



ACCORD

MAINTENANCE, REPAIR and CONSTRUCTION 99

BODY REPAIR MANUAL 99

TURBO DIESEL SUPPLEMENT 99

ACCORD 5 DOOR/ACCORD 5 DOOR TURBO DIESEL SUPPLEMENT 00

ACCORD 4/5 DOOR SUPPLEMENT 00

ACCORD/ACCORD 5 DOOR 01





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


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

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

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Outline of Model Change

- ◆ Shift schedule has been modified.

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Outline of model change

♦ 5-door Hatchback models have been added. The differences between these models and 4-door Sedan models are as follows:

- The component parts of the rear window
- The component parts of the interior trim
- The Headliner and attaching clips
- The rear seat and related parts
- The tailgate and related parts
- Type V emblems (for some models)
- The rear pillar moulding
- The fuel lid opener and the fuel lid opener cable wiring

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Outline of Model Changes

- ♦ 5-door model has been added.
- ♦ Accessory socket has been added.
- ♦ High mount brake light has been changed.
- ♦ Tailgate light has been added.
- ♦ Stereo amplifier has been changed and the tweeter has been added.
- ♦ Rear window wiper/washer has been added.
- ♦ Keyless entry/security alarm system has been changed.

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NOTE: Refer to 1999 ACCORD Shop Manual, P/N. 62S1A00B, for the items not shown in this section.

Outline of Model Change

- ♦ The locations of the navigation unit and GPS antenna have been changed.

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NOTE: Refer to the 1999 Accord Shop Manual, P/N 62S1A00B for the items not shown in this section.

Outline of Model Change

♦ 5-Door Hatchback models have been added. The differences between these models and 4-door Sedan models are as follows :

- The rear seat belt
- The rear centre belt

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- ◆ Replacement procedure of the alternator for turbocharger engine has been changed.

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Outline of Model Change

- ♦ The cooling system components and operation have been changed.

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Outline of Model Change

- ♦ 20T2N engine (turbocharger with intercooler) has been modified.

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NOTE: Refer to the '99 Accord TurboDiesel Shop Manual Supplement (P/N 62S1A20) for the item not shown in this section.

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The refit of the clutch assembly has been changed.

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NOTE: Refer to the '99 Accord Turbo Diesel Shop Manual Supplement (P/N 62S1A20) for the item not shown in this section.

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The special tool of refit of the differential oil seals has been added.

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Wiring Diagrams

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This Accord Sedan SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box. Some types include seat belt tensioners located in the front seat belt retractors and some types include airbags located in the front seat-backs.

Information necessary to safely service the SRS is included in this Shop Manual.

Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Honda dealer.



WARNING

- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ SRS electrical wiring harnesses are indicated with yellow colour coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

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SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If electrical maintenance is required)

This Accord Sedan SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box, and some types include seat belt tensioners located in the front seat belt retractors, and some types include side airbags located in the front seat-backs.

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Wiring Diagrams

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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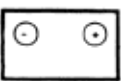
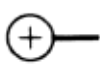






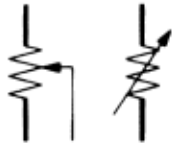

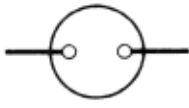







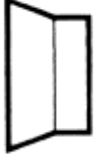

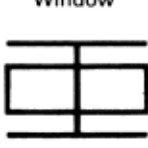
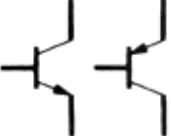


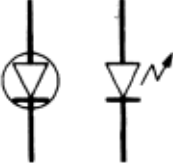
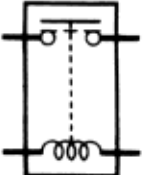
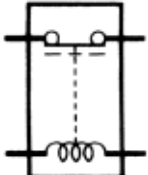





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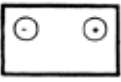







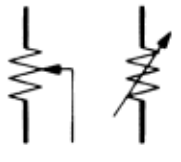

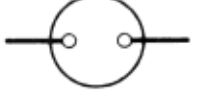









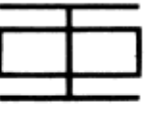
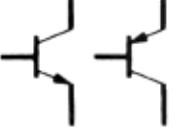


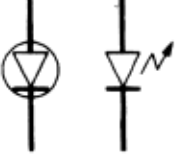
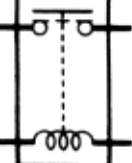
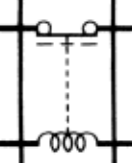



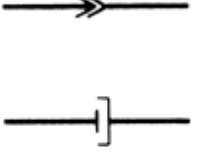

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Schematic symbols

BATTERY  	GROUND Ground terminal  Component ground 		FUSE 	COIL, SOLENOID 	CIGARETTE LIGHTER 
RESISTOR 	VARIABLE RESISTOR 	THERMISTOR 	IGNITION SWITCH 	BULB 	HEATER 
MOTOR 	PUMP 	CIRCUIT BREAKER 	HORN 	DIODE 	SPEAKER, BUZZER 
ANTENNA Mast  Window 		TRANSISTOR (Tr) 	SWITCH (In normal position) Normally open switch  Normally closed switch 		LIGHT EMITTING DIODE (LED) 
RELAY (In normal position) Normally open relay  Normally closed relay 		CONDENSER 	CONNECTION Input  Output 	CONNECTOR 	REED SWITCH 

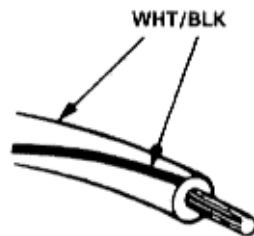
BATTERY  	GROUND Ground terminal  Component ground 		FUSE 	COIL, SOLENOID 	CIGARETTE LIGHTER 
RESISTOR 	VARIABLE RESISTOR 	THERMISTOR 	IGNITION SWITCH 	BULB 	HEATER 
MOTOR 	PUMP 	CIRCUIT BREAKER 	HORN 	DIODE 	SPEAKER, BUZZER 
ANTENNA Mast  Window 		TRANSISTOR (Tr) 	SWITCH (In normal position) Normally open switch  Normally closed switch 		LIGHT EMITTING DIODE (LED) 
RELAY (In normal position) Normally open relay  Normally closed relay 		CONDENSER 	CONNECTION Input  Output 	CONNECTOR 	REED SWITCH 

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics :

WHT	White	PNK	Pink
YEL	Yellow	BRN	Brown
BLK	Black	GRY	Grey
BLU	Blue	PUR	Purple
GRN	Green	LT BLU	Light Blue
RED	Red	LT GRN	Light Green
ORN	Orange		

The wire insulation has one color or one color with another color stripe. The second color is the stripe.



NOTE : Different wires with the same color in the same system have been given number suffixes to distinguish them (for example, YEL1 and YEL2 are not the same).

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Engine Index

Cylinder Head/Valve Train **6-B-1**

F18B2, F18B4 engine

Intake Manifold/Exhaust System **9-1**

Outline of Model Change

♦ VTEC Control System of F18B2 and F18B4 engine has been changed. For related information, refer to the F10B6 engine information in the 1999 Accord Shop Manual (P/S: 62S1A00A).

Engine Index

Cylinder Head/Vavle Train **6-B-1**

F18B2, F18B4 engine

Intake Manifold/Exhaust System **9-1**

Exhaust Pipe and Muffler

Replacement **9-2**

Outline of Model Change

Secondary heated oxygen sensor has been adopted on F18B2 engine (M/T) and F18B4 engine (M/T) models.

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F18B2, F18B3, F18B4 engine

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Outline of Model Change

♦ F18B2, F18B4 engine (KE, KG, KS and KR models) have been changed. For related information, refer to the F18B2, F18B3, F18B4 engine information in the 1999 Accord Shop Manual (P/N: 62S1A00A).

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NOTE: Refer to the 1999 Accord Shop Manual, P/N 62S1A00B and the 1999 Accord 5 Door/Accord 5 Door Turbo Diesel Shop Manual Supplement, P/N 62S1A21 for the items not shown in this section.

Outline of model change

- ♦ On 5-door Hatchback models, the tailgate latch and tailgate lock cylinder replacement procedures have been changed

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The symbols in the mass production body welding diagrams and in the replacement illustrations carry the following meanings:

〈Mass Production Body Welding Diagram〉

✱ : Spot welding
 ▽ : MIG welding
 × : 2-plate welding
 ⊗ : 3-plate welding
 ⊠ : 4-plate welding
 P= : Spot welding pitch
 Unit: mm (in.)
 (): The number of spot welds.

〈Replacement Illustration〉

X : Spot welding
 ● : MIG welding

NOTE: The welding symbols in the illustrations don't show exact welding locations. For exact welding locations, refer to the mass production body welding diagrams.

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NOTE: Seal the following areas to prevent air leaks, water leaks and rust.

▶ : Sealing locations

Spot Sealer : 3M #08892 (internal)

: 3M #08893 (External)

Use materials above or equivalents.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This Accord Sedan SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box and some types include seat belt tensioner located in the front seat belt retractors, and some types include side airbags located in the front seat-backs.

Information necessary to safely service the SRS is included in this Shop Manual.

Items marked with an asterisk (*) on the contents page include, or are located near SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Honda dealer.



WARNING

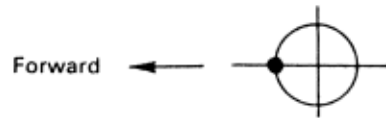
- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ All SRS electrical wiring harnesses are indicated with yellow color. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

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NOTE: Measuring dimensions show the distance between the forward or upper edge of positioning bosses and/or holes shown in the detail sketches.

Measuring point (Black dots)



F: Forward

C: Center

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Outline of Model Change

* 20T2N engine (turbocharger with intercooler) has been added

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Outline of Model Change

* 20T2N engine (turbocharger with intercooler) has been added.

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Outline of Model Change

* 20T2N engine (turbocharger with intercooler) has been added

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* 20T2N engine (turbocharger with intercooler) has been added.

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Note: Refer to the '99 Accord Shop Manual, P/N 62S 1A00, for the items not shown in this section.

Outline of Model Changes

- ♦ The 20T2N engine (turbocharger with intercooler) has been added.
 - The component location is different
 - The circuit diagram is different
 - The A/C system torque specifications is different
 - The compressor is different
 - The condenser is different
 - The A/C service tips and precaution is different.

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Outline of Model Changes

- ♦ The relay and control unit locations have been changed.
- ♦ The wire harness and ground locations have been changed.
- ♦ The power and ground distributions have been changed.
- ♦ The vehicle speed sensor has been changed; related information was entered.

All of the above -mentioned changes have been refracted in Relay and Control Unit Locations, Wire Harness and Ground Locations, Power Distribution and Ground Distribution.

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INTRODUCTION

How to Use This Manual

This manual is divided into 24 sections. Click on the chapter you want to look at from the opening screen, this is followed by a contents list of the chapter, click on the page you require. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each section includes:

1. A table of contents, or an exploded view index showing:
 - Parts disassembly sequence.
 - Bolt torques and thread sizes.
 - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

⚠ WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

⚠ CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTICE : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE : Gives helpful information.

⚠ CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings and cautions cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of each conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardized.

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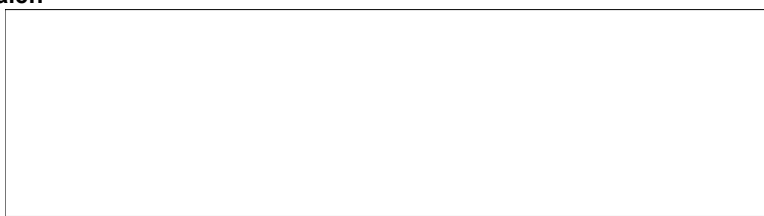
As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This Accord Sedan SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box. Some types include seat belt tensioner located in the front seat belt retractors, and some types include side airbags located in the front seat-backs. Information necessary to safely service the SRS is included in this Shop Manual.

Items marked with an asterisk (*) on the contents page include, or are located near SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Honda dealer.

General Info	
Specifications	
Maintenance	
Engine Electrical	
Engine	
Cooling	
Fuel & Emmissions	
Transaxle	
Steering	
Suspension	
Brakes (including ABS)	
Body	
Heating & Air Conditioning	
Body Electrical	
Restraints	





WARNING

- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ All SRS electrical wiring harnesses are indicated with yellow color. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.


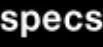













INTRODUCTION

How to Use This Manual

This supplement contains information for the 1999 HONDA Accord 5 Door/Accord 5 Door Turbo Diesel. Refer to following shop manual for service procedures and data not included in this supplement.

Description	Code No.
HONDA Accord MAINTENANCE, REPAIR and CONSTRUCTION 99 VOL. 1 and VOL. 2	62S1A00A 62S1A00B

This manual is divided into 24 sections. Click on the chapter you want to look at from the opening screen, this is followed by a contents list of the chapter, click on the page you require. The symbols printed at the top corner of each page can also be used as a quick reference system.

General Info	
Specifications	
Maintenance	
Engine Electrical	
Engine	
Cooling	
Fuel & Emmissions	
* Transaxle	
* Steering	
Suspension	
* Brakes (including ABS)	
* Body	
* Heating & Air Conditioning	
* Body Electrical	
* Restraints	

Special Information

WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTICE : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE : Gives helpful information.

CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause PERSONAL INJURY, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardized.

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As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This model has an SRS which includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box, seat belt tensioners located in the front seat belt retractors and some types include side airbags located in the front seat-backs. Information necessary to safely service the SRS is included in this '99 Accord Shop Manual, 62S1A00.

Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorised Honda dealer.





WARNING

- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorised Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ SRS electrical wiring harnesses are indicated by yellow colour coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

Outline of Model Changes

ITEM	DESCRIPTION	99 MODEL	REFERENCE SECTION
General	Added <ul style="list-style-type: none"> ♦ 5 door model 	O	1
Body	Changed <ul style="list-style-type: none"> ♦ Component parts of the rear window ♦ Component parts of the interior trim ♦ Headliner and attached clips ♦ Rear seat and related parts ♦ Tailgate and related parts Added <ul style="list-style-type: none"> ♦ Type V emblems for some models ♦ Rear pillar moulding Changed <ul style="list-style-type: none"> ♦ Fuel lid opener and fuel lid opener cable 	O	20
Body Electrical	Added <ul style="list-style-type: none"> ♦ Accessory socket ♦ Tailgate light ♦ Tweeter speaker ♦ Rear window wiper and washer Changed <ul style="list-style-type: none"> ♦ High mount brake light ♦ Stereo amplifier ♦ Keyless entry and security alarm system 	O	23
Navigation System	Changed <ul style="list-style-type: none"> ♦ Locations of the navigation unit and GPS antenna 	O	23
Seat Belts	Changed <ul style="list-style-type: none"> ♦ Rear seat belt Equipped <ul style="list-style-type: none"> ♦ Rear centre shoulder belt 	O	24

INTRODUCTION

How to Use This Manual

This manual covers the repair of a '99 Accord 5 Door/Accord 5 Door Turbo Diesel that has been involved in an accident, and it describes the work related to the replacement of damaged body parts.

Please read through these instructions and familiarise yourself with them before actually using this manual.

NOTE: Refer to the '99 Accord Body Repair Manual, (P/N 62S1A30), for the items not shown in this manual, and refer to the '99 Accord Shop Manual (P/N 62S1A00), '9 Accord Turbo Diesel Shop Manual Supplement (P/N 62S1A20) and '99 Accord 5 Door/Accord 5 Door Turbo Diesel Shop Manual Supplement (P/N 62S1A21) for specifications, wire harness locations, safety stand support points etc.

Special Information



WARNING : Indicates a strong possibility of severe personal injury or death if instructions are not followed.



CAUTION

CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.



CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done or of the possible hazardous consequences of each conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardised.

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Service Precautions

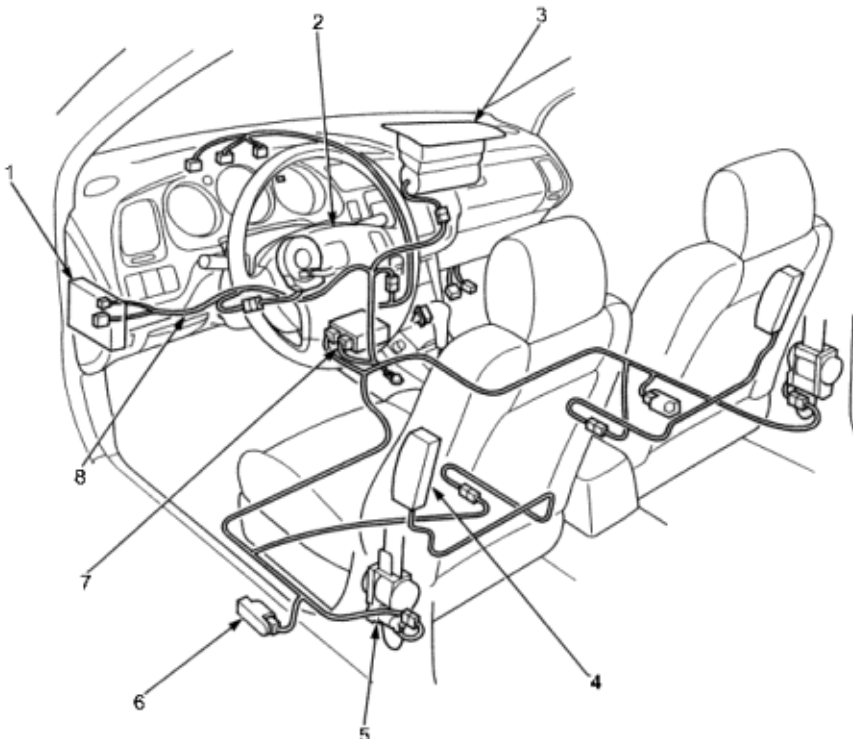
Supplemental Restraint System (SRS)

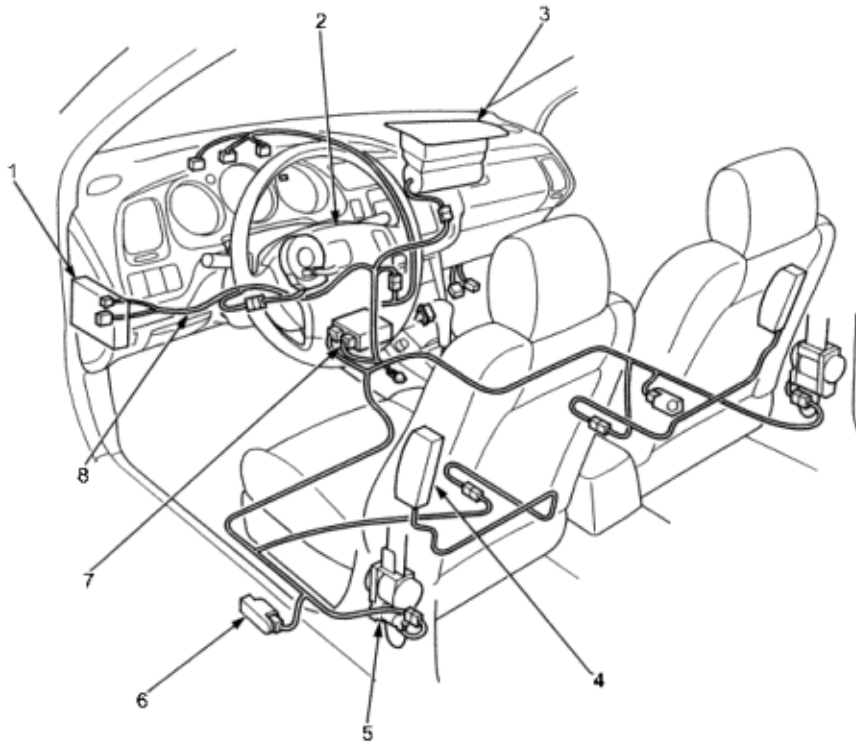
The Accord 5 Door/Accord 5 Door Turbo Diesel SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box and some types include seat belt tensioners located in the seat belt retractors, and some types include side airbags located in the front seat-backs. The SRS unit is not part of the airbag assembly, has built-in sensors and side impact sensors.

NOTE: The following precautions should be observed when performing sheet metal work, paint work and repair work around the locations of the SRS components.

1. The SRS unit (including safe sensor and impact sensor) is located under the dashboard, and impact sensor is located inside the sill. Avoid any strong impact with a hammer or other tools when repairing the front side frame, the lower part of the dashboard and the side sill. Do not apply heat to these areas with a torch, etc.
2. All SRS electrical wiring harnesses are located under the lower part of the dashboard below the dashboard panel. (All SRS electrical wiring harnesses are covered with yellow insulation.) Care should be taken not to damage the harness when repairing this area.
3. Do not apply heat of more than 100°C (212°F) when drying painted surfaces anywhere around the locations of SRS components.
4. If strong impact or high temperature needs to be applied to the areas around the locations of SRS components, remove the components before performing the repair work.
5. If any of the SRS related components are damaged or deformed, be sure to replace them.

NOTE: Refer to Restraints section of the Shop Manual for removal and replacement of SRS related components.





1. UNDER-DASH FUSE/RELAY BOX
2. DRIVER'S AIRBAG ASSEMBLY
3. PASSENGER'S AIRBAG ASSEMBLY
4. SIDE AIRBAG ASSEMBLY
5. SEAT BELT TENSIONER
6. SIDE IMPACT SENSOR
7. SRS UNIT
(With built-in sensor)
8. SRS MAIN HARNESS
(Covered with yellow insulation)

General Safety Precautions

Before beginning work:

- ♦ Disconnect the battery to reduce the possibility of fire caused by electrical shorts.
- ♦ Check for fuel leaks and repair as necessary.
- ♦ Remove the fuel tank and/or fuel lines if welding equipment is to be used near the fuel system.
- ♦ Before welding, sanding or cutting, protect carpets and seats with fire-proof covers.

Use standard safety equipment when spraying paint, welding, cutting, sanding, or grinding. Standard safety equipment includes:

Respirator and filter masks- Designed to filter out toxic fumes, mist, dust or other airborne particles. Use a respirator or filter mask designed to protect you from the hazards of the particular job; some respirators, for example, are designed to filter out only dust and airborne particles, not toxic fumes.

Safety goggles or glasses- Designed to protect your eyes from projectiles, dust particles, or splashing liquid.

Gloves- Rubber gloves protect against corrosive chemicals. Welding gloves protect against burns and abrasions caused by welding, sanding or grinding.

Safety shoes- Non-slip soles protect against slipping. Metal toe inserts protect against falling objects.

Ear plugs- Protect eardrums from harmful noise levels.

During work:

- ♦ Do not smoke while working near the fuel system.
- ♦ Deposit gas or solvent-soaked shop towels in an approved container.
- ♦ Always attach a safety cable when using a hydraulic ram or a frame straightening table; do not stand in direct line with the chains used on such equipment.
- ♦ Follow standard safety practices when using toxic or flammable liquids.

INTRODUCTION

How to Use This Manual

This supplement contains information for the 2000 Accord Turbo Diesel/Accord 5 Door Turbo Diesel. Refer to following shop manual for service procedures and data not included in this supplement.

Description	Code No.
Accord MAINTENANCE, REPAIR and CONSTRUCTION 99 VOL. 1 and VOL. 2	62S1A00A 62S1A00B
Accord Turbo Diesel SUPPLEMENT	62S1A20
Accord 5 Door/Accord 5 Door Turbo Diesel SUPPLEMENT	62S1A21
Accord 5 Door/Accord 5 Door Turbo Diesel SUPPLEMENT	62S1A22

Each major section starts with a contents page, listing the information contained in the relevant sections.

Adjustment and repair operations include reference to Service Tool numbers and the associated illustration depicts the tool. Where usage is not obvious the tool is shown in use. Adjustment and Repair operations also include reference to wear limits, relevant data, torque figures and specialist information and useful assembly details.

General Info



Engine Electrical



Cooling



Fuel & Emissions



*Transaxle



Special Information



WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.



CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.



NOTICE : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE: Gives helpful information.

CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause PERSONAL INJURY, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommend by HONDA, might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardised.

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As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This model has an SRS which includes a driver's airbag in the steering wheel hub and a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors and some types include side airbags in the front seat-backs.

Information necessary to safely service the SRS is included in the '99 Accord Shop Manual, 62S1A00.

Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorised Honda dealer.





WARNING

- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorised Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ SRS electrical wiring harnesses are identified by yellow colour coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

ITEM	DESCRIPTION	99 MODEL	99MODEL	REFERENCE SECTION
General	Added <ul style="list-style-type: none"> ♦ 5 door model 	O		-
Engine Electrical	Changed <ul style="list-style-type: none"> ♦ Alternator replacement procedure 		O	4
Cooling	Changed <ul style="list-style-type: none"> ♦ Cooling system components and operation 		O	10
Fuel and Emission	Modified <ul style="list-style-type: none"> ♦ 20T2N engine (turbocharger with intercooler) 		O	11
Clutch	Changed <ul style="list-style-type: none"> ♦ Refit of the clutch assembly 		O	12
Manual Transmission	Added <ul style="list-style-type: none"> ♦ Special tool of refit of the differential oil seals 		O	13
Body	Changed <ul style="list-style-type: none"> ♦ Component parts of the rear window ♦ Component parts of the interior trim ♦ Headliner and attached clips ♦ Rear seat and related parts ♦ Tailgate and related parts Added <ul style="list-style-type: none"> ♦ Type V emblems for some models ♦ Rear pillar moulding Changed <ul style="list-style-type: none"> ♦ Fuel lid opener and fuel lid opener cable 	O		-
Body Electrical	Added <ul style="list-style-type: none"> ♦ Accessory socket ♦ Tailgate light ♦ Tweeter speaker ♦ Rear window wiper and washer Changed <ul style="list-style-type: none"> ♦ High mount brake light ♦ Stereo amplifier ♦ Keyless entry and security alarm system 	O		-
Navigation System	Changed <ul style="list-style-type: none"> ♦ Locations of the navigation unit and GPS antenna 	O		-
Seat Belts	Changed <ul style="list-style-type: none"> ♦ Rear seat belt Equipped <ul style="list-style-type: none"> ♦ Rear centre shoulder belt 	O		-

INTRODUCTION

How to Use This Manual

This manual covers the repair of an Accord that has been involved in an accident, and it describes the work related to the replacement of damaged body parts.

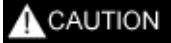
Please read through these instructions and familiarize yourself with them before actually using this manual.

NOTE: Refer to the Accord Shop Manual P/N 62S1A00, for specifications, wire harness locations, safety stand support points etc.

Special Information



WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.



CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings and cautions cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of each conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardized.

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Service Precautions

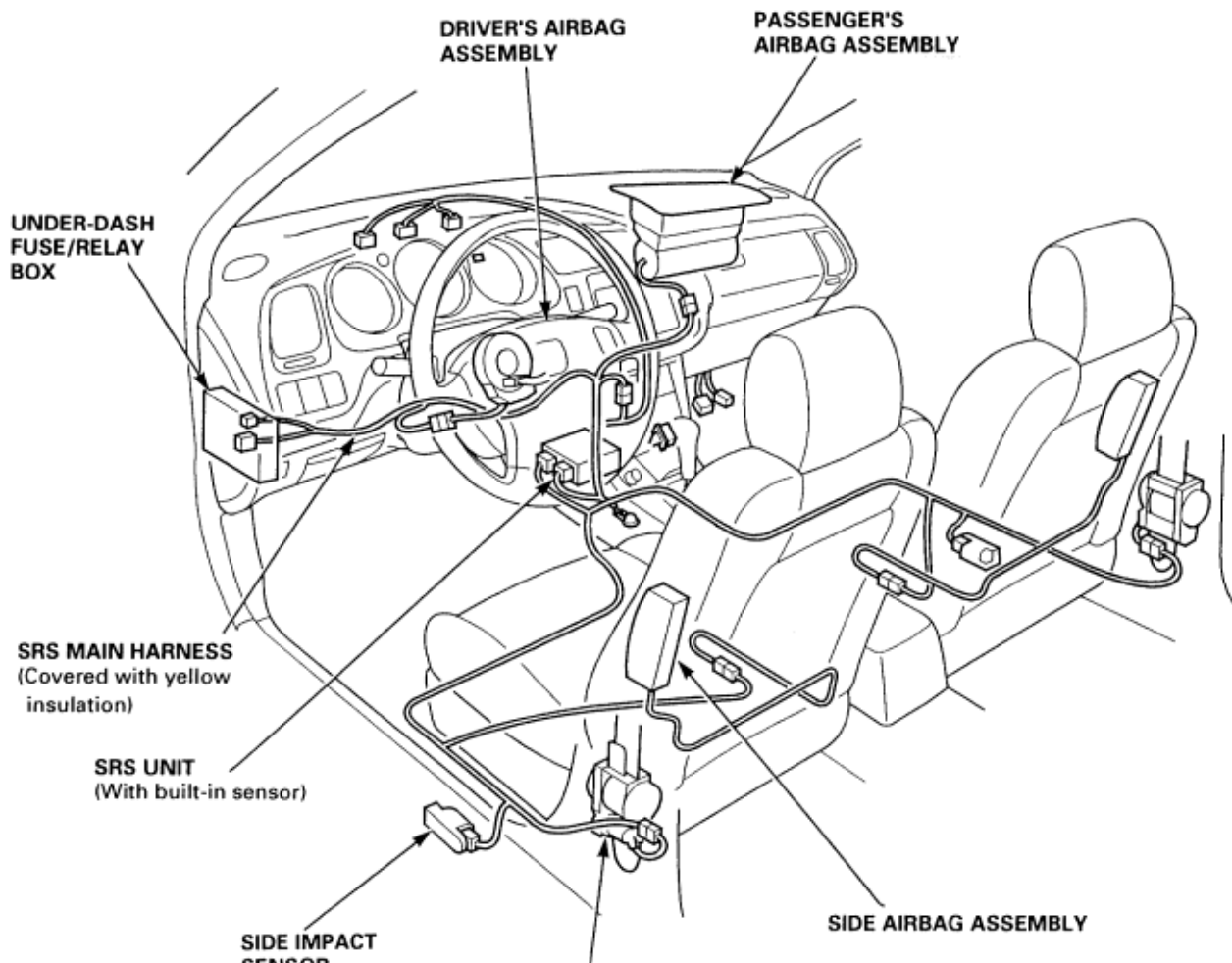
Supplemental Restraint System (SRS)

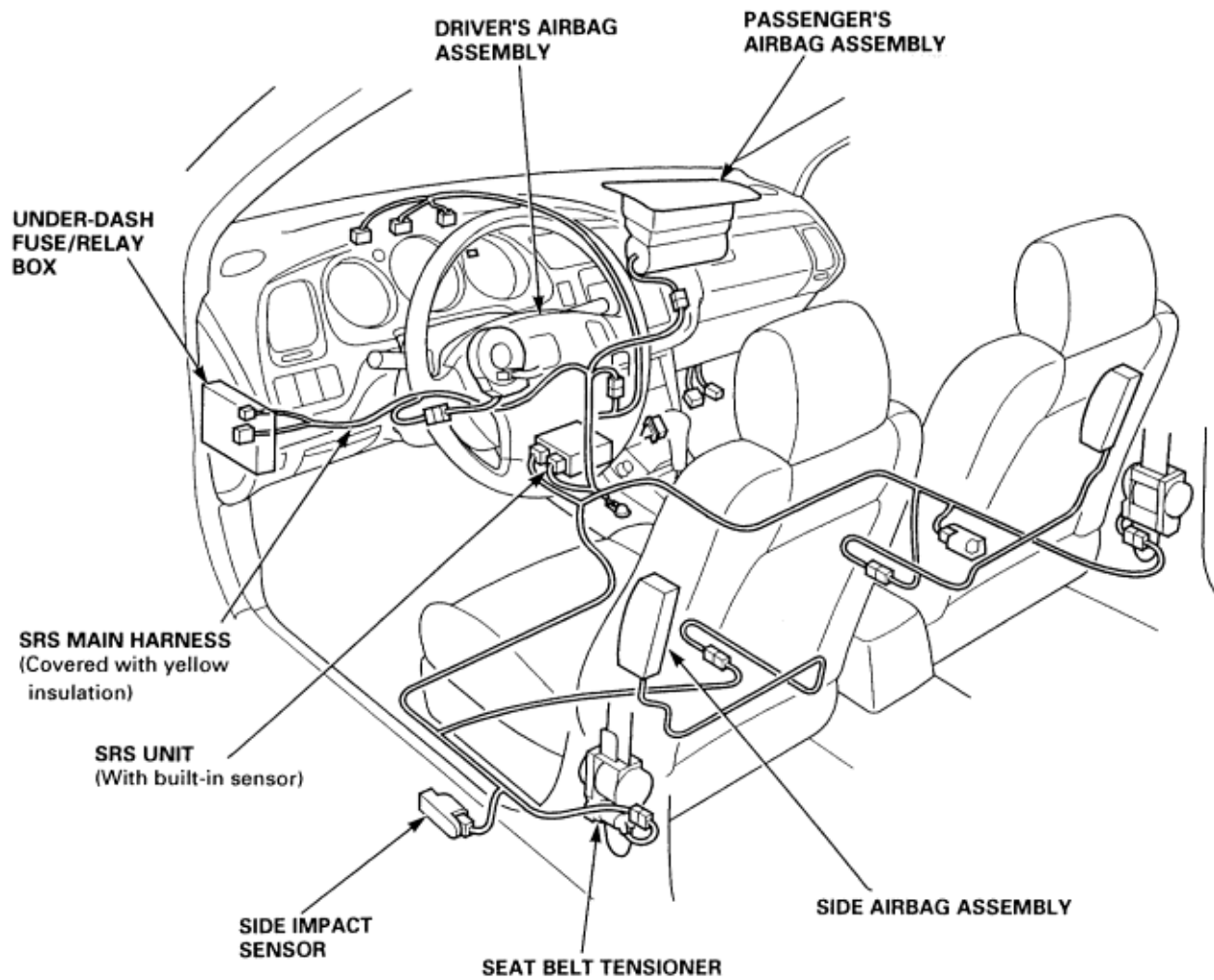
The Accord SRS includes a driver's airbag located in the steering wheel hub and a front passenger's airbag located in the dashboard above the glove box, and some types include seat belt tensioners located in the front seat belt retractors, and some types include side airbags located in the front seat-backs. The SRS unit is not part of the airbag assembly, has built-in sensors and side impact sensors.

NOTE: The following precautions should be observed when performing sheet metal work, paint work and repair work around the locations of the SRS components.

- The SRS unit (including safety sensor and impact sensor) is located under the dashboard, the impact sensor is located inside the sill. Avoid strong impact with a hammer or other tools when repairing the front side frame, the lower part of the dashboard and side sill. Do not apply heat to these areas with a torch, etc.
- All SRS electrical wiring harnesses are located under the lower part of the dashboard, below the dashboard panel. (All SRS electrical wiring harnesses are covered with yellow insulation.) Care should be taken not to damage the harness when repairing this area.
- Do not apply heat of more than 100°C (212°F) when drying painted surfaces anywhere around the locations of SRS components.
- If strong impact or high temperature needs to be applied to the areas around the locations of SRS components, remove the components before performing the repair work.
- If any of the SRS related components are damaged or deformed, be sure to replace them.

NOTE: Refer to the Restraints section of the Shop Manual for removal and replacement of SRS related components.





General Safety Precautions

Before beginning work:

- ♦ Disconnect the battery to reduce the possibility of fire caused by electrical shorts.
- ♦ Check for fuel leaks and repair as necessary.
- ♦ Remove the fuel tank and/or fuel lines if welding equipment is to be used near the fuel system.
- ♦ Before welding, sanding or cutting, protect carpets and seats with fire-proof covers.

Use standard safety equipment when spraying paint, welding, cutting, sanding or grinding.

Standard safety equipment includes:

Respirator and filter masks - Designed to filter out toxic fumes, mist, dust or other airborne particles. Use a respirator or filter mask designed to protect you from the hazards of the particular job; some respirators, for example, are designed to filter out only dust and airborne particles, not toxic fumes.

Safety goggles or glasses - Designed to protect your eyes from projectiles, dust particles, or splashing liquid.

Gloves - Rubber gloves protect against corrosive chemicals. Welding gloves protect against burns and abrasions caused by welding, sanding, or grinding.

Safety shoes - Non-slip soles protect against slipping. Metal toe inserts protect against falling objects.

Ear plugs - Protect eardrums from harmful noise levels.

During work:

- ♦ Do not smoke while working near the fuel system.
- ♦ Deposit gas or solvent-soaked towels in an approved container
- ♦ Always attach a safety cable when using a hydraulic ram or a frame straightening table; do not stand in direct line with the chains used on such equipment.
- ♦ Follow standard safety practices when using toxic or flammable liquids.


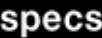




INTRODUCTION

How to Use This Manual

This supplement contains information for the 2000 HONDA Accord/Accord 5 Door. Refer to following shop manual for service procedures and data not included in this supplement.

Description	Code No.
HONDA Accord MAINTENANCE, REPAIR and CONSTRUCTION 99 VOL. 1 and VOL. 2	62S1A00A 62S1A00B
HONDA Accord 5 Door/Accord 5 Door Turbo Diesel SUPPLEMENT 99	62S1A21
HONDA Accord Turbo Diesel/Accord 5 Door Turbo Diesel SUPPLEMENT 99	62S1A22
HONDA Accord/Accord 5 Door Turbo Diesel Fuel and Emissions SUPPLEMENT 99	62S1A23

This manual is divided into 6 sections. Click on the chapter you want to look at from the opening screen, this is followed by a contents list of the chapter, click on the page you require. The symbols printed at the top corner of each page can also be used as a quick reference system.

General Info	
Specifications	
Maintenance	
Engine	
Fuel & Emissions	
* Body	

Special Information



WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.



CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.



NOTICE : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE: Gives helpful information.



CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause PERSONAL INJURY, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardised.

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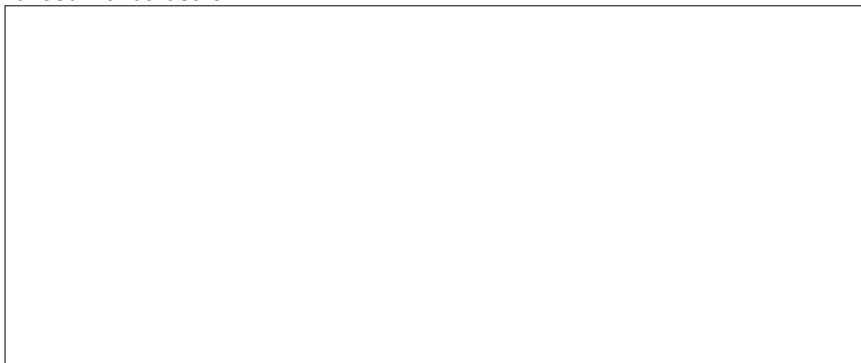
As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This model has an SRS which includes a driver's airbag located in the steering wheel hub and a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors and some types include side airbags in the front seat-backs.

Information necessary to safely service the SRS is included in this '99 Accord Shop Manual, 62S1A00.

Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorised Honda dealer.





WARNING

- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorised Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ SRS electrical wiring harnesses are identified by yellow colour coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

Outline of Model Changes

ITEM	DESCRIPTION	99 MODEL	99 MODEL	99 MODEL	2000 MODEL	REFERENCE SECTION
General	Added <ul style="list-style-type: none"> ♦ 5 door model 	○	○			-
Engine Electrical	Changed <ul style="list-style-type: none"> ♦ Alternator replacement procedure 		○			-
Engine	Changed <ul style="list-style-type: none"> ♦ VTEC Control System of F18B2 and F18B4 engine 				○	6
Engine	Adapted <ul style="list-style-type: none"> ♦ Secondary heated Oxygen sensor on F18B2 engine (M/T) and F18B4 engine (M/T) 				○	9
Cooling	Changed <ul style="list-style-type: none"> ♦ Cooling system components and operation 		○			-
Fuel and Emission	Modified <ul style="list-style-type: none"> ♦ 20T2N engine (turbocharger with intercooler) 			○		-
Fuel and Emission	Changed <ul style="list-style-type: none"> ♦ F18B2, F18B4 engine (KE, KG, KS and KR models) 				○	11
Clutch	Changed <ul style="list-style-type: none"> ♦ Refit of the clutch assembly 		○			-
Manual Transmission	Added <ul style="list-style-type: none"> ♦ Special tool of refit of the differential oil seals 		○			-
Body	Changed <ul style="list-style-type: none"> ♦ Component parts of the rear window ♦ Component parts of the interior trim ♦ Headliner and attached clips ♦ Rear seat and related parts ♦ Tailgate and related parts Added <ul style="list-style-type: none"> ♦ Type V emblems for some models ♦ Rear pillar moulding Changed <ul style="list-style-type: none"> ♦ Fuel lid opener and fuel lid opener cable 	○				-
Body	Changed <ul style="list-style-type: none"> ♦ Tailgate latch and tailgate lock cylinder replacement procedure for 5 door models 				○	20
Body Electrical	Added <ul style="list-style-type: none"> ♦ Accessory socket ♦ Tailgate light ♦ Tweeter speaker ♦ Rear window wiper and washer Changed <ul style="list-style-type: none"> ♦ High mount brake light ♦ Stereo amplifier ♦ Keyless entry and security alarm system 	○				-
Navigation System	Changed <ul style="list-style-type: none"> ♦ Locations of the navigation unit and GPS antenna 	○				-
Seat Belts	Changed <ul style="list-style-type: none"> ♦ Rear seat belt Equipped <ul style="list-style-type: none"> ♦ Rear centre shoulder belt 	○				-

INTRODUCTION

How to Use This Manual

This Repair Manual Supplement contains information on the components and systems unique to 99 Accord Turbo Diesel models. This supplement should be used in conjunction with Honda Accord Maintenance, Repair and Construction 99 Manual 62S1A00.

Each major section starts with a contents page, listing the information contained in the relevant sections.

Adjustment and repair operations include reference to Service Tool numbers and the associated illustration depicts the tool. Where usage is not obvious the tool is shown in use. Adjustment and Repair operations also include reference to wear limits, relevant data, torque figures and specialist information and useful assembly details.

Special Information

WARNING : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTICE : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE : Gives helpful information.

CAUTION

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings and cautions cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of each conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardized.

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As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This Accord Sedan SRS includes a driver's airbag located in the steering wheel hub and a passenger's airbag located in the dashboard above the glove box and some types include seat belt tensioner located in the front seat belt retractors, and some types include side airbags located in the front seat-backs.

Information necessary to safely service the SRS is included in the Shop Manual 62S1A00.

Items marked with an asterisk (*) on the contents page include, or are located near SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorised Honda dealer.

General Info	
Specifications	
Maintenance	
Engine Electrical	
Engine	
Cooling	
Fuel & Emissions	
Transaxle	
Steering	
Suspension	
Brakes (including ABS)	
Body	
Heating & Air Conditioning	
Body Electrical	
Restraints	



WARNING

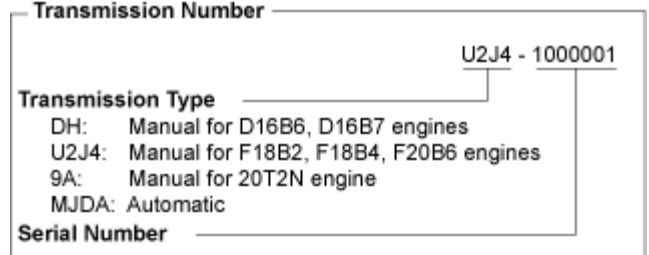
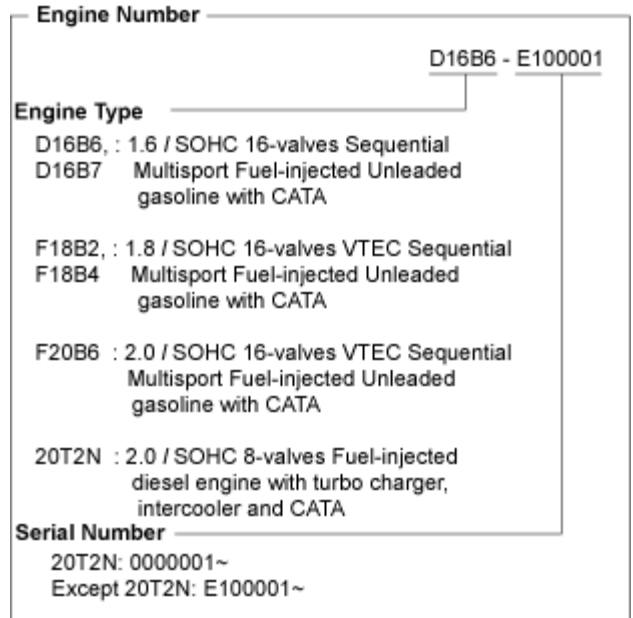
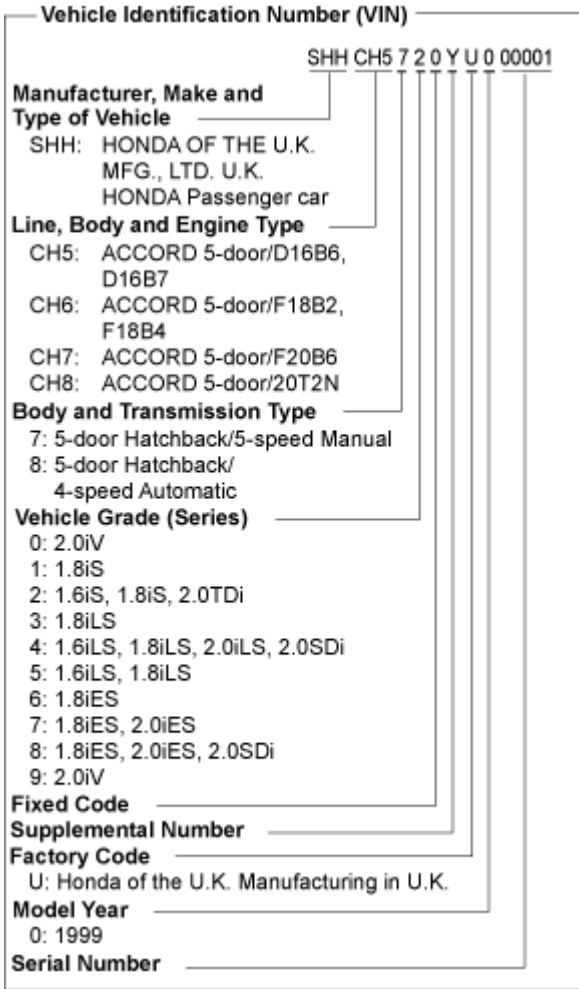
- ♦ To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorised Honda dealer.
- ♦ Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- ♦ All SRS electrical wiring harnesses are indicated with yellow colour. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

References

Reference to the LH or RH side given in this manual are made when viewing the vehicle from the rear. With the engine and gearbox assembly removed, the crankshaft pulley end of the engine is referred to as the front. Operations covered in this manual do not include reference to testing the vehicle after repair. It is essential that work is inspected and tested after completion and if necessary a road test of the vehicle carried out particularly where safety related items are concerned.

Dimensions

The dimensions quoted are to design engineering specification with Service limits where applicable. During the period of running-in from new, certain adjustments may vary from the specification figures given in this manual. These will be reset by the dealer at the after sales service and thereafter should be maintained at the figures specified in this manual.



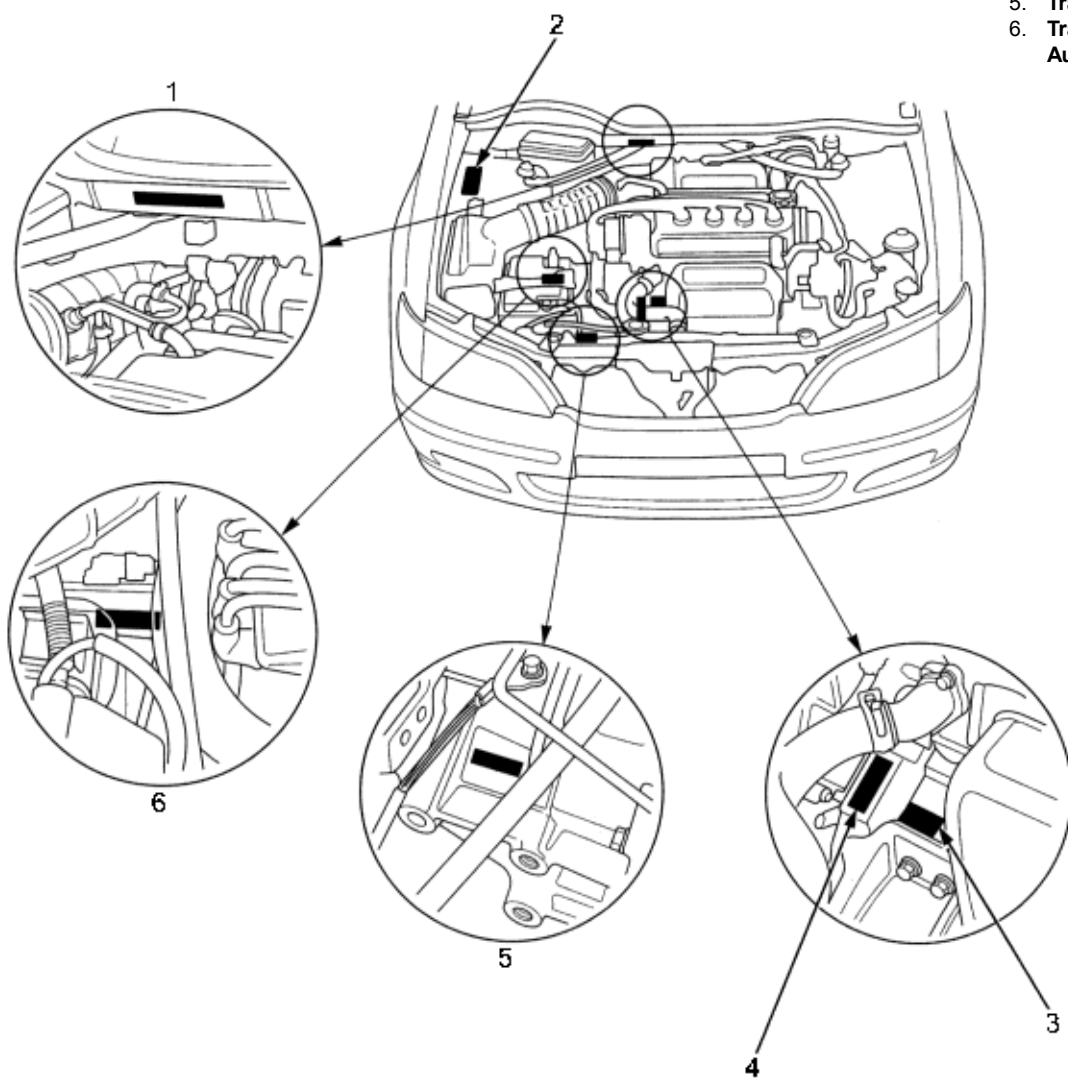
Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD 5-door	KE	1.6iS	5MT	SHHCH5720YU000001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU000001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iS	4AT	SHHCH6820YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iLS	5MT	SHHCH6740YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	5MT	SHHCH6770YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	5MT	SHHCH6780YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	4AT	SHHCH6870YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	4AT	SHHCH6880YU000001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iLS	4AT	SHHCH7840YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	4AT	SHHCH7870YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	4AT	SHHCH7880YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iV	5MT	SHHCH7790YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iV	5MT	SHHCH7700YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iV	4AT	SHHCH7890YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iV	4AT	SHHCH7800YU000001~	F20B6-E100001~	MDJA-1000001~
2.0TDi	5MT	SHHCH8720YU000001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8780YU000001~	20T2N-0000001~	9A-1000001~		
ACCORD 5-door	KG	1.6iS	5MT	SHHCH5720YU000001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU000001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5750YU000001~	D16B7-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iS	5MT	SHHCH6710YU000001~	F18B4-E100001~	U2J4-1000001~
		1.8iS	4AT	SHHCH6820YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iLS	5MT	SHHCH6730YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6750YU000001~	F18B4-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	5MT	SHHCH6760YU000001~	F18B4-E100001~	U2J4-1000001~
		1.8iES	5MT	SHHCH6770YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	5MT	SHHCH6780YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	4AT	SHHCH6870YU000001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	4AT	SHHCH6880YU000001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iLS	4AT	SHHCH7840YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU000001~	F20B6-E100001~	U2J4-1000001~
2.0iES	4AT	SHHCH7870YU000001~	F20B6-E100001~	MDJA-1000001~		
2.0iES	4AT	SHHCH7880YU000001~	F20B6-E100001~	MDJA-1000001~		
2.0iV	5MT	SHHCH7790YU000001~	F20B6-E100001~	U2J4-1000001~		
2.0iV	5MT	SHHCH7700YU000001~	F20B6-E100001~	U2J4-1000001~		
2.0iV	4AT	SHHCH7890YU000001~	F20B6-E100001~	MDJA-1000001~		
2.0iV	4AT	SHHCH7800YU000001~	F20B6-E100001~	MDJA-1000001~		
2.0TDi	5MT	SHHCH8720YU000001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8740YU000001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8780YU000001~	20T2N-0000001~	9A-1000001~		

Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD 5-door	KS	1.6iS	5MT	SHHCH5720YU000001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU000001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU000001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU000001~	F20B6-E100001~	U2J4-1000001~
ACCORD 5-door	KR	2.0iES	5MT	SHHCH7770YU000001~	F20B6-E100001~	U2J4-1000001~
		1.6iS	5MT	SHHCH5720YU000001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU000001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU000001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU000001~	F18B2-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU000001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	4AT	SHHCH7870YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	4AT	SHHCH7880YU000001~	F20B6-E100001~	MDJA-1000001~
		2.0TDi	5MT	SHHCH8720YU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8740YU000001~	20T2N-0000001~	9A-1000001~

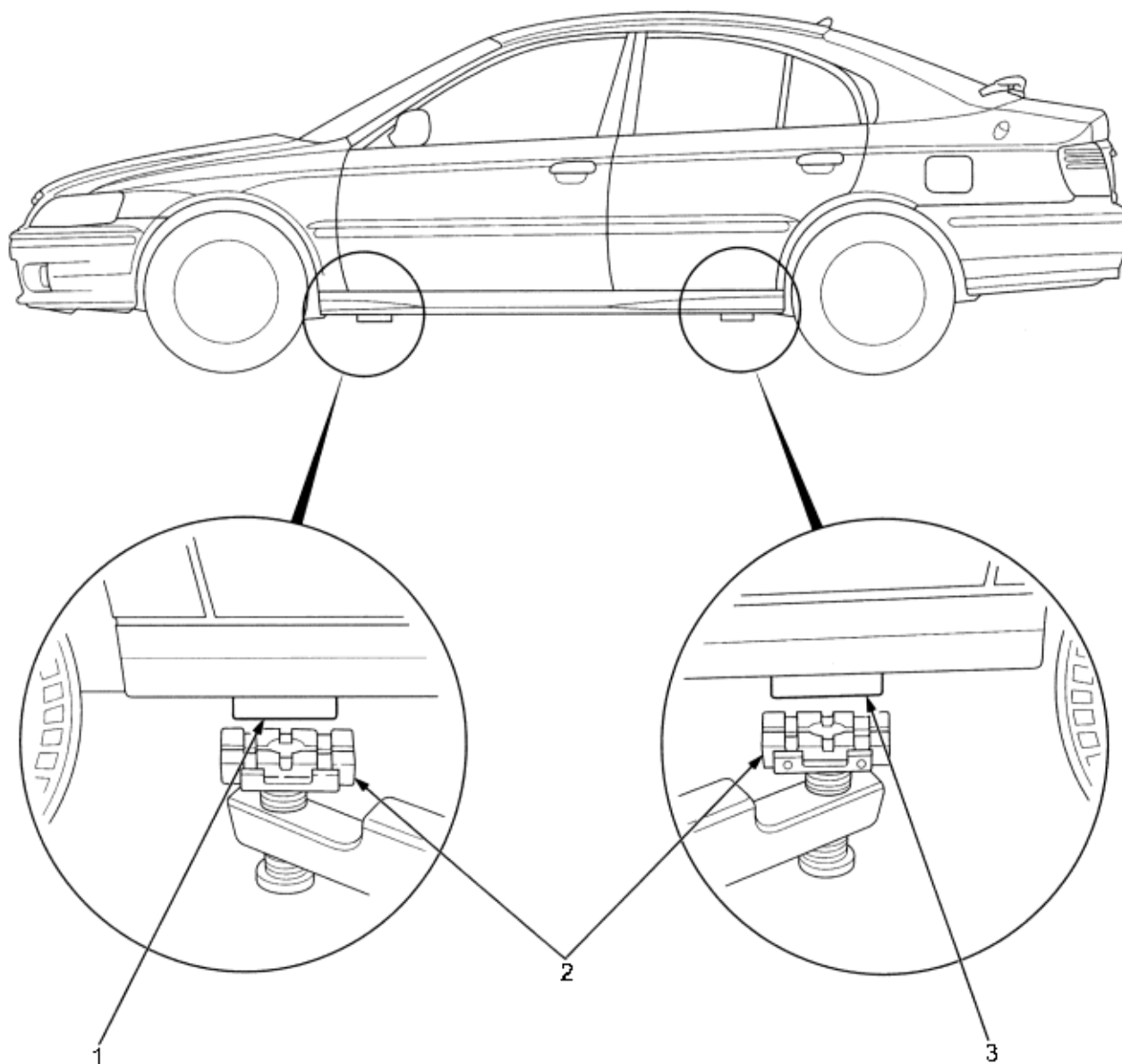
- 1. Vehicle Identification Number
- 2. Engine, VIN Number Plate
- 3. Engine Number
- 4. Transmission Number (U2J4 Manual)
- 5. Transmission Number (DH Manual)
- 6. Transmission Number (MDJA Automatic)



1. Place the lift blocks as shown.
2. Raise the hoist a few inches (centimetres), and rock the vehicle to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid support.

NOTE: Use the same support points to support the vehicle on safety stands.

1. FRONT SUPPORT POINT
2. LIFT BLOCKS
3. REAR SUPPORT POINT



Lift and Support Points

Floor Jack

1-7

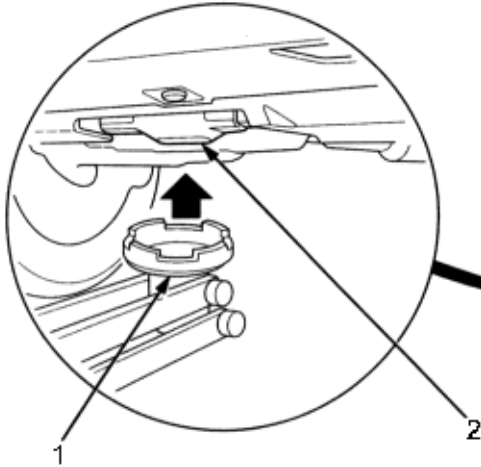
1. Set the parking brake, and block the wheels that are not being lifted.
2. When lifting the rear of the vehicle, put the gearshift lever in reverse (Automatic in **P** position).
3. Raise the vehicle high enough to insert the safety stands.
4. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.



WARNING

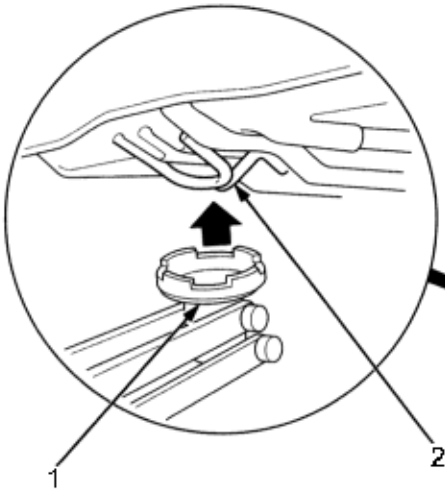
- ♦ Always use safety stands when working on or under any vehicle that is supported by only a jack.
- ♦ Never attempt to use a bumper jack for lifting or supporting the vehicle.

Front:



1. **JACK LIFT PLATFORM**
2. Centre the jack bracket in the middle of the jack lift platform.

Rear:



1. **JACK LIFT PLATFORM**
2. Centre the jack bracket in the middle of the jack lift platform.

Abbreviations

1-8

List of automotive abbreviations which may be used in shop manual.

ABS Anti-lock Brake System
A/C Air Conditioning, Air Conditioner
ACL Air Cleaner
A/F Air Fuel Ratio
ALT Alternator
AMP Ampere (s)
ANT Antenna
API American Petroleum Institute
APPROX. Approximately
ASSY Assembly
A/T Automatic Transmission
ATDC After Top Dead Centre
ATF Automatic Transmission Fluid
ATT Attachment
ATTS Active Torque Transfer System
AUTO Automatic
AUX Auxiliary

BARO Barometric
BAT Battery
BDC Bottom Dead Centre
BTDC Before Top Dead Centre

CARB Carburettor
CAT Catalytic Converter
or CATA
CHG Charge
CKF Crankshaft Speed Fluctuation
CKP Crankshaft Position
CO Carbon Monoxide
COMP Complete
CPB Clutch Pressure Back up
CPC Clutch Pressure Control
CPU Central Processing Unit
CVT Continuously Variable Transmission
CYL Cylinder
CYP Cylinder Position

DI Distributor Ignition
DIFF Differential
DLC Data Link Connector
DOHC Double Overhead Camshaft
DPI Dual Point Injection
DTC Diagnostic Trouble Code

EBD Electronic Brake Distribution
ECM Engine Control Module
ECT Engine Coolant Temperature
EGR Exhaust Gas Recirculation
ELD Electrical Load Detector
EPR Evaporator Pressure Regulator
EPS Electrical Power Steering

EVAP Evaporative
EX Exhaust

F Front
FIA Fuel Injection Air
FL Front Left
FP Fuel Pump
FR Front Right
FSR Fail Safe Relay
FWD Front Wheel Drive

GAL Gallon
GND Ground
GPS Global Positioning System

H/B Hatchback
HC Hydrocarbons
HID High Intensity Discharge
H02S Heated Oxygen Sensor

IAB Intake Air Bypass
IAC Idle Air Control
IAR Intake Air Resonator
IAT Intake Air Temperature
ICM Ignition Control Module
ID Identification
ID or I.D. Inside Diameter
IG or IGN Ignition
IMA Idle Mixture Adjustment
IMMOBI. Immobilizer (Immobiliser)
IN Intake
INJ Injection
INT Intermittent

KS Knock Sensor

L Left
L/C Lock-up Clutch
LCD Liquid Crystal Display
LED Light Emitting Diode
LF Left Front
LH Left Handle
LHD Left Handle Drive
LR Left Rear
LSD Limited Slip Differential
L-4 In-line Four Cylinder (engine)

Abbreviations
(cont'd)

MAP Manifold Absolute Pressure
MAX. Maximum
MBS Mainshaft Brake System
MCK Motor Check
MCU Moment Control Unit
MIL Malfunction Indicator Light
MIN. Minimum
MPI Multi Point Injection
M/S Manual Steering
M/T Manual Transmission

N Neutral
NOx Oxides of Nitrogen

OBD On-board Diagnostic
O2S Oxygen Sensor
OD or O.D. Outside Diameter

P Park
PAIR Pulsed Secondary Air Injection
PCM Powertrain Control Module
PCV Positive Crankcase Ventilation
Proportioning Control Valve
PGM-FI Programmed-fuel Injection
PGM-IG Programmed Ignition
PH Pressure High
PL Pilot Light or Pressure Low
PMR Pump Motor Relay
P/N Part Number
PRI Primary
P/S Power Steering
PSF Power Steering Fluid
PSP Power Steering Pressure
PSW Pressure Switch

Qty Quantity

R Right
REF Reference
RGB Red, Green, Black
RHD Right Handle Drive
RL Rear Left
RON Research Octane Number
RR Rear Right

SAE Society of Automotive Engineers
SCS Service Check Signal
SEC Second
Secondary
SOHC Single Overhead Camshaft
SOL Solenoid
SPEC Specification
S/R Sun Roof
SRS Supplemental Restraint System
STD Standard
SW Switch

T Torque
TB Throttle Body
T/B Timing Belt
TC Torque Converter
TCM Transmission Control Module
TCS Traction Control System
TDC Top Dead Centre
TFT Thin Film Transistor
T/N Tool Number
TP Throttle Position
TWC Three Way Catalytic Converter

VC Viscous Coupling
VIN Vehicle Identification Number
VSS Vehicle Speed Sensor
VTEC Variable Valve Timing & Valve Lift
Electronic Control
VVIS Variable Volume Intake System

W With
W/O Without
WOT Wide Open Throttle

2WD Two Wheel Drive
4WD Four Wheel Drive
2WS Two Wheel Steering
4WS Four Wheel Steering
4AT 4-speed Automatic Transmission
5MT 5-speed Manual Transmission

P Park
R Reverse
N Neutral
D4 Drive (1st through 4th gear)
D3 Drive (1st through 3rd gear)
2 Second
1 First
D Drive
S Second
L Low
1ST Low (gear)
2ND Second (gear)
3RD Third (gear)
4TH Fourth (gear)
5TH Fifth (gear)

Standards and Service Limits
Engine Electrical - Section 4

2-2

		MEASUREMENT	Standard (NEW)	
Ignition coil	Rated voltage V		12	
	Primary winding resistance at 20°C (68°F) ohms		0.45 - 0.55	
	Secondary winding resistance at 20°C (68°F) k ohms	D16B6, D16B7 engines	12.0 - 14.6	
		Except D16B6, D16B7 engines	22.4 - 33.6	
Ignition wire	Resistance at 20°C (68°F) k ohms		25 max.	
	Firing order	D16B6, D16B7 engines	1 - 4 - 2 - 3	
		Except D16B6, D16B7 engines	1 - 3 - 4 - 2	
			Standard (NEW)	Service Limit
Spark plug	Type		See section 4	
	Gap		1.0-1.1 (0.039-0.043) -	
Ignition timing	At idle	M/T	12 ± 2 (Neutral)	
	BTDC (Red)	A/T	12 ± 2 (N or P position)	
Alternator Belt*1 (D16B6, D16B7 engines)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.0-10.5 (0.28-0.41) with used belt	
Alternator Belt*1 (D16B6, D16B7 engines)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		5.0-7.0 (0.20-0.28) with new belt	
Alternator Belt*1 (D16B6, D16B7 engines)	Belt tension N (kgf, lbf)		340-490 (35-50, 77-110) with used belt	
	Measured with belt tension gauge			
Alternator Belt*1 (D16B6, D16B7 engines)	Belt tension N (kgf, lbf)		640-780 (65-80, 140-180) with new belt	
	Measured with belt tension gauge			
Alternator Belt*1 (Except D16B6, D16B7 engines with A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-12.0 (0.39-0.47) with used belt	
Alternator Belt*1 (Except D16B6, D16B7 engines with A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		5.5-7.5 (0.22-0.30) with new belt	
Alternator Belt*1 (Except D16B6, D16B7 engines with A/C)	Belt tension N (kgf, lbf)		390-540 (40-55, 88-120) with used belt	
	Measured with belt tension gauge			
Alternator Belt*1 (Except D16B6, D16B7 engines with A/C)	Belt tension N (kgf, lbf)		880-1,030 (90-105, 200-230) with new belt	
	Measured with belt tension gauge			
Alternator Belt*1 (Except D16B6, D16B7 engines without A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-12.0 (0.39-0.51) with used belt	
Alternator Belt*1 (Except D16B6, D16B7 engines without A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.5-10.0 (0.30-0.39) with new belt	
Alternator Belt*1 (Except D16B6, D16B7 engines without A/C)	Belt tension N (kgf, lbf)		290-440 (30-45, 66-99) with used belt	
	Measured with belt tension gauge			
Alternator Belt*1 (Except D16B6, D16B7 engines without A/C)	Belt tension N (kgf, lbf)		540-740 (55-75, 120-170) with new belt	
	Measured with belt tension gauge			
			Standard (NEW)	Service Limit
Alternator	Output 13.5 V at hot			
		D16B6, D16B7 engines	85 A	
		Except D16B6, D16B7 engines	90 A	
	Coil resistance (rotor) at 20 C (68 F) ohm			
		D16B6, D16B7 engines	2.6 -	
		Except D16B6, D16B7 engines	2.4 -	
	Slip ring O.D.		15.4 (0.61)	14.15 (0.557)
Brush length		13.2 (0.52)	3.2 (0.13)	
Brush spring tension N (kgf, lbf)		1.9 (0.19, 0.42)	-	

Starter	Manufacturer	VALEO	
	Output	1.0 kW	
	Commutator mica depth	0.5-0.9 (0.020-0.035)	0.2 (0.08)
	Commutator runout	0-01 (0-0004) max.	0.015 (0.0006)
	Brush length	18 (0.7)	5 (0.2)
	Brush spring tension N (kgf, lbf)	15.3-19.2 (1.56-1.96, 3.44-4.32)	-

*1: When using a new belt, adjust deflection or tension to new belt values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Standards and Service Limits

2-3

**Cylinder Head/Valve Train (D16B6, D16B7 engines) -
Section 6**

		Unit of length: mm (in.)	
	MEASUREMENT	Standard (NEW)	Service Limit
Compression	250 rpm (min*1) and wide open throttle kPa (kgf/cm2, psi) Minimum Maximum variation	930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height	- 92.95-93.05 (3.659-3.663)	0.05 (0.002) -
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	0.05-0.15 (0.002-0.006) 0.050-0.089 (0.0020-0.0035) 0.03 (0.001) max. 35.019 (1.3787)*1, 34.734 (1.3675)*2	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) -
	IN	37.904 (1.4923)	-
	EX		-
Valve	Valve clearance (Cold)	0.18-0.22 (0.007-0.009) 0.23-0.27 (0.009-0.011)	- -
	IN	5.48-5.49 (0.2157-0.2161)	5.45 (0.2146)
	EX	5.45-5.46 (0.2146-0.2150)	5.42 (0.2134)
	IN	0.02-0.05 (0.001-0.002)	0.08 (0.003)
	EX	0.05-0.08 (0.002-0.003)	0.11 (0.004)
Valve seat	Width	0.85-1.15 (0.033-0.045) 1.25-1.55 (0.049-0.061)	1.6 (0.063) 2.0 (0.079)
	IN	53.17-53.64 (2.093-2.112)	53.89 (2.122)
	EX	53.17-53.64 (2.093-2.112)	53.89 (2.122)
Valve spring	Free length	58.7 (2.31)	-
Valve guide	I.D.	5.51-5.53 (0.217-0.218) 5.51-5.53 (0.217-0.218)	5.55 (0.219) 5.55 (0.219)
	IN	17.85-18.35 (0.703-0.722)	-
	EX	18.65-19.15 (0.734-0.754)	-
Rocker arm	Arm-to-shaft clearance	0.017-0.050 (0.0007-0.0020) 0.018-0.054 (0.0007-0.0021)	0.08 (0.003) 0.08 (0.003)

*1: Timing belt side, *2: Distributor side

Standards and Service Limits

2-4

Cylinder Head/Valve Train (F18B2, F18B4, F20B6 engines) - Section 6

	MEASUREMENT		Standard (NEW)	Service Limit	
Compression	250 rpm (min*1) and wide open throttle kPa (kgf/cm2, psi)	Minimum	930 (9.5, 135)		
		Maximum variation	200 (2.0, 28)		
Cylinder head	Warpage		-	0.05 (0.002)	
	Height		99.95-100.05 (3.935-3.939)	-	
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)	
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)	
	Total runout		0.03 (0.001) max.	0.04 (0.002)	
	Cam lobe height F18B2, F18B4 engines	IN Primary		38.539 (1.5173)	-
			Mid	39.223 (1.5442)	-
			Secondary	33.913 (1.3352)	-
	F20B6 engine	EX		38.645 (1.5215)	-
		IN Primary		38.539 (1.5173)	-
		Mid		39.725 (1.5640)	-
		Secondary		33.913 (1.3352)	-
Valve	Valve clearance (Cold)	IN	0.24-0.28 (0.009-0.011)	-	
		EX	0.28-0.32 (0.011-0.013)	-	
	Valve stem O.D.	IN	5.485-5.495 (0.2159-0.2163)	5.455 (0.2148)	
		EX	5.450-5.460 (0.2146-0.2150)	5.420 (0.2134)	
	Stem-to-guide clearance	IN	0.020-0.045 (0.0008-0.0018)	0.08 (0.003)	
		EX	0.055-0.080 (0.0022-0.0031)	0.12 (0.005)	
Valve seat	Width	IN	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
	Stem installed height	IN	46.75-47.55 (1.841-1.872)	47.80 (1.882)	
		EX	46.68-47.48 (1.838-1.869)	47.73 (1.879)	
Valve spring	Free length	IN	51.08 (2.011)	-	
		EX	55.58 (2.188)	-	
Valve guide	I.D.	IN	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
		EX	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
	Installed height	IN	21.20-22.20 (0.835-0.874)	-	
		EX	20.63-21.63 (0.812-0.852)	-	
Rocker arm	Arm-to-shaft clearance	IN	0.026-0.067 (0.0010-0.0026)	0.08 (0.003)	
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)	

Unit of length: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	75.00-75.02 (2.953-2.954)	75.07 (2.956)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.5 (0.02)	
Piston	Skirt O.D. At 15 mm (0.2 in) from bottom of skirt	74.980-74.990 (2.9520-2.9524)	74.970 (2.9516)	
	Clearance in cylinder	0.010-0.040 (0.0004-0.0016)	0.05 (0.002)	
	Groove width (for ring)	Top	1.020-1.030 (0.0402-0.0406)	1.05 (0.041)
		Second	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
Piston ring	Ring-to-groove clearance	Top	0.030-0.060 (0.0012-0.0024)	
		Second	0.030-0.055 (0.0012-0.0022)	
	Ring end gap	Top	0.15-0.30 (0.006-0.012)	
		Second	0.20-0.70 (0.008-0.028)	
Piston pin	O.D.	18.994-19.000 (0.7478-0.7480)	-	
	Pin-to-piston clearance	-0.010 - 0.022 (0.0004-0.0009)	-	
	Connecting rod	Pin-to-rod interference	0.014-0.040 (0.0006-0.0016)	-
		Small end bore diameter	18.96-18.98 (0.746-0.747)	-
Connecting rod	Large end bore diameter	Nominal 48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.116)	
Crankshaft	Main journal diameter	54.976-55.000 (2.1644-2.1654)	-	
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-	
	Taper	0.0025 (0.0001) max.	0.005 (0.0002)	
	Out of round	0.0025 (0.0001) max.	0.005 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Total runout	0.03 (0.001) max.	0.04 (0.002)	
Bearing	Main bearing-to-journal oil clearance			
	No. 1 and 5 journals	0.018-0.036 (0.0007-0.0014)	0.05 (0.002)	
	No. 2, 3 and 4 journals	0.024-0.042 (0.0009-0.0017)	0.05 (0.002)	
	Rod bearing-to-journal oil clearance	0.020-0.038 (0.0008-0.0015)	0.05 (0.002)	

Standards and Service Limits
Engine Block (F18B2, F18B4, F20B6 engines) –
Section 7

2-6

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	A or I 85.010-85.020 (3.3468-3.3472)	85.070 (3.3492)	
		B or II 85.000-85.010 (3.3465-3.3468)	85.070 (3.3492)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.25 (0.01)	
Piston	Skirt O.D. [at 16 mm (0.6 in)] No letter	84.980-84.990 (3.3457-3.3461)	84.970 (3.3453)	
		[from bottom of skirt] Letter B	84.970-84.980 (3.3453-3.3457)	84.960 (3.3449)
	Clearance in cylinder	0.020-0.040 (0.0008-0.0016)	0.05 (0.002)	
	Groove width (For ring)	Top	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
		Second	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
		Oil	2.805-2.825 (0.1104-0.1112)	2.85 (0.112)
Piston ring	Ring-to-groove clearance	Top	0.035-0.060 (0.0014-0.0024)	0.13 (0.005)
		Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap	Top	0.20-0.35 (0.008-0.014)	0.60 (0.024)
		Second	0.40-0.55 (0.016-0.022)	0.70 (0.028)
		Oil	0.20-0.70 (0.008-0.028)	0.80 (0.031)
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)	
	Pin-to-piston clearance	-0.0050 - + 0.0020 (-0.00020 - + 0.00008)	(0.004-0.0002)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.0006)	0.020 (0.0008)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-	
	Large end bore diameter	Nominal 48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter			
		No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655) -	
		No. 3 journal	54.976-55.000 (2.1644-2.1654) -	
		No. 5 journal	54.992-55.016 (2.1650-2.1660) -	
	Rod journal diameter		44.976-45.000 (1.7707-1.7717) -	
	Taper	0.005 (0.0002) max.	0.010 (0.0004)	
	Out-of-Round	0.005 (0.0002) max.	0.010 (0.0004)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Runout	0.02 (0.001) max.	0.04 (0.002)	
Bearing	Main bearing-to-journal oil clearance			
		No. 1 and No. 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)
		No. 2 journal	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)
		No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)
		No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)
		Rod bearing-to-journal oil clearance	0.015-0.043 (0.0006-0.0017)	0.050 (0.0020)
Balancer shaft	Journal diameter			
		No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)
		No. 1 rear journal	20.938-20.950 (0.8243-0.8248)	20.92 (0.824)
		No. 2 front and rear journals	38.712-38.724 (1.5241-1.5246)	38.70 (1.524)
		No. 3 front and rear journals	34.722-34.734 (1.3670-1.3675)	34.71 (1.367)
	Journal taper	0.005 (0.0002) max.	-	
	End play	Front	0.10-0.40 (0.004-0.016)	-
		Rear	0.04-0.15 (0.002-0.006)	-
	Total runout	0.02 (0.001) max.	0.03 (0.001)	
	Shaft-to-bearing oil clearance			
	No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)	0.12 (0.005)	
	No. 1 rear journal	0.050-0.075 (0.0020-0.0030)	0.09 (0.004)	
	No. 2 front and rear journals	0.076-0.108 (0.0030-0.0043)	0.13 (0.005)	
Balancer shaft bearing	I.D.	No. 1 front journal	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)
		No. 1 rear journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)
		No. 2 front and rear journals	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)
		No. 3 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)

Unit of length: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity / (US qt, Imp qt)	D16B6, D16B7 engines: 4.0 (4.2, 3.5) for engine overhaul 3.6 (3.8, 3.2) for oil change, including filter 3.3 (3.5, 2.9) for oil change, without filter Except D16B6, D16B7 engines: 5.7 (6.0, 5.0) for engine overhaul 4.4 (4.6, 3.9) for oil change, including filter 4.1 (4.3, 3.6) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing-to-rotor axial clearance D16B6, D16B7 engines Except D16B6, D16B7 engines	0.02-0.14 (0.001-0.006) 0.02-0.16 (0.001-0.006) 0.10-0.18 (0.004-0.007) 0.10-0.19 (0.004-0.007) 0.03-0.08 (0.001-0.003) 0.02-0.07 (0.001-0.003)	0.20 (0.008) 0.20 (0.008) 0.20 (0.008) 0.21 (0.008) 0.15 (0.006) 0.12 (0.005)
Relief valve	Pressure setting at engine oil temp. 80°C (176°F) kPa (kgf/cm2, psi) at idle at 3,000 rpm (min-1)	70 (0.7, 10) min. 340 (3.5, 50) min.	

Cooling - Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity / (US qt, Imp qt.) [including engine, heater,] [cooling line and reservoir] Reservoir capacity: 0.55 / (0.58 US qt, 0.48 Imp qt)	D16B6, D16B7 engines: 4.6 (4.9, 4.1) for overhaul 3.9 (4.1, 3.4) for coolant change Except D16B6, D16B7 engines: M/T: 5.8 (6.1, 5.1) for overhaul 4.2 (4.4, 3.7) for coolant change A/T: 5.7 (6.0, 5.0) for overhaul 4.1 (4.3, 3.6) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm2, psi)	93-123 (0.95-1.25, 14-18)
Thermostat	Start to open °C (°F) Fully open °C (°F) Valve lift at fully open:	70-80 (169-176) 90 (194) 8.0 (0.31) min
Cooling fan	Thermoswitch "ON" temperature °C (°F) Thermoswitch "OFF" temperature °C (°F) Fan timer "ON" temperature °C (°F) Fan timer "OFF" temperature °C (°F)	91-95 (196-203) Subtract 3-8 (5-15) from actual "ON" temperature 103-109 (217-228) Subtract 4-9 (7-16) from actual "ON" temperature

	MEASUREMENT	STANDARD (NEW)
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm ² , psi)	D16B6, D16B7 engines 290-300 (3.0-3.1, 43-44) Except D16B6, D16B7 engines 270-320 (2.8-3.3, 40-47)
Fuel tank	Capacity / (US gal. Imp gal.)	65.0 (17.2, 14.3)
Engine	Idle speed with headlights and cooling fan off rpm (min-1)	D16B6, D16B7, F18B4 engines 750± 50 (M/T: neutral) Except D16B6, D16B7, F18B4 engines 750± 50 (M/T: neutral) 730± 50 (A/T: N or P position)
	Idle CO %	

Clutch - Section 12

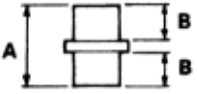
	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Clutch pedal	Pedal height	to floor		
		LHD	177-187 (7.0-7.4)	-
		RHD	201-211 (7.9-8.3)	-
	Stroke		141-151 (5.55-5.94)	-
		Free play	9-15 (0.4-0.6)	-
		Pedal play	1.0-7.0 (0.04-0.28)	-
		Disengagement height	to floor	
LHD	18.(3.2) min.		-	
RHD	107 (4.21) min.		-	
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)	
Clutch disc	Rivet head depth	U2J4	1.4 (0.06) min.	0.2 (0.008)
		DH	1.3 (0.05) min.	0.2 (0.008)
	Surface runout		0.6 (0.02) max.	1.0 (0.04)
	Thickness	U2J4	7.9-8.4 (0.31-0.33)	6.0 (0.24)
		DH	7.7-8.2 (0.30-0.32)	6.0 (0.24)
Pressure plate	Warpage	0.03 (0.001) max.	0.15 (0.006)	
	Diaphragm spring finger alignment	0.6 (0.02) max.	0.8 (0.03)	

Manual Transmission (DH) - Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission fluid	Capacity / (US qt. Imp qt.)	1. 8 (1.9, 1.6) at fluid change		
		1.9 (2.0, 1.7) at overhaul		
Mainshaft	End play	0.11-0.18 (0.004-0.007)	Adjust	
	Diameter of ball bearing contact area A (Transmission housing side)	21.987-22.000 (0.8656-0.8661)	21.930 (0.8634)	
	Diameter of 4th, 5th gear contact area B	26.980-26.993 (1.0622-1.0627)	26.930 (1.0602)	
	Diameter of 3rd gear contact area C	33.984-34.000 (1.3380-1.3386)	33.930 (1.3358)	
	Diameter of ball bearing contact area D (Clutch housing side)	25.977-25.990 (1.0227-1.0232)	25.920 (1.0205)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	
Mainshaft 3rd and 4th gears	I.D.	39.009-39.025 (1.5358-1.5364)	39.07 (1.5382)	
	End play	3rd	0.06-0.21 (0.002-0.008)	0. 33 (0.013)
		4th	0.06-0.19 (0.002-0.007)	0. 31 (0.012)
	Thickness	3rd	30.22-30.27 (1.190-1.192)	30.15 (1.187)
4th		30.12-30.17 (1.186-1.188)	30.05 (1.183)	
Mainshaft 5th gears	I.D.	37.009-37.025 (1.4570-1.4577)	37.07 (1.459)	
	End play	0.06-0.19 (0.002-0.007)	0.31 (0.012)	
	Thickness	28.42-28.47 (1.119-1.121)	28.35 (1.116)	
Countershaft	Diameter of needle bearing contact area A	30.000-30.015 (1.1811-1.1817)	29.95 (1.179)	
	Diameter of 1st gear contact area B.	35.984-36.000 (1.4167-1.4173)	35.93 (1.415)	
	Diameter of ball bearing contact area C	24.980-24.993 (0.9835-0.9840)	24.93 (0.982)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	

Unit of length: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Countershaft 1st gear	I.D.	41.009-41.025 (1.6145-1.6152)	41.07 (1.617)
	End play (When tightened by the specified torque)	0.03-0.10 (0.001-0.004)	0.22 (0.09)
	Thickness	30.41-30.44 (1.197-1.198)	30.36 (1.195)
Countershaft 2nd gear	I.D.	44.009-44.025 (1.7326-1.7333)	44.07 (1.735)
	End play (When tightened by the specified torque)	0.04-0.12 (0.002-0.005)	0.24 (0.009)
	Thickness.	31.91-31.96 (1.256-1.258)	31.85 (1.254)
Spacer collar (Countershaft 2nd gear)	I.D.	33.000-33.010 (1.2992-1.2996)	33.04 (1.301)
	O.D.	38.989-39.000 (1.5350-1.5354)	38.93 (1.533)
	Length	32.03-32.06 (1.261-1.262)	32.01 (1.260)
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	27.002-27.012 (1.0631-1.0635)	27.06 (1.065)
	O.D.	33.989-34.000 (1.3381-1.3386)	33.93 (1.336)
		31.989-32.000 (1.2594-1.2598)	31.93 (1.257)
	Length	22.83-22.86 (0.899-0.900)	22.81 (0.898)
		23.53-23.56 (0.926-0.928)	23.51 (0.926)
Reverse idler gear	I.D. Gear-to-reverse gear shaft clearance	15.016-15.043 (0.5912-0.5922) 0.032-0.077 (0.0013-0.0030)	15.08 (0.594) 0.14 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.73-1.18 (0.029-0.046)	0.4 (0.016)
Shift fork	Finger thickness	1st/2nd/5th 3rd/4th	6.2-6.4 (0.24-0.25) 7.4-7.6 (0.29-0.30)
	Fork-to-synchro sleeve clearance		0.35-0.65 (0.014-0.026)
			-
Reverse shift fork	Fork pawl groove width		12.7-13.0 (0.50-0.51)
	Fork-to-reverse idler gear clearance		0.5-1.1 (0.02-0.04)
	L-groove width		7.05-7.25 (0.278-0.285)
	Fork-to-6th/reverse shift shaft piece pin clearance		0.05-0.35 (0.002-0.014)
Shift arm A	Inner diameter of shift arm A contact point		13.05-13.13 (0.514-0.517)
	Shift arm A-to-shift arm C clearance		0.05-0.23 (0.002-0.009)
Shift arm B	Inner diameter of shift arm B shaft contact point		13.973-14.000 (0.5501-0.5512)
	Shift arm B-to-shaft clearance		0.013-0.070 (0.0005--0.0028)
	Shift arm B-to-shift piece clearance		0.2-0.5 (0.01-0.02)
	Diameter of shift fork contact point		12.900-13.000 (0.5079-0.5118)
	Shift fork 1st - 2nd/shift piece groove width		13.2-13.4 (0.52-0.53)
MBS shift piece	Diameter of pin		6.9-7.1 (0.27-0.28)
Differential carrier	Pinion shaft bore diameter		18.010-18.028 (0.7091-0.7098)
	Carrier-to-pinion shaft clearance		0.023-0.057 (0.0009-0.0022)
	Driveshaft bore diameter		26.025-26.045 (1.0246-1.0254)
	Carrier-to-driveshaft clearance		0.045-0.086 (0.0018-0.0034)
Differential pinion gear	Backlash		0.05-0.15 (0.002-0.006)
	Pinion gear bore diameter		18.042-18.066 (0.7103-0.7113)
	Pinion gear-to-pinion shaft clearance		0.055-0.095 (0.0022-0.0037)
Set ring-to-bearing out race		0-0.1 (0-0.004)	Adjust

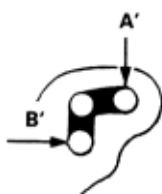
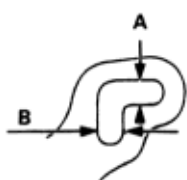
	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity / (US qt. Imp qt.)	1.9 (2.0, 1.7) at fluid change 2.0 (2.1, 1.8) at overhaul	
Mainshaft	End play Diameter of ball bearing contact area C Diameter of needle bearing contact area B Diameter of ball bearing contact area A Diameter of 4th/5th contact area Runout	0.10-0.16 (0.004-0.008) 27.977-27.990 (1.1015-1.1020) 37.984-38.000 (1.4954-1.4961) 27.987-28.000 (1.1018-1.1024) 30.987-31.000 (1.2200-1.2205) 0.02 (0.001) max.	Adjust 27.93 (1.100) 37.93 (1.493) 27.94 (1.100) 30.93 (1.218) 0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D. End play Thickness 3rd gear 4th gear	43.009-43.025 (1.6933-1.6939) 0.06-0.21 (0.002-0.008) 32.42-32.47 (1.276-1.278) 30.92-30.97 (1.217-1.219)	43.080 (1.6961) 0.30 (0.012) 32.3 (1.27) 30.8 (1.21)
Mainshaft 5th gear	I.D. End play Thickness	43.009-43.025 (1.6933-1.6939) 0.06-0.21 (0.002-0.008) 30.92-30.97 (1.217-1.219)	43.080 (1.6961) 0.30 (0.012) 30.8 (1.21)
Countershaft	Diameter of needle bearing contact area A Diameter of ball bearing and needle bearing contact area C. Diameter of 1st gear contact area B Runout	38.000-38.015 (1.4961-1.4967) 24.987-25.000 (0.9837-0.9843) 39.984-40.000 (1.5742-1.5748) 0.02 (0.001) max.	37.95 (1.494) 24.94 (0.982) 39.93 (1.572) 0.05 (0.002)
Countershaft 1st gear	I.D. End Play Thickness	46.009-46.025 (1.8114-1.8120) 0.06-0.23 (0.002-0.009) 32.95-33.00 (1.297-1.299)	46.08 (1.814) 0.23 (0.009) -
Countershaft 2nd gear	I.D. End Play Thickness	47.009-47.025 (1.8507-1.8514) 0.10-0.15 (0.004-0.006) 28.94-28.97 (1.139-1.141)	47.08 (1.854) 0.18 (0.007) -
Thrust washer (Countershaft 1st gear)	Thickness	1.95-1.97 (0.077-0.078)	-
Spacer collar (Countershaft 2nd gear)	I.D. O.D. Length	36.48-36.49 (1.436-1.437) 41.989-42.000 (1.6531-1.6535) 29.07-29.09 (1.144-1.145)	36.50 (1.437) 41.94 (1.651) -
Spacer collar (Mainshaft 4th and 5th gears)	I.D. O.D. Length A B	31.002-31.012 (1.2205-1.2209) 37.989-38.000 (1.4956-1.4961) 56.45-56.55 (2.222-2.226) 26.03-26.08 (1.025-1.027)	31.06 (1.223) 37.94 (1.494) - 26.01 (1.024)
			
Reverse idler gear	I.D. Gear-to-reverse gear shaft clearance	20.016-20.043 (0.7880-0.7891) 0.036-0.084 (0.0014-0.0033)	20.09 (0.7909) 0.160 (0.0063)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.85-1.10 (0.033-0.043)	0.40 (0.016)
Double cone synchro	Clearance (ring pushed against gear) Outer synchro ring-to-synchro cone Inner synchro ring-to-gear Outer synchro ring-to-gear	0.5-1.0 (0.02-0.04) min 0.5-1.0 (0.02-0.04) min 0.95-1.68 (0.037-0.066)	0.3 (0.01) 0.3 (0.01) 0.6 (0.02)

Unit of length: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Shift fork	Finger thickness 1st/2nd/5th	6.2-6.4 (0.24-0.25)	-	
	3rd/4th	7.4-7.6 (0.29-0.30)	-	
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	1.0 (0.04)	
Reverse shift fork	Pawl groove width	13.0-13.3 (0.51-0.52)	-	
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)	
	Groove width*1	at A	7.05-7.25 (0.278-0.285)	-
		at B	7.4-7.7 (0.29-0.30)	-
	For-to-5th/reverse shift shaft Clearance*2	at A'	0.05-0.35 (0.002-0.014)	0.5 (0.02)
	at B'	0.4-0.8 (0.02-0.03)	1.0 (0.04)	
Shift arm	I.D.	15.973-16.000 (0.6289-0.6299)	-	
	Shift arm-to-shaft clearance	0.005-0.059 (0.0002-0.0023)	-	
	Shift fork diameter contact area	12.9-13.0 (0.508-0.512)	-	
	Shift arm-to-shift fork shaft clearance	0.2-0.5 (0.01-0.02)	0.6 (0.02)	
Selected lever	Shaft outer diameter	15.941-15.968 (0.6276-0.6287)	-	
	Shift arm cover clearance	0.032-0.102 (0.0013-0.0040)	-	
Shift lever	O.D.	15.941-15.968 (0.6276-0.6287)	-	
	Transmission housing clearance	0.021-0.141 (0.0008-0.0056)	-	
Interlock	Bore diameter	16.00-16.05 (0.630-0.632)	-	
	Shift arm clearance	0.032-0.109 (0.0013-0.0043)	-	
Differential carrier	Pinion shaft contact area I.D.	18.000-18.018 (0.7087-0.7094)	-	
	Carrier-to-pinion shaft clearance	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)	
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	-	
	Carrier-to-driveshaft clearance	R	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)
L		0.055-0.091 (0.0022-0.0036)	0.15 (0.006)	
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	-	
	I.D.	18.042-18.066 (0.7103-0.7113)	-	
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)	
Tapered roller bearing preload	Starting torque N.m (kgf.cm, lbf.in)	1.4-2.5 (14-26, 12-23)	Adjust	

*1: Measuring points

*2: Measuring points



Manual Transmission (Diesel Engine) - Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	1st gear to thrust washer clearance	0.03-0.08 (0.001-0.003)	0.18 (0.007)
	Input shaft end thrust	0.14-0.21 (0.006-0.008)	-
	Planet gear backlash	0.05-0.15 (0.002-0.006)	-
	Differential bearing to circlip clearance	0.15 (0.006) Max.	-
	Reverse idler gear to selector for clearance	0.5-1.1 (0.02-0.04)	-
	Selector fork prong width	13.0-13.3 (0.51-0.52)	-
	Selector fork groove to pin clearance	0.05-0.35 (0.002-0.01)	0.5 (0.02)
	Selector fork groove width	7.05-7.25 (0.278-0.285)	-
	Gearshift arm to guide clearance	0.2-0.3 (0.008-0.012)	0.55 (0.022)
	Interlock shift guide groove width	8.1-8.2 (0.319-0.323)	-
	Synchro ring to gear clearance	0.85-1.1 (0.03-0.04)	0.4 (0.02)
	Selector shaft forks in synchro sleeve grooves clearance	0.45-0.65 (0.02-0.03)	1.0 (0.04)
	Gearshift arm guide to selector fork clearance	0.2-0.5 (0.01-0.02)	0.8 (0.03)
	Gearshift arm guide tongue width	11.9-12.0 (0.469-0.472)	-
	Gearshift arm guide to interlock assembly clearance	0.05-0.35 (0.002-0.01)	0.6 (0.02)
	Gearshift arm guide groove width	13.05-13.25 (0.514-0.522)	-
	Interlock ball to gearshift arm guide clearance	0.05-0.25 (0.002-0.01)	0.5 (0.02)
	Interlock ball outside diameter	12.05-12.15 (0.474-0.478)	-
	2nd to 3rd gear clearance	0.06-0.21 (0.002-0.01)	0.3 (0.01)
	3rd gear thickness	35.42-35.47 (1.394-1.396)	35.30 (1.390)
4th to 5th gear clearance	0.06-0.21 (0.002-0.01)	0.3 (0.01)	
Spacer collar length	26.03-26.08 (1.023-1.027)	26.01 (1.024)	
4th gear thickness	30.92-30.97 (1.217-1.219)	30.80 (1.213)	
5th gear thickness	30.42-30.47 (1.198-1.200)	30.30 (1.193)	

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity / (US qt. Imp qt.)	6.1 (6.4, 5.4) at overhaul 2.5 (2.6, 2.2) at fluid change	
Hydraulic pressure	Line pressure at 2,000 rpm (min ⁻¹) in N or P position	850-910 (8.7-9.3, 120-130)	800 (8.2, 120)
kPa (kgf/cm ² , psi)	4th clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 3rd clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 2nd clutch pressure at 2,000 rpm (min ⁻¹) in 2 position 1st clutch pressure at 2,000 rpm (min ⁻¹) in 1 position	840-920 (8.6-9.4, 120-130)	790 (8.1, 120)
Stall speed rpm (min ⁻¹) (Check with vehicle on level ground)	F20B6 engine F18B2, F18B4 engines	2,250 2,450	1,950-2,550 2,150-2,750
Clutch	Clutch initial clearance 1st 2nd 3rd 4th Clutch return spring free length 1st, 2nd 3rd, 4th Clutch disc thickness Clutch plate thickness 1st 2nd 3rd 4th	1.15-1.35 (0.045-0.053) 0.7-0.9 (0.028-0.035) 0.6-0.8 (0.024-0.031) 0.4-0.6 (0.016-0.024) 45.7 (1.80) 33.5 (1.32) 1.88-2.00 (0.074-0.079) 1.95-2.05 (0.077-0.081) 2.25-2.35 (0.089-0.093) 2.55-2.65 (0.100-0.104) 2.25-2.35 (0.089-0.093)	- - - - 43.7 (1.72) 31.5 (1.24) Until grooves worn out Discoloration Discoloration Discoloration Discoloration
	Clutch end plate thickness 1st, 2nd clutches Mark 6 Mark 7 Mark 8 Mark 9 Mark 0 Mark 1 Mark 2 Mark 3 Mark 4	2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114) 2.95-3.00 (0.116-0.118) 3.05-3.10 (0.120-0.122) 3.15-3.20 (0.124-0.126) 3.25-3.30 (0.128-0.130) 3.35-3.40 (0.132-0.134)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
	Clutch end plate thickness 3rd, 4th clutches Mark 1 Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9	2.05-2.10 (0.081-0.083) 2.15-2.20 (0.085-0.087) 2.25-2.30 (0.089-0.091) 2.35-2.40 (0.093-0.094) 2.45-2.50 (0.096-0.098) 2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
Valve body	Stator shaft needle bearing contact I.D. Torque converter side ATF pump side ATF pump gear thrust clearance ATF pump gear-to-body clearance Drive Driven ATF pump driven gear I.D. ATF pump driven gear shaft O.D.	27.000-27.021 (1.0630-1.0638) 29.000-29.021 (1.1417-1.1426) 0.03-0.05 (0.001-0.002) 0.210-0.265 (0.0083-0.0104) 0.070-0.125 (0.0028-0.0049) 14.016-14.034 (0.5518-0.5525) 13.980-13.990 (0.5504-0.5508)	Wear or damage - 0.07 (0.003) - - Wear or damage Wear or damage
Shifting device and parking brake	Reverse shift fork finger thickness Parking brake pawl Parking gear	5.90-6.00 (0.232-0.236) - -	5.40 (0.213) Wear or other defect Wear or other defect
Servo body	Shift fork shaft bore I.D. Shift fork shaft valve bore I.D.	14.000-14.010 (0.5512-0.5516) 37.000-37.039 (1.4567-1.4582)	- 37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.	32.000-32.025 (1.2598-1.2608)	32.050 (1.2618)
Accumulator body	Sealing ring contact I.D.	35.000-35.025 (1.3780-1.3789)	35.05 (1.3799)
Stator shaft	Sealing ring contact I.D.	29.000-29.021 (1.1417-1.1426)	29.050 (1.1437)

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 3rd gear thrust shim, 41 x 72 mm thickness	6.32-6.35 (0.2488-0.2500)	Wear or damage
		6.37-6.40 (0.2508-0.2520)	Wear or damage
		6.42-6.45 (0.2528-0.2539)	Wear or damage
		6.47-6.50 (0.2547-0.2559)	Wear or damage
		6.52-6.55 (0.2567-0.2579)	Wear or damage
		6.57-6.60 (0.2587-0.2598)	Wear or damage
	Mainshaft 4th gear thrust washer, 27 x 47 mm thickness	4.95-5.00 (0.1949-0.1969)	Wear or damage
	Secondary shaft splined washer, 38 x 56.5 mm thickness	6.82-6.85 (0.269-0.270)	Wear or damage
		6.87-6.90 (0.270-0.272)	Wear or damage
		6.92-6.95 (0.272-0.274)	Wear or damage
		6.97-7.00 (0.274-0.276)	Wear or damage
		7.02-7.05 (0.276-0.278)	Wear or damage
		7.07-7.10 (0.278-0.280)	Wear or damage
	Secondary shaft thrust shim, 37 x 55 mm thickness	4.87-4.90 (0.192-0.193)	Wear or damage
		4.92-4.95 (0.194-0.195)	Wear or damage
		4.97-5.00 (0.196-0.197)	Wear or damage
		5.02-5.05 (0.198-0.199)	Wear or damage
		5.07-5.10 (0.200-0.201)	Wear or damage
		5.12-5.15 (0.202-0.203)	Wear or damage
	Mainshaft 4th gear collar length	49.40-49.50 (1.945-1.949)	-
	Mainshaft 4th gear collar flange thickness	4.35-4.50 (0.171-0.177)	Wear or damage
	Countershaft distance collar length	50.42-50.46 (1.985-1.987)	-
	Cotter thickness	1.99-2.02 (0.078-0.080)	-
	Secondary shaft sealing ring, 35 mm thickness	1.890-1.950 (0.074-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 32 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 29 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Secondary shaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (.0082)
	Mainshaft 4th clutch feed pipe O.D.	11.47-11.48 (0.4516-0.4520)	11.45 (0.4508)
	Mainshaft 3rd clutch feed pipe O.D.	5.97-5.98 (0.2350-0.2354)	5.95 (0.2343)
	Secondary shaft feed pipe O.D.	7.97-7.98 (0.3138-0.3142)	7.95 (0.3130)
	Mainshaft 4th clutch feed pipe bushing I.D.	11.500-11.518 (0.4528-0.4535)	11.530 (0.4539)
	Mainshaft 3rd clutch feed pipe bushing I.D.	6.018-6.030 (0.2369-0.2374)	6.045 (0.2380)
	Secondary shaft bushing I.D.	8.000-8.015 (0.3150-0.3156)	8.030 (0.3161)
	Diameter of needle bearing contact area		
	On mainshaft of stator shaft	22.984-23.000 (0.9049-0.9055)	Wear or damage
	On mainshaft of 3rd gear	55.975-55.991 (2.2037-2.2044)	Wear or damage
	On mainshaft of 4th gear collar	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 4th gear	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft 2nd gear	39.979-40.000 (1.5740-1.5748)	Wear or damage
	On countershaft of L. side	36.005-36.015 (1.4175-1.4179)	Wear or damage
	On parking gear	41.964-41.980 (1.6521-1.6528)	Wear or damage
	On secondary shaft of 1st gear	37.978-37.993 (1.4952-1.4958)	Wear or damage
	On secondary shaft of 2nd gear	33.986-33.999 (1.3380-1.3385)	Wear or damage
	On secondary shaft of L. side	34.000-34.013 (1.3386-1.3391)	Wear or damage
	On reverse idler gear shaft	14.985-15.000 (0.5900-0.5906)	Wear or damage
	Transmission housing of reverse idler gear shaft contact area I.D.	14.800-14.818 (0.5827-0.5834)	-
	Reverse idler gear shaft holder I.D.	14.800-14.824 (0.5827-0.5836)	Wear or damage
	Reverse selector hub O.D.	55.87-55.90 (2.1996-2.2008)	Wear or damage
	Inside Diameter		
	Mainshaft 3rd gear	61.000-61.019 (2.4016-2.4023)	Wear or damage
Mainshaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage	
Countershaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage	
Countershaft idler gear	50.000-50.016 (1.9685-1.9891)	Wear or damage	
Countershaft reverse gear	46.000-46.016 (1.8110-1.8116)	Wear or damage	
Reverse idler gear	20.007-20.020 (0.7877-0.7882)	Wear or damage	
Secondary shaft 1st gear	44.000-44.016 (1.7323-1.7329)	Wear or damage	
Secondary shaft 2nd gear	40.000-40.016 (1.5748-1.5754)	Wear or damage	

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	End play		
	Mainshaft 3rd gear	0.03-0.11 (0.001-0.004)	-
	Mainshaft 4th gear	0.10-0.22 (0.004-0.009)	-
	Countershaft 1st gear	0.00-0.33 (0.000-0.013)	-
	Countershaft 4th gear	0.04-0.28 (0.002-0.011)	-
	Countershaft idler gear	0.015-0.045 (0.0006-0.0018)	-
	Countershaft reverse gear	0.10-0.25 (0.004-0.010)	-
	Reverse idler gear	0.20-0.55 (0.008-0.022)	-
	Secondary shaft 1st gear	0.07-0.15 (0.003-0.006)	-
Secondary shaft 2nd gear	0.04-0.12 (0.002-0.005)	-	
Differential carrier	Pinion shaft contact area I.D.	18.010-18.028 (0.709-0.710)	-
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.001-0.002)	0.1 (0.004)
	Driveshaft contact area I.D.	28.025-28.045 (1.103-1.104)	-
	Carrier-to-driveshaft clearance	0.045-0.086 (0.002-0.003)	0.12 (0.005)
Differential pinion gear	Backlash	0.050-0.150 (0.002-0.006)	-
	I.D.	18.042-18.066 (0.710-0.711)	-
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.002-0.004)	0.12 (0.005)
Differential tapered roller bearing preload Starting torque	For new bearing	2.7-3.9 (28-40, 24-35)	Adjust
	For used bearing	2.5-3.6 (25-37, 22-32)	Adjust

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0
	Relief valve spring	0.9 (0.035)	6.6 (0.260)	39.8 (1.567)	20.4
	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
	Shift valve E spring	0.7 (0.028)	6.6 (0.260)	32.2 (1.268)	13.4
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	1st accumulator spring A	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5	
3rd accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
4th accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
2nd accumulator spring A	2.6 (0.102)	21.6 (0.850)	73.2 (2.862)	10.0	
2nd accumulator spring B	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6	

Unit of length: mm (in.)

		MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotation play at steering wheel circumference		0-10 (0-0.39)
	Starting load at steering wheel circumference N (kgf, lbf) Engine running		30 (3.1, 6.8)
Gearbox	Angle of rack-guide-screw loosened from locked position		5° - 10°
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm ² , psi).		
	D16B6, D16B7 engines model Except D16B6, D16B7 engines model		5,700-6,400 (58-65, 820-920) 6,700-7,400 (68-75, 970-1,070)
Power steering fluid	Recommended fluid		Honda power steering fluid S
	Fluid capacity / (US qt. Imp qt) For overhaul		
	D16B6, D16B7 engines model		1.0 (1.1, 0.9)
	RHD (Except D16B6, D16B7 engines) LHD (Except D16B6, D16B7 engines) For fluid change		1.1 (1.2, 1.0) 1.0 (1.1, 0.9) 0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys D16B6, D16B7 engines model		10.5-14.0 (0.41-0.55) with used belt 7.5-10.0 (0.30-0.39) with new belt
	Except D16B6, D16B7 engines model		13.0-16.5 (0.51-0.65) with used belt 8.5-11.0 (0.33-0.43) with new belt
	Belt tension N (kgf, lbf)		
	Measured with belt tension gauge D16B6, D16B7 engines model Except D16B6, D16B7 engines model		340-490 (35-50, 77-110) with used belt 640-780 (65-80, 143-176) with new belt 390-540 (40-55, 88-121) with used belt 740-880 (75-90, 165-198) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension - Section 18

		MEASUREMENT	STANDARD (NEW)	
Wheel alignment	Camber	Front	0° ± 1°	
		Rear	-1°00' ± 30'	
	Caster	Front	2°50' ± 1°	
		Total toe	Front	0 ± 2 (0 ± 0.08)
		Rear	IN 2 ± 2 (0.08 ± 0.08)	
Front wheel turning angle	Inward wheel	39°10' ± 2°		
	Outward wheel	30°58' (Reference)		
Wheel bearing	End play	Front	0-0.05 (0-0.002)	
		Rear	0-0.05 (0-0.002)	
Wheel	Rim runout	Aluminium wheel Axial	STANDARD (NEW)	SERVICE LIMIT
		Radial	0-0.7 (0-0.03)	2.0 (0.08)
	Steel Wheel	Axial	0-0.7 (0-0.03)	1.5 (0.06)
		Radial	0-1.0 (0-0.04)	2.0 (0.08)
		Radial	0-1.0 (0-0.04)	1.5 (0.06)

MEASUREMENT		STANDARD (NEW)		
Parking brake lever	Play in stroke at 200 N (20 kgf, 44 lbf) lever force	To be locked when pulled: 6-9 notches		
Foot brake pedal	Pedal height (with floor mat removed)	M/T	168.5 (6.63)	
		A/T	173.5 (6.83)	
	Free play	1-5 (0.04-0.20)		
Master cylinder	Piston-to-pushrod clearance	0-0.4 (0.-0.02)		
Disc brakes	Disc thickness Except D16B6, D16B7 engines model	STANDARD (NEW)		
		SERVICE LIMIT		
	D16B6, D16B7 engines model	24.9-25.1 (0.98-0.99)	23.0 (0.91)	
		22.9-23.1 (0.90-0.91)	21.0 (0.83)	
	Disc runout	Rear	9.9-10.1 (0.390-0.398)	8.0 (0.31)
		Front	-	0.10 (0.004)
	Disc parallelism	Rear	-	0.10 (0.004)
		Front and rear	-	0.015 (0.0006)
Pad thickness	Front	10.5-11.5 (0.41-0.45)	1.6 (0.06)	
	Rear	8.5-9.5 (0.33-0.37)	1.6 (0.06)	
Drum brake	Drum I.D.	228.6-228.7 (9.000-9.004)	229.6 (9.039)	
	Lining thickness	5.0 (0.20)	2.0 (0.08)	
Brake booster	Characteristics at 98 N (10 kgf, 22 lbf) and 294 N (30 kgf, 68 lbf) pedal force	Vacuum kPa (mm Hg, in Hg)	Minimum line pressure D16B6 engine model	
			N (kgf, lbf)	kPa kgf/cm2, psi)
			98 (10, 22)	0 (0, 0)
			294 (30, 66)	1,470 (15, 213)
Brake booster	Characteristics at 98 N (10 kgf, 22 lbf) and 294 N (30 kgf, 68 lbf) pedal force	Vacuum kPa (mm Hg, in Hg)	Except D16B6 engine model	
			N (kgf, lbf)	kPa kgf/cm2, psi)
			98 (10, 22)	0 (0, 0)
			294 (30, 66)	1,275 (13, 185)
			98 (10, 22)	3,825 (39, 555)
			294 (30, 66)	8,238 (84, 1, 194)

Air Conditioning - Section 22

MEASUREMENT		STANDARD (NEW)		
Air conditioning system SANDEN	Lubricant type: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 38899-P13-A01) (For Refrigerant: HFC-134a (R-134a))			
	Lubricant capacity m/ (fl oz, Imp oz)	Condenser	25 (5/6, 0.9)	
		Evaporator	40 (1, 1/3, 1.4)	
		Line or hose	10 (1/3, 0.4)	
		Receiver	10 (1/3, 0.4)	
	DENSO	Lubricant type: ND-OIL8 (P/N 38897-PR7-003, 38898-PR7-003 or 38899-PR7-A01) (for Refrigerant: HFC-134a (R-134a))		
		Lubricant capacity m/ (fl oz, Imp oz)	Condenser	25 (5/6, 0.9)
			Evaporator	40 (1, 1/3, 1.4)
			Line or hose	10 (1/3, 0.4)
			Receiver	10 (1/3, 0.4)
Compressor SANDEN		Lubricant type: SP-10		
		Lubricant capacity m/ (fl oz, Imp oz)	130 (4 1/3, 4.6)	
		Field coil resistance at 20°C (68°F) ohms	3.05-3.35	
		Pulley-to-pressure plate clearance	0.5 ± 0.15 (0.02 ± 0.006)	
DENSO		Lubricant type: ND-OIL8		
	Lubricant capacity m/ (fl oz, Imp oz)	160 (5 1/3, 5.6)		
	Stator coil resistance at 20°C (68°F) ohms	3.9-4.3		
	Pulley-to-pressure plate clearance	0.5 ± 0.15 (0.02 ± 0.006)		
Compressor belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	D16B6, D16B7 engines	7.5-9.5 (0.30-0.37) with used belt	
		D16B6, D16B7 engines	5.0-6.5 (0.20-0.26) with new belt	
		All except D16B6, D16B7 engines	10.0-12.0 (0.39-0.47) with used belt	
		All except D16B6, D16B7 engines	5.5-7.5 (0.22-0.30) with new belt	
		Belt Tension N (kgf, lbf)	Measured with belt tension gauge	
			D16B6, D16B7 engines	340-490 (35-50, 77-110) with used belt
D16B6, D16B7 engines	690-830 (70-85, 150-190) with new belt			

	All except D16B6, D16B7 engines	390-540 (40-55, 88-120) with used belt	
	All except D16B6, D16B7 engines	880-1,030 (90-105, 200-231) with new belt	

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off.
Readjust deflection or tension to used belt values.

	ITEM	METRIC	ENGLISH	NOTES
Dimensions	Overall Length	4,595 mm	180.9 in	
	Overall Width	1,750 mm	68.9 in	
	Overall Height	1,430 mm	56.3 in	
	Wheelbase	2,668 mm	105.0 in	
	Track Front/Rear	1,495/1,504 mm	58.9/59.2 in	
	Wheel Arch Front/Rear	666/669 mm	26.2/26.3 in	EU
	Seating capacity		Five	
Weight	Curb Weight			
	KE 1.6iS M/T with SRS	1,314 kg	2,897 lbs	
	1.6iLS M/T with SRS	1,314 kg	2,897 lbs	
	1.8iS M/T with SRS, A/C	1,389 kg	3,062 lbs	
	M/T with SRS, S/R	1,404 kg	3,095 lbs	
	A/T with SRS, A/C	1,414 kg	3,117 lbs	
	A/T with SRS, S/R	1,429 kg	3,150 lbs	
	1.8iLS M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs	
	A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
	1.8iES M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs	
	A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
	2.0iLS M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs	
	A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs	
	2.0iES M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
	2.0iV M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,439 kg	3,172 lbs	
	A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	1,464 kg	3,228 lbs	
	2.0TDi M/T with SRS, A/C	1,464 kg	3,228 lbs	
	2.0SDi M/T with SRS, A/C, S/R	1,479 kg	3,261 lbs	
	KG 1.6iS M/T	1,312 kg	2,892 lbs	
	M/T with SRS	1,314 kg	2,897 lbs	
	1.6iLS M/T	1,312 kg	2,892 lbs	
	M/T with SRS	1,314 kg	2,897 lbs	
	M/T with SRS, side SRS	1,309 kg	2,885 lbs	
	1.8iS M/T	1,390 kg	3,064 lbs	
	M/T with SRS	1,419 kg	3,128 lbs	
	M/T with SRS, side SRS	1,386 kg	3,056 lbs	
	A/T with SRS	1,417 kg	3,124 lbs	
	1.8iLS M/T	1,390 kg	3,064 lbs	
	M/T with side SRS	1,390 kg	3,064 lbs	
	M/T with SRS, A/C	1,392 kg	3,068 lbs	
	M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs	
	M/T with SRS	1,376 kg	3,034 lbs	
	A/T with SRS, A/C	1,417 kg	3,123 lbs	
	A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
	1.8iES M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs	
	M/T with SRS, S/R	1,389 kg	3,062 lbs	
	A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
	A/T with SRS, A/C S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	

	ITEM	METRIC	ENGLISH	NOTES
Weight	KG 2.0iLS M/T with SRS, A/C	1,396 kg	3,077 lbs	
	M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs	
	A/T with SRS, A/C	1,419 kg	3,128 lbs	
	A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs	
	2.0iES M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
	M/T with SRS, A/C, S/R NAVI.	1,427 kg	3,146 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs	
	A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
	2.0iV M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,439 kg	3,172 lbs	
	A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs	
	A/T with SRS, A/C, S/R NAVI.	1,464 kg	3,228 lbs	
	2.0TDi M/T with SRS, A/C	1,464 kg	3,228 lbs	
	2.0SDi M/T with SRS, A/C	1,464 kg	3,228 lbs	
	M/T with SRS, A/C, S/R	1,479 kg	3,260 lbs	
	KS 1.6iS M/T	1,312 kg	2,892 lbs	
	M/T with SRS	1,314 kg	2,897 lbs	
	1.6iLS M/T with SRS	1,314 kg	2,897 lbs	
	1.8iS M/T with SRS	1,419 kg	3,128 lbs	
	1.8iLS M/T with SRS, A/C	1,392 kg	3,068 lbs	
	A/T with SRS, A/C	1,417 kg	3,123 lbs	
	2.0iLS M/T with SRS, A/C	1,396 kg	3,077 lbs	
	2.0iES M/T with SRS, A/C	1,409 kg	3,106 lbs	
	KR 1.6iS M/T	1,307 kg	2,881 lbs	
	M/T with SRS	1,314 kg	2,897 lbs	
	1.6iLS M/T with SRS	1,314 kg	2,897 lbs	
	1.8iS M/T with SRS	1,419 kg	3,128 lbs	
	1.8iLS M/T with SRS, A/C	1,408 kg	3,104 lbs	
	M/T with SRS, A/C (AUTO)	1,408 kg	3,104 lbs	
	M/T with SRS, A/C, S/R	1,423 kg	3,137 lbs	
	A/T with SRS, A/C	1,433 kg	3,159 lbs	
	A/T with SRS, A/C (AUTO)	1,433 kg	3,159 lbs	
	2.0iES M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
	M/T with SRS, A/C, S/R, NAVI	1,427 kg	3,146 lbs	
	A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs	
	A/T with SRS, A/C S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI	1,450 kg	3,197 lbs	
	2.0TDi M/T with SRS, A/C	1,464 kg	3,228 lbs	
	2.0SDi M/T with SRS, A/C	1,464 kg	3,228 lbs	

	ITEM	METRIC	ENGLISH	NOTES
Weight	Weight Distribution (Front/Rear)			
	KE 1.6iS M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.6iLS M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.8iS M/T with SRS, A/C	802/587 kg	1,768/1,294 lbs	
	M/T with SRS, S/R	810/594 kg	1,786/1,309 lbs	
	A/T with SRS, A/C	827/587 kg	1,823/1,294 lbs	
	A/T with SRS, S/R	835/594 kg	1,840/1,310 lbs	
	1.8iLS M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs	
	A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs	
	1.8iES M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs	
	M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs	
	M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,835/1,307 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	835/596 kg	1,841/1,314 lbs	
	A/T with SRS, A/C, S/R	851/594 kg	1,876/1,310 lbs	
	A/T with SRS, A/C, S/R, Power seat	854/597 kg	1,883/1,316 lbs	
	A/T with SRS, A/C, S/R, NAVI.	856/594 kg	1,887/1,310 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	859/597 kg	1,894/1,316 lbs	
	2.0iLS M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs	
	A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs	
	2.0iES M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs	
	M/T with SRS, A/C, S/R, NAVI.	827/600 kg	1,823/1,323 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs	
	A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs	
	A/T with SRS, A/C, S/R, NAVI.	858/592 kg	1,892/1,305 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs	
	2.0iV M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	836/603 kg	1,843/1,329 lbs	
	A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	861/603 kg	1,899/1,329 lbs	
	2.0TDi M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs	
	2.0SDi M/T with SRS, A/C, S/R	881/598 kg	1,942/1,319 lbs	
	KG 1.6iS M/T	738/574 kg	1,627/1,265 lbs	
	M/T with SRS	738/576 kg	1,627/1,270 lbs	
	1.6iLS M/T	738/574 kg	1,627/1,265 lbs	
	M/T with SRS	739/575 kg	1,629/1,268 lbs	
	M/T with SRS, side SRS	730/578 kg	1,610/1,275 lbs	
	1.8iS M/T	806/584 kg	1,777/1,287 lbs	
	M/T with SRS	809/610 kg	1,783/1,345 lbs	
	M/T with SRS, side SRS	813/573 kg	1,793/1,263 lbs	
	A/T with SRS	832/585 kg	1,834/1,290 lbs	
	1.8iLS M/T	806/584 kg	1,777/1,287 lbs	
	M/T with side SRS	806/584 kg	1,777/1,287 lbs	
	M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs	
	M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs	
	M/T with SRS	805/570 kg	1,775/1,259 lbs	
	A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs	
	A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs	
	1.8iES M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs	
	M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs	
	M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,834/1,308 lbs	
	M/T with SRS, A/C, S/R, Power seat, NAVI.	835/596 kg	1,841/1,314 lbs	
	M/T with SRS, S/R	803/586 kg	1,770/1,292 lbs	
A/T with SRS, A/C, S/R	851/594 kg	1,876/1,310 lbs		
A/T with SRS, A/C, S/R, Power seat	854/597 kg	1,883/1,316 lbs		
A/T with SRS, A/C, S/R, NAVI.	856/594 kg	1,887/1,310 lbs		
A/T with SRS, A/C S/R, Power seat, NAVI.	859/597 kg	1,894/1,316 lbs		
2.0iLS M/T with SRS, A/C	801/595 kg	1,765/1,312 lbs		
M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs		
A/T with SRS, A/C	824/595 kg	1,816/1,312 lbs		
A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs		

	ITEM	METRIC	ENGLISH	NOTES	
Weight	KG 2.0iES M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs		
	M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs		
	M/T with SRS, A/C, S/R NAVI.	827/600 kg	1,823/1,323 lbs		
	M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs		
	A/T with SRS, A/C, S/R	848/594 kg	1,870/1,309 lbs		
	A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs		
	A/T with SRS, A/C, S/R, NAVI.	858/592 kg	1,892/1,305 lbs		
	A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs		
	2.0iV M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs		
	M/T with SRS, A/C, S/R, NAVI.	836/603 kg	1,843/1,329 lbs		
	A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs		
	A/T with SRS, A/C, S/R NAVI.	861/603 kg	1,899/1,329 lbs		
	2.0TDi M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
	2.0SDi M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
	M/T with SRS, A/C, S/R	881/598 kg	1,942/1,318 lbs		
	KS 1.6iS M/T	738/574 kg	1,627/1,265 lbs		
	M/T with SRS	739/575 kg	1,629/1,268 lbs		
	1.6iLS M/T with SRS	739/575 kg	1,629/1,268 lbs		
	1.8iS M/T with SRS	809/610 kg	1,783/1,345 lbs		
	1.8iLS M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs		
	A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs		
	2.0iLS M/T with SRS, A/C	801/595 kg	1,766/1,311 lbs		
	2.0iES M/T with SRS, A/C	816/592 kg	1,799/1,305 lbs		
	KR 1.6iS M/T	733/574 kg	1,616/1,265 lbs		
	M/T with SRS	739/575 kg	1,629/1,268 lbs		
	1.6iLS M/T with SRS	739/575 kg	1,629/1,268 lbs		
	1.8iS M/T with SRS	809/610 kg	1,784/1,344 lbs		
	1.8iLS M/T with SRS, A/C	823/585 kg	1,814/1,290 lbs		
	M/T with SRS, A/C (AUTO)	823/585 kg	1,814/1,290 lbs		
	M/T with SRS, A/C, S/R	830/593 kg	1,830/1,307 lbs		
	A/T with SRS, A/C	847/586 kg	1,867/1,292 lbs		
	A/T with A/C (AUTO)	847/586 kg	1,867/1,292 lbs		
	2.0iES M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs		
	M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs		
	M/T with SRS, A/C, S/R, NAVI	827/600 kg	1,823/1,323 lbs		
	A/T with SRS, A/C, S/R	848/594 kg	1,869/1,310 lbs		
	A/T with SRS, A/C S/R, Power seat	856/595 kg	1,887/1,312 lbs		
	A/T with SRS, A/C, S/R, NAVI	858/592 kg	1,892/1,305 lbs		
	2.0TDi M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
	2.0SDi M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
		Max. Permissible Weight (EU)			
		D16B6, D16B7 engine models	1,740 kg	3,241 lbs	
	F18B2, F18B4, F20B6 engine models	1,930 kg	4,255 lbs		
	20T2N engine model	1,940 kg	4,277 lbs		

	ITEM	METRIC	ENGLISH	NOTES	
Engine	Type	D16B6, D16B7 engines	Water-cooled, 4-stroke SOHC gasoline engine		
		Except D16B6, D16B7 engines	Water cooled, 4-stroke SOHC VTEC gasoline engine		
	Cylinder Arrangement				
	Bore and Stroke				
		D16B6, D16B7 engines	75.0 x 90.0 mm	2.95 x 3.54 in	
		F18B2, F18B4 engines	85.0 x 81.5 mm	3.35 x 3.21 in	
		F20B6 engine	85.0 x 88.0 mm	3.35 x 3.46 in	
	Displacement				
		D16B6, D16B7 engines	1,590 cm ³ (ml)	97.0 cu-in	
		F18B2, F18B4 engines	1,850 cm ³ (ml)	112.9 cu-in	
		F20B6 engine	1,997 cm ³ (ml)	121.9 cu-in	
	Compression Ratio				
		D16B6, D16B7 engines		9.6	
		F18B2, F18B4, F20B6 engines		10.0	
	Valve Train				
	D16B6, D16B7 engines		Belt Driven, SOHC 4 valves per cylinder		
	F18B2, F18B4, F20B6 engines		Belt Driven, SOHC VTEC 4 valves per cylinder		
Lubrication System			Forced and wet sump, trochoid pump		
Oil Pump Displacement					
	D16B6, D16B7 engines	35.4 / (37.4 US qt, 31.1 Imp qt)		at 6,000 engine rpm (min-1)	
	Except D16B6, D16B7 engines	73.5 / (77.7 US qt, 64.7 Imp qt)			
Water Pump Displacement					
	D16B6, D16B7 engines	125 / (132 US qt, 110 Imp qt)		at 6,000 engine rpm (min-1)	
	Except D16B6, D16B7 engines	160 / (169 US qt, 141 Imp qt)			
Fuel Required			Premium UNLEADED gasoline with a Research Octane Number (RON) of 95 or higher		
Starter	Type		Gear reduction		
	Normal Output		1.0 kW		
	Normal Voltage		12 V		
	Hour Rating		30 seconds		
	Direction of Rotation		Clockwise as viewed from gear end		

	ITEM		METRIC	ENGLISH	NOTES
Clutch	Type	M/T	Single plate dry, diaphragm spring		
		A/T	Torque converter		
	Facing Area	M/T	176 cm ²	27.3 sq-in	
Trans- mission	Type	M/T	Synchronised 5-speed forward, 1 reverse		
		A/T	Electronically controlled		
	Primary Reduction	Type/Ratio	4-speed automatic, 1 reverse Direct/ 1:1		
	Manual Transmission		DH	U2J4	DIESEL
	Gear Ratio		D16B6, D16B7(7PA) engine	F18B2, F18B4(7PA) F20B6 engines	20T2N engine
		1st	3,250	3,285	3,250
		2nd	1,782	1,807	1,894
		3rd	1,250	1,266	1,222
		4th	0.937	0.966	0.848
		5th	0.750	0.787	0.648
		Reverse	3,153	3,000	3,000
	Final Reduction Gear	Ratio	4,437	4,266	3,937
		Type	Single helical gear		
	Automatic transmission				
	Gear Ratio	1st		2.528	
		2nd		1.427	
		3rd		0.976	
		4th		0.653	
		Reverse		1.863	
	Final Reduction	Ratio		4.466	
		Type	Single helical gear		
Air Conditioning	Cooling Capacity		3,910 Kcal/h	15,500 BTU/h	KR model KG, KE, KS models
			3,740 Kcal/h	14,800 BTU/h	
	Compressor:				
	SANDEN	Type	Scroll		
		Capacity	85.7 cm ³ /rev	5.22 cu-in/rev	
		Max. Speed	10,000 rpm (min-1)		
		Lubricant Type	SP-10		
		Lubricant Capacity	130 cm ³	4.1/3 fl oz, 4.6 Imp oz	
	DENSO	Type	Swash-plate		
		No. of Cylinder	10		
		Capacity	188.0 cm ³ /rev	11.47 cu-in/rev	
		Max. speed	7,600 rpm (min-1)		
		Lubricant Type	ND-OIL8		
		Lubricant Capacity	160 cm ³	5 1/3 fl oz, 5.6 Imp oz	
	Condenser	Type	Corrugated fin		
	Evaporator	Type	Corrugated fin		
	Blower	Type	Sirocco fan		
		Motor Input	220 W/12 V max.		
		Speed Control	4-speed*1/Infinite variable*2		*1 Manual A/C
		Max. Capacity	470 m ³ /h 16,600 cu-ft/h		*2 AUTO A/C
	Temp. Control	Type	Air-Mix		
	Compressor Clutch	Type	Dry, single plate, poly-V belt drive		
		Power Consumption			
		SANDEN	40 W max/12 V		
		DENSO	40 W max/12 V		
	Refrigerant	Type	HFC-134a (R-134a)		
		Quantity	500-550 g	18-19 oz	
Steering System	Type		Power assisted, rack and pinion		
	Overall Ratio		15.50		
	Turns, Lock-to-Lock		3.02		
	Steering Wheel Dia.		380 mm	15.0 in	

ITEM		METRIC	ENGLISH	NOTES
Suspension	Type	Front	Independent double wishbone, coil spring with stabiliser	
		Rear	Independent double wishbone, coil spring with stabiliser	
	Shock Absorber	Front and Rear	Telescopic, hydraulic nitrogen gas-filled	
Wheel Alignment	Camber	Front	-0°00'	
		Rear	-1° 00'	
	Caster Total Toe	Front	2° 50'	
		Front	0 mm	0 in
		Rear	In 2 mm	In 0.08 in
Brake System	Type	Front	Power-assisted self-adjusting ventilated disc	
		Rear	Power-assisted self-adjusting solid disc*1 Power-assisted self-adjusting drum*2	Except D16B6 engine model D16B6 engine model
	Pad Surface Area	Front	47.6 cm ² x 2	7.38 sq-in x 2
		Rear	40.0 cm ² x 2	6.20 sq-in x 2
	Lining Surface Area	Front	25.4 cm ² x 2	3.94 sq-in x 2
		Rear	86.8 cm ² x 2	13.45 sq-in x 2
Parking brake	Type	Mechanical actuating, rear two wheel brakes		Disc brake Drum brake
Tyre	Size and pressure	See tyre label (See Page 1-12).		
Washer reservoir	Capacity / (US qt, Imp qt)	4.5*3 (4.8, 4.0) 6.9*4 (7.3, 6.1)		
Electrical	Battery	*512 V, 47 AH-20 HR *612 V, 57 AH-20 HR		
	Under-hood fuse/relay box	100 A, 50 A, 40 A, 30 A, 20 A, 15 A, 10 A, 7.5 A		
	Driver's under-dash fuse/relay box	30 A, 15 A, 10 A, 7.5 A		
	Passenger's under-dash fuse/relay box	30 A, 20 A, 15 A, 7.5 A		
	Headlight high beam	12 V - 55 W		
	Headlight low beam	*712 V - 55 W		
	Front turn signal lights	12 V - 21 W		
	Front parking lights	12 V - 5 W		
	Front fog lights	12 V - 55 W		
	Side turn signal lights	12 V - 5 W		
	Rear turn signal lights	12 V - 21 W		
	Brake lights	12 V - 21 W		
	Tail lights	12 V - 5 W		
	High mount brake light	12 V - LED		
	Back-up lights	12 V - 21 W		
	Rear fog light	12 V - 21 W		
	License plate lights	12 V - 5 W		
	Front ceiling light	12 V - 5 W		
	Rear ceiling light	12 V - 5 W		
	Trunk Light	12 V - 5 W		
Tailgate light	12 V - 5 W			
Spotlights	12 V - 5 W			
Gauge lights	14 V - 1.12 W, 14 W, 3.0 W, 9.5 V - 1.1 W			
Indicator lights	12 V - LED, 14 V - 0.84 W, 1.4 W			
Panel and pilot lights	14 V - 0.84 W, 1.2 W			

*1: Except D16B6, D16B7 engines model

*2: D16B6, D16B7 engines model

*3: Without headlight washer

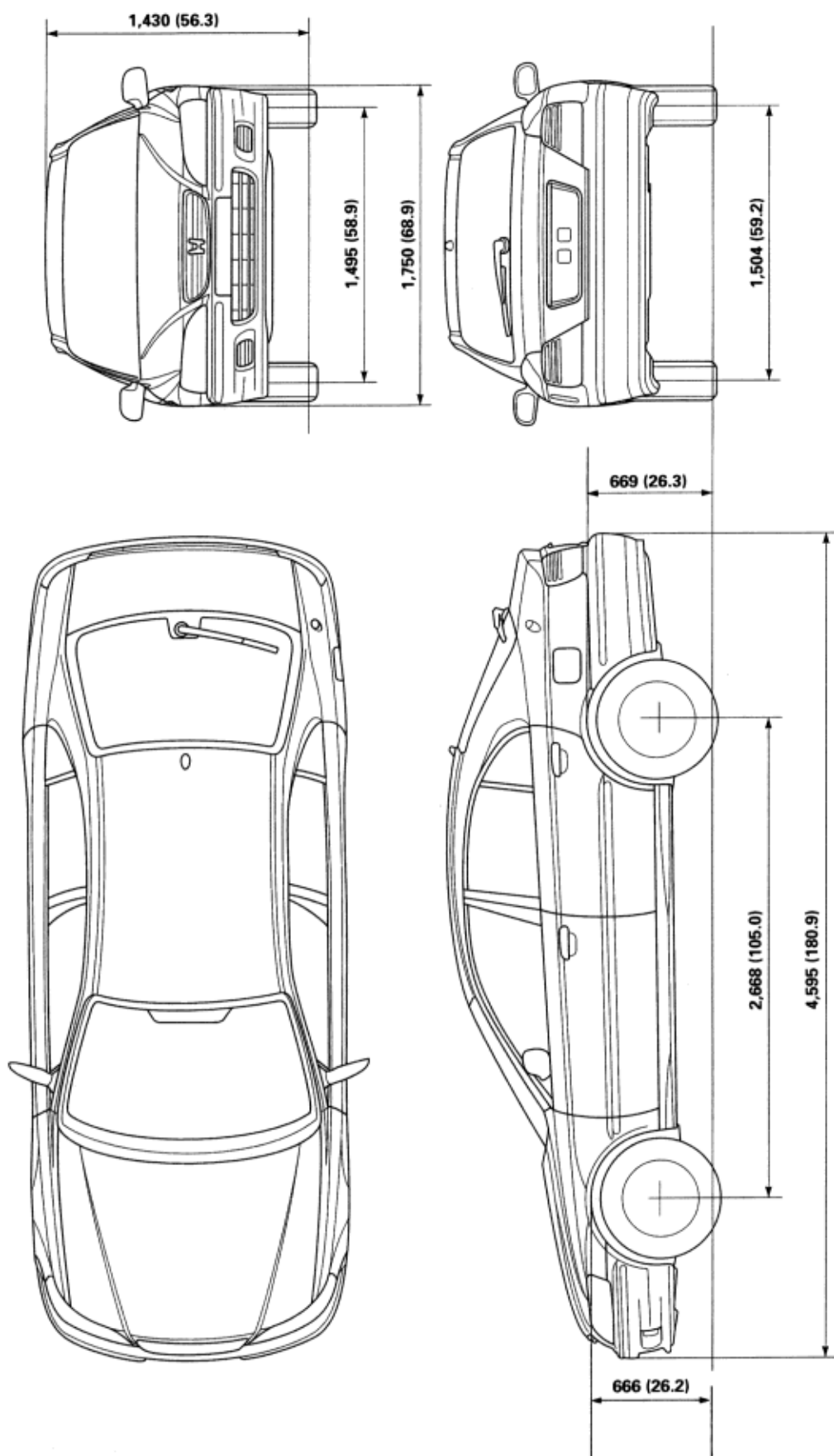
*4: With headlight washer

*5: CG7 (Vehicle type)

*6: Except CG7 (Vehicle type)

*7: Without HID lamp

Unit : mm (in)

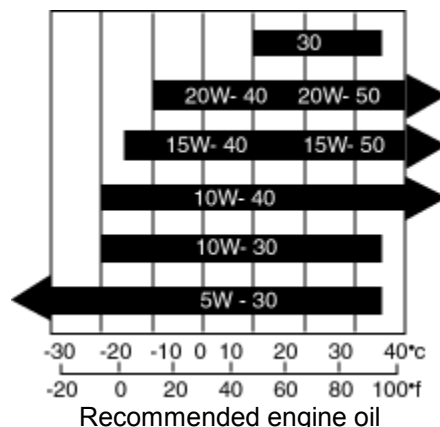


For the details of lubrication points and types of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	Always use a fuel-efficient oil as "API Service SG, SH or SJ". SAE Viscosity: See chart below
2	Transmission Manual Automatic	Genuine Honda MTF*1 Genuine Honda ATF PREMIUM (Automatic Transmission Fluid PREMIUM) or DEXRONR II or III ATF
3	Brake line (includes Anti-lock brake line)	Brake fluid DOT3 or DOT4*2
4	Clutch line	Brake fluid DOT3 or DOT4*2
5	Power steering gearbox	Steering grease P/N 08733-B070E
6	Release fork (Manual transmission)	Urea Grease UM264 (P/N 41211-PY5-305)
7	Shift and select cable ends (Manual transmission)	Urea Grease UM264 (P/N 41211-PY5-305)
8	Throttle cable end (Dashboard lower panel hole)	Silicone grease
9	Throttle cable end (Throttle link)	Multi-purpose grease
10	Brake master cylinder pushrod	Multi-purpose grease
11	Clutch master cylinder pushrod	Multi-purpose grease
12	Hood hinges and hood latch	Multi-purpose grease
13	Battery terminals	Multi-purpose grease
14	Fuel fill lid	Multi-purpose grease
15	Tailgate hinges and latch	Multi-purpose grease
16	Door hinges, upper and lower	Multi-purpose grease
17	Door open detent	Multi-purpose grease
18	Rear brake shoe linkages	Multi-purpose grease
19	Brake callipers	Silicone grease
20	Power steering system	Genuine Honda Power Steering Fluid (V, II or S)
21	Air conditioning compressor	Compressor oil: SANDEN: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 38899-P13-A01) DENSO: ND OIL 8 (38897-PR7-003, 38898-PR7-003 or 38899-PR7-A01) (For Refrigerant: HFC-134a (R-134a))
21	Air conditioning compressor	
21	Air conditioning compressor	

▲ CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

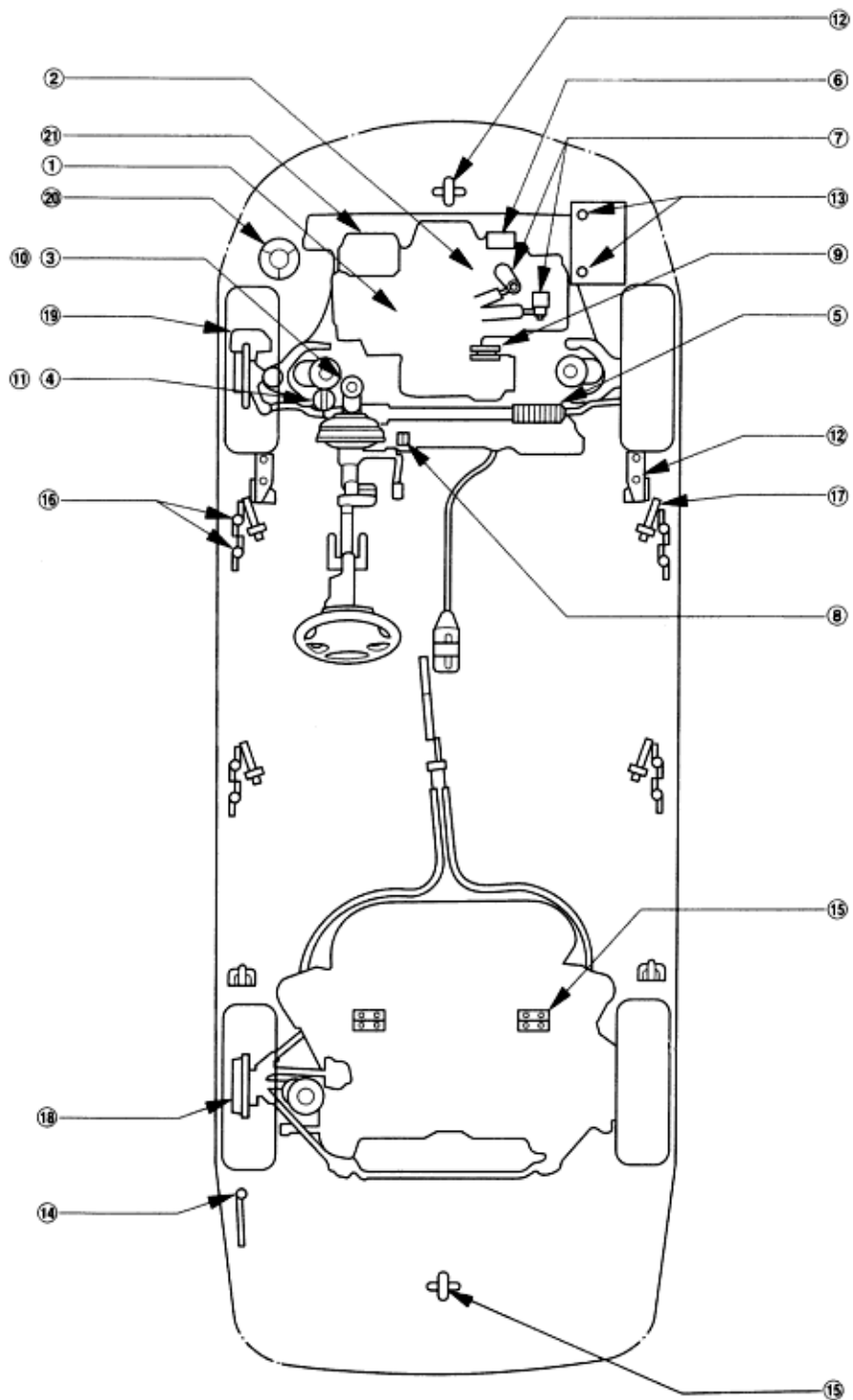


Engine oil viscosity for ambient temperature ranges

*1: If Honda MTF is not available, you may use an AP1 service SG, SH or SJ-rated motor oil with a viscosity of SAE 10 W-30 or 10 W-40 temporarily.

Motor oil can cause increased transmission wear and higher shifting effort.

*2: We recommend Genuine Honda Brake Fluid.



Maintenance Schedule

European Model - Normal Conditions

3-4

Follow the Normal Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
	miles x 1,000	9	18	27	36	45	54	63	72	81	90	99		
	months	12	24	36	48	60	72	84	96	108	120	132		
Replace engine oil and oil filter		●	●	●	●	●	●	●	●	●	●	●		*1 8-7 to 8-10
Replace air cleaner element				●			●			●				*1 11-A-119
Inspect valve clearance				●			●			●			Check the valve clearance.	*1 6-A-3, 6-B-12, 6-C-9
Replace fuel filter								●						*1 11-A-105
Replace spark plugs				●			●			●				*1 4-31
Replace timing belt, timing balancer belt and inspect water pump									●				Check water pump for signs of seal leakage.	*1 6-A-8, 6-B-18, 6-C-14, 10-17
Inspect and adjust drive belts				●			●			●			<ul style="list-style-type: none"> • Check for cracks and damage. • Check deflection and tension 	*1 4-46, 4-47, 4-48, 17-14, 22-53, 22-54
Inspect idle speed								●						*1 11-A-94, 11-B-65, 11-C-57
Replace engine coolant						●			●			●	Check specific gravity for freezing point.	*1 10-7 to 10-10
Replace transmission fluid (O: Inspect)	MT				O				●				Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF.	*1 13-3, 13-57
Replace transmission fluid (O: Inspect)	AT			O*3		●			O			●	Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF.	*1 14-132
Inspect front and rear brakes		●	●	●	●	●	●	●	●	●	●	●	<ul style="list-style-type: none"> • Check the brake pad and disc thickness. • Check for damage or cracks. • Check the callipers for damage, leaks and tightness. 	*2 19-A-4, 19-A-10, 19-A-12, 19-A-14, 19-A-15, 19-A-17, 19-A-26, 19-A-28, 19-A-30, 19-A-31
Replace brake fluid		Every 3 years											Use only DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*2 19-A-7
Check parking brake adjustment		●	●		●		●		●		●		Check the parking brake operation	*2 19-A-6
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months												*2 22-39
Check lights alignment		●	●	●	●	●	●	●	●	●	●	●	Check the position of the headlights.	*2 23-D-9
Test drive (noise, stability, dashboard operations)		●	●	●	●	●	●	●	●	●	●	●	Check for road stability, noise, vibrations and dashboard operation.	-

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

*3: Inspect at 45,000 km (27,000 miles/36 months and every 45,000 km (27,000 miles/36 months after replacement.

*4: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule
European Model - Normal Conditions (cont'd)

3-5

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
miles x 1,000	months	9	18	27	36	45	54	63	72	81	90	99		
Visually inspect the following items													<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten 	-
Tie rod ends, steering gearbox, and boots		•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-13, 17-26
Suspension components		•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22
Driveshaft boots		•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3
Brake hoses and lines (including ABS)		•	•	•	•	•	•	•	•	•	•	•	Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.	*2 19-A-3, 19-A-36
Exhaust system		•	•	•	•	•	•	•	•	•	•	•	Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	*1 9-9 to 9-12
Fuel lines and connections		•	•	•	•	•	•	•	•	•	•	•	Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	*1 11-A-95, 11-C-59
Tyre condition		•	•	•	•	•	•	•	•	•	•	•	Check for pressure, puncture or cuts and irregular tread wear.	-

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

Maintenance Schedule
European Model - Severe Conditions

3-6

Service at the indicated distance or time whichever comes first	km x 1,000	miles x 1,000	months	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	SECTION and PAGE	
				4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72			76
Replace engine oil and oil filter				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		*1 8-7 to 8-10
Clean (O) or replace (●) air cleaner element	Except 1.6 /				O				●				O			●			O			*1 11-A-119
- Use normal schedule except in dusty conditions	1.6 /				●				●				●			●			●			*1 11-A-119
Inspect valve clearance									●						●							Check the valve clearance *1 6-A-3, 6-B-12, 6-C-9
Replace fuel filter																			●			*1 11-A-105
Replace spark plugs									●						●							*1 4-31
Replace timing belt, timing balancer belt and inspect water pump																				●	*3	Check water pump for signs of seal leakage *16-A-8, 6-B-18, 6-C-14, 10-17
Inspect and adjust drive belts									●						●							• Check for cracks and damage. • Check for deflection and tension. *1 4-46, 4-47, 4-48, *217-14, 22-53, 22-54
Inspect idle speed																			●			*1 11-A-94, 11-B-65, 11-C-57
Replace engine coolant													●							●		Check specific gravity for freezing point *1 10-7, 10-10
Replace transmission fluid	MT										●									●		Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF. *1 13-3, 13-57
	AT								●						●							Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF. *1 14-132
Inspect front and rear brakes				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		• Check the brake pad and disc thickness. • Check for damage or cracks. • Check the callipers for damage, leaks and tightness. *2 19-A-4, 19-A-10, 19-A-12, 19-A-14, 19-A-15, 19-A-17, 19-A-26, 19-A-28, 19-A-30, 19-A-31,
Replace brake fluid			Every three years																			Use DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir. *2 19-A-7
Check parking brake adjustment				●		●					●				●					●		Check the parking brake operation *2 19-A-6
Replace pollen filter			Every 30,000 km (18,000 miles) or 12 months																			*2 22-39
Check lights alignment				●		●		●		●		●		●		●		●		●		Check the position of the headlights *2 23-D-9
Test drive (noise, stability, dashboard operations)				●		●		●		●		●		●		●		●		●		Check for road stability, noise, vibrations, and dashboard operation. -

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A
 *2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B
 *3: These belts should normally be replaced at the intervals shown in the maintenance schedule. (Normal Conditions)
 Replace these belts at 75,000 km or 45,000 miles if you regularly drive your vehicle in one or more of these conditions.
 ● In very high temperatures [43°C (110°F) above]
 ● In very low temperatures [-29°C (-20°F) under]
 *4: We recommend Genuine Honda Brake Fluid

Maintenance Schedule
European Model - Severe Conditions (cont'd)

3-7

Service at the indicated distance or time whichever comes first	km x 1,000	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	SECTION and PAGE	
	miles x 1,000	4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72			
	months	6	12									66	72	78	84	90	96			
Visually inspect the following items:																		<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints. If necessary, retighten. 	-	
Tie rod ends, steering gearbox and boots		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-A-13, 17-A-26
Suspension components		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22
Driveshaft boots		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3
Brake hoses and lines (including ABS)			•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage. 	*2 19-A-3, 19-A-36	
Exhaust system			•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness. 	*1 9-9 to 9-12	
Fuel lines and connections			•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. 	*1 11-A-95, 11-C-59	
Tyre condition			•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check for pressure, puncture or cuts and irregular tread wear. 	-	

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

Follow the Severe Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot [over 32°C, (90°F)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty or de-iced roads.

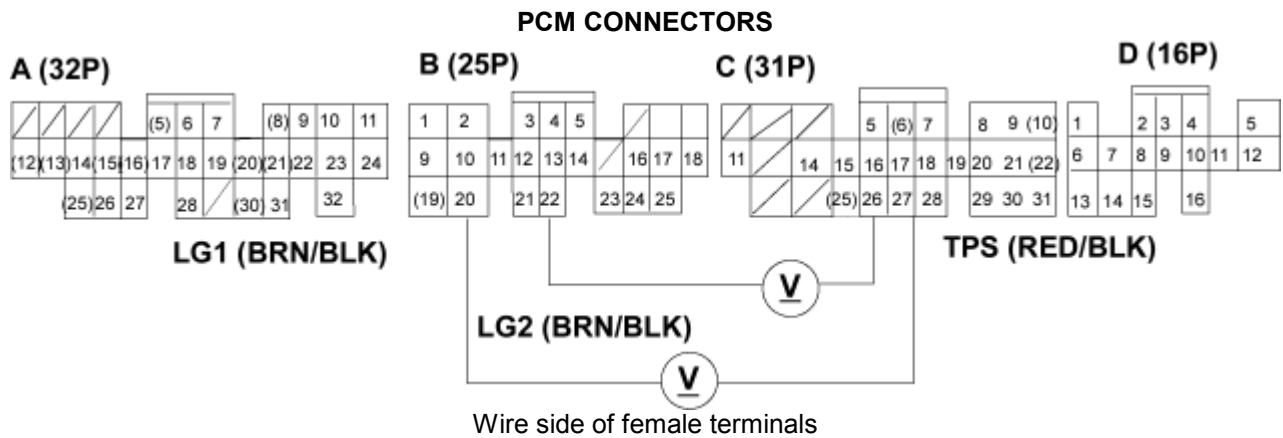
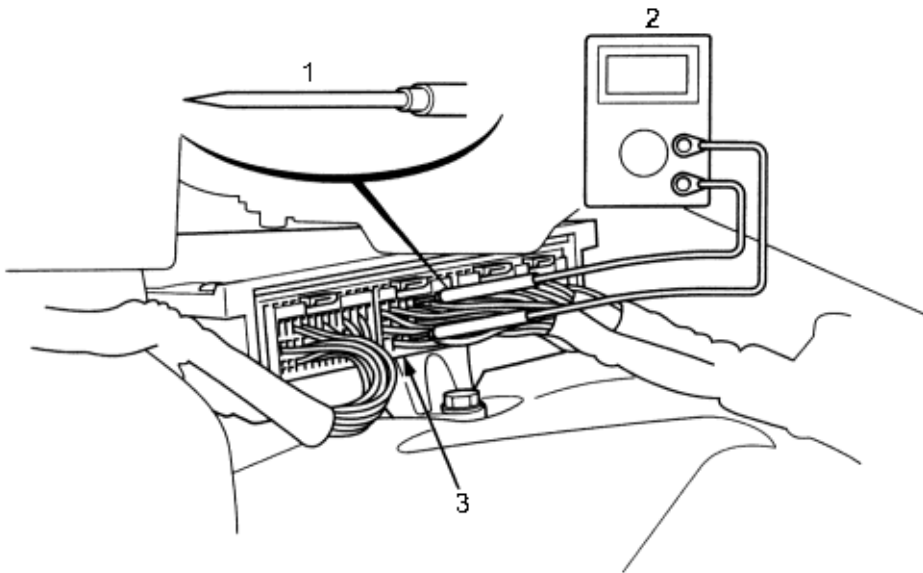
NOTE: If the customer's vehicle is driven OCCASIONALLY under severe conditions, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block both rear wheels securely. Start the engine, then shift to **D4** position while depressing the brake pedal. Depress the accelerator pedal and release it suddenly. The engine should not stall.
3. Repeat the same test in **D3** position.
4. Test-drive the vehicle on a flat road in **D4** position. Check that the shift points occur at the approximate speeds shown. Also check for abnormal noise and clutch slippage.

NOTE: Throttle position sensor voltage represents the throttle opening.

- 1. Pull back the carpet from passenger's side of the centre console to expose the PCM.
- 2. Set the digital multimeter to monitor voltage between the C27 (+) terminal and B20 (-) or B22 (-) terminal of the PCM for the throttle position sensor.

1. **TAPERED TIP PROBE**
2. **DIGITAL MULTITESTER**
Commercially available or
07411-002000
3. **PCM CONNECTOR**



D4 Position

Upshift

Throttle Opening	Unit of Speed	1st to 2nd	2nd to 3rd	3rd to 4th
Throttle position sensor voltage: 0.75 V	mph	10 - 12	17 - 20	25 - 29
Throttle position sensor voltage: 0.75 V	km/h	16 - 20	28 - 32	40 - 46
Throttle position sensor voltage: 2.25 V	mph	21 - 23	40 - 42	58 - 62
Throttle position sensor voltage: 2.25 V	km/h	33 - 37	64 - 68	94 - 100
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	mph	33 - 37	61 - 65	91 - 95
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	km/h	53 - 59	98 - 104	147 - 153

Downshift

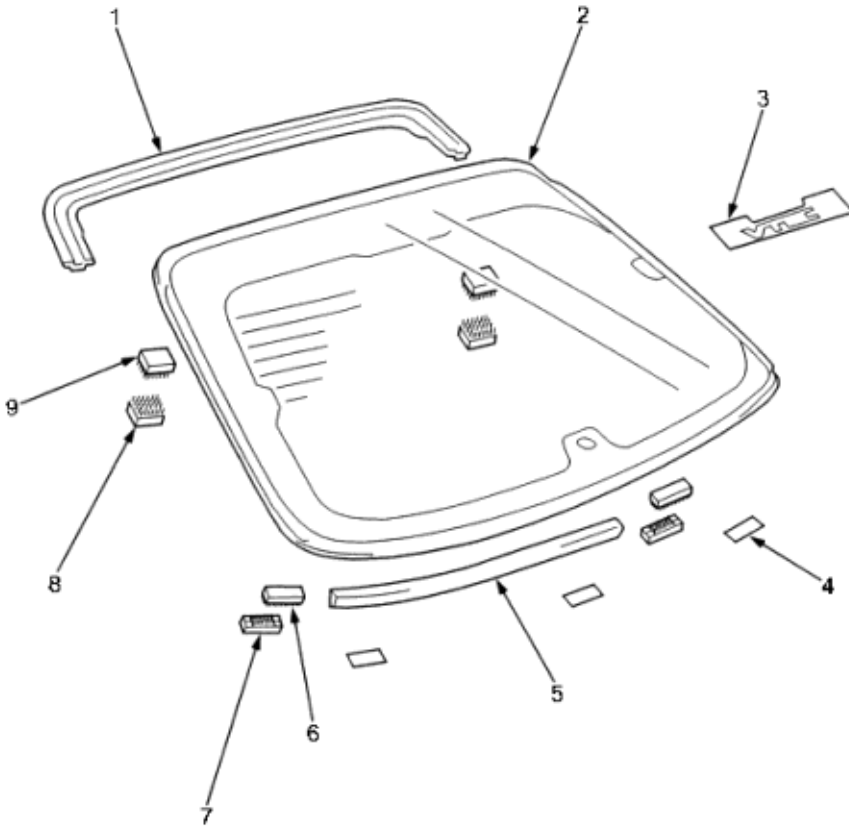
Throttle Opening	Unit of Speed	4th to 3rd	3rd to 2nd	2nd to 1st
Throttle position sensor voltage: 0.75 V	mph	16 - 18	-	5 - 7
Throttle position sensor voltage: 0.75 V	km/h	25 - 29	-	8 - 12
Throttle position sensor voltage: 2.25 V	mph	-	-	-
Throttle position sensor voltage: 2.25 V	km/h	-	-	-
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	mph	85 - 89	54 - 58	26 - 30
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	km/h	137 - 143	87 - 93	42 - 48

Lock-up points

Throttle Opening	Unit of Speed	4th gear in D4 position and manual mode		D3 position		2nd gear and 3rd gear in manual mode	
		Lock-up ON	Lock-up OFF	Lock-up ON	Lock-up OFF	Lock-up ON	Lock-up OFF
Throttle position sensor voltage: 0.8 V	mph	48 - 50	47 - 49	61 - 63	58 - 60	38 - 40	26 - 29
Throttle position sensor voltage: 0.8 V	km/h	77 - 81	75 - 79	98 - 102	93 - 97	61 - 65	42 - 46
Throttle position sensor voltage: 2.25 V	mph	69 - 73	59 - 63	69 - 73	59 - 63	101 - 104	94 - 98
Throttle position sensor voltage: 2.25 V	km/h	111 - 117	95 - 101	111 - 117	95 - 101	162 - 168	152 - 158
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	mph	101 - 105	95 - 99	101 - 105	95 - 99	101 - 105	95 - 99
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	km/h	163 - 169	153 - 159	163 - 169	153 - 159	163 - 169	153 - 159

5. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from **D4** position to **2** position. The vehicle should immediately begin slowing down from engine braking.
6. Check for abnormal noise and clutch slippage in the following positions.
 - 1** (1st Gear) Position
 - a. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
 - b. Upshifts should not occur with the shift lever in this position.
 - 2** (2nd Gear) Position
 - a. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
 - b. Upshifts and downshifts should not occur with the shift lever in this position.
 - R** (Reverse) Position
Accelerate from a stop at full throttle and check for abnormal noise and clutch slippage.
7. **Test in P (Parking) Position**
Park the vehicle on a slope (approx. 16°), apply the parking brake and shift in **P** position. Release the brake; the vehicle should not move.

The numbers after the part names show the quantities of the parts used.



1. **MOULDING UPPER SEAL**
2. **REAR WINDOW**
Replacement, (See Page 20-3)
3. **REAR VTEC STICKER**
(for some models)
Replacement, (See Page 20-8)
4. **MOULDING LOWER SEAL, 3**
5. **RUBBER DAM**
6. **LOWER FASTENER, 2**
(Self-adhesive-type, glass side)
7. **LOWER FASTENER, 2**
(Self-adhesive-type, tailgate side)
8. **LOWER FASTENER, 2**
(Self-adhesive-type, tailgate side)
9. **UPPER FASTENER, 2**
(Self-adhesive-type, glass side)

NOTE:

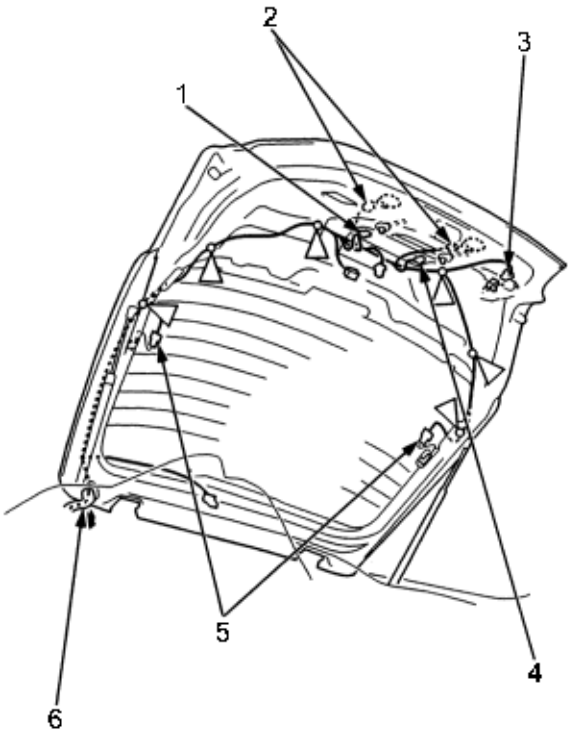
- ♦ Put on gloves to protect your hands.
- ♦ When removing the glass with the piano wire, put on eye protection to protect your eyes.
- ♦ Use seat covers and plastic plates to avoid damaging any surfaces.
- ♦ Do not damage the rear window defogger grid lines or terminals.
- ♦ If the old glass is to be reinstalled, do not damage the rear window moulding.

1. Remove:

- ♦ Tailgate lining (**See Page 20-13**)
- ♦ High mount brake light (see section 23)
- ♦ Rear window wiper motor (see section 23)

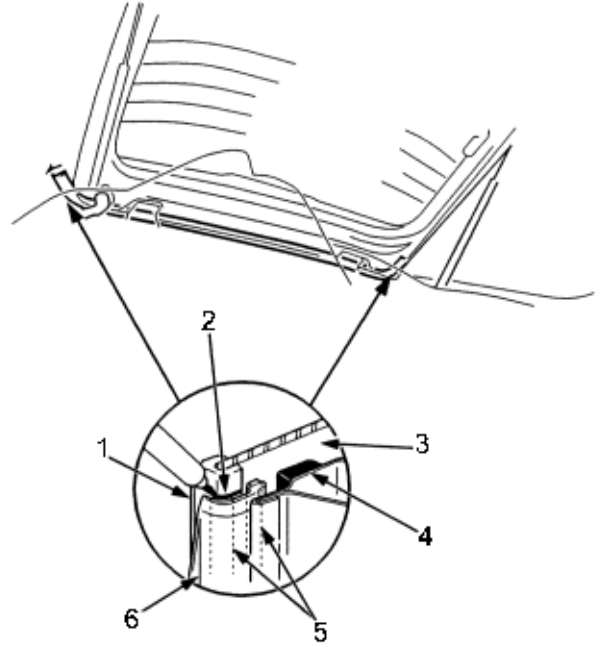
2. Disconnect the tailgate lock cylinder switch connector, tailgate latch switch connector, tailgate latch actuator connector, license plate light connectors and rear window defogger connectors. Detach the harness clips, and remove the grommet, then remove the wire harness from the tailgate.

▷: **Harness clip locations**



1. TAILGATE LATCH ACTUATOR CONNECTOR
2. LICENSE PLATE LIGHT CONNECTORS
3. TAILGATE LOCK CYLINDER SWITCH CONNECTORS
4. TAILGATE LATCH SWITCH CONNECTOR
5. REAR WINDOW DEFOGGER CONNECTORS
6. GROMMET

3. Scribe lines on the moulding along both sides end of the upper seal for the moulding upper seal installation. Remove the moulding upper seal from the top of the rear window. If necessary, cut the moulding upper seal with a utility knife.

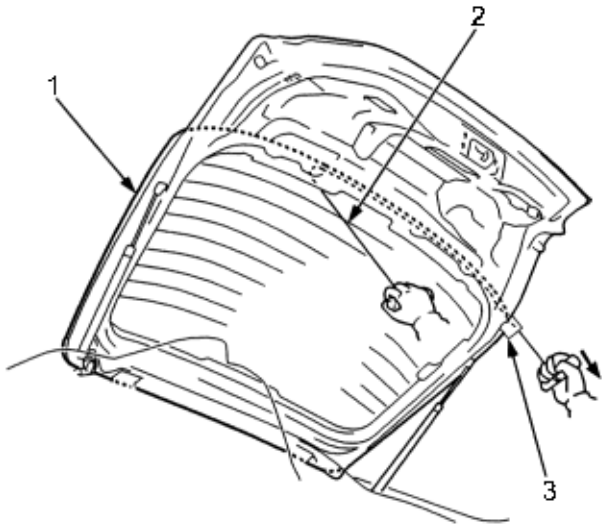


1. MOULDING
2. ALIGNMENT LINE
3. REAR WINDOW
4. ADHESIVE
5. ADHESIVE TAPES
6. MOULDING UPPER SEAL

4. If the old glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil at the four points.
5. Apply protective tape along the edge of the body.
6. Using an awl, make a hole through the adhesive from inside the vehicle at the corner portion of the rear window. Push piano wire through the hole, and wrap each end around a piece of wood.

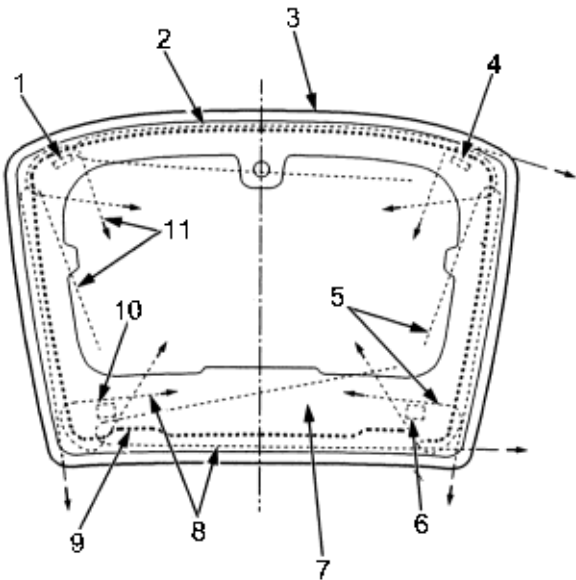
7. Carefully cut through the adhesive around the entire rear window as follows:

- ♦ Straight portion: Hold a piece of wood inside the vehicle, and with a helper on the outside, pull back the piano wire.
- ♦ Corner portion: Pull back each end of the piano wire.



- 1. REAR WINDOW
- 2. PIANO WIRE
- 3. PLASTIC PLATE

Cutting positions with the piano wire:



- 1. FASTENER
- 2. PIANO WIRE
- 3. MOULDING
- 4. FASTENER
- 5. PIANO WIRES
- 6. FASTENER
- 7. REAR WINDOW
- 8. PIANO WIRES
- 9. ADHESIVE
- 10. FASTENER
- 11. PIANO WIRES

8. Carefully remove the rear window.

9. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire rear window opening flange:

- ♦ Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- ♦ Mask off surrounding surfaces before painting.
- ♦ Remove the fasteners from the body.

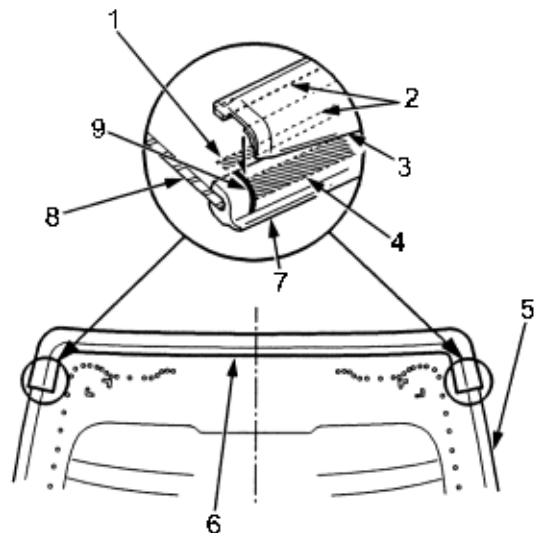
10. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.

11. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, fasteners and rubber dam, then clean the rear window surface and edge with alcohol where the new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil and grease.

12. Apply primer (3M N-200, or equivalent) to the areas on the rear window and moulding where the adhesive tapes of the upper seal will be applied.

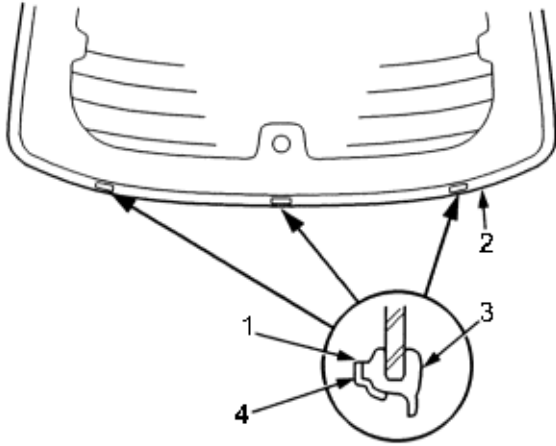
13. Glue the moulding upper seal to the inside face of the rear window and moulding as shown:

- ♦ Be sure both sides end of the moulding upper seal line up with the alignment lines of the moulding you made in step 3.
- ♦ Be careful not to touch the rear window where adhesive will be applied.



- 1. Apply primer here.
- 2. ADHESIVE TAPES
- 3. MOULDING UPPER SEAL
- 4. Apply primer here.
- 5. MOULDING
- 6. MOULDING UPPER SEAL
- 7. MOULDING
- 8. REAR WINDOW
- 9. ALIGNMENT LINE

14. If necessary, replace the moulding lower seals.



- 1. The shape of a spacer
- 2. MOULDING
- 3. MOULDING
- 4. MOULDING LOWER SEAL

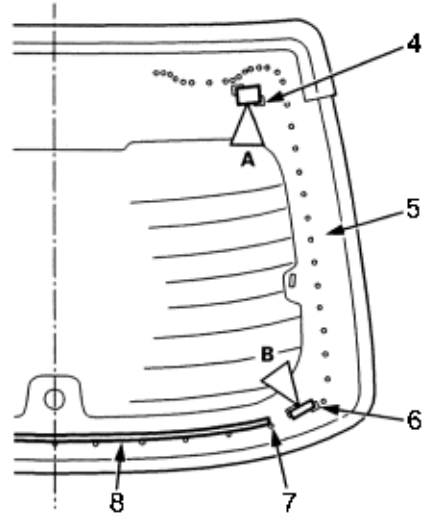
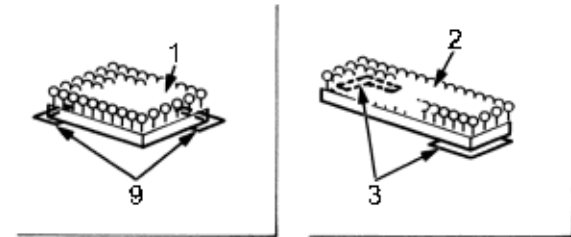
15. Glue the fasteners and rubber dam to the inside face of the rear window as shown.

- ♦ Be sure the fasteners line up with the alignment marks, and the rubber dam lines up with the printed dots.
- ♦ Be careful not to touch the rear window where the adhesive will be applied.

▷: Fastener locations

A ▷, 2

B ▷, 2



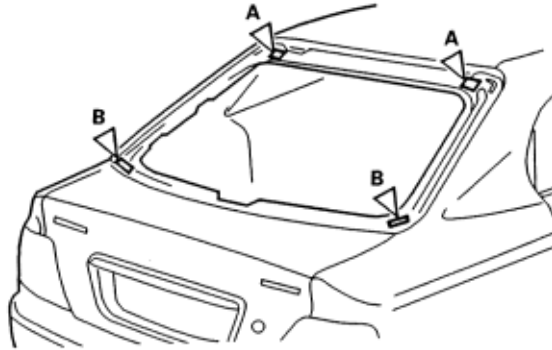
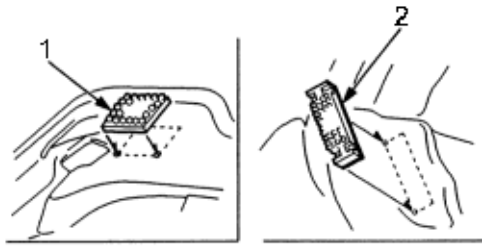
- 1. UPPER FASTENER
- 2. LOWER FASTENER
- 3. ALIGNMENT MARKS
- 4. ALIGNMENT MARK
- 5. REAR WINDOW
- 6. ALIGNMENT MARK
- 7. PRINTED DOT
- 8. RUBBER DAM
- 9. ALIGNMENT MARKS

16. Glue the upper and lower fasteners to the body as shown.

▷: Fastener locations

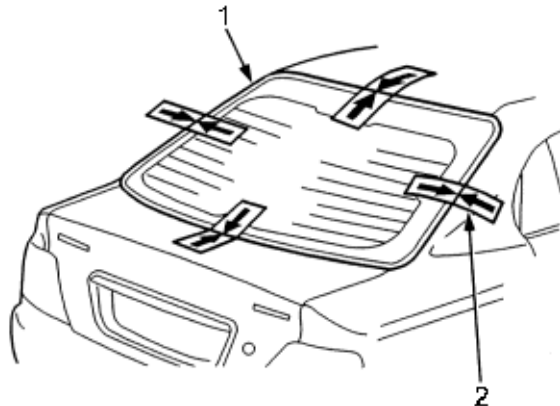
A ▷, 2

B ▷, 2



- 1. UPPER FASTENER
- 2. LOWER FASTENER

17. If the new rear window is to be installed, set the rear window in the opening, and centre it. make alignment marks across the rear window and body with a grease pencil at the four points shown. Be careful not to touch the rear window where adhesive will be applied.

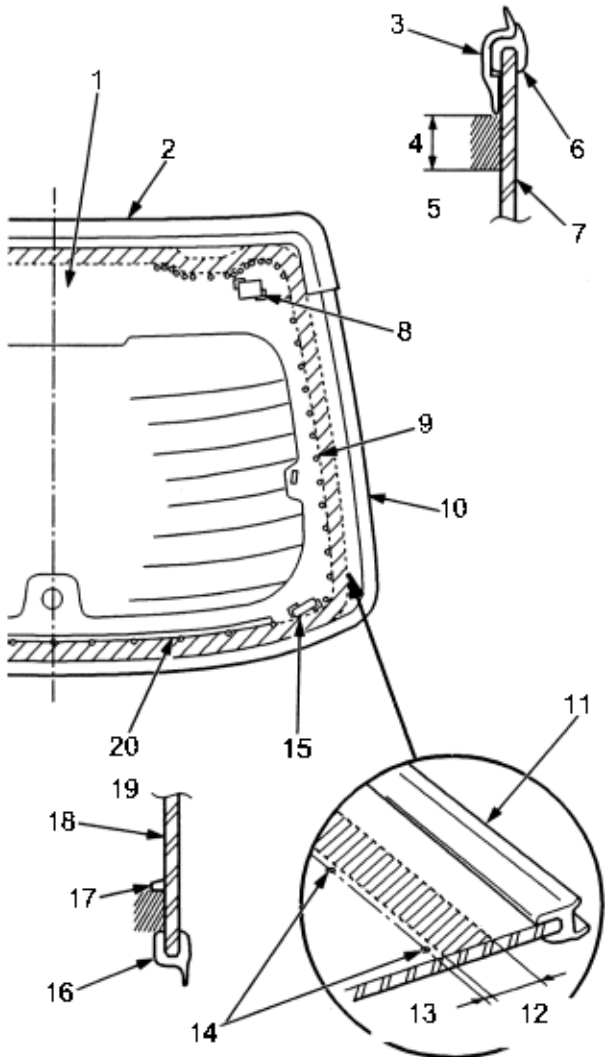


- 1. REAR WINDOW
- 2. ALIGNMENT MARK

18. Remove the rear window.

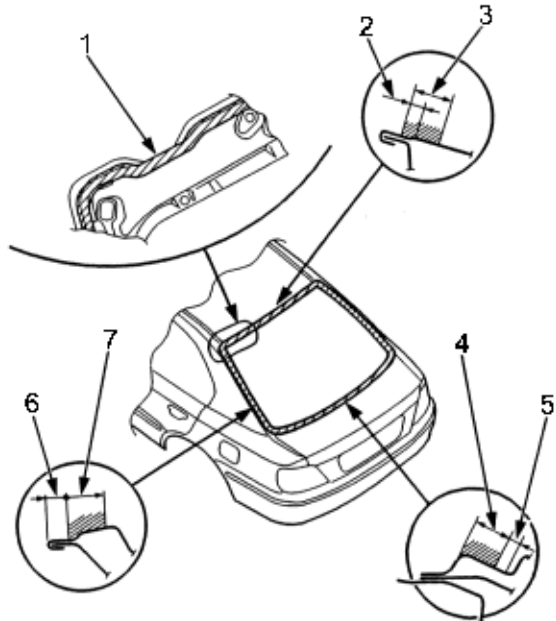
Rear Window Replacement (cont'd)

19. With a sponge, apply a light coat of glass primer around the edge of the rear window as shown, then lightly wipe it off with gauze or cheesecloth:
- ♦ Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
 - ♦ Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
 - ♦ Keep water, dust, and abrasive materials away from the primed surface.
- Apply glass primer in the grey shaded areas as shown.

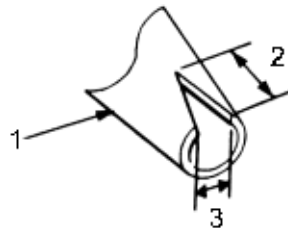


1. REAR WINDOW
2. UPPER SEAL
3. UPPER SEAL
4. 14.5 mm, (0.57 in.)
5. inside
6. MOULDING
7. REAR WINDOW
8. UPPER FASTENER
9. PRINTED DOT
10. MOULDING
11. MOULDING
12. 14.5 mm, (0.57 in.)
13. 1.5 mm, (0.06 in.)
14. PRINTED DOTS
15. LOWER FASTENER
16. MOULDING
17. RUBBER DAM
18. REAR WINDOW
19. inside
20. RUBBER DAM

20. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes:
- ♦ Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
 - ♦ Never touch the primed surfaces with your hands.
- Apply glass primer in the grey shaded areas as shown.

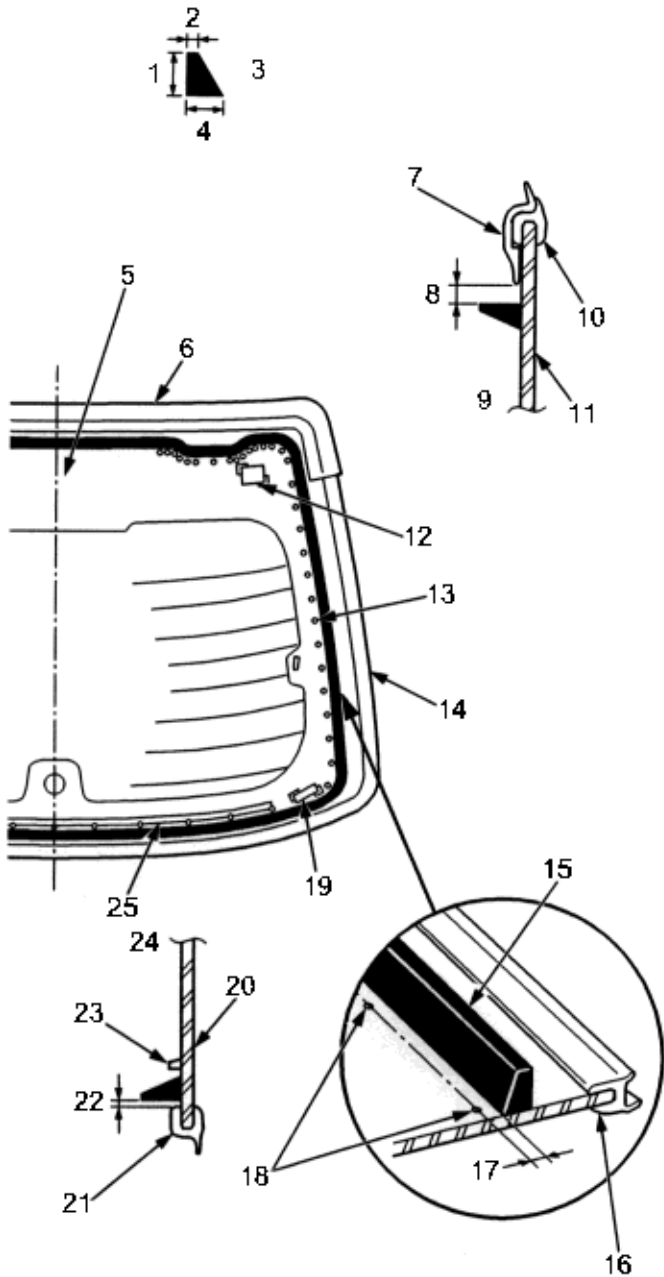


1. Apply body primer along the body shape.
 2. 7 mm, (0.28 in.)
 3. 20 mm, (0.79 in.)
 4. 20 mm, (0.79 in.)
 5. 3 mm, (0.12 in.)
 6. 11 mm, (0.43 in.)
 7. 20 mm, (0.79 in.)
21. Thoroughly mix the adhesive and hardener together on a clean glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.
22. Before filling the cartridge, cut a "V" in the end of the nozzle as shown.



1. NOZZLE
2. 10 mm (0.39 in)
3. 7 mm (0.27 in)

23. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the rear window as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



24. Use suction cups to hold the rear window over the opening, align it with the alignment marks you made in step 4 or 17, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.
25. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.
26. Let the adhesive dry for at least one hour, then spray water over the rear window and check for leaks. Mark the leaking areas, let the rear window dry, then seal with sealant. Let the vehicle stand for at least four hours after rear window installation. If the vehicle has to be used within the first four hours, it must be driven slowly.
27. Reinstall all remaining removed parts. Advise the customer not to do the following things for two to three days:
- ♦ Slam the doors with all the windows rolled up.
 - ♦ Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

1. 13 mm, (0.51 in)
2. 2 mm, (0.08 in)
3. : ADHESIVE
4. 8 mm, (0.31 in)
5. REAR WINDOW
6. UPPER SEAL
7. UPPER SEAL
8. 4.5 mm, (0.18 in.)
9. inside
10. MOULDING
11. REAR WINDOW
12. UPPER FASTENER
13. PRINTED DOT
14. MOULDING
15. ADHESIVE
16. MOULDING
17. 3.5 mm, (0.14 in.)
18. PRINTED DOTS
19. LOWER FASTENER
20. REAR WINDOW
21. MOULDING
22. 2 mm, (0.1 in.)

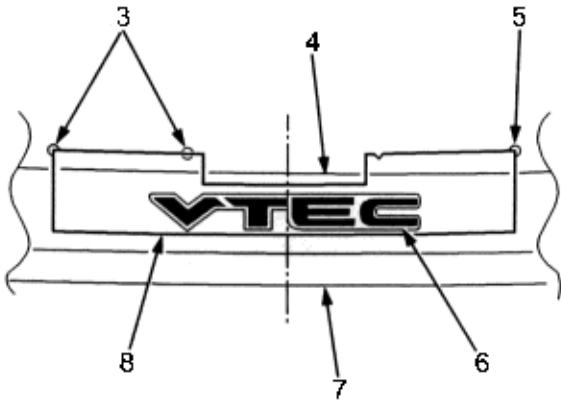
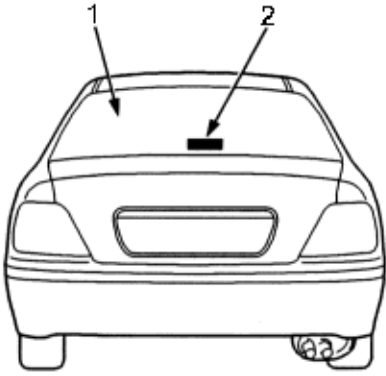
23. RUBBER DAM
24. inside
25. RUBBER DAM

Apply the sticker where shown.

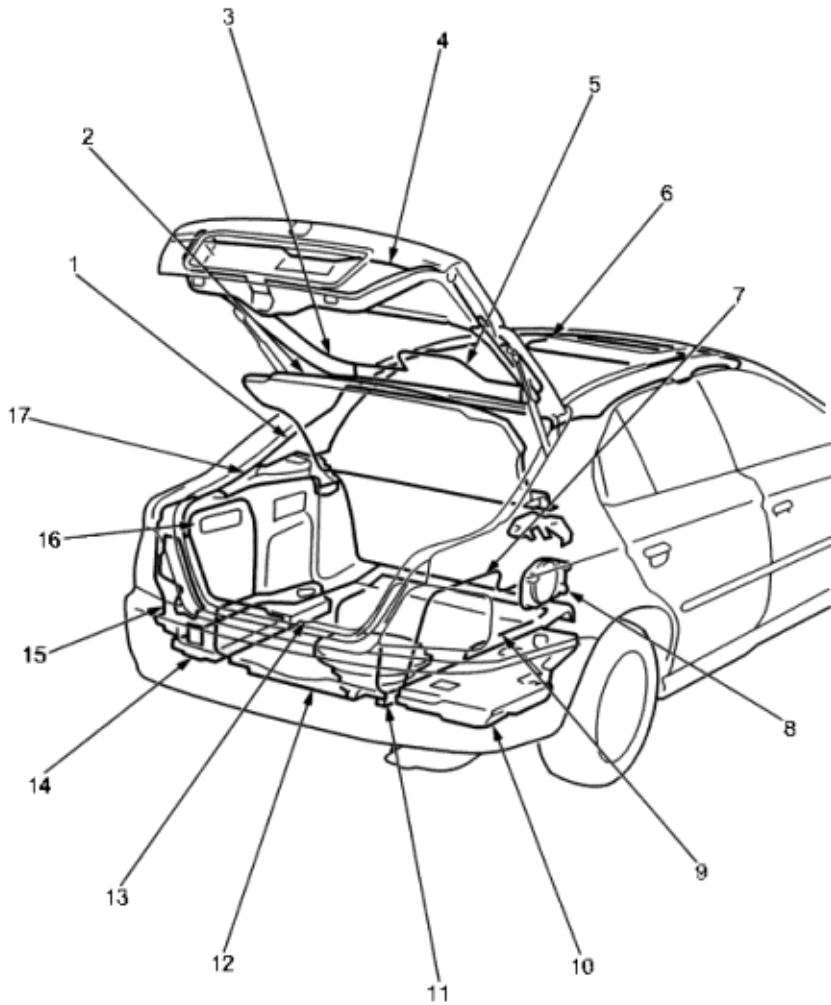
NOTE:

- ♦ Before applying, clean the rear window surface with a sponge dampened in alcohol.
- ♦ After cleaning, keep oil, grease and water from getting on the surface.

Attachment Point (Reference):



1. REAR WINDOW
2. REAR VTEC STICKER
(for some models)
3. PRINTED DOTS
4. BLACK CERAMIC END LINE
5. PRINTED DOT
6. REAR VTEC STICKER
7. REAR WINDOW MOULDING
8. APPLICATION TAPE



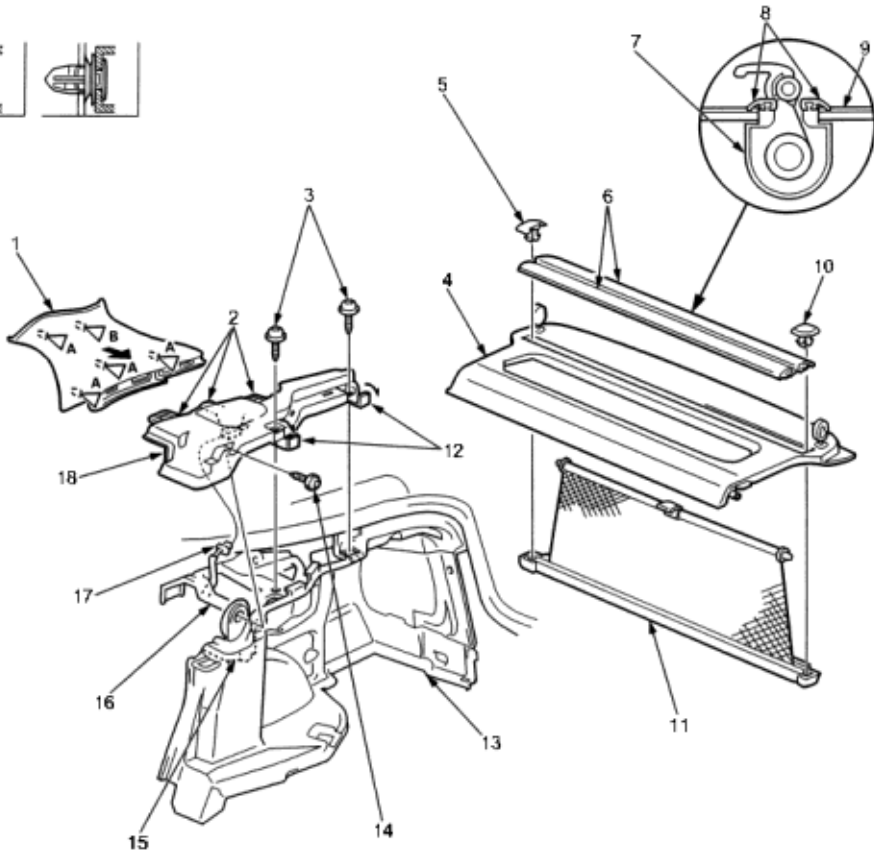
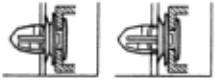
1. **REAR PILLAR TRIM**
(See Page 20-10)
2. **REAR SHELF**
(See Page 20-10)
3. **TAILGATE SIDE TRIM**
(See Page 20-13)
4. **TAILGATE LINING**
(See Page 20-13)
5. **TAILGATE UPPER TRIM**
(See Page 20-13)
6. **HEADLINER**
Removal and Installation, (See Page 20-14)
7. **SPARE TYRE LID**
(See Page 20-11)
8. **WOOFER SPEAKER GRILLE**
(See Page 20-11)
9. **REAR FLOOR INSULATOR**
(See Page 20-12)
10. **RIGHT TRUNK SIDE SPACER**
(See Page 20-12)
11. **TOOL BOX**
(See Page 20-12)
12. **REAR TRIM PANEL**
(See Page 20-11)
13. **LEFT TRUNK SIDE FRONT SPACER**
(See Page 20-12)
14. **LEFT TRUNK SIDE REAR SPACER**
(See Page 20-12)
15. **TRUNK SIDE TRIM**
(See Page 20-11)
16. **JACK COVER**
(See Page 20-11)
17. **REAR SIDE SHELF**
(See Page 20-10)

NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- ♦ Take care not to bend or scratch the trim and panels.
- ♦ Put on gloves to protect your hands.

▷: Clip locations

- A ▷, 4 (Grey)** **B ▷, 1 (Black)**



1. REAR PILLAR TRIM
2. HOOKS
3. ET SCREWS
5 x 0.8 mm
4 N.m (0.4 kgf.m, 3 lbf.ft)
Use a Torx T25 bit.
4. REAR SHELF
5. END CAP
(for some models)
6. SUN BLIND FRAMES
(for some models)
7. SUN BLIND
(for some models)
8. SUN BLIND FRAMES
(for some models)
9. REAR SHELF
10. END CAP
(for some models)
11. SUN BLIND
(for some models)
12. LID
13. TRUNK SIDE TRIM
14. ET SCREW
5 x 0.8 mm
4 N.m (0.4 kgf.m, 3 lbf.ft)
Use a Torx T25 bit.
15. REAR SIDE SHELF BRACKET A
16. REAR SIDE SHELF BRACKET B
17. TWEETER CONNECTOR
(for some models)
18. REAR SIDE SHELF

Interior Trim

Trim Removal and Installation (cont'd)

20-11

▷: Clip locations

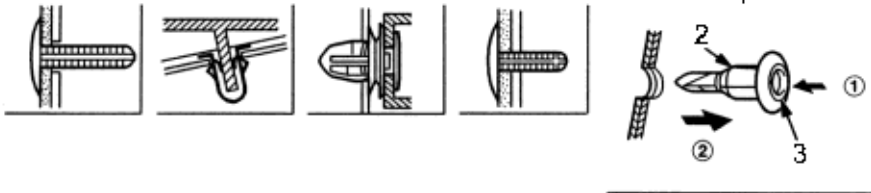
A ▷, 5

B ▷, 6

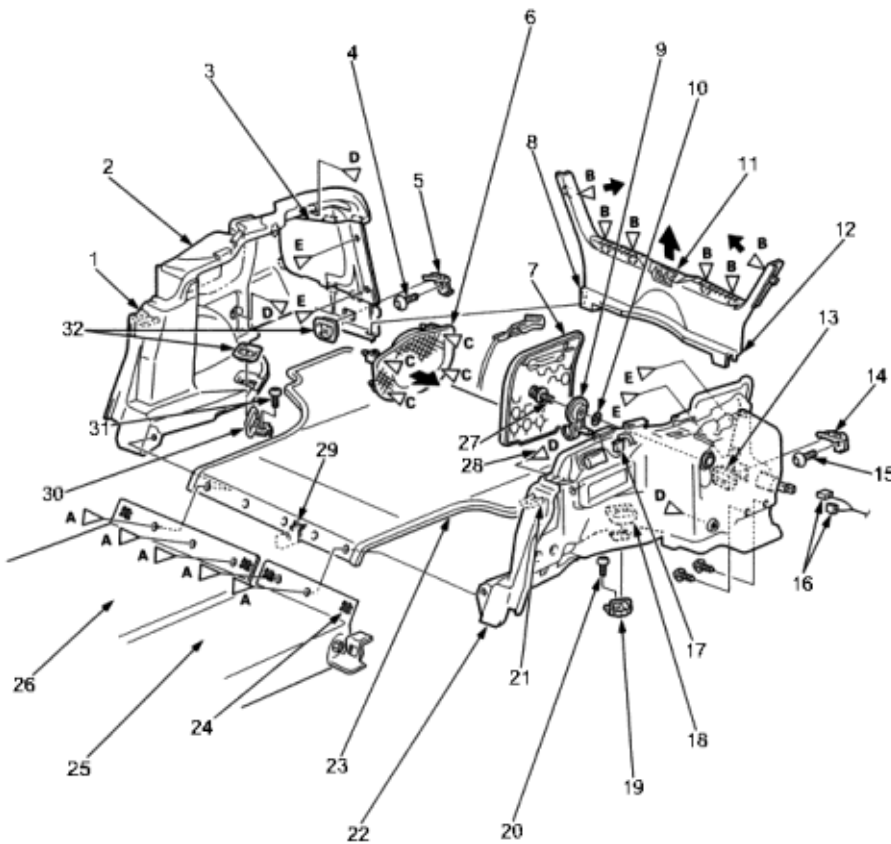
C ▷, 4
(White)

D ▷, 3 or 4

E ▷, 4



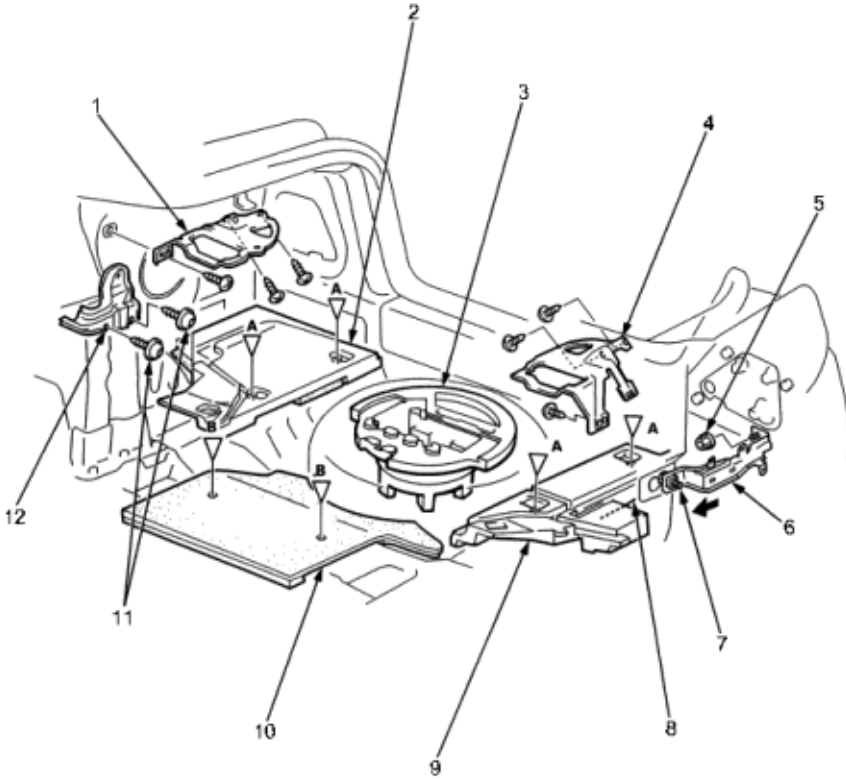
1. NOTE: Do not push the inner clip in too far.
2. CLIP
3. INNER CLIP



1. SLIT
2. RIGHT TRUNK SIDE TRIM
Remove the right rear side shelf
3. ACCESS LID
4. 8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
Use a Torx T40 bit.
5. TIE DOWN HOOK
6. WOOFER SPEAKER GRILLE
(with BOSE sound system)
7. JACK COVER
8. HOOK
9. TRUNK HOOK
10. LOCK WASHER
11. REAR PANEL LINING
12. HOOK
13. TIE DOWN HOOK TRIM
14. TIE DOWN HOOK
8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
Use a Torx T40 bit.
15. REAR ACCESSORY SOCKET CONNECTORS
16. TRUNK LIGHT CONNECTOR
17. TIE DOWN HOOK TRIM
18. TIE DOWN HOOK
8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
Use a Torx T40 bit.
19. SLIT
20. LEFT TRUNK SIDE TRIM
Remove the left rear side shelf.
21. SPARE TYRE LID
22. FASTENER
23. LEFT REAR SEAT BACK
24. RIGHT REAR SEAT BACK
25. 5 x 0.8 mm
26. With navigation system:
SLIT
27. TIE DOWN HOOK
8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
Use a Torx T40 bit
28. TIE DOWN HOOK TRIMS

▷: Clip locations

A ▷, 4 B ▷, 2



1. **RIGHT REAR SIDE SHELF BRACKET B**
Remove:
 - ♦ Right trunk side trim (See Page 20-11)
 - ♦ Stereo amplifier (with BOSE sound system), (see section 23)
2. **RIGHT TRUNK SIDE SPACER**
Remove the right trunk side trim (See Page 20-11)
3. **TOOL BOX**
4. **LEFT REAR SIDE SHELF BRACKET B**
Remove:
 - ♦ Left trunk side trim (See Page 20-11)
 - ♦ Rear window wiper control unit (see section 23)
5. **TAIL LIGHT MOUNTING NUT**
5 x 0.8 mm
6. **LEFT TRUNK SIDE TRIM BRACKET**
Remove the left trunk side trim (See Page 20-11)
7. **5 x 0.8 mm**
loosen.
8. **LEFT TRUNK SIDE REAR SPACER**
Remove the left trunk side trim (See Page 20-11)
9. **LEFT TRUNK SIDE FRONT SPACER**
Remove the left trunk side trim (See Page 20-11)
10. **REAR FLOOR INSULATOR**
11. **ET SCREWS**
5 x 0.8 mm
4 N.m (0.4 kgf.m, 3 lbf.ft)
Use a Torx T25 bit.
12. **REAR SHELF SIDE BRACKET A**
Remove the trunk side trim (See Page 20-11)

Interior Trim

Trim Removal and Installation (cont'd)

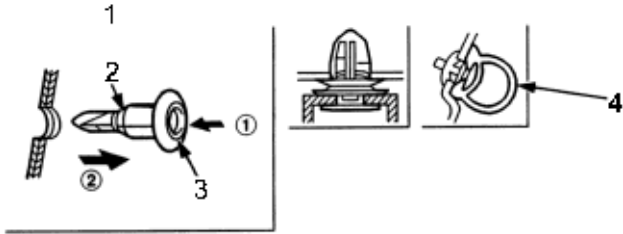
20-13

▷: Clip locations

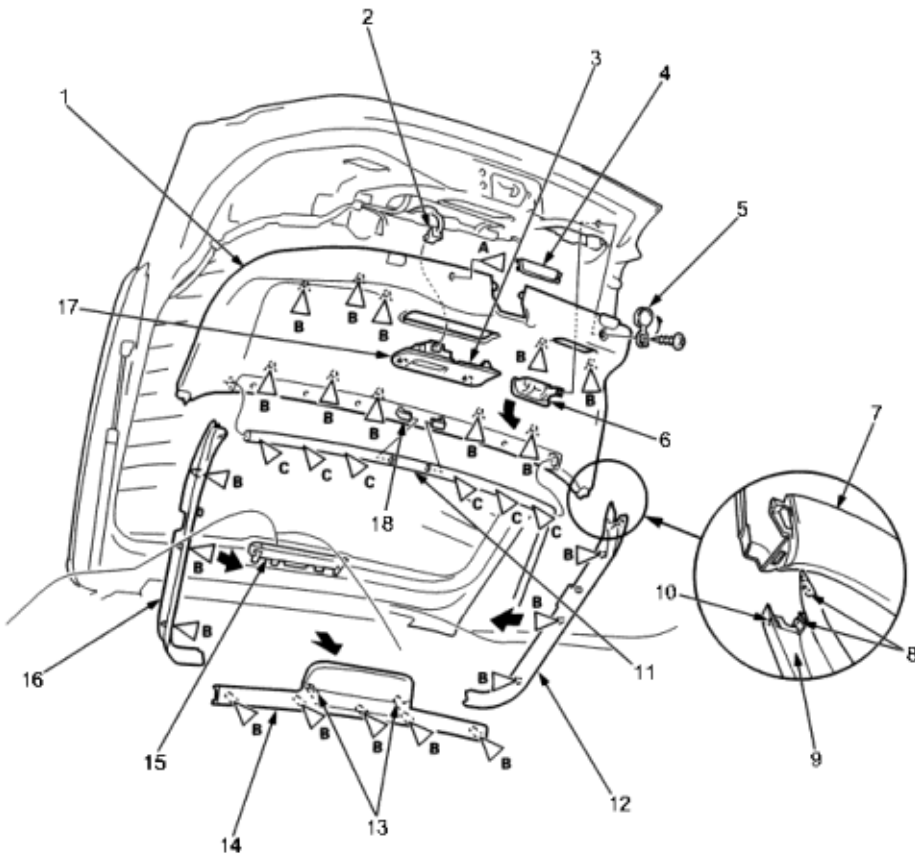
A ▷, 1

B ▷, 21
(Grey)

C ▷, 6



1. NOTE: Do not push the inner clip in too far.
2. CLIP
3. INNER CLIP
4. TAILGATE LINING SEAL



1. TAILGATE LINING
2. TAILGATE LIGHT CONNECTOR
3. Pry here.
4. COVER
5. CAP
6. PULL POCKET
7. TAILGATE LINING
8. HOOKS
9. TAILGATE SIDE TRIM
10. HOOK
11. TAILGATE LINING SEAL
12. RIGHT TAILGATE SIDE TRIM
13. HOOKS
14. TAILGATE UPPER TRIM
15. HIGH MOUNT BRAKE LIGHT
16. LEFT TAILGATE SIDE TRIM
17. MAINTENANCE LID

Install in the reverse order of removal, and note these items:

- ♦ Replace any damaged clips.
- ♦ Make sure the connectors are plugged in properly.
- ♦ If the thread in the ET screw is worn out, use an oversized ET screw made specifically for this application.

NOTE:

- ♦ When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.
- ♦ Take care not to bend and scratch the headliner.
- ♦ Be careful not to damage the dashboard and other interior trim.

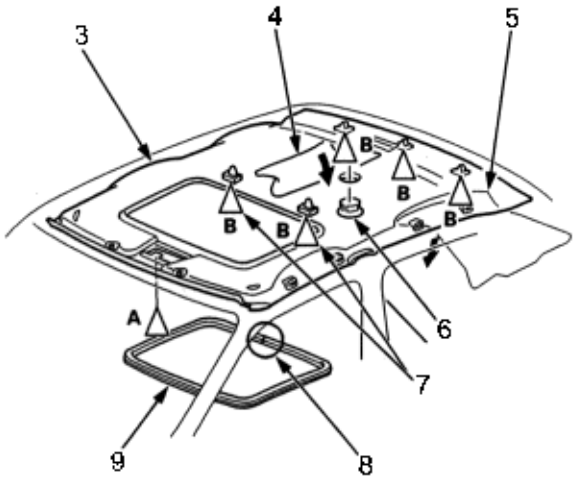
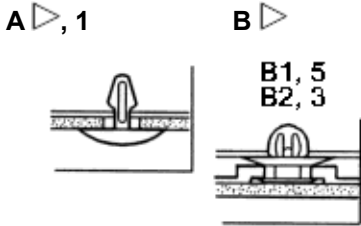
1. Remove:

- ♦ Front door trim, both sides as necessary
- ♦ Front pillar trim, both sides
- ♦ Rear door trim, both sides as necessary
- ♦ Front seat belt upper anchor bolt, both sides
- ♦ Centre pillar upper trim, both sides
- ♦ Front ceiling light/spot light
- ♦ Rear ceiling light (see section 23)
- ♦ Sunvisor and holder
- ♦ Grab handles, front and rear passenger's

2. Remove the headliner.

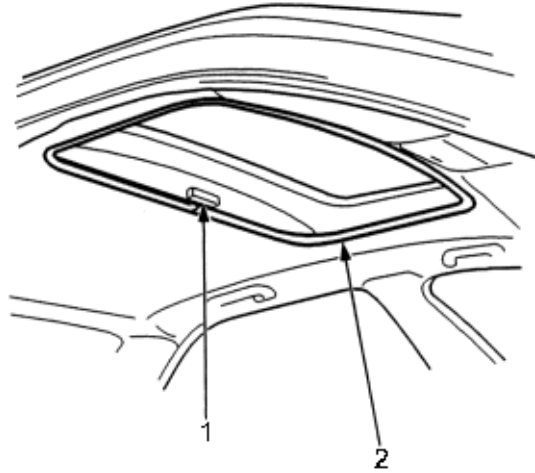
- 1. Remove the upper portion of the rear pillar trim from each side (See Page 20-10)
- 2. With sunroof: Remove the socket plug and roof trim.
- 3. With the help of an assistant, detach the clips, then lower the headliner.
- 4. Remove the headliner through the passenger's door opening.

▷:Clip locations



- 1. With sunroof, 5
- 2. Without sunroof, 3
- 3. HEADLINER
- 4. REAR PILLAR TRIM
- 5. REAR PILLAR TRIM
- 6. SOCKET PLUG
- 7. With sunroof:
- 8. JOINT
- 9. ROOF TRIM (With sunroof)

- 3. Install in the reverse order of removal, and note these items:**
- ♦ When reinstalling the headliner through the door opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
 - ♦ With sunroof: When reinstalling the roof trim, install the joint toward the rear centre.
 - ♦ If the thread in the ET screw is worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that both sides of the headliner are securely attached to the trim.



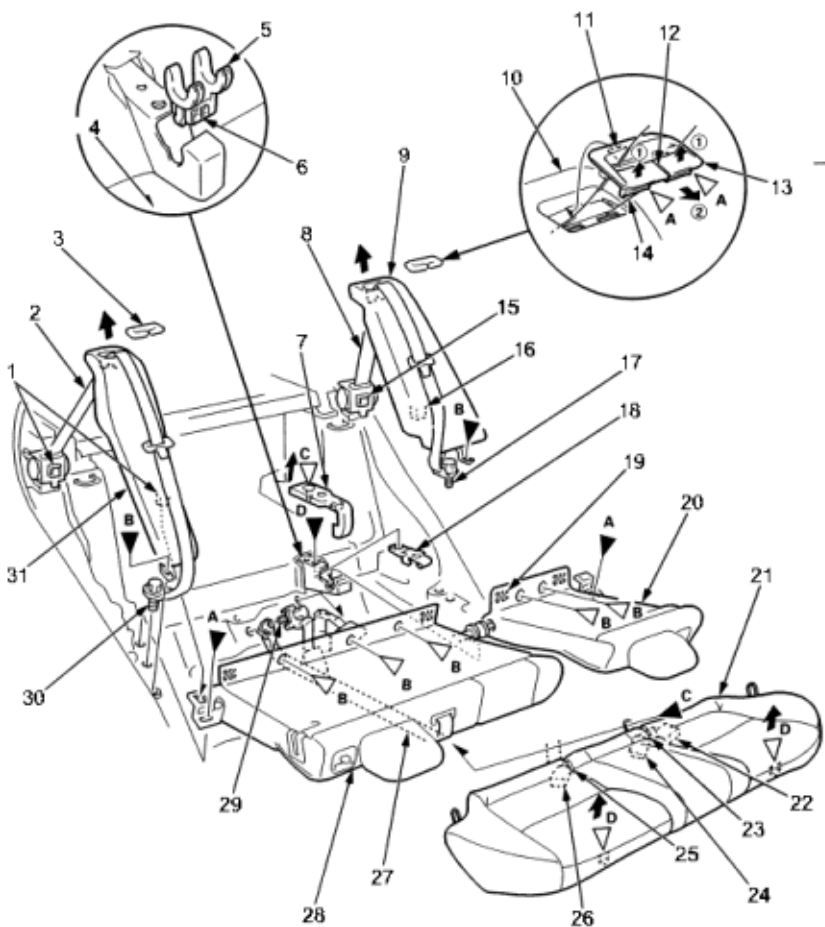
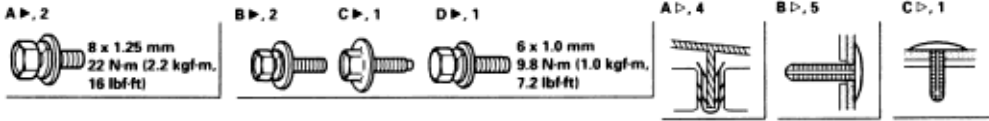
- 1. JOINT
- 2. ROOF TRIM (With sunroof)

NOTE:

- ♦ Take care not to scratch the body or tear the seat covers.
- ♦ Take care not to scratch the rear seat belt with the clips while removing and installing the rear seat belt hole cap.

▶ Bolt locations

▷ Clip, hook locations



1. 8 x 1.25 mm, 22 Nm (2.2 kgf/m, 16 lbf/ft)
2. 6 x 1.0 mm, 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)

1. HOOKS
2. RIGHT REAR SEAT BELT
3. REAR SEAT BELT HOLE CAP
4. Forward
5. CENTRE PIVOT BUSHING
6. STAMPING
7. CENTRE PIVOT COVER
8. LEFT REAR SEAT BELT
9. LEFT SIDE BOLSTER
10. SIDE BOLSTER
11. HOOK
12. SLIT
13. REAR SEAT BELT HOLE CAP
14. REAR SEAT BELT
15. HOOK
16. HOOK
17. LOWER ANCHOR BOLT
7/16-20 UNF
32 N.m (3.3 kgf.m, 24 lbf.ft)
18. PIVOT BRACKET PLATE
19. FASTENER
20. LEFT SEAT-BACK
21. REAR SEAT CUSHION
22. REAR SEAT BELT BUCKLE
23. SLIT
24. CENTRE BELT BUCKLE
25. SLIT
26. REAR SEAT BELT BUCKLE
27. CENTRE BELT
28. RIGHT SEAT-BACK
29. CENTRE ANCHOR BOLT
7/16-20 UNF
32 N.m (3.3 kgf.m, 24 lbf.ft)
30. LOWER ANCHOR BOLT
7-16-20 UNF
32 N.m (3.3 kgf.m, 24 lbf.ft)
31. RIGHT SIDE BOLSTER

Install in the reverse order of removal, and note these items:

- ♦ Apply liquid thread lock to the rear seat belt lower anchor bolts before reinstallation.
- ♦ Before attaching the rear seat-back and seat cushion, make sure there are no twists or kinks in the rear seat belts and centre belt.
- ♦ When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.
- ♦ Make sure the seat-back locks securely.

Seat Rear Seat Armrest Replacement

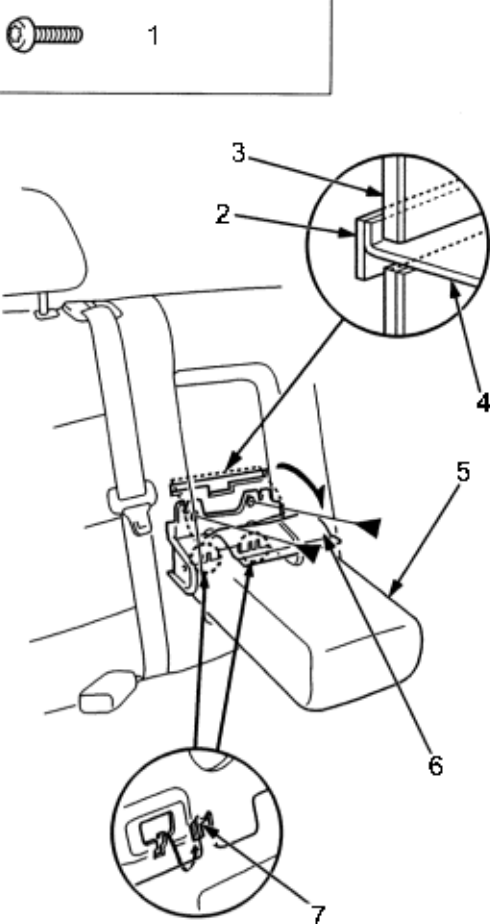
20-16

Rear Seat-back Latch Replacement

NOTE: Take care not to tear the seams or damage the seat covers.

1. Release the retainer from the armrest trim board, then turn over the cover.

▶: Screw locations, 2

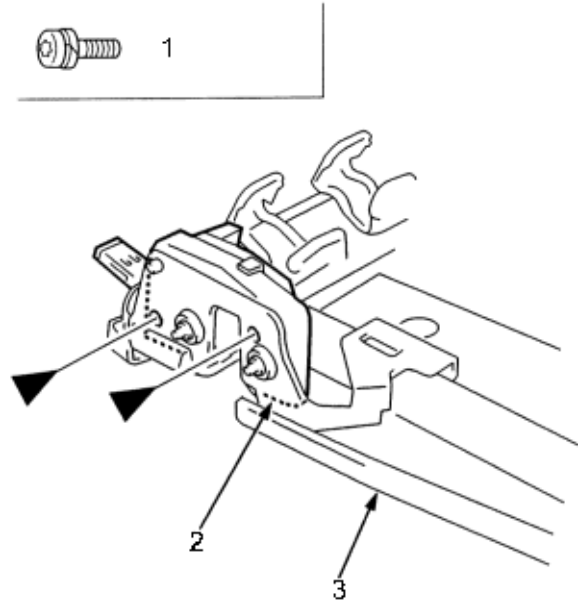


1. 6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. RETAINER
3. ARMREST TRIM BOARD
4. COVER
5. ARMREST
6. COVER
7. HOOK

2. With a Torx T30 bit, remove the screws, and remove the armrest by releasing the hooks.
3. Install in the reverse order of removal.

1. Remove the seat-back ([See Page 20-15](#)).
2. Separate the seat-back cover/pad and frame ([See Page 20-17](#)).
3. With a Torx T40 bit, remove the screws, then remove the seat-back latch from the seat-back frame.

▶: Screw locations, 2



1. 8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
2. SEAT-BACK LATCH
3. SEAT-BACK FRAME

4. Install in the reverse order of removal, and make sure the seat-back locks securely and opens properly.

NOTE:

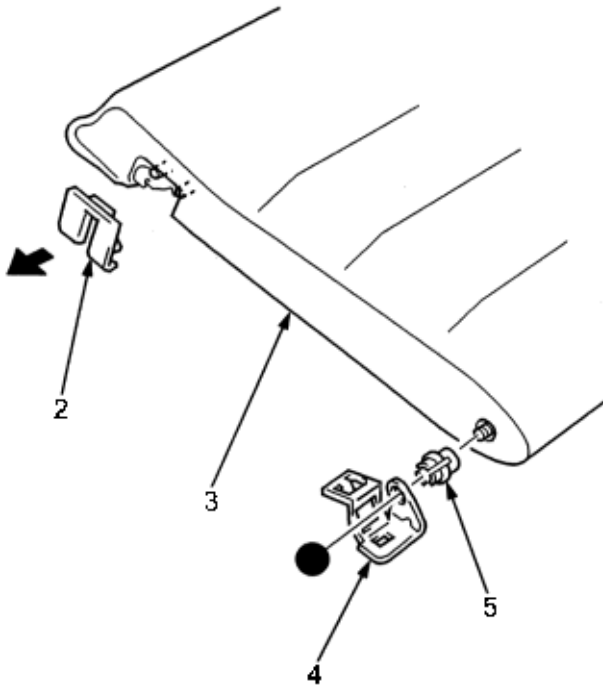
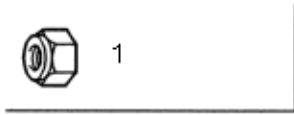
- ♦ Take care not to tear the seams or damage the seat covers.
- ♦ Put on gloves to protect your hands.
- ♦ Be careful not to damage the rear centre belt and retractor during removal and installation of the right seat-back cover.

Seat-back cover:

NOTE: The right seat-back is shown, the left seat-back is in the same manner.

1. Remove the seat-back (See Page 20-15).
2. Remove the armrest (See Page 20-16).
3. Remove the seat-back latch cover by pulling it.
4. Remove the nut, then remove the pivot bracket and pivot bushing.

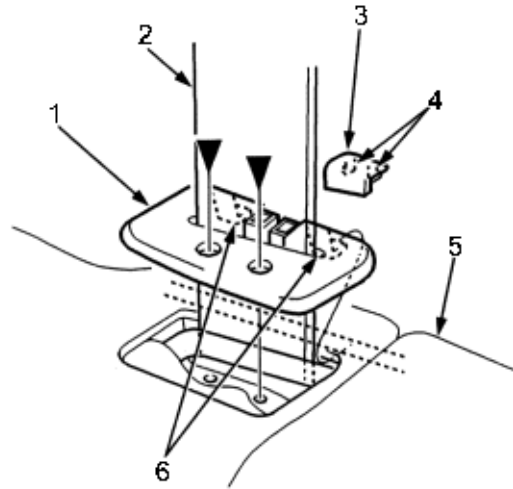
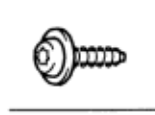
●: **Nut location, 1**



1. 10 x 1.25 mm
38 N.m (3.9 kgf.m, 28 lbf.ft)
2. SEAT-BACK LATCH COVER
3. SEAT-BACK
4. PIVOT BRACKET
5. PIVOT BUSHING

5. On the right seat-back only, remove the screws with a Torx T20 bit, release the hooks, then remove the centre belt guide. Remove the cap and remove the centre belt from the centre belt guide through its slit.

▶: **Screw location, 2**

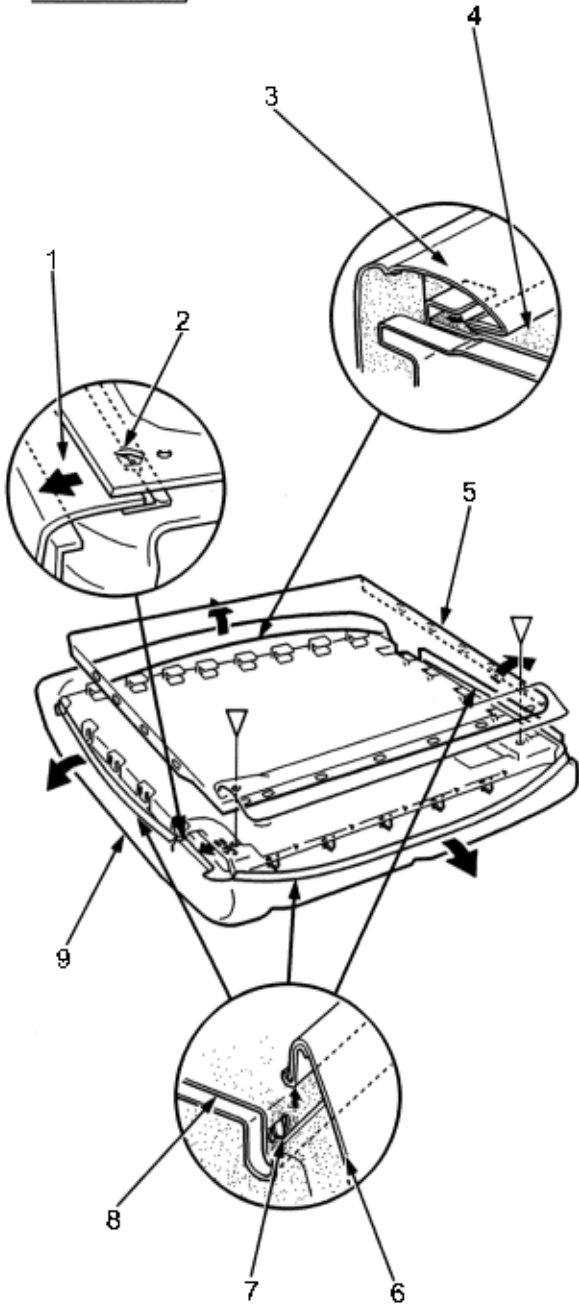


1. CENTRE BELT GUIDE
2. CENTRE BELT
3. CAP
4. HOOKS
5. RIGHT SEAT-BACK
6. HOOKS

Rear Seat Cover Replacement (cont'd)

6. Release the clips, pull back the seat-back cover all the way around, then remove the back-cover.

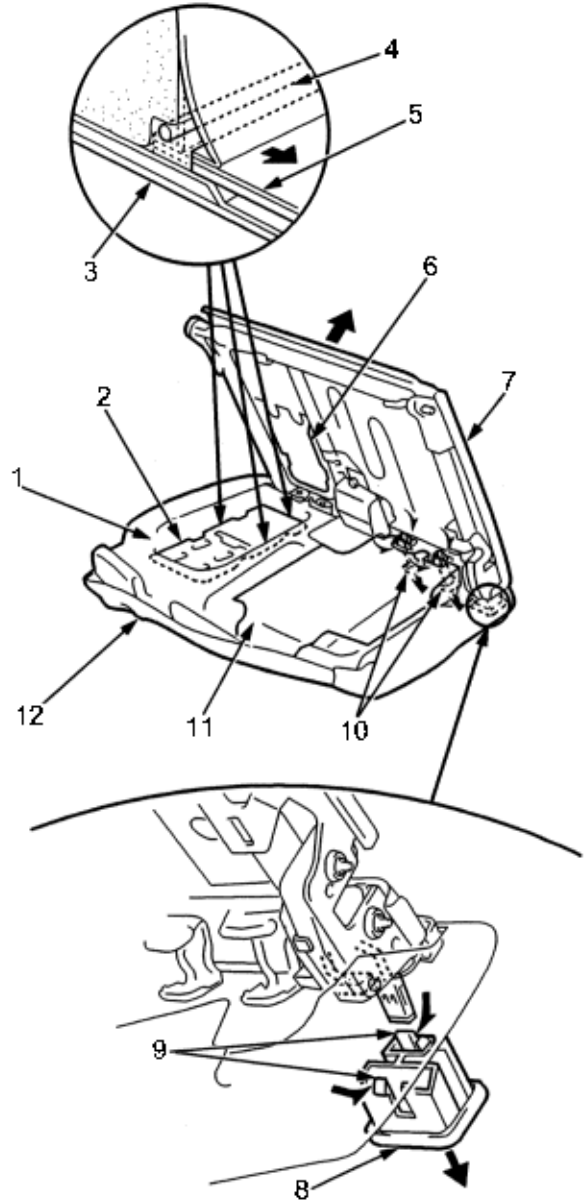
▷: Clip locations, 2



- 1. SEAT-BACK COVER
- 2. HOOK
- 3. SEAT-BACK COVER
- 4. BACK-COVER
- 5. BACK COVER
- 6. SEAT-BACK COVER
- 7. HOOK
- 8. BACK COVER
- 9. SEAT-BACK COVER

7. On the left seat-back only, release the right, left and lower edges of the armrest trim board from the seat-back frame wire.

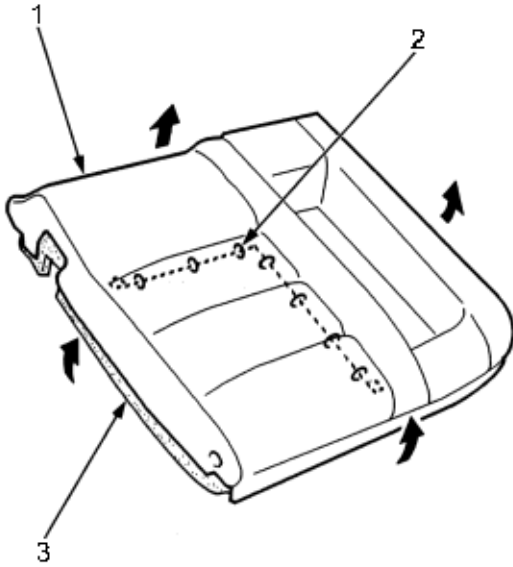
8. Pull back the seat-back frame, remove the headrest guides and lock knob trim, then separate the seat-back cover/pad and seat-back frame.



- 1. PAD
- 2. ARMREST TRIM BOARD (left seat-back)
- 3. SEAT-BACK FRAME
- 4. SEAT-BACK FRAME WIRE (left seat-back)
- 5. ARMREST TRIM BOARD (left seat-back)
- 6. SEAT-BACK FRAME WIRE (left seat-back)
- 7. SEAT-BACK FRAME
- 8. LOCK KNOB TRIM
- 9. HOOKS
- 10. HEADREST GUIDES
- 11. ANTI NOISE FABRIC
- 12. SEAT-BACK COVER

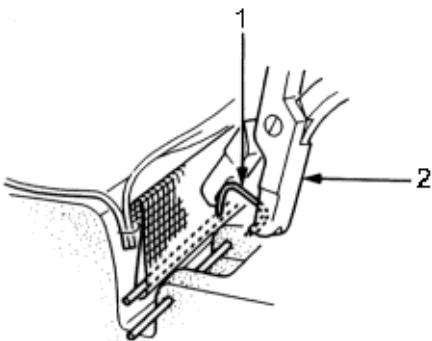
Rear Seat Cover Replacement (cont'd)

9. Pull back the edge of the seat-back cover all the way around, and release the clips, then remove the seat-back cover.



1. SEAT-BACK COVER
2. CLIP
3. PAD

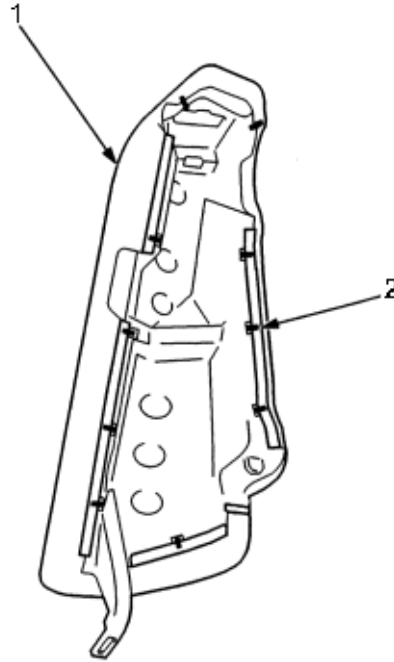
10. Install in the reverse order of removal, and note these items:
 - ♦ Before installing the centre belt guide to the right seat-back, make sure there are no twists or kinks in the centre belt.
 - ♦ Make sure that the centre belt can be pulled out and be retracted smoothly.
 - ♦ To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hooks and clips.
 - ♦ Replace the clips with new ones using commercially available upholstery ring pliers.



1. NEW CLIP
2. UPHOLSTERY RING PLIERS

Seat side bolster cover:

1. Remove the seat side bolster (**See Page 20-15**).
2. Release all the clips, and fold back the seat side bolster cover, and remove it.



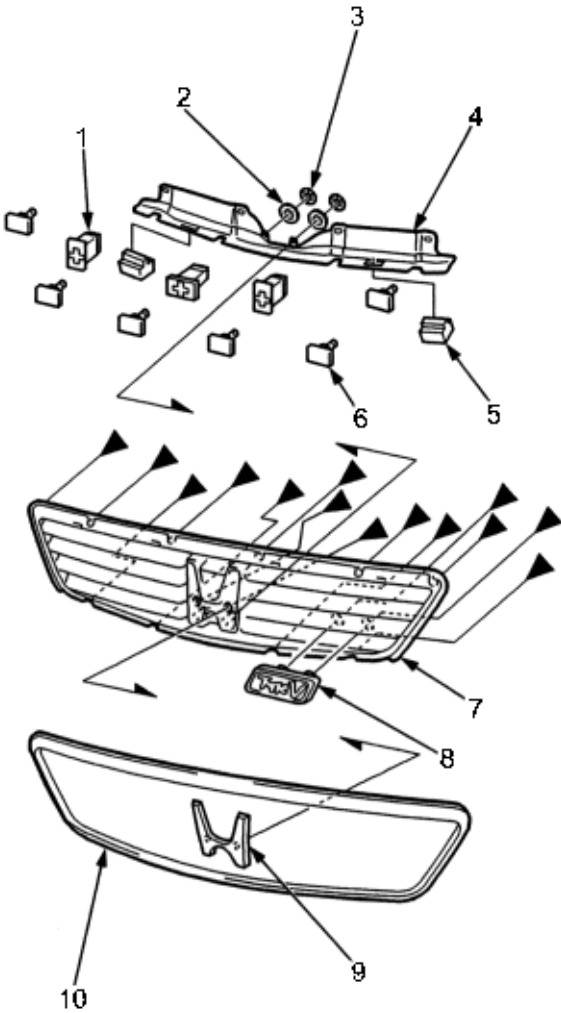
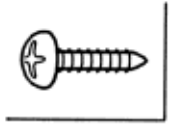
1. SIDE BOLSTER COVER
2. CLIP

3. Install in the reverse order of removal, and note these items:
 - ♦ To prevent wrinkles when installing a side bolster cover, make sure the material is stretched evenly over the pad before securing the clips.
 - ♦ Replace the released clips with new ones using commercially available upholstery ring pliers.

Type V:

Take care not to scratch the front grille and front grille moulding.

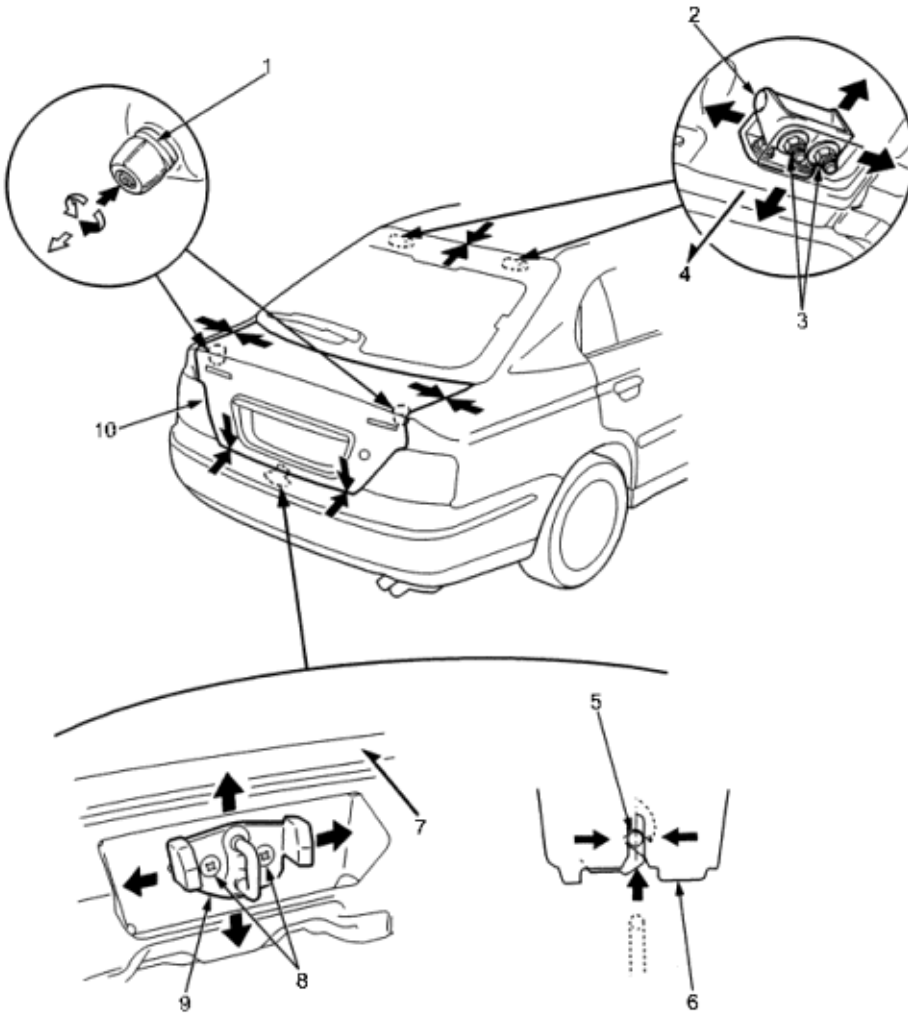
►: Screw locations, 14



1. CLIP
2. WASHER
3. TOOTHED LOCK WASHER
4. FRONT GRILLE STIFFENER
5. STOP
6. SPECIAL BOLT
7. FRONT GRILLE
8. Type V, EMBLEM
9. EMBLEM
10. FRONT GRILLE MOULDING

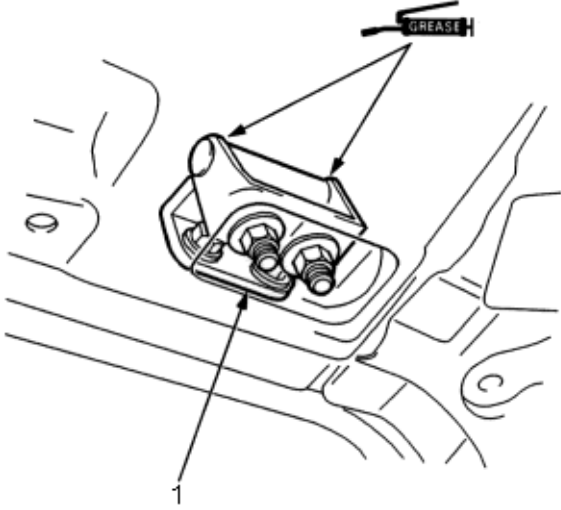
Reassemble in the reverse order of disassemble.

1. Remove the support strut from each side.
2. Slightly loosen each screw and nut.
3. Adjust the tailgate alignment in the following sequence.
 - ♦ Pull down the rear portion of the headliner (**See Page 20-14**). Take care not to bend the headliner excessively. Adjust the tailgate hinges right and left, as well as fore and aft, by using the elongated holes.
 - ♦ Turn the tailgate edge cushions, as necessary, to make the tailgate fit flush with the body at the side edges.
 - ♦ Adjust the fit between the tailgate and tailgate opening by moving the striker.



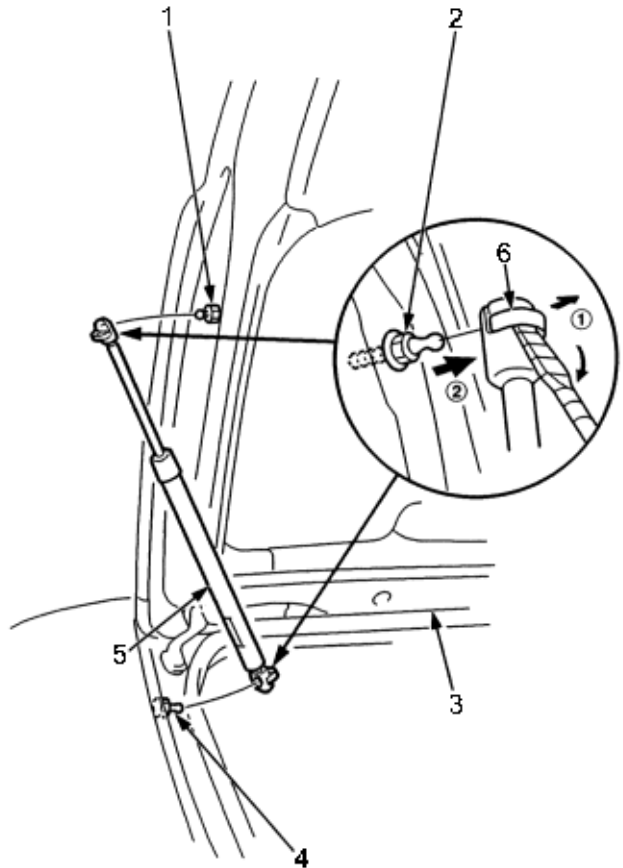
1. TAILGATE EDGE CUSHION
2. TAILGATE HINGE
3. 8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
4. Rearward
5. STRIKER
6. TAILGATE LATCH
7. Rearward
8. 8 x 1.25 mm
22 N.m (2.2 kgf.m, 16 lbf.ft)
9. STRIKER
10. TAILGATE

4. Tighten each bolt and nut securely.
5. Check that the tailgate opens properly and locks securely.
6. Reinstall the support struts securely.
7. Grease the pivot portion of the tailgate hinges as indicated by the arrows.



1. TAILGATE HINGE

1. With a flat-tip screwdriver, pry the clips of the support strut on the tailgate and body, then release the support strut from the pivot bolts with the help of an assistant. Do not remove the clips from the support strut.



1. PIVOT BOLT
2. PIVOT BOLT, 8 x 1.25 mm, 22 N.m (2.2 kgf.m, 16 lbf.ft)
3. TAILGATE
4. PIVOT BOLT
5. SUPPORT STRUT
6. CLIP

2. Set the clips to the original position, then reattach the support strut on the pivot bolts by pushing the support strut.



1. PIVOT BOLT
2. CLIP
3. SUPPORT STRUT

Tailgate

License Plate Trim Replacement

20-23

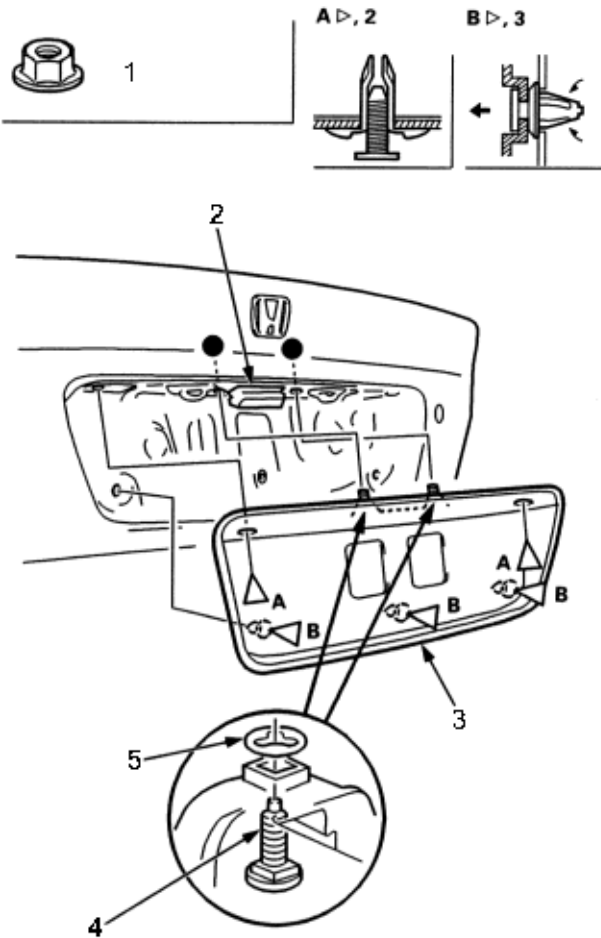
Tailgate Weather-strip Replacement

NOTE:

- ♦ Take care not to scratch the tailgate.
 - ♦ Put on gloves to protect your hands.
1. Remove the tailgate lining (See Page 20-13).
 2. Remove the nuts securing the license plate trim and tailgate handle. Remove and detach the clips, then remove the license plate trim.

●, Nut Locations, 2

▷: Clip locations

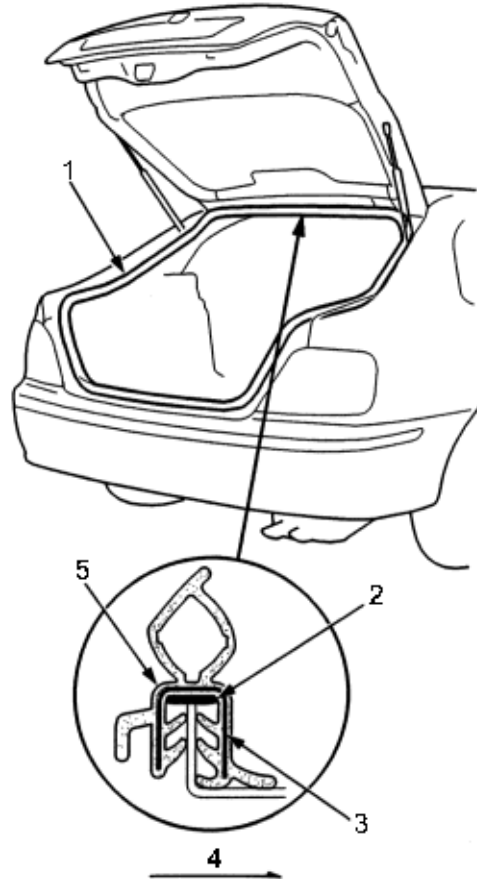


1. 6 x 1.0 mm, 9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. TAILGATE HANDLE
3. LICENSE PLATE TRIM
4. SPECIAL BOLT
5. TOOTHED LOCK WASHER

3. Install in the reverse order of removal, and replace any damaged clips.

1. Remove the tailgate weather-strip by pulling it out.
2. Apply clear sealant into the channel of the tailgate weather-strip all the way around.
3. Locate the painted alignment mark on the tailgate weather-strip. Align the painted mark with the alignment tab in the centre of the tailgate opening, and install the tailgate weather-strip all the way around in the direction shown. Make sure there are no wrinkles in the weather-strip.

Sealant: Cemedine P/N 08712 - 0004, or equivalent



1. TAILGATE WEATHER-STRIP
2. SEALANT
3. STEEL CORE
4. Forward
5. WEATHER-STRIP

4. Check for water leaks.

Tailgate

Tailgate Dynamic Damper Replacement

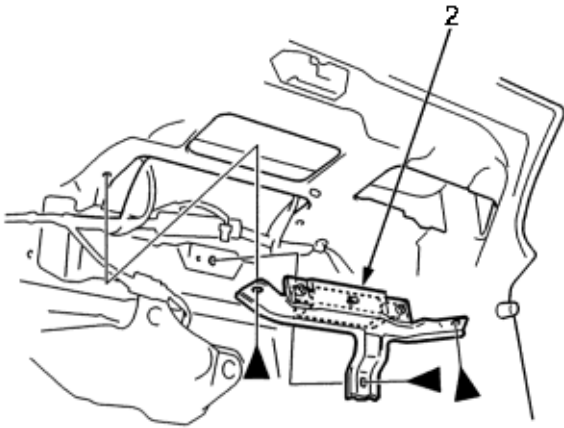
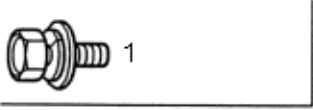
20-24

Emblem Replacement

NOTE: Take care not to scratch the tailgate.

1. Remove the tailgate lining (See Page 20-13).
2. Remove the bolts, then remove the tailgate dynamic damper.

►: Bolt locations,3



1. 6 x 1.0 mm, 9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. TAILGATE DYNAMIC DAMPER
3. Install in the reverse order of removal.

Type V:

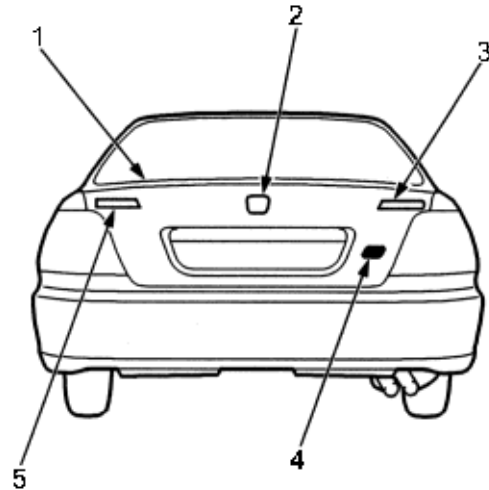
Apply the emblem where shown.

NOTE:

- ♦ Before applying, clean the tailgate surface with a sponge dampened in alcohol.
- ♦ After cleaning, keep oil, grease and water from getting on the surface.

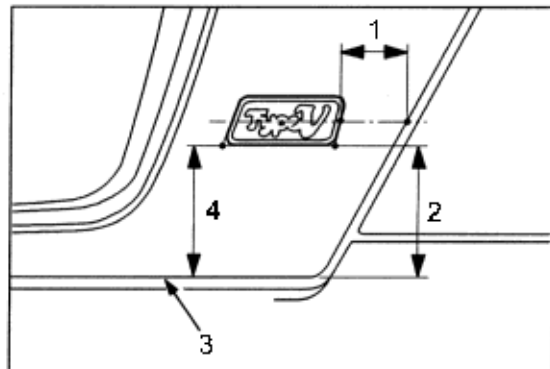
Attachment Point (Reference):

Unit: mm (in.)



1. TAILGATE
2. "H" EMBLEM
3. ACCORD EMBLEM
4. GRADE EMBLEM, (Type V)
5. HONDA EMBLEM

Grade emblem (Type V)



1. 43 (1.7)
2. 80 (3.1)
3. Edge of the tailgate
4. 81 (3.2)

Mouldings

Rear Pillar Moulding Replacement

20-25

NOTE:

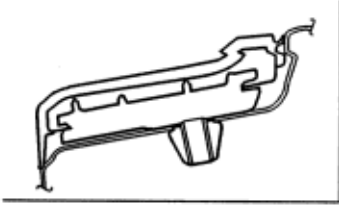
- ♦ Take care not to scratch the body.
- ♦ Put on gloves to protect your hands.

▷:Clip locations

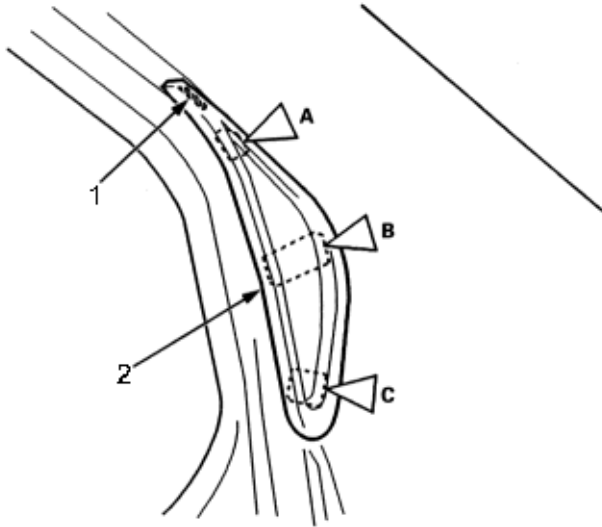
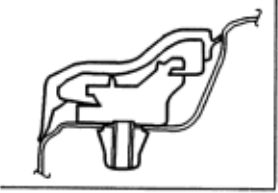
A ▷, 1



B ▷, 1



C ▷, 1



1. ADHESIVE TAPE
2. REAR PILLAR MOULDING

Install in the reverse order of removal

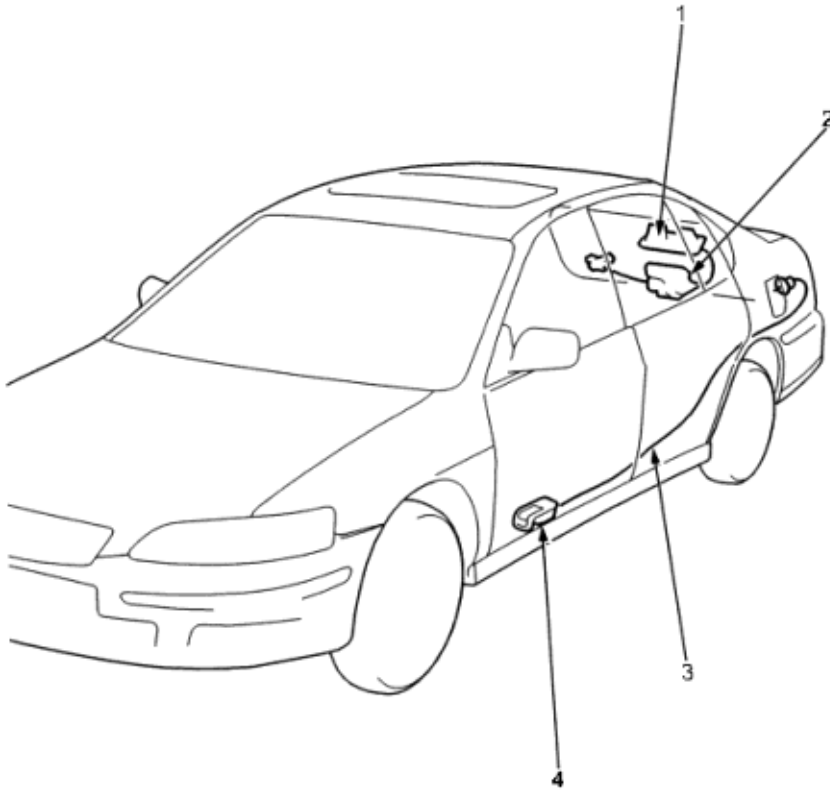
Openers

Component Location Index

20-26

SRS components are located in the areas marked with an asterisk (*). Review the SRS component locations, precautions, and procedures in the 1999 Accord Shop Manual, P/N 62S1A00B, SRS section (24) before performing repairs or service.

1. **TAILGATE HANDLE**
Replacement, ([See Page 20-28](#))
2. **TAILGATE LATCH**
Replacement, ([See Page 20-29](#))
3. ***FUEL LID OPENER CABLE**
Replacement, ([See Page 20-27](#))
4. **FUEL LID OPENER**
Replacement, ([See Page 20-28](#))



Openers

Fuel Lid Opener Cable Replacement

20-27

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the 1999 Accord Shop Manual, P/N 62S1A00B, SRS section (24) before performing repairs or service.

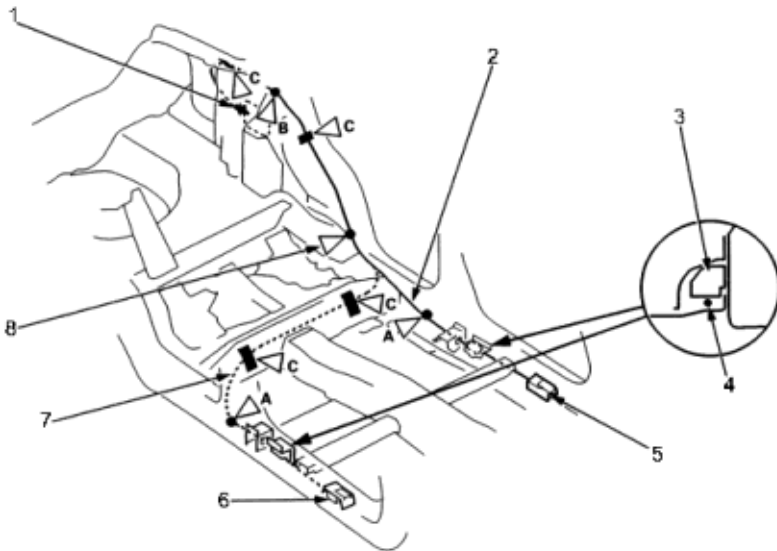
1. Remove the following parts.
 - ♦ Rear seat side bolster (**See Page 20-15**)
 - ♦ Rear seat cushion (RHD, **See Page 20-15**)
 - ♦ Front side trim
 - ♦ Rear side trim
 - ♦ Centre pillar lower trim panel
 - ♦ Front seat belt lower anchor bolt
 - ♦ Left rear side shelf (**See Page 20-10**)
 - ♦ Left trunk side trim, as necessary (**See Page 20-11**)
2. Pull the carpet back as necessary.
3. Disconnect the fuel lid opener cable from the fuel lid opener (**See Page 20-28**).
4. Release the opener cable from the clips and remove the cable cushions.

▷: Clip, cable cushion locations

A ▷, 1	B ▷, 1	C ▷	D ▷	E ▷ RHD
		LHD, 2	LHD/RHD	
		RHD, 4		
		without	with	
		navigation	navigation	
		system, 1	system, 1	



1. FUEL LID LATCH
2. FUEL LID OPENER CABLE (LHD)
3. SIDE IMPACT SENSOR
(for some models)
4. FUEL LID OPENER CABLE
5. FUEL LID OPENER (LHD)
6. FUEL LID OPENER (RHD)
7. FUEL LID OPENER CABLE (RHD)
8. D/E



5. Remove the fuel lid latch from the body, then remove the fuel lid opener cable from the vehicle. Take care not to bend the opener cable.
6. Install in the reverse order of removal, and replace any damaged cable cushions.

Openers

Fuel Lid Opener Replacement

20-28

Tailgate Handle Replacement

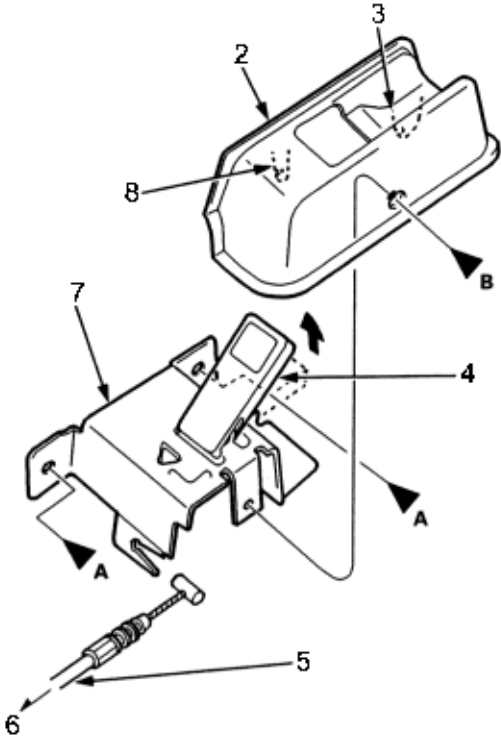
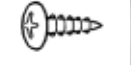
NOTE:

- ♦ Take care not to bend the opener cable.
- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- ♦ LHD is shown, RHD is symmetrical.

▶: Bolt, screw locations

A ▶, 2

B ▶, 1



1. 6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. OPENER COVER
Slide and remove the opener cover while pulling it up.
3. HOOK
4. KNOB
5. FUEL LID OPENER CABLE
(See Page 20-27)
6. To fuel lid latch
7. FUEL LID OPENER

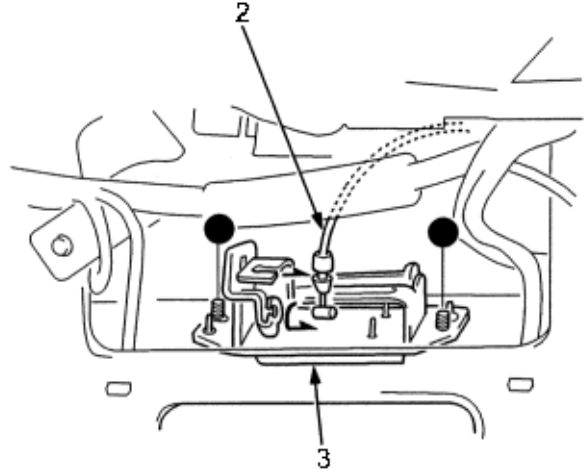
Install in the reverse order of removal, and note these items:

- ♦ Make sure the opener cable is connected properly.
- ♦ Make sure the fuel lid opens properly.

NOTE:

- ♦ Take care not to bend the handle cable.
 - ♦ Put on gloves to protect your hands.
1. Remove the tailgate lining (See Page 20-13).
 2. Disconnect the handle cable from the tailgate handle.
 3. Remove the nuts securing the license plate trim and tailgate handle, then remove the tailgate handle.

●: Nut locations, 2



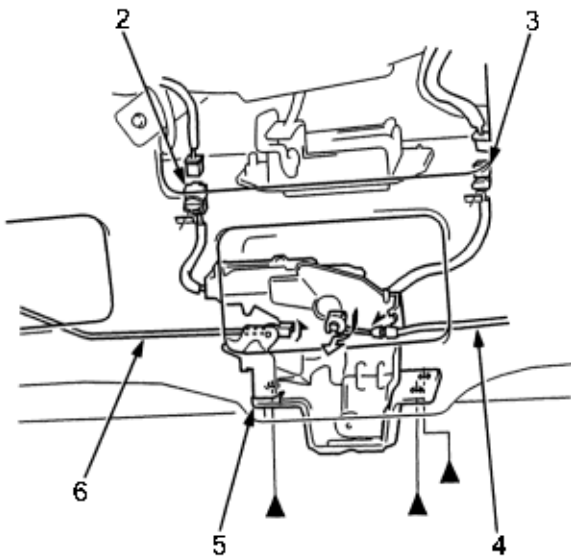
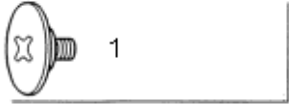
1. 6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. HANDLE CABLE
3. TAILGATE HANDLE

4. Install in the reverse order of removal, and note these items:
 - ♦ Make sure the handle cable is connected securely.
 - ♦ Make sure the tailgate opens properly.

NOTE:

- ♦ Take care not to bend the handle cable and cylinder rod.
 - ♦ Put on gloves to protect your hands.
1. Remove the tailgate lining (**See Page 20-13**).
 2. Disconnect the handle cable, cylinder rod, tailgate latch switch connector and tailgate latch actuator connector, and detach the connectors.
 3. Remove the bolts, then remove the tailgate latch.

►: Bolt, screw locations, 3

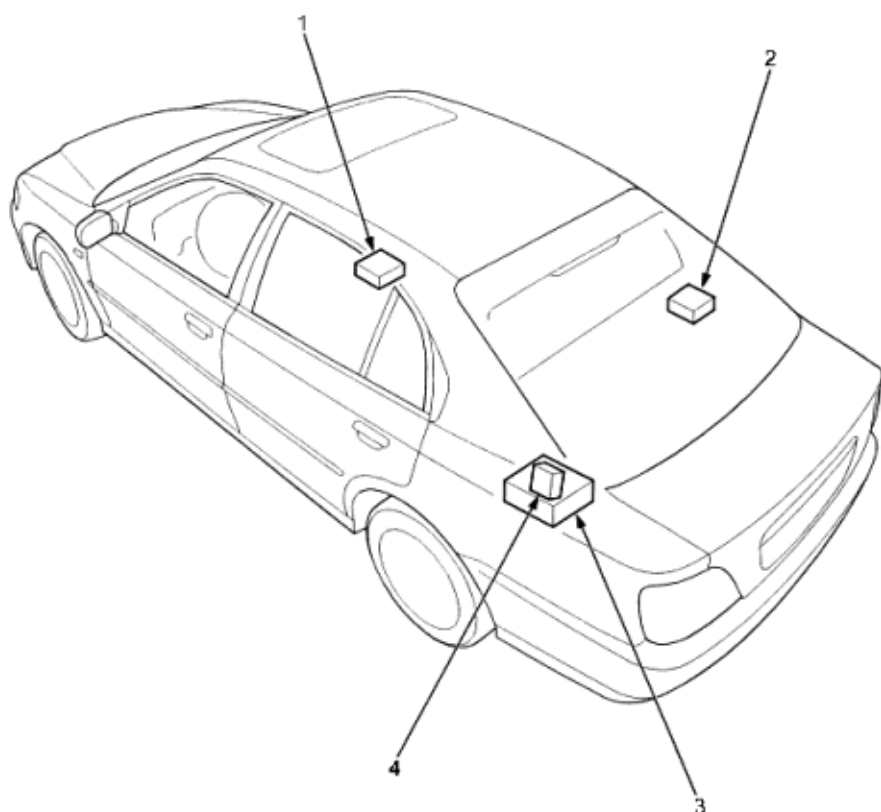


1. 6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
 2. TAILGATE LATCH ACTUATOR CONNECTOR
 3. TAILGATE LATCH SWITCH CONNECTOR
 4. HANDLE CABLE
 5. TAILGATE LATCH
 6. CYLINDER ROD
4. Install in the reverse order of removal, and note these items:
 - ♦ Make sure the connectors are plugged in properly and the handle cable and the cylinder rod are connected properly.
 - ♦ Make sure the tailgate opens properly and locks securely.

Relay and Control Unit Locations
Floor and Rear

23-A-2

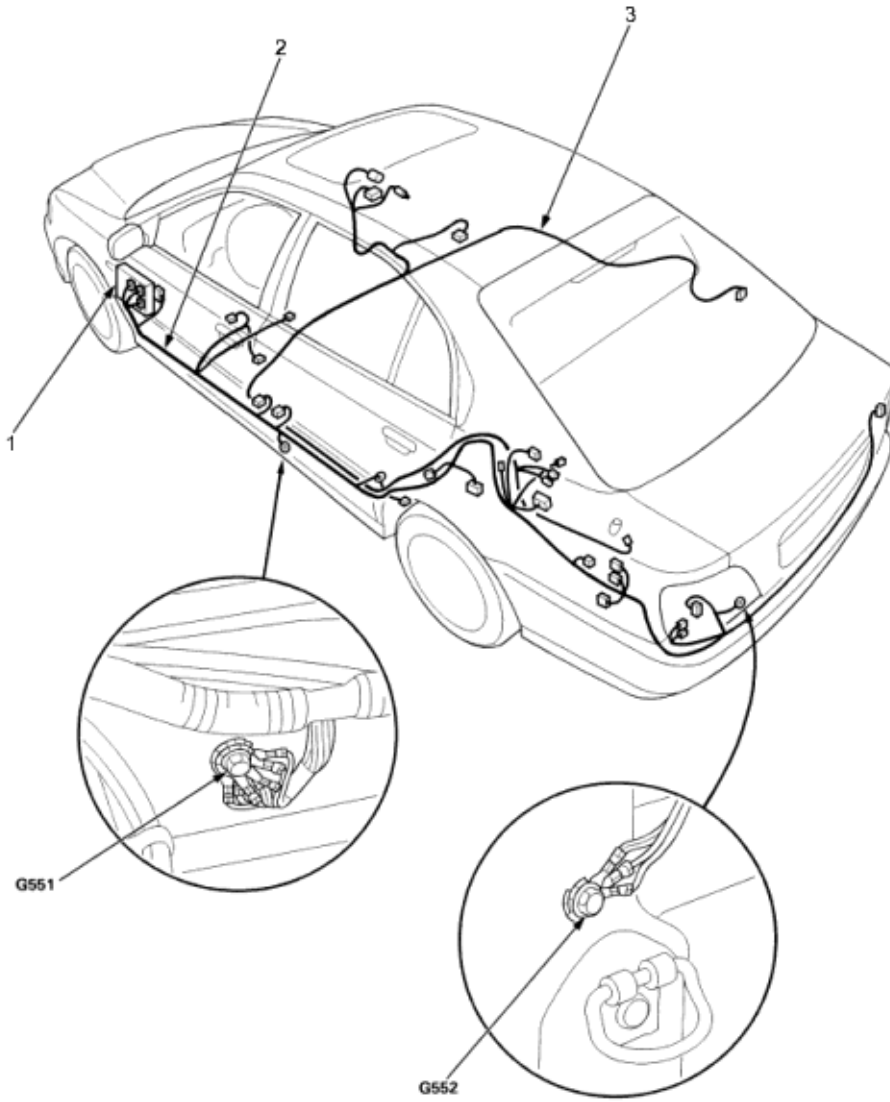
NOTE: LHD type is shown, RHD type is similar.



1. **EQUALISER UNIT**
(With Bose sound system)
2. **STEREO AMPLIFIER**
(With Bose sound system)
3. **NAVIGATION UNIT**
4. **REAR WINDOW INTERMITTENT
WIPER CONTROL UNIT**

NOTE: LHD type is shown, RHD type is similar.

1. DRIVER'S UNDER-DASH FUSE/RELAY BOX
2. LEFT SIDE WIRE HARNESS
3. AUDIO SUB-HARNESS
(With Bose sound system)

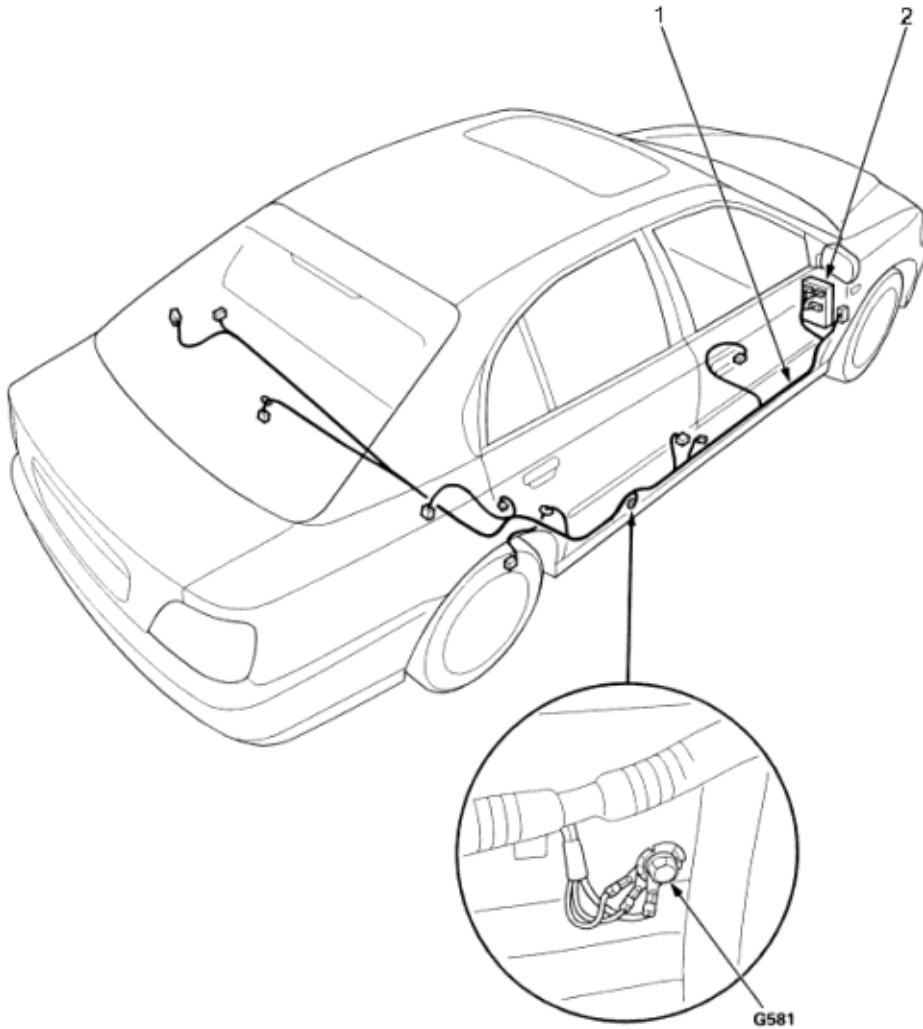


Wire Harness and Ground Locations
Floor (cont'd)

23-A-4

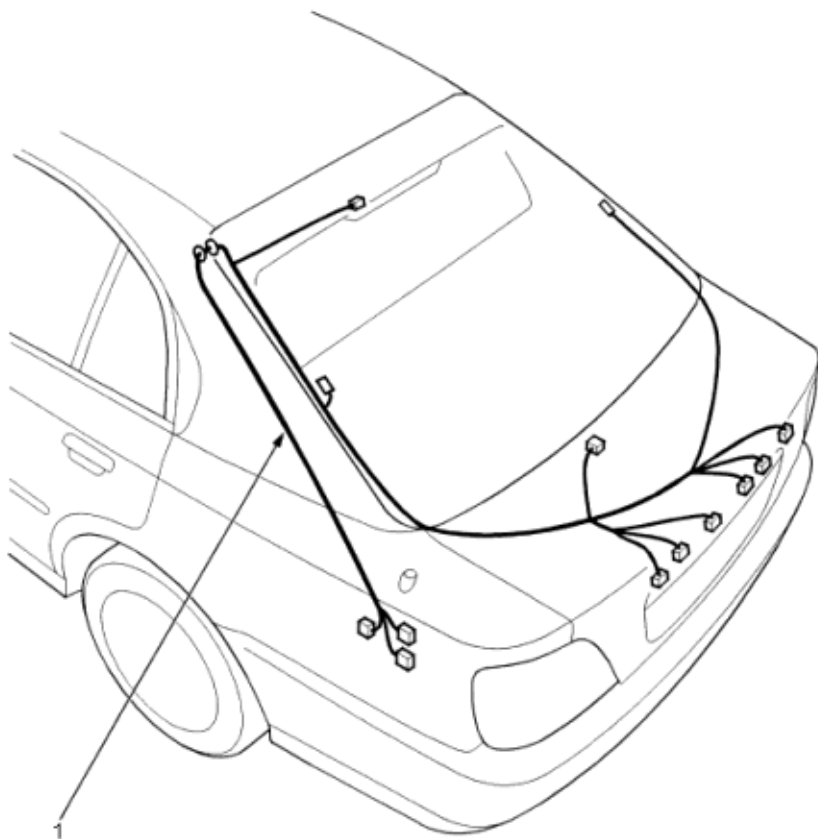
NOTE: LHD type is shown, RHD type is similar.

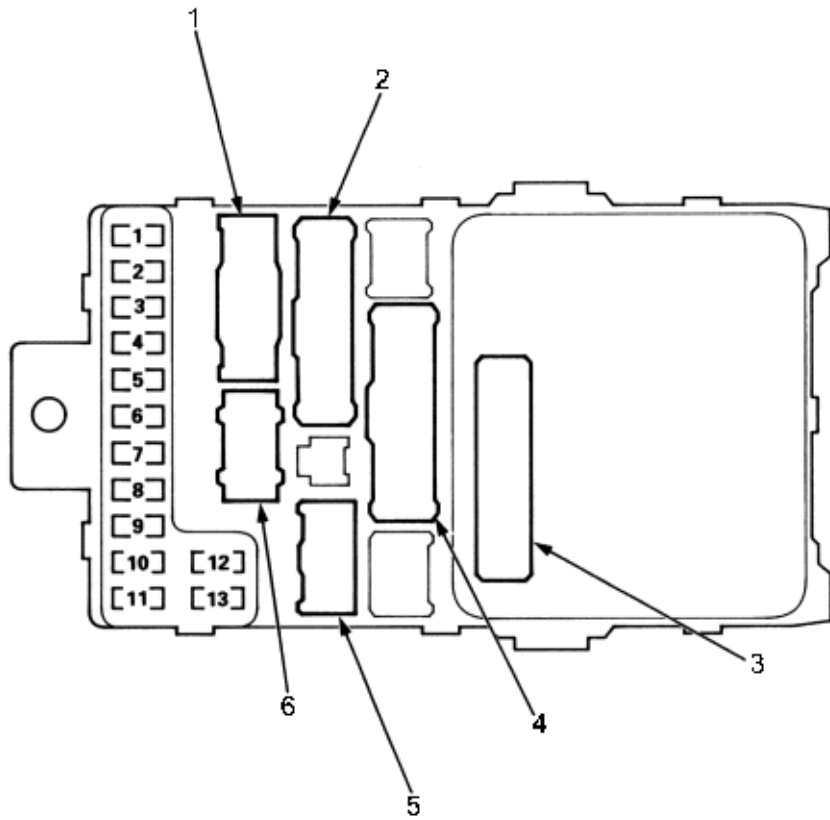
1. RIGHT SIDE WIRE HARNESS
2. PASSENGER'S UNDER-DASH FUSE/RELAY BOX



NOTE: LHD type is shown, RHD type is similar.

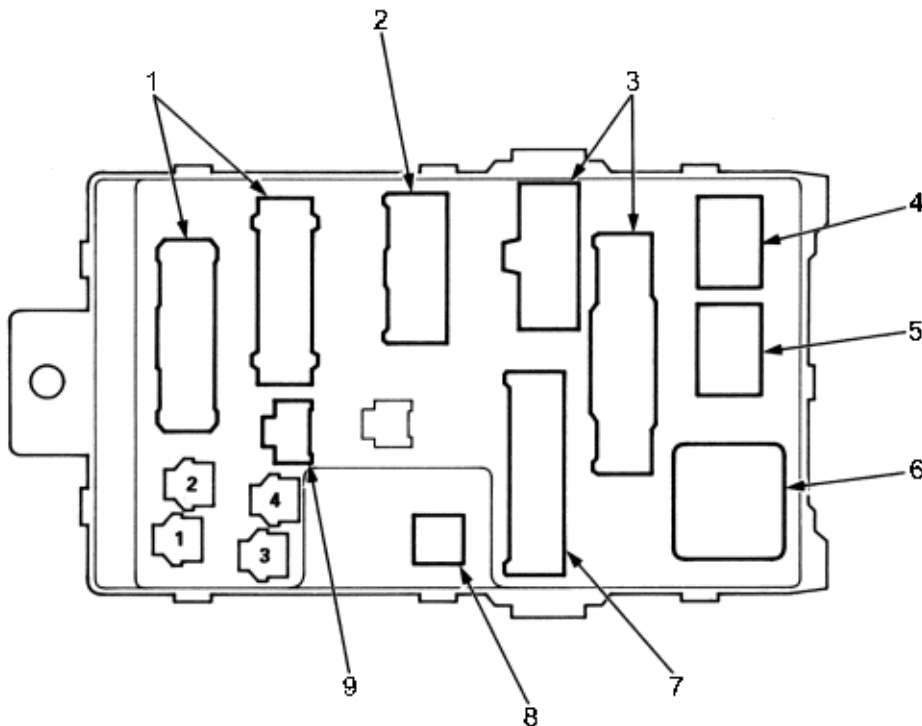
1. TAILGATE WIRE HARNESS





1. To driver's side wire harness
2. ♦ To left engine compartment wire harness (LHD type)
 ♦ To right engine compartment wire harness (RHD type)
3. To multiplex control unit (driver's) (Plugs directly into the fuse box)
4. To driver's door wire harness
5. ♦ To left engine compartment wire harness (LHD type)
 ♦ To right engine compartment wire harness (RHD type)
6. To driver's side wire harness

NOTE: View from the backside of driver's under-dash fuse/relay box.



1. To dashboard wire harness
2. To ignition switch
3. To steering beam wire harness
4. To starter cut relay
5. To reverse relay
6. To turn signal/hazard relay
7. To steering beam wire harness
8. To SRS main harness
9. Service check connector

- 1: Option connector (ACC)
- 2: Option connector (IG2)
- 3: Option connector (+B)
- 4: Option connector

Fuses**23-B-3****Driver's Under-dash Fuse/Relay Box (cont'd)****Driver's Under-dash Fuse/Relay Box**

Fuse Number	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	15 A	RED/WHT	PGM-FI main relay, Inertia switch
1	15 A	GRN (RED/WHT)	SRS unit (VA)
2	10 A	GRN (BLK/RED)	SRS unit (VB)
3	7.5 A	BLK/ORN	Climate control unit, Heater control panel, A/C thermostat, Recirculation control motor, Blower motor relay, Condenser fan motor relay, Radiator fan motor relay, Radiator fan control module (KY), Rear window defogger relay
4	7.5 A	YEL/BLK	Power mirror actuators, Power mirror defoggers, Seat heater main relay, Right power mirror defogger, Left power mirror defogger
4	7.5 A	Fuse/relay box socket	Optional connector
5	10 A	YEL/RED	ABS modulator unit (IG2)
6	15 A	BLK/YEL	Alternator, Cruise control unit, Charging system light, Engine mount control solenoid valve (A/T), EVAP purge control solenoid valve, HO2S, Primary HO2S, Secondary HO2S, ECM/PCM, VSS (M/T), IAB control solenoid valve*3, Radiator fan control module (KY)
7	7.5 A	YEL/GRN	Headlight adjuster control unit*1, Headlight adjuster units*2, Headlight adjuster switch, Sunroof relays, Multiplex control unit (door), Rear window washer motor, Rear window wiper motor
8	7.5 A	YEL/BLK	Navigation unit, Shift lock solenoid (A/T), Multiplex control unit (driver's) (A/T)
8	7.5 A	Fuse/relay box socket	Optional Connector
9	7.5 A	YEL	Back-up lights (M/T), Clock, Gauge assembly, Keyless door lock control unit, Vehicle speed alarm unit (KY)
9	7.5 A	Fuse/relay box socket	Multiplex control unit (driver's), Reverse relay (A/T)
10	7.5 A	YEL/RED	Turn signal/hazard relay
11	15 A	BLK/YEL	Ignition coil
12	30 A	GRN/BLK	Windshield wiper intermittent relay, Windshield wiper motor, Multiplex control unit (driver's)
13	7.5 A	BLU/ORN	ECM/PCM*3, PGM-FI main relay*3

[]: RHD

*1: With high intensity discharge lamp system

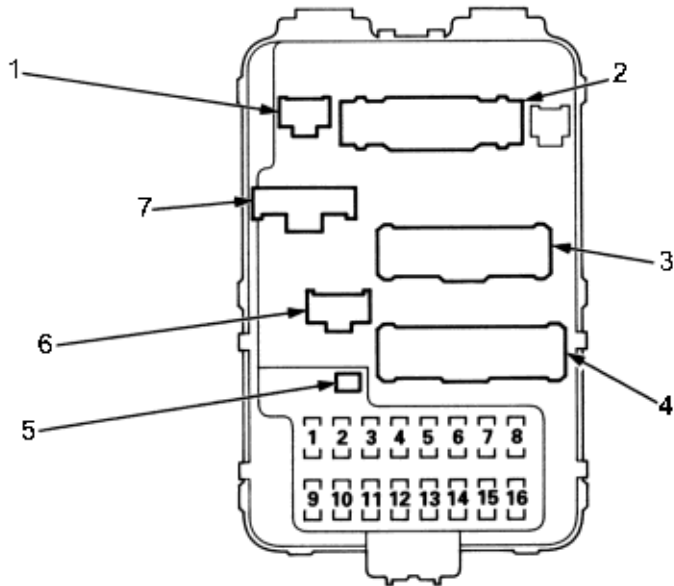
*2: Without high intensity discharge lamp system

*3: Except D16B6 engine

Fuses

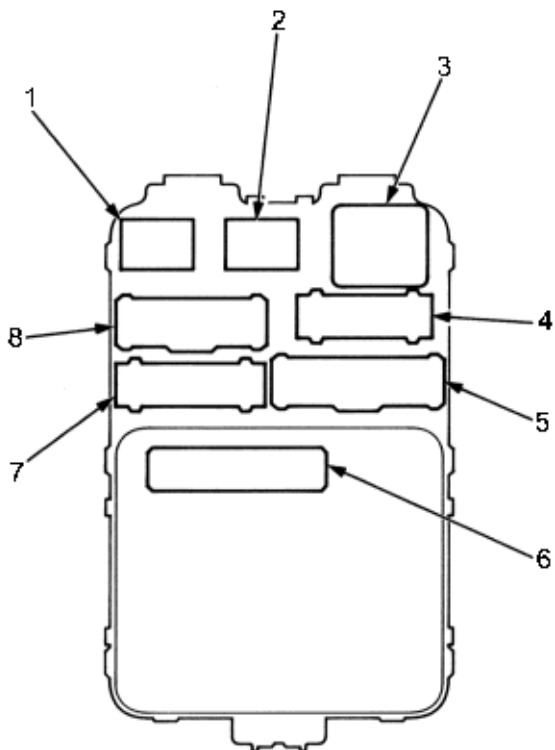
Passenger's Under-dash Fuse/Relay Box

23-B-4



1. To passenger's side wire harness
2. To front passenger's door wire harness
3. ♦ To right engine compartment wire harness (LHD type)
♦ To left engine compartment wire harness (RHD type)
4. To passenger's side wire harness
5. Diode
6. To roof wire harness
7. ♦ To right engine compartment wire harness (LHD type)
♦ To left engine compartment wire harness (RHD type)

NOTE: View from the backside of passenger's under-dash fuse/relay box.



1. To power window relay
2. To cigarette lighter relay
3. To rear window defogger relay
4. To steering beam wire harness
5. To dashboard wire harness
6. To multiplex control unit (passenger's), (plugs directly into the fuse box)
7. To dashboard wire harness
8. To steering beam wire harness

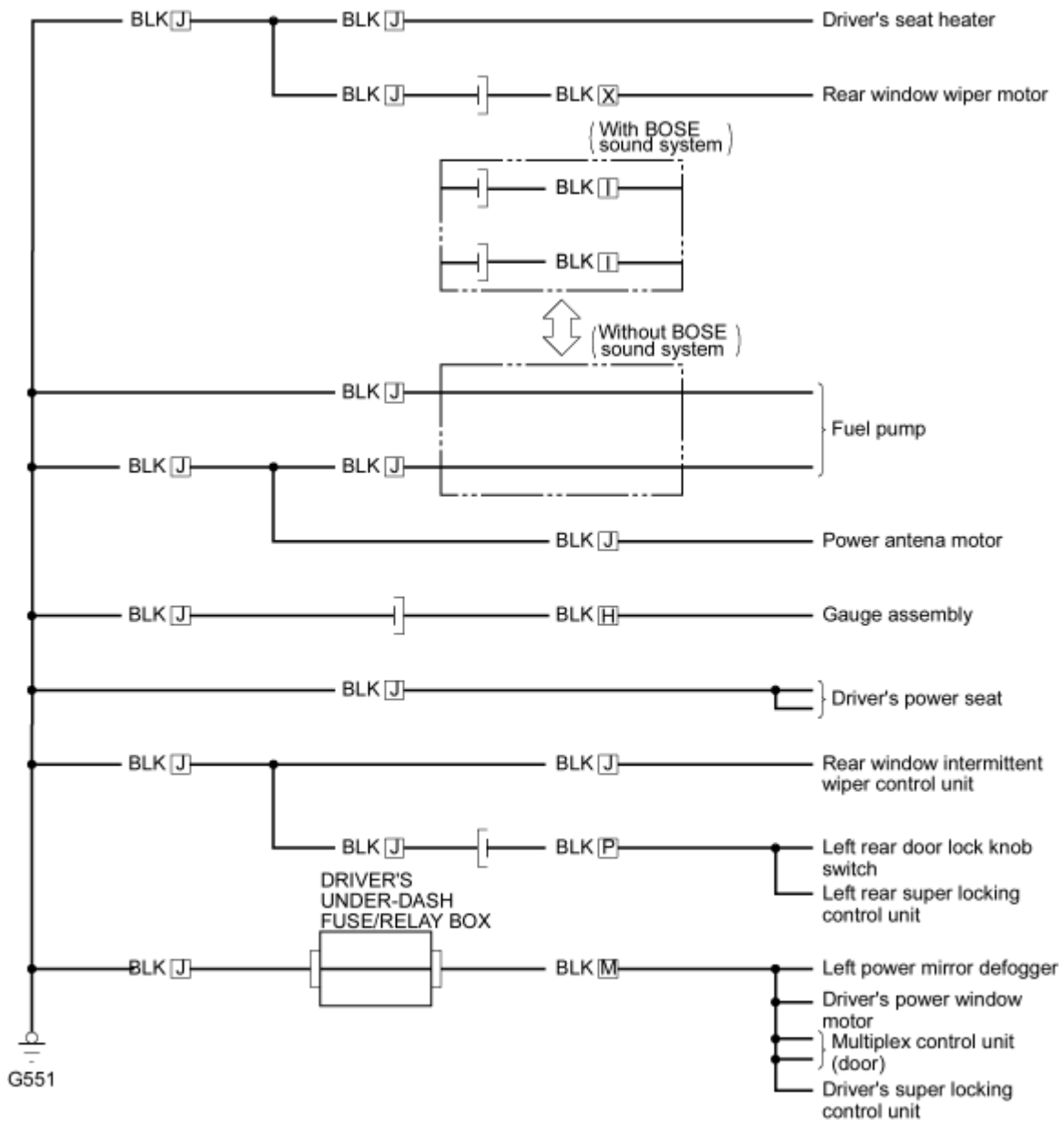
Fuses**23-B-5****Passenger's Under-dash Fuse/Relay Box (cont'd)****Passenger's Under-dash Fuse/Relay Box**

Fuse Number	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	20 A	GRN/WHT	Power window control unit, Driver's power window motor
2	20 A	RED	Power seat recline and rear up-down motors
3	30 A	WHT/BLK	Headlight washer control unit
4	20 A	BLU	Power seat slide and front up-down motors
5	20 A	RED/YEL	Front fog lights
5	20 A	Fuse/relay box socket	Multiplex control unit (passenger's)
6	7.5 A*1	WHT/RED	ECM
6	20 A*2	RED/BLU	Primary HO2S
7	20 A	WHT/GRN	Left [right] rear power window motor
8	20 A	BLU/BLK	Front passenger's power window motor
9	15 A	WHT/GRN	Audio unit
9	15 A	Fuse/relay box socket	Cigarette lighter, Accessory socket
10	20 A	WHT/BLU	BOSE amplifier
11	7.5 A	WHT/BLU	Front ceiling light, Rear ceiling light, Spotlights, Trunk light, Power antenna motor, Tailgate light
12	20 A	WHT	Keyless door lock control unit
12	20 A	Fuse/relay box socket	Multiplex control unit (passenger's)
13	7.5 A	PNK	Climate control unit, Clock, ECM/PCM, Navigation display and unit, Immobilizer indicator light, Security indicator light
13	7.5 A	Fuse/relay box socket	Multiplex control unit (passenger's)
14	20 A	WHT/BLK	Seat Heaters
15	30 A	GRN	Sunroof motor
16	20 A	WHT/BLK	Right [left] rear power window motor

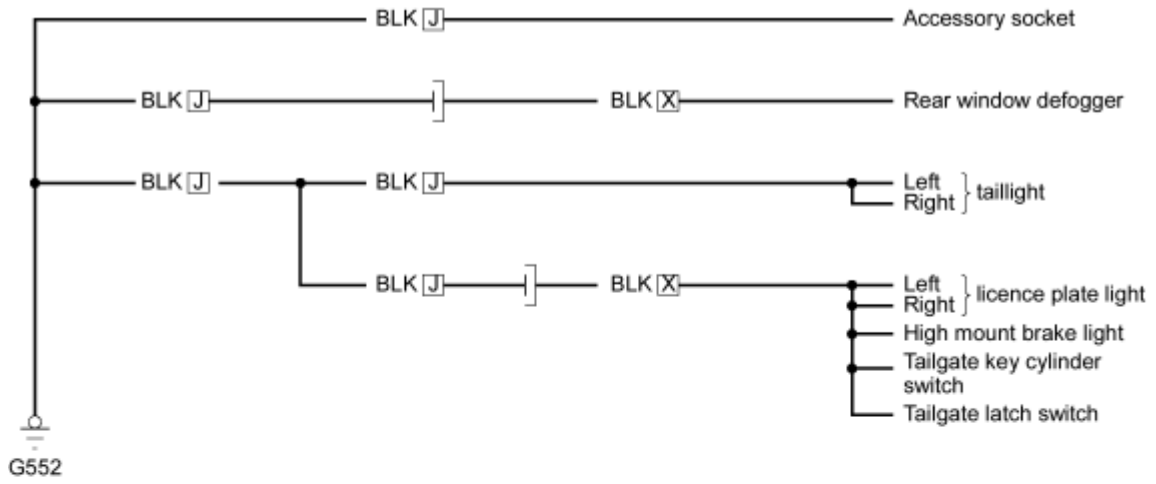
[]: RHD

*1: D16B6 engine

*2: F10B6 engine



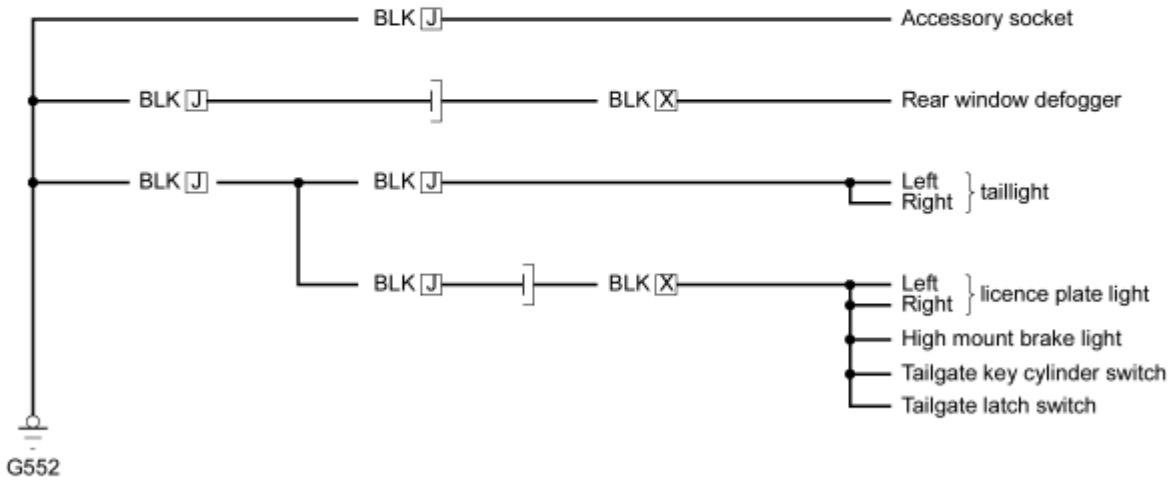
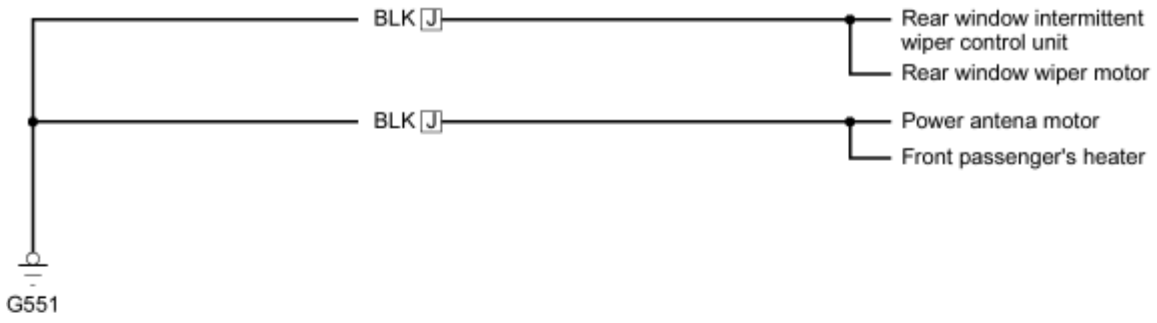
- | | |
|-------------------------------|-----------------------------------|
| [H] : Dashboard wire harness | [M] : Driver's door wire harness |
| [I] : Right side wire harness | [P] : Left rear door wire harness |
| [J] : Left side wire harness | [X] : Tailgate wire harness |



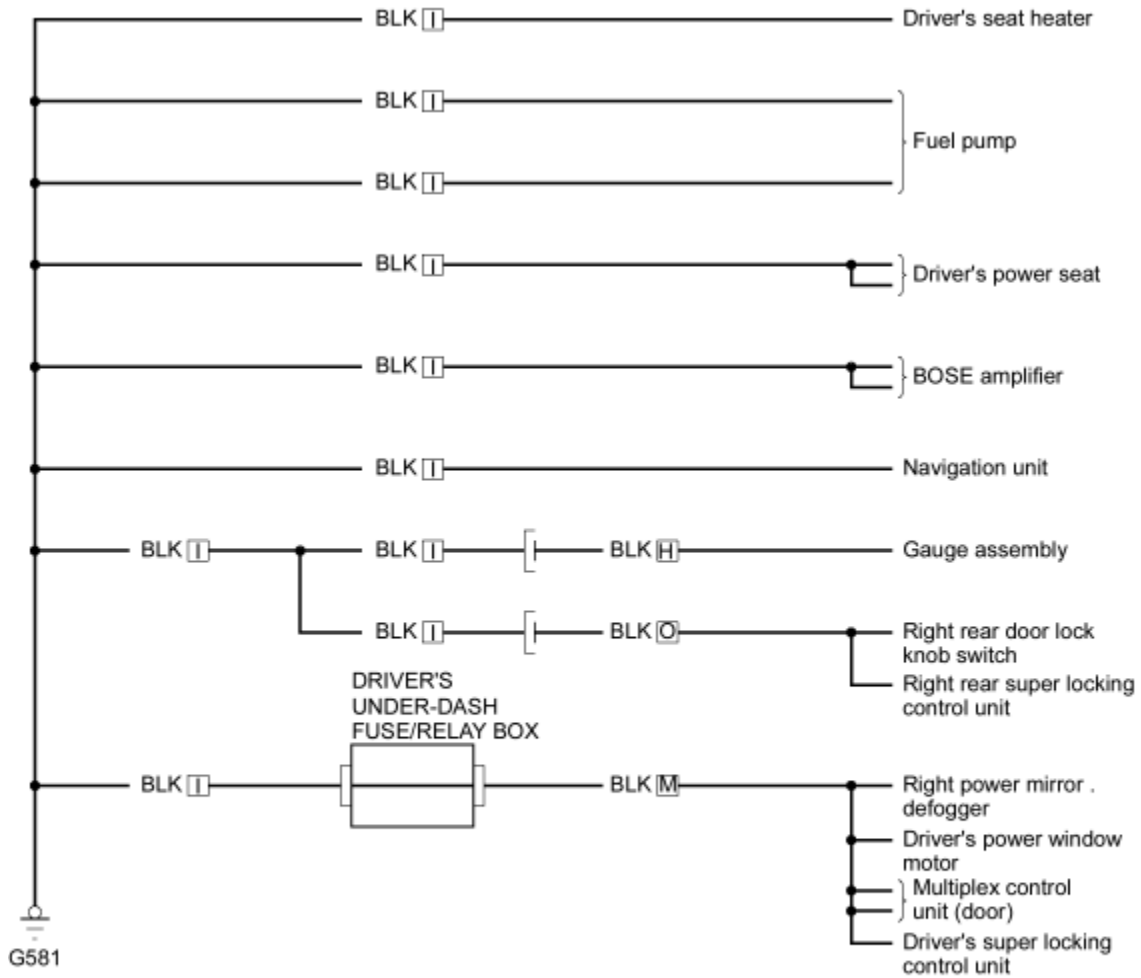
I : Right side wire harness X : Tailgate wire harness
 J : Left side wire harness

Ground Distribution
Circuit Identification (RHD type)

23-B-8

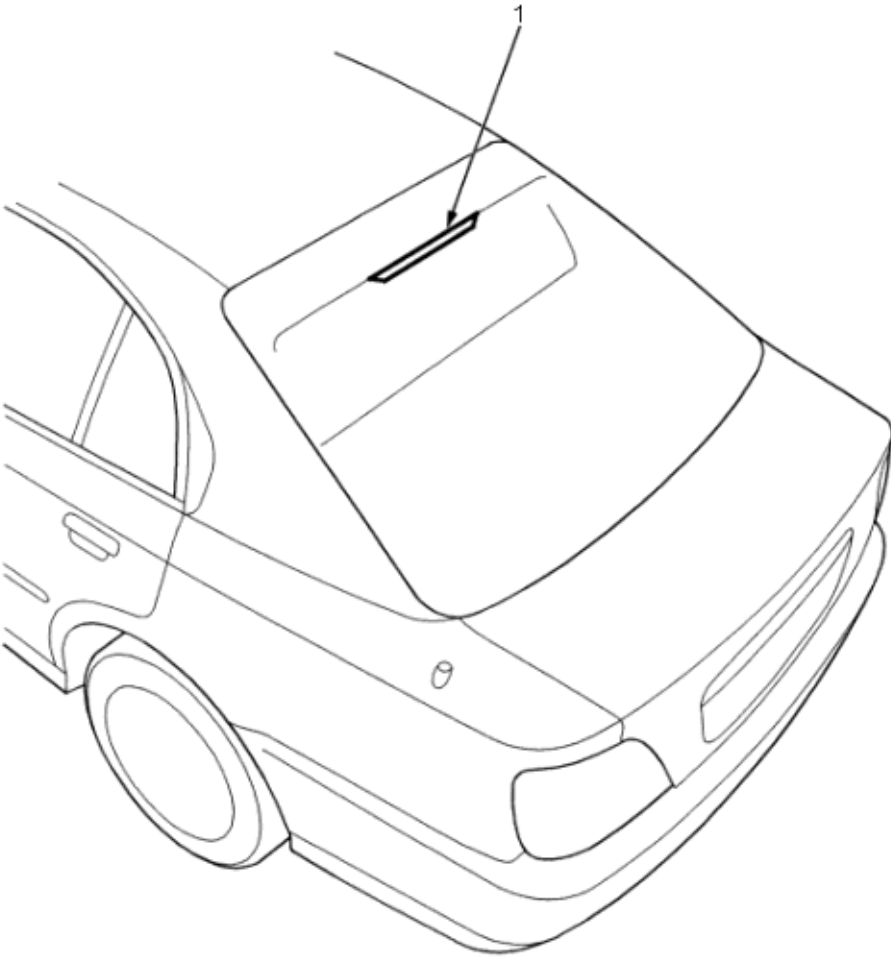


[J] : Left side wire harness
[X] : Tailgate wire harness



- [H] : Dashboard wire harness
- [I] : Right side wire harness
- [M] : Driver's door wire harness
- [O] : Right rear door wire harness

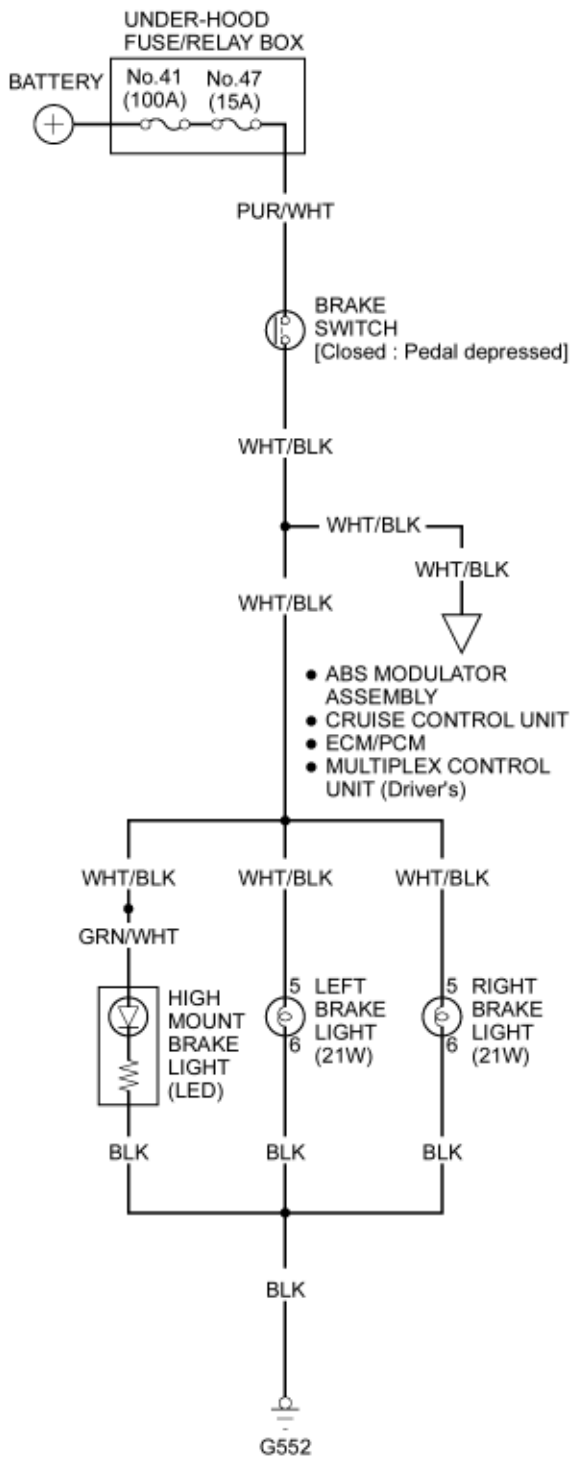
1. **HIGH MOUNT BRAKE LIGHT**
Replacement, (**See Page** 23-D-3)



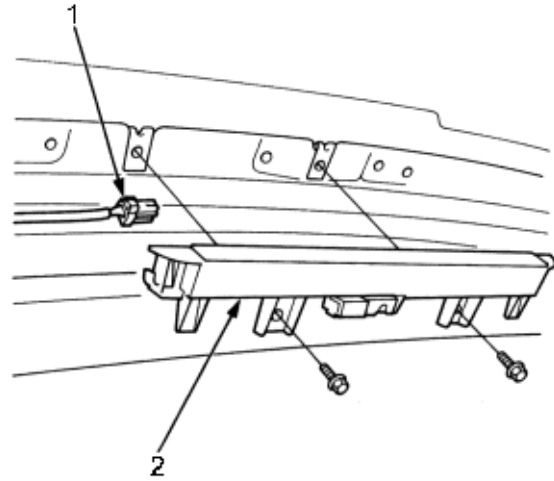
Brake Lights Circuit Diagram

23-D-3

High Mount Brake Light Replacement

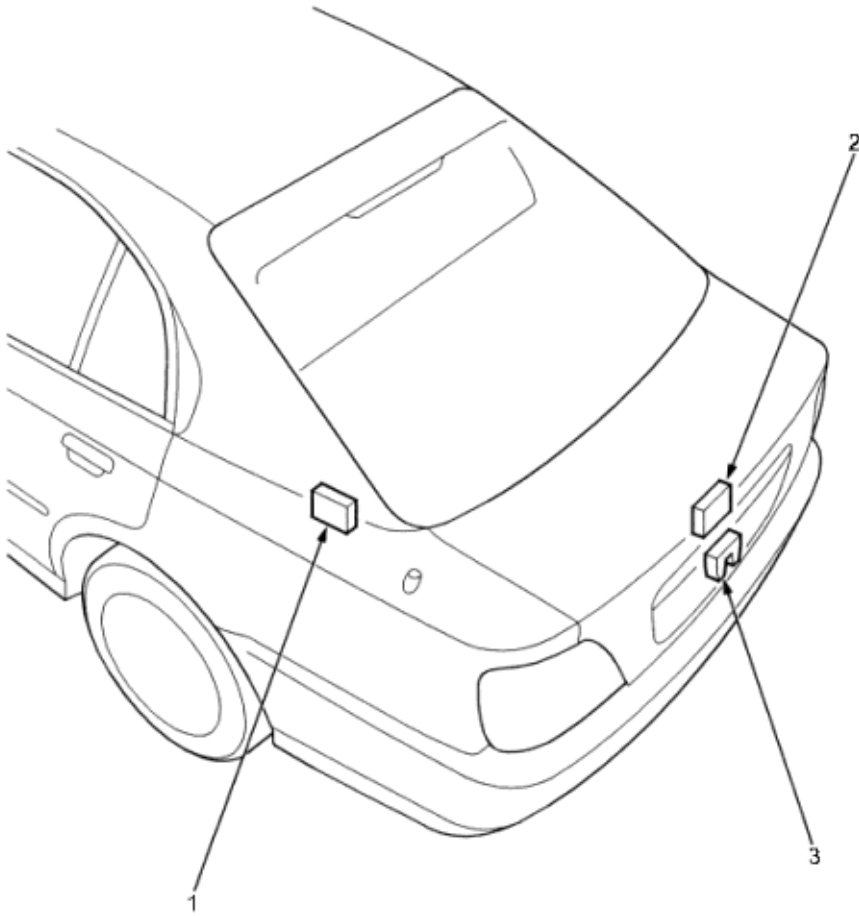


1. Remove the tailgate upper trim (see section 20).
2. Disconnect the 2P connector and remove the high mount brake light.

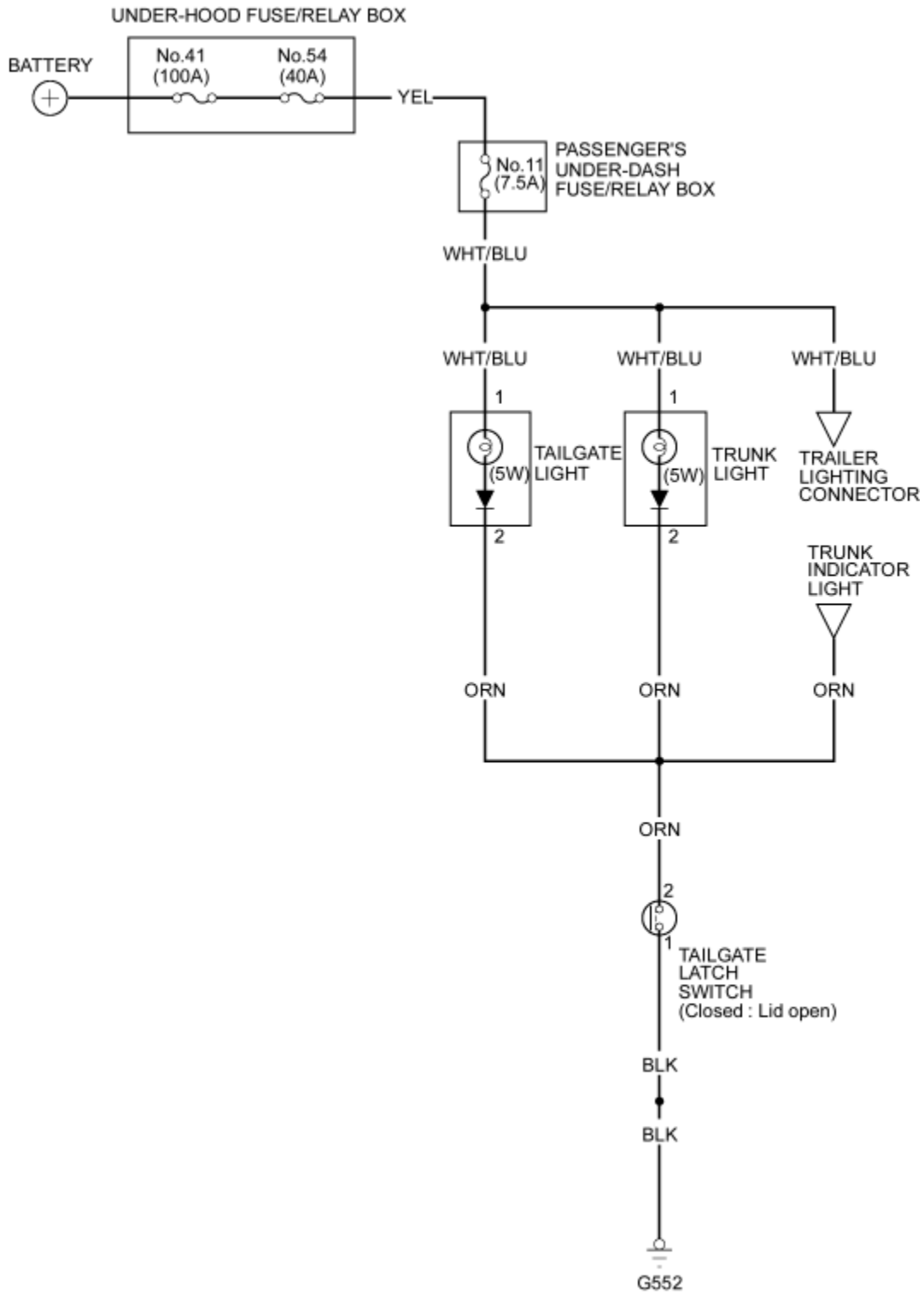


1. 2P CONNECTOR
2. HIGH MOUNT BRAKE LIGHT
3. Clean the rear window glass, and install the light in the reverse order of removal.

NOTE: LHD type is shown, RHD type is similar.



1. **TRUNK LIGHT**
Test, ([See Page 23-D-6](#))
2. **TAILGATE LIGHT**
Test, ([See Page 23-D-6](#))
3. **TAILGATE LATCH SWITCH**
Test, ([See Page 23-D-6](#))



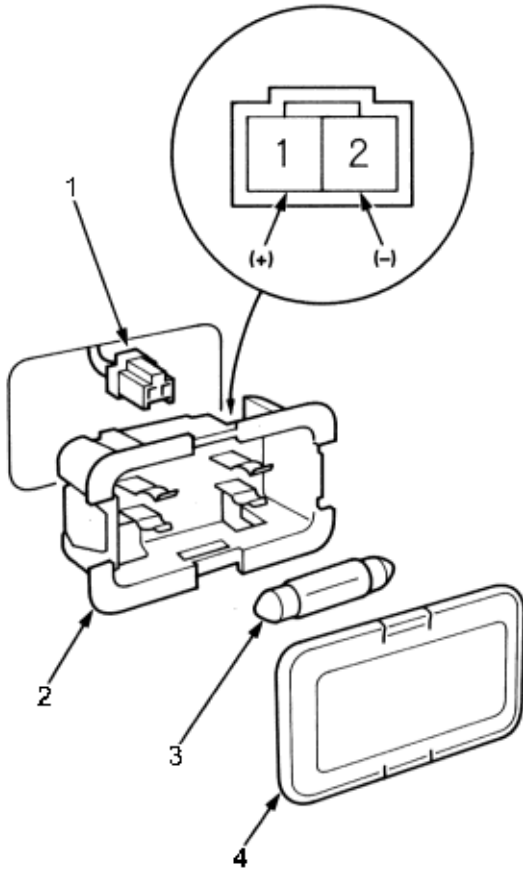
Interior Lights

Trunk Light/Tailgate Light Test

23-D-6

Tailgate Latch Switch Test

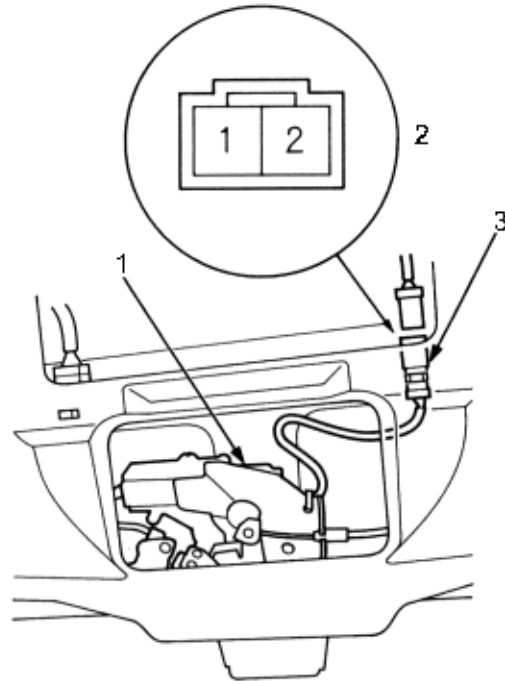
1. Open the tailgate.
2. Pry out the trunk light assembly.
3. Disconnect the 2P connector from the housing.



1. 2P CONNECTOR
2. HOUSING
3. BULB (5 W)
4. LENS

4. Make sure that the bulb is OK. Check for continuity between the No. 1 and No. 2 terminals.

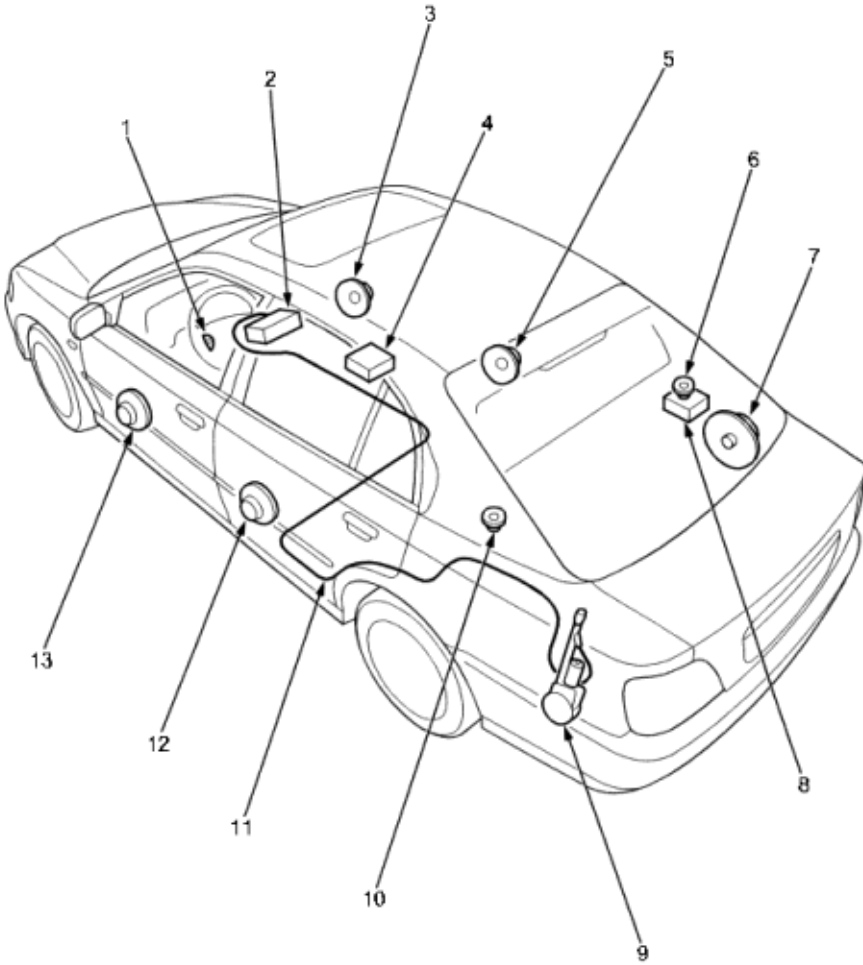
1. Open the tailgate.
2. Remove the tailgate trim panel (see section 20).
3. Disconnect the 2P connector from the tailgate latch.



1. TAILGATE LATCH
2. Terminal side of male terminals
3. 2P CONNECTOR

4. Check for continuity between the terminals in each switch position according to the table.

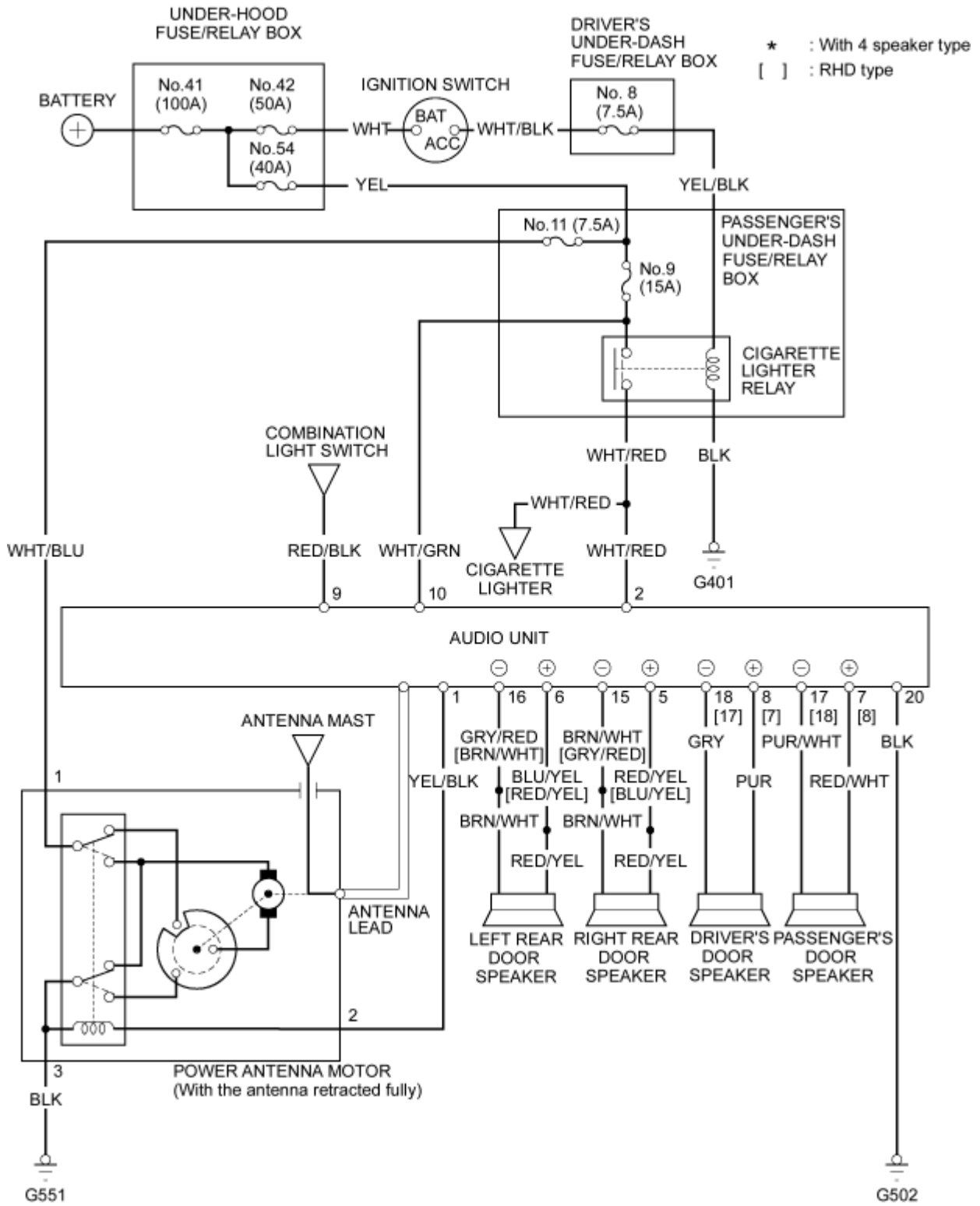
Terminal	1	2
Position		
Trunk lid open	○	○
Trunk lid closed		

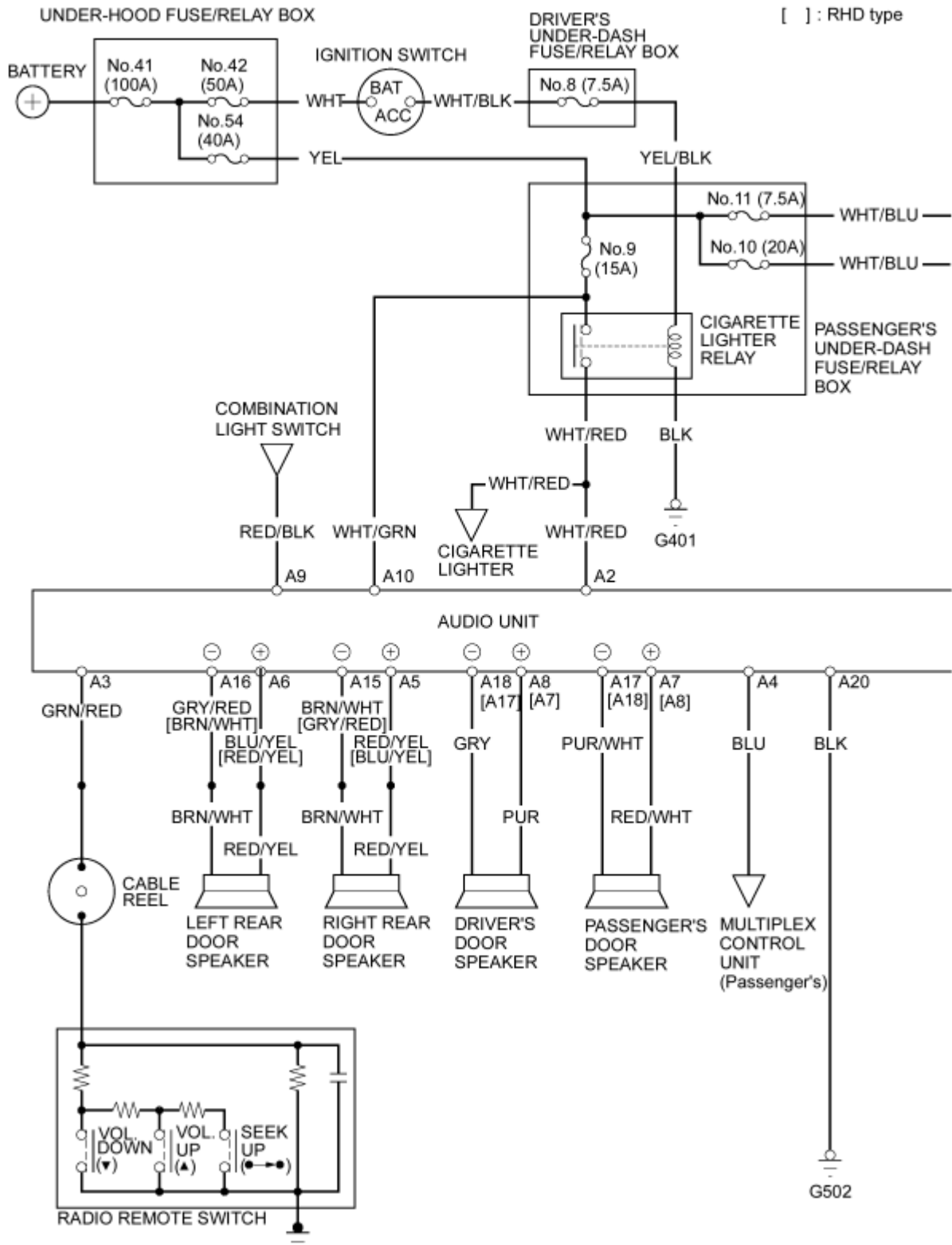


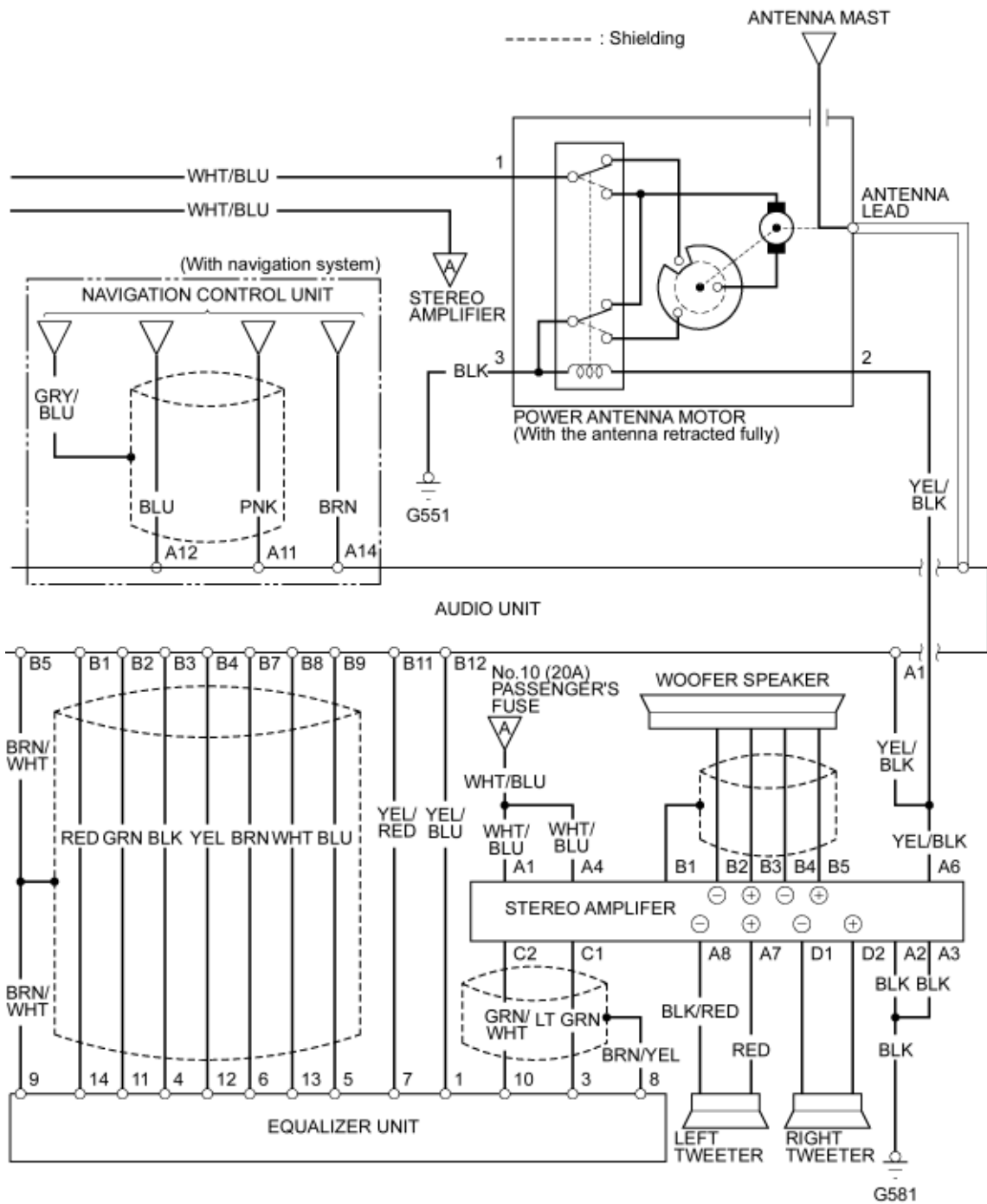
1. **RADIO REMOTE SWITCH**
2. **AUDIO UNIT**
Terminals, (See Page 23-F-6)
3. **PASSENGER'S DOOR SPEAKER**
4. **EQUALIZER UNIT**
5. **RIGHT REAR DOOR SPEAKER**
6. **RIGHT TWEETER**
Replacement, (See Page 23-F-8)
7. **WOOFER SPEAKER**
Replacement, (See Page 23-F-9)
8. **STEREO AMPLIFIER**
Replacement, (See Page 23-F-8)
Terminals, (See Page 23-F-7)
9. **POWER ANTENNA MOTOR**
10. **LEFT TWEETER**
Replacement, (See Page 23-F-8)
11. **ANTENNA LEAD**
12. **LEFT REAR DOOR SPEAKER**
13. **DRIVER'S DOOR SPEAKER**

Stereo Sound System
Circuit Diagram (Without BOSE Sound System)

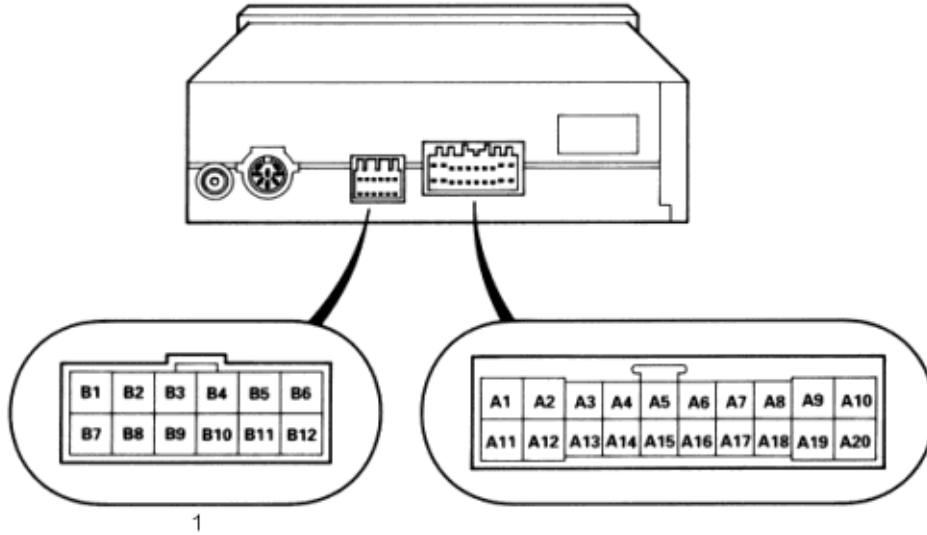
23-F-3







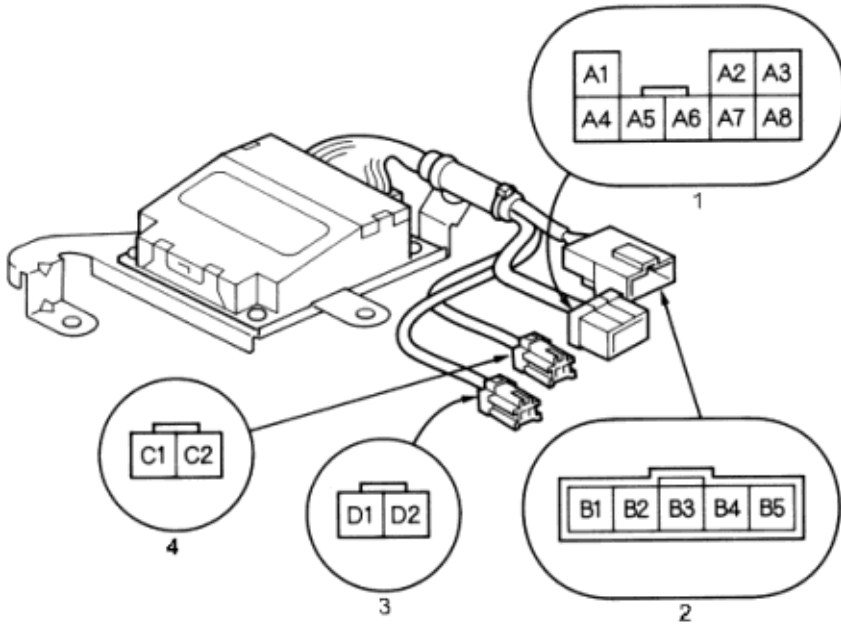
1. With Bose sound system



Cavity	Wire	Connect to	Cavity	Wire	Connect to
A1	YEL/BLK	Radio-switched power	A17	PUR/WHT	Passenger's door speaker (-)
A2	WHT/RED	ACC (Main stereo power supply)	[A17]	[GRY]	Driver's door speaker (-)
*A3	GRN/RED	Radio remote switch	A18	GRY	Driver's door speaker (-)
*A4	BLU	Security in (passenger's MPCs unit)	[A18]	[PUR/WHT]	Passenger's door speaker (-)
A5	RED/YEL [BLU/YEL]	Right rear speaker (+)	A19	-	Not used
A6	BLU/YEL [GRY/RED]	Left rear speaker (+)	A20	BLK	Ground (G502)
A7	RED/WHT	Passenger's door speaker (+)	*B1	RED	Equalizer unit (Left input)
[A7]	[PUR]	Driver's door speaker (+)	*B2	GRN	Equalizer unit (SUM input)
A8	PUR	Driver's door speaker (+)	*B3	BLK	Equalizer unit (Left output)
[A8]	[RED/WHT]	Passenger's door speaker (+)	*B4	YEL	Equalizer unit (COMMON output)
A9	RED/BLK	Lights-on signal	*B5	BRN/WHT	Equalizer unit (Output shielding)
A10	WHT/GRN	Constant power	*B6	-	Not used
*A11	PNK	Navigation control unit (AF (-))	*B7	BRN	Equalizer unit (Right input)
*A12	BLU	Navigation control unit (AF (+))	*B8	WHT	Equalizer unit (COMMON input)
A13	-	Not used	*B9	BLU	Equalizer unit (Right output)
*A14	BRN	Navigation control unit (MUTE signal)	*B10	-	Not used
A15	BRN/WHT GRY/RED	Right rear speaker (-)	*B11	YEL/RED	Equalizer unit (Ground)
A16	GRY/RED [BRN/WHT]	Left rear speaker (-)	*B12	YEL/BLU	Equalizer unit (Switched +BAT)

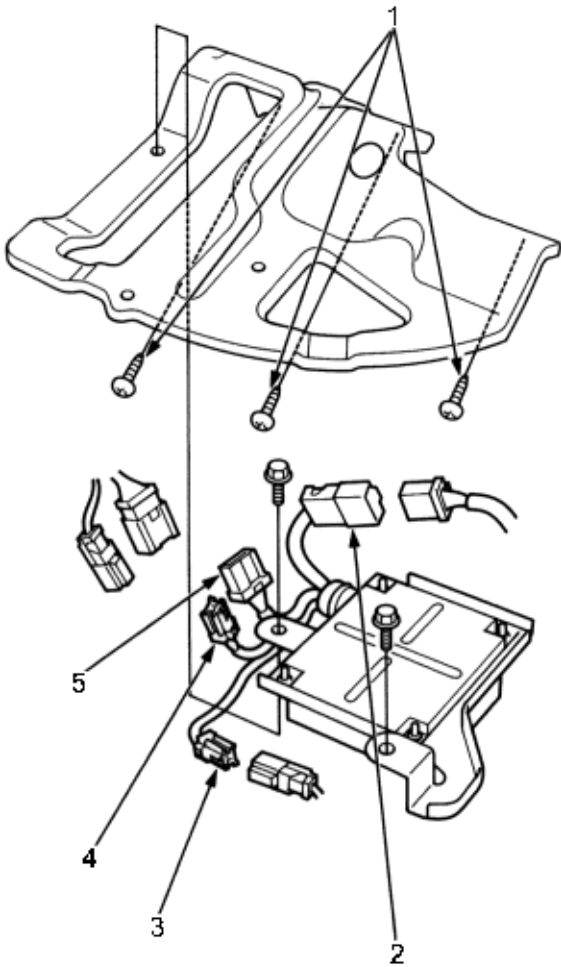
*: With Bose sound system
 [: RHD type

1. Wire side of female terminals
2. Terminal side of male terminals
3. Wire side of female terminals
4. Wire side of female terminals



Cavity	Wire	Connect to	Cavity	Wire	Connect to
A1	WHT/BLU	Constant power	B2	-	Woofer speaker (-)
A2	BLK	Ground (G581)	B3	-	Woofer speaker (+)
A3	BLK	Ground (G581)	B4	-	Woofer speaker (-)
A4	WHT/BLU	Constant power	B5	-	Woofer speaker (+)
A5	-		C1	LT GRN	Equalizer unit (BASS (+))
A6	YEL/BLK	Radio-switched power	C2	GRN/WHT	Equalizer unit (BASS (-))
A7	RED	Left tweeter (+)	D1	-	Right tweeter (-)
A8	BLK/RED	Left tweeter (-)	D2	-	Right tweeter (+)
B1	-	Woofer speaker (shielding)			

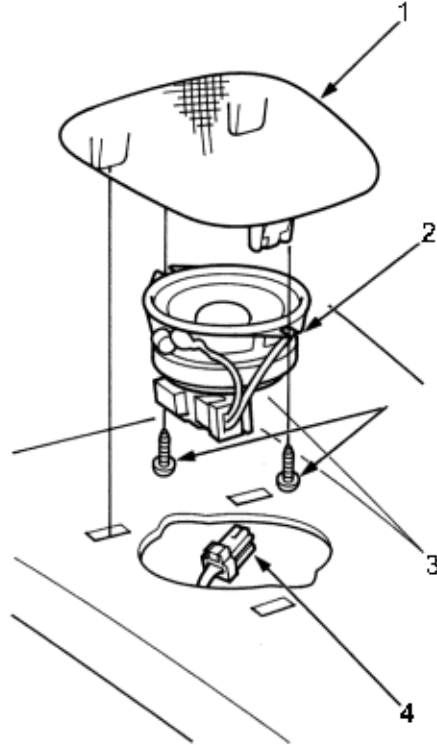
1. Remove the right rear side shelf and the right trunk side trim (see section 20).
2. Remove the screws.
3. Disconnect the connectors from the amplifier, then remove the amplifier.



1. SCREWS
2. 5P CONNECTOR
3. 2P CONNECTOR
4. 2P CONNECTOR
5. 8P CONNECTOR

Tweeter:

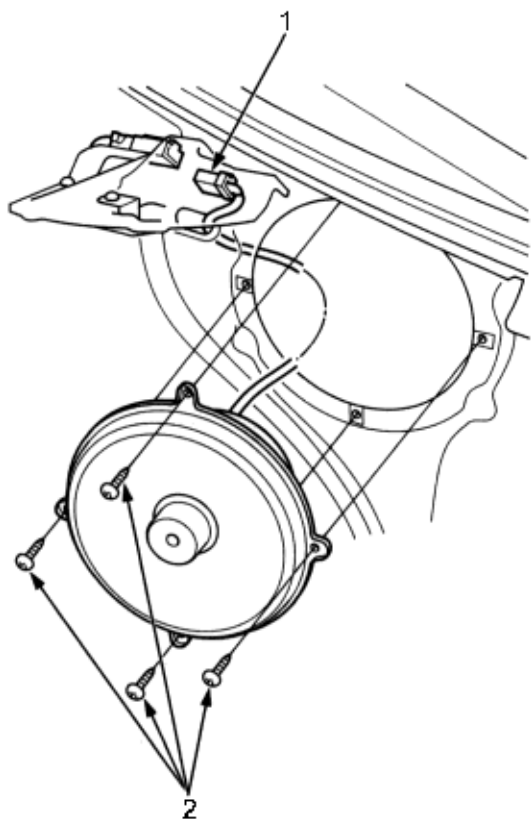
1. Remove the tweeter grille.
2. Disconnect the tweeter 2P connector.
3. Remove the two screws and tweeter.



1. TWEETER GRILLE
2. TWEETER
3. SCREWS
4. 2P CONNECTOR

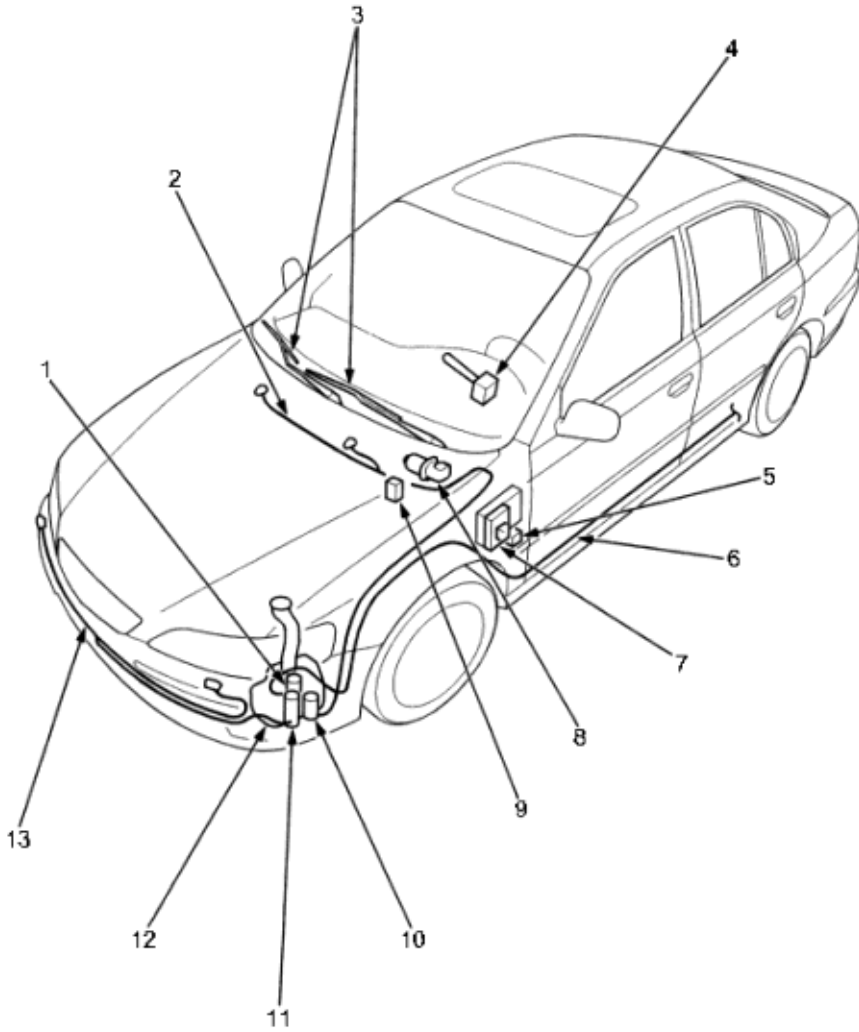
Woofers:

1. Remove the woofer speaker grille and the right rear side shelf (see section 20).
2. Disconnect the woofer 5P connector.
3. Remove the four screws and the woofer.

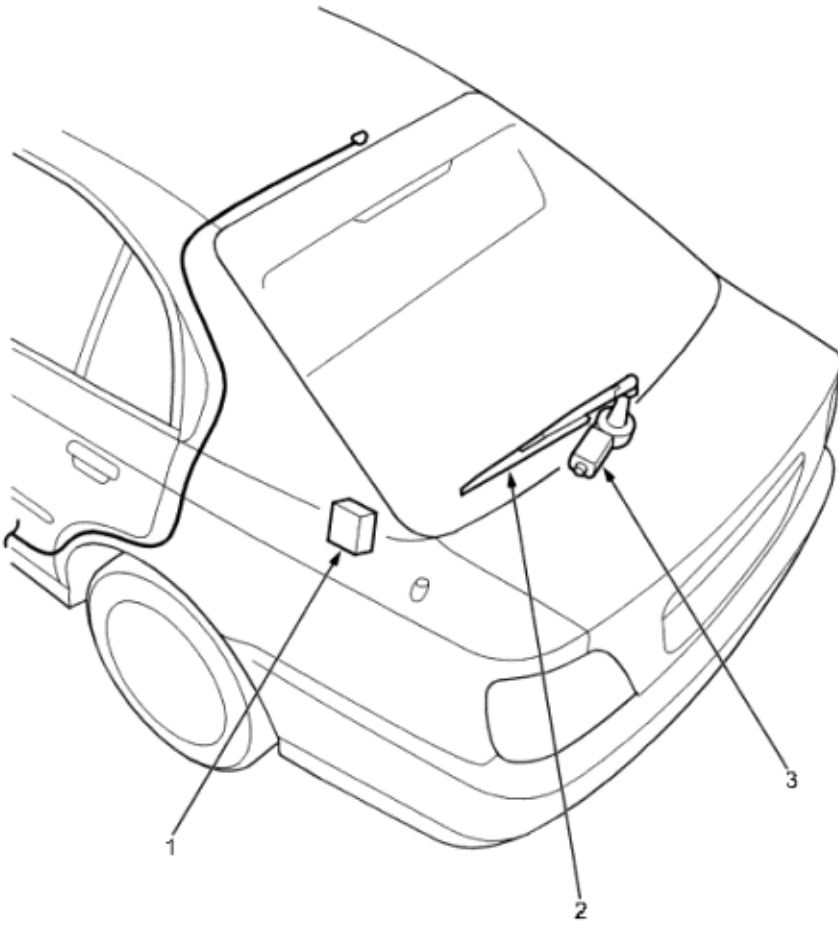


1. 5P CONNECTOR
2. SCREWS

1. REAR WINDOW WASHER MOTOR
Test, (See Page 23-F-19)
2. WINDSHIELD WASHER TUBE
3. WINDSHIELD WIPER ARMS and
LINKAGE
4. WINDSHIELD/REAR WINDOW
WIPER/WASHER SWITCH
Test, (See Page 23-F-15)
Replacement, (See Page 23-F-15)
5. HEADLIGHT WASHER CONTROL
UNIT
6. REAR WINDOW WASHER TUBE
Replacement, (See Page 23-F-20)
7. INTERMITTENT WIPER CIRCUIT
8. WINDSHIELD WIPER MOTOR
9. WINDSHIELD WIPER
INTERMITTENT RELAY
10. WINDSHIELD WASHER MOTOR
11. HEADLIGHT WASHER MOTOR
12. WASHER RESERVOIR
Replacement, (See Page 23-F-19)
13. HEADLIGHT WASHER TUBE

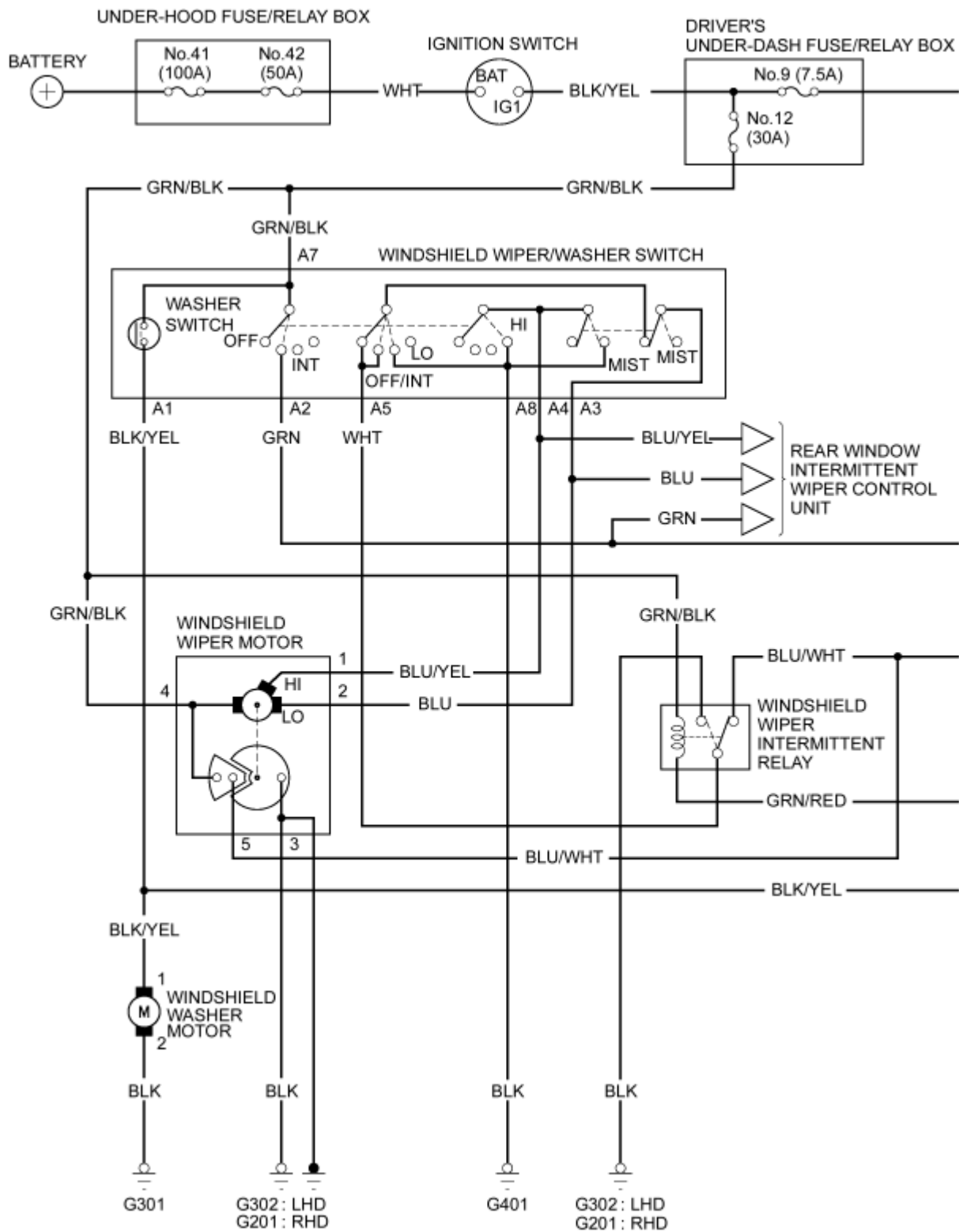


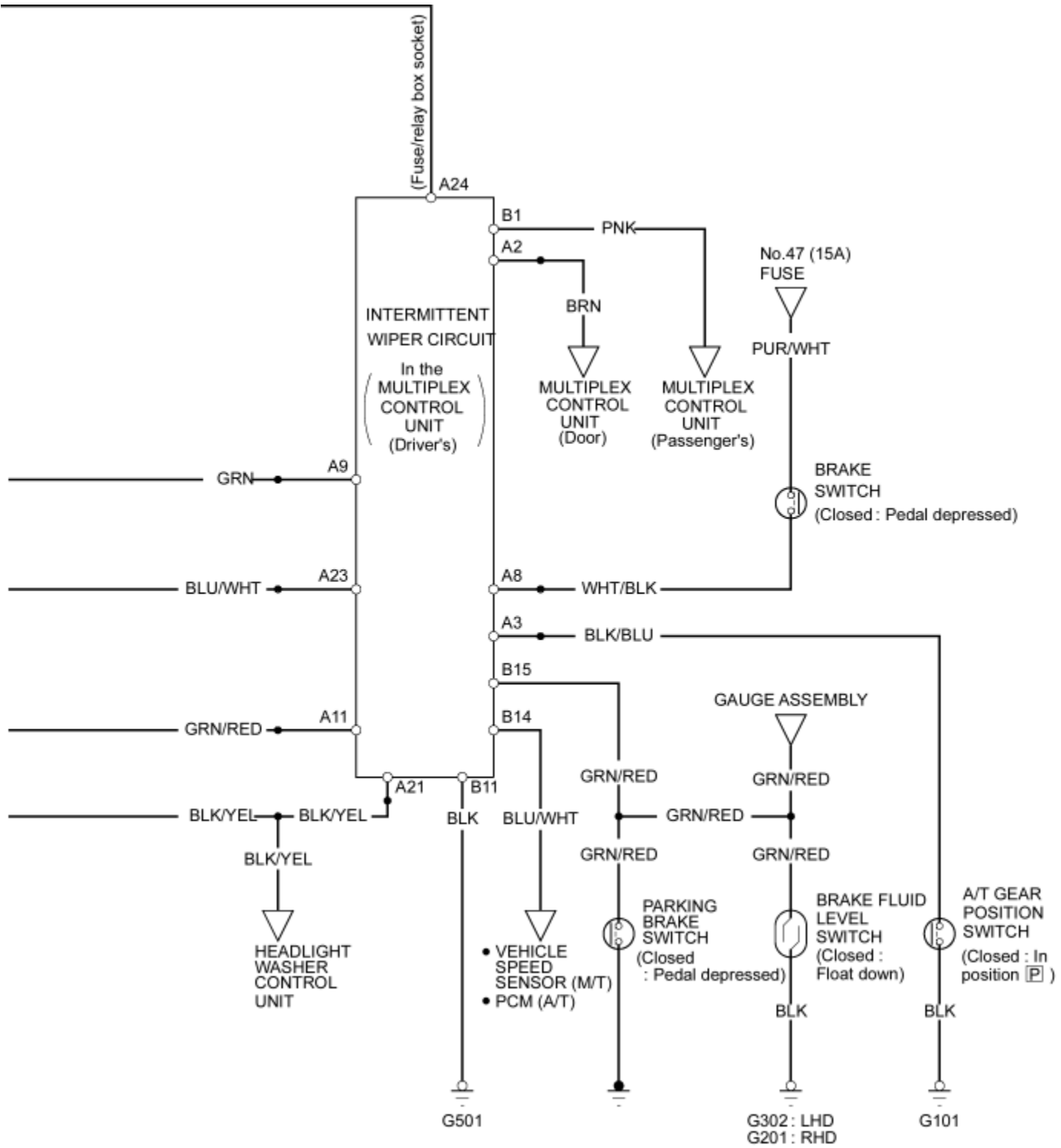
1. **REAR WINDOW INTERMITTENT WIPER CONTROL UNIT**
Input Test, ([See Page 23-F-16](#))
2. **REAR WIPER ARM/LINKAGE**
Replacement, ([See Page 23-F-18](#))
3. **REAR WINDOW WIPER MOTOR**
Test, ([See Page 23-F-18](#))
Replacement, ([See Page 23-F-18](#))



Wipers/Washers
Circuit Diagram (Windshield)

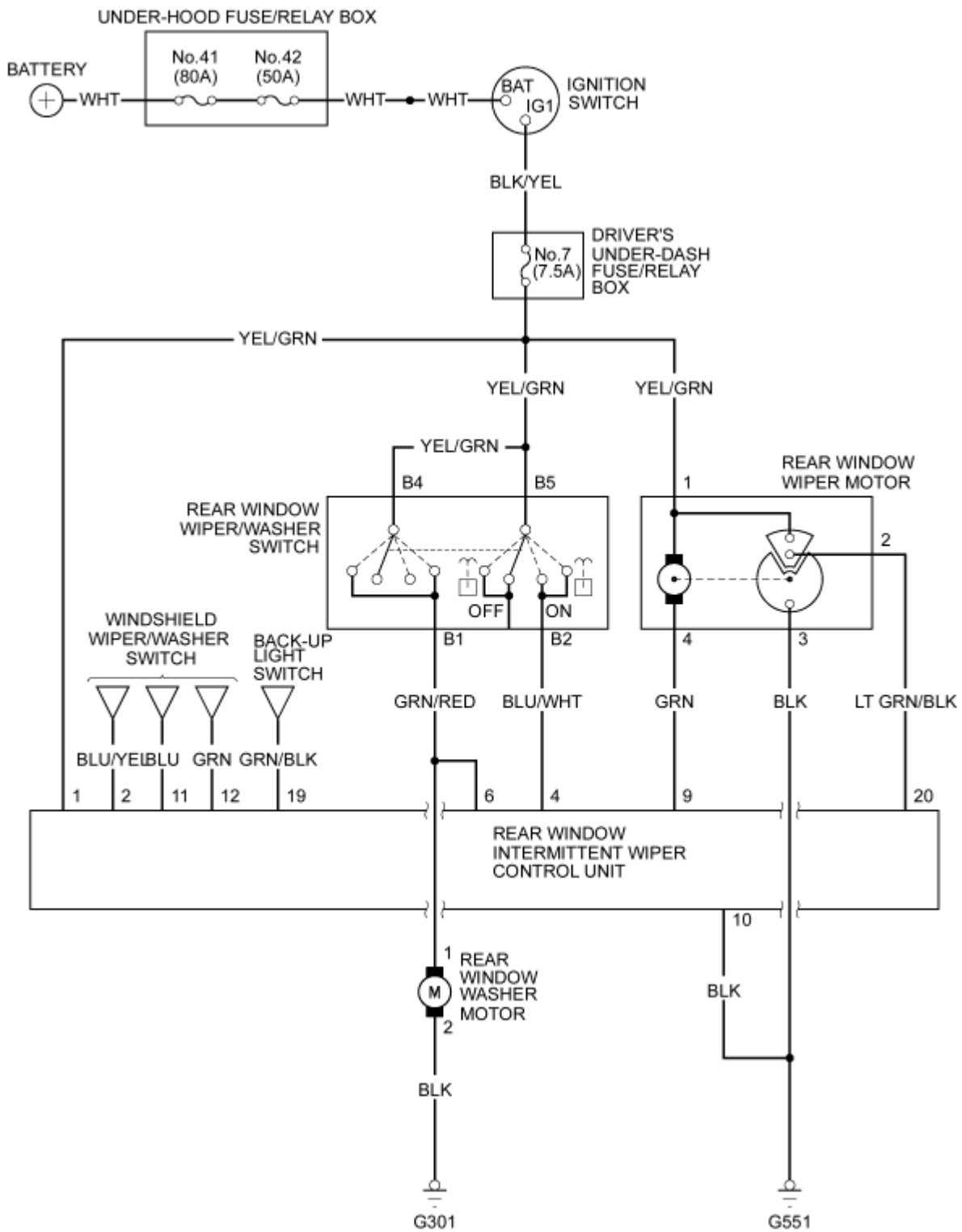
23-F-12





Wipers/Washers
Circuit Diagram (Rear window)

23-F-14

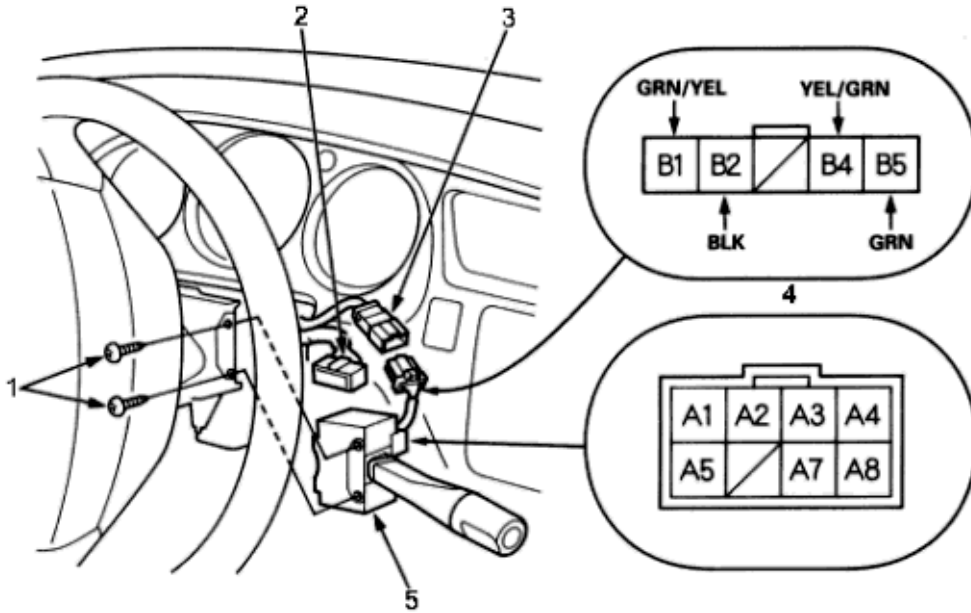


Wipers/Washers

23-F-15

Wiper/Washer Switch Test/Replacement

1. Remove the driver's dashboard lower cover (see section 20).
2. Remove the steering column covers (see section 17).
3. Disconnect the 8P and 5P connectors from the windshield/rear window wiper/washer switch, then remove the two screws and the switch.
4. Check for continuity between the terminals in each switch position according to the table. If there is no continuity, replace the switch.



1. SCREWS
2. 8P CONNECTOR
3. 5P CONNECTOR
4. Wire side of female terminal
5. WINDSHIELD/REAR WINDOW WIPER/WASHER SWITCH

Windshield Wiper/Washer Switch:

Terminal	A1	A2	A3	A4	A5	A7	A8
Position							
OFF			○		○		
INT		○	○		○	○	
LO			○				○
HI				○			○
Mist switch "ON"				○			○
Washer switch "ON"	○					○	

Rear Window Wiper/Washer Switch:

Terminal	B1	B2	B4	B5
Position				
Washer switch "ON" (Wiper switch "OFF")	○		○	
OFF				
ON		○		○
Washer switch "ON" (Wiper switch "ON")	○	○	○	○

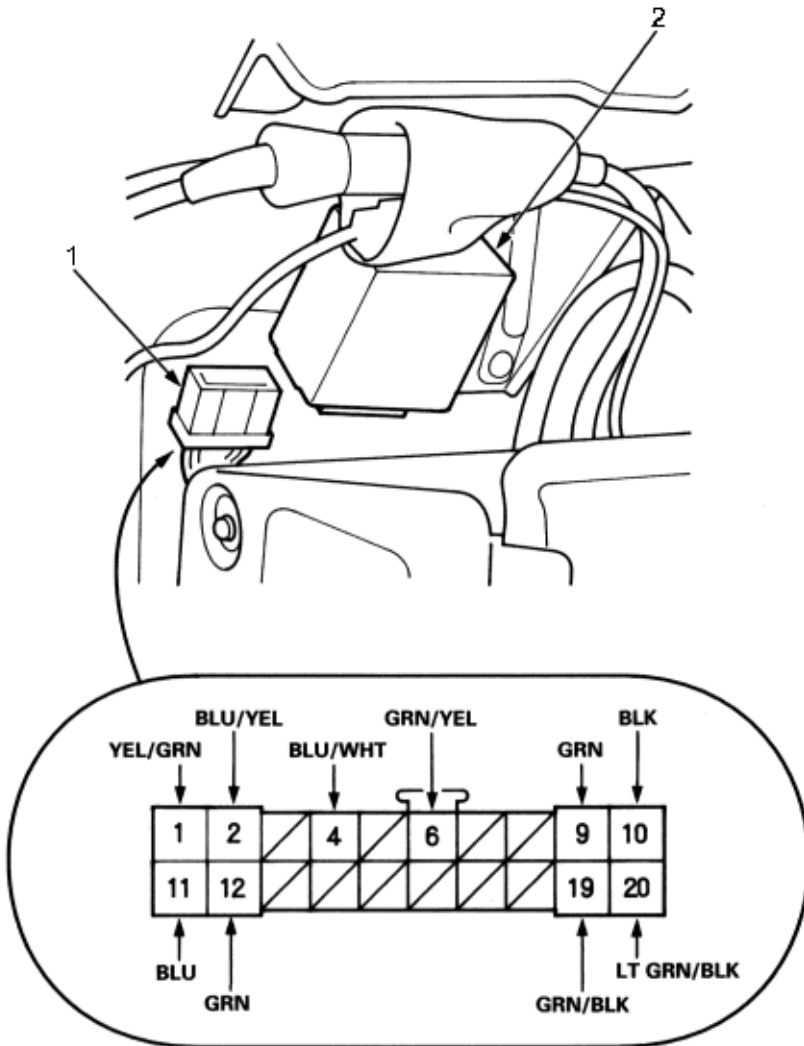
Wipers/Washers

Rear Window Intermittent Wiper Control Unit Input Test

23-F-16

1. Remove the left rear side shelf (see section 20).
2. Disconnect the 20P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all input tests prove OK, the control unit must be faulty; replace it.

1. 20P CONNECTOR
2. REAR WINDOW INTERMITTENT WIPER CONTROL UNIT
3. Wire side of female terminals



Wipers/Washers**23-F-17****Rear Window Intermittent Wiper Control Unit Input
Test (cont'd)**

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	YEL/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 7 (10 A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor ground (G551) ♦ An open in the wire.
2	BLU/YEL	Ignition switch ON (II) and windshield wiper switch HI	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 12 (30 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty windshield wiper/washer switch ♦ An open in the wire
11	BLU	Ignition switch ON (II) and windshield wiper switch LO	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 12 (30 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty windshield wiper/washer switch ♦ An open in the wire
12	BRN	Ignition switch ON (II) and windshield wiper switch INT	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 12 (30 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty windshield wiper/washer switch ♦ An open in the wire
19	GRN/BLK	Ignition switch ON (II) and the shift lever is in reverse position	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty back-up light switch ♦ An open in the wire
6	GRN/RED	Ignition switch ON (II) and rear window washer switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 7 (10 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty rear window wiper/washer switch ♦ An open in the wire
4	BLU/WHT	Ignition switch ON (II) and rear window wiper switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 7 (10 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty rear window wiper/washer switch ♦ An open in the wire
9	GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 7 (10 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty rear window wiper motor ♦ An open in the wire
20	LT GRN/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 7 (10 A) fuse in the driver's under-dash fuse/relay box ♦ Faulty rear window wiper motor ♦ An open in the wire

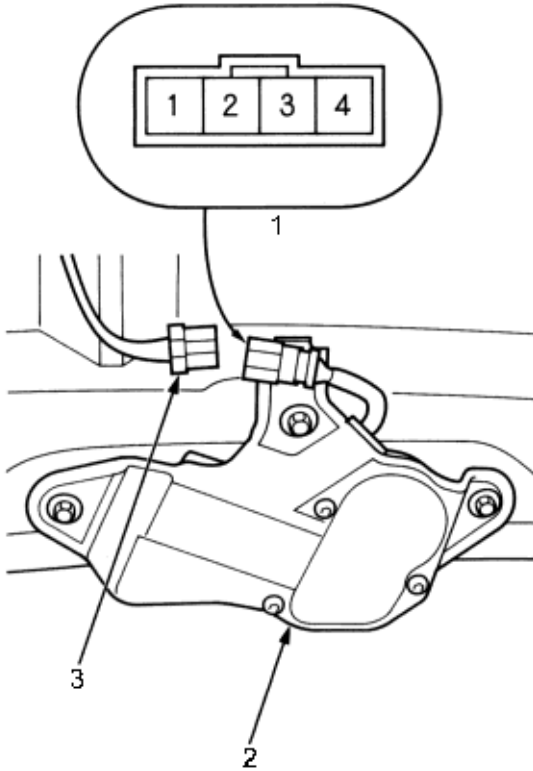
Wipers/Washers

Rear Window Wiper Motor Test

23-F-18

Rear Window Wiper Motor Replacement

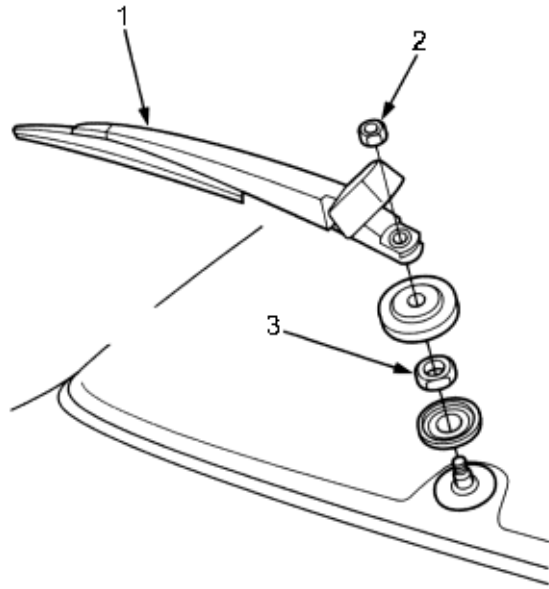
1. Remove the tailgate trim panel (see section 20).
2. Disconnect the 4P connector from the wiper motor assembly.



1. Terminal side of male terminal
2. REAR WINDOW WIPER MOTOR
3. 4P CONNECTOR

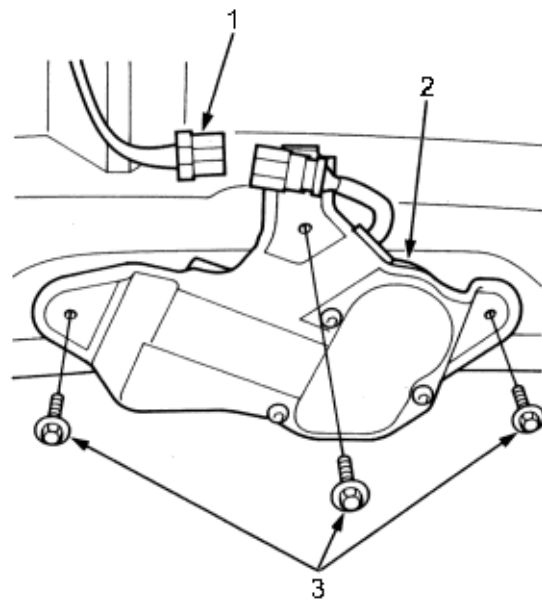
3. Test the motor by connecting battery power to the No. 1 terminal and ground to the No. 4 terminal.
 - ♦ If the motor does not run or fails to run smoothly, replace it.
4. Reconnect the 4P connector to the wiper motor.
5. Connect an analogue voltmeter between the No. 2 (+) and No. 3 (-) terminals.
6. Run the motor by turning the wiper switch ON.
 - ♦ The voltmeter should indicate 0 V and 4 V or less alternately.

1. Remove the tailgate trim panel (see section 20).
2. Remove the rear window wiper arm.



1. REAR WINDOW WIPER ARM
2. NUT
8 x 1.0 mm
14 N.m (1.4 kgf.m, 10 lbf.ft)
3. SPECIAL NUT
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)

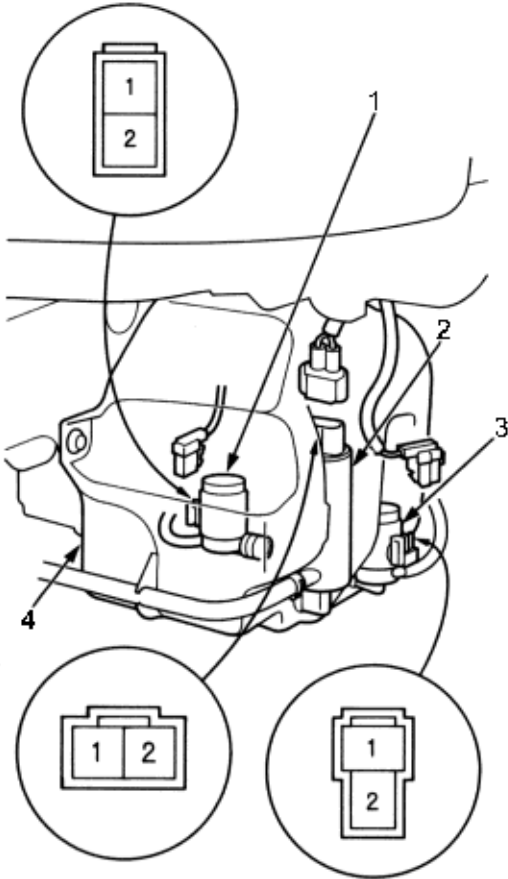
3. Disconnect the 4P connector from the motor.
4. Remove the three mounting bolts from the tailgate and the wiper motor.



1. 4P CONNECTOR
2. REAR WINDOW WIPER MOTOR
3. BOLTS
6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)

5. Install in the reverse order of removal.

1. Remove the left inner fender (see section 20)
2. Disconnect the 2P connector from the washer motor.



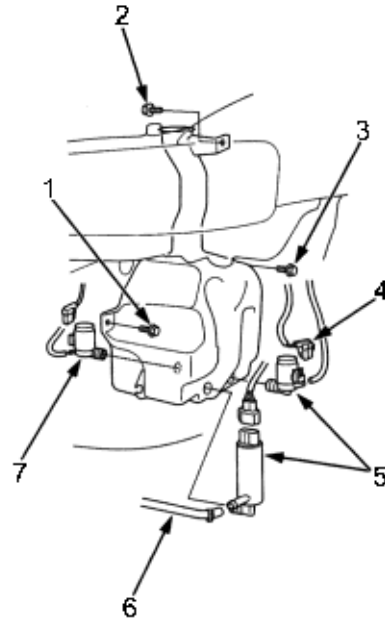
1. REAR WINDOW WASHER MOTOR
2. HEADLIGHT WASHER MOTOR
3. WINDSHIELD WASHER MOTOR
4. WASHER FLUID RESERVOIR

3. Test the washer motor by connecting battery power and ground according to the table.

Terminal	1	2
Battery		
Disconnected		
Connected	⊕	⊖

- ♦ If the motor fails to run smoothly, replace it.
- ♦ If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

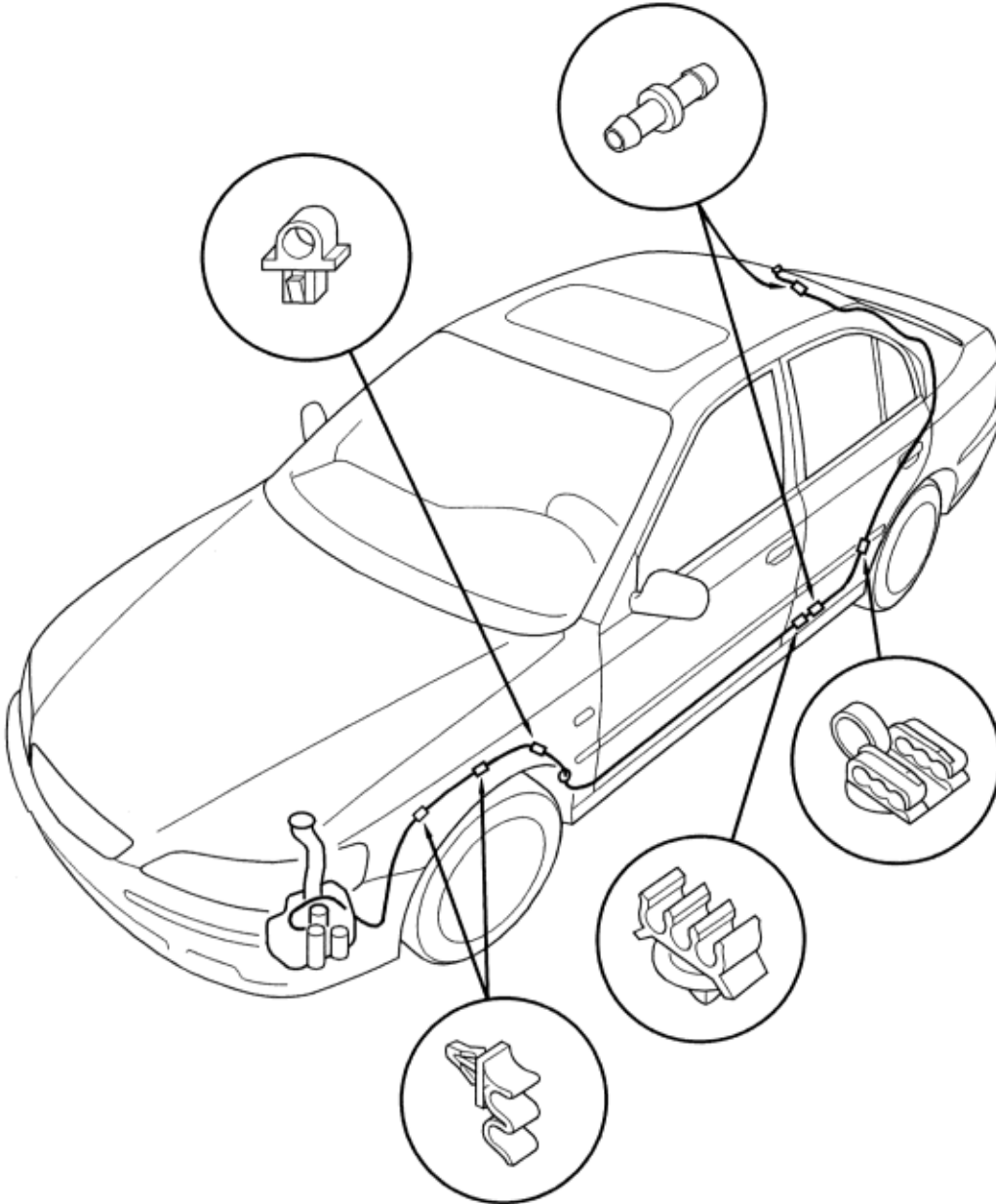
1. Pull away the left inner fender (see section 20).
2. Disconnect the washer tube(s) and washer motor connector(s).



1. BOLT
6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
2. BOLT
6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
3. BOLT
6 x 1.0 mm
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
4. CONNECTOR
5. WASHER MOTORS
6. WASHER TUBE
7. WASHER MOTOR

3. Remove the three bolts and washer reservoir.
4. Install in the reverse order or removal. Check the washer motor operation.

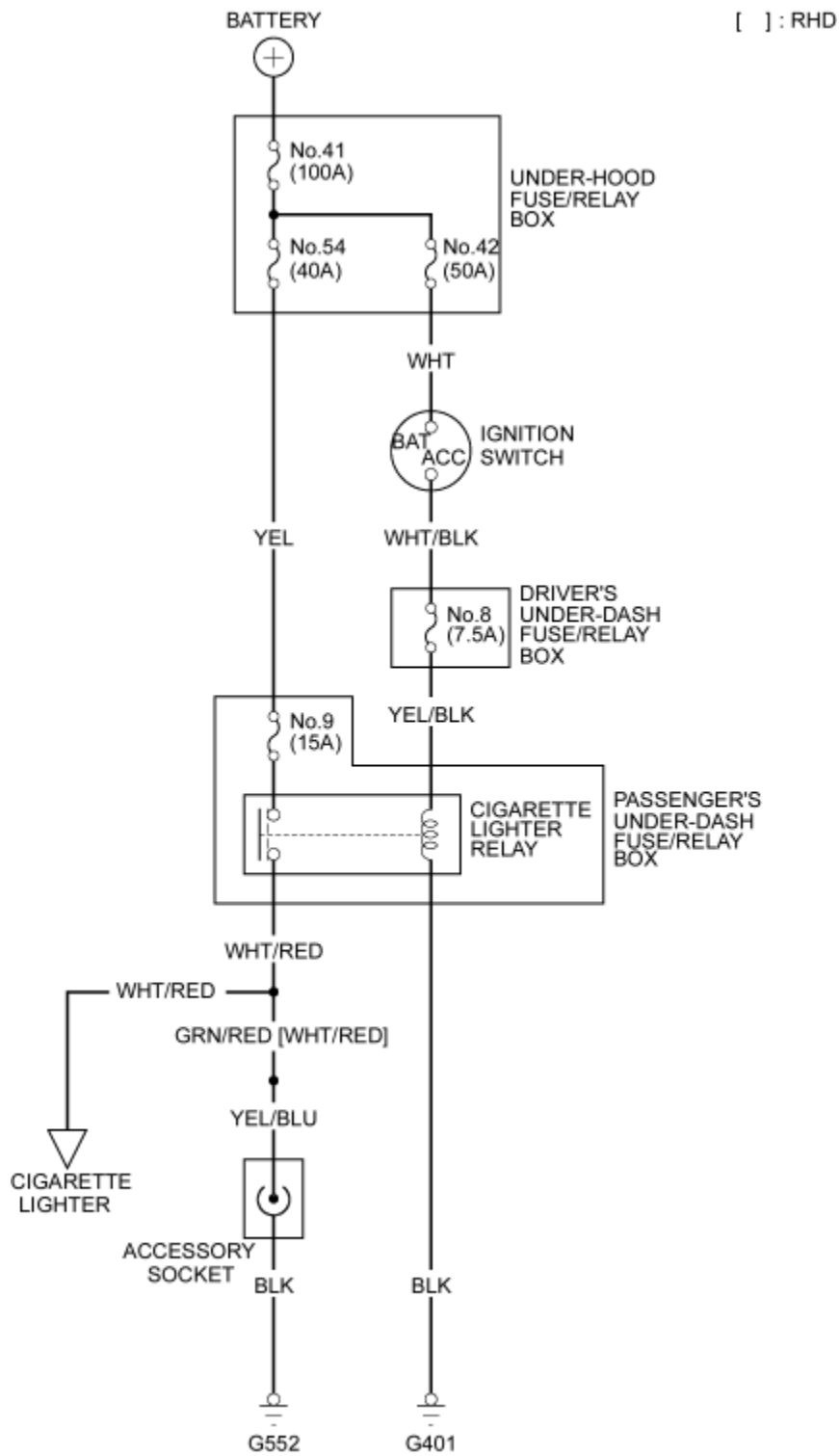
1. Remove the left inner fender (see section 20).
2. Remove the rear window washer nozzles and clips, then remove the tube.



3. Install in the reverse order of removal. Take care not to pinch the washer tube. Check the rear window washer operation.

**Accessory Socket
Circuit Diagram**

23-F-21

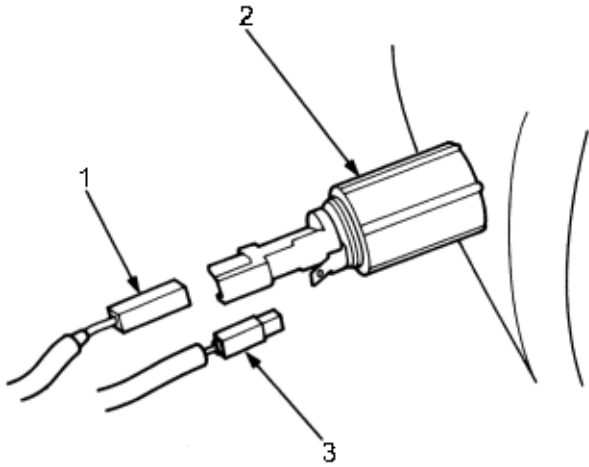


Accessory Socket

Accessory Socket Test/Replacement

23-F-22

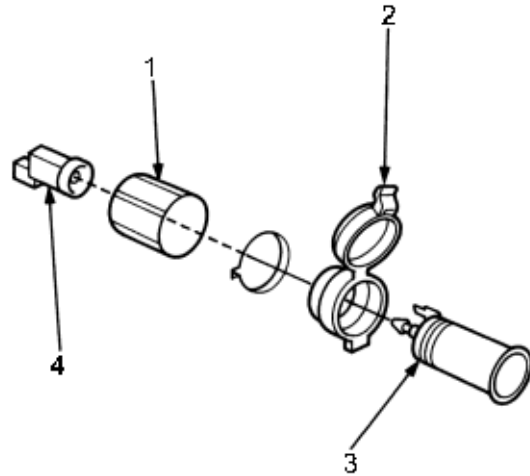
1. Remove the left rear side trim panel (see section 20).
2. Disconnect the connectors.
3. Inspect the connector terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair then as necessary, and recheck the system.
 - ♦ If the terminals look OK, go to step 4.



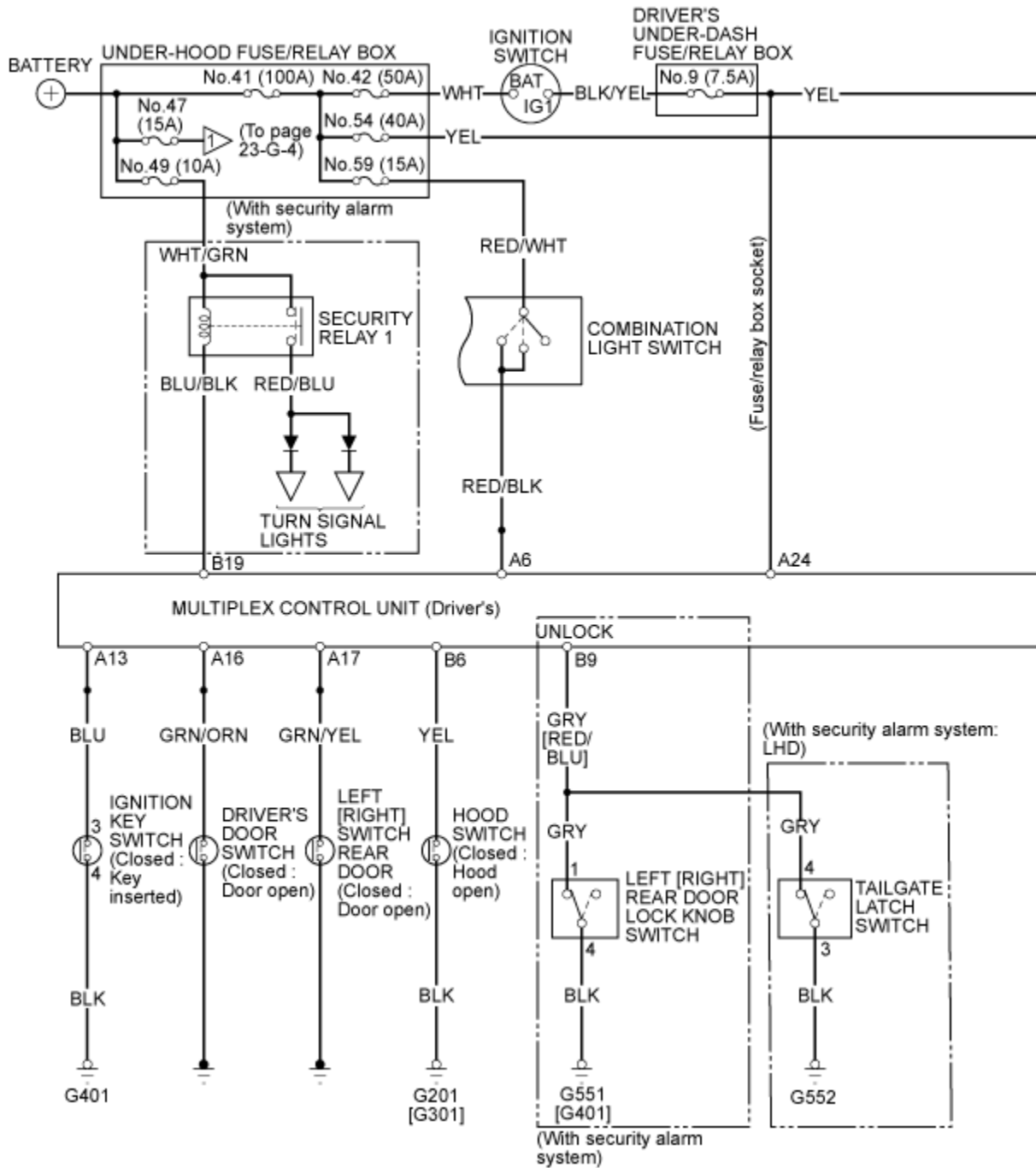
1. A (YEL/BLU)
2. ACCESSORY SOCKET
3. B (BLK)

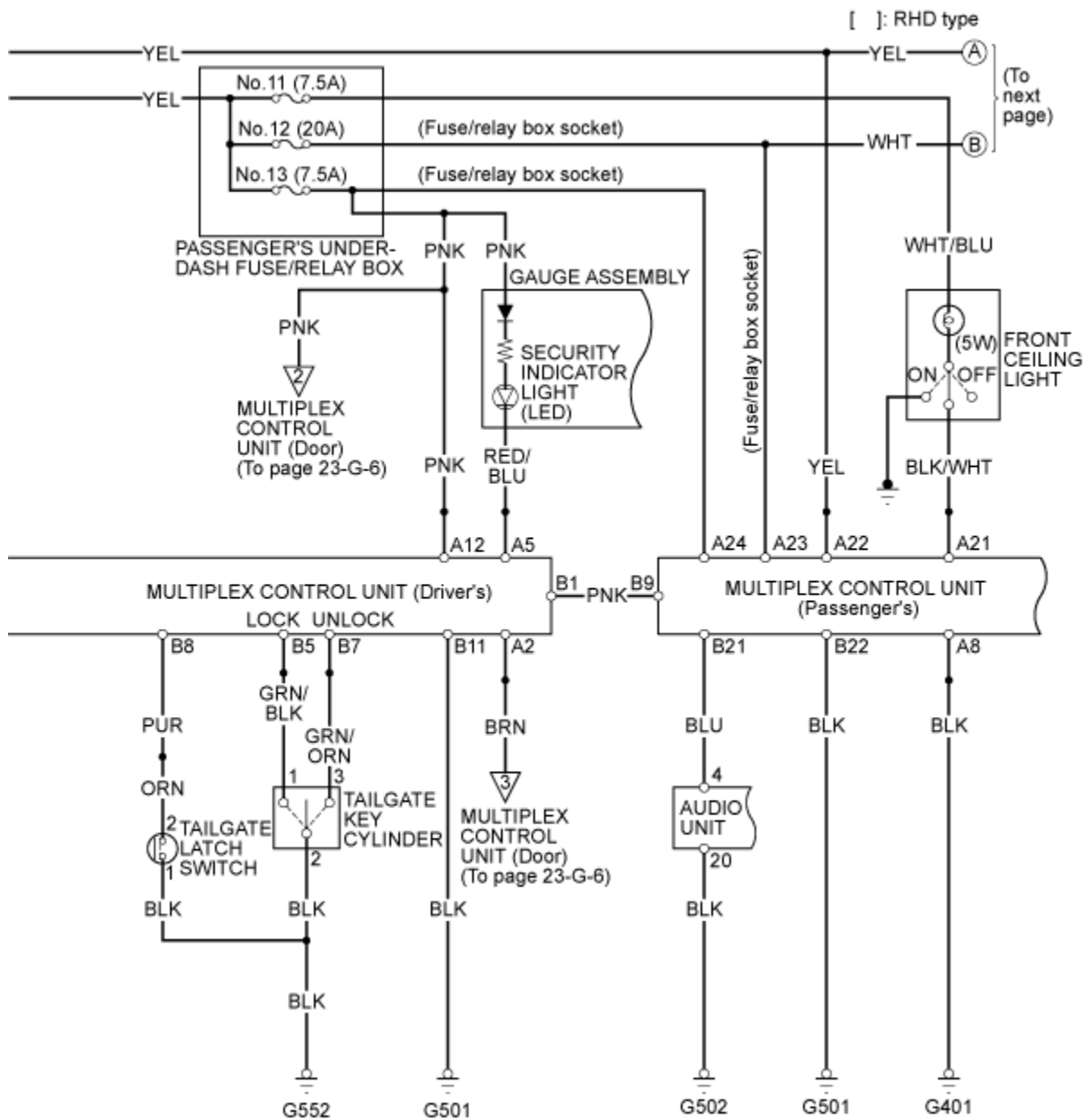
4. Turn the ignition switch ON (II), and check for voltage between the A and B terminals.
 - ♦ There should be battery voltage.
 - ♦ If there is no battery voltage, check for:
 - blown No. 8 (7.5 A) fuses in the driver's under-dash fuse/relay box.
 - poor ground (G401)
 - an open in the wire.

5. Remove the thermofuse housing and thermal protector, then remove the socket and cover.

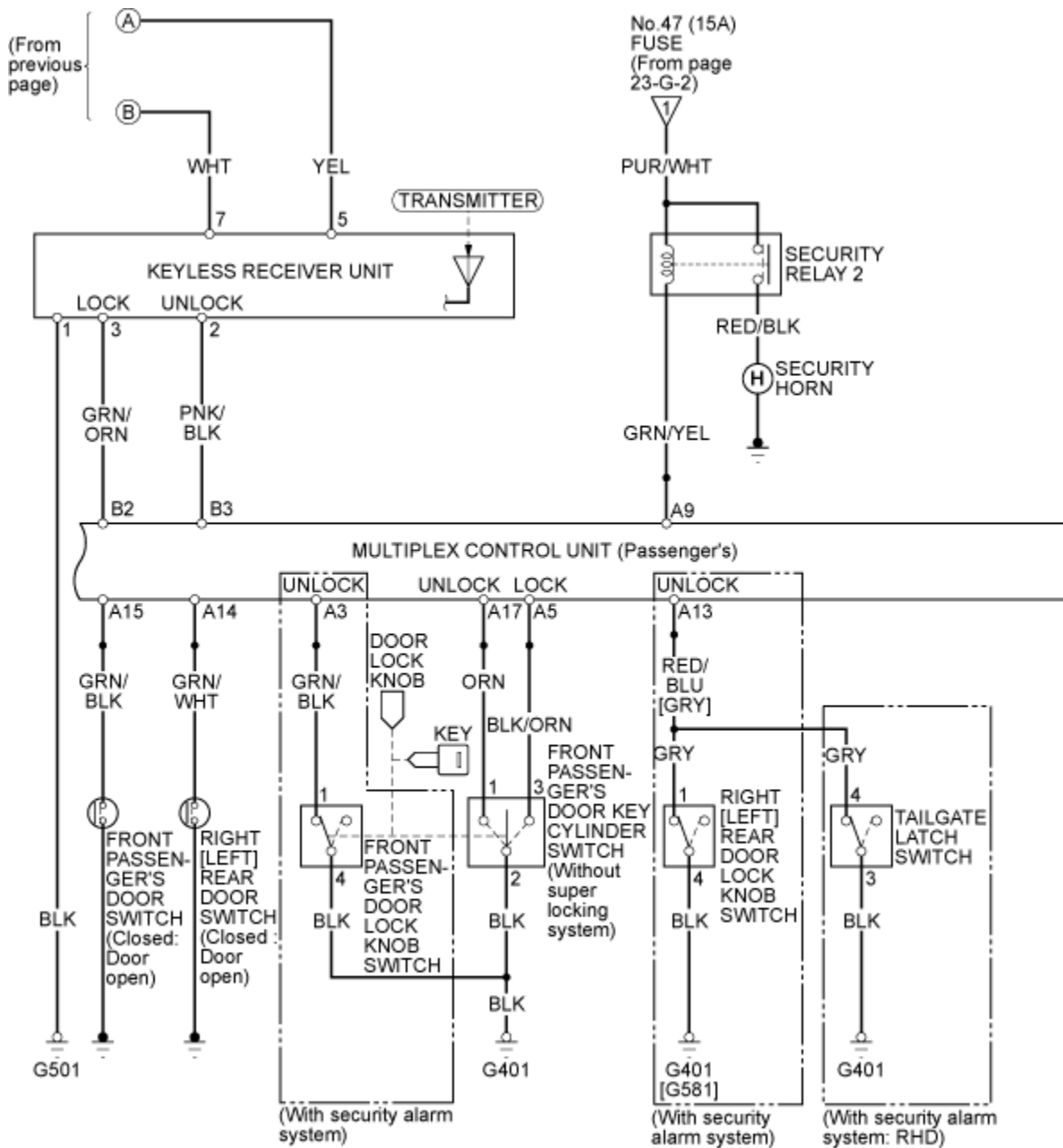


1. THERMAL PROTECTOR
2. COVER
3. SOCKET
4. THERMOFUSE HOUSING

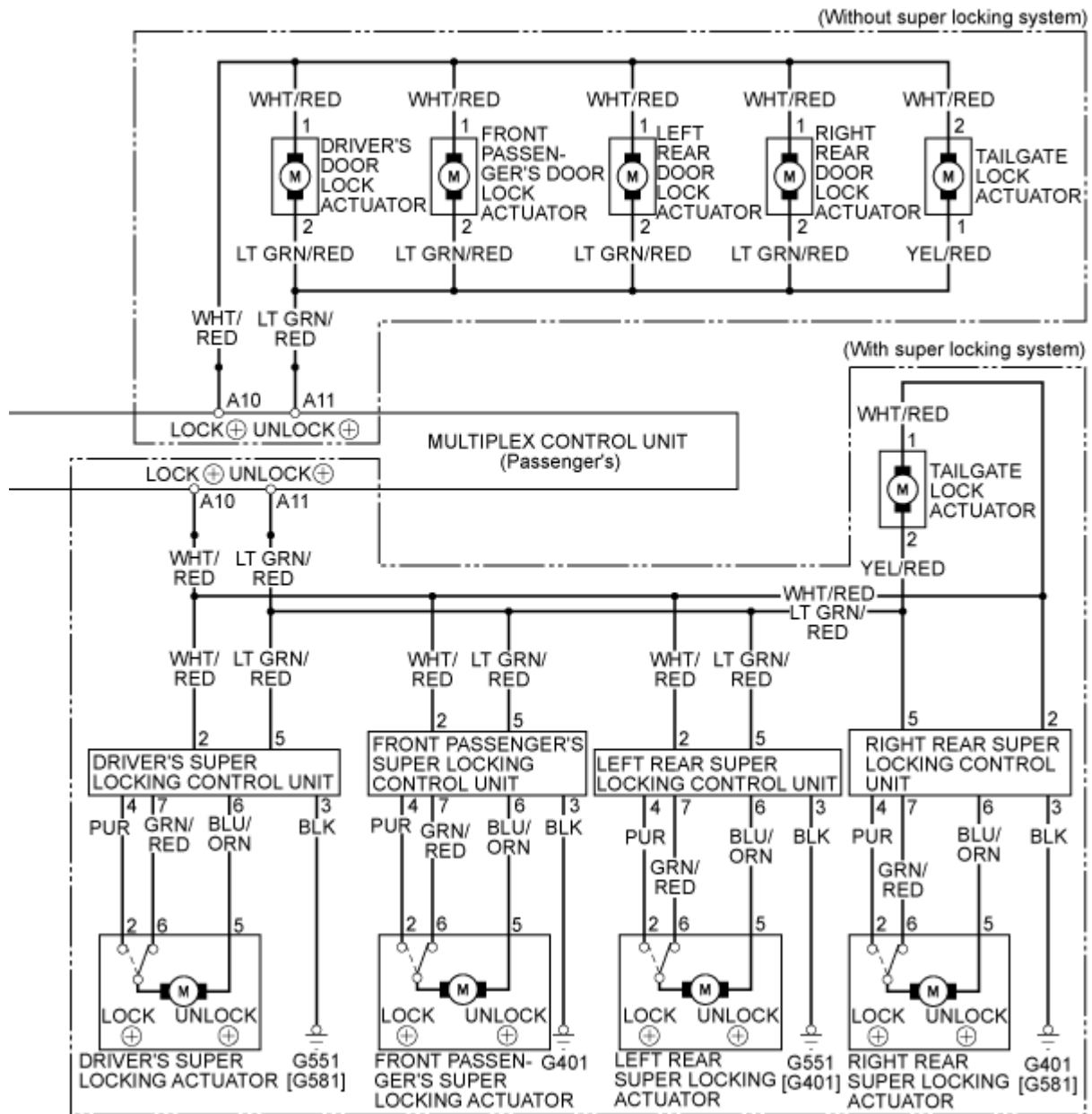




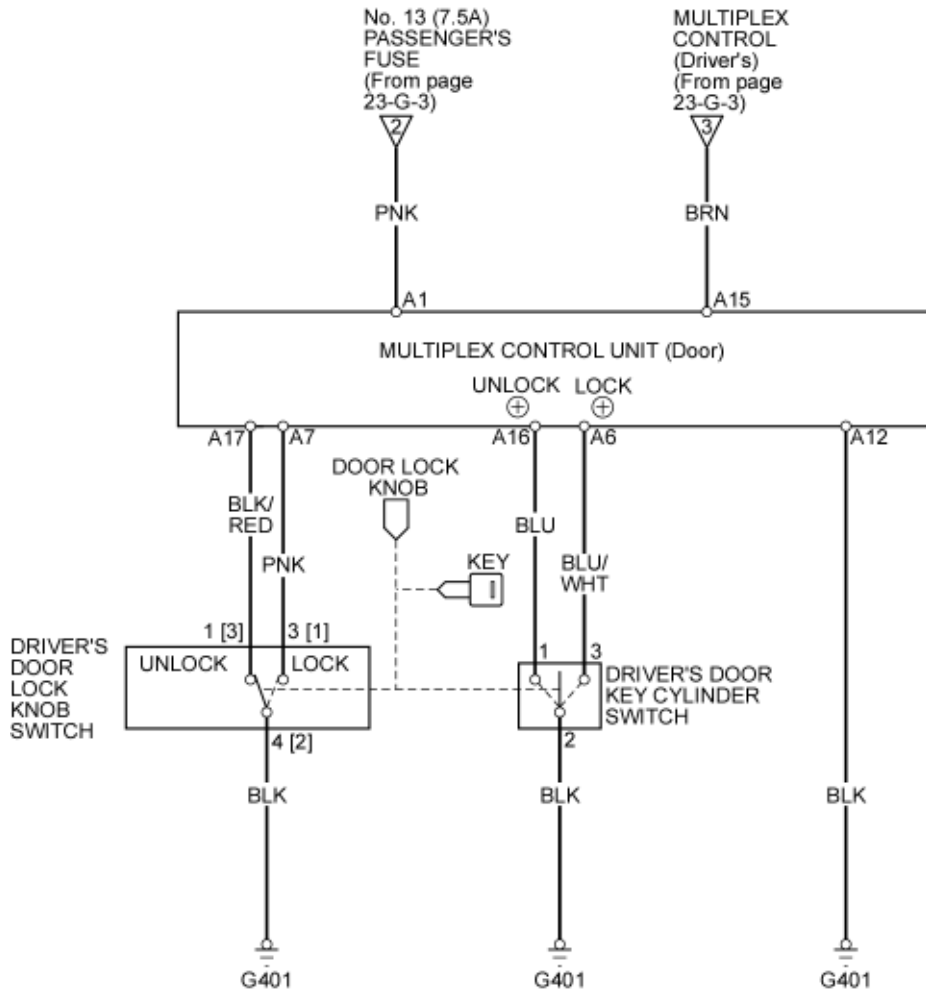
To go to the page referenced on the diagram above, click on the following:
 (See Page 23-G-6)



[]: RHD type



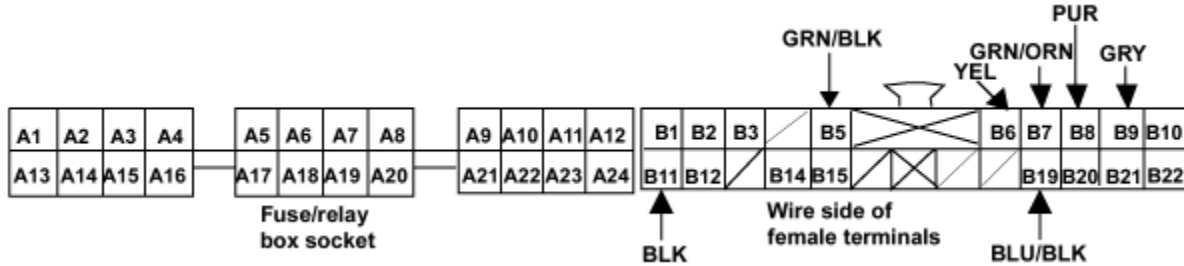
[] : Without super locking system



NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide.

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box.
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor Ground (G501) ♦ An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire.
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A5	Fuse/relay box socket	Under all conditions	Connect to ground: The security indicator light should come on.	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty security indicator light (LED) ♦ An open in the wire
A6	Fuse/relay box socket	Combination light switch ON	Connect to ground: The small lights should come on.	<ul style="list-style-type: none"> ♦ Blown No. 59 (15 A) fuse in the under-hood fuse/relay box ♦ Faulty combination light switch ♦ An open in the wire
B19	BLU/BLK	Under all conditions	Connect to ground: The turn signal lights should come on.	<ul style="list-style-type: none"> ♦ Blown No. 49 (10 A) fuse in the under-hood fuse/relay box ♦ Faulty security relay 1 ♦ An open in the wire

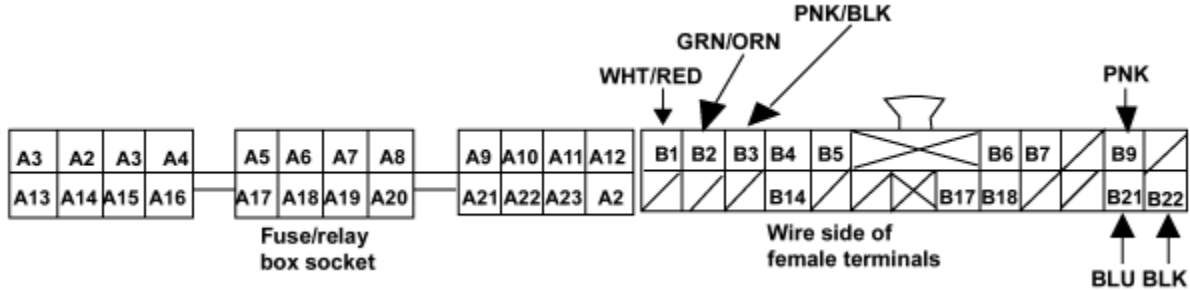
Reconnect the connectors to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A13	Fuse/relay box socket	Ignition key inserted in the ignition switch	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ Poor ground (G401) ♦ An open in the wire
A13	Fuse/relay box socket	Ignition key out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ Poor ground (G401) ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire
A17	Fuse/relay box socket	Left [Right] rear door opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty left [right] rear door switch ♦ An open in the wire
A17	Fuse/relay box socket	Left [Right] rear door closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty left [right] rear door switch ♦ An open in the wire
B6	YEL	Hood opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty hood switch ♦ Poor ground (G201 [G301]) ♦ An open in the wire
B6	YEL	Hood closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty hood switch ♦ Poor ground (G201 [G301]) ♦ An open in the wire
B5	GRN/BLK	Tailgate key cylinder switch in neutral	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty trunk key cylinder switch ♦ Poor ground (G552) ♦ An open in the wire
B5	GRN/BLK	Tailgate key cylinder switch in locked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty trunk key cylinder switch ♦ Poor ground (G552) ♦ An open in the wire
B7	GRN/ORN	Tailgate key cylinder switch in neutral	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty trunk key cylinder switch ♦ Poor ground (G552) ♦ An open in the wire
B7	GRN/ORN	Tailgate key cylinder switch in unlocked	Check for voltage to ground : There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty trunk key cylinder switch ♦ Poor ground (G552) ♦ An open in the wire
B8	PUR	Tailgate lid opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty tailgate latch switch ♦ Poor ground (G601) ♦ An open in the wire
B8	PUR	Tailgate lid closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty tailgate latch switch ♦ Poor ground (G601) ♦ An open in the wire
B9	GRY [RED/BLU]	Left [Right] rear door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty left [right] rear super door lock actuator ♦ Poor ground (G551) ♦ An open in the wire
B9	GRY [RED/BLU]	Left [Right] rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty left [right] rear super door lock actuator ♦ Poor ground (G551) ♦ An open in the wire
B9	GRY [RED/BLU]	Tailgate latch switch unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty tailgate lock knob switch ♦ Poor ground (G552) ♦ An open in the wire
B9	GRY [RED/BLU]	Tailgate latch switch locked	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty tailgate lock knob switch ♦ Poor ground (G552) ♦ An open in the wire

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide.

Multiplex Control Unit (Passenger's):

1. Remove the passenger's under-dash fuse/relay box.
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, then recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor Ground (G401) ♦ An open in the wire
A9	Fuse/relay box socket	Under all conditions	Connect to ground: The security horn should sound.	<ul style="list-style-type: none"> ♦ Blown No. 47 (15 A) fuse in the under-hood fuse/relay box ♦ Faulty security horn ♦ Faulty security relay 2 ♦ An open in the wire
A21	Fuse/relay box socket	Ceiling light switch in "middle" position	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 11 (7.5 A) fuse in the passenger's under-dash fuse/relay box ♦ Blown ceiling light bulb ♦ Faulty ceiling light ♦ An open in the wire
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A23	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 12 (20 A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5 A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
B21	BLU	Under all conditions	Check for continuity between B21 terminal and audio unit No. 4 terminal: There should be continuity.	<ul style="list-style-type: none"> ♦ Faulty audio unit ♦ Poor ground (G502) ♦ An open in the wire
B22	BLK	Under all conditions	Check for continuity: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire

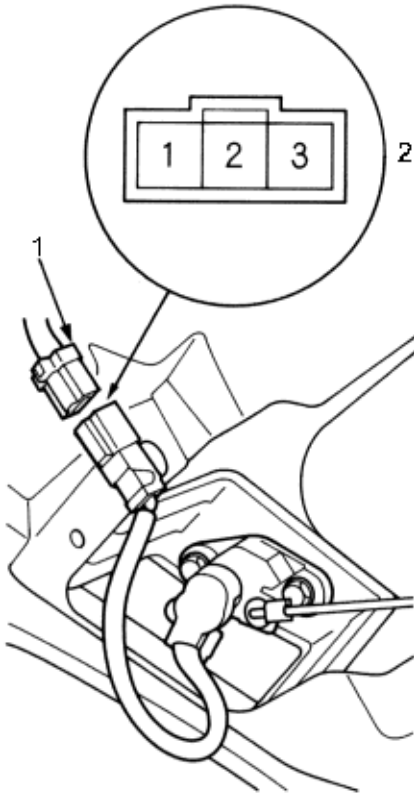
Reconnect the connectors to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A3	Fuse/relay box socket	Front passenger's door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty front passenger's super locking or door lock actuator (knob switch) ♦ Poor ground (G401) ♦ An open in the wire
A3	Fuse/relay box socket	Front passenger's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty front passenger's super locking or door lock actuator (knob switch) ♦ Poor ground (G401) ♦ An open in the wire
A5	Fuse/relay box socket	Front passenger's door lock key cylinder locked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A5	Fuse/relay box socket	Front passenger's door lock key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A17	Fuse/relay box socket	Front passenger's door lock key cylinder unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A17	Fuse/relay box socket	Front passenger's door lock key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A14	Fuse/relay box socket	Right [Left] rear door opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty right [left] rear door switch ♦ An open in the wire
A14	Fuse/relay box socket	Right [Left] rear door closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty right [left] rear door switch ♦ An open in the wire
A15	Fuse/relay box socket	Front passenger's door opened	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door switch ♦ An open in the wire
A15	Fuse/relay box socket	Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty front passenger's door switch ♦ An open in the wire
A13	Fuse/relay box socket	Right [Left] rear door lock knob unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty right [left] super locking actuator (knob switch) ♦ Poor ground (G401 [G581]) ♦ An open in the wire
A13	Fuse/relay box socket	Right [Left] rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty right [left] super locking actuator (knob switch) ♦ Poor ground (G401 [G581]) ♦ An open in the wire
A13	Fuse/relay box socket	tailgate latch switch unlocked	Check for voltage to ground: There should be less than 1 V.	<ul style="list-style-type: none"> ♦ Faulty tailgate latch switch ♦ Poor ground (G552) ♦ An open in the wire
A13	Fuse/relay box socket	Tailgate latch switch locked	Check for voltage to ground: There should be 5 V or more.	<ul style="list-style-type: none"> ♦ Faulty tailgate latch switch ♦ Poor ground (G552) ♦ An open in the wire
		Connect the A10 terminal to the A23 terminal, and the	Check door lock operation: All doors should lock.	<ul style="list-style-type: none"> ♦ Blown No. 12 (20 A) fuse in the passenger's under-dash fuse/relay

A10	Fuse/relay box socket	A11 terminal to the B22 terminal momentarily.		box <ul style="list-style-type: none"> ♦ Faulty actuator ♦ Faulty super locking control unit (with super locking system) ♦ An open in the wire
A11	Fuse/relay box socket	Connect the A10 terminal to the A23 terminal, and the A11 terminal to the B22 terminal momentarily.	Check door lock operation: All doors should lock.	<ul style="list-style-type: none"> ♦ Blown No. 12 (20 A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty actuator ♦ Faulty super locking control unit (with super locking system) ♦ An open in the wire

[]: RHD type

1. Open the tailgate.
2. Remove the tailgate trim panel.
3. Disconnect the 3P connector from the tailgate key cylinder switch.



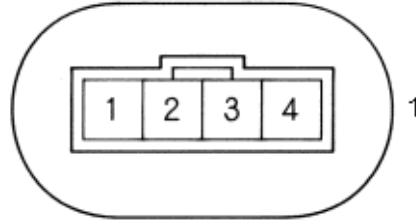
1. 3P CONNECTOR
2. Terminal side of male terminal

4. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1	2	3
LOCK	○	○	
OFF			
UNLOCK		○	○

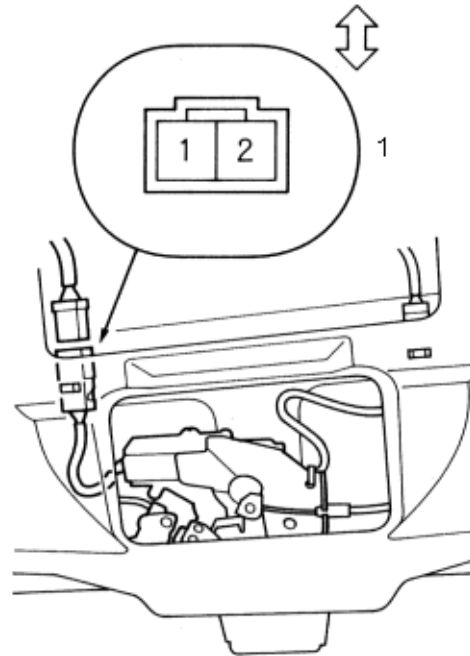
1. Open the tailgate.
2. Remove the tailgate trim panel (see section 20)
3. Disconnect the 4P [2P] connector from the trunk latch.

With Security Alarm System:



1. Terminal side of male terminals

Without Security Alarm System:



1. Terminal side of male terminals

4. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

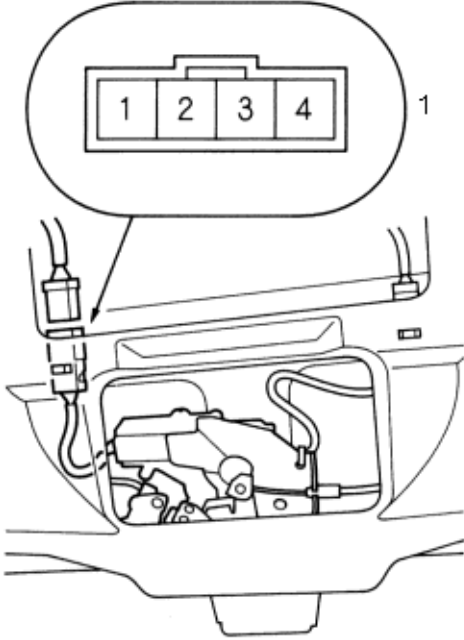
Terminal Position	1 [2]	2 [1]
LOCK	⊕	⊖
UNLOCK	⊖	⊕

[]: Without security alarm system

Keyless Entry/Security Alarm System
Tailgate Latch Switch Test
(With Security Alarm System)

23-G-12

1. Open the tailgate.
2. Remove the tailgate trim panel (see section 20).
3. Disconnect the 4P [2P] connector from the trunk latch



1. Terminal side of male terminals
4. Check for continuity between the terminals in each knob switch position according to the table.

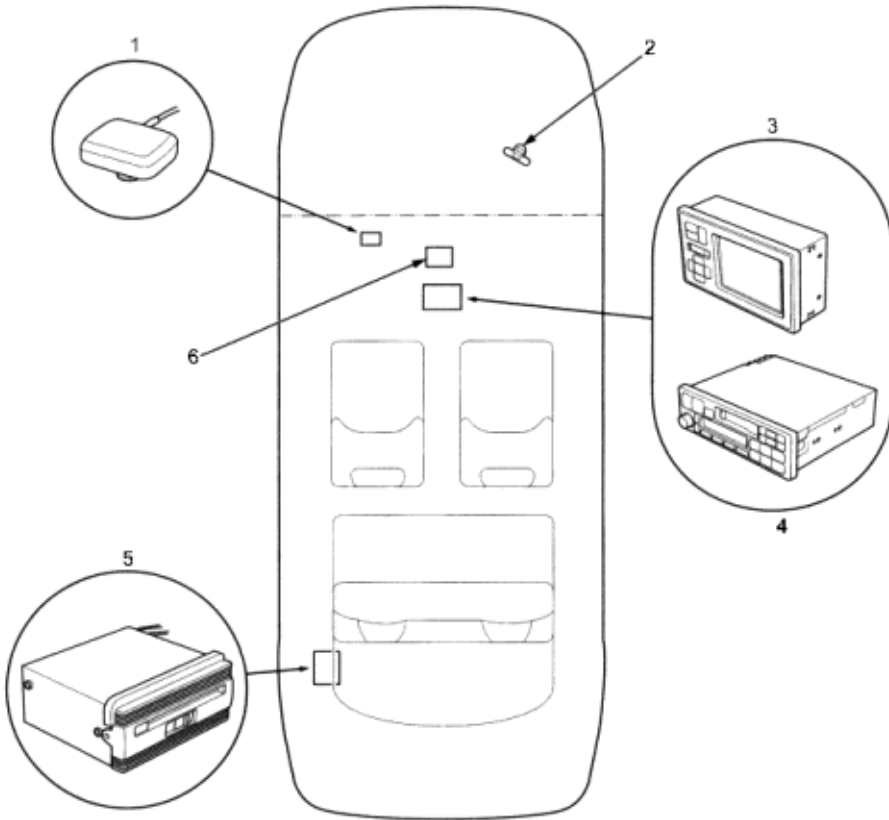
Terminal Position	3	4
Opened		
Closed		

Description
Component Location

23-H-2

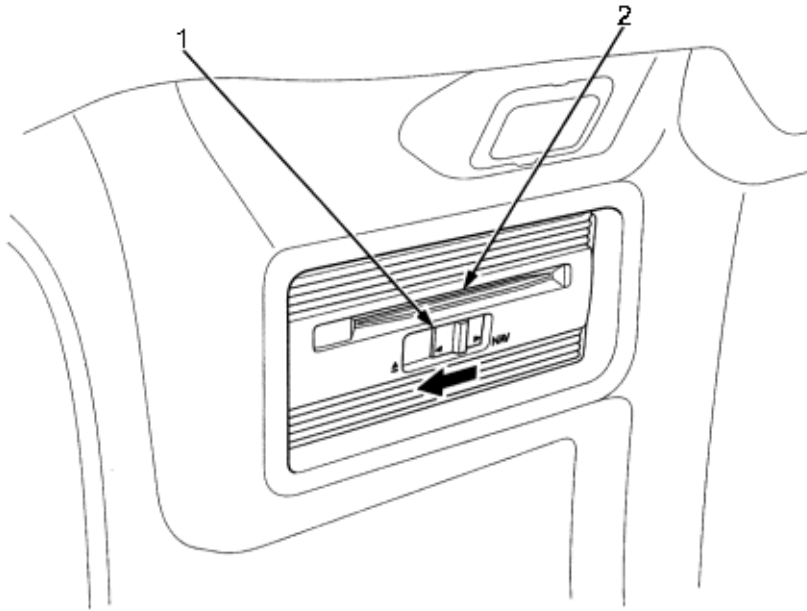
The parts with an asterisk (*): LHD type is shown, RHD type is symmetrical.

1. *GPS ANTENNA
(located behind the gauge assembly)
2. VEHICLE SPEED SENSOR (VSS)
(M/T)
3. DISPLAY UNIT
4. AUDIO UNIT
5. NAVIGATION UNIT
6. PCM (A/T) for vehicle speed signal



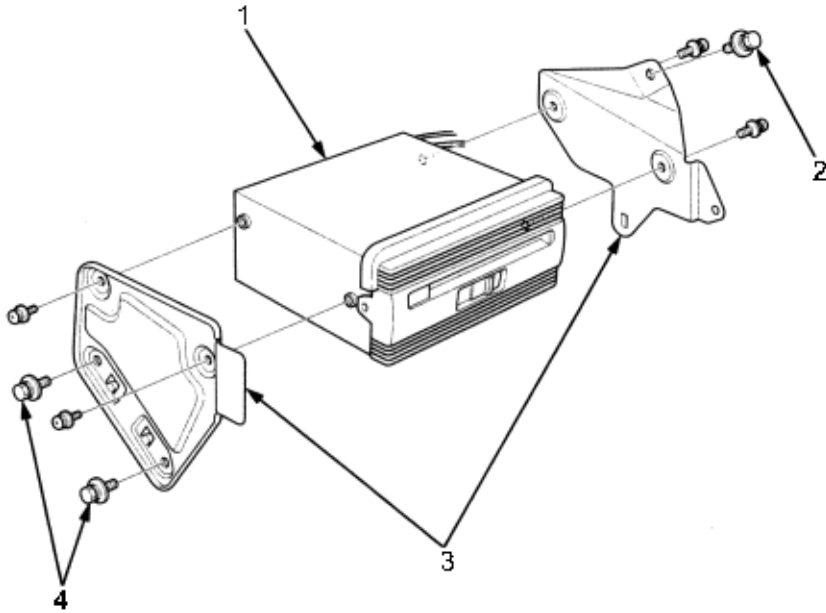
1. Turn the ignition switch ON (II).
2. Move the slide switch to the left side, and the CD-ROM is ejected automatically

1. SLIDE SWITCH
2. CD SLOT



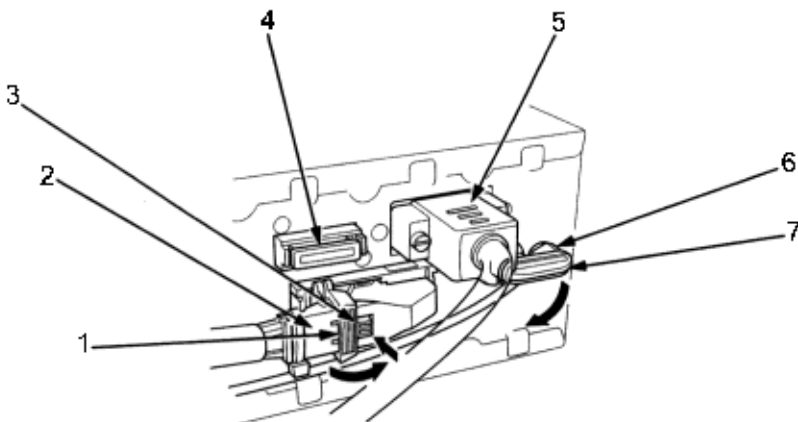
3. Remove the CD-ROM
4. Insert the CD-ROM with the label facing up carefully into the CD slot until it automatically pulled into the CD-ROM drive.
5. After the CD-ROM is securely in the drive, move the slide switch to the right side.

1. Remove the left trunk side trim (See Page 20-11).
2. Remove the navigation unit bracket from the frame.



1. **NAVIGATION UNIT**
2. **6 x 1.0 mm**
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
3. **BRACKET**
4. **6 x 1.0 mm**
9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)

3. Remove the navigation unit from the bracket.
4. Disconnect the connectors from the navigation unit.

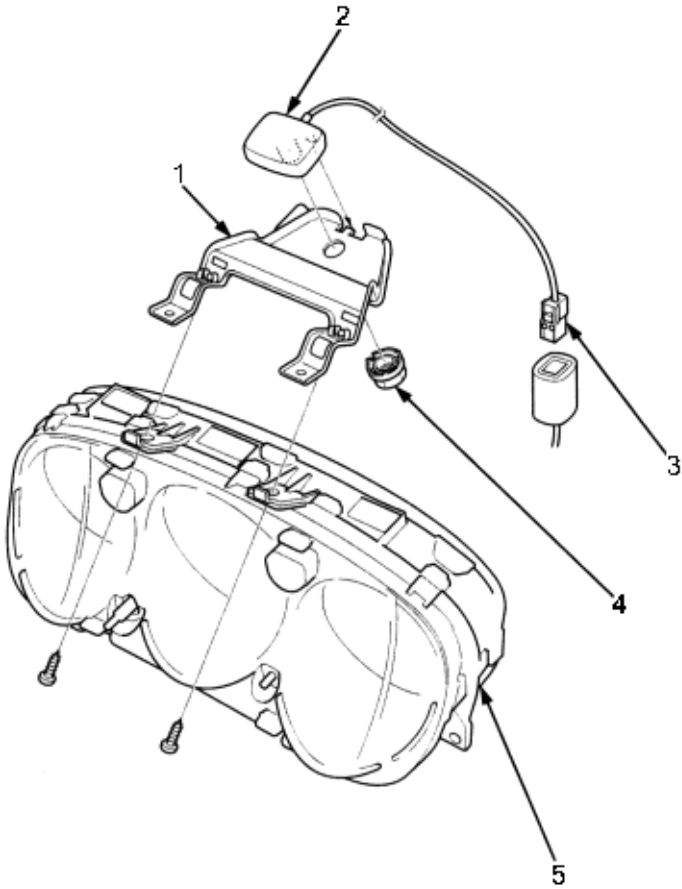


1. **LEVER**
Pull the lever to lock side while pushing the lock to disconnect the navigation unit 26P connector
2. **NAVIGATION UNIT 26P CONNECTOR**
3. **LOCK**
4. **FUSE (5 A)**
5. **NAVIGATION UNIT 15P CONNECTOR**
6. **GPS ANTENNA CONNECTOR**
7. **LEVER**
Turn the lever to downward to disconnect the GPS antenna connector.

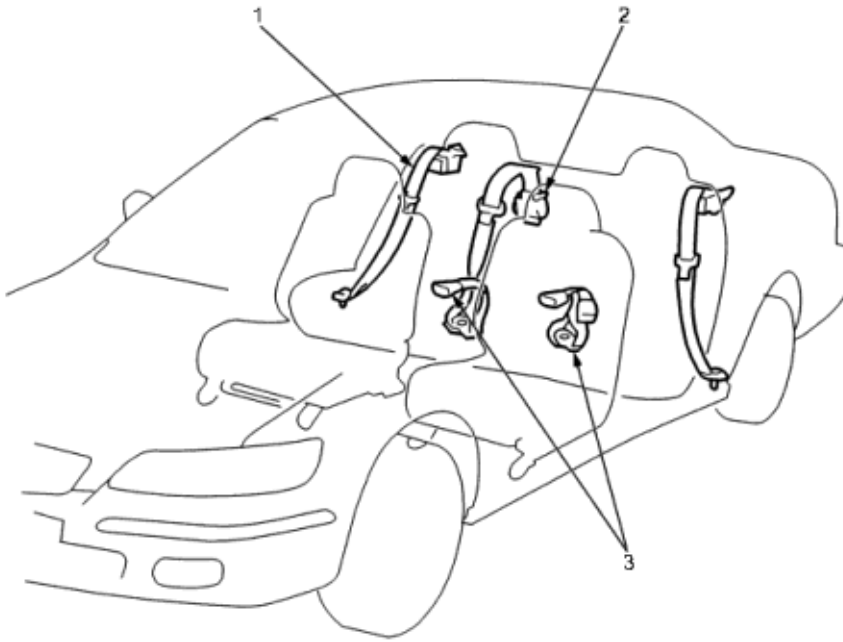
5. Install the parts in the reverse order of removal.

1. Remove the instrument panel (**See Page 20-77**) and gauge assembly (**See Page 23-C-11**).
2. Disconnect the GPS antenna connector.

1. BRACKET
2. GPS ANTENNA
3. GPS ANTENNA CONNECTOR
4. LOCKING NUT
7 N.m (0.7 kgf.m, 5 lbf.ft)
5. GAUGE ASSEMBLY



3. Remove the GPS antenna bracket from the gauge assembly.
4. Remove the locking nut located under the bracket, then remove the GPS antenna.
5. Install the parts in the reverse order of removal.



1. **REAR SEAT BELT**
Replacement, (**See Page** 24-3)
Inspection, (**See Page** 24-6)
2. **REAR CENTRE BELT**
Replacement, (**See Page** 24-4)
Inspection, (**See Page** 24-6)
3. **REAR SEAT BELT BUCKLES**
(**See Page** 24-4)

Seat Belts

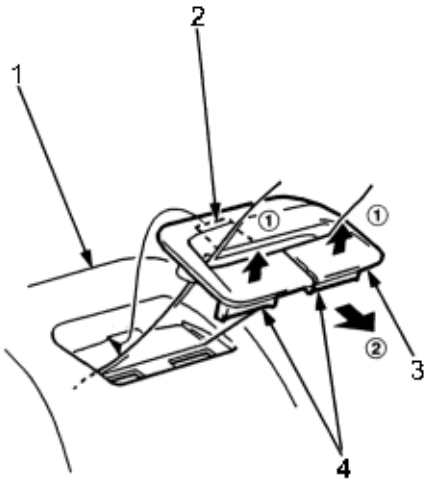
Rear Seat Belt Replacement

24-3

NOTE: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

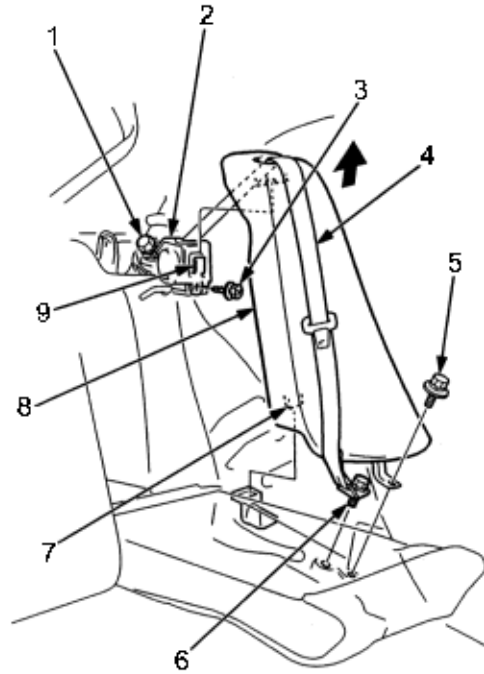
Rear seat belt:

1. Remove (see section 20):
 - ♦ Rear seat cushion
 - ♦ Rear side shelf
2. Detach the clips and release the hook, then remove the seat belt hole cap from the rear seat side bolster. Release the seat belt hole cap from the rear seat belt through its slit. Take care not to scratch the rear seat belt with the belt hole cap clips while removing and hole cap.



1. REAR SEAT SIDE BOLSTER
2. HOOK
3. BELT HOLE CAP
4. CLIPS

3. Remove the bolt, then remove the rear seat side bolster by lifting it up.
4. Remove the lower anchor bolt, then pull out the rear seat belt through the belt hole in the rear seat side bolster.
5. Remove the retractor mounting ET screw and retractor bolt, then remove the rear seat belt and retractor.



1. RETRACTOR BOLT
7/16-20 UNF 32 N.m (3.3 kgf.m, 24 lbf.ft)
2. RETRACTOR
3. RETRACTOR MOUNTING ET SCREW
6 x 10 mm 5.9 N.m (0.60 kgf.m, 4.3 lbf.ft)
4. REAR SEAT BELT
5. 6 x 1.0 mm 9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
6. LOWER ANCHOR BOLT
7/16-20 UNF 32 N.m (3.3 kgf.m, 24 lbf.ft)
7. HOOK
8. REAR SEAT SIDE BOLSTER
9. HOOK

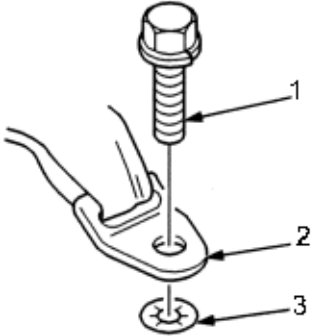
Seat Belts

Rear Seat Belt Replacement (cont'd)

24-4

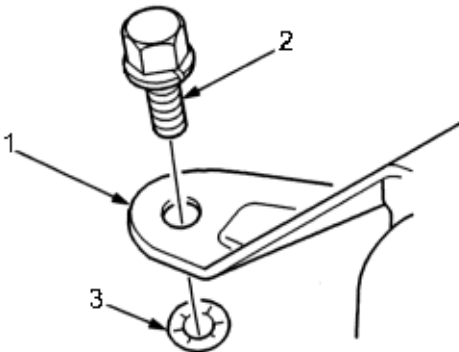
6. Install in the reverse order of removal, and note these items:
 - ♦ If the threads on the retractor mounting ET screw are worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that the retractor locking mechanism functions as described (**See Page 24-6**).
 - ♦ Before installing the anchor bolt, make sure there are no twists or kinks in the rear seat belt.

Lower anchor bolt construction:



1. LOWER ANCHOR BOLT
2. LOWER ANCHOR
3. TOOTHED LOCK WASHER

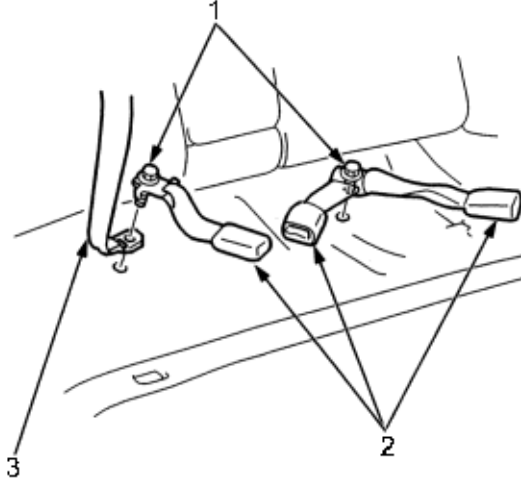
Retractor bolt construction:



1. RETRACTOR
2. RETRACTOR BOLT
3. TOOTHED LOCK WASHER

Centre belt and seat belt buckles:

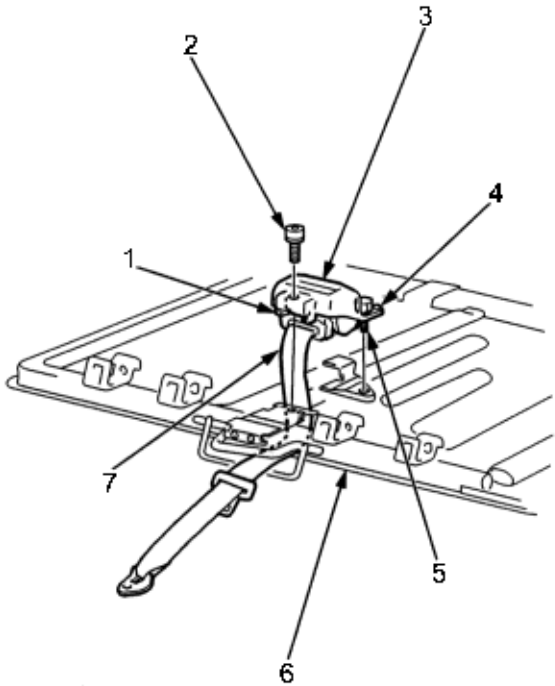
1. Remove the rear seat cushion (see section 20).
2. Remove the centre anchor bolts, and remove the seat belt buckles.



1. CENTRE ANCHOR BOLT
7/16-20 UNF 32 N.m (3.3 kgf.m, 24 lbf.ft)
2. SEAT BELT BUCKLES
3. CENTRE BELT

3. Remove the right seat-back (see section 20)
4. Remove the right seat-back cover/pad as necessary (see section 20).

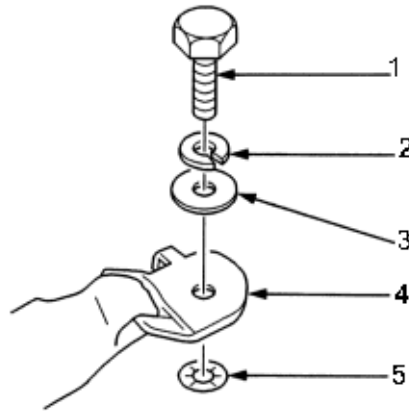
5. With a Torx T30 bit, remove the retractor mounting screw. Remove the retractor bolt and release the hooks, then remove the centre belt and retractor/protector from the right seat-back frame. Take care not to damage the rear centre belt with the edge of the seat-back frame while removing and installing it.



1. HOOK
2. RETRACTOR MOUNTING SCREW
6 x 1.0 mm 9.8 N.m (1.0 kgf.m, 7.2 lbf.ft)
3. RETRACTOR/PROTECTOR
4. RIVET
5. RETRACTOR BOLT
7/16-20 UNF 32 N.m (3.3 kgf.m, 24 lbf.ft)
6. RIGHT SEAT-BACK-FRAME
7. CENTRE BELT

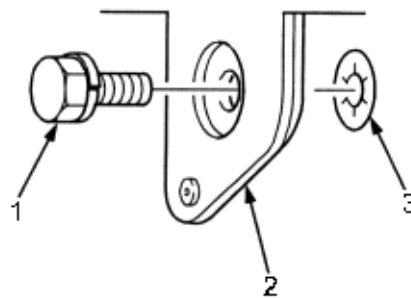
6. Install in the reverse order of removal, and note these items
 - ♦ When removing the protector from the retractor by removing the rivet, after reinstalling the retractor onto the seat-back-frame, reinstall the protector onto the retractor with new rivet.
 - ♦ Apply liquid thread lock to the lower anchor bolt before reinstallation.
 - ♦ Before tightening the retractor bolt, make sure the protector is not pinched with the bolt.
 - ♦ Check that the retractor locking mechanism functions are as described (See Page 24-6).
 - ♦ Before installing the anchor bolts, make sure there are no twists or kinks in the rear centre belt.

Centre anchor bolt construction:



1. CENTRE ANCHOR BOLT
2. SPRING WASHER
3. WASHER
4. CENTRE ANCHOR
5. TOOTHED LOCK WASHER

Retractor bolt construction:

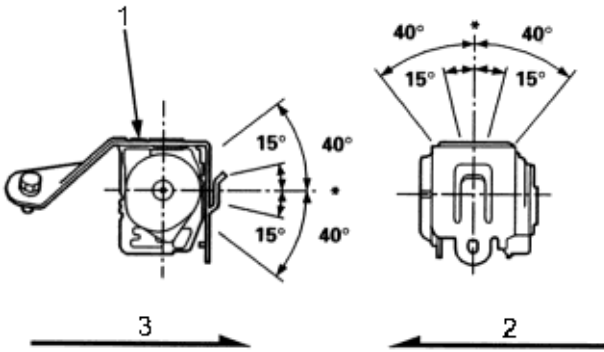


1. RETRACTOR BOLT
2. RETRACTOR/PROTECTOR
3. TOOTHED LOCK WASHER

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Rear centre belt: Hold the rear centre belt pulled out of the retractor over 900 mm (35.4 in.).
3. Make sure that the seat belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°. Do not attempt to disassemble the retractor.

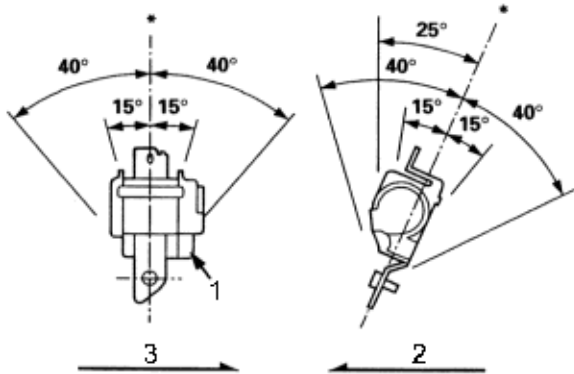
***: Mounted Position**

Rear side:



1. RETRACTOR
2. Inside
3. Forward

Rear centre:



1. RETRACTOR
2. Forward
3. Inside

4. Replace the seat belt with a new one if there is any abnormality.

In vehicle:

1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Rear centre belt: Check that the seat belt locks when pulled out over 300 mm (11.8 in.) with the seat-back folded down.
6. Make sure that the seat belt will retract automatically when released.
7. For each passenger's seat belt, make sure that the locking mechanism in the seat belt retractor will engage when the seat belt is pulled all the way out.
8. Replace the seat belt with a new one if there is any abnormality.

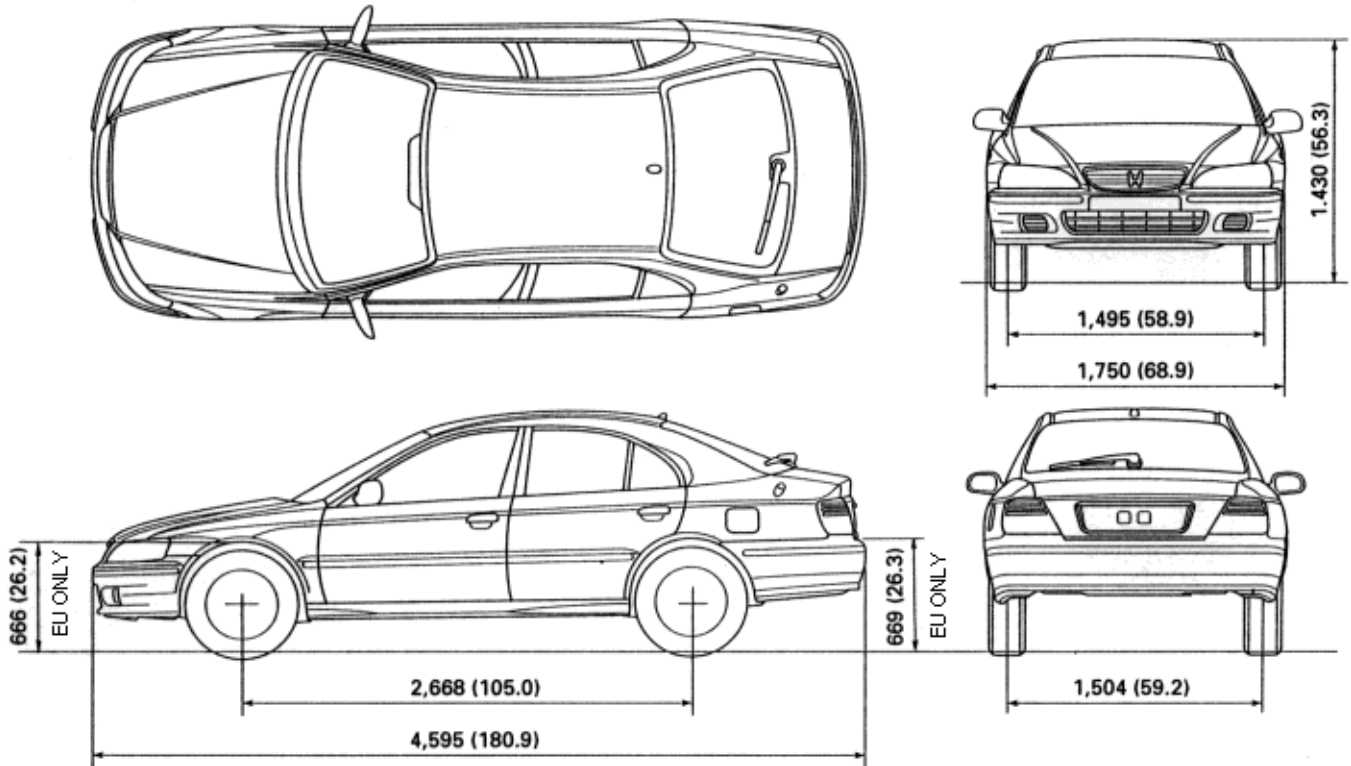
Preparation of Work
Description

1-2

Most monocoque bodies are composed as a single unit by welding together pressed parts made of steel plates which come in a variety of different shapes and sizes. Each part is responsible for displaying a certain strength and durability in order that it may play its role in meeting the functions of the body as a whole.

Damage to the exterior of the body can be inspected visually, but where there has been an external impact, it is necessary to inspect the extent of the damage. In some cases, the deformation may have spread beyond the actual areas which were in the collision so the deformation must be inspected closely.

Unit: mm (in.)

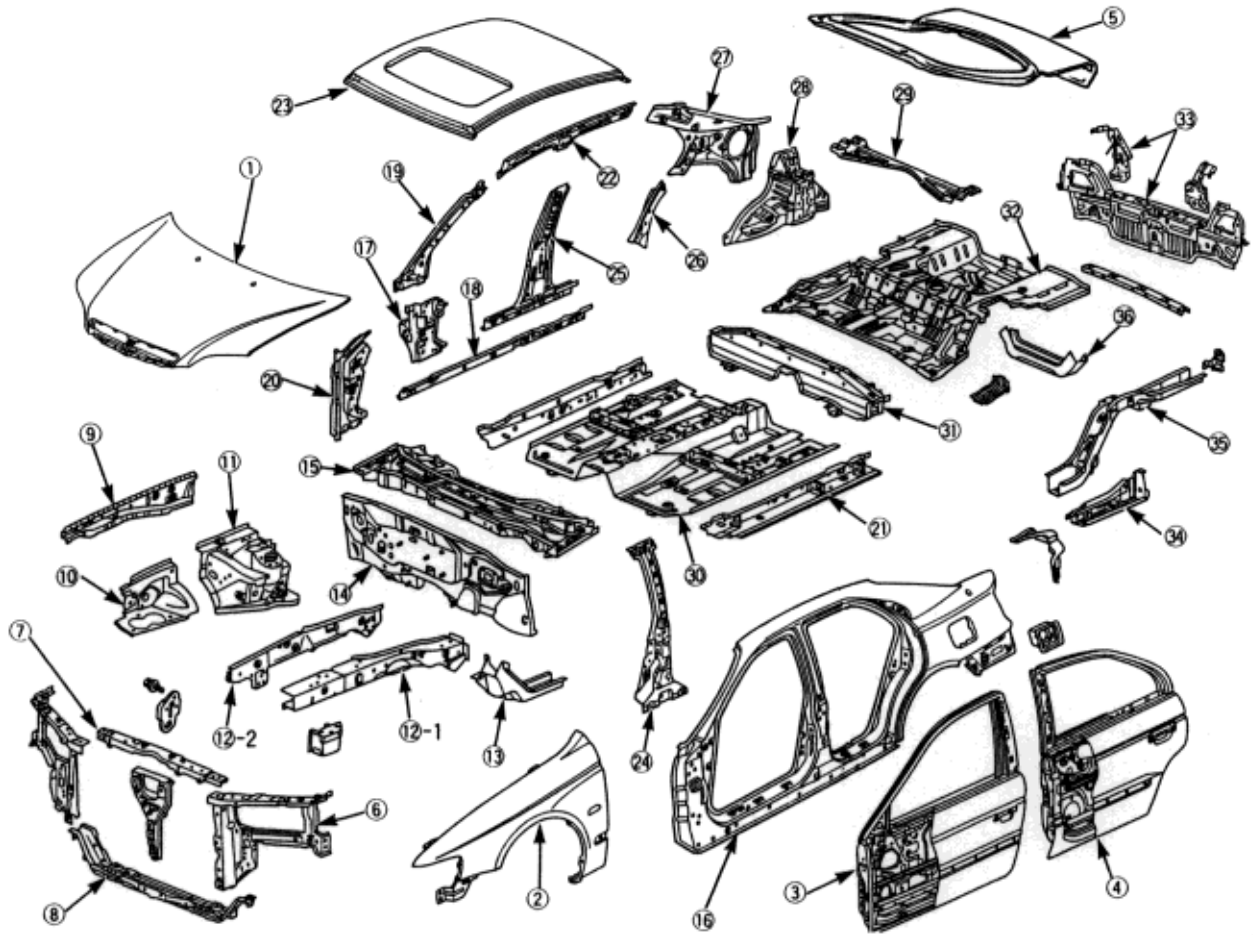


Front Wheel Alignment

Camber	0°00' ±1°
Caster	2°50' ±1°
Total Toe	0 ± 2 (0 ± 0.08)
Wheel turning angle	in 30°10' ± 2°
	out 30°58'

Rear Wheel Alignment

Camber	-1°00' ±30'
Total Toe	IN 2 +2/-1 (0.08) +0.08/-0.04



NOTE: Be sure to use epoxy-based putty and primer surfacer to make any repairs on paint coats or zinc-plated sheet metal

No.	Part Name	Zinc-plated	No.	Part Name	Zinc-plated
1	Hood	O	19	Front Pillar Inner Upper	O
2	Front Fender	O	20	Front Pillar Lower Stiffener	O
3	Front Door Panel/Door Skin	O	21	Inside Sill	
4	Rear Door Panel/Door Skin	O	22	Roof Side Rail	
5	Tailgate	O	23	Roof Panel	
6	Front Side Bulkhead	O	24	Centre Pillar Stiffener	
7	Bulkhead Upper Centre Frame	O	25	Centre Pillar Inner	
8	Bulkhead Lower Cross-member	O	26	Wheel Arch Extension	O
9	Wheelhouse Upper Member		27	Rear Inner Panel	O
10	Front Wheelhouse	O	28	Rear Wheelhouse	O
11	Damper Housing	O	29	Rear Floor Upper Cross-member	
12-1	Front Side Frame	O	30	Front Floor	O
12-2	Front Side Extension	O	31	Middle Floor Cross-member	O
13	Side Frame Rear End/Outtrigger	O	32	Rear Floor	O
14	Dashboard Lower	O	33	Rear Panel	O
15	Dashboard Upper	O	34	Side Sill Extension	O
16	Outer Panel	O	35	Rear Frame	O
17	Front Pillar Inner Lower	O	36	Rear Floor Cross-member	O
18	Side Sill Reinforcement	O			

NOTE: To adjust the clearance with the tailgate alignment, refer to the Accord 5 Door/Accord 5 Door Turbo Diesel Shop Manual Supplement.

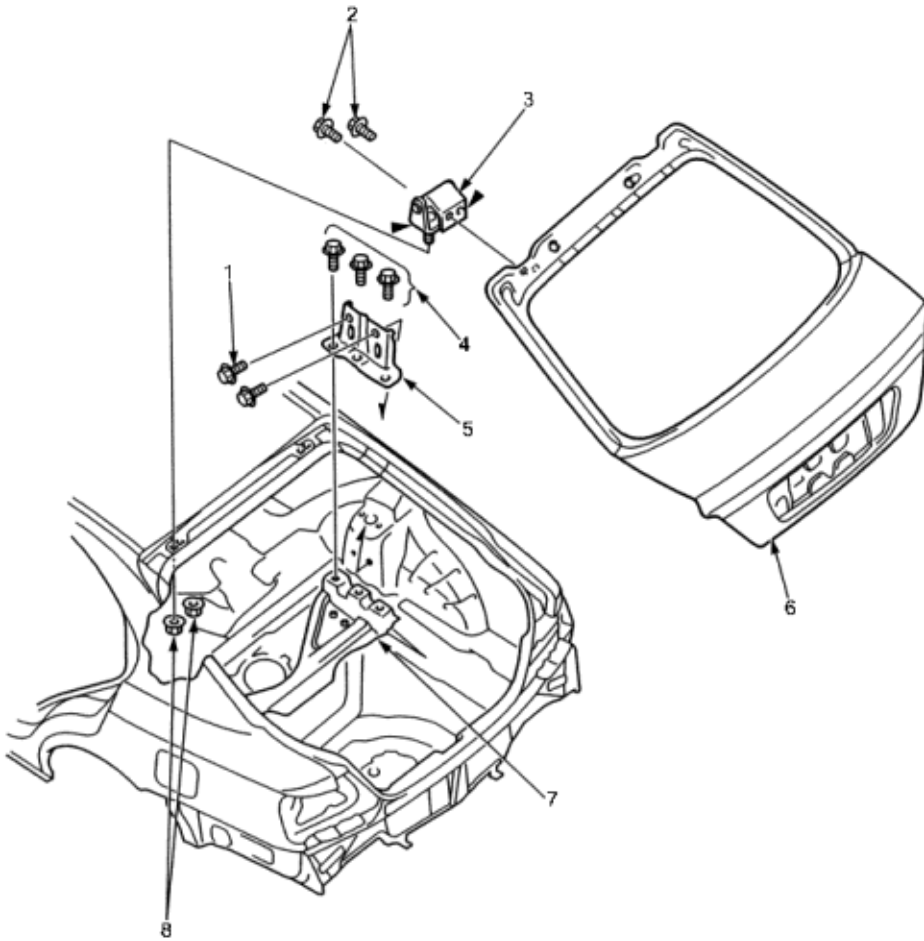
Mounting bolts/nuts Torque:

8 x 1.25 mm: 22 N.m (2.2 kgf.m, 16 lbf.ft)

▶: Sealing locations

NOTE: Seal the following areas to prevent water leak and rust.

Mastic sealer: 3M #08654 or equivalent.

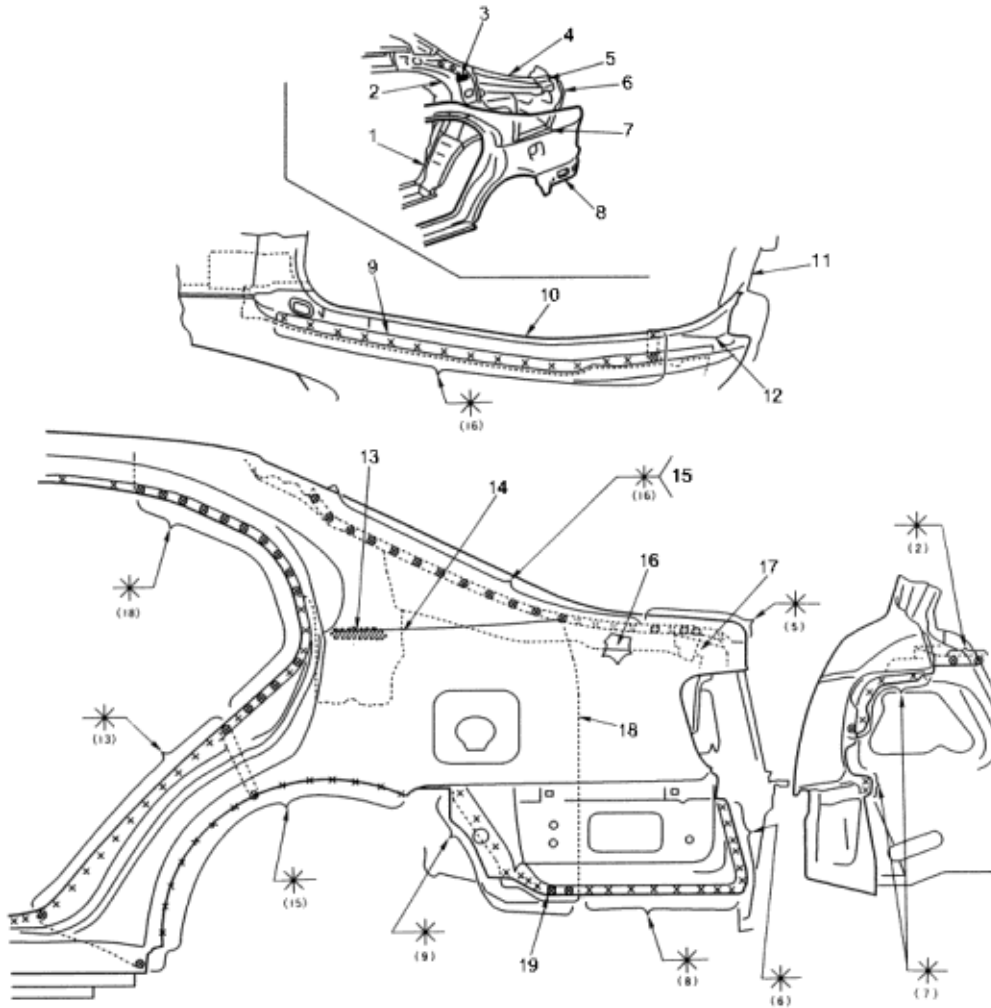


1. 8 x 1.25 mm
2. 8 x 1.25 mm
3. TAILGATE HINGE
4. 8 x 1.25 mm
5. REAR WHEELHOUSE GUSSET
6. TAILGATE
7. REAR FLOOR UPPER CROSS-MEMBER
8. 8 x 1.25 mm

Rear Side Outer Panel
Mass Production Body Welding Diagram

1-5

The rear side outer panel is a conspicuous part of the vehicle. It is especially important for the body line continuing from the door. Therefore, pay particular attention to it when conducting work. This part also is next to the tailgate and rear door, and other parts and must be aligned with them.



1. Wheel arch extension
2. Rear pillar separator
3. Rear damper stiffener
4. Rear pillar member
5. Rear combi stiffener
6. Rear panel
7. Rear floor
8. Outer Panel
9. Outer Panel
10. Rear pillar gutter
11. Rear panel
12. Rear gutter extension
13. Rear pillar separator
14. Rear damper stiffener
15. Rear pillar gutter, Rear pillar member and Inner panel
16. Rear pillar member
17. Rear combi stiffener
18. Inner panel
19. 4-plate welding

Rear Side Outer Panel Replacement

1-6

1. Remove the related parts.
 - ♦ Rear bumper
 - ♦ Tailgate
 - ♦ Taillight
 - ♦ Rear pillar trim panel
 - ♦ Trunk side panel
 - ♦ Rear seat
 - ♦ Rear seat belt
 - ♦ Fuel fill pipe (left side only)



WARNING

Do not smoke while working near the fuel system. Keep open flames away from the fuel system. If necessary, remove the fuel tank and/or lines before welding nearby. Drain fuel into an approved container.

2. Pull out and straighten the damaged area.

NOTE: Carefully check the inner panel, rear pillar member and rear panel for position and damage. Pull out the inner panel by cutting the outer if necessary.

 - ♦ Jack-up the body and place safety stands at the four designated support points.
 - ♦ Pull out the damaged rear side outer panel with the frame straightener, then pull out and straighten the rear pillar inner panel and rear wheelhouse.

NOTE: Be careful not to pull out more than necessary.

 - ♦ After pulling, check the inner pillar, rear panel and rear pillar member position using the body dimensional drawings (see page 1-11).
3. Peel off the undercoat.

Heat the undercoat at the weld areas of the rear wheelhouse with a gas torch and peel off the undercoat with a metal spatula.



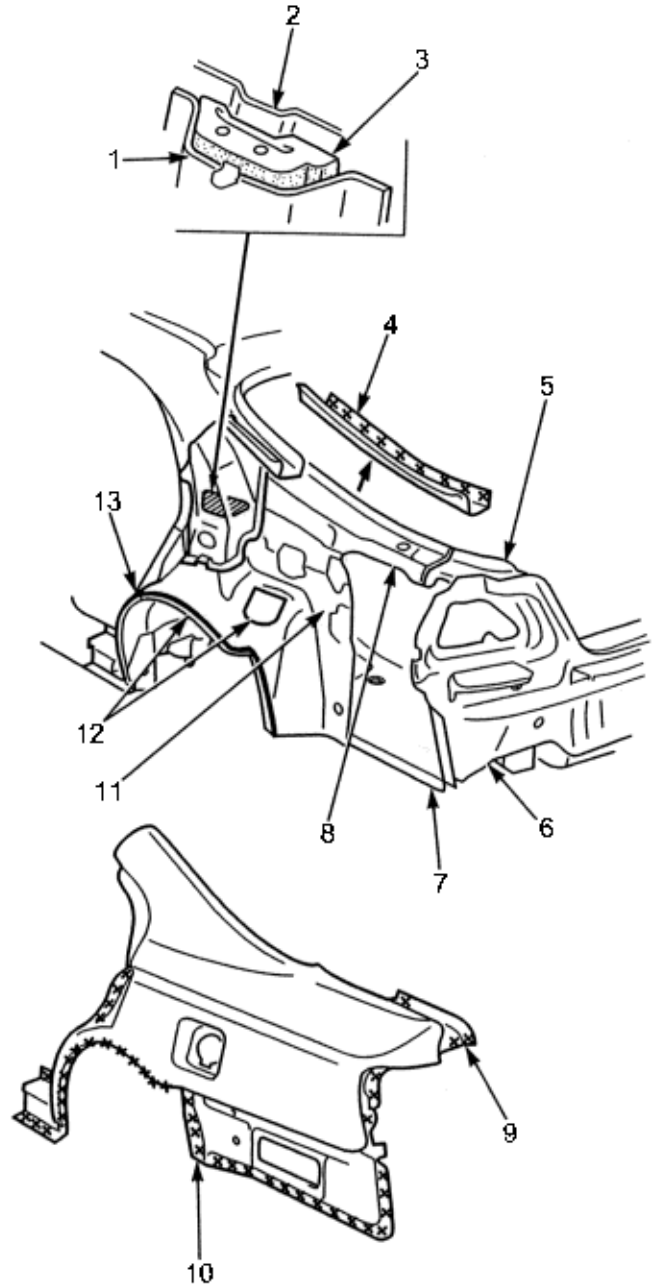
WARNING

Do not smoke while working near the fuel system. Keep open flames away from the fuel system. If necessary, remove the fuel tank and/or lines before welding nearby. Drain fuel into an approved container.

4. Cut and pry off the rear side outer panel
 - ♦ Cut at the rear pillar and side sill with a handsaw.
 - ♦ Cut the panel from the body with a chisel, leaving the weld flange at the rear pillar gutter and inner panel intact.

NOTE: Do not cut or damage the rear pillar member, inner panel, rear damper stiffener and rear pillar separator.

- ♦ Cut at the side sill or wheel arch according to the extent of the damage.
- ♦ Centre punch around the spot weld imprints on the remaining flange.
- ♦ Drill out the spot welds with the spot cutter.
- ♦ Pry off the welded flange sections using a chisel.
- ♦ Check the rear pillar gutter for position and damage.
- ♦ Cut and drill out the spot welds and replace the rear pillar gutter if necessary.



1. REAR DAMPER STIFFENER
2. INNER PANEL
3. REAR PILLAR SEPARATOR
4. REAR PILLAR GUTTER
5. REAR COMBI STIFFENER
6. REAR PANEL
7. REAR FLOOR
8. REAR PILLAR MEMBER
9. REAR GUTTER EXTENSION
10. OUTER PANEL
11. INNER PANEL
12. MASTIC SEALERS
13. WHEEL ARCH EXTENSION

Rear Side Outer Panel Replacement (cont'd)

1-7

5. Straighten the inner panel and related parts.
 - ♦ Use a slide hammer to even out the damaged areas of the rear wheel arch.
 - ♦ Fill the holes drilled by MIG or gas welding.



WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Level and finish burrs, etc. with a disc sander.



WARNING

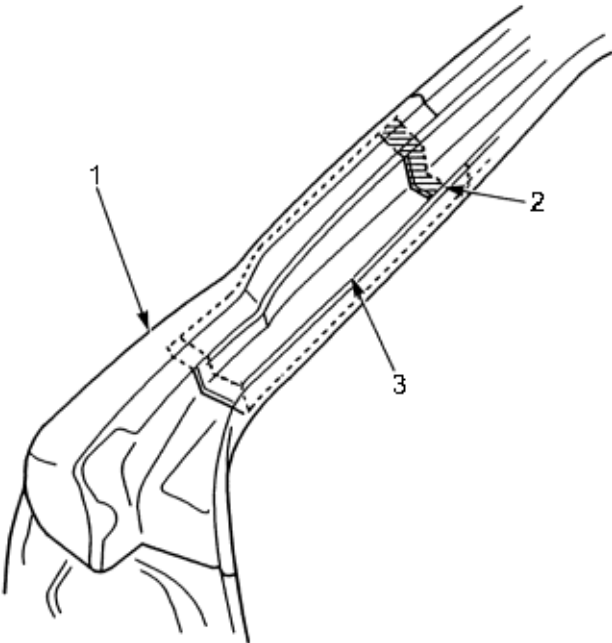
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

6. Set the new rear pillar gutter.
 - ♦ Cut the new rear pillar gutter so it overlaps the body side gutter by approximately 20 mm (0.8 in).
 - ♦ Remove the undercoat from both sides of the weld flange with a sander to expose the steel plate.

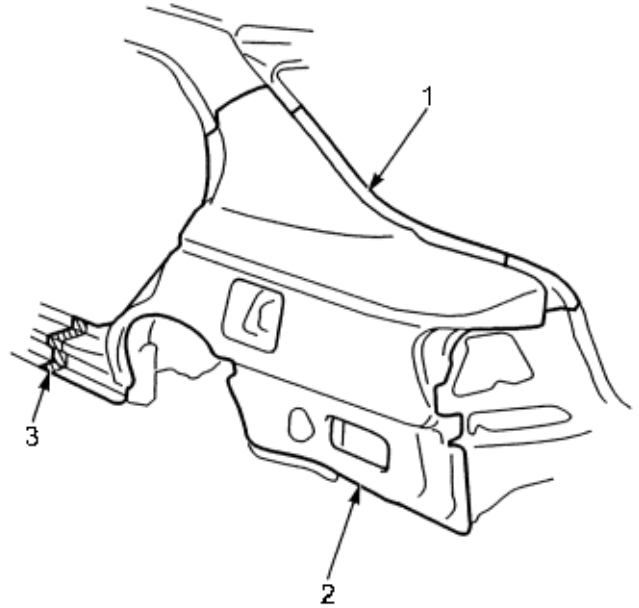
NOTE: Apply the spot sealer to the welding surface when spot welding.

 - ♦ Clamp the new rear pillar gutter in place with the vice-grips.
7. Cut and set the new outer panel.
 - ♦ Align the new outer panel with the rear pillar section, then cut it with a handsaw.

NOTE: Cut the side sill joint with a handsaw leaving an overlap of 30 mm (1.2 in.).



1. NEW OUTER PANEL
2. Overlap 20 mm (0.8 in.)
3. NEW REAR PILLAR GUTTER



1. NEW PILLAR GUTTER
2. NEW OUTER PANEL
3. Overlap 30 mm (1.2 in.)

8. Check the position of the new pillar gutter and new outer panel using the body dimensional drawings ([see page 1-11](#)).
9. Temporarily spot weld the new rear pillar gutter.



WARNING

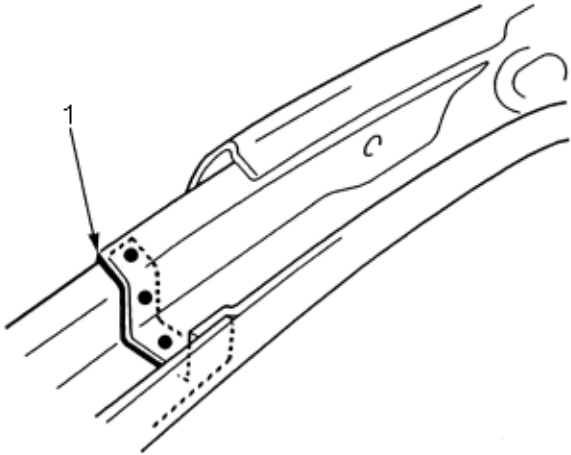
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

10. Remove the vice-grips and install the rear door, taillight, rear bumper, and tailgate.

NOTE:

 - ♦ Check for flushness of the front fender, doors, and the rear fender, taillight, rear bumper, and make sure the body lines flow smoothly.
 - ♦ Check the alignment of the tailgate.

11. Remove the new outer panel, and weld the new rear pillar gutter.



1. Fillet welding

12. Set the new outer panel.
- ♦ Attach the patch to the cut section of the rear pillar (body side) and plug weld it.
 - ♦ Apply body paint to the back of the repaired part.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames or cigarettes.
- ♦ Remove the undercoat from both sides of the weld flange with a sander to expose the steel plate.

NOTE: Apply the spot sealer to the welding surface when spot welding.

- ♦ Temporarily spot weld the panel at the clamped positions.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves, and safety shoes.

NOTE: Recheck the alignment of the rear door and tailgate.

13. Perform the main welding.

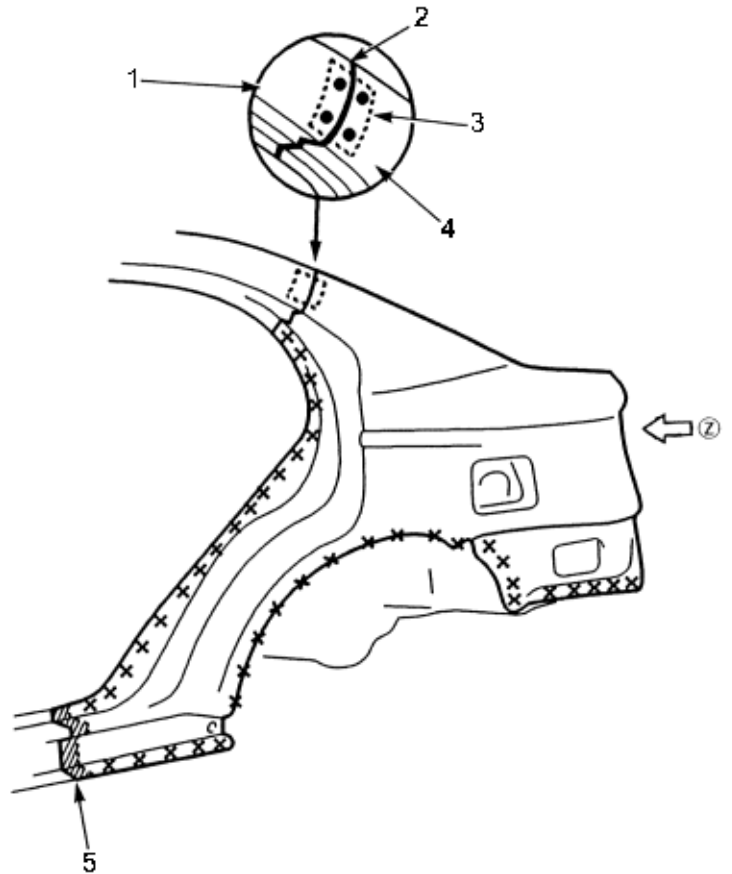
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves, and safety shoes.

- ♦ Make 20% to 30% more spot welds than there were holes drilled.

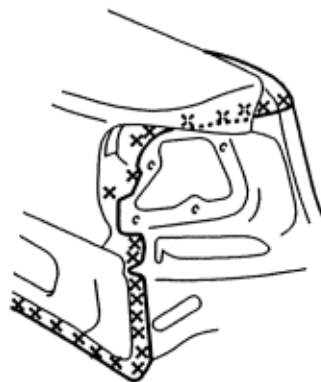
NOTE: If there is not room for spot welds, compensate by using MIG welds.

- ♦ Make 5 mm (0.2 in.) holes in the MIG weld hole with the repair part and the inner panel and centre pillar stiffener with a MIG welder.
- ♦ Weld the outer panel at the rear pillar side sill with a MIG welder.

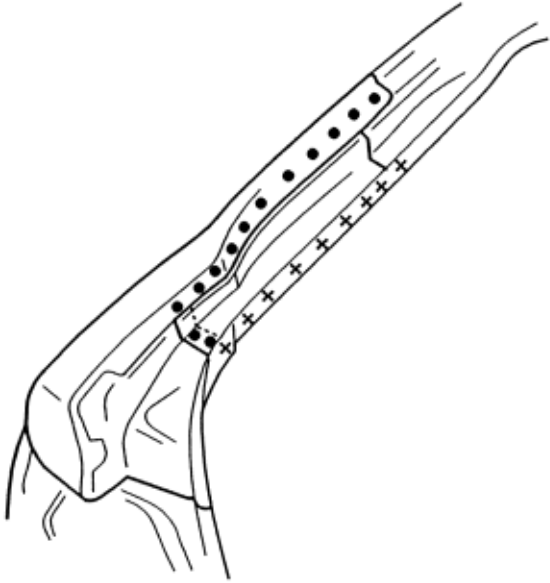


- 1. OUTER PANEL(body side)
- 2. Butt welding
- 3. PATCH
- 4. NEW OUTER PANEL
- 5. Fillet welding

VIEW (Z)



- ♦ Weld the new rear pillar gutter.



14. Finish the welded areas.
 - ♦ Level the MIG welded areas with a disc sander.



WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting, or grinding.

- ♦ Even out high areas with a hammer. Be careful not to deform them.
- ♦ Even out the spot welded flange areas with a hammer and dolly.
- ♦ Fill in deformations and level differences of the welded areas with solder or putty, then finish.

15. Apply the sealer (**see page 1-10**).
Apply sealer to the fuel filler section, tailgate opening joint and around the taillight area of the rear panel.
16. Apply paint.

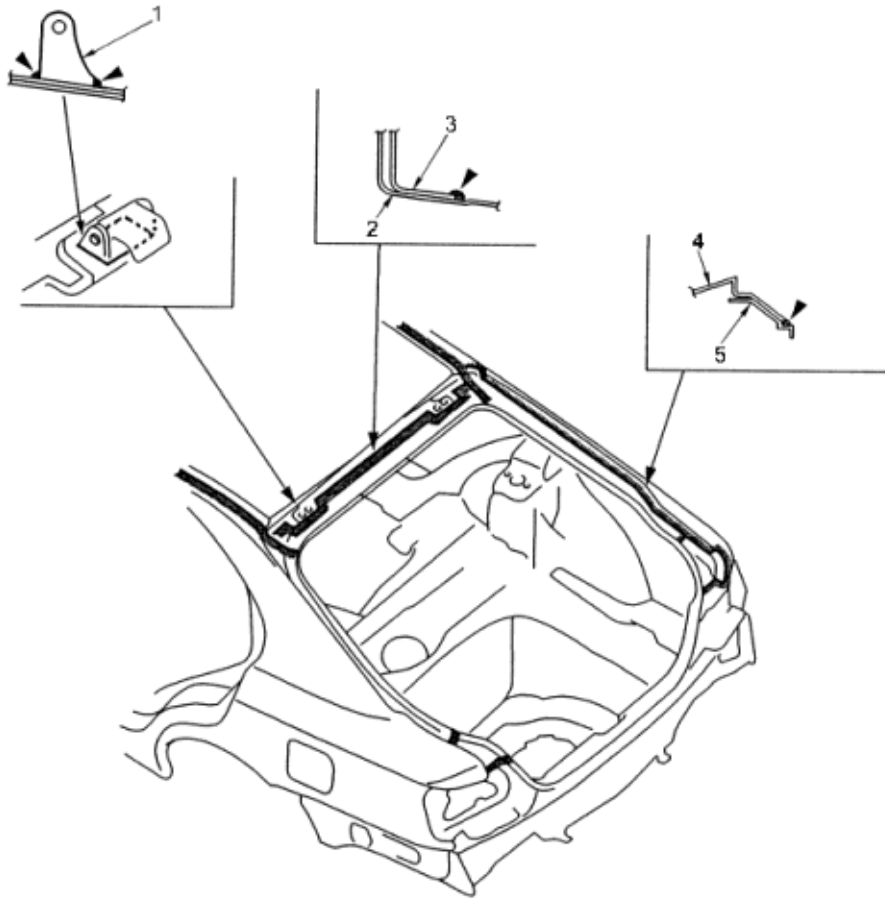


WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames or cigarettes.

17. Apply the undercoat.
Apply undercoat to the wheelhouse and apply anti-rust agent to the inside of the outer panel (**see page 1-12**).
18. Install the related parts in the reverse order in which they were removed.
19. Inspect, check, and clean.
 - ♦ Adjust the clearance with the door and tailgate then adjust the level difference and fit.
Check operation.
 - ♦ Test for leaks in the trunk and passenger compartments.
 - ♦ Clean the trunk floor.

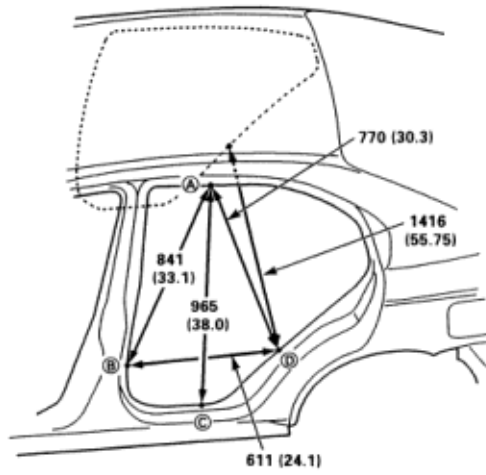
1. Tailgate hinge
2. Rear rail upper
3. Roof Panel
4. Outer panel
5. Rear pillar upper gutter



(Rear Door Opening)

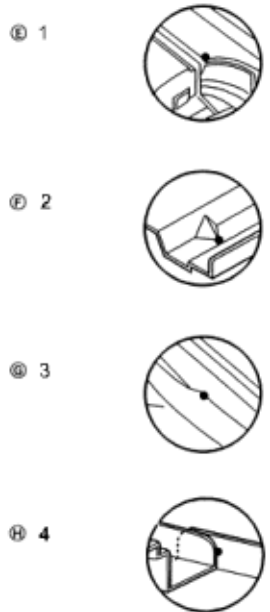
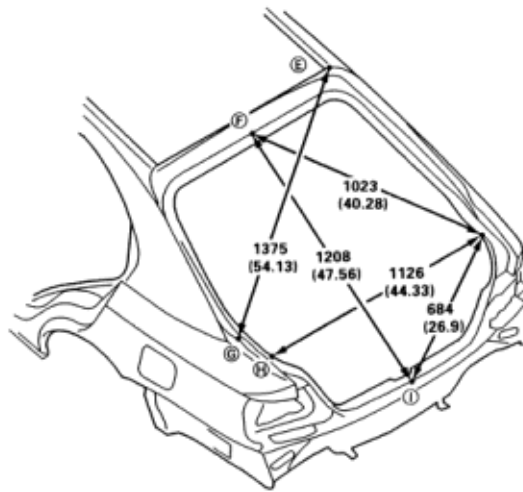
Unit: mm (in.)

- (A), (B), (C), (D)
 Door opening flange notch (4 places)



(Tailgate Opening)

- (E) Outer panel rear end moulding shape
- (F) Rear roof rail projection bead
- (G) Outer panel projection shape (2 places)
- (H) Rear gutter upper flange end (2 places)
- (I) Trunk seal flange water drain hole

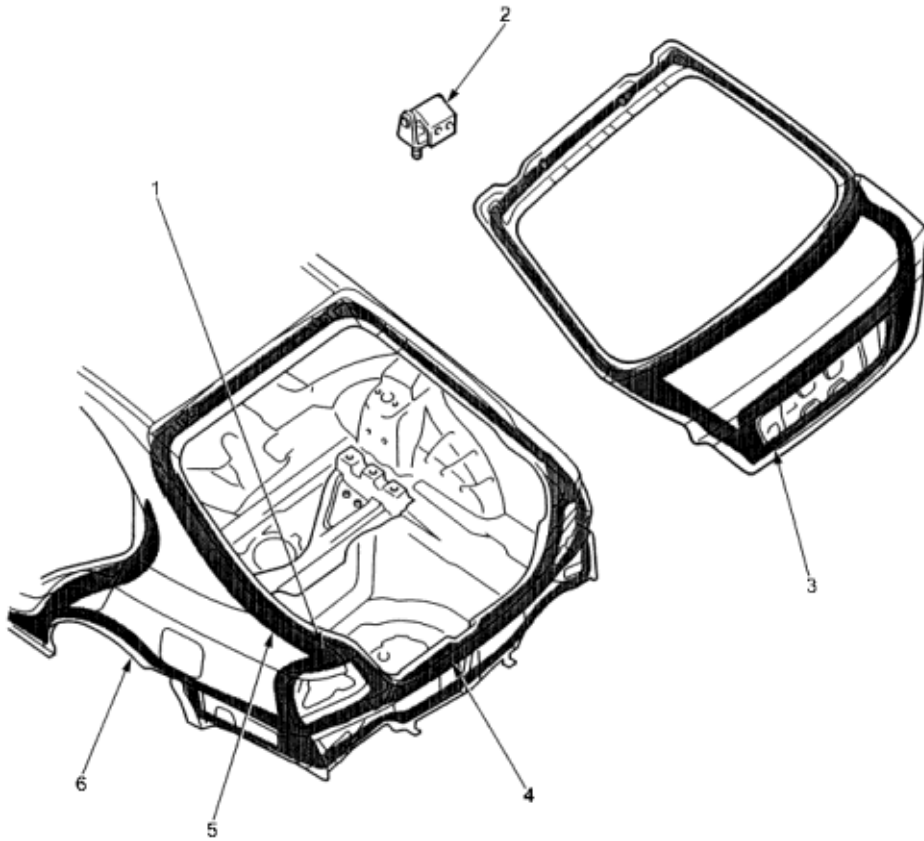


NOTE:

- ♦ Apply the designated thickness over surfaces including gaps and edges.
- ♦ Avoid spraying agents on the following parts:
Window glass, lights, grille, exhaust parts, tyres, bumper and lower skirt.
- ♦ Wipe up spilled agents at once from rubber and plastic parts.

Anti-rust Agents:

- ♦ Use RUSTOP, DEOX #100, WAXOYL, or equivalents for protecting inner surfaces
- ♦ Use NOX-RUST 409-20S, SOLTON 1000S, or equivalents for protecting outer surfaces.



1. **REAR COMBI STIFFENER
(Inside)**
2. **TAILGATE HINGE**
3. **TAILGATE FRAME
(Inside)**
4. **REAR PANEL
(Inside)**
5. **REAR PILLAR GUTTER
(Inside)**
6. **REAR SIDE OUTER PANEL
(Inside)**

Paint Code	Colour Name	B-99P Atlantic Blue pearl	B-94 Midnight Blue Solid	G-86P Baikal Green Pearl	GY-20M Chartreuse Metallic	B-92P Nighthawk Black Pearl	NH-614M Titan Silver Metallic	R-500P Sicilian Red Pearl	R-502 Vesuvio Red
KR	1.6 is	0	0	0	0	0	0	0	0
KR	1.6 iLs	0	0	0	0	0	0	0	0
KR	1.8 is	0	0	0	0	0	0	0	0
KR	1.8 iLs	0	0	0	0	0	0	0	0
KR	1.8 iEs	0	0	0	0	0	0	0	0
KR	2.0 iLs	0	0	0	0	0	0	0	0
KR	2.0 iEs	0	0	0	0	0	0	0	0
KR	2.0 TDi	0	0	0	0	0	0	0	0
KR	2.0 SDi	0	0	0	0	0	0	0	0
KE	1.6 is	0	0	0	0	0	0	0	0
KE	1.6 iLs	0	0	0	0	0	0	0	0
KE	1.8 is	0	0	0	0	0	0	0	0
KE	1.8 iLs	0	0	0	0	0	0	0	0
KE	1.8 iEs	0	0	0	0	0	0	0	0
KE	2.0 iLs	0	0	0	0	0	0	0	0
KE	2.0 iEs	0	0	0	0	0	0	0	0
KE	2.0 TDi	0	0	0	0	0	0	0	0
KE	2.0 SDi	0	0	0	0	0	0	0	0
KE	2.0 V	0	0	0	0	0	0	0	0
KG	1.6 is	0	0	0	0	0	0	0	0
KG	1.6 iLs	0	0	0	0	0	0	0	0
KG	1.8 is	0	0	0	0	0	0	0	0
KG	1.8 iLs	0	0	0	0	0	0	0	0
KG	1.8 iEs	0	0	0	0	0	0	0	0
KG	2.0 iLs	0	0	0	0	0	0	0	0
KG	2.0 iEs	0	0	0	0	0	0	0	0
KG	2.0 TDi	0	0	0	0	0	0	0	0
KG	2.0 SDi	0	0	0	0	0	0	0	0
KG	2.0 V	0	0	0	0	0	0	0	0
KS	1.6 is	0	0	0	0	0	0	0	0
KS	1.6 iLs	0	0	0	0	0	0	0	0
KS	1.8 is	0	0	0	0	0	0	0	0
KS	1.8 iLs	0	0	0	0	0	0	0	0
KS	2.0 iLs	0	0	0	0	0	0	0	0
KS	2.0 iEs	0	0	0	0	0	0	0	0

Side Sill Panel:

Body colour 2.0 V
 BP. Dark grey NH-533 Except 2.0 V

Protector Moulding:

Body colour 2.0 V, 2.0 iEs, 1.8 iEs
 BP. Dark grey NH-533 Except 2.0 V, 2.0 iEs, 1.8 iEs

Door Mirror:

Body colour 2.0 V, 2.0 iEs, 1.8 iEs
 Black NH-72 (Gloss 30) Except 2.0 V, 2.0 iEs, 1.8 iEs

Outer Door Handle:

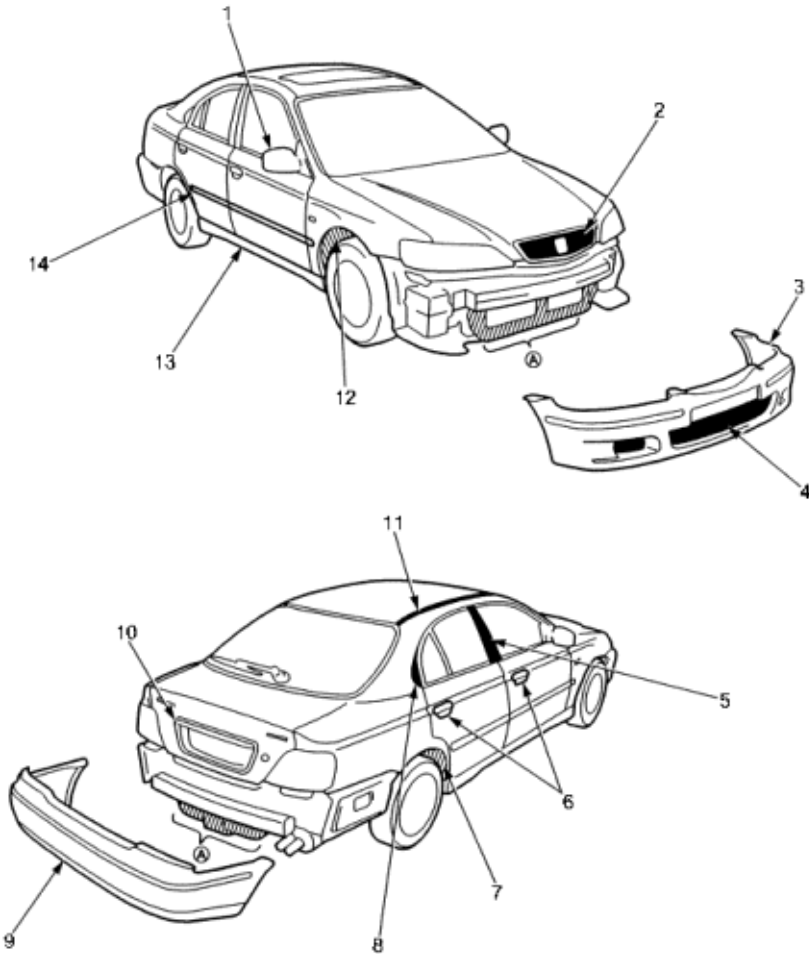
Chrome Plating 2.0 V
 Body colour 2.0 iEs, 1.8 iEs
 Black NH-72 (Gloss 30) Except 2.0 V, 2.0 iEs, 1.8 iEs

Front Grille:

NH-573M (Emblem grey metallic) 2.0 V
 Black NH-70 (Gloss 20) Except 2.0 V

NOTE:

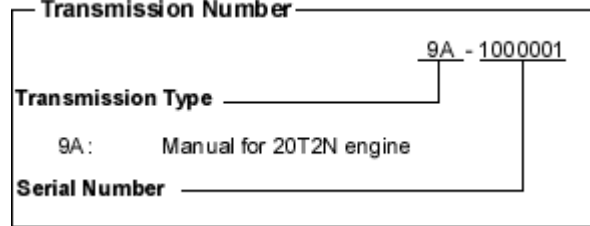
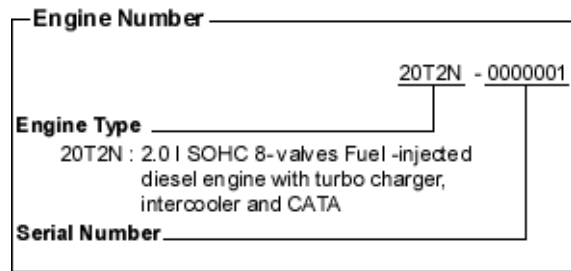
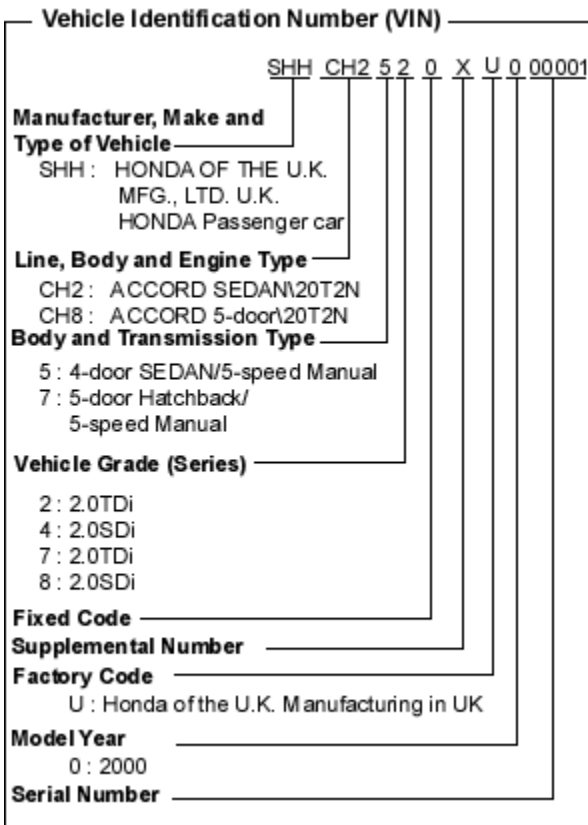
- ♦ Apply NH-86 black (Gloss 40) to the visible surfaces of (A) areas, front and rear wheelhouses after installing equipment (except vehicles painted with B-94, G-86P and B-92).
- ♦ For body colours B-99P, GY-20M, NH-614M, R-500P and R-502 apply NH-86 black (Gloss 40) to the (A) areas, front and rear wheelhouses.



1. **DOOR MIRROR**
Body colour or Black NH-72 Gloss 30
2. **FRONT GRILLE**
Grille: Black NH-70 Gloss 20 or
NH-573M Emblem grey metallic
Moulding: Chrome plated moulding
3. **FRONT BUMPER**
Body colour
4. **GRILLE**
BP. Dark grey NH-533
5. **DOOR CENTRE SASH**
Black NH-72 Gloss 30
6. **DOOR OUTER HANDLE**
Body colour, Black NH-72 Gloss 30
or Chrome plating
7. **REAR WHEELHOUSE**
8. **REAR PILLAR MOULDING**
Black NH-72 Gloss 30
9. **REAR BUMPER**
Body colour
10. **LICENSE PLATE TRIM**
Moulding: Chrome plated moulding
11. **ROOF MOULDING**
Black NH-72 Gloss 30
12. **FRONT WHEELHOUSE**
13. **SIDE SILL PANEL**
Body colour or BP. dark grey NH-533
14. **PROTECTOR MOULDING**
Body colour or BP. dark grey NH-533

General Information
Chassis and Engine Numbers

1-2



General Information**1-3****Chassis and Engine Numbers (cont'd)**

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
Accord SEDAN	KE	2.0TDi	5MT	SHHCH2520XU000001~	20T2N-0000001~	9A-1000001~
			5MT	SHHCH2570XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH2580XU000001~	20T2N-0000001~	9A-1000001~
Accord SEDAN	KG	2.0TDi	5MT	SHHCH2520XU000001~	20T2N-0000001~	9A-1000001~
			5MT	SHHCH2570XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH2540XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH2580XU000001~	20T2N-0000001~	9A-1000001~
Accord SEDAN	KR	2.0TDi	5MT	SHHCH2520XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH2540XU000001~	20T2N-0000001~	9A-1000001~
Accord 5-door	KE	2.0TDi	5MT	SHHCH8720XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8780XU000001~	20T2N-0000001~	9A-1000001~
Accord 5-door	KG	2.0TDi	5MT	SHHCH8720XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8740XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8780XU000001~	20T2N-0000001~	9A-1000001~
Accord 5-door	KR	2.0TDi	5MT	SHHCH8720XU000001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8740XU000001~	20T2N-0000001~	9A-1000001~

General Information
Abbreviations

1-4

List of automotive abbreviations which may be used in shop manual.

ABDC	After Bottom Dead Centre
ABS	Anti-lock Brake System
AC	Alternating Current
A/C	Air Conditioning, Air Conditioner
ACL	Air Cleaner
A/F	Air Fuel Ratio
AFR	Air Fuel Ratio
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Ampere (s)
ANT	Antenna
API	American Petroleum Institute
APPROX.	Approximately
ASSY	Assembly
A/T	Automatic Transmission
ATDC	After Top Dead Centre
ATF	Automatic Transmission Fluid
ATT	Attachment
ATTS	Active Torque Transfer System
AUTO	Automatic
AUX	Auxiliary
BARO	Barometric
BAT	Battery
BBDC	Before Bottom Dead Centre
BDC	Bottom Dead Centre
BTDC	Before Top Dead Centre
CARB	Carburettor
CAT or CATA	Catalytic Converter
CHG	Charge
CKF	Crankshaft Speed Fluctuation
CKP	Crankshaft Position
CO	Carbon Monoxide
COMP	Complete
CPB	Clutch Pressure Back up
CPC	Clutch Pressure Control
CPU	Central Processing Unit
CVT	Continuously Variable Transmission
CYL	Cylinder
CYP	Cylinder Position
DC	Direct Current
DI	Distributor Ignition
DIFF	Differential
DLC	Data Link Connector
DOHC	Double Overhead Camshaft
DPI	Dual Point Injection
DTC	Diagnostic Trouble Code
DTI	Dial Test Indicator
EACV	Electronic Air Control Valve
EBD	Electronic Brake Distribution

ECM	Engine Control Module
ECT	Engine Coolant Temperature
ECU	Electronic Control Unit
EDC	Electronic Diesel Control
EGR	Exhaust Gas Recirculation
ELD	Electrical Load Detector
EPR	Evaporator Pressure Regulator
EPS	Electrical Power Steering
EVAP	Evaporative
EX	Exhaust
F	Front
FIA	Fuel Injection Air
FIP	Fuel Injection Pump
FL	Front Left
FP	Fuel Pump
FR	Front Right
FSR	Fail Safe Relay
FWD	Front Wheel Drive
GAL	Gallon
GND	Ground
GPS	Global Positioning System
H/B	Hatchback
HC	Hydrocarbons
HID	High Intensity Discharge
HO2S	Heated Oxygen Sensor
IAB	Intake Air Bypass
IAC	Idle Air Control
IACV	Idle Air Control Valve
IAR	Intake Air Resonator
IAT	Intake Air Temperature
ICM	Ignition Control Module
ID	Identification
ID or I.D.	Inside Diameter
IG or IGN	Ignition
IMA	Idle Mixture Adjustment
IMMOBI.	Immobiliser
IN	Intake
INJ	Injection
INT	Intermittent
KS	Knock Sensor
L	Left
L/C	Lock-up Clutch
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LEV	Low Emission Vehicle
LF	Left Front
LH	Left Handle
LHD	Left Handle Drive

General Information
Abbreviations (cont'd)

LR Left Rear
LSD Limited Slip Differential
L-4 In-line Four Cylinder (engine)

MAF Mass Air Flow
MAP Manifold Absolute Pressure
MAX. Maximum
MBS Mainshaft Brake System
MCK Motor Check
MCU Moment Control Unit
MFU Multi-Function Unit
MIL Malfunction Indicator Light
MIN. Minimum
MPI Multi Point Injection
M/S Manual Steering
M/T Manual Transmission

N Neutral
NOx Oxides of Nitrogen

OBD On-board Diagnostic
O2S Oxygen Sensor
OD or O.D. Outside Diameter

P Park
PAIR Pulsed Secondary Air Injection
PCM Powertrain Control Module
PCV Positive Crankcase Ventilation
Proportioning Control Valve
PGM-FI Programmed-fuel Injection
PGM-IG Programmed Injection
PH Pressure High
PL Pilot Light or Pressure Low
PMR Pump Motor Relay
P/N Part Number
PRI Primary
P/S Power Steering
PSF Power Steering Fluid
PSP Power Steering Pressure
PSW Pressure Switch
PTC Positive Temperature Coefficient

QTY Quantity

R Right
REF Reference
RGB Red, Green, Black
RHD Right Handle Drive
RL Rear Left
RON Research Octane Number
RR Rear Right

SAE Society of Automotive Engineers
SCS Service Check Signal
SEC Second
Secondary

SOHC Singe Overhead Camshaft
SOL Solenoid
SPEC Specification
S/R Sun Roof
SRS Supplemental Restraint System
STD Standard
SW Switch

T Torque
TB Throttle Body
T/B Timing Belt
TC Torque Converter
TCM Transmission Control Module
TCS Traction Control System
TDC Top Dead Centre
TFT Thin Film Transistor
T/N Tool Number
TP Throttle Position
TWC Three Way Catalytic Converter

VC Viscous Coupling
VIN Vehicle Identification Number
VSS Vehicle Speed Sensor
VTEC Variable Valve Timing & Valve Lift
Electronic Control
VVIS Variable Volume Intake System
W With
W/O Without
WOT Wide Open Throttle

2WD Two Wheel Drive
4WD Four Wheel Drive
2WS Two Wheel Steering
4WS Four Wheel Steering
4AT 4-speed Automatic Transmission
5MT 5-speed Manual Transmission

P Park
R Reverse
N Neutral
D4 Drive (1st through 4th gear)
D3 Drive (1st through 3rd gear)
2 Second
1 First
D Drive
S Second
L Low
O/D Over Drive
1ST Low (gear)
2ND Second (gear)
3RD Third (gear)
4TH Fourth (gear)
5TH Fifth (gear)

Remove

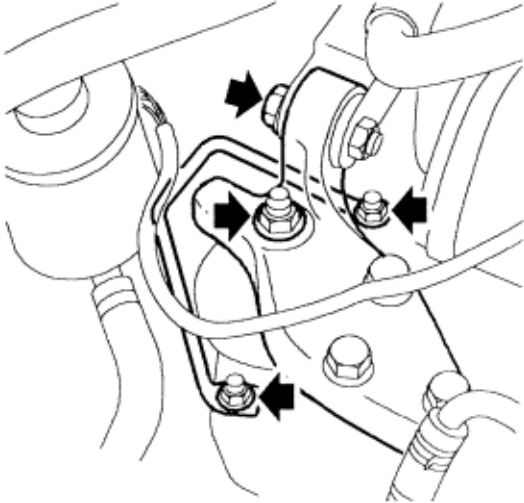
1. Disconnect battery earth lead.
2. Raise front of vehicle.



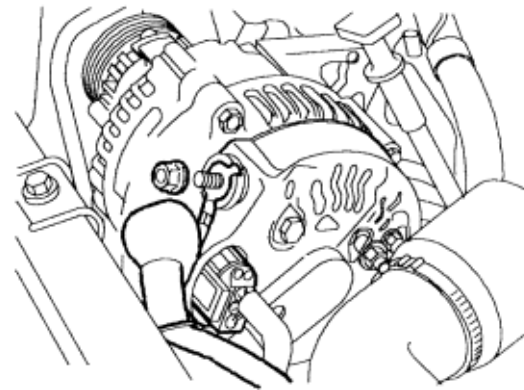
WARNING

Support on safety stands.

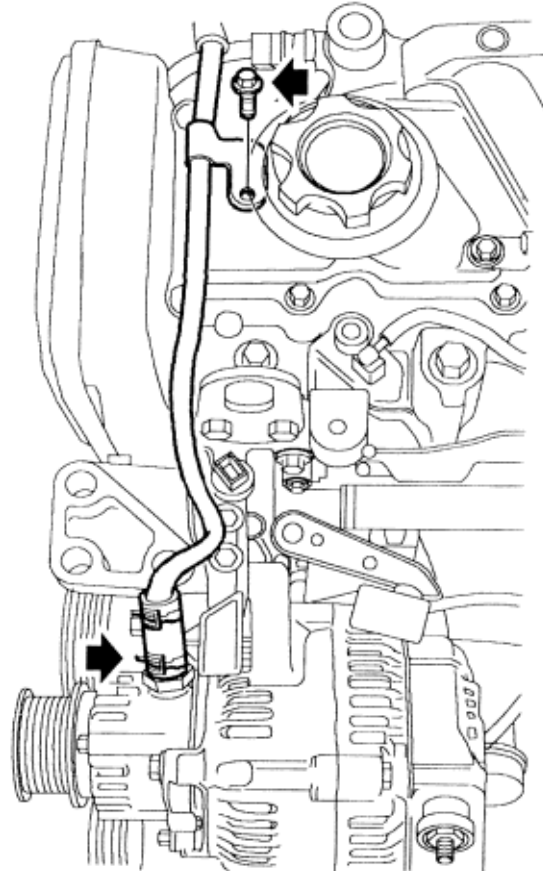
3. Remove engine acoustic cover. *See ENGINE, Repairs.*
4. Remove auxiliary drive belt. *See this section.*
5. Fit wooden block to jack and position jack to support engine.



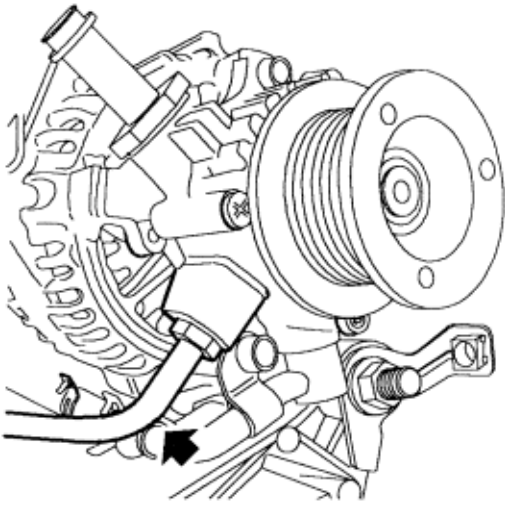
6. Remove through bolt securing RH steady bar to engine mounting bracket.
7. Remove nut securing RH mounting bracket to engine mounting.
8. Loosen 2 nuts securing restraint bar to body.



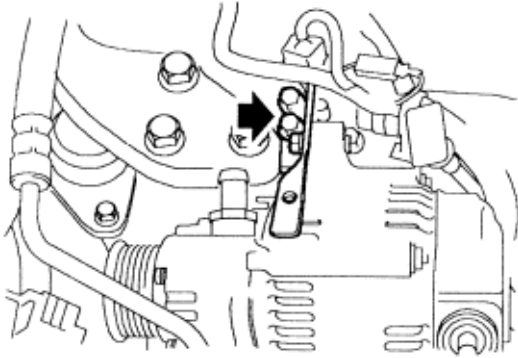
9. Disconnect multiplug from alternator.
10. Release cover, remove nut and disconnect battery cable from alternator.



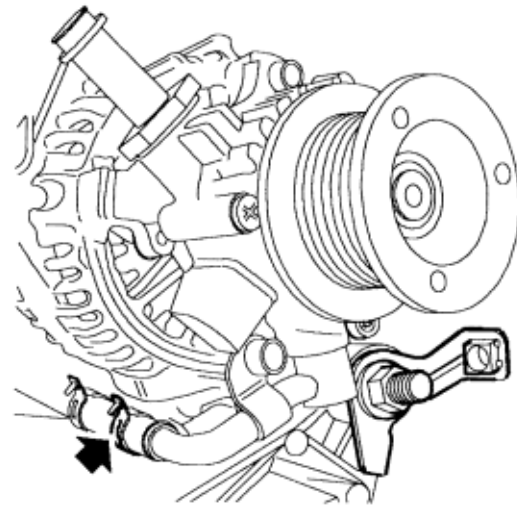
11. Remove bolt securing brake servo vacuum pipe to camshaft cover.
12. Release clip and disconnect vacuum hose from vacuum pump.



- 13. Place absorbent cloth beneath alternator oil feed pipe, to contain spill.
- 14. Loosen union and disconnect oil feed pipe from vacuum pump.



- 15. Remove 3 bolts and alternator upper mounting bracket.
- 16. Raise engine on jack to remove alternator bolt.



- 17. Remove nut and bolt from alternator lower mounting bracket.
- 18. Release alternator from mounting, release clip and remove oil return pipe.
- 19. Remove alternator from vehicle.

⚠ CAUTION

Plug the connections.
Do not carry out further dismantling if component is removed for access only.

- 20. Transfer vacuum pump to new alternator. **See *BRAKES, Repairs.***

Refit

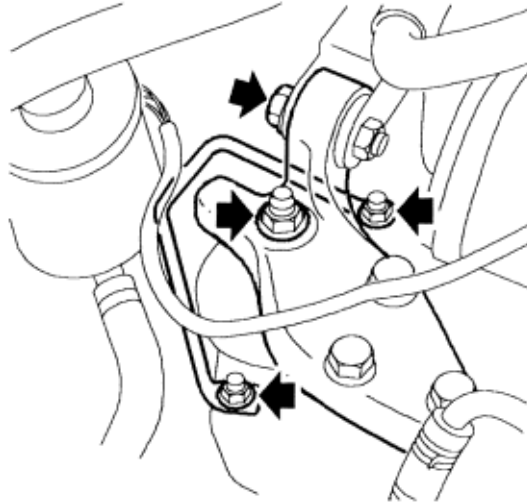
1. Clean all pipe connections.
2. Fit oil return hose to vacuum pump and secure with clip, fit alternator to lower mounting bracket.
3. Fit nut and bolt to alternator lower mounting but do not tighten at this stage.
4. Fit bolts securing alternator upper mounting bracket to coolant elbow and tighten to 25 Nm (2.5 kgf/m, 18 lbf/ft).
5. Fit oil feed pipe union to vacuum pump and tighten union to 12 Nm (1.2 kgf/m, 9 lbf/ft).
6. Fit and tighten alternator upper mounting bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).
7. Tighten alternator lower mounting bolt to 45 Nm (4.6 kgf/m, 33 lbf/ft).
8. Connect vacuum hose to vacuum pump and secure hose with clip.
9. Align vacuum pipe bracket to camshaft cover and tighten bolt.
10. Connect battery cable to alternator stud tighten nut to 4 Nm (0.4 kgf/m, 3 lbf/ft) and position cover.
11. Connect multiplug to alternator.
12. Lower engine, fit nut securing RH mounting bracket to engine mounting and tighten to 85 Nm (8.7 kgf/m, 63 lbf/ft).
13. Tighten engine mounting restraint bar nuts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
14. Connect steady bar to engine mounting bracket, fit through bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
15. Remove jack positioned to support engine.
16. Fit auxiliary drive belt.
17. Fit engine acoustic cover. **See ENGINE, Repairs.**
18. Connect battery earth lead.

Remove

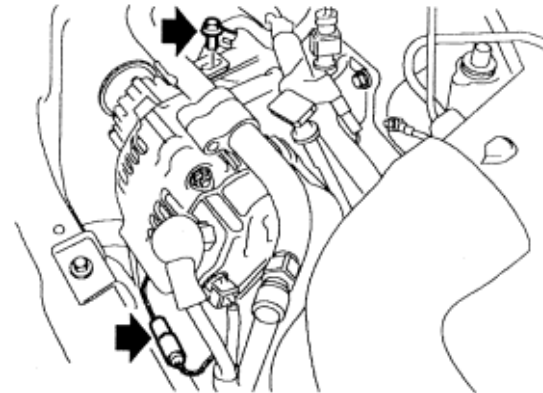
1. Disconnect battery earth lead.
2. Raise front of vehicle.

**WARNING****Support on safety stands.**

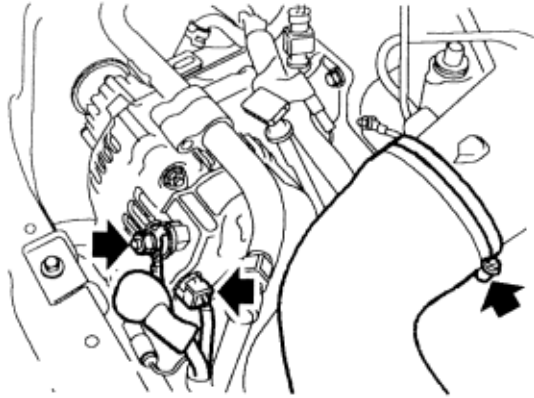
3. Remove engine acoustic cover. **See ENGINE, Repairs.**
4. Remove auxiliary drive belt. **See this section.**
5. Remove receiver drier. **See AIR CONDITIONING, Repairs.**
6. Fit wooden block to jack and position jack to support engine.



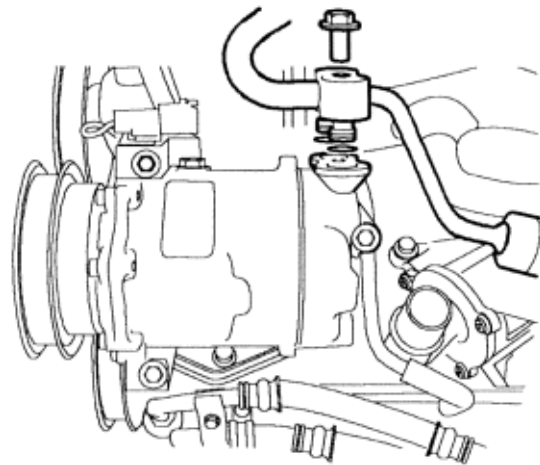
7. Remove through bolt securing RH steady bar to engine mounting bracket.
8. Remove nut securing RH mounting bracket to engine mounting.
9. Loosen 2 nuts securing restraint bar to body.



- 10. Remove bolt securing low pressure A/C pipe, to alternator upper mounting bracket.



- 11. Disconnect multiplug from alternator.
- 12. Release cover, remove nut and disconnect battery cable from alternator.
- 13. Release clip and remove intake hose from plenum chamber for access.



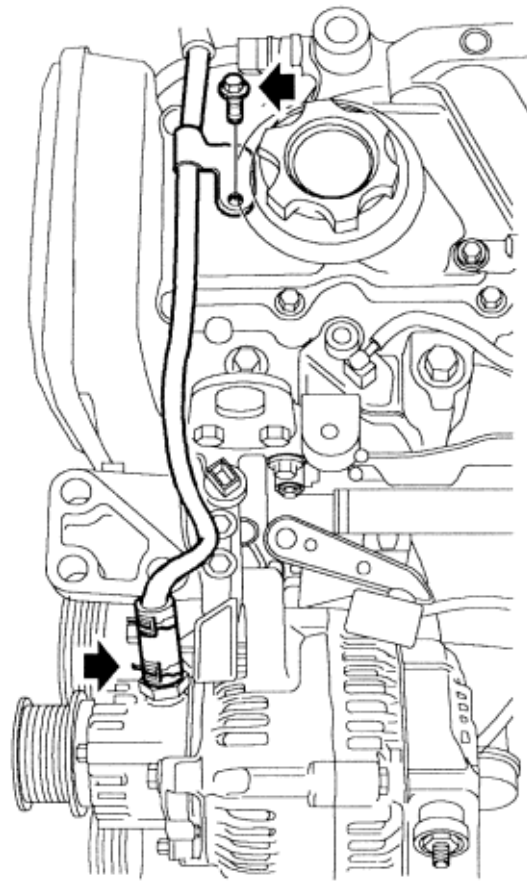
- 14. Remove bolt, release A/C pipes from compressor and discard 'O' rings.



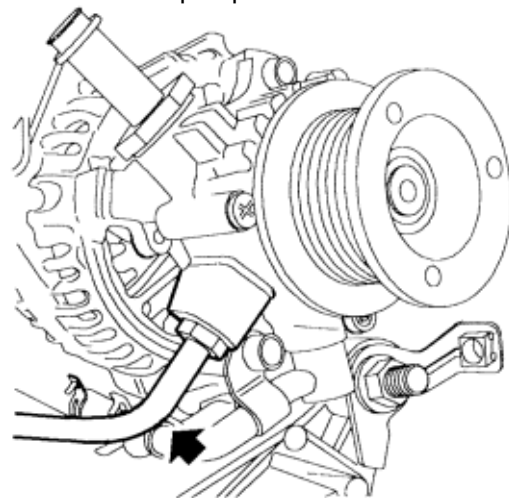
CAUTION

Immediately cap all A/C pipes to prevent ingress of dirt and moisture into the system.

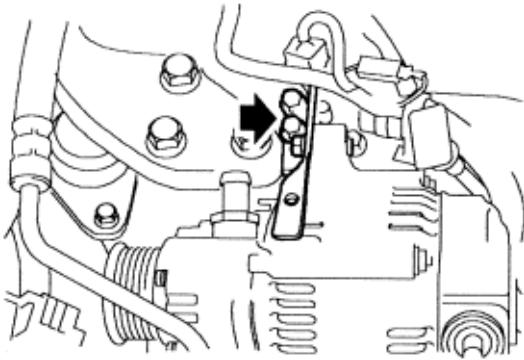
- 15. Tie A/C pipe aside to clear alternator.



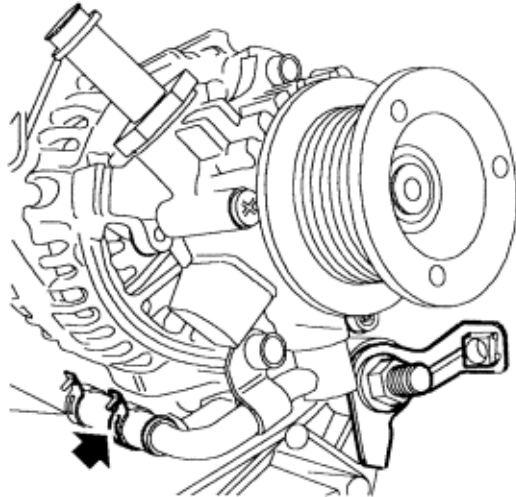
- 16. Remove bolt securing brake servo vacuum pipe to camshaft cover.
- 17. Release clip and disconnect vacuum hose from vacuum pump.



- 18. Place absorbent cloth beneath alternator oil feed pipe, to contain spill.
- 19. Loosen union and disconnect oil feed pipe from vacuum pump.



20. Remove 3 bolts and alternator upper mounting bracket.



21. Raise engine on jack, remove nut and bolt from alternator lower mounting bracket.
22. Release alternator from mounting, release clip and remove oil return pipe.
23. Remove alternator from vehicle.



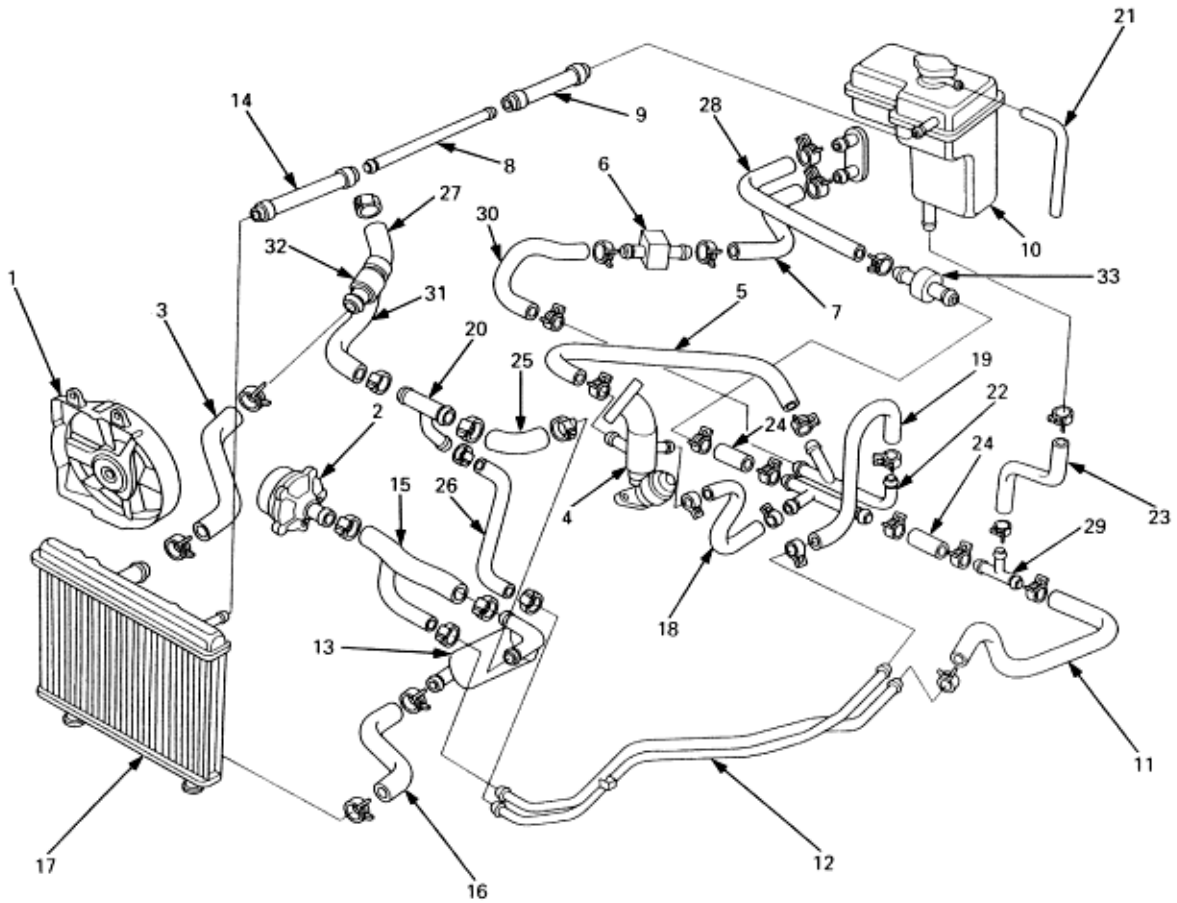
CAUTION

Plug the connections.

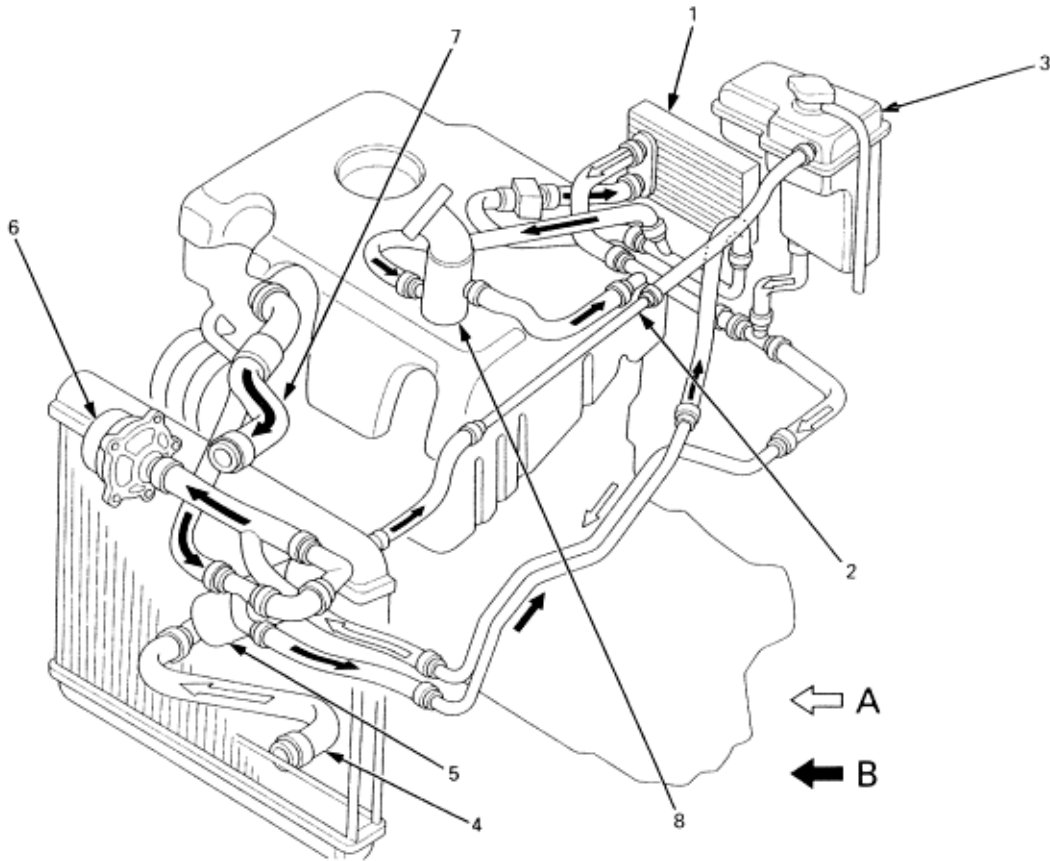
24. Transfer vacuum pump to new alternator. **See BRAKES, Repairs.**

Refit

1. Clean all pipe connections.
2. Fit oil return hose to vacuum pump and secure with clip, fit alternator to lower mounting bracket.
3. Fit nut and bolt to alternator lower mounting but do not tighten at this stage.
4. Fit bolts securing alternator upper mounting bracket to coolant elbow and tighten to 25 Nm (2.5 kgf/m, 18 lbf/ft).
5. Fit oil feed pipe union to vacuum pump and tighten union to 12 Nm (1.2 kgf/m, 9 lbf/ft).
6. Fit and tighten alternator upper mounting bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).
7. Tighten alternator lower mounting bolt to 45 Nm (4.6 kgf/m, 33 lbf/ft).
8. Connect vacuum hose to vacuum pump and secure with clip.
9. Align vacuum pipe bracket to camshaft cover and tighten bolt.
10. Clean A/C pipe connections and compressor mounting face.
11. Lubricate new 'O' rings with refrigerant oil and fit to compressor. Connect A/C pipe union to compressor and tighten bolt to 35 Nm (3.6 kgf/m, 26 lbf/ft).
12. Fit bolt retaining A/C low pressure pipe, to alternator upper mounting bracket and tighten bolt to 10 Nm (1.0 kgf/m, 7 lbf/ft).
13. Connect battery cable to alternator stud, tighten nut to 4 Nm (0.4 kgf/m, 3 lbf/ft) and position cover.
14. Connect multiplug to alternator.
15. Lower engine, fit nut securing RH mounting bracket to engine mounting and tighten to 85 Nm (8.7 kgf/m, 63 lbf/ft).
16. Tighten engine mounting restraint bar nuts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
17. Connect steady bar to engine mounting bracket, fit through bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
18. Fit air intake hose to plenum and tighten clip.
19. Remove jack positioned to support engine.
20. Fit receiver drier. **See AIR CONDITIONING, Repairs.**
21. Fit auxiliary drive belt.
22. Fit engine acoustic cover. **See ENGINE, Repairs.**
23. Connect battery earth lead.



- | | |
|--|--|
| 1. Cooling fan and cowl | 18. Hose - EGR cooler return |
| 2. Coolant pump | 19. Hose - coolant rail to 6 way joint |
| 3. Top hose A | 20. Heater joint |
| 4. EGR cooler | 21. Hose - expansion tank |
| 5. Hose - 6 way joint to EGR cooler | 22. 6 way joint |
| 6. Heater temperature control valve | 23. Hose - expansion tank return |
| 7. Hose - heater matrix feed | 24. Hose - return connecting |
| 8. Pipe - expansion | 25. Hose - heater joint to engine oil cooler |
| 9. Elbow - expansion tank to expansion pipe | 26. Hose - heater in |
| 10. Expansion tank | 27. Top hose B |
| 11. Hose - 3 way joint to coolant rail | 28. Hose - heater matrix return |
| 12. Coolant rail | 29. 3 way joint |
| 13. Engine oil cooler | 30. Hose - 6 way joint to heater temperature control valve |
| 14. Elbow - radiator to expansion pipe | 31. Top hose C |
| 15. Hose - engine oil cooler to coolant pump | 32. Top hose joint |
| 16. Bottom hose | 33. Water hose joint |
| 17. Radiator | |



- 1. Heater matrix
 - 2. Pipe - expansion
 - 3. Expansion tank
 - 4. Bottom hose
 - 5. Engine oil cooler
 - 6. Coolant pump
 - 7. Top hose
 - 8. EGR cooler
- A = Cold; B = Hot

The cooling system employed is the bypass type, which allows coolant to circulate around the engine while the thermostat is closed.

When the engine is cold the thermostat in the base of the engine oil cooler closes off the coolant feed from the radiator bottom hose. The pump draws coolant from the top of the cylinder block via the engine oil cooler and the circuit through the Exhaust Gas Recirculation (EGR) cooler. If the heater temperature control valve is open, coolant also flows through the heater matrix. Circulating a small amount of coolant prevents localised over-heating while retaining the majority of the heat within the engine, and so reduces the engine warm up time. The siting of the thermostat in the inlet rather than the outlet side provides a more stable control of the coolant temperature in the engine.

As the coolant temperature increases the thermostat gradually opens, bleeding cold coolant from the bottom hose into the pump via the oil cooler, and allowing hot coolant from the top of the cylinder block to flow to the radiator via the top hose. The thermostat then balances the proportion of hot and cold coolant flowing through the oil cooler and into the pump, to maintain the optimum engine operating temperature. Any excess coolant created by heat expansion is returned to the expansion tank via the expansion pipe from the top of the radiator.

The radiator is a cross flow type with a fin and tube core between moulded plastic end tanks. The bottom of the radiator is located in rubber bushes mounted on the front body member. The top of the radiator is located in rubber bushes mounted in brackets attached to the bonnet locking platform.

For additional air flow through the radiator, particularly when the vehicle is stationary, an electric cooling fan is fitted.

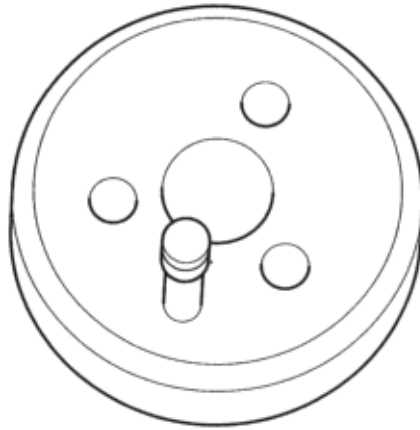
Operation of the cooling fan is controlled by the Engine Control Module (ECM). **See ENGINE MANAGEMENT SYSTEM, Description and Operation.**

The coolant pump is a rotor type pump which draws coolant from the engine oil cooler and from the EGR cooler/heater matrix circuit, and supplies it directly into the cylinder block. The pump is driven by the auxiliary drive belt via the Power Assisted Steering (PAS) pump.

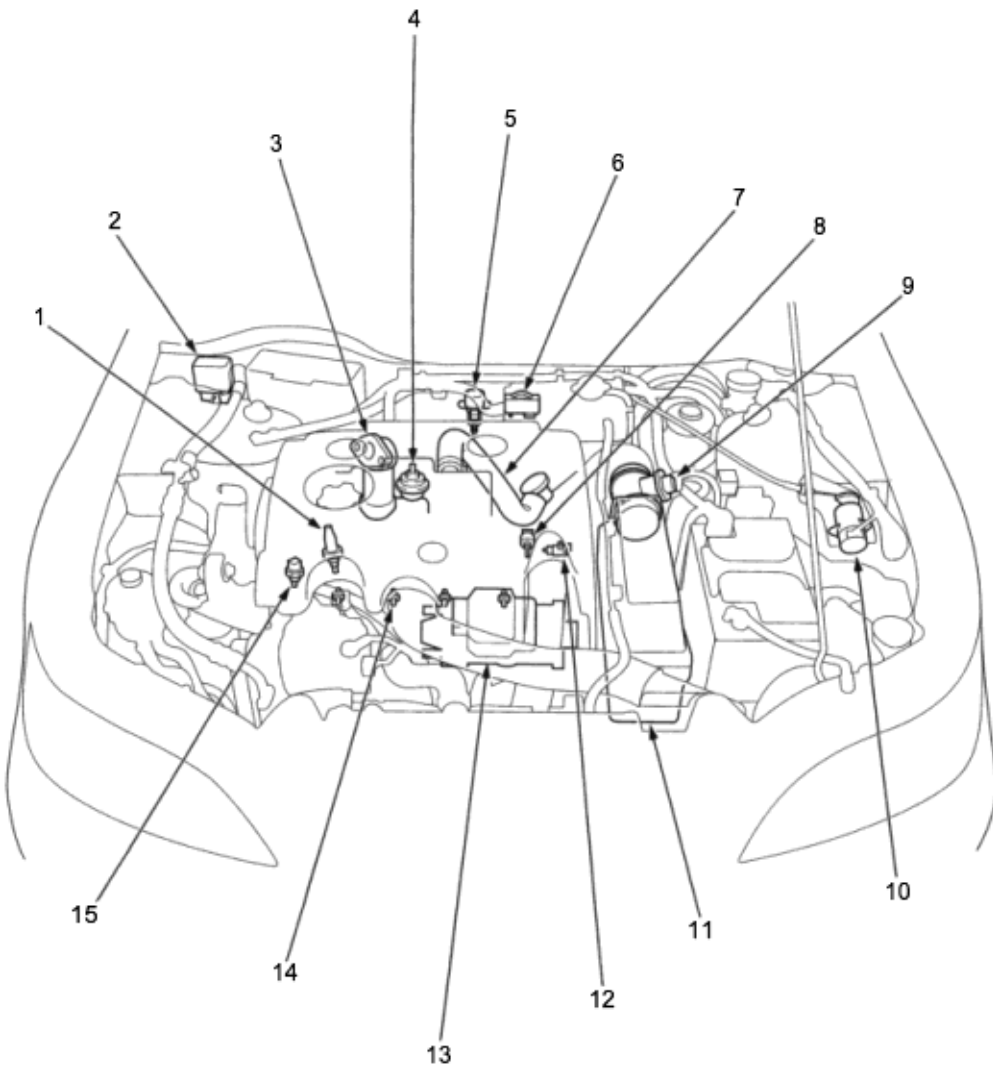
Special Tools

11-2

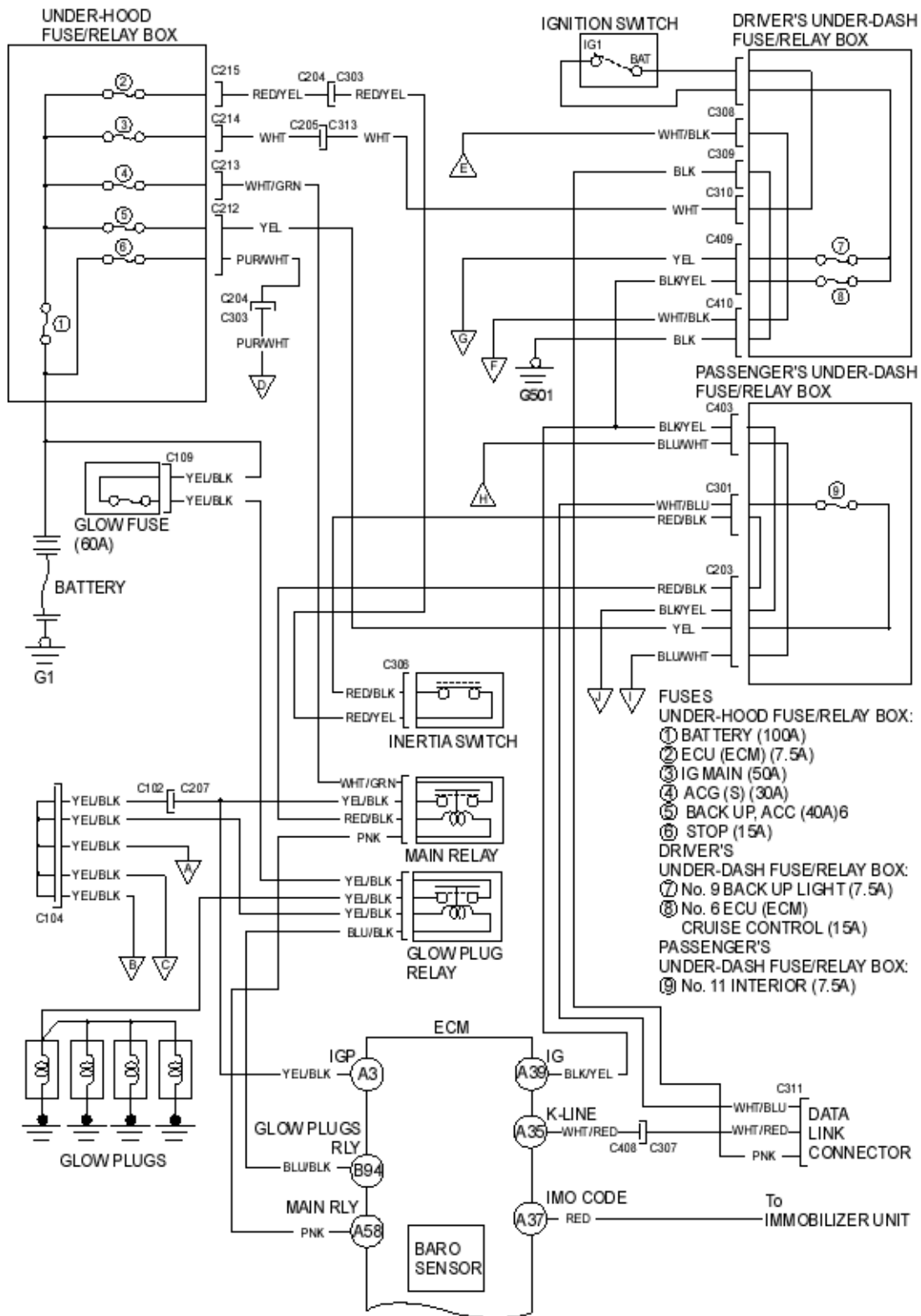
Ref. No.	Tool Number	Description	Qty	Remarks
(1)	18G 1717	Pull-off Device	1	VL-Churchill unique tool number

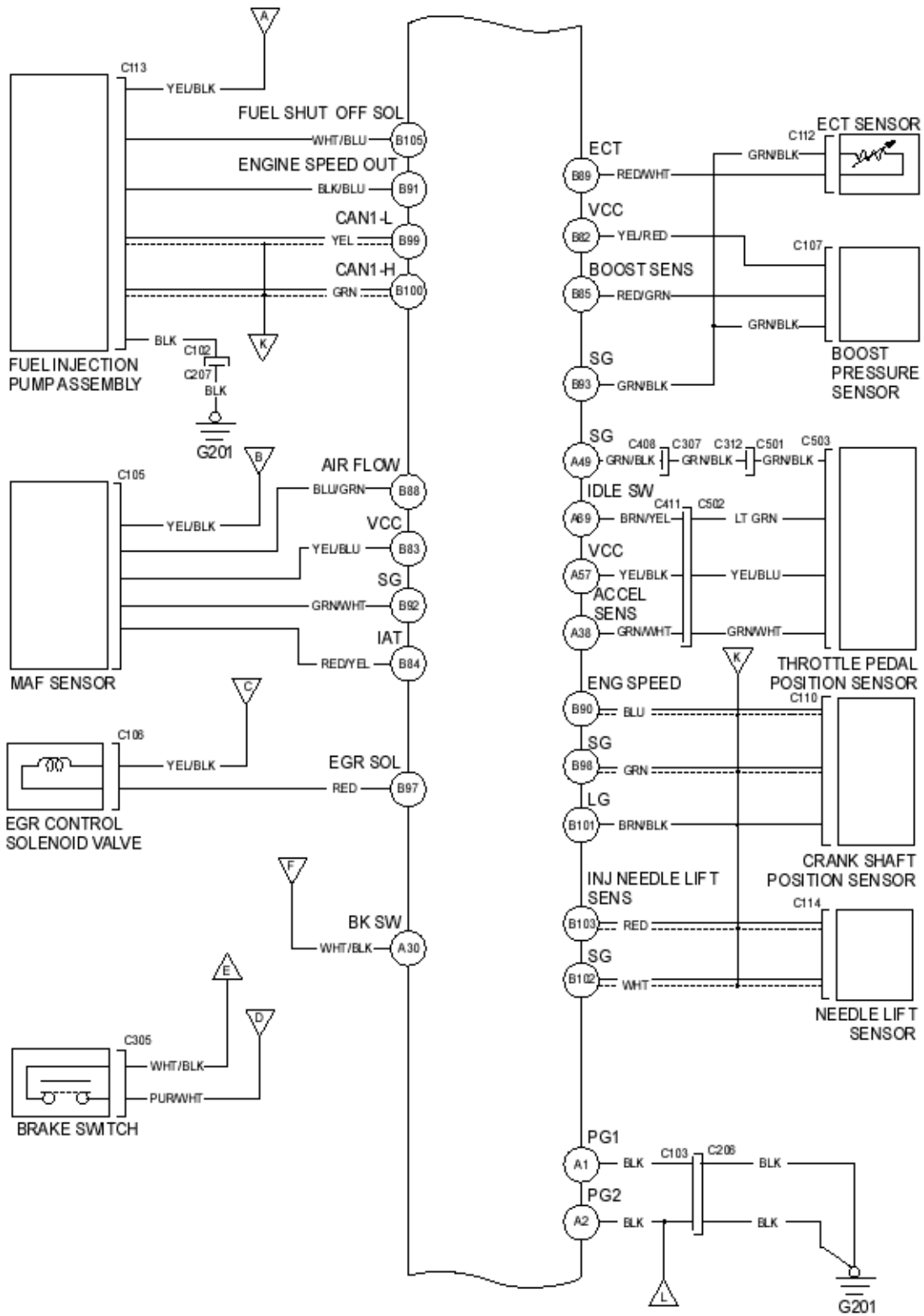


①

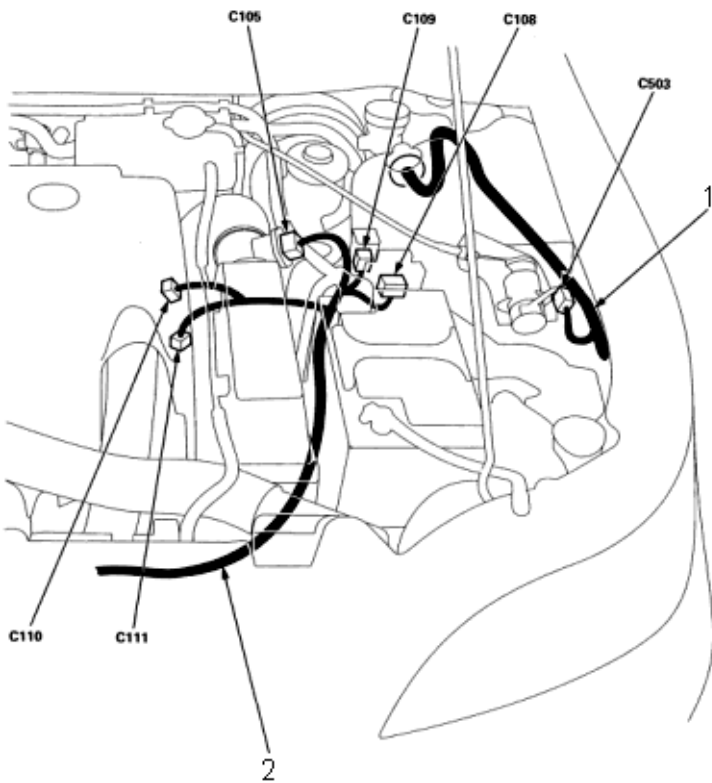


1. **NEEDLE LIFT SENSOR**
2. **RADIATOR FAN CONTROL MODULE**
3. **EXHAUST GAS RECIRCULATION (EGR) COOLER**
Removal, ([see page 11-26](#))
Installation, ([see page 11-26](#))
4. **EXHAUST GAS RECIRCULATION (EGR) VALVE**
Removal, ([see page 11-25](#))
Installation, ([see page 11-25](#))
5. **EXHAUST GAS RECIRCULATION (EGR) SOLENOID VALVE**
6. **BOOST PRESSURE SENSOR**
7. **CRANKCASE BREATHER HOSE**
8. **VEHICLE SPEED SENSOR (VSS)**
9. **MASS AIR FLOW (MAF) SENSOR**
10. **THROTTLE PEDAL POSITION SENSOR**
11. **AIR CLEANER**
Removal, ([see page 11-25](#))
Installation, ([see page 11-25](#))
12. **CRANKSHAFT POSITION (CKP) SENSOR**
13. **FUEL INJECTION PUMP ASSEMBLY**
Removal, ([see page 11-21](#))
Installation, ([see page 11-23](#))
14. **GLOW PLUG**
Removal, ([see page 11-24](#))
Installation, ([see page 11-24](#))
15. **ENGINE COOLANT TEMPERATURE (ECT) SENSOR**

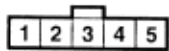




1. LEFT ENGINE COMPARTMENT WIRE HARNESS
2. ENGINE WIRE HARNESS

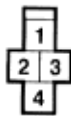


C105



①	BLU/GRN
②	YEL/BLU
③	GRN/WHT
④	YEL/BLK
⑤	RED/YEL

C108



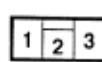
①	YEL/BLK
②	BLU/BLK
③	YEL/BLK
④	YEL/BLK

C109



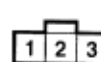
①	YEL/BLK
②	YEL/BLK

C110



①	BRN/BLK
②	BLU
③	GRN

C111



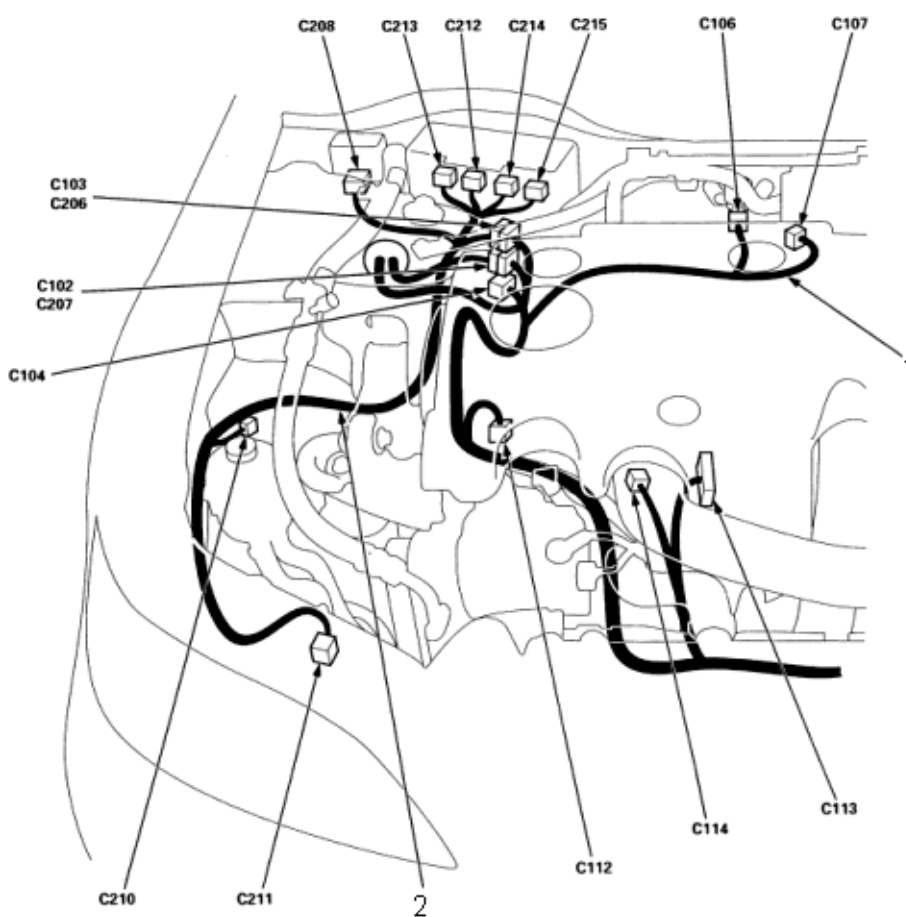
①	BLK/YEL
②	BLK
③	BLU/WHT

C503

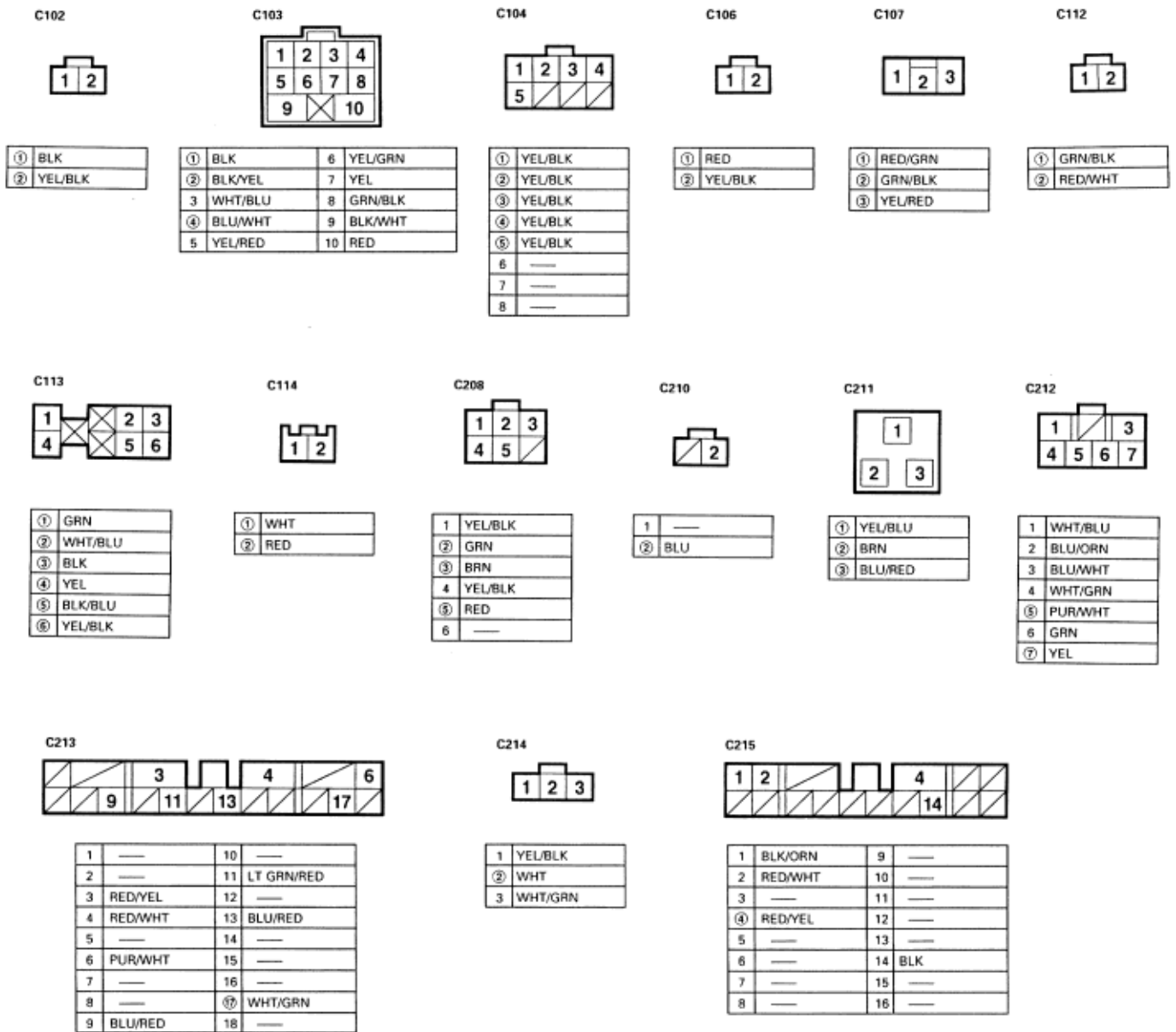


①	GRN/BLK
②	LT GRN
③	GRN/WHT
④	YEL/BLU

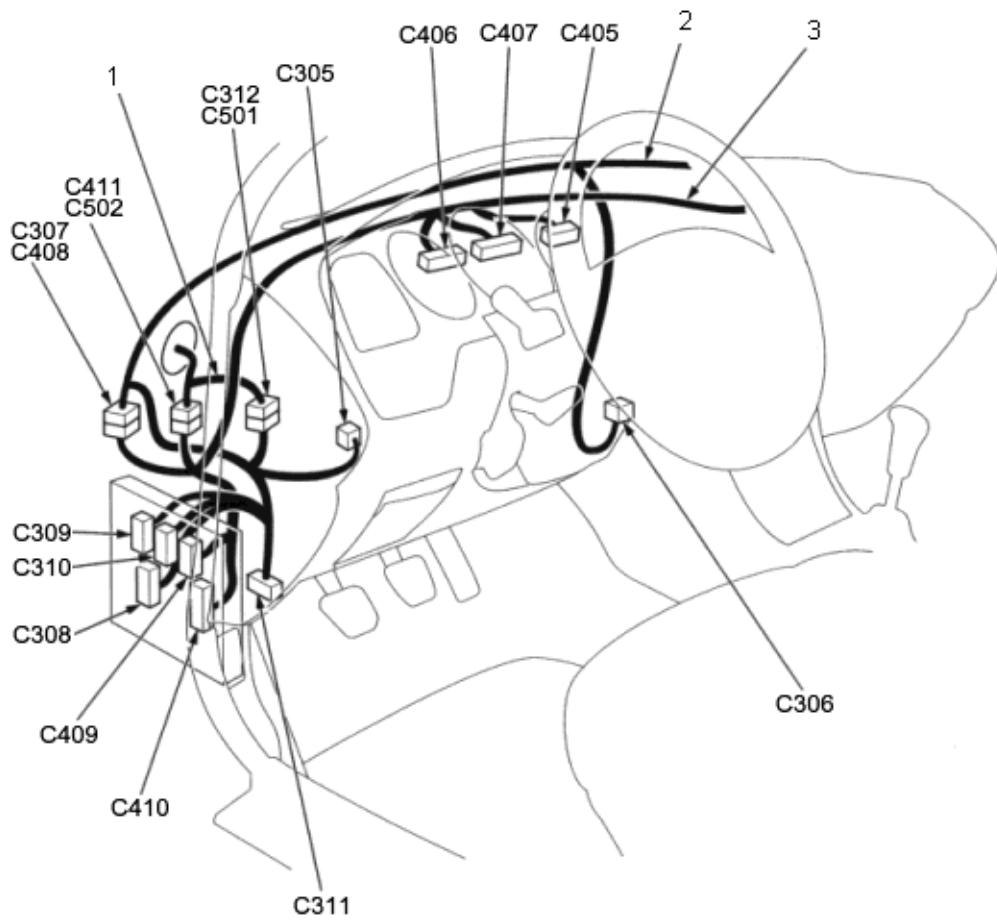
- NOTE:
- ♦ O: Related to Fuel and Emissions System.
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side



1. ENGINE WIRE HARNESS
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS



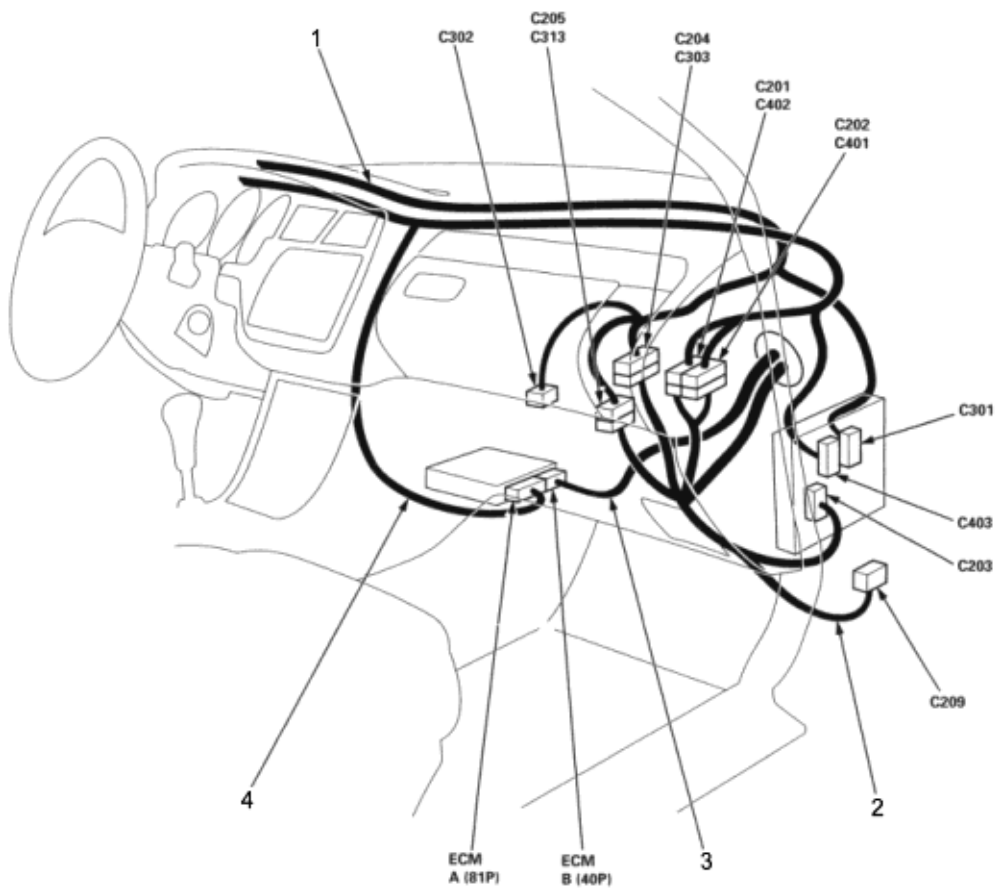
NOTE: ♦ O: Related to Fuel and Emissions System.
 ♦ Connector with male terminals (double outline): View from terminal side
 ♦ Connector with female terminals (single outline): View from wire side



1. LEFT ENGINE COMPARTMENT WIRE HARNESS
2. DASHBOARD WIRE HARNESS B
3. DASHBOARD WIRE HARNESS A

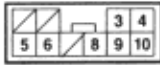
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<table border="1"> <tr><td>1</td><td>---</td></tr> <tr><td>2</td><td>---</td></tr> <tr><td>③</td><td>WHT/BLK</td></tr> <tr><td>④</td><td>PUR/WHT</td></tr> </table>	1	---	2	---	③	WHT/BLK	④	PUR/WHT	<table border="1"> <tr><td>①</td><td>RED/YEL</td></tr> <tr><td>②</td><td>RED/BLK</td></tr> </table>	①	RED/YEL	②	RED/BLK	<table border="1"> <tr><td>1</td><td>---</td><td>9</td><td>GRN/WHT</td></tr> <tr><td>2</td><td>---</td><td>10</td><td>---</td></tr> <tr><td>3</td><td>---</td><td>11</td><td>RED</td></tr> <tr><td>④</td><td>WHT/BLU</td><td>⑩</td><td>WHT/RED</td></tr> <tr><td>⑤</td><td>YEL/BLU</td><td>13</td><td>---</td></tr> <tr><td>6</td><td>YEL/RED</td><td>⑩</td><td>BLK/BLU</td></tr> <tr><td>7</td><td>---</td><td>15</td><td>PNK</td></tr> <tr><td>8</td><td>WHT/RED</td><td>⑩</td><td>GRN/BLK</td></tr> </table>	1	---	9	GRN/WHT	2	---	10	---	3	---	11	RED	④	WHT/BLU	⑩	WHT/RED	⑤	YEL/BLU	13	---	6	YEL/RED	⑩	BLK/BLU	7	---	15	PNK	8	WHT/RED	⑩	GRN/BLK	<table border="1"> <tr><td>1</td><td>---</td><td>11</td><td>YEL/BLK</td></tr> <tr><td>2</td><td>---</td><td>12</td><td>RED</td></tr> <tr><td>3</td><td>RED/BLK</td><td>13</td><td>BLK/ORN</td></tr> <tr><td>4</td><td>LT GRN/RED</td><td>14</td><td>BLK/YEL</td></tr> <tr><td>5</td><td>WHT/RED</td><td>15</td><td>---</td></tr> <tr><td>6</td><td>BLK</td><td>16</td><td>LT GRN</td></tr> <tr><td>7</td><td>---</td><td>17</td><td>BLU/WHT</td></tr> <tr><td>8</td><td>WHT/BLK</td><td>18</td><td>YEL</td></tr> <tr><td>9</td><td>BLU</td><td>19</td><td>PNK</td></tr> <tr><td>10</td><td>---</td><td>⑩</td><td>WHT/BLK</td></tr> </table>	1	---	11	YEL/BLK	2	---	12	RED	3	RED/BLK	13	BLK/ORN	4	LT GRN/RED	14	BLK/YEL	5	WHT/RED	15	---	6	BLK	16	LT GRN	7	---	17	BLU/WHT	8	WHT/BLK	18	YEL	9	BLU	19	PNK	10	---	⑩	WHT/BLK	<table border="1"> <tr><td>1</td><td>PUR</td><td>12</td><td>ORN</td></tr> <tr><td>2</td><td>WHT/BLU</td><td>13</td><td>GRN/WHT</td></tr> <tr><td>3</td><td>GRN/BLK</td><td>14</td><td>YEL/RED</td></tr> <tr><td>4</td><td>BLK</td><td>15</td><td>BLK</td></tr> <tr><td>5</td><td>BLK/ORN</td><td>16</td><td>WHT</td></tr> <tr><td>6</td><td>---</td><td>17</td><td>LT BLU</td></tr> <tr><td>7</td><td>---</td><td>18</td><td>GRN</td></tr> <tr><td>8</td><td>RED/BLK</td><td>19</td><td>---</td></tr> <tr><td>⑩</td><td>BLK</td><td>20</td><td>GRN/RED</td></tr> <tr><td>10</td><td>---</td><td>21</td><td>GRN/ORN</td></tr> <tr><td>11</td><td>---</td><td>22</td><td>---</td></tr> </table>	1	PUR	12	ORN	2	WHT/BLU	13	GRN/WHT	3	GRN/BLK	14	YEL/RED	4	BLK	15	BLK	5	BLK/ORN	16	WHT	6	---	17	LT BLU	7	---	18	GRN	8	RED/BLK	19	---	⑩	BLK	20	GRN/RED	10	---	21	GRN/ORN	11	---	22	---							
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 ♦ Connector with male terminals (double outline): View from terminal side
 ♦ Connector with female terminals (single outline): View from wire side



1. DASHBOARD WIRE HARNESS B
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS
3. ENGINE WIRE HARNESS
4. DASHBOARD WIRE HARNESS A

C201



1	---	6	PUR/WHT
2	---	7	---
③	BLK	8	YEL
4	WHT/GRN	⑨	BLK
5	ORN	⑩	YEL/BLK

C202



①	PNK	12	BLU/BLK
②	GRN	13	---
3	---	④	RED
4	YEL	15	YEL/RED
5	GRN/BLK	16	---
6	---	⑦	BLU
7	---	18	YEL/GRN
⑧	YEL/BLU	19	WHT/BLU
⑨	BLU/RED	20	YEL/GRN
⑩	BRN	21	---
⑪	BRN	22	---

C203



①	RED/BLK	10	---
2	RED/YEL	11	---
③	BLK/YEL	④	BLU/WHT
4	---	13	BLU/RED
⑤	YEL	14	---
6	---	15	---
7	RED/BLK	16	---
8	BLK/ORN	17	---
9	WHT/GRN	18	BLK

C204



1	---	13	LT GRN/RED
2	---	14	LT BLU
3	---	15	---
4	---	16	---
⑤	RED/YEL	⑥	PUR/WHT
6	YEL	18	---
7	---	19	GRN
8	---	20	GRN/BLK
9	---	21	RED/WHT
10	---	22	WHT/GRN
11	---	23	---
12	---	24	---

C205



1	BLK/WHT
2	WHT/BLU
③	WHT
4	BLU
5	BLU/YEL
6	BLU/RED
7	BLU/BLK

C209



①	WHT/GRN
②	RED/BLK
③	YEL/BLK
④	PNK

C301



①	WHT/BLU	9	---
2	GRN/YEL	10	BLU/YEL
3	WHT	11	---
4	BLK/RED	12	YEL
5	RED/BLK	13	LT GRN
6	BLK	④	RED/BLK
7	YEL/BLK	15	BLK/ORN
8	BLU/WHT	16	---

C302



①	WHT/BLU
②	BLK/BLU

C403



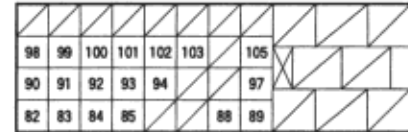
①	BLU/WHT	10	RED/WHT
2	---	11	PUR/WHT
3	---	④	BLK/YEL
4	---	13	RED/YEL
5	RED/YEL	14	RED/BLU
6	BRN/WHT	15	WHT/GRN
7	RED/BLK	16	GRN/WHT
8	BLK/WHT	17	---
9	GRN/BLK	18	RED/YEL

ECM A (81P)



①	BLK	16	---	31	---	46	---	⑥	BRN	76	---
②	BLK	17	---	32	---	47	---	⑦	---	77	---
③	YEL/BLK	18	---	⑧	YEL/BLU	48	---	⑧	---	78	---
4	---	19	---	34	---	⑨	GRN/BLK	64	---	79	---
5	---	20	---	⑩	WHT/RED	⑩	BLU/RED	65	---	80	---
6	---	21	---	⑪	BLK/BLU	⑪	WHT/BLU	66	---	⑪	YEL/BLU
7	---	22	---	⑫	RED	52	---	67	---		
8	---	23	---	⑬	GRN/WHT	53	---	⑬	BLU/WHT		
9	---	24	---	⑭	BLK/YEL	54	---	⑭	BRN/YEL		
10	---	25	---	⑮	GRN	⑮	BRN	70	---		
11	---	26	---	⑯	RED	56	---	71	---		
12	---	⑰	BLU	⑰	GRN/ORN	⑰	YEL/BLK	72	---		
13	---	28	---	⑱	BLU/RED	⑱	PNK	73	---		
14	---	29	---	44	---	59	---	74	---		
15	---	⑳	WHT/BLK	45	---	60	---	75	---		

ECM B (40P)



⑰	YEL/RED	⑱	BLU/BLK	106	---	118	---
⑱	YEL/BLU	95	---	107	---	119	---
⑲	RED/YEL	96	---	108	---	120	---
⑲	RED/GRN	⑲	RED	109	---	121	---
86	---	⑲	GRN	110	---		
87	---	⑲	YEL	111	---		
⑲	BLU/GRN	⑲	GRN	112	---		
⑲	RED/WHT	⑲	BRN/BLK	113	---		
⑲	BLU	⑲	WHT	114	---		
⑲	BLK/BLU	⑲	RED	115	---		
⑲	GRN/WHT	104	---	116	---		
⑲	GRN/BLK	⑲	WHT/BLU	117	---		

NOTE:

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- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

Connect the Honda PGM Tester or the P-code Reader to the Data Link Connector (DLC) to check the Diagnostic Trouble Code (DTC) and the status.

Diagnostic Trouble Code (DTC)	Status	MIL	Detected Item	Possible Cause
P0101	1010		Mass Air Flow (MAF) sensor plausibility	MAF sensor
P0102	0010		Mass Air Flow (MAF) sensor low input	AIRFLOW circuit VCC circuit ECM
P0102	1011		Mass Air Flow (MAF) sensor low input	MAF sensor
P0103	0001		Mass Air Flow (MAF) sensor high input	AIRFLOW circuit SG circuit ECM
P0103	1100		Mass Air Flow (MAF) sensor high input	MAF sensor
P0107	0010		Barometric Pressure (Baro) sensor low input	ECM
P0108	0001		Barometric Pressure (Baro) sensor high input	ECM
P0112	0010		Intake Air Temperature (IAT) sensor high input	MAF sensor IAT circuit ECM
P0113	0001		Intake Air Temperature (IAT) sensor high input	MAF sensor SG circuit ECM
P0117	0010		Engine Coolant Temperature (ECT) sensor low input	ECT sensor ECT circuit ECM
P0118	0001		Engine Coolant Temperature (ECT) sensor high input	ECT sensor SG circuit ECM
P0121	1010		Throttle pedal position sensor plausibility with idle switch	Throttle pedal position sensor ACCEL SENS circuit IDLE SW circuit ECM
P0121	1011		Throttle pedal position sensor plausibility with potentiometer	Throttle pedal position sensor ACCEL SENS circuit ECM
P0121	1110		Throttle pedal position sensor plausibility general	Throttle pedal position sensor ACCEL SENS circuit ECM
P0122	0010		Throttle pedal position sensor low input	Throttle pedal position sensor ACCEL SENS circuit VCC circuit ECM
P0123	0001		Throttle pedal position sensor high input	Throttle pedal position sensor ACCEL SENS circuit SG circuit ECM
P0126	1010		Engine Coolant Temperature (ECT) not attained	ECT sensor Cooling system
P0181	1011		Fuel injection pump temperature sensor problem	Fuel injection pump
P0183	1010		Fuel injection pump over temperature	Fuel injection pump
P0215	1010	ON	Shut-off solenoid valve continuously enabled	Fuel injection pump
P0215	1011	ON	Shut-off solenoid valve continuously disabled	Fuel injection pump
P0215	1101	ON	Shut-off solenoid valve shut off path defect	Fuel injection pump
P0215	1110	ON	Shut-off solenoid valve shut off defective	Fuel injection pump
P0215		ON	Shut-off solenoid valve short circuit	Fuel injection pump

Troubleshooting**11-15****DTC Troubleshooting (cont'd)**

Diagnostic Trouble Code (DTC)	Status	MIL	Detected Item	Possible Cause
P0216	1010		Timing device position governing permanent governor deviation	Engine assembly
P0219	1110		Crankshaft position sensor overspeed recognition	Fuel injection pump
P0236	1010		Boost pressure sensor plausibility with atmospheric pressure	MAF sensor
P0237	0010		Boost pressure sensor low input	MAF sensor BOOST SENS circuit ECM
P0238	0001		Boost pressure sensor high input	MAF sensor BOOST SENS circuit ECM
P0251	0110		Fuel pump control unit control pulse width fault	Fuel injection pump
P0251	0111		Fuel pump control unit crankshaft speed and camshaft speed comparison	Fuel injection pump
P0251	1001		Fuel pump control unit no pump map programmed or RAM	Fuel injection pump
P0251	1010		Fuel pump control unit EEPROM or ADC defect	Fuel injection pump
P0251	1011		Fuel pump control unit fuel powerstage hardware error	Fuel injection pump
P0251	1101		Fuel pump control unit fuel powerstage voltage measurement defect	Fuel injection pump
P0251	1110		Fuel pump control unit time out	Fuel injection pump
P0336	1010		Crankshaft position sensor plausibility with boost pressure	Crankshaft position sensor ENG SPEED circuit ECM
P0336	1011		Crankshaft position sensor dynamic plausibility	Crankshaft position sensor ENG SPEED circuit ECM
P0336	1101		Crankshaft position sensor static plausibility	Crankshaft position sensor ENG SPEED circuit ECM
P0480	0100		Slow fan control short circuit to ground	Radiator fan control module SLOW FAN circuit ECM
P0480	1000		Slow fan control short circuit to battery positive	Radiator fan control module SLOW FAN circuit ECM
P0481	0100		Fast fan control short circuit to ground	Radiator fan control module FAST FAN circuit ECM
P0481	1000		Fast fan control short circuit to battery positive	Radiator fan control module FAST FAN circuit ECM
P0501	1011		Vehicle Speed Sensor (VSS) plausibility with engine speed and injection	VSS
P0503	0001		Vehicle Speed Sensor (VSS) high input	VSS VSS circuit ECM

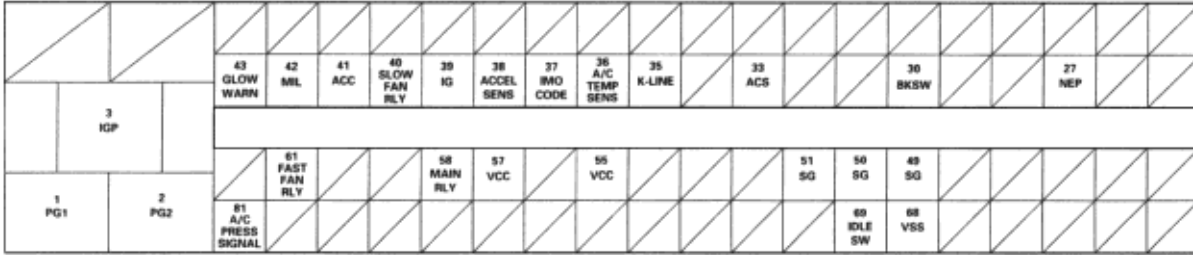
Diagnostic Trouble Code (DTC)	Status	MIL	Detected Item	Possible Cause
P0503	1010		Vehicle Speed Sensor (VSS) input frequency too high	Transmission assembly
P0532	0010		Air conditioning pressure low input	A/C refrigerant A/C pressure switch A/C PRESS SENSOR circuit ECM
P0533	0001		Air conditioning pressure high input	A/C pressure switch A/C PRESS SENSOR circuit ECM
P0562	0010		Battery voltage low input	Battery IGP circuit ECM
P0563	0001		Battery voltage high input	Alternator
P0571	1010		Brake switch plausibility with redundant contact after initialisation	Brake switch BKSW circuit ECM
P0571	1011		Brake switch plausibility with redundant contact	Brake switch BKSW circuit ECM
P0601	1011		EEPROM and configuration compensation values and checksum	ECM
P0601	1101		EEPROM and configuration EEPROM communication	ECM
P0601	1110		EEPROM and configuration fuel quantity compensation	ECM
P0606	0001		Reference voltage too high	VCC circuit ECM
P0606	0010		Reference voltage too low	MAF sensor Boost pressure sensor Throttle pedal position sensor A/C pressure switch VCC circuit ECM
P0606	1011		Microcontroller redundant overrun monitoring	ECM
P1102	1001		Mass Air Flow (MAF) sensor supply too low	MAF sensor VCC circuit ECM
P1103	0111		Mass Air Flow (MAF) sensor supply too low	MAF sensor VCC circuit ECM
P1111			Boost pressure sensor governor deviation	Pipes to boost pressure sensor
P1112			Boost pressure sensor short circuit to battery positive	Boost pressure sensor BOOST SENS circuit ECM
P1113			Boost pressure sensor short circuit to battery negative	Boost pressure sensor BOOST SENS circuit ECM
P1122	1001		Throttle pedal position sensor supply too low	Throttle pedal position sensor ACCEL SENS circuit VCC circuit ECM
P1123	0111		Throttle pedal position sensor supply too high	Throttle pedal position sensor ACCEL SENS circuit SG circuit ECM

Troubleshooting**11-17****DTC Troubleshooting (cont'd)**

Diagnostic Trouble Code (DTC)	Status	MIL	Detected Item	Possible Cause
P1124	1101		Throttle pedal position sensor plausibility with brake switch	Throttle pedal position sensor ACCEL SENS circuit ECM
P1215	0110		Terminal 15 plausibility after initialisation	ECM (15 A) fuse in the under-hood fuse/relay box and circuit Main relay ECM
P1215	1101		Fault emergency shut-off circuit	ECM (15 A) fuse in the under-hood fuse/relay box and circuit Main relay ECM
P1217	0010		Needle lift sensor low input	Needle lift sensor INJ NEEDLE LIFT SENS circuit ECM
P1218	0001		Needle lift sensor high input	Needle lift sensor INJ NEEDLE LIFT SENS circuit ECM
P1221	0011		Positive timing governor deviation	Fuel injection pump
P1222	0101		Negative timing governor deviation	Fuel injection pump
P1233	1010		Fuel injection pump battery voltage	Battery voltage supply circuit Fuel injection pump
P1241	1001		Boost pressure sensor supply too low	Boost pressure sensor tubing connection
P1242	0111		Boost pressure sensor supply too high	Boost pressure sensor tubing connection
P1251	1010		Fuel quantity solenoid valve error	Fuel injection pump
P1252	1011		Fuel quantity solenoid valve continuously energised	Fuel injection pump
P1253	1101		Fuel quantity solenoid valve sticks	Fuel injection pump
P1335	1010		Fuel pump position sensor malfunction	Engine assembly
P1380	1010		Glow plug relay positioner total error	Glow plug relay
P1381	0100		Glow plug relay positioner short circuit to battery negative	Glow plug relay GLOW PLUG RLY circuit ECM
P1382	1000		Glow plug relay positioner short circuit to battery positive	Glow plug relay GLOW PLUG RLY circuit ECM
P1401			EGR valve positive governor deviation	EGR tubing
P1402			EGR valve negative governor deviation	EGR tubing
P1403	1000		EGR valve short circuit to battery positive	EGR control solenoid valve EGR SOL circuit ECM
P1404	0100		EGR valve short circuit to battery negative	EGR control solenoid valve EGR SOL circuit ECM

Diagnostic Trouble Code (DTC)	Status	MIL	Detected Item	Possible Cause
P1437			A/C compressor temperature sensor low input	A/C compressor temperature sensor A/C TEMP SENSOR circuit ECM
P1438			A/C compressor temperature sensor high input	A/C compressor temperature sensor A/C TEMP SENSOR circuit ECM
P1537	0100		A/C compressor short circuit to battery negative	Radiator fan control module ACC circuit ECM
P1538	1000		A/C compressor short circuit to battery positive	Radiator fan control module ACC circuit ECM
P1602			Crankshaft position sensor synchronisation pulse defective	Crankshaft position sensor
P1610	1011	ON	Main relay shuts off too late	ECM
P1611	1010	ON	Main relay shuts off too early	MAIN RLY circuit
P1615			Microcontroller gate array communication not checked for validity	ECM
P1616	1010		Microcontroller gate array communication	ECM
P1621	1100		Immobiliser, no code received	Immobiliser unit IMOCODE circuit ECM
P1622	1110		Immobiliser, wrong code received and EPROM data NG	Ignition keys Immobiliser receiver ECM
P1623	0110		Immobiliser, no code received and different EPROM data	Ignition keys Immobiliser receiver ECM
P1640	1011		CAN controller device defective	Fuel injection pump
P1641	1010		CAN controller device offline	Fuel injection pump CAN1-L circuit CAN1-H circuit ECM
P1667	0111		Immobiliser, wrong level detected	ECM
P1672	1010		Immobiliser, wrong code received	Ignition keys Immobiliser receiver ECM
P1673	1011		Immobiliser, engine operations blocked	ECM (re-mobilise)
P1688	1010	ON	Fuel pump control unit read error PSG1 message	Fuel injection pump
P1688	1011	ON	Fuel pump control unit CAN defect recognised	Fuel injection pump
P1688	1110	ON	Fuel pump control unit write error MSG1 message	Fuel injection pump

ECM Inputs and Outputs at Connector A (81P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire colour	Terminal name	Description	Signal
1	BLK	PG1 (POWER GROUND)	Ground for the ECM control circuit.	Less than 1.0 V at all times
2	BLK	PG2 (POWER GROUND)	Ground for the ECM control circuit.	Less than 1.0 V at all times
3	YEL/BLK	IGP (POWER SOURCE)	Power source for the ECM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
27	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With ignition running: pulses
30	WHT/BLK	BKSWS (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage
33	YEL/BLU	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: battery voltage
35	WHT/RED	K-LINE	Sends and receives scan tool signal.	With ignition switch ON (II): pulses
36	BLK/BLU	A/C TEMP SENS (A/C TEMPERATURE SENSOR)	Detects A/C temperature sensor signal.	With ignition switch ON (II): about 0-5 V (depending on A/C temperature)
37	RED	IMO CODE (IMMOBILISER CODE)	Detects immobiliser signal.	
38	GRN/WHT	ACCEL SENS (THROTTLE PEDAL POSITION SENSOR)	Detects throttle pedal position sensor signal.	With ignition switch ON (II): about 0-5 V (depending on throttle pedal position)
39	BLK/YEL	IG (IGNITION SWITCH)	Detects the ignition switch signal.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
40	GRN	SLOW FAN RLY (RADIATOR FAN RELAY SLOW CONTROL)	Drives the radiator fan relay (slow control).	With radiator fan relay ON (slow control): 0 V With radiator fan relay OFF (slow control): battery voltage
41	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
42	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
43	BLU/RED	GLOW WARN (GLOW PLUGS INDICATOR)	Drives glow plugs indicator.	With glow plugs indicator ON: 0 V With glow plugs indicator OFF: battery voltage
49	GRN/BLK	SG (SENSOR GROUND)	Ground for throttle pedal position sensor.	
50	BLU/RED	SG (SENSOR GROUND)	Ground for A/C pressure switch.	
51	WHT/BLU	SG (SENSOR GROUND)	Ground for A/C temperature sensor.	
55	BRN	VCC (SENSOR VOLTAGE)	Power source to A/C pressure switch.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
57	YEL/BLK	VCC (SENSOR VOLTAGE)	Power source to throttle pedal position sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
58	PNK	MAIN RLY (MAIN RELAY)	Drives main relay.	With ignition switch ON (II): 0 V With ignition switch turned OFF:

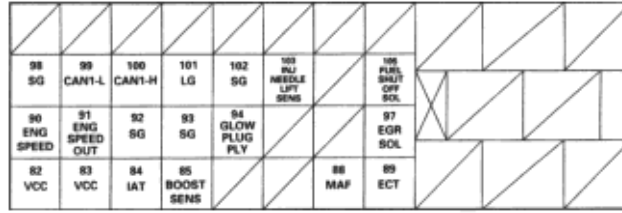
				battery voltage
61	BRN	FAST FAN RLY (RADIATOR FAN RELAY FAST CONTROL)	Drives the radiator fan relay (fast control).	With radiator fan relay ON (fast control): 0 V With radiator fan relay OFF (fast control): battery voltage
68	BLU/WHT	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheel rotating: cycles 0 V - about 5 V or battery voltage
69	BRN/YEL	IDLE SW (IDLE SWITCH)	Detect idle switch (throttle pedal position sensor) signal.	With idle switch open: battery voltage With idle switch close: 0 V
81	YEL/BLU	A/C PRESS SIGNAL (A/C PRESSURE SWITCH)	Detects A/C pressure switch signal.	With A/C switch ON: 0-5 V (depending on A/C pressure)

Troubleshooting

Engine Control Module Terminal Arrangement (cont'd)

11-20

ECM Inputs and Outputs at Connector B (40P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire colour	Terminal name	Description	Signal
82	YEL/RED	VCC (SENSOR VOLTAGE)	Power source to boost pressure sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
83	YEL/BLU	VCC (SENSOR VOLTAGE)	Power source to MAF sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
84	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0 - 5 V (depending on intake air temperature)
85	RED/GRN	BOOST SENS (BOOST PRESSURE SENSOR)	Detects boost pressure sensor signal.	With ignition switch ON (II): about 0 - 5 V (depending on boost pressure)
88	BLU/GRN	MAF (MASS AIR FLOW SENSOR)	Detects MAF sensor signal.	With engine running: about 0 - 5 V (depending on engine speed)
89	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0 - 5 V (depending on engine coolant temperature)
90	BLU	ENG SPEED (CRANKSHAFT POSITION SENSOR)	Detects crankshaft position sensor signal.	With engine running: pulses
91	BLK/BLU	ENG SPEED OUT (ENGINE SPEED OUTPUT SIGNAL)	Sends engine speed signal.	With engine running: pulses
92	GRN/WHT	SG (SENSOR GROUND)	Ground for MAF sensor.	
93	GRN/BLK	SG (SENSOR GROUND)	Ground for ECT sensor and boost pressure sensor.	
94	BLU/BLK	GLOW PLUG RLY (GLOW PLUG RELAY)	Drives glow plug relay.	With glow plug relay ON: duty controlled
97	RED	EGR SOL (EGR CONTROL SOLENOID VALVE)	Drives EGR control solenoid valve.	With engine running and EGR operating during with fully warmed up engine: duty controlled With engine running and EGR not operating: battery voltage
98	GRN	SG (SENSOR GROUND)	Ground for crankshaft position sensor.	
99	YEL	CAN1-L	Drives fuel injection pump.	With engine running: duty controlled
100	GRN	CAN1-H	Drives fuel injection pump.	With engine running: duty controlled
101	BRN/BLK	LG (LOGIC GROUND)	Ground for the ECM control circuit.	
102	WHT	SG (SENSOR GROUND)	Ground for needle lift sensor.	
103	RED	INJ NEEDLE LIFT SENS (NEEDLE LIFT SENSOR)	Detects needle lift sensor signal.	With engine running: pulses
105	WHT/BLU	FUEL SHUT OFF SOL (FUEL SHUT OFF SOLENOID)	Drives fuel shut off solenoid valve (fuel injection pump)	With engine running: duty controlled

| VALVE)

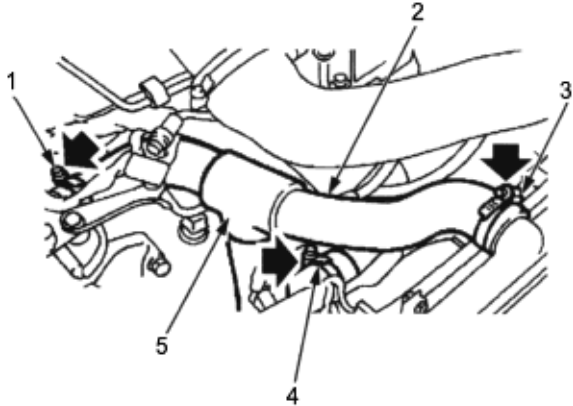
| assembly).

⚠ WARNING

Do not smoke while working on the fuel system.
Keep open flames or sparks away from your work area.
Be careful when working with diesel fuel. Some people can experience severe allergic reactions.

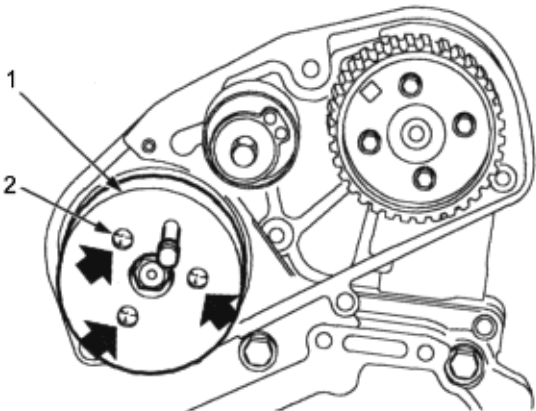
Removal

1. Disconnect the battery earth cable.
2. Remove the plenum chamber.
3. Drain the engine coolant.
4. Loosen the clip and disconnect the radiator top hose from radiator.
5. Loosen the clip and disconnect the radiator top hose from the engine coolant outlet elbow.
6. Loosen the clip and remove the radiator top hose from the oil cooler housing.



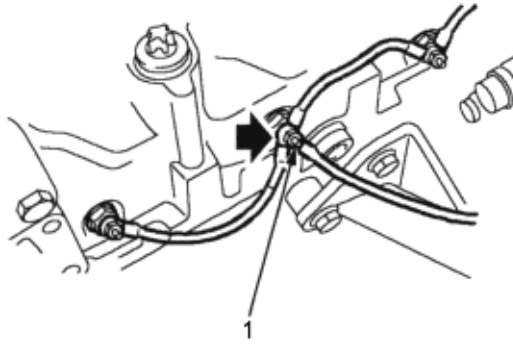
1. CLIP
2. RADIATOR TOP HOSE
3. CLIP
4. CLIP
5. ENGINE COOLANT OUTLET ELBOW

7. Remove the fuel injection pump timing belt.
8. Attach the pull-off device to fuel injection pump drive flange. Remove the three torx bolts, flywheel and drive gear from mounting.



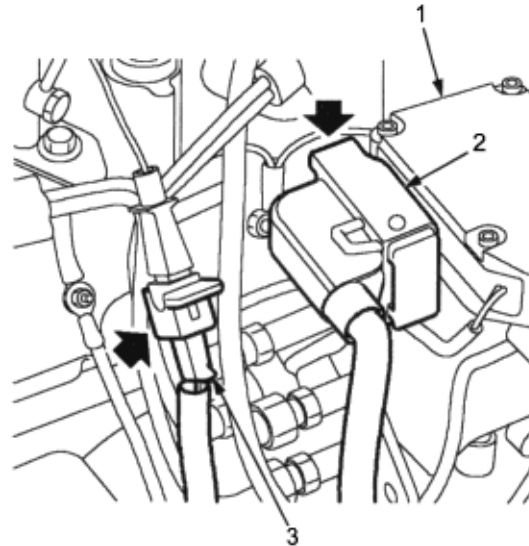
1. PULL-OFF DEVICE 18G 1717
2. 20 Nm (2.0 kgf/m, 14 lbf/ft)

9. Remove the nut and disconnect the wire harness feed lead from the No. 2 glow plug.



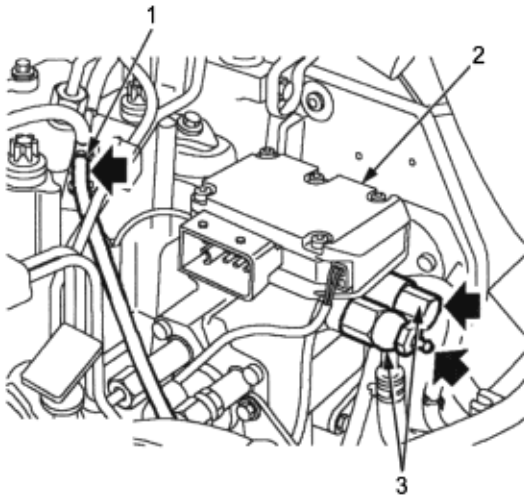
1. No. 2 GLOW PLUG
3 Nm (0.3 kgf/m, 2 lbf/ft)

10. Release the injector needle lift sensor connector from the fuel injection pump mounting bracket and disconnect from the engine wire harness.
11. Disconnect the connector from the fuel injection pump.



1. FUEL INJECTION PUMP
2. CONNECTOR
3. INJECTOR NEEDLE LIFT SENSOR CONNECTOR

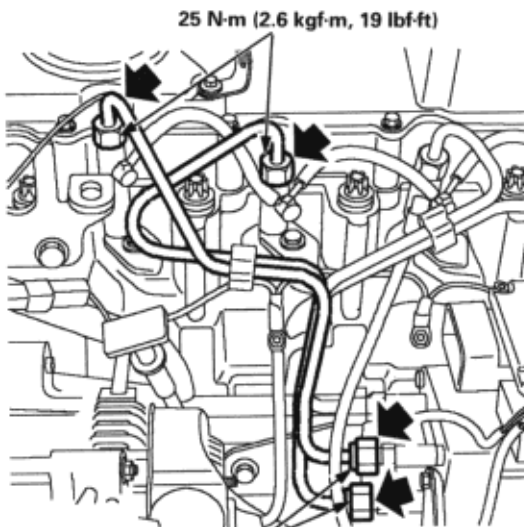
12. Release the engine wire harness clips from the support brackets.
13. Remove the banjo bolt securing fuel feed pipe to the fuel injection pump and discard sealing washers.
14. Disconnect the fuel return spill pipe from the No. 3 fuel injector.



- 1. FUEL RETURN SPILL PIPE
- 2. FUEL INJECTION PUMP
- 3. 25 Nm (2.6 kgf-m, 19 lbf-ft)

- 15. Remove the cap nut, disconnect the fuel return pipe banjo from the fuel injection pump and discard sealing washers.

CAUTION
Plug the connections.



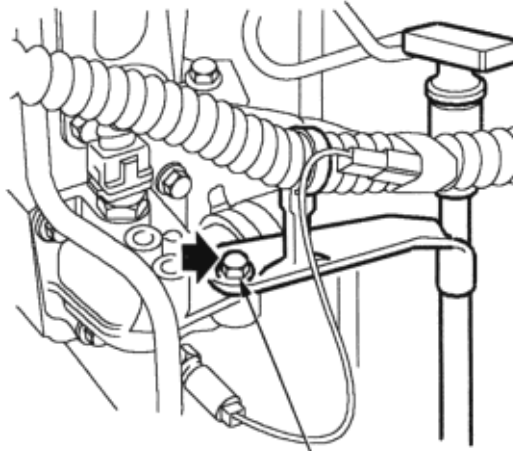
- 16. Position the absorbent cloth around the fuel injector pipe connections to absorb fuel spillage.
- 17. Loosen the No. 1 and No. 2 fuel injector pipe unions at fuel injectors and the fuel injection pump.

CAUTION
To prevent damage to the fuel injection pipes or components use two spanners when loosening unions.

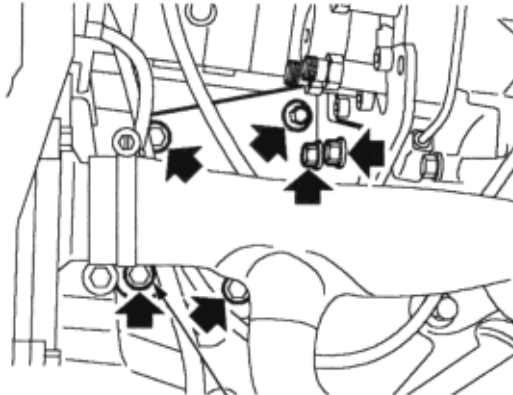
- 18. Disconnect the fuel injector pipe unions from the fuel injectors and the fuel injection pump and remove the fuel injector pipe assembly.

CAUTION
Plug the connections.

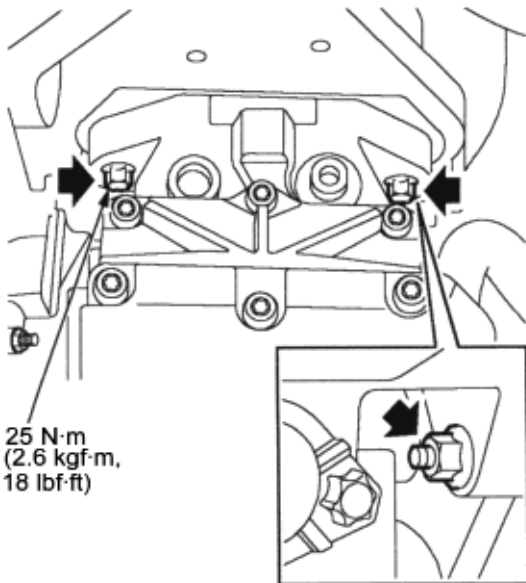
- 19. Repeat above procedure to remove the fuel injector pipes No. 3 and No. 4.
- 20. Remove the bolt securing dipstick bracket to the engine coolant elbow, move as required for access.



- 21. Remove the four bolts securing the fuel injection pump support bracket to cylinder block.



- 22. Remove the two bolts securing support bracket to the fuel injection pump and move the bracket aside.
- 23. Remove the two torx bolts and nut securing the fuel injection pump to gearbox adapter plate.

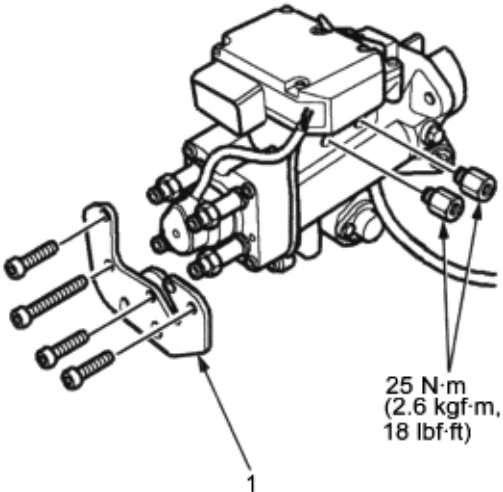


24. Remove the fuel injection pump and collect the fuel injection pump mounting bracket.
25. Remove the three allen and 1 torx headed screw securing adapter bracket to the fuel injection pump, collect bracket.
26. Remove the fuel feed banjo adapter from the fuel injection pump and discard sealing washer.
27. Remove the fuel return banjo adapter from the fuel injection pump and discard sealing washer.



CAUTION

Plug the connections.



1. BRACKET

28. Install the fuel return banjo adapter to the fuel injection pump using new sealing washer and tighten adapter to 23 Nm (2.3 kgf/m, 17 lbf/ft).
29. Install the fuel feed banjo adapter to the fuel injection pump using new sealing washer and tighten adapter to 23 Nm (2.3 kgf/m, 17 lbf/ft).
30. Install the adapter bracket to the fuel injection pump and tighten allen and torx screws to 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft).

Installation

1. Clean mating faces of the fuel injection pump and gearbox mounting plate.
2. Position the mounting bracket to the engine.
3. Install the fuel injection pump to gearbox mounting plate and tighten torx bolts and nut to 25 Nm (2.5 kgf/m, 18 lbf/ft).
4. Install the fuel injection pump to the engine, fit the bolts but do not tighten.
5. Install the nuts and bolts securing support bracket to the fuel injection pump and tighten to 25 Nm (2.5 kgf/m, 18 lbf/ft).
6. Tighten the bolts, fuel injection pump support bracket to the engine to 25 Nm (2.5 kgf/m, 18 lbf/ft).
7. Align the dipstick bracket to dowel on the engine coolant elbow fit and tighten bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).
8. Remove the plugs from the fuel injector pipes, fuel injection pump and fuel injector union connections.
9. Clean unions of the fuel injector pipes, fuel injection pump and fuel injectors.
10. Position fuel injector pipes No. 3 and No. 4 to the fuel injection pump and the fuel injectors and tighten unions to 28 Nm (2.9 kgf/m, 21 lbf/ft).
11. Position fuel injector pipes No. 1 and No. 2 to the fuel injection pump and the fuel injectors and tighten unions to 28 Nm (2.9 kgf/m, 21 lbf/ft).



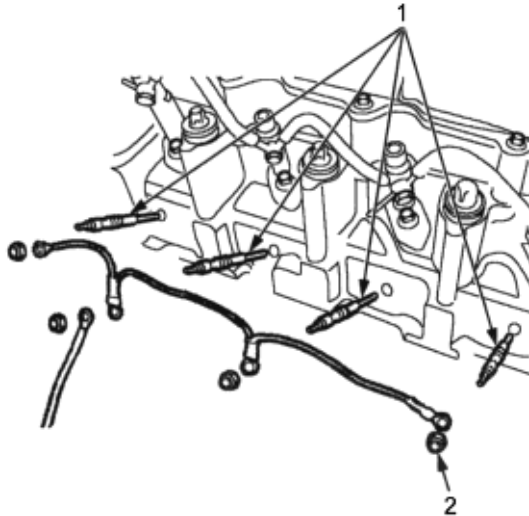
CAUTION

To prevent damage to the fuel injection pipes or components use two spanners when loosening unions.

12. Connect the fuel return spill pipe to fuel injector No. 3.
13. Using new sealing washers, fit the fuel return pipe to the fuel injection pump and tighten banjo bolt to 25 Nm (2.6 kgf/m, 19 lbf/ft).
14. Using new sealing washers, connect the fuel return banjo to the fuel injection pump, fit cap nut and tighten to 25 Nm (2.6 kgf/m, 19 lbf/ft).
15. Secure the engine wire harness clip to the fuel injection pump abutment bracket.
16. Connect the multiplug to the fuel injection pump.
17. Secure injector needle lift sensor connector to the fuel injection pump mounting bracket.
18. Connect the engine wire harness feed lead to glow plug No. 2 and tighten terminal nut to 3 Nm (0.3 kgf/m, 2 lbf/ft).
19. Clean the fuel injection pump drive flange, drive gear and flywheel.
20. Install the flywheel and drive gear to the fuel injection pump drive flange, tighten torx bolts to 20 Nm (2.0 kgf/m, 14 lbf/ft).
21. Remove the pull-off device from the fuel injection pump.
22. Install the fuel injection pump timing belt (see section 5).
23. Install the radiator top hose to oil cooler and tighten clip.
24. Connect the radiator top hose to the engine coolant outlet elbow and tighten clip.
25. Connect the radiator top hose to the radiator and tighten clip.
26. Install the plenum chamber.
27. Refill the engine coolant.
28. Connect the battery earth cable.

Removal

1. Disconnect the battery earth cable.
2. Remove the fuel injection pump assembly (see page 11-21).
NOTE: Glow plugs, numbers 1, 2 and 3, can be removed without the removal of the fuel injection pump assembly.
3. Remove the four terminal nuts securing feed leads to the glow plugs.
4. Disconnect and remove the glow plug leads.
5. Remove the four glow plugs.



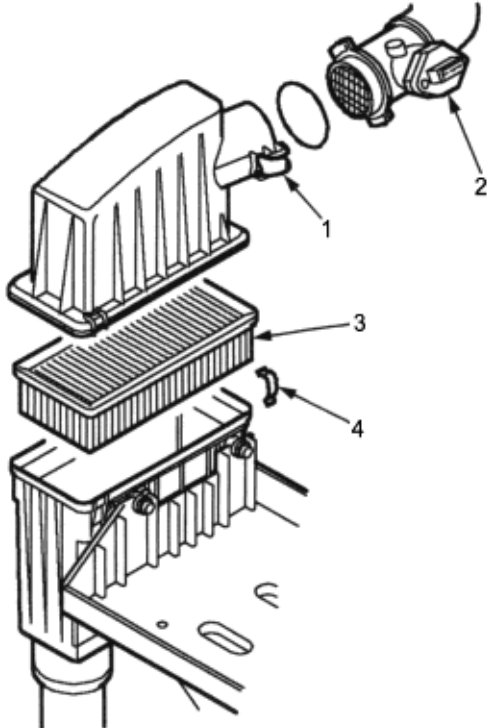
1. GLOW PLUGS
20 Nm (2.0 kgf/m, 14 lbf/ft)
2. 3 Nm (0.3 kgf/m, 2 lbf/ft)

Installation

1. Thoroughly clean the glow plugs and the glow plug sealing area in cylinder head.
2. Apply a suitable anti-size compound to threads of the glow plugs.
3. Install the glow plugs and tighten to 20 Nm (2.0 kgf/m, 14 lbf/ft).
4. Install the leads to the glow plugs with the feed lead connected to No. 2.
5. Install and tighten terminal nut to 3 Nm (0.3 kgf/m, 2 lbf/ft).
6. Install the fuel injection pump assembly (see page 11-23).
7. Connect the battery earth cable.

Removal

1. Release the engine coolant pipe from the clips on the air cleaner.
2. Release the four clips securing two halves of the air cleaner.
3. Release the two clips securing top half of the air cleaner to the MAF sensor.
4. Release top half of the air cleaner and position aside.
5. Remove and discard the air cleaner element.



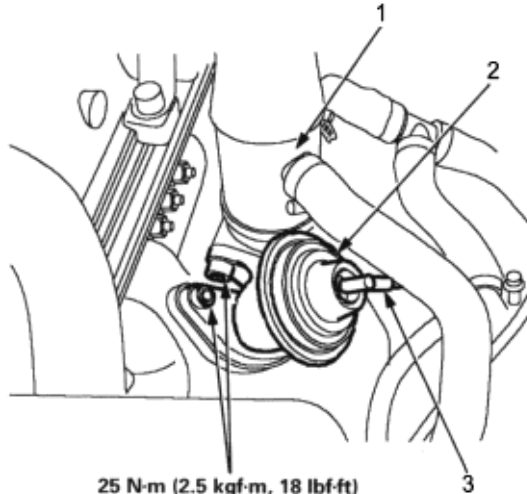
1. CLIP
2. MAF SENSOR
3. AIR CLEANER ELEMENT
4. CLIP

Installation

1. Clean inside of the air cleaner casing.
2. Install the air cleaner element in casing.
3. Position top half of air cleaner casing and secure with the clips.
4. Secure the air cleaner to the MAF sensor with the clips.
5. Secure the engine coolant pipe to the clips on the air cleaner.

Removal

1. Disconnect the battery earth cable.
2. Remove the engine acoustic cover.
3. Disconnect the vacuum hose from the EGR valve.
4. Remove the two screws securing the EGR valve to the EGR cooler.
5. Remove the two screws securing the EGR valve to the exhaust manifold.



- 25 N-m (2.5 kgf-m, 18 lbf-ft)
1. EGR COOLER
 2. EGR VALVE
 3. VACUUM HOSE

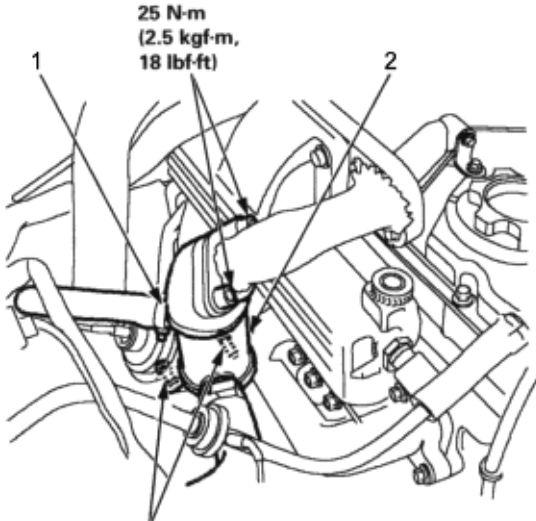
6. Remove the EGR valve.
7. Remove and discard two gaskets.

Installation

1. Clean mating faces of the EGR valve, exhaust manifold and EGR cooler.
2. Install the new gaskets to the EGR valve.
3. Align the EGR valve to exhaust manifold and the EGR cooler.
4. Install the two allen screws securing the EGR valve to the exhaust manifold.
5. Install the two allen screws securing the EGR cooler. Connect the vacuum hose from the EGR valve control solenoid valve to the EGR valve.
6. Install the engine acoustic cover.
7. Connect the battery earth cable.

Removal

1. Disconnect the battery earth cable.
2. Remove the engine acoustic cover.
3. Drain the engine coolant.
4. Loosen the clips and remove the coolant hoses from the EGR cooler.
5. Remove the two screws securing the EGR cooler to the EGR valve.
6. Remove the two screws securing the EGR cooler to the EGR pipe.



25 N-m (2.5 kgf-m, 18 lbf-ft)

1. CLIP
2. EGR COOLER

7. Remove the EGR cooler and discard gaskets.

Installation

1. Clean gasket mating faces the EGR cooler pipe and the EGR valve.
2. Install the EGR cooler and the gaskets tighten allen bolts.
3. Install the coolant hoses to the EGR cooler and tighten clips.
4. Refill the engine coolant.
5. Install the engine acoustic cover.
6. Connect the battery earth cable.

Clutch (TurboDiesel)

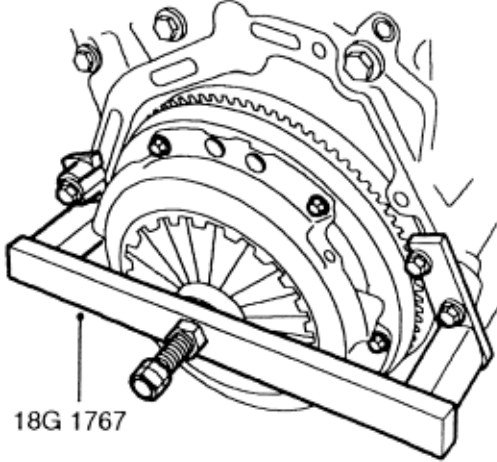
Clutch Assembly and Release Bearing

12-2

Service repair no - 33.10.07

Refit

1. Clean pressure plate and flywheel, dowels and dowel holes.
2. Inspect flywheel for signs of scoring or other damage. Renew if worn or damaged.
3. Smear clutch drive plate splines with Molybdenum disulphide grease.
4. Position drive plate to flywheel with 'FLYWHEEL SIDE' marking towards flywheel.



5. Fit pressure plate to flywheel and ensure located on dowels.
6. Fit 6 bolts securing pressure plate to flywheel but do not tighten.
7. Fit alignment tool **18G 1767** and secure to gearbox adapter plate with 3 bolts.
8. Rotate centre screw of **18G 1767** clockwise until clutch is fully depressed.
9. Working in diagonal sequence, progressively tighten bolts to 26 Nm.
10. Rotate centre screw of **18G 1767** anti-clockwise to release clutch.

11. Remove 3 bolts and remove **18G 1767**.
12. Remove flywheel locking pin tool **18G 1523**.
13. Clean clutch release fork and release bearing guide sleeve.
14. Smear release fork shaft and bore of release bearing with Molybdenum disulphide grease.
15. Fit release bearing to release fork and slide onto guide sleeve.
16. Operate release lever to ensure that release bearing is correctly located on release fork and slides smoothly on guide sleeve.
17. Fit gearbox assembly. See **MANUAL GEARBOX - 'PG1', Repairs.**

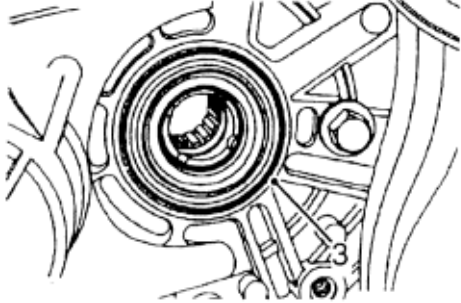
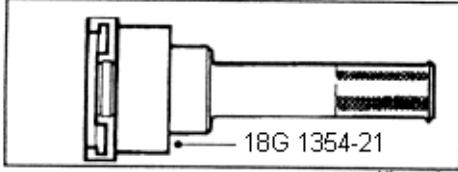
Service repair no - 54.10.18

Remove

1. Remove drive shaft. *See DRIVE SHAFTS, Repairs.*
2. Carefully remove oil seal from differential housing, discard oil seal.

Refit

1. Thoroughly clean oil seal recess in differential housing, splines and oil seal running surface on drive shaft.



2. Locate new seal on **18G 1354/21** with sealing lip facing towards differential housing.
3. Carefully drift oil seal into differential housing until it is fully seated in recess.
4. Remove **18G 1354/21**.
5. Fit LH drive shaft. *See DRIVE SHAFTS, Repairs.*

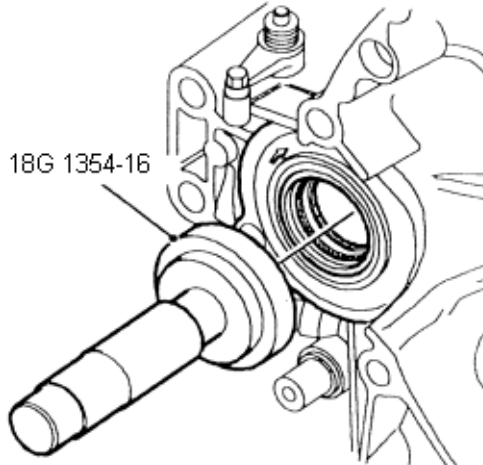
Service repair no - 54.10.21

Remove

1. Remove drive shaft. *See DRIVE SHAFTS, Repairs.*
2. Carefully prise oil seal out of differential housing and discard oil seal.

Refit

1. Thoroughly clean oil seal recess in differential housing, splines and oil seal running surface on drive shaft.

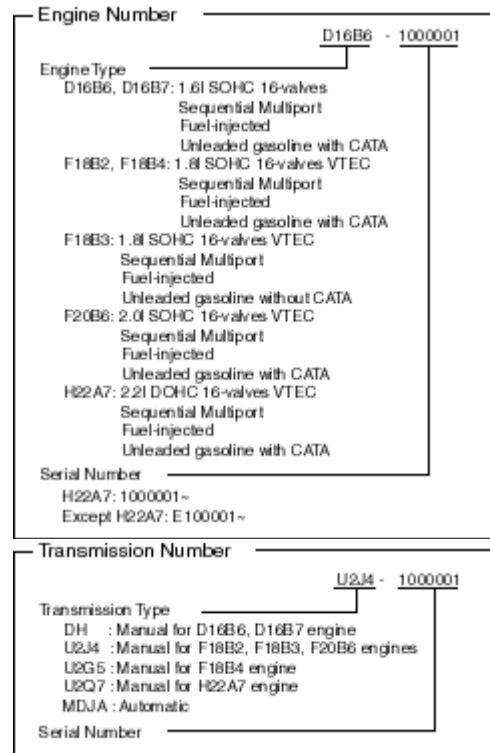
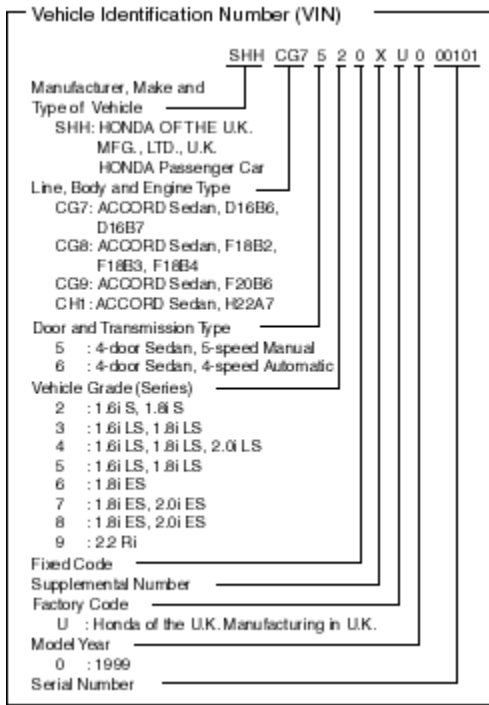


2. Fit **18G 1354-16** onto **18G 1354**.
3. Position new seal onto **18G 1354-16** with sealing lip facing towards differential housing.
4. Carefully drift oil seal into differential housing until it is fully seated in recess.
5. Remove **18G 1354** and **18G 1354-16**.
6. Fit RH drive shaft. *See DRIVE SHAFTS, Repairs.*

Chassis and Engine Numbers Vehicle Identification Number (VIN)

1-2

Engine Number/Transmission Number



Chassis and Engine Numbers

1-3

Model/Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
Accord SEDAN	KE	1.6i S	5MT	SHHCG7520YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU000101~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i S	4AT	SHHCG8620YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i LS	5MT	SHHCG8540YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	5MT*1	SHHCG8580YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	4AT	SHHCG8670YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	4AT*1	SHHCG8680YU000101~	F18B2-E100001~	MDJA-1000001~
		2.0i LS	5MT	SHHCG9540YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	4AT	SHHCG9640YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	5MT	SHHCG9570YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU000101~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU000101~	H22A7-100001~	U2Q7-1000001~
		2.2 R	5MT*5	SHHCH1580YU000101~	H22A7-100001~	U2Q7-1000001~
		2.0 TDi	5MT	SHHCH2520YU000101~	20T2N-0000001~	9A-100000A~
		2.0TDi	5MT	SHHCH2570YU000101~	20T2N-0000001~	9A-1000001~
2.0SDi	5MT	SHHCH2580YU000101~	20T2N-0000001~	9A-1000001~		
	KG	1.6i S	5MT	SHHCG7520YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7530YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT*2	SHHCG7540YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT*4	SHHCG7550YU000101~	D16B7-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i S	4AT	SHHCG8620YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i LS	5MT	SHHCG8530YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT*3	SHHCG8540YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT*4	SHHCG8550YU000101~	F18B4-E100001~	U2G5-1000001~
		1.8i LS	4AT	SHHCG8640YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	5MT*1	SHHCG8580YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	5MT*4	SHHCG8560YU000101~	F18B4-E100001~	U2G5-1000001~
		1.8i ES	4AT	SHHCG8670YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	4AT*1	SHHCG8680YU000101~	F18B2-E100001~	MDJA-1000001~

*1: with NAVI.

*2: with Auto Aircon.

*3: with NAVI and Leather seat

*4: 7PA

*5: with Trunk Spoiler

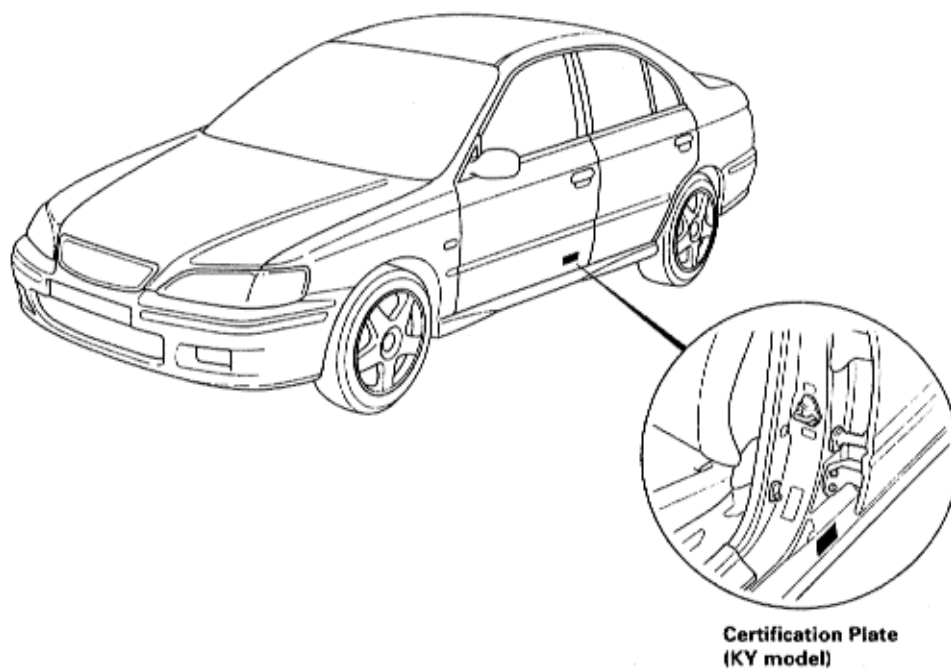
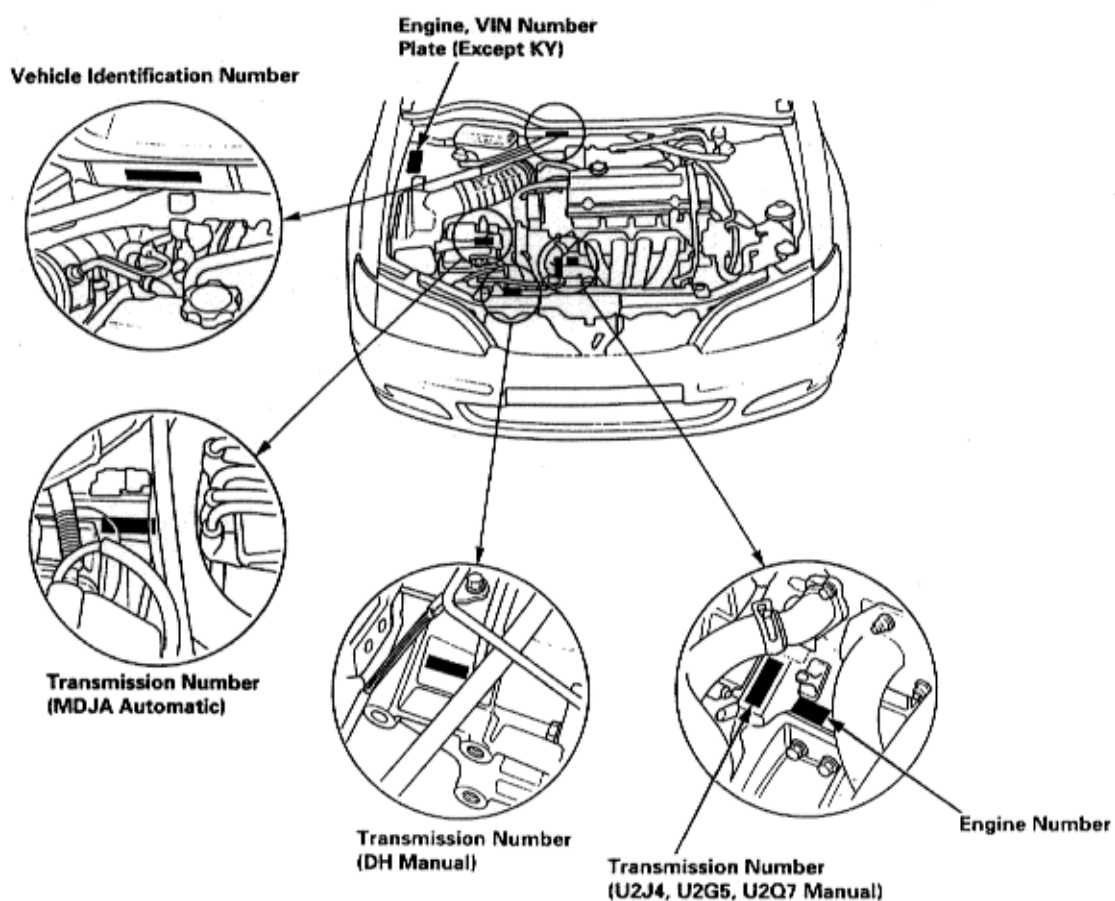
Chassis and Engine Numbers

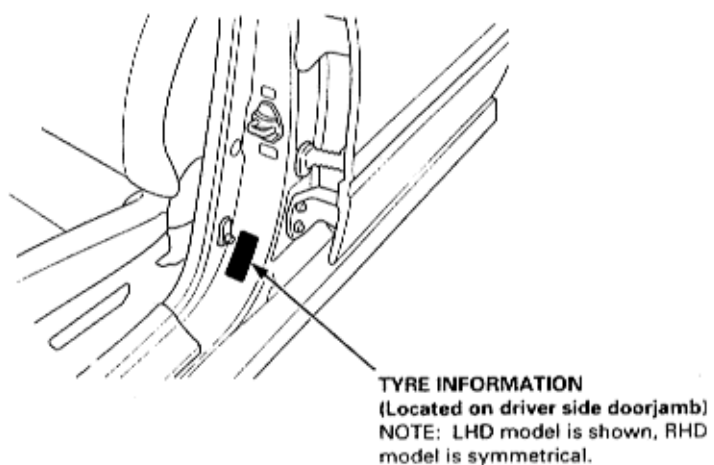
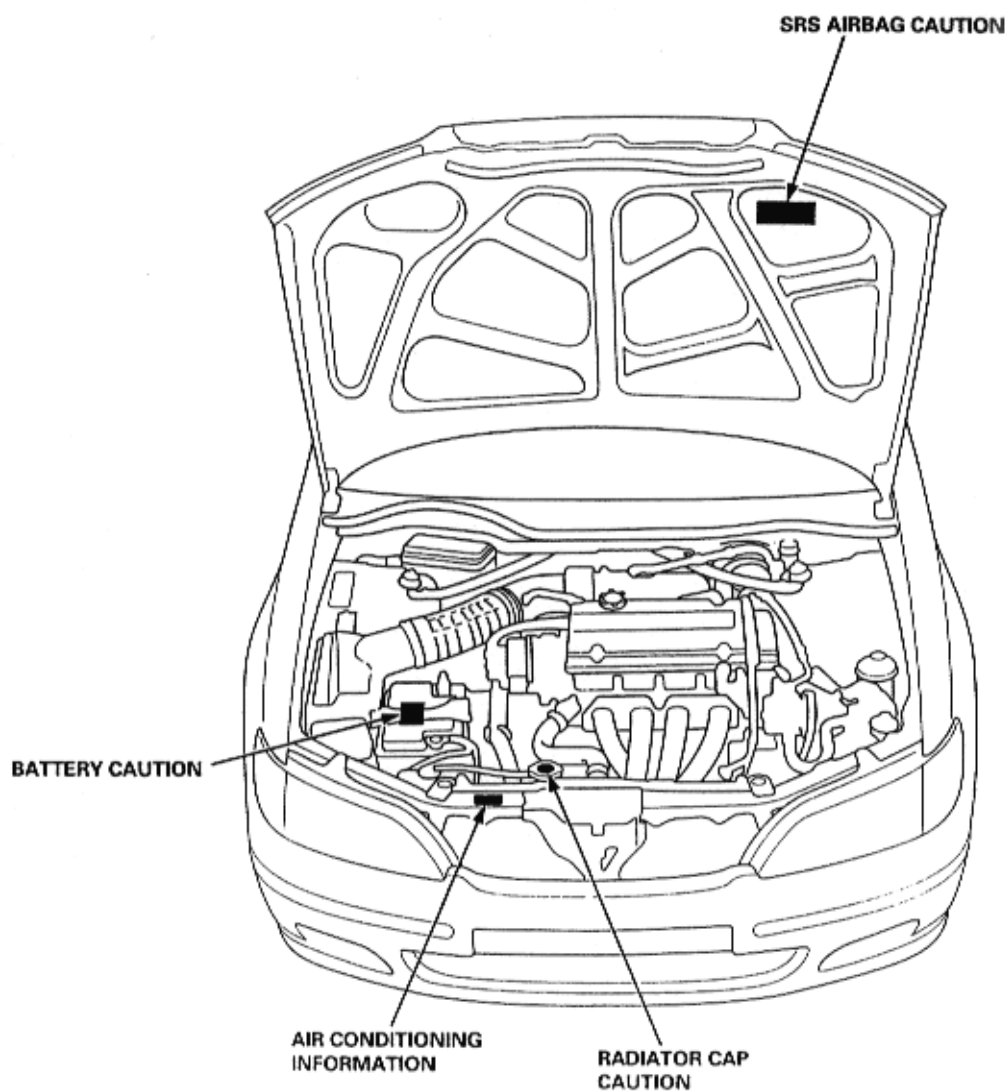
1-4

Applicable Area Code/VIN/Engine
Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
Accord SEDAN	KG	2.0i LS	5MT	SHHCG9540YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	5MT	SHHCG9550YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	4AT	SHHCG9640YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i LS	4AT	SHHCG9650YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	5MT	SHHCG9570YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9590YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9510YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT	SHHCG9690YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT	SHHCG9610YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU000101~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU000101~	H22A7-1000001~	U2Q7-1000001~
		2.0TDi	5MT	SHHCH2520YU000101~	20T2N-0000001~	9A-1000001~
		2.0TDi	5MT	SHHCH2570YU000101~	20T2N-0000001~	9A-1000001~
		2.0TDi	5MT	SHHCH2540YU000101~	20T2N-0000001~	9A-1000001~
2.0SDi	5MT	SHHCH2580YU000101~	20T2N-0000001~	9A-1000001~		
	KS	1.6i S	5MT	SHHCG7520YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU000101~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT	SHHCG8540YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU000101~	F18B2-E100001~	MDJA-1000001~
		2.0i LS	5MT	SHHCG9540YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9570YU000101~	F20B6-E100001~	U2J4-1000001~
	KR	1.6i S	5MT	SHHCG7520YU000101~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU000101~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT	SHHCG8540YU000101~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU000101~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU000101~	F18B2-E100001~	U2J4-1000001~
		2.0i LS	5MT	SHHCG9540YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9570YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU000101~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU000101~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU000101~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU000101~	H22A7-1000001~	U2Q7-1000001~
		2.0TDi	5MT	SHHCH2520YU000101~	20T2N-0000001~	9A-1000001~
2.0SDi	5MT	SHHCH2540YU000101~	20T2N-0000001~	9A-1000001~		
	KY	1.8i S	5MT	SHHCG8527YU000001~	F18B3-E100001~	U2J4-1000001~
			4AT	SHHCG8627YU000001~	F18B3-E100001~	MDJA-1000001~

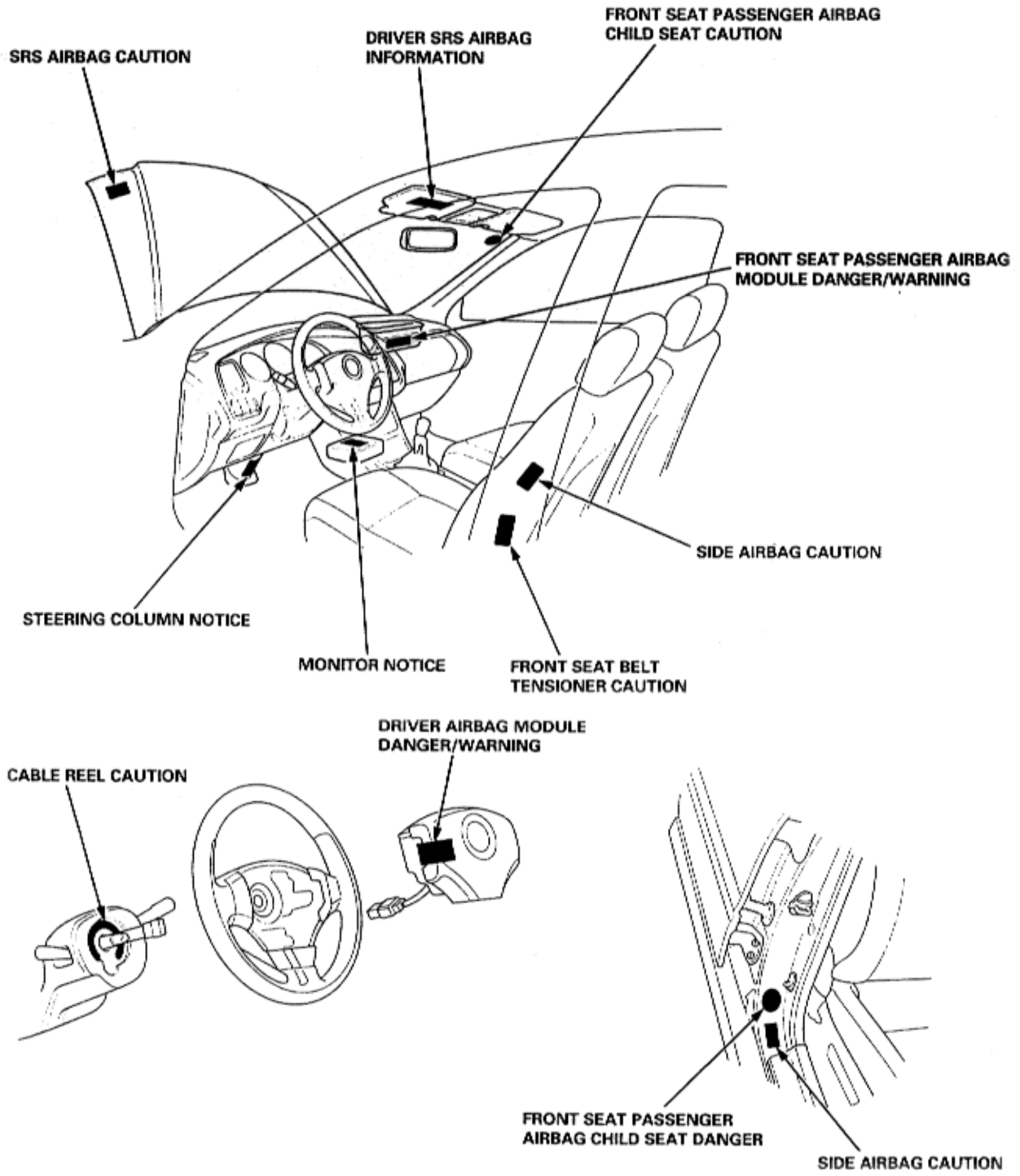
*1: with NAVI.





Warning/Caution Label Locations
(cont'd)

NOTE: LHD model is shown; RHD model is similar.

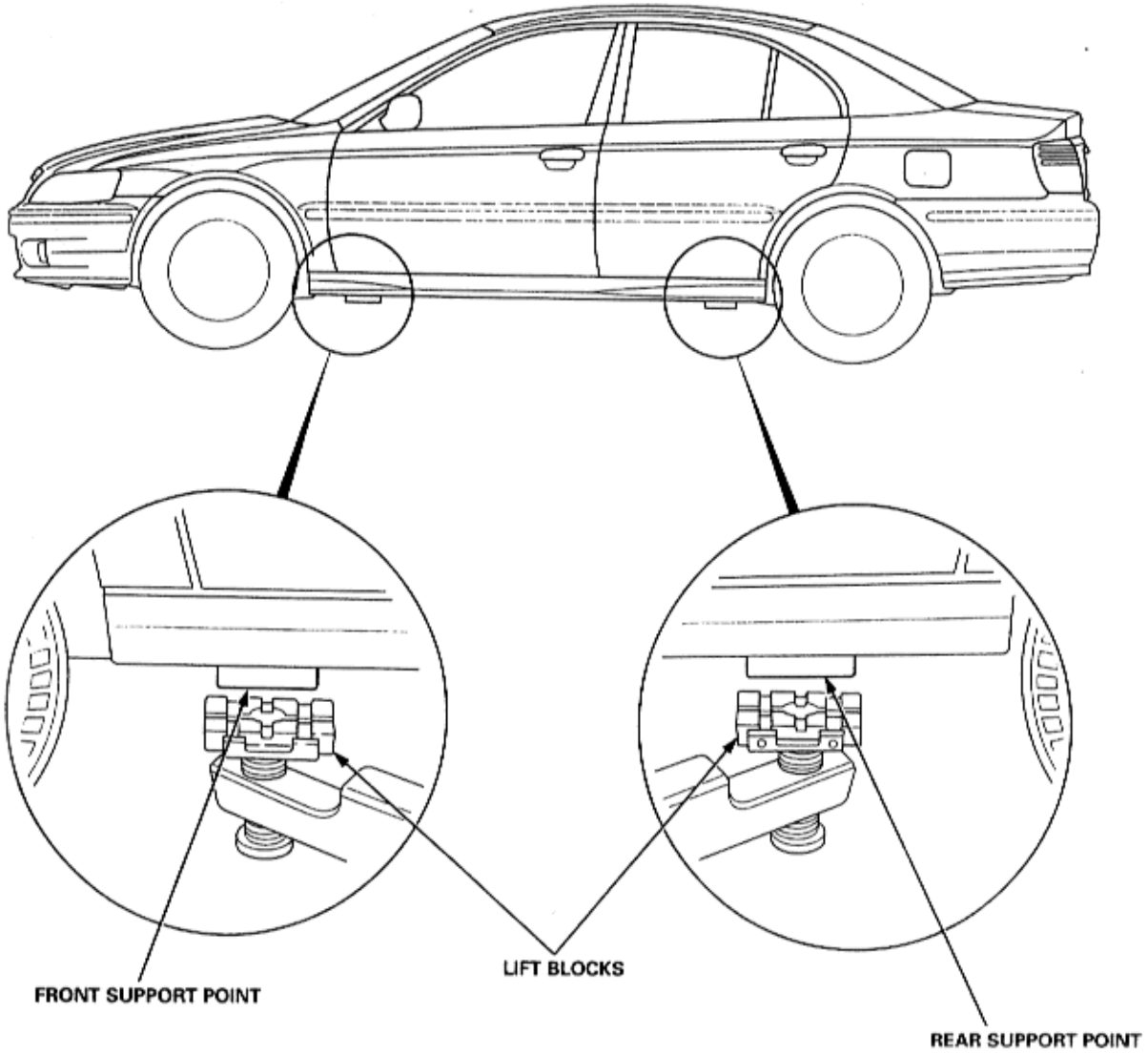


Lift and Support Points
Lift and Safety Stands

1-8

1. Place the lift blocks as shown.
2. Raise the hoist a few inches (centimeters), and rock the vehicle to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid support.

NOTE: Use the same support points to support the vehicle on safety stands.



Lift and Support Points

1-9

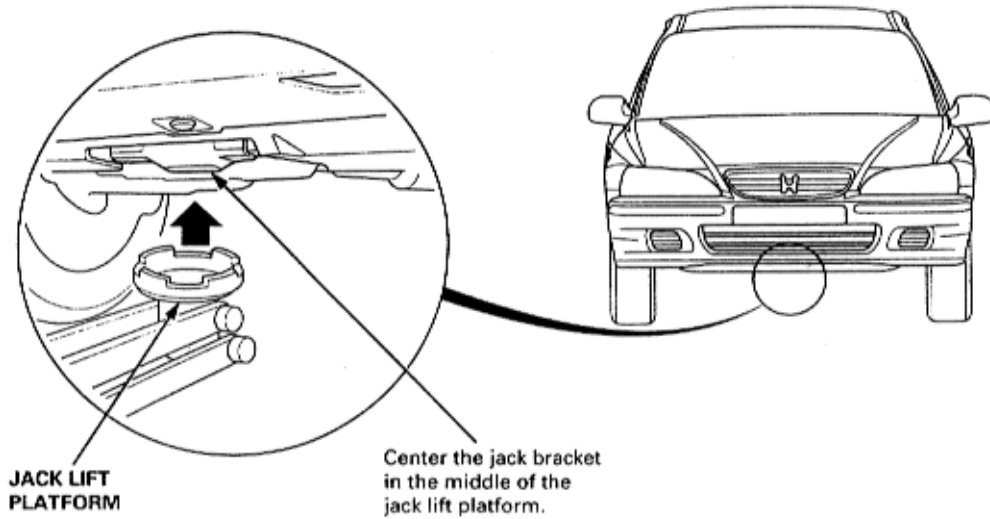
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the vehicle, put the gearshift lever in reverse (Automatic in **P** position).
3. Raise the vehicle high enough to insert the safety stands.
4. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.

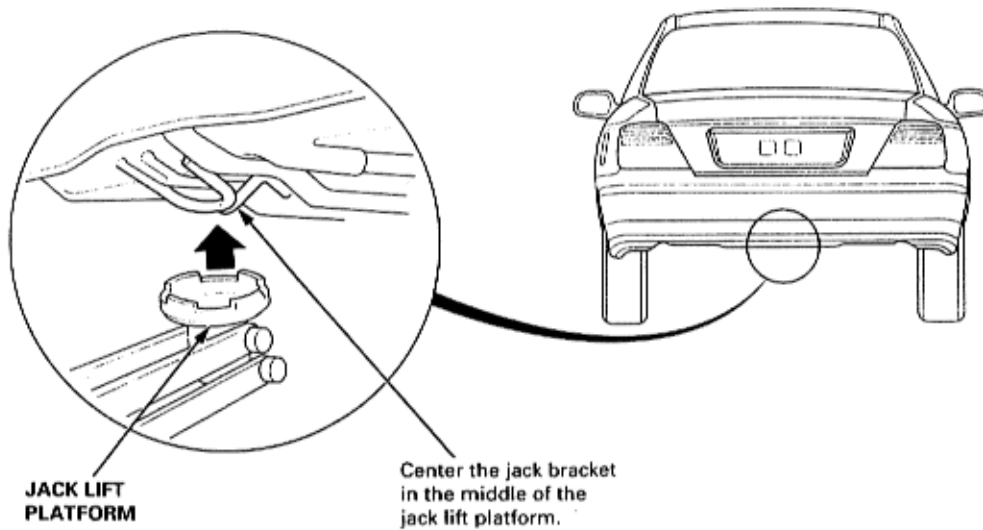
WARNING

- ♦ Always use safety stands when working on or under any vehicle that is supported by only a jack.
- ♦ Never attempt to use a bumper jack for lifting or supporting the vehicle.

Front:



Rear:



If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

Emergency Towing

There are three popular methods of towing a vehicle.

Flat-bed Equipment

The operator loads the vehicle on the back of a truck. This is the best way of transporting the vehicle.

Wheel Lift Equipment

The tow truck uses two pivoting arms that go under the tyres (front or rear) and lifts them off the ground. The other two wheels remain on the ground.

Sling-type Equipment

The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted.

If the vehicle cannot be transported by the flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, do the following.

Manual Transmission

- ♦ Release the parking brake.
- ♦ Shift the transmission to Neutral.

Automatic Transmission

- ♦ Release the parking brake.
- ♦ Start the engine.
- ♦ Shift to **D4** position, then **N** position.
- ♦ Turn off the engine.

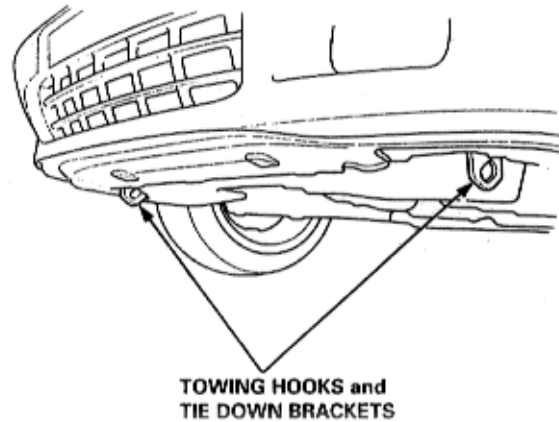
Ri:
Remove the front air spoiler before towing so it does not get damaged.



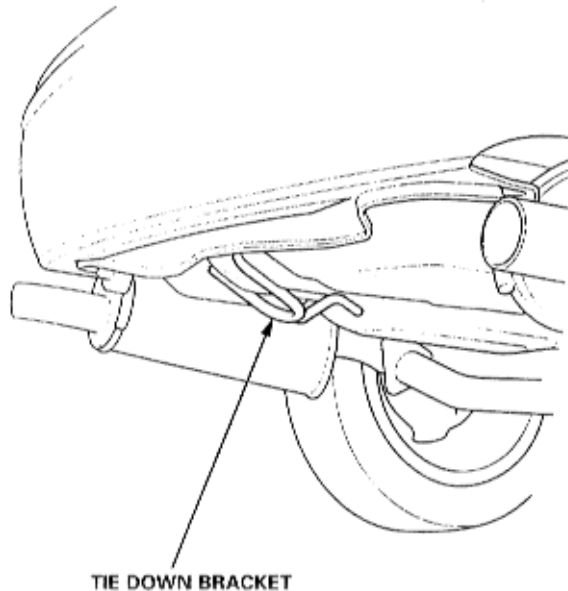
CAUTION

- ♦ Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), the vehicle must be transported on a flat-bed.
- ♦ It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).
- ♦ Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

Front:



Rear:



**CAUTION**

Observe all safety precautions and notes while working.

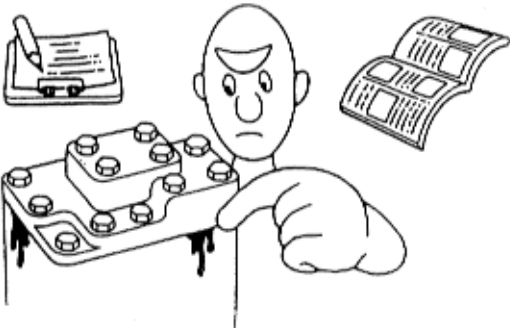
- Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.



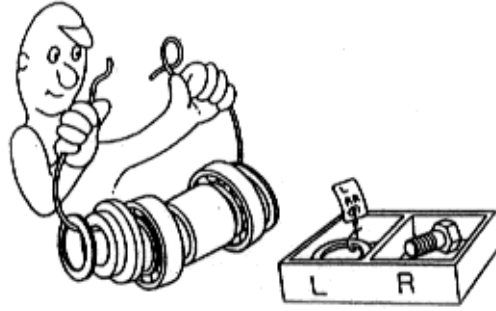
- Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Communicate as frequently as possible when work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



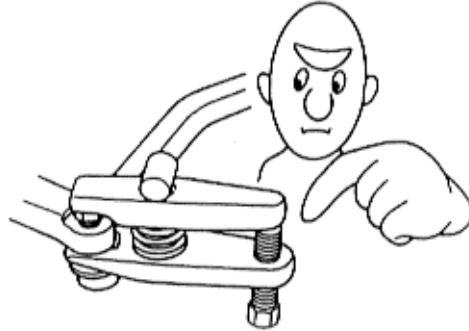
- Before removing or disassembling parts, they must be inspected carefully to isolate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



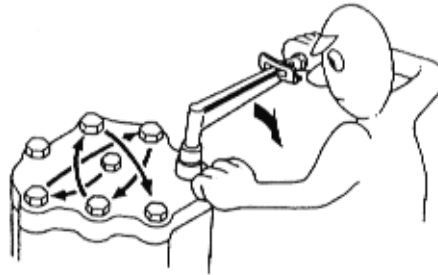
- Mark or place all removed parts in order in a parts rack so they can be reassembled in their original places.



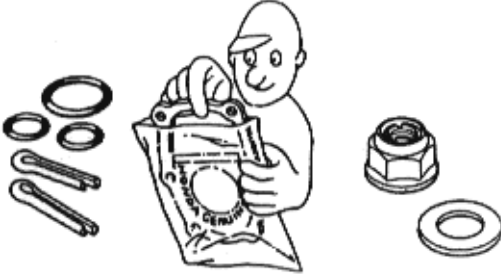
- Use the special tool when use of such a tool is specified.



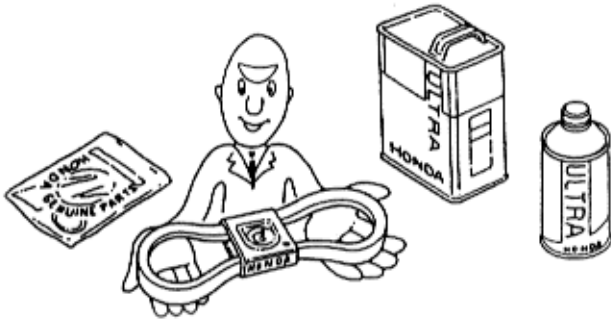
- Parts must be assembled with the proper torque according to the maintenance standards established.
- When tightening a series of bolts or nuts, begin with the centre or large diameter bolts and tighten them in criss-cross pattern in two or more steps.



- ♦ Use new packing, gaskets, O-rings and cotter pins whenever reassembling.
- ♦ Do not reuse parts that are required to be replaced. Always replace them.



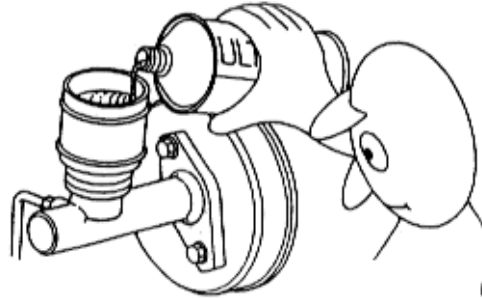
- ♦ Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.



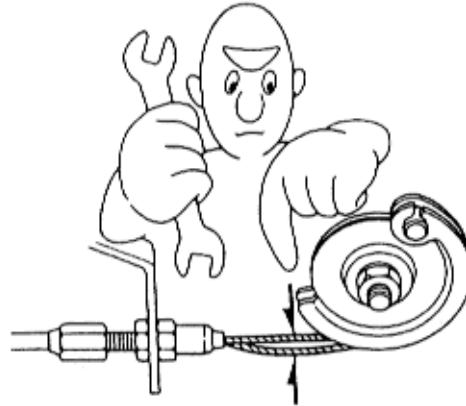
- ♦ Coat or fill parts with specified grease as specified (page 4-2). Clean all removed parts with solvent upon disassembly.



- ♦ Brake fluid and hydraulic components
 - ♦ When replenishing the system, use extreme care to prevent dust and dirt from entering the system.
 - ♦ Do not mix different brands of fluid as they may not be compatible
 - ♦ Do not reuse drained brake fluid.
 - ♦ Because brake fluid can cause damage to painted and resin surfaces, care should be taken not to spill it on such surfaces. If spilled accidentally, quickly rinse it off with water or warm water from all painted or resin surfaces.
 - ♦ After disconnecting brake hoses or pipes, be sure to plug the openings to prevent loss of brake fluid.
 - ♦ Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.



- ♦ Keep disassembled parts away from air-borne dust and abrasives.
- ♦ Check that parts are clean before assembly.
- ♦ Avoid oil or grease getting on rubber parts and tubes, unless specified.
- ♦ Upon assembling, check every part for proper installation and operation.



Before Troubleshooting

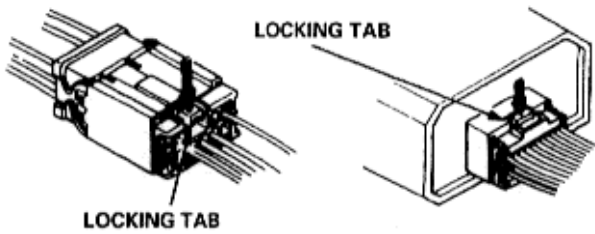
- ♦ Check applicable fuses in the appropriate fuse/relay box.
- ♦ Check the battery for damage, state of charge, and clean and tighten connections.
- ♦ Check the alternator belt tension.

CAUTION

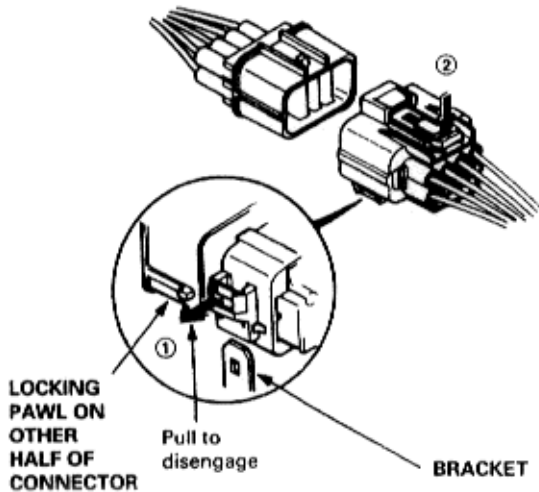
- ♦ Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
- ♦ Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

Handling Connectors

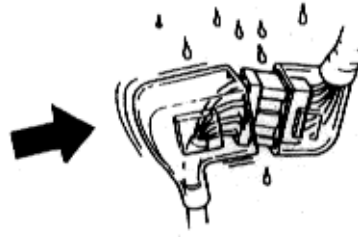
- ♦ Make sure the connectors are clean and have no loose wire terminals.
- ♦ Make sure multiple cavity connectors are packed with grease (except waterproof connectors).
- ♦ All connectors have push-down release type locks.



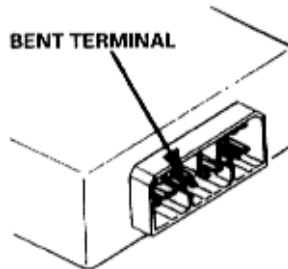
- ♦ Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- ♦ Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket.



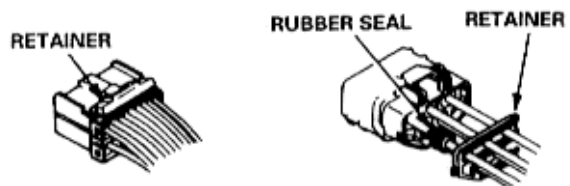
- ♦ Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- ♦ Always reinstall plastic covers.



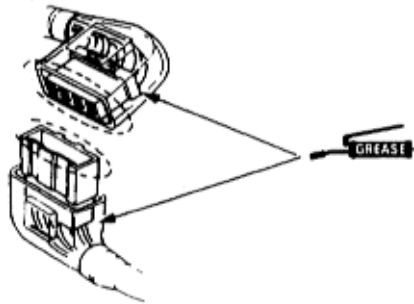
- ♦ Before connecting connectors, make sure the terminals are in place and not bent.



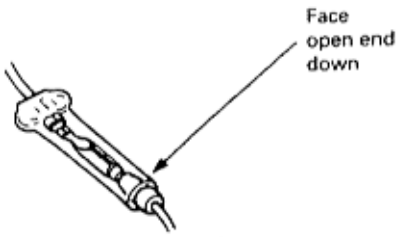
- ♦ Check for loose retainer and rubber seals.



- ♦ The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.

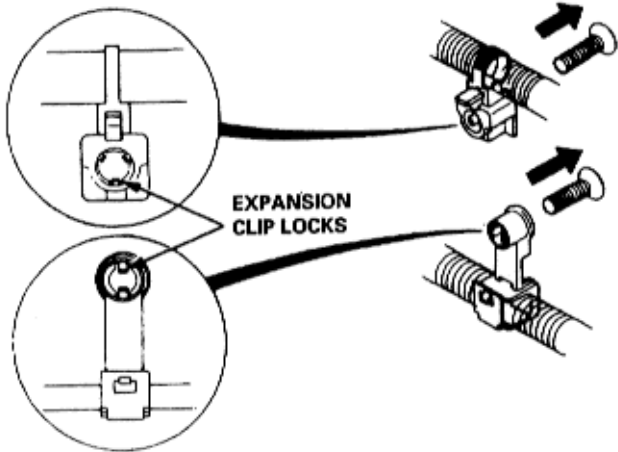


- ♦ Insert the connector all the way and make sure it is securely locked.
- ♦ Position wires so that the open end of the cover faces down.

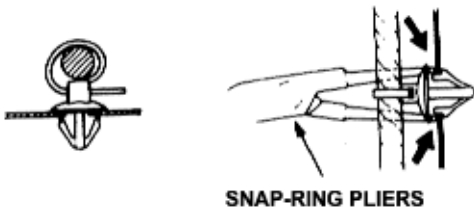


Handling Wires and Harnesses

- ♦ Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- ♦ Remove clips carefully; don't damage their locks.

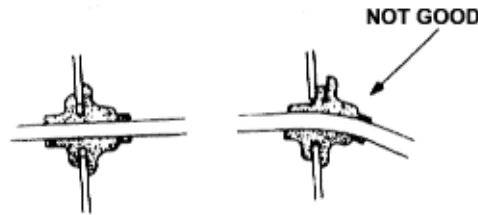


Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



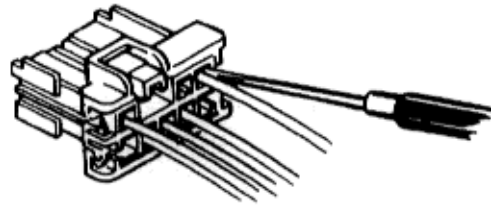
- ♦ After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- ♦ Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.

- ♦ Seat grommets in their grooves properly.

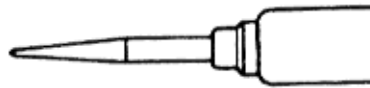


Testing and Repairs

- ♦ Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- ♦ After installing parts, make sure that no wires are pinched under them.
- ♦ When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- ♦ If possible, insert the probe of the tester from the wire side (except waterproof connector).







- ♦ Use a probe with a sharp tester probe.



How to Read Flowcharts

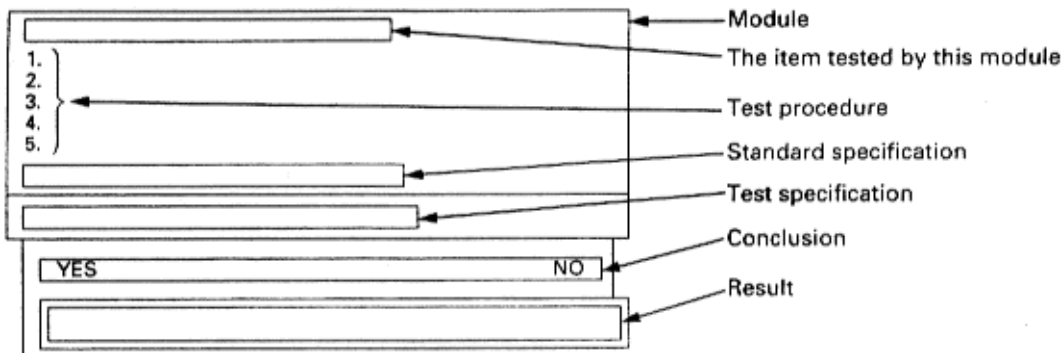
Except SRS:

A flowchart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware: if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

 (bold type)	Describes the conditions or situation to start a troubleshooting flowchart.
	Asks you to do something; perform a test, set up a condition etc.
	Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.
 (bold type)	The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

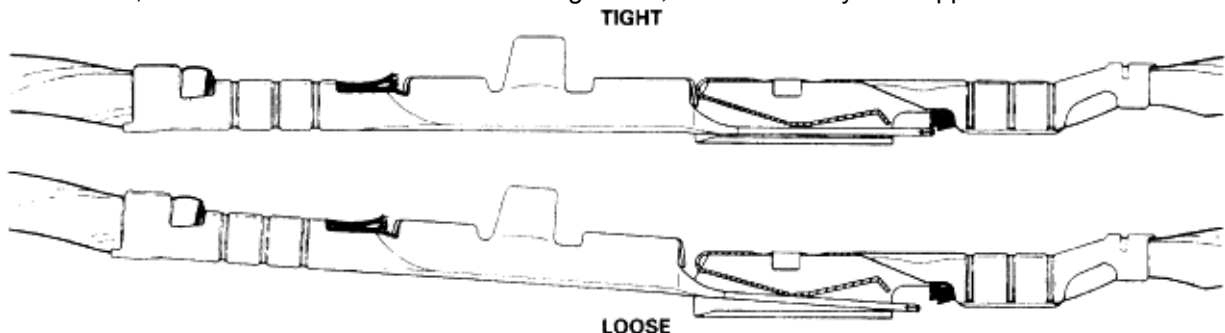
SRS:

SRS troubleshooting flowcharts are comprised of modules, each of which contains all actions necessary to reach one decision. Except of the steps you must perform, the modules also include standard specifications of a correctly working system and test specifications. If the result of a test meets the specification shown in the module, the conclusion from this test is YES. If the specification is not met, the conclusion is NO. If you do not exactly follow the procedure described in the module, you may get the wrong test result.



NOTE:

- The term "Intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If any indicator light on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- Most of the troubleshooting flowcharts have reset control module(s) or unit(s) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you cannot duplicate the code, do not continue through the flowchart. To do so will only result in confusion and, possibly, (a) needlessly replace control module(s) or unit(s).
- "Open" and "Short" are common electrical terms. An open is a break in a wire at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. In complex electronics, this can sometimes mean something works, but not the way it is supposed to.



Five-step Troubleshooting

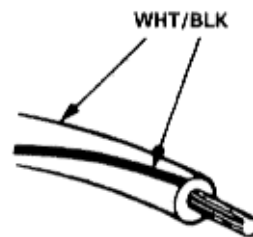
1. **Verify The Complaint**
Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.
2. **Analyze The Schematic**
Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause. Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.
3. **Isolate The Problem By Testing The Circuit**
Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.
4. **Fix The Problem**
Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.
5. **Make Sure The Circuit Works**
Turn on all components in the repaired circuit in all modes to make sure you have fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Colour Codes

The following abbreviations are used to identify wire colours in the circuit schematics:

WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Grey
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

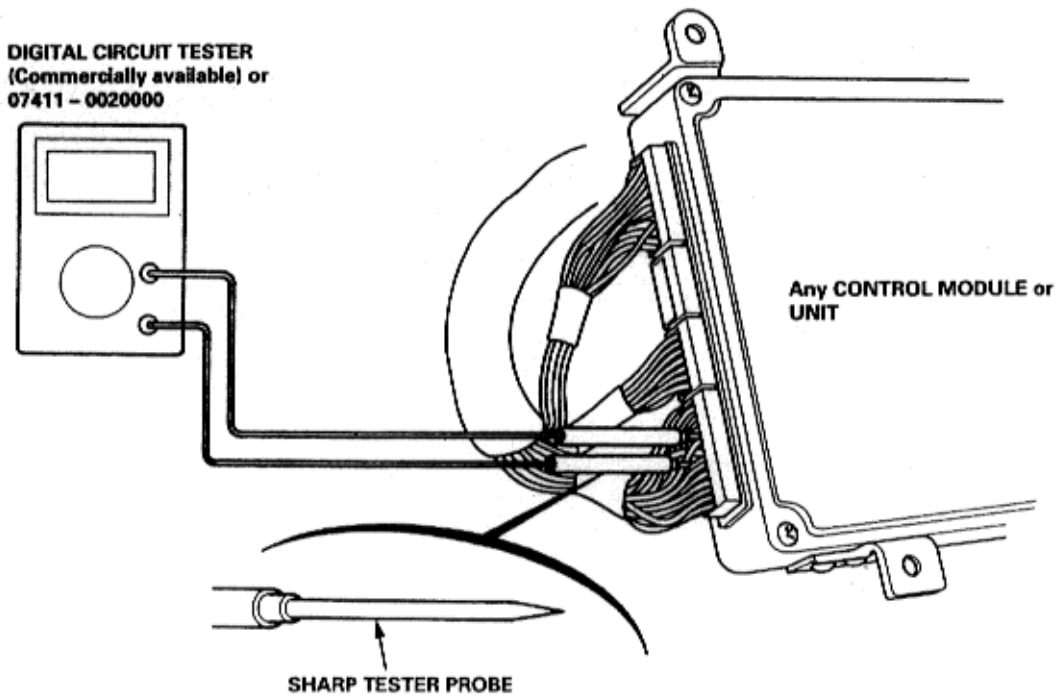
The wire insulation has one colour or one colour with another colour stripe. The second colour is the stripe.



NOTE:

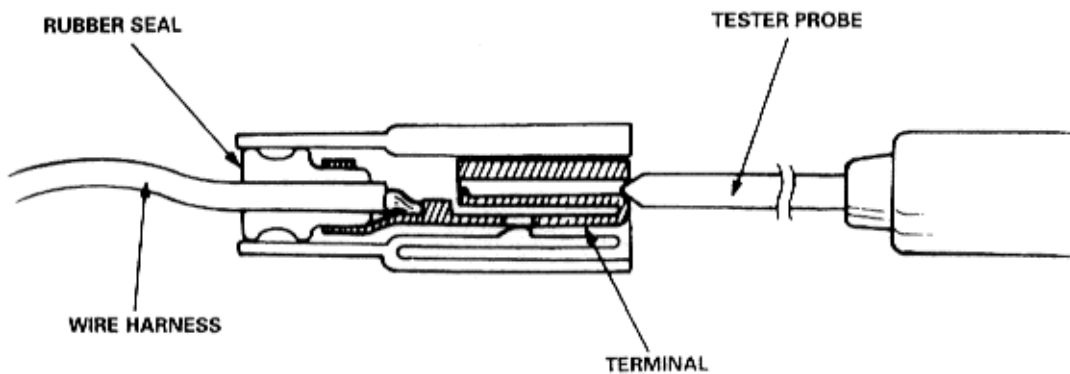
Different wires with the same colour in the same system have been given number suffixes to distinguish them (for example, YEL1 and YEL2 are not the same).

When checking any control module(s) or units(s) connector terminals, gently slide the sharp tester probe from the wire side into the connector until it comes in contact with the terminal end of the wire.



⚠ CAUTION

- ♦ Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- ♦ For testing at connectors, bring the tester probe into contact with the terminal from the connector side of wire harness connectors in the engine compartment.
- ♦ For female connectors, just touch lightly with the tester probe and do not insert the probe.



List of automotive abbreviations, which may be used in shop manual.

ABS	Anti-lock Brake System	F	Front
A/C	Air Conditioning, Air Conditioner	FIA	Fuel Injection Air
ACL	Air Cleaner	FL	Front Left
A/F	Air Fuel Ratio	FP	Fuel Pump
ALT	Alternator	FR	Front Right
AMP	Ampere (s)	FSR	Fail Safe Relay
ANT	Antenna	FWD	Front Wheel Drive
API	American Petroleum Institute		
APPROX.	Approximately	GAL	Gallon
ASSY	Assembly	GND	Ground
A/T	Automatic Transmission	GPS	Global Positioning System
ATDC	After Top Dead Center		
ATF	Automatic Transmission Fluid	H/B	Hatchback
ATT	Attachment	HC	Hydrocarbons
ATTS	Active Torque Transfer System	H02S	Heated Oxygen Sensor
AUTO	Automatic		
AUX	Auxiliary	IAB	Intake Air Bypass
		IAC	Idle Air Control
BARO	Barometric	IAR	Intake Air Resonator
BAT	Battery	IAT	Intake Air Temperature
BDC	Bottom Dead Center	ICM	Ignition Control Module
BTDC	Before Top Dead Center	ID	Identification
		ID or I.D.	Inside Diameter
CARB	Carburettor	IG or IGN	Ignition
CAT	Catalytic Converter	IMA	Idle Mixture Adjustment
or CATA		IMMOBI.	Immobilizer (Immobiliser)
CHG	Charge	IN	Intake
CKF	Crankshaft Speed Fluctuation	INJ	Injection
CKP	Crankshaft Position	INT	Intermittent
CO	Carbon Monoxide		
COMP	Complete	KS	Knock Sensor
CPB	Clutch Pressure Back up		
CPC	Clutch Pressure Control	L	Left
CPU	Central Processing Unit	L/C	Lock-up Clutch
CVT	Continuously Variable Transmission	LCD	Liquid Crystal Display
CYL	Cylinder	LED	Light Emitting Diode
CYP	Cylinder Position	LF	Left Front
		LH	Left Handle
DI	Distributor Ignition	LHD	Left Handle Drive
DIFF	Differential	LR	Left Rear
DLC	Data Link Connector	LSD	Limited Slip Differential
DOHC	Double Overhead Camshaft	L-4	In-line Four Cylinder (engine)
DPI	Dual Point Injection		
DTC	Diagnostic Trouble Code		
ECM	Engine Control Module		
ECT	Engine Coolant Temperature		
EGR	Exhaust Gas Recirculation		
ELD	Electrical Load Detector		
EPR	Evaporator Pressure Regulator		
EPS	Electrical Power Steering		
EVAP	Evaporative		
EX	Exhaust		

Abbreviations
(cont'd)

1-19

MAP Manifold Absolute Pressure
MAX. Maximum
MBS Mainshaft Brake System
MCK Motor Check
MCU Moment Control Unit
MIL Malfunction Indicator Light
MIN. Minimum
MPI Multi Point Injection
M/S Manual Steering
M/T Manual Transmission

N Neutral
NOx Oxides of Nitrogen

OBD On-board Diagnostic
O2S Oxygen Sensor
OD or O.D. Outside Diameter

P Park
PAIR Pulsed Secondary Air Injection
PCM Powertrain Control Module
PCV Positive Crankcase Ventilation
Proportioning Control Valve
PGM-FI Programmed-fuel Injection
PGM-IG Programmed Ignition
PH Pressure High
PL Pilot Light or Pressure Low
PMR Pump Motor Relay
P/N Part Number
PRI Primary
P/S Power Steering
PSF Power Steering Fluid
PSP Power Steering Pressure
PSW Pressure Switch

Qty Quantity

R Right
REF Reference
RGB Red, Green, Black
RHD Right Handle Drive
RL Rear Left
RON Research Octane Number
RR Rear Right

SAE Society of Automotive Engineers
SCS Service Check Signal
SEC Second
Secondary
SOHC Single Overhead Camshaft
SQL Solenoid
SPEC Specification
S/R Sun Roof
SRS Supplemental Restraint System
STD Standard
SW Switch

T Torque
TB Throttle Body
T/B Timing Belt
TC Torque Converter
TCM Transmission Control Module
TCS Traction Control System
TDC Top Dead Center
TFT Thin Film Transistor
T/N Tool Number
TP Throttle Position
TWC Three Way Catalytic Converter

VC Viscous Coupling
VIN Vehicle Identification Number
VSS Vehicle Speed Sensor
VTEC Variable Valve Timing & Valve Lift
Electronic Control
VVIS Variable Volume Intake System

W With
W/O Without
WOT Wide Open Throttle

2WD Two Wheel Drive
4WD Four Wheel Drive
2WS Two Wheel Steering
4WS Four Wheel Steering
4AT 4-speed Automatic Transmission
5MT 5-speed Manual Transmission

P Park
R Reverse
N Neutral
D4 Drive (1st through 4th gear)
D3 Drive (1st through 3rd gear)
2 Second
1 First
D Drive
S Second
L Low
1ST Low (gear)
2ND Second (gear)
3RD Third (gear)
4TH Fourth (gear)
5TH Fifth (gear)

	MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V	12	
	Primary winding resistance at 20°C (68°F) ohms:		
	Except H22A7 engine	0.45 - 0.55	
	H22A7 engine	0.63 - 0.77	
Ignition wire	Secondary winding resistance at 20°C (68°F) k ohms		
	D16B6 engine	12.0 - 14.6	
	F18B2, F18B3, F20B6 engine	22.4 - 33.6	
	H22A7 engine	12.8 - 19.2	
Ignition timing	Resistance at 20°C (68°F) k ohms:	25 max.	
	Firing order	1 - 4 - 2 - 3 1 - 3 - 4 - 2	
Spark plug	Type	Standard (New)	Service Limit
	Gap	See section 4	
Ignition timing	Except H22A7 engine	1.0-1.1 (0.039-0.043)	-
	H22A7 engine	1.0-1.1 (0.039-0.043)	1.3 (0.051)
Alternator belt *1 (D16B6 engine)	At idle	M/T	12+2 (Neutral)
	Except H22A7 engine	A/T	12+2 (N or P position)
Alternator belt *1 (D16B6 engine)	BTDC (Red)		15+2 (Neutral)
	H22A7 engine		
Alternator belt *1 (D16B6 engine)	Deflection with 98 Nm (10 kgf, 22 lbf) between pulleys	7.0-10.5 (0.28-0.41) with used belt 5.0-7.0 (0.20-0.28) with new belt	
	Alternator belt *1 (Except D16B6 engine with A/C)	Belt tension N (kgf, lbf) Measured with belt tension gauge	340-490 (35-50, 77-110) with used belt 640-780 (65-80, 140-180) with new belt
Alternator belt *1 (Except D16B6 engine with A/C)	Deflection with 98 Nm (10 kgf, 22 lbf) between pulleys	10.0-12.0 (0.39-0.47) with used belt 5.5-7.5 (0.22-0.30) with new belt	
Alternator belt *1 (Except D16B6 engine without A/C)	Belt tension N (kgf, lbf) Measured with belt tension gauge	390-540 (40-55, 88-120) with used belt 880-1,030 (90-105, 200-230) with new belt	
Alternator belt *1 (Except D16B6 engine without A/C)	Deflection with 98 Nm (10 kgf, 22 lbf) between pulleys	10.0-13.0 (0.39-0.51) with used belt 7.5-10.0 (0.30-0.39) with new belt	
Alternator (Except H22A7 engine)	Belt tension N (kgf, lbf) Measured with belt tension gauge	290-440 (30-45, 66-99) with used belt 540-740 (55-75, 120-170) with new belt	
Alternator (Except H22A7 engine)	Output 13.5V at hot	Standard (New)	Service Limit
	D16B6 engine	85A	
	Except D16B6 engine	90A	
	Coil resistance (rotor) at 20 °C (68°F) ohms	2.6	-
	D16B6 engine	2.4	-
	Except D16B6 engine	15.4 (0.61)	14.15 (0.557)
	Slip ring O.D.	13.2 (0.52)	32. (0.13)
Brush length	1.9 (0.19, 0.42)	-	
Alternator (H22A7 engine)	Output 13.5V at hot	Standard (New)	Service Limit
	Coil resistance (rotor) at 20 °C (68°F) ohms	95A	
Alternator (H22A7 engine)	Slip ring O.D.	2.2-3.0	-
	Brush length	14.4 (0.57)	14.0 (0.55)
	Brush spring tension N (kgf, lbf)	10.5 (0.41)	1.5 (0.06)
		2.9-3.5 (0.30-0.36, 0.66-0.79)	-
Starter (Except H22A7 engine)	Manufacturer	Standard (New)	Service Limit
	Output	VALEO	
	Commutator mica depth	1.0 kW	
	Commutator runout	0.5-0.9 (0.020-0.031)	0.2 (0.08)
	Brush length	0.01 (0.0004) max.	0.015 (0.0006)
	Brush spring tension N (kg, lbf)	18 (0.7)	5 (0.2)
		15.3-19.2 (1.56-1.96, 3.44-4.32)	
Starter (H22A7 engine)	Manufacturer	Standard (New)	Service Limit
	Output	DENSO	
	Commutator mica depth	1.0 kW	
	Commutator runout	0.5-0.8 (0.020-0.031)	0.2 (0.0008)
	Brush length	0.02 (0.0008) max.	0.05 (0.002)
	Brush spring tension N (kg, lbf)	27.9-28.0 (1.098-1.108)	27.0 (1.06)
		14.0-14.5 (0.55-0.57) 13.7-17.7 (1.4-1.8), 3.09-3.97)	9.0 (0.35) -

*1: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Standards and Service Limits**Cylinder Head/Valve Train (D16B6 engine)– Section****2-3**

6

Unit of length: mm (in)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm (min ⁻¹) and wide open throttle kPa (kgf/cm ² , psi)	Nominal Minimum Max. variation	1,270 (13.0, 185) 930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height		- 92.95-93.05 (3.659-3.663)	0.05 (0.002) -
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height		0.05-0.15 (0.002-0.006) 0.050-0.089 (0.0020-0.0075) 0.003 (0.001) max. IN 35.019 (1.3787)*1, 34.734 (1.3675)*2 EX 37.904 (1.423)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) -
Valve	Valve clearance (cold) Valve stem O.D. Stem-to-guide clearance	IN EX IN EX IN EX	0.18-0.22 (0.007-0.009) 0.23-0.27 (0.009-0.011) 5.48-5.49 (0.2157-0.2161) 5.45-5.46 (0.2146-0.2150) 0.02-0.05 (0.001-0.002) 0.05-0.08 (0.002-0.003)	- - 5.45 (0.2146) 5.42 (0.2134) 0.08 (0.003) 0.11 (0.004)
Valve seat	Width Stem installed height	IN EX IN EX	0.85-1.15 (0.033-0.045) 1.25-1.55 (0.049-0.061) 53.17-53.64 (2.093-2.112) 53.17-53.64 (2.093-2.112)	1.6 (0.063) 2.0 (0.079) 53.89 (2.122) 53.89 (2.122)
Valve spring	Free length	IN and EX	58.7 (2.31)	-
Valve guide	I.D. Installed height	IN EX IN EX	5.51-5.53 (0.217-0.218) 5.51-5.53 (0.217-0.218) 17.85-18.35 (0.703-0.72) 18.65-19.15 (0.734-0.754)	5.55 (0.219) 5.55 (0.219) - -
Rocker arm	Arm-to-shaft clearance	IN EX	0.017-0.050 (0.0007-0.0020) 0.018-0.054 (0.0007-0.0021)	0.08 (0.003) 0.08 (0.003)

*1: Timing belt side

*2: Distributor side

Standards and Service Limits
Cylinder Head/Valve Train (F18B2, F18B3, F20B6
engines)– Section 6

2-4

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Compression	250 rpm (min ⁻¹) and wide open throttle	Nominal Minimum Max. variation	1,420 (14.5, 206) 930 (9.5, 135) 200 (2.0, 28)		
Cylinder head	Warpage Height		-	0.05 (0.002)	
			92.95-93.05 (3.659-3.663)	-	
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)	
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0075)	0.15 (0.006)	
	Total runout		0.003 (0.001) max.	0.04 (0.002)	
	Cam lobe height				
	F18B2, F18B3 engines:				
		IN Primary	38.539 (1.5173)	-	
		Mid	39.223 (1.5442)	-	
		Secondary	33.913 (1.3352)	-	
		EX	38.645 (1.5215)	-	
	F20B6 engine:				
		IN Primary	38.539 (1.5173)	-	
	Mid	39.725 (1.564)	-		
	Secondary	33.913 (1.3352)	-		
	EX	38.645 (1.5215)	-		
Valve	Valve clearance (cold)	IN	0.24-0.28 (0.009-0.011)	-	
		EX	0.28-0.32 (0.011-0.013)	-	
	Valve stem O.D.	IN	5.485-5.495 (0.2159-0.2163)	5.455 (0.2148)	
		EX	5.450-5.460 (0.2146-0.2150)	5.420 (0.2134)	
	Stem-to-guide clearance	IN	0.020-0.045 (0.0008-0.0018)	0.08 (0.003)	
		EX	0.055-0.080 (0.0022-0.0031)	0.12 (0.005)	
Valve seat	Width	IN	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
	Stem installed height	IN	46.75-47.55 (1.841-1.872)	47.80 (1.882)	
		EX	46.68-47.48 (1.838-1.869)	47.73 (1.879)	
Valve spring	Free length	IN	51.08 (2.0111)	-	
		EX	55.58 (2.188)	-	
Valve guide	I.D.	IN	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
		EX	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
	Installed height	IN	21.20-22.20 (0.835-0.874)	-	
		EX	20.63-21.63 (0.812-0.854)	-	
Rocker arm	Arm-to-shaft clearance	IN	0.026-0.067 (0.001-0.0026)	0.08 (0.003)	
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)	

Standards and Service Limits

2-5

Cylinder Head/Valve Train (H22A7 engine)– Section

6

Unit of length: mm (in)

		MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm (min*1) and wide open throttle	Nominal		1,270 (13.0, 185)	
	kPa (kgf/cm ² , psi)	Minimum		930 (9.5, 135)	
		Max. variation		200 (2.0, 28)	
Cylinder head	Warpage			-	0.05 (0.002)
	Height			146.95-147.05 (5.785-5.789)	-
Camshaft	End play			0.05-0.15 (0.002-0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance			0.050-0.089 (0.0020-0.0075)	0.15 (0.006)
	Total runout			0.003 (0.001) max.	0.04 (0.002)
	Cam lobe height				
	F18B2, F18B3 engines:				
		IN	Primary	34.041 (1.3402)	-
			Mid	37.229 (1.4657)	-
			Secondary	34.071 (1.3414)	-
		EX	Primary	33.745 (1.3285)	-
			Mid	36.704 (1.4450)	-
			Secondary	34.683 (1.3655)	-
Valve	Valve clearance (cold)		IN	0.15-0.19 (0.006-0.007) *1	-
			EX	0.17-0.21 (0.007-0.008) *1	-
	Valve stem O.D.		IN	5.475-5.485 (0.2156-0.2159)	5.455 (0.2144)
			EX	5.475-5.485 (0.2156-0.2159)	5.420 (0.2144)
	Stem-to-guide clearance		IN	0.025-0.055 (0.0010-0.0022)	0.08 (0.003)
			EX	0.050-0.080 (0.0020-0.0031)	0.11 (0.004)
Valve seat	Width		IN	1.30-1.50 (0.051-0.059)	2.00 (0.079)
			EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)
	Stem installed height		IN	42.5-42.7 (1.673-1.681)	42.95 (1.691)
			EX	43.9-44.1 (1.728-1.736)	44.35 (1.746)
Valve spring	Free length		IN	44.10 (1.736)	-
			Inner	41.32 (1.627)	-
			EX	44.92 (1.769)	-
			Inner	40.01 (1.575)	-
Valve guide	I.D.		IN	5.510-5.530 (0.2169-0.2177)	5.55 (0.219)
			EX	5.535-5.555 (0.2179-0.2187)	5.60 (0.220)
	Installed height		IN	14.55-15.05 (0.573-0.593)	-
			EX	14.95-15.45 (0.589-0.608)	-
Rocker arm	Arm-to-shaft clearance		IN	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)
			EX	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)

*1: Measuring point between camshaft and rocker arm

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface	0.07 (0.003) max	0.10 (0.004)
	Bore diameter	75.00-75.02 (2.953-2.954)	75.07 (2.956)
	Bore taper	-	0.05 (0.002)
	Reboring limit	-	0.5 (0.02)
Piston	Skirt O.D. At 5 mm (0.2 in) from bottom of skirt	74.980-74.990 (2.9520-2.9524)	74.970 (2.9516)
	Clearance in cylinder	0.010-0.040 (0.0004-0.0016)	0.05 (0.002)
	Groove width (for ring)		
	Top	1.020-1.030 (0.0404-0.0406)	1.05 (0.041)
	Second	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
	Oil	2.805-2.820 (0.1104-0.1110)	2.85 (0.112)
Piston ring	Ring-to-groove clearance		
	Top	0.030-0.060 (0.0012-0.0024)	0.13 (0.005)
	Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap		
	Top	0.15-0.30 (0.006-0.012)	0.70 (0.028)
	Second	0.20-0.70 (0.008-0.028)	0.80 (0.03)
	Oil	0.20-0.80 (0.008-0.031)	0.90 (0.035)
Piston pin	O.D	18.994-19.000 (0.7478-0.7480)	-
	Pin-to-piston clearance	0.010-0.022 (0.0004-0.0009)	-
Connecting rod	Pin-to-rod interference	0.014-0.040 (0.0006-0.0016)	-
	Small end bore diameter	18.96-18.98 (0.746-0.747)	-
	Large end bore diameter		
	Nominal	48.0 (1.89)	-
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)
Crankshaft	Main journal diameter	54.975-55.000 (2.1644-2.1654)	-
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-
	Taper	0.0025 (0.0001) max.	0.005 (0.0002)
	Out of Round	0.0025 (0.0001) max.	0.005 (0.0002)
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)
	Total runout	0.03 (0.001) max.	0.04 (0.002)
Bearing	Main bearing-to-journal oil clearance		
	No. 1 and 5 journals	0.018-0.036 (0.0007-0.0014)	0.05 (0.002)
	No. 2, 3 and 4 journals	0.024-0.042 (0.0009-0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance	0.020-0.038 (0.0008-0.0015)	0.05 (0.002)

Standards and Service Limits
Engine Block (F18B2, F18B3, F20B6 engines) –
Section 7

2-7

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	A or I	85.010-85.020 (3.3465-3.3468)	85.070 (3.3492)
		B or II	85.000-85.010 (3.3465-3.3468)	85.070 (3.3492)
	Bore taper	-	0.05 (0.002)	
Reboring limit	-	0.25 (0.010)		
Piston	Skirt O.D. at 16 mm (0.6 in) from (bottom of skirt)	No letter	84.980-84.990 (3.3457-3.3461)	84.970 (3.353)
		Letter B	84.970-84.980 (3.3453-3.3457)	84.960 (3.3449)
	Clearance in cylinder	0.020-0.040 (0.008-0.0016)	0.05 (0.002)	
	Groove width (for ring)	Top	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
Second Oil		1.220-1.230 (0.0480-0.0484)	1.25 (0.049)	
Piston ring	Ring-to-groove clearance	Top	0.035-0.060 (0.0014-0.0024)	0.13 (0.005)
		Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap	Top	0.20-0.35 (0.008-0.014)	0.60 (0.024)
		Second Oil	0.40-0.55 (0.016-0.022)	0.70 (0.028)
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)	
	Pin-to-piston clearance	-0.0050+0.0020 (-0.00020+0.00008)	0.04 (0.0002)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.0006)	0.020 (0.0008)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-	
	Large end bore diameter	48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter			
	No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655)	-	
	No. 3 journal	54.976-55.000 (2.1644-2.165)	-	
	No. 5 journal	54.992-55.016 (2.1650-2.1660)	-	
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-	
	Taper	0.005 (0.0002) max.	0.010 (0.0004)	
	Out-of-round	0.005 (0.0002) max.	0.010 (0.0004)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
Runout	0.02 (0.001) max.	0.04 (0.002)		
Bearings	Main bearing-to-journal oil clearance			
	No. 1 and 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)	
	No. 2 journal	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)	
	No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)	
	No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)	
	Rod bearing-to-journal oil clearance	0.015-0.043 (0.0006-0.0017)	0.050 (0.0020)	
Balancer shaft	Journal diameter			
	No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)	
	No. 1 rear journal	20.938-20.950 (0.8243-0.8248)	42.71 (1.681)	
	No. 2 front and rear journals	38.712-38.724 (1.5241-1.5246)	38.70 (1.524)	
	No. 3 front and rear journals	34.772-34.734 (1.3670-1.3675)	34.71 (1.367)	
	Journal taper	0.005 (0.0002) max.	-	
	End play	Front	0.10-0.40 (0.004-0.016)	-
		Rear	0.04-0.15 (0.002-0.006)	-
	Total runout	0.02 (0.001) max.	0.03 (0.001)	
	Shaft-to-bearing oil clearance			
No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)	0.12 (0.005)		
No. 1 rear journal	0.050-0.07 (0.0020-0.0030)	0.09 (0.004)		
No. 2 front and rear journals	0.076-0.108 (0.0030-0.0043)	0.13 (0.005)		
Balancer shaft bearing	I.D.	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)	
	No. 1 front journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)	
	No. 1 rear journal	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)	
	No. 2 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)	
	No. 3 front and rear journals			

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	A or I 87.010-87.020 (3.4256-3.4260)	87.070 (3.4279)	
		B or II 87.000-87.010 (3.4252-3.4256)	87.070 (3.4279)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.25 (0.010)	
Piston	Skirt O.D. at 15 mm (0.6 in) from (bottom of skirt)	No letter Letter B 86.993-87.006 (3.4249-3.4254)	86.980 (3.4244)	
		86.983-86.996 (3.4245-3.4250)	86.980 (3.4240)	
	Clearance in cylinder	0.004-0.027 (0.0002-0.0011)	0.04 (0.002)	
	Groove width (for ring)	Top Second Oil 1.240-1.255 (0.0488-0.0494)	1.275 (0.0502)	
Piston ring	Ring-to-groove clearance	Top	0.055-0.085 (0.0022-0.0033)	0.13 (0.005)
		Second	0.040-0.070 (0.0016-0.0028)	0.13 (0.005)
	Ring end gap	Top	0.25-0.35 (0.010-0.014)	0.60 (0.024)
		Second	0.60-0.70 (0.024-0.028)	0.90 (0.035)
		Oil	0.20-0.70 (0.008-0.028)*1	0.80 (0.031) *1
			0.20-0.50 (0.008-0.020)*2	0.60 (0.024)*2
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)	
	Pin-to-piston clearance	-0.0030-+0.0060 (-0.00012-+0.00024)	0.009 (0.0004)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.0006)	0.002 (0.0008)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-	
	Large end bore diameter	Nominal 51.0 (2.01)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter			
	No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655)	-	
	No. 3 journal	54.976-55.000 (2.1644-2.1654)	-	
	No. 5 journal	54.992-55.016 (2.1650-2.1660)	-	
	Rod journal diameter	47.976-48.000 (1.8888-1.8898)	-	
	Taper	0.005 (0.0002) max.	0.006 (0.0002)	
	Out-of-round	0.004 (0.0002) max.	0.006 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.0016)	
Runout	0.03 (0.001) max.	0.04 (0.002)		
Bearings	Main bearing-to-journal oil clearance			
	No. 1 and 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)	
	No. 2 journal	0.021-0.045 (0.008-0.0018)	0.050 (0.0020)	
	No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)	
	No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)	
	Rod bearing-to-journal oil clearance	0.027-0.055 (0.0011-0.0022)	0.060 (0.0024)	
Balancer shaft	Journal diameter			
	No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)	
	No. 1 rear journal	20.938-20.950 (0.8243-0.8248)	20.92 (0.824)	
	No. 2 front and rear journals	38.712-38.724 (1.5241-1.5246)	38.70 (1.524)	
	No. 3 front and rear journals	34.722-34.734 (1.3670-1.3675)	34.71 (1.367)	
	Journal taper	0.005 (0.0002) max.	-	
	End play	Front Rear 0.10-0.40 (0.004-0.016)	-	
		0.04-0.15 (0.002-0.006)	-	
	Total runout	0.02 (0.001) max.	-	
	Shaft-to-bearing oil clearance			
No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)	0.12 (0.005)		
No. 1 rear journal	0.050-0.075 (0.0020-0.0030)	0.09 (0.004)		
No. 2 front and rear journals	0.076-0.108 (0.0030-0.0043)	0.13 (0.005)		
Balancer shaft bearing	I.D.	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)	
	No. 1 front journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)	
	No. 1 rear journal	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)	
	No. 2 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)	
	No. 3 front and rear journals			

*1: RIKEN manufactured piston ring

*2: TEIKOKU PISTON RING manufactured piston ring

Engine Lubrication - Section 8

Unit of length: mm (in)

Engine Lubrication - Section 8		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity / (US qt, Imp qt)	D16B6 engine: 4.0 / (4.2US qt. 3.5 Imp qt.) for engine overhaul 3.6 / (3.8 US qt. 3.2 Imp qt.) for oil change, with filter 3.3 / (3.5 US qt. 2.9 Imp qt.) for oil change, without filter F18B2, F18B3, F20B6 engines: 5.7 / (6.0US qt. 5.0 Imp qt.) for engine overhaul 4.4 / (4.6 US qt. 3.9 Imp qt.) for oil change, with filter 4.1 / (4.3 US qt. 3.6 Imp qt.) for oil change, without filter H22A7 engine: 5.9 / (6.2US qt. 5.2 Imp qt.) for engine overhaul 4.8 / (5.1 US qt. 4.2 Imp qt.) for oil change, with filter 4.5 / (4.8 US qt. 4.0 Imp qt.) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance D16B6 engine Except D16B6 engine Pump housing-to-outer rotor clearance D16B6 engine Except D16B6 engine Pump housing-to-rotor axial clearance D16B6 engine Except D16B6 engine	0.02-0.14 (0.001-0.006) 0.02-0.16 (0.001-0.006) 0.10-0.18 (0.004-0.007) 0.10-0.19 (0.004-0.007) 0.03-0.08 (0.001-0.003) 0.02-0.07 (0.001-0.003)	0.20 (0.008) 0.20 (0.008) 0.20 (0.008) 0.21 (0.008) 0.15 (0.006) 0.12 (0.005)
Relief valve	Pressure setting at engine oil temp. 80°C (176°F) kPa (kgf/cm ² , psi) at idle at 3,000 rpm (min-1)	70 (0.7, 10) min. 340 (3.5, 50) min.	

Cooling - Section 10

Cooling - Section 10		STANDARD (NEW)
Radiator	Coolant capacity / (US qt. Imp qt.) (including engine, heater, cooling line and reservoir) Reservoir capacity 0.55 / (0.58 US qt. 0.48 Imp qt.)	D16B6 engine: 4.6 / (4.9 US qt. 4.1 Imp qt.) for overhaul 3.9 / (4.1 US qt. 3.4 Imp qt.) for coolant change F18B2, F18B3, F20B6 engines: M/T 5.8 / (6.1US qt. 5.1 Imp qt.) for overhaul 4.2 / (4.4 US qt. 3.7 Imp qt.) for coolant change A/T 5.7 / (6.0US qt. 5.0 Imp qt.) for overhaul 4.1 / (4.3 US qt. 3.6 Imp qt.) for coolant change H22A7 engine: 6.9 / (7.3US qt. 6.1 Imp qt.) for overhaul 3.3 / (3.5 US qt. 2.9 Imp qt.) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm ² , psi)	93-123 (0.95-1.25, 14-18)
Thermostat	Start to open °C (°F) Fully open °C (°F) Valve lift a fully open: except H22A7 engine H22A7 engine	70-80 (169-176) 90 (194) 8.0 (0.31) min. 10.0 (0.39) min.
Cooling fan	Thermostat "ON" temperature °C (°F) except H22A7 engine H22A7 engine Thermostat "OFF" temperature °C (°F) except H22A7 engine H22A7 engine Fan timer "ON" temperature °C (°F) Fan timer "OFF" temperature °C (°F)	91-95 (196-203) 92-98 (198-208) Subtract 3-8 (5-15) from actual "ON" temperature Subtract 2-7 (4-12) from actual "ON" temperature 103-109 (217-228) Subtract 4-9 (7-16) from actual "ON" temperature

Standards and Service Limits

2-10

Fuel and Emissions - Section 11/Clutch - Section 12/
Manual Transmission (DH) –Section 13

Fuel and Emissions - Section 11

	MEASUREMENT	STANDARD (NEW)
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm ² , psi)	D16B6 engine: 290-300 (3.0-3.1, 43-44) F18B2, F18B3, F20B6 engines: 270-320 (2.8-3.3, 40-47) H22A7 engine: 270-370 (2.8-3.8, 40-54)
Fuel tank	Capacity / (US gal. Imp gal.)	65.0 (17.2, 14.3)
Engine	Idle speed with headlight and cooling fan off rpm (min-1)	D16B6 engine: 750 ± 50 (M/T: neutral) F18B2, F18B3, F20B6 engines: 750 ± 50 (M/T: neutral) 730 ± 50 (A/T: N or P position) H22A7 engine: 790 ± 50 (M/T: neutral)
	Idle CO %	With TWC model: 0.1 max. Without TWC model: 1.0 ± 1.0

Clutch - Section 12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT		
Clutch pedal	Pedal height	to floor	177-187 (7.0-7.4)	-	
		LHD	201-211 (7.9-8.3)	-	
		RHD	141-151 (5.55-5.94)	-	
	Stroke	Free play	1.0-7.0 (0.04-0.28)	-	
		Pedal play		-	
		Disengagement height	to floor	81 (3.2) min.	-
			LHD	107 (4.21) min.	-
	RHD		-		
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)		
Clutch disc	Rivet head depth	U2J4, U2G5	1.4 (0.06) min.	0.2 (0.008)	
		DH	1.3 (0.05) min.	0.2 (0.008)	
		U2Q7	1.2-1.7 (0.05-0.07)	0.2 (0.008)	
	Surface runout	Thickness	0.6 (0.02) max.	1.0 (0.04)	
		U2J4, U2G5	DH	7.9-8.4 (0.31-0.33)	6.0 (0.24)
			U2Q7	7.7-8.2 (0.30-0.32)	6.0 (0.24)
		8.3-9.0 (0.33-0.35)	6.0 (0.24)		
Pressure plate	Warpage	0.03 (0.001) max.	0.15 (0.006)		
	Diaphragm spring finger alignment	0.6 (0.02) max.	0.8 (0.03)		

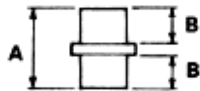
Manual Transmission (DH) - Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission oil	Capacity / (US qt. Imp qt.)	1.8 (1.9, 1.6) at oil change 1.9 (2.0, 1.7) at overhaul		
Mainshaft	End play	Diameter of ball bearing contact area A (Transmission housing side)	0.11-0.18 (0.004-0.007)	Adjust
		Diameter of 4th, 5th gear contact area B	21.987-22.000 (0.8656-0.8661)	21.930 (0.8634)
		Diameter of 3rd gear contact area C	26.980-26.993 (1.0622-1.0627)	26.930 (1.0602)
		Diameter of ball bearing contact area D (Clutch housing side)	33.984-34.000 (1.3380-1.3386)	33.930 (1.3358)
		Runout	25.977-25.990 (1.0227-1.0232)	25.920 (1.0205)
			0.02 (0.001) max.	0.05 (0.002)
Mainshaft 3rd and 4th gears	End play	I.D.	39.009-39.025 (1.5358-1.5364)	39.07 (1.5382)
		3rd	0.06-0.21 (0.002-0.008)	0.33 (0.013)
		4th	0.06-0.19 (0.002-0.007)	0.31 (0.012)
		3rd	30.22-30.27 (1.190-1.192)	30.15 (1.187)
		4th	30.12-30.17 (1.186-1.188)	30.05 (1.183)
Mainshaft 5th gear	End play	I.D.	37.009-37.025 (1.4570-1.4577)	37.07 (1.459)
		Thickenss	0.06-0.19 (0.002-0.007)	0.31 (0.012)
			28.42-28.47 (1.119-1.121)	28.35 (1.116)
Countershaft	Runout	Diameter of needle bearing contact area A	30.000-30.015 (1.1811-1.1817)	29.95 (1.179)
		Diameter of 1st gear contact area B	35.984-36.000 (1.4167-1.4173)	35.93 (1.415)
		Diameter of ball bearing contact area C	24.980-24.993 (0.9835-0.9840)	24.93 (0.982)
			0.02 (0.001) max.	0.05 (0.02)

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Countershaft 1st gear	I.D.	41.009-41.025 (1.6145-1.6152)	41.07 (1.617)	
	End play (when tightened by the specified torque)	0.03-0.10 (0.001-0.004)	0.22 (0.009)	
	Thickness	30.41-30.44 (1.197-1.198)	0.36 (1.195)	
Countershaft 2nd gear	I.D.	44.009-44.025 (1.7326-1.7333)	44.07 (1.735)	
	End play (when tightened by the specified torque)	0.04-0.12 (0.002-0.005)	0.24 (0.009)	
	Thickness	31.91-31.96 (1.256-1.258)	31.85 (1.254)	
Spacer collar (Countershaft 2nd gear)	I.D.	33.000-33.010 (1.2992-1.2996)	33.04 (1.301)	
	O.D.	38.989-39.000 (1.5350-1.5354)	38.93 (1.533)	
	Length	32.03-32.06 (1.261-1.262)	32.01 (1.260)	
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	27.002-27.012 (1.0631-1.0635)	27.06 (1.065)	
	O.D.	4th	33.989-34.000 (1.3381-1.3386)	33.93 (1.336)
		5th	31.989-32.000 (1.2594-1.2598)	31.93 (1.257)
	Length	4th	22.83-22.86 (0.899-0.900)	22.81 (0.898)
		5th	23.53-23.56 (0.926-0.928)	23.51 (0.926)
Reverse idler gear	I.D.	15.016-15.043 (0.5912-0.5922)	15.08 (0.594)	
	Gear-to-reverse gear shaft clearance	0.032-0.077 (0.0013-0.0030)	0.14 (0.006)	
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.73-1.18 (0.029-0.046)	0.4 (0.016)	
Shift fork	Finger thickness	1st, 2nd, 5th	6.2-6.4 (0.243-0.253)	-
		3rd, 4th	7.4-7.6 (0.293-0.300)	-
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	-	
Reverse shift fork	Fork pawl groove width	12.7-13.0 (0.50-0.51)	-	
	Fork-to-reverse idle gear clearance	0.5-1.1 (0.023-0.043)	1.8 (0.07)	
	L-groove width	7.05-7.25 (0.278-0.285)	-	
	Fork-to-6th/reverse shift shaft piece pin clearance	0.05-0.35 (0.002-0.014)	0.5 (0.02)	
Shift arm A	Inner diameter of shift arm A shaft contact point	13.05-13.13 (0.514-0.517)	-	
		0.05-0.23 (0.002-0.009)	0.35 (0.014)	
	Shift arm A-to-shift arm C clearance			
Shift arm B	Inner diameter of shift arm B shaft contact point	13.973-14.000 (0.5501-0.5512)	-	
	Shift arm B-to-shaft clearance	0.013-0.070 (0.0005-0.0028)	0.16 (0.006)	
	Shift arm B-to-shift piece clearance	0.2-0.5 (0.01-0.02)	0.6 (0.024)	
	Diameter of shift fork contact point	12.908-13.000 (0.5029-0.5118)	12.78 (0.503)	
	Shift fork 1st-2nd/shift piece groove width	13.2-13.4 (0.52-0.53)	-	
MBS shift piece	Diameter of pin	6.9-7.1 (0.27-0.28)	6.8 (0.27)	
Differential carrier	Pinion shaft bore diameter	18.010-18.028 (0.7091-0.7098)	-	
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.0009-0.0022)	0.095 (0.004)	
	Driveshaft bore diameter	26.025-26.045 (1.0246-1.0254)	-	
	Carrier-to-driveshaft clearance	0.045-0.086 (0.0018-0.0034)	0.14 (0.006)	
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	-	
	Pinion gear bore diameter	18.042-18.066 (0.7103-0.7113)	0.095 (0.004)	
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)	
Set ring-to-bearing outer race		0-0.1 (0-0.004)	Adjust	

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission fluid	Capacity / (US qt. Imp. qt)	1.9 (2.0, 1.7) at fluid change 2.0 (2.1, 1.18) at overhaul		
Mainshaft	End play	0.10-0.16 (0.004-0.006)	Adjust	
	Diameter of ball bearing contact area C	27.977-27.990 (1.1015-1.1020)	27.93 (1.100)	
	Diameter of needle bearing contact area B	37.984-38.000 (1.4954-1.4961)	37.93 (1.493)	
	Diameter of ball bearing contact area A	27.987-28.000 (1.1018-1.1024)	27.94 (1.100)	
	Diameter of 4th/5th contact area Runout	30.987-31.000 (1.2200-1.2205) 0.02 (0.001) max.	30.93 (1.218) 0.05 (0.002)	
Mainshaft 3rd and 4th gears	I.D.	43.009-43.025 (1.6933-1.6939)	43.080 (1.6961)	
	End play	0.06-0.21 (0.002-0.008)	0.30 (0.012)	
	Thickness	3rd gear Except U2Q7 U2Q7	32.42-32.47 (1.276-1.278) 34.92-34.97 (1.375-1.377)	32.3 (1.27) 34.8 (1.37)
		4th gear Except U2Q7 U2Q7	30.92-30.97 (1.217-1.219) 31.42-31.47 (1.237-1.239)	30.8 (1.21) 31.3 (1.23)
Mainshaft 5th gear	I.D.	43.009-43.025 (1.6933-1.6939)	43.080 (1.6961)	
	End play	0.06-0.21 (0.002-0.008)	0.30 (0.012)	
	Thickness	30.92-30.97 (1.217-1.219)	30.8 (1.21)	
Countershaft	Diameter of needle bearing contact area A	38.000-38.015 (1.4961-1.4967)	37.95 (1.494)	
	Diameter of ball bearing and needle bearing contact area C	24.987-25.000 (0.9837-0.9843)	24.94 (0.982)	
	Diameter of 1st gear contact area B	39.984-40.000 (1.5742-1.5748)	39.93 (1.572)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	
Countershaft 1st gear	I.D.	46.009-46.025 (1.8114-1.8120)	46.08 (1.814)	
	End play	Except U2Q7 U2Q7	0.06-0.23 (0.002-0.009) 0.06-0.18 (0.002-0.007)	0.23 (0.009) 0.23 (0.009)
		Thickness	Except U2Q7 U2Q7	32.95-33.00 (1.297-1.299) 26.95-27.000 (1.061-1.063)
Countershaft 2nd gear	I.D.	47.009-47.025 (1.8507-1.8514)	47.08 (1.854)	
	End play	0.10-0.15 (0.004-0.006)	0.18 (0.007)	
	Thickness	28.94-28.97 (1.139-1.141)	-	
Thrust washer (countershaft 1st gear)	Thickness	1.95-1.97 (0.077-0.078)	-	
Spacer collar (countershaft 2nd gear)	I.D.	36.48-36.49 (1.436-1.437)	36.50 (1.437)	
	O.D.	41.989-42.000 (1.6531-1.535)	41.94 (1.651)	
	Length	29.07-29.09 (1.144-1.145)	-	
Spacer collar (mainshaft 4th and 5th gears)	I.D.	31.002-31.012 (1.2205-1.2209)	31.06 (1.223)	
	O.D.	37.989-38.000 (1.4956-1.4961)	37.94 (1.494)	
	Length	A	56.45-56.55 (2.222-2.226)	-
		B	26.03-26.08 (1.025-1.027)	26.01 (1.024)



Standards and Service Limits

2-13

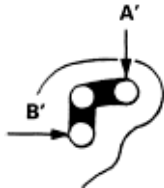
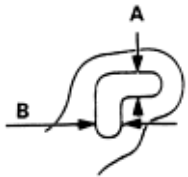
**Manual Transmission (U2J4/U2G5/U2Q7) - Section13
(cont'd)**

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Shift fork	Finger thickness 1st,2nd,5th	6.2-6.4 (0.24-0.25)	-	
	3rd,4th	7.4-7.6 (0.29-0.30)	-	
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	1.0 (0.04)	
Reverse shift fork	Pawl groove width	13.0-13.3 (0.51-0.52)	-	
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)	
	Groove width *1	at A	7.05-7.25 (0.278-0.285)	-
		at B	7.4-7.7 (0.29-0.30)	-
	Fork-to-5th/reverse shift shaft Clearance*2	at A'	0.05-0.35 (0.002-0.014)	0.5 (0.02)
at B'		0.4-0.8 (0.02-0.03)	1.0 (0.04)	
Shift arm	I.D.	15.973-16.000 (0.6289-0.6299)	-	
	Shift arm-to-shaft clearance	0.005-0.059 (0.0002-0.0023)	-	
	Shift fork diameter contact area	12.9-13.0 (0.508-0.512)	-	
	Shift arm-to-shift fork shaft clearance	0.2-0.5 (0.01-0.02)	0.6 (0.02)	
Select lever	Shaft outer diameter	15.941-15.968 (0.6276-0.6287)	-	
	Shift arm cover clearance	0.032-0.102 (0.0013-0.0040)	-	
Shift lever	O.D.	15.941-15.968 (0.6276-0.6287)	-	
	Transmission housing clearance	0.021-0.141 (0.0008-0.0056)	-	
Interlock	Bore diameter	16.00-16.05 (0.630-0.632)	-	
	Shift arm clearance	0.032-0.109 (0.0013-0.0043)	-	
Differential carrier	Pinion shaft contact area Except U2Q7	18.000-18.018 (0.7087-0.7094)	-	
	I.D.			
	Carrier-to-pinion shaft clearance Except U2Q7	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)	
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	-	
	Carrier-to-driveshaft clearance	R	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)
L		0.055-0.091 (0.0022-0.0036)	0.15 (0.006)	
Differential pinion gear Except U2Q7	Backlash	0.05-0.15 (0.002-0.006)	-	
	I.D.	18.042-18.066 (0.7103-0.7113)	-	
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)	
Tapered roller bearing preload	Starting torque Nm (kgf/cm, lbf/in)	1.4-2.5 (14-26, 12-23)	Adjust	

*1: Measuring points

*2: Measuring points



	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity / (US qt, Imp qt)		6.1 (6.4, 5.4) at overhaul 2.5 (2.6, 2.2) at fluid change	
Hydraulic pressure kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm (min-1) in N or P position		850-910 (8.7-9.3, 120-130)	800 (8.2, 120)
Hydraulic pressure kPa (kgf/cm ² , psi)	4th clutch pressure at 2,000 rpm (min-1) in D4 position 3rd clutch pressure at 2,000 rpm (min-1) in D4 position 2nd clutch pressure at 2,000 rpm (min-1) in 2 position 1st clutch pressure at 2,000 rpm (min-1) in 1 position		840-920 (8.6-9.4, 120-130)	790 (8.1, 120)
Stall speed rpm (min-1) (Check with vehicle on level ground)				
F20B6 engine			2,250	1,950-2,550
F18B2, F18B3 engine			2,450	2,150-2,750
Clutch	Clutch initial clearance	1st	1.15-1.35 (0.045-0.053)	-
		2nd	0.7-0.9 (0.028-0.035)	-
		3rd	0.6-0.8 (0.024-0.031)	-
		4th	0.4-0.6 (0.016-0.024)	-
	Clutch return spring free length	1st,2nd	45.7 (1.80)	43.7 (1.72)
		3rd,4th	33.5 (1.32)	31.5 (1.24)
	Clutch disc thickness		1.88-2.00 (0.074-0.079)	Until grooves worn
	Clutch plate thickness		1st out	
		2nd	1.95-2.05 (0.077-0.081)	Discoloration
		3rd	2.25-2.35 (0.089-0.093)	Discoloration
	4th	2.55-2.65 (0.100-0.104)	Discoloration	
		2.25-2.35 (0.089-0.093)	Discoloration	
Clutch	Clutch end plate thickness 1st, 2nd clutches	Mark 6	2.55-2.60 (0.100-0.102)	Discoloration
		Mark 7	2.65-2.70 (0.104-0.106)	Discoloration
		Mark 8	2.75-2.80 (0.108-1.110)	Discoloration
		Mark 9	2.85-2.90 (0.112-0.114)	Discoloration
		Mark 0	2.95-3.00 (0.116-0.118)	Discoloration
		Mark 1	3.05-3.10 (0.120-0.122)	Discoloration
		Mark 2	3.15-3.20 (0.124-0.126)	Discoloration
		Mark 3	3.25-3.30 (0.128-0.130)	Discoloration
		Mark 4	3.35-3.40 (0.132-0.134)	Discoloration
Clutch	Clutch end plate thickness 3rd, 4th clutches	Mark 1	2.05-2.10 (0.081-0.083)	Discoloration
		Mark 2	2.15-2.20 (0.085-0.087)	Discoloration
		Mark 3	2.25-2.30 (0.089-0.091)	Discoloration
		Mark 4	2.35-2.40 (0.093-0.094)	Discoloration
		Mark 5	2.45-2.50 (0.096-0.098)	Discoloration
		Mark 6	2.55-2.60 (0.100-0.102)	Discoloration
		Mark 7	2.65-2.70 (0.104-0.106)	Discoloration
		Mark 8	2.75-2.80 (0.108-0.110)	Discoloration
		Mark 9	2.85-2.90 (0.112-0.114)	Discoloration
Valve body	Stator shaft needle bearing contact I.D.			
	Torque converter side		27.000-27.021 (1.630-1.0638)	Wear or damage
	ATF pump side		29.000-29.021 (1.1417-1.1426)	-
	ATF pump gear thrust clearance		0.03-0.05 (0.001-0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance	Drive	0.210-0.265 (0.0083-0.0104)	-
		Driven	0.070-0.125 (0.0028-0.0049)	-
ATF pump driven gear I.D.		14.016-14.034 (0.5518-0.5525)	Wear or damage	
ATF pump driven gear shaft O.D.		13.980-13.990 (0.5504-0.5508)	Wear or damage	
Shifting device and parking brake	Reverse shift fork finger thickness		5.90-6.00 (0.232-0.236)	5.40 (0.213)
	Parking brake pawl		-	Wear or
	Parking gear		-	other defect
Servo body	Shift fork shaft bore I.D.		14.000-14.010 (0.5512-0.5516)	-
	Shift fork shaft valve bore I.D.		37.000-37.039 (1.4567-1.4582)	37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.		32.000-32.025 (1.2598-1.2608)	32.050 (1.2618)
Accumulator body	Sealing ring contact I.D.		35.000-35.025 (1.3780-1.3789)	35.05 (1.3799)
Stator shaft	Sealing ring contact I.D.		29.000-29.021 (1.1417-1.1426)	29.050 (1.1437)

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 3rd gear thrust shim, 41 x 72 mm thickness	6.32-6.35 (0.2488-0.2500) 6.37-6.40 (0.2508-0.2520) 6.42-6.45 (0.2528-0.2539) 6.47-6.50 (0.2547-0.2559) 6.52-6.55 (0.2567-0.2579) 6.57-6.60 (0.2587-0.2598)	Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage
Transmission	Mainshaft 4th gear thrust washer, 27 x 47 mm thickness	4.95-5.00 (0.1949-0.1969)	Wear or damage
Transmission	Secondary shaft splined washer, 38 x 56.5 mm thickness	6.82-6.85 (0.269-0.270) 6.87-6.90 (0.270-0.272) 6.92-6.95 (0.272-0.274) 6.97-7.00 (0.274-0.276) 7.02-7.05 (0.276-0.278) 7.07-7.10 (0.278-0.280)	Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage
Transmission	Secondary shaft thrust shim, 37 x 55 mm thickness	4.87-4.90 (0.192-0.193) 4.92-4.95 (0.194-0.195) 4.97-5.00 (0.196-0.197) 5.02-5.05 (0.198-0.199) 5.07-5.10 (0.200-0.201) 5.12-5.15 (0.202-0.203) 5.17-5.20 (0.204-0.205)	Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage Wear or damage
Transmission	Mainshaft 4th gear collar length	49.40-49.50 (1.945-1.949)	-
	Mainshaft 4th gear collar flange thickness	4.35-4.50 (0.171-0.177)	Wear or damage
	Countershaft distance collar length	50.42-50.46 (1.985-1.987)	-
	Cotter thickness	1.99-2.02 (0.078-0.080)	-
	Secondary shaft sealing ring, 35 mm thickness	1.890-1.950 (0.074-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 32 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 29 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Secondary shaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Mainshaft 4th clutch feed pipe O.D.	11.47-11.48 (0.4516-0.4520)	11.45 (0.4508)
	Mainshaft 3rd clutch feed pipe O.D.	5.97-5.98 (0.2350-0.2354)	5.95 (0.2343)
	Secondary shaft feed pipe O.D.	7.97-7.98 (0.3138-0.3142)	7.95 (0.3130)
	Mainshaft 4th clutch feed pipe bushing I.D.	11.500-11.518 (0.4528-0.4535)	11.530 (0.4539)
	Mainshaft 3rd clutch feed pipe bushing I.D.	6.018-6.030 (0.2369-0.2374)	6.045 (0.2380)
	Secondary shaft bushing I.D.	8.000-8.015 (0.3150-0.3156)	8.030 (0.3161)
	Diameter of needle bearing contact area		
	On mainshaft of stator shaft	22.984-23.000 (0.9049-0.9055)	Wear or damage
	On mainshaft of 3rd gear	55.975-55.991 (2.2037-2.2044)	Wear or damage
	On mainshaft of 4th gear collar	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 4th gear	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft 2nd gear	39.979-40.000 (1.5740-1.5748)	Wear or damage
	On counter shaft of L side	36.005-36.015 (1.4175-1.4179)	Wear or damage
	On parking gear	41.964-41.980 (1.6521-1.6528)	Wear or damage
	On secondary shaft of 1st gear	37.978-37.993 (1.4952-1.4958)	Wear or damage
	On secondary shaft of 2nd gear	33.986-33.999 (1.3380-1.3385)	Wear or damage
	On secondary shaft of L side	34.000-34.013 (1.3386-1.3391)	Wear or damage
	On reverse idler gear shaft	14.985-15.000 (0.5900-0.5906)	Wear or damage
	Transmission housing of reverse idler gear shaft contact area I.D.	14.800-14.819 (0.5827-0.5834)	-
	Reverse idler gear shaft holder I.D.	14.800-14.824 (0.5827-0.5836)	Wear or damage
	Reverse selector hub O.D.	55.87-55.90 (2.1996-2.2008)	Wear or damage
	Inside Diameter		
	Mainshaft 3rd gear	61.000-61.019 (2.4016-2.4023)	Wear or damage
	Mainshaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft idler gear	50.000-50.016 (1.9685-1.9691)	Wear or damage
	Countershaft reverse gear	46.000-46.016 (1.8110-1.8116)	Wear or damage
	Reverse idler gear	20.007-20.020 (0.7877-0.7882)	Wear or damage
	Secondary shaft 1st gear	44.000-44.016 (1.7323-1.7329)	Wear or damage
	Secondary shaft 2nd gear	40.000-40.016 (1.5748-1.5754)	Wear or damage

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT		
Transmission	End play				
	Mainshaft 3rd gear	0.03-0.11 (0.001-0.004)	-		
	Mainshaft 4th gear	0.10-0.22 (0.004-0.009)	-		
	Countershaft 1st gear	0.00-0.33 (0.000-0.013)	-		
	Countershaft 4th gear	0.04- 0.28 (0.002-0.911)	-		
	Countershaft idler gear	0.015-0.045 (0.0006-0.0018)	-		
	Countershaft reverse gear	0.10-0.25 (0.004-0.010)	-		
	Reverse idler gear	0.20-0.55 (0.008-0.022)	-		
	Secondary shaft 1st gear	0.07-0.15 (0.003-0.006)	-		
	Secondary shaft 2nd gear	0.04-0.12 (0.002-0.005)	-		
Differential carrier	Pinion shaft contact area I.D.	18.010-18.028 (0.709-0.710)	-		
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.001-0.002)	0.1 (0.004)		
	Driveshaft contact area I.D.	28.025-28.045 (1.103-1.104)	-		
	Carrier-to-driveshaft clearance	0.045-0.086 (0.002-0.003)	0.12 (0.005)		
Differential Pinion gear	Backlash	0.050-0.150 (0.002-0.006)	-		
	I.D.	18.042-18.066 (0.710-0.711)	-		
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.002-0.004)	0.12 (0/005)		
Differential tapered roller bearing preload	For new bearing	2.7-3.9 (28-40, 24-35)	Adjust		
	Starting torque Nm (kgf/cm, lbf/in)	For used bearing	2.5-3.6 (25-37, 22-32)	Adjust	
	MEASUREMENT	STANDARD (NEW)			
		Wire Dia	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0
	Relief valve spring	0.9 (0.035)	6.6 (0.260)	39.8 (1.567)	20.4
	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve B spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
	Shift valve C spring	0.7 (0.28)	6.6 (0.260)	32.2 (1.268)	13.4
	Shift valve E spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
	Lock-up shift valve spring	0.65 (0.026)	6.6 (0.260)	34.9 (1.370)	15.6
	Lock-up timing valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Servo control valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve B spring	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
	1st accumulator spring A	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5
1st accumulator spring B	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
3rd Accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
4th accumulator spring	2.6 (0.102)	21.6 (0.850)	73.2 (2.882)	10.0	
2nd accumulator spring A	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6	
	2nd accumulator spring B				

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	
Steering wheel	Rotation play at steering wheel circumference	0-10 (0-0.39)	
	Starting load at steering wheel circumference N (kgf, lbf) Engine running	30 (3.1, 6.8)	
Gearbox	Angle of rack-guide-screw loosened from locked position	5°-10°	
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm ² , psi)		
	D16B6 engine model	5,700-6,400 (58-65, 820-920)	
	F18B2, F18B3, F20B6 engine models	6,700-7,400 (68-75, 970-1,070)	
	H22A7 engine model	6,900-7,600 (70-77, 1,000-1,090)	
Power steering fluid	Recommended fluid		
	Fluid capacity		
	l (US qt. Imp qt) For overhaul		
	D16B6 engine model	1.0 (1.1, 0.9)	
	RHD (Except D16B6 engine)	1.1 (1.2, 1.0)	
	LHD (Except D16B6 engine)	1.0 (1.1, 0.9)	
	For fluid change	0.4 (0.42, 0.35)	
Power steering belt*	Deflection with 98 N (10 kgf. 22lbf) between pulleys	D16B6 engine model	10.5-14.0 (0.41-0.55) with used belt
		Except D16B6 engine model	7.5-10.0 (0.30-0.39) with new belt
			13.0-16.5 (0.51-0.65) with used belt
		8.5-11.0 (0.33-0.43) with new belt	
Power steering belt*	Belt tension N (kgf, lbf) Measured with belt tension gauge	D16B6 engine model	340-490 (35-50, 77-110) with used belt
			640-780 (65-80, 143-176) with new belt
		Except D16B6 engine model	390-540 (40-55, 88-121) with used belt
		740-880 (75-90, 165-198) with new belt	

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension - Section 18

	MEASUREMENT	STANDARD (NEW)		
Wheel alignment	Camber Front	H22A7 engine model	-0°15' ±1°	
		Except H22A7 engine model	0° ±1°, 0°10' ±1°*1	
	Rear	H22A7 engine model	-1°15' ±30'	
		Except H22A7 engine model	-1°00', ±30', -0°50' ±30°*1	
	Caster Front	H22A7 engine model	30°00' ±1°	
		Except H22A7 engine model	2°50' ±1°, 2°45' ±1°*1	
	Total toe Front		0 ±2 (0 ±0.08)	
		Rear	IN 2 ±2 (0.08 ±0.08)	
	Front wheel turning angle	Inward wheel	H22A7 engine model	36°06' ±2°
			Except H22A7 engine model	39°10' ±2°, 39°27' ±2°
Outward wheel		H22A7 engine model	29°12' (Reference)	
		Except H22A7 engine model	30°58' (Reference), 31°14' (Reference)*1	
Wheel bearing	End play	Front	0-0.05 (0-0.002)	
		Rear	0-0.05 (0-0.002)	
Wheel	Rim runout Aluminium wheel	Axial	STANDARD (NEW)	
		Radial	SERVICE LIMIT	
	Steel wheel	Axial	0-0.7 (0-0.03)	
		Radial	0-1.0 (0-0.04)	
		2.0 (0.08)		
		1.5 (0.06)		
		2.0 (0.08)		
		1.5 (0.06)		

*1: KY model

	MEASUREMENT	STANDARD (NEW)		
Parking brake lever	Play on stroke at 200 N (20 kgf, 44 lbf) lever force	To be locked when pulled 6-9 notches		
Foot brake pedal	Pedal height (With floor mat removed)	M/T 168.5 (6.63)		
		A/T 173.5 (6.83)		
	Free play	1-5 (0.04-0.20)		
Master cylinder	Piston-to-pushrod clearance	0-0.4 (0-0.02)		
Disc brake	Disc thickness	H22A7 engine model Except D16B6, H22A7 engine model	STANDARD (NEW) 27.9-28.1 (1.10-1.11)	SERVICE LIMIT 26.0 (1.02)
		D16B6 engine model	24.9-25.1 (0.98-0.99)	23.0 (0.91)
		Rear	22.9-23.1 (0.90-0.91)	21.0 (0.83)
	Disc runout	Front	9.9-10.1 (0.390-0.398)	8.0 (0.31)
		Rear	-	0.10 (0.004)
	Disc parallelism	Front and rear	-	0.10 (0.004)
	Pad thickness	Front	-	0.015 (0.0006)
		Rear	10.5-11.5 (0.41-0.45)	1.6 (0.06)
	Drum brake	Drum I.D.	228.6-228.7 (9.000-9.004)	229.6 (9.039)
Lining		5.0 (0.20)	2.0 (0.08)	
Brake booster	Characteristics at 98 N (10 kgf, 22 lbf) and 294 N (30 kgf, 66 lbf) pedal force	<u>Minimum line pressure</u>		
		<u>D16B6 engine model</u>	<u>Except D16B6 engine model</u>	
	Vacuum	98 (10, 22) N (kgf, lbf)	98 (10, 22) N (kgf, lbf)	
	<u>kPa (mm Hg, in Hg)</u>	0 (0,0) kPa (kgf/cm ² , psi)	0 (0,0) kPa (kgf/cm ² , psi)	
	0 (0.0)	294 (30, 66) N (kgf, lbf)	294 (30, 66) N (kgf, lbf)	
		1,470 (15, 213)	1,275 (13, 185)	
		(kgf/cm ² , psi)	(kgf/cm ² , psi)	
		98 (10, 22) N (kgf, lbf)	98 (10, 22) N (kgf, lbf)	
	66.7 (500, 19.7)	3,040 (31, 441)	3,825 (39, 555)	
		(kgf/cm ² , psi)	(kgf/cm ² , psi)	
		294 (30, 66) N (kgf, lbf)	295 (30, 66) N (kgf, lbf)	
		6,860 (70, 995)	8,238 (84, 1, 194)	
		(kgf/cm ² , psi)	(kgf/cm ² , psi)	

Air Conditioning - Section 22

	MEASUREMENT	STANDARD (NEW)
Air conditioning system SANDEN	Lubricant type: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 368899-P13-A01). (For Refrigerant: HFC-134a (R-134a))	
	Lubricant capacity	25 (5/6, 0.9)
	m/ (fl oz, Imp oz)	40 (11/3, 1.4)
	Condenser	10 (1/3, 0.4)
	Evaporator	10 (1/3, 0.4)
Air conditioning system DENSO	Lubricant type: ND-OIL8 (P/N 38897-PR7-003, 38898-PR7-003 or 38899-PR7-A01). (For Refrigerant: HFC-134a (R-134a))	
	Lubricant capacity	25 (5/6, 0.8)
	m/ (fl oz, Imp oz)	40 (11/3, 1.4)
	Condenser	10 (1/3, 0.4)
	Evaporator	10 (1/3, 0.4)
Compressor SANDEN	Lubricant type: SP-10	
	Lubricant capacity m/ (fl oz, Imp oz)	130 (4 1/3, 4.6)
	Field coil resistance at 20°C (68°F) ohms	3.05-3.35
	Pulley-to-pressure plate clearance	0.5 ±0.15 (0.02 ±0.006)
Compressor DENSO	Lubricant type: ND-OIL8	
	Lubricant capacity m/ (fl oz, Imp oz)	160 (5 1/3, 5.6)
	Stator coil resistance at 20°C (68°F) ohms	3.9-4.3
	Pulley-to-pressure plate clearance	0.5 ±0.15 (0.02 ±0.006)
Compressor belt	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	
	D16B6 engine model	7.5-9.5 (0.30-0.37) with used belt 5.0-6.5 (0.20-0.26) with new belt
	All except D16B6	10.0-12.0 (0.39-0.47) with used belt

	engine model	5.5-7.5 (0.22-0.30) with new belt
Compressor belt	Belt tension N (kgf, lbf)	
	Measured with belt tension gauge	
	D16B6 engine model	340-490 (35-50, 77-110) with used belt 690-830 (70-85, 150-190) with new belt
	All except D16B6 engine model	390-540 (40-55, 88-120) with used belt 880-1,030 (90-105, 200-231) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

	ITEM		METRIC	ENGLISH	NOTES	
Dimensions	Overall Length		4,595 mm	180.9 in		
	Overall Width		1,750 mm	68.9 in		
	Overall Height	Except KY model	1,430 mm	56.3 in		
		KY model	1,445 mm	56.9 in		
	Wheelbase	Except TYPE R	2,668 mm	105.0 in		
		TYPE R	2,670 mm	105.1 in		
	Track Front/Rear	Except TYPE R	1,495/1,504 mm	58.9/59.2 in		
Wheel Arch Front/Rear	TYPE R	1,507/1,515 mm	59.3/59.6 in			
Seating Capacity			666/669 mm	26.2/26.3 in	EU	
			Five			
Weight	Curb Weight					
	KE	1.6iS	M/T	1,270 kg	2,800 lbs	
			M/T with A/C, S/R	1,301 kg	2,868 lbs	
	1.6iLS	1.8iS	M/T with A/C, S/R	1,301 kg	2,868 lbs	
			M/T	1,345 kg	2,965 lbs	
	1.8iLS	1.8iES	A/T	1,370 kg	3,020 lbs	
			M/T with A/C	1,360 kg	2,998 lbs	
			A/T with A/C	1,385 kg	3,053 lbs	
			M/T with S/R	1,361 kg	3,000 lbs	
			A/T with S/R	1,386 kg	3,056 lbs	
			M/T with S/R	1,361 kg	3,000 lbs	
			A/T with S/R	1,386 kg	3,056 lbs	
			M/T with A/C, S/R	1,376 kg	3,034 lbs	
			A/T with A/C, S/R	1,401 kg	3,089 lbs	
			M/T	1,406 kg	3,100 lbs	
	2.0iLS	2.0iES	A/T	1,431 kg	3,155 lbs	
			M/T with S/R	1,361 kg	3,000 lbs	
			A/T with S/R	1,386 kg	3,056 lbs	
			M/T with A/C, S/R	1,376 kg	3,034 lbs	
	2.0iES	TYPE R	A/T with A/C, S/R	1,401 kg	3,089 lbs	
			M/T	1,406 kg	3,100 lbs	
			A/T	1,431 kg	3,155 lbs	
			M/T	1,345 kg	2,965 lbs	
	KG	1.6iS	M/T with A/C	1,285 kg	2,833 lbs	
			M/T with S/R	1,286 kg	2,935 lbs	
		1.6iLS	1.8iS	M/T with A/C	1,285 kg	2,833 lbs
				M/T with S/R	1,286 kg	2,835 lbs
		1.8iS	1.8iLS	M/T with A/C, S/R	1,301 kg	2,868 lbs
				M/T with A/C	1,360 kg	2,998 lbs
		1.8iLS	1.8iES	A/T with A/C	1,385 kg	3,053 lbs
				M/T with S/R	1,361 kg	3,000 lbs
		KS	1.6iS	M/T	1,345 kg	2,965 lbs
				A/T	1,370 kg	3,020 lbs
	1.6iLS		1.8iS	M/T with A/C	1,360 kg	2,998 lbs
				A/T with A/C	1,385 kg	3,053 lbs
	1.8iS		1.8iLS	M/T with S/R	1,361 kg	3,000 lbs
				A/T with S/R	1,386 kg	3,056 lbs
	1.8iLS		1.8iES	M/T with A/C, S/R	1,376 kg	3,034 lbs
				A/T with A/C, S/R	1,401 kg	3,089 lbs
	2.0iLS		2.0iES	M/T	1,406 kg	3,100 lbs
				A/T	1,431 kg	3,155 lbs
	TYPE R	1.6iS	M/T	1,345 kg	2,965 lbs	
			A/T	1,370 kg	3,020 lbs	
		1.6iLS	1.8iS	M/T with A/C	1,360 kg	2,998 lbs
				A/T with A/C	1,365 kg	3,053 lbs
		1.8iS	1.8iLS	M/T with S/R	1,361 kg	3,000 lbs
				A/T with S/R	1,386 kg	3,056 lbs
		1.8iLS	2.0iLS	M/T with A/C, S/R	1,376 kg	3,034 lbs
				A/T with A/C, S/R	1,401 kg	3,089 lbs
		2.0iES	TYPE R	M/T	1,406 kg	3,100 lbs
A/T				1,431 kg	3,155 lbs	
1.6iS	1.6iLS	M/T	1,345 kg	2,965 lbs		
		M/T with A/C	1,270 kg	2,800 lbs		
1.6iLS	1.8iS	M/T with A/C	1,285 kg	2,833 lbs		
		M/T with A/C	1,285 kg	2,833 lbs		
1.8iS	1.8iLS	M/T with A/C	1,360 kg	2,998 lbs		
		A/T	1,375 kg	3,031 lbs		
1.8iLS		M/T with A/C	1,360 kg	2,998 lbs		

	ITEM			METRIC	ENGLISH	NOTES
Weight	KS	2.0iLS	M/T	1,345 kg	2,965 lbs	
		2.0iES	M/T with A/C	1,390 kg	3,064 lbs	
	KR	1.6iS	M/T	1,265 kg	2,789 lbs	
			M/T with ABS	1,270 kg	2,800 lbs	
			M/T with ABS, A/C	1,285 kg	2,833 lbs	
		1.6iLS	M/T with A/C	1,285 kg	2,833 lbs	
			M/T with A/C, S/R	1,301 kg	2,868 lbs	
		1.8iS	M/T with A/C	1,360 kg	2,998 lbs	
		1.8iLS	M/T	1,345 kg	2,965 lbs	
			A/T	1,370 kg	3,020 lbs	
			M/T with A/C	1,360 kg	2,998 lbs	
			A/T with A/C	1,385 kg	3,053 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs		
		1.8iES	M/T	1,375 kg	3,031 lbs	
		2.0LS	M/T	1,360 kg	2,998 lbs	
		2.0ES	M/T	1,406 kg	3,100 lbs	
			A/T	1,431 kg	3,155 lbs	
		TYPE R	M/T	1,345 kg	2,965 lbs	
	KY	1.8iS	M/T	1,340 kg	2,954 lbs	
			A/T	1,365 kg	3,009 lbs	
Weight	Weight Distributions (Front/Rear)					
	KE	1.6iS	M/T	730/540 kg	1,610/1,190 lbs	
			M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
		1.6iLS	M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
			1.8iS	M/T	805/540 kg	1,775/1,190 lbs
		A/T		830/540 kg	1,830/1,190 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			A/T with A/C	845/540 kg	1,863/1,190 lbs	
			M/T with S/R	813/548 kg	1,792/1,208 lbs	
			A/T with S/R	838/548 kg	1,848/1,208 lbs	
		1.8iLS	M/T with S/R	813/548 kg	1,792/1,208 lbs	
	A/T with S/R		838/548 kg	1,848/1,208 lbs		
	M/T with A/C, S/R		828/548 kg	1,826/1,208 lbs		
	A/T with A/C, S/R		853/548 kg	1,881/1,208 lbs		
	1.8iES	M/T	838/568 kg	1,848/1,252 lbs		
		A/T	863/568 kg	1,903/1,252 lbs		
	2.0iLS	M/T with S/R	823/538 kg	1,814/1,846 lbs		
			A/T with S/R	848/538 kg	1,870/1,186 lbs	
		M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs		
			A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs	
	2.0iES	M/T	848/558 kg	1,870/1,230 lbs		
		A/T	873/558 kg	1,925/1,230 lbs		
	TYPE R	M/T	820/525 kg	1,808/1,157 lbs		
	KG	1.6iS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with S/R	738/548 kg	1,627/1,208 lbs	
		1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with S/R	738/548 kg	1,627/1,208 lbs	
		M/T with A/C, S/R	753/548 kg	1,680/1,208 lbs		
			1.8iS	M/T with A/C	820/540 kg	1,808/1,190 lbs
		A/T with A/C		845/540 kg	1,863/1,190 lbs	
			M/T with S/R	813/548 kg	1,792/1,208 lbs	
		1.8iLS	M/T	805/540 kg	1,775/1,190 lbs	
			A/T	830/540 kg	1,830/1,190 lbs	
	M/T with A/C		820/540 kg	1,808/1,190 lbs		
	A/T with A/C		845/540 kg	1,863/1,190 lbs		
		M/T with S/R	813/548 kg	1,792/1,208 lbs		
		A/T with S/R	838/548 kg	1,848/1,208 lbs		
		M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs		
		A/T with A/C, S/R	853/548 kg	1,881/1,208 lbs		
	1.8iES	M/T	838/568 kg	1,848/1,252 lbs		
		A/T	863/568 kg	1,903/1,252 lbs		
	2.0iLS	M/T	815/530 kg	1,797/1,168 lbs		
			A/T	640/530 kg	1,852/1,168 lbs	
		M/T with A/C	830/530 kg	1,830/1,168 lbs		
			A/T with A/C	855/530 kg	1,885/1,168 lbs	
		M/T with S/R	823/538 kg	1,814/1,186 lbs		
			A/T with S/R	848/538 kg	1,870/1,186 lbs	
		M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs		
			A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs	

	ITEM			METRIC	ENGLISH	NOTES
Weight	KG	2.0iES	M/T	848/558 kg	1,870/1,230 lbs	
			A/T	873/558 kg	1,925/1,230 lbs	
	KS	1.6iS	TYPE R M/T	820/525 kg	1,808/1,157 lbs	
			M/T	730/540 kg	1,610/1,190 lbs	
	KR	1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	830/530 kg	1,830/1,168 lbs	
			A/T	815/560 kg	1,797/1,234 lbs	
			M/T with A/C	820/540 kg	1,808/1,180 lbs	
			M/T	815/530 kg	1,797/1,168 lbs	
			M/T with A/C	840/550 kg	1,852/1,212 lbs	
			M/T	725/540 kg	1,598/1,191 lbs	
			M/T with ABS	730/540 kg	1,610/1,190 lbs	
			M/T with ABS, A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C, S/R	753/549 kg	1,660/1,208 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			M/T	805/540 kg	1,775/1,190 lbs	
	KY	1.8iS	A/T	830/540 kg	1,830/1,190 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			A/T with A/C	845/540 kg	1,883/1,190 lbs	
			M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs	
			M/T	815/560 kg	1,797/1,234 lbs	
			M/T	830/530 kg	1,830/1,168 lbs	
			M/T	848/558 kg	1,870/1,230 lbs	
			A/T	873/558 kg	1,925/1,230 lbs	
			TYPE R M/T	820/525 kg	1,808/1,157 lbs	
			M/T	805/535 kg	1,775/1,179 lbs	
	Weight	Max. Permissible Weight (EU)	A/T	830/535 kg	1,830/1,179 lbs	
			D16B6 engine model	1,740 kg	3,836 lbs	
			F18B2, F18B3, F20B6 engine models	1,890 kg	4,167 lbs	
			H22A7 engine model	1,820 kg	4,012 lbs	

	ITEM	METRIC	ENGLISH	NOTES
ENGINE	Type	D16B6 engine	Water-cooled, 4-stroke SOHC gasoline engine	
		F18B2, F18B3, F20B6 engines	Water-cooled, 4-stroke SOHC VTEC gasoline engine	
		H22A7 engine	Water-cooled, 4-stroke DOHC VTEC gasoline engine	
	Cylinder Arrangement		Inline 4-cylinder, transverse	
	Bore and Stroke		75.0 x 90.0 mm	2.95 x 3.54 in
		D16B6 engine	85.0 x 81.5 mm	3.25 x 3.21 in
		F18B2, F18B3 engines	85.0 x 88.0 mm	3.25 x 3.46 in
		F20B6 engine	87.0 x 90.7 mm	3.43 x 3.57 in
		H22A7 engine		
	Displacement		1,590 cm ³ (ml)	97.0 cu-in
		D16B6 engine	1,850 cm ³ (ml)	112.9 cu-in
		F18B2, F18B3 engines	1,997 cm ³ (ml)	121.9 cu-in
		F20B6 engine	2,157 cm ³ (ml)	131.6 cu-in
		H22A7 engine		9.6
	Compression Ratio			10.0
		D16B6 engine		11.0
		F18B2, F18B3, F20B6 engines		
		H22A7 engine		
	Valve Train		Belt Driven, SOHC	
		D16B6 engine	4 valve per cylinder	
		F18B2, F18B3, F20B6 engines	Belt Driven, SOHC VTEC	
		H22A7 engine	4 valve per cylinder	
			Belt Driven, DOHC VTEC	
		4 valve per cylinder		
		Forced and wet sump, trochoid pump		
Lubrication System		35.4 / (37.4 US qt, 31.1 Imp qt)		
Oil pump Displacement		73.5 / (77.7 US qt, 64.7 Imp qt)		
	D16B6 engine		at 6,000 engine rpm (min-1)	
	Except D16B6 engine	125 / (132 US qt, 110 Imp qt)		
Water Pump Displacement		160 / (169 US qt, 141 Imp qt)	at 6,000 engine rpm (min-1)	
	D16B6 engine			
	Except D16B6 engine	Premium UNLEADED gasoline with a Research Octane Number (RON) of 95 or higher		
Fuel Required		LEADED gasoline with a Research Octane Number (RON) of 91 or higher *1		
	D16B6, F18B2, F20B6 engines	Super plus UNLEADED gasoline with a Research Octane Number (RON) of 98 or higher		
	F18B3 engine			
	H22A7 engine			
Starter	Type		Gear reduction	
	Normal Output		1.0W	
	Normal Voltage		12V	
	Hour Rating		30 seconds	
	Direction of Rotation		Clockwise as viewed from gear end	

		ITEM	METRIC	ENGLISH	NOTES		
Clutch	Type	M/T	Single plate dry, diaphragm spring				
	Facing Area	A/T	Torque converter				
Transmission	Type	M/T	176 cm ²	27.3 sq in			
	Primary Reduction	A/T	Synchronized 5-speed forward, 1 reverse				
Transmission	Manual Transmission Gear Ratio	Type/Ratio	Electronically controlled 4-speed automatic, 1 reverse				
			DH	U2J4	U2G5	U2Q7	
				F18B2			
		1st	D16B6	F18B3	F18B2	H22A7	
		2nd	engine	F20B6	(7cv)	engine	
		3rd		<u>engines</u>	<u>engine</u>		
		4th	3,250	3,285	3,285	3,285	
		5th	1,782	1,807	1,807	2,090	
		Reverse	1,250	1,266	1,193	1,481	
		Final Reduction Gear	Ratio	0.937	0,966	0,843	1,071
	Type	0,750	0,787	0,685	0,870		
		3,153	3,000	3,000	3,000		
		4,437	4,266	4,062	4,266		
			Single helical gear				
Transmission	Automatic Transmission Gear Ratio	1st	2,528				
		2nd	1,427				
		3rd	0.976				
		4th	0,653				
		Reverse	1,863				
		Final Reduction Gear	Ratio	4,466			
	Type	Single helical gear					
Air Conditioning	Cooling Capacity		4,780 Kcal/h	19,000 BTU/h	KY model		
			3,910 Kcal/h	15,500 BTU/h	KR model		
			3,740 Kcal/h	14,800 BTU/h	KG, KE models		
Air Conditioning	Compressor: SANDEN	Type	Scroll				
		Capacity	85.7 cm ³ /rev	5.22 cu-in/rev			
		Max. Speed	10,000 rpm (min-1)				
		Lubricant Type	SP-10				
		Lubricant Capacity	130 cm ³	4 1/3 fl oz, 4.6 Imp oz			
		DENSO	Type	Swash-plate			
			No of Cylinder	10			
			Capacity	188.0 cm ³ /rev	11.47 cu-in/rev		
			Max. Speed	7,600 rpm (min-1)			
			Lubricant Type	ND-OIL8			
Lubricant Capacity	160 cm ³		5 1/3 fl oz, 5.6 Imp oz				
Air Conditioning	Condenser	Type	Corrugated fin				
Air Conditioning	Evaporator	Type	Corrugated fin				
Air Conditioning	Blower	Type	Sirocco fan				
		Motor Input	220 W/12 V max.				
		Speed Control	4-speed*1/Infinite variable*2		*1: Manual A/C		
		Max. Capacity	470 m ³ /h	16.600 cu-ft/h		*2: AUTO A/C	
Air Conditioning	Temp. Control	Type	Air Mix				
Air Conditioning	Compressor Clutch	Type	Dry, single plate, poly-V belt drive				
		Power Consumption	40 W max/12 V				
		SANDEN	40 W max/12 V				
Air Conditioning	Refrigerant	Type	HFC - 134a (R - 134a)				
		Quantity	500-550 g	18-19 oz			
Steering System	Type	Power assisted, rack and pinion					
	Overall Ratio	Except H22A7 engine model	15.50				
	Turns, Lock-to-Lock	H22A7 engine model	15.74				
		Except H22A7 engine model	3.02				
		H22A7 engine model	2.88				
	Steering Wheel Dia.		380 mm	15.0 in			

	ITEM		METRIC	ENGLISH	NOTES
Suspension	Type	Front	Independent double wishbone, coil spring with stabilizer		
		Rear	Independent double wishbone, coil spring with stabilizer		
	Shock Absorber	Front and Rear	Telescopic, hydraulic nitrogen gas-filled		
Wheel Alignment	Camber	H22A7 engine model	-0°15'		
	Front	Except H22A7 engine model	0°00', 0°10'*1		
	Rear	H22A7 engine model	-1°15'		
		Except H22A7 engine model	-1°00', -0°50'*1		
	Caster	H22A7 engine model	3°00'		
	Front	Except H22A7 engine model	2°50', 2°45'*1		
	Total Toe	Front	0 mm	0 in	
		Rear	In 2 mm	In 0.08 in	
Brake System	Type	Front	Power-assisted self-adjusting ventilated disc		
		Rear	Power-assisted self-adjusting solid disc*2. Power-assisted self-adjusting drum*3		
	Pad Surface Area	Front	53.2 cm2 x 2	8.25 sq-in x 2	H22A7 engine model
			47.6 cm2 x 2	7.38 sq-in x 2	Except H22A7, D16B6 engine model
		Rear	40.0 cm2 x 2	6.20 sq-in x 2	D16B6 engine model
	Lining Surface Area	Rear	25.4 cm2 x 2	3.94 sq-in x 2	Disk brake
Parking Brake		86.8 cm2 x 2	13.45 sq-in x 2	Drum brake	
	Type	Mechanical actuating, rear two wheel brakes			
Tyre	Size and Pressure		See tire label (see page 1-12)		
Electrical	Battery		*4 12 V-47 AH-20 HR *5 12 V-57 AH-20 HR		
	Under-hood fuse/relay box		100 A, 50 A, 40 A, 30 A, 20 A, 15 A, 10 A, 7.5 A		
	Driver's under-dash fuse/relay box		30 A, 15 A, 10 A, 7.5 A		
	Passenger's under-dash fuse/relay box		30 A, 20 A, 7.5 A		
	Headlight high beam		12 V-55 W		
	Headlight low beam		*6 12 V-35 W *7 12 V-55 W		
	Front turn signal lights		12 V-21 W		
	Front parking lights		12 V-5 W		
	Front fog lights		12 V-55 W		
	Side turn signal lights		12 V-5 W		
	Rear turn signal lights		12 V-21 W		
	Brake lights		12 V-21 W		
	Tail lights		12 V-5 W		
	High mount brake light		12 V-5 W		
	Back-up lights		12 V-21 W		
	Rear fog light		12 V-21 W		
	License plate lights		12 V-5 W		
	Front ceiling light		12 V-5 W		
	Rear ceiling light		12 V-5 W		
	Trunk light		12 V-5 W		
	Glove box light		12 V-3.4 W		
Spotlights		12 V-5 W			
Gauge lights		14 V-1.12 W, 1.4 W, 3.0 W, 9.5 V-1.1W			
Indicator lights		12 V-LED, 14 V-0.84 W, 1.4 W			
Panel and pilot lights		14 V-0.84 W, 1.2 W			

*1: KY model

*2: Except B16B6 engine model

*3: B16B6 engine model

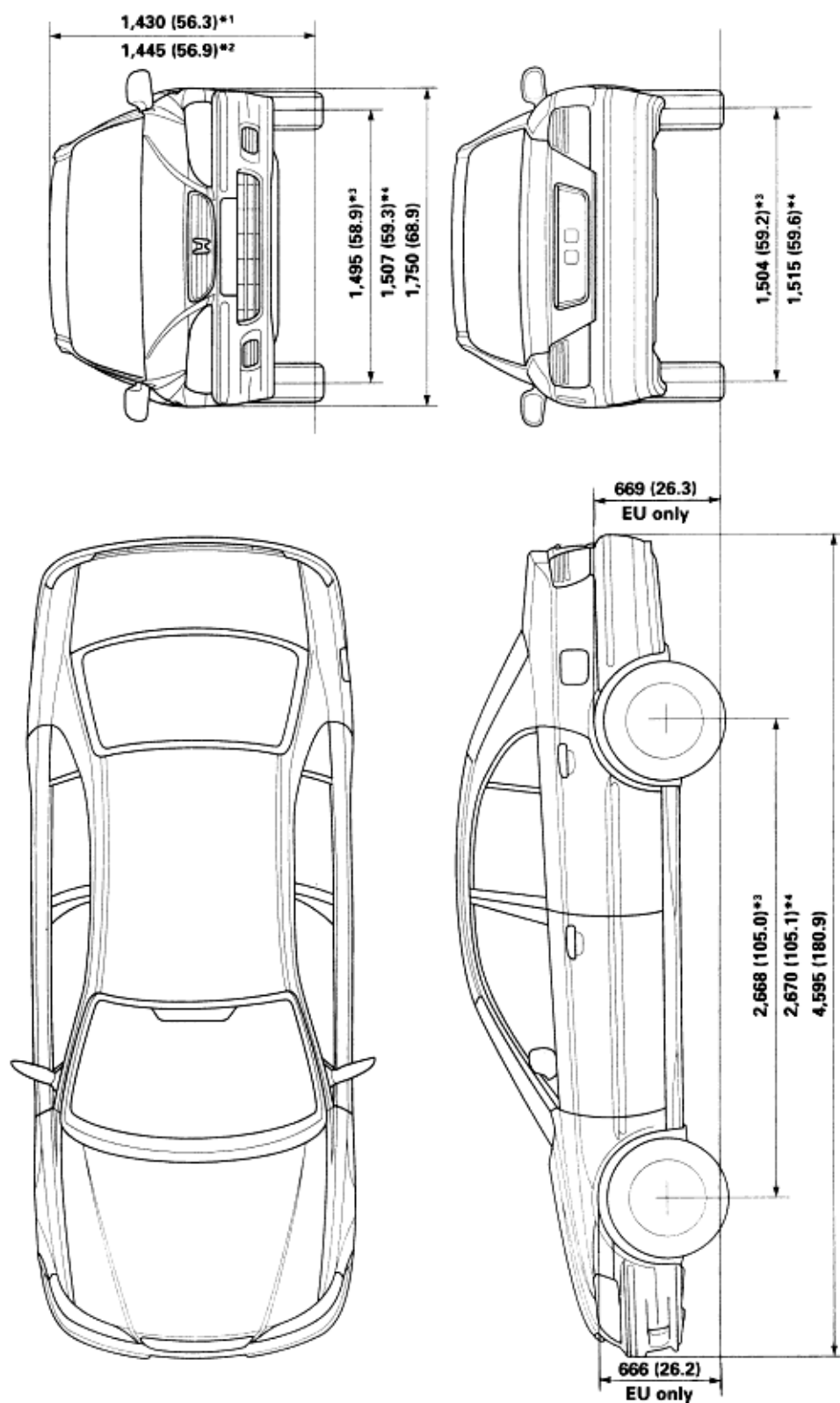
*4: CG7 (Vehicle type)

*5: Except CG7 (Vehicle type)

*6: With HID lamp

*7: Without HID lamp

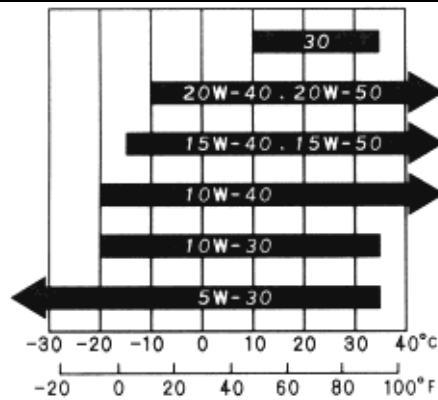
Unit: mm (in)



- *1: Except KY model
- *2: KY model
- *3: Except Type R
- *4: Type R

For the details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	Always use a fuel-efficient oil that says "API Service SG, SH or SJ." SAE Viscosity: See chart below).
2	Transmission Manual Automatic	Genuine Honda MTF*1 Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRONR II or III ATF
3	Brake line (includes Anti-lock brake line)	Brake fluid DOT3 or DOT4*2
4	Clutch line	Brake fluid DOT3 or DOT4*2
5	Power steering gearbox	Steering grease P/N 08733-B070E
6	Release fork (Manual transmission)	Urea Grease UM264 (P/N 41211-PY5-305)
7	Sift and select cable ends (Manual transmissions)	Urea Grease UM264 (P/N 41211-PY5-305)
8	Throttle cable end (Dashboard lower panel hole)	Silicone grease
9	Throttle cable end (Throttle link)	Multi-purpose grease
10	Brake master cylinder pushrod	Multi-purpose grease
11	Clutch master cylinder pushrod	Multi-purpose grease
12	Hood hinges and hood latch	Multi-purpose grease
13	Battery terminals	Multi-purpose grease
14	Fuel fill lid	Multi-purpose grease
15	Trunk hinges and latch	Multi-purpose grease
16	Door hinges, upper and lower	Multi-purpose grease
17	Door open detent	Multi-purpose grease
18	Rear brake shoe linkages	Multi-purpose grease
19	Brake calipers	Silicone grease
20	Power steering system	Genuine Honda Power Steering Fluid (V, II or S)
21	Air conditioning compressor	Compressor oil: SANDEN: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 38899-P13-A01) DENSO: ND OIL 8 (38897-PR7-003, 38898-PR7-003 or 38899-PR7-A)1) (For Refrigerant: HFC-134a (R-134a))

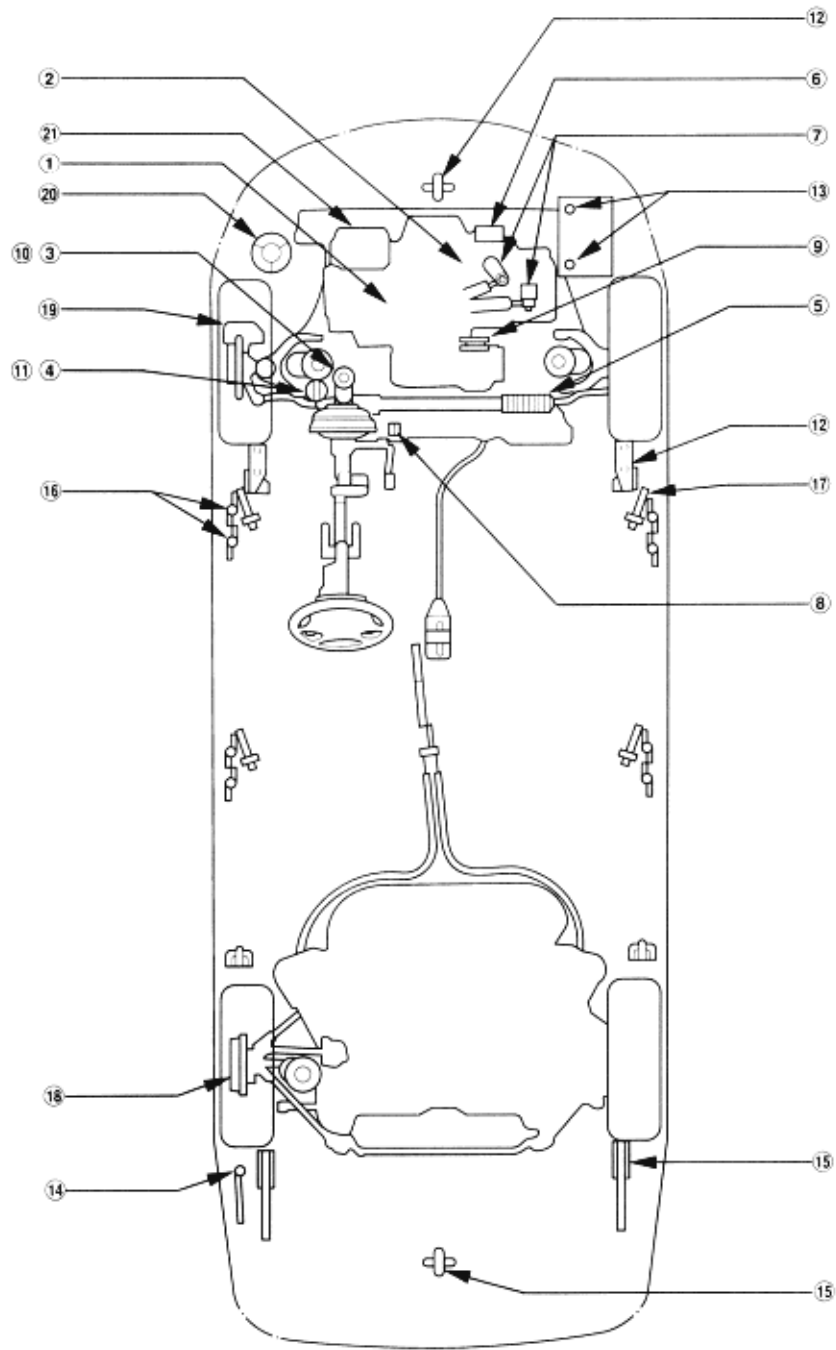


Recommended engine oil
Engine oil viscosity for ambient temperature ranges

CAUTION

Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil

- *1: If Honda MTF is not available, you may use an AP1 service SG, SH or SJ-rated motor oil with viscosity of SAE 10W-30 or 10W-40 temporarily. Motor oil can cause increased transmission wear and higher shifting effort.
- *2: We recommend Genuine Honda Brake Fluid.



Maintenance Schedule
European Model - Normal Conditions

3-4

Follow the Normal Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

Service at the indicated distance or time whichever comes first.	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES
	miles x 1,000	9	18	27	36	45	54	63	72	81	90	99	
	months	12	24	36	48	60	72	84	96	108	120	132	
Replace engine oil and oil filter		●	●	●	●	●	●	●	●	●	●	●	
Replace air cleaner element				●			●			●			
Inspect valve clearance				●			●			●			Check the valve clearance
Replace fuel filter				●			●			●			
Replace spark plugs	Except Type R			●			●			●			
	Type R							●					
Replace timing belt, timing balancer belt and inspect water pump									●				Check water pump for signs of seal leakage
Inspect and adjust drive belts				●			●			●			<ul style="list-style-type: none"> • Check for cracks and damage. • Check deflection and tension.
Inspect idle speed								●					
Replace engine coolant						●			●			●	Check specific gravity for freezing point
Replace transmission fluid (O: Inspect)	M/T				○				●				Manual transmission: Genuine Honda Motor Oil Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III A
	A/T			○*1		●			○		●		
Inspect front and rear brakes		●	●	●	●	●	●	●	●	●	●	●	<ul style="list-style-type: none"> • Check the brake pad and disc thickness. Check for damage or cracks. • Check the calipers for damage, leak and tightness.
Replace brake fluid		Every 3 years											Use only DOT3 or DOT4*2 fluid. Check brake fluid level is between the upper and lower marks on the reservoir.
Check parking brake adjustment		●	●		●		●		●		●		Check the parking brake operation.
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months											
Check lights alignment		●	●	●	●	●	●	●	●	●	●	●	Check the position of the headlights
Test drive (noise, stability, dashboard operations).		●	●	●	●	●	●	●	●	●	●	●	Check for road stability, noise, vibration and dashboard operation

*1: Inspect at 45,000 km (27,000 miles)/36 months, and every 45,000 km (27,000 miles)/36 months after replacement.

*2: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule

3-5

European Model - Normal Conditions (cont'd)

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES
	miles x 1,000												
	months												
		9	18	27	36	45	54	63	72	81	90	99	
		12	24	36	48	60	72	84	96	108	120	132	
Visually inspect the following items:													<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints, if necessary, retighten
Tie rod ends, steering gearbox, and boots		•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease • Check the fluid line for damage and leaks
Suspension components													<ul style="list-style-type: none"> • Check the bolts for tightness • Check the all dust cover for deterioration and damage
Driveshaft boots													<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease.
Brake hoses and lines (including ABS)													Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage
Exhaust system													Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.
Fuel lines and connections													Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.
Tyre condition													Check for pressure, punctures or cuts and irregular thread wear.

Maintenance Schedule
European Model - Severe Conditions

3-6

Service at the indicated distance or time whichever comes first.	km x 1,000	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	
	miles x1,000	4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72		
	months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96		
Replace engine oil and oil filter		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
Clean (○) or replace (●) air cleaner element - Use normal schedule except in dusty conditions				○			●			○			●			○			
Inspect valve clearance							●						●					Check the valve clearance	
Replace fuel filter							●						●						
Replace spark plugs	Except TYPE R						●						●						
	TYPE														●				
Replace timing belt, timing balancer belt and inspect water pump																	*1 ●	Check water pump for signs of seal leakage	
Inspect and adjust drive belts							●						●					+ Check for cracks and damage. + Check deflection and tension.	
Inspect idle speed															●				
Replace engine coolant											●						●	Check specific gravity for freezing point	
Replace transmission fluid	M/T								●									●	Manual transmission: Genuine Honda Automatic transmission: Genuine Honda PREMIUM (Automatic Transmission Fluid PREMIUM) or DEXRON II or III ATF.
	A/T						●						●						
Inspect front and rear brakes		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		+ Check the brake pad and disc thickness. Check for damage or cracks. + Check the calipers for damage, leakage and tightness
Replace brake fluid		Every 3 years																Use only DOT3 or DOT4**2 fluid. Check brake fluid level is between the upper and lower marks on the reservoir.	
Check parking brake adjustment			●		●				●				●				●		Check the parking brake operation.
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months																	
Check lights alignment			●		●		●		●		●		●		●		●		Check the position of the headlights.
Test drive (noise, stability, dashboard operations).			●		●		●		●		●		●		●		●		Check for road stability, noise, vibration and dashboard operation.

*1 These belts should normally be replaced at the intervals shown in the maintenance schedule. (Normal Conditions).
 Replace the timing belts at 75,000 km or 45,000 mile if the vehicle regularly is driven in one or more of these conditions:
 ♦ In very high temperatures [43°C, (110°F) above].
 ♦ In very low temperatures [-29°C, (-20°F) under].

*2: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule

3-7

European Models - Severe Conditions (cont'd)

Service at the indicated distance or time whichever comes first.	km x 1,000	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	
	miles x1,000																		
	months																		
		4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72		
		6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96		
Visually inspect the following items:																		<ul style="list-style-type: none"> • Check for correct installation and position. Check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints. If necessary, retighten. 	
Tie rod ends, steering gearbox and boots		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks.
Suspension components																			<ul style="list-style-type: none"> • Check the bolts for tightness. • Check the all dust caps for deterioration and damage.
Driveshaft boots																			<ul style="list-style-type: none"> • Check boots and boots band for cracks. • Check rack grease.
Brake hoses and lines (including ABS)			•		•		•		•		•		•		•		•		<ul style="list-style-type: none"> • Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.
Exhaust system																			<ul style="list-style-type: none"> • Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.
Fuel lines and connections																			<ul style="list-style-type: none"> • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged lines.
Tyre condition																			<ul style="list-style-type: none"> • Check for pressure, punctures or cuts and irregular thread wear.

Follow the Severe Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot (over 32°C, (90°F) conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty or de-iced roads.

Note: If the customer's vehicle is driven OCCASIONALLY under severe conditions, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

Maintenance Schedule
KY Model

3-8

This Maintenance Schedule outlines the minimum required maintenance that you should perform to ensure the trouble-free operations of the customer's vehicle. Due to regional and climatic differences, some additional servicing maybe required. Please consult the warranty handbook for a more detailed description.

Service at the indicated distance or time whichever comes first	km x 1,000	20	40	60	80	100	120	140	160	180	200	NOTES
	miles x 1,000											
	months											
		12	24	36	48	60	72	84	96	108	120	
		12	24	36	48	60	72	84	96	108	120	
Replace engine oil		Every 5,000 km (3,000 miles) or 6 months										
Replace engine oil filter		Every 5,000 km (3,000 miles) or 6 months										
Clean or replace air cleaner element		Clean every 10,000 km (6,000 miles) or 6 months and replace every 20,000 km (12,000) or 12 months										
Inspect valve clearance		●	●	●	●	●	●	●	●	●	●	Check the valve clearance
Replace fuel filter			●		●		●		●		●	
Replace spark plugs		●	●	●	●	●	●	●	●	●	●	
Inspect distributor cap, rotor and ignition wiring			●		●		●		●		●	
Replace timing belt, timing balancer belt and inspect water pump						●					●	Check water pump for signs of seal leakage
Inspect and adjust drive belts			●		●		●		●		●	<ul style="list-style-type: none"> Check for cracks and damage Check deflection and tension.
Inspect idle speed and idle CO		●	●	●	●	●	●	●	●	●	●	
Replace engine coolant					●		●		●		●	Check specific gravity for freezing point.
Inspect PCV valve			●		●		●		●		●	Check the clicking sound of motion from the PCV valve of idling.
Inspect ignition timing			●		●		●		●		●	
Inspect evaporative emission control system						●					●	<ul style="list-style-type: none"> Check the EVAP control canister operation. Check the hose for blockage, cracks or disconnected.
Replace transmission fluid			●		●		●		●		●	Manual transmission: Genuine Honda MTF Automatic Transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF.
Inspect front and rear brakes		Every 10,000 km (6,000 miles) or 6 months										<ul style="list-style-type: none"> Check the brake pad and disc thickness. Check for damage or cracks. Check the calipers for damage, leaks and tightness

Maintenance Schedule
KY Model (cont'd)

3-9

Service at the indicated distance or time whichever comes first	km x 1,000	20	40	60	80	100	120	140	160	180	200	NOTES
	miles x 1,000											
	months											
		12	24	36	48	60	72	84	96	108	120	
		12	24	36	48	60	72	84	96	108	120	
Replace brake fluid			●		●		●		●		●	Use only DOT3 or DOT4*1 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.
Check parking brake adjustment		●	●		●		●		●		●	Check the parking brake operation.
Rotate tyres (Check tyre inflation and condition at least one per month)		Rotate tyres every 10,000 km (6,000 miles)										The suggested rotation method is shown in the diagram of the Owner's Manual.
Visually inspect the following items:												<ul style="list-style-type: none"> • Check for correct installation and position check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints. If necessary, retighten
Tie rod ends, steering gearbox, and boots		Every 10,000 km (6,000 miles) or 6 months										<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks
Suspension components												<ul style="list-style-type: none"> • Check the bolts for tightness. • Check the all dust cover for deterioration and damage.
Driveshaft boots												<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease.
Brake hoses and lines (including ABS)		●	●	●	●	●	●	●	●	●	●	Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.
Cooling system hoses and connection												<ul style="list-style-type: none"> • Check all hoses for damage, leaks or deterioration. • Check all hose clamps. Retighten if necessary.
Exhaust system												Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness
Fuel lines and connections												Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.

*1: We recommend Genuine Honda Brake Fluid.

Follow the Normal Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

*1: Inspect at 45,000 km (27,000 miles)/36 months, and every 45,000 km (27,000 miles)/36 months after replacement.

*2: We recommend Genuine Honda Brake Fluid.

- *1 These belts should normally be replaced at the intervals shown in the maintenance schedule. (Normal Conditions).
Replace the timing belts at 75,000 km or 45,000 mile if the vehicle regularly is driven in one or more of these conditions:
- ♦ In very high temperatures [43°C, (110°F) above].
 - ♦ In very low temperatures [-29°C, (-20°F) under].
- *2: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule

3-7

European Models - Severe Conditions (cont'd)

Follow the Severe Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.

Driving in extremely hot (over 32°C, (90°F) conditions.

Extensive idling or long periods of stop-and-go driving.

Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.

Driving on muddy, dusty or de-iced roads.

Note: If the customer's vehicle is driven OCCASIONALLY under severe conditions, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

This Maintenance Schedule outlines the minimum required maintenance that you should perform to ensure the trouble-free operations of the customer's vehicle. Due to regional and climatic differences, some additional servicing maybe required. Please consult the warranty handbook for a more detailed description.

*1: We recommend Genuine Honda Brake Fluid.

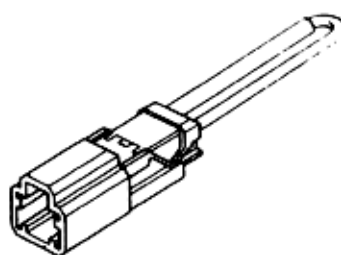
Special Tools

4-2

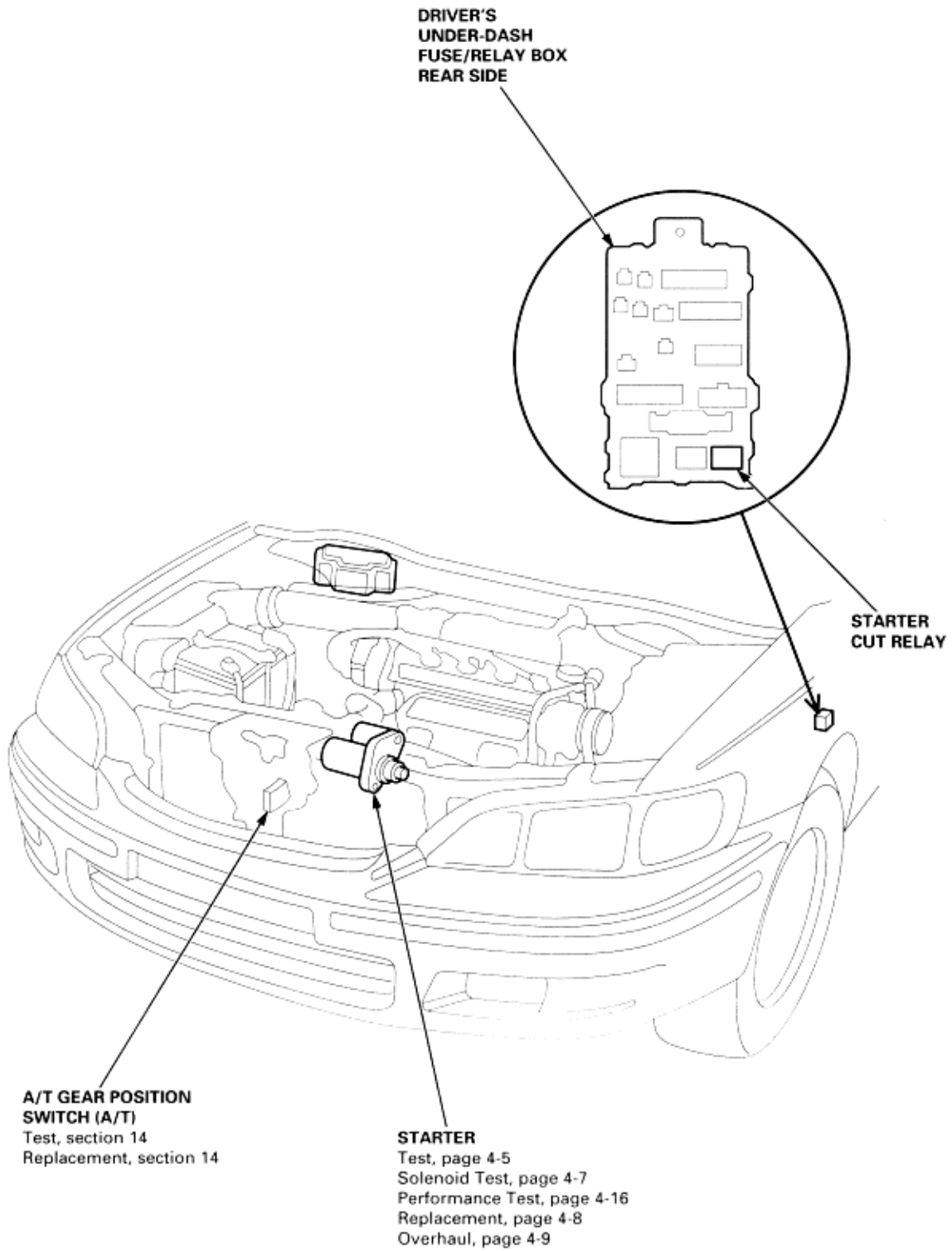
Ref No.	Tool Number	Description	Qty	Remark
1	07JGG - 0010100	Belt Tension Gauge	1	
2	07PAZ - 0010100	SRS Short Connector	1	



①



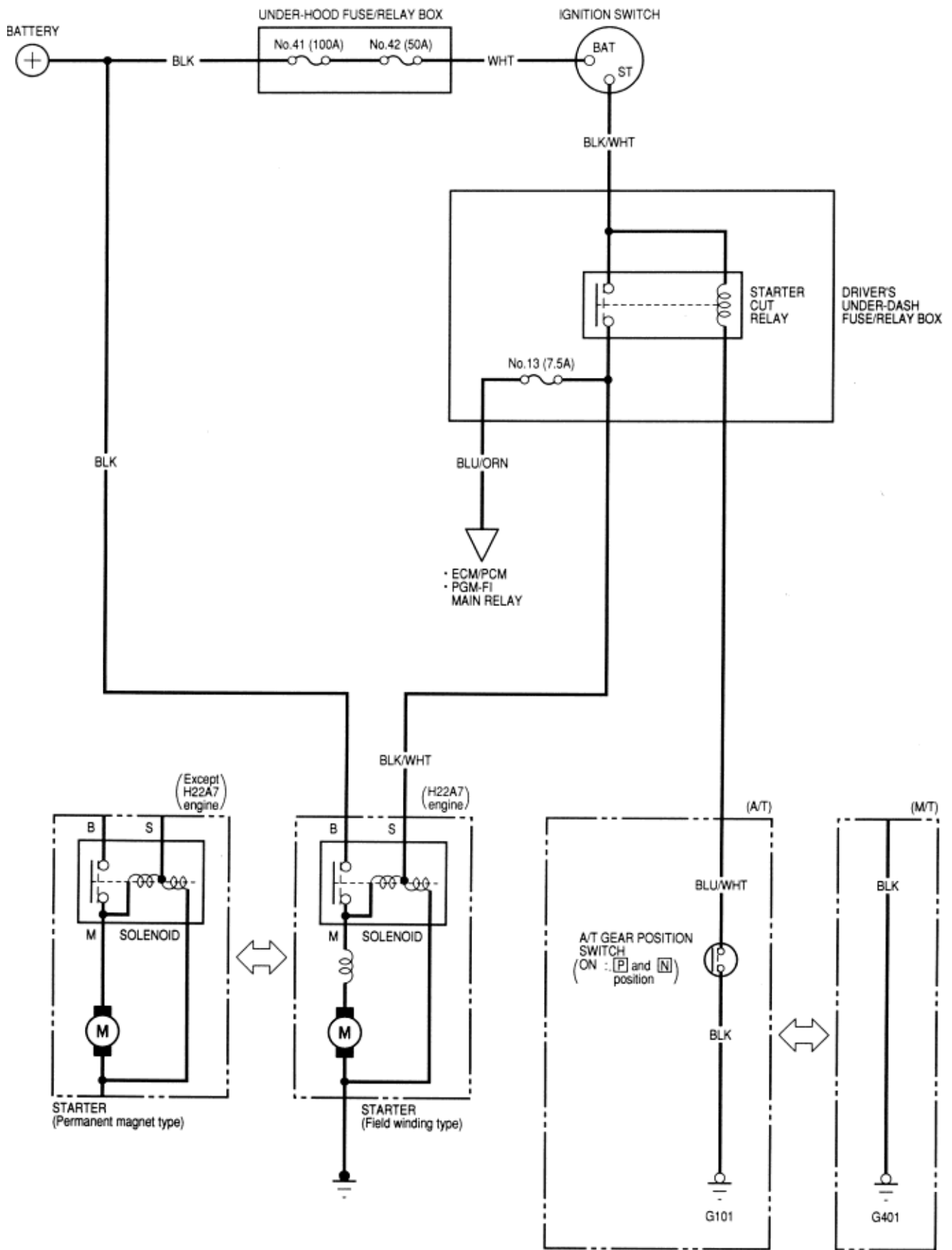
②



To go to the pages referenced on the diagram above, click on the following:

- (See page 4-5)
- (See page 4-7)
- (See page 4-16)
- (See page 4-8)
- (See page 4-9)

**Starting System
Circuit Diagram**



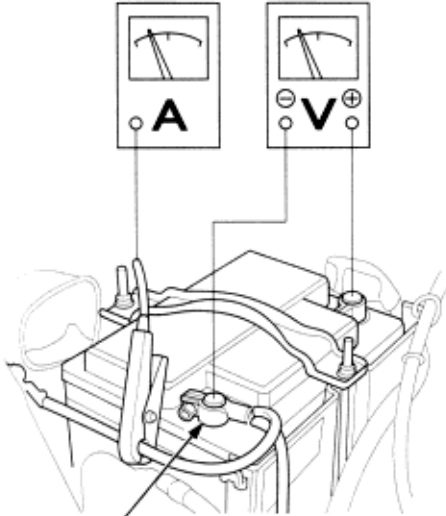
NOTE: The air temperature must be between 15 and 38°C (59 and 100°F) before testing.

Recommended Procedure:

- ♦ Use a starter system tester.
- ♦ Connect and operate the equipment in accordance with the manufacturer's instructions.
- ♦ Test and troubleshoot as described.

Alternate Procedure:

- ♦ Use the following equipment:
 - Ammeter, 0 - 400 A.
 - Voltmeter, 0 - 20 V (accurate within 0.1 volt).
 - Tachometer, 0 - 1,200 rpm (min.-1).
- ♦ Hook up a voltmeter and ammeter as shown.



**NEGATIVE
TERMINAL**

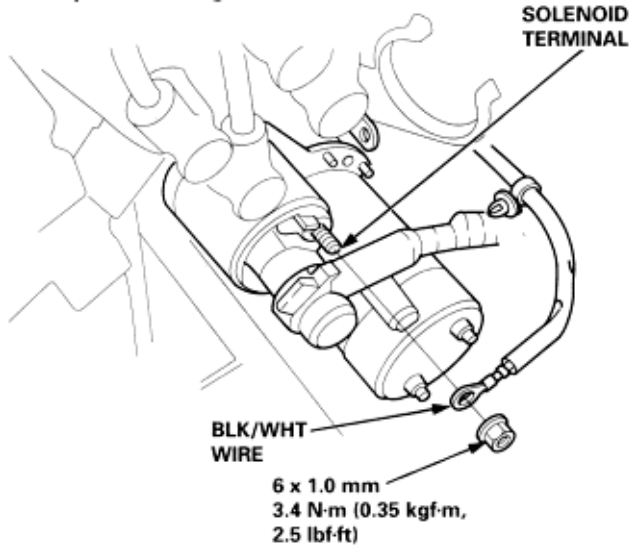
NOTE: After this test, or any subsequent repair, reset the ECM to clear any codes (see section 11).

Check the Starter Engagement:

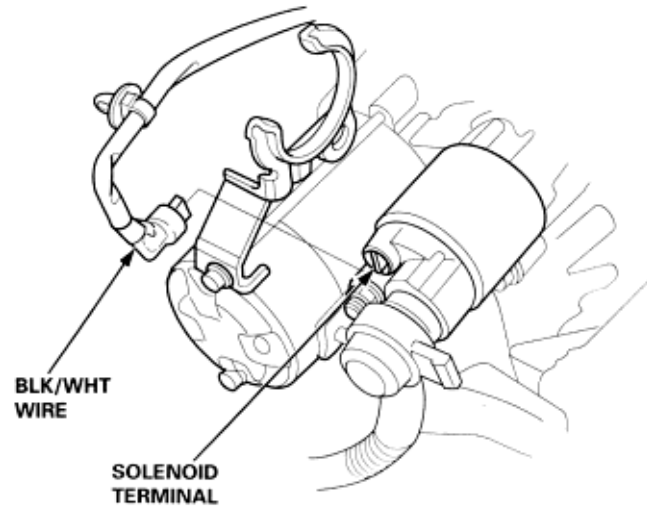
1. Remove the No.31 (15 A) fuse from the under-hood fuse/relay box.
2. Turn the ignition switch to START (III) with the shift lever in **N** or **P** position (A/T) or neutral position (M/T). The starter should crank the engine.
 - If the starter does not crank the engine, go to step 3.
 - If it cranks the engine erratically or too slowly, go to "Check for Wear and Damage" on the next page.

3. Check the battery, battery positive cable, ground, starter cut relay and the wire connections for looseness and corrosion. Test again. If the start still does not crank the engine, go to step 4.
4. Unplug the connector (BLK/WHT wire and solenoid terminal) from the starter.
5. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.

Except H22A7 engine:



H22A7 engine:



- ♦ If the starter still does not crank the engine, remove it, and diagnose its internal problem.
- ♦ If the starter cranks the engine, go to step 6.

6. Check the ignition switch (see section 23).
7. Check the starter cut relay (see section 23).
8. Check the A/T gear position switch (see section 14).
9. Check for an open in the wire between the ignition switch and starter.
10. Check the immobilizer system (see section 23).

Check for Wear and Damage

The starter should crank the engine smoothly and steadily, if the starter engages, but cranks the engine erratically, remove it, and inspect the starter drive gear and torque converter or flywheel ring gear for damage.

- ♦ Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held.
 - If damaged, replace the gears.

Check Cranking Voltage and Current Draw

Cranking voltage should be no less than 8.0 volts.

Current draw should be more than *1 amperes.

- *1 Valeo: 300
- DENSO: 200

If cranking voltage is too low, or current draw too high, check for:

- ♦ dead or low battery.
- ♦ open circuit in starter armature commutator segments.
- ♦ starter armature dragging.
- ♦ shorted armature winding.
- ♦ excessive drag in engine.

Check Cranking rpm

Engine speed during cranking should be above 100 rpm (min -1).

If speed is too low, check for:

- ♦ loose battery or starter terminals.
- ♦ excessively worn starter brushes.
- ♦ open circuit in commutator segments.
- ♦ dirty or damaged helical spline or drive gear.
- ♦ defective drive gear overrunning clutch.

Check Starter Disengagement

With shift lever in **N** or **P** position (A/T) or neutral position (M/T), turn the ignition switch to START (III), and release to ON (II).

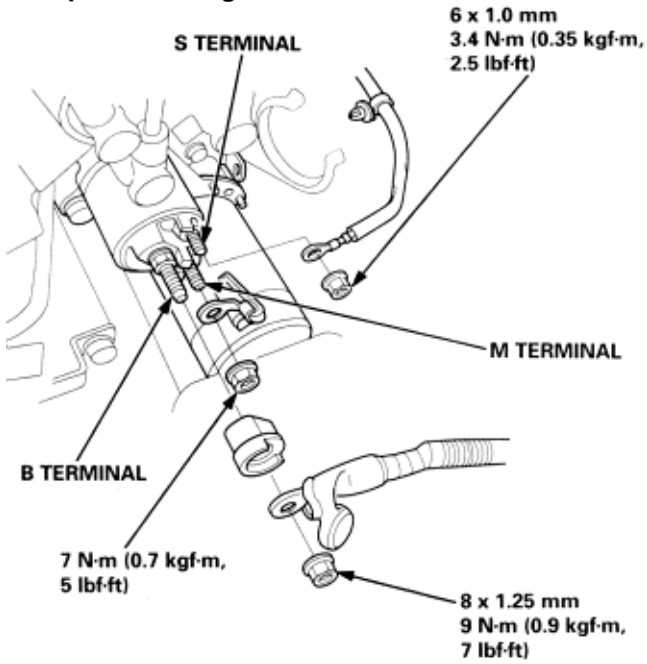
The starter drive gear should disengage from the torque converter or flywheel ring gear when you release the key.

If the drive gear hangs up on the torque converter or flywheel ring gear, check for:

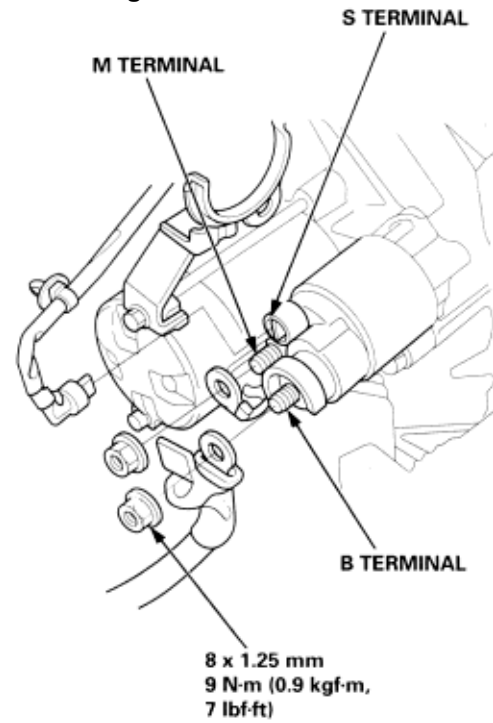
- ♦ solenoid plunger and switch malfunction.
- ♦ dirty drive gear assembly or damaged overrunning clutch.

1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). The coil is OK if there is continuity.

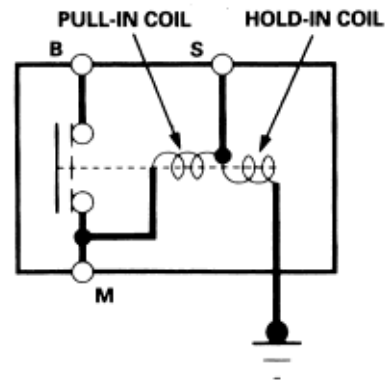
Except H22A7 engine:



H22A7 engine:



2. Check the pull-in coil for continuity between the S and M terminals. The coil is OK if there is continuity.

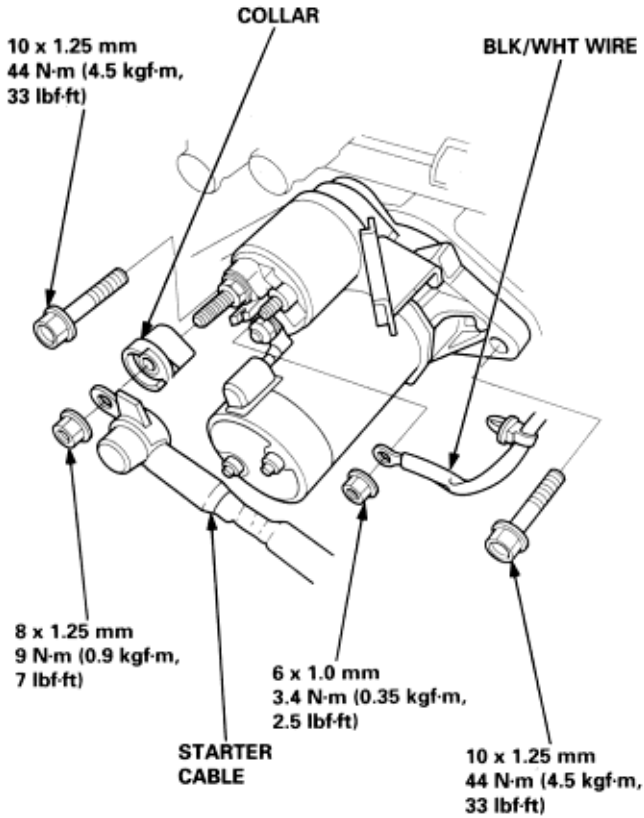


Starting System Starter Replacement

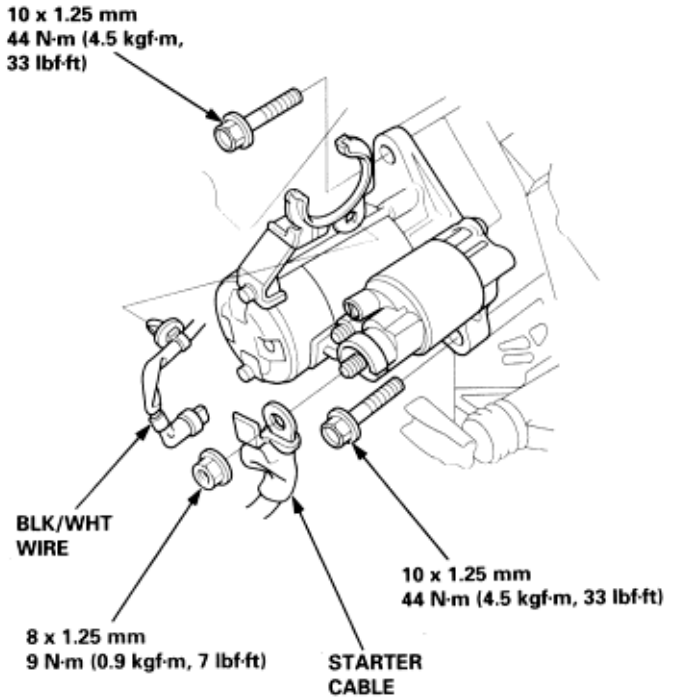
4-8

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
2. Remove the engine wire harness and radiator lower hose from the bracket on the starter motor.
3. Disconnect the starter cable from the B terminal on the solenoid, then disconnect the BLK/WHT wire from the S terminal wire.

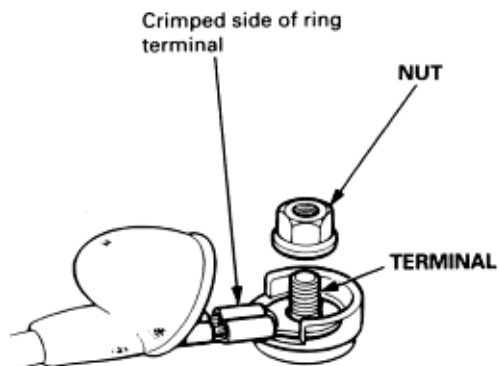
Except H22A7 engine:



H22A7 engine:

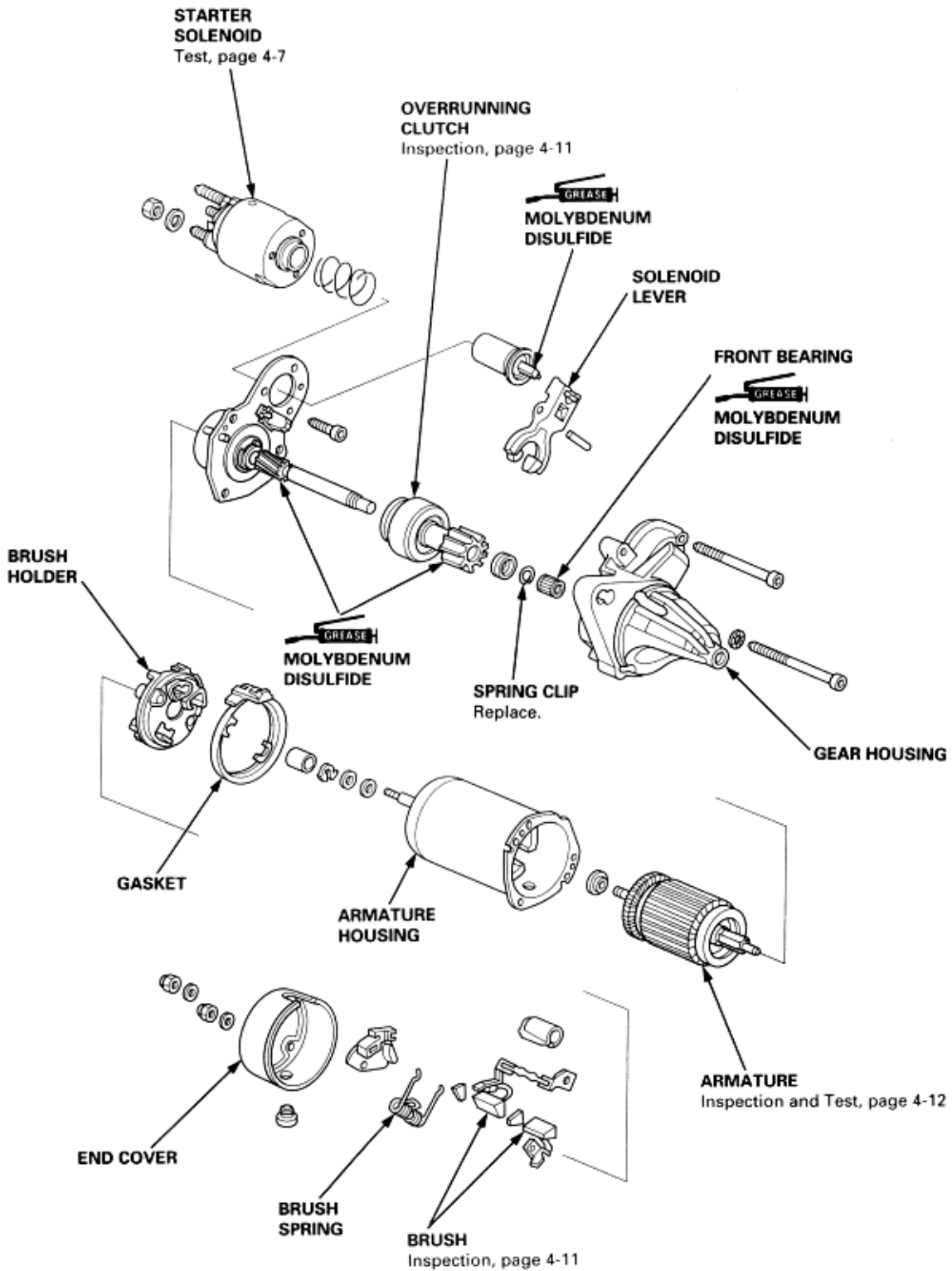


4. Remove the two bolts holding the starter, then remove the starter.
5. Install in the reverse order of removal.
NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out



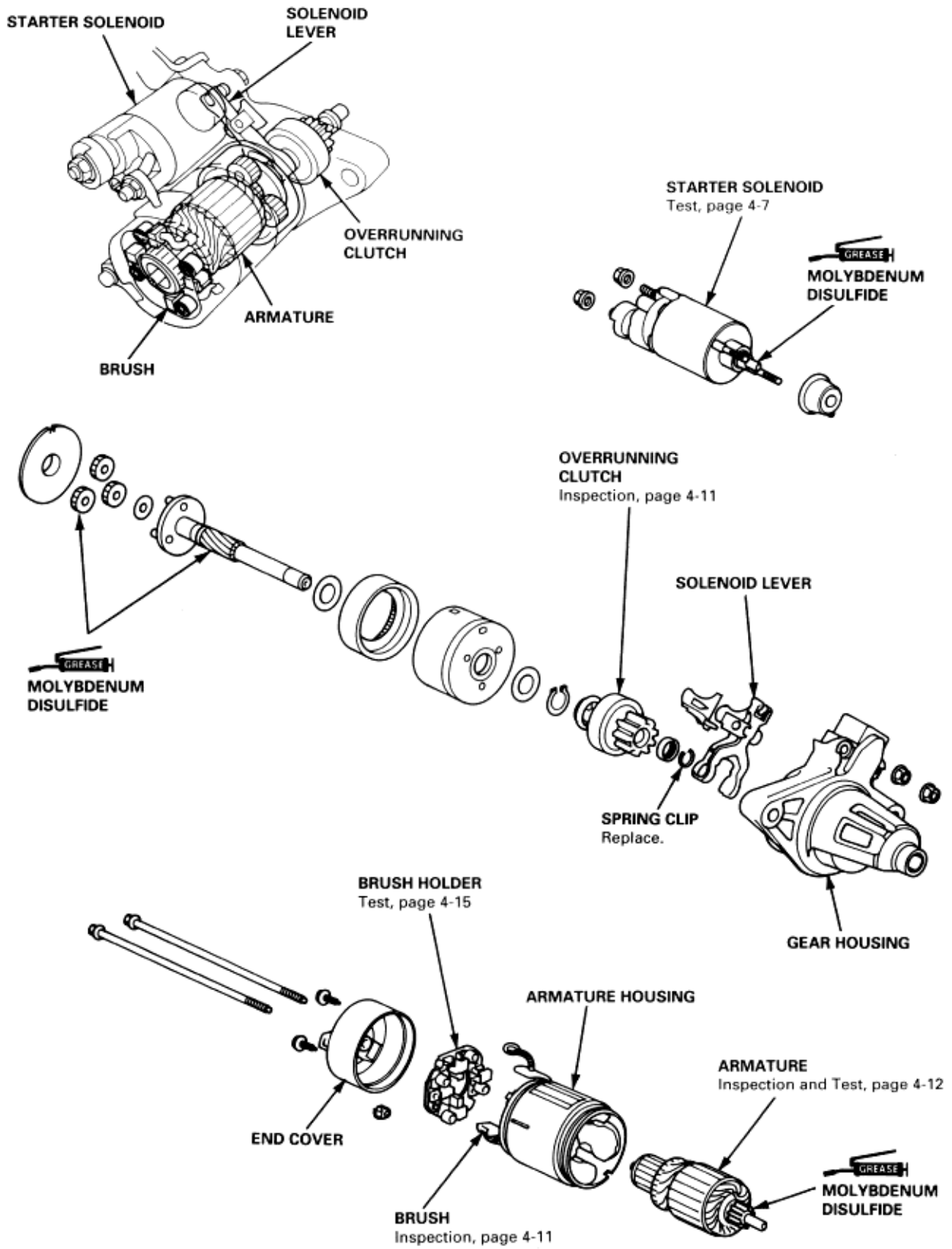
6. Connect the battery positive cable and negative to the battery.

Except H22A7 engine:



To go to the pages referenced on the diagram above,
click on the following:
[\(See page 4-7\)](#)
[\(See page 4-11\)](#)
[\(See page 4-12\)](#)

H22A7 engine:



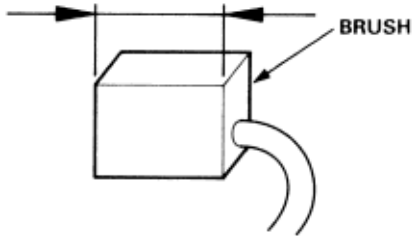
To go to the pages referenced on the diagram above, click on the following:

- (See page 4-7)
- (See page 4-11)
- (See page 4-12)
- (See page 4-15)

Measure the brush length. If not within the service limit, replace the brush (or brush holder assembly).

Brush Length

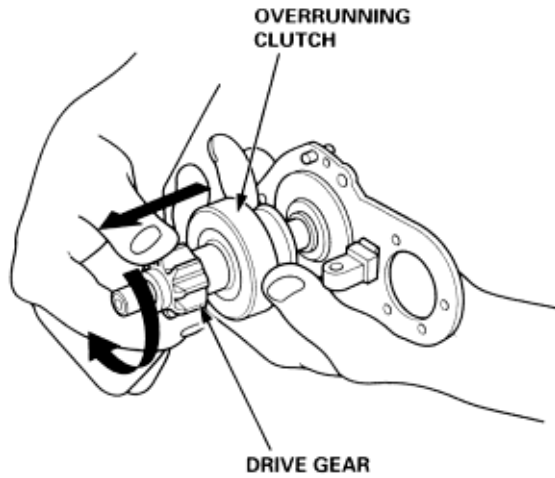
	Standard (NEW)	Service Limit
Valeo	18 mm (0.7 in)	5 mm (0.2 in)
DENSO	14.0 - 14.5 mm (0.55 - 0.57 in)	9.0 mm (0.35 in)



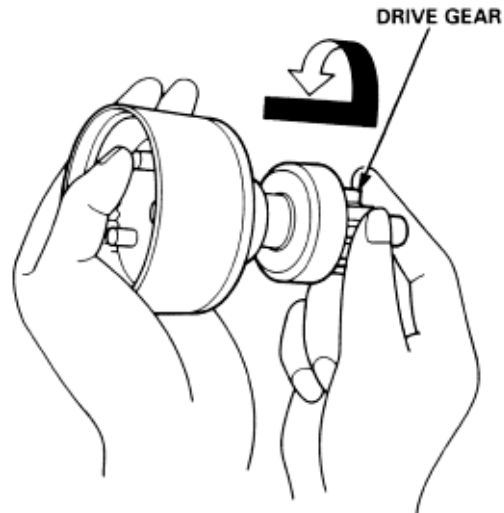
NOTE: To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

1. Slide the overrunning clutch along the shaft. Does it move freely? If not, replace it.
2. Rotate the overrunning clutch both ways. Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.

VALEO



DENSO:



3. If the starter drive gear is worn or damaged, replace the over-running clutch assembly; the gear is not available separately.
4. Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

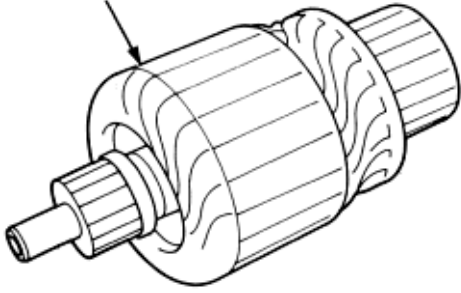
Starting System

Armature Inspection and Test

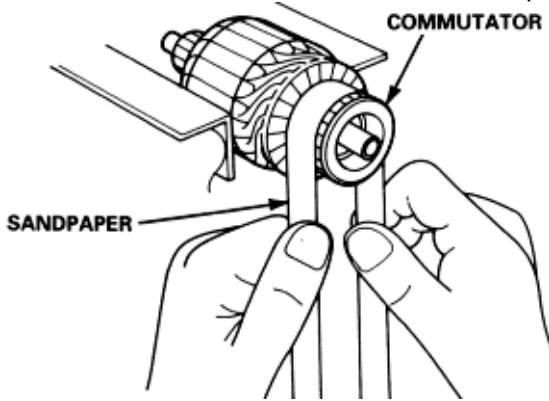
4-12

1. Inspect the armature for wear or damage, due to contact with the permanent magnet or field winding. If there is wear or damage, replace the armature.

Inspect for damage.



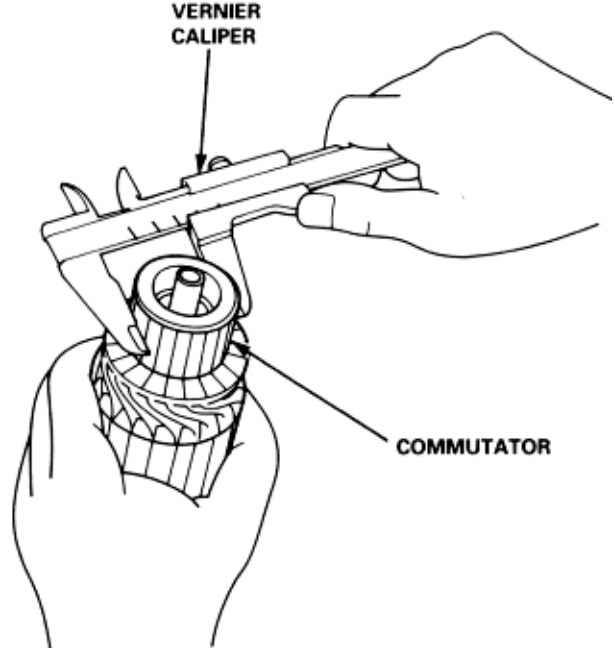
2. Check commutator surface and diameter.
 - ♦ If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with #500 or #600 sandpaper.



- ♦ If commutator diameter is below the service limit, replace the armature.

Commutator Diameter:

	Standard (NEW)	Service Limit
DENSO	27.9 - 28.0 mm (1.09 - 1.10 in)	27.0 mm (1.06 in)

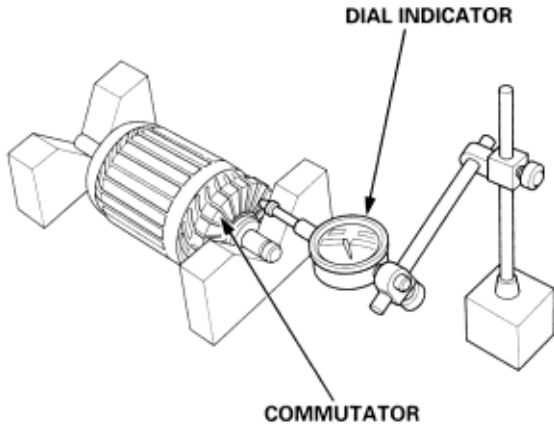


3. Measure the commutator runout.
 - ♦ If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
 - ♦ If the commutator runout is not within the service limit, replace the armature.

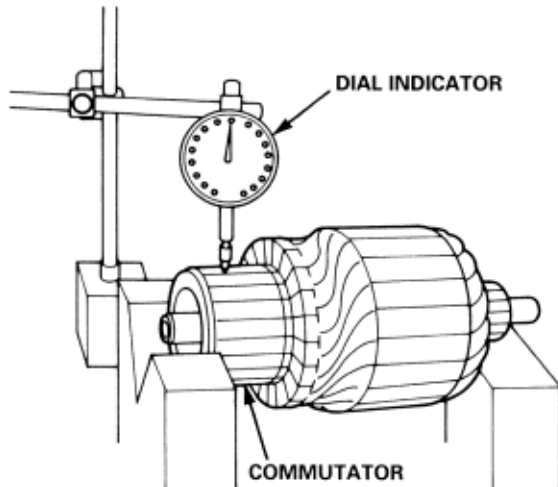
Commutator Runout:

	Standard (New)	Service Limit
Valeo	0 - 0.01 mm (0 - 0.0004 in)	0.015 mm (0.0006 in)
DENSO	0 - 0.02 mm (0 - 0.0008 in)	0.05 mm (0.002 in)

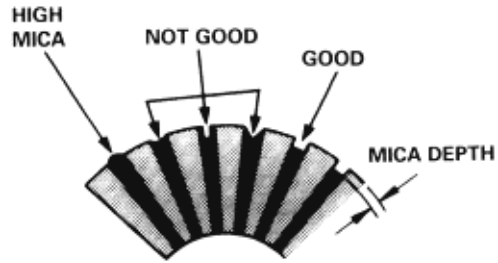
VALEO:



DENSO:



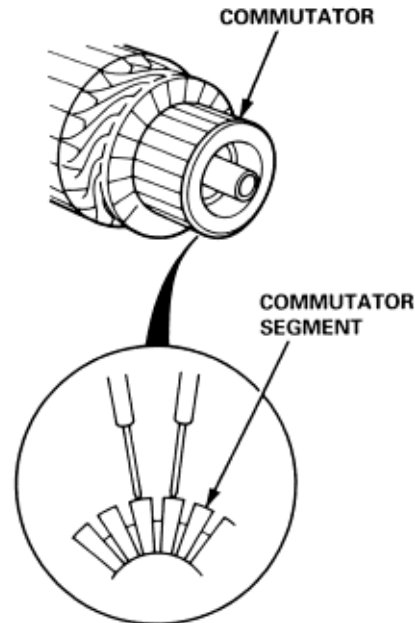
4. Check the mica depth. If necessary, undercut the mica with a hacksaw blade to achieve proper depth. If the service limit cannot be maintained, replace the armature.



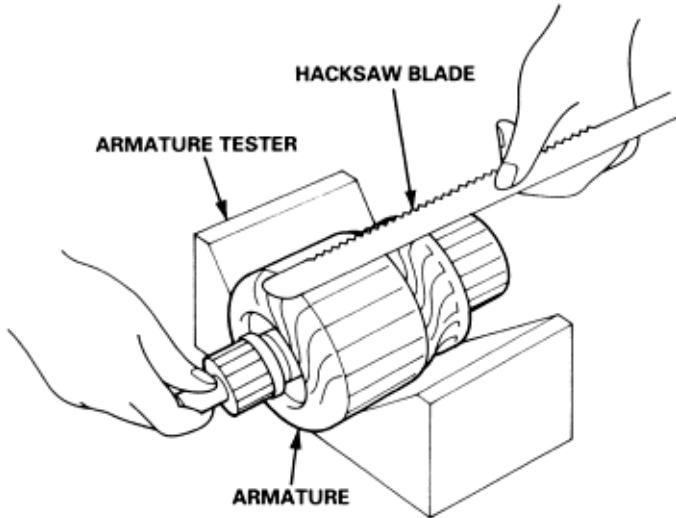
Commutator Mica Depth:

	Standard (New)	Service Limit
Valeo	0.5 - 0.9 mm (0.020 - 0.035 in)	0.2 mm (0.008 in)
DENSO	0.5 - 0.8 mm (0.020 - 0.031 in)	0.2 mm (0.008 in)

5. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.

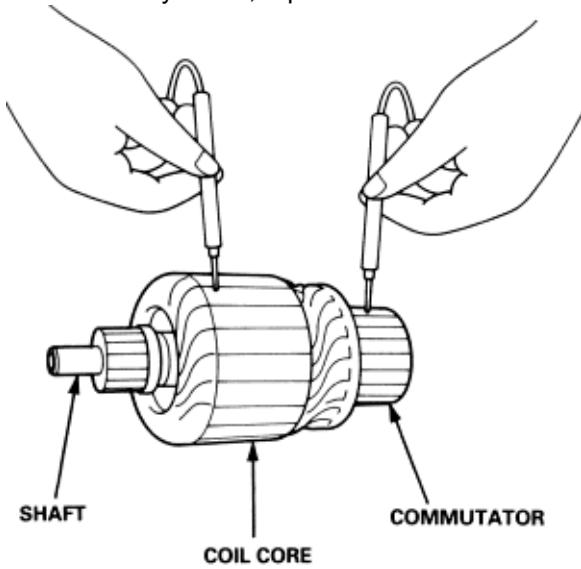


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.

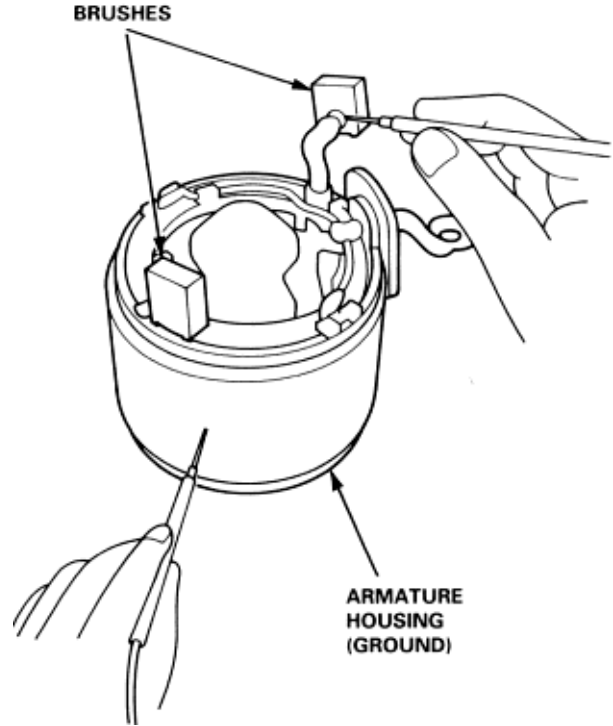


If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.

7. Check with an ohmmeter that no continuity exists between the commutator and armature coil core, and between the commutator and armature shaft. If continuity exists, replace the armature.



1. Check for continuity between the brushes. If there's no continuity, replace the armature housing.
2. Check for continuity between each brush and the armature housing (ground). If there is continuity, replace the armature housing.



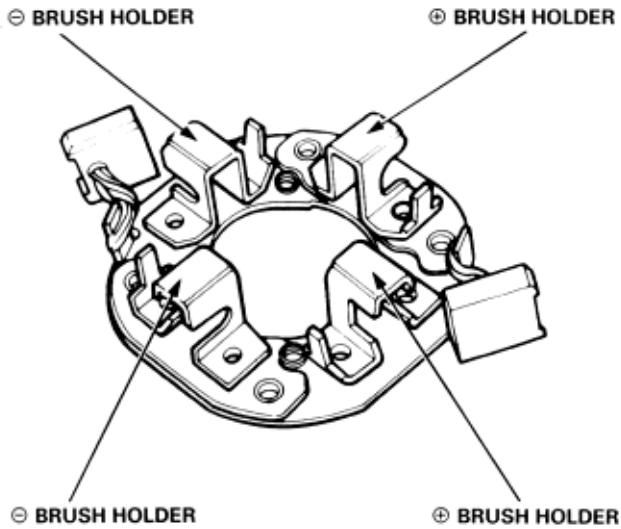
Starting System

Brush Holder Test (DENSO)

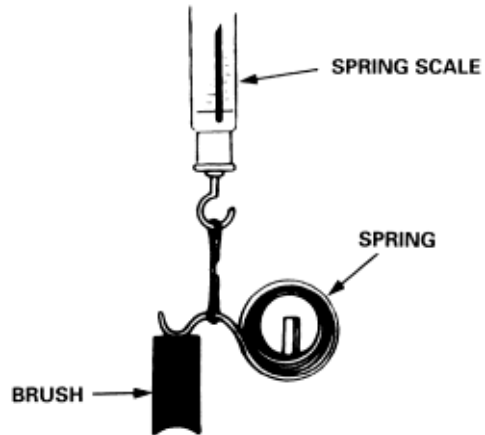
4-15

Brush Spring Test

1. Check that there is no continuity between the (+) brush holder and (-) brush holder. If there is continuity, replace the brush holder assembly.



1. Insert the brush into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale to the spring. Measure the spring tension at the moment the spring lifts off the brush.



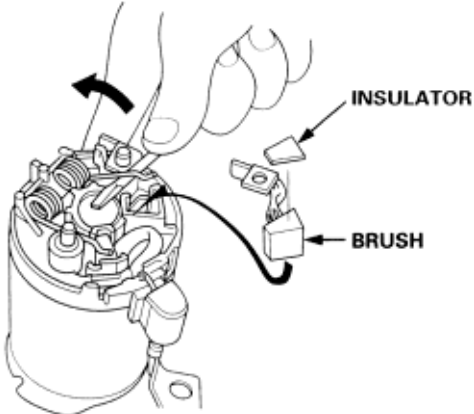
Spring Tension:

Valeo	15.25 - 19.25 N (1.56 - 1.96 kgf, 3.44 - 4.32 lbf)
DENSO	13.7 - 17.7 N (1.4 - 1.8 kgf, 3.09 - 3.97 lbf)

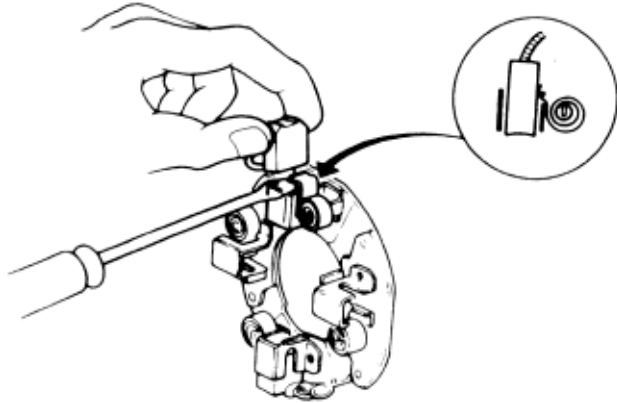
NOTE: Use the illustration as reference for reassembly (See page 4-9) and (See page 4-10)

1. Pry back each brush spring with a screwdriver, position the brush about halfway out of its holder and release the spring to hold it there.

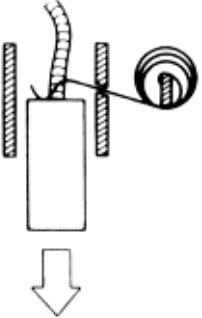
VALEO:



DENSO:

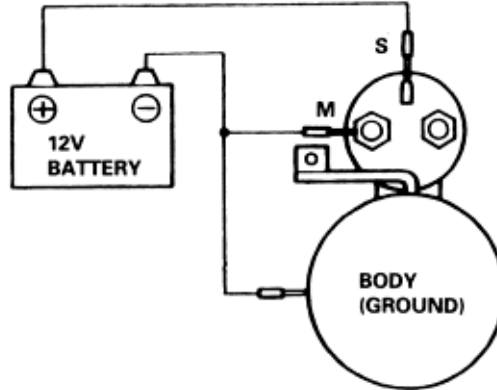


2. Install the armature in the housing. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.

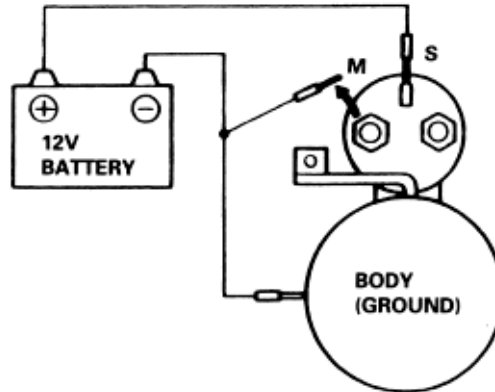


3. Install the end cover on the brush holder.

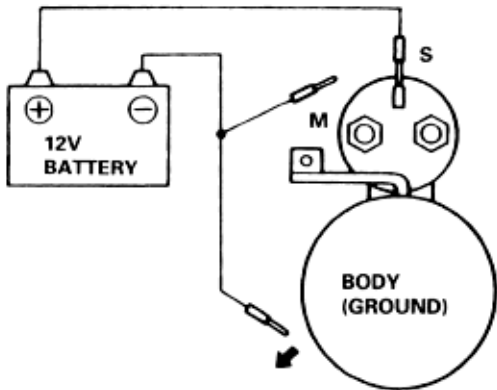
1. Disconnect the wires from S terminal and M terminal.
2. Make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle).
3. Connect the battery as shown. If the starter pinion pops out, it is working properly. To avoid damaging the starter, do not leave the battery connected for more than 10 seconds.



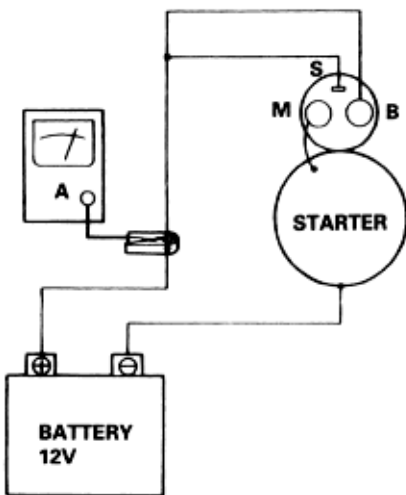
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil is working properly. To avoid damaging the starter, do not leave the battery connected for more than 10 seconds.



5. Disconnect the battery also from the body. If the pinion retracts immediately, it is working properly. To avoid damaging the starter, do not leave the battery connected for more than 10 seconds.



6. Clamp the starter firmly in a vice.
 7. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.

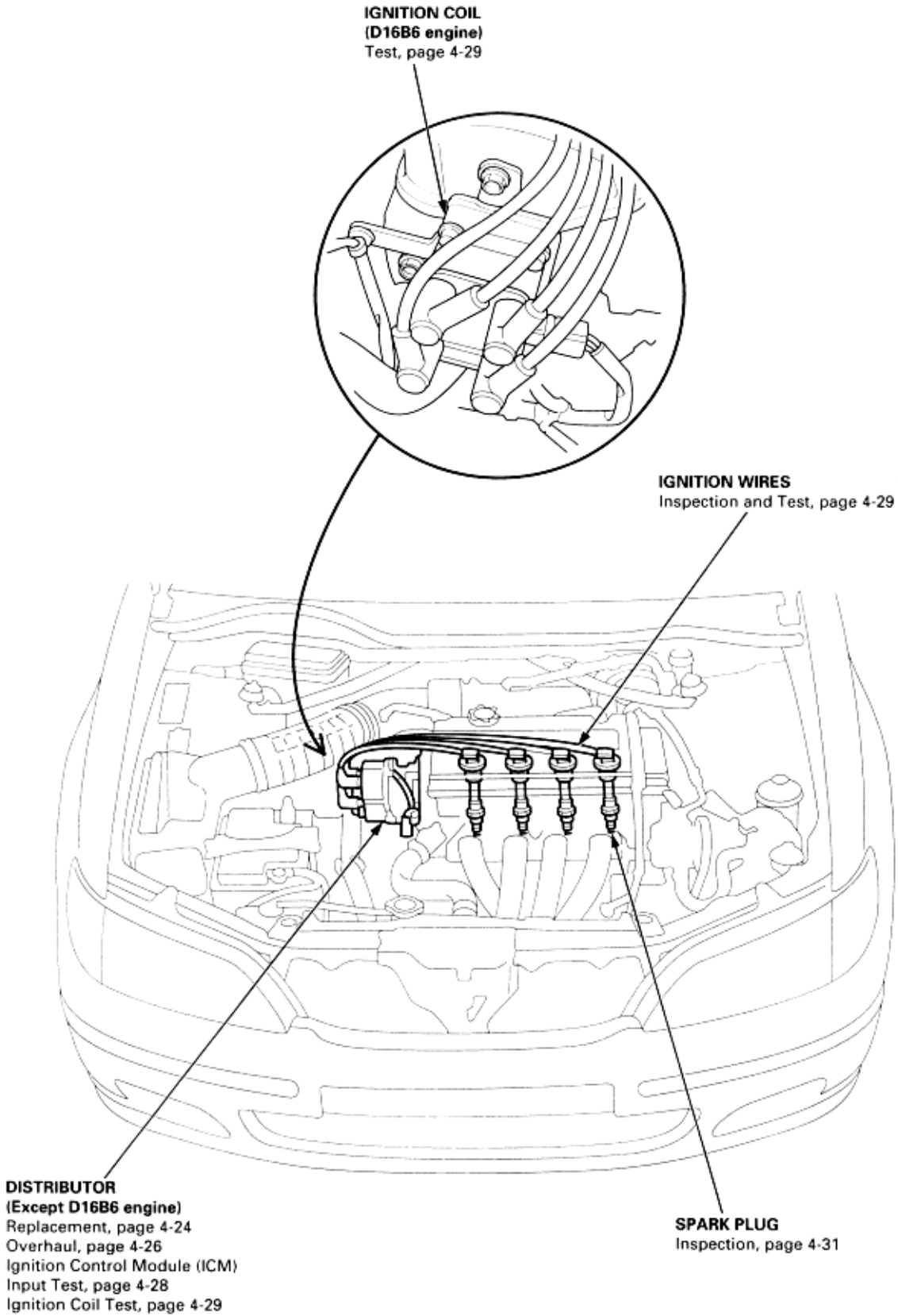


8. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications:

Maker	Electric current	Motor speed
Valeo	70A or less	2,700 rpm (min-1) or more
DENSO	90A or less	3,000 rpm (min-1) or more

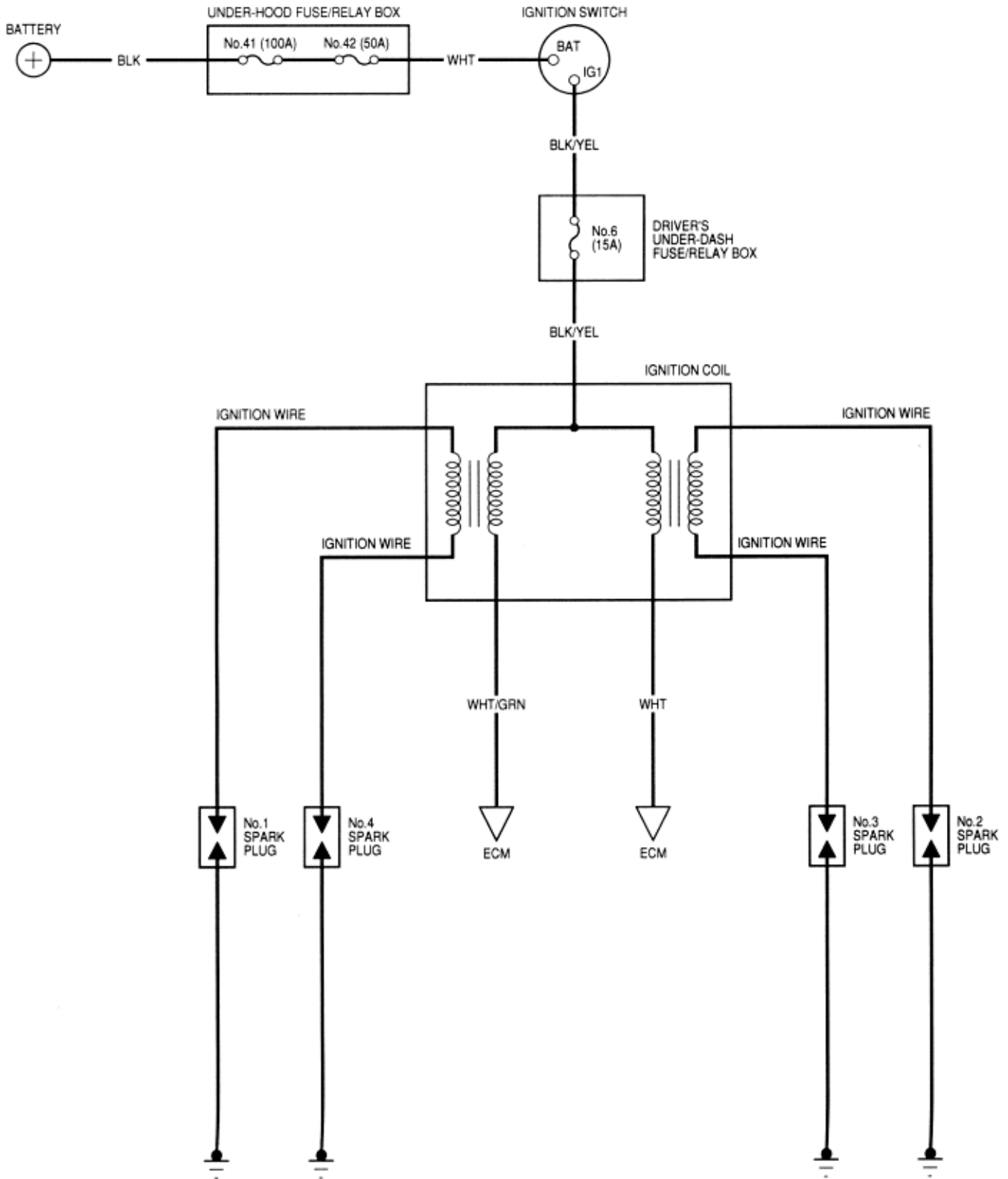
IGNITION TIMING CONTROL SYSTEM
Inspection (**See Page** 4-21)



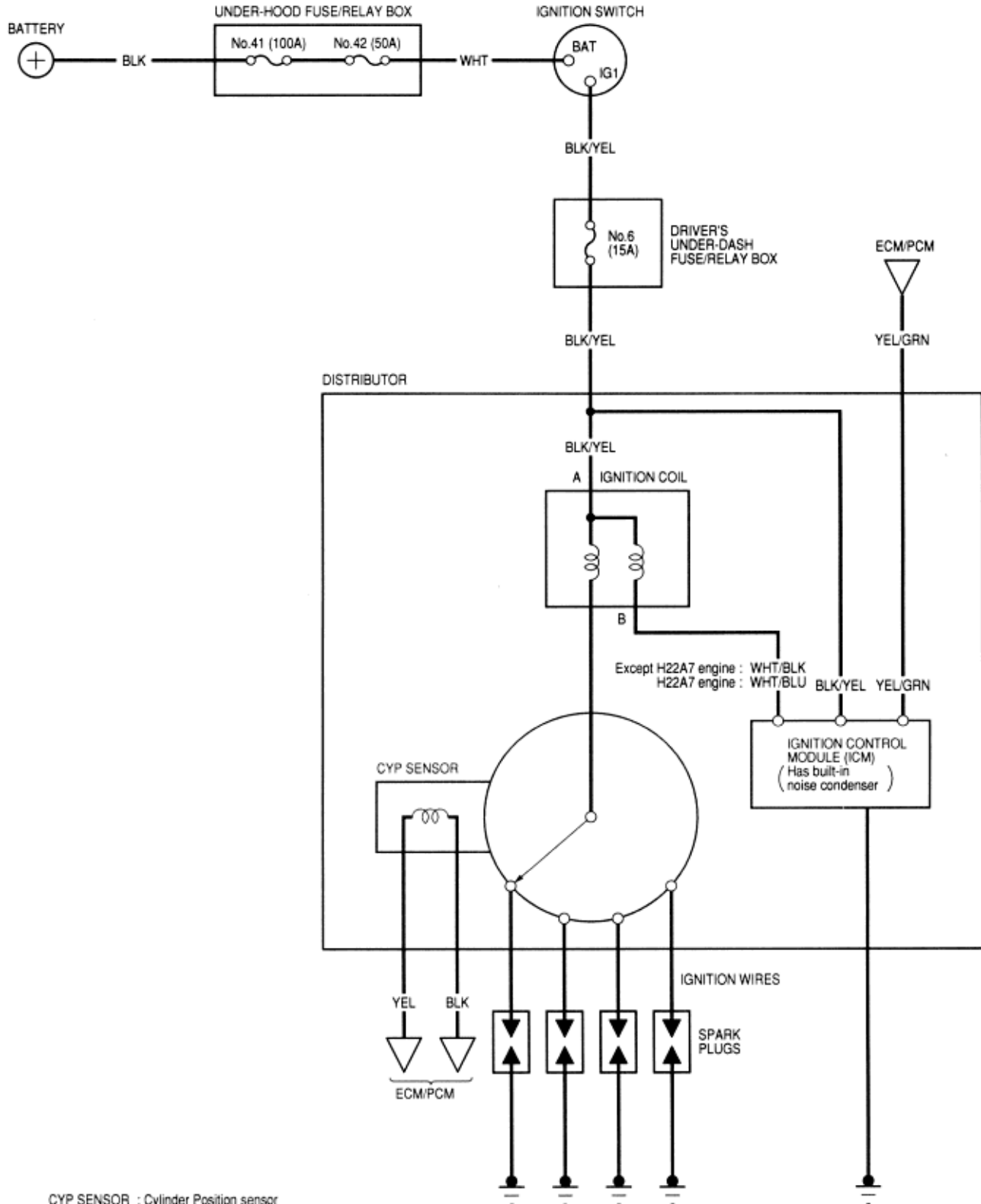
To go to the pages referenced on the diagram above, click on the following:

- (**See page** 4-29)
- (**See page** 4-24)
- (**See page** 4-26)
- (**See page** 4-28)
- (**See page** 4-29)
- (**See page** 4-31)

D16B6 engine:



Except D16B6 engine:



CYP SENSOR : Cylinder Position sensor

Ignition System

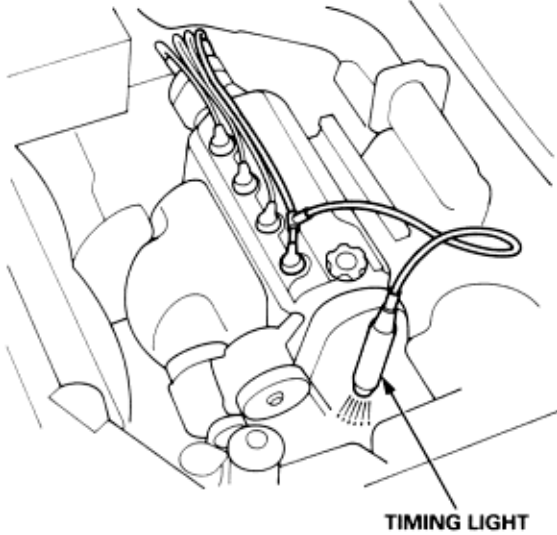
Ignition Timing Inspection

4-21

1. Check the idle speed, and adjust it if necessary (see section 11).
2. Pull out the service check connector 2P (GRN/BLK and BRN wires) from the connector holder located under the dash on the front passenger side, then connect the SCS short connector (T/N 07PAZ-0010100) to it.
3. Start the engine. Hold the engine at 3,000 rpm (min.-1) with no load (A/T in **N** or **P** position, M/T in neutral) until the radiator fan comes on, then let it idle.
4. Connect a timing light to the No. 1 ignition wire.

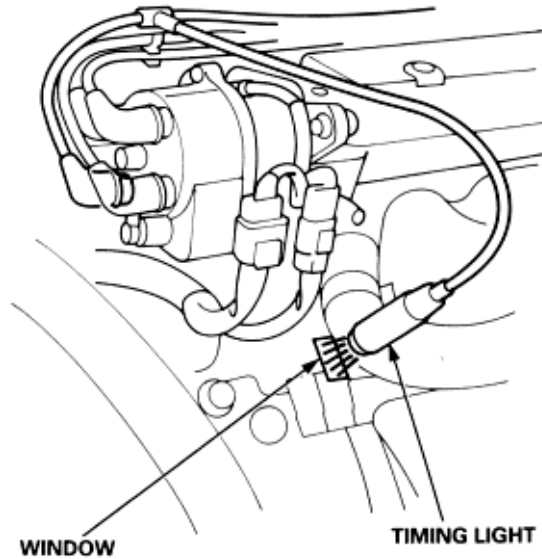
Except H22A7 engine:

- ♦ Point the timing light toward the pointer on the timing belt cover.



H22A7 engine:

- ♦ Remove the rubber plug from the "window" in the flywheel housing. While the engine idles, point the timing light toward the pointer on the flywheel.



Ignition System

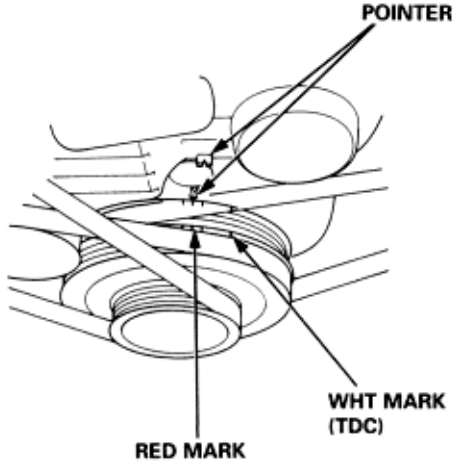
Ignition Timing Inspection (cont'd)

5. Check the ignition timing in no load conditions: headlights, blower fan, rear window defogger, and air conditioner are not operating.

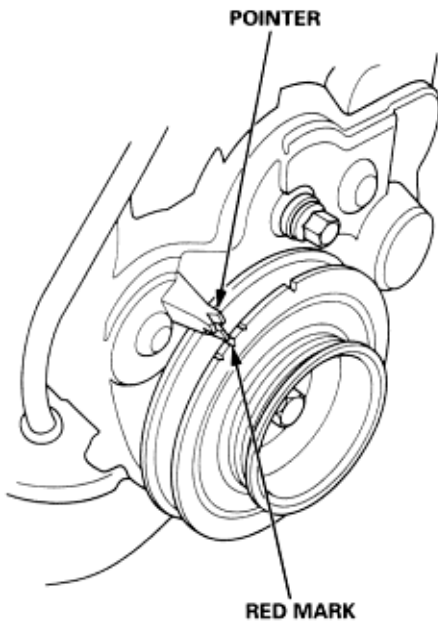
Ignition Timing:

Except H22A7 engine	M/T	$12^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in neutral
	A/T	$12^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in N or P position
H22A7 engine		$15^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in neutral

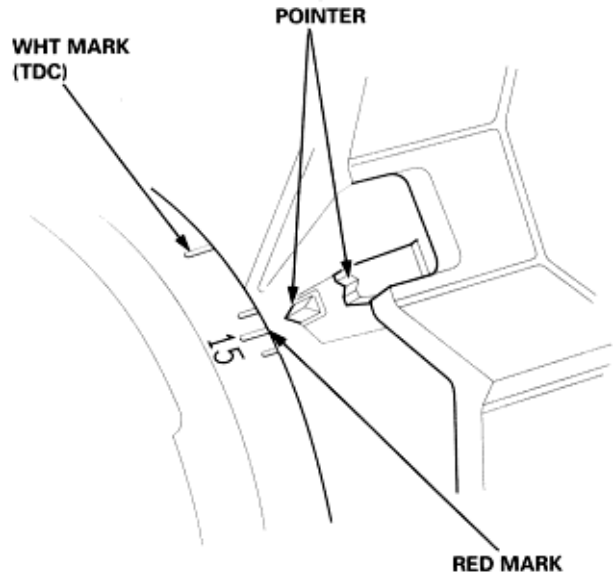
D16B6 engine:



F18B2, F18B3, F20B6 engines:

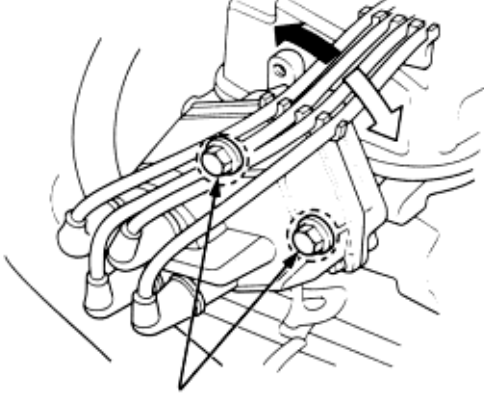


H22A7 engine:



- If the ignition timing is incorrect;
 - the PCM in the D16B6 engine should be replaced.
 - for engines except D16B6 engine, ignition timing should be set (**See Page 4-23**).
- Disconnect the SCS short connector.

1. Inspect the ignition timing (**See Page** 4-21).
2. If necessary, adjust the ignition timing, as follows. Loosen the distributor mounting bolts, and turn the distributor ignition (DI) housing counterclockwise to advance the timing, or clockwise to retard the timing.



MOUNTING BOLTS
22 N·m (2.2 kgf·m, 16 lbf·ft)

3. Tighten the distributor mounting bolts, and recheck the ignition timing (**See Page** 4-21).

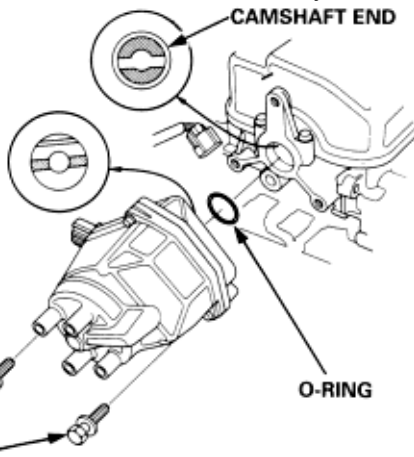
Ignition System

Distributor Replacement (Except D16B6 engine)

4-24

Removal:

1. Disconnect the connector from the distributor.
2. Disconnect the ignition wires from the distributor ignition (DI) cap.
3. Remove the mounting bolts from the distributor then remove the distributor from the cylinder head.



MOUNTING BOLTS
24 N·m (2.4 kgf·m,
17 lbf·ft)

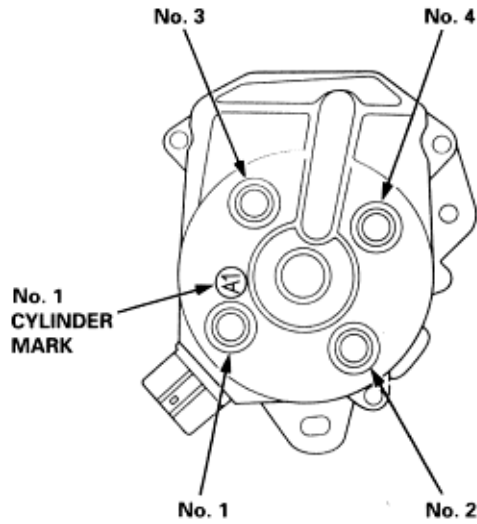
Installation:

NOTE: Before you install the distributor, bring the No.1 piston to compression stroke TDC.

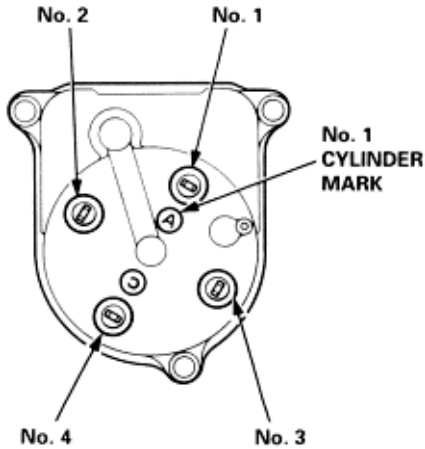
1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.
NOTE: The lug on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.
3. Install the mounting bolts, and tighten them lightly.

4. Connect the ignition wires to the distributor ignition (DI) cap as shown.

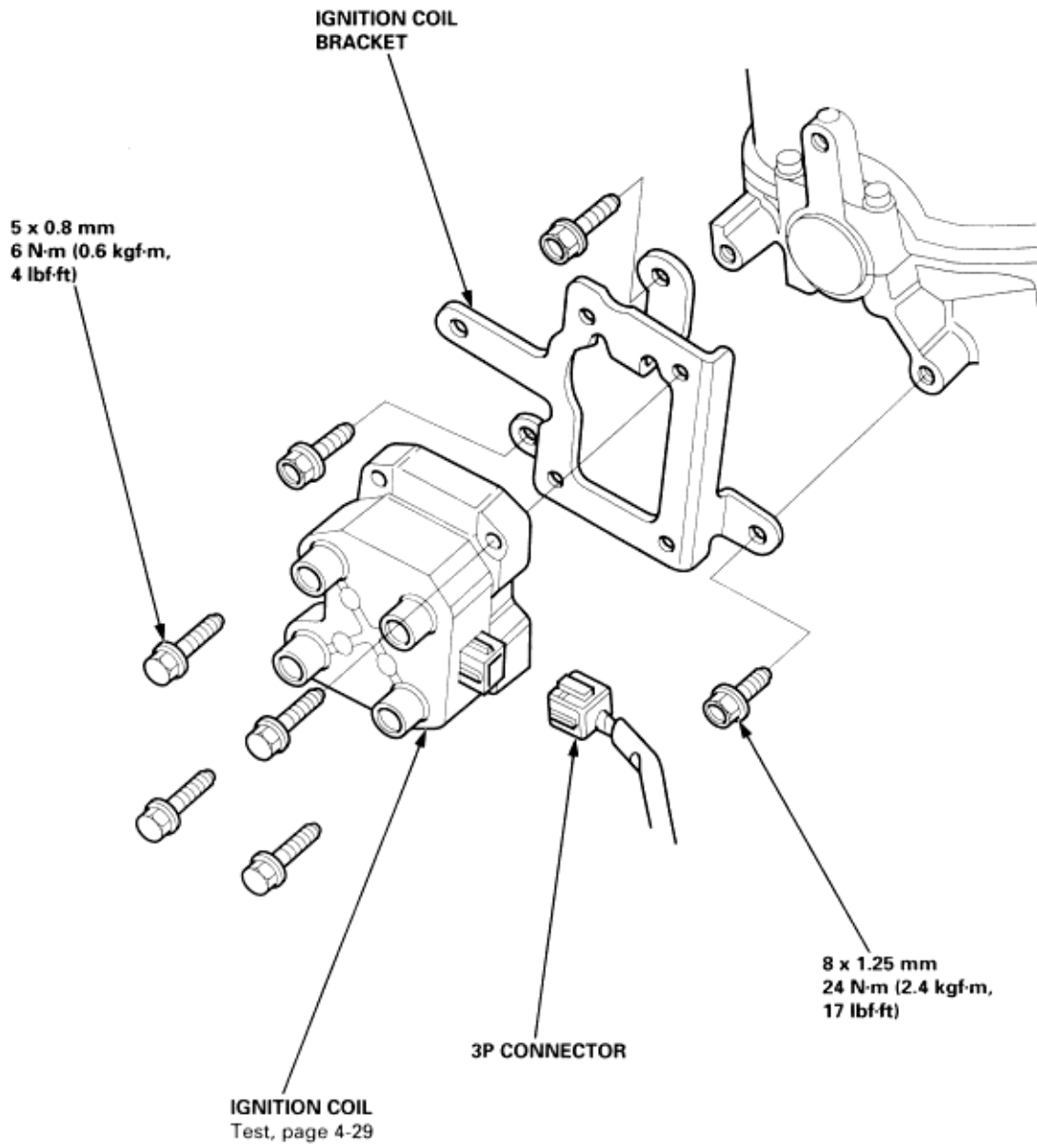
F18B2, F18B3, F20B6 engines:



H22A7 engine:



5. Connect the connector to the distributor.
6. Set the ignition timing (**See Page 4-23**).
7. After setting the ignition timing, tighten the mounting bolts.



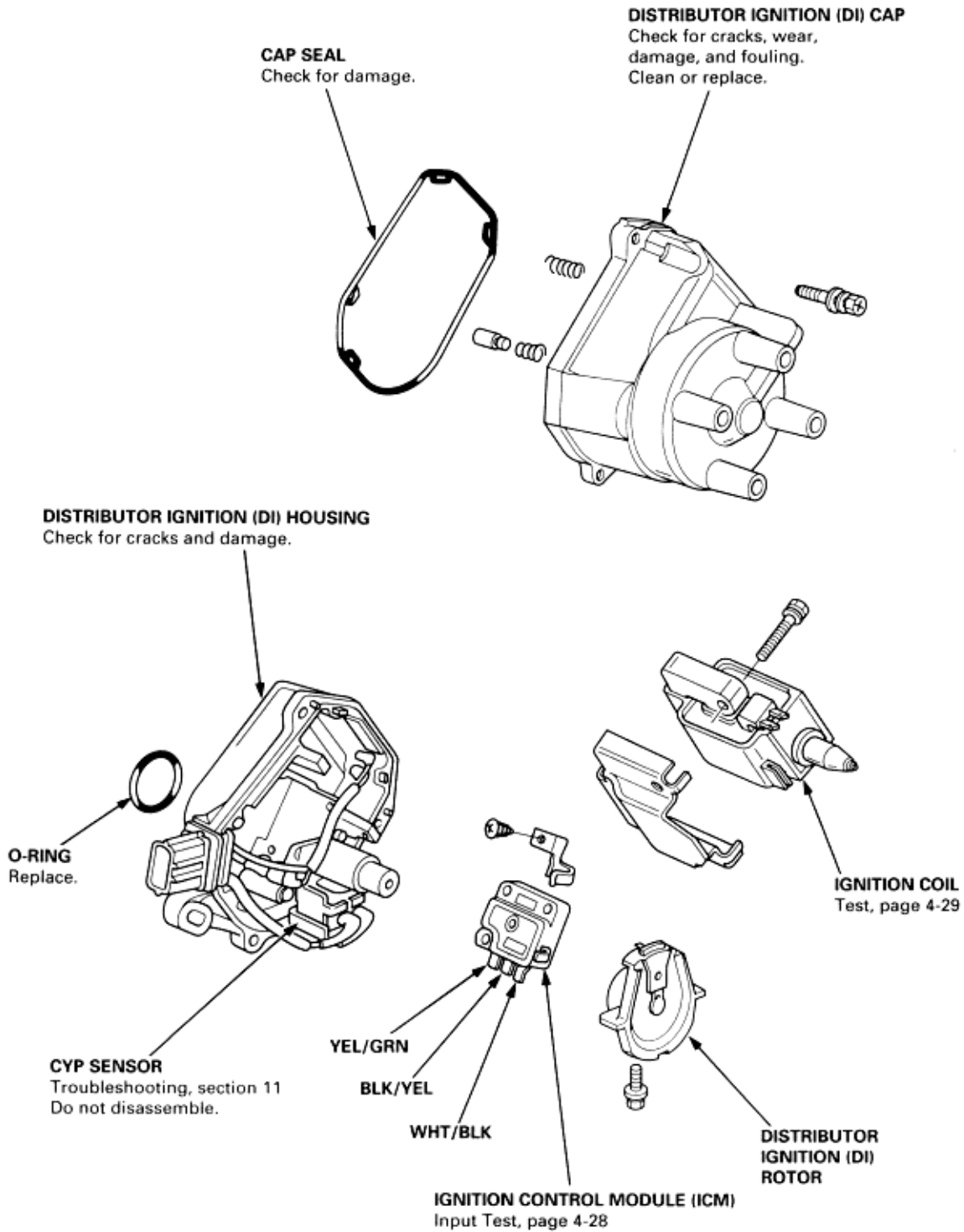
To go to the page referenced on the diagram above, click on the following:
[\(See page 4-29\)](#)

Ignition System

Distributor Overhaul (Except D16B6 engine)

4-26

F18B2, F18B3, F20B6 engines:

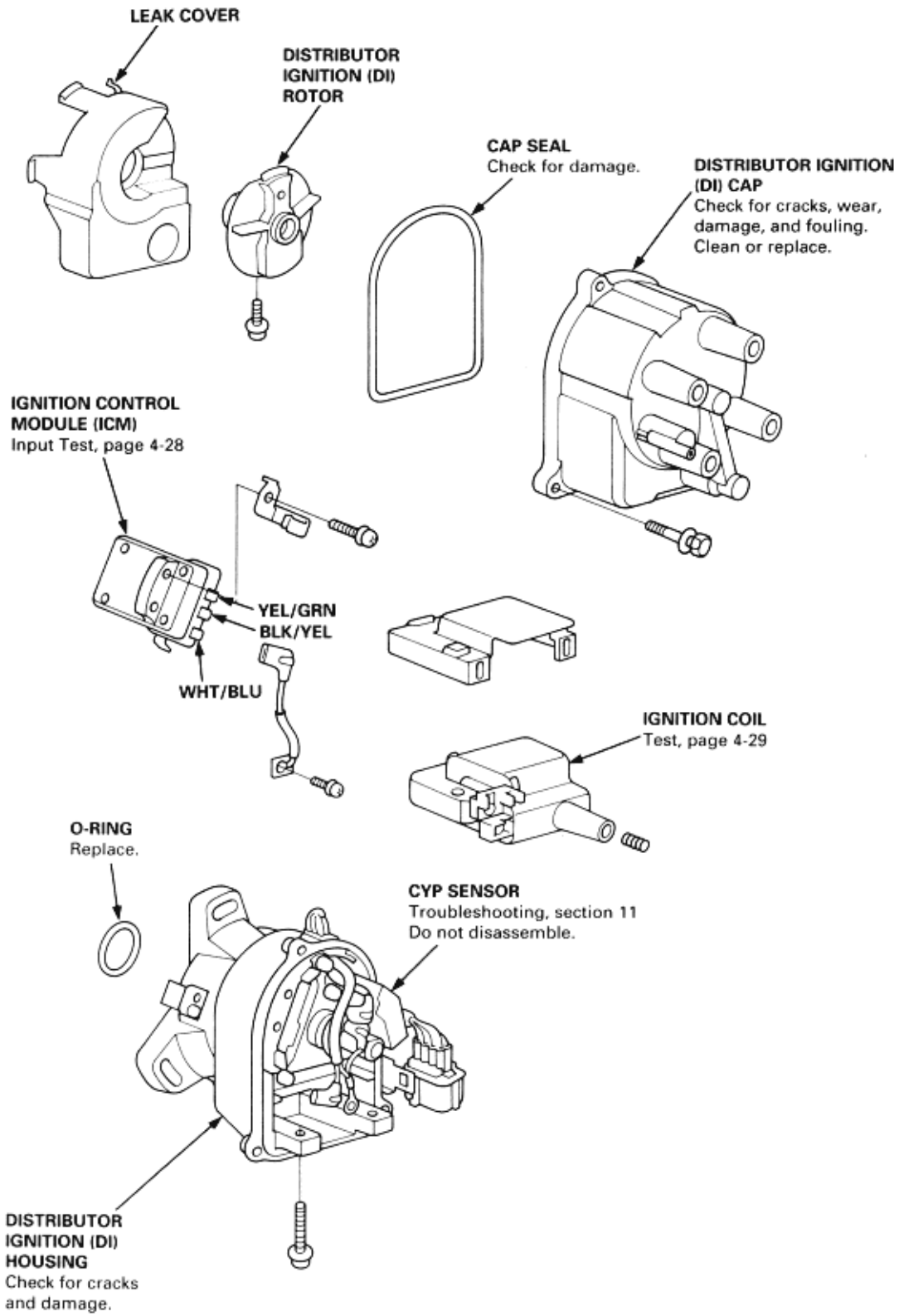


To go to the pages referenced on the diagram above,
click on the following:

(See page 4-28)

(See page 4-29)

H22A7 engine:



To go to the pages referenced on the diagram above, click on the following:
(See page 4-28)
(See page 4-29)

Ignition System

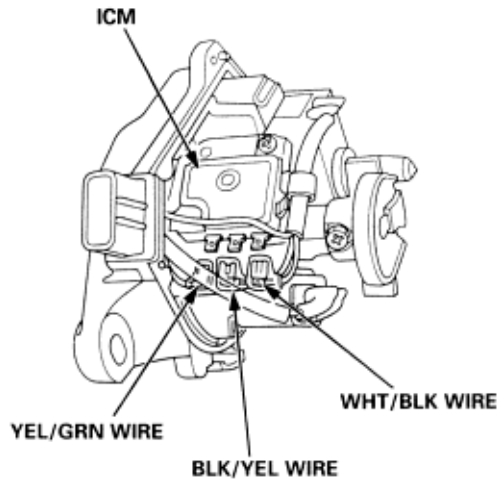
Ignition Control Module (ICM) Input Test (Except D16B6 engine)

4-28

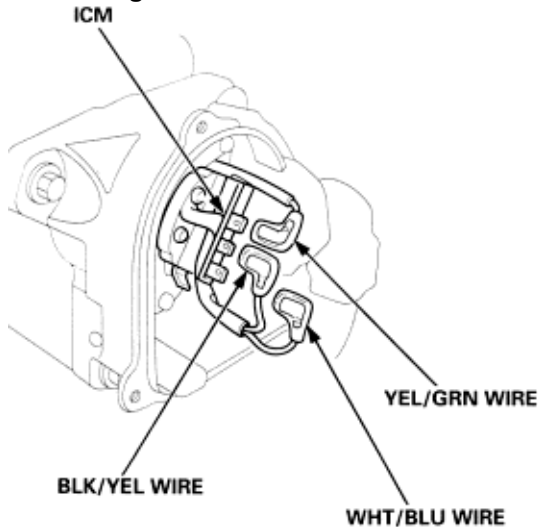
NOTE:

- ♦ See section 11 when the malfunction indicator lamp (MIL) comes on.
 - ♦ Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emissions systems.
 - ♦ The tachometer should operate normally if the ICM is OK.
1. Remove the distributor ignition (DI) cap, the distributor ignition (DI) rotor, and the leak cover.
 2. Disconnect the wires from the ICM.

F18B2, F18B3, F20B6 engines:



H22A7 engine:



3. Turn the ignition switch ON (II). Check for voltage between the BLK/YEL wire and body ground. There should be battery voltage.
 - ♦ If there is no battery voltage, check the BLK/YEL wire between the ignition switch and the ICM.
 - ♦ If there is battery voltage, go to step 4.
4. Turn the ignition switch ON (II). Check for voltage between the WHT/BLK [WHT/BLU] wire and body ground. There should be battery voltage.
 - []: H22A7 engine
 - ♦ If there is no battery voltage, check:
 - ignition coil.
 - WHT/BLK [WHT/BLU] wire between the ICM and ignition coil.
 - ♦ If there is battery voltage, go to step 5.
5. Disconnect the 25P connector from the ECM/PCM, and check for continuity on the YEL/GRN wire between the ICM and ECM/PCM. There should be continuity.
6. Check for continuity on the YEL/GRN wire to body ground. There should be no continuity.
7. If all the tests are normal, reconnect the ECM/PCM 25P connector, and replace the ICM.

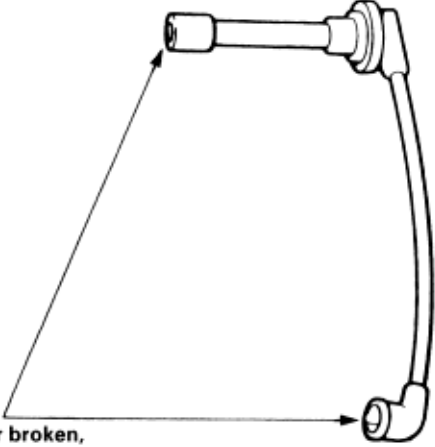
Ignition System

Ignition Wire Inspection and Test

4-29

Ignition Coil Test

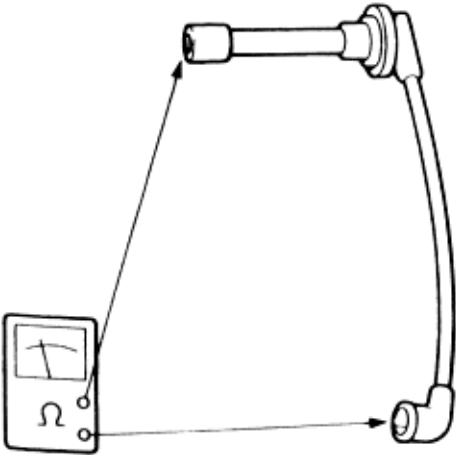
1. Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.
2. Check the condition of the ignition wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the ignition wire.



Check for broken, corroded, and bent terminals.

3. Connect ohmmeter probes and measure resistance.

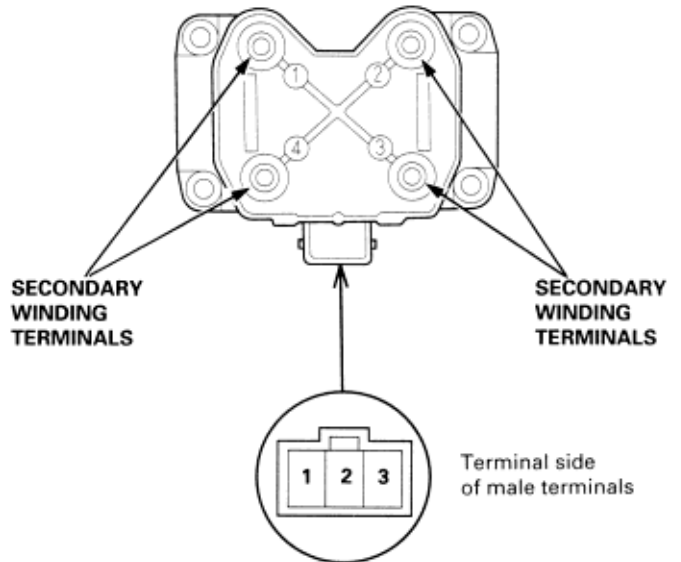
Ignition Wire Resistance:
25 k ohms max. at 20°C (68°F)



4. If resistance exceeds 25 k ohms replace the ignition wire.

D16B6 engine:

1. Turn the ignition switch OFF.
2. Disconnect the 3P connector and ignition wire.



3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

NOTE: Resistance will vary with the coil temperature; specifications are at 20°C (68°F).

Primary Winding Resistance

(Between the No. 1 and No. 2 terminals, and the No. 3 and No. 2 terminals):

0.45 - 0.55 ohms.

Secondary Winding Resistance

(Between the secondary winding terminals):

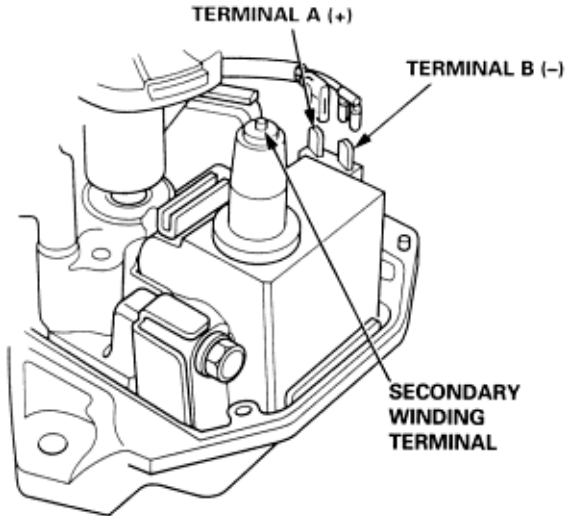
12.0-14.6k ohms.

Ignition System

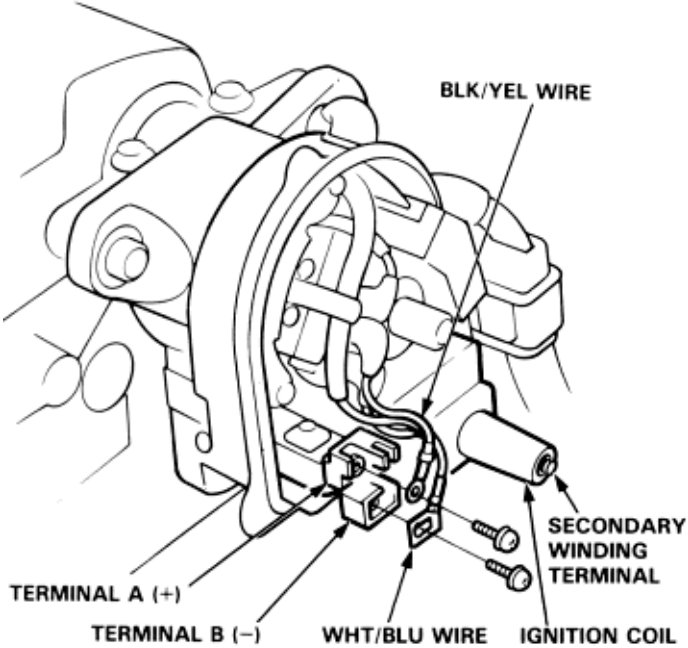
Ignition Coil Test (cont'd)

Except D16B6 engine:

1. Turn the ignition switch OFF, and remove the distributor ignition (DI) cap.
2. Disconnect the BLK/YEL and WHT/BLK (H22A7 engine: WHT/BLU) wires from terminals (+) and (-) respectively.



H22A7 engine:



3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

NOTE: Resistance will vary with the coil temperature: specifications are at 20°C (68°F).

F18B2, F18B3, F20B6 engines:

Primary Winding Resistance

(Between the A and B terminals):

0.45 - 0.55 ohms.

Secondary Winding Resistance

(Between the A and secondary winding terminals)

22.4 - 33.6k ohms.

H22A7 engine:

Primary Winding Resistance

(Between the A and B terminals):

0.63 - 0.77 ohms.

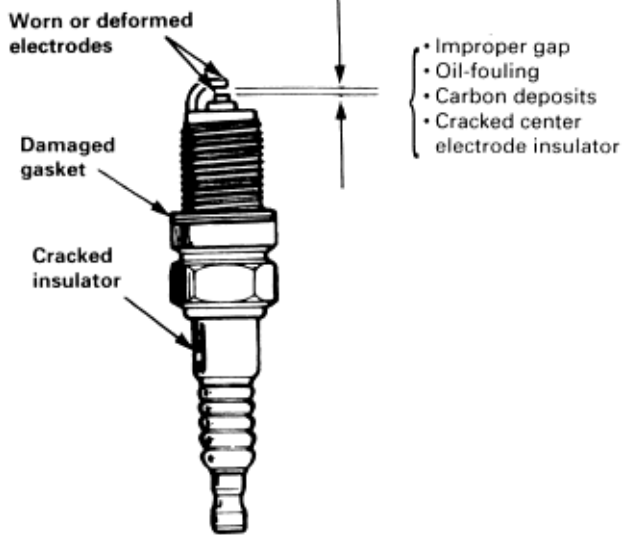
Secondary Winding Resistance

(Between the A and secondary Winding Terminals):

12.8 - 19.2 k ohms.

Except H22A7 engine:

1. Inspect the electrodes and ceramic insulator for:



Burned or worn electrodes may be caused by:

- ♦ Advanced ignition timing
- ♦ Loose spark plug
- ♦ Plug heat range too hot
- ♦ Insufficient cooling

Fouled plug may be caused by:

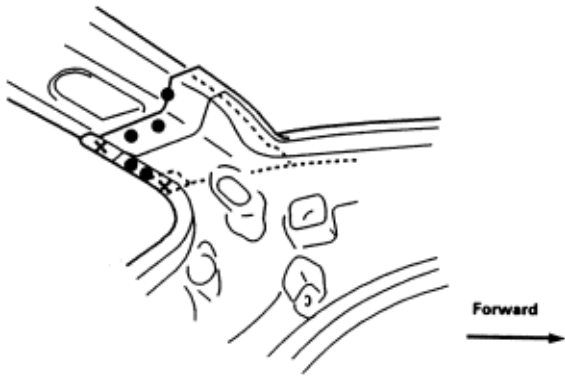
- ♦ Retarded ignition timing
- ♦ Oil in combustion chamber
- ♦ Incorrect spark plug gap
- ♦ Plug heat range too cold
- ♦ Excessive idling/low speed running
- ♦ Clogged air cleaner element
- ♦ Deteriorated ignition coil or ignition wires

2. Check the electrode gap.

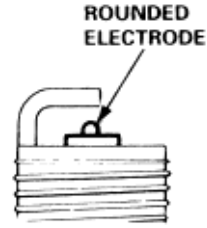
- ♦ Adjust the gap with a suitable gapping tool.

Electrode Gap

Standard	1.1 - 8.1 mm (0.043 - 8.004 in)
----------	---------------------------------



- ♦ Replace the plug if the center electrode is rounded as shown below:



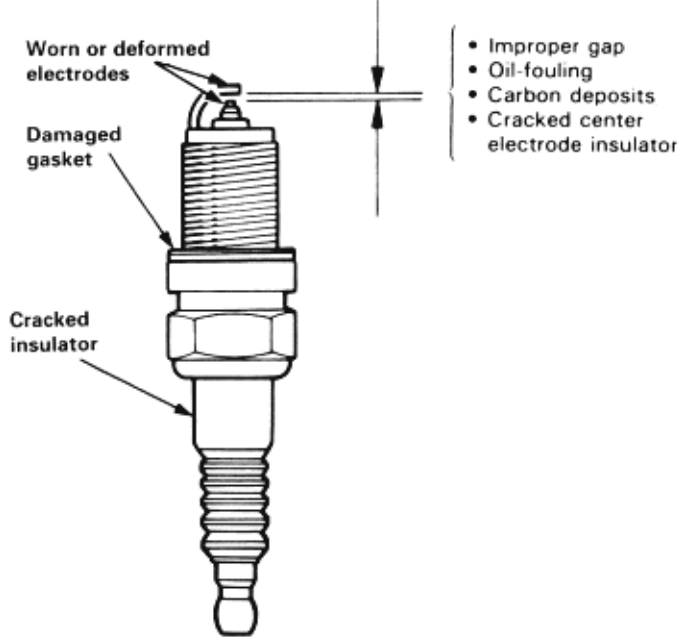
Spark Plugs

Engine Type	Spark Plug Type
D16B6	ZFR5F-11 (NGK)
	ZFR5J-11 (NGK)
	KJ16CR-L11 (DENSO)
F18B3	ZFR5F-11 (NGK)
	ZFR5J-11 (NGK)
	KJ20CR-L11 (DENSO)
F18B2	ZFR6F-11 (NGK)
F20B6	KJ20CR-L11 (DENSO)

3. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 Nm (1.8 kgf/m, 13 lbf/ft).

H22A7 engine:

1. Inspect the electrodes and ceramic insulator for:



Burned or worn electrodes may be caused by:

- ♦ Advanced ignition timing
- ♦ Loose spark plug
- ♦ Plug heat range too hot
- ♦ Insufficient cooling

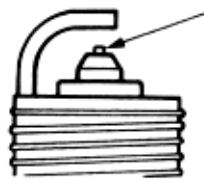
Fouled plug may be caused by:

- ♦ Retarded ignition timing
- ♦ Oil in combustion chamber
- ♦ Incorrect spark plug gap
- ♦ Plug heat range too cold
- ♦ Excessive idling/low speed running
- ♦ Clogged air cleaner element
- ♦ Deteriorated ignition coil or ignition wires

2. Do not adjust the gap of platinum tip plugs; replace the spark plug if the gap is out of specification or if the center electrode is rounded.

Electrode Gap:

Standard	1.1 +0, -0.1 mm, (0.043 +0, -0.004 in)
Service Limit	1.3 mm (0.051 in)



Platinum tip plug:

Do not adjust the gap; replace the spark plug if the gap is out of specification or if the center electrode is rounded.

3. Replace the plug at the specified interval, or if center electrode is rounded as shown below:

ROUNDED ELECTRODE

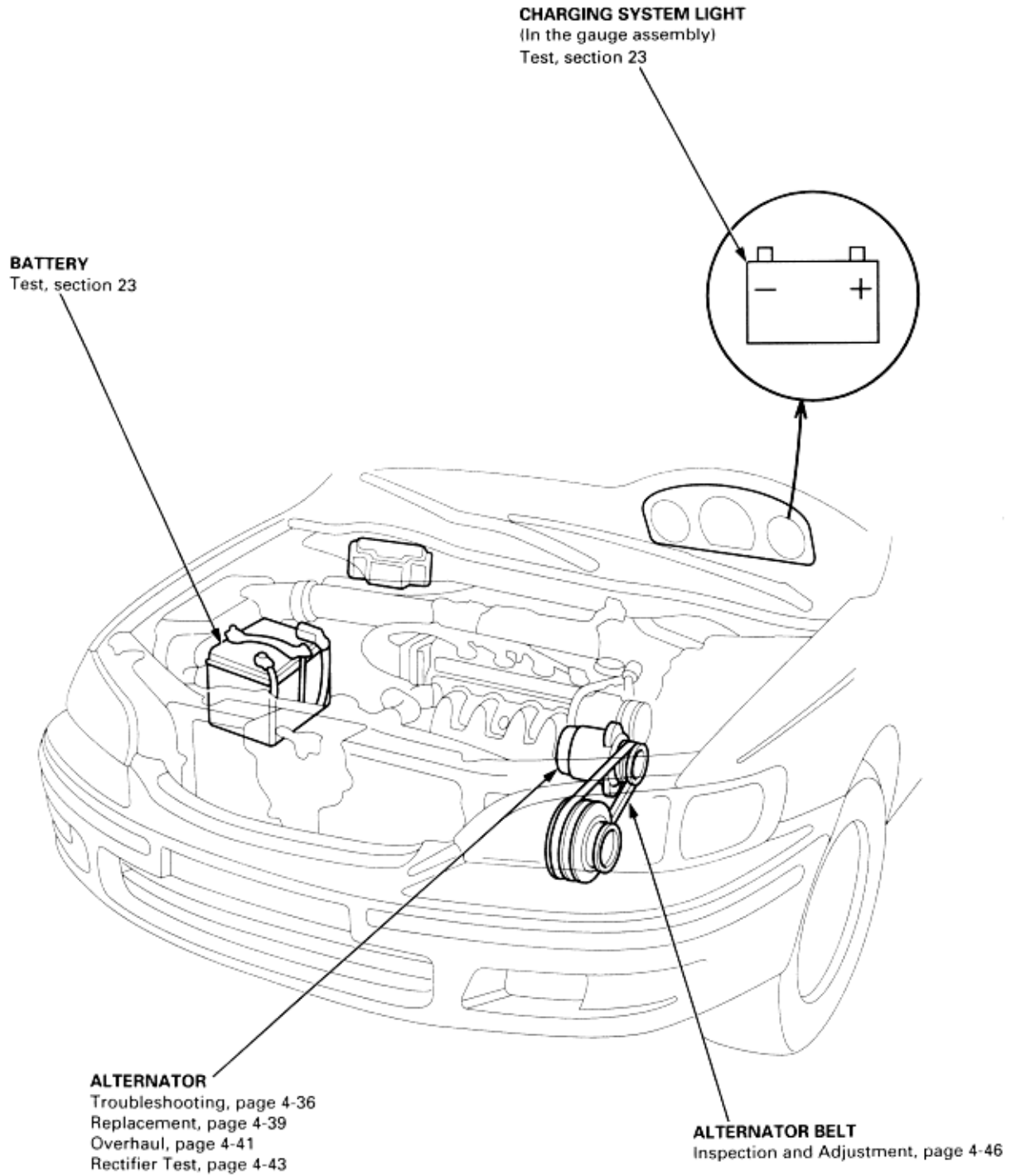


NOTE: Use only the spark plugs listed below.

Spark Plugs: PZFR6F-11 (NGK)

4. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 Nm (1.8 kgf/m, 13lbf/ft).

D16B6 engine:



To go to the pages referenced on the diagram above,
click on the following:

(See page 4-36)

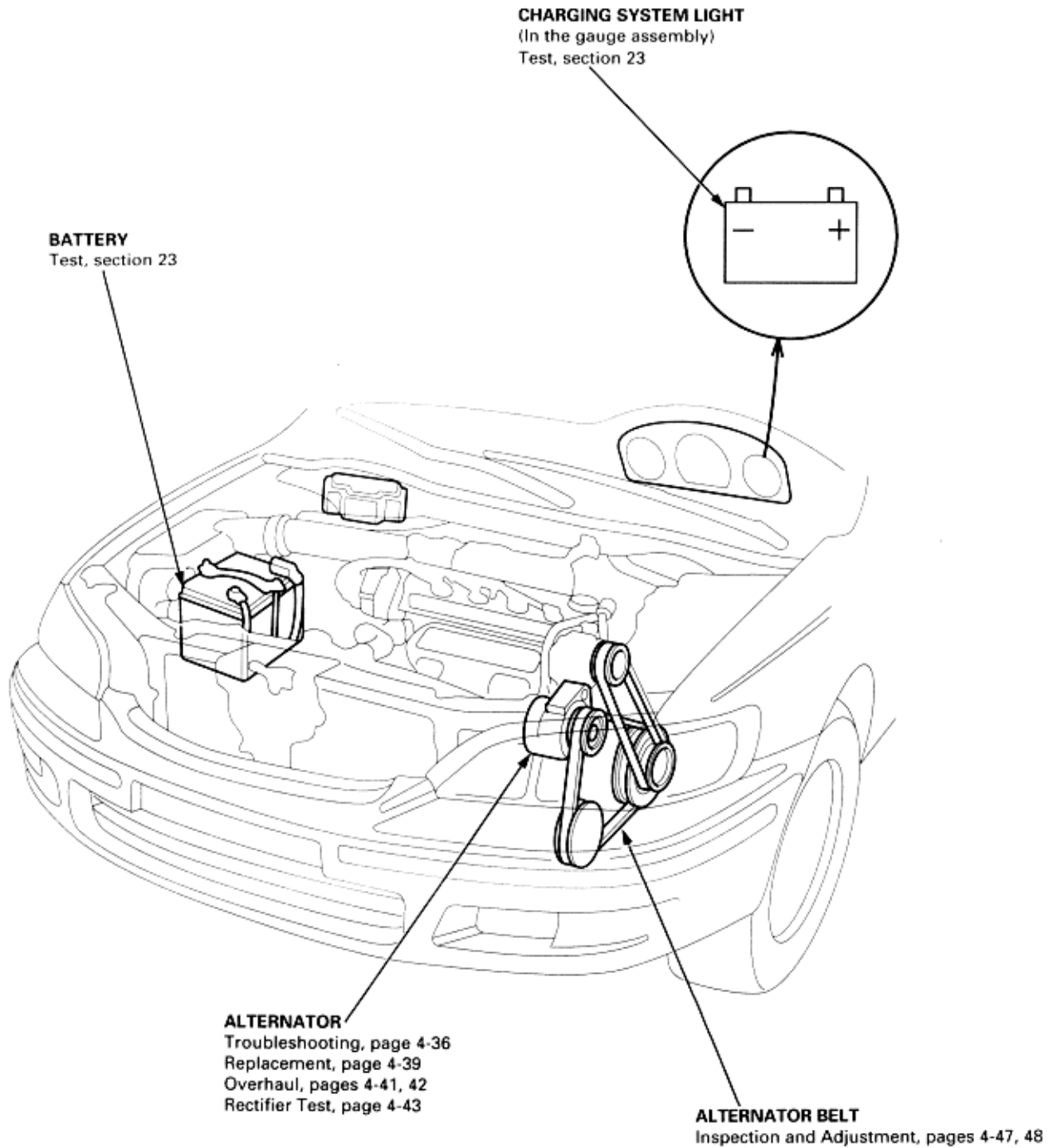
(See page 4-39)

(See page 4-41)

(See page 4-43)

(See page 4-46)

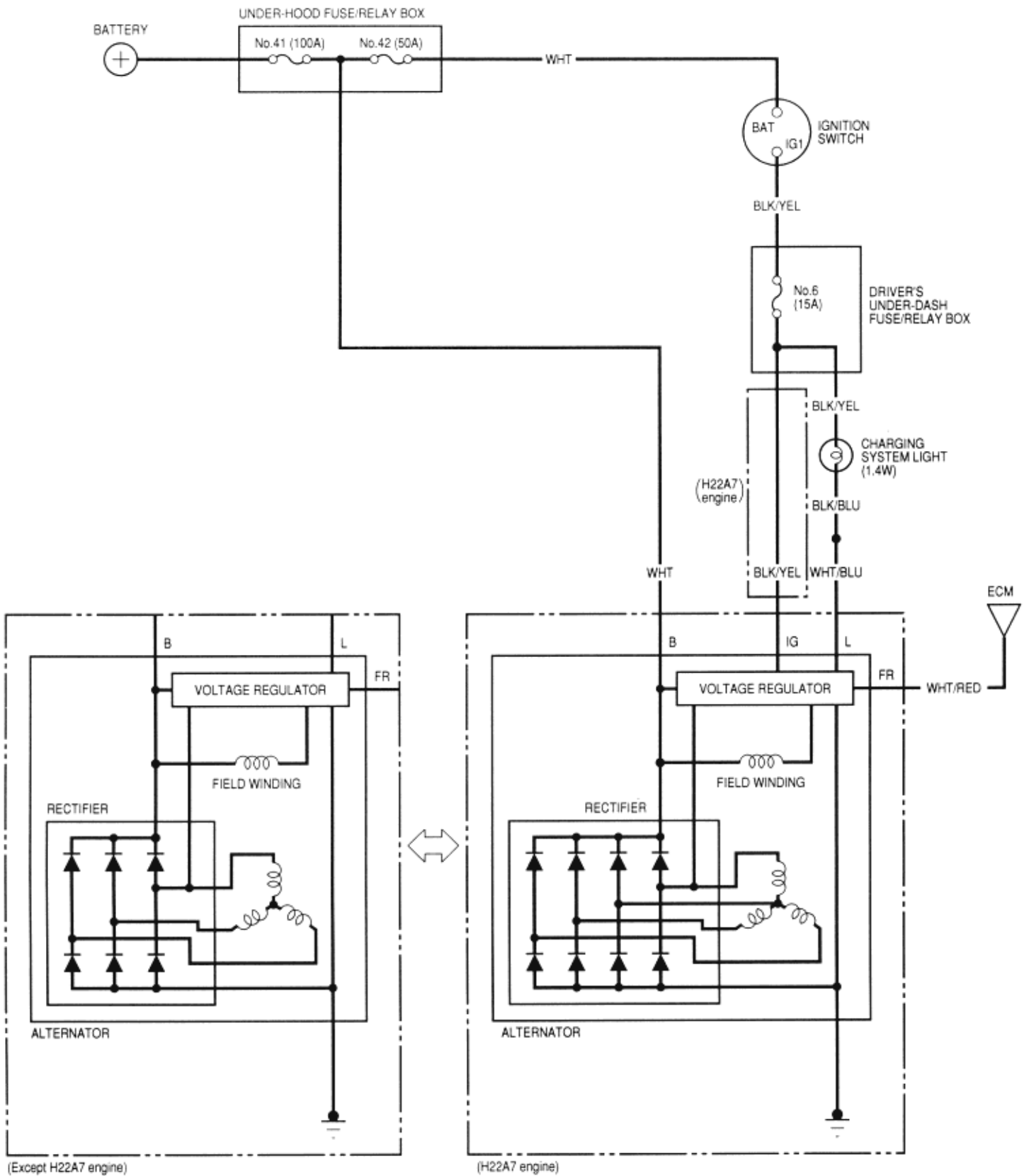
Except D16B6 engine:



To go to the pages referenced on the diagram above, click on the following:

- (See page 4-36)
- (See page 4-39)
- (See page 4-41)
- (See page 4-42)
- (See page 4-43)
- (See page 4-47)
- (See page 4-48)

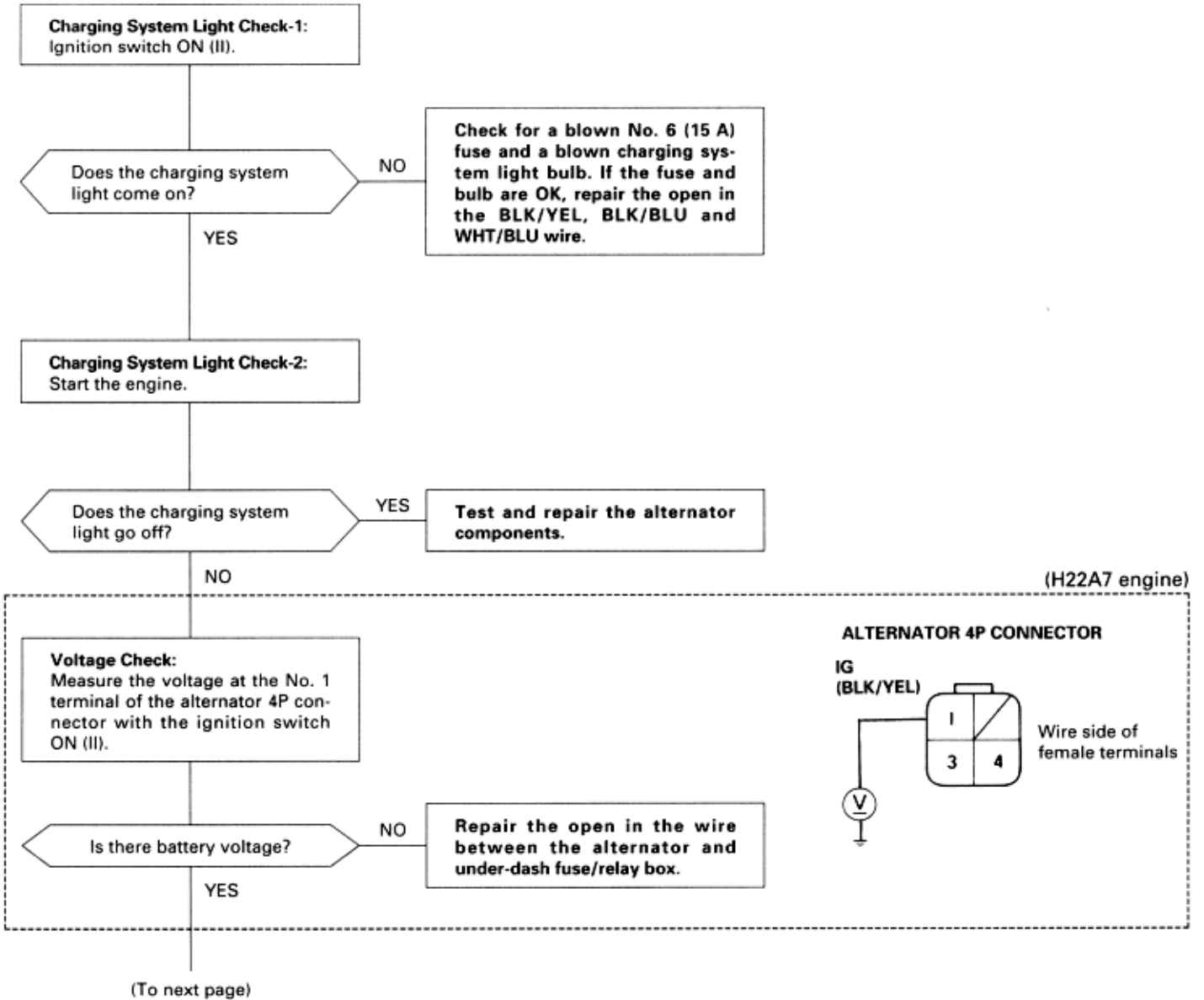
**Charging System
Circuit Diagram**



If the charging system light does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:

1. Battery (see section 23).
2. Charging system light.
3. Voltage.
4. Alternator/regulator.

Charging System Light Test



(From previous page)

Check for an open in the L circuit-1:
 1. Turn the ignition switch OFF.
 2. Disconnect the 2P [4P] connector from the alternator.
 3. Connect the alternator 2P [4P] connector terminal No. 1 [No. 3] to body ground with a jumper wire.
 4. Turn the ignition switch ON (II).

Does the charging system light come on?

NO
 Turn the ignition switch OFF, and repair the open in the BLK/YEL, BLK/BLU and WHT/BLU wire.

YES

Check for an open in the L circuit-2:
 Disconnect the alternator 2P [4P] connector terminal No. 1 [No. 3] from body ground with a jumper wire.

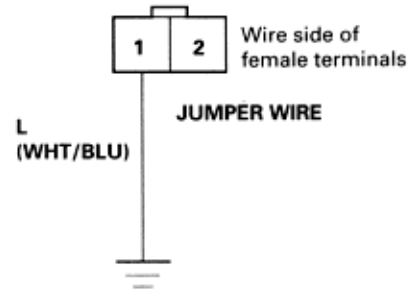
Does the charging system light go off?

YES
 Test and repair the alternator components.

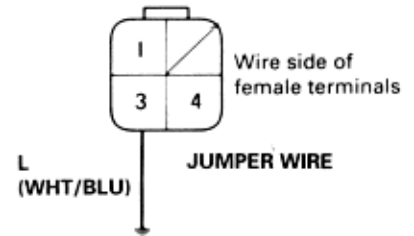
NO

Turn the ignition switch OFF, and repair the short to ground in the WHT/BLU wire.

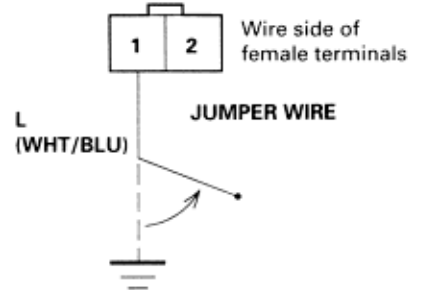
ALTERNATOR 2P CONNECTOR
 (Except H22A7 engine)



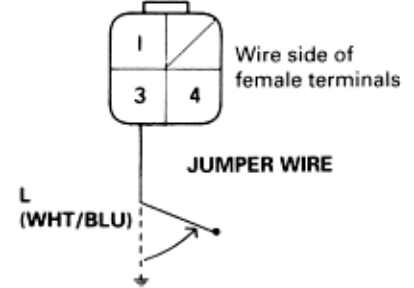
ALTERNATOR 4P CONNECTOR
 (H22A7 engine)



ALTERNATOR 2P CONNECTOR
 (Except H22A7 engine)



ALTERNATOR 4P CONNECTOR
 (H22A7 engine)



[]: H22A7 engine

Alternator/Regulator Test

CAUTION

Be careful during testing as the radiator and condenser fans come on suddenly while the engine is running.

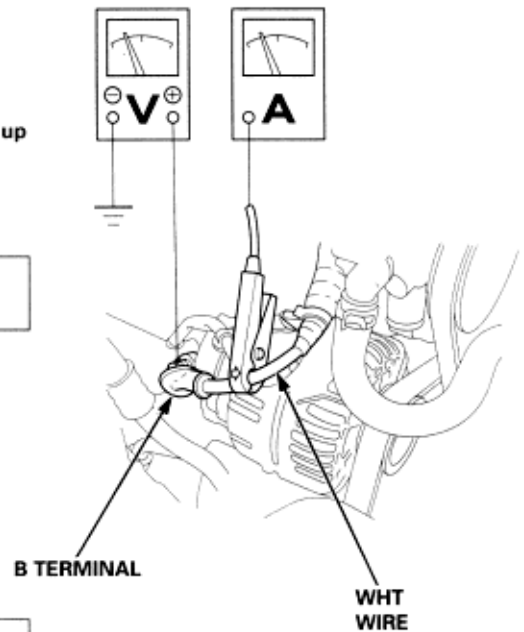
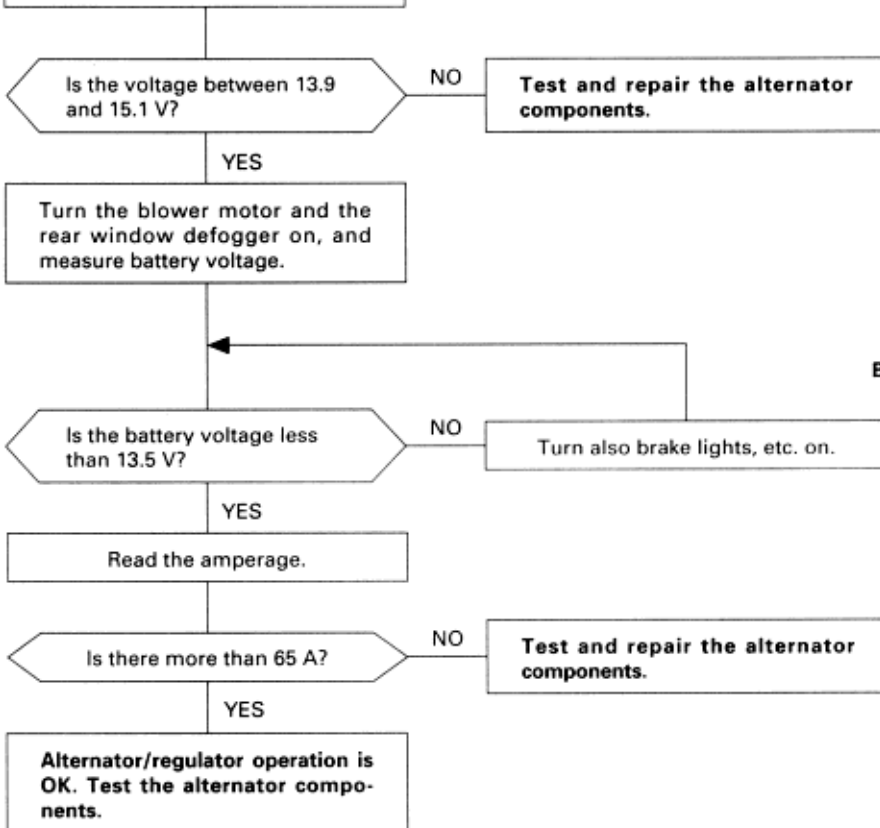
NOTE

Be sure to use an ammeter capable of measuring amperages higher than 120 A.

Alternator/Regulator Test:

1. Shift to **P** or **N** position (A/T) or neutral (M/T), and start the engine.
2. Hold the engine at 3,000 rpm (min^{-1}) with no load until the radiator fan comes on, then let it idle.
3. Raise the engine speed to 2,000 rpm (min^{-1}), and hold it there.
4. Turn the headlights (high beam) on, and measure voltage at the battery terminals.

CAUTION: As the headlights warm up considerably, do not cover them.



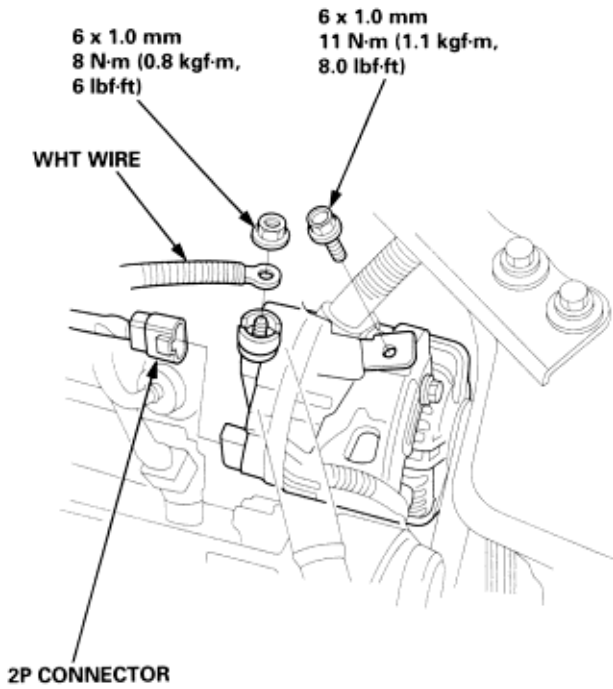
Charging System

Alternator Replacement (D16B6 engine)

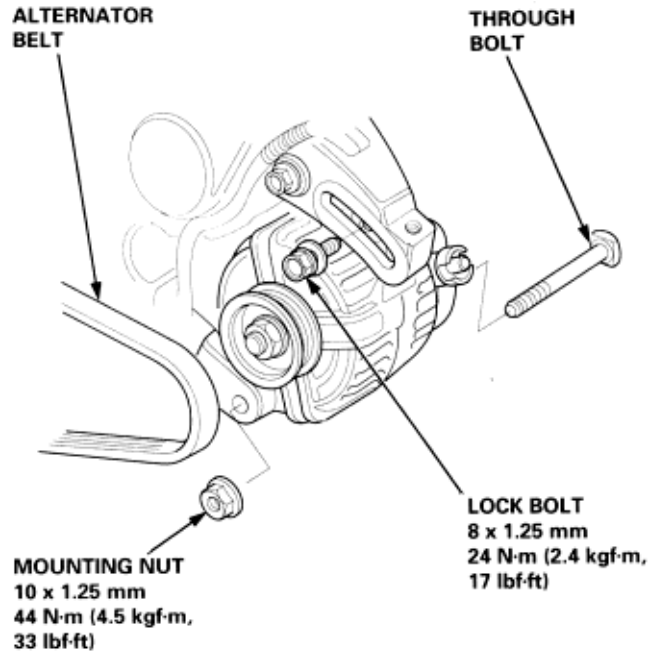
4-39

D16B6 engine:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the 2P connector. WHT wire and wire harness clamp.



4. Remove the lock bolt and mounting nut, then remove the alternator belt.
5. Pull out the through bolt, then remove the alternator from the transmission side.



6. Install the alternator in the reverse order of removal.
7. Adjust the alternator belt tension (**See Page 4-46**).
8. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

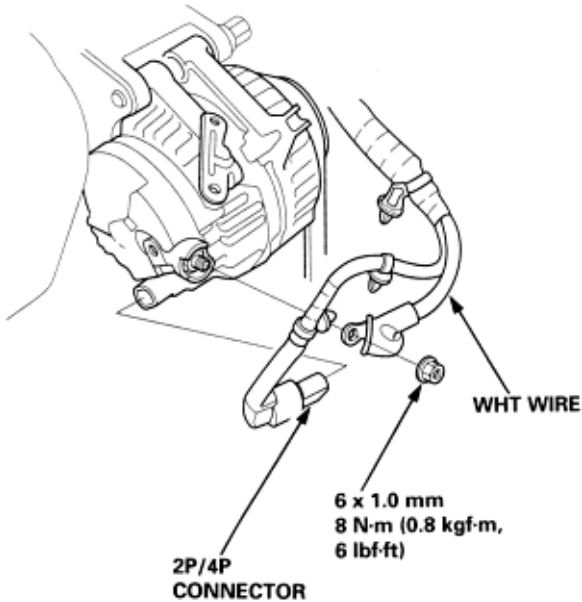
Charging System

Alternator Replacement (D16B6 engine) (cont'd)

4-40

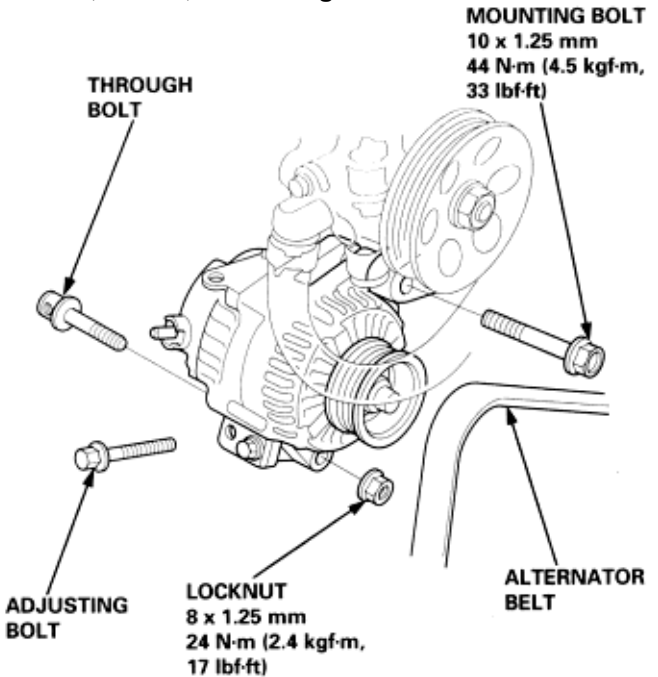
Except D16B6 engine:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the 2P/4P connector and WHT wire

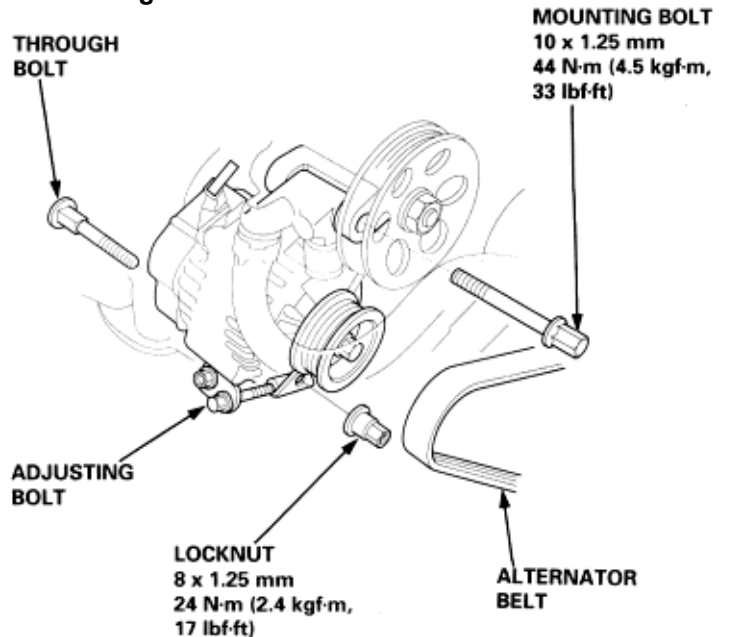


4. Remove the adjusting bolt, locknut and mounting bolt, then remove the alternator belt.
5. Pull out the through bolt, then remove the alternator.

F18B2, F18B3, F20B6 engines:



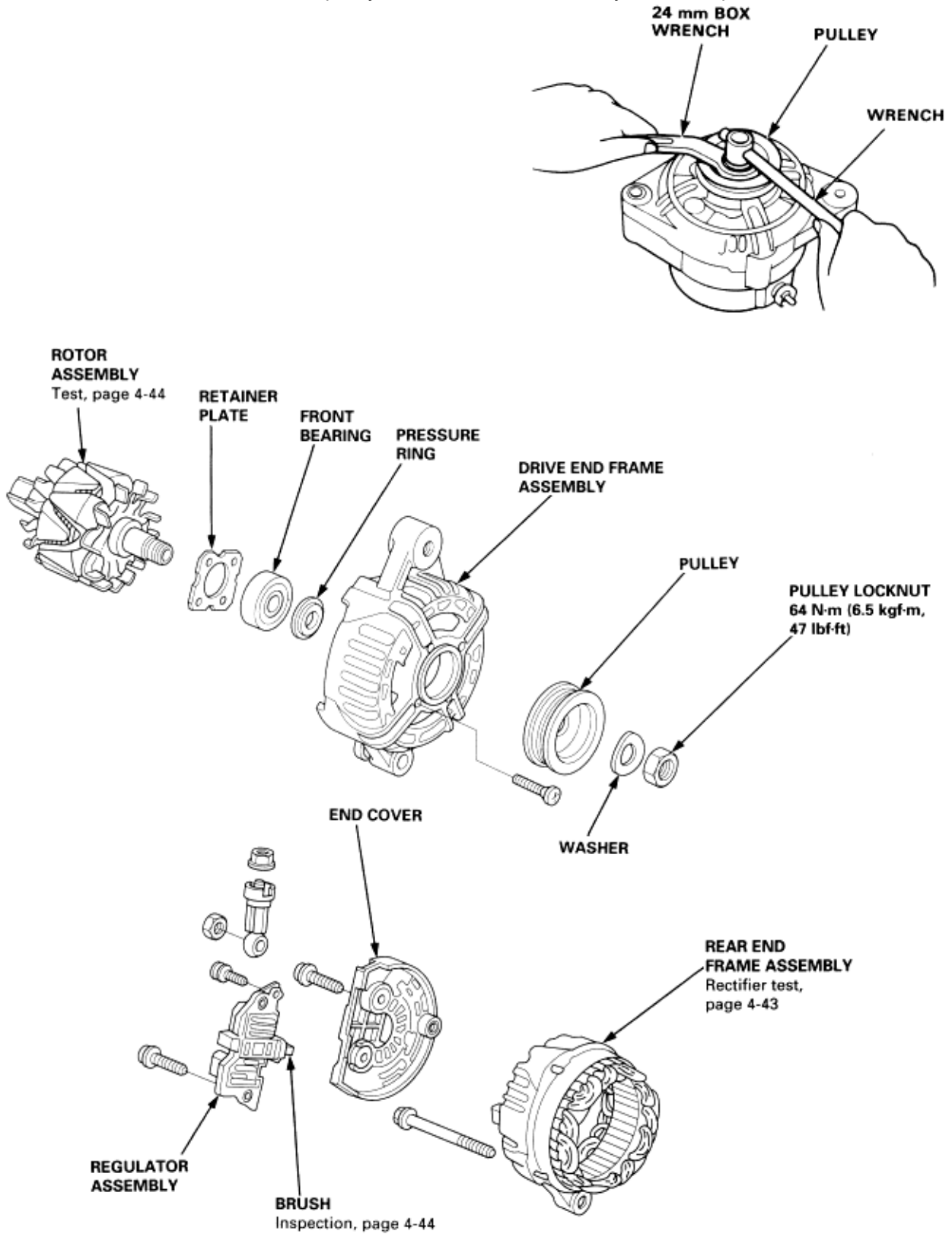
H22A7 engine:



6. Install the alternator in the reverse order of removal.
7. Adjust the alternator belt tension ([See Page 4-47](#)) and ([See Page 4-48](#))
8. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Except H22A7 engine:

NOTE: It is necessary to separate the pulley, drive end housing and rotor only when the front bearing needs replacement. Loosen the locknut with wrenches to remove the pulley from the rotor. If necessary, use an impact wrench.

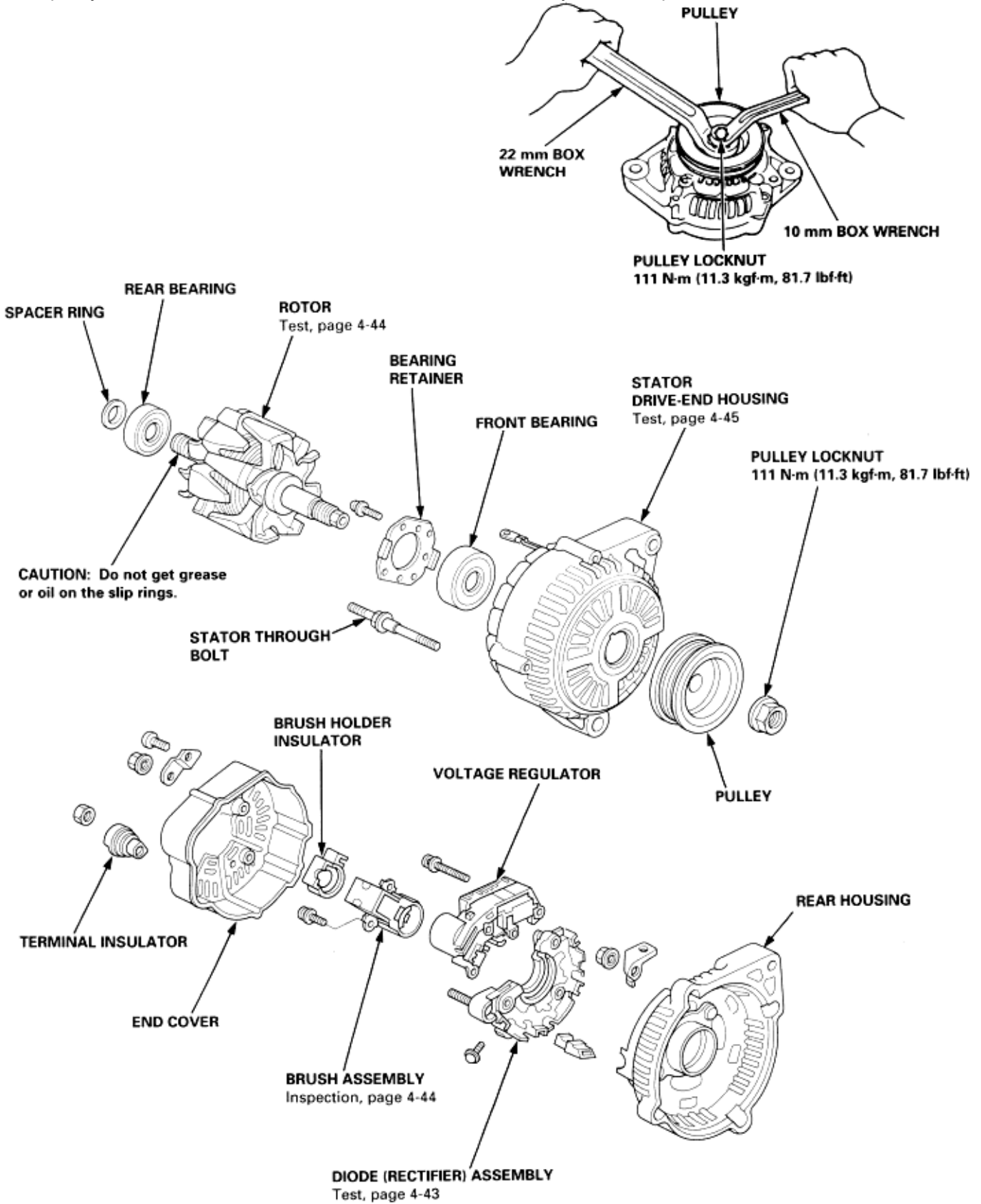


To go to the pages referenced on the diagram above, click on the following:
[\(See page 4-43\)](#)
[\(See page 4-44\)](#)

H22A7 engine:

NOTE: Do not remove the pulley unless the front bearing needs replacement.

To loosen the pulley locknut, use 10 mm and 22 mm wrenches. If necessary, use an impact wrench.



To go to the pages referenced on the diagram above, click on the following:

(See page 4-43)

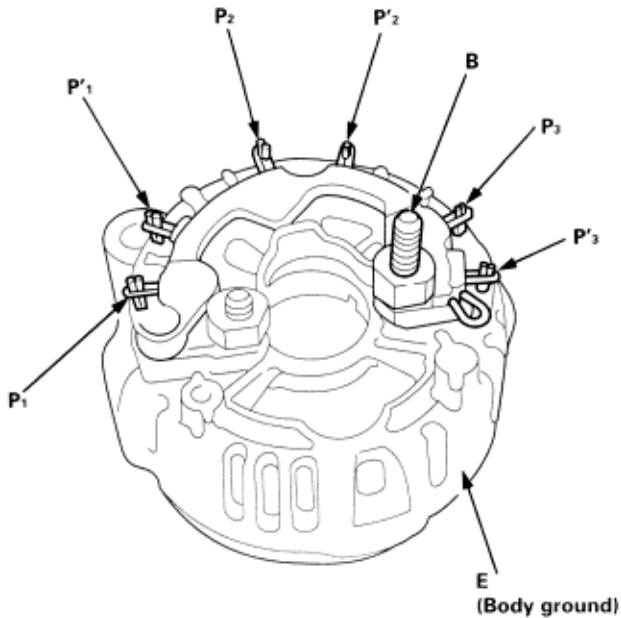
(See page 4-44)

(See page 4-45)

Except H22A7 engine:

NOTE: The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Since the alternator rectifier is made up of six diodes, each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability; a total of 12 checks.

1. Check for continuity in each direction between:
 - the B and P terminals.
 - E (ground) and the P terminals.All diodes should have continuity in only one direction.

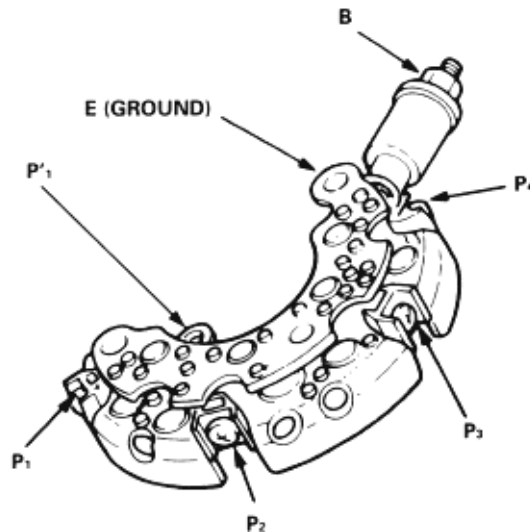


2. If any of the diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

H22A7 engine:

NOTE: The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Since the alternator rectifier is made up of eight diodes (four pairs), each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability; a total of 16 checks.

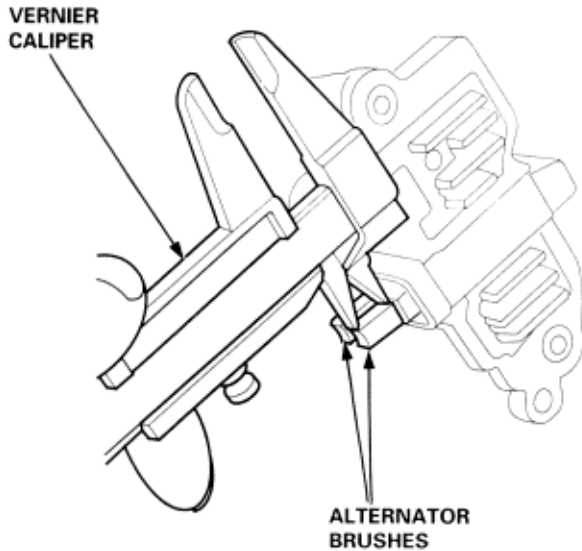
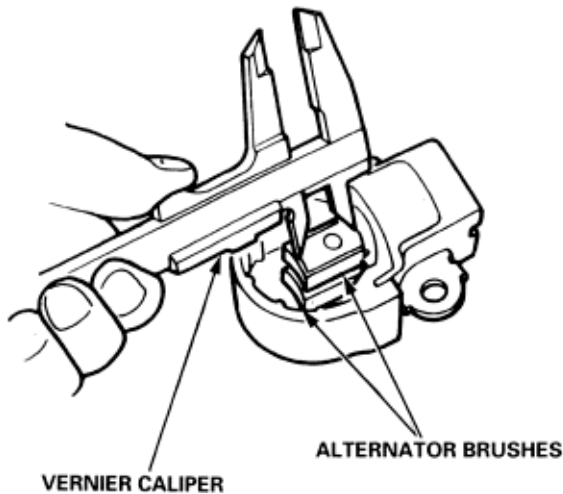
1. Check for continuity in each direction between:
 - the B and P terminals.
 - E (ground) and P terminals.All diodes should have continuity in only one direction.



2. If any of the diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

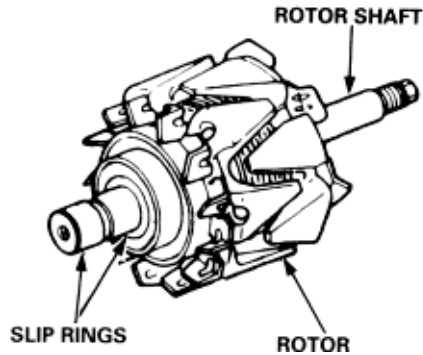
Alternator Brush Inspection

1. Remove the end cover, then take out the brush holder by removing its two screws.
2. Measure the length of the brushes with a vernier caliper.

Alternator Brush Length:**Except H22A7 engine:****Standard (new) 13.2 mm (0.52 in)****Service limit 3.2 mm (0.13 in)****H22A7 engine:****Standard (New): 10.5 mm (0.41 in)****Service Limit: 1.5 mm (0.06 in)****Except H22A7 engine:****H22A7 engine:**

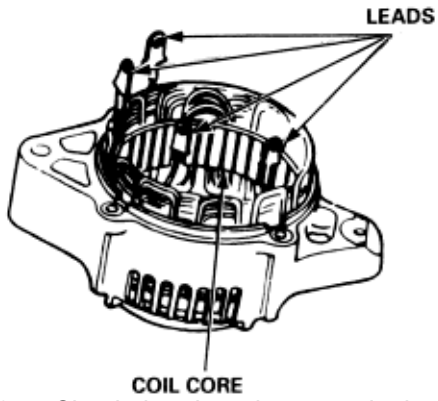
3. If the brushes are less than the service limit, replace the alternator brush assembly.

1. Check the resistance between the slip rings. There should be 1.8 - 3.0 ohms.
 - ♦ If resistance meets the specification, go to step 2.
 - ♦ If resistance does not meet the specification, replace the alternator.



2. Check that there is no continuity between the slip rings and the rotor or rotor shaft.
3. If the rotor fails either continuity check, replace the alternator.

1. Check that there is continuity between each pair of leads.



2. Check that there is no continuity between each lead and the coil core.
3. If the coil fails either continuity check, replace the alternator.

Charging System

Alternator Belt Adjustment (D16B6 engine)

4-46

NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

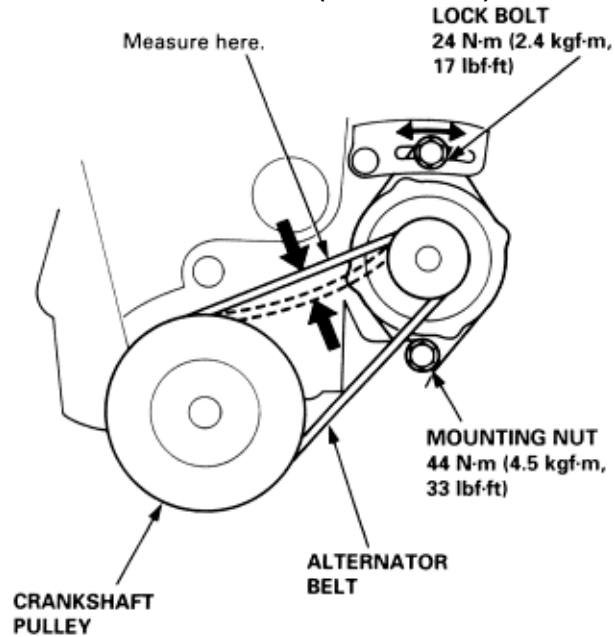
Inspection with Deflection Method

1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection at the mid point between the alternator and crankshaft pulley. If the belt is worn or damaged, replace it.

Deflection:

Used Belt: 7.0 - 10.5 mm (0.28 - 0.41 in)

New Belt: 5.0 - 7.0 mm (0.19 - 0.28 in)



Adjustment

1. Loosen the mounting nut and lock bolt
2. Move the alternator to obtain the proper belt tension, then retighten the lock bolt and mounting nut.
3. Recheck the belt tension.

NOTE:

- ♦ For the power steering pump belt adjustment, refer to section 17.
- ♦ For the air conditioning compressor belt adjustment, refer to section 22.

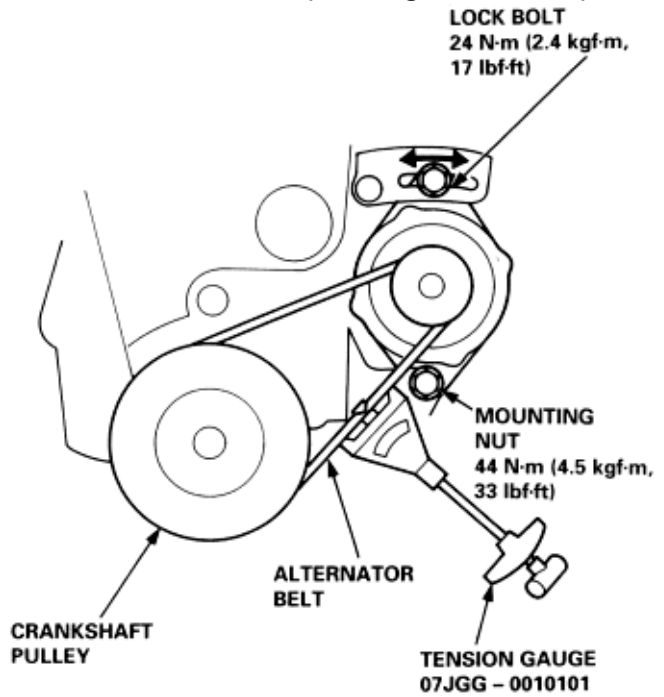
Inspection with Belt tension gauge method

1. Attach the belt tension gauge to the belt to measure the tension. Follow the gauge manufacturer's instructions. If the belt is worn or damaged, replace it.

Tension:

Used Belt: 340-490 N (35-50 kgf, 77-110 lbf)

New Belt: 640-780 N (65-80 kgf, 140-180 lbf)



Adjustment

1. Loosen the mounting nut and lock bolt
2. Move the alternator to obtain the proper belt tension, then retighten the lock bolt mounting nut.
3. Recheck the belt tension.

NOTE:

- ♦ For the power steering pump belt adjustment, refer to section 17.
- ♦ For the air conditioning compressor belt adjustment, refer to section 22.

Charging System

Alternator Belt Adjustment with A/C (Except D16B6 engine)

4-47

NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

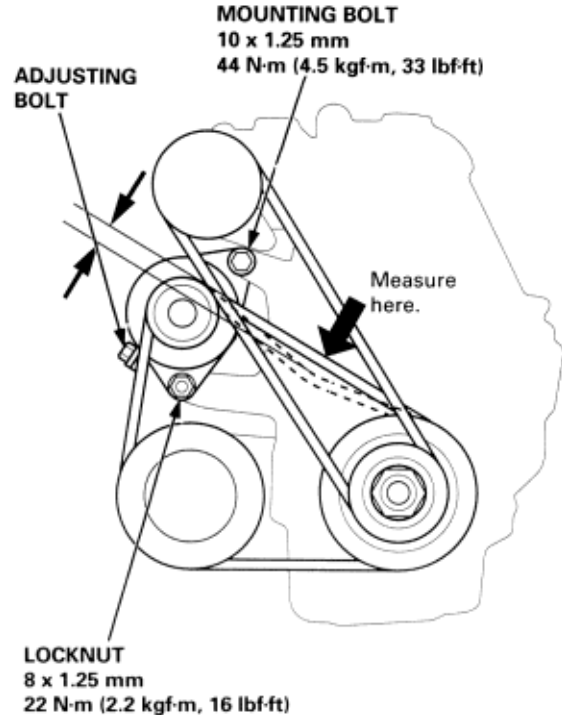
Inspection with Deflection Method

1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection at the mid point between the alternator and crankshaft pulley. If the belt is worn or damaged, replace it.

Deflection:

Used Belt: 10.0 - 12.0 mm (0.39 - 0.47 in)

New Belt: 5.5 - 7.5 mm (0.22 - 0.30 in)



Adjustment

1. Loosen the mounting bolt and locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

NOTE: For the power steering pump belt adjustment, refer to section 17.

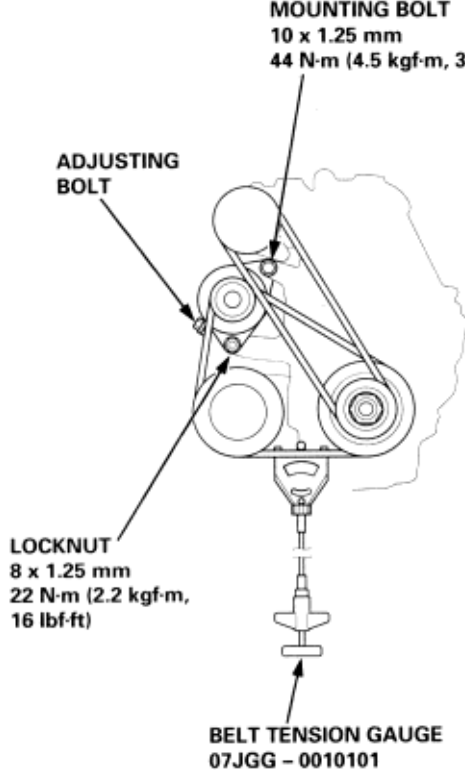
Inspection with Belt tension gauge method

1. Remove the three bolts from the left end of the splash shield, and pull it back as needed.
2. Attach the belt tension gauge to the belt and measure the tension. Follow the gauge manufacturer's instructions. If the belt is worn or damaged, replace it.

Tension:

Used Belt: 390 - 540 N (88 - 120 lbf)

New Belt: 880 - 1,030 N (90 - 105 kgf, 200 - 231 lbf)



Adjustment

1. Loosen the mounting bolt and locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

NOTE: For the power steering pump belt adjustment, refer to section 17.

Charging System

Alternator Belt Adjustment without A/C (Except D16B6 engine)

4-48

NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Inspection with Deflection method

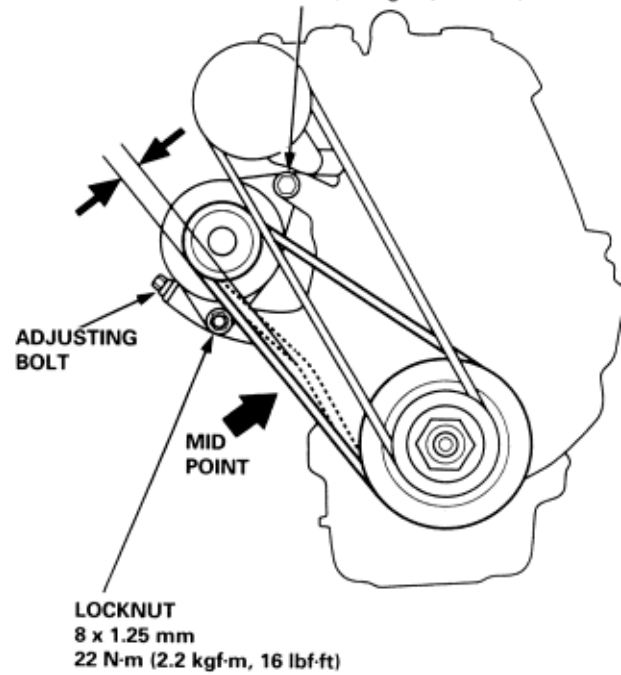
1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection at the mid point between the alternator and crankshaft pulley. If the belt is worn or damaged, replace it.

Deflection:

Used Belt: 10.0 - 13.0 mm (0.39 - 0.51 in)

New Belt: 7.5 - 10.0 mm (0.30 - 0.39 in)

MOUNTING BOLT
10 x 1.25 mm
44 N-m (4.5 kgf-m, 33 lbf-ft)



Adjustment

1. Loosen the mounting bolt and locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

NOTE: For the power steering pump belt adjustment, refer to section 17.

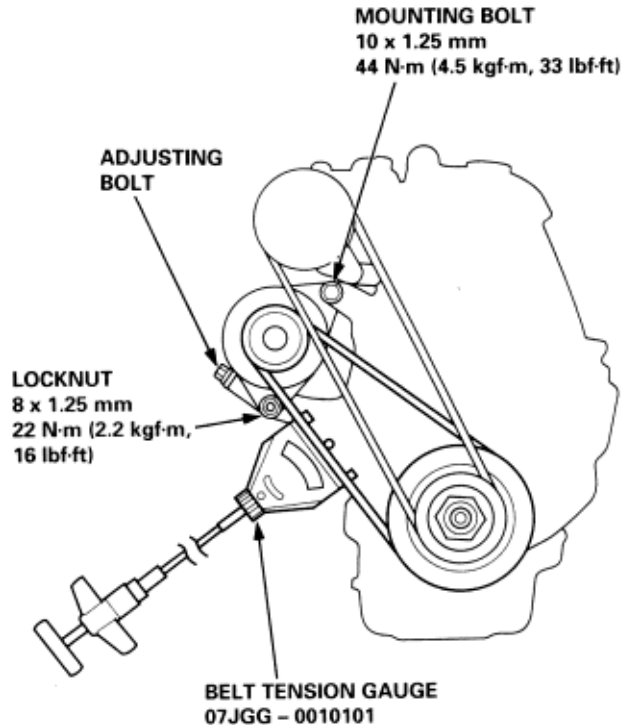
Inspection with Belt tension gauge method

1. Attach the belt tension gauge to the belt and measure the tension. Follow the gauge manufacturer's instructions. If the belt is worn or damaged, replace it.

Tension:

Used Belt: 290 - 440 N (30 - 45 kgf, 66 - 99 lbf)

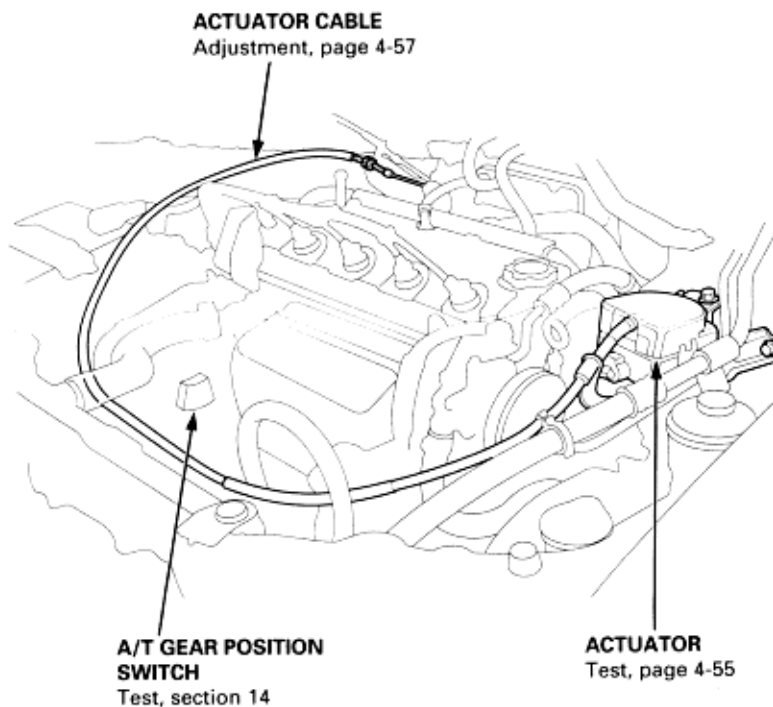
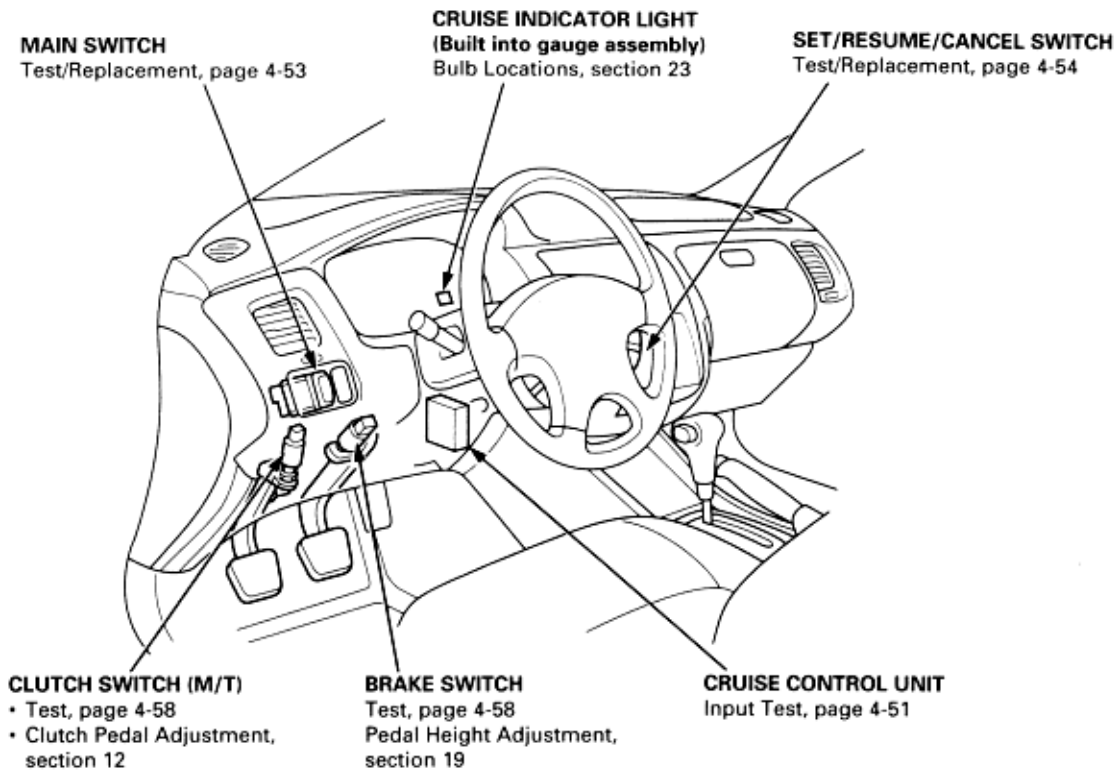
New Belt: 540 - 740 N (55 - 75 kgf, 120 - 170 lbf)



Adjustment

1. Loosen the mounting bolt and locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

NOTE: For the power steering pump belt adjustment, refer to section 17.



To go to the pages referenced on the diagram above,
click on the following:

(See page 4-53)

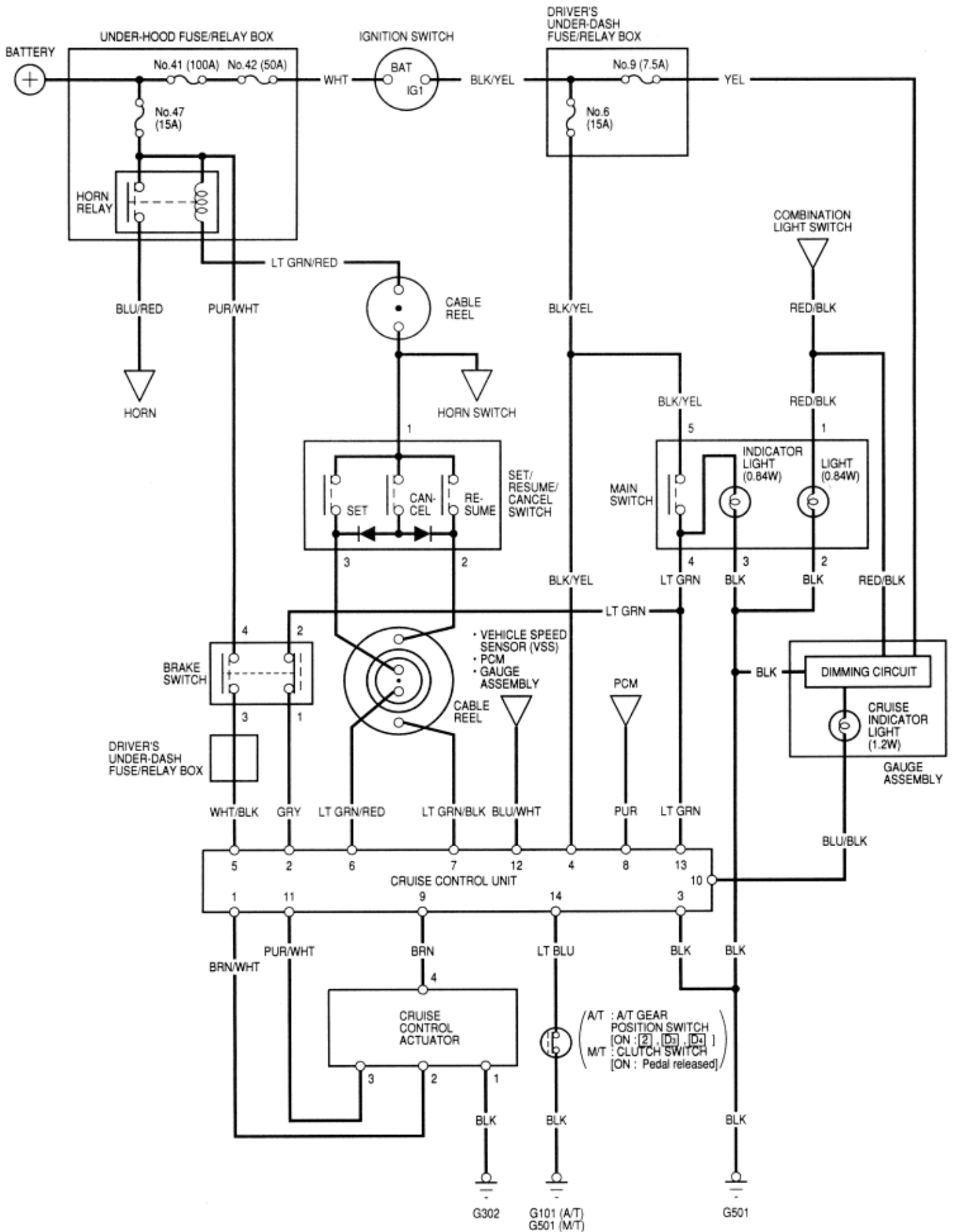
(See page 4-54)

(See page 4-58)

(See page 4-51)

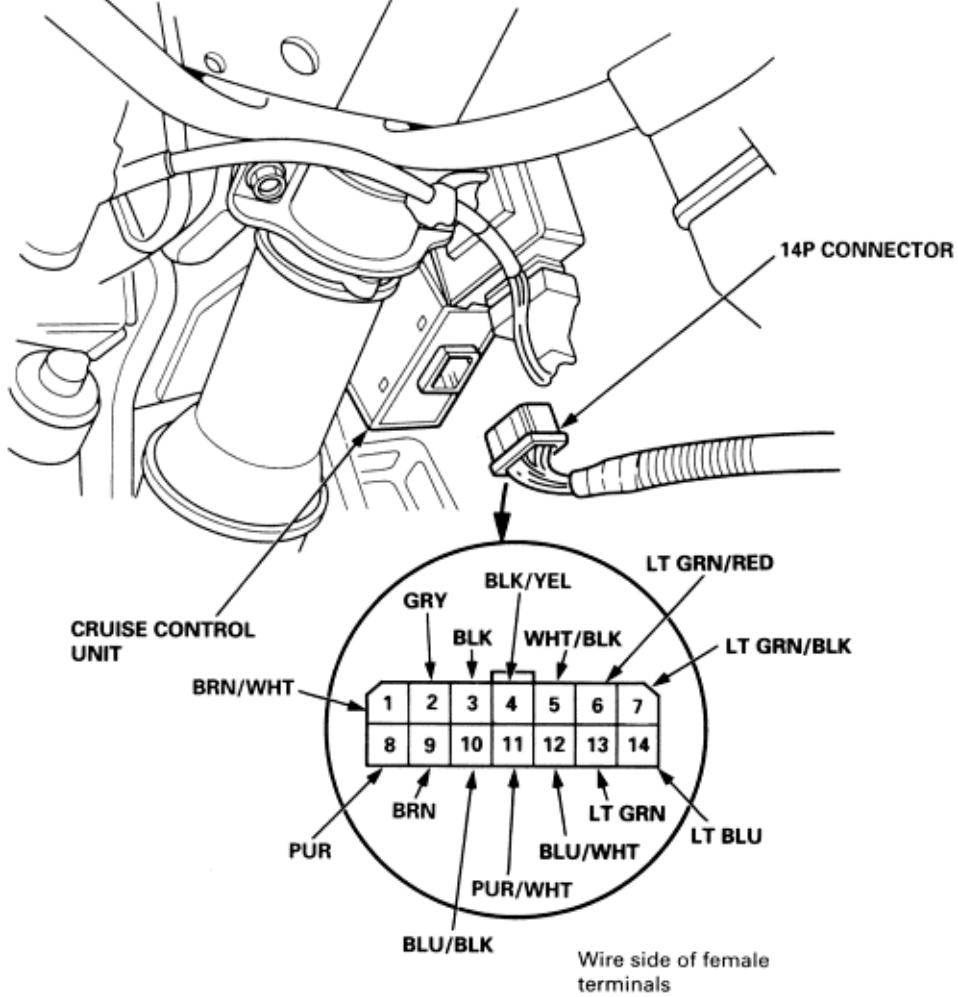
(See page 4-57)

(See page 4-55)



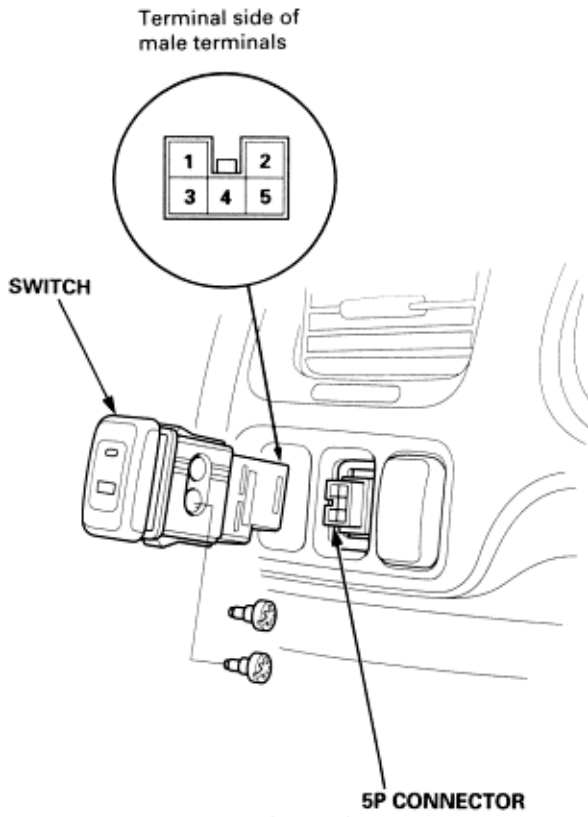
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the driver's dashboard lower cover (see section 20).
2. Disconnect the 14P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BRN/WHT	Connect battery power	Check the operation of the magnetic clutch: Clutch should click and output link should be locked	<ul style="list-style-type: none"> ♦ Faulty actuator ♦ Poor ground (G302) ♦ An open in the wire
2	GRY	Ignition switch ON (II), main switch ON and brake pedal depressed, then released	Check for voltage to ground: There should be 0V with the pedal depressed and battery voltage with the pedal released	<ul style="list-style-type: none"> ♦ Faulty brake switch ♦ An open in the wire
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
4	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
5	WHT/BLK	Brake pedal depressed, then released	Check for voltage to ground: There should be battery voltage with the pedal depressed, and 0V with the pedal released	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Faulty brake switch ♦ An open in the wire
6	LT GRN/ RED	Set button pushed	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Faulty horn relay ♦ Faulty set/resume switch ♦ Faulty cable reel ♦ An open in the wire
7	LT GRN/ BLK	Resume button pushed	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Faulty horn relay ♦ Faulty set/resume switch ♦ Faulty cable reel ♦ An open in the wire
8	PUR	Start the engine, main switch ON and drive the vehicle to speed over 25 mph (40 km/h) with the cruise control	Check for voltage to ground: There should be approx. 5V	<ul style="list-style-type: none"> ♦ Faulty cruise control unit
9	BRN	Connect battery power to the BRN terminal and ground to the PUR/WHT terminal.	Check the operation of the actuator motor: You should be able to hear the motor.	<ul style="list-style-type: none"> ♦ Faulty actuator ♦ An open in the wire
10	BLU/BLK	Ignition switch ON (II)	Attach to ground: Cruise indicator light in the gauge assembly should come on.	<ul style="list-style-type: none"> ♦ Blown bulb ♦ Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ Faulty dimming circuit in the gauge assembly ♦ An open in the wire
11	PUR/WHT	Connect battery power to the BRN terminal and ground to the PUR/WHT terminal.	Check the operation of the actuator motor: You should be able to hear the motor.	<ul style="list-style-type: none"> ♦ Faulty actuator ♦ An open in the wire
12	BLU/WHT	Ignition switch ON (II) and main switch ON; raise the front of the vehicle, and rotate one wheel slowly while holding the other wheel	Check for voltage between the BLU/WHT (+) and BLK (-) terminals: There should be 0 - 5V or more -0 - 5V or more repeatedly	<ul style="list-style-type: none"> ♦ Faulty vehicle speed sensor (VSS) (M/T) ♦ Faulty PCM (A/T) ♦ An open in the wire
13	LT GRN	Ignition switch ON (II) and mains switch ON	Check for voltage to ground; There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 6 (15A) fuse in the driver's under-dash fuse/relay box ♦ Faulty main switch ♦ An open in the wire
14	LT BLU	A/T: Shift lever in 2 , D3 or D4 M/T: Clutch pedal released	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the clutch pedal is depressed or when the shift lever is in other positions	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch (A/T) ♦ Faulty or misadjusted clutch switch (M/T) ♦ Poor ground (G101, G501) ♦ An open in the wire

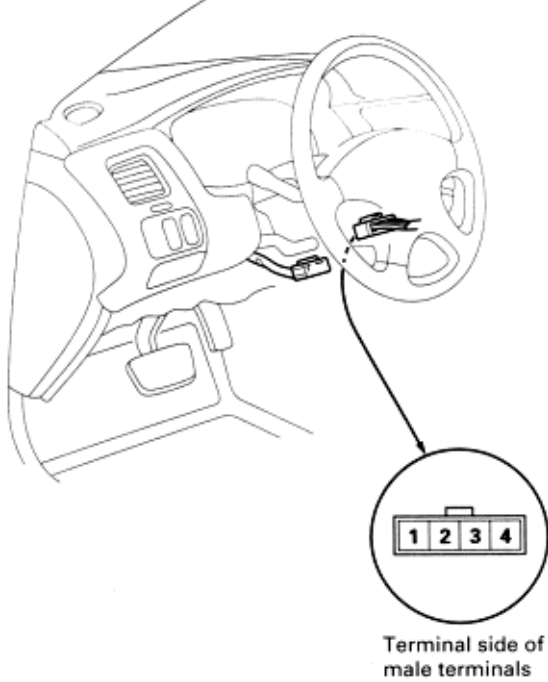
- Carefully pry the switch out of the instrument panel.



- Disconnect the 5P connector
- Check for continuity between the terminals in each switch position according to the table. If there is no continuity, replace the switch.

Terminal Position	3	4	5	1	2
OFF	○	⊗	○	○	⊗
ON	○	⊗	○	○	⊗

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radios preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Disconnect the driver's airbag and front passenger's airbag connectors (see section 24).
4. Remove the dashboard lower cover and knee bolster.
5. Disconnect the combination switch harness 4P connector from the cable reel.

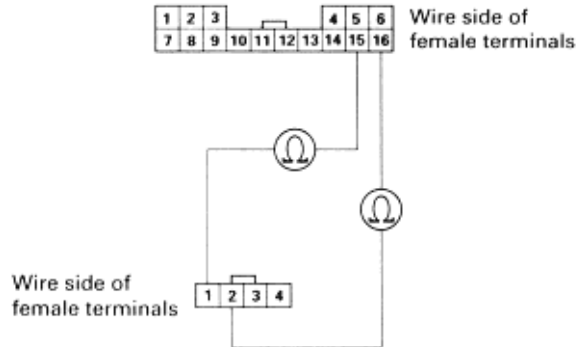


6. Check for continuity between the terminals of the 4P connector in each switch position according to the table.

Terminal	3	1	2
Position			
SET (ON)	○	○	
RESUME (ON)	○		○
CANCEL (ON)	○	○	○

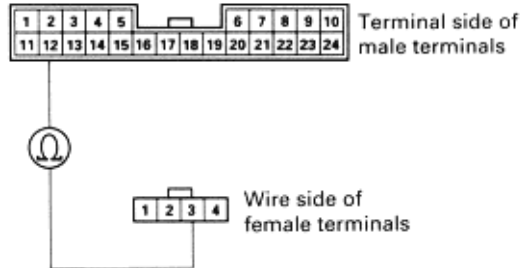
- ♦ If there is continuity, and it matches the table, go to step 7.
- ♦ If there is no continuity in one or both positions, go to step 12.

7. Remove the steering column covers.
8. Disconnect the 16P connector between the combination switch harness and main wire harness.
9. Check for continuity between the terminals as shown:



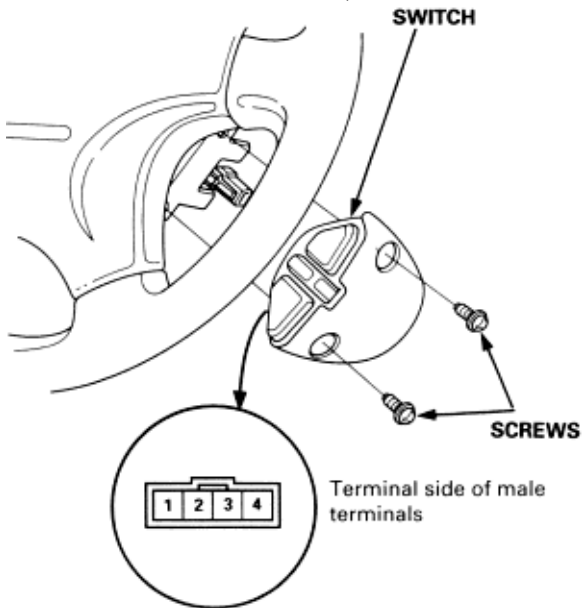
- ♦ If there is no continuity, replace the combination switch harness.

10. Disconnect the 24P connector between the combination switch harness and left engine compartment wire harness.
11. Check for continuity between terminals as shown.



- ♦ If there is no continuity, replace the combination switch harness.

12. Remove the two screws, then remove the switch.

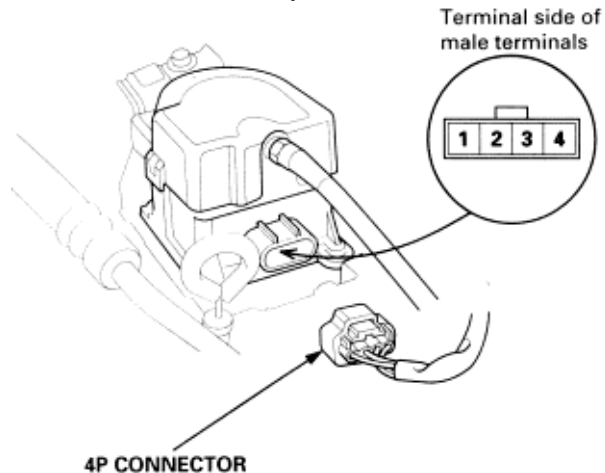


13. Check for continuity between the terminals in switch position according to the table.

Terminal	1	2	3
Position			
SET (ON)	○		○
RESUME (ON)	○	○	
CANCEL (ON)	○	○	○

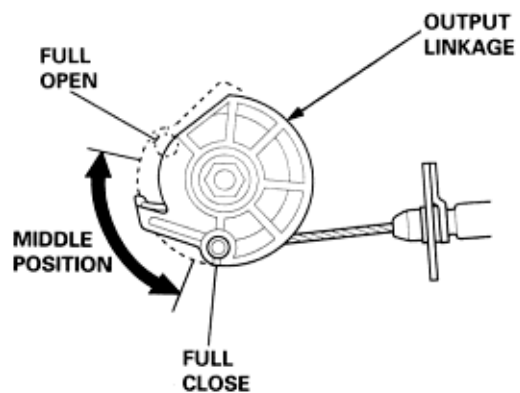
- If there is continuity, and it matches the table, replace the cable reel.
 - If there is no continuity in one or both positions, replace the switch.
14. If all tests prove OK, reconnect the cable reel and combination switch harness connectors then reinstall the steering column covers.
15. Reconnect the driver's airbag and front passenger's airbag connectors, and reinstall the access panel on the steering wheel.
16. Reconnect the battery positive cable, then the negative cable.
17. After connecting the airbag connectors, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
18. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

1. Disconnect the 4P connector from the actuator.
2. Check the output linkage for smooth movement.
3. Connect battery power to the No.2 terminal and ground to the No.1 terminal.
4. Check for a clicking sound from the magnetic clutch. The output linkage should be locked.
5. If the output linkage is not locked, replace the actuator assembly.

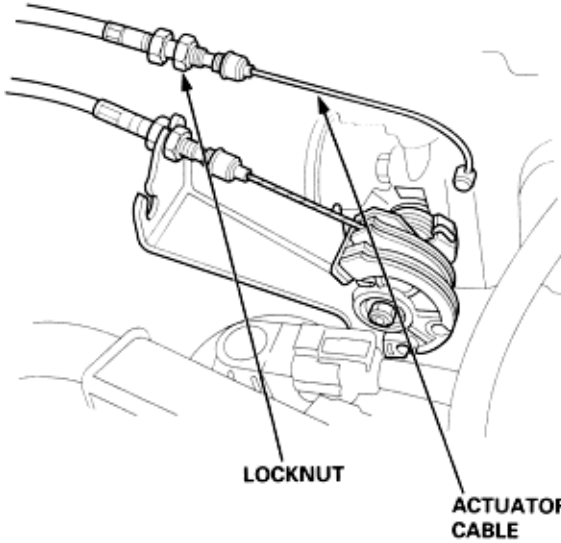


6. Check the operation of the actuator motor in each output linkage position according to the table. You should be able to hear the motor.

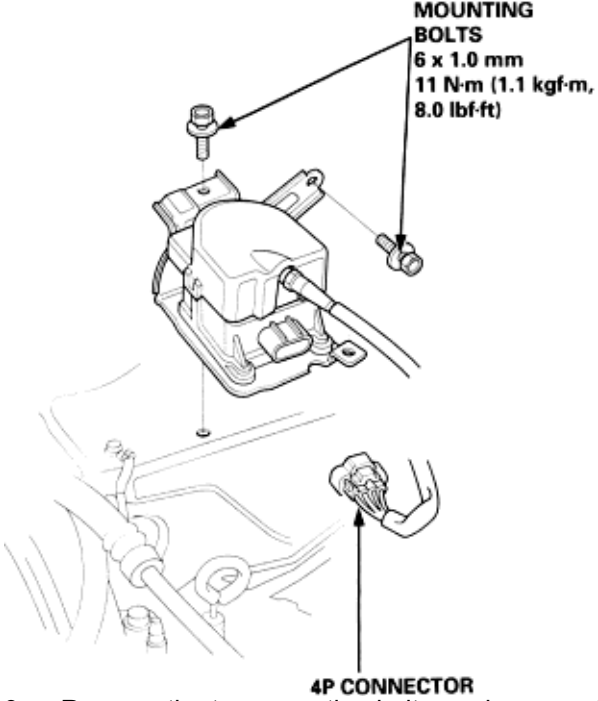
Battery power polarities		Output linkage position		
⊕	⊖	FULL CLOSE	MIDDLE POSITION	FULL OPEN
No. 4 Terminal	No. 3 Terminal	The motor runs.	The motor runs.	The motor stops.
No. 3 Terminal	No. 4 Terminal	The motor stops.	The motor runs.	The motor runs.



1. Loosen the locknut, then disconnect the actuator cable from the throttle linkage.

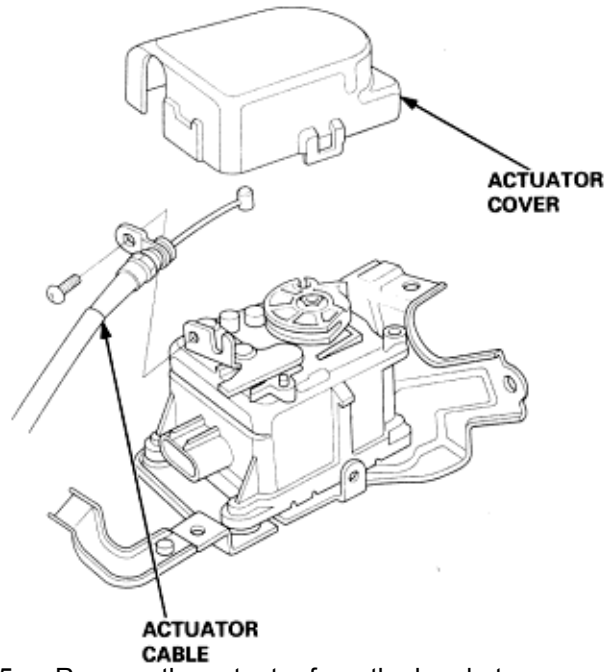


2. Disconnect the 4P connector from the actuator.

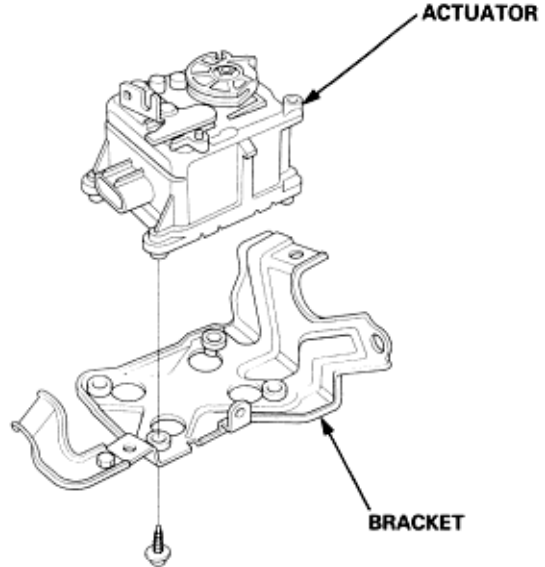


3. Remove the two mounting bolts, and remove the actuator with the bracket.

4. Remove the actuator cover, then remove the actuator cable from the actuator.

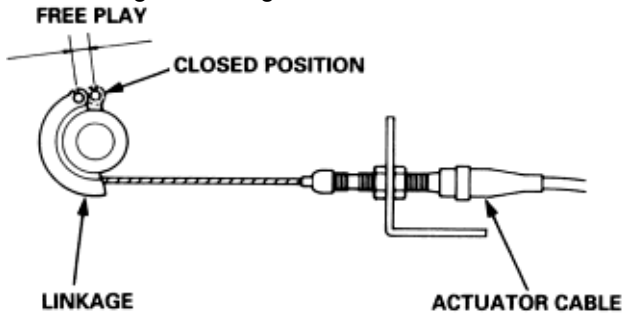


5. Remove the actuator from the bracket.

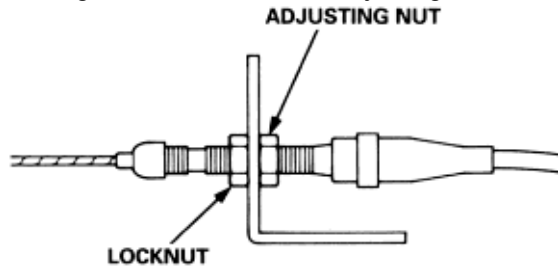


6. Install the reverse order of removal, and adjust the free play at the throttle linkage after connecting the actuator cable.

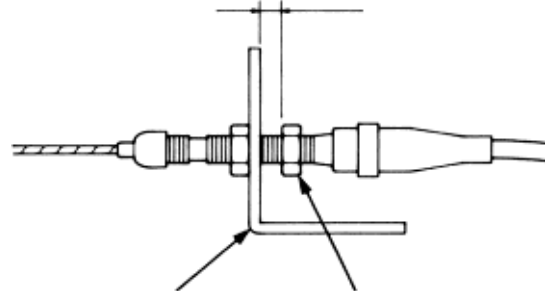
1. Check that the actuator cable moves smoothly with no binding or sticking.



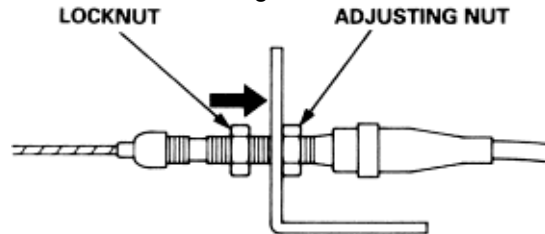
2. Start the engine. Hold the engine at 3,000 min⁻¹ (rpm) with no load (A/T in **N** or **P** position, M/T in neutral) until the radiator fan comes on, then let it idle.
3. Measure the amount of movement of the output linkage until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position. The free play should be 3.75 ± 0.5 mm (0.15 ± 0.02 in).
4. If the free play is not within specs, move the cable to the point where the engine speed starts to increase, and tighten the locknut and adjusting nut.



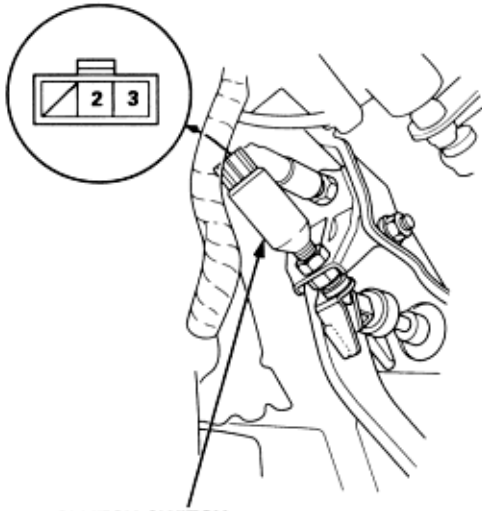
5. Turn the adjusting nut until it is 3.75 ± 0.5 mm (0.15 ± 0.02 in) away from the bracket.



6. Pull the cable so that the adjusting nut touches bracket, and tighten the locknut.



1. Disconnect the 3P connector from the clutch switch.
Terminal side of male terminals



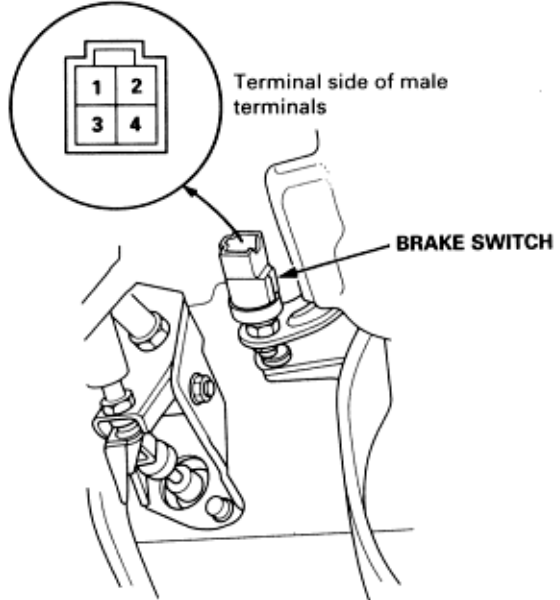
CLUTCH SWITCH

2. Remove the clutch switch.
3. Check for continuity between the terminals according to the table.

Terminal	2	3
Clutch Switch		
DEPRESSED		
RELEASED	○	○

4. If necessary, replace the switch or adjust the pedal height (see section 12).

1. Disconnect the 4P connector from the switch.



2. Remove the brake switch.
3. Check for continuity between the terminals according to the table.

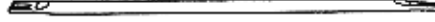
Terminal	1	2	3	4
Brake Switch				
DEPRESSED			○	○
RELEASED	○	○		

4. If necessary, replace the switch or adjust the pedal height (see section 19).

Special Tools

5-2

Ref No.	Tool Number	Description	Qty	Remark
1	07KAK - SJ40101	Engine Tilt Hanger Set	1	Except EU

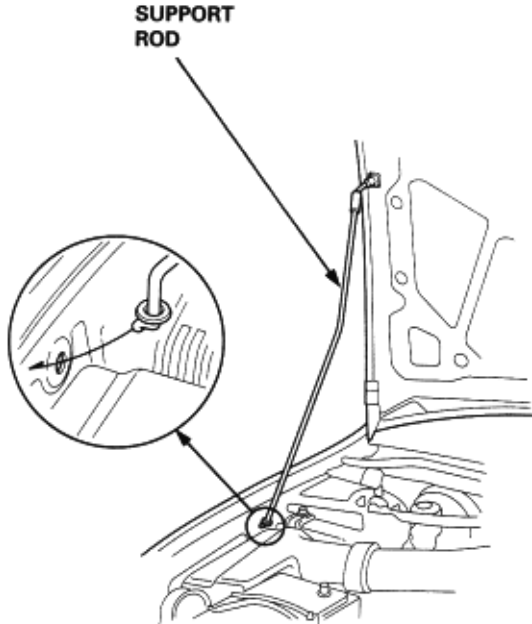


①

NOTE:

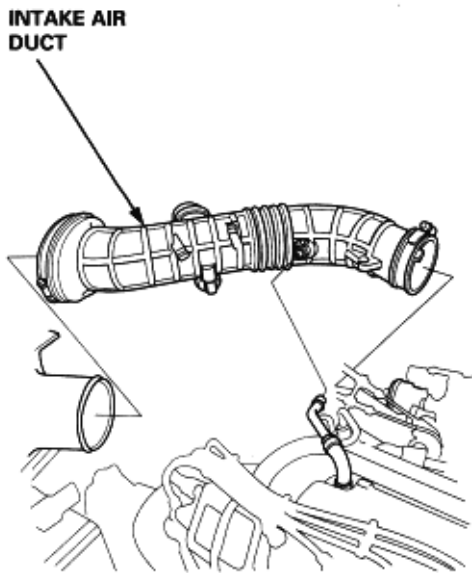
Use fender covers to avoid damaging painted surfaces. To avoid damage, unplug the wiring connectors carefully while holding the connector portion. Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts

1. Fix the hood in the vertical position by using a support rod (P/N 74145-S84-A00) as shown below.

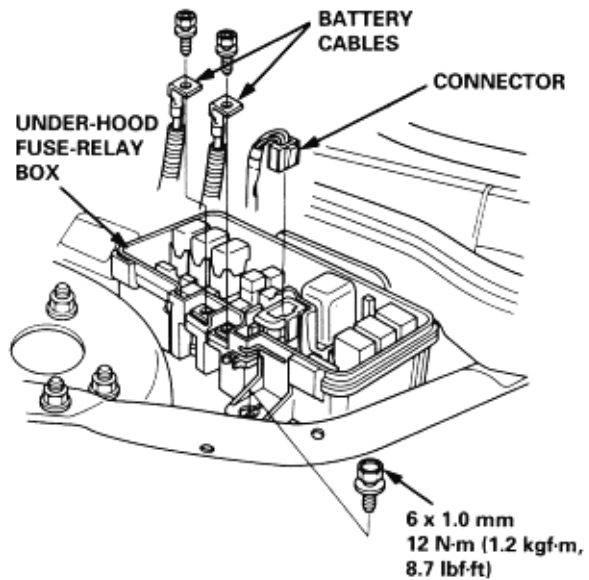


2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
3. Disconnect the battery negative terminal first, then the positive terminal.

4. Disconnect the intake air temperature (IAT) sensor connector from intake air duct (D16B6 engine).
5. Remove the intake air duct.



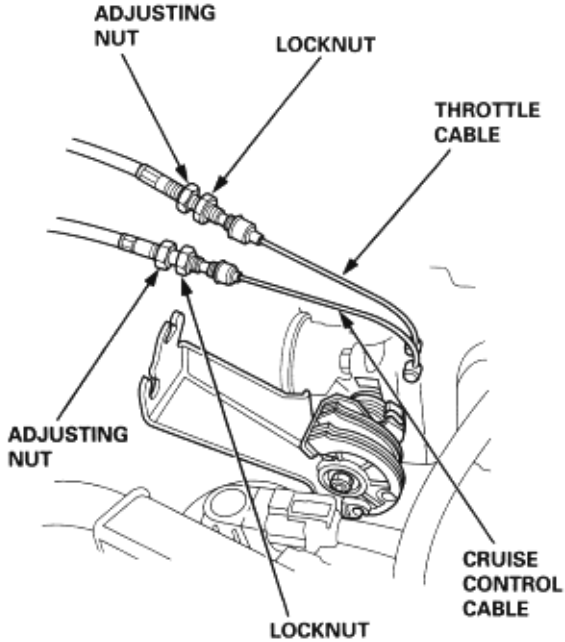
6. Disconnect the battery cables and connector from the under-hood fuse/relay box, then remove the under-hood fuse/relay box.



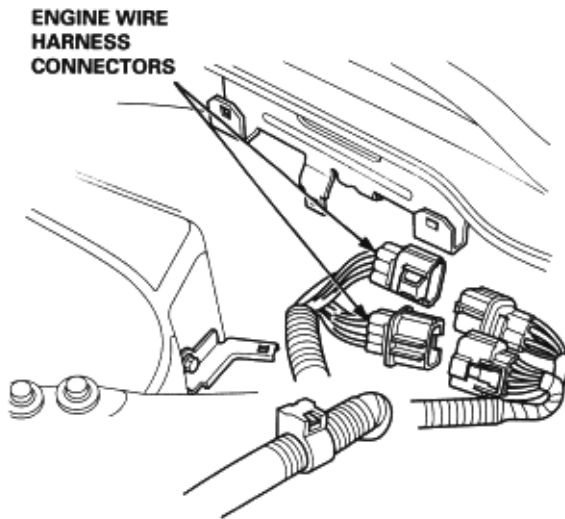
7. Remove the throttle cable and cruise control cable by loosening the locknuts then slip the cable ends out of the accelerator linkage.

NOTE:

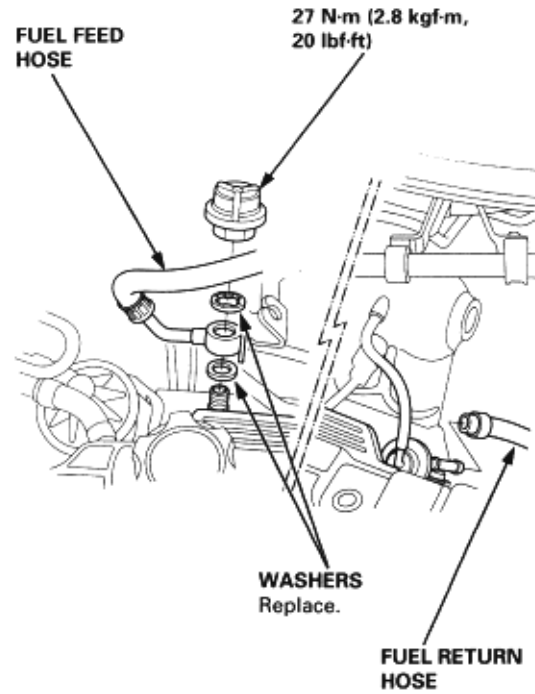
- ♦ Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- ♦ Adjust the throttle cable when installing (see section 11).
- ♦ Adjust the cruise control cable when installing (see section 4).



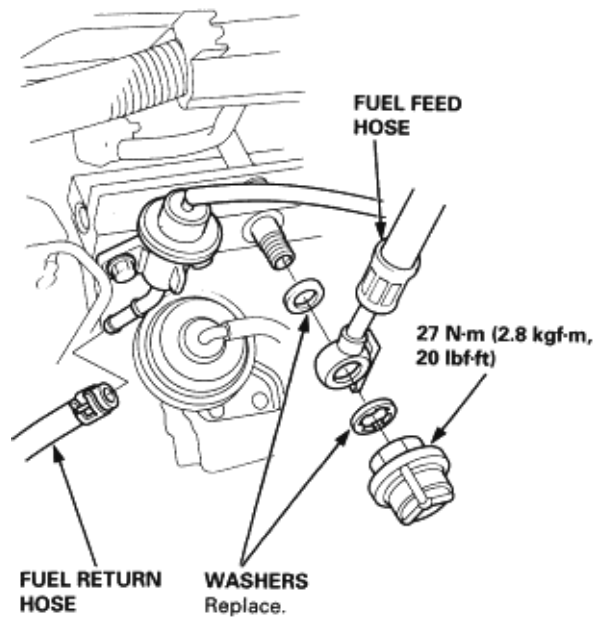
8. Disconnect the engine wire harness connectors from under the under-hood fuse/relay box.



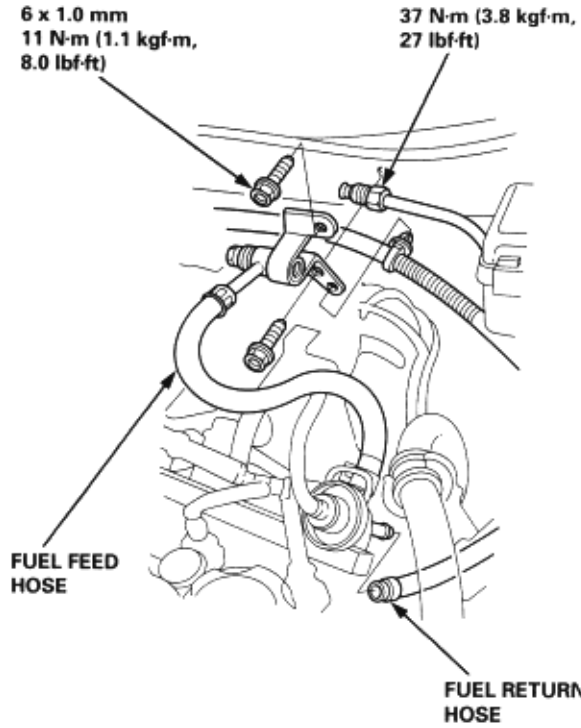
9. Relieve fuel pressure (see section 11).
10. Remove the fuel feed hose and fuel return hose.
H22A7 engine:



F18B2, F18B3, F20B6 engines:

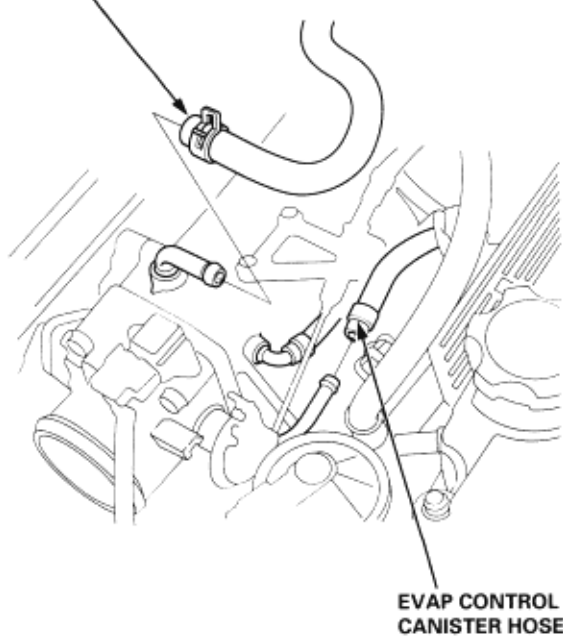


D16B6 engine

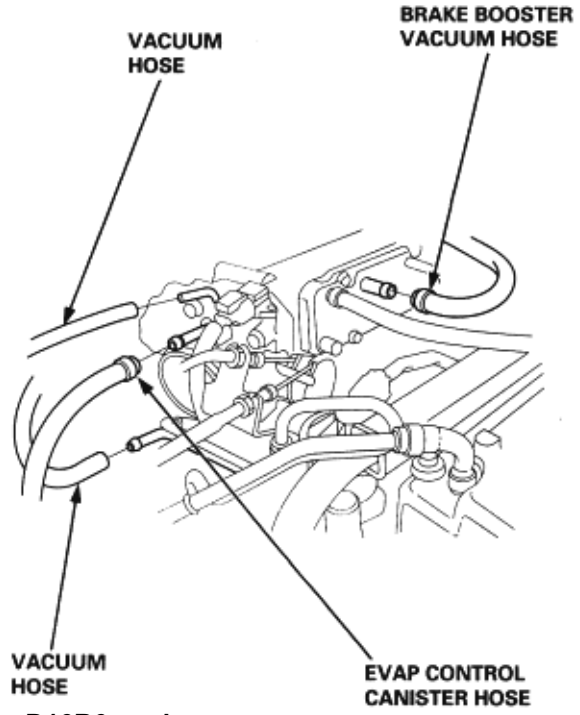


11. Remove the brake booster vacuum hose, evaporative emission (EVAP) control canister hose.

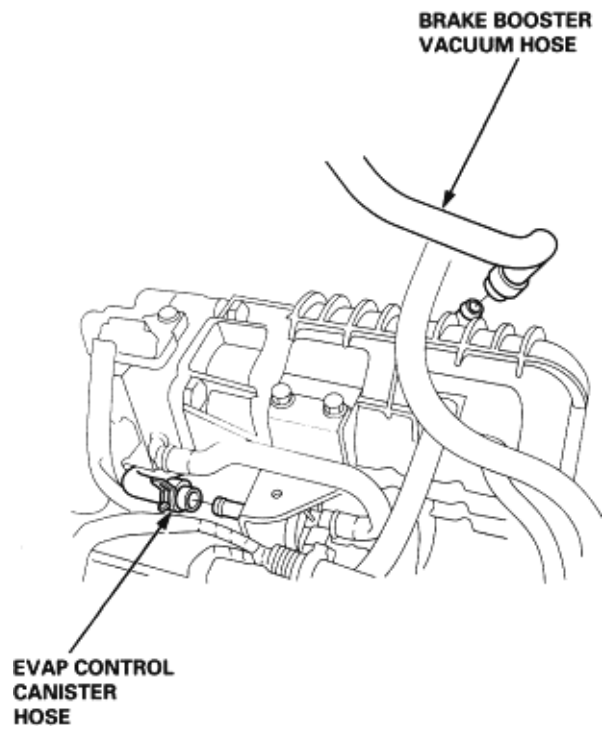
H22A7 engine:
BRAKE BOOSTER
VACUUM HOSE



F18B2, F18B3, F20B6 engines



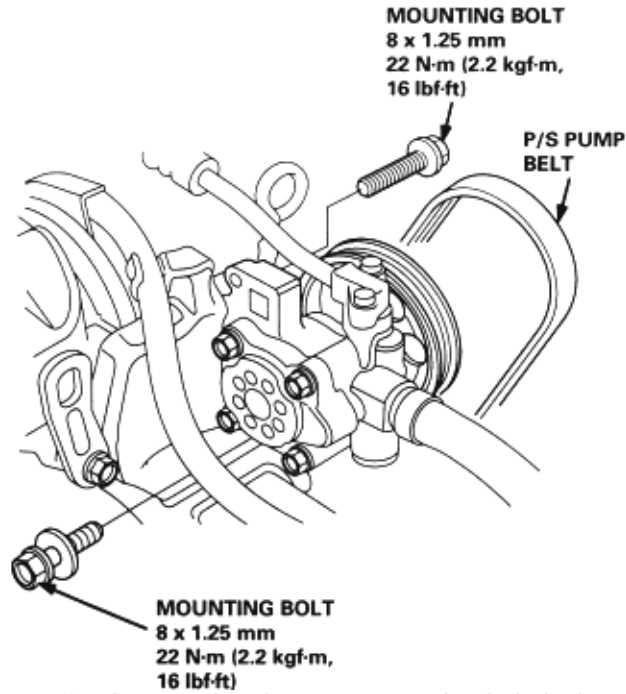
D16B6 engine



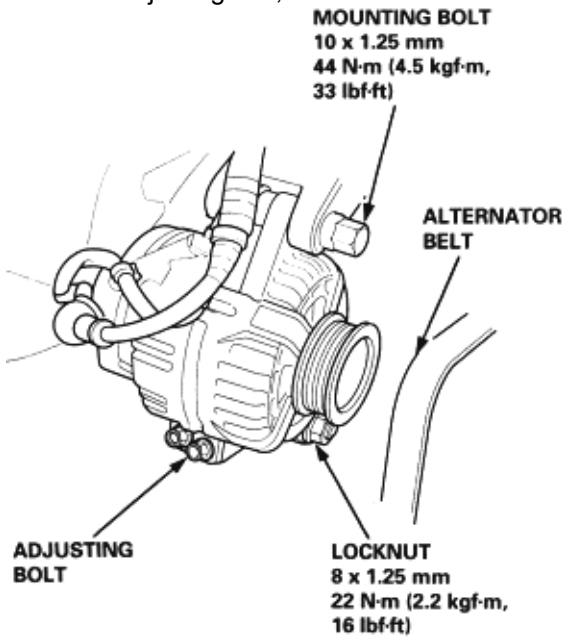
12. Remove the power steering (P/S) pump and air conditioning (A/C) compressor.

Except D16B6 engine:

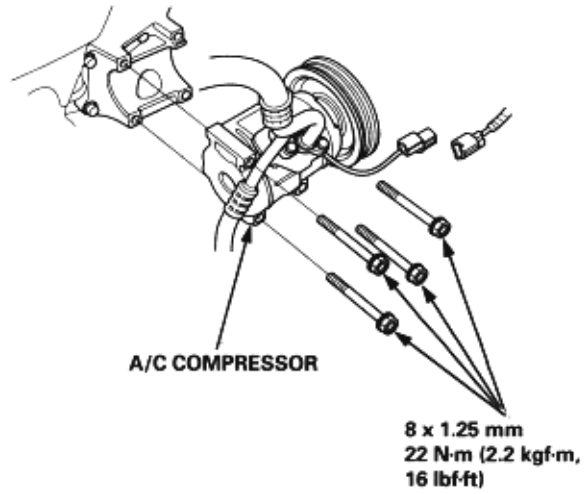
- 1. Remove the mounting bolts, then remove the P/S pump belt and pump without disconnecting the P/S hoses.



- 2. Loosen the alternator mounting bolt, locknut and adjusting bolt, then remove the alternator belt.



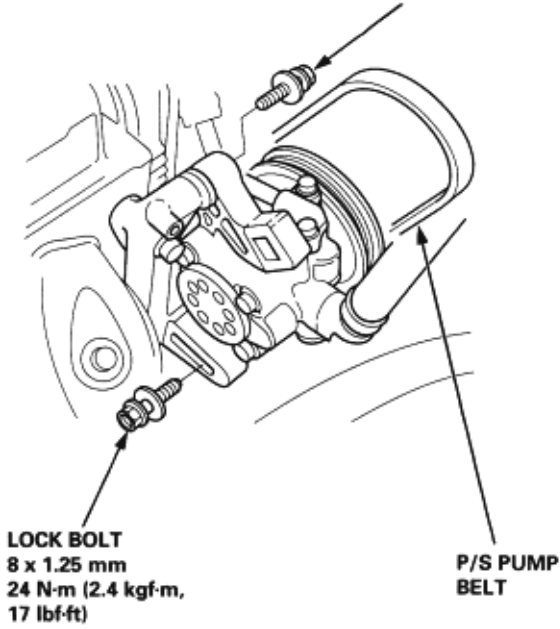
- 3. Remove the A/C compressor without disconnecting the A/C hoses.



D16B6 engine:

- 1. Remove the mounting bolts, then remove the P/S pump belt and pump without disconnecting the P/S hoses.

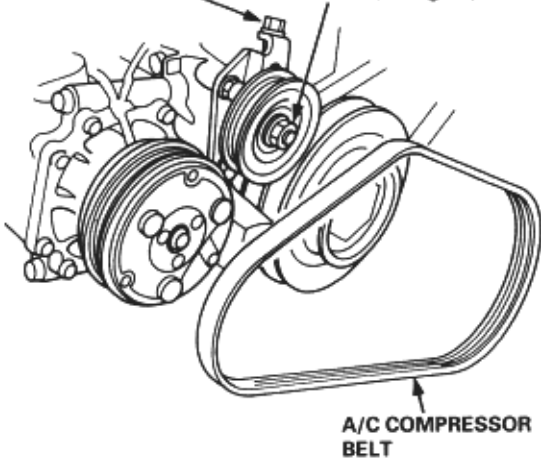
MOUNTING BOLT
8 x 1.25 mm
24 N-m (2.4 kgf-m,
17 lbf-ft)



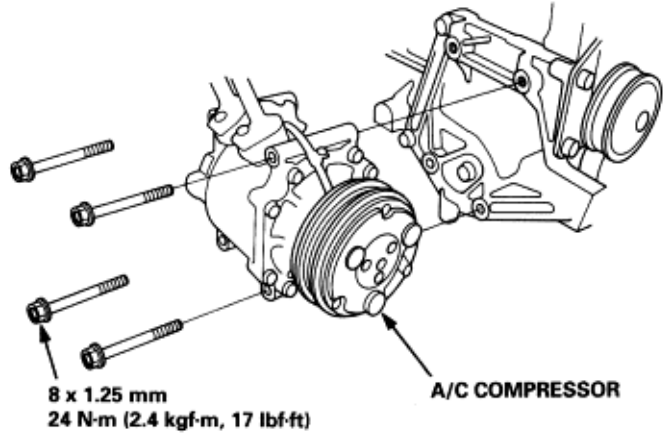
- 2. Loosen the idler pulley center nut and adjusting bolt, then remove the A/C compressor belt.

ADJUSTING BOLT

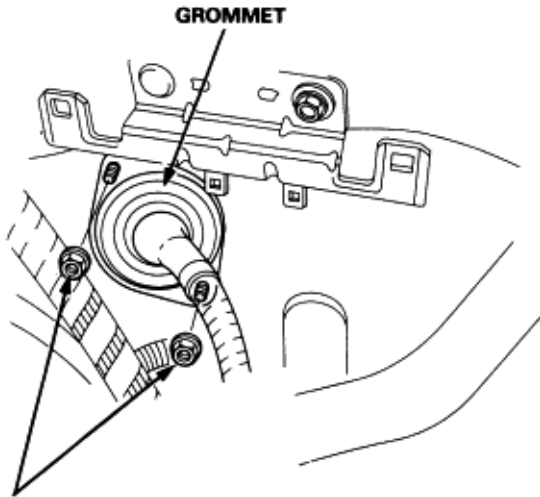
IDLER PULLEY CENTER NUT
10 x 1.25 mm
44 N-m (4.5 kgf-m, 33 lbf-ft)



- 3. Remove the A/C compressor without disconnecting the A/C hoses.

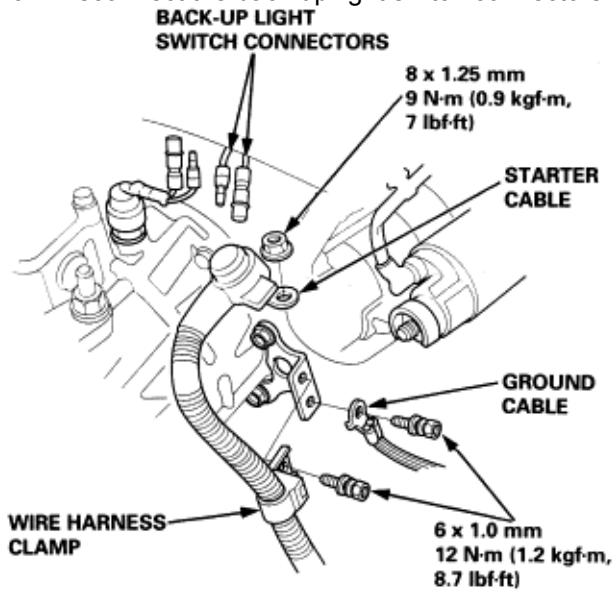


13. Disconnect the engine control module (ECM)/power-train control module (PCM) connectors from the ECM/PCM (see section 11).
14. Remove the grommet mounting nuts from under the under-hood fuse/relay box, then pull out the ECM/PCM connectors.



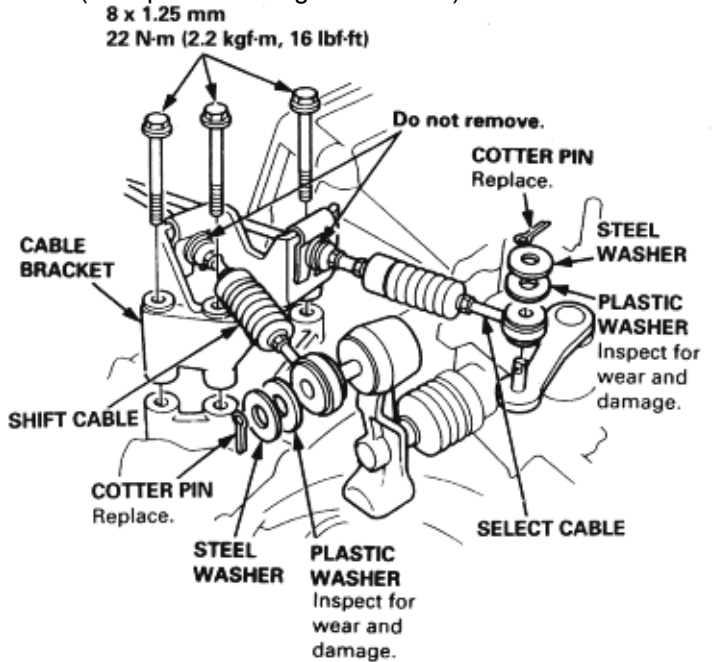
6 x 1.0 mm
12 N-m (1.2 kgf-m, 8.7 lbf-ft)

15. Remove the starter cable, wire harness clamp and ground cable.
16. Disconnect the back up light switch connectors (M/T).



6 x 1.0 mm
12 N-m (1.2 kgf-m, 8.7 lbf-ft)

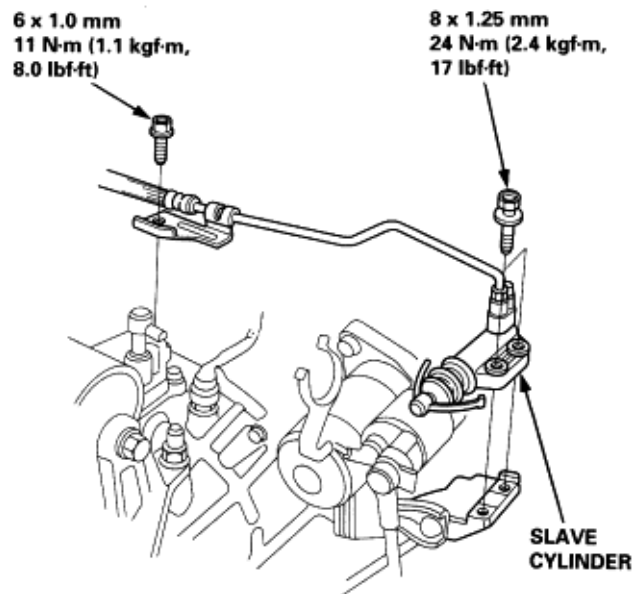
17. Remove the shift cable and select cable. Take care not to bend the cable when removing it. Always replace any kinked cable with a new one (Except D16B6 engine with M/T).



18. Remove the clutch slave cylinder and line/hose assembly (M/T).

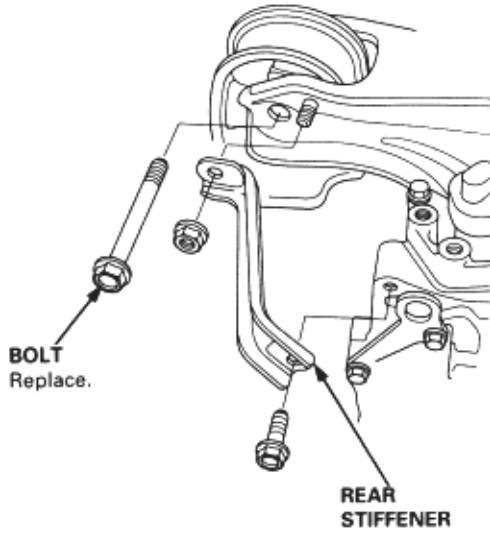
NOTE:

- ♦ Do not disconnect the line/hose assembly.
- ♦ Do not operate the clutch pedal once the slave cylinder has been removed.
- ♦ Take care not to bend the line.

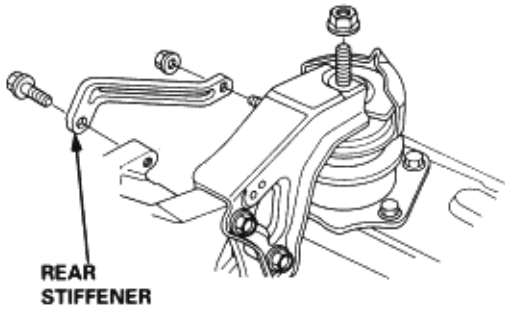


19. Remove the rear engine mount bracket mounting bolt-nut and rear stiffener.

Except D16B6 engine with M/T:

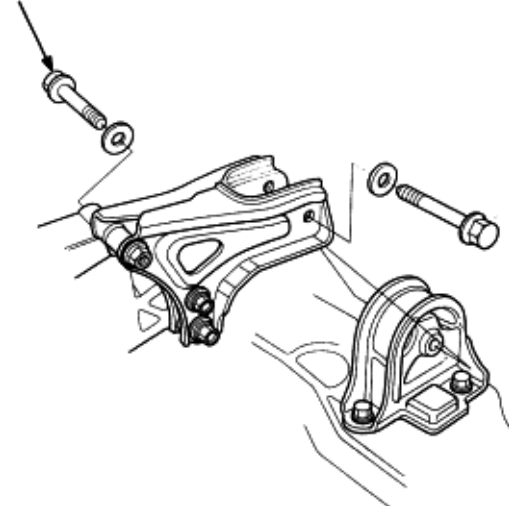


A/T:



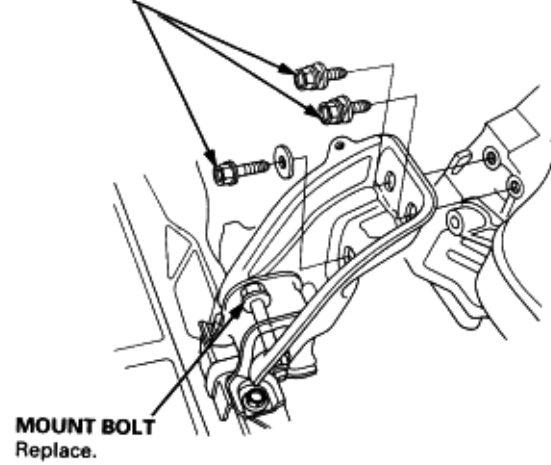
D16B6 engine:

BOLT
Replace.

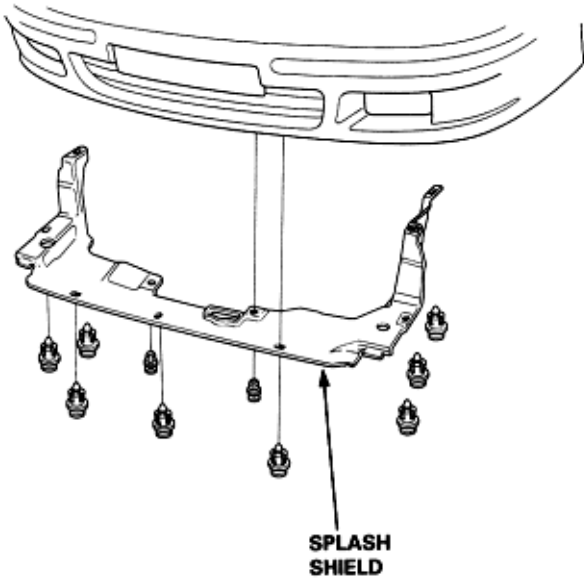


20. Remove the front engine mount bracket mounting bolts, and loosen the mount bolt.

MOUNTING BOLT

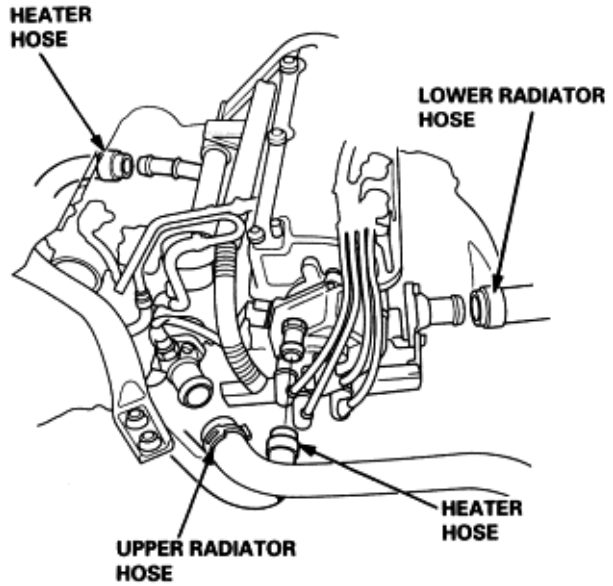


21. Remove the radiator cap.
22. Raise the hoist to full height.
23. Remove the front tyres/wheels.
24. Remove the splash shield.

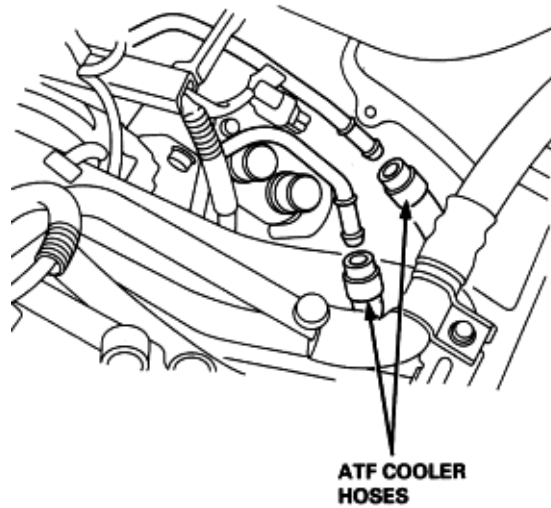


25. Loosen the drain plug in the radiator, drain the engine coolant (**See Page** 10-7).
26. Drain the transmission oil or fluid. Reinstall the drain plug using a new washer (see section 13 (M/T) or section 14 (A/T)).
27. Drain the engine oil. Reinstall the drain bolt using a new washer (**See Page** 8-7).

28. Lower the hoist, then remove the upper radiator hose, lower radiator hose and the heater hoses.



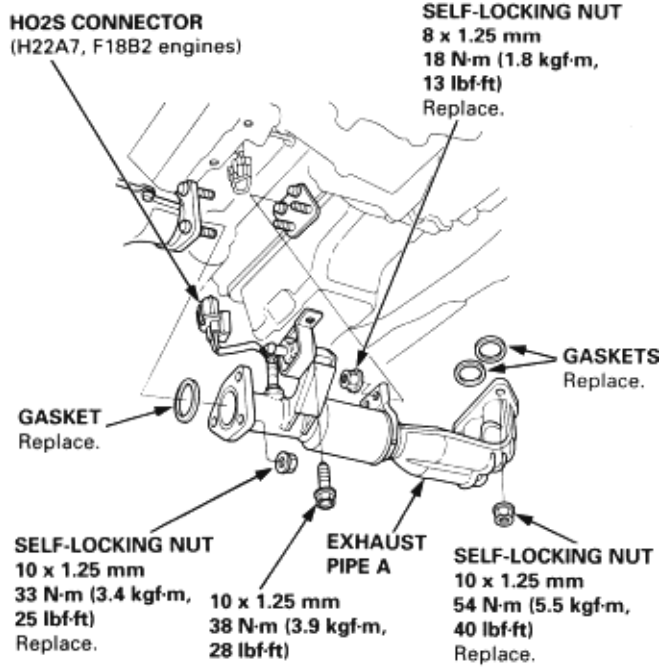
29. Remove the ATF cooler hoses, then plug the ATF cooler hoses and lines.



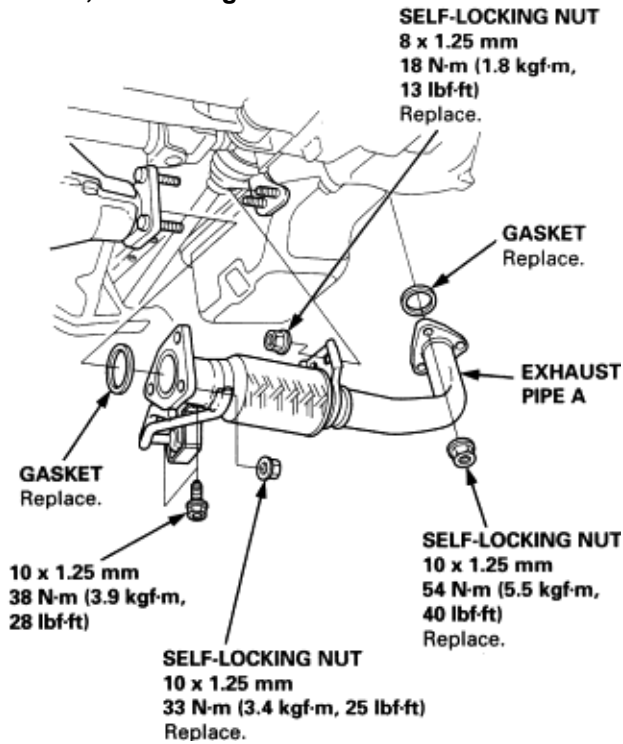
Removal (cont'd)

30. Raise the hoist to full height.
31. Disconnect the heated oxygen sensor (HO2S) connector. (H22A7, F18B2 engines.)
32. Remove exhaust pipe A.

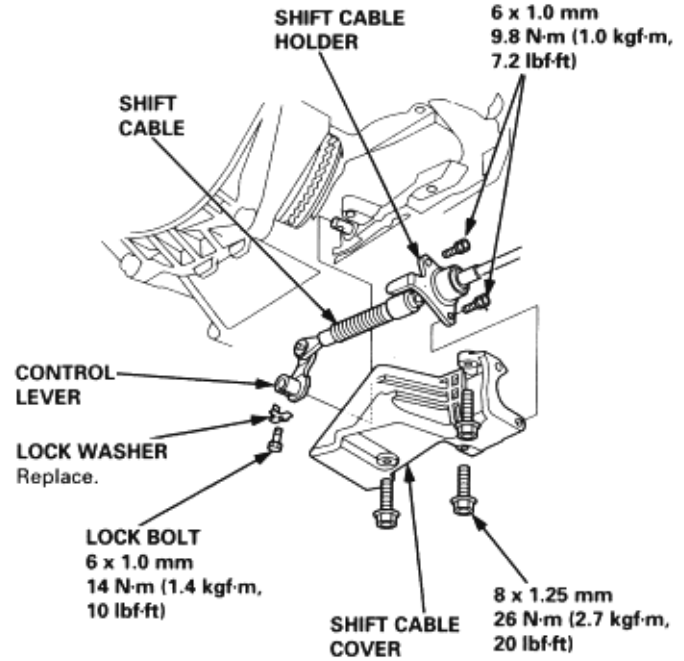
H22A7, F18B2, F18B3 engines:



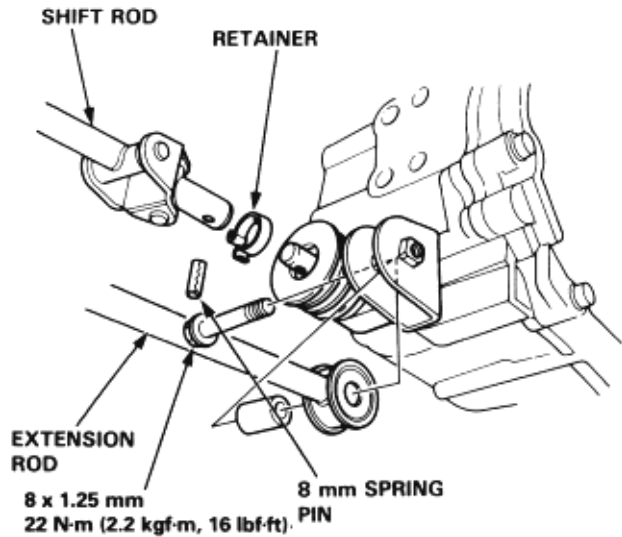
F20B6, D16B6 engines:



33. Remove the bolts securing the shift cable holder, then remove the shift cable cover. To prevent damage to the control lever joint, be sure to remove the bolts securing the shift cable holder before removing the bolts securing the shift cable cover (A/T).
34. Remove the lock bolt securing the control lever, then remove the shift cable with control lever. Take care not to bend the shift cable while removing it (A/T).

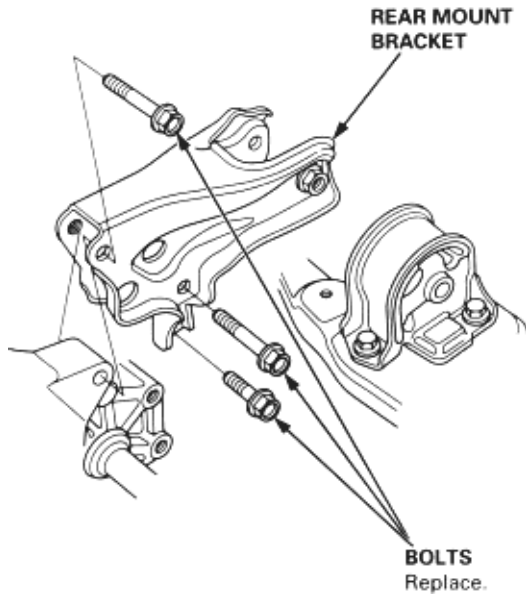


35. Remove the shift rod and extension rod (D16B6 engine with M/T).

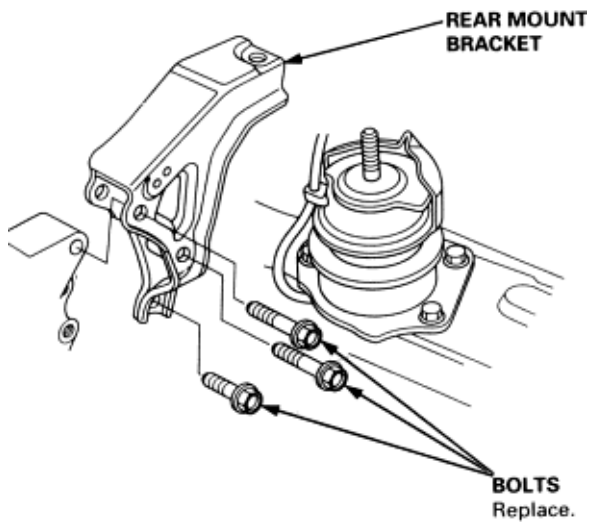


36. Remove the damper fork (see section 18).
37. Disconnect the suspension lower arm ball joints (see section 18).
38. Remove the driveshafts (see section 16). Coat all precision finished parts with clean engine oil. Tie plastic bags over the driveshaft ends.
39. Remove the rear mount bracket.

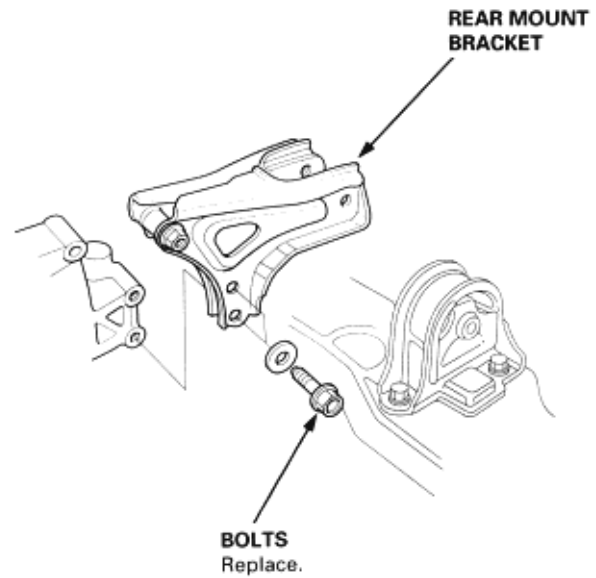
Except D16B6 engine with M/T:



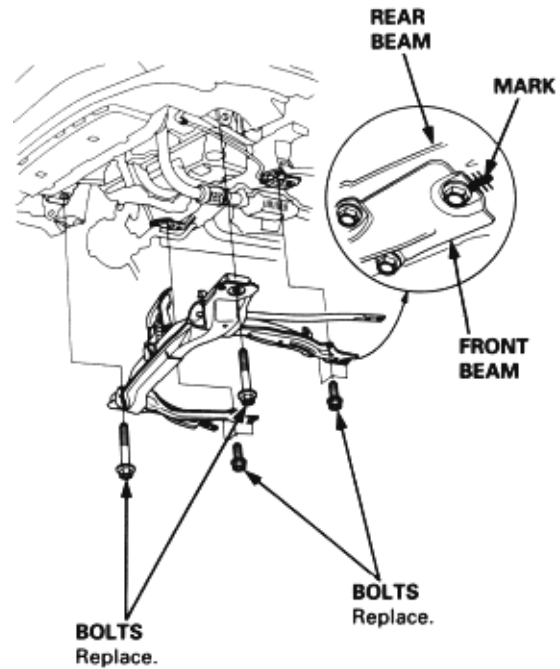
A/T



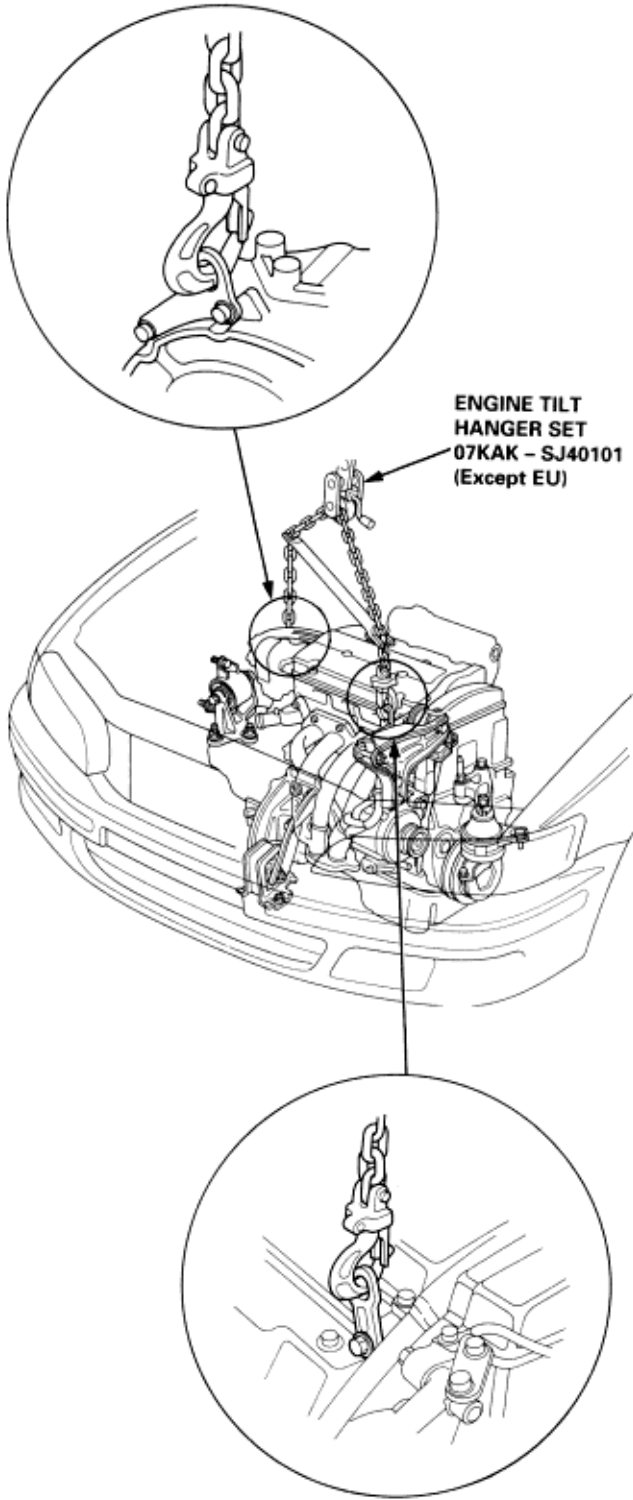
D16B6 engine:



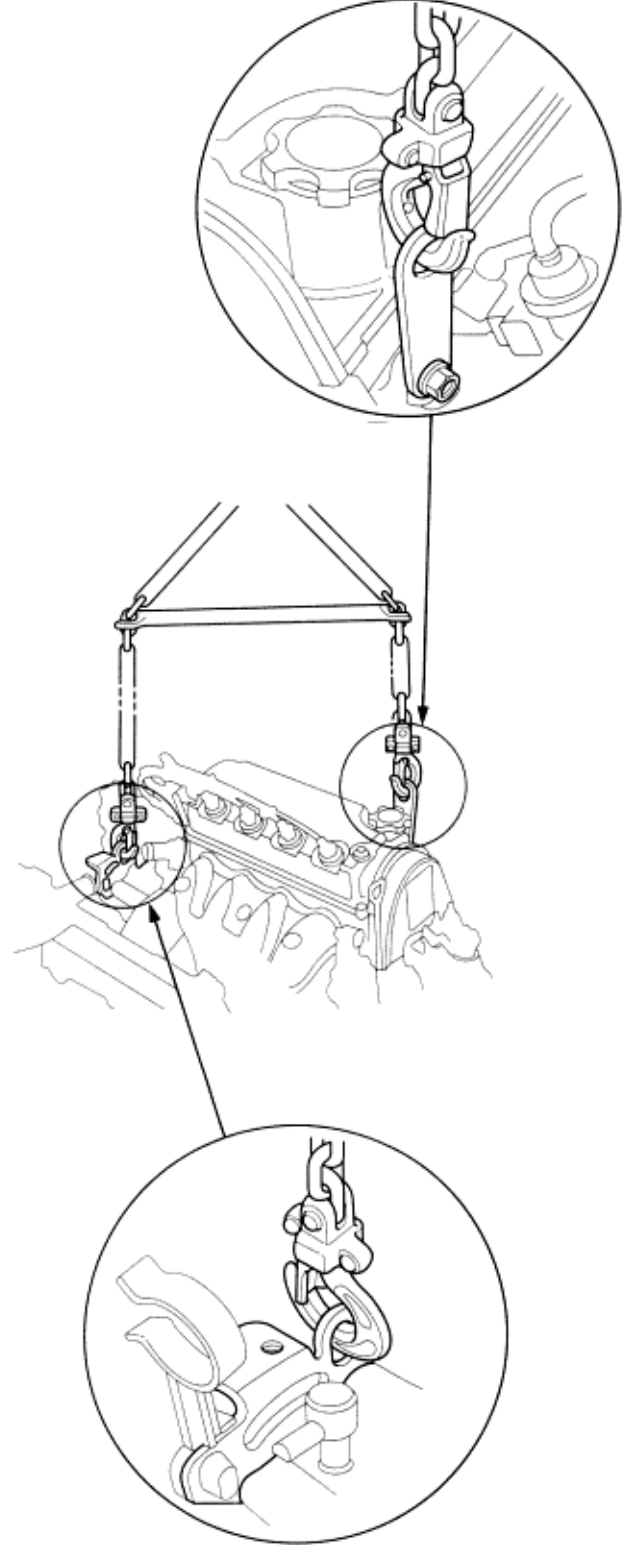
40. Remove flange bolts securing the radius rods (see section 18).
41. Mark on the front beam and rear beam, then remove the front beam.



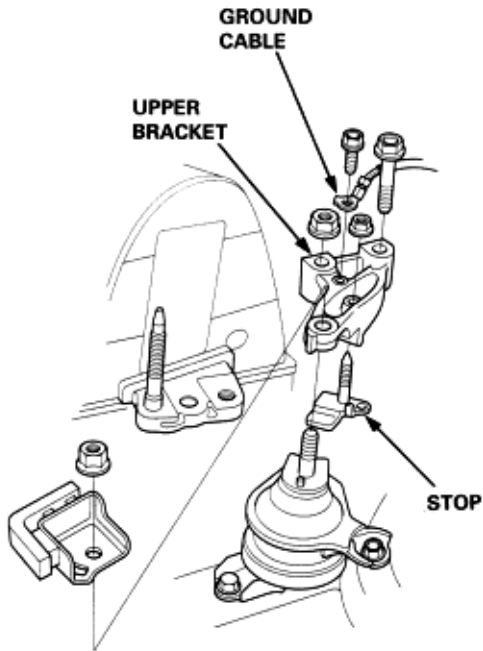
- 42. Lower the hoist.
 - 43. Attach the chain hoist to the engine as shown.
- Except D16B6 engine:**



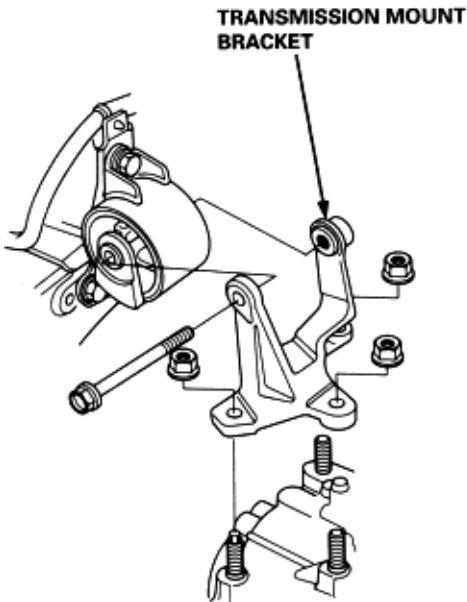
D16B6 engine:



44. Remove the stopper and ground cable, then remove the upper bracket.

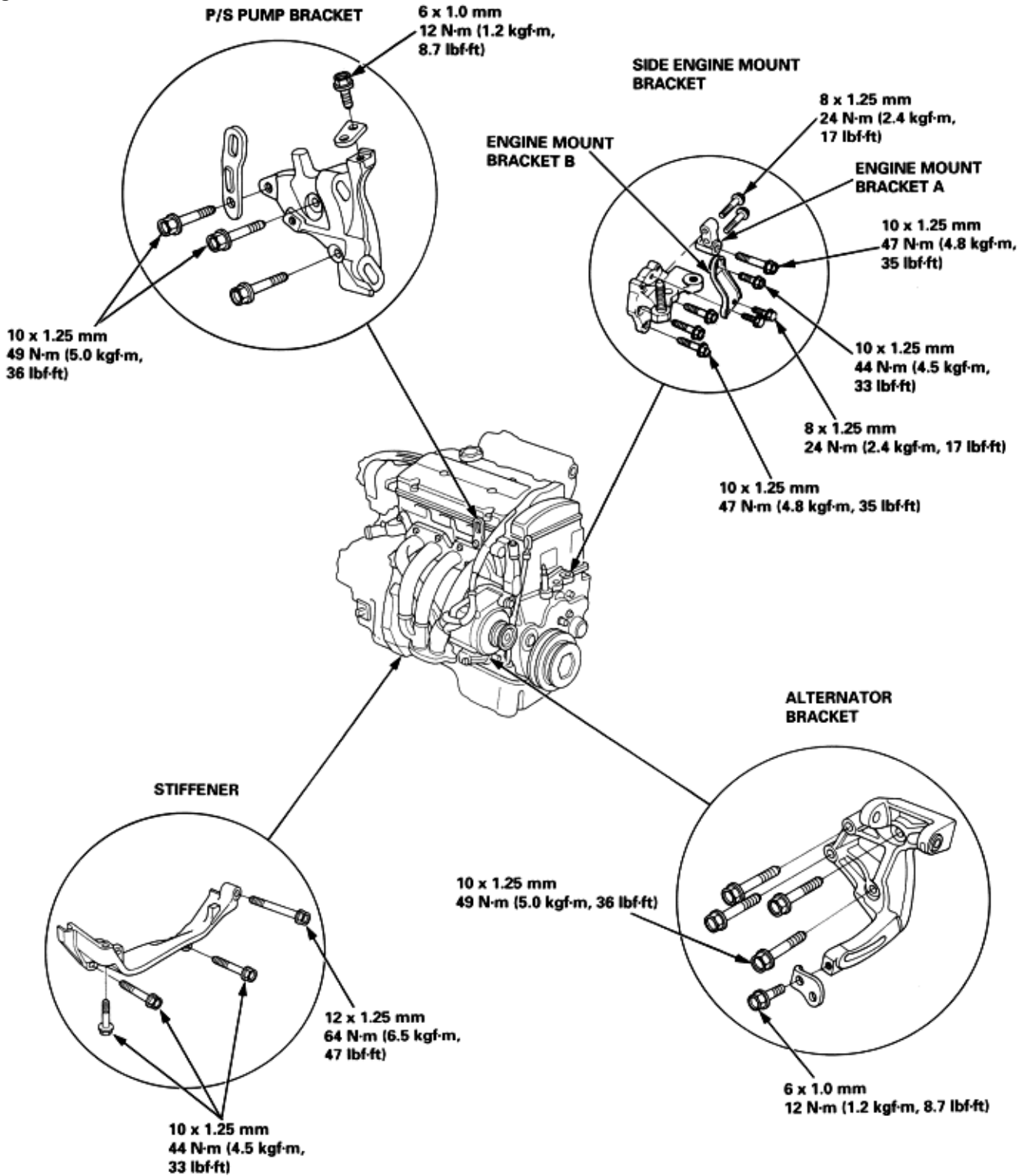


45. Remove the transmission mount bracket.

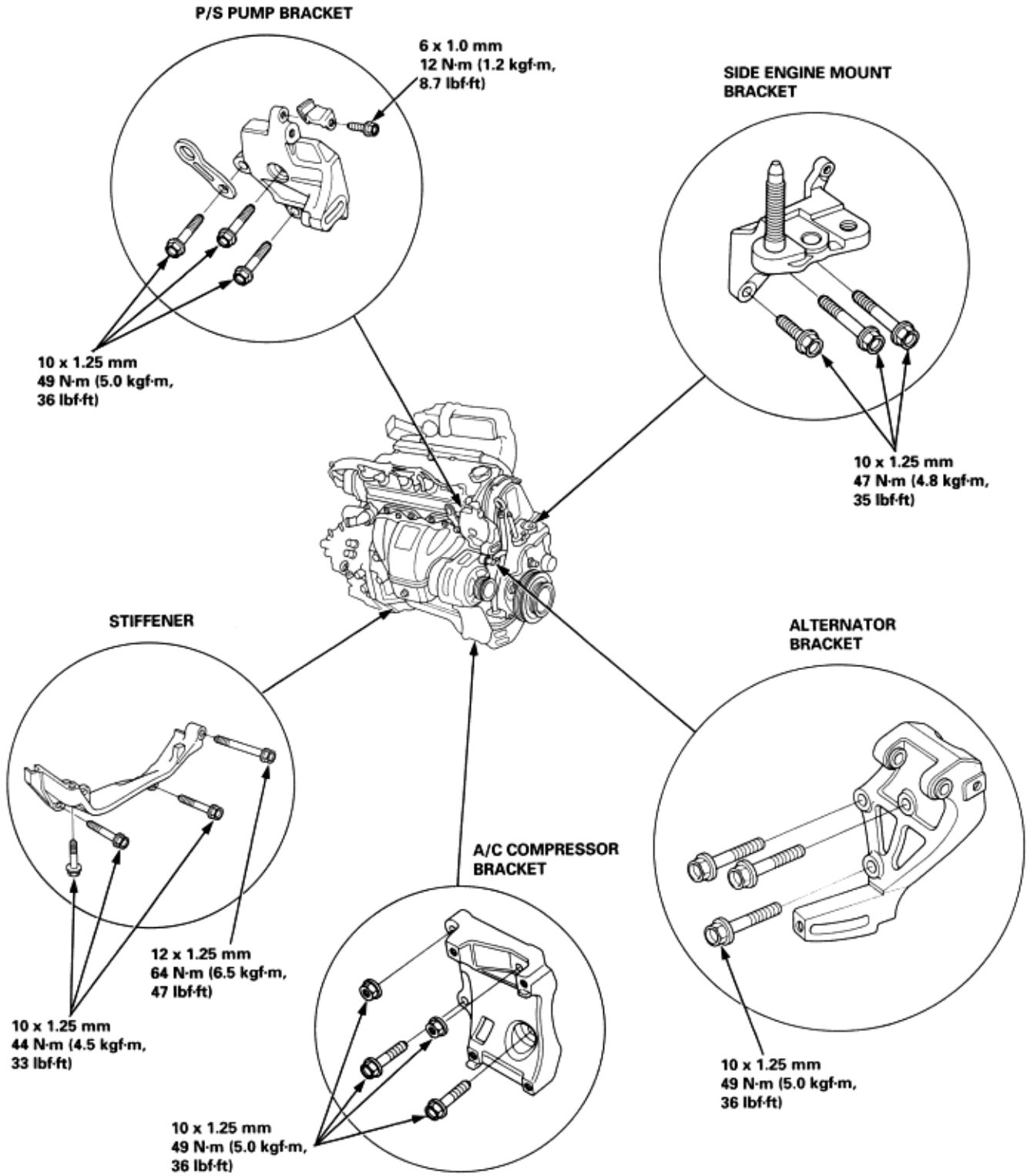


46. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses, and electrical wiring.
47. Slowly lower the engine approximately 150 mm (6 in). Check once again that all hoses and wires are disconnected from the engine/transmission.
48. Lower the engine all the way. Remove the chain hoist from the engine.
49. Remove the engine from under the vehicle.

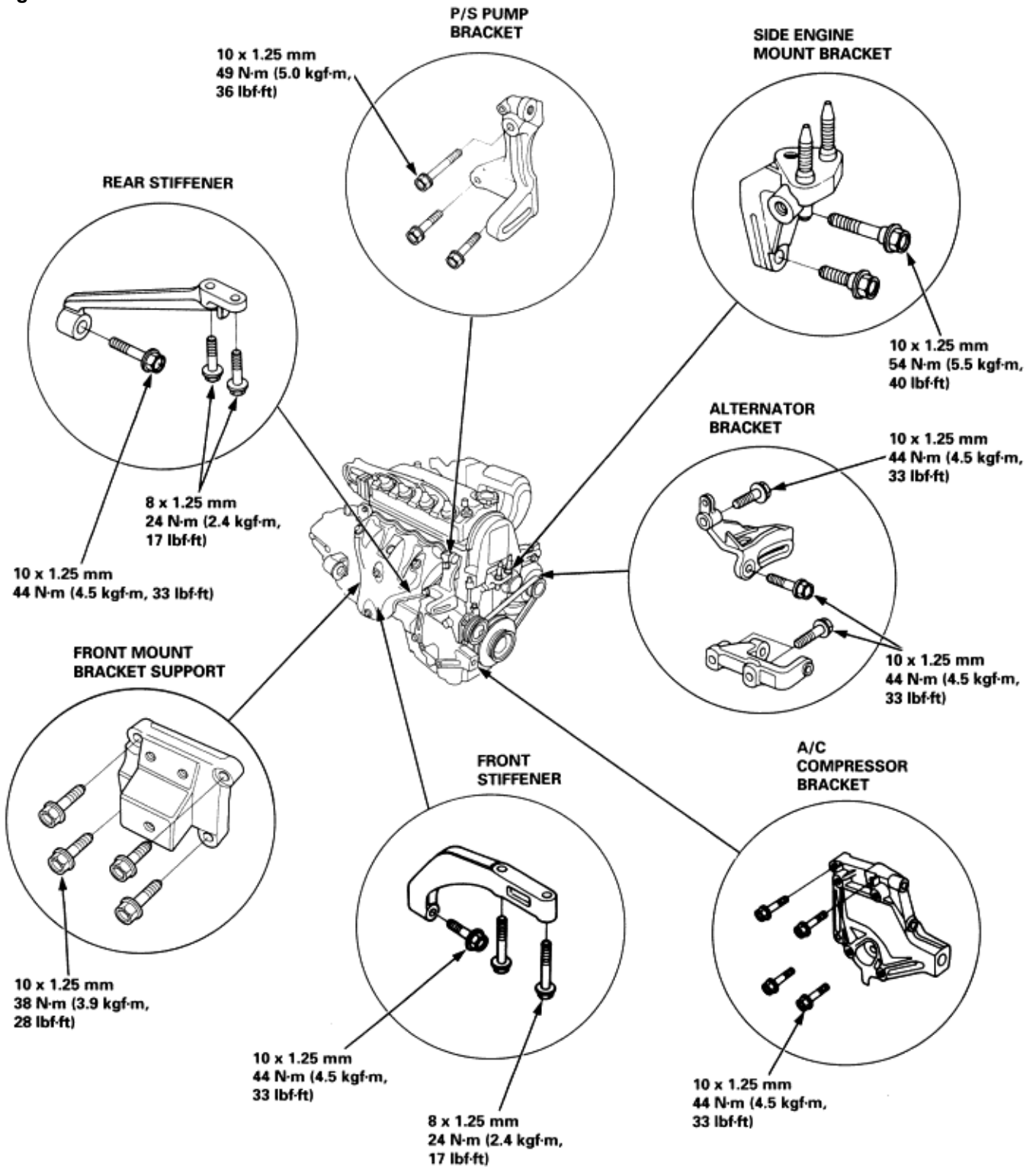
Bracket Bolts/Nuts Torque Specification:
H22A7 engine:



Bracket Bolts/Nuts Torque Specification:
F18B2, F18B3, F20B6 engines:



Bracket Bolts/Nuts Torque Specification:
D16B6 engine:

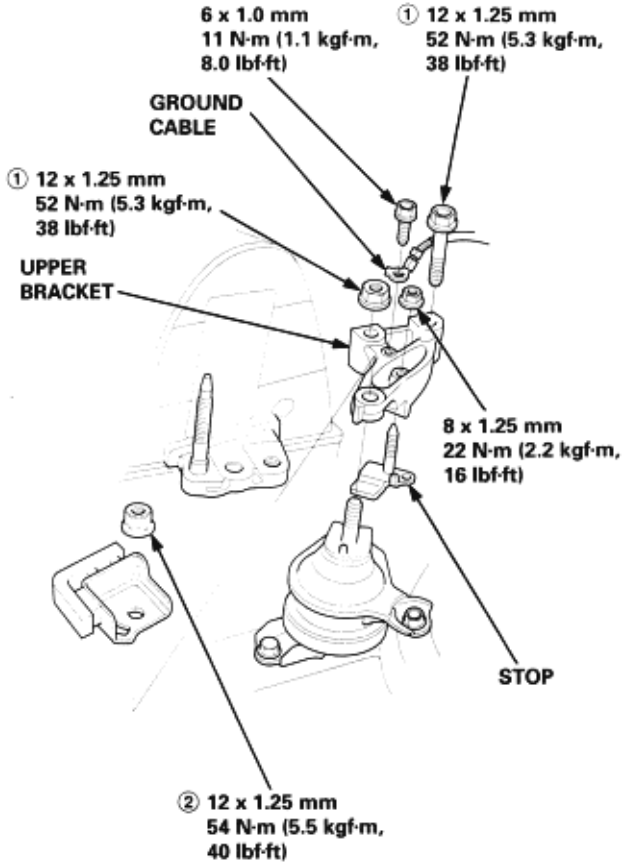


Engine Installation:

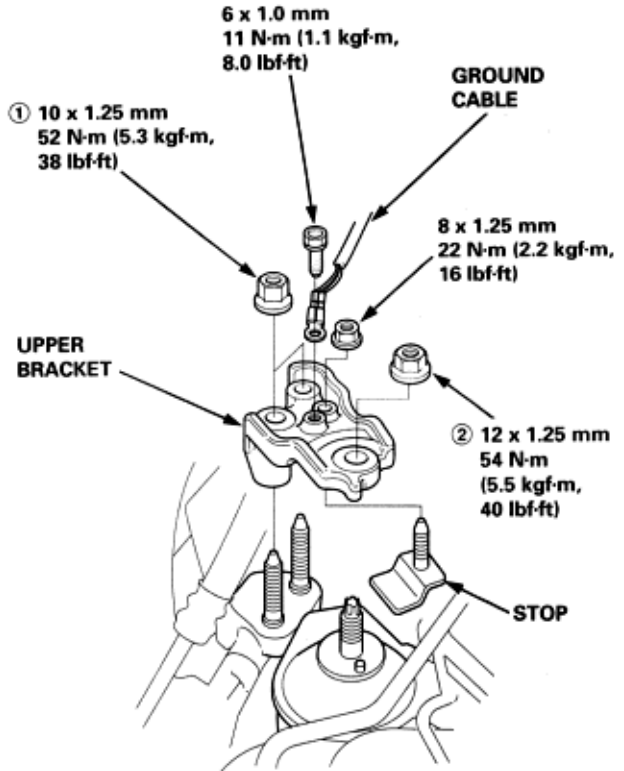
Install the engine in the reverse order of removal. Reinstall the mount bolts/nuts in the following sequence. Failure to follow this procedure may cause excessive noise and vibration, and reduce bushing life.

1. Push the engine under the vehicle. Attach the chain hoist to the engine, then lift the engine into position in the vehicle.
2. Install the upper bracket, then tighten the bolt and nuts in the numbered sequence shown.
3. Install the stop.

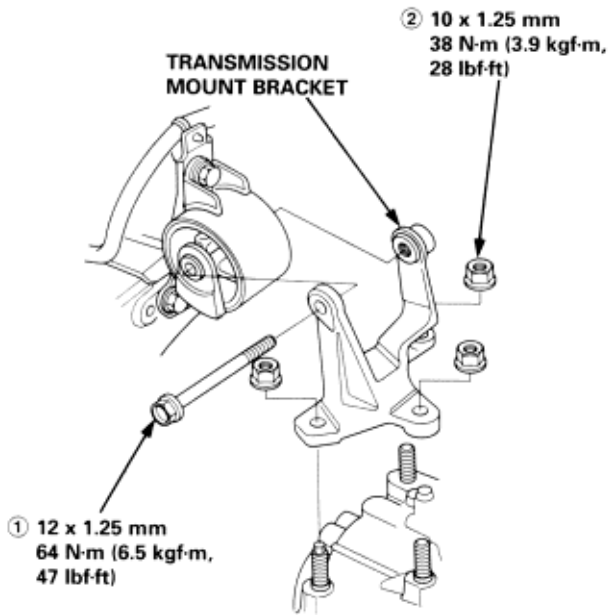
Except D16B6 engine:



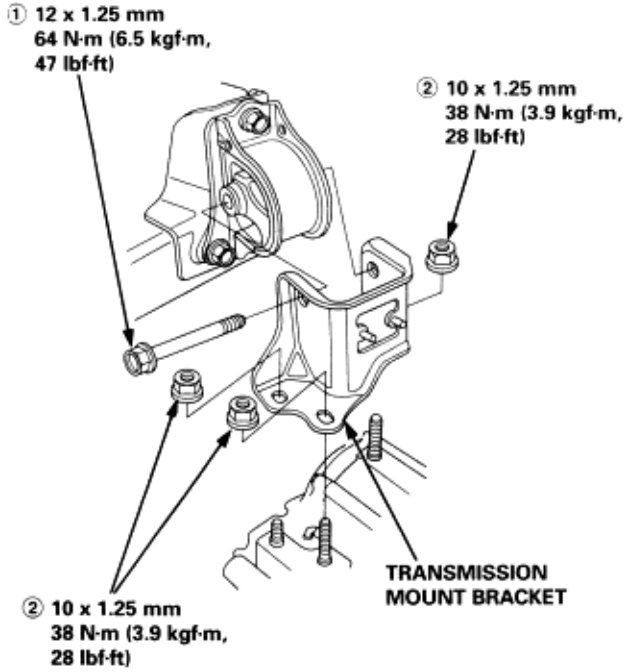
D16B6 engine:



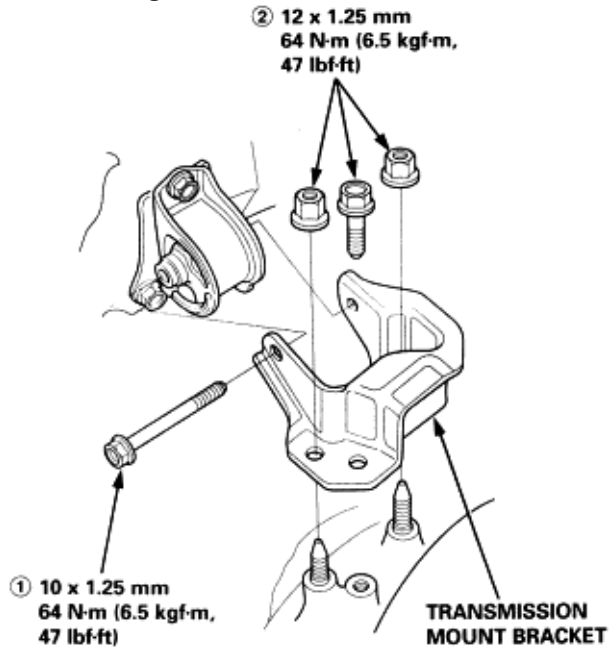
4. Install the transmission mount bracket, then tighten the bolt and nuts in the numbered sequence shown.
Except D16B6 engine with M/T:



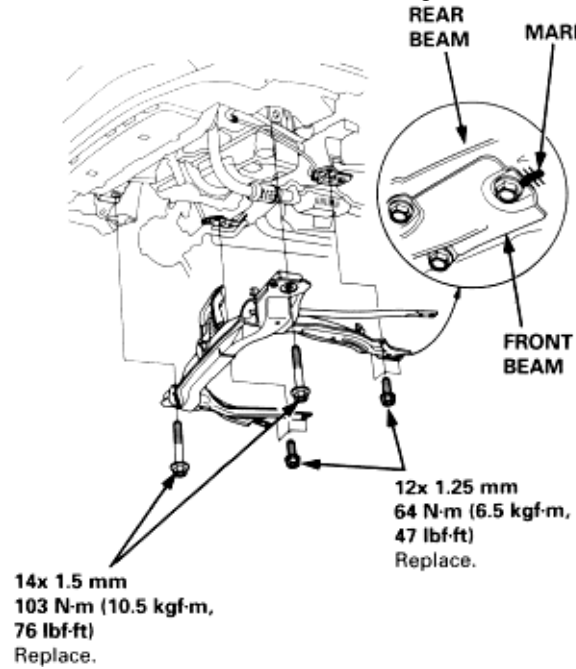
A/T:



D16B6 engine:

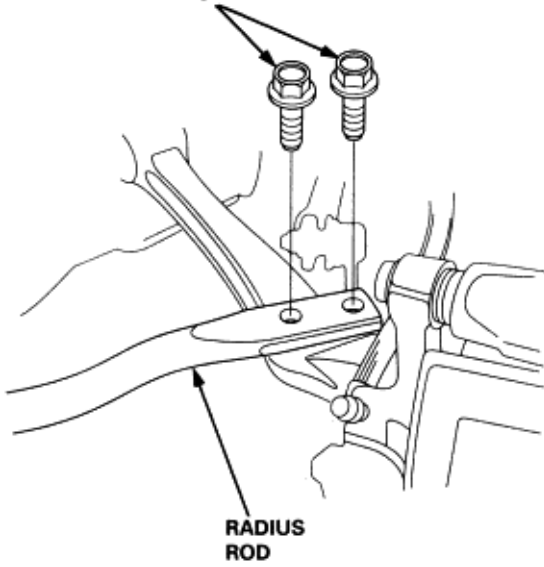


5. Remove the chain hoist from the engine.
6. Raise the hoist to full height.
7. Install the front beam. Align the marks on the rear beam and front beam, then tighten the bolts.



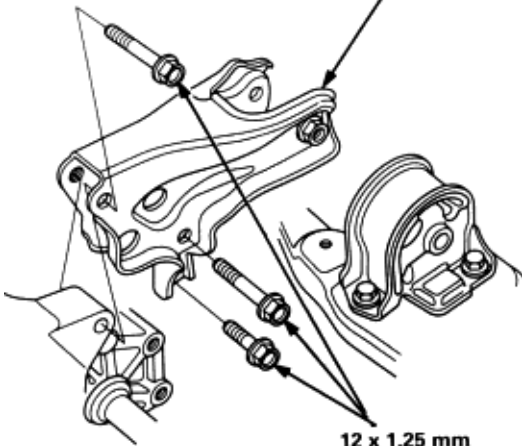
8. Tighten the flange bolts on the radius rods.

14 x 1.5 mm
162 N-m (16.5 kgf-m, 119 lbf-ft)



9. Install the rear mount bracket, then tighten the bolts.
Except D16B6 engine with M/T:

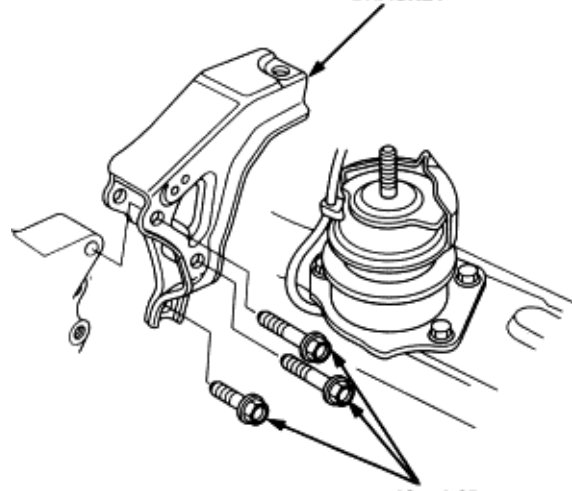
REAR MOUNT BRACKET



12 x 1.25 mm
64 N-m (6.5 kgf-m,
47 lbf-ft)
Replace.

A/T:

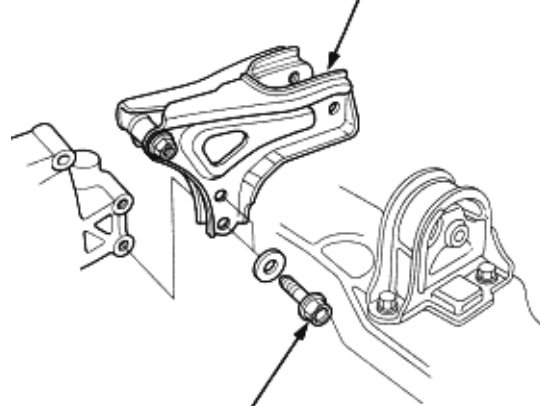
REAR MOUNT BRACKET



12 x 1.25 mm
64 N-m (6.5 kgf-m,
47 lbf-ft)
Replace.

D16B6 engine:

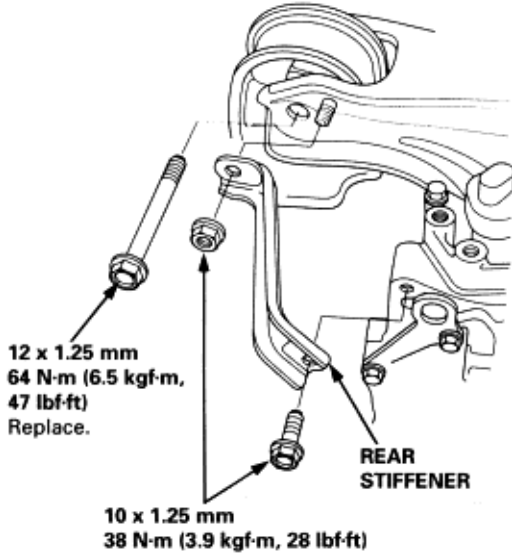
REAR MOUNT BRACKET



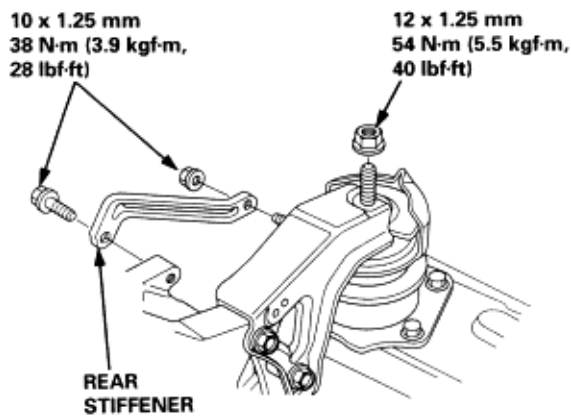
14 x 1.5 mm
83 N-m (8.5 kgf-m,
61 lbf-ft)
Replace.

10. Lower the hoist.
11. Tighten the rear mount mounting bolt/nut, then install the rear stiffener.

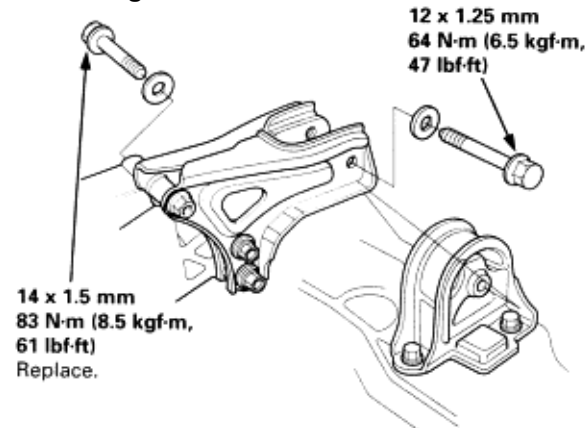
Except D16B6 engine with M/T:



A/T:

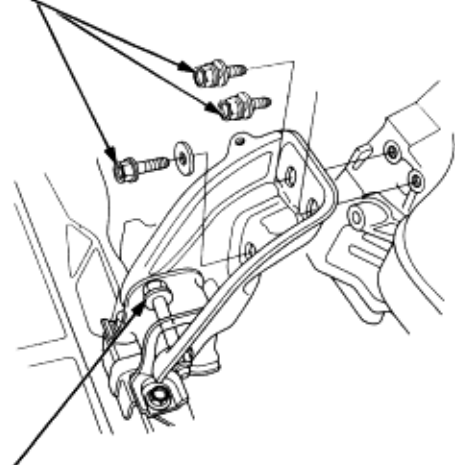


D16B6 engine:



12. Tighten the front mount bracket mounting bolts in the numbered sequence shown.

① **10 x 1.25 mm**
38 N-m (3.9 kgf-m, 28 lbf-ft)

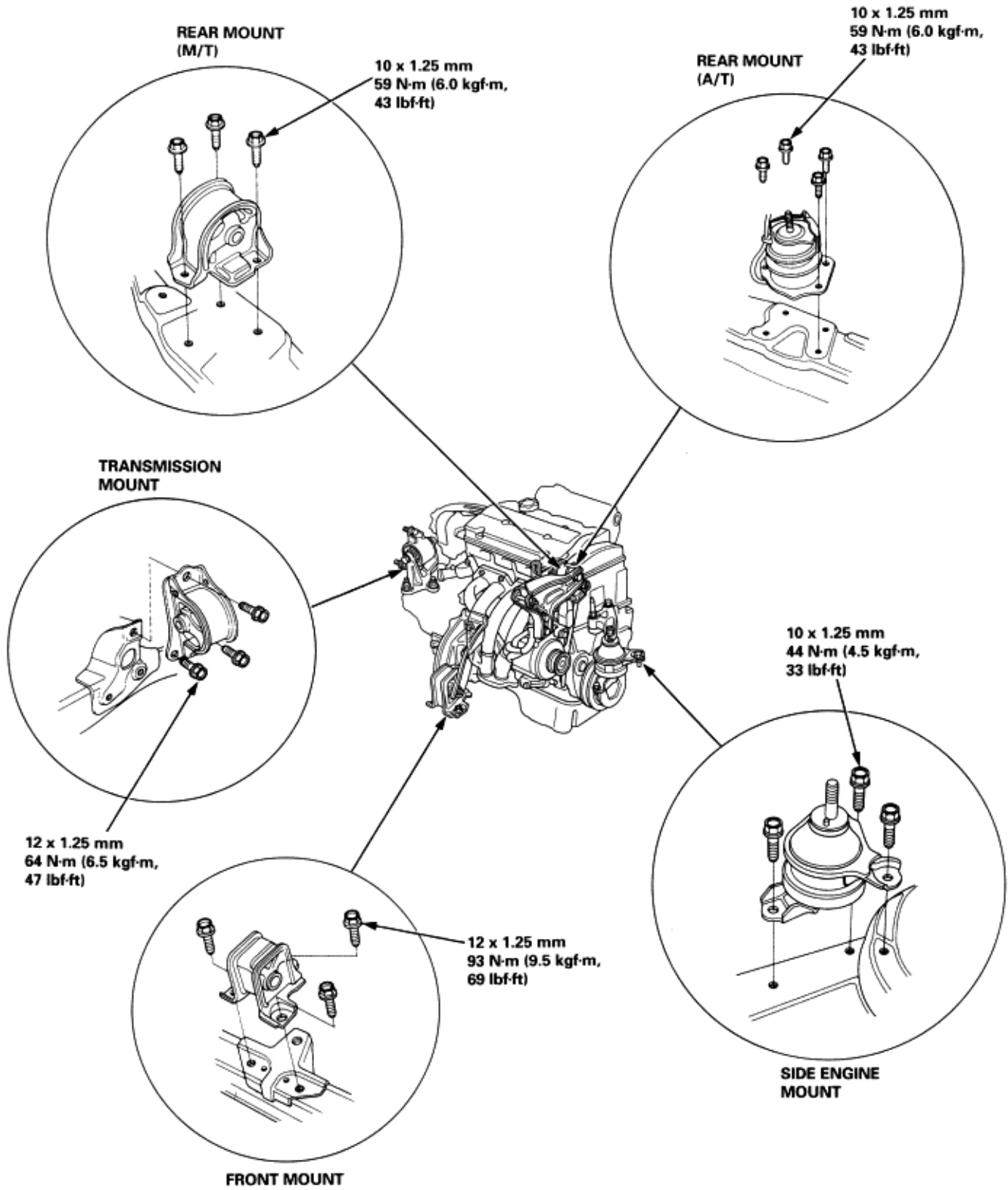


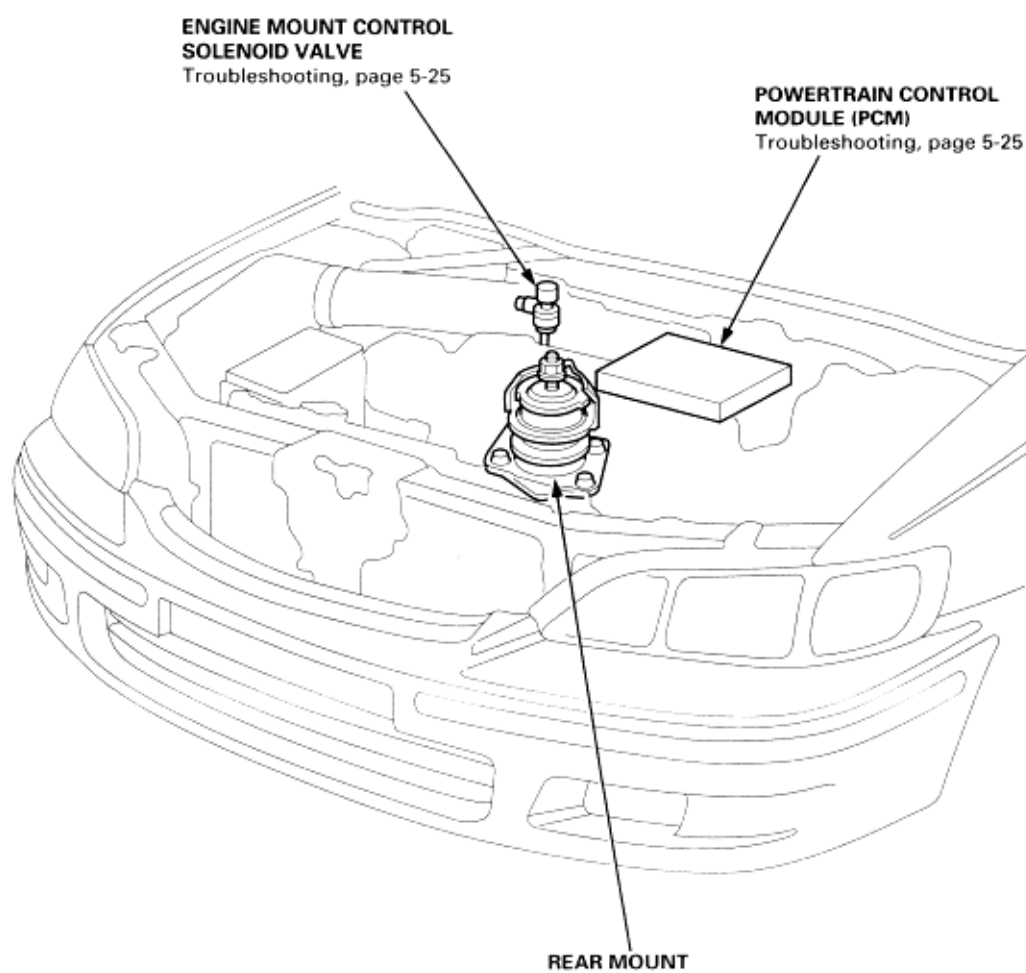
② **12 x 1.25 mm**
64 N-m (6.5 kgf-m, 47 lbf-ft)
Replace.

13. Adjust and make sure as follows:

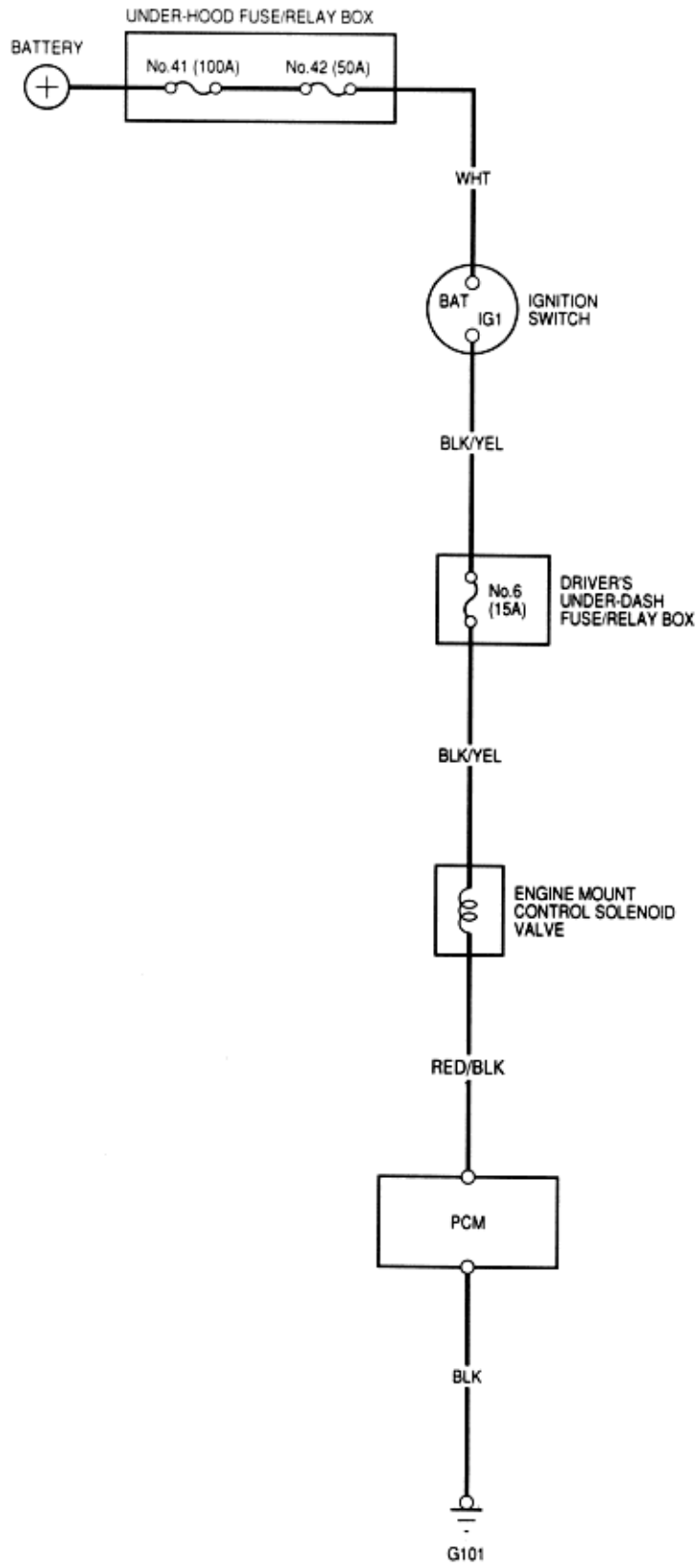
- ♦ Check that the set ring on the ends of the driveshaft and intermediate shaft set rings into place.
- ♦ Adjust the throttle cable (see section 11).
- ♦ Refill the engine with engine oil (**See Page 8-7**).
- ♦ Refill the transmission with oil or ATF (see section 13 or 14).
- ♦ Refill the radiator with engine coolant, and bleed air from the cooling system (**See Page 10-7**).
- ♦ Clean the battery posts and cable terminals with sandpaper, assemble them, then apply grease to prevent corrosion.
- ♦ Inspect for fuel leakage (see section 11). After assembling fuel line parts, turn ON (II) the ignition switch (do not operate the starter) so that the fuel pump operates for approximately two seconds and the fuel line pressurizes. Repeat this operation two or three times, and check for fuel leakage at any point in the fuel line.
- ♦ Check the wheel alignment (see section 18).
- ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Mount and Bracket Bolts/Nuts Torque Value Specifications:



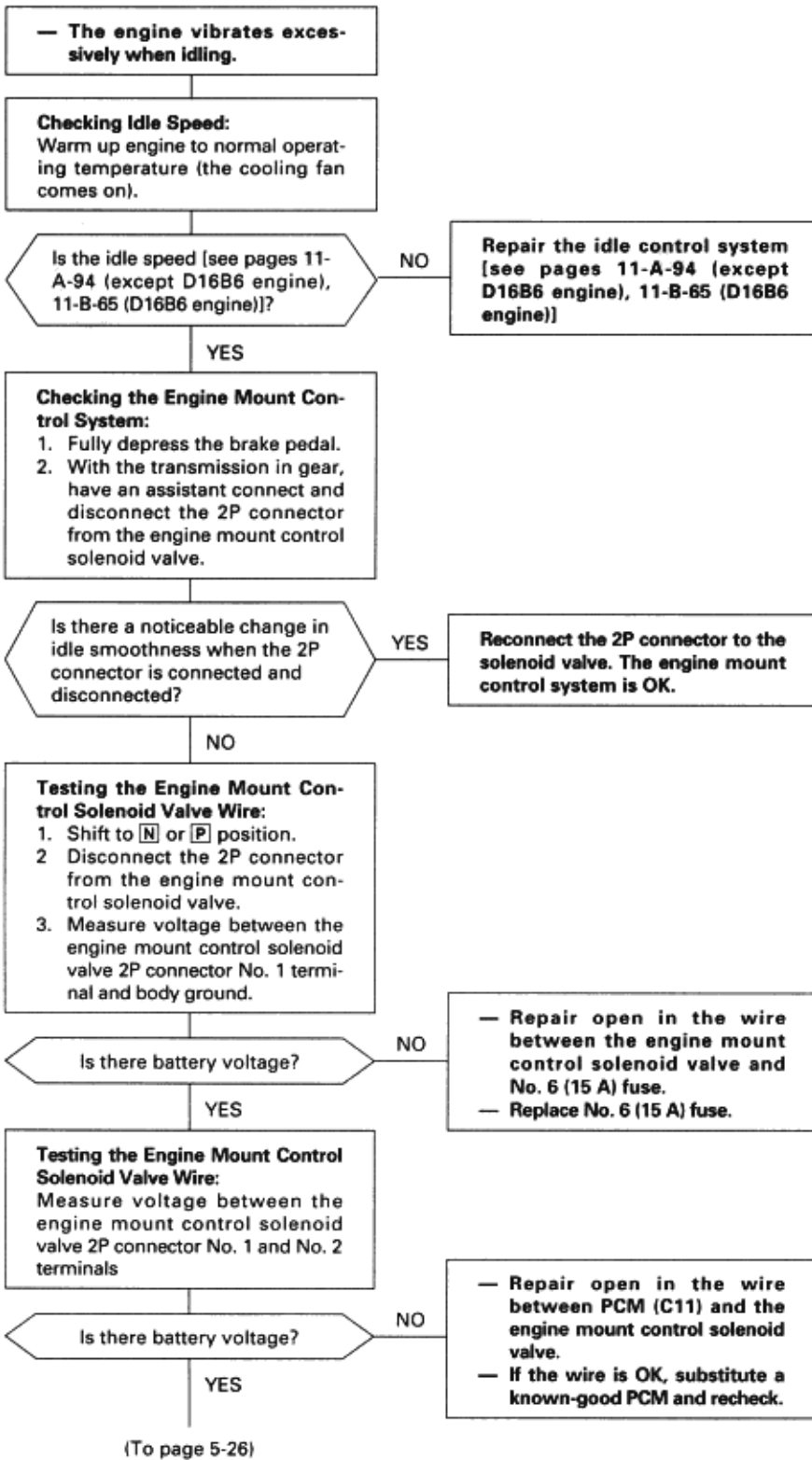


To go to the pages referenced on the diagram above,
click on the following:
(See Page 5-25)

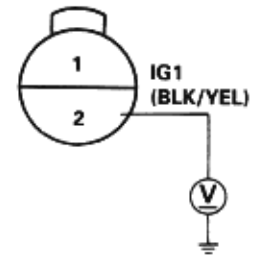


NOTE:

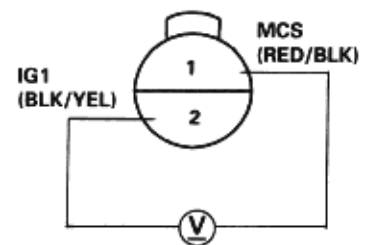
- ♦ Check the vacuum hoses and pipes for damage and proper connections.
- ♦ (See Page 11-A-15 to 11-A-20) before troubleshooting.



ENGINE MOUNT CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals



To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-A-94)
 (See Page 11-B-65)

(From page 5-25)

Testing the Engine Mount Control Solenoid Valve Wire:
 1. Raise the engine speed above 1,000 rpm (min⁻¹).
 2. Measure voltage between the engine mount control solenoid valve 2P connector No. 1 and No. 2 terminals.

Is there battery voltage?

YES
 — Repair short to the body ground in the wire between PCM (C11) and the engine mount control solenoid valve.
 — If the wire is OK, substitute a known-good PCM and recheck.

Testing the Engine Mount and Vacuum Hose:
 Disconnect the lower vacuum hose from the engine mount control solenoid valve, and connect a vacuum pump/gauge to the hose. Apply vacuum for 20 seconds.

Does the engine mount hold vacuum?

NO
 — Replace the vacuum hose between the engine mount control solenoid valve and the engine mount.
 — Replace the engine mount.

Testing the Engine Mount:
 Release the vacuum, then apply vacuum again.

Is there a noticeable change in idle smoothness with and without vacuum applied?

NO
 Replace the engine mount.

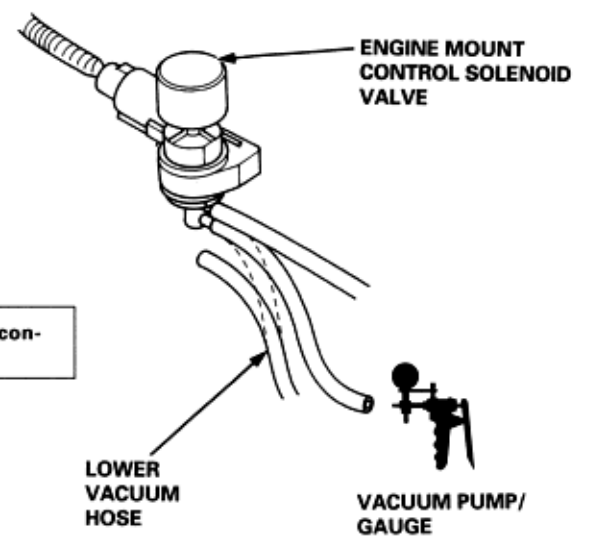
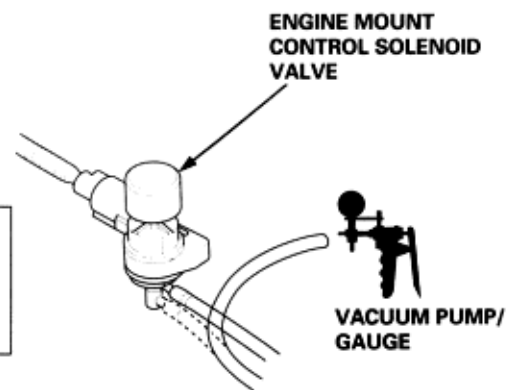
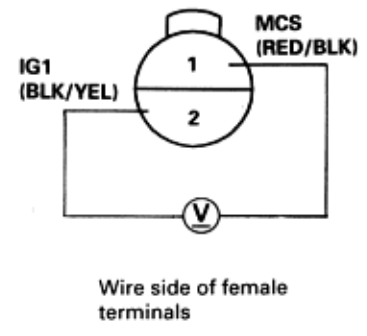
Testing the Engine Mount Control Solenoid Valve:
 Disconnect the lower vacuum hose from the engine mount control solenoid valve, and connect a vacuum pump/gauge to the hose.

Is there manifold vacuum at idling, and decrease the manifold vacuum when raise the engine speed above 1,000 rpm (min⁻¹)?

NO
 Replace the engine mount control solenoid valve.

YES
 Engine mount control system is OK at this time.
 Check the engine mount is necessary.

ENGINE MOUNT CONTROL SOLENOID VALVE 2P CONNECTOR



Special Tools

6-A-2

Ref No.	Tool Number	Description	Qty	Remark
1	07HAH - PJ70100	Valve Guide Reamer, 5.525 mm	1	
2	07JAA - 0010100	Socket Wrench, 17 mm	1	
3	07JAB - 0010200	Handle	1	
4	07JAB - 0010400	Pulley Holder Attachment, HEX 50 mm	1	
5	07PAD - 0010000	Stem Seal Driver	1	
6	07742 - 0010100	Valve Guide Driver, 5.5 mm	1	
7	07757 - 0010000	Valve Spring Compressor	1	



①



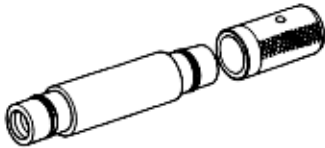
②



③



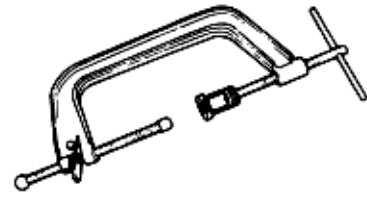
④



⑤



⑥



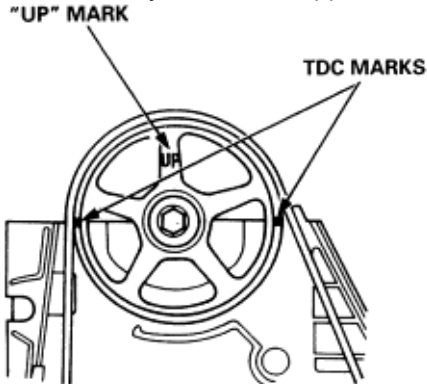
⑦

Valve Clearance Adjustment

6-A-3

NOTE:

- Valves should be adjusted only when the cylinder head temperature is less than 38°C (100°F).
 - After adjusting, loosen the crankshaft pulley bolt, then retorque the crankshaft pulley bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°
- Remove the cylinder head cover.
NOTE: When installing the cylinder head cover (see page 6-A-30).
 - Remove the upper cover (see page 6-A-8).
 - Set the No. 1 piston at TDC. "UP" mark on the camshaft pulley should be at top, and TDC marks should align with the cylinder head upper surface.



- Adjust valves on No.1 cylinder.

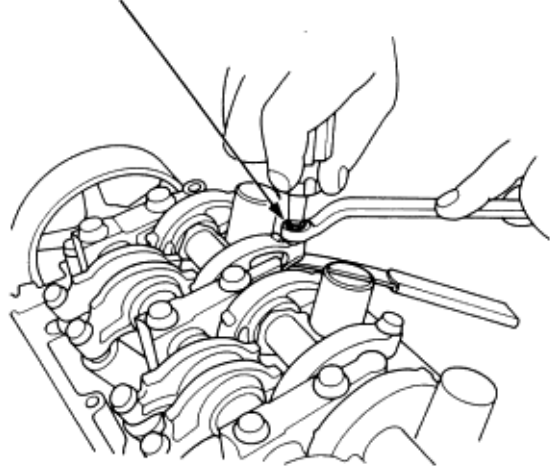
Intake: 0.20 mm (0.008 in) ± 0.02 mm (0.008 in)
Exhaust: 0.25 mm (0.010 in) ± 0.02 mm (0.008 in)

- Loosen locknut and turn adjustment screw until feeler gauge slides back and forth with slight amount of drag.

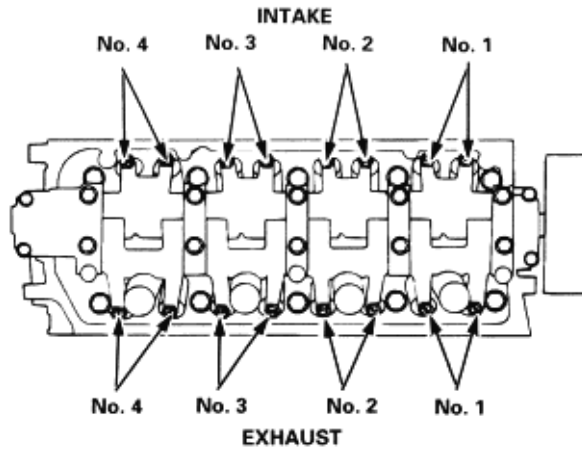
NOTE: Do not overtighten the locknuts, for the rocker arms are made of aluminium.

INTAKE and EXHAUST VALVE LOCKNUTS

18 N·m (1.8 kgf·m, 13 lbf·ft)



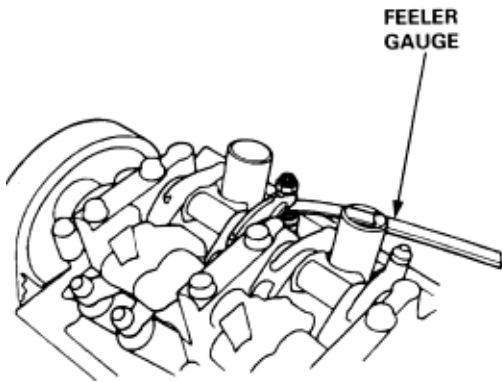
Adjusting screw location:



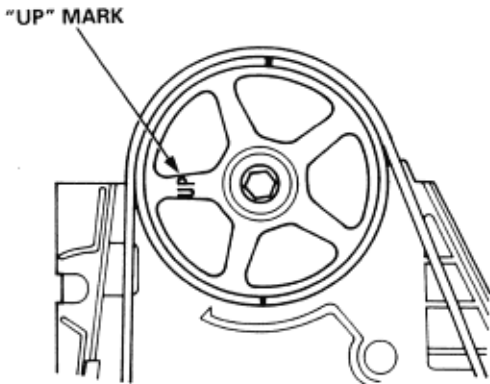
**Valve Clearance
Adjustment (cont'd)**

6-A-4

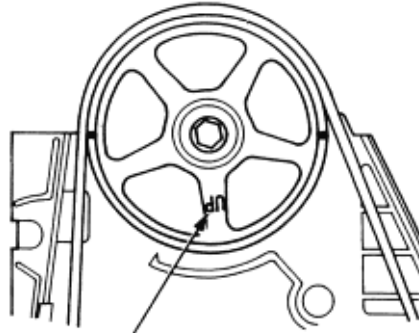
6. Tighten the locknut, and check clearance again. Repeat the adjustment if necessary.



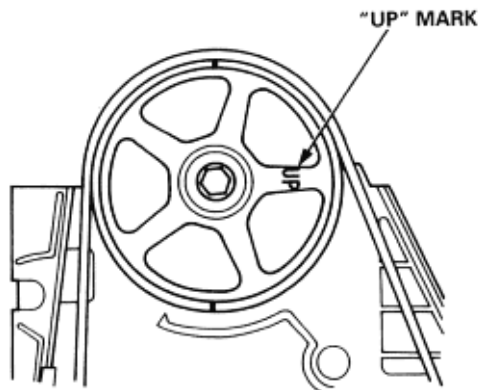
7. Rotate the crankshaft 180° counterclockwise (camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust valves on No. 3 cylinder.



8. Rotate the crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible. Adjust valves on No. 4 cylinder.



9. Rotate the crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" mark should be on the intake side. Adjust valves on No. 2 cylinder.

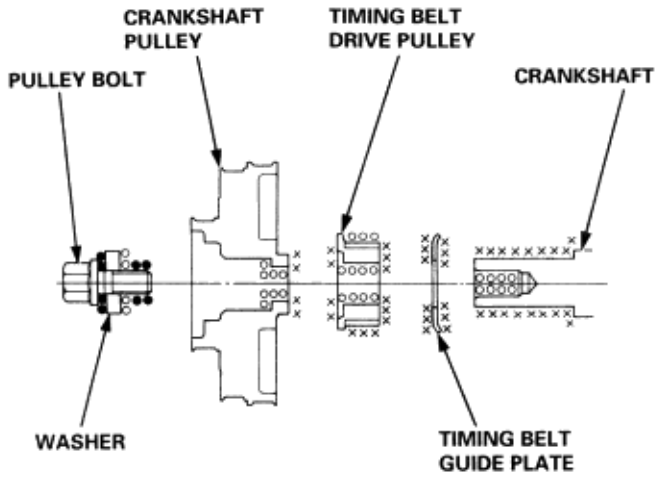


Crankshaft Pulley and Pulley Bolt Replacement

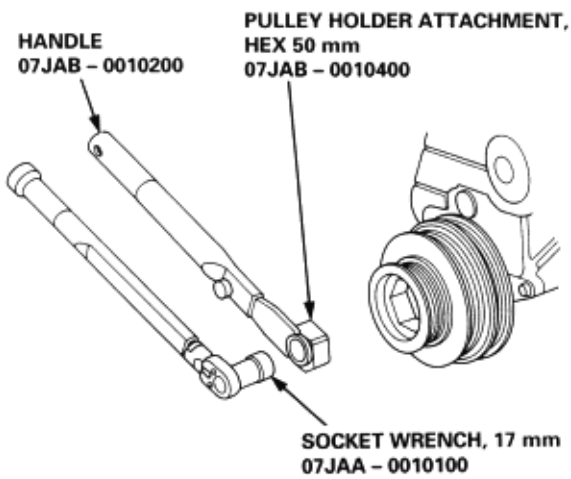
6-A-5

1. Remove any oil from the pulleys, crankshaft, bolt and washer. Clean and lubricate as shown below.

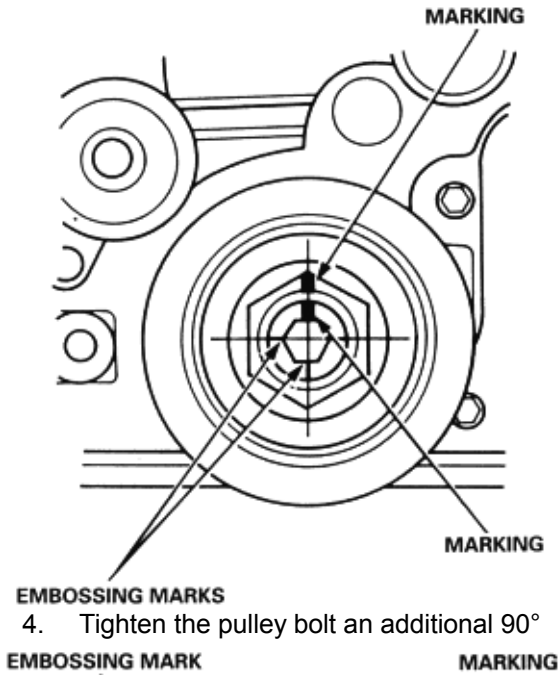
- : Clean
- ×: Remove any oil
- : Lubricate



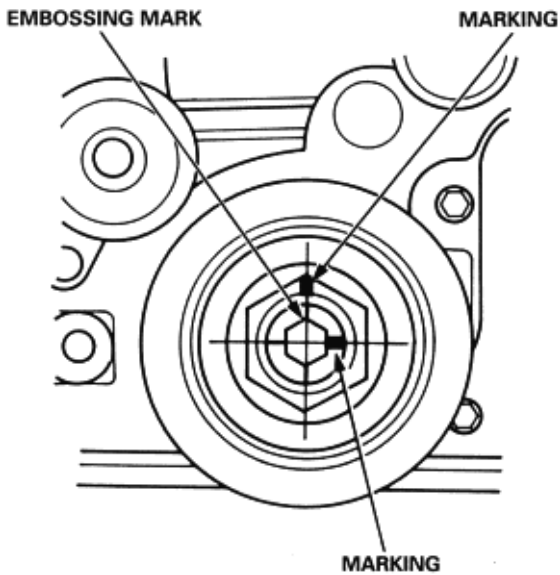
2. Tighten the pulley bolt to the specified torque.
Torque: 20 Nm (2.0 kgf/m, 14 lbf/ft)



3. Use a felt tip pen to mark the pulley bolt head and washer.

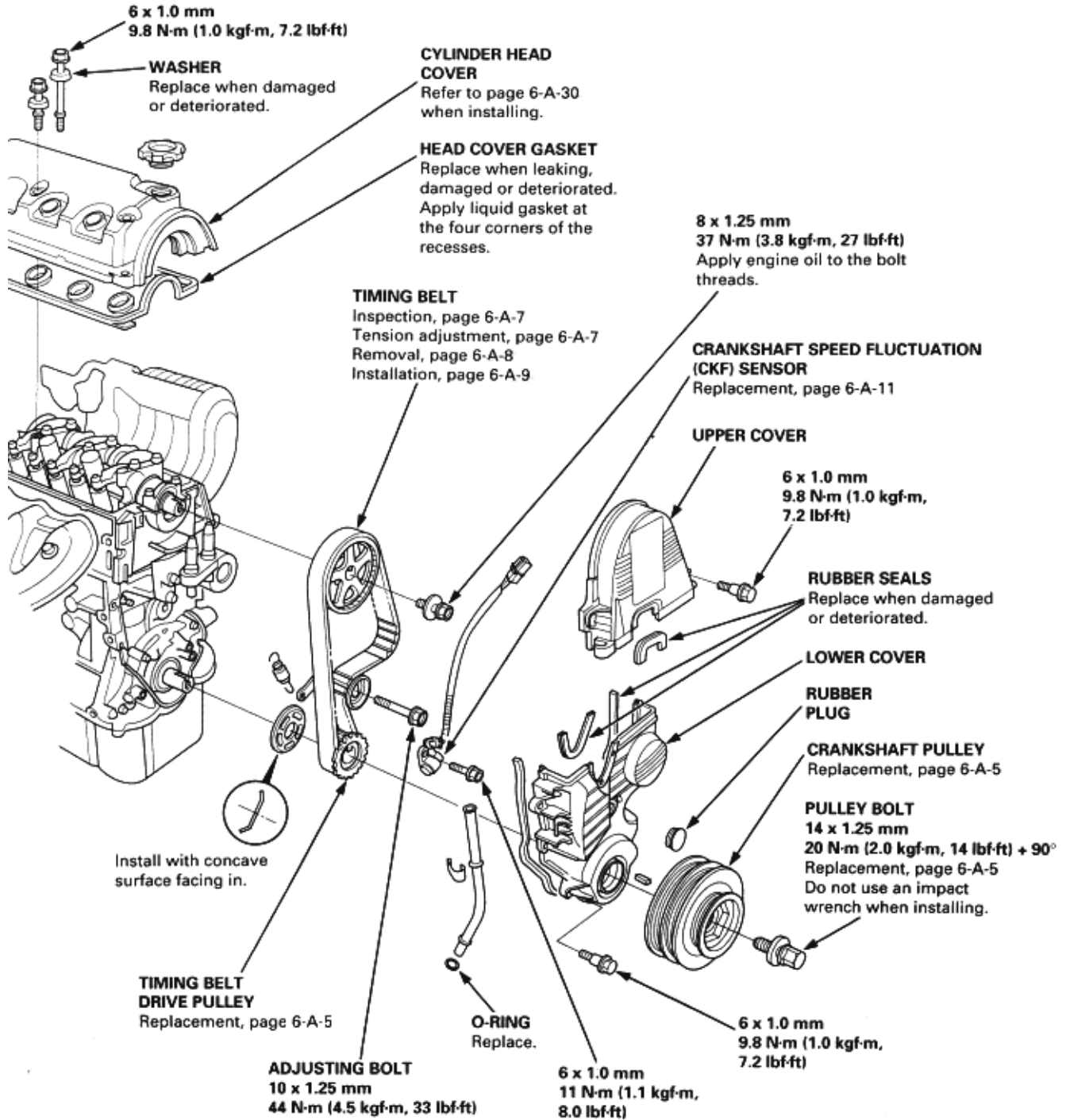


4. Tighten the pulley bolt an additional 90°



NOTE:

- ♦ For how to position the crankshaft and pulley before installing the belt (see page 6-A-9).
- ♦ Mark the direction of rotation on the belt before removing.
- ♦ Do not use the upper cover and lower cover for storing removed items.
- ♦ Clean the upper cover and lower cover before installing.
- ♦ Replace the camshaft seals and crankshaft seals if there is oil leakage.



To go to the pages referenced on the diagram above, click on the following:

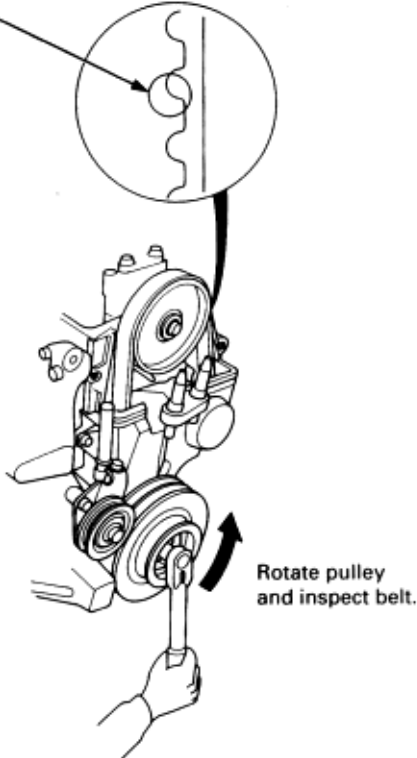
- (See Page 6-A-30)
- (See Page 6-A-7)
- (See Page 6-A-8)
- (See Page 6-A-9)
- (See Page 6-A-11)
- (See Page 6-A-5)

1. Remove the cylinder head cover.
 - ♦ When installing (see page 6-A-30).
2. Remove the upper cover (see page 6-A-8).
3. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

- ♦ Replace the belt if oil or coolant soaked.
- ♦ Remove any oil or solvent that gets on the belt.

Inspect this area for wear.

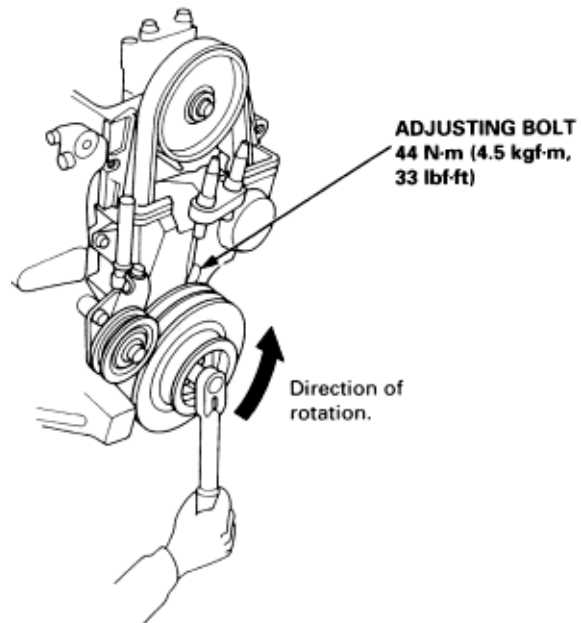


4. After inspecting, loosen the crankshaft pulley bolt, then retorque the crankshaft pulley bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°.

NOTE:

- ♦ Always adjust the timing belt tension with the engine cold.
- ♦ The tensioner is spring-loaded to apply tension to the belt automatically after making the following adjustment.
- ♦ Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.
- ♦ Inspect the timing belt before adjusting the belt tension.

1. Remove the cylinder head cover.
 - ♦ Refer to page 6-A-30 when installing.
2. Remove the upper cover (see page 6-A-8).
3. Rotate the crankshaft five or six revolutions to set the belt.
4. Set the No.1 piston at TDC (see page 6-A-10).
5. Loosen the adjusting bolt 180°.



6. Rotate the crankshaft counterclockwise three teeth on the camshaft pulley.
7. Tighten the adjusting bolt.
8. After inspecting, loosen the crankshaft pulley bolt, then retorque the crankshaft pulley bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°.

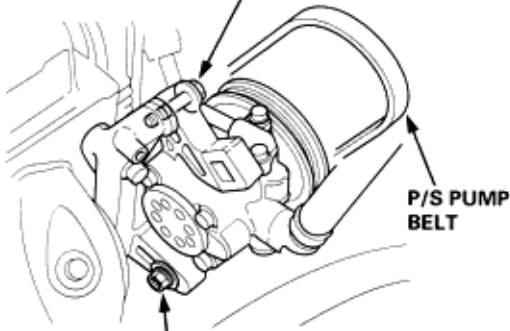
Timing Belt Removal

6-A-8

NOTE:

- ♦ Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt ([see page 6-A-10](#)).
 - ♦ Inspect the water pump before installing the timing belt ([see page 10-17](#)).
1. Remove the splash shield ([see page 5-10](#)).
 2. Loosen the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump.

MOUNTING BOLT
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)

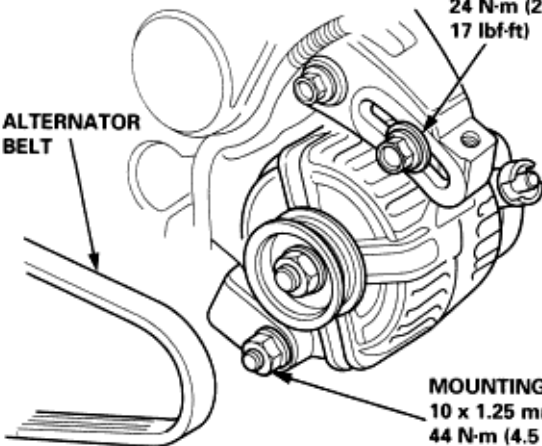


LOCK BOLT
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)

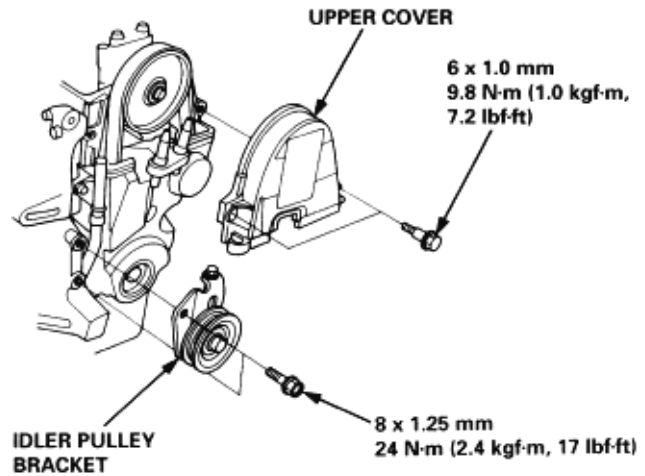
3. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt ([see page 5-7](#)).
4. Loosen the mounting nut and lock bolt, then remove the alternator belt.

LOCK BOLT
8 x 1.25 mm
24 N·m (2.4 kgf·m, 17 lbf·ft)

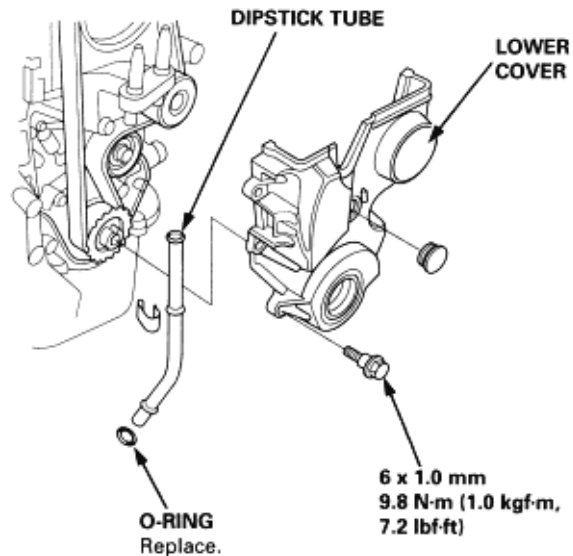
ALTERNATOR BELT



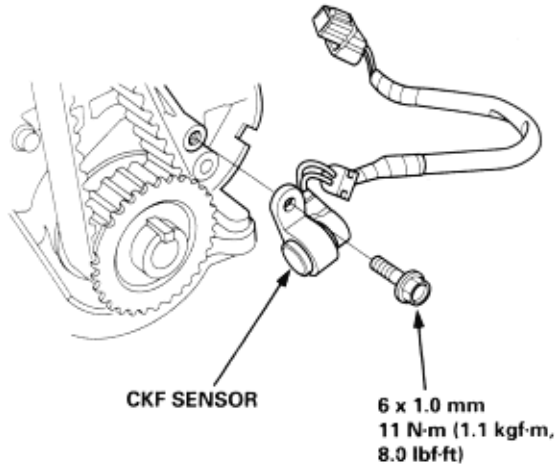
5. Remove the dipstick, then remove upper cover and idler pulley bracket.
NOTE: Do not use the upper cover for storing removed items.



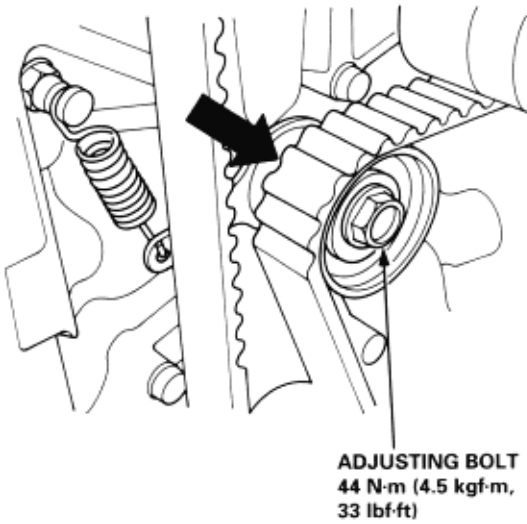
6. Support the engine with the jack and wood under the oil pan.
7. Remove the stop and ground cable, then remove upper bracket ([see page 6-A-17](#)).
8. Remove the crankshaft pulley ([see page 6-A-5](#)).
9. Remove the lower cover and dipstick tube.
NOTE: Do not use the lower cover for storing removed items.



10. Remove the crankshaft speed fluctuation (CKF) sensor from the oil pump.



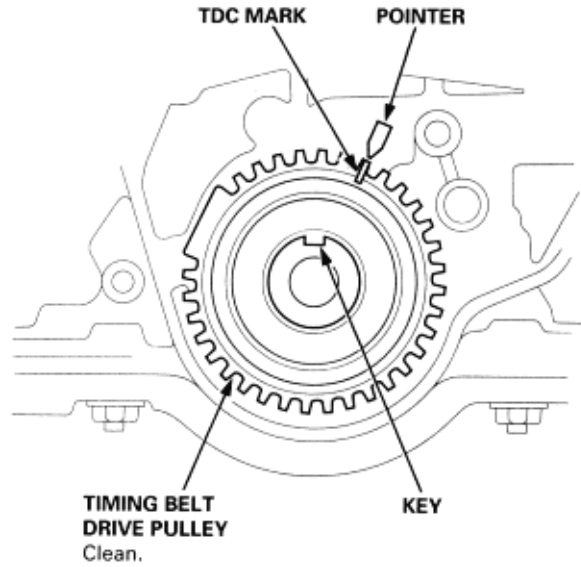
11. Loosen the adjusting bolt 180°. Push the tensioner to remove tension from the timing belt, then retighten the adjusting bolt.



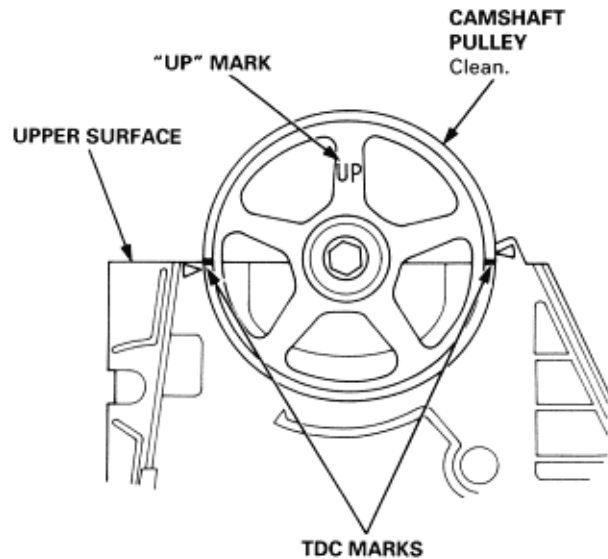
12. Remove the timing belt.

Install the timing belt in the reverse order of removal; Only key points are described here.

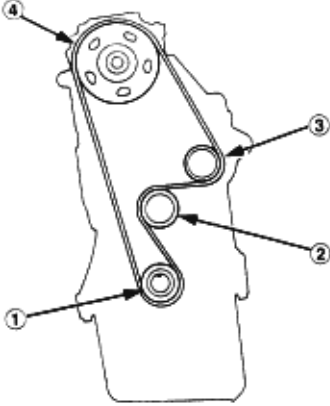
1. Set the timing belt drive pulley so that the No. 1 piston is at top dead center (TDC). Align the groove on the timing belt drive pulley to the pointer on the oil pump



2. Set the camshaft pulley so that the No. 1 piston TDC. Align the TDC marks on the camshaft pulley with the cylinder head upper surface.



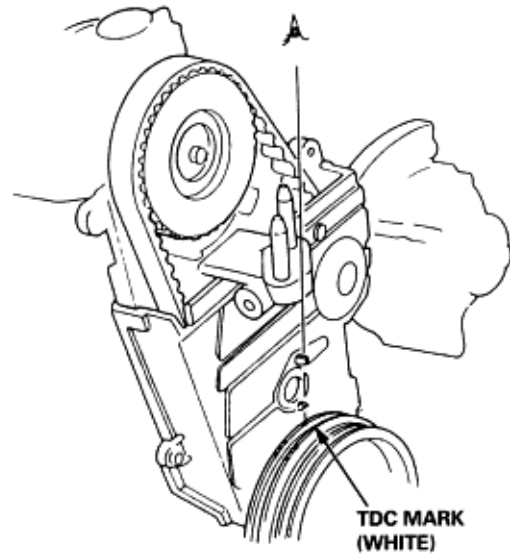
3. Install the timing belt tightly in the sequence shown. (1) to Timing belt drive pulley (crankshaft) to (2) Adjusting pulley to (3) Water pump pulley to (4) Camshaft pulley. NOTE: Make sure the timing belt drive pulley and camshaft pulley are at TDC.



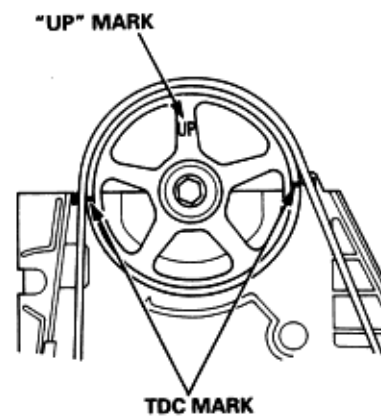
4. Loosen and retighten the adjusting bolt to tension the timing belt.
5. Install the lower cover and upper cover. NOTE: Clean the upper and lower covers before installation.
6. Install the crankshaft pulley, then tighten the pulley bolt (**see page 6-A-5**).
7. Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.
8. Adjust the timing belt tension (**see page 6-A-7**).

9. Check that the crankshaft pulley and camshaft pulley are both at TDC.

CRANKSHAFT PULLEY:

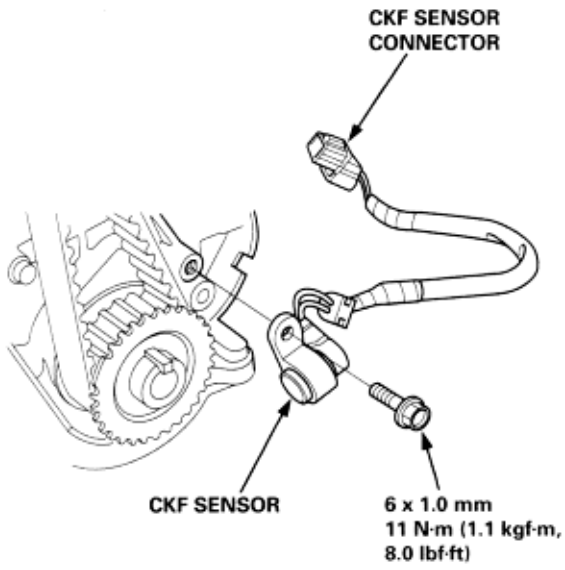


CAMSHAFT PULLEY:



10. If the camshaft and crankshaft pulleys are not positioned at TDC remove the timing belt, and adjust the position, following the procedure (**see page 6-A-9**), then reinstall the timing belt.
11. After installation, adjust the tension of each belt.
 - ♦ See section 4 for alternator belt tension adjustment.
 - ♦ See section 22 for A/C compressor belt tension adjustment.
 - ♦ See section 17 for P/S pump belt tension adjustment.

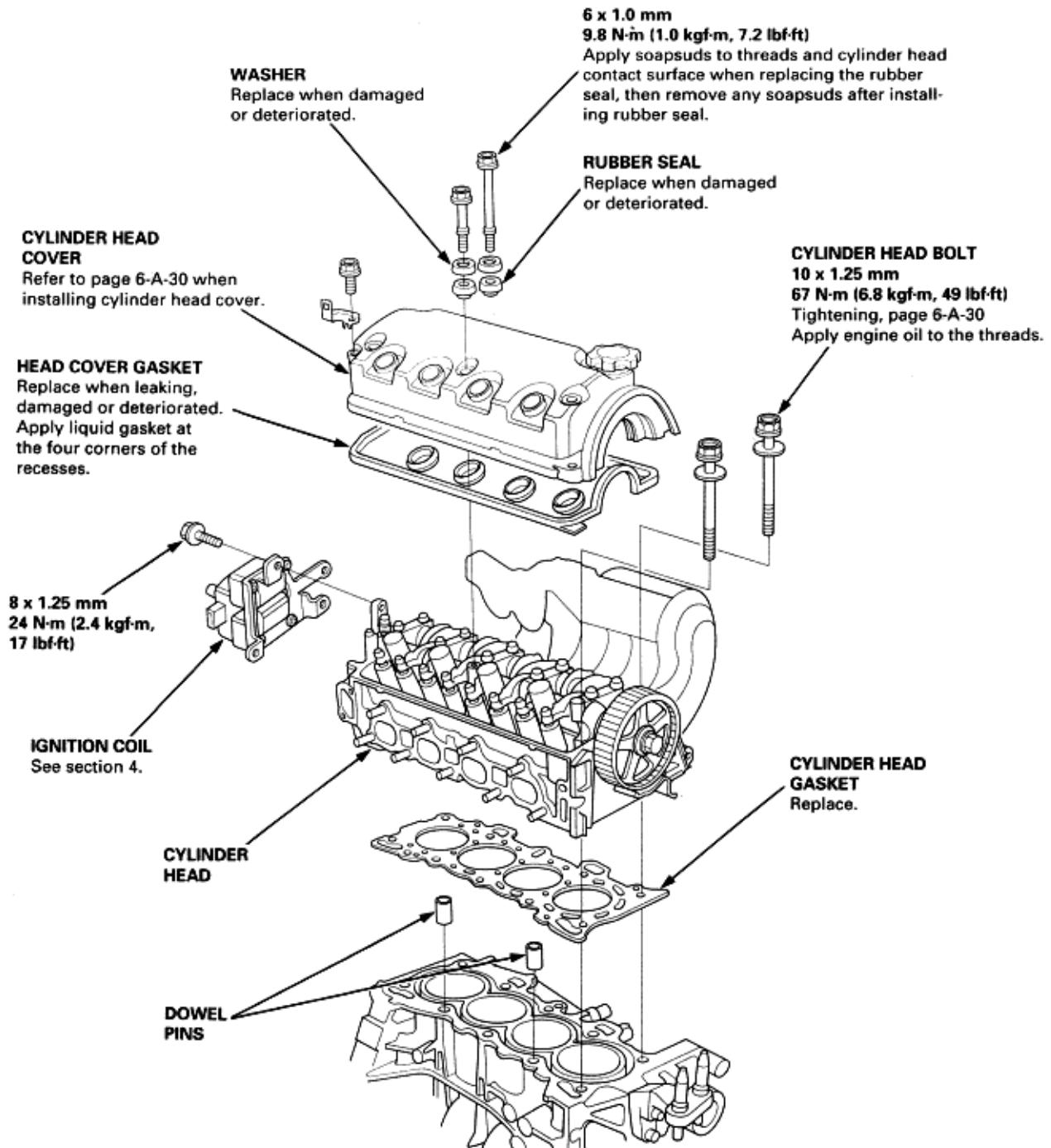
1. Remove the cylinder head cover.
NOTE: Refer to page 6-A-30 when installing.
2. Remove the crankshaft pulley (**see page 6-A-5**).
3. Remove the upper cover and idler pulley bracket (**see page 6-A-8**).
4. Remove the dipstick tube, then remove lower cover (**see page 6-A-8**).
5. Disconnect the CKF sensor connector, then remove the CKF sensor.



6. Install the CKF sensor in reverse order of removal.

NOTE:

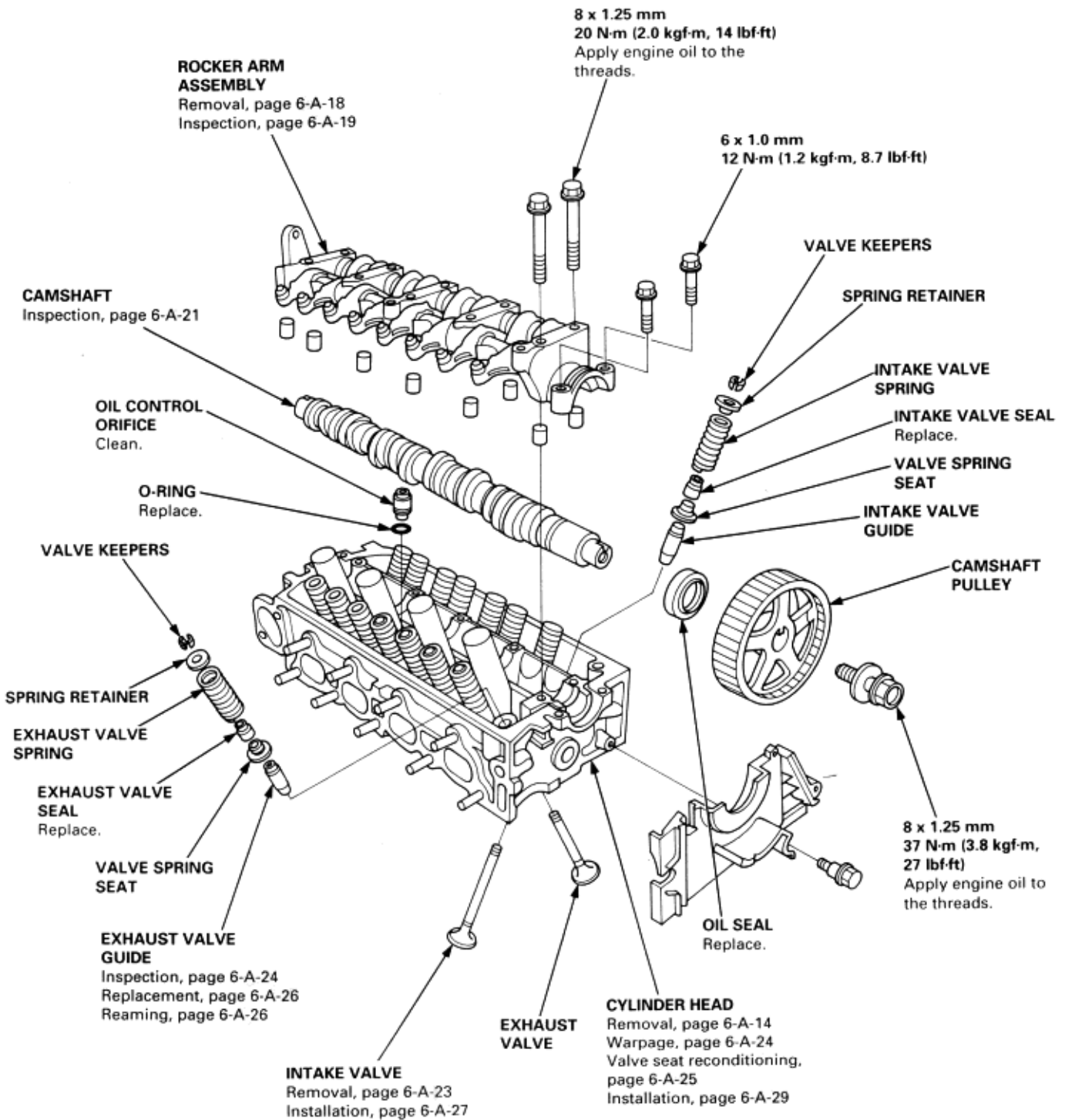
- ♦ To avoid damage, wait until the engine coolant temperature drops below 38°C (100°F) before removing the cylinder head.
- ♦ When handling a metal gasket, take care not to fold it or damage the contact surface.
- ♦ Use new O-rings and gaskets when reassembling.



To go to the page referenced on the diagram above, click on the following:
(See Page 6-A-30)



Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 6-A-18)
- (See Page 6-A-19)
- (See Page 6-A-21)
- (See Page 6-A-24)
- (See Page 6-A-26)
- (See Page 6-A-23)
- (See Page 6-A-27)
- (See Page 6-A-14)
- (See Page 6-A-25)
- (See Page 6-A-29)

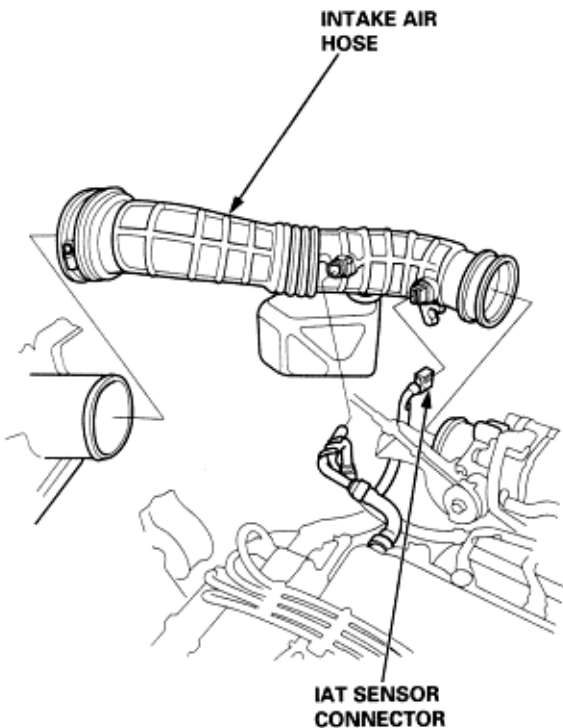
Cylinder Head Removal

6-A-14

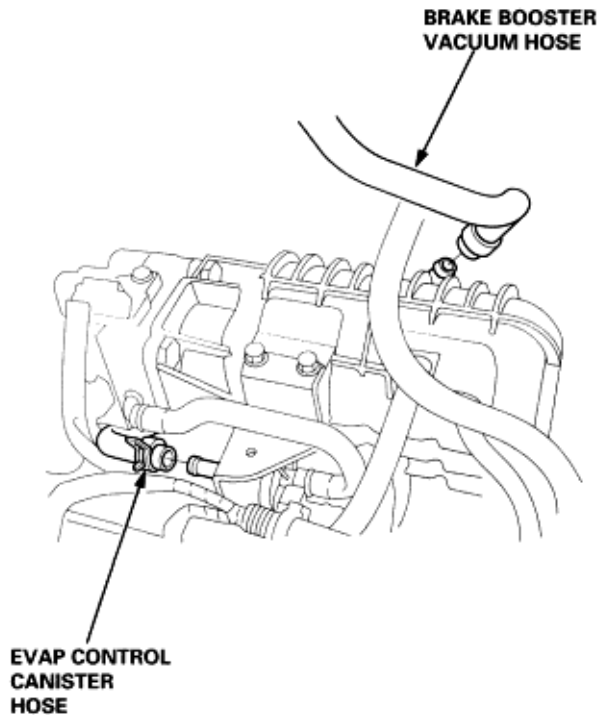
Engine Removal is not required in this procedure.

NOTE:

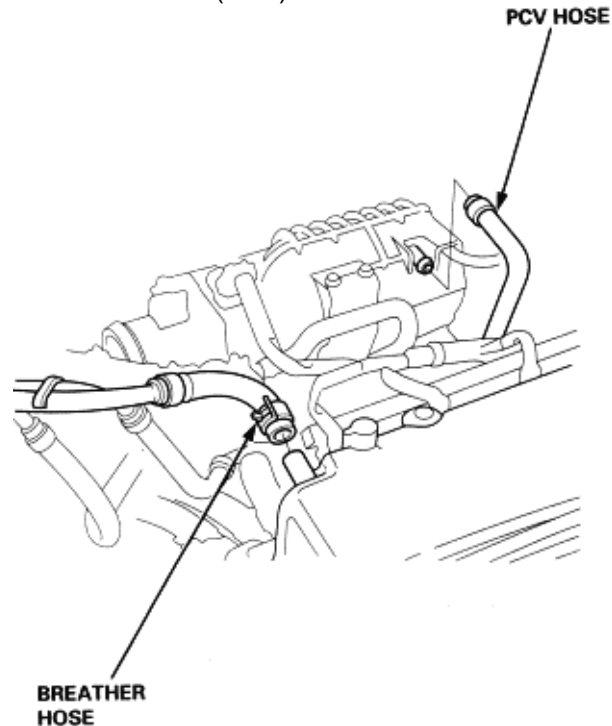
- ♦ Use fender covers to avoid damaging painted surfaces.
 - ♦ To avoid damage, carefully unplug the wiring connectors while holding the connector portion.
 - ♦ To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the retaining bolts.
 - ♦ Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.
1. Secure the hood in the open position.
 2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 3. Disconnect the battery negative terminal first, then the positive terminal.
 4. Drain the engine coolant ([see page 10-7](#)).
 5. Disconnect the intake air temperature (IAT) sensor connector, then remove the intake air duct.



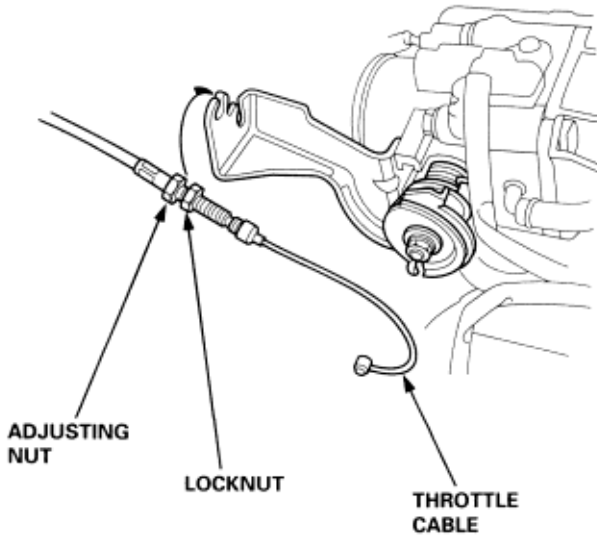
6. Remove the brake booster vacuum hose and evaporative emission (EVAP) control canister hose.



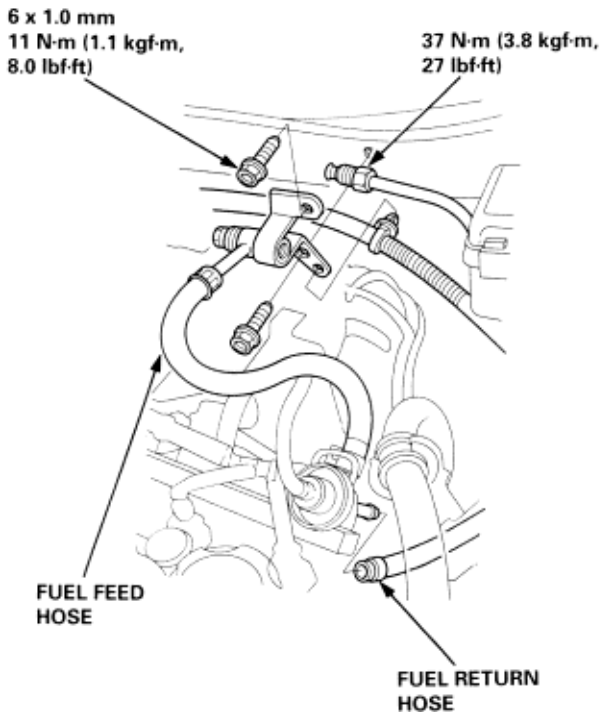
7. Remove the breather hose and positive crankcase ventilation (PCV) hose.



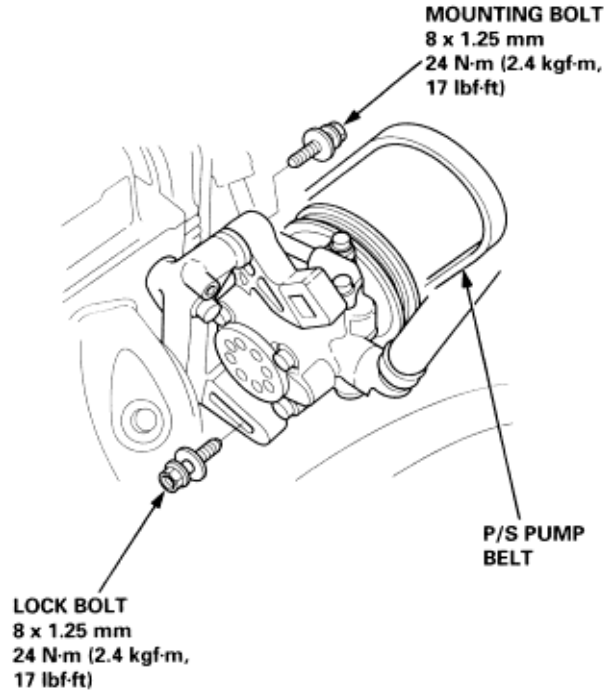
8. Remove the throttle cable by loosening the locknut, then slip the cable ends out of the accelerator linkage. Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.



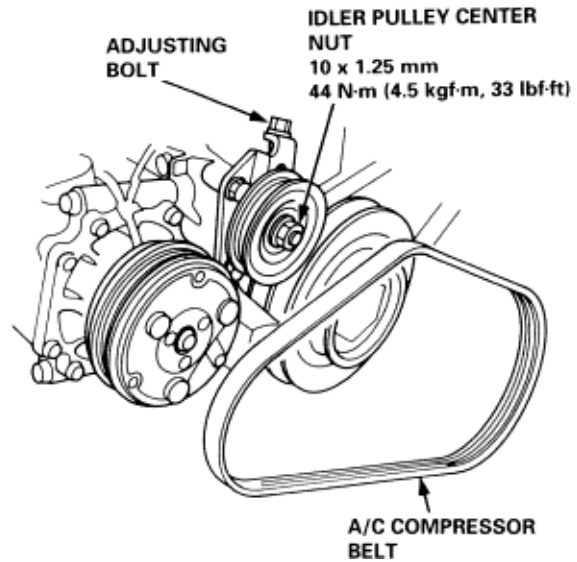
9. Relieve fuel pressure (see section 11).
10. Remove the fuel feed hose and fuel return hose.



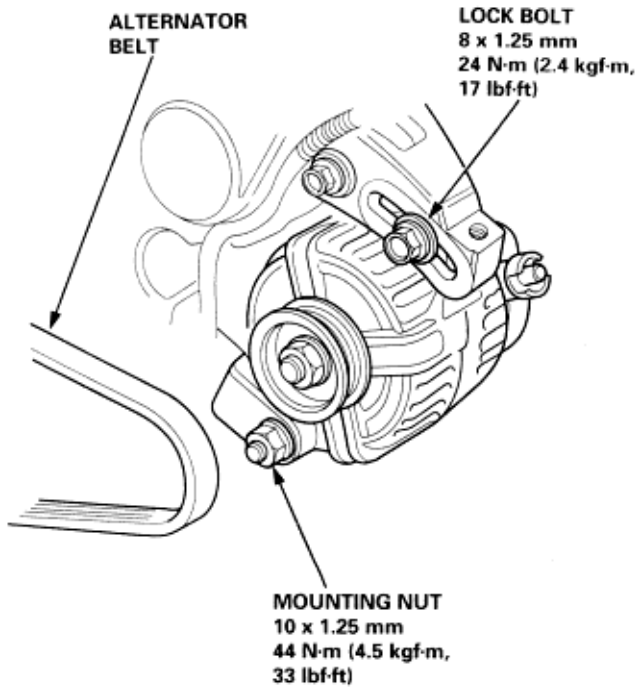
11. Remove the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump without disconnecting the P/S hoses.



12. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt.

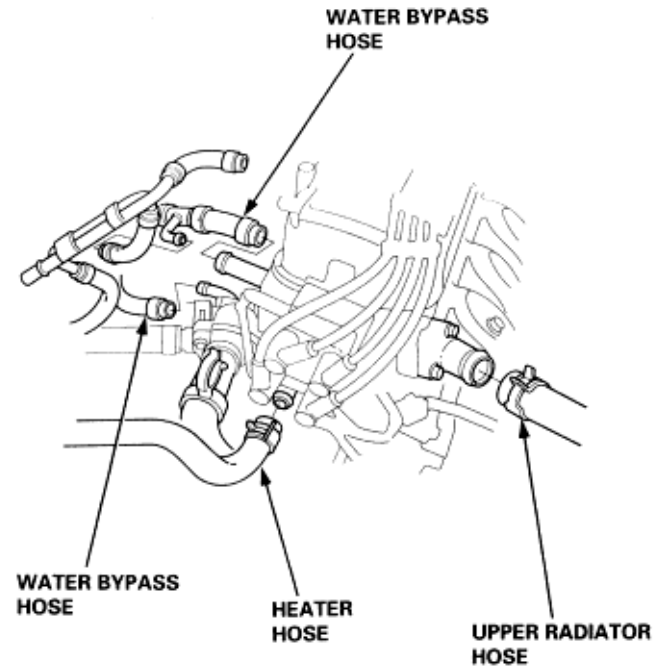


13. Loosen the mounting nut and lock bolt, then remove the alternator belt.



14. Remove the P/S pump bracket (see page 5-17).

15. Remove the upper radiator hose, heater hose and water bypass hoses.

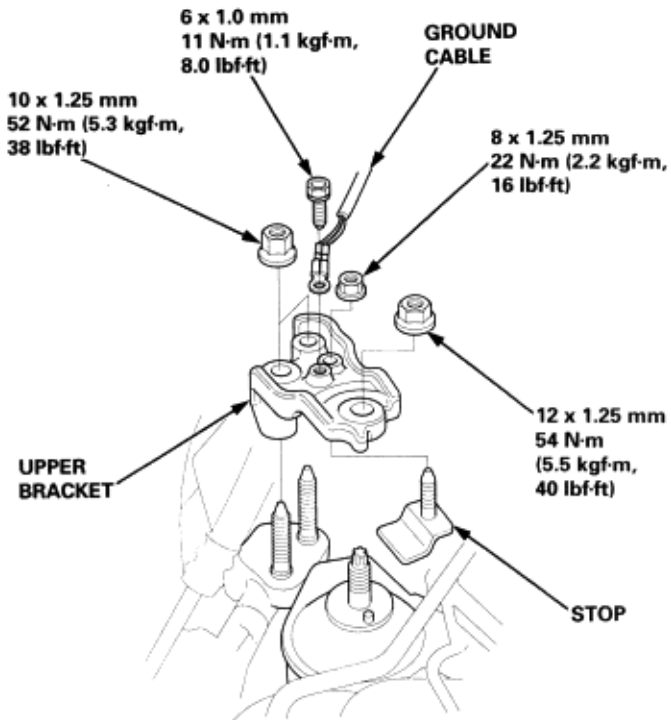


16. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
- ♦ Four injector connectors
 - ♦ Intake air control (IAC) valve connector
 - ♦ Idle air control (IAC) valve connector
 - ♦ Throttle position sensor connector
 - ♦ Manifold absolute pressure (MAP) sensor connector
 - ♦ Engine coolant temperature (ECT) sensor connector
 - ♦ Radiator fan switch connector
 - ♦ Coolant temperature gauge sending unit connector
 - ♦ Heated oxygen sensor (HO2S) connector
17. Remove the spark plug caps and ignition coil from the cylinder head.

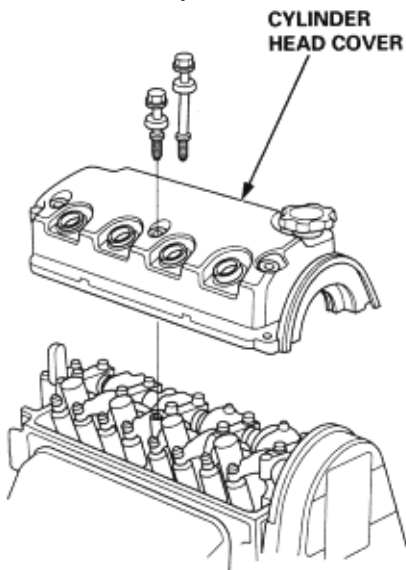
Cylinder Head Removal (cont'd)

6-A-17

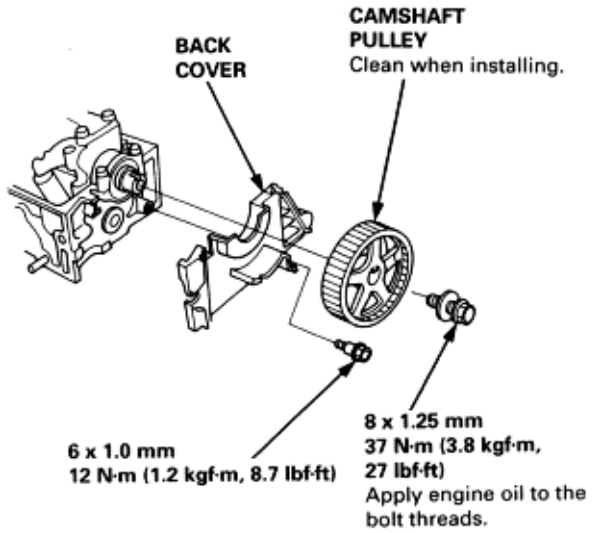
- Support the engine with the jack and wood block under the oil pan.
- Remove the stop and ground cable, then remove the upper bracket.



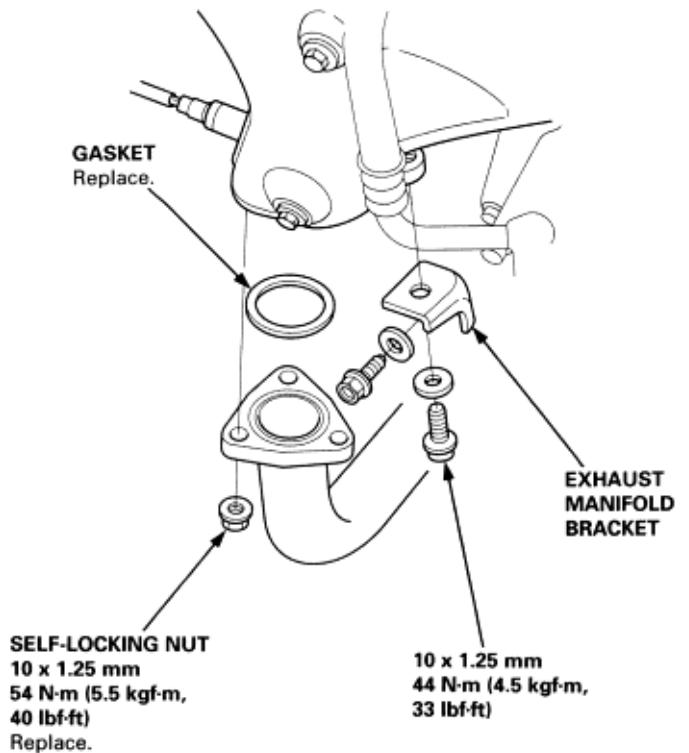
- Remove the cylinder head cover.



- Remove the timing belt (see page 6-A- 8).
- Remove the camshaft pulley and back cover.

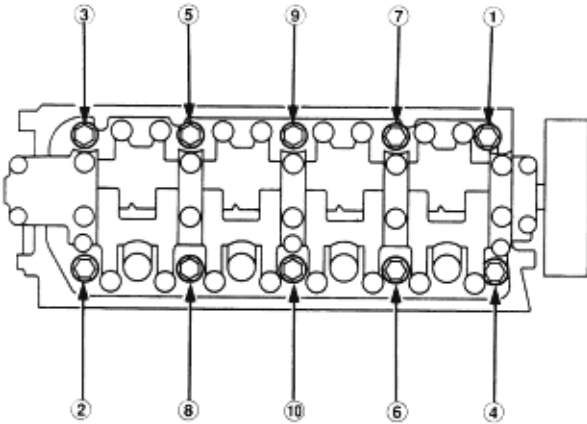


- Remove the exhaust manifold brackets and self-locking nuts.



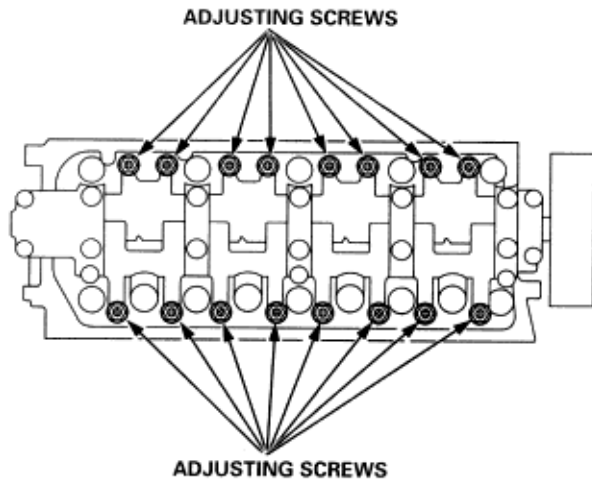
24. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLT LOOSING SEQUENCE:



25. Remove the cylinder head.

1. Loosen the adjusting screws.

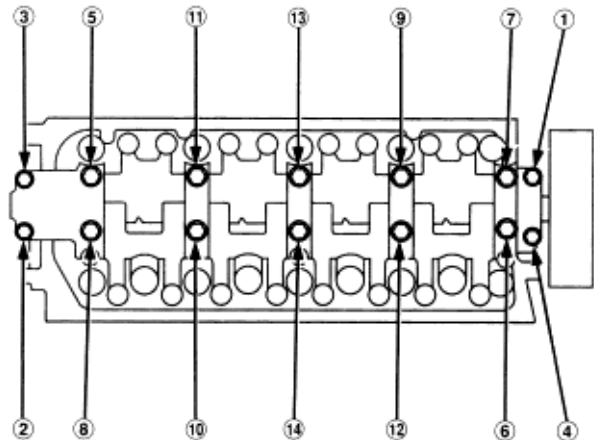


2. Unscrew the camshaft holder bolts, then remove the rocker arm assembly.

NOTE:

- Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
- When removing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the camshaft holders, the springs and the rocker arms on the shaft.

CAMSHAFT HOLDER BOLTS LOOSENING SEQUENCE:

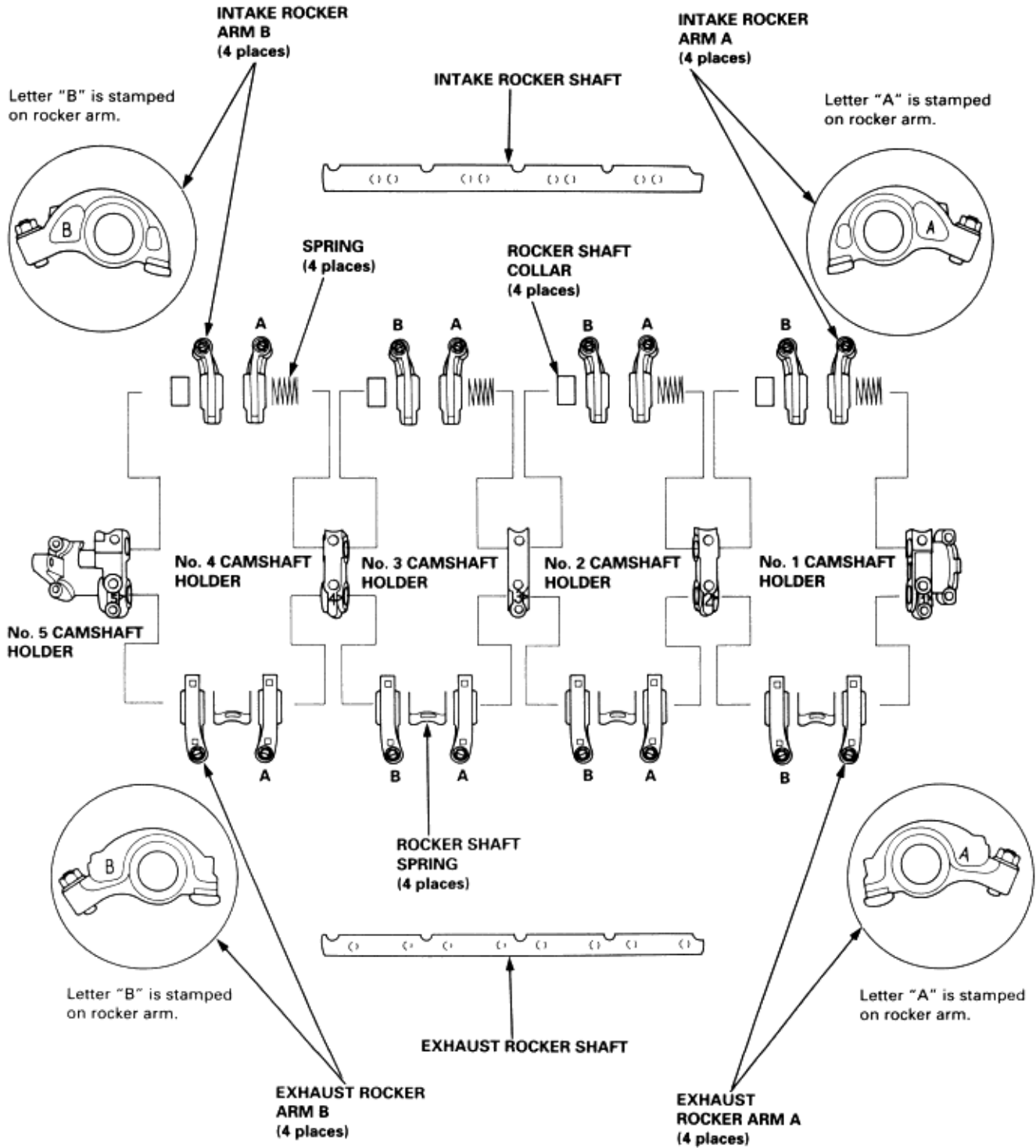


Rocker Arms
Disassembly/Reassembly

6-A-19

NOTE:

- ♦ Identify parts as they are removed to ensure reinstallation in original locations.
- ♦ Inspect rocker shafts and rocker arms ([see page 6-A-20](#)).
- ♦ Rocker arms must be installed in the same position if reused.
- ♦ When removing or installing rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.

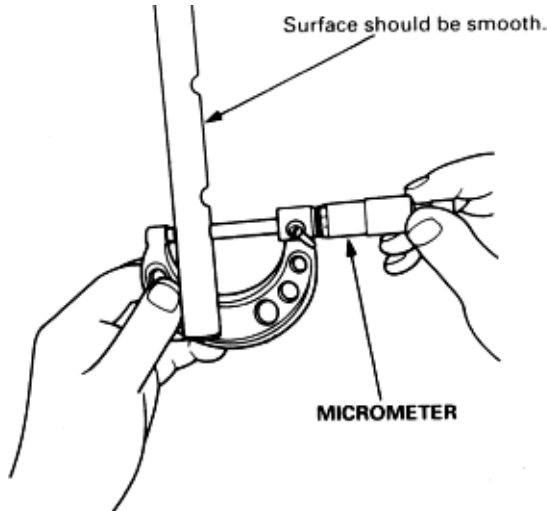


Rocker Arms and Shafts Clearance Inspection

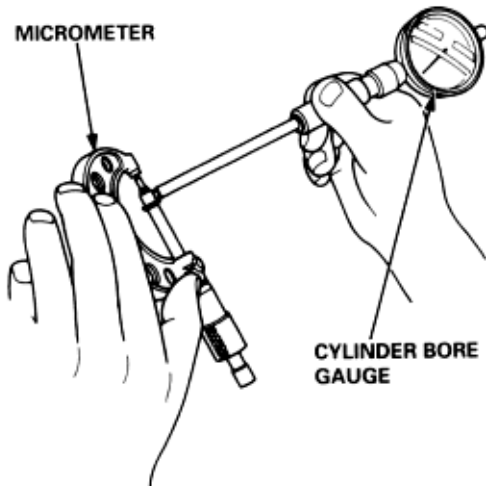
6-A-20

Measure both the intake rocker shaft and exhaust rocker shaft.

1. Measure the diameter of shaft at the first rocker location.



2. Zero the gauge to the shaft diameter.



3. Measure inside diameter of rocker arm and check for out-of-round condition.

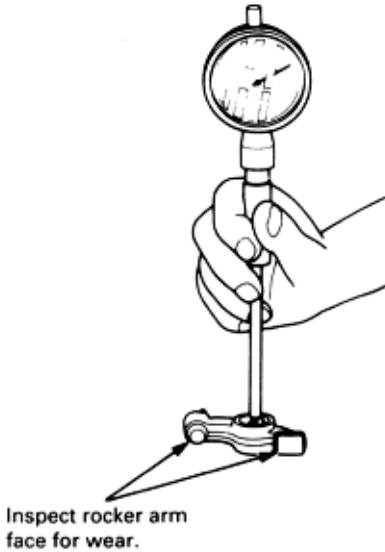
Rocker Arm-to-Shaft Clearance:

Standard (New):

Intake: 0.017 - 0.050 mm
(0.0007 - 0.0020 in)

Exhaust: 0.018 - 0.054 mm
(0.0007 - 0.0021 in)

Service Limit: 0.08 mm (0.003 in)



4. Repeat for all the rockers.
 - If the clearance is over the service limit, replace the rocker shaft and all over tolerance rocker arms.

Camshaft Inspection

6-A-21

NOTE:

- ♦ Do not rotate the camshaft during inspection.
 - ♦ Remove the rocker arms and rocker shafts.
1. Put the camshaft and the camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

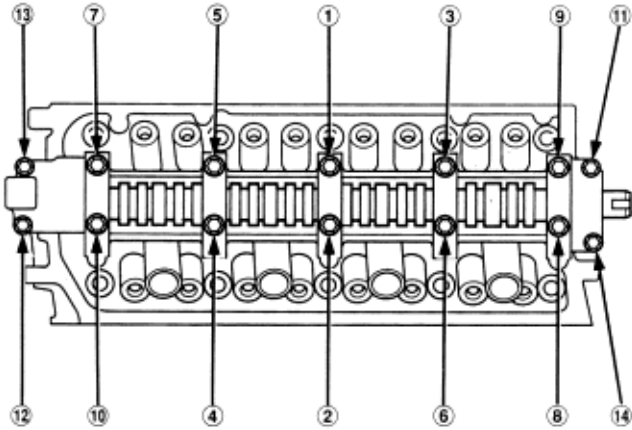
Specified torque:

8 mm bolts: 20 Nm (2.0 kgf/m 14 lbf/ft)

Apply engine oil to the threads.

6 mm bolts: 12 Nm (1.2 kgf/m 8.7 lbf/ft)

6 mm bolts: ⑪, ⑫, ⑬, ⑭

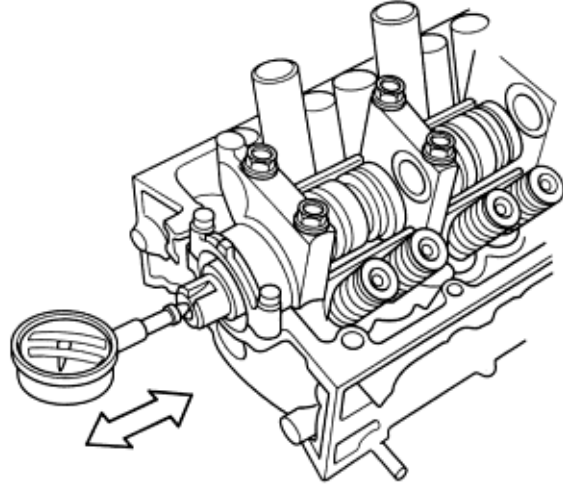


2. Seat the camshaft by pushing it toward the rear of the cylinder head.
3. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth, and read the end play.

Camshaft End Play:

Standard (New): 0.05 - 0.15 mm
(0.002 - 0.006 in)

Service Limit: 0.5 mm (0.02 in)



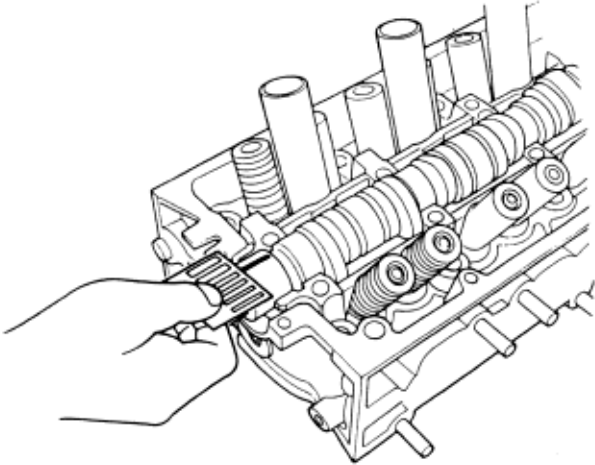
4. Remove the bolts, then remove the camshaft holders from the cylinder head.
 - Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.
 - Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.
 - Insert plastigage strip across each journal.
5. Install the camshaft holders and tighten the bolts to the specified torque.

6. Remove the camshaft holders, then measure the widest portion of the plastigage on each journal.

Camshaft-to-Holder Oil Clearance:

Standard (New): 0.050 - 0.089 mm
(0.002 - 0.004 in)

Service Limit: 0.15 mm (0.006 in)



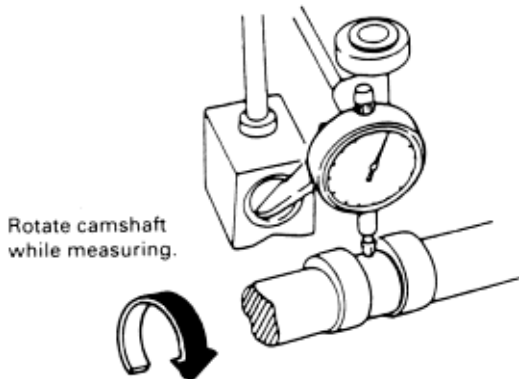
7. If the camshaft-to-holder oil clearance is out of tolerance:

- And the camshaft has already been replaced, you must replace the cylinder head.
- If the camshaft has not been replaced, first check the total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)



- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance, replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

8. Check the cam lobe height wear.

Cam Lobe Height Standard (New):

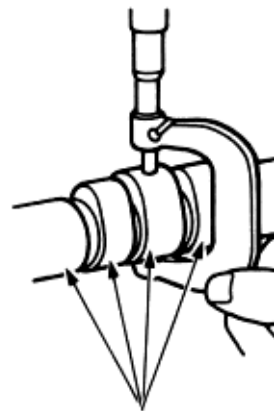
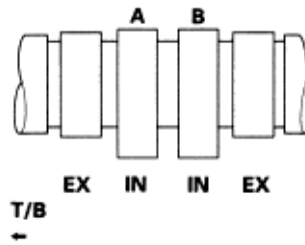
Intake A: 35.019 mm (1.3787 in)

Intake B: 34.734 mm (1.3675 in)

Exhaust: 37.904 mm (1.4923 in)

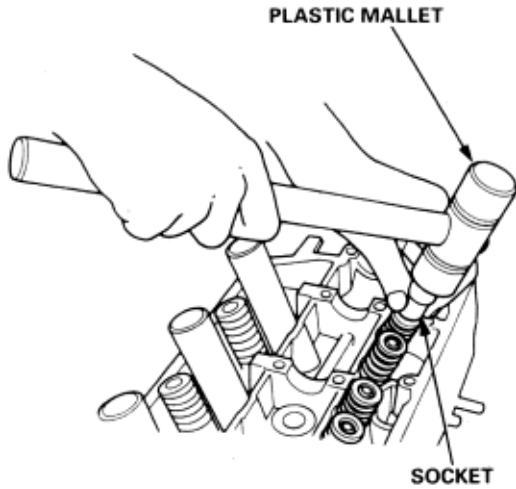
T/B: Timing belt

IN: Intake, **EX:** Exhaust

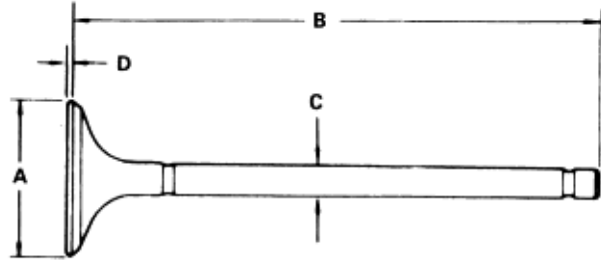
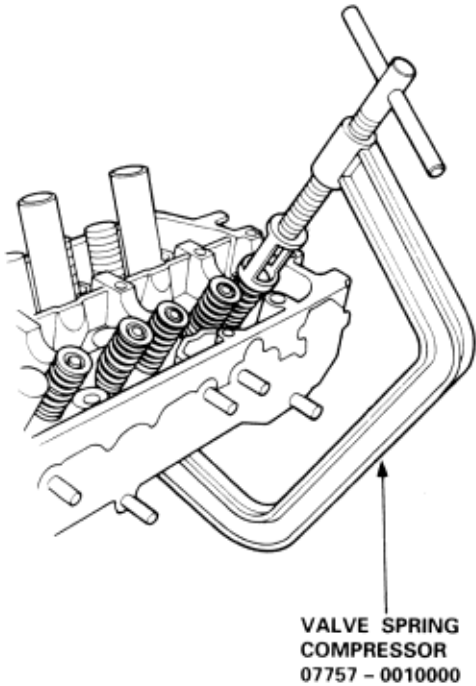


NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Using an appropriate-sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers before installing the valve spring compressor.



2. Install the spring compressor. Compress the spring and remove the valve keeper.



Intake Valve Dimensions

- A Standard (New):** 29.90 - 30.10 mm in
(1.177 - 1.185 in)
- B Standard (New):** 117.42 - 117.72 mm
(4.623 - 4.635 in)
- C Standard (New):** 5.48 - 5.49 mm
(0.2157 - 0.2161 in)
- C Service Limit:** 5.45 mm (0.2146 in)
- D Standard (New):** 0.75 - 1.25 mm
(0.030 - 0.049 in)
- D Service Limit:** 0.55 mm (0.022 in)

Exhaust Valve Dimensions

- A Standard (New):** 25.90 - 26.10 mm
(1.020 - 1.028 in)
- B Standard (New):** 114.60 - 114.90 mm
(4.512 - 4.524 in)
- C Standard (New):** 5.45 - 5.46 mm
(0.2146 - 0.2150 in)
- C Service Limit:** 5.42 mm (0.2134 in)
- D Standard (New):** 0.95 - 1.45 mm
(0.037 - 0.057in)
- D Service Limit:** 0.85 mm (0.033 in)

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.04 - 0.10 mm
(0.002 - 0.004 in)

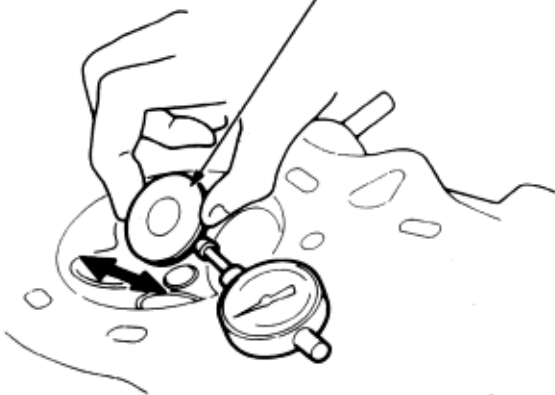
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.10 - 0.16 mm
0.004 - 0.006 in)

Service Limit: 0.22 mm (0.009 in)

Valve extended 10 mm out from seat.



- ♦ If measurement exceeds the service limit, recheck using a new valve.
- ♦ If measurement is now within the service limit, reassemble using a new valve.
- ♦ If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.02 - 0.05 mm
(0.001 - 0.002 in)

Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.05 - 0.08 mm
(0.002 - 0.003 in)

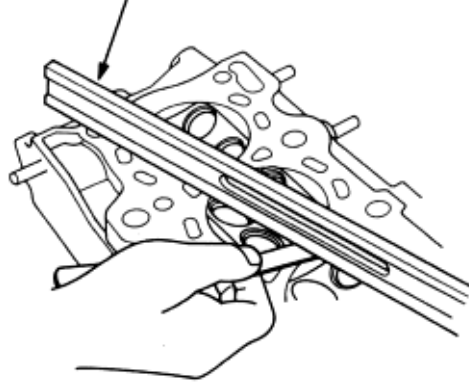
Service Limit: 0.11 mm (0.004 in)

NOTE: If the camshaft-to-holder oil clearances (see page 6-A-21) are not within specification, the cylinder head cannot be resurfaced.

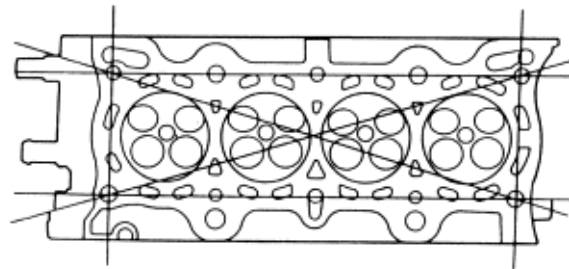
If the camshaft-to-holder oil clearances are within specifications, check the cylinder head for warpage.

- ♦ If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- ♦ If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface cylinder head.
- ♦ Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 93 mm (3.66 in).

PRECISION STRAIGHT EDGE



Measure along edges, and three ways across center.

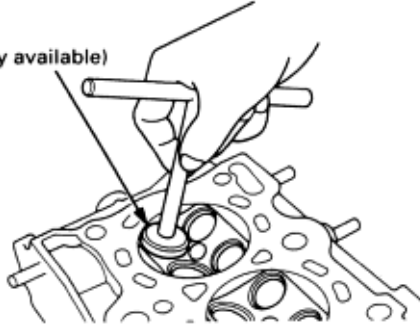


Cylinder Head Height:

Standard (New): 92.95 - 93.05 mm
(3.659 - 3.663 in)

1. Renew the valve seats in the cylinder head using a valve seat cutter.
NOTE: If the guides are worn (**see page 6-A-24**) replace them (**see page 6-A-26**) before cutting the valve seats.

VALVE SEAT CUTTER
(Commercially available)



2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of seat and adjust accordingly.
4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

Valve Seat Width:

Standard (New):

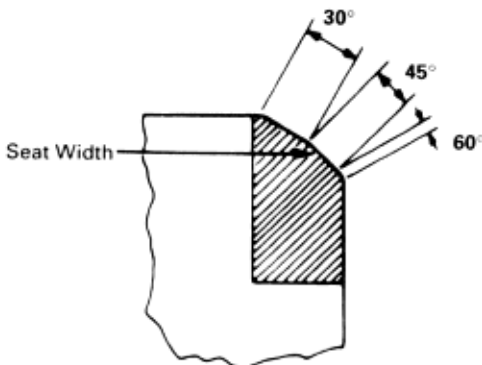
Intake: 0.85 - 1.15 mm (0.033 - 0.045 in)

Exhaust: 1.25 - 1.55 mm (0.049 - 0.061 in)

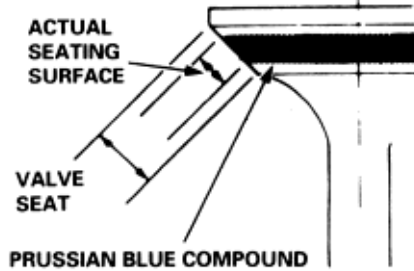
Service Limit:

Intake: 1.6 mm (0.063 in)

Exhaust: 2.0 mm (0.079 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face, and insert the valve in its original location in the head, then lift and snap it closed against the seat several times.

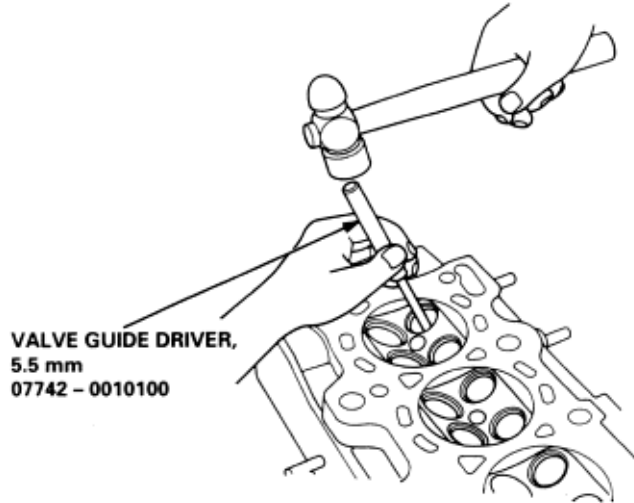


6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
 - ♦ If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
 - ♦ If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.NOTE: The final cut should always be made with the 45° cutter.
7. Insert the intake and exhaust valves in the head and measure the valve stem installed height.
Intake, Exhaust Stem Installed Height:
Standard (New): 53.17 - 53.64 mm (2.093 - 2.112 in)
Service Limit: 53.89 mm (2.122 in)
8. If the valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.



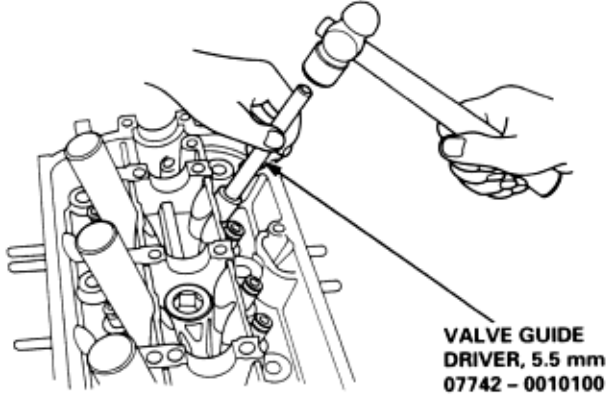
NOTE:

- ♦ For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
 - ♦ It may be necessary to use an air hammer to remove some valve guides.
1. Drive the valve guide out from the bottom of the cylinder head.



**VALVE GUIDE DRIVER,
5.5 mm
07742 - 0010100**

2. Drive in a new valve guide to the specified depth.

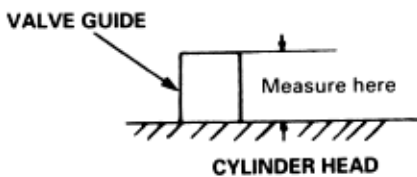


**VALVE GUIDE
DRIVER, 5.5 mm
07742 - 0010100**

Valve Guide Installed Height:

Intake: 17.85 - 18.35 mm (0.703 - 0.722 in)

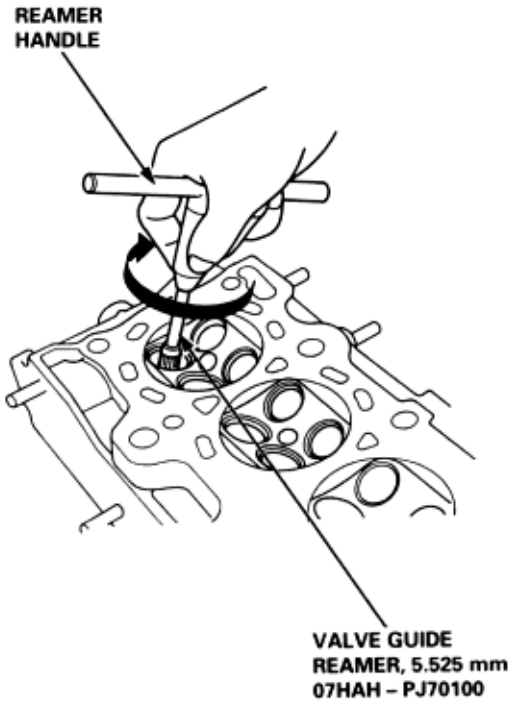
Exhaust: 18.65 - 19.15 mm (0.734 - 0.754 in)



NOTE: For new valve guides only.

1. Coat both the reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check the clearance with a valve (**see page 6-A-24**).
 - Verify that the valve slides in the valve guide without exerting pressure.

Turn reamer in
clockwise direction
only.



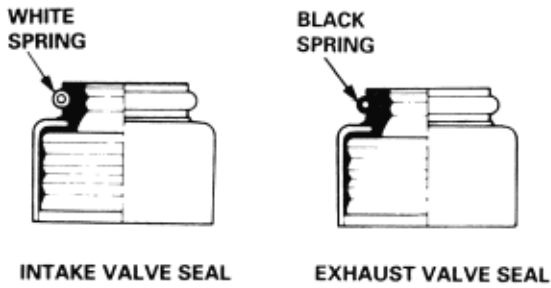
**REAMER
HANDLE**

**VALVE GUIDE
REAMER, 5.525 mm
07HAH - PJ70100**

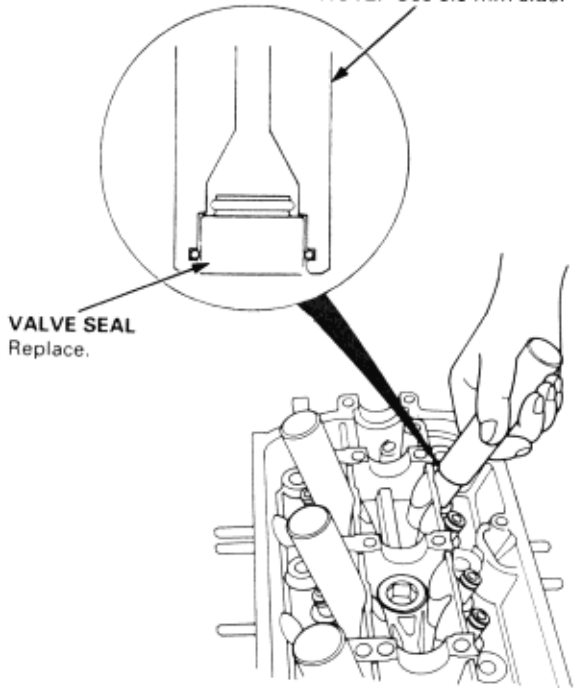
Valves, Valve Springs and Valve Seats Installation

6-A-27

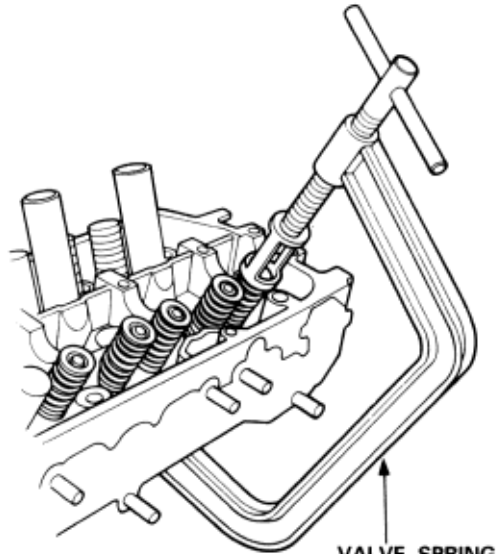
1. Insert the valves into the valve guides coat the valve stems with engine oil before inserting the valves.
NOTE: Check the valves move up and down smoothly.
2. Install the spring seats on the cylinder head.
3. Install the valve seals using the special tool.
NOTE: Exhaust and intake valve seal are not interchangeable.



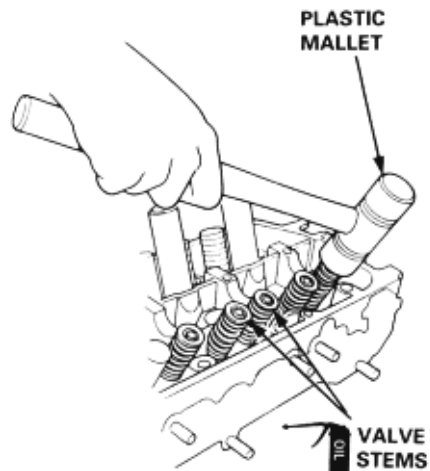
STEM SEAL DRIVER,
07PAD - 0010000
NOTE: Use 5.5 mm side.



4. Install the valve spring and valve retainer, then install the valve spring compressor. Compress the spring, and install the valve keepers.
NOTE: Place the end of valve spring with closely wound coils toward the cylinder head.



5. Lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.
NOTE: Tap the valve stem only along its so you do not bend the stem.

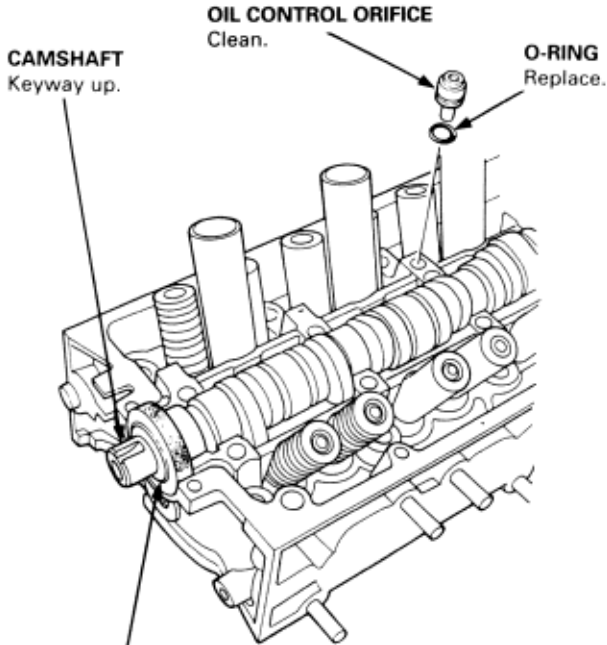


Camshaft/Rocker Arms and Camshaft Seal/Pulley Installation

6-A-28

NOTE:

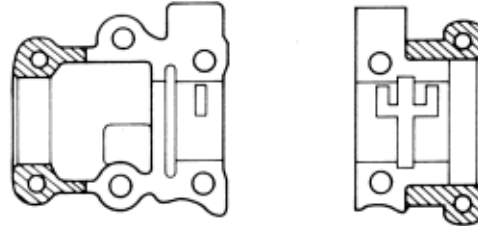
- ♦ Make sure that all rockers are in alignment with valves when torquing rocker assembly bolts.
 - ♦ Valve locknuts should be loosened and adjusting screws backed off before installation.
 - ♦ To prevent rocker arm assembly from coming apart, leave camshaft holder bolts in the holes.
1. After wiping down the camshaft, camshaft seal and journals in the cylinder head, lubricate both surfaces and install the camshaft.
 2. Clean and install the oil control orifice with new O-ring.



CAMSHAFT SEAL
Seal housing surface should be dry.
Apply a light coat of oil to camshaft and inner lip of seal.

3. Turn the camshaft until its keyway is facing up (No. 1 piston TDC).

4. Apply liquid gasket (P/N 08C70 - K0234M, 08C70 - K0334M, or 08C70 - X0331S) to the head mating surfaces of the No. 1 and No. 5 camshaft holders. **NOTE:** Clean and dry the cylinder head mating surfaces before applying liquid gasket.
 - Apply liquid gasket to the shaded areas.



5. Set the rocker arm assembly in place and loosely install the bolts.
 - Make sure that the rocker arms are properly positioned on the valve stems.
6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

NOTE: Wipe off the excess of liquid gasket from No. 1 and No. 5 camshaft holders with a shop towel.

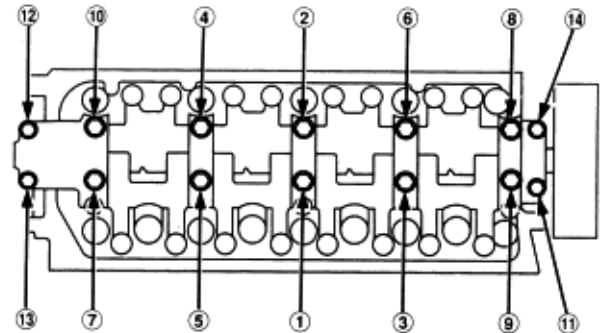
Specified torque:

8 mm bolts: 20 Nm (2.0 kgf/m, 14 lbf/ft)

Apply engine oil to the threads.

6 mm bolts: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)

6 mm bolts: ⑪, ⑫, ⑬, ⑭

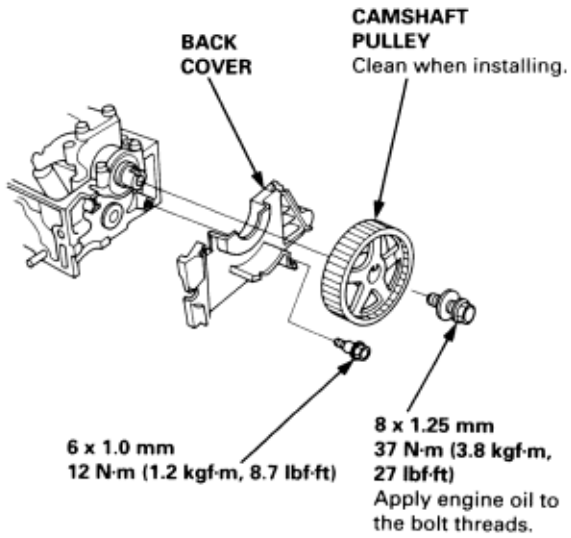


**Camshaft/Rocker Arms and Camshaft
Seal/Pulley
Installation (cont'd)**

6-A-29

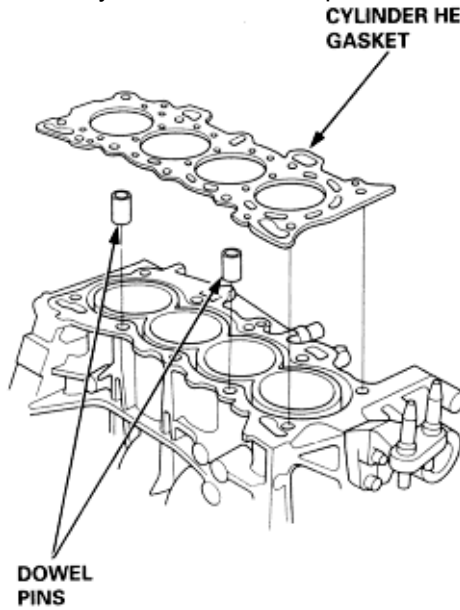
**Cylinder Head
Installation**

7. Install the back cover, then install the camshaft pulley.



Install the cylinder head in the reverse order of removal:
NOTE:

- ♦ Always use a new head gasket.
 - ♦ Cylinder head and cylinder block surface must be clean.
 - ♦ "UP" mark on camshaft pulley should be at the top.
 - ♦ Turn the crankshaft so the No. 1 piston is at TDC (see page 6-A-9).
 - ♦ Clean the oil control orifice before installing.
 - ♦ Do not use the upper cover and lower cover for storing items disassembled.
 - ♦ Clean the upper cover and lower cover before installation.
1. Cylinder head dowel pins must be aligned.

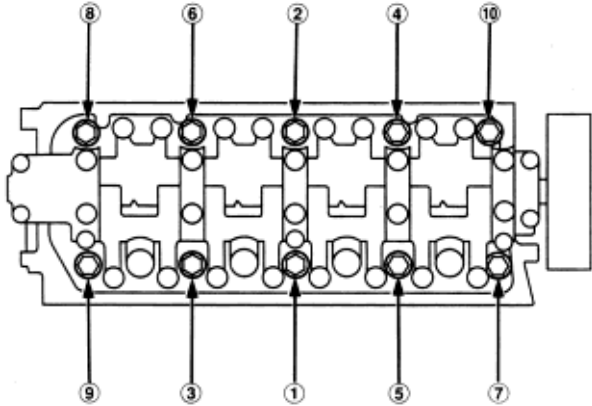


2. Position the camshaft correctly (see page 6-A-9).
3. Tighten the cylinder head bolts sequentially in four steps.
1st step: (1) - (10) 20 Nm (2.0 kgf/m, 14 lbf/ft)
2nd step: (1) - (10) 49 Nm (5.0 kgf/m, 36 lbf/ft)
3rd step: (1) - (10) 67 Nm (6.8 kgf/m, 49 lbf/ft)
4th step: (1),(2) 67 Nm (6.8 kgf/m, 49 lbf/ft)

NOTE:

- ♦ We recommend using a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
- ♦ If a bolt makes any noise while you are torquing it, loosen the bolt, and retighten it from the 1st step.

CYLINDER HEAD BOLT TORQUE SEQUENCE:

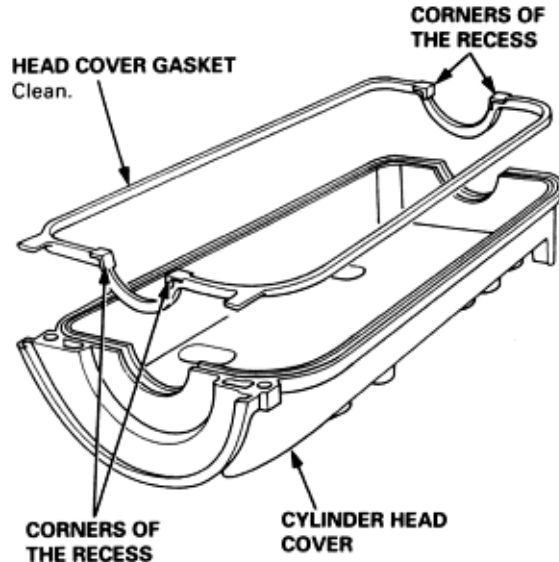


4. Install the exhaust manifold bracket, then install the exhaust pipe A and the bracket, and then install the cover.

5. Install the timing belt (see page 6-A-9).
6. Adjust the valve clearance (see page 6-A-3).
7. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:

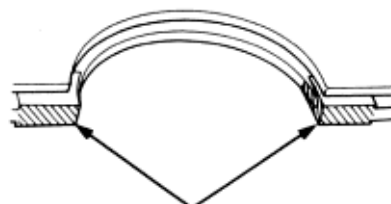
- ♦ Before installing the head cover gasket, thoroughly clean the seal and the groove.
- ♦ When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.



8. Apply liquid gasket to the head cover gasket at the four corners of the recesses.

NOTE:

- ♦ Use liquid gasket, Part No. 08C70 - K0234M, 08C70 - K0334M or 08C70 - X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.



Apply liquid gasket to the shaded areas.

Cylinder Head Installation (cont'd)

6-A-31

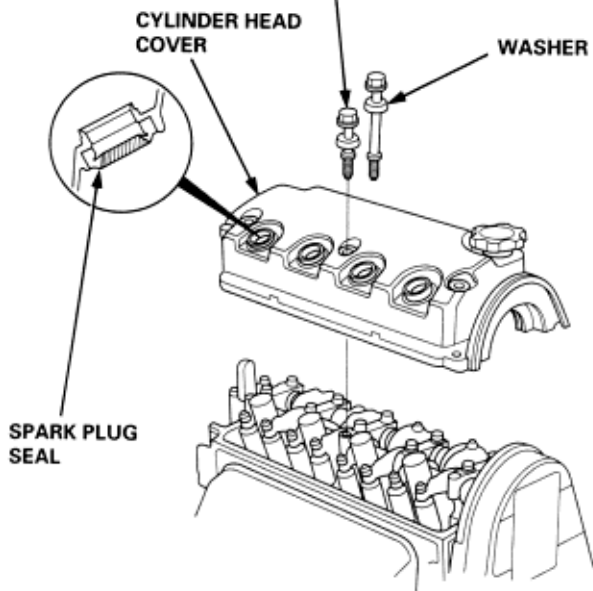
9. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).

Set the spark plug seal on the spark plug pipe. Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

NOTE:

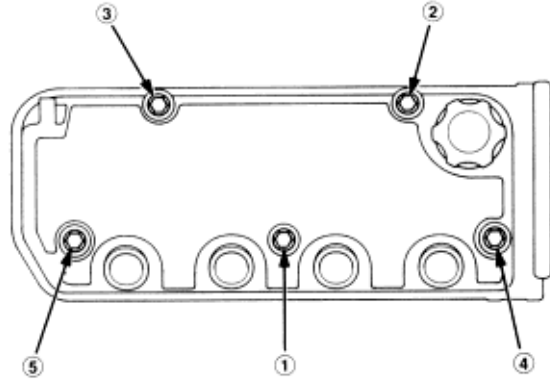
- ♦ Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
- ♦ Do not touch the parts where liquid gasket was applied.
- ♦ Take care not to damage the spark plug seal when installing the cylinder head cover.
- ♦ Visually check the spark plug seal for damage.
- ♦ Replace the washer when damaged or deteriorated.

6 x 1.0 mm
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)



10. Tighten the nuts in two or three steps. In the final step, tighten all bolts, in sequence, to 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft).

NOTE: After assembly, wait at least 30 minutes before filling the engine with oil.



11. After installation, check that all tubes, hoses and connectors are installed correctly.
12. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Special Tools

6-B-2

Ref No.	Tool Number	Description	Qty	Remark
1	07HAH - PJ70100	Valve Guide Reamer, 5.525 mm	1	
2	07JAA - 0010200	Socket Wrench, 19 mm	1	
3	07JAB - 0010200	Handle	1	
4	07LAG - PT20100	Balancer Shaft Lock Pin	1	
5	07LAJ - PR30101	Valve Inspection Set	1	
6	07LAJ - PR30201	Air Stopper	1	
7	07MAB - PY30100	Pulley Holder Attachment, HEX 50mm	1	
8	07NAJ - P070100	Oil Pressure Gauge Attachment	1	
9	07PAD - 0010000	Stem Seal Driver	1	
10	07406.-.0070001	Low Pressure Gauge	1	
11	07742 - 0010100	Valve Guide Driver, 5.5 mm	1	
12	07757 - 0010000	Valve Spring Compressor	1	



①



②



③



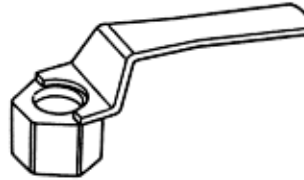
④



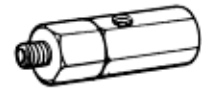
⑤



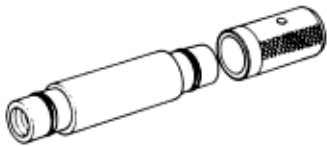
⑥



⑦



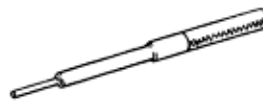
⑧



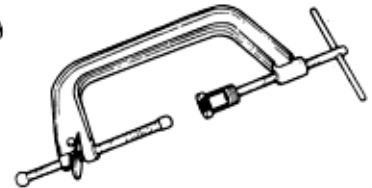
⑨



⑩



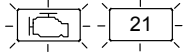
⑪



⑫

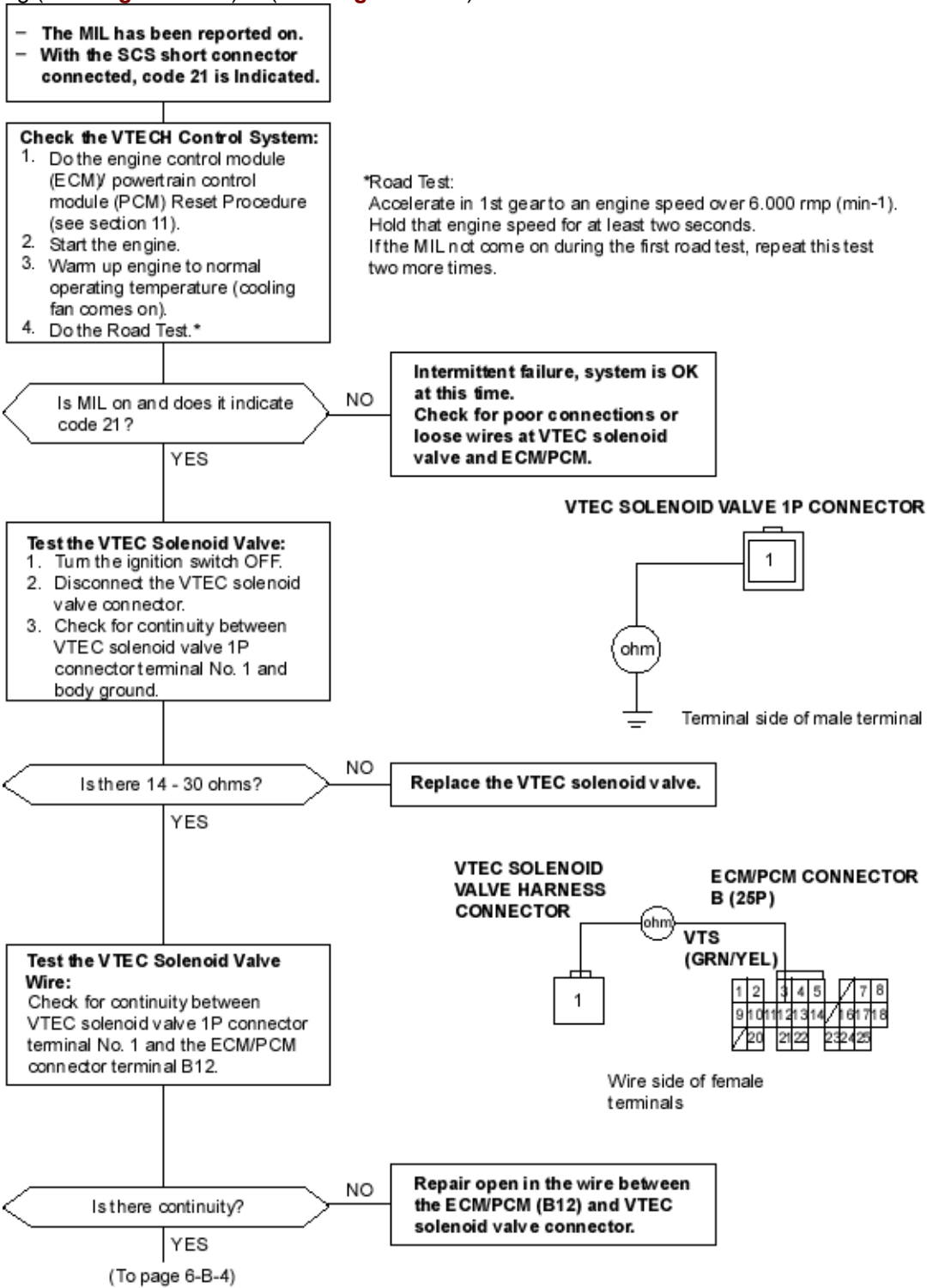
**Variable Valve Timing and Valve Lift
Electronic Control (VTEC) Control System
Troubleshooting Flowchart (F18B2, F18B3 engines)**

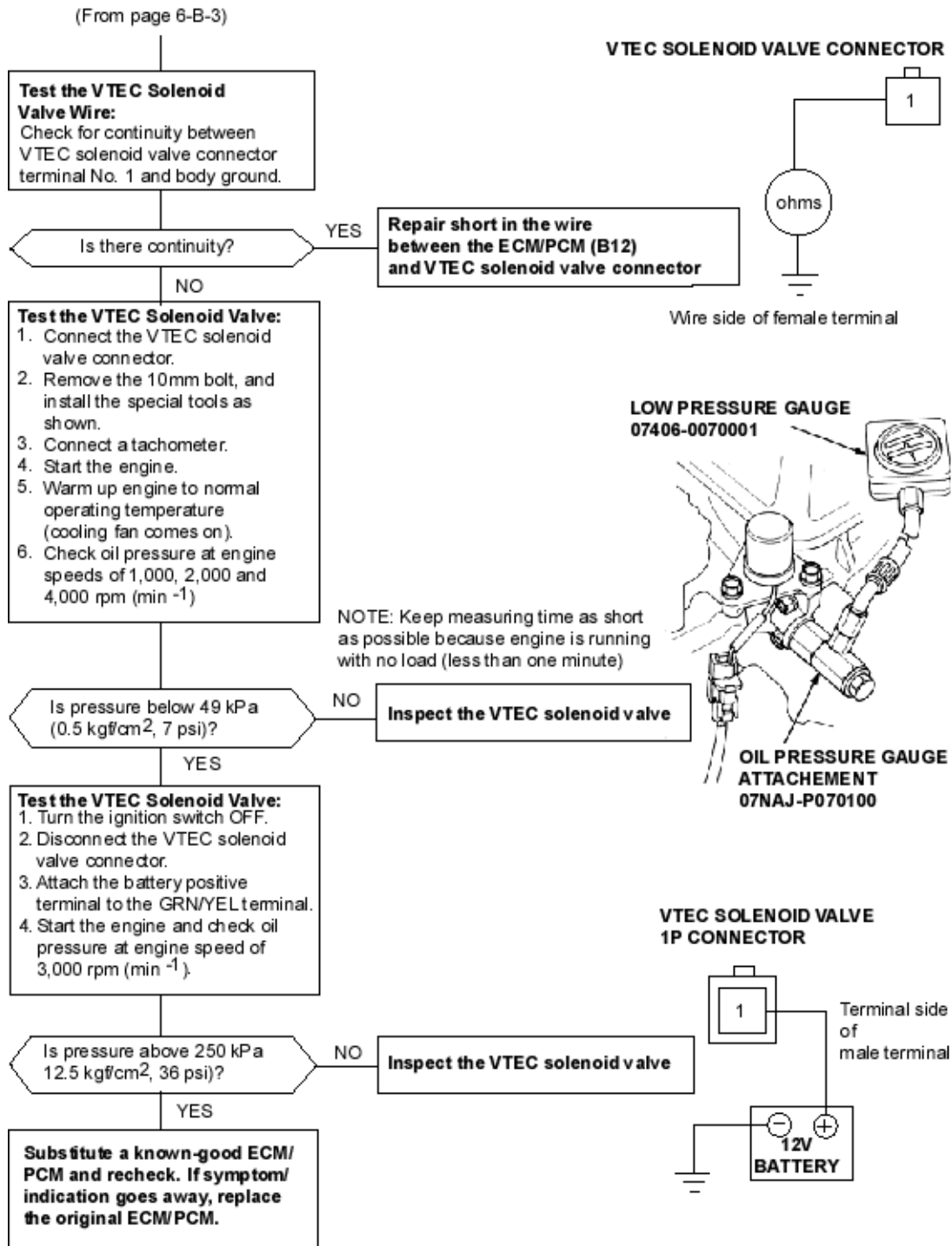
6-B-3



Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 21: A problem in the VTEC Solenoid Valve circuit.

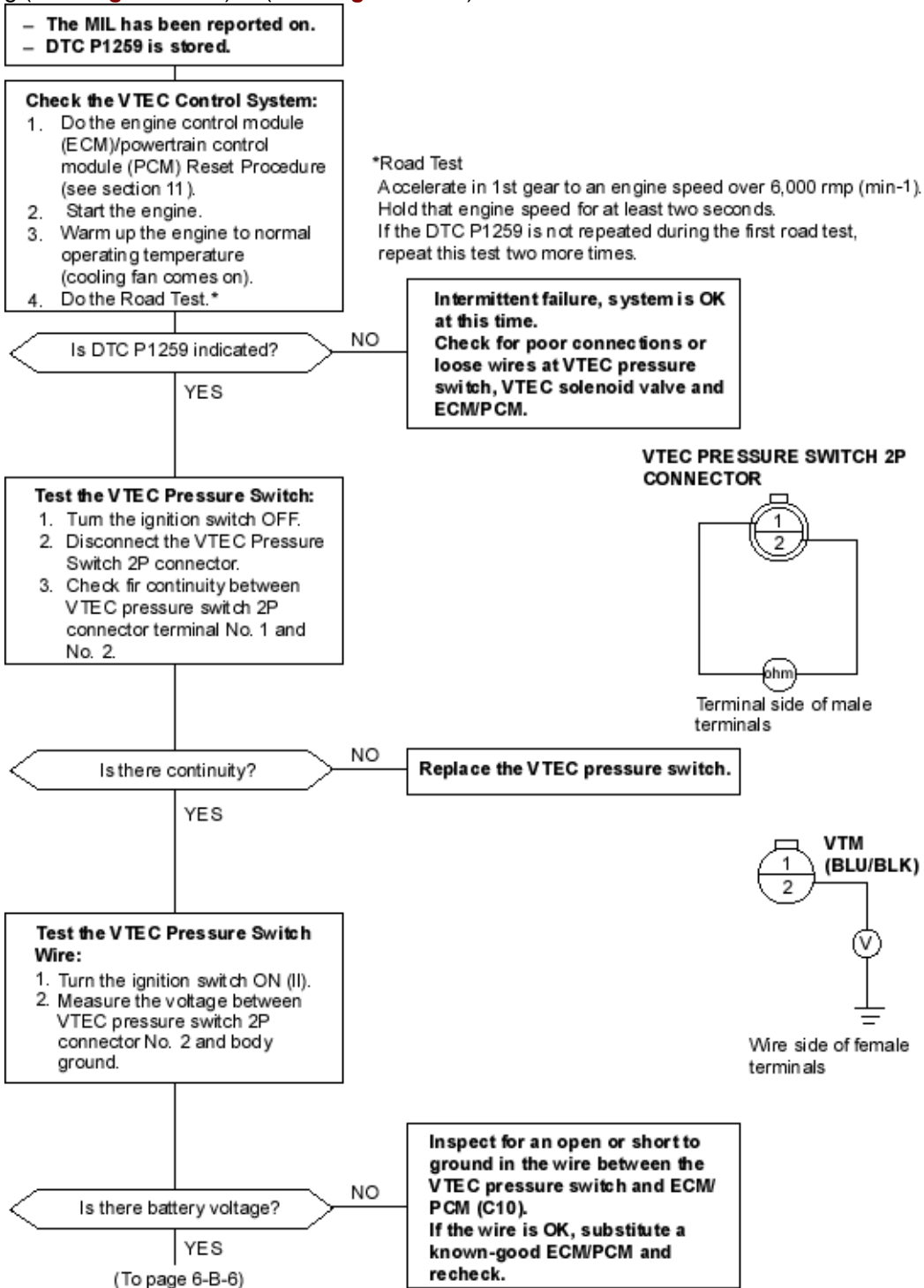
Before troubleshooting (See Page 11-A-15) to (See Page 11-A-20).

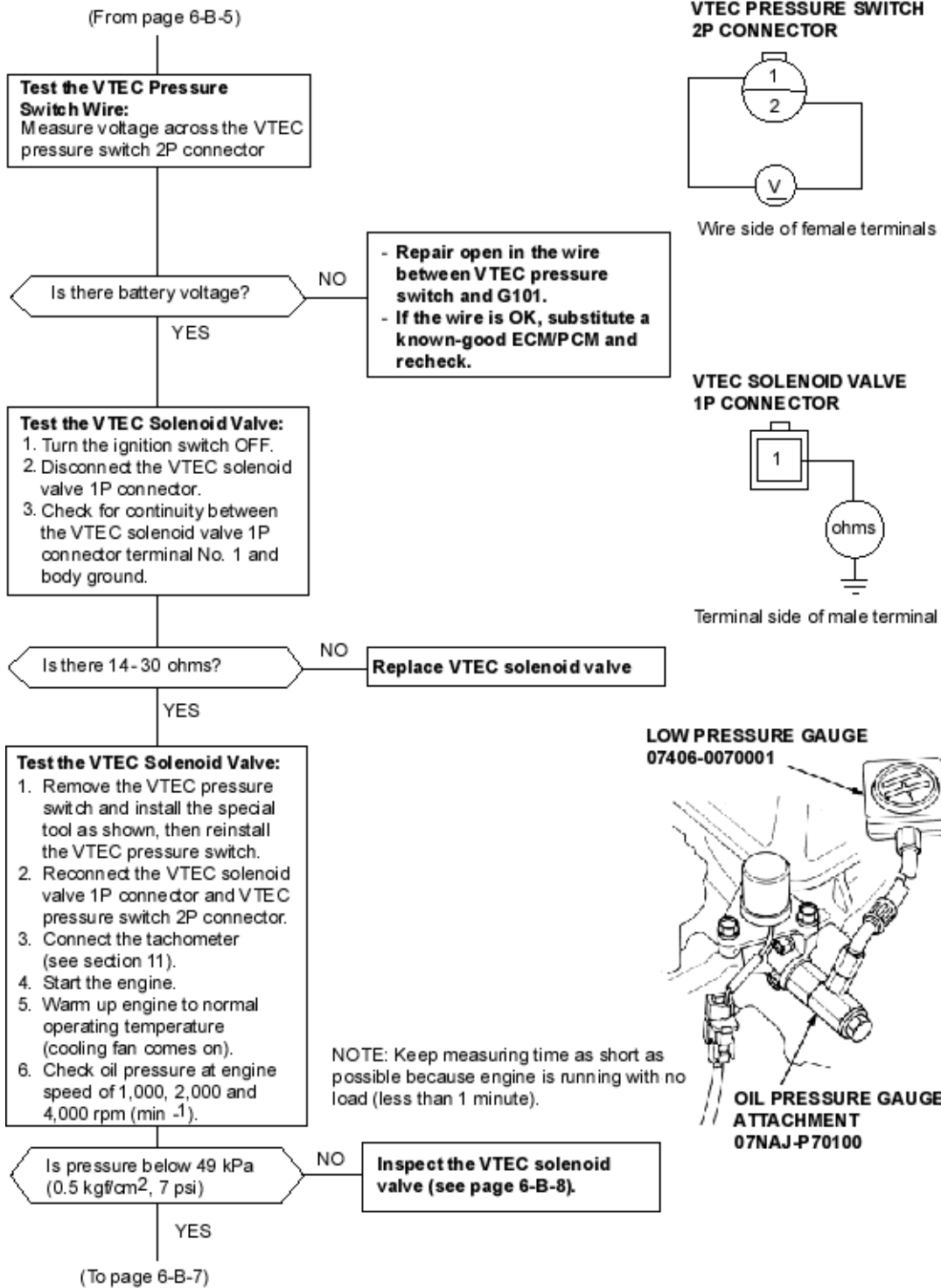


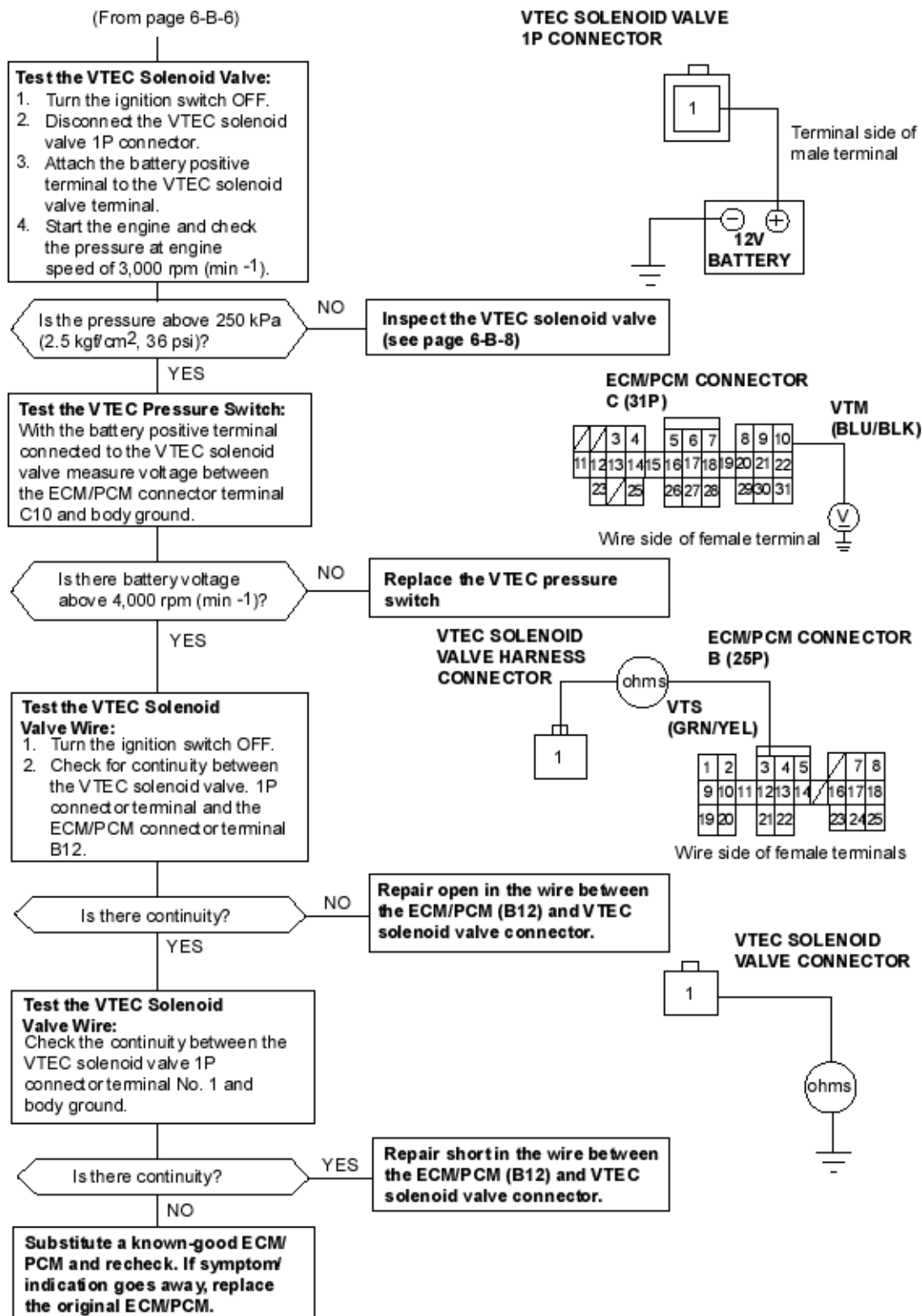


P1259 The scan tool indicates Diagnostic Trouble Code (DTC) P1259: A problem in the VTEC Pressure Switch circuit or VTEC Solenoid Valve circuit.

Before troubleshooting (See Page 11-A-15) to (See Page 11-A-20).







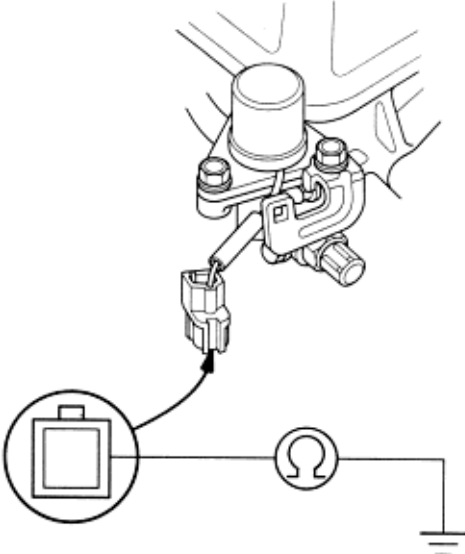
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-8)

VTEC Solenoid Valve Inspection

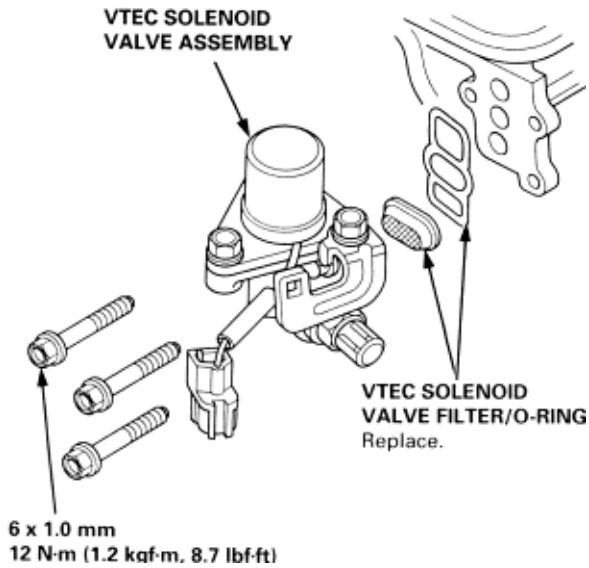
6-B-8

1. Disconnect the 1P connector from the VTEC solenoid valve.
2. Measure resistance between the terminal and body ground.

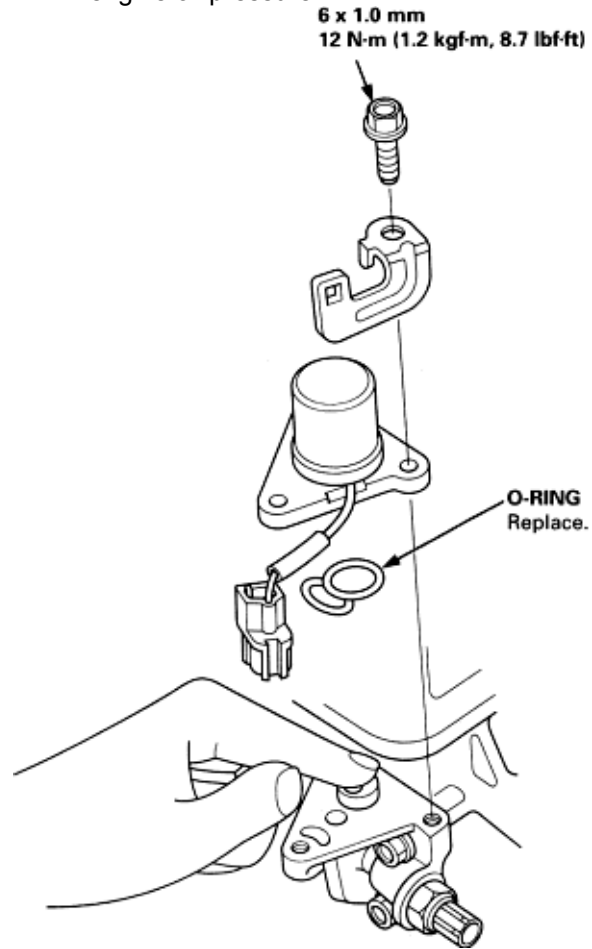
Resistance: 14 – 30 Ω



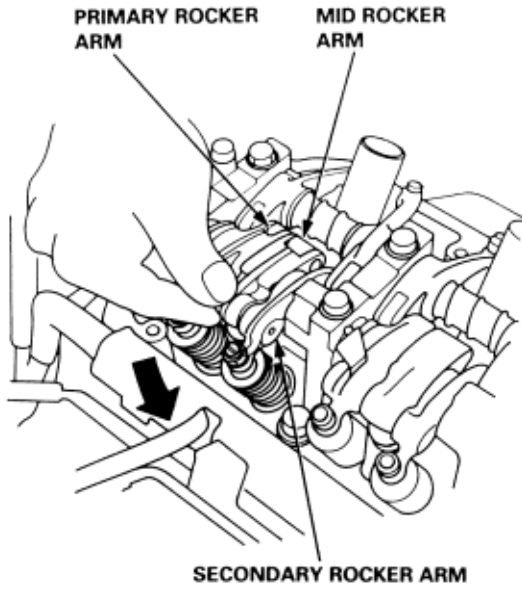
3. If the resistance is within specifications, remove the VTEC solenoid valve assembly from the cylinder head, and check the VTEC solenoid valve filter/O-ring for clogging. If there is clogging, replace the engine oil filter and the engine oil.



4. If the filter is not clogged, push the VTEC solenoid valve with your finger and check its movement. If the VTEC solenoid valve is normal, check the engine oil pressure.



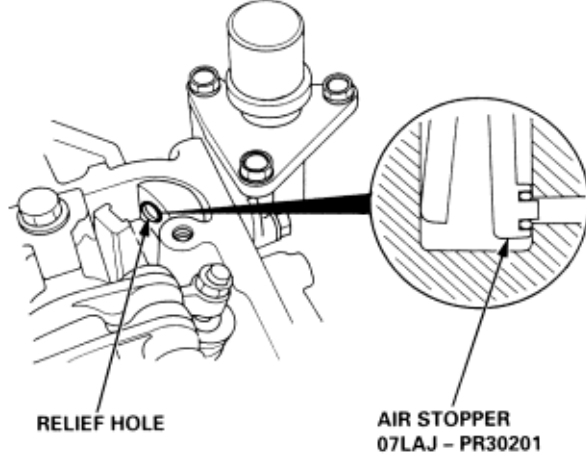
1. Set the No. 1 piston at TDC.
2. Remove the cylinder head cover.
NOTE: When installing the cylinder head cover (**See Page 6-B-45**) and (**See Page 6-B-46**).
3. Push the intake mid rocker arm on the No. 1 cylinder manually.
4. Check that the intake mid rocker arm moves independently of the primary and secondary intake rocker arms.



5. Check the intake mid rocker arm of each cylinder at TDC.
 - ♦ If the intake mid rocker arm does not move, remove the mid, primary and secondary intake rocker arms as an assembly, and check that the pistons in the mid and primary rocker arms move smoothly.
 - ♦ If any rocker arm needs replacing, replace the primary, mid, and secondary rocker arms as an assembly.

NOTE:

- ♦ Before using the Valve Inspection Tool, make sure that the air pressure gauge on the air compressor indicates over 400 kPa (4 kgf/cm², 57 psi).
 - ♦ Inspect the valve clearance before rocker arm inspection.
 - ♦ Cover the timing belt with a shop towel to protect the belt.
 - ♦ Check the intake primary rocker arm of each cylinder at TDC.
1. Remove the cylinder head cover.
NOTE: When installing the cylinder head cover (**See Page 6-B-45**) and (**See Page 6-B-46**).
 2. Plug the relief hole with the special tool.



VTEC Rocker Arms

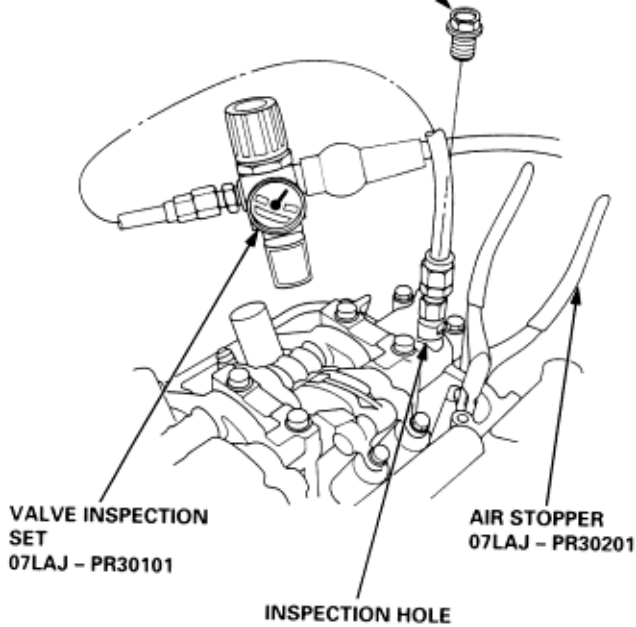
Inspection Using Special Tools (cont'd)

6-B-10

3. Remove the sealing bolt from the inspection hole, and connect the special tool.

NOTE: Remove any oil from the bolt threads and camshaft holder threads before retightening the sealing bolt.

10 x 1.0 mm
SEALING BOLT
20 N·m (2.0 kgf·m, 14 lbf·ft)



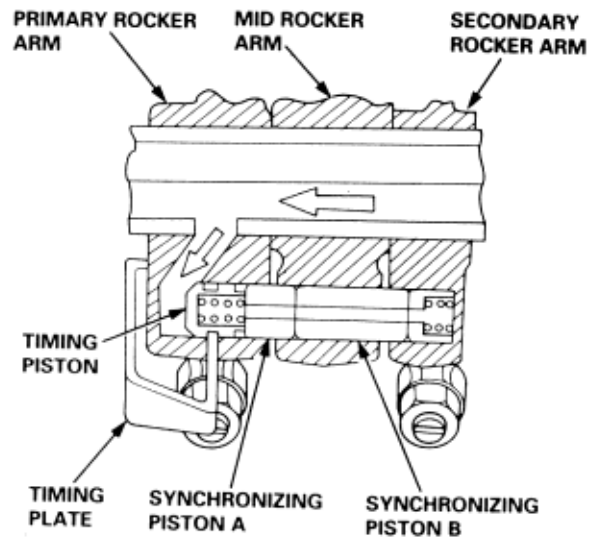
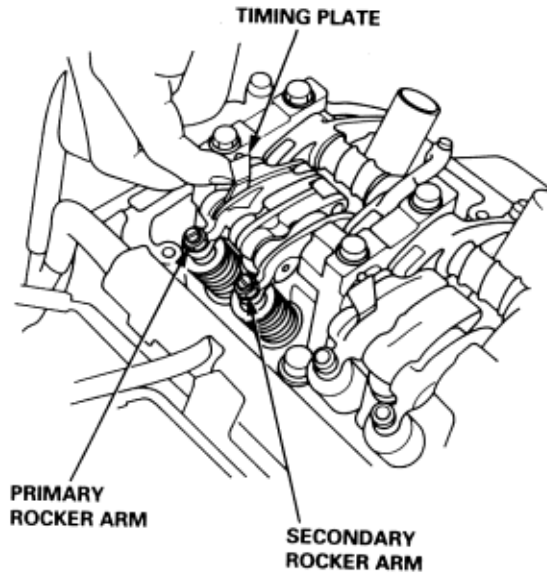
4. Loosen the regulator valve on the valve inspection tool, and apply the specified air pressure to the rocker arm synchronizing pistons A/B.

Specified Air Pressure:
250 kPa (2.5 kgf/cm², 36 psi)

5. With the specified air pressure applied, push up the timing plate 2 - 3 mm (0.08 - 0.12 in) at plate end; the synchronizing piston will pop out and engage the intake mid, primary and secondary rocker arms. Visually check the engagement of the synchronizing pistons A/B.

NOTE:

- ♦ The synchronizing pistons can be seen in the gap between the mid, secondary and primary rocker arms.
- ♦ With the timing plate engaged in the groove on the timing piston, the piston is locked in the pushed out position.
- ♦ Do not apply too much force when pushing up the timing plate.

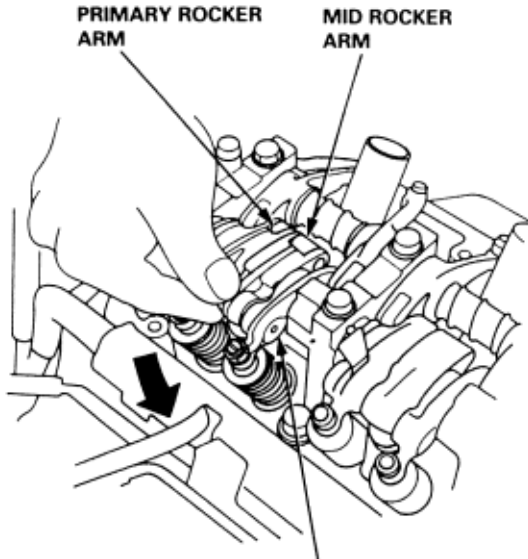


VTEC Rocker Arms

Inspection Using Special Tools (cont'd)

6-B-11

6. Make sure that the intake primary and secondary rocker arms are mechanically connected by the pistons, and that the mid rocker arm does not move when pushed manually.



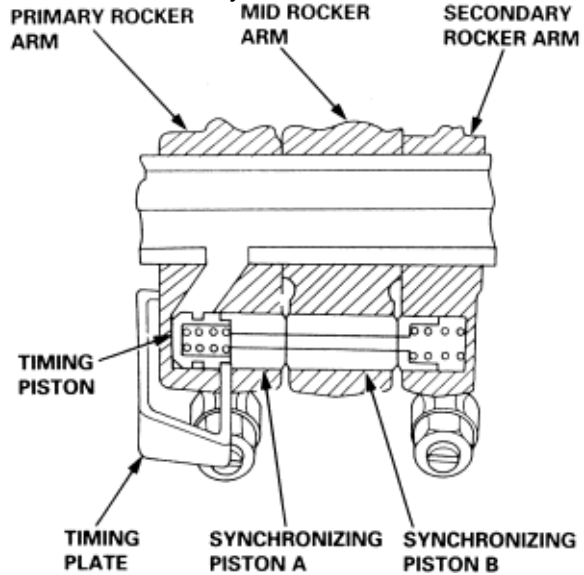
- ♦ If any intake mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.

7. Stop applying air pressure and push up the timing plate; the synchronizing pistons will snap back to their original positions.

Visually check the disengagement of the synchronizing pistons A/B.

NOTE:

- ♦ When the timing plate is pushed up, it releases the timing piston, letting the return spring move the synchronizing pistons to their original positions.
- ♦ Replace the intake rocker arms as an assembly if either does not work correctly.



8. Remove the special tools.
9. Check for smooth operation of each lost motion assembly. It is compressed slightly when the intake mid rocker arm is lightly pushed and compressed deeply when the mid rocker arm is strongly pushed.
 - ♦ Replace the lost motion assembly if it does not move smoothly.
10. After inspection, check that the MIL does not come on.

Valve Clearance Adjustment

6-B-12

NOTE:

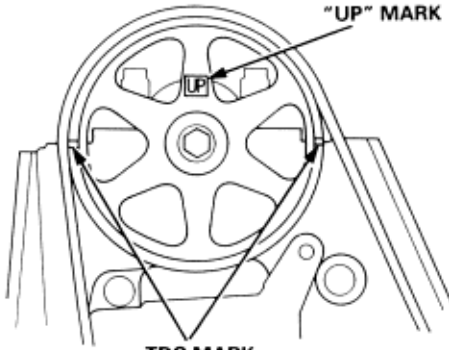
- ♦ Valves should be adjusted only when the cylinder head temperature is less than 38°C (100°F).
- ♦ After adjusting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).

1. Remove the cylinder head cover.

NOTE: When installing the cylinder head cover ([See Pages 6-B-45](#)) and ([See Pages 6-B-46](#)).

2. Set No. 1 piston at TDC. "UP" mark on the camshaft pulley should be at top, and TDC grooves on the camshaft pulley should align with the cylinder head surface.

Number 1 Piston at TDC:

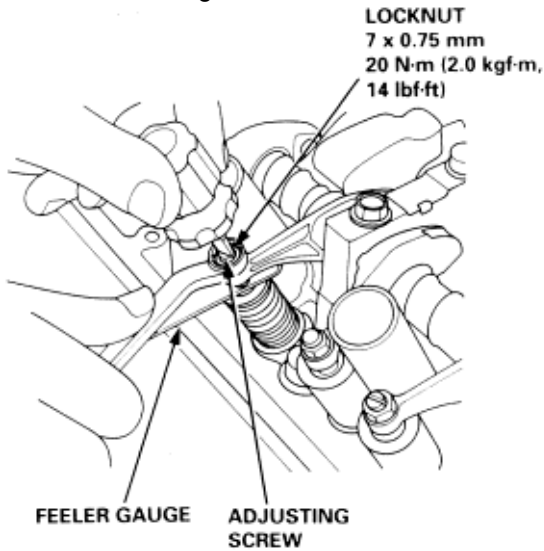


3. Adjust valves on No. 1 cylinder.

Intake: 0.26 mm (0.010 in) \pm 0.02 mm (0.0008 in)

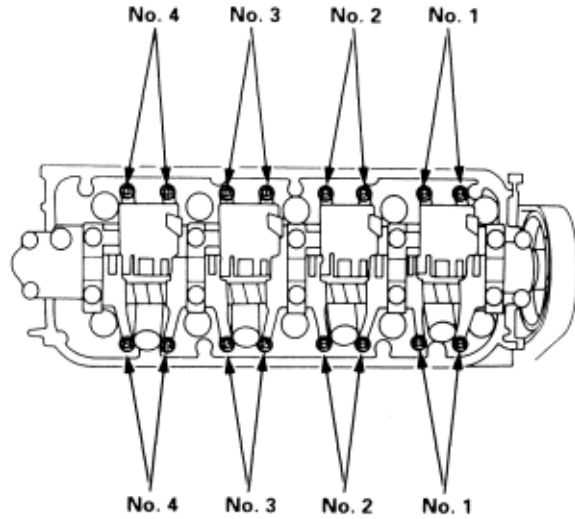
Exhaust: 0.30 mm (0.012 in) \pm 0.02 mm (0.0008 in)

4. Loosen the locknut, and turn the adjusting screw until the feeler gauge slides back and forth with a slight amount of drag.



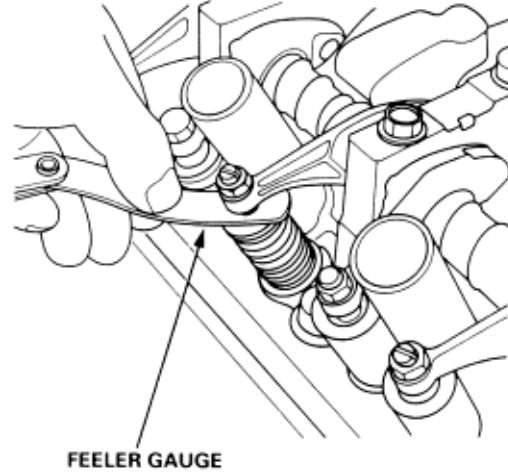
Adjusting screw location:

INTAKE



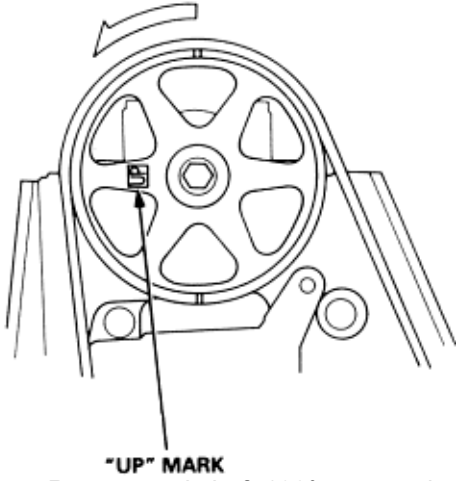
EXHAUST

5. Tighten the locknut and check clearance again. Repeat adjustment if necessary.



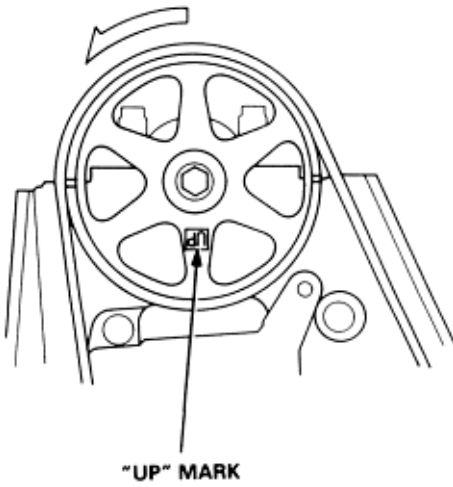
6. Rotate crankshaft 180° counterclockwise (Camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust valves on No. 3 cylinder.

Number 3 Piston at TDC:



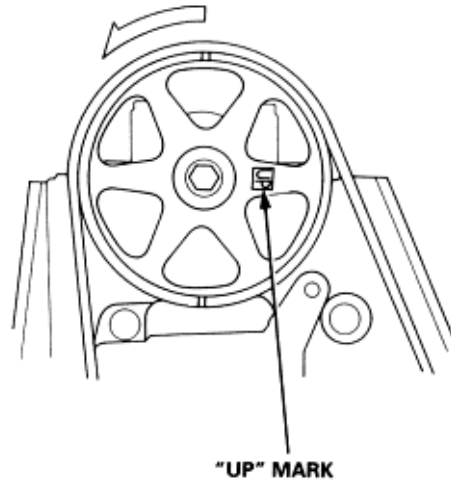
7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible. Adjust valves on No. 4 cylinder.

Number 4 Piston at TDC:



8. Rotate crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" mark should be on the intake side. Adjust valves on No. 2 cylinder.

Number 2 Piston at TDC:



Crankshaft Pulley and Pulley Bolt Replacement

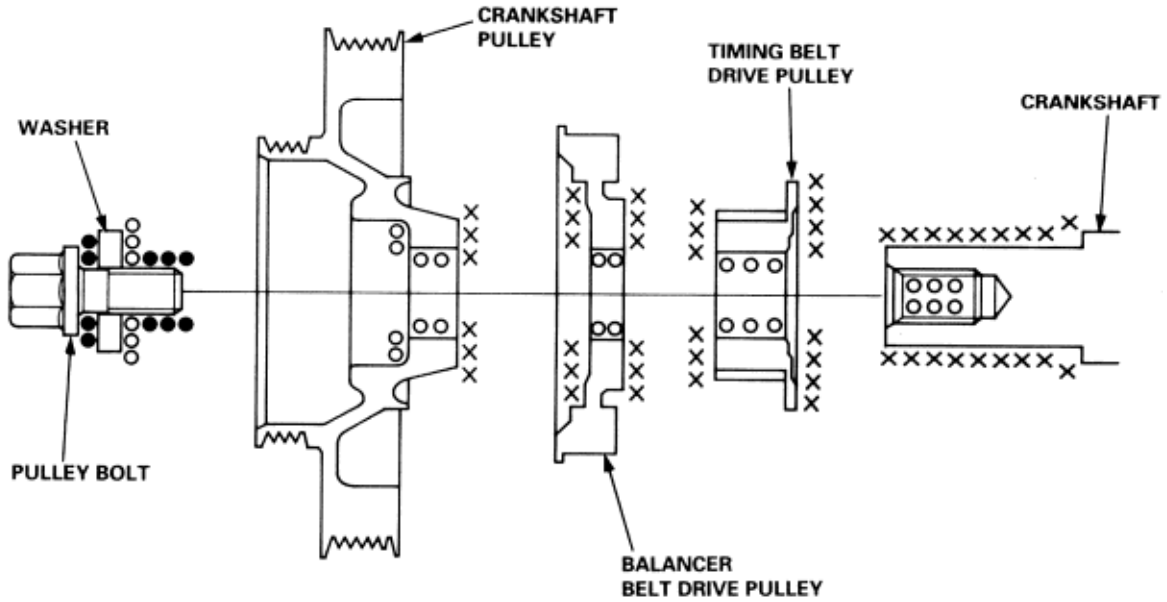
6-B-14

When installing and tightening the pulley, follow the procedure below.
Clean, remove any oil and lubricate points shown below.

o : Clean

x : Remove any oil

♦ : Lubricate

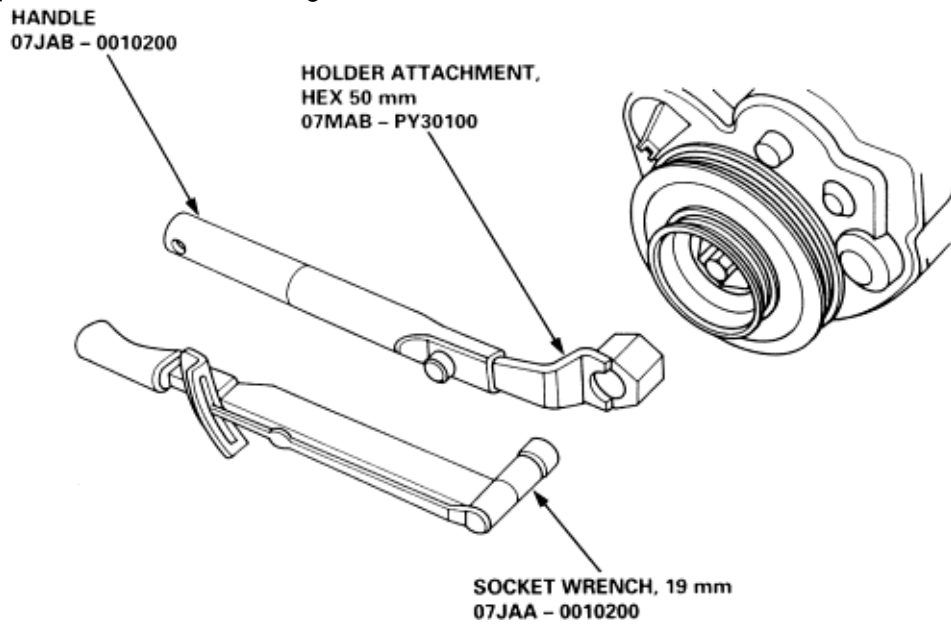


Crankshaft pulley bolt size and torque valve:

16 x 1.5 mm

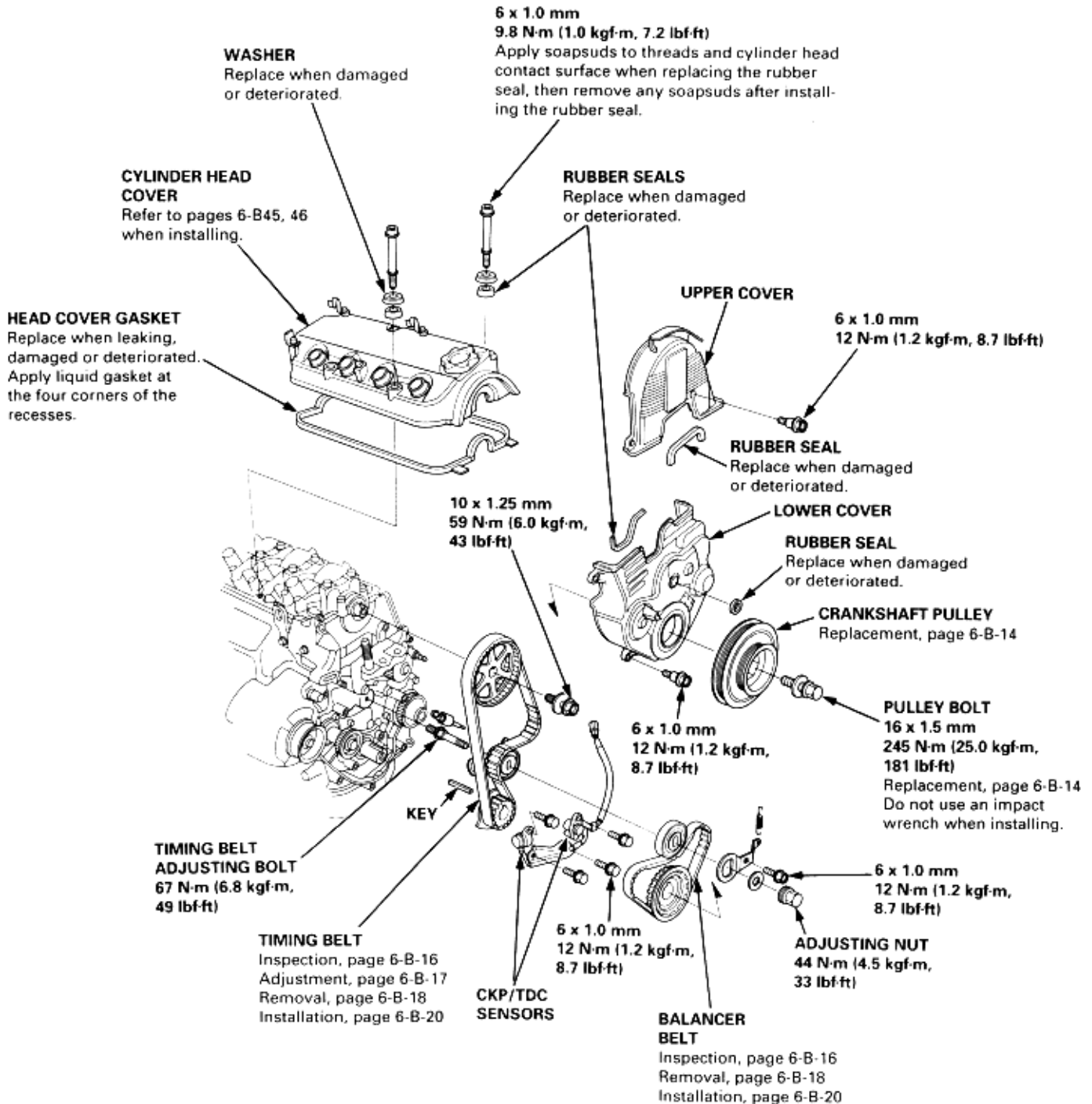
245 Nm (25.0 kgf/m, 181 lbf/ft)

NOTE: Do not use an impact wrench when installing.



NOTE:

- ♦ How to position the crankshaft and pulley before installing the belt (**See Page 6-B-20**).
- ♦ Mark the direction of rotation on the belt before removing it.
- ♦ Do not use the upper cover and lower cover for storing removed items.
- ♦ Clean the upper cover and lower cover before installing them.
- ♦ Replace the camshaft seals and crankshaft seals if there is an oil leakage.
- ♦ Before installing the timing belt and balancer belt (**See Page 6-B-14**).
- ♦ Inspect the lower cover rubber seal for cracks and other damage before installing the lower cover.
- ♦ If the rubber seal is coming off, apply liquid gasket to the lower cover and put the rubber seal back. Wipe off any liquid gasket that is pressed out.
- ♦ When replacing rubber seal, clean the lower cover groove, cut the repair rubber seal to length, and put the rubber seal into the groove evenly.



To go to the pages referenced on the diagram above, click on the following:
(**See Page 11-B-45**)
(**See Page 11-B-46**)
(**See Page 11-B-16**)
(**See Page 11-B-17**)
(**See Page 11-B-18**)
(**See Page 11-B-20**)
(**See Page 11-B-14**)

Timing Belt Inspection

6-B-16

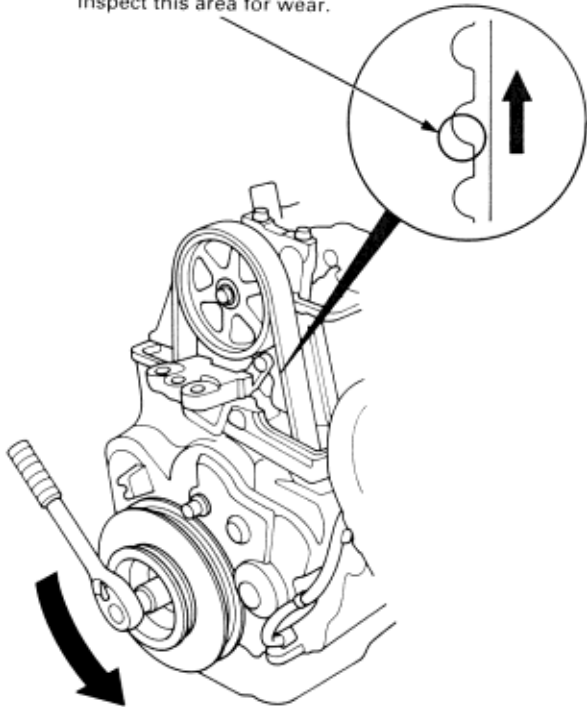
Balancer Belt Inspection

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Remove the cylinder head cover.
 - ♦ When installing (See Page 6-B-45) and (See Page 6-B-46).
5. Remove the upper cover.
6. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

- ♦ Replace the belt if it is oil or coolant soaked.
- ♦ Remove any oil or solvent that gets on the belt.

Inspect this area for wear.



Rotate pulley
counterclockwise
and inspect belt.

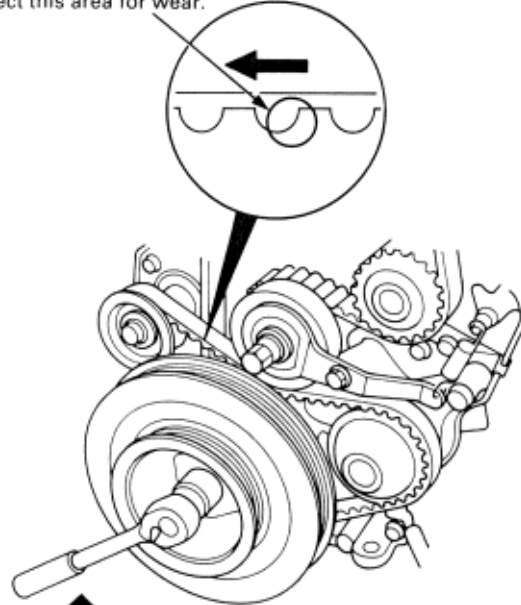
7. After inspecting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).
8. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Remove the cylinder head cover.
 - ♦ When installing (See Page 6-B-45) and (See Page 6-B-46).
5. Remove the upper cover.
6. Remove the crankshaft pulley.
7. Remove the lower cover.
8. Install the crankshaft pulley.
9. Inspect the balancer belt for cracks and oil or coolant soaking.

NOTE:

- ♦ Replace the belt if it is oil or coolant soaked.
- ♦ Remove any oil or solvent that gets on the belt.

Inspect this area for wear.



Rotate pulley
counterclockwise
and inspect belt.

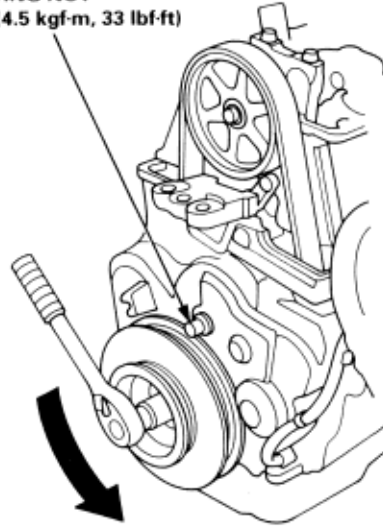
10. After inspecting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).
11. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

NOTE:

- ♦ Always adjust timing belt tension with the engine cold.
 - ♦ The tensioner is spring-loaded to apply proper tension to the belts automatically after making the following adjustment.
 - ♦ Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.
 - ♦ Inspect the balancer belt before adjusting the belt tension.
 - ♦ Do not loosen the adjusting nut-more than one full turn.
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 2. Disconnect the battery negative terminal first, then the positive terminal.
 3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
 4. Remove the cylinder head cover. (**See Page 6-B-45**) (**See Page 6-B-46**).
 5. Rotate the crankshaft five or six revolutions to set the belt.
 6. Set the No. 1 piston at TDC.

7. Loosen the adjusting nut 2/3 - 1 turn.

ADJUSTING NUT
44 N·m (4.5 kgf·m, 33 lbf·ft)



Direction of
rotation.

8. Rotate the crankshaft counterclockwise three teeth on the camshaft pulley.
9. Tighten the adjusting nut.
10. After adjusting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).
11. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Timing Belt and Balancer Belt Removal

6-B-18

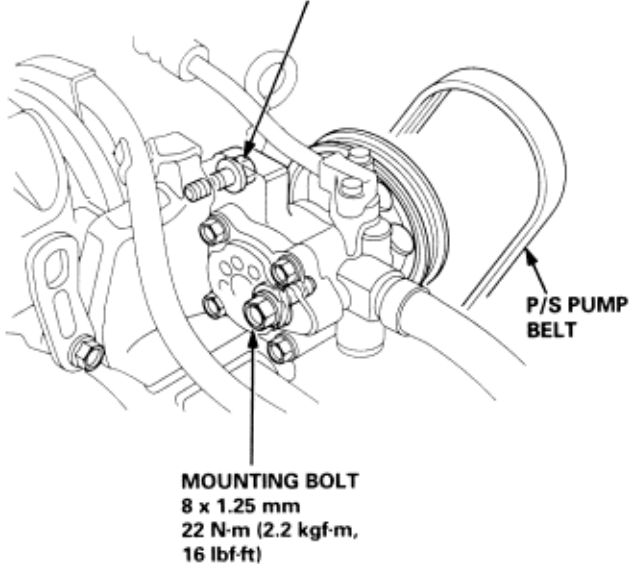
NOTE:

- ♦ Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (**See Page 6-B-21**).
 - ♦ Inspect the water pump (**See Page 10-17**).
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 2. Disconnect the battery negative terminal.
 3. Remove the splash shield (**See Page 5-10**).
 4. Remove the stop and ground cable, then remove the upper bracket (**See Page 6-B-28**).

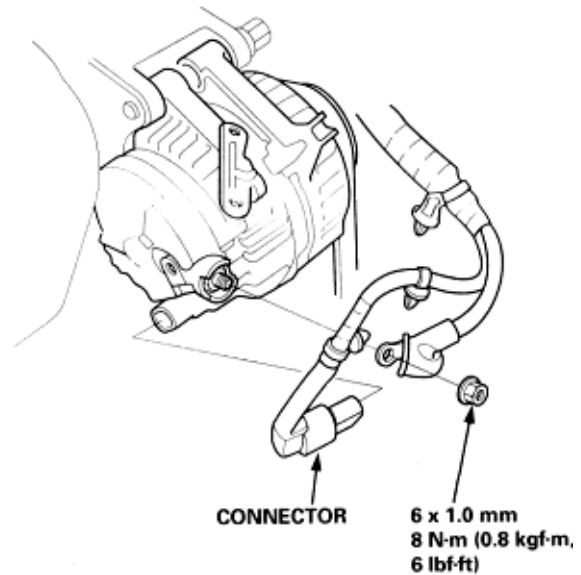
NOTE:

- ♦ Use a jack to support the engine before the upper bracket is removed.
 - ♦ Make sure to place a cushion between the oil pan and the jack.
5. Loosen the mounting bolts, then remove the power steering (P/S) pump belt.

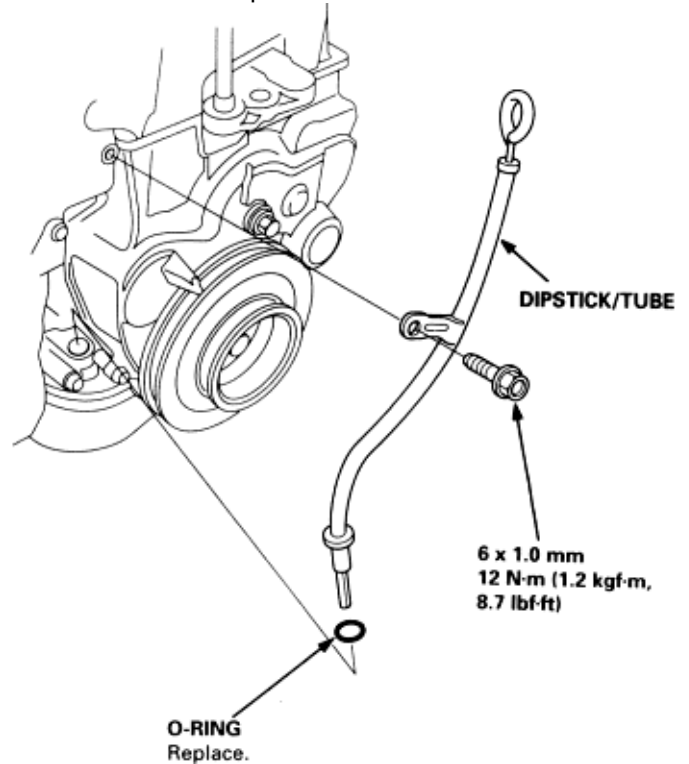
MOUNTING BOLT
8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)



6. Remove the alternator terminal and connector.



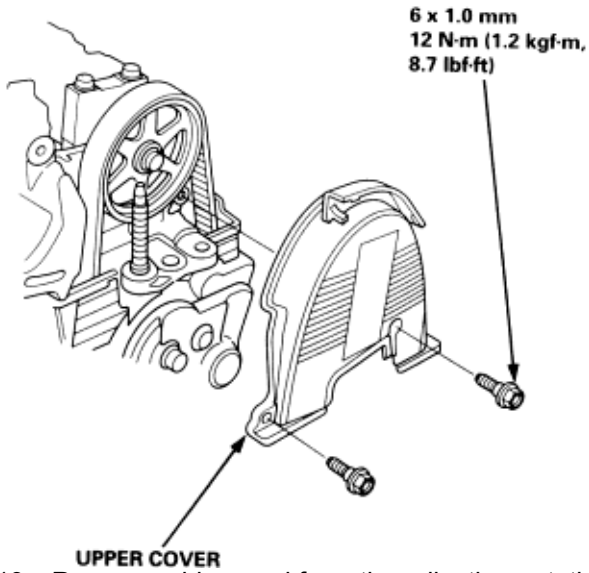
7. Remove the alternator (see section 4).
8. Remove the alternator bracket (**See Page 5-16**).
9. Remove the dipstick and the tube.



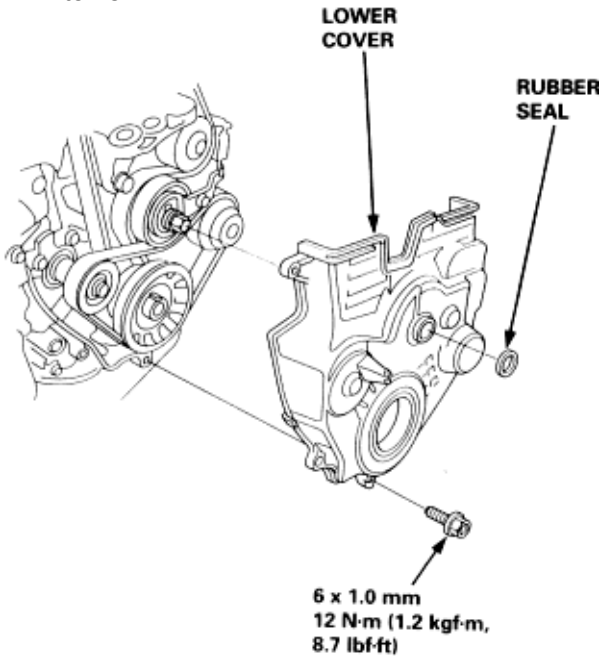
Timing Belt and Balancer Belt Removal (cont'd)

6-B-19

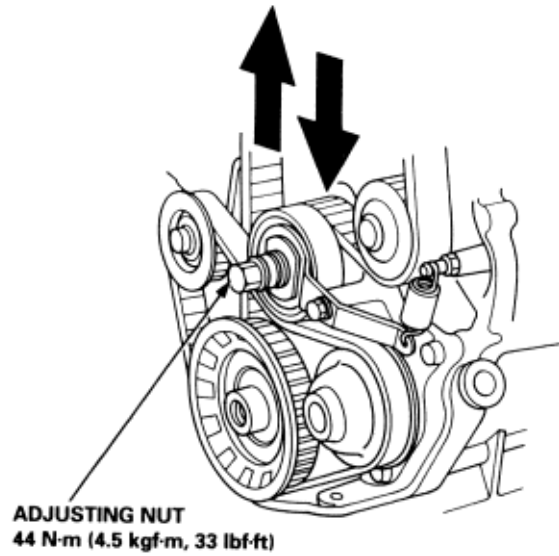
10. Remove the cylinder head cover.
 - ♦ When installing (See Page 6-B-45) and (See Page 6-B-46).
11. Remove the pulley bolt and crankshaft pulley (See Page 6-B-14).
12. Remove the upper cover.
NOTE: Do not use the upper cover for storing removed items.



13. Remove rubber seal from the adjusting nut, then remove the lower cover.
NOTE: Do not use the lower cover for storing removed items.

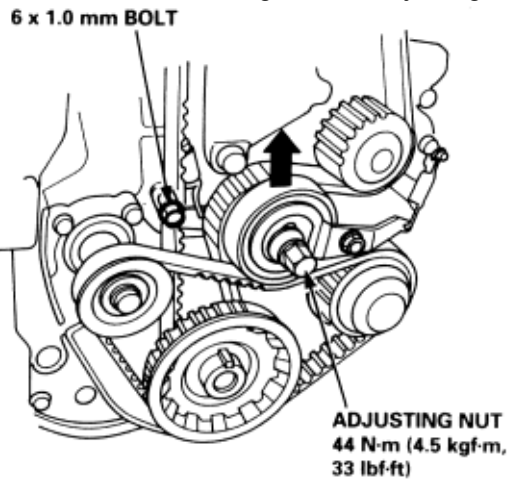


14. Loosen the adjusting nut 2/3 - 1 turn. Push the tensioner to remove tension from the timing belt and balancer belt, then retighten the adjusting nut.



NOTE: When removing the balancer belt only:

- ♦ Lock the timing belt adjuster arm in place by installing one of the 6 x 1.0 mm bolts.
- ♦ Loosen the adjusting nut 2/3 - 1 turn. Push the tensioner to remove tension from the balancer belt, then retighten the adjusting nut.



15. Remove the balancer belt and timing belt.

Timing Belt and Balance Belt Installation

6-B-20

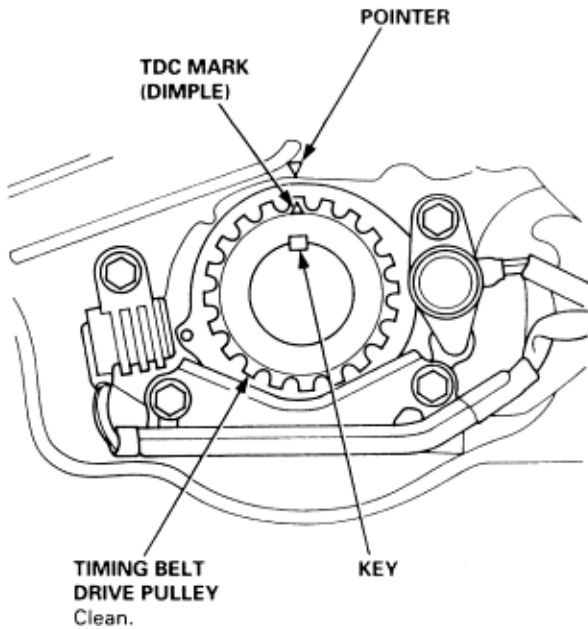
Install the timing belt and balancer belt in the reverse order of removal.

Only key points are described here.

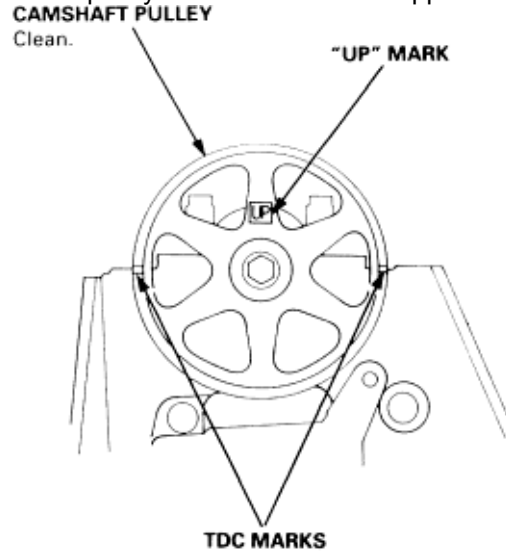
- When installing only the balancer belt, go to step 13.

NOTE: Clean the upper and lower covers before installation.

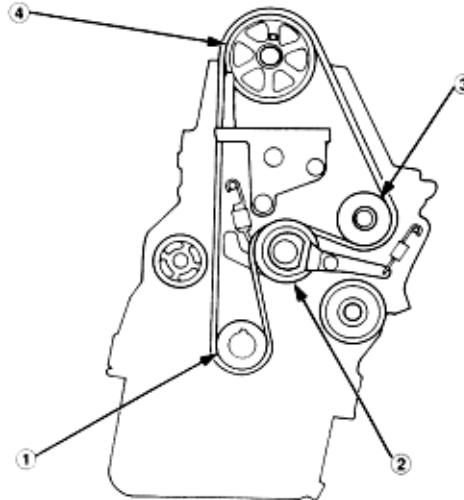
1. Remove the balancer belt drive pulley (See Page 6-B-15).
2. Set the timing belt drive pulley so that the No. 1 piston is at top dead center (TDC). Align the dimple on the tooth of the timing belt drive pulley with the V pointer on the oil pump.



3. Set the camshaft pulley so that the No. 1 piston is at TDC. Align the TDC mark on the camshaft pulley with the back cover upper surface.



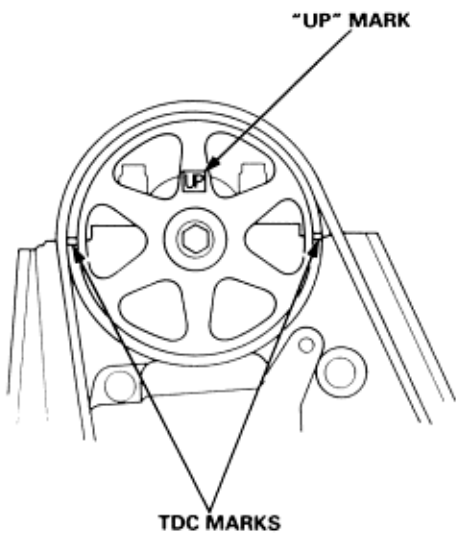
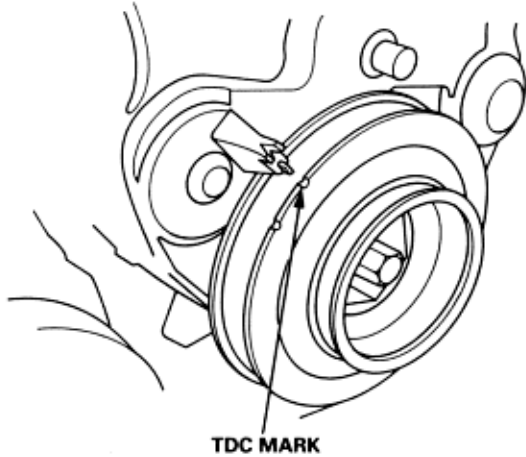
4. Install the timing belt tightly in the sequence shown. (1) Timing belt drive pulley (crankshaft) to (2) Adjusting pulley to (3) Water pump pulley to (4) Camshaft pulley. NOTE: Make sure the timing belt drive pulley and camshaft pulley are at TDC.



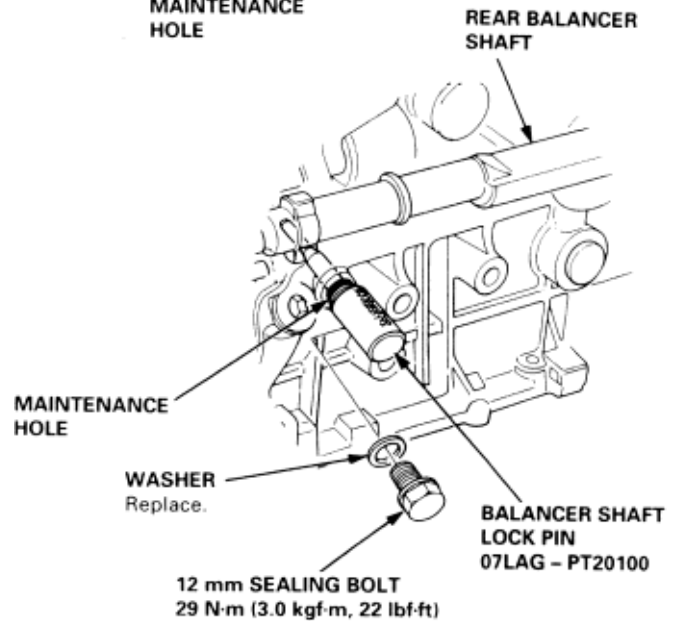
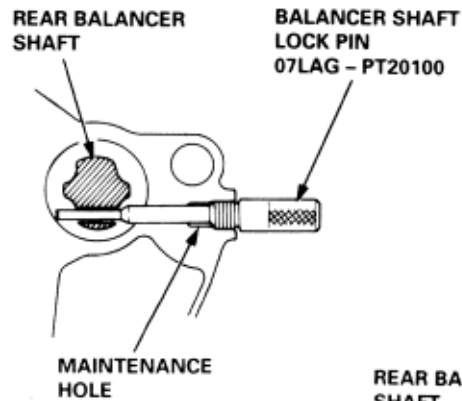
Timing Belt and Balance Belt Installation (cont'd)

6-B-21

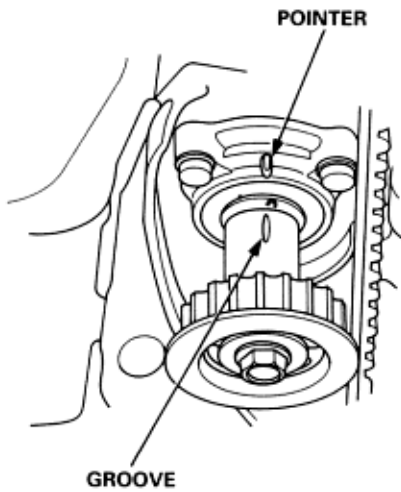
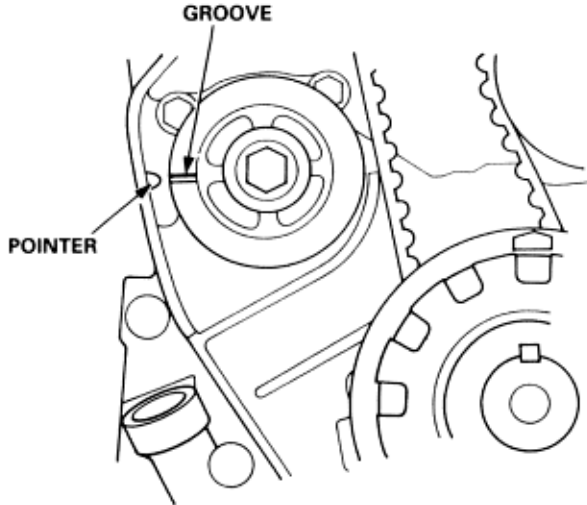
- Loosen and retighten the adjusting nut to tension the timing belt.
- Install the balancer belt drive pulley and lower cover.
- Install the crankshaft pulley, then tighten the pulley bolt (See Page 6-B-14).
- Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.
- Adjust the timing belt tension (See Page 6-B-17).
- Make sure the crankshaft pulley and camshaft pulley are at TDC.



- If the camshaft or crankshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure (See Page 6-B-20), then reinstall the timing belt.
- Remove the crankshaft pulley and lower cover.
- Set the timing belt drive pulley so that the No. 1 piston is at TDC.
- Lock the timing belt adjuster arm in place by installing one of the 6 x 1.0 mm bolts.
- Loosen the adjusting nut 2/3 - 1 turn, and verify that the balancer belt adjuster moves freely.
- Push the tensioner to remove tension from the balancer belt, then retighten the adjusting nut.
- Align the rear balancer shaft pulley by using a special tool. Insert the special tool into the maintenance hole to fix the rear balancer shaft.



18. Align the groove on the front balancer shaft pulley with the pointer on the oil pump housing as shown.



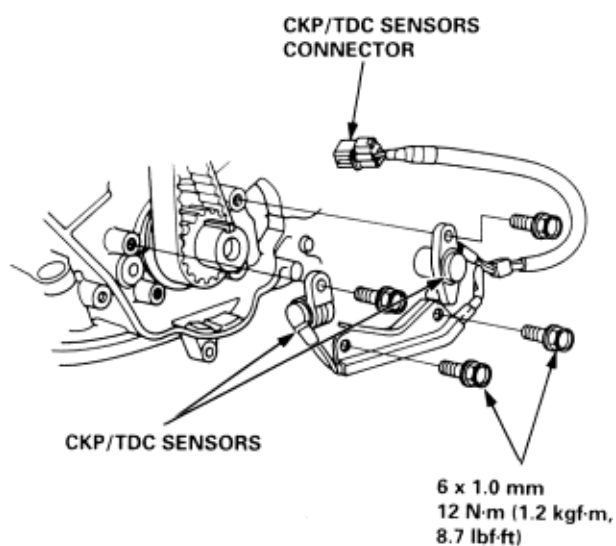
19. Install the balancer belt. Loosen the adjusting nut 2/3 - 1 turn to tension the balancer belt.
20. Remove the special tool from the rear balancer shaft, then install the 12 mm sealing bolt.
21. Install the crankshaft pulley, then tighten the pulley bolt (**See Page 6-B-14**).
22. Turn the crankshaft pulley about one turn counterclockwise, then tighten the adjusting nut.
23. Remove the 6 x 1.0 mm bolt from the timing belt adjuster arm.

24. Check the lower cover rubber seal for cracks and other damage.

NOTE:

- ♦ If the rubber seal is coming off, apply liquid gasket to the lower cover and put the rubber seal back. Wipe off any liquid gasket that is pressed out.
 - ♦ When replacing rubber seal, clean the lower cover groove, cut the repair rubber seal to length, and put the rubber seal into the groove evenly.
25. Remove the crankshaft pulley, then install the lower cover.
26. Install the rubber seal around the adjusting nut. **NOTE:** Do not loosen the adjusting nut.
27. Install the crankshaft pulley, then tighten the pulley bolt (**See Page 6-B-14**).
28. After installation, adjust the tension of each belt.
- ♦ See section 4 for alternator belt tension adjustment.
 - ♦ See section 22 for air conditioning (A/C) compressor belt tension adjustment.
 - ♦ See section 17 for P/S pump belt tension adjustment.
29. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

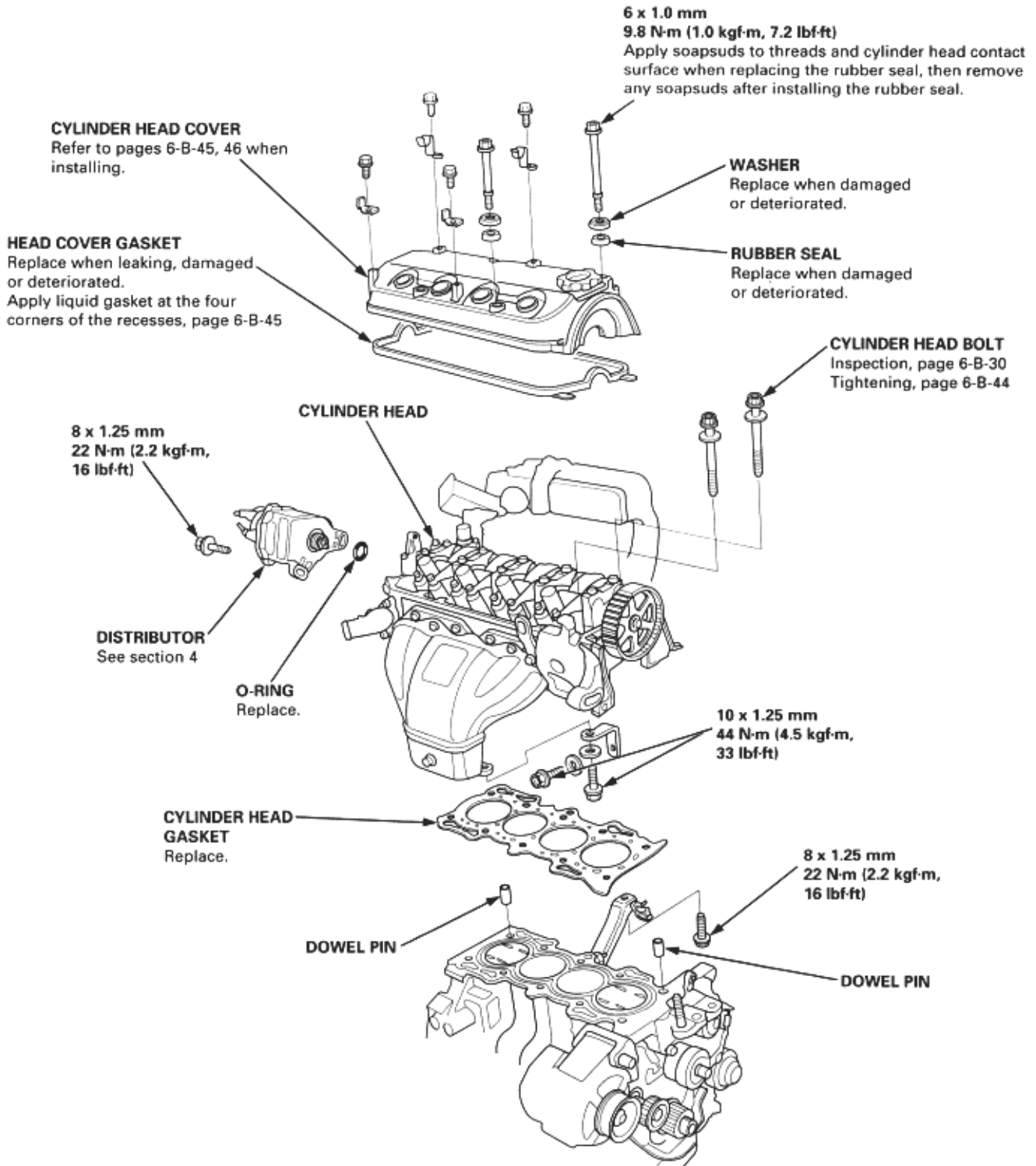
1. Removal the balancer belt (**See Page** 6-B-18).
2. Remove the balancer belt drive pulley.
3. Disconnect the CKP/TDC sensors connector, then remove the CKP/TDC sensors.



4. Install the CKP/TDC sensors in reverse order of removal.
5. Install the balancer belt (**See Page** 6-B-20).

NOTE:

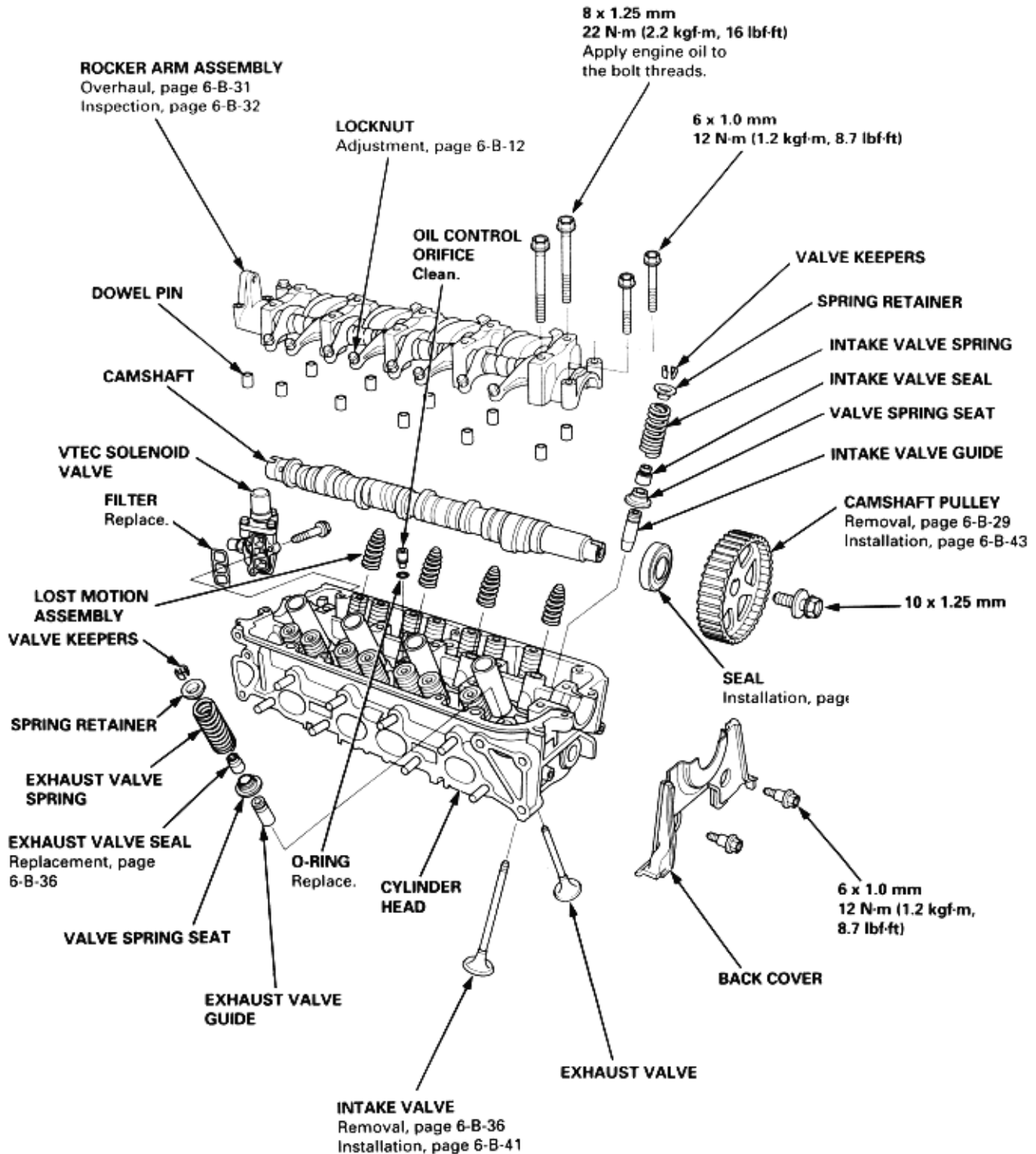
- ♦ To avoid damage, wait until the engine coolant temperature drops below 38°C (100°F) before removing the cylinder head.
- ♦ When handling a metal gasket, take care not to fold it or damage the contact surface.
- ♦ Use new O-rings and gaskets when reassembling.



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-45)
(See Page 11-B-46)
(See Page 11-B-30)
(See Page 11-B-44)



Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-B-12)
- (See Page 11-B-36)
- (See Page 11-B-41)
- (See Page 11-B-29)
- (See Page 11-B-43)

Cylinder Head Removal

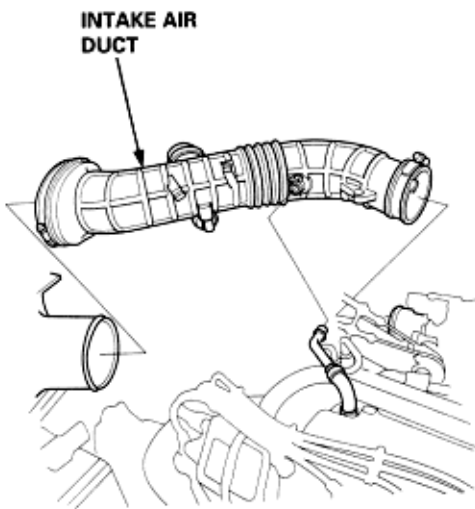
6-B-26

Engine Removal is not required in this procedure.

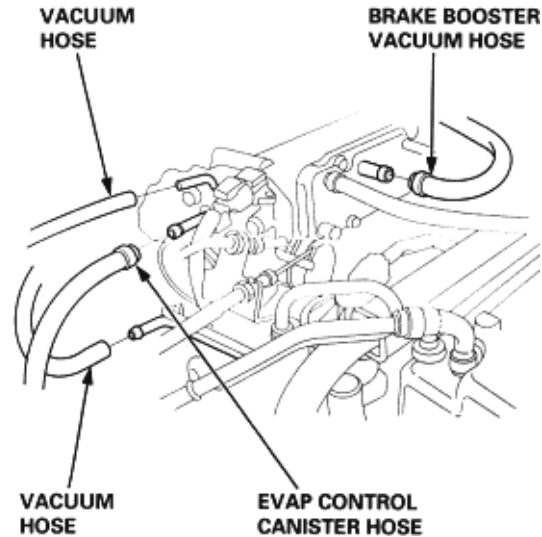
NOTE:

- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the retaining bolts.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

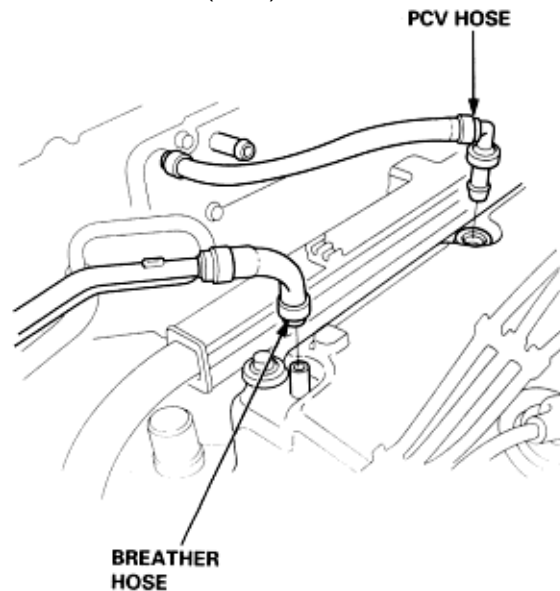
1. Secure the hood in the open position.
2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
3. Disconnect the battery negative terminal first, then the positive terminal.
4. Drain the engine coolant (**See Page 10-7**).
5. Remove the intake air duct.



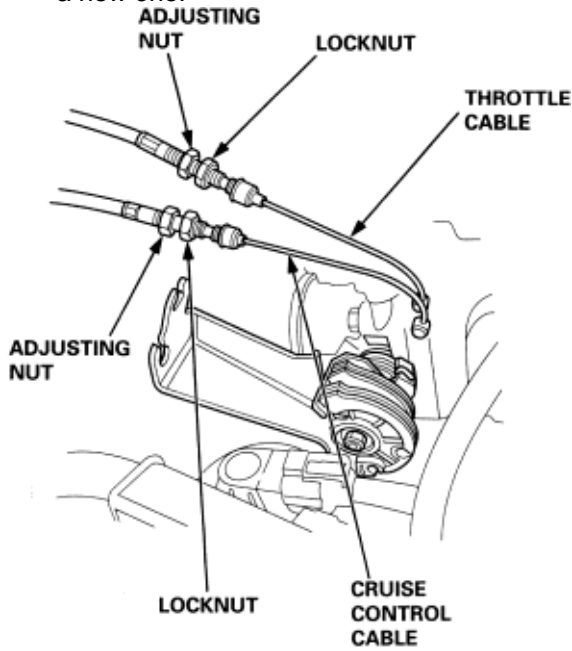
6. Remove the brake booster vacuum hose, evaporative emission (EVAP) control canister hose and vacuum hoses.



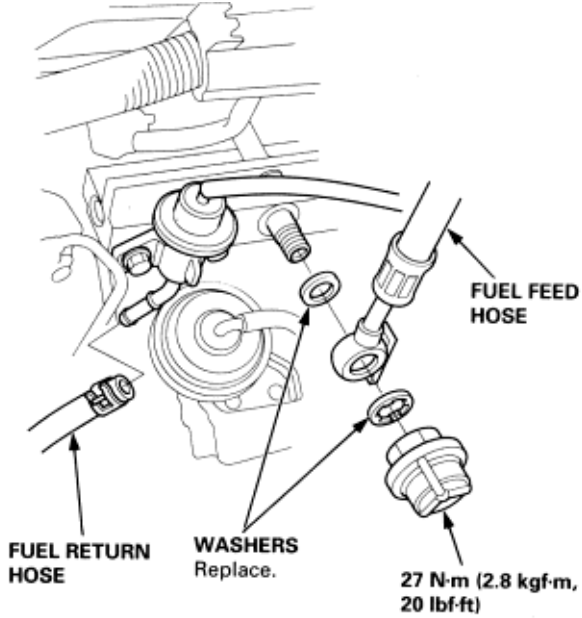
7. Remove the breather hose and positive crankcase ventilation (PCV) hose.



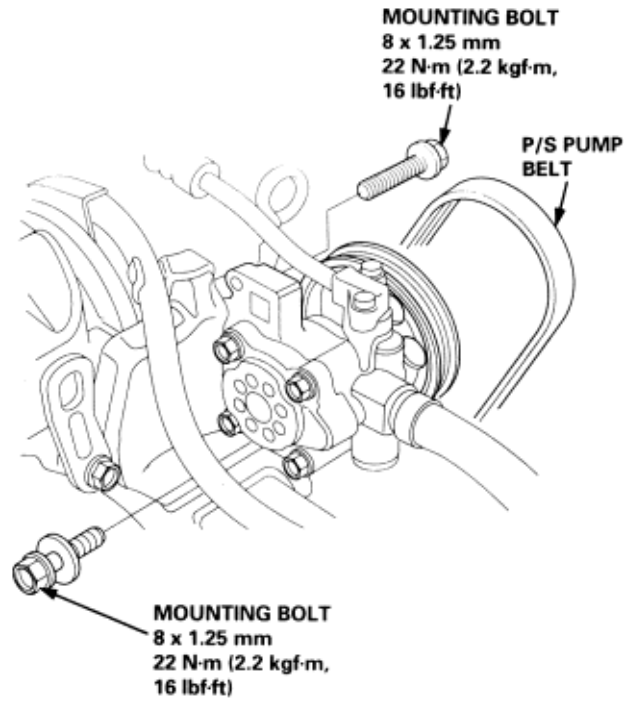
8. Remove the throttle cable and cruise control cable by loosening the locknuts then slip the cable ends out of the accelerator linkage. Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.



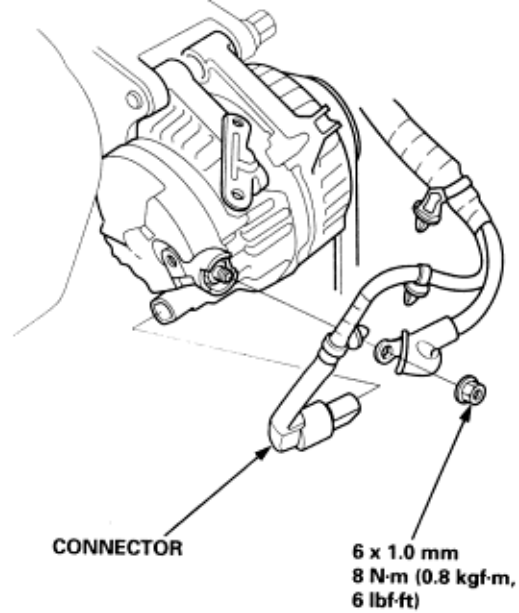
9. Relieve fuel pressure (see section 11).
10. Remove the fuel feed hose and fuel return hose.



11. Remove the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump without disconnecting the P/S hoses.



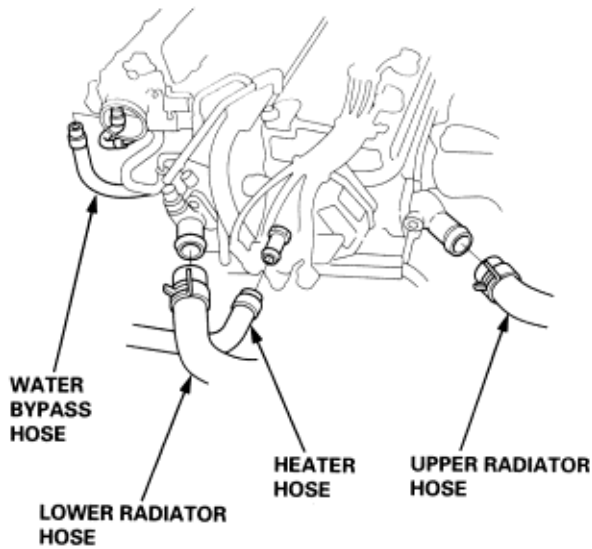
12. Remove the alternator terminal and connector.



Cylinder Head Removal (cont'd)

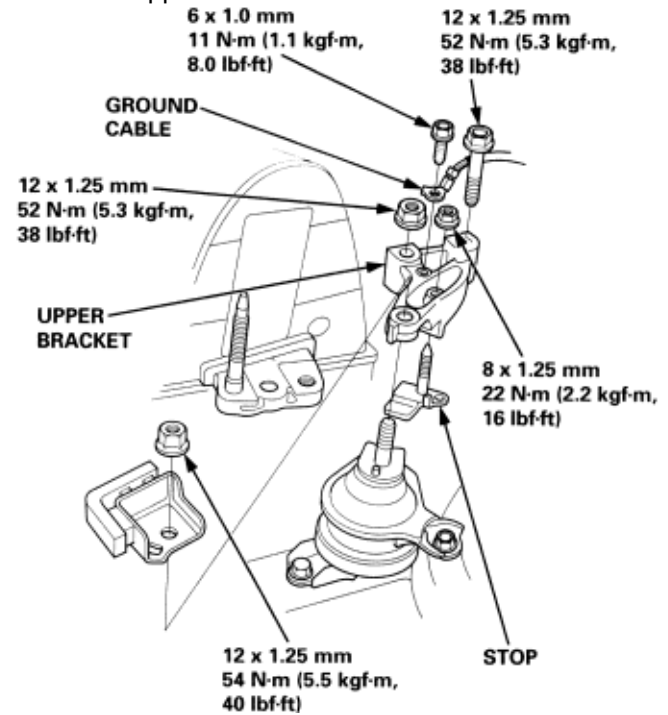
6-B-28

13. Remove the alternator (see section 4).
14. Remove the upper radiator hose, lower radiator hose, heater hose and water bypass hoses.

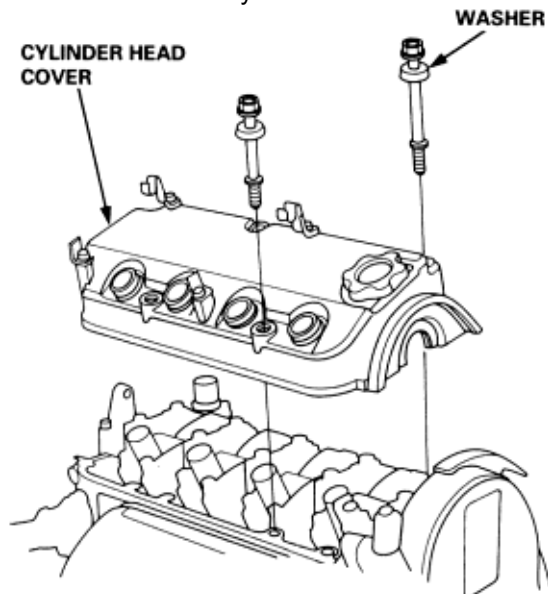


15. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
 - ♦ Four injector connectors.
 - ♦ Intake air temperature (IAT) sensor connector.
 - ♦ Idle air control (IAC) valve connector.
 - ♦ Throttle position sensor connector.
 - ♦ Manifold absolute pressure (MAP) sensor connector.
 - ♦ Engine coolant temperature (ECT) sensor connector.
 - ♦ Radiator fan switch A connector.
 - ♦ Radiator fan switch B connector.
 - ♦ Coolant temperature gauge sending unit connector.
 - ♦ Exhaust gas recirculation (EGR) connector.
 - ♦ Heated oxygen sensor (HO2S) connector.
 - ♦ CKP/TDC sensor connector.
 - ♦ VTEC solenoid valve connector.
 - ♦ VTEC oil pressure switch connector (F20B6 engine).
16. Remove the spark plug caps and distributor from the cylinder head.

17. Support the engine with the jack and wood block under the oil pan.
18. Remove the stop and ground cable, then remove the upper bracket.



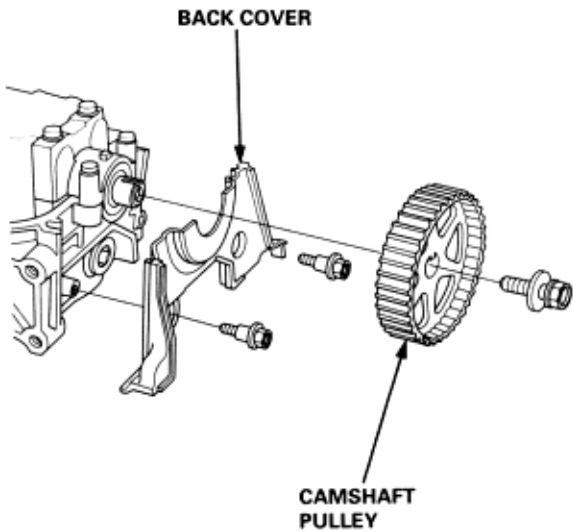
19. Remove the cylinder head cover.



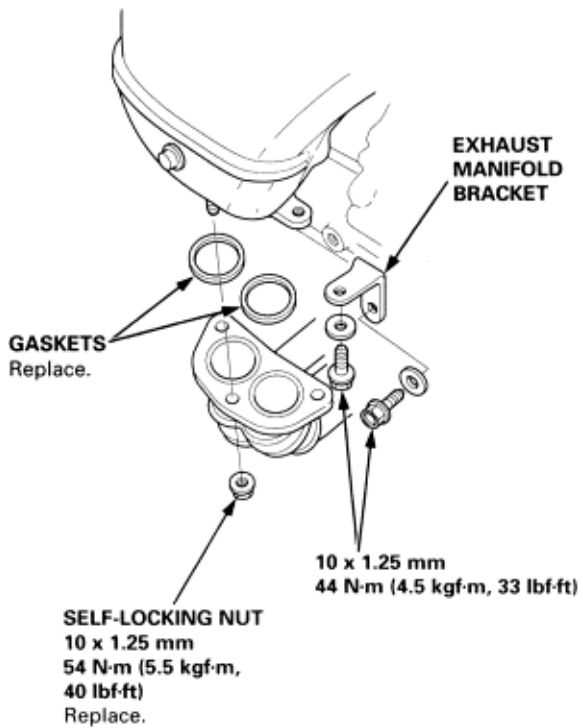
Cylinder Head Removal (cont'd)

6-B-29

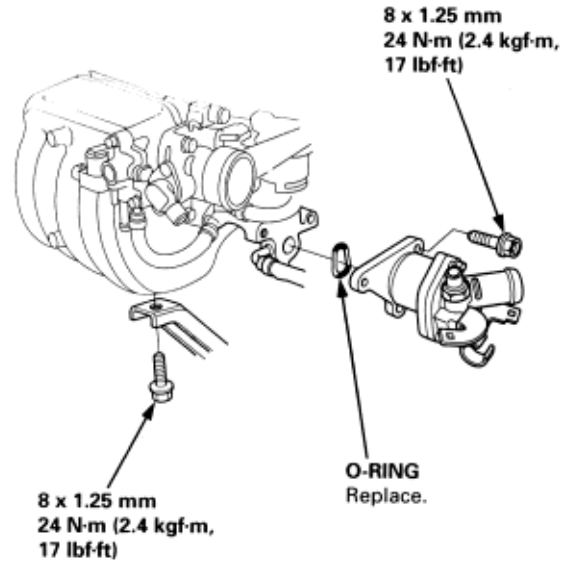
20. Remove the balancer belt and timing belt (See Page 6-B-18).
21. Remove the camshaft pulley and back cover.



22. Remove the exhaust manifold brackets and self-locking nuts.

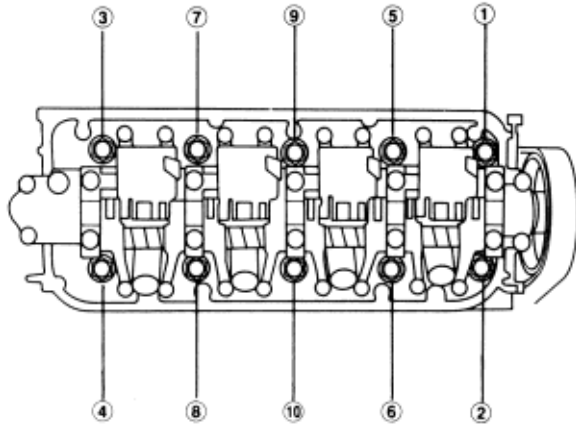


23. Remove the intake manifold bracket and thermostat housing mounting bolts.



24. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLT LOOSENING SEQUENCE:



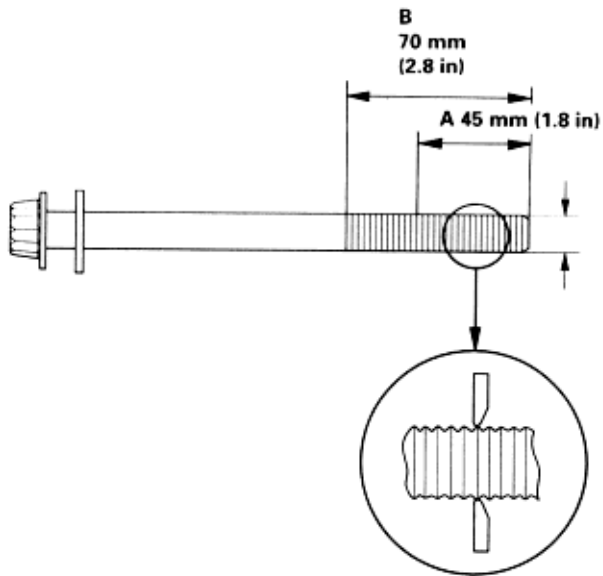
25. Remove the cylinder head.

Cylinder Head Bolt Inspection

6-B-30

Rocker Arms Assembly Removal

1. Measure the diameter of each cylinder head bolt at point A and point B.

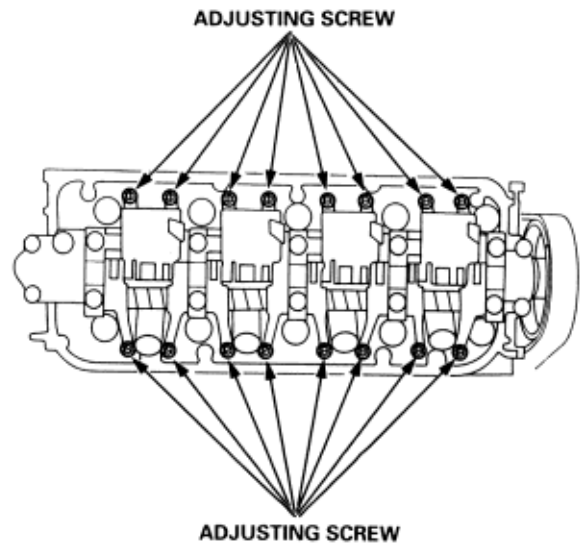


2. If either diameter is less than 11.3 mm (0.44 in), replace the cylinder head bolt.

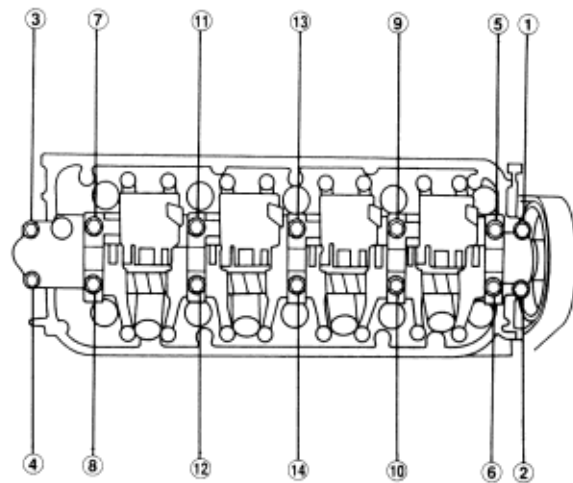
1. Loosen the adjusting screws, then remove the bolts and the rocker arm assembly.

NOTE:

- Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
- When removing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the camshaft holders, the springs and the rocker arms on the shafts.




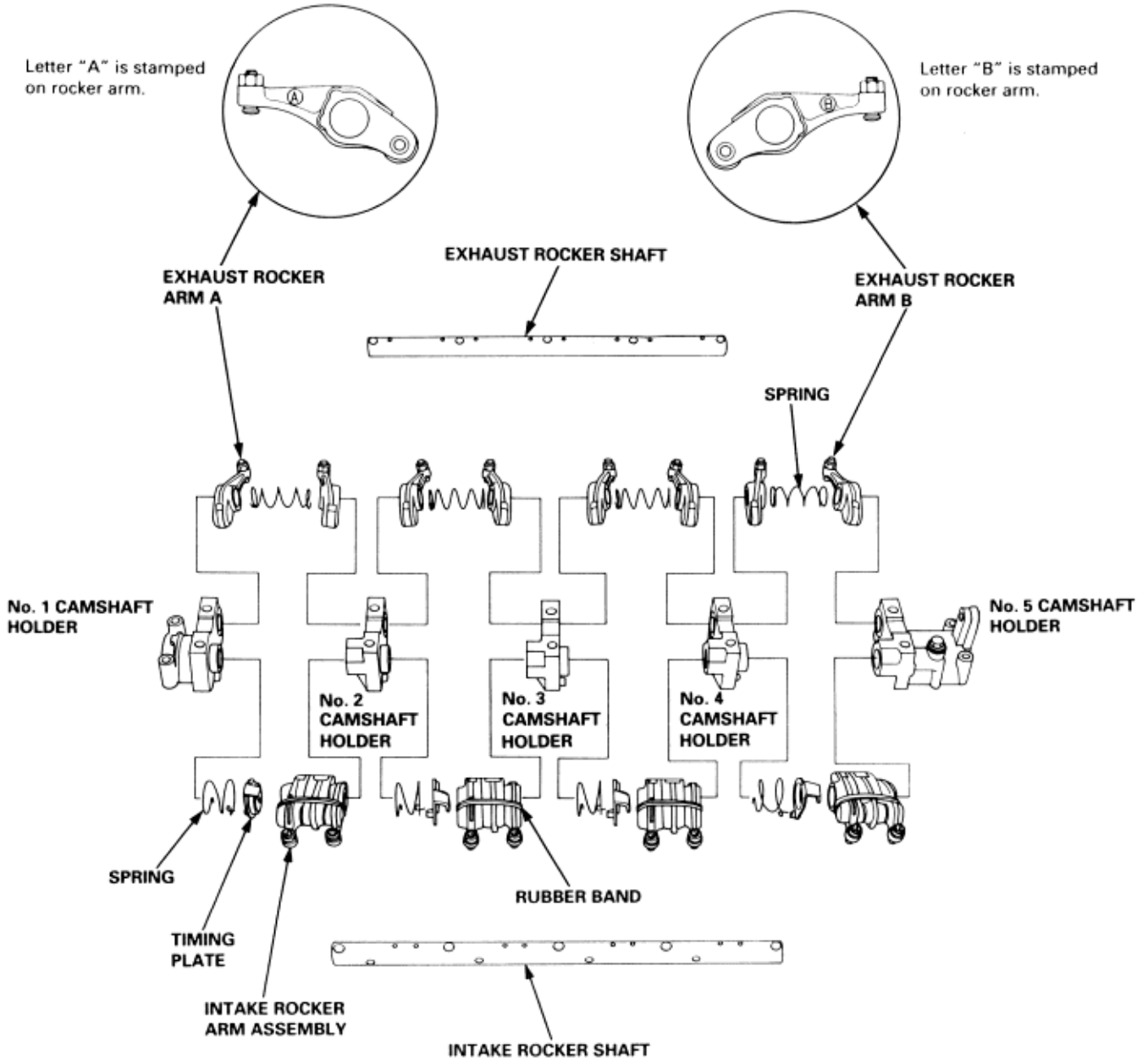
CAMSHAFT HOLDER BOLT LOOSENING SEQUENCE:



NOTE:

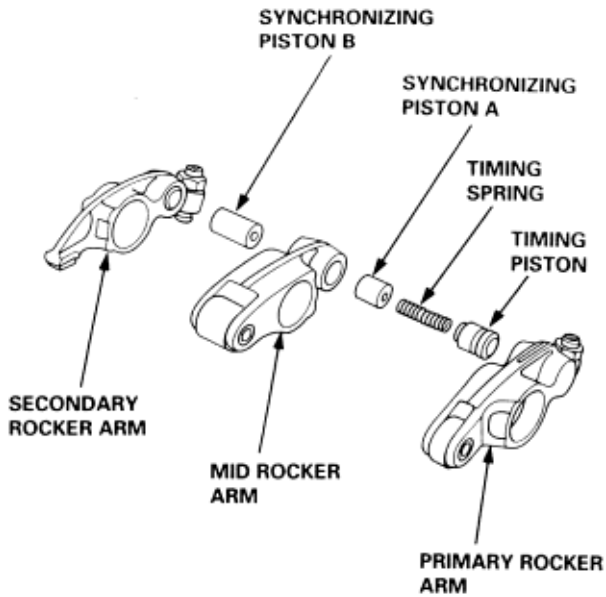
- ♦ Identify parts as they are removed to ensure reinstallation in the original locations.
- ♦ Inspect rocker shafts and rocker arms (**See Page 6-B-32**).
- ♦ Rocker arms must be installed in the same positions if reused.
- ♦ When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.

 Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact points.



NOTE: When reassembling the primary rocker arm, carefully apply air pressure to the oil passage of the rocker arm.

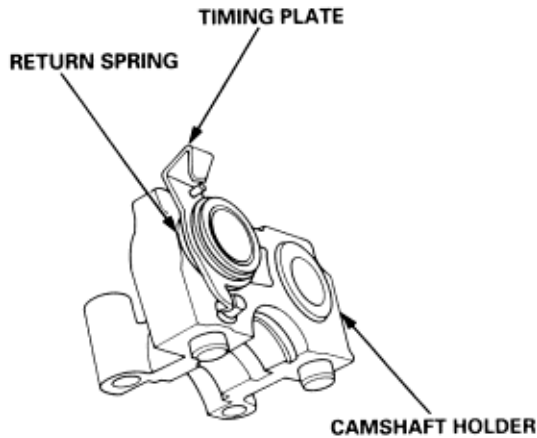
1. Inspect the rocker arm piston. Push it manually.
 - If it does not move smoothly, replace the rocker arm assembly.



NOTE:

- ♦ Apply oil to the pistons when reassembling.
- ♦ Bundle the rocker arms with a rubber band to keep them together as a set.

NOTE: Set the timing plate and return spring as shown below.

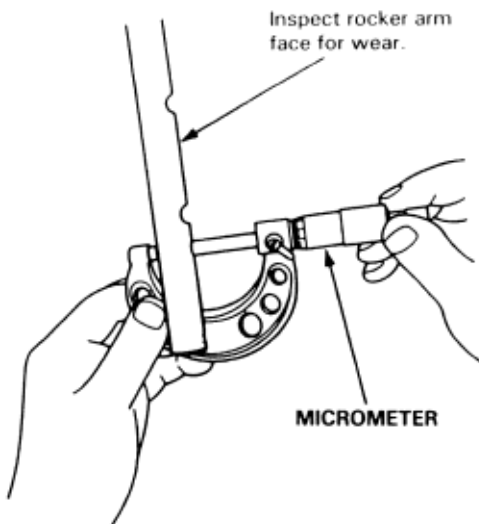


Rocker Arms and Shafts Clearance Inspection

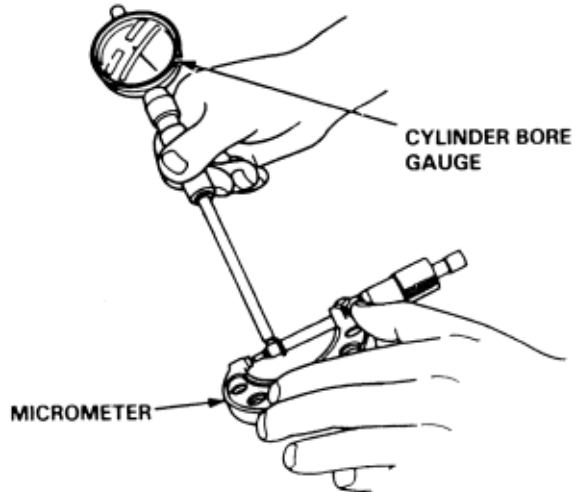
6-B-33

Measure the intake rocker shaft and the exhaust rocker shaft.

1. Measure the diameter of the shaft at the first rocker location.



2. Zero the gauge to the shaft diameter.



3. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

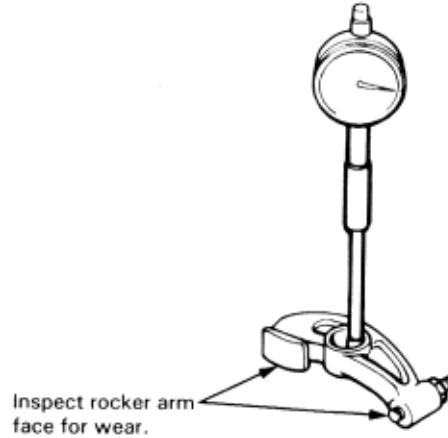
Rocker Arm-to-Shaft Clearance:

Standard (New):

Intake: 0.026 - 0.067 mm
(0.0010 - 0.0026 in)

Exhaust: 0.018 - 0.054 mm
(0.0007 - 0.0021 in)

Service Limit: 0.08 mm (0.003 in)



Repeat for all rockers.

- If the clearance is over the limit, replace the rocker shaft and all over tolerance rocker arms.

NOTE: If any intake rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

Camshaft Inspection

6-B-34

NOTE:

- ♦ Do not rotate the camshaft during inspection.
 - ♦ Remove the rocker arms and rocker shafts.
1. Put the camshaft and the camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

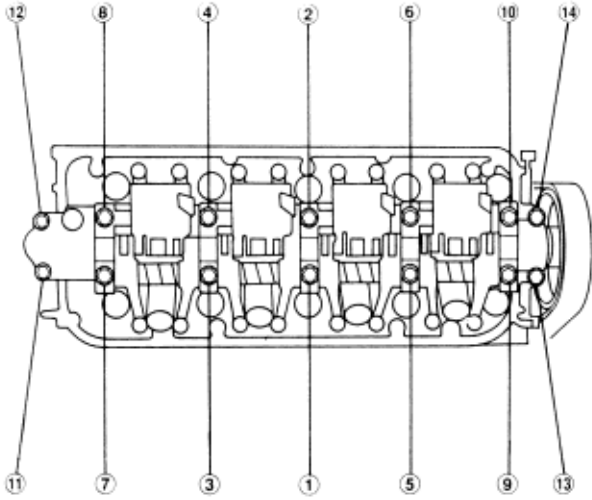
Specified torque:

8 mm bolts: 22 Nm (22 kgf/m 16 lbf/ft)

Apply engine oil to the bolt threads

6 mm bolts: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)

6 mm bolts (11), (12), (13), (14)

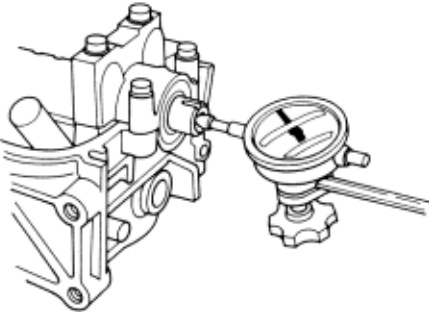


2. Seat the camshaft by pushing it toward the distributor end of the cylinder head.
3. Zero the dial indicator against the end of the distributor drive, then push the camshaft back and forth and read the end play.

Camshaft End Play:

**Standard (New): 0.05 - 0.15 mm
(0.002 - 0.006 in)**

Service Limit: 0.5 mm (0.02 in)

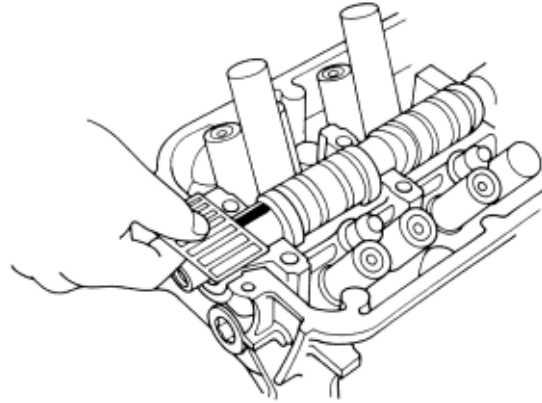


4. Remove the bolts, then remove the camshaft holders from the cylinder head.
 - Lift the camshaft out of the cylinder head, wipe it clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
 - Clean the camshaft bearing surfaces in the cylinder head, then set the camshaft back in place.
 - Place a plastigage strip across each journal.
5. Install the camshaft holders, then tighten the bolts to the specified torque as shown in the left column of this page.
6. Remove the camshaft holders. Measure the widest portion of plastigage on each journal.

Camshaft-to-Holder Oil Clearance:

**Standard (New): 0.050 - 0.089 mm
(0.0020 - 0.0035 in)**

Service Limit: 0.15 mm (0.006 in)



**Camshaft
Inspection (cont'd)**

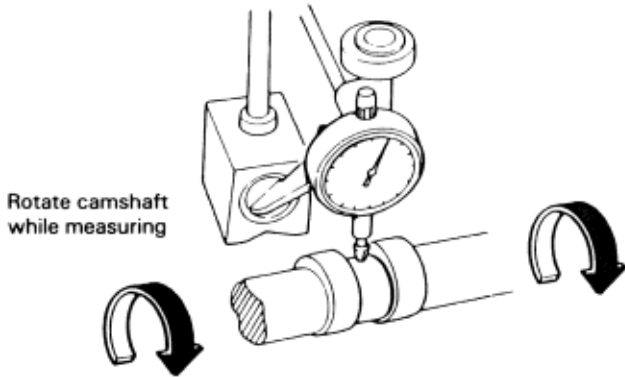
6-B-35

7. If camshaft-to-holder oil clearance is out of tolerance:
- And the camshaft has already been replaced, you must replace the cylinder head.
 - If the camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)



- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance, replace the camshaft and recheck. If the oil clearance is still out of tolerance, replace the cylinder head.

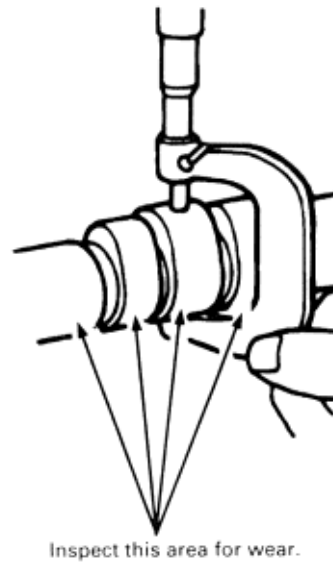
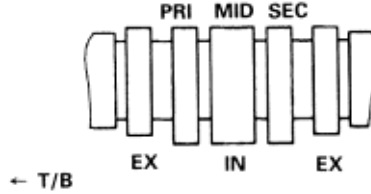
8. Measure cam lobe height.

Cam Lobe Height Standard (New):

Unit: mm (in)

		INTAKE	EXHAUST
F18B2, F18B3 engines	PRI	38.539(1.5173)	38.645(1.5215)
	MID	39.223(1.5442)	
	SEC	33.913(1.3352)	
F20B6 engine	PRI	38.539(1.5173)	38.645(1.5215)
	MID	39.725(1.5640)	
	SEC	33.913(1.3352)	

PRI: Primary MID: Mid SEC: Secondary
IN: Intake EX: Exhaust T/B: Timing Belt

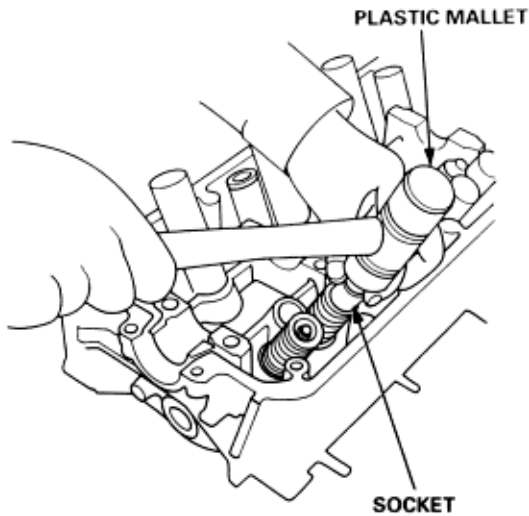


Valves, Valve Springs and Valve Seals Removal

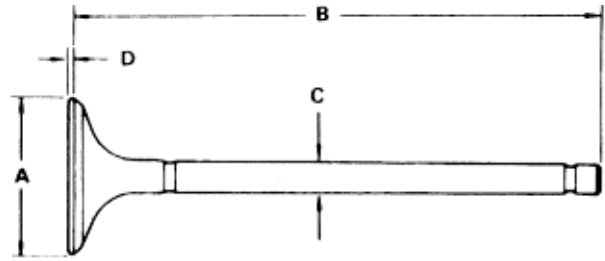
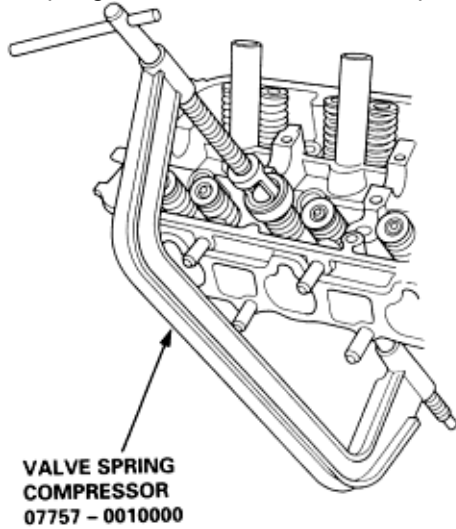
6-B-36

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Using an appropriate-sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers.



2. Install the valve spring compressor. Compress the spring and remove the valve keepers.



F18B2, F20B6 engines:

Intake Valve Dimensions

- A Standard (New):** 33.90 - 34.10 mm
(1.335 - 1.343 in)
- B Standard (New):** 114.85 - 115.15 mm
(4.522 - 4.533 in)
- C Standard (New):** 5.485 - 5.495 mm
(0.2159 - 0.2163 in)
- C Service Limit:** 5.455 mm (0.2148 in)
- D Standard (New):** 0.75 - 1.25 mm
(0.030 - 0.049 in)
- D Service Limit:** 0.55 mm (0.022 in)

Exhaust Valve Dimensions

- A Standard (New):** 28.85 - 29.15 mm
(1.136 - 1.148 in)
- B Standard (New):** 112.85 - 113.15 mm
(4.443 - 4.455 in)
- C Standard (New):** 5.450 - 5.460 mm
(0.2146 - 0.2150 in)
- C Service Limit:** 5.420 mm (0.2134)
- D Standard (New):** 0.95 - 1.45 mm
(0.037 - 0.057 in)
- Service Limit:** 0.85 mm (0.033 in)

F18B3 engine:

Intake Valve Dimensions

A Standard (New): 33.90 - 34.10 mm
(1.335 - 1.343 in)

B Standard (New): 114.85 - 115.15 mm
(4.522 - 4.533 in)

C Standard (New): 5.485 - 5.495 mm
(0.2159 - 0.2163 in)

C Service Limit: 5.455 mm (0.2148 in)

D Standard (New): 0.75 - 1.25 mm
(0.030 - 0.049 in)

D Service Limit: 0.55 mm (0.022 in)

Exhaust Valve Dimensions

A Standard (New): 28.90 - 29.10 mm
(1.138 - 1.146 in)

B Standard (New): 112.85 - 113.15 mm
(4.443 - 4.455 in)

C Standard (New): 5.450 - 5.460 mm
(0.2146 - 0.2150 in)

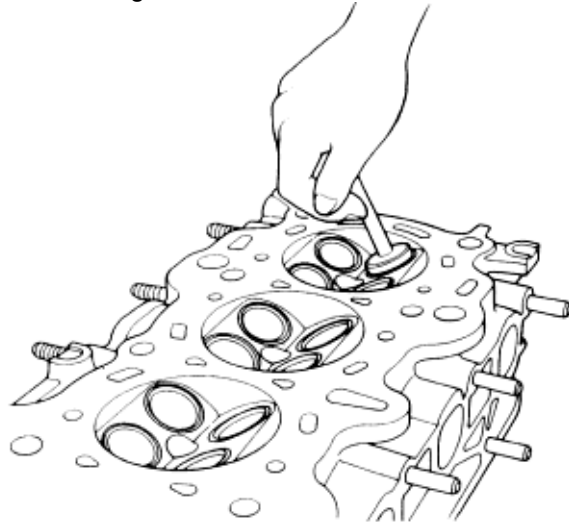
C Service Limit: 5.420 mm (0.2134 in)

D Standard (New): 1.55 - 1.85 mm
(0.061 - 0.073 in)

D Service Limit: 1.45 mm (0.057 in)

1. Renew the valve seats in the cylinder head using a valve seat cutter.

NOTE: If the valve guides are worn (**See Page 6-B-39**) replace them, (**See Page 6-B-40**) before cutting the valve seats.

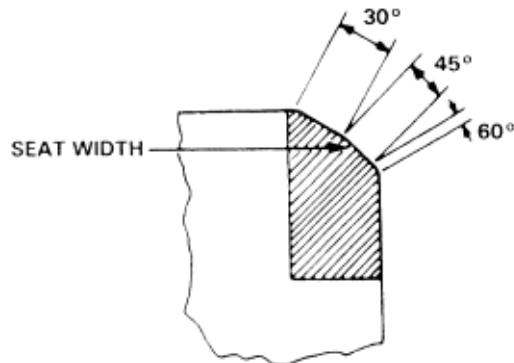


2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of the seat and adjust accordingly.
4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutter.

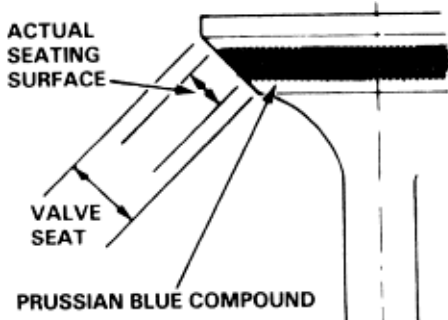
Valve Seat Width:

Standard (New): 1.25 - 1.55 mm
(0.049 - 0.061 in)

Service Limit: 2.00 mm (0.079 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
- ♦ If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
 - ♦ If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

NOTE: The final cut should always be made with the 45° cutter.

7. Insert the intake and exhaust valves in the head and measure valve stem installed height.

Intake Valve Stem Installed Height:

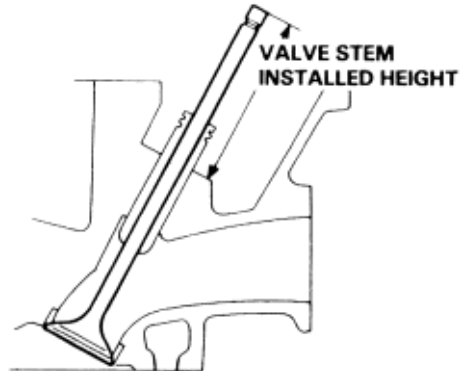
Standard (New): 46.75 - 47.55 mm
(1.841 - 1.872 in)

Service Limit: 47.80 mm (1.882 in)

Exhaust Valve Stem Installed Height:

Standard (New): 46.68 - 47.48 mm
(1.838 - 1.869 in)

Service Limit: 47.73 mm (1.879 in)



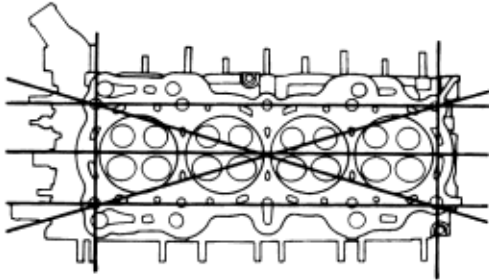
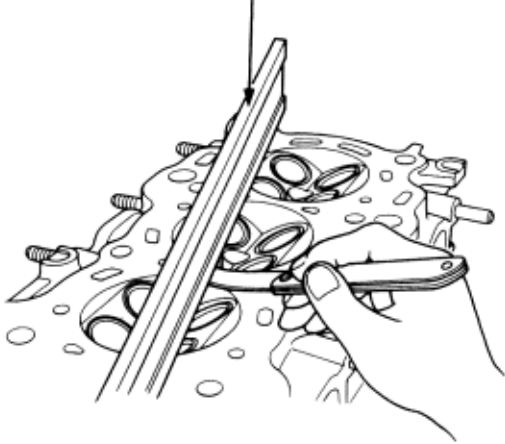
8. If valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

NOTE: If camshaft-to-holder oil clearances are not within specifications, (See Page 6-B-34), the cylinder head cannot be resurfaced.

If camshaft-to-holder oil clearances are within specifications, check the cylinder head for warpage.

- ♦ If warpage is less than 0.05 mm (0.002 in) cylinder head resurfacing is not required.
- ♦ If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface the cylinder head.
- ♦ Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 100 mm (3.94 in).

PRECISION STRAIGHT EDGE



Measure along edges, and three ways across center.

Cylinder Head Height:

Standard (New): 99.95 - 100.05 mm
(3.935 - 3.939 in)

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:

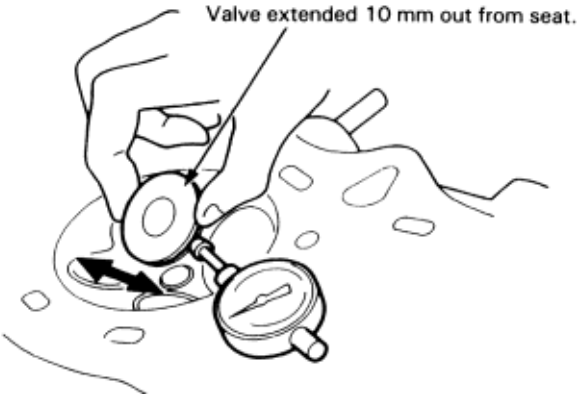
Standard (New): 0.04 - 0.09 mm
(0.002 - 0.004 in)

Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.11 - 0.16mm
(0.004 - 0.006 in)

Service Limit: 0.24 mm (0.009 in)



- ♦ If measurement exceeds the service limit, recheck using a new valve.
- ♦ If measurement is now within the service limit, reassemble using a new valve.
- ♦ If measurement still exceeds the limit, recheck using the alternate method below, then replace the valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.

Take the measurements in three places along the valve stem and three places inside the valve guide.

The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

Standard (New): 0.020 - 0.045 mm
(0.0008 - 0.0018 in)

Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.055 - 0.080 mm
(0.0022-0.0031 in)

Service Limit: 0.12 mm (0.005 in)

Valve Guides Replacement

6-B-40

Reaming

NOTE:

- For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
- It may be necessary to use an air hammer to remove some valve guides.

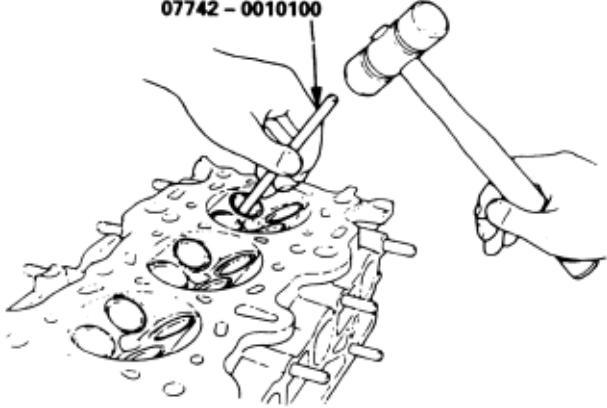


CAUTION

To avoid burns, use heavy gloves when handling heated cylinder head.

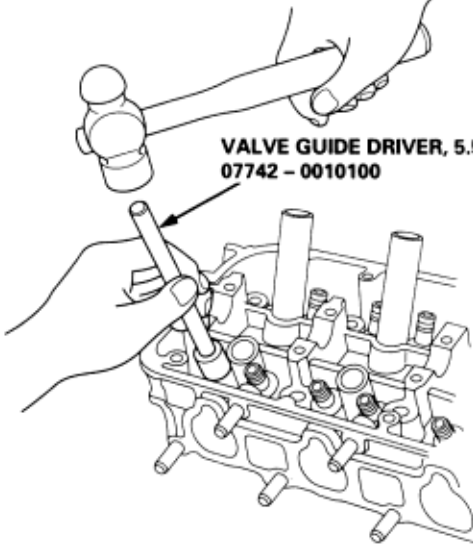
1. Drive the valve guide out from the bottom of the cylinder head.

VALVE GUIDE DRIVER,
5.5 mm
07742 - 0010100



2. Drive in a new valve guide to the specified depth.

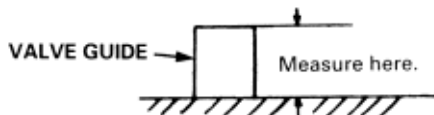
VALVE GUIDE DRIVER, 5.5 mm
07742 - 0010100



Valve Guide Installed Height:

Intake: 21.20 - 22.20 mm (0.835 - 0.874 in)

Exhaust: 20.63 - 21.63 mm (0.812 - 0.852 in)



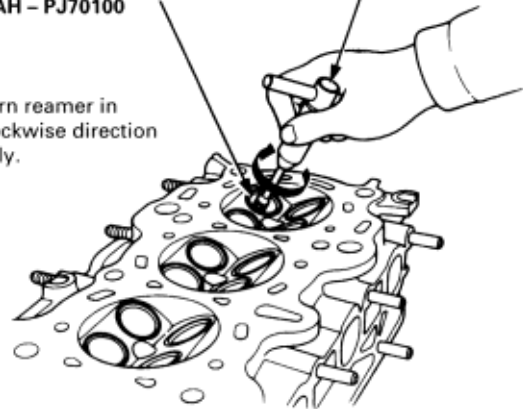
NOTE: For new valve guides only.

1. Coat both reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check the clearance with a valve (**See Page 6-B-39**).
 - Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

VALVE GUIDE REAMER, 5.525 mm
07HAH - PJ70100

REAMER HANDLE

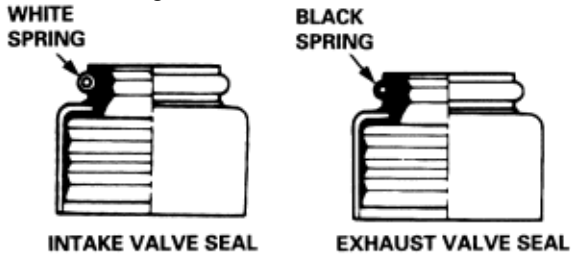
Turn reamer in
clockwise direction
only.



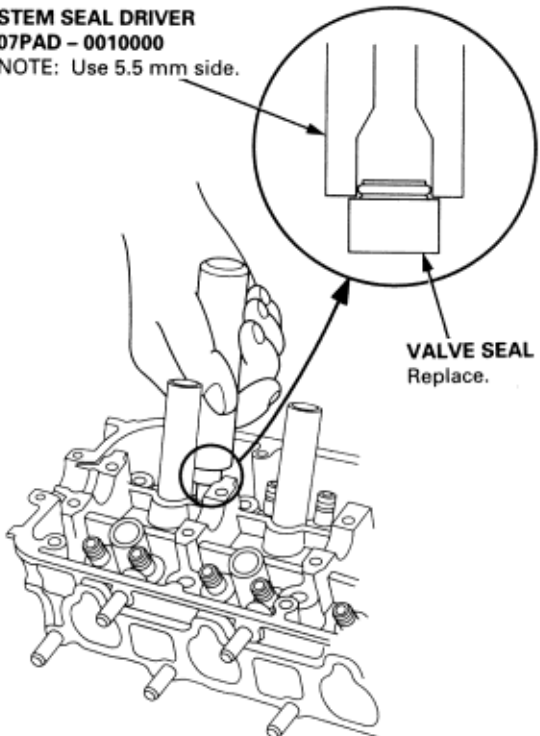
Valves, Valve Springs and Valve Seats Installation

6-B-41

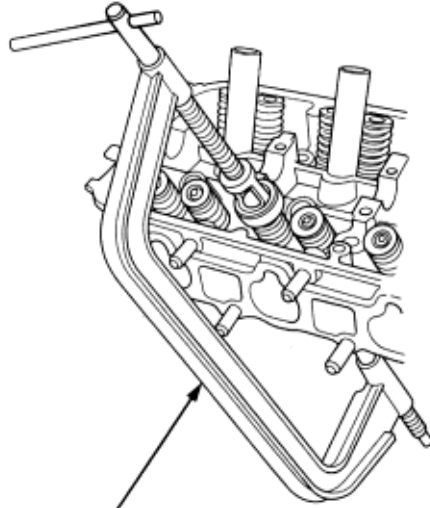
1. Coat the valve stems with engine oil. Install the valves in the valve guides.
NOTE: Make sure the valves move up and down smoothly.
2. Install the spring seats on the cylinder head.
3. Install the valve seals using the valve guide seal installer.
NOTE: Exhaust and intake valve seals are not interchangeable.



STEM SEAL DRIVER
07PAD - 0010000
NOTE: Use 5.5 mm side.

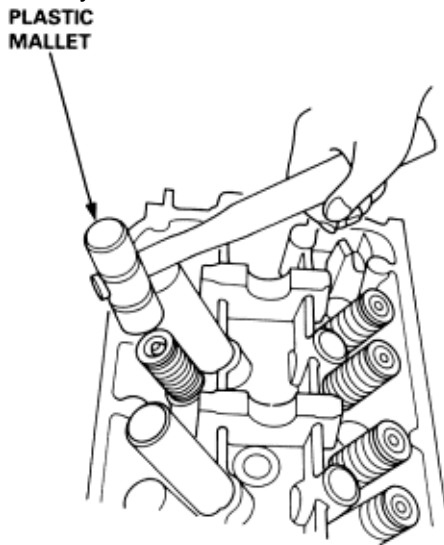


4. Install the valve spring and valve retainer, then install the valve spring compressor. Compress the spring and install the valve keepers.
NOTE: Place the end of the valve spring with closely wound coils toward the cylinder head.



VALVE SPRING COMPRESSOR
07757 - 0010000

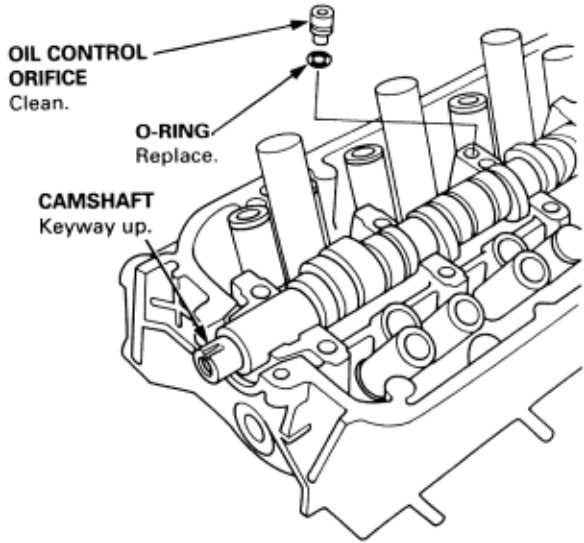
5. Lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of the valve and valve keepers.
NOTE: Tap the valve stem only along its axis so you do not bend the stem.



Camshaft/Rocker Arms and Camshaft Seal/Pulley Installation

6-B-42

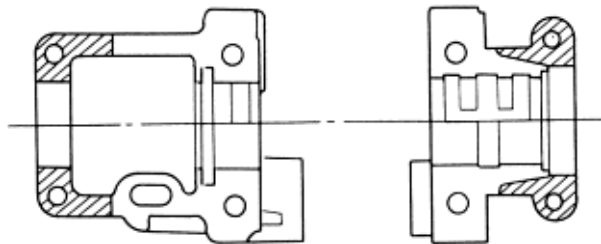
1. After wiping down the camshaft and journals in the cylinder head, lubricate both surfaces and install the camshaft and camshaft seal.
2. Clean and install the oil control orifice with a new O-ring.



- LUBRICATE** Lubricate cam lobes after reassembly.
3. Turn the camshaft until its keyway is facing up. (No. 1 piston TDC).
 4. Apply liquid gasket to the head mating surfaces of the No. 1 and No. 5 camshaft holders.
 - Apply liquid gasket to the shaded areas.

No. 5

No. 1



5. Set the rocker arm assembly in place and loosely install the bolts.
 - Make sure that the rocker arms are properly positioned on the valve stems.
6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

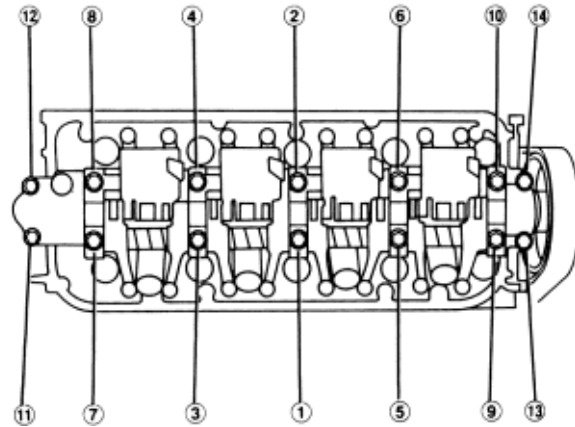
Specified torque:

8 mm bolts: 22 Nm (2.2 kgf/m, 16 lbf/ft)

Apply engine oil to the bolt threads.

6 mm bolts: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)

6 mm bolts: (11), (12), (13), (14)

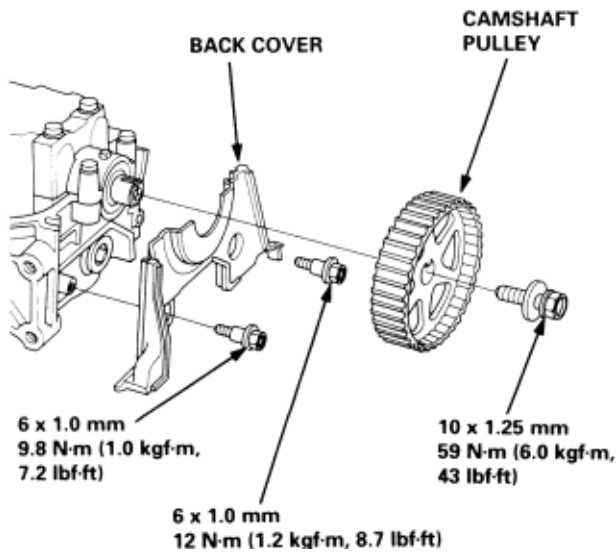


**Camshaft/Rocker Arms and Camshaft
Seal/Pulley
Installation (cont'd)**

6-B-43

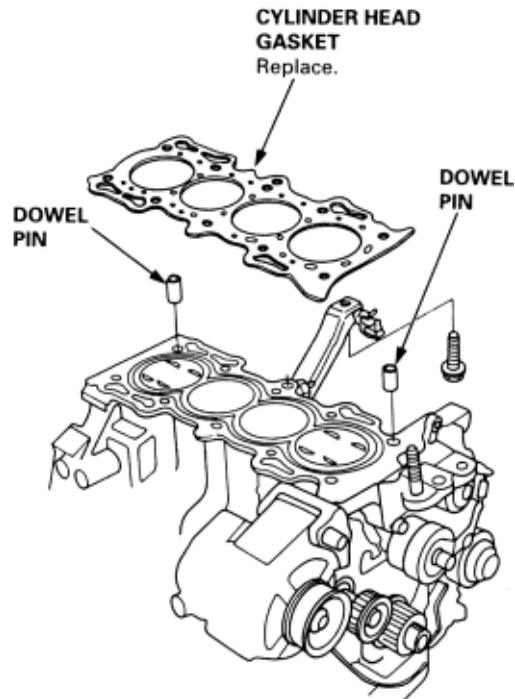
**Cylinder Head
Installation**

7. Check the back cover rubber seal for cracks and other damage.
NOTE:
 - ♦ If the rubber seal is coming off, apply liquid gasket to the lower cover and put the rubber seal back. Wipe off any liquid gasket that is pressed out.
 - ♦ When replacing rubber seal, clean the lower cover groove cut the repair rubber seal to length, and put the rubber seal into the groove evenly.
 - ♦ After putting rubber seal check the jointing parts of the rubber seal. Apply liquid gasket if there is any gap or opening.
8. Install the back cover.
9. Install the camshaft pulley onto the camshaft, then tighten the retaining bolt to the torque shown.



Install the cylinder head in the reverse order of removal:
NOTE:

- ♦ Always use a new head gasket.
 - ♦ Cylinder head and cylinder block surface must be clean.
 - ♦ "UP" mark on the camshaft pulley should be at the top.
 - ♦ Turn the crankshaft so the No. 1 piston is at TDC (**See Page 6-B-20**).
 - ♦ Do not use the upper cover and lower cover for storing removed items.
 - ♦ Clean the upper cover and lower cover before installation.
1. Cylinder head dowel pins must be aligned.



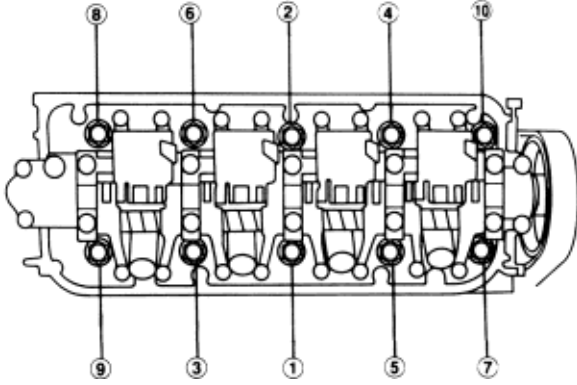
Cylinder Head Installation (cont'd)

6-B-44

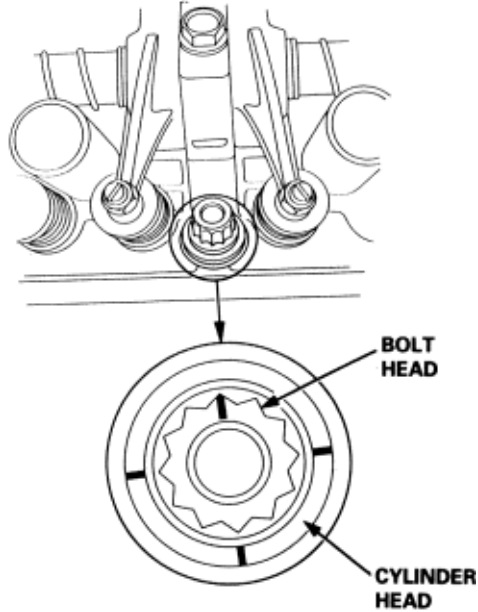
2. Position the camshaft correctly (See Page 6-B-20).
3. Apply clean engine oil to the threads of the cylinder head bolts.
4. Tighten the cylinder head bolts in sequence to 29 Nm (3.0 kgf/m, 22 lbf/ft).

NOTE:

- ♦ We recommend using a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
- ♦ If a bolt makes any noise when you are torquing it, loosen the bolt, and retighten it.



5. Mark the bolt head and the cylinder head as shown.

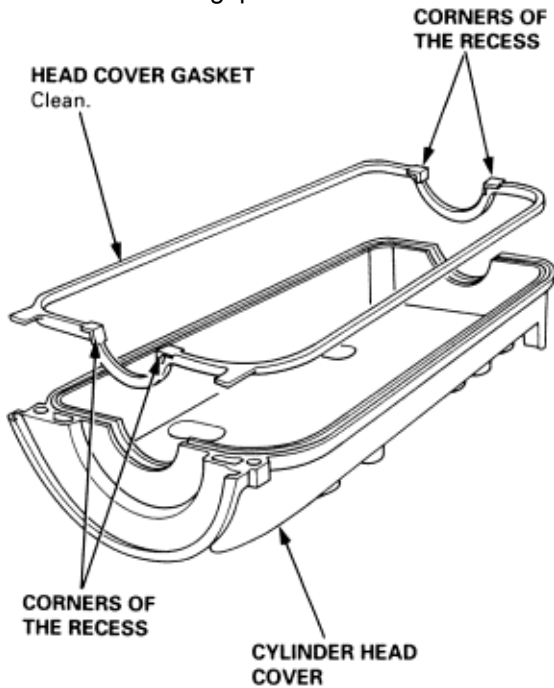


6. Tighten the cylinder head bolts until the mark on the bolt head align to the mark on the cylinder head (turn the bolt 90°) twice.
NOTE: If using a new cylinder head bolt, tighten the bolt 90° further.
7. Tighten the intake manifold bracket mounting bolt and thermostat housing mounting bolts (See Page 6-B-29).
8. Install the exhaust manifold bracket and the exhaust pipe A, then install the cover (See Page 6-B-29).

9. Install the timing belt (**See Page 6-B-20**).
10. Adjust the valve clearance (**See Page 6-B-12**).
11. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:

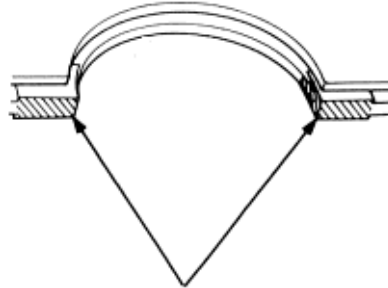
- ♦ Before installing the head cover gasket, thoroughly clean the seal and the groove.
- ♦ When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.



12. Apply liquid gasket to the head cover gasket at the four corners of the recesses.

NOTE:

- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M, or 08C70 -X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.



Apply liquid gasket to the shaded areas.

Cylinder Head Installation (cont'd)

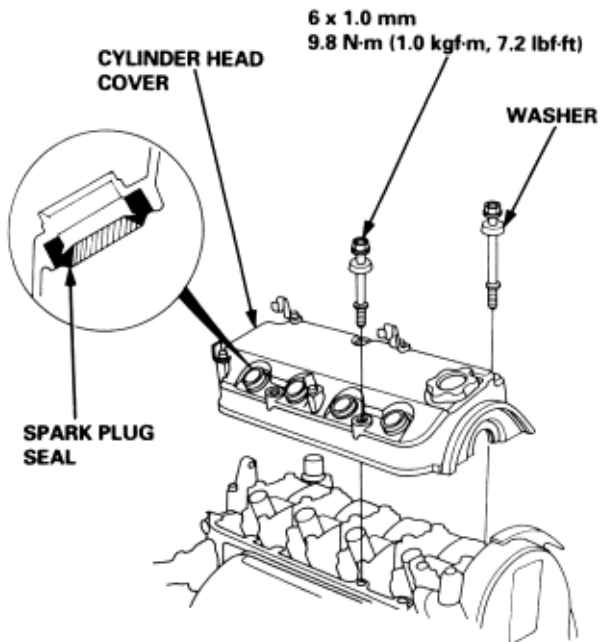
6-B-46

13. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).

Set the spark plug seal on the spark plug pipe. Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

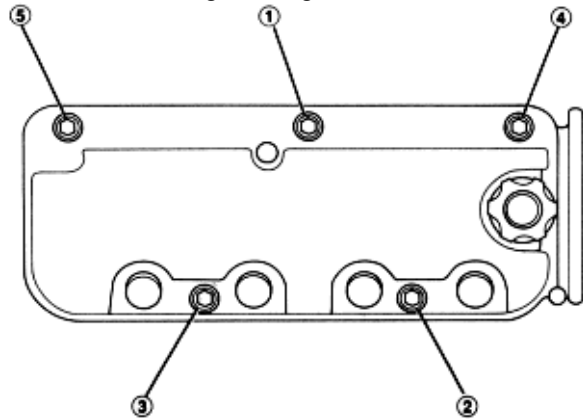
NOTE:

- Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
- Do not touch the parts where liquid gasket was applied.
- Take care not to damage the spark plug seal when installing the cylinder head cover.
- Visually check the spark plug seal for damage.
- Replace the washer when damaged or deteriorated.



14. Tighten the nuts in two or three steps. In the final step, tighten all nuts, in sequence, to 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft).

NOTE: After assembly, wait at least 30 minutes before filling the engine with oil.

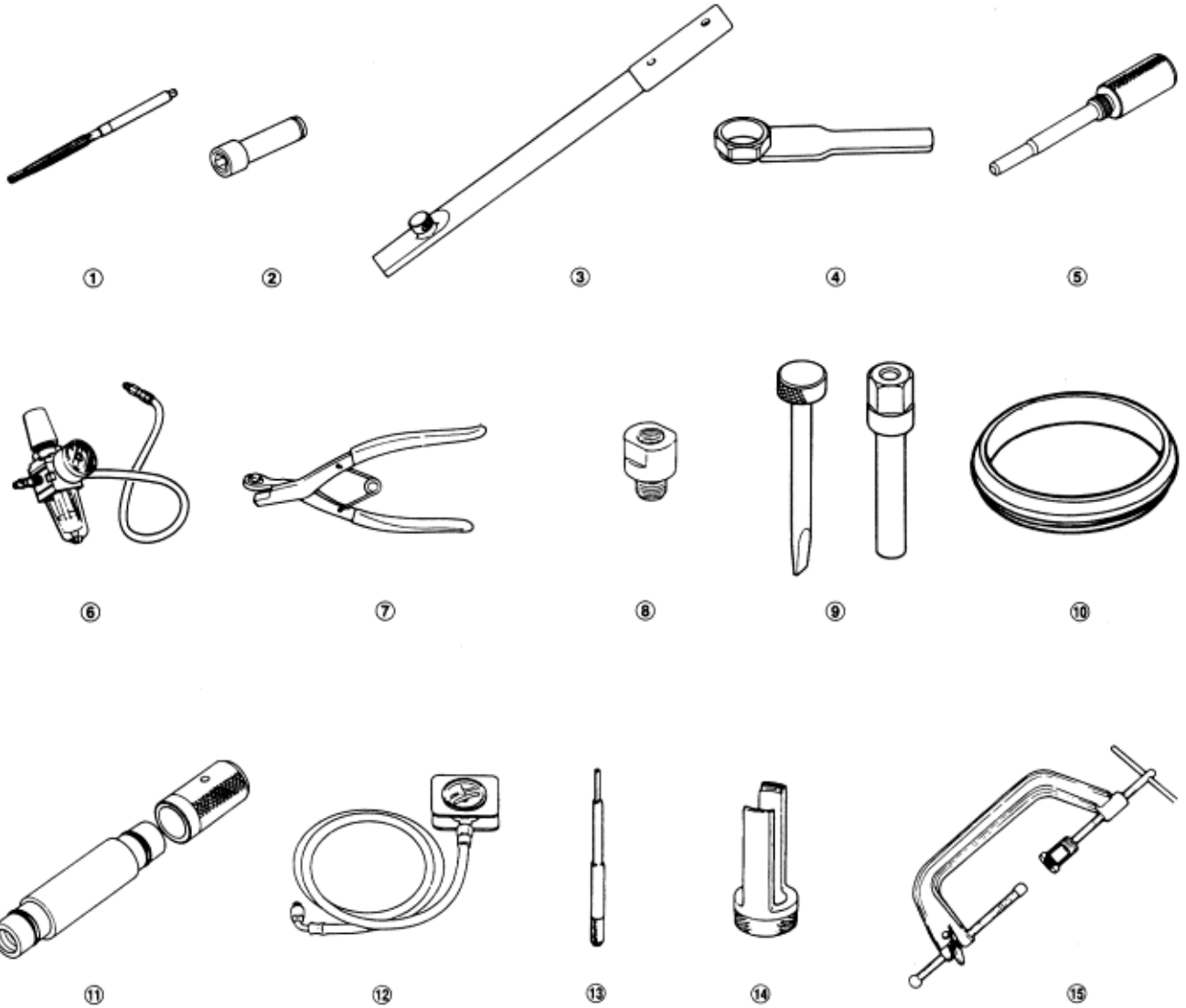


15. After installation, check that all tubes, hoses and connectors are installed correctly.
16. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Special Tools

6-C-2

Ref No.	Tool Number	Description	Qty	Remark
1	07HAH - PJ70100	Valve Guide Reamer, 5.525 mm	1	
2	07JAA - 0010200	Socket Wrench, 19 mm	1	
3	07JAB - 0010200	Handle	1	
4	07JAB - 0010400	Pulley Holder Attachment, HEX 50mm	1	
5	07LAG - PT20100	Balancer Shaft Lock Pin	1	
6	07LAJ - PR30101	Valve Inspection Set	1	
7	07LAJ - PR30201	Air Stopper	1	
8	07LAK - PR30100	Oil Pressure Gauge Attachment	1	
9	07MAA - PR70100	Tappet Adjuster Wrench Set	1	
10	07NAG - P130100	Timing Belt Slider	1	
11	07PAD - 0010000	Stem Seal Driver	1	
12	07406 - 0070001	Low Pressure Gauge	1	
13	07742 - 0010100	Valve Guide Driver, 5.5 mm	1	
14	07757 - PJ10100	Valve Spring Compressor Attachment	1	
15	07757 - 0010000	Valve Spring Compressor	1	

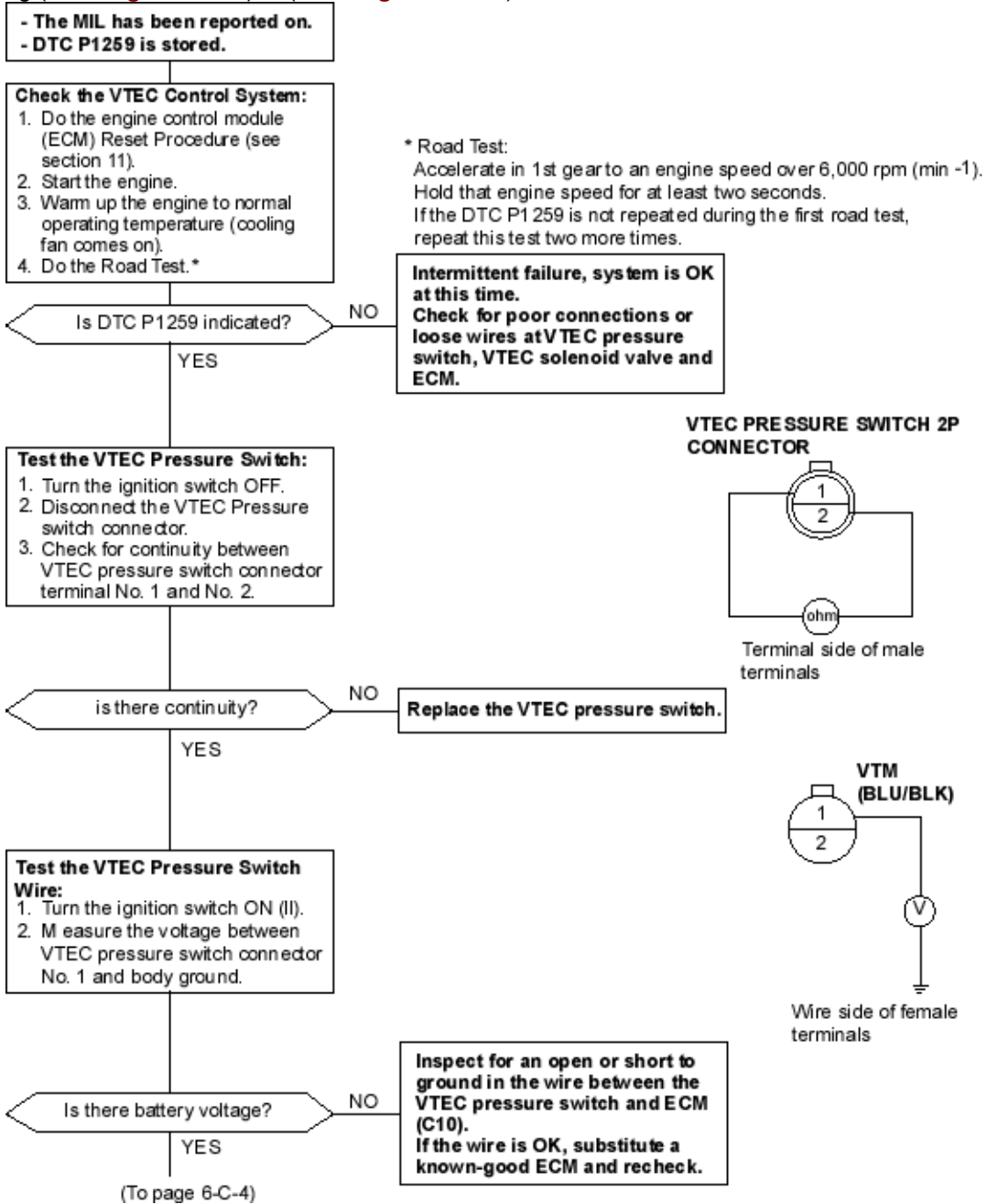


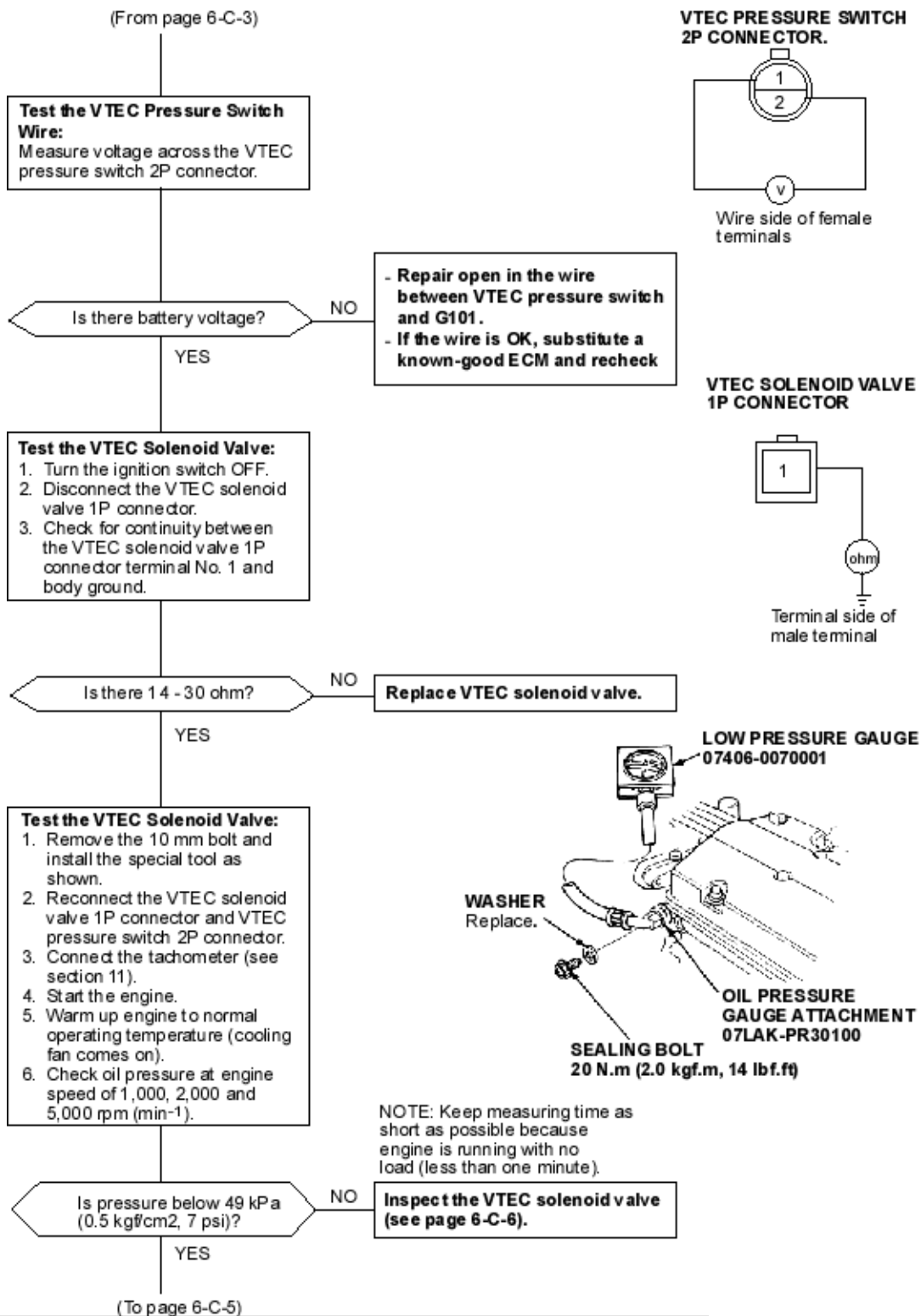
**Variable Valve Timing and Valve Lift
Electronic Control (VTEC) Control System
Troubleshooting Flowchart**

6-C-3

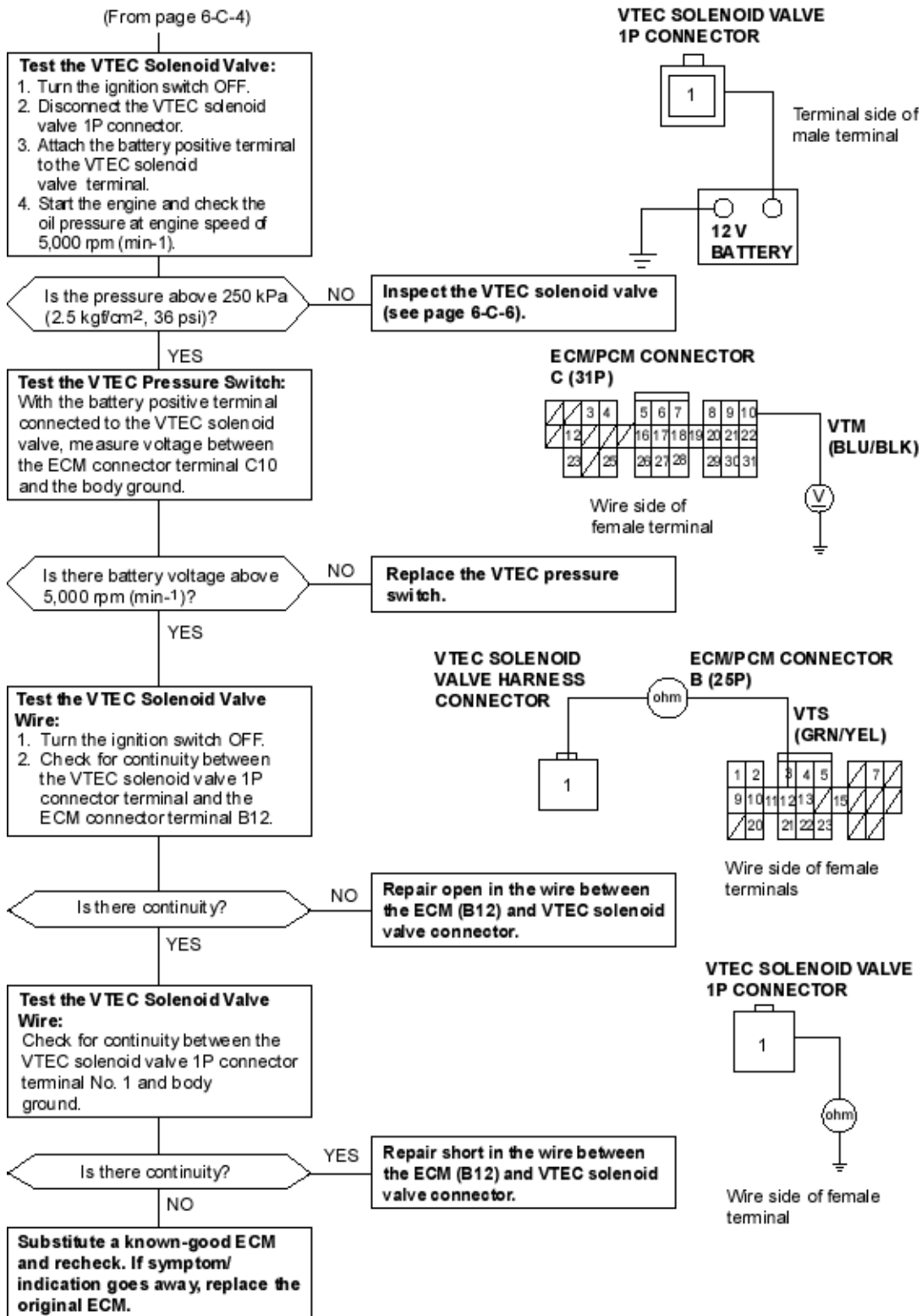
P1259 The scan tool indicates Diagnostic Trouble Code (DTC) P1259: A problem in the VTEC Pressure Switch circuit or VTEC Solenoid Valve circuit.

Before troubleshooting (See Page 11-A-15) to (See Page 11--A-20)





To go to the page referenced on the diagram above, click on the following:
(See Page 6-C-6)



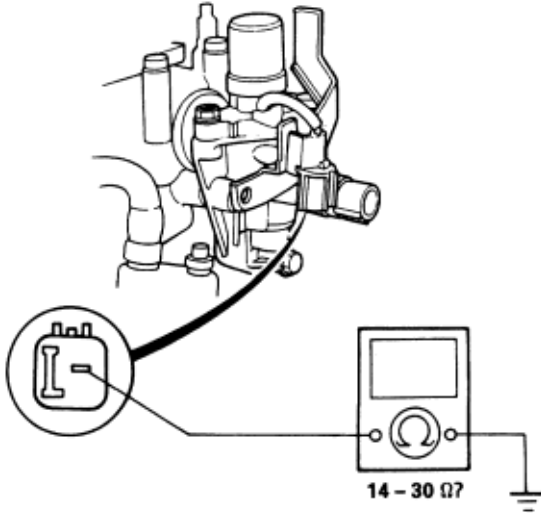
To go to the page referenced on the diagram above, click on the following:
 (See Page 6-C-6)

VTEC Solenoid Valve Inspection

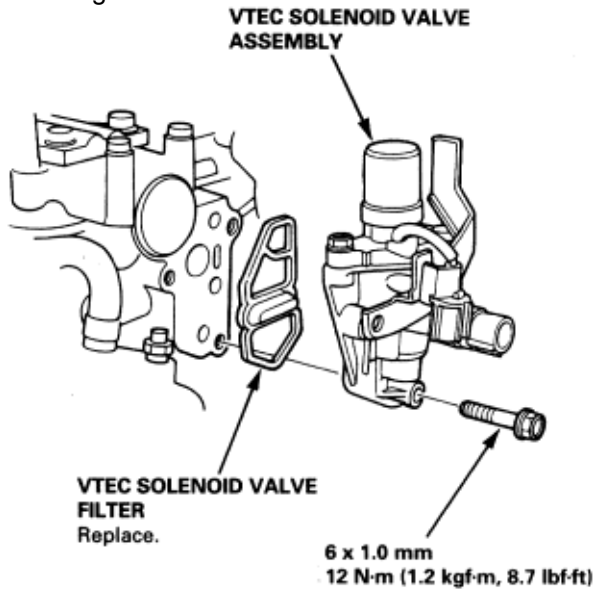
6-C-6

1. Disconnect the 1P connector from the VTEC solenoid valve.
2. Measure resistance between the terminal and body ground.

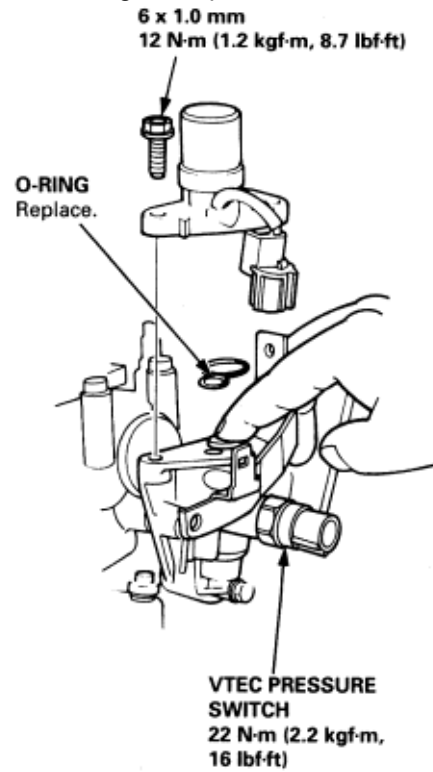
Resistance: 14 - 30 ohms



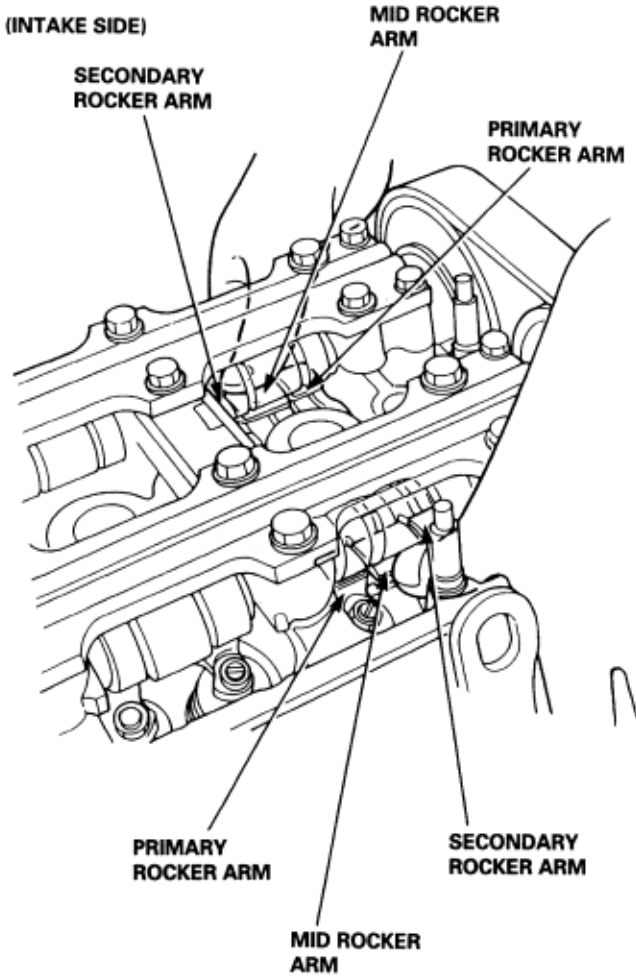
3. If the resistance is within specifications, remove the VTEC solenoid valve assembly from the cylinder head, and check the VTEC solenoid valve filter for clogging. If there is clogging, replace the engine oil filter and the engine oil.



4. If the filter is not clogged, push the VTEC solenoid valve with your finger and check its movement. If the VTEC solenoid valve is normal, check the engine oil pressure.



1. Set the No. 1 piston at TDC.
2. Remove the cylinder head cover.
NOTE: When installing the cylinder head cover (**See Page 6-C-45**) and (**See Page 6-C-46**).
3. Push the mid rocker arm on the No. 1 cylinder manually.
4. Check that the mid rocker arm moves independently of the primary and secondary intake rocker arms.



(EXHAUST SIDE)

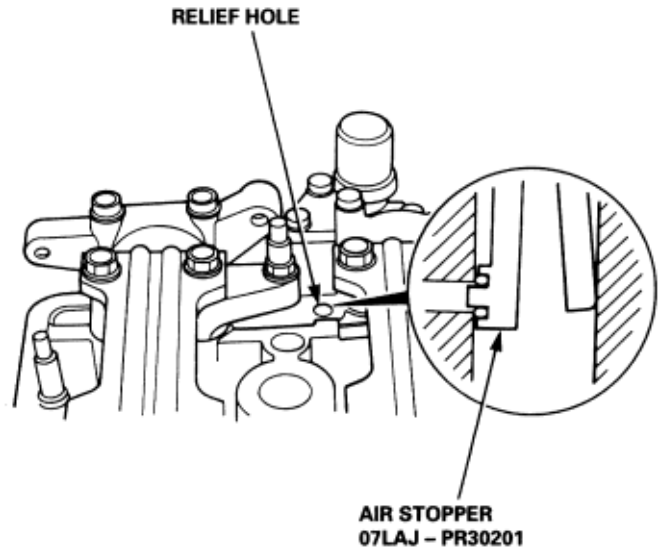
5. Check the mid rocker arm of each cylinder at TDC.
 - ♦ If the mid rocker arm does not move, remove the mid, primary and secondary rocker arms as an assembly and check that the pistons in the mid and primary rocker arms move smoothly.
 - ♦ If any rocker arm needs replacing, replace the primary, mid, and secondary rocker arms as an assembly.



CAUTION

- ♦ Before using the special tool (Valve Inspection Tool), make sure that the air pressure gauge on the air compressor indicates over 400 kPa (4 kgf/cm², 57 psi).
- ♦ Inspect the valve clearance before rocker arm inspection.
- ♦ Cover the timing belt with a shop towel to protect the belt from oil soaking.
- ♦ Check the mid rocker arm of each piston at TDC.

1. Remove the cylinder head cover.
NOTE: When installing the cylinder head cover (**See Page 6-C-45**) and (**See Page 6-C-46**).
2. Plug the relief hole with the special tool.



VTEC Rocker Arms

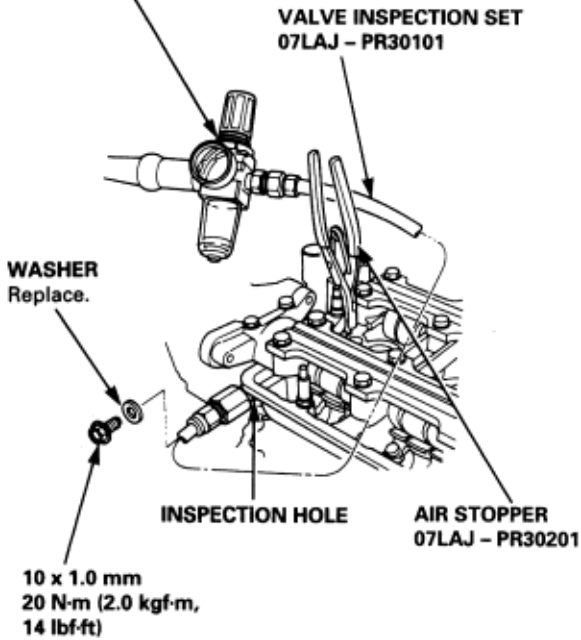
Inspection Using Special Tools (cont'd)

6-C-8

- Remove the bolt and washer from the inspection hole and connect the special tool.

REGULATOR VALVE

- Pull the lever and turn to adjust.

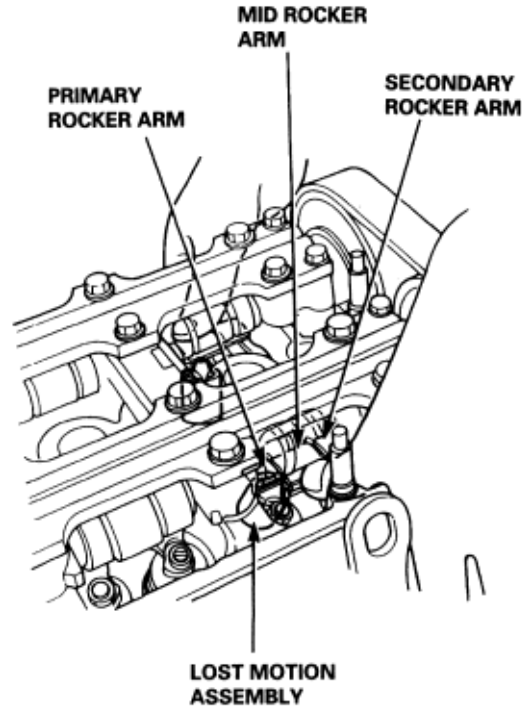


- Loosen the regulator valve on the valve inspection set and apply the specified air pressure to the rocker arm pistons.

Specified Air Pressure:

250 kPa (2.5 kgf/cm², 36 psi)

- Make sure that the intake primary and secondary rocker arms are mechanically connected by the pistons and that the mid rocker arms do not move when pushed manually.



- ♦ If any mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms, as a set.
- Remove the tools.
- Check for smooth operation of the lost motion assembly. It is compressed slightly when the mid rocker arm is lightly pushed and compressed deeply when the mid rocker arm is strongly pushed.
 - ♦ Replace the lost motion assembly if it does not move smoothly.
- After inspection, check that the check engine light does not come on.

Valve Clearance Adjustment

6-C-9

NOTE:

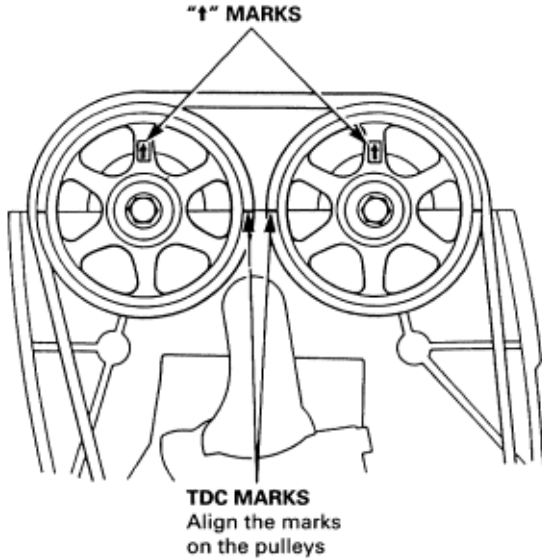
- Valves should be adjusted only when the cylinder head temperature is less than 38°C (100°F).
- After adjusting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf-m, 181 lbf-ft).

- Remove the cylinder head cover.

NOTE: When installing the cylinder head cover (See Page 6-C-45) and (See Page 6-C-46).

- Set No. 1 piston at TDC. "↑" marks on the pulleys should be at the top, and the TDC grooves on the pulleys should align with the cylinder head surface.

Number 1 piston at TDC:



- Adjust valves on No. 1 cylinder.

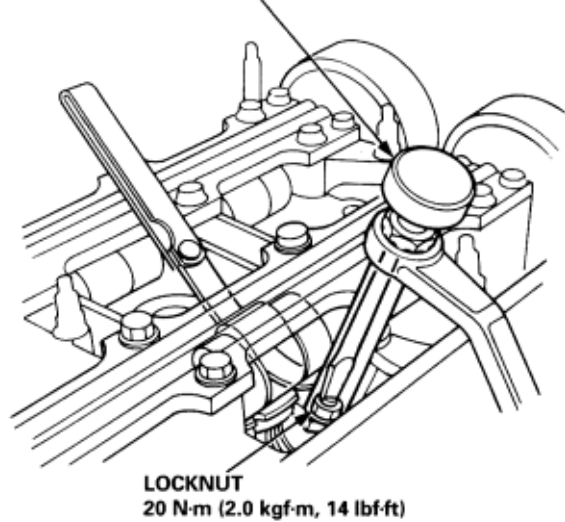
Valve Clearance:

Intake: 0.17 mm (0.007 in)
± 0.02 mm (0.0008 in)

Exhaust: 0.19 mm (0.007 in)
± 0.02 mm (0.0008 in)

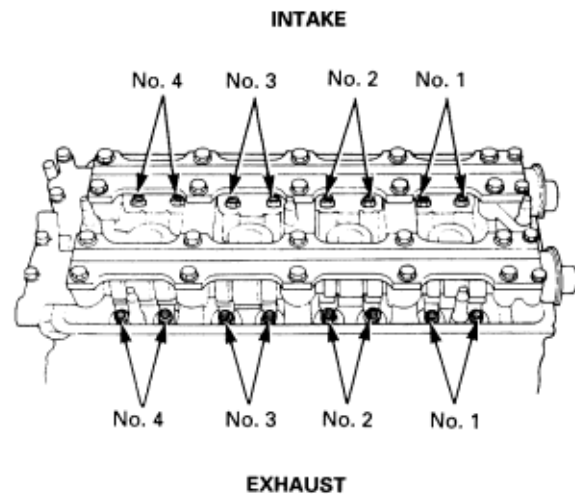
- Loosen the locknut and turn the adjusting screw until a feeler gauge slides back and forth with a slight amount of drag.

TAPPET ADJUSTER
WRENCH SET
07MAA - PR70100



Adjusting screw location:

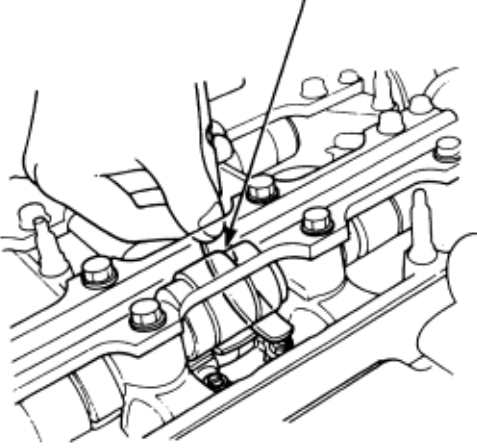
Adjusting screw location:



(cont'd)

5. Tighten the locknut, and check the clearance again. Repeat the adjustment if necessary.

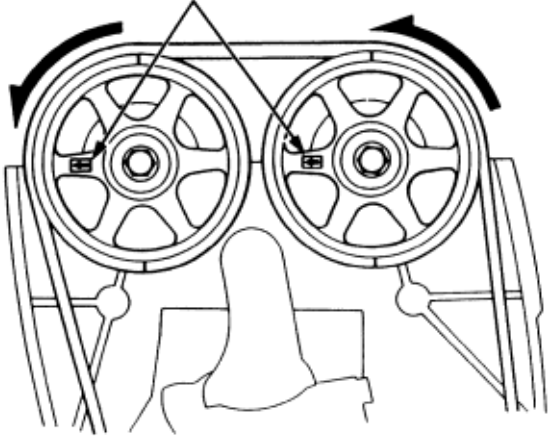
FEELER GAUGE



6. Rotate the crankshaft 180° counterclockwise (camshaft pulleys turn 90°). The “↑” marks should be on the exhaust side. Adjust the valves on No. 3 cylinder.

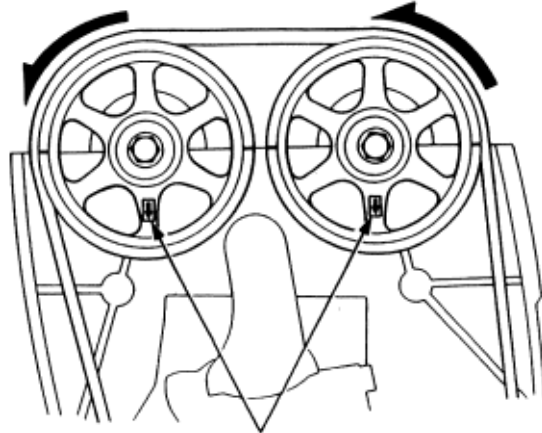
Number 3 piston at TDC:

“↑” MARKS



7. Rotate the crankshaft 180° counterclockwise to bring No. 4 piston to TDC. The TDC grooves are once again aligned. Adjust the valves on No. 4 cylinder.

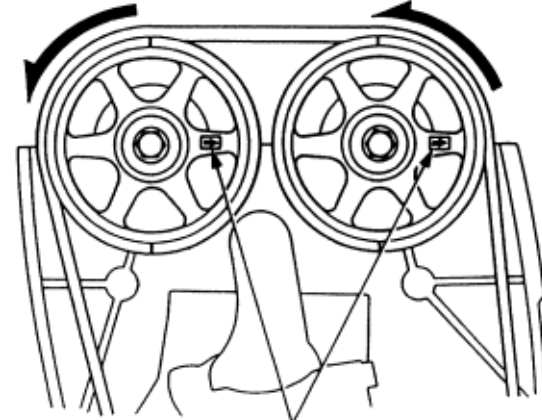
Number 4 piston at TDC:



“↑” MARKS

8. Rotate the crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The “↑” marks should be on the intake side. Adjust the valves on No. 2 cylinder.

Number 2 piston at TDC:



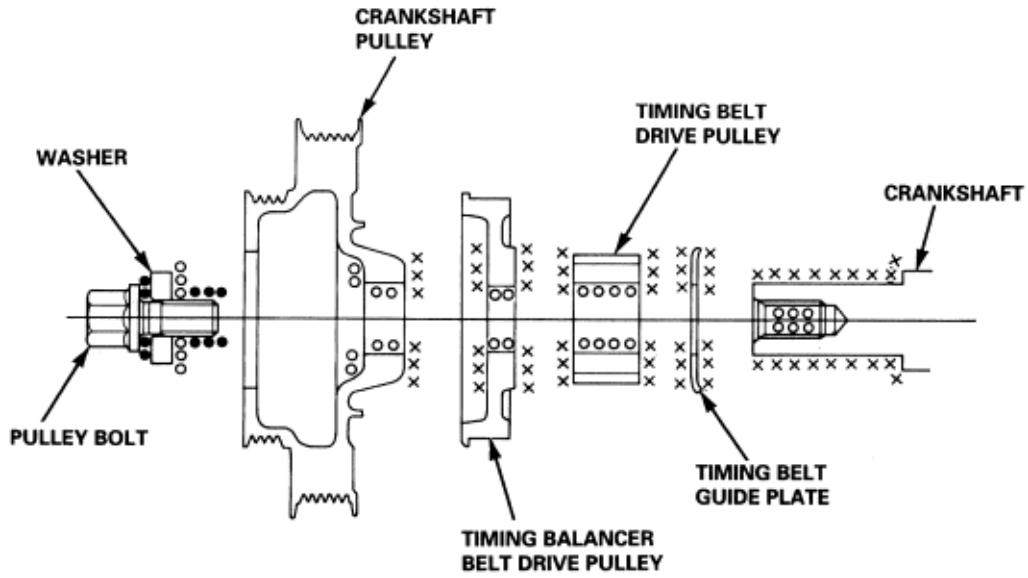
“↑” MARKS

Crankshaft Pulley and Pulley Bolt Replacement

6-C-11

When installing and tightening the pulley, follow the procedure below.
Clean, remove any oil and lubricate all the points shown below:

- o : Clean
- x : Remove any oil
- ♦ : Lubricate

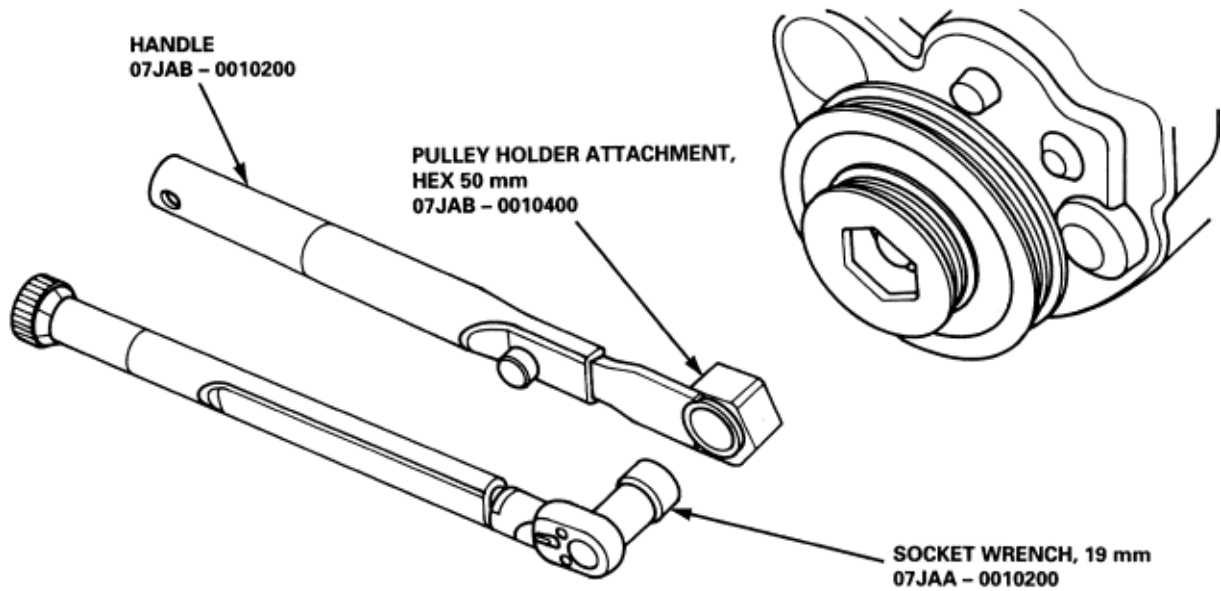


Crankshaft pulley bolt size and torque value:

16 x 1.5 mm

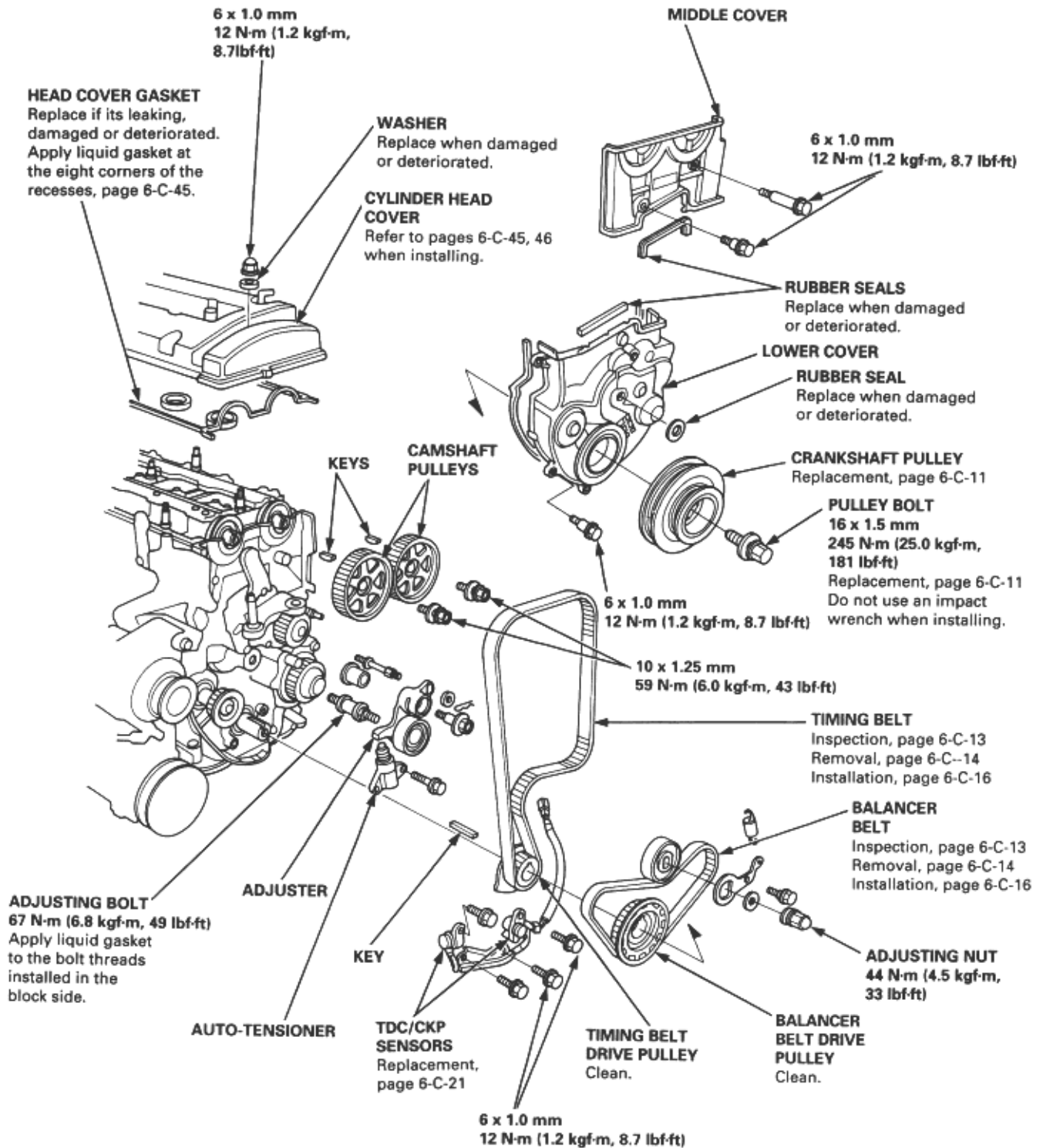
245 Nm (25.0 kgf/m, 181 lbf/ft)

NOTE: Do not use an impact wrench when installing.



NOTE:

- ♦ How to position the crankshaft and pulley before installing the belt (**See Page 6-C-16**).
- ♦ Mark the direction of rotation on the belt before removing it.
- ♦ Do not use the middle cover and lower cover to store removed items.
- ♦ Clean the middle cover and lower cover before installing them.
- ♦ Replace the camshaft seals and crankshaft seals if there is oil leakage.
- ♦ Before installing the timing belt and timing balancer belt (**See Page 6-C-11**).



To go to the page referenced on the diagram above, click on the following:
[\(See Page 6-C-45\)](#)
[\(See Page 6-C-46\)](#)
[\(See Page 6-C-11\)](#)
[\(See Page 6-C-13\)](#)
[\(See Page 6-C-14\)](#)
[\(See Page 6-C-16\)](#)
[\(See Page 6-C-21\)](#)

Timing Belt Inspection

6-C-13

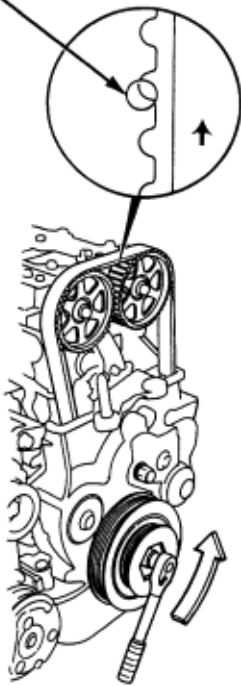
Balancer Belt Inspection

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Remove the cylinder head cover.
 - ♦ When installing (See Page 6-C-45) and (See Page 6-C-46).
5. Remove the middle cover.
6. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

- ♦ Replace the belt if oil or coolant soaked.
- ♦ Remove any oil or solvent that gets on the belt.

Inspect this area for wear.



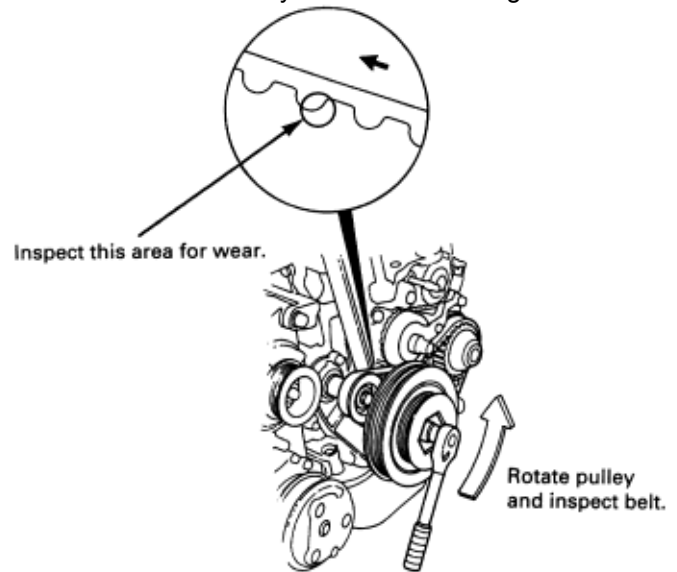
Rotate pulley and inspect belt.

7. After inspecting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).
8. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative terminal first, then the positive terminal.
3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Remove the cylinder head cover.
 - ♦ When installing (See Page 6-C-45) and (See Page 6-C-46).
5. Remove the middle cover.
6. Remove the crankshaft pulley.
7. Remove the lower cover.
8. Install the crankshaft pulley.
9. Inspect the timing balancer belt for cracks and oil or coolant soaking.

NOTE:

- ♦ Replace the belt if oil or coolant soaked.
- ♦ Remove any oil or solvent that gets on the belt.



Inspect this area for wear.

Rotate pulley and inspect belt.

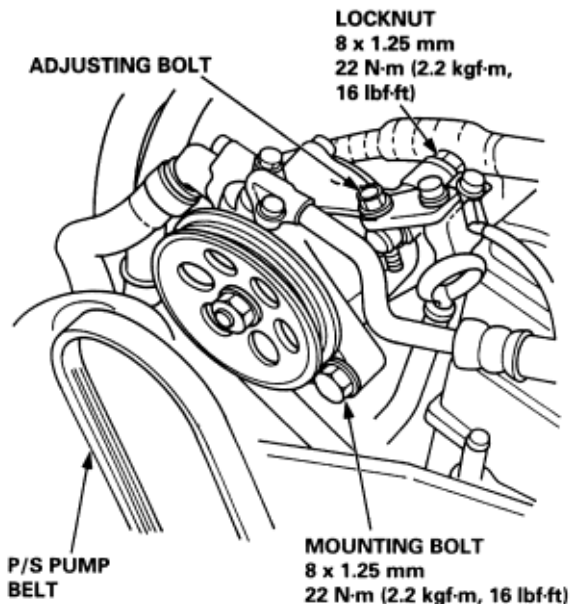
10. After inspecting, retorque the crankshaft pulley bolt to 245 Nm (25.0 kgf/m, 181 lbf/ft).
11. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Timing Belt and Balancer Belt Removal

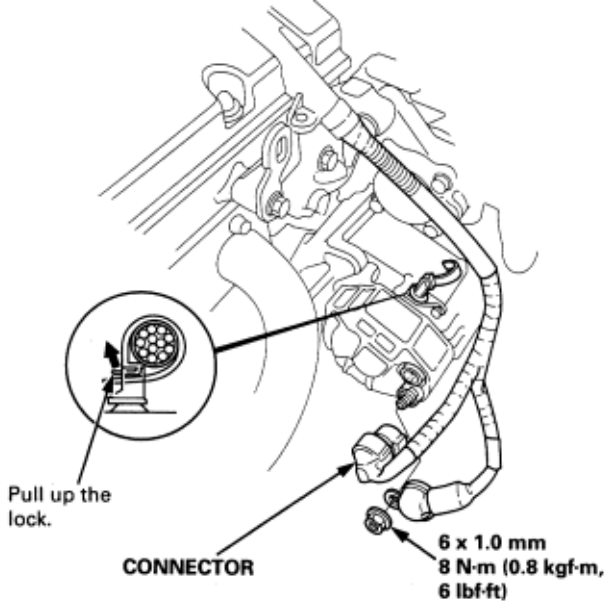
6-C-14

NOTE:

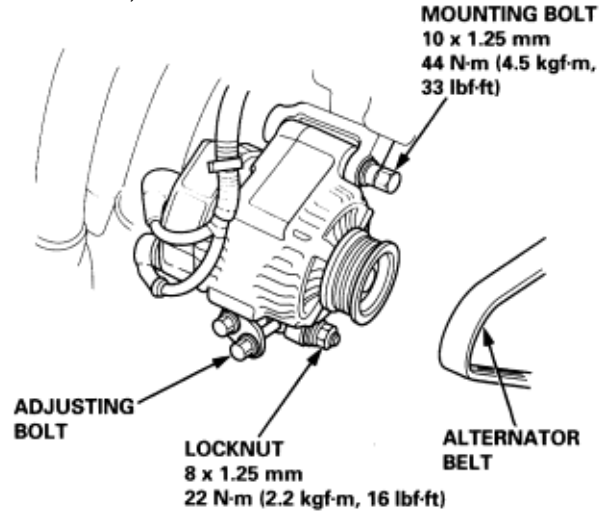
- ♦ Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (**See Page 6-C-17**).
 - ♦ Inspect the water pump after removing the timing belt (**See Page 6-C-17**).
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 2. Disconnect the battery negative terminal first, then the positive terminal.
 3. Remove the wheel well splash shield.
 4. Loosen the adjusting bolt, locknut and mounting bolt, then remove the power steering (P/S) pump belt.



5. Remove the alternator terminal and connector.



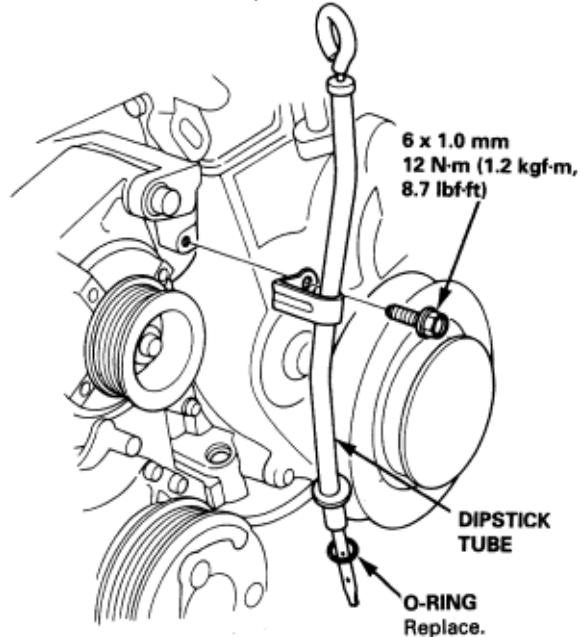
6. Loosen the adjusting bolt, mounting bolt and locknut, then remove the alternator belt.



7. Remove the stop and ground cable, then remove the upper bracket (**See Page 6-C-27**).

NOTE:

- ♦ Use a jack to support the engine before the upper bracket is removed.
 - ♦ Make sure to place a cushion between the oil pan and the jack.
8. Remove the dipstick and tube.



9. Remove the cylinder head cover.
 - ♦ When installing (**See Page 6-C-45**) and (**See Page 6-C-46**).

Timing Belt and Balancer Belt Removal (cont'd)

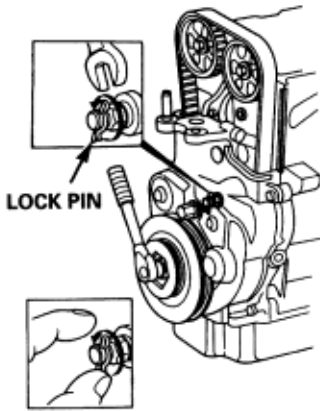
6-C-15

NOTE: The procedures in steps 9 and 10 are for reusing the timing belt. For replacing the timing belt, skip these procedures and go to step 12.

10. Use an open-end wrench to loosen the maintenance bolt. If it cannot be loosened with an open-end wrench, a box wrench can be used after removing the lock pin.
NOTE: Use of a tool should be limited to initial loosening only.
11. Unscrew the maintenance bolt by hand until it stops. The auto-tensioner bracket is now fixed.

NOTE:

- ♦ Never use a tool to unscrew the maintenance bolt after initial loosening it.
- ♦ If the auto-tensioner has been extended and the timing belt cannot be installed, remove the auto-tensioner, compress it and reinstall it (See Page 6-C-16).

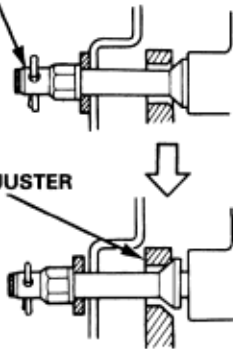


MAINTENANCE
BOLT

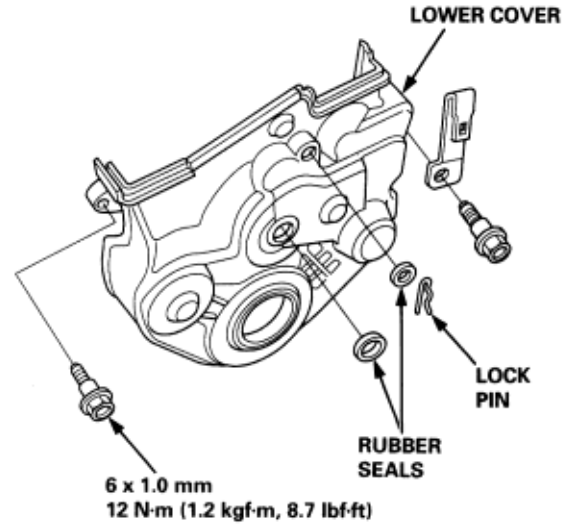
Auto-tensioner
functional:

ADJUSTER

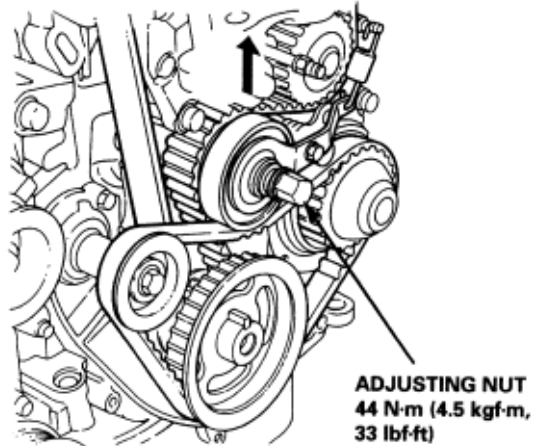
Auto-tensioner
fixed in place:



12. Remove the middle cover.
NOTE: Do not use the middle cover to store removed items.
13. Remove the pulley bolt and crankshaft pulley (See Page 6-C-11).
14. Remove the lock pin and rubber seals, then remove the lower cover.
NOTE: Do not use the lower cover to store removed items.



15. Loosen the adjusting nut 2/3-1 turn. Push the tensioner to remove tension from the timing balancer belt, then retighten the adjusting nut.



16. Remove the timing balancer belt and timing belt.

Timing Belt and Balance Belt Installation

6-C-16

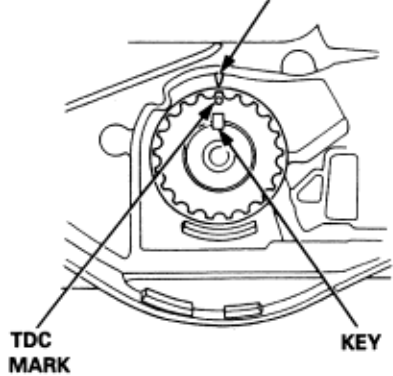
NOTE: This procedure is to replace the timing belt. If you are reusing the timing belt, (See Page 6-C-19). Install the timing belt and timing balancer belt in the reverse order of removal;

Only key points are described here.

NOTE: Clean the middle and lower covers before installation.

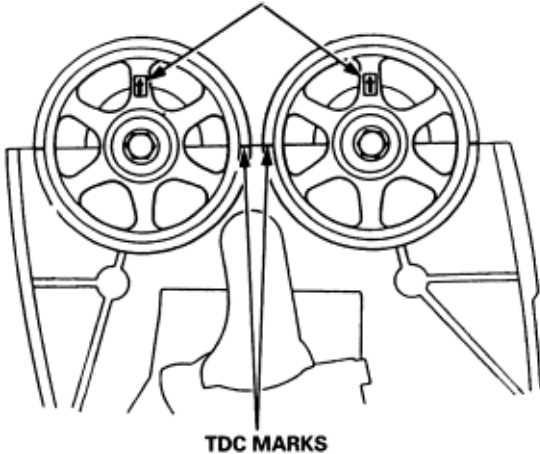
1. Remove the timing balancer belt drive pulley (See Page 6-C-12).
2. Set the timing belt drive pulley so that the No. 1 piston is at top dead center (TDC). Align the dimple on the teeth of the timing belt drive pulley with the V pointer on the oil pump.

POINTER ON THE OIL PUMP HOUSING

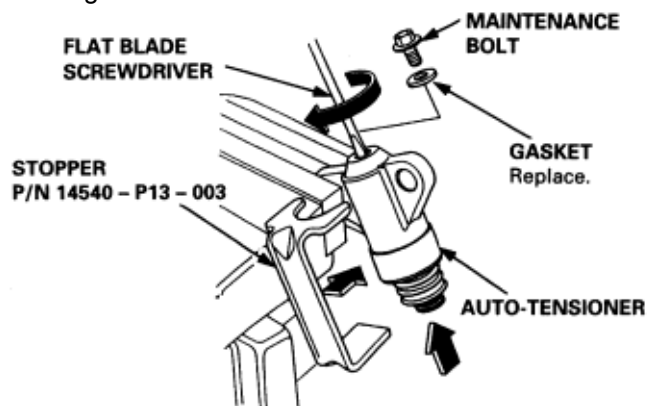


3. The "↑" marks on the camshaft pulleys should be at the top, and the TDC grooves on the pulleys should align with the cylinder head surface.

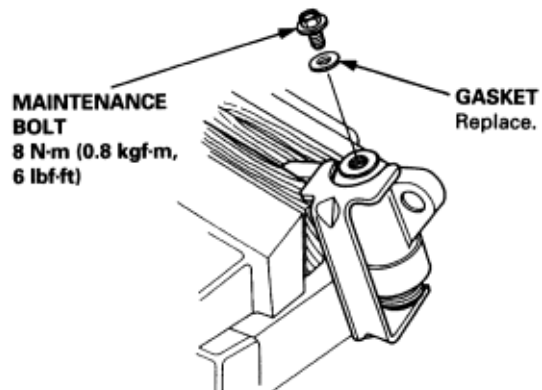
"↑" MARKS



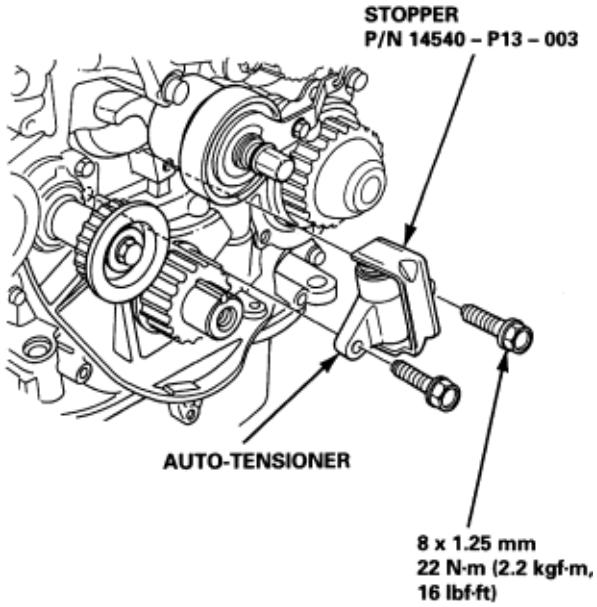
4. Remove the auto-tensioner.
5. Hold the auto-tensioner with the maintenance bolt pointing up. Loosen and remove the maintenance bolt.
NOTE: Handle the auto-tensioner carefully so the oil inside does not spill or leak. Replenish the auto-tensioner with oil if any spills or leaks. The total capacity is 8 ml (1/4 fl oz).
6. Clamp the boss of the auto-tensioner in a vice. Use pieces of wood or a cloth to protect the boss.
NOTE: Do not grip the housing of the auto-tensioner.
7. Insert a flat blade screwdriver into the maintenance hole. Place the stopper (P/N 14540-P13-003) on the auto-tensioner while turning the screwdriver clockwise to compress the bottom.
NOTE: Take care not to damage the threads or the gasket contact surface with the screwdriver.



8. Reinstall the maintenance bolt.
NOTE: Be sure to use a new gasket.

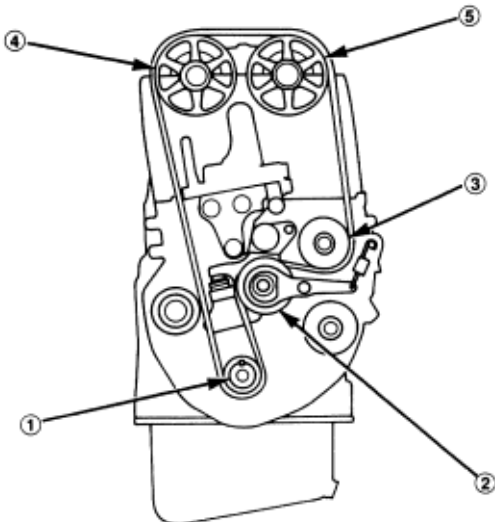


9. Make sure no oil is leaking around the maintenance bolt, then install the auto-tensioner.

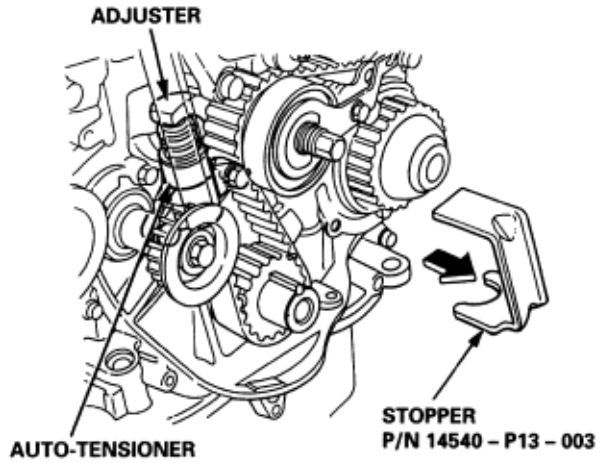


NOTE: Make sure the stopper stays in place.

10. Install the timing belt tightly in the sequence shown.
1 Timing belt drive pulley (crankshaft) then **2** Adjusting pulley then **3** Water pump pulley then **4** Exhaust camshaft pulley then **5** Intake camshaft pulley.
 NOTE: Make sure the timing belt drive pulley and camshaft pulleys are at TDC.

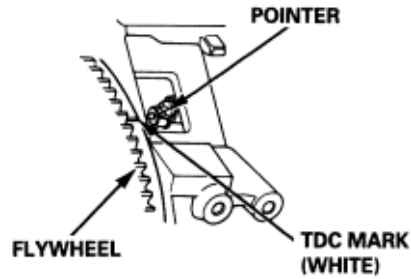


11. Remove the stopper.

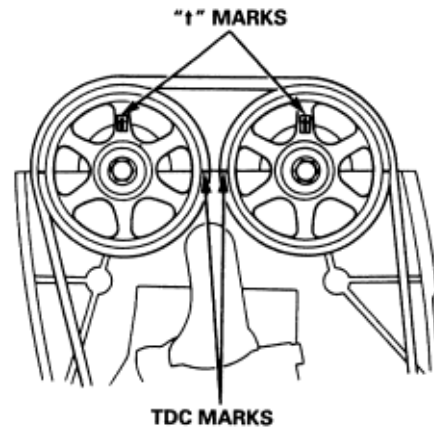


12. Install the timing balancer belt drive pulley and lower cover.
 13. Install the crankshaft pulley, then tighten the pulley bolt (**See Page 6-C-11**).
 14. Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.
 15. Make sure the crankshaft and camshaft pulleys are at TDC.

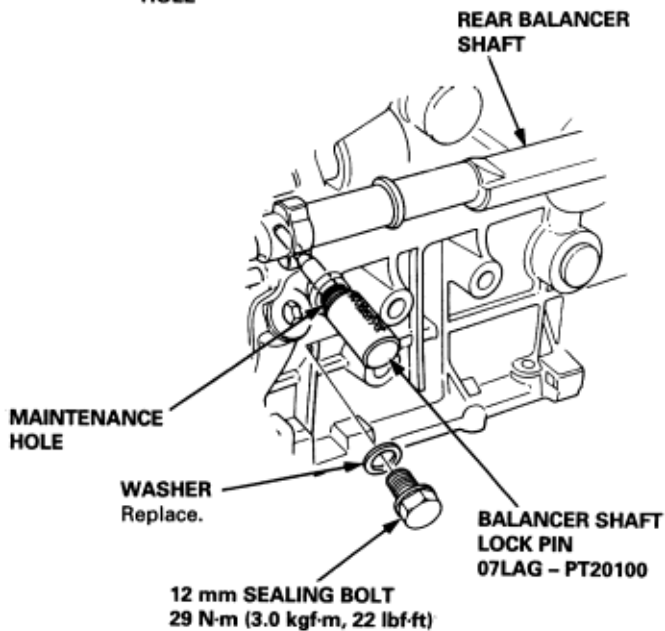
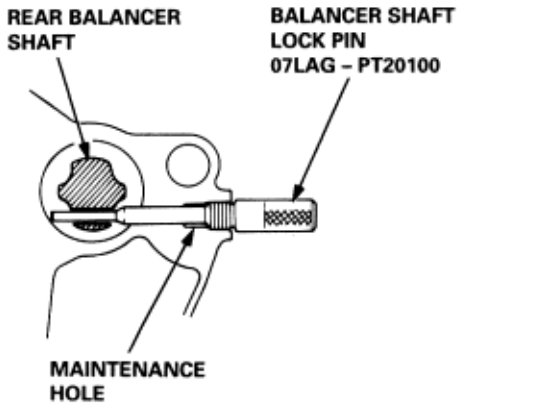
CRANKSHAFT:



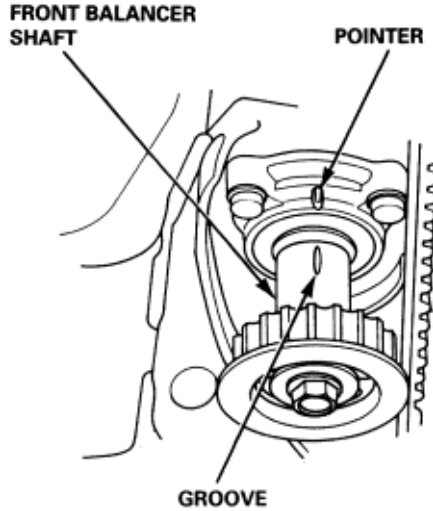
CAMSHAFT PULLEYS:



16. If either camshaft and crankshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure on page 6-C-16, then reinstall the timing belt.
17. Set the crankshaft pulley so that the No. 1 piston is at TDC.
18. Remove the crankshaft pulley and lower cover.
19. Loosen the adjusting nut 2/3-1 turn and verify that the timing balancer belt adjuster moves freely.
20. Retighten the adjusting nut.
21. Align the rear balancer shaft pulley by using a special tool. Insert the special tool into the maintenance hole to fix the rear balancer shaft.



22. Align the groove on the front balancer shaft with the pointer on the oil pump housing as shown.



23. Install the timing balancer belt. Loosen the adjusting nut 2/3-1 turn to tension the timing balancer belt.
24. Remove the special tool, then install the 12 mm sealing bolt.
25. Install the lower cover and crankshaft pulley, then tighten the pulley bolt (**See Page 6-C-11**).
26. Turn the crankshaft pulley about one turn counter-clockwise, then tighten the adjusting nut.
27. Install the rubber seal around the adjusting nut.
NOTE: Do not loosen the adjusting nut.
28. After installation, adjust the tension of each belt.
 - ♦ See section 4 for alternator belt tension adjustment.
 - ♦ See section 17 for P/S pump belt tension adjustment.
29. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Timing Belt and Balance Belt Installation (cont'd)

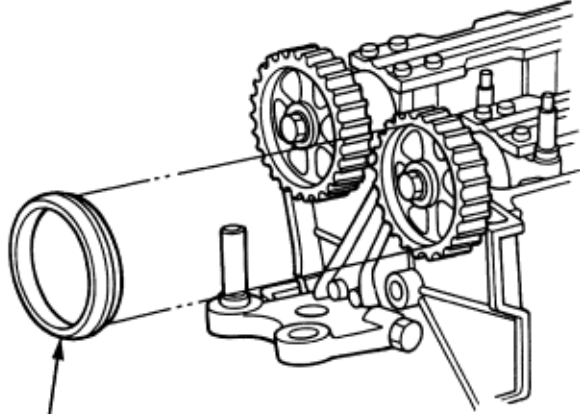
6-C-19

NOTE: Use this procedure when reusing the timing belt. Install the timing belt and timing balancer belt in the reverse order of removal;

Only key points are described here.

NOTE: Clean the middle and lower covers before installation.

1. Remove the balancer belt drive pulley (**See Page 6-C-12**).
2. Set the timing belt drive pulley so that the No. 1 piston is at TDC (**See Page 6-C-16**).
3. Set the camshaft pulleys so that the No. 1 piston is at TDC (**See Page 6-C-16**).
4. Install the special tool on the intake camshaft pulley.

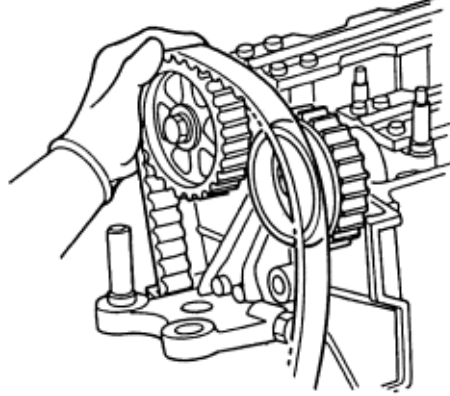


**TIMING BELT
SLIDER
07NAG - P130100**

5. Install the timing belt (**See Page 6-C-17**).

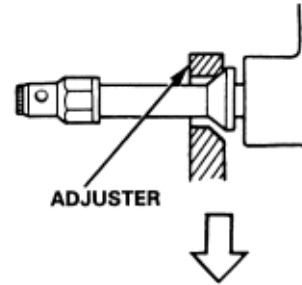
NOTE:

- ♦ If the auto-tensioner has extended and the timing belt cannot be installed, remove and compress the auto-tensioner (**See Page 6-C-16**).
- ♦ Take care not to damage the timing belt when installing it.
- ♦ Make sure the timing belt drive pulley and camshaft pulleys are at TDC.



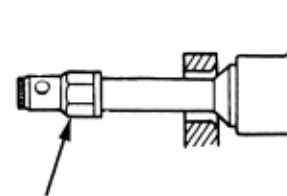
6. Remove the special tool.
7. Tighten the maintenance bolt to make the auto-tensioner functional.

Auto-tensioner
fixed in place:



ADJUSTER

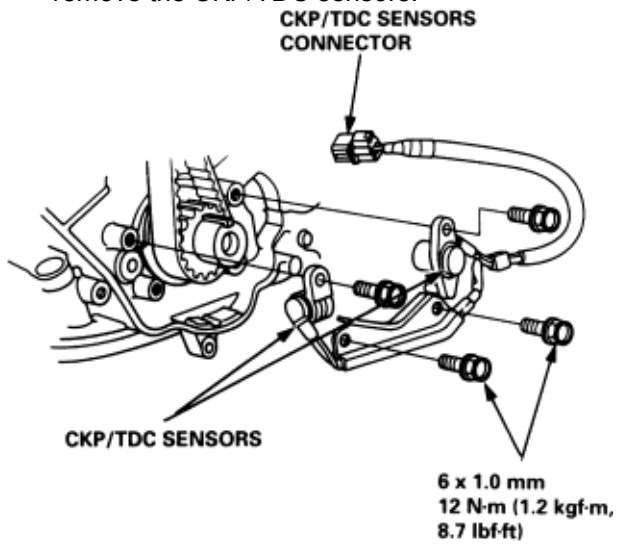
Auto-tensioner
functional:



**MAINTENANCE
BOLT
22 N-m (2.2 kgf-m, 16 lbf-ft)**

8. Install the timing balancer belt drive pulley and lower cover.
9. Install the crankshaft pulley, then tighten the pulley bolt (**See Page 6-C-11**).
10. Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.
11. Make sure the crankshaft pulley and camshaft pulleys are at TDC (**See Page 6-C-17**).
12. If either camshaft and crankshaft pulley is not positioned at TDC, remove the timing belt and adjust the positioning following the procedure (**See Page 6-C-16**), reinstall the timing belt.
13. Set the crankshaft pulley so that the No. 1 piston is at TDC.
14. Remove the crankshaft pulley and lower cover.
15. Loosen the adjusting nut 2/3-1 turn and verify that the timing balancer belt adjuster moves freely.
16. Retighten the adjusting nut.
17. Align the rear balancer shaft pulley by using a special tool. Insert the special tool into the maintenance hole to the fix the rear balancer shaft (**See Page 6-C-18**).
18. Align the groove on the front balancer shaft pulley with the pointer on the oil pump housing (**See Page 6-C-18**).
19. Install the timing balancer belt. Loosen the adjusting nut 2/3-1 turn to tension the timing balancer belt.
20. Remove the special tool, then install the 12 mm sealing bolt.
21. Install the lower cover and crankshaft pulley, then tighten the pulley bolt (**See Page 6-C-11**).
22. Turn the crankshaft pulley about one turn counterclockwise, then tighten the adjusting nut.
23. Install the rubber seal around the adjusting nut.
NOTE: Do not loosen the adjusting nut.
24. After installation, adjust the tension of each belt.
 - ♦ See section 4 for alternator belt tension adjustment.
 - ♦ See section 17 for P/S pump belt tension adjustment.
25. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

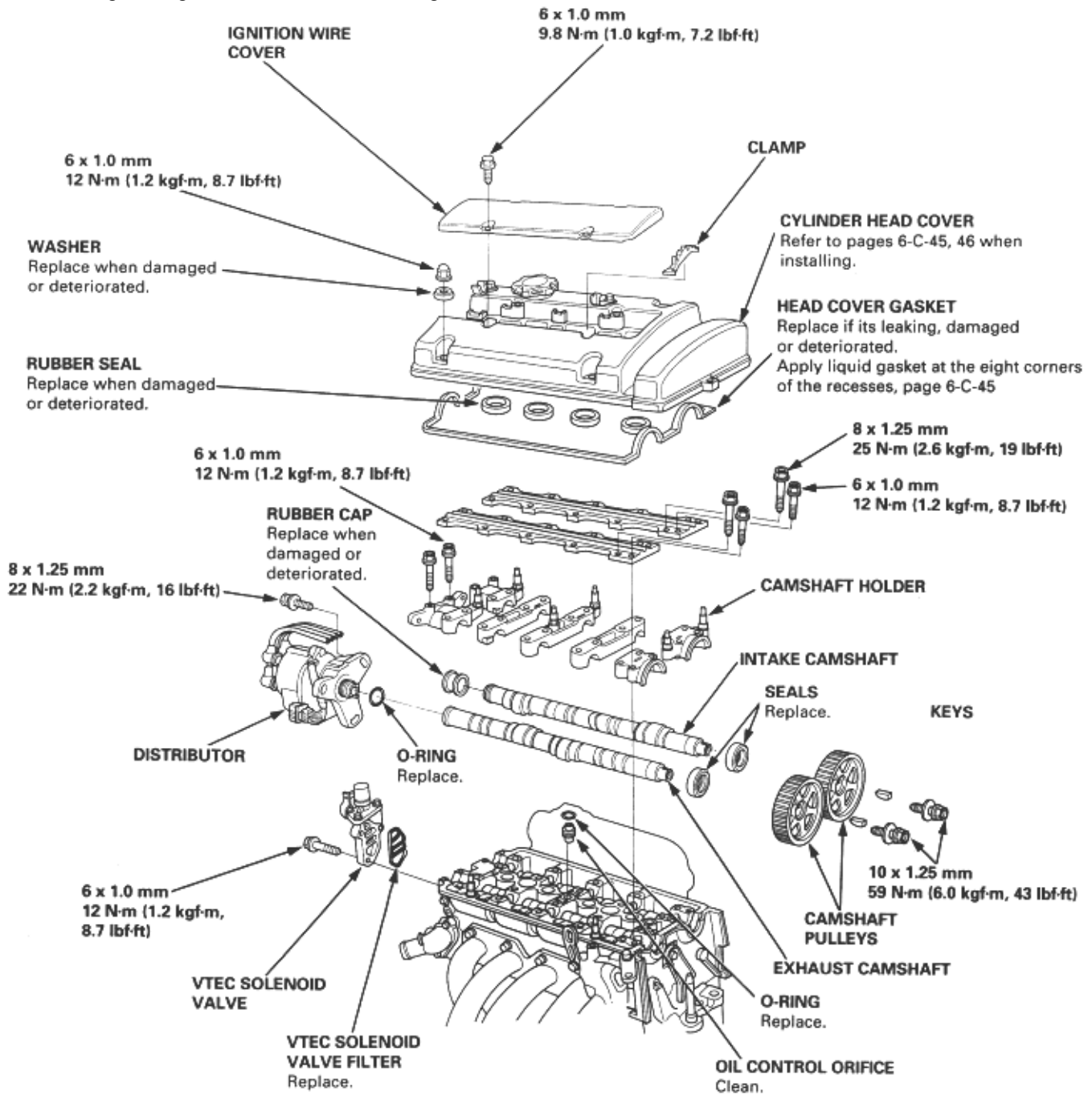
1. Removal of the balancer belt (**See Page 6-C-14**).
2. Remove the balancer belt drive pulley.
3. Disconnect the CKP/TDC sensors connector, then remove the CKP/TDC sensors.



4. Install the CKP/TDC sensors in reverse order of removal.
5. Install the balancer belt (**See Page 6-C-16**).

NOTE:

- ♦ To avoid damage, wait until the engine coolant temperature drops below 38°C (110°F) before removing the cylinder head.
- ♦ When handling a metal gasket, take care not to fold it or damage the contact surface.
- ♦ Use new O-rings and gaskets when reassembling.



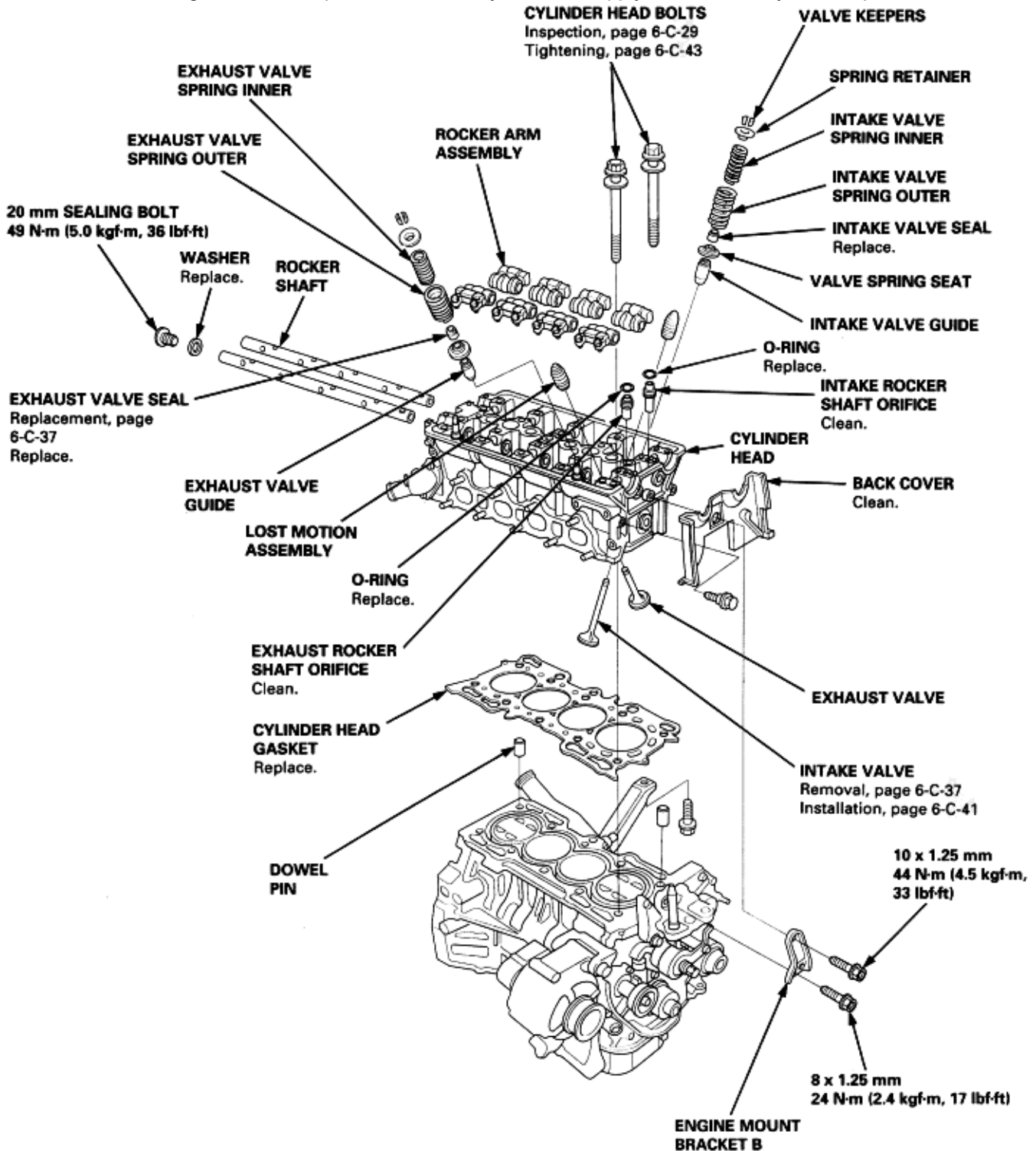
To go to the page referenced on the diagram above, click on the following:

(See Page 6-C-45)

(See Page 6-C-46)



Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact parts.



To go to the page referenced on the diagram above, click on the following:

(See Page 6-C-29)

(See Page 6-C-43)

(See Page 6-C-37)

(See Page 6-C-41)

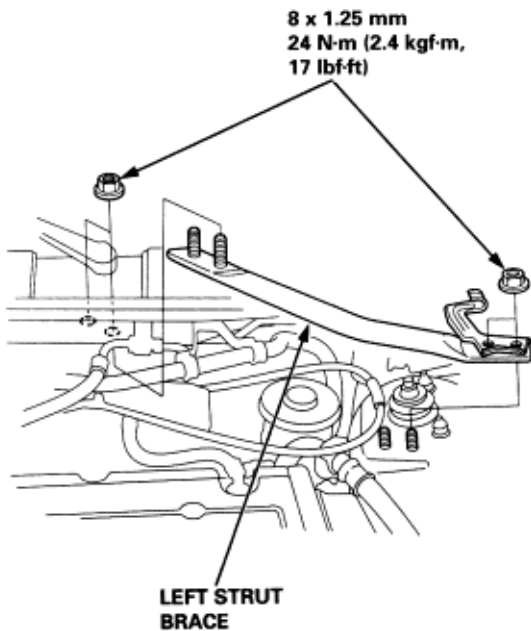
Cylinder Head Removal

6-C-24

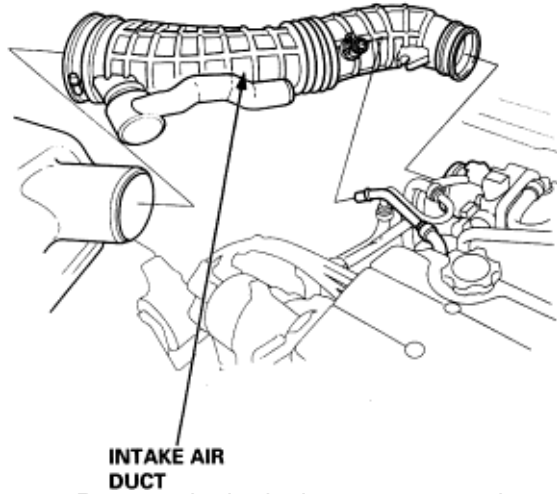
Engine removal is not required in this procedure.

NOTE:

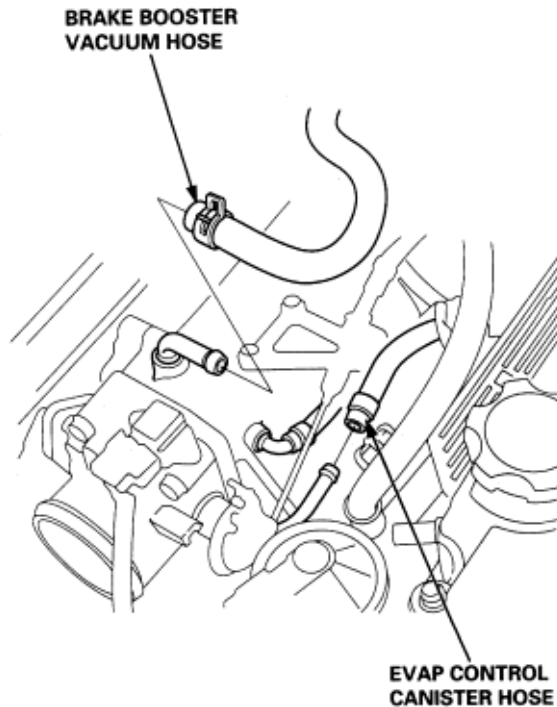
- ♦ Use fender covers to avoid damaging painted surfaces.
 - ♦ To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
 - ♦ To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the retaining bolts.
 - ♦ Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.
1. Secure the hood in the open position.
 2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 3. Disconnect the battery negative terminal first, then the positive terminal.
 4. Drain the engine coolant (**See Page 10- 7**).
 5. Remove the left strut brace.



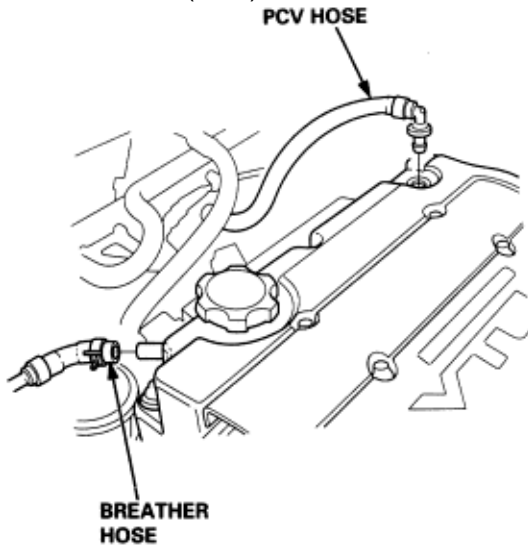
6. Remove the intake air duct.



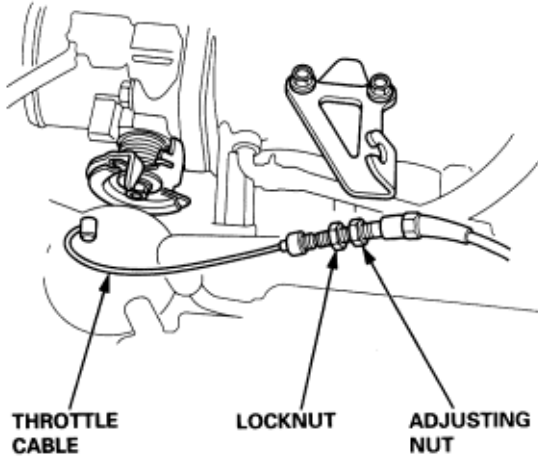
7. Remove the brake booster vacuum hose and evaporative emission (EVAP) control canister hose.



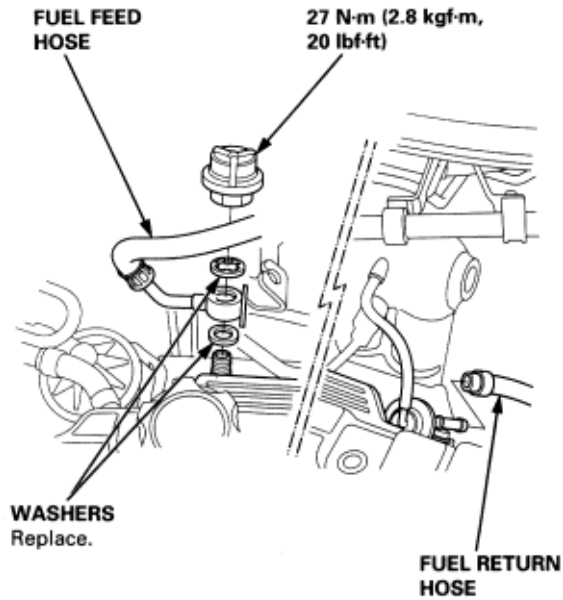
8. Remove the breather hose and positive crankcase ventilation (PCV) hose.



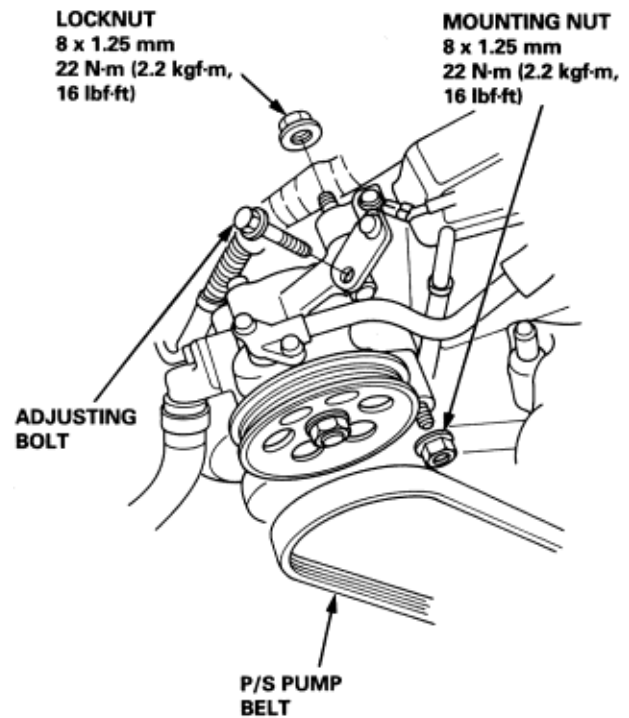
9. Remove the throttle cable by loosening the locknut, then slip the cable end out of the accelerator linkage. Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.



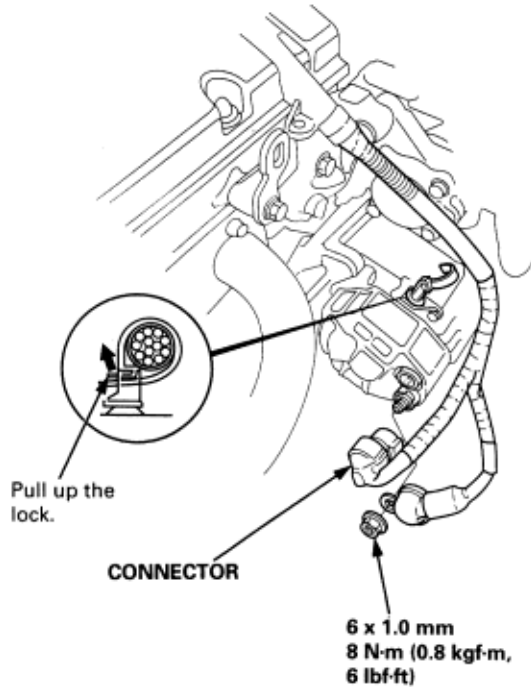
10. Relieve fuel pressure (see section 11).
11. Remove the fuel feed hose and fuel return hose.



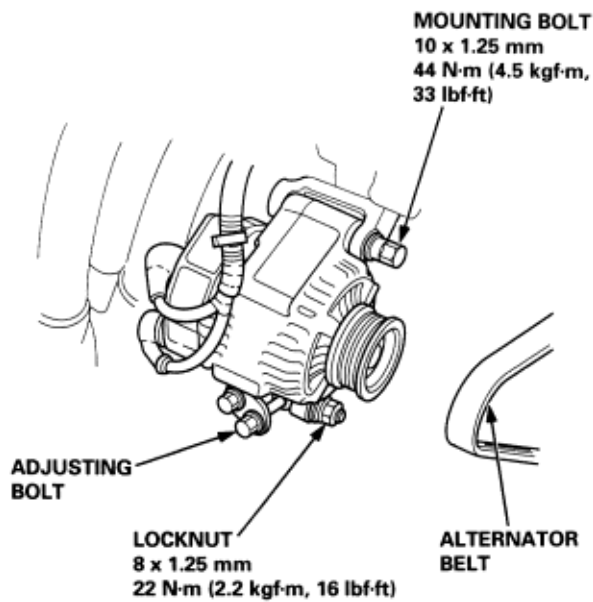
12. Remove the adjusting bolt, mounting nut and locknut, then remove the power steering (P/S) pump belt and pump, without disconnecting the P/S hoses.



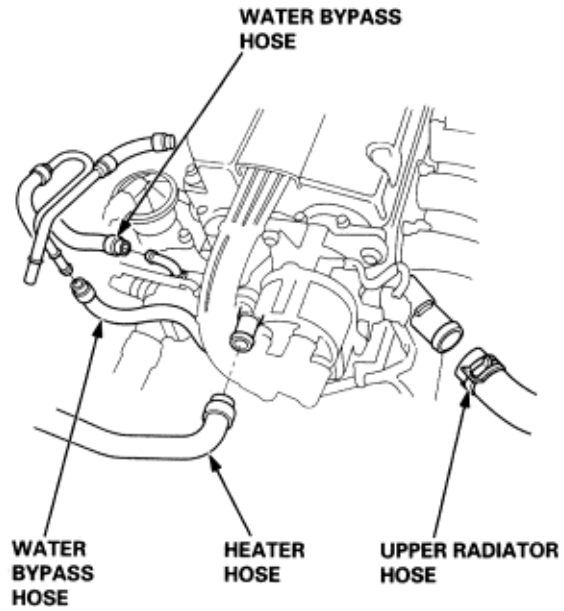
13. Remove the alternator terminal and connector.



14. Loosen the mounting bolt, locknut and adjusting bolt, then remove the alternator belt.



15. Remove the upper radiator hose, lower radiator hose, heater hose and water bypass hoses.

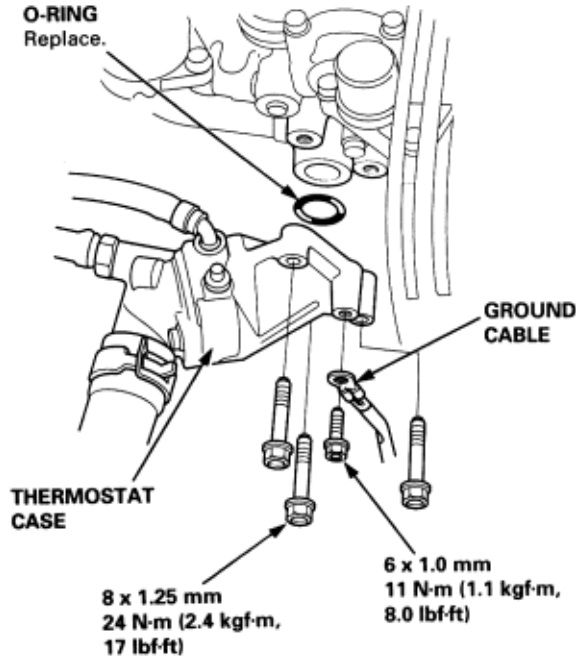


16. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
- ♦ Four injector connectors
 - ♦ Intake air temperature (IAT) sensor connector
 - ♦ Idle air control (IAC) valve connector
 - ♦ Throttle position sensor connector
 - ♦ Manifold absolute pressure (MAP) sensor connector
 - ♦ Engine coolant temperature (ECT) sensor connector
 - ♦ Radiator fan switch connector
 - ♦ Coolant temperature gauge sending unit connector
 - ♦ Exhaust gas recirculation (EGR) connector
 - ♦ Heated oxygen sensor (HO2S) connector
 - ♦ CKP/TDC sensor connector
 - ♦ VTEC solenoid valve connector
 - ♦ VTEC pressure switch connector
17. Remove the spark plug caps and ignition coil from the cylinder head.

**Cylinder Head
Removal (cont'd)**

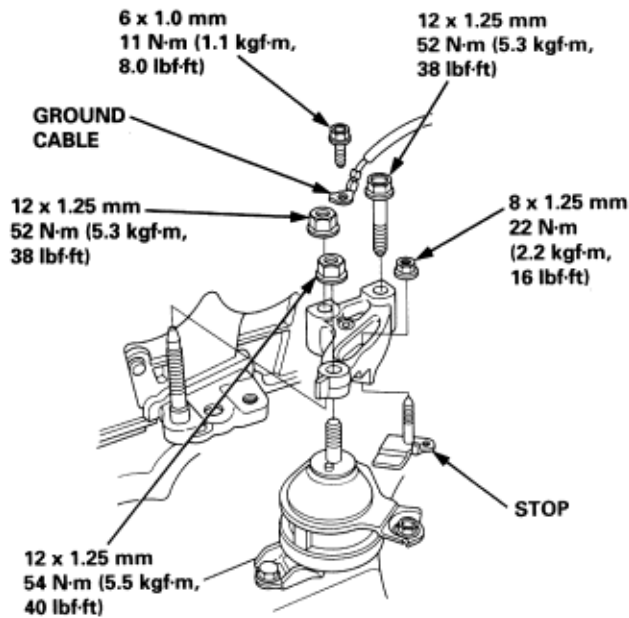
6-C-27

18. Remove the ground cable, then remove the thermostat housing mounting bolts.

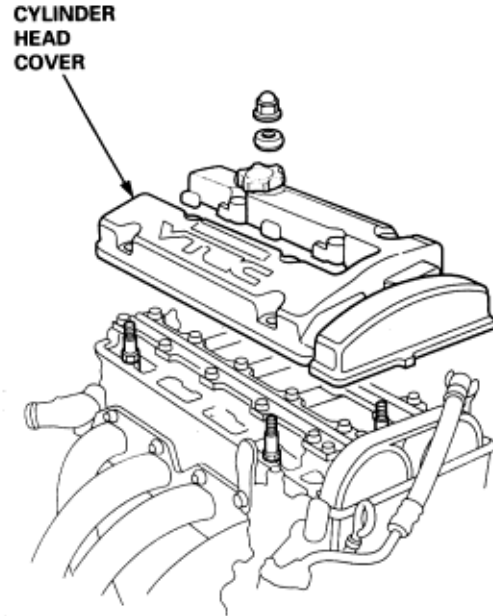


19. Support the engine with the jack and wood block under the oil pan.

20. Remove the stop and ground cable, then remove the upper bracket.

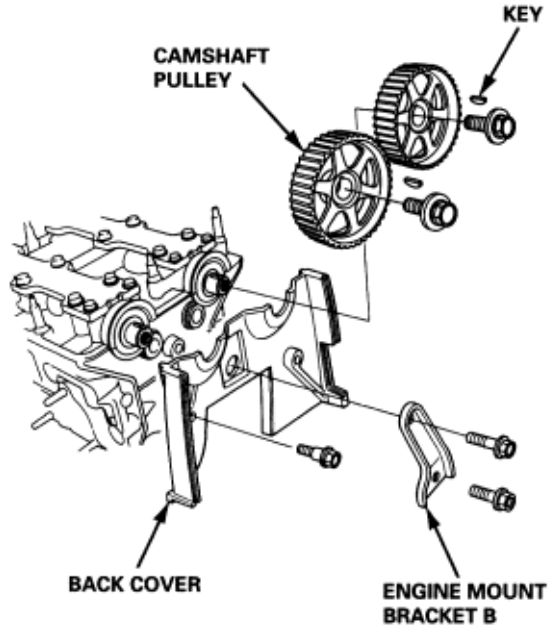


21. Remove the cylinder head cover.

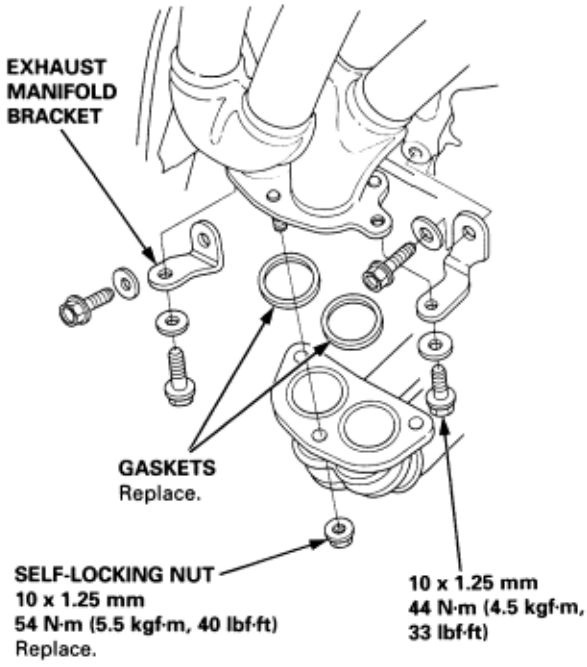


22. Remove the timing belt (See Page 6-C-14).

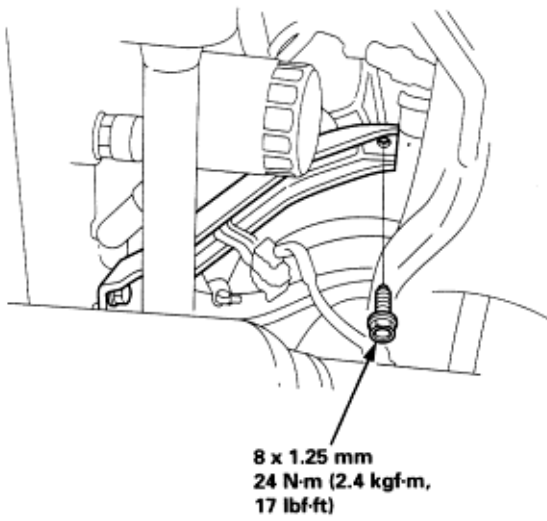
23. Remove the camshaft pulley, engine mount bracket B and back cover.



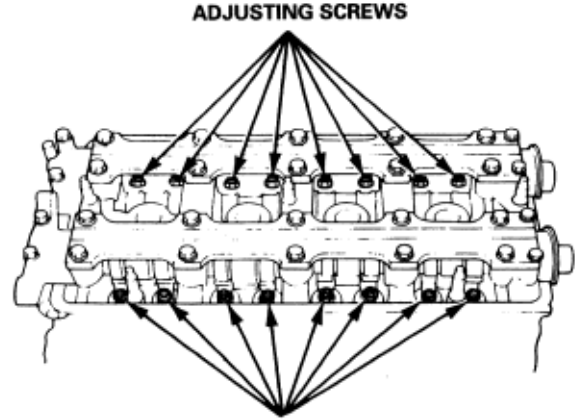
24. Remove the exhaust manifold brackets and self-locking nuts.



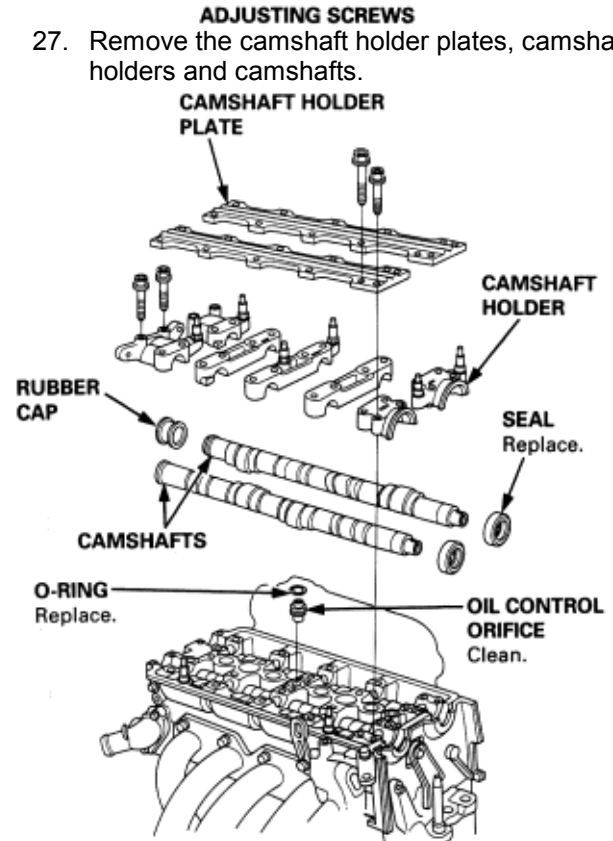
25. Remove the intake manifold bracket.



26. Loosen the rocker arm adjusting screws.



27. Remove the camshaft holder plates, camshaft holders and camshafts.

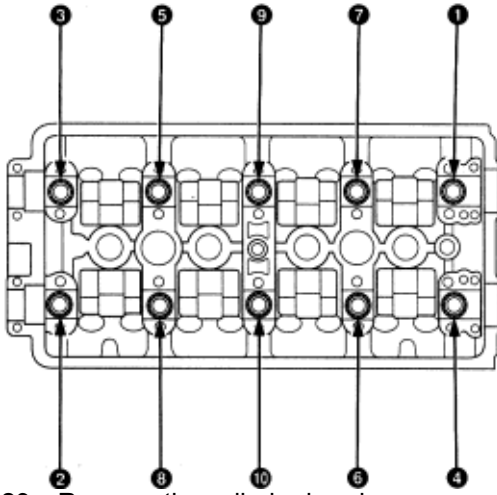


**Cylinder Head
Removal (cont'd)**

6-C-29

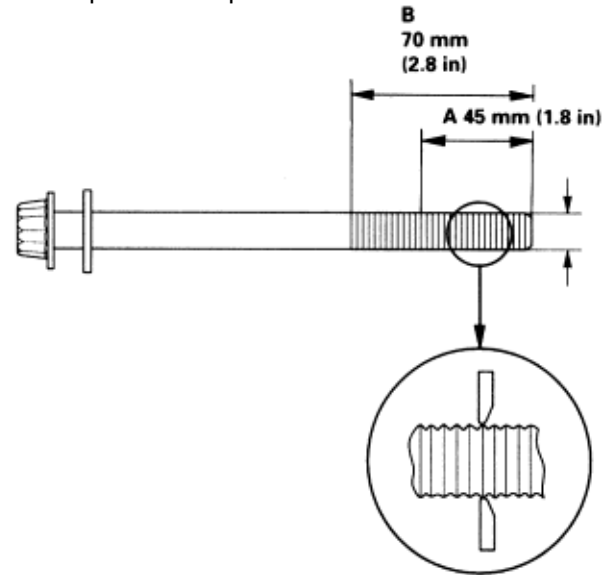
**Cylinder Head Bolt
Inspection**

28. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.



29. Remove the cylinder head.

1. Measure the diameter of each cylinder head bolt at point A and point B.

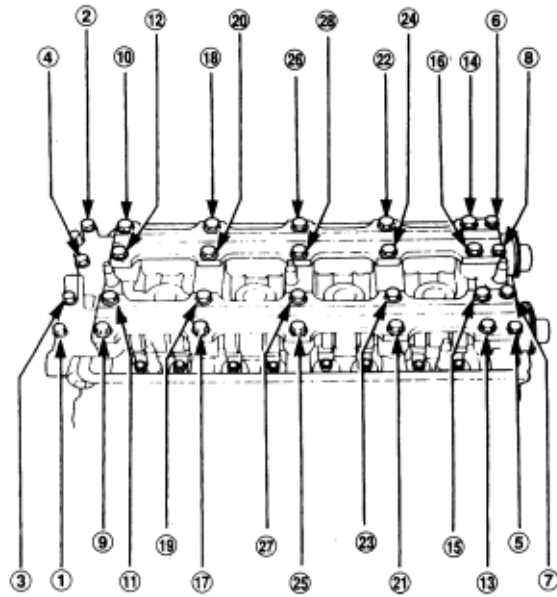
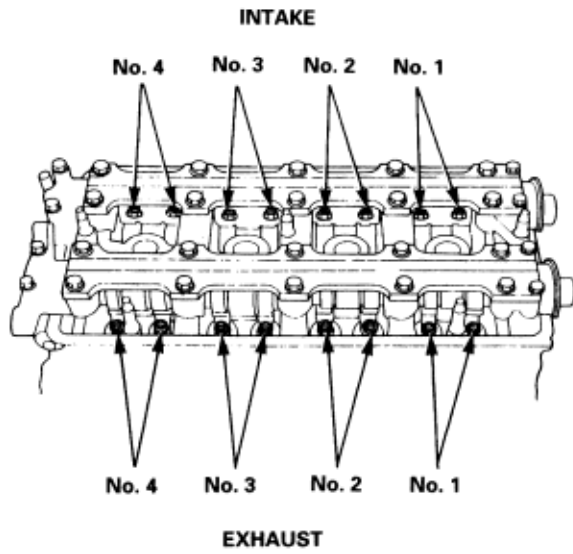


2. If either diameter is less than 11.3 mm (0.44 in), replace the cylinder head bolt.

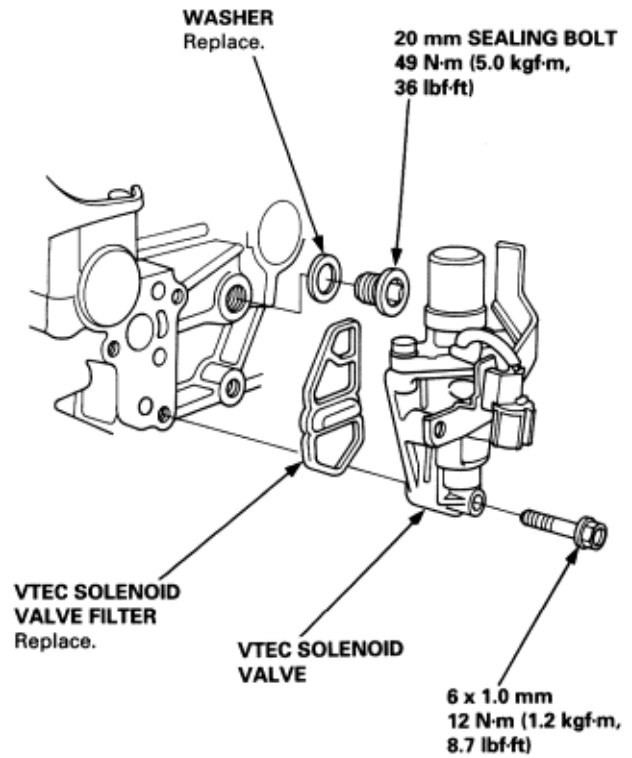
Rocker Arms and Shafts Removal

6-C-30

1. Loosen the adjusting screws, then remove the camshaft holder plate, camshaft holders and camshafts.
NOTE: Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.



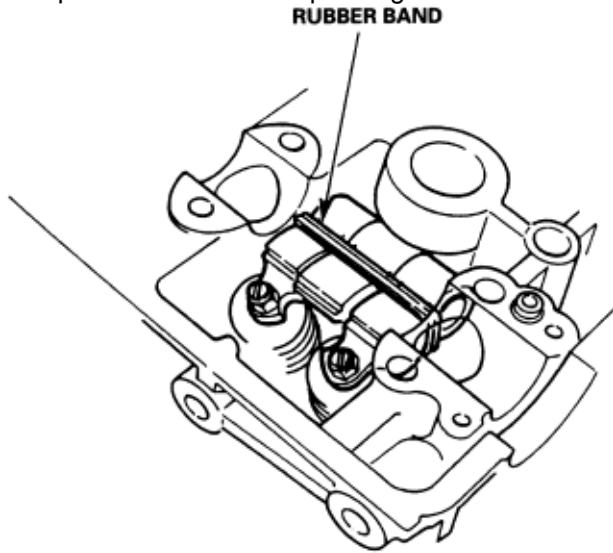
2. Remove the VTEC solenoid valve and 20 mm sealing bolt



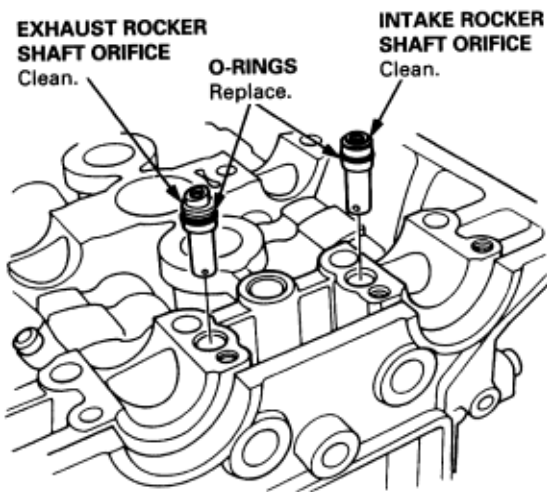
Rocker Arms and Shafts Removal (cont'd)

6-C-31

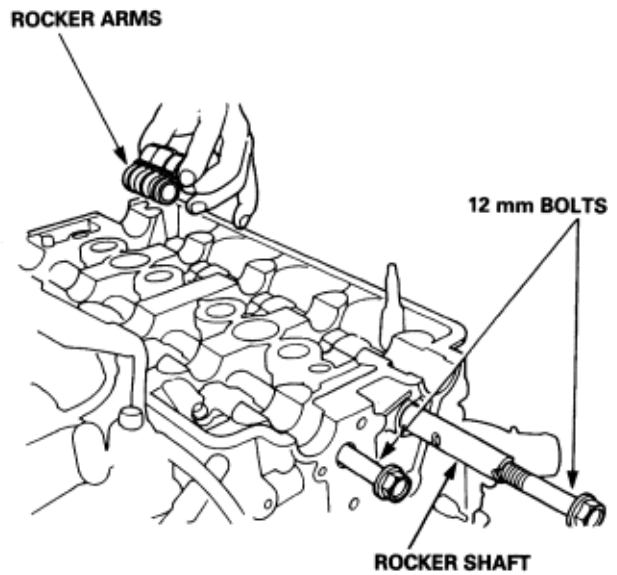
3. Hold the rocker arms together with a rubber band to prevent them from separating.



4. Remove the intake and exhaust rocker shaft orifices.
NOTE: The shapes of the rocker shaft orifices of the intake and exhaust are different. Identify the parts as they are removed to ensure reinstallation in the original locations.




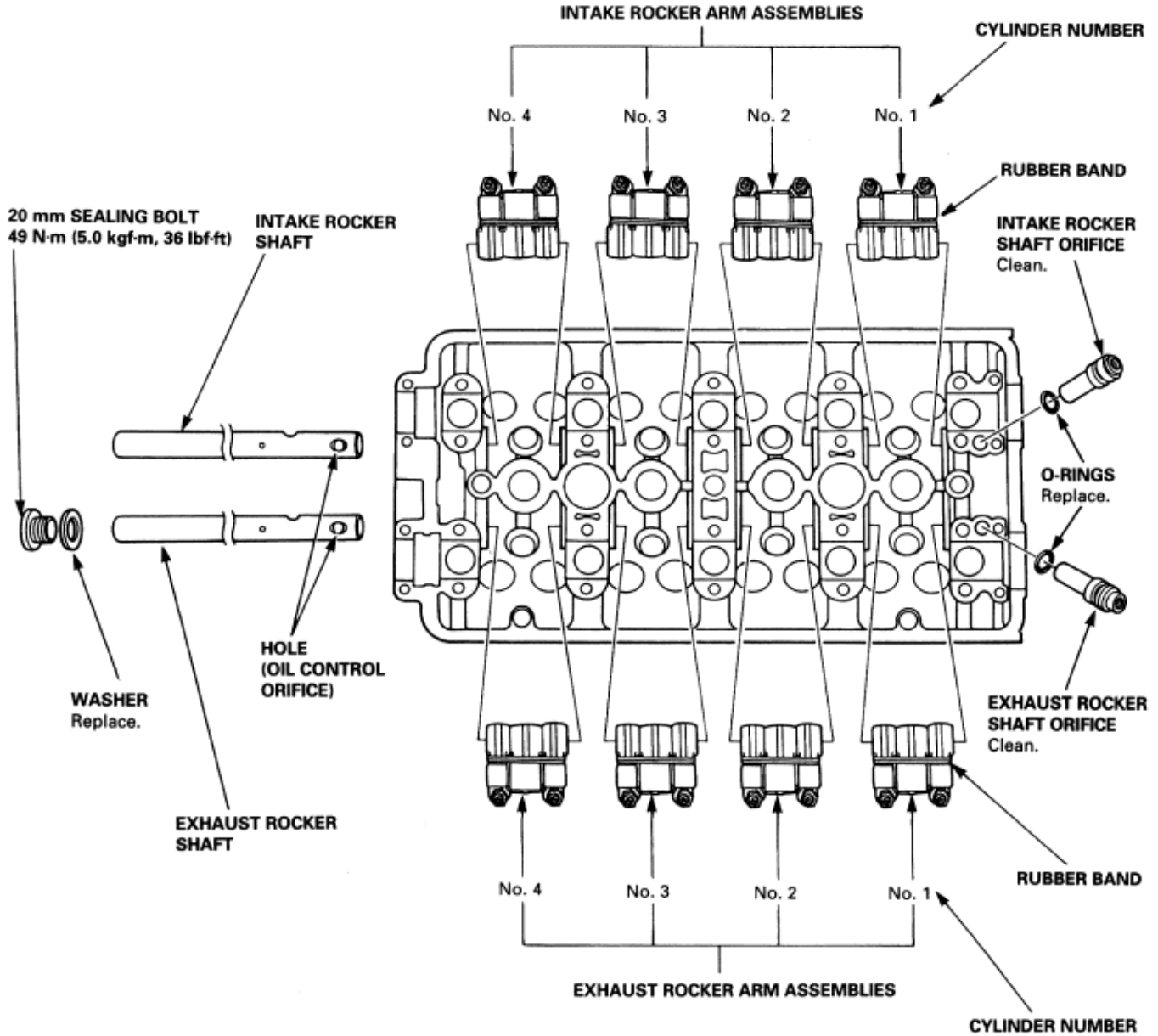
5. Screw 12 mm bolts into the rocker arm shafts. Remove each rocker arm while slowly pulling out the intake and exhaust rocker arm shafts.



NOTE:

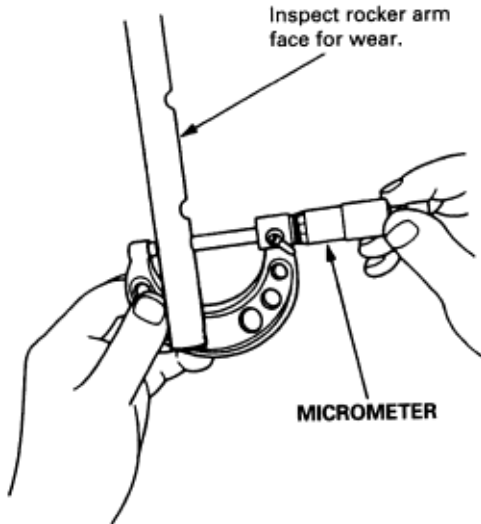
- ♦ Identify parts as they are removed to ensure reinstallation in original locations.
- ♦ Inspect rocker shafts and rocker arms (**See Page 6-C-33**).
- ♦ Rocker arms must be installed in the same position if reused.
- ♦ Clean the intake and exhaust rocker shaft orifices before installing.
- ♦ After installing the rocker shaft orifices, try to turn the rocker shaft to make sure that the orifice has been inserted in the hole of the rocker shaft correctly. If the orifice is in place, it should not turn.

 Prior to reinstalling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces.

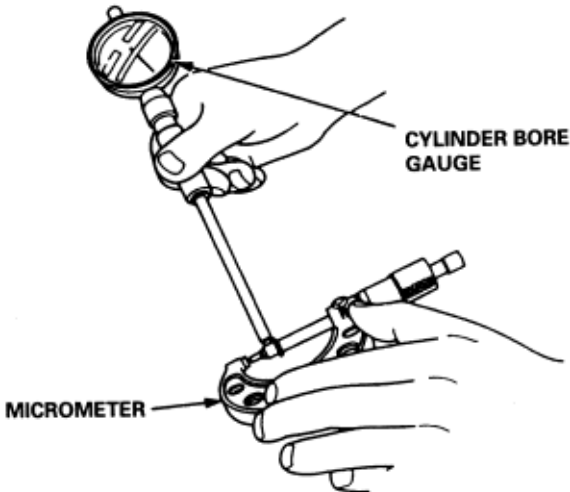


Measure both the intake rocker shaft and exhaust rocker shaft.

1. Measure diameter of shaft at first rocker location.

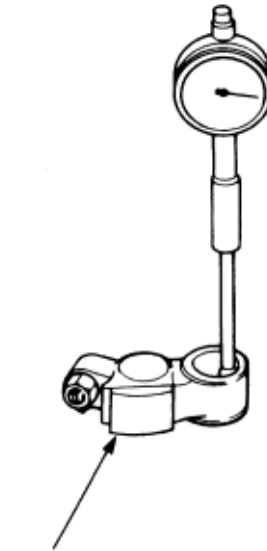


2. Zero gauge to shaft diameter.



3. Measure inside diameter of rocker arm and check for out-of round condition.

Rocker Arm-to-Shaft Clearance:
Intake and Exhaust
Standard (New): 0.025 - 0.052 mm
(0.0010 - 0.0020 in)
Service Limit: 0.08 mm (0.003 in)



Surface should be smooth.

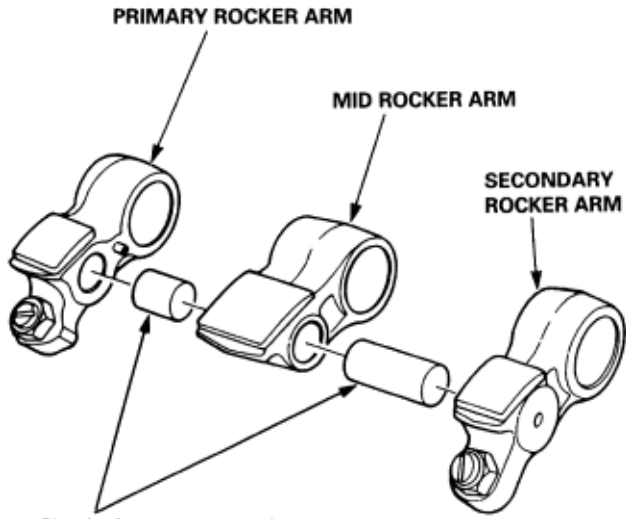
Repeat for all rockers.

- If over limit, replace rocker shaft and all overtolerance rocker arms.

NOTE: If any rocker arm needs replacement, replace all three rocker arms in that set (primary, mid, and secondary).

NOTE: When reassembling the primary rocker arm, carefully apply air pressure to the oil passage of the rocker arm.

1. Inspect the rocker arm piston. Push it manually.
 - If it does not move smoothly, replace the rocker arm assembly.



Check piston movement

NOTE:

- ♦ Apply oil to the pistons when reassembling.
- ♦ Bundle the rocker arms with a rubber band to prevent them from separating.

Camshaft Inspection

6-C-35

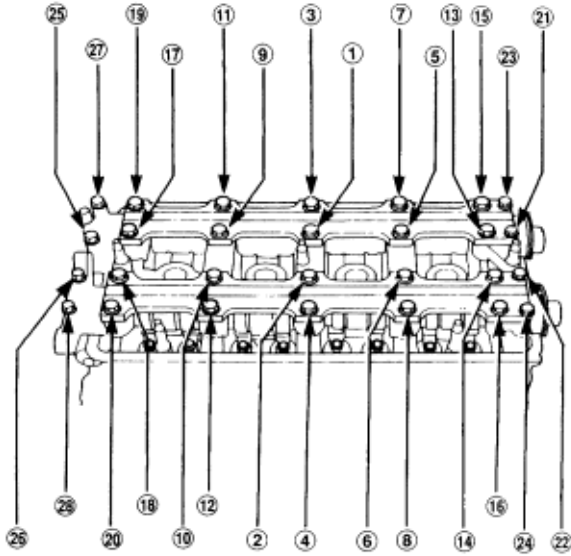
NOTE: Do not rotate the camshaft during inspection.

1. Remove the rocker arms and rocker shafts.
NOTE: Rocker arms must be installed in the same position if reused.
2. Put the camshafts, camshaft holders and holder plates on the cylinder head, then tighten the bolts to the specified torque.

Specified torque:

**1 to 20: 8 x 1.25 mm
25 Nm (2.6 kgf/m, 19 lbf/ft)**

**21 to 26: 6 x 1.0 mm
12 Nm (1.2 kgf/m, 8.7 lbf/ft)**

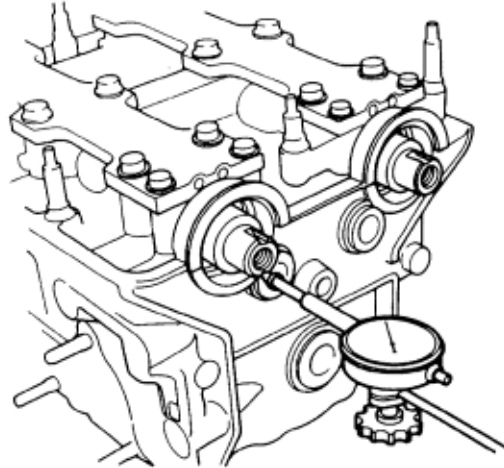


3. Seat the camshafts by pushing them toward the distributor end of the cylinder head.
4. Zero the dial indicator against the end of the camshaft, then push the camshaft back and forth. Read the end play.

Camshaft End Play:

**Standard (New): 0.05 - 0.15 mm
(0.002 - 0.006 in)**

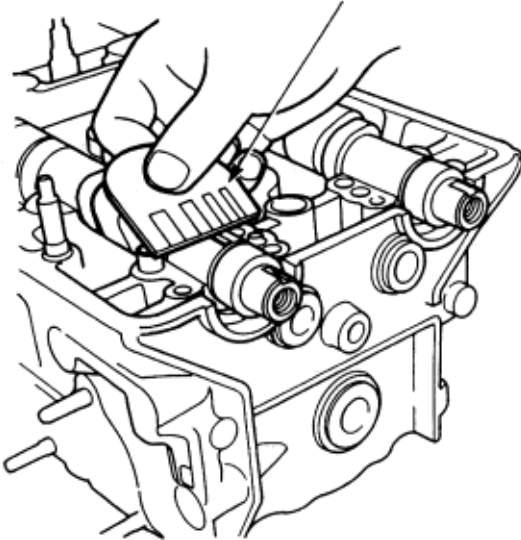
Service Limit: 0.5 mm (0.02 in)



5. Remove the camshaft holders and holder plates bolts from the cylinder head.
6. Lift the camshaft out of the cylinder head, wipe it clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
7. Clean the camshaft holder surfaces in the cylinder head, then set the camshaft back in place.
8. Place a plastigage strip across each journal.
9. Install the camshaft holders and holder plates. Torque the bolts to the values and in the sequence shown in left column.

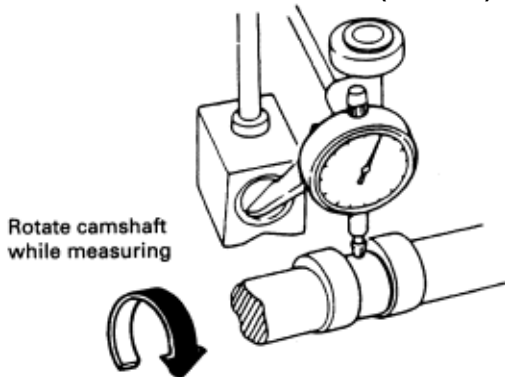
10. Measure the widest portion of the plastigage on each journal.

Camshaft-to-Holder Oil Clearance
Standard (New): 0.050-0.089 mm
 (0.0020-0.0035 in)
Service Limit: 0.15 mm (0.006 in)



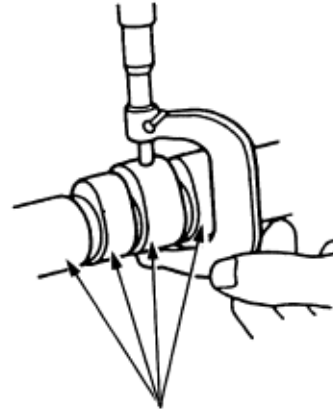
11. If camshaft-to-holder oil clearance is out of tolerance:
- And the camshaft has already been replaced, you must replace the cylinder head.
 - If the camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:
Standard (New): 0.03 mm (0.001 in) max.
Service Limit: 0.04 mm (0.002 in)

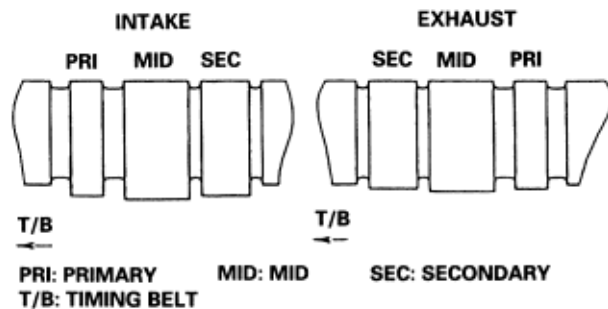


- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance, replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

Measure cam lobe height.



Inspect this area for wear.

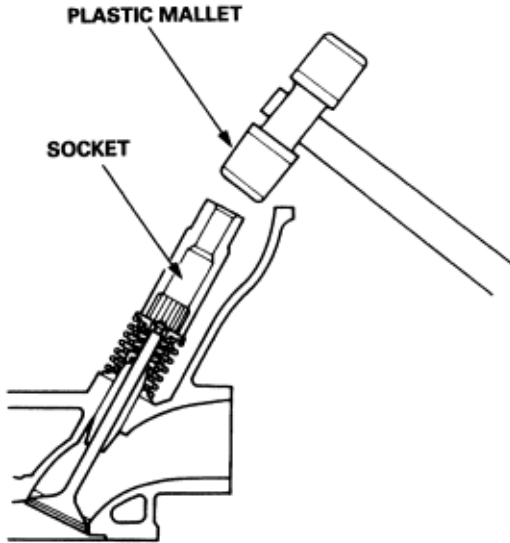


Cam Lobe Height Standard (New):

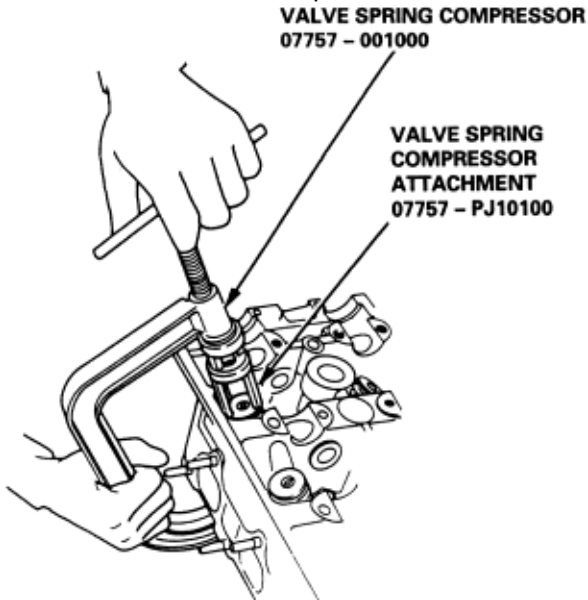
	Intake	Exhaust
Primary	34,041 mm (1,3402 in)	33,745 mm (1,3285 in)
Mid	37,229 mm (1,4657 in)	36,704 mm (14450 in)
Secondary	34,071 mm (1,3414 in)	34,683 mm (1,3655 in)

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

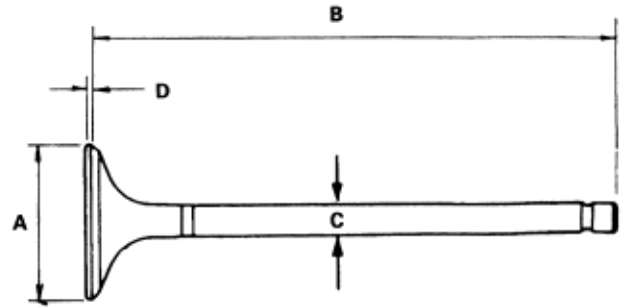
- Using an appropriately sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers before installing the valve spring compressor.



- Install the spring compressor. Compress the spring and remove the valve keeper.



Valve Dimensions:



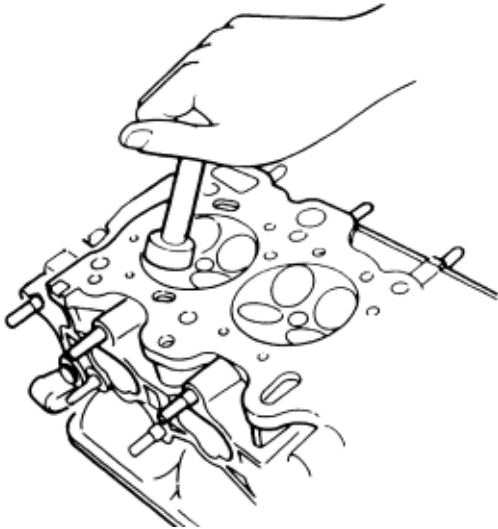
Intake Valve

- A Standard (New):** 34.90 - 35.10 mm (1.374 - 1.382 in)
- B Standard (New):** 105.40 - 105.70 mm (4.150 - 4.161 in)
- C Standard (New):** 5.475 - 5.485 mm (0.2156 - 0.2159 in)
- C Service Limit:** 5.445 (0.2144 in)
- D Standard (New):** 1.05 - 1.35 mm (0.041 - 0.053 in)
- D Service Limit:** 0.85 mm (0.034 in)

Exhaust Valve

- A Standard (New):** 29.90 - 30.10 mm (1.177 - 1.185 in)
- B Standard (New):** 105.00 - 105.30 mm (4.134 - 4.146 in)
- C Standard (New):** 5.475 - 5.485 mm (0.2156 - 0.2159 in)
- C Service Limit:** 5.445 (0.2144 in)
- D Standard (New):** 1.65 - 1.95 mm (0.065 - 0.078 in)
- D Service Limit:** 1.45 mm (0.057 in)

1. Renew the valve seats in the cylinder head using a valve seat cutter.



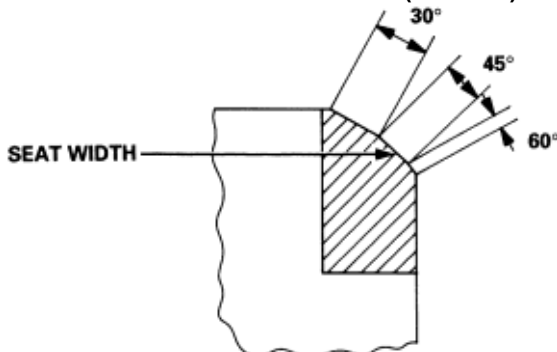
NOTE: If guides are worn (See Page 6-C-39), replace them (See Page 6-C-40) before cutting the valve seats.

2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of the seat and adjust accordingly.
4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

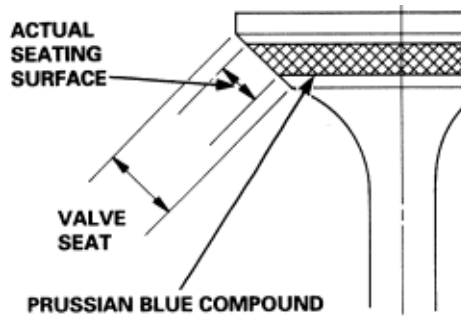
Valve Seat Width:

Standard (New):

Intake: 1.30 - 1.50 mm (0.051 - 0.059 in)
Exhaust: 1.25 - 1.55 mm (0.049 - 0.061 in)
Service Limit: 2.00 mm (0.079 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face, and insert the valve in the original location in the head, then lift it and snap it closed against the seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
 - ♦ If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
 - ♦ If it is too low (close to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

NOTE: The final cut should always be made with the 45° cutter.

7. Insert the intake and exhaust valves in the head and measure valve stem installed height.

Intake Valve Stem Installed Height:

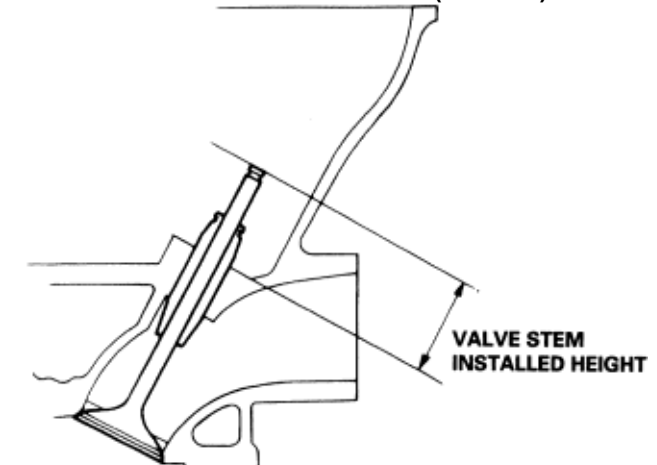
Standard (New): 42.5 - 42.7 mm
 (1.673 - 1.681 in)

Service Limit: 42.95 mm (1.691 in)

Exhaust Valve Stem Installed Height:

Standard (New): 43.9 - 44.1 mm
 (1.728 - 1.736 in)

Service Limit: 44.35 mm (1.746 in)

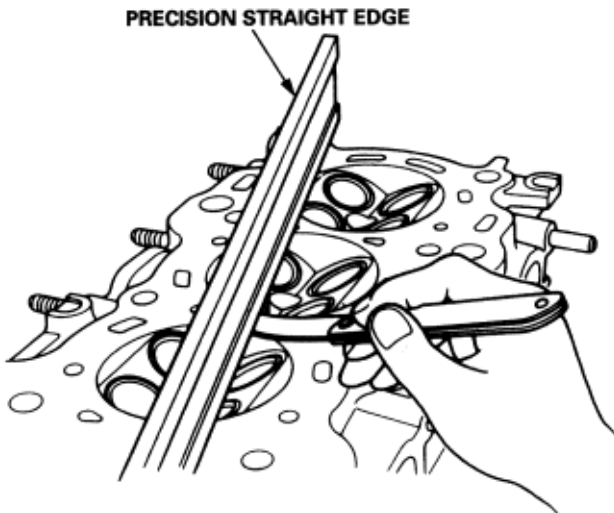


8. If valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

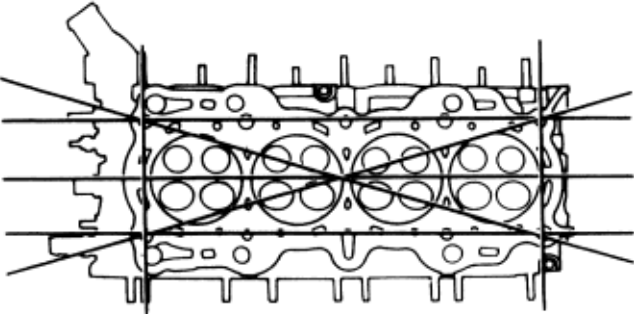
NOTE: If camshaft-to-holder, oil clearances are not within specification, the head cannot be resurfaced (See Page 6-C-35).

If camshaft-to-holder oil clearances are within specifications, check the head for warpage.

- ♦ If warpage is less than 0.05 mm (0.002 in), cylinder head resurfacing is not required.
- ♦ If warpage is between 0.05 mm (0.002 in) and 0.2 mm (0.008 in), resurface the cylinder head.
- ♦ Maximum resurface limit is 0.2 mm (0.008 in) based on a height of 147 mm (5.79 in).



Measure along edges, and three ways across center.



Cylinder Head Height:

**Standard (New): 146.95 - 147.05
(5.785 - 5.789 in)**

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:

**Standard (New): 0.05 - 0.11 mm
(0.002 - 0.004 in)**

Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

**Standard (New): 0.10 - 0.16 mm
(0.004 - 0.006 in)**

Service Limit: 0.22 mm (0.009 in)

Valve extended 10 mm out from seat.



- ♦ If the measurement exceeds the service limit, recheck it using a new valve.
- ♦ If the measurement is now within the service limit, reassemble with the new valve.
- ♦ If the measurement still exceeds limit, recheck using the alternate method below, then replace the valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.

Take the measurement in three places along the valve stem and three places inside the valve guide.

The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

**Standard (New): 0.025 - 0.055 mm
(0.0010 - 0.0022 in)**

Service Limit: 0.8 mm (0.003 in)

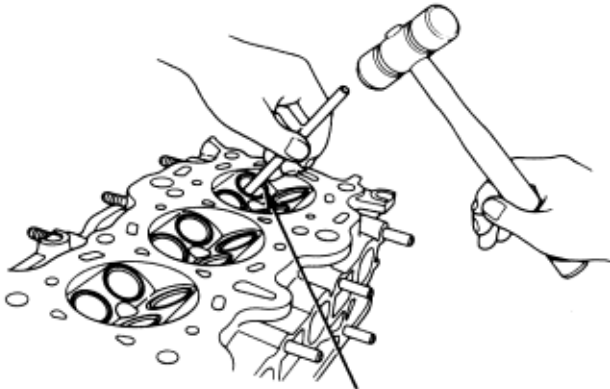
Exhaust Valve Stem-to-Guide Clearance:

**Standard (New): 0.050 - 0.080 mm
(0.0020 - 0.0031 in)**

Service Limit: 0.11 mm (0.004 in)

NOTE:

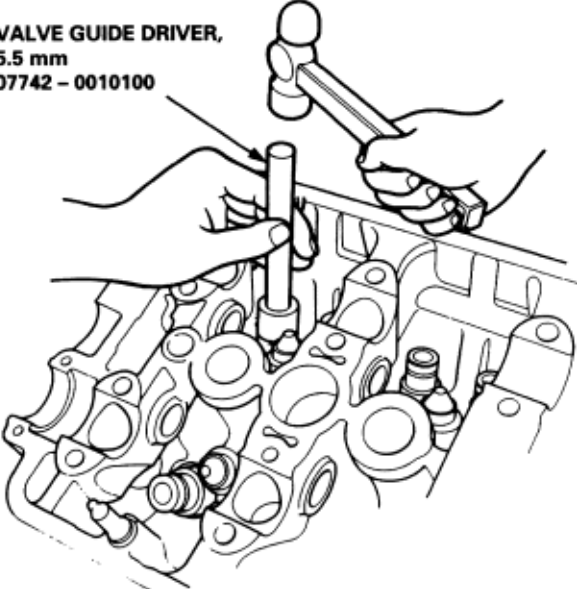
- ♦ For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
 - ♦ It may be necessary to use an air hammer to guides, remove some valve guides.
1. Drive the valve guide out from the bottom of the cylinder head.



VALVE GUIDE DRIVER,
5.5 mm
07742 - 0010100

2. Drive in a new valve guide to the specified depth.

VALVE GUIDE DRIVER,
5.5 mm
07742 - 0010100



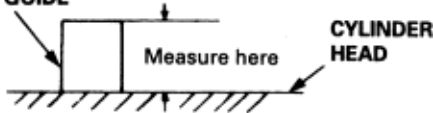
Valve Guide Installed Height:

Standard (New):

Intake: 14.55 - 15.05 mm (0.573 - 0.593 in)

Exhaust: 14.95 - 15.45 mm (0.589 - 0.608 in)

VALVE GUIDE

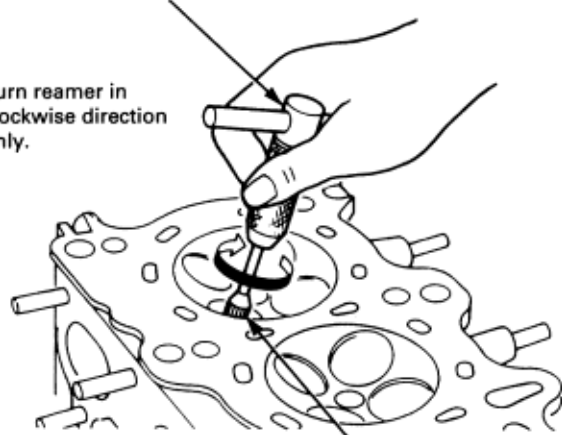


NOTE: For new valve guides only.

1. Coat both reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check the clearance with a valve (**See Page 6-C-39**).
 - ♦ Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

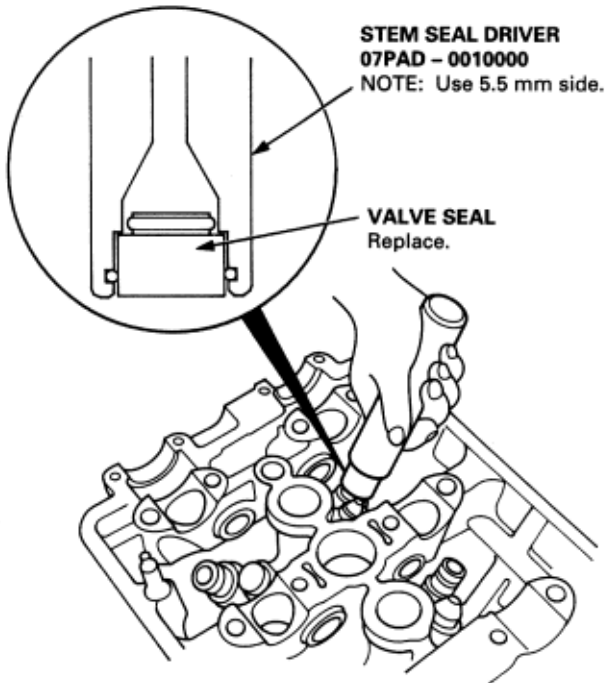
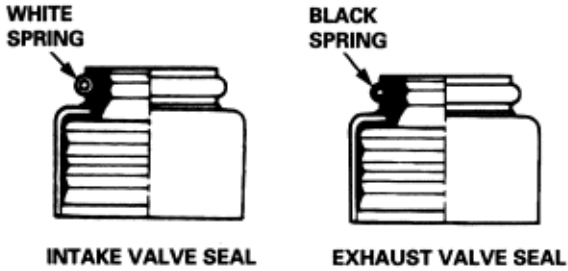
REAMER HANDLE

Turn reamer in clockwise direction only.

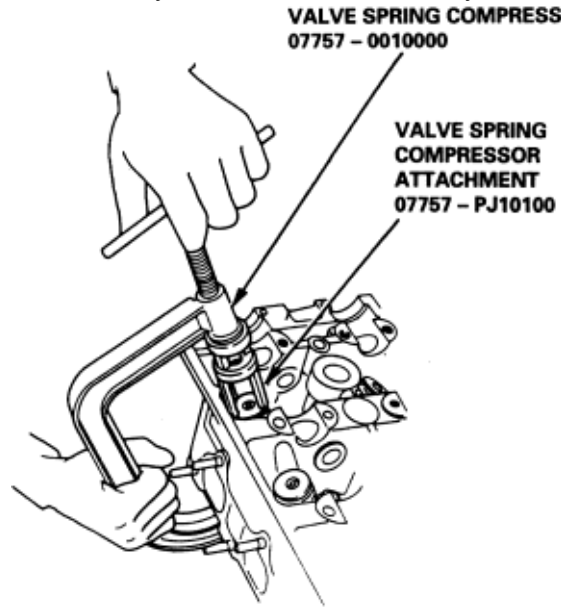


VALVE GUIDE REAMER,
5.525 mm
07HAH - PJ70100

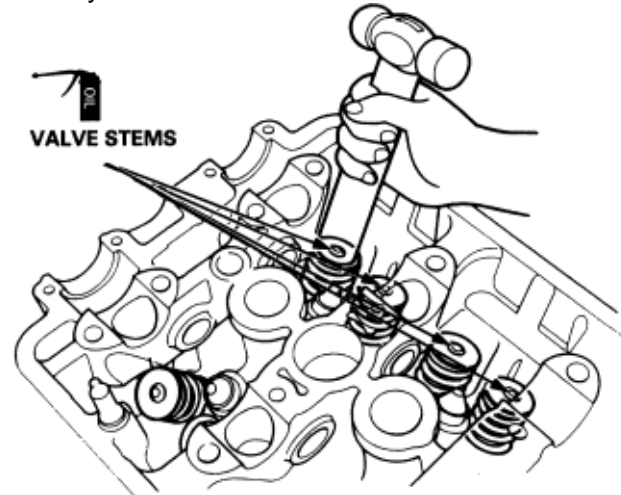
1. Coat the valve stems with engine oil. Install the valves in the valve guides.
NOTE: Make sure the valves move up and down smoothly.
2. Install the spring seats on the cylinder head.
3. Install the valve seals using the valve guide seal installer.
NOTE: Exhaust and intake valve seals are not interchangeable.



4. Install the valve spring and valve retainer, then install the valve spring compressor. Compress the spring and install the valve keepers.
NOTE: Place the end of the valve spring with closely wound coils toward the cylinder head.



5. Lightly tap the end of each valve stem two or three times with the wooden handle of a hammer to ensure proper seating of the valve and valve keepers.
NOTE: Tap the valve stem only along its axis so you do not bend the stem.



Rocker Arms Installation

6-C-42

1. Install the lost motion assemblies.
2. Install the rocker arms while passing the rocker arm shaft through the cylinder head.
 - ♦ Valve adjusting locknuts should be loosened and adjusting screw backed off before installation.
 - ♦ The component parts must be reinstalled in the original locations.

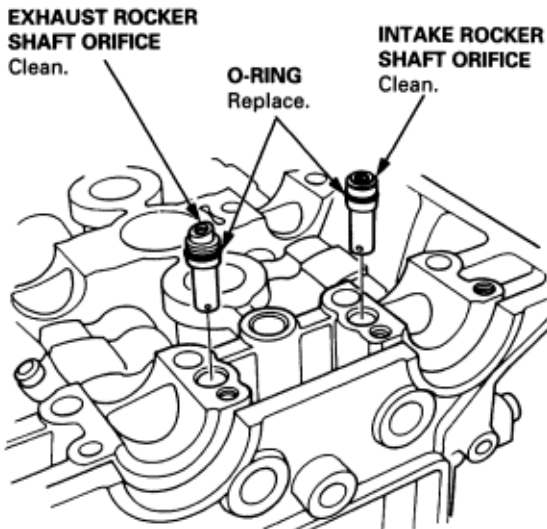
NOTE: Remove the rubber bands after installing the rocker arms.



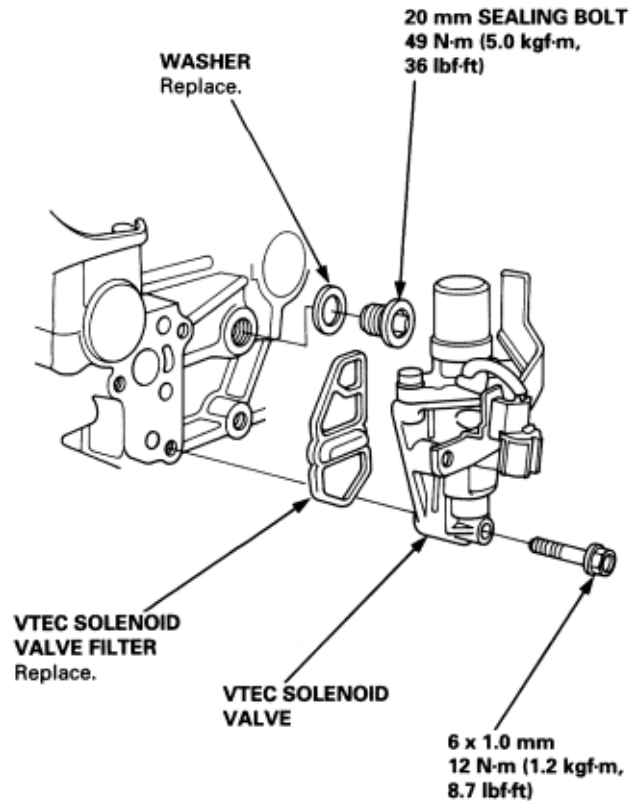
3. Install the rocker shaft orifices. If the holes in the rocker arm shaft and cylinder head are not in line with each other, thread a 12 mm bolt into the rocker arm shaft and rotate the shaft.

NOTE:

- ♦ The shapes of the rocker shaft orifices for the intake and exhaust are different. The orifices must be installed in the original locations.
- ♦ Clean the rocker shaft orifices and install them with new O-rings.



4. Install the VTEC solenoid valve and 20 mm sealing bolt.



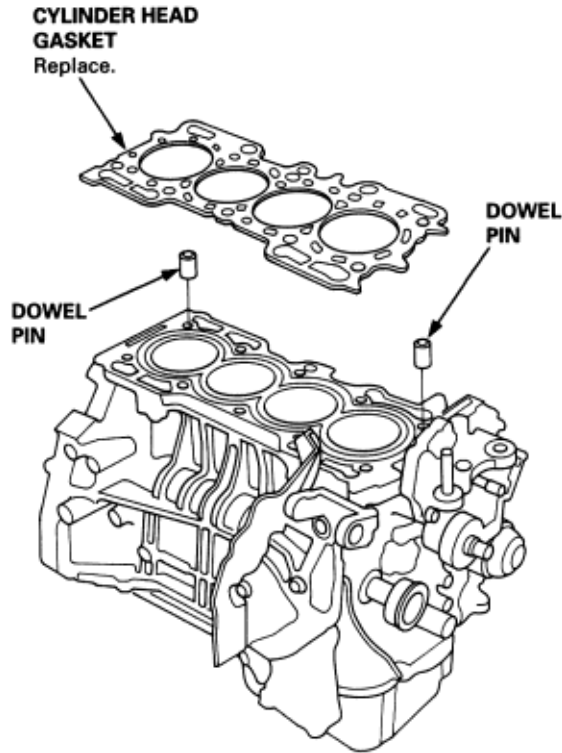
Cylinder Head Installation

6-C-43

Install the cylinder head in the reverse order of removal:

NOTE:

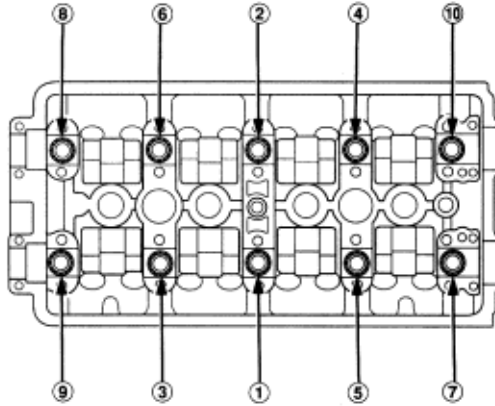
- ♦ Always use a new head gasket.
 - ♦ Cylinder head and cylinder block surface must be clean.
 - ♦ Turn the crankshaft so the No. 1 piston is at TDC (**See Page 6-C-16**).
 - ♦ Do not use the middle cover and lower cover to store removed items.
 - ♦ Clean the middle cover and lower cover before installation.
1. Cylinder head dowel pins must be aligned.



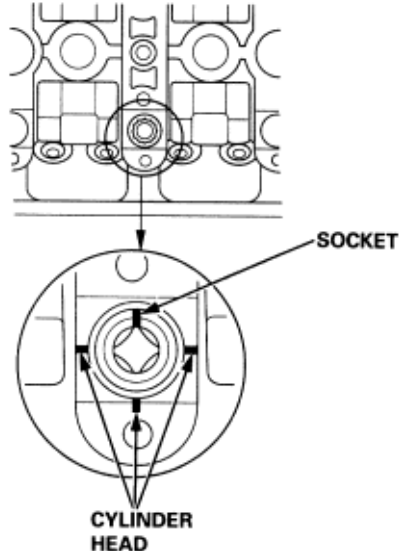
2. Apply clean engine oil to the threads of the cylinder head bolts.
3. Tighten the cylinder head bolts in sequence to 29Nm (3.0 kgf/m, 22 lbf/ft).

NOTE:

- ♦ We recommend using a beam-type torque wrench. When using a preset type torque wrench, be sure to tighten slowly and not to overtighten.
- ♦ If a bolt makes any noise when you are torquing it, loosen the bolt, and retighten it.



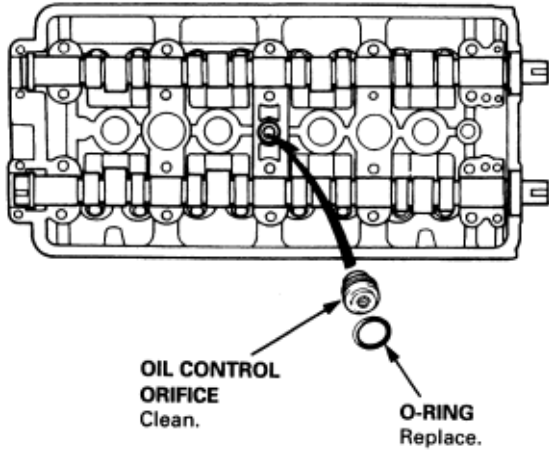
4. Attach the socket to the cylinder head bolt without lash by turning the socket clockwise slightly, then mark the socket and the cylinder head as shown.



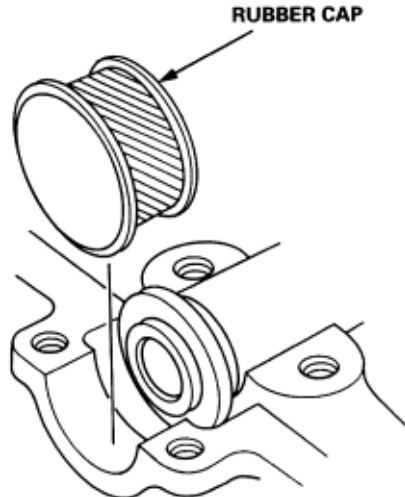
5. Tighten the cylinder head bolts until the mark on the bolt head aligns to the mark on the cylinder head (turn the bolt 90°) twice.

NOTE: If using a new cylinder head bolt, tighten the bolt 90° further.

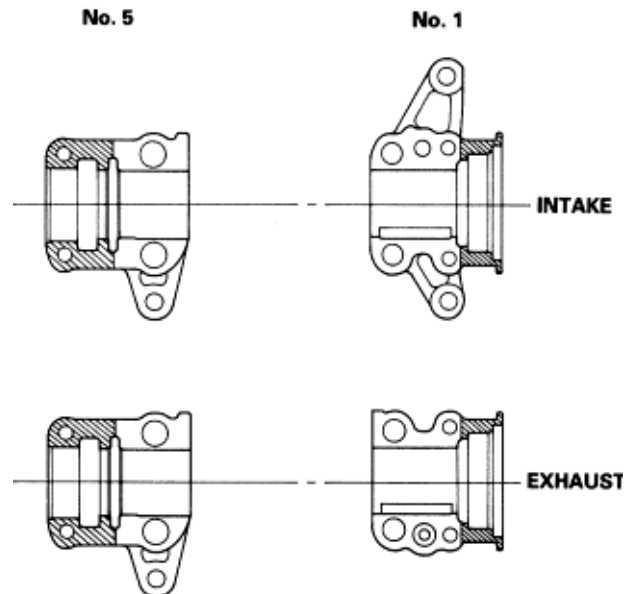
6. Tighten the intake manifold mounting bolt (**See Page 6-C-28**).
7. Install the exhaust manifold bracket, and tighten the new self-locking nuts (**See Page 6-C-28**).
8. Install the camshafts and camshaft oil seals.
NOTE:
 - ♦ Install the camshafts with the keyways facing up.
 - ♦ Install the oil seal with the spring side facing in.
 - ♦ The oil seal housing surface should be dry.
9. Clean and install the oil control orifice with a new O-ring in the oil passage of the No. 3 camshaft holder.



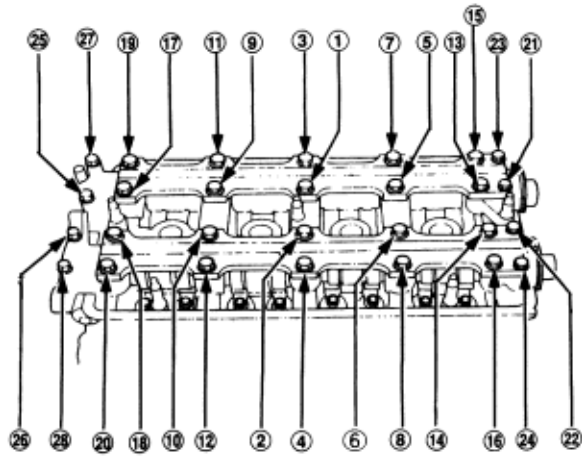
10. Apply liquid gasket around the rubber cap, then install the rubber cap.



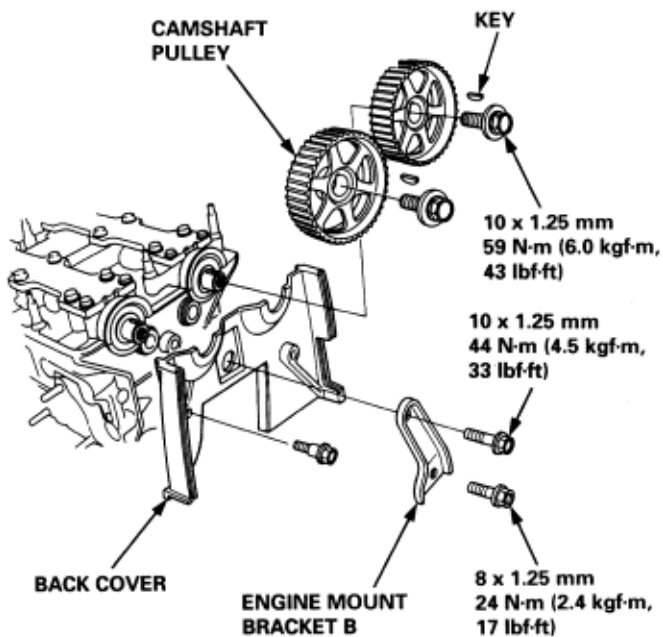
11. Apply liquid gasket to the head mating surface of the No. 1 and No. 5 camshaft holders on both the intake and exhaust side. Confirm that the camshaft keyways face up, then place those holders, together with the No. 2, No. 3 and No. 4 camshaft holders, on the cylinder head.
NOTE: The arrows marked on the camshaft holders should point toward the timing belt.
- Apply liquid gasket to the shaded areas.



12. Tighten the bolts in the sequence shown below.



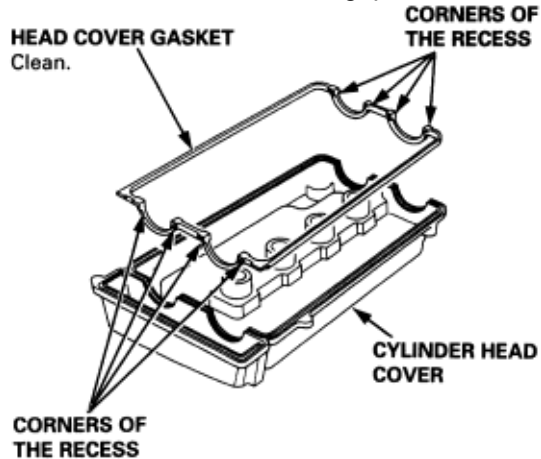
13. Install the back cover, camshaft pulleys and engine mount bracket B.



14. Install the timing belt (**See Page 6-C-16**).
15. Adjust the valve clearance (**See Page 6-C-9**).
16. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

NOTE:

- ♦ Before installing the head cover gasket, thoroughly clean the seal and the groove.
- ♦ When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.

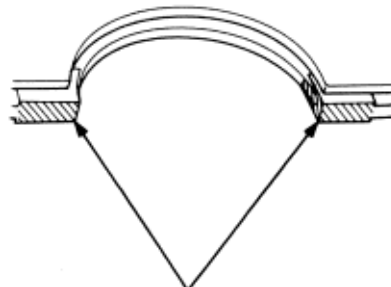


CORNERS OF THE RECESS

17. Apply liquid gasket to the head cover gasket at the eight corners of the recesses.

NOTE:

- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.



Apply liquid gasket to the shaded areas.

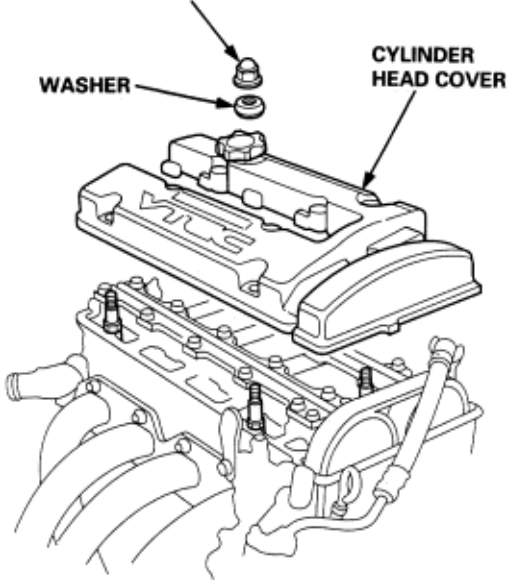
18. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).

Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

NOTE:

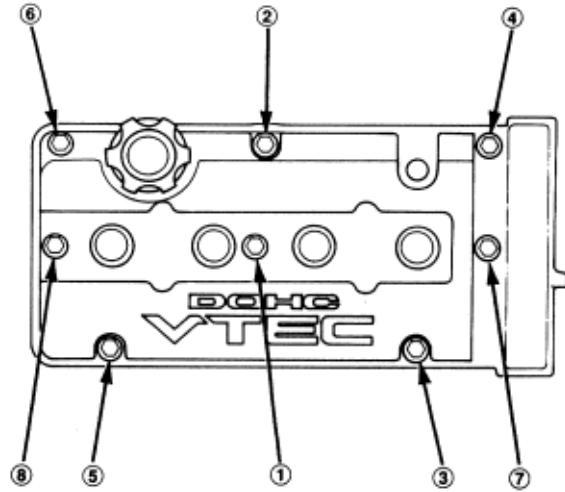
- ♦ Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
- ♦ Do not touch the parts where liquid gasket was applied.
- ♦ Replace the washer when damaged or deteriorated.

6 x 1.0 mm
12 N·m (1.2 kgf·m,
8.7 lbf·ft)



19. Tighten the nuts in two or three steps. In the final step, tighten all nuts, in sequence, to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).

NOTE: After assembly, wait at least 30 minutes before filling the engine with oil.



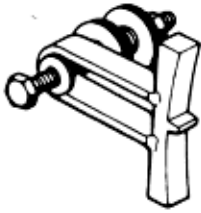
20. After installation, check that all tubes, hoses and connectors are installed correctly.

21. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

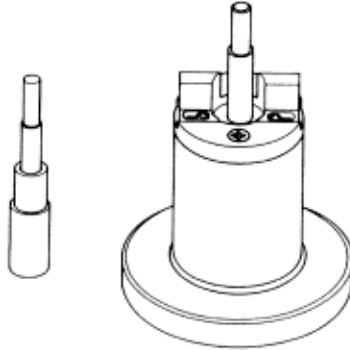
Special Tools

7-A-2

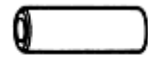
Ref No.	Tool Number	Description	Qty	Remark
1	07LAB - PV00100	Ring Gear Holder	1	
2	07PAF - 0010000	Piston Pin Assembly Tool Set	1	
2-1	07PAF - 0010650	Piston Collar, O.D. 19 mm	1	
3	07749 - 0010000	Handle Driver	1	
4	07948 - SB00101	Driver Attachment, 96 mm	1	



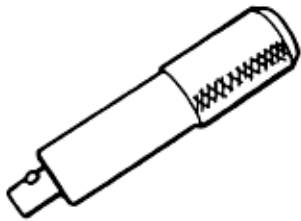
①



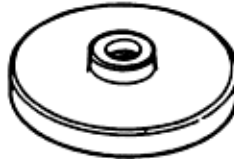
②



②-1



③



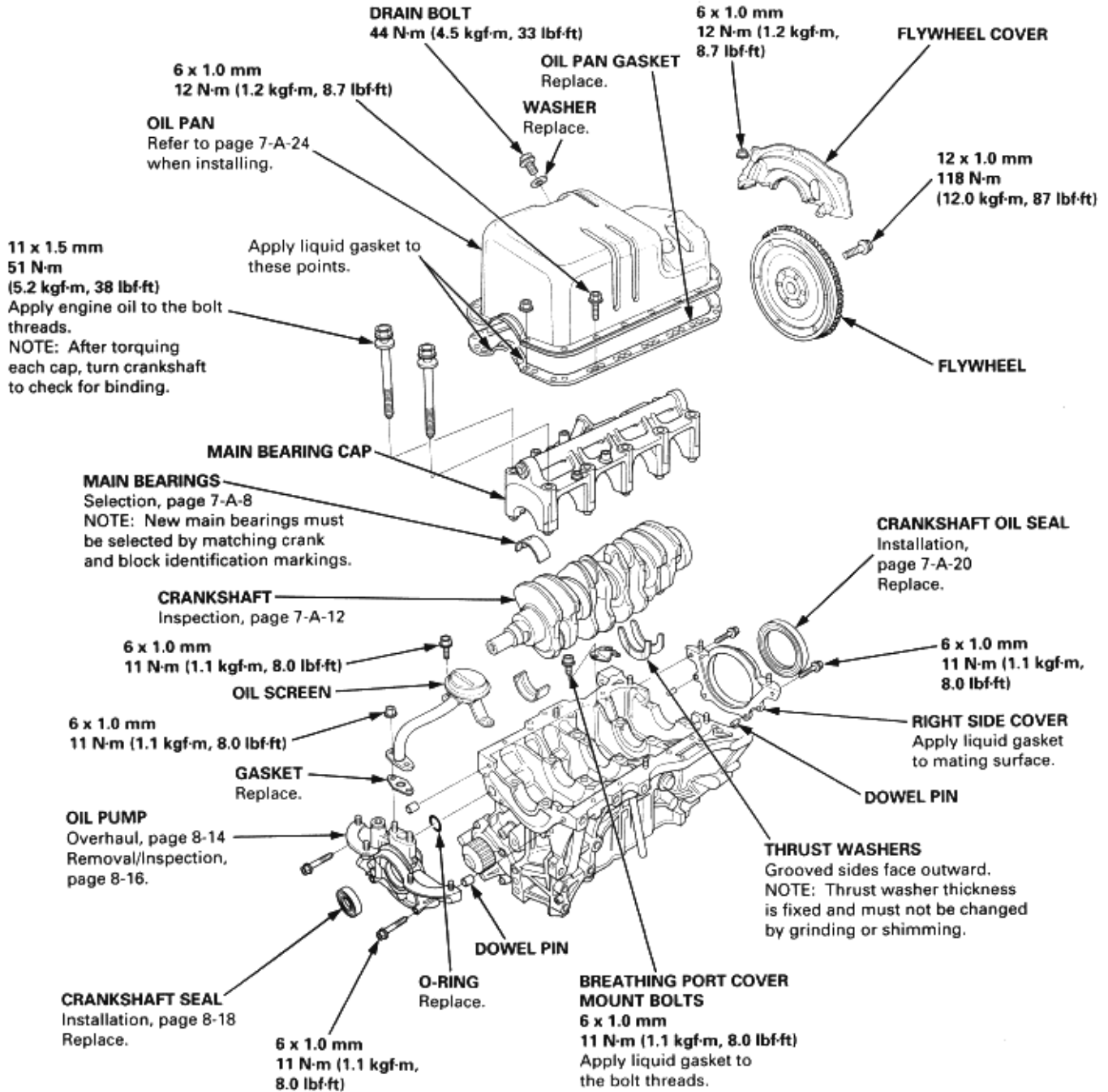
④

NOTE:

Apply liquid gasket to the mating surfaces of the right side cover and oil pump housing before installing them.
 Use liquid gasket part No. 08C70-K0234M, 08C70-K0334M or, 08C70-X0331S.
 Clean the oil pan gasket mating surfaces before installing it.




Lubricate all internal parts with engine oil during reassembly.



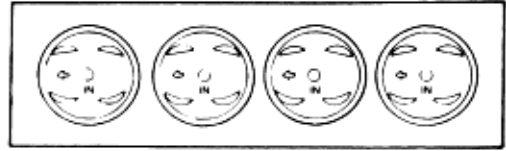
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 7-A-24\)](#)
[\(See Page 7-A-8\)](#)
[\(See Page 7-A-12\)](#)
[\(See Page 7-A-20\)](#)
[\(See Page 8-14\)](#)
[\(See Page 8-16\)](#)
[\(See Page 8-18\)](#)

NOTE: New rod bearings must be selected by matching connecting rod assembly and crankshaft identification markings (see page 7-A-9).

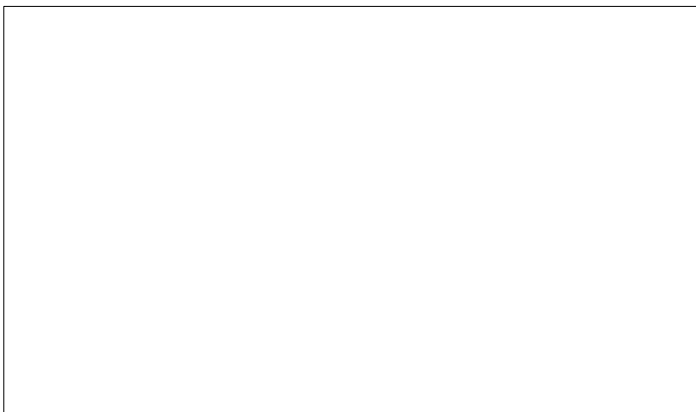
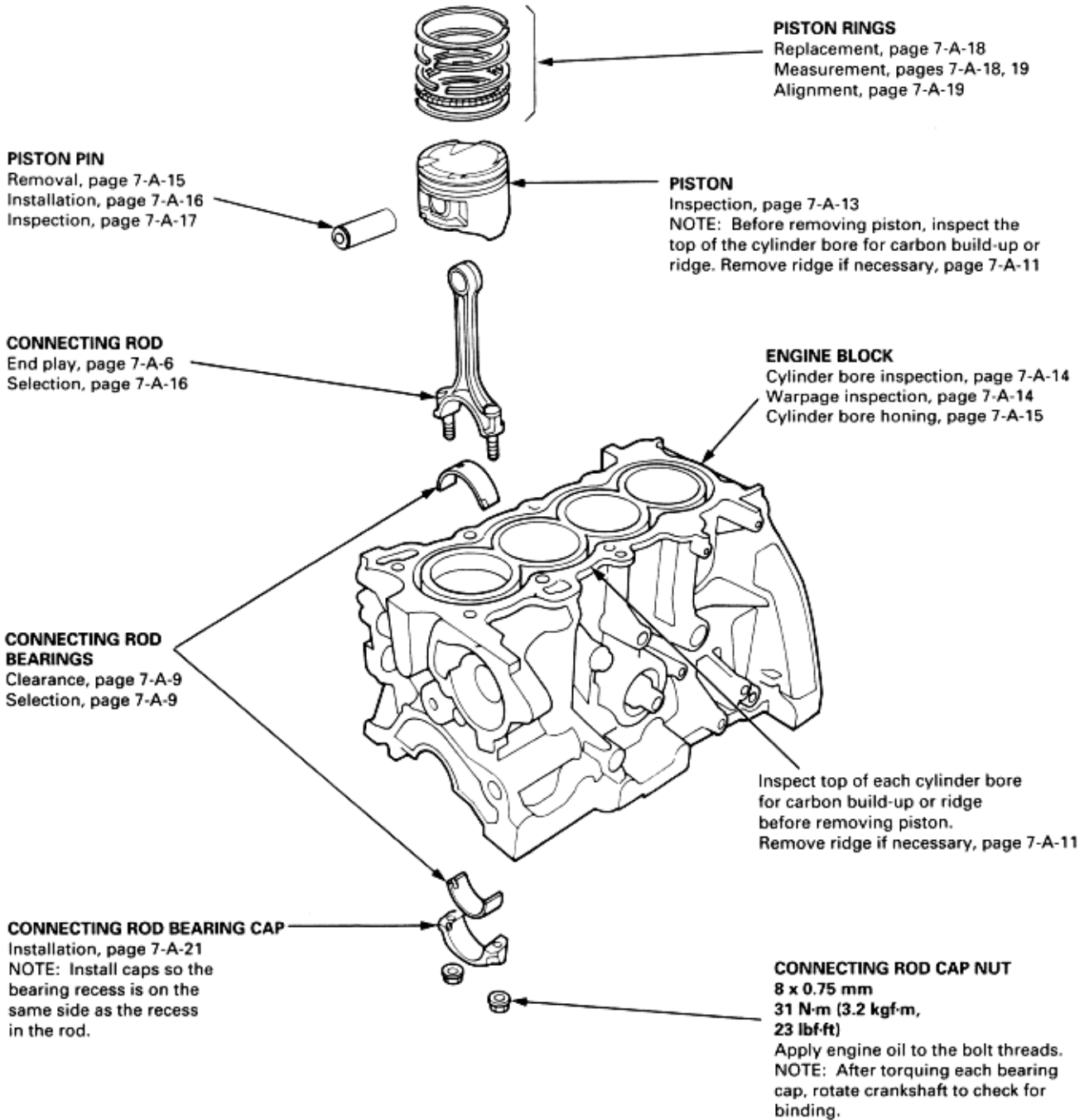
 Lubricate all internal parts with engine oil during reassembly.

PISTON INSTALLATION DIRECTION:

EXHAUST



INTAKE



bearing recess is on the same side as the recess in the rod.



8 x 0.75 mm
31 N·m (3.2 kgf·m,
23 lbf·ft)

Apply engine oil to the bolt threads.
NOTE: After torquing each bearing cap, rotate crankshaft to check for binding.

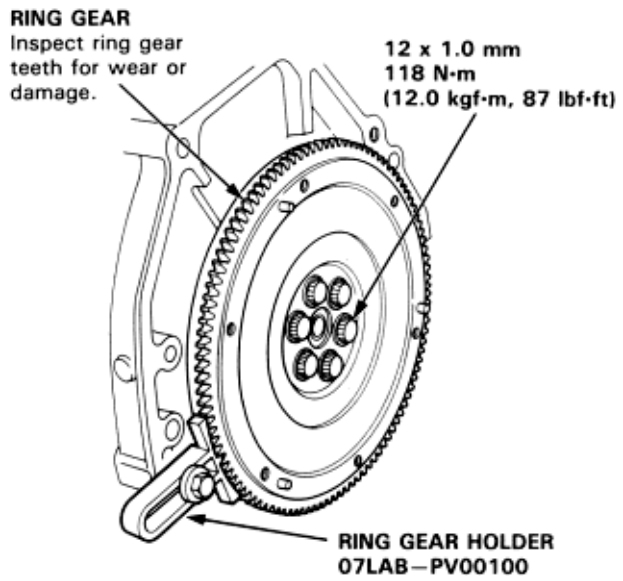
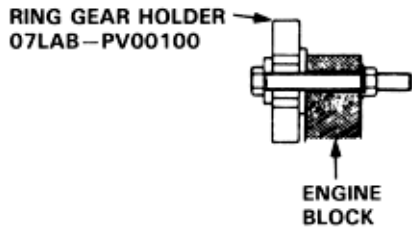
To go to the pages referenced on the diagram above, click on the following:

- (See Page 7-A-15)
- (See Page 7-A-6)
- (See Page 7-A-16)
- (See Page 7-A-9)
- (See Page 7-A-21)
- (See Page 7-A-18)
- (See Page 7-A-19)
- (See Page 7-A-13)
- (See Page 7-A-11)
- (See Page 7-A-14)
- (See Page 7-A-15)

**Flywheel
Replacement**

7-A-5

Remove the six flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in a crisscross pattern.



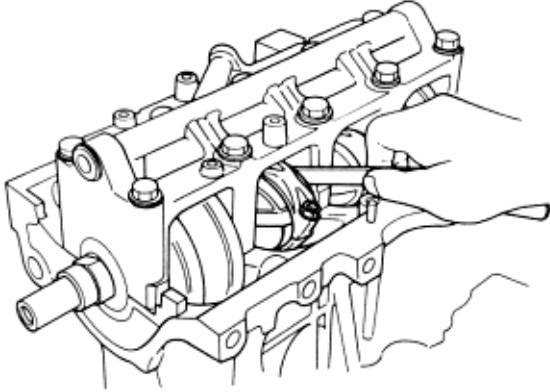
Connecting Rod and Crankshaft End Play

7-A-6

Connecting Rod End Play:

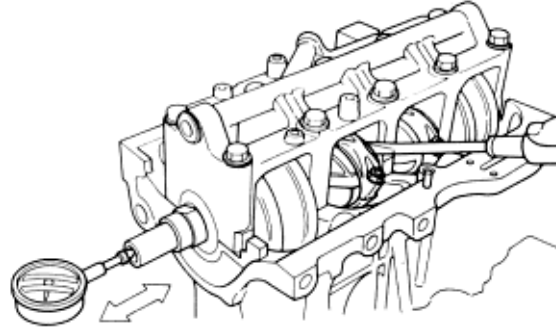
Standard (New): 0.15 - 0.30 mm
(0.006 - 0.012 in)

Service Limit: 0.40 mm (0.016 in)



- ♦ If out-of-tolerance, install a new connecting rod.
- ♦ If still out-of-tolerance, replace the crankshaft ([See Page 7-A-10](#)) and ([See Page 7-A-21](#)).

Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; dial reading should not exceed service limit.



Crankshaft End Play:

Standard (New): 0.10 - 0.35 mm
(0.004 - 0.014 in)

Service Limit: 0.45 mm (0.018 in)

- ♦ If end play is excessive, inspect the thrust washers and thrust surface on the crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming. Thrust washers are installed with grooved sides facing outward.

Main Bearings Clearance

7-A-7

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal. NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crankshaft and flywheel will flatten the plastigage further than just the torque on the cap bolt, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time.
4. Reinstall the bearings and caps, then torque the bolts.
1st step: 25 Nm (2.5 kgf/m, 18 lbf/ft)
Final step: 51 Nm (5.2 kgf/m, 38 lbf/ft)
NOTE: Do not rotate the crankshaft during inspection.
5. Remove the cap and bearing again, and measure the widest part of the plastigage.

Main Bearing-to-Journal Oil Clearance: Standard (New):

No. 1, 5 Journals:

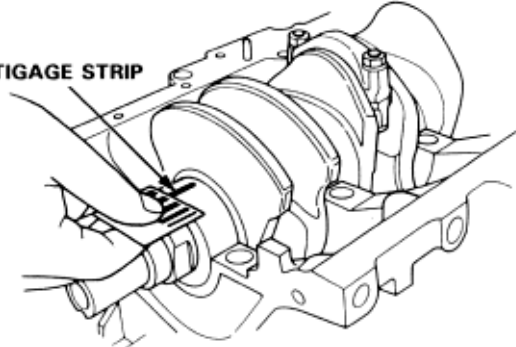
0.018 - 0.036 mm (0.0007 - 0.0014 in)

No. 2, 3, 4 Journals:

0.024 - 0.042 mm (0.0009 - 0.0017 in)

Service Limit: 0.05 mm (0.002 in)

PLASTIGAGE STRIP



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Main Bearings Selection

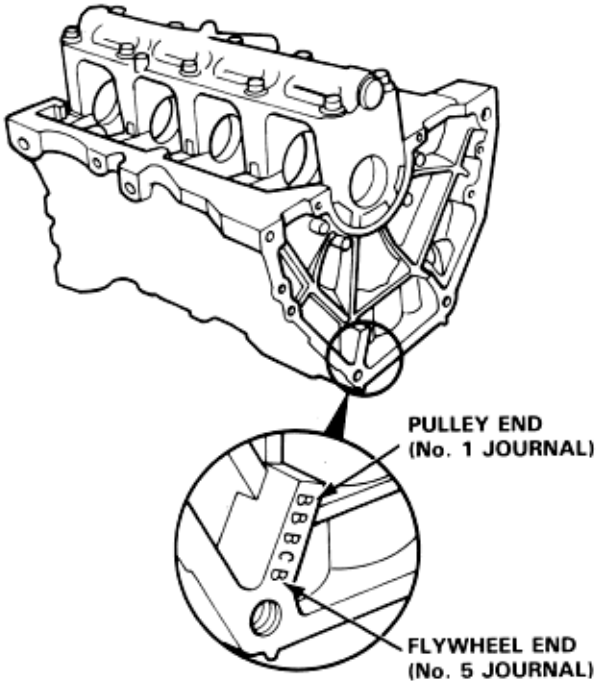
7-A-8

NOTE: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

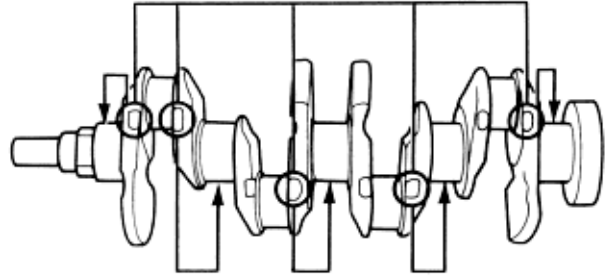
Crankshaft Bore Code Location

Letters have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.

Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



Main Journal Code Location (Numbers)



Bearing Identification

Color code is → Larger crank bore on the edge of the bearing.

A	B	C	D
---	---	---	---

→ Smaller bearing (thicker)

↓ Smaller main journal

1
2
3
4

↓ Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
3. Place the plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts.

Torque

31 Nm (3.2 kgf/m, 23 lbf/ft)

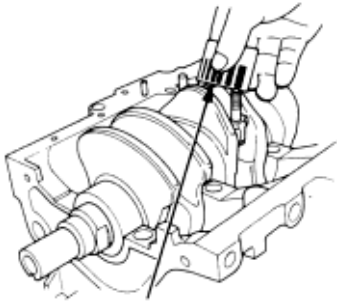
NOTE: Do not rotate the crankshaft during inspection.

5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance:

**Standard (New): 0.020 - 0.038 mm
(0.0008 - 0.0015 in)**

Service Limit: 0.05 mm (0.002 in)



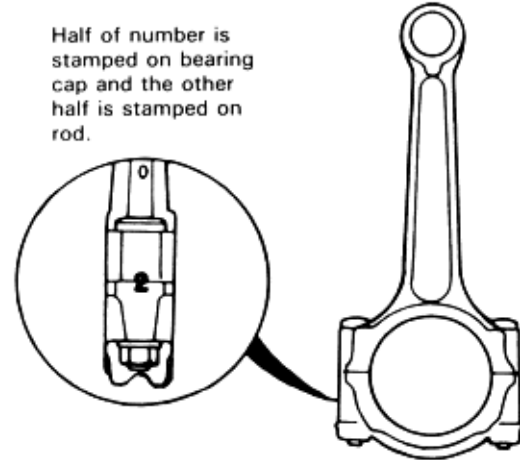
PLASTIGAGE STRIP

6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code (select the color as shown in the right column), and recheck the clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again.
NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

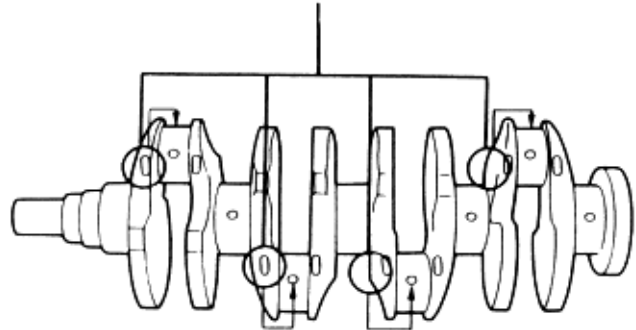
NOTE: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Connection Rod Code Location

Numbers have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters stamped on the crankshaft (codes for rod journal size), to choose the correct bearings.



Connecting Rod Journal Code Locations (Letters)



Bearing Identification

Color code is on the _____ → Larger big end bore edge of the bearing.

1	2	3	4
---	---	---	---

↓
Smaller rod journal

A or I
B or II
C or III
D or IIII

↓
Smaller bearing (thicker)

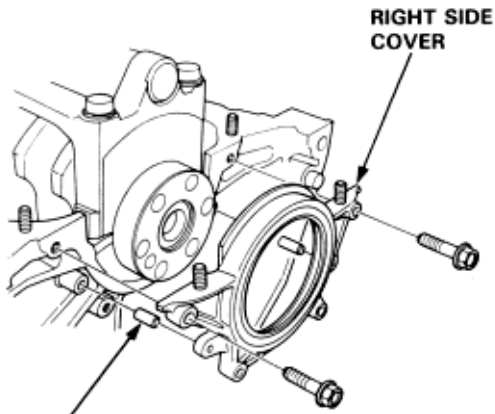
→ Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

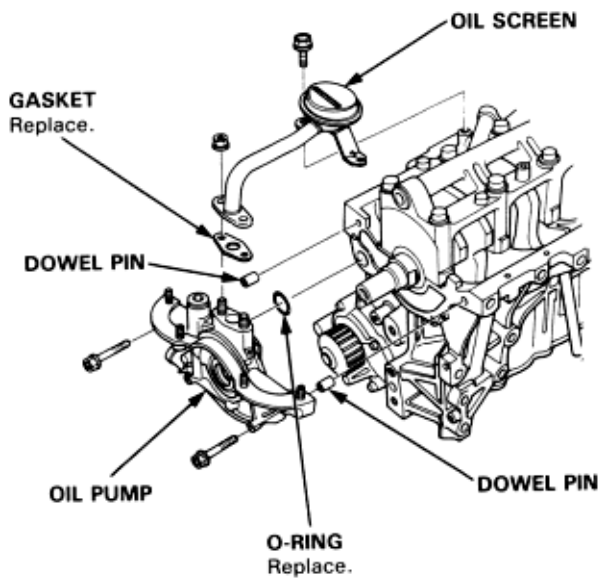
Pistons and Crankshaft Removal

7-A-10

1. Remove the oil pan assembly.
2. Remove the right side cover.

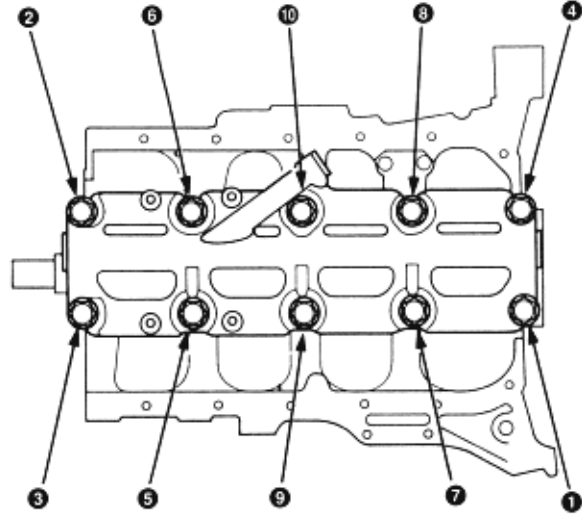


3. Remove the oil screen.
4. Remove the oil pump.

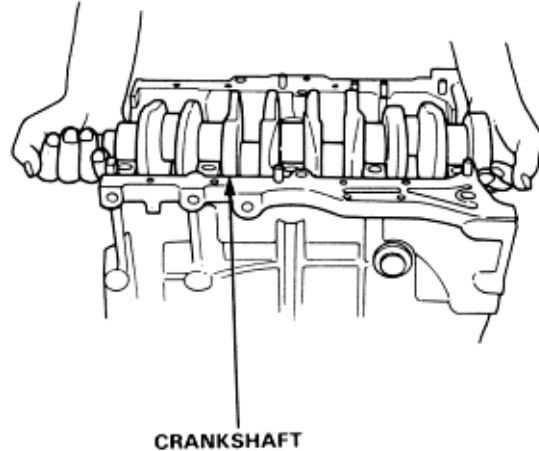


5. Remove the bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened, then remove the bearing cap.

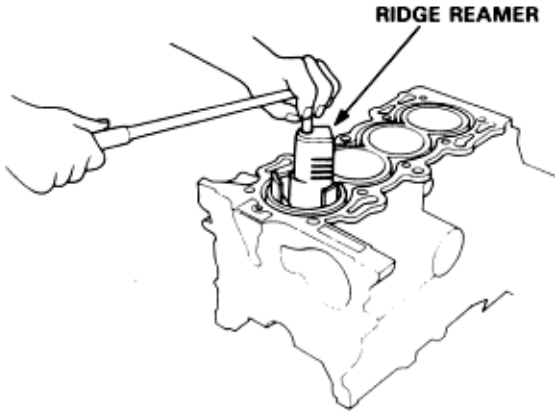
MAIN BEARING CAP BOLTS LOOSENING SEQUENCE



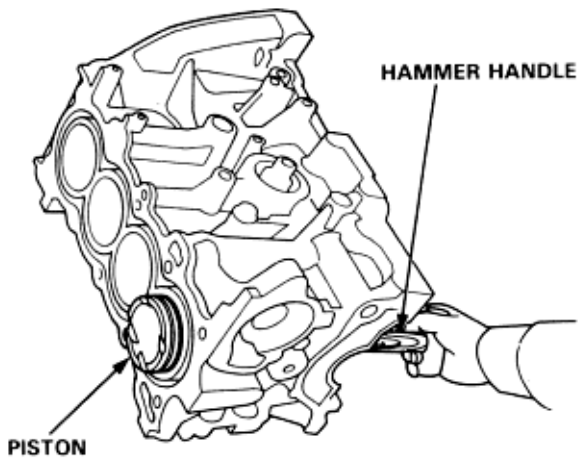
6. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
7. Lift the crankshaft out of the engine, being careful not to damage journals



8. Remove the upper bearing halves from the connecting rods and set them aside with their respective caps.
9. Reinstall the main caps and bearings on the engine in proper order.
10. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow the reamer manufacturer's instructions. If the ridge is not removed, it may damage the pistons as they are pushed out.



11. Use the wooden handle of a hammer to drive the pistons out.



12. Reinstall the connecting rod bearings and caps after removing each piston/connecting rod assembly.
13. Mark each piston/connecting rod assembly with its cylinder number to avoid mixup on reassembly.
NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

Crankshaft Inspection

7-A-12

- ♦ Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- ♦ Check the keyway and threads.

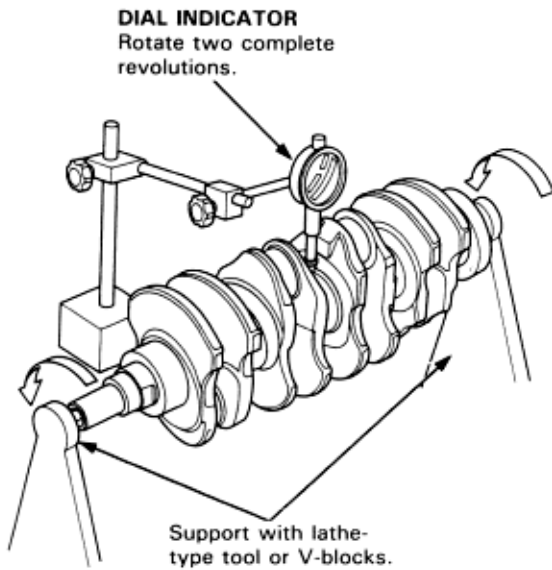
Alignment

- ♦ Measure runout on all main journals to make sure the crank is not bent.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Crankshaft Total Indicated Runout:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)



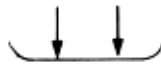
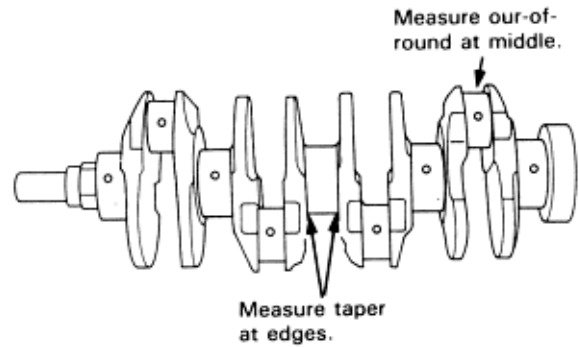
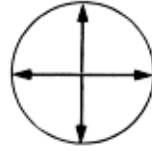
Out-of-Round and Taper

- ♦ Measure out-of-round at the middle of each rod and main journal in two places.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Journal Out-of-Round:

Standard (New): 0.0025 mm (0.0001 in) max.

Service Limit: 0.005 mm (0.0002 in)



- ♦ Measure the taper at edges of each rod and main journal.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Journal Taper:

Standard (New): 0.0025 mm (0.0001 in) max.

Service Limit: 0.005 mm (0.0002 in)

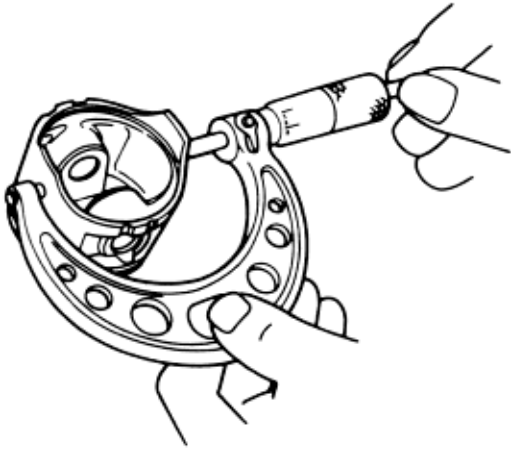
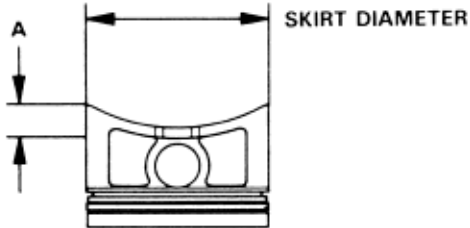
1. Check the piston for distortion or cracks.
NOTE: If cylinder is bored, an oversized piston must be used.
2. Measure piston diameter at point A from bottom of skirt.

A: 5 mm (0.2 in)

Piston Diameter:

Standard (New): 74.980 - 74.990 mm
(2.9520 - 2.9524 in)

Service Limit: 74.970 mm (2.9516 in)

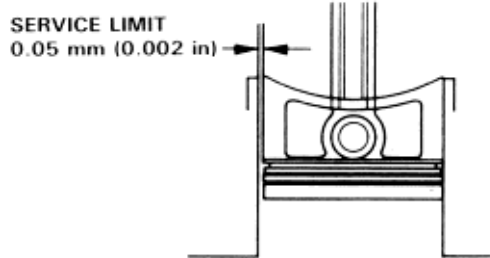


3. Calculate difference between cylinder bore diameter (**see page 7-A-14**) and piston diameter.

Piston to Cylinder Clearance

Standard (New): 0.010 - 0.040 mm
(0.0004 - 0.0016 in)

Service Limit: 0.05 mm (0.002 in)



If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

Oversize Piston Diameter

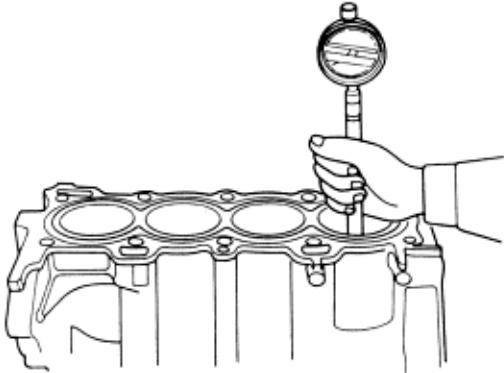
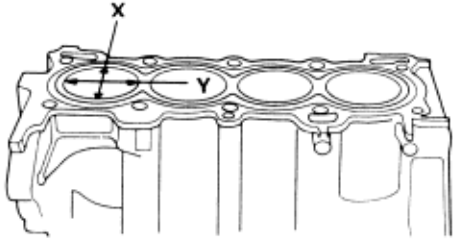
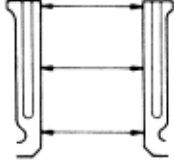
0.25: 75.23 - 75.24 mm (2.9618 - 2.9622 in)

0.50: 75.48 - 75.49 mm (2.9716 - 2.9720 in)

Cylinder Block Inspection

7-A-14

1. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.



Cylinder Bore Size:

Standard (New): 75.00 - 75.02 mm
(2.953 - 2.954 in)

Service Limit: 75.07 mm (2.956 in)

Oversize

0.25: 75.25 - 75.27 mm (2.9626 - 2.9634 in)

0.50: 75.50 - 75.52 mm (2.9724 - 2.9732 in)

Bore Taper

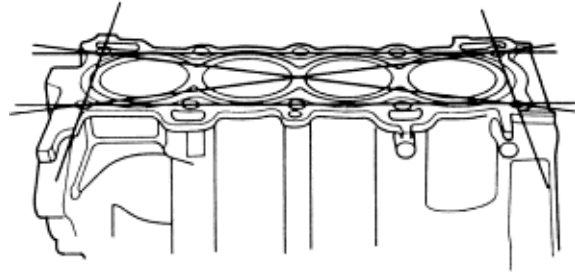
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in).

- ♦ If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- ♦ If block is to be rebored, refer to Piston Clearance Inspection (see page 7-A-13) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Reboring Limit: 0.50mm (0.02 in)

2. Check the top of the block for warpage. Measure along the edges and across the center as shown.
SURFACES TO BE MEASURED

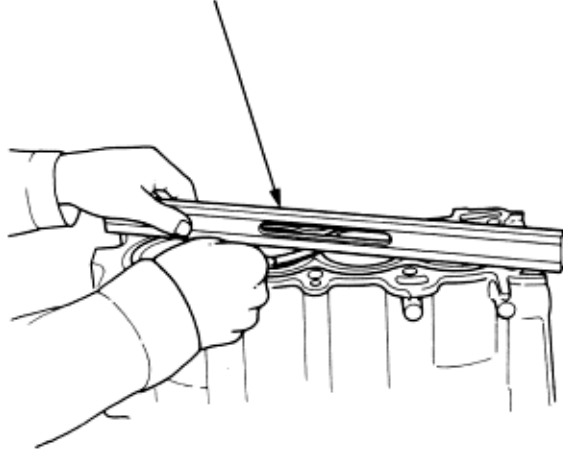


Engine Block Warpage:

Standard (New): 0.07 mm (0.003 in) max.

Service Limit: 0.10 mm (0.004 in)

PRECISION STRAIGHT EDGE



Cylinder Block Bore Honing

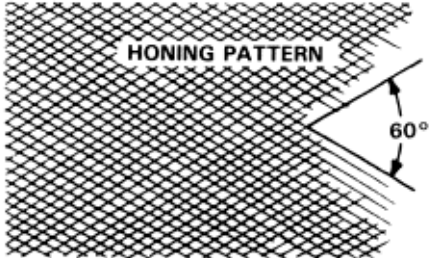
7-A-15

Piston Pins Removal

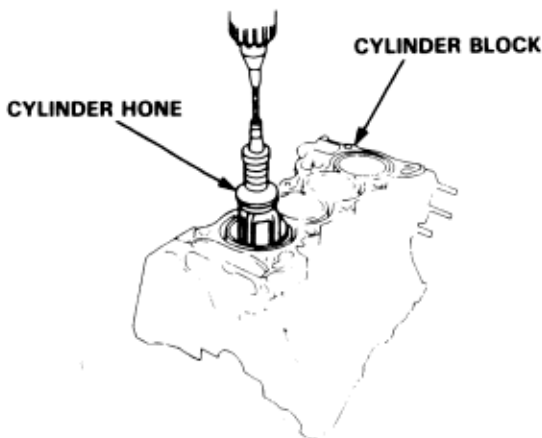
1. Measure cylinder bores, ([see page 7-A-14](#)). If the block is to be reused, hone the cylinders and remeasure the bores.
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.

NOTE:

- ♦ Use only a rigid hone with 400 grit or finer stone such as Sunnen, Ammco, or equivalent.
- ♦ Do not use stones that are worn or broken.



3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.
NOTE: Never use solvent, it will only redistribute the grit on the cylinder walls.
4. If scoring or scratches are still present in cylinder bores after honing to the service limit, rebore the cylinder block.
NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



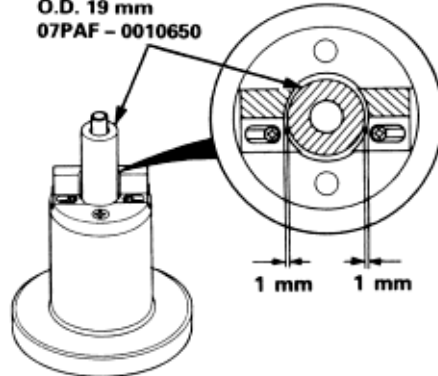
NOTE:

- ♦ After honing, clean the cylinder thoroughly with soapy water.
- ♦ Only a scored or scratched cylinder bore must be honed.

NOTE:

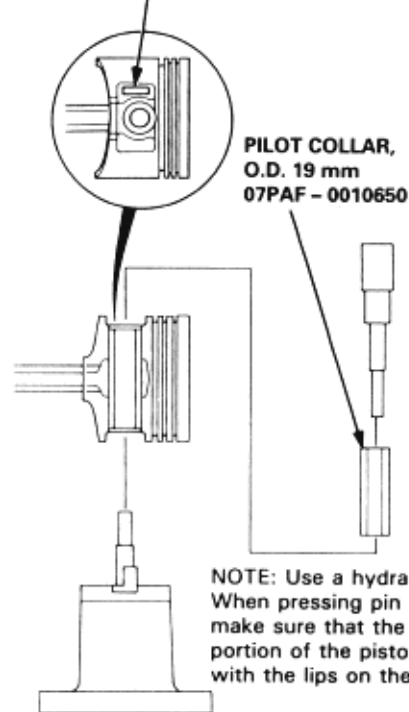
- ♦ Use the piston pin assembly tool set (No. 07PAF-0010000) for removal of piston pins.
 - ♦ Be sure to use the pilot collar of correct No. as designated.
1. Set the special tools as shown.

PILOT COLLAR,
O.D. 19 mm
07PAF - 0010650



2. Place the piston on the special tools and press the pin out using a hydraulic press.

Embossed mark facing up.



Connecting Rods Selection

7-A-16

Piston Pins Installation

Each rod falls into one of four tolerance ranges (from 0 to + 0.024 mm (0 to + 0.0009 in), in 0.006 mm (0.0002 in) increments) depending on the size of its big end bore. It's then stamped with a number (1, 2, 3, or 4) indicating the range.

You may find any combination of 1, 2, 3, or 4 in any engine.

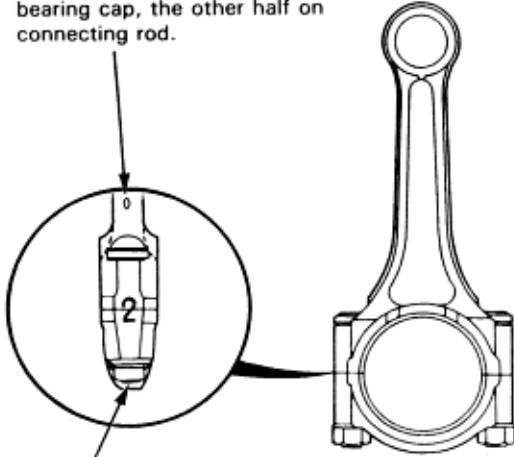
Normal Bore Size: 48.0 mm (1.89 in)

NOTE:

- ♦ Reference numbers are for big end bore size and do NOT indicate the position of the rod in the engine.
- ♦ Inspect connecting rod for cracks and heat damage.

CONNECTING ROD BORE REFERENCE NUMBER

Half of number is stamped on bearing cap, the other half on connecting rod.

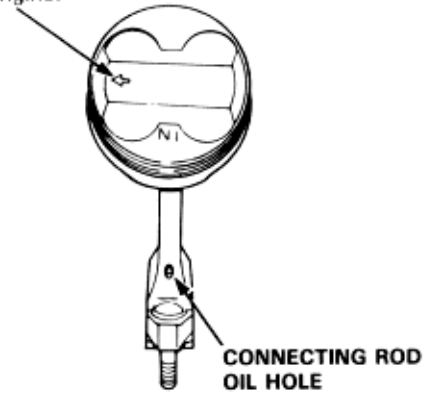


Inspect bolts and nuts for stress cracks.

NOTE:

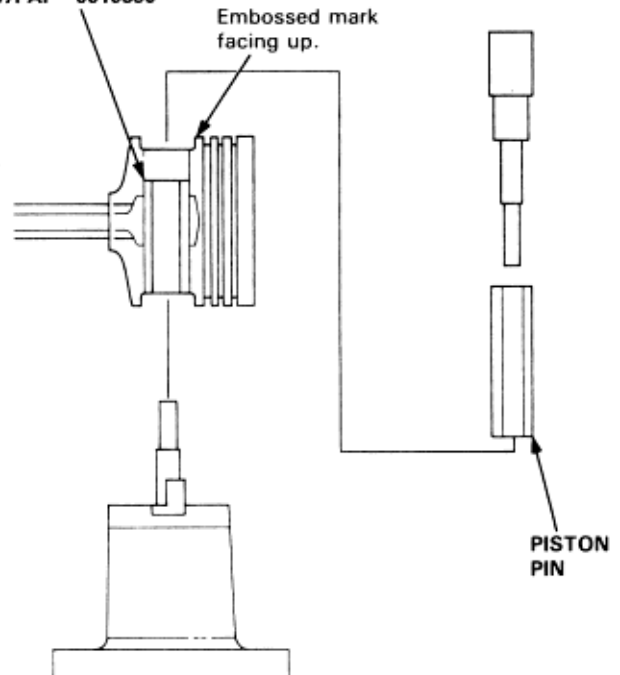
- ♦ Use the piston pin assembly tool set (No. 07PAF - 0010000) with a hydraulic press.
- ♦ Be sure to use the pilot collar of correct No. as designated.

The arrow must face the timing belt side of the engine and the connecting rod oil hole must face the rear of the engine.



1. Install the piston pin as shown.

PILOT COLLAR, O.D. 19 mm 07PAF - 0010650



NOTE: Install the assembled piston and rod with the oil hole facing the intake manifold.

Piston Pins
Inspection

7-A-17

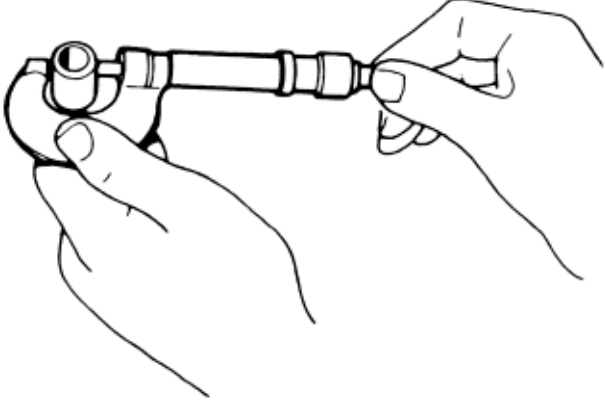
1. Measure the diameter of the piston pin.

Piston Pin Diameter:

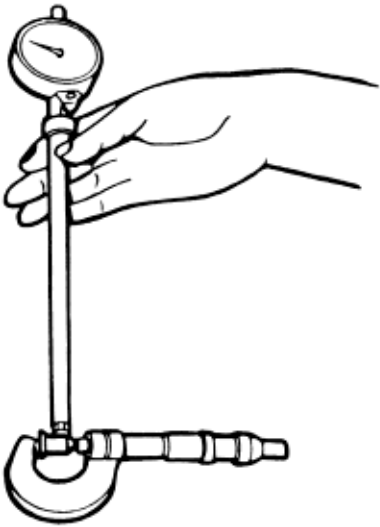
Standard (New): 18.994 - 19.000 mm
(0.7478 - 0.7480 in)

Oversize: 18.997 - 19.003 mm
(0.7479 - 0.7481 in)

NOTE: All replacement piston pins are oversize.



2. Zero the dial indicator to the piston pin diameter.

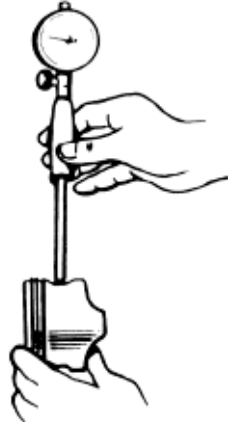


3. Measure the piston pin-to-piston clearance.

NOTE: Check the piston for distortion or cracks. If the piston pin clearance is greater than 0.024 mm (0.0009 in), remeasure using an oversized piston pin.

Piston Pin-to-Piston Clearance:

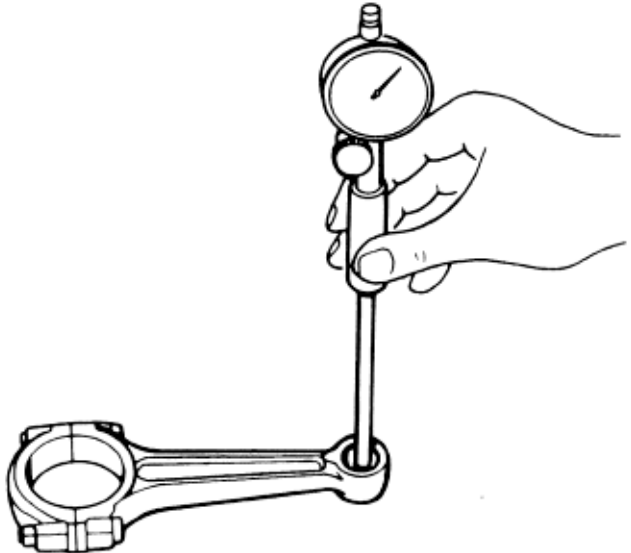
Standard (New): 0.010 - 0.022 mm
(0.0004 - 0.0009 in)



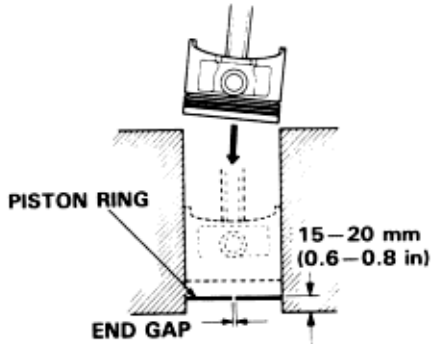
4. Check the difference between piston pin diameter and connecting rod small end diameter.

Piston Pin-to-Connecting Rod Interference:

Standard (New): 0.014 - 0.040 mm
(0.0006 - 0.0016 in)



1. Using a piston, push a new ring into the cylinder bore 15 - 20 mm (0.6 - 0.8 in) from the bottom.



2. Measure the piston ring end-gap with a feeler gauge:
 - ♦ If the gap is too small, check to see if you have the proper rings for your engine.
 - ♦ If the gap is too large, recheck the cylinder bore diameter against the wear limits, ([see page 7-A-14](#)). If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:

Tap Ring

Standard (New): 0.15 - 0.30 mm
(0.006 - 0.012 in)

Service Limit: 0.70 mm (0.028 in)

Second Ring

Standard (New): 0.20 - 0.70 mm
(0.008 - 0.028 in)

Service Limit: 0.80 mm (0.031 in)

Oil Ring

Standard (New): 0.20 - 0.80 mm
(0.008 - 0.031 in)

Service Limit: 0.90 mm (0.035 in)

1. Using a ring expander, remove the old piston rings.
2. Clean all ring grooves thoroughly.

NOTE:

- ♦ Use a squared-off broken ring or ring groove cleaner with blade to fit piston grooves.
- ♦ Top ring groove is 1.0 mm (0.039 in) wide
- ♦ Second ring groove is 1.2 mm (0.047 in) wide
- ♦ Oil ring groove is 2.8 mm (0.11 in) wide.
- ♦ File down blade if necessary.
- ♦ Do not use a wire brush to clean ring lands or cut ring lands deeper with cleaning tool.

3. Install new rings in proper sequence and position ([see page 7-A-20](#)).

NOTE:

- ♦ Do not reuse old piston rings.
- ♦ If piston is to be separated from connecting rod, do not install new rings yet.



Piston Rings

Ring-to-Groove Clearance

7-A-19

Alignment

After installing a new set of rings measure ring to-groove clearance:

Top Ring Clearance

Standard (New): 0.030 - 0.060 mm
(0.0012 - 0.0024 in)

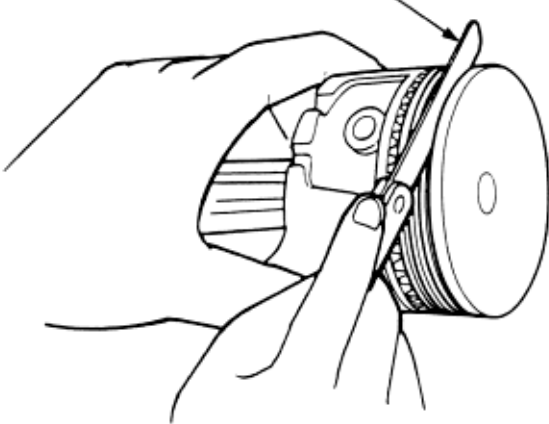
Service Limit: 0.13 mm (0.005 in)

Second Ring Clearance

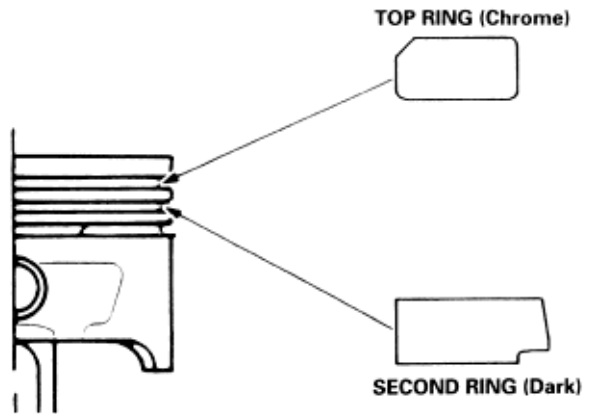
Standard (New): 0.030 - 0.055 mm
(0.0012 - 0.0022 in)

Service Limit: 0.13 mm (0.005 in)

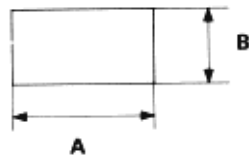
FEELER GAUGE



1. Install the rings as shown.
NOTE: The manufacturing marks must be facing upward.



Piston Ring Dimensions:



Top Ring (Standard):

A: 2.6 mm (0.10 in)

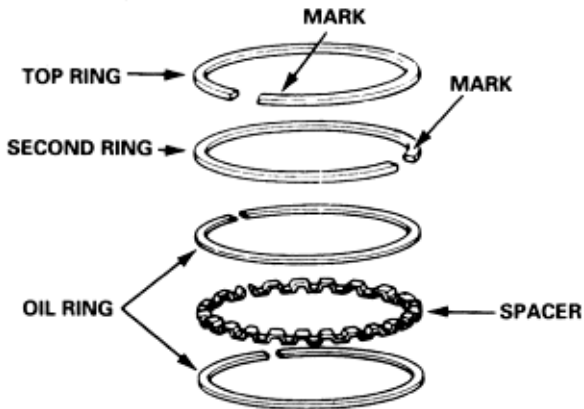
B: 1.0mm (0.04 in)

Second Ring (Standard):

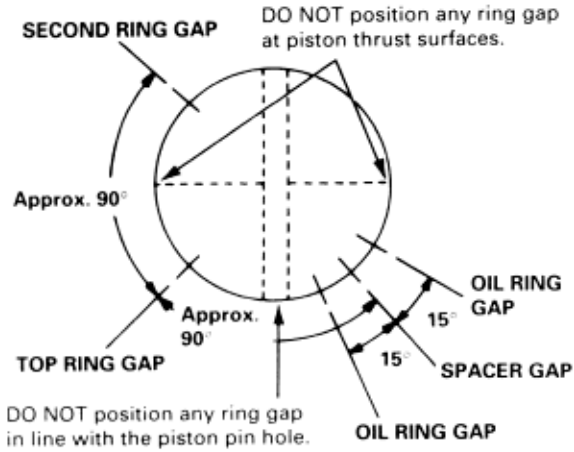
A: 3.0 mm (0.12 in)

B: 1.2 mm (0.05 in)

2. Rotate the rings in their grooves to make sure they do not bind.

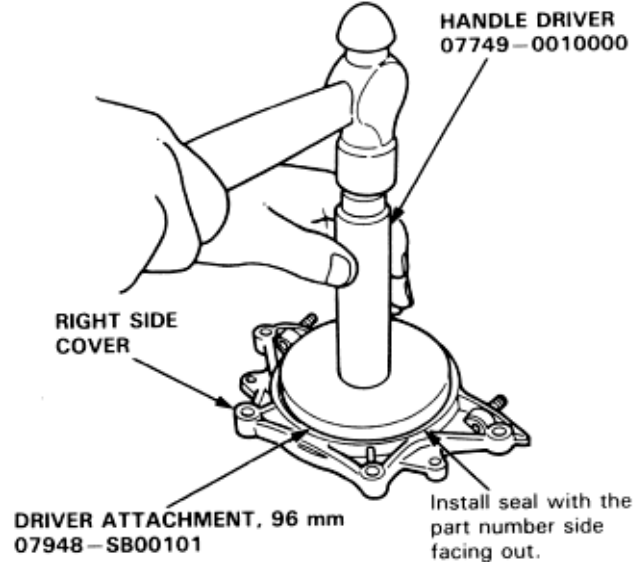


3. Position the ring and gaps as shown:



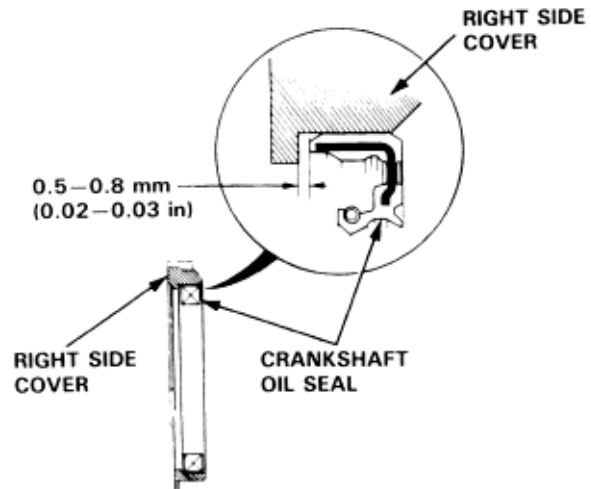
The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the tip of the seal.

1. Drive in crankshaft oil seal against right side cover.
NOTE: Drive the crankshaft oil seal in squarely.



2. Confirm that the clearance is equal all the way around with a feeler gauge.

Clearance: 0.5 - 0.8 mm (0.02 - 0.03 in)



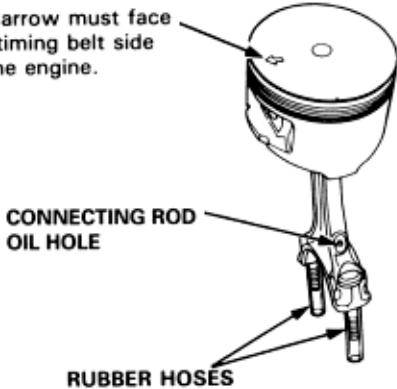
NOTE: (See page 8-18) for installation of the oil pump side crankshaft oil seal.



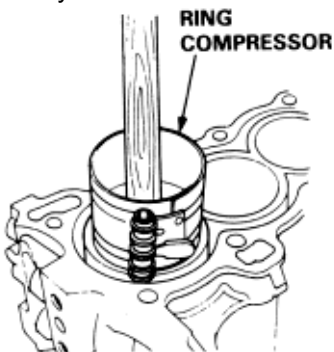
Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
 - ♦ Set the crankshaft to BDC for each cylinder.
 - ♦ Remove the connecting rod caps, and slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
 - ♦ Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder, and tap it in using the wooden handle of a hammer.
 - ♦ Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing piston into place.
 - ♦ Install the rod caps with bearings, and torque the nuts to:
31 Nm (3.2 kgf/m, 23 lbf/ft)
Apply engine oil to the bolt threads.
2. If the crankshaft is not installed:
 - ♦ Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder, and tap it in using the wooden handle of a hammer.

The arrow must face the timing belt side of the engine.

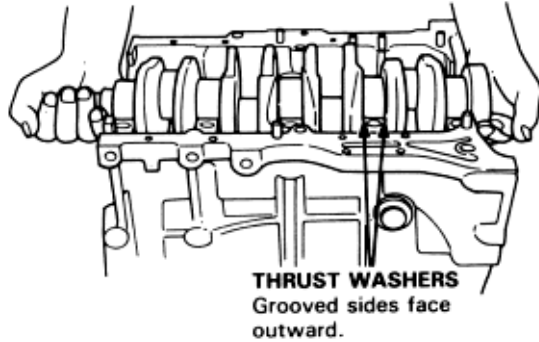


- ♦ Position all pistons at top dead center.
- NOTE: Maintain downward force on the ring compressor to prevent rings from expanding before entering the cylinder bore.



Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. Insert the thrust washers in the No.4 journal of the cylinder block.
2. Insert bearing halves in the cylinder block and connecting rods.
3. Hold the crankshaft so rod journals for cylinders No.2 and No.3 are straight down.
4. Lower the crankshaft into the block, seating the rod journals, into connecting rods No.2 and No.3, and install the rod caps and nuts finger-tight.



5. Rotate the crankshaft clockwise, seat journals into connecting rods No.1 and No.4, and install the rod caps and nuts finger-tight.
NOTE: Install caps so the bearing recess is on the same side as the recess in the rod.

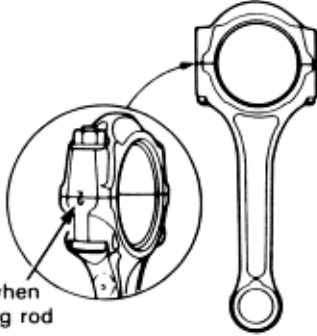
6. Check rod bearing clearance with plastigage ([see page 7-A-9](#)), then torque the cap nuts.

31 Nm (3.2 kgf/m, 23 lbf/ft)

Apply engine oil to the bolt threads.

NOTE: Reference numbers on connecting rod are for big-end bore tolerance and do not indicate the position of piston in the engine.

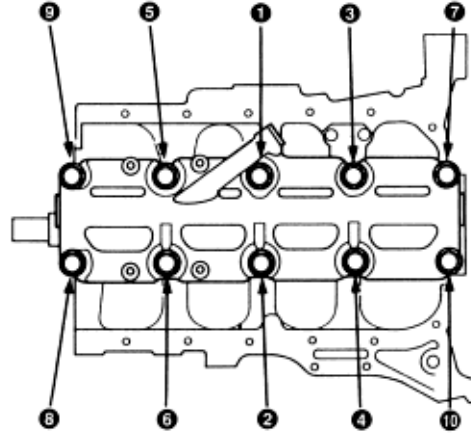
7. Install the thrust washers on the No. 4 journal. Oil the thrust washer surfaces.



Line up the mark when installing connecting rod cap.

8. Install the main bearing caps.
9. Check clearance with plastigage ([see page 7-A-7](#)), tighten the bearing cap bolts in 2 steps.
1st step: 25 Nm (2.5 kgf/m, 18 lbf/ft)
2nd step: 51 Nm (5.2 kgf/m, 38 lbf/ft)
NOTE: Coat the thrust washer surfaces and bolt threads with oil.

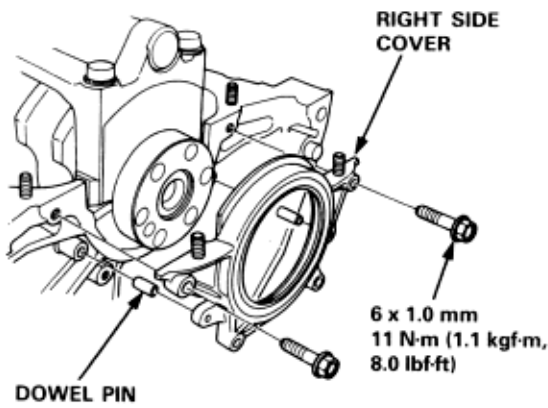
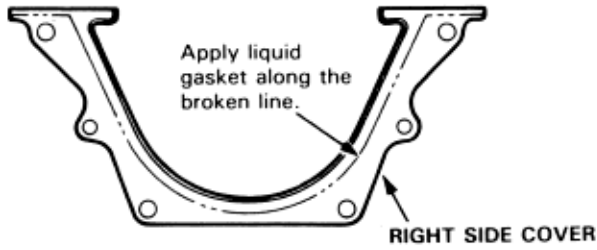
MAIN BEARING CAP BOLTS TIGHTENING SEQUENCE



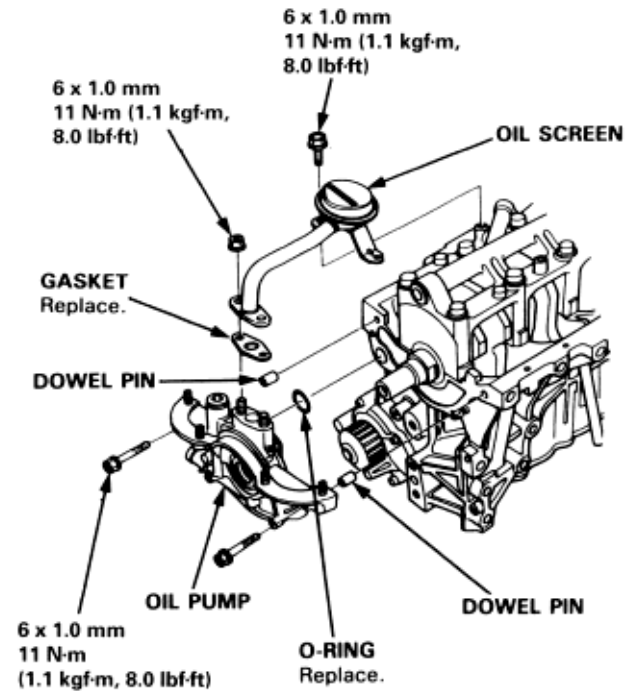
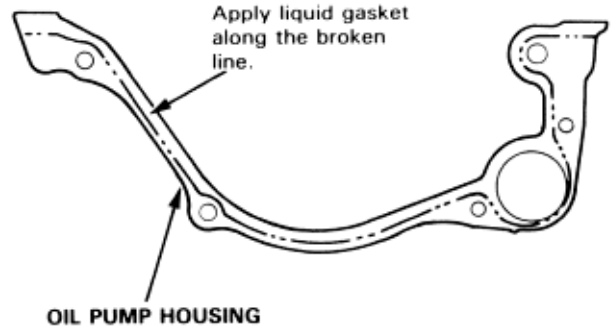
NOTE: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for approximately 15 minutes.

NOTE:

- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
 - ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
 - ♦ Apply liquid gasket evenly, being careful to cover all the mating surface.
 - ♦ To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
 - ♦ Do not install the parts if five minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
 - ♦ After assembly, wait at least 30 minutes before filling the engine with oil.
10. Apply liquid gasket to the block mating surface of the right side cover, then install it on the cylinder block.

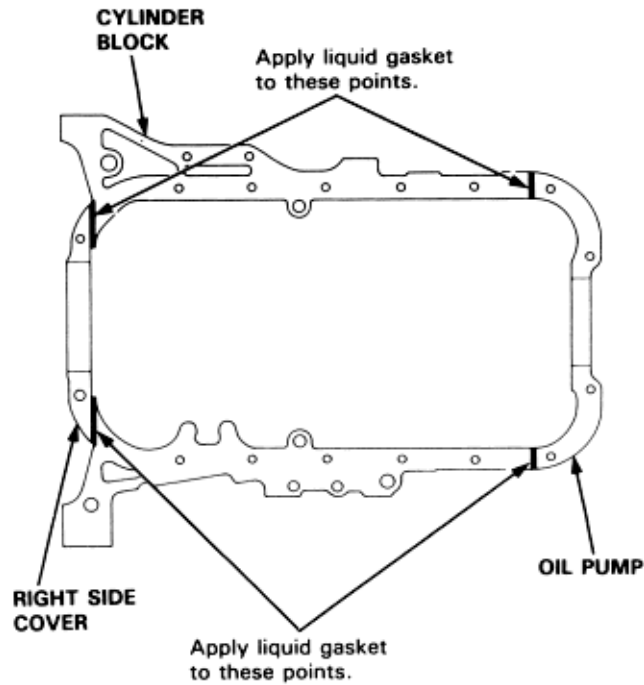


11. Apply liquid gasket to the oil pump mating surface of the block, then install the oil pump on the cylinder block.
- ♦ Apply grease to the lips of the oil seals. Then, install the oil pump while aligning the inner rotor with the crankshaft. When the pump is in place, clean any excess grease off the crankshaft, then check that the oil seal lips are not distorted.



NOTE:

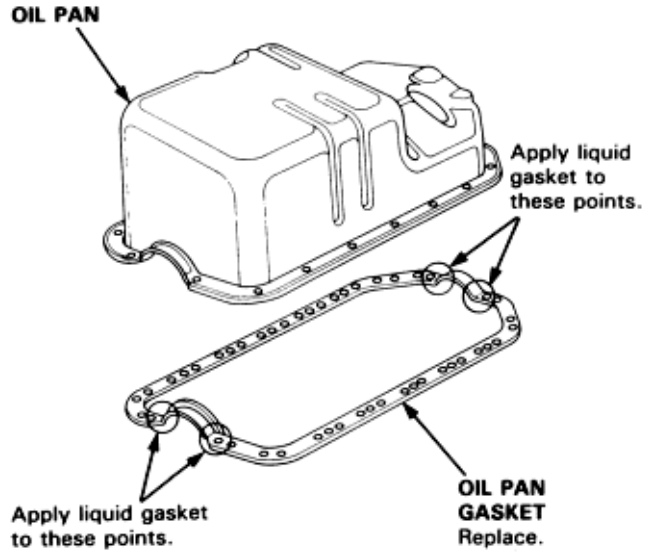
- ♦ Use liquid gasket, part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
 - ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
 - ♦ Apply liquid gasket as an even bead, centered between the edges of the mating surface.
 - ♦ To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
 - ♦ Do not install the parts if five minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
 - ♦ After assembly, wait at least 30 minutes before filling the engine with oil.
1. Apply liquid gasket on the oil pump and right side cover mating areas as shown below.



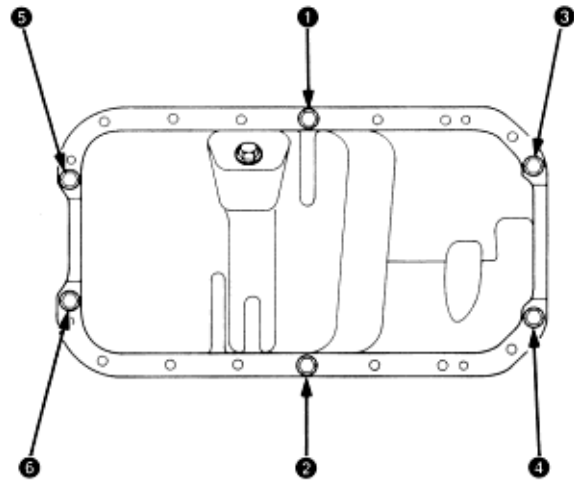
2. Install the oil pan gasket and oil pan.

NOTE:

- ♦ Use a new oil pan gasket.
- ♦ Install oil pan no more than five minutes after liquid gasket applied.



3. Tighten bolts and nuts finger tight at six points as shown below.



4. Tighten all bolts and nuts, starting from bolt 1, in a clockwise direction.

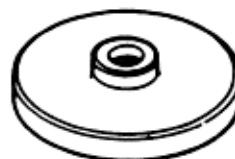
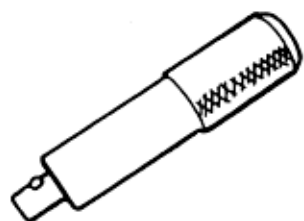
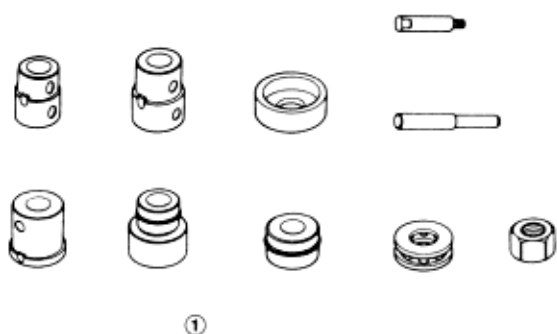
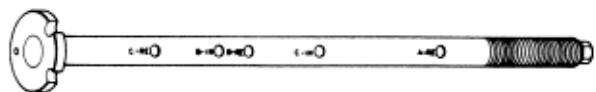
NOTE: Excessive tightening can cause distortion of oil pan gasket and oil leakage.

Torque: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)

Special Tools

7-B-2

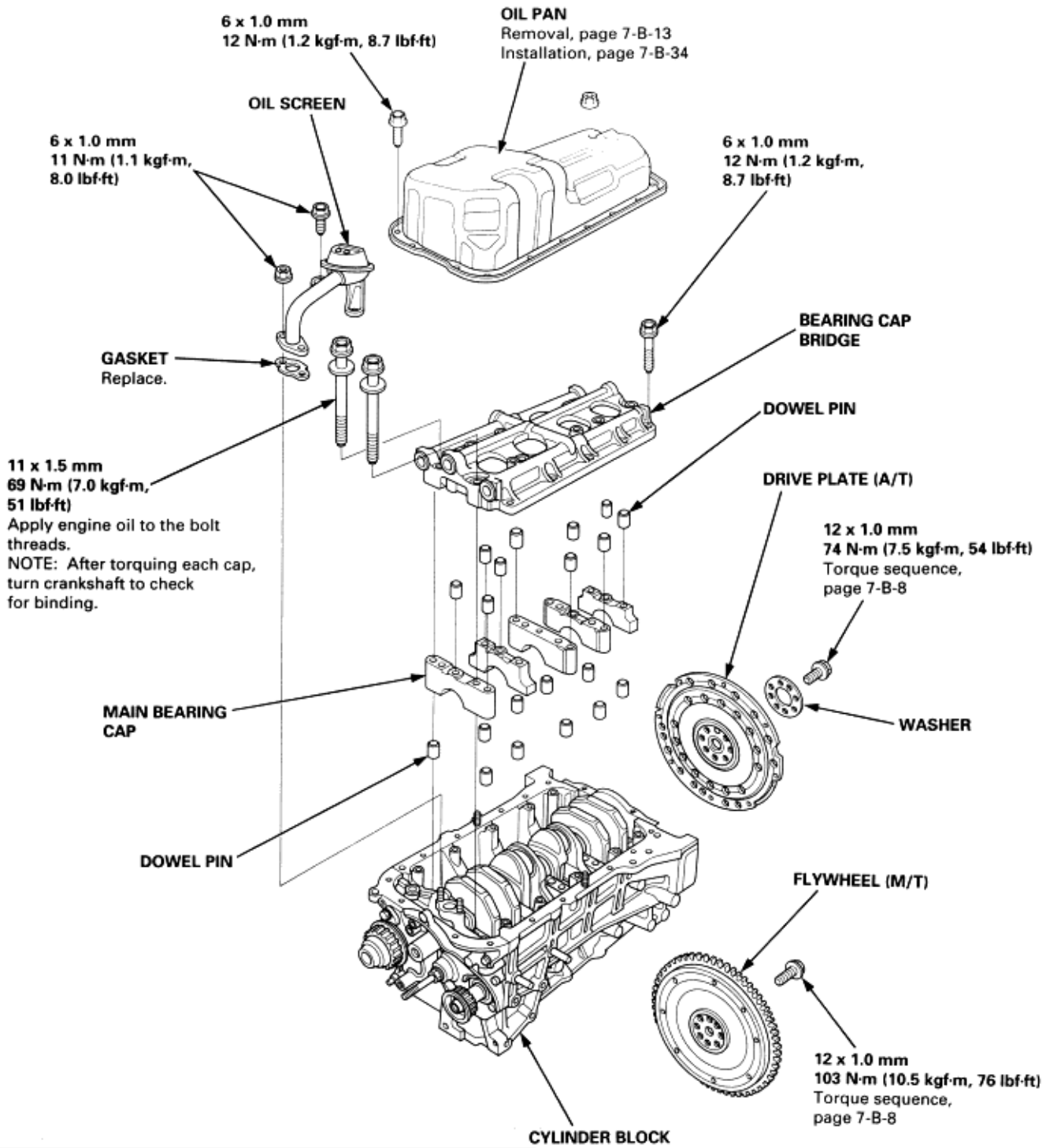
Ref No.	Tool Number	Description	Qty	Remark
1	07LAF - PT20100	Bearing Replacement Tool Set	1	
2	07LAG - PT20100	Balancer Shaft Lock Pin	1	
3	07749 - 0010000	Handle Driver	1	
4	07948 - SB00101	Driver Attachment, 96 mm	1	





Lubricate all internal parts with engine oil during reassembly.

F18B2, F18B3, F20B6 engines:

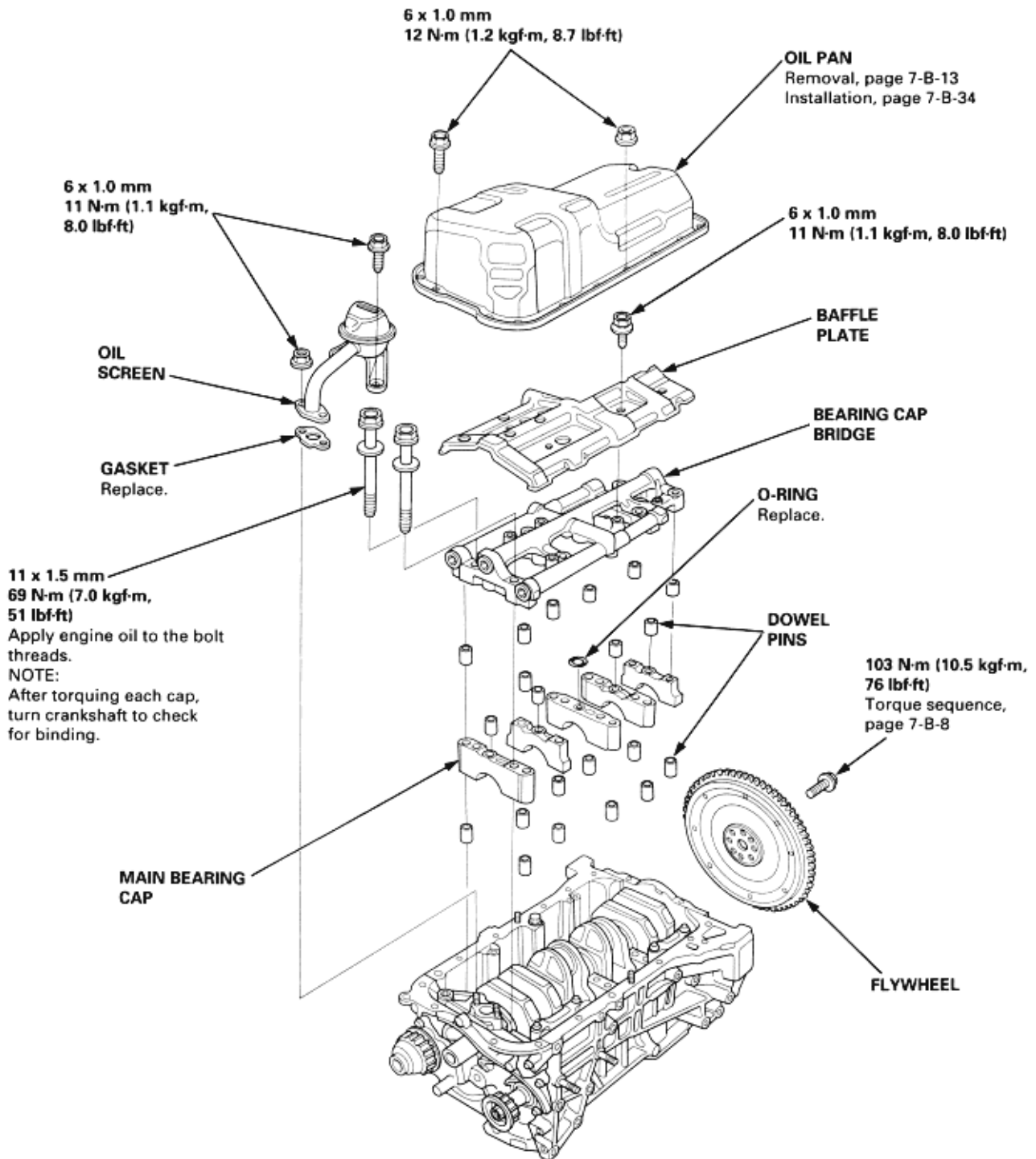


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 7-B-13\)](#)
[\(See Page 7-B-34\)](#)
[\(See Page 7-B-8\)](#)



Lubricate all internal parts with engine oil during reassembly.

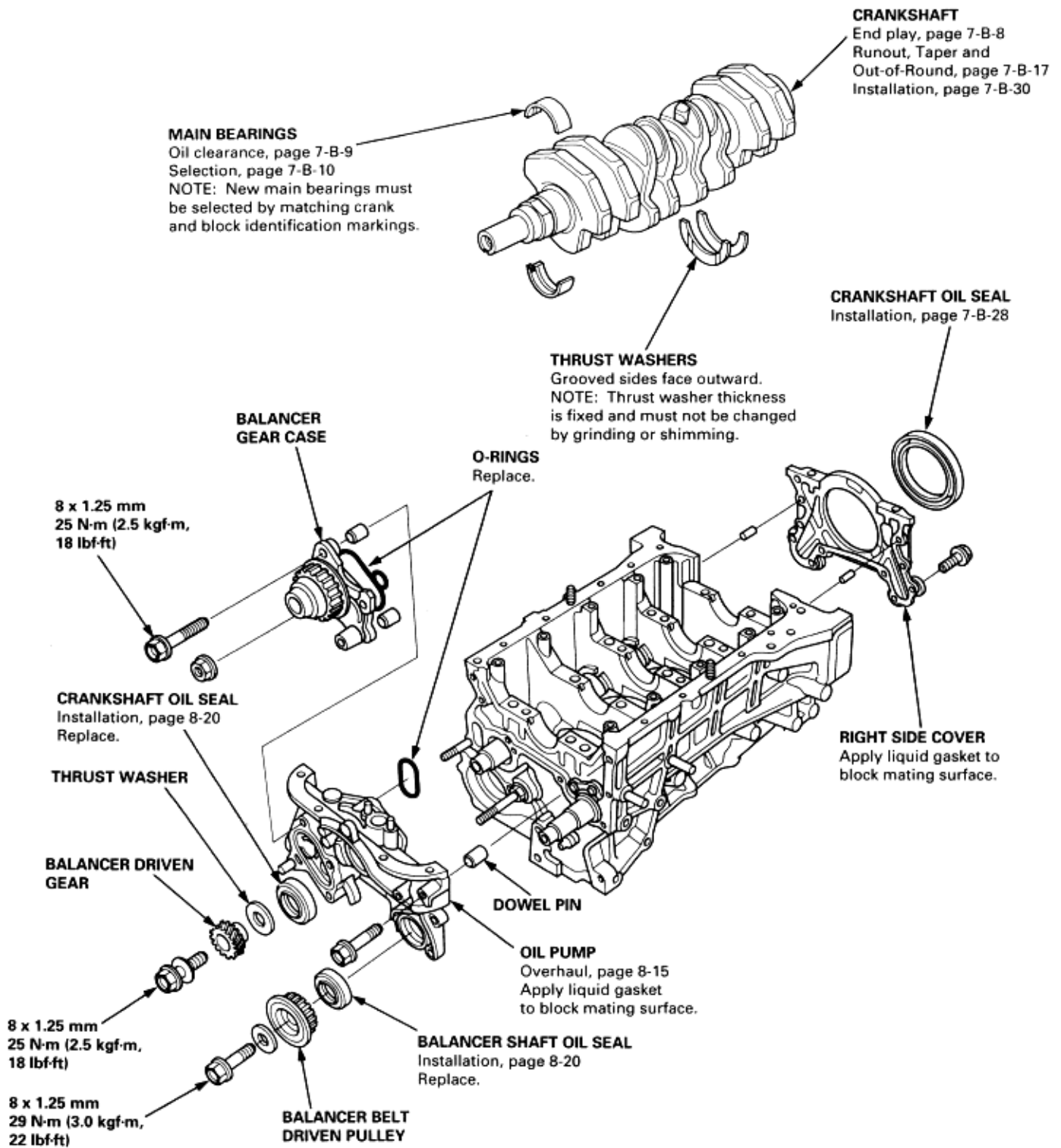
HA22A7 engine:



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 7-B-13\)](#)
[\(See Page 7-B-34\)](#)
[\(See Page 7-B-8\)](#)

NOTE:

- ♦ Apply liquid gasket to the mating surfaces of the right side cover and oil pump case before installing them.
- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M, or 08C70-X0331S.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 7-B-9)
- (See Page 7-B-10)
- (See Page 7-B-8)
- (See Page 7-B-17)
- (See Page 7-B-30)
- (See Page 7-B-28)
- (See Page 7-B-20)
- (See Page 7-B-15)



Lubricate all internal parts with engine oil during reassembly.

REAR BALANCER SHAFT
End play, page 7-B-35
Runout, Taper and
Out-of-Round, pages 7-B-35, 36
Installation, page 7-B-32

RETAINER
NOTE: Retainer thickness is fixed
and must not be changed by
grinding or shimming.

6 x 1.0 mm
20 N-m (2.0 kgf-m,
14 lbf-ft)

**FRONT BALANCER
SHAFT**

**BALANCER SHAFT
BEARINGS**
Inspection, page 7-B-37
Replacement, page 7-B-38

OIL JET BOLT
39 N-m (4.0 kgf-m, 29 lbf-ft)
Inspection, page 8-13

OIL JET
Handle the nozzle with
care. Do not damage or
deform.
Inspection, page 8-13

6 x 1.0 mm
11 N-m (1.1 kgf-m,
8.0 lbf-ft)

H22A7 engine:

**RIGHT BREATHER
COVER**

**LEFT BREATHER
COVER**

To go to the pages referenced on the diagram above,
click on the following:

(See Page 7-B-35)

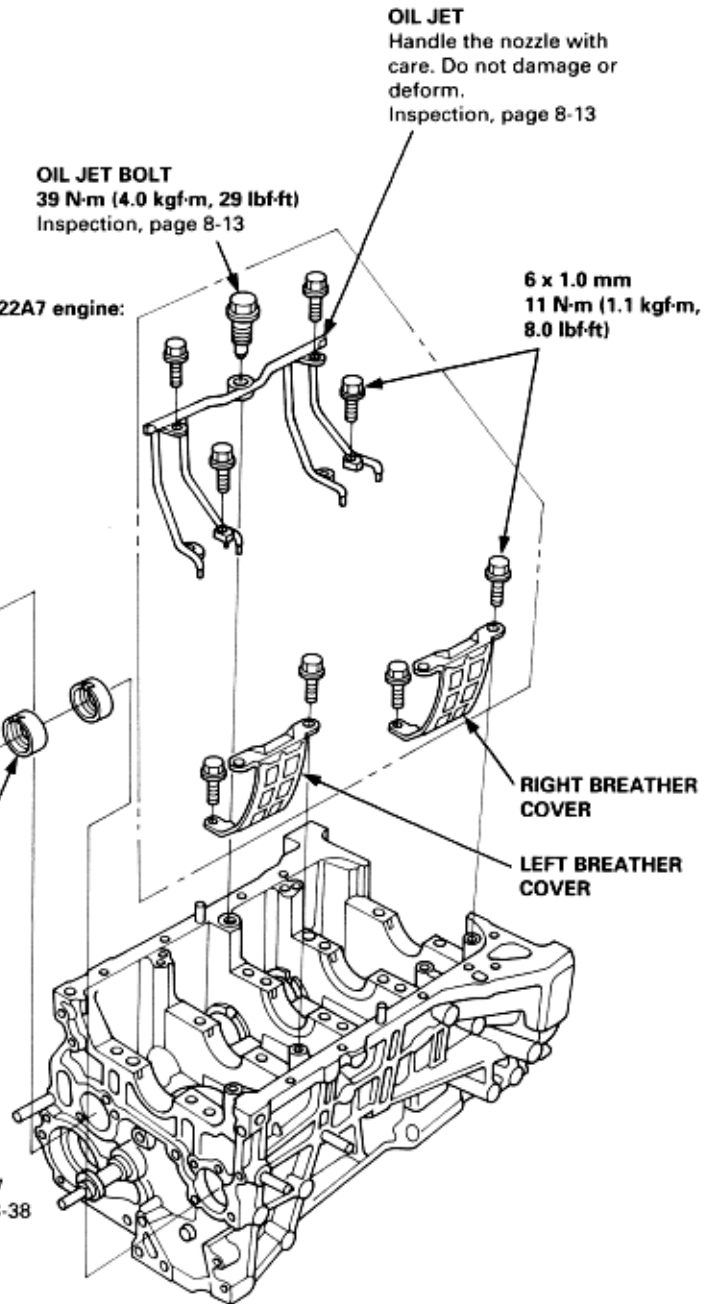
(See Page 7-B-36)

(See Page 7-B-32)

(See Page 7-B-13)

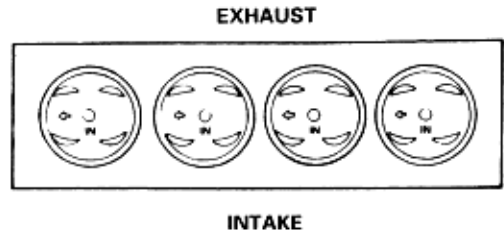
(See Page 7-B-37)

(See Page 7-B-38)



NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (see page 7-B-11).

PISTON INSTALLATION DIRECTION



PISTON RINGS

Replacement, page 7-B-26
Measurement, pages 7-B-25, 26
Alignment, page 7-B-27

PISTON PIN

Removal, page 7-B-20
Installation, page 7-B-24
Inspection, page 7-B-23

PISTON

Removal, page 7-B-13
Measurement, page 7-B-18
NOTE: To maintain proper clearance, match the letter on the piston top with the letter for each cylinder stamped on the block.

On the piston top	On the block
No letter	A or I
B	B or II

SNAP RING

CYLINDER BLOCK

Cylinder bore inspection, page 7-B-19
Warpage inspection, page 7-B-19
Cylinder bore honing, page 7-B-20
Ridge removal, page 7-B-16

CONNECTING ROD

End play, page 7-B-8
Small end measurement, page 7-B-23

CONNECTING ROD BEARINGS

Clearance, page 7-B-11
Selection, page 7-B-12

CYLINDER BORE SIZES

(A or I, B or II)
NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from left to right, No. 1 through No. 4 cylinders.

On the block	On the piston top
A or I	No letter
B or II	B

DOWEL PIN

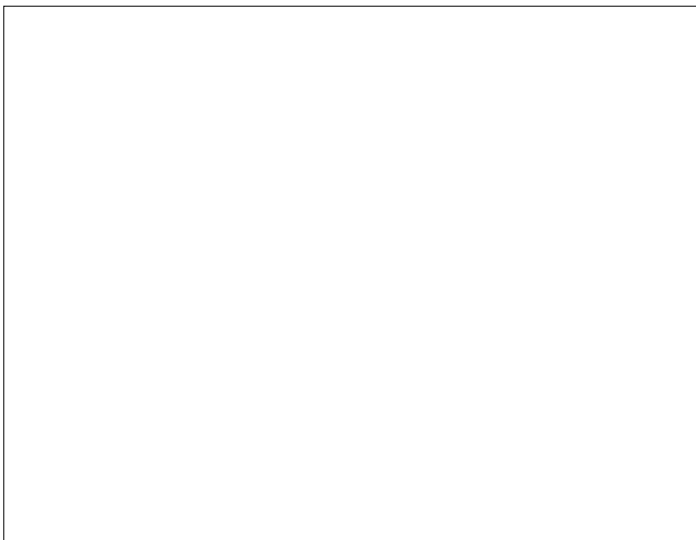
CONNECTING ROD BEARING CAP

NOTE: Install cap so the bearing recess is on the same side as the recess in the rod.

CONNECTING ROD BOLT

Inspection, page 7-B-22
Tightening, page 7-B-30

No. 1 No. 4





CONNECTING ROD BOLT

Inspection, page 7-B-22
Tightening, page 7-B-30

To go to the pages referenced on the diagram above,
click on the following:

- (See Page 7-B-26)
- (See Page 7-B-25)
- (See Page 7-B-27)
- (See Page 7-B-20)
- (See Page 7-B-24)
- (See Page 7-B-23)
- (See Page 7-B-8)
- (See Page 7-B-11)
- (See Page 7-B-12)
- (See Page 7-B-22)
- (See Page 7-B-30)
- (See Page 7-B-13)
- (See Page 7-B-18)
- (See Page 7-B-19)
- (See Page 7-B-16)

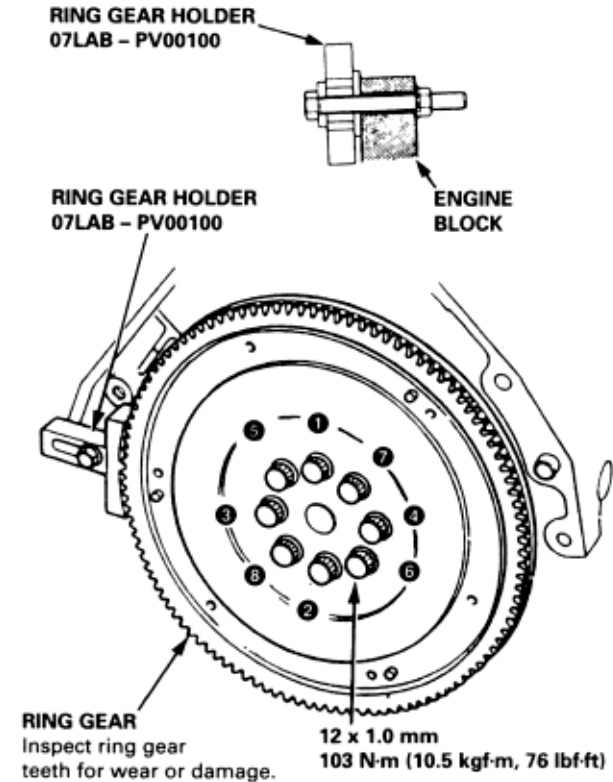
Flywheel and Drive Plate Replacement

7-B-8

Connecting Rod and Crankshaft End Play

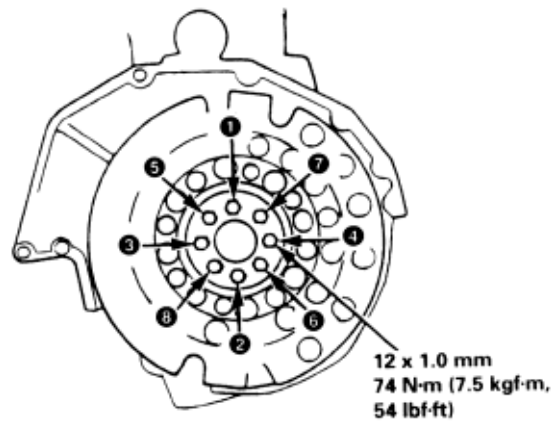
Manual Transmission:

Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



Automatic Transmission:

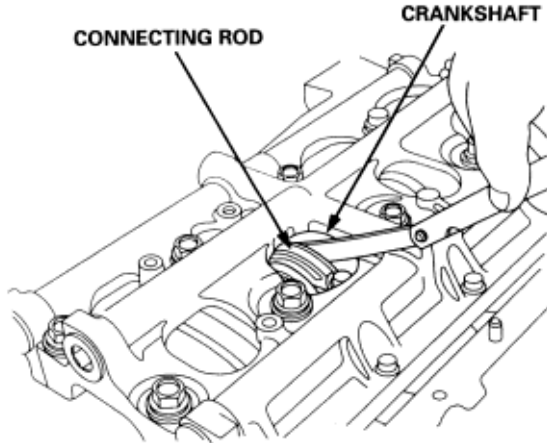
Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



Connecting Rod End Play:

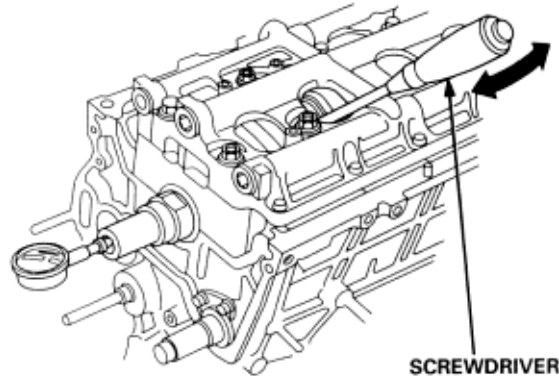
Standard (New): 0.15 - 0.30 mm
(0.006 - 0.012 in)

Service Limit: 0.40 mm (0.016 in)



- ♦ If out-of-tolerance, install a new connecting rod.
- ♦ If still out-of-tolerance, replace the crankshaft ([see page 7-B-13](#)) and ([see page 7-B-30](#)).

Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; dial reading should not exceed service limit.



Crankshaft End Play:

Standard (New): 0.10 - 0.35 mm
(0.004 - 0.014 in)

Service Limit: 0.45 mm (0.018 in)

- ♦ If end play is excessive, inspect the thrust washers and thrust surface on the crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming.

Thrust washers are installed with the grooved sides facing outward.

Main Bearings Clearance

7-B-9

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal. NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crankshaft and flywheel will flatten the plastigage further than just the torque on the cap bolt and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights, and check only one bearing at a time.
4. Reinstall the bearings and caps, then torque the bolts (see page 7-B-31).
5. Remove the cap and bearings again, and measure the widest part of the plastigage.

Main Bearing-to-Journal Oil Clearance:

Standard (New):

No. 1 and 4	0.013 - 0.037 mm (0.0005 - 0.0015 in)
Service Limit:	0.050 mm (0.0020 in)
No. 2	0.021 - 0.045 mm (0.0008 - 0.0018 in)
Service Limit:	0.050 mm (0.0020 in)
No. 3	0.025 - 0.049 mm (0.0010 - 0.0019 in)
Service Limit:	0.055 mm (0.0022 in)
No. 5	0.009 - 0.033 mm (0.0004 - 0.0013 in)
Service Limit:	0.040 mm (0.0016 in)

PLASTIGAGE STRIP



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.
 7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
- NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Main Bearings Selection

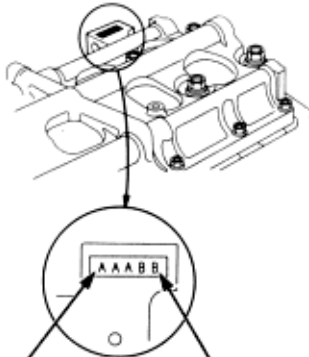
7-B-10

NOTE: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

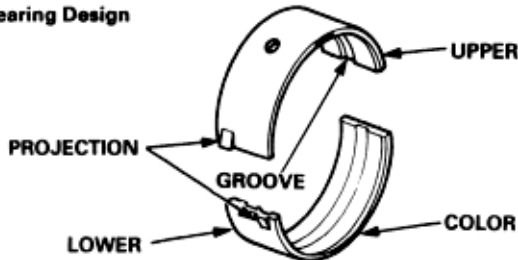
Crankshaft Bore Code Location

Numbers or Letters or Bars have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.

Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



Bearing Design



No. 1 and 4 journals:

Bearing Identification

Color code is on the edge of the bearing.

→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII

→ Smaller bearing (Thicker)			
Yellow	Yellow/ Green	Green	Green/ Brown
Yellow/ Green	Green	Green/ Brown	Brown
Green	Green/ Brown	Brown	Brown/ Black
Green/ Brown	Brown	Brown/ Black	Black
Brown	Brown/ Black	Black	Black/ Blue
Brown/ Black	Black	Black/ Blue	Blue

Smaller main journal Smaller bearing (Thicker)

NOTE: When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

No. 2, 3 and 5 journals:

Bearing Identification

Color code is on the edge of the bearing.

→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII

→ Smaller bearing (Thicker)			
Pink	Pink/ Yellow	Yellow	Yellow/ Green
Pink/ Yellow	Yellow	Yellow/ Green	Green
Yellow	Yellow/ Green	Green	Green/ Brown
Yellow/ Green	Green	Green/ Brown	Brown
Green	Green/ Brown	Brown	Brown/ Black
Green/ Brown	Brown	Brown/ Black	Black

Smaller main journal Smaller bearing (Thicker)

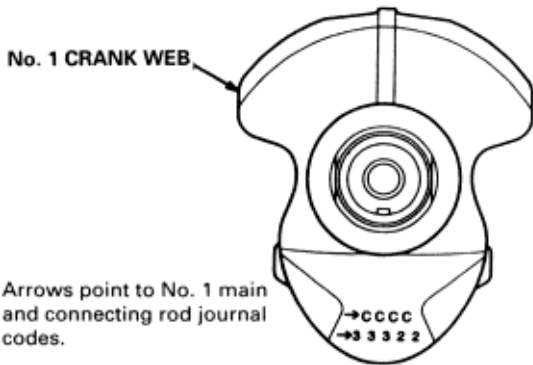
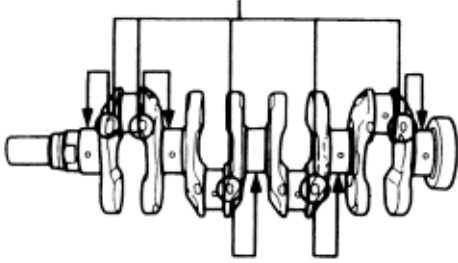
NOTE: When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Main Journal Code Locations (Numbers or Bars)

The Main Journal Codes are stamped in one of the following locations.

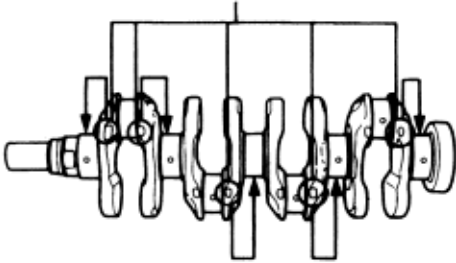
Except H22A7 engine:

Main Journal Code Locations (Numbers or Bars)



H22A7 engine:

Main Journal Code Locations (Numbers or Bars)



1. Remove the connecting rod cap and bearing half.
 2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
 3. Place plastigage across the rod journal.
 4. Reinstall the bearing half and cap, and torque the bolts (**see page 7-B-30**).
- NOTE: Do not rotate the crankshaft during inspection.
5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance:

Except H 22A7 engine:

Standard (New): 0.015 - 0.043 mm
(0.0006 - 0.0017 in)

Service Limit: 0.050 mm (0.0020 in)

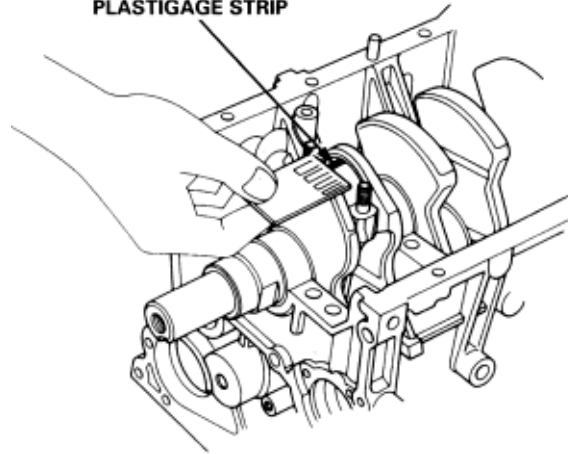
H22A7 engine:

Standard (New): 0.027 - 0.055

(0.0011 - 0.0022 in)

Service Limit: 0.060mm (0.0024 in)

PLASTIGAGE STRIP



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and recheck clearance again.

NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

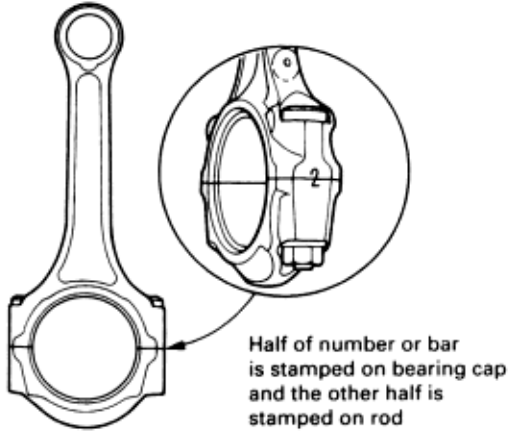
Connecting Rod Bearings Selection

7-B-12

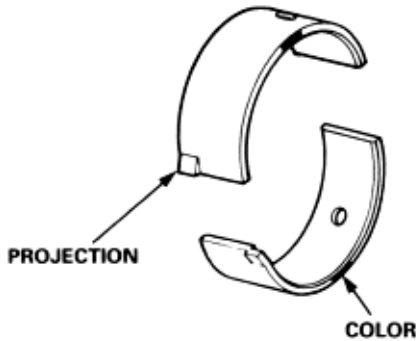
NOTE: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Connecting Rod Journal Code Locations

Numbers or Bars have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters or bars stamped on the crank (codes for rod journal size), to choose the correct bearings.



Bearing Design



Bearing Identification

Color code is on the edge of the bearing.

A or I	Smaller rod journal
B or II	
C or III	
D or IIII	
	Smaller bearing (Thicker)

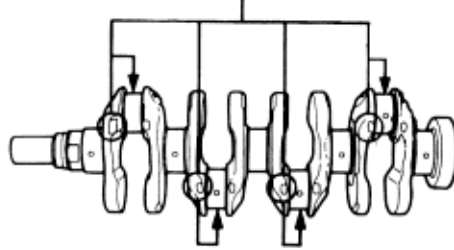
→ Larger big end bore			
1 or I	2 or II	3 or III	4 or IIII
→ Smaller bearing (Thicker)			
Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

Connecting Rod Journal Code Locations (Letters or Bars)

The Connecting Rod Journal Codes are stamped in one of the following locations.

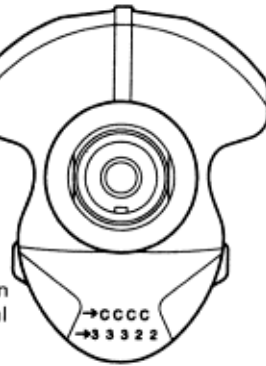
Except H22A7 engine:

Connecting Rod Journal Code Locations (Letters or Bars)



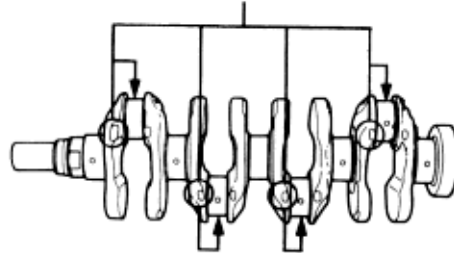
No. 1 CRANK WEB

Arrows point to No. 1 main and connecting rod journal codes.

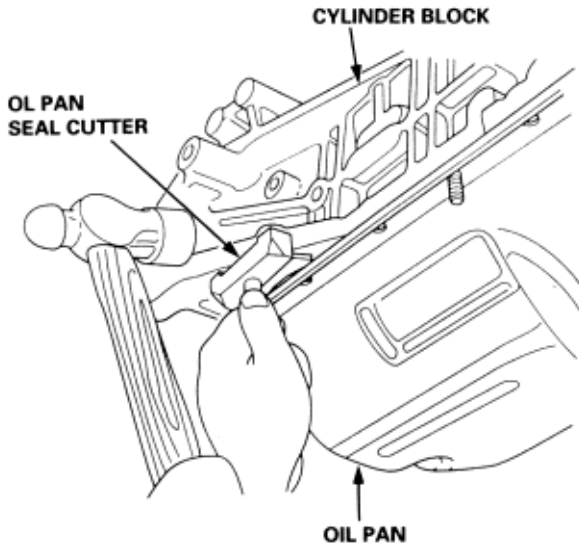


H22A7 engine:

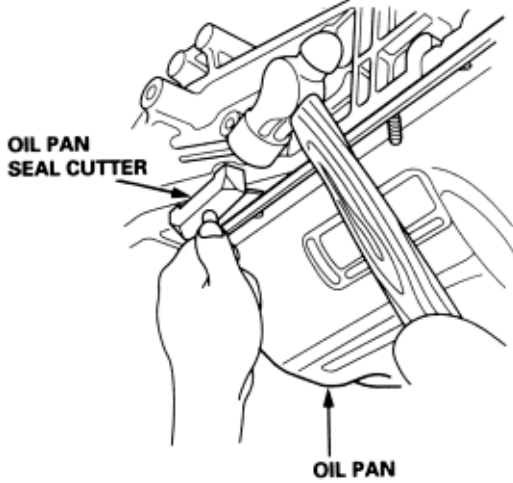
Connecting Rod Journal Code Locations (Letters or Bars)



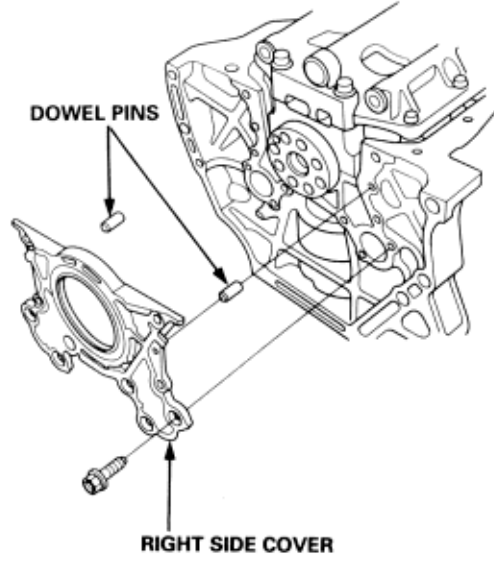
1. Remove the bolts securing the oil pan.
2. Hammer in an oil pan seal cutter between the oil pan and cylinder block.



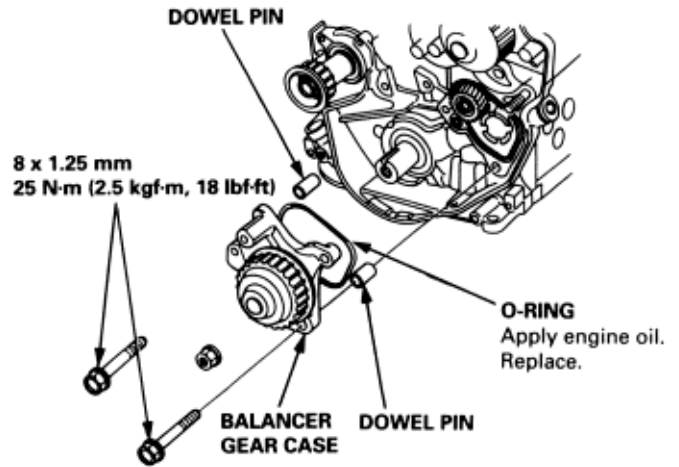
3. Cut the oil pan seal by striking the side of the cutter to slide the cutter along the oil pan. Remove the oil pan.



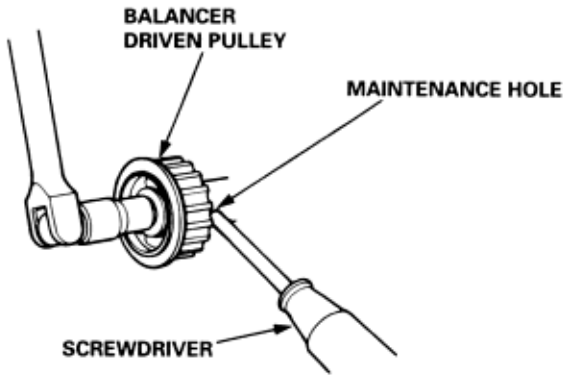
4. Remove the right side cover.



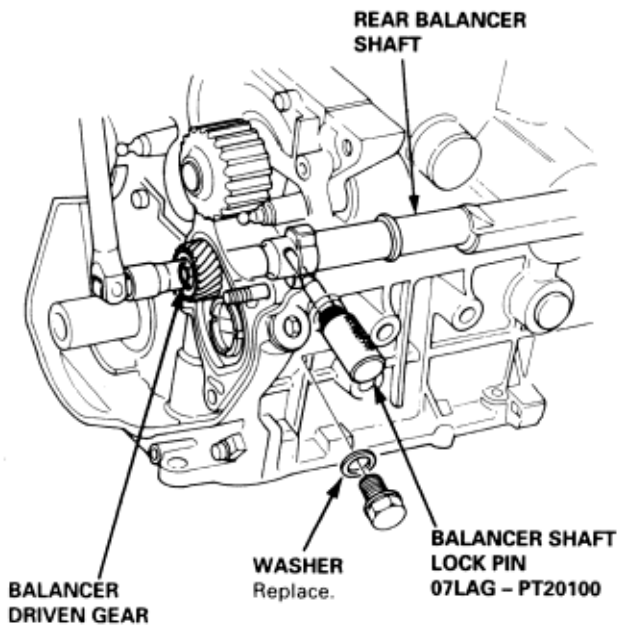
5. Remove the CKP/TDC sensors, then remove the timing belt drive pulley (see section 6).
6. Remove the balancer gear case.



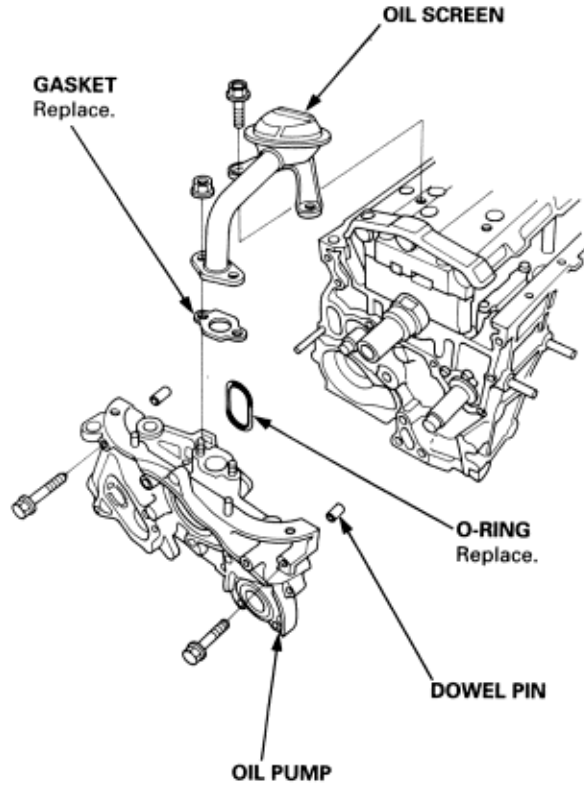
7. Remove the front balancer driven pulley as shown.



8. Align the bolt hole and the balancer shaft hole, then insert a special tool to hold the rear balancer shaft.
9. Remove the bolt and the balancer driven gear.



10. Remove the oil screen and the oil pump.



11. Remove the baffle plate (H22A7 engine).

12 Remove the bolts and the bearing cap bridge, then remove the bearing caps.

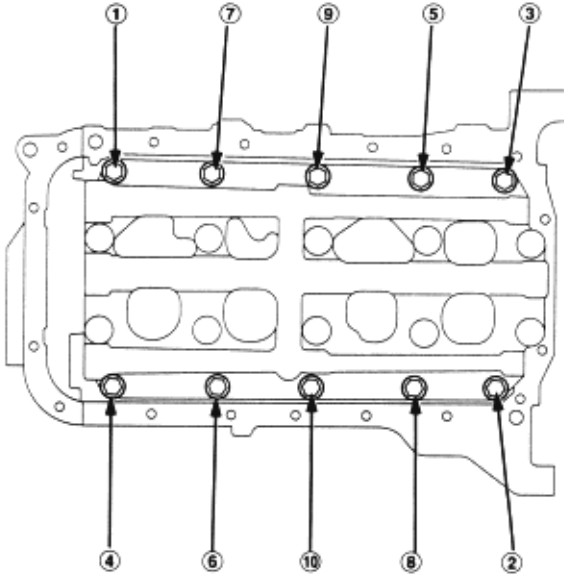


CAUTION

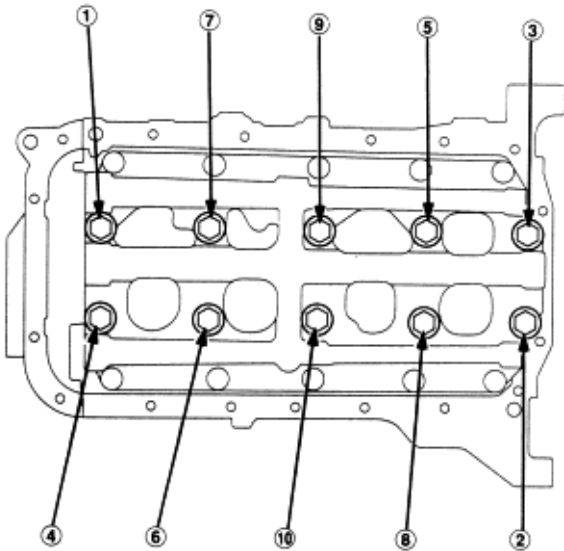
To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

F18B2, F18B3, F20B6 engines:

-1. Remove the 6 mm bolts.

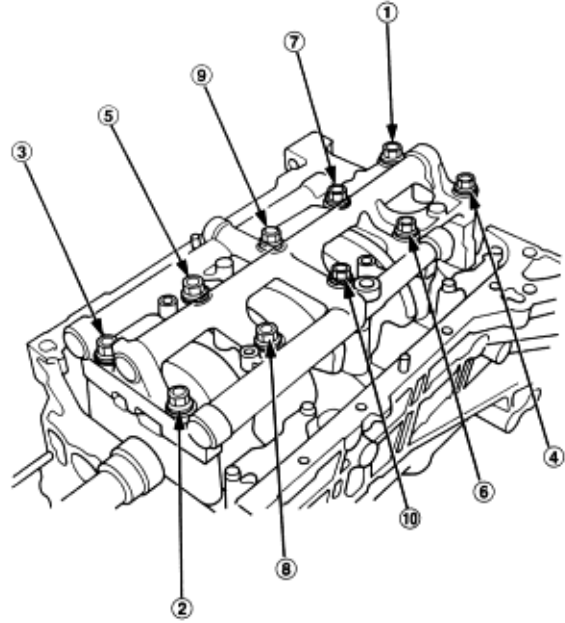


-2. Remove the 11 mm bolts

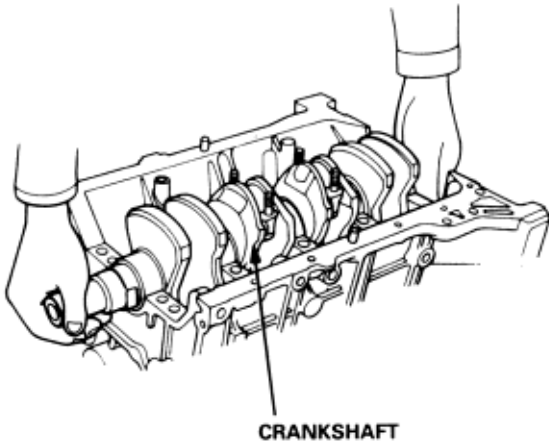


H22A7 engine:

-1. Remove the 11 mm bolts.

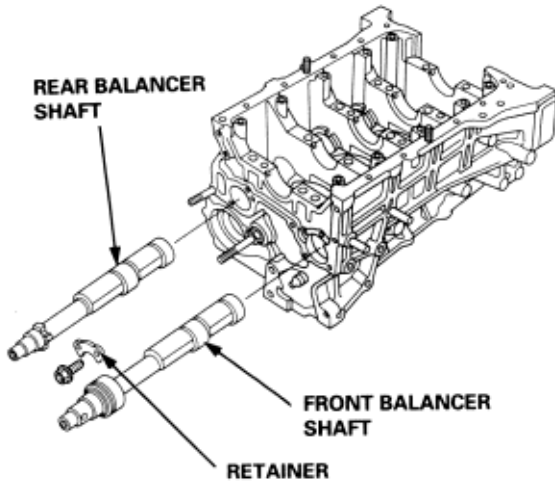


13. Remove the bearing cap bridge and bearing caps.
14. Turn the crankshaft so No. 2 and 3 crankpins are at the top.
15. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
16. Lift the crankshaft out of the engine, being careful not to damage the journals.



CRANKSHAFT

17. Remove the bolts and the retainer, then remove the front balancer shaft and the rear balancer shaft.

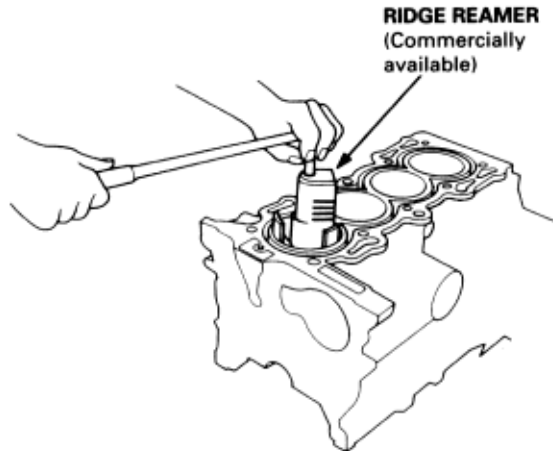


REAR BALANCER SHAFT

FRONT BALANCER SHAFT

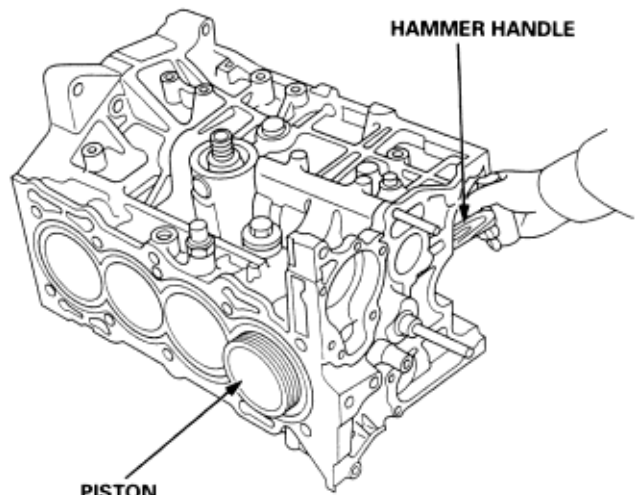
RETAINER

18. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow the reamer manufacturer's instructions.



RIDGE REAMER
(Commercially available)

19. Use the wooden handle of a hammer to drive the pistons out.



HAMMER HANDLE

PISTON

20. Reinstall the connecting rod bearings and caps after removing each piston/connecting rod assembly.
21. To avoid mixup on reassembly, mark each piston/connecting rod assembly with its cylinder number.
NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

Crankshaft Inspection

7-B-17

- ♦ Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- ♦ Check the keyway and threads.

Alignment

- ♦ Measure runout on all main journals to make sure the crank is not bent.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Crankshaft Total Indicated Runout:

F18B2, F18B3, F20B6 engines:

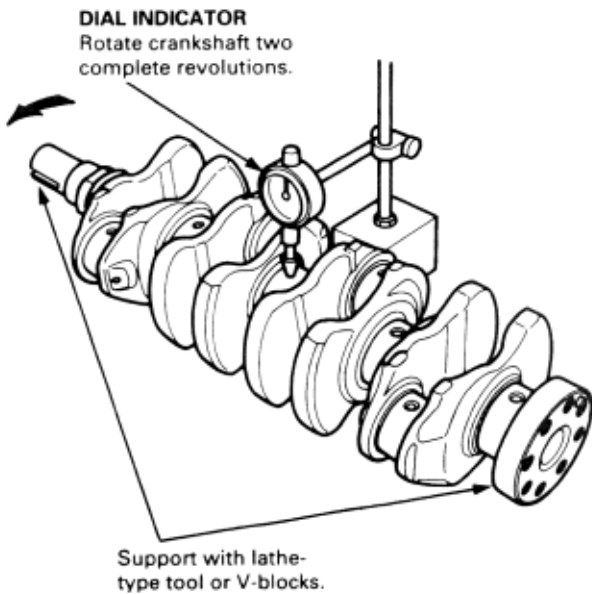
Standard (New): 0.02 mm (0.001 in) max

Service Limit: 0.04 mm (0.002 in)

H22A7 engine:

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.04 mm (0.002 in)



Out-of-Round and Taper

- ♦ Measure out-of-round at the middle and main journal in two places.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Journal Out of-Round:

F18B2, F18B3, F20B6 engines:

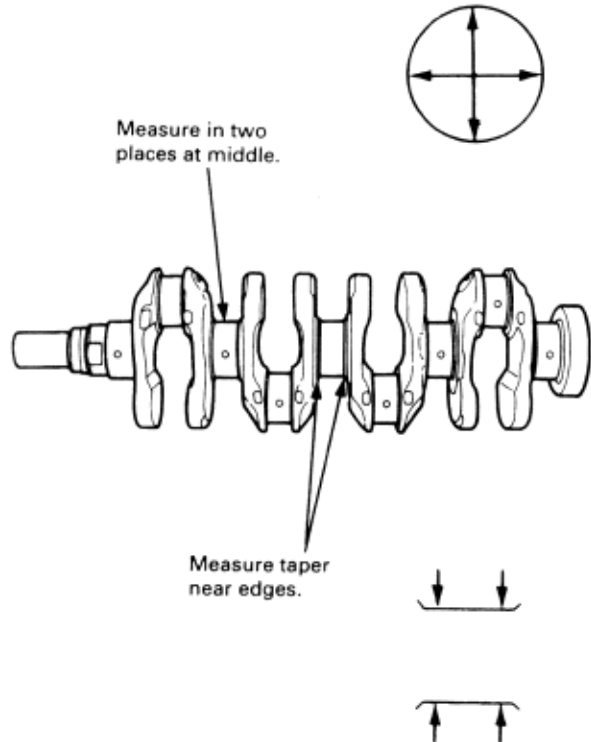
Standard (New): 0.005 mm (0.0002 in) max.

Service Limit: 0.010 mm (0.0004 in)

H22A7 engine:

Standard (New): 0.004 mm (0.0002 in) max.

Service Limit: 0.006 mm (0.0002 in)



- ♦ Measure taper at the edge of each rod and main journal.
- ♦ The difference between measurements on each journal must not be more than the service limit.

Journal Taper:

F18B2, F18B3, F20B6 engines:

Standard (New): 0.005 mm (0.0002 in) max.

Service Limit: 0.010 mm (0.0004 in)

H22A7 engine:

Standard (New): 0.005 mm (0.0002 in) max.

Service Limit: 0.006 mm (0.0002 in)

1. Check the piston for distortion or cracks.
NOTE: If the cylinder is bored, an oversized piston must be used.
2. Measure the piston diameter at a point A from the bottom of the skirt.

Point A:

F18B2, F18B3, F20B6 engines: 16 mm (0.6 in)

H22A7 engine: 15 mm (0.6 in)

NOTE: There are two standard-size pistons (No Letter or A, and B). The letter is stamped on the top of the piston. Letters are also stamped on the block as cylinder bore sizes.

Piston Diameter:

F18B2, F18B3, F20B6 engines:

Standard (New):

No Letter (A): 84.980 - 84.990 mm
(3.3457 - 3.3461 in)

B: 84.970 - 84.980 mm
(3.3453 - 3.3457 in)

Service Limit:

No Letter (A): 84.970 mm (3.3453 in)

B: 84.960 mm (3.3449 in)

H22A7 engine:

Standard (New):

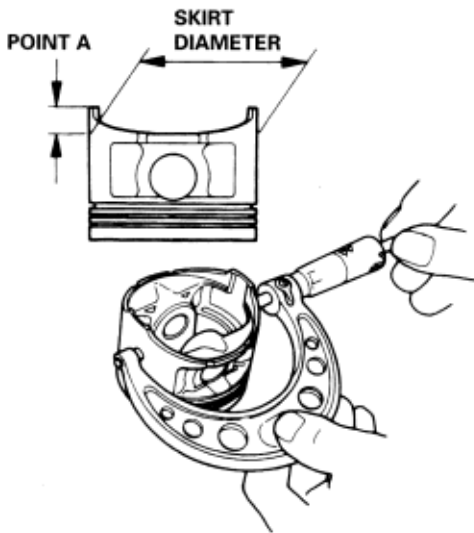
No Letter (A): 86.993 - 87.006 mm
(3.4249 - 3.4254 in)

B: 86.983 - 86.996 mm
(3.4245 - 3.4250 in)

Service Limit:

No Letter (A): 86.980 mm (3.4244 in)

B: 86.970 mm (3.4240 in)



3. Calculate the difference between the cylinder bore diameter (see page 7-B-19) and piston diameter.

Piston-to-Cylinder Clearance:

F18B2, F18B3, F20B6 engines:

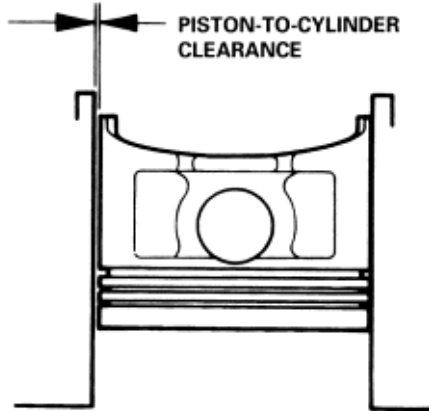
Standard (New): 0.020 - 0.040 mm
(0.0008 - 0.0016 in)

Service Limit: 0.05 mm (0.002 in)

H22A7 engine:

Standard (New): 0.004 - 0.027 mm
(0.0002 - 0.0011 in)

Service Limit: 0.04 mm (0.002 in)



If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

Oversize Piston Diameter:

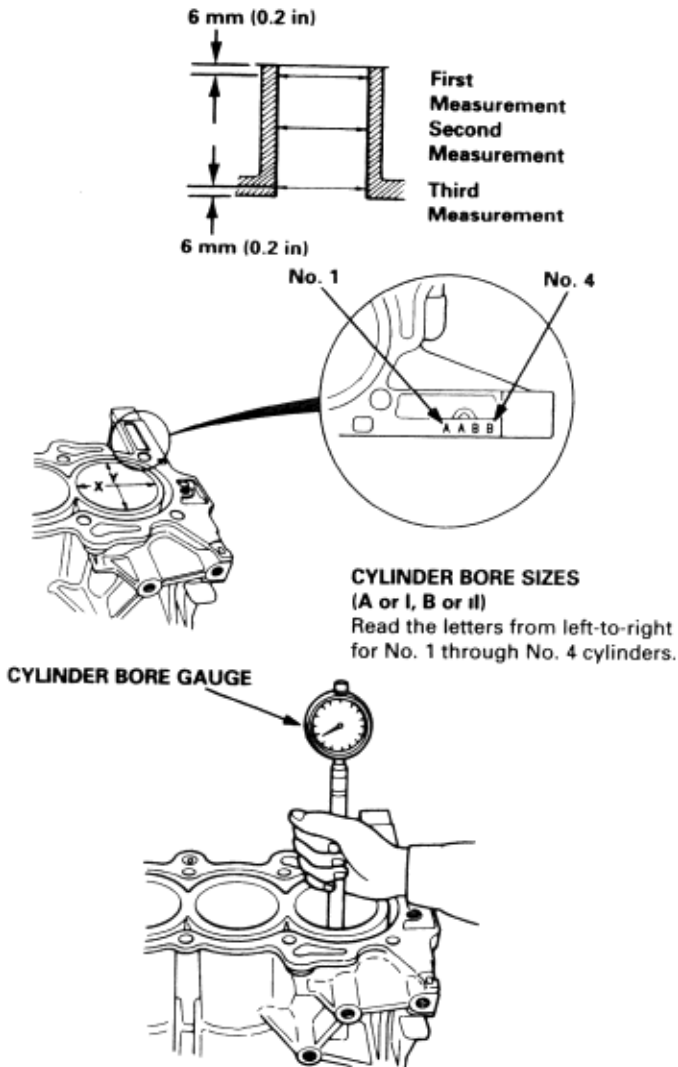
F18B2, F18B3, F20B6 engines:

0.25: 85.230 - 85.240 mm (3.3555 - 3.3559 in)

H22A7 engine:

0.25: 87.233 - 87.246 mm (3.4344 - 3.4349 in)

1. Measure wear and taper in direction X and Y at three levels in each cylinder as shown.



Cylinder Bore Size:

F18B2, F18B3, F20B6 engines:

Standard (New):

A or I: 85.010 - 85.020 mm (3.3468 - 3.3472 in)

B or II: 85.000 - 85.010 mm (3.3465 - 3.3468 in)

Service Limit: 85.070 mm (3.3492 in)

H22A7 engine:

Standard (New):

A or I: 87.010 - 87.020 mm (3.4256 - 3.4260 in)

B or II: 87.000 - 87.010 mm (3.4252 - 3.4256 in)

Service Limit: 87.070 mm (3.4279 in)

Oversize:

F18B2, F18B3, F20B6 engines:

0.25: 85.250 - 85.260 mm (3.3563 - 3.3567 in)

H22A7 engine:

0.25: 87.250 - 87.260 mm (3.4350 - 3.4354 in)

Bore Taper:

Limit: (Difference between first and third measurement) 0.05 mm (0.002 in)

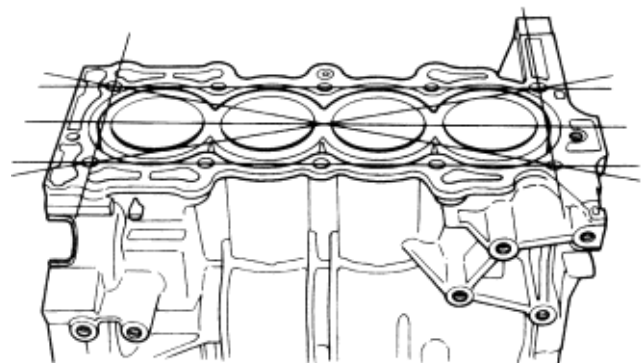
- ♦ If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- ♦ If the block is to be rebored, refer to Piston Clearance Inspection (see page 7-B-18) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Rebore Limit: 0.25 mm (0.01 in)

2. Check the top of the block for warpage. Measure along the edges and across the center as shown.

SURFACES TO BE MEASURED

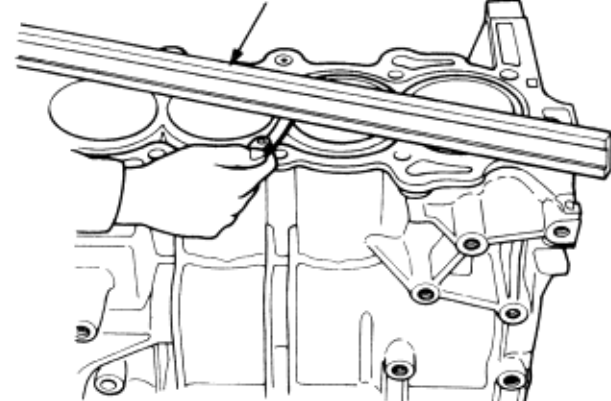


Cylinder Block Warpage:

Standard (New): below 0.07 mm (0.003 in) max.

Service Limit: 0.10 mm (0.004 in)

PRECISION STRAIGHT EDGE



Cylinder Block Bore Honing

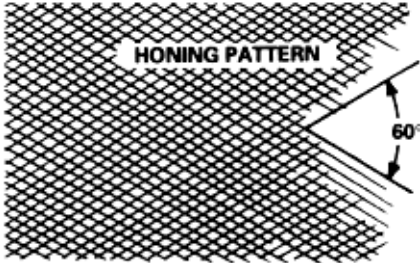
7-B-20

Piston Pins Removal

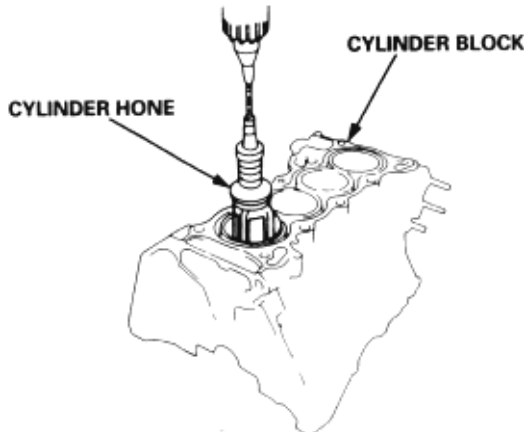
1. Measure cylinder bores, (**see page 7-B-19**). If the block is to be reused, hone the cylinders and remeasure the bores.
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.

NOTE:

- ♦ Use only a rigid hone with 400 grit or finer stone such as Sunnen, Ammco, or equivalent.
- ♦ Do not use stones that are worn or broken.



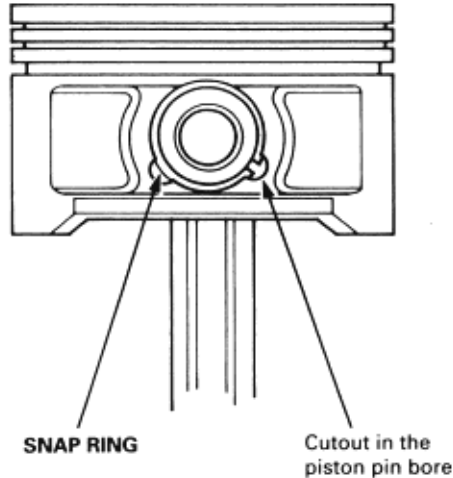
3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.
NOTE: Never use solvent, it will only redistribute the grit on the cylinder walls.
4. If scoring or scratches are still present in cylinder bores after honing to the service limit, rebore the cylinder block.
NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



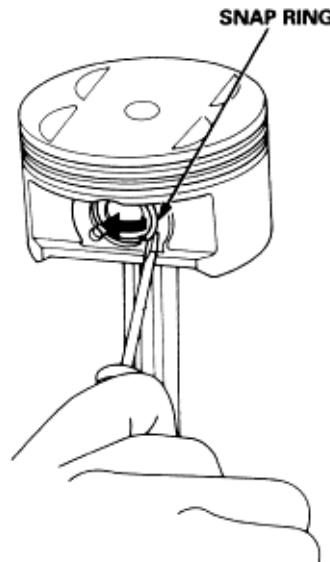
NOTE:

- ♦ After honing, clean the cylinder thoroughly with soapy water.
- ♦ Only a scored or scratched cylinder bore must be honed.

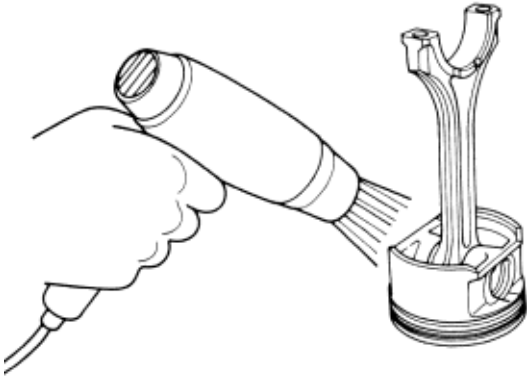
1. Apply engine oil to the piston pin snap rings and turn them in the ring grooves until the end gaps are lined up with the cutouts in the piston pin bores.
NOTE: Take care not to damage the ring grooves.



2. Remove both snap rings. Start at the cutout in the piston pin bore. Remove the snap rings carefully so they do not go flying or get lost. Wear eye protection.



3. Heat the piston and connecting rod assembly to approximately 70°C (158°F), then remove the piston pin.



NOTE: Inspect the piston, piston pin and connecting rod when they are at the room temperature.

Each rod falls into one of four tolerance ranges (**F18B2, F18B3, F20B6 engines:** from 0 to 0.024 mm (0.0009 in), in 0.006 mm (0.0002 in) increments, **H22A7 engines:** from 0.008 mm (0.0003 in) to 0.032 mm (0.0013 in), in 0.006 mm (0.0002 in) increments) depending on the size of its big end bore.

It is then stamped with a number (1, 2, 3, or 4/I, II, III, or IIII) indicating the range. You may find any combination of 1, 2, 3, or 4/I, II, III, or IIII in any engine.

Normal Bore Size:

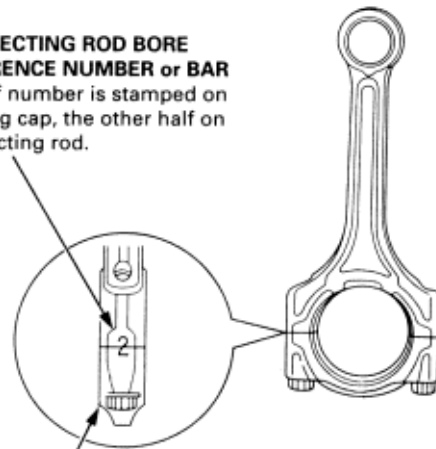
F18B2, 18B3, F20B6 engines: 48.0 mm (1.89 in)

H22A7 engine: 51.0 mm (2.01 in)

NOTE:

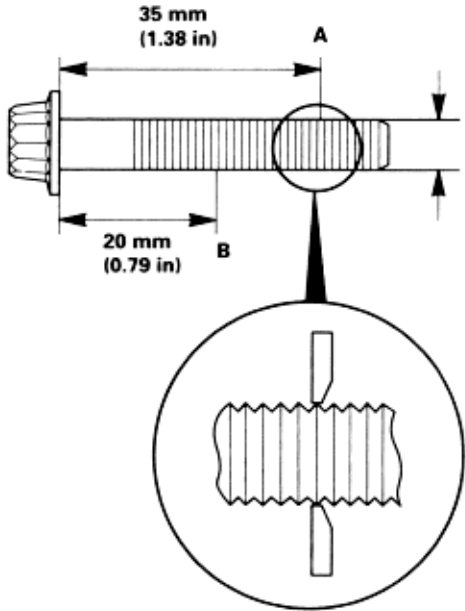
- ♦ Reference numbers or bars are for big end bore size and do not indicate the position of the rod in the engine.
- ♦ Inspect each connecting rod for cracks and heat damage.

CONNECTING ROD BORE REFERENCE NUMBER or BAR
Half of number is stamped on bearing cap, the other half on connecting rod.



Inspect bolts and nuts for stress cracks.

1. Measure the diameter of each connecting rod bolt at point A and point B.



2. Calculate the difference in diameter between point A and point B.
Point A - B = Difference in Diameter
Difference in Diameter:
Specification: 0 - 0.1 mm (0 - 0.004 in)
3. If the difference in diameter is out of tolerance, replace the connecting rod bolt.

Piston Pins Inspection

7-B-23

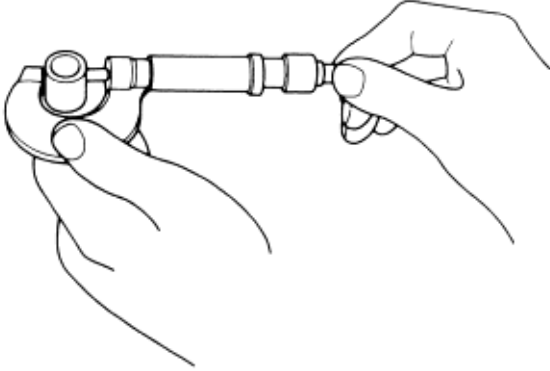
NOTE: Inspect the piston, piston pin and connecting rod when they are at room temperature.

1. Measure the diameter of the piston pin.

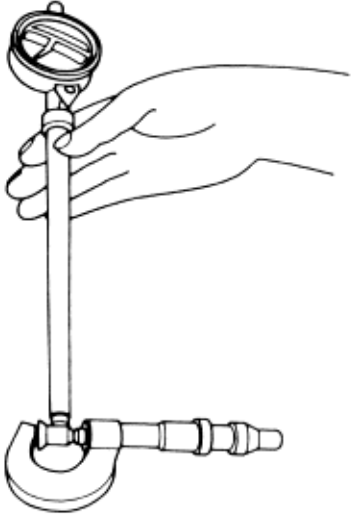
Piston Pin Diameter:

Standard (New): 21.961 - 21.965 mm
(0.8646 - 0.8648 in)

Service Limit: 21.953 mm (0.8643 in)



2. Zero the dial indicator to the piston pin diameter.



3. Check the difference between the piston pin diameter and piston pin hole diameter on the piston.

Piston Pin-to-Piston Clearance :

F18B2, F18B3, F20B6 engines:

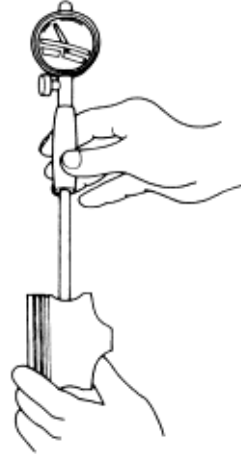
Standard (New): -0.0050 to +0.0020 mm
(-0.00020 to +0.00008 in)

Service Limit: 0.004 mm (0.0002 in)

H22A7 engine:

Standard (New): -0.0030 to +0.0060 mm
(-0.00012 to +0.00024 in)

Service Limit: 0.009 mm (0.0004 in)

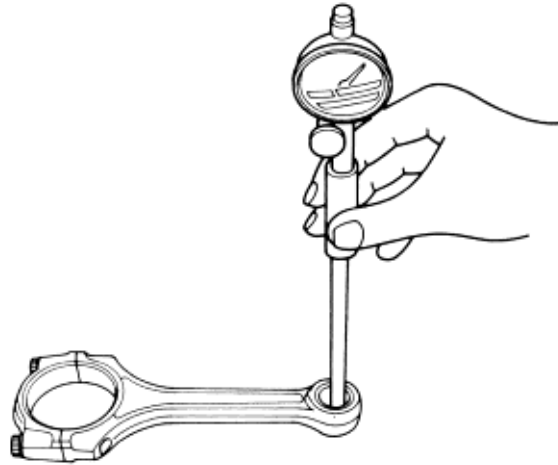


4. Measure the piston pin-to-connecting rod clearance.

Piston Pin-to-Connecting Rod Clearance:

Standard (New): 0.005 - 0.015 mm
(0.0002 - 0.0006 in)

Service Limit: 0.020 mm (0.0008 in)



Piston Pins
Installation

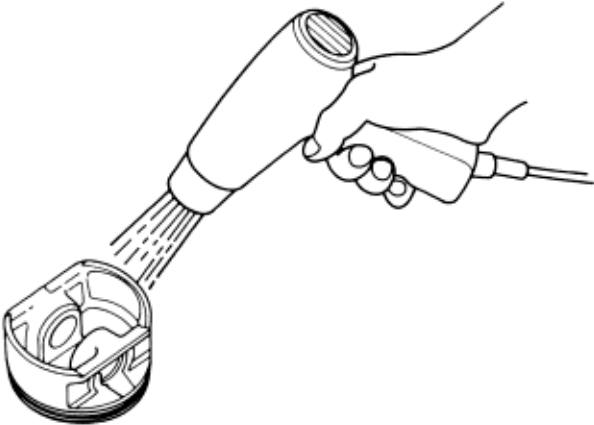
7-B-24

1. Install a piston pin snap ring.

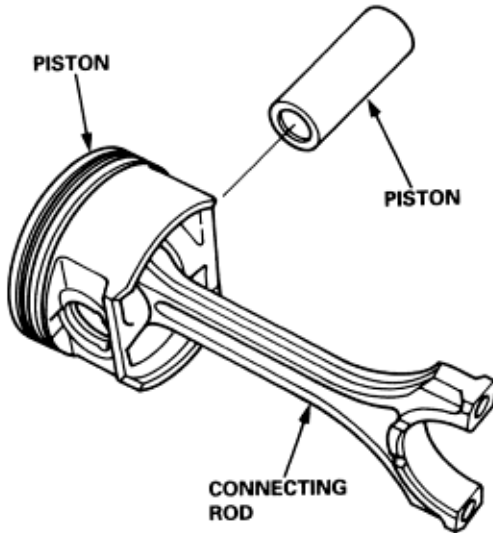
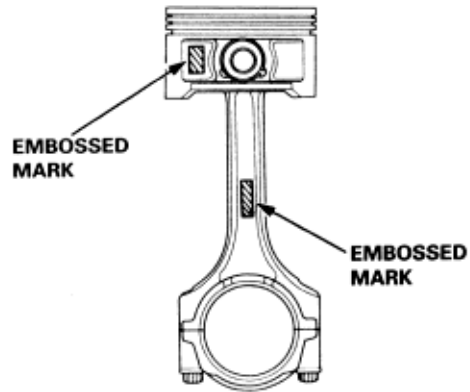
SNAP RING



2. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with engine oil.
3. Heat the piston to approximately 70°C (158°F).



4. Install the piston pin. Assemble the piston and connecting rod with the embossed marks on the same side.



5. Install the remaining snap ring.

Piston Rings End Gap

7-B-25

1. Using a piston, push a new ring into the cylinder bore 15 - 20 mm (0.6 - 0.8 in) from the bottom.
2. Measure the piston ring end-gap with a feeler gauge:
 - ♦ If the gap is too small, check to see if you have the proper rings for your engine.
 - ♦ If the gap is too large, recheck the cylinder bore diameter against the wear limits (see page 7-B-19). If the bore is over the service limit, the cylinder block must be rebored

Piston Ring End-Gap:

F18B2, F18B3, F20B6 engines:

Top Ring

Standard (New): 0.20 - 0.35 mm
(0.008 - 0.014 in)

Service Limit: 0.60 mm (0.024 in)

Second Ring

Standard (New): 0.40 - 0.55 mm
(0.016 - 0.022 in)

Service Limit: 0.70 mm (0.028 in)

Oil Ring

Standard (New): 0.20 - 0.70 mm
(0.008 - 0.028 in)

Service Limit: 0.80 mm (0.031 in)

H22A7 engine:

Top Ring

Standard (New): 0.25 - 0.35 mm
(0.010 - 0.014 in)

Service Limit: 0.60 mm (0.024 in)

Second Ring

Standard (New): 0.60 - 0.70 mm
(0.024 - 0.028 in)

Service Limit: 0.90 mm (0.035 in)

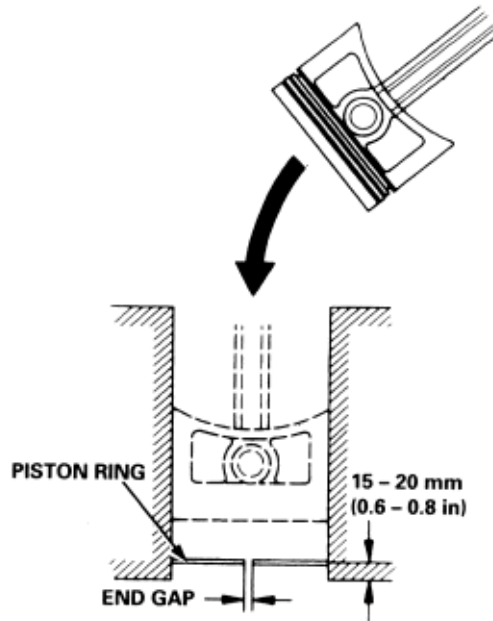
Oil Ring

Standard (New): 0.20 - 0.70 mm*1
(0.008 - 0.028 in)
0.20 - 0.50 mm*2
(0.008 - 0.020 in)

Service Limit: 0.80 mm (0.031 in)*1
0.60 mm (0.024 in)*2

*1: RIKEN manufactured piston ring.

*2: TEIKOKU PISTON RING manufactured piston ring.



1. Using a ring expander, remove the old piston rings.
2. Clean all ring grooves thoroughly.

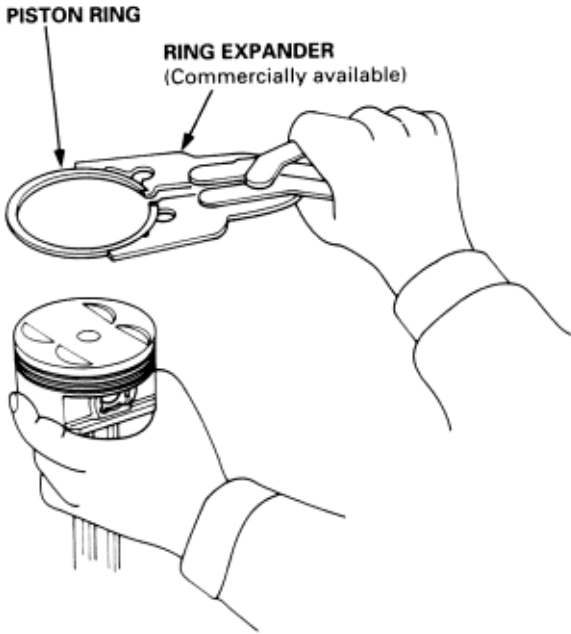
NOTE:

- ♦ Use a squared-off broken ring or ring groove cleaner with a blade to fit the piston grooves.
- ♦ The top and 2nd ring grooves are 1.2 mm (0.05 in) wide. The oil ring groove is 2.8 mm (0.11 in) wide.
- ♦ File down a blade if necessary.
- ♦ Do not use a wire brush to clean the ring grooves, or cut the ring grooves deeper with cleaning tools.

NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

3. Install new rings in the proper sequence and position (**see page 7-B-27**).

NOTE: Do not use old piston rings.



After installing a new set of rings, measure the ring-to-groove clearances:

Top Ring Clearance

F18B2, F18B3, F20B6 engines:

Standard (New): 0.035 - 0.060 mm
(0.0014 - 0.0024 in)

Service Limit: 0.13 mm (0.005 in)

H22A7 engine:

Standard (New): 0.055 - 0.085 mm
(0.0022 - 0.0033 in)

Service Limit: 0.13 mm (0.005 in)

Second Ring Clearance

F18B2, F18B3, F20B6 engines:

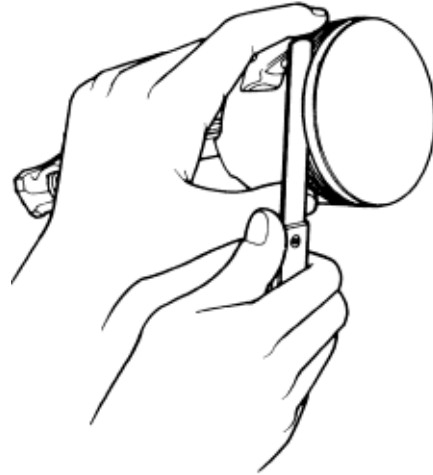
Standard (New): 0.030 - 0.055 mm
(0.0012 - 0.0022 in)

Service Limit: 0.13 mm (0.005 in)

H22A7 engine:

Standard (New): 0.040 - 0.070 mm
(0.0016 - 0.0028 in)

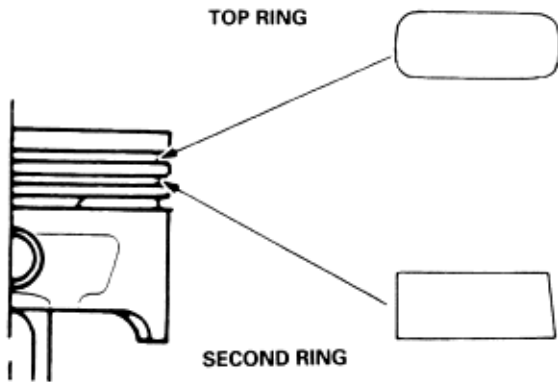
Service Limit: 0.13 mm (0.005 in)



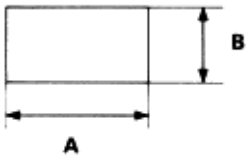
Piston Rings Alignment

7-B-27

1. Install the rings as shown.



Piston Ring Dimensions:



Top Ring (Standard):

A: 3.1 mm (0.12 in)

B: 1.2 mm (0.05 in)

Second Ring (Standard):

F18B2, F18B3, F20B6 engines:

A: 3.4 mm (0.13 in)

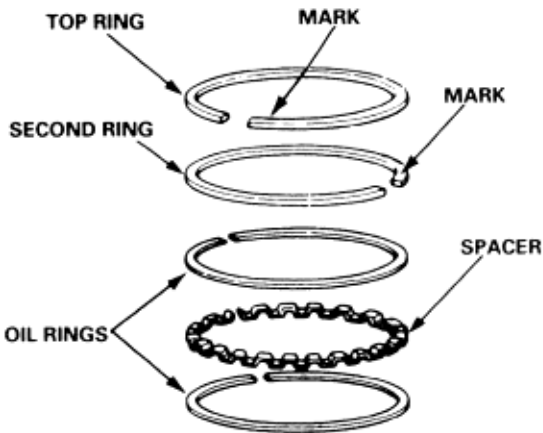
B: 1.2 mm (0.05 in)

H22A7 engine:

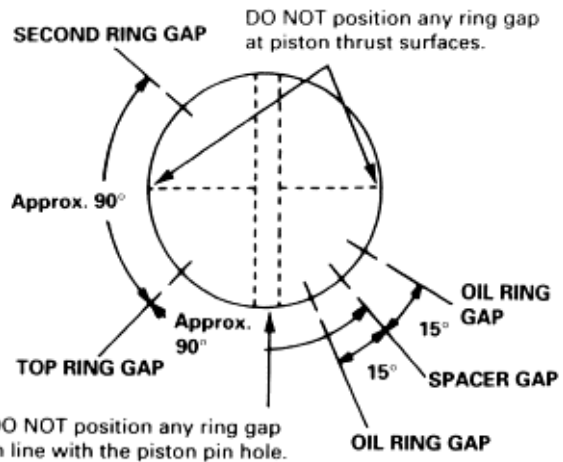
A: 3.2 mm (0.13 in)

B: 1.2 mm (0.05 in)

NOTE: The manufacturing marks must be facing upward.



2. Rotate the rings in their grooves to make sure they do not bind.
3. Position the ring end gaps as shown:



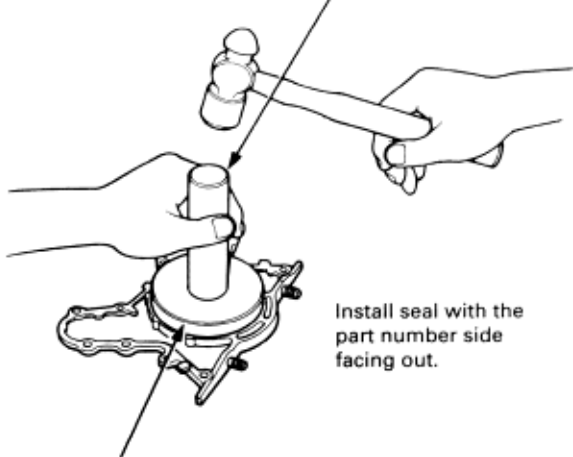


The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of the seal.

1. Drive in the crankshaft oil seal against the right side cover.

NOTE: Drive the crankshaft oil seal in squarely.

HANDLE DRIVER
07749 - 0010000

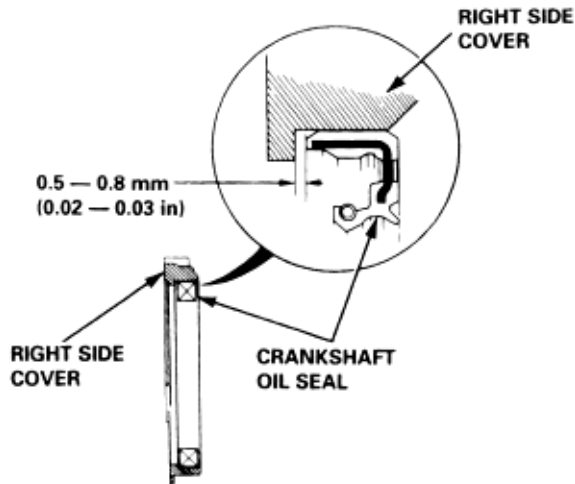


Install seal with the
part number side
facing out.

DRIVER ATTACHMENT, 96 mm
07948 - SB00101

2. Confirm that the clearance is equal all the way around with a feeler gauge.

Clearance: 0.5 - 0.8 mm (0.02 - 0.03 in)



NOTE: For installation of oil pump side crankshaft oil seal. (See page 8-20).



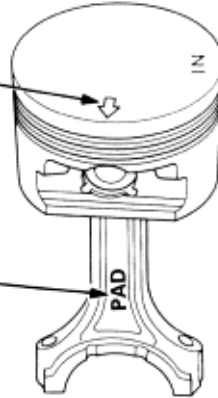
Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

If the crankshaft is already installed

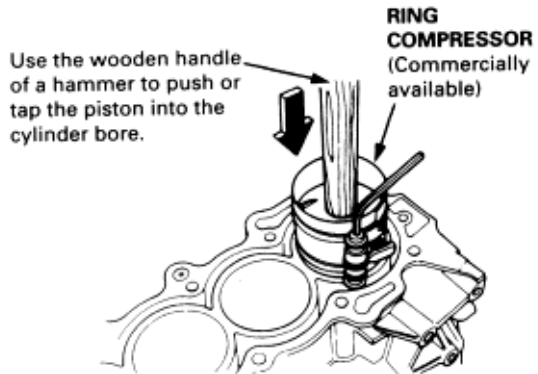
1. Set the crankshaft to BDC for each cylinder.
2. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.
3. Position the arrow and the mark facing towards the timing belt side of the engine.

The arrow must face the
timing belt side of the
engine.

The mark must face
the timing belt side
of the engine.

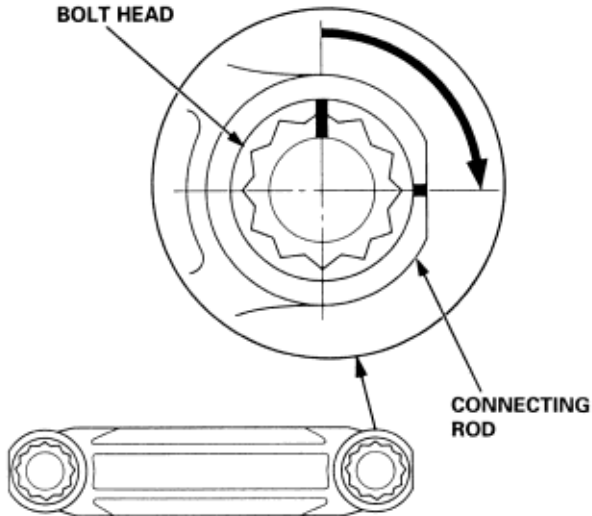


4. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.
NOTE: Maintain downward force on the ring compressor to prevent the rings from expanding before entering the cylinder bore.



5. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.

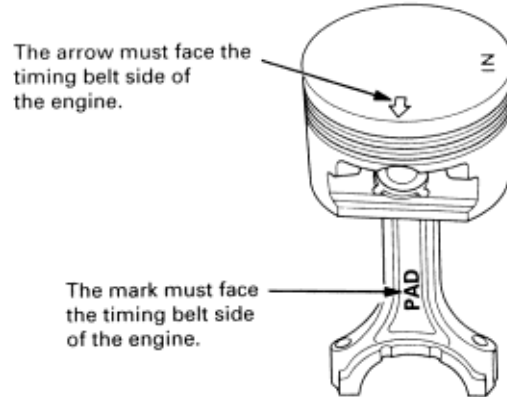
6. Check the connecting rod bearing clearance with plastigage ([see page 7-B-11](#)).
7. Apply engine oil to the bolt threads, then install the rod caps with bearings, then torque the bolts.
F18B2, F18B3, F20B6 engines:
20 Nm (2.0 kgf/m, 14 lbf/ft)
H22A7 engine:
25 Nm (2.5 kgf/m, 18 lbf/ft)
8. Mark the connecting rod and bolt head as shown.



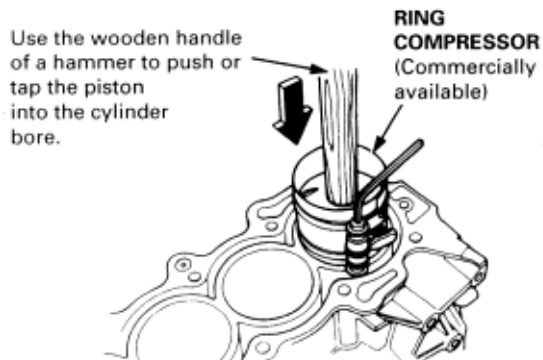
9. Tighten the bolt until the mark on the bolt head lines up with the mark on the connecting rod (Turn the bolt 90°).

If the crankshaft is not installed

1. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.
2. Position the arrow and the mark facing towards the timing belt side of the engine.



3. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer.
NOTE: Maintain downward force on the ring compressor to prevent the rings from expanding before entering the cylinder bore.

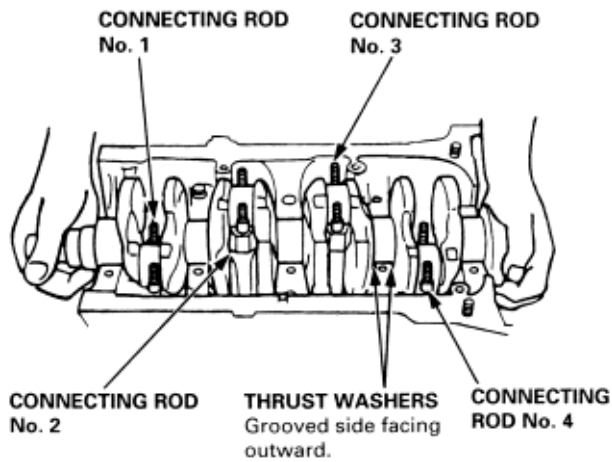


4. Position all pistons at top dead center.



Before installing the crankshaft, apply a coat of engine oil to the main bearings, rod bearings and balancer shaft bearings.

1. Install the bearing halves in the cylinder block and connecting rods.
2. Hold the crankshaft so rod journal No. 2 and rod journal No. 3 are straight up.
3. Install the thrust washers in the No. 4 journal of the cylinder block.



4. Lower the crankshaft into the block, seating the rod journals into connecting rod No. 1 and connecting rod No. 4. Install the connecting rod caps and bolts finger tight.
5. Rotate the crankshaft clockwise, seat the journals into connecting rod No. 2 and connecting rod No. 3. Install the connecting rod caps and bolts finger tight. Install caps so the bearing recess is on the same side as the recess in the rod.

6. Check the connecting rod bearing clearance with plastigage ([see page 7-B-11](#)).
7. Apply engine oil to the bolt threads, then install the rod caps with bearings, then torque the bolts.

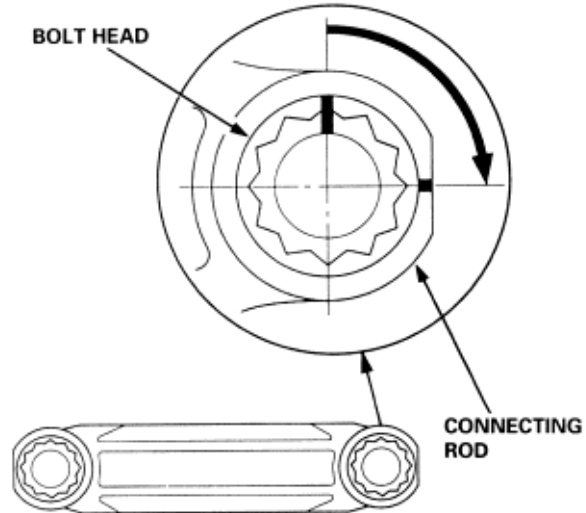
F18B2, F18B3, F20B6 engines:

20 Nm (2.0 kgf/m, 14 lbf/ft)

H22A7 engines:

25 Nm (2.5 kgf/m, 18 lbf/ft)

8. Mark the connecting rod and bolt head as shown.

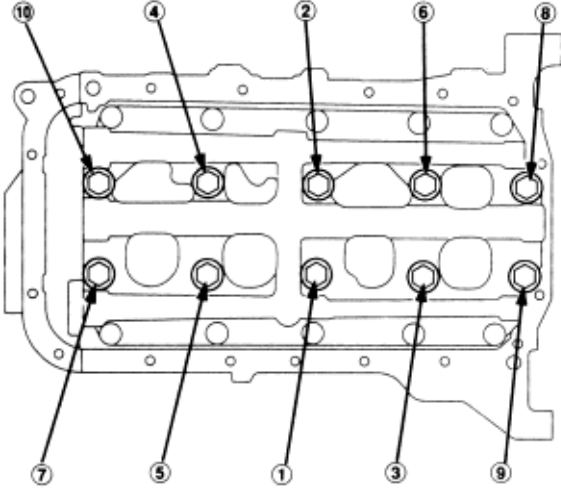


9. Tighten the bolt until the mark on the bolt head lines up with the mark on the connecting rod (Turn the bolt 90°).

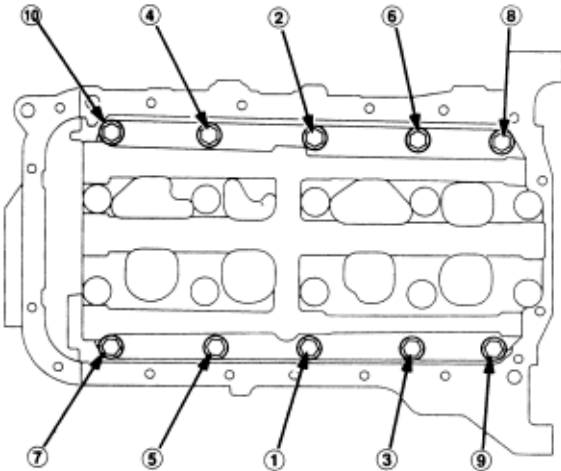
10. Install the main bearing caps and bearing cap bridge.
Coat the bolt threads with engine oil.
11. Check clearance with plastigage (**see page 7-B-9**).
12. Tighten the bearing cap bolts.

F18B2, F18B3, F20B6 engines:

- 1. Tighten the 11 mm bolts in two steps. In the first step, tighten all bolts in sequence to about 29 Nm (3.0 kgf/m, 22 lbf/ft); in the final step, tighten in same sequence, to 78 Nm (8.0 kgf/m, 58 lbf/ft).

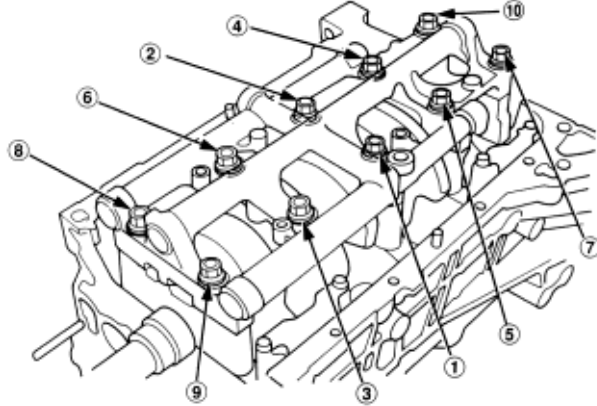


- 2. Tighten the 6 mm bolts in sequence to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).



H22A7 engine:

- 1. Tighten the 11 mm bolts in two steps. In the first step, tighten all bolts in sequence to about 29 Nm (3.0 kgf/m, 22 lbf/ft) in the final step, tighten in same sequence, to 78 Nm (8.0 kgf/m, 58 lbf/ft).



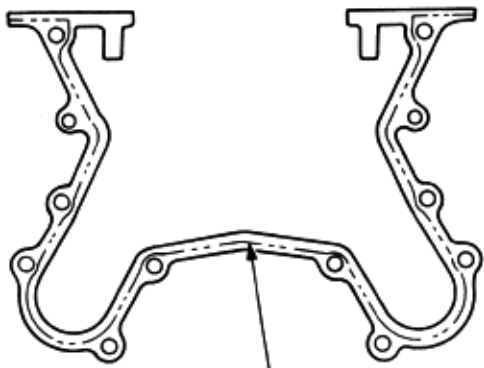
NOTE: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for approximately 15 minutes.

NOTE:

- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Apply liquid gasket evenly, being careful to cover all the mating surface.
- ♦ To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
- ♦ Do not install the parts if five minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.

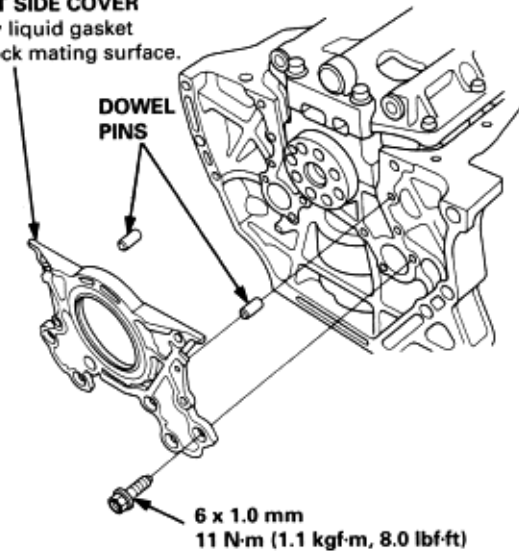
13. Apply liquid gasket to the block mating surface of the right side cover, then install it on the cylinder block.

RIGHT SIDE COVER:



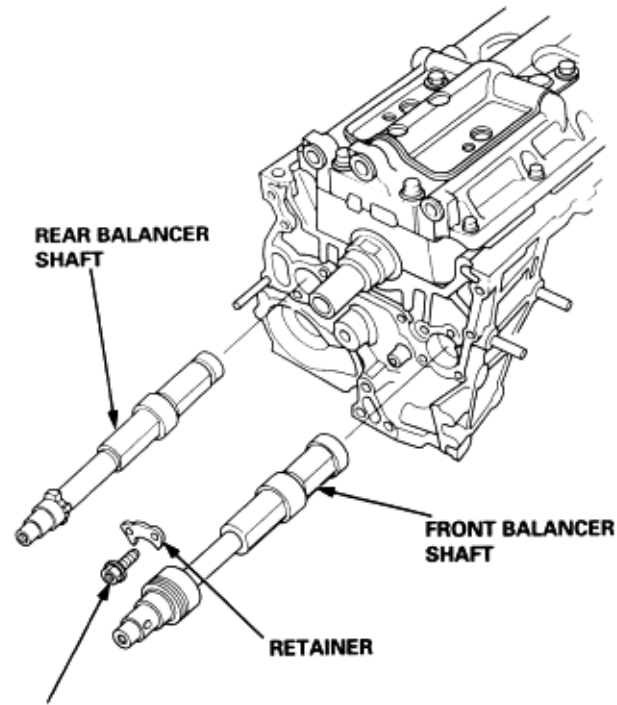
Apply liquid gasket along the broken line.

RIGHT SIDE COVER
Apply liquid gasket to block mating surface.



6 x 1.0 mm
11 N-m (1.1 kgf-m, 8.0 lbf-ft)

14. Insert the balancer shafts into the block, then install the retainer to the front balancer shaft and block.

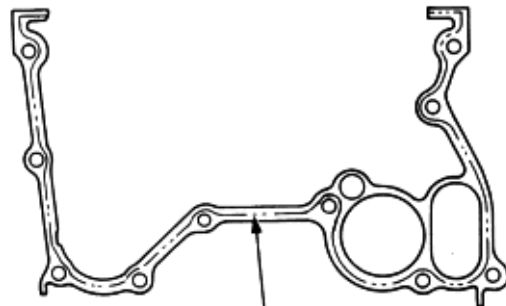


6 x 1.0 mm
20 N-m (2.0 kgf-m, 14 lbf-ft)

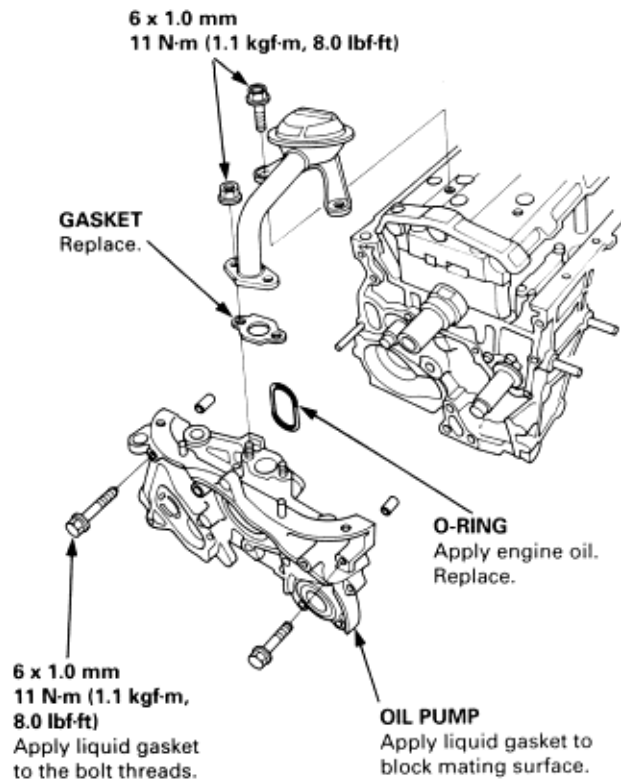
15. Apply liquid gasket to the oil pump mating surface of the block, then install the oil pump on the cylinder block.

- ♦ Apply grease to the lips of the oil seals. Then, install the oil pump while aligning the inner rotor with the crankshaft. When the pump is in place, clean any excess grease off the crankshaft and the balancer shaft, then check that the oil seal lips are not distorted.

OIL PUMP:

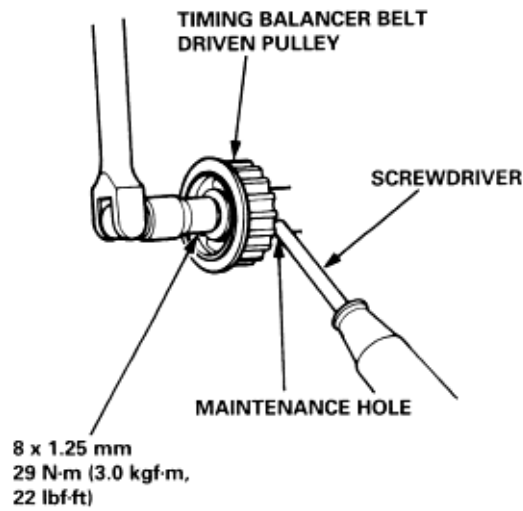


Apply liquid gasket along the broken line.

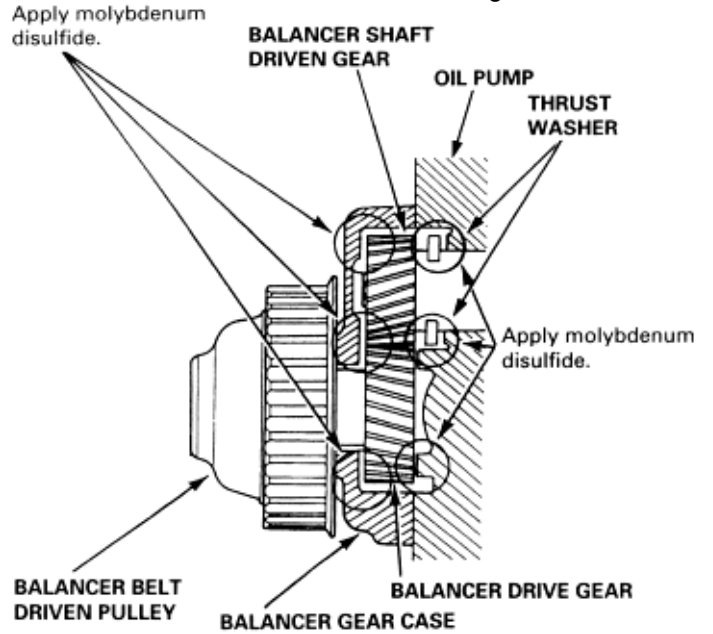


16. Install the oil screen.
17. Hold the front balancer shaft with a screwdriver, then install the timing balancer belt driven pulley.

FRONT BALANCER SHAFT:

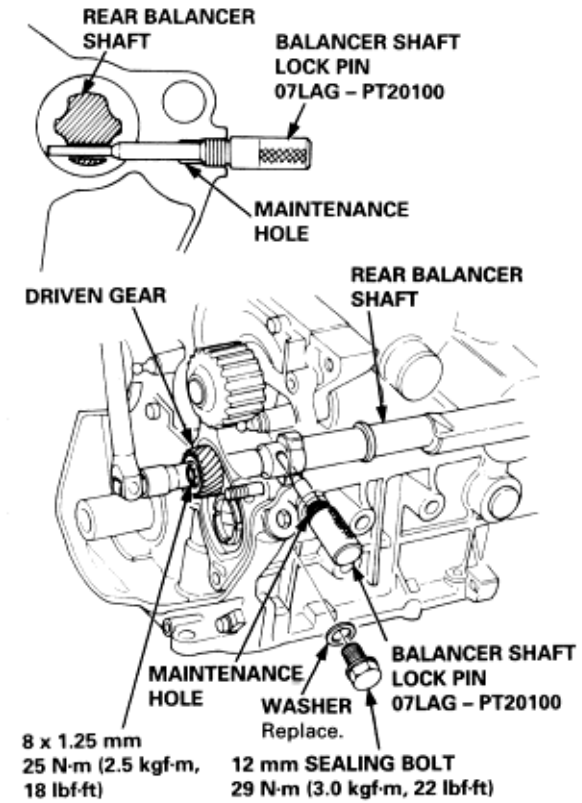


18. Before installing the balancer driven gear and the balancer gear case, apply molybdenum disulfide to the thrust surfaces of the balancer gears as shown.

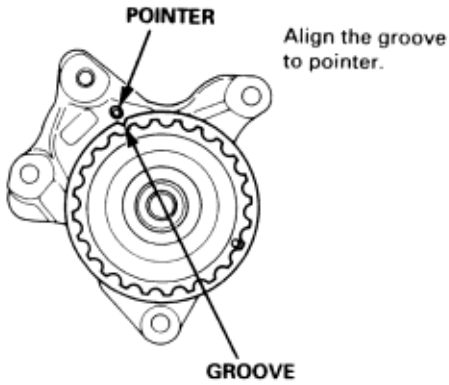
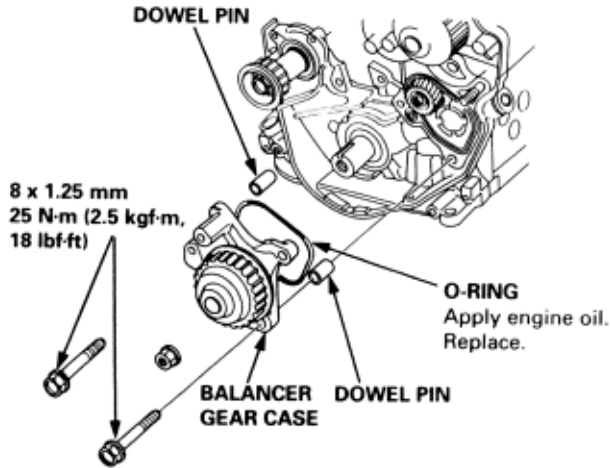


19. Hold the rear balancer shaft with the special tool, then install the balancer driven gear.

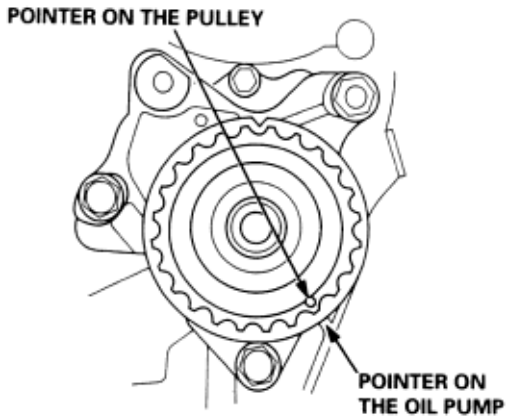
REAR BALANCER SHAFT:



20. Install the balancer gear case to the oil pump.
NOTE: Align the groove on the pulley edge to the pointer on the gear case while holding the rear balancer with the special tool, then install the gear case.



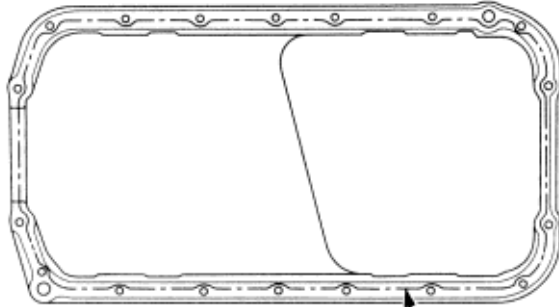
21. Check the alignment of the pointers after installing the gear case.



22. Clean and dry the cylinder block mating surfaces.
23. Apply liquid gasket, Part No. 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the oil pan and to the inner threads of the bolt holes. Install the oil pan.

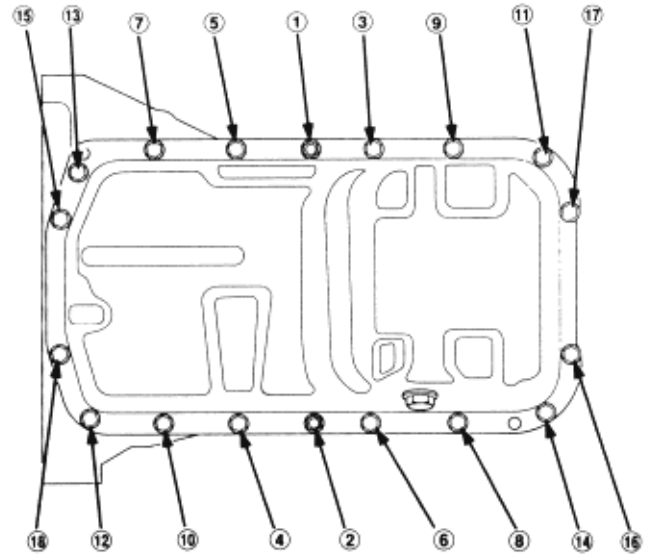
NOTE:

- ♦ Apply liquid gasket 4 mm wide.
- ♦ Apply liquid gasket doubly to the jointing point of the liquid gasket.



Apply liquid gasket
along the broken line.

24. Tighten the bolts/nuts in two or three steps. In the final step, tighten all bolts/nuts, in sequence to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).

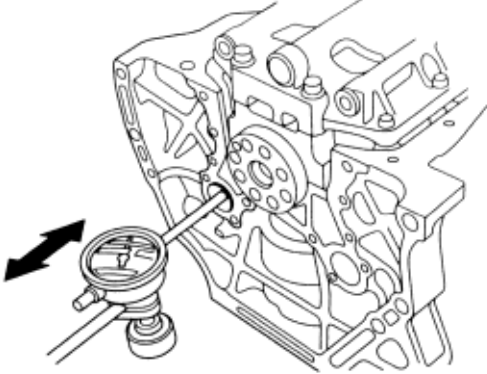


NOTE: Inspect the balancer shaft before removing the right side cover and the balancer gear case (see page 7-B-13).

1. Push the balancer shaft firmly away from the dial indicator. Zero the dial against the front end of the balancer shaft, then pull the balancer shaft firmly back toward the indicator.

Front Balancer Shaft End Play

Standard (New): 0.10 - 0.40 mm
(0.004 - 0.016 in)



- ♦ If end play is excessive, inspect the retainer and thrust surfaces on the balancer shaft.

Rear Balancer Shaft End Play

Standard (New): 0.04 - 0.15 mm
(0.002 - 0.006 in)



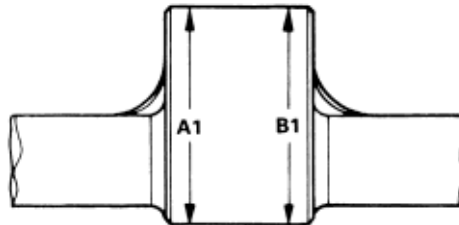
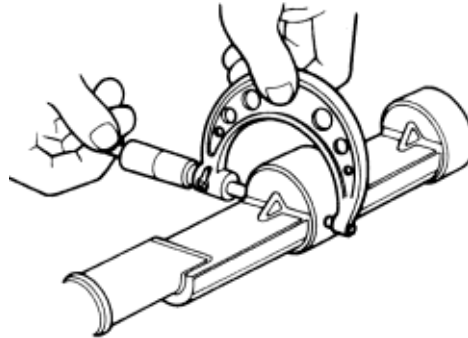
- ♦ If end play is excessive, inspect the thrust washer and thrust surfaces on the driven gear and oil pump body.

NOTE: The thickness of the retainer (front) and thrust washer (rear) are fixed and must not be changed either by grinding or shimming.

2. Remove the balancer shafts (see page 7-B-13).
NOTE: Clean the balancer shafts.
3. Inspect the surface of the balancer shaft journal and balancer bearing.
4. Replace the bearing or balancer shaft if there is wear, damage or discoloration on the surface of the bearing or the balancer shaft journal. When replacing the rear No. 1 bearing, be sure to replace the oil pump housing with a new one.
NOTE: A mirror-like surface is normal.
5. Measure taper at the edges of each journal.
 - ♦ The difference between measurements on each journal must not exceed the standard.

Journal Taper

Standard (New): 0.005 mm (0.0002 in) max.

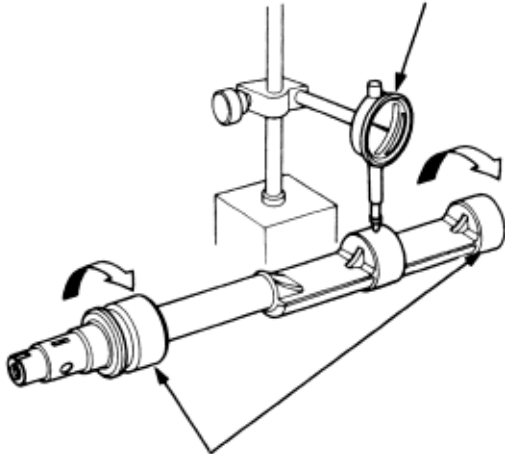


6. Measure runout on the No. 2 journal of each balancer shaft to make sure the balancer shafts are not bent.

Balancer Shaft Total Indicated Runout

Standard (New): 0.02 mm (0.001 in) max.
Service Limit: 0.03 mm (0.001 in)

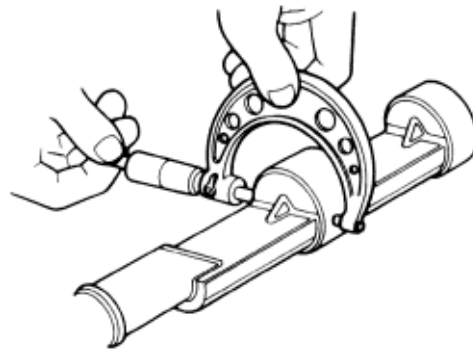
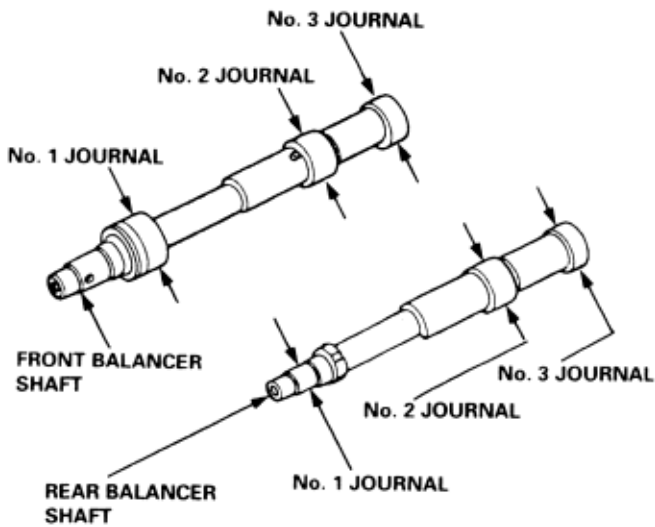
DIAL INDICATOR
 Rotate two complete revolutions.



Support with lathe type tool or V-blocks.

7. Measure the diameters of the balancer shaft journals.

MEASURING POINTS



Journal Diameter

Standard (New):

No. 1 journal:

Front: 42.722 - 42.734 mm
 (1.6820 - 1.6824 in)

Rear: 20.938 - 20.950 mm
 (0.8243 - 0.8248 in)

No. 2 journals front and rear:

38.712 - 38.724 mm
 (1.5241 - 1.5246 in)

No. 3 journals front and rear:

34.722 - 34.734 mm
 (1.3670 - 1.3675 in)

Service Limit:

No. 1 journal:

Front: 42.71 mm (1.681 in)
Rear: 20.92 mm (0.824 in)

No. 2 journals front and rear:

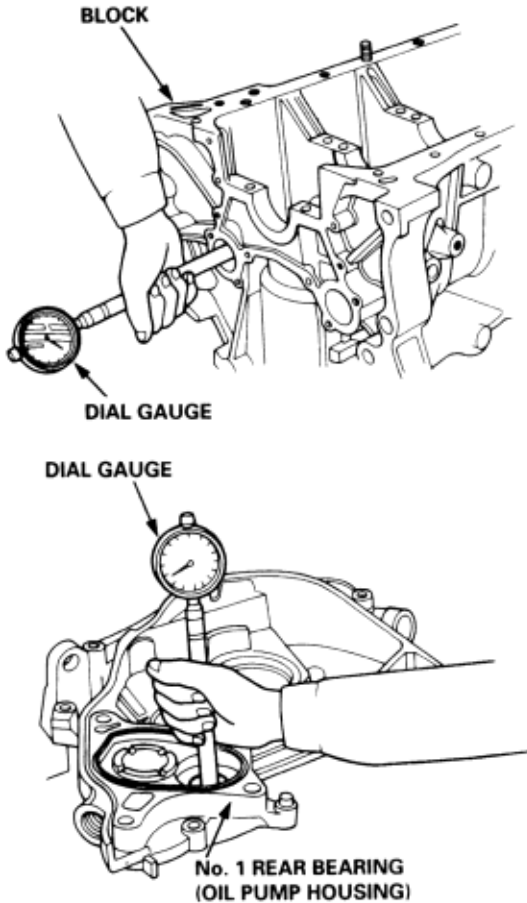
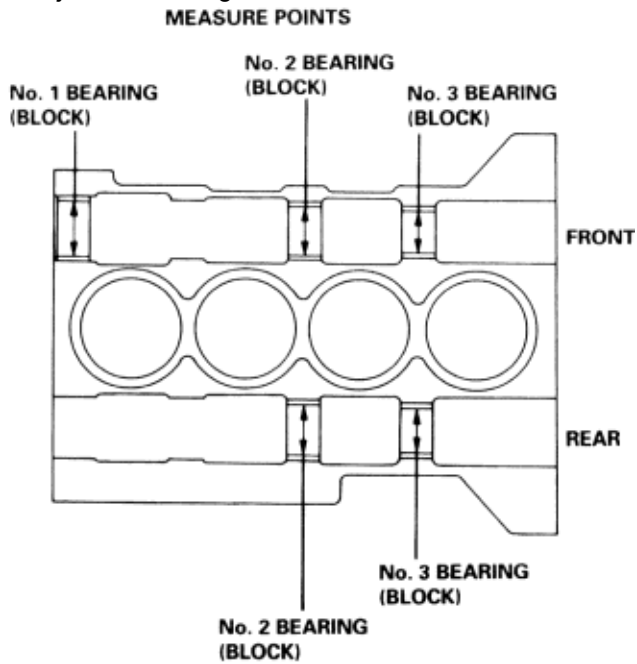
38.70 mm (1.524 in)

No. 3 journals front and rear:

34.71 mm (1.367 in)

8. Remove the crankshaft, the pistons and the other parts from the block, then clean the balancer shaft journal bearings in the block and the oil pump housing with a clean shop towel.
9. Check the surface of the bearings; if there is wear, damage or discoloration, replace the bearings or the oil pump housing.

10. Measure the inner diameters of the balancer shaft journal bearings.



Bearing Inner Diameter

Standard (New):

No. 1 journals:

Front: 42.800 - 42.820 mm
 (1.6850 - 1.6858 in)
 Rear: 21.000 - 21.013 mm
 (0.8268 - 0.8273 in)

No. 2 journals front and rear:

38.800 - 38.820 mm
 (1.5276 - 1.5283 in)

No. 3 journals front and rear:

34.800 - 34.820 mm
 (1.3701 - 1.3709 in)

Service Limit:

No. 1 journals:

Front: 42.83 mm (1.686 in)
 Rear: 21.02 mm (0.828 in)

No. 2 journals front and rear:

38.83 mm (1.529 in)

No. 3 journals front and rear:

34.83 mm (1.371 in)

11. Calculate the shaft-to-bearings oil clearances.

BEARING I.D. - JOURNAL O.D. = OIL CLEARANCE

Shaft-to-Bearings Oil Clearances

Standard (New):

No. 1 front journal, No. 3 front and rear journals:

0.066 - 0.098 mm (0.0026 - 0.0039 in)

No. 2 front and rear journals:

0.076 - 0.108 mm (0.0030 - 0.0043 in)

No. 1 rear journal:

0.050 - 0.075 mm (0.0020 - 0.0030 in)

Service Limit:

No. 1 front journal, No. 3 front and rear journals:

0.12 mm (0.005 in)

No. 2 front and rear journals:

0.13 mm (0.005 in)

No. 1 rear journal:

0.09 mm (0.004 in)

Balancer Shaft Bearings Replacement

7-B-38

The procedure shown below is used when using the bearing replacement tool set (07LAF-PT20100).

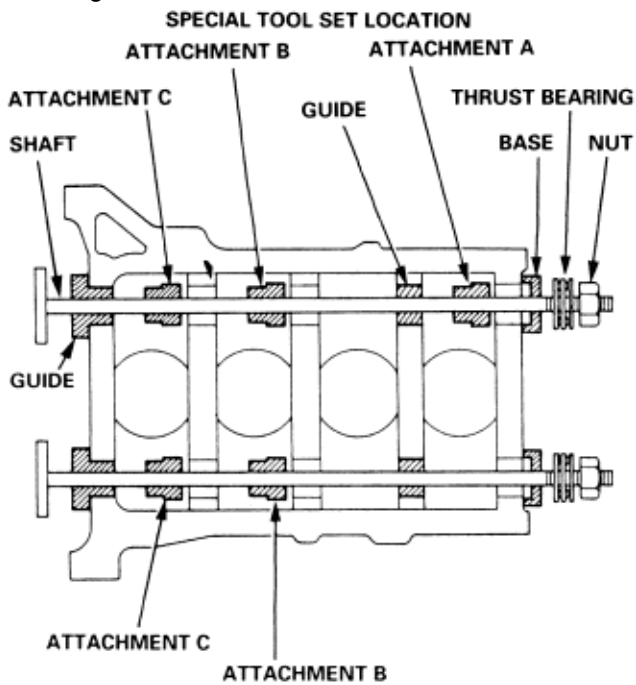
NOTE:

- Remove all attachment parts from the cylinder block and lay it with its oil pan side up.
- Remove or reinstall bearings one at a time.
- Remove bearings from the transmission side to the timing belt side and reinstall them in reverse sequence.

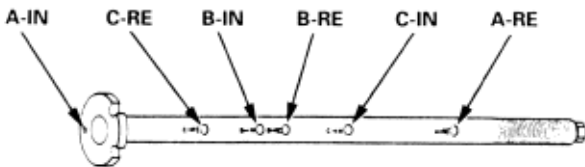
Removal:

NOTE:

- By changing the size and attachment point of the attachment, all balancer bearings can be removed from the cylinder block in the same procedure.
- The illustration shows the attachment points of each special tool.
- When removing bearings successively, put the corresponding attachment through the shaft without fixing them in advance.

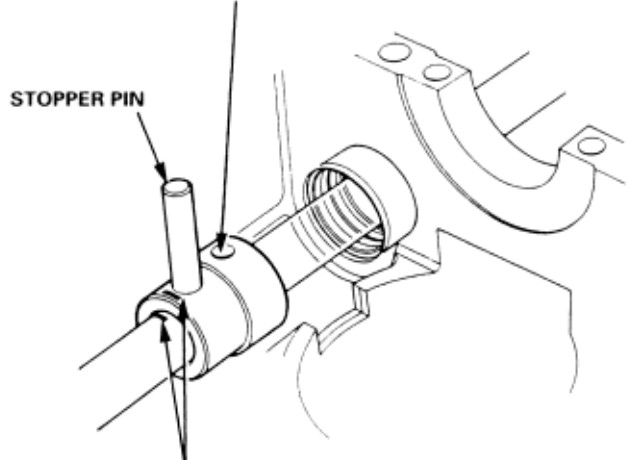


- Position of attachment fixing holes and guide marks on the shaft.



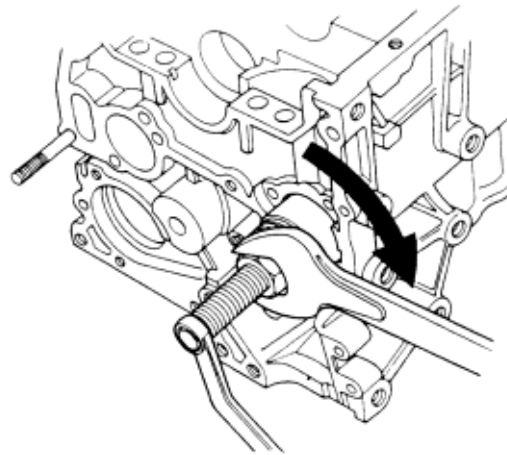
- Put the attachment with the side having larger diameter facing the bearing. Align the stopper pin holes of the attachment and the shaft. Insert the stopper pin to fix the attachment.

FRONT No. 1 BEARING: ATTACHMENT A
No. 2 BEARINGS: ATTACHMENT B
No. 3 BEARINGS: ATTACHMENT C



Align with the guide mark.

- Hold the shaft end with a wrench and turn the nut clockwise until the bearing comes off.
 - Do not rotate the shaft.



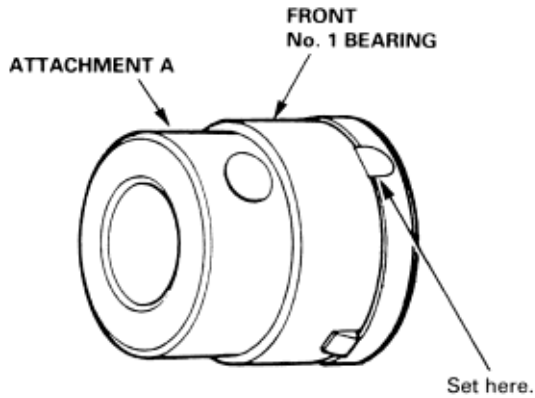
- When removing bearings in succession, loosen the nut, remove the stopper pin from the pin hole you have finished and repeat above step 1 and 2 on the next bearing.

Installation:

Front No. 1 bearing

NOTE: Always use new bearings.

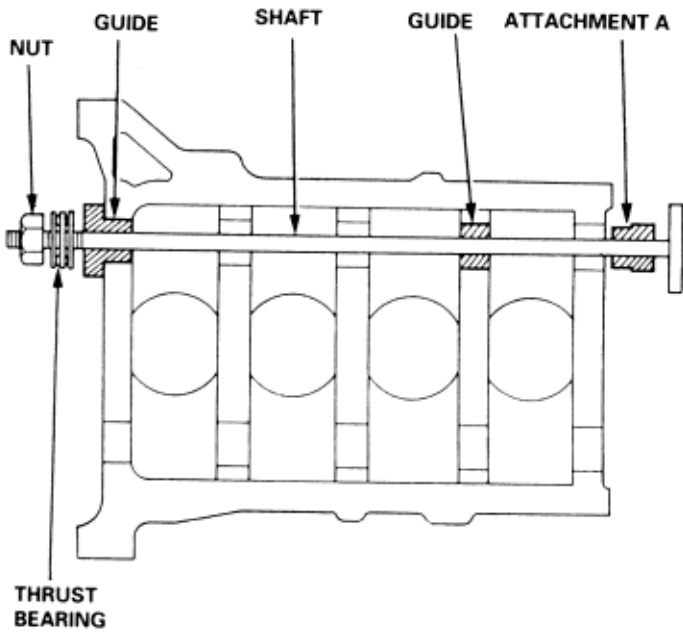
1. Set the recess of the bearing to the detent of the attachment.



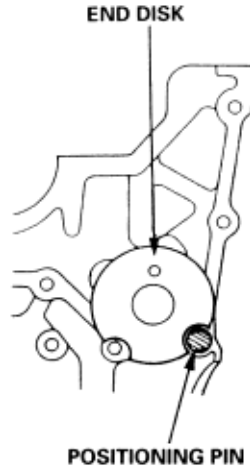
Attachment

Front No. 1 bearing: Attachment A

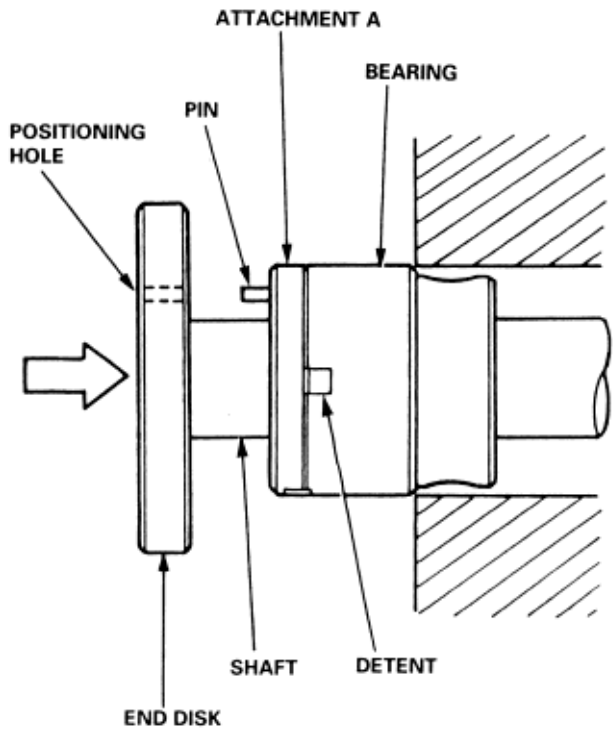
- The illustration shows the attachment points of the special tools.



2. Install the shaft positioning pin.



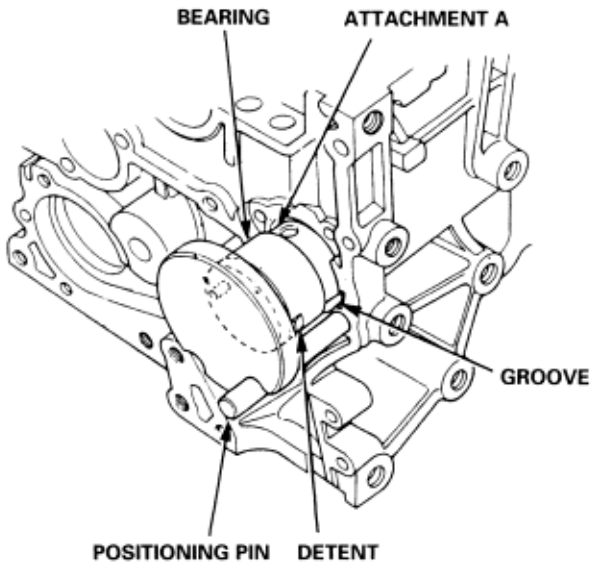
3. Set the shaft so that the attachment pin is aligned with the positioning hole in the end disc.



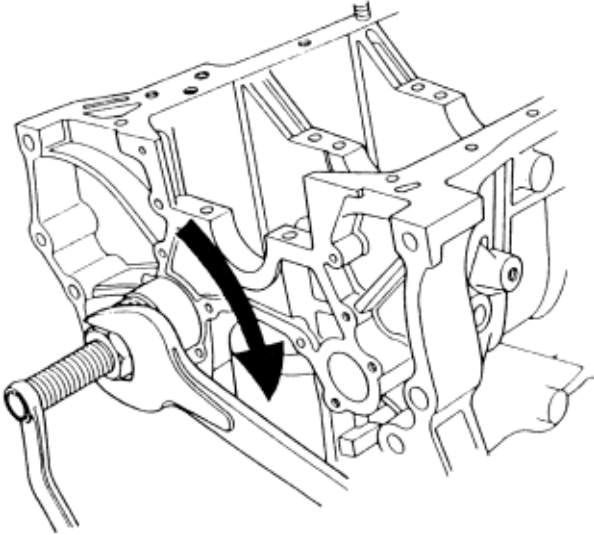
Balancer Shaft Bearings Replacement (cont'd)

7-B-40

4. Set the detent of the bearing to the groove of the cylinder block.



5. Hold the end of the shaft with wrench and install the bearing by turning the nut clockwise.
- Do not rotate the shaft.

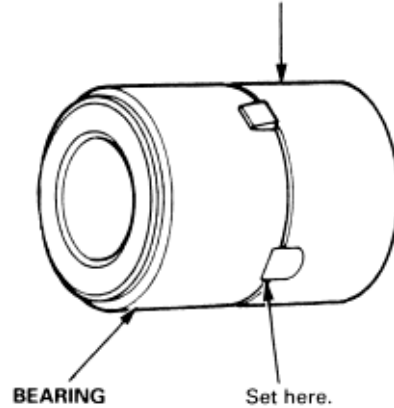


Installation:

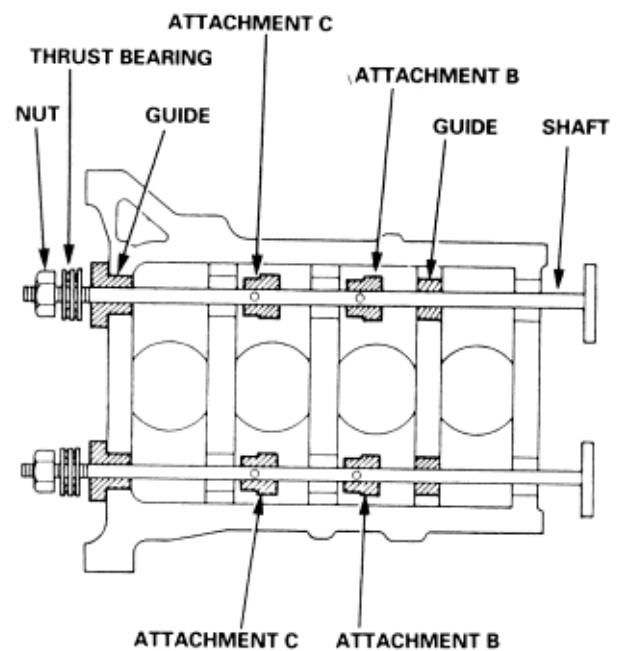
No. 2 and No. 3 Bearings

1. Set the recess of the bearing to the detent of the attachment.

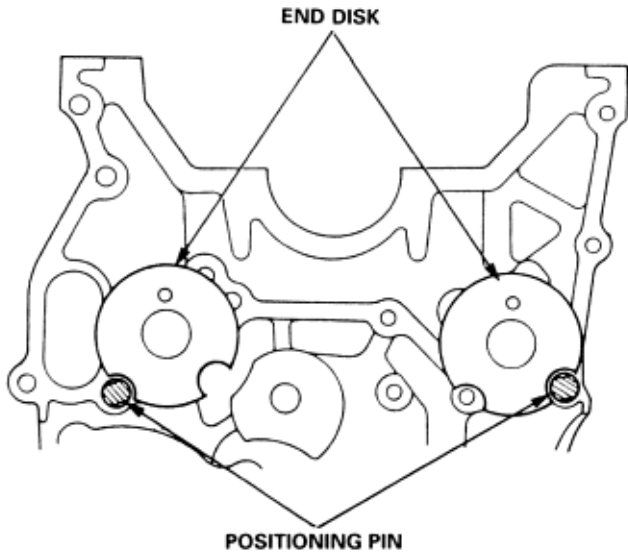
No. 2 BEARINGS: ATTACHMENT B
No. 3 BEARINGS: ATTACHMENT C



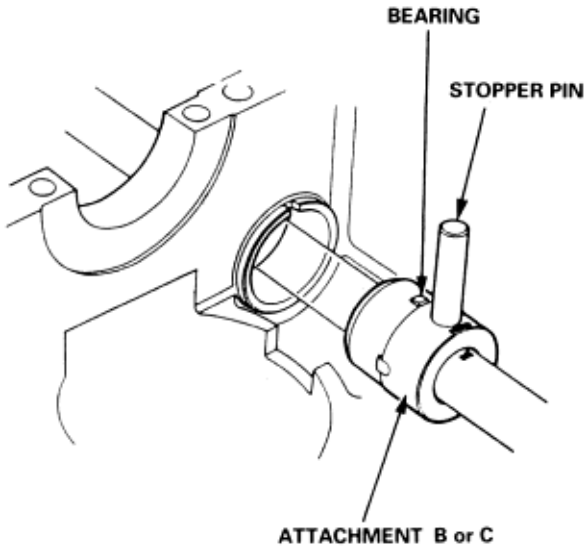
- The illustration shows attachment points of each special tool.
- When installing bearings successively, set the bearings to the attachment and put them through the shaft without fixing them in advance.



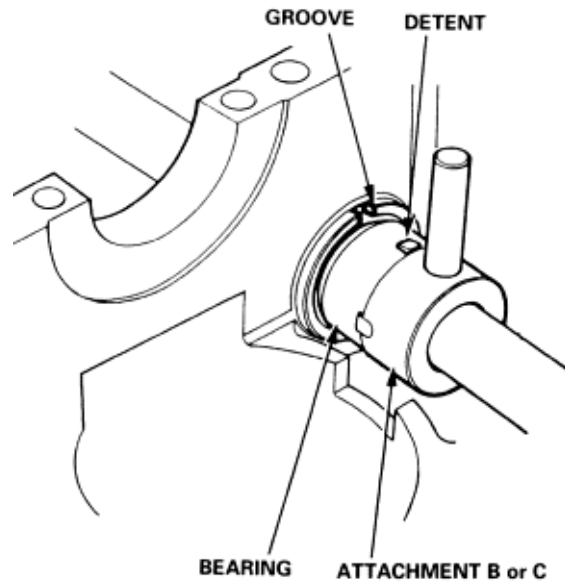
2. Install the shaft positioning pin.



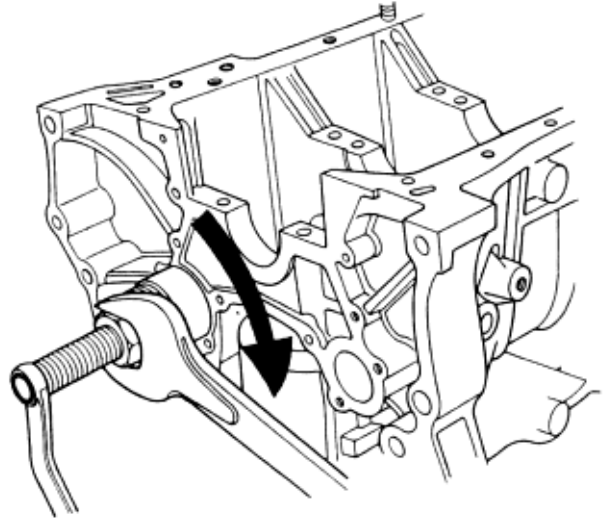
3. Align the attachment with the guide mark. Applicable bearing No. is indicated at the guide mark. Align the pin holes of the attachment and the shaft. Insert the stopper pin to fix the attachment (for No. 2, and No. 3 bearings).



4. Set the detent of the bearing to the groove of the cylinder block.



5. Hold the end of the shaft with wrench and install the bearing by turning the nut clockwise.
• Do not rotate the shaft.



Special Tools

8-2

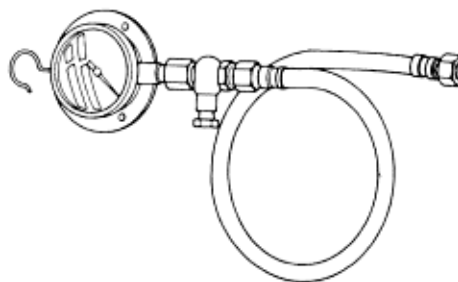
Ref No.	Tool Number	Description	Qty	Remark
1	07LAG - PT20100	Balancer Shaft Lock Pin	1	
2	07406 - 0030000	Oil Pressure Gauge Attachment	1	
3	07506 - 3000000	Oil Pressure Gauge	1	
4	07746 - 0010300	Driver Attachment, 42 x 47 mm	1	
5	07746 - 0010400	Driver Attachment, 52 x 55 mm	1	
6	07749 - 0010000	Handle Driver	1	
7	07912 - 6110001	Oil Filter Wrench	1	



①



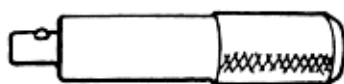
②



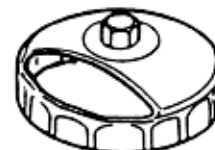
③



④ ⑤



⑥

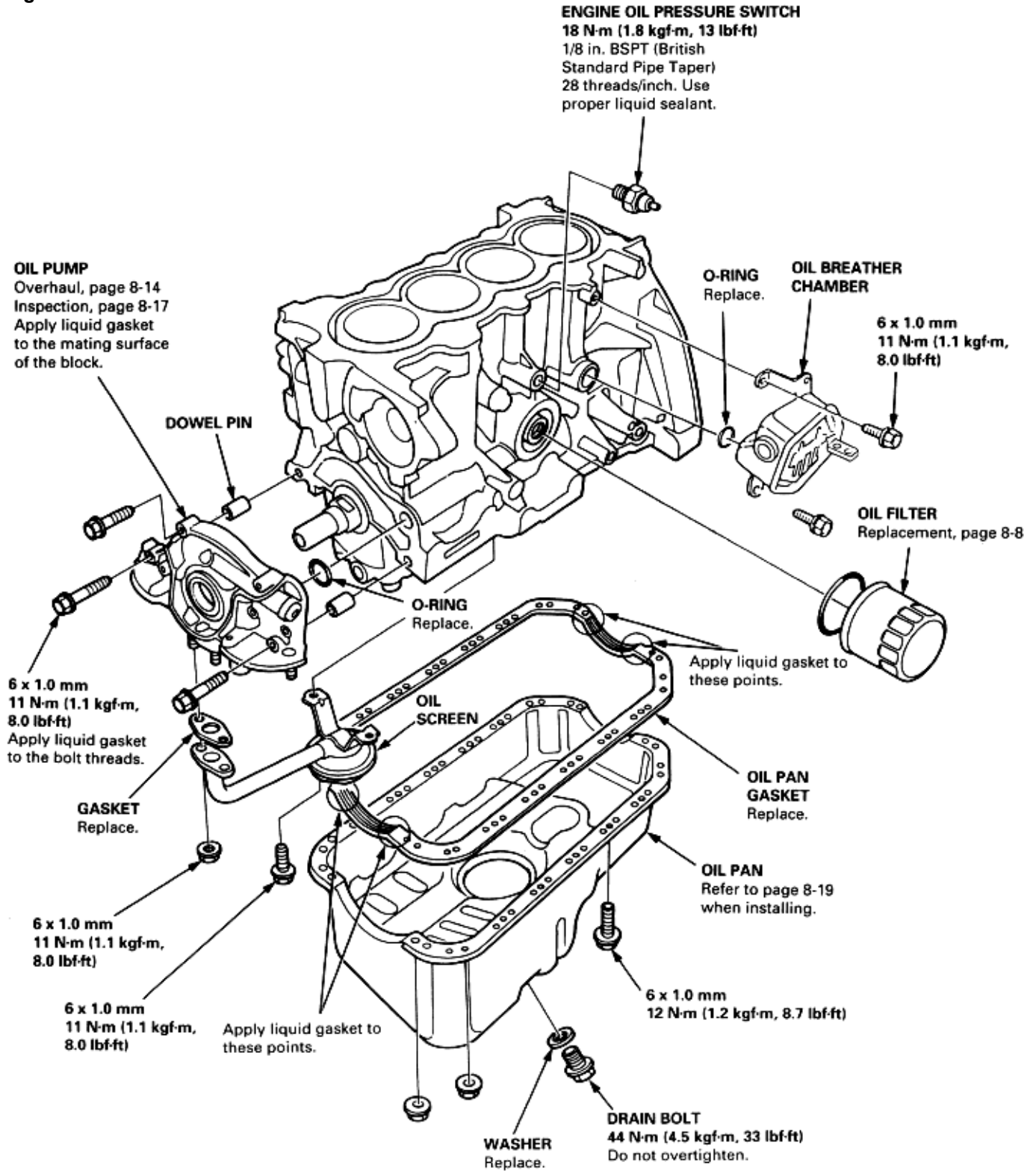


⑦

NOTE:

- ♦ Use new O-rings when reassembling.
- ♦ Apply oil to O-rings before installation.
- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
- ♦ Clean the oil pan gasket mating surfaces before installing.

D16B6 engine:

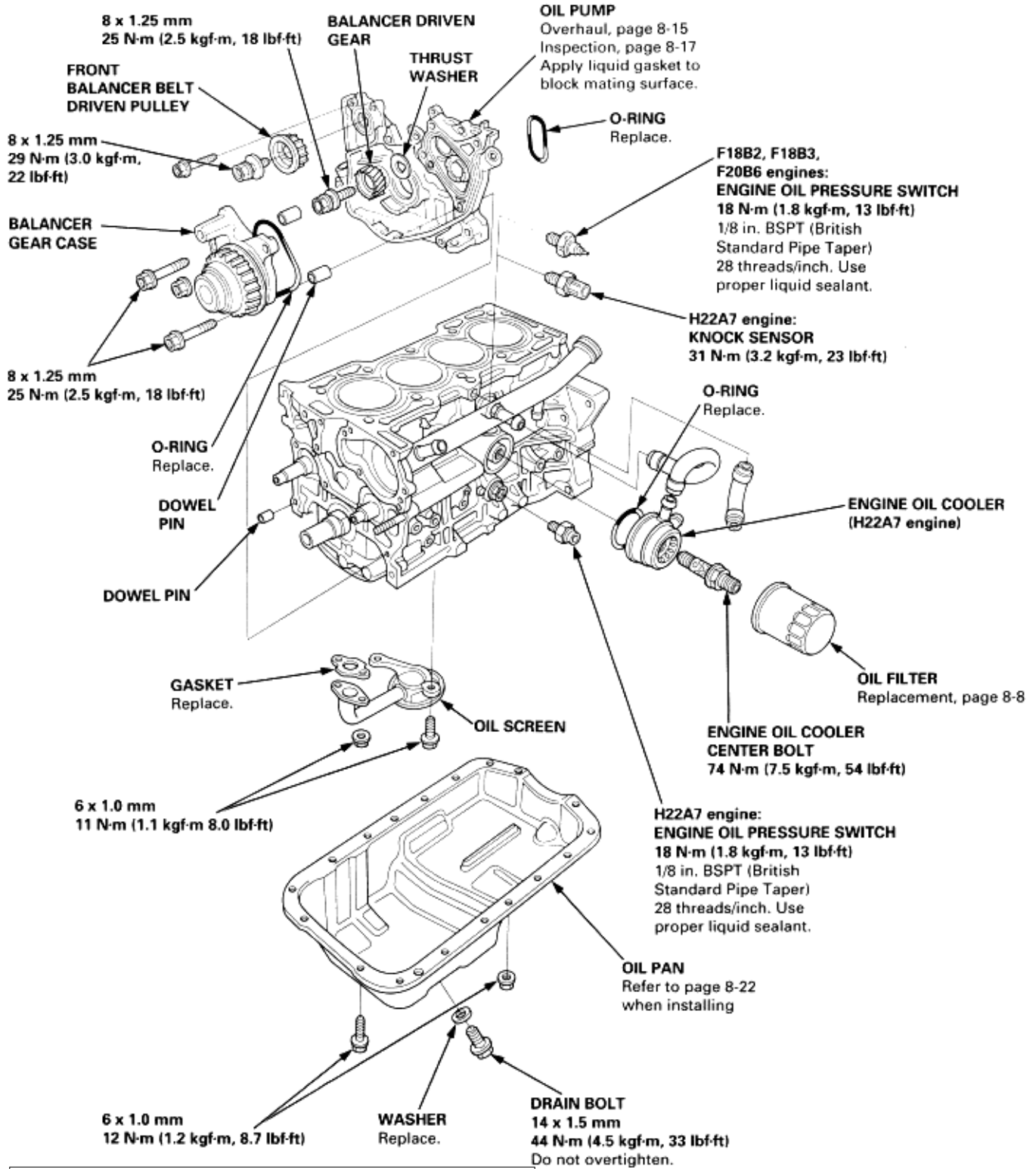


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 8-14\)](#)
[\(See Page 8-17\)](#)
[\(See Page 8-8\)](#)
[\(See Page 8-19\)](#)

NOTE:

- ♦ Use new O-rings when reassembling.
- ♦ Apply oil to O-rings for European models before installation.
- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.

F18B2, F18B3, F20B6, H22A7 engines:

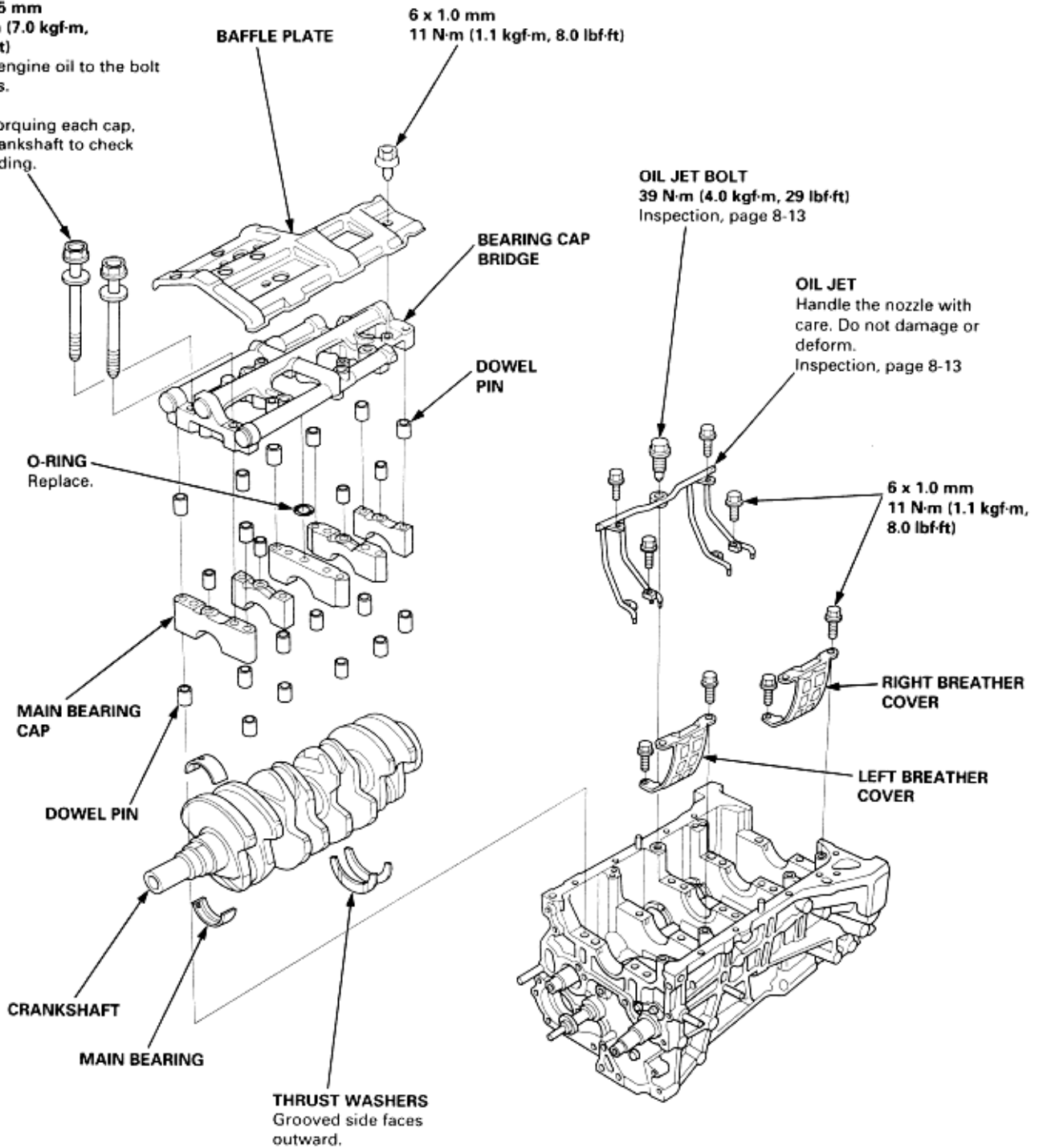


To go to the pages referenced on the diagram above, click on the following:

- (See Page 8-15)
- (See Page 8-17)
- (See Page 8-8)
- (See Page 8-22)

H22A7 engine:

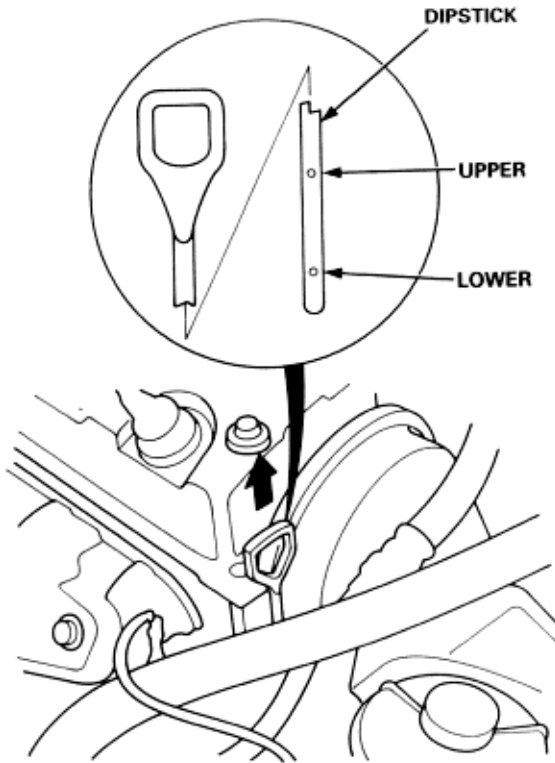
11 x 1.5 mm
69 N-m (7.0 kgf-m, 51 lbf-ft)
Apply engine oil to the bolt threads.
NOTE:
After torquing each cap, turn crankshaft to check for binding.



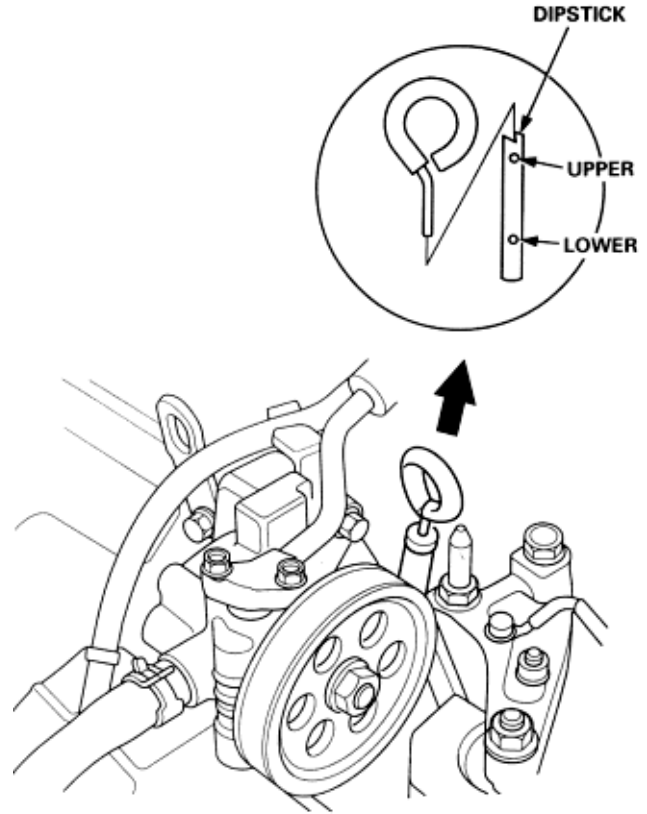
To go to the page referenced on the diagram above, click on the following:
(See [Page 8-13](#))

1. Park the vehicle on level ground, and turn off the engine. Allow the oil a few minutes to drain back into the oil pan so the dipstick will show the actual level.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.

D16B6 engine:



Except D16B6 engine:

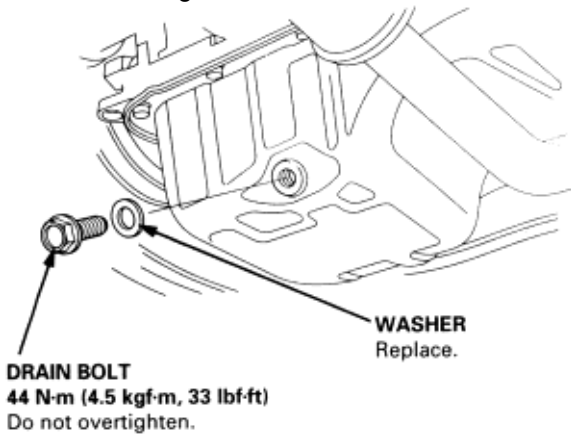


3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

Engine Oil Replacement

8-7

1. Warm up the engine.
2. Drain the engine oil.



3. Reinstall the drain plug with a new washer, and refill with the recommended oil.

Requirement

Always use a fuel efficient oil that says "API Service SG, SH or SJ".

SAE Viscosity; See chart in right hand column.

Capacity

D16B6 engine:

- 3.3 / (3.5 US qt, 2.9 Imp qt) at oil change.
- 3.6 / (3.8 US qt, 3.2 Imp qt) at oil change, including filter.
- 4.0 / (4.2 US qt, 3.5 Imp qt) after engine overhaul.

F18B2, F18B3, F20B6 engines:

- 4.1 / (4.3 US qt, 3.6 Imp qt) at oil change.
- 4.4 / (4.6 US qt, 3.9 Imp qt) at oil change, including filter.
- 5.7 / (6.0 US qt, 5.0 Imp qt) after engine overhaul.

H22A7 engine:

- 4.5 / (4.8 US qt, 4.0 Imp qt) at oil change.
- 4.8 / (5.1 US qt, 4.2 Imp qt) at oil change, including filter.
- 5.9 / (6.2 US qt, 5.2 Imp qt) after engine overhaul.

Change Interval

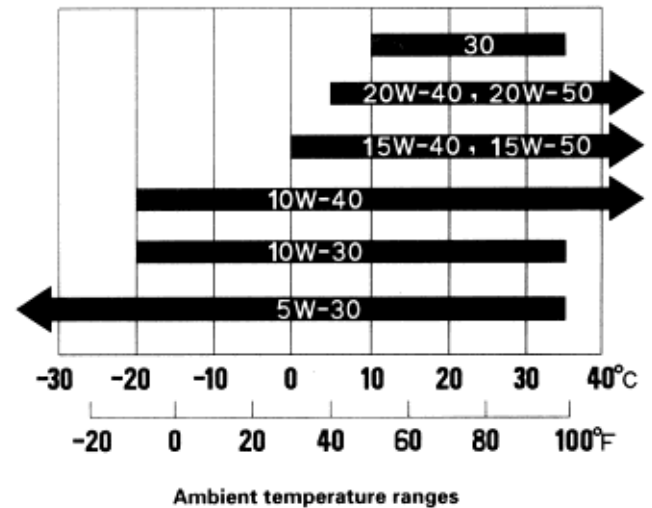
European models:

- Every 10,000 km (6,000 miles) or 12 months (Normal condition).
- Every 5,000 km (3,000 miles) or 6 months (Severe conditions).

Except European models:

- Every 5,000 km (3,000 miles) or 6 months.

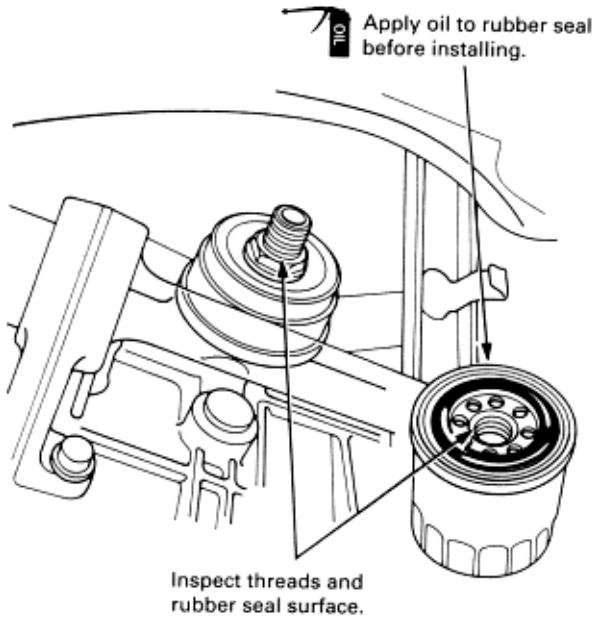
Engine Oil SAE Viscosity for Outside Temperature Ranges



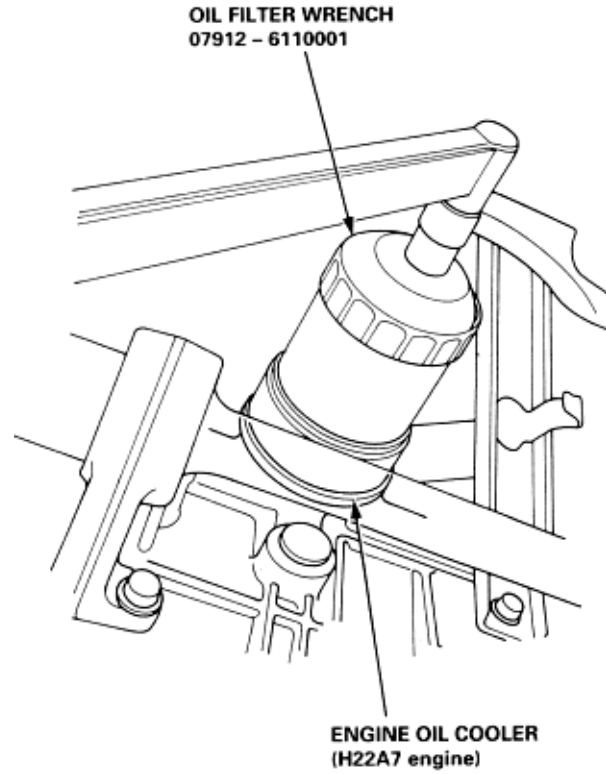
4. Fill the engine with oil up to the specified level, run the engine for more than three minutes, then check for oil leakage and oil level.

A type oil Filter:

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads and rubber seal on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal.
NOTE: Use only filters with a built-in bypass system.

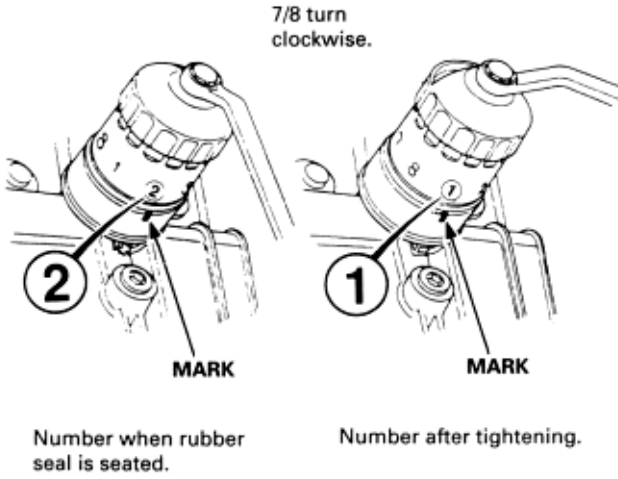


3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.
Tighten: 7/8 turn clockwise.
Tightening torque: 22 Nm (2.2 kgf/m, 16 lbf/ft)



Eight numbers (1 to 8) are printed on the surface of the filter. The following explains the procedure for tightening filters using these numbers.

1. Make a mark on the cylinder block under the number that shows at the bottom of the filter when the rubber seal is seated.
2. Tighten the filter by turning it clockwise seven numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.

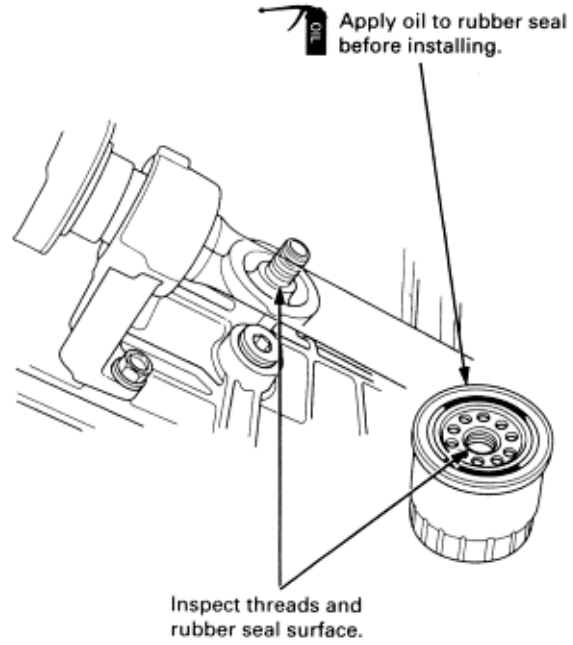


Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

5. After installation, fill the engine with oil up to the specified level, run the engine for more than three minutes, then check for oil leakage.

B type oil filter:

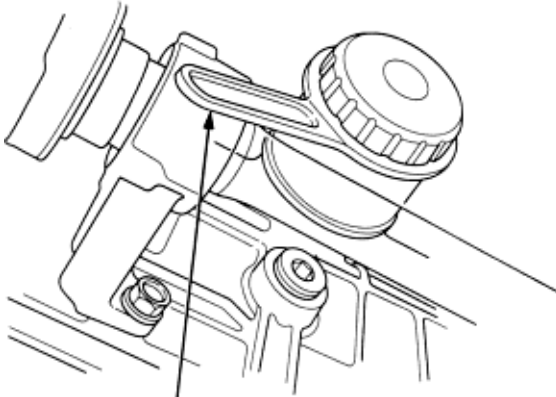
1. Remove the oil filter with the oil filter wrench.
2. Inspect the threads and rubber seal on the new filter. Wipe off seat on the engine block. Apply a light coat of oil to the filter rubber seal.
NOTE: Use only filters with a built-in bypass system.



**Oil Filter
Replacement (cont'd)**

3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the tool.

**Tighten: three quarter turn clockwise.
Tightening torque: 22 Nm (2.2 kgf/m, 16 lbf/ft)**



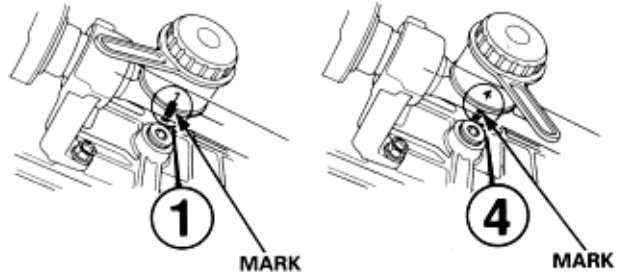
LABINAL-Purflux 76
COMMERCIALY-AVAILABLE

Four numbers (1 to 4) are printed on the surface of the filter.

The following explains the procedure for tightening filters using these numbers.

1. Make a mark on the engine oil cooler under the number that shows at the bottom of the filter when the rubber seal is seated.
2. Tighten the filter by turning it clockwise three numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.

3/4 turn
clockwise.



Number when rubber
seal is seated.

Number after tightening.

Number when rubber seal is seated	1	2	3	4
Number after tightening	4	1	2	3

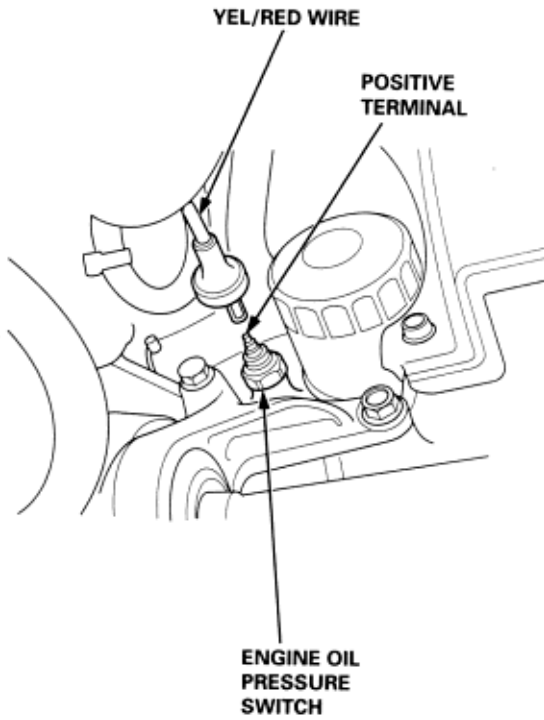
5. After installation, fill the engine with oil up to the specified level, run the engine for more than three minutes, then check for oil leakage.

Oil Pressure Switch Testing

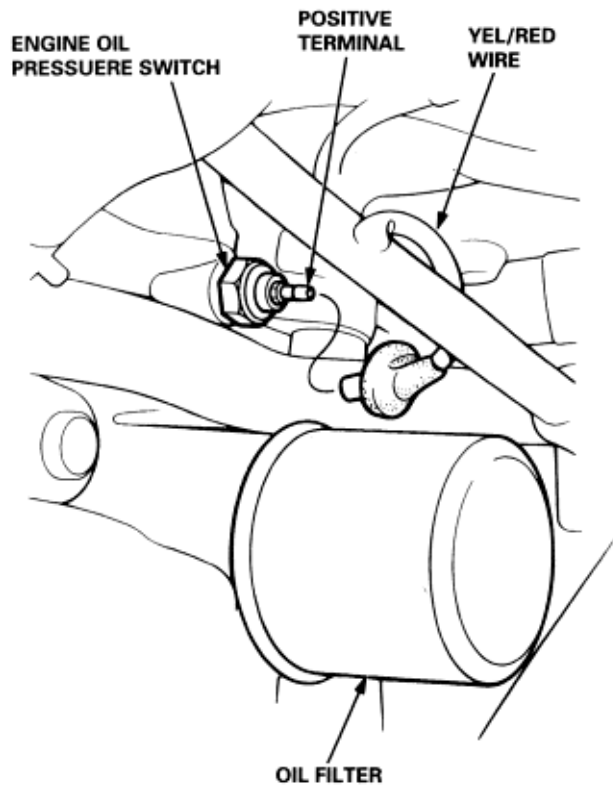
8-11

1. Remove the YEL/RED wire from the engine oil pressure switch.
2. Check for continuity between the positive terminal and the engine (ground).
 - ♦ There should be continuity with the engine stopped.
 - ♦ There should be no continuity with the engine running.

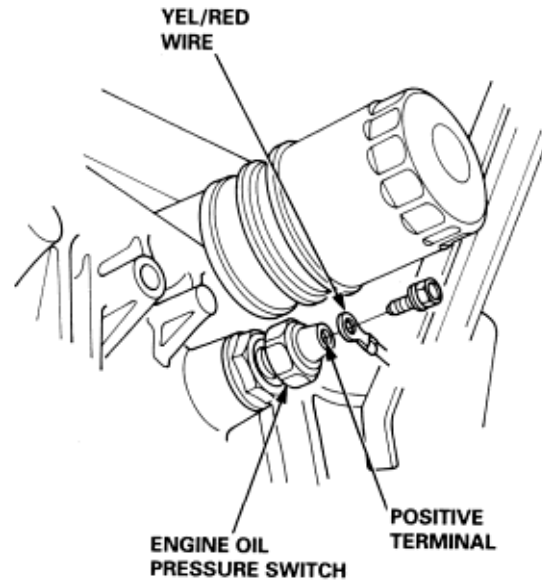
D16B6 engine:



F18B2, F18B3, F20B6 engines:



HA22A7 engine:



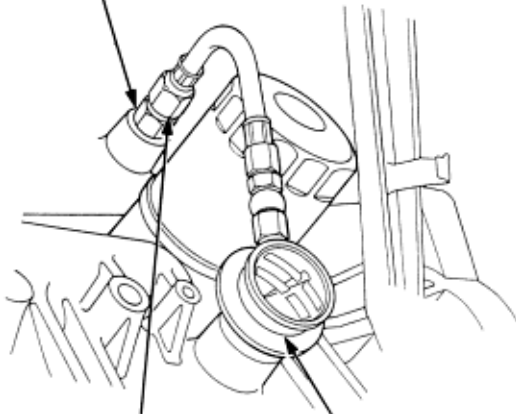
3. If the switch fails to operate, check the engine oil level. If the engine oil level is OK, check the engine oil pressure.

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the engine oil pressure switch and install an oil pressure gauge.

Except H22A7 engine:

**ENGINE OIL PRESSURE SWITCH
MOUNTING HOLE**

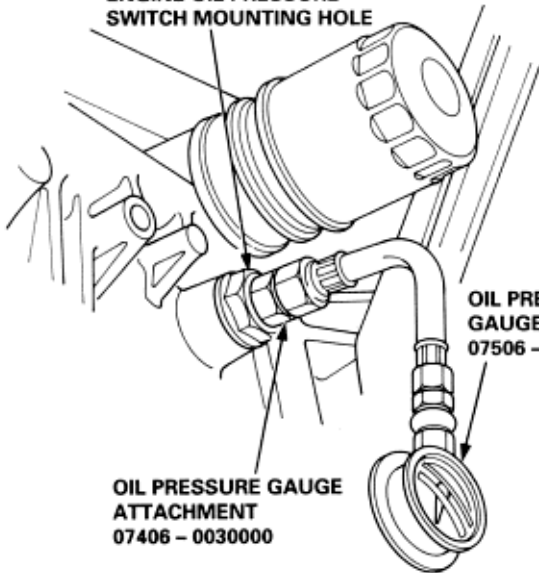


**OIL PRESSURE GAUGE
ATTACHMENT
07406 - 0030000**

**OIL PRESSURE GAUGE
07506 - 3000000**

H22A7 engine:

**ENGINE OIL PRESSURE
SWITCH MOUNTING HOLE**



**OIL PRESSURE GAUGE
ATTACHMENT
07406 - 0030000**

**OIL PRESSURE
GAUGE
07506 - 3000000**

3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

Engine Oil Temperature: 80°C (176°F)

Engine Oil Pressure:

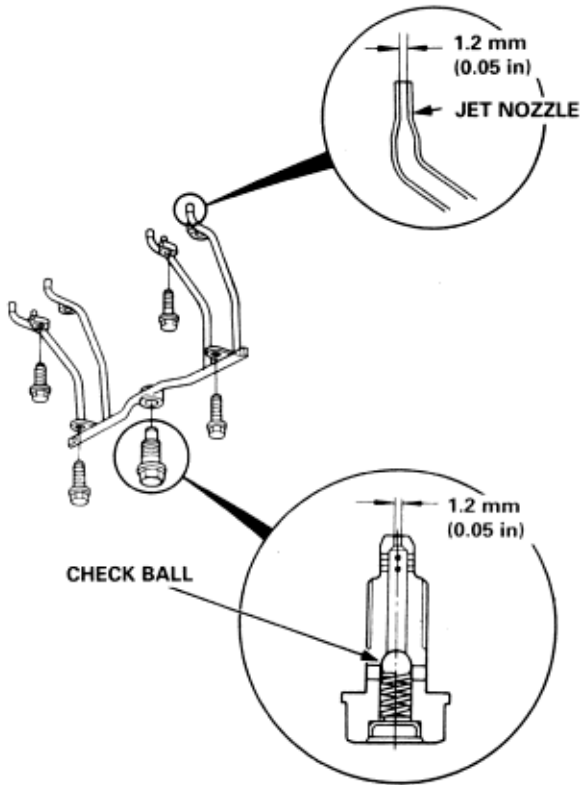
At Idle: 70 kPa (0.7 kgf /cm², 10 psi) minimum

At 3,000 rpm (min-1): 340 kPa (3.5 kgf/cm², 50 psi) minimum

- ♦ If oil pressure is NOT within specifications, inspect the oil pump (**see page 8-17**).

1. Remove the oil jet (**see page 8-5**) and inspect it as follows.
 - ♦ Make sure that a 1.1 mm (0.04 in) diameter drill will go through the nozzle hole (1.2 mm (0.05 in) diameter).
 - ♦ Insert the other end of the same 1.1 mm (0.04 in) drill into the oil intake (1.2 mm (0.05 in) diameter). Make sure the check ball moves smoothly and has a stroke of approximately 4.0 mm (0.16 in).
 - ♦ Check the oil jet operation with an air nozzle. It should take at least 200 kPa (2.0 kgf/cm², 28 psi) to unseat the check ball.

NOTE: Replace the oil jet assembly if the nozzle is damaged or bent.

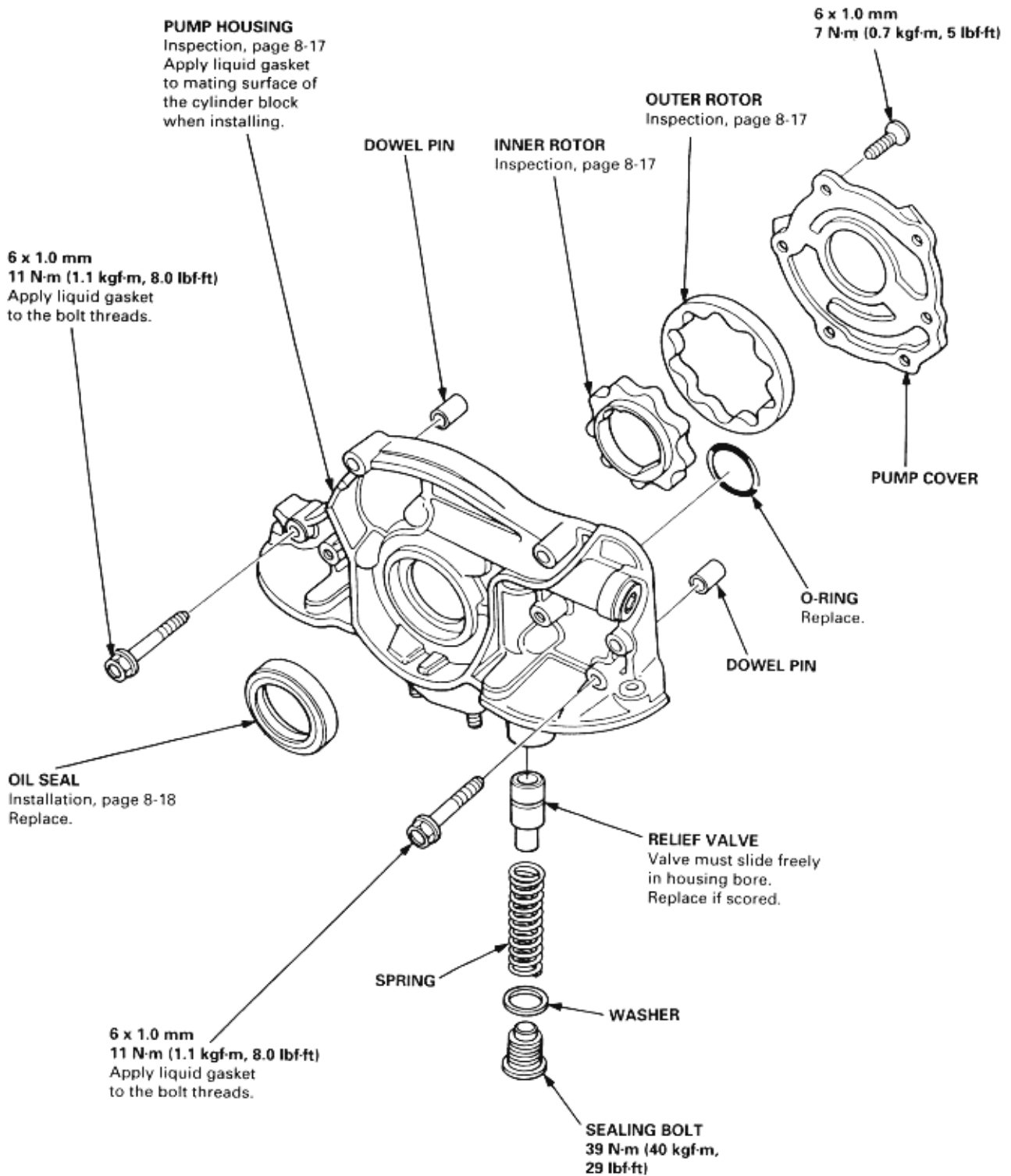


2. Mounting torque is critical. Be very precise when installing.
Torque: 39 Nm (4.0 kgf/m, 29 lbf/ft)

NOTE:

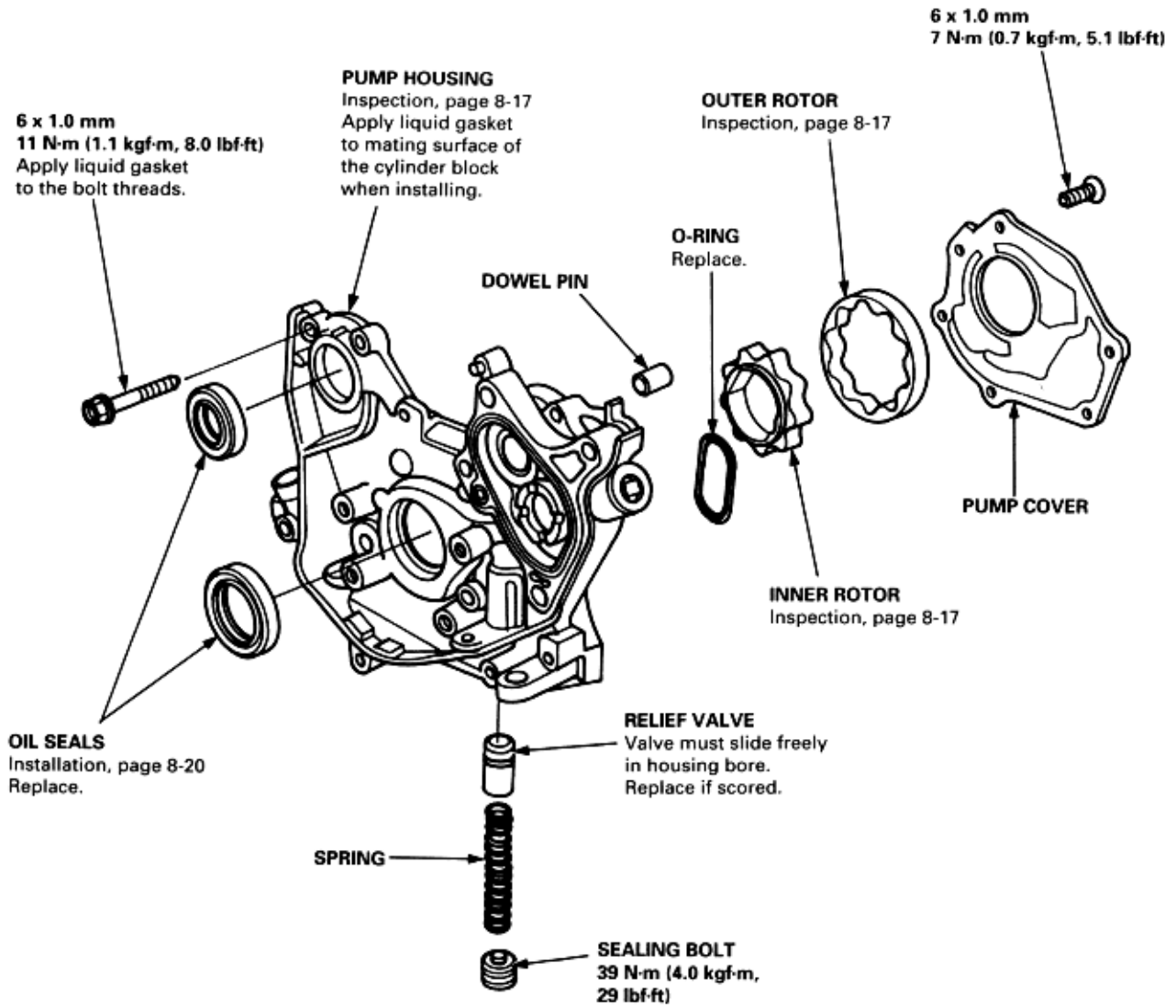
- ♦ Use new O-rings when reassembling.
- ♦ Apply oil to O-rings before installation.
- ♦ Use liquid gasket, Part No. 08C70-K0234M, 08C70-K0334M or 08C70 -X0331S
- ♦ The rotors must be installed to the same direction.
- ♦ After reassembly, check that the rotors move without binding.

D16B6 engine:



To go to the page referenced on the diagram above, click on the following:
[\(See Page 8-17\)](#)
[\(See Page 8-18\)](#)

Except D16B6 engine:



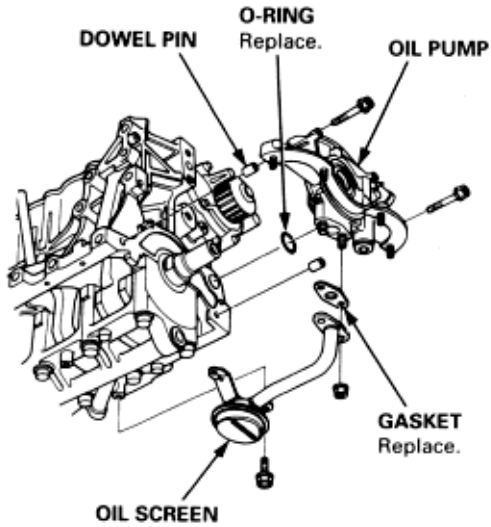
To go to the page referenced on the diagram above, click on the following:
[\(See Page 8-17\)](#)
[\(See Page 8-20\)](#)

Oil Pump Removal

8-16

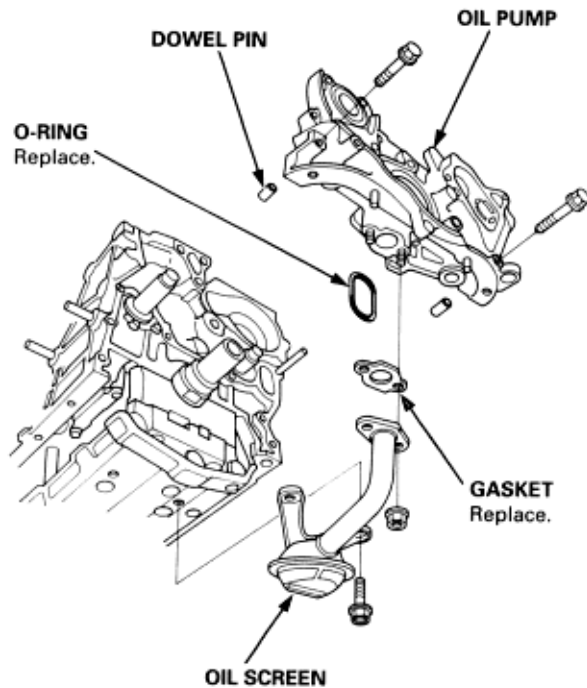
D16B6 engine:

1. Drain the engine oil.
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see section 6).
3. Remove the timing belt (see section 6).
4. Remove the oil pan and the oil screen.
5. Remove the mounting bolts and the oil pump assembly.



Except D16B6 engine:

1. Drain the engine oil.
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see section 6).
3. Remove the timing belt and the balancer belt (see section 6).
4. Remove the timing belt tensioner and the balancer belt tensioner.
5. Remove the CKP/TDC sensors, then remove the timing belt drive pulley (see section 6).
6. Remove the balancer belt driven pulley (see page 7-B-13).
7. Remove the balancer gear case and the balancer driven gear (see page 7-B-14).
8. Remove the oil pan and the oil screen.
9. Remove the mounting bolts and the oil pump assembly.



1. Remove the screws from the pump housing, then separate the housing and cover.
2. Check the inner-to-outer rotor radial clearance on the pump rotor. If the inner-to-outer rotor clearance exceeds the service limit, replace the inner and outer rotors.

Inner Rotor-to-Outer Rotor Radial Clearance

D16B6 engine:

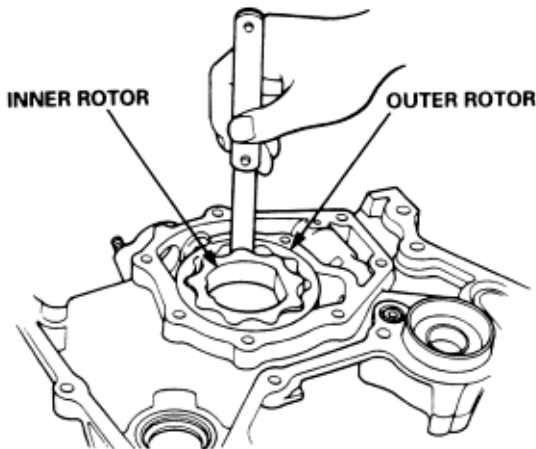
Standard (New): 0.02 - 0.14 mm
(0.001 - 0.006 in)

Service Limit: 0.20 mm (0.008 in)

Except D16B6 engine:

Standard (New): 0.02 - 0.16 mm
(0.001 - 0.006 in)

Service Limit: 0.20 mm (0.008 in)



3. Check the housing-to-rotor axial clearance on the pump rotor. If the housing-to-rotor axial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

Housing-to-Rotor Axial Clearance

D16B6 engine:

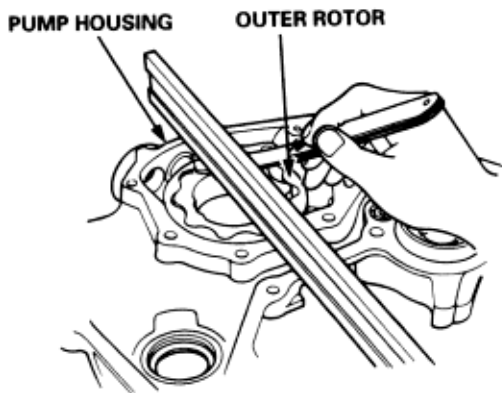
Standard (New): 0.03 - 0.08 mm
(0.001 - 0.003 in)

Service Limit: 0.15 mm (0.006 in)

Except D16B6 engines:

Standard (New): 0.02 - 0.07 mm
(0.001 - 0.003 in)

Service Limit: 0.12 mm (0.005 in)



4. Check the housing-to-outer rotor radial clearance. If the housing-to-outer rotor radial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

Housing-to-Outer Rotor Radial Clearance

D16B6 engine:

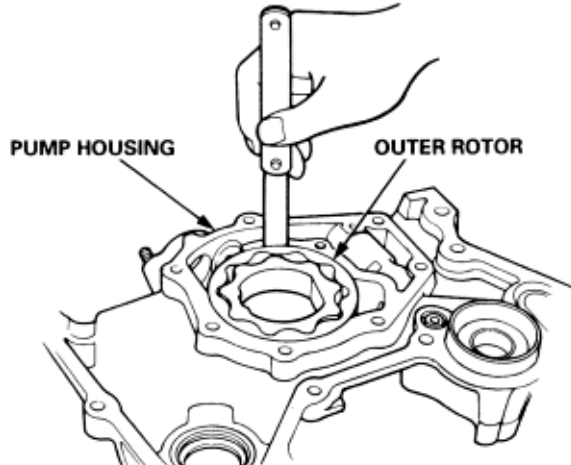
Standard (New): 0.10 - 0.18 mm
(0.004 - 0.007 in)

Service Limit: 0.20 mm (0.008 in)

Except D16B6 engine:

Standard (New): 0.10 - 0.19 mm
(0.004 - 0.007 in)

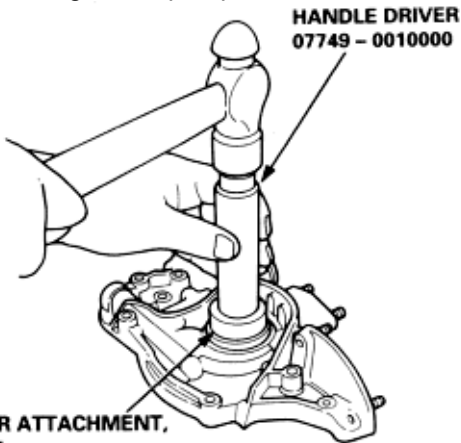
Service Limit: 0.21 mm (0.008 in)



5. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.

D16B6 engine:

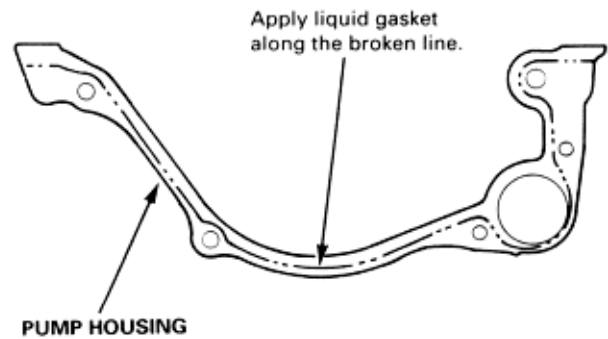
1. Remove the old oil seal from the oil pump.
2. Using the special tool, gently tap in the new oil seal until the driver bottoms against the pump.
NOTE: The oil seal alone can be replaced without removing the oil pump.

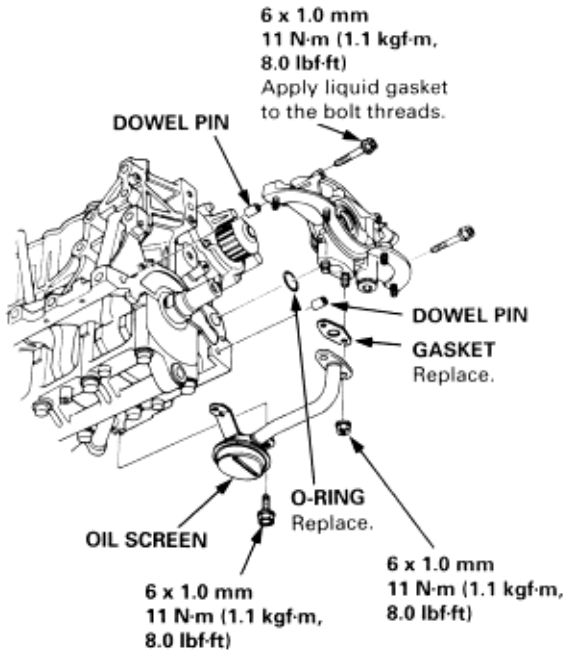


3. Reassemble the oil pump, applying thread lock to the pump housing screws.
4. Check that the oil pump turns freely.
5. Apply a light coat of oil to the seal lip.
6. Install the two dowel pins and new O-ring on the oil pump.

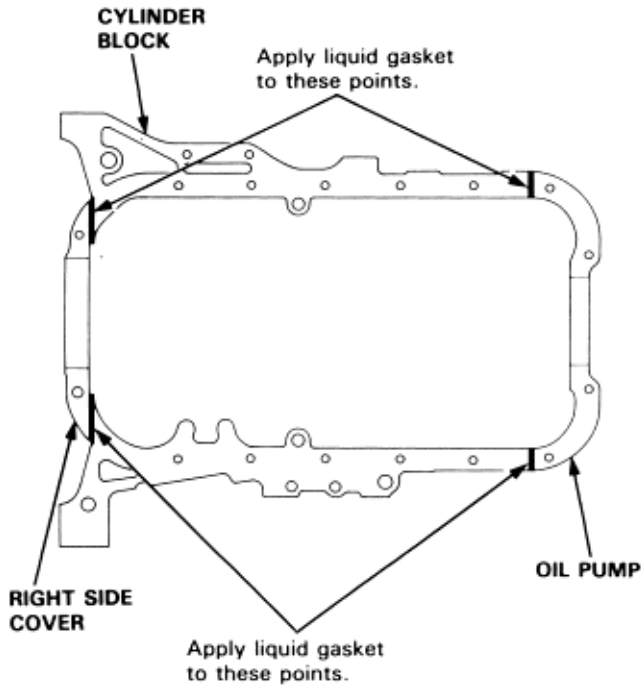
7. Apply liquid gasket to the oil pump and install it.
NOTE:

- ♦ Use liquid gasket, Part No. 08C70- K0234M, 08C70- K0334M or 08C70-X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- ♦ To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
- ♦ Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.
- ♦ Apply grease to the lips of the crankshaft oil seal. Then, install the oil pump inner rotor onto the crankshaft. When the pump is in place, clean any excess grease off the crankshaft, then check that the oil seal lips are not distorted.

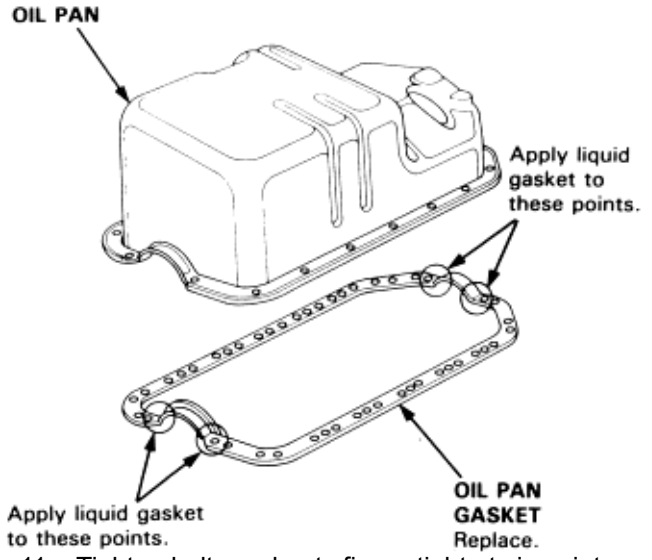




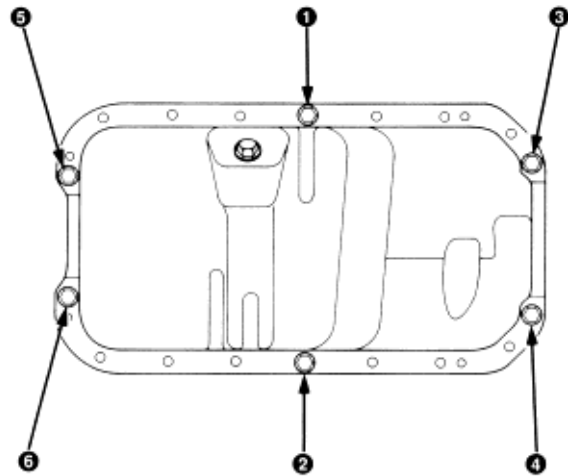
8. Install the oil screen.
9. Apply liquid gasket to the oil pump and right side cover mating areas as shown below.



10. Install the oil pan gasket and oil pan.
NOTE:
 - ♦ Use a new oil pan gasket.
 - ♦ Install oil pan no more than five minutes after liquid gasket applied.



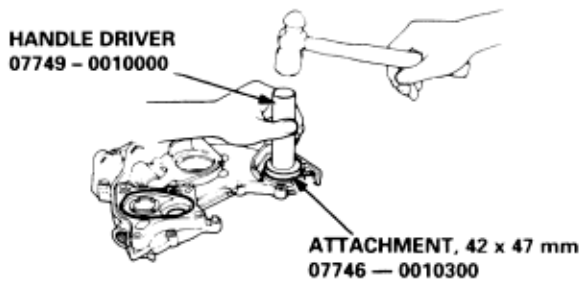
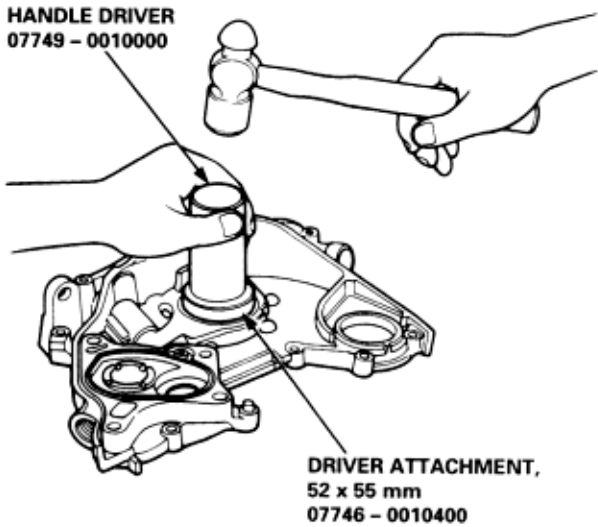
11. Tighten bolts and nuts finger tight at six points as shown below.



12. Tighten all bolts and nuts, starting from bolt (1), clockwise direction.
NOTE: Excessive tightening can cause distortion of oil pan gasket and oil leakage.
Torque: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)

Except D16B6 engine:

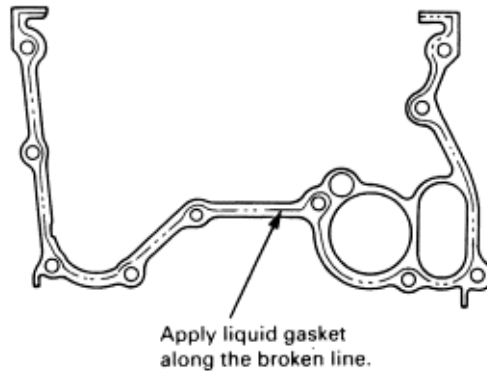
1. Remove the old oil seals from the oil pump.
2. Gently tap in the new oil seals until the special tool bottoms on the pump.
NOTE: The oil seals alone can be replaced without removing the oil pump by using the special tools.

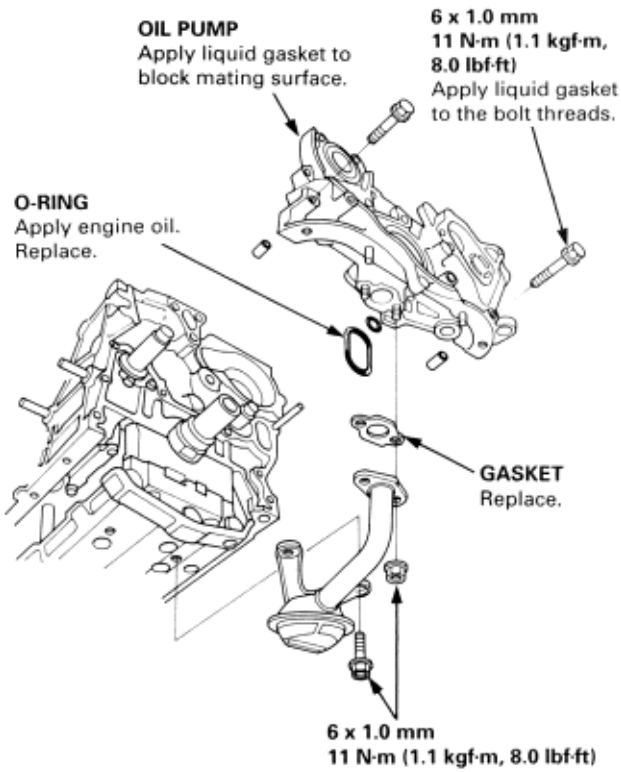


3. Reassemble the oil pump, applying liquid thread lock to the pump housing screws.
4. Check that the oil pump turns freely.
5. Install a dowel pin and the new O-ring on the pump.
6. Apply liquid gasket to the oil pump and install it.

NOTE:

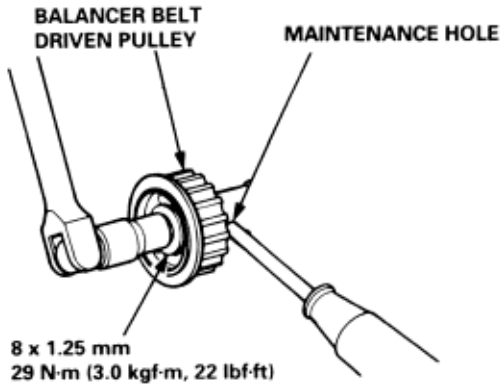
- ♦ Use liquid gasket for European models, Part No. 08C70-K0234M, 08C70-K0334M or 08C70-X0331S.
- ♦ Check that the mating surfaces are clean and dry before applying liquid gasket.
- ♦ Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- ♦ To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
- ♦ Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- ♦ After assembly, wait at least 30 minutes before filling the engine with oil.
- ♦ Apply grease to the lips of the crankshaft oil seal and the balancer shaft seal. Then, install the oil pump inner rotor onto the crankshaft. When the pump is in place, clean any excess grease off the crankshaft and the balancer shaft, then check that the oil seal lips are not distorted.



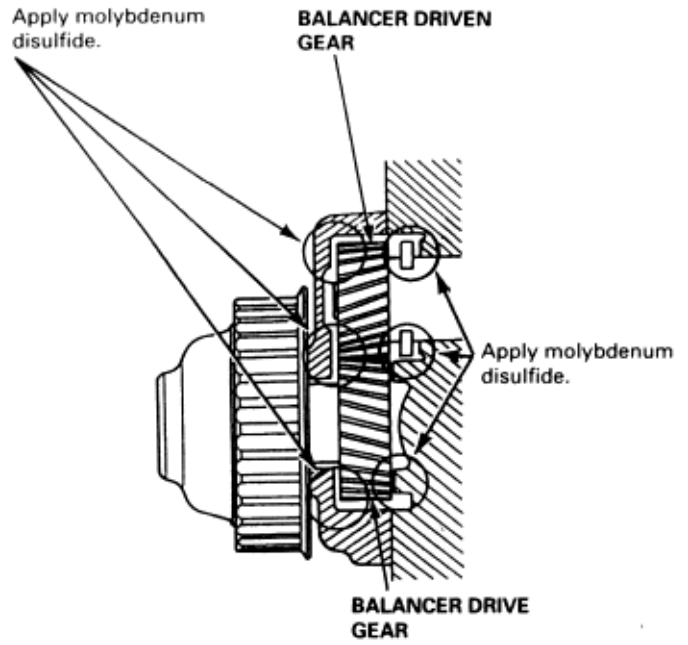


7. Install the oil screen.
8. Hold the front balancer shaft with a screwdriver, then install the timing balancer belt driven pulley.

FRONT BALANCER:

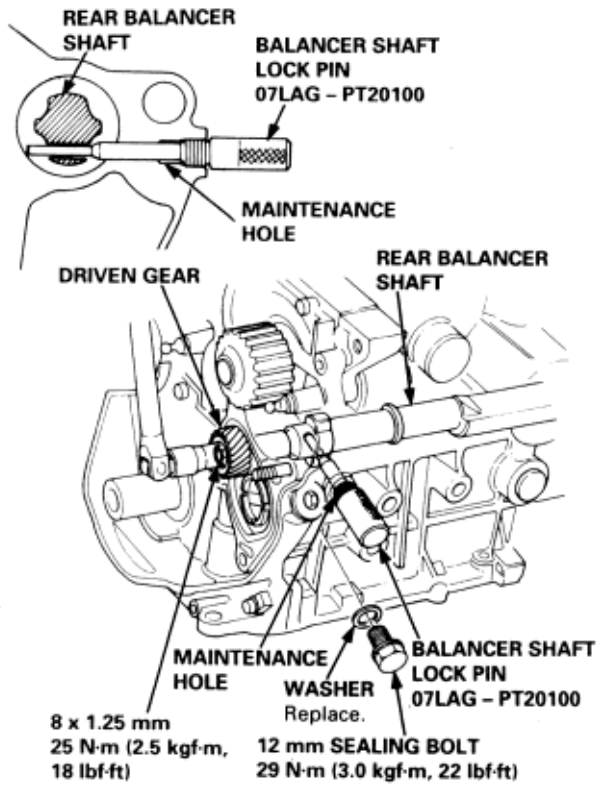


9. Before installing the balancer driven gear and the balancer gear case, apply molybdenum disulfide to the thrust surfaces of the balancer gears as shown.

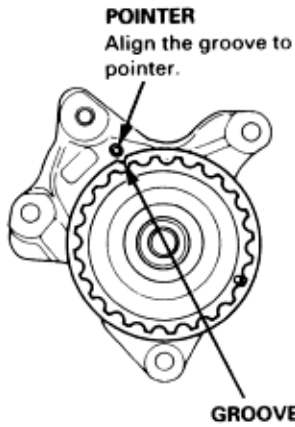
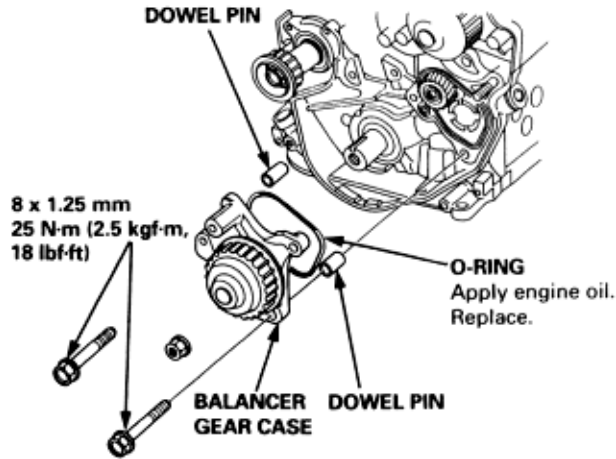


10. Hold the rear balancer shaft with the special tool, then install the balancer driven gear.

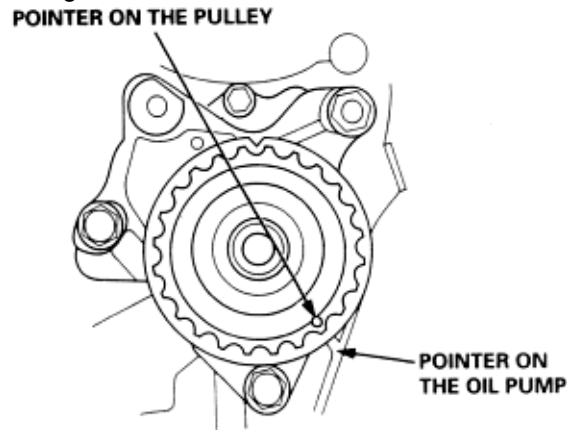
REAR BALANCER SHAFT:



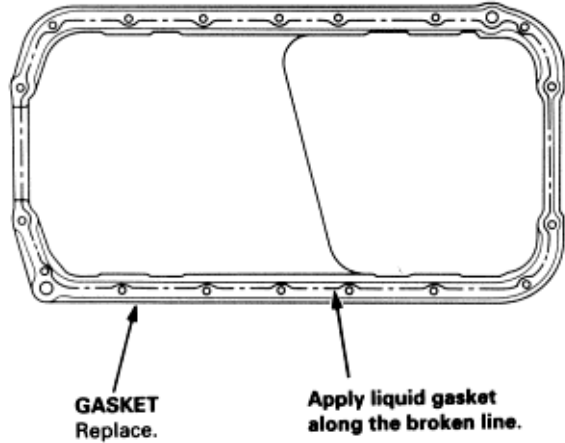
11. Install the balancer gear case on the oil pump.
NOTE: Align the groove on the pulley edge to the pointer on the gear case while holding the rear balancer with the special tool, then install the gear case.



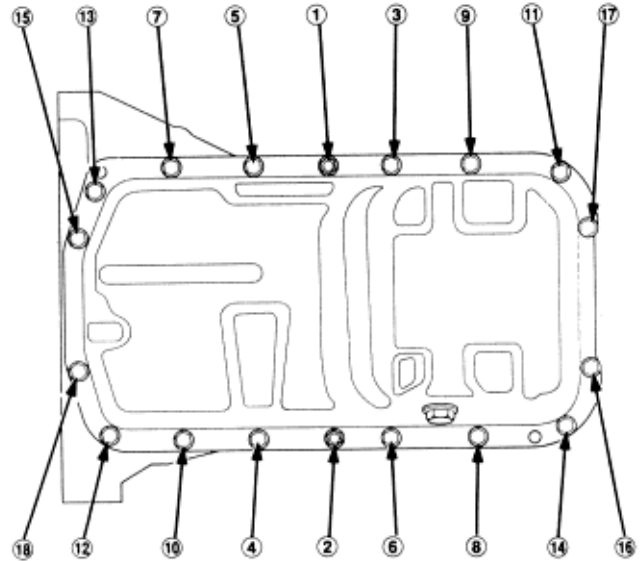
12. Check the alignment of the pointers after installing the gear case.



13. Apply liquid gasket, Part No. 08C70-K0334M or 08C70-X0331S, to the cylinder block mating surface of the oil pan, then install the oil pan.
NOTE:
- ♦ Apply liquid gasket 4 mm wide.
 - ♦ Apply liquid gasket doubly to the jointing point of the liquid gasket.



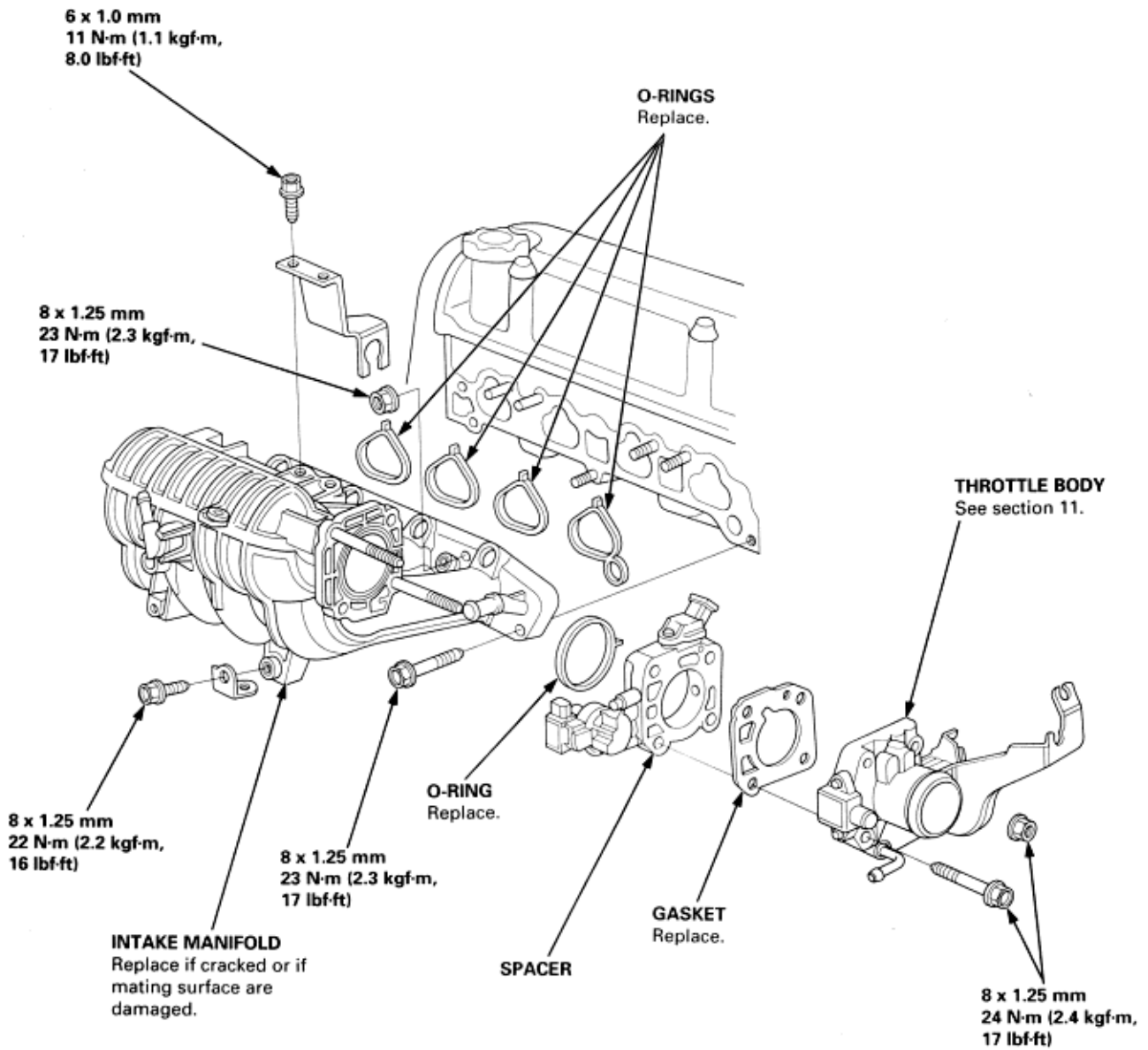
14. Tighten the bolts/nuts in two or three steps. In the final step, tighten all bolts/nuts, in sequence to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).



Intake Manifold Replacement

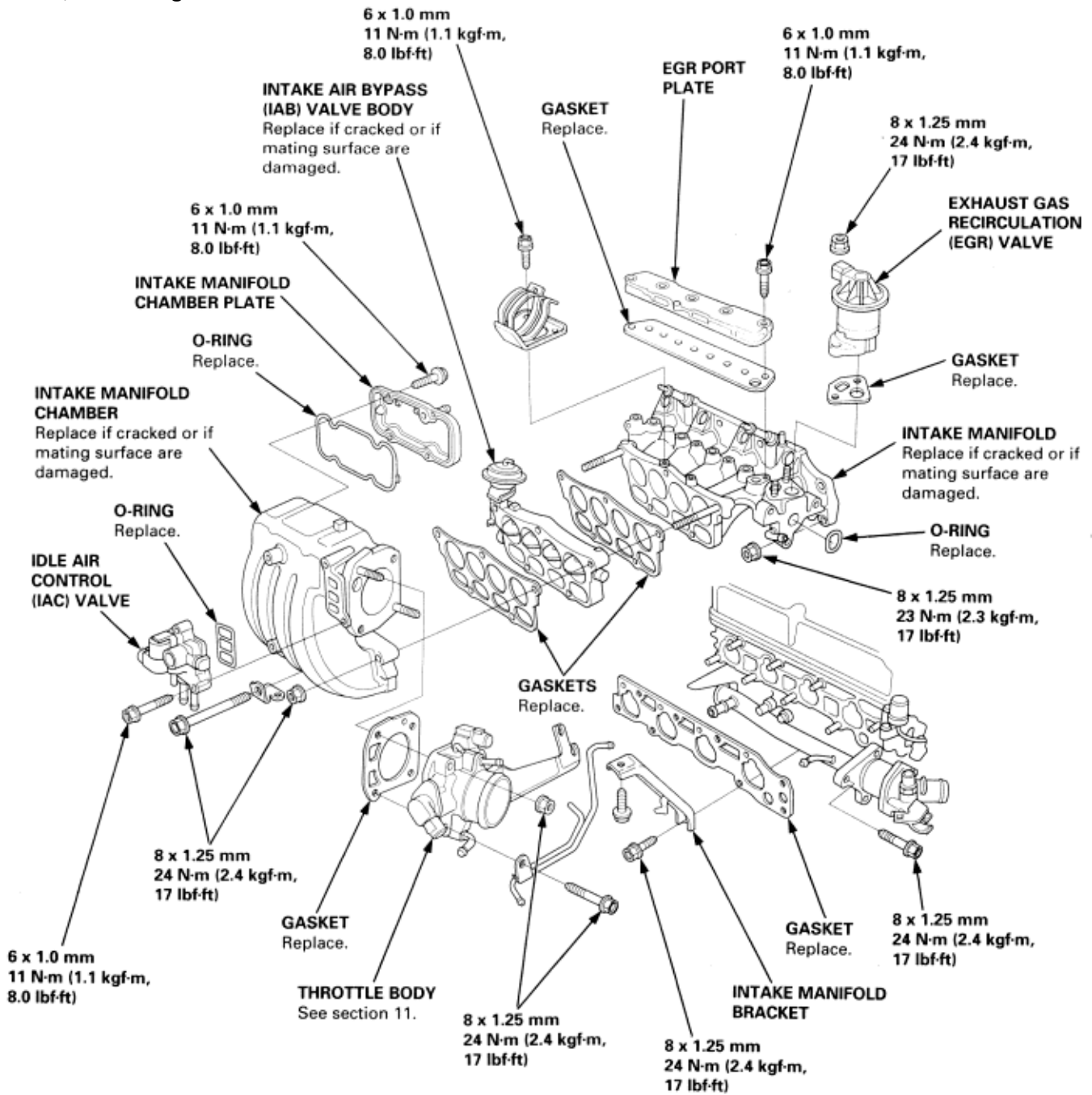
9-2

Note: Use new O-rings and gaskets when reassembling.
D16B6 engine:



**Intake Manifold
Replacement (cont'd)**

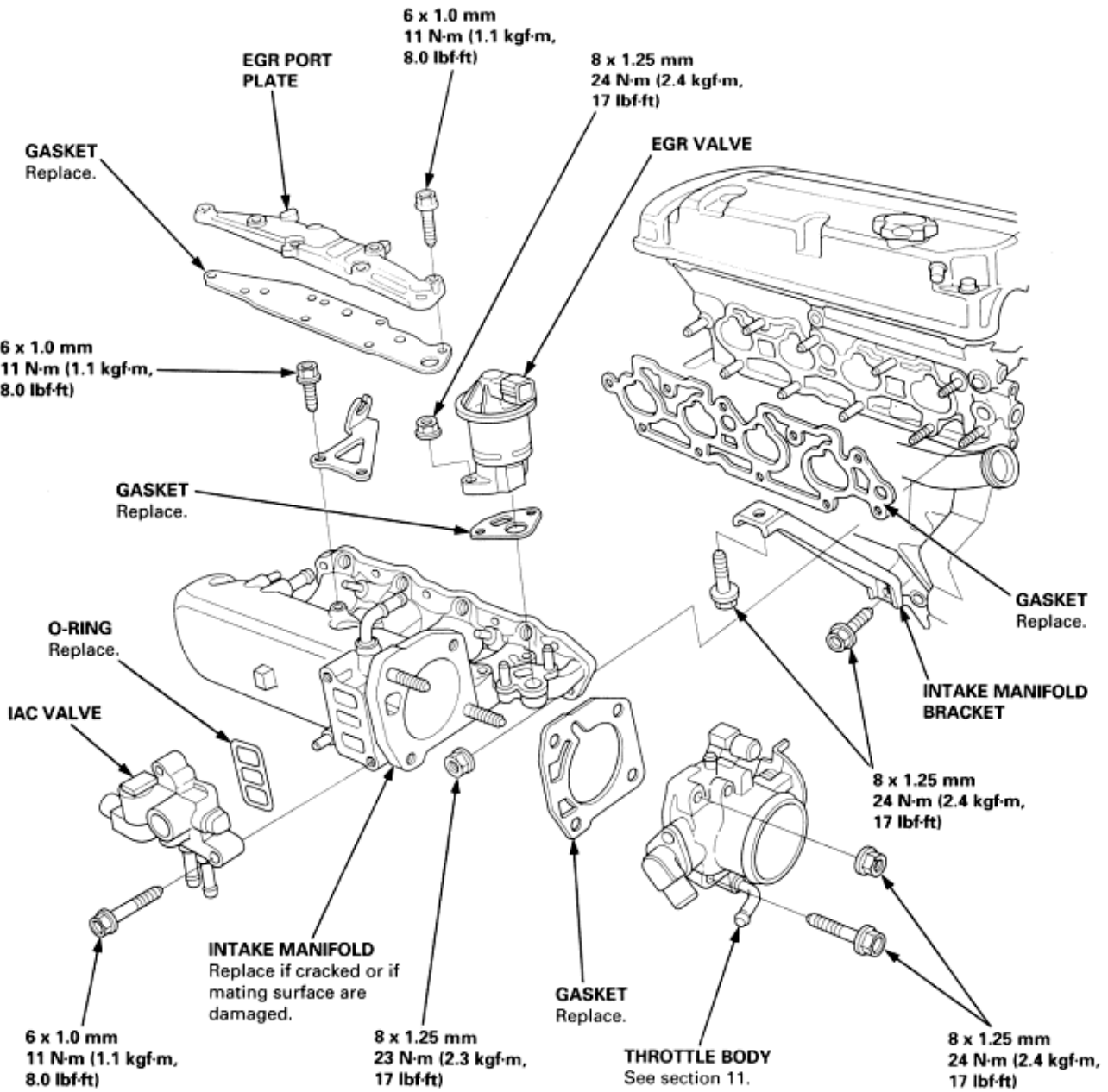
F18B2, F18B3, F20B6 engines:



Intake Manifold Replacement (cont'd)

9-4

- NOTE:
- ♦ Use new O-rings and gaskets when reassembling.
 - ♦ Remove the wire harness clamp from the rear mount bracket before removing the intake manifold.
- H22A7 engine:



Exhaust Manifold Replacement

9-5

NOTE: Use new gaskets and self-locking nuts when reassembling.

D16B6 engine:

8 x 1.25 mm
24 N-m (2.4 kgf-m,
17 lbf-ft)

COVER

EXHAUST
MANIFOLD

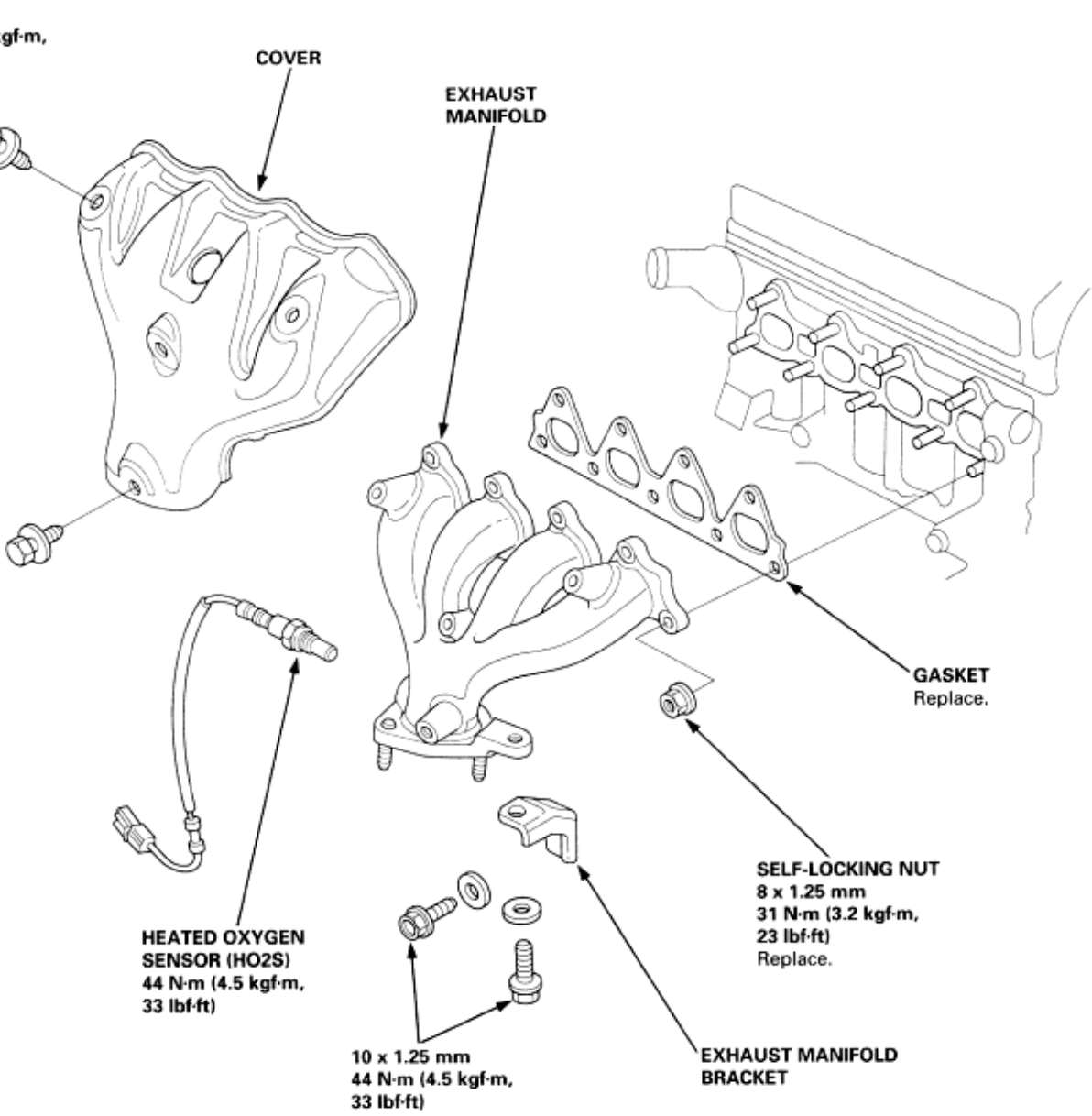
GASKET
Replace.

HEATED OXYGEN
SENSOR (HO2S)
44 N-m (4.5 kgf-m,
33 lbf-ft)

SELF-LOCKING NUT
8 x 1.25 mm
31 N-m (3.2 kgf-m,
23 lbf-ft)
Replace.

10 x 1.25 mm
44 N-m (4.5 kgf-m,
33 lbf-ft)

EXHAUST MANIFOLD
BRACKET



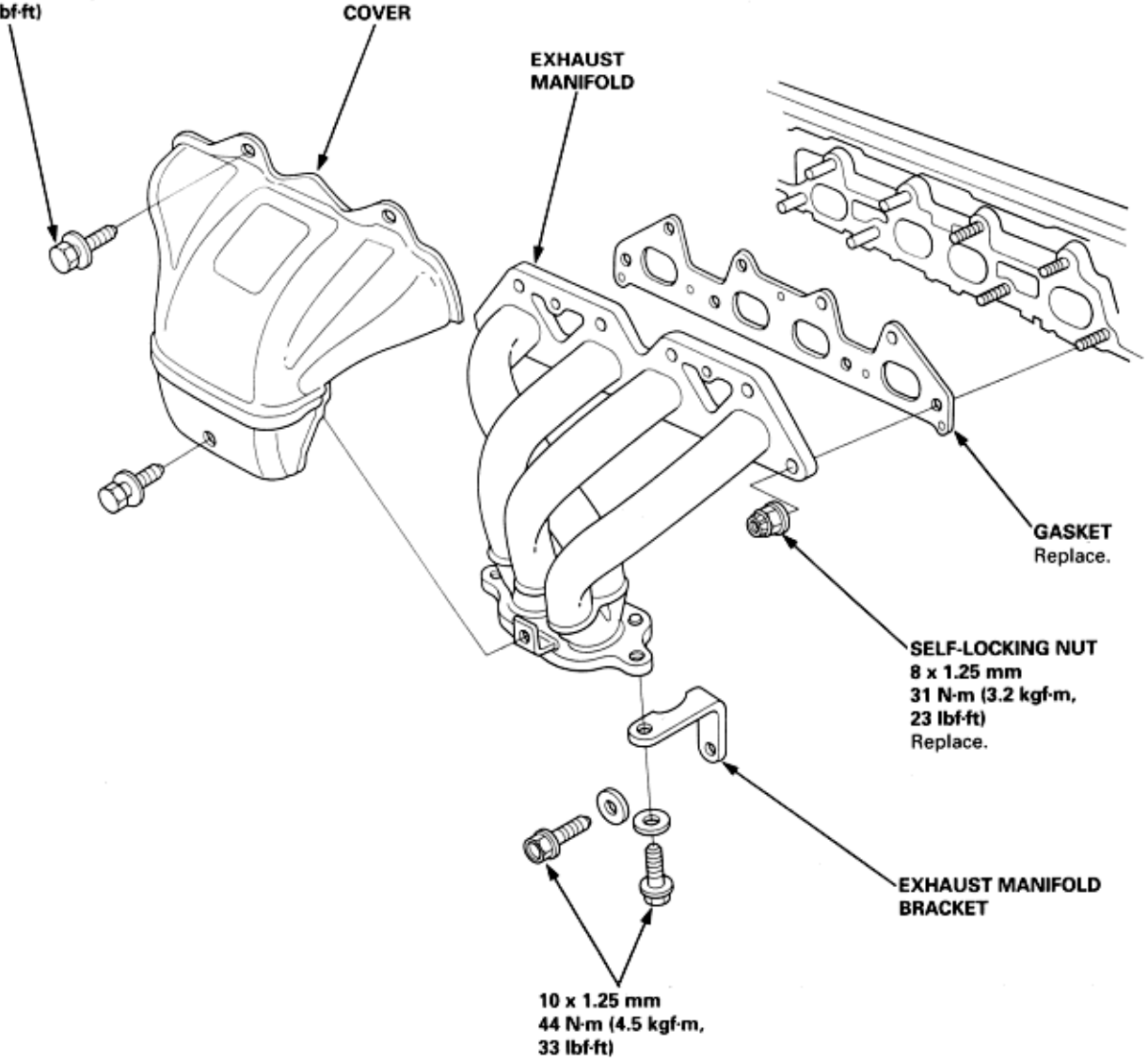
**Exhaust Manifold
Replacement (cont'd)**

9-6

NOTE: Use new gaskets and self-locking nuts when reassembling.

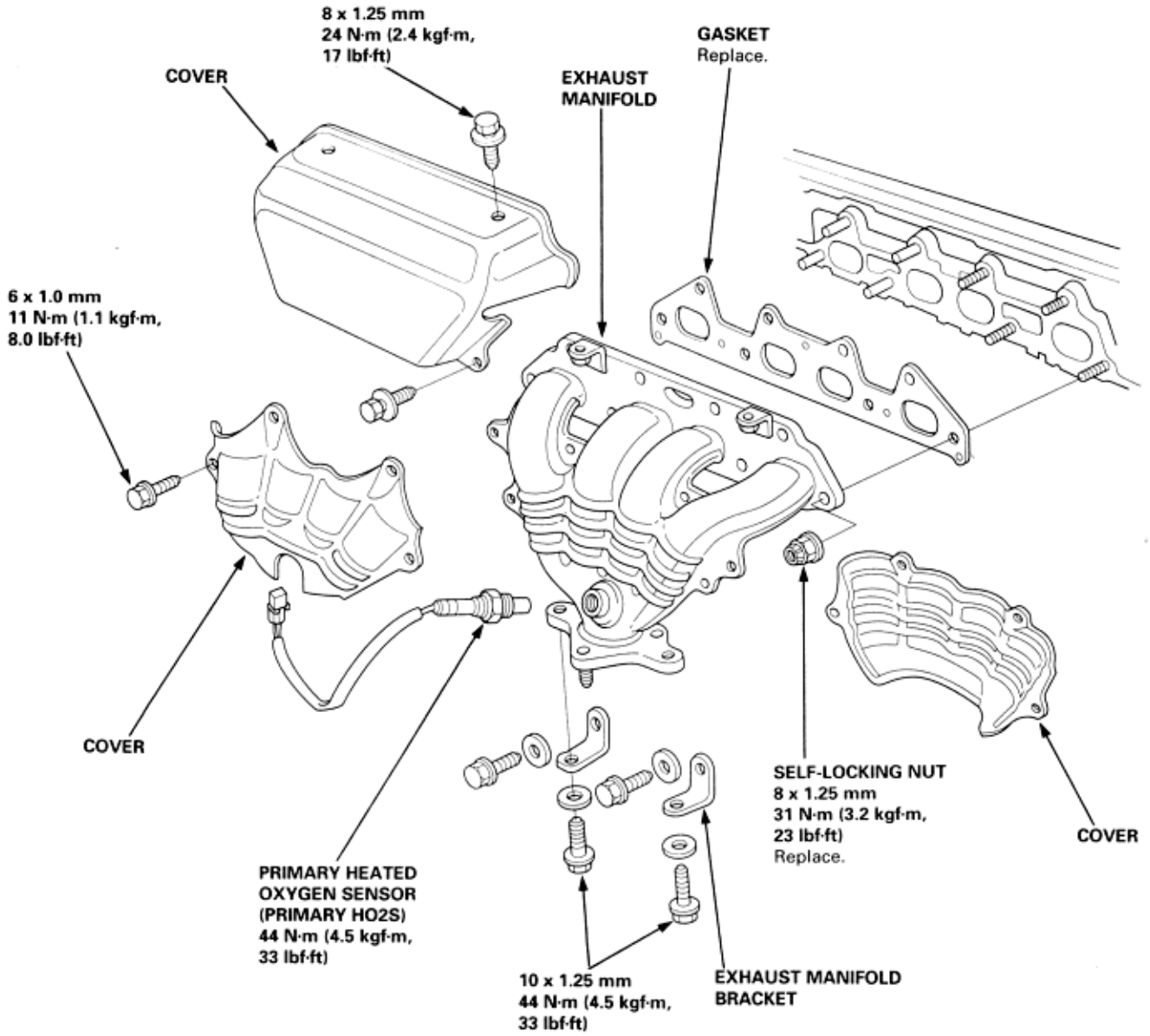
F18B2, F18B3 engines:

**8 x 1.25 mm
24 N-m (2.4 kgf-m,
17 lbf-ft)**



**Exhaust Manifold
Replacement (cont'd)**

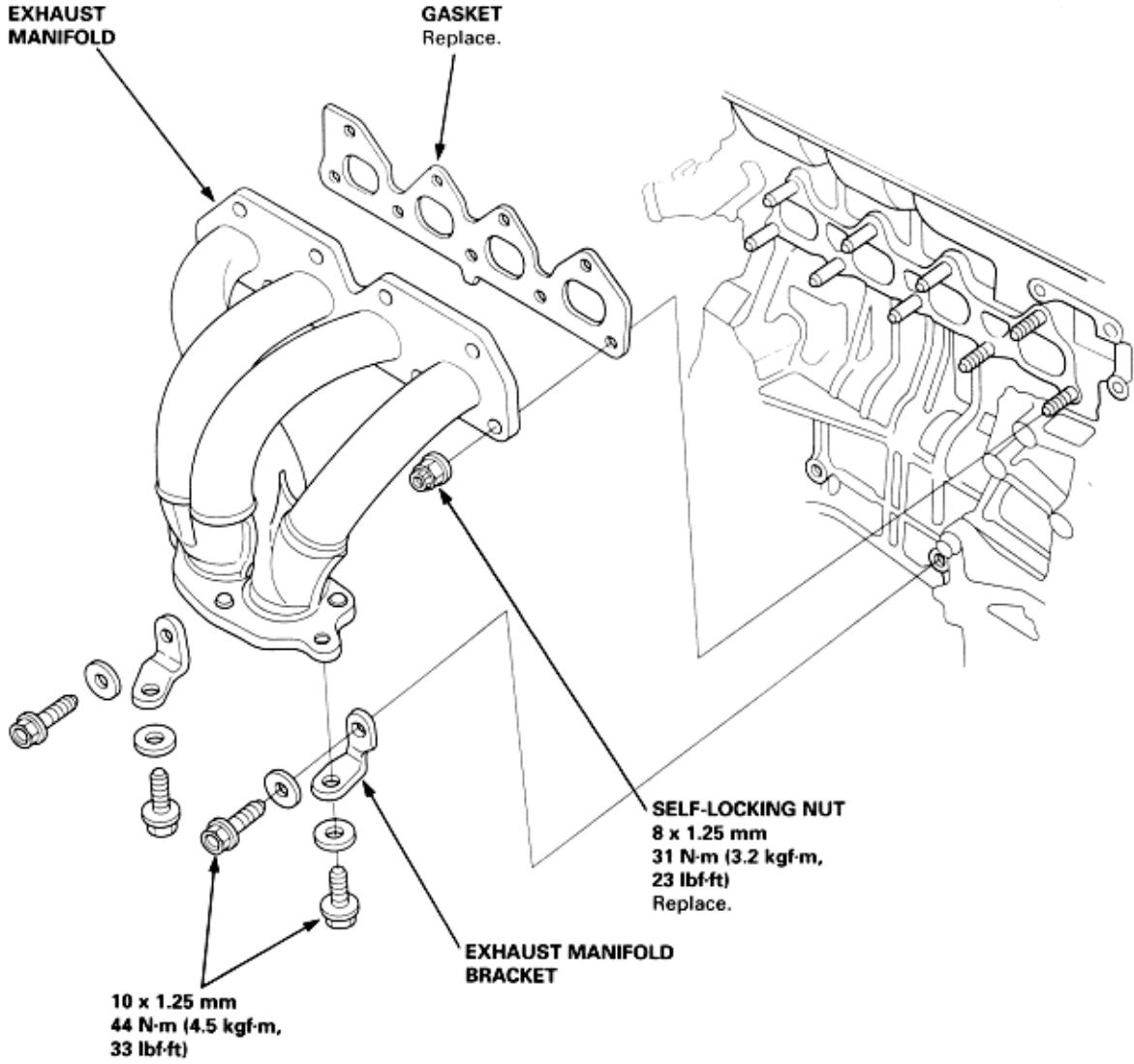
F20B6 engine:



**Exhaust Manifold
Replacement (cont'd)**

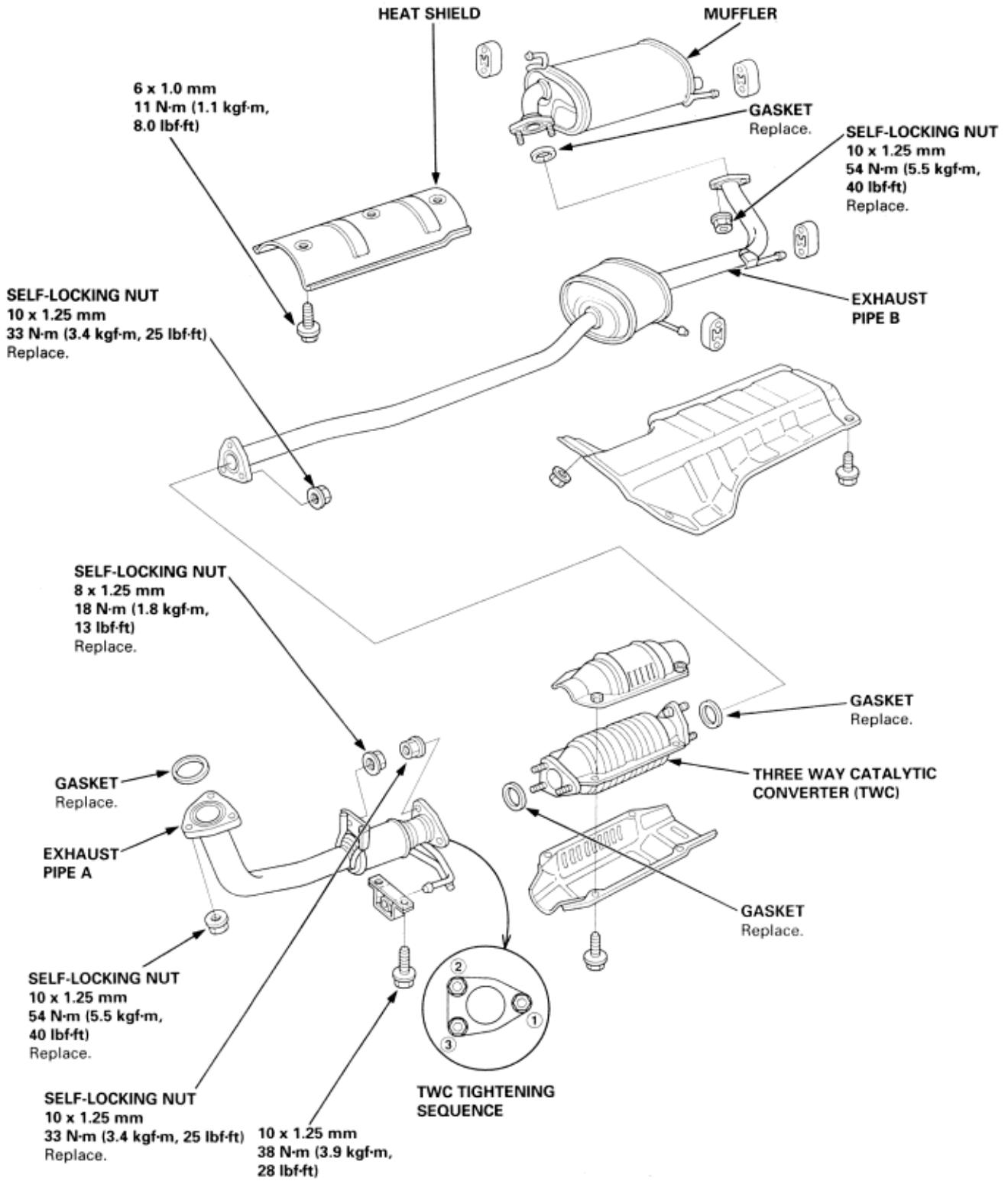
9-8

NOTE: Use new gaskets and self-locking nuts when reassembling.
H22A7 engine:



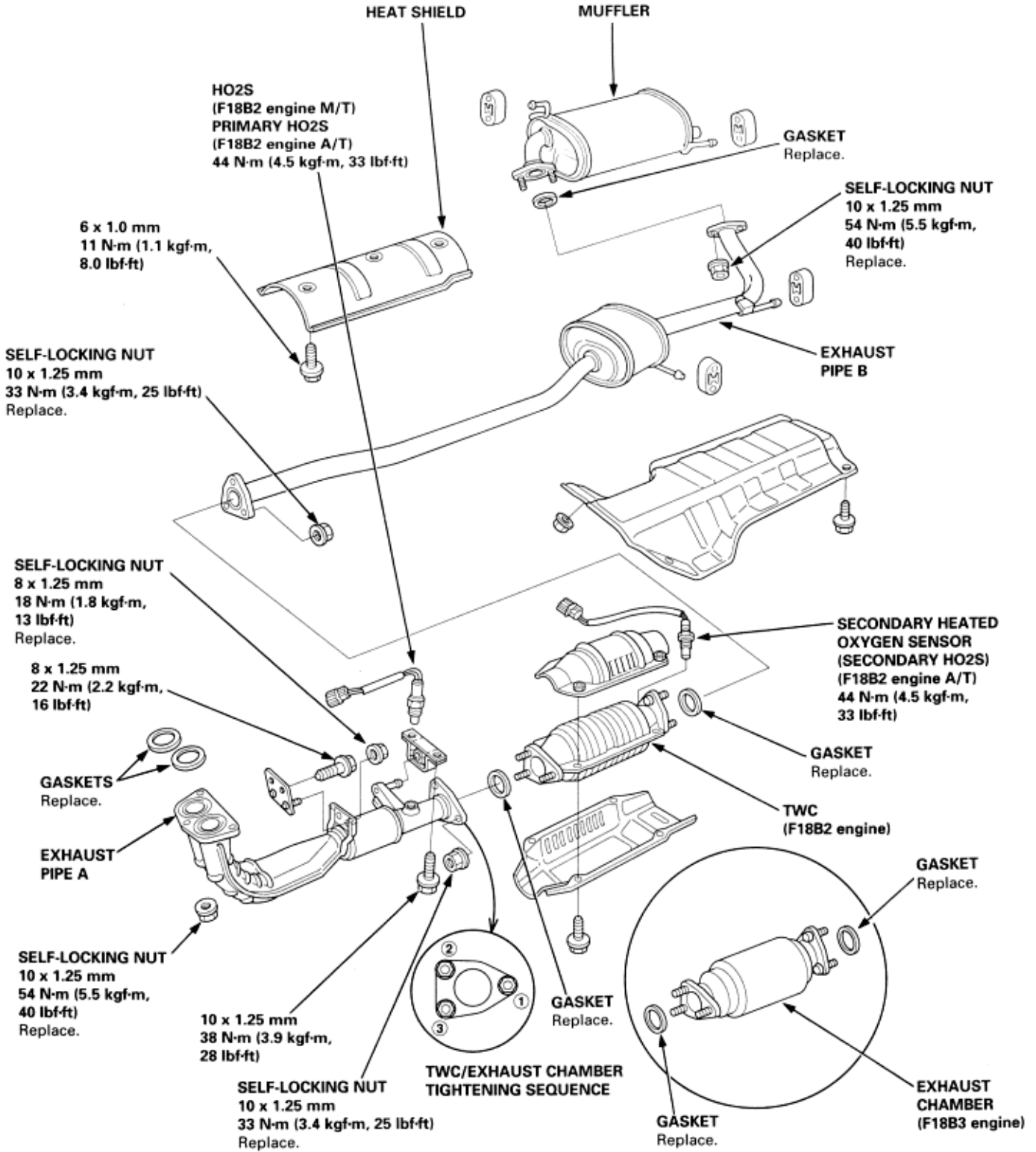
Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.
D16B6 engine:



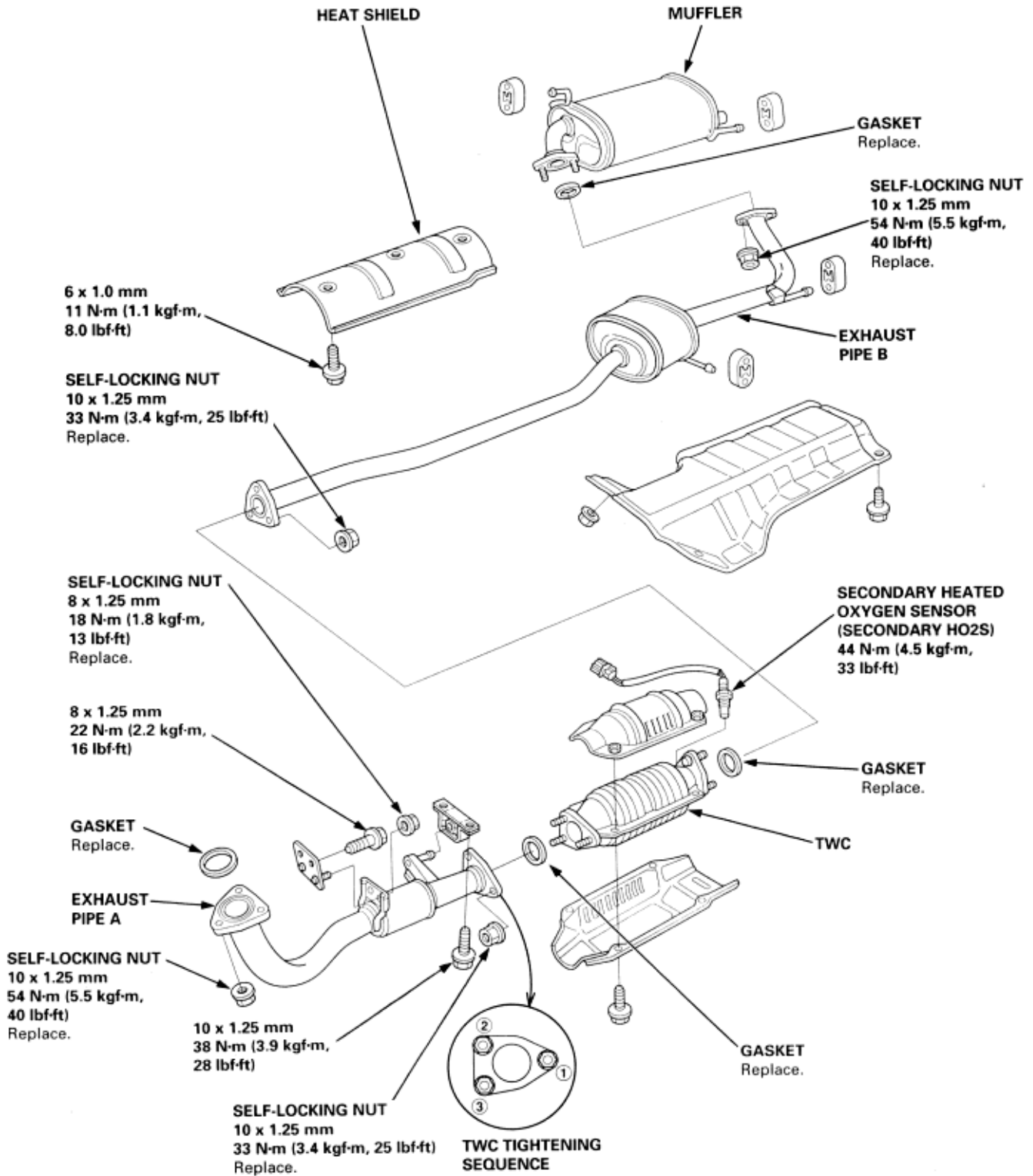
Exhaust Pipe and Muffler Replacement (cont'd)

NOTE: Use new gaskets and self-locking nuts when reassembling.
F18B2, F18B3 engines:



**Exhaust Pipe and Muffler
Replacement (cont'd)**

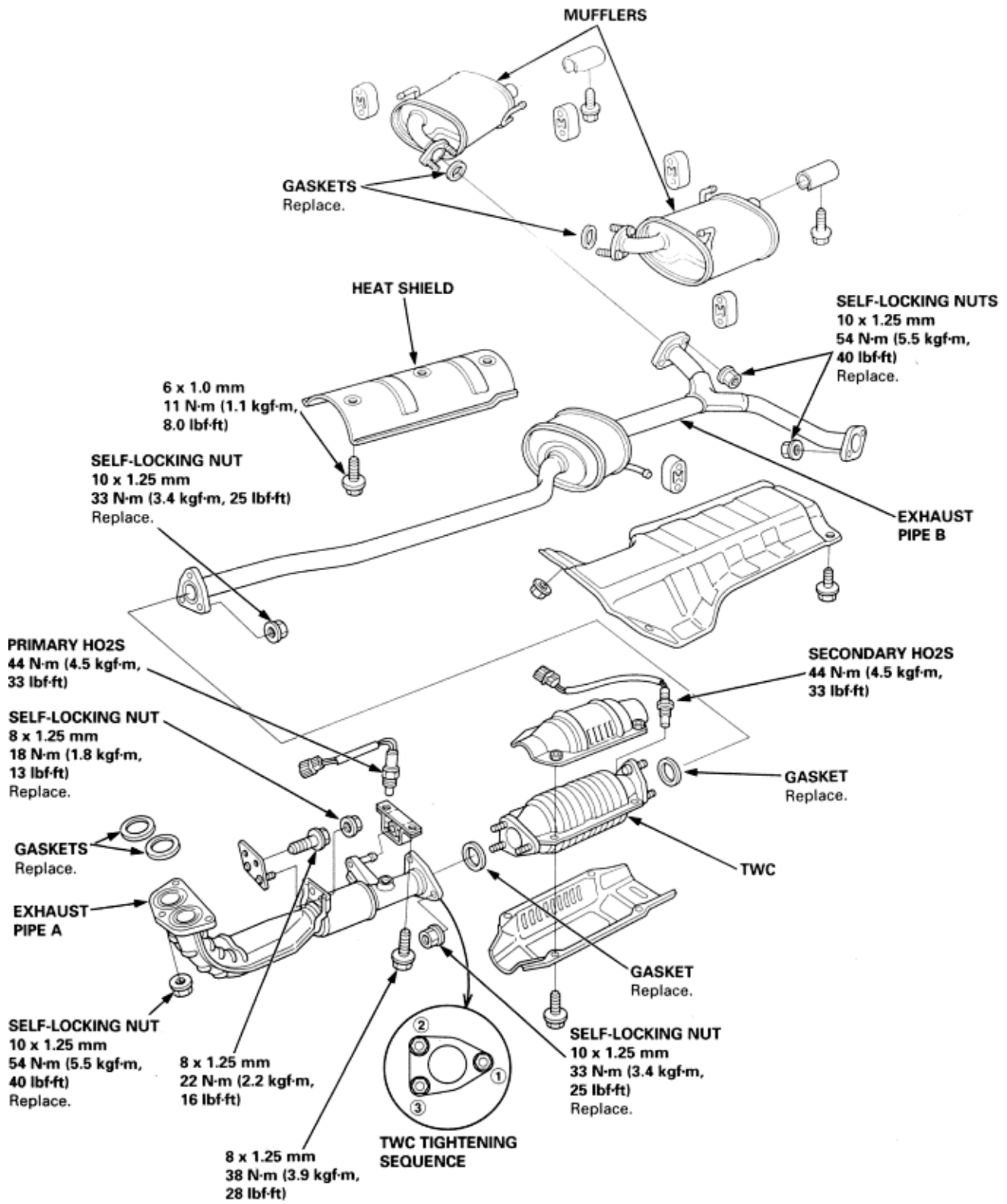
F20B6 engine:



Exhaust Pipe and Muffler Replacement (cont'd)

9-12

NOTE: Use new gaskets and self-locking nuts when reassembling.
H22A7 engine:



Total Cooling System Capacity [Including heater and reservoir]

D16B6 engine: 4.6 / (4.9 US qt, 4.0 Imp qt)

F18B2, F18B3, F20B6 engines:

M/T: 5.8 / (6.1 US qt, 5.1 Imp qt)

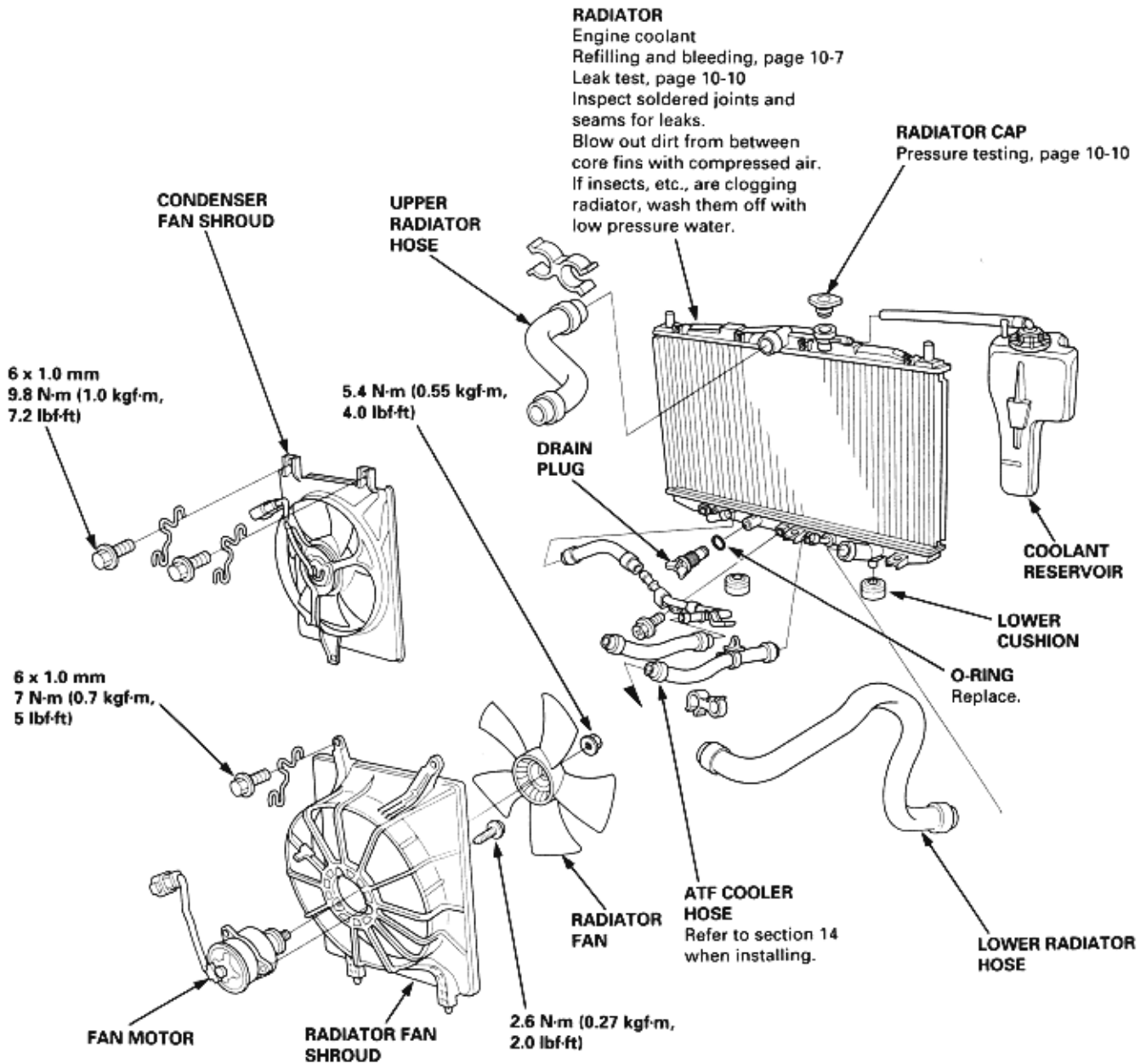
A/T: 5.7 / (6.0 US qt, 5.0 Imp qt)

H22A7 engine: 6.9 / (7.3 US qt, 6.1 Imp qt)

Reservoir capacity: 0.55 / (0.58 US qt, 0.48 Imp qt)

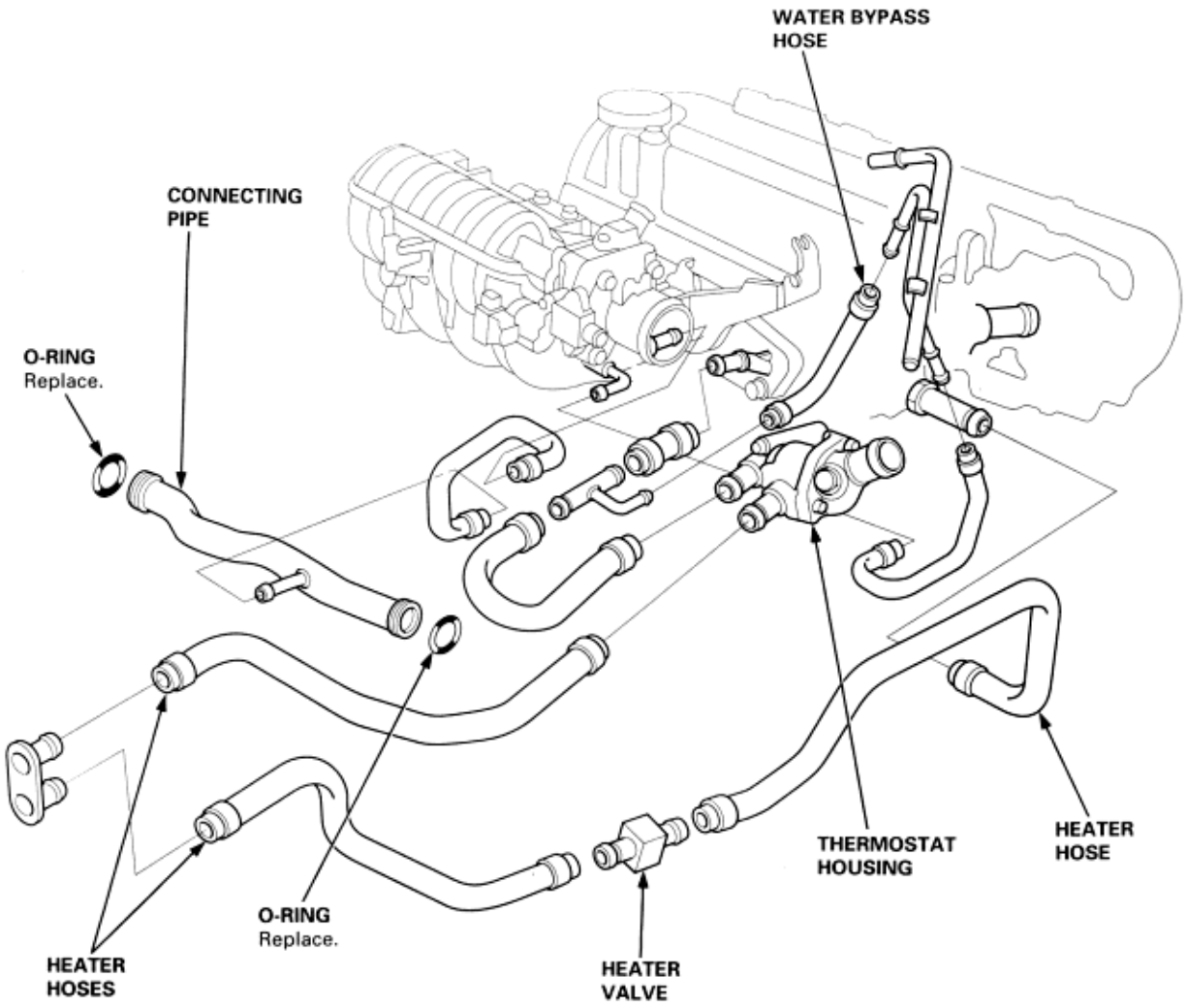
NOTE:

- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings when reassembling.

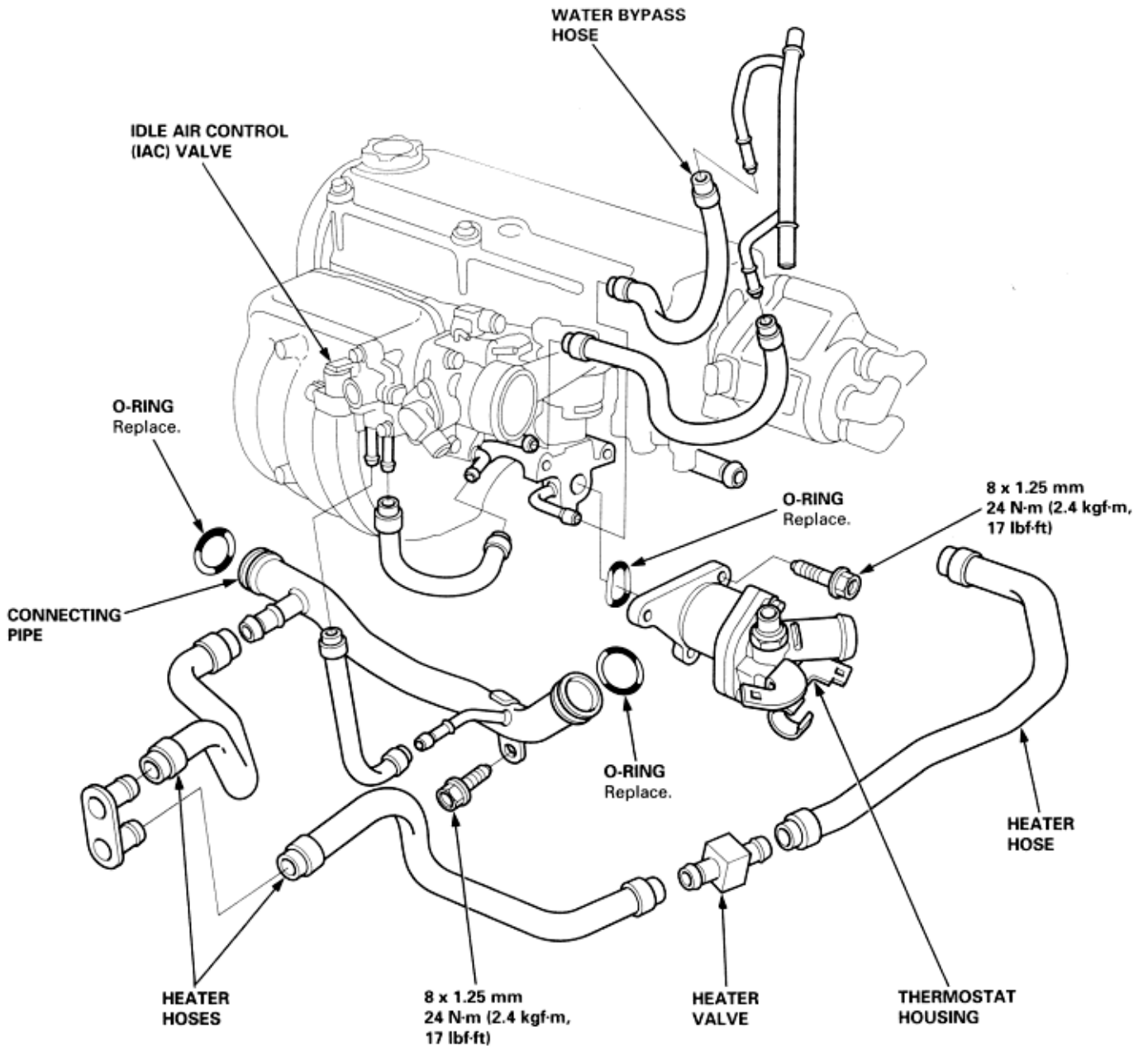


To go to the page referenced on the diagram above, click on the following:
(See Page 10-7)
(See Page 10-10)

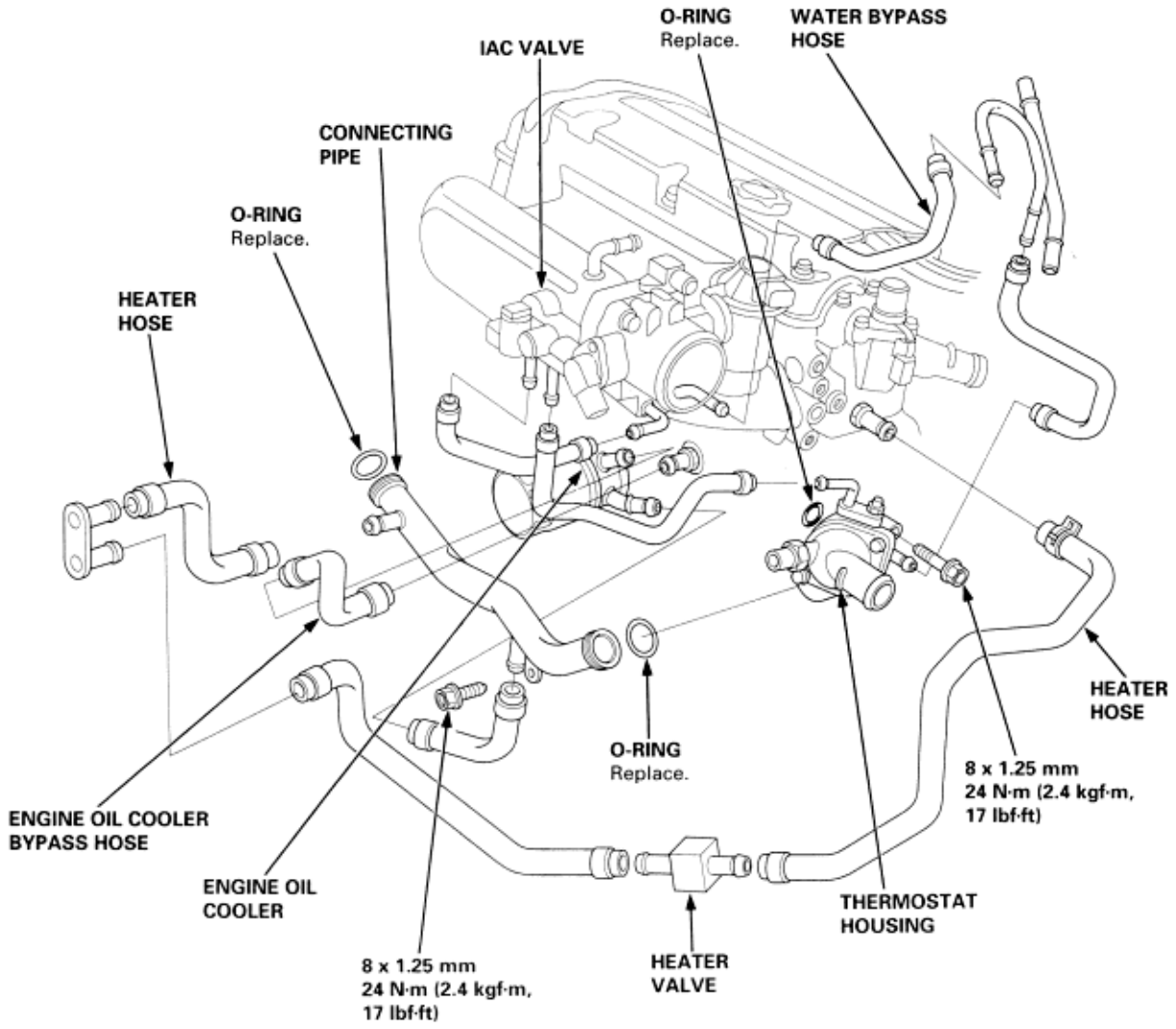
Engine Hose Connection:
D16B6 engine:



F18B2, F18B3, F20B6 engines:



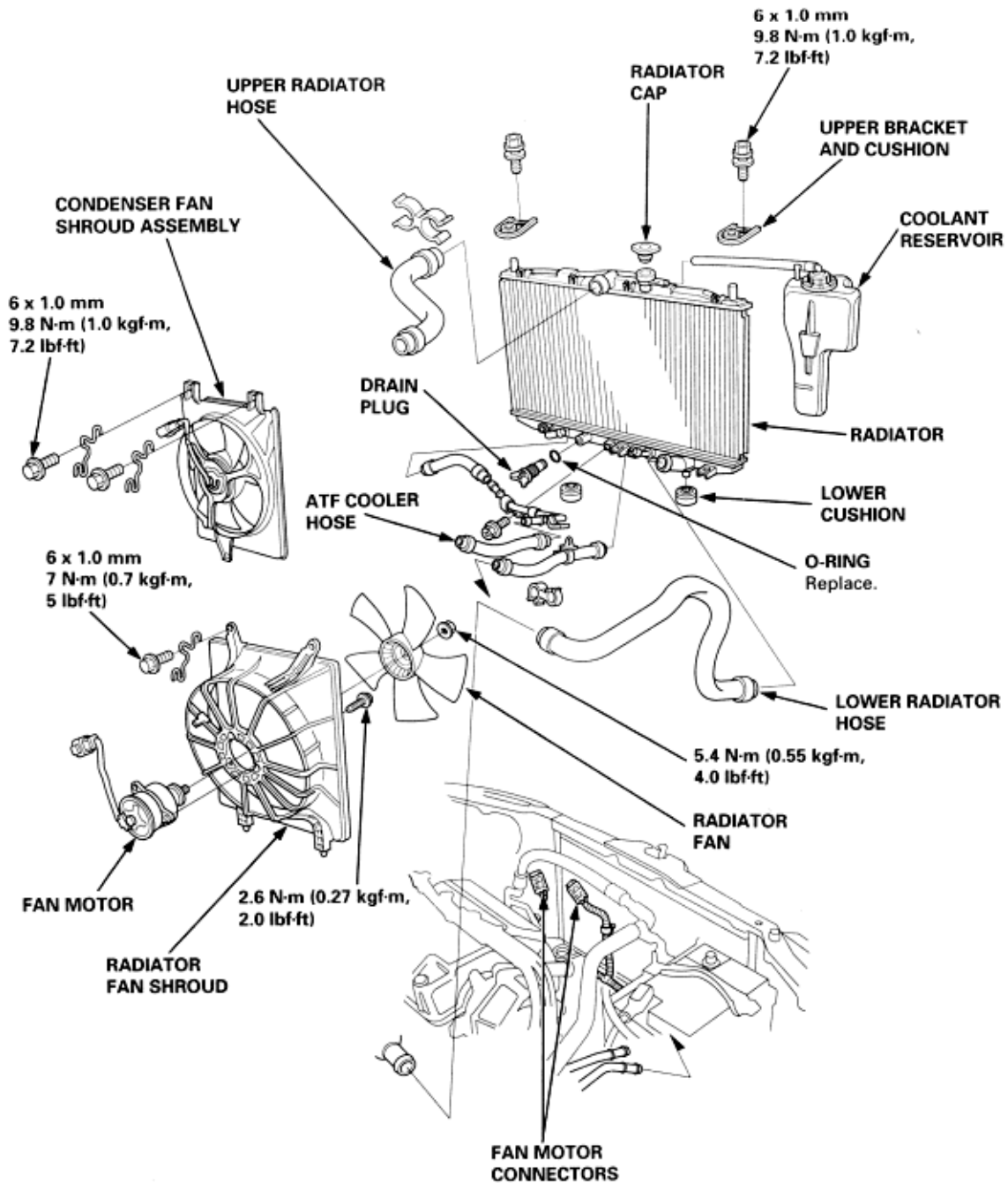
H22A7 engine:



Radiator Replacement

10-6

1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connectors.
4. Remove the radiator upper brackets, then pull up the radiator.
5. Remove the fan shroud assemblies and other parts from the radiator.
6. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
7. Fill the radiator with engine coolant and bleed the air.



Radiator

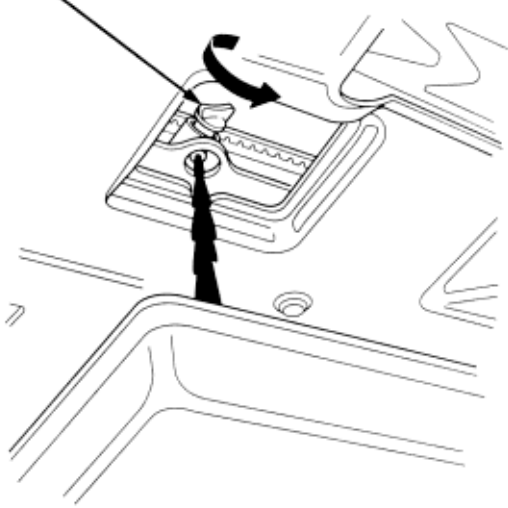
Engine Coolant Refilling and Bleeding

10-7

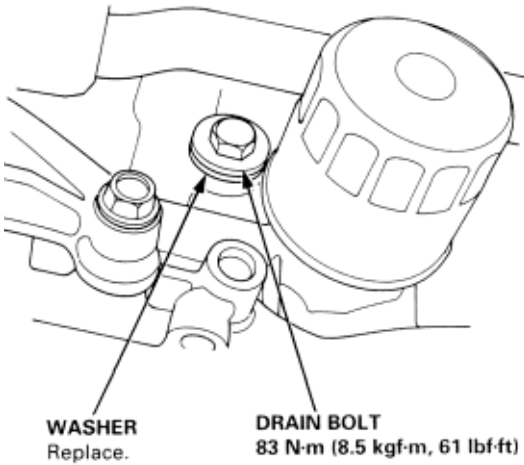
Except H22A7 engine:

1. Start the engine. Set the heater temperature control dial to maximum heat, then turn off the engine. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug, and drain the coolant.

DRAIN PLUG



4. Remove the drain bolt from the rear side of the cylinder block.



5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to MAX mark with antifreeze.



MAX MARK

8. Mix the recommended antifreeze with an equal amount of water in a clean container.
NOTE:
 - ♦ Use only genuine Honda antifreeze/coolant.
 - ♦ For best corrosion protection, the coolant concentration must be maintained year-round at 50% minimum. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
 - ♦ Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.
 - ♦ Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the coolant.

Engine Coolant Refill Capacity (including reservoir 0.55 l (0.50 US qt, 0.48 Imp qt)):

D16B6 engine: 3.9 l (4.1 US qt, 3.4 Imp qt)

F18B2, F18B3, F20B6 engine:

M/T: 4.2 l (4.4 US qt, 3.7 Imp qt)

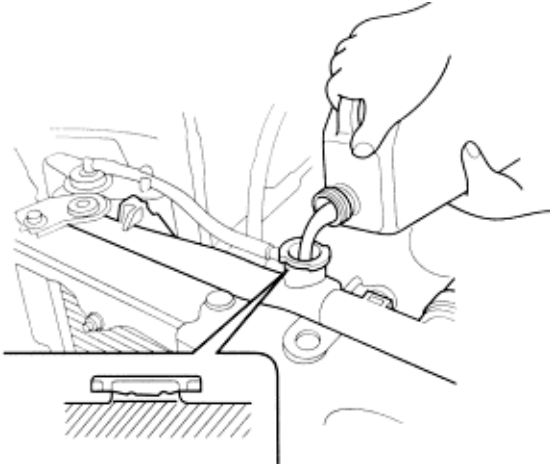
A/T: 4.1 l (4.3 US qt, 3.6 Imp qt)

Radiator

Engine Coolant Refilling and Bleeding (cont'd)

10-8

9. Pour coolant into the radiator up to the base of the filler neck.

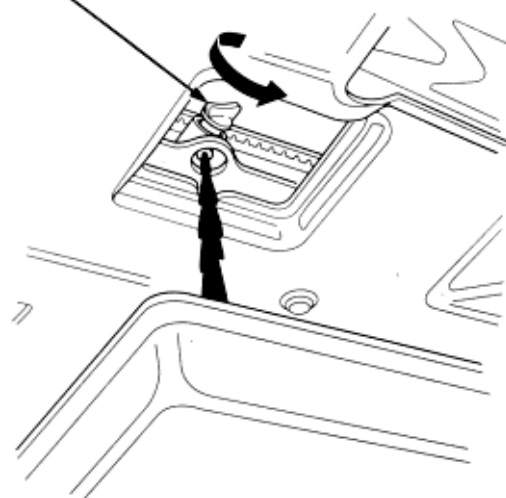


10. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).
11. Turn off the engine. Check the level in the radiator, add coolant if needed.
12. Put the radiator cap on tightly, then run the engine again and check for leaks.

H22A7 engine:

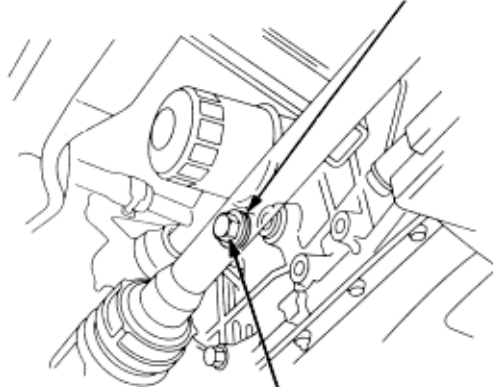
1. Start the engine. Set the heater temperature control dial to maximum heat, then turn off the engine. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug, and drain the coolant.

DRAIN PLUG



4. Remove the drain bolt from the rear side of the cylinder block.

WASHER
Replace.



DRAIN BOLT
83 N·m (8.5 kgf·m,
61 lbf·ft)

5. After the coolant has drained, apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with antifreeze.
8. Mix the recommended antifreeze with an equal amount of water in a clean container.

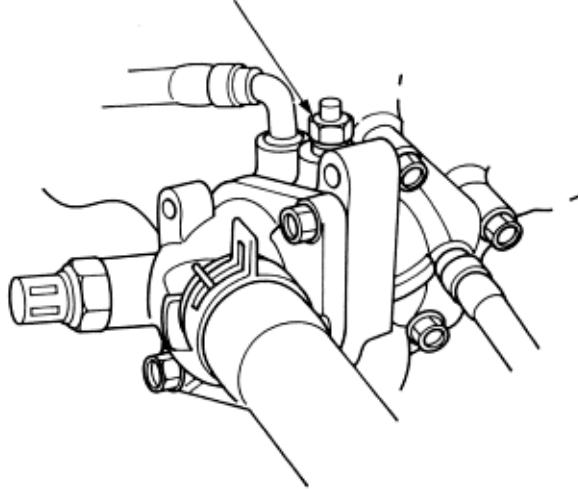
NOTE:

- ♦ Always use Genuine Honda Antifreeze/Coolant. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- ♦ For best corrosion protection, the coolant concentration must be maintained year-round at 50% minimum. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing. Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.
- ♦ Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the coolant.

Engine Coolant Refill Capacity [including reservoir (0.55 / (0.58 US qt, 0.48 Imp qt))]:
3.3 / (3.5 US qt, 2.9 Imp qt)

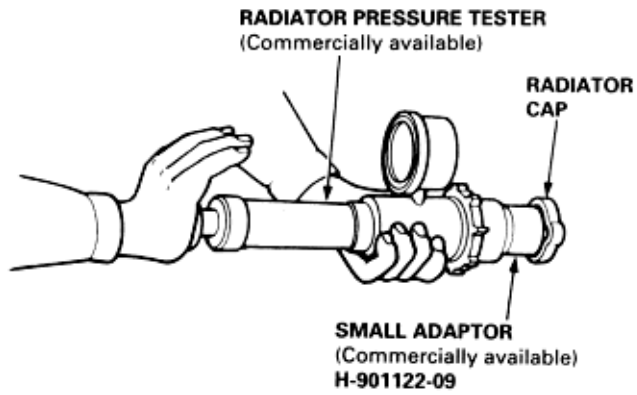
9. Loosen the air bleed bolt in the thermostat housing, then pour coolant into the radiator to the bottom of the filler neck. Do not let coolant spill on any electrical parts or the paint. If any coolant spills, rinse it off immediately.

BLEED BOLT
9.8 N·m (1.0 kgf·m, 7 lbf·ft)



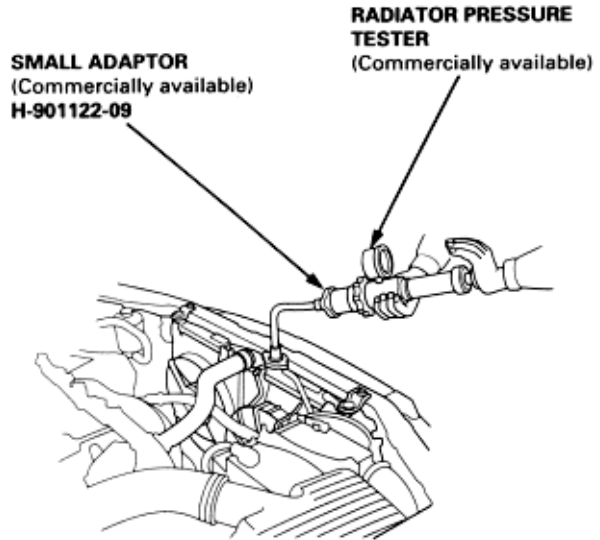
10. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream.
11. With the radiator cap off, start the engine and let it run until warmed up (radiator fan comes on at least twice). Then, if necessary, add more coolant mix to bring the level back up to the bottom of the filler neck.
12. Put the radiator cap on tightly, then run the engine again and check for leaks.

1. Remove the radiator cap, wet it's seal with engine coolant, then install it on the pressure tester.



2. Apply a pressure of 93 - 123 kPa (0.95 - 1.25 kgf/cm², 14 - 18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filter neck.
2. Attach the pressure tester to the radiator and apply a pressure of 93 - 123 kPa (0.95 - 1.25 kgf/cm², 14 - 18 psi).

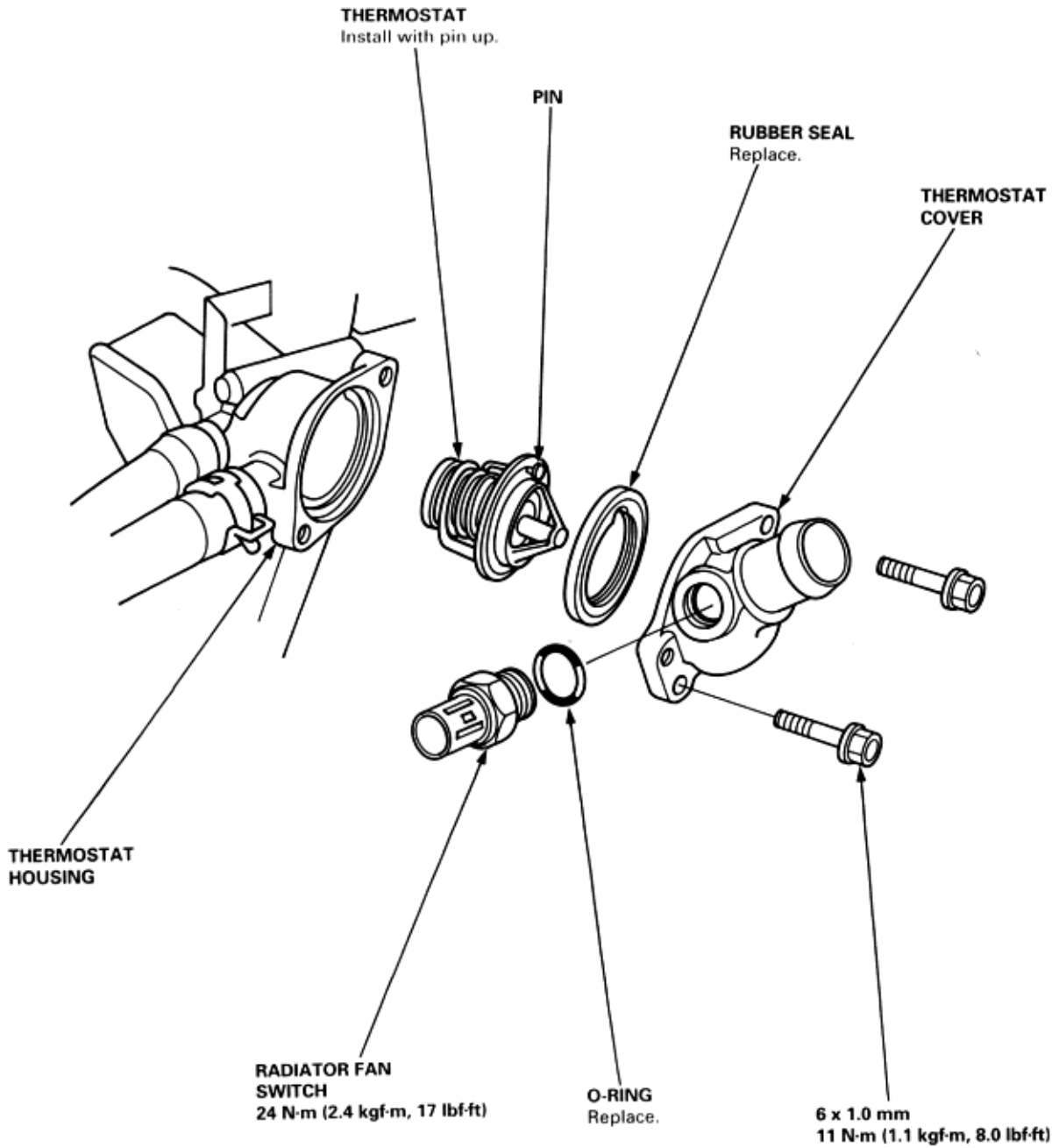


3. Inspect for engine coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the radiator cap.
NOTE: Check for engine oil in the coolant and/or coolant in the engine oil.

**Thermostat
Replacement**

10-11

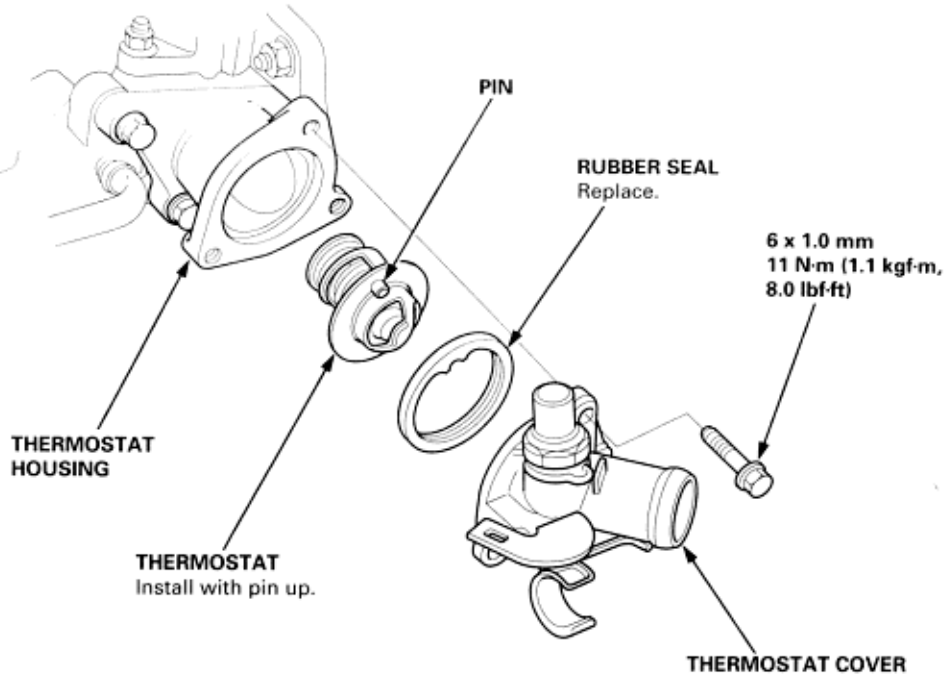
NOTE: Use new O-ring when reassembling.
D16B6 engine:



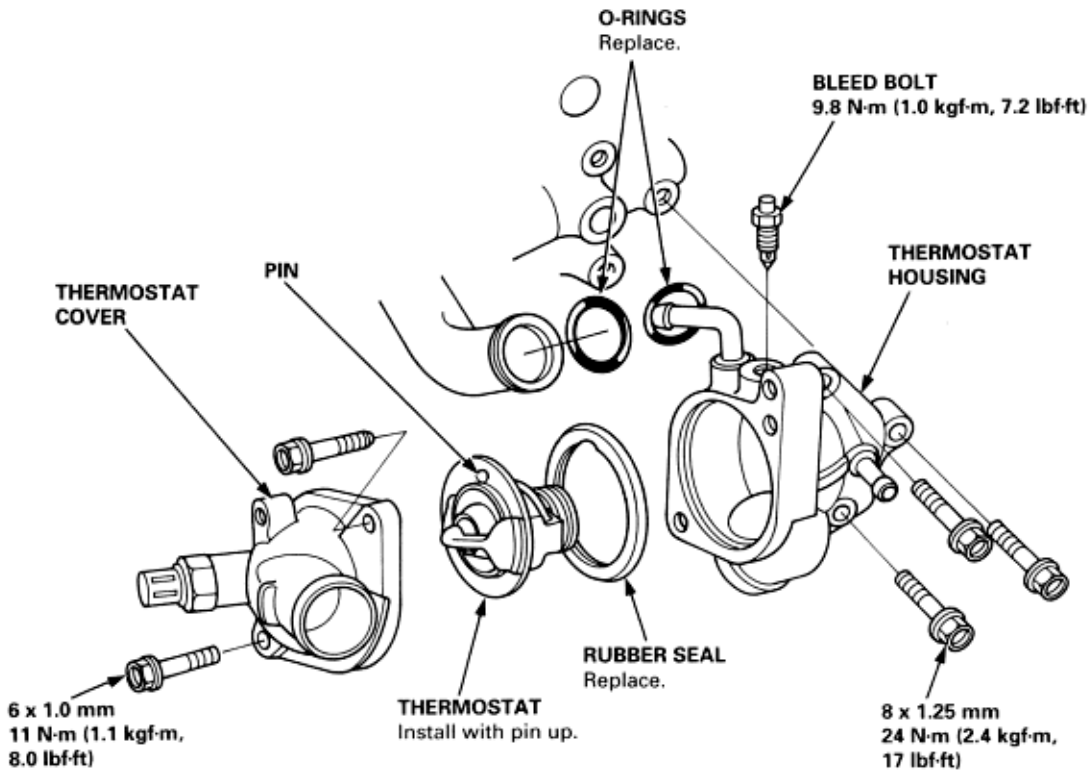
**Thermostat
Replacement (cont'd)**

10-12

NOTE: Use new O-ring when reassembling.
F18B2, F18B3, F20B6 engines:



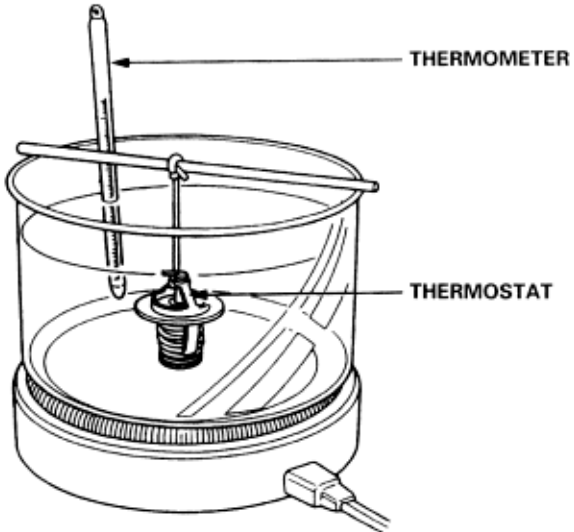
H22A7 engine:



Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat in a container of water as shown.



2. Heat the water, and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.
3. Measure lift height of the thermostat when fully open.

STANDARD THERMOSTAT

Lift height:

Except H22A7 engine:

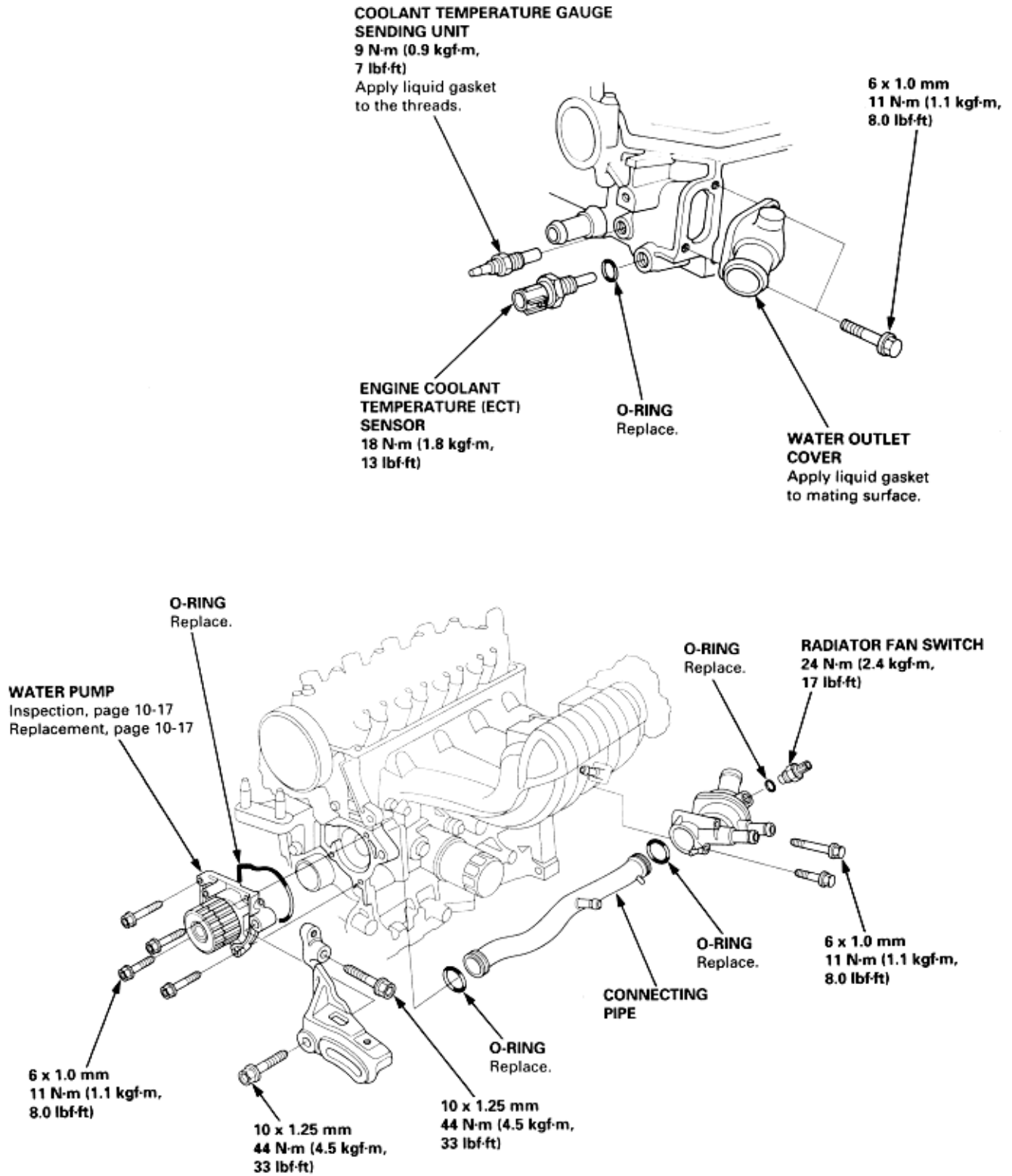
above 8.0 mm (0.31 in)

H22A7 engine: above 10.0 mm (0.39 in)

Starts opening: 76 - 80°C (169 -176°F)

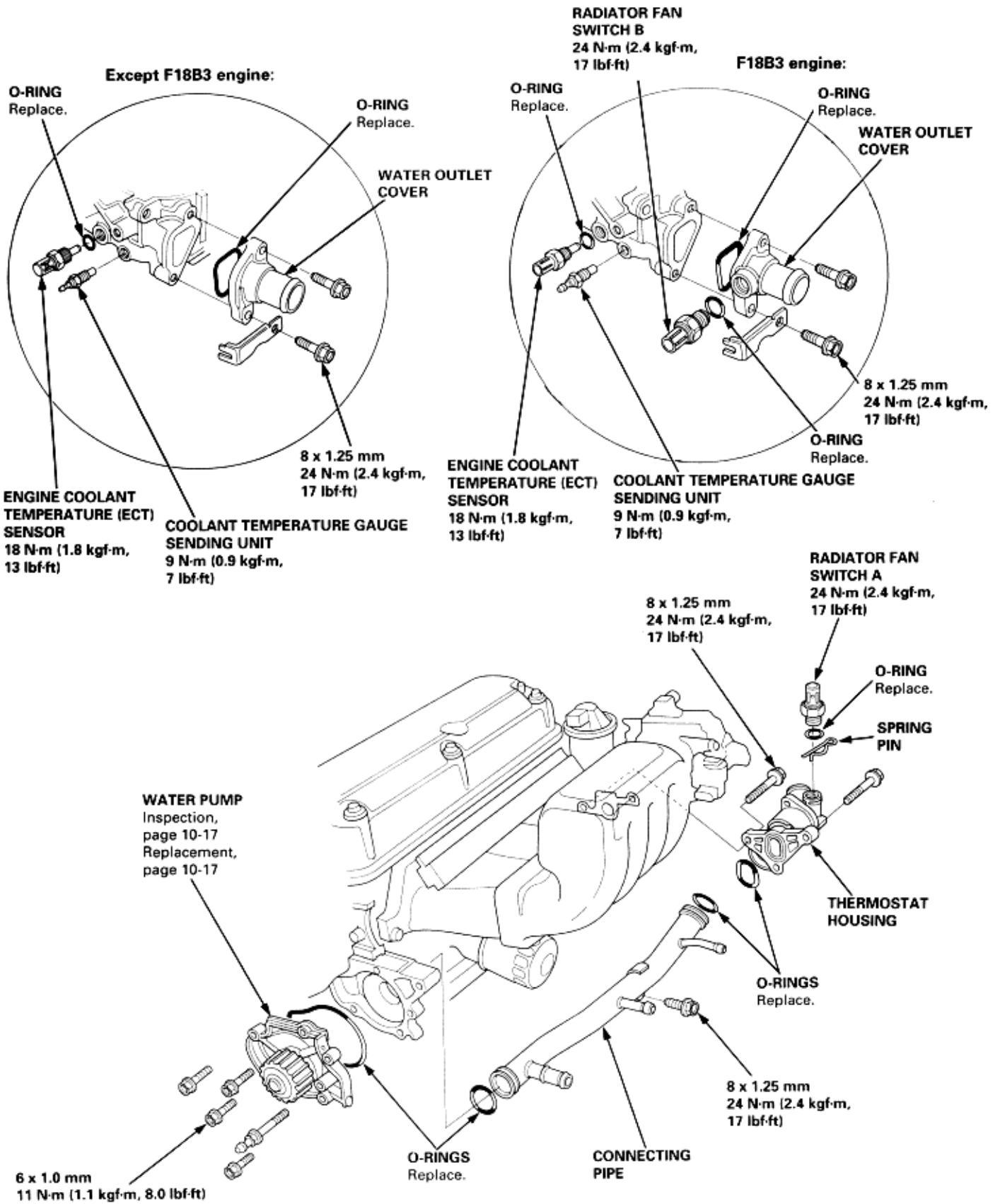
Fully open: 90°C (194°F)

NOTE: Use new O-rings when reassembling.
D16B6 engine:



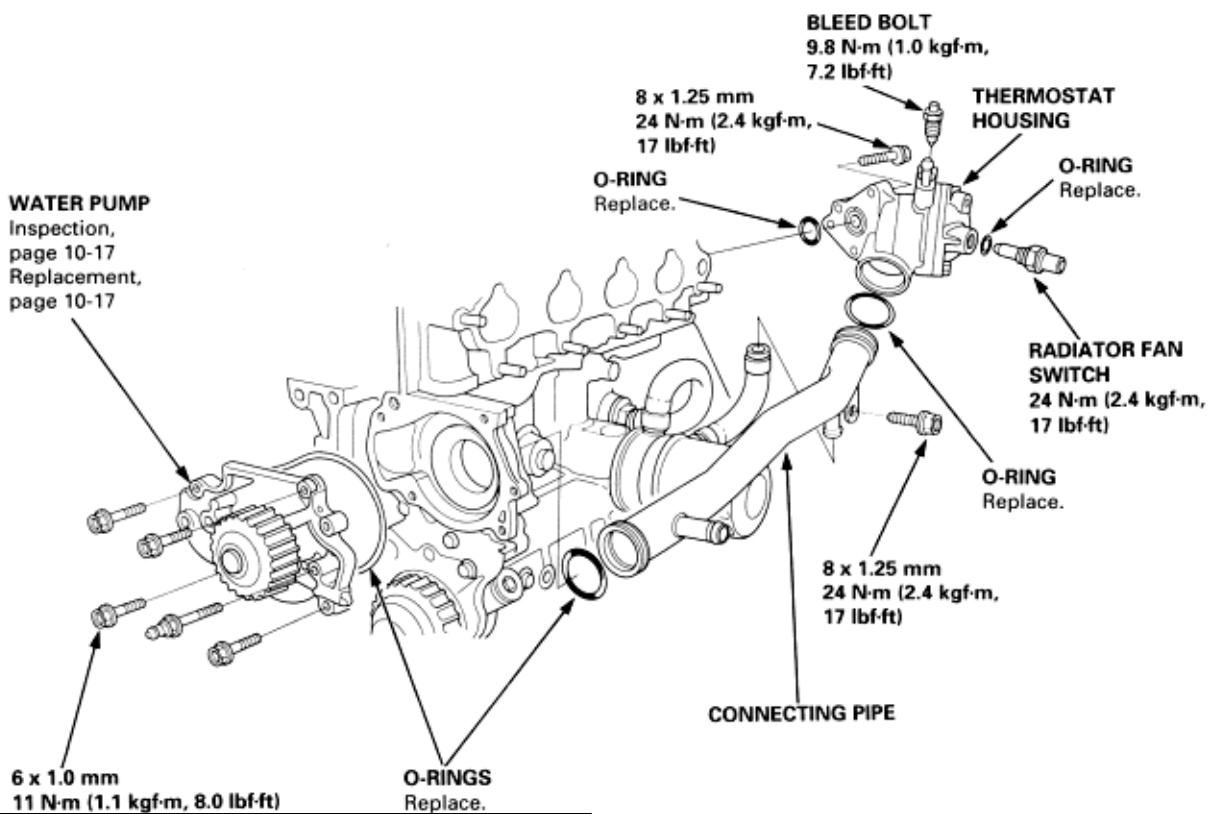
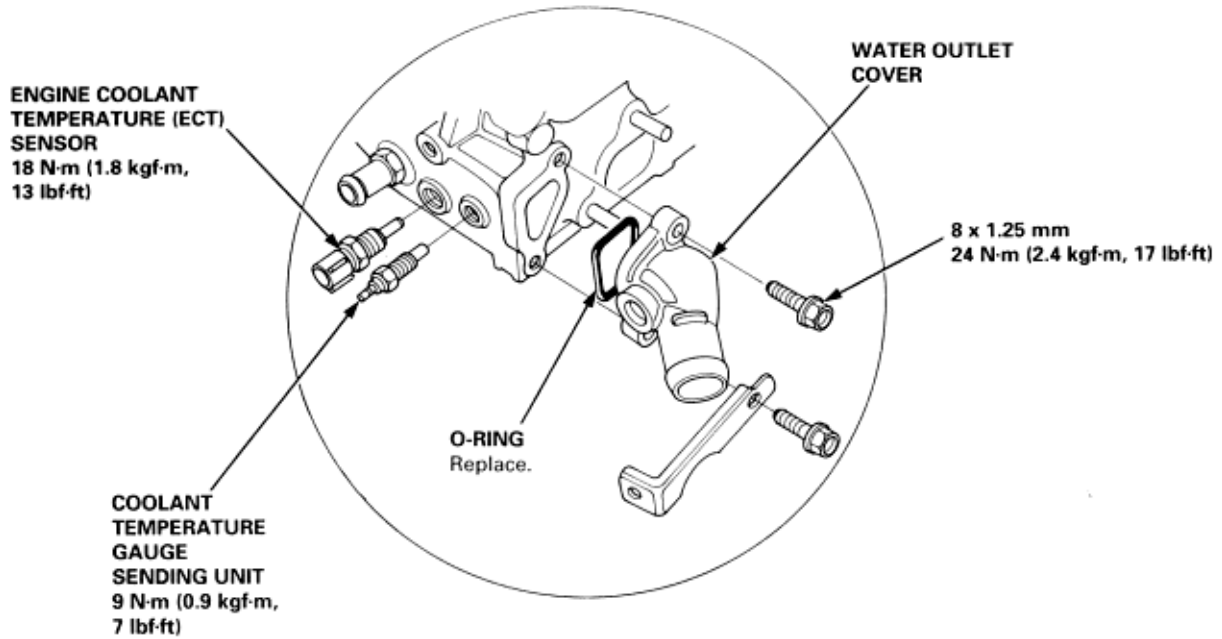
To go to the page referenced on the diagram above, click on the following:
(See [Page 10-17](#))

F18B2, F18B3, F20B6 engines:



To go to the page referenced on the diagram above, click on the following:
[\(See Page 10-17\)](#)

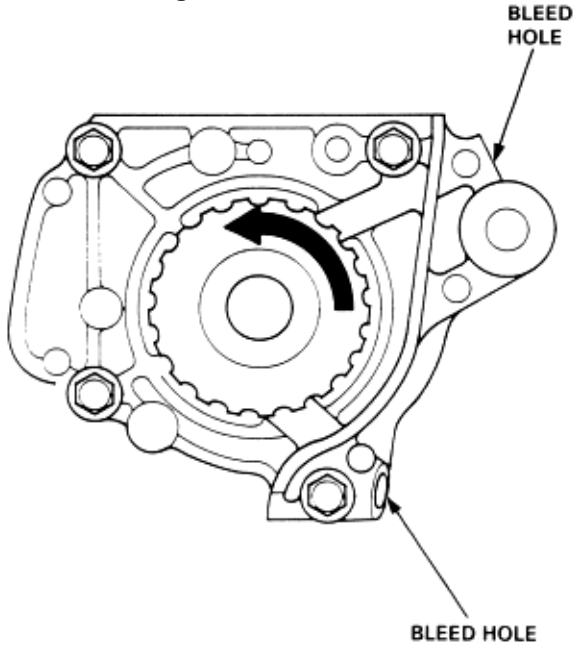
NOTE: Use new O-rings when reassembling.
H22A7 engine:



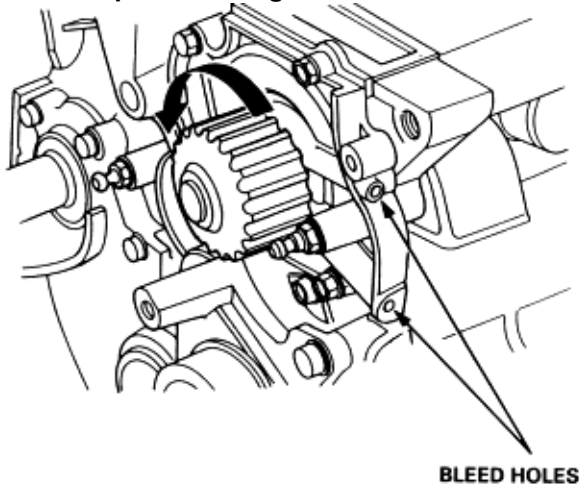
To go to the page referenced on the diagram above, click on the following:
(See Page 10-17)

1. Remove the timing belt (see section 6).
2. Check that the water pump pulley turns counterclockwise.
3. Check for signs of seal leakage.
NOTE: A small amount of "weeping" from the bleed hole is normal.

D16B6 engine:

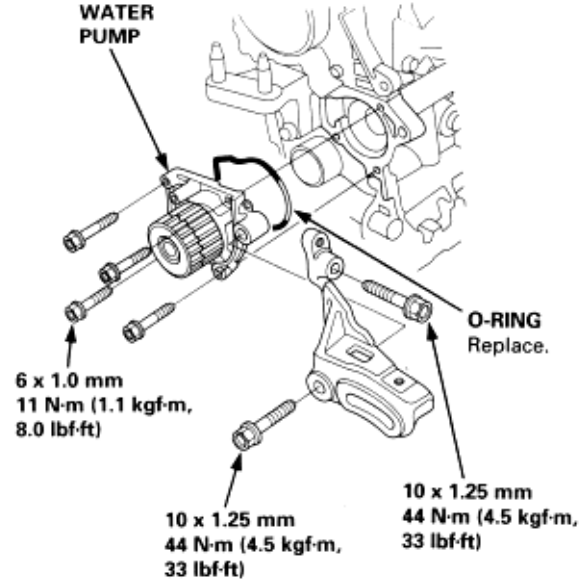


Except D16B6 engine:

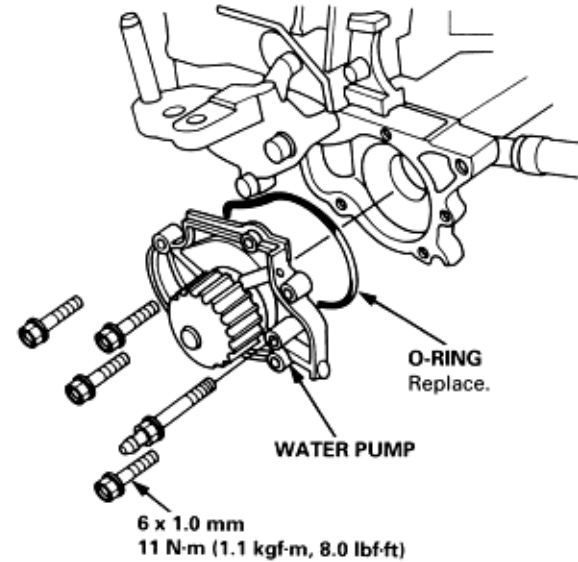


1. Remove the timing belt (see section 6).
2. Remove the water pump by removing five bolts.
NOTE: Inspect, repair and clean the O-ring groove and mating surface with the cylinder block.

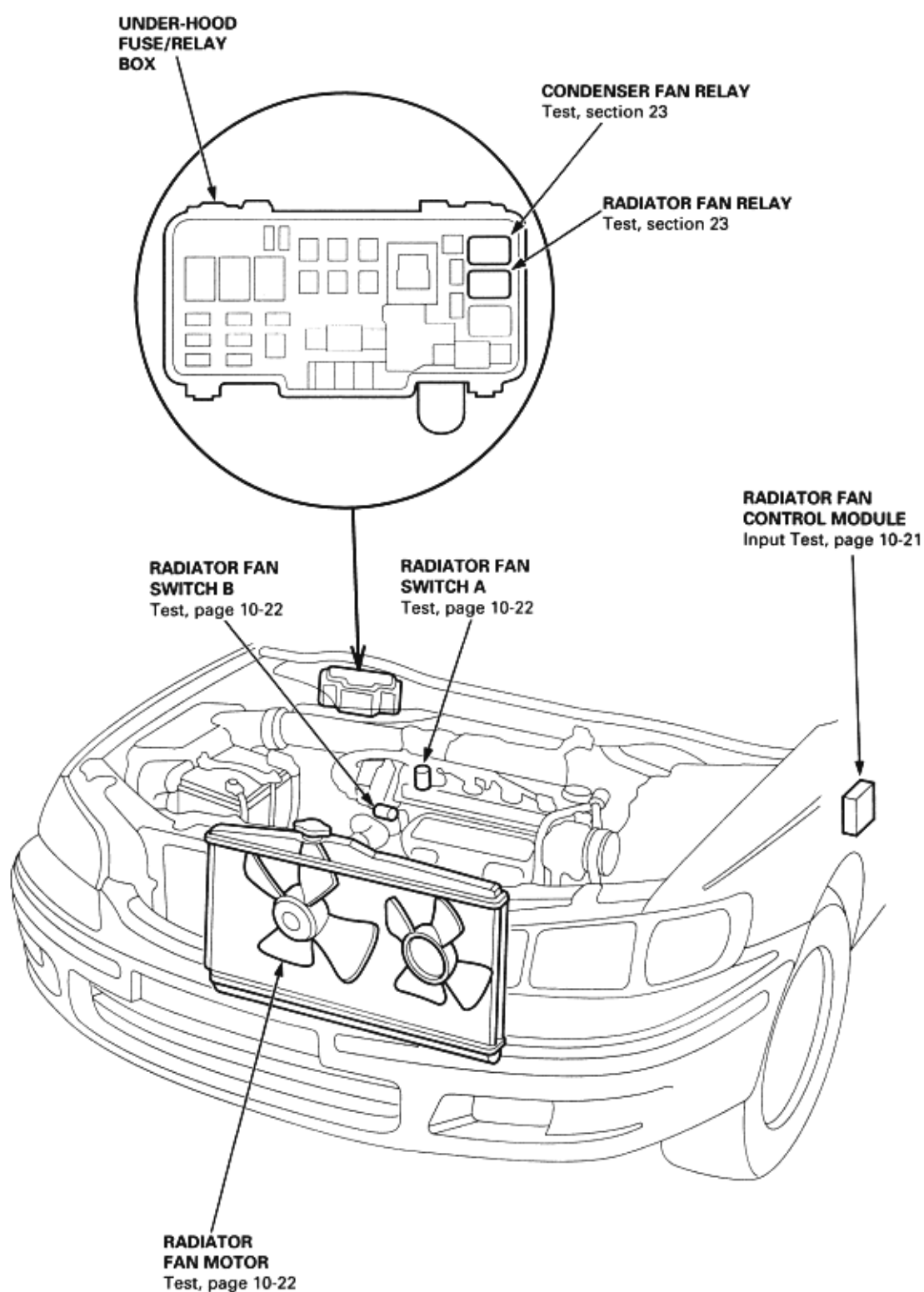
D16B6 engine:



Except D16B6 engine:

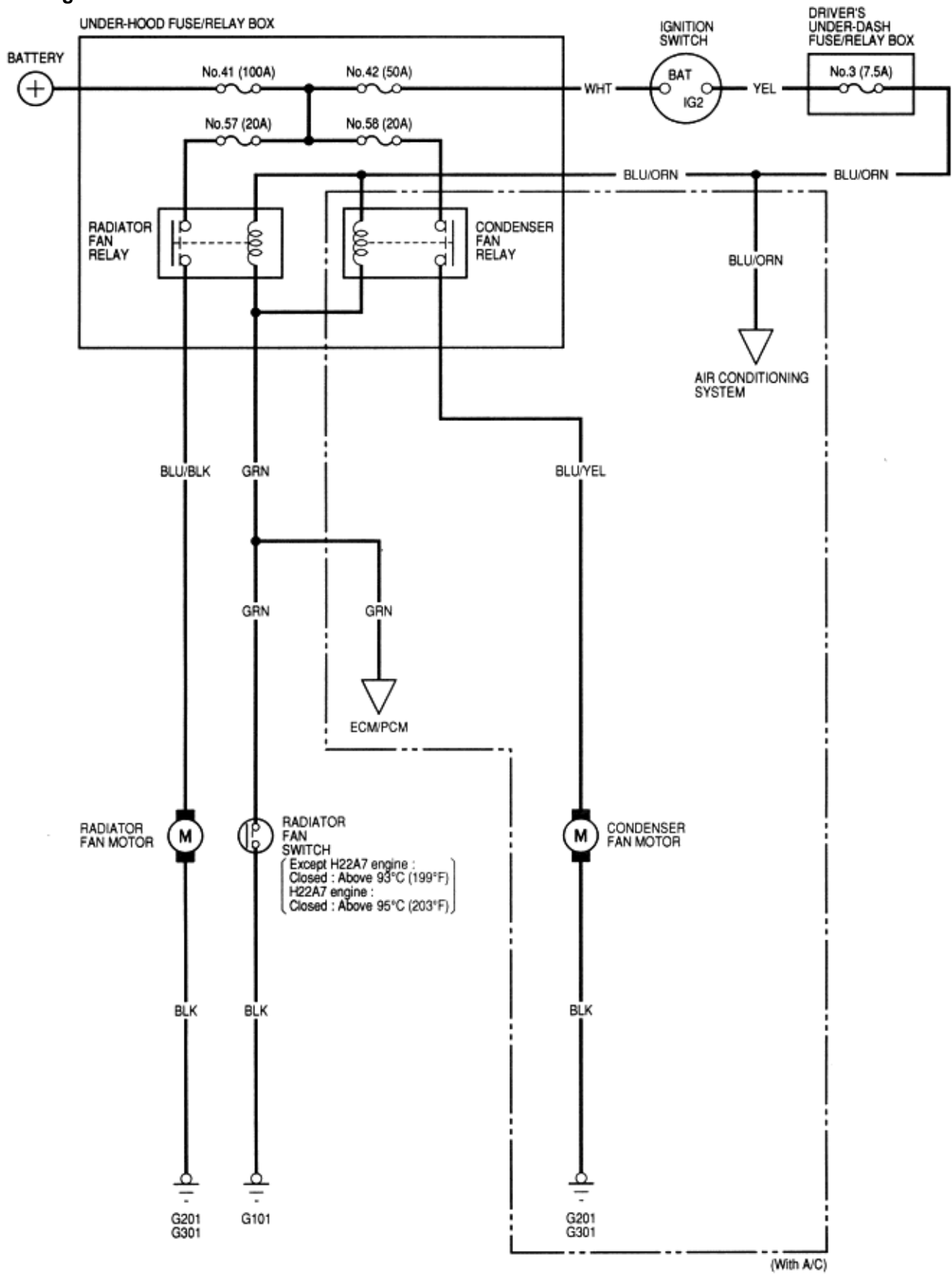


3. Install the water pump in the reverse order of removal.
NOTE:
 - ♦ Keep the O-ring in position when installing.
 - ♦ Clean the spilled engine coolant.



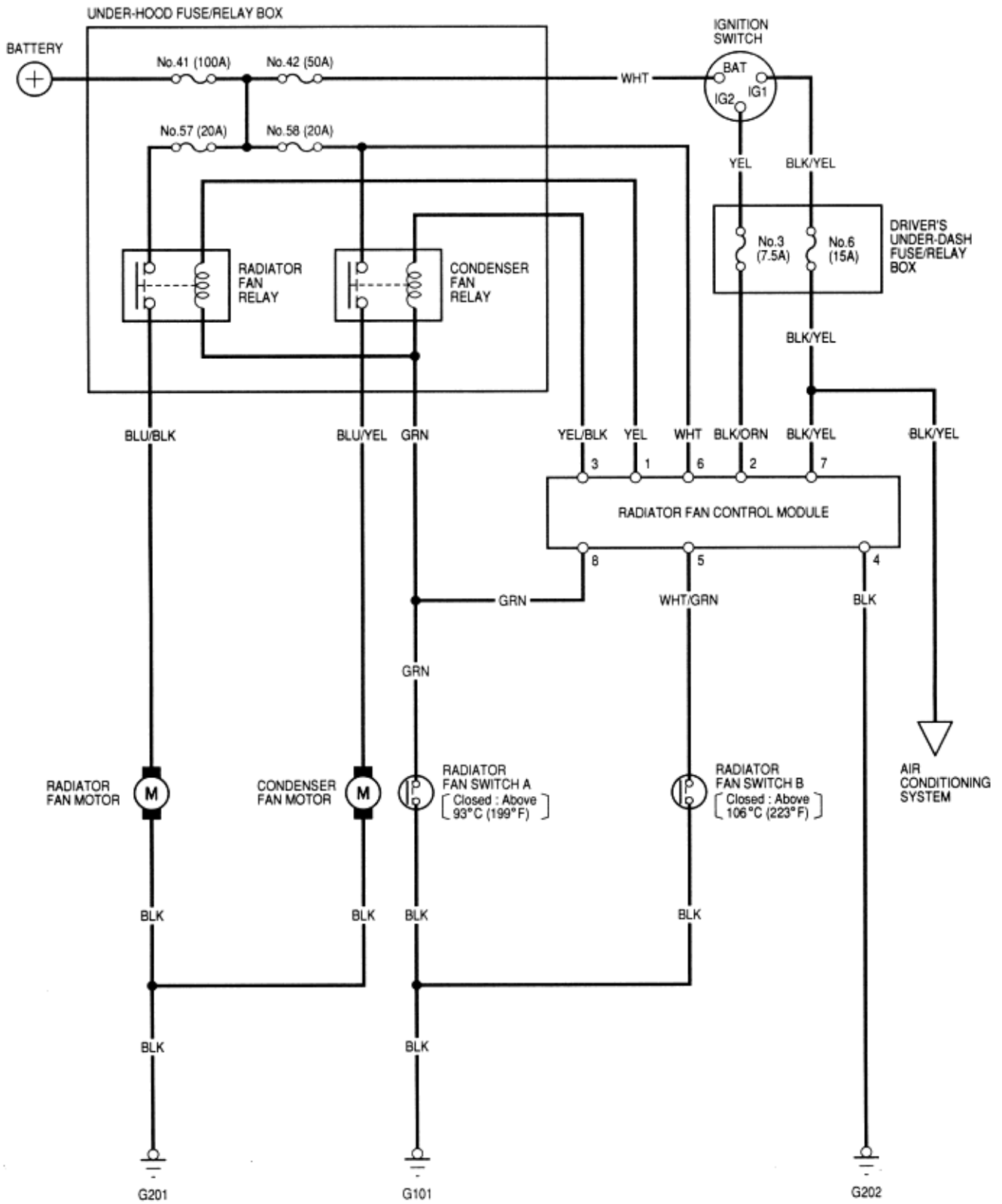
To go to the pages referenced on the diagram above, click on the following:
(See Page 10-21)
(See Page 10-22)

Except F18B3 engine:



Fan Controls
Circuit Diagram

F18B3 engine:

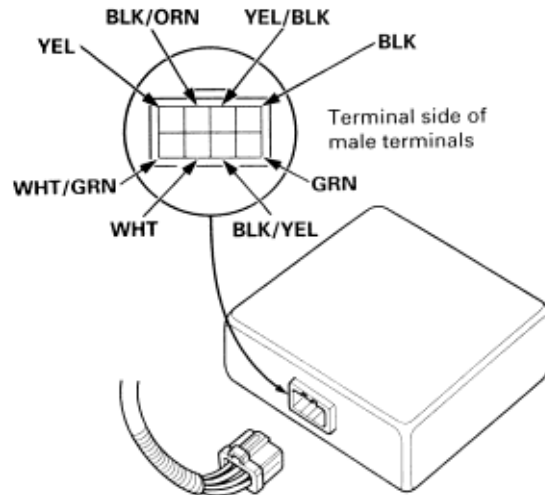


Fan Controls
Module Input Test (F18B3 engine)

10-21

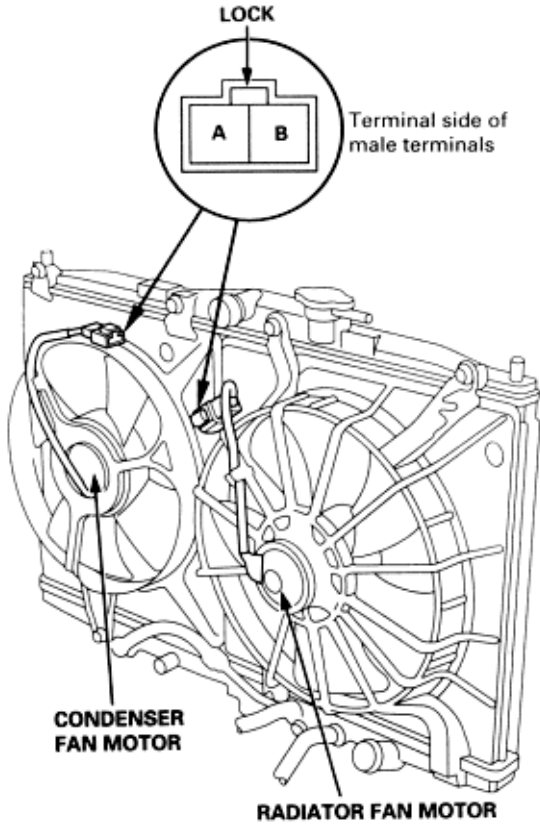
Perform the following tests with the radiator fan control module 8P connector connected, the ignition switch ON (II) and the A/C switch OFF.

If you find the cause of a problem, correct it before you continue.



Wire colour	Test condition	Desired result	Possible cause if desired result is not obtained
BLK	Check for voltage to body ground.	There should be less than one volt.	<ul style="list-style-type: none"> ♦ Poor ground (G202) ♦ An open in the wire
WHT	Check for battery voltage to body ground.	There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 58 (20A) fuse in the under-hood fuse/relay box. ♦ An open in the wire
BLK/YEL	Check battery voltage to body ground: Ignition switch-ON (II).	There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 6 (15A) fuse in the under-dash driver's fuse/relay box. ♦ An open in the wire
BLK/ORN	Check battery voltage to body ground: Ignition switch-ON (II).	There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No. 3 (7.5A) fuse in the under-dash driver's fuse/relay box. ♦ An open in the wire
YEL/BLK	Check battery voltage to body ground: Ignition switch-ON (II).	There should be battery voltage.	<ul style="list-style-type: none"> ♦ Faulty radiator fan control module ♦ An open in the wire
YEL	Check battery voltage to body ground: Ignition switch-ON (II).	There should be battery voltage.	<ul style="list-style-type: none"> ♦ Faulty radiator fan control module ♦ An open in the wire
GRN	Connect to body ground: Ignition switch-ON (II).	Radiator fan and condenser fan should come on.	<ul style="list-style-type: none"> ♦ Blown No. 58 (20A) fuse or No. 57 (20A) fuse in the under-hood fuse/relay box. ♦ Faulty radiator fan relay or condenser fan relay ♦ An open in the wire ♦ Faulty radiator fan control module
WHT/GRN	Check for voltage: Engine coolant temperature below 106°C (223°F).	There should be approx. 11 volts.	<ul style="list-style-type: none"> ♦ Faulty radiator fan switch B ♦ Faulty radiator fan control module

1. Disconnect the 2P connectors from the radiator fan motor and condenser fan motor.

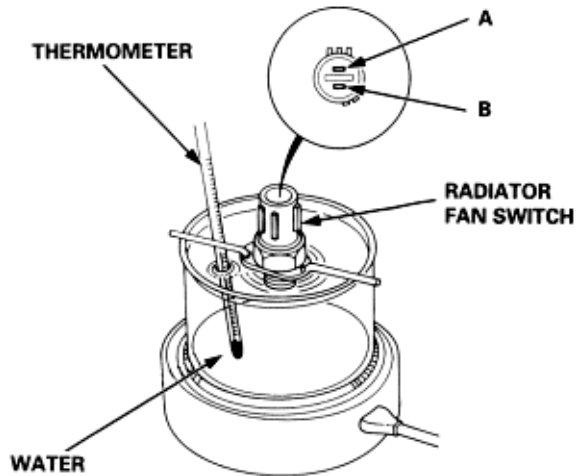


2. Test the motor by connecting battery power to the B terminal and ground to the A terminal.
3. If the motor fails to run or does not run smoothly, replace it.

Except F18B3 engine:

NOTE: Bleed air from the cooling system after installing the radiator fan switch (See Page 10-7).

1. Remove the radiator fan switch from the thermostat cover (See Page 10-11) and (See Page 10-12).
2. Suspend the radiator fan switch in a container of water as shown.



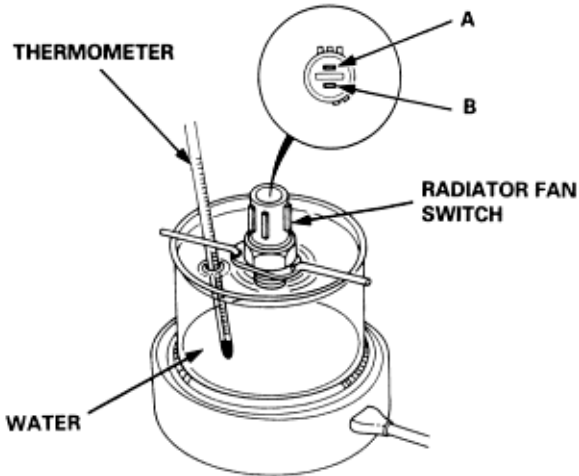
3. Heat the water and check the temperature with a thermometer. Do not let the thermometer touch the bottom of hot container.
4. Measure the continuity between the A and B terminal according to the table.

Operation		Temperature	Terminal	
			A	B
Except H22A7 engine	ON	91 – 95°C (196 – 203°F)	○	○
	OFF	3 – 8°C (5 – 15°F) lower than the temperature when it goes on		
H22A7 engine	ON	92 – 98°C (198 – 208°F)	○	○
	OFF	2 – 7°C (4 – 12°F) lower than the temperature when it goes on		

F18B3 engine:

NOTE: Bleed air from the cooling system after installing the radiator fan switch (See Page 10-17).

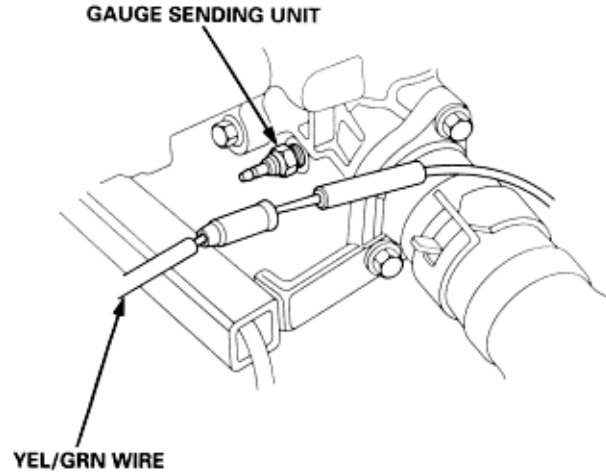
1. Remove the radiator fan switch A from the thermostat cover and radiator fan switch B from the water outlet cover (See Page 10-15).
2. Suspend the radiator fan switch in a container of water as shown.



3. Heat the water and check the temperature with a thermometer. Do not let the thermometer touch the bottom of the container.
4. Measure the continuity between the A terminal and B terminal according to the table.

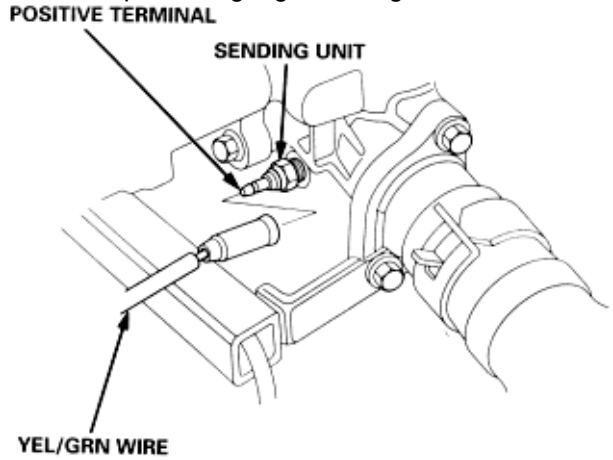
Operation		Temperature	Terminal	
			A	B
SWITCH A	ON	91 – 95°C (196 – 203°F)	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	3 – 8°C (5 – 15°F) lower than the temperature when it goes on	<input type="checkbox"/>	<input type="checkbox"/>
SWITCH B	ON	103 – 109°C (217 – 228°F)	<input type="checkbox"/>	<input type="checkbox"/>
	OFF	4 – 9°C (7 – 16°F) lower than the temperature when it goes on	<input type="checkbox"/>	<input type="checkbox"/>

1. Check the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Make sure the ignition switch is OFF, then disconnect the YEL/GRN wire from the coolant temperature gauge sending unit, and ground it with a jumper wire.



3. Turn the ignition switch ON (II). Check that the pointer of the coolant temperature gauge starts moving toward the "H" mark. Turn the ignition switch OFF before the pointer reaches "H" on the gauge dial. Failure to do so may damage the gauge.
 - ♦ If the pointer of the gauge does not move at all, check for an open in the YEL/GRN wire. If the wires are OK, replace the coolant temperature gauge.
 - ♦ If the coolant temperature gauge works, test the coolant temperature sending unit.

1. Disconnect the YEL/GRN wire from the coolant temperature gauge sending unit.



2. Using an ohmmeter, measure the change in resistance between the positive terminal and the engine (ground) with the engine cold and with the engine at operating temperature.

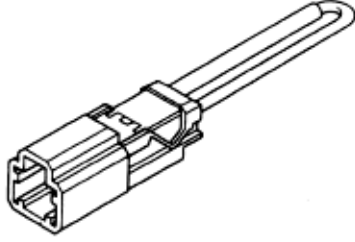
Temperature	56°C (133°F)	85 - 100°F (85 - 212°C)
Resistance ohms	137	46 - 30

3. If the obtained readings are substantially different from the specifications above, replace the sending unit.

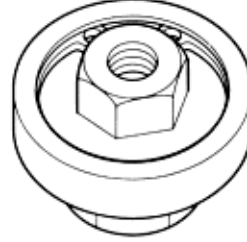
Component Locations
Index

11-A-2

Ref No.	Tool Number	Description	Qty	Remark
1	07PAZ - 0010100	SCS Short Connector	1	
2	07VAJ - 0040100	Fuel Pressure Gauge Attachment	1	
3	07406 - 0040002	Fuel Pressure Gauge Set	1	
3-1	07406 - 0040202	Fuel Pressure Hose Assembly	(1)	Component Tools
4	07WAA - 0010100	Adjustable Ring Nut Wrench	1	



①



②



③

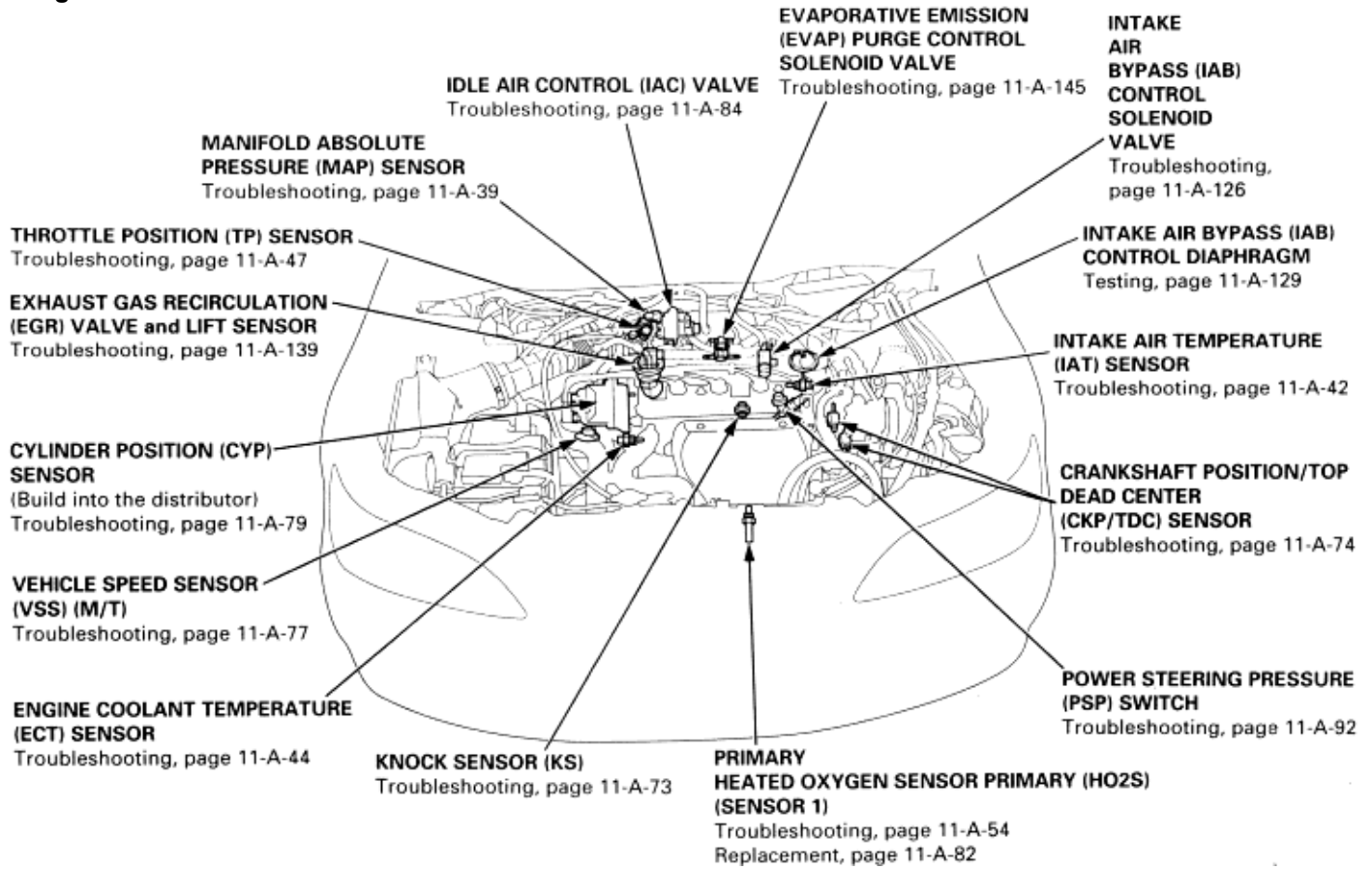


③-1

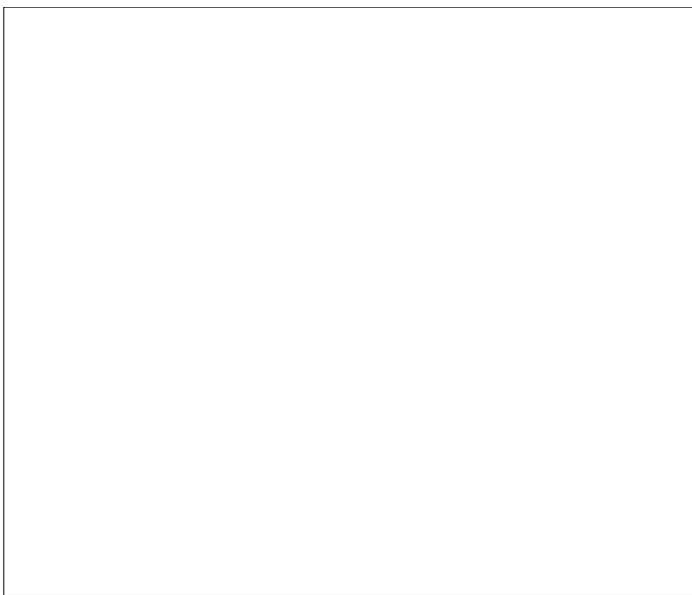
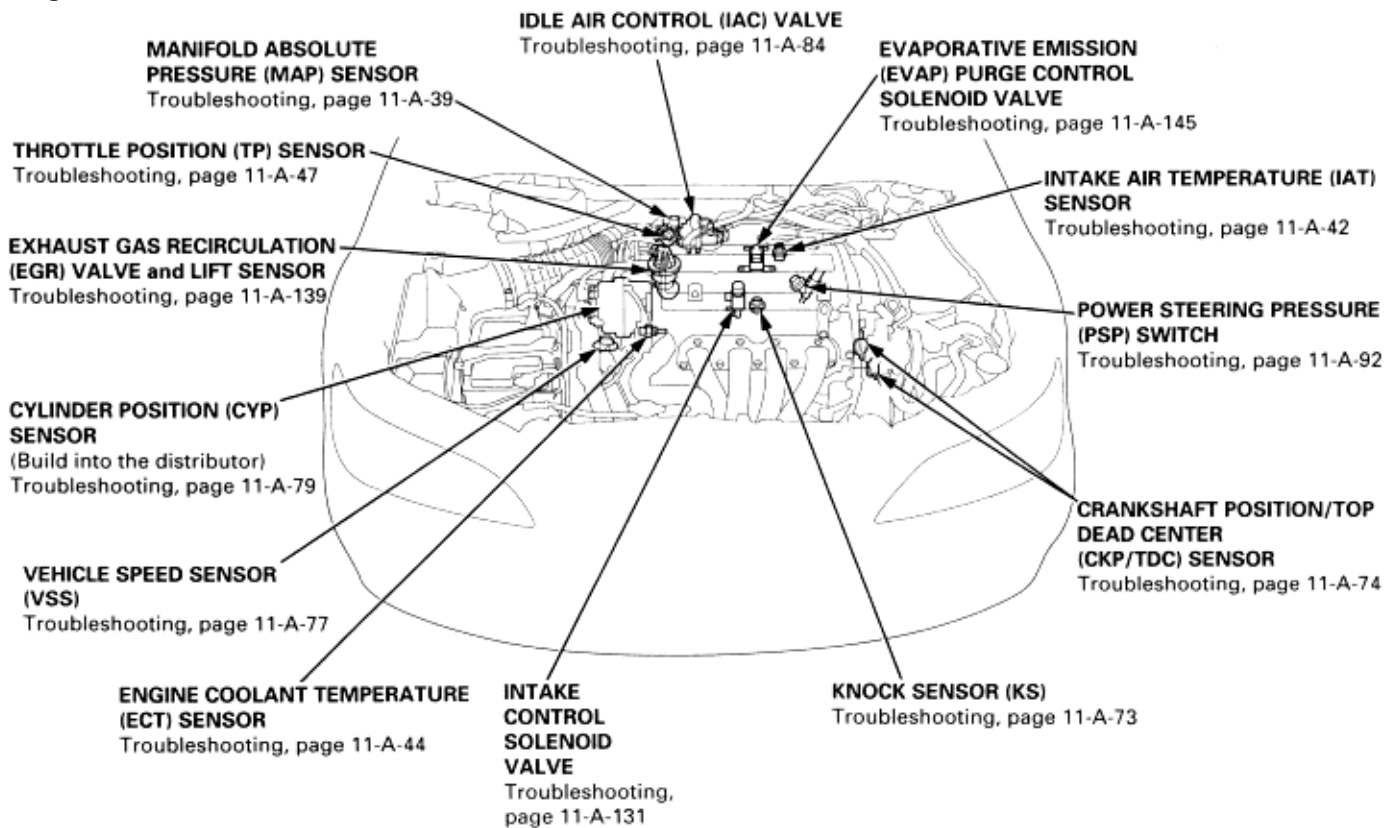


④

F20B6 engine:



H22A7 engine:



**ENGINE COOLANT TEMPERATURE
(ECT) SENSOR**
Troubleshooting, page 11-A-44

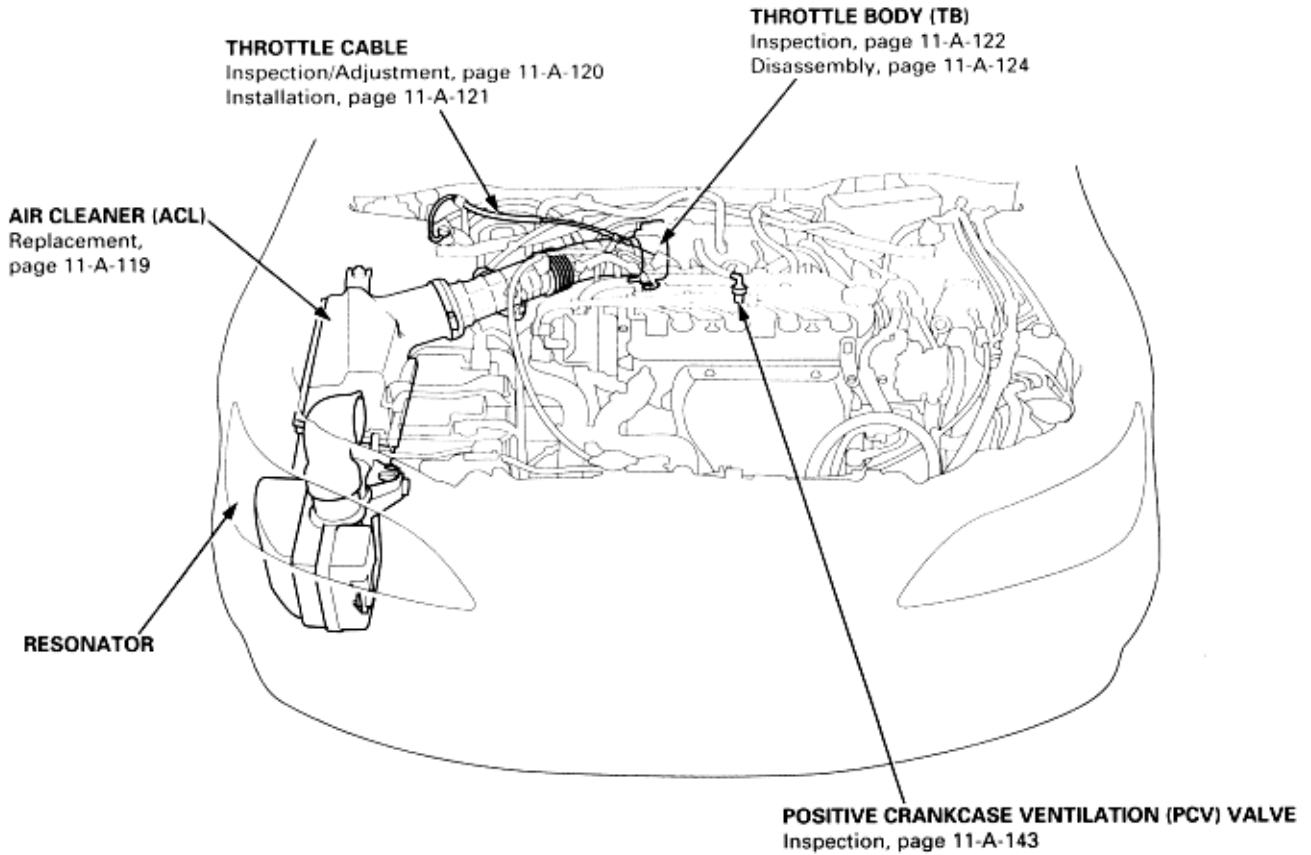
**INTAKE
CONTROL
SOLENOID
VALVE**
Troubleshooting,
page 11-A-131

KNOCK SENSOR (KS)
Troubleshooting, page 11-A-73

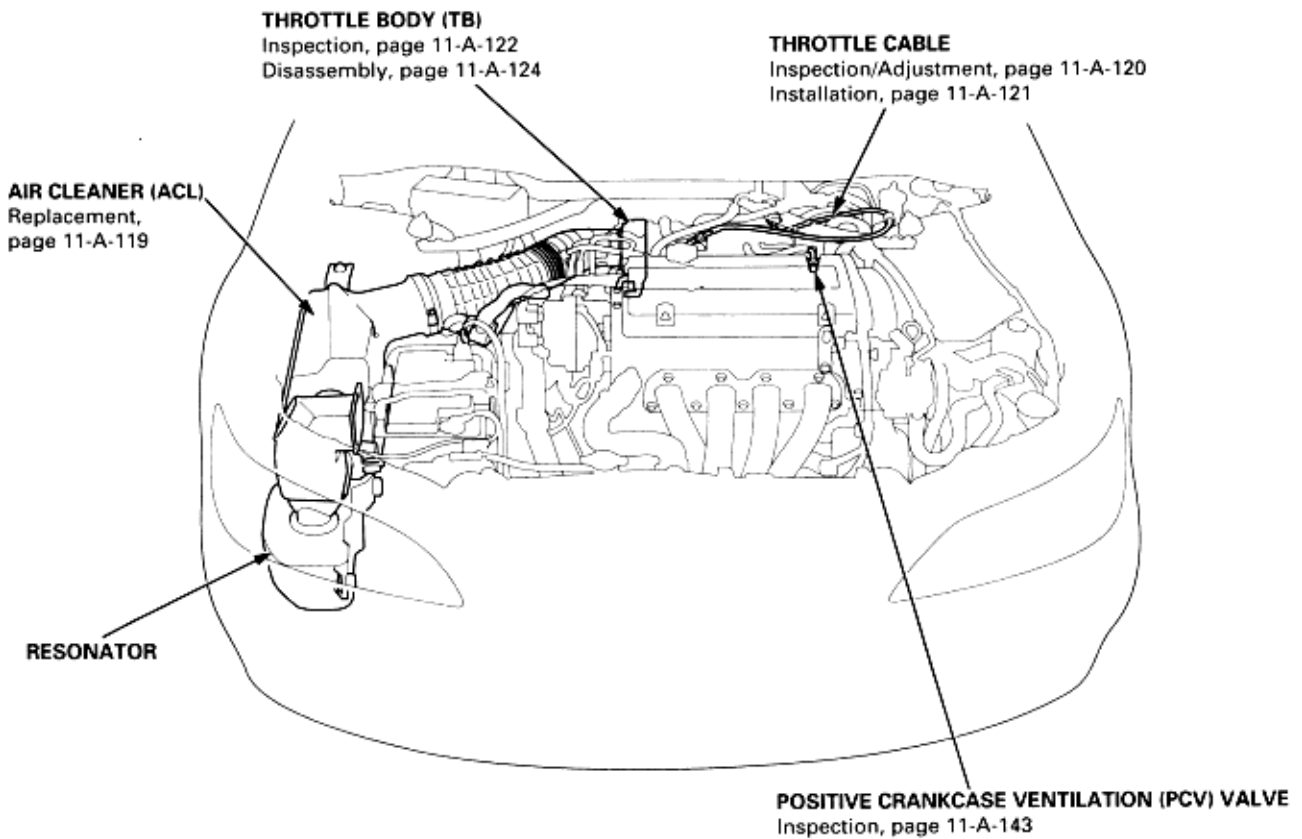
To go to the pages referenced on the diagram above,
click on the following:

- (See Page 11-A-84)
- (See Page 11-A-39)
- (See Page 11-A-47)
- (See Page 11-A-139)
- (See Page 11-A-79)
- (See Page 11-A-77)
- (See Page 11-A-44)
- (See Page 11-A-73)
- (See Page 11-A-145)
- (See Page 11-A-126)
- (See Page 11-A-129)
- (See Page 11-A-42)
- (See Page 11-A-74)
- (See Page 11-A-92)
- (See Page 11-A-54)
- (See Page 11-A-82)
- (See Page 11-A-131)

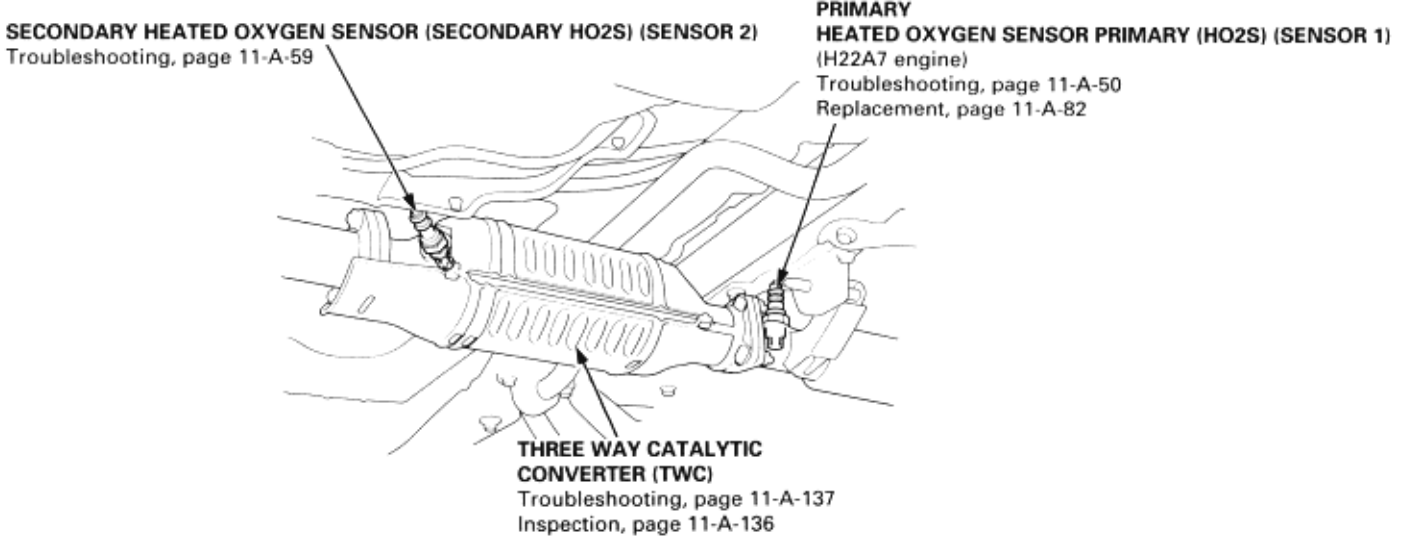
F20B6 engine:



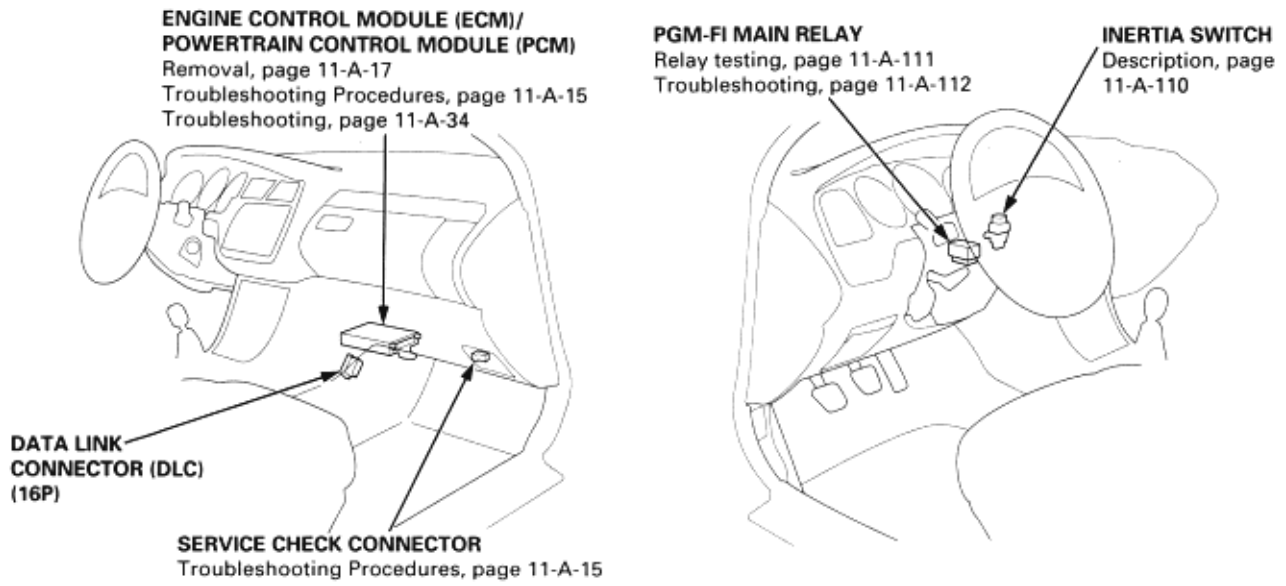
H22A7 engine:



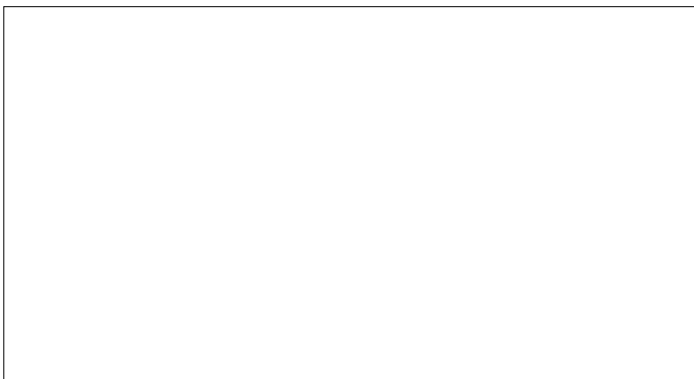
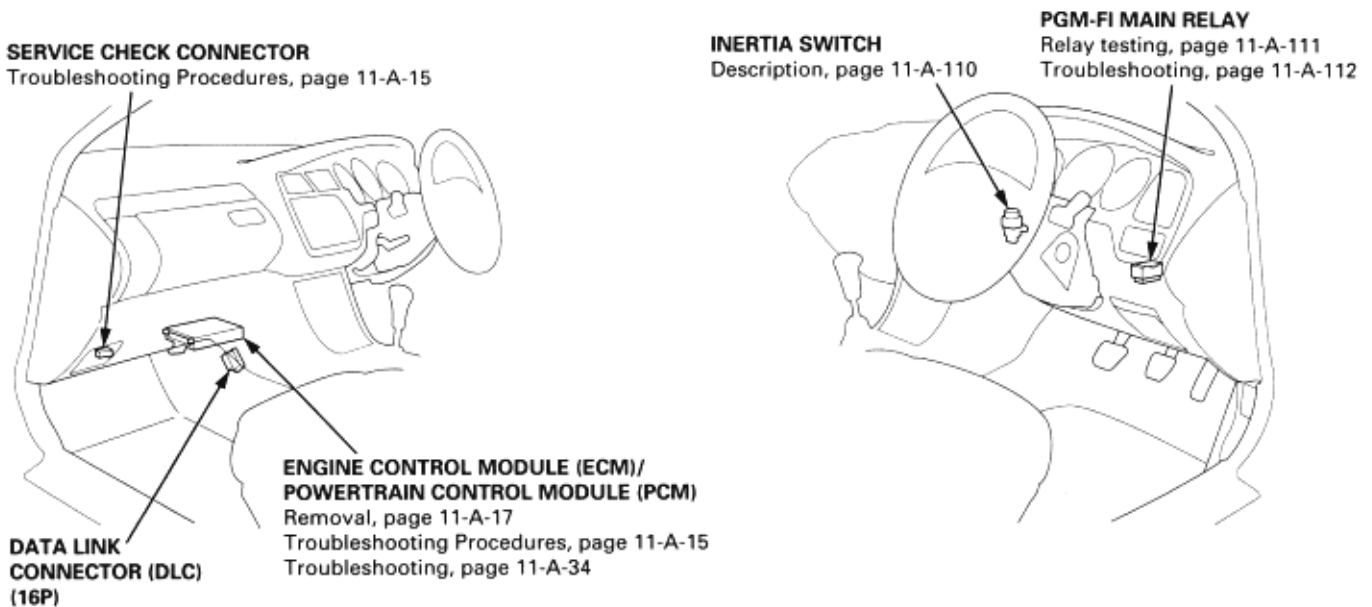
To go to the pages referenced on the diagram above, click on the following:
(See Page 11-A-120)
(See Page 11-A-121)
(See Page 11-A-119)
(See Page 11-A-122)
(See Page 11-A-124)
(See Page 11-A-143)

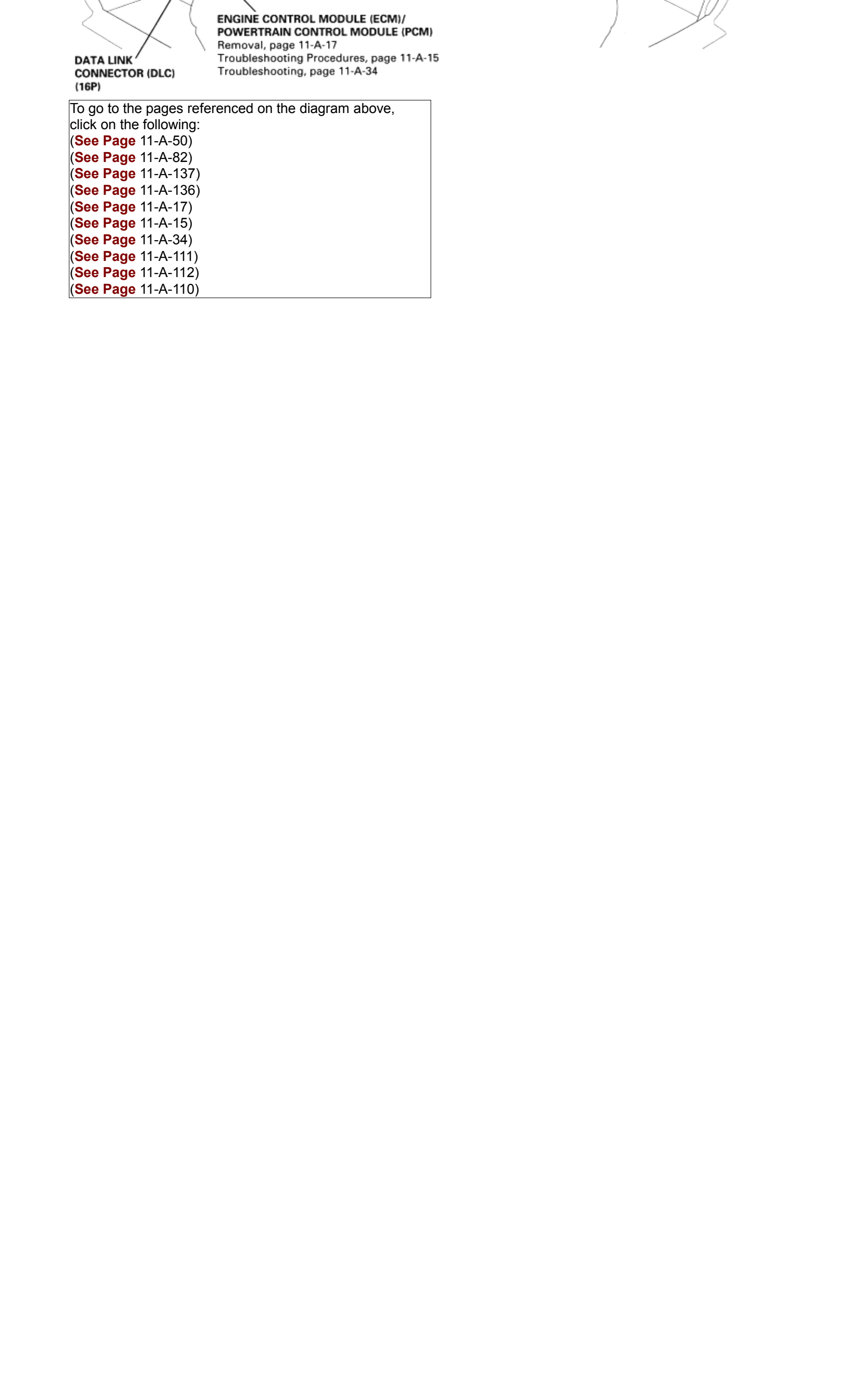


LHD:



RHD:





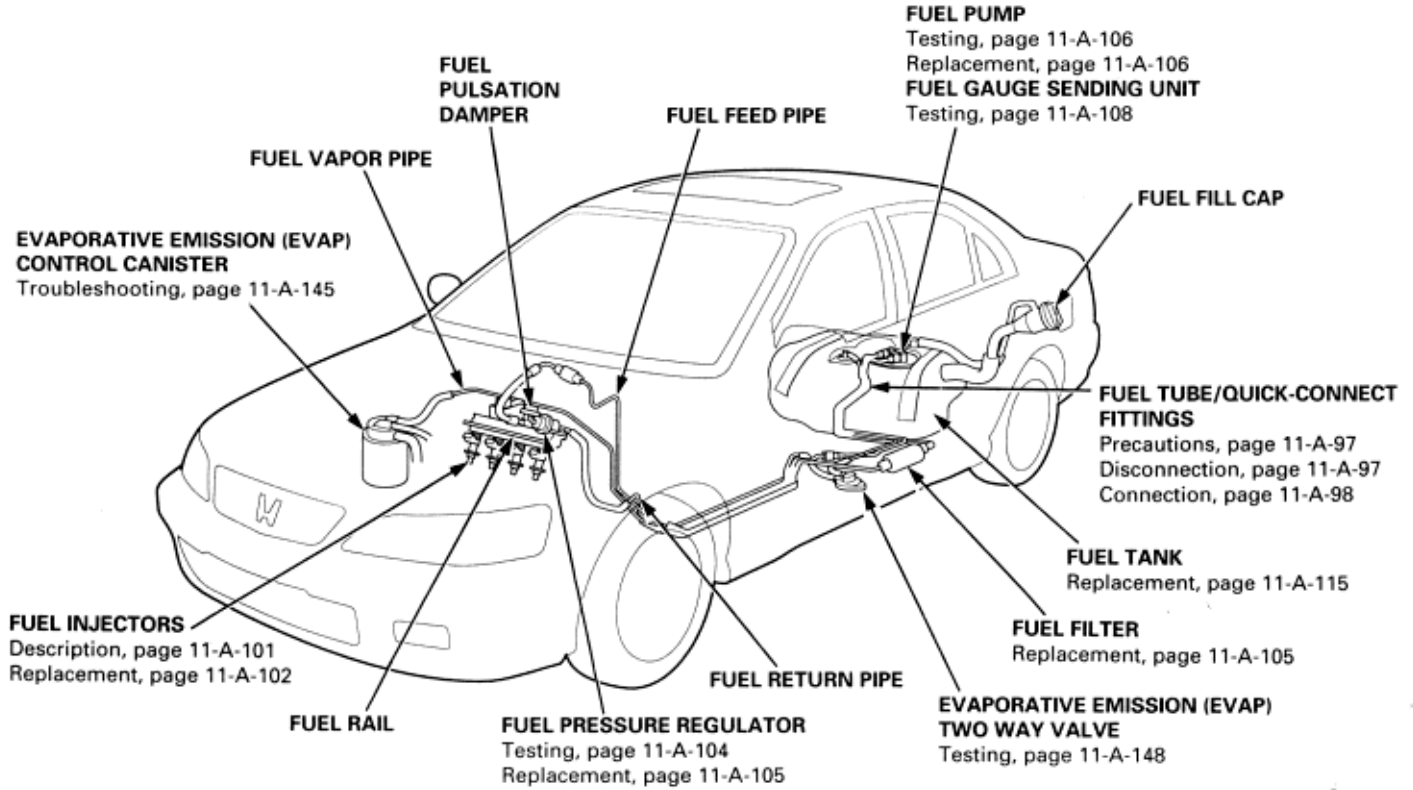
**DATA LINK
CONNECTOR (DLC)
(16P)**

**ENGINE CONTROL MODULE (ECM)/
POWERTRAIN CONTROL MODULE (PCM)**
Removal, page 11-A-17
Troubleshooting Procedures, page 11-A-15
Troubleshooting, page 11-A-34

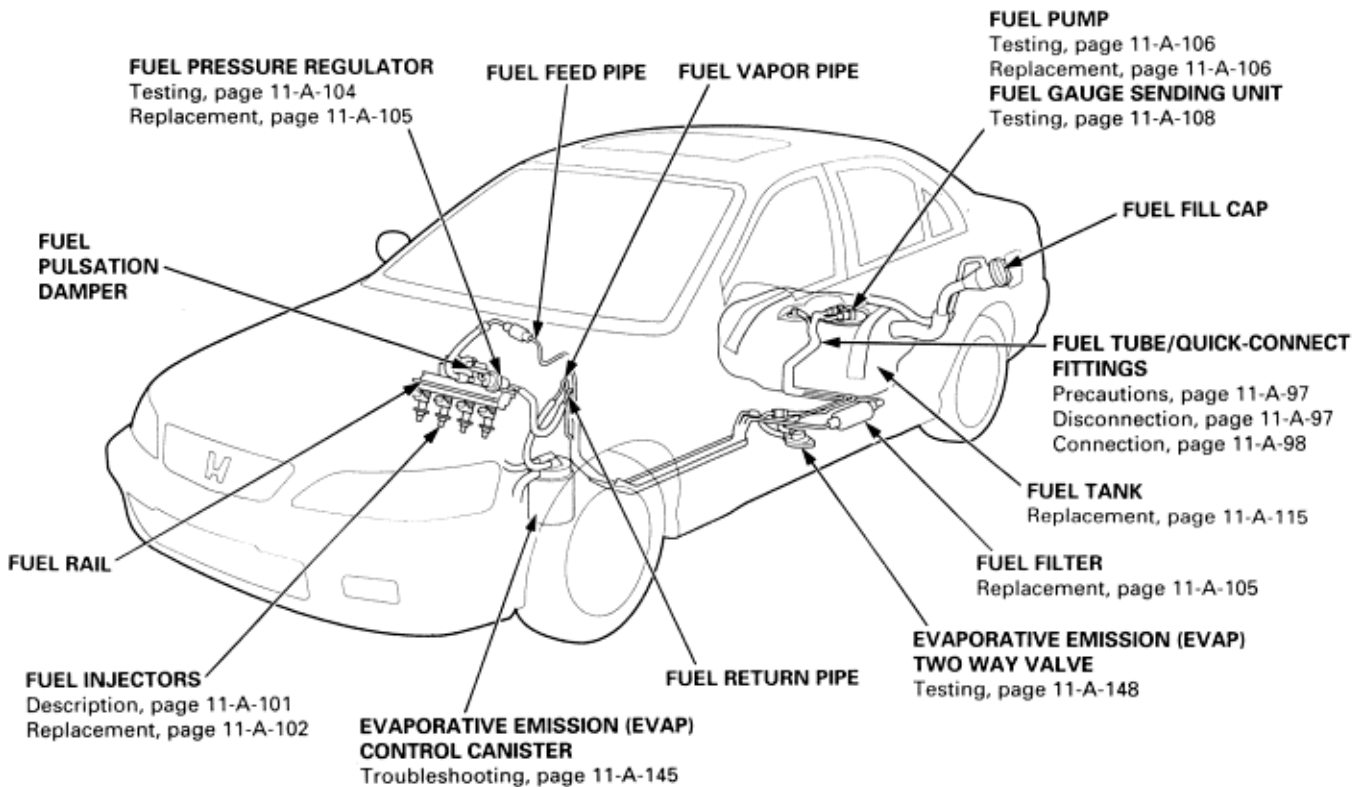
To go to the pages referenced on the diagram above,
click on the following:

- ([See Page 11-A-50](#))
- ([See Page 11-A-82](#))
- ([See Page 11-A-137](#))
- ([See Page 11-A-136](#))
- ([See Page 11-A-17](#))
- ([See Page 11-A-15](#))
- ([See Page 11-A-34](#))
- ([See Page 11-A-111](#))
- ([See Page 11-A-112](#))
- ([See Page 11-A-110](#))

F20B6 engine:
LHD:



RHD:



To go to the pages referenced on the diagram above,

click on the following:

(See Page 11-A-106)

(See Page 11-A-108)

(See Page 11-A-145)

(See Page 11-A-101)

(See Page 11-A-102)

(See Page 11-A-104)

(See Page 11-A-105)

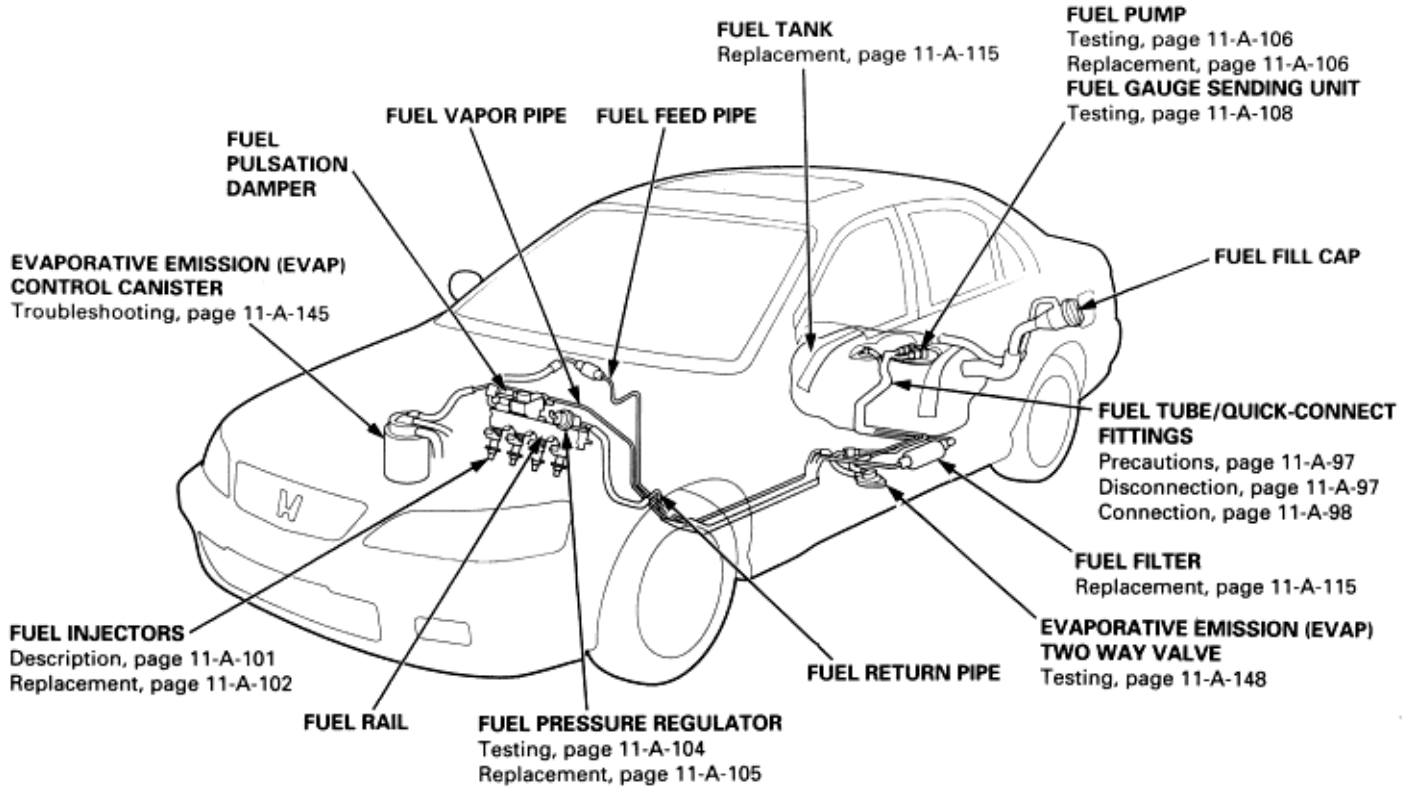
(See Page 11-A-97)

(See Page 11-A-98)

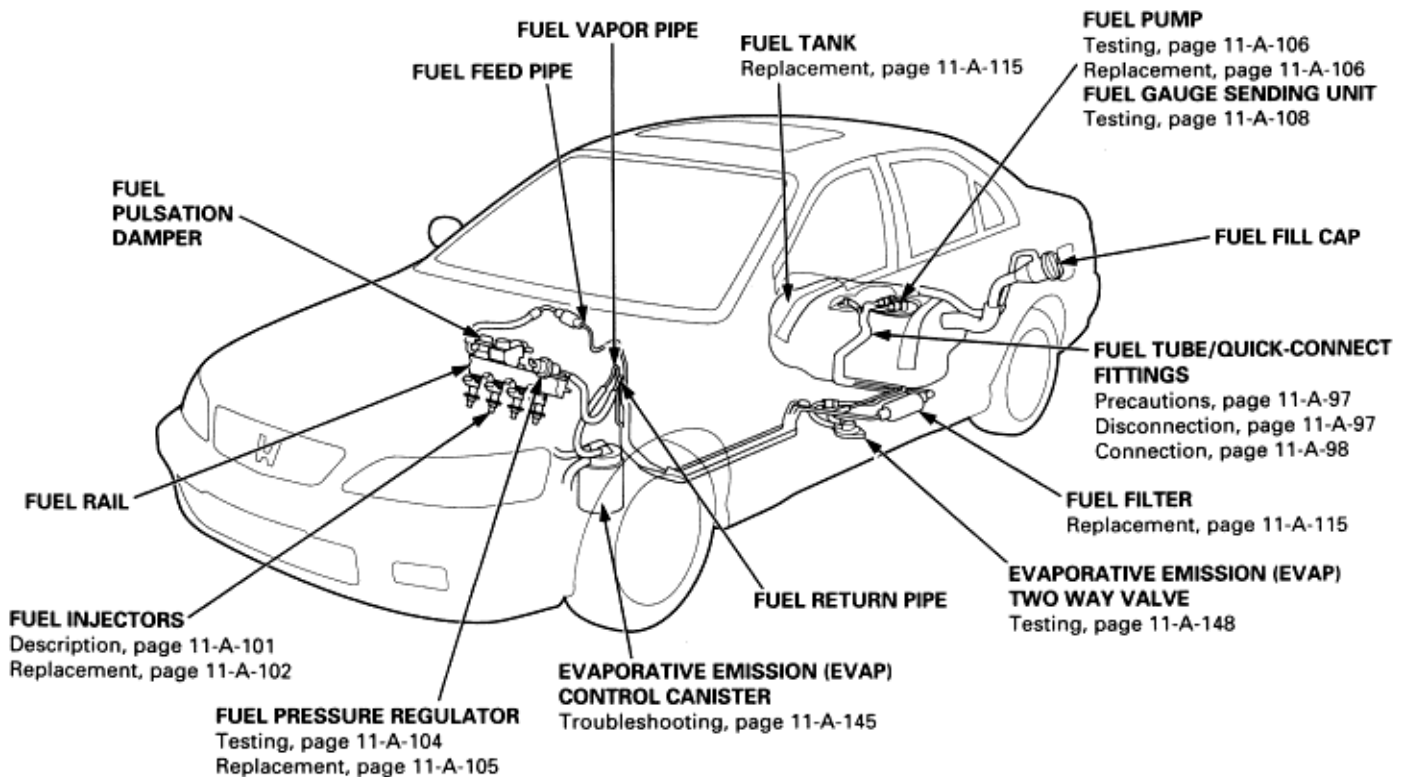
(See Page 11-A-115)

(See Page 11-A-148)

H22A7 engine:
LHD:



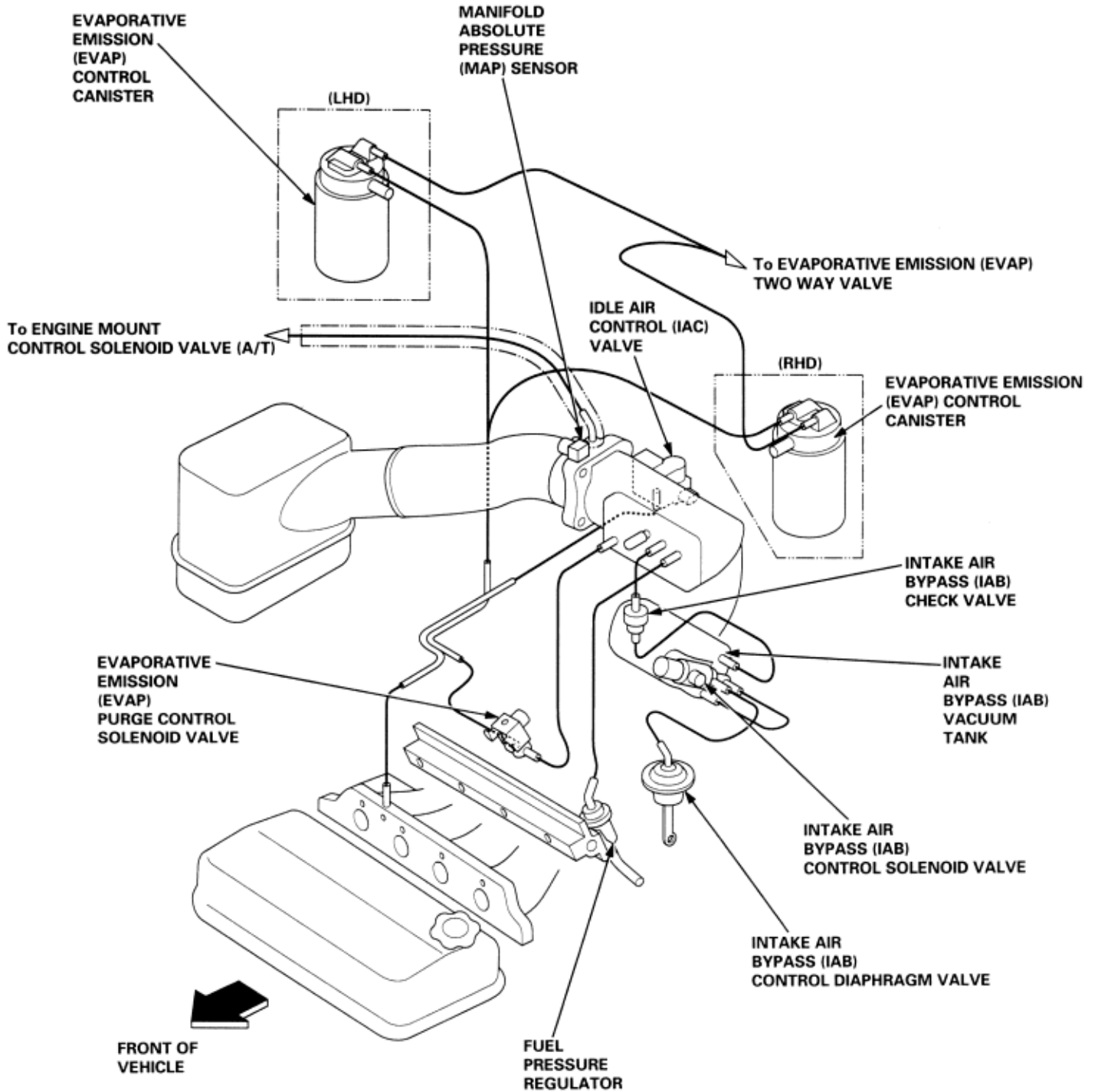
RHD:



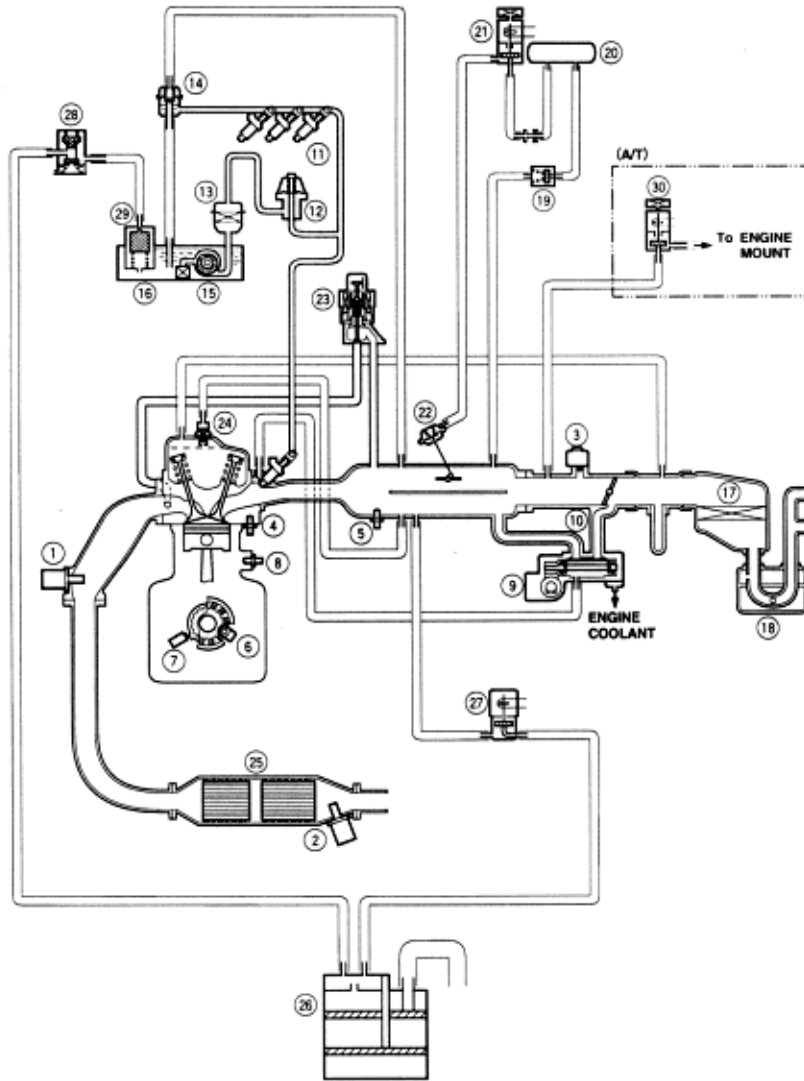
To go to the pages referenced on the diagram above,
click on the following:

- (See Page 11-A-106)
- (See Page 11-A-108)
- (See Page 11-A-145)
- (See Page 11-A-101)
- (See Page 11-A-102)
- (See Page 11-A-104)
- (See Page 11-A-105)
- (See Page 11-A-97)
- (See Page 11-A-98)
- (See Page 11-A-115)
- (See Page 11-A-148)

F20B6 engine:

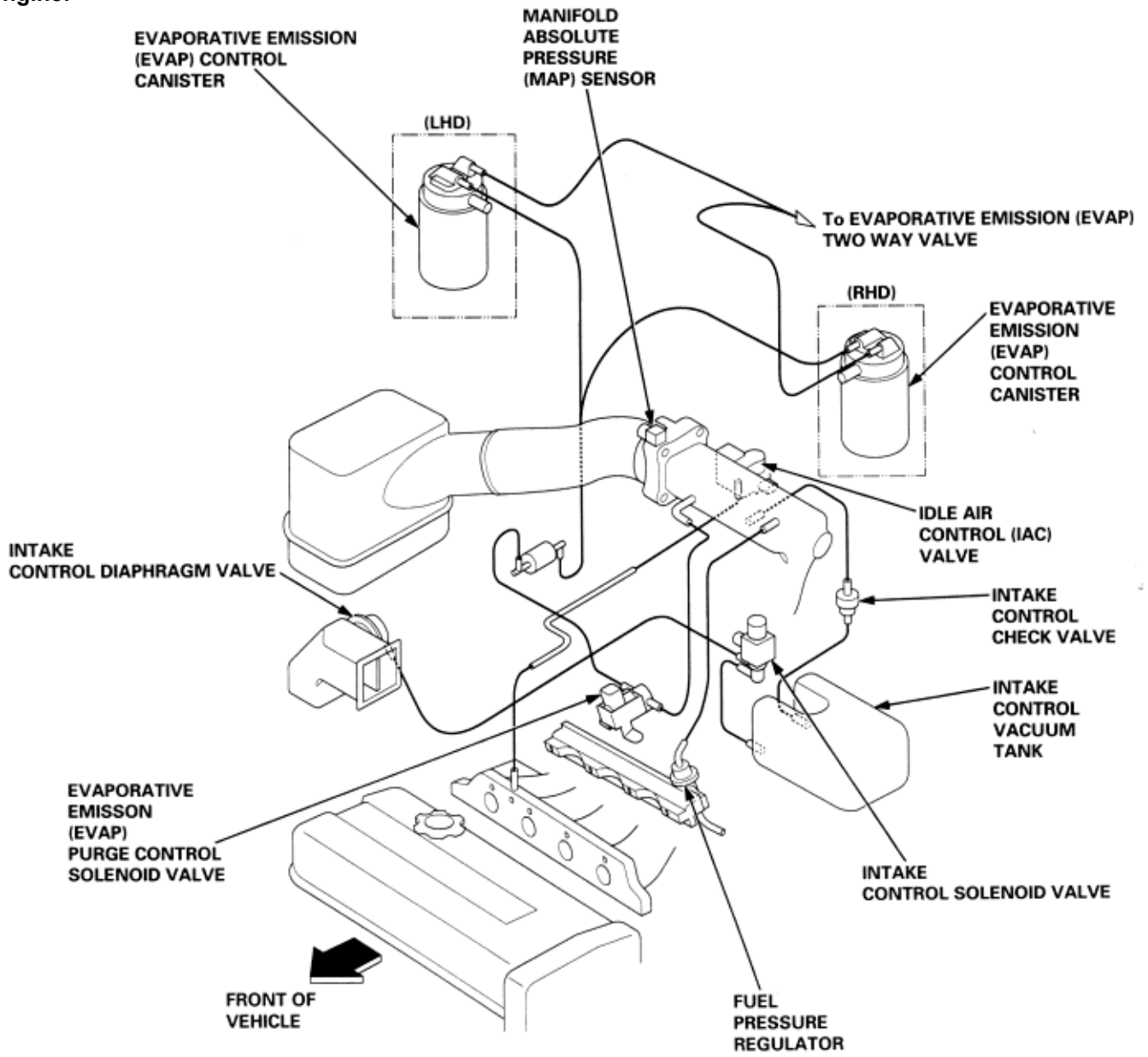


F20B6 engine:

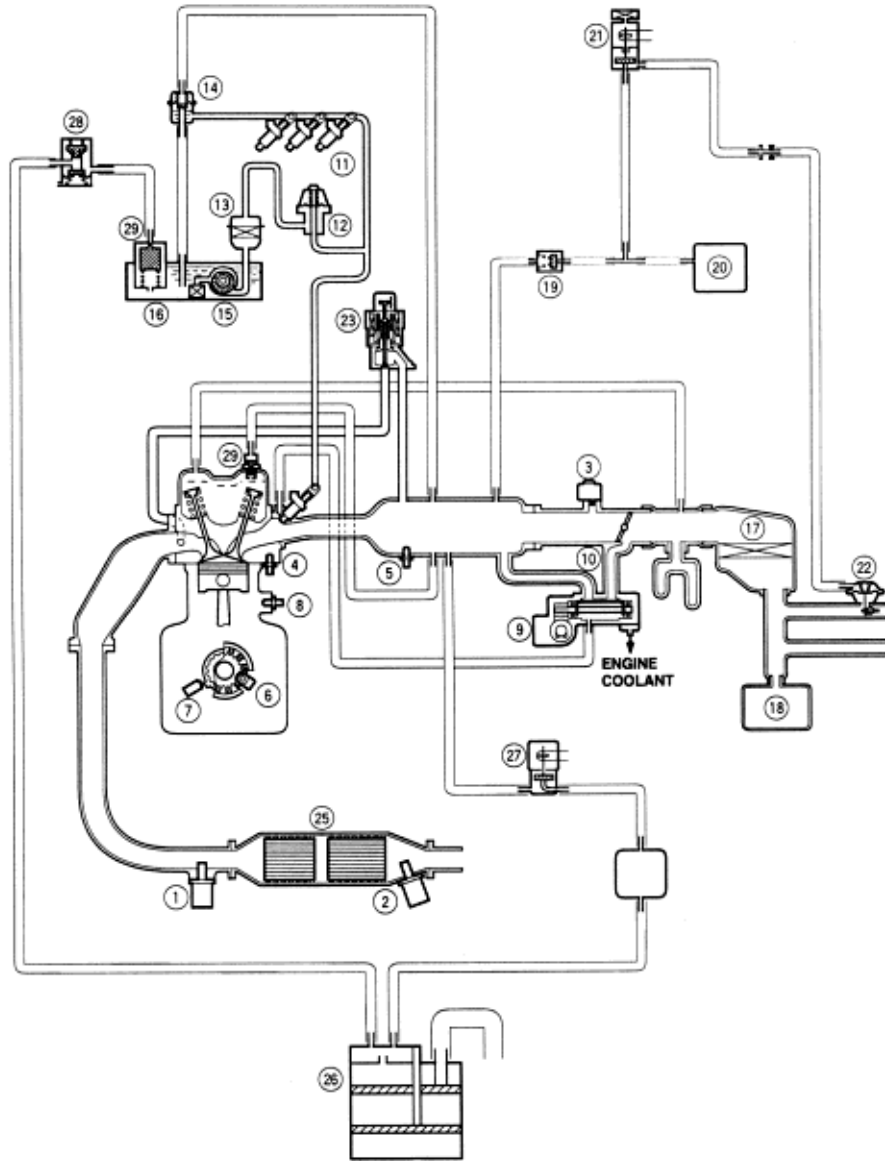


- | | |
|--|---|
| 1 Primary heated oxygen sensor (Primary HO2S) (Sensor 1) | 19 Intake air bypass (IAB) check valve |
| 2 Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) | 20 Intake air bypass (IAB) check valve |
| 3 Manifold absolute pressure (MAP) sensor | 21 Intake air bypass (IAB) control solenoid valve |
| 4 Engine coolant temperature (ECT) sensor | 22 Intake air bypass (IAB) control diaphragm valve |
| 5 Intake air temperature (IAT) sensor | 23 Exhaust gas recirculation (EGR) valve and lift sensor |
| 6 Crankshaft position (CKP) sensor | 24 Positive crankcase ventilation (PCV) valve |
| 7 Top dead center (TDC) sensor | 25 Three way catalytic converter |
| 8 Knock sensor (KS) | 26 Evaporative emission (EVAP) control canister |
| 9 Idle air control (IAC) valve | 27 Evaporative emission (EVAP) purge control solenoid valve |
| 10 Throttle body (TB) | 28 Evaporative emission (EVAP) two way valve |
| 11 Fuel injector | 29 Fuel tank evaporative emission (EVAP) valve |
| 12 Fuel pulsation damper | 30 Engine mount control solenoid valve |
| 13 Fuel filter | |
| 14 Fuel pressure regulator | |
| 15 Fuel pump (FP) | |
| 16 Fuel tank | |
| 17 Air cleaner | |
| 18 Resonator | |

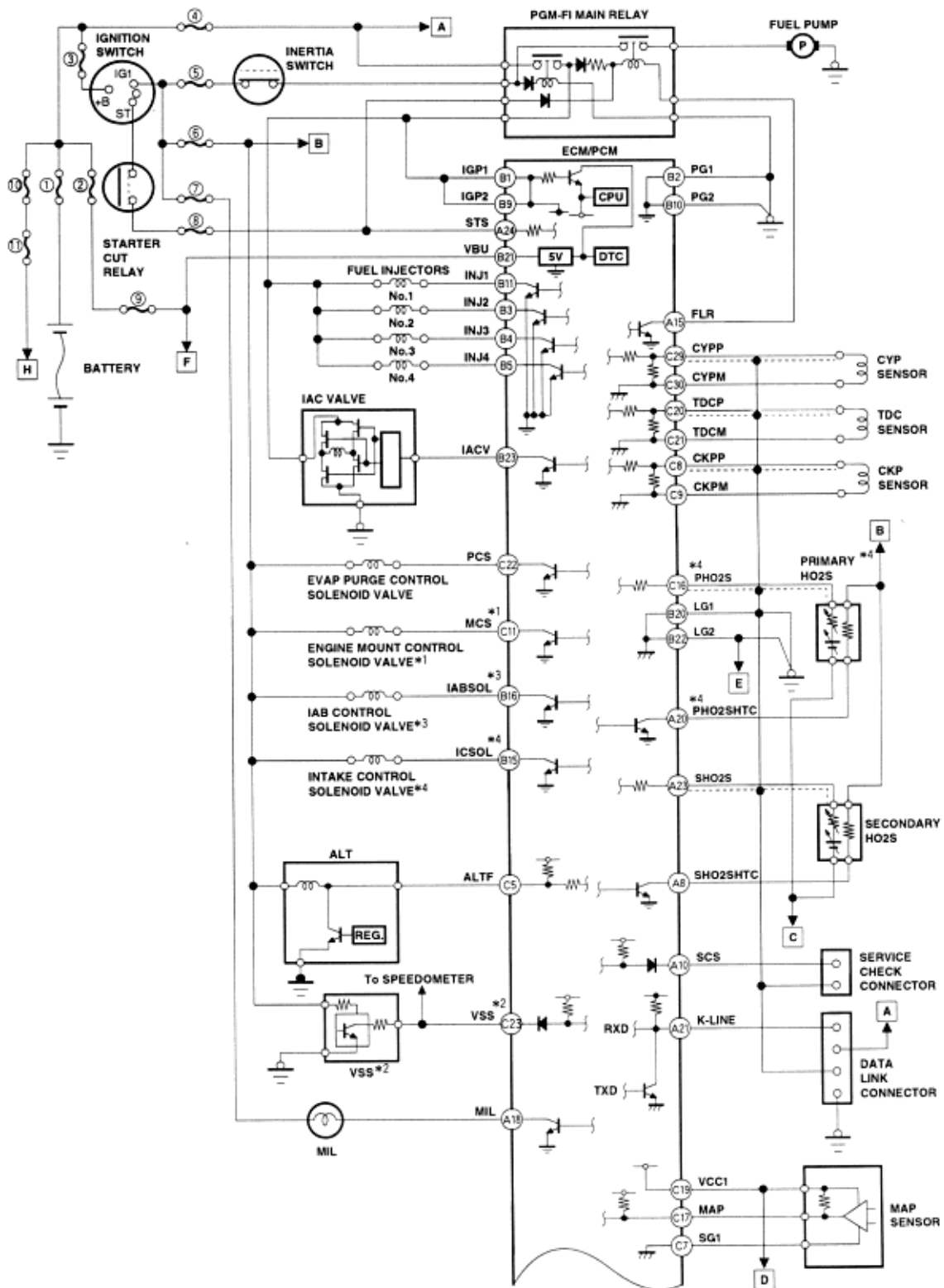
H22A7 engine:



H22A7 engine:



- | | |
|--|---|
| 1 Primary heated oxygen sensor (Primary HO2S) (Sensor 1) | 19 Intake control check valve |
| 2 Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) | 20 Intake control vacuum tank |
| 3 Manifold absolute pressure (MAP) sensor | 21 Intake control solenoid valve |
| 4 Engine coolant temperature (ECT) sensor | 22 Intake control diaphragm valve |
| 5 Intake air temperature (IAT) sensor | 23 Exhaust gas recirculation (EGR) valve and lift sensor |
| 6 Crankshaft position (CKP) sensor | 24 Positive crankcase ventilation (PCV) valve |
| 7 Top dead center (TDC) sensor | 25 Three way catalytic converter |
| 8 Knock sensor (KS) | 26 Evaporative emission (EVAP) control canister |
| 9 Idle air control (IAC) valve | 27 Evaporative emission (EVAP) purge control solenoid valve |
| 10 Throttle body (TB) | 28 Evaporative emission (EVAP) two way valve |
| 11 Fuel injector | 29 Fuel tank evaporative emission (EVAP) valve |
| 12 Fuel pulsation damper | |
| 13 Fuel filter | |
| 14 Fuel pressure regulator | |
| 15 Fuel pump (FP) | |
| 16 Fuel tank | |
| 17 Air cleaner | |
| 18 Resonator | |



Fuses:

- 1 Battery (100) *A
- 2 Back-up, ACC (40A) *A
- 3 IG main (50A) *A
- 4 AGCS (15A) *A
- 5 No 1 fuel pump (15A) *B
- 6 No 6 ECU (ECM/PCM) cruise control (15A) *B
- 7 No 9 Back-up light instrument light (7.5A) *B
- 8 No 13 Starter signal (7.5A) *B
- 9 No 13 Clock back-up (7.5A) *C
- 10 Heated seat (30A) *A
- 11 No 6 LAF heater (20A) *C

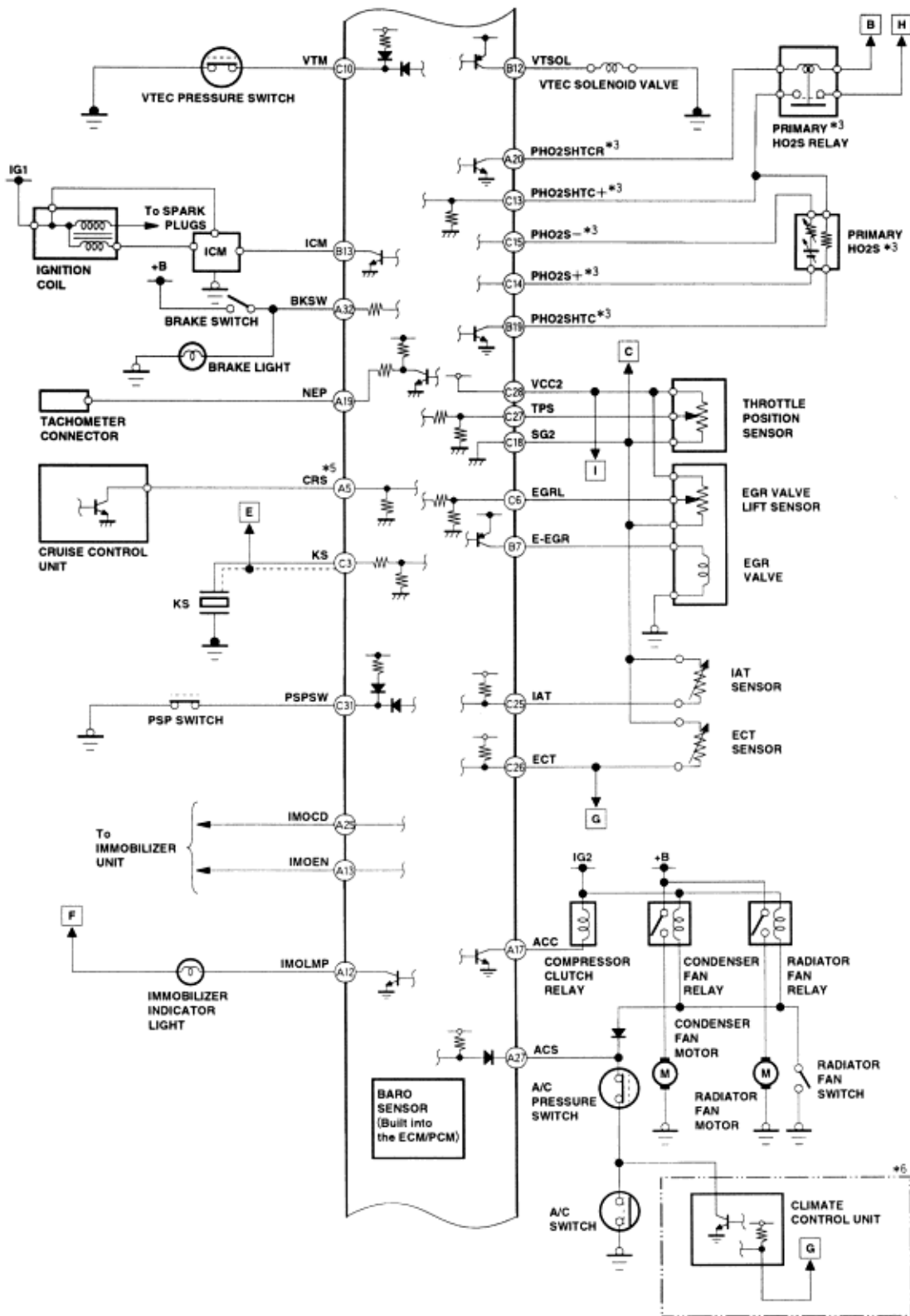
*A: in the under-hood fuse/relay box

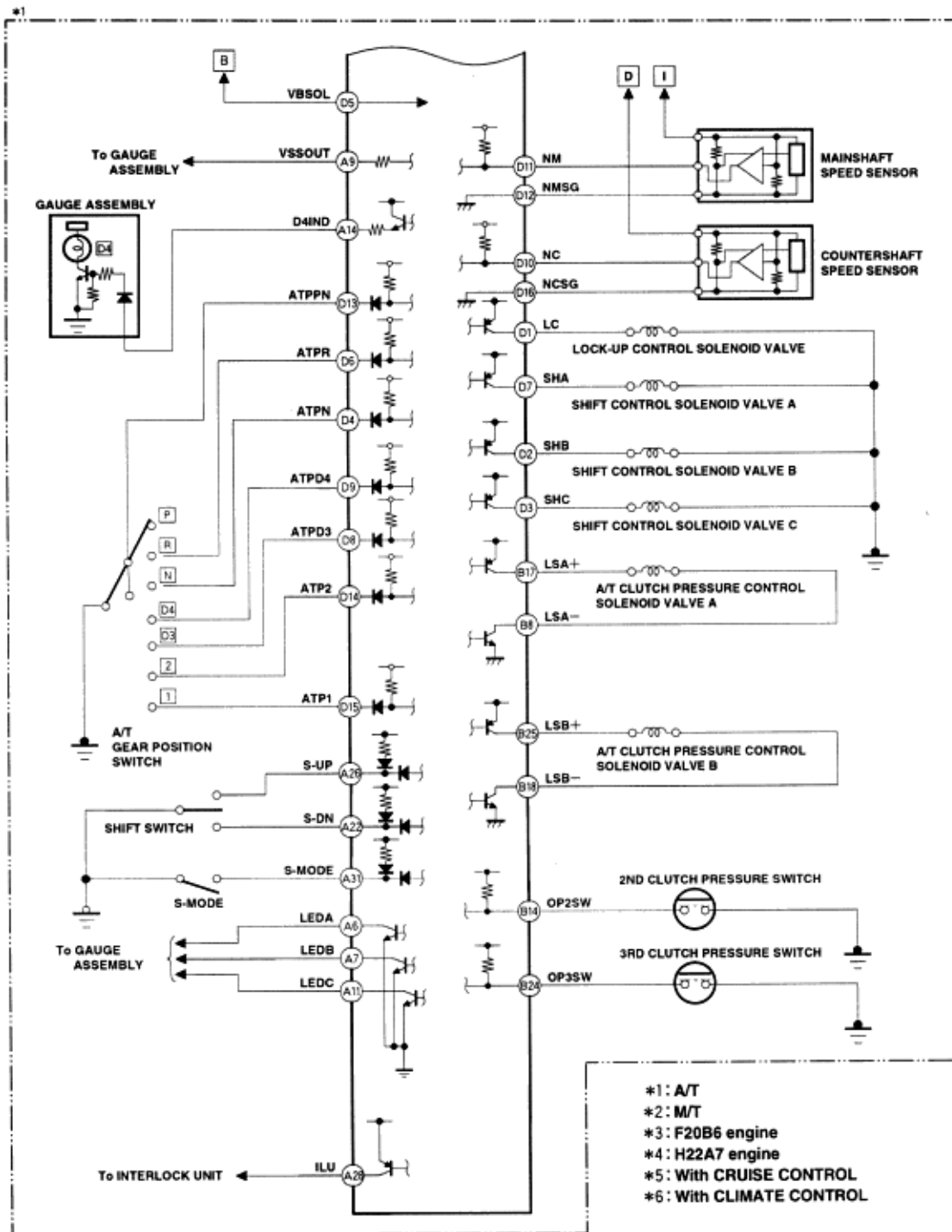
*B: in the driver's under-dash fuse/relay box

*C: in the passenger's under-dash fuse/relay box

System Description
Electrical Connections (cont'd)

11-A-13





ECM/PCM CONNECTOR TERMINAL LOCATIONS

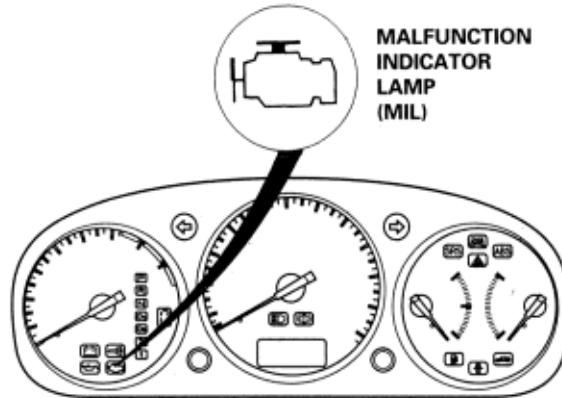
A (32P)												B (25P)								C (31P)							D (16P)												
12	13	14	15	5	6	7	8	9	10	11		1	2	3	4	5	7	8		3	5	6	7	8	9	10	1	2	3	4	5								
				17	18	19	20	21	22	23	24	9	10	11	12	13	14	15	16	17	18	11	13	14	15	16	17	18	19	20	21	22	6	7	8	9	10	11	12
				25	26	27	28	31	32			19	20	21	22	23	24	25				23	25	26	27	28	29	30	31	13	14	15	16						

How To Begin Troubleshooting

When the Malfunction indicator Lamp (MIL) has been reported on, or there is a driveability problem, use the appropriate procedure below to diagnose and repair the problem.

A. When the MIL has come on:

1. Connect the Honda PGM Tester or a scan tool to the 16P Data Link Connector (DLC) located on the passengers side of the center console.
2. Turn the ignition switch ON (II).
3. Check the Diagnostic trouble code C (DTC) and note it. Also check and note the freeze frame data.
4. Refer to the Diagnostic trouble Code Chart and begin troubleshooting.

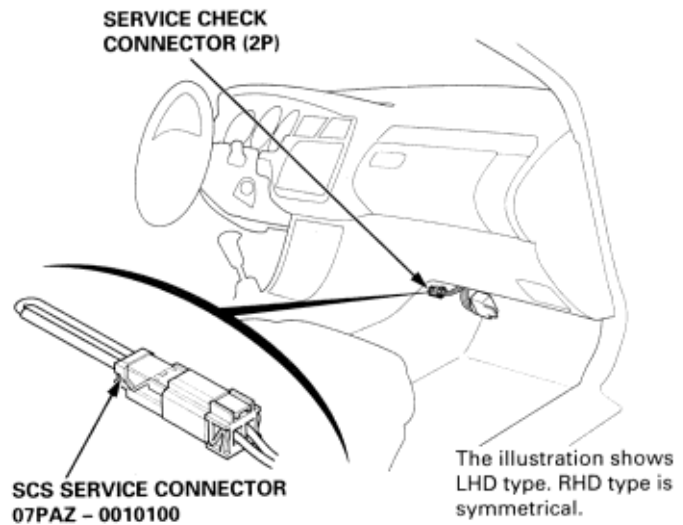
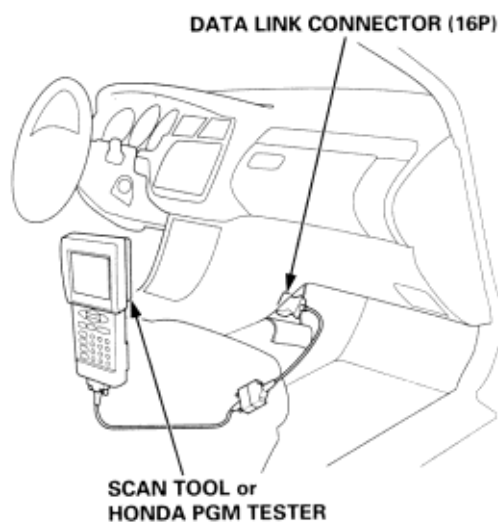


NOTE:

- See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- The scan tool or tester can read the diagnostic trouble codes (DTC), freeze frame data current data and other engine control module (ECM)/Powertrain control module (PCM) data.
- Freeze frame data indicates the engine conditions when the first malfunction, misfire, or fuel trim malfunction was detected. It can be useful information when troubleshooting.

B. When the MIL has not come on, but there is a driveability problem, refer to the Symptom Chart ([see page 11-A-18](#)).

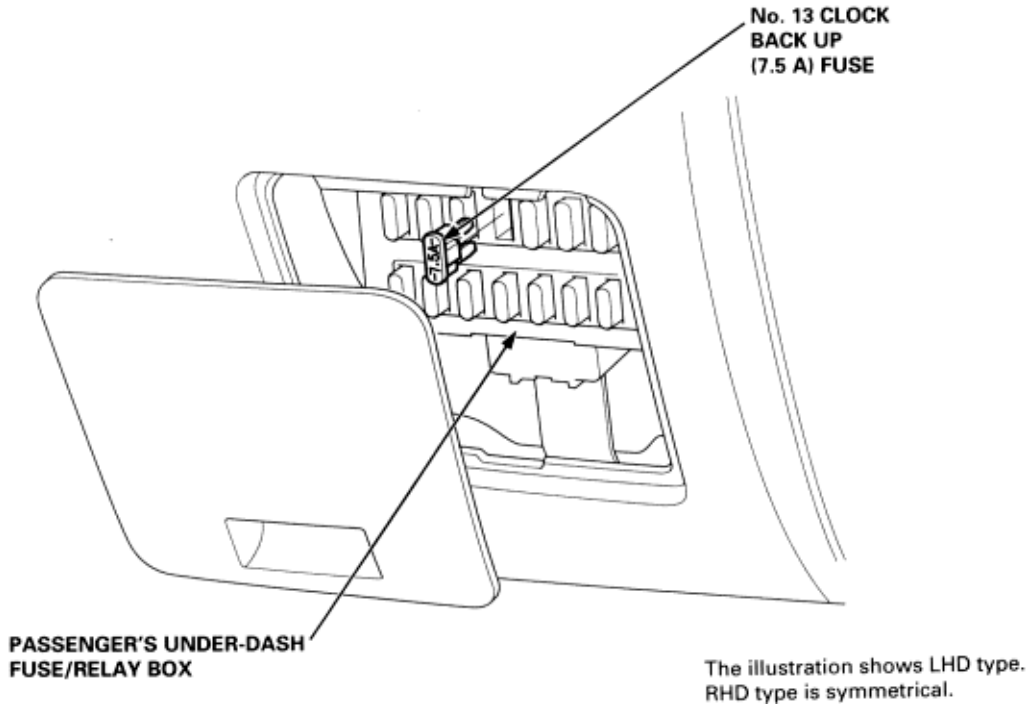
C. DTCs are indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected. Connect the SCS short connector to Service Check Connector as shown (The 2P Service Check Connector is located). Turn the ignition switch ON (II).



Engine Control Module (ECM)/Powertrain Control Module (PCM) Reset Procedure

Either of the following actions will reset the ECM/PCM.

- ♦ Use the scan tool or Honda PGM Tester to clear the ECM's/PCM's memory.
NOTE: See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- ♦ Turn the ignition switch OFF. Remove the No. 13 CLOCK BACK UP (7.5A) fuse from the passenger's wider-dash fuse/relay box for 10 seconds.

**Final Procedure (this procedure must be done after any troubleshooting)**

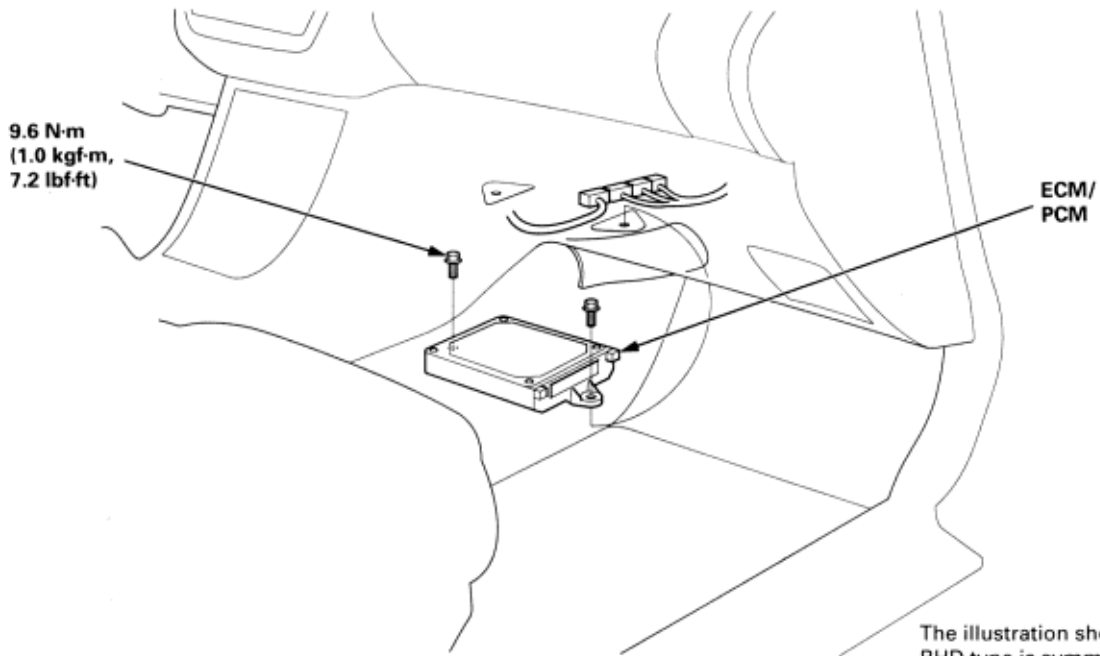
1. Remove the SCS short connector if it connected.
NOTE: If the SCS short connector is connected and there is on DTCs stored in the ECM/PCM, the MIL will stay on when the ignition switch is turned ON (II).
2. Do the ECM/PCM Reset Procedure.
3. Turn the ignition switch OFF.
4. Disconnect the scan tool or Honda PGM Tester from the Data Link Connector. (16P).

Known-Good ECM/PCM Substitution

The ECM/PCM is part of the immobilise system. If you substitute a known-good ECM/PCM the ECM/PCM will have a different immobilise code. In order for the engine to start, you must rewrite the immobilise code with the Honda PGM Tester.

ECM/PCM Removal

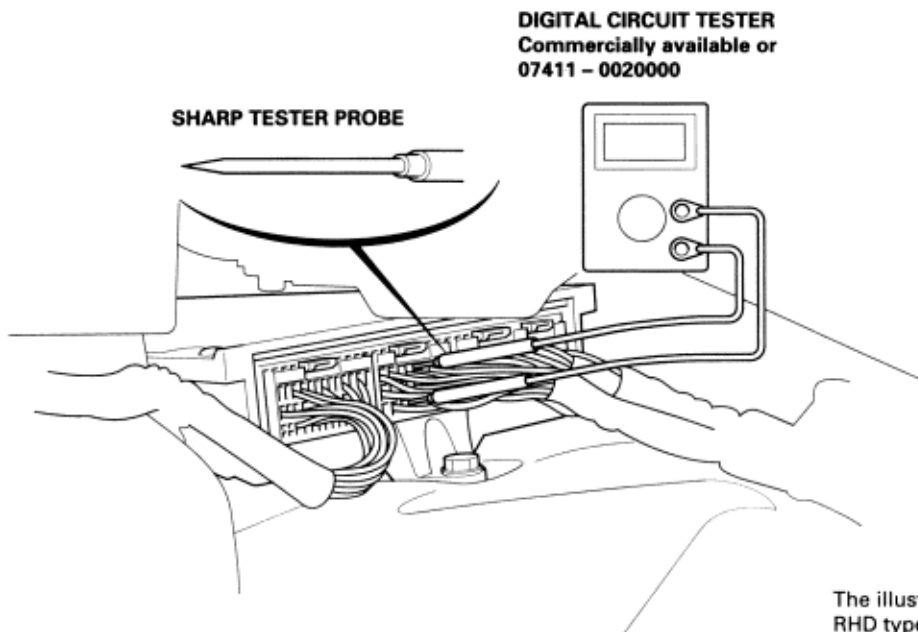
Pull the carpet from the passenger's side of the center console to expose the ECM/PCM. Remove the two bolts from the ECM/PCM. Check the system according to the procedure described for the appropriate DTC listed on the following pages.



The illustration shows LHD type.
RHD type is symmetrical.

Checking The ECM/PCM Connector Terminals

When checking the ECM/PCM connector terminals, gently slide the sharp tester probe from the wire side into the connector until it comes in contact with the terminal end of the wire.



The illustration shows LHD type.
RHD type is symmetrical.

Symptom Chart

Listed below are symptoms and probable causes for problems that DO NOT cause the Malfunction indicator Lamp (MIL) to come on. If the MIL was reported on, ([see page 11-A-15](#)). Troubleshoot each probable cause in the order listed (from left to right) until the symptom is eliminated. The probable cause and troubleshooting page reference can be found below.

Symptom	Probable Cause
Engine will not start	4, 2, 3, 5, 19, 13, 1
Hard starting	2, 4, 10, 15, 12, 18
Cold fast idle too low	7, 6, 15
Cold fast idle too high	7, 9, 10
Idle speed fluctuates	7, 9, 8
Misfire or rough running	Troubleshoot for misfire (see page 11-A-69), (see page 11-A-70)
Low power	2, 8, 9, 11, 16, 15, 17, 19
Engine stalls	2, 4, 10, 7, 19, 5, 14

Other Probable Causes for an engine that will not start:

- Compression
- Intake air leakage
- Engine locked up
- Timing belt
- Starting system
- Overheating
- Battery
- Immobilise system
- Inertia switch

Probable Cause List (For the DTC Chart ([see page 11-A-26](#)))

Probable Cause	System	Page
1	Engine control module (ECM)/Powertrain control module (PCM)	(see page 11-A-34)
2	Fuel pressure	(see page 11-A-101)
3	PGM-FI main relay	(see page 11-A-111)
4	Ignition system	Section 4
5	Crankshaft position/top dead center/cylinder position sensor circuit	(see page 11-A-74), and (see page 11-A-79)
6	Intake air temperature (IAT) sensor circuit	(see page 11-A-42)
7	Idle air control valve (IACV)	(see page 11-A-84)
8	Throttle body	(see page 11-A-122)
9	Throttle cable	(see page 11-A-120)
10	Manifold position (TP) sensor	(see page 11-A-39)
11	Throttle position (TP) sensor	(see page 11-A-47)
12	Barometer pressure (Baro) sensor	(see page 11-A-78)
13	A/T gear position signal	Section 14
14	Brake switch signal	(see page 11-A-90)
15	Air cleaner	(see page 11-A-119)
16	Intake control system, intake air pipe	(see page 11-A-125), (see page 11-A-130), (see page 11-A-134)
17	Three way catalytic converter (TWC)	(see page 11-A-136)
18	Evaporative emission (EVAP) control	(see page 11-A-144)
19	Contaminated fuel	-

EXM/PCM Data

You can retrieve data from the ECM/PCM by connecting the scan tool or the PGM Tester to the 16P data link connector (DLC). The items listed in the table below can be indicated by both scan tool and Honda PGM tester. The Honda PGM Tester also reads data beyond these items. Understanding this data may help you find the causes of intermittent problems.

NOTE:

- The "operating values" listed are approximate and may vary depending on the environment and the individual vehicle.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up. A/T in park or neutral, M/T in neutral, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM/PCM detects a problem, it will store it as a code consisting of one letter and four numbers.	If no problem is detected, there is no output	YES
Engine Speed	The ECM/PCM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication. At idle speed: F20B6 engine: M/T: 750 ± 50 rpm (min-1) A/T: 730 ± 50 rpm (min-1) H22A7 engine: 790 ± 50 rpm (min-1)	YES
Vehicle Speed	The ECM/PCM converts pulse signals from the Vehicle Speed Sensor (VSS) (M/T) or countershaft speed sensor (A/T) into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure. At idle speed: 21-41 kPa (160-310 mm Hg, 6.3-12.2 in Hg)	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM/PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM/PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT. With engine warmed up: approx: 70-100°C (158-212°F)	YES
Heated Oxygen Sensor (HO2S) (Primary Sensor 1) (Secondary Sensor 2)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM/PCM. Based on these signals, the ECM/PCM controls the air/fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometer ratio) the voltage signal is lower. When the oxygen content is low (that is, when the ration is richer than the stoichiometric ratio), the voltage signal is higher.	0.0-1.25V At idle speed: about 0.1-0.9V	YES (Primary, Sensor 1 only)
Heated Oxygen Sensor (HO2S) (Primary Sensor 1) (F20B6 engine)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM/PCM. Based on these signals, the ECM/PCM controls the air/fuel ratio. When the oxygen content is high (that is, when the ration is leaner than the stoichiometer ration), the voltage signal is higher. The heated Oxygen Sensor signals are electrical current that are indicated as voltage on the scan tool.	0.0-1.25V At idle speed: about 0.1-0.9V	NO

Data	Description	Operating Value	Freeze Data
HO2S Feedback Loop Status	Loop status is indicated as "open" or "closed". Closed: Based on the HO2S output, the ECM/PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: Ignoring HO2S output, the ECM/PCM refers to signals from the TP, MAP and ECT sensors to control the amount of injected fuel.	At idle speed: closed	YES
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO2S feedback is in the closed loop status. When the signal from the HO2S feedback is weak, short term fuel trim gets higher and the ECM/PCM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO2S output. Consequently, the short term fuel trim is lowered, and the ECM/PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	± 20%	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	± 20%	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM/PCM. When intake air temperature is low, the internal resistance of the sensor increases and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: approx. 10%	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the ECM/PCM. The ECM/PCM matches ignition timing to the driving conditions.	At idle speed: F20B6 engine: $12^{\circ} \pm 2^{\circ}$ H22A7 engine: $15^{\circ} \pm 2^{\circ}$ BTDC with SCS service signal line is jumped with the Honda PGM tester	NO
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 12-34%	NO

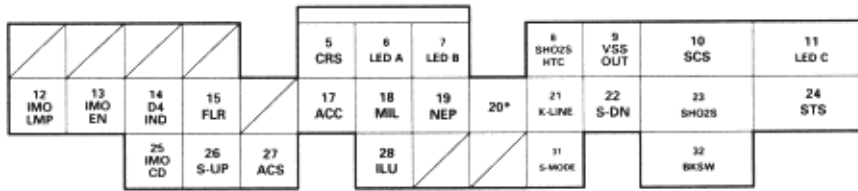
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement

11-A-21

ECM/PCM CONNECTOR A (32P)

ECM/PCM CONNECTOR A (32P)



*: PHO2S
HTCR*³
PHO2S
HTC*⁴

Wire side female terminals

ECM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
5 * ¹	PUR	CRS (Cruise control signal)	Down shift signal input from cruise control	When cruise control is used: pulses
6 * ¹	BLU/YEL	LED A	Shift indicator light control	In manual mode: ♦ In 4th gear position: Battery voltage ♦ In 1st, 2nd and 3rd gear positions: 0V
7	PUR	LED B	Shift indicator light control	In manual mode: ♦ In 2nd and 3rd gear positions: Battery voltage ♦ In 1st, and 4th gear positions: 0V
8	BLK/WHT	SO2SHTC (Secondary heated oxygen sensor heater control)	Drives secondary heated oxygen sensor heater	With ignition ON (II): Battery voltage With fully warmed up engine running: 0V
9 * ¹	BLU/WHT	VSSOUT (Vehicle speed sensor output signal)	Vehicle speed signal detected from countershaft speed sensor	Depending on vehicle speed: Pulses
10	BRN	SCS (Service check signal)	Detect service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0V With the terminal disconnected: Battery voltage
11 * ¹	BLU/BLK	LED C	Shift indicator light control	In manual mode: ♦ In 1st and 3rd gear positions: Battery voltage ♦ In 2nd and 4th gear positions: 0V
12	PNK	IMOLMP (Immobiliser indicator light)	Drives immobiliser indicator light	With immobiliser indicator light turned ON: 0V With immobiliser indicator light turned OFF: Battery voltage
13	PNK/BLK	IMOEN (Immobiliser enable signal)	Sends immobiliser enable signal	
14 * ¹	GRN/BLK	D4IND (D4 indicator)	Drives D4 indicator light	With D4 indicator light turned ON: 0V With D4 indicator light turned OFF: Battery voltage
15	GRN/YEL	FLR (Immobiliser fuel pump relay)	Drives fuel pump relay	0V for two seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C clutch relay)	Drives A/C clutch relay	With compressor ON: 0V With compressor OFF: Battery voltage
18	GRN/ORN	MIL (Malfunction indication light)	Drives MIL	With MIL turned ON: 0V With MIL turned OFF: Battery voltage
19	BLU	NEP (Engine speed pulse)	Outputs engine speed pulse	With engine running: Pulses
20	BLK./WHT	PHO2SHTCR (Primary heated oxygen sensor heater control relay)	Drives primary heated oxygen sensor heater	With ignition switch ON (II): Battery voltage With fully warmed up engine running: 0V
20 * ³	GRN/RED	PHO2SHTCR (Primary heated oxygen sensor heater control relay)	Drives primary heated oxygen sensor heater relay	With ignition switch ON (II): 0V
21	GRY	K Line	Sends and receives	With ignition switch ON (II): Pulses

| scan tool signal |

*1: A/T

*2: M/T

*3: F20B6 engine

*4: H22A7 engine

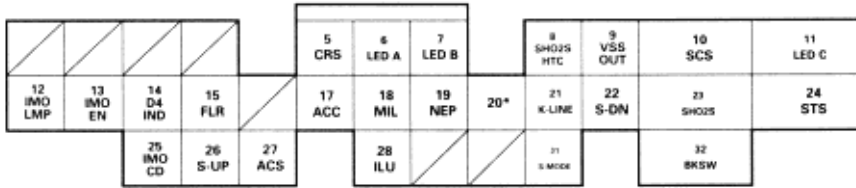
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-A-22

ECM/PCM CONNECTOR A (32P)

ECM/PCM CONNECTOR A (32P)



Wire side female terminals

*: PHO2S
HTCR*³
PHO2S
HTC*⁴

ECM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
22 * ¹	ORN	S-DN (Shift down)	Detects downshift switch signal	In manual mode and shift lever pushed toward downshift position (marked with "-"): 0V In manual mode and shift lever in neutral position: Battery voltage
23	WHT	SHO2S (Secondary heated oxygen sensor, sensor 2)	Detects secondary heated oxygen sensor (sensor 2) signal	With throttle fully opened from idle with fully warmed up engine: Above 0.6V With throttle quickly closed: Below 0.4V
24	BLU/ORN	STS (Starter switch signal)	Detects starter switch signal	With starter switch ON (II): Battery voltage With starter switch OFF: 0V
25	RED	IM OCD (Immobiliser code)	Detects immobiliser signal	
26 * ¹	WHT/BLU	S-UP (Shift up)	Detects upshift switch signal	In manual mode and shift lever pushed toward upshift position (marked with "+"): 0V In manual mode and shift lever in neutral position: Battery voltage
27	BLU/RED	ACS (A/C switch signal)	Detects A/C switch signal	With A/C switch ON: 0V With A/C switch OFF: About 5V
28 * ¹	WHT/RED	ILU (Interlock control unit)	Drives interlock control unit	With ignition switch ON (II) and brake pedal depressed: Battery voltage
31 * ¹	BRN	S-MODE (Shift mode)	Detects manual mode switch signal	In manual mode (shift lever is positioned in manual mode): 0V In other than manual mode: Battery voltage
32	WHT/BLK	BKSW (Brake switch)	Detects brake switch signal	With brake pedal released: 0V With brake pedal depressed: Battery voltage

*1: A/T

*2: M/T

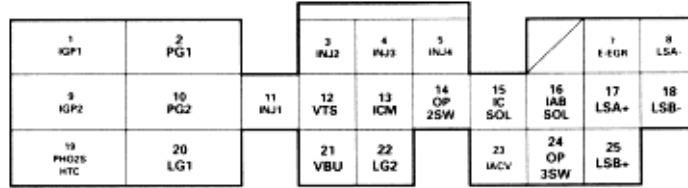
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-A-23

ECM/PCM CONNECTOR B (25P)

ECM/PCM CONNECTOR B (25P)



Wire side female terminals

ECM CONNECTOR B (25P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	YEL/BLK	IGP1 (Power source)	Power source for the ECM/PCM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
2	BLK	PG1 (Power ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
3	RED	INJ2 (No. 2 fuel injection)	Drives No. 2 fuel injector	With engine running: Pulses
4	BLU	INJ3 (No. 3 fuel injection)	Drives No. 3 fuel injector	With engine running: Pulses
5	YEL	INJ4 (No. 4 fuel injection)	Drives No. 4 fuel injector	With engine running: Pulses
7	PNK	E-EGR	Drives EGR valve	With EGR operation during driving with fully warmed up engine: Duty controlled With EGR not operating: 0V
8 *1	WHT	LSA- (A/T clutch pressure control solenoid valve A - side)	A/T clutch pressure control solenoid valve A power supply negative electrode	With ignition switch ON (II): Pulses
9	YEL/BLK	IGP2 (Power source)	Power source for the ECM/PCM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
10	BLK	PG2 (Power source)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
11	BRN	INJ1 (No. 1 fuel injection)	Drives No. 1 fuel injector	With engine running: Pulses
12	GRN/YEL	VTS (VTEC solenoid valve)	Drives VTEC solenoid valve	With engine at low rpm: 0V With engine at high rpm: Battery voltage
13	YEL/GRN	ICM (Ignition control module)	Sends ignition pulse	With ignition switch ON (II): Battery voltage With engine running: About 10V (depending on engine speed)
14 *1	BLU/BLK	OP2SW (2nd Oil pressure switch)	Detects 2nd oil pressure switch	With ignition switch ON (II): Pulses
15 *4	RED/BLU	ICSOL (Intake control solenoid valve)	Drives intake control solenoid valve	With engine running, engine speed below 3,950 rpm (min-1): Battery voltage With engine running, engine speed above 3,950 rpm (min-1): 0V
16 *3	RED/BLU	IABSOL (Intake air bypass control solenoid valve)	Drives IAB control solenoid valve	With engine running, engine speed below 4,200 rpm (min-1): Battery voltage With engine running, engine speed above 4,200 rpm (min-1): 0V
17 *1	RED	LSA+ (A/T clutch pressure control solenoid valve A + side)	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulses
18 *1	GRN	LSB- (A/T clutch pressure control solenoid valve B - side)	A/T clutch pressure control solenoid valve B power supply negative electrode	With ignition switch ON (II): Pulses
19 *3	BLK/WHT	HO2SHTC (Primary heated oxygen sensor)	Drives primary heated oxygen sensor heater	With ignition switch ON (II): Battery voltage

		heater control)		With fully warmed up engine running: Duty controlled
20	BRN/BLK	LG1 (Logic ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
21	WHT/BLU	VBU (Voltage back up)	Power source for the ECM/PCM control circuit Power source for the DTC memory	Battery voltage at all times
22	BRN/BLK	LG2 (Logic ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
23	BLK/BLU	IACV (Idle air control valve)	Drives IAC valve	With engine running: Pulses
24 *1	BLU/WHT	OP3SW (3rd oil pressure switch)	Detects 3rd pressure switch	With ignition switch ON (II): Battery voltage
25 *1	ORN	LSB+ (A/T clutch pressure control solenoid valve B + side)	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulses

*1: A/T

*2: M/T

*3: F20B6 engine

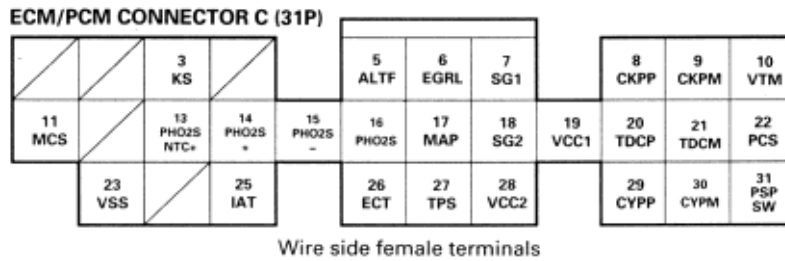
*4: H22A7 engine

Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-A-24

ECM/PCM CONNECTOR C (31P)



ECM CONNECTOR C (31P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
3	RED/BLU	KS (Knock sensor)	Detects KS signal	With engine knocking: Pulses
5	WHT/RED	ALTF (Alternator FR signal)	Detects alternator FR signal	With fully warmed up engine running: 0V - battery voltage (depending on electrical load)
6	WHT/BLK	EGRL (EGR lift sensor)	Detects EGR valve lift sensor signal	At idle: About 1.2V
7	GRN/WHT	SG1 (Sensor ground)	Ground for MAP sensor	Less than 1.0V at all times
8	BLU	CKPP (CKP sensor P side)	Detects CKP sensor	With engine running: Pulses
9	WHT	CKPM (CKP sensor M side)	Ground for CKP sensor	
10	BLU/BLK	VTM (VTEC pressure switch signal)	Detects VTEC pressure switch signal	With engine at low engine speed: 0V With engine at high engine speed: Battery voltage
11 *1	RED/BLK	MCS (Engine mount control solenoid valve)	Drives engine mount control solenoid valve	At idle: 0V Above idle: Battery voltage
13 *3	WHT	PHO2SHTC+ (Primary heated oxygen sensor heater control + side)	Detects primary heated oxygen sensor heater voltage	With ignition switch ON (II): Battery voltage
14 *3	RED	PHO2S+ (Primary heated oxygen sensor, sensor 1 + side)	Detects primary heated oxygen sensor (sensor 1) signal	With ignition switch ON (II): Battery voltage
15 *3	BLU	PHO2S- (Primary heated oxygen sensor, sensor 1 - side)	Detects primary heated oxygen sensor (sensor 1) signal	With ignition switch ON (II): Battery voltage
16	WHT	PHO2S (Primary heated oxygen sensor, sensor 1)	Detects primary heated oxygen sensor (sensor 1) signal	With throttle fully opened from idle with fully warmed up engine: Above 0.6V With throttle quickly closed: Below 0.4V
17	RED/GRN	MAP (Manifold absolute pressure sensor)	Detects MAP sensor signal	With ignition switch ON (II): About 3V At idle: About 1.0V (depending on engine speed)
18	GRN/BLK	SG2 (Sensor ground)	Sensor ground	Less than 1.0V at all times
19	YEL/RED	VCC1 (Sensor voltage)	Power source to MAP sensor	With ignition switch ON (II): About 5V With ignition OFF: 0V
20	GRN	TDCP (TDC sensor P side)	Detects TDC sensor	With engine running: Pulses
21	RED	TDCM (TDC sensor M side)	Ground for TDC sensor	
22	RED/YEL	PCS (EVAP purge control solenoid valve)	Drives EVAP purge control solenoid valve	With engine running, engine coolant below 35°C (131°F) *3, 65°C (149°F) *4: Battery voltage With engine running, engine coolant above 35°C (131°F) *3, 65°C (149°F) *4: 0V
23 *2	BLU/WHT	VSS (Vehicle speed sensor)	Detects VSS signal	With ignition switch ON (II) and front wheel rotating: Cycles 0V - about 5V or battery voltage
25	RED/YEL	IAT (Intake air temperature sensor)	Detects IAT sensor signal	With ignition switch ON (II): About 0.1 - 4.8V (depending on intake air temperature)
26	RED/WHY	ECT (Engine coolant temperature sensor)	Detects ECT sensor	With ignition switch ON (II): About

		temperature sensor)	signal	0.1 - 4.8V (depending on engine coolant temperature)
27	RED/BLK	TPS (Throttle position sensor)	Detects TP sensor signal	With throttle fully open: About 4.8V With throttle fully closed: About 0.5V
28	YEL/BLU	VCC2 (Sensor voltage)	Provides sensor voltage	With ignition switch ON (II): About 5V With ignition switch OFF: 0V
29	YEL	CYPP (CYP sensor P side)	Detects CYP sensor	With engine running: Pulses
30	BLK	CYPM (CYP sensor P side)	Ground for CYP sensor	
31	GRN	PSPSW (P/S pressure switch signal)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: 0V At idle with steering wheel at full lock: Battery voltage

*1: A/T

*2: M/T

*3: F20B6 engine

*4: H22A7 engine

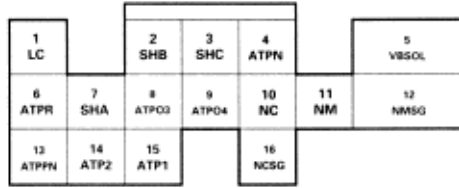
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-A-25

ECM/PCM CONNECTOR D (16P) (A/T only)

PCM CONNECTOR D (16P) (A/T only)



Wire side female terminals

ECM CONNECTOR D (16P) (A/T only)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	YEL	LC (Lock-up control solenoid valve)	Drives lock-up control solenoid valve	During half and full lock-up conditions, and during deceleration condition: Battery voltage during no lock-up condition: 0V
2	GRN/WHT	SHB (Shift control solenoid valve B)	Drives shift control solenoid valve B	Battery voltage in following positions: ♦ 1 and 2 positions ♦ D4 and D3 positions in 1st and 2nd gear ♦ P, R and N positions 0V in following positions: ♦ D4 and D3 positions in 3rd gear ♦ D4 position in 4th gear
3	GRN	SHC (Shift control solenoid valve C)	Drives shift control solenoid valve C	Battery voltage in following positions: ♦ 1 position ♦ D4 and D3 positions in 1st and 3rd gear 0V in following positions: ♦ 2 position ♦ D4 and D3 positions in 2nd gear ♦ D4 position in 4th gear ♦ P, R and N positions
4	RED/BLK	ATPNP (At gear position switch)	Detects A/T gear position switch signal	In N position: 0V In any other position: Battery voltage
5	BLK/YEL	VBSOL (Battery voltage for solenoid valve)	Power source of solenoid valve	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
6	WHT	ATPR (At gear position switch)	Detects A/T gear position switch signal	In R position: 0V In any other position: Battery voltage
7	BLU/YEL	SHA (Shift control solenoid valve A)	Drives shift control solenoid valve A	Battery voltage in following positions: ♦ 2 position ♦ D4 and D3 positions in 2nd and 3rd gear 0V in following positions: ♦ 1 position ♦ D4 and D3 positions in 1st gear ♦ D4 position in 4th gear ♦ P, R and N positions
8	PNK	ATPD3 (At gear position switch)	Detects A/T gear position switch signal)	In D3 position: 0V In any other position: Battery voltage
9	YEL	ATPD4 (At gear position switch)	Detects A/T gear position switch signal)	In D4 position: 0V In any other position: Battery voltage
10	PNK	NC (Countershaft speed sensor)	Detects countershaft speed sensor signal	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx 0V
11	RED	NM (Mainshaft speed sensor)	Detects mainshaft speed sensor	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx 0V
12	WHT	NMSG (Mainshaft speed sensor ground)	Ground mainshaft speed sensor signals	
13	BLU/WHT	ATPPN (At gear	Detects A/T gear	

		position switch)	position switch signal)	In any other position: Battery voltage
14	BLU	ATP2 (At gear position switch)	Detects A/T gear position switch signal)	In 2 position: 0V In any other position: Battery voltage
15	BRN	ATP1 (At gear position switch)	Detects A/T gear position switch signal)	In 1 position: 0V In any other position: Battery voltage
16	GRN	NCSG (Countershaft speed sensor ground)	Ground for countershaft speed sensor	

DTC (MIL indication*)	Detection Item	Probable Cause	Page
P0101 (3)	Manifold absolute Pressure circuit Low input	<ul style="list-style-type: none"> ♦ Open or short in MAP sensor circuit ♦ MAP sensor ♦ ECM/PCM 	(see page 11-A-39)
P0108 (3)	Manifold absolute Pressure circuit High input	<ul style="list-style-type: none"> ♦ Open in MAP sensor circuit ♦ MAP sensor ♦ ECM/PCM 	(see page 11-A-41)
P0112 (10)	Intake air Temperature circuit Low input	<ul style="list-style-type: none"> ♦ Short in IAT sensor circuit ♦ IAT sensor ♦ ECM/PCM 	(see page 11-A-42)
P0113 (10)	Intake air Temperature circuit High input	<ul style="list-style-type: none"> ♦ Open in IAT sensor circuit ♦ IAT sensor ♦ ECM/PCM 	(see page 11-A-43)
P0117 (6)	Engine coolant Temperature circuit Low input	<ul style="list-style-type: none"> ♦ Short in ECT sensor circuit ♦ ECT sensor ♦ ECM/PCM 	(see page 11-A-44)
P0118 (6)	Engine coolant Temperature circuit High input	<ul style="list-style-type: none"> ♦ Open in ECT sensor circuit ♦ ECT sensor ♦ ECM/PCM 	(see page 11-A-46)
P0122 (7)	Throttle position Circuit Low input	<ul style="list-style-type: none"> ♦ Open or short in TP sensor circuit ♦ TP sensor ♦ ECM/PCM 	(see page 11-A-47)
P0123 (7)	Throttle position Circuit High input	<ul style="list-style-type: none"> ♦ Open in TP sensor circuit ♦ TP sensor ♦ ECM/PCM 	(see page 11-A-49)
P0131 *4 (1)	Primary heated oxygen sensor Circuit low voltage (Sensor 1)	<ul style="list-style-type: none"> ♦ Short in Primary HO2S (Sensor 1) circuit ♦ Primary HO2S (Sensor 1) ♦ Fuel supply system ♦ ECM 	(see page 11-A-50)
P0132 *4 (1)	Primary heated oxygen sensor Circuit high voltage (Sensor 1)	<ul style="list-style-type: none"> ♦ Open in Primary HO2S (Sensor 1) circuit ♦ Primary HO2S (Sensor 1) ♦ ECM 	(see page 11-A-52)
P0133 *4 (61)	Primary heated oxygen sensor Slow response (Sensor 1)	<ul style="list-style-type: none"> ♦ Primary HO2S (Sensor 1) ♦ Exhaust system 	(see page 11-A-53)
P0135 *4 (41)	Primary heated oxygen sensor Circuit malfunction (Sensor 1)	<ul style="list-style-type: none"> ♦ Open or short in Primary HO2S (Sensor 1) heater circuit ♦ ECM 	(see page 11-A-62)
P0137 (63)	Secondary heated oxygen sensor Circuit malfunction (Sensor 2)	<ul style="list-style-type: none"> ♦ Open or short in Secondary HO2S (Sensor 2) heater circuit ♦ Secondary HO2S sensor ♦ ECM 	(see page 11-A-59)
P0138 (63)	Secondary heated oxygen sensor Circuit malfunction (Sensor 2)	<ul style="list-style-type: none"> ♦ Open or short in Secondary HO2S (Sensor 2) heater circuit ♦ Secondary HO2S sensor ♦ ECM 	(see page 11-A-60)
P0139 (63)	Secondary heated oxygen sensor Circuit malfunction (Sensor 2)	<ul style="list-style-type: none"> ♦ Secondary HO2S sensor 	(see page 11-A-61)

*: These DTCs are indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS short connector connected.

** The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

*1: A/T

*2: M/T

*3: F20B6 engine

*4: H22A7 engine

DTC (MIL indication*)	Detection Item	Probable Cause	Page
P0141 (65)	Secondary heated oxygen sensor Circuit malfunction (Sensor 2)	<ul style="list-style-type: none"> ♦ Open or short in secondary HO2S (Sensor 2) heater circuit ♦ ECM/PCM 	(see page 11-A-62)
P0171 (45)	System too lean	<ul style="list-style-type: none"> ♦ Fuel supply system ♦ Primary HO2S (Sensor 1) ♦ MAP sensor ♦ Contaminated fuel ♦ Valve clearance ♦ Exhaust leakage 	(see page 11-A-67)
P0172 (45)	System too rich	<ul style="list-style-type: none"> ♦ Fuel supply system ♦ Primary HO2S (Sensor 1) ♦ MAP sensor ♦ Contaminated fuel ♦ Valve clearance 	(see page 11-A-67)
P0300 and some of P0301 (71) P0302 (72) P0303 (73) P0304 (74)	Random misfire	<ul style="list-style-type: none"> ♦ Ignition system ♦ Fuel supply system ♦ Primary HO2S (Sensor 1) ♦ MAP sensor ♦ EGR system ♦ IAC valve ♦ Contaminated fuel ♦ Lack of fuel 	(see page 11-A-69)
P0301 (71) P0302 (72) P0303 (73) P0304 (74)	- Cylinder 1 - Cylinder 2 - Cylinder 3 - Cylinder 4 Misfire Detected	<ul style="list-style-type: none"> ♦ Fuel injector ♦ Fuel injector circuit ♦ Ignition system ♦ Low compression ♦ Valve clearance 	(see page 11-A-70)
P0325 (23)	Knock sensor (KS) circuit Malfunction	<ul style="list-style-type: none"> ♦ Open to short in Knock sensor (KS) circuit ♦ Knock sensor (KS) ♦ ECM/PCM 	(see page 11-A-73)
P0335 (4)	Crankshaft position Sensor circuit Low input	<ul style="list-style-type: none"> ♦ Crankshaft position sensor ♦ Crankshaft position sensor circuit ♦ ECM/PCM 	(see page 11-A-74)
P0336 (4)	Crankshaft position Sensor Range/performance	<ul style="list-style-type: none"> ♦ Crankshaft position sensor ♦ Timing belt skipped teeth 	(see page 11-A-74)
P0401 (80)	Exhaust gas Recirculation Insufficient flow despatched	<ul style="list-style-type: none"> ♦ EGR valve ♦ EGR line 	(see page 11-A-139)
P0420 (67)	Catalyst system Efficiency below Threshold	<ul style="list-style-type: none"> ♦ Three way catalytic converter ♦ Secondary HO2S (Sensor 2) 	(see page 11-A-137)
P0443 (92)	Evaporative emission (EVAP) Purge control solenoid valve Circuit malfunction	<ul style="list-style-type: none"> ♦ Open or short in evaporative emission (EVAP) purge control solenoid valve circuit ♦ Evaporative emission (EVAP) purge control solenoid valve ♦ ECM/PCM 	(see page 11-A-145)

*: These DTCs are indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS short connector connected.

** : The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

*1: A/T

*2: M/T

DTC (MIL indication*)	Detection Item	Probable Cause	Page
P0500 (17)*2	Vehicle speed Sensor circuit Malfunction	<ul style="list-style-type: none"> ♦ Vehicle speed sensor ♦ Vehicle speed sensor circuit ♦ ECM 	(see page 11-A-77)
P0715 (70)*1** P0720 (70)*1** P0730 (70)*1** P0753 (70)*1** P0758 (70)*1** P0763 (70)*1**	Automatic Transaxle		Section 14
P1107 (13)	Barometric Pressure circuit Low input	♦ ECM/PCM (Baro sensor)	(see page 11-A-78)
P1108 (13)	Barometric Pressure circuit High input	♦ ECM/PCM (Baro sensor)	(see page 11-A-78)
P1149 *3 (61)	Primary heated oxygen sensor (Sensor 1) Circuit range/performance problem	<ul style="list-style-type: none"> ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-54)
P1162*3 (48)	Primary heated oxygen sensor (Sensor 1) Circuit malfunction	<ul style="list-style-type: none"> ♦ Open or short in Primary HO2S (Sensor 1) circuit ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-55)
P1163*3 (61)	Primary heated oxygen sensor (Sensor 1) Circuit slow response	<ul style="list-style-type: none"> ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-57)
P1164*3 (61)	Primary heated oxygen sensor (Sensor 1) Circuit/range/performance problem	<ul style="list-style-type: none"> ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-58)
P1165*3 (61)	Primary heated oxygen sensor (Sensor 1) Circuit range/performance problem	<ul style="list-style-type: none"> ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-54)
P1166*3 (41)	Primary heated oxygen sensor (Sensor 1) Heater system electrical problem	<ul style="list-style-type: none"> ♦ Open or short in Primary HO2S (Sensor 1) circuit ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-64)
P1167*3 (41)	Primary heated oxygen sensor (Sensor 1) Heater system malfunction	<ul style="list-style-type: none"> ♦ Open or short in Primary HO2S (Sensor 1) circuit ♦ Primary HO2S (Sensor 1) ♦ ECM/PCM 	(see page 11-A-66)
P1259 (22)	VTEC system malfunction	<ul style="list-style-type: none"> ♦ VTEC Solenoid valve ♦ Open or short in VTEC solenoid valve circuit ♦ VTEC pressure switch ♦ Open or short in VTEC pressure switch circuit ♦ ECM/PCM 	Section 6

*: These DTCs are indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS short connector connected.

** The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

*1: A/T

*2: M/T

*3: F20B6 engine

*4: H22A7 engine

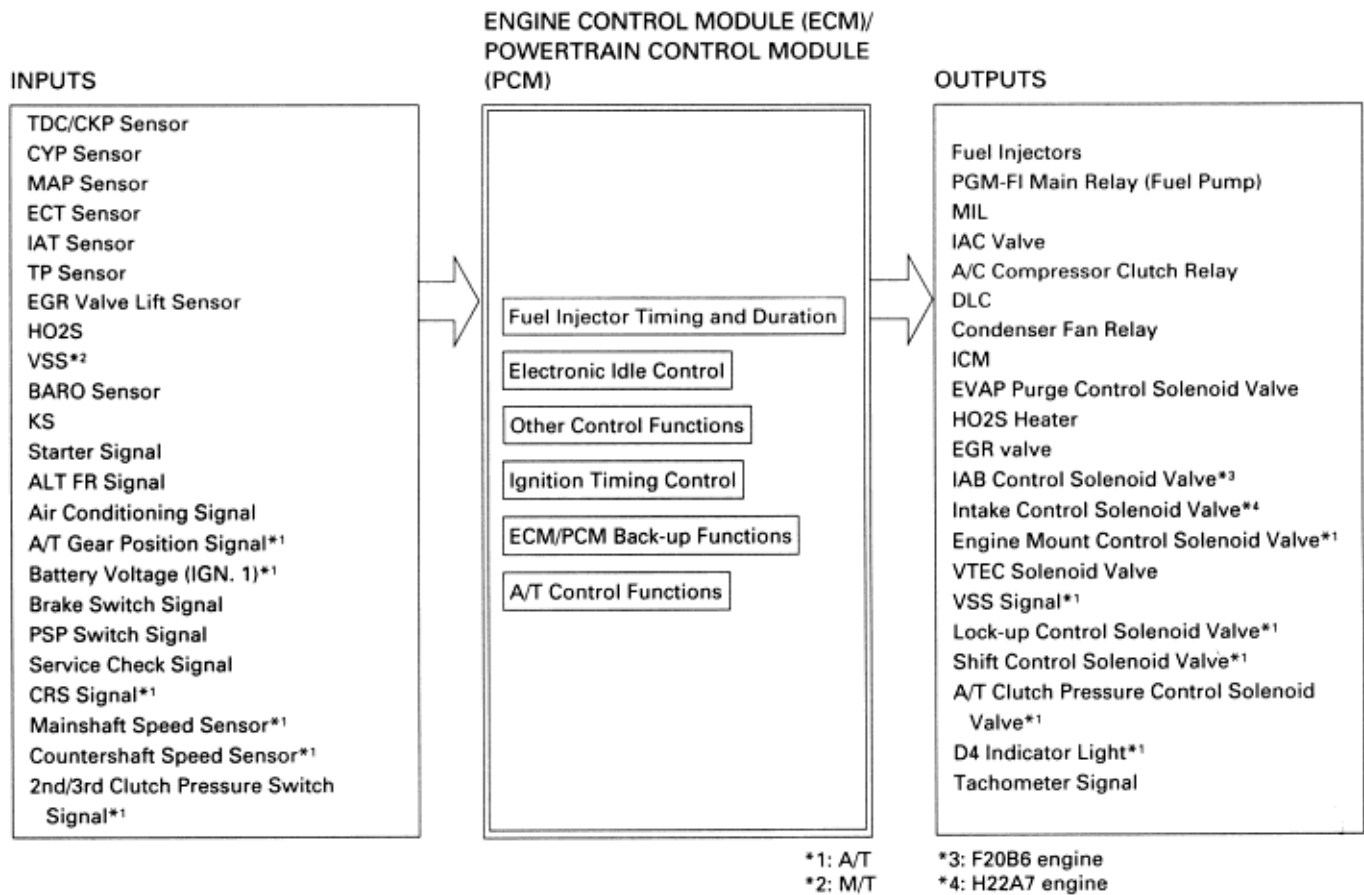
DTC (MIL indication*)	Detection Item	Probable Cause	Page
P1359 (8)	Crankshaft position/top Dead center sensor Connector disconnection	♦ CKP/TDC sensor circuit	(see page 11-A-76)
P1361 (8)	Top dead center Sensor intermittent Interruption	♦ TDC sensor	(see page 11-A-74)
P1362 (8)	Top dead center Sensor no signal	♦ TDC sensor ♦ TDC sensor circuit ♦ ECM/PCM	(see page 11-A-74)
P1381 (8)	Cylinder position sensor Intermittent interruption	♦ CYP sensor	(see page 11-A-79)
P1382 (9)	Cylinder position sensor No signal	♦ CYP sensor ♦ CYP sensor circuit ♦ ECM/PCM	(see page 11-A-79)
P1491 (12)	EGR valve Lift insufficient Detected	♦ EGR valve (with lift sensor) ♦ EGR valve lift sensor circuit ♦ EGR valve circuit ♦ EGR line ♦ ECM/PCM	(see page 11-A-140)
P1498 (12)	EGR valve Lift sensor High voltage	♦ EGR valve (with lift sensor) ♦ EGR valve lift sensor circuit ♦ ECM/PCM	(see page 11-A-142)
P1519 (14)	Idle air control Valve circuit Failure	♦ IAC valve ♦ IAC valve circuit ♦ ECM	(see page 11-A-84)
P1607 (-)	Engine control Module/power control module internal Circuit failure A	♦ ECM/PCM	(see page 11-A-81)
P1750 (70)** P1706 (70)** P1738 (70)** P1739 (70)** P1753 (70)** P1768 (70)** P1773 (70)** P1791 (70)**	Automatic Transaxle		Section 14

*: These DTCs are indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS short connector connected.

** : The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

*1: A/T

*2: M/T



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM/PCM contains memories for the basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

When the engine is cold, the A/C compressor is on, the transmission is in gear *1, the brake pedal is depressed, the P/S load is high, or the alternator is charging, the ECM/PCM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- The ECM/PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- A knock control system is also used. When detonation is detected by a knock sensor (KS), the ignition timing is retarded.

Other Control Functions

1. Starting control
When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
 - ♦ When the ignition switch is initially turned ON (II), the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurise the fuel system.
 - ♦ When the engine is running, the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
 - ♦ When the engine is not running and the ignition is ON (II), the ECM/PCM cuts ground to the PGM-FI main relay, which cuts current to the fuel pump.
3. Fuel Cut-off Control
 - ♦ During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,100 rpm (min⁻¹).
 - ♦ Fuel cut-off action also takes place when engine speed exceeds 6,500 rpm (min⁻¹): F20B6 engine, 7,700 rpm (min⁻¹): H22A7 engine, regardless of the position of the throttle valve to protect the engine from over-revving.
4. A/C Compressor Clutch Relay
When the ECM/PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energised, and enriches the mixture to assure smooth transition to the A/C mode.
5. Intake Control Solenoid Valve *4
When the engine speed is below 3,950 rpm (min⁻¹), the ECM supplies a ground to the intake control solenoid valve. This opens the solenoid valve sending intake manifold vacuum to the intake control diaphragm.
6. Intake Air Bypass (IAB) Control Solenoid Valve *3
When the engine rpm is below 4,200 rpm (min⁻¹), the IAB control solenoid valve is activated by a signal from the ECM/PCM, intake air flows through the long intake path, then high torque is delivered. At speeds higher than 4,200 rpm (min⁻¹), the solenoid valve is deactivated by the ECM/PCM, and intake air flows through the short intake path in order to reduce the resistance in airflow.
7. Evaporation Emission (EVAP) Purge Control Solenoid Valve
When the engine coolant temperature is above 55°C (131°F): F20B6 engine, 65°C (149°F): H22A7 engine, the ECM/PCM supplies a ground to the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.
8. Exhaust Gas Recirculation (EGR) Control Solenoid Valve
When the EGR is required for control of oxides of nitrogen (NOx) emissions, the ECM/PCM controls the EGR valve.

ECM/PCM Fail-safe/Back-up Functions

1. Fail safe Function
When an abnormality occurs in a signal from a sensor, the ECM/PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. Back-up Function
When an abnormality occurs in the ECM/PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.
3. Self-diagnosis Function (Malfunction Indicator Lamp (MIL))
When an abnormality occurs in a signal from a sensor, the ECM/PCM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned ON (II), the ECM/PCM supplies ground for the MIL for two seconds to check the MIL bulb condition.
4. Two Driving Cycle Detection Method
To prevent false indications, the "two driving cycle detection method" is used for the EGR system and other self-diagnostic functions. When an abnormality occurs, the ECM/PCM stores it in its memory. When the same abnormality re-occurs after the ignition switch is turned OFF and ON (II) again, the ECM/PCM informs the driver by turning on the MIL.

A flowchart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware: if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

START
(bold type)

Describes the conditions or situation to start a troubleshooting flowchart.

ACTION

Asks you to do something; perform a test, set up a condition etc.

DECISION

Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.

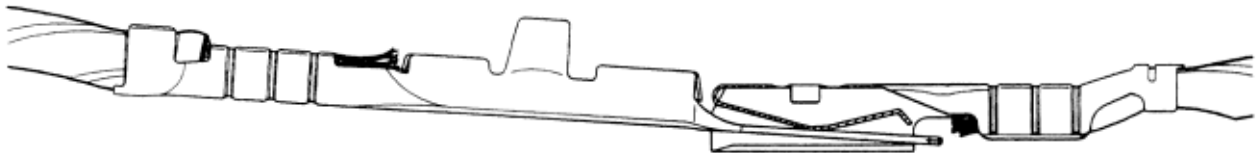
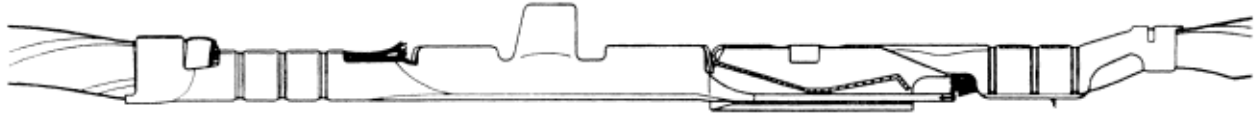
STOP
(bold type)

The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

NOTE:

- The term "Intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If any indicator light on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- Most of the troubleshooting flowcharts have reset control module(s) or unit(s) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you cannot duplicate the code, do not continue through the flowchart. To do so will only result in confusion and, possibly, (a) needlessly replace control module(s) or unit(s).
- "Open" and "Short" are common electrical terms. An open is a break in a wire at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. In complex electronics, this can sometimes mean something works, but not the way it is supposed to.

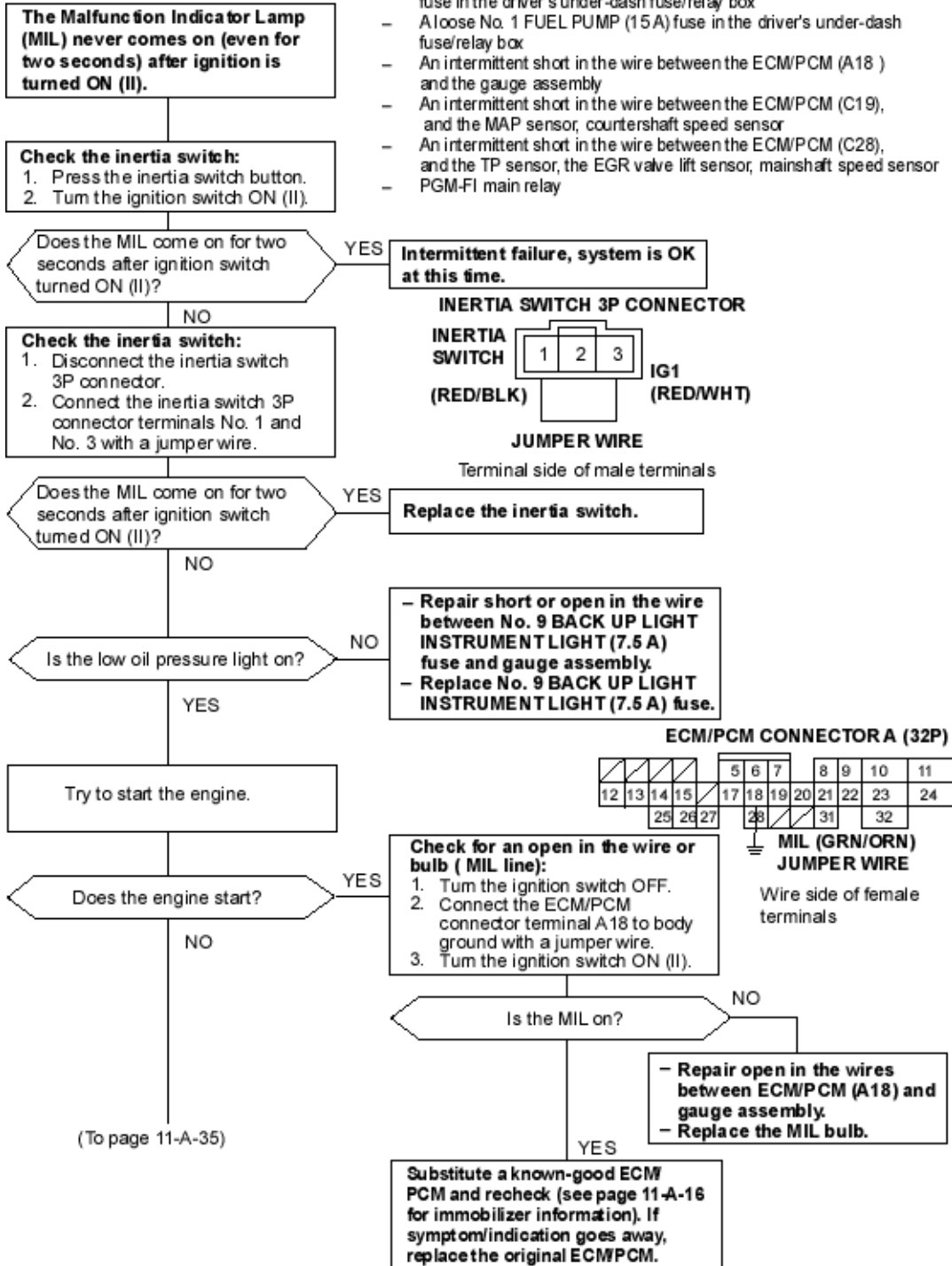
TIGHT

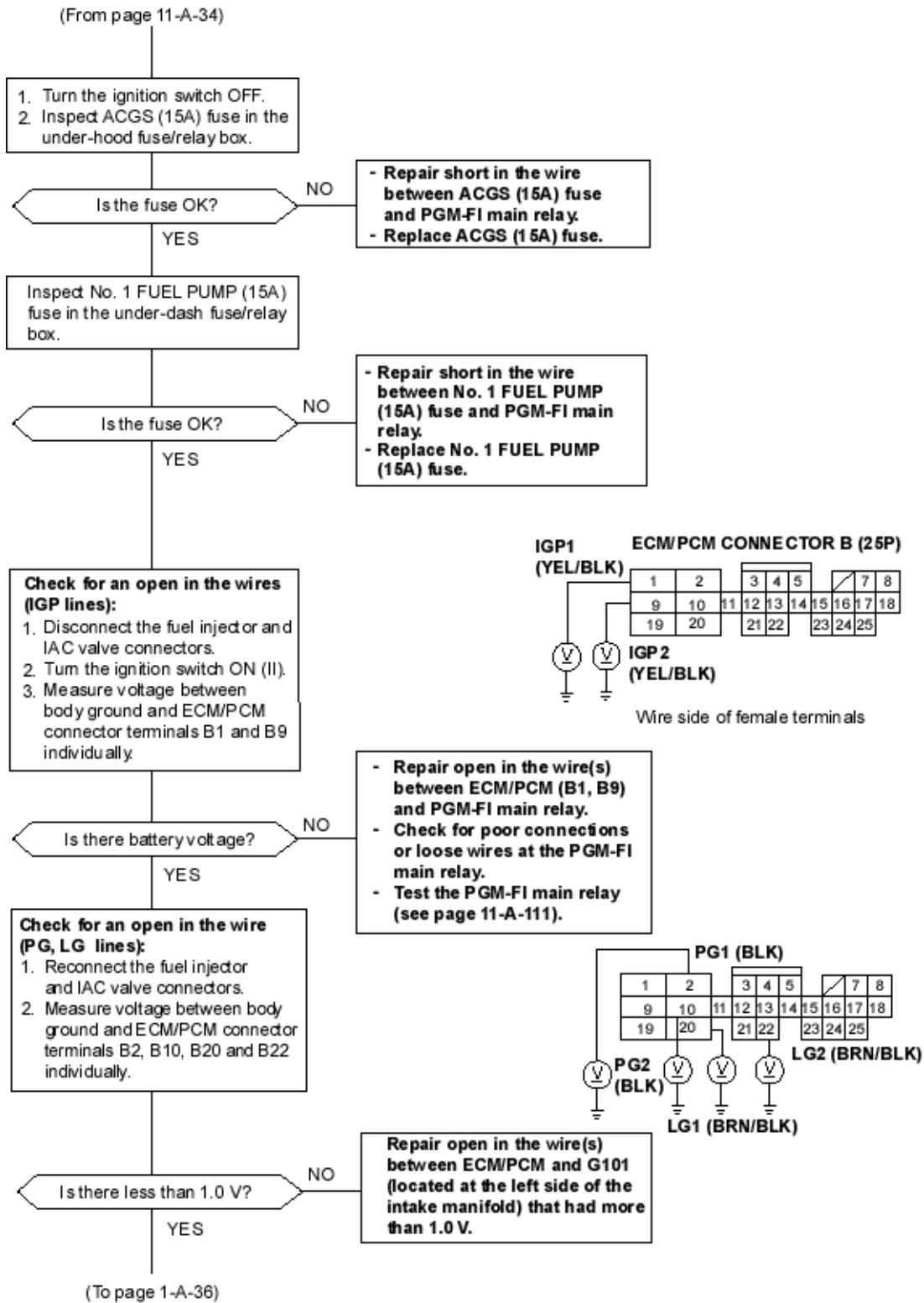


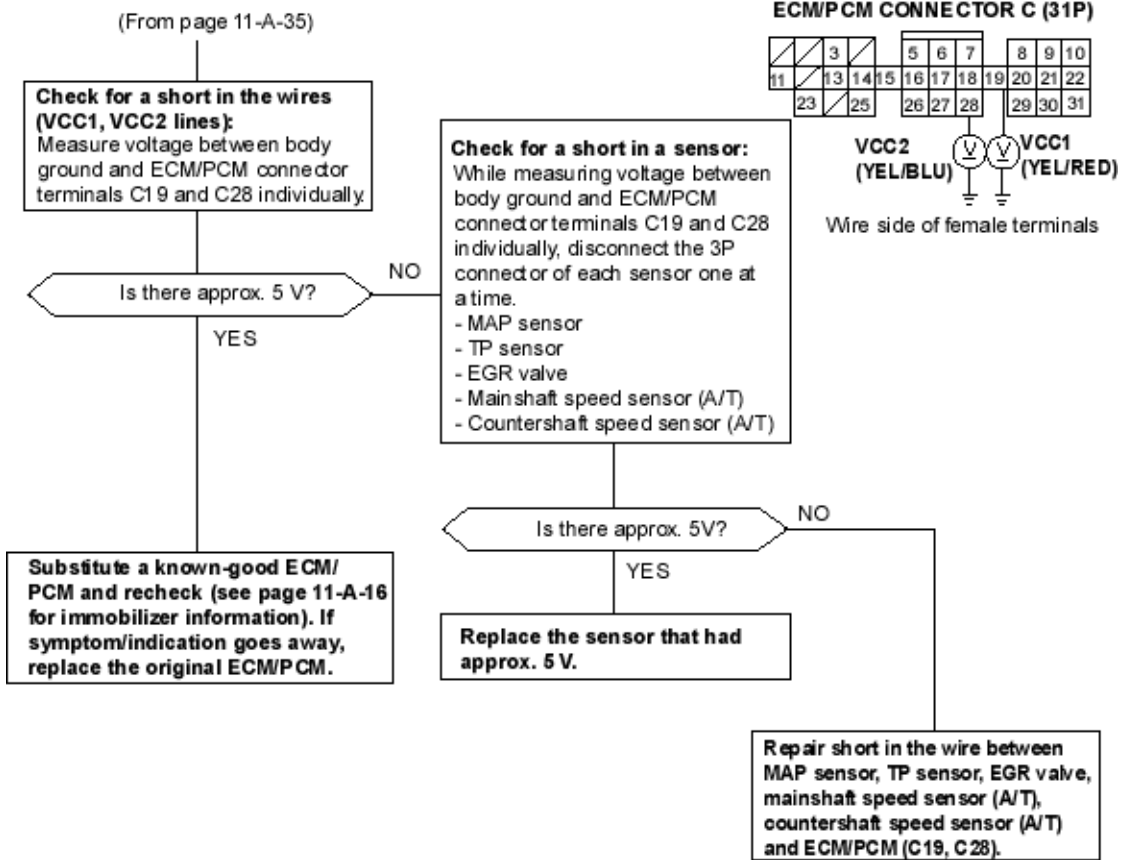
LOOSE

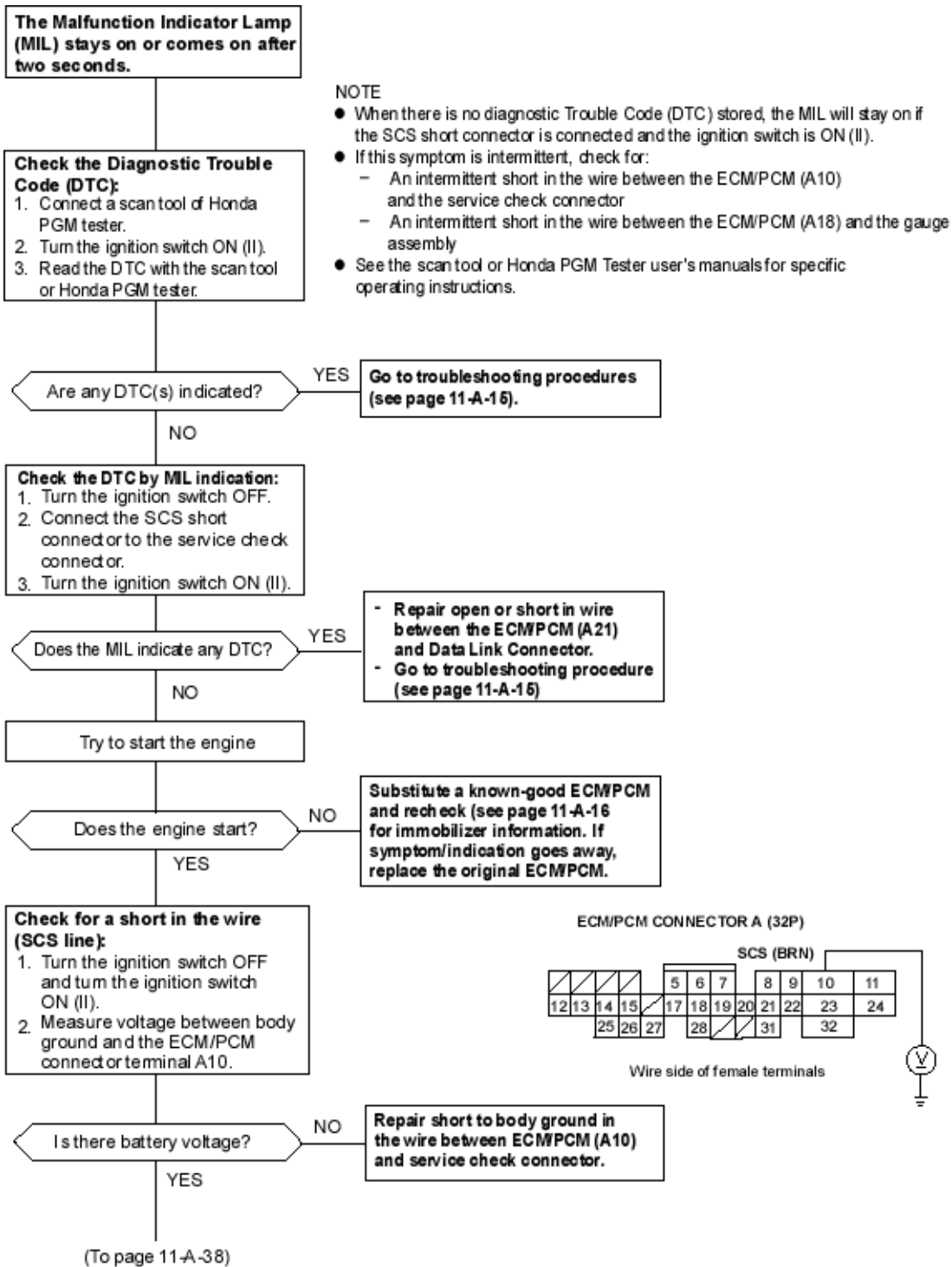
NOTE

- If this symptom is intermittent, check for:
 - A loose ACGS (15 A) fuse in the under-hood fuse/relay box.
 - A loose No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the driver's under-dash fuse/relay box
 - A loose No. 1 FUEL PUMP (15 A) fuse in the driver's under-dash fuse/relay box
 - An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly
 - An intermittent short in the wire between the ECM/PCM (C19), and the MAP sensor, countershaft speed sensor
 - An intermittent short in the wire between the ECM/PCM (C28), and the TP sensor, the EGR valve lift sensor, mainshaft speed sensor
 - PGM-FI main relay

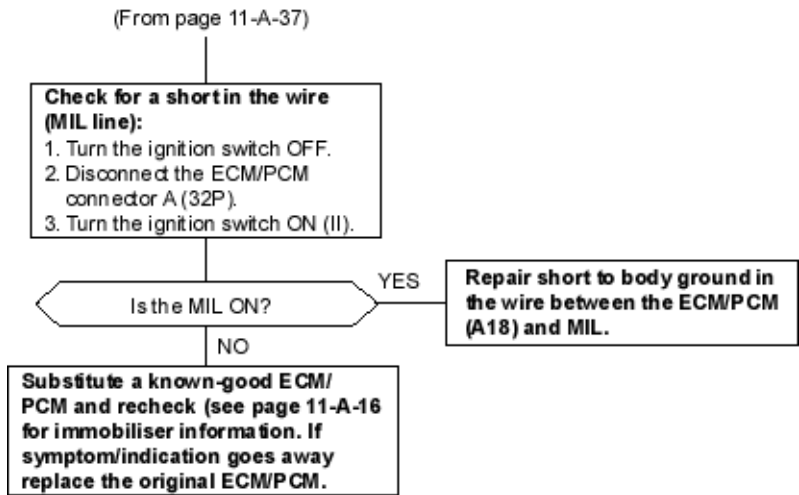








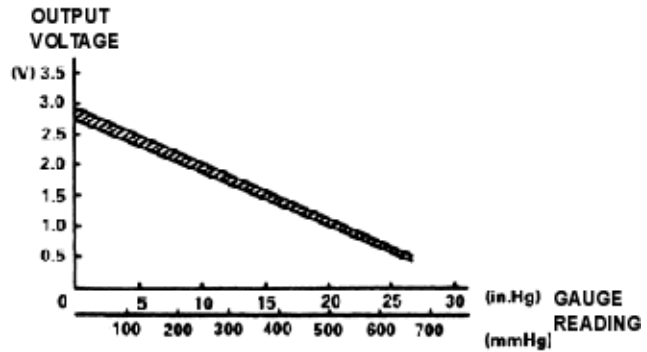
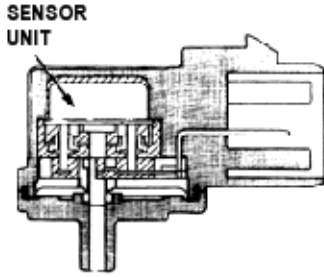
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-15)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

P0107 The scan tool indicates Diagnostic Trouble Code (DTC) P0107: A low input (high vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

The MAP sensor converts manifold absolute pressure into electrical signals and inputs the ECM/PCM.

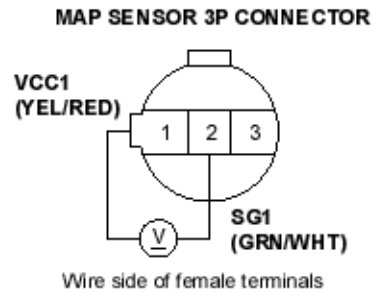


- The MIL has been reported on.
- DTC P0107 is stored.

Problem verification:
1. Turn the ignition switch (ON (II)).
2. Check the MAP with the scan tool.

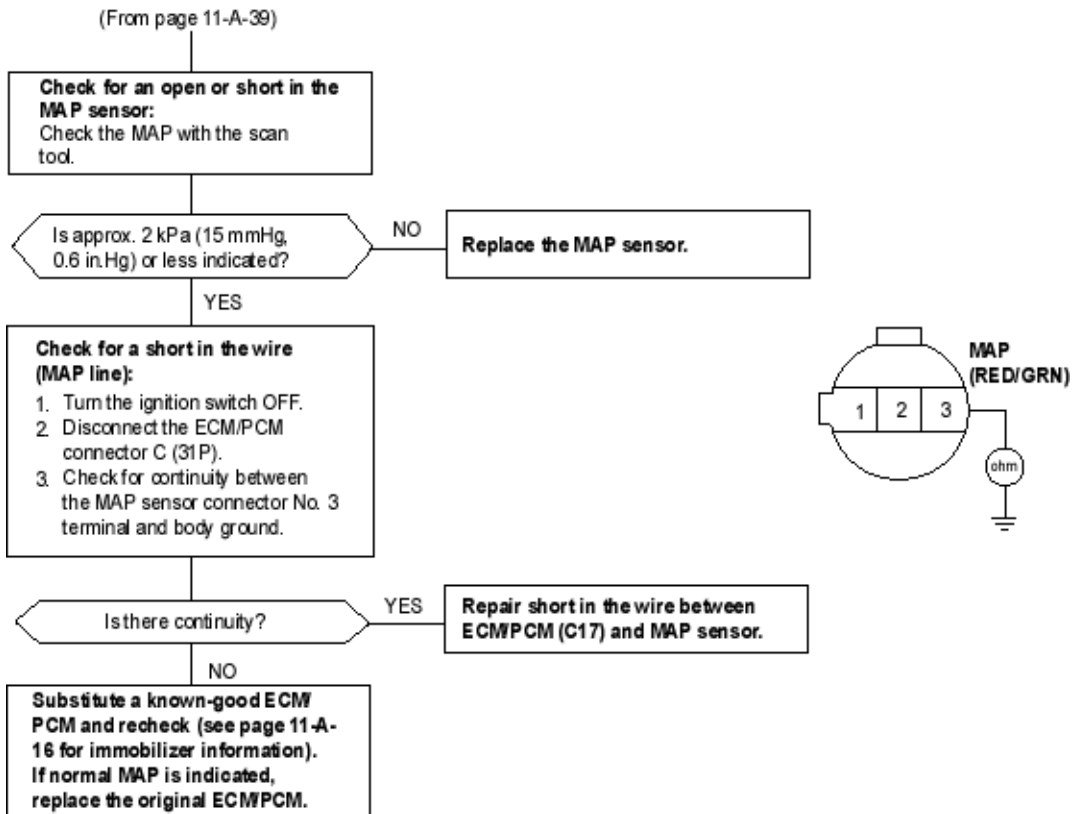
Is approx. 101 kPa (760 mmHg, 30 in.Hg) indicated? **YES** → Intermittent failure, system is OK at this time. Check for poor connections or loose wires at MAP sensor and ECM/PCM.

Check for an open in wire (VCC1 line):
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between the MAP sensor connector No. 1 terminal and No. 2 terminal.



Is there approx. 5 V? **NO** → Repair open in the wire between ECM/PCM (C19) and MAP sensor.

(To page 11-A-40)



To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-A-16\)](#)

P0108 The scan tool indicates Diagnostic Trouble Code (DTC) P0108: A high voltage (low vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

- The MIL has been reported on.
- DTC P0108 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

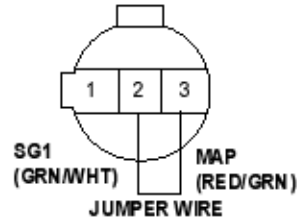
Is 101 kPa (760 mmHg, 30 in. Hg), 1.0V or higher indicated?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at MAP sensor and ECM/PCM.

YES

Check for an open in the MAP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor 3P connector.
3. Install a jumper wire between the MAP sensor 3P connector terminals No. 3 and No. 2.
4. Turn the ignition switch ON (II).
5. Check the MAP with the scan tool.

MAP SENSOR 3P CONNECTOR



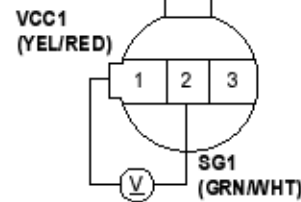
Wire side of female terminals

Is 101 kPa (760 mmHg, 30 in. Hg), 1.0 V or higher indicated?

NO
Replace the MAP sensor.

YES

Check for an open in wire (SG1 line):
1. Remove the jumper wire.
2. Measure voltage between the MAP sensor 3P connector terminals No. 1 and No. 2.



Is there approx. 5V?

NO
Repair open in the wire between the ECM/PCM (C7) and the MAP sensor.

YES

Check for an open in the wire (MAP line):
1. Turn the ignition switch OFF.
2. Install a jumper wire on the ECM/PCM connectors between C7 and C17.
3. Turn the ignition switch ON (II).
4. Check the MAP with the scan tool.

ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

Is 101 kPa (760 mmHg, 30 in. Hg), 1.0 V or higher indicated?

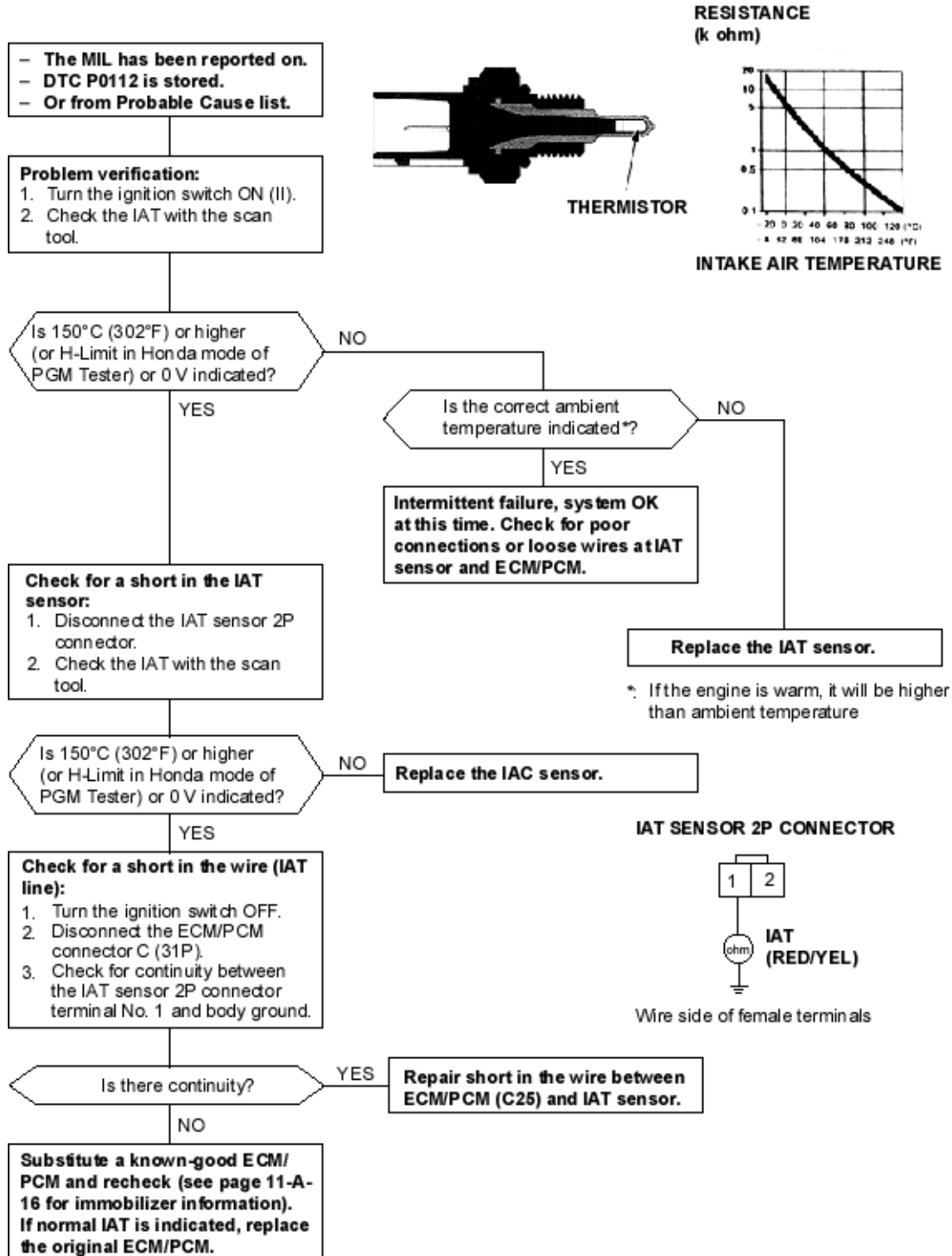
NO
Repair open in the wires between the ECM/PCM (C17) and the MAP sensor.

YES

Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If normal MAP is indicated, replace the original ECM/PCM.

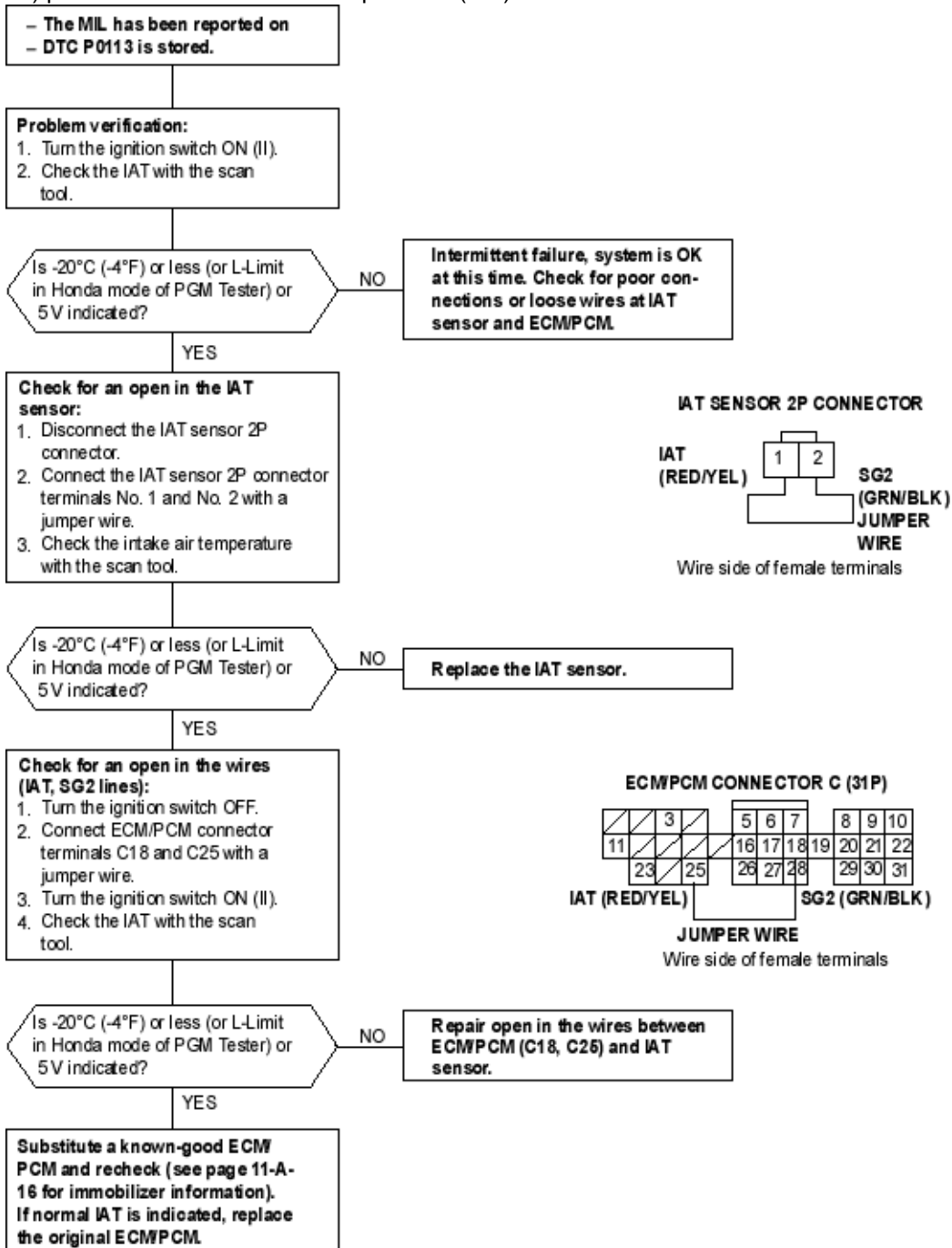
P0112 The scan tool indicates Diagnostic Trouble Code (DTC) P0112: A low voltage (high temperature) problem in the Intake Air Temperature (IAT) sensor circuit.

The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below:



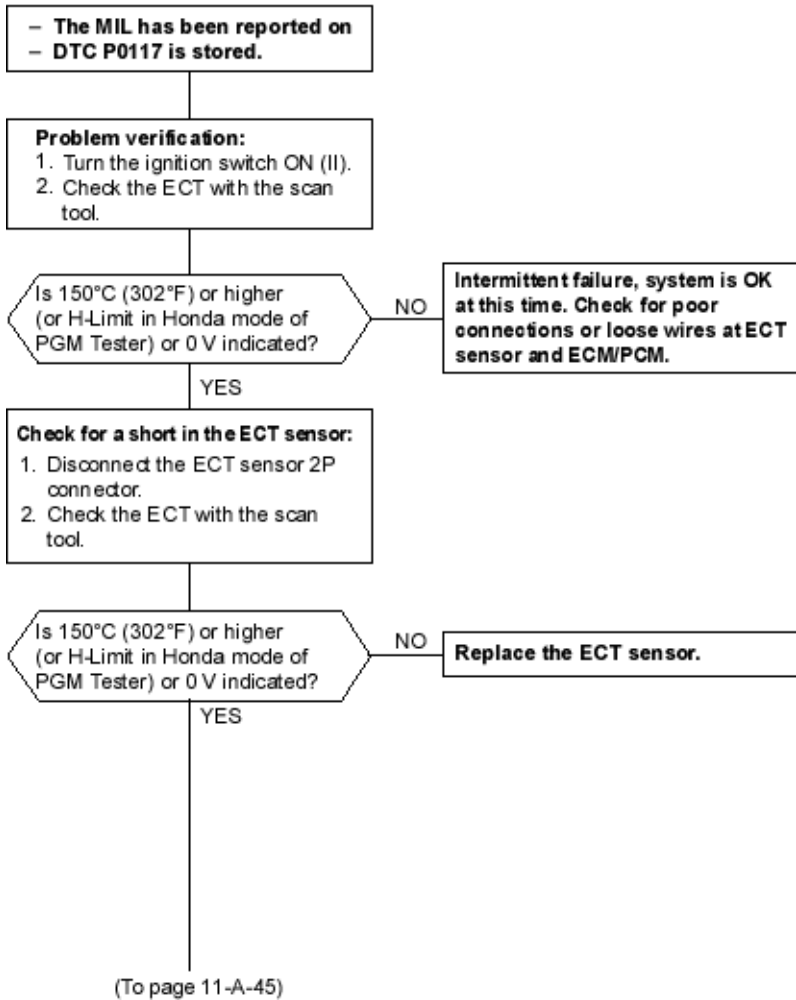
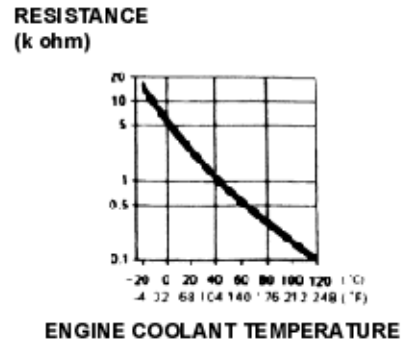
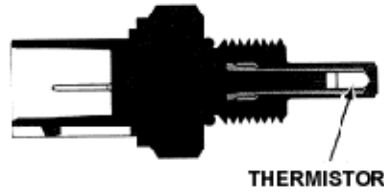
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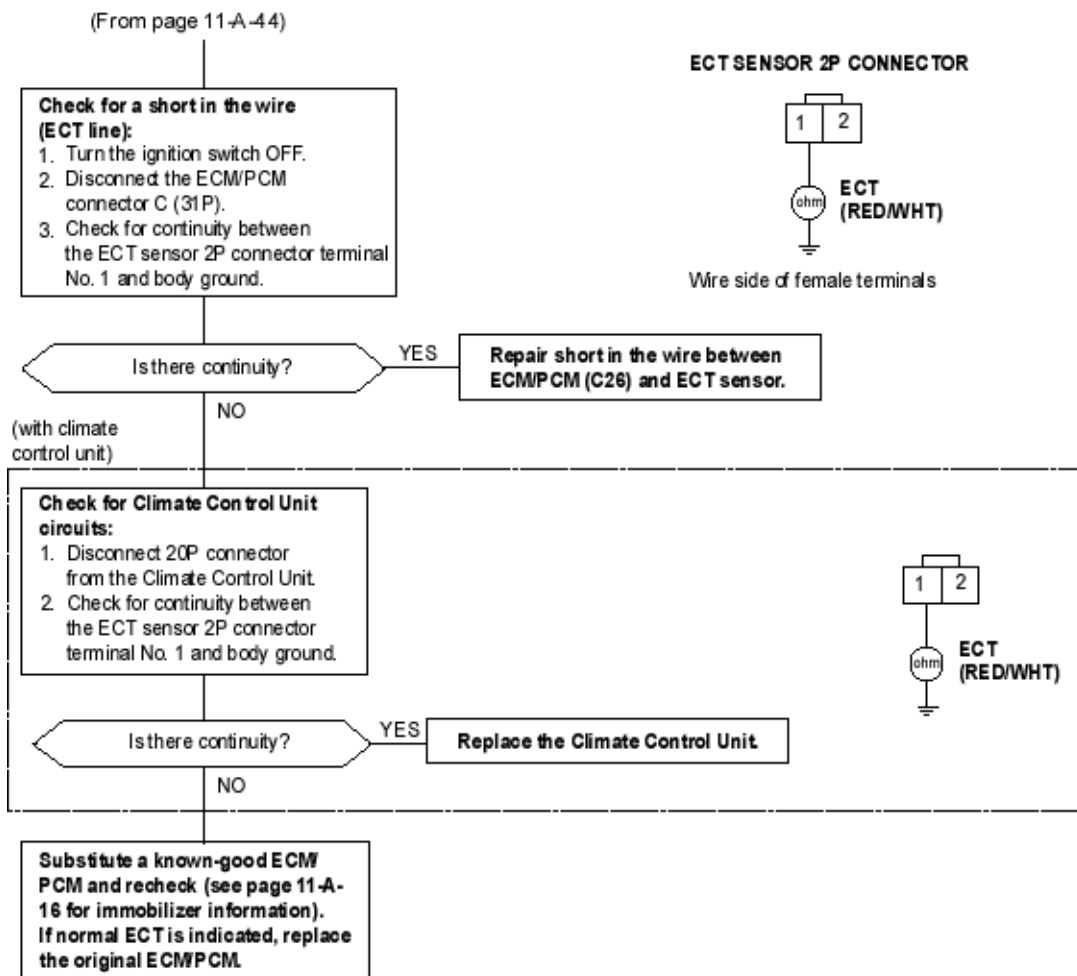
P0113 The scan tool indicates Diagnostic Trouble Code (DTC) P0113: A high voltage (low temperature) problem in the Intake Air Temperature (IAT) sensor circuit.



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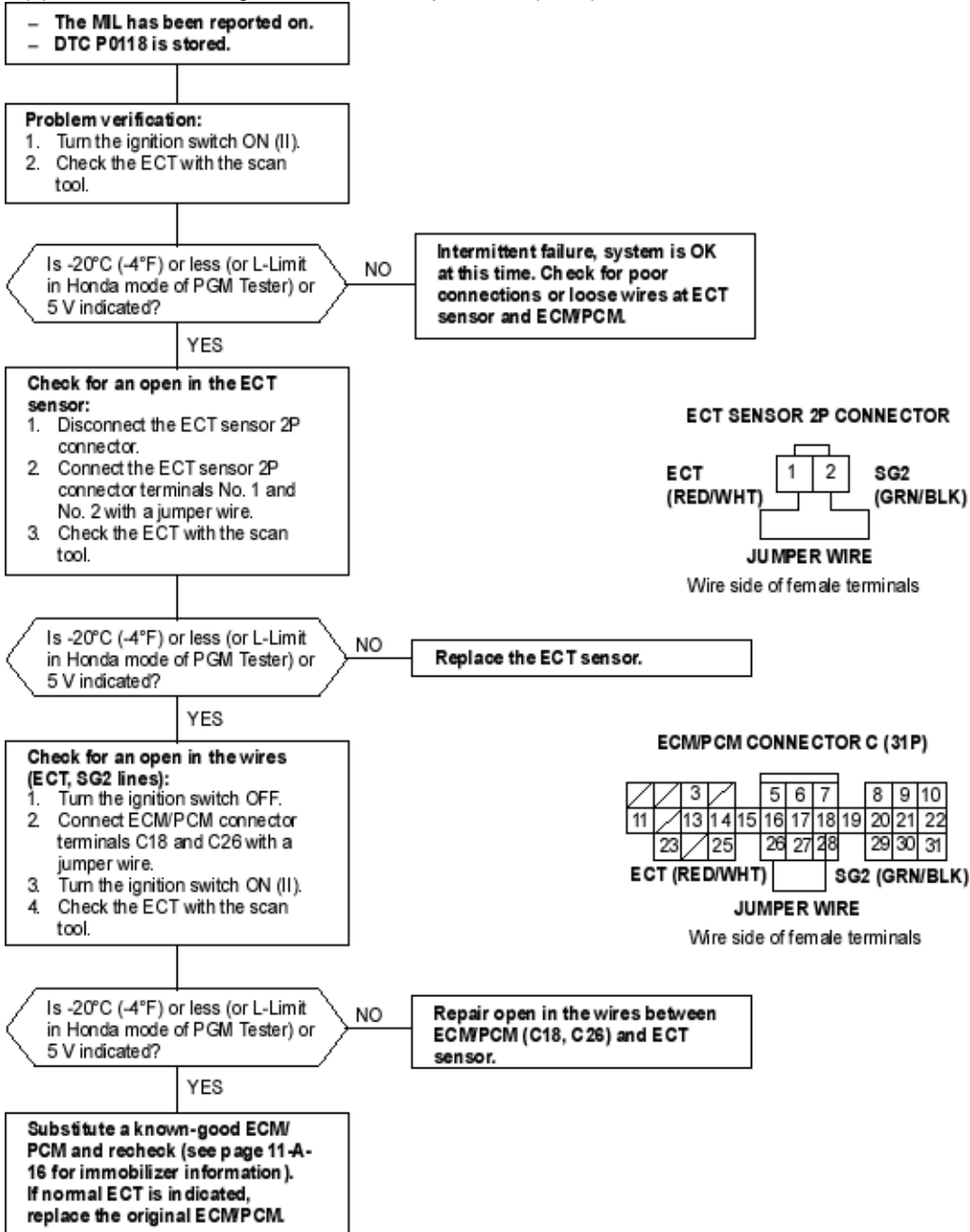
P0117 The scan tool indicates Diagnostic Trouble Code (DTC) P0117: A low voltage (high temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit. The ECT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below:





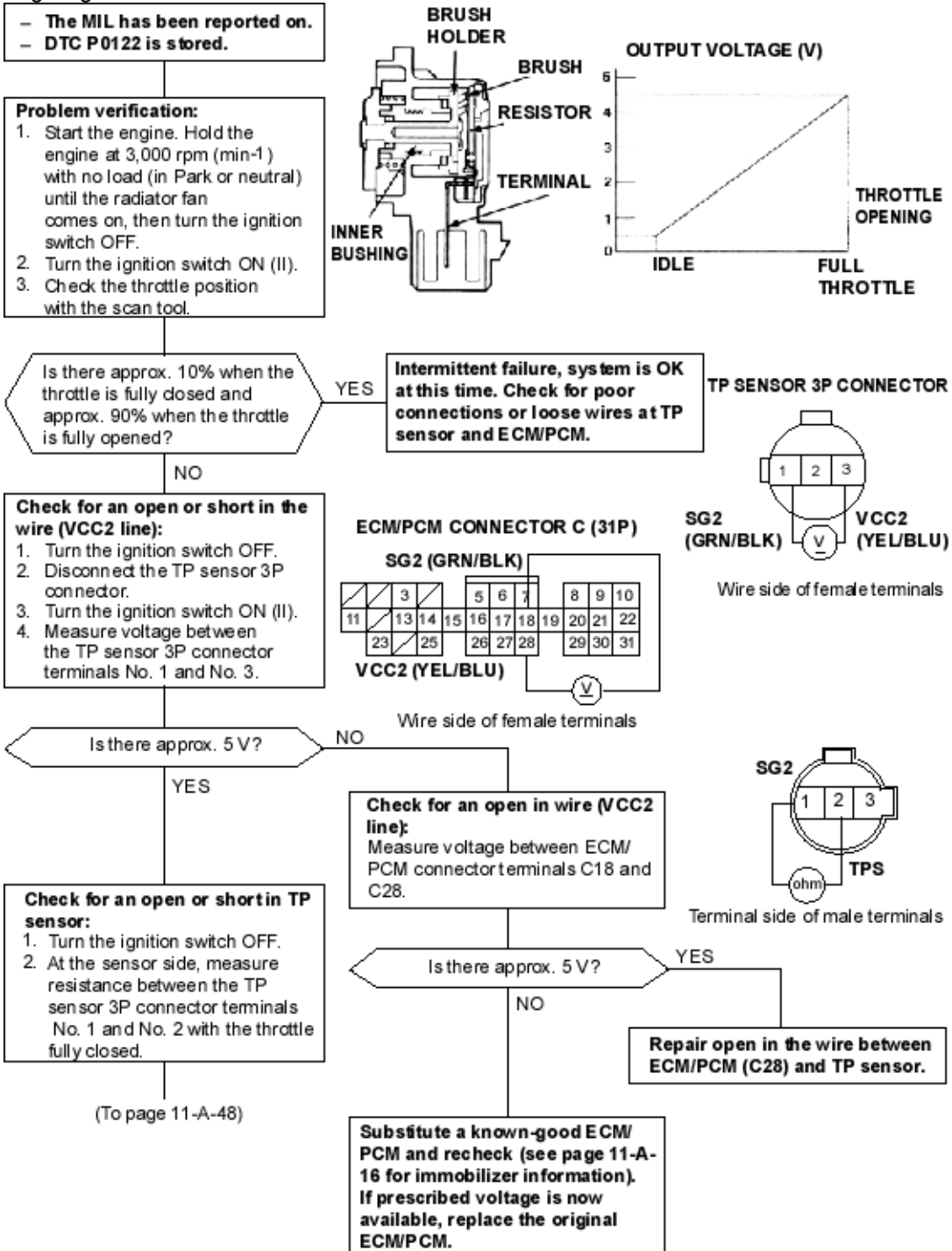
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[\(See Page 11-A-16\)](#)

P0118 The scan tool indicates Diagnostic Trouble Code (DTC) P0118: A high voltage (low temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit.

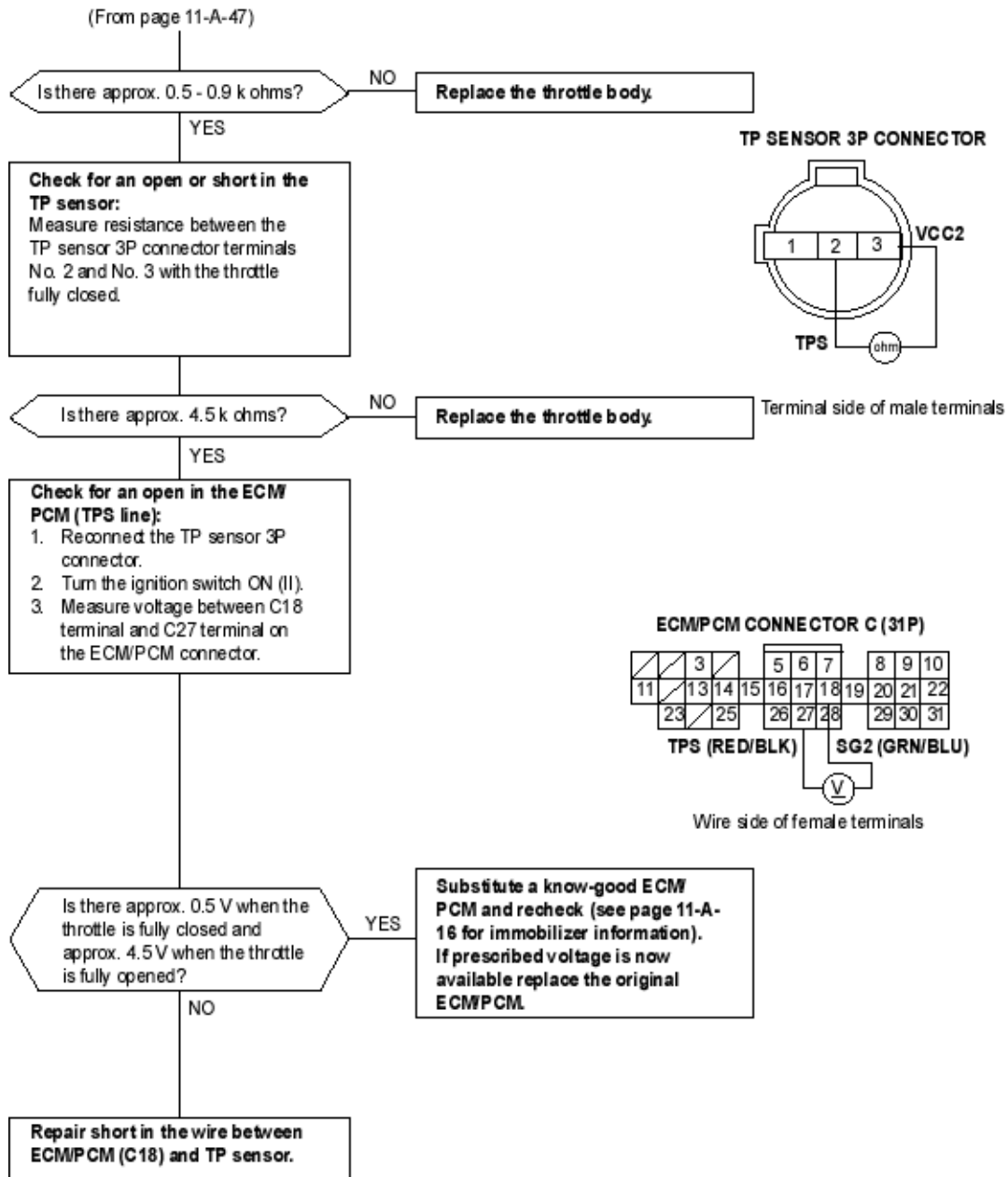


P0122 The scan tool indicates Diagnostic Trouble Code (DTC) P0122: A low voltage problem in the Throttle Position (TP) sensor circuit.

The TP Sensor is a potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the throttle position sensor varies the voltage signal to the ECM/PCM.



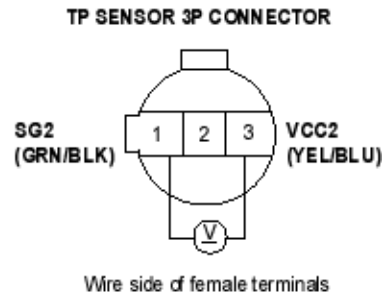
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)



P0123 The scan tool indicates Diagnostic Trouble Code (DTC) P0123: A high voltage problem in the Throttle Position (TP) sensor circuit.

- The MIL has been reported on.
- DTC P0123 is stored.

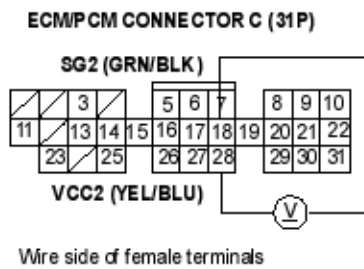
Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.



Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at TP sensor and ECM/PCM.

NO
Check for an open in the TP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. At the wire harness side, measure voltage between the TP sensor 3P connector terminals No. 1 and No 3.



Is there approx. 5V?

YES
Replace the throttle body.

NO
Check for an open in the wire (SG2 line):
Measure voltage between ECM/PCM connector C (31P) terminals C18 and C28.

Is there approx. 5V?

YES
Repair open in the wire between ECM/PCM (C18) and TP sensor

NO
Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If prescribed voltage is now available, replace the original ECM/PCM.

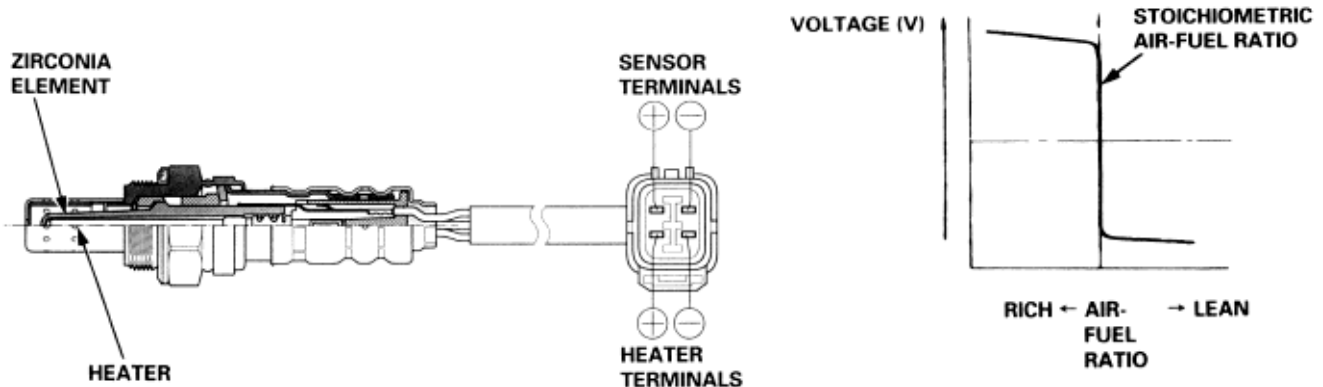
*1: A/T
*2: M/T

PGM-FI System

Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) (H22A7 engine)

11-A-50

The Heated Oxygen Sensors (HO2S) detect the oxygen content in the exhaust gas and signals the ECM. In operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilise the sensor's output, the sensor has an internal heater. The Primary HO2S (Sensor 1) is installed in exhaust pipe A.

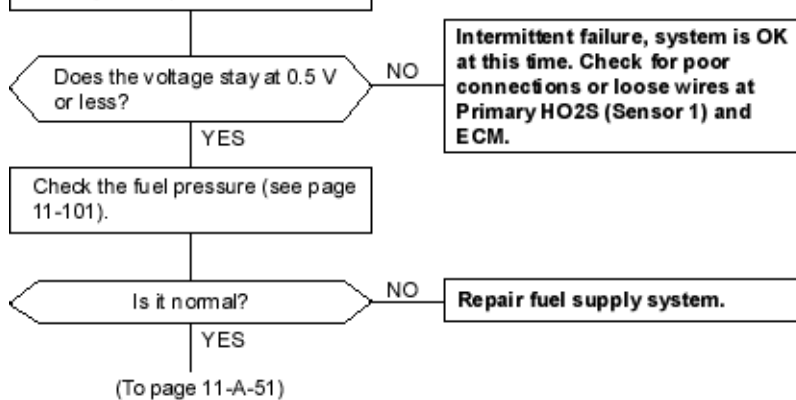


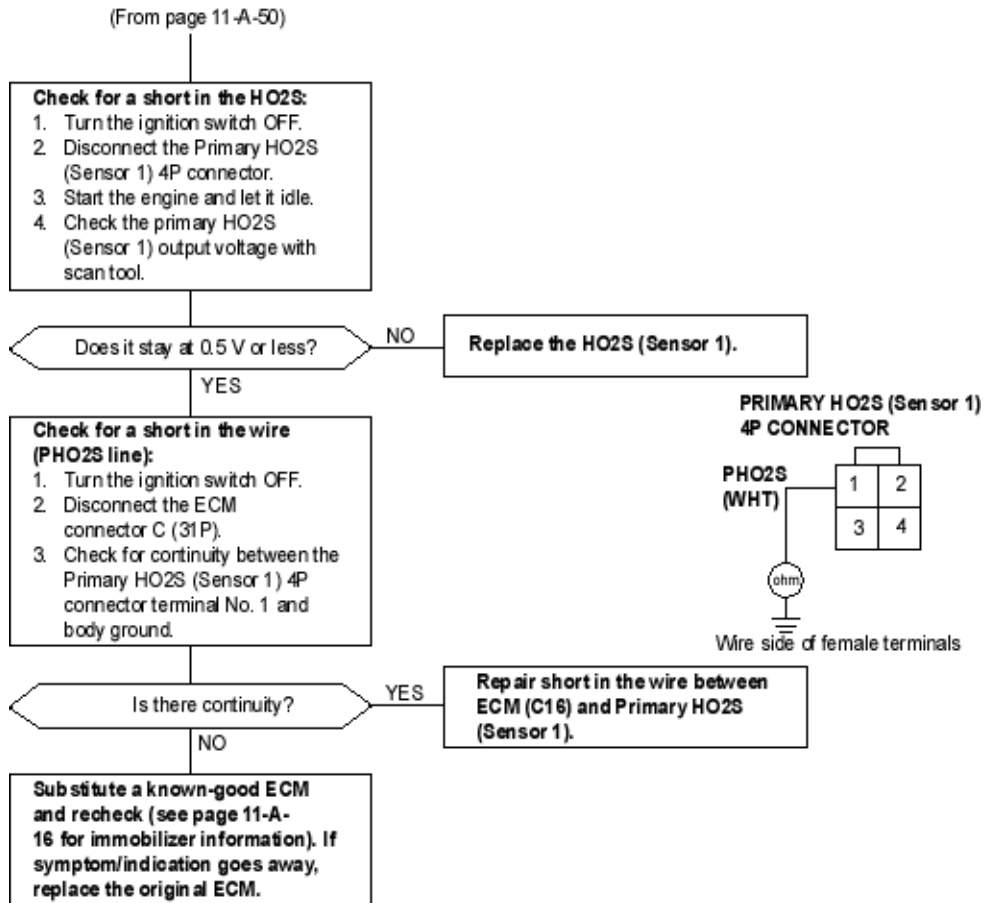
P0131 The scan tool indicates Diagnostic Trouble Code (DTC) P0131: A low voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

- The MIL has been reported on.
- DTC P0131 is stored.

Problem verification:

1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.





To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

P0132 The scan tool indicates Diagnostic Trouble Code (DTC) P0132: A high voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

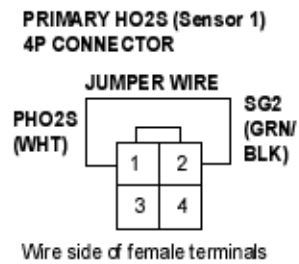
- The MIL has been reported on.
- DTC P0132 is stored.

Problem verification:
1. Do the ECM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

Does the voltage stay at 1.5 V or more?

Intermittent failure, system is OK at this time. Check for poor connections or loose wires at Primary HO2S (Sensor 1) and ECM.

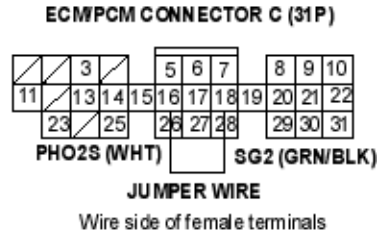
Check for an open in the Primary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) connector.
3. Connect the Primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.
4. Turn the ignition switch ON (II).
5. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.



Is there 1.5 V or more?

Replace the Primary HO2S

Check for an open in the wire (PHO2S line):
1. Turn the ignition switch OFF.
2. Connect ECM connector terminals C16 and C18 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.



Is there 1.5 V or more?

Repair open in the wire between ECM (C16) and Primary HO2S (Sensor 1).

Substitute a known-good ECM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM.

P0133 The scan tool indicates Diagnostic Trouble Code (DTC) P0133: A slow response problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

Description

By controlling the air/fuel ratio with a Primary HO2S (Sensor 1) and a Secondary HO2S (Sensor 2), the deterioration of the Primary HO2S (Sensor 1) can be evaluated by its feedback period. When the feedback period of the HO2S exceeds a certain value during stable driving conditions, the sensor will be judged as deteriorated.

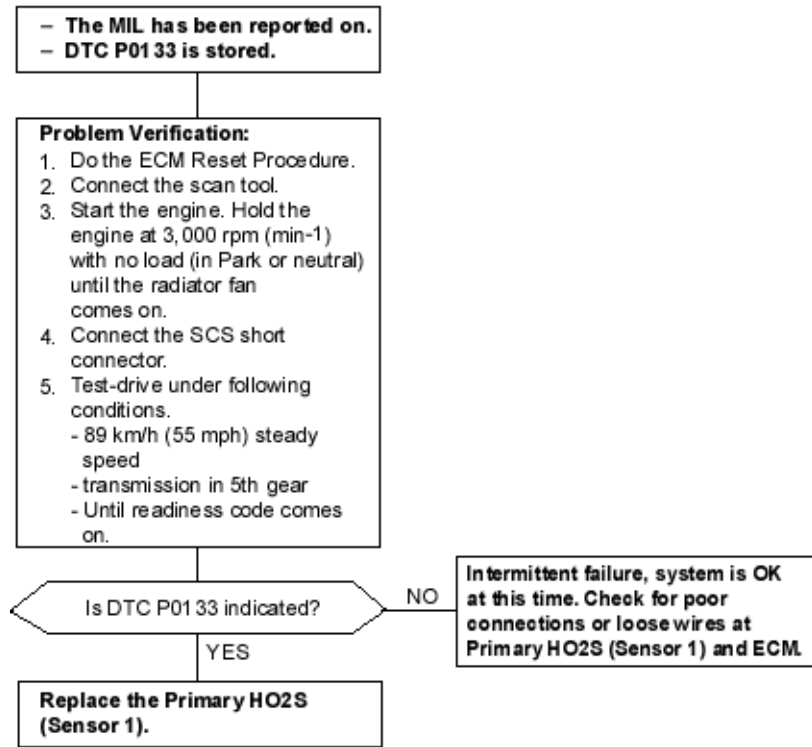
When deterioration has been detected during two consecutive trips, the MIL comes on and DTC P0133 will be stored.

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then troubleshoot DTC P0133.

Possible Cause

- ♦ Primary HO2S (Sensor 1) Deterioration
- ♦ Primary HO2S Heater (Sensor 1) Deterioration
- ♦ Exhaust system leakage

Troubleshooting Flowchart

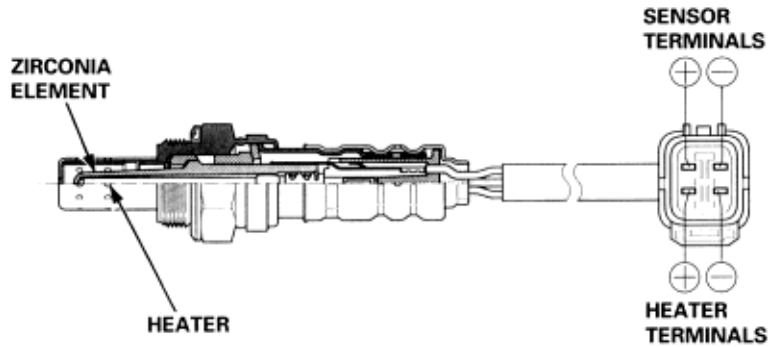


PGM-FI System

Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) (F20B6 engine)

11-A-54

The Primary Heated Oxygen Sensor (Primary HO2S (Sensor 1) operates over a wide air/fuel range. The Primary HO2S (Sensor 1) is installed in the exhaust manifold.



P1149 The scan tool indicates Diagnostic Trouble Code (DTC) P1149: A range/performance problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

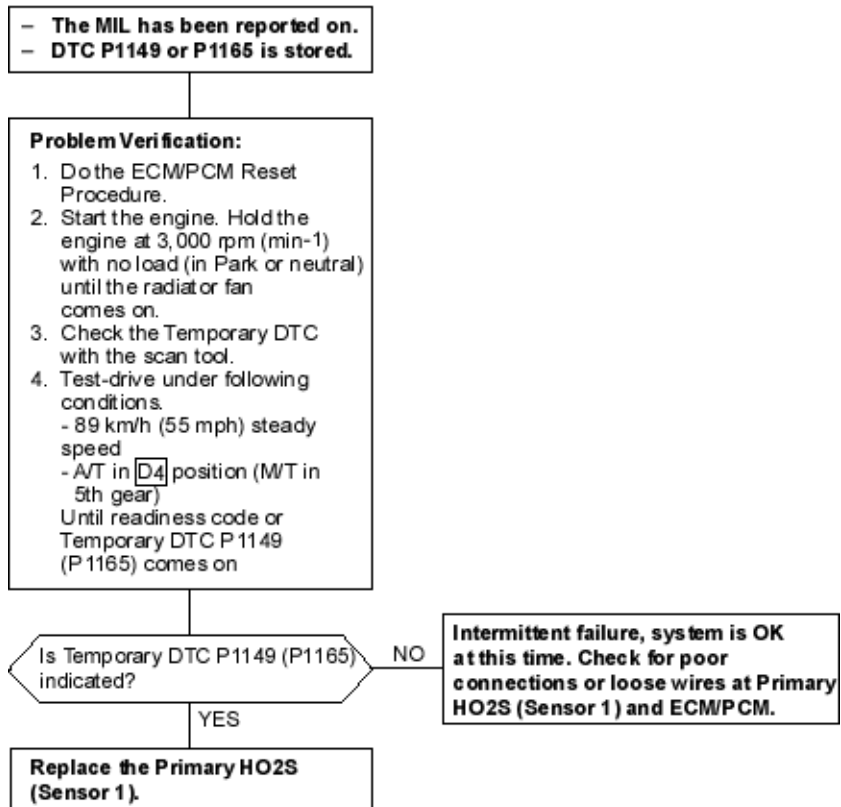
P1165 The scan tool indicates Diagnostic Trouble Code (DTC) P1165: A range/performance problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

NOTE: If some of the DTCs listed below are stored at the same time as DTC P1149 or P1165, troubleshoot those DTCs first, then troubleshoot DTC P1149 or P1165.

P0137, P0138: Secondary HO2S (sensor 2)

P0141: Secondary HO2S (sensor 2) Heater

Troubleshooting Flowchart



P1162 The scan tool indicates Diagnostic Trouble Code (DTC) P1162: A malfunction in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P1162 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine and wait at least two minutes.

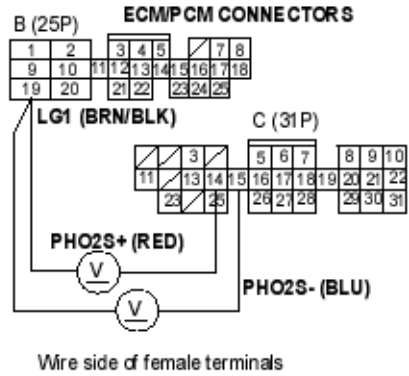
Is DTC P1162 indicated?

Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the Primary HO2S (Sensor 1) and the ECM/PCM.

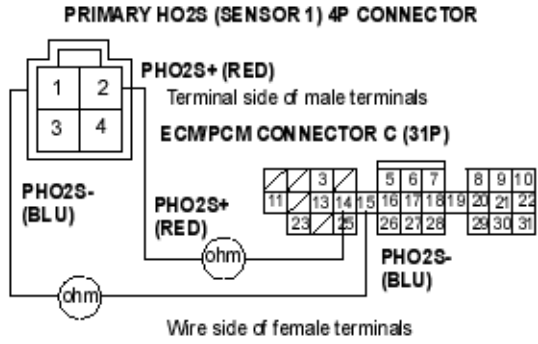
Check for an open or short in the wires (PHO2S+, PHO2S- lines):
1. Turn the ignition switch OFF.
2. Start the engine.
3. Measure voltage between the ECM/PCM connector terminals C14 and B20 and between C15 and B20.

Is there 2.5 - 3.0 V?

A (To page 11-A-56)



Check for an open in the wires (PHO2S+, PHO2S- lines):
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S 4P connector, and the ECM/PCM connector C (31P).
3. Check for continuity between the Primary HO2S (Sensor 1) 4P connector terminal No. 2 and the ECM/PCM connector terminal C14 and between Primary HO2S (Sensor 1) 4P connector terminal No. 1 and ECM/PCM connector terminal C15.

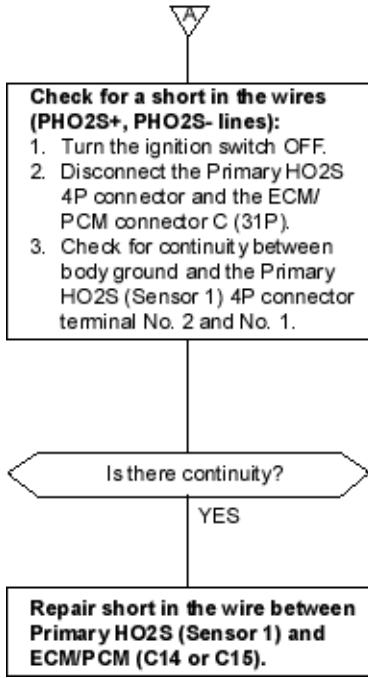


Is there continuity?

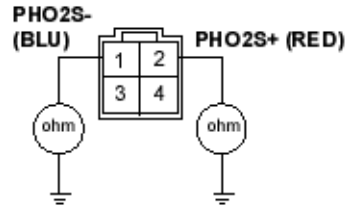
Repair open in the wire between Primary HO2S (Sensor 1) and ECM/PCM (C14 or C15).

Replace the Primary HO2S (Sensor 1).

(From page 11-A-55)



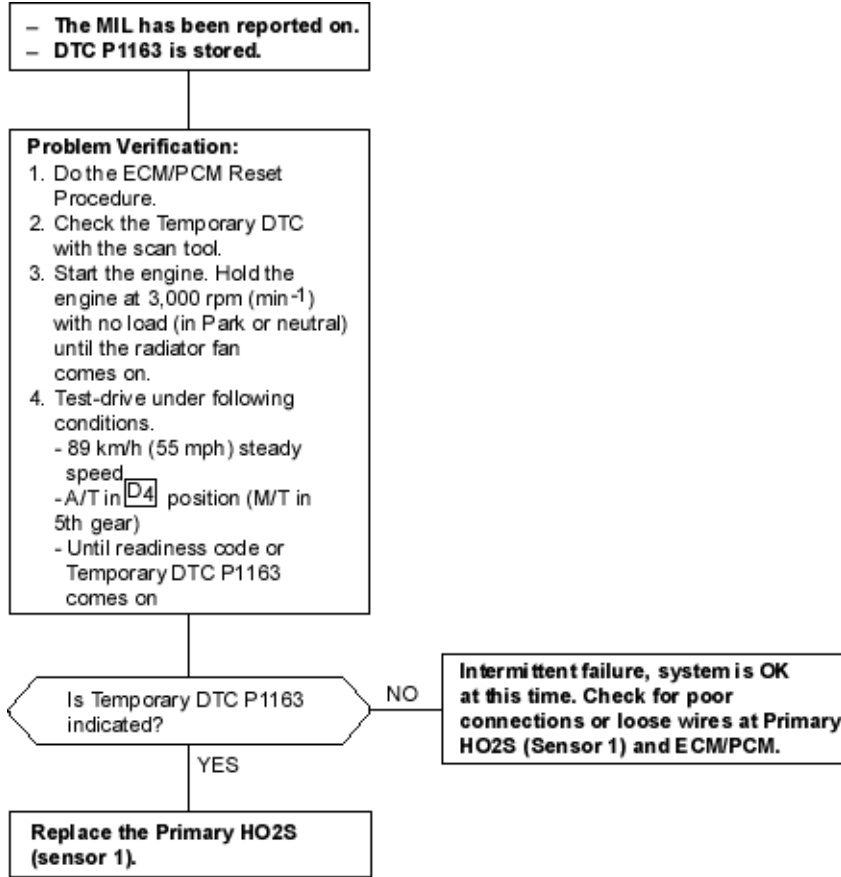
PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



P1163 The scan tool indicates Diagnostic Trouble Code (DTC) P1163: A slow response problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

NOTE: If DTC P1162 is stored at the same time as DTC P1163, troubleshoot DTC P1162 first, then troubleshoot DTC P1163.

Troubleshooting Flowchart



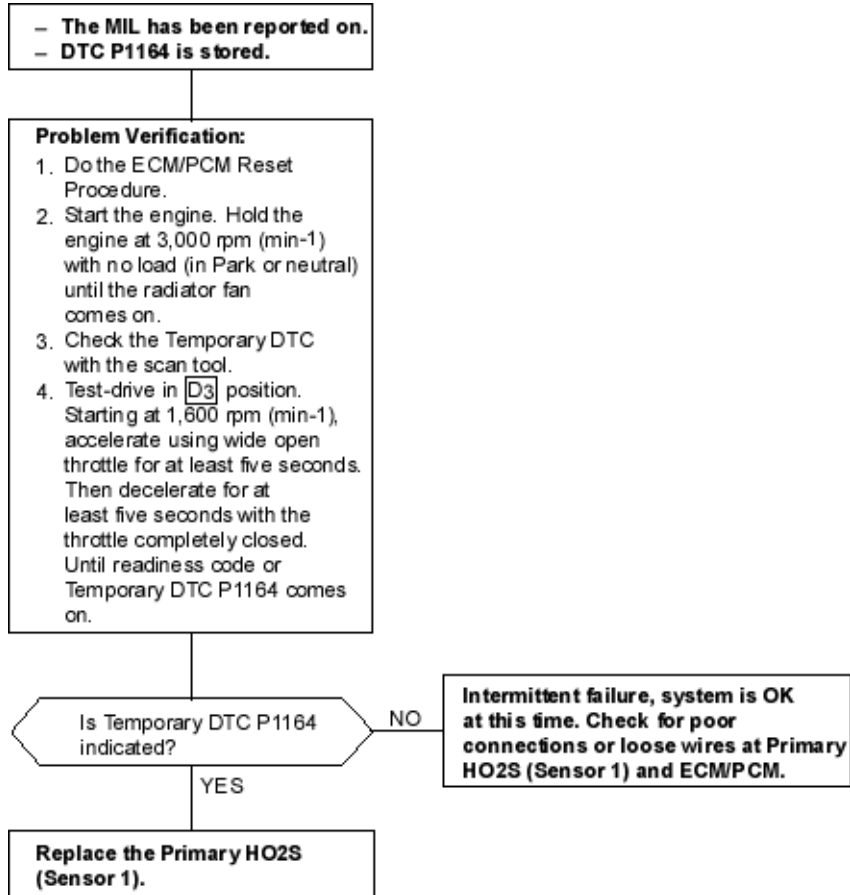
PGM-FI System

Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) (F20B6 engine) (cont'd)

11-A-58

P1164 The scan tool indicates Diagnostic Trouble Code (DTC) P1164: A range/performance problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

Troubleshooting Flowchart



P0137 The scan tool indicates Diagnostic Trouble Code (DTC) P0137: A low voltage problem in the Primary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) circuit.

- The MIL has been reported on.
- DTC P0137 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the Secondary HO2S (Sensor 2) output voltage at 3,000 rpm (min-1) with the scan tool.

Does the voltage stay at 0.3 V or less?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at Secondary HO2S (Sensor 2) and ECM/PCM.

YES
Check for a short in the Secondary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) 4P connector.
3. Start the engine.
4. Check the Secondary HO2S (Sensor 2) output with the scan tool.

Does the voltage stay at 0.3 V or less?

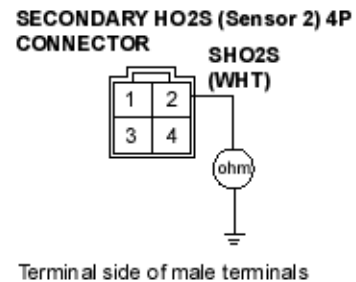
NO
Replace the Secondary HO2S (Sensor 2).

YES
Check for a short in the wire (SHO2S line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector A (32P).
3. Check for continuity between the Secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.

Is there continuity?

YES
Repair short in the wire between ECM/PCM (A23) and Secondary HO2S (Sensor 2).

NO
Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.



P0138 The scan tool indicates Diagnostic Trouble Code (DTC) P0138: A high voltage problem in the Primary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) circuit.

- The MIL has been reported on.
- DTC P0138 is stored.

Problem verification:

1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm (min^{-1}) with the scan tool.

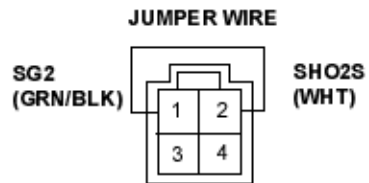
Does the voltage stay at 0.6 V or more?

Intermittent failure, system is OK at this time. Check for poor connections or loose wires at Secondary HO2S (Sensor 2) and ECM/PCM.

Check for an open in the Secondary HO2S:

1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) 4P connector.
3. Connect the Secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.
4. Turn the ignition switch ON (II).
5. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

SECONDARY HO2S (Sensor 2) 4P CONNECTOR



Terminal side of male terminals.

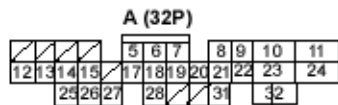
Is there 0.6 V or more?

Replace the Secondary HO2S (Sensor 2).

Check for an open in the wire (SHO2S line):

1. Turn the ignition switch OFF.
2. Connect ECM/PCM connector terminals A23 and C18 with a jumper wire. Turn the ignition switch ON (II).
3. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

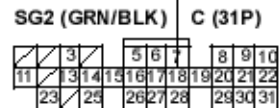
ECM/PCM CONNECTORS



SHO2S (WHT) JUMPER WIRE

Is there 0.6 V or more?

Repair open in the wire between ECM/PCM (A23) and Secondary HO2S (Sensor 2).

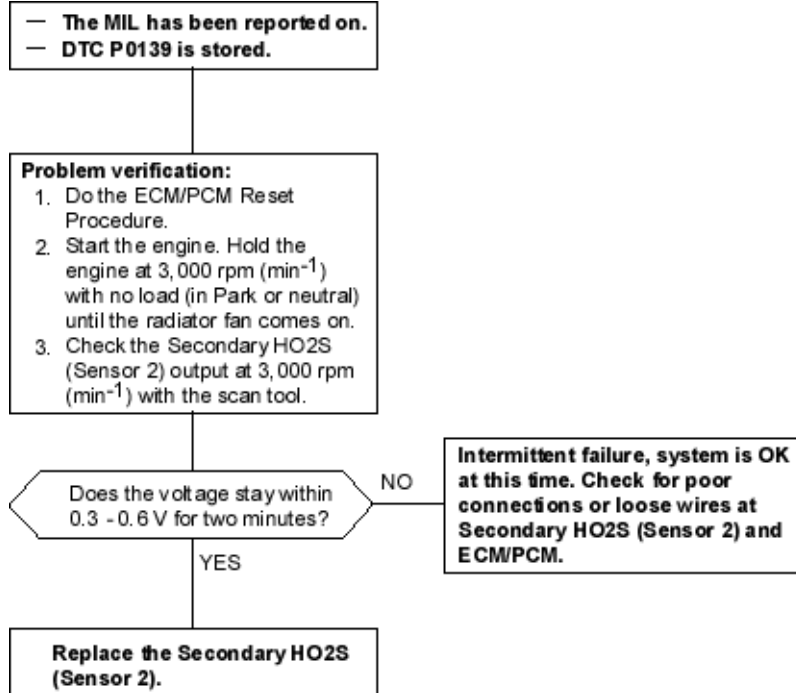


Wire side of female terminals

Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

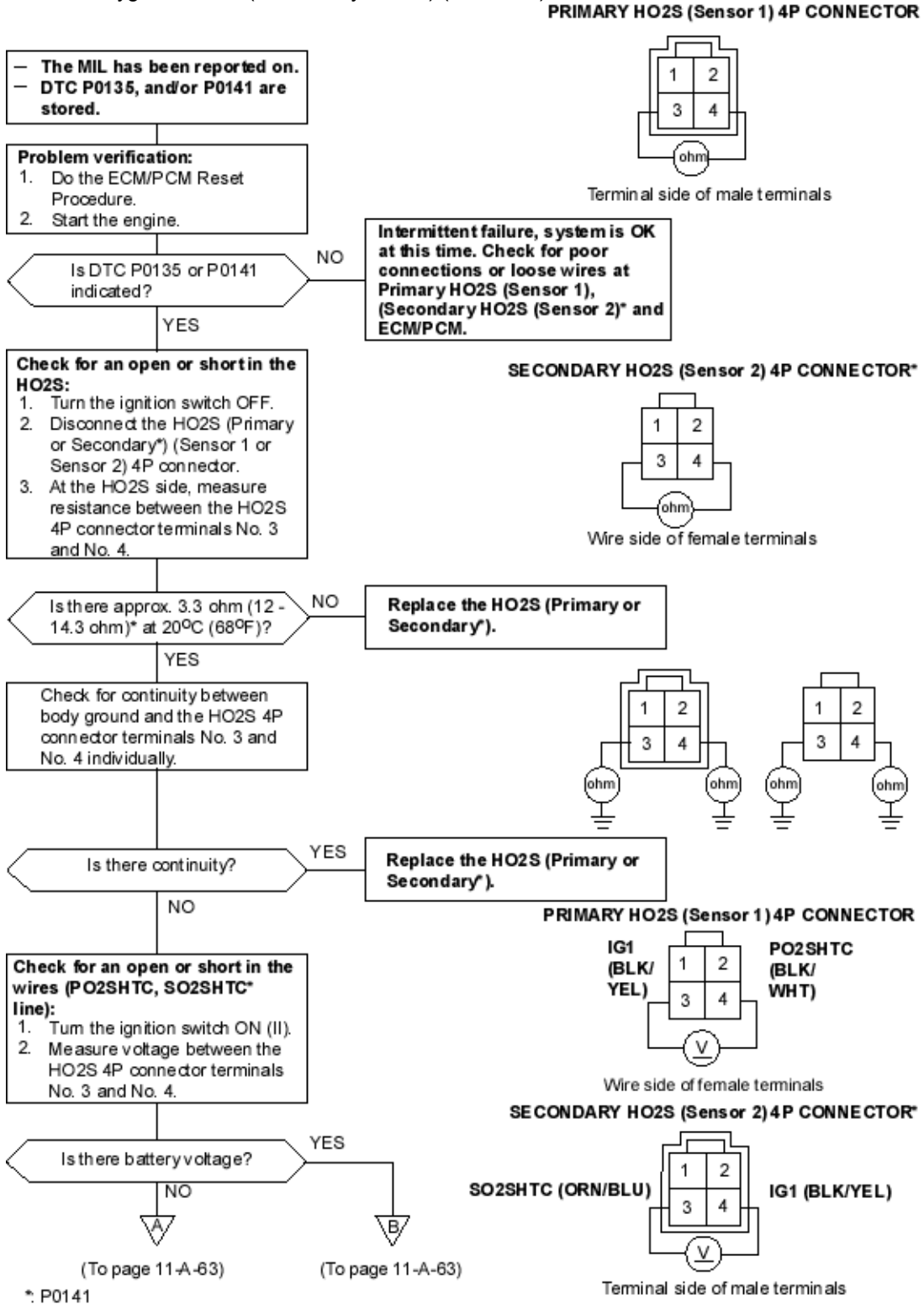
To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-A-16\)](#)

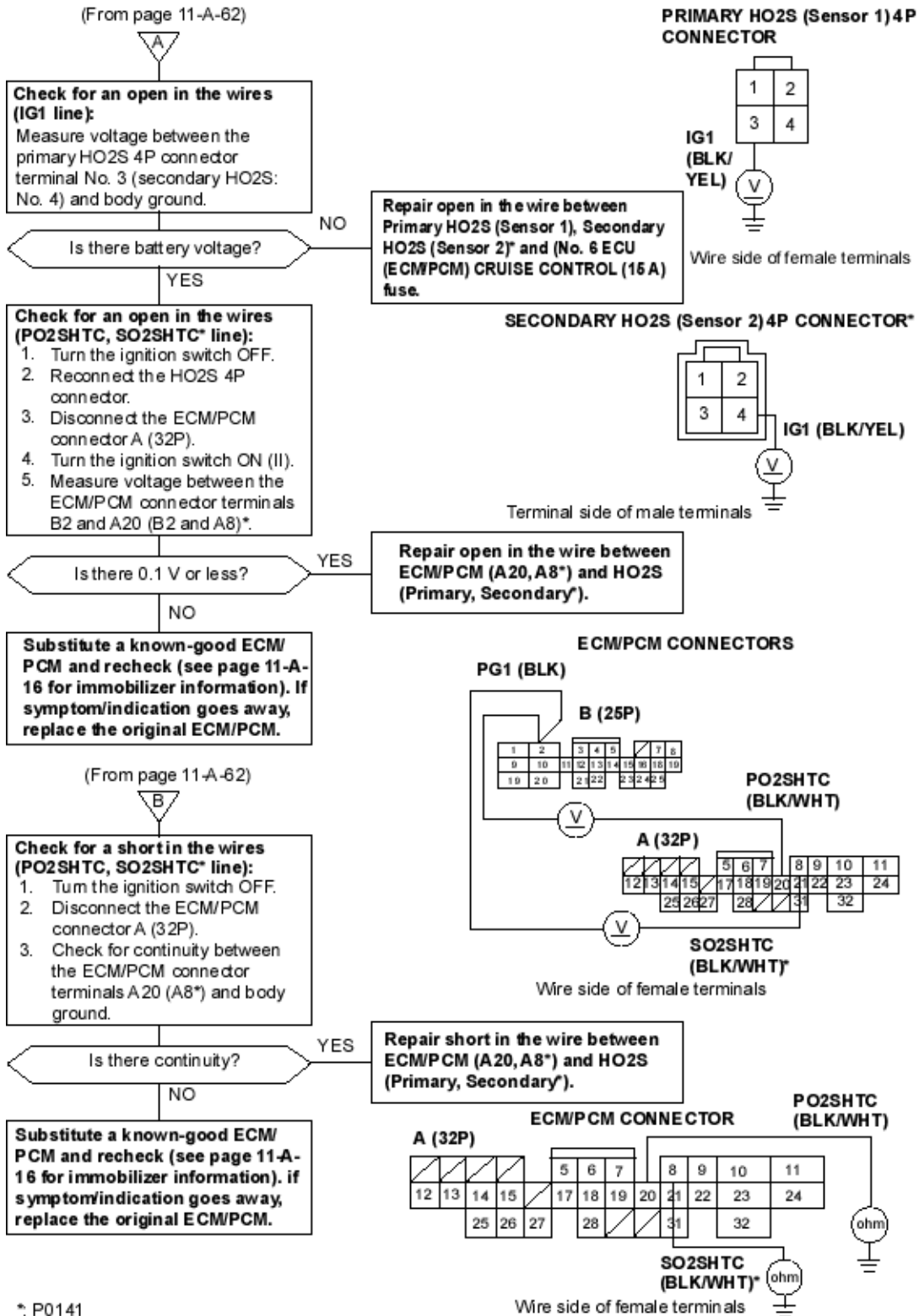
P0139 The scan tool indicates Diagnostic Trouble Code (DTC) P0139: A slow response problem in the Primary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) circuit.



P0135 The scan tool indicates Diagnostic Trouble Code (DTC) P0135: A problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) heater circuit.

P0141 The scan tool indicates Diagnostic Trouble Code (DTC) P0141: A problem in the Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) heater circuit.





*: P0141

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

P1166 The scan tool indicates Diagnostic Trouble Code (DTC) P1166: An electrical problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) heater circuit.

— The MIL has been reported on.
 — DTC P1166 is stored.

Problem verification:
 1. Do the ECM/PCM Reset Procedure.
 2. Start the engine.

Is DTC P1166 indicated?

NO
 Intermittent failure, system is OK at this time. Check for poor connections or loose wires at Primary HO2S (Sensor 1) and ECM/PCM.

YES

Check for an open or short in the wire (PHO2SHTC line):
 Measure voltage between ECM/PCM connector terminals B19 and B20, 30 seconds after ignition switch is turned ON (II).

ECM/PCM CONNECTOR B (25P)



PHO2SHTC (BLK/WHT)

LG1 (BRN/BLK)

Wire side of female terminals

Is there battery voltage?

YES
 Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

NO

Check for an open or short in the wire (PHO2SHTC + line):
 Measure voltage between ECM/PCM connector terminals C13 and B20.

Is there battery voltage?

NO → (To page 11-A-65)

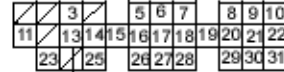
ECM/PCM CONNECTORS

B (25P)



LG1 (BRN/BLK)

C (31P)



PHO2SHTC+ (WHT)

Wire side of female terminals

Is there battery voltage?

NO
 Repair open or short in the wire between Primary HO2S (Sensor 1) and ECM/PCM (B19).

YES

Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

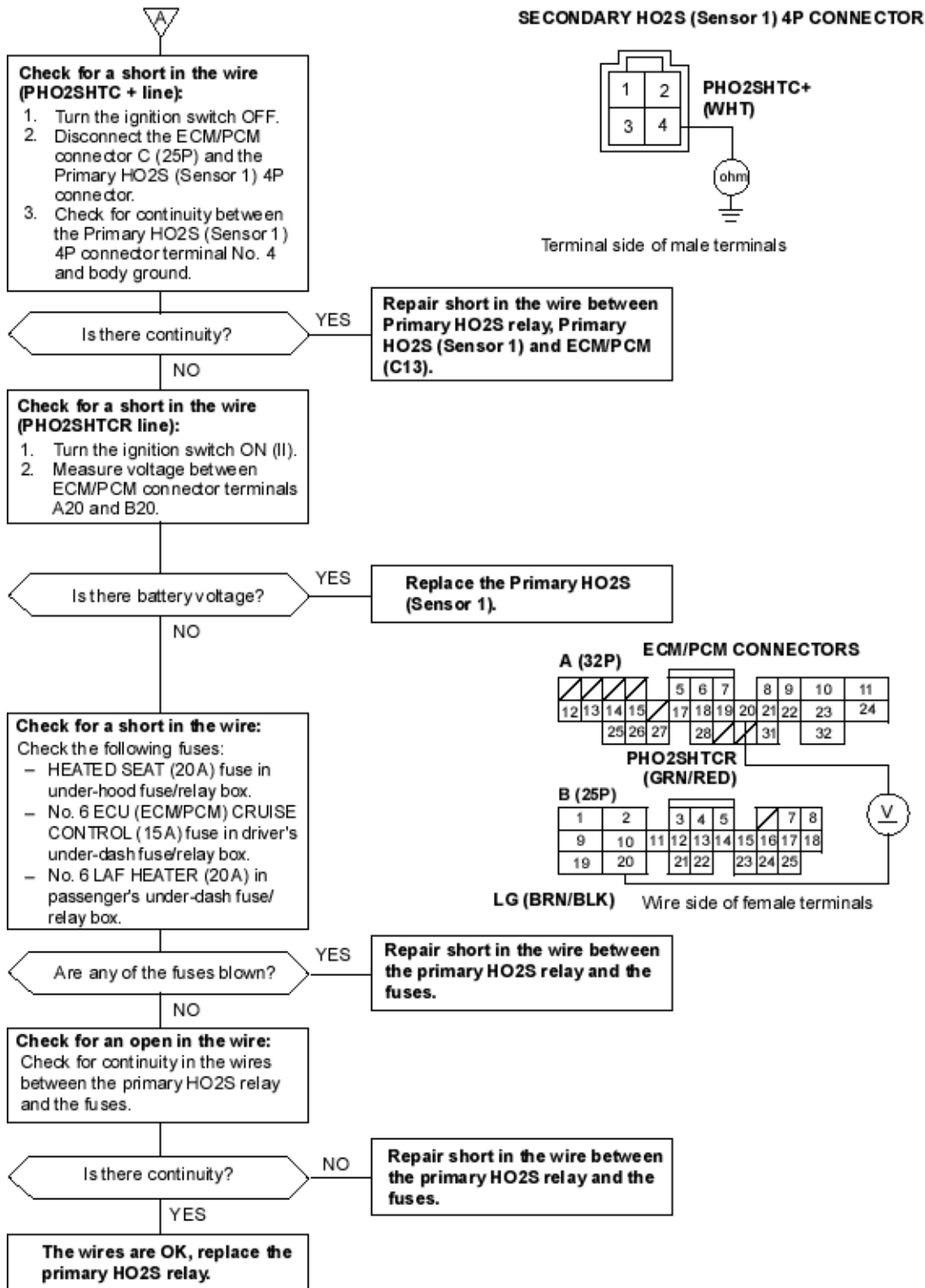


PHO2SHTC (BLK/WHT)

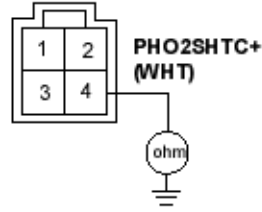
LG1 (BRN/BLK)

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

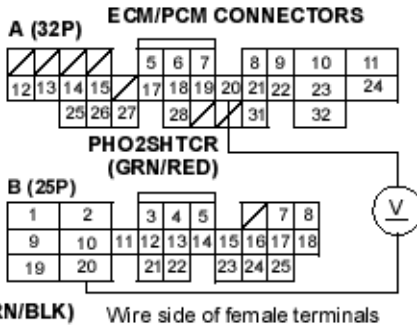
(From page 11-A-64)



SECONDARY HO2S (Sensor 1) 4P CONNECTOR



Terminal side of male terminals



P1167 The scan tool indicates Diagnostic Trouble Code (DTC) P1167: A system malfunction in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) heater circuit.

NOTE: If DTC P1162 is stored at the same time as DTC P1167, troubleshoot DTC P1162 first, then troubleshoot DTC P1167.

— The MIL has been reported on.
— DTC P1167 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Wait for at least 80 seconds.

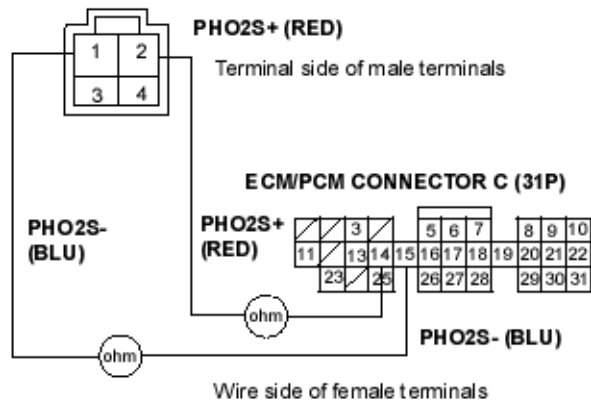
Is DTC P1167 indicated?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at Primary HO2S (Sensor 1) and ECM/PCM.

YES

Check for an open in the wire (PHO2S+, PHO2S- lines):
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S 4P connector and the ECM/PCM connector C (31P).
3. Check for continuity between the Primary HO2S (Sensor 1) 4P connector terminal No. 2 and the ECM/PCM connector terminal C14 and between Primary HO2S (Sensor 1) 4P connector terminal No. 1 and ECM/PCM connector terminal C15.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Is there continuity?

NO
Repair open in the wire between Primary HO2S (Sensor 1) and ECM/PCM (C14 or C15).

YES

Replace the Primary HO2S (Sensor 1).

P1171 The scan tool indicates Diagnostic Trouble Code (DTC) P1171: The fuel system is too lean.
P1172 The scan tool indicates Diagnostic Trouble Code (DTC) P1172: The fuel system is too rich

Description

By monitoring the Long Term Fuel Trim, long term malfunctions in the fuel system will be detected. If a malfunction has been detected during two consecutive trips, the MIL will come on and DTC P0171 and/or P0172 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then troubleshoot DTC P0171 and/or P0172.

P0107-8: MAP sensor.
P0135*1,P166*2,P1167*2: Primary HO2S (Sensor 1) Heater.
P0137-8: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) Heater
P0401: EGR Flow Insufficient
P0443: EVAP purge control solenoid valve circuit.
P1259: VTEC System.
P1491: EGR Valve Lift Insufficient.
P1498: EGR Valve Lift Sensor High Voltage.

*1:H22A7 engine

*2:F20B6 engine

Possible Cause

DTC P0171

System too lean

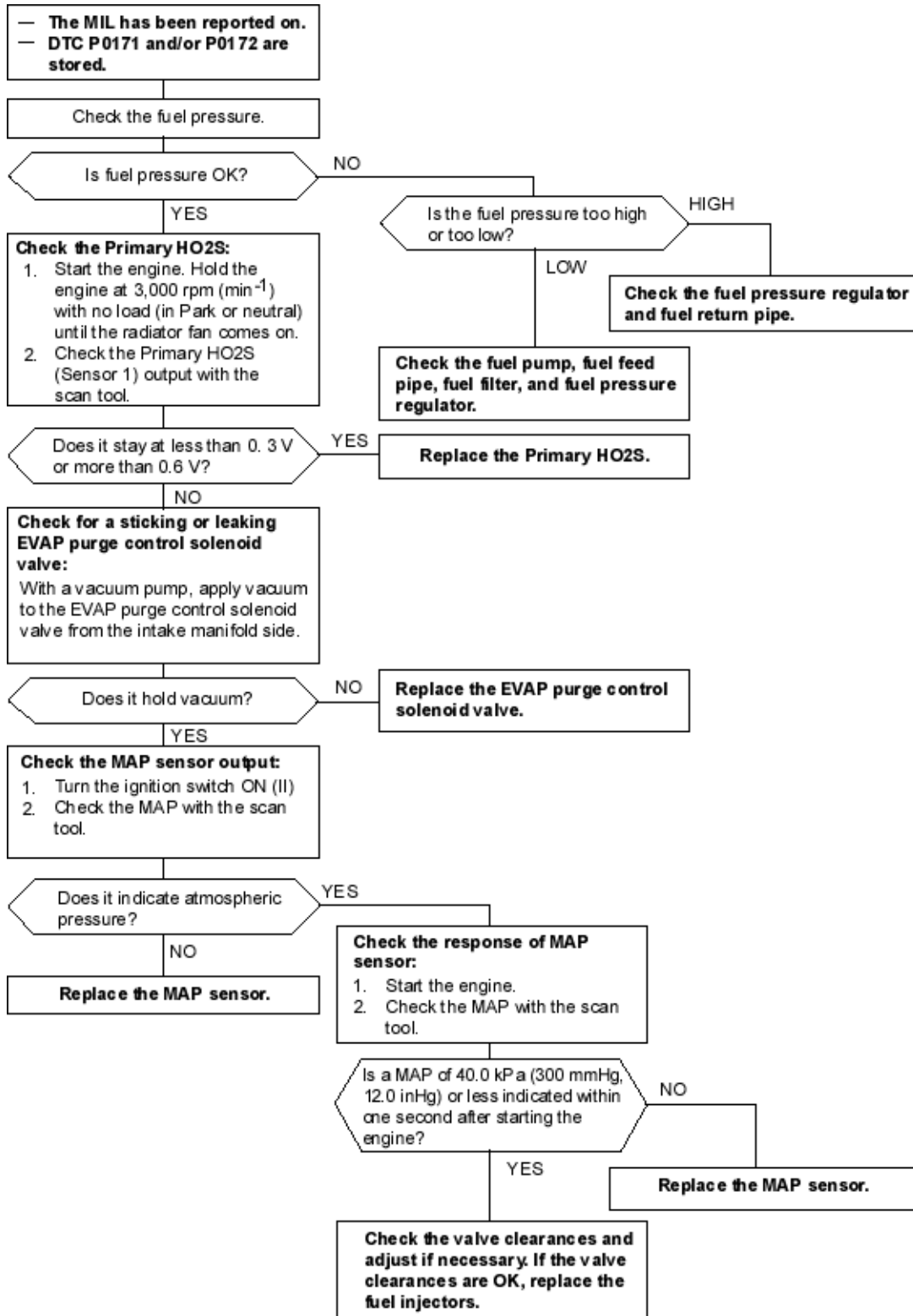
- ♦ Fuel Pump insufficient flow/pressure
- ♦ Fuel Feed Line clogged, leaking
- ♦ Fuel Pressure Regulator stuck open
- ♦ Fuel Filter clogged
- ♦ Fuel Injector clogged, air inclusion
- ♦ Gasoline doesn't meet Owner's Manual spec.
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ EGR System malfunction (too much flow)
- ♦ Valve Clearance
- ♦ Exhaust leak

DTC P0172

System too rich

- ♦ Fuel Pressure Regulator clogged, stuck closed
- ♦ Fuel Return Pipe clogged
- ♦ Fuel Injector leaking
- ♦ Gasoline doesn't meet Owner's Manual spec
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ EGR insufficient flow
- ♦ EVAP Purge Control Solenoid Valve leaking, stuck open
- ♦ Valve clearance

Troubleshooting Flowchart



P0300 and P0301 through P0304 The scan tool indicates Diagnostic Trouble Code (DTC) P0300 and some of P0301 - P0304: Random misfire.

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft position (CKP) sensor which is attached to the crankshaft. If misfiring is strong enough to cause damage, the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0300 and some of DTCs P0301 through P0304 will be stored. Then, after misfire has ceased, the MIL will come on. If misfiring increases, emissions are detected during two consecutive driving cycles, the MIL will come on, and DTC P0300 and some of DTCs P0301 through P0304 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.

- P0107, P0108: MAP Sensor
- P0171, P0172: Fuel metering
- P0401, P1491, P1498: EGR system
- P1259: VTEC System
- P1361, P1362: TDC sensor
- P1381, P1382: CYP sensor
- P1519: IAC valve

Possible Cause

- ♦ Fuel pump insufficient fuel pressure, amount of flow
- ♦ Fuel line clogging, blockage, leakage
- ♦ Fuel filter clogging
- ♦ Fuel pressure regulator stuck open
- ♦ EGR system malfunction
- ♦ Distributor malfunction
- ♦ Ignition coil wire open, leakage
- ♦ Ignition control module malfunction
- ♦ MAP sensor range/performance, poor response
- ♦ Valves carbon deposit
- ♦ Compression low
- ♦ IAC valve malfunction
- ♦ VTEC system malfunction
- ♦ Fuel does not meet Owner's Manual spec., lack of fuel

Troubleshooting

By test-driving, determine the conditions during which misfire occurs. Depending on these conditions, test in the order described in the table below.

Possible cause Page	EGR system	MAP sensor	Crankshaft position sensor	Fuel pressure	Distributor and Ignition wires	ICM	Valve Clearance	IAC Valve
Condition	11-A-139	11-A-39	section 6	11-A-101	section 4	section 4	section 6	11-A-84
Only low rpm and load	③	②	⑤	④			⑤	①
Only accelerating		④		②	①	③		
Only high rpm and load		④	⑤	①	②	③	⑤	
Not specific		③	⑤	①	②	④	⑤	

NOTE: If the misfire doesn't recur, some possible causes are fuel that doesn't meet owner's manual spec, lack of fuel, carbon deposits on spark plug, etc.

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-A-139)
 (See Page 11-A-39)
 (See Page 11-A-101)
 (See Page 11-A-84)

P0301	The scan tool indicates Diagnostic Trouble Code (DTC) P0301: Cylinder 1 misfire detected.
P0302	The scan tool indicates Diagnostic Trouble Code (DTC) P0302: Cylinder 2 misfire detected.
P0303	The scan tool indicates Diagnostic Trouble Code (DTC) P0303: Cylinder 3 misfire detected.
P0304	The scan tool indicates Diagnostic Trouble Code (DTC) P0304: Cylinder 4 misfire detected.

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft position (CKP) sensor, which is attached to the crankshaft. If misfiring is strong enough to cause damage, the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0301, P0302, P0303 or P0304 will be stored. Then, after the misfire has ceased, the MIL will come on. If misfiring that increases emissions, is detected during two consecutive driving cycles, the MIL will come on and DTC P0301, P0302, P0303 or P0304 will be stored.

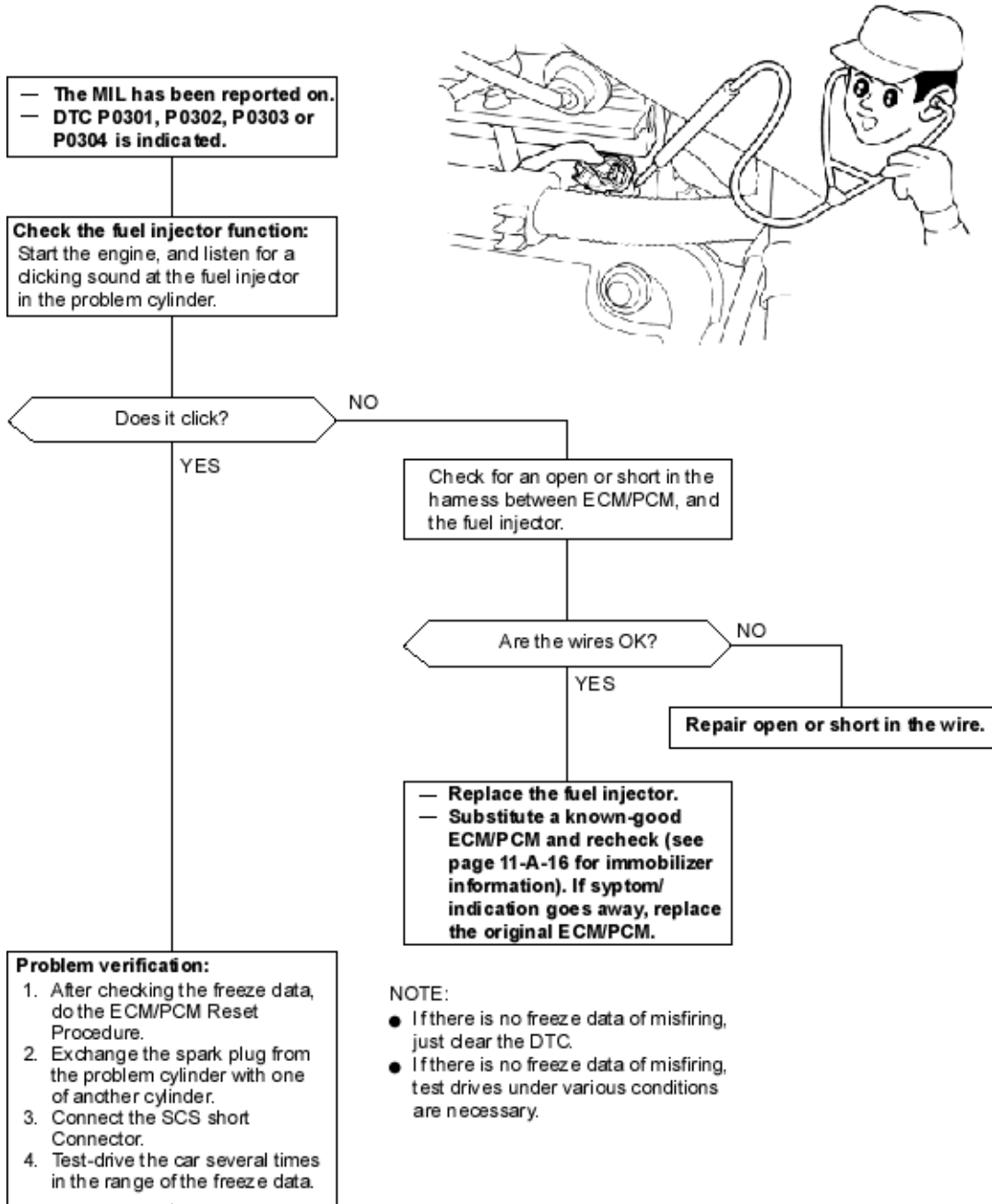
NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.

P0107, P0108:	MAP sensor
P0171, P0172:	Fuel metering
P0401, P1491, P1498:	EGR system
P1259:	VTEC System
P1361, P1362:	TDC sensor
P1381, P1382:	CYP sensor
P1519:	IAC valve

Possible Cause

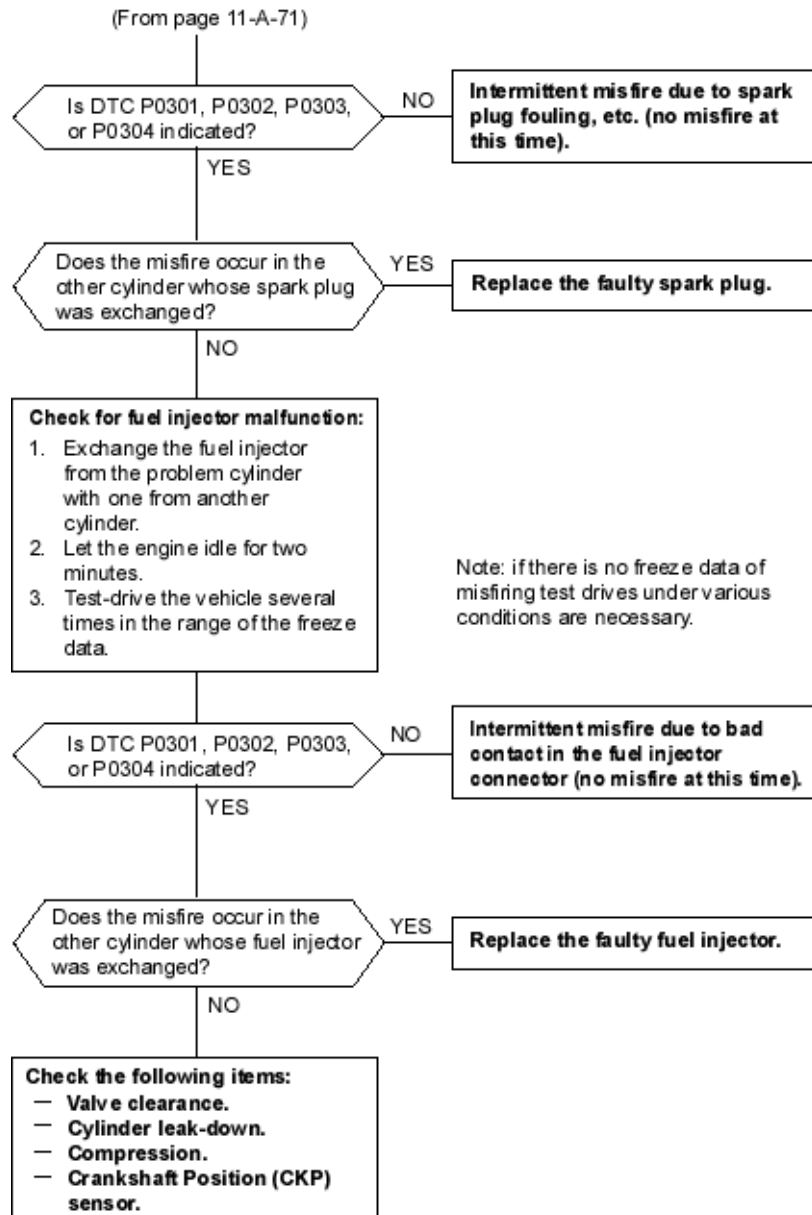
- ♦ Fuel injector clogging, fuel leakage, air leakage.
- ♦ Fuel injector circuit open or shorted.
- ♦ Spark plug carbon deposits, fouling, malfunction.
- ♦ Ignition wires open, leaking.
- ♦ Distributor malfunction.
- ♦ Compression low.
- ♦ Valve clearance out of spec.

Troubleshooting Flowchart

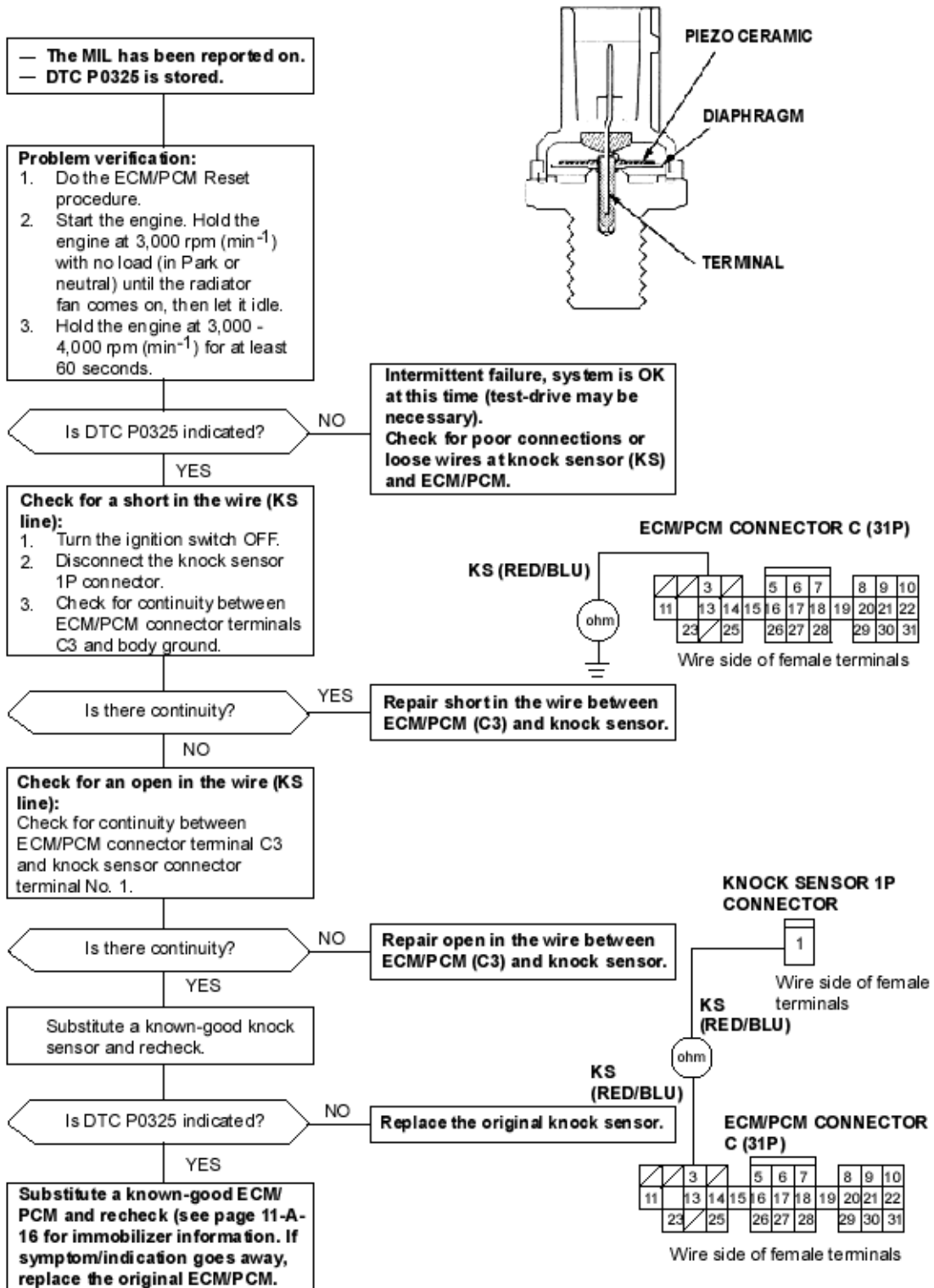


(To page 11-A-72)

To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)



P0325 The scan tool indicates Diagnostic Trouble Code (DTC) P0325: A malfunction in the circuit of the Knock Sensor (KS).



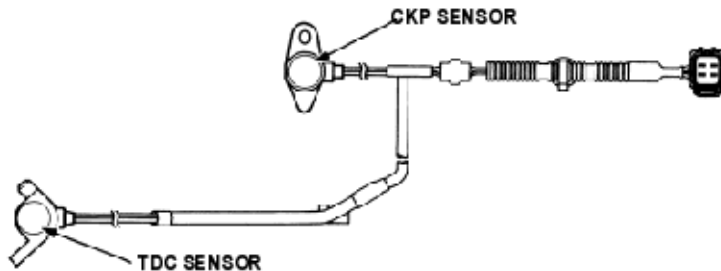
To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

- P0335** The scan tool indicates Diagnostic Trouble Code (DTC) P0335: A malfunction in the Crankshaft Position (CKP) sensor circuit.
- P0336** The scan tool indicates Diagnostic Trouble Code (DTC) P0336: A malfunction in the Crankshaft Position (CKP) sensor circuit.
- P1361** The scan tool indicates Diagnostic Trouble Code (DTC) P1361: Intermittent interruption in the Top Dead Center (TDC) sensor circuit.
- P1362** The scan tool indicates Diagnostic Trouble Code (DTC) P1362: No signal in the Top Dead Center (TDC) sensor circuit.

Description

The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The TDC Sensor determines ignition timing at start-up (cranking) and when crank angle is abnormal.

NOTE: If DTC P1359 is stored at the same time as DTC P0335, P0336, P1361 and/or P1362, troubleshoot DTC 1359 first, then troubleshoot those DTCs.



— The MIL has been reported on.
— DTC P0335, P0336, P1361 and/or P1362 are stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. If the engine does not start, turn the ignition switch to start position (II) for 10 seconds.

Is DTC P0335, P0336, P1361 or P1362 indicated?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at CKP/TDC Sensor and ECM/PCM.

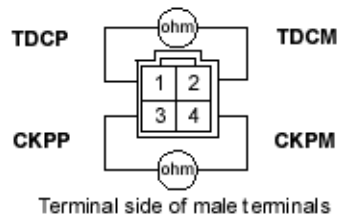
YES
Check for an open in the CKP/TDC sensor:
1. Turn the ignition switch OFF.
2. Disconnect the CKP/TDC sensor 4P connector.
3. Measure resistance between the terminals of the indicated sensor (* see table)

Is there 2,010 - 2,510 ohm at 20°C (68°F).

NO
Replace the CKP/TDC sensor (see section 6).

YES
(To page 11-A-75)

CKP/TDC SENSOR 4P CONNECTOR



SENSOR	DTC	SENSOR TERMINAL	ECM/PCM TERMINAL	WIRE COLOR
TDC	P1361	1	C20	GRN
	P1362	2	C21	RED
CKP	P0335	3	C8	BLU
	P0336	4	C9	WHT

(From page 11-A-74)

Check for a short in the CKP/TDC sensor:
Check for continuity to body ground on both terminals of the indicated sensor individually.

Is there continuity? YES

Replace the CKP/TDC sensor.

NO

Check for an open in the wires (CKP/TDC lines):
1. Reconnect the CKP/TDC sensor 4P connector.
2. Disconnect the ECM/PCM connector C (31P).
3. Measure resistance between the terminals of the indicated sensor on the ECM/PCM connector (*see table).

Is there 2,010 - 2,510 ohms at 20°C (68°F)? NO

Repair open in the indicated sensor wires (* see table)

YES

Check for a short in the wires (CKP/TDC lines):
Check for continuity between body ground and ECM/PCM connector terminals C3 and/or C2 individually.

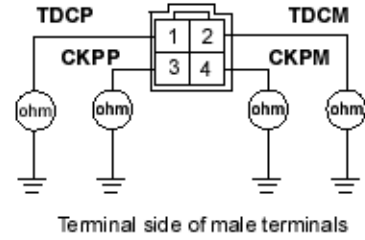
Is there continuity? YES

Repair short in the indicated sensor wires (* see table).

NO

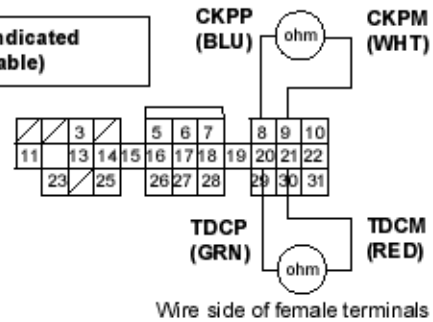
Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

CKP/TDC SENSOR 4P CONNECTOR

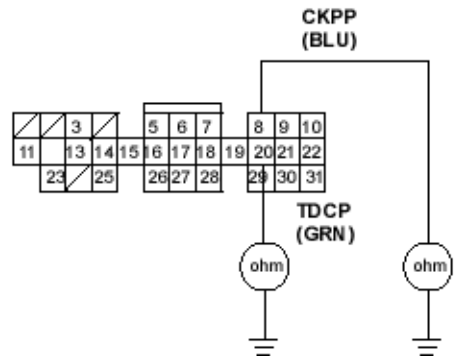


Terminal side of male terminals

ECM/PCM CONNECTOR C (31P)

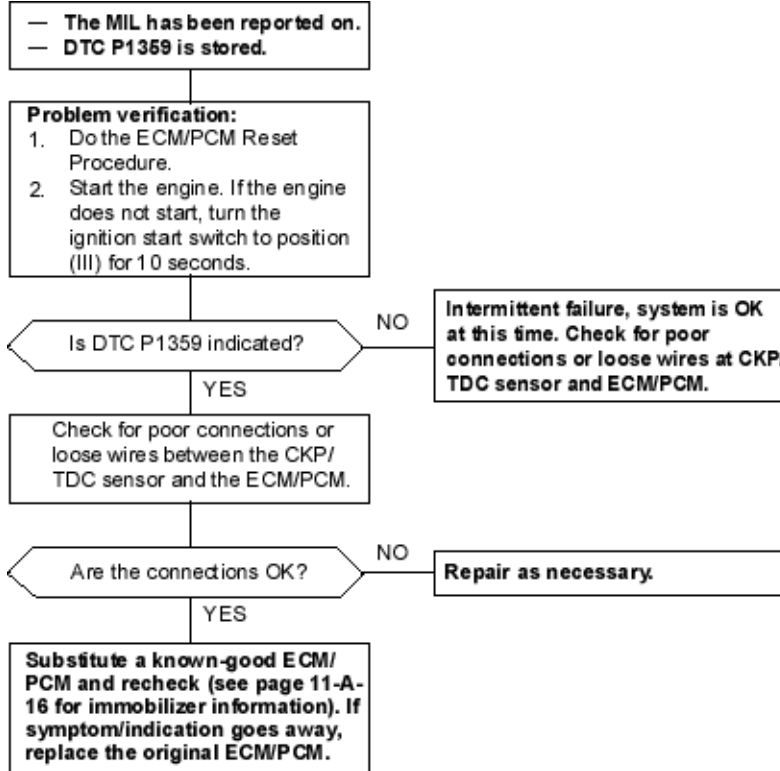


Wire side of female terminals



P1359

The scan tool indicates Diagnostic Trouble Code (DTC) P1359: A problem Crankshaft Position/Top Dead Center (CKP/TDC) sensor circuit.



To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

P0500 The scan tool indicates Diagnostic Trouble Code (DTC) P0500: A malfunction in the Vehicle Speed Sensor (VSS) circuit.

- The MIL has been reported on.
- DTC P0500 is stored.

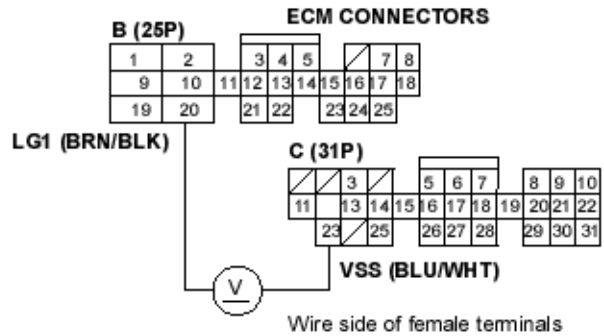
WARNING
Make sure lifts, jacks and safety stands are placed properly (see section 1).

- Problem verification:**
1. Test-drive the vehicle.
 2. Check the vehicle speed with the scan tool.

Is the correct tool indicated?
YES
NO

Intermittent failure, system is OK at this time. Check for poor connections or loose wires at VSS and ECM.

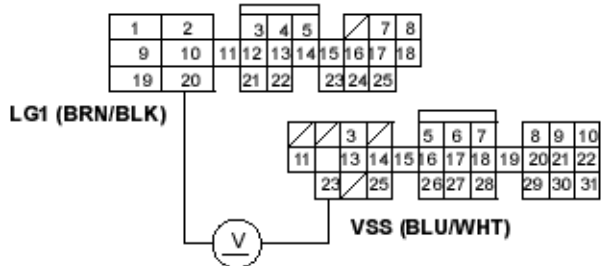
- Check for an open in the ECM:**
1. Turn the ignition switch OFF.
 2. Block the rear wheels and set the parking brake.
 3. Jack up the front of the vehicle and support it with safety stands.
 4. Turn the ignition switch ON (II).
 5. Block the right front wheel and slowly rotate the left front wheel.
 6. Measure voltage between the ECM connector terminals B20 and C23.



Does the voltage pulse between 0 V and approx. 5 V or battery voltage?
YES
NO

Substitute a known-good ECM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM.

- Check for a short in the ECM:**
1. Turn the ignition switch OFF.
 2. Disconnect the ECM connector C (31P).
 3. Turn the ignition switch ON (II).
 4. Block the right front wheel and slowly rotate the left front wheel.
 5. Measure voltage between the ECM connector terminals B20 and C23.



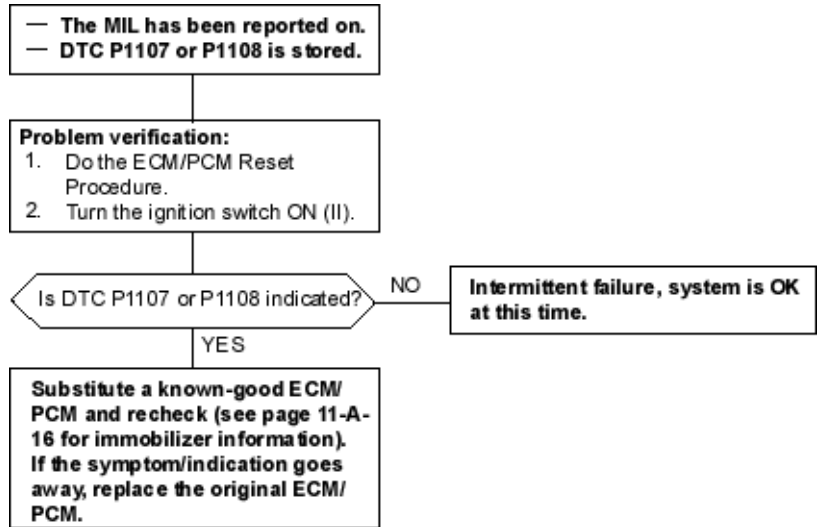
Does the voltage pulse between 0 V and approx. 5 V or battery voltage?
YES
NO

Substitute a known-good ECM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM.

- Repair short in the wire between ECM (C23) and the VSS.
- Repair open in the wire between ECM (C23) and the VSS.
- If wire is OK, test the VSS (see section 23).

To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

- P1107** The scan tool indicates Diagnostic Trouble Code (DTC) P1107: A low voltage problem in the Baro sensor circuit.
- P1108** The scan tool indicates Diagnostic Trouble Code (DTC) P1108: A high voltage problem in the Baro sensor circuit.

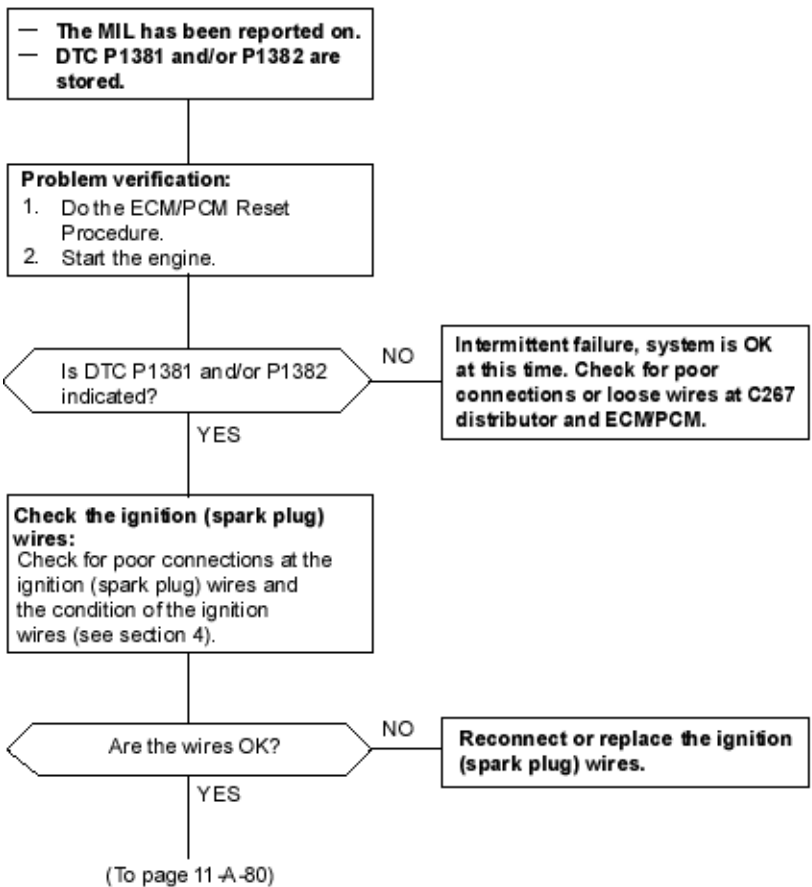
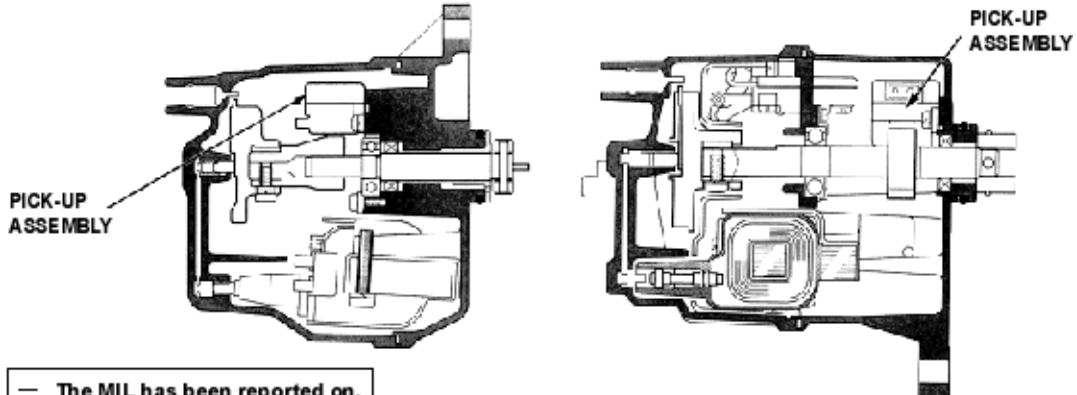


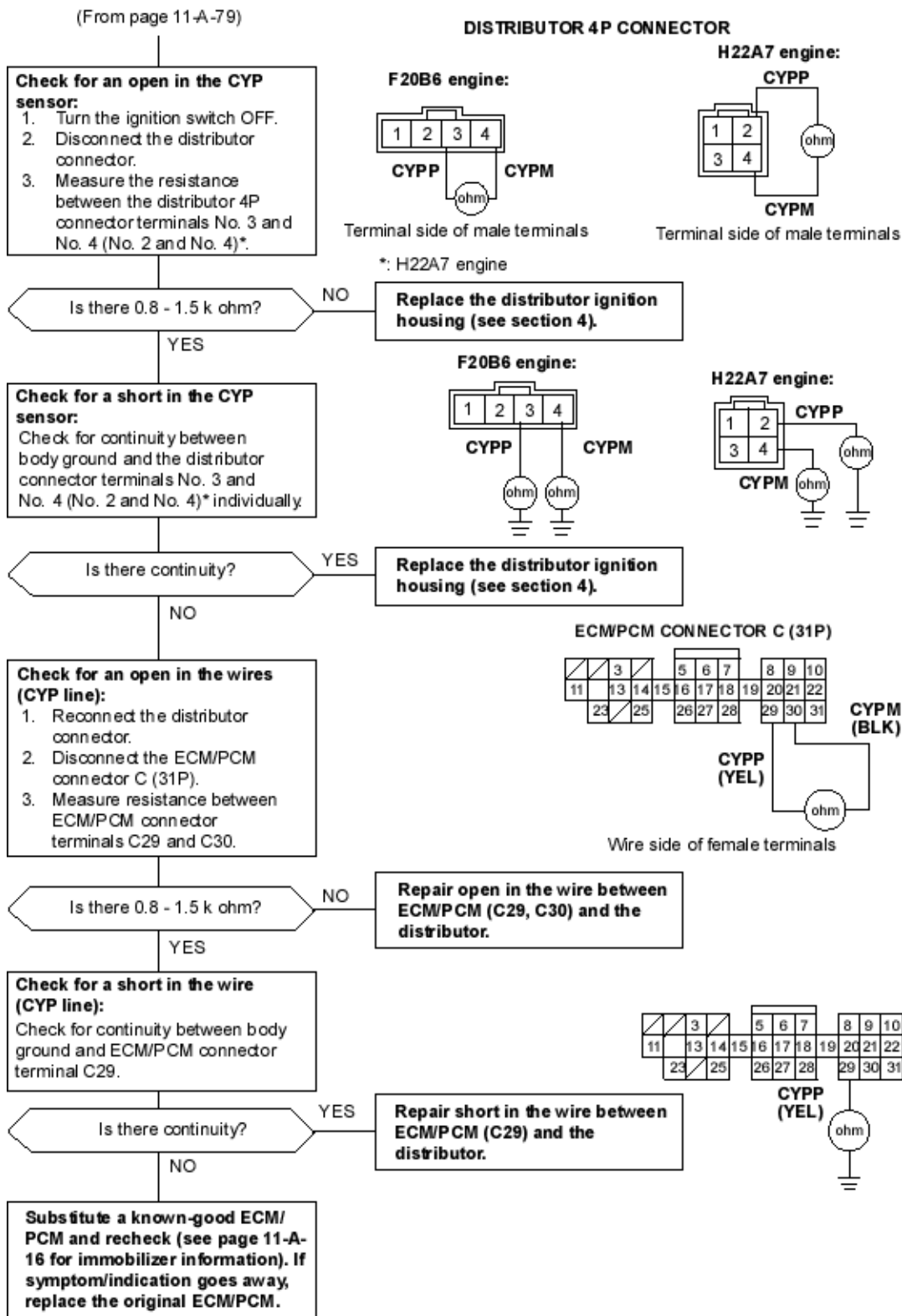
To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-A-16\)](#)

- P1381** The scan tool indicates Diagnostic Trouble Code (DTC) P1381: Intermittent interruption in the Cylinder Position (CYP) sensor circuit.
- P1382** The scan tool indicates Diagnostic Trouble Code (DTC) P1382: No signal in the Cylinder Position (CYP) sensor circuit.

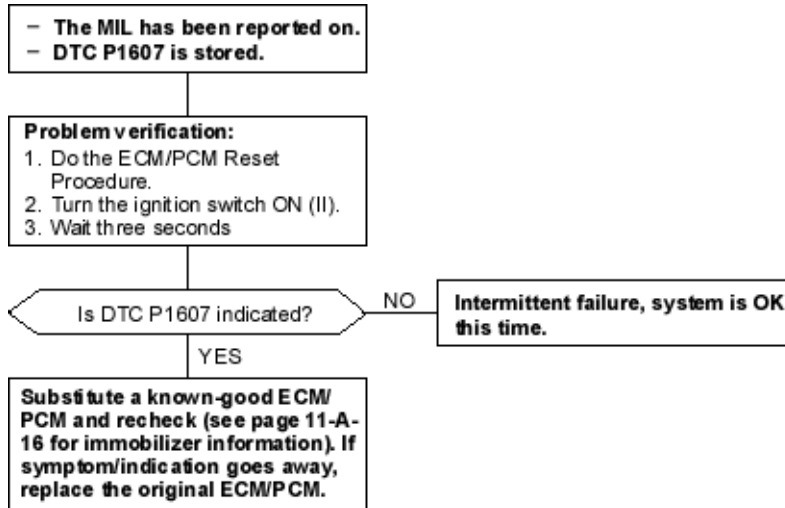
Description

The CYP Sensor detects the position of No.1 cylinder for sequential fuel injection to each cylinder.





P1607 The scan tool indicates Diagnostic Trouble Code (DTC) P1607: A ECM/PCM Internal Circuit Problem.



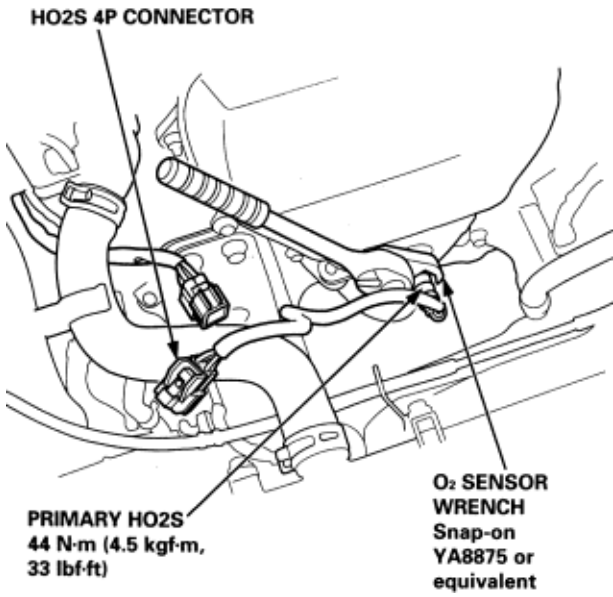
To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

Heated Oxygen Sensor Replacement

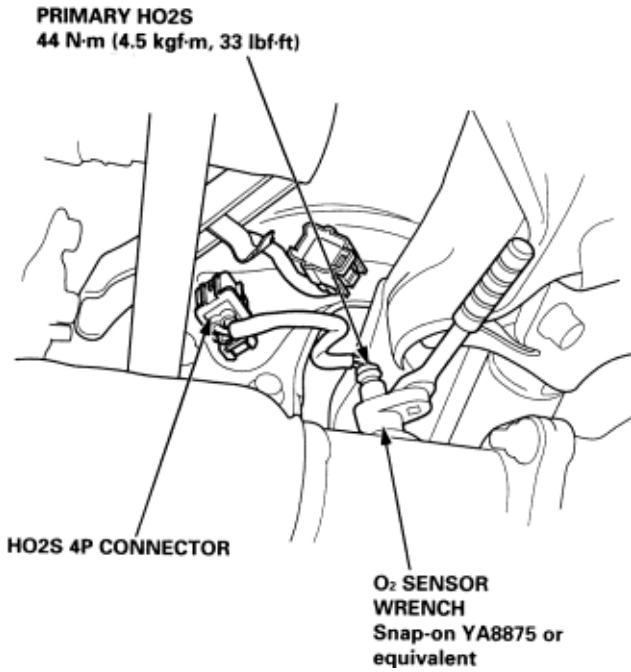
11-A-82

1. Disconnect the HO2S 4P connector, then remove the HO2S.

Primary HO2S: F20B6 engine:

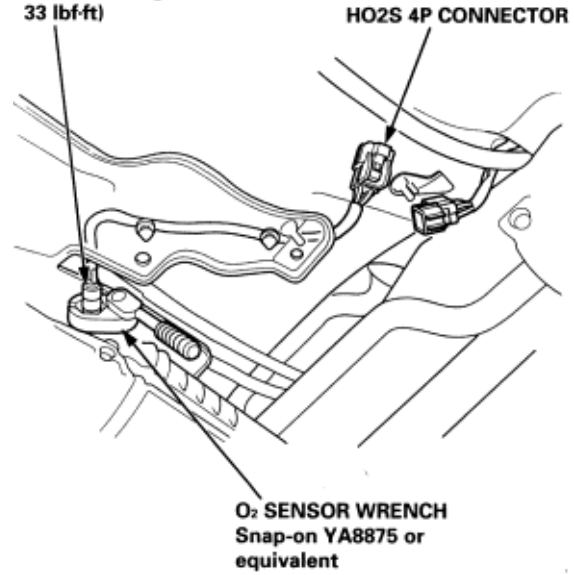


H22A7 engine:



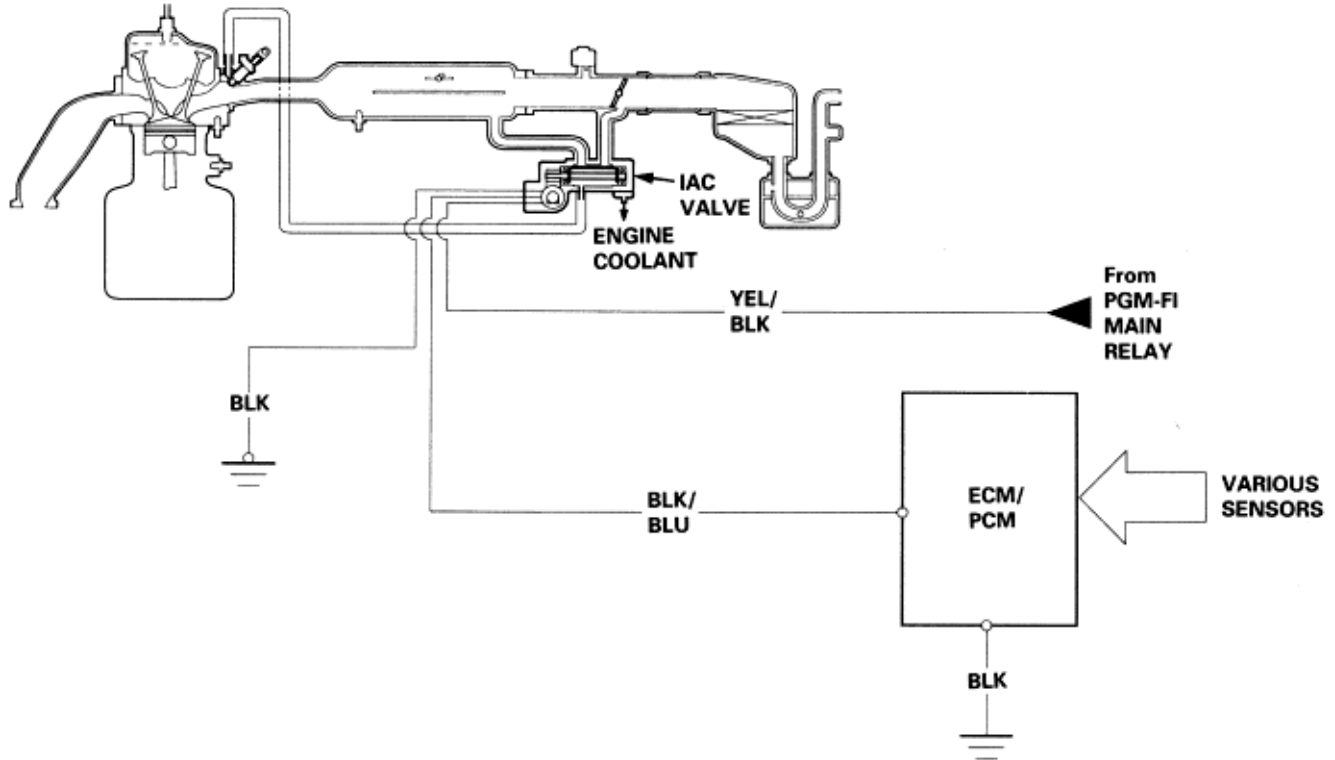
Secondary HO2S:

SECONDARY HO2S
44 N·m (4.5 kgf·m,
33 lbf·ft)



2. Install the HO2S in reverse order of removal.

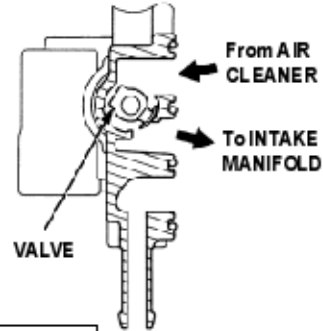
The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve. The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM/PCM. When the AC Valve is activated, the valve opens to maintain the proper idle speed.



1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about 150-300 rpm (min-1).
2. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.
3. When the idle speed is out of specification and the scan tool does not indicate Diagnostic Trouble Code (DTC) P1519, check the following items:
 - ♦ Air conditioning signal (**See Page** 11-A-86).
 - ♦ ALT FR signal (**See Page** 11-A-88).
 - ♦ Brake switch signal (**See Page** 11-A-90).
 - ♦ Starter switch signal (**See Page** 11-A-91).
 - ♦ A/T gear position signal (see section 14).
 - ♦ PSP switch signal (**See Page** 11-A-92).
 - ♦ Hoses and connections
 - ♦ IAC valve and its mounting O-rings
4. If the above items are normal (and the scan tool does not indicate DTC P1519), after AC valve replacement, substitute a known-good ECM/PCM and recheck. If symptom goes away, replace the original ECM/PCM.

P1519 The scan tool indicates Diagnostic Trouble Code (DTC) P1519: A problem in the Idle Control (IAC) valve circuit.

The IAC Valve changes the amount of air bypassing the throttle body in response to a duty signal from the ECM/PCM in order to maintain the proper idle speed.



- The MIL has been reported on.
 - DTC P1519 is stored.

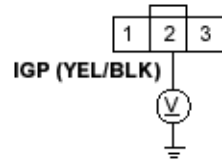
Problem verification
 1. Do the ECM/PCM Reset Procedure.
 2. Turn the ignition switch ON (II).

Is DTC P1519 indicated?
 YES

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at IAC valve and ECM/PCM.

Check for an open in the wire (IGP line):
 1. Turn the ignition switch OFF.
 2. Disconnect the IAC valve 3P connector.
 3. Turn the ignition switch ON (II).
 4. At the wire harness, measure voltage between IAC valve 3P connector terminal No. 2 and body ground.

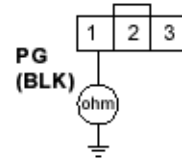
IAC VALVE 3P CONNECTOR



Is there battery voltage?
 YES

NO
Repair open in the wire between the IAC valve and PGM-FI main relay.

Check for an open in the wire (PG line):
 1. Turn the ignition switch OFF.
 2. At the wire harness, check for continuity between IAC valve 3P connector terminal No. 1 and body ground.

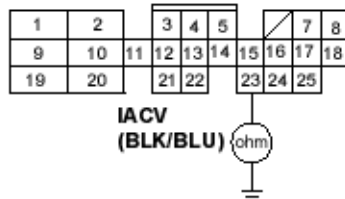


Is there continuity?
 YES

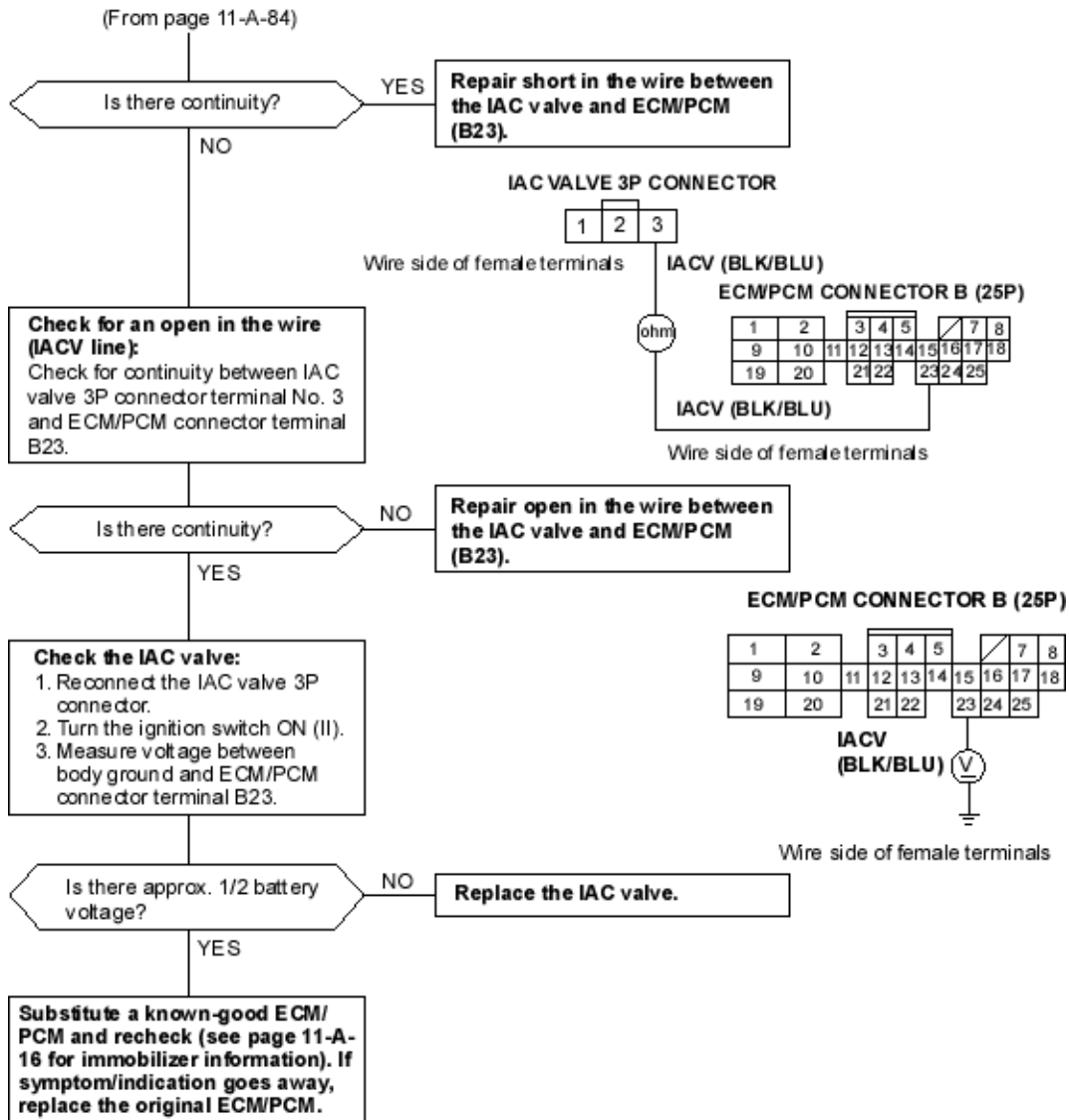
NO
Repair open in the wires between ECM/PCM and G101 (located at the thermostat housing).

Check for a short in the wire (IACV line):
 1. Disconnect the ECM/PCM connector B (25P).
 2. Check for continuity between body ground and ECM/PCM connector terminal B23.

ECM/PCM CONNECTOR B (25P)

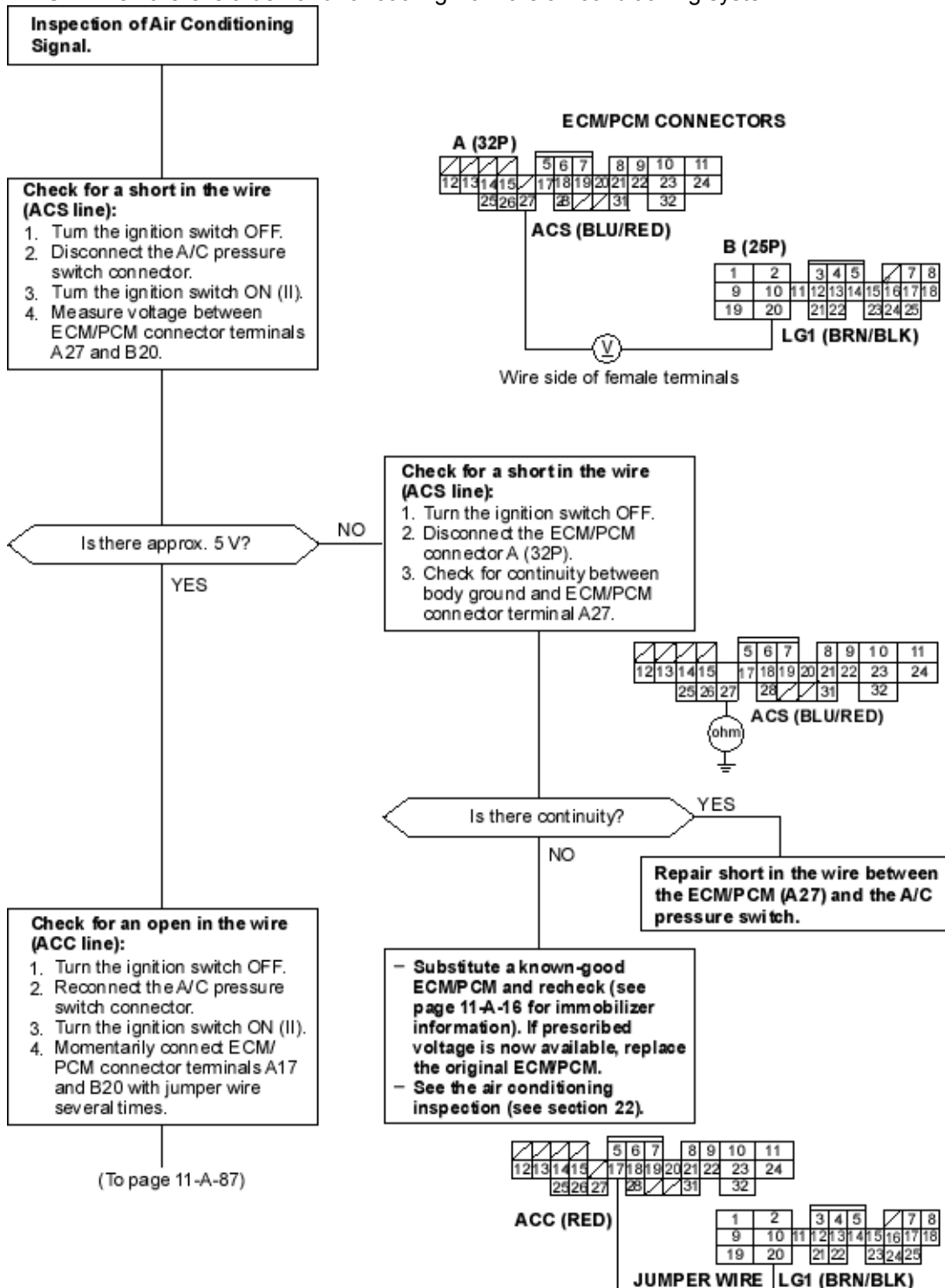


(To page 11-A-85)

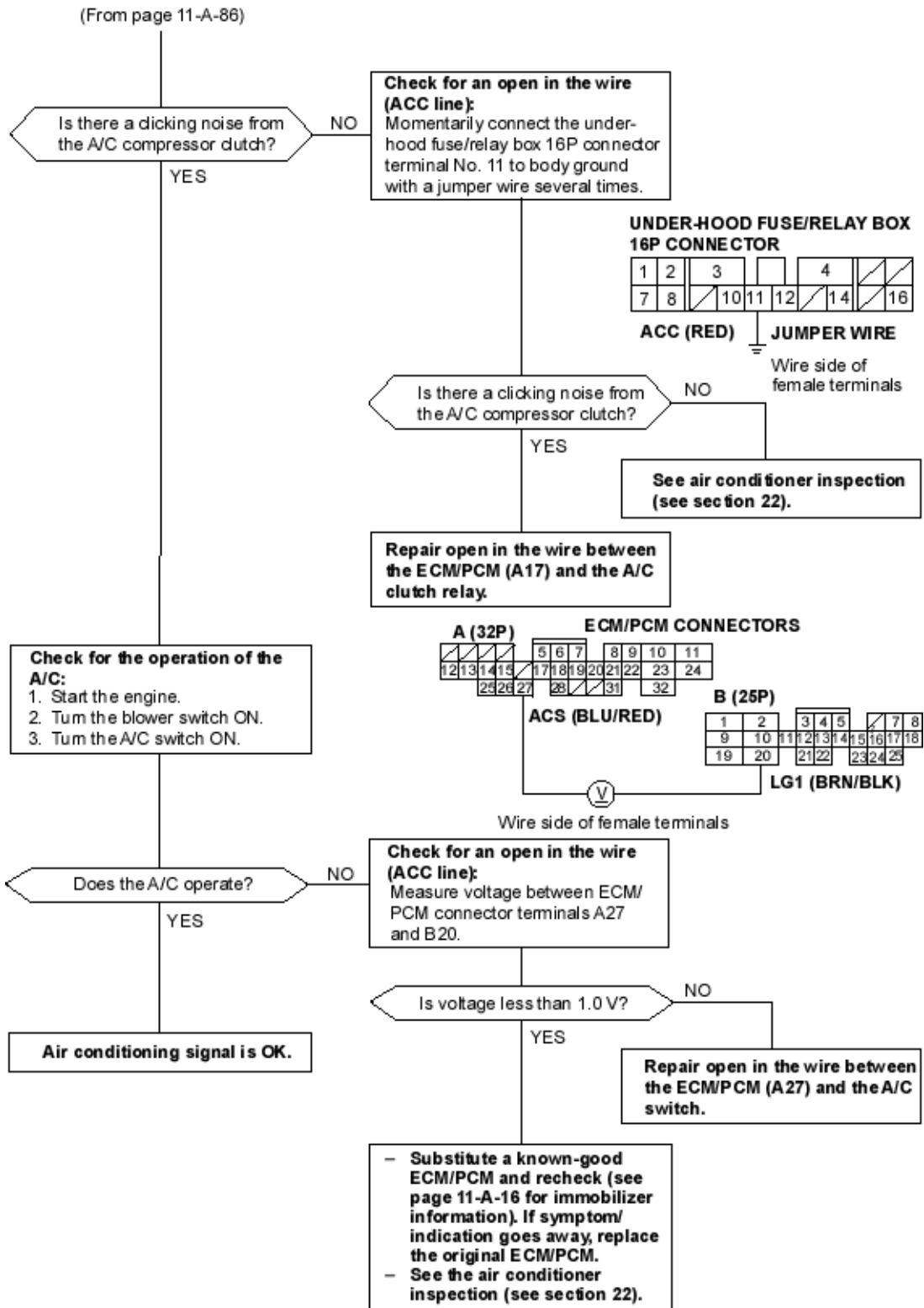


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

This signals the ECM/PCM when there is a demand for cooling from the air conditioning system.

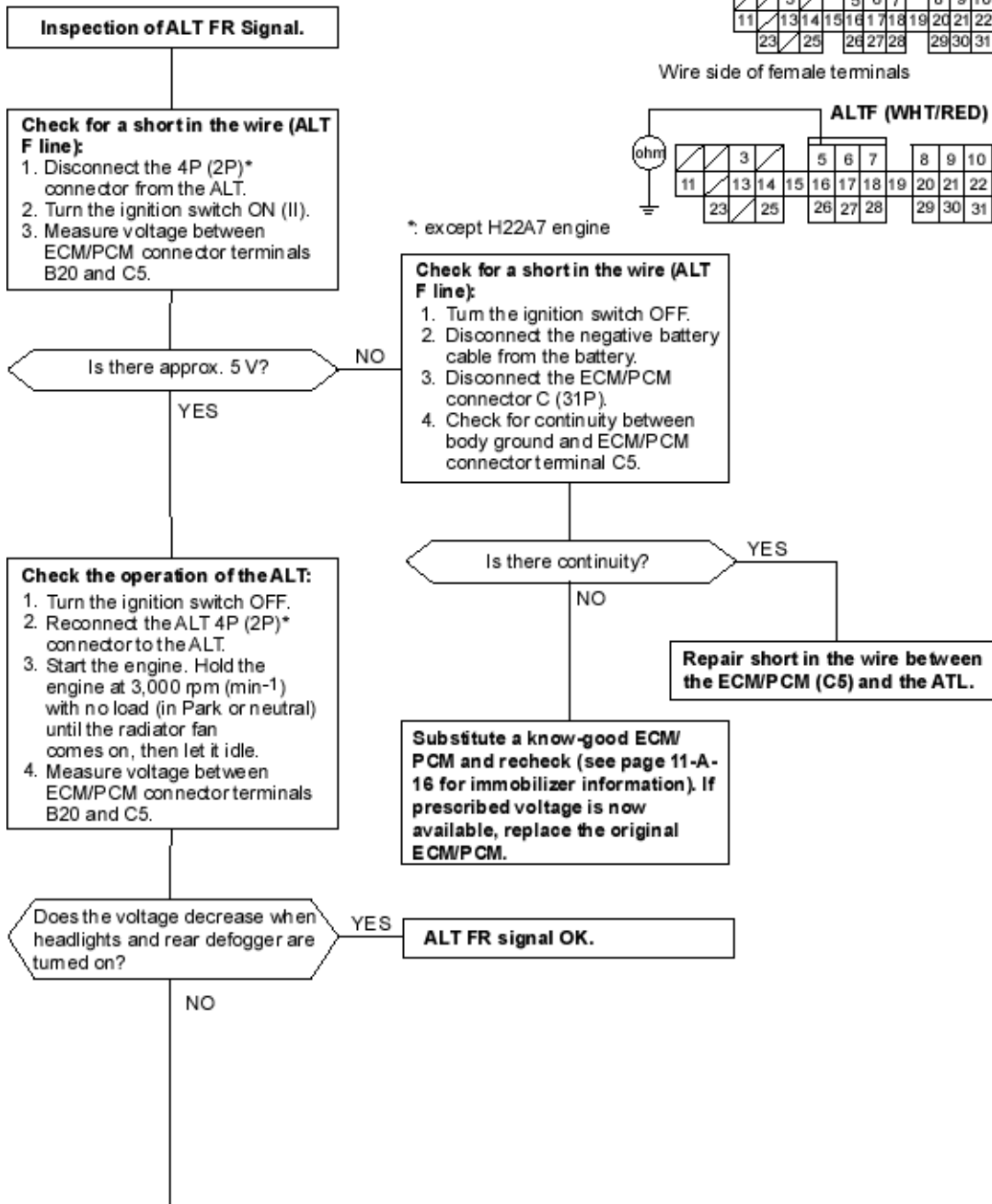
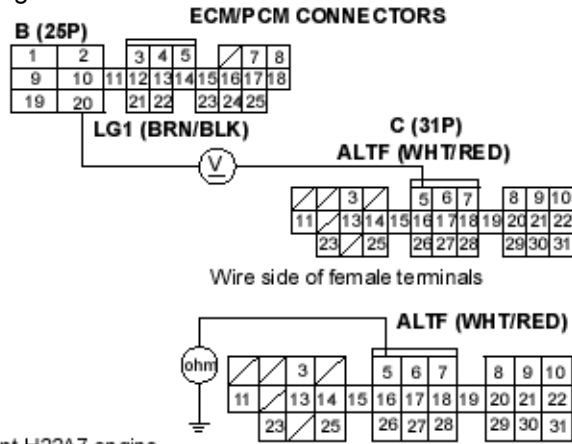


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

This signals the ECM/PCM when the Alternator (ALT) is charging.



*: except H22A7 engine

To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

(From page 11-A-88)

Check for an open in the wire (ALT F line):
1. Turn the ignition switch OFF.
2. Disconnect the 4P (2P)* connector from the ALT.
3. Turn the ignition switch ON (II).
4. Measure voltage between the ALT 4P connector terminal No. 4 (No. 2)* and body ground.

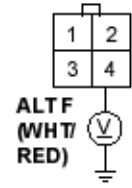
*: except H22A7 engine

Is there approx. 5 V?

NO **Repair open wire between the ECM/PCM (C5) and the ALT.**

YES **See the ALT inspection (see section 4).**

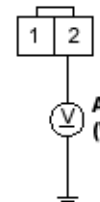
ALT4P CONNECTOR



ALT F (WHT/RED)

Wire side of female terminals

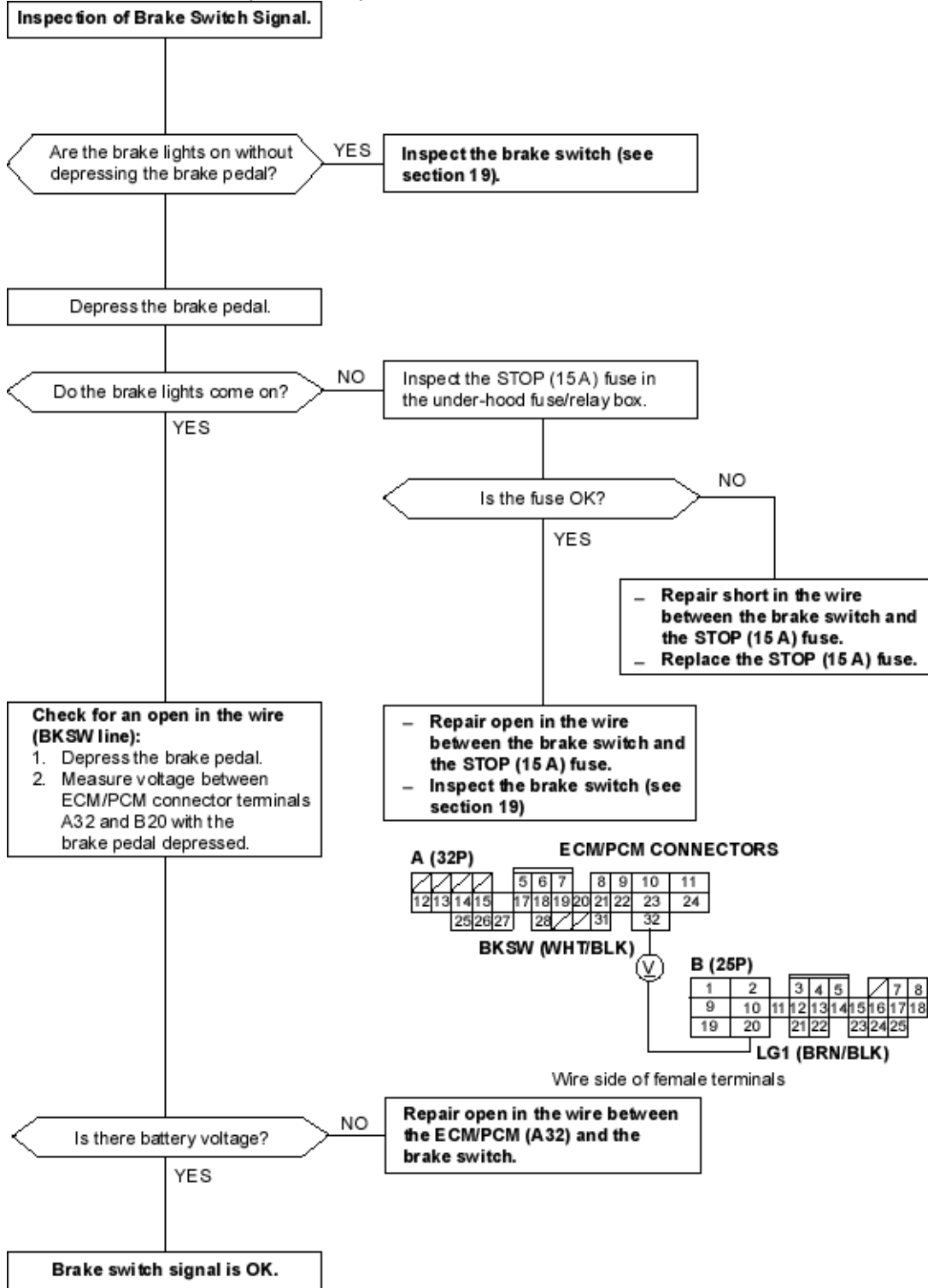
ALT 2P CONNECTOR*



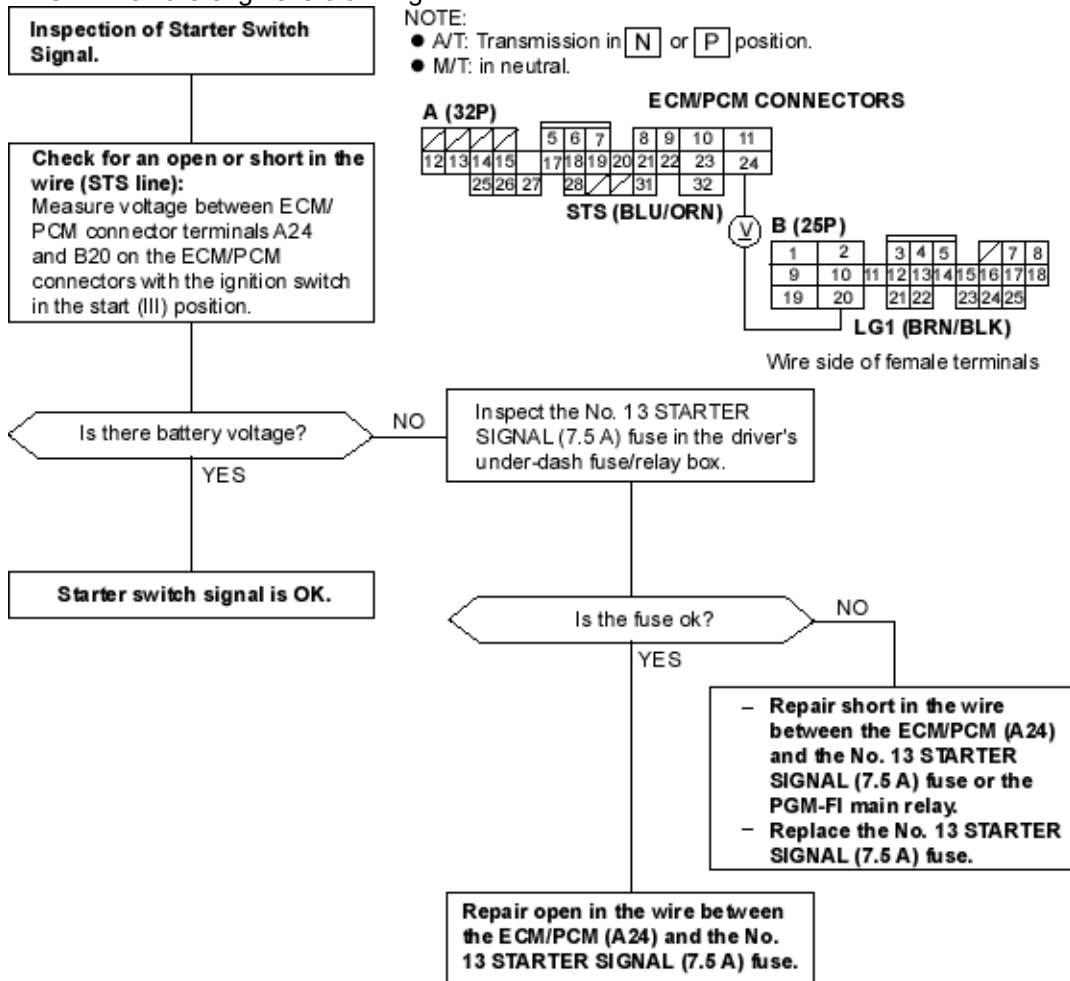
ALT F (WHT/RED)

Wire side of female terminals

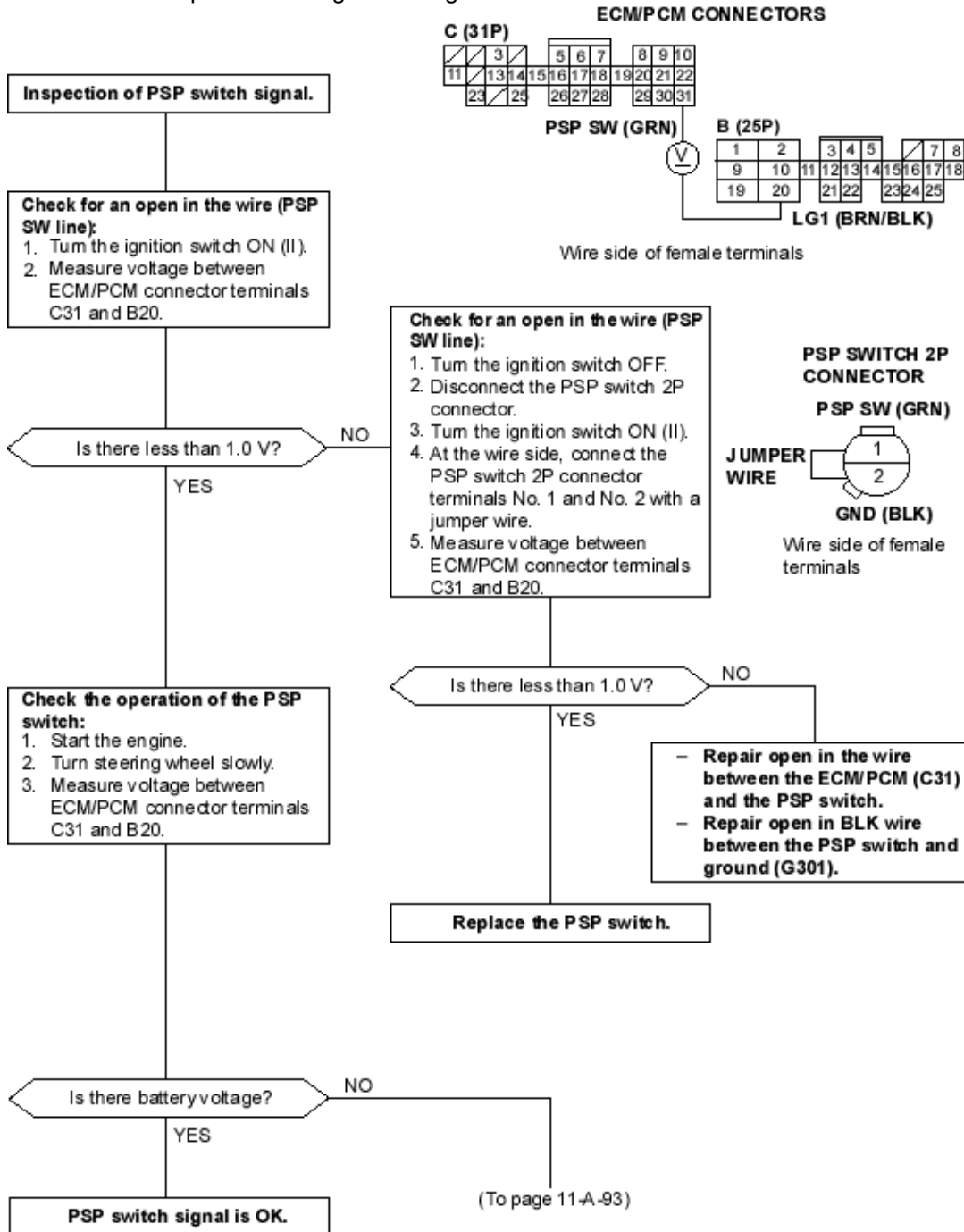
This signals the ECM/PCM when the brake pedal is depressed.



This signals the ECM/PCM when the engine is cranking



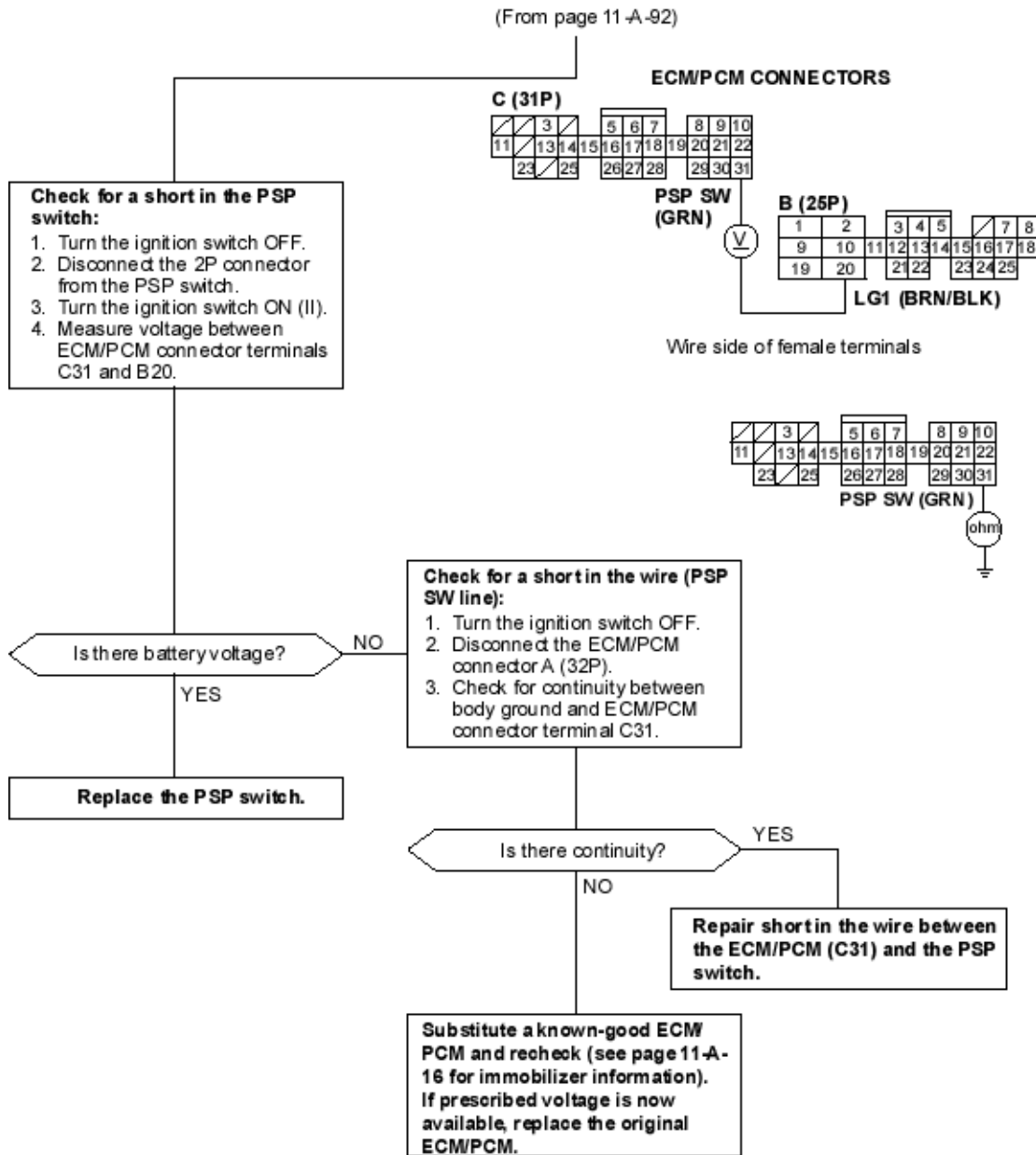
This signals the ECM/PCM when the power steering load is high.



Idle Control System

Power Steering Pressure (PSP) Switch Signal (cont'd)

11-A-93

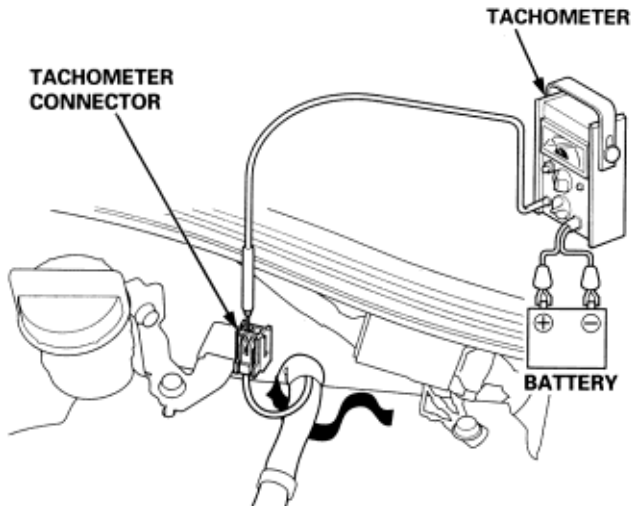


Idle Control System Idle Speed Inspection

11-A-94

NOTE:

- ♦ Leave the AC valve connected.
 - ♦ Before inspecting the idle speed, check these items:
 - The MIL has not been reported on.
 - Ignition timing.
 - Spark plugs.
 - Air cleaner.
 - PCV system.
1. Connect a tachometer.



2. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load in parking or neutral until the radiator fan comes on, then let it idle.
3. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

Idle speed should be:

F20B6 engine:

M/T	750 ± 50 rpm (min ⁻¹)
A/T	730 ± 50 rpm (min ⁻¹)
	(in N or P position)

H22A7 engine:

790±50rpm (min ⁻¹)

4. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

Idle speed should be:

F20B6 engine:

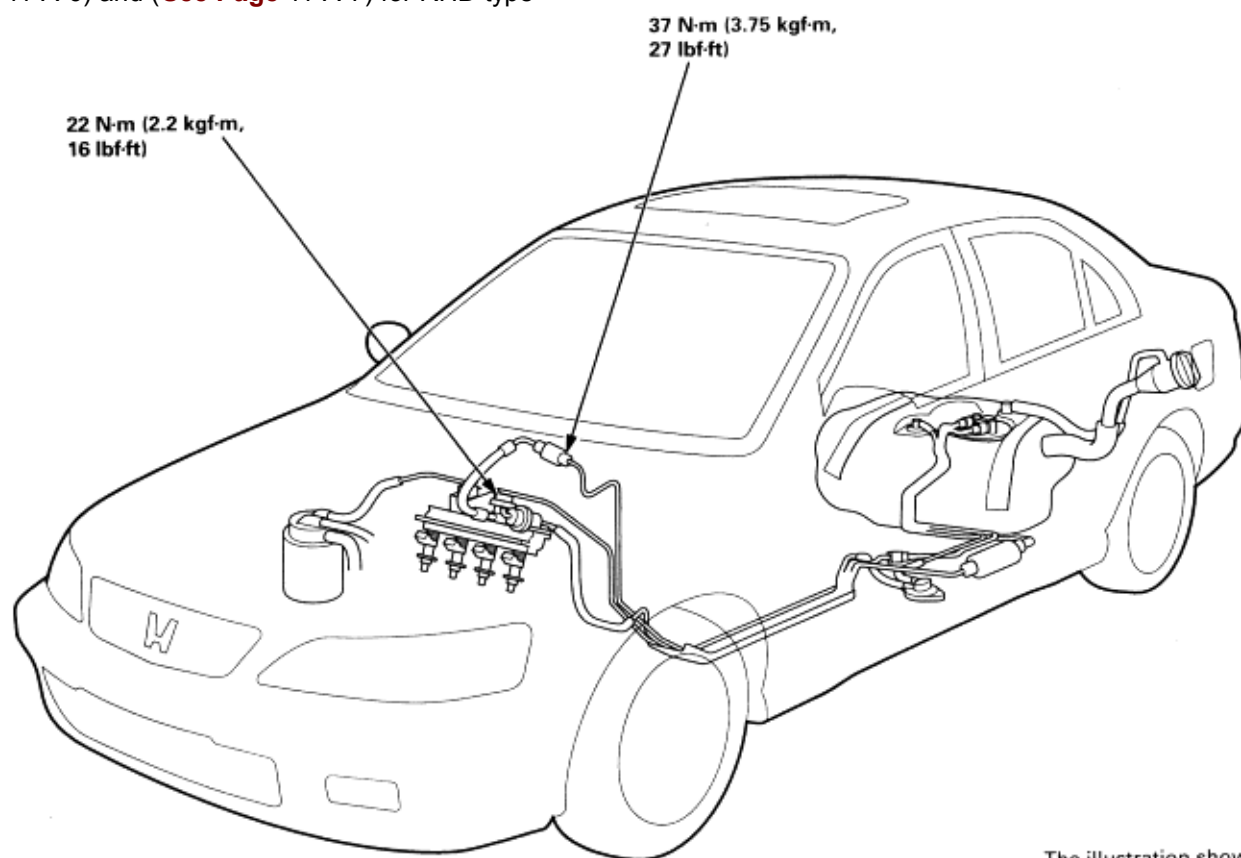
M/T	750 ± 50 rpm (min ⁻¹)
A/T	730 ± 50 rpm (min ⁻¹)
	(in N or P position)

H22A7 engine:

790 ± 50 rpm (min ⁻¹)

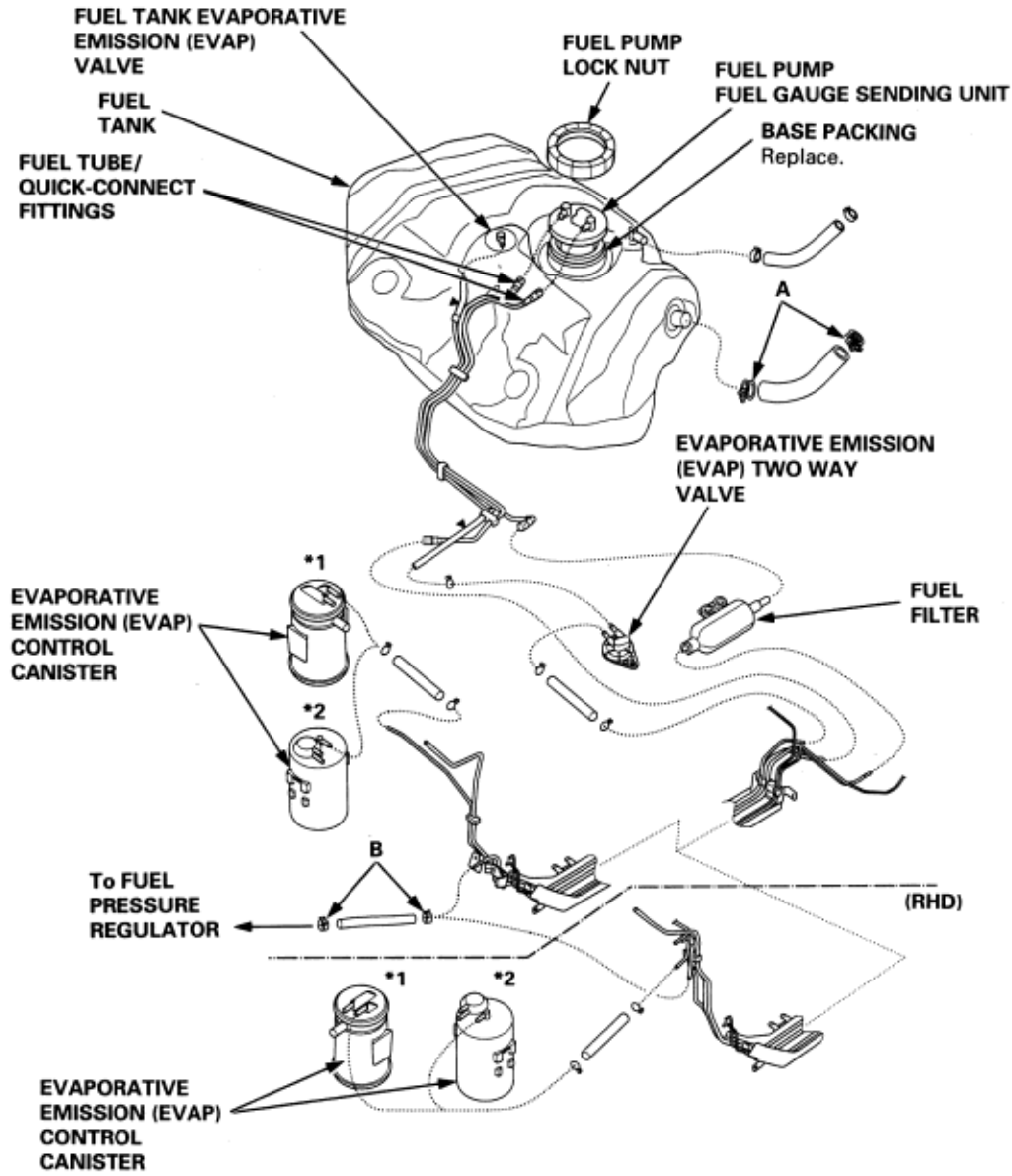
NOTE: If the idle speed is not within specification refer to Symptom Chart (**See Page 11-A-18**).

NOTE: Check fuel system lines, hoses and fuel filter for damage, leaks or deterioration, and replace if necessary.
The illustration shows LHD type:
(See Page 11-A-6) and (See Page 11-A-7) for RHD type

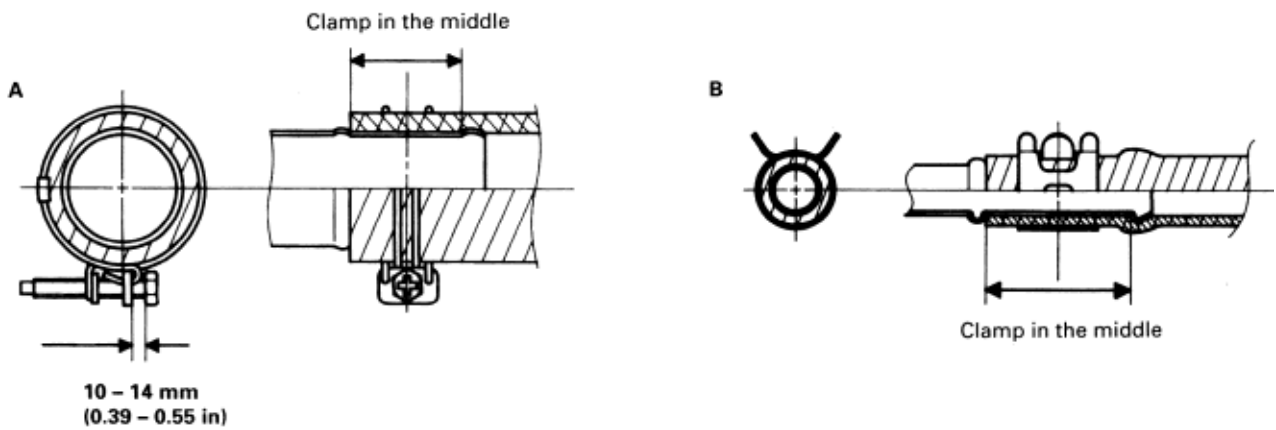


The illustration shows
LHD type.
Refer to 11-A-6, 7
page for RHD type.

NOTE: Check all hose clamps and retighten if necessary.
 Black Triangle means do not disconnect the hose from the pipe



*1: F20B6, H22A7 engine
 *2: F18B2, F18B3 engine



Precautions

WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

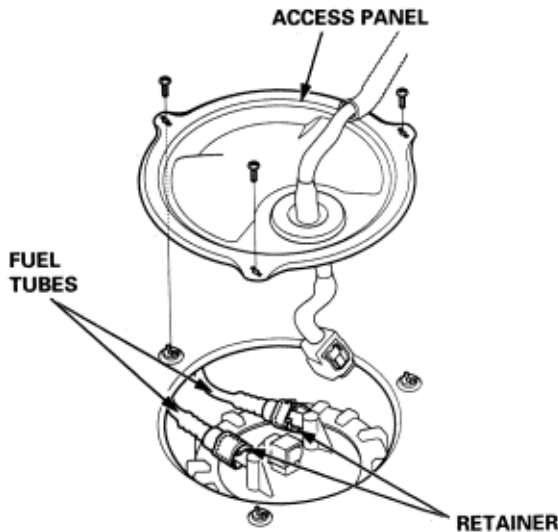
The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump with the fuel filter and the fuel return pipe, the fuel filter with the fuel feed pipe. For removing or installing the fuel filter, the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings.

Pay attention to following:

- The fuel tube/quick-connect fitting assembly is not heat-resistant; be careful not to damage it during welding or other heat-generating procedures.
- The fuel tube/quick-connect fitting assembly is not acid-proof; do not touch it with a shop towel which was used for wiping battery electrolyte. Replace the fuel tube/quick-connect fittings assembly if it came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tube/quick-connect fittings assembly, be careful not to bend or twist it excessively. Replace it if damaged.

A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when

- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel feed pipe.
- it has been removed from the pipe.
- it is damaged.



Disconnections

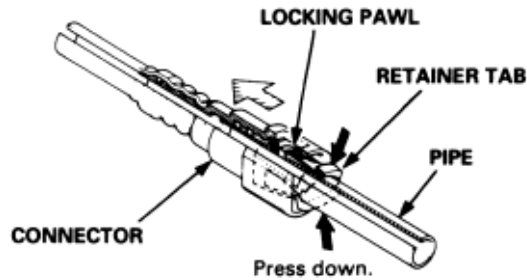
WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

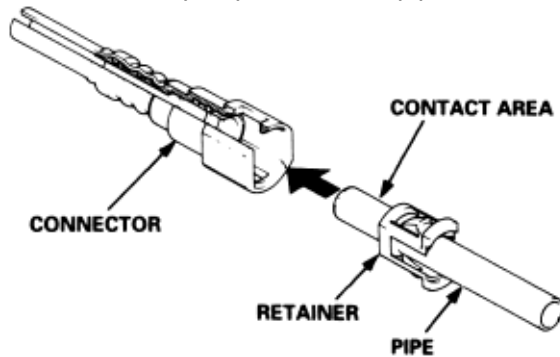
1. Disconnect the battery negative cable.
2. Remove the fuel fill cap, and relieve fuel pressure in the tank
3. Relieve fuel pressure (**See Page 11-A-100**).
4. Check the fuel quick-connect fittings for dirt, and clean if necessary.
5. Hold the connector with one hand and press down the retainer tabs with the other hand, then pull the connector off.

NOTE:

- Be careful not to damage the pipe or other parts. Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
- Do not remove the retainer from the pipe; and removed, the retainer must be replaced with new one.



6. Check the contact area of the pipe for dirt and damage.
 - If the surface is dirty, clean it.
 - If the surface is rusty or damaged, replace the fuel pump or fuel feed pipe.

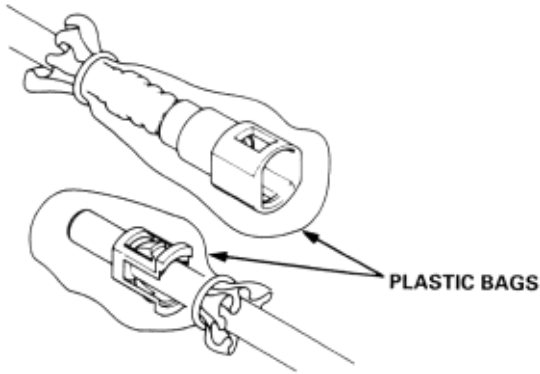


Fuel Supply System

Fuel Tube/Quick-Connect Fittings (cont'd)

11-A-98

7. To prevent damage and keep out foreign matter, cover the disconnected connector and pipe end with plastic bags.



NOTE:

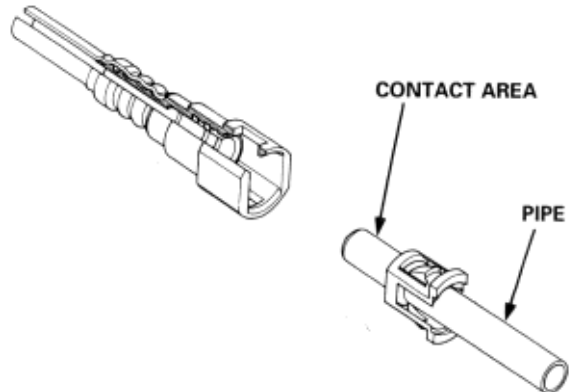
- ♦ The retainer cannot be reused once it has been removed from the pipe.
Replace the retainer when
 - replacing the fuel pump
 - replacing the fuel feed pipe.
 - it has been removed from the pipe.
 - it is damaged.

Connection

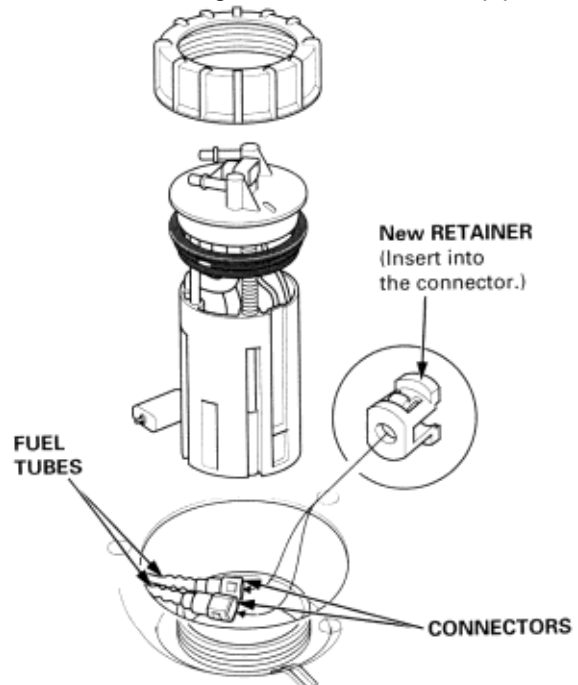
⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Check the pipe contact area for dirt and damage, and clean if necessary.



2. Insert a new retainer into the connector if the retainer is damaged, or after
 - replacing the fuel pump.
 - replacing the fuel feed pipe.
 - removing the retainer from the pipe.

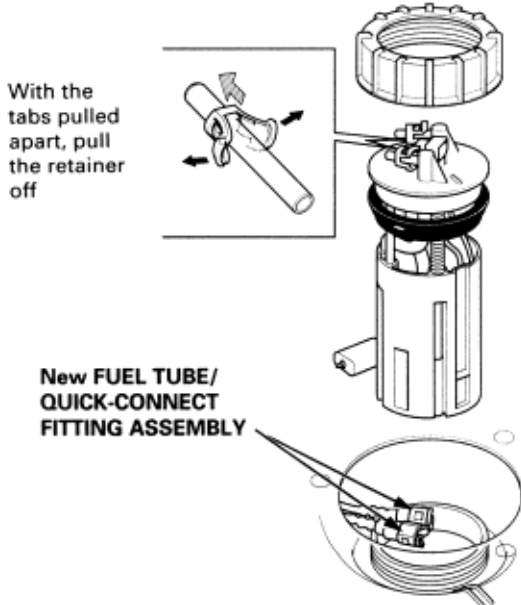


Fuel Supply System

Fuel Tube/Quick-Connect Fittings (cont'd)

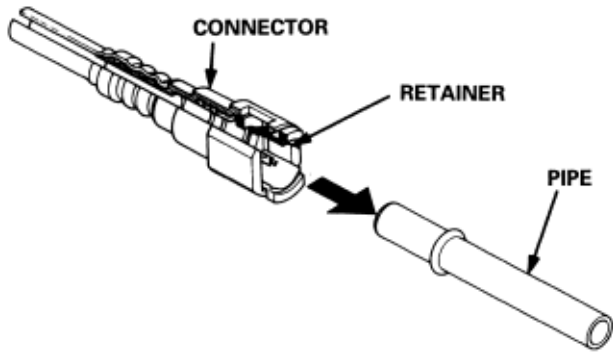
11-A-99

Before connecting a new fuel tube/quick-connect fitting assembly, remove the old retainer from the mating pipe.

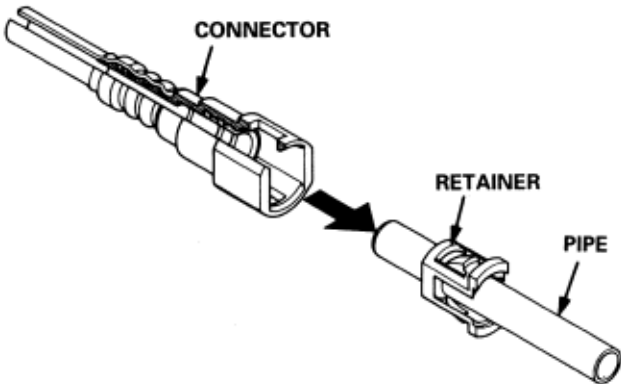


- Align the quick-connect fittings with the pipe, and align the retainer locking pawls with the connector grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.
NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

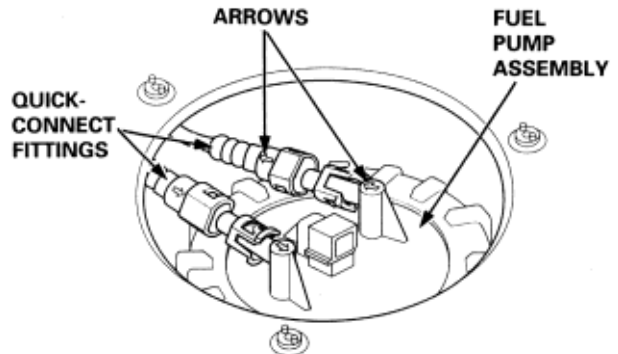
Connection with new retainer:



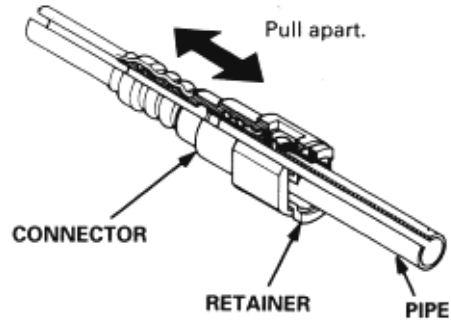
Connection to existing retainer:



- Reconnect the quick-connect fittings checking their arrows line up with the arrows on the fuel pump assembly.



- Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.
- Reconnect the battery negative cable, and turn the ignition switch ON (II). The fuel pump will run for about two seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.



Fuel Supply System

System Description

11-A-100 Fuel Pressure

The fuel supply system consists of a fuel tank, in-tank high-pressure fuel pump, PGM-FI main relay, fuel filter, fuel pressure regulator, fuel injectors, and fuel delivery and return lines. This system delivers pressure-regulated fuel to the fuel injectors and cuts the fuel delivery when the engine is not running.

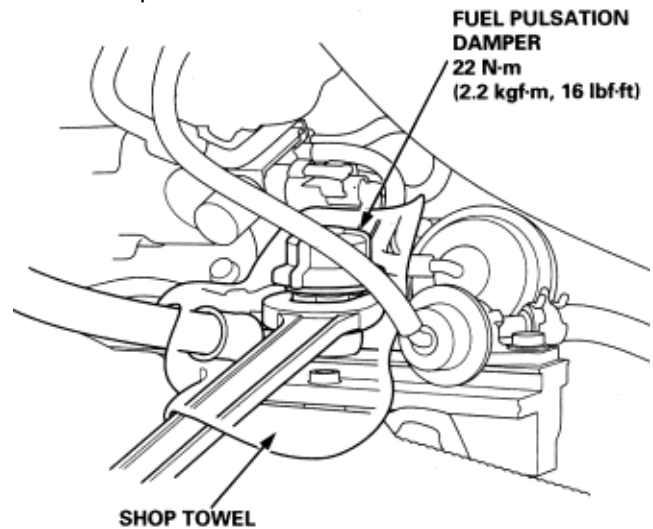
Relieving

Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the fuel pulsation damper on top of the fuel rail.

⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area. Be sure to relieve fuel pressure while the ignition switch is off.

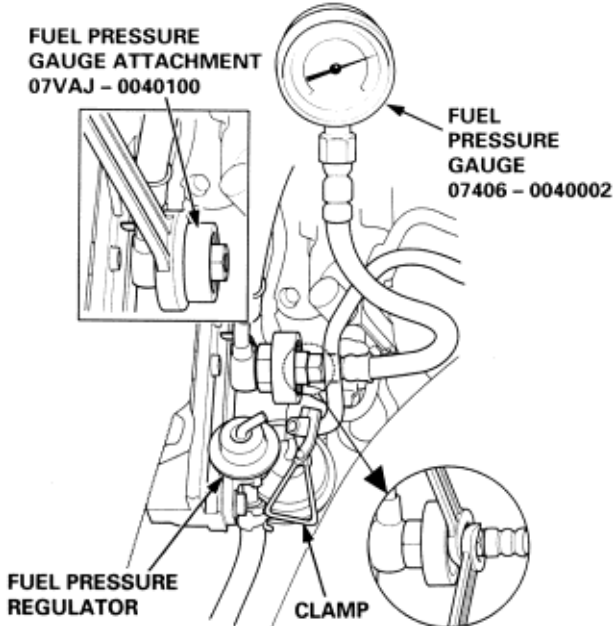
1. Disconnect the battery negative cable from the battery negative terminal.
2. Remove the fuel fill cap.
3. Use a wrench on the fuel pulsation damper at the fuel rail.
4. Place a rag or shop towel over the fuel pulsation damper
5. Slowly loosen the fuel pulsation damper one complete turn.



NOTE: Replace the washers whenever the fuel pulsation damper is loosened or removed.

Inspection

1. Relieve fuel pressure (**See Page 11-A-100**).
2. Remove the fuel pulsation damper from the fuel rail. Attach the fuel pressure gauge attachment and fuel pressure gauge.



3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the fuel pressure regulator disconnected from the fuel pressure regulator and pinched. If the engine will not start, turn the ignition switch ON (II), wait for two seconds, turn it off, then back on again and read the fuel pressure.

Pressure should be:

F20B6, F18B2, F18B3 engine:

280-330 kPa (2.9-3.4 kgf/cm², 41-48 psi)

H2AA7 engine:

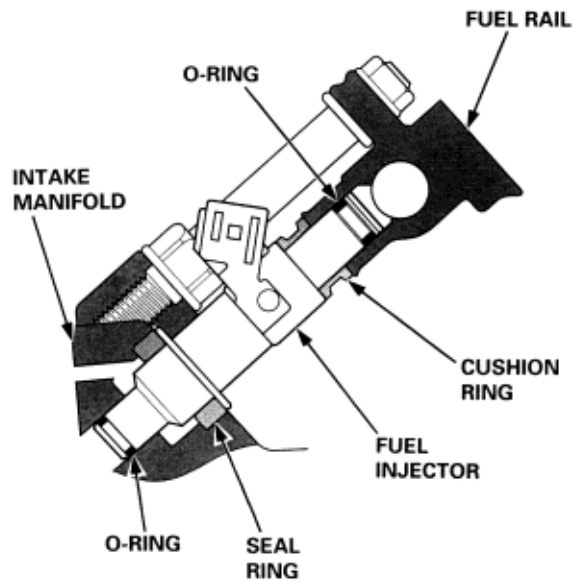
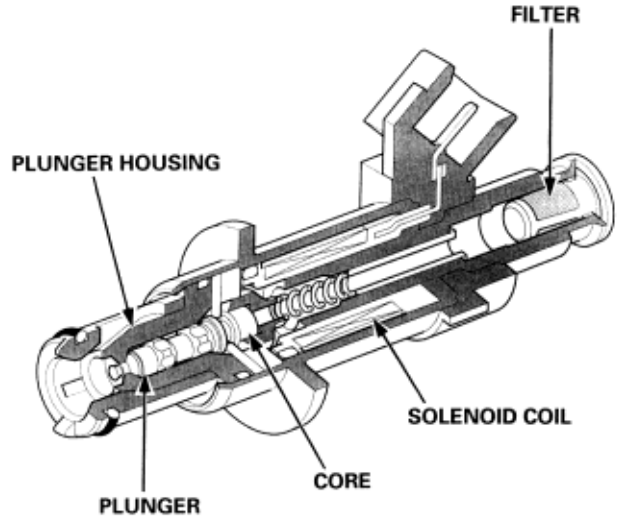
330-380 kPa (3.4-3.9 kgf/cm², 48-55 psi)

If the fuel pressure is not as specified, first check the fuel pump (**See Page 11-A-106**) if the fuel pump is OK, check, the following:

- ♦ If the fuel pressure is higher than specified, inspect for:
 - Pinched or clogged fuel return hose or line.
 - Faulty fuel pressure regulator (**See Page 11-A-104**).
- ♦ If the fuel pressure is lower than specified, inspect for:
 - Clogged fuel filter.
 - Faulty fuel pressure regulator (**See Page 11-A-104**).
 - Leakage in the fuel line.

Description

The fuel injectors are a solenoid-actuated constant stroke, pintle-type consisting of a solenoid, plunger needle valve and housing. When current is applied to the solenoid coil, the valve lifts up and pressurised fuel is injected. Because the needle valves lift and pressures are constant, the injection quantity is determined by the length of time that the valve open (that is the duration the current is supplied to the solenoid coil). The fuel injector is sealed by an O-ring and seal ring at the top and bottom. These seals also reduce operating noise.



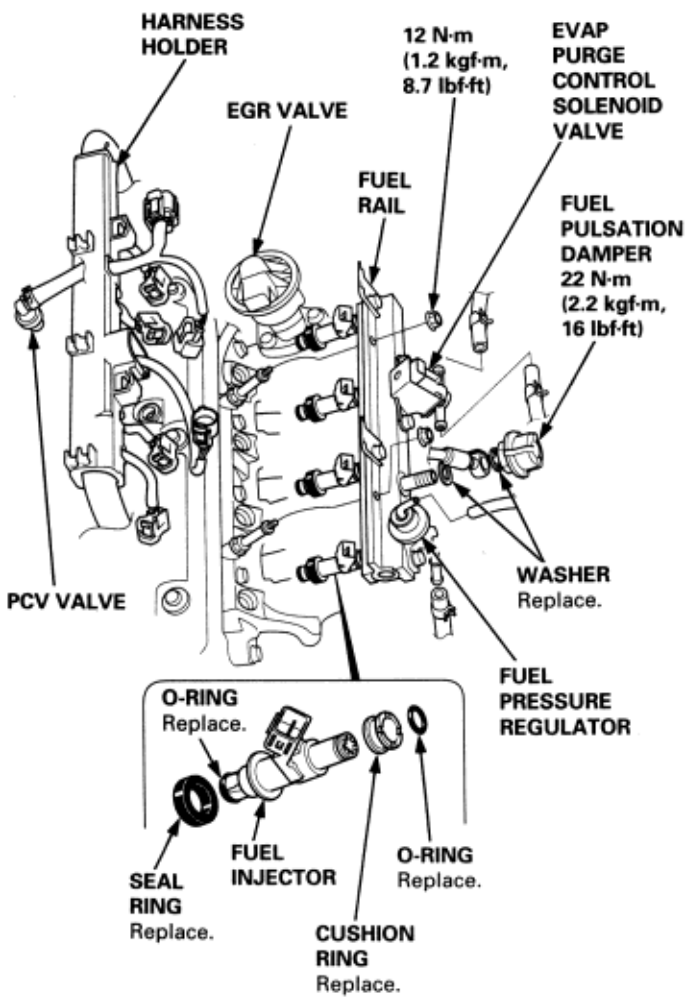
Replacement

⚠ WARNING

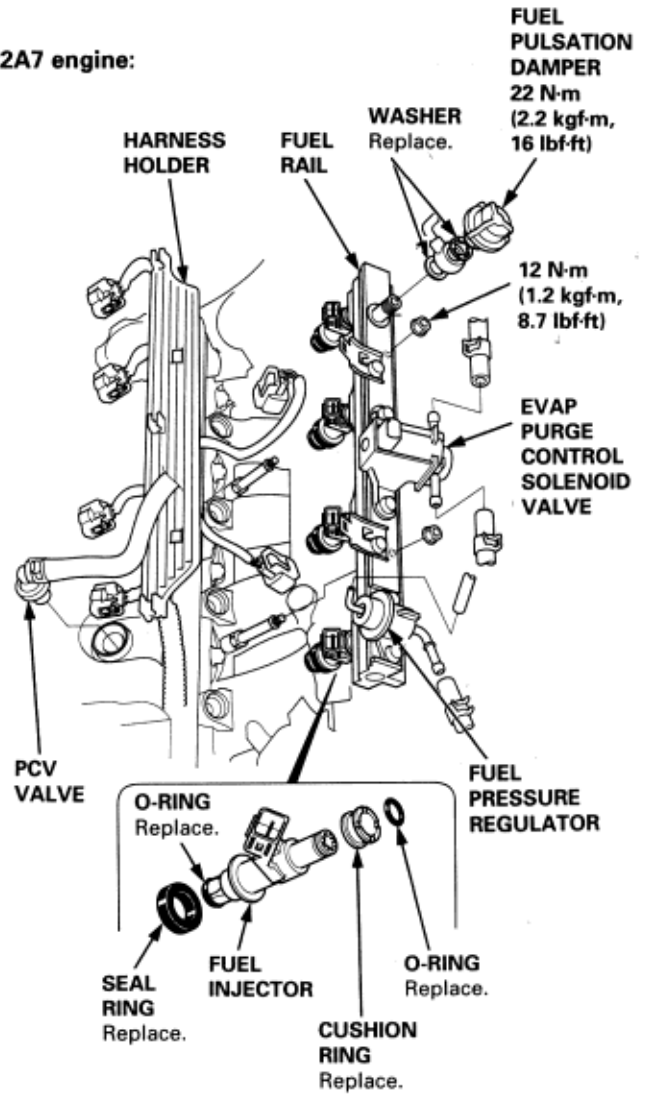
Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Relieve the fuel pressure (**See Page 11-A-100**).
2. Disconnect the connectors from the fuel injectors EGR valve (and EVAP purge control solenoid valve).
3. Disconnect the vacuum hose from the EVAP purge control solenoid valve.
4. Disconnect the vacuum hoses and fuel return nose from the fuel pressure regulator.
 NOTE: Place a rag or shop towel over the hoses before disconnecting them.
5. Disconnect the fuel hose from the fuel rail.
6. Remove the retainer nuts from the fuel rail and harness holder.
7. Disconnect the PCV valve.
8. Disconnect the fuel rail.
9. Remove the fuel injectors from the intake manifold.

F20B6 engine:

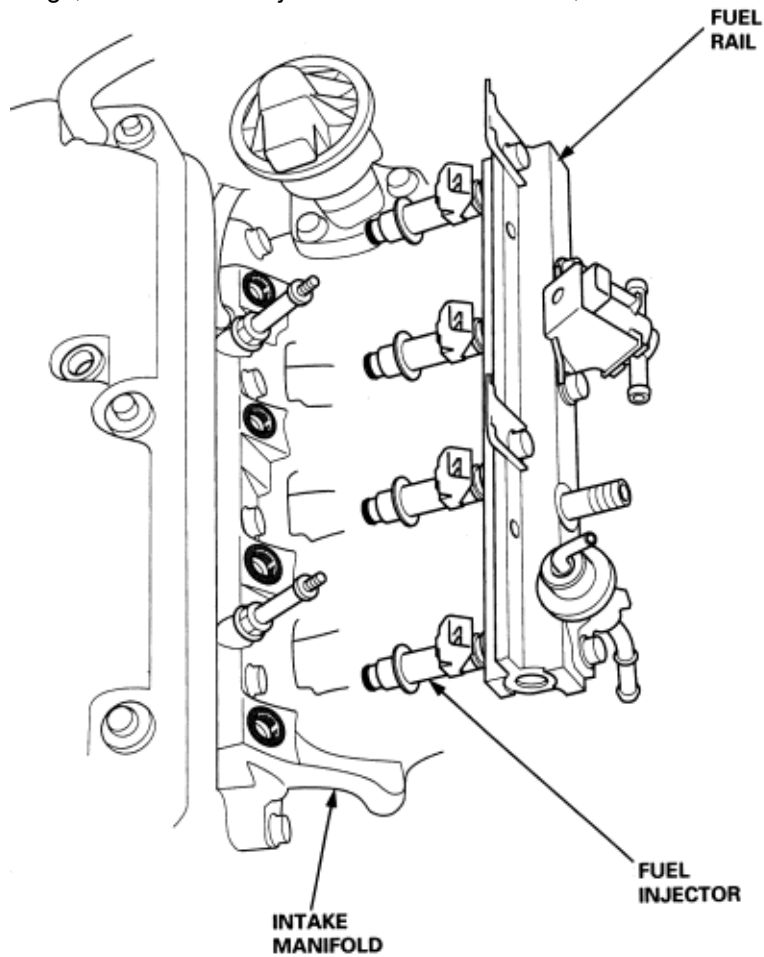


H22A7 engine:



10. Slide new cushions rings onto the fuel injectors.
11. Coat new O-rings with clean engine oil, and put them on the fuel injectors.
12. Insert the fuel injectors into the fuel rail first.
13. Coat new seal rings with clean engine oil, and press them into the intake manifold.

14. To prevent damage to the O-rings, install the fuel injectors in the fuel rail first, then install them in the intake manifold.

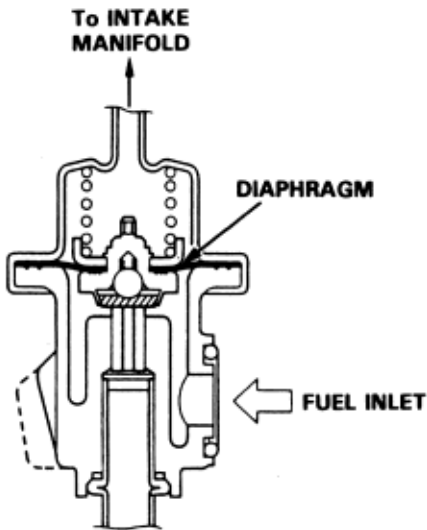


15. Install and tighten the retainer nuts.
16. Connect the fuel hose to the fuel rail with new washers.
17. Connect the vacuum hoses and fuel return hose to the fuel pressure regulator.
18. Connect the vacuum hose to the EVAP purge control solenoid valve.
19. Install the connectors on the fuel injectors, EGR valve and EVAP purge control solenoid.
20. Connect the PCV valve.
21. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

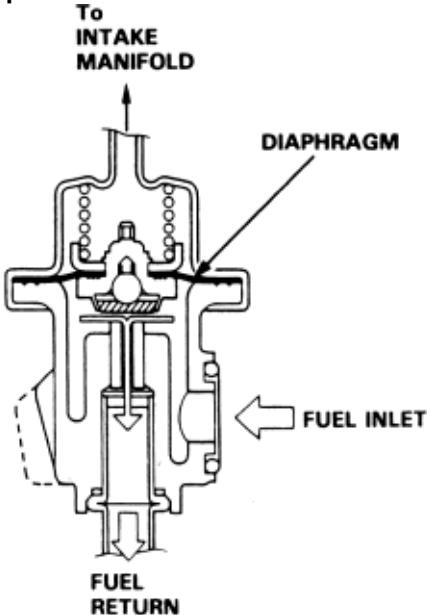
Description

The fuel pressure regulator maintains a constant fuel pressure to the fuel injectors. When the difference between the fuel pressure and manifold pressure exceeds F20B6, F18B2, F18B3 engine:290 kPa (3.0 kgf/cm², 43 psi), H22A7 engine:340 kPa (3.5 kgf /cm², 50psi), the diaphragm is pushed upward, and the excess fuel is fed back into the fuel tank through the return line.

Closed:



Open:



Testing

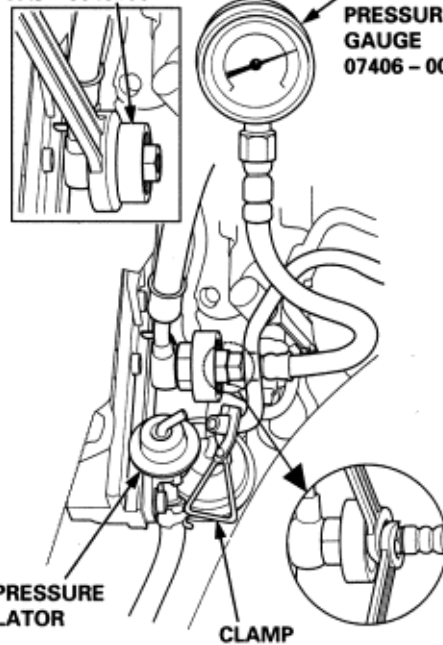
WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Attach the fuel pressure gauge attachment and fuel pressure gauge (See Page 11-A-101). Start the engine.

FUEL PRESSURE GAUGE ATTACHMENT
07VAJ - 0040100

FUEL PRESSURE GAUGE
07406 - 0040002



Pressure should be:

F20B6, F18B2, F18B3 engine:
280-330 kPa (2.9-3.4 kgf/cm², 41-48 psi)

H22A7 engine
330-380 kPa (3.4-3.9 kgf/cm², 48-55 psi)

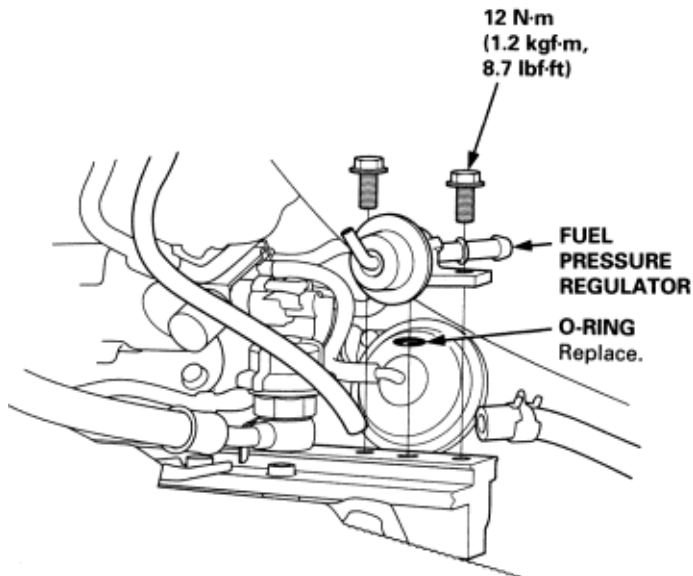
2. Reconnect the vacuum hose to the fuel pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the fuel pressure regulator is disconnected again.
 - ♦ If the fuel pressure did not rise, replace the fuel pressure regulator.

Replacement

WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (**See Page 11-A-100**).
2. Disconnect the vacuum hose and fuel return hose.
3. Remove the two 6 mm retainer bolts.



4. Apply clean engine oil to a new O-ring, and carefully install it into its proper position.
5. Install the fuel pressure regulator and the 6 mm retainer bolts
6. Reconnect the vacuum hose and fuel hose.

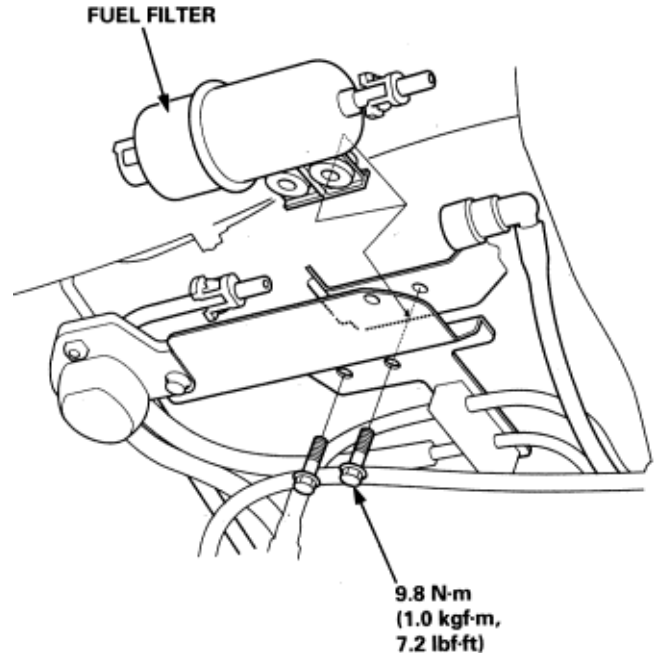
Replacement

WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area. While replacing the fuel filter, be careful to keep a safe distance between battery terminals and any tools.

The fuel filter should be replaced whenever the fuel pressure drops below the specified value [F10B6,F18B2,F18B3 engine: 280-330 kPa (2.9-3.4 kgf/cm², 41-48 psi), H22A7 engine: 330-380 kPa (3.4-3.9 kgf/cm², 48-55 psi) with the fuel pressure regulator vacuum hose disconnected and pinched] after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Disconnect the battery negative cable from the battery negative terminal.
2. Relieve fuel pressure (**See Page 11-A-100**).
3. Disconnect the hose and quick-connect fittings (**See Page 11-A-97**).
4. Remove the fuel filter.



Testing

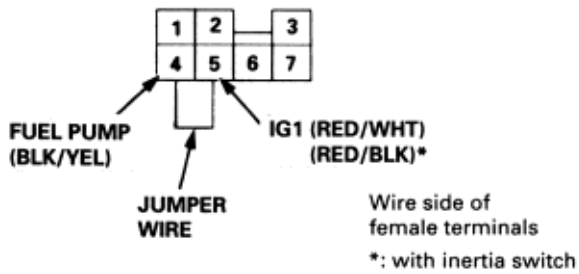
⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON (II), you will hear some noise if you hold your ear to the fuel filler port with the fuel filler cap removed. The fuel pump should run for two seconds when ignition switch is first turned ON (II). If the fuel pump does not make noise, check it as follows:

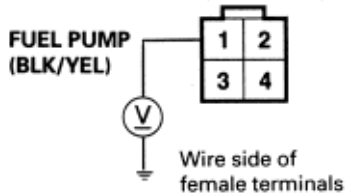
1. Remove the spare tyre lid
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF, then disconnect the 5P connector from fuel pump.
4. Connect the PGM-FI main relay 7P connector terminal No. 4 and No. 5 with a jumper wire.

PGM-FI MAIN RELAY 7P CONNECTOR



5. Check that battery voltage is available between the fuel pump 4P connector terminal No. 1 and body ground when the ignition switch is turned ON (III).

FUEL PUMP 4P CONNECTOR



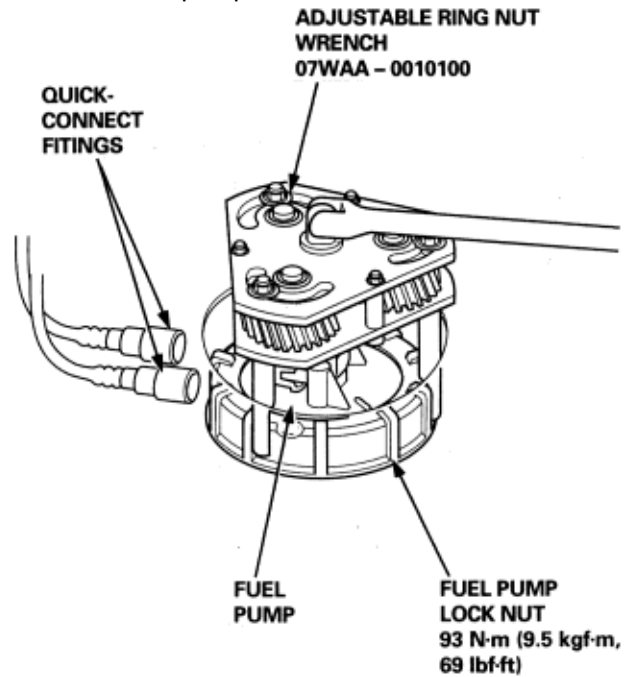
- ♦ If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump.
- ♦ If there is no voltage, check the wire harness (**See Page 11-A-112**).

Replacement

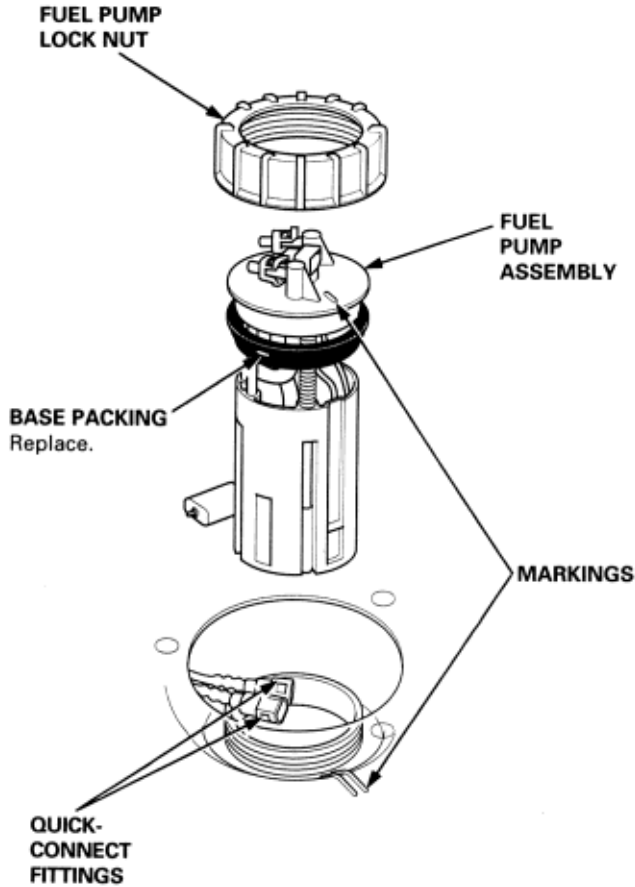
⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

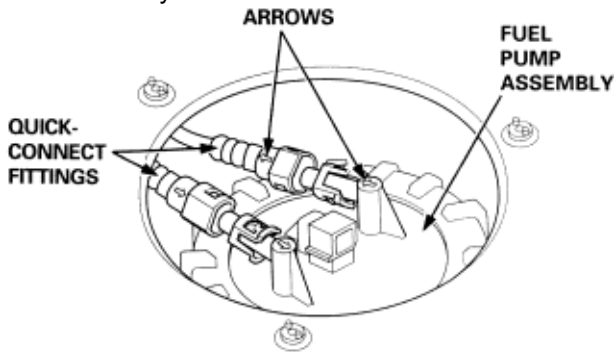
1. Remove the spare tyre lid.
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF, then disconnect the fuel pump 4P connector.
4. Disconnect the quick-connect fittings from the fuel pump.
5. Attach the adjustable ring nut wrench, and remove the fuel pump lock nut.



6. Remove the fuel pump assembly.



7. Align the mark on the fuel pump assembly with mark on the fuel tank.
 8. Reconnect the quick-connect fittings checking their arrows line up with the arrows on the fuel pump assembly.



9. Install the part in the reverse order of removal with a new base gasket.

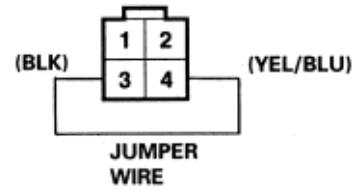
Testing

NOTE: See section 23 for the fuel gauge system circuit diagram.

1. Check the No.9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Remove the spare tyre lid.
3. Remove the access panel from the floor.
4. Turn the ignition switch OFF, then disconnect the fuel pump 4P connector.
5. Measure voltage between the fuel pump 4P connector terminals No.3 and No.4 with the ignition switch ON (II).

There should be between 5 and 8 V.

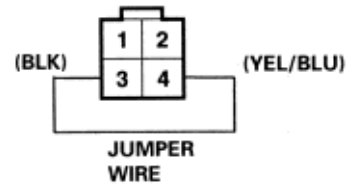
FUEL PUMP 4P CONNECTOR



Wire side of female terminals

- ♦ If the voltage is as specified, go to step 6.
 - ♦ If the voltage is not as specified, check for:
 - An open in the YEL/BLU or BLK wire.
 - Poor ground (LHD: G551, RHD: G581).
6. Turn the ignition switch OFF.
 7. Connect the fuel pump 4P connector terminals No.3 and No.4 with a jumper wire, then turn the ignition switch ON (II).

FUEL PUMP 4P CONNECTOR



Wire side of female terminals

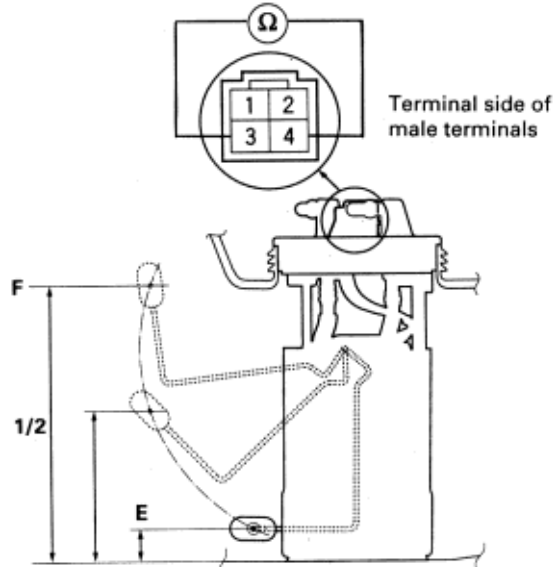
8. Check that the pointer of the fuel gauge starts moving toward the "F" mark.
 - ♦ If the pointer of the fuel gauge does not move at all, replace the gauge.
 - ♦ If the gauge is OK, inspect the fuel gauge sending unit.

NOTE:

- ♦ Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.
- ♦ The fuel gauge is a bobbin (cross-coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves more slowly than that of a bimetal type.

1. Remove the spare tyre lid.
2. Remove the access panel from the floor.
3. Turn the ignition switch OFF, then disconnect the fuel pump 4P connector.
4. Disconnect the quick-connect fittings from the fuel pump.
5. Remove the fuel pump assembly (**See Page 11-A-106**).
6. Measure the resistance between the No.1 and No.2 terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

Float Position	E	1/2	F
Resistance (ohms)	130-132	68.5-74.5	11-12



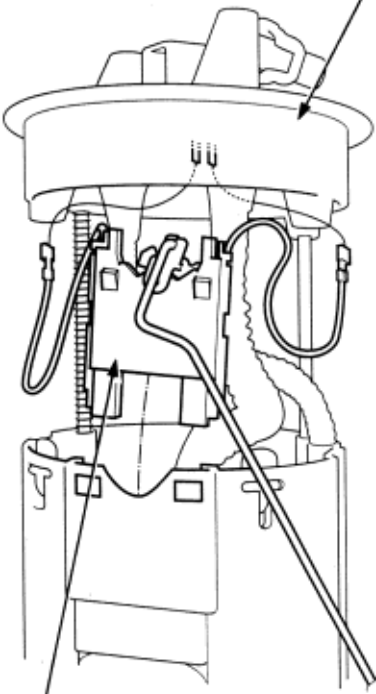
If you do not get the above readings, replace the fuel gauge sending unit (**See Page 11-A-109**).

7. Install the part in the reverse order of removal of removal with a new base gasket (**See Page 11-A-106**).

Replacement

1. Remove the fuel pump assembly (**See Page** 11-A-106).
2. Remove the fuel gauge sending unit from the fuel pump assembly.

**FUEL PUMP
ASSEMBLY**



**FUEL GAUGE
SENDING UNIT**

3. Install the parts in the reverse order of removal.

Indicator Light Testing

NOTE: See section 23 for the low fuel indicator circuit diagram

1. Check the No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Park the vehicle on level ground.
3. Drain the fuel tank: Remove the fuel return line from the fuel pressure regulator, and attach a suitable hose to the regulator fitting. Place the other end of the hose in a container suitable for gasoline. Start the engine, and run it until the tank is empty (the engine stalls).
4. Add less than 8.5 / 12.2 U.S. Gal, 1.8 Imp. Gal) of fuel, and turn the ignition switch ON (II). The low fuel indicator light should come on within four minutes.



LOW FUEL INDICATOR LIGHT

- ♦ If the light comes on within four minutes, go to step 9.
 - ♦ If the light does not come on within four minutes, go to step 5.
5. Remove the spare tyre lid.
 6. Remove the access panel from the floor.
 7. Turn the ignition switch OFF, then disconnect the fuel pump 4P connector.

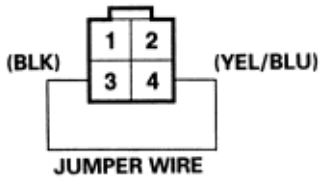
Fuel Supply System

Low Fuel Indicator Light System (cont'd)

11-A-110 Inertia Switch (KG, KE, KS, KR models)

8. Connect the fuel pump 4P, connector terminals No.3 and No.4 with a jumper wire.
 - ♦ If the light comes on, replace the fuel gauge sending unit (**See Page 11-A-109**).
 - ♦ If the light does not come on check for:
 - an open in the YEL/BLU wire between the fuel gauge sending unit and fuel gauge assembly.
 - blown bulb.
 - poor ground (LHD:G55I, RHD:G58I).

FUEL PUMP 4P CONNECTOR

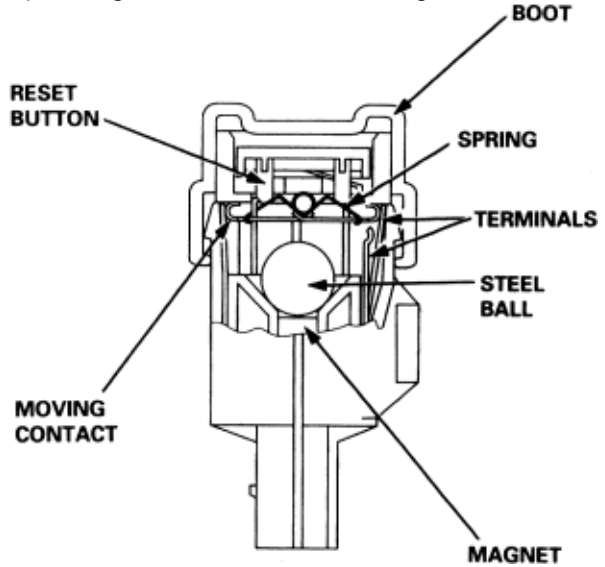


Wire side of female terminals

9. Add 4 l of fuel (1.1 U.S. Gal, 0.9 Imp. Gal). The light should go off within four minutes.

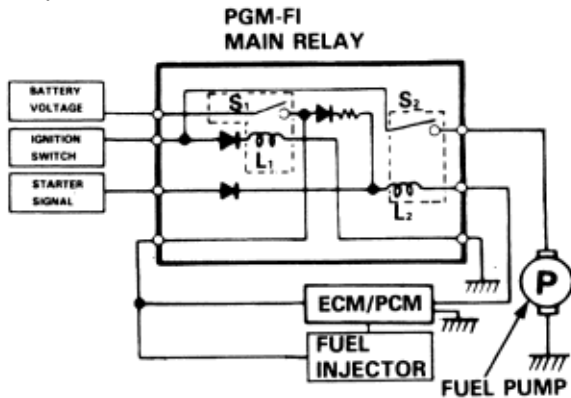
Description

The inertia switch is a safety device which automatically cuts off the fuel supply in the event of a collision or sudden impact. The switch is located behind the glove box. After an impact, the switch must be reset by pressing the button before the engine can be restarted.



Description

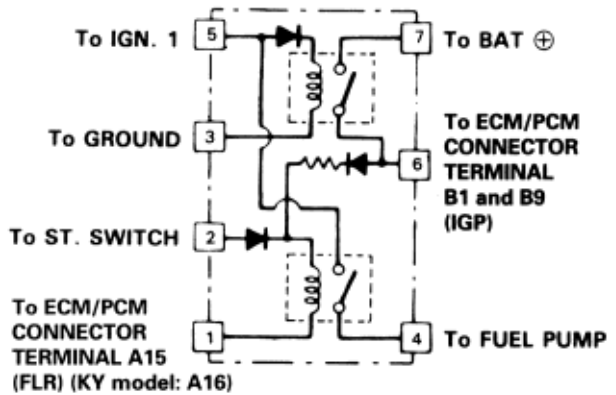
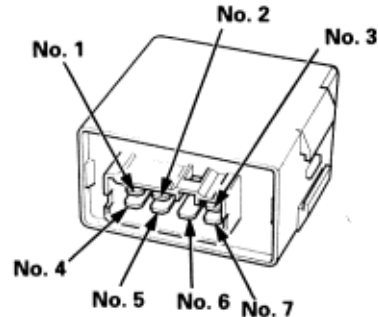
The PGM-FI main relay actually contains two individual relays. This relay is located at the driver side of the cowl. One relay is energised whenever the ignition is on, which supplies the battery voltage to the ECM/PCM, power to the fuel injectors, and power for the second relay. The second relay is energised for two seconds when the ignition is switched on, and when the engine is running, to supply power to the fuel pump.



Relay Testing

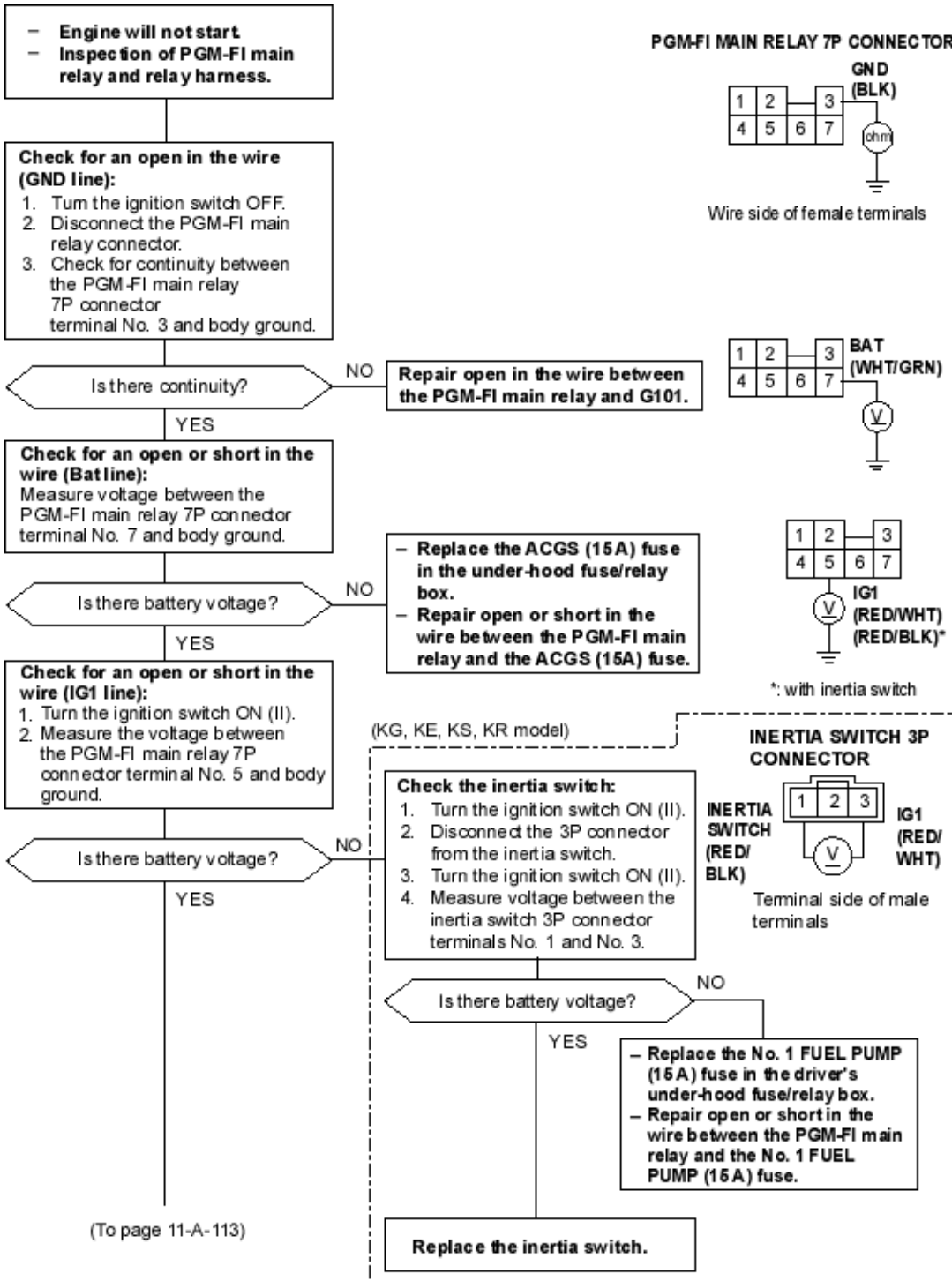
NOTE: If the car starts and continues to run, the PGM-FI main relay is OK.

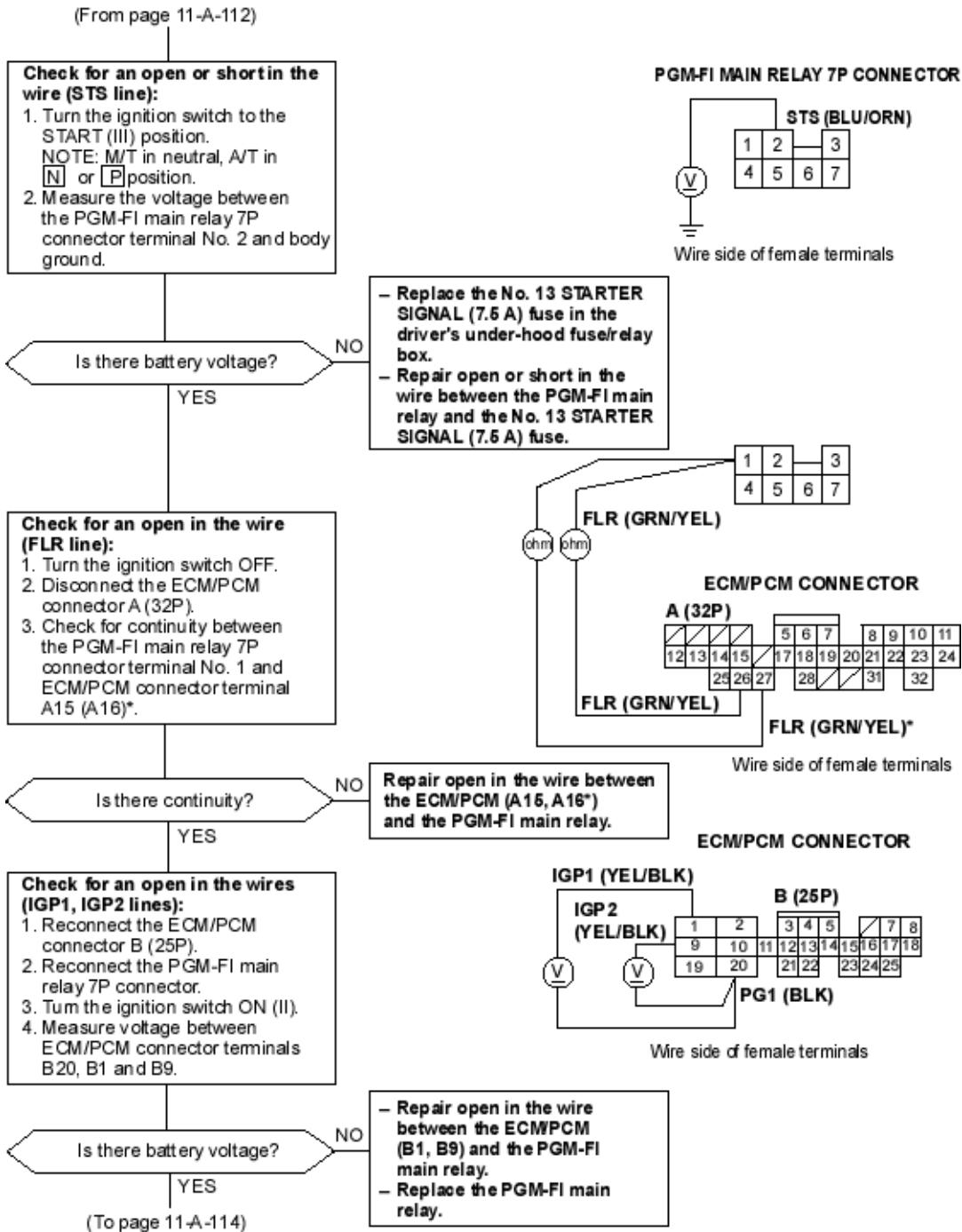
1. Remove the PGM-FI main relay
2. Attach the battery positive terminal to the No. 2 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check for continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, go on to step 3.
 - ♦ If there is no continuity, replace the PGM-FI main relay and retest.



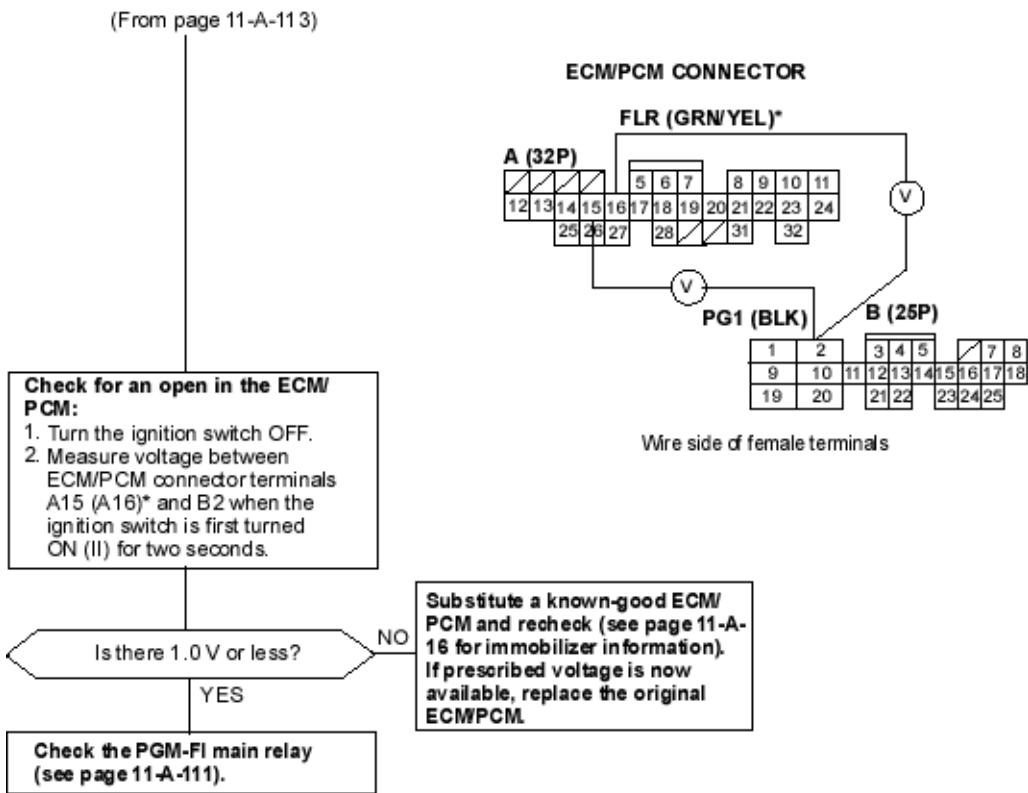
3. Attach the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 3 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 7 terminal and No. 6 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, go on to step 4.
 - ♦ If there is no continuity, replace the PGM-FI main relay and retest.
4. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, the PGM-F1 main relay is OK.
 - ♦ If there is no continuity, replace the PGM-F1 main relay and retest.

Troubleshooting





* KY model



*: KY model

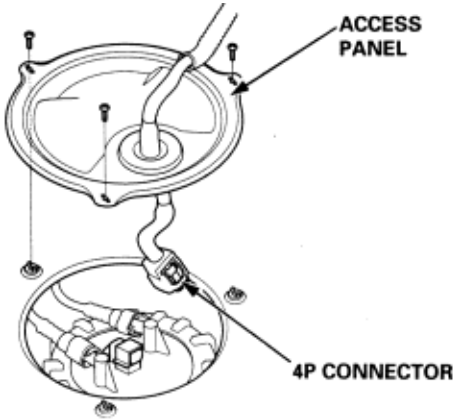
To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-111)

WARNING

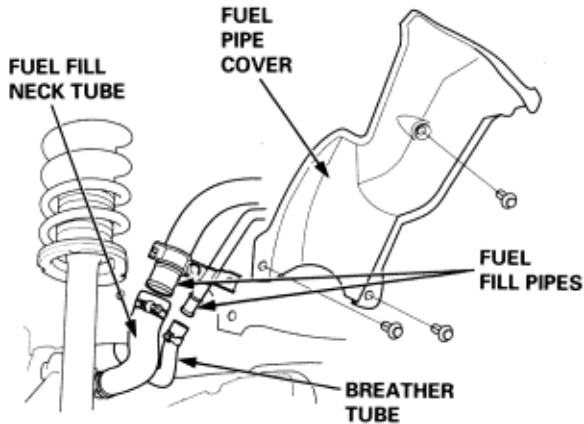
Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

Removal

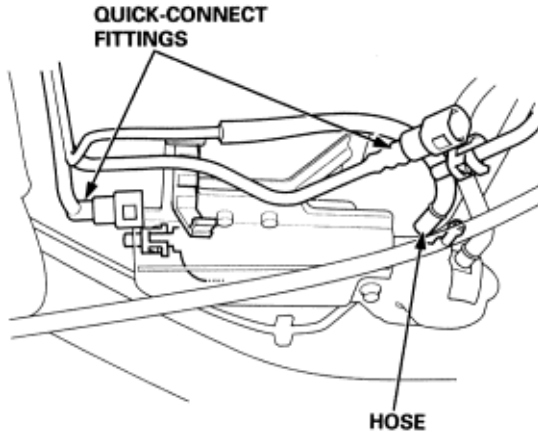
1. Relieve the fuel pressure (See Page 11-A-100).
2. Remove the fuel fill cap.
3. Drain the fuel tank: Remove the fuel return line from the fuel pressure regulator, and attach a suitable hose to the regulator fitting. Place the other end of hose in a container suitable for gasoline. Start the engine, and run it until the tank is empty (the engine stalls).
4. Remove the spare tyre lid (see section 20), and the access panel from the floor. Disconnect the fuel tank 4P connector.



5. Loosen the rear wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the rear wheels.
6. Release the parking brake lever fully.
7. Remove the TWC (see section 9).
8. Remove the fuel cover and disconnect the fuel fill neck tube and the breather tube from the fuel fill pipes.

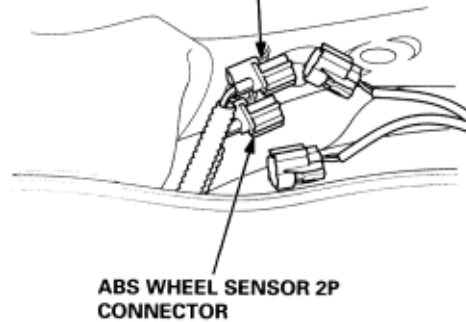


9. Disconnect the hose and quick-connect fittings (See Page 11-A-97).

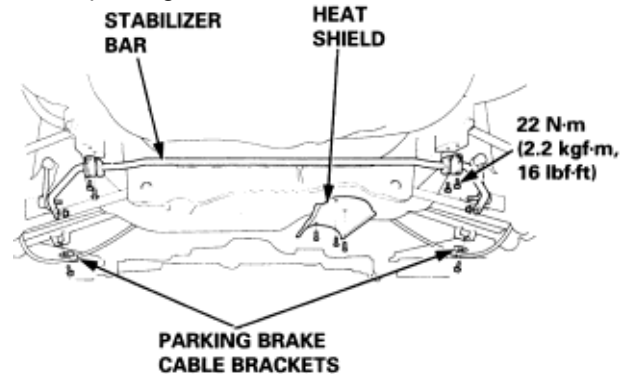


10. Disconnect the ABS wheel sensor 2P connector, and headlight adjuster levelling sensor 3P connector if equipped

HEADLIGHT ADJUSTER LEVELING SENSOR 3P CONNECTOR



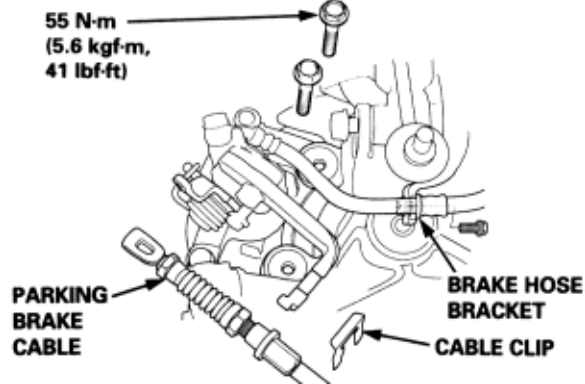
11. Remove the stabiliser bar, the heat shield and parking brake cable bracket.



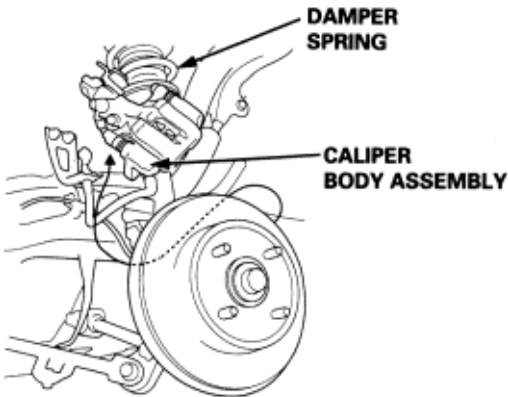
12. Remove the rear brakes:

With rear disc brakes

- 1. Remove the cable clip and parking brake cable. Remove the two caliper bolts, caliper body assembly. Remove the brake hose bracket.

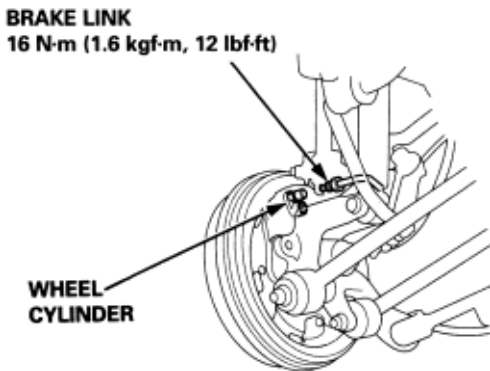


- 2. Hold the caliper body assembly to the damper spring.

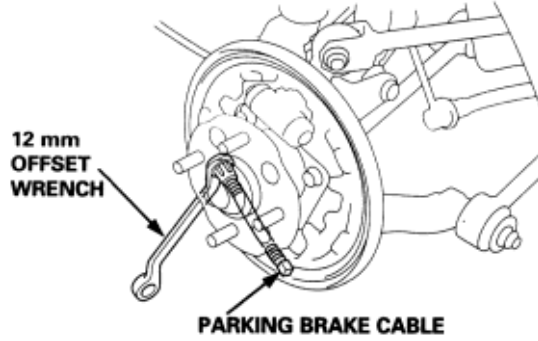


With rear drum brakes

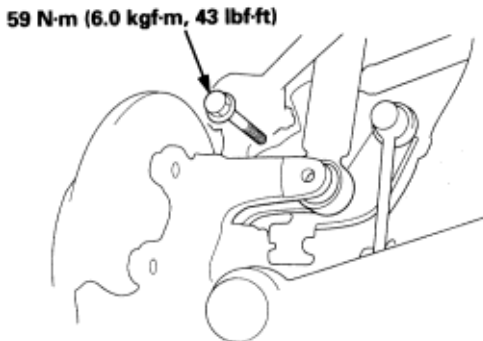
- 1. Disconnect the brake line from the wheel cylinder.



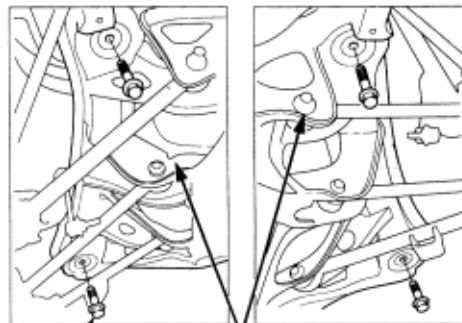
- 2. Remove the brake drum and brake shoe. Remove the parking brake cable from the backing plate using a 12 mm offset wrench.



- 13. Remove the flange bolt.

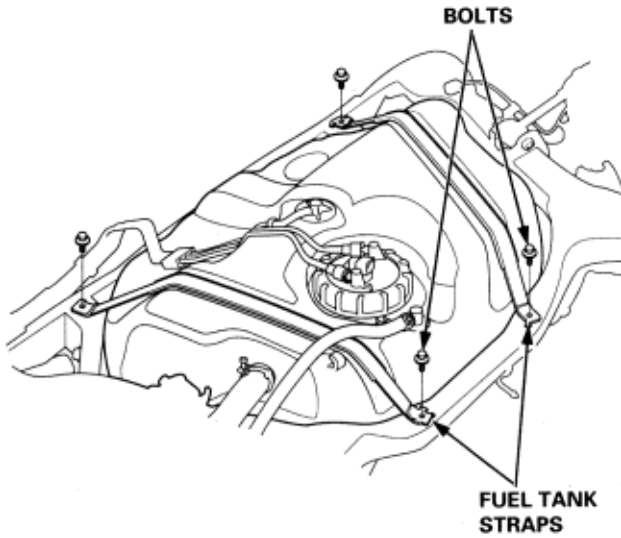


- 14. Place the jack, or support, under the rear suspension sub frame. Remove the mounting bolts, and the rear suspension sub frame.



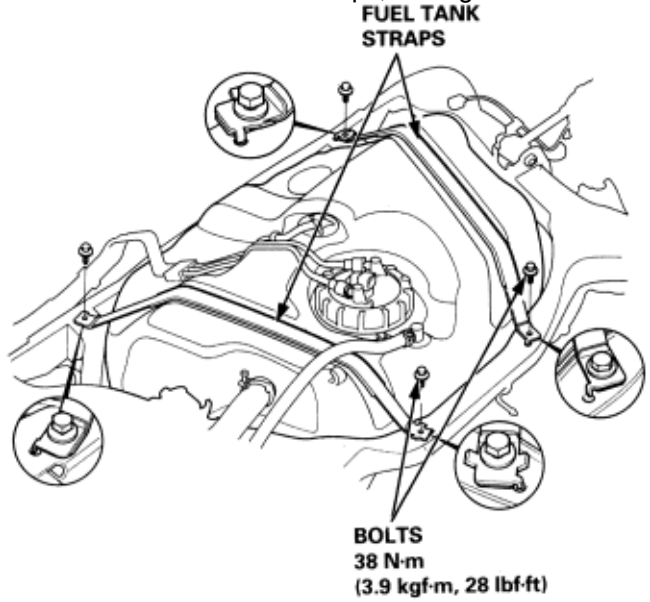
- 103 N-m (10.5 kgf-m, 75.9 lbf-ft)

15. Remove the bolts, and the fuel tank straps.

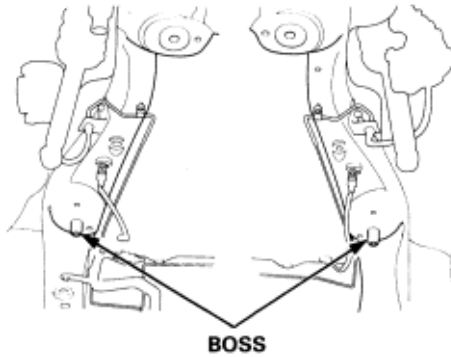


Installation

1. Install the fuel tank straps, and tighten the bolts.



2. Place the jack, or support, under the rear suspension sub frame. Install the rear suspension sub frame, installing the boss with the holes in the rear suspension sub frame.

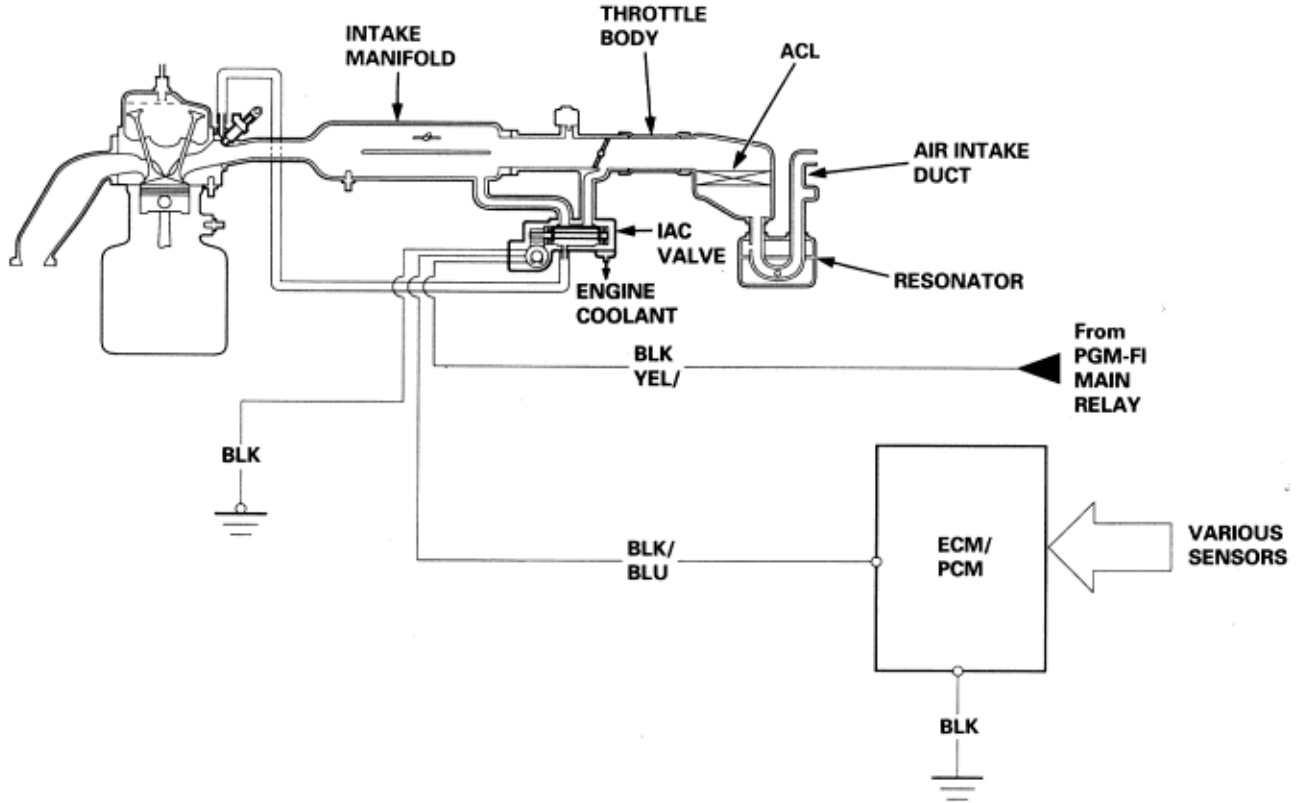


3. Install the remaining parts in the reverse order of removal.
4. If equipped with drum brakes, after installing the brake hose, bleed the brake system (see section 19). If not go to step 5.
5. After installing, adjust the wheel alignment (see section 18).

Intake Air System
System Description

11-A-118

The system supplies air for all the engine needs. It consists of the intake air pipe, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) Valve and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.

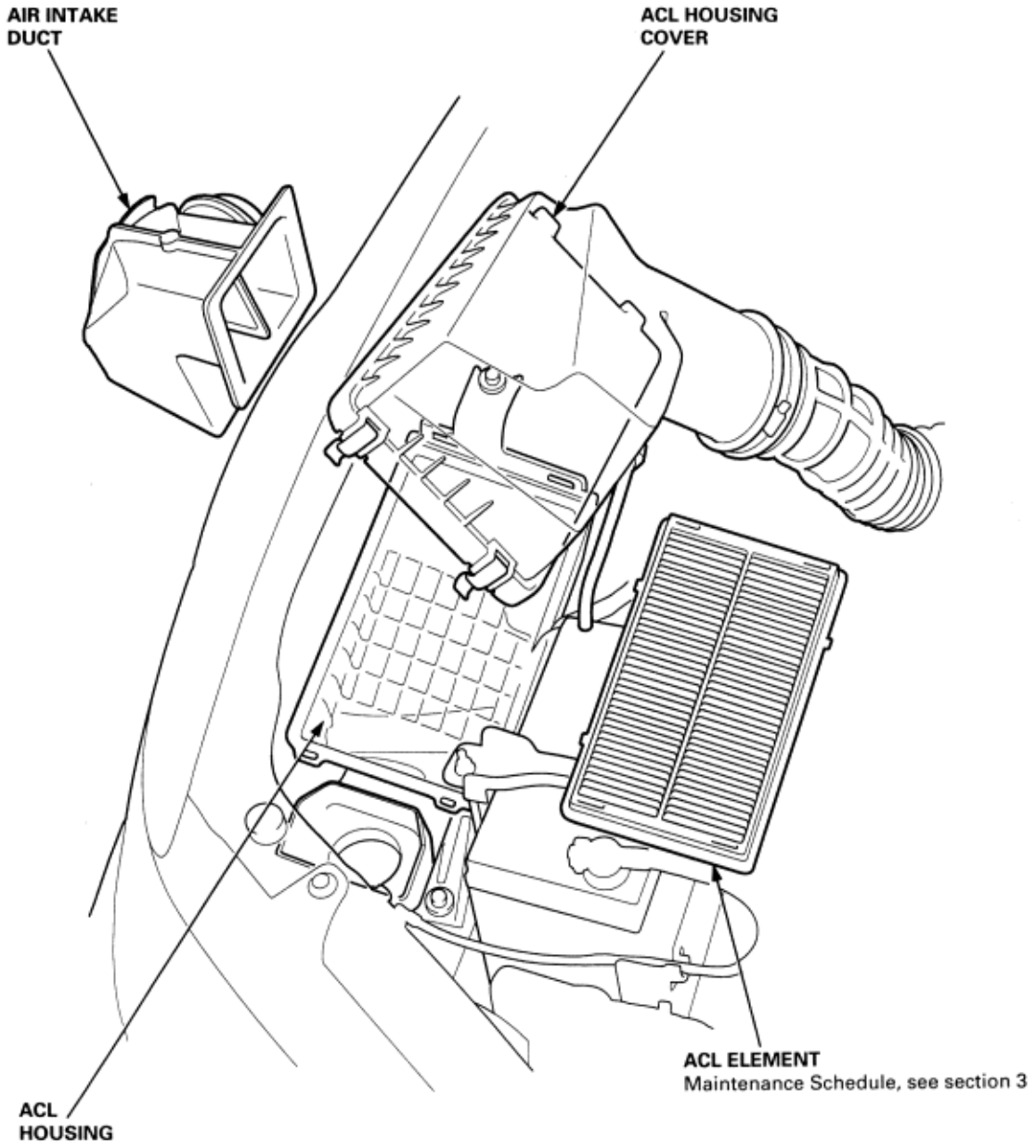


Intake Air System
Air Cleaner (ACL)

11-A-119

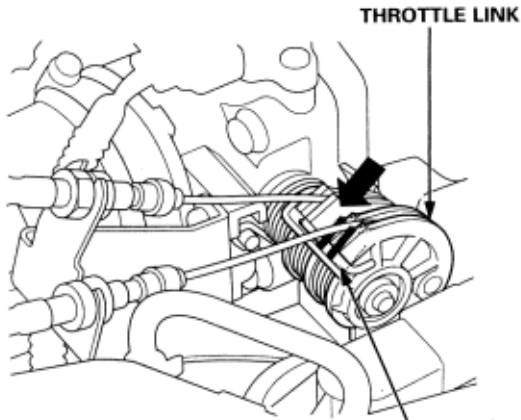
ACL Element Replacement

Remove the air intake duct and ACL housing cover.



Inspection/Adjustment

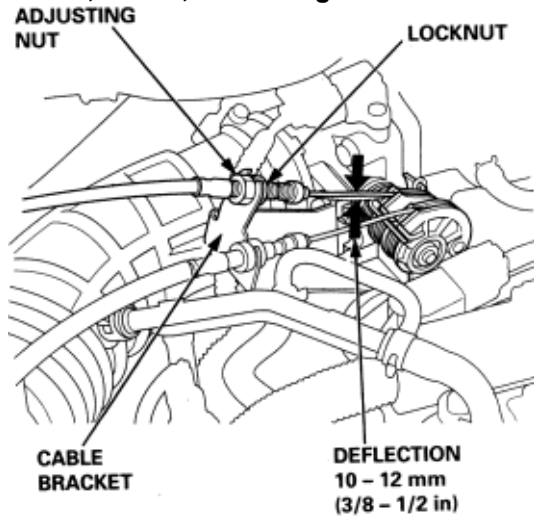
1. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in park or neutral) until the radiator fan comes on then let it idle.
2. Hold the throttle link to the throttle; there should be no clearance (with cruise control).



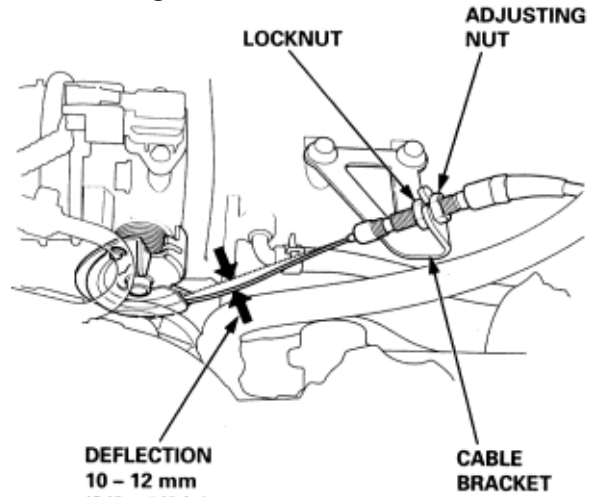
There should be no clearance.

3. Check cable free play at the throttle linkage. Cable deflection should be 10-12 mm (3/8-1/2 in).

F20B6, F18B2, F18B3 engine:



H22A7 engine

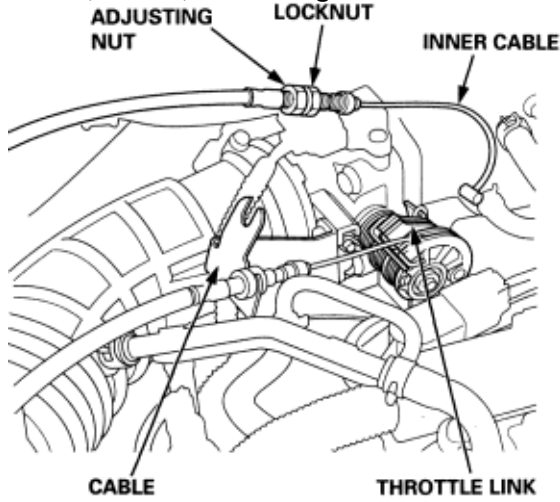


4. If deflection is not within specs, loosen the lock nut, turn the adjusting nut until the deflection as specified, then retighten the lock nut.
5. With the cable properly adjusted, check the throttle valve to make sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to make sure it returns to the idle position whenever you release the accelerator pedal.

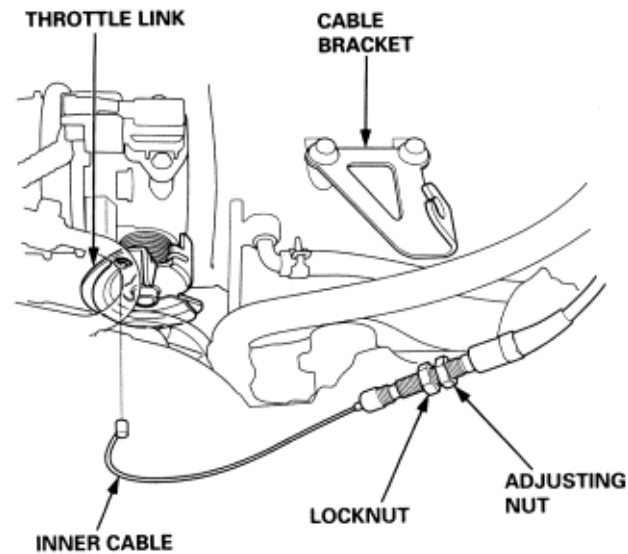
Installation

1. Fully open the throttle valve, then install the throttle cable in the throttle link and install the cable housing in the cable bracket.
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in park or neutral) until the radiator fan comes on then let it idle

F20B6, F18B2, F18B3 engine:

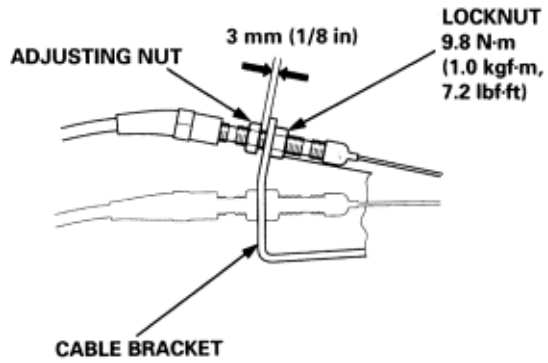


H22A7 engine:

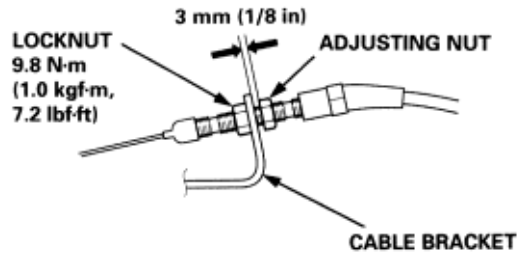


3. Hold the cable sheath, removing all slack from the cable.
4. Turn the adjusting nut until it is 3 mm (0.12 in.) away from the cable bracket.
5. Tighten the lock nut. The cable deflection should now be 10-12 mm (3/8-1/2 in). If not, see Inspection/Adjustment.

F20B6, F18B2, F18B3 engine:

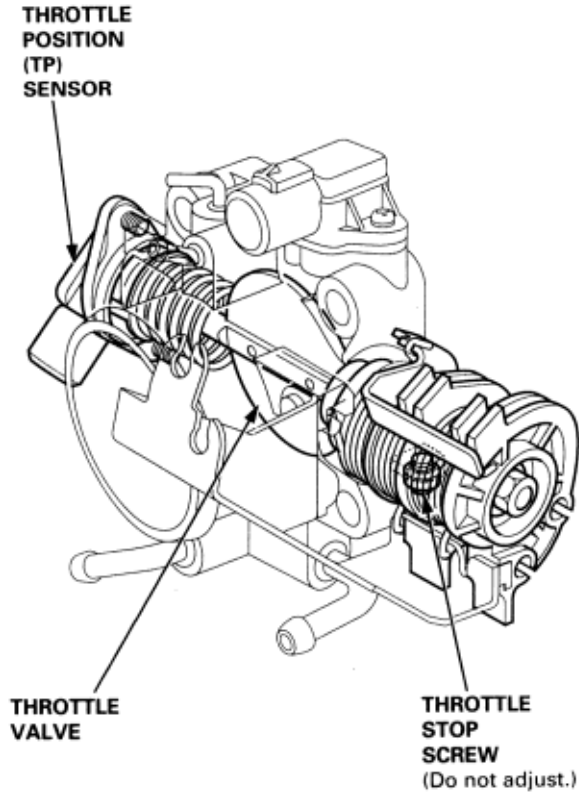


H22A7 engine:



Description

The throttle body is a single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head.



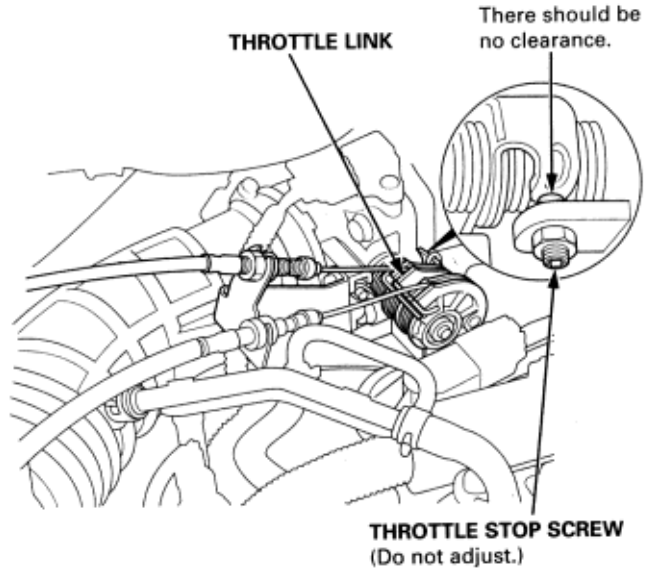
Inspection

Check that the throttle cable operates smoothly without binding or sticking.

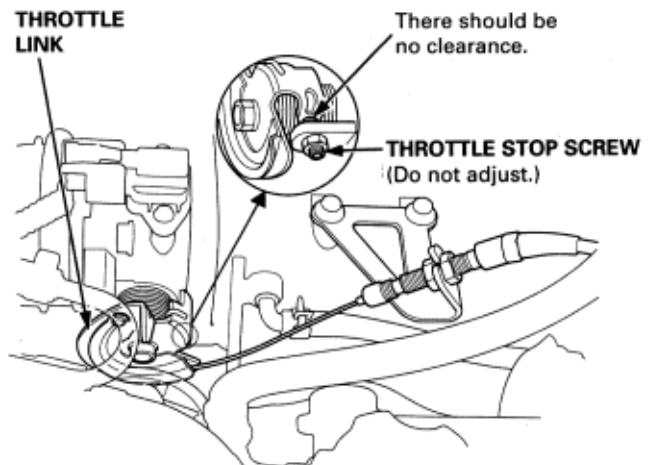
If there are any abnormalities, check for:

- ♦ Excessive wear or play in the throttle valve shaft.
- ♦ Sticky or binding throttle stop screw and throttle link at the fully closed position.
- ♦ Clearance between throttle stop screw and the throttle link at the fully closed position.

F20B6 engine:

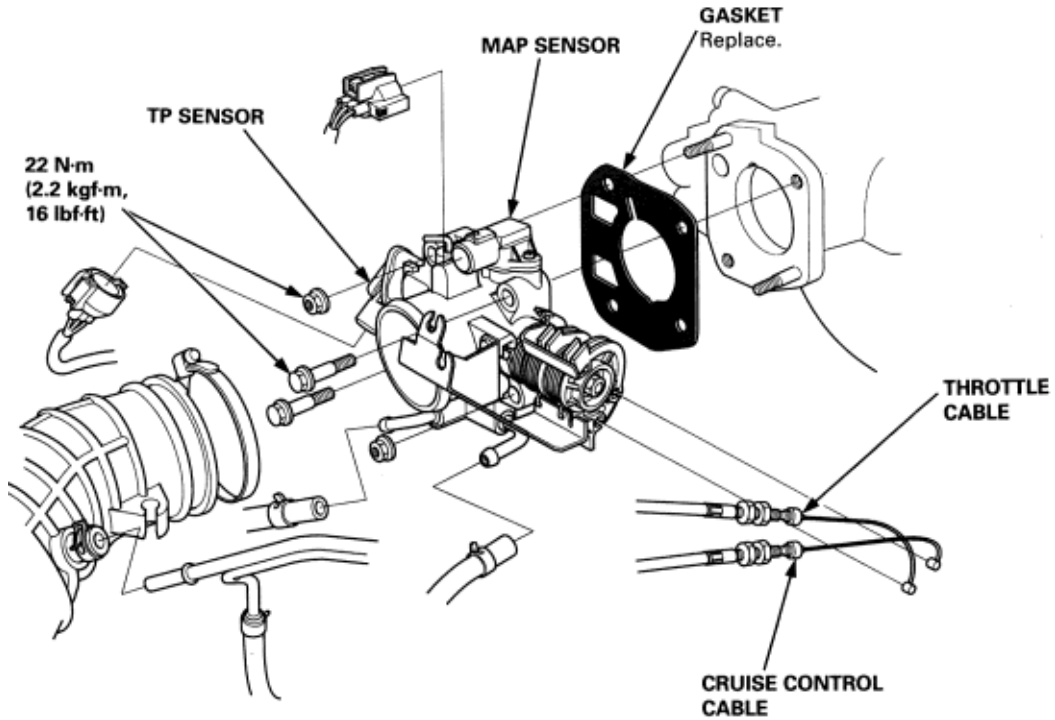


H22A7 engine:

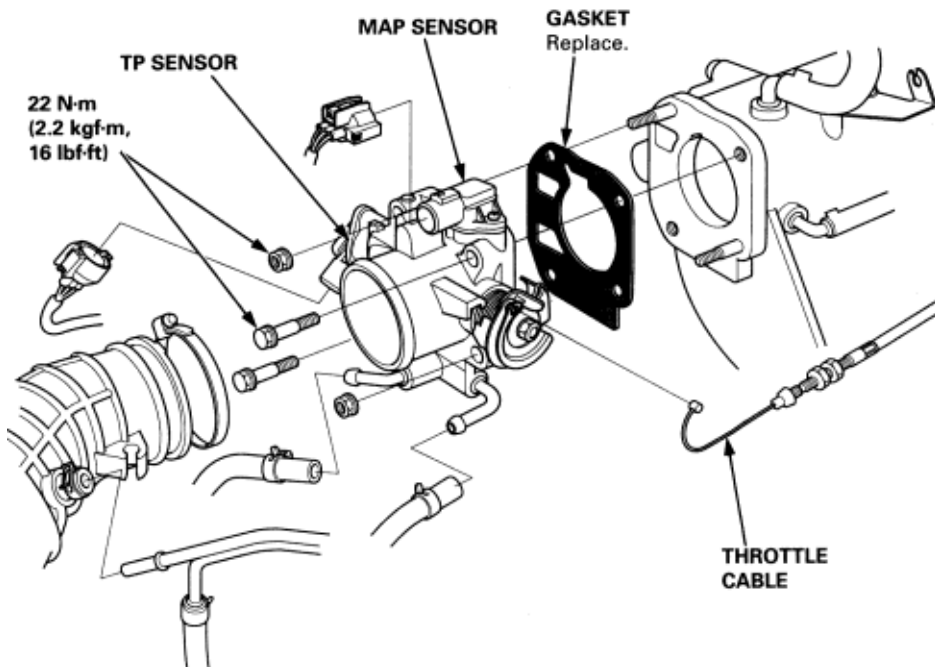


Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

Removal
F20B6 engine:



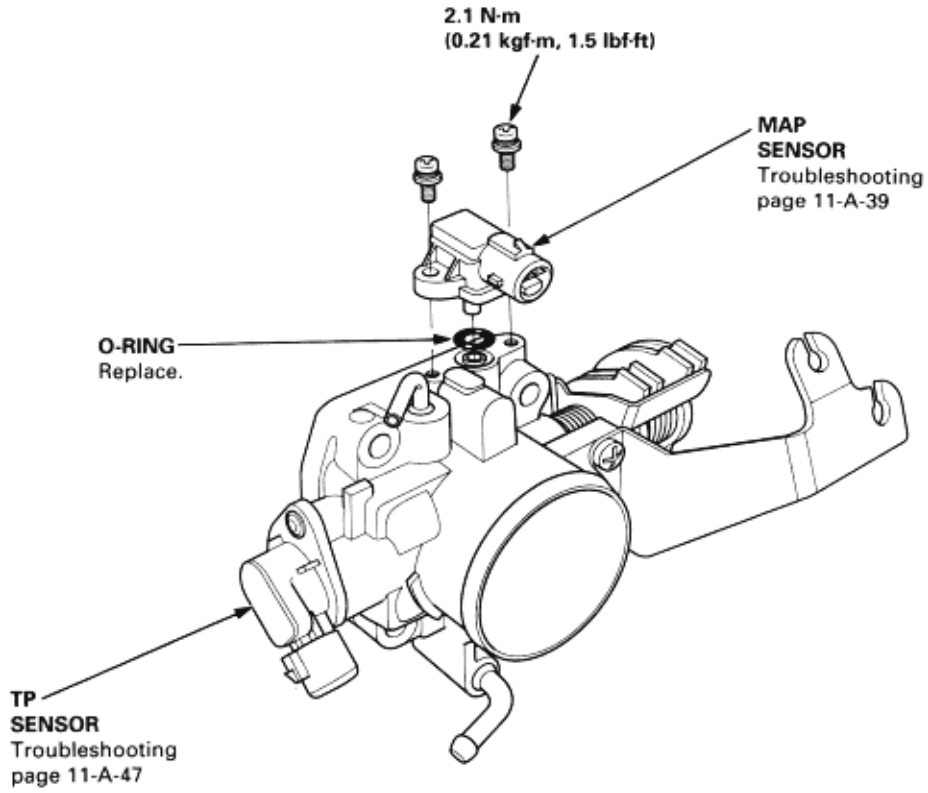
H22A7 engine:



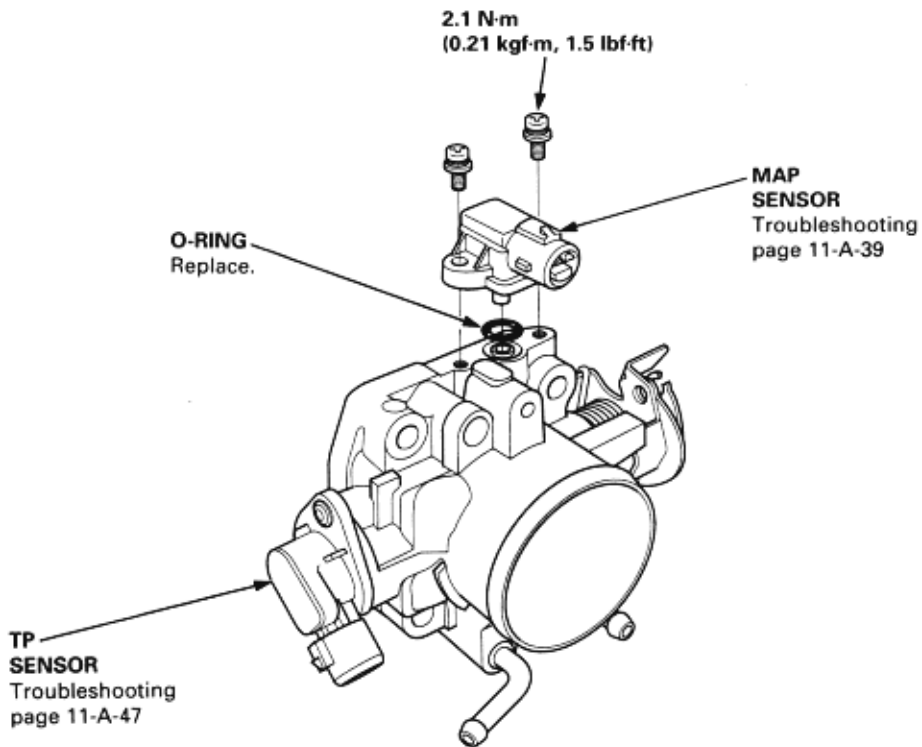
NOTE:

- ♦ Do not adjust the throttle stop screw.
- ♦ After reassembly, adjust the cruise control cable (see section 4), the throttle cable (**See Page 11-A-120**).
- ♦ The TP sensor is not removable.

Disassembly
F20B6 engine:



H22A7 engine:



To go to the pages referenced on the diagram above,
click on the following:
(See Page 11-A-47)
(See Page 11-A-39)

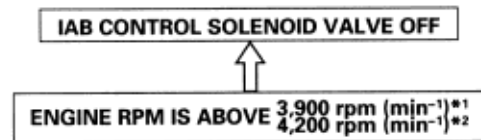
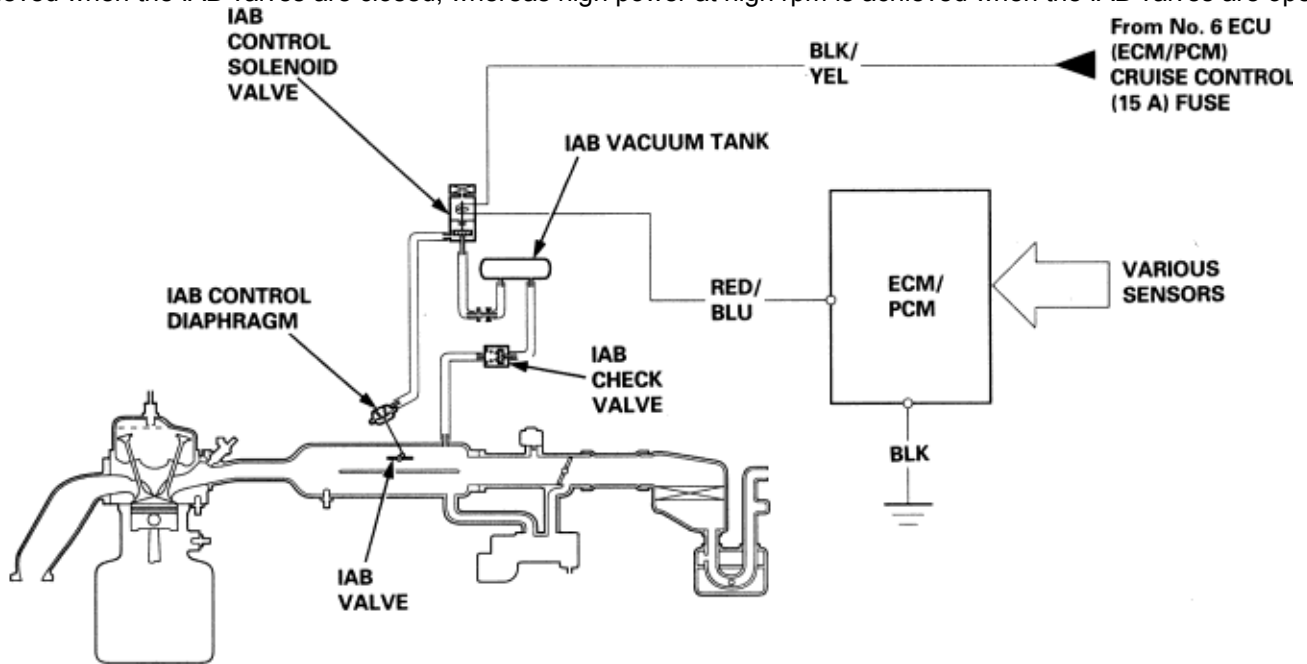
Intake Air System

Intake Air Bypass (IAB) Control System (F20B6, F18B2, F18B3 engines)

11-A-125

Description

Two air intake paths are provided in the intake manifold to allow the selection of the intake path most favourable for a given engine speed. Satisfactory power performance is achieved by closing and opening the Intake Air Bypass (IAB) valves. High torque at low rpm is achieved when the IAB valves are closed, whereas high power at high rpm is achieved when the IAB valves are opened.



*1: F18B2, F18B3 engine

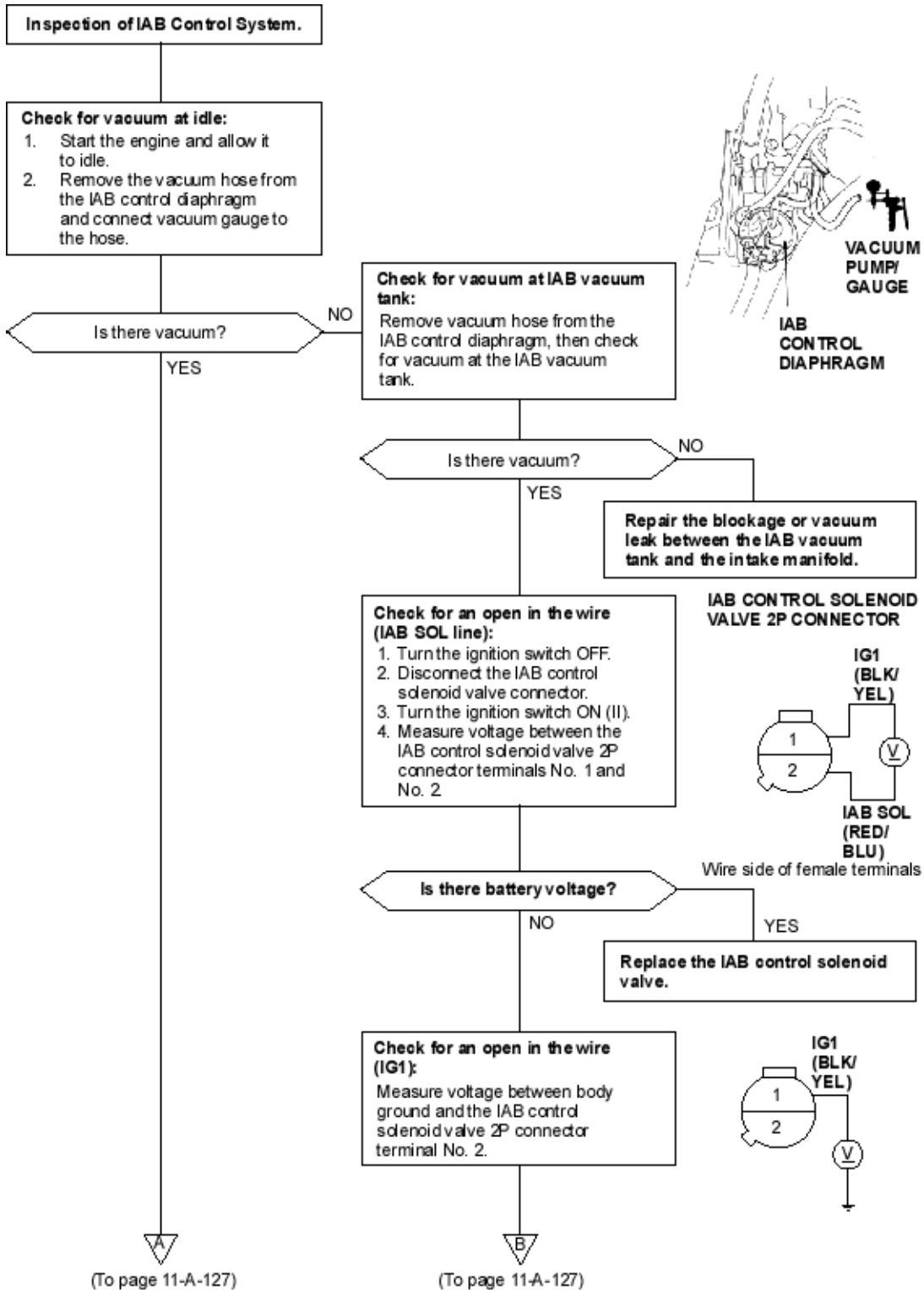
*2: F20B6 engine

Intake Air System

Intake Air Bypass (IAB) Control System (F20B6, F18B2, F18B3 engines) (cont'd)

11-A-126

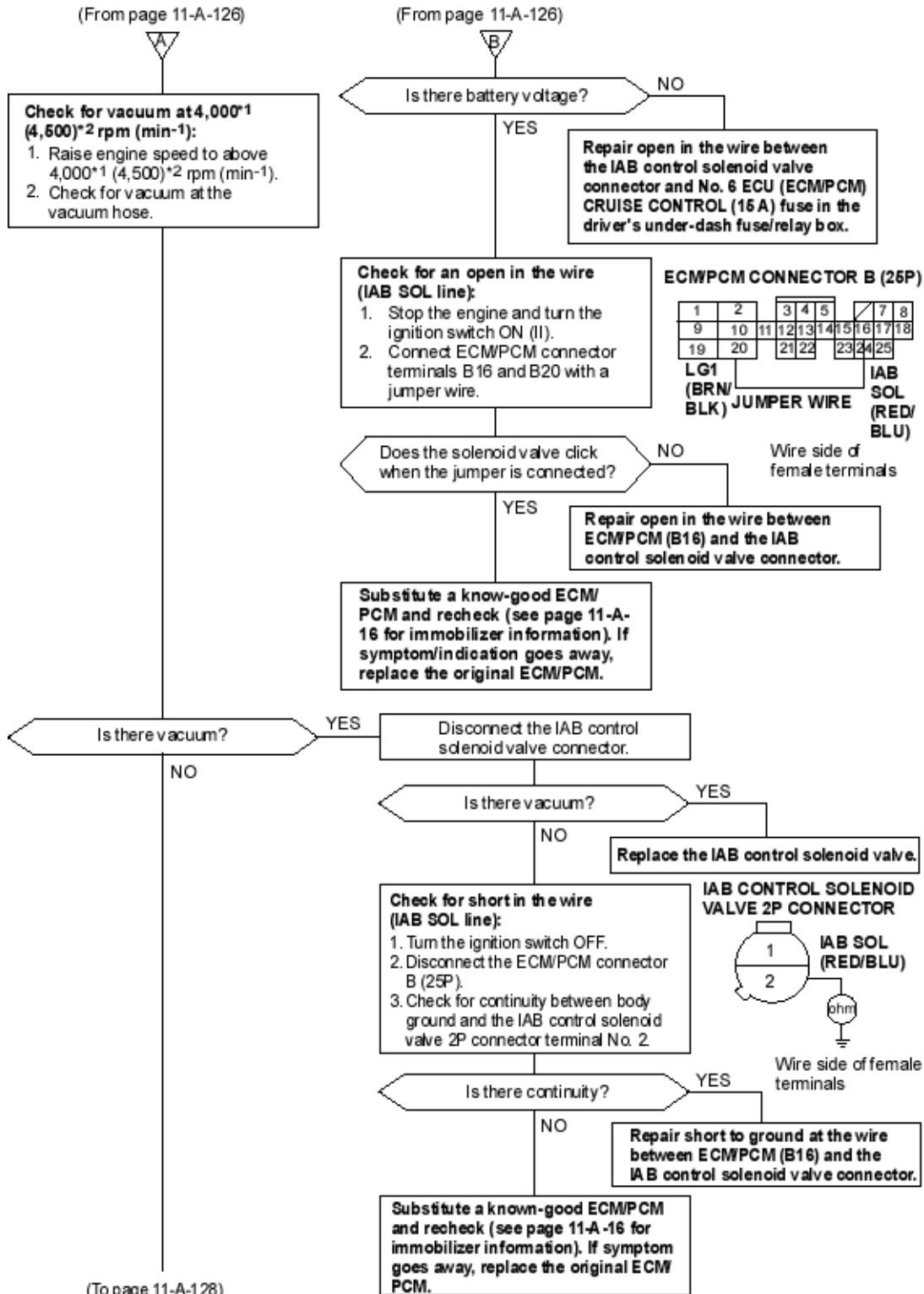
Troubleshooting



Intake Air System

Intake Air Bypass (IAB) Control System (F20B6, F18B2, F18B3 engines) (cont'd)

11-A-127



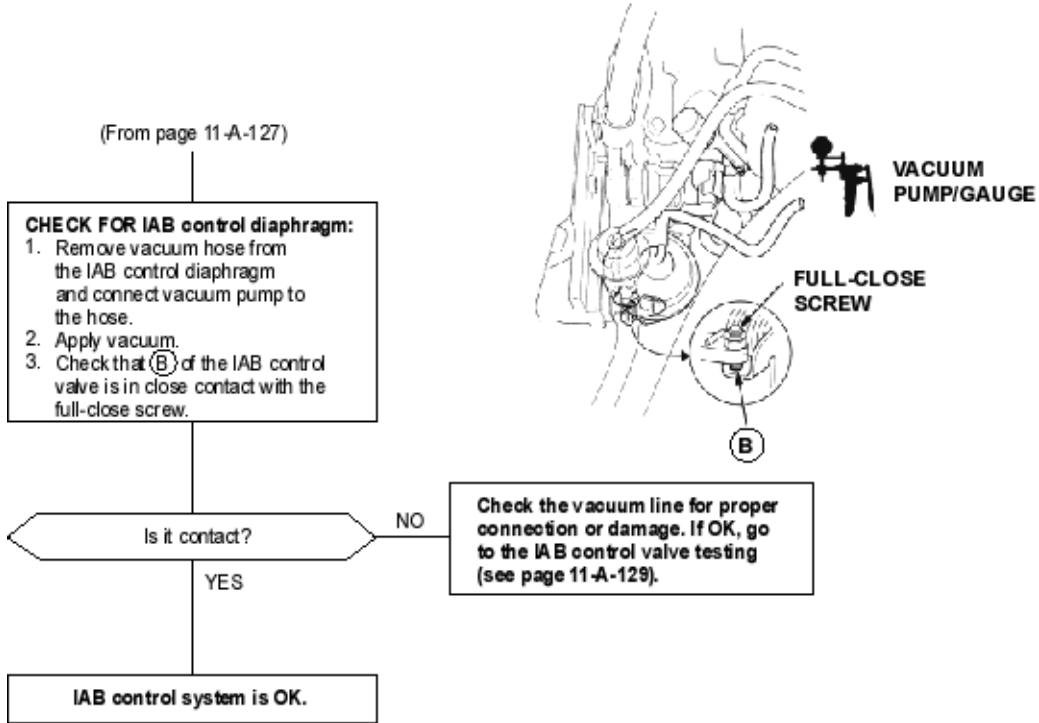
(To page 11-A-128)

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

Intake Air System

Intake Air Bypass (IAB) Control System (F20B6, F18B2, F18B3 engines) (cont'd)

11-A-128

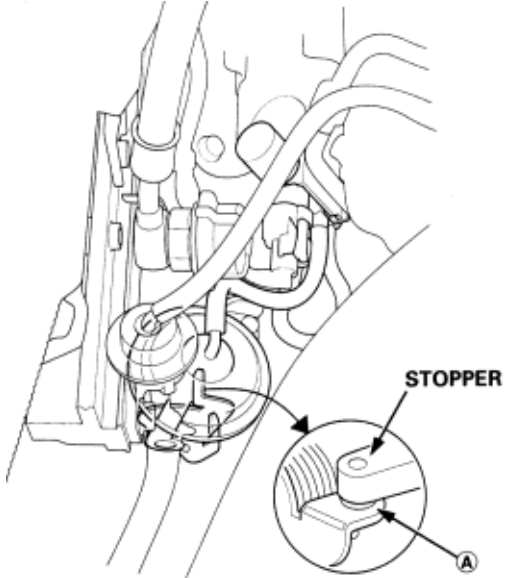


To go to the page referenced on the diagram above, click on the following:
(See Page [11-A-129](#))

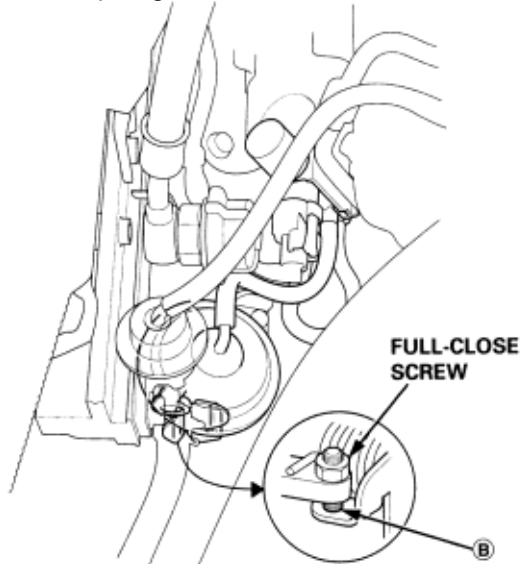
**CAUTION**

Do not adjust the IAB control valve full-close screw. It was preset at the factory.

1. Check the IAB control valve shaft for binding or sticking.
2. Check the IAB control valve for smooth movement.
3. Check that (A) of the IAB control valve is in close contact with the stopper when the vacuum hose is disconnected from the IAB control diaphragm.



4. Check that (B) of the IAB control valve is in close contact with the full-close screw when you apply 51 kPa (380 mm Hg, 15 in Hg) of vacuum to the IAB control diaphragm.



- ♦ If any fault is found, clean the linkage and shafts with carburettor cleaner
- If the problem still exists after cleaning, disassemble the intake manifold and check the IAB valve body assembly (see section 9).

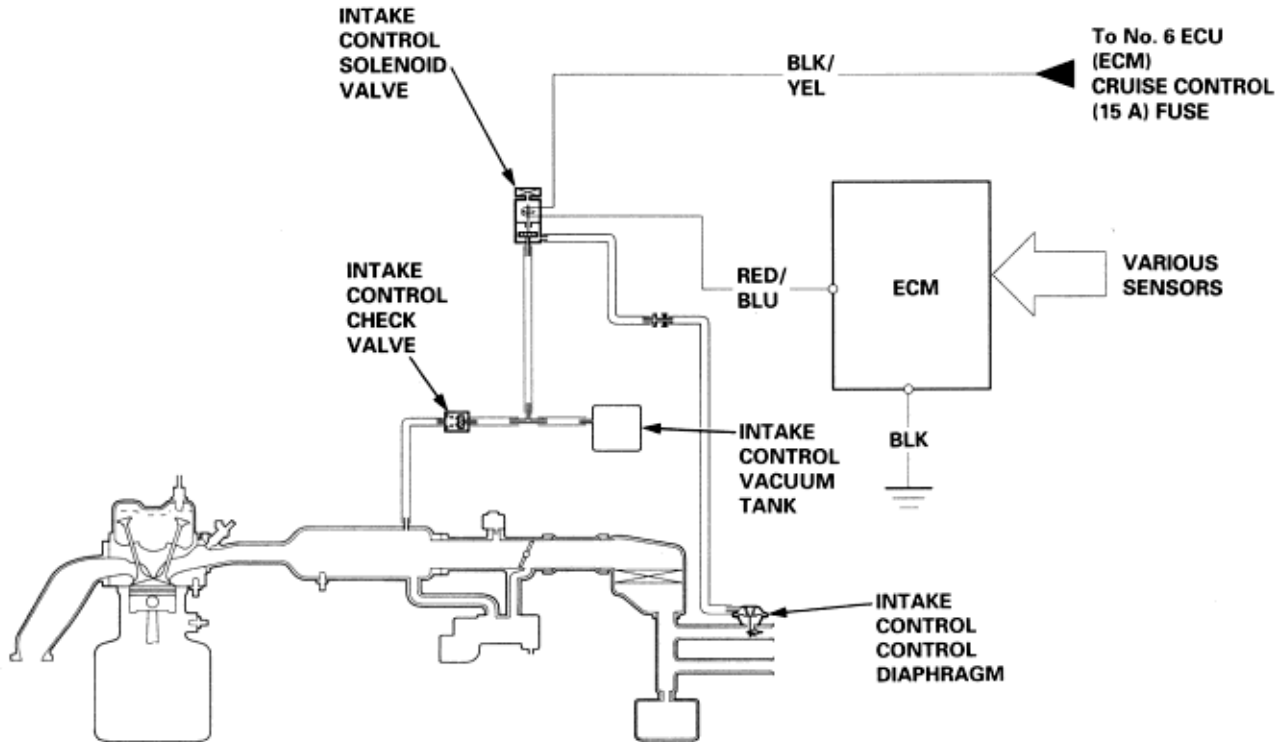
Intake Air System

Intake Control System (H22A7 engine)

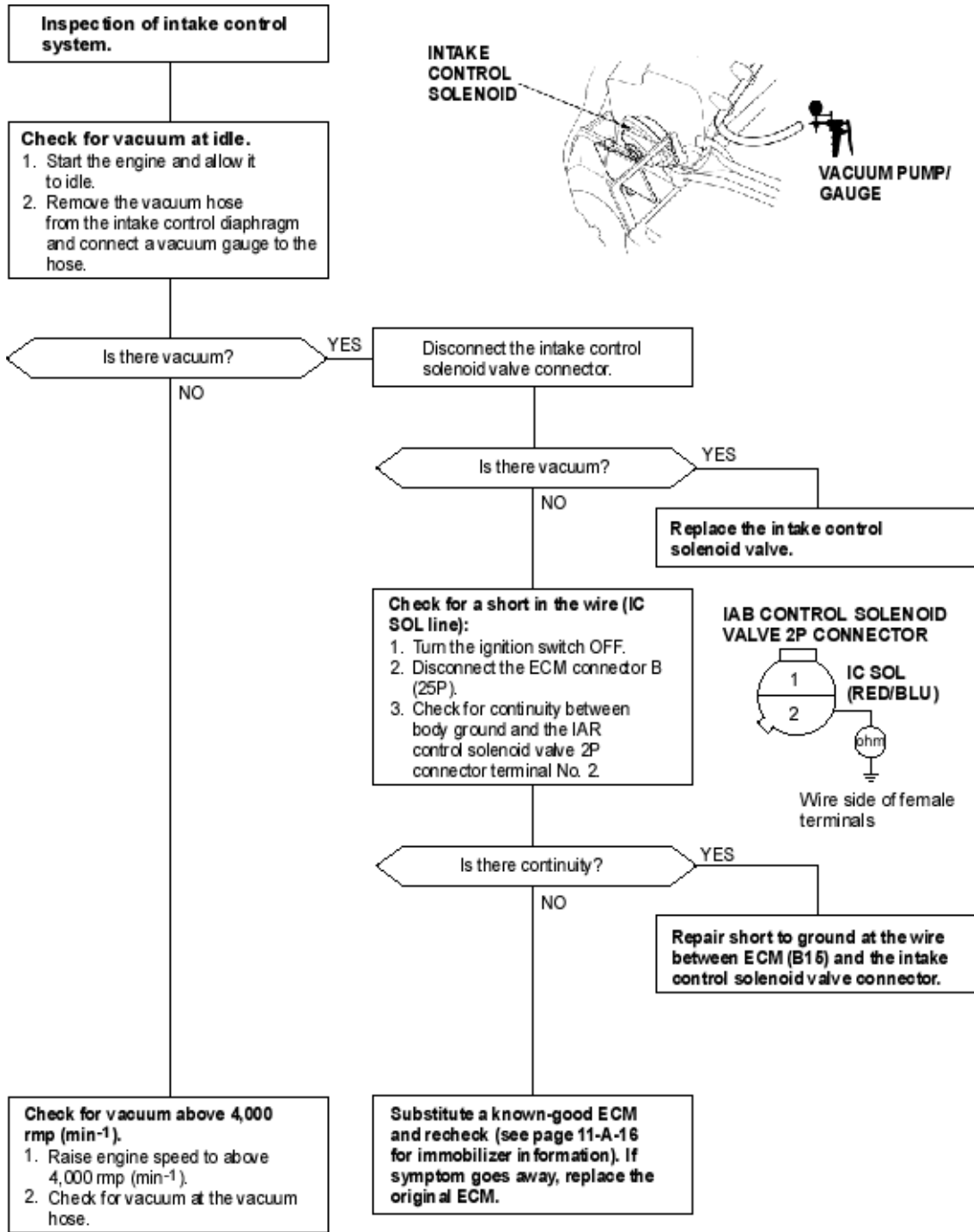
11-A-130

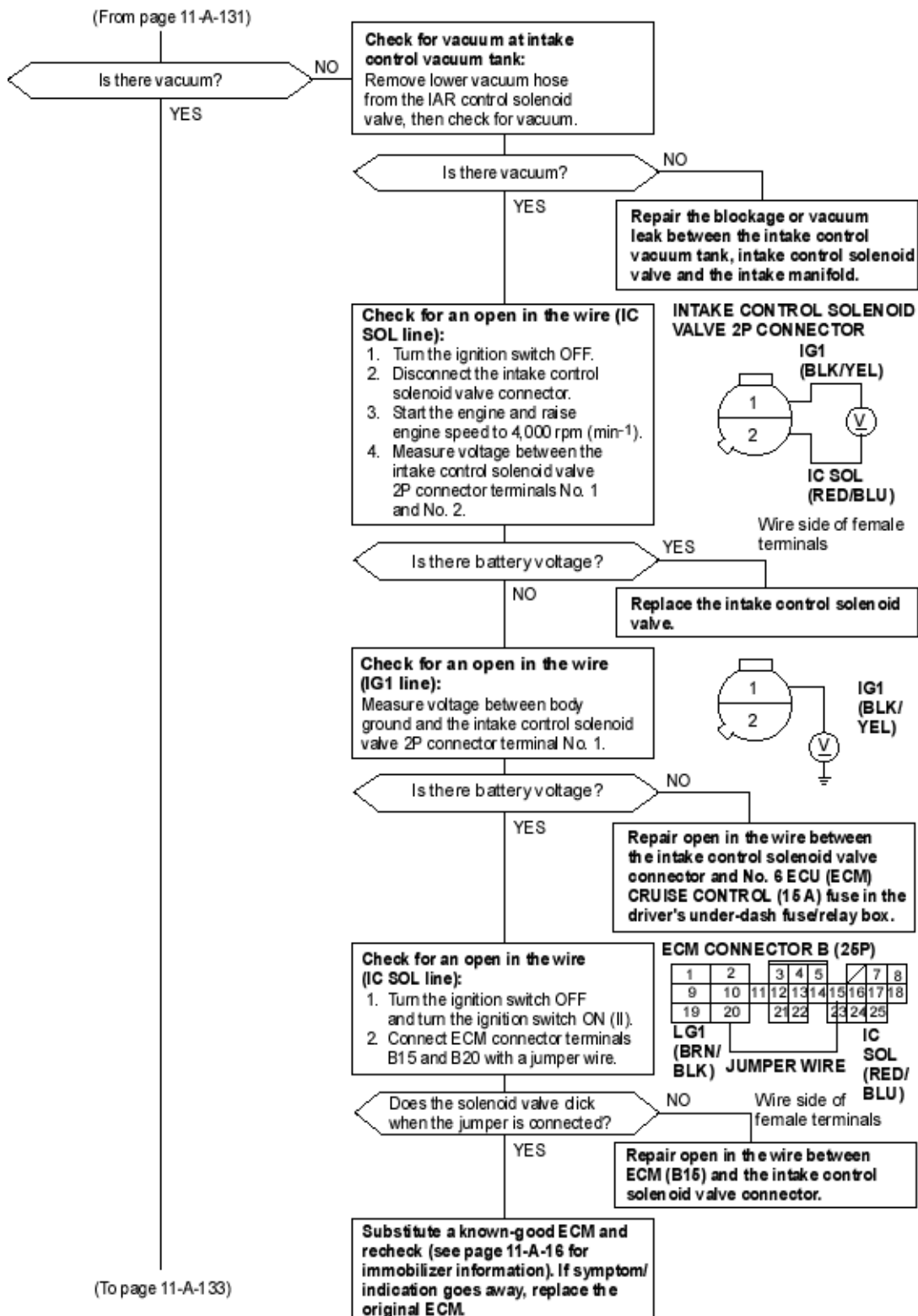
Description

When the engine speed is below 3,950 rpm (min⁻¹), the ECM supplies a ground to the intake control solenoid valve. This opens the solenoid valve sending intake manifold vacuum to the intake control diaphragm.

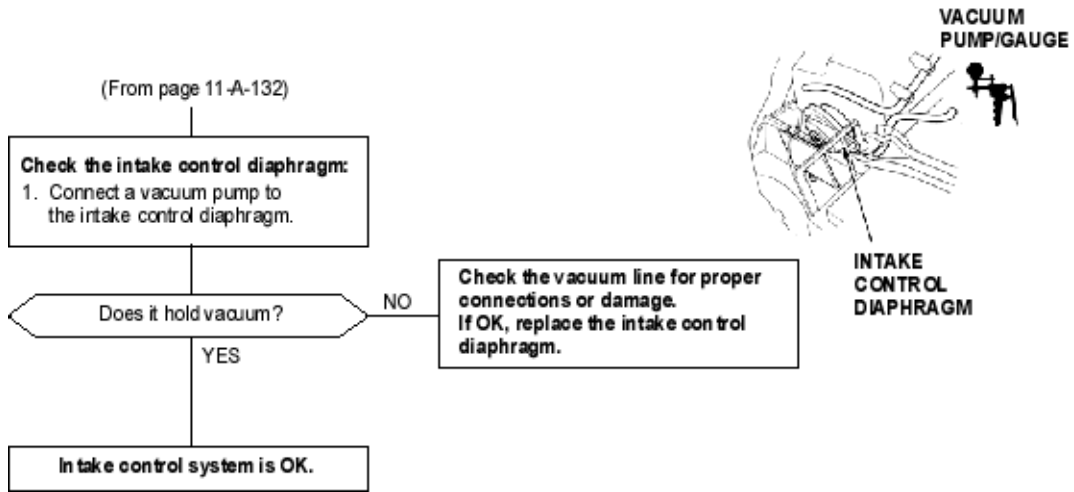


Troubleshooting





To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)



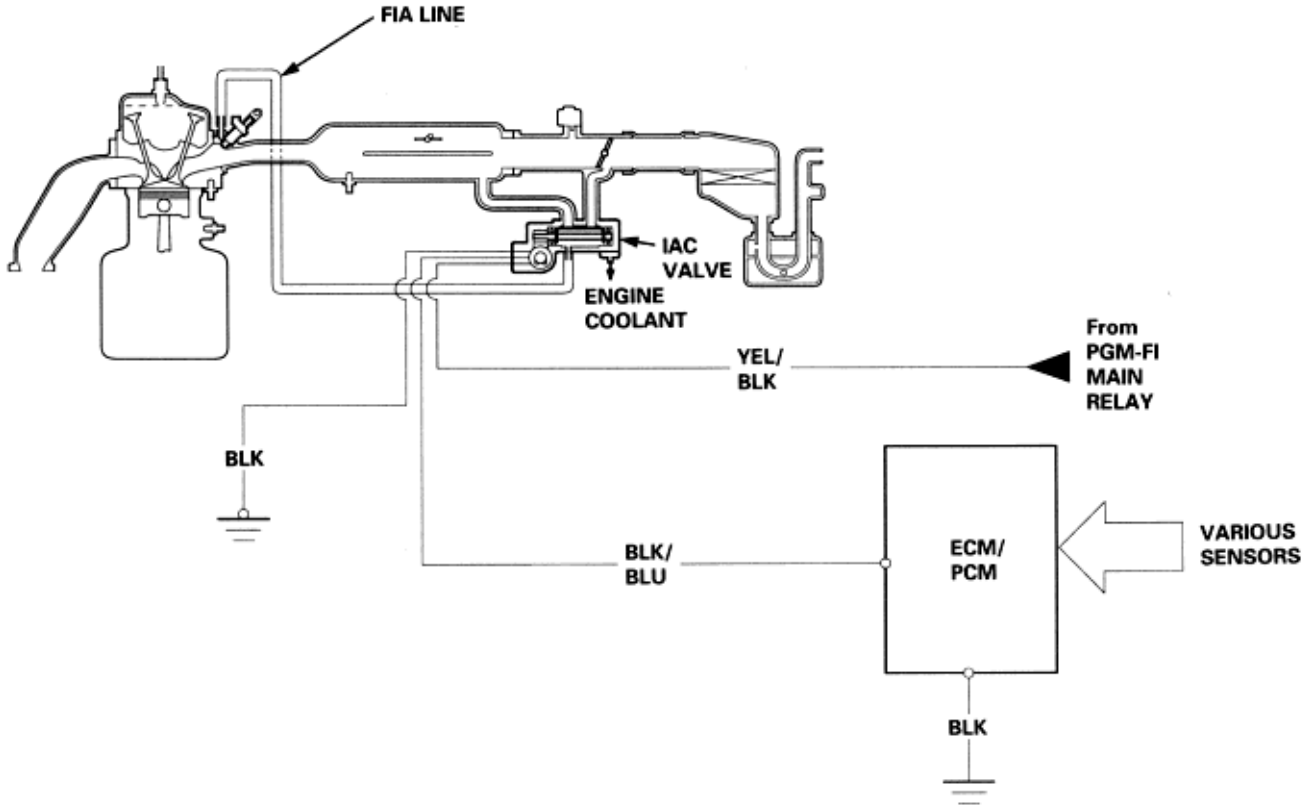
Intake Air System

Fuel Injection Air (FIA) Control System

11-A-134

Description

When the engine running, the IAC valve sends intake air to the fuel injectors.



Inspection of the Fuel Injection Air (FIA) control system.

Check for Air Assist line:

1. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Remove the vacuum hose from the IAC valve and connect a vacuum gauge to the hose.

Is there vacuum?

NO

Repair the blockage or vacuum leak between the IAC valve and the intake manifold.

YES

Check the IAC valve:

1. Turn the ignition switch OFF.
2. Remove the vacuum gauge, and connect a 3-way joint and vacuum gauge as shown.
3. Disconnect the IAC valve 3P connector.
4. Start the engine and check the vacuum.

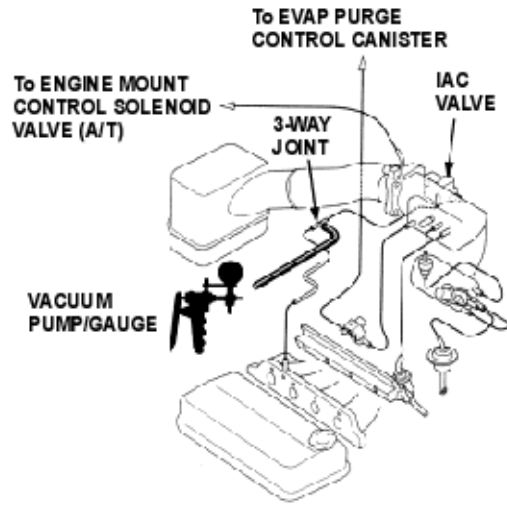
Is there vacuum over - 40 kpa (-300 mmHg, 11.8 in.Hg)?

YES

Replace the IAC valve.

NO

Fuel Injection Air (FIA) control system is OK.



The emission control system includes a Three Way Catalytic Converter (TWC), Exhaust Gas Recirculation (EGR) system, Positive Crankcase Ventilation (PCV) system and Evaporative Emission (EVAP) Control system.

Tailpipe Emission

Inspection

⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in park or neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Check the idle speed (**See Page 11-A-94**).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.
CO meter should indicate 0.1% maximum.

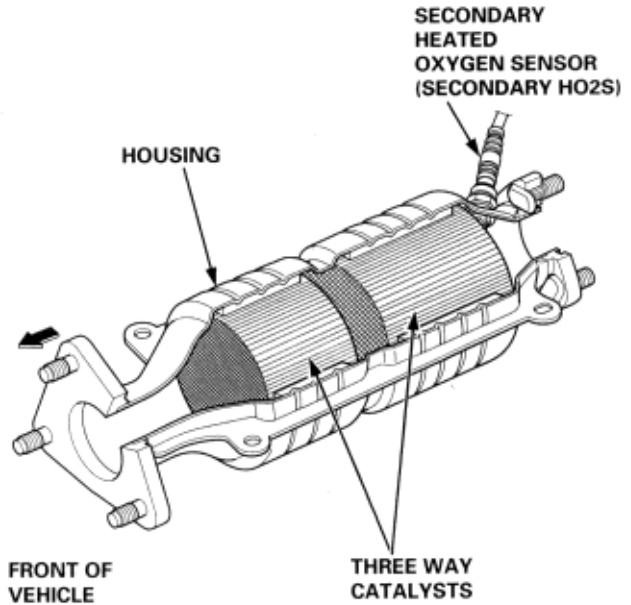
Description

The Three Way Catalytic Converter (TWC):

The Three Way Catalytic Converter (TWC) is used to convert hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NO x) in the exhaust gas to carbon dioxide (CO₂), dinitrogen (N₂) and water vapour.

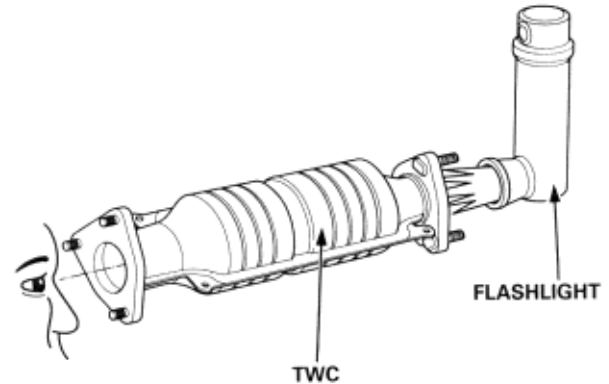
Removal/Installation

(see section 9)



Inspection

If excessive exhaust system back-pressure is suspected, remove the TWC from the car. Using a flashlight, make a visual check for plugging, melting or cracking of the catalyst. Replace the TWC if any of the visible area is damaged or plugged.



P0420 The scan tool indicates Diagnostic Trouble Code (DTC) P0420: Catalyst system efficiency below threshold.

Description

This system evaluates the catalyst's capacity by means of the HO₂S (Primary and Secondary) output during stable driving conditions. If deterioration has been detected during three consecutive driving cycles, the MIL comes on and DTC P0420 will be stored.

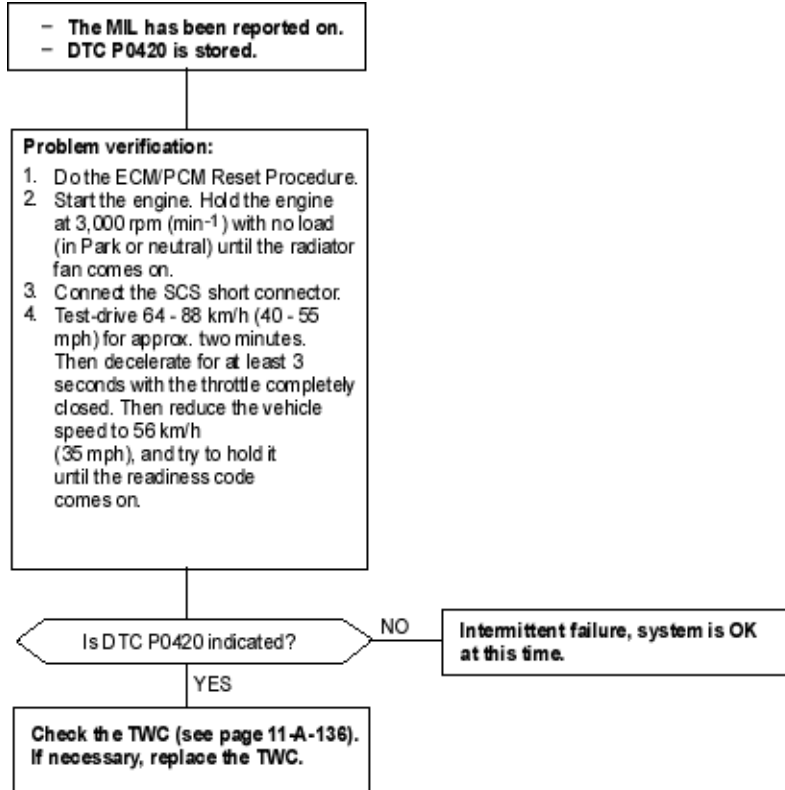
NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then troubleshoot DTC P0420.

P0137, P0138: Secondary H₂O₂S (Sensor 2)
P0141: Secondary H₂O₂S (Sensor 2) Heater

Possible Cause

- ♦ TWC Deterioration
- ♦ Exhaust system leakage

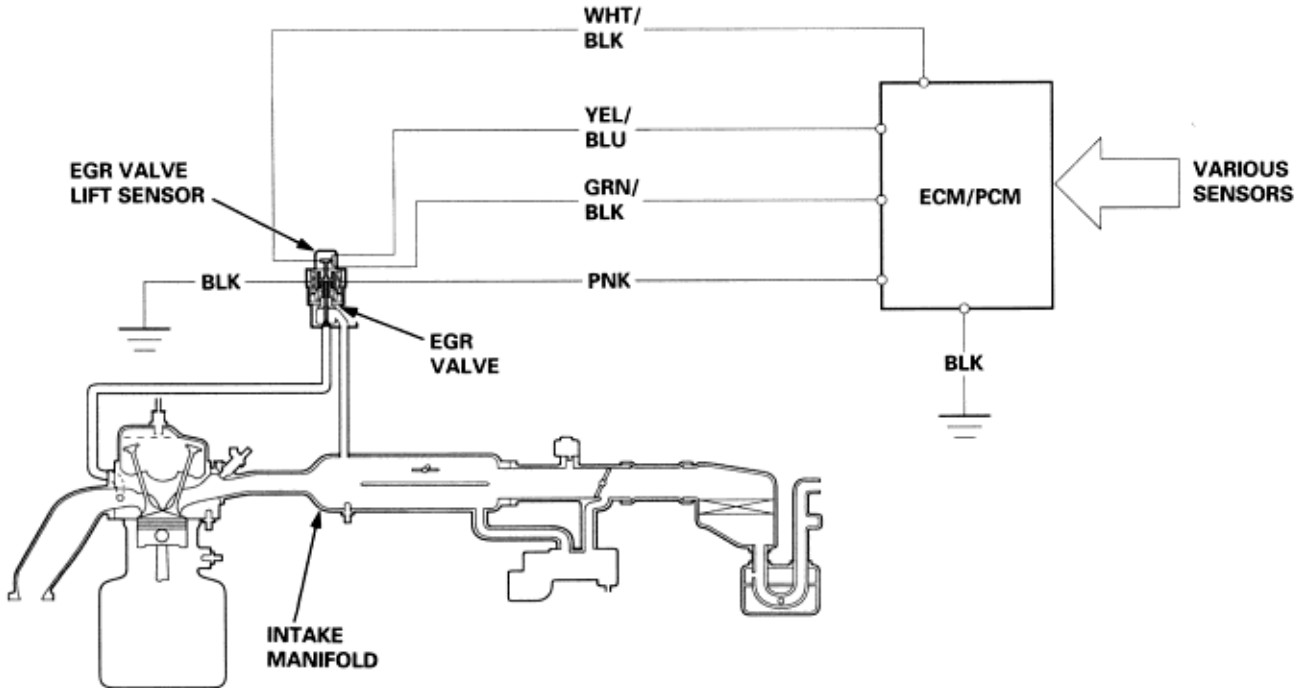
Troubleshooting Flowchart



To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-136)

Description

The EGR system reduces oxides of nitrogen (NOx) emissions by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. The ECM/PCM memory includes the ideal EGR valve lift for varying operating conditions. The EGR valve lift sensor detects the amount of EGR valve lift and sends it to the ECM/PCM. The ECM/PCM then compares it with the ideal lift in its memory (based on signals sent from other sensors). If there is any difference between the two, the ECM/PCM cuts current to the EGR valve.



P0401 The scan tool indicates Diagnostic Trouble Code (DTC) P0401: Insufficient flow in the Exhaust Gas Recirculation (EGR) system.

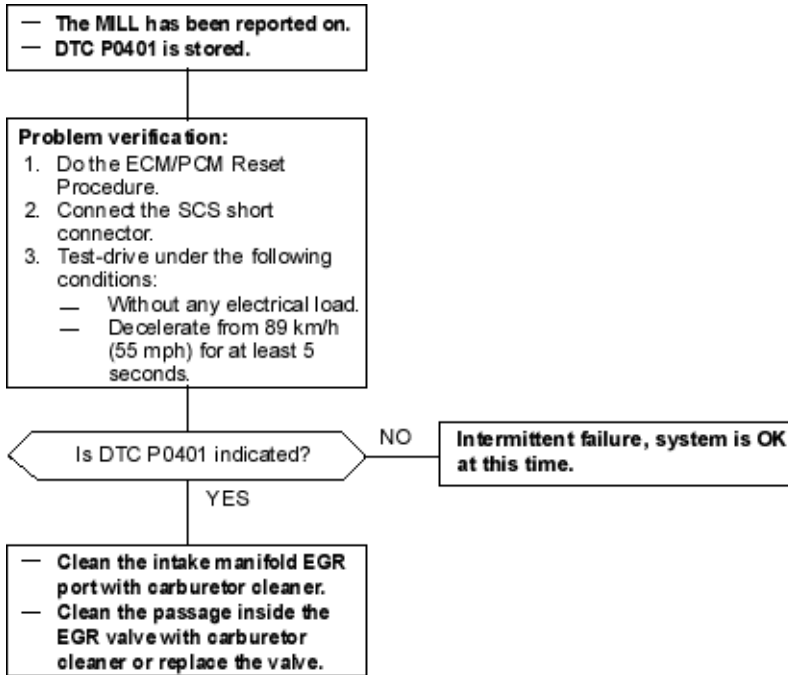
Description

Deterioration (clogging, leakage, etc.) in the EGR line or EGR valve is detected by means of the changes in MAP before and after the operation of the EGR valve. If deterioration has been detected during two consecutive driving cycles, the MIL will come on and DTC P0401 will be stored.

Possible Causes

- ♦ Clogging, leakage in the EGR line
- ♦ Faulty EGR valve

Troubleshooting Flowchart



P1491 The scan tool indicates Diagnostic Trouble Code (DTC) P1491: A malfunction in the Exhaust Gas Recirculation (EGR) system.

- The MIL has been reported on.
- DTC P1491 is stored.

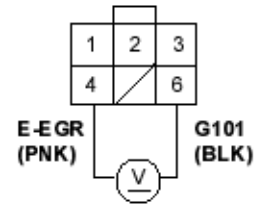
Problem verification:

1. Do the ECM/PCM Reset Procedure.
2. Connect the SCS short connector.
3. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in Park or neutral) until the radiator fan comes on.
4. Drive the vehicle on the road for approx. 10 minutes. Try to keep the engine speed in the 1,700 - 2,500 rpm (min-1) range.

Is DTC P1491 indicated?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at EGR valve and ECM/PCM.

EGR VALVE 6P CONNECTOR



Wire side of female terminals

YES
Check for a malfunction in the EGR valve:

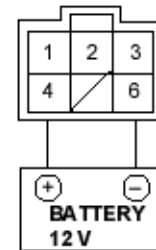
1. Start the engine and let it idle.
2. Measure voltage between the EGR valve 6P connector terminals No 4 and No. 6.

Is there battery voltage?

NO
Check the EGR valve:

1. Turn the ignition switch OFF.
2. Disconnect the EGR valve 6P connector.
3. Connect the battery positive terminal to EGR valve 6P connector terminal No. 6.
4. Start the engine and let it idle, then connect the battery negative terminal to EGR valve 6P connector terminal No. 4

EGR VALVE 6P CONNECTOR



Wire side of female terminals

YES
Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

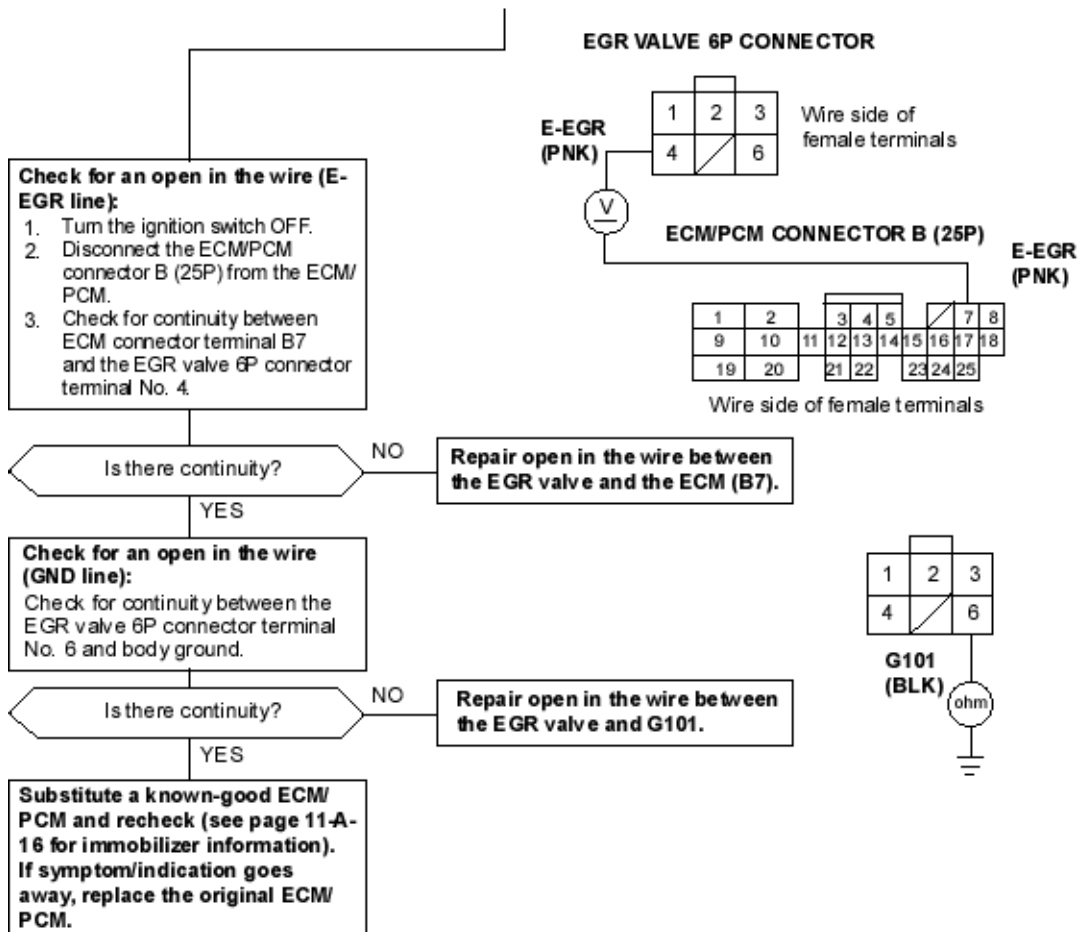
Does the engine stall or run rough?

NO
Replace the EGR valve.

(To page 11-A-141)

To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

(From page 11-A-140)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-A-16)

P1498 The scan tool indicates Diagnostic Trouble Code (DTC) P1498: A high voltage problem in the Exhaust Gas Recirculation (EGR) valve lift sensor circuit.

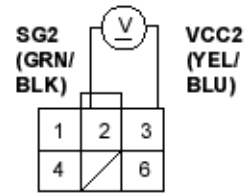
- The MIL has been reported on.
- DTC P1498 is stored.

Problem verification:
 1. Do the ECM/PCM Reset Procedure.
 2. Start the engine.

Is DTC P1498 indicated? **NO** → Intermittent failure, system is OK at this time. Check for poor connections or loose wires between EGR valve and ECM/PCM.

Check for an open in the EGR valve lift sensor:
 1. Turn the ignition switch OFF.
 2. Disconnect the EGR valve lift sensor 6P connector.
 3. Turn the ignition switch ON (II).
 4. Measure voltage between the EGR valve lift sensor 6P connector terminals No. 3 and No. 2.

EGR VALVE SENSOR 6P CONNECTOR



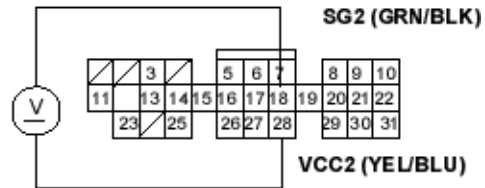
Wire side of female terminals

Is there approx. 5 V? **YES** → **Replace the EGR valve.**

Check for an open in the wire (SG2 line):
 Measure voltage between ECM/PCM connector terminals C18 and C28.

Is there approx. 5 V? **YES** → **Repair open in the wire between ECM (D18) and EGR valve lift sensor.**

ECM/PCM CONNECTOR C (31P)



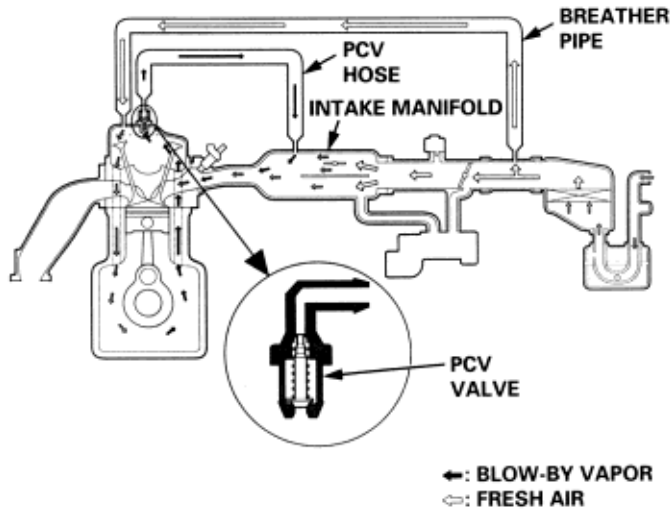
Wire side of female terminals

Substitute a known-good ECM/PCM and recheck (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

Description

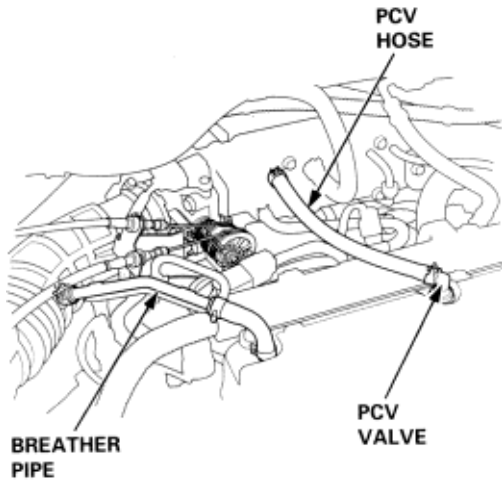
The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to the intake manifold vacuum, and the blow-by gas is drawn directly into the intake manifold.



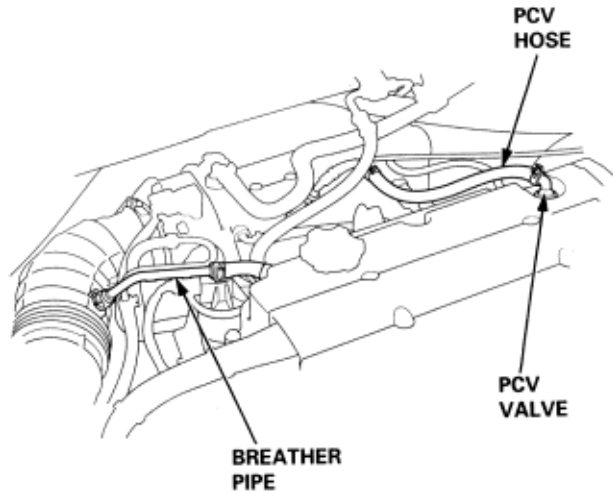
Inspection

1. Check the PCV hoses and connections for leaks and clogging.

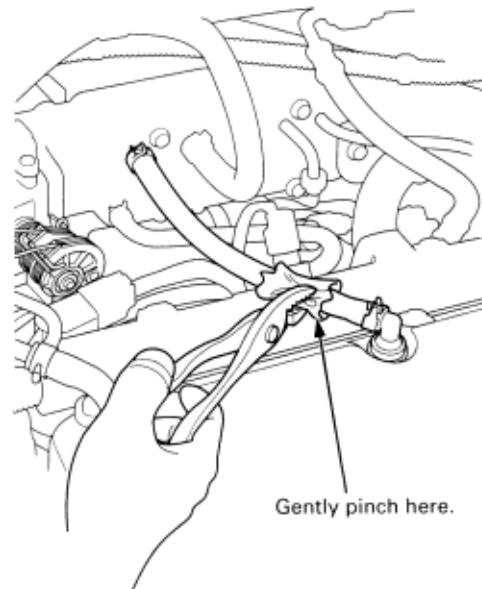
F20B6, F18B2, F18B3 engines:



H22A7 engine:



2. At idle, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold is lightly pinched with your fingers or pliers. If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.



Description

The evaporative emission controls are designed to minimise the amount of fuel vapour escaping to the atmosphere. The system consists of the following components:

A. Evaporative Emission (EVAP) Control Canister

An EVAP control canister is used for the temporary storage of fuel vapour until the fuel vapour can be purged from the EVAP control canister into the engine and burned.

B. Vapour Purge Control System

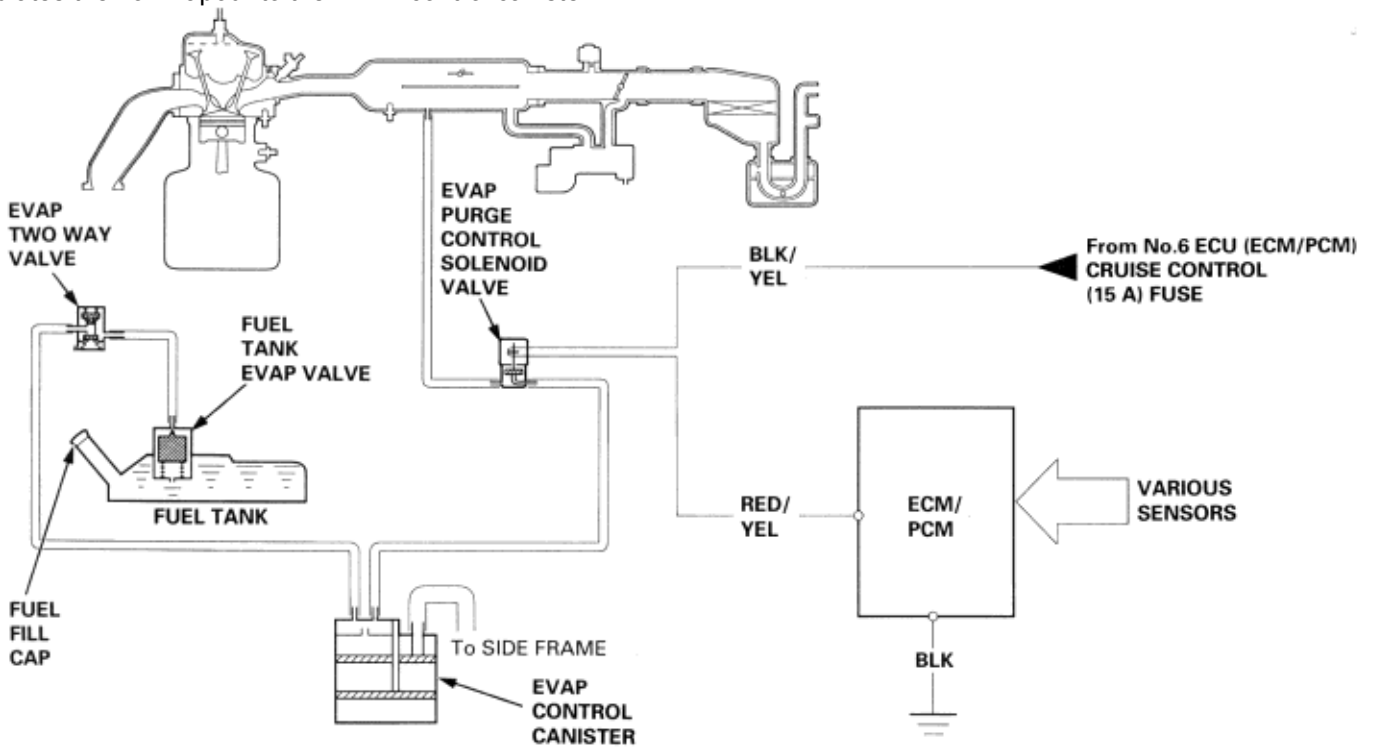
EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the throttle body. The purging vacuum is controlled by the EVAP purge control canister and the EVAP purge control solenoid valve.

EVAP PURGE CONTROL DIAPHRAGM VALVE OPEN AFTER STARTING ENGINE
EVAP PURGE CONTROL SOLENOID VALVE DUTY CONTROLLED

ENGINE COOLANT TEMPERATURE ABOVE 55°C (131°F); F20B6 engine, 65°C (149°F); H22A7 engine

C. Fuel Tank Vapour Control System

When fuel vapour pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow vapour to the EVAP control canister.



P0443 The scan tool indicates Diagnostic Trouble Code (DTC) P0443: An electrical problem in the EVAP Purge Control Solenoid Valve circuit.

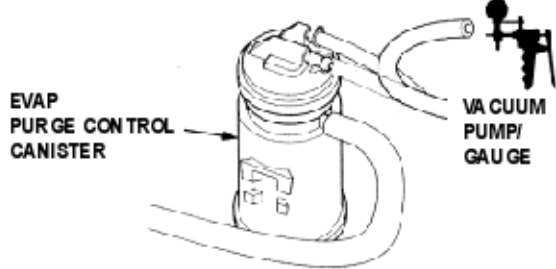
— The MIL has been reported on.
 — DTC P0443 is stored.

Problem verification:
 1. Do the ECM/PCM Reset Procedure.
 2. Turn the ignition switch ON (II).

Is DTC P0443 indicated?
 NO
 YES

Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the EVAP Purge Control Solenoid Valve and the ECM/PCM.

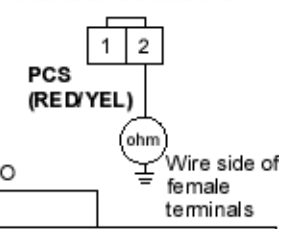
Check the EVAP purge control solenoid valve:
 1. Turn the ignition switch OFF.
 2. Disconnect the 2P connector from the EVAP purge control solenoid valve.
 3. Disconnect the vacuum hose from the EVAP purge control canister and connect a vacuum gauge to the hose.
 4. Start the engine and allow it to idle.



Is there vacuum?
 YES
 NO

Check for a short in the wire (PCS line):
 1. Turn the ignition switch OFF.
 2. Check for continuity between the EVAP purge control solenoid valve 2P connector terminal No. 2 and body ground.

EVAP PURGE CONTROL SOLENOID VALVE 2P CONNECTOR



Is there continuity?
 NO
 YES

Replace the EVAP purge control solenoid valve.

Check for a short in the ECM/PCM:
 1. Disconnect the ECM/PCM connector C (31P).
 2. Check for continuity between the EVAP purge control solenoid valve 2P connector terminal No. 2 and body ground.

Is there continuity?
 YES
 NO

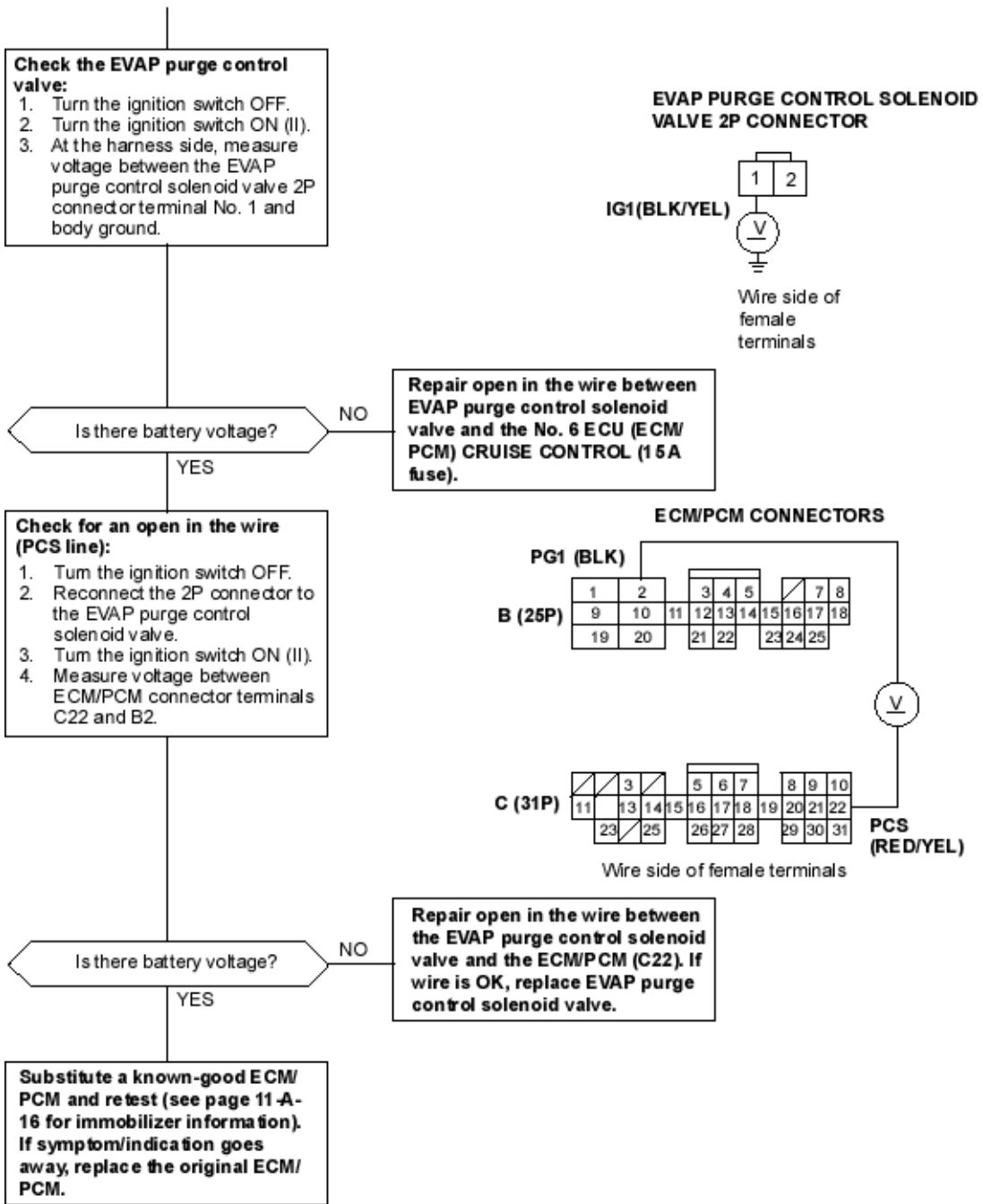
Repair short in the wire between the EVAP purge control solenoid valve and the ECM/PCM (C22).

(To page 11-A-146)

Substitute a known-good ECM/PCM and retest (see page 11-A-16 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

(From page 11-A-145)



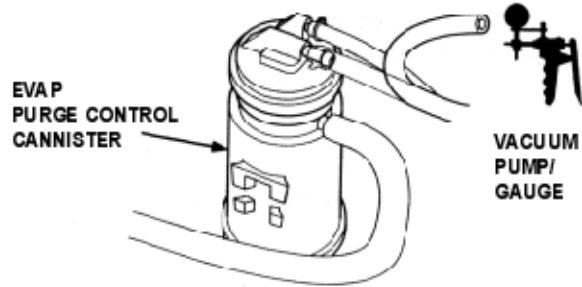
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-A-16)

Inspection

Inspection of Evaporative Emission Controls

Check the vacuum when cold:

1. Disconnect the vacuum hose from the EVAP purge control canister and connect a vacuum gauge to the hose.
2. Start the engine and allow it to idle:
NOTE: Engine coolant temperature must be below 55°C (131°F): B20B6 engine, 65°C (149°F): H22A7 engine.



Is there vacuum?

YES

Inspect vacuum hose routing. If OK, replace the EVAP purge control solenoid valve.

NO

Check the vacuum when hot:

Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then raise the engine speed to 3,500 rpm (min⁻¹). Check for vacuum at the vacuum hose.

Is there vacuum?

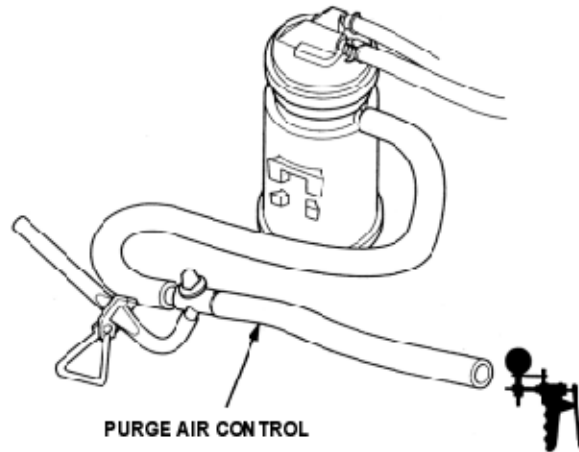
YES

Inspect vacuum hose routing. If OK, replace the EVAP purge control solenoid valve.

NO

Check the EVAP control canister:

1. Turn the ignition switch OFF.
2. Reconnect the vacuum hose to the EVAP purge control canister.
3. Remove the fuel fill cap.
4. Connect a vacuum gauge to canister purge air hose.
5. Start the engine and raise speed to 3,500 rpm (min⁻¹).



Does vacuum appear on gauge within 1 minute?

NO

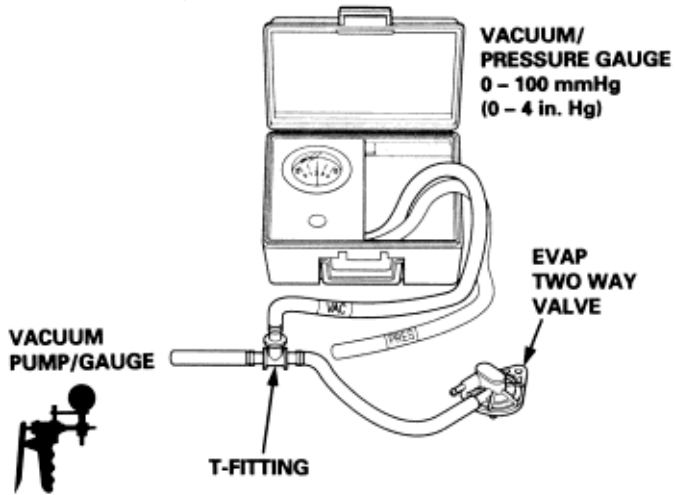
Replace the EVAP control canister.

YES

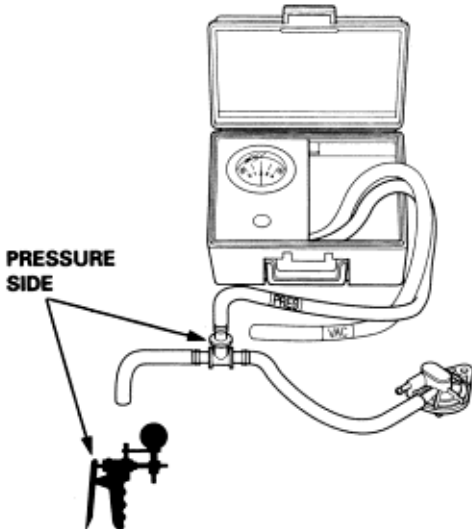
See EVAP two-way valve test to complete. Evaporative emission controls are OK.

Evaporative Emission (EVAP) Two Way Valve Testing

1. Remove the fuel fill cap.
2. Remove vapour line from the two way valve on the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.



3. Apply vacuum slowly and continuously while watching the gauge.
Vacuum should stabilise momentarily at 0.7-2.0 kPa (5-15 mm Hg, 0.2-0.6 in. Hg)
 - ♦ If vacuum stabilises (valve opens) below 0.7 kPa (5 mm Hg, 0.2 in. Hg) or above 2.0 kPa (15 mm Hg, 0.6 in. Hg) install a new valve and retest.
4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.

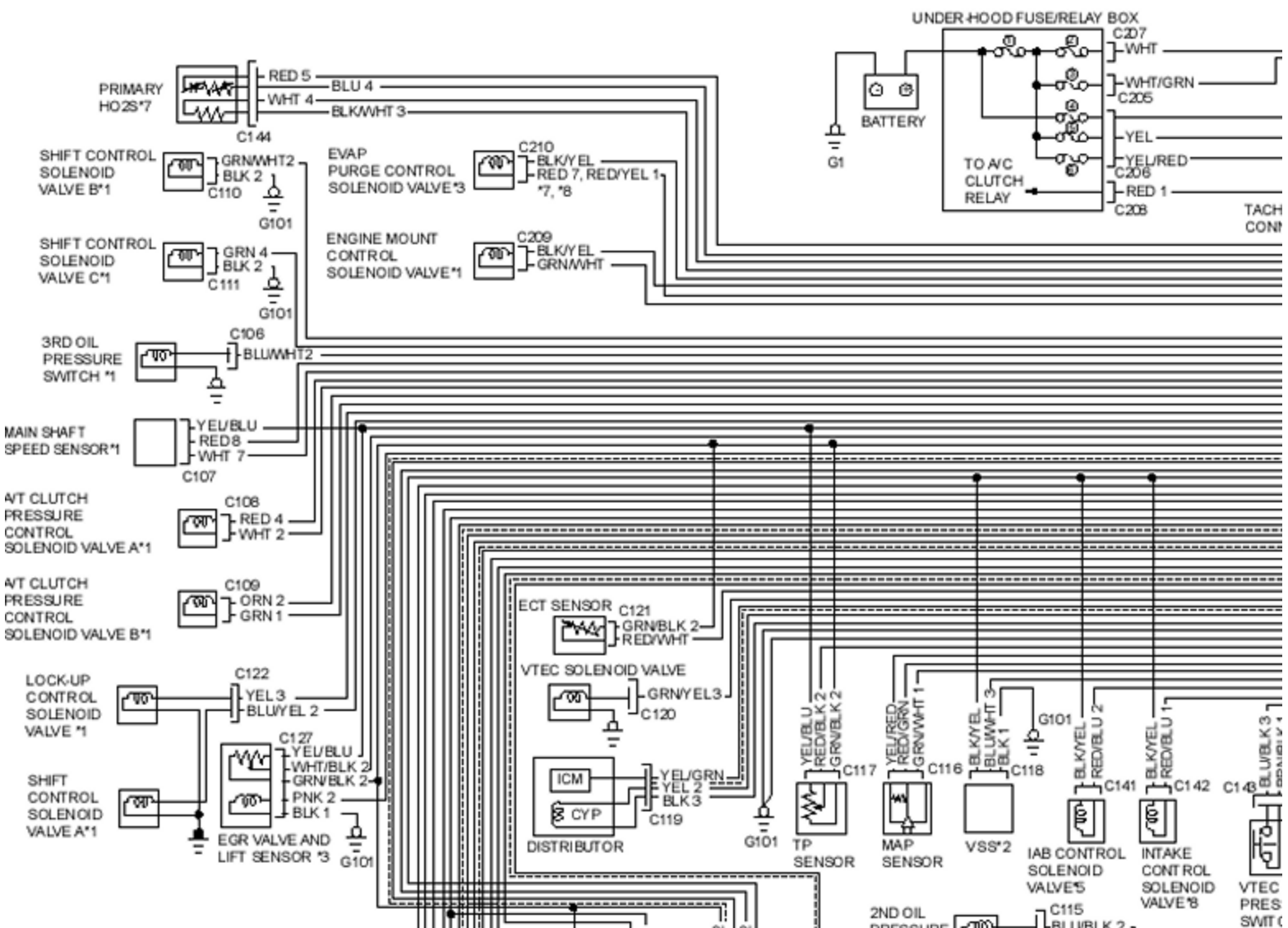
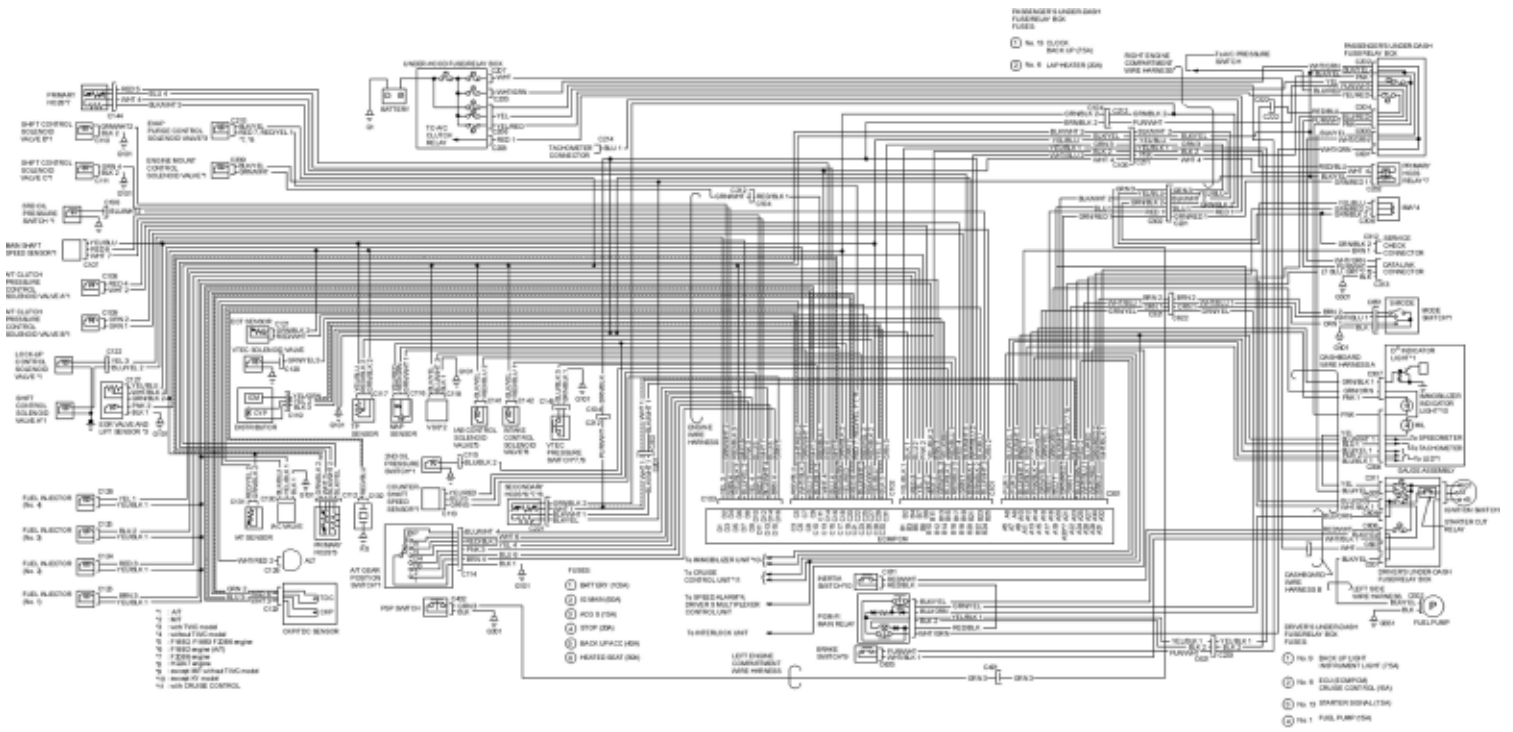


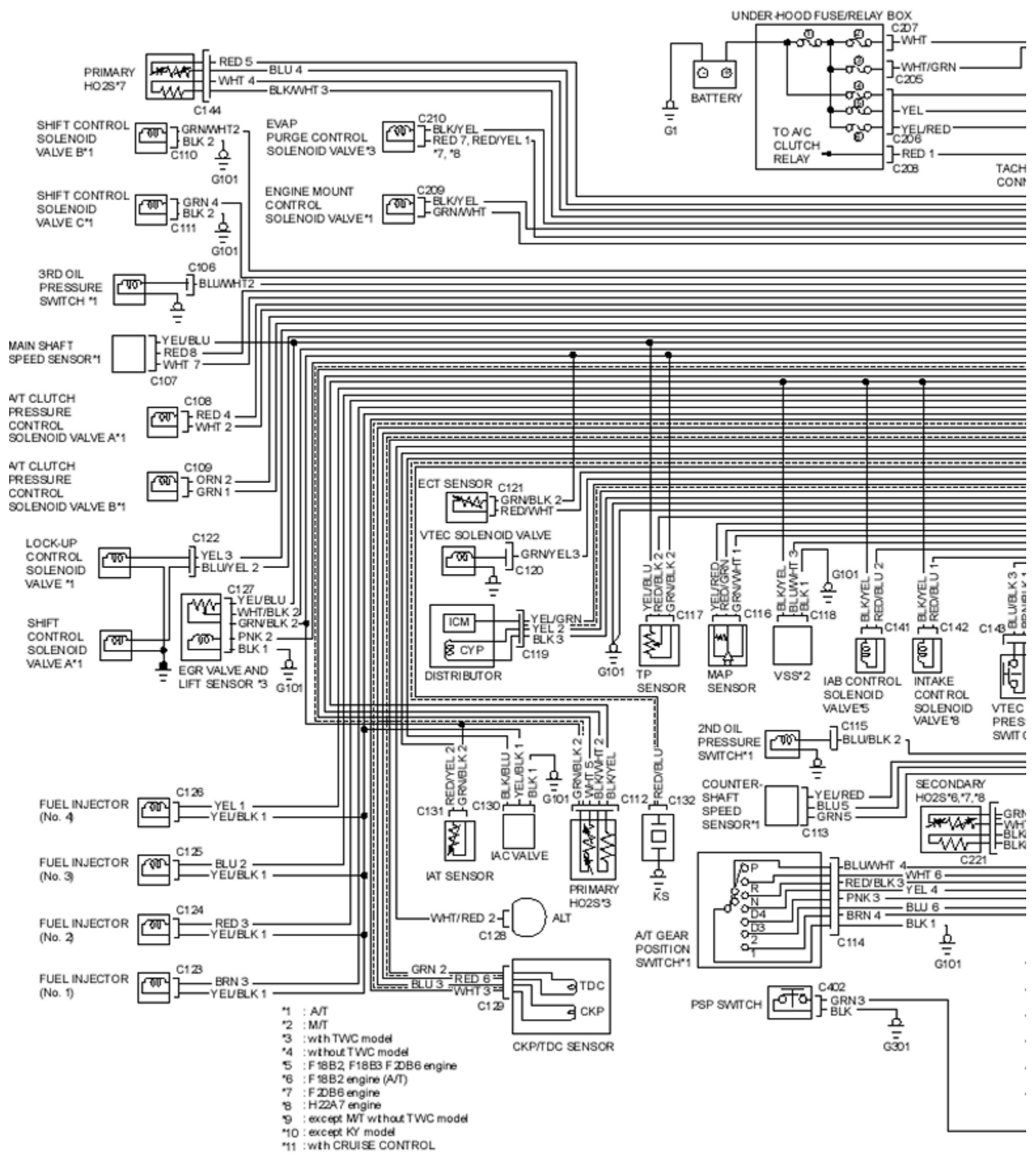
5. Slowly pressurize the vapour line while watching the gauge.
Pressure should stabilise at 1.3-4.7 kPa (10-35 mm Hg, 0.4-1.4 in. Hg).
 - ♦ If pressure momentarily stabilises (valve opens) at 1.3-4.7 kPa (10-35 mm Hg, 0.4-1.4 in. Hg), the valve is OK.
 - ♦ If pressure stabilises below 1.3 kPa (10 mm Hg, 0.4 in. Hg) or above 4.7 kPa (35 mm Hg, 1.4 in. Hg), install a new valve and retest.

Diagrams

Fuel-injected System Diagram (F18B2, F18B3, F20B6, H22A7 engine: LHD)

11-A-149





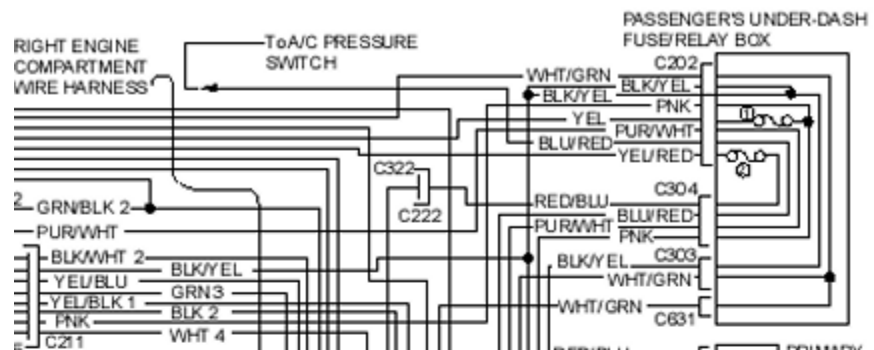
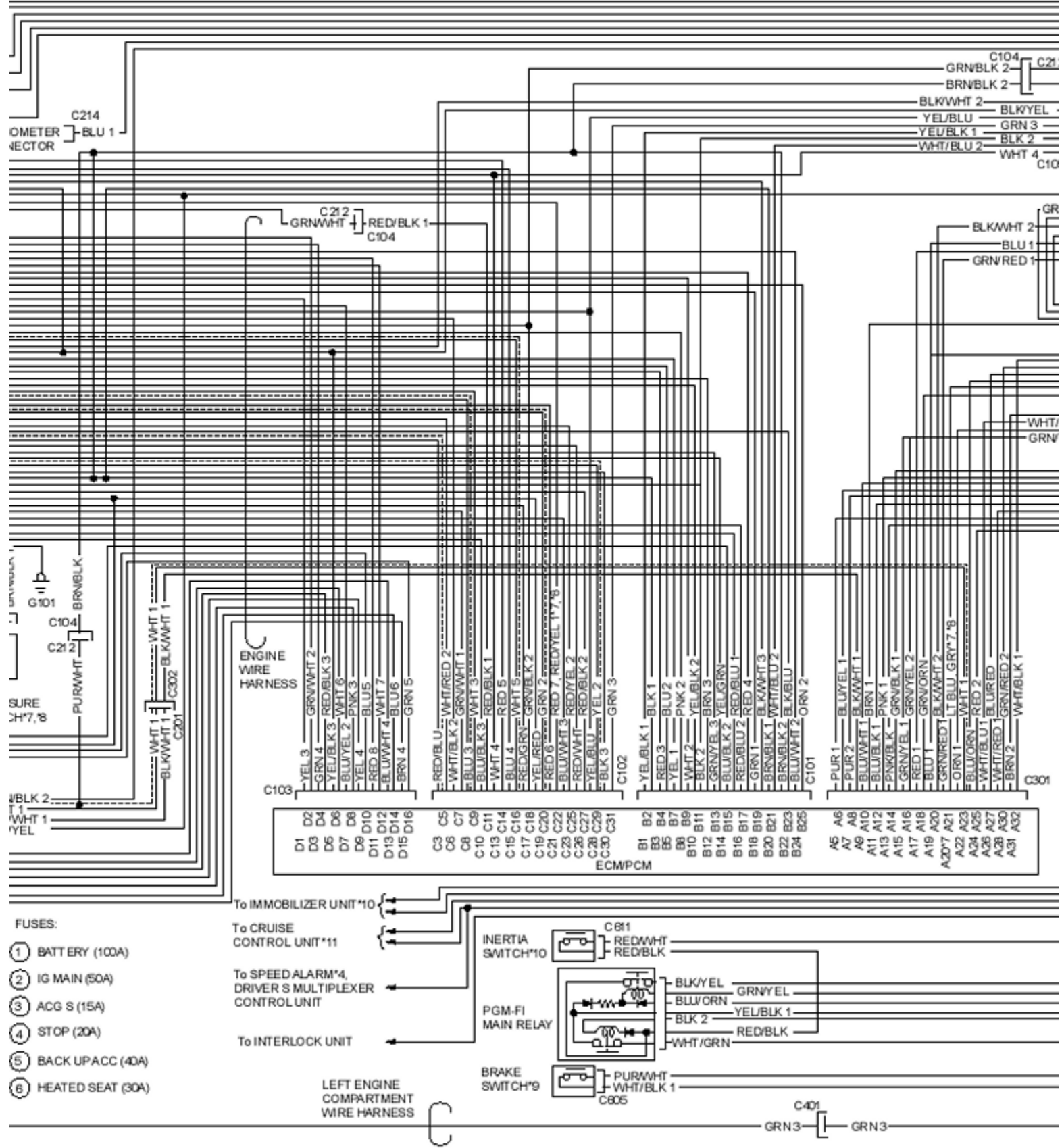
PASSENGER'S UNDER-DASH FUSE/RELAY BOX FUSES

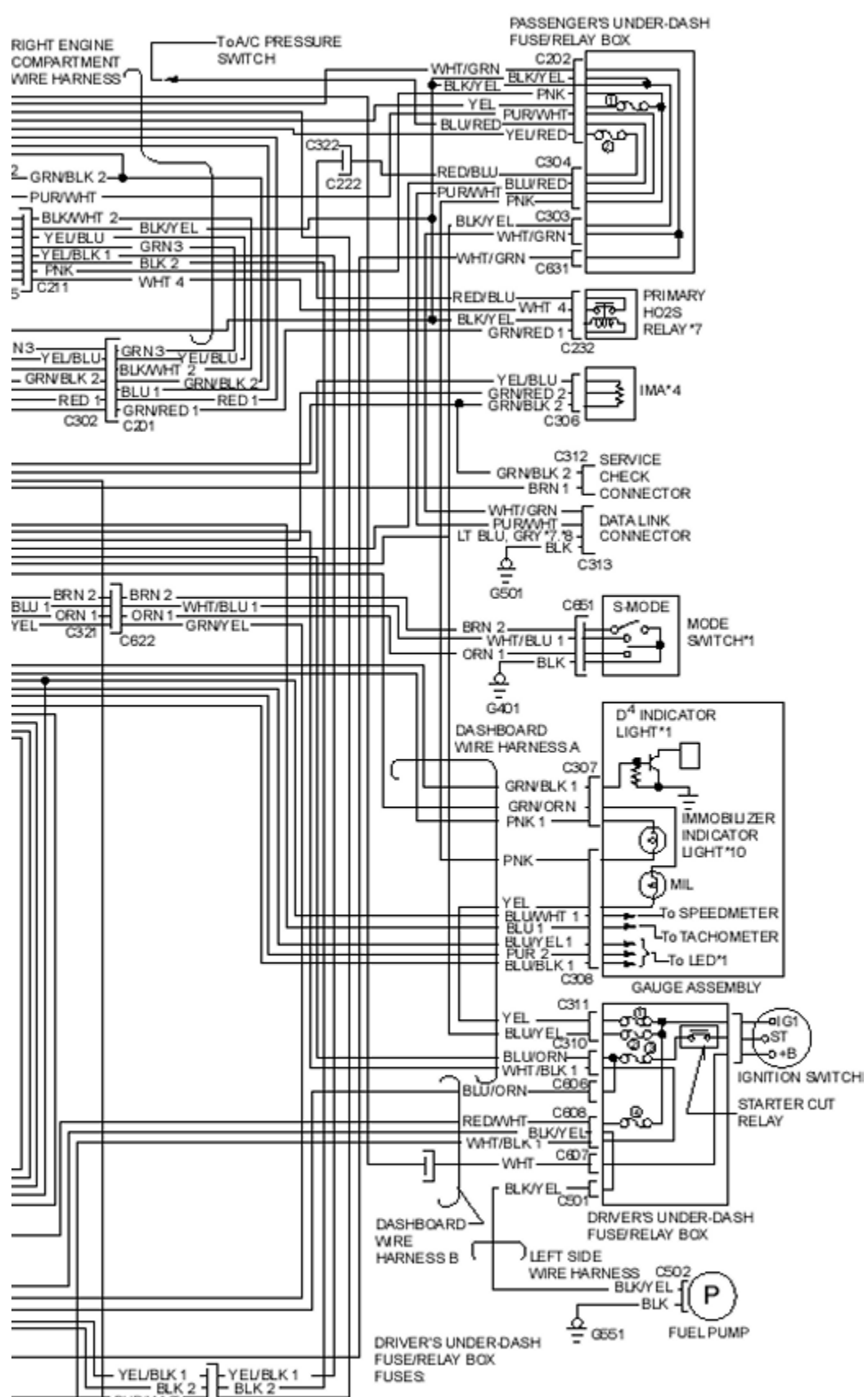
- ① No. 13 CLOCK BACK UP (75A)
- ② No. 6 LAPHEATER (20A)



PASSENGER'S UNDER-DASH FUSE/RELAY BOX FUSES

- ① No. 13 CLOCK BACK UP (75A)
- ② No. 6 LAPHEATER (20A)



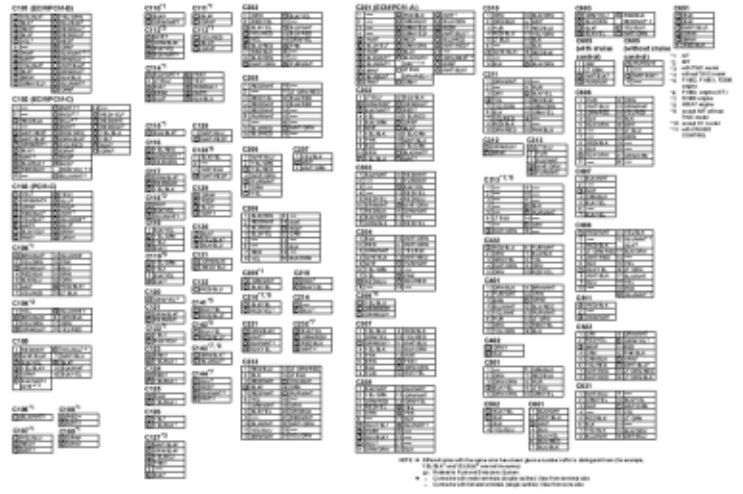
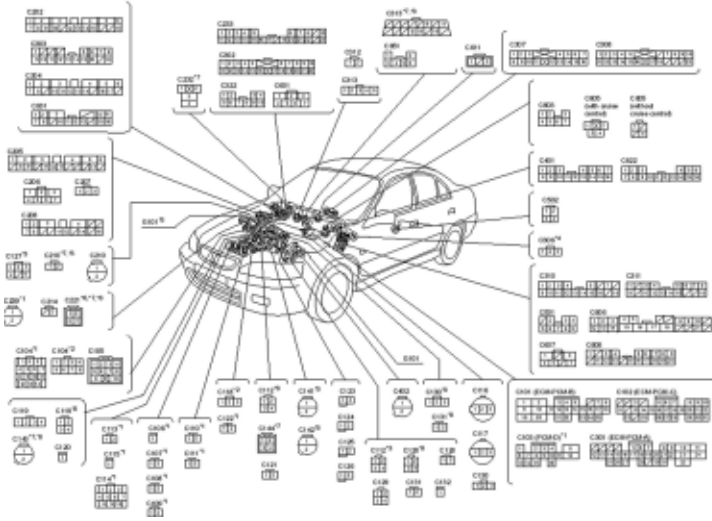


- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
- ② No. 6 ECU (ECMPCM) CRUISE CONT ROL (15A)
- ③ No. 13 STARTER SIGNAL (7.5A)
- ④ No. 1 FUEL PUMP (15A)

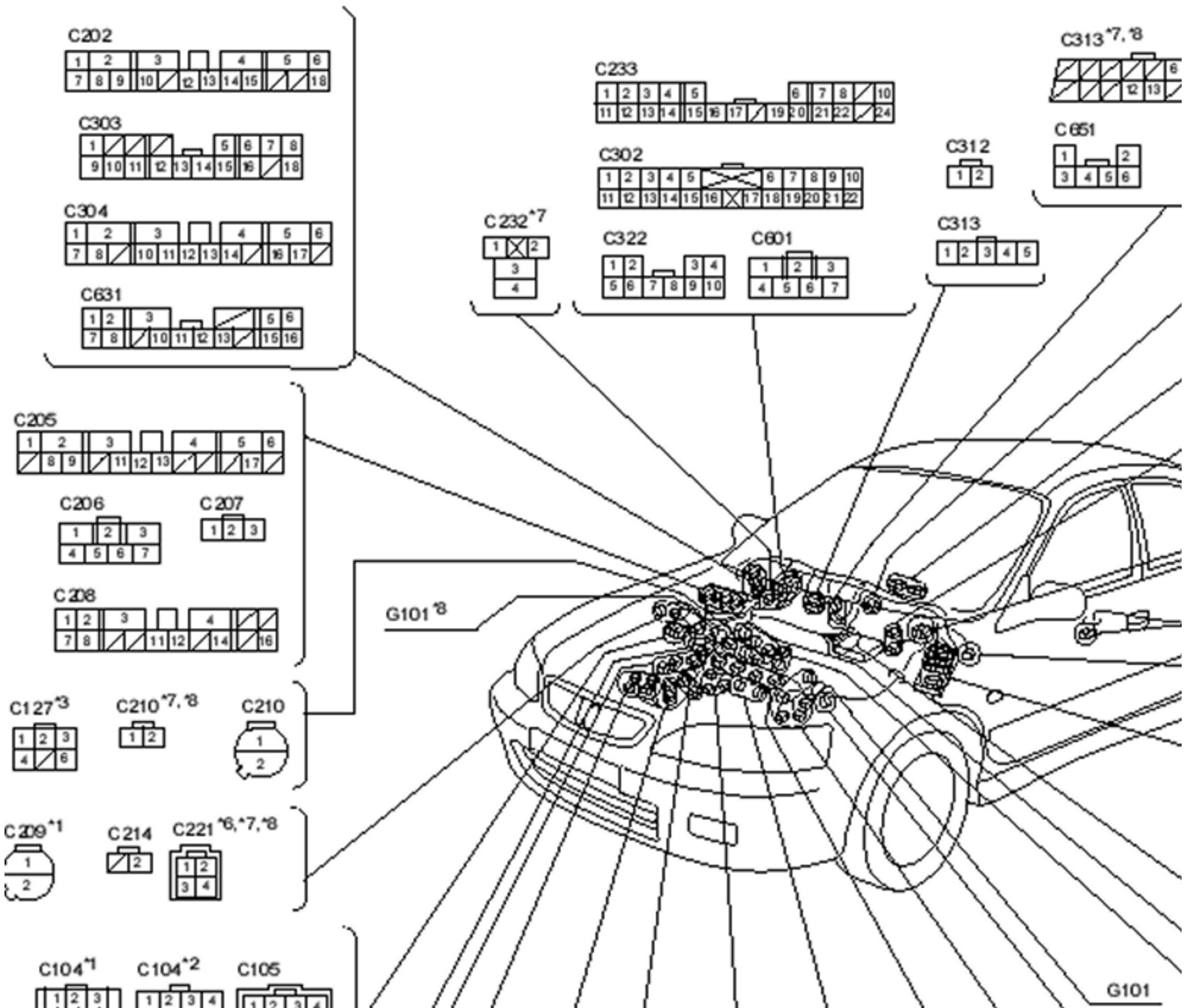
Diagrams

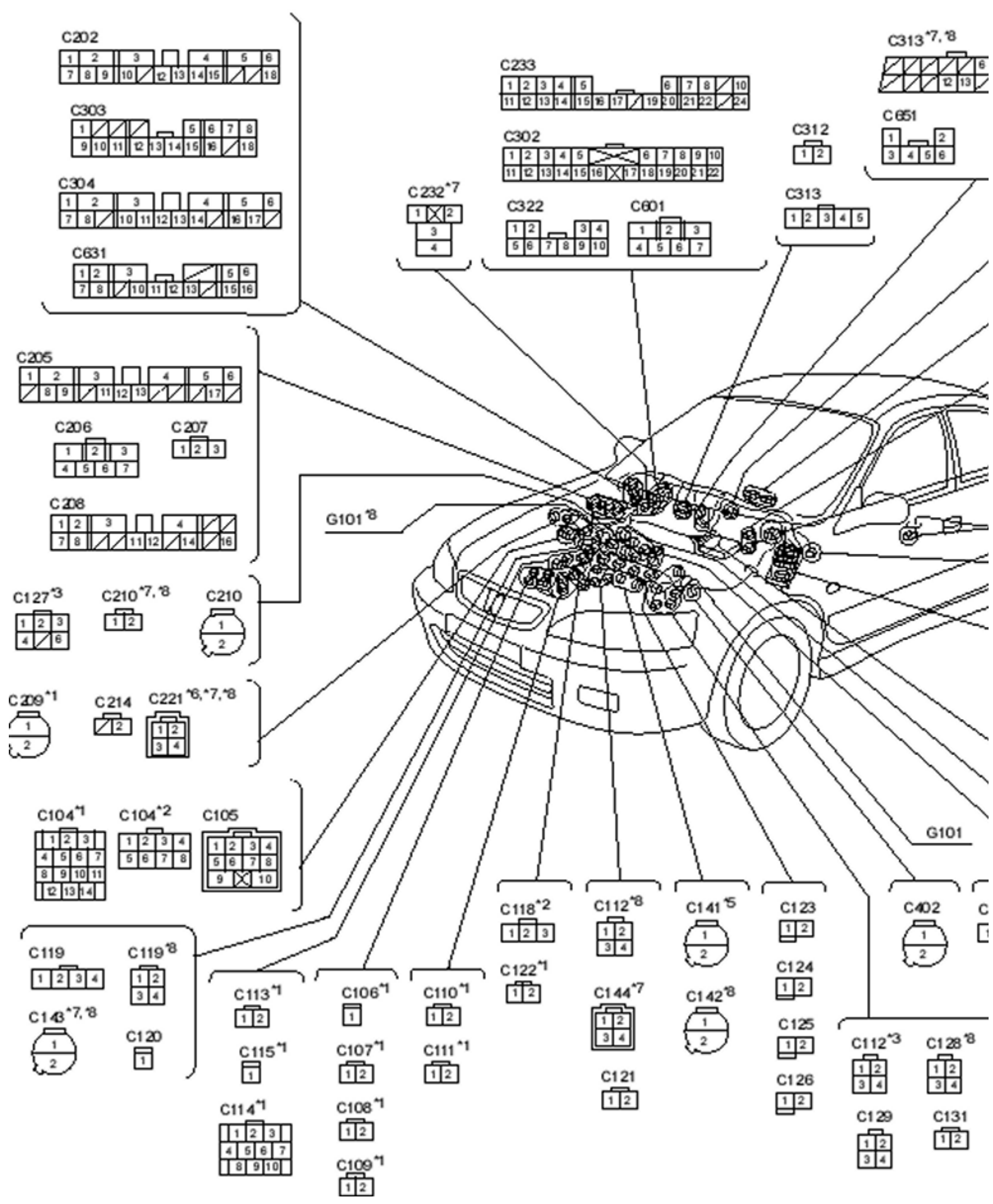
Fuel-injected System Connectors (F18B2, F18B3, F20B6, H22A7 engine: LHD)

11-A-150



1. The connector pinout is for the connector as shown in the diagram.
 2. The connector pinout is for the connector as shown in the diagram.
 3. The connector pinout is for the connector as shown in the diagram.





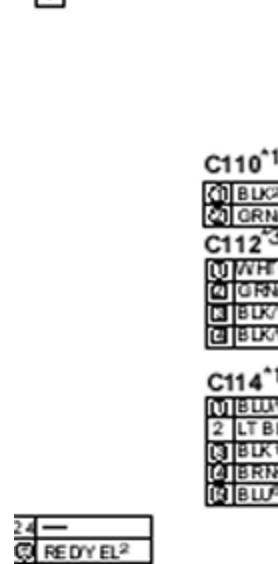
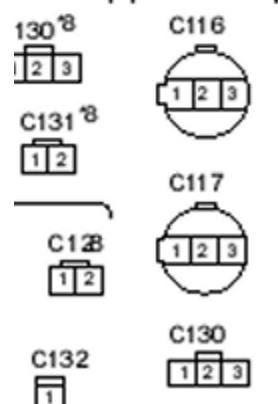
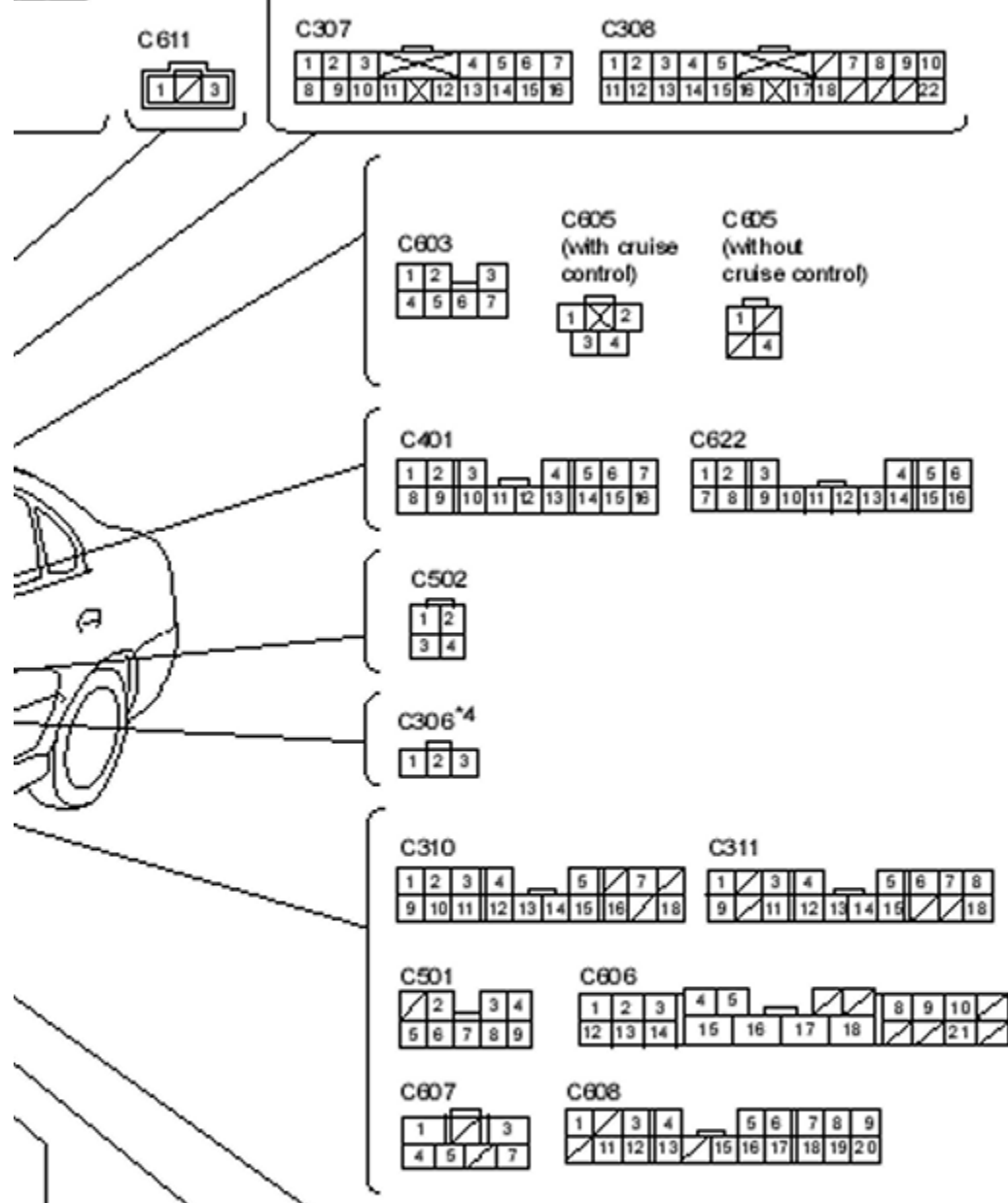
C101 (ECM/PCM-B)

1) YEL/BLK ¹	11) YEL/GRN
2) BLK ¹	12) BLU/BLK ²
3) RED ³	13) RED/BLU ¹
4) BLU ⁴	14) RED/BLU ²
5) YEL ¹	15) RED ⁴
6) —	16) GRN ¹
7) PNK ⁵	17) BLK/WH ^{2,7}
8) WH ⁶	18) BRN/BLK ¹
9) YEL/BLK ²	19) WH/BLU ²
10) BLK ²	20) BRN/BLK ²
11) BRN ⁶	21) BLK/BLU
12) GRN/YEL ³	22) BLU/WH ²
	23) GRP ²

C102 (ECM/PCM-C)

1) —	11) WH ^{4,7}
2) —	12) RED ^{7,7}
13) RED/YEL	14) BLU ^{4,7}





C101 (ECM/PCM-B)

1 YEL/BLK ¹	11 YEL/GRN
2 BLK ¹	12 BLU/BLK ²
3 RED ¹	13 RED/BLU ¹
4 BLU ²	14 RED/BLU ²
5 YEL ¹	15 RED ²
6 —	16 GRN ¹
7 PNK ²	17 BLK/WHT ^{2,7}
8 WHT ²	18 BRN/BLK ¹
9 YEL/BLK ²	19 WHT/BLU ²
10 BLK ²	20 BRN/BLK ²
11 BRN ²	21 BLK/BLU
12 GRN/YEL ³	22 BLU/WHT ²
	23 GRP ²

C102 (ECM/PCM-C)

1 —	11 WHT ^{4,7}
2 —	12 RED ^{2,7}
3 RED/BLU	13 BLU ^{4,7}
4 —	14 WHT ⁵
5 WHT/RED ²	15 RED/GRN
6 WHT/BLK ²	16 GRN/BLK ²
7 GRN/WHT ¹	17 YEL/RED
8 BLU ³	18 GRP ²
9 WHT ³	19 RED ²
10 BLU/BLK ³	20 RED ⁷
11 RED/BLK ¹	21 RED/YEL ^{7,8}
12 —	22 BLU/WHT ³

C103 (PCM-C)

1 YEL ³	11 YEL ⁴
2 GRN/WHT ²	12 BLU ⁵
3 GRN ⁴	13 RED ⁵
4 RED/BLK ³	14 WHT ⁷
5 YEL/BLK ³	15 BLU/WHT ⁴
6 WHT ⁶	16 BLU ²
7 BLU/YEL ²	17 BRN ⁴
8 PNK ³	18 GRN ⁵

C104¹

1 BRN/BLK ²	8 BLU/WHT
2 YEL/GRN	9 PNK
3 GRN/BLK ²	10 BLU
4 RED/BLK	11 BRN
5 BLK/BLU	12 GRN
6 WHT	13 RED/BLK ¹
7 YEL/RED	14 LT BLU

C104²

1 YEL	8 BLU/WHT ³
2 BRN/BLK ²	9 GRN/BLK
3 YEL/GRN	10 GRN
4 GRN/BLK ²	11 YEL/RED

C105

1 RED/WHT	11 YEL/BLU ⁴
2 WHT/BLU ²	12 WHT/BLU
3 BLK/YEL	13 BLK ²
4 YEL/BLK ³	14 BLK/WHT
5 GRN ³	15 BLK/YEL
6 BLK/WHT ²	
7 WHT ^{4,5}	

C106¹

1 BLU/WHT ²

C107¹

1 YEL/BLU
2 RED ⁵
3 WHT ⁷

C108¹

1 RED ⁴
2 WHT ²

C109¹

1 GRN ²
2 GRN ¹

C101 (ECM-PCM-B)

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32

C102 (ECM-PCM-C)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

C103 (PCM-D)¹

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

C301 (ECM-PCM-A)

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

C301 (ECM/PCM-A)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48

C302

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

C310

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

C311

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

C202

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36

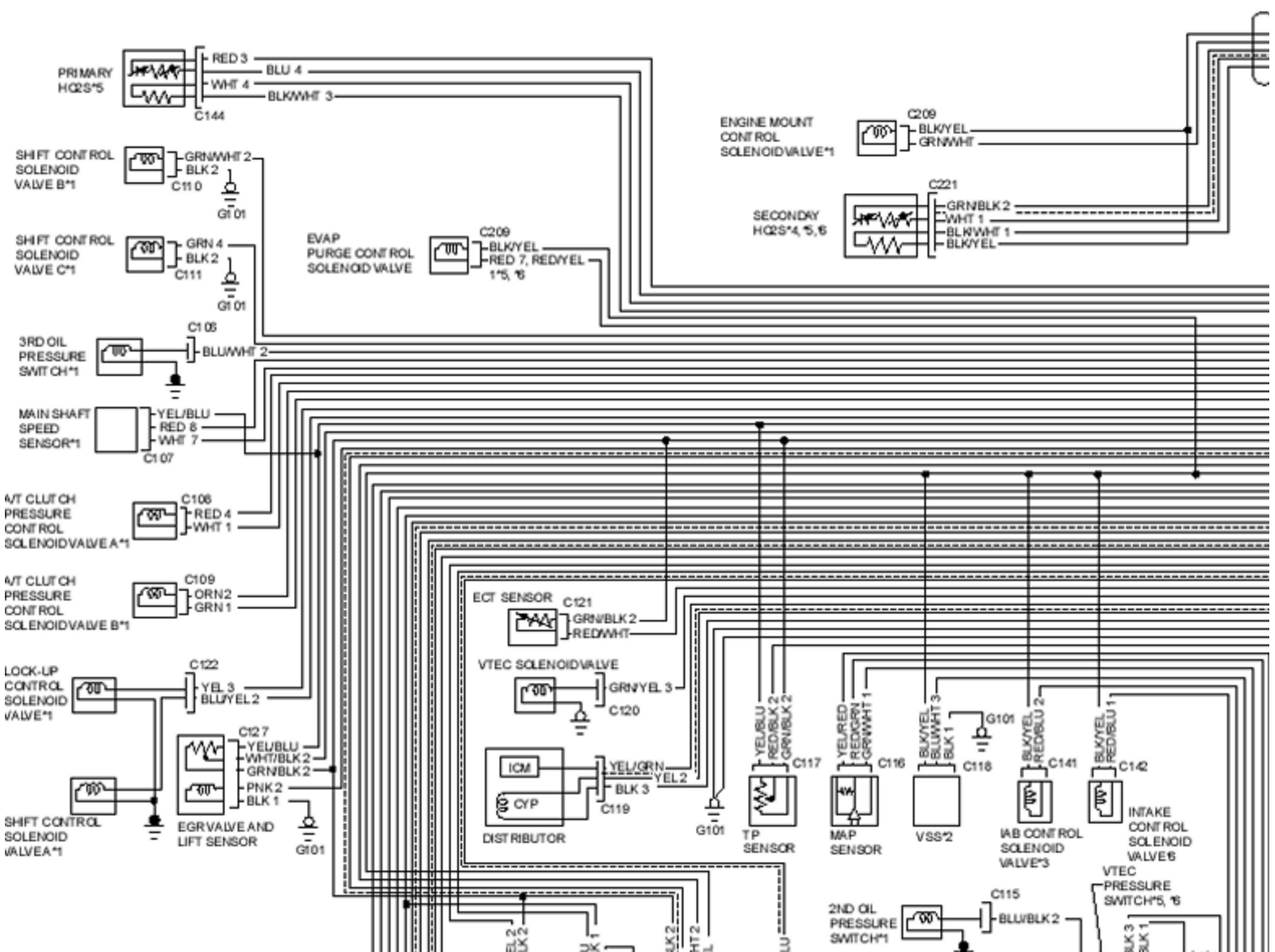
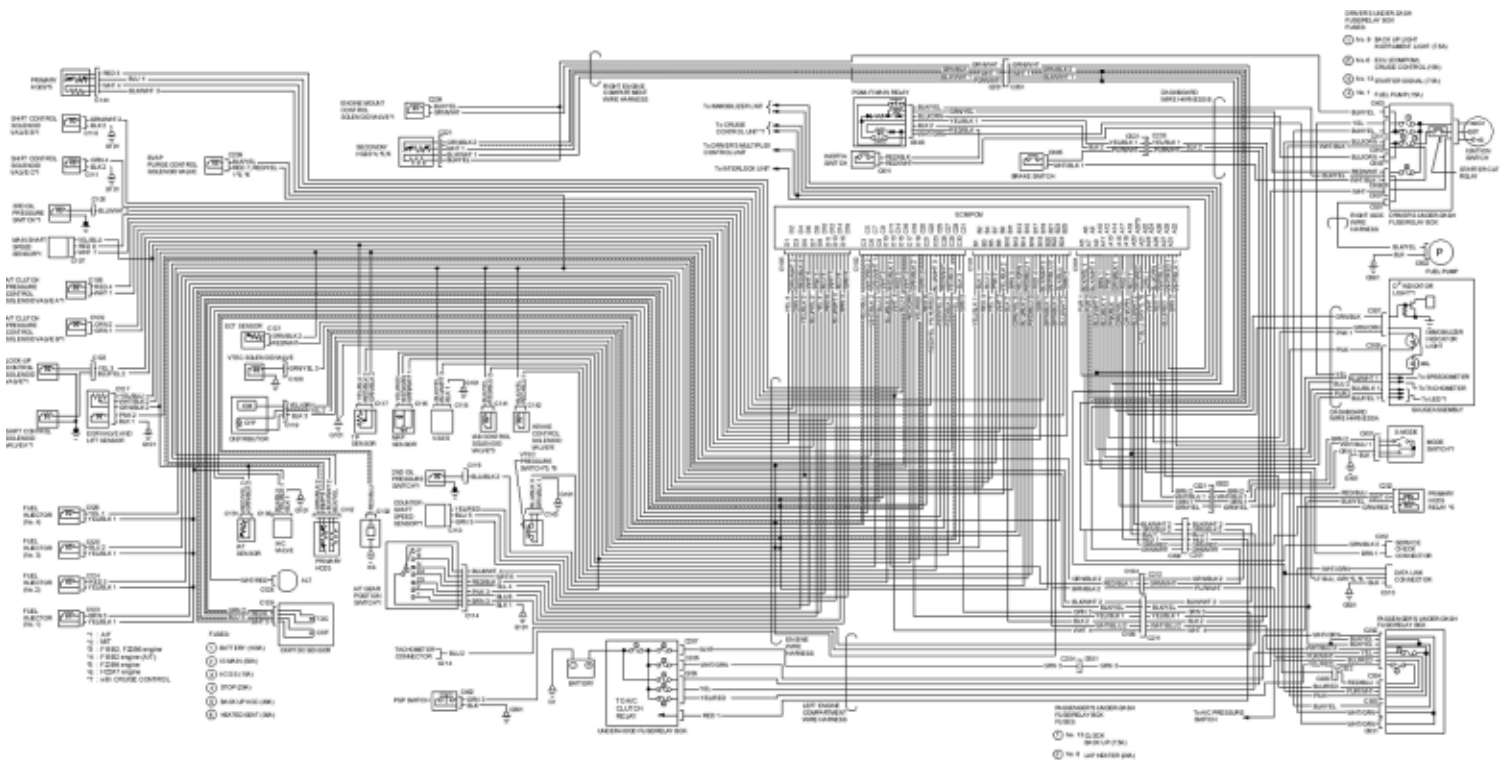
C205

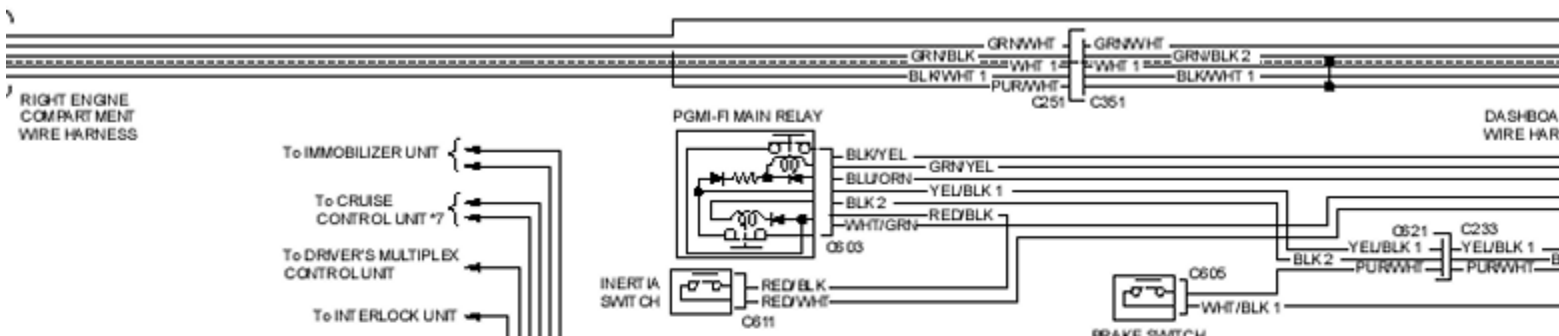
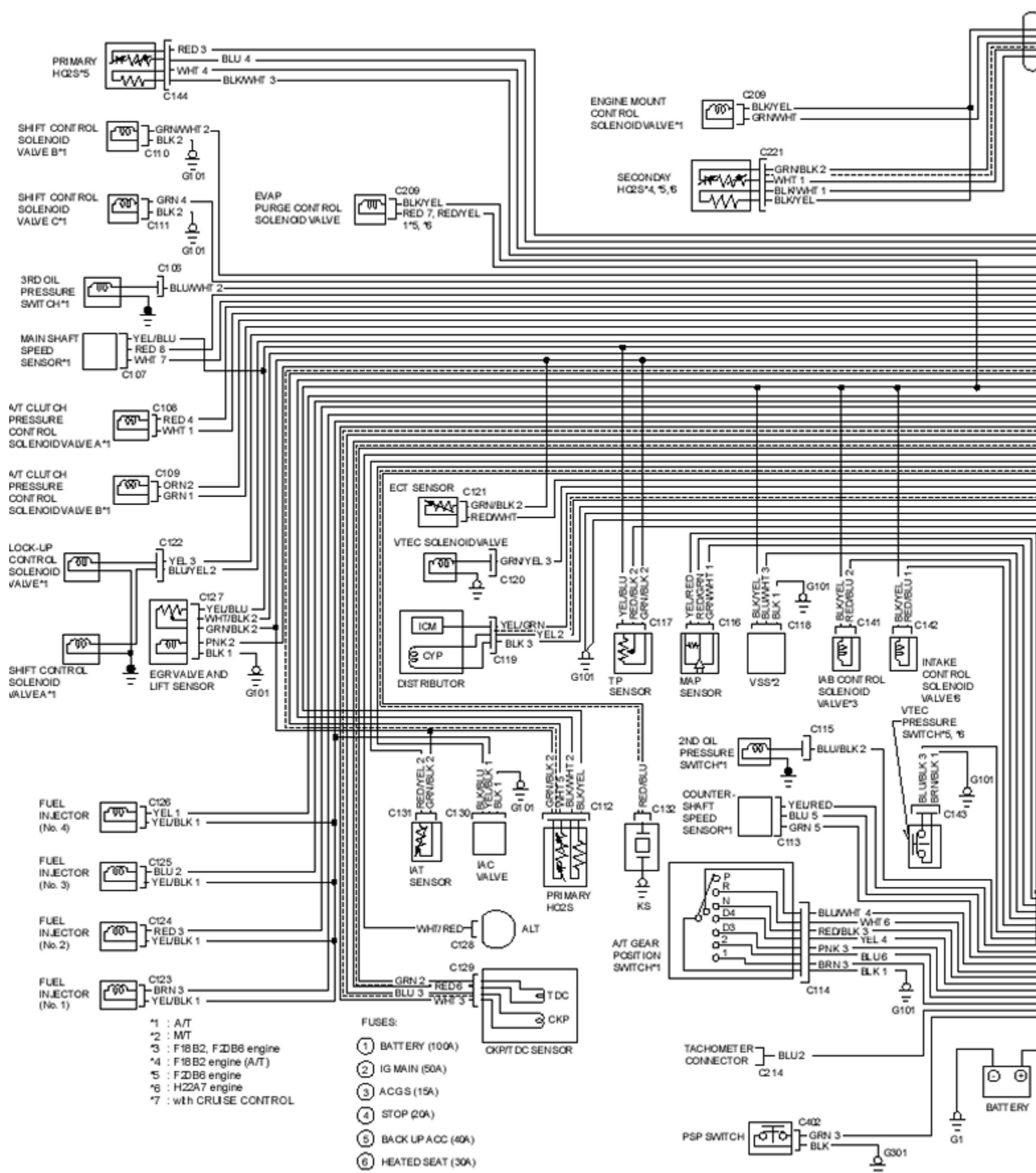
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

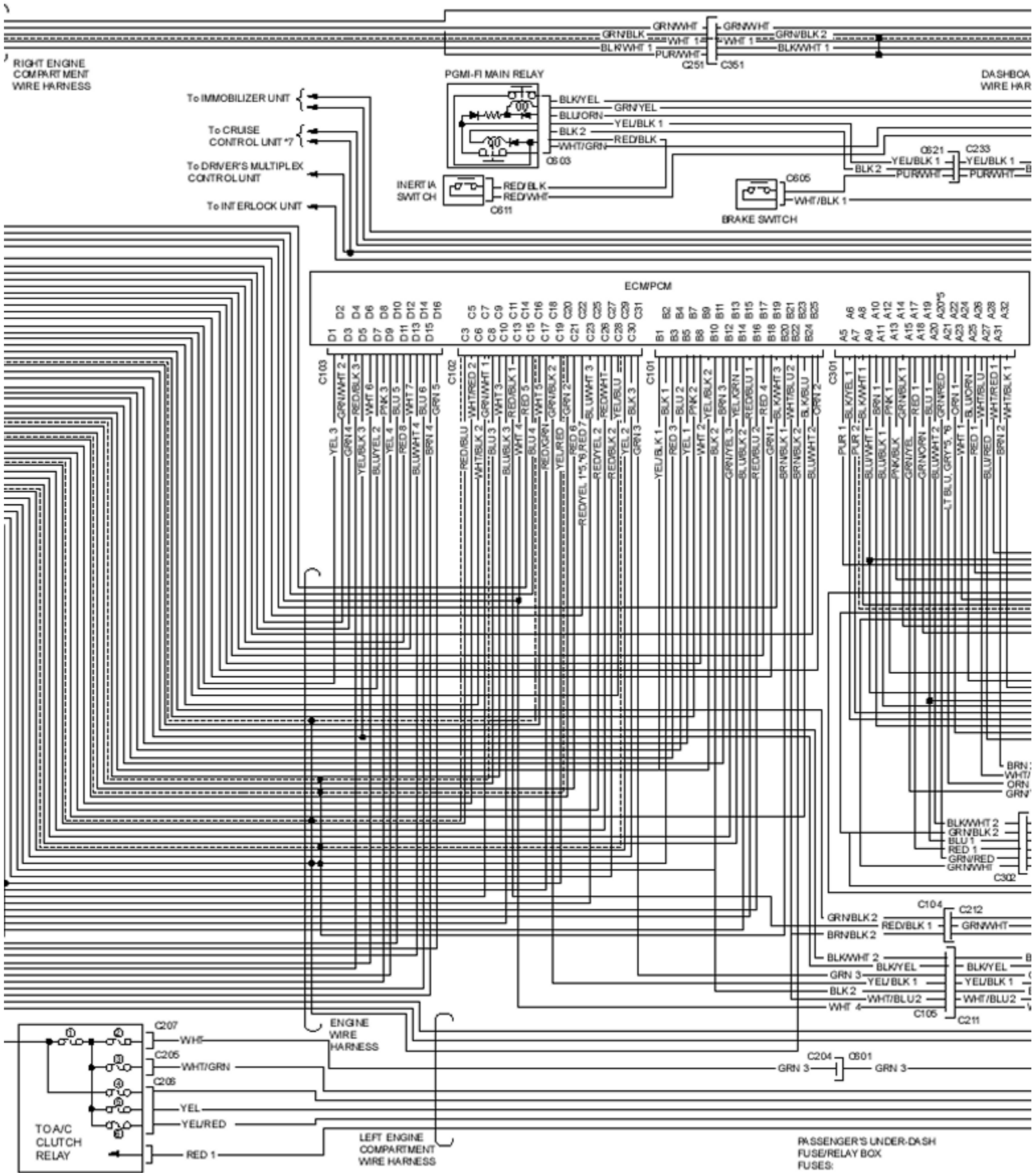
Diagrams

Fuel-injected System Diagram (F18B2, F18B3, F20B6, H22A7 engine: RHD)

11-A-151







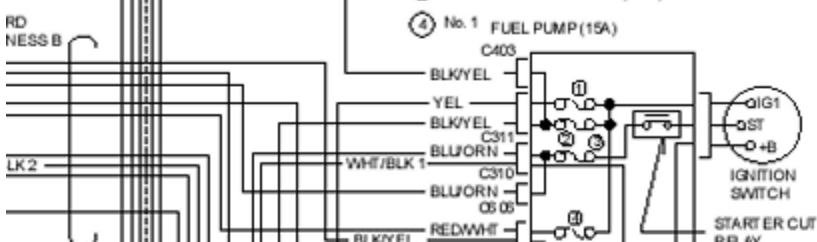
UNDERHOOD FUSE/RELAY BOX

PASSENGER'S UNDER-DASH FUSE/RELAY BOX FUSES:

- ① No. 13 CLOCK BACK UP (7.5A)
- ② No. 6 LAP HEATER (20A)

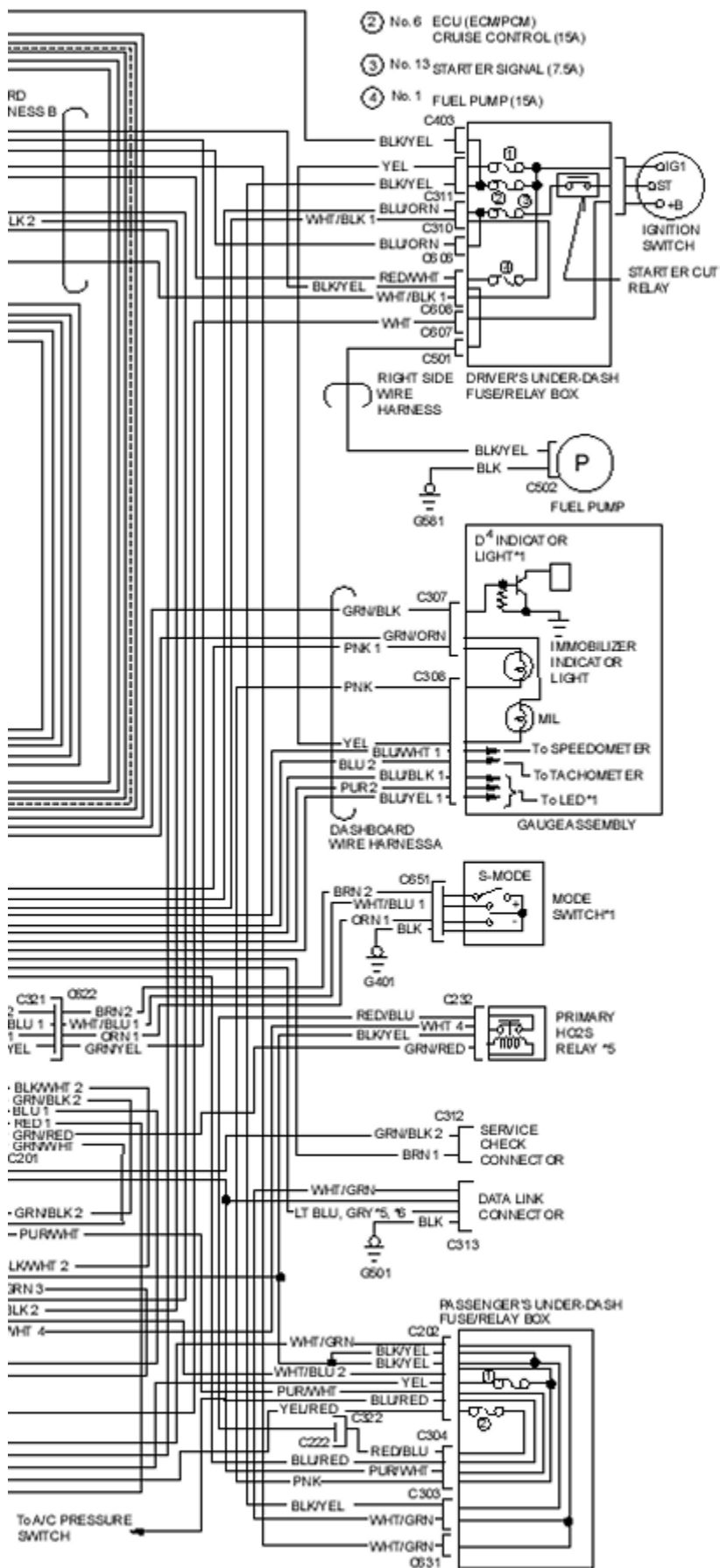
DRIVER'S UNDER-DASH FUSE/RELAY BOX FUSES:

- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
- ② No. 6 ECU (ECM/PCM) CRUISE CONTROL (15A)
- ③ No. 13 STARTER SIGNAL (7.5A)
- ④ No. 1 FUEL PUMP (15A)



DRIVER'S UNDER-DASH FUSE/RELAY BOX
FUSES:

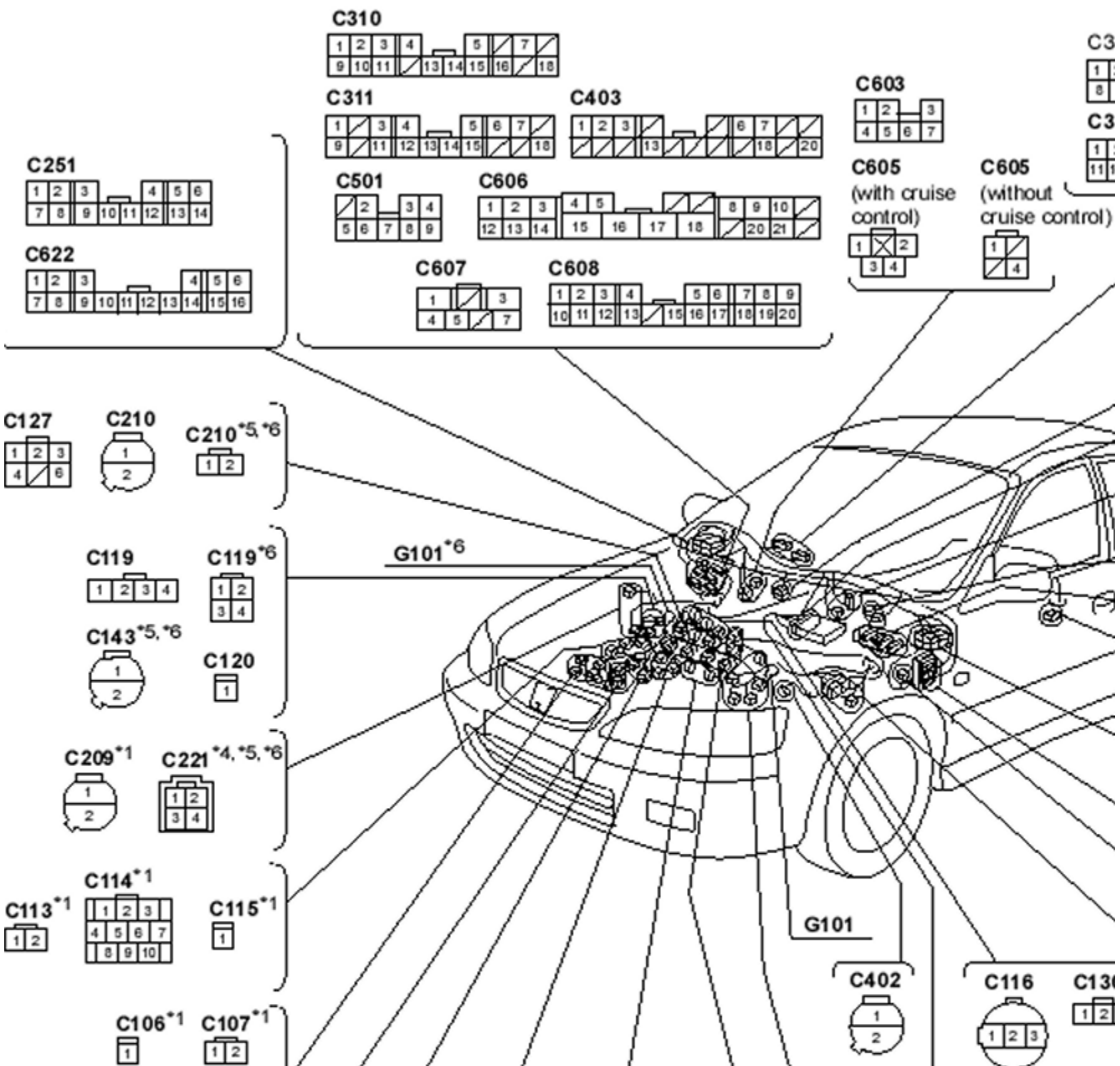
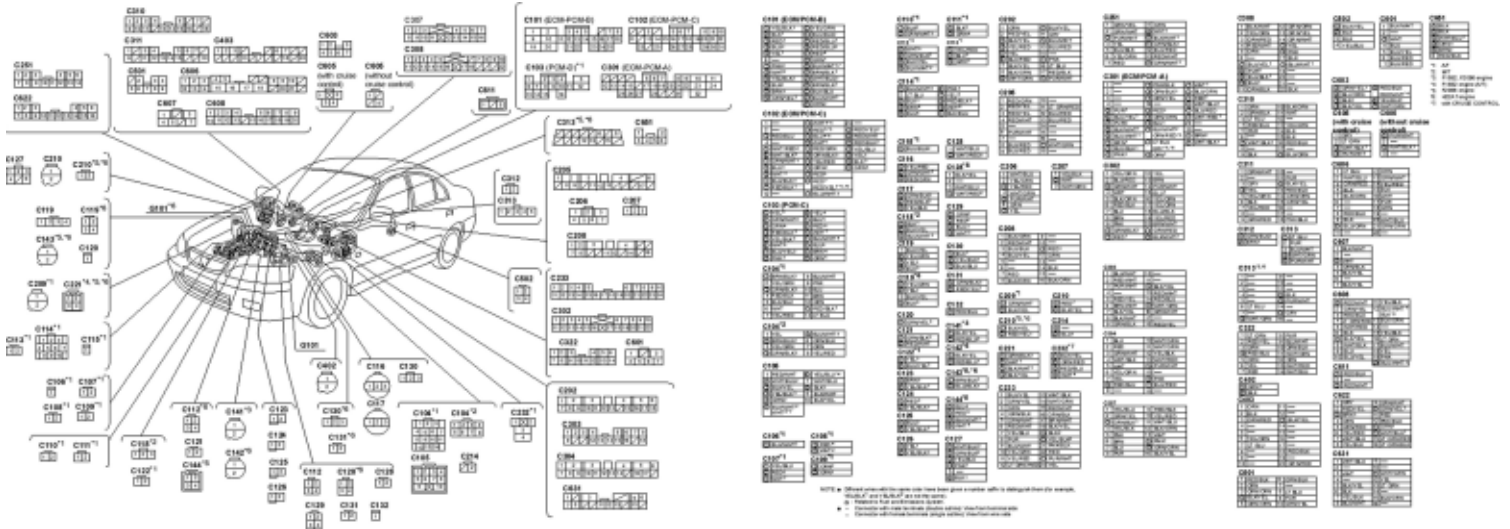
- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
- ② No. 6 ECU (ECM/PCM) CRUISE CONTROL (15A)
- ③ No. 13 STARTER SIGNAL (7.5A)
- ④ No. 1 FUEL PUMP (15A)

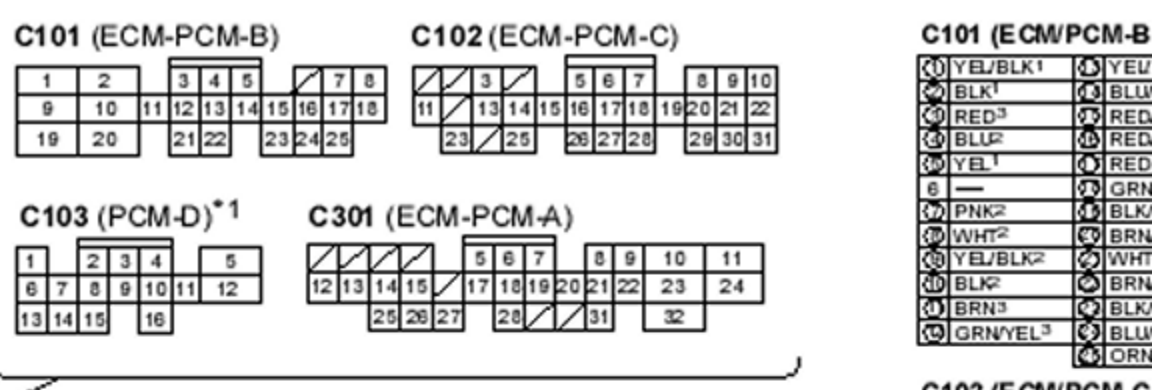
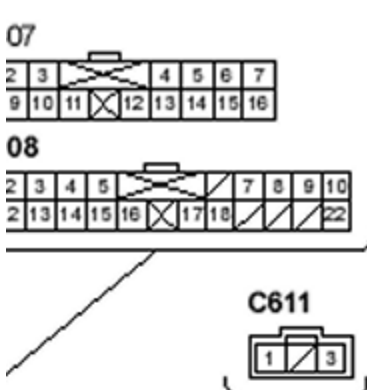
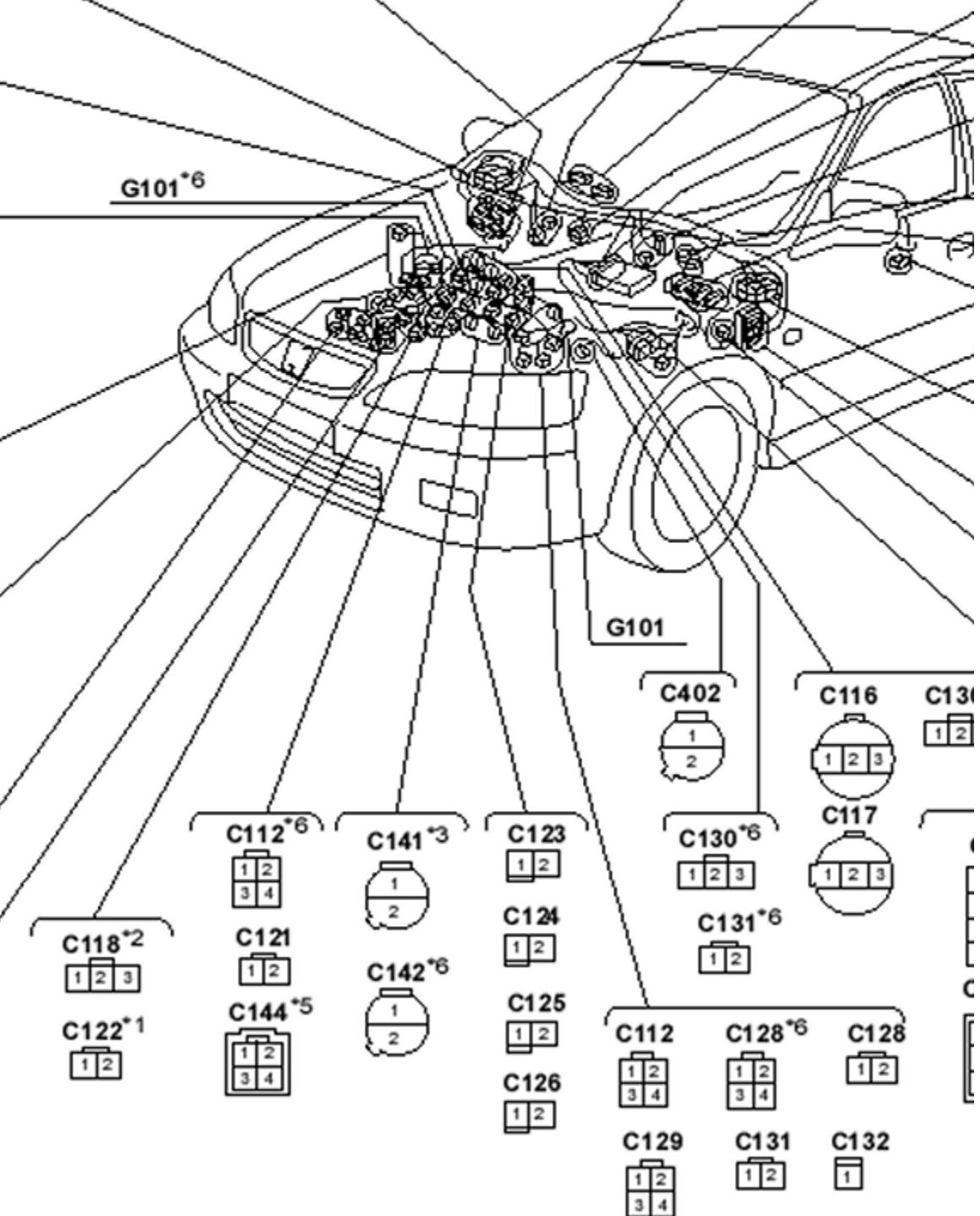
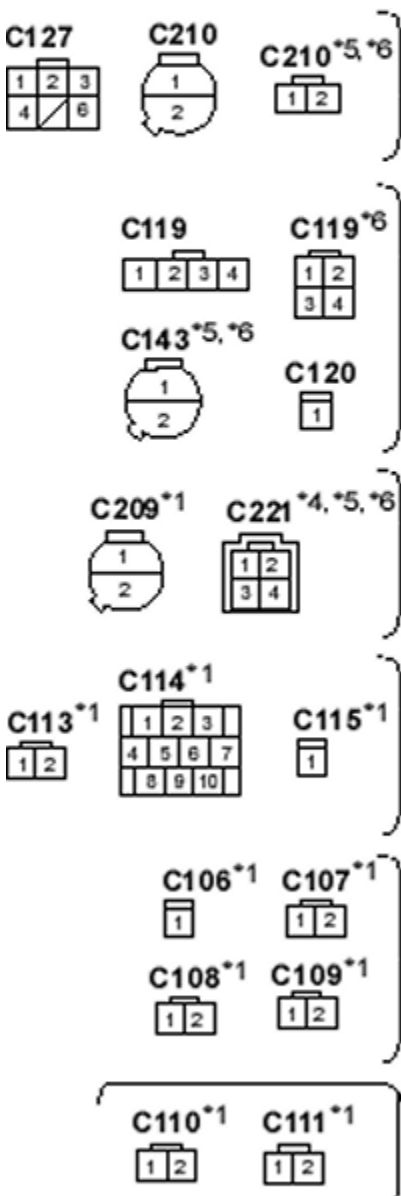
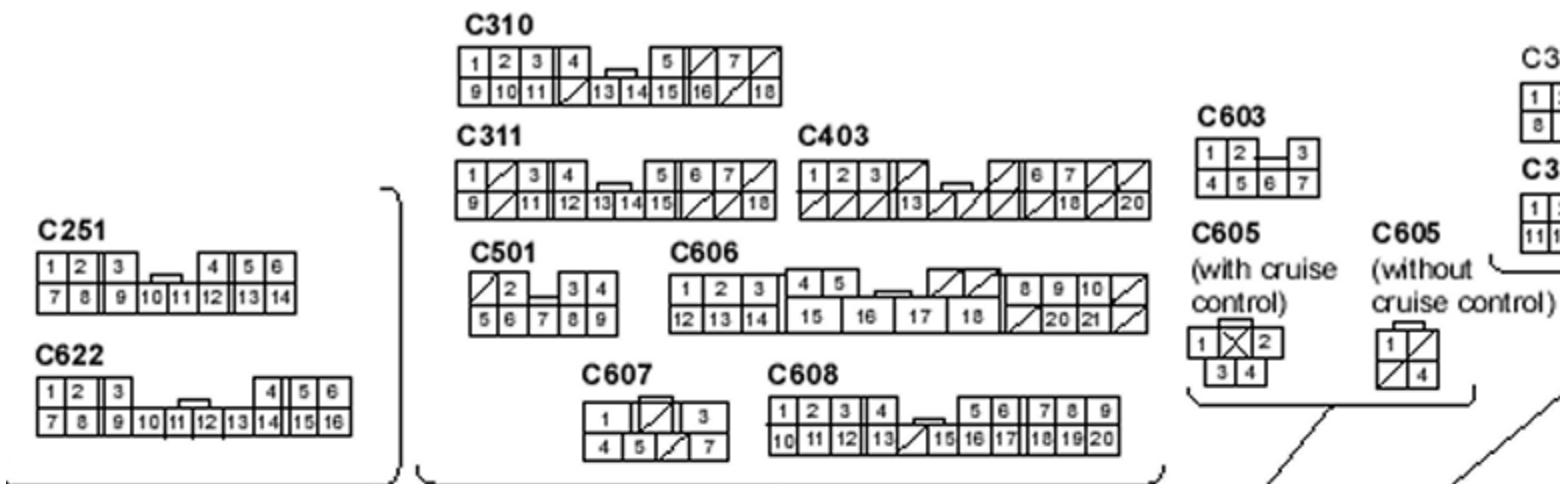


Diagrams

Fuel-injected System Connectors (F18B2, F18B3, F20B6, H22A7 engine: RHD)

11-A-152







C611



C101 (ECM-PCM-B)



C102 (ECM-PCM-C)



C103 (PCM-D)*1



C301 (ECM-PCM-A)



C101 (ECM/PCM-B)

① YEL/BLK ¹	② YEL/BLK ¹
③ BLK ¹	④ BLU
⑤ RED ³	⑥ RED
⑦ BLU ²	⑧ RED
⑨ YEL ¹	⑩ RED
⑪ —	⑫ GRN
⑬ PNK ²	⑭ BLK
⑮ WHT ²	⑯ BRN
⑰ YEL/BLK ²	⑱ WHT
⑲ BLK ²	⑳ BRN
㉑ BRN ³	㉒ BLK
㉓ GRN/YEL ³	㉔ BLU
㉕ —	㉖ ORN

C102 (ECM/PCM-C)

1	—	① WHT
2	—	② RED
3	RED/BLU	③ BLU
4	—	④ WHT
5	WHT/RED ²	⑤ RED
6	WHT/BLK ²	⑥ GRN
7	GRN/WHT ¹	⑦ YEL
8	BLU ³	⑧ GRN
9	WHT ³	⑨ RED
10	BLU/BLK ³	⑩ RED
11	RED/BLK ¹	⑪ RED
12	—	⑫ BLU

C103 (PCM-C)

① YEL ³	② YEL
③ GRN/WHT ²	④ BLU
⑤ GRN ⁴	⑥ RED
⑦ RED/BLK ³	⑧ WHT
⑨ YEL/BLK ³	⑩ BLU
⑪ WHT ⁶	⑫ BLU
⑬ BLU/YEL ²	⑭ BRN
⑮ PNK ³	⑯ GRN

C104*1

① BRN/BLK ²	8 BLU
2 YEL/GRN	9 PNK
③ GRN/BLK ²	10 BLU
4 RED/BLK	11 BRN
5 BLK/BLU	12 GRN
6 WHT	④ RED
7 YEL/RED	14 LT B

C104*2

1 YEL	⑤ BLU
② BRN/BLK ²	6 GRN
3 YEL/GRN	7 GRN
④ GRN/BLK ²	8 YEL

C105

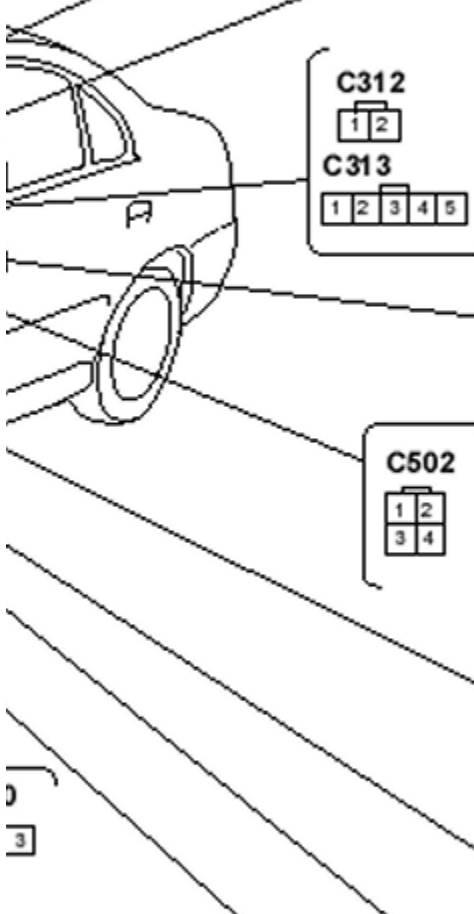
1 RED/WHT	⑥ YEL
② WHT/BLU	7 WHT
③ BLK/YEL	⑦ BLK
④ YEL/BLK ³	8 BLK
⑤ GRN ²	10 BLK
⑥ BLK/WHT ²	WHT ^{4,7}

C106*1

① BLU/WHT ²	⑧ R
	⑨ V

C107*1

① YEL/BLU	⑩ C
② RED ⁶	⑪ C
③ WHT ⁷	⑫ C



GRN
BLK ²
BLU ¹
BLU ²
—
1
WHT ^{5*}
BLK ¹
BLU ²
BLU
WHT ²
2

C110*1

① BLK ²
② GRN/WHT ²

C112*3

① WHT ⁵
② GRN/BLK ²
③ BLK/YEL
④ BLK/WHT ²

C114*1

① BLU/WHT ⁴	② PNK ³
3 BLK ¹	④ YEL ⁴
⑤ BRN ⁴	⑥ RED/BLK ³
⑦ BLU ⁵	⑧ WHT ⁶
⑨ BLK/BLU	⑩ BLK/BLU

C111*1

① BLK ²
② GRN ⁴

C113*1

① YEL/RED
② BLU ⁵
③ GRN ⁵

C202

1 GRN	① BLK/YEL
2 RED/YEL	11 GRY
③ BLK/YEL	④ BLU/WHT
⑤ YEL/RED	13 BLU/RED
⑥ YEL	14 —
⑦ BLU/RED	⑧ PNK
8 BLK/YEL	16 LT BLU
9 BLK/ORN	17 RED/BLK
⑩ WHT/GRN	⑪ PUR/WHT

C205

1 RED/GRN	10 —
2 RED/YEL	11 LT GRN/RED
3 RED/YEL	12 BLU/RED

C251

1 GRN/YEL	8 GRN
2 GRN/WHT	① WHT ¹
③ PUR/WHT	④ BLK/WHT ¹
4 YEL	⑤ GRN/BLK ²
5 BLU/BLK	12 BLU/RED
6 YEL/GRN	13 RED/WHT
7 RED	⑥ GRN/WHT ¹

C301 (ECM/PCM-A)

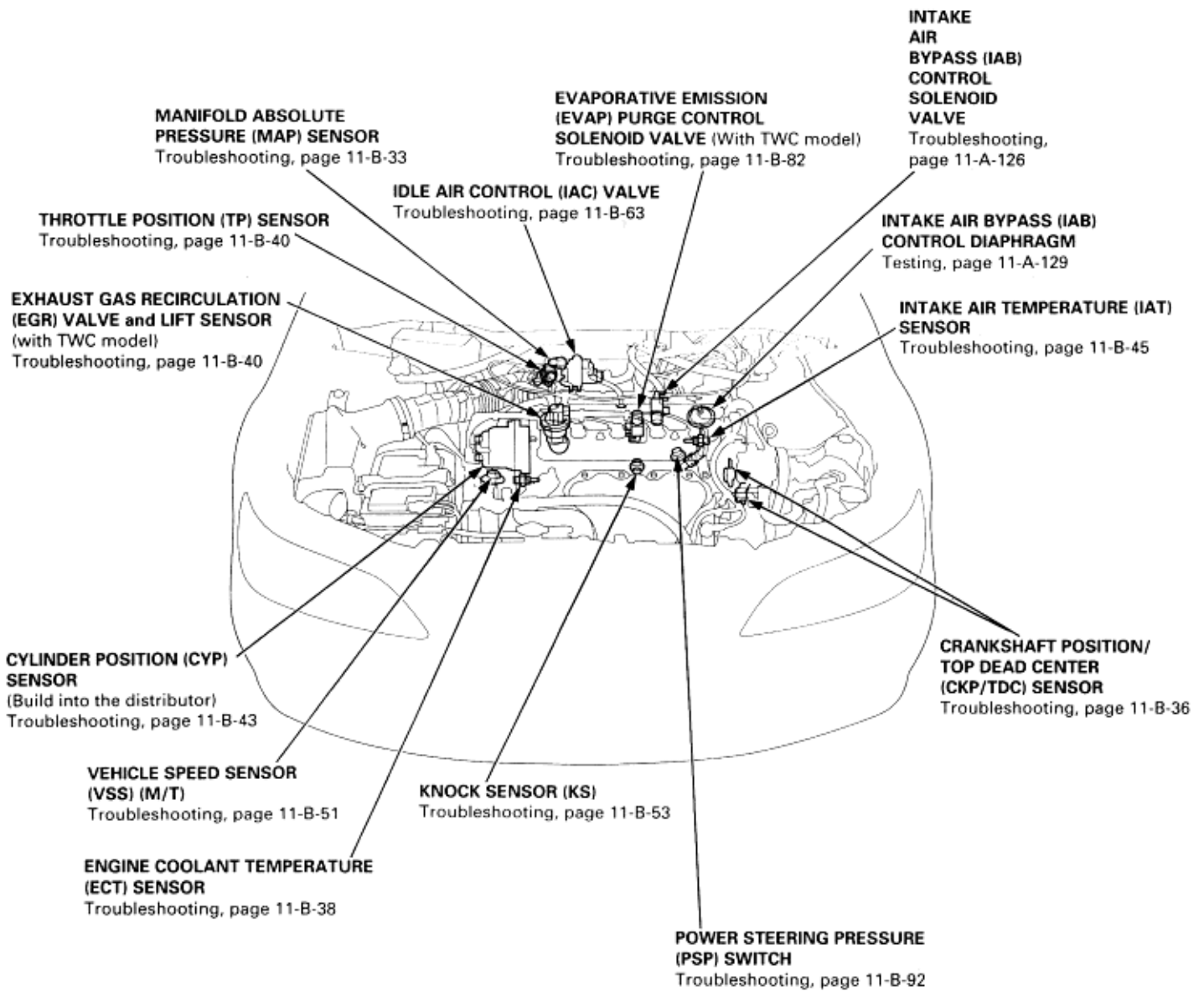
1 —	③ PNK/BLK	④ WHT ¹
2 —	⑤ GRN/BLK ¹	⑥ BLU/ORN
3 —	⑦ GRN/YEL	⑧ RED ²
4 —	16 —	⑨ WHT/BLU ¹
⑩ PUR ¹	⑪ RED ¹	⑫ BLU/RED
⑬ BLU/BLK ¹	⑭ GRN/ORN	⑮ WHT/RED ¹

C308

1 BLK
2 YEL
3 GRN
4 RED
5 ORN
6 —
⑦ BLU
⑧ PUR
⑨ BLU
⑩ BLU
11 GRN

C310

1 GRN
2 GRN

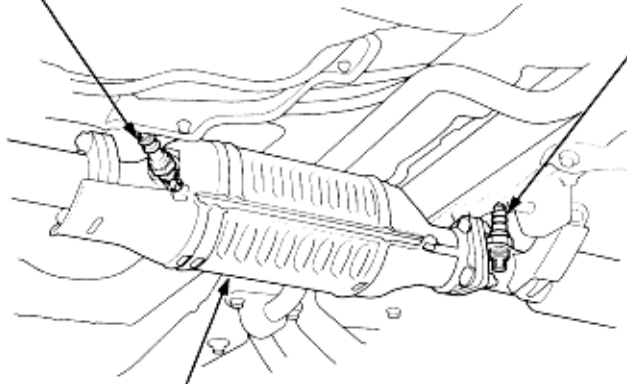


To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-B-33)
- (See Page 11-B-40)
- (See Page 11-B-43)
- (See Page 11-B-51)
- (See Page 11-B-38)
- (See Page 11-B-63)
- (See Page 11-B-53)
- (See Page 11-B-82)
- (See Page 11-A-126)
- (See Page 11-A-129)
- (See Page 11-B-45)
- (See Page 11-B-36)
- (See Page 11-B-92)

SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (With TWC model: A/T)
Troubleshooting, page 11-B-58

PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S)
(With TWC model)
Troubleshooting, page 11-B-31
Replacement, page 11-B-60



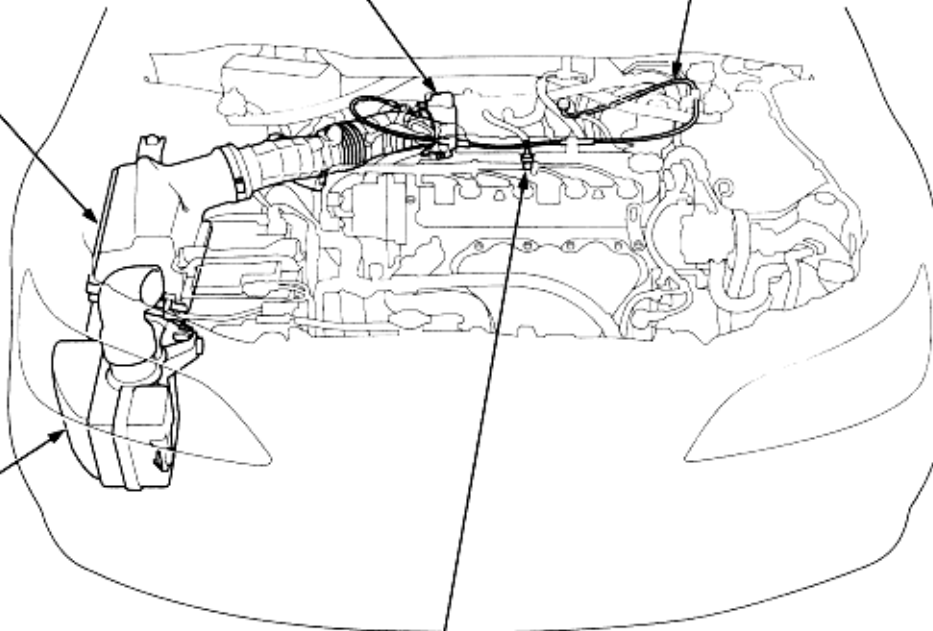
THREE WAY CATALYTIC CONVERTER (TWC)
Inspection, page 11-B-75

THROTTLE BODY (TB)
Inspection, page 11-B-72
Disassembly, page 11-B-73

THROTTLE CABLE
Inspection/Adjustment, page 11-A-120
Installation, page 11-A-121

AIR CLEANER (ACL)
Replacement, page 11-A-119

RESONATOR



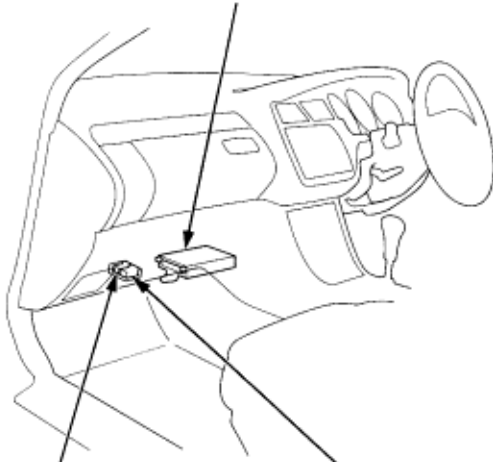
POSITIVE CRANKCASE VENTILATION (PCV) VALVE
Inspection, page 11-A-143

To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-B-58)
- (See Page 11-B-31)
- (See Page 11-B-60)
- (See Page 11-B-75)
- (See Page 11-B-119)
- (See Page 11-B-72)
- (See Page 11-B-73)
- (See Page 11-A-120)
- (See Page 11-A-121)
- (See Page 11-A-143)
- (See Page 11-A-119)

LHD:

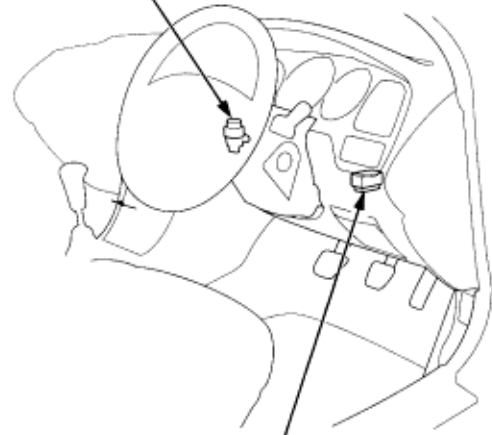
**ENGINE CONTROL MODULE (ECM)/
POWERTRAIN CONTROL MODULE (PCM)**
Removal, page 11-B-15
Troubleshooting Procedures, page 11-B-13
Troubleshooting, page 11-B-26



**DATA LINK
CONNECTOR (DLC)**
(5P)

SERVICE CHECK CONNECTOR
Self-diagnostic Procedures, page 11-B-13

INERTIA SWITCH
Description, page 11-A-110

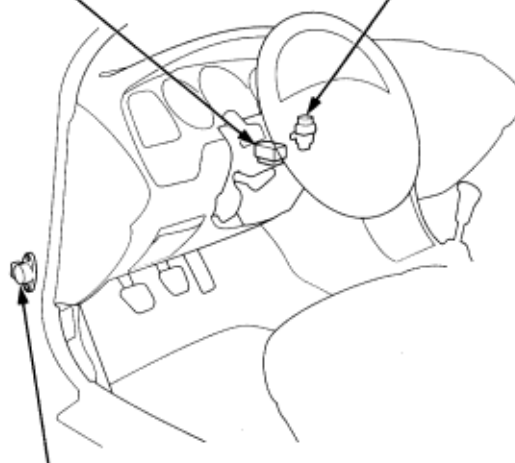


PGM-FI MAIN RELAY
Relay testing, page 11-A-111
Troubleshooting, page 11-A-112

RHD:

PGM-FI MAIN RELAY
Relay testing, page 11-A-111
Troubleshooting, page 11-A-112

INERTIA SWITCH
Description, page 11-A-110

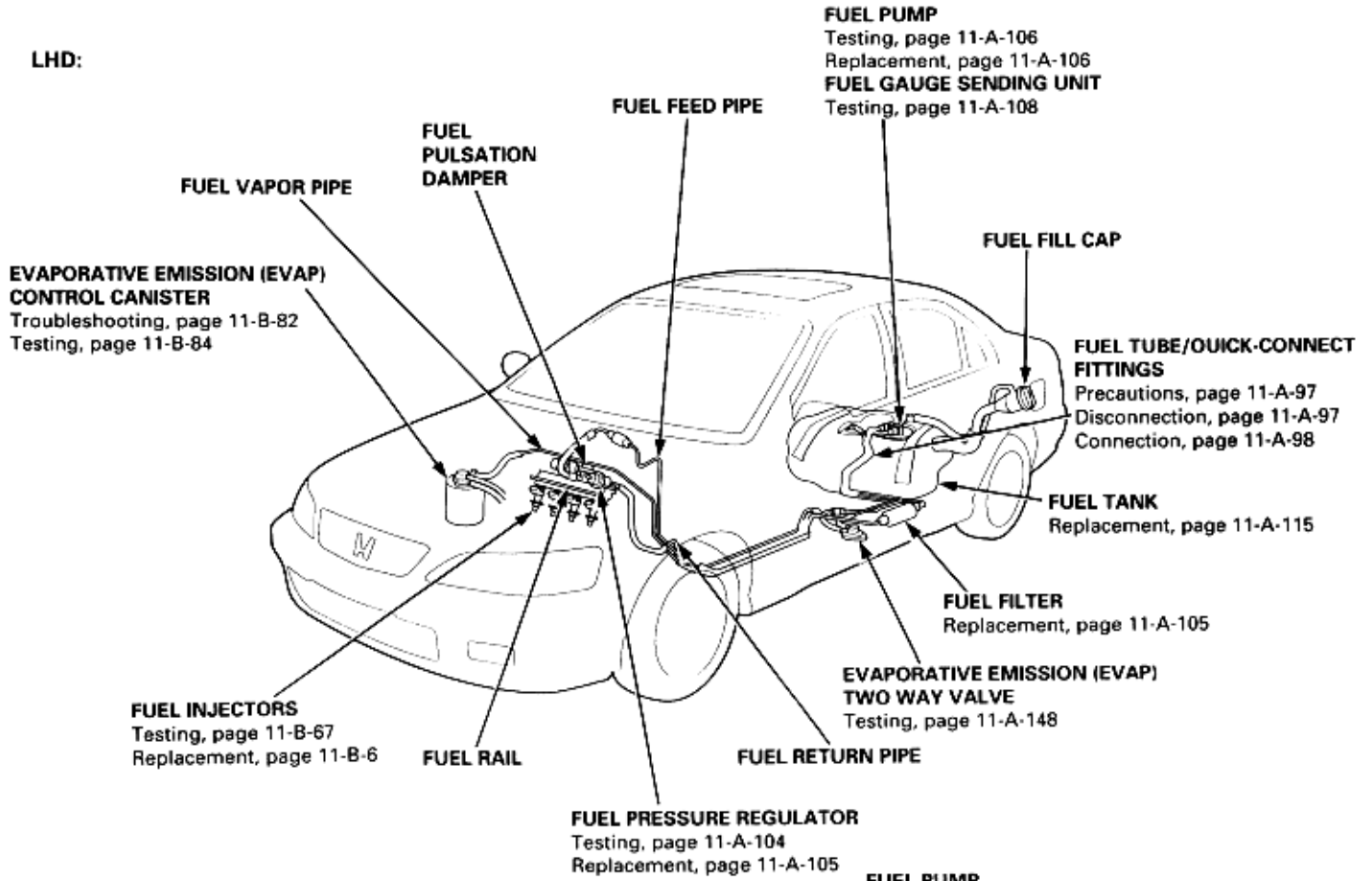


IDLE MIXTURE ADJUSTER (IMA)
(Without TWC model)
Troubleshooting, page 11-B-47

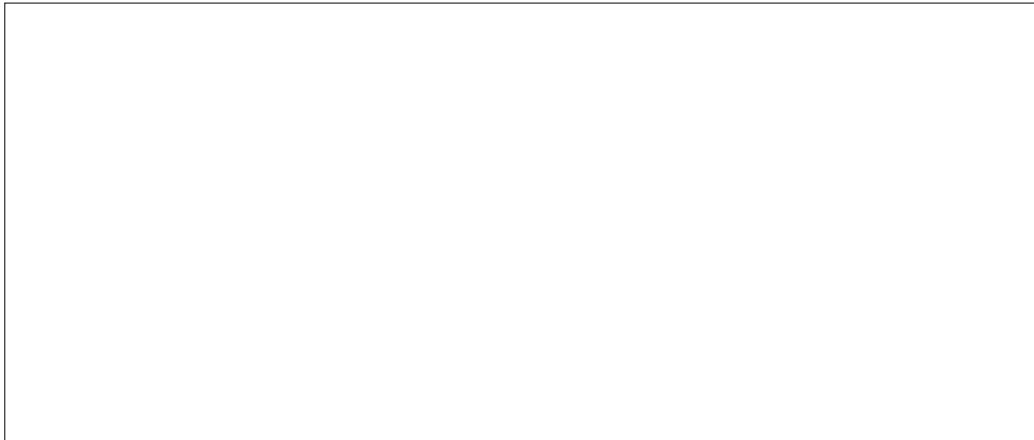
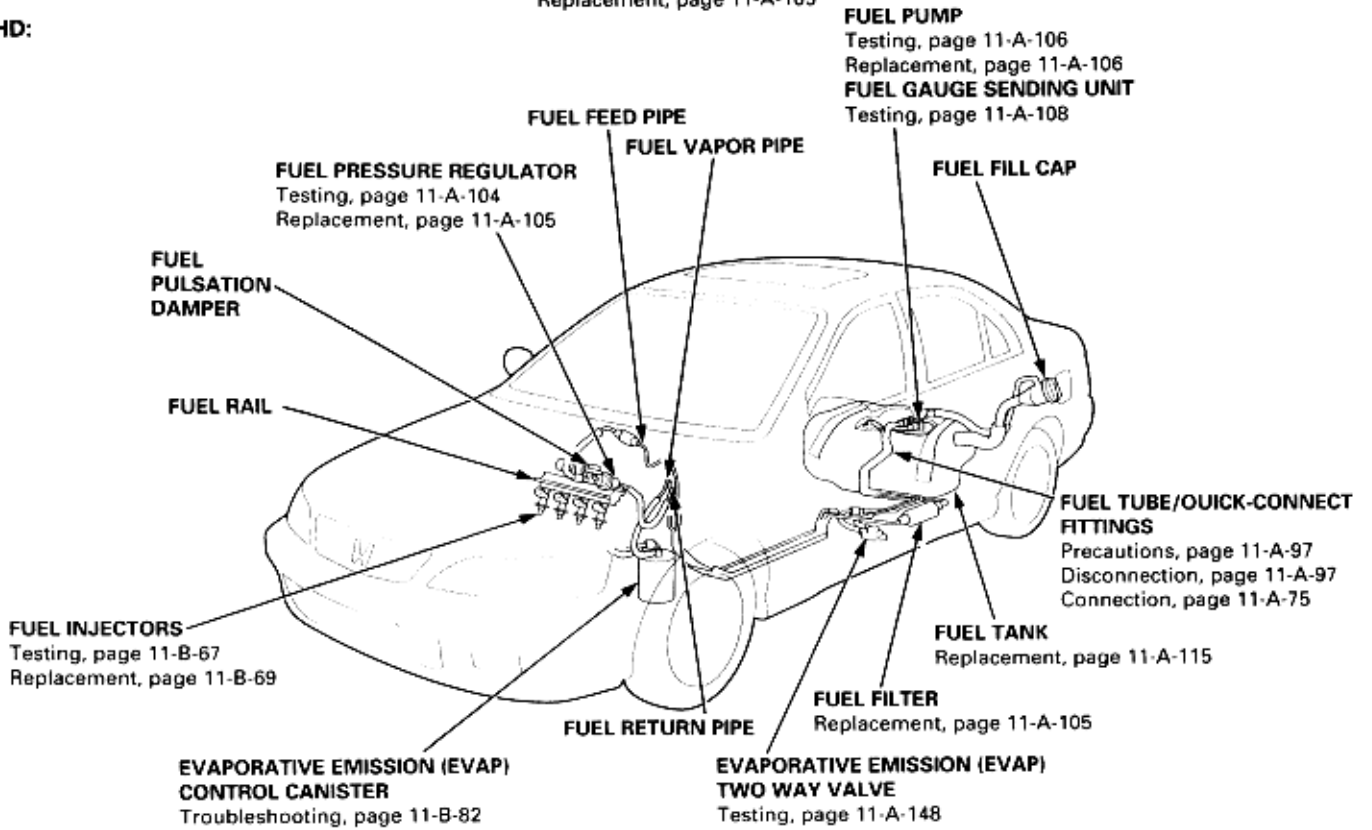
To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-B-15)
- (See Page 11-B-13)
- (See Page 11-B-26)
- (See Page 11-A-111)
- (See Page 11-A-112)
- (See Page 11-A-110)
- (See Page 11-B-47)

LHD:



RHD:



Replacement, page 11-B-69

Replacement, page 11-A-115

**EVAPORATIVE EMISSION (EVAP)
CONTROL CANISTER**
Troubleshooting, page 11-B-82

FUEL RETURN PIPE

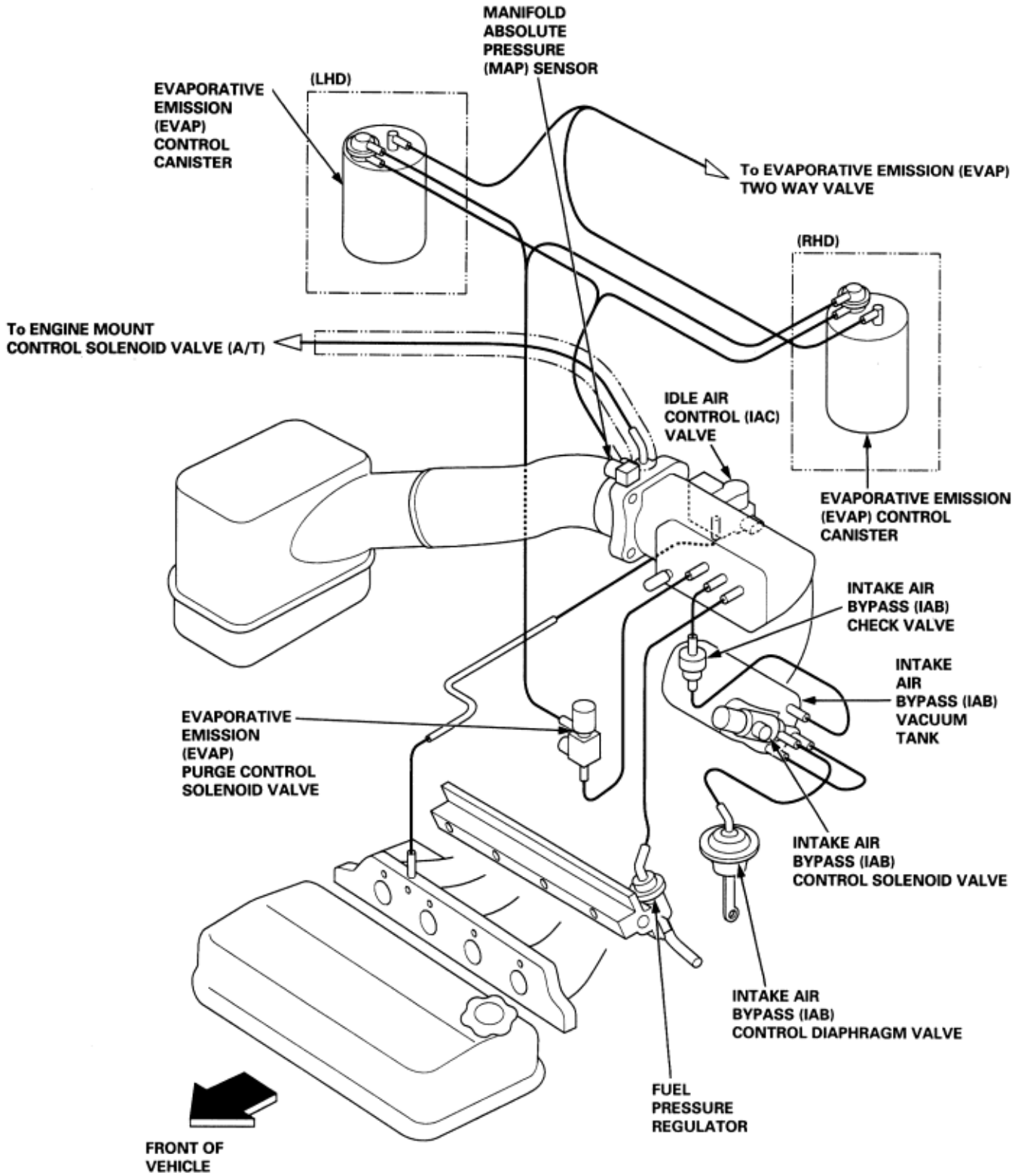
FUEL FILTER
Replacement, page 11-A-105

**EVAPORATIVE EMISSION (EVAP)
TWO WAY VALVE**
Testing, page 11-A-148

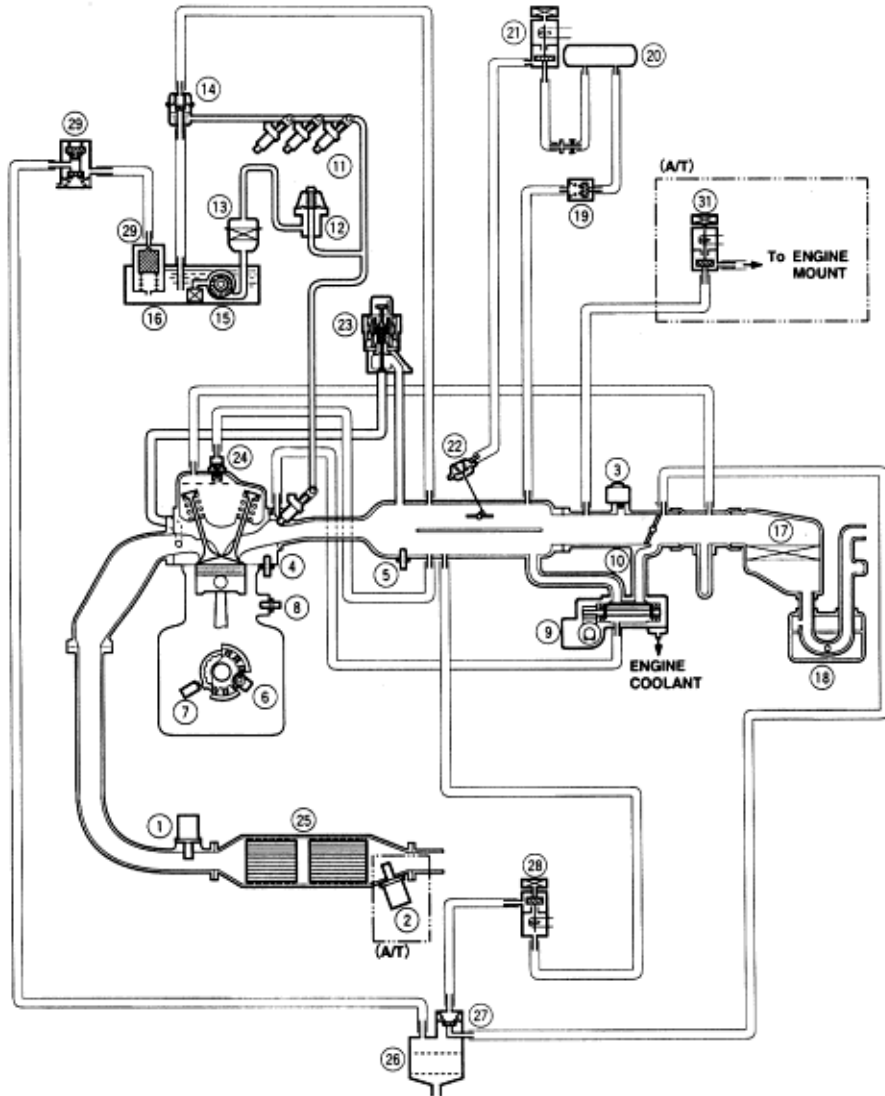
To go to the pages referenced on the diagram above, click on the following:

- [\(See Page 11-B-82\)](#)
- [\(See Page 11-B-84\)](#)
- [\(See Page 11-B-67\)](#)
- [\(See Page 11-B-69\)](#)
- [\(See Page 11-A-106\)](#)
- [\(See Page 11-A-108\)](#)
- [\(See Page 11-A-97\)](#)
- [\(See Page 11-A-98\)](#)
- [\(See Page 11-A-115\)](#)
- [\(See Page 11-A-105\)](#)
- [\(See Page 11-A-148\)](#)
- [\(See Page 11-A-104\)](#)
- [\(See Page 11-A-75\)](#)

With TWC model:



With TWC model:



- 1 Primary heated oxygen sensor (Primary HO2S) (Sensor 1)
- 2 Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)
- 3 Manifold absolute pressure (MAP) sensor
- 4 Engine coolant temperature (ECT) sensor
- 5 Intake air temperature (IAT) sensor
- 6 Crankshaft position (CKP) sensor
- 7 Top dead center (TDC) sensor
- 8 Knock sensor (KS)
- 9 Idle air control (IAC) valve

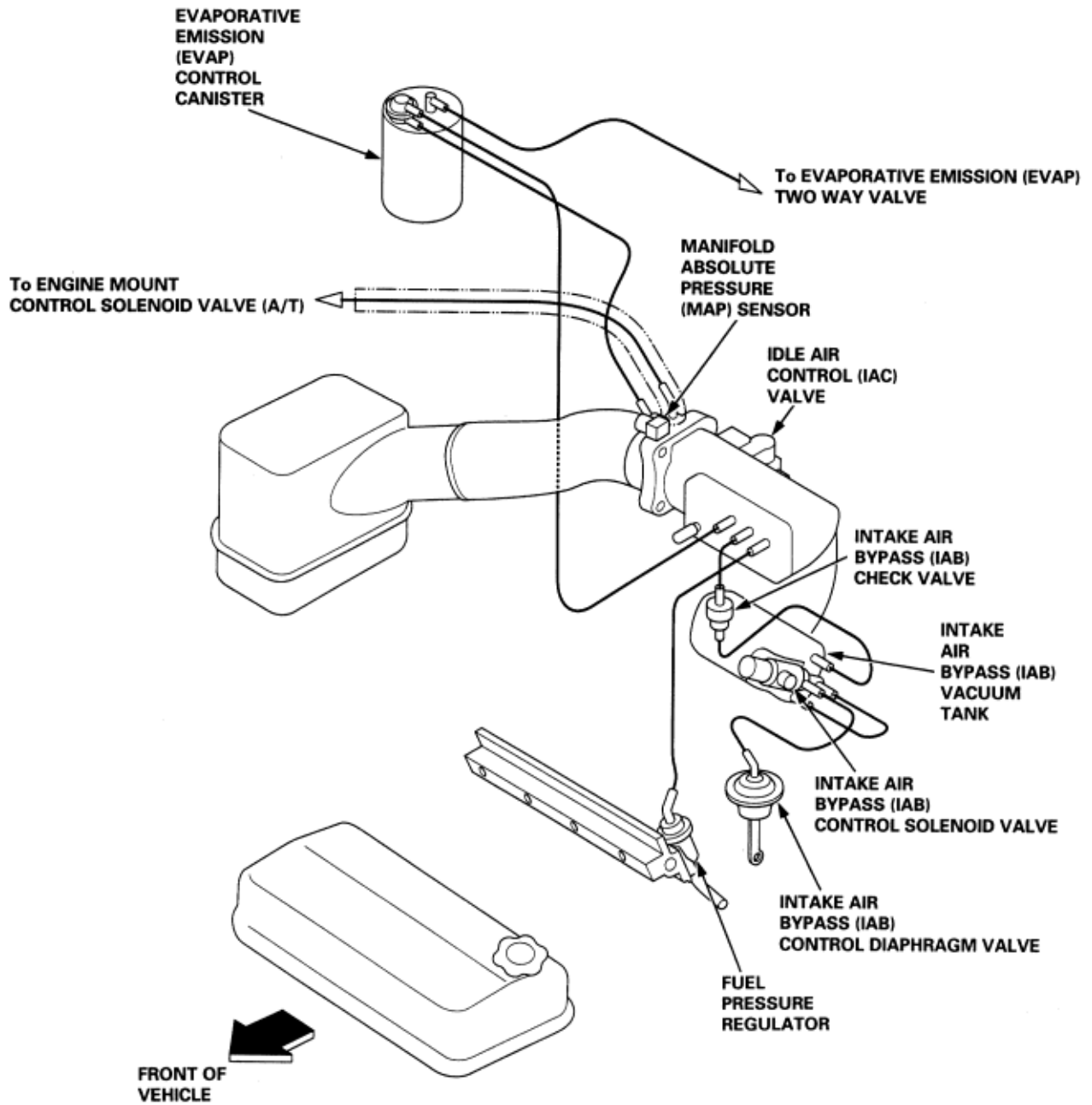
10 Throttle body (TB)

- 11 Fuel injector
- 12 Fuel pulsation damper
- 13 Fuel filter
- 14 Fuel pressure regulator
- 15 Fuel pump (FP)
- 16 Fuel tank
- 17 Air cleaner
- 18 Resonator

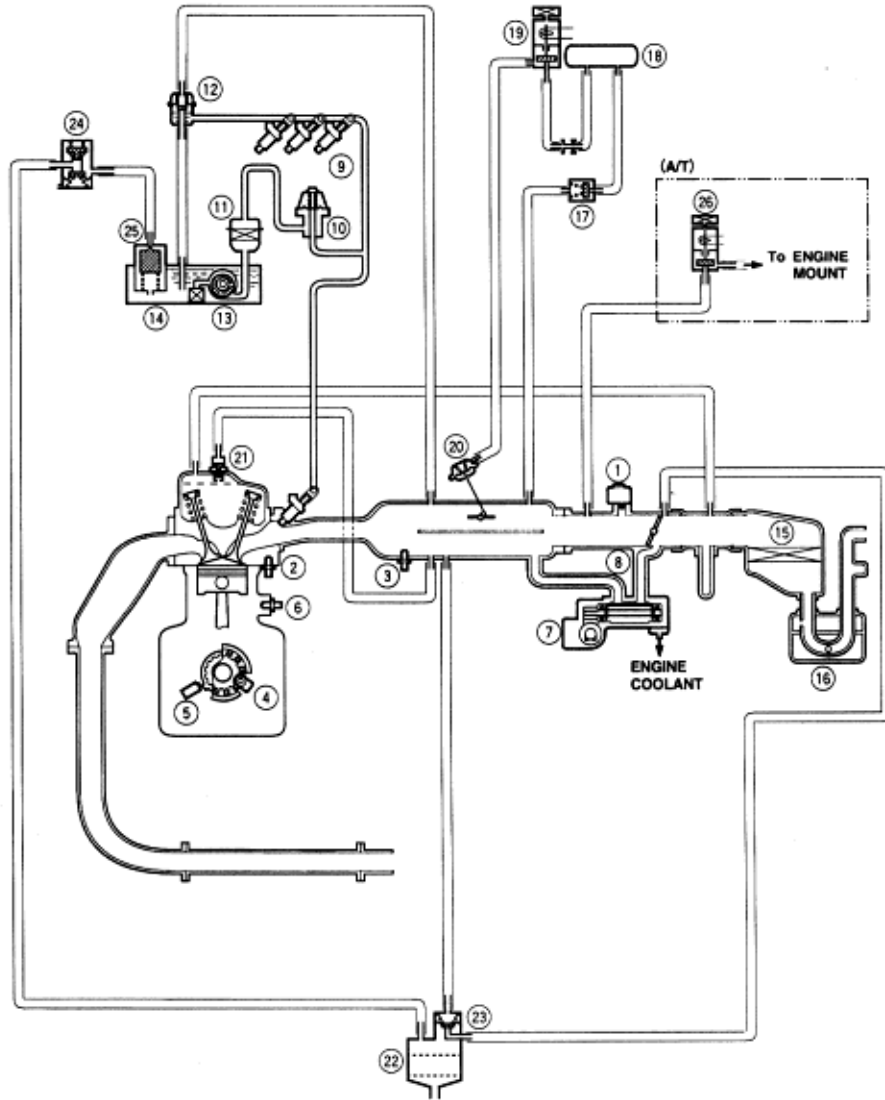
- 19 Intake air bypass (IAB) check valve
- 20 Intake air bypass (IAB) check valve

- 21 Intake air bypass (IAB) control solenoid valve
- 22 Intake air bypass (IAB) control diaphragm valve
- 23 Exhaust gas recirculation (EGR) valve and lift sensor
- 24 Positive crankcase ventilation (PCV) valve
- 25 Three way catalytic converter
- 26 Evaporative emission (EVAP) control canister
- 27 Evaporative emission (EVAP) purge control diaphragm valve
- 28 Evaporative emission (EVAP) purge control solenoid valve
- 29 Evaporative emission (EVAP) two way valve
- 30 Fuel tank evaporative emission (EVAP) valve
- 31 Engine mount control solenoid valve

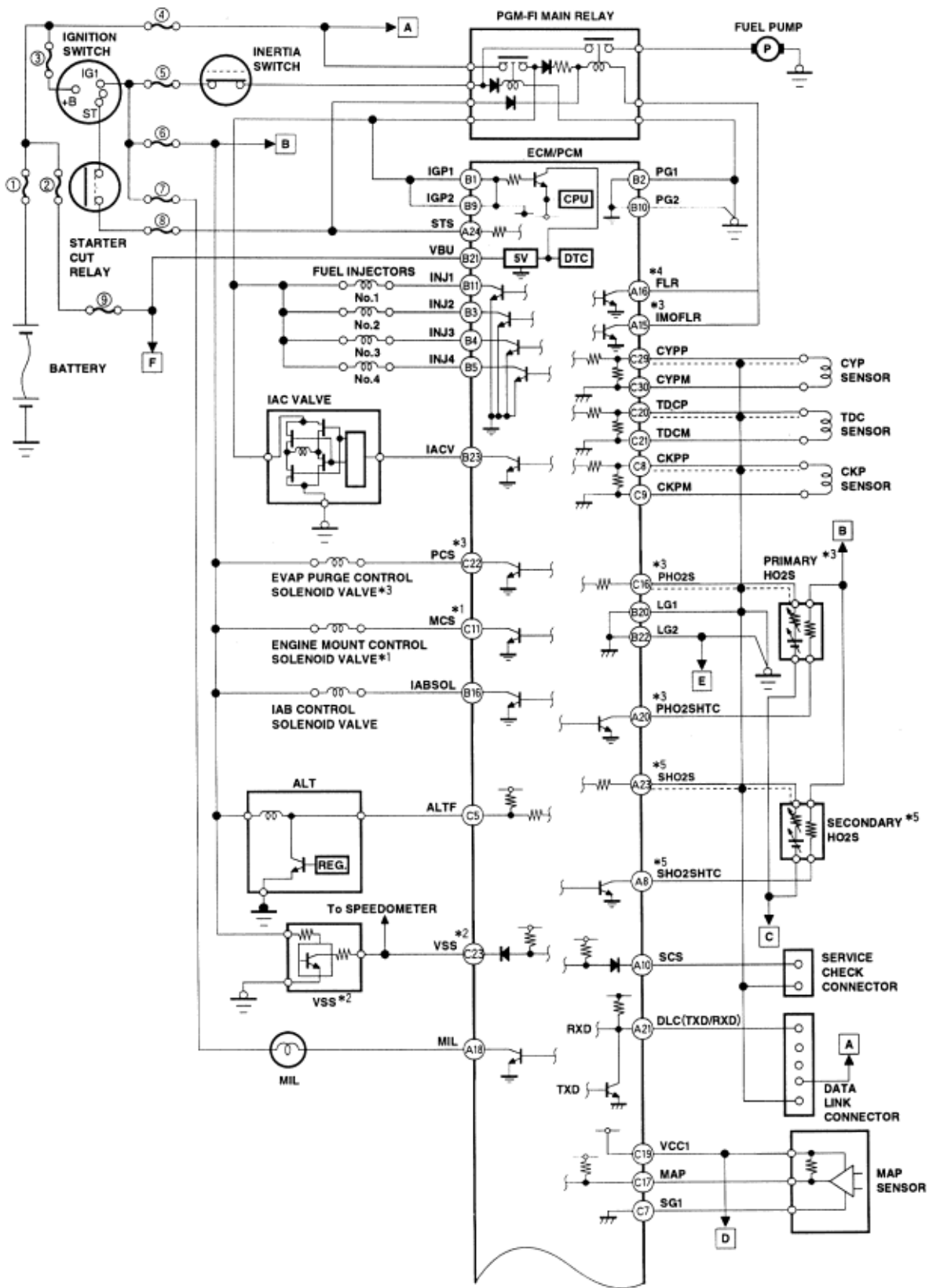
Without TWC model:



Without TWC model:



- | | | | |
|----|---|----|--|
| 1 | Manifold absolute pressure (MAP) sensor | 17 | Intake control (IAB) check valve |
| 2 | Engine coolant temperature (ECT) sensor | 18 | Intake control (IAB) vacuum tank |
| 3 | Intake air temperature (IAT) sensor | 19 | Intake air bypass (IAB) control solenoid valve |
| 4 | Crankshaft position (CKP) sensor | 20 | Intake air bypass (IAB) control diaphragm valve |
| 5 | Top dead center (TDC) sensor | 21 | Positive crankcase ventilation (PCV) valve |
| 6 | Knock sensor (KS) | 22 | Evaporative emission (EVAP) control canister |
| 7 | Idle air control (IAC) valve | 23 | Evaporative emission (EVAP) purge control solenoid valve |
| 8 | Throttle body (TB) | 24 | Evaporative emission (EVAP) two way valve |
| 9 | Fuel injector | 25 | Fuel tank evaporative emission (EVAP) valve |
| 10 | Fuel pulsation damper | 26 | Engine mount control solenoid valve |
| 11 | Fuel filter | | |
| 12 | Fuel pressure regulator | | |
| 13 | Fuel pump (FP) | | |
| 14 | Fuel tank | | |
| 15 | Air cleaner | | |
| 16 | Resonator | | |



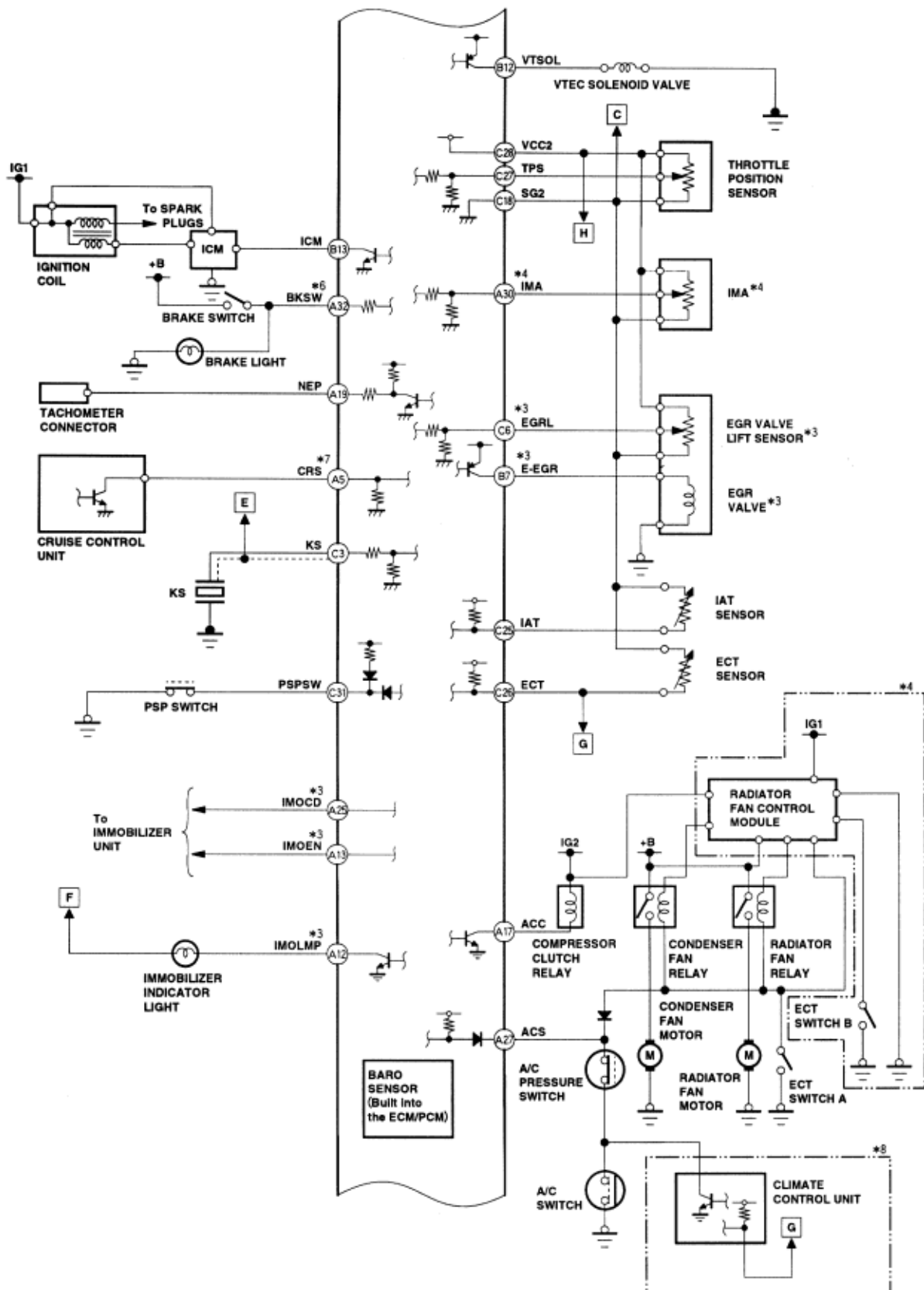
Fuses:

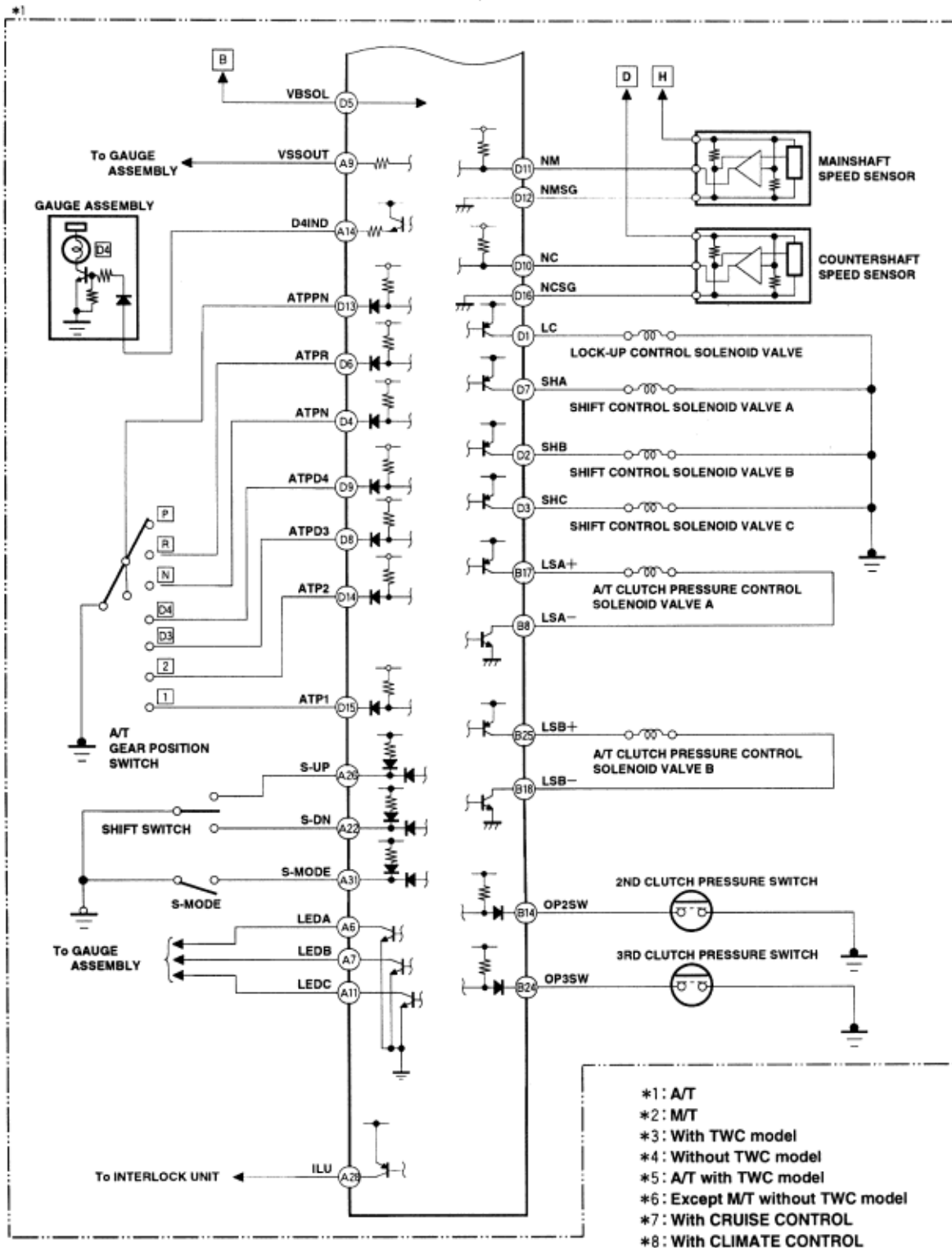
- 1 Battery (100) *A
- 2 Back-up, ACC (40A) *A
- 3 IG main (50A) *A
- 4 AGCS (15A) *A
- 5 No 1 fuel pump (15A) *B
- 6 No 6 ECU (ECM/PCM) cruise control (15A) *B
- 7 No 9 Back-up light instrument light (7.5A) *B
- 8 No 13 Starter signal (7.5A) *B
- 9 No 13 Clock back-up (7.5A) *C
- 10 Heated seat (30A) *A
- 11 No 6 LAF heater (20A) *C

*A: in the under-hood fuse/relay box

*B: in the driver's under-dash fuse/relay box

*C: in the passenger's under-dash fuse/relay box





ECM/PCM CONNECTOR TERMINAL LOCATIONS

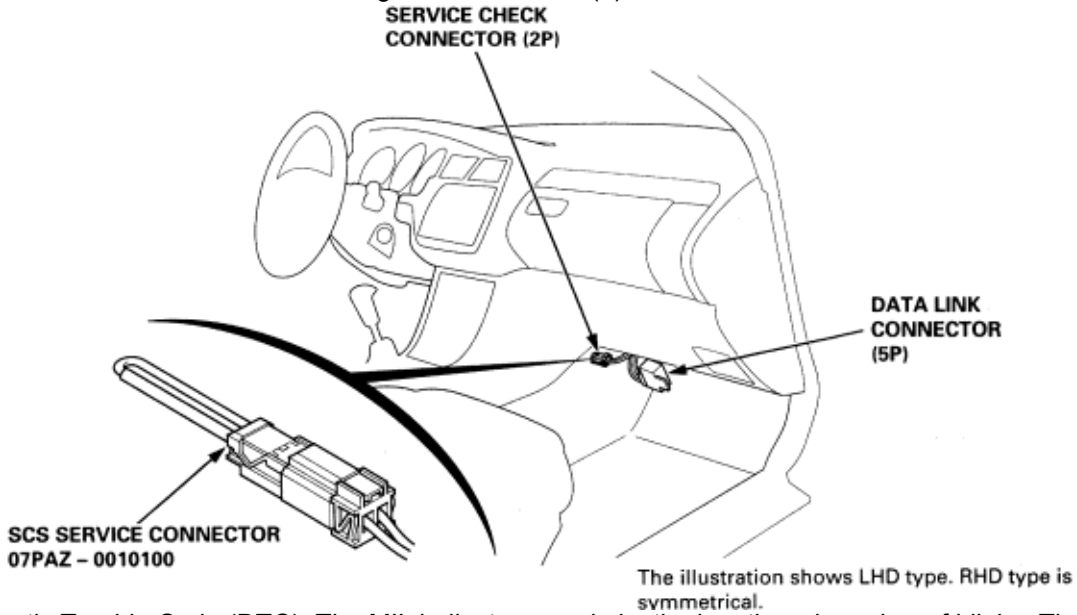
A (32P)								B (25P)								C (31P)					D (16P)						
12	13	14	15	16	5	6	7	1	2	3	4	5	7	8	3	5	6	7	1	2	3	4	5				
17	18	19	20	21	8	9	10	9	10	11	12	13	14	16	17	18	16	17	18	19	20	6	7	8	9	10	
22	23	24	25	26	11	12	13	20	21	22	23	24	25	23	25	26	27	8	9	10	11	12	11	12	13	14	15
27	28	29	30	31	14	15	16	28	29	30	31	32	33	34	35	36	37	28	29	30	31	32	13	14	15	16	16

How to Begin Troubleshooting

When the Malfunction Indicator Lamp (MIL) has been reported on, check the Diagnostic Trouble Code (DTC) as following:

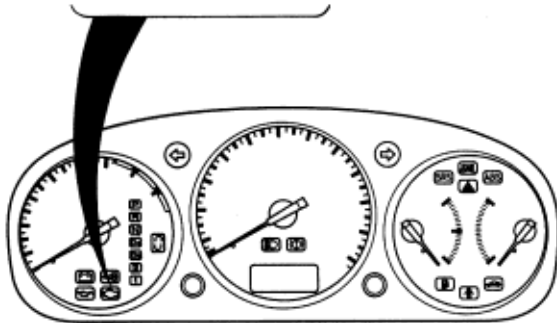
NOTE: This operation can also be carried out with Honda PGM Tester connected to data link connector (5P).

1. Connect the SCS short connector to Service Check Connector as shown (The 2P Service Check Connector is located under the dash on the driver side of the car. Turn the ignition switch ON (II).



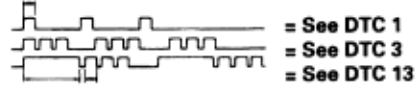
2. Note the Diagnostic Trouble Code (DTC): The MIL indicates a code by the length and number of blinks. The MIL can indicate multiple problems by blinking separate codes, one after another. Codes 1 through 9 are indicated by individual short blinks. Codes 10 through 65 are indicated by a series of long and short blinks. The number of long blinks equals the first digit, the number of short blinks equals the second digit. Sometimes the first blink is difficult to see; always count the blinks at least twice to verify the code.

**MALFUNCTION
INDICATOR
LAMP
(MIL)**



Separate Problems:

Short



Long short

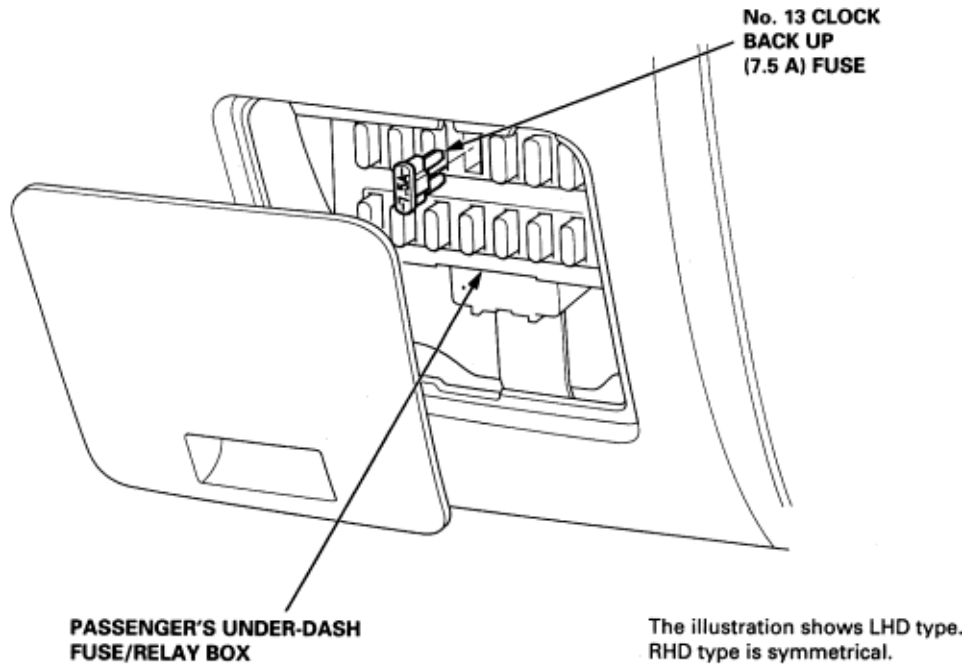
Multiple Problems:



Engine/Powertrain Control Module (ECM/PCM) Reset Procedure

NOTE: This operation can also be carried out with Honda PGM Tester.

1. Turn the ignition switch off.
2. Remove the No.13 CLOCK BACK UP (7.5 a) fuse from the passenger's under-dash fuse/relay box for 10 seconds to reset the ECM/PCM.

**Final Procedure (this procedure must be done after any troubleshooting)**

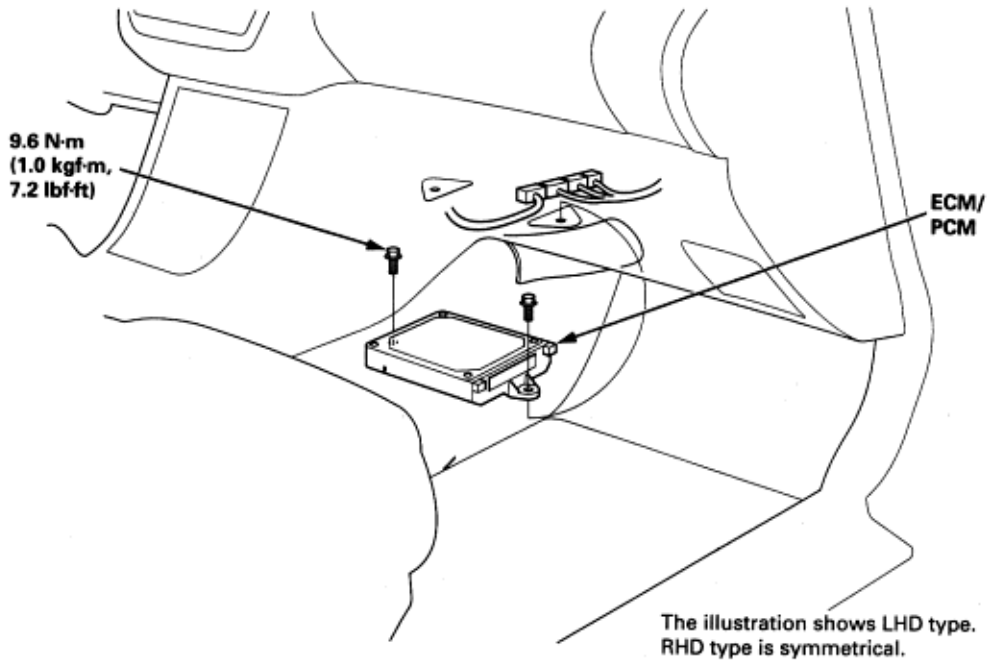
1. Remove the SCS Short Connector.
NOTE: If the SCS short connector is connected and there are no DTCs stored in the ECM/PCM, the MIL will stay on when the ignition switch is turned ON (II).
2. Do the ECM/PCM Reset Procedure.

Known-Good ECM/PCM Substitution (KG, KE, KS, KR models)

The ECM/PCM is part of the immobilizer system. If you substitute a known-good ECM/PCM, the ECM/PCM will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the Honda PGM Tester.

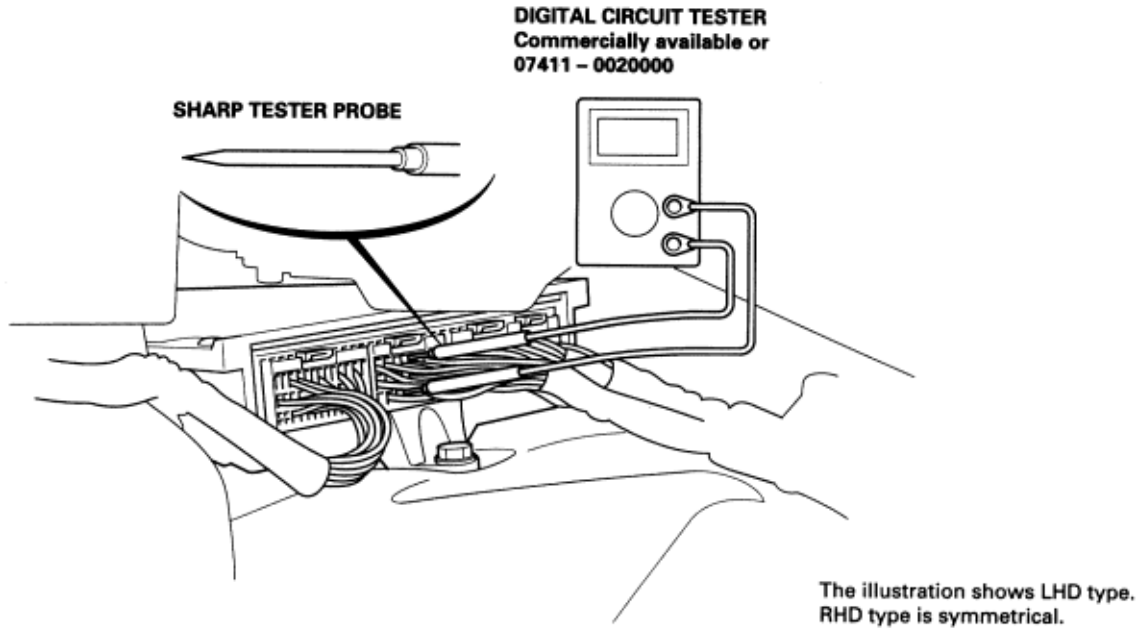
ECM/PCM Removal

Pull the carpet from the passenger's side of the center console to expose the ECM/PCM. Remove the two bolts from the ECM/PCM. Check the system according to the procedure described for the appropriate DTC listed on the following pages.



Checking the ECM/PCM Connector Terminals

When checking the ECM/PCM connector terminals, gently slide the sharp tester probe from the wire side into the connector until it comes in contact with the terminal end of the wire.



NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system (2) etc.

PAGE	SYSTEM	PGM-FI								
		ENGINE/ POWER- TRAIN CONTROL MODULE	HEATED OXYGEN SENSOR**	MANIFOLD ABSOLUTE PRESSURE SENSOR	TOP DEAD CEN- TER/CRANKSHAFT POSITION/CYLIN- DER POSITION SENSOR	ENGINE COOLANT TEMPERA- TURE SENSOR	THROTTLE POSITION SENSOR	INTAKE AIR TEMPERA- TURE SENSOR	IDLE MIXTURE ADJUSTER**2	BARO- METRIC PRESSURE SENSOR
SYMPTOM		11-B-26	11-B-31, 55, 58	11-B-33	11-B-36, 43	11-B-38	11-B-40	11-B-45	11-B-47	11-B-50
MALFUNCTION INDICATOR LAMP (MIL) TURNS ON										
MALFUNCTION INDICATOR LAMP (MIL) BLINKS										
ENGINE WON'T START		①			③					
DIFFICULT TO START ENGINE WHEN COLD		BU		③	③	①				
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	BU				③				
	ROUGH IDLE	BU		③						
	WHEN WARM ENGINE SPEED TOO HIGH	BU				③				
	WHEN WARM ENGINE SPEED TOO LOW	BU								
FREQUENT STALLING	WHILE WARMING UP	BU				③				
	AFTER WARMING UP	BU								
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	BU		②	③					
	FAILS EMISSION TEST	BU	③	②						
	LOSS OF POWER	BU		③			②			

* If codes other than those listed above are indicated, count the number of blinks again. If the MIL is in fact blinking these codes, replace the ECM/PCM.

BU If the MIL is on while the engine is running, connect the SCS short connector to the service check connector if no code is displayed (MIL stays on steady), the back up system is in operation.











Substitute a known-good ECM/PCM and recheck if the indication goes away, replace the original ECM/PCM.

*1: with TWC model

*2: without TWC model

*3: M/T

*4: with TWC model (A/T)

PGM-FI			IDLE CONTROL		FUEL SUPPLY		INTAKE AIR	EMISSION CONTROL	
VEHICLE SPEED SENSOR**	VTEC SOLENOID VALVE*	KNOCK SENSOR	IDLE AIR CONTROL VALVE	OTHER IDLE CONTROLS	FUEL INJECTOR	OTHER FUEL SUPPLY		EXHAUST GAS RECIRCULATION (EGR) CONTROL SYSTEM**	OTHER EMIS- SION CONTROL SYSTEM
11-B-51	6-B-3	11-B-53	11-B-63	11-B-61	11-B-67	11-B-66	11-B-71	11-B-76	11-B-74
									
									
						②			
						②			
			①	②					
			①	②	②			③	
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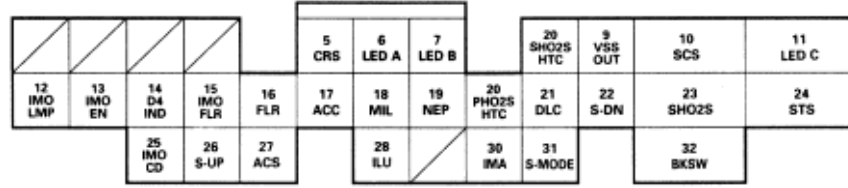
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement

11-B-18

ECM CONNECTOR A (32P)

ECM/PCM CONNECTOR A (32 P)



Wire side female terminals

ECM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
5 *1	PUR	CRS (Cruise control signal)	Down shift signal input from cruise control	When cruise control is used: Pulses
6 *1	BLU/YEL	LED A	Shift indicator light control	In manual mode: ♦ In 4th gear position: Battery voltage ♦ In 1st, 2nd and 3rd gear positions: 0V
7 *1	PUR	LED B	Shift indicator light control	In manual mode: ♦ In 2nd and 3rd gear positions: Battery voltage ♦ In 1st, and 4th gear positions: 0V
8 *5	BLK/WHT	SO2SHTC (Secondary heated oxygen sensor heater control)	Drives secondary heated oxygen sensor heater	With ignition ON (II): Battery voltage With fully warmed up engine running: Duty controlled
9 *1	BLU/WHT	VSSOUT (Vehicle speed sensor output signal)	Vehicle speed signal detected from countershaft speed sensor	Depending on vehicle speed: Pulses
10	BRN	SCS (Service check signal)	Detect service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0V With the terminal disconnected: Battery voltage
11 *1	BLU/BLK	LED C	Shift indicator light control	In manual mode: ♦ In 1st and 3rd gear positions: Battery voltage ♦ In 2nd and 4th gear positions: 0V
12 *3	PNK	IMOLMP (Immobiliser indicator light)	Drives immobiliser indicator light	With immobiliser indicator light turned ON: 0V With immobiliser indicator light turned OFF: Battery voltage
13 *3	PNK/BLK	IMOEN (Immobiliser enable signal)	Sends immobiliser enable signal	
14 *1	GRN/BLK	D4IND (D4 indicator)	Drives D4 indicator light	With D4 indicator light turned ON: 0V With D4 indicator light turned OFF: Battery voltage
15 *3	GRN/YEL	IMOFLR (Immobiliser fuel pump relay)	Drives fuel pump relay	0V for two seconds after turning ignition switch ON (II), then battery voltage
16 *4	GRN/YEL	FLR (Fuel pump relay)	Drives fuel pump relay	0V for two seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C clutch relay)	Drives A/C clutch relay	With compressor ON: 0V With compressor OFF: Battery voltage
18	GRN/ORN	MIL (Malfunction indication light)	Drives MIL	With MIL turned ON: 0V With MIL turned OFF: Battery voltage
19	BLU	NEP (Engine speed pulse)	Outputs engine speed pulse	With engine running: Pulses
20 *3	BLK./WHT	PHO2SHTCR (Primary heated oxygen sensor heater control relay)	Drives primary heated oxygen sensor heater	With ignition switch ON (II): Battery voltage With fully warmed up engine running: Duty controlled
21	GRY	DLC (TxD/RxD)	Sends and receives	With ignition switch ON (II): Pulses

| scan tool signal |

*1: A/T model

*2: M/T model

*3: with TWC model

*4: without TWC model

*5: A/T with TWC model

*6: Except M/T without TWC model

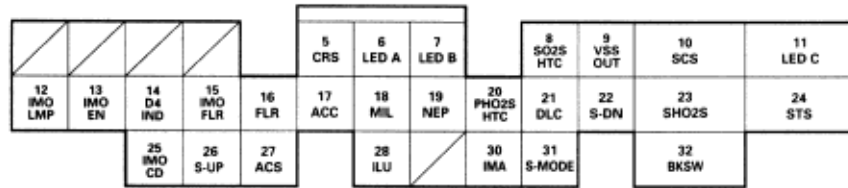
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-B-19

ECM/PCM CONNECTOR A (32P)

ECM/PCM CONNECTOR A (32 P)



Wire side female terminals

ECM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
22 *1	ORN	S-DN (Shift down)	Detects downshift switch signal	In manual mode and shift lever pushed toward downshift position (marked with "-"): 0V In manual mode and shift lever in neutral position: Battery voltage
23 *5	WHT	SHO2S (Secondary heated oxygen sensor, sensor 2)	Detects secondary heated oxygen sensor (sensor 2) signal	With throttle fully opened from idle with fully warmed up engine: Above 0.6V With throttle quickly closed: Below 0.4V
24	BLU/ORN	STS (Starter switch signal)	Detects starter switch signal	With starter switch ON (II): Battery voltage With starter switch OFF: 0V
25 *3	RED	IMOCD (Immobiliser code)	Detects immobiliser signal	
26 *1	WHT/BLU	S-UP (Shift up)	Detects upshift switch signal	In manual mode and shift lever pushed toward upshift position (marked with "+"): 0V In manual mode and shift lever in neutral position: Battery voltage
27	BLU/RED	ACS (A/C switch signal)	Detects A/C switch signal	With A/C switch ON: 0V With A/C switch OFF: About 5V
28 *1	WHT/RED	ILU (Interlock control unit)	Drives interlock control unit	With ignition switch ON (II) and brake pedal depressed: Battery voltage
30 *4	GRN/RED	IMA (Idle mixture adjuster)	Detects IMA signal	With ignition ON (II): About 0.5-4.5V (depending on idle mixture)
31 *1	BRN	S-MODE (Shift mode)	Detects manual mode switch signal	In manual mode (shift lever is positioned in manual mode): 0V In other than manual mode: Battery voltage
32 *6	WHT/BLK	BKS (Brake switch)	Detects brake switch signal	With brake pedal released: 0V With brake pedal depressed: Battery voltage

*1: A/T model

*2: M/T model

*3: with TWC model

*4: without TWC model

*5: A/T with TWC model

*6: Except M/T without TWC model

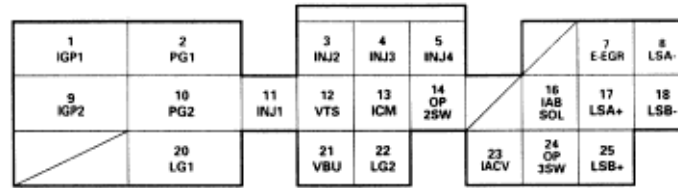
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-B-20

ECM/PCM CONNECTOR B (25P)

ECM/PCM CONNECTOR B (25P)



ECM CONNECTOR B (25P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	YEL/BLK	IGP1 (Power source)	Power source for the ECM/PCM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
2	BLK	PG1 (Power ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
3	RED	INJ2 (No. 2 fuel injection)	Drives No. 2 fuel injector	With engine running: Pulses
4	BLU	INJ3 (No. 3 fuel injection)	Drives No. 3 fuel injector	With engine running: Pulses
5	YEL	INJ4 (No. 4 fuel injection)	Drives No. 4 fuel injector	With engine running: Pulses
7 *3	PNK	E-EGR	Drives EGR valve	With EGR operation during driving with fully warmed up engine: Duty controlled With EGR not operating: 0V
8 *1	WHT	LSA- (A/T clutch pressure control solenoid valve A - side)	A/T clutch pressure control solenoid valve A power supply negative electrode	With ignition switch ON (II): Pulses
9	YEL/BLK	IGP2 (Power source)	Power source for the ECM/PCM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
10	BLK	PG2 (Power source)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
11	BRN	INJ1 (No. 1 fuel injection)	Drives No. 1 fuel injector	With engine running: Pulses
12	GRN/YEL	VTS (VTEC solenoid valve)	Drives VTEC solenoid valve	With engine at low rpm: 0V With engine at high rpm: Battery voltage
13	YEL/GRN	ICM (Ignition control module)	Sends ignition pulse	With ignition switch ON (II): Battery voltage With engine running: About 10V (depending on engine speed)
14 *1	BLU/BLK	OP2SW (2nd Oil pressure switch)	Detects 2nd oil pressure switch	With ignition switch ON (II): Pulses
16	RED/BLU	IABSOL (Intake air bypass control solenoid valve)	Drives IAB control solenoid valve	With engine running, engine speed below 3,900 rpm (min-1): Battery voltage With engine running, engine speed above 3,900 rpm (min-1): 0V
17 *1	RED	LSA+ (A/T clutch pressure control solenoid valve A + side)	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulses
18 *1	GRN	LSB- (A/T clutch pressure control solenoid valve B - side)	A/T clutch pressure control solenoid valve B power supply negative electrode	With ignition switch ON (II): Pulses
20	BRN/BLK	LG1 (Logic ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times
21	WHT/BLU	VBU (Voltage back up)	Power source for the ECM/PCM control circuit Power source for the DTC memory	Battery voltage at all times
22	BRN/BLK	LG2 (Logic ground)	Ground for the ECM/PCM control circuit	Less than 1.0V at all times

23	BLK/BLU	IACV (Idle air control valve)	Drives IAC valve	With engine running: Pulses
24 *1	BLU/WHT	OP3SW (3rd oil pressure switch)	Detects 3rd pressure switch	With ignition switch ON (II): Battery voltage
25 *1	ORN	LSB+ (A/T clutch pressure control solenoid valve B + side)	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulses

*1: A/T model

*2: M/T model

*3: with TWC model

*4: without TWC model

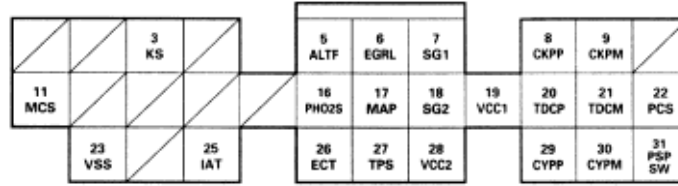
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-B-21

ECM/PCM CONNECTOR C (31P)

ECM/PCM CONNECTOR C (31P)



Wire side female terminals

ECM CONNECTOR C (31P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
3	RED/BLU	KS (Knock sensor)	Detects KS signal	With engine knocking: Pulses
5	WHT/RED	ALTF (Alternator FR signal)	Detects alternator FR signal	With fully warmed up engine running: 0V - battery voltage (depending on electrical load)
6 *3	WHT/BLK	EGRL (EGR lift sensor)	Detects EGR valve lift sensor signal	At idle: About 1.2V
7	GRN/WHT	SG1 (Sensor ground)	Ground for MAP sensor	Less than 1.0V at all times
8	BLU	CKPP (CKP sensor P side)	Detects CKP sensor	With engine running: Pulses
9	WHT	CKPM (CKP sensor M side)	Ground for CKP sensor	
11 *1	RED/BLK	MCS (Engine mount control solenoid valve)	Drives engine mount control solenoid valve	At idle: 0V Above idle: Battery voltage
16 *3	WHT	PHO2S (Primary heated oxygen sensor, sensor 1)	Detects primary heated oxygen sensor (sensor 1) signal	With throttle fully opened from idle with fully warmed up engine: Above 0.6V With throttle quickly closed: Below 0.4V
17	RED/GRN	MAP (Manifold absolute pressure sensor)	Detects MAP sensor signal	With ignition switch ON (II): About 3V At idle: About 1.0V (depending on engine speed)
18	GRN/BLK	SG2 (Sensor ground)	Sensor ground	Less than 1.0V at all times
19	YEL/RED	VCC1 (Sensor voltage)	Power source to MAP sensor	With ignition switch ON (II): About 5V With ignition OFF: 0V
20	GRN	TDCP (TDC sensor P side)	Detects TDC sensor	With engine running: Pulses
21	RED	TDCM (TDC sensor M side)	Ground for TDC sensor	
22 *3	RED/YEL	PCS (EVAP purge control solenoid valve)	Drives EVAP purge control solenoid valve	With engine running, engine coolant below 65°C (149°F): Battery voltage With engine running, engine coolant above 65°C (149°F): 0V
23 *2	BLU/WHT	VSS (Vehicle speed sensor)	Detects VSS signal	With ignition switch ON (II) and front wheel rotating: Cycles 0V - about 5V or battery voltage
25	RED/YEL	IAT (Intake air temperature sensor)	Detects IAT sensor signal	With ignition switch ON (II): About 0.1 - 4.8V (depending on intake air temperature)
26	RED/WHT	ECT (Engine coolant temperature sensor)	Detects ECT sensor signal	With ignition switch ON (II): About 0.1 - 4.8V (depending on engine coolant temperature)
27	RED/BLK	TPS (Throttle position sensor)	Detects TP sensor signal	With throttle fully open: About 4.8V With throttle fully closed: About 0.5V
28	YEL/BLU	VCC2 (Sensor voltage)	Provides sensor voltage	With ignition switch ON (II): About 5V With ignition switch OFF: 0V
29	YEL	CYPP (CYP sensor P side)	Detects CYP sensor	With engine running: Pulses
30	BLK	CYPM (CYP sensor P side)	Ground for CYP sensor	
31	GRN/YEL	PSPSW (P/S pressure switch signal)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: 0V At idle with steering wheel at full

lock: Battery voltage

*1: A/T model

*2: M/T model

*3: with TWC model

*4: without TWC model

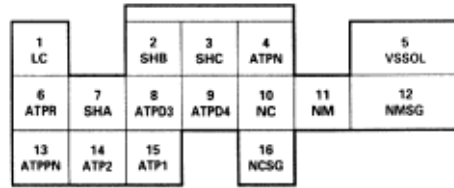
Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

11-B-22

ECM/PCM CONNECTOR D (16P)

PCM CONNECTOR D (16P)



Wire side of female terminals

ECM CONNECTOR D (16P)

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	YEL	LC (Lock-up control solenoid valve)	Drives lock-up control solenoid valve	During half and full lock-up conditions, and during deceleration condition: Battery voltage during no lock-up condition: 0V
2	GRN/WHT	SHB (Shift control solenoid valve B)	Drives shift control solenoid valve B	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 1 and 2 positions ♦ D4 and D3 positions in 1st and 2nd gear ♦ P, R and N positions 0V in following positions: <ul style="list-style-type: none"> ♦ D4 and D3 positions in 3rd gear ♦ D4 position in 4th gear
3	GRN	SHC (Shift control solenoid valve C)	Drives shift control solenoid valve C	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4 and D3 positions in 1st and 3rd gear 0V in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4 and D3 positions in 2nd gear ♦ D4 position in 4th gear ♦ P, R and N positions
4	RED/BLK	ATPNP (At gear position switch)	Detects A/T gear position switch signal	In N position: 0V In any other position: Battery voltage
5	BLK/YEL	VBSOL (Battery voltage for solenoid valve)	Power source of solenoid valve	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
6	WHT	ATPR (At gear position switch)	Detects A/T gear position switch signal	In R position: 0V In any other position: Battery voltage
7	BLU/YEL	SHA (Shift control solenoid valve A)	Drives shift control solenoid valve A	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4 and D3 positions in 2nd and 3rd gear 0V in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4 and D3 positions in 1st gear ♦ D4 position in 4th gear ♦ P, R and N positions
8	PNK	ATPD3 (At gear position switch)	Detects A/T gear position switch signal)	In D3 position: 0V In any other position: Battery voltage
9	YEL	ATPD4 (At gear position switch)	Detects A/T gear position switch signal)	In D4 position: 0V In any other position: Battery voltage
10	PNK	NC (Countershaft speed sensor)	Detects countershaft speed sensor signal	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx 0V
11	RED	NM (Mainshaft speed sensor)	Detects mainshaft speed sensor	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx 0V
12	WHT	NMSG (Mainshaft speed sensor ground)	Ground mainshaft speed sensor signals	
13	BLU/WHT	ATPPN (At gear position switch)	Detects A/T gear position switch signal)	In P or N positions: 0V In any other position: Battery voltage
14	BLU	ATP2 (At gear position switch)	Detects A/T gear position switch signal)	In 2 position: 0V In any other position: Battery voltage

15	BRN	ATP1 (At gear position switch)	Detects A/T gear position switch signal)	In 1 position: 0V In any other position: Battery voltage
16	GRN	NCSG (Countershaft speed sensor ground)	Ground for countershaft speed sensor	

Diagnostic Trouble Code (DTC)	System Indicated	Page
0	Engine/powertrain control module (ECM/PCM)	(See Page 11-B-26)
1	Primary heated oxygen sensor (primary HO2S) *1	(See Page 11-B-31)
3	Manifold absolute pressure (MAP) sensor	(See Page 11-B-33)
4	Crankshaft position (CKP) sensor	(See Page 11-B-36)
6	Engine coolant temperature (ECT) sensor	(See Page 11-B-38)
7	Throttle position (TP) sensor	(See Page 11-B-40)
8	Top dead center position (TDC) sensor	(See Page 11-B-36)
9	No. 1 cylinder position (CYP) sensor	(See Page 11-B-43)
10	Intake air temperature (IAT) sensor	(See Page 11-B-45)
11	Idle mixture adjuster (IMA) *2	(See Page 11-B-47)
12	Exhaust gas recirculation (EGR) valve lift sensor *1	(See Page 11-B-76)
13	Barometer pressure (Baro) sensor	(See Page 11-B-50)
14	Idle air control (IAC) valve	(See Page 11-B-63)
17	Vehicle speed sensor (VSS) *3	(See Page 11-B-51)
21	VTEC solenoid valve	(See Page 11-B-3)
23	Knock sensor	(See Page 11-B-53)
41	Primary heated oxygen sensor (primary HO2S) heater *1	(See Page 11-B-55)
63*4	Secondary heated oxygen sensor (secondary HO2S) *4	(See Page 11-B-58)
65*%	Secondary heated oxygen sensor (secondary HO2S) heater *4	(See Page 11-B-55)
70 *4	Automatic Transmission	Section 14

*1: with TWC model

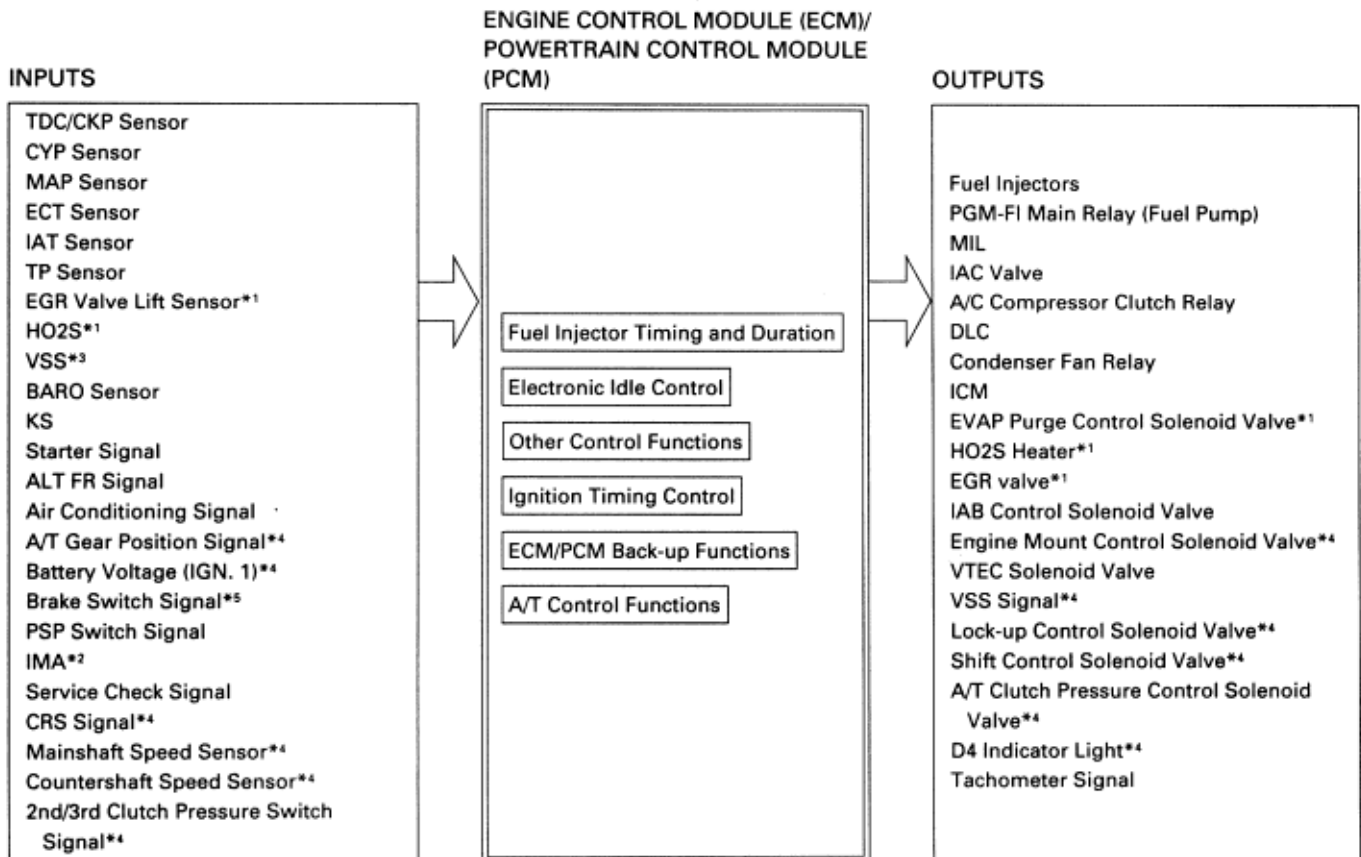
*2: without TWC model

*3: M/T

*4: A/T

*5: A/T with TWC model

- If codes other than those listed above are indicated, verify the code. If the code indicated is not listed above, replace the ECM/PCM (for immobilizer information) (See Page 11-B-14).
- The MIL may come on, indicating a system problem when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessary.



- *1: with TWC model
- *2: without TWC model
- *3: M/T
- *4: A/T
- *5: except M/T without TWC model

PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM/PCM contains memories for the basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

When the engine is cold, the A/C compressor is on, the transmission is in gear *4, the brake pedal is depressed *5, the P/S load is high, or the alternator is charging, the ECM/PCM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- The ECM/PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- A knock control system is also used. When detonation is detected by a knock sensor (KS), the ignition timing is retarded.

Other Control Functions

1. Starting control
When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
 - ♦ When the ignition switch is initially turned ON (II), the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurise the fuel system.
 - ♦ When the engine is running, the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
 - ♦ When the engine is not running and the ignition is ON (II), the ECM/PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.
3. Fuel Cut-off Control
 - ♦ During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,100 rpm (min⁻¹).
 - ♦ Fuel cut-off action also takes place when engine speed exceeds 6,900 rpm (min⁻¹), regardless of the position of the throttle valve to protect the engine from over-revving.
4. A/C Compressor Clutch Relay
When the ECM/PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energised, and enriches the mixture to assure smooth transition to the A/C mode.
5. Intake Air Bypass (IAB) Control Solenoid Valve
When the engine rpm is below 3,900 rpm (min⁻¹), the IAB control solenoid valve is activated by a signal from the ECM/PCM, intake air flows through the long intake path, then high torque is delivered. At speeds higher than 3,900 rpm (min⁻¹), the solenoid valve is deactivated by the ECM/PCM, and intake air flows through the short intake path in order to reduce the resistance in airflow.
6. Evaporation Emission (EVAP) Purge Control Solenoid Valve*1
When the engine coolant temperature is below 65°C (149°F), the ECM/PCM supplies a ground to the EVAP purge control solenoid valve which cuts vacuum to the EVAP purge control canister.
7. Exhaust Gas Recirculation (EGR) Control Solenoid Valve *1
When the EGR is required for control of oxides of nitrogen (NOx) emissions, the ECM/PCM controls the EGR valve.

ECM/PCM Fail-safe/Back-up Functions

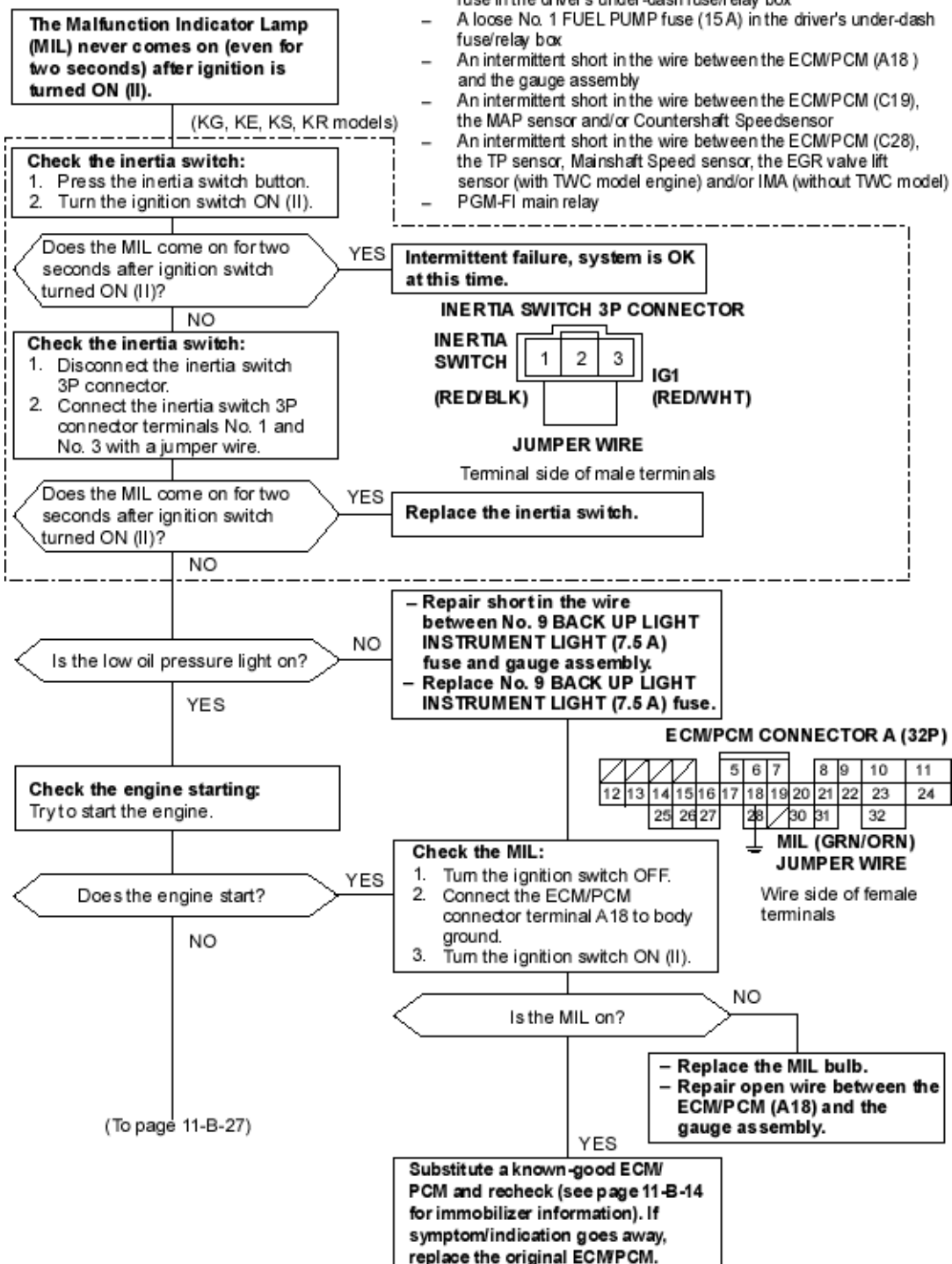
1. Fail safe Function
When an abnormality occurs in a signal from a sensor, the ECM/PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. Back-up Function
When an abnormality occurs in the ECM/PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.
3. Self-diagnosis Function (Malfunction Indicator Lamp (MIL))
When an abnormality occurs in a signal from a sensor, the ECM/PCM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned ON (II), the ECM/PCM supplies ground for the MIL for two seconds to check the MIL bulb condition.
4. Two Driving Cycle Detection Method
To prevent false indications, the "two driving cycle detection method" is used for the EGR system and other self--diagnostic functions. When an abnormality occurs, the ECM/PCM stores it in its memory. When the same abnormality re-occurs after the ignition switch is turned OFF and ON (II) again, the ECM/PCM informs the driver by turning on the MIL.

NOTE:

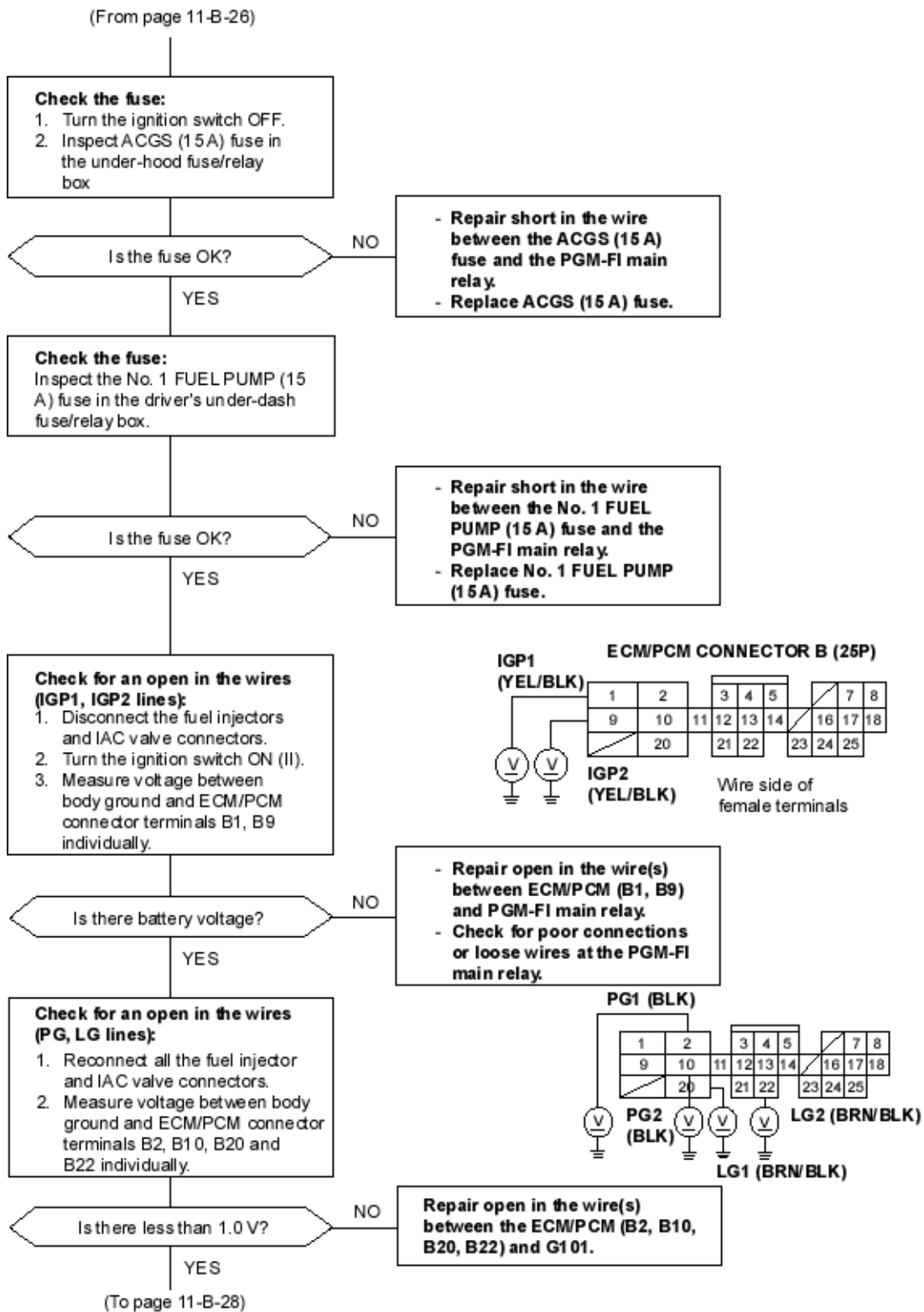
- ♦ If this symptom is intermittent, check for:
 - A loose ACGS (15A) fuse in the under-hood fuse/relay box.
 - A loose No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A) fuse in the driver's under-dash fuse/relay box.
 - A loose No. 1 FUELPUMP fuse (15A) in the driver's under-dash fuse/relay box.
 - An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly.
 - An intermittent short in the wire between the ECM/PCM (C19), the MAP sensor and/or Countershaft Speed sensor.
 - An intermittent short in the wire between the ECM/PCM (C28), the TP sensor, Mainshaft Speed sensor, the EGR valve lift sensor (with TWC model engine) and/or IMA (without TWC model).
 - PGM-FI main relay.

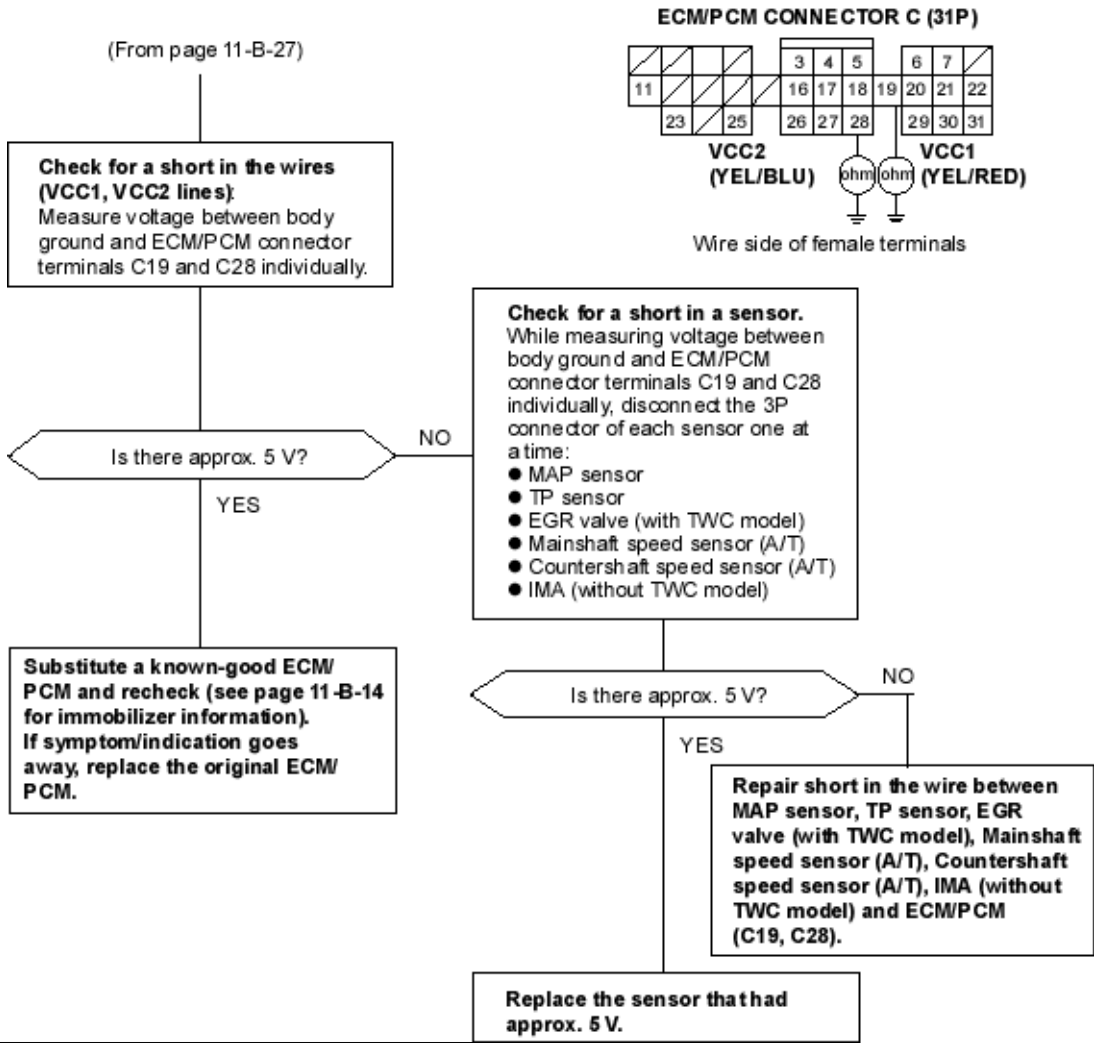
NOTE

- If this symptom is intermittent, check for:
 - A loose ACGS (15A) fuse in the under-hood fuse/relay box.
 - A loose No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A) fuse in the driver's under-dash fuse/relay box
 - A loose No. 1 FUEL PUMP fuse (15A) in the driver's under-dash fuse/relay box
 - An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly
 - An intermittent short in the wire between the ECM/PCM (C19), the MAP sensor and/or Countershaft Speedsensor
 - An intermittent short in the wire between the ECM/PCM (C28), the TP sensor, Mainshaft Speed sensor, the EGR valve lift sensor (with TWC model engine) and/or IMA (without TWC model)
 - PGM-FI main relay



To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)





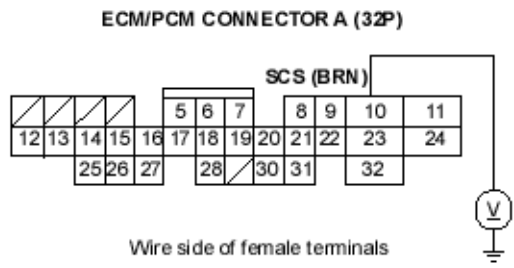
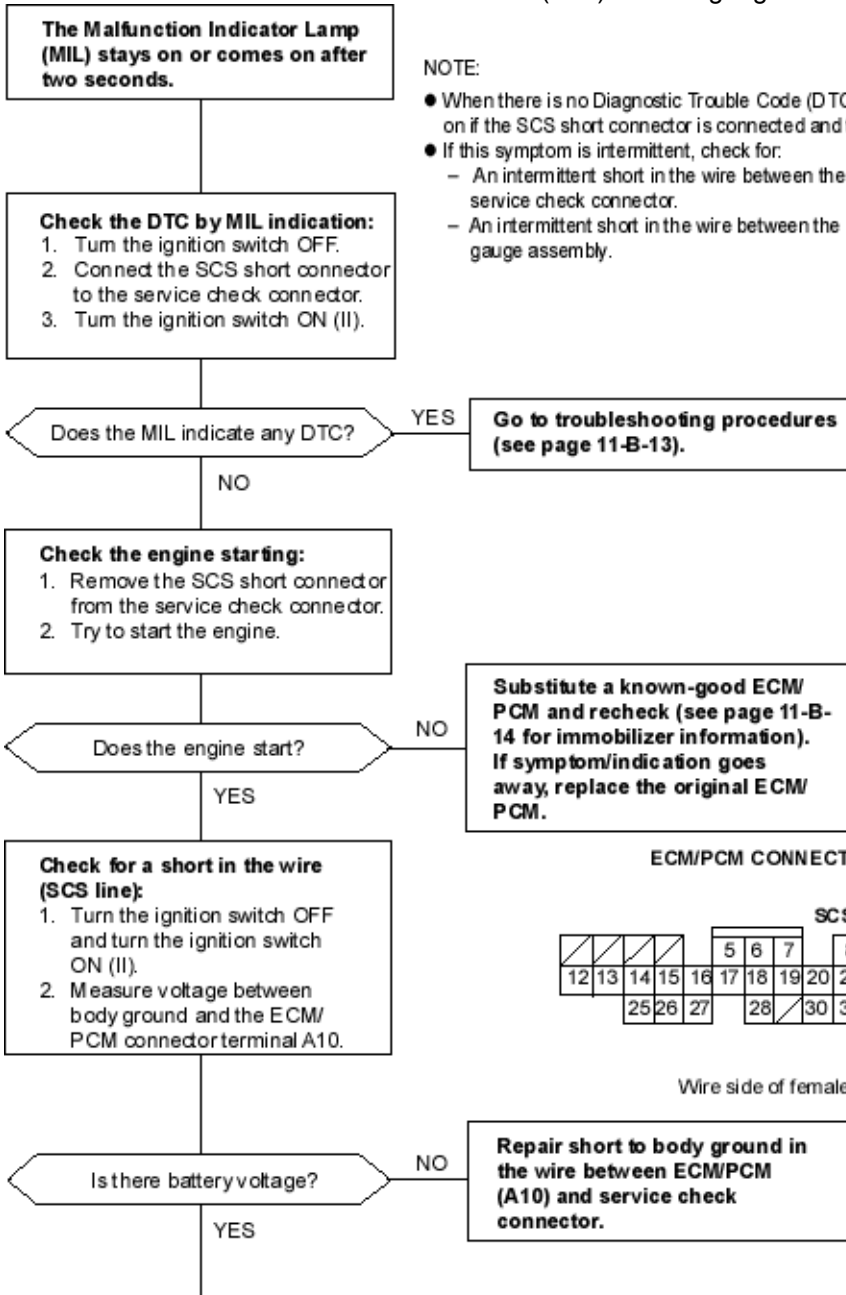
To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)

NOTE:

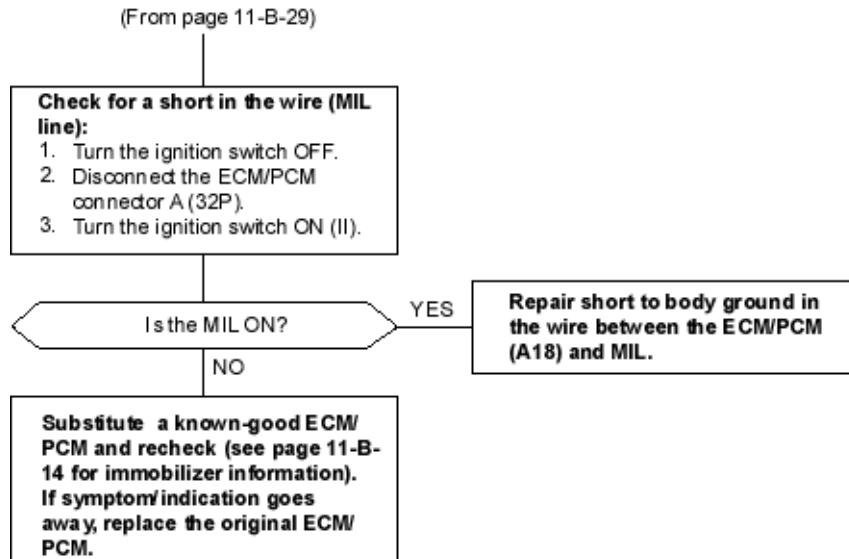
When there is no Diagnostic Trouble Code (DTC) stored, the MIL will stay on if the SCS short connector is connected and the ignition switch is ON (II).

If this symptom is intermittent, check for:

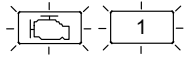
- An intermittent short in the wire between the ECM/PCM (A10) and the service check connector.
- An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly..



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)

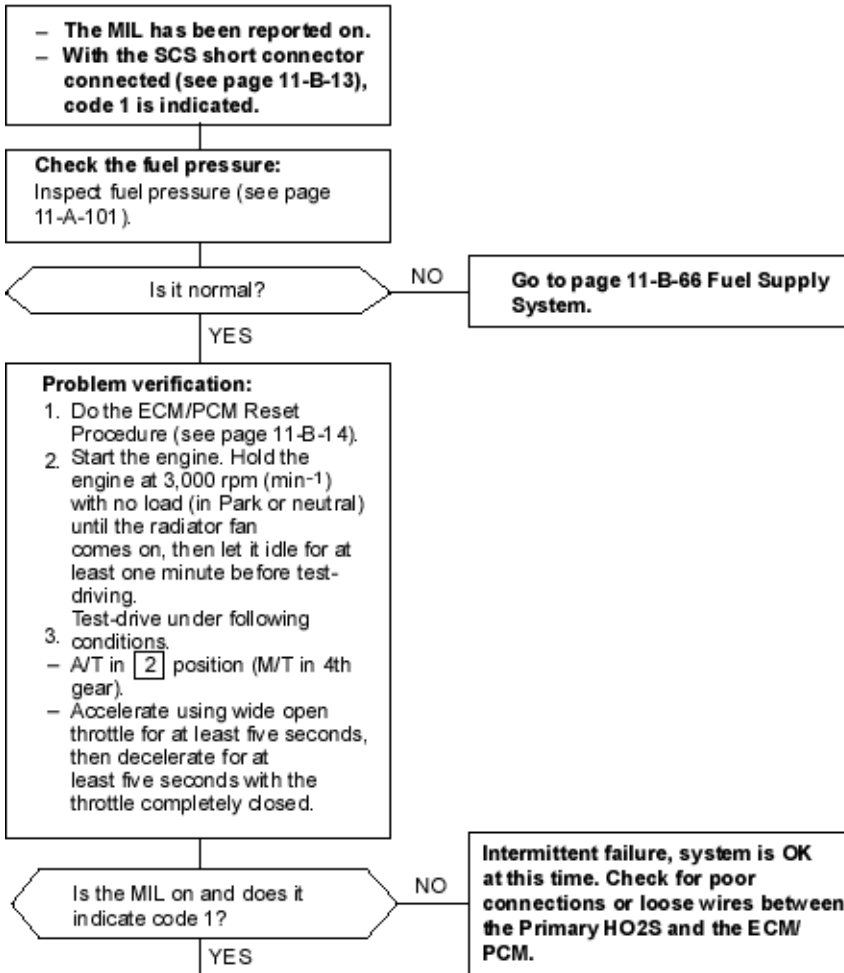
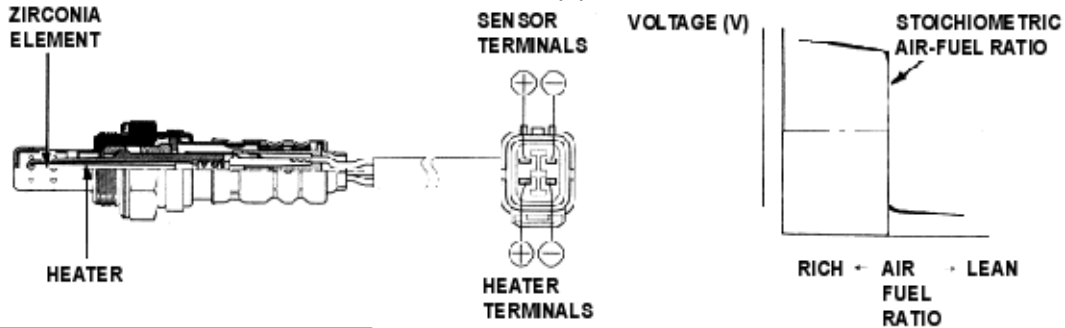


To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)



The Malfunction Indicator Lamp (MIL) Indicates Diagnostic Trouble Code (DTC) 1: A problem in the Heated Oxygen Sensor (HO2S) circuit.

The Heated Oxygen Sensor (HO2S) detects the oxygen content in the exhaust gas and signals the ECM/PCM in operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilize the sensor's output, the sensor has an internal heater. The HO2S is installed in the exhaust pipe A.

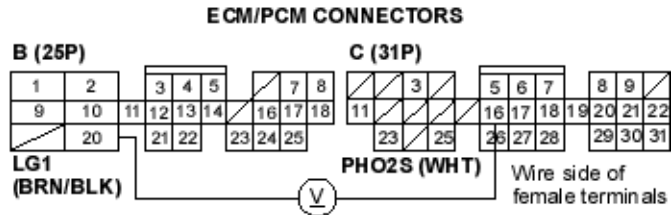


To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)

(From page 11-B-31)

Check the ECM/PCM voltage:

1. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then let it idle for at least one minute before test-driving.
2. Measure voltage between ECM/PCM connector terminals B20 and C16.
3. Open the throttle wide open, then quickly release it.



Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min⁻¹) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min⁻¹)?

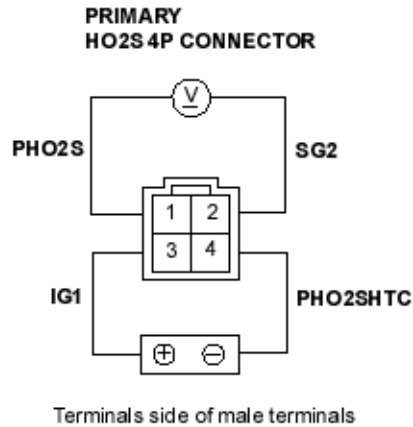
YES

Substitute a known-good ECM/PCM and recheck (see page 11-B-14 for immobilizer information). If symptom/indication goes away, replace the original ECM/PCM.

NO

Check the Primary HO2S:

1. Turn the ignition switch OFF.
2. Disconnect the 4P connector from the Primary HO2S.
3. At the Primary HO2S harness side, connect the battery positive terminal to terminal No. 3 and battery negative terminal to terminal No. 4.
4. Start the engine.
5. After two minutes, measure voltage between Primary HO2S 4P connector terminals No. 1 and No. 2.



Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min⁻¹) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min⁻¹)?

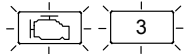
NO

Replace the Primary HO2S (see page 11-B-60).

YES

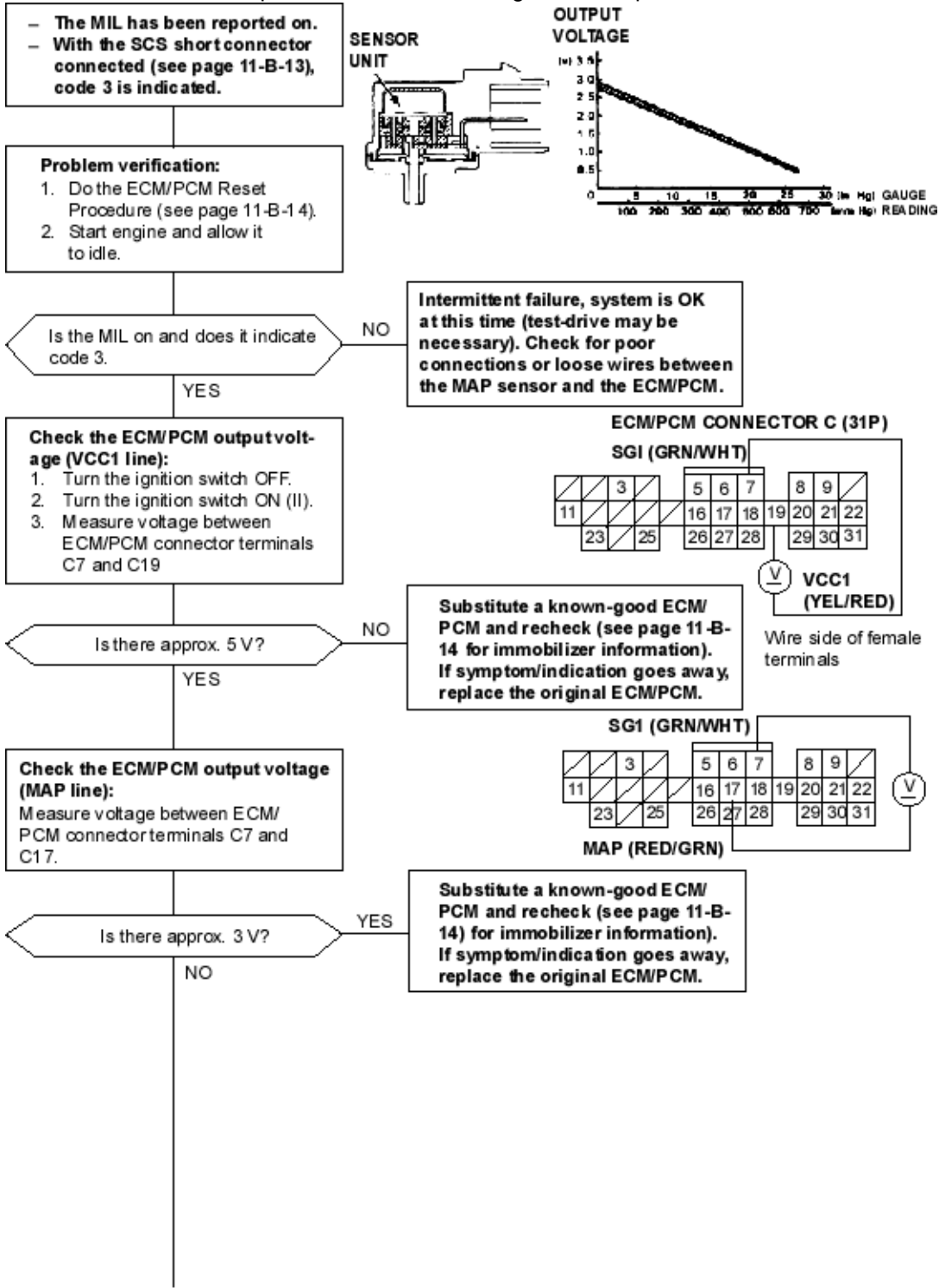
Repair open or short in the wire ECM/PCM (C16) and the Primary HO2S.

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)
[\(See Page 11-B-60\)](#)

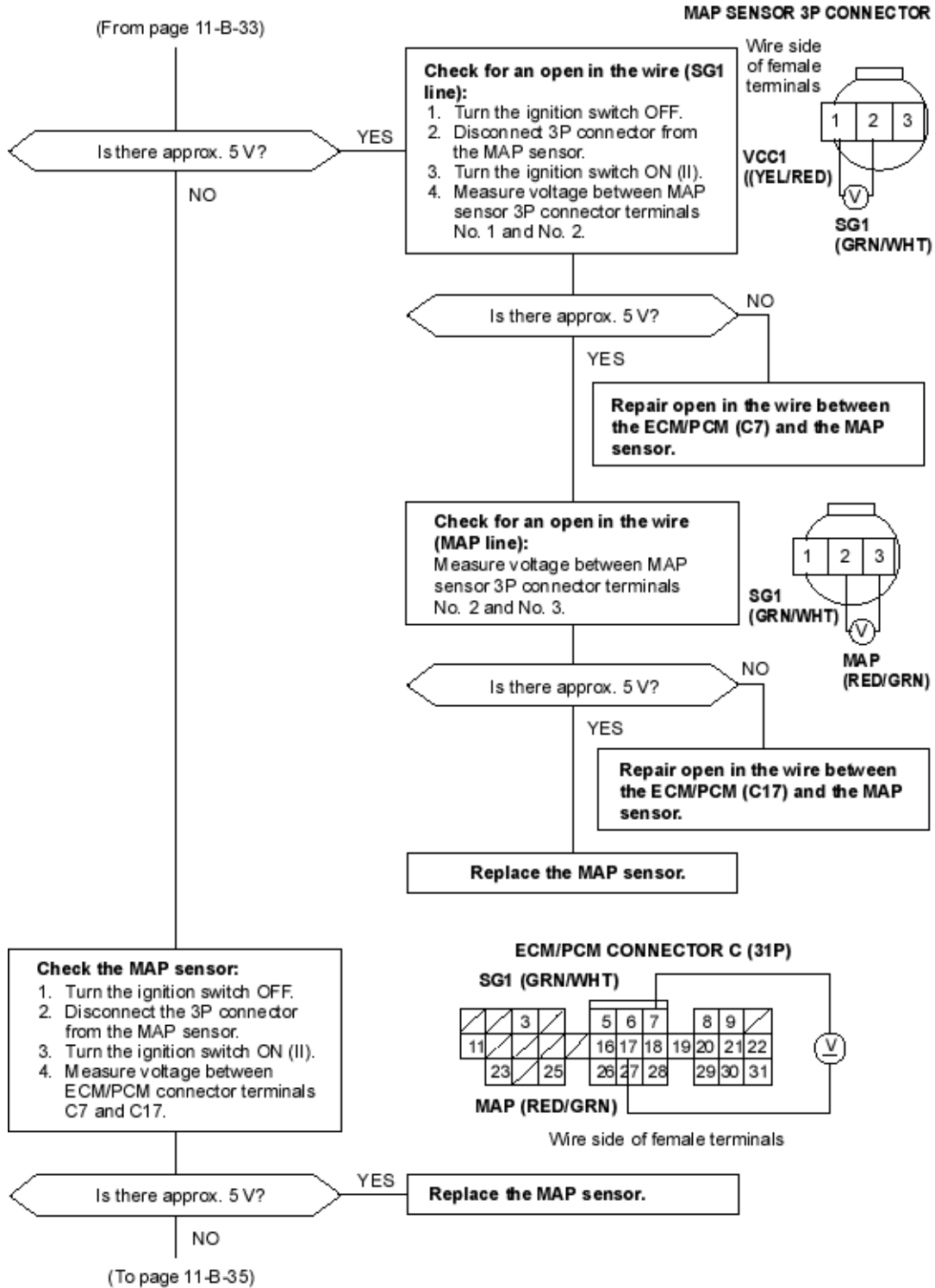


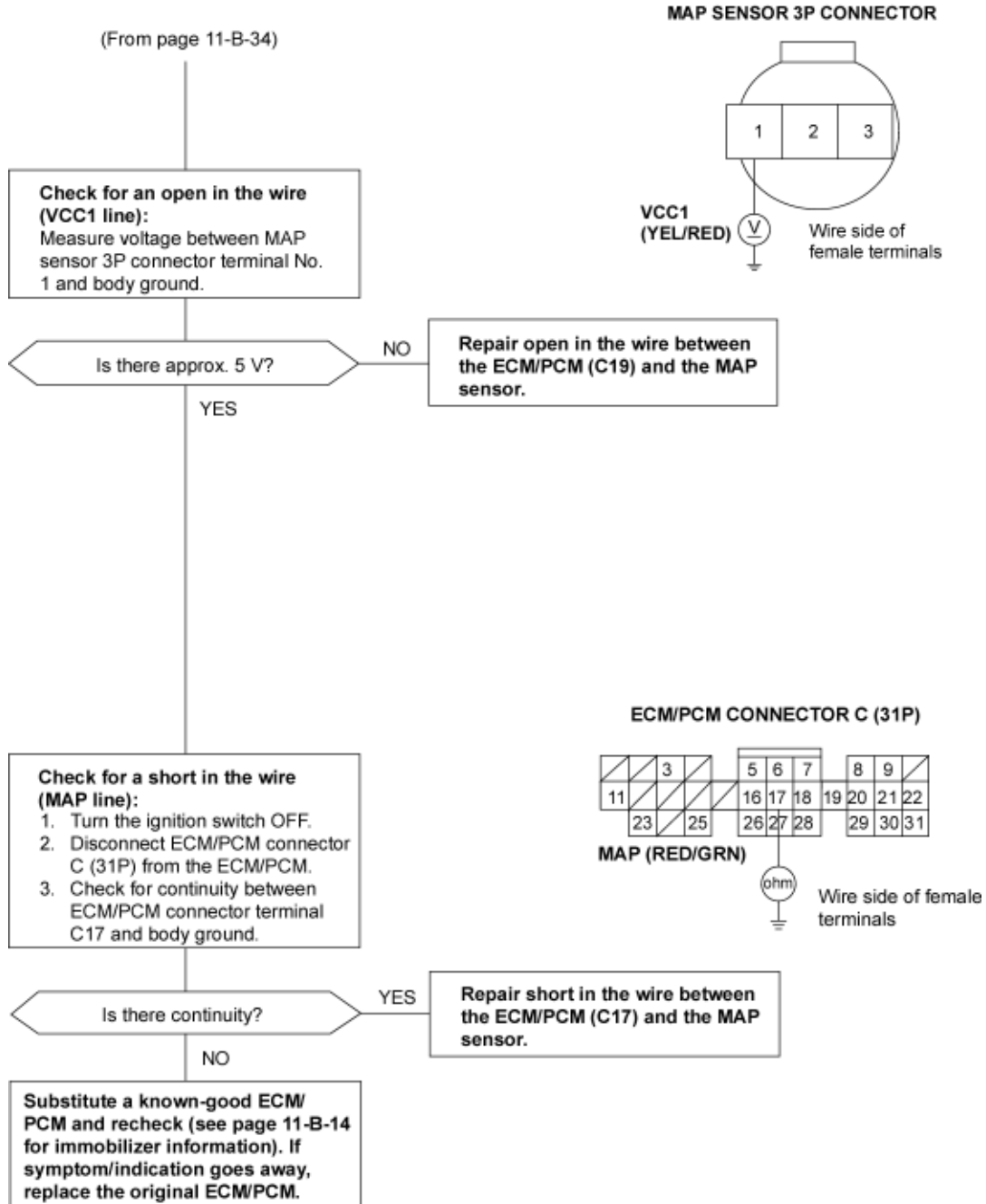
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 3: An electrical problem in the Manifold Absolute Pressure (MAP) Sensor circuit.

The MAP sensor converts manifold absolute pressure into electrical signals and inputs ECM/PCM.

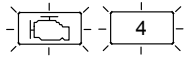


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-14)

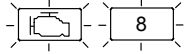




To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)

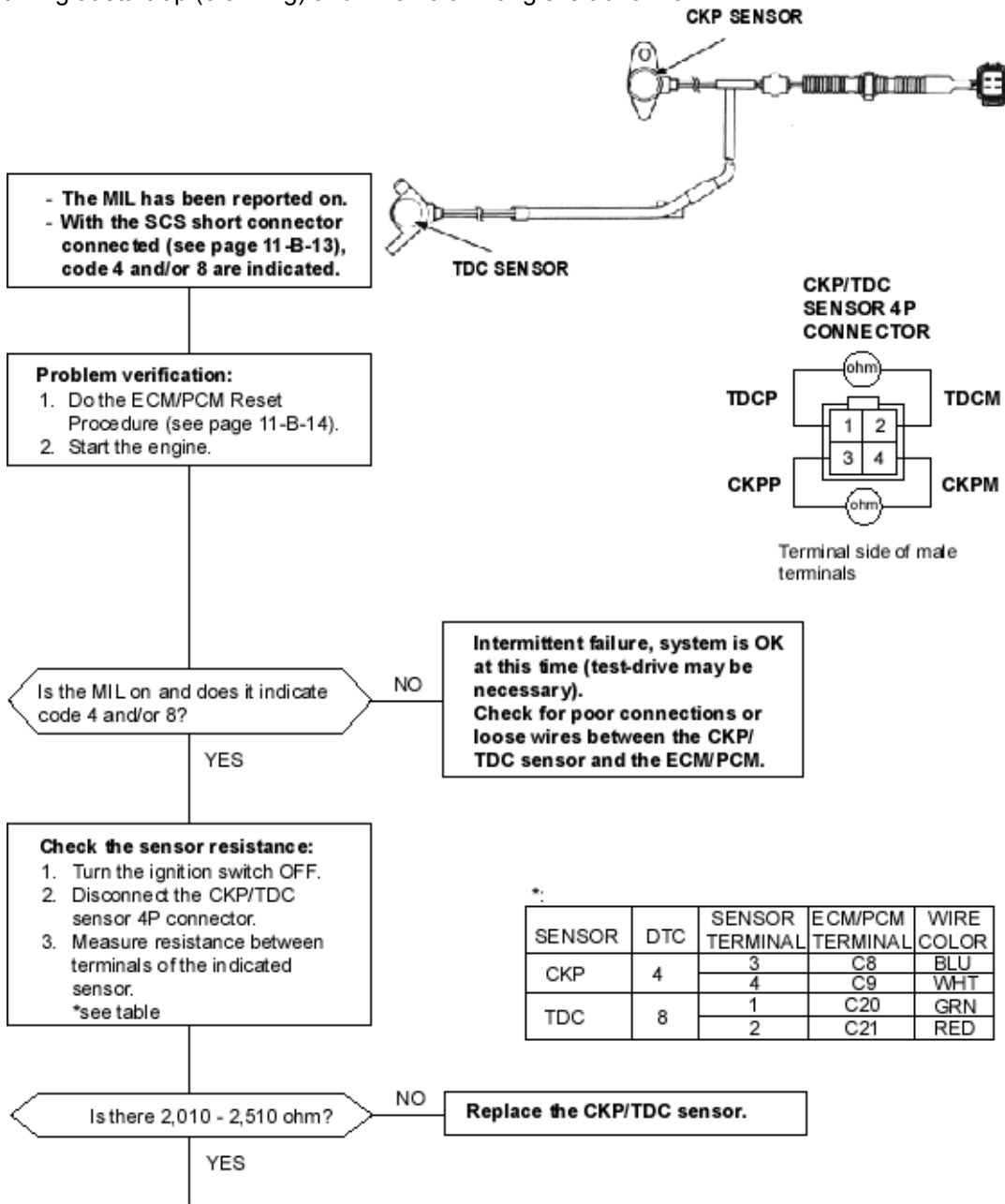


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 4: A problem in the Crankshaft Position (CKP) Sensor circuit.



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 8: A problem in the Top Dead Center (TDC) Sensor circuit.

The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The TDC Sensor determines ignition timing at start-up (cranking) and when crank angle is abnormal.



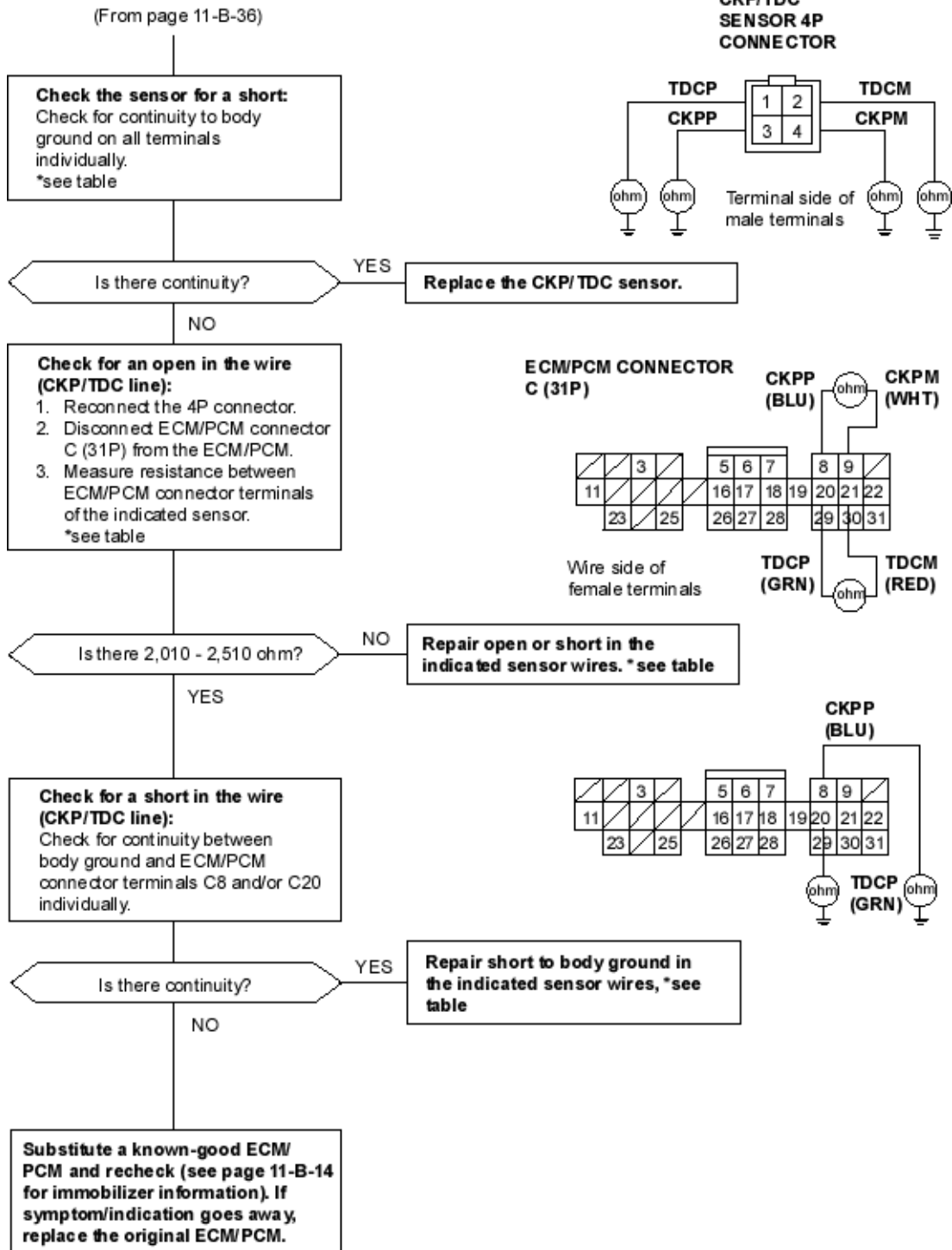
SENSOR	DTC	SENSOR TERMINAL	ECM/PCM TERMINAL	WIRE COLOR
CKP	4	3	C8	BLU
		4	C9	WHT
TDC	8	1	C20	GRN
		2	C21	RED

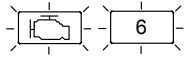
(To page 11-B-37)

To go to the pages referenced on the diagram above, click on the following:

(See Page 11-B-13)

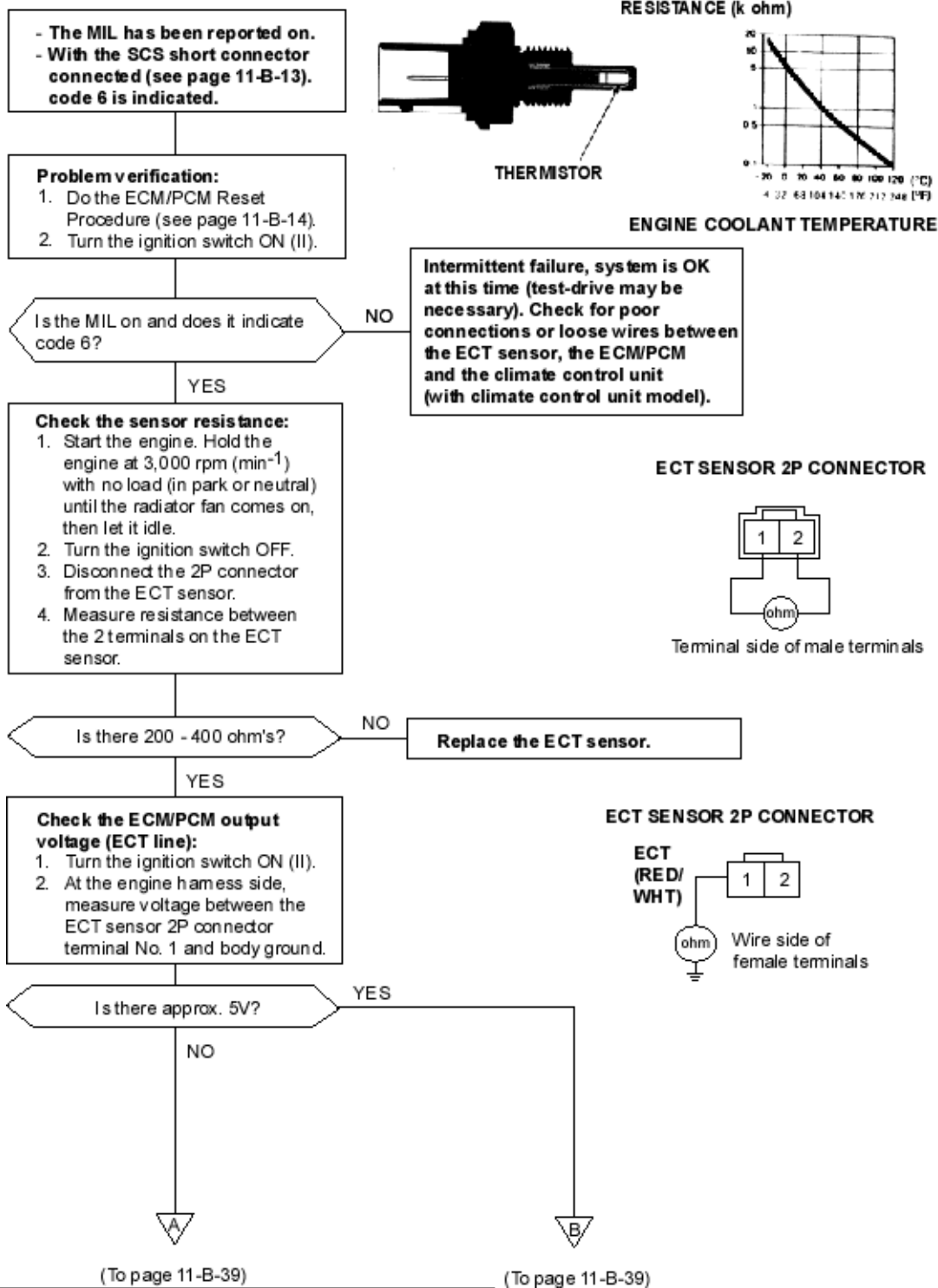
(See Page 11-B-14)



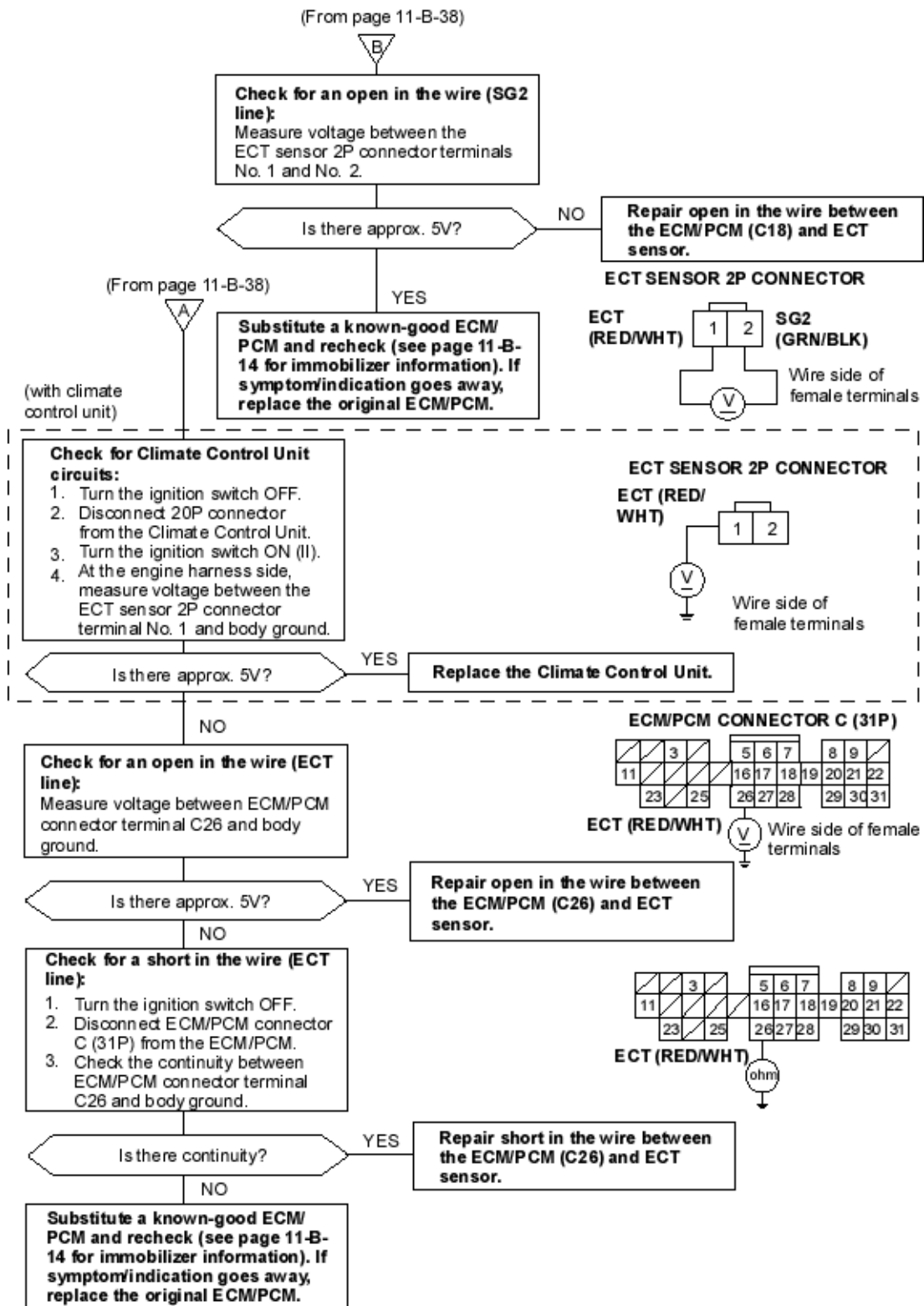


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 6: A problem in the Engine Coolant Temperature (ECT) Sensor circuit.

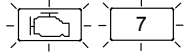
The ECT sensor is temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.



To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-B-13)
 (See Page 11-B-14)

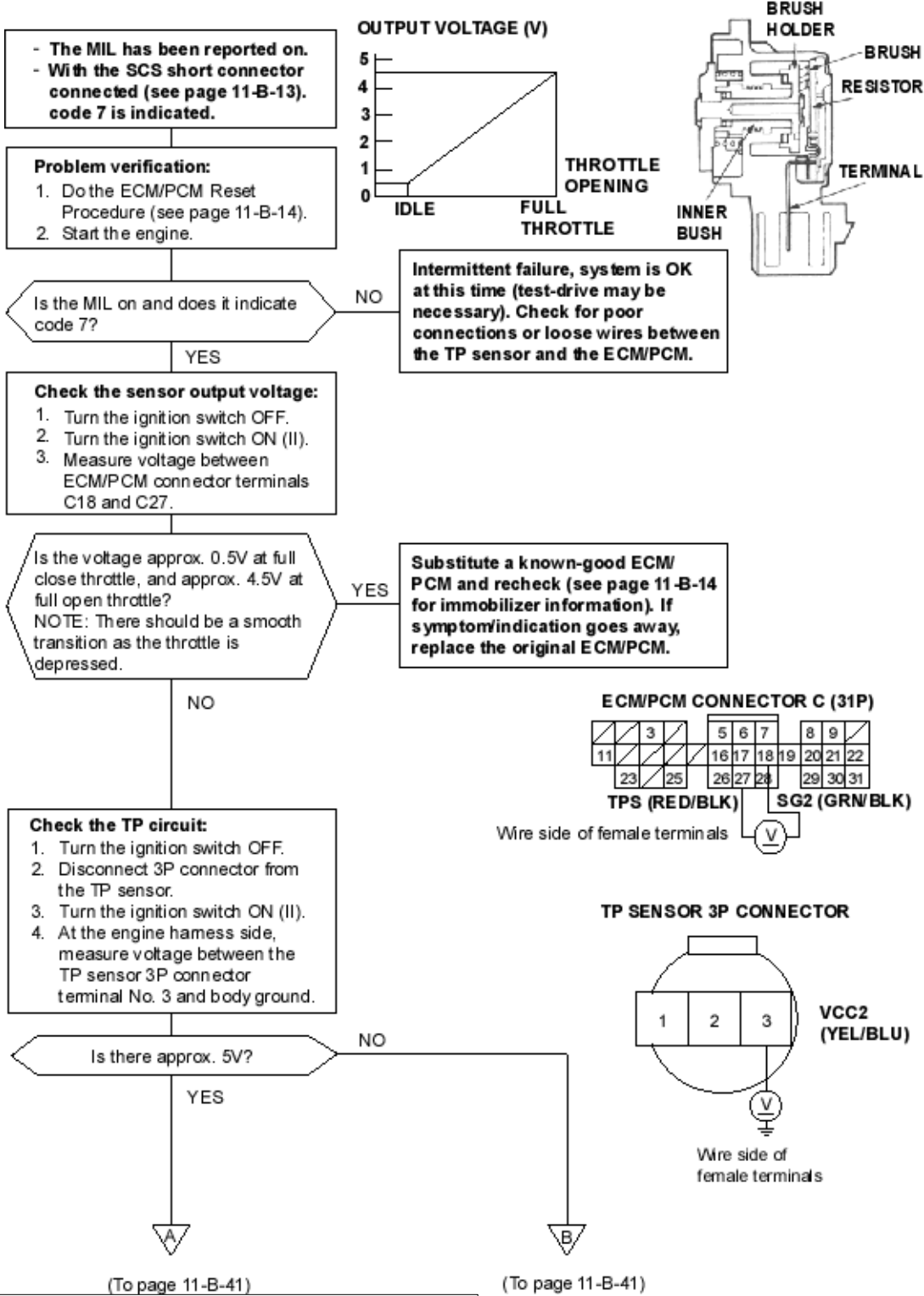


To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)

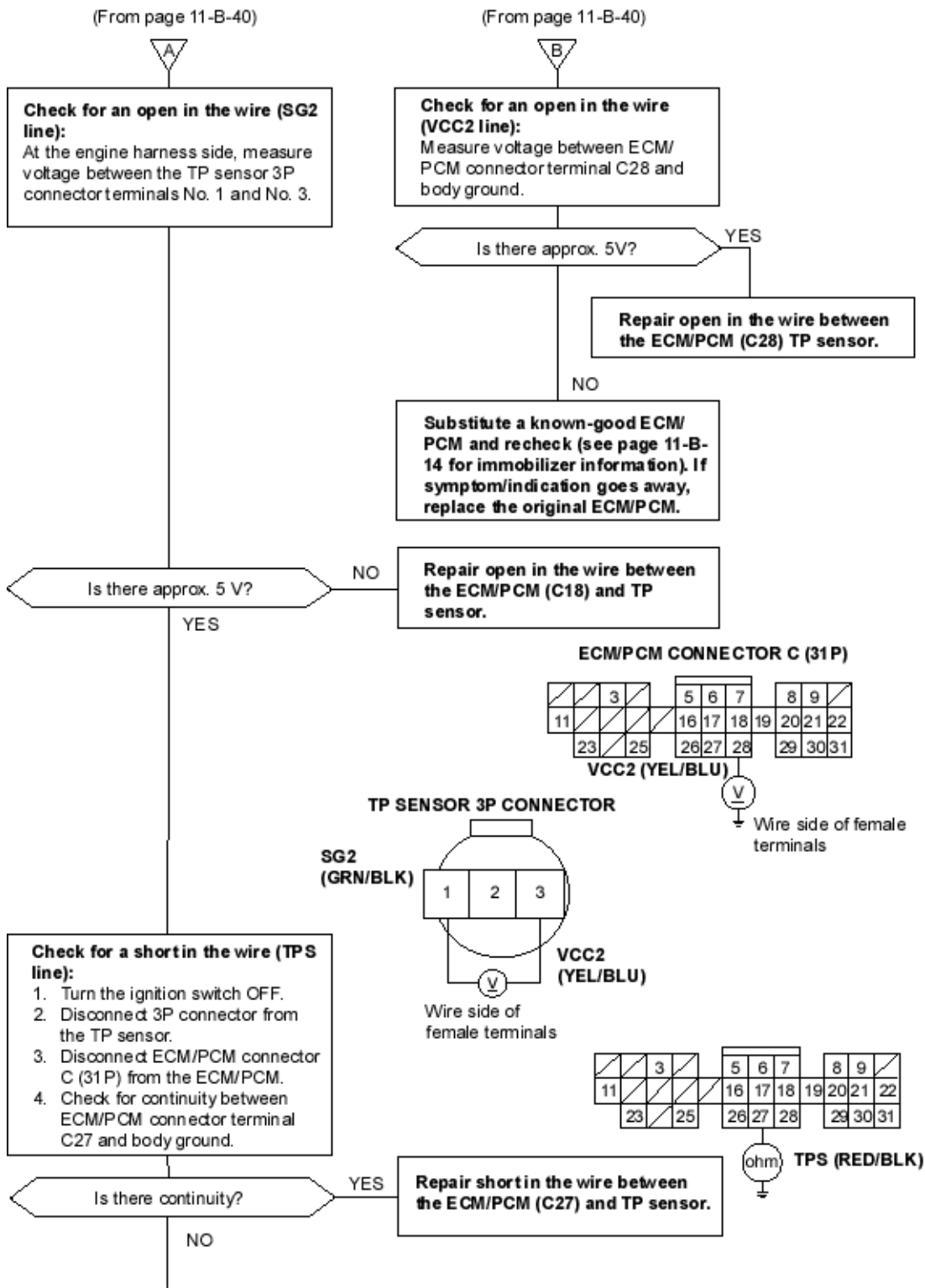


The Malfunction Indicator (MIL) indicates Diagnostic Trouble Code (DTC) 7: A problem in the Throttle Position (TP) Sensor circuit.

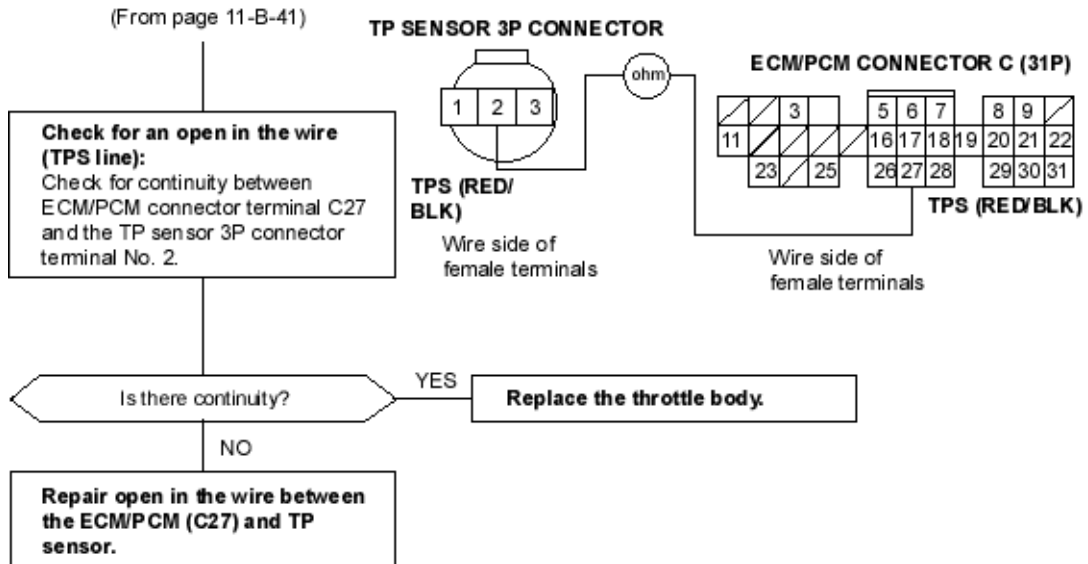
The TP sensor is potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the throttle position sensor varies the voltage signal to the ECM/PCM.

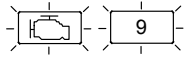


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)



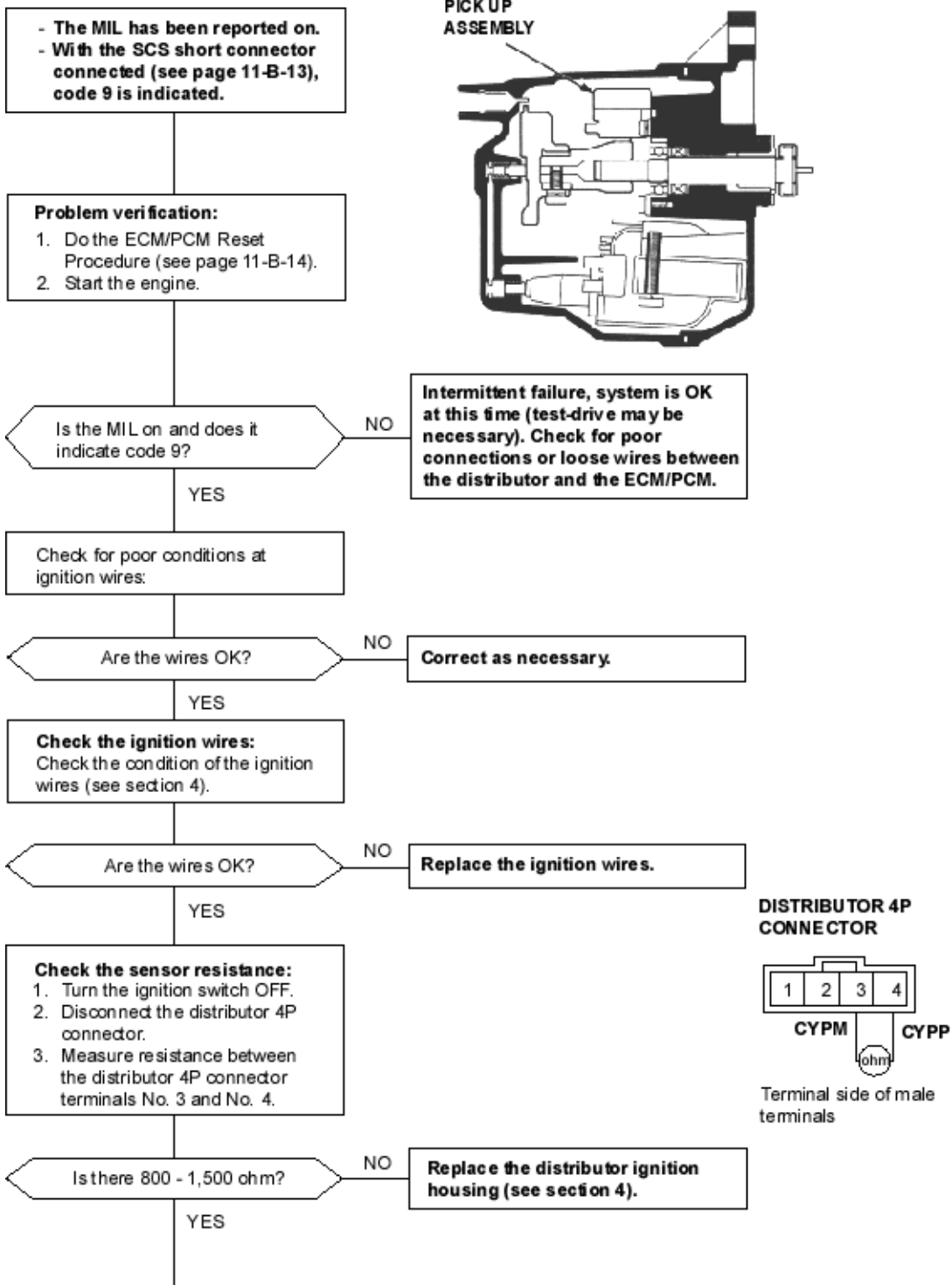
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)





The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 9: A problem in the Cylinder Position (CYP) Sensor circuit.

The CYP Sensor detects the position of No. 1 cylinder for sequential fuel injection to each cylinder. The CYP Sensor is built into the distributor.

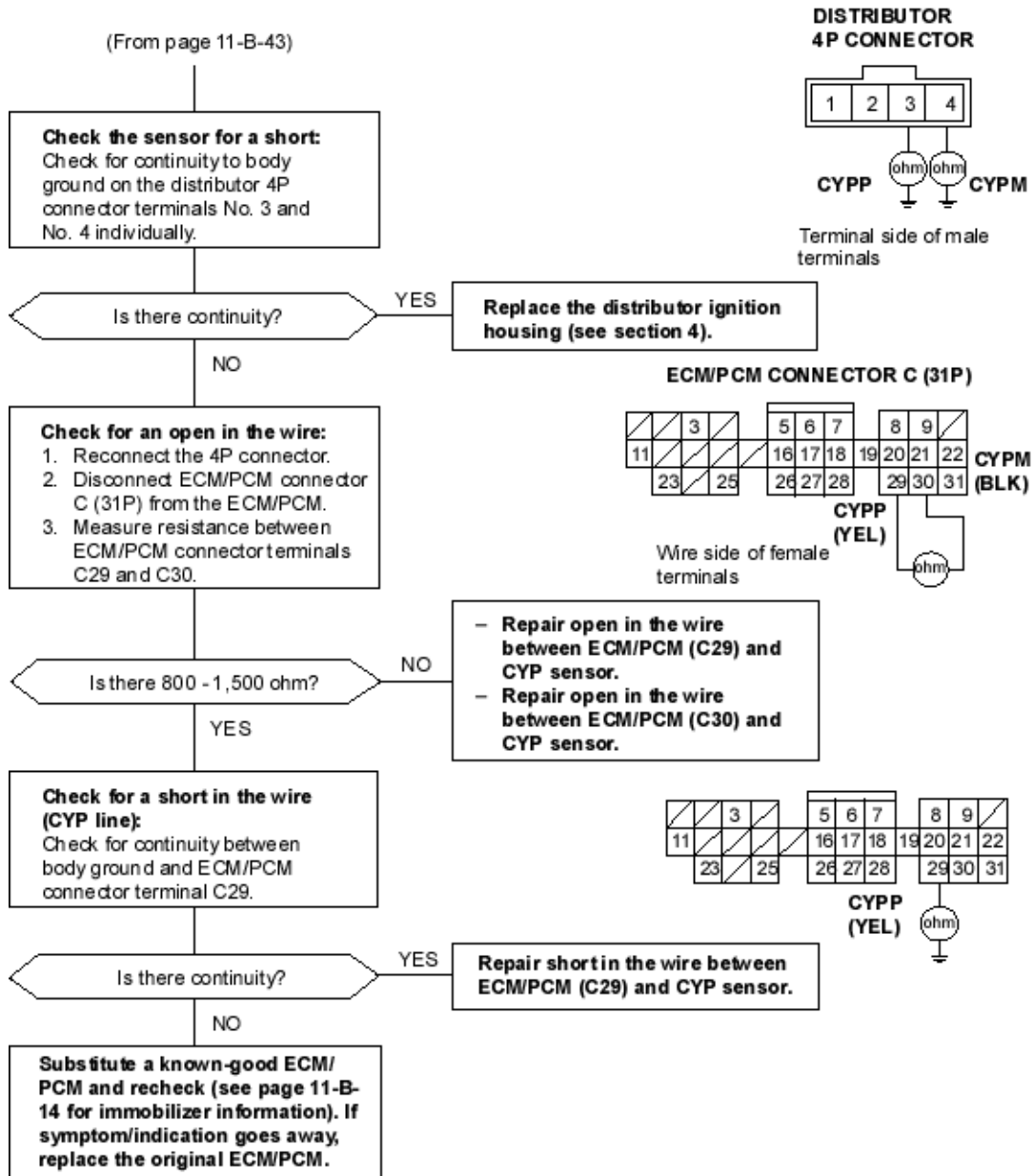


(To page 11-B-44)

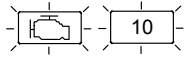
To go to the pages referenced on the diagram above, click on the following:

[\(See Page 11-B-13\)](#)

[\(See Page 11-B-14\)](#)

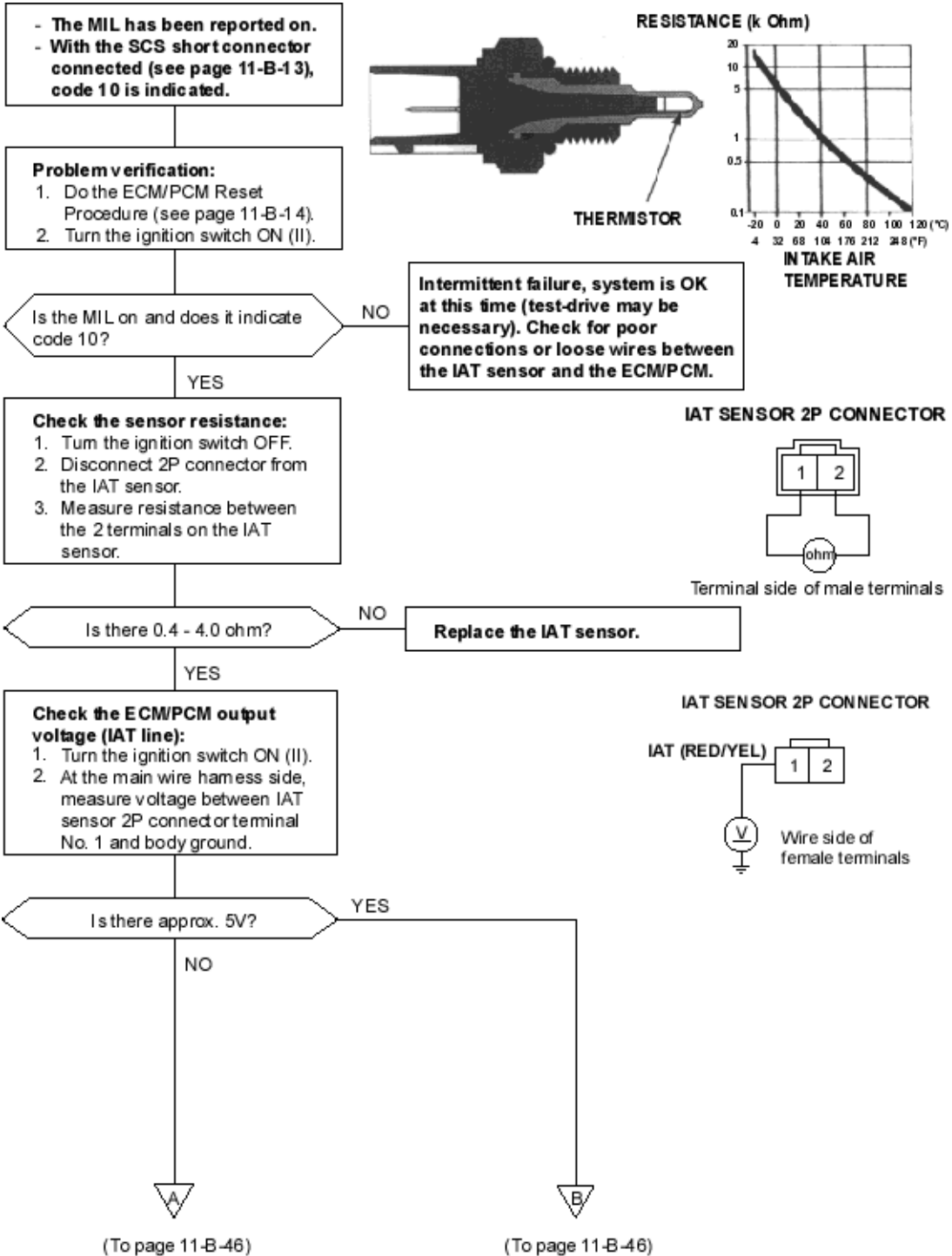


To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)

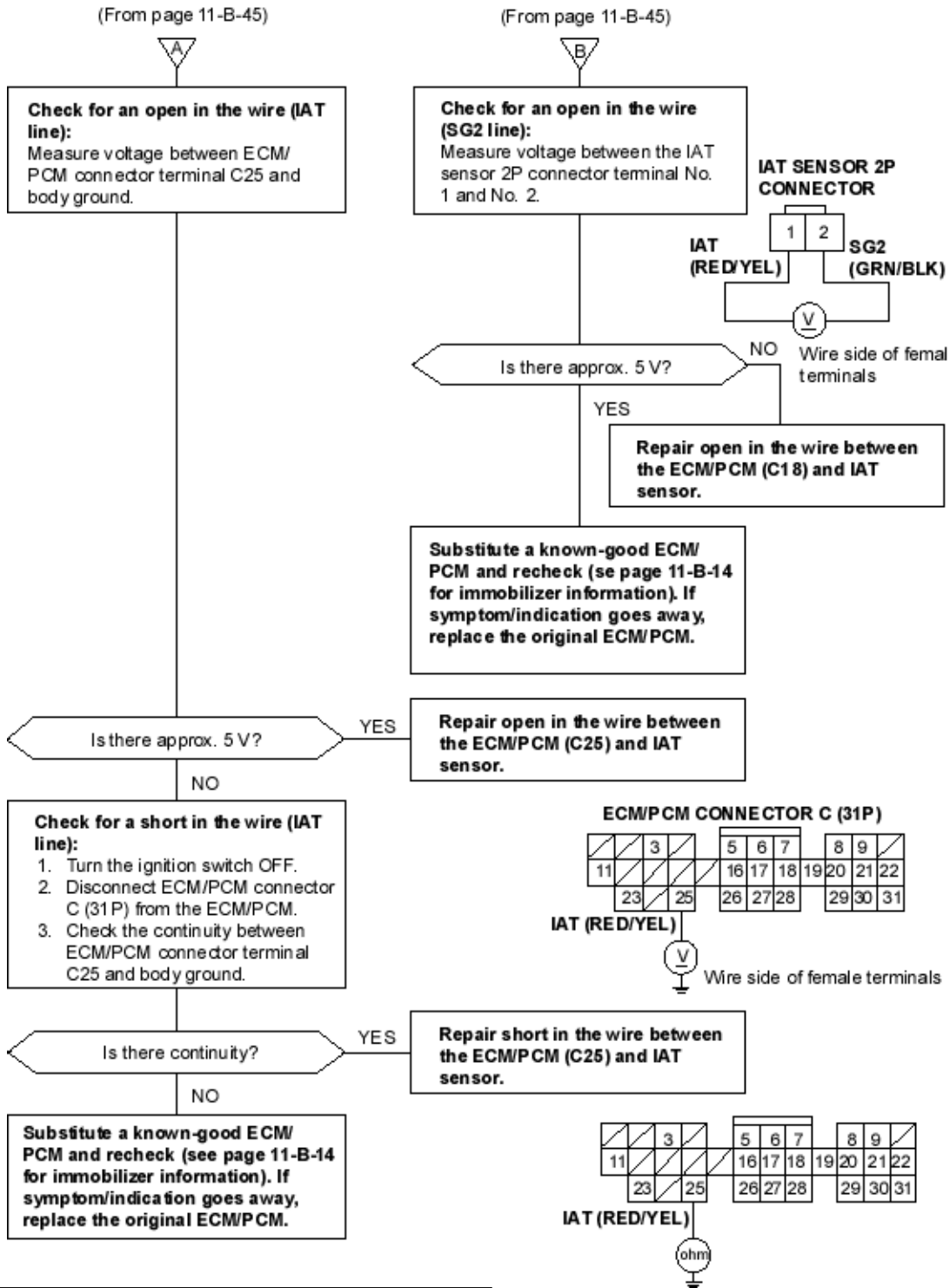


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 10: A problem in the Intake Air Temperature (IAT) Sensor circuit.

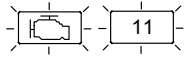
The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the air temperature increases as shown below.



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)

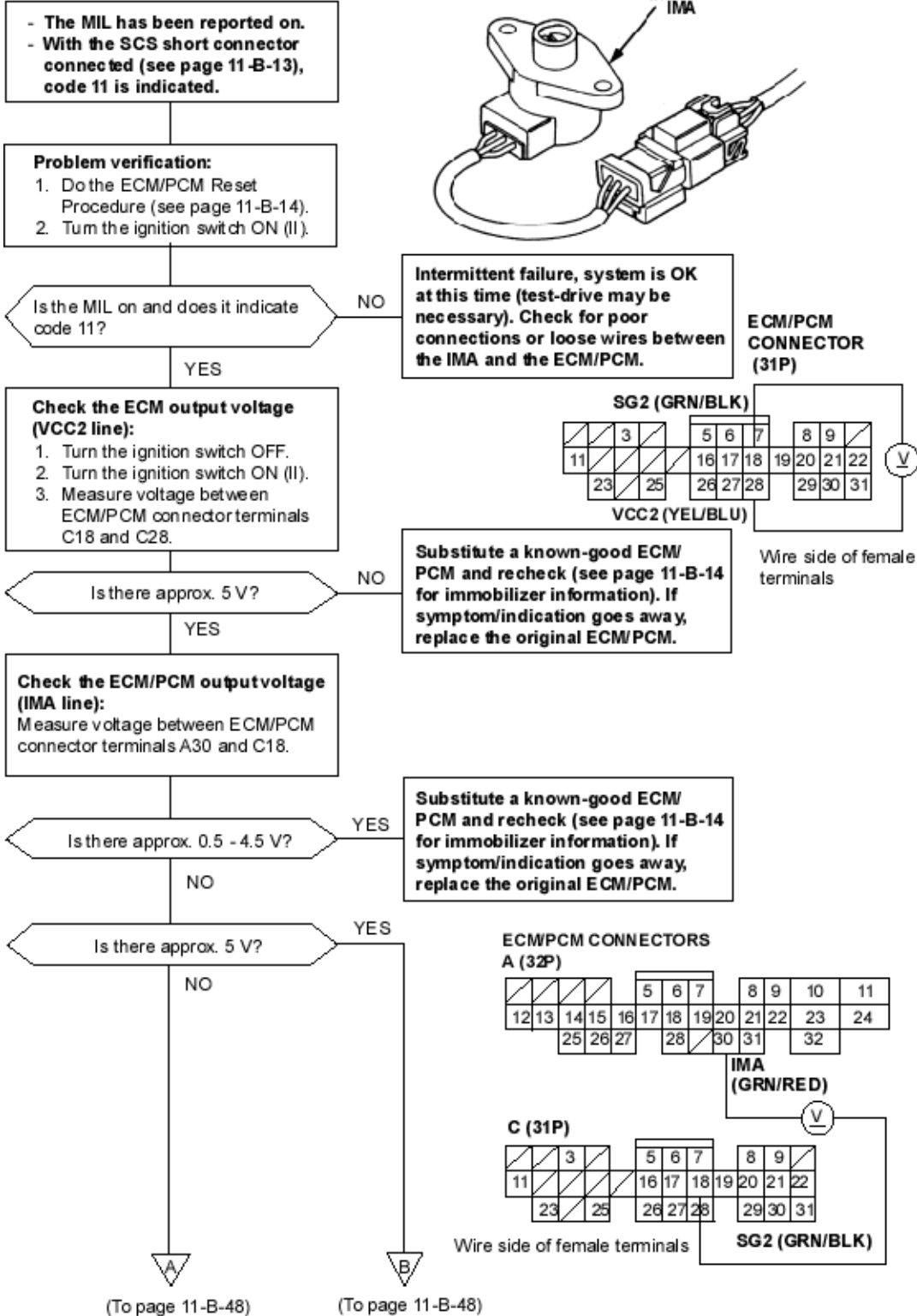


To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)

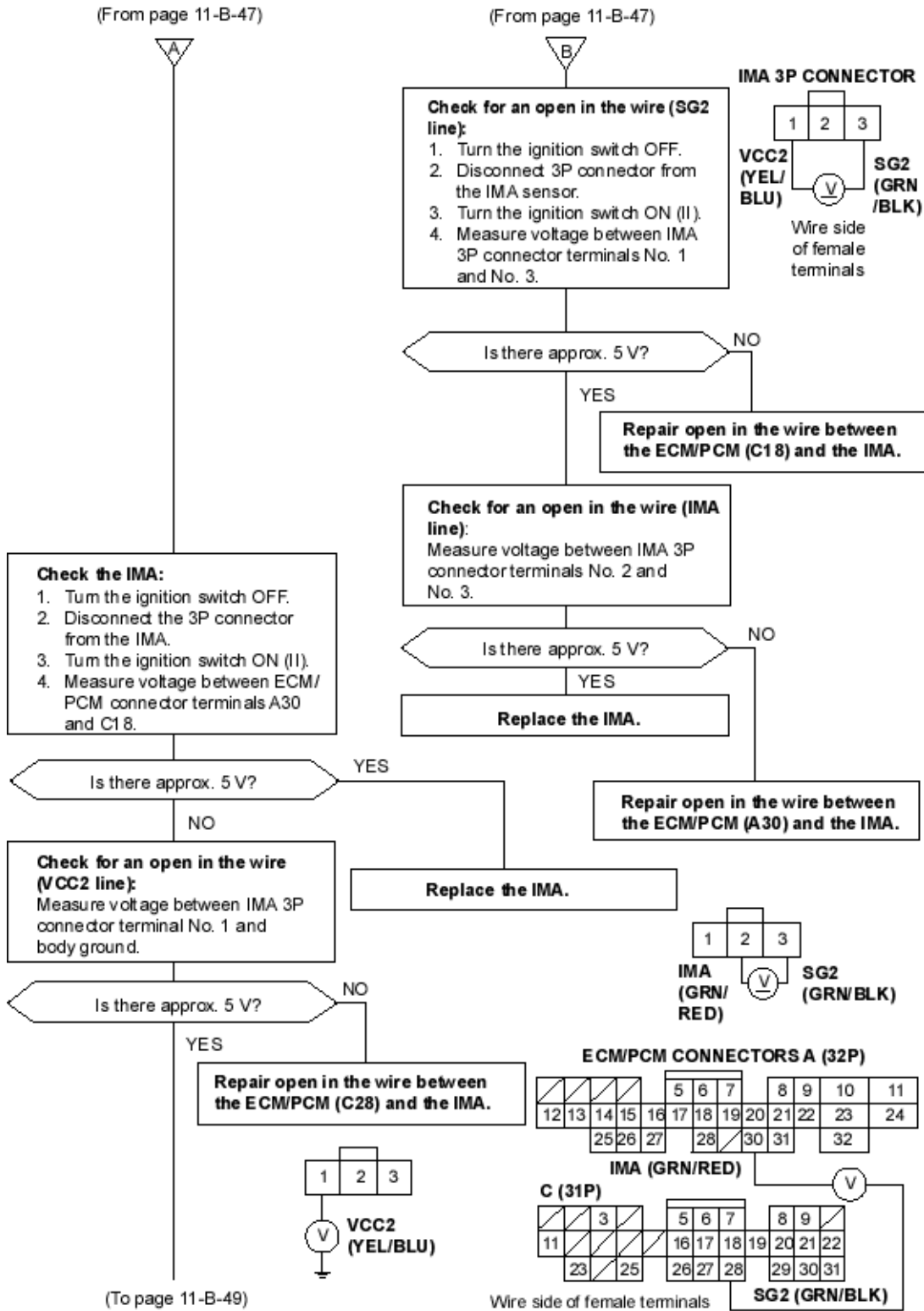


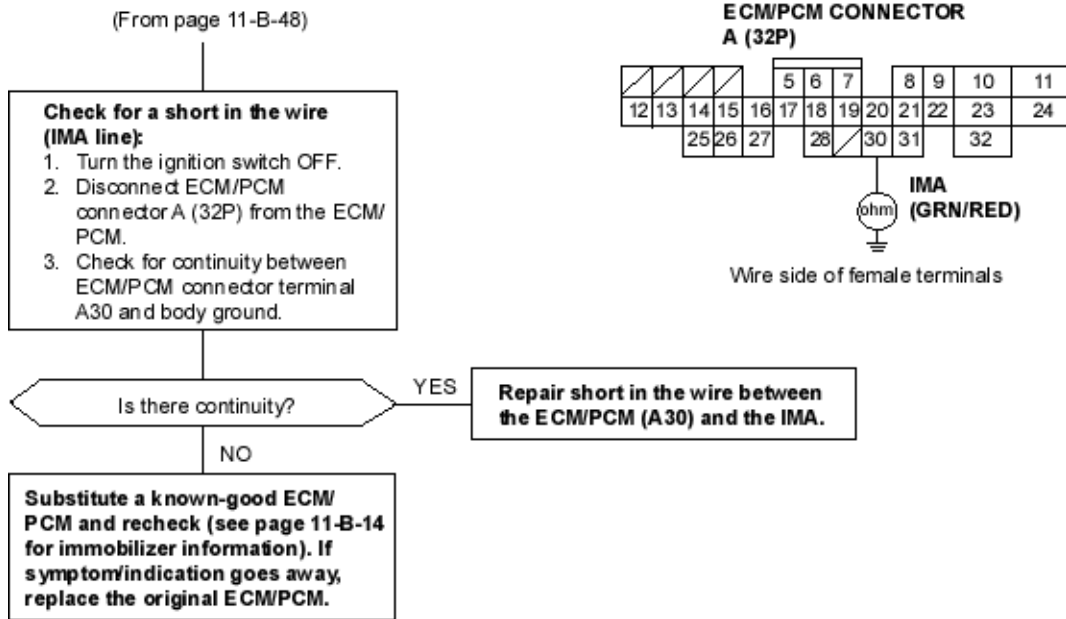
Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 11: A problem in the Idle Mixture Adjuster (IMA) circuit.

The Idle Mixture Adjuster (IMA) is selected resistance device used to control idle mixture.

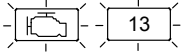


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)



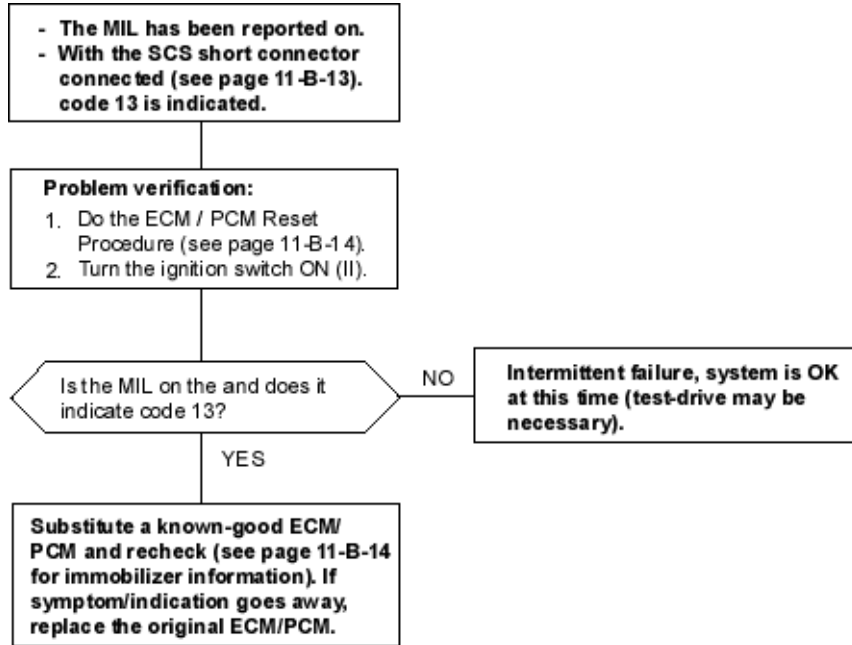


To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)

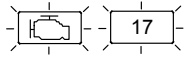


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 13: A problem in the Barometric Pressure (BARO) Sensor.

The BARO Sensor is built into the ECM/PCM.

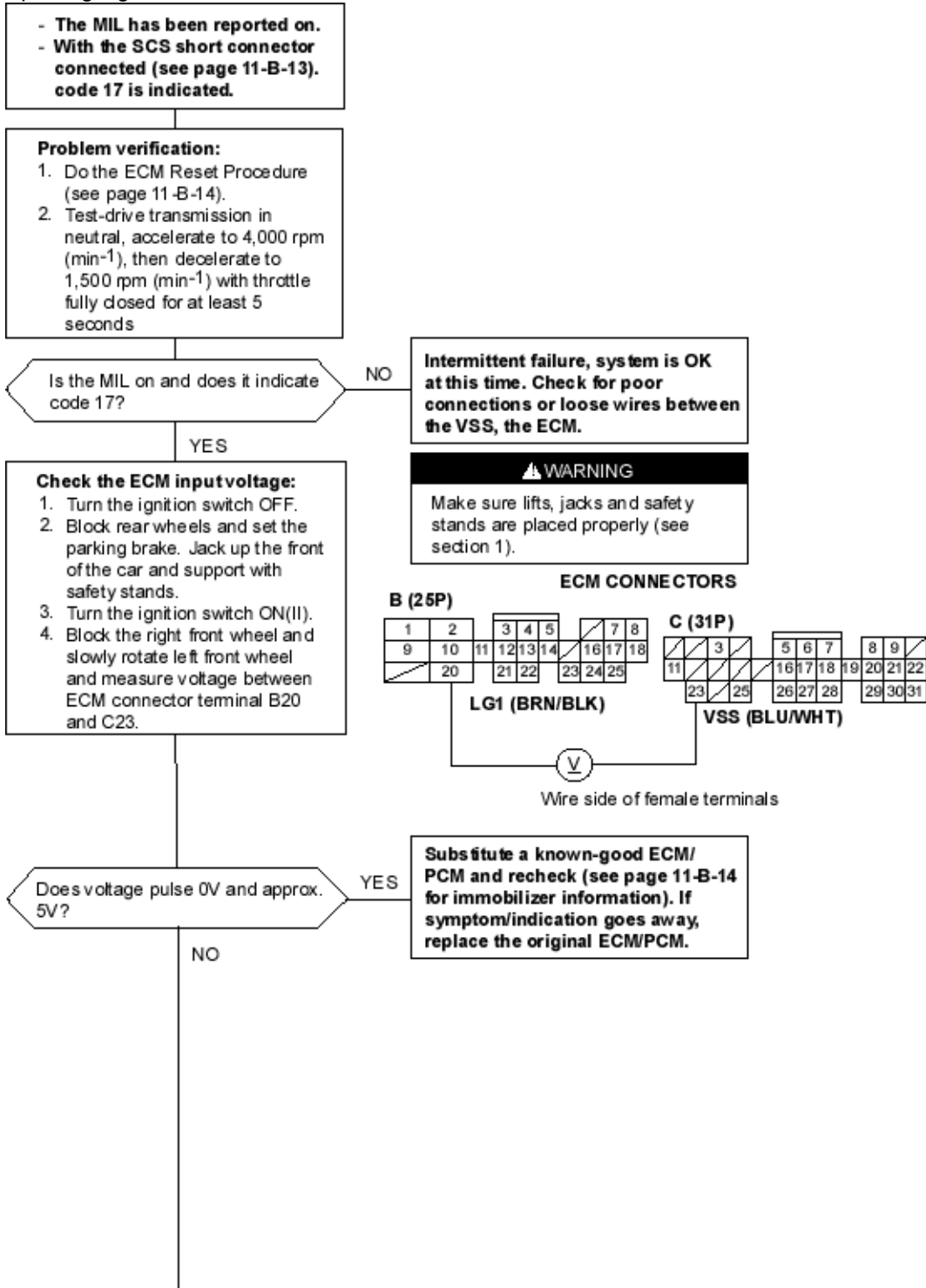


To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-13)
(See Page 11-B-14)



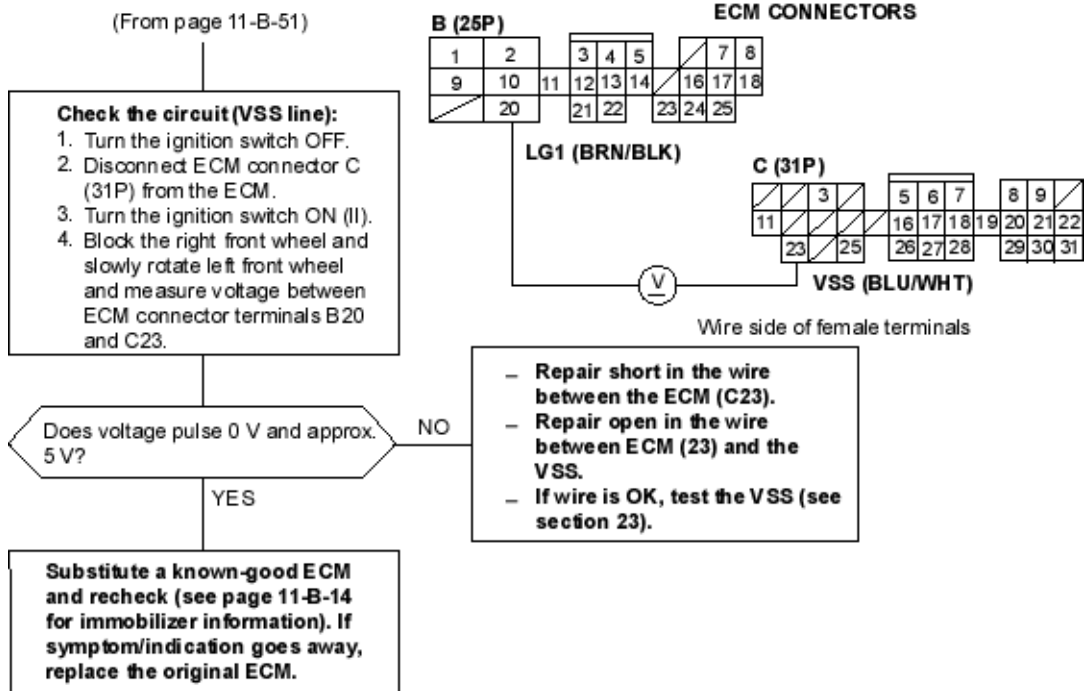
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 17: A problem in the Vehicle Speed Sensor (VSS) circuit.

The VSS generates a pulsing signal when the front wheels turn.

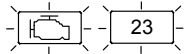


(To page 11-B-52)

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-B-13)
 (See Page 11-B-14)

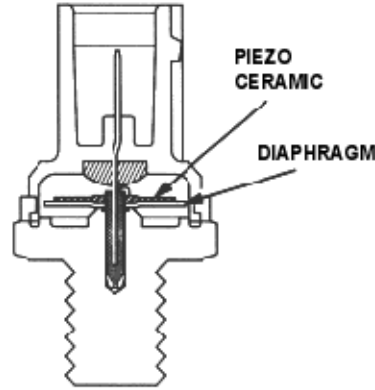


To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 23: A problem in the Knock Sensor (KS) circuit.

A knock control system was adopted which sets the ideal ignition timing for the octane number of the gasoline used.



- The MIL has been reported on.
 - With the SCS short connector connected (see page 11-B-13), code 23 is indicated.

Problem Verification

1. Do the ECM/PCM Reset Procedure (see page 11-B-14).
2. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold engine at 3,000 - 4,000 rpm (min⁻¹) for 10 seconds A/T in [N] or [P] position, M/T in neutral.

Is the MIL on and does it indicate code 23?

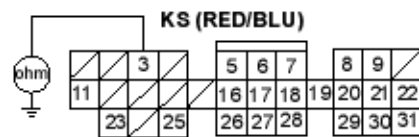
NO: Intermittent failure, system is OK at this time (test-drive may be necessary). Check for poor connections or loose wires between the KS and the ECM/PCM.

YES

Check for a short in the wire (KS line):

1. Turn the ignition switch OFF.
2. Disconnect the KS connector.
3. Disconnect the ECM/PCM connector C (31P).
4. Check for continuity between ECM/PCM connector terminal C3 and body ground.

ECM/PCM CONNECTOR C (31P)

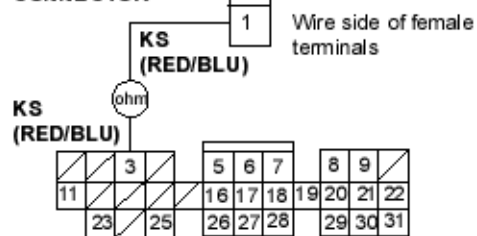


Wire side of female terminals

Is there continuity?

YES: Repair short in the wire between ECM/PCM (C3) and KS.

KNOCK SENSOR 1P CONNECTOR



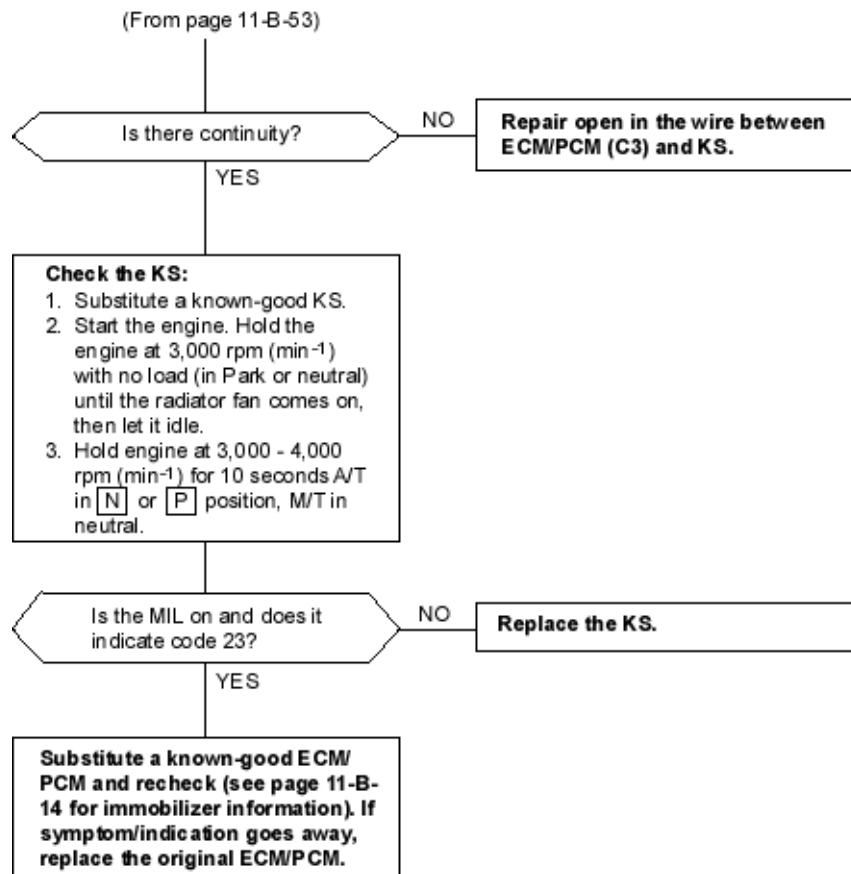
Wire side of female terminals

NO

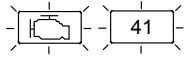
Check for an open in the wire (KS line):
 Check for continuity between ECM/PCM connector terminal C3 and the KS 1P connector terminal No. 1.

(To page 11-B-54)

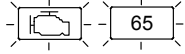
To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-B-13)
 (See Page 11-B-14)



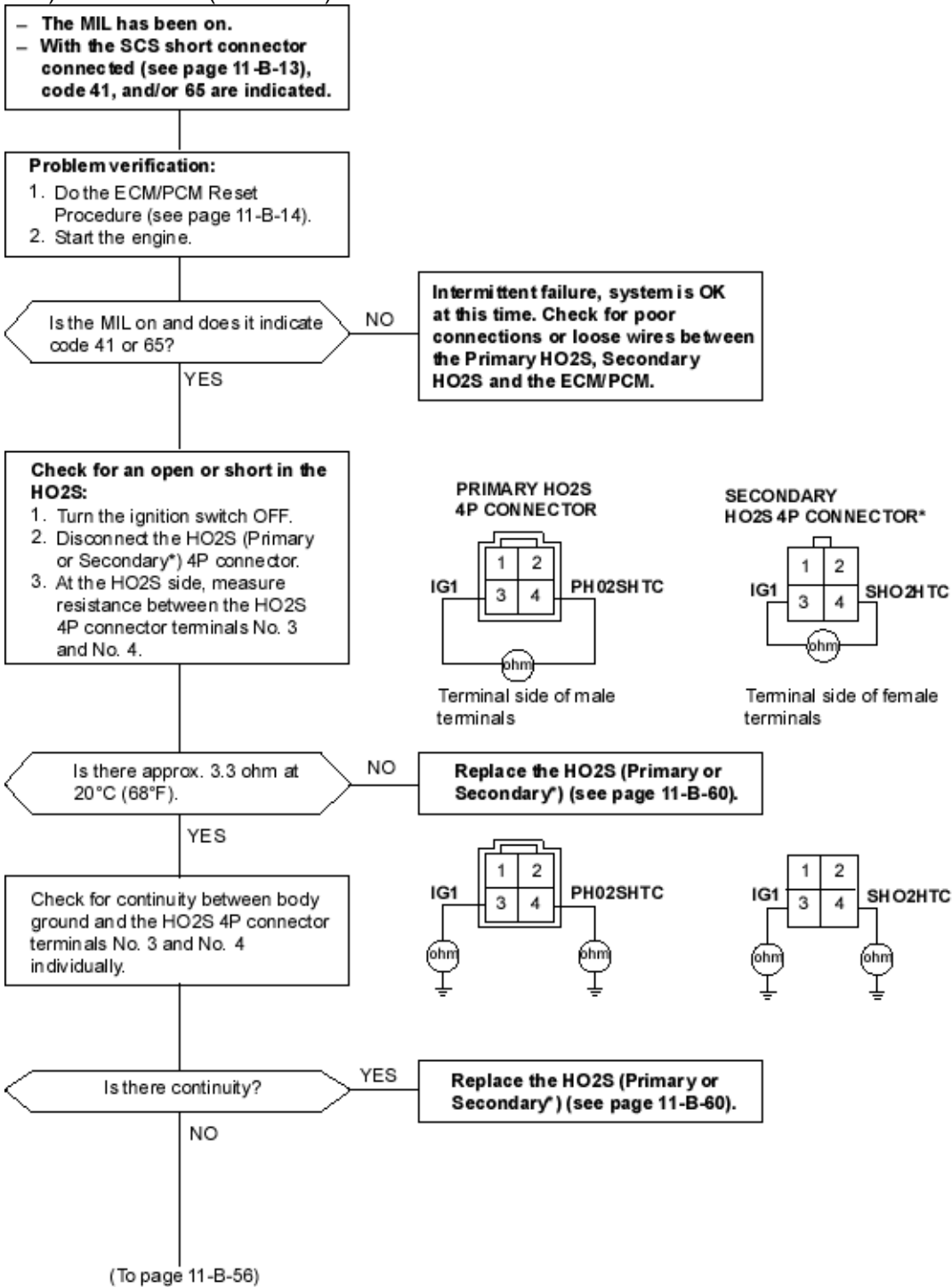
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-14)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 41: A problem in the Primary Heated Oxygen Sensor (PHO2S) Heater circuit.



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 65: A problem in the Secondary Oxygen Sensor (SHO2S) Heater circuit (A/T model).



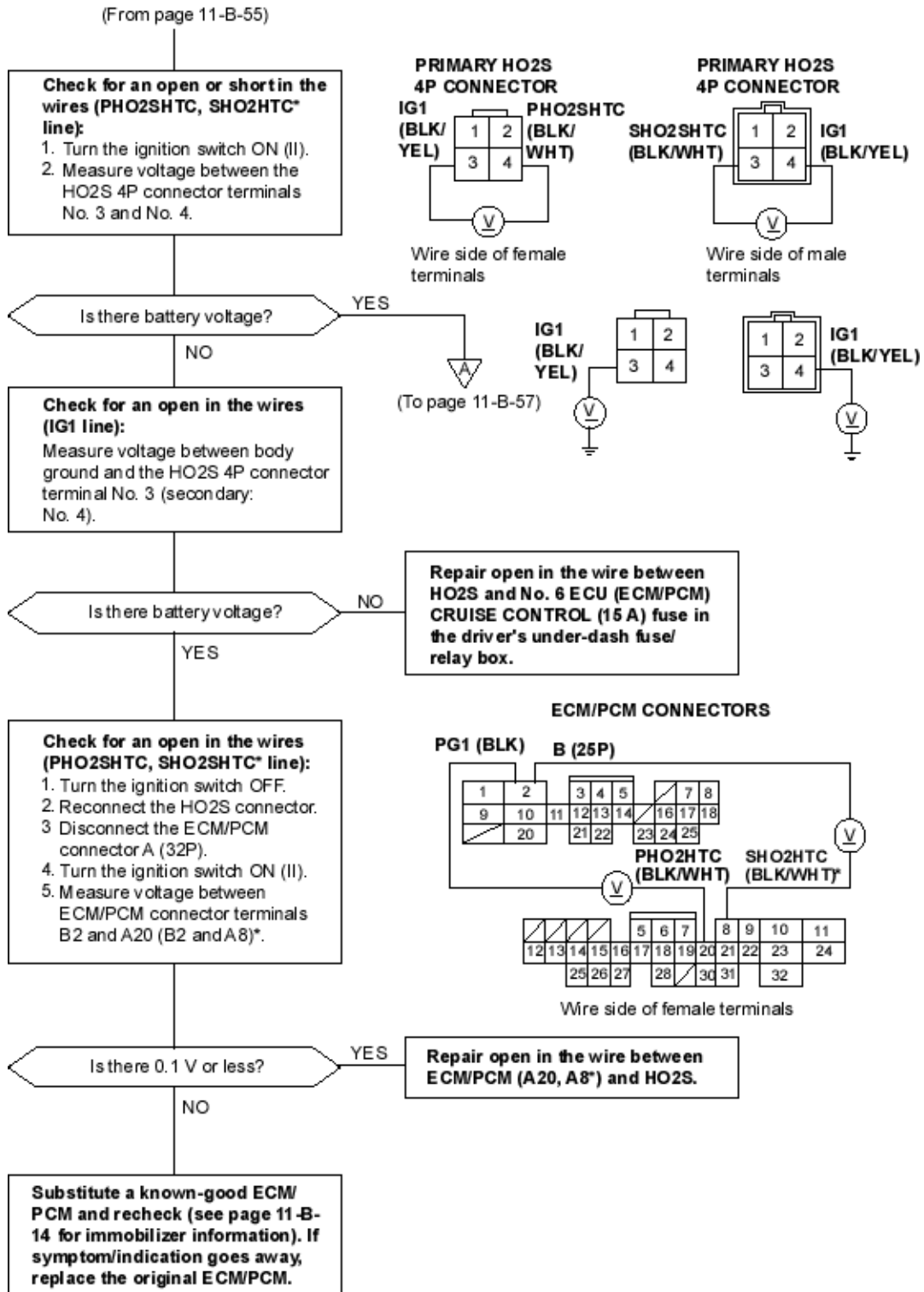
*. code 65

To go to the pages referenced on the diagram above, click on the following:

[\(See Page 11-B-13\)](#)

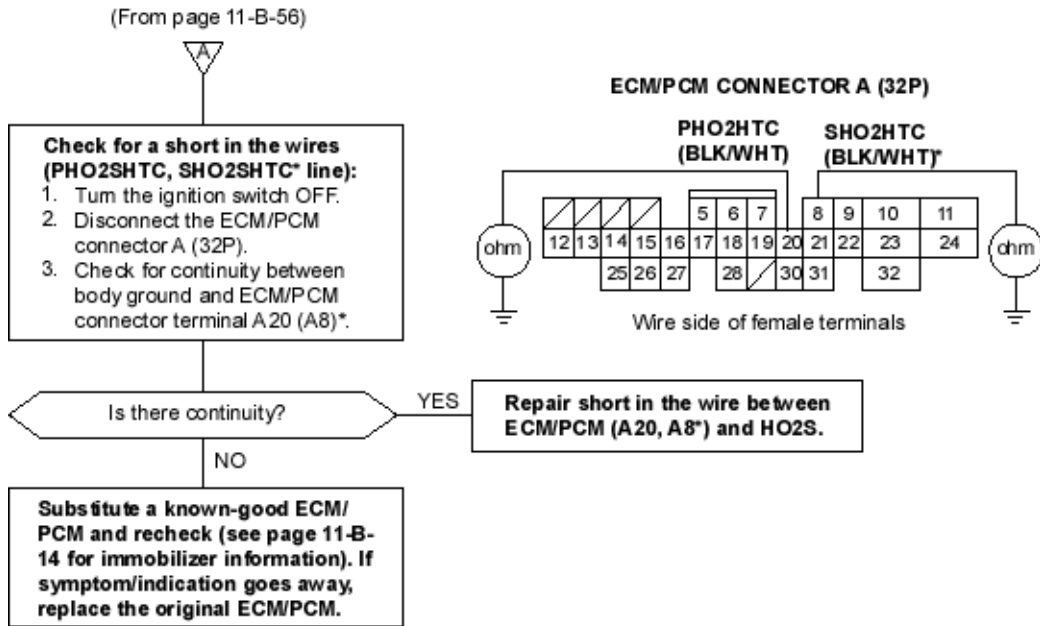
[\(See Page 11-B-14\)](#)

[\(See Page 11-B-60\)](#)



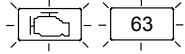
*: DTC 65

To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-14)

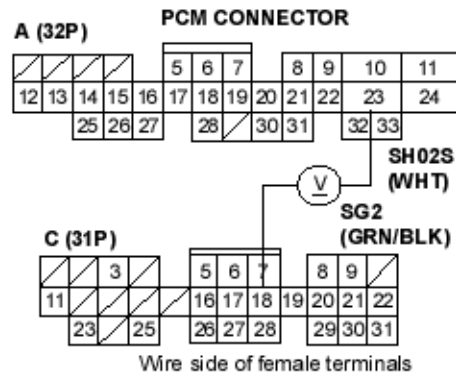
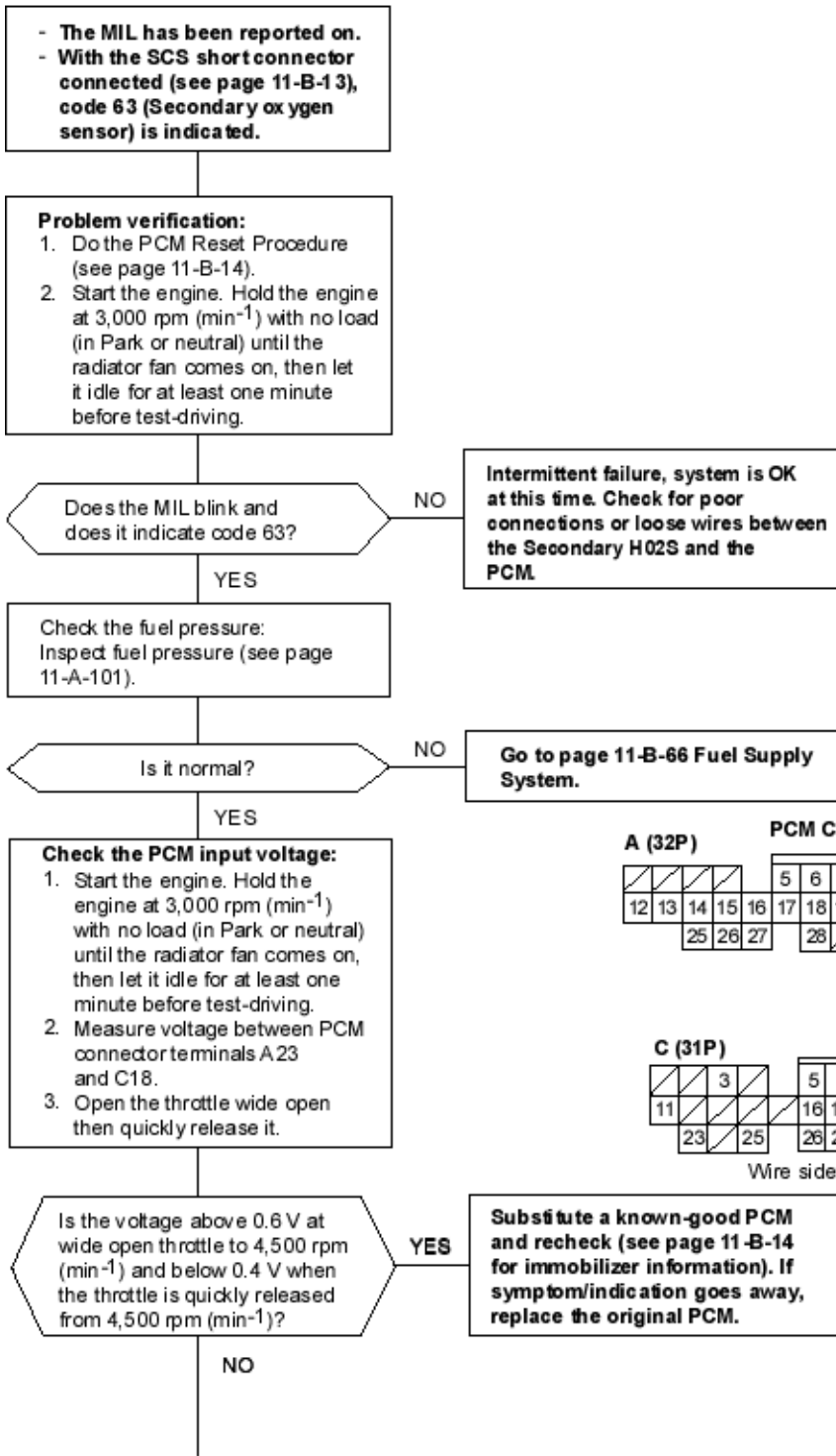


*: DTC 65

To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 63: A problem in the Secondary Heated Oxygen Sensor (Secondary HO2S) circuit.

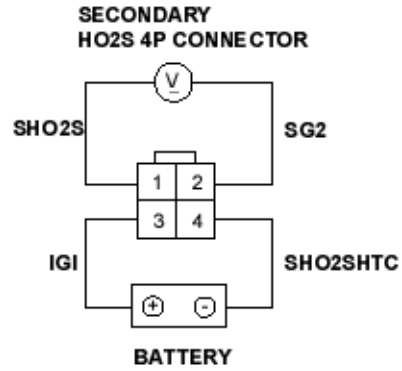


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)
[\(See Page 11-A-101\)](#)
[\(See Page 11-B-66\)](#)

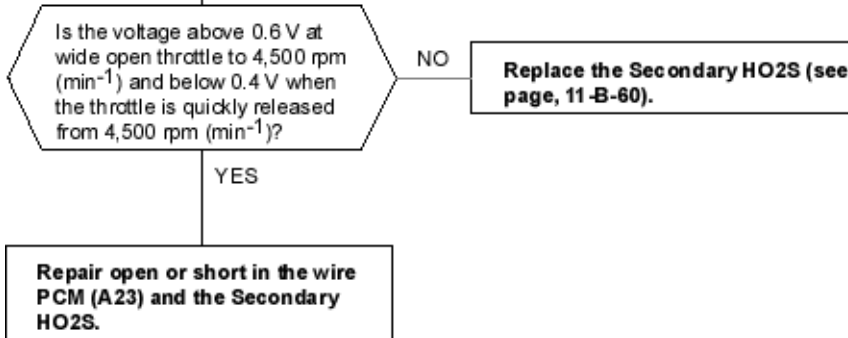
(From page 11-B-58)

Check the Secondary HO2S:

1. Turn the ignition switch OFF.
2. Disconnect the 4P connector from the Secondary HO2S.
3. At the Secondary HO2S harness side, connect the battery positive terminal to terminal No. 3 and battery negative terminal to terminal No. 4.
4. Start the engine.
5. After two minutes, measure voltage between Secondary HO2S 4P connector terminals No. 1 and No. 2.



Terminal side of female terminals



To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-60)

Heated Oxygen Sensor Replacement

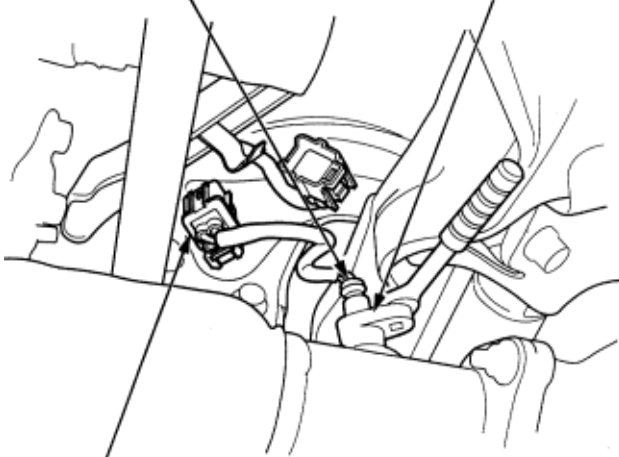
11-B-60

1. Disconnect the HO2S 4P connector, then remove the HO2S.

Primary HO2S:

PRIMARY HO2S
44 N·m (4.5 kgf·m, 33 lbf·ft)

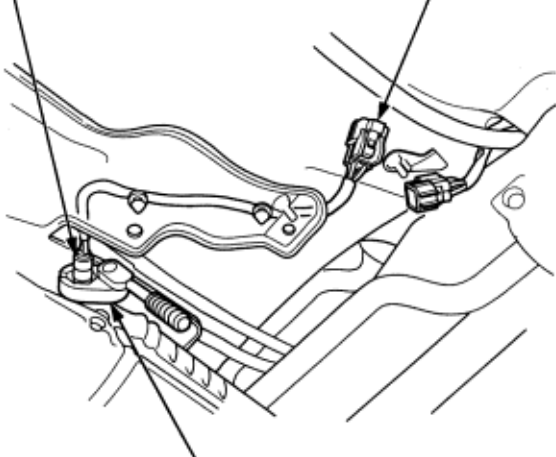
O₂ SENSOR WRENCH
Snap-on YA 8875 or equivalent



HO2S 4P CONNECTOR
Secondary HO2S:

SECONDARY HO2S
44 N·m (4.5 kgf·m, 33 lbf·ft)

HO2S 4P CONNECTOR



O₂ SENSOR WRENCH
Snap-on YA 8875 or equivalent

2. Install the HO2S in reverse order of removal.

NOTE:

Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected, starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system (2) etc.

If the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, go to inspection (**See Page 11-B-61**).

PAGE	SUB-SYSTEM	IDLE AIR CONTROL VALVE	AIR CONDITIONING SIGNAL	ALTERNATOR FR SIGNAL	BRAKE SWITCH SIGNAL*2	STARTER SWITCH SIGNAL	POWER STEERING PRESSURE SWITCH SIGNAL	AUTOMATIC TRANSAXLE GEAR POSITION SIGNAL*1	HOSES AND CONNECTIONS
	SYMPTOM	11-B-63	11-A-86	11-A-88	11-A-90	11-A-91	11-A-92	Section 14	—
	DIFFICULT TO START ENGINE WHEN COLD					①			
	WHEN COLD FAST IDLE OUT OF SPEC (1,000 – 2,000 rpm (min ⁻¹))	①							
	ROUGH IDLE	②							①
	WHEN WARM ENGINE SPEED TOO HIGH	①					③		②
WHEN WARM RPM TOO LOW	Idle speed is below specified rpm (no load)	①							
	Idle speed does not increase after initial start up.	①							
	On models with automatic transmission, the idle speed drops in gear	②						①	
	Idle speeds drops when air conditioner in ON	②	①						
	Idle speed drops when steering wheel is turning	②					①		
	Idle speed fluctuates with electrical load	②			③				①
FRE-QUENT STALLING	WHILE WARMING UP	①							
	AFTER WARMING UP	①							
	FAILS EMISSION TEST								①

*1: A/T

*2: except M/T with out TWC model

To go to the pages referenced on the diagram above,

click on the following:

(See Page 11-B-63)

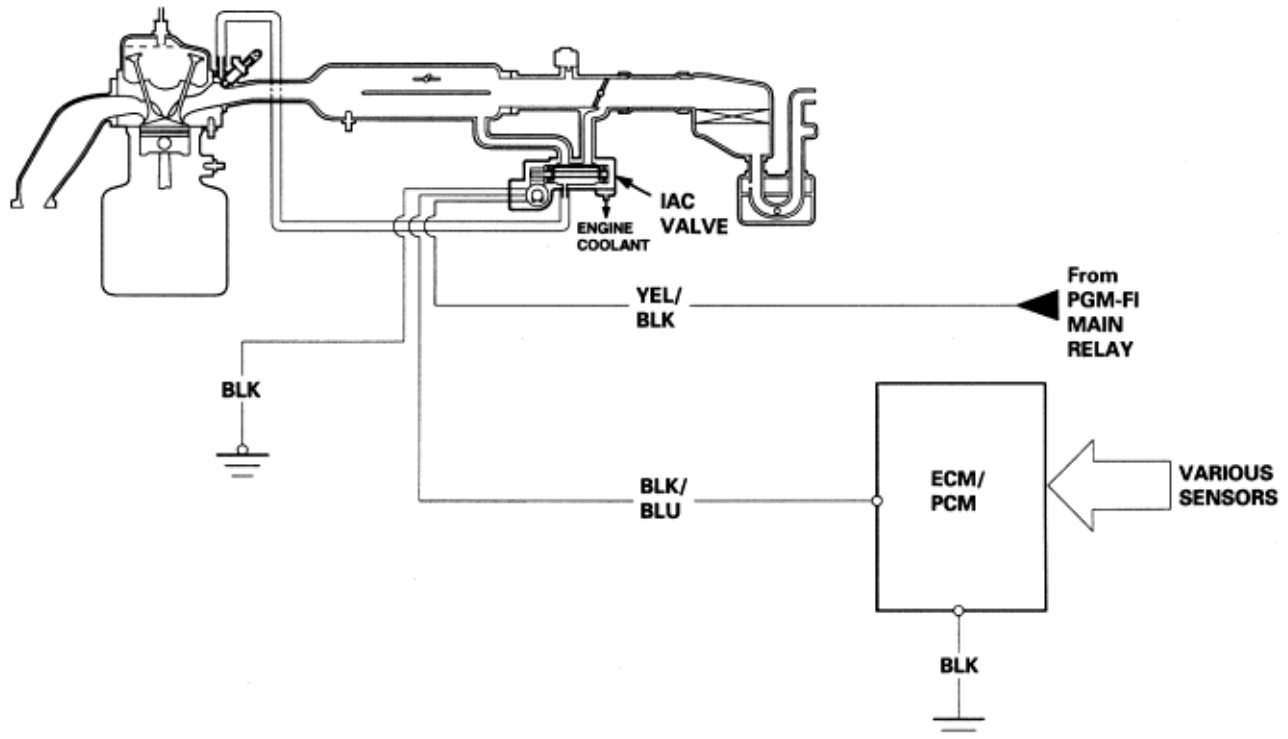
(See Page 11-A-86)

(See Page 11-A-88)

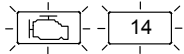
(See Page 11-A-90)

(See Page 11-A-92)

The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve. The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM/PCM. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

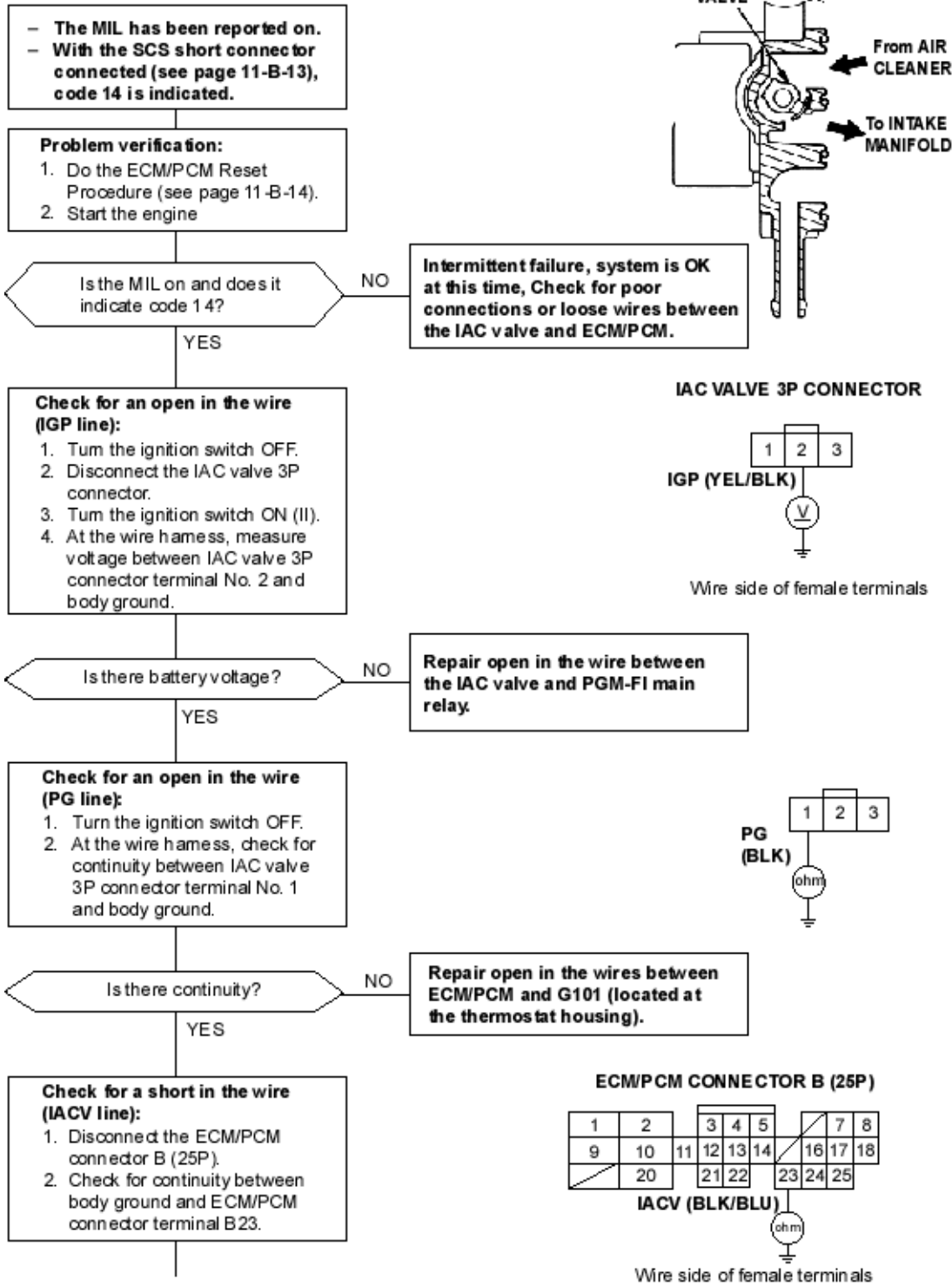


1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about 150-300 rpm (min-1).
2. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.
3. When the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not indicate Diagnostic Trouble Code (DTC) 14, check the following items:
 - ♦ Air conditioning signal (**See Page** 11-A-86)
 - ♦ ALT FR signal (**See Page** 11-A-88)
 - ♦ Brake switch signal (**See Page** 11-A-90)
 - ♦ Start switch signal (**See Page** 11-A-91)
 - ♦ A/T gear position signal (see section 14)
 - ♦ PSP switch signal (**See Page** 11-A-92)
 - ♦ Hoses and connections
 - ♦ IAC valve and its mounting O-rings
4. If the above items are normal (and the MIL does not indicate DTC 14) after IAC valve replacement, substitute a known-good ECM/PCM and recheck. If symptom goes away, replace the original ECM/PCM.



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 14: A problem in the Idle Air Control (IAC) Valve circuit.

The IAC Valve changes the amount of air bypassing the throttle body in response to a current signal from the ECM/PCM in order to maintain the proper idle speed.



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-B-13\)](#)
[\(See Page 11-B-14\)](#)

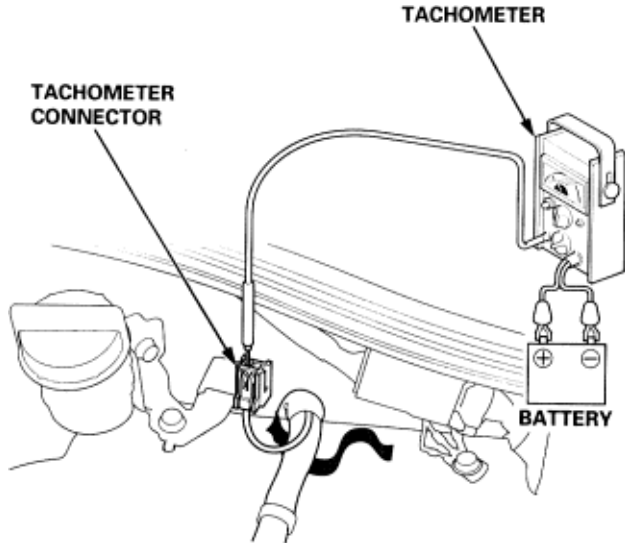
Idle Control System
Idle Speed Inspection

11-B-65

NOTE:

- ♦ Leave the IAG valve connected.
- ♦ Before inspect the idle speed, check these items:
 - The MIL has not been reported on.
 - Ignition timing
 - Spark plugs
 - Air cleaner
 - PCV system

1. Connect a tachometer.



2. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (M/T: in park or neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

Idle speed should be:
KG, KE, KS, KR model:

M/T	750 ± 50 rpm (min ⁻¹)
A/T	730 ± 50 rpm (min ⁻¹) (in N or P position)

KY model:

M/T	750 ± 50 rpm (min ⁻¹)
A/T	750 ± 50 rpm (min ⁻¹) (in N or P position)

4. Idle the engine for one minute with heater switch at HI and air conditioner on, then check the idle speed.

Idle speed should be:
KG, KE, KS, KR model:

M/T	750 ± 50 rpm (min ⁻¹)
A/T	730 ± 50 rpm (min ⁻¹) (in N or P position)

KY model:

M/T	750 ± 50 rpm (min ⁻¹)
A/T	750 ± 50 rpm (min ⁻¹) (in N or P position)

NOTE: If the idle speed is not within specification Refer to Symptom Chart (**See Page 11-B-61**).

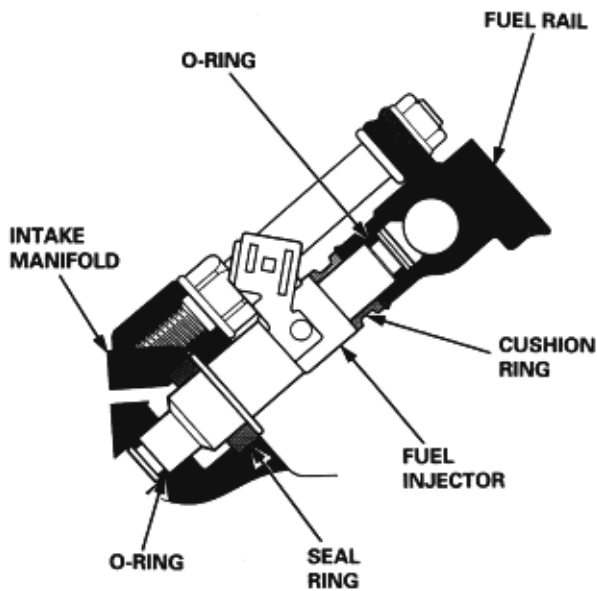
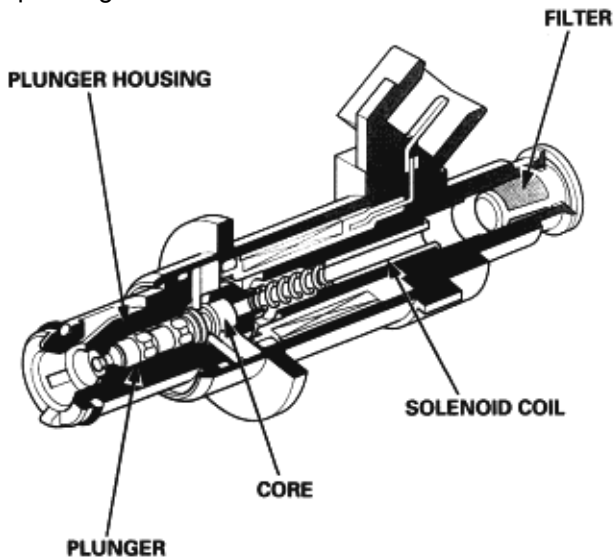
NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system (2), etc.

PAGE	SUB-SYSTEM	FUEL LINES	FUEL INJECTOR	FUEL PRESSURE REGULATOR	FUEL FILTER	FUEL PUMP	PGM-FI MAIN RELAY	CONTAMINATED FUEL
	SYMPTOM	11-A-95	11-B-67	11-A-104	11-A-105	11-A-106	11-A-111	—
	ENGINE WON'T START		③		③	①	②	
	DIFFICULT TO START ENGINE WHEN COLD OR HOT				①	②		
	ROUGH IDLE		①					②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING		①	②				②
	FAILS EMISSION TEST		②	①				
	LOSS OF POWER		③		②	①		
FREQUENT STALLING	WHILE WARMING UP			①				
	AFTER WARMING UP			①				

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-A-95)
(See Page 11-B-67)
(See Page 11-A-104)
(See Page 11-A-105)
(See Page 11-A-106)
(See Page 11-A-111)

Description

The fuel injectors are a solenoid-actuated constant stroke, pintle-type consisting of a solenoid, plunger needle valve and housing. When current is applied to the solenoid coil, the valve lifts up and pressurized fuel is injected. Because the needle valve lift and the fuel pressure are constant, the injection quantity is determined by the length of time that the valve is open (that is the duration the current is supplied to the solenoid coil). The fuel injector is sealed by an O-ring and seal ring at the top and bottom. These seals also reduce operating noise.

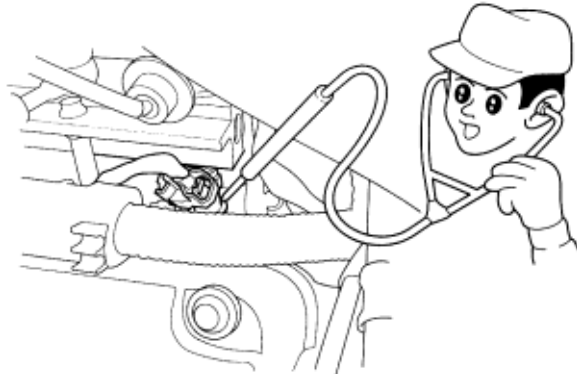


Testing

NOTE: Check the following items before testing: idle speed, ignition timing and idle CO%.

If the engine runs:

1. With the engine idling, disconnect each fuel inject connector individually and inspect the change in the idle speed.
 - ♦ If the idle speed drop is almost the same for each cylinder, the fuel injectors are normal.
 - ♦ If the idle speed or quality remains the same when you disconnect a particular fuel injector replace the fuel injector and retest.
2. Check the clicking sound of each fuel injector means of a stethoscope when the engine is idling.



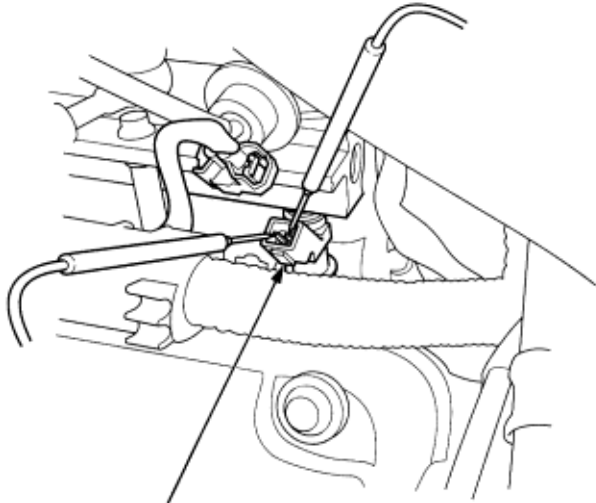
- ♦ If any fuel injector fails to make the typical clicking sound, check the sound again after replacing the fuel injector.
- ♦ If clicking sound is still absent, check the following.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and junction connector.
 - ♦ Whether the junction connector is open or corroded.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the junction connector and the fuel injector.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM/PCM.

If all is OK, check the ECM/PCM (**See Page 11-B-26**) and PGM-FI main relay (**See Page 11-A-111**).

If the engine cannot be started:

1. Remove the connector of the fuel injector, and measure the resistance between the 2 terminals of the, fuel injector.

Resistance should be: 10-20 ohms



**FUEL
INJECTOR**

- ♦ If the resistance is not as specified, replace the fuel injector.
- ♦ If the resistance is as specified, check the fuel pressure (**See Page 11-A-101**).
- If the fuel pressure is as specified, check the following:
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the junction connector.
 - ♦ Whether the junction connector is open or corroded.
 - ♦ Whether there is any short-circuiting, wire breakage, or poor connection in the YEL/BLK wire between the junction connector and the fuel injector.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM/PCM.

If all is OK, check the EGM/PCM (**See Page 11-B-26**).

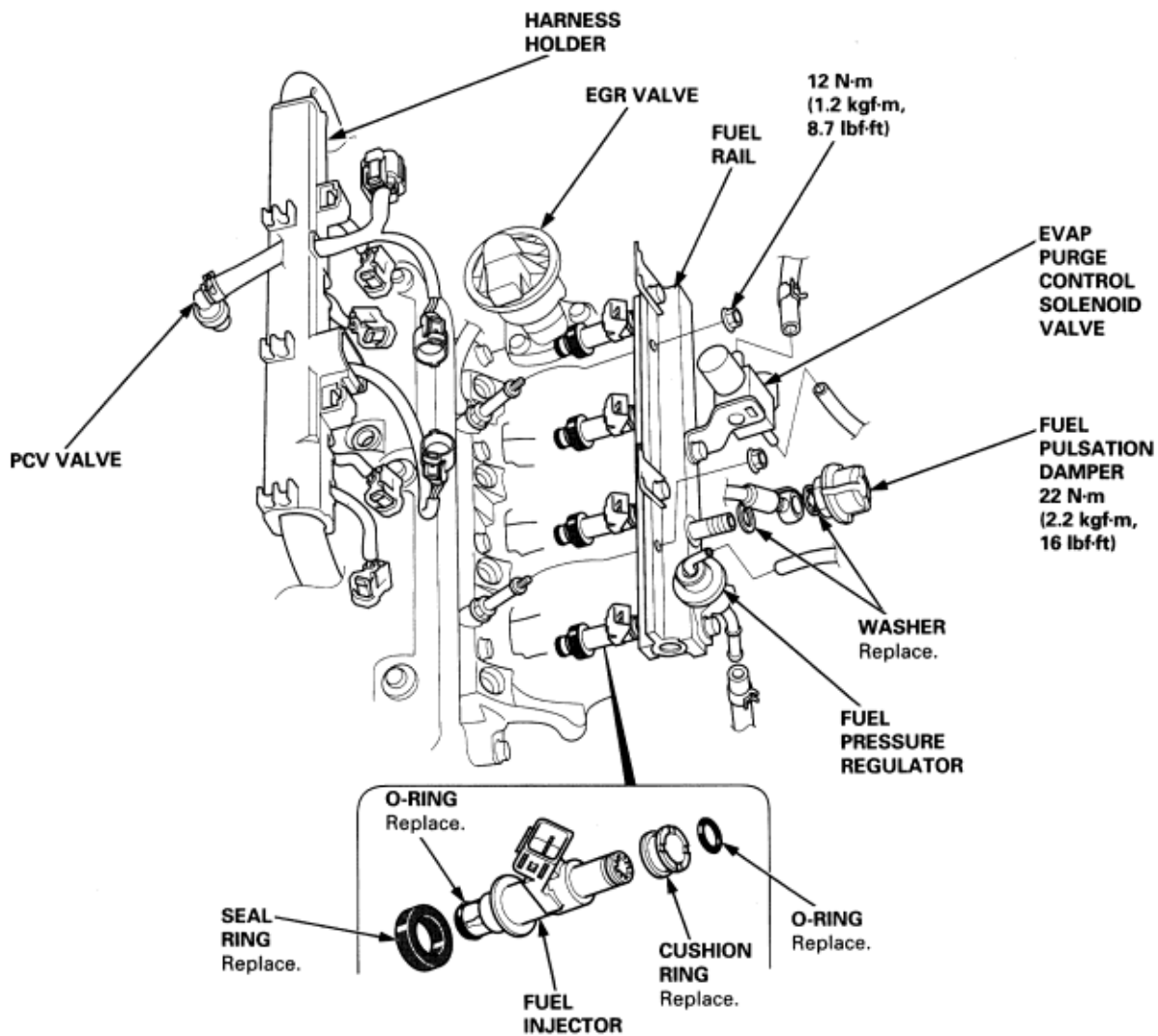
Replacement

WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

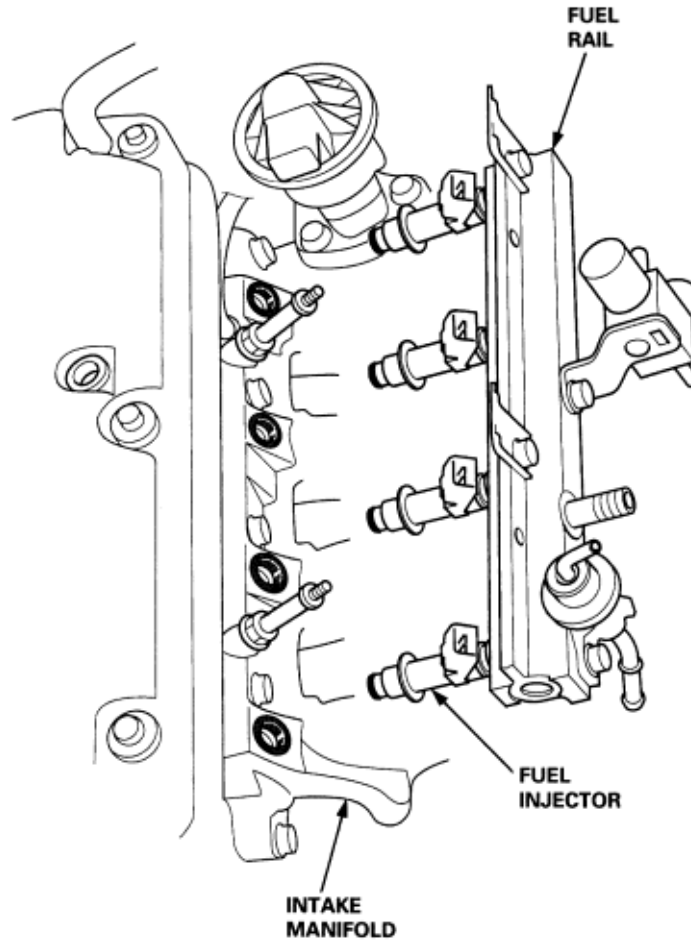
1. Relieve the fuel pressure (**See Page** 11-A-100).
2. Disconnect the connectors from the fuel injectors, EGR valve (and EVAP purge control solenoid valve*).
3. Disconnect the vacuum hose from the EVAP purge control solenoid valve*.
4. Disconnect the vacuum hoses and fuel return hose from the fuel pressure regulator.
NOTE: Place a rag or shop towel over the hoses before disconnecting them.
5. Disconnect the fuel hose from the fuel rail.
6. Remove the retainer nuts from the fuel rail and harness holder.
7. Disconnect the PCV valve.
8. Disconnect the fuel rail.
9. Remove the fuel injectors from the intake manifold.

*: With TWC model



10. Slide new cushion rings onto the fuel injectors.
11. Coat new O-rings with clean engine oil, and put them on the fuel injectors.
12. Insert the fuel injectors into the fuel rail first.
13. Coat new seal rings with clean engine oil, and press them into the intake manifold.

14. To prevent damage to the O-rings, install the fuel injectors in the fuel rail first, then install them in the intake manifold.



15. Install and tighten the retainer nuts.
16. Connect the fuel hose to the fuel rail with new washers.
17. Connect the vacuum hoses and fuel return hose to the fuel pressure regulator.
18. Connect the vacuum hose to the EVAP purge control solenoid valve*.
19. Install the connectors on the fuel injectors, EGR valve and EVAP purge control solenoid valve*.
20. Connect the PCV valve
21. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

*: with TWC model

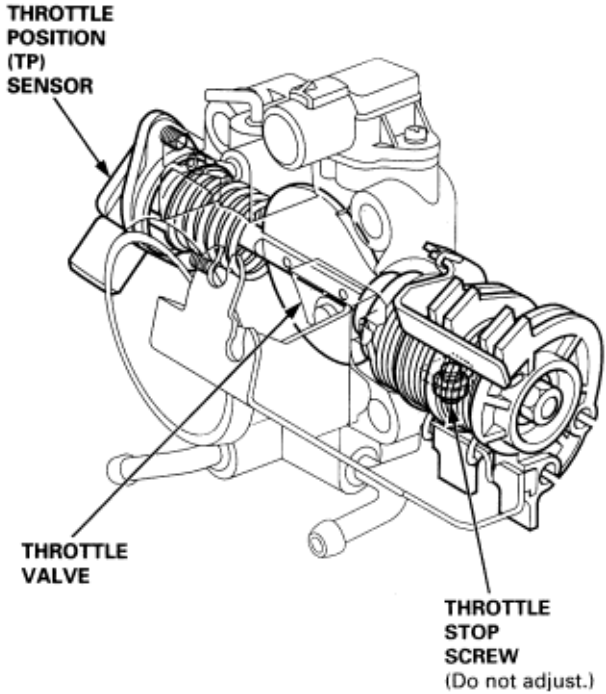
NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system (2), etc.

PAGE	SUB-SYSTEM	AIR CLEANER AND INTAKE AIR DUCT	THROTTLE CABLE	THROTTLE BODY	INTAKE AIR BYPASS CONTROL
		11-A-119	11-A-120	11-B-72	11-A-125
	WHEN COLD FAST IDLE OUT OF SPEC			①	
	WHEN WARM IDLE SPEED TOO HIGH		②	①	
	LOSS OF POWER	②		①	②

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-A-119)
 (See Page 11-A-120)
 (See Page 11-B-72)
 (See Page 11-A-125)

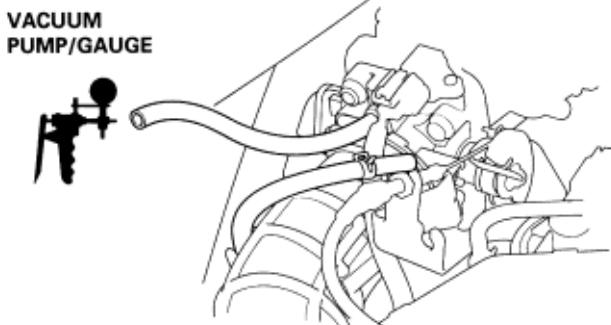
Description

The throttle body is a single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The Evaporative Emission (EVAP) Control Canister port is located on the top of the throttle body.



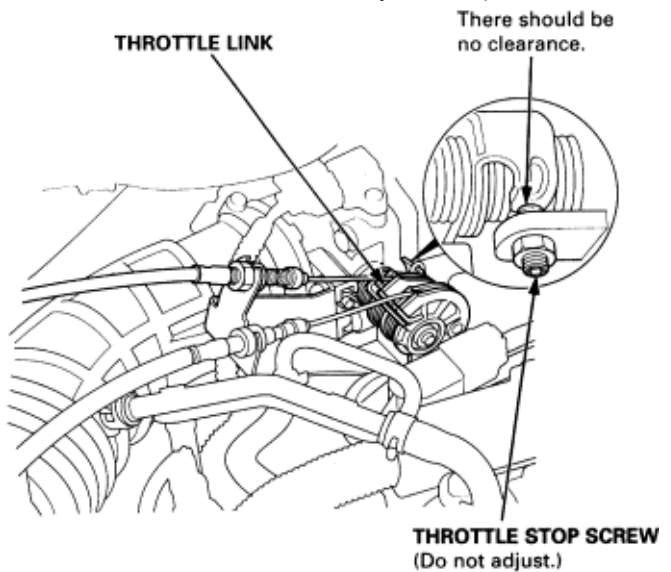
Inspection

1. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in park or neutral) until the radiator fan comes on, then let it idle.



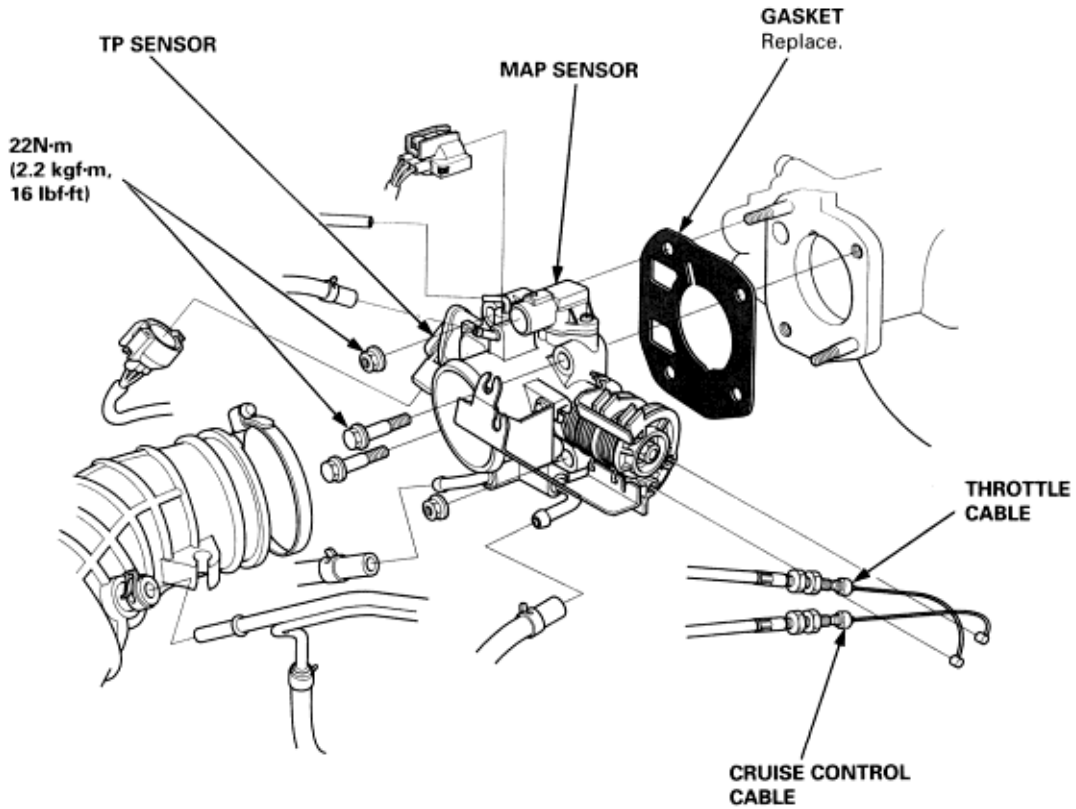
2. Disconnect the vacuum hose (to the EVAP control canister) from the top of the throttle body, connect a vacuum gauge to the throttle body.

3. Allow the engine to idle, and check that the gauge indicates no vacuum. If there is vacuum, check the throttle cable (**See Page 11-A-120**).
4. Check that vacuum is indicated on the gauge when the throttle is opened slightly from idle. If the gauge indicates no vacuum, check the throttle body port. If the throttle body port is clogged, clean it with carburettor cleaner.
5. Stop the engine, and check that the throttle cable operates smoothly without binding or sticking. If there are any abnormalities in the above steps, check for:
 - ♦ Excessive wear or play in the throttle valve shaft.
 - ♦ Sticky or binding throttle at full close position.
 - ♦ Clearance between throttle stop screw and throttle link at the fully closed position



Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

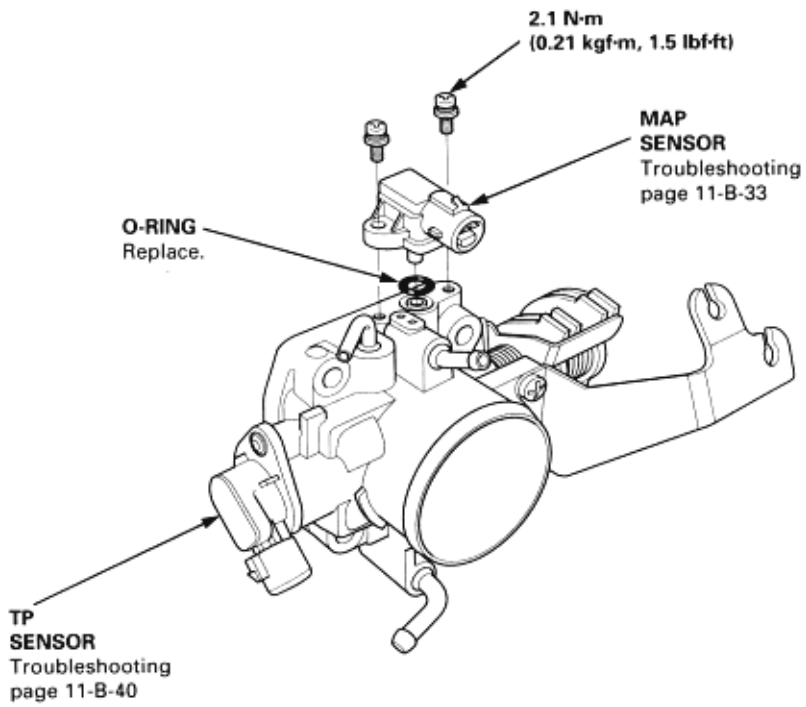
Removal



NOTE:

- ♦ Do not adjust the throttle stop screw.
- ♦ After reassembly, adjust the cruise control cable (see section 4), the throttle cable (**See Page 11-A-120**).
- ♦ The TP sensor is not removable.

Disassembly



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)
(See Page 11-A-40)

NOTE: Across each row in the chart, the sub-system that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system (2), etc.

PAGE	SUB-SYSTEM	THREE WAY CATALYTIC CONVERTER*1	EXHAUST GAS RECIRCULATION SYSTEM*1	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
SYMPTOM		11-B-75	11-B-76	11-A-143	11-B-80
ROUGH IDLE			①	②	
FREQUENT STALLING	AFTER WARMING UP		①		
POOR PERFORMANCE	FAILS EMISSION TEST	①			②
	LOSS OF POWER	①			

*1: with TWC model

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-75)
(See Page 11-B-76)
(See Page 11-A-143)
(See Page 11-B-80)

The emission control system includes a Three-Way Catalytic Converter (TWC)*1, Exhaust Gas Recirculation (EGR)*1, Positive Crankcase Ventilation (PCV) system and Evaporative Emission (EVAP) Control system.

*1: with TWC model

Tailpipe Emission Inspection

⚠ WARNING

Do not smoke during this procedure. Keep open flame or sparks away from the work area.

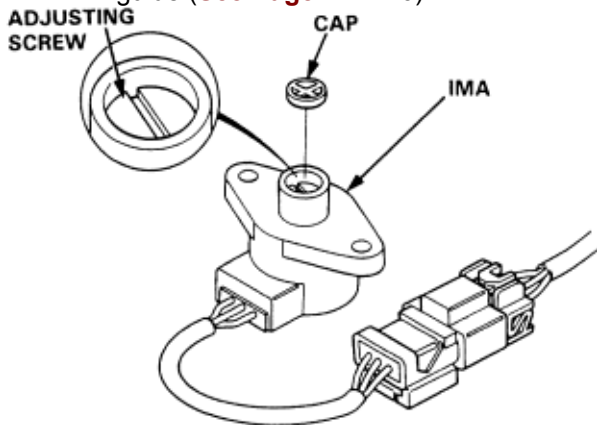
1. Connect a tachometer.
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in park or neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed (**See Page 11-B-65**).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights heater blower, rear window defogger, cooling fan, and air conditioner off.

Specified CO:

For cars with TWC model: 0.1% maximum

For cars without TWC model: 1.0 ± 1.0%

- ♦ If unable to obtain this reading:
Without TWC model, adjust by turning the adjusting screw of the IMA.
With TWC model, see ECM/PCM troubleshooting guide (**See Page 11-B-26**).

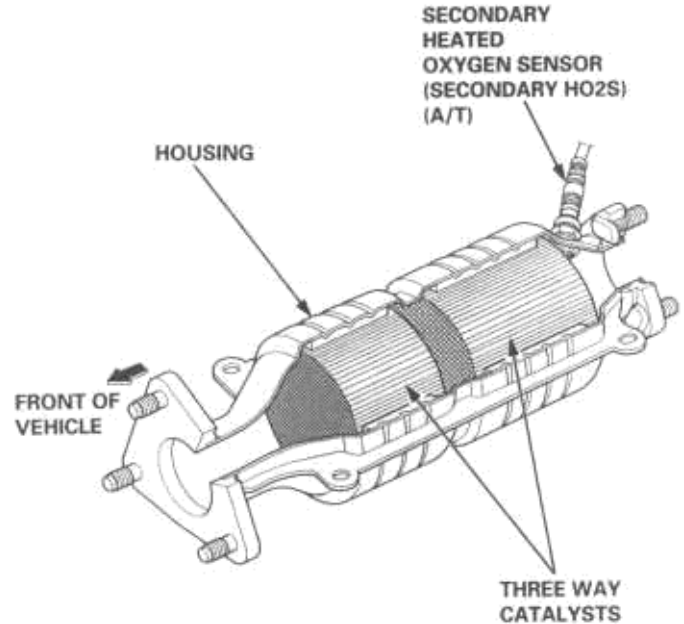


- If unable to obtain a CO reading of specified % by this procedure, check the engine tune-up condition.

Description

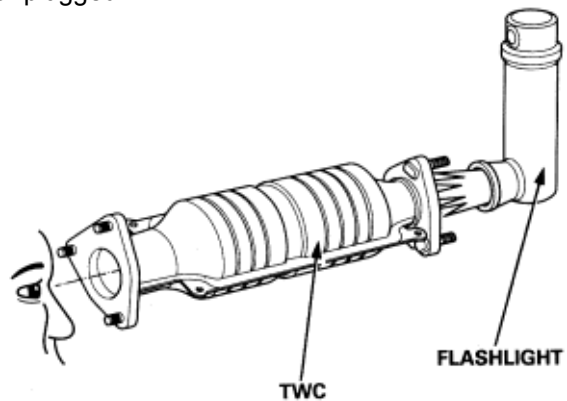
The Three Way Catalytic Converter (TWC) is used to convert hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas, to carbon dioxide (CO₂), dinitrogen (N₂) and water vapour.

Removal/Installation (see section 9)



Inspection

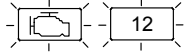
If excessive exhaust system back-pressure is suspected, remove the TWC from the vehicle. Using a flashlight, make a visual check for plugging, melting or cracking of the catalyst. Replace the TWC if any of the visible area is damaged or plugged.



Emission Control System

Exhaust Gas Recirculation (EGR) System (with TWC model)

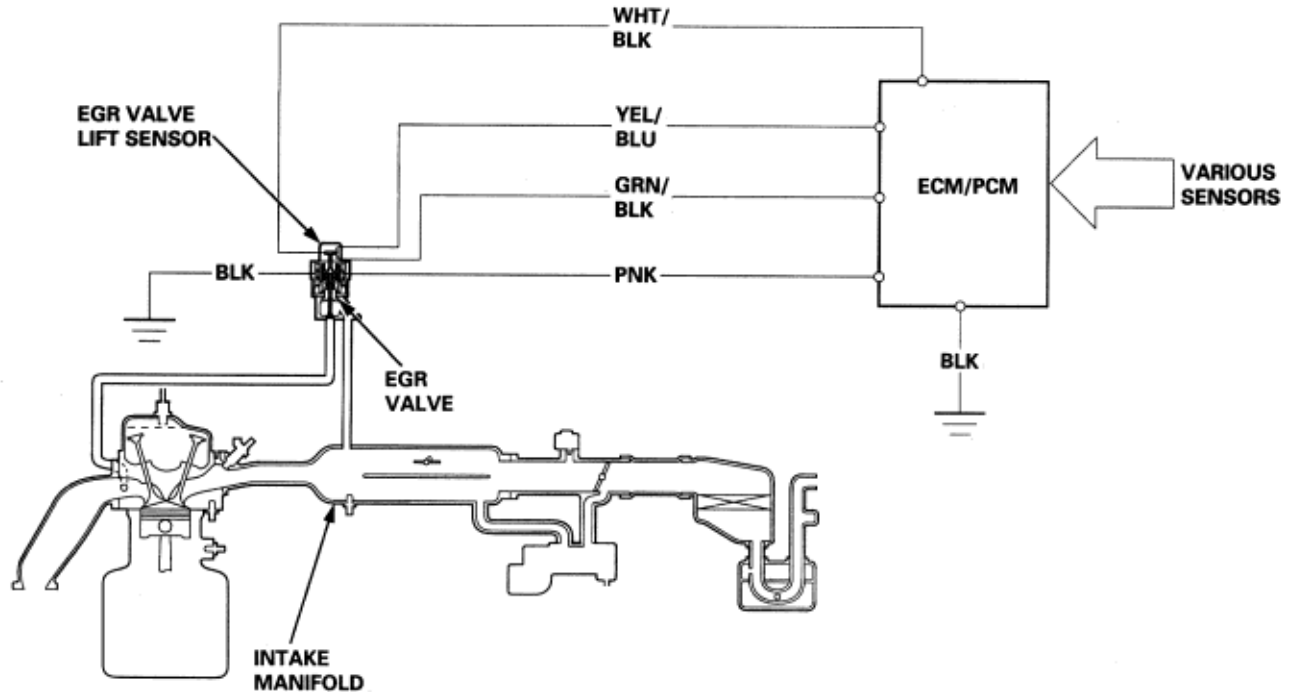
11-B-76



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 12: A problem in the Exhaust Gas Recirculation (EGR) system.

The EGR system is designed to reduce oxides of nitrogen emissions (NO_x) by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. It is composed of the EGR valve, ECM/PCM and various sensors.

The EGR valve lift sensor detects the amount of EGR valve lift and sends the information to the ECM/PCM. The ECM/PCM then compares it with the ideal EGR valve lift, which is determined, by signals sent from the other sensors. If there is any difference between the two, the ECM/PCM reduces current to the EGR valve to reduce EGR valve.



- The MIL has been reported on.
 - With the SCS short connector connected (see page 11-B-13), code 12 is indicated.

Problem verification:
 1. Do the ECM/PCM Reset Procedure (see page 11-B-14).
 2. Connect the SCS service check connector (see page 11-B-13).
 3. Test-drive necessary: Start engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (in Park or neutral) until the radiator fan comes on, then let it idle. Drive the vehicle on the road for approx. 10 minutes. Try to keep the engine speed in the 1,700 - 2,500 rpm (min⁻¹) range.

Does the MIL blink and does it indicate code 12?
 YES
 NO

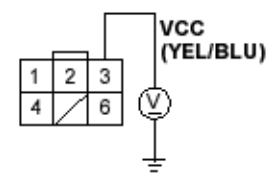
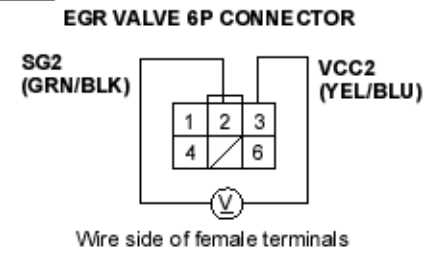
Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the EGR valve and ECM/PCM.

Check the ECM/PCM output voltage (VCC2 line):
 1. Turn the ignition switch OFF.
 2. Disconnect the EGR valve 6P connector.
 3. Turn the ignition switch ON (I).
 4. At the harness side, measure voltage between the EGR valve 6P connector terminals No. 2 and No. 3.

Is there approx. 5V?
 YES
 NO

Check for an open in the wire (SG2 line):
 Measure voltage between the EGR valve 6P connector terminal No. 3 and body ground.

Is there approx. 5V?
 YES
 NO



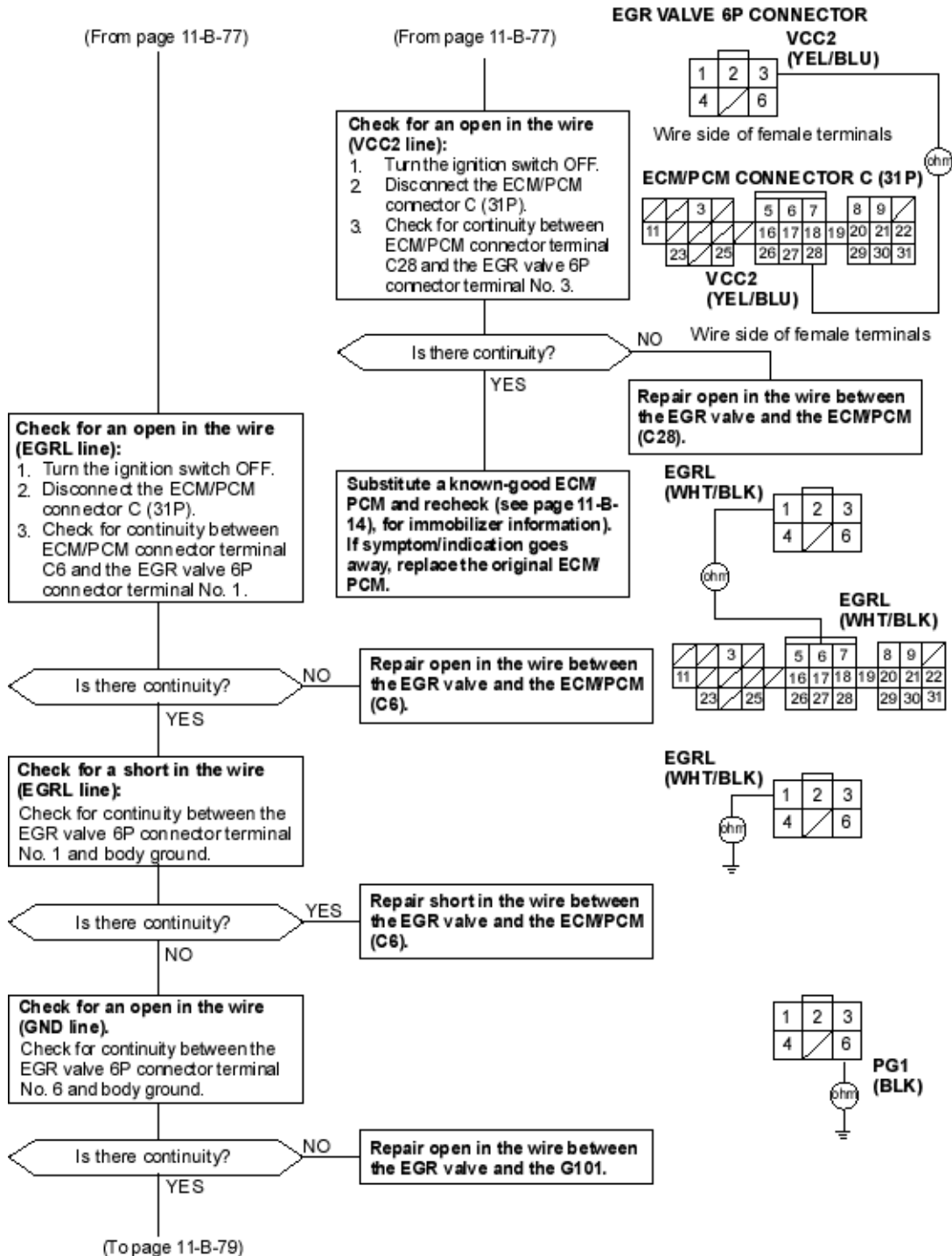
Repair open in the wire between the EGR valve and the ECM/PCM (C18).

(To page 11-B-78)

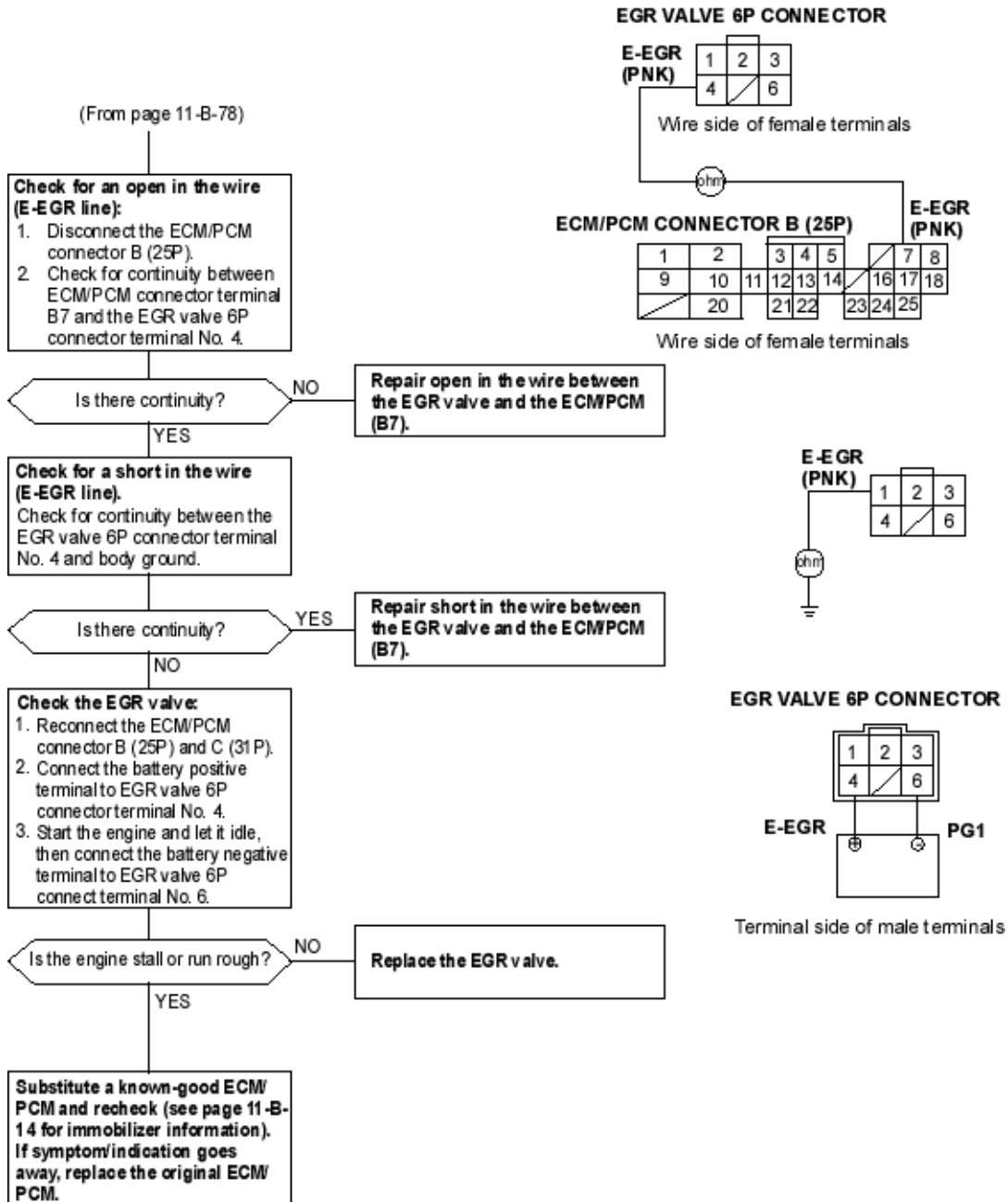
(To page 11-B-78)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-B-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-14)



To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-14\)](#)

Description

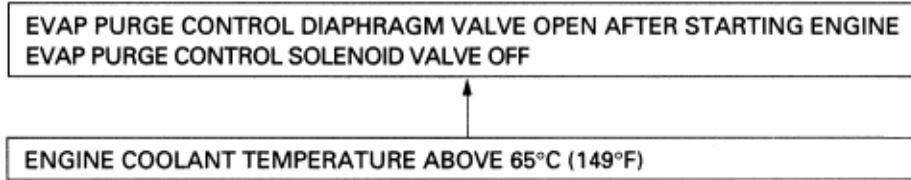
The evaporative emission controls are designed to minimize the amount of fuel vapor escaping to the atmosphere. The system consists of the following components:

A Evaporative Emission (EVAP) Control Canister

An EVAP control canister is used for the temporary storage of fuel vapor until the fuel vapor can be purged from the EVAP control canister into the engine and burned.

B Vapor Purge Control System

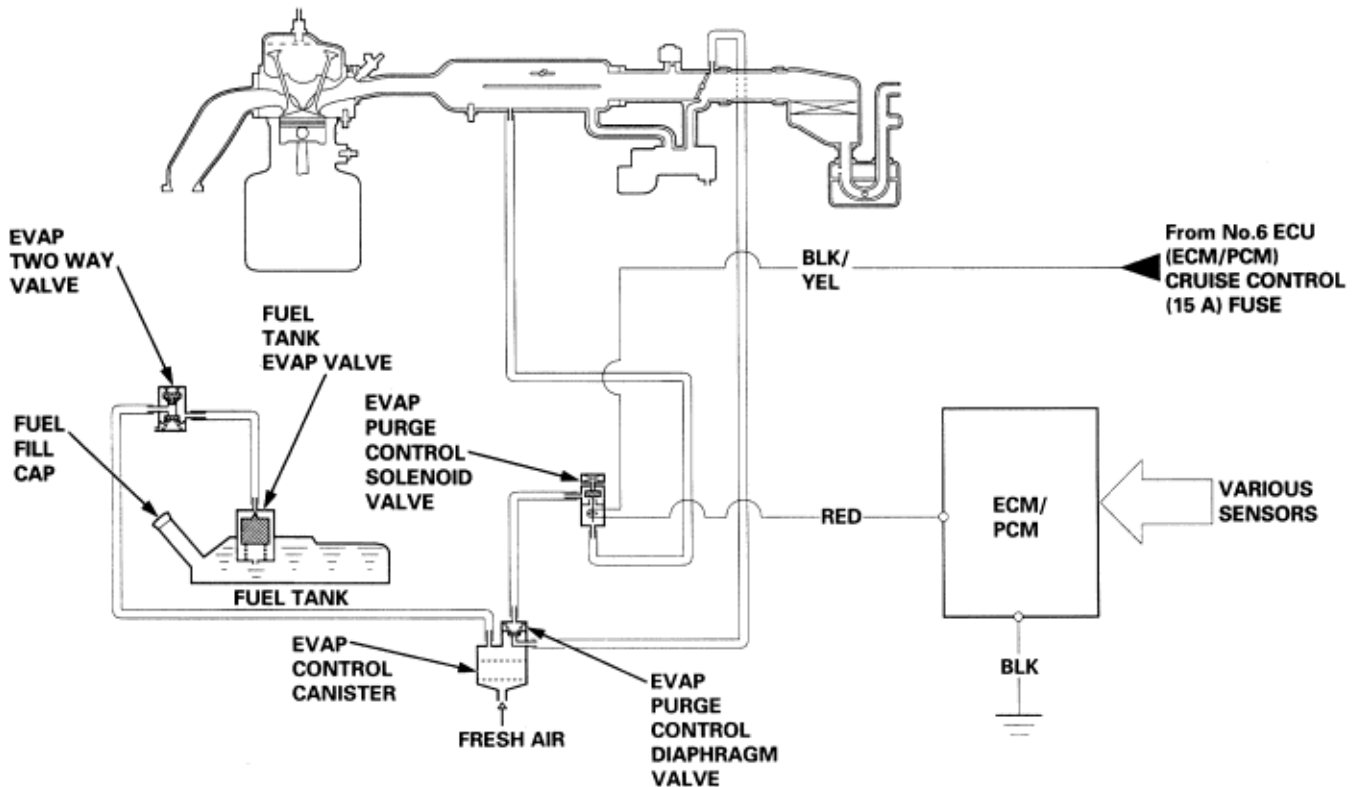
EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the throttle body. The purging vacuum is controlled by the EVAP purge control diaphragm valve and the EVAP purge control solenoid valve (with TWC model).



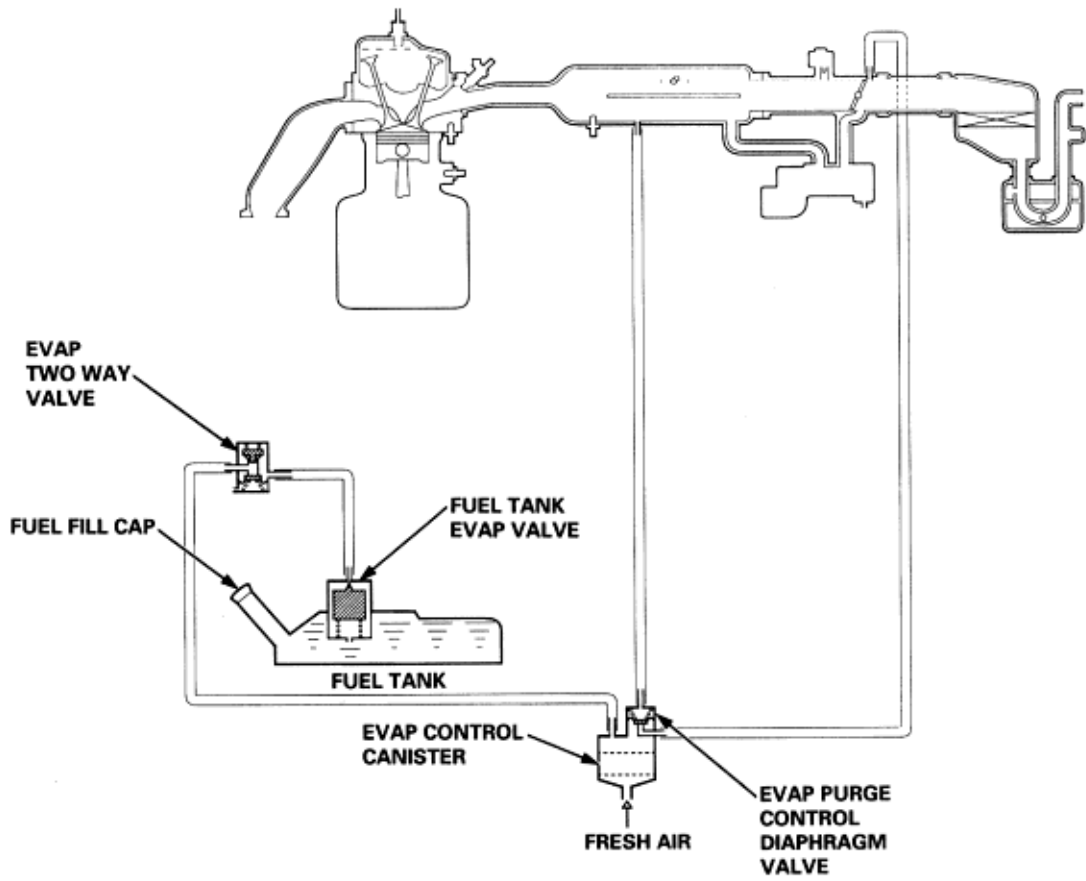
C Fuel Tank Vapor Control System

When fuel vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP control canister.

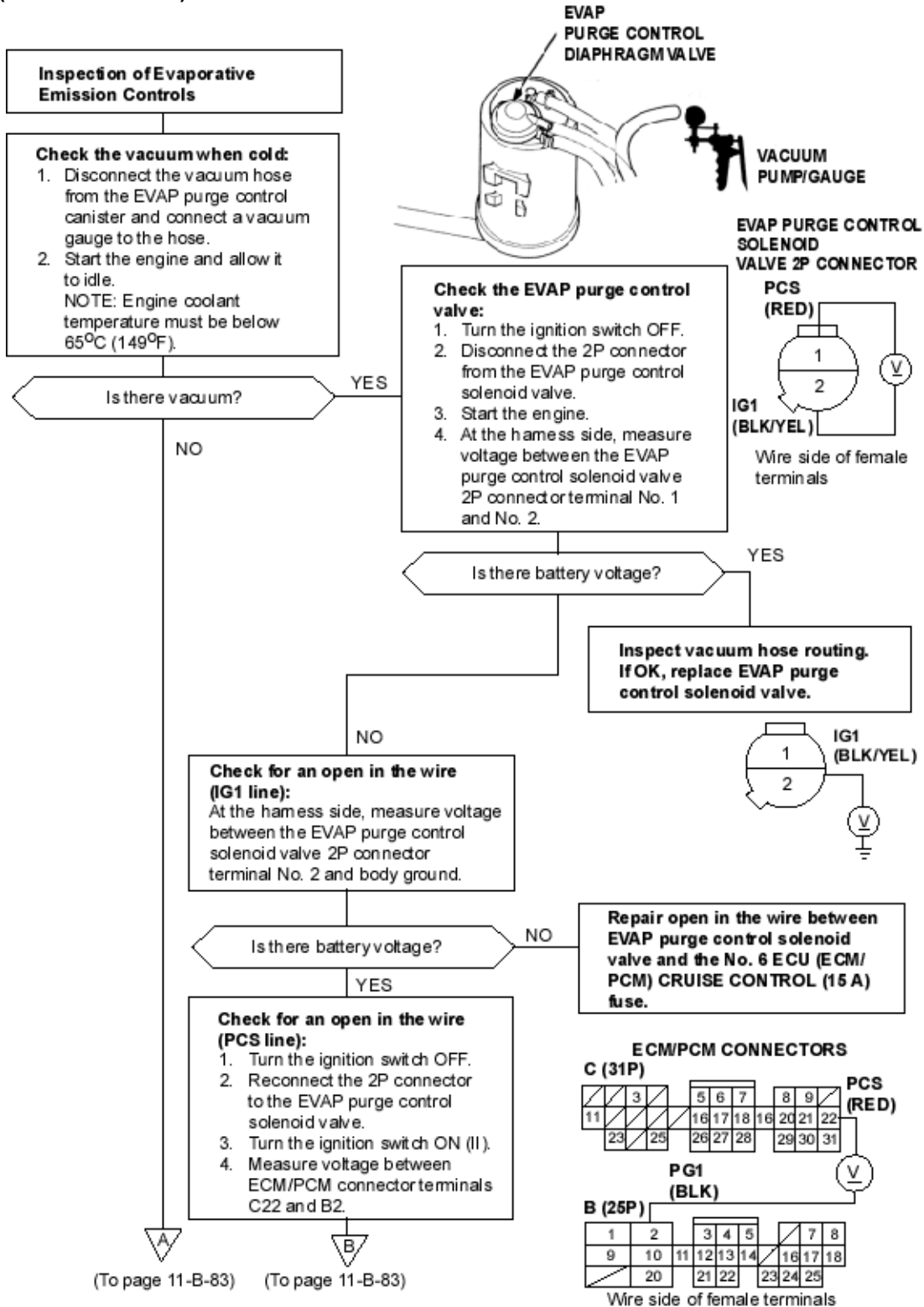
With TWC model:

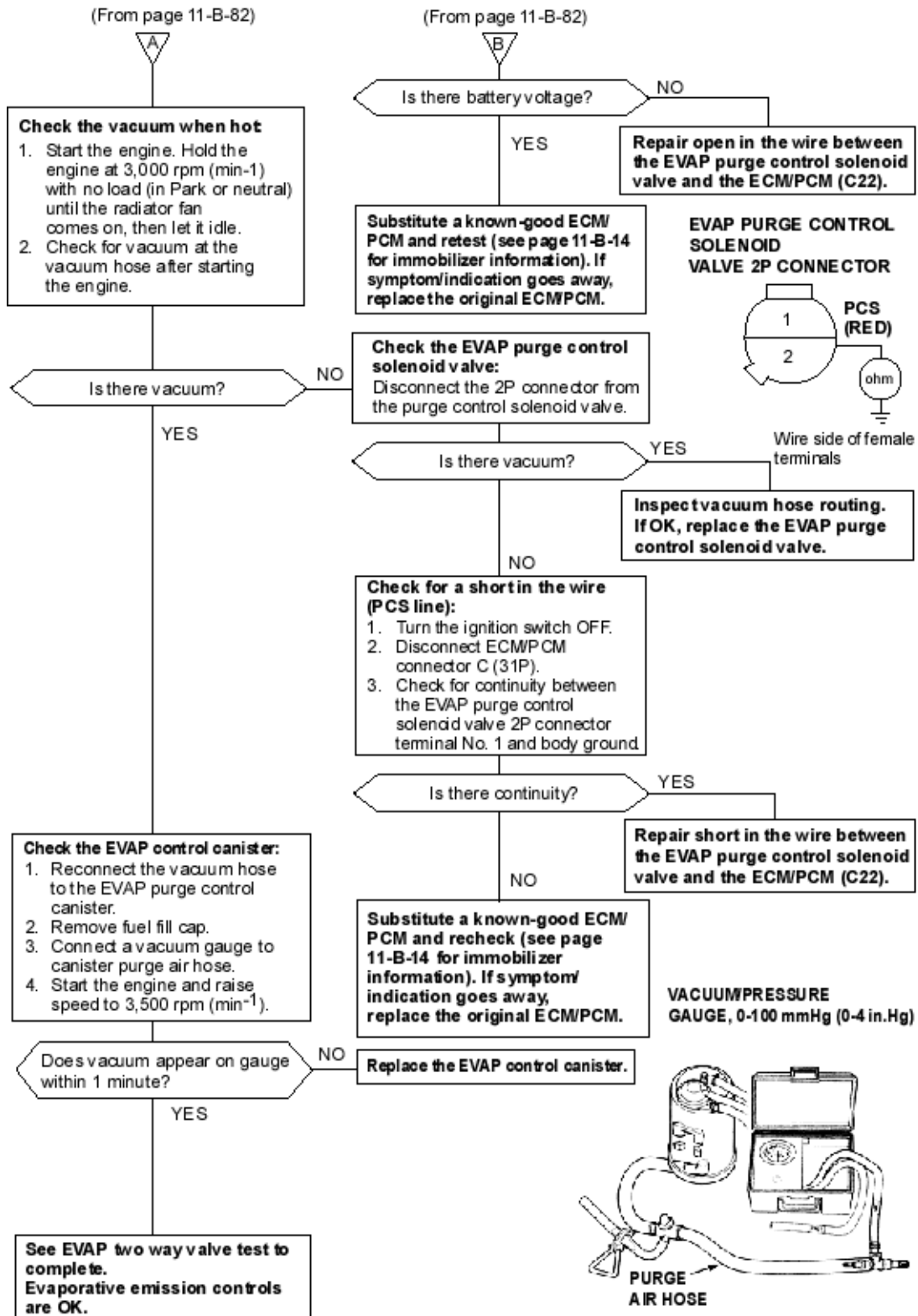


Without TWC model:



Troubleshooting (with TWC model)

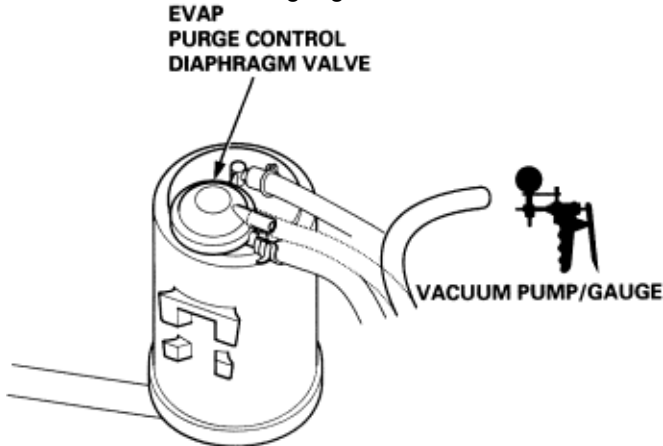




To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-14)

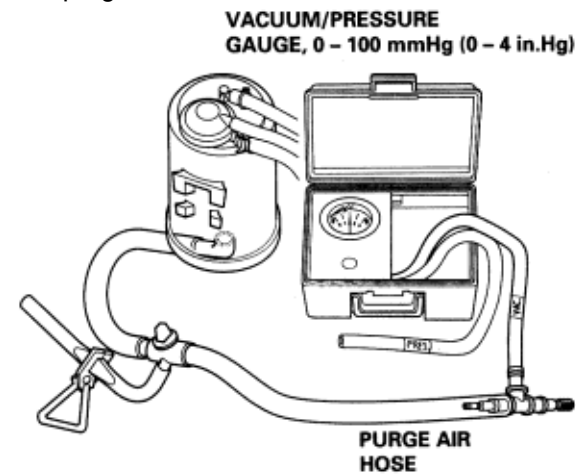
Testing (without TWC model)

1. Remove the fuel fill cap.
2. Start the engine and allow it to idle.
3. Disconnect vacuum hose at the EVAP purge control diaphragm valve (on the EVAP control canister) and connect a vacuum gauge to the hose.



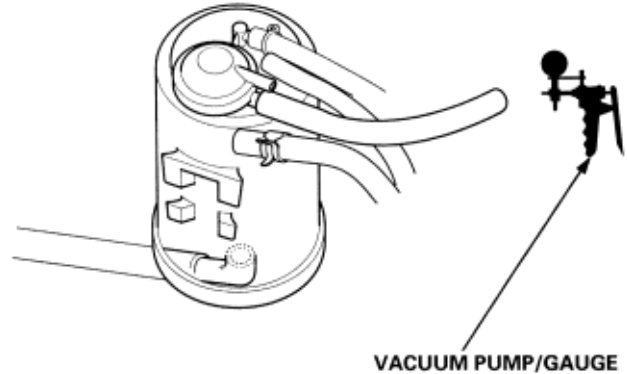
- ♦ If there is no vacuum, check vacuum hose for blockage, cracks or disconnected hose, as well as vacuum port for blockage.

4. Disconnect the vacuum gauge and reconnect the hose.
5. Connect a vacuum gauge to EVAP control canister purge air hose.



6. Raise engine speed to 3,500 rpm (min-1) Vacuum should appear on gauge within 1 minute.
 - ♦ If vacuum appears on the gauge in 1 minute, remove gauge, test is complete.
 - ♦ If no vacuum, disconnect vacuum gauge and reinstall fuel fill cap.
7. Remove EVAP control canister and check for signs of damage or defects.
 - ♦ If defective, replace EVAP control canister.
8. Stop engine. Disconnect upper vacuum hose from EVAP purge control diaphragm valve. Connect a vacuum pump to lower vacuum as shown, and apply vacuum.

Vacuum should remain steady

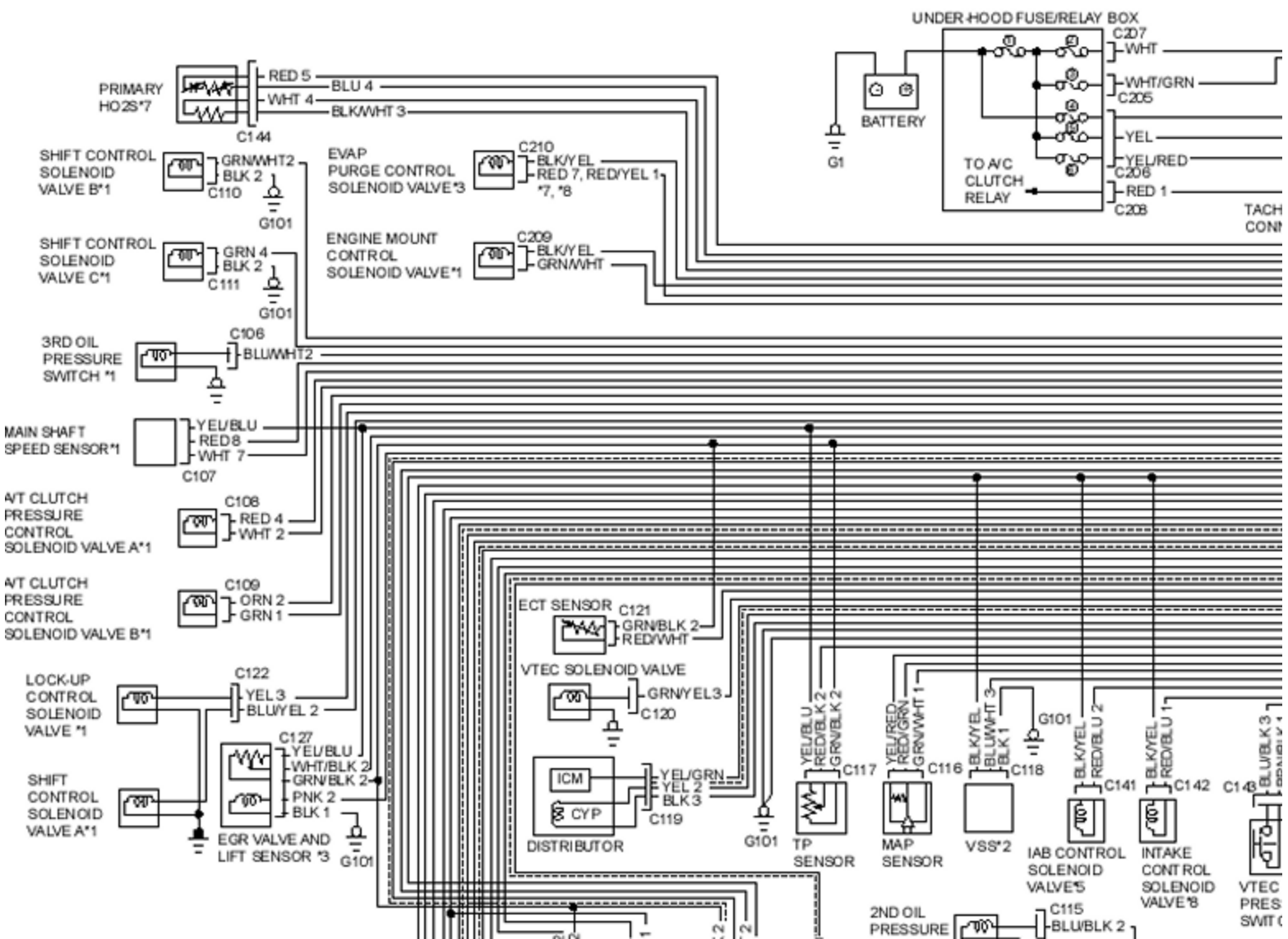
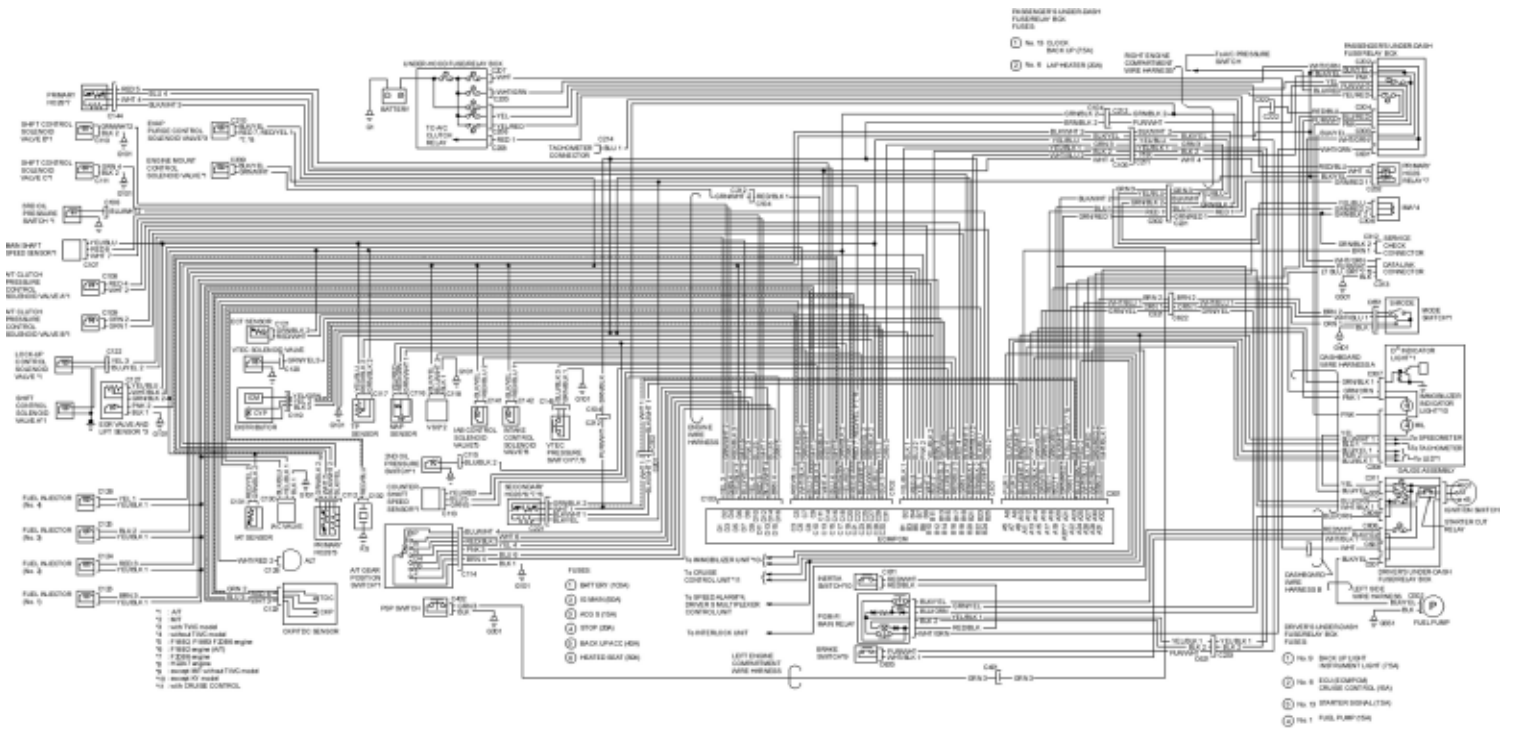


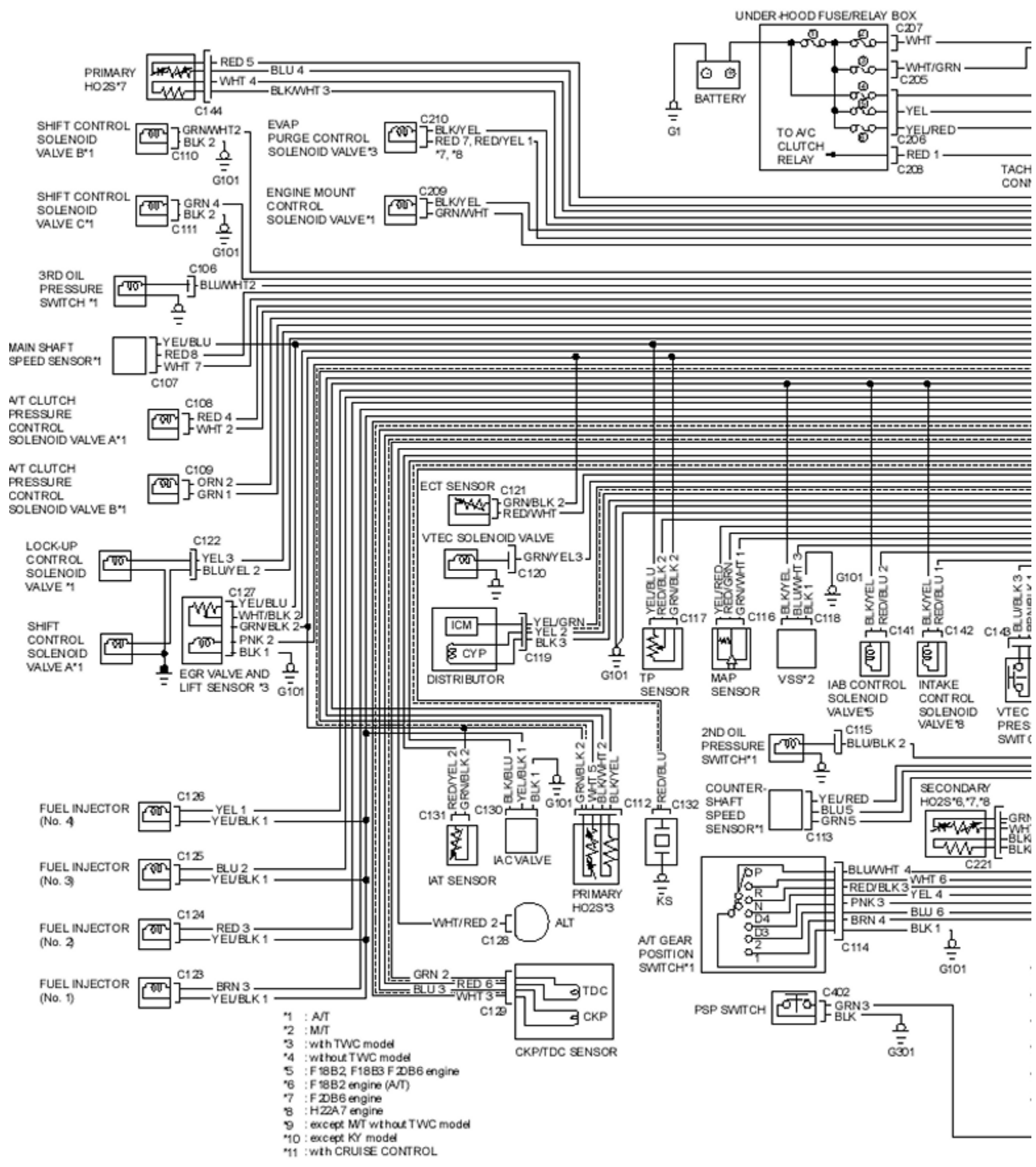
- ♦ If vacuum drops, replace the EVAP control canister and retest.
9. Restart engine. Reconnect upper vacuum hose EVAP purge control diaphragm valve. Vacuum (lower vacuum hose side) should drop 1 zero.
 - ♦ If vacuum does not drop to zero, replace the EVAP control canister and retest.

Diagrams

Fuel-injected System Diagram (F18B2, F18B3, F20B6, H22A7 engine: LHD)

11-B-85





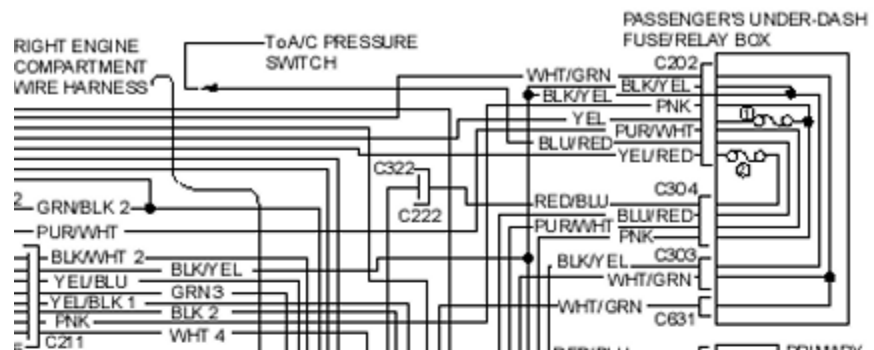
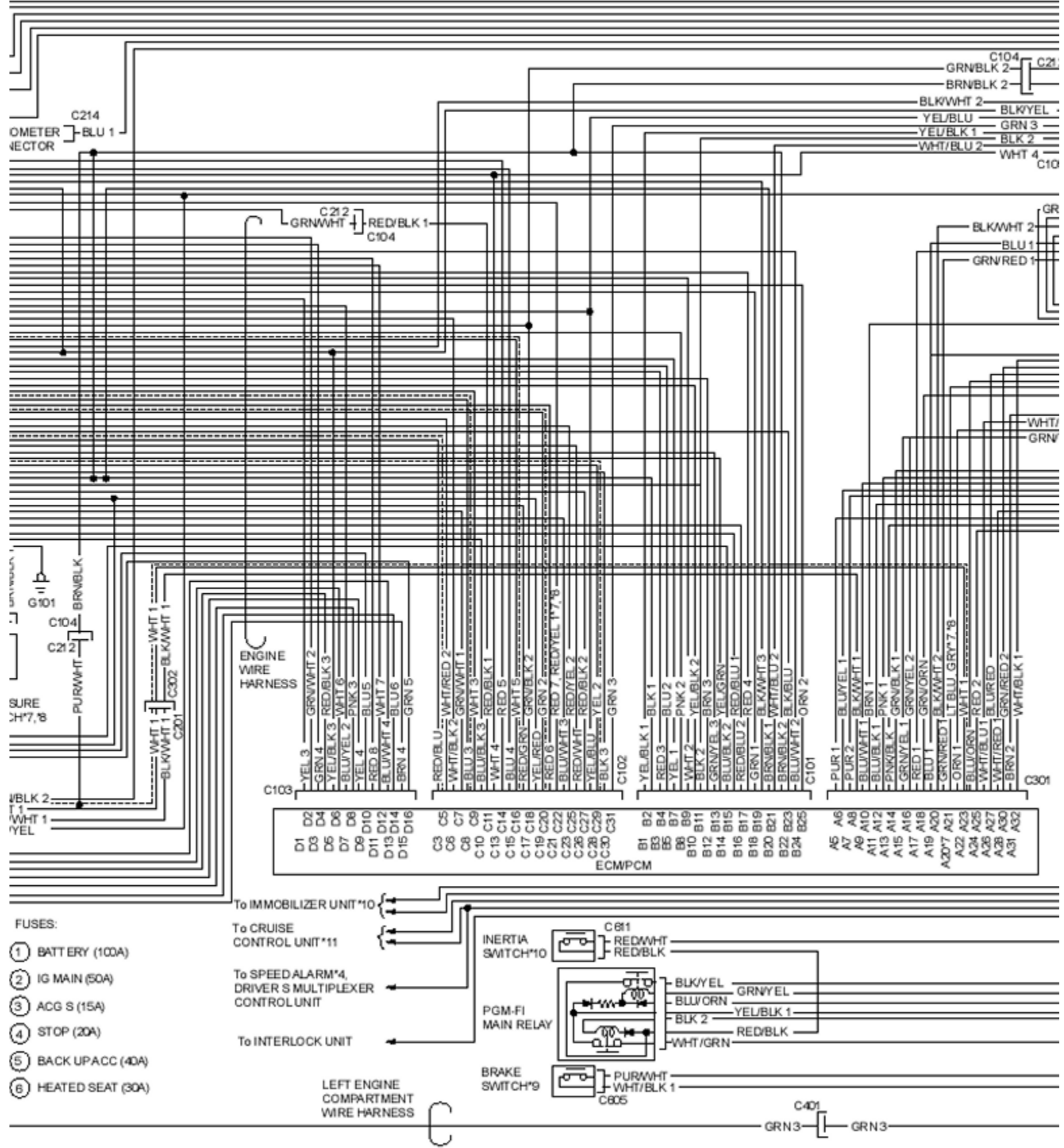
PASSENGER'S UNDER-DASH FUSE/RELAY BOX FUSES

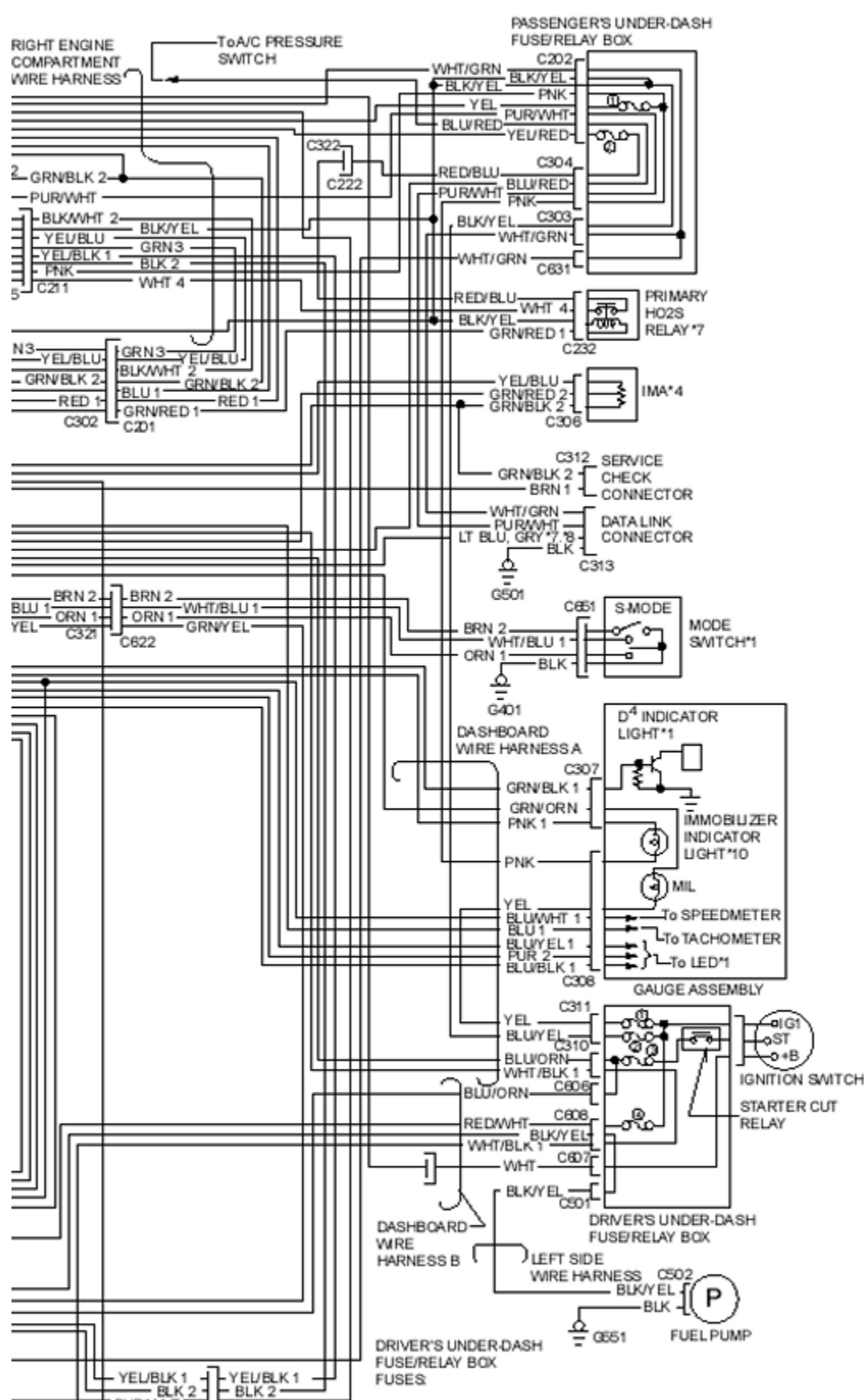
- ① No. 13 CLOCK BACK UP (7.5A)
- ② No. 6 LAPHEATER (20A)



PASSENGER'S UNDER-DASH
FUSE/RELAY BOX
FUSES

- ① No. 13 CLOCK BACK UP (75A)
- ② No. 6 LAPHEATER (20A)



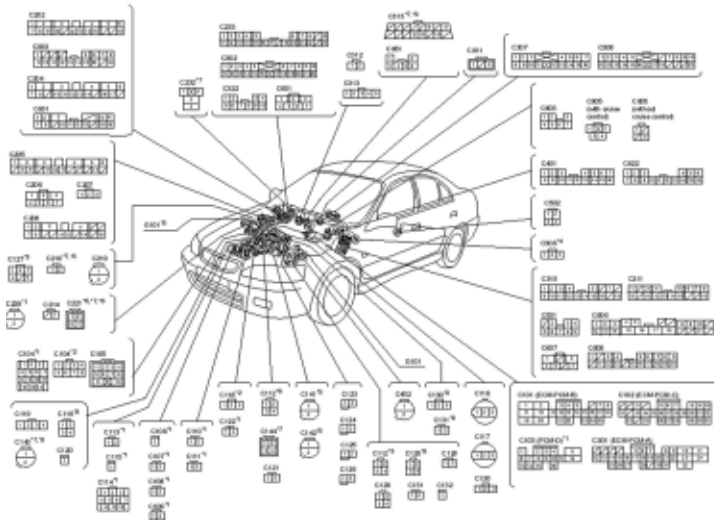


- DRIVER'S UNDER-DASH FUSE/RELAY BOX FUSES
- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
 - ② No. 6 ECU (ECMPCM) CRUISE CONT ROL (15A)
 - ③ No. 13 STARTER SIGNAL (7.5A)
 - ④ No. 1 FUEL PUMP (15A)

Diagrams

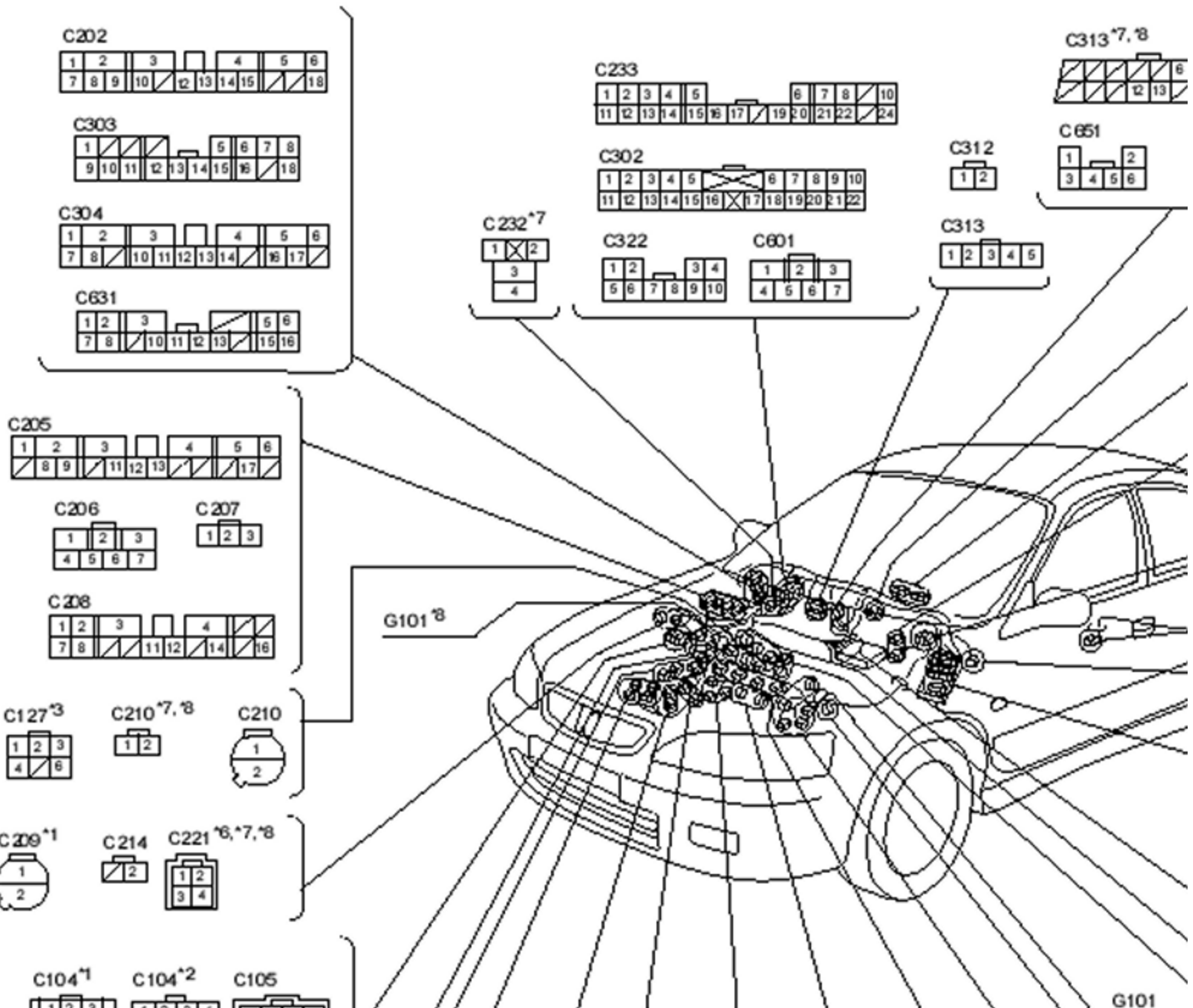
Fuel-injected System Connectors (F18B2, F18B3, F20B6, H22A7 engine: LHD)

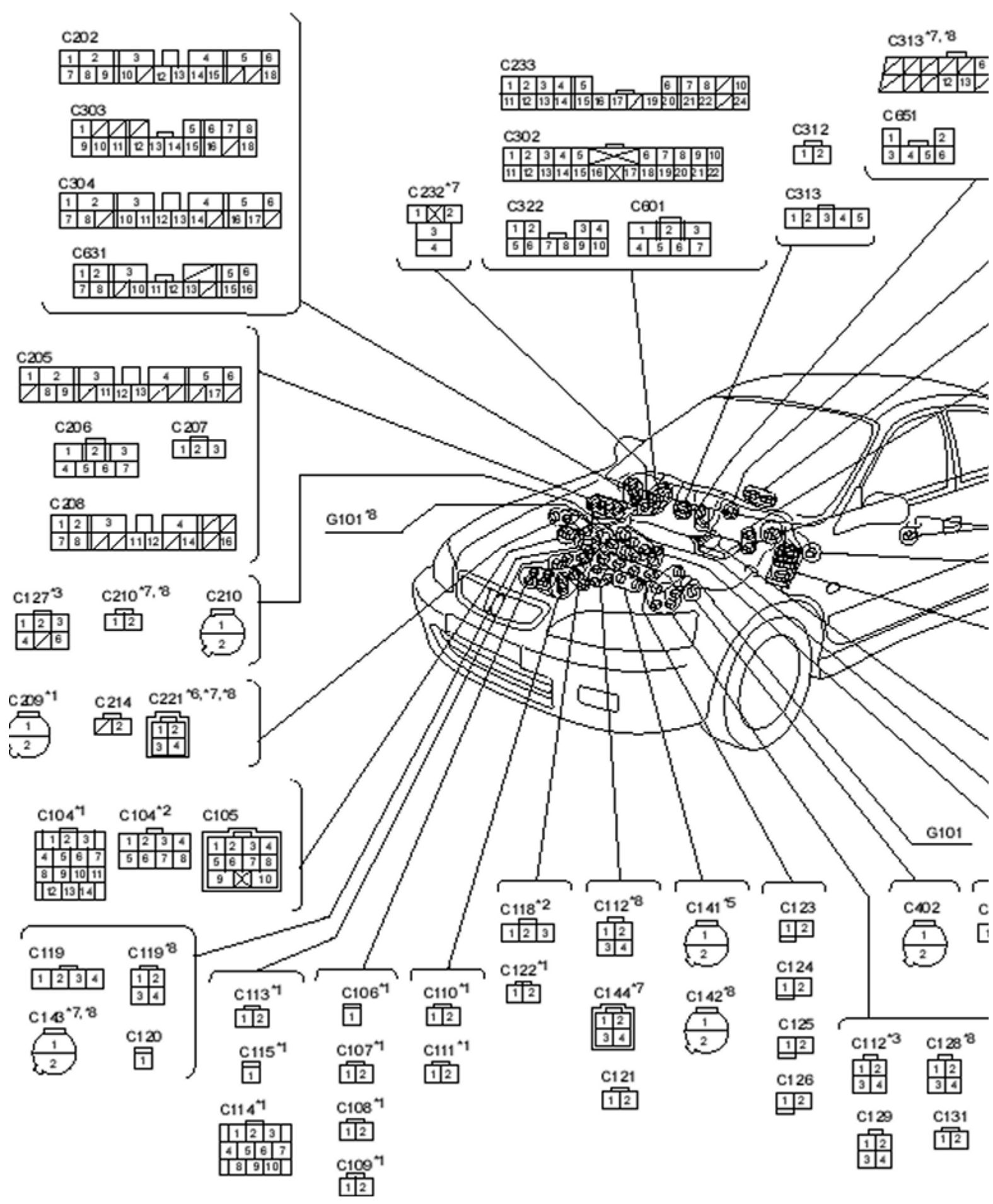
11-B-86



Connector	Pin	Color	Signal / Component
C202	1	Orange	IGNITION
	2	Black	GROUND
	3	Red	BATTERY
	4	Green	IGNITION
	5	Blue	IGNITION
	6	White	IGNITION
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
C303	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
C304	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
C631	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
C233	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
	19	Black	GROUND
	20	Black	GROUND
	21	Black	GROUND
	22	Black	GROUND
	23	Black	GROUND
	24	Black	GROUND
C302	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND
	13	Black	GROUND
	14	Black	GROUND
	15	Black	GROUND
	16	Black	GROUND
	17	Black	GROUND
	18	Black	GROUND
19	Black	GROUND	
20	Black	GROUND	
21	Black	GROUND	
22	Black	GROUND	
C322	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
C601	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
	7	Black	GROUND
C312	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
C313	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
C651	1	Black	GROUND
	2	Black	GROUND
	3	Black	GROUND
	4	Black	GROUND
	5	Black	GROUND
	6	Black	GROUND
C313*7,8	7	Black	GROUND
	8	Black	GROUND
	9	Black	GROUND
	10	Black	GROUND
	11	Black	GROUND
	12	Black	GROUND

NOT A REPAIR MANUAL... CONSULT THE REPAIR MANUAL FOR THE CORRECT WIRING DIAGRAMS.



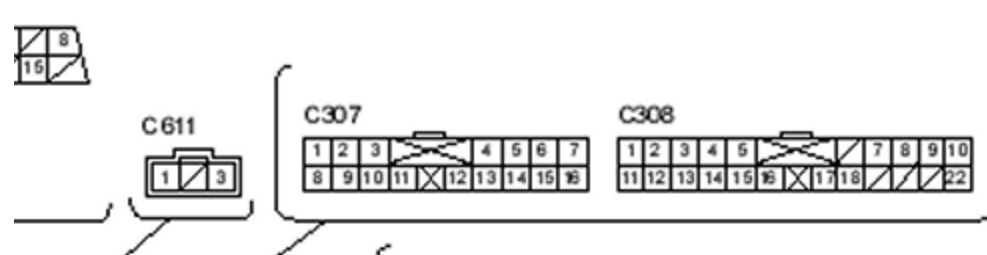


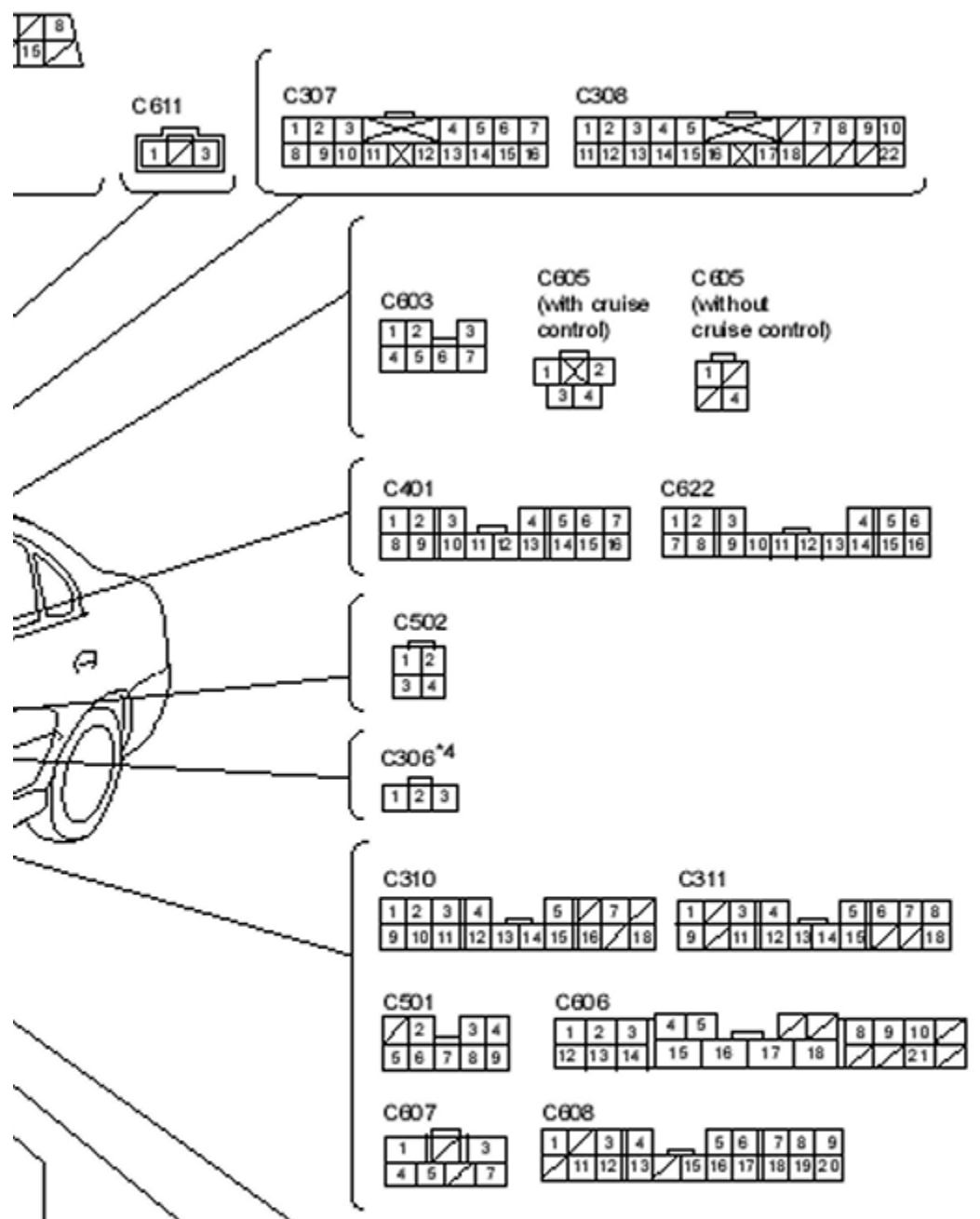
C101 (ECM/PCM-B)

1) YEL/BLK ¹	1) YEL/GRN
2) BLK ¹	2) BLU/BLK ²
3) RED ³	3) RED/BLU ¹
4) BLU ⁴	4) RED/BLU ²
5) YEL ¹	5) RED ⁴
6) —	6) GRN ¹
7) PNK ⁵	7) BLK/WH ^{2,7}
8) WH ⁶	8) BRN/BLK ¹
9) YEL/BLK ²	9) WH ¹ /BLU ²
10) BLK ²	10) BRN/BLK ²
11) BRN ⁶	11) BLK/BLU
12) GRN/YEL ³	12) BLU/WH ²
	13) GRP ⁶

C102 (ECM/PCM-C)

1) —	1) WH ^{4,7}
2) —	2) RED ^{7,7}
3) RED/YEL	3) BLU ^{4,7}





C101 (ECM/PCM-B)

1 YEL/BLK ¹	13 YEL/GRN
2 BLK ¹	14 BLU/BLK ²
3 RED ¹	15 RED/BLU ¹
4 BLU ²	16 RED/BLU ²
5 YEL ¹	17 RED ²
6 —	18 GRN ¹
7 PNK ²	19 BLK/WHT ^{2,7}
8 WHT ²	20 BRN/BLK ¹
9 YEL/BLK ²	21 WHT/BLU ²
10 BLK ²	22 BRN/BLK ²
11 BRN ²	23 BLK/BLU
12 GRN/YEL ³	24 BLU/WHT ²
	25 GRP ²

C102 (ECM/PCM-C)

1 —	13 WHT ^{4,7}
2 —	14 RED ^{2,7}
3 RED/BLU	15 BLU ^{4,7}
4 —	16 WHT ⁵
5 WHT/RED ²	17 RED/GRN
6 WHT/BLK ²	18 GRN/BLK ²
7 GRN/WHT ¹	19 YEL/RED
8 BLU ³	20 GRP ²
9 WHT ³	21 RED ²
10 BLU/BLK ³	22 RED ⁷
11 RED/BLK ¹	23 RED/YEL ^{7,8}
12 —	24 BLU/WHT ³

C103 (PCM-C)

1 YEL ³	13 YEL ⁴
2 GRN/WHT ²	14 BLU ⁵
3 GRN ⁴	15 RED ⁵
4 RED/BLK ³	16 WHT ⁷
5 YEL/BLK ³	17 BLU/WHT ⁴
6 WHT ⁶	18 BLU ²
7 BLU/YEL ²	19 BRN ⁴
8 PNK ³	20 GRN ⁵

C104^{*1}

1 BRN/BLK ²	8 BLU/WHT
2 YEL/GRN	9 PNK
3 GRN/BLK ²	10 BLU
4 RED/BLK	11 BRN
5 BLK/BLU	12 GRN
6 WHT	13 RED/BLK ¹
7 YEL/RED	14 LT BLU

C104^{*2}

1 YEL	8 BLU/WHT ³
2 BRN/BLK ²	9 GRN/BLK
3 YEL/GRN	10 GRN
4 GRN/BLK ²	11 YEL/RED

C105

1 RED/WHT	13 YEL/BLU ⁴
2 WHT/BLU ²	14 WHT/BLU
3 BLK/YEL	15 BLK ²
4 YEL/BLK ³	16 BLK/WHT
5 GRN ³	17 BLK/YEL
6 BLK/WHT ²	
7 WHT ^{4,5}	

C106^{*1}

1 BLU/WHT ²

C108^{*1}

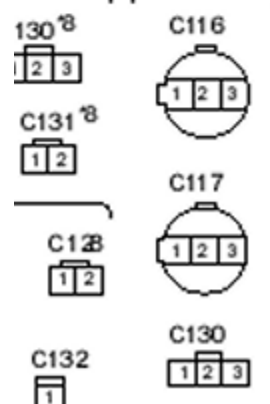
1 RED ⁴
2 WHT ²

C107^{*1}

1 YEL/BLU
2 RED ⁵
3 WHT ⁷

C109^{*1}

1 GRN ²
2 GRN ¹



C101 (ECM-PCM-B)

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	

C102 (ECM-PCM-C)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31									

C103 (PCM-D)^{*1}

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16				

C301 (ECM-PCM-A)

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	

C110^{*1}

1 BLK ²
2 GRN/WHT ²

C111^{*1}

1 BLK ²
2 GRN ⁴

C112^{*3}

1 WHT ⁵
2 GRN/BLK ²
3 BLK/YEL
4 BLK/WHT ²

C113^{*1}

1 YEL/RED
2 BLU ⁵
3 GRP ²

C114^{*1}

1 BLU/WHT ⁴	10 PNK ³
2 LT BLU	11 YEL ⁴
3 BLK ¹	12 RED/BLK ³
4 BRN ⁴	13 WHT ⁶
5 BLU ²	14 BLK/BLU

C202

1 GRN	10 BLK/YEL
2 RED/YEL	11 —
3 BLK/YEL	12 BLU/WHT
4 YEL/RED	13 BLU/RED
5 YEL	14 GRN/YEL
6 BLU/RED	15 PNK
7 RED/BLK	16 —
8 BLK/ORN	17 —
9 WHT/GRN	18 PUR/WHT

C205

1 RED/WHT	10 —
2 —	11 LT GRN/RED
3 RED/YEL	12 BLU/RED
4 RED/WHT	13 BLU/RED
5 RED/WHT	14 —
6 PUR/WHT	15 —

C301 (ECM/PCM-A)

1 —	10 PNK/BLK	19 WHT ¹
2 —	11 GRN/BLK ¹	20 BLU/ORN
3 —	12 GRN/YEL ¹	21 RED ²
4 —	13 GRN/YEL ²	22 WHT/BLU ¹
5 PUR ¹	14 RED ¹	23 BLU/RED
6 BLU/YEL ¹	15 GRN/ORN	24 WHT/RED ¹
7 PUR ²	16 BLU ¹	25 —
8 BLK/WHT ¹	17 BLK/WHT ²	26 GRN/RED ^{1,4}
9 BLU/WHT ¹	18 GRN ^{7,8}	27 BRP ²
10 BRN ¹	19 LT BLU	28 WHT/BLK ¹
11 BLU/BLK ¹	20 GRN/RED ^{1,7}	
12 PNK ¹	21 GRN ¹	

C302

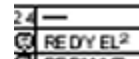
1 LT BLU	12 BLU/BLK
2 GRN/RED ¹	13 GRN/BLK ²
3 BLK/WHT ²	14 RED ¹
4 YEL	15 YEL/RED

C310

1 GRN	10
2 GRN/BLK	11
3 PUR	12
4 RED/BLU	13
5 LT BLU	14
6 —	15
7 WHT/BLK ¹	16
8 —	17
9 BLK	18

C311

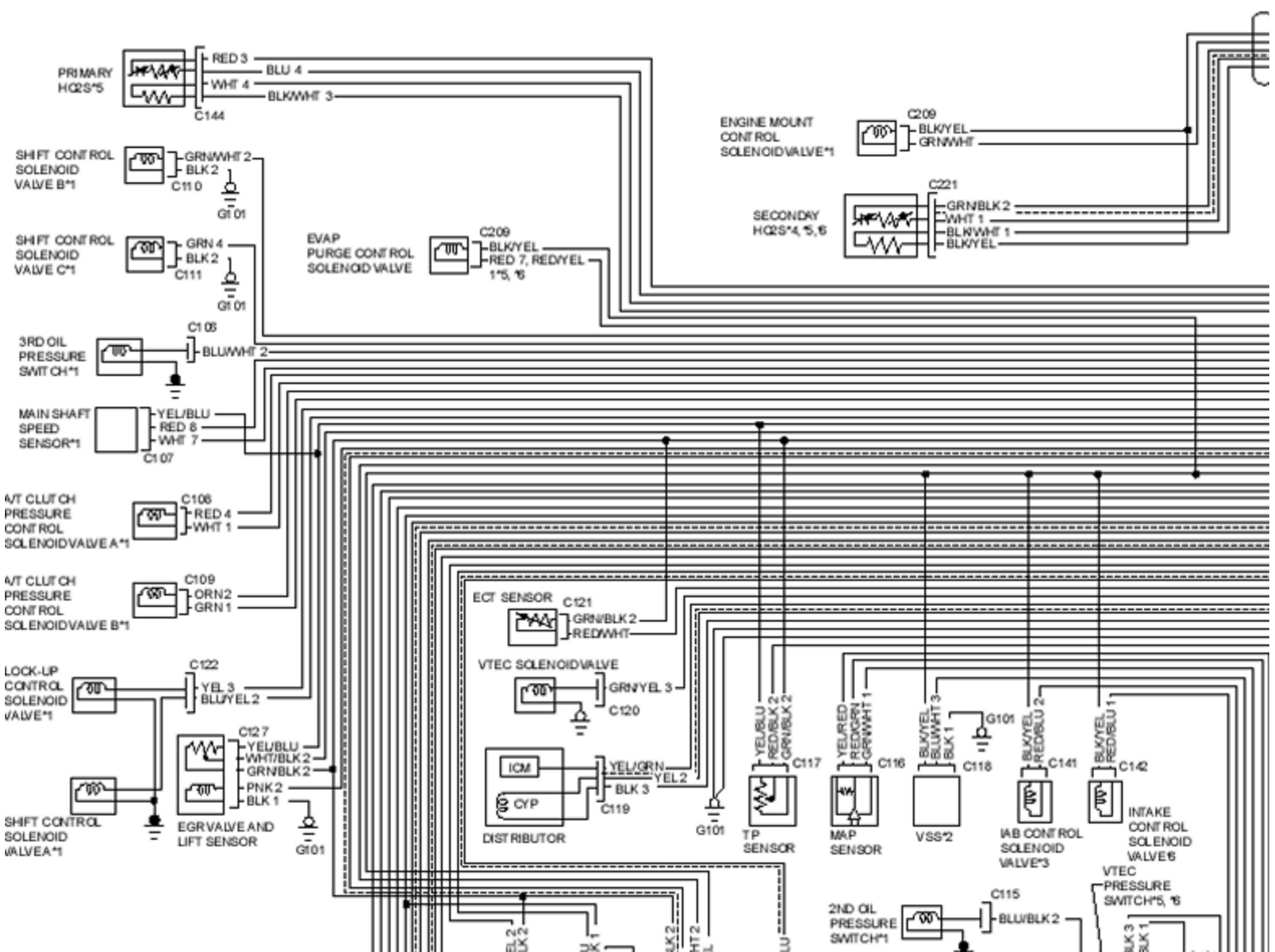
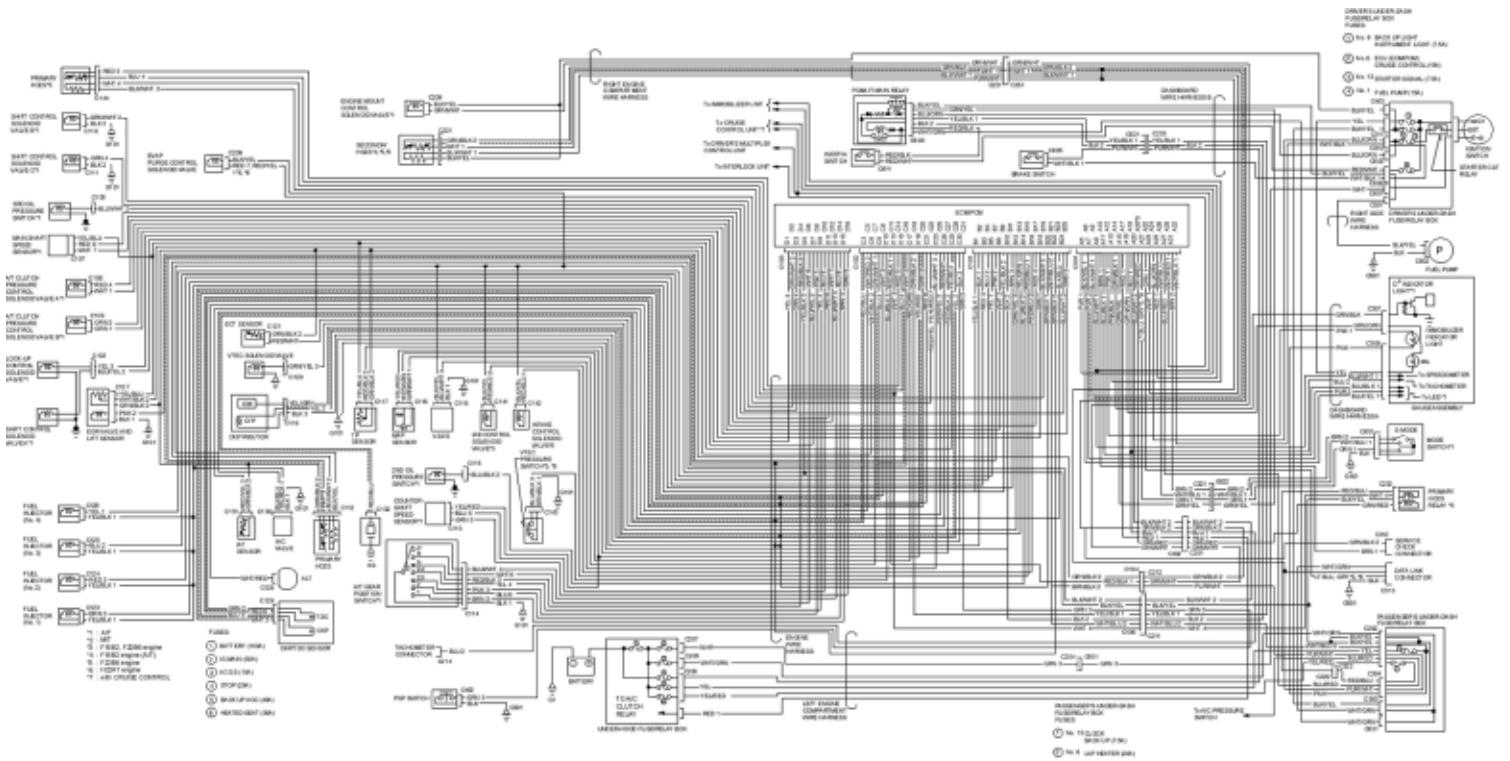
1 GRN/WHT	10
2 —	11
3 GRN	12
4 YEL	13
5 YEL/GRN	14
6 BLK	15
7 YEL/RED	16

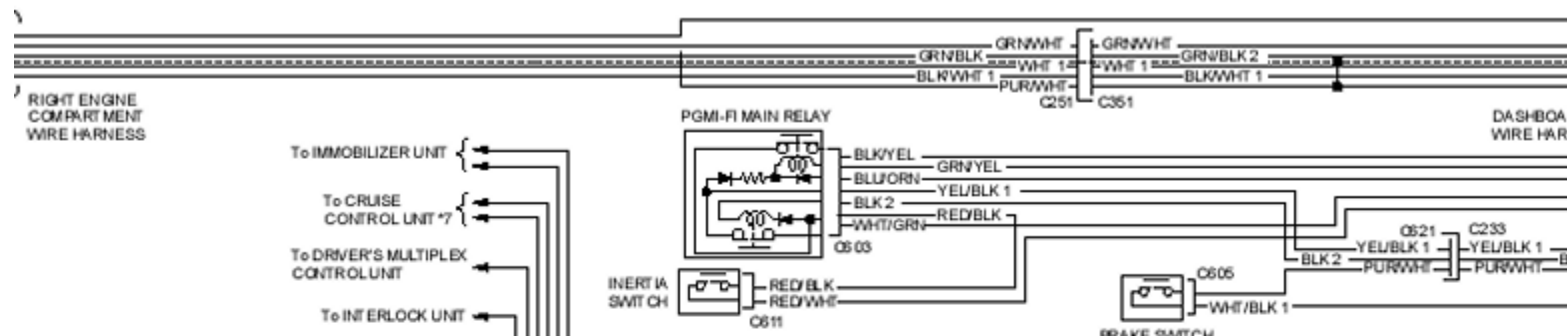
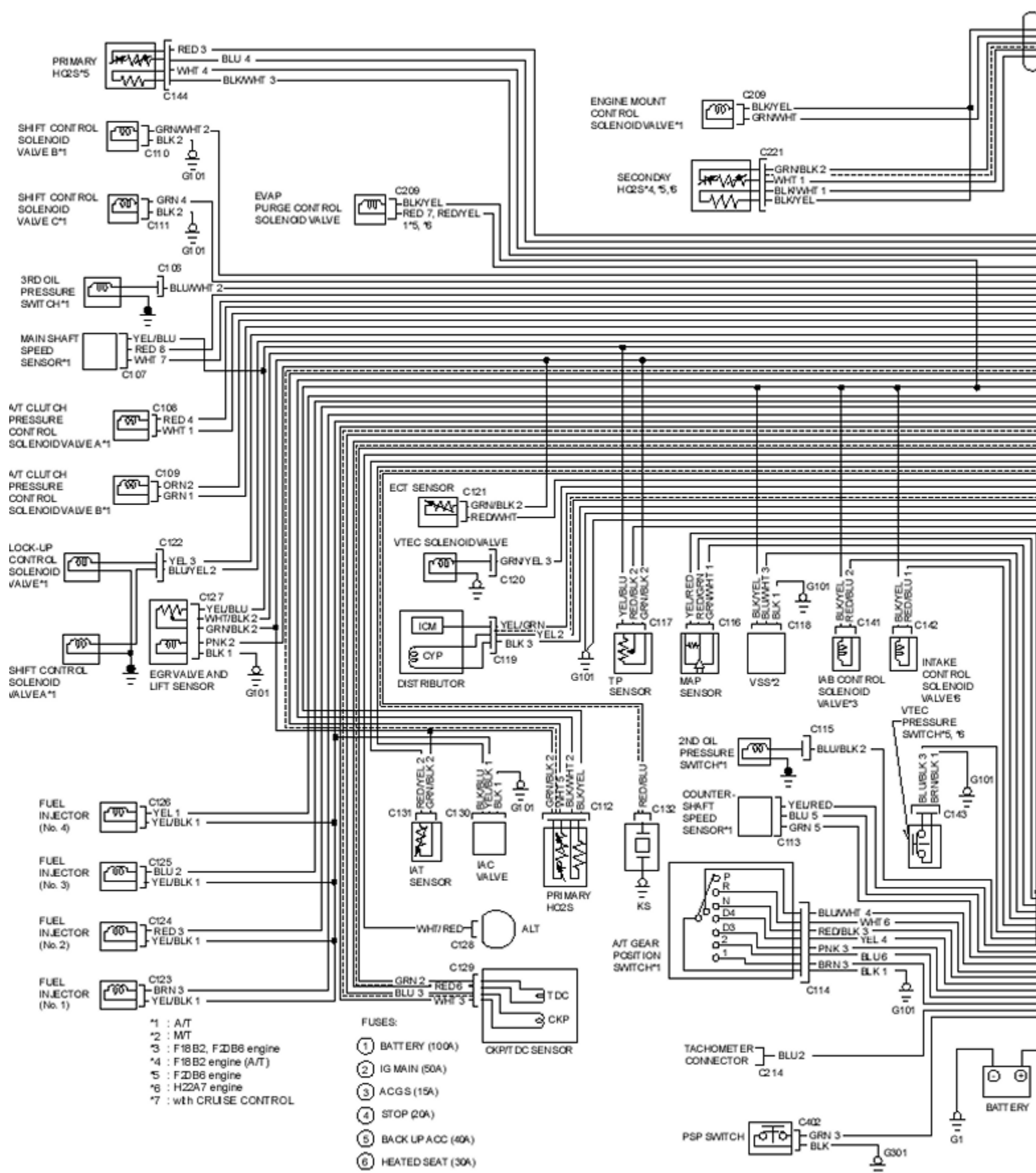


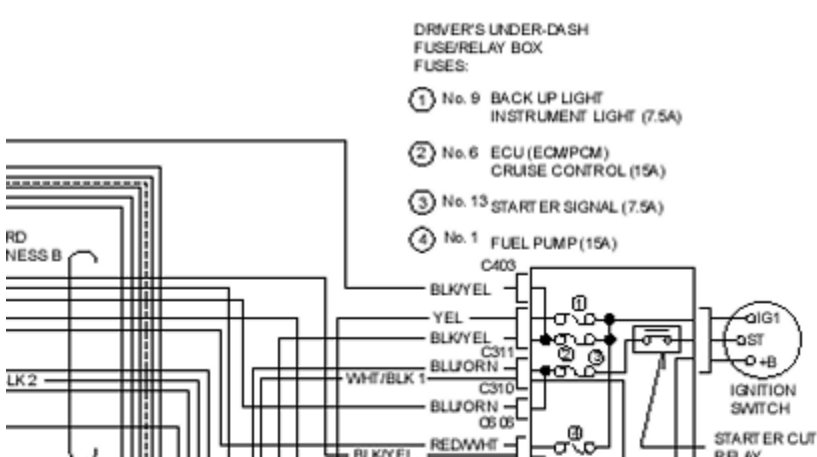
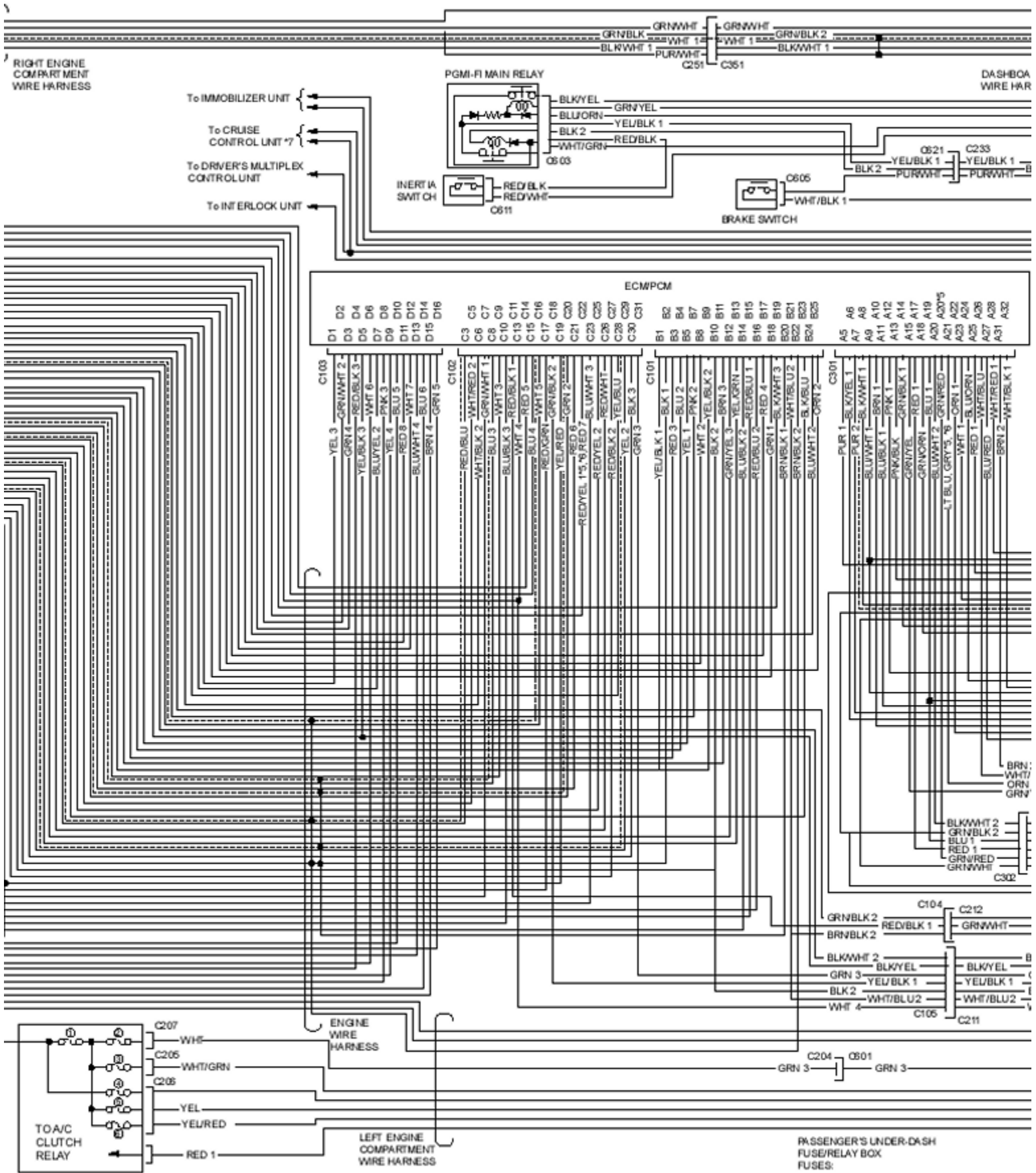
Diagrams

Fuel-injected System Diagram (F18B2, F18B3, F20B6, H22A7 engine: RHD)

11-B-87

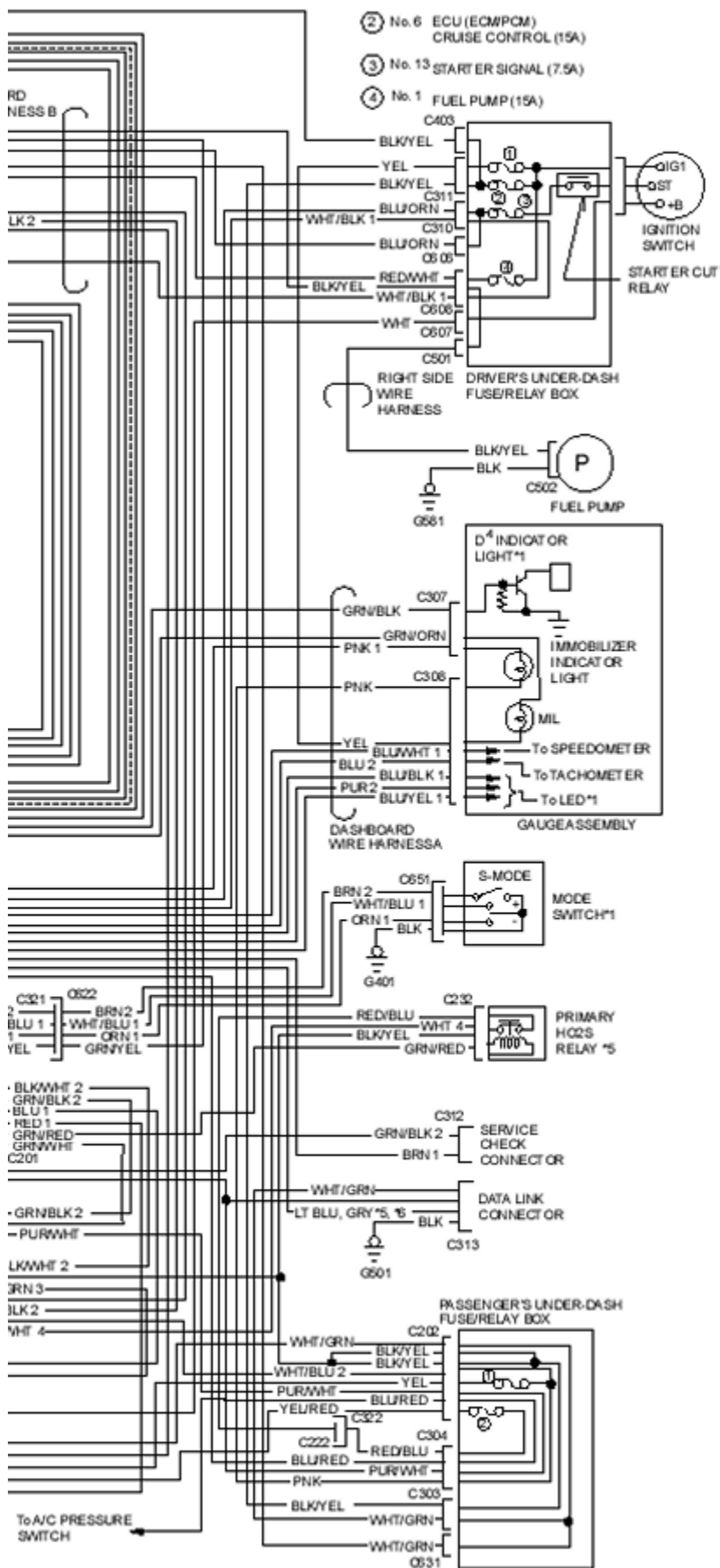






DRIVER'S UNDER-DASH FUSE/RELAY BOX
FUSES:

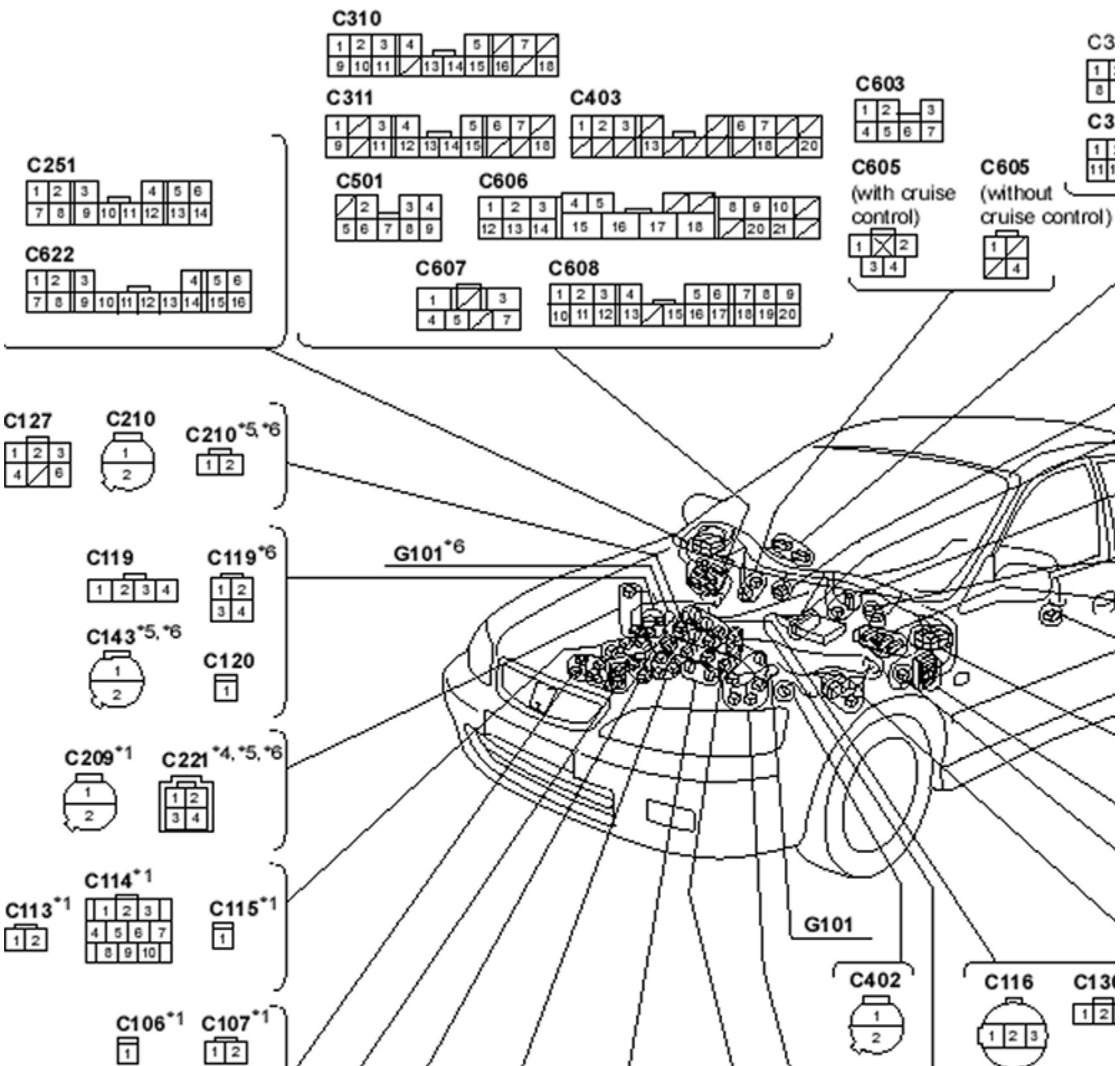
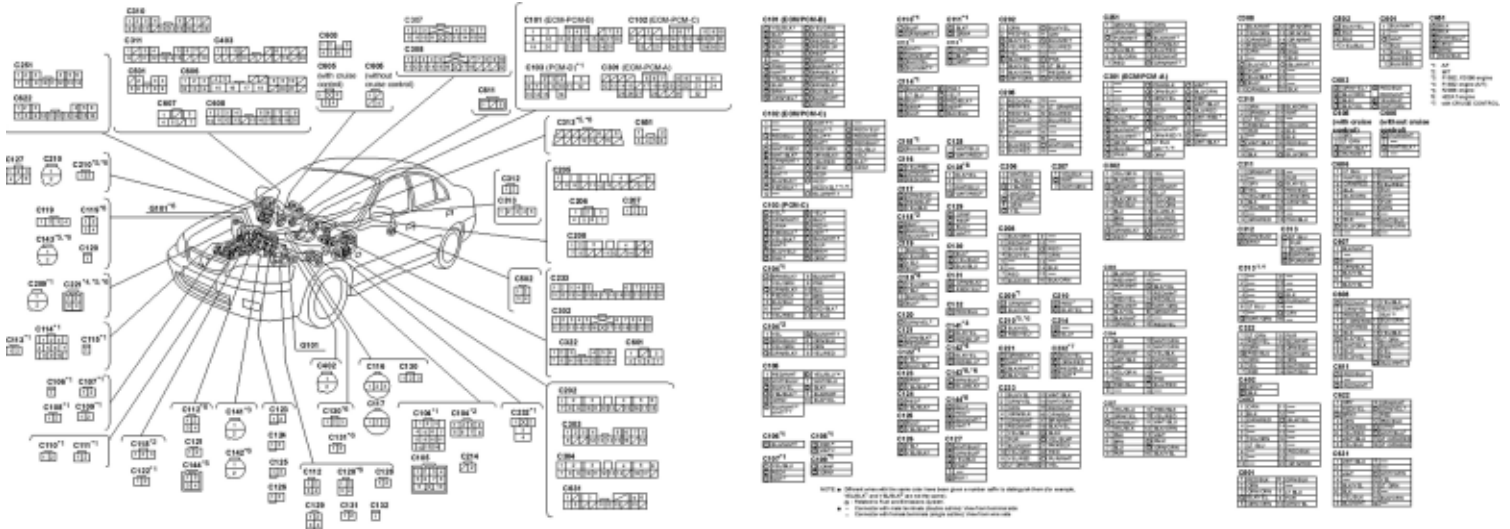
- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
- ② No. 6 ECU (ECM/PCM) CRUISE CONTROL (15A)
- ③ No. 13 STARTER SIGNAL (7.5A)
- ④ No. 1 FUEL PUMP (15A)

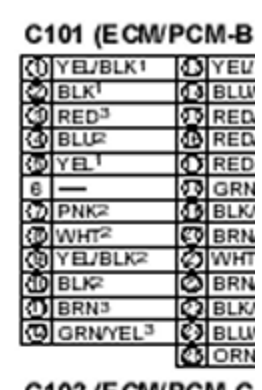
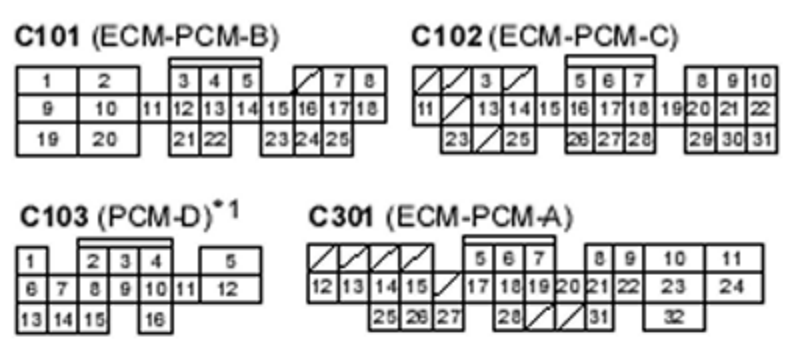
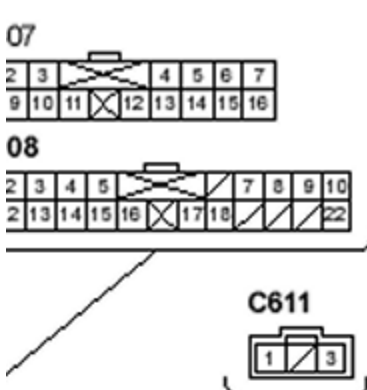
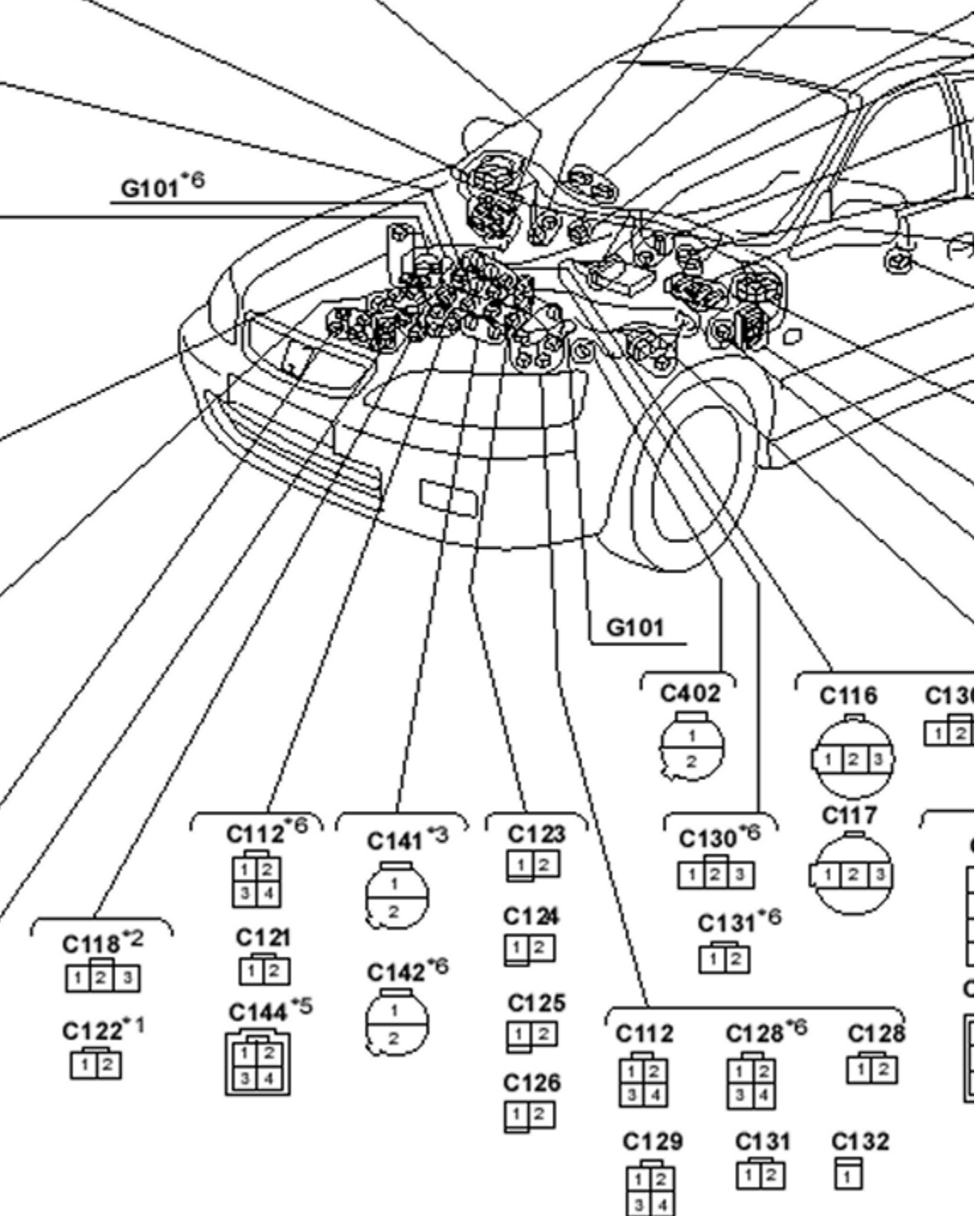
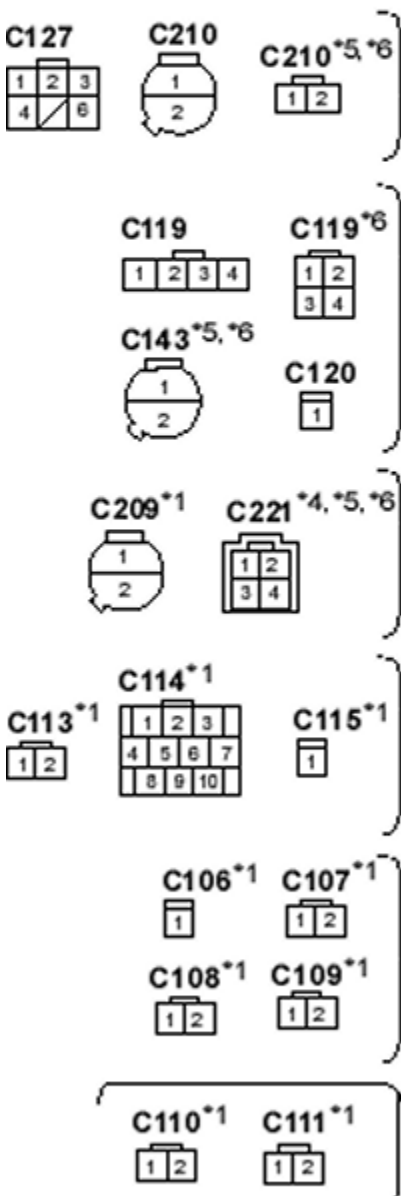
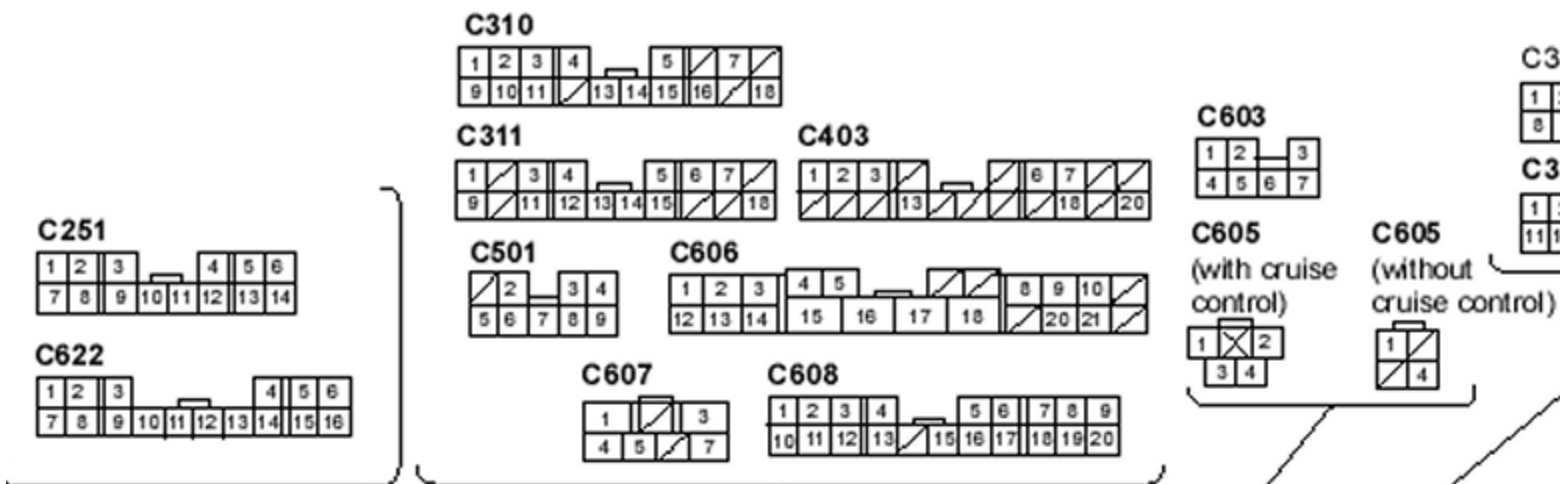


Diagrams

Fuel-injected System Connectors (F18B2, F18B3, F20B6, H22A7 engine: RHD)

11-B-88







C611



C101 (ECM-PCM-B)



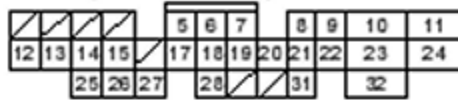
C102 (ECM-PCM-C)



C103 (PCM-D)*1



C301 (ECM-PCM-A)



C101 (ECM/PCM-B)

① YEL/BLK ¹	② YEL/BLK ¹
③ BLK ¹	④ BLU
⑤ RED ³	⑥ RED
⑦ BLU ²	⑧ RED
⑨ YEL ¹	⑩ RED
⑪ —	⑫ GRN
⑬ PNK ²	⑭ BLK
⑮ WHT ²	⑯ BRN
⑰ YEL/BLK ²	⑱ WHT
⑲ BLK ²	⑳ BRN
㉑ BRN ³	㉒ BLK
㉓ GRN/YEL ³	㉔ BLU
㉕ —	㉖ ORN

C102 (ECM/PCM-C)

1	—	① WHT
2	—	② RED
3	RED/BLU	③ BLU
4	—	④ WHT
5	WHT/RED ²	⑤ RED
6	WHT/BLK ²	⑥ GRN
7	GRN/WHT ¹	⑦ YEL
8	BLU ³	⑧ GRN
9	WHT ³	⑨ RED
10	BLU/BLK ³	⑩ RED
11	RED/BLK ¹	⑪ RED
12	—	⑫ BLU

C103 (PCM-C)

① YEL ³	② YEL
③ GRN/WHT ²	④ BLU
⑤ GRN ⁴	⑥ RED
⑦ RED/BLK ³	⑧ WHT
⑨ YEL/BLK ³	⑩ BLU
⑪ WHT ⁶	⑫ BLU
⑬ BLU/YEL ²	⑭ BRN
⑮ PNK ³	⑯ GRN

C104*1

① BRN/BLK ²	8 BLU
2 YEL/GRN	9 PNK
③ GRN/BLK ²	10 BLU
4 RED/BLK	11 BRN
5 BLK/BLU	12 GRN
6 WHT	④ RED
7 YEL/RED	14 LT B

C104*2

1 YEL	⑤ BLU
② BRN/BLK ²	6 GRN
3 YEL/GRN	7 GRN
④ GRN/BLK ²	8 YEL

C105

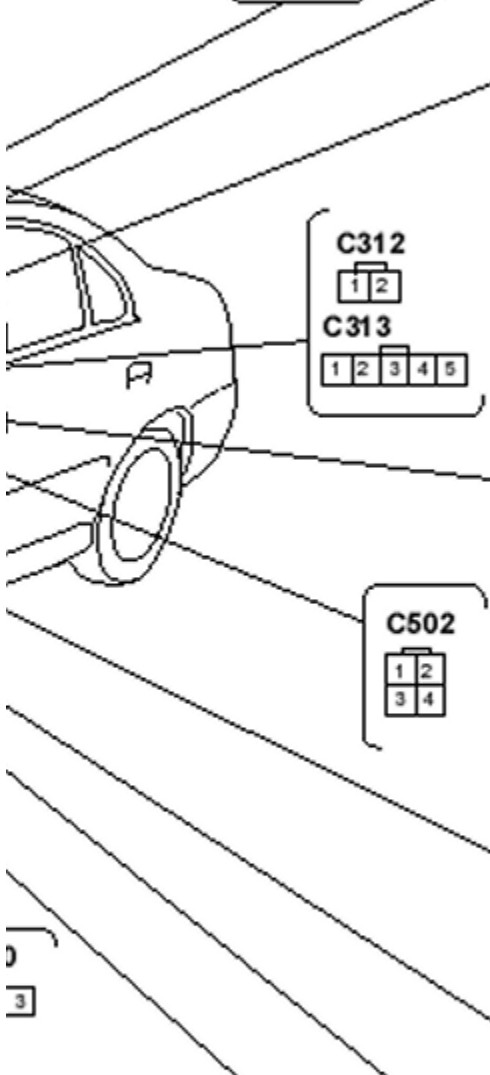
1 RED/WHT	⑥ YEL
② WHT/BLU	7 WHT
③ BLK/YEL	⑦ BLK
④ YEL/BLK ³	8 BLK
⑤ GRN ²	10 BLK
⑥ BLK/WHT ²	WHT ^{4,7}

C106*1

① BLU/WHT ²	⑧ R
	⑨ V

C107*1

① YEL/BLU	⑩ C
② RED ⁶	⑪ C
③ WHT ⁷	⑫ C



C110*1

① BLK ²	② GRN/WHT ²
③ WHT ⁵	④ GRN/BLK ²
⑤ BLK/YEL	⑥ BLK/WHT ²

C111*1

① BLK ²	② GRN ⁴
③ YEL/RED	④ BLU ⁵
⑤ GRN ⁵	

C114*1

① BLU/WHT ⁴	② PNK ³
3 BLK ¹	④ YEL ⁴
⑤ BRN ⁴	⑥ RED/BLK ³
⑦ BLU ⁵	⑧ WHT ⁵
⑨ BLK/BLU	

C202

1 GRN	① BLK/YEL
2 RED/YEL	11 GRY
③ BLK/YEL	④ BLU/WHT
⑤ YEL/RED	13 BLU/RED
⑥ YEL	14 —
⑦ BLU/RED	⑧ PNK
8 BLK/YEL	16 LT BLU
9 BLK/ORN	17 RED/BLK
⑩ WHT/GRN	⑪ PUR/WHT

C205

1 RED/GRN	10 —
2 RED/YEL	11 LT GRN/RED
3 RED/YEL	12 BLU/RED

C251

1 GRN/YEL	8 GRN
2 GRN/WHT	① WHT ¹
③ PUR/WHT	④ BLK/WHT ¹
4 YEL	⑤ GRN/BLK ²
5 BLU/BLK	12 BLU/RED
6 YEL/GRN	13 RED/WHT
7 RED	⑥ GRN/WHT ¹

C301 (ECM/PCM-A)

1 —	③ PNK/BLK	④ WHT ¹
2 —	⑤ GRN/BLK ¹	⑥ BLU/ORN
3 —	⑦ GRN/YEL	⑧ RED ²
4 —	16 —	⑨ WHT/BLU ¹
⑩ PUR ¹	⑪ RED ¹	⑫ BLU/RED
⑬ BLU/BLK ¹	⑭ GRN/ORN	⑮ WHT/RED ¹

C308

1 BLK	⑦ BLU
2 YEL	⑧ PUR
3 GRN	⑨ BLU
4 RED	⑩ BLU
5 ORN	⑪ BLU
6 —	⑫ GRN

C310

1 GRN	2 GRN
-------	-------

-) GRN
- BLK²
- BLU¹
- BLU²
- 1
- WHT^{5*}
- BLK¹
- BLU²
- BLK²
- BLU
- WHT²
- 2

-) 4⁵
- 5⁵
- 4⁵
- 5
- 7/GRN
- VELK²
- RED
- 2
- 6
- 7
- YEL^{1,5,6}
- WHT³

- 4
- 5
- 6
- 7
- WHT⁴
- 5
- 4
- 5

- WHT
-
-
-
-
-
-
- /BLK¹
- LU

- WHT³
- /BLK
-
- RED

- BLU⁴
- 7/BLU
- 2
- WHT
- YEL

- 8^{*1}
- ED⁴
- HT²
- 9^{*1}
- RN²
- RN¹

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).
 □ : Related to Fuel and Emissions System.
 ● - Connector with male terminals (double outline): View from terminal side
 ◻ - Connector with female terminals (single outline): View from wire side

C110*1

① BLK ²
② GRN/WHT ²

C112*3

① WHT ⁵
② GRN/BLK ²
③ BLK/YEL
④ BLK/WHT ²

C111*1

① BLK ²
② GRN ⁴

C113*1

① YEL/RED
② BLU ⁵
③ GRN ⁵

C202

1 GRN	⑩ BLK/YEL
2 RED/YEL	⑪ GRY
⑫ BLK/YEL	⑬ BLU/WHT
⑭ YEL/RED	13 BLU/RED
⑮ YEL	14 —
⑯ BLU/RED	⑰ PNK
7 BLK/YEL	16 LT BLU
8 BLK/ORN	17 RED/BLK
⑱ WHT/GRN	⑳ PUR/WHT

C251

1 GRN/YEL	8 GRN
2 GRN/WHT	⑨ WHT ¹
⑭ PUR/WHT	⑮ BLK/WHT ¹
4 YEL	⑯ GRN/BLK ²
5 BLU/BLK	12 BLU/RED
6 YEL/GRN	13 RED/WHT
7 RED	⑲ GRN/WHT ¹

C114*1

① BLU/WHT ⁴	② PNK ³
2 LT BLU	③ YEL ⁴
④ BLK ¹	⑤ RED/BLK ³
⑥ BRN ⁴	⑦ WHT ⁶
⑧ BLU ⁵	⑨ BLK/BLU

C205

1 RED/GRN	10 —
2 RED/YEL	11 LT GRN/RED
3 RED/YEL	12 BLU/RED
4 RED/WHT	13 BLU/RED
5 —	14 —
6 PUR/WHT	15 —
7 —	⑯ —
8 BLU/RED	⑰ WHT/GRN
9 BLU/RED	18 —

C301 (ECM/PCM -A)

1 —	③ PNK/BLK	④ WHT ¹
2 —	⑤ GRN/BLK ¹	⑥ BLU/ORN
3 —	⑦ GRN/YEL	⑧ RED ²
4 —	16 —	⑨ WHT/BLU ¹
⑩ PUR ¹	⑪ RED ¹	⑫ BLU/RED
⑬ BLU/YEL ¹	⑭ GRN/ORN	⑮ WHT/RED ¹
⑯ PUR ²	⑰ BLU ¹	29 —
⑱ BLK/WHT ¹	⑲ BLK/WHT ²	30 —
⑳ BLU/WHT ¹	⑳ GRN/RED ⁵	㉑ BRN ²
㉒ BRN ¹	㉓ LT BLU	㉔ WHT/BLK ¹
㉕ BLU/BLK ¹	㉕ GRY ^{5,6}	
㉖ PNK ¹	㉖ CRN ¹	

C115*1

① BLU/BLK ²

C116

① YEL/RED
② GRN/WHT ¹
③ RED/GRN

C128

1 WHT/BLU
② WHT/RED ²

C128*8

1 BLK/YEL
2 —
3 WHT/BLU
④ WHT/RED ²

C206

1 WHT/BLU
2 YEL/GRN
③ YEL/RED
4 WHT/GRN
④ PUR/WHT
5 GRN
⑤ YEL

C207

1 YEL/BLK
② WHT
3 WHT/GRN

C302

1 YEL/GRN	12 YEL
2 BLU/RED	13 BRN
③ GRN/WHT	14 PUR/WHT
4 WHT	15 BLU ¹
5 BLK/ORN	16 YEL/GRN
6 RED/BLK	17 YEL/GRN
7 BLU	18 BLU/BLK
8 BRN	19 YEL/RED
9 PNK	20 BRN/WHT
④ GRN/BLK ²	⑤ GRN/RED
⑥ RED ¹	⑦ BLK/WHT ²

C117

① GRN/BLK ²
② RED/BLK ²
③ YEL/BLK

C118*2

① BLK ¹
② BLK/YEL
③ BLU/WHT ³

C129

① GRN ²
② RED ²
③ BLU ³
④ WHT ³

C130

① BLK ¹
② YEL/BLK ¹
③ BLK/BLU

C208

1 BLK/ORN	9 —
2 RED/WHT	10 —
3 BLU/BLK	③ RED ¹
4 BLU/YEL	12 GRN
5 —	13 —
6 —	14 BLK
7 RED	15 —
8 BLK/ORN	16 BLK/ORN

C303

1 BLU/WHT	10 —
2 RED/WHT	11 —
3 PUR/WHT	③ BLK/YEL
4 —	13 RED/WHT
5 RED/YEL	14 RED/BLU
6 BRN/WHT	④ WHT/GRN
7 BLK/YEL	⑤ GRN/WHT
8 BLK/WHT	17 —
9 GRN/BLK	18 RED/YEL

C119

1 BLK/YEL
② YEL/GRN
③ YEL ²
④ BLK ³

C119*6

① YEL/GRN
② YEL ²
③ BLK/YEL
④ BLK ³

C131

① GRN/BLK ²
② RED/YEL ²

C132

① RED/BLU

C209*1

① GRN/WHT
② BLK/YEL

C210*5,*6

① BLK/YEL
② RED/YEL ¹

C210

① RED ⁷
② BLK/YEL

C304

1 BLU	10 WHT/GRN
2 RED	11 WHT/GRN
3 GRN/WHT	12 YEL/BLK
4 WHT/BLK	13 WHT/RED
5 WHT	③ PUR/WHT
6 YEL/GRN	15 —
7 YEL	④ PNK
⑤ RED/BLU	⑥ BLU/RED
9 —	18 —

C120

① GRN/YEL ³

C121

① GRN/BLK ²
② RED/WHT

C122*1

① YEL ³
② BLU/YEL ²

C123

① BRN ³
② YEL/BLK ¹

C141*3

① BLK/YEL
② RED/BLU ²

C142*6

① BLK/YEL
② RED/BLU ¹

C143*5,*6

① BRN/BLK ¹
② BLU/BLK ³

C221

① GRN/BLK ²
② WHT ¹
③ BLK/WHT ¹
④ BLK/YEL

C214

① —
② BLU ¹

C402

① GRN
② BLK

C403

1 YEL/BLU	9 RED/BLK
2 GRN/YEL	10 YEL/RED
③ GRN/BLK ¹	11 WHT/BLU
4 YEL/BLK	12 BLK/ORN
5 PNK	13 WHT
6 BRN	④ PNK ¹
7 BLU	⑤ GRN/ORN
8 PUR	16 BLK/YEL

C124

① RED ³
② YEL/BLK ¹

C125

① BLU ²
② YEL/BLK ¹

C144*5

① BLU ⁴
② RED ³
③ BLK/WHT ³
④ WHT ⁴

C127

① WHT/BLK ²
② GRN/BLK ²
③ YEL/BLU
④ PNK ²
5 —
⑤ BLK ¹

C233

1 BLU/YEL	13 WHT/BLK
2 GRN/YEL	14 WHT/GRN
3 GRN	15 RED/WHT
4 GRN/BLK	16 ORN/BLK
5 GRN/WHT	17 BRN/WHT
6 RED/WHT	18 BLK/YEL
7 YEL/BLU	⑥ BLK ²
8 PUR	⑦ YEL/BLK ²
9 BLU/WHT	21 PNK/BLK
10 YEL/GRN	22 RED
11 YEL/RED	⑧ PUR/WHT
12 LT GRN/RED	24 YEL

- C308**
- 1 BLK
- 2 YEL
- 3 GRN
- 4 RED
- 5 ORN
- 6 —
- ⑦ BLU
- ⑧ PUR
- ⑨ BLU
- ⑩ BLU
- 11 GRN

- C310**
- 1 GRN
- 2 GRN
- 3 LT BL
- 4 RED
- 5 PUR
- 6 —
- ⑩ WHT
- 8 —
- 9 BLK

- C311**
- 1 GRN
- 2 —
- 3 GRY
- ④ YEL
- 5 YEL
- 6 BLK
- 7 YEL
- 8 —
- 9 GRN

- C312**
- ① GRN
- ② BRN

- C313***
- 1 —
- 2 —
- 3 —
- 4 —
- 5 —
- 6 LT BL
- 7 —
- ③ WHT

- C322**
- 1 LT G
- 2 RED
- 3 GRN
- ④ RED
- 5 GRN
- 6 YEL
- 7 RED

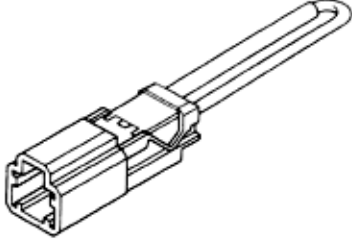
- C402**
- ① GRN
- ② BLK
- C403**
- 1 ORN
- 2 BLK
- 3 GRN
- 4 —
- 5 —
- 6 YEL
- 7 LT B
- 8 —
- 9 —
- 10 —

- C501**
- 1 RED
- 2 GRN
- 3 GRN
- ④ BLK²
- 5 GRN

Special Tools

11-C-2

Ref No.	Tool Number	Description	Qty	Remark
1	07PAZ - 0010100	SCS Short Connector	1	
2	07406 - 0040002	Fuel Pressure Gauge Set	1	
2-1	07406 - 0040202	Fuel Pressure Hose Assembly	1(1)	Component Tools
3	07XAZ - SIA0300	ECM Test Harness	1	
4	07XAZ - 0010100	Test Pin Box (Pin Box 130 Seem)	1	



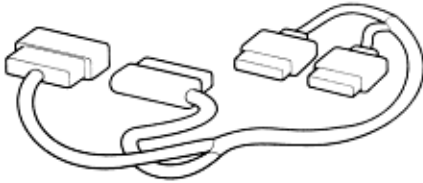
①



②



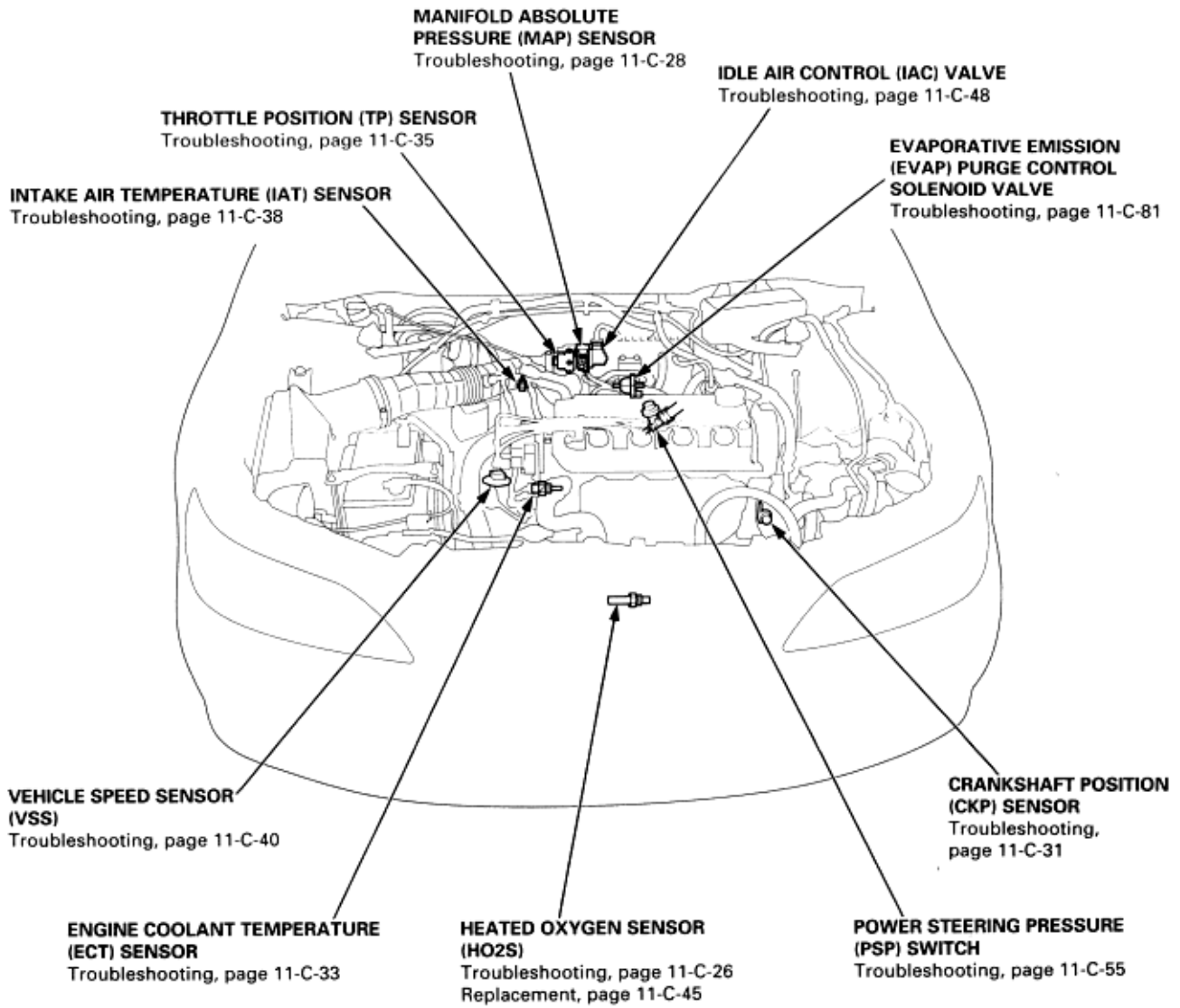
②-1



③

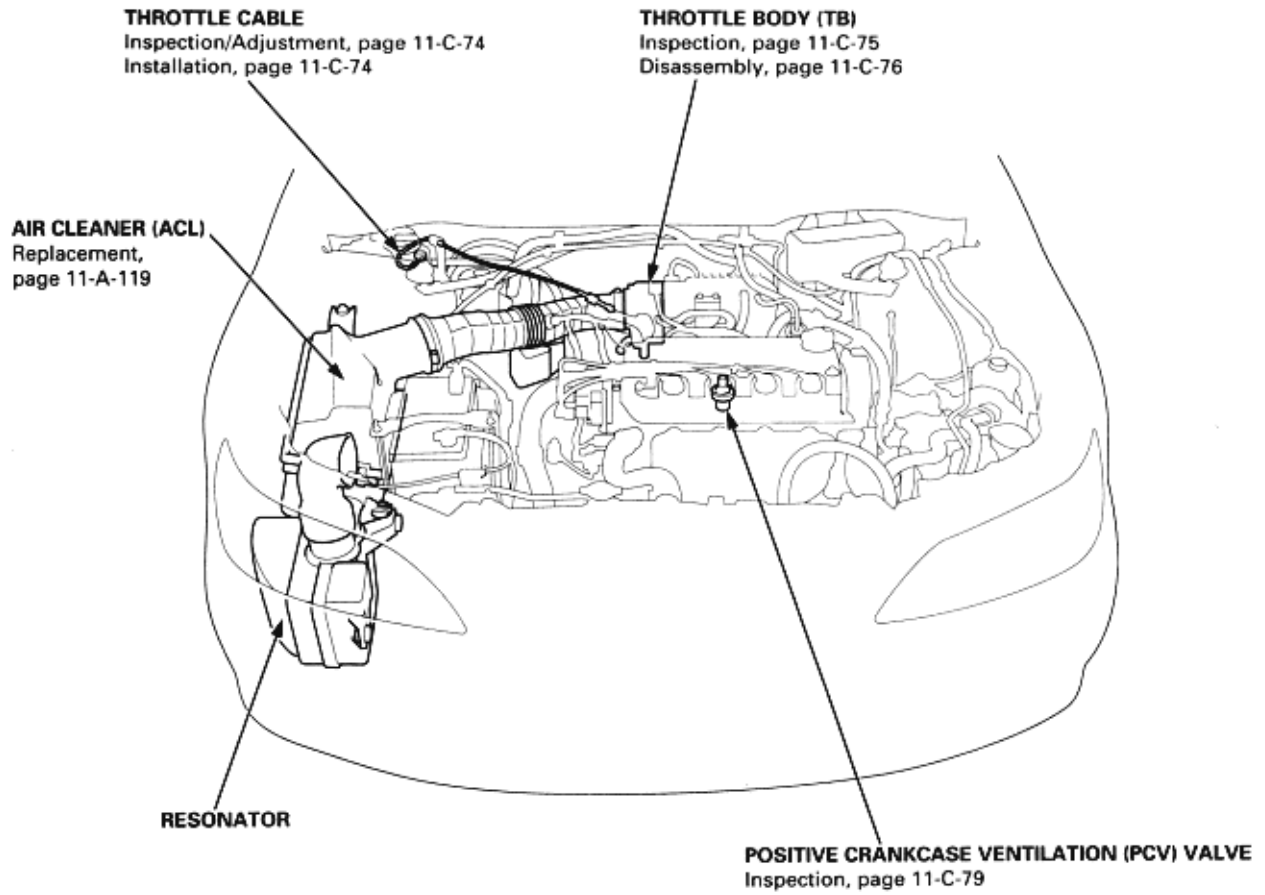


④



To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-C-28)
- (See Page 11-C-35)
- (See Page 11-C-38)
- (See Page 11-C-40)
- (See Page 11-C-33)
- (See Page 11-C-48)
- (See Page 11-C-81)
- (See Page 11-C-31)
- (See Page 11-C-55)
- (See Page 11-C-26)
- (See Page 11-C-45)



To go to the pages referenced on the diagram above, click on the following:

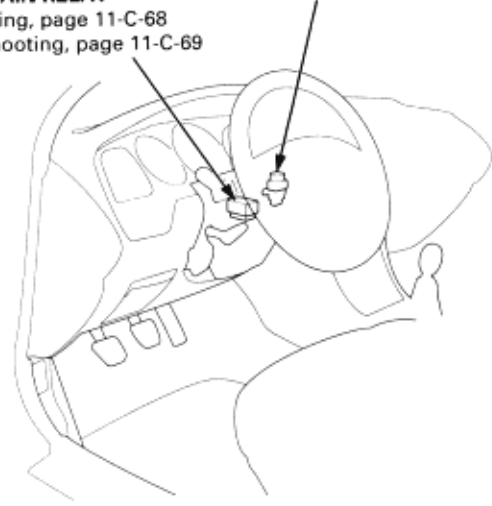
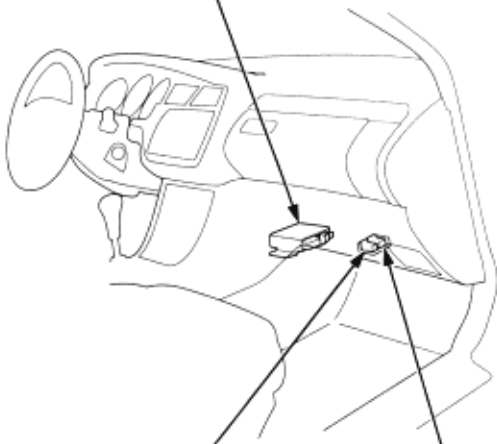
- (See Page 11-C-74)
- (See Page 11-A-119)
- (See Page 11-C-75)
- (See Page 11-C-76)
- (See Page 11-C-79)

LHD:

ENGINE CONTROL MODULE (ECM)
Removal, page 11-C-13
Troubleshooting Procedures, page 11-C-11
Troubleshooting, page 11-C-21

PGM-FI MAIN RELAY
Relay testing, page 11-C-68
Troubleshooting, page 11-C-69

INERTIA SWITCH
Description, page 11-C-67



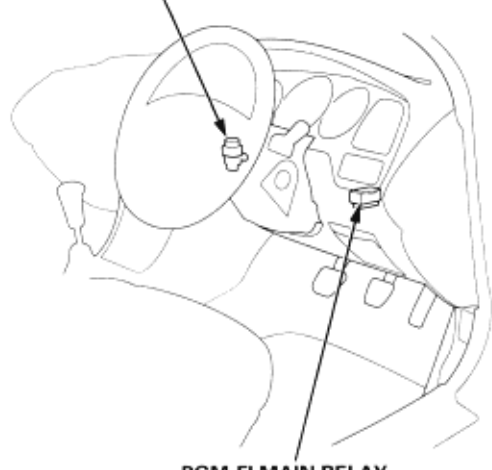
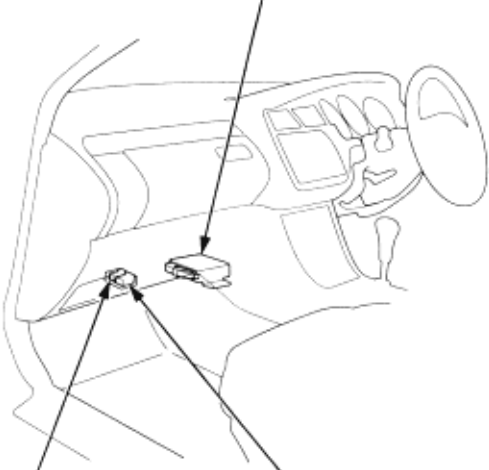
SERVICE CHECK CONNECTOR
Self-diagnostic Procedures, page 11-C-13

DATA LINK CONNECTOR (DLC) (5P)

RHD:

ENGINE CONTROL MODULE (ECM)
Removal, page 11-C-13
Troubleshooting Procedures, page 11-C-11
Troubleshooting, page 11-C-21

INERTIA SWITCH
Description, page 11-C-67



DATA LINK CONNECTOR (DLC) (5P)

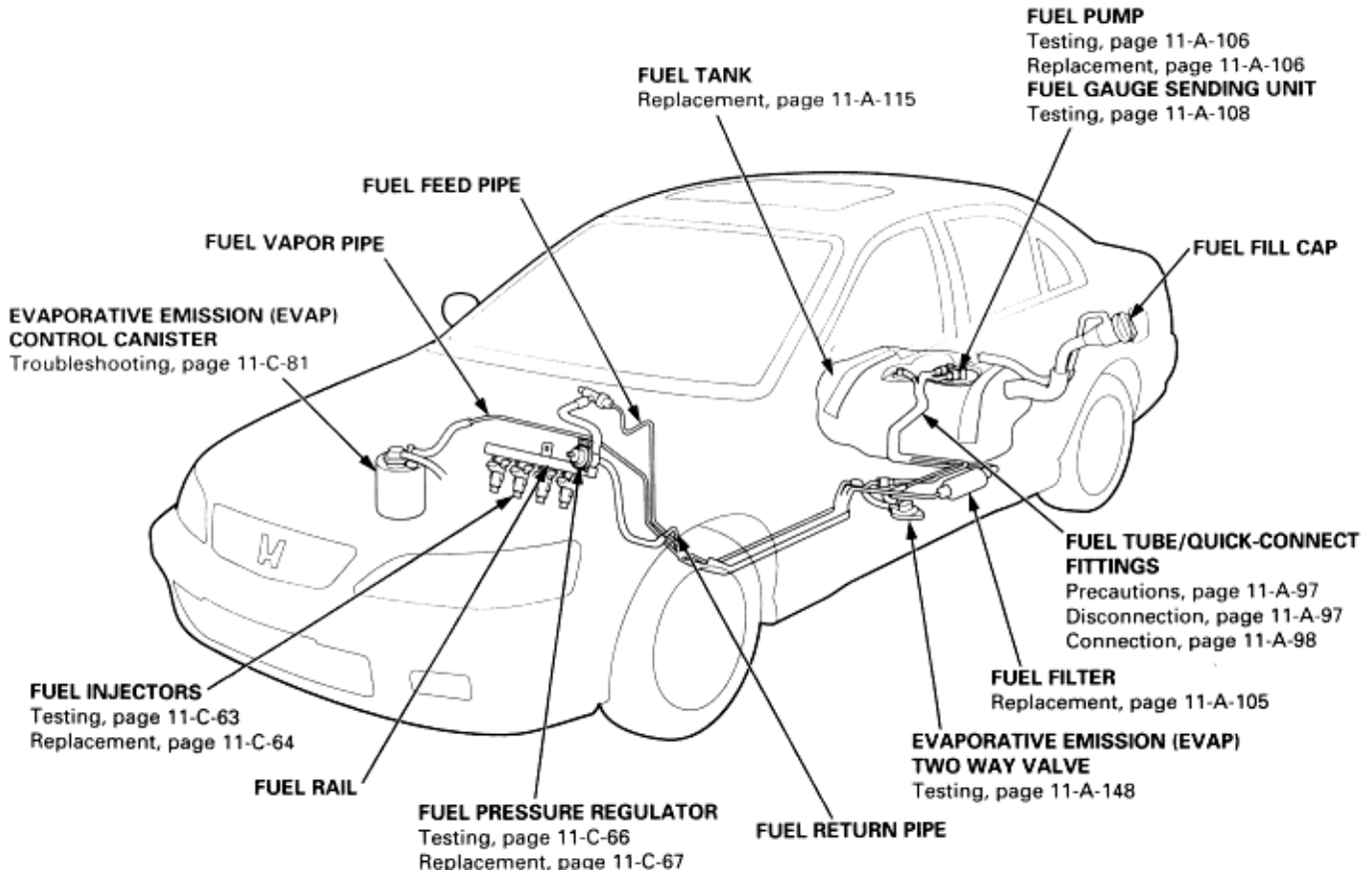
SERVICE CHECK CONNECTOR
Self-diagnostic Procedures, page 11-C-13

PGM-FI MAIN RELAY
Relay testing, page 11-C-68
Troubleshooting, page 11-C-69

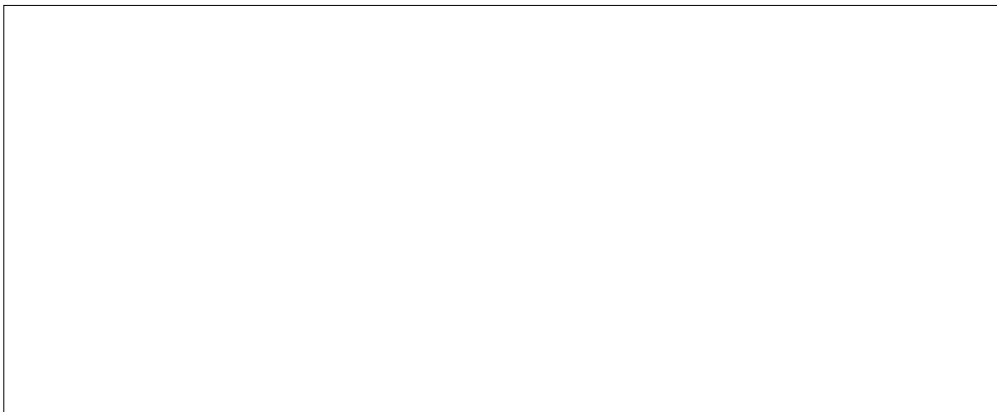
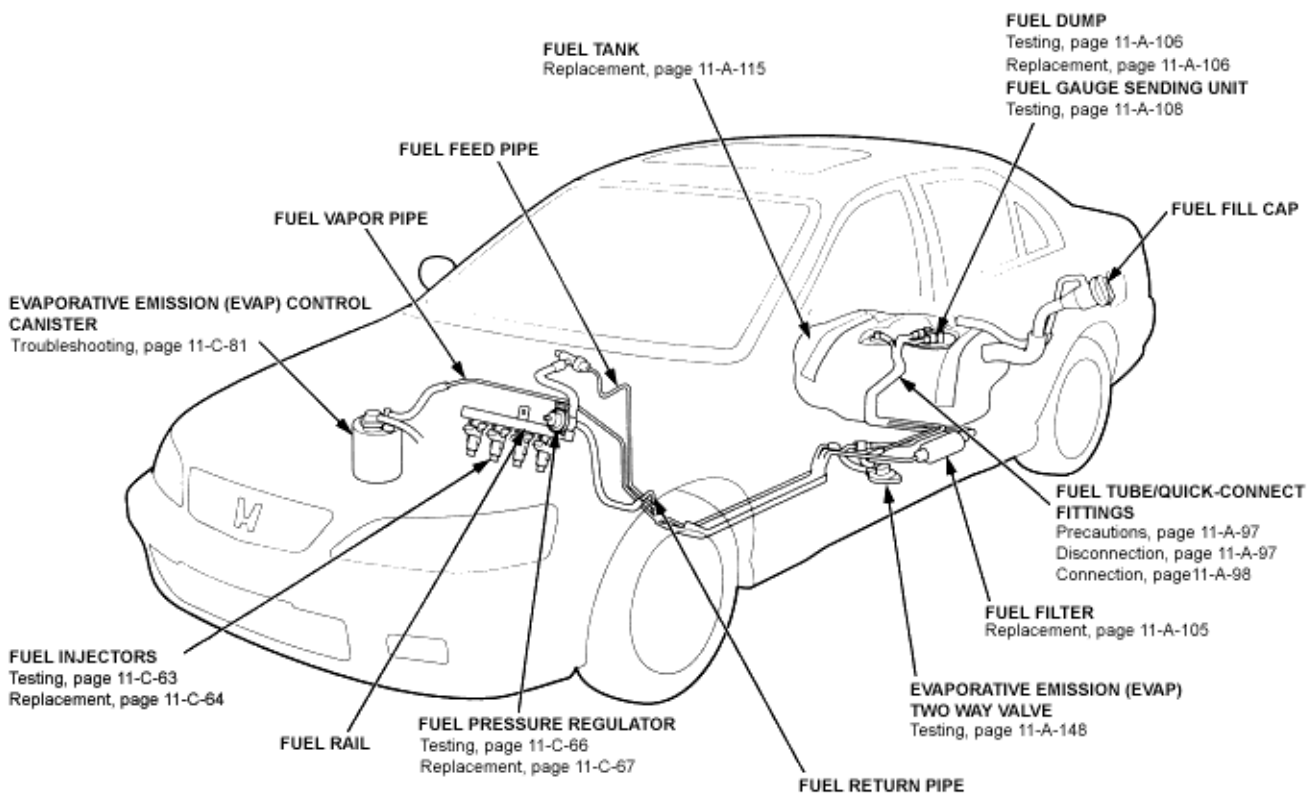
To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-C-13)
- (See Page 11-C-11)
- (See Page 11-C-21)
- (See Page 11-C-13)
- (See Page 11-C-68)
- (See Page 11-C-69)
- (See Page 11-C-67)

LHD:



RHD:



FUEL INJECTORS
Testing, page 11-C-63
Replacement, page 11-C-64

FUEL RAIL

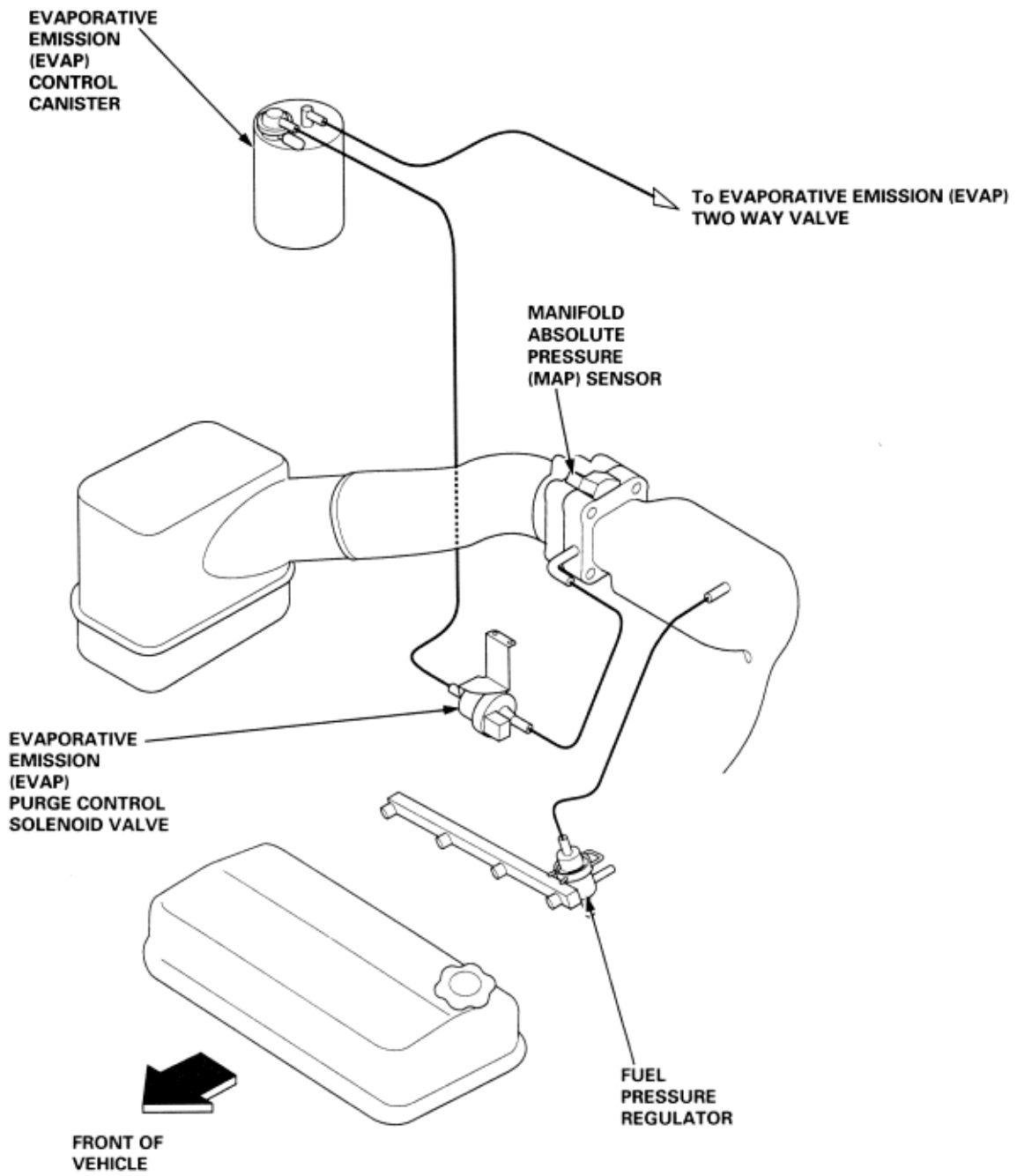
FUEL PRESSURE REGULATOR
Testing, page 11-C-66
Replacement, page 11-C-67

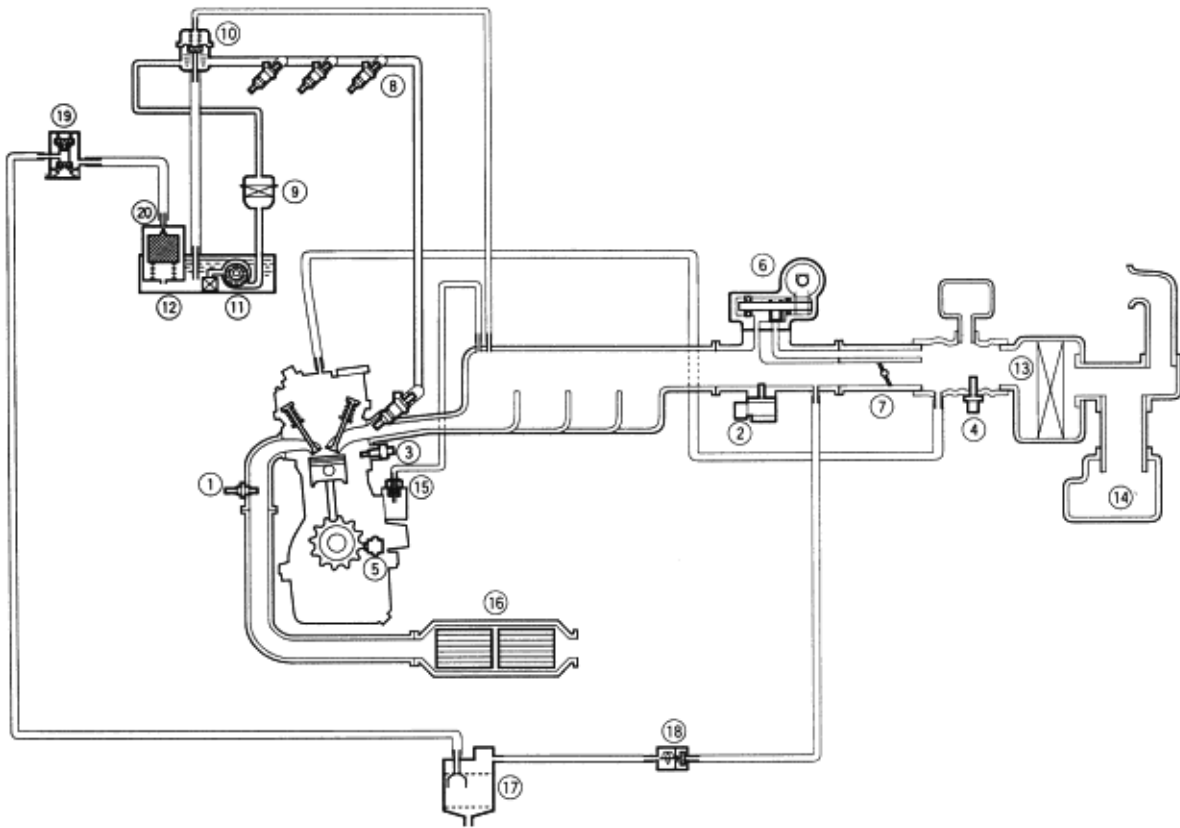
EVAPORATIVE EMISSION (EVAP)
TWO WAY VALVE
Testing, page 11-A-148

FUEL RETURN PIPE

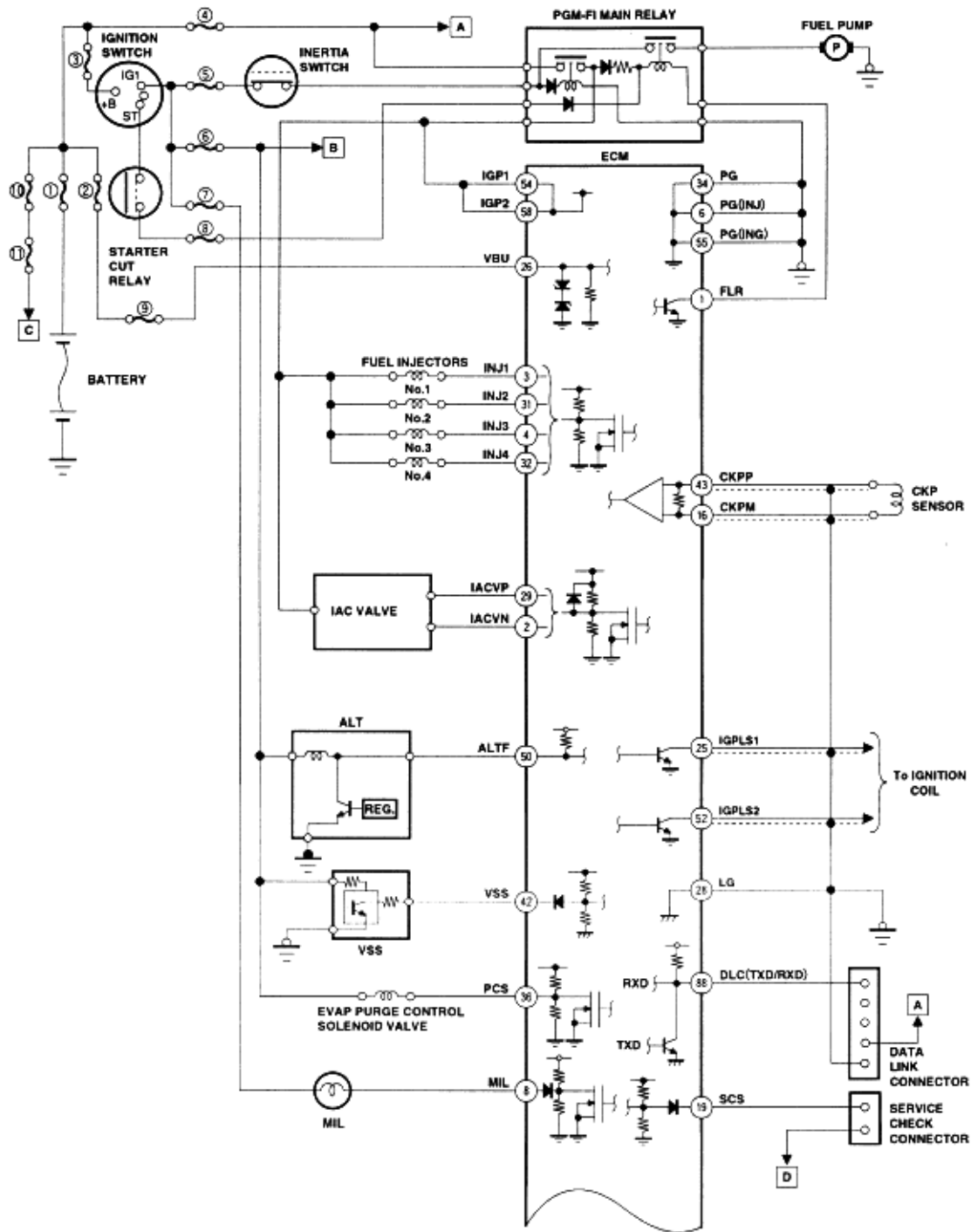
To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-A-106)
- (See Page 11-A-108)
- (See Page 11-A-115)
- (See Page 11-C-81)
- (See Page 11-C-63)
- (See Page 11-C-64)
- (See Page 11-C-66)
- (See Page 11-C-67)
- (See Page 11-A-97)
- (See Page 11-A-98)
- (See Page 11-A-105)
- (See Page 11-A-148)





- | | |
|---|---|
| 1 Heated oxygen sensor (HO2S) | 13 Air cleaner |
| 2 Manifold absolute pressure (MAP) sensor | 14 Resonator |
| 3 Engine coolant temperature (ECT) sensor | 15 Positive crankcase ventilation (PCV) valve |
| 4 Intake air temperature (IAT) sensor | 16 Three way catalytic converter |
| 5 Crankshaft position (CKP) sensor | 17 Evaporative emission (EVAP) control canister |
| 6 Idle air control (IAC) valve | 18 Evaporative emission (EVAP) purge control solenoid valve |
| 7 Throttle body (TB) | 19 Evaporative emission (EVAP) two way valve |
| 8 Fuel injector | 20 Fuel tank evaporative emission (EVAP) valve |
| 9 Fuel filter | |
| 10 Fuel pressure regulator | |
| 11 Fuel pump (FP) | |
| 12 Fuel tank | |



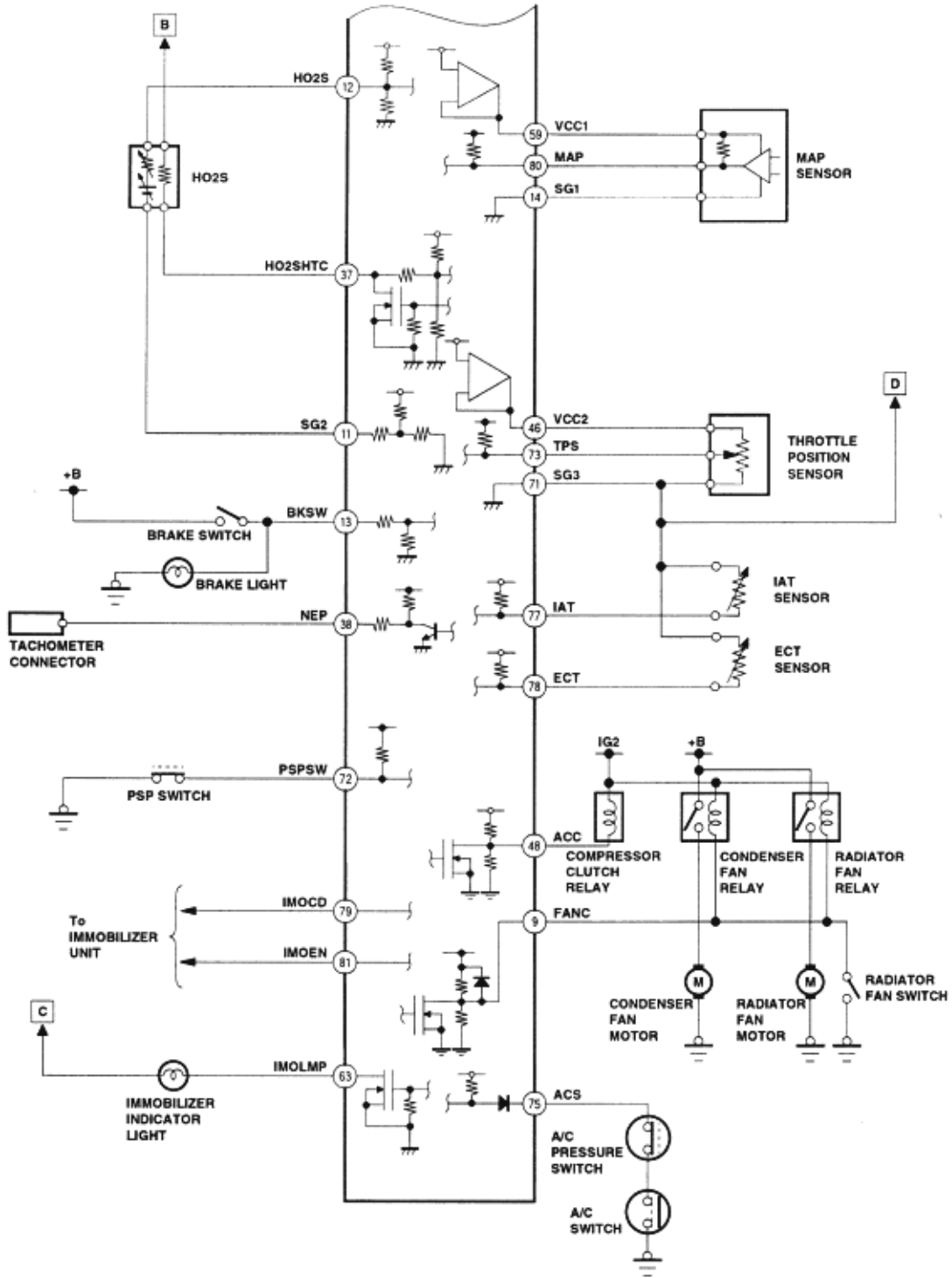
Fuses:

- 1 Battery (100) *A
- 2 Heated seat (30A) *A
- 3 IG main (50A) *A
- 4 AGCS (15A) *A
- 5 No 1 fuel pump (15A) *B
- 6 No 6 ECU (ECM/PCM) cruise control (15A) *B
- 7 No 9 Back-up light instrument light (7.5A) *B
- 8 No 13 Starter signal (7.5A) *B
- 9 No 6 H-ECU (ECM) VBU (7.5A) *C
- 10 Back up, ACC (40A) *A
- 11 No 13 Clock back up(7.5A) *C

*A: in the under-hood fuse/relay box

*B: in the driver's under-dash fuse/relay box

*C: in the passenger's under-dash fuse/relay box



ECM CONNECTOR TERMINAL LOCATIONS

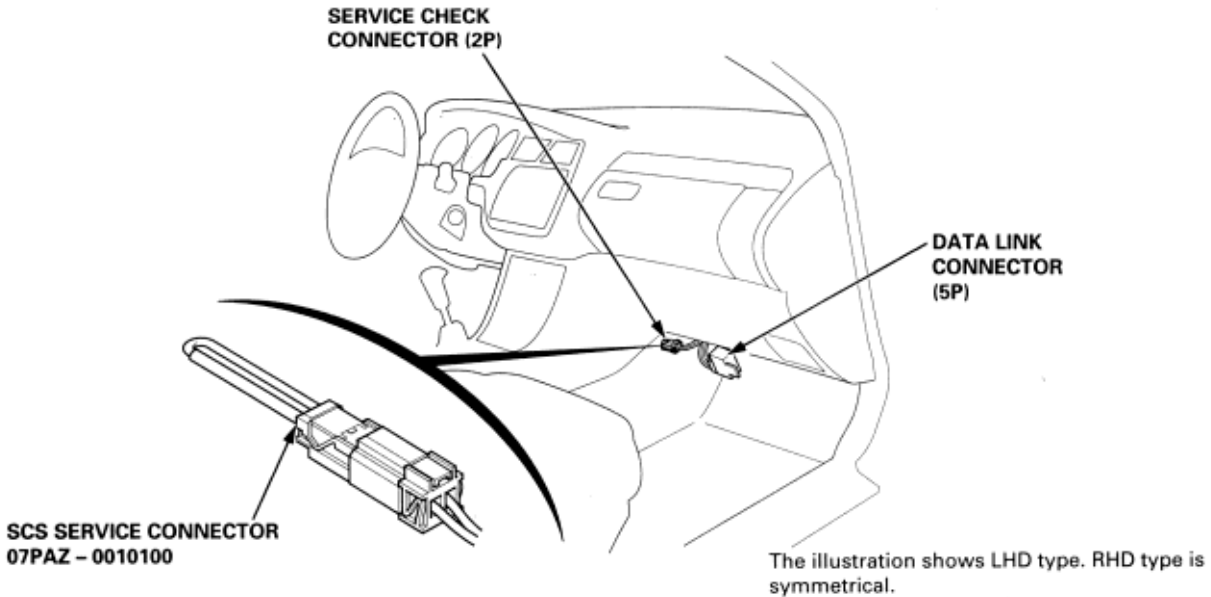
88	81 80 79 78 77	75 73 72 71	63 59 58
55 54	52 50 48 46	43 42 38 37 36	34 32 31 29
28	26 25 19	16 14 13 12 11	9 8 6 4 3 2 1

How to Begin Troubleshooting

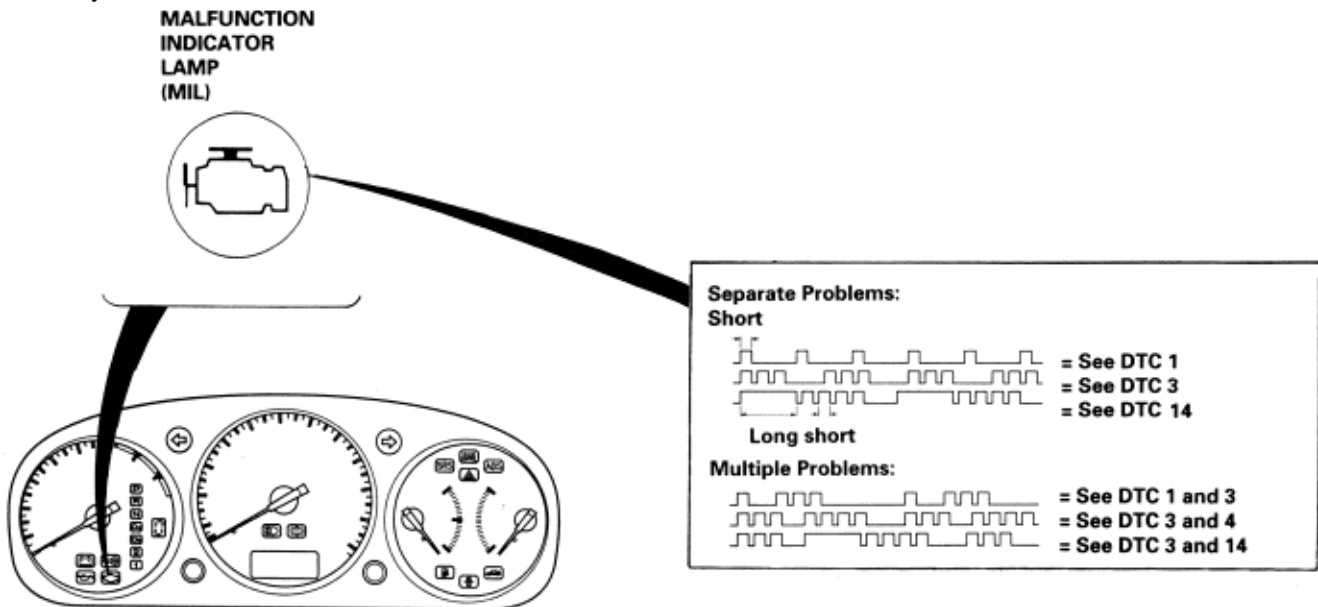
When the Malfunction Indicator Lamp (MIL) has been reported on, check the Diagnostic Trouble Code (DTC) as following:

NOTE: This operation can also be carried out with Honda PGM Tester connected to data link connector (5P).

1. Connect the SCS short connector to Service Check Connector as shown (The 2P Service Check Connector is located under the dash on the driver side of the car). Turn the ignition switch ON (II).



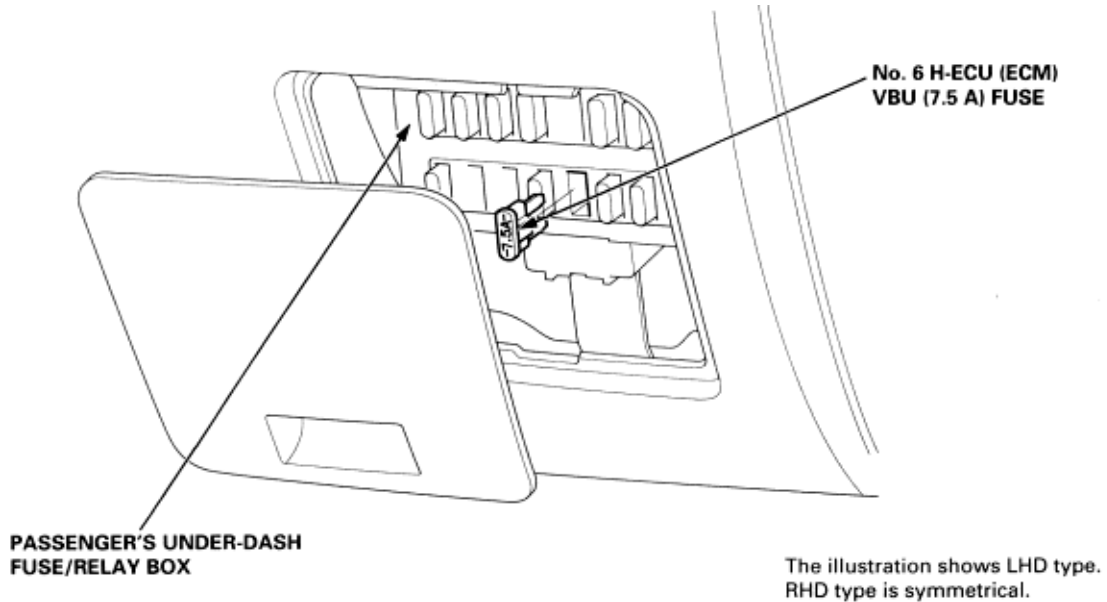
2. Note the Diagnostic Trouble Code (DTC): The MIL indicates a code by the length and number of blinks. The MIL can indicate multiple problems by blinking separate codes, one after another. Codes 1 through 9 are indicated by individual short blinks. Codes 10 through 41 are indicated by a series of long and short blinks. The number of long blinks equals the first digit, the number of short blinks equals the second digit. Sometimes the first blink is difficult to see; always count the blinks at least twice to verify the code.



Engine Control Module (ECM) Reset Procedure

NOTE: This operation can also be carried out with Honda PGM Tester.

1. Turn the ignition switch off.
2. Remove the No.6 H-ECU (ECM) VBU (7.5A) fuse from the passenger's under-dash fuse/relay box for 10 seconds to reset the ECM.

**Final Procedure (this procedure must be done after any troubleshooting)**

1. Remove the SCS Short Connector.
NOTE: If the SCS short connector is connected and there are no DTCs stored in the ECM the MIL will stay on when the ignition switch is turned ON (II)
2. Do the ECM Reset Procedure.

Known-Good ECM Substitute

The ECM is part of the immobilizer system. If you substitute a known-good ECM the ECM will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the Honda PGM Tester.

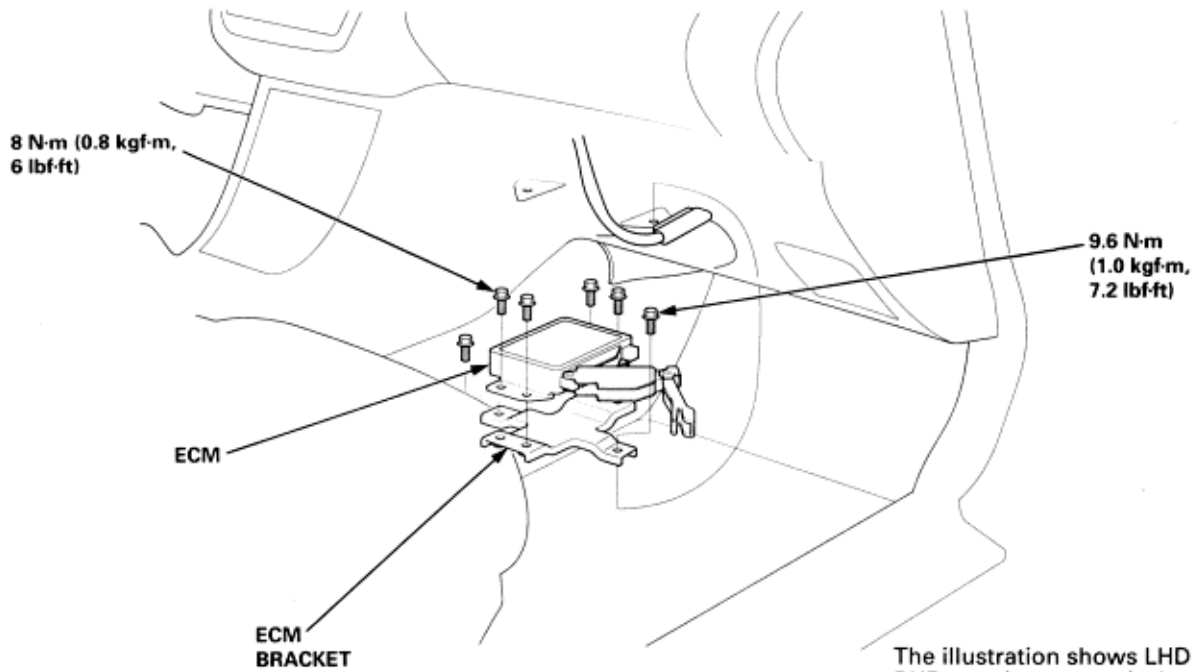
Troubleshooting

Troubleshooting Procedures (cont'd)

11-C-13

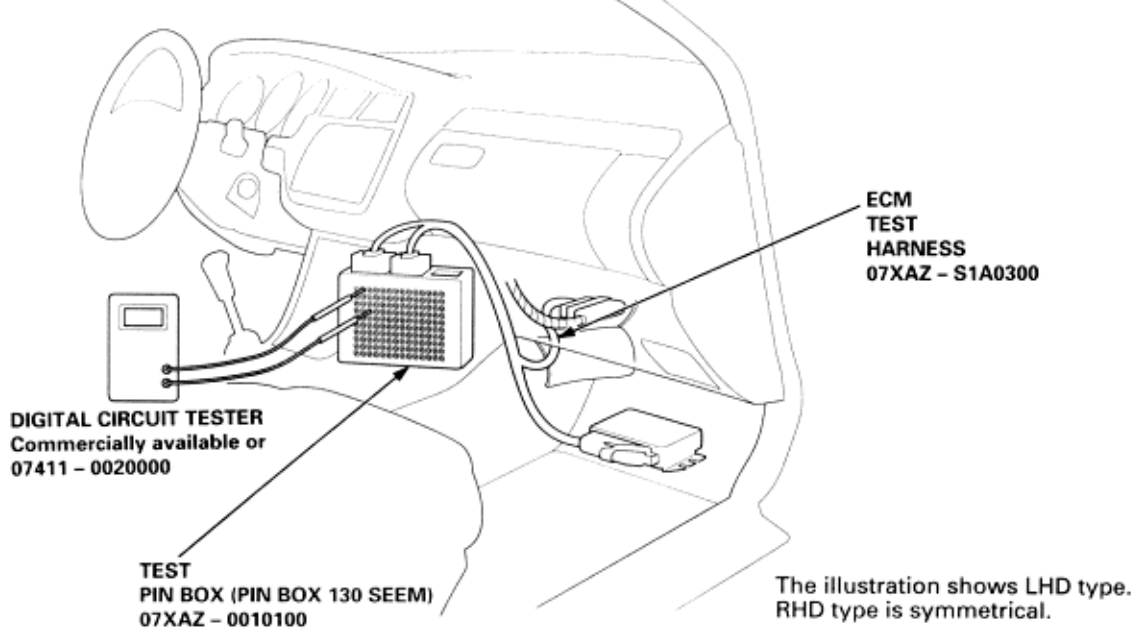
ECM Removal

Pull the carpet from the passenger's side of the center console to expose the ECM. Unbolt the ECM cover. Remove the four bolts from the ECM.



Checking the ECM Connector Terminals

When checking the ECM connector terminals, connect the ECM test harness and test pin box. Check the system according to the procedure described for the appropriate DTC listed on the following pages.





NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system (2) etc.

PAGE	SYSTEM	PGM-FI							
		ENGINE CONTROL MODULE	HEATED OXY-GEN SENSOR**	MANIFOLD ABSOLUTE PRESSURE SENSOR	CRANKSHAFT POSITION SENSOR	ENGINE COOLANT TEMPERATURE SENSOR	THROTTLE POSITION SENSOR	INTAKE AIR TEMPERATURE SENSOR	VEHICLE SPEED SENSOR
	SYMPTOM	11-C-21	11-C-26, 42	11-C-28	11-C-31	11-C-33	11-C-35	11-C-38	11-C-40
	MALFUNCTION INDICATOR LAMP (MIL) TURNS ON								
	MALFUNCTION INDICATOR LAMP (MIL) BLINKS								
	ENGINE WON'T START	①			③				
	DIFFICULT TO START ENGINE WHEN COLD			③	③	①			
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC					③			
	ROUGH IDLE			③					
	WHEN WARM ENGINE SPEED TOO HIGH					③			
	WHEN WARM ENGINE SPEED TOO LOW								
FREQUENT STALLING	WHILE WARMING UP					③			
	AFTER WARMING UP								
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING			②	③				
	FAILS EMISSION TEST		③	②					
	LOSS OF POWER			③			②		

* If codes other than those listed above are indicated, count the number of blinks again, If the MIL is in fact blinking these codes, replace the ECM.

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-21)
 (See Page 11-C-26)
 (See Page 11-C-42)
 (See Page 11-C-28)
 (See Page 11-C-31)
 (See Page 11-C-35)
 (See Page 11-C-38)
 (See Page 11-C-40)

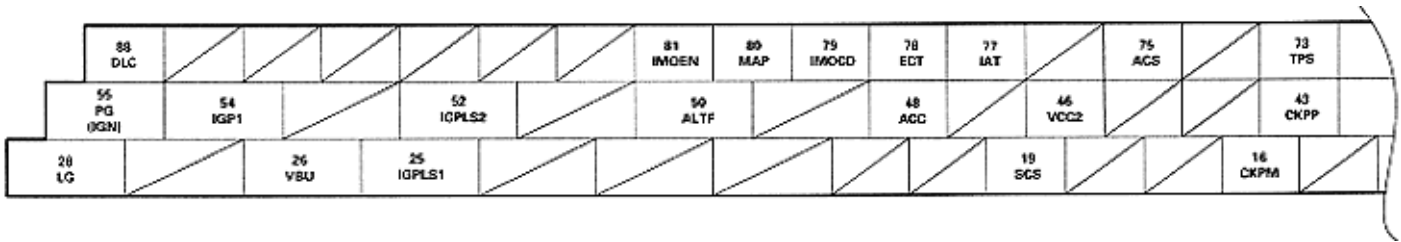
IDLE CONTROL		FUEL SUPPLY		INTAKE AIR	EMISSION CONTROL SYSTEM
IDLE AIR CONTROL VALVE	OTHER IDLE CONTROLS	FUEL INJECTOR	OTHER FUEL SUPPLY		
11-C-48	11-C-46	11-C-62	11-C-58	11-C-72	11-C-77
					
					
			②		
			②		
①	②				
①	②	②			
①	②				
①	②	②			
①	②		③		
②			①		
		①			
					①
		③	①	③	③

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-46)
(See Page 11-C-62)
(See Page 11-C-58)
(See Page 11-C-72)
(See Page 11-C-77)

Troubleshooting

Engine Control Module Terminal Arrangement

11-C-16



Wire side of female terminals

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	GRN/YEL	FLR (Fuel pump relay)	Drives fuel pump relay	0V for two seconds after turning ignition switch ON (II), then battery voltage
2	ORN	IACV N (Idle air control valve N side)	Drives IAC valve N side coil	With engine running: Pulses
3	BRN	INJ1 (No. 1 fuel injection)	Drives No. 1 fuel injector	With engine running: Pulses
4	BLU	INJ3 (No. 3 fuel injection)	Drives No. 3 fuel injector	With engine running: Pulses
6	BLK	PG ((INJ) (Power ground))	Ground for the injector circuit	Less than 1.0V at all times
8	GRN/ORN	MIL (Malfunction indicator light)	Drives MIL	With MIL turned ON: 0V With MIL turned OFF: Battery voltage
9	GRN	FANC (Radiator fan control)	Drives radiator fan relay	With radiator fan running: 0V With radiator fan stopped: Battery voltage
11	GRN/BLK	SG2 (Sensor ground)	Ground for HO2S	Less than 1.0V at all times
12	WHT	HO2S (Heated oxygen sensor)	Detects heated oxygen sensor signal	With throttle fully opened from idle with fully, warmed up engine: Above 0.6V With throttle quickly closed: Below 0.4V
13	GRN/WHT	BKSW (Brake switch)	Detects brake switch signal	With brake pedal released: 0V With brake pedal depressed: Battery voltage
14	GRN/WHT	SG1 (Sensor ground)	Ground for MAP sensor	Less than 1.0V at all times
16	WHT	CKPM (CKP Sensor M side)	Ground for CKP sensor	
19	BRN	SCS (Service check signal)	Detects service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0V With the terminal disconnected: Battery voltage
25	WHT	IGPLS1 (Ignition pulse)	Sends ignition pulse to ignition coil No. 1 and No. 4	With engine running: Pulses
26	WHT/BLU	VBU (Voltage back-up)	Power source for the ECM control circuit Power source for the DTC memory	Battery voltage at all times
28	BRN/BLK	LG (Logic ground)	Ground for the ECM control circuit	Less than 1.0V at all times
29	BLK/BLU	IACV P (Idle air control valve P side)	Drives IAC valve P side coil	With engine running: Pulses
31	RED	INJ2 (No. 2 fuel injector)	Drives No. 2 fuel injector	With engine running: Pulses
32	YEL	INJ4 (No. 4 fuel injector)	Drives No. 4 fuel injector	With ignition switch ON (II): Battery voltage
34	BLK	PG (Power ground)	Ground for the ECM control circuit	Less than 1.0V at all times
36	RED/YEL	PCS (EVAP purge control solenoid valve)	Drives EVAP purge control solenoid valve	With engine running, engine coolant, below 39°C (102°F): Battery voltage With engine running, engine coolant above duty controlled
37	BLK/WHT	HO2SHTC (Heated oxygen sensor heater)	Drives heated oxygen sensor heater	With ignition switch ON (II): Battery voltage

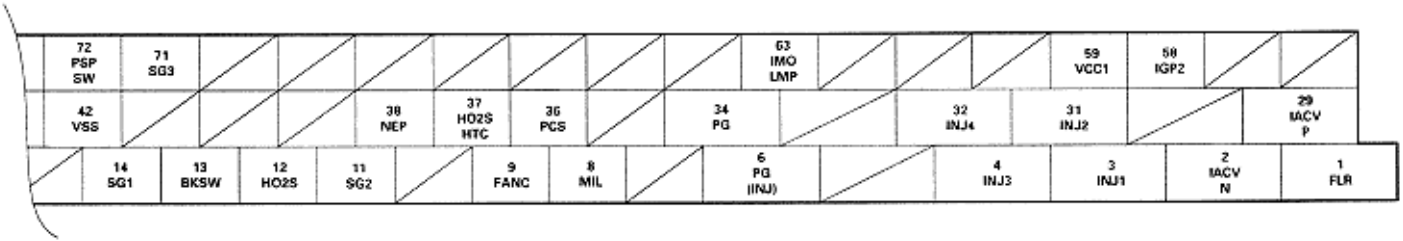
control)

With fully warmed up engine
running: 0V

Troubleshooting

Engine Control Module Terminal Arrangement (cont'd)

11-C-17



Wire side of female terminals

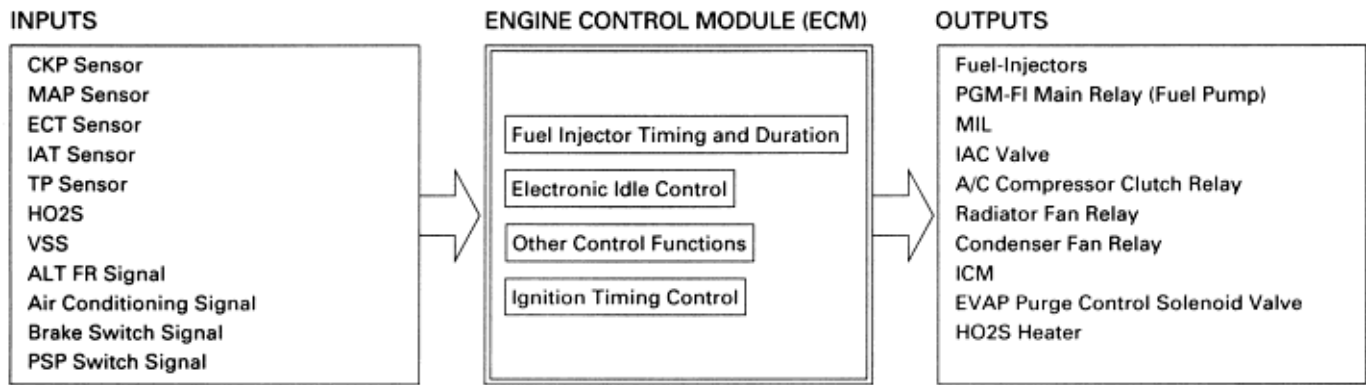
NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
38	BLU	NEP (Engine speed pulse)	Outputs engine speed pulse	With engine running: Pulses
42	BLU/WHT	VSS (Vehicle speed sensor)	Detects VSS signal	With ignition switch ON (II) and front wheel rotating: Cycles 0V – 5V
43	BLU	CKPP (CKP sensor P side)	Detects CKP sensor	With engine running: Pulses
46	YEL/BLU	VCC2 (Sensor voltage)	Provides sensor voltage	With ignition switch ON (II): About 5V With ignition switch OFF: Battery voltage
48	RED	ACC (A/C clutch relay)	Drives A/C clutch relay	With compressor ON: 0V With compressor OFF: Battery voltage
50	WHT/RED	ALTF (Alternator FR signal)	Detects alternator FR signal	With fully warmed up engine running: 0V – battery voltage (depending on electrical load)
52	WHT/GRN	IGPLS2 (Ignition pulse)	Sends ignition pulse to ignition coil No. 2 and No. 3	With engine running: Pulses
54	YEL/BLK	IGP1 (Power source)	Power source for the ECM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
55	BLK	PG (IGN) (Power ground)	Ground for the ignition system	Less than 1.0V at all times
58	YEL/BLK	IGP2 (Power source)	Power source for the ECM control circuit	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
59	YEL/RED	VCC11 (Sensor voltage)	Power source to MAP sensor	With ignition switch ON (II): About 5V With ignition switch OFF: 0V
63	PNK	IMOLMP (Immobilizer indicator light)	Drives immobilizer indicator light	With immobilizer indicator light turned ON (II): 0V With immobilizer indicator light turned OFF: Battery voltage
71	GRN/BLK	SG3 (Sensor ground)	Sensor ground	Less than 1.0V at all times
72	GRN	PSPSW (P/S pressure switch signal)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: 0V At idle with steering wheel at full lock: Battery voltage
73	RED/BLK	TPS (Throttle position sensor)	Detects TP sensor signal	With throttle fully open: About 4.8V With throttle fully closed: About 0.5V
75	BLU/RED	ACS (A/C switch signal)	Detects A/C switch signal)	With A/C switch ON: 0V With A/C switch OFF: About 5V
77	RED/YEL	IAT (Intake air temperature sensor)	Detects IAT sensor signal	With ignition switch ON (II): About 0.1-4.8V (depending on air intake temperature)
78	RED/WHT	ECT (Engine coolant temperature sensor)	Detects ECT sensor signal	With ignition switch ON (II): About 0.1-4.8V (depending on air intake temperature)
79	BLU/GRN	IMOCD (Immobilizer code)	Detects immobilizer signal	
80	RED/GRN	MAP (Manifold absolute pressure sensor)	Detects MAP sensor signal	With ignition switch ON (II): About 3V At idle: About 1.0V (depending on engine speed)
81	ORN/BLU	IMOEN (Immobilizer enable signal)	Sends immobilizer enable signal	

88	LT BLU	DLC (TxD/RxD)	Sends and receives scan tool signal	With ignition switch ON (II): Pulses
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Diagnostic Trouble Code (DTC)	System Indicated	Page
0	Engine control module (ECM)	(See Page 11-C-21)
1	Heated oxygen sensor (HO2S)	(See Page 11-C-26)
3	Manifold absolute pressure (MAP) sensor	(See Page 11-C-28)
4	Crankshaft position (CKP) sensor	(See Page 11-C-31)
6	Engine coolant temperature (ECT) sensor	(See Page 11-C-33)
7	Throttle position (TP) sensor	(See Page 11-C-35)
10	Intake air temperature (IAT) sensor	(See Page 11-C-38)
14	Idle air control (IAC) valve	(See Page 11-C-48)
17	Vehicle speed sensor (VSS) *3	(See Page 11-C-40)
41	Heated oxygen sensor (HO2S)	(See Page 11-C-42)

- If codes other than those listed above are indicated, verify the code. If the code indicated is not listed above, replace the ECM (See Page 11-C-12) for immobilizer information.
- The MIL may come on, indicating a system problem when, in fact, there is a poor or intermittent electrical connection. First check the electrical connections, clean or repair connections if necessary.



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM/PCM contains memories for the basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

Idle Air Control Valve (IAC Valve)

When the engine is cold, the A/C compressor is on, the brake pedal is depressed, the P/S load is high, or the alternator is charging, the ECM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- ♦ The ECM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.

Other Control Functions

1. Starting control

When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.

2. Fuel Pump Control

- ♦ When the engine is running, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
- ♦ When the engine is not running and the ignition is ON (II), the ECM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

3. Fuel Cut-off Control
 - ♦ During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,160 rpm (min⁻¹).
 - ♦ Fuel cut-off action also takes place when engine speed exceeds 6,780 rpm (min⁻¹), regardless of the position of the throttle valve to protect the engine from over-revving.
4. A/C Compressor Clutch Relay

When the ECM receives a demand for cooling from the air conditioning system, it delays the compressor from being energised, and enriches the mixture to assure smooth transition to the A/C mode.
5. Evaporation Emission (EVAP) Purge Control Solenoid Valve

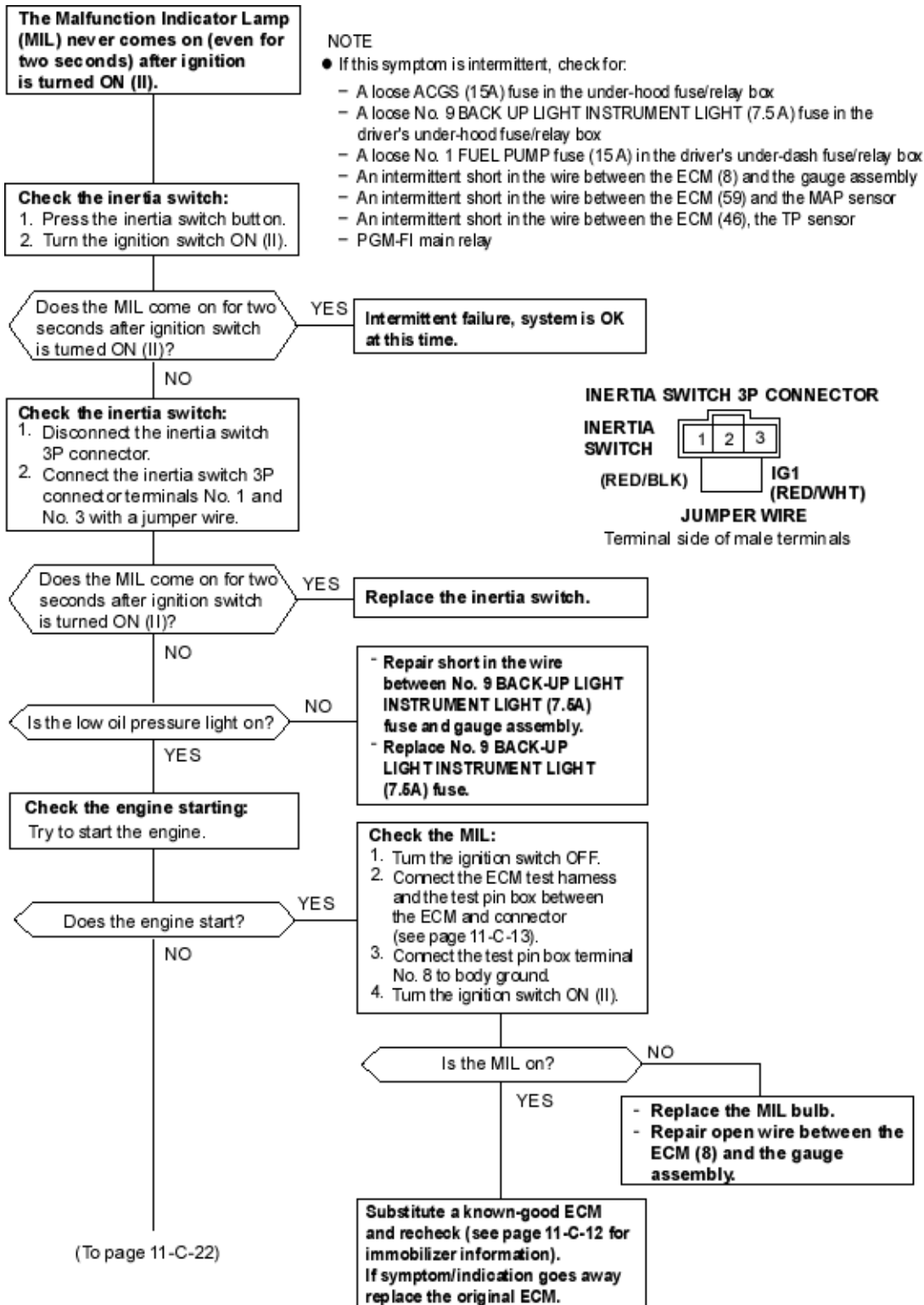
When the engine coolant temperature is below 38°C (102°F), the ECM supplies a ground to the EVAP purge control solenoid valve which cuts vacuum to the EVAP purge control canister.

ECM/PCM Fail-safe/Self-diagnosis Functions

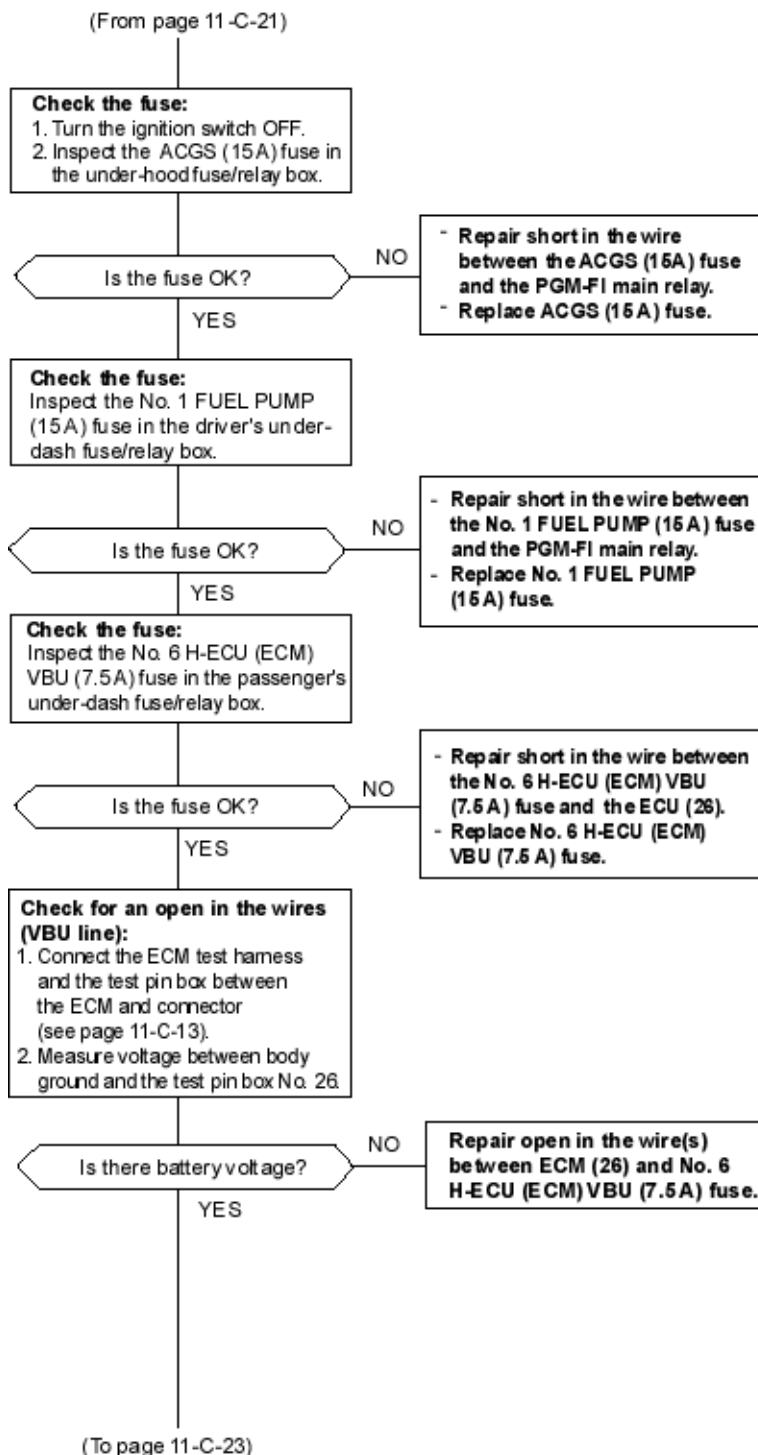
1. Fail safe Function

When an abnormality occurs in a signal from a sensor, the ECM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. Self-diagnosis Function (Malfunction Indicator Lamp (MIL))

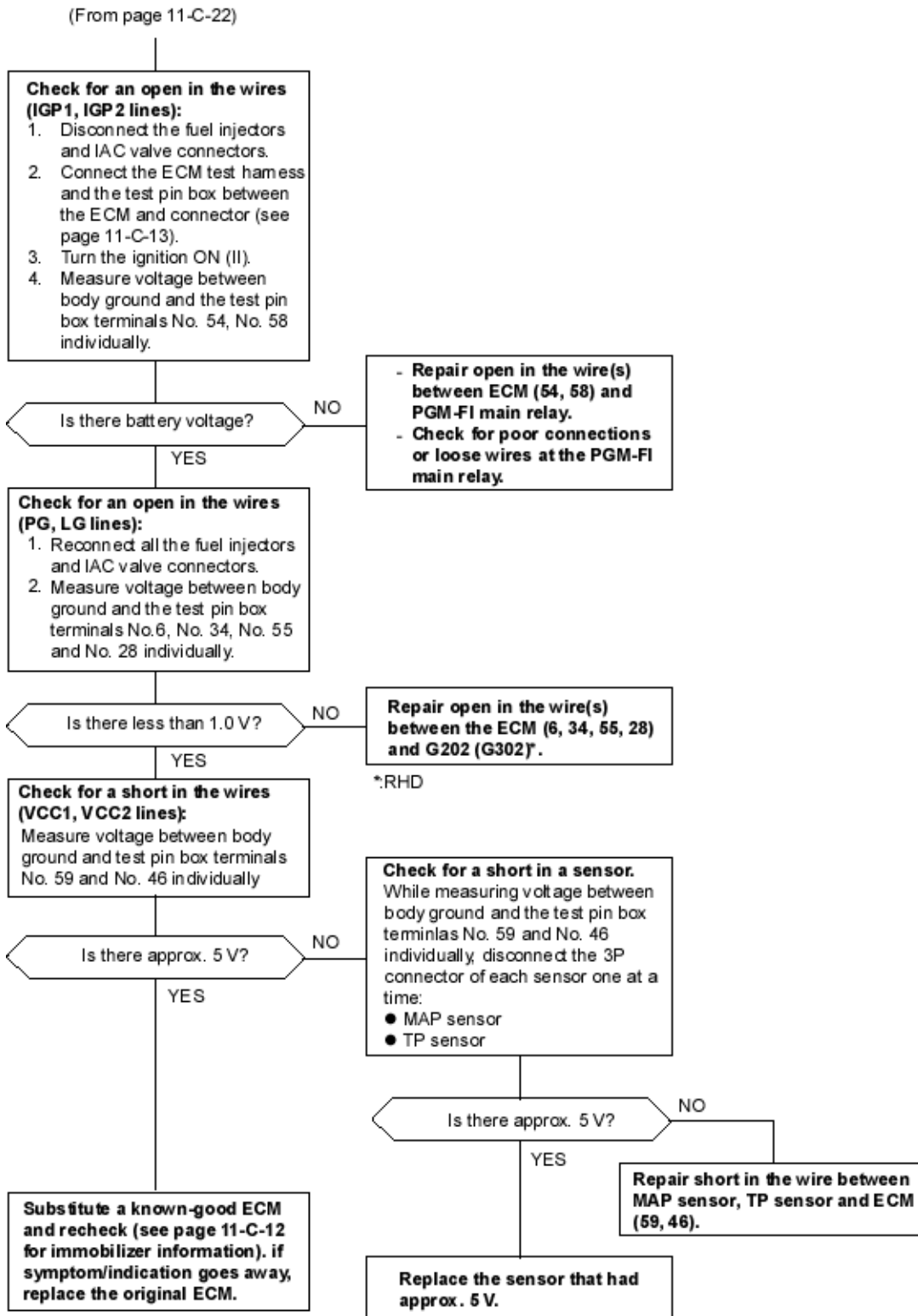
When an abnormality occurs in a signal from a sensor, the ECM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned on, the ECM supplies ground for the MIL for two seconds to check the MIL bulb condition.



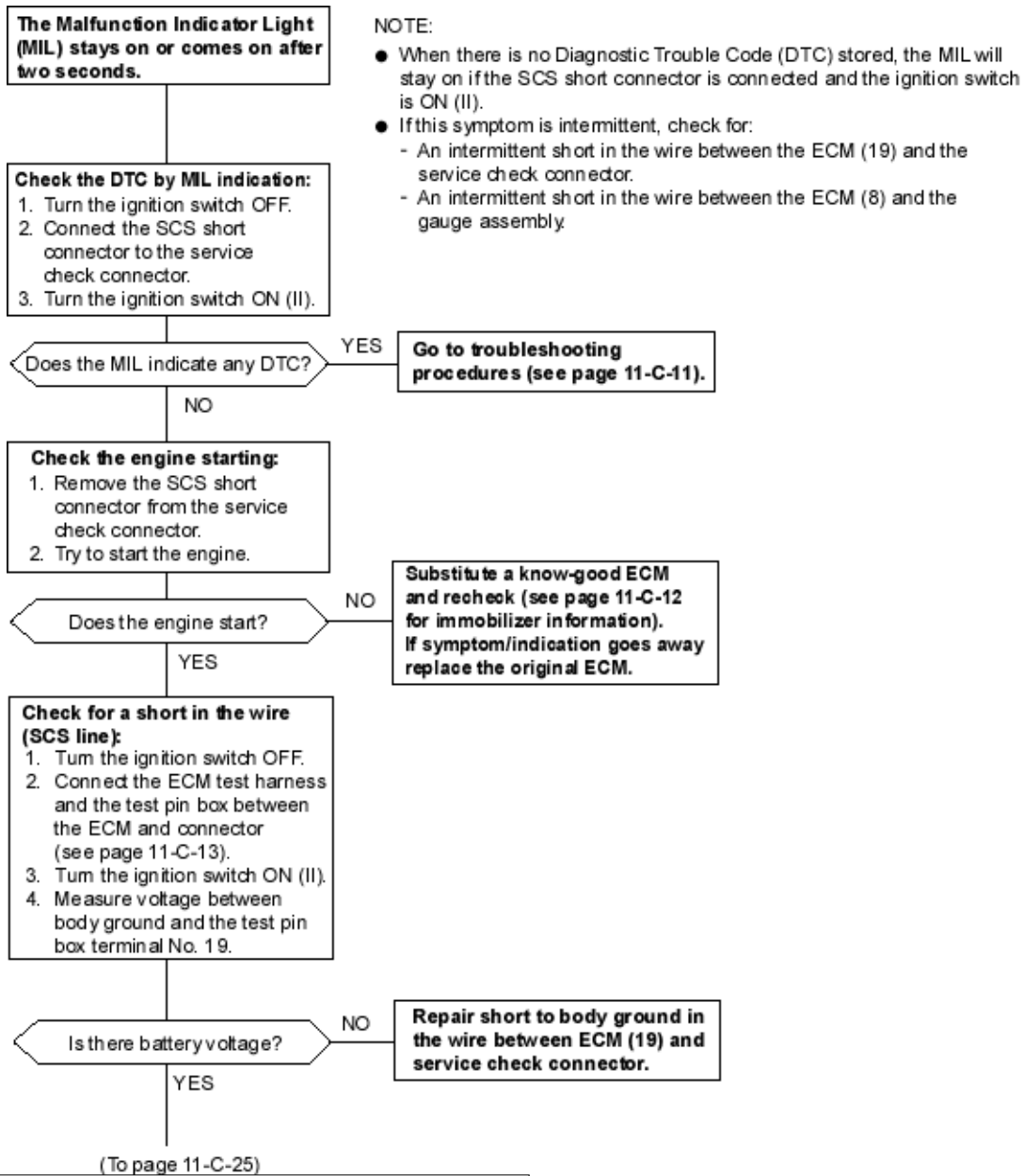
To go to the pages referenced on the diagram above,
 click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-13)

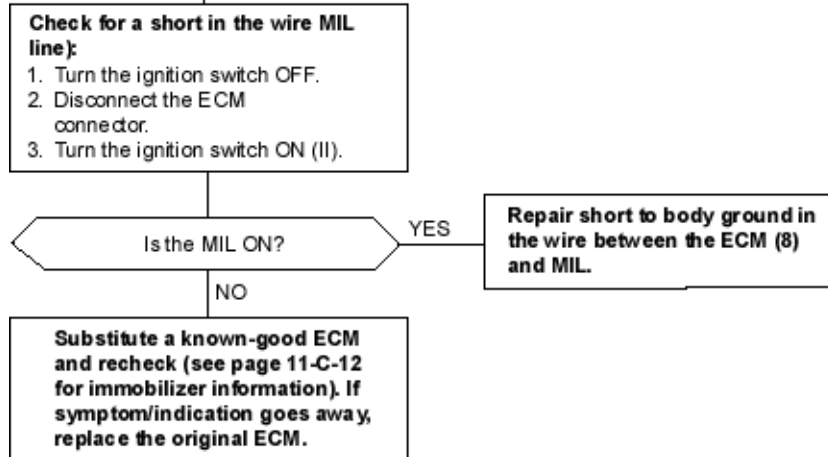


To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-13)
(See Page 11-C-12)

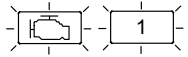


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-11\)](#)

(From page 11-C-24)

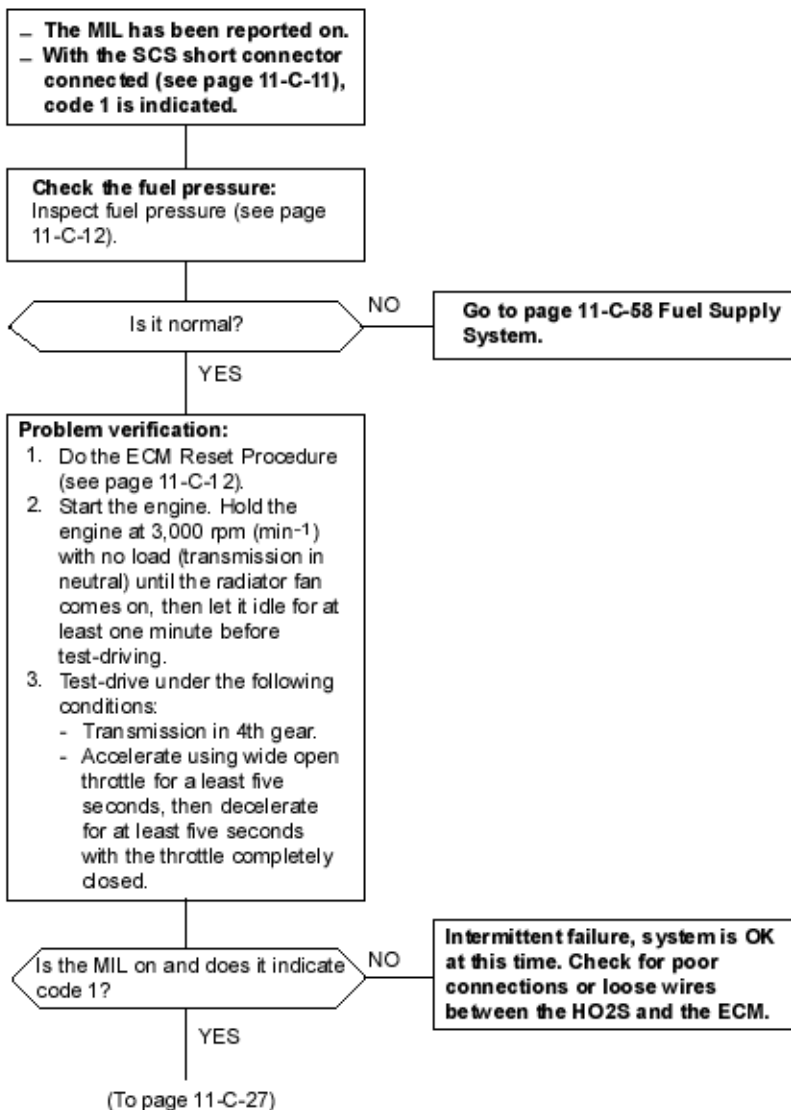
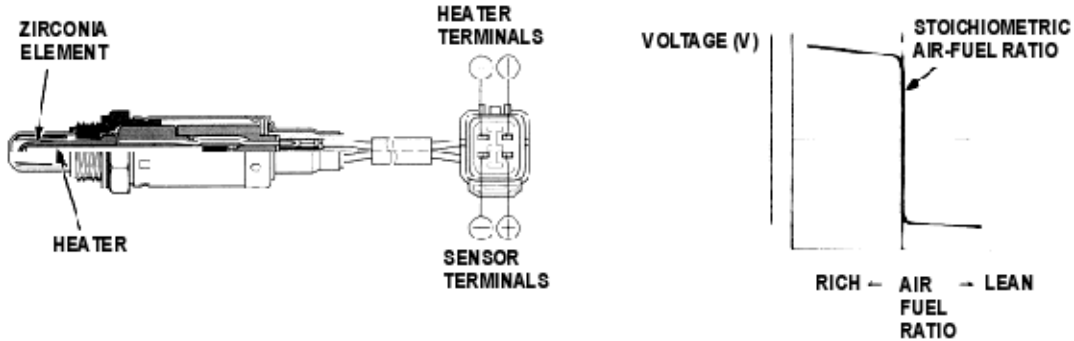


To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 1: A problem in the Heated Oxygen Sensor (HO2S) circuit.

The Heated Oxygen Sensor (HO2S) detects the oxygen content in the exhaust gas and signals the ECM operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilize the sensor's output, the sensor has an internal heater. The HO2S is installed in the exhaust manifold.



To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-13)
 (See Page 11-C-12)
 (See Page 11-C-11)

(From page 11-C-26)

Check the ECM input voltage:

1. Turn the ignition switch OFF.
2. Connect the ECM test harness and the test pin box between the ECM and connector (see page 11-C-13).
3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (transmission in neutral) until the radiator fan comes on, then let it idle for at least one minute before test-driving.
4. Measure voltage between ECM connector terminals No. 11 and No. 12.
5. Open the throttle wide open, then quickly release it.

Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

YES

Substitute a known-good ECM and recheck (see page 11-C-12 for immobilizer information). If symptom/indication goes away, replace the original ECM.

NO

Check the HO2S:

1. Turn the ignition switch OFF.
2. Disconnect the 4P connector from the HO2S.
3. At the HO2S sensor side, connect the battery positive terminal to terminal No. 2 and battery negative terminal to terminal No. 1.
4. Start the engine.
5. After two minutes, measure voltage between HO2S 4P connector terminals No. 3 and No. 4.

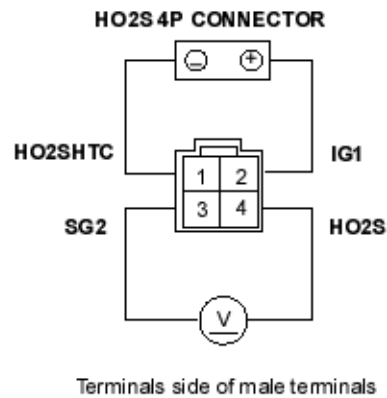
Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

NO

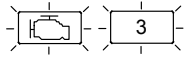
Replace the HO2S (see page 11-C-45).

YES

Repair open or short in the wire ECM (12) and the HO2S.

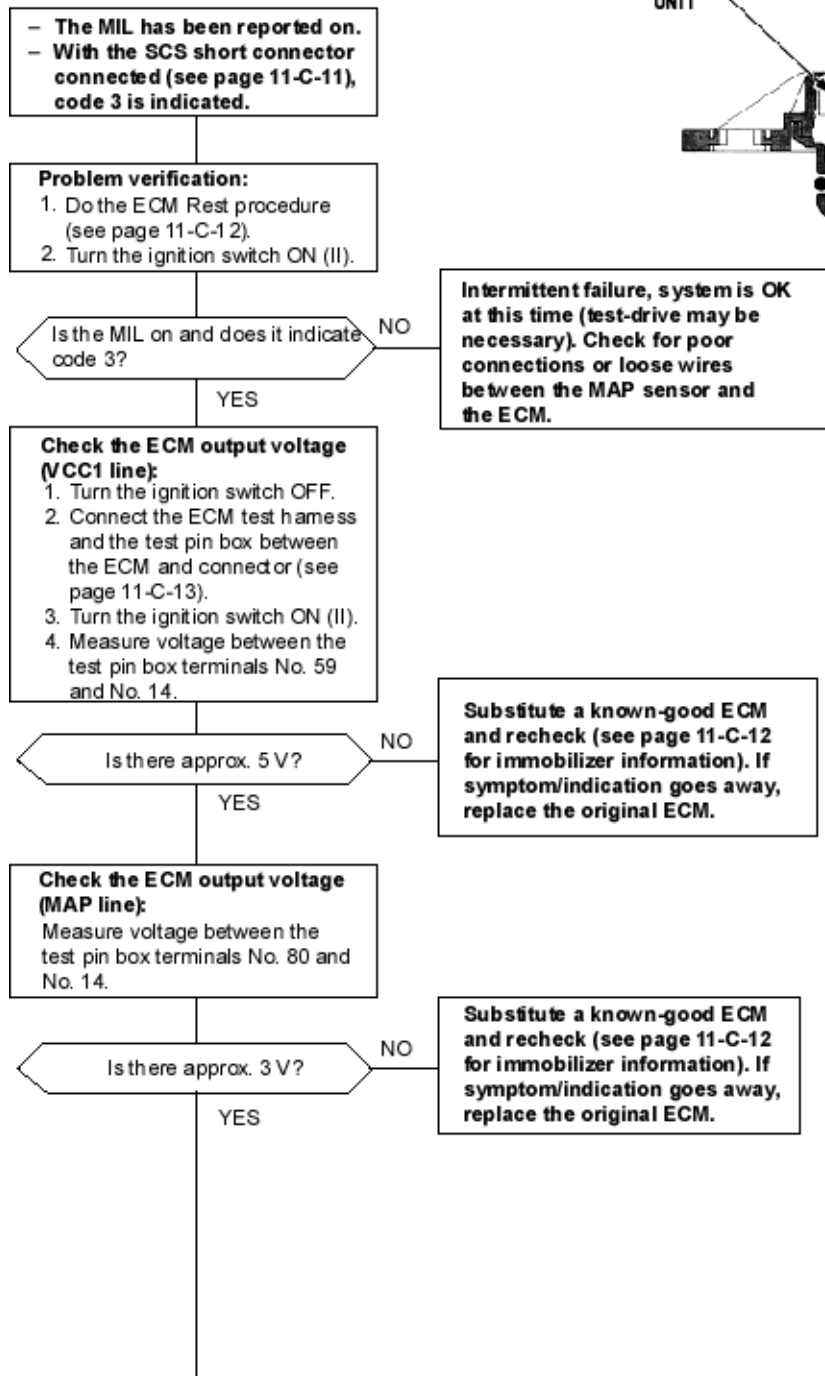
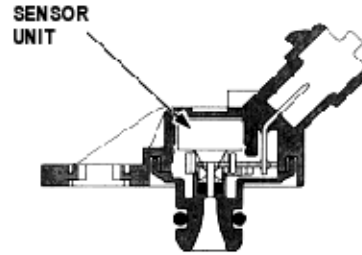


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-45\)](#)



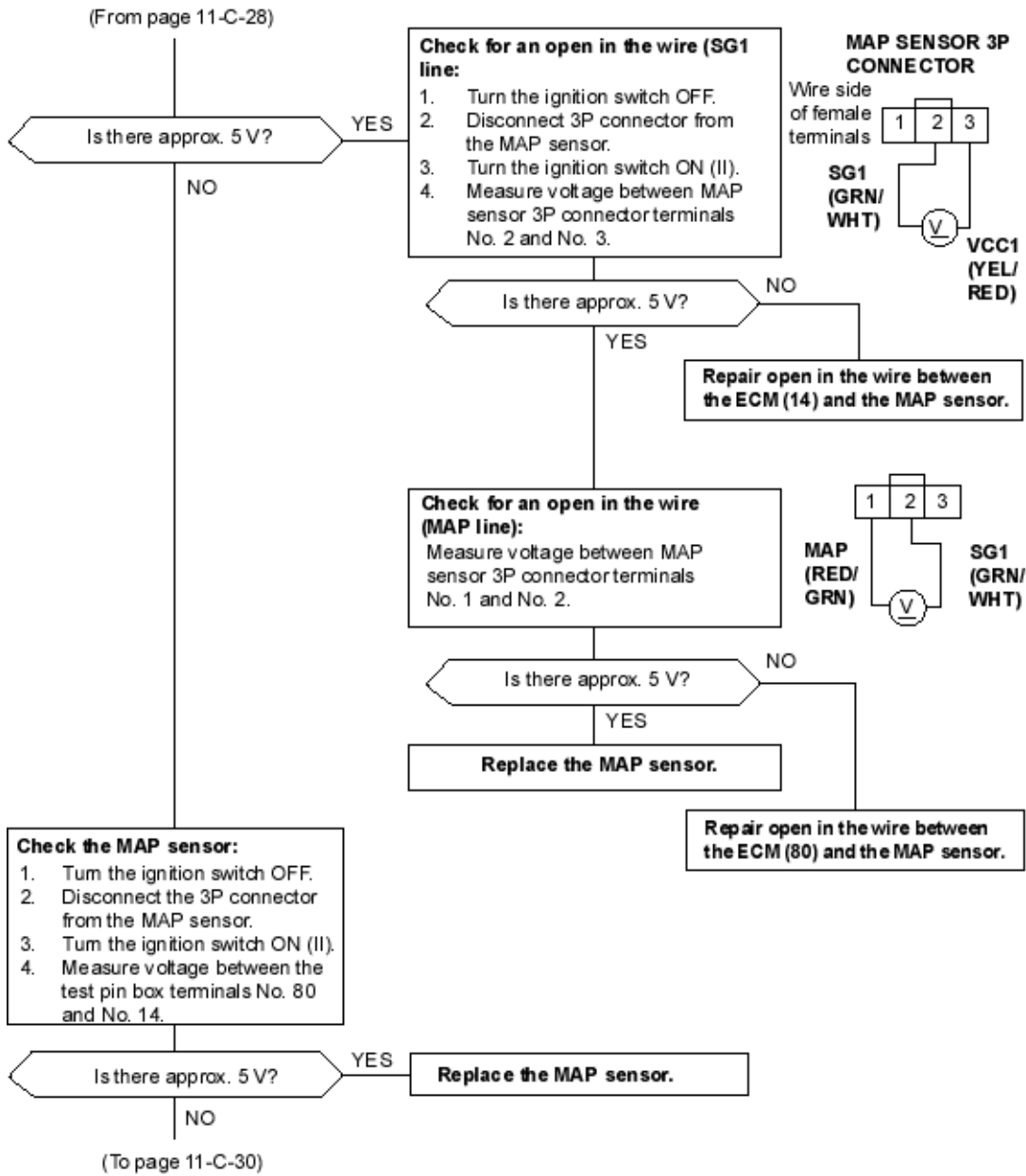
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 3: An electrical problem in the Manifold Absolute Pressure (MAP) Sensor circuit.

The MAP sensor converts manifold absolute pressure into electrical signals and inputs the ECM.

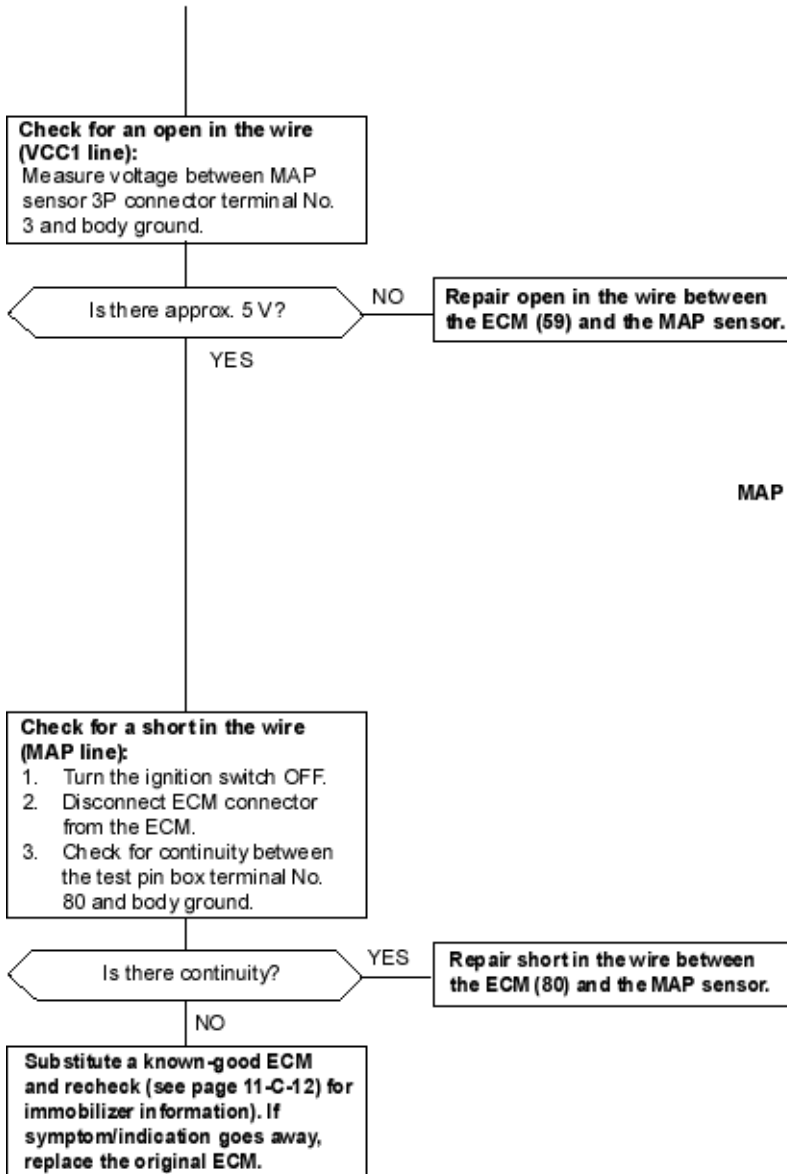


(To page 11-C-29)

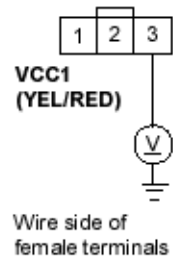
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-11\)](#)



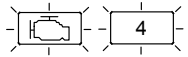
(From page 11-C-29)



MAP SENSOR 3P CONNECTOR

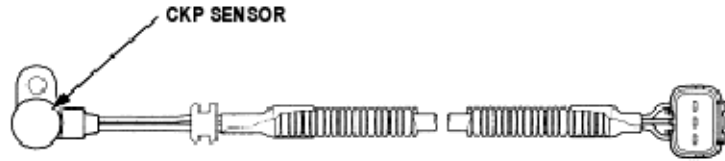


To go to the page referenced on the diagram above, click on the following:
(See Page 11-C-12)



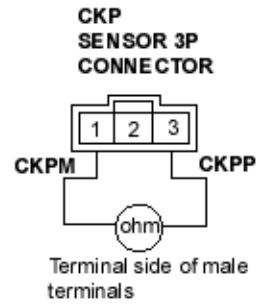
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 4: A problem in the Crankshaft Position (CKP) Sensor circuit.

The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed.



- The MIL has been reported on.
 - With the SCS short connector connected (see page 11-C-11), code 4 is indicated.

Problem verification:
 1. Do the ECM Reset Procedure (see page 11-C-12).
 2. Try to start the engine.



Is the MIL on and does it indicate code 4?
 YES
 NO: Intermittent failure, system is OK at this time (test-drive may be necessary). Check for poor connections or loose wires between the CKP sensor and the ECM.

Check the sensor resistance:
 1. Turn the ignition switch OFF.
 2. Disconnect the CKP sensor 3P connector.
 3. Measure resistance between the CKP sensor 3P connector terminals No. 1 and No. 3.

Is there 1,850 - 2,450 ohm?
 YES
 NO: Replace the CKP sensor.

(To page 11-C-32)

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-11)
 (See Page 11-C-12)

(From page 11-C-31)

Check the sensor for a short:
Check for continuity between body ground and the CKP sensor 3P terminals No. 1 and No.3 individually.

Is there continuity? YES → **Replace the CKP sensor.**

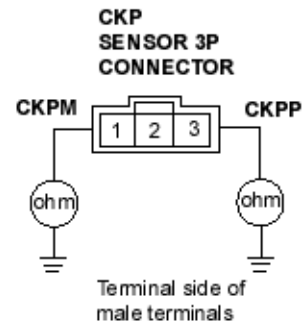
NO
Check for an open in the wire (CKP line):
1. Reconnect the 3P connector.
2. Connect the ECM test harness and the test pin box to the wire harness only, not to the ECM (see page 11-C-13).
3. Measure resistance between ECM connector terminals No. 1 and No. 3.

Is there 1,850 - 2,450 ohm? NO → **Repair open or short in the wire between ECM (43, 16) and CKP sensor.**

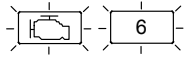
YES
Check for a short in the wire (CKP line):
Check for continuity between body ground and the test pin box terminal No. 43.

Is there continuity? YES → **Repair short to body ground in the wire between ECM (43) and CKP sensor.**

NO
Substitute a known-good ECM and recheck (see page 11-C-12 for immobilizer information). If symptom/indication goes away, replace the original ECM.

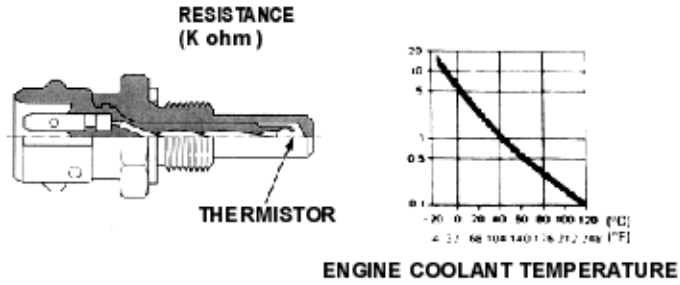


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 6: A problem in the Engine Coolant Temperature (ECT) Sensor circuit.

The ECT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.



— The MIL has been reported on.
 — With the SCS short connector connected (see page 11-C-11), code 6 indicated.

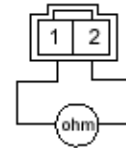
Problem verification:
 1. Do the ECM Reset Procedure (see page 11-C-12).
 2. Turn the ignition switch ON (II).

Is the MIL on and does it indicate code 6?

NO
 Intermittent failure, system is OK at this time (test-drive may be necessary). Check for poor connections or loose wires between the ECT sensor and the ECM.

YES
Check the sensor resistance:
 1. Start the engine. Hold the engine at 3,000 rpm (min⁻¹) with no load (transmission in neutral) until the radiator fan comes on, then let it idle.
 2. Turn the ignition switch OFF.
 3. Disconnect the 2P connector from the ECT sensor.
 4. Measure resistance between the 2 terminals on the ECT sensor.

ECT SENSOR 2P CONNECTOR



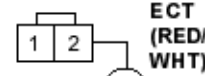
Terminal side of male terminals

Is there 200 - 400 ohm?

NO
 Replace the ECT sensor.

YES
Check the ECM output voltage (ECT line):
 1. Turn the ignition switch ON (II).
 2. At the engine harness side, measure voltage between the ECT sensor 2P connector terminal No.2 and body ground.

ECT SENSOR 2P CONNECTOR



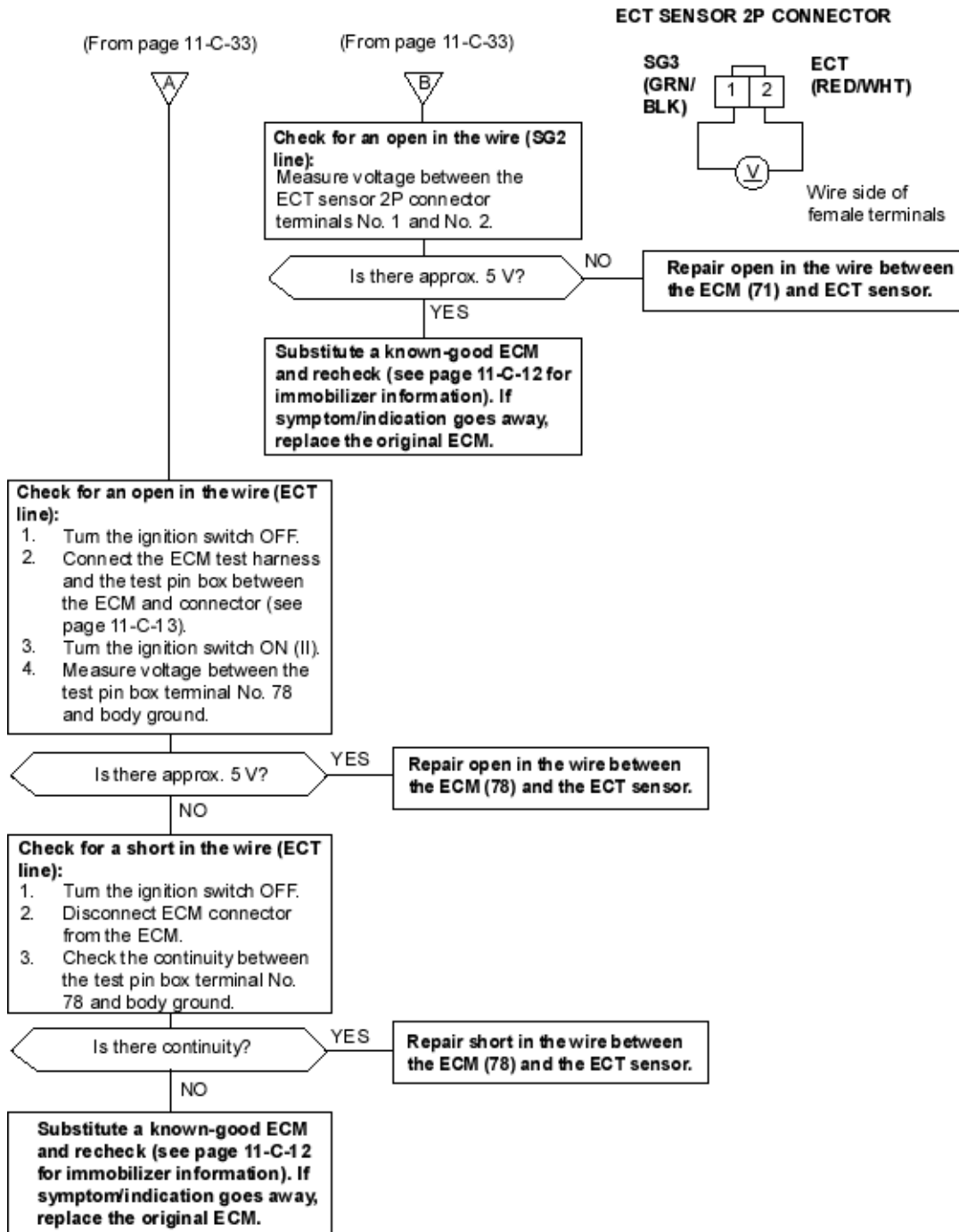
Wire side of female terminals

Is there approx. 5 V?

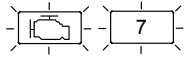
YES
 (To page 11-C-34)

NO
 (To page 11-C-34)

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-12)
 (See Page 11-C-11)

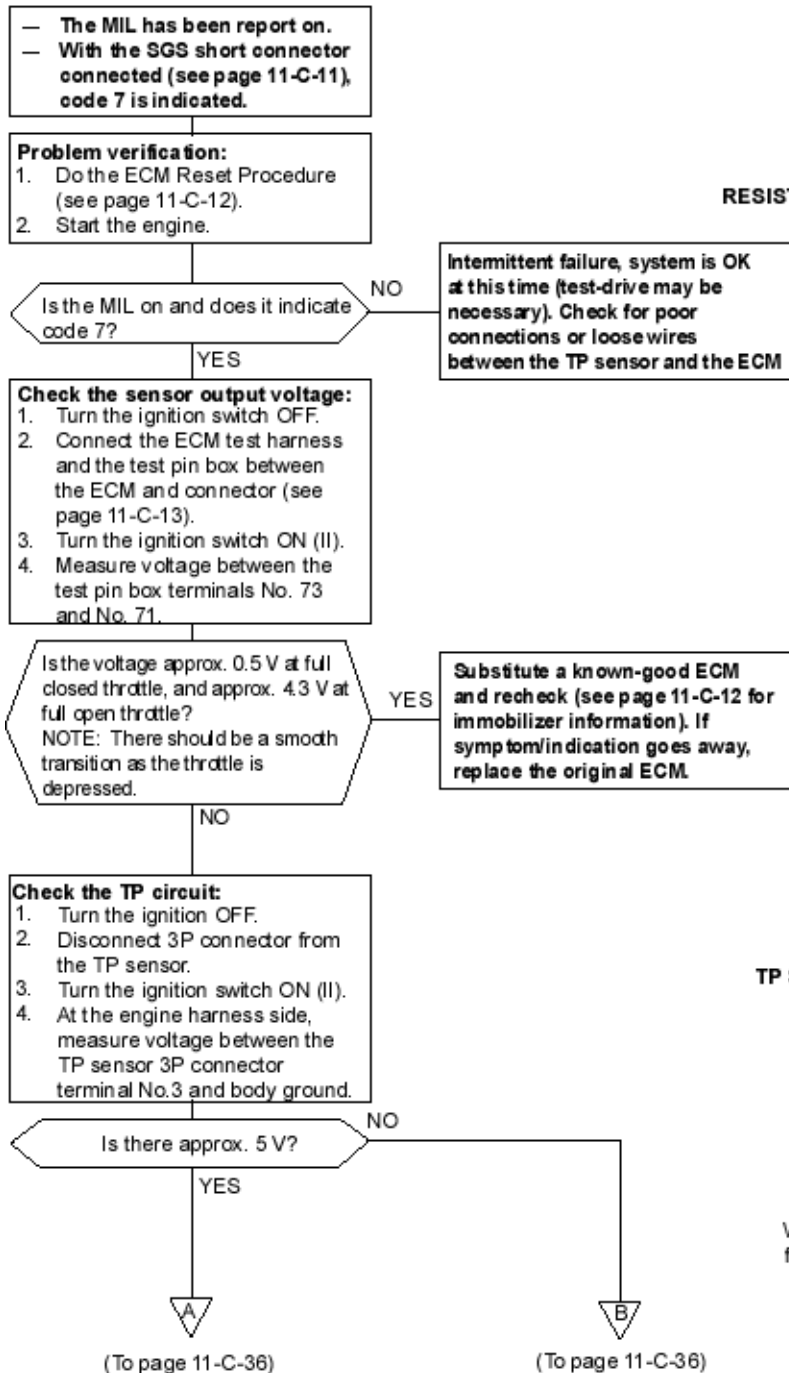
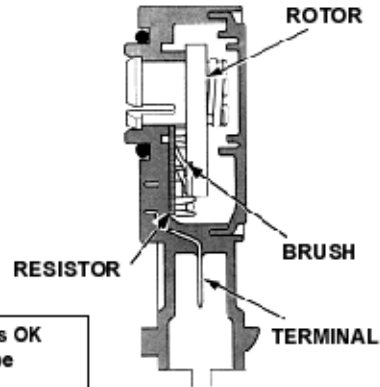


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-11\)](#)

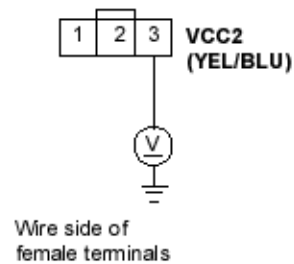


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 7: A problem in the Throttle Position (TP) Sensor circuit.

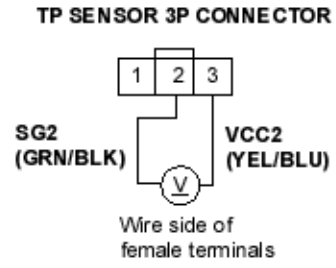
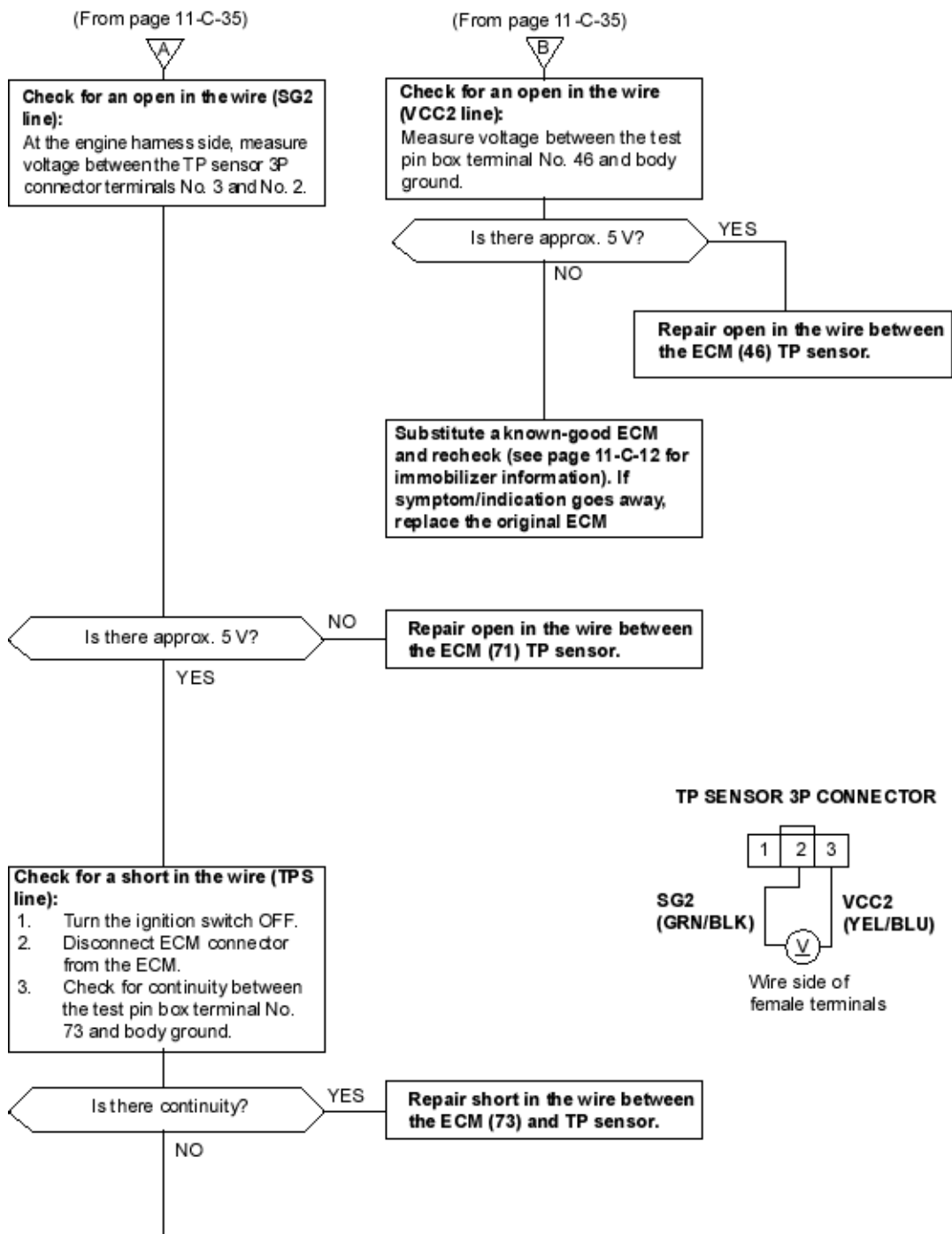
The TP sensor is a potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the throttle position sensor varies the voltage signal to the ECM.



TP SENSOR 3P CONNECTOR

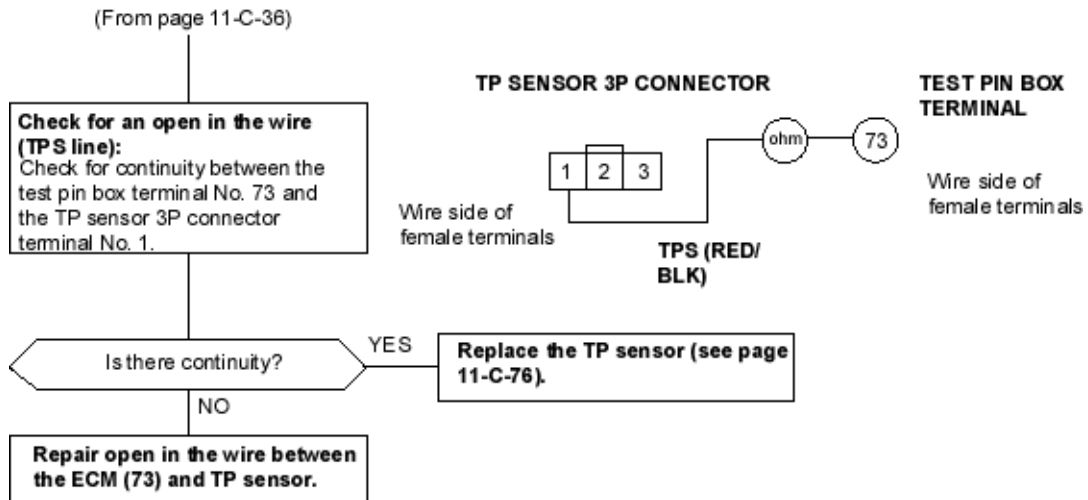


To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-13)
 (See Page 11-C-12)
 (See Page 11-C-11)

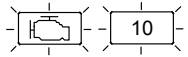


(To page 11-C-37)

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-76)



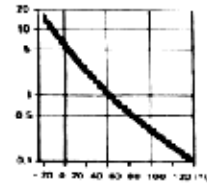
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTG) 10: A problem in the Intake Air Temperature (IAT) Sensor circuit.

The AT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the air temperature increases as shown below.

RESISTANCE (k ohm)



THERMISTOR



INTAKE AIR TEMPERATURE

— The MIL has been reported on.
— With the SGS short connector connected (see page 11-C-11), code 10 is indicated.

Problem verification:
1. Do the ECM Reset Procedure (see page 11-C-12)
2. Turn the ignition switch ON (II).

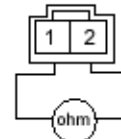
Is the MIL on and does it indicate code 10?

NO
Intermittent failure, system is OK at this time (test-drive may be necessary). Check for poor connections or loose wires between the IAT sensor and the ECM.

YES

Check the sensor resistance:
1. Turn the ignition switch OFF.
2. Disconnect 2P connector from the IAT sensor.
3. Measure resistance between the 2 terminals on the IAT sensor.

IAT SENSOR 2P CONNECTOR



Terminal side of male terminals

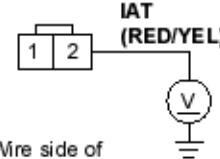
Is there 0.4 - 4.0 K ohm?

NO
Replace the IAT sensor.

YES

Check the ECM output voltage (IAT Line):
1. Turn the ignition switch ON (II).
2. At the main wire harness side, measure voltage between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there approx. 5 V?

YES

NO

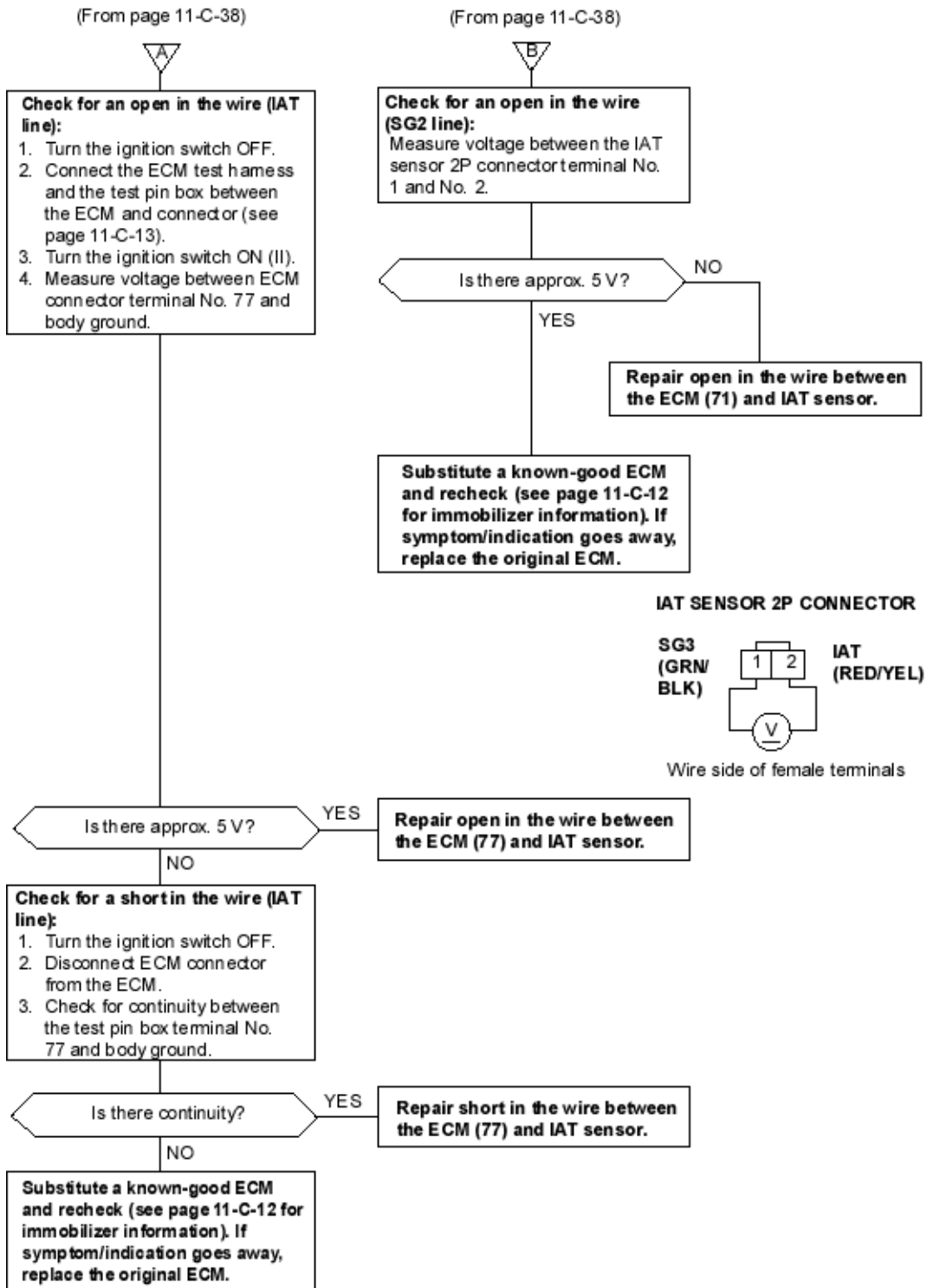


(To page 11-C-39)

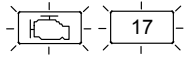


(To page 11-C-39)

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)
(See Page 11-C-11)

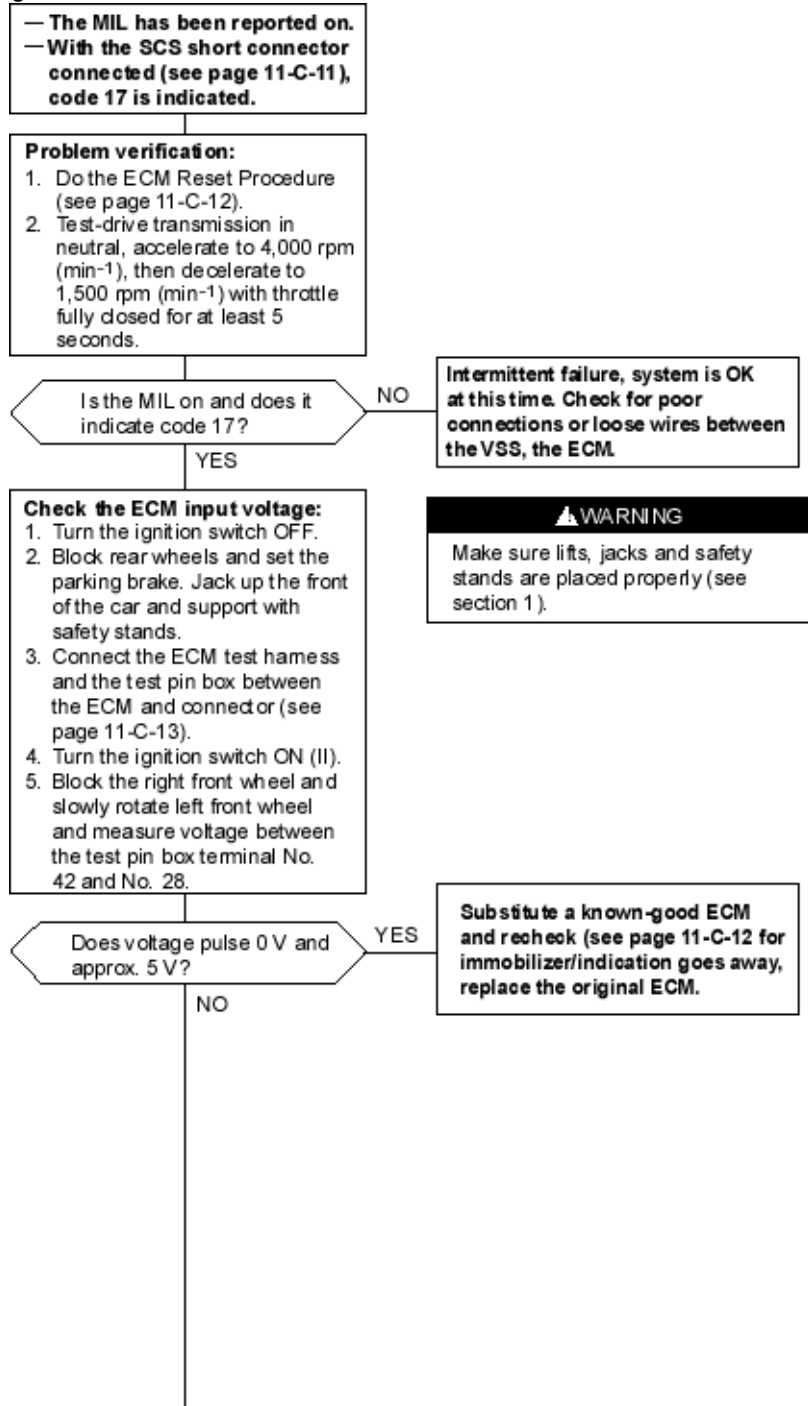


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-11\)](#)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 17: A problem in the vehicle speed sensor VSS circuit.

The VSS generates a pulsing signal when the front wheels turn.



(To page 11-C-41)

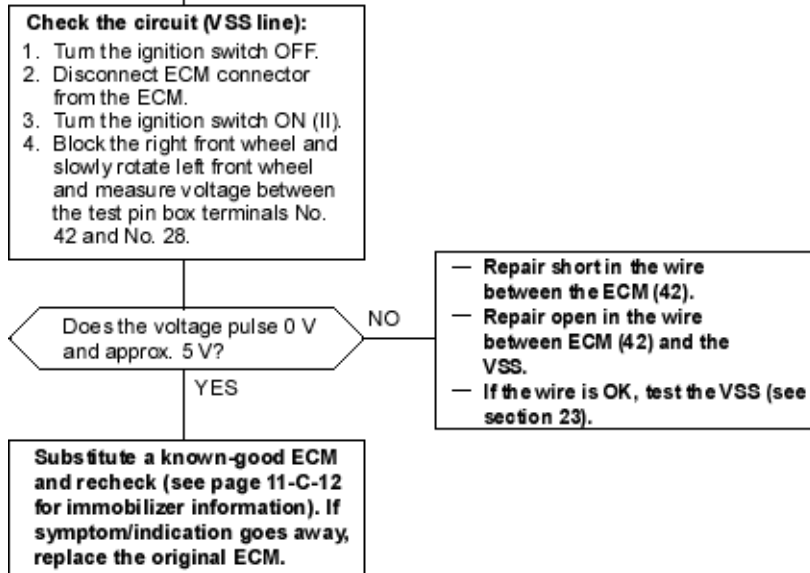
To go to the pages referenced on the diagram above, click on the following:

(See Page 11-C-13)

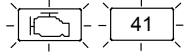
(See Page 11-C-12)

(See Page 11-C-11)

(From page 11-C-40)



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)



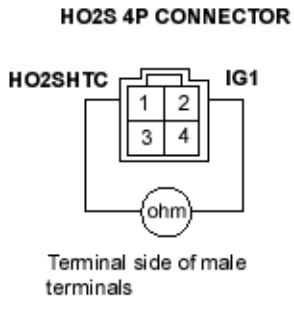
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 41: A problem in the Heated Oxygen Sensor (HO2S) Heater circuit.

— The MIL has been reported on.
 — With the SCS short connector connected (see page 11-C-11), code 41 is indicated.

Problem verification:
 1. Do the ECM Reset Procedure (see page 11-C-12).
 2. Start the engine.

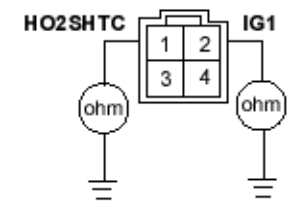
Is the MIL on and does it indicate code 41?
 NO: Intermittent failure, system is OK at this time. Check for poor connections or loose wire between the HO2S and the ECM.

Check for an open or short in the HO2S:
 1. Turn the ignition switch OFF.
 2. Disconnect the HO2S 4P connector.
 3. At the HO2S side, measure resistance between the HO2S 4P connector terminals No. 1 and No. 2.



Is there 2 - 20 ohms?
 NO: Replace the HO2S (see page 11-C-45).

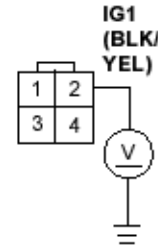
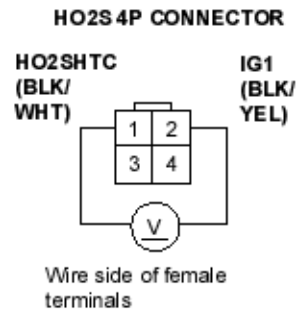
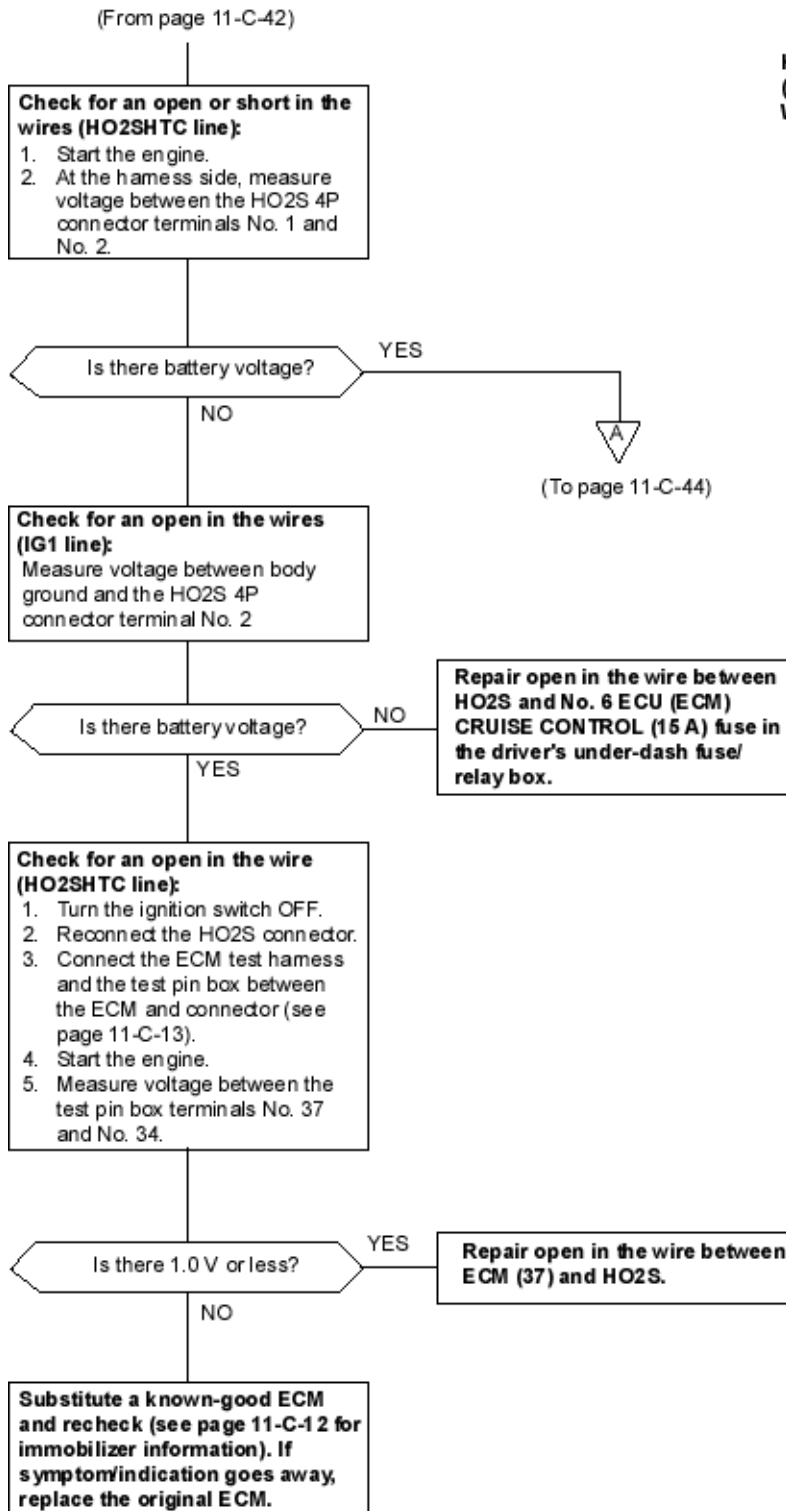
At the HO2S side, check for continuity between body ground and the HO2S 4 P connector terminals No. 1 and No. 2 individually.



Is there continuity?
 YES: Replace the HO2S (see page 11-C-45).

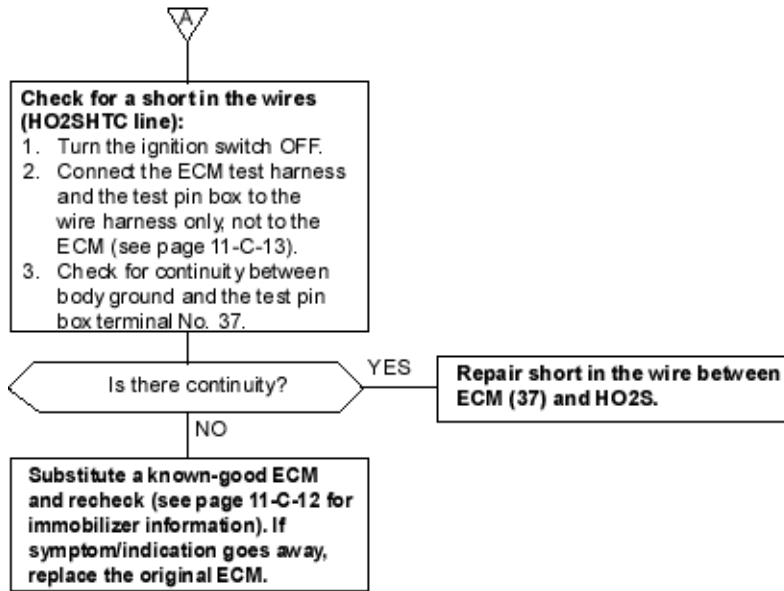
(To page 11-C-43)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-45\)](#)
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-11\)](#)



To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-13)
 (See Page 11-C-12)

(From page 11-C-43)

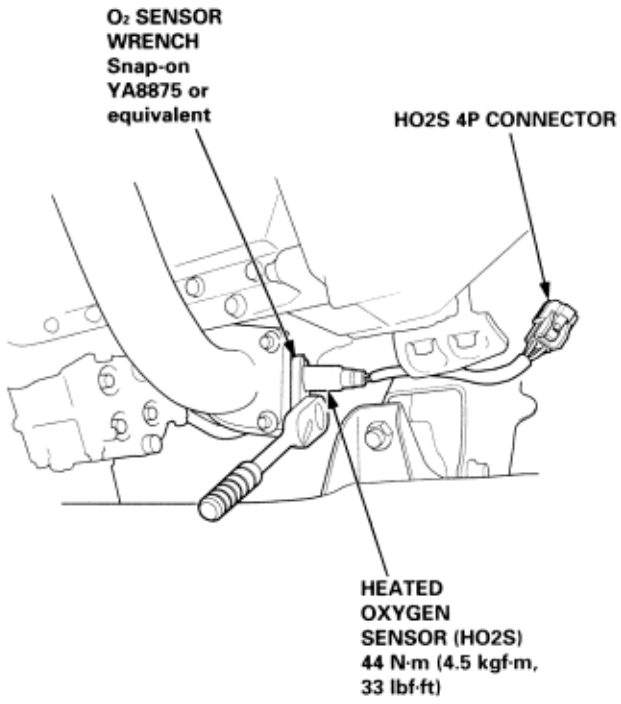


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)
[\(See Page 11-C-12\)](#)

**Heated Oxygen Sensor
Replacement**

11-C-45

1. Disconnect the HO2S 4P connector, then remove the HO2S.



2. Install the HO2S in reverse order of removal.

NOTE:

Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected, starting with 1. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system 2. etc.

If the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, go to inspection (**See Page 11-C-47**).

PAGE	SUB-SYSTEM	IDLE AIR CONTROL VALVE	AIR CONDITIONING SIGNAL	ALTERNATOR FR SIGNAL	BRAKE SWITCH SIGNAL	POWER STEERING PRESSURE SWITCH SIGNAL	HOSES AND CONNECTIONS
		11-C-48	11-C-50	11-C-52	11-C-54	11-C-55	—
DIFFICULT TO START ENGINE WHEN COLD							
WHEN COLD FAST IDLE OUT OF SPEC [1,000 – 2,000 rpm (min ⁻¹)]		①					
ROUGH IDLE		②					①
WHEN WARM ENGINE SPEED TOO HIGH		①				③	②
WHEN WARM RPM TOO LOW	Idle speed is below specified rpm (no load)	①					
	Idle speed does not increase after initial start up.	①					
	Idle speeds drops when air conditioner in ON	②	①				
	Idle speed drops when steering wheel is turning	②				①	
	Idle speed fluctuates with electrical load	②		③			①
FREQUENT STALLING	WHILE WARMING UP	①					
	AFTER WARMING UP	①					
FAILS EMISSION TEST							①

To go to the pages referenced on the diagram above, click on the following:

(**See Page 11-C-48**)

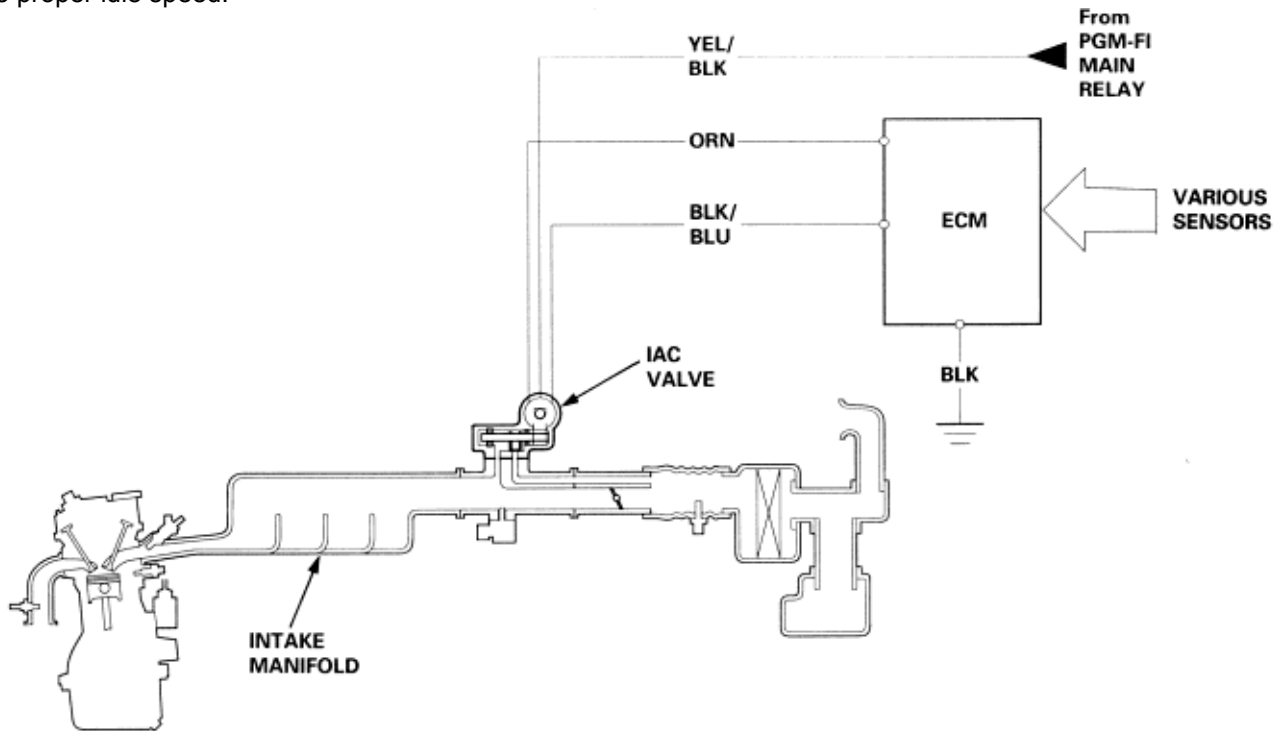
(**See Page 11-C-50**)

(**See Page 11-C-52**)

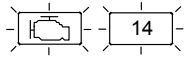
(**See Page 11-C-54**)

(**See Page 11-C-55**)

The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve. The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

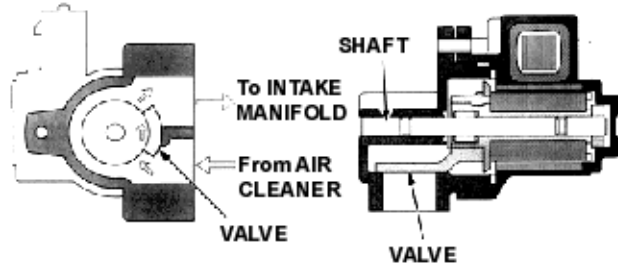


1. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.
2. When the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not indicate Diagnostic Trouble Code (DTC) 14, check the following items:
 - Air conditioning signal (**See Page** 11-C-50).
 - ALT FR signal (**See Page** 11-C-52).
 - Brake switch signal (**See Page** 11-C-54).
 - PSP switch signal (**See Page** 11-C-55).
 - Hoses and connections.
 - IAC valve and its mounting gasket.
3. If the above items are normal (and the MIL does not indicate DTC 14), after IAC valve replacement, substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.



The Malfunction Indicator Lamp (MIL) Diagnostic Trouble Code (DTC) 14: A problem in the Idle Air Control (IAC) Valve.

The IAC Valve changes the amount of air bypassing the throttle body in response to a current signal from the ECM in order to maintain the proper idle speed.



— The MIL has been reported on.
 — With the SCS short connector connected (see page 11-C-11), code 14 is indicated.

Problem verification:
 1. Do the ECM Reset Procedure (see page 11-C-12).
 2. Turn the ignition switch ON (II).

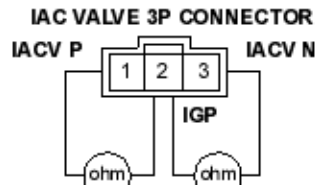
Does the MIL blink and does it indicate code 14?

NO
Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the IAC valve and the ECM.

YES
Check the ECM input voltage:
 1. Turn the ignition switch OFF.
 2. Connect the ECM test harness and the test pin box between the ECM and connector (see page 11-C-13).
 3. Turn the ignition switch ON (II).
 4. Measure voltage between body ground and the test pin box terminals No. 29, No. 2* individually.

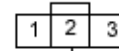
Is there battery voltage?

NO
Check the IAC Valve:
 1. Turn the ignition switch OFF.
 2. Disconnect the IAC Valve 3P connector.
 3. Measure resistance between IAC Valve 3P connector terminals No. 2 and No. 1, No. 3 individually.



* IACV N line Terminal side of male terminals

IAC VALVE 3P CONNECTOR



IGP (YEL/BLK)
 Wire side of female terminals

YES
Check for an open in the wire (IGP line):
 1. Turn the ignition switch OFF.
 2. Disconnect the IAC Valve 3P connector.
 3. Turn the ignition switch ON (II).
 4. At the wire harness, measure voltage between IAC Valve 3P connector terminal No. 2 and body ground.

Is there battery voltage?

NO
Repair open in the wire between the IAC Valve and PGM-FI main relay.

YES
 Is there 10 - 22 ohms?

NO
Replace the IAC Valve.

YES
Substitute a known-good ECM and recheck (see page 11-C-12 for immobilizer information). If symptom/indication goes away, replace the original ECM.

(To page 11-C-49)

To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-11)
 (See Page 11-C-12)
 (See Page 11-C-13)

(From page 11-C-48)

Check for an open in the wire (IACV P, IACV N* line):
 1. Turn the ignition switch OFF.
 2. Disconnect the ECM connector.
 3. Check for continuity between IAC Valve 3P connector terminal No. 1 and the test pin box terminal No. 29 (IAC Valve 3P connector terminal No. 3 and the test pin box terminal No. 2).*

Is there continuity?

NO **Repair open in the wire between the IAC Valve and ECM (29, 2*).**

Check for a short in the wire (IACV P, IACV N* line):
 Check for continuity between body ground and the test pin box terminals no. 29, No. 2* individually.

Is there continuity?

NO **Repair short in the wire between the IAC Valve and ECM (29, 2*).**

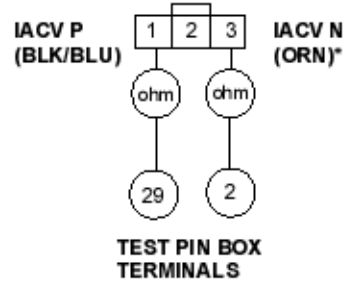
Check the IAC Valve:
 1. Disconnect the IAC Valve 3P connector.
 2. Measure resistance between IAC Valve 3P connector terminals No. 2 and No. 1, No. 3 individually.

Is there 10 - 22 ohms?

NO **Replace the IAC Valve.**

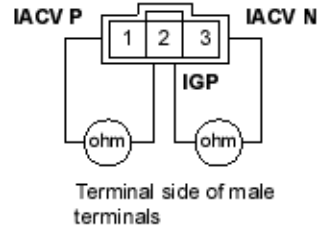
Substitute a known-good ECM and recheck (see page 11-C-12 for immobilizer information). If symptom/indication goes away, replace the original ECM.

IAC VALVE 3P CONNECTOR



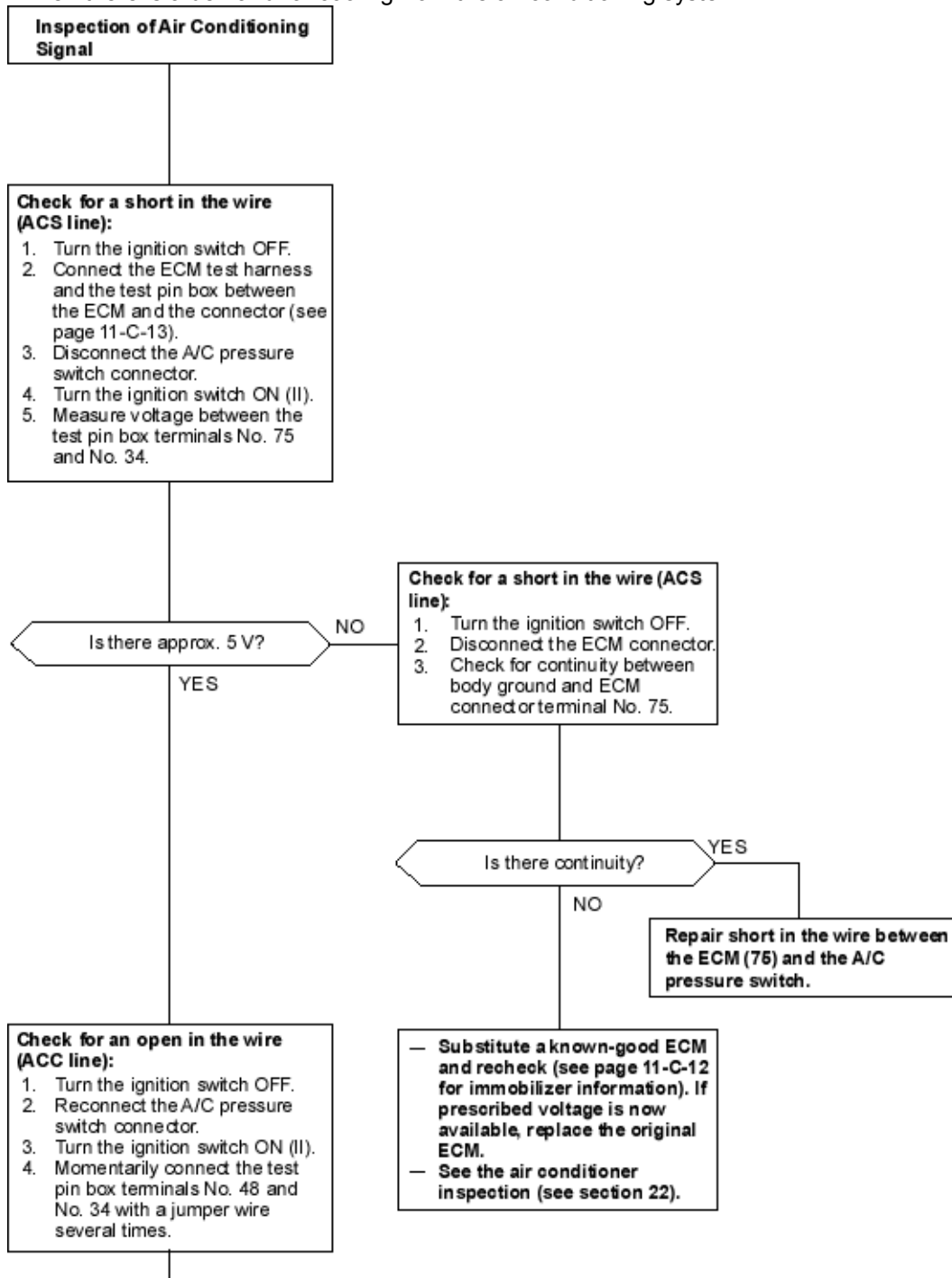
*: IACV N line

IAC VALVE 3P CONNECTOR

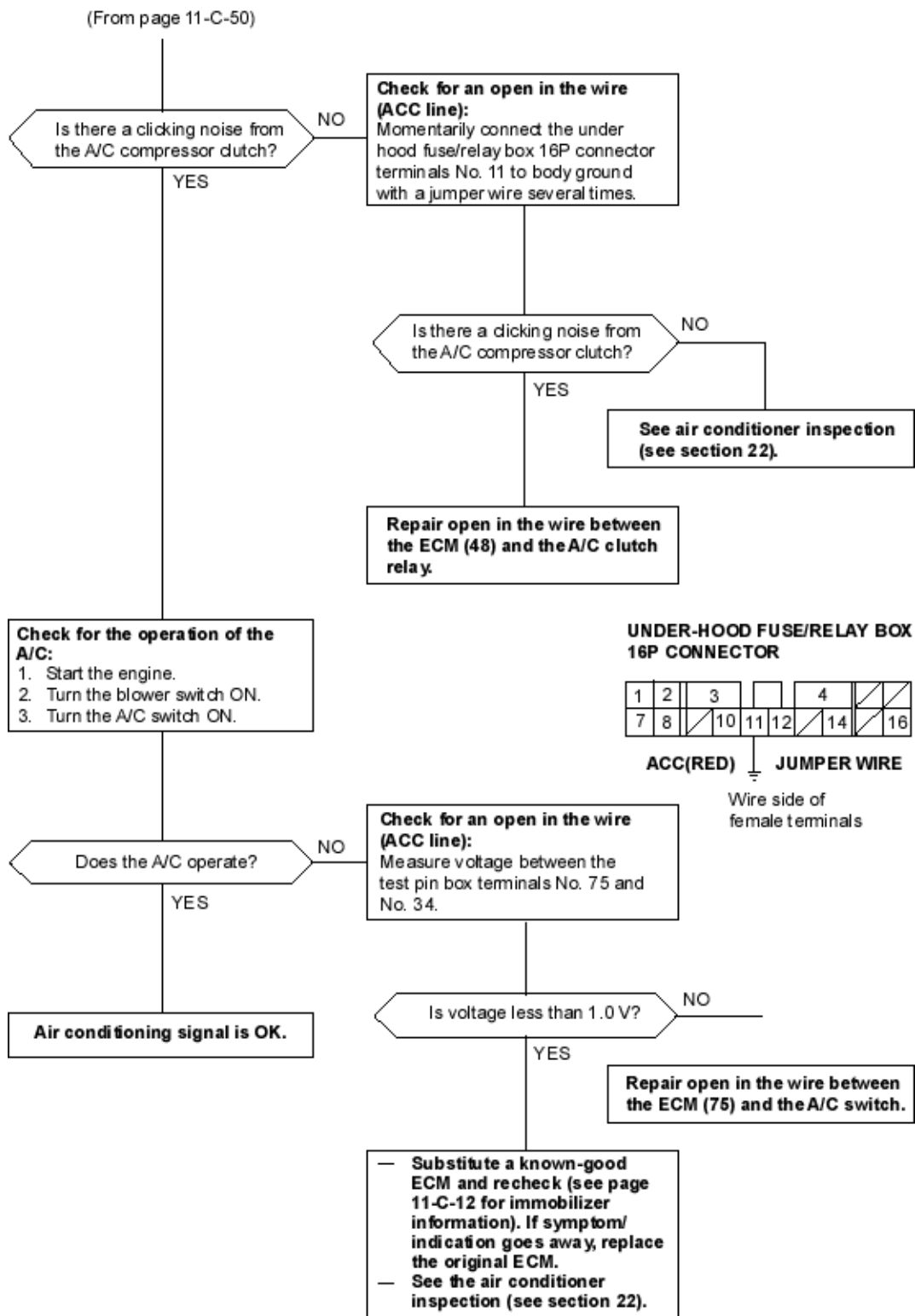


To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-12)

This signals the ECM when there is a demand for cooling from the air conditioning system.

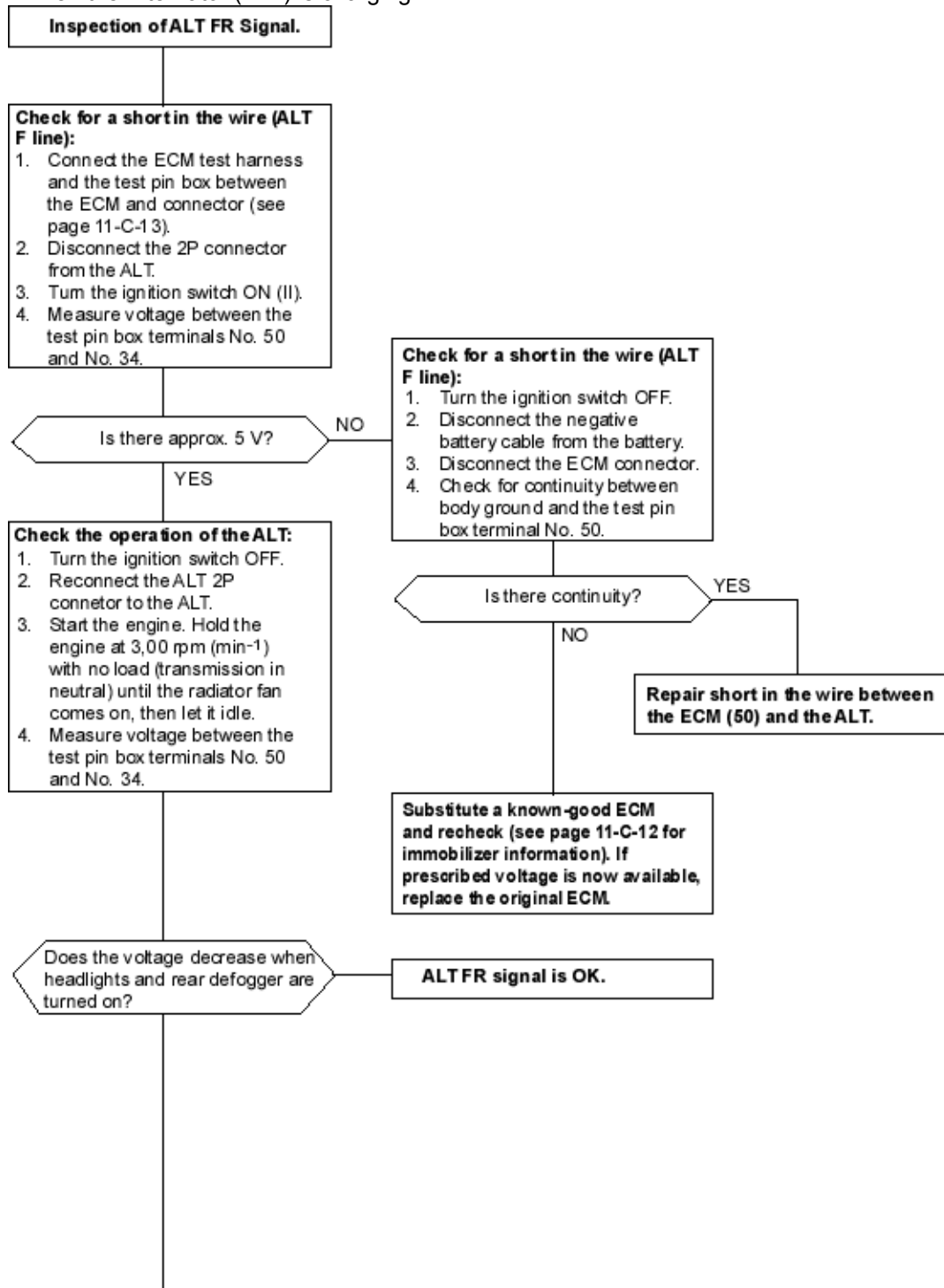


To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)
(See Page 11-C-13)



To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-12)

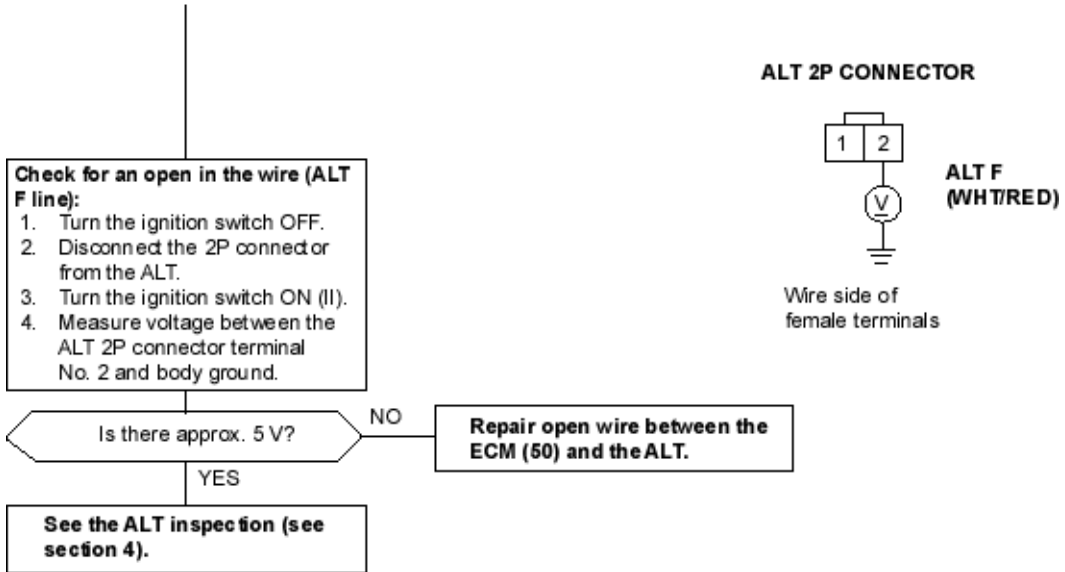
This signals the ECM when the Alternator (ALT) is charging.



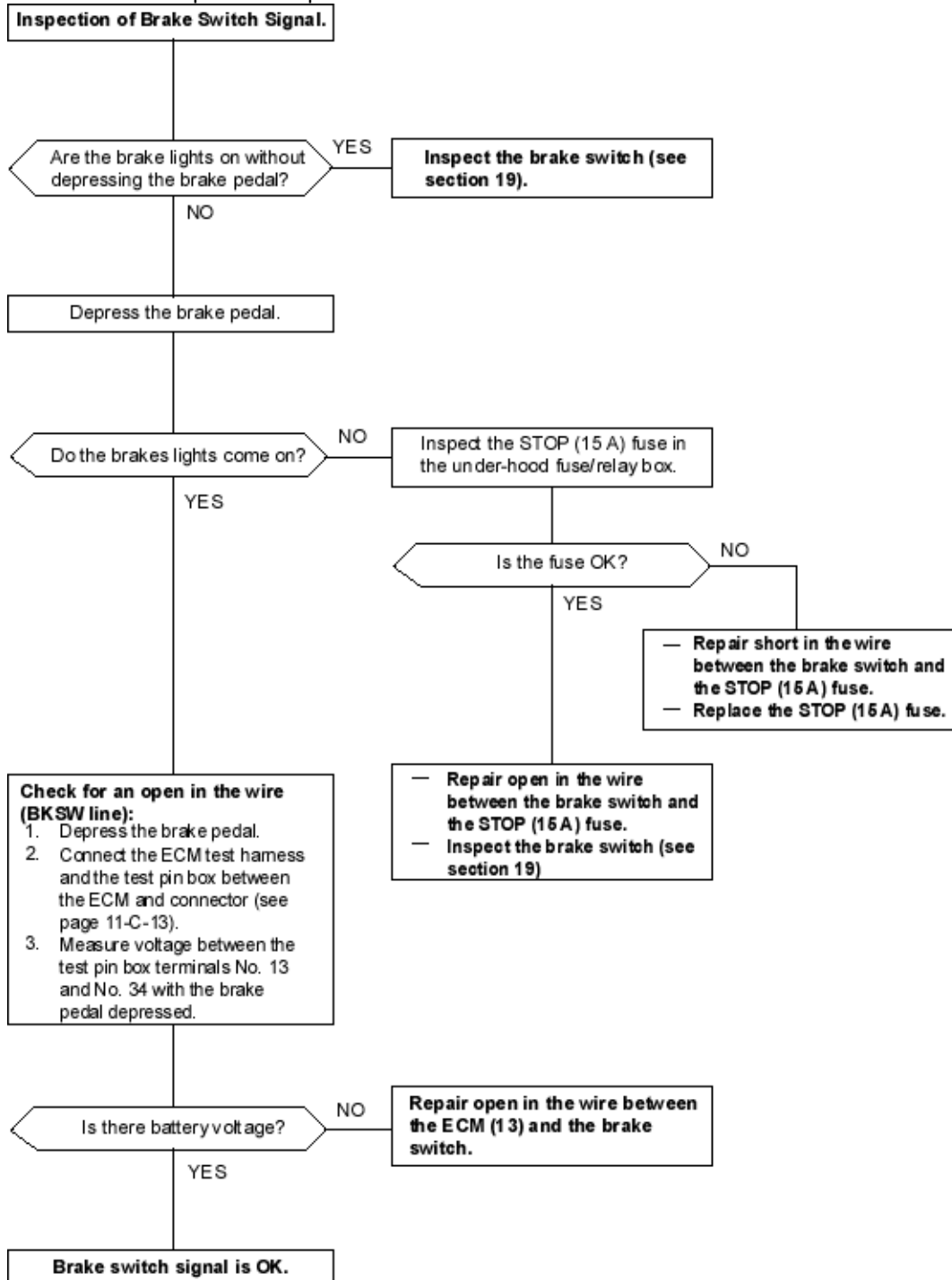
(To page 11-C-53)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-13\)](#)

(From page 11-C-52)

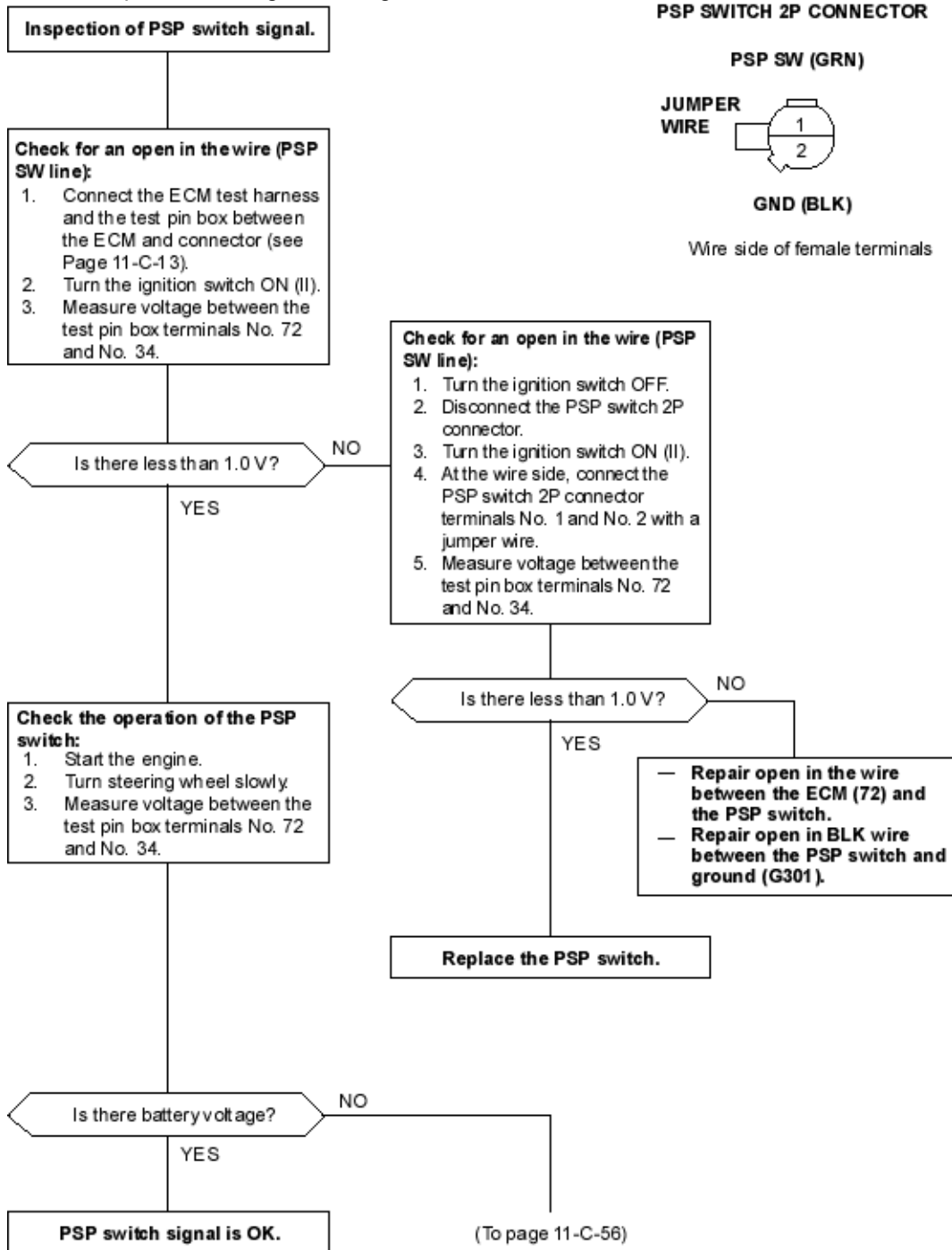


This signals the ECM when the brake pedal is depressed.

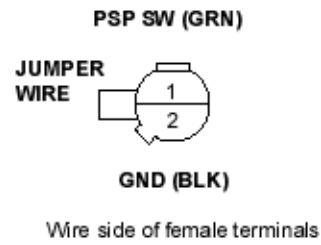


To go to the page referenced on the diagram above, click on the following:
(See Page 11-C-13)

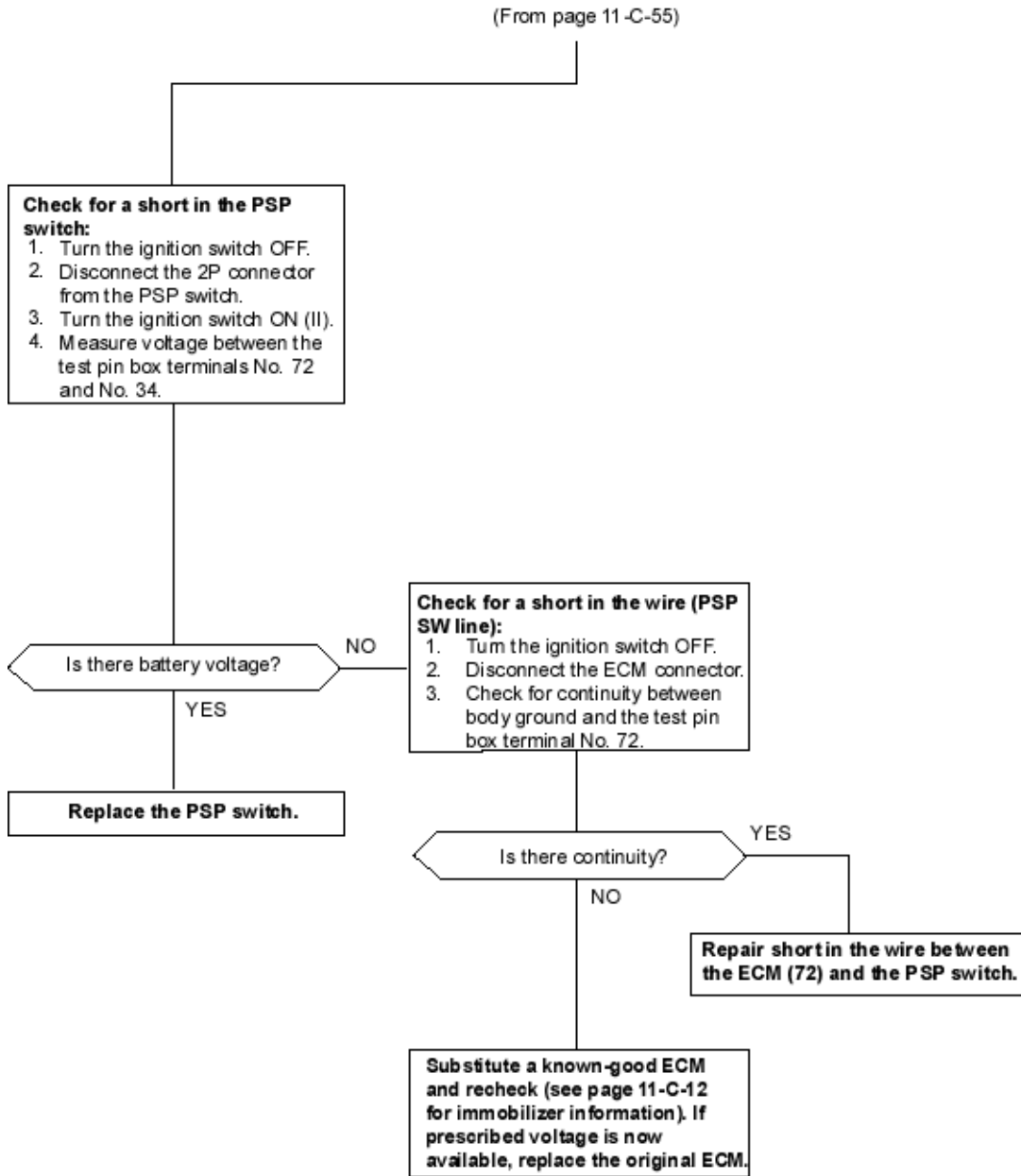
This signals the ECM when the power steering load is high.



PSP SWITCH 2P CONNECTOR



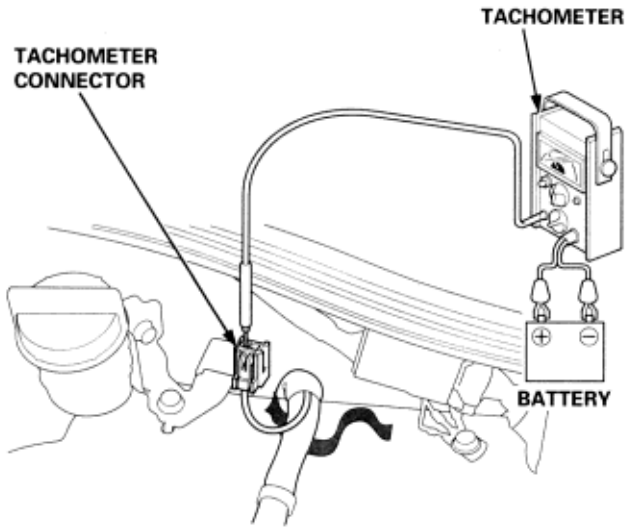
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-C-13)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-C-12)

NOTE:

- ♦ Leave the IAC valve connected.
 - ♦ Before inspect the idle speed, check these items:
 - The MIL has not been reported on.
 - Ignition timing.
 - Spark plugs.
 - Air cleaner.
 - PCV system.
1. Connect a tachometer.



2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (transmission in neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.
Idle speed should be:
 $750 \pm 50 \text{ rpm (min-1)}$

4. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

Idle speed should be:
 $810 \pm 50 \text{ rpm (min-1)}$

NOTE:

If the idle speed is not within specification, refer to Symptom Chart (**See Page 11-C-46**).

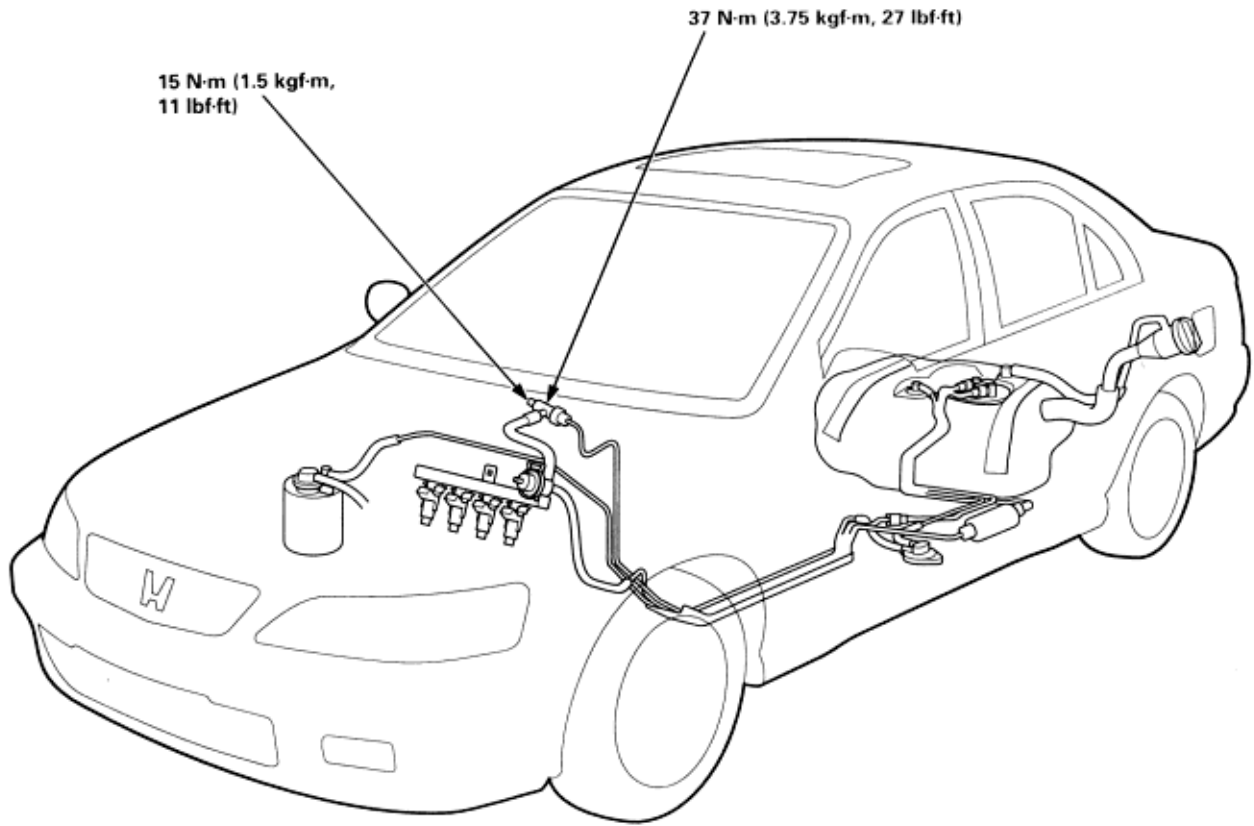
NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system (2), etc.

PAGE	SUB-SYSTEM	FUEL LINES	FUEL INJECTOR	FUEL PRESSURE REGULATOR	FUEL FILTER	FUEL PUMP	PGM-FI MAIN RELAY	CONTAMINATED FUEL
		11-C-59	11-C-62	11-C-66	11-A-105	11-A-106	11-C-68	—
	ENGINE WON'T START		③		③	①	②	
	DIFFICULT TO START ENGINE WHEN COLD OR HOT				①	②		
	ROUGH IDLE		①					②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING		①	②				②
	FAILS EMISSION TEST		②	①				
	LOSS OF POWER		③		②	①		
FREQUENT STALLING	WHILE WARMING UP			①				
	AFTER WARMING UP			①				

To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-C-59)
- (See Page 11-C-62)
- (See Page 11-C-66)
- (See Page 11-A-105)
- (See Page 11-A-106)
- (See Page 11-C-68)

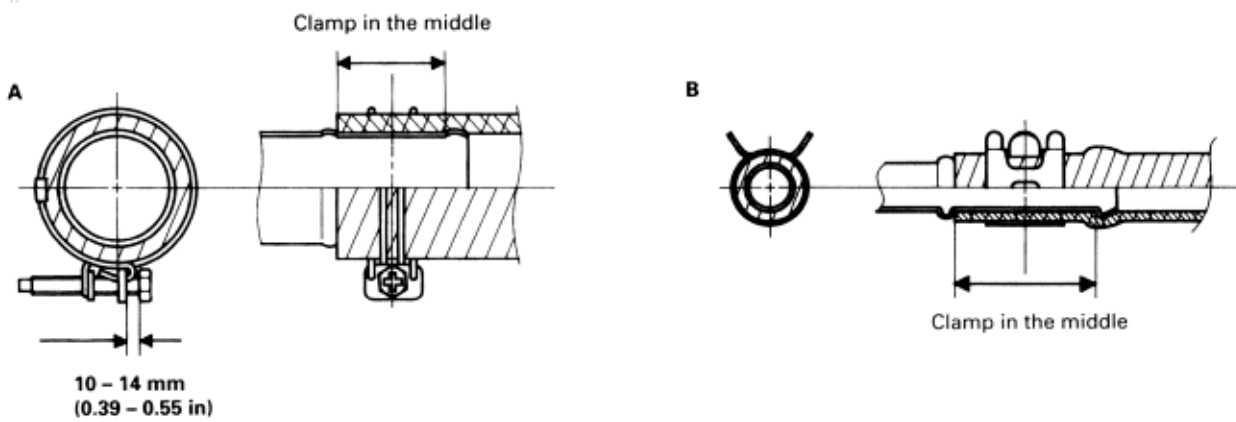
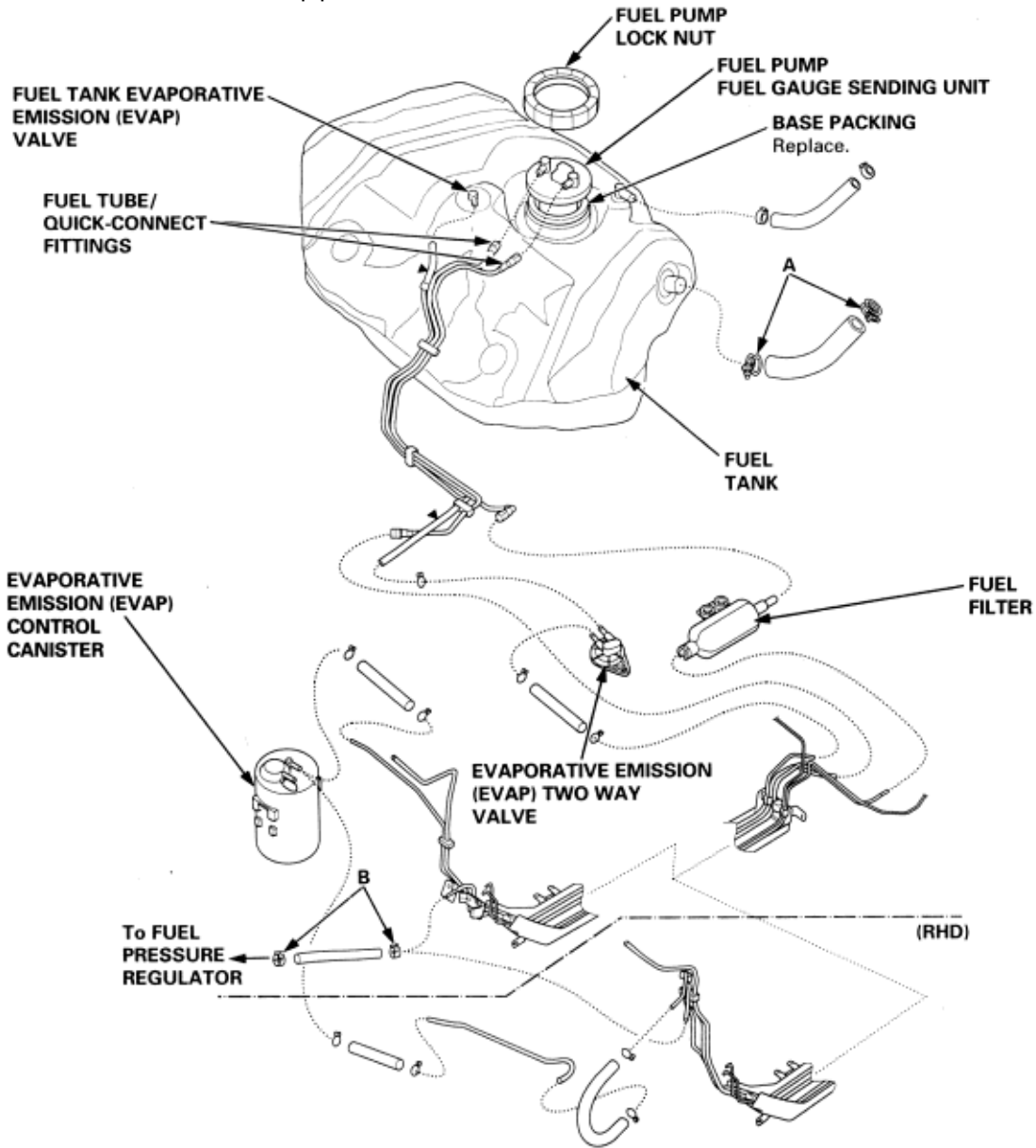
NOTE: Check fuel system lines, hoses and fuel filter for damage, leaks or deterioration, and replace if necessary.



The illustration shows
LHD type.
Refer to 11-C-6
page for RHD type.

NOTE: Check all hose clamps and retighten if necessary.

▶ Do not disconnect the hose from the pipe.



Fuel Supply System

System Description

11-C-61 Fuel Pressure

The fuel supply system consists of a fuel tank, in-tank high-pressure fuel pump, PGM-FI main relay, fuel filter, fuel pressure regulator, fuel injectors, and fuel delivery and return lines. This system delivers pressure-regulated fuel to the fuel injectors and cuts the fuel delivery when the engine is not running.

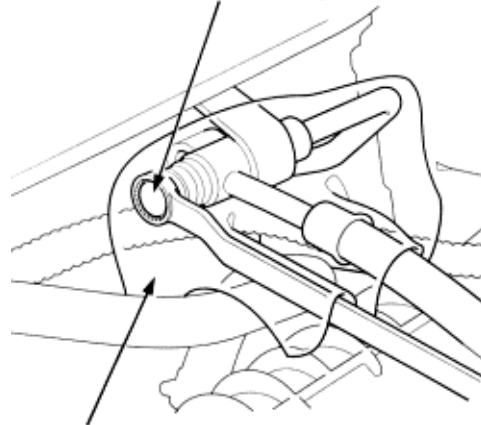
Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the service bolt on the fuel feed pipe.

⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area. Be sure to relieve fuel pressure while the ignition switch is off.

1. Disconnect the battery negative cable from the battery negative terminal.
2. Remove the fuel fill cap.
3. Use a wrench on the service bolt at the fuel feed pipe.
4. Place a rag or shop towel over the service bolt.
5. Slowly loosen the service bolt one complete turn.

SERVICE BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)

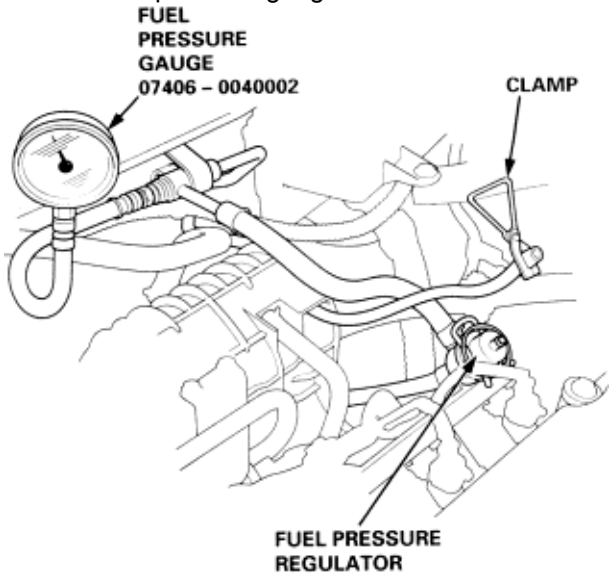


SHOP TOWEL

NOTE: Replace the washers whenever the service bolt is loosened or removed.

Inspection

1. Relieve fuel pressure (**See Page** 11-C-61).
2. Remove the service bolt from the fuel feed pipe Attach the fuel pressure gauge.



3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the fuel pressure regulator disconnected from the fuel pressure regulator and pinched. If the engine will not start, turn the ignition switch ON (II), wait for two seconds, turn it off, then back on again and read the fuel pressure.

Pressure should be:

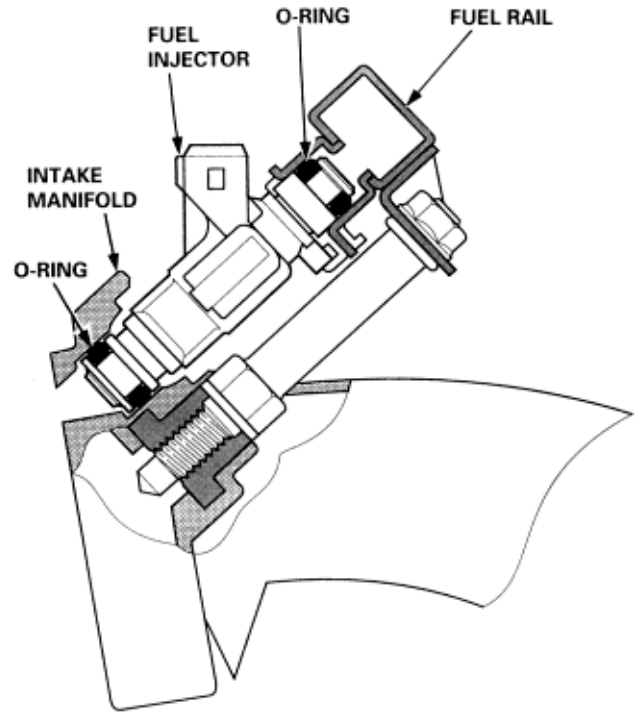
280-330 kPa (2.9-3.4 kgf/cm², 41-48 psi)

If the fuel pressure is not as specified, first check the fuel pump (**See Page** 11-A-107). If the fuel pump is OK, check the following:

- ♦ If the fuel pressure is higher than specified, inspect for:
 - Pinched or clogged fuel return hose or line.
 - Faulty fuel pressure regulator (**See Page** 11-C-66).
- ♦ If the fuel pressure is lower than specified, inspect for:
 - Clogged fuel filter.
 - Faulty fuel pressure regulator (**See Page** 11-C-66).
 - Leakage in the fuel line.

Description

The fuel injectors are a solenoid-actuated constant stroke, pintle-type consisting of a solenoid, plunger needle valve and housing. When current is applied to the solenoid coil, the valve lifts up and pressurized fuel is injected. Because the needle valve lift and the fuel pressure are constant, the injection quantity is determined by the length of time that the valve is open (that is the duration the current is supplied to the solenoid coil). The fuel injector is sealed by an O-ring at the top and bottom. These seals also reduce operating noise.

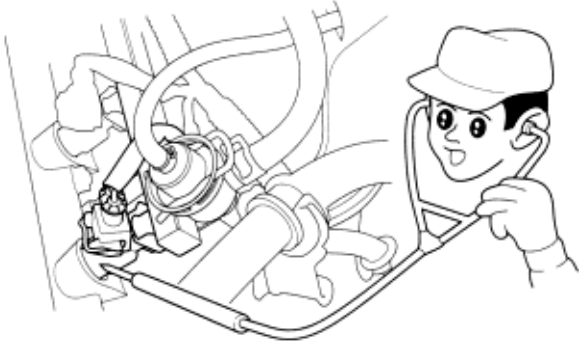


Testing

NOTE: Check the following items before testing: idle speed, ignition timing and idle CO%.

If the engine runs:

1. With the engine idling, disconnect each fuel injector connector individually and inspect the change in the idle speed.
 - ♦ If the idle speed drop is almost the same for each cylinder, the fuel injectors are normal.
 - ♦ If the idle speed or quality remains the same when you disconnect a particular fuel injector, replace the fuel injector and retest.
2. Check the clicking sound of each fuel injector by means of a stethoscope when the engine is idling.



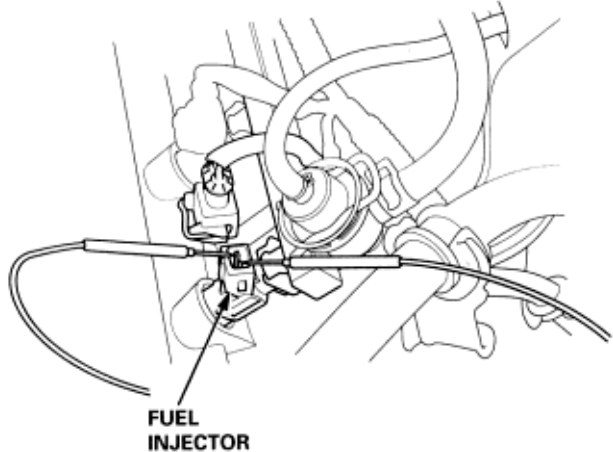
- ♦ If any fuel injector fails to make the typical clicking sound, check the sound again after replacing the fuel injector.
- If clicking sound is still absent, check the following.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the junction connector.
 - ♦ Whether the junction connector is open or corroded.
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the junction connector and the fuel injector.
 - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM.

If all is OK, check the ECM (**See Page 11-C-21**) and PGM-F1 main relay (**See Page 11-C-68**).

If the engine cannot be started

1. Remove the connector of the fuel injector, and measure the resistance between the 2 terminals of the fuel injector.

Resistance should be: 13.8-15.3 ohms at 20°C (68°F)



- ♦ If the resistance is not as specified, replace the fuel injector.
- ♦ If the resistance is as specified, check the fuel pressure (**See Page 11-C-62**).
- If the fuel pressure is as specified, check the following:
 - ♦ Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the junction connector.
 - ♦ Whether the junction connector is open or corroded.
 - ♦ Whether there is any short-circuiting, wire breakage, or poor connection in the YEL/BLK wire between the junction connector and the ECM.

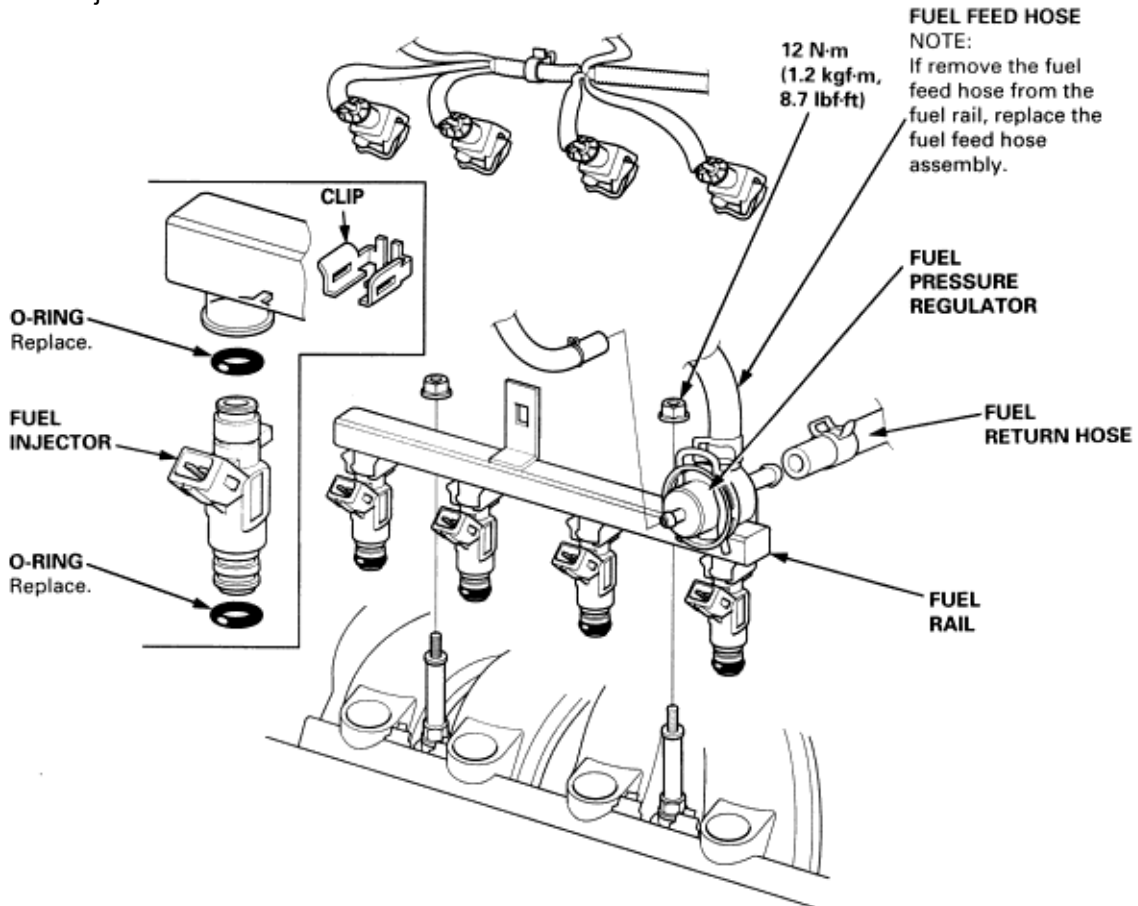
If all is OK, check the ECM (**See Page 11-C-21**).

Replacement:

⚠ WARNING

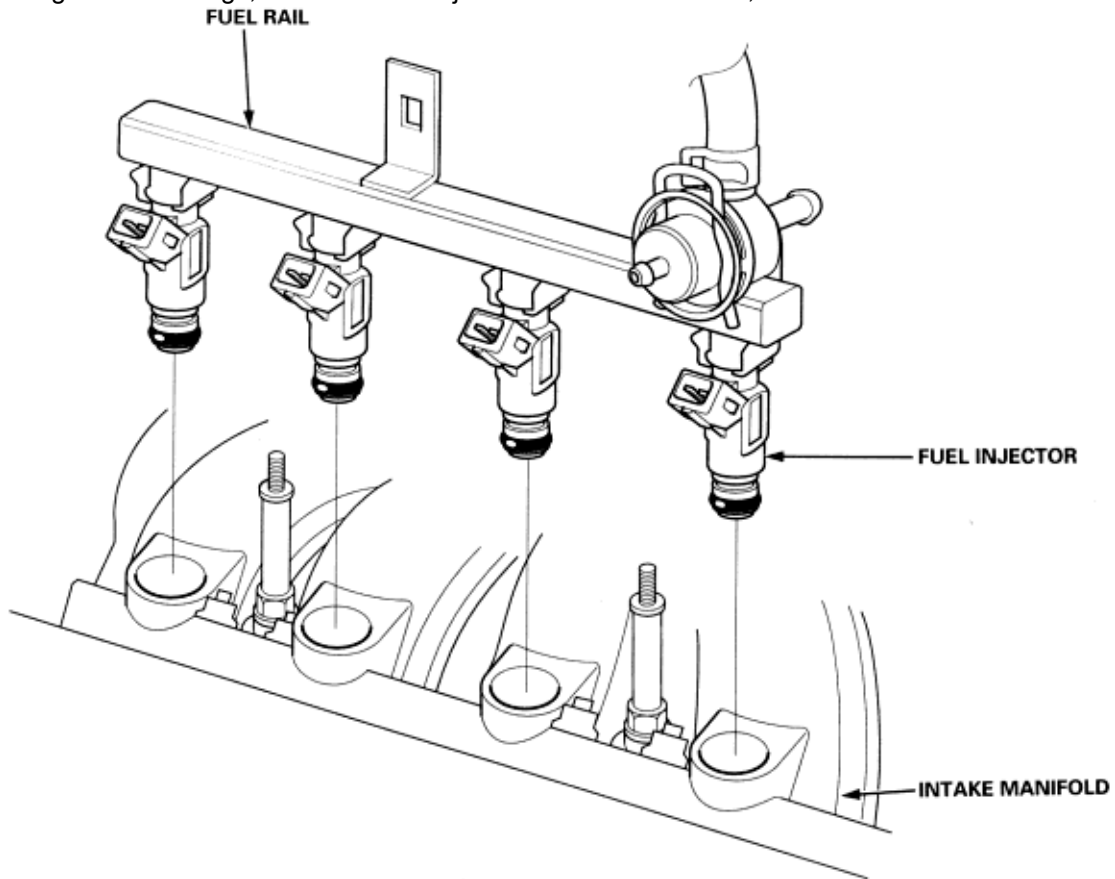
Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Relieve the fuel pressure (**See Page 11-C-61**).
2. Disconnect the connectors from the fuel injectors.
3. Disconnect the vacuum hoses and fuel return hose from the fuel pressure regulator.
NOTE: Place a rag or shop towel over the hoses before disconnecting them.
4. Remove the retainer nuts from the fuel rail.
5. Disconnect the fuel rail.
6. Remove the fuel injectors from the intake manifold.



7. Slide new cushions rings onto the fuel injectors.
8. Coat new O-rings with clean engine oil, and put them on the fuel injectors.
9. Insert the fuel injectors into the fuel rail first.

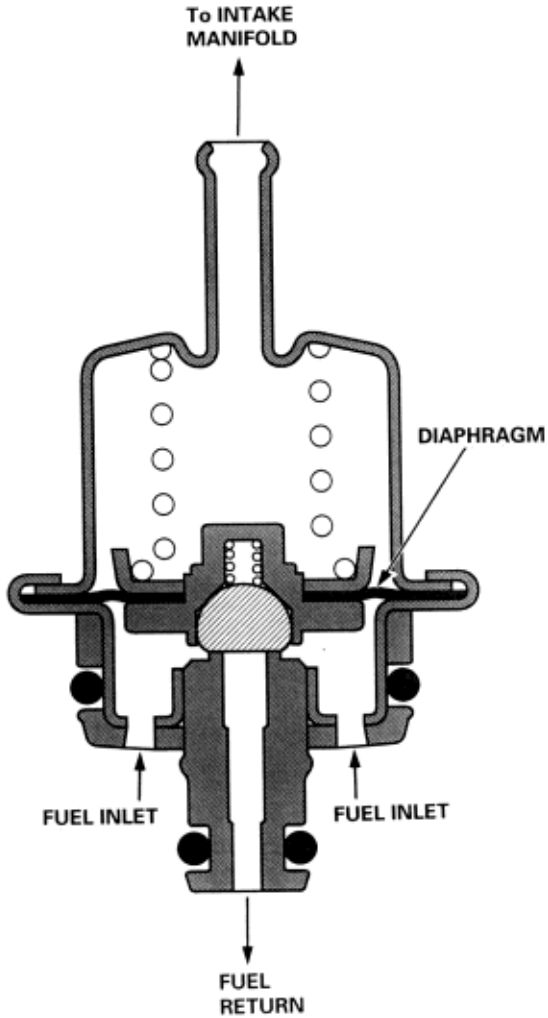
10. To prevent damage to the O-rings, install the fuel injectors in the fuel rail first, then install them in the intake manifold.



11. Install and tighten the retainer nuts.
12. Connect the vacuum hoses and fuel return hose to the fuel pressure regulator.
13. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

Description

The fuel pressure regulator maintains a constant fuel pressure to the fuel injectors. When the difference between the fuel pressure and manifold pressure exceeds 300 kPa, 3.1 kgf/cm², 44 psi, the diaphragm is pushed upward, and the excess fuel is fed back into the return line.

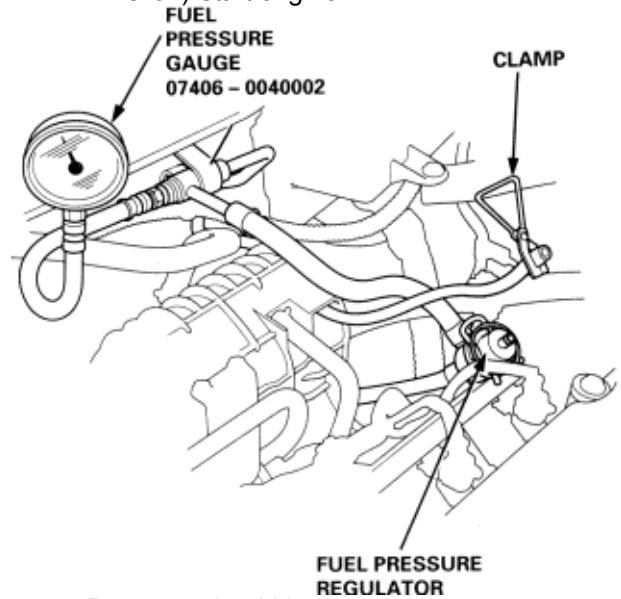


Testing

WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Attach the fuel pressure gauge (See Page 11-C-62) Start engine.



Pressure should be:

280-330 kPa (2.9-3.4 kgf/cm², 41-48 psi)

(with the fuel pressure regulator vacuum hose disconnected and pinched).

2. Reconnect the vacuum hose to the fuel pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the fuel pressure regulator is disconnected again.
 - ♦ If the fuel pressure did not rise, replace the fuel pressure regulator.

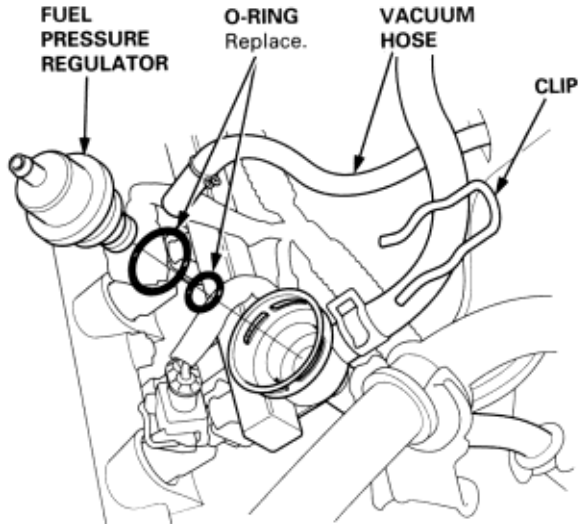
Replacement



WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (See Page 11-C-61).
2. Disconnect the vacuum hose.
3. Remove the clip from fuel pressure regulator.

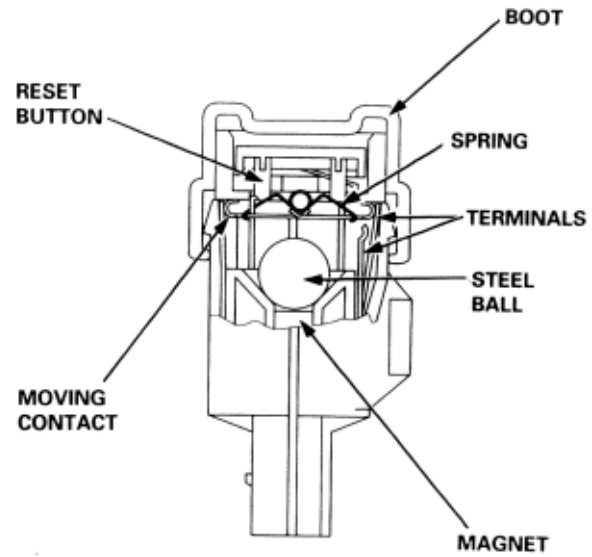


4. Apply clean engine oil to a new O-ring, and carefully install it into its proper position.
5. Install the fuel pressure regulator and clip.
6. Reconnect the vacuum hose.

Description

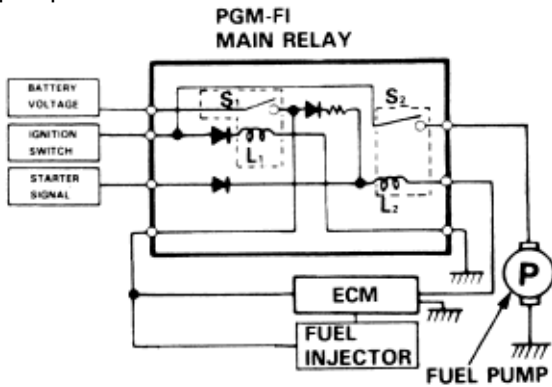
The inertia switch is a safety device which automatically cuts off the fuel supply in the event of a collision or sudden impact.

The switch is located behind the glove box. After an impact, the switch must be reset by pressing the button before the engine can be restarted.



Description

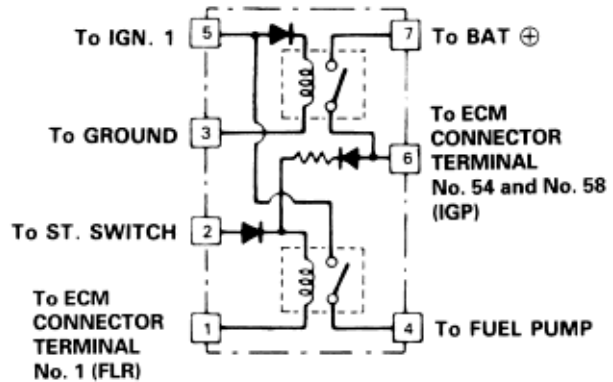
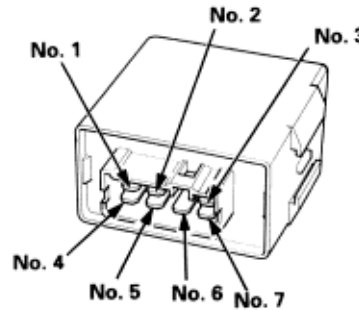
The PGM-FI main relay actually contains two individual relays. This relay is located at the driver side of the cowl. One relay is energized whenever the ignition is on which supplies the battery voltage to the ECM, power to the fuel injectors, and power for the second relay. The second relay is energized for two seconds when the ignition is switched on, and when the engine is running, to supply power to the fuel pump.



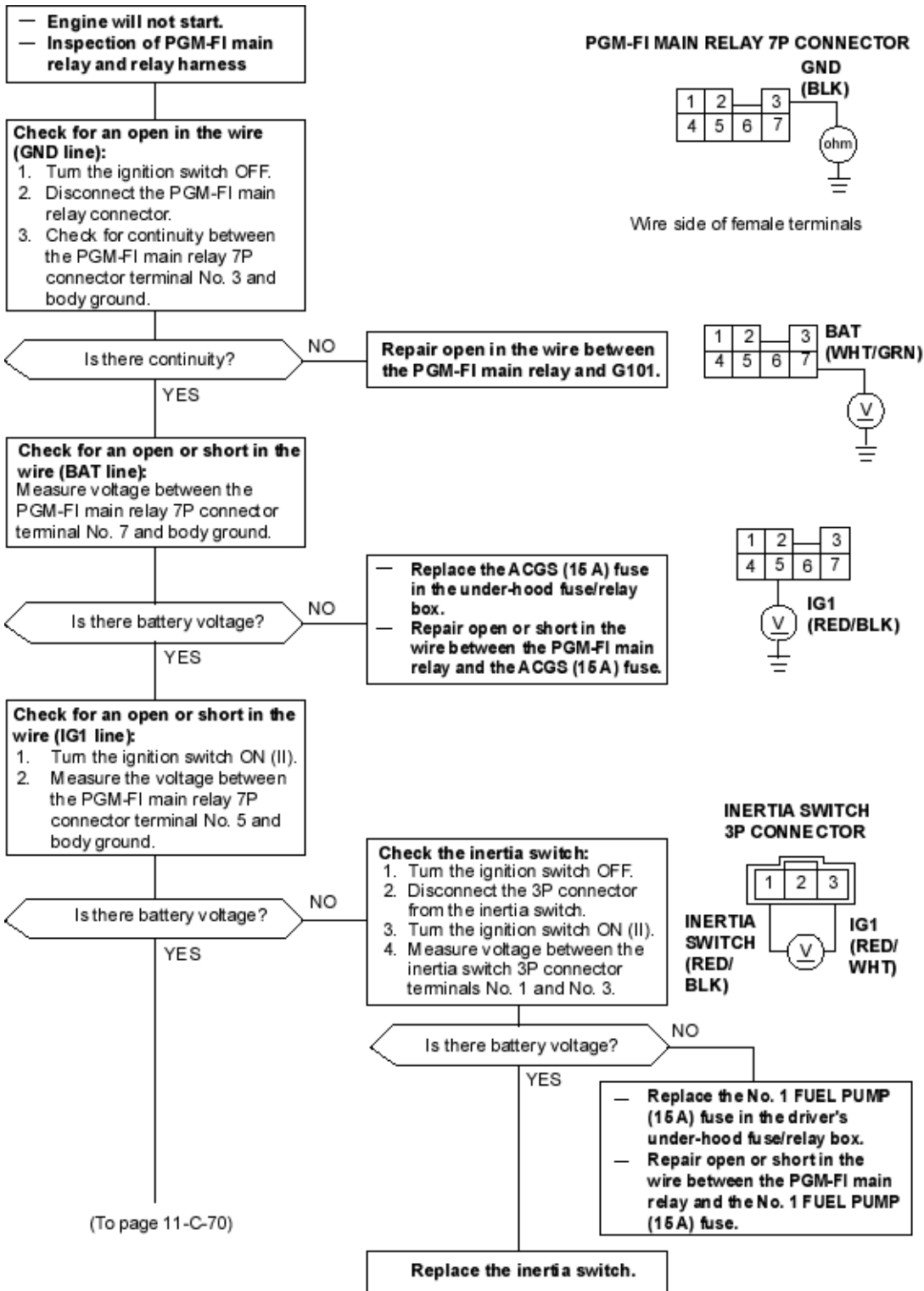
Relay Testing

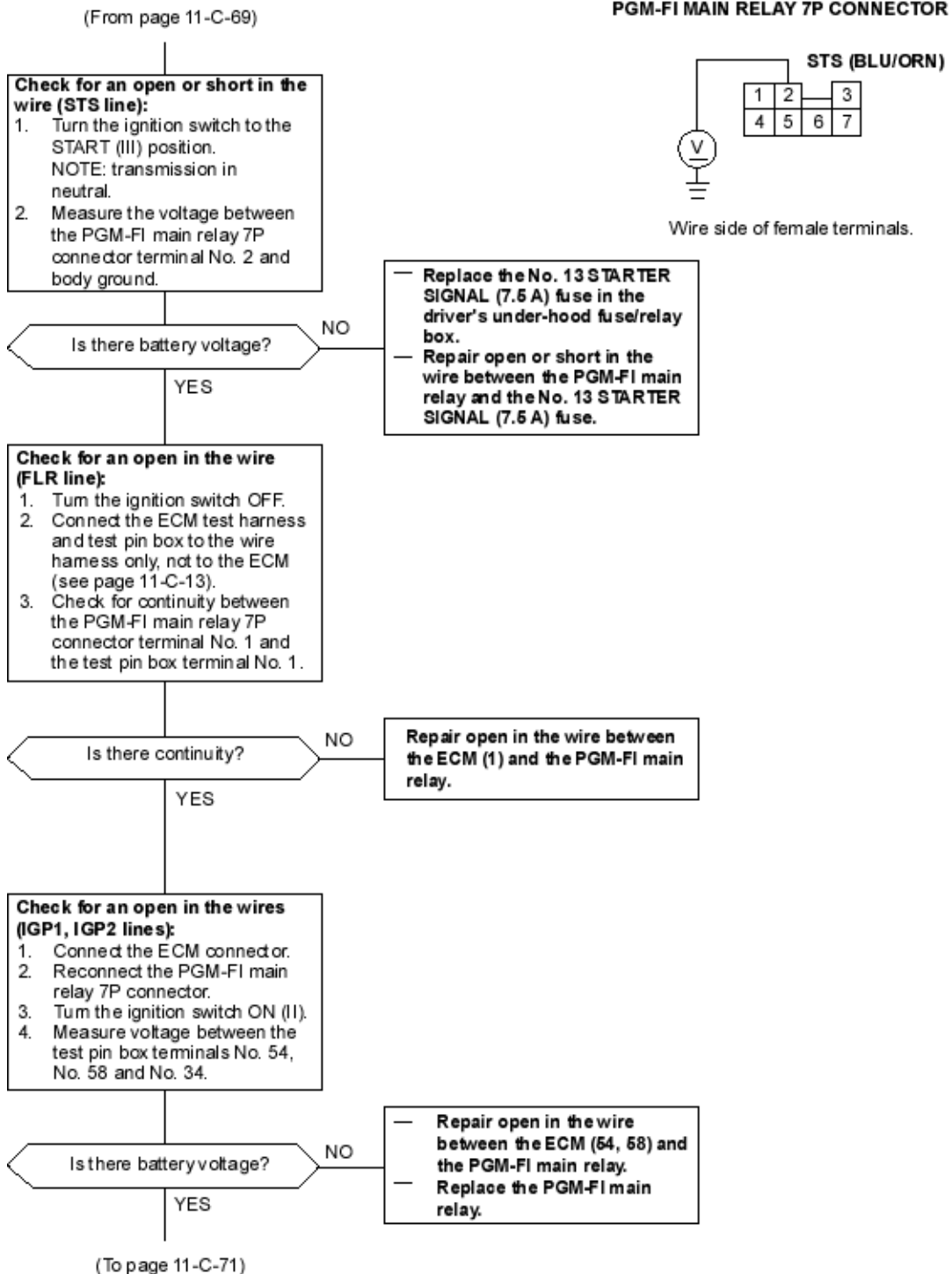
NOTE: If the car starts and continues to run, the 1 main relay is OK.

1. Remove the PGM-FI main relay.
2. Attach the battery positive terminal to the No.2 terminal and the battery negative terminal to the No.1 terminal of the PGM-FI main relay. Then check for the continuity between the No.5 terminal and No.4 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, go on to step 3.
 - ♦ If there is no continuity, replace the PGM-FI main relay and retest.



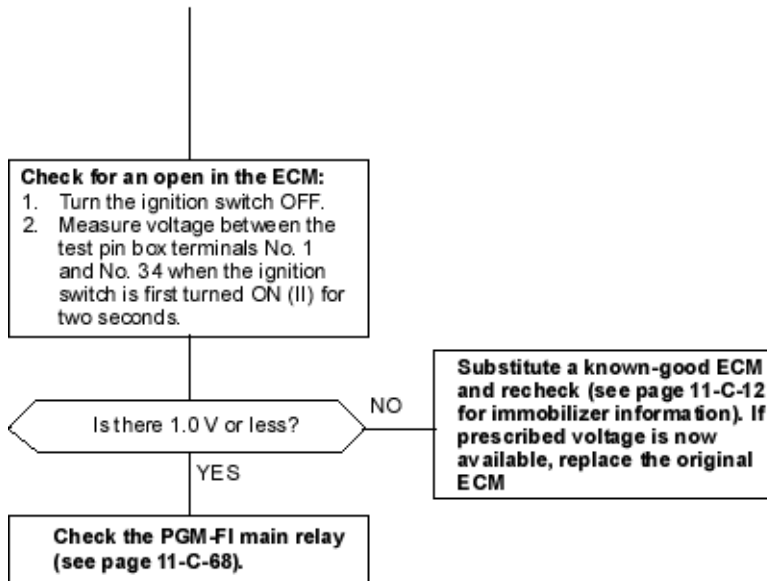
3. Attach the battery positive terminal to the No.5 terminal and the battery negative terminal to the No.3 terminal of the PGM-FI main relay. Then check there is continuity between the No.7 and the No. 6 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, go on to step 4.
 - ♦ If there is no continuity, replace the PGM-FI main relay and retest.
4. Attach the battery positive terminal to the No.6 terminal and the battery negative terminal to the No.1 terminal of the PGM-FI main relay. Then check there is continuity between the No.5 and the No.4 terminal of the PGM-FI main relay.
 - ♦ If there is continuity, the PGM-FI main relay is OK.
 - ♦ If there is no continuity, replace the PGM-FI main relay and retest.





To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-C-13\)](#)

(From page 11-C-70)



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 11-C-12\)](#)
[\(See Page 11-C-68\)](#)

NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of the column. If inspection shows the system is OK, try the next system (2), etc.

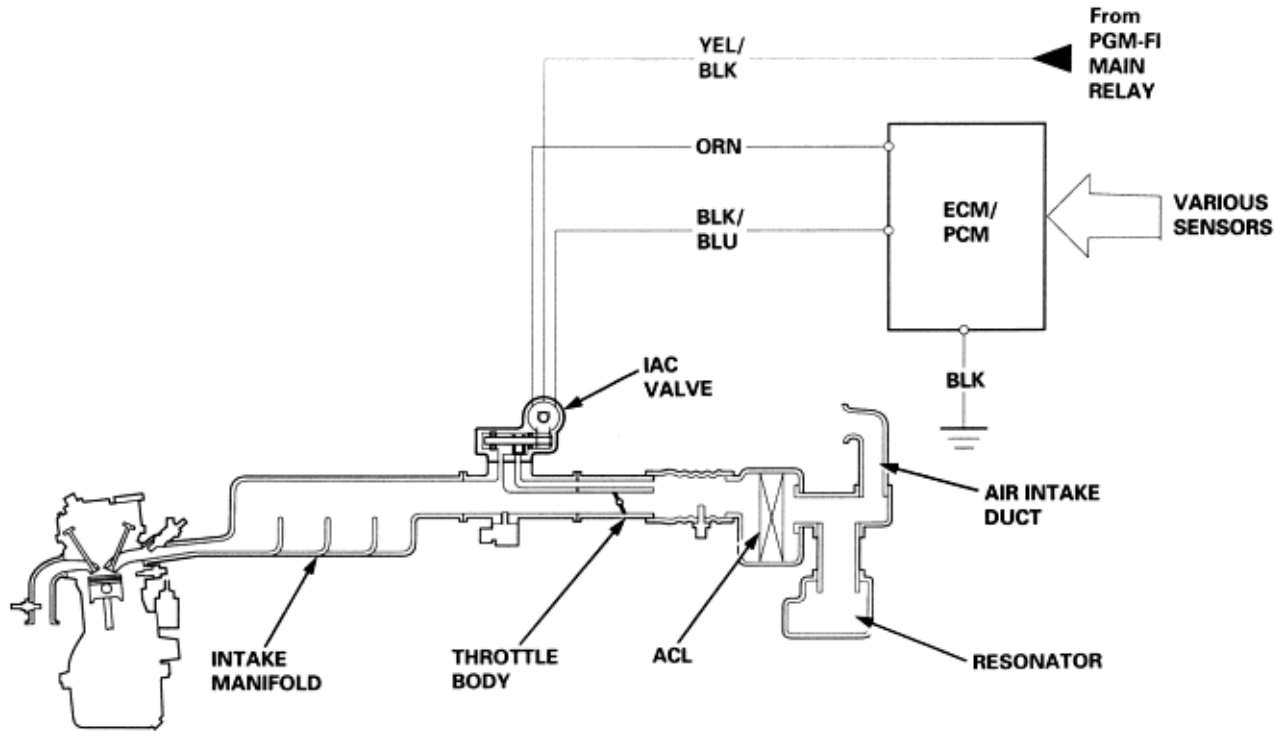
PAGE	SUB-SYSTEM	AIR CLEANER AND INTAKE AIR DUCT	THROTTLE CABLE	THROTTLE BODY
		11-A-119	11-C-74	11-C-75
	WHEN COLD FAST IDLE OUT OF SPEC			①
	WHEN WARM IDLE SPEED TOO HIGH		②	①
	LOSS OF POWER	②		①

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-A-119)
(See Page 11-C-74)
(See Page 11-C-75)

Intake Air System
System Description

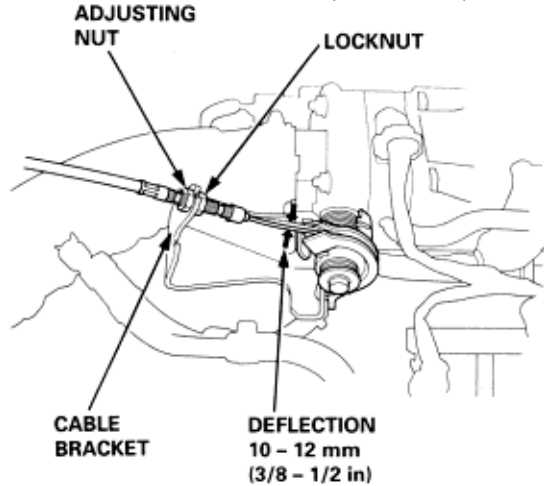
11-C-73

The system supplies air for all engine needs. It consists of the intake air pipes, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) valve and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.



Inspection/Adjustment

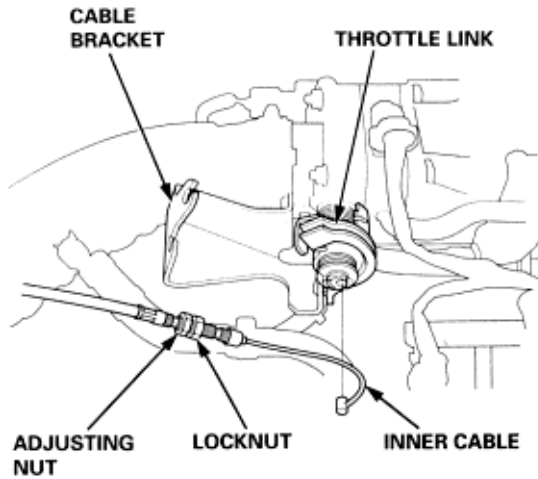
1. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load neutral) until the radiator fan comes on, then let it idle.
Check cable free play at the throttle link Cable deflection should be 10 - 12 mm (3/8 - 1/2 in.).



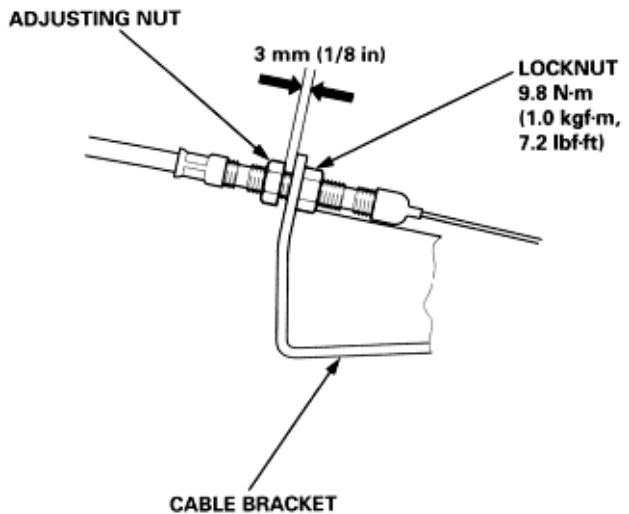
If deflection is not within specs, loosen the locknut, turn the adjusting nut until the deflection is as specified. Then retighten the locknut.
With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Installation

1. Fully open the throttle valve, then install the throttle/cable in the throttle link and install the cable housing in the cable bracket
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (transmission in neutral) until the radiator fan comes on, then let it idle.



3. Hold the cable sheath, removing all slack from the cable.
4. Turn the adjusting nut until it is 3 mm (1/8 in) away from the cable bracket.
5. Tighten the locknut. The cable deflection should now be 10 - 12 mm (3/8 - 1/2 in). If not, see Inspection/Adjustment



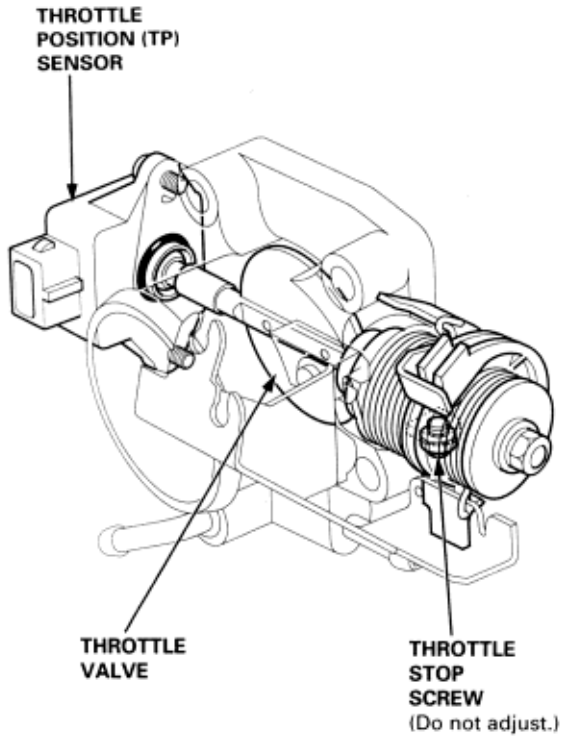
Intake Air System

Throttle Body

11-C-75

Description

The throttle body is a single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head.

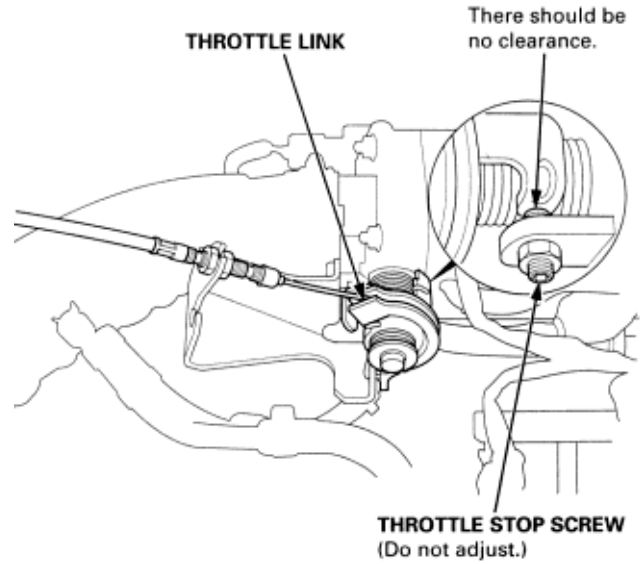


Inspection

Check that the throttle cable operates smoothly without binding or sticking.

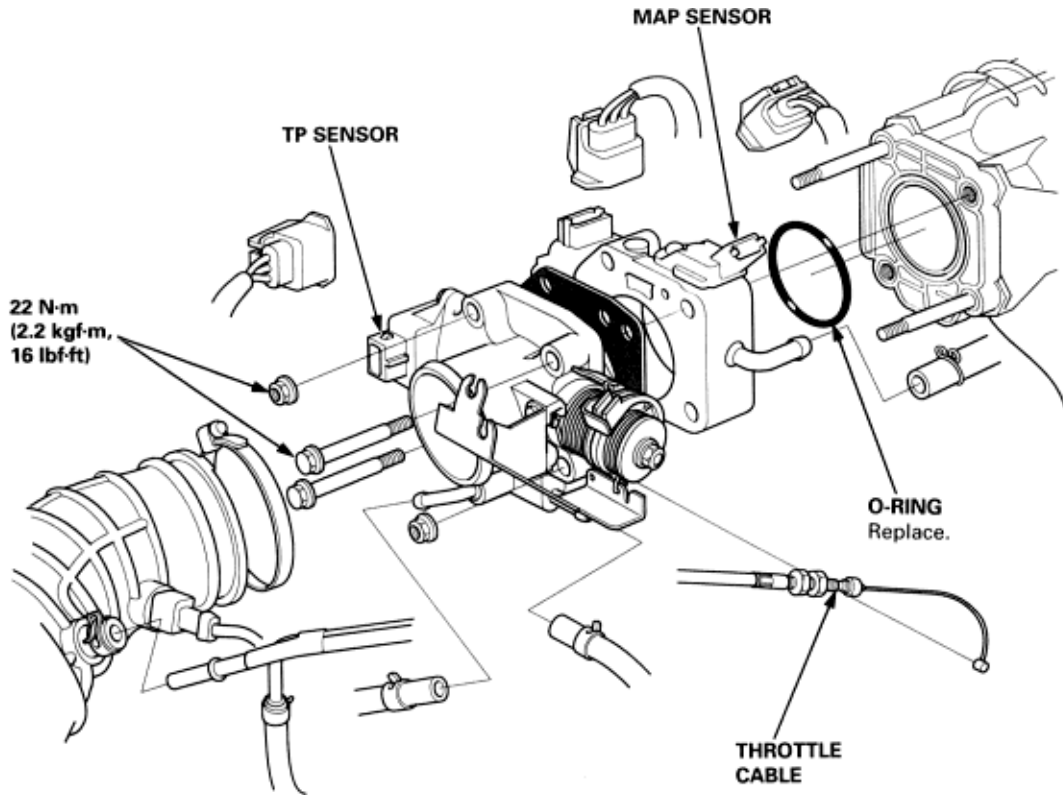
If there are any abnormalities, check for:

- ♦ Excessive wear or play in the throttle valve shaft.
- ♦ Sticky or binding throttle lever at the fully closed position.
- ♦ Clearance between throttle stop screw and throttle lever at the fully closed position.



Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

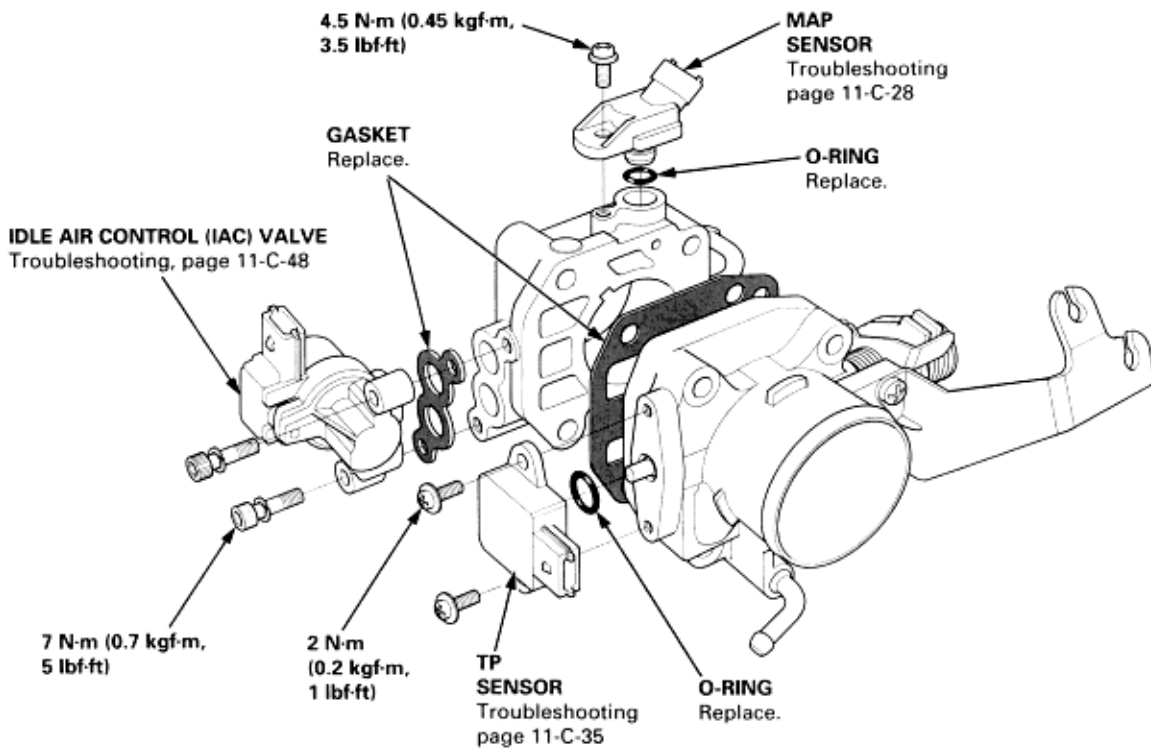
Removal



NOTE:

- ♦ Do not adjust the throttle stop screw.
- ♦ After reassembly, adjust the cruise control cable (see section 4), the throttle cable (**See Page 11-C-74**).

Disassembly



To go to the pages referenced on the diagram above,
click on the following:
[\(See Page 11-C-28\)](#)
[\(See Page 11-C-48\)](#)
[\(See Page 11-C-35\)](#)

NOTE: Across each row in the chart, the sub-system that could be sources of a symptom are ranked in the order they should be inspected starting with (1). Find the symptom in the left column, read across the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system (2), etc.

PAGE	SUB-SYSTEM	THREE WAY CATALYTIC CONVERTER	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
SYMPTOM		11-C-78	11-C-79	11-C-80
ROUGH IDLE			①	
POOR PERFORMANCE	FAILS EMISSION TEST	①		②
	LOSS OF POWER	①		

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-78)
(See Page 11-C-79)
(See Page 11-C-80)

The emission control system includes a Three-Way Catalytic Converter (TWC), Positive Crankcase Ventilation (PCV) system and Evaporative Emission (EVAP) Control system.

Tailpipe Emission

Inspection



WARNING

Do not smoke during this procedure. Keep open flame or sparks away from the work area.

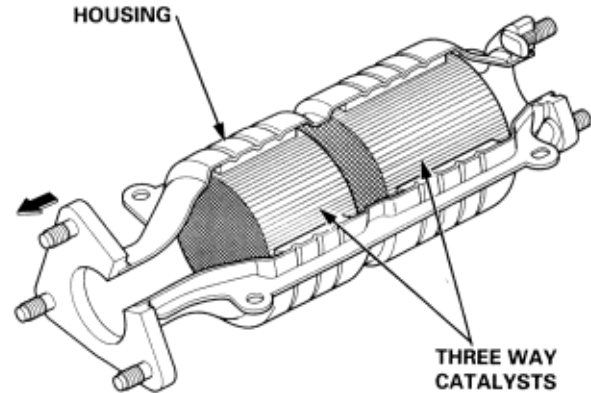
1. Connect a tachometer.
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (transmission in neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed and adjust the idle speed. If necessary (See Page 11-C-57).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlight's heater blower, rear window defogger, cooling fan, and air conditioner off.

Specified CO%: 0.1% maximum

Description

The Three Way Catalytic Converter (TWC) is used to convert hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas, to carbon dioxide (CO₂), dinitrogen (N₂) and water vapor.

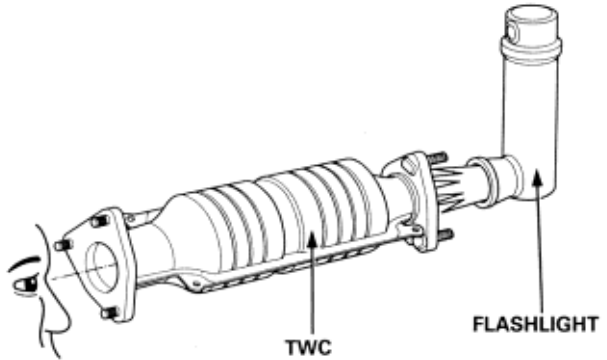
Removal/Installation (see section 9)



FRONT OF
VEHICLE

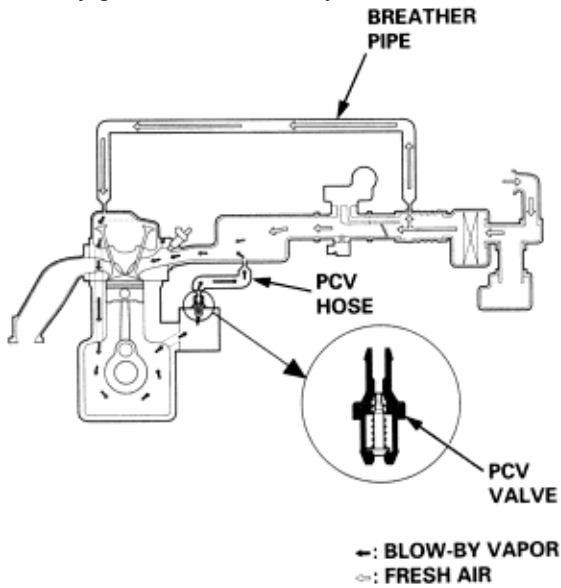
Inspection

If excessive exhaust system back-pressure is suspected, remove the TWC from the vehicle. Using a flashlight, make a visual check for plugging, melting or cracking of the catalyst. Replace the TWC if any of the visible area is damaged or plugged.

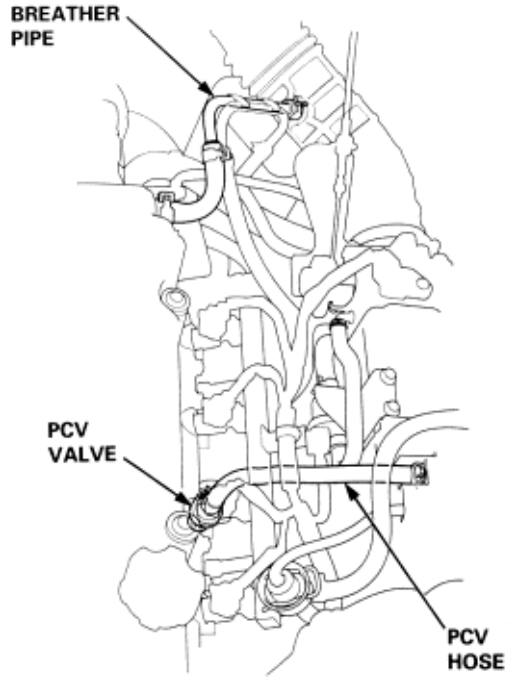


Description

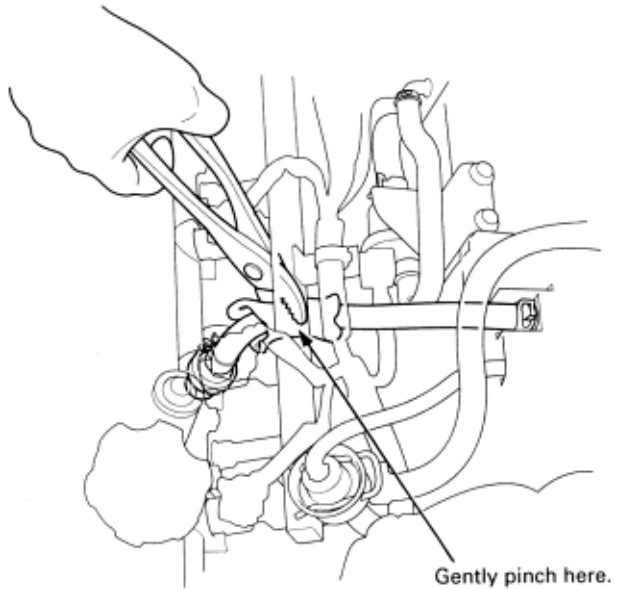
The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.



1. Check the PCV hoses and connections for leaks and clogging.



2. At idle, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold is lightly pinched with your fingers or pliers. If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.



Description

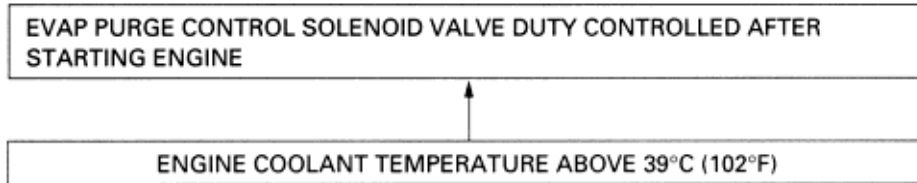
The evaporative emission controls are designed to minimize the amount of fuel vapor escaping to the atmosphere. The system consists of the following components:

A Evaporative Emission (EVAP) Control Canister

An EVAP control canister is used for the temporary storage of fuel vapor until the fuel vapor can be purged from the EVAP control canister into the engine and burned.

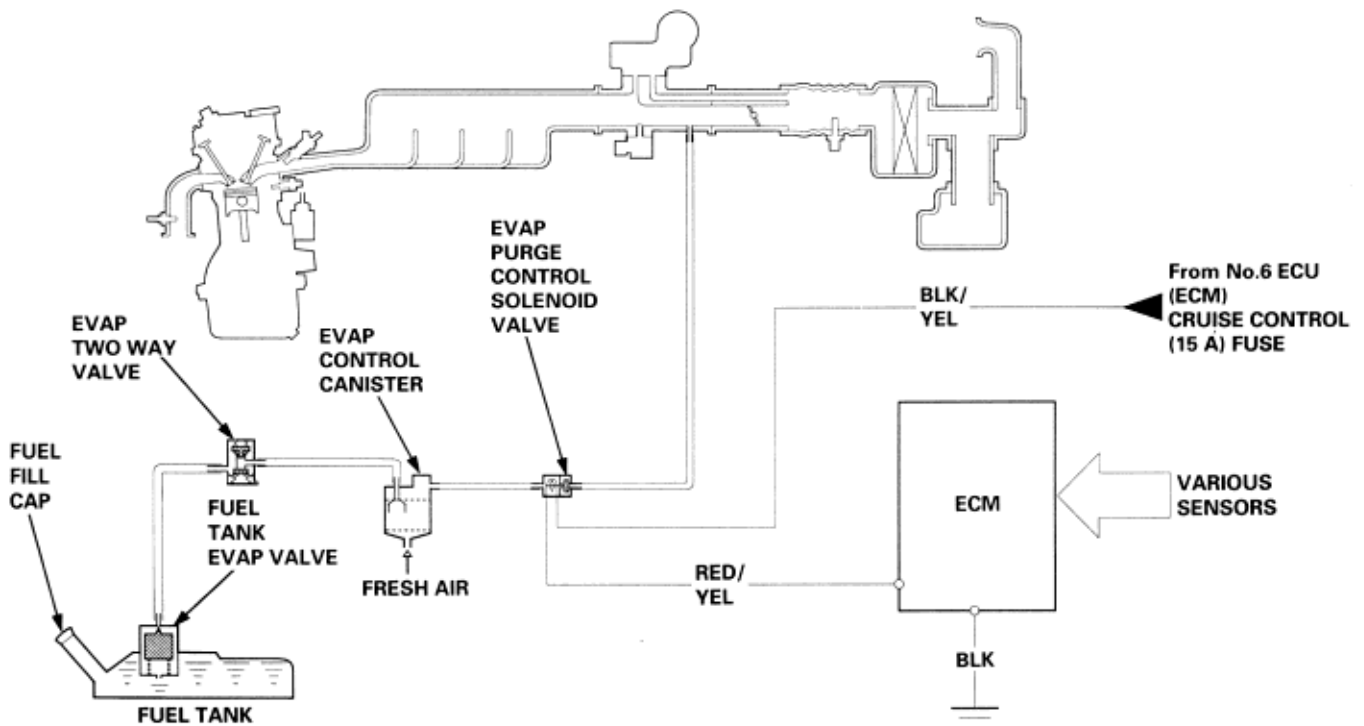
B Vapor Purge Control System

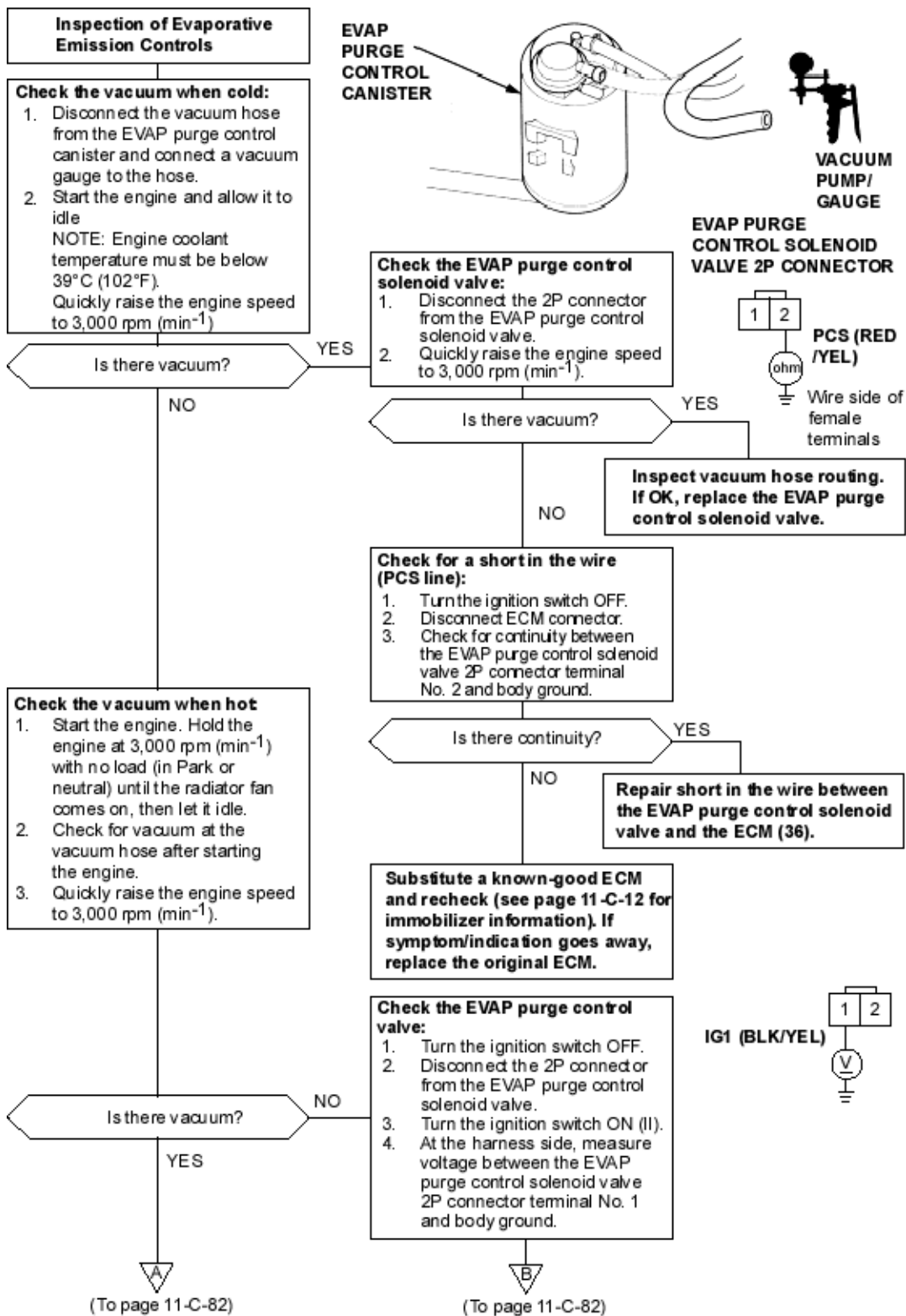
EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the throttle body. The purging vacuum is controlled by the EVAP purge control canister and the EVAP purge control solenoid valve.



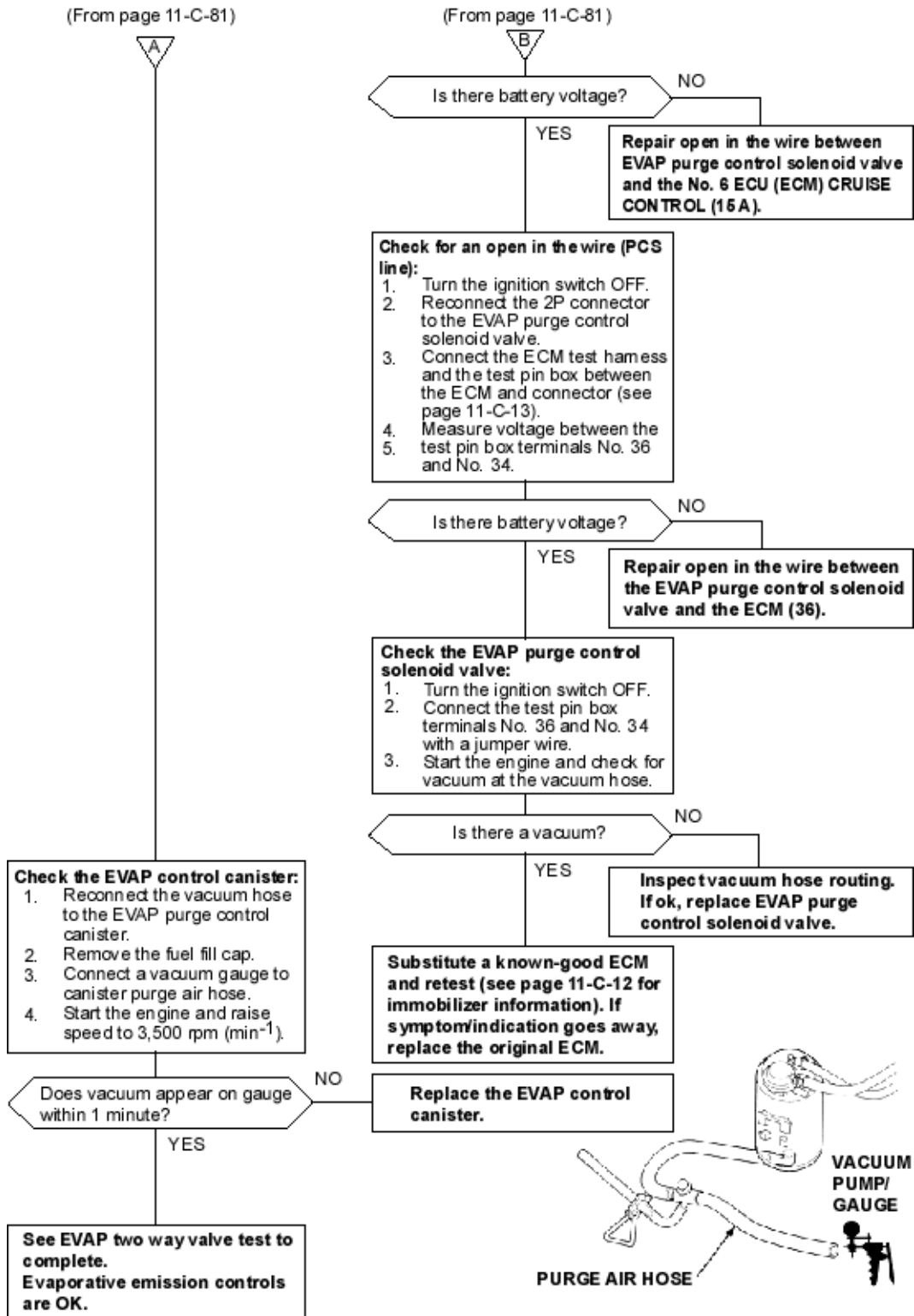
C Fuel Tank Vapor Control System

When fuel vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP control canister.





To go to the pages referenced on the diagram above, click on the following:
(See Page 11-C-12)

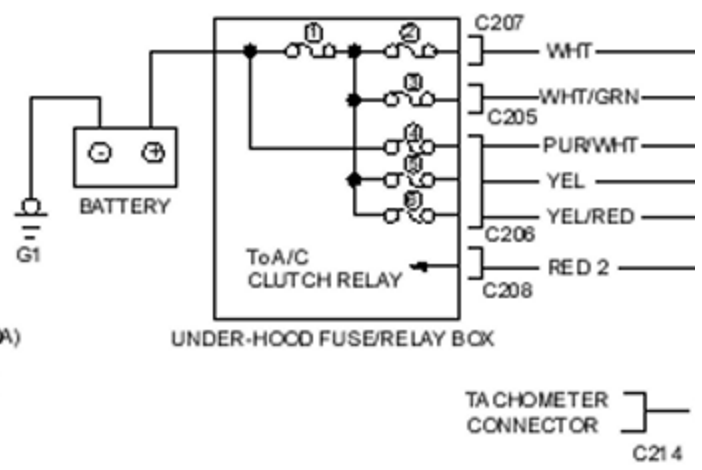
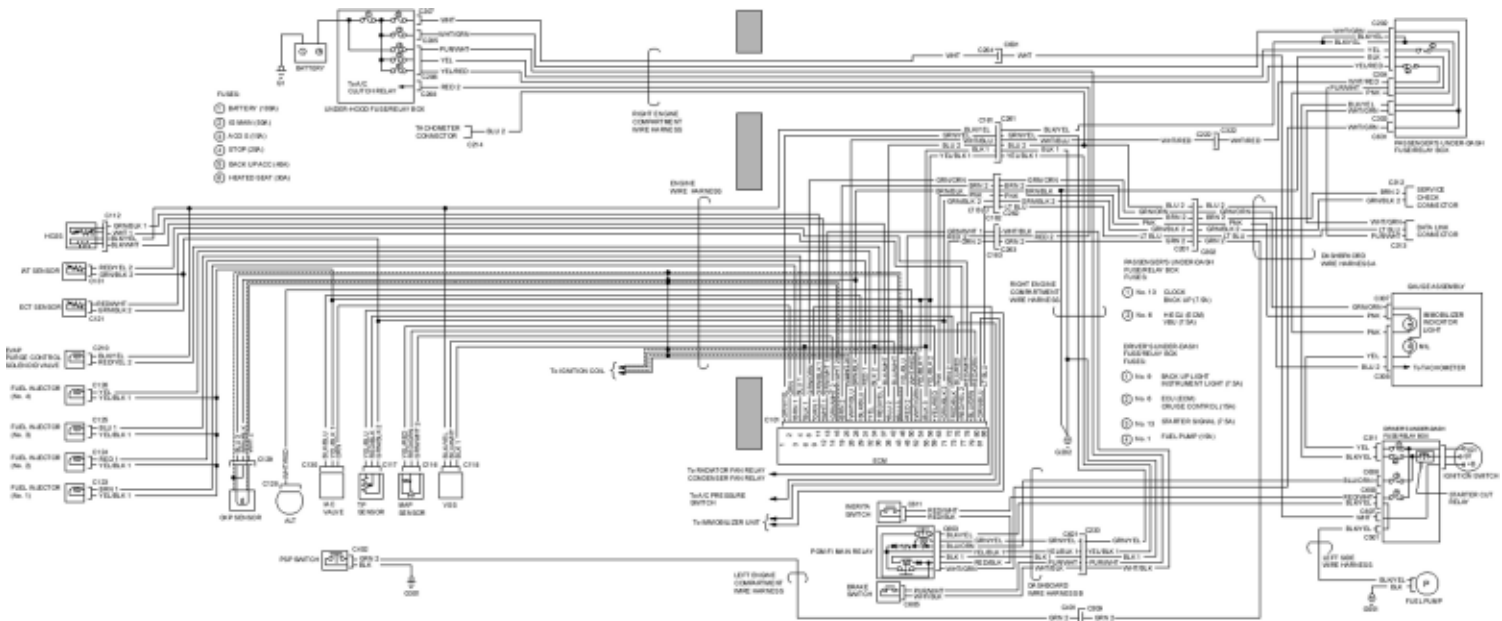


To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-C-12)
 (See Page 11-C-13)

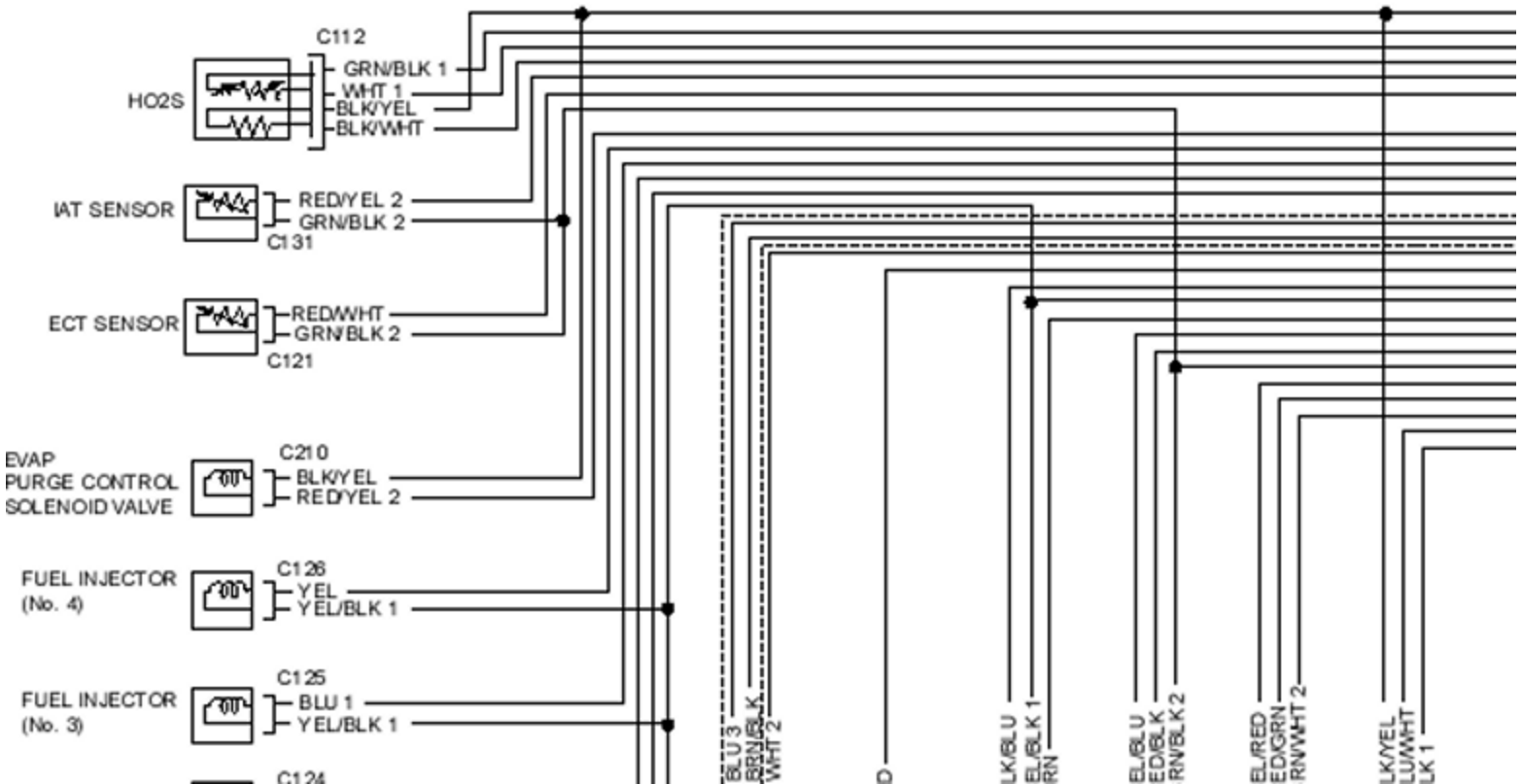
Diagrams

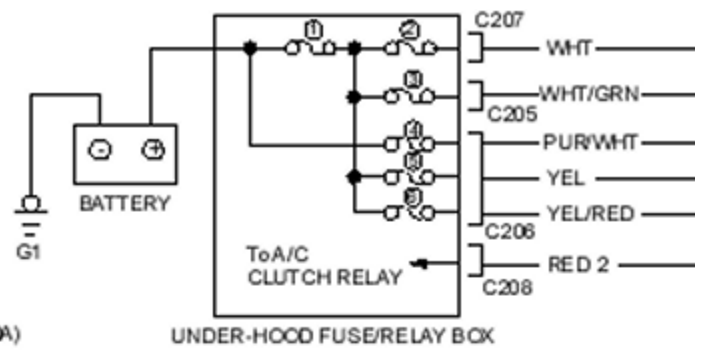
Fuel-injected System Diagram (D16B6 engine: LHD)

11-C-83



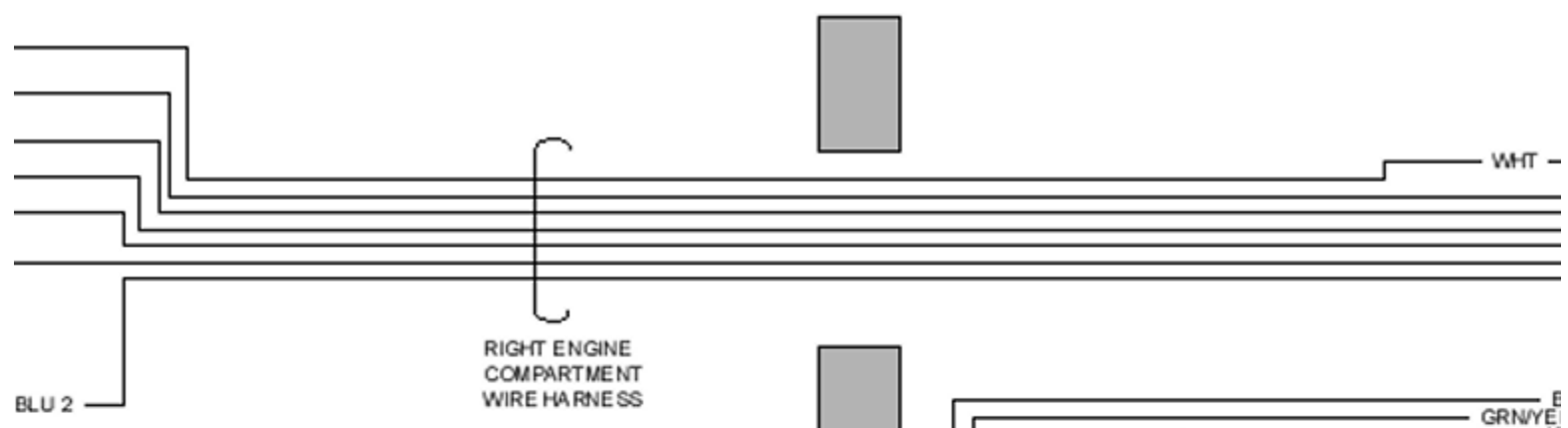
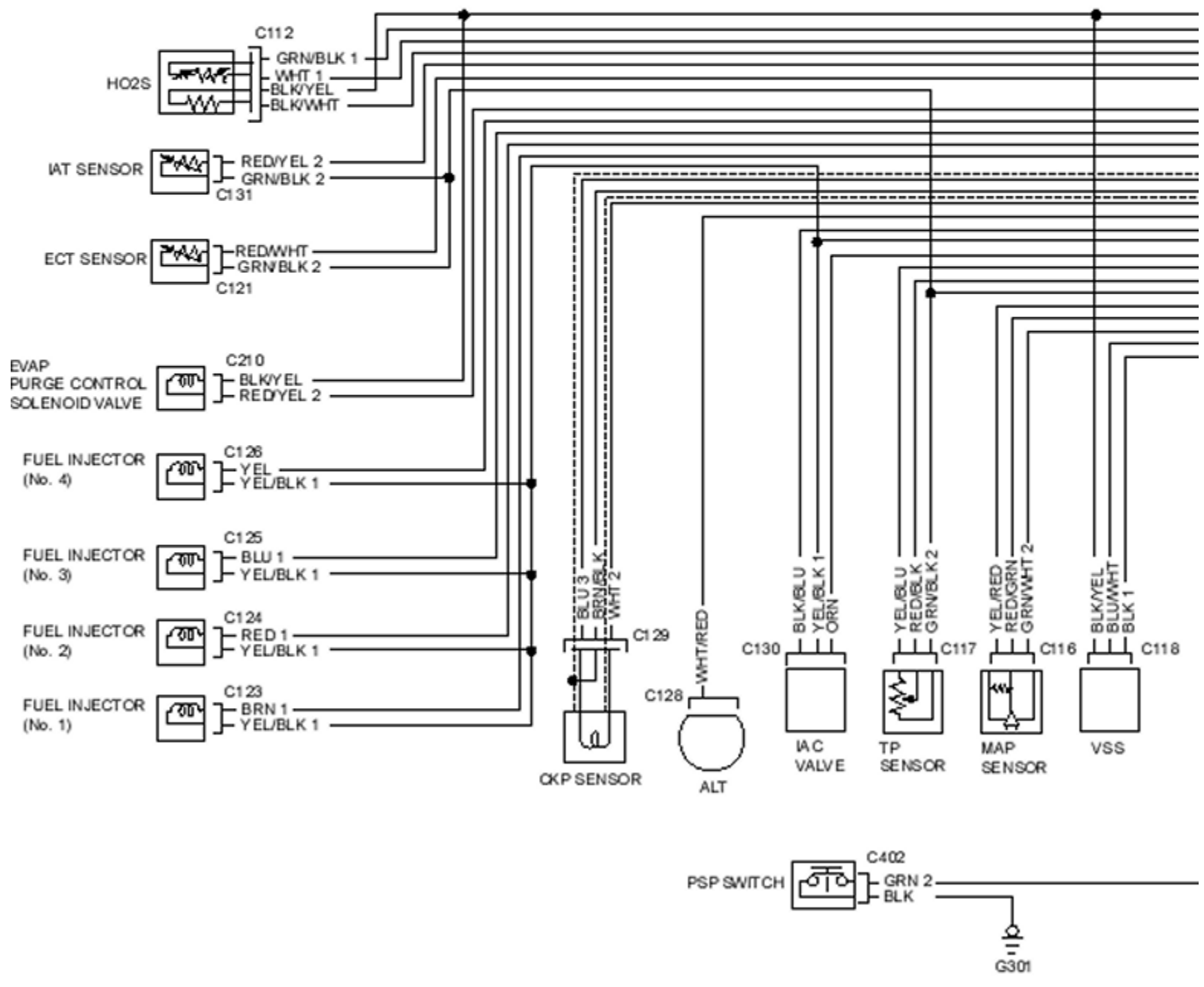
- FUSES:
- ① BATTERY (100A)
 - ② IG MAIN (50A)
 - ③ A O G S (15A)
 - ④ STOP (20A)
 - ⑤ BACK UPACC (40A)
 - ⑥ HEATED SEAT (30A)

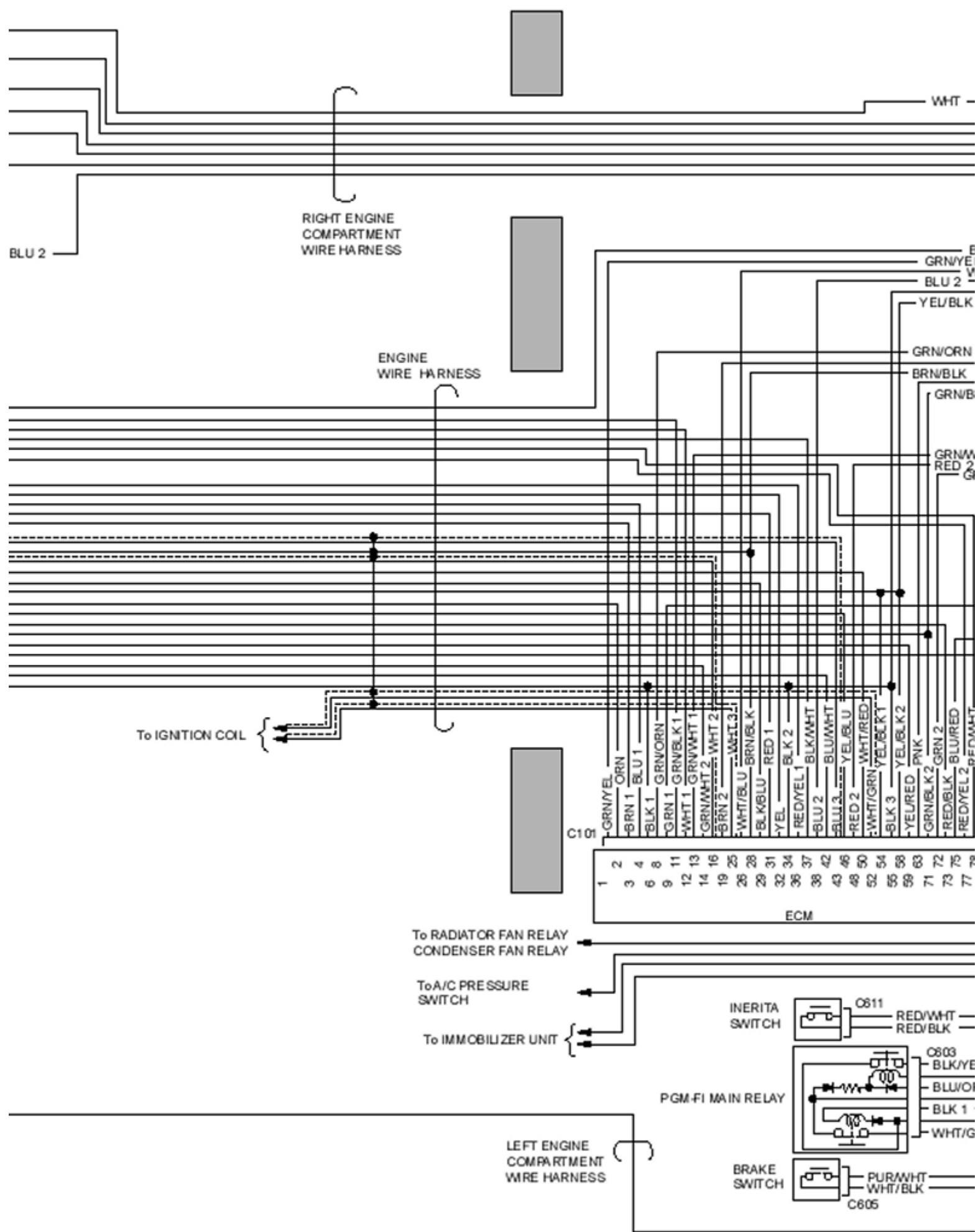


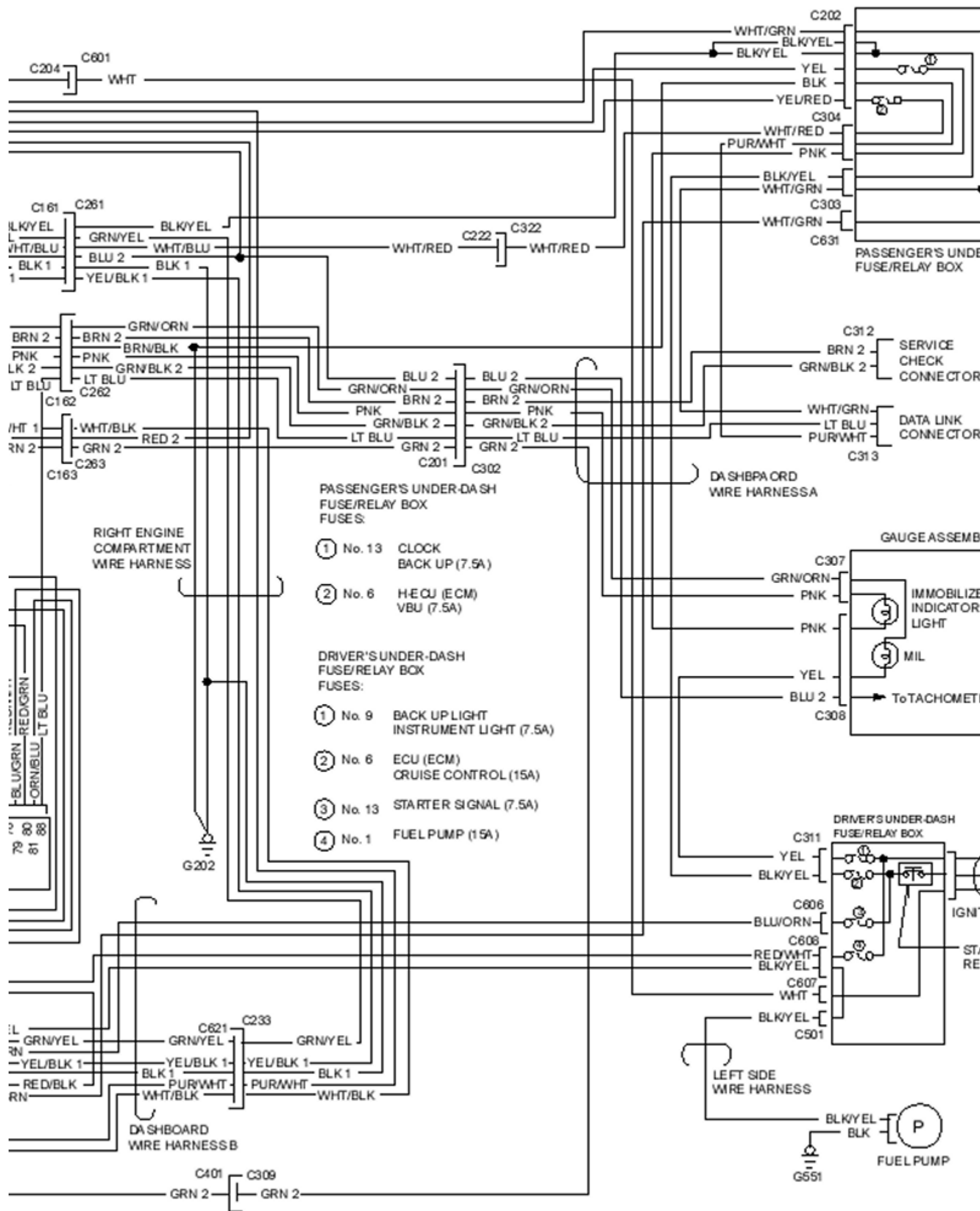


- FUSES:
- ① BATTERY (100A)
 - ② IG MAIN (50A)
 - ③ A O G S (15A)
 - ④ STOP (20A)
 - ⑤ BACK UP ACC (40A)
 - ⑥ HEATED SEAT (30A)

TACHOMETER CONNECTOR C214







PASSENGER'S UNDER-DASH FUSE/RELAY BOX FUSES:

- ① No. 13 CLOCK BACK UP (7.5A)
- ② No. 6 H-ECU (ECM) VBU (7.5A)

DRIVER'S UNDER-DASH FUSE/RELAY BOX FUSES:

- ① No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5A)
- ② No. 6 ECU (ECM) CRUISE CONTROL (15A)
- ③ No. 13 STARTER SIGNAL (7.5A)
- ④ No. 1 FUEL PUMP (15A)

RIGHT ENGINE COMPARTMENT WIRE HARNESS

DASHBOARD WIRE HARNESS B

DASHBOARD WIRE HARNESS

LEFT SIDE WIRE HARNESS

PASSENGER'S UNDER-DASH FUSE/RELAY BOX

SERVICE CHECK CONNECTOR

DATA LINK CONNECTOR

GAUGE ASSEMBLY

IMMOBILIZER INDICATOR LIGHT

MIL

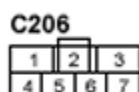
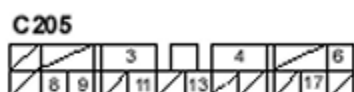
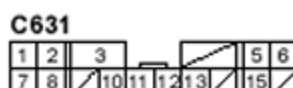
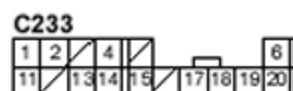
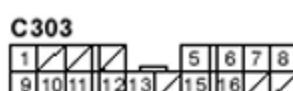
To TACHOMETER

DRIVER'S UNDER-DASH FUSE/RELAY BOX

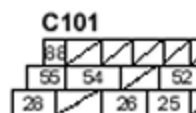
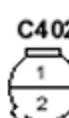
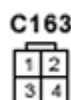
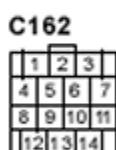
IGNITION

STARTER RELAY

FUEL PUMP

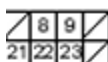


G202



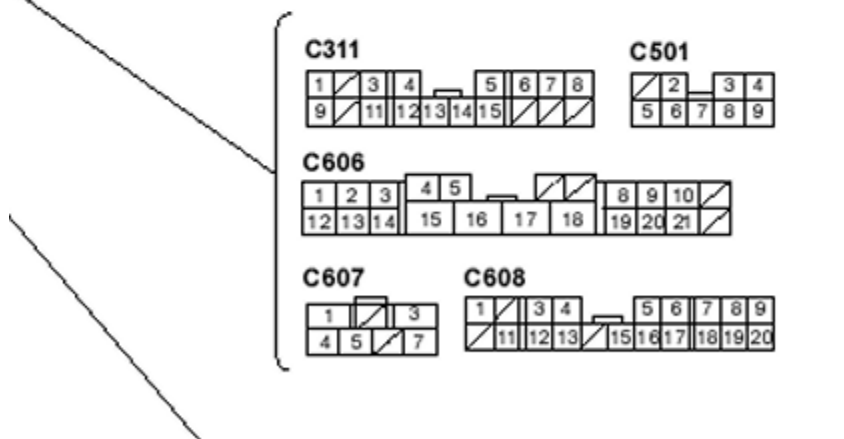
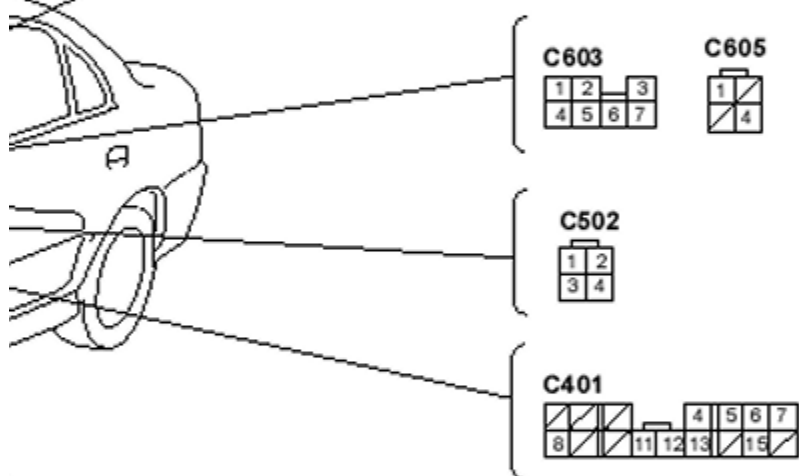
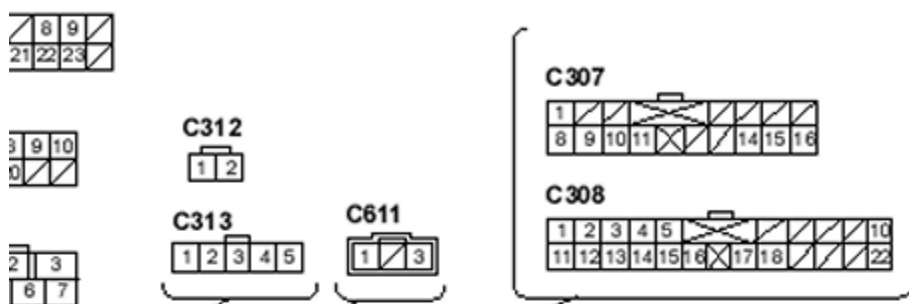
C101 (ECM)

① GRN/YEL	45	—
② ORN	④ YEL/BLU	
③ BRN ¹	47	—
⑤ BLU ¹	⑥ RED ²	
5	49	—
⑦ BLK ¹	⑧ WHT/RED	
7	51	—
⑨ GRN/ORN	⑩ WHT/GRN	
⑪ GRN ¹	53	—
10	⑫ YEL/BLK ¹	
⑬ GRN/BLK ¹	⑭ BLK ³	
⑮ WHT ¹	56	—
⑯ GRN/WHT ¹	57	—
⑰ GRN/WHT ²	⑱ YEL/BLK	
15	⑲ YEL/RED	



C307





C101 (ECM)

1	GRN/YEL	45	—
2	ORN	46	YEL/BLU
3	BRN ¹	47	—
4	BLU ¹	48	RED ²
5	—	49	—
6	BLK ¹	50	WHT/RED
7	—	51	—
8	GRN/ORN	52	WHT/GRN
9	GRN ¹	53	—
10	—	54	YEL/BLK ¹
11	GRN/BLK ¹	55	BLK ³
12	WHT ¹	56	—
13	GRN/WHT ¹	57	—
14	GRN/WHT ²	58	YEL/BLK
15	—	59	YEL/RED
16	WHT ²	60	—
17	—	61	—
18	—	62	—
19	BRN ²	63	PNK
20	—	64	—
21	—	65	—
22	—	66	—
23	—	67	—
24	—	68	—
25	WHT ³	69	—
26	WHT/BLU	70	—
27	—	71	GRN/BLK ²
28	BRN/BLK	72	GRN ²
29	BLK/BLU	73	RED/BLK
30	—	74	—
31	RED ¹	75	BLU/RED
32	YEL	76	—
33	—	77	RED/YEL ²
34	BLK ²	78	RED/WHT
35	—	79	BLU/GRN
36	RED/YEL ¹	80	RED/GRN
37	BLK/WHT	81	ORN/BLU
38	BLU ²	82	—
39	—	83	—
40	—	84	—
41	—	85	—
42	BLU/WHT	86	—
43	BLU ³	87	—
44	—	88	LT BLU

C112

1	BLK/WHT
2	BLK/YEL
3	GRN/BLK ¹
4	WHT ¹

C116

1	RED/GRN
2	GRN/WHT ²
3	YEL/RED

C117

1	RED/BLK
2	GRN/BLK ²
3	YEL/BLU

C118

1	YEL/BLU
2	BLK ¹
3	BLU/WHT

C121

1	GRN/BLK ²
2	RED/WHT

C123

1	BRN ¹
2	YEL/BLK ¹

C124

1	RED ¹
2	YEL/BLK ¹

C125

1	BLU ¹
2	YEL/BLK ¹

C126

1	YEL
2	YEL/BLK ¹

C128

1	WHT/BLU
2	WHT/RED

C129

1	WHT ²
2	BRN/BLK
3	BLU ³

C130

1	BLK/BLU
2	YEL/BLK ¹
3	ORN

C131

1	GRN/BLK ²
2	RED/YEL ²

C161

1	—	6	GRN/YEL
2	WHT/BLU	7	WHT/BLU
3	BLK/YEL	8	BLK ¹
4	YEL/BLK ¹	9	BLK/WHT
5	BLU ²	10	BLK/YEL

C210

1	BLK/YEL
2	BLK/YEL ¹

C214

1	—
2	BLU ²

C233

1	RED/BLU	13	LT GRN/RED
2	GRN/YEL	14	LT BLU
3	—	15	YEL
4	BLK ¹	16	—
5	—	17	PUR/WHT
6	YEL	18	WHT/BLK
7	—	19	GRN
8	BLK/YEL	20	GRN/BLK
9	RED	21	RED/WHT
10	—	22	WHT/GRN
11	YEL/BLU	23	PNK/BLK

C308

1	BLK/WHT	12	GRN/BLK
2	YEL/GRN	13	GRN/WHT
3	GRN/RED	14	GRN/YEL
4	RED/YEL	15	YEL
5	ORN	16	PNK
6	—	17	BLK
7	—	18	BLU/WHT
8	—	19	—
9	—	20	—
10	BLU ²	21	—
11	GRN/ORN	22	BLK

C311

1	GRN/WHT	10	—
2	—	11	PUR

C603

1	GRN/YEL	6	R
2	BLU/ORN	7	Y
3	BLK ²	8	W
4	BLU/YEL	9	—

C605

1	PUR/WHT
2	—
3	WHT/BLK
4	—

C606

1	PUR	12	GRN/RED
2	WHT/BLU	13	—

C129

① WHT ²
② BRN/BLK
③ BLU ³

C130

① BLK/BLU
② YEL/BLK ¹
③ ORN

C131

① GRN/BLK ²
② RED/YEL ²

C161

1 —	⑥ GRN/YEL
② WHT/BLU	7 WHT/BLU
③ BLK/YEL	⑧ BLK ¹
④ YEL/BLK ¹	9 BLK/WHT
⑤ BLU ²	10 BLK/YEL

C162

① BRN/BLK	③ PNK
2 YEL/GRN	④ LT BLU
⑤ GRN/BLK ²	⑥ GRN/ORN
4 BLU/WHT	⑦ BRN ²
5 GRN/BLK	12 GRN
6 YEL	13 BLU/GRN
7 YEL/RED	14 ORN/BLU

C163

① GRN ²
② RED ²
③ GRN/WHT ¹
4 BLU/RED

C202

1 —	⑥ BLK/YEL
2 RED/YEL	11 —
③ BLK/YEL	④ BLU/WHT
⑤ YEL/RED	13 BLU/RED
⑥ YEL	14 GRN/YEL
6 —	15 —
7 RED/BLK	16 —
8 BLK/ORN	17 —
⑧ WHT/GRN	⑨ BLK

C205

1 —	10 —
2 —	11 LT GRN/RED
3 RED/YEL	12 —
4 RED/WHT	13 BLU/RED
5 —	14 —
6 PUR/WHT	15 —
7 —	16 —
8 BLU/RED	⑦ WHT/GRN
9 BLU/RED	18 —

C206

1 WHT/BLU
2 YEL/GRN
③ YEL/RED
4 WHT/GRN
④ PUR/WHT
6 GRN
⑤ YEL

C207

1 YEL/BLK
② WHT
3 WHT/GRN

C208

1 BLK/ORN	9 —
2 RED/WHT	10 —
3 BLU/BLK	11 RED ¹
4 BLU/YEL	12 GRN
5 —	13 —
6 —	14 BLK
7 RED	15 —
8 BLK/ORN	13 BLK/ORN

C210

① BLK/YEL
② BLK/YEL ¹

C214

1 —
② BLU ²

C233

1 RED/BLU	13 LT GRN/RED
② GRN/YEL	14 LT BLU
3 —	15 YEL
④ BLK ¹	16 —
5 —	⑤ PUR/WHT
6 YEL	18 WHT/BLK
7 —	19 GRN
8 BLK/YEL	20 GRN/BLK
9 RED	21 RED/WHT
10 —	22 WHT/GRN
11 YEL/BLU	23 PNK/BLK
12 —	24 —

C302

1 —	12 BLU/BLK
2 —	⑥ GRN/BLK ²
3 —	14 —
4 YEL	15 YEL/RED
5 GRN/BLK	⑦ GRN ²
6 —	⑧ BLU ²
⑨ LT BLU	18 YEL/GRN
⑩ BRN ²	19 WHT/BLU
⑪ GRN/ORN	20 YEL/GRN
⑫ PNK	21 —
11 —	22 —

C303

1 BLU/WHT	10 RED/WHT
2 —	11 PUR/WHT
3 —	④ BLK/YEL
4 —	13 RED/YEL
5 RED/YEL	14 —
6 BRN/WHT	⑤ WHT/GRN
7 RED/BLK	16 GRN/WHT
8 BLK/WHT	17 —
9 GRN/BLK	18 —

C304

1 —	10 WHT/GRN
2 —	11 WHT/GRN
3 GRN/WHT	12 —
4 —	13 WHT/RED
5 WHT	④ PUR/WHT
6 YEL/GRN	15 —
7 YEL	⑤ PNK
⑧ WHT/RED	17 —
9 —	18 —

C307

1 YEL/BLU	9 RED/BLK
2 —	10 YEL/RED
3 —	11 WHT/BLU
4 —	12 —
5 —	13 —
6 —	④ PNK ¹
7 —	⑤ GRN/ORN
8 PUR	16 BLK/YEL

C308

1 BLK/WHT	12 GRN/BLK
2 YEL/GRN	13 GRN/WHT
3 GRN/RED	14 GRN/YEL
4 RED/YEL	⑥ YEL
5 ORN	⑦ PNK
6 —	17 BLK
7 —	18 BLU/WHT
8 —	19 —
9 —	20 —
⑧ BLU ²	21 —
11 GRN/ORN	22 BLK

C311

1 GRN/WHT	10 —
2 —	11 PUR
3 GRY	⑥ BLK/YEL
④ YEL	13 RED/BLK
5 YEL/GRN	14 GRN/ORN
6 BLK	15 GRN/YEL
7 YEL/RED	16 —
8 RED/BLK	17 —
9 GRN/RED	18 —

C312

① GRN/BLK ²
② BRN ²

C313

① LT BLU
2 PUR
3 BLU/WHT
④ WHT/GRN
⑤ PUR/WHT

C322

1 —	6 PUR/WHT
2 —	7 BLU/BLK
③ WHT/RED	8 YEL
4 WHT/GRN	9 —
5 ORN	10 —

C401

1 —	9 —
2 —	10 —
3 —	① GRN ²
4 BLU/WHT	12 BLU/RED
5 BLU/BLK	13 PUR/WHT
6 PUR	14 —
7 GRN	15 RED/YEL
8 YEL/GRN	16 BLU

C402

① GRN ²
② BLK

C501

1 —	6 GRN/BLK
2 GRN	7 RED/BLU
3 GRN/ORN	8 PUR
④ BLK/YEL	9 LT BLU
5 GRN/ORN	10 GRN/YEL

C502

① BLK/YEL
② BLK
3 BLK
4 YEL/BLU

C601

1 BLK/WHT
2 WHT/BLU
③ WHT
4 BLU
5 BLU/YEL
6 BLU/RED
7 BLU/BLK

C603

① GRN/YEL	④ R
② BLU/ORN	⑤ Y
③ BLK ²	⑥ W
④ BLU/YEL	

C605

① PUR/WHT
2 —
③ WHT/BLK
4 —

C606

1 PUR	12 C
2 WHT/BLU	13 C
3 GRN/RED	14 Y
4 BLK	15 E
5 BLK/ORN	16 V
6 —	17 L
7 —	18 C
8 RED/BLK	19 —
9 BLK	20 —
④ BLU/ORN	21 C
11 —	22 —

C607

1 BLK/WHT
2 —
③ WHT
4 GRN/BLK
5 BLK/YEL
6 —
7 BLK/YEL

C608

① RED/WHT	11 Y
2 —	12 B
3 RED/BLK	13 B
4 LT GRN/RED	14 —
5 WHT/RED	15 Y
6 BLK	16 L
⑦ BLK/YEL	17 B
8 WHT/BLK	18 Y
9 BLU	19 P
10 —	20 V

C611

① RED/BLK
2 —
③ RED/WHT

C631

1 WHT/BLU	9 —
2 GRN/WHT	10 E
3 WHT	① V
4 —	12 Y
5 RED/BLK	13 L
6 BLK	14 —
7 YEL/BLK	15 E
8 BLU/WHT	16 —

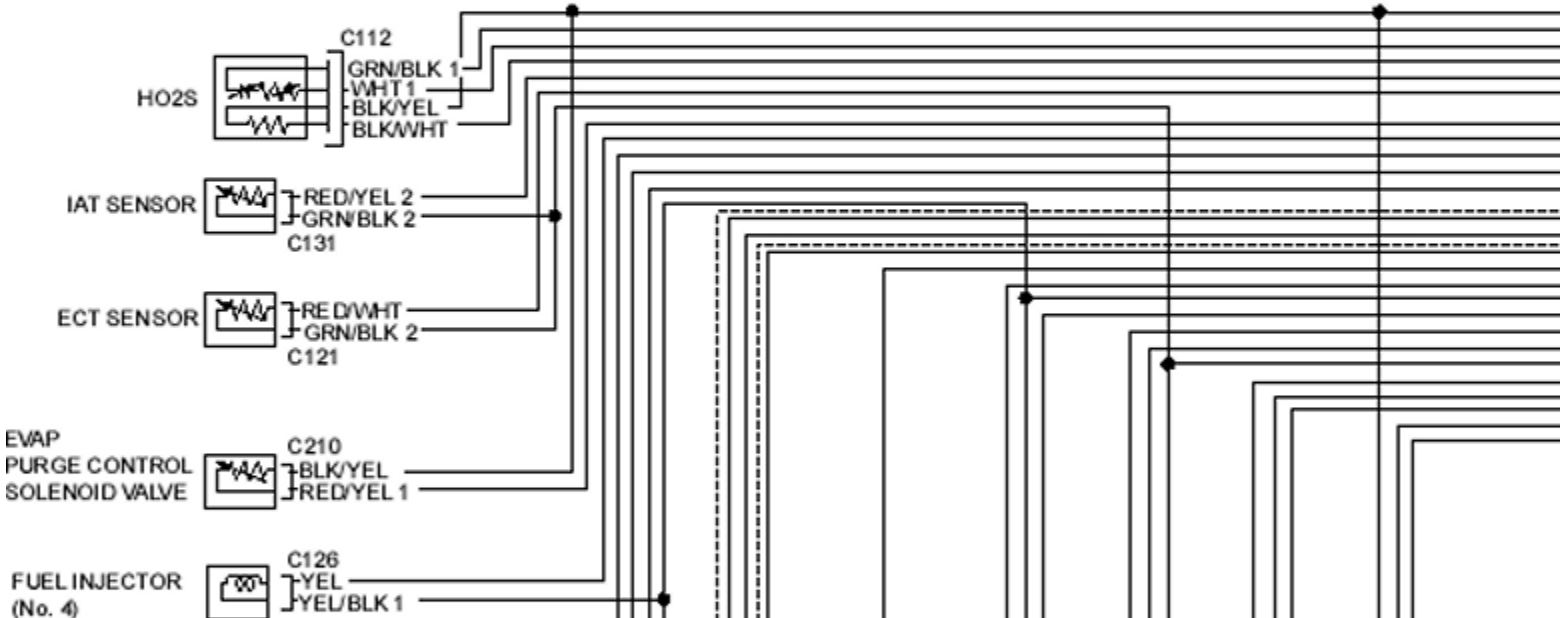
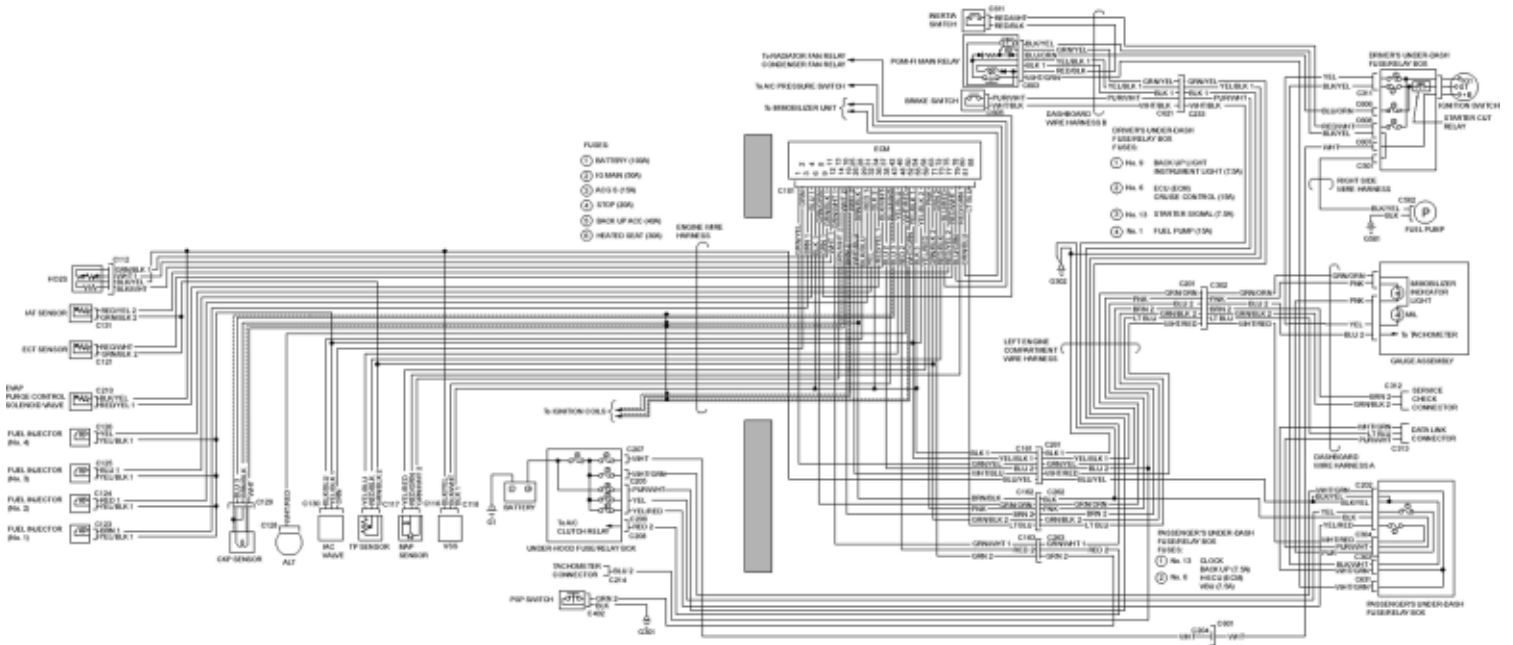
NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

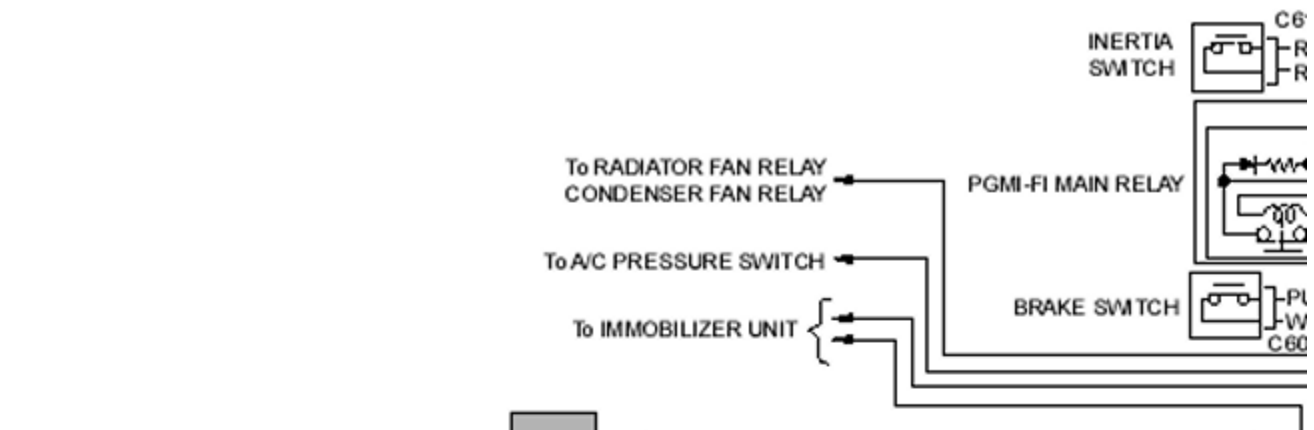
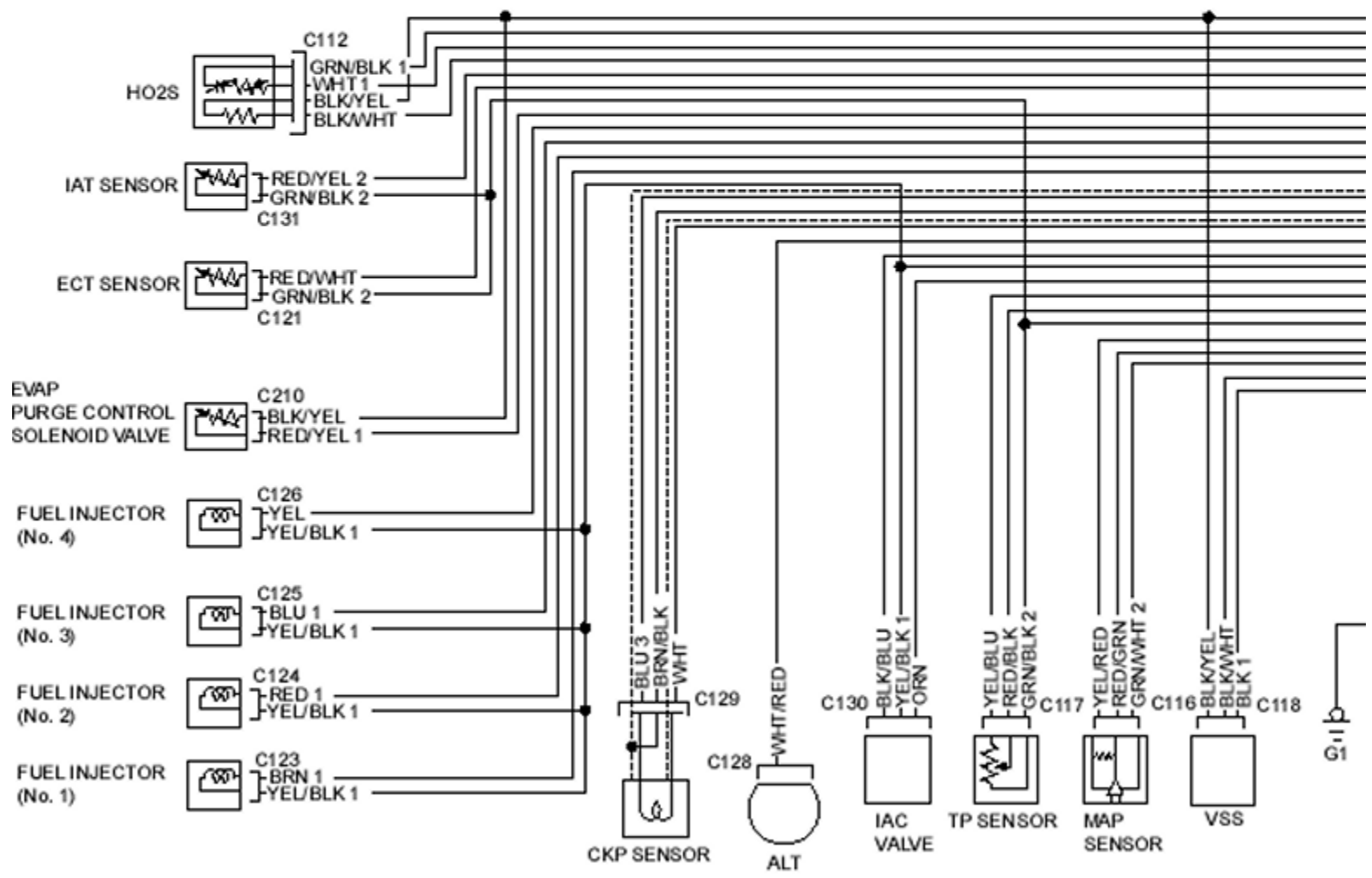
- : Related to Fuel and Emissions System.
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

Diagrams

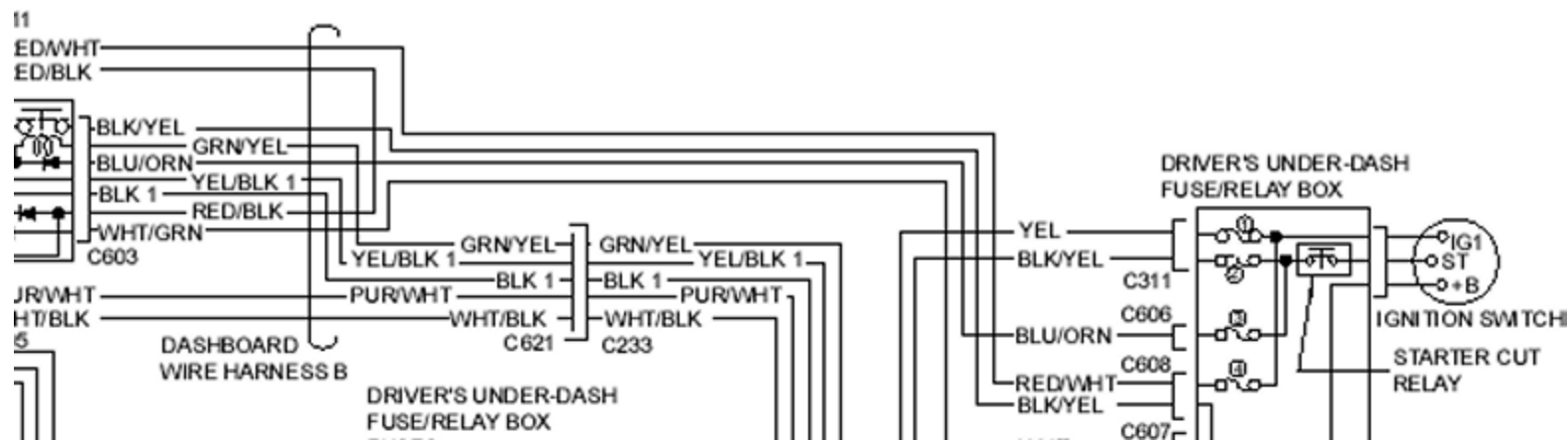
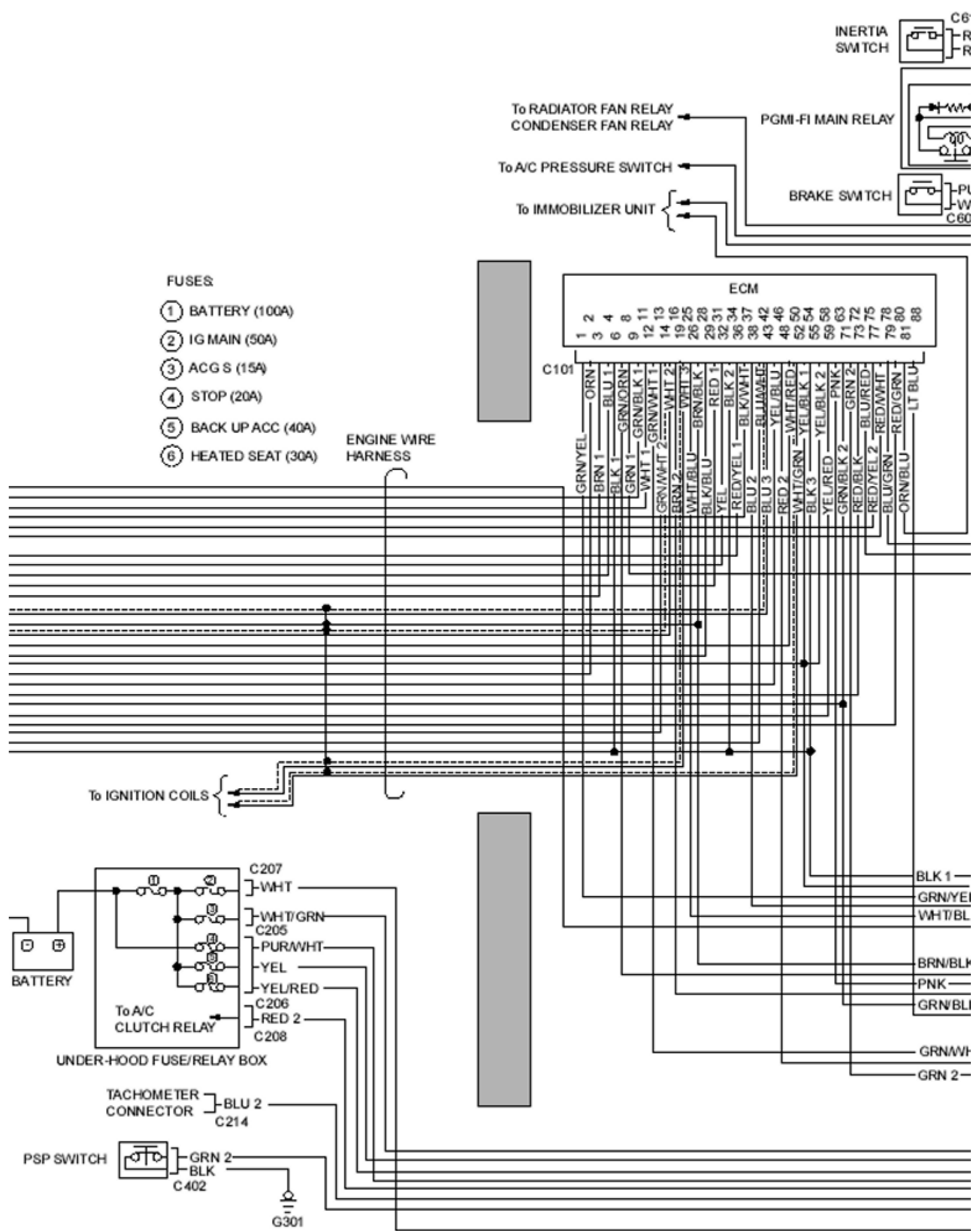
Fuel-injected System Diagram (D16B6 engine: RHD)

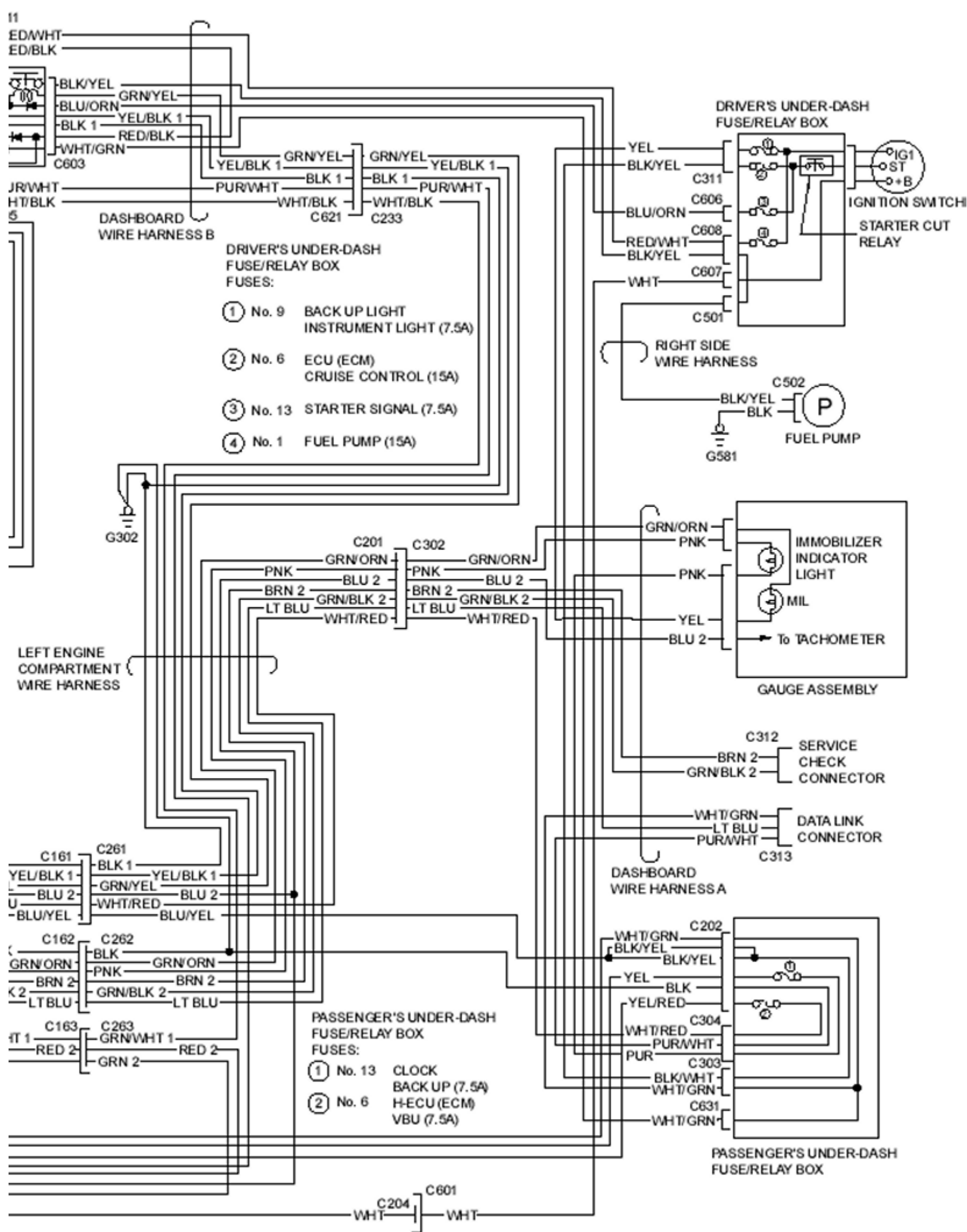
11-C-85





FUSES

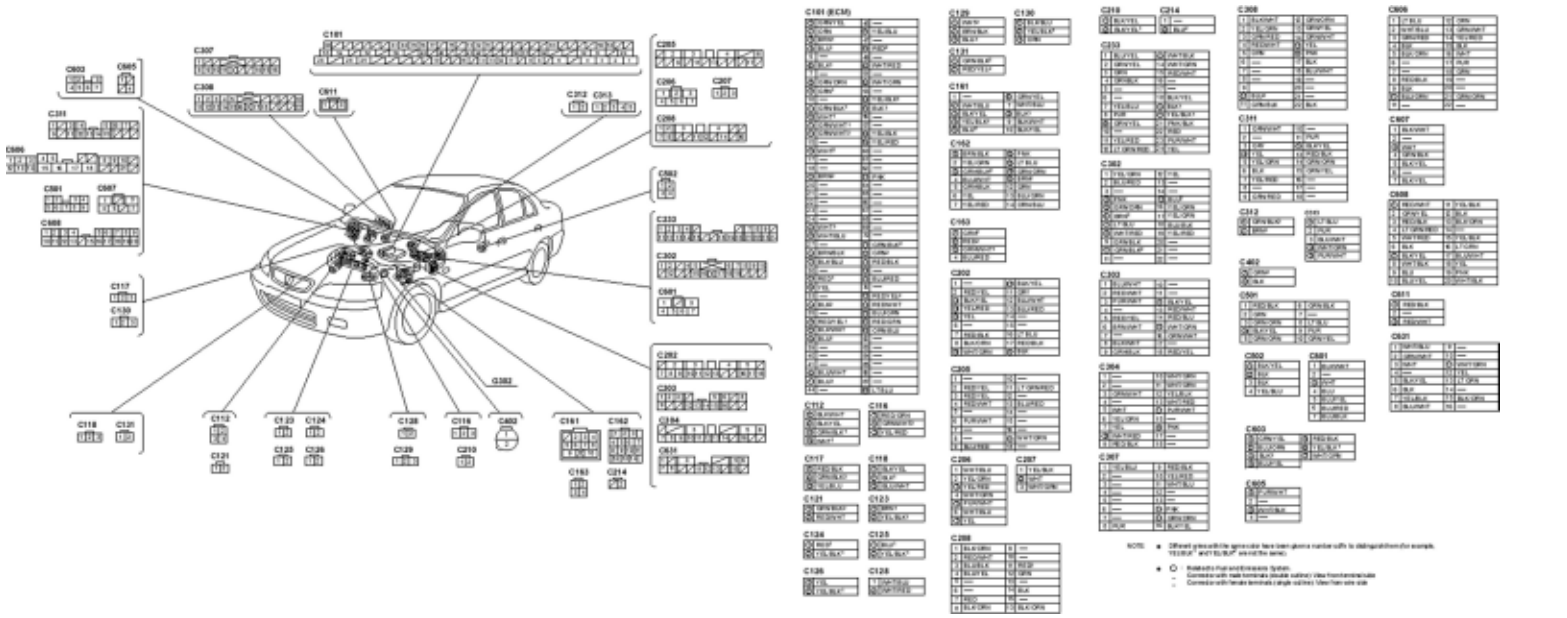




Diagrams

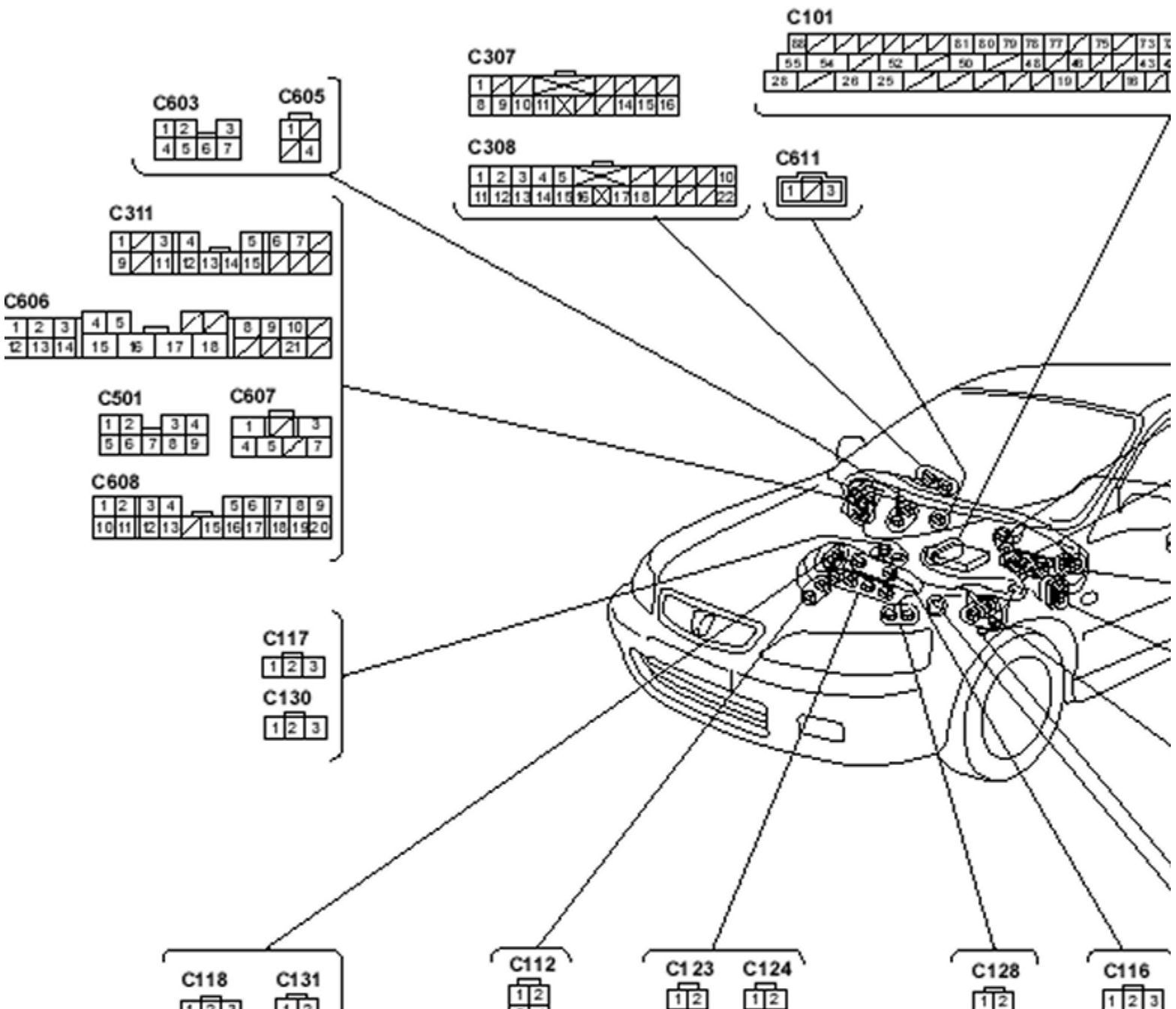
Fuel-injected System Connectors (D16B6 engine: RHD)

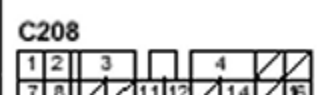
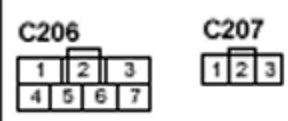
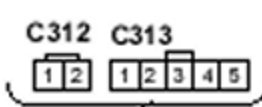
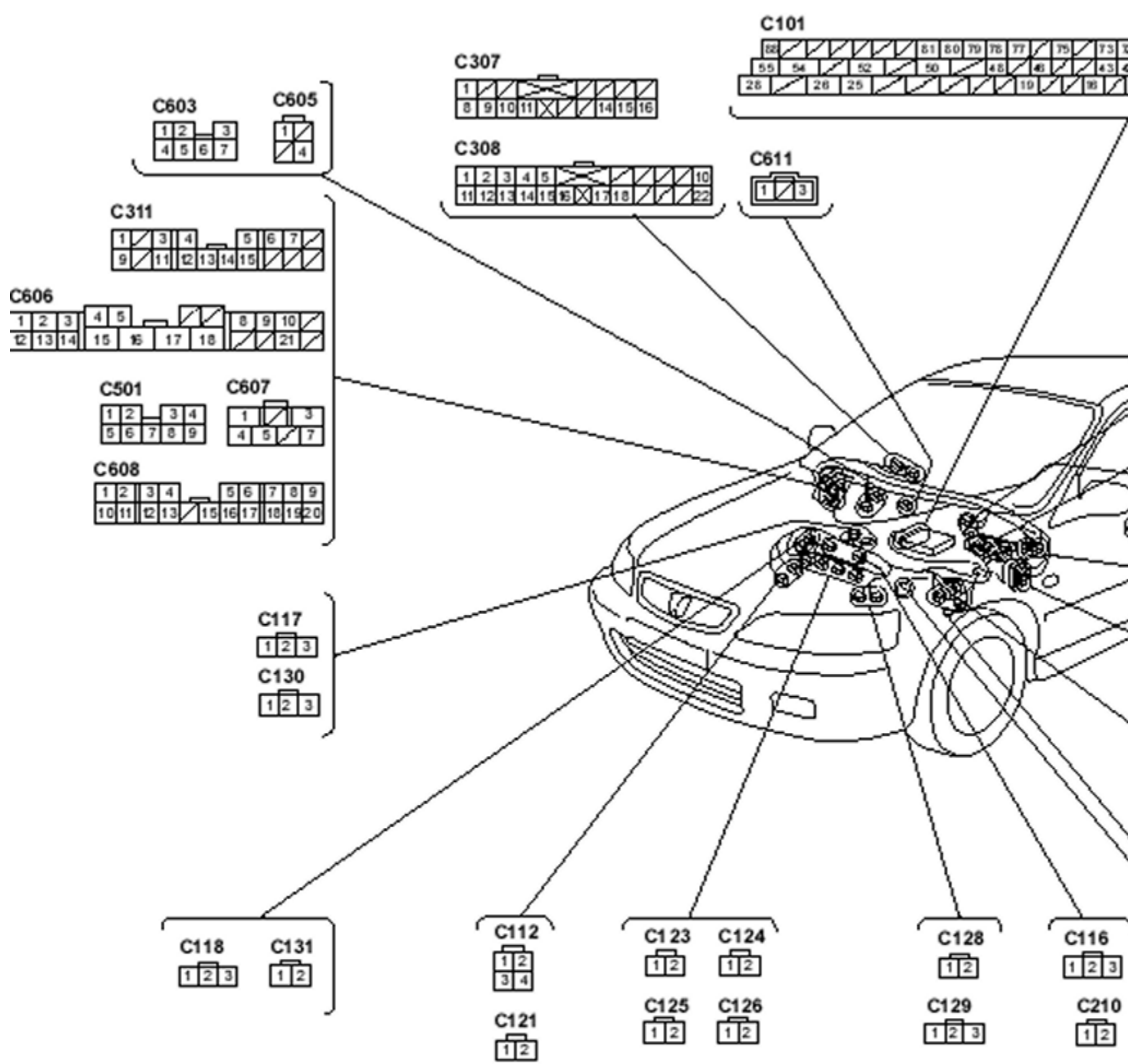
11-C-86



C101 (C40)	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306	C307	C308	C309	C310	C311	C312	C313	C314	C315	C316	C317	C318	C319	C320	C321	C322	C323	C324	C325	C326	C327	C328	C329	C330	C331	C332	C333	C334	C335	C336	C337	C338	C339	C340	C341	C342	C343	C344	C345	C346	C347	C348	C349	C350	C351	C352	C353	C354	C355	C356	C357	C358	C359	C360	C361	C362	C363	C364	C365	C366	C367	C368	C369	C370	C371	C372	C373	C374	C375	C376	C377	C378	C379	C380	C381	C382	C383	C384	C385	C386	C387	C388	C389	C390	C391	C392	C393	C394	C395	C396	C397	C398	C399	C400	C401	C402	C403	C404	C405	C406	C407	C408	C409	C410	C411	C412	C413	C414	C415	C416	C417	C418	C419	C420	C421	C422	C423	C424	C425	C426	C427	C428	C429	C430	C431	C432	C433	C434	C435	C436	C437	C438	C439	C440	C441	C442	C443	C444	C445	C446	C447	C448	C449	C450	C451	C452	C453	C454	C455	C456	C457	C458	C459	C460	C461	C462	C463	C464	C465	C466	C467	C468	C469	C470	C471	C472	C473	C474	C475	C476	C477	C478	C479	C480	C481	C482	C483	C484	C485	C486	C487	C488	C489	C490	C491	C492	C493	C494	C495	C496	C497	C498	C499	C500	C501	C502	C503	C504	C505	C506	C507	C508	C509	C510	C511	C512	C513	C514	C515	C516	C517	C518	C519	C520	C521	C522	C523	C524	C525	C526	C527	C528	C529	C530	C531	C532	C533	C534	C535	C536	C537	C538	C539	C540	C541	C542	C543	C544	C545	C546	C547	C548	C549	C550	C551	C552	C553	C554	C555	C556	C557	C558	C559	C560	C561	C562	C563	C564	C565	C566	C567	C568	C569	C570	C571	C572	C573	C574	C575	C576	C577	C578	C579	C580	C581	C582	C583	C584	C585	C586	C587	C588	C589	C590	C591	C592	C593	C594	C595	C596	C597	C598	C599	C600	C601	C602	C603	C604	C605	C606	C607	C608
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NOTE:
 • Different pinouts are specified for two-pin glow plug sockets in different models.
 • "X" indicates that the connector is not used in the engine.
 • "O" indicates that the connector is not used in the engine.
 • Connect with correct polarity (check color) for the correct use.





C101 (ECM)

1	GRN/YEL	46	—
2	ORN	47	YEL/BLU
3	BRN ¹	48	—
4	BLU ¹	49	RED ²
5	—	50	—
6	BLK ¹	51	WHT/RED
7	—	52	—
8	GRN/CRN	53	WHT/GRN
9	GRN ¹	54	—
10	—	55	YEL/BLK ¹
11	GRN/BLK ¹	56	BLK ³
12	WHT ¹	57	—
13	GRN/WHT ¹	58	—
14	GRN/WHT ²	59	YEL/BLK

71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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C312 C313

1	2	1	2	3	4	5
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C205

2	3	4	5	6
9	11	13	17	

C206

1	2	3	
4	5	6	7

C207

1	2	3
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C208

1	2	3	4	5	6	
7	8	9	11	12	14	15

C502

1	2
3	4

C233

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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C302

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

C601

1	2	3	
4	5	6	7

C202

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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C303

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

C304

3	4	5	6						
7	8	9	10	11	12	13	14	15	16

C631

1	2	3	4	5	6			
7	8	9	10	11	12	13	14	15

G302

C402

1
2

C161

2	3	4	
5	6	7	8
9	10	11	

C162

1	2	3	
4	5	6	7
8	9	10	11
12	13	14	

C163

1	2
3	4

C214

2

C101 (ECM)

1	GRN/YEL	46	—
2	ORN	47	YEL/BLU
3	BRN ¹	48	—
4	BLU ¹	49	RED ²
5	—	50	—
6	BLK ¹	51	WHT/RED
7	—	52	—
8	GRN/ORN	53	WHT/GRN
9	GRN ¹	54	—
10	—	55	YEL/BLK ¹
11	GRN/BLK ¹	56	BLK ³
12	WHT ¹	57	—
13	GRN/WHT ¹	58	—
14	GRN/WHT ²	59	YEL/BLK
15	—	60	YEL/RED
16	WHT ²	61	—
17	—	62	—
18	—	63	—
19	BRN ²	64	PNK
20	—	65	—
21	—	66	—
22	—	67	—
23	—	68	—
24	—	69	—
25	WHT ³	70	—
26	WHT/BLU	71	—
27	—	72	GRN/BLK ²
28	BRNBLK	73	GRN ²
29	BLK/BLU	74	REDBLK
30	—	75	—
31	RED ¹	76	BLURED
32	YEL	77	—
33	—	78	REDYEL ²
34	BLK ²	79	REDWHT
35	—	80	BLUGRN
36	REDYEL ¹	81	REDGRN
37	BLK/WHT	82	ORN/BLU
38	BLU ²	83	—
39	—	84	—
40	—	85	—
41	—	86	—
42	BLU/WHT	87	—
43	BLU ³	88	—
44	—	89	LTBLU

C112

1	BLK/WHT
2	BLK/YEL
3	GRN/BLK ¹
4	WHT ¹

C116

1	RED/GRN
2	GRN/WHT ²
3	YEL/RED

C117

1	RED/BLK
2	GRN/BLK ²
3	YEL/BLU

C118

1	BLK/YEL
2	BLK ¹
3	BLU/WHT

C121

1	GRN/BLK ²
2	REDWHT

C123

1	BRN ¹
2	YEL/BLK ¹

C124

1	RED ¹
2	YEL/BLK ¹

C125

1	BLU ¹
2	YEL/BLK ¹

C126

1	YEL
2	YEL/BLK ¹

C128

1	WHT/BLU
2	WHT/RED

C129

1	WHT ²
2	BRN/BLK
3	BLU ³

C130

1	BLK/BLU
2	YEL/BLK ¹
3	ORN

C131

1	GRN/BLK ²
2	REDYEL ²

C161

1	—	6	GRN/YEL
2	WHT/BLU	7	WHT/BLU
3	BLK/YEL	8	BLK ¹
4	YEL/BLK ¹	9	BLK/WHT
5	BLU ²	10	BLK/YEL

C210

1	BLK/YEL
2	BLK/YEL ¹

C214

1	—
2	BLU ²

C233

1	BLU/YEL	11	WHT/BLK
2	GRN/YEL	12	WHT/GRN
3	GRN	13	REDWHT
4	GRNBLK	14	—
5	—	15	—
6	—	16	—
7	YEL/BLU	17	BLK/YEL
8	PUR	18	BLK ¹
9	GRN/YEL	19	YEL/BLK ¹
10	—	20	PNK/BLK
11	—	21	RED

C308

1	BLK/WHT	12	GRNORN
2	YEL/GRN	13	GRN/YEL
3	GRN/RED	14	GRN/WHT
4	REDWHT	15	YEL
5	ORN	16	PNK
6	—	17	BLK
7	—	18	BLU/WHT
8	—	19	—
9	—	20	—
10	BLU ²	21	—
11	GRN/BLK	22	BLK

C311

1	GRN/WHT	10	—
2	—	11	BLU

C606

1	LTBLU
2	WHT/BLU
3	GRN/RED
4	BLK
5	BLK/ORN
6	—
7	—
8	REDBLK
9	BLK
10	BLU/ORN
11	—

C607

1	BLK/WHT
---	---------

C129

① WHT ²
② BRN/BLK
③ BLU ³

C130

① BLK/BLU
② YEL/BLK ¹
③ ORN

C131

① GRN/BLK ²
② RED/YEL ²

C161

1 —	② GRN/YEL
② WHT/BLU	7 WHT/BLU
③ BLK/YEL	④ BLK ¹
④ YEL/BLK ¹	9 BLK/WHT
⑤ BLU ²	10 BLK/YEL

C162

① BRN/BLK	⑥ PNK
2 YEL/GRN	⑦ LT BLU
③ GRN/BLK ²	⑧ GRN/CRN
4 BLU/WHT	⑨ BRN ²
5 GRN/BLK	12 GRN
6 YEL	13 BLU/GRN
7 YEL/RED	14 CRN/BLU

C163

① GRN ²
② RED ²
③ GRN/WHT ¹
4 BLURED

C202

1 —	⑦ BLK/YEL
2 RED/YEL	11 GRY
③ BLK/YEL	12 BLU/WHT
④ YEL/RED	13 BLU/RED
⑤ YEL	14 —
6 —	15 —
7 RED/BLK	16 LT BLU
8 BLK/ORN	17 RED/BLK
⑨ WHT/GRN	⑩ BLK

C205

1 —	10 —
2 RED/YEL	11 LT GRN/RED
3 RED/YEL	12 —
4 RED/WHT	13 BLURED
5 —	14 —
6 PUR/WHT	15 —
7 —	16 —
8 —	⑦ WHT/GRN
9 BLU/RED	18 —

C206

1 WHT/BLU
2 YEL/GRN
③ YEL/RED
4 WHT/GRN
④ PUR/WHT
6 WHT/BLU
⑤ YEL

C207

1 YEL/BLK
② WHT
3 WHT/GRN

C208

1 BLK/CRN	9 —
2 RED/WHT	10 —
3 BLU/BLK	11 RED ²
4 BLU/YEL	12 GRN
5 —	13 —
6 —	14 BLK
7 RED	15 —
8 BLK/CRN	13 BLK/CRN

C210

① BLK/YEL
② BLK/YEL ¹

C214

1 —
② BLU ²

C233

1 BLU/YEL	① WHT/BLK
2 GRN/YEL	14 WHT/GRN
3 GRN	15 RED/WHT
4 GRN/BLK	16 —
5 —	17 —
6 —	18 BLK/YEL
7 YEL/BLU	② BLK ¹
8 PUR	③ YEL/BLK ¹
④ GRN/YEL	21 PNK/BLK
10 —	22 RED
11 YEL/RED	23 PUR/WHT
⑤ LT GRN/RED	24 YEL

C302

1 YEL/GRN	⑫ YEL
2 BLURED	13 —
3 —	14 —
④ PNK	⑬ BLU ²
⑤ GRN/ORN	16 YEL/GRN
⑥ BRN ²	17 YEL/GRN
⑦ LT BLU	18 BLU/BLK
⑧ WHT/RED	19 YEL/RED
9 GRN/BLK	20 —
⑨ GRN/BLK ²	21 —
11 —	22 —

C303

1 BLU/WHT	10 —
2 RED/WHT	11 —
3 PUR/WHT	④ BLK/YEL
4 —	13 RED/WHT
5 RED/YEL	14 RED/BLU
6 BRN/WHT	⑤ WHT/GRN
7 —	16 GRN/WHT
8 BLK/WHT	17 —
9 GRN/BLK	18 RED/YEL

C304

1 —	10 WHT/GRN
2 —	11 WHT/GRN
3 GRN/WHT	12 YEL/BLK
4 —	13 WHT/RED
5 WHT	⑥ PUR/WHT
6 YEL/GRN	15 —
7 YEL	⑦ PNK
⑧ WHT/RED	17 —
9 RED/BLK	18 —

C307

1 YEL/BLU	9 RED/BLK
2 —	10 YEL/RED
3 —	11 WHT/BLU
4 —	12 —
5 —	13 —
6 —	① PNK
7 —	② GRN/CRN
8 PUR	16 BLK/YEL

C308

1 BLK/WHT	⑫ GRN/ORN
2 YEL/GRN	13 GRN/YEL
3 GRN/RED	14 GRN/WHT
4 RED/WHT	⑬ YEL
5 ORN	⑭ PNK
6 —	17 BLK
7 —	18 BLU/WHT
8 —	19 —
9 —	20 —
⑯ BLU ²	21 —
11 GRN/BLK	22 BLK

C311

1 GRN/WHT	10 —
2 —	11 PUR
3 GRY	④ BLK/YEL
③ YEL	13 RED/BLK
5 YEL/GRN	14 GRN/ORN
6 BLK	15 GRN/YEL
7 YEL/RED	16 —
8 —	17 —
9 GRN/RED	18 —

C312

① GRN/BLK ²
② BRN ²

C313

① LT BLU
2 PUR
3 BLU/WHT
④ WHT/GRN
⑤ PUR/WHT

C402

① GRN ²
② BLK

C501

1 RED/BLK	6 GRN/BLK
2 GRN	7 —
3 GRN/ORN	8 LT BLU
④ BLK/YEL	9 PUR
5 GRN/ORN	10 GRN/YEL

C502

① BLK/YEL
② BLK
3 BLK
4 YEL/BLU

C601

1 BLK/WHT
2 —
③ WHT
4 BLU
5 BLU/YEL
6 BLURED
7 BLU/BLK

C603

① GRN/YEL	⑥ RED/BLK
② BLU/ORN	⑦ YEL/BLK ¹
③ BLK ²	⑧ WHT/GRN
④ BLU/YEL	

C605

① PUR/WHT
2 —
② WHT/BLK
4 —

C606

1 LT BLU
2 WHT/BLU
3 GRN/RED
4 BLK
5 BLK/CRN
6 —
7 —
8 RED/BLK
9 BLK
⑩ BLU/CRN
11 —

C607

1 BLK/WHT
2 —
③ WHT
4 GRN/BLK
5 BLK/YEL
6 —
7 BLK/YEL

C608

① RED/WHT
2 GRN/YEL
3 RED/BLK
4 LT GRN/RED
5 WHT/RED
6 BLK
⑦ BLK/YEL
8 WHT/BLK
9 BLU
10 BLU/YEL

C611

① RED/BLK
2 —
③ RED/WHT

C631

1 WHT/BLU
2 GRN/WHT
3 WHT
4 —
5 BLK/YEL
6 BLK
7 YEL/BLK
8 BLU/WHT

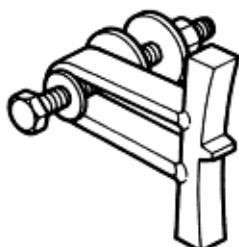
NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

- : Related to Fuel and Emissions System.
- : Connector with male terminals (double outline); View from terminal side
- : Connector with female terminals (single outline); View from wire side

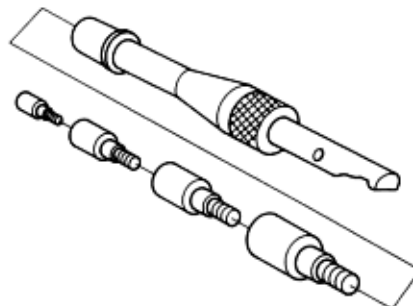
Special Tools

12-2

Ref No.	Tool Number	Description	Qty	Remark
1	07LAB - PV00100 or 07924 - PD20003	Ring Gear Holder	1	
2	07PAF - 0020000	Clutch Alignment Tool Set	1	
3	07746 - 0010100	Attachment, 32 x 35 mm	1	
4	07749 - 0010000	Handle Driver	1	



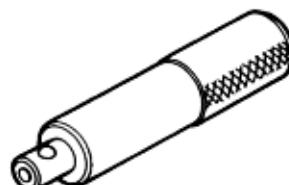
①



②



③

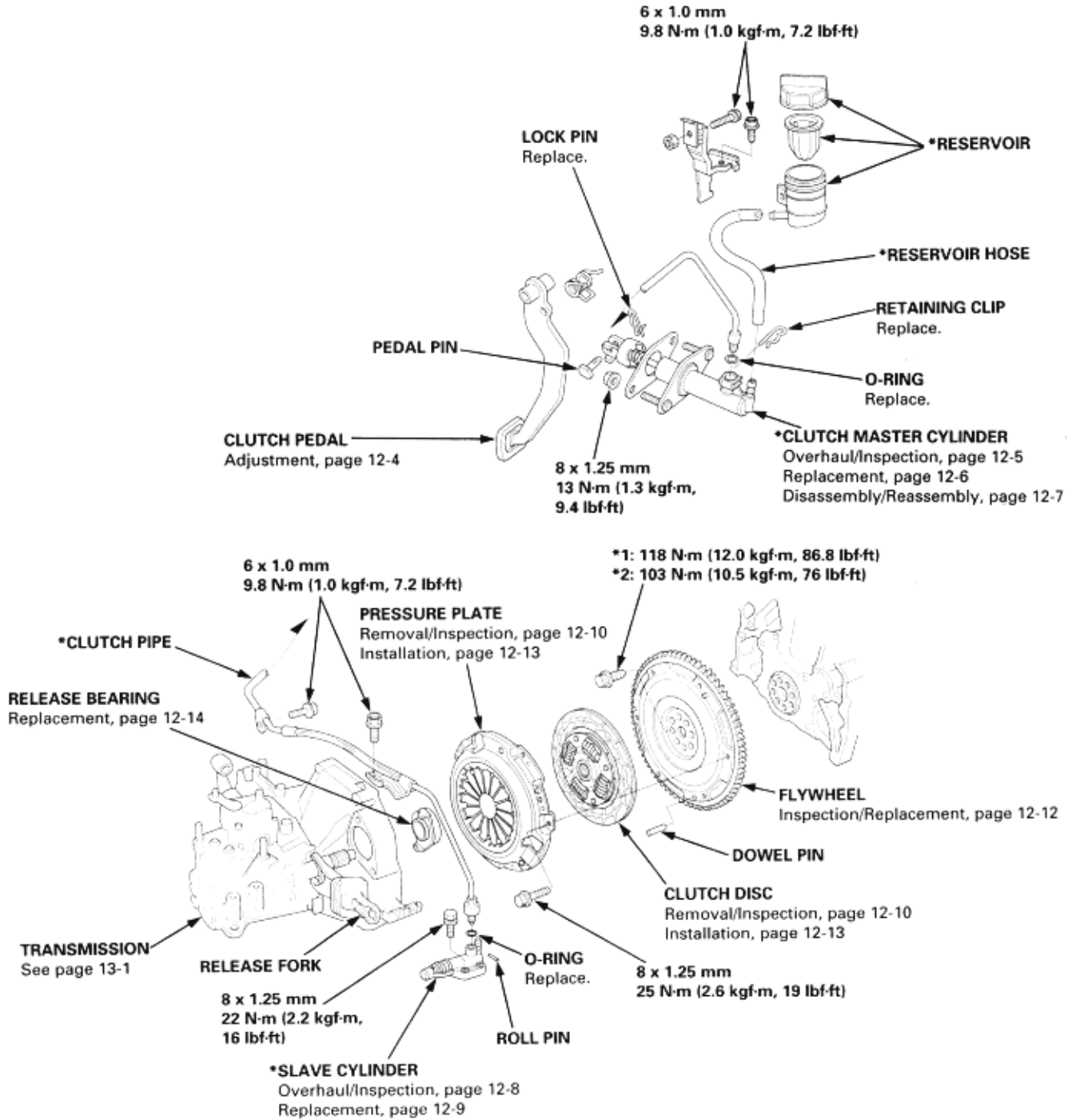


④

NOTE:

- ♦ Whenever the transmission is removed, clean and grease the release bearing sliding surface.
- ♦ If the parts marked * are removed, the clutch hydraulic system must be bled (See Page 12-9)
- ♦ Inspect the hoses for damage, leaks, interference, and twisting.
- ♦ LHD type is shown. RHD type is similar.

- *1. D16B6 engine model
- *2. Except D16B6 engine model



To go to the pages referenced on the diagram above, click on the following:

- (See page 12-5)
- (See page 12-6)
- (See page 12-7)
- (See page 12-4)
- (See page 12-14)
- (See page 13-2)
- (See Page 12-10)
- (See page 12-13)
- (See page 12-12)
- (See page 12-8)
- (See page 12-9)

Clutch Pedal Adjustment

12-4

NOTE:

- ♦ To check the clutch switch, see section 23.
- ♦ The clutch is self-adjusting to compensate for wear.

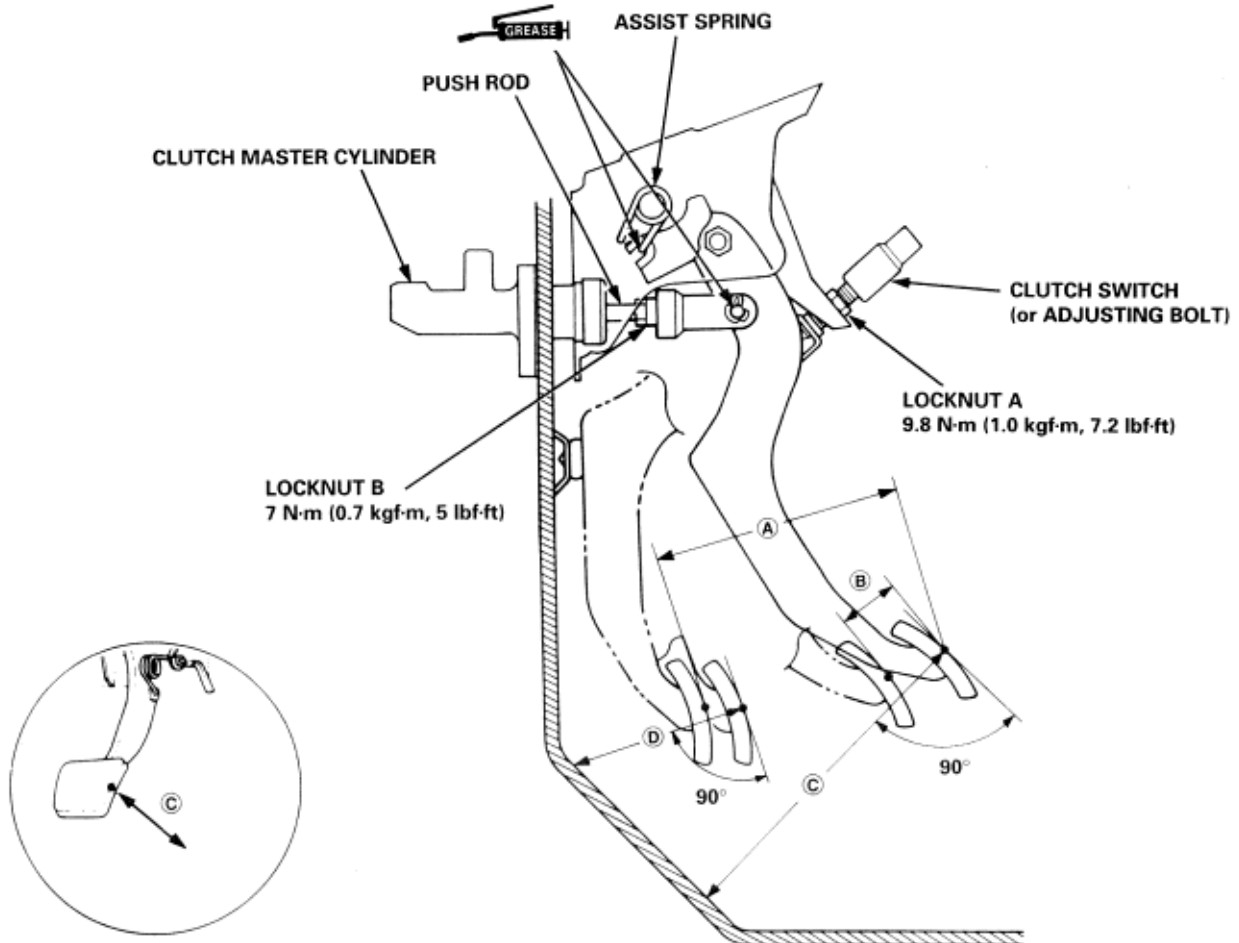


CAUTION

If there is no clearance between the clutch master cylinder piston and push rod the release bearing is held against the diaphragm spring, which can result in clutch slippage or other clutch problems.

1. Loosen locknut A, and back off the clutch switch (or adjusting bolt) until it no longer touches the clutch pedal.

2. Loosen locknut B, and turn the push rod in or out to get the specified stroke (A) and height (C) at the clutch pedal.
3. Tighten locknut B.
4. Turn the clutch switch (or adjusting bolt) in until it contacts the clutch pedal.
5. Turn the clutch switch (or adjusting bolt) in an additional 3/4 to 1 full turn.
6. Tighten locknut A.



(A) (STROKE at PEDAL):

(B) (TOTAL CLUTCH PEDAL FREE PLAY):

(C) (CLUTCH PEDAL HEIGHT):

(D) (CLUTCH PEDAL DISENGAGEMENT HEIGHT):

141-151 mm (5.55-5.94 in)

9-15 mm (0.4-0.6 in) includes the pedal play 1.0-7.0 mm (0.04-0.28 in)

LHD: 177-187 mm (6.97-7.36 in) to the floor

RHD: 201-211 mm (7.91-8.31 in) to the floor


LHD: 81 mm (3.19 in) minimum to the floor

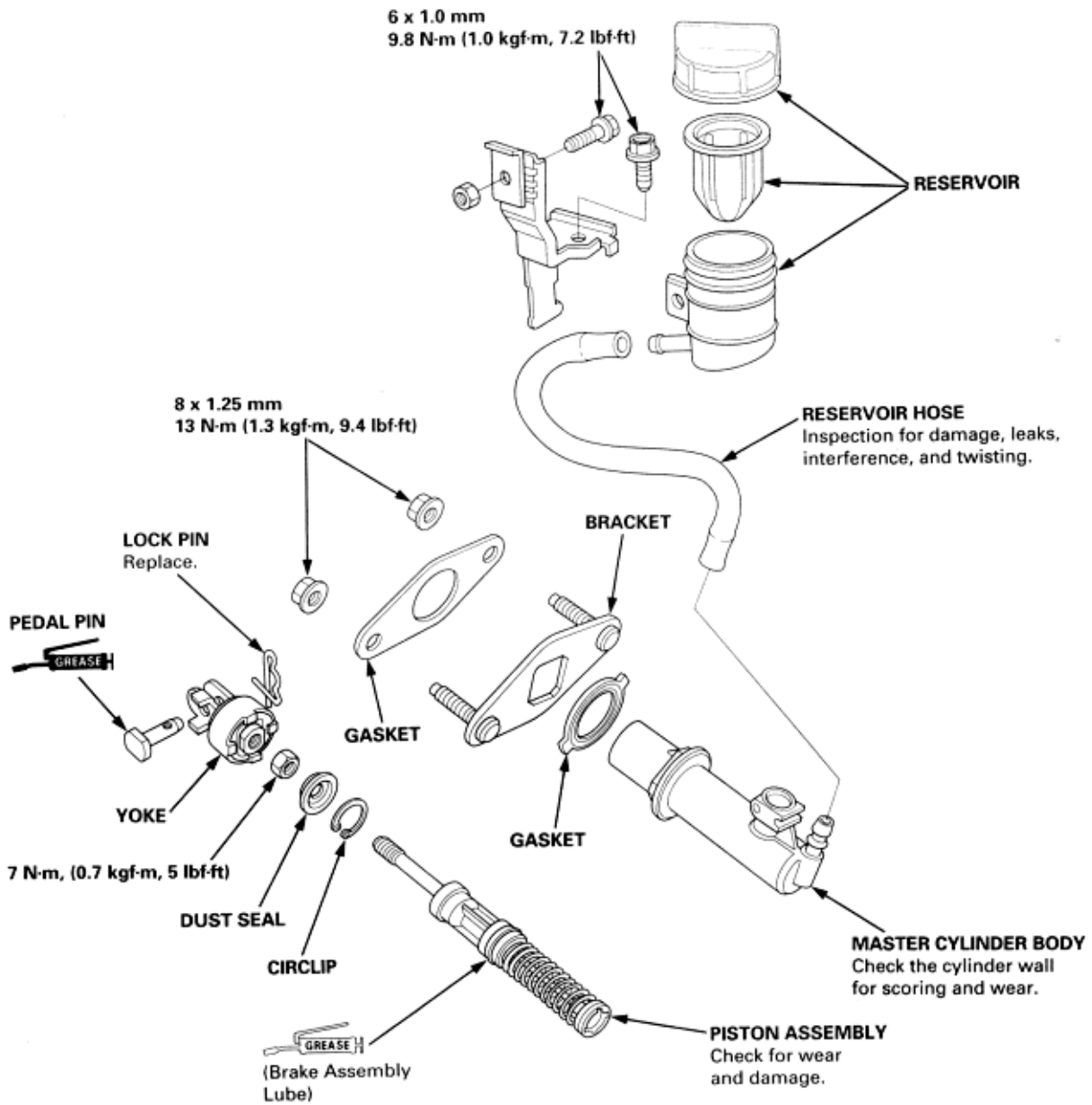
RHD 107 mm (4.21 in) minimum to the floor

CAUTION

- ♦ Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
- ♦ Replace parts with new ones whenever specified to do so.
- ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- ♦ Do not mix different brands of brake fluid as they may not be compatible.
- ♦ Do not reuse the drained fluid. Use only Genuine Honda Brake Fluid or an equivalent DOT 3 or DOT 4 brake fluid.

NOTE: LHD type is shown. RHD type is similar.

 : Brake Assembly Lube or equivalent rubber grease.



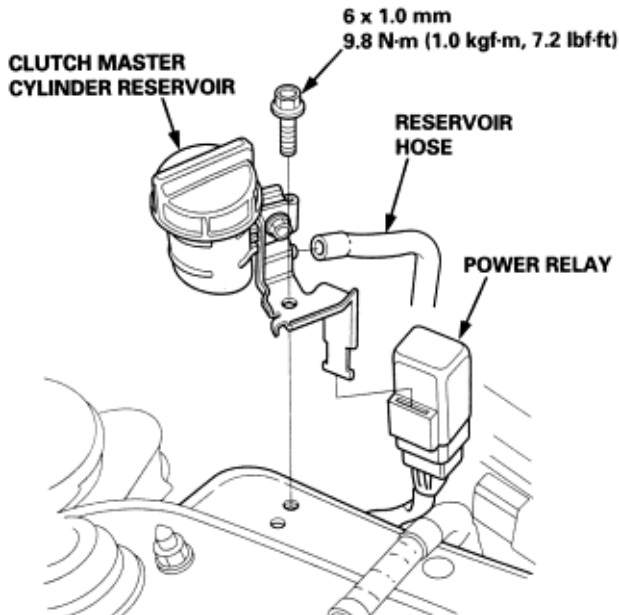


CAUTION

- ♦ Do not spill brake fluid on the vehicle may damage the paint; if brake fluid does contact the paint, wash it off immediately with water
- ♦ Plug the end of the clutch line reservoir hose with a shop towel to prevent brake fluid from coming out.

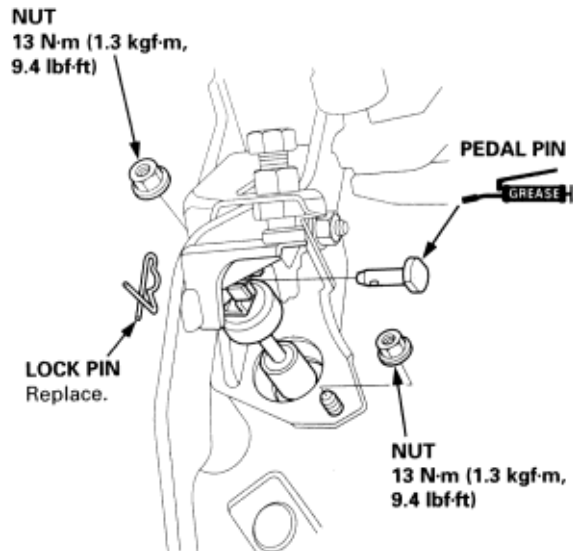
LHD type:

1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Disconnect the reservoir hose from the clutch master cylinder reservoir.

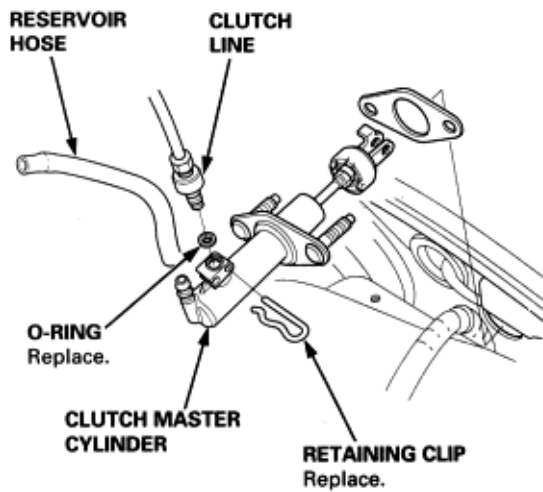


3. Remove the clutch master cylinder reservoir and power relay.

4. Pry out the cotter pin, and pull the pedal pin out of the yoke. Remove the nuts.



5. Remove the retaining clip. Disconnect the clutch line, and remove the O-ring.



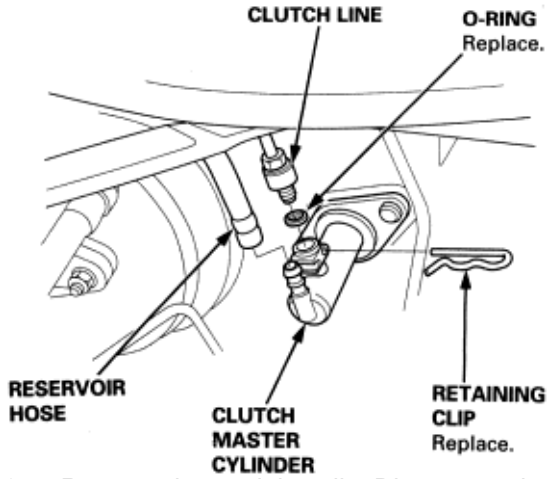
6. Remove the clutch master cylinder, then remove the reservoir hose from the clutch master cylinder.
7. Install the clutch master cylinder in the reverse order of removal.
8. Bleed the clutch hydraulic system (See Page 12-10)

Clutch Master Cylinder Replacement (cont'd)

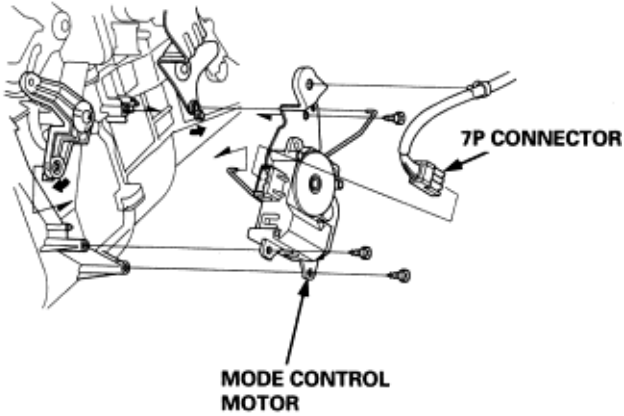
12-7

RHD type:

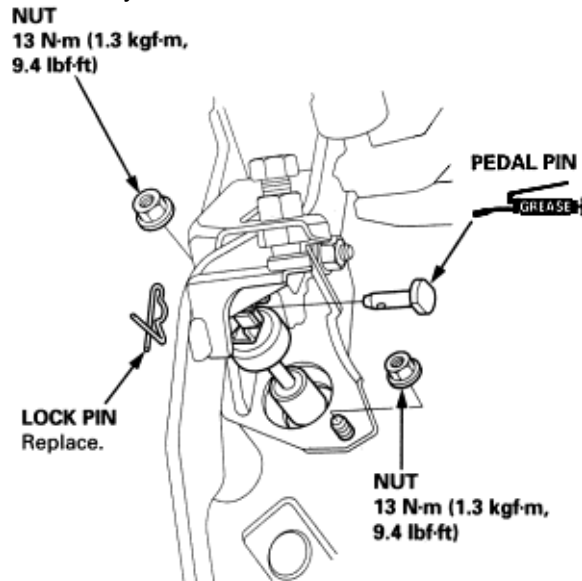
1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Disconnect the reservoir hose from the clutch master cylinder reservoir.



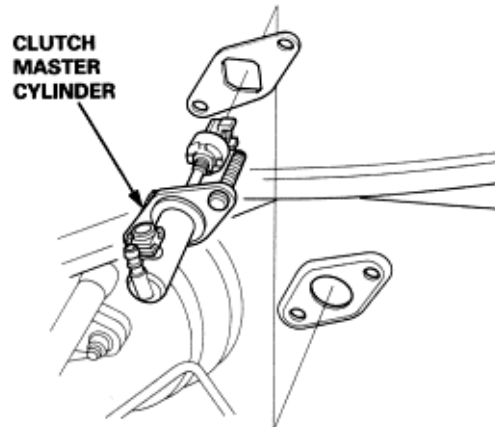
3. Remove the retaining clip. Disconnect the clutch line, and remove the O-ring.
4. Disconnect the connector, then remove the mode control motor.



5. Pry out the lock pin, and pull the pedal pin out of the yoke. Remove the nuts.



6. Remove the clutch master cylinder.



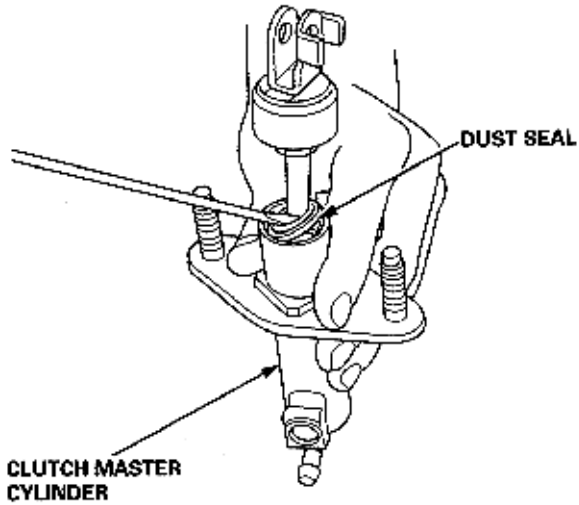
7. Install the clutch master cylinder in the reverse order of removal.
8. Bleed the clutch hydraulic system (See Page 12-10)



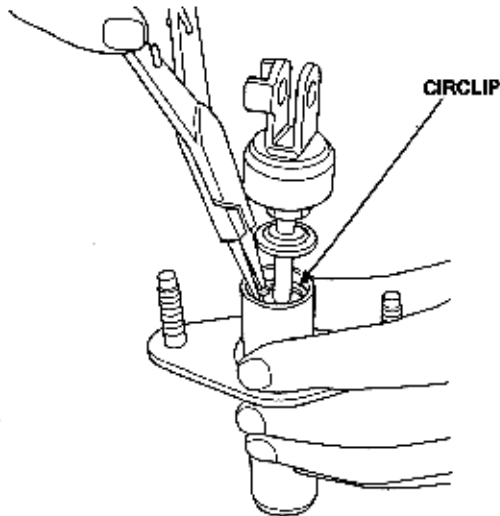
CAUTION

- ♦ Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
- ♦ Replace parts with new ones whenever specified to do so.
- ♦ Make sure not dirt or other foreign matter is allowed to contaminate the brake fluid.
- ♦ Do not mix different brands of brake fluid as they may not be compatible.
- ♦ Do not reuse the drained fluid. Use only Genuine Honda Brake Fluid or an equivalent DOT 3 or DOT 4 brake fluid.

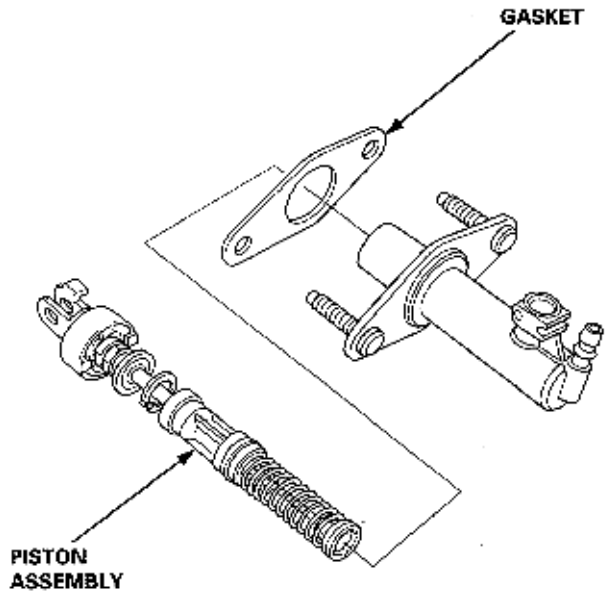
1. Remove the dust seal from the clutch master cylinder.



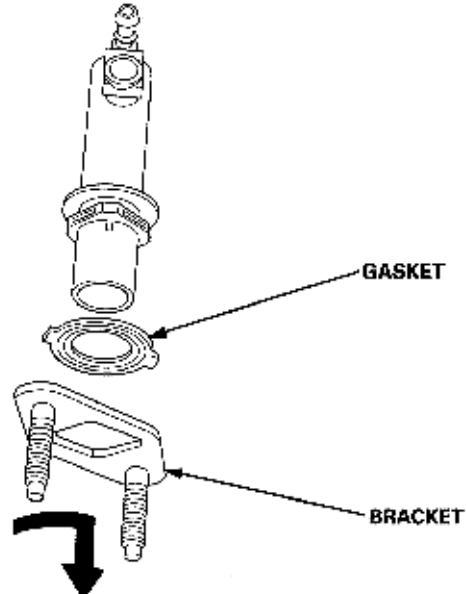
2. Pry the circlip off the clutch master cylinder.



3. Remove the piston assembly and gasket from the master cylinder body.




4. Turn and remove the bracket and gasket from the master cylinder body.




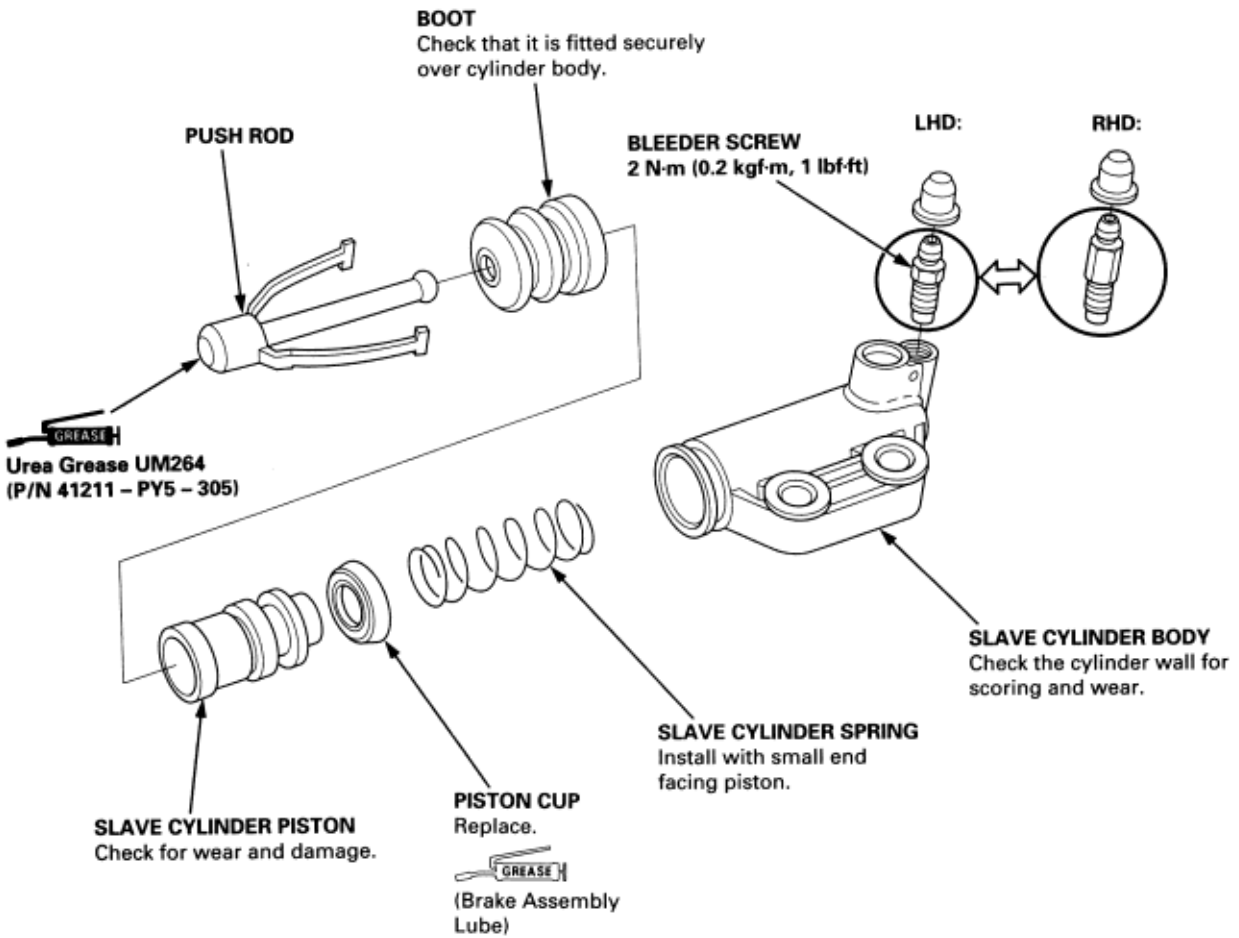
5. Install in the reverse order of removal.

CAUTION

- ♦ Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
- ♦ Replace parts with new ones whenever specified to do so.
- ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- ♦ Do not mix different brands of brake fluid as they may not be compatible.
- ♦ Do not reuse the drained fluid. Use only Genuine Honda Brake Fluid or an equivalent DOT 3 or DOT 4 brake fluid.

 **GREASE**: HONDA Genuine Urea Grease UM264 (P/N41211-PY5-305).

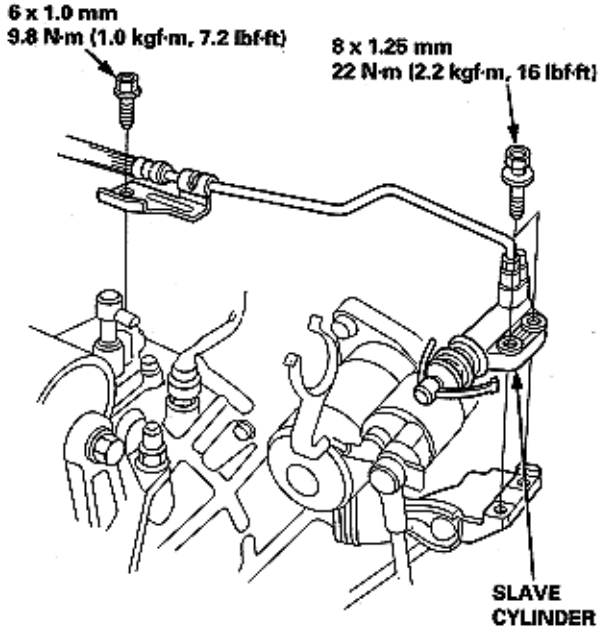
 **GREASE**: Brake Assembly Lube or equivalent rubber grease.



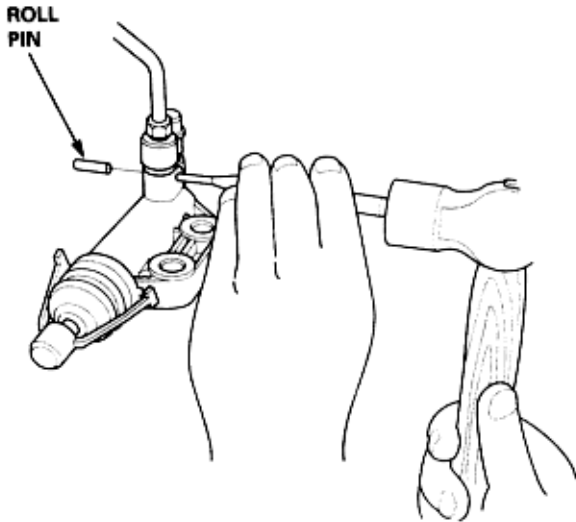
CAUTION

- ♦ Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ Plug the end of the clutch line a shop towel to prevent brake fluid from coming out.

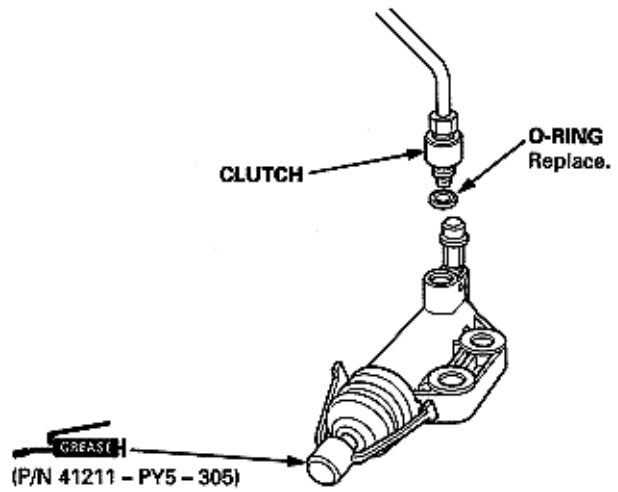
1. Remove the mounting bolts, the slave cylinder, and clutch line mounting bolt.



2. Remove the roll pin.



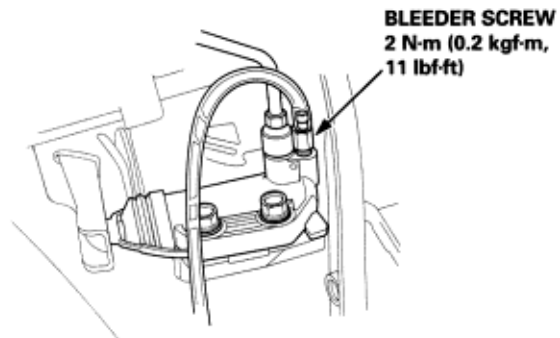
3. Remove the slave cylinder and O-ring.
NOTE: Use only Honda Genuine Urea Grease UM 264 (P/N 41211 - PY5 - 305).



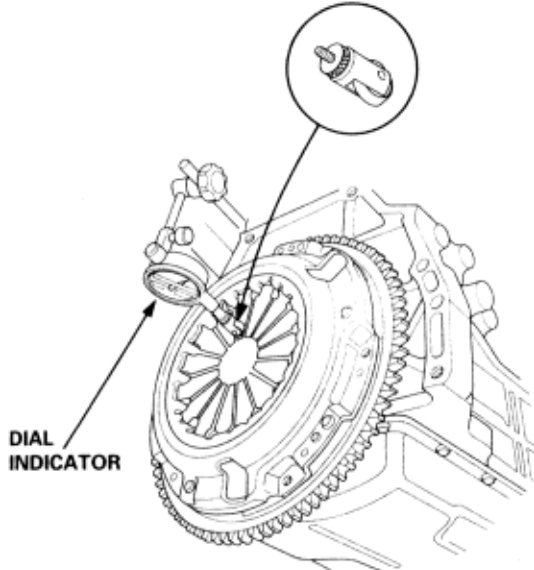
4. Install the slave cylinder in the reverse order of removal.

5. Bleed the clutch hydraulic system.
NOTE: Be careful not to damage the slave cylinder body with over tighten the bleeder screw.

- ♦ Remove front engine stopper bracket (D16B6 engine only), then attach a hose to the bleeder screw, and suspend the hose in a container of brake fluid.
- ♦ Make sure there is an adequate supply of fluid at the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
- ♦ Refill the clutch master cylinder with fluid when done.
- ♦ Use only genuine Honda super Duty DOT 3 brake fluid or an equivalent DOT 3 or DOT 4 brake fluid.
- ♦ Confirm clutch operation, and check for leaking fluid.

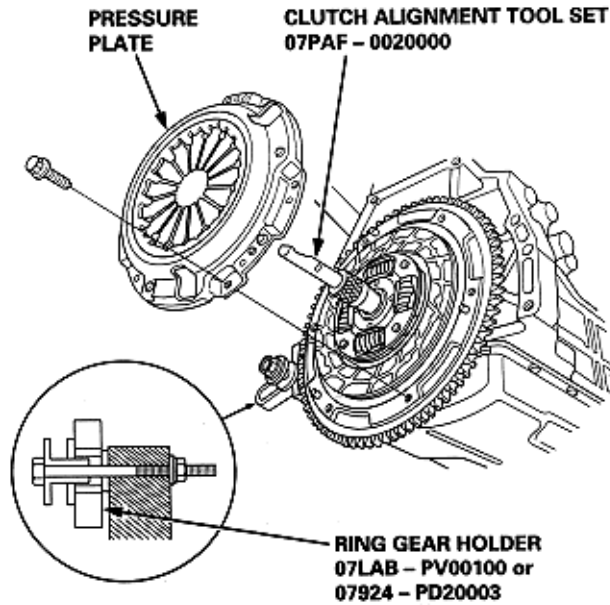


1. Check the diaphragm spring fingers for height using the dial indicator.
Standard (New): 0.6 mm (0.02 in) max.
Service Limit: 0.8 mm (0.03 in)
Standard (New): 0.6 mm (0.02 in) max.
Service Limit: 0.8 mm (0.03 in)



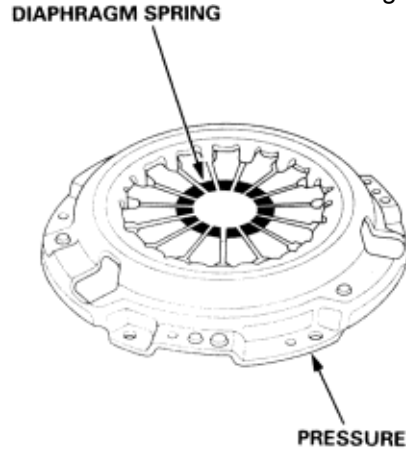
If the height is more than the service limit, replace the pressure plate.

2. Install the special tools as shown.

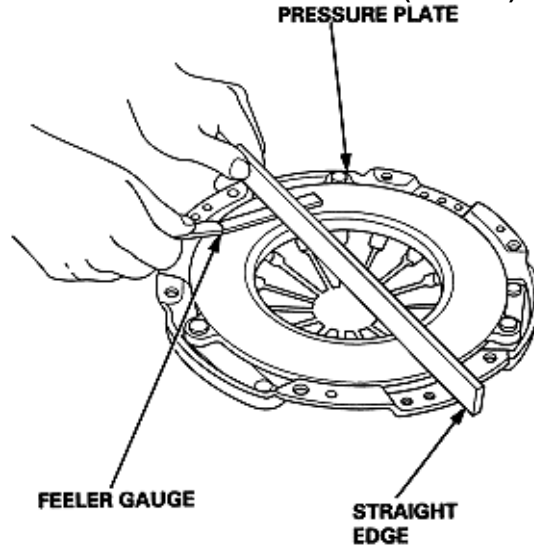


3. To prevent warping, unscrew the pressure plate mounting bolts in a crisscross pattern in several steps, then remove the pressure plate.

4. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.

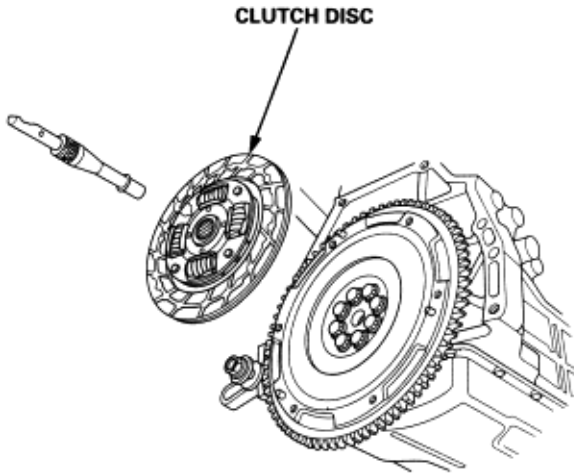


5. Inspect the pressure plate surface for wear, cracks, and burning.
6. Inspect for warpage using a straight edge and feeler gauge. Measure across the pressure plate.
Standard (New): 0.03 mm (0.001 in) max.
Service Limit: 0.15 mm (0.006 in)



If the warpage is more than the service limit, replace the pressure plate.

1. Remove the clutch disc and special tools.



2. Inspect the lining of the clutch disc for signs of slipping or oil. If the clutch disc is burned black or oil soaked, replace it.
3. Measure the clutch disc thickness.

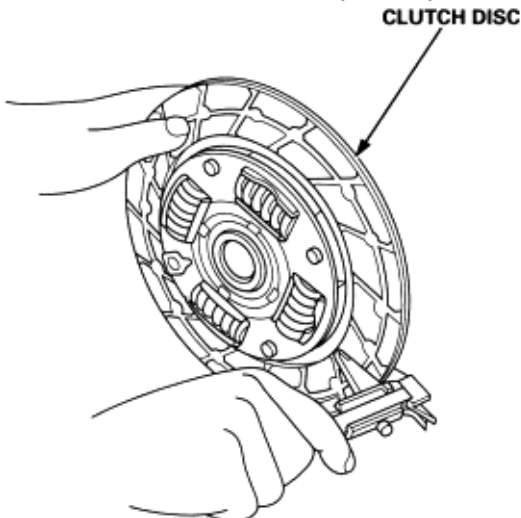
Standard (New)

D16B6 engine: 7.7-8.2 mm (0.30-0.32 in)

F18B2, F18B3, F20B6 engines:
7.9-8.4 mm (0.31-0.33 in)

H22A7 engine: 8.3-9.0 mm (0.33-0.35 in)

Service Limit: 6.0 mm (0.24 in)



If the thickness is less than the service limit, replace the clutch disc.

4. Measure the rivet depth from the lining surface to the rivets, on both sides.

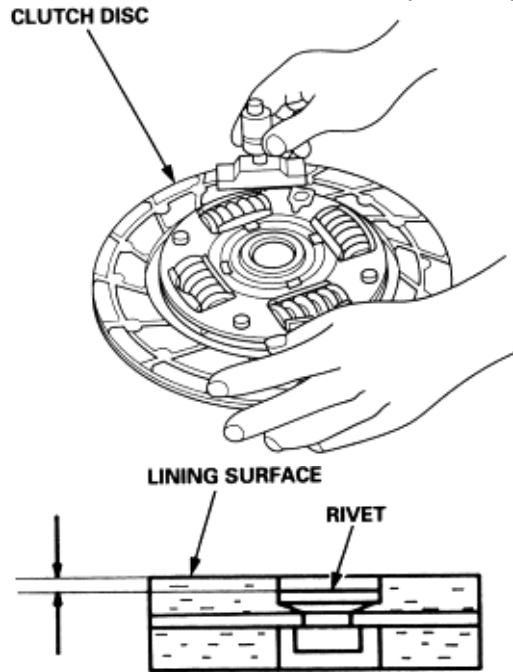
Standard (New)

D16B6 engine: 1.3 mm (0.051 in)

F18B2, F18B3, F20B6 engines:
1.4 mm (0.055 in)

H22A7 engine: 1.2-1.7 mm (0.047-0.067 in)

Service Limit: 0.2 mm (0.008 in)



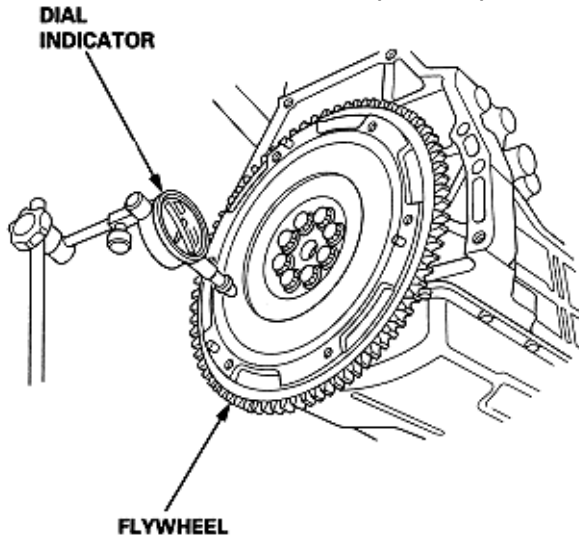
If the rivet depth is less than the service limit, replace the clutch disc.

1. Inspect the ring gear teeth for wear and damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks, and burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push against the flywheel each time you turn it to take up the crankshaft thrust washer clearance.

NOTE: The runout can be measured with the engine installed.

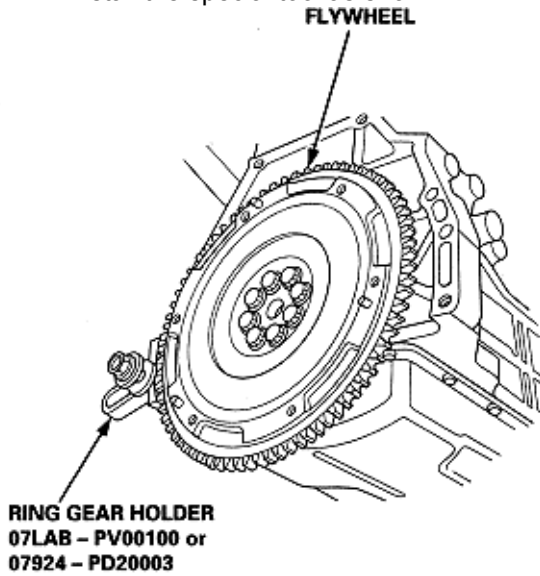
Standard (New): 0.05 mm (0.002 in) max.

Service Limit: 0.15 mm (0.006 in)



If the runout is more than the service limit, replace the flywheel and recheck the runout.

4. Install the special tool as shown.



5. Install the flywheel mounting bolts in a crisscross pattern in several steps as shown, then remove the special tool and the flywheel.

Torque

D16B6 engine model:

118 Nm (12.0 kgf/m, 86.8 lbf/ft)

Except D16B6 engine model:

103 Nm (10.5 kgf/m, 76 lbf/ft)

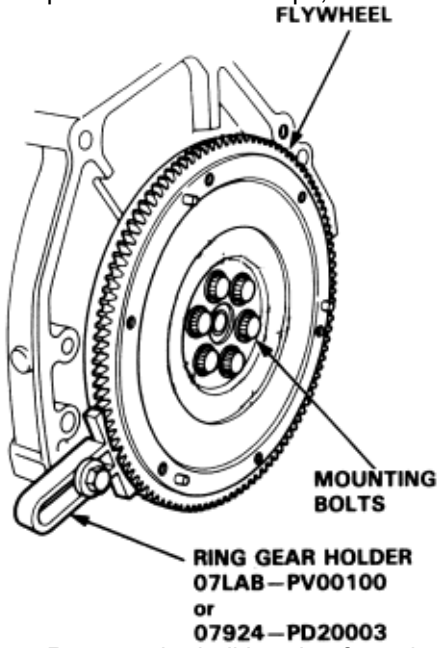
6. Align the hole in the flywheel with the crankshaft dowel pin, and install the flywheel. Install the mounting bolts finger-tight.
7. Install the special tool, then torque the flywheel mounting bolts in a crisscross pattern in several steps.

Flywheel

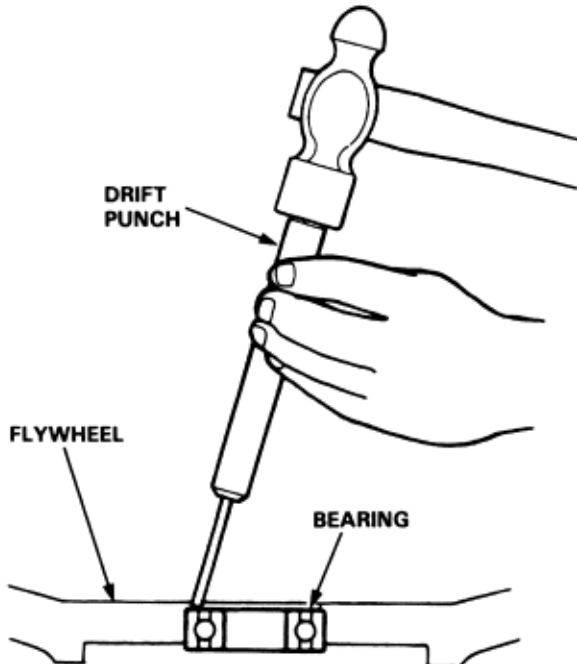
Bearing Replacement (D16B6 engine)

12-14

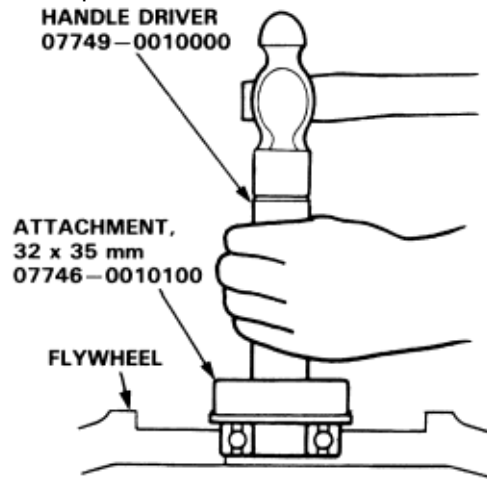
1. Install the special tool as shown.
2. Remove the flywheel mounting bolts in a crisscross pattern in several steps, and remove the flywheel.



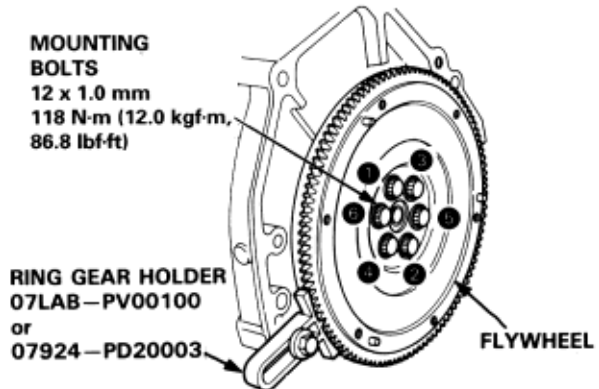
3. Remove the ball bearing from the flywheel.



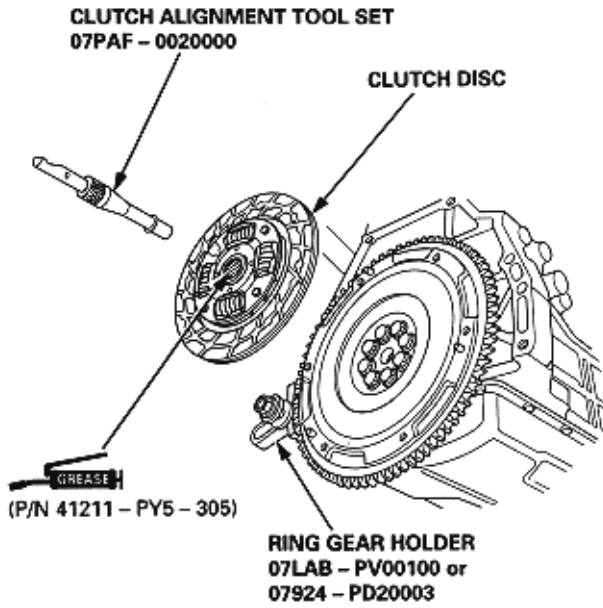
4. Drive the new bearing into the flywheel using the special tools as shown.



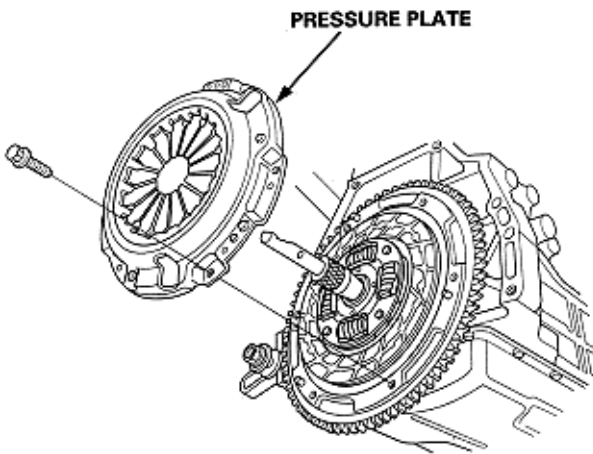
5. Align the hole in the flywheel with the crankshaft dowel pin, and install the flywheel. Install the mounting bolts finger-tight.
6. Install the special tool, then torque the flywheel mounting bolts in a crisscross pattern in several steps as shown.



1. Install the ring gear holder.

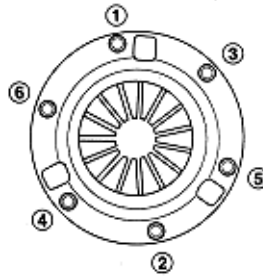
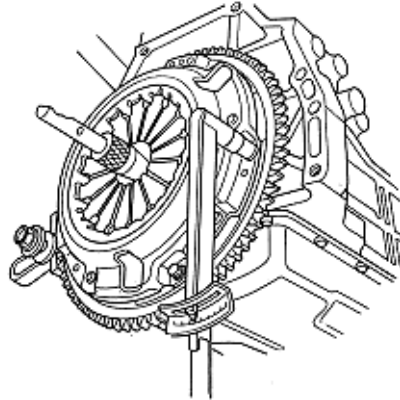


2. Apply grease to the splines of the clutch disc, then install the clutch disc using the special tools as shown.
NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).
3. Install the pressure plate and the mounting bolts finger-tight.



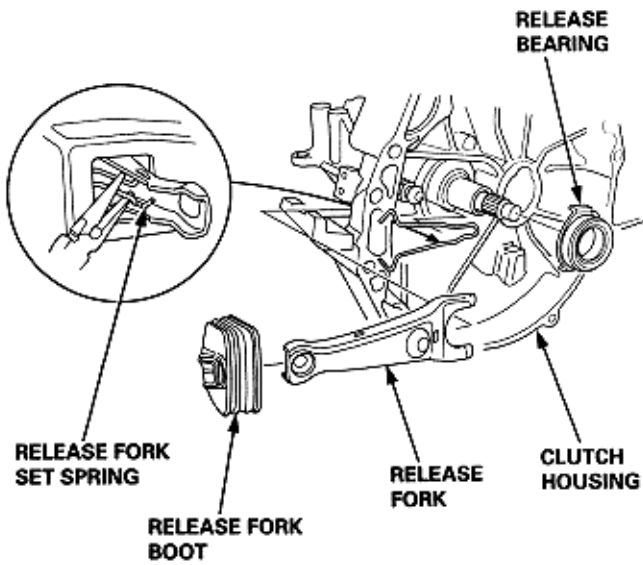
4. Torque the mounting bolts in a crisscross pattern as shown. Tighten the bolts in several steps to prevent warping the diaphragm spring.

Torque:
8 x 1.25mm
25 Nm 12.6 kgf/m. 19 lbf/ft

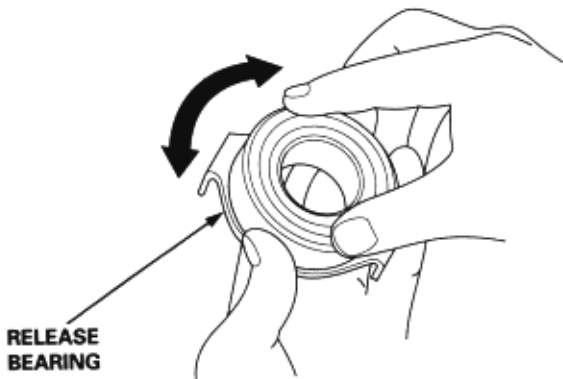


5. Remove the special tools.
6. Check the diaphragm spring fingers for height (**See Page 12-11**)

1. Remove the release fork boot from the clutch housing.



2. Remove the release fork from the clutch housing by squeezing the release fork set spring with pliers. Remove the release bearing.
3. Check the release bearing for play by spinning it by hand. If there is excessive play, replace the release bearing with a new one.
NOTE: The release bearing is packed with grease. Do not wash it in solvent.



4. Apply grease to the release fork the release fork bolt, the release bearing, and the release bearing guide in the shaded areas.

NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).

D16B6 engine:

A : Fill up

B : 0.3-0.9 g (0.01-0.03 oz)

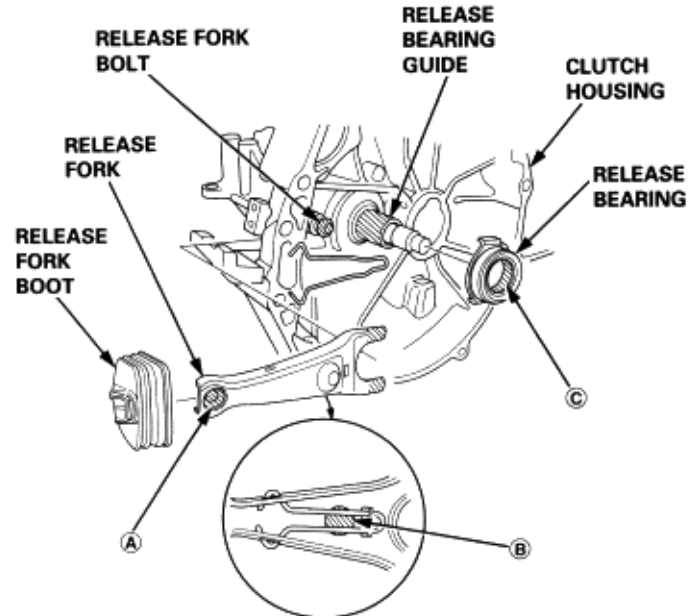
C : 0.5-1.1 g (0.02-0.04 oz)

Except D16B6 engine:

A : 0.4-1.0 g (0.01-0.04 oz)

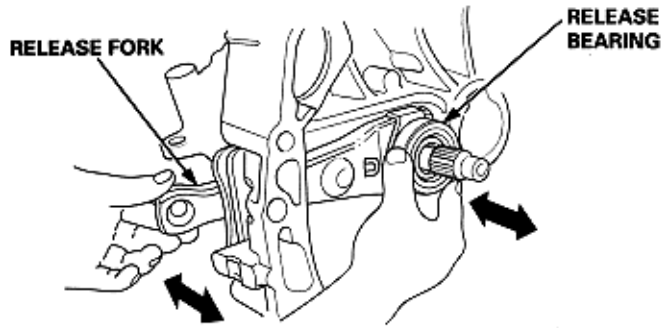
B : 1.0-1.6 g (0.04-0.06 oz)

C : 0.4-1.0 g (0.01 0.04 oz)

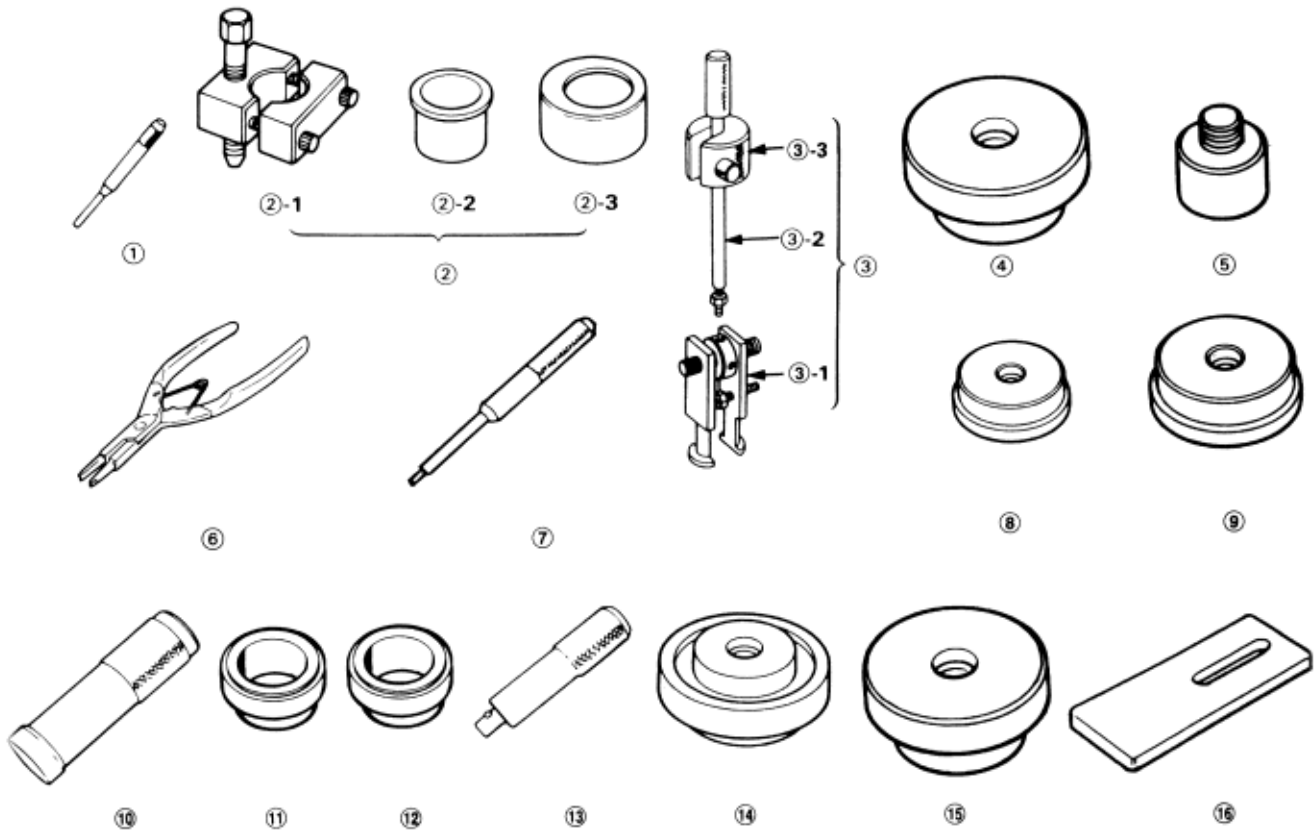


5. Install the release bearing set spring on the release fork, with the release fork slid between the release bearing pawls.
6. Install the release bearing on the mainshaft while inserting the release fork through the hole in the clutch housing.
7. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt squarely.
8. Install the release fork boot, make sure the boot seals around the release fork and clutch housing.

9. Move the release fork right and left to make sure that it fits properly against the release bearing, and that the release bearing slides smoothly. Wipe off overflowed grease.

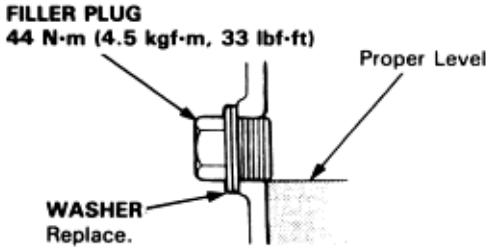


Ref No.	Tool Number	Description	Qty	Remark
1	07GAD - PG20100	Pin Driver, 5.0 mm	1	
2	07GAJ - PG20102	Mainshaft Clearance Inspection Tool Set	1	
2-1	07GAJ - PG20110	Mainshaft Holder	(1)	Component Tools
2-2	07GAJ - PG20120	Collar	(1)	Component Tools
2-3	07GAJ - PG20130	Mainshaft Base	(1)	Component Tools
3	07JAC - PH80000	Adjustable Bearing Remover Set	1	
3-1	07JAC - PH80100	Bearing Remover Attachment	(1)	Component Tools
3-2	07JAC - PH80200	Remover Handle Assembly	(1)	Component Tools
3-3	07741 - 0010201	Remover Weight	(1)	Component Tools
4	07JAD- PH80101	Seal Driver Attachment	1	
5	07JAD - PH80200	Pilot, 26 x 30 mm	1	
6	07LGC - 0010100	Snap Ring Pliers	1	
7	07744 - 0010600	Pin Driver, 8.0 mm	1	
8	07746 - 0010300	Driver Attachment, 42 x 47 mm	1	
9	07746 - 0010400	Driver Attachment, 52 x 55 mm	1	
10	07746 - 0030100	Driver, 40 mm	1	
11	07746 - 0030400	Driver, 35 mm	1	
12	07746 - 0030300	Driver, 30 mm	1	
13	07749 - 0010000	Handle Driver	1	
14	07947 - SD90200	Seal Drive Attachment	1	
15	07947 - 6110501 or 07947 - 6110500	Seal Driver Attachment	1	
16	07979 - PJ40001	Magnet Stand Base	1	



NOTE: Check the fluid with the engine OFF and car on level ground.

1. Remove the filler plug, then check the level and condition of the fluid.



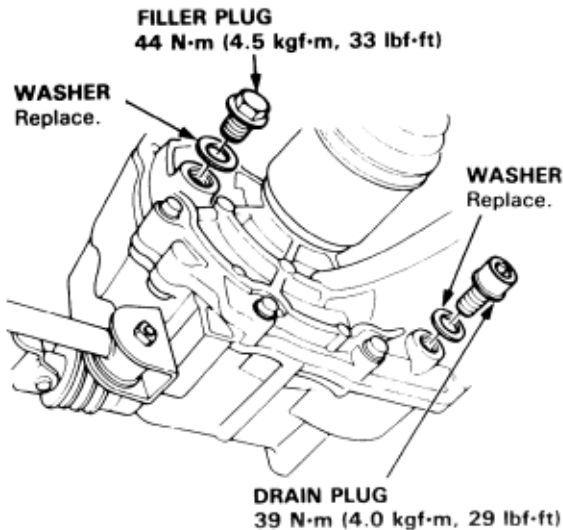
2. The oil level must be up to the filler hole. If it is below the hole, add fluid until it runs out, then reinstall the filler plug with a new washer.
3. If the transmission fluid is dirty, remove the drain plug and drain the fluid.
4. Reinstall the drain plug with a new washer, and refill the transmission fluid to the proper level.
NOTE: The drain plug washer should be replaced at every fluid change.
5. Reinstall the filler plug with a new washer.

Fluid Capacity

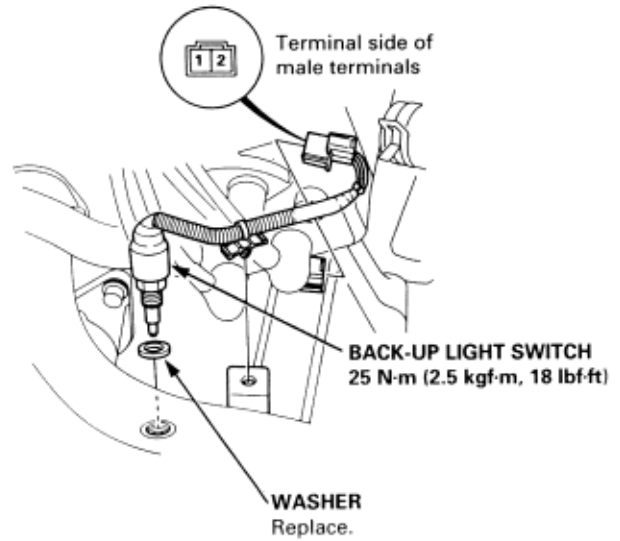
1.8/ (1.9 US qt, 1.6 Imp qt) at fluid change

1.9/ (2.0 US qt, 1.7 Imp qt) at overhaul

Always use genuine Honda manual transmission fluid (MTF). If it is not available, you may use an API service SG or SH grade motor oil with a viscosity of SAE 10W-30 or 10W-40 as a temporary replacement.



1. Disconnect the connectors from the switch.



2. Check for continuity between the No. 1 and No. 2 terminals.
 - ♦ There should be continuity when the shift lever moves into reverse.
 - ♦ There should be no continuity when the shift lever is in any position except reverse.
3. If necessary, replace the switch.

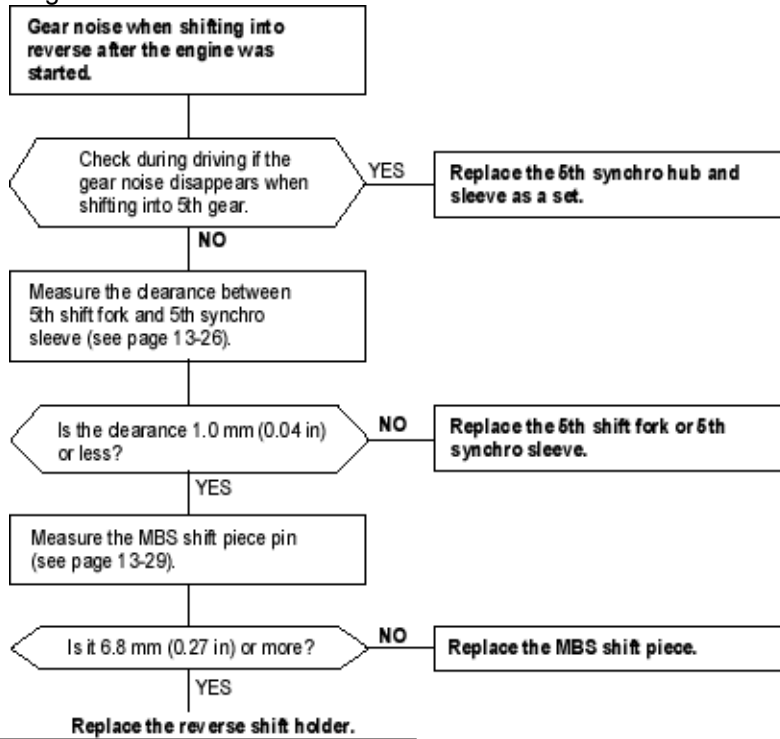
After the clutch pedal was depressed to shift into Reverse, the mainshaft continues to rotate because of its inertia. The resulting speed difference between mainshaft and reverse idler gear produces gear noise.

The reverse gear noise reduction system employs a cam plate, which was added to the reverse shift holder. When shifting into Reverse, the 5th/reverse shift piece-connected to the shift lever-rotates the cam plate. This causes the 5th synchro set to stop the rotating mainshaft. As there is no speed difference between mainshaft and reverse idler gear, there will be less gear noise.

NOTE: This system is not a fully-synchronized gear noise reduction system.

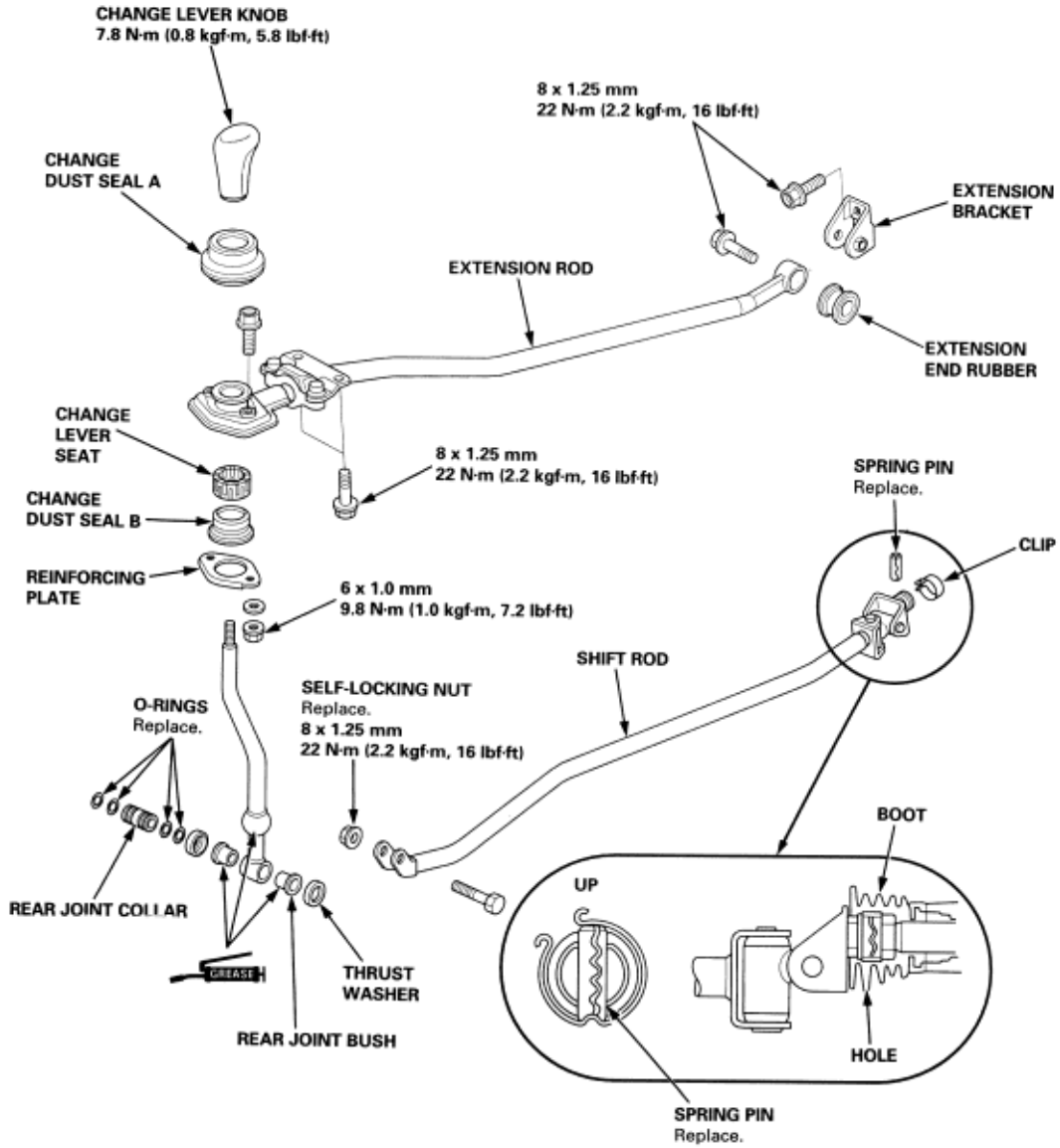
Therefore, you may hear gear noise when

- 1) you shift into Reverse with the car not yet completely stopped.
- 2) you shift speedily during fast idling.



To go to the pages referenced on the diagram above, click on the following:
[\(See page 13-26\)](#)
[\(See page 13-29\)](#)

- NOTE:
- ♦ Inspect rubber parts for wear and damage when disassembling, replace any worn or damaged parts.
 - ♦ Install the clip as shown.
 - ♦ Turn the boot so the hole is facing down as shown.
 - ♦ Make sure the boot is installed on the shift rod.



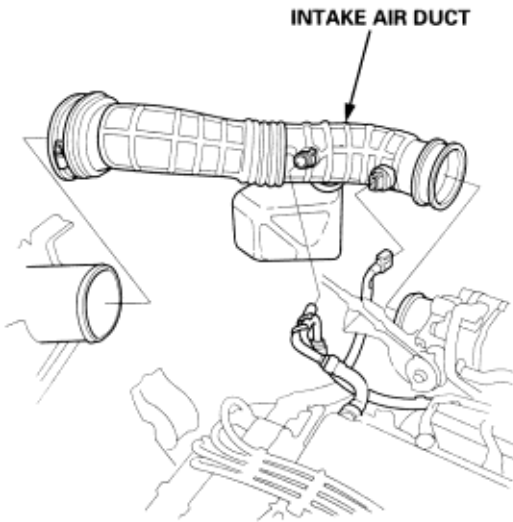
⚠ WARNING

- ♦ Make sure jacks and safety stands are placed properly (see section 1).
- ♦ Apply parking brake and block rear wheels so vehicle will not roll off stands and fall on you while working under it.

⚠ CAUTION

Use fender covers to avoid damaging painted surfaces

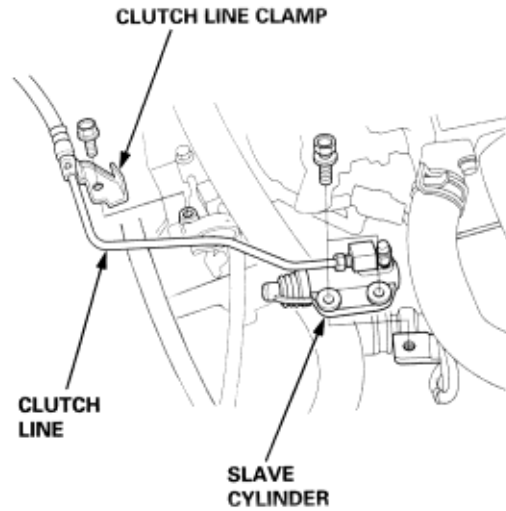
1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery.
2. Remove the intake air duct



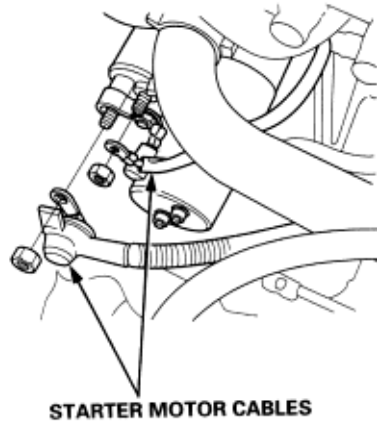
3. Carefully remove the slave cylinder and clutch line clamp so as not to bend the clutch line.

⚠ CAUTION

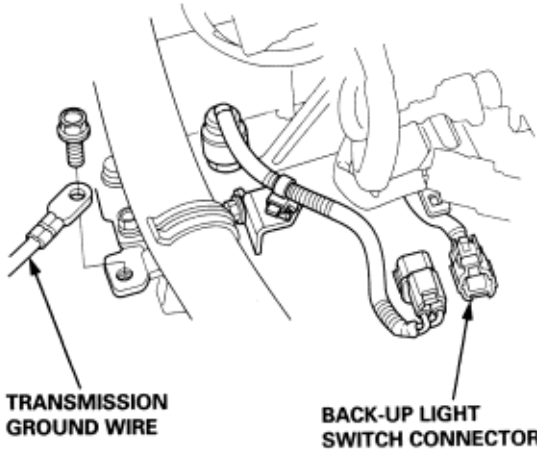
- ♦ Do not operate the clutch pedal once the slave cylinder has been removed.
- ♦ Take care not to bend the clutch pipe



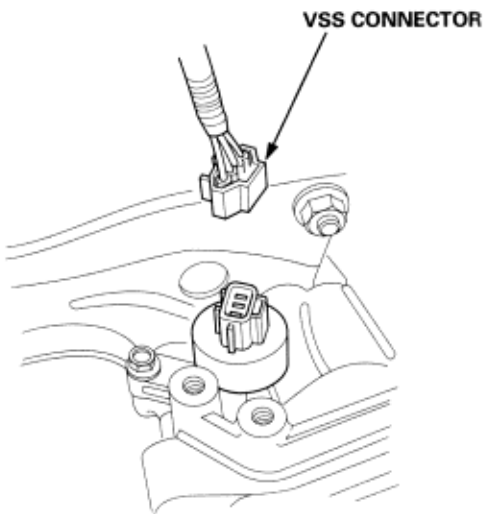
4. Disconnect the starter motor cables.



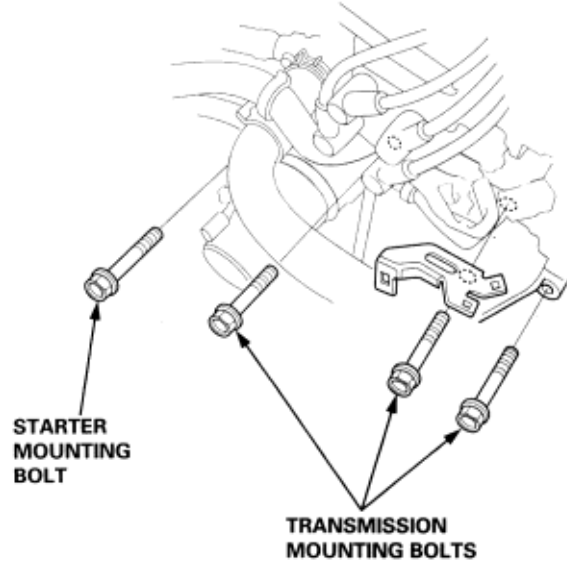
5. Disconnect the back-up light switch connector and transmission ground wire.



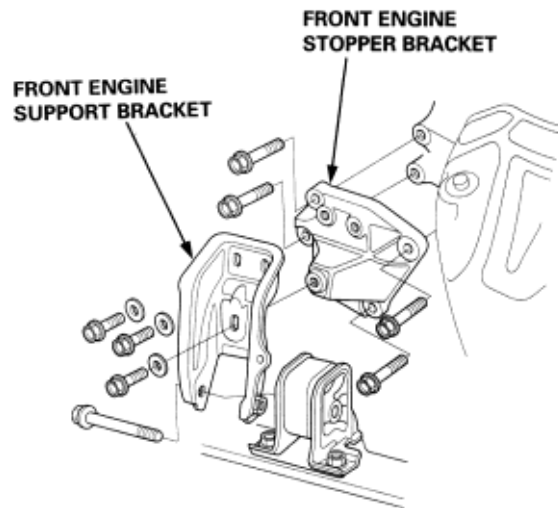
6. Disconnect the vehicle speed sensor (VSS) connector.



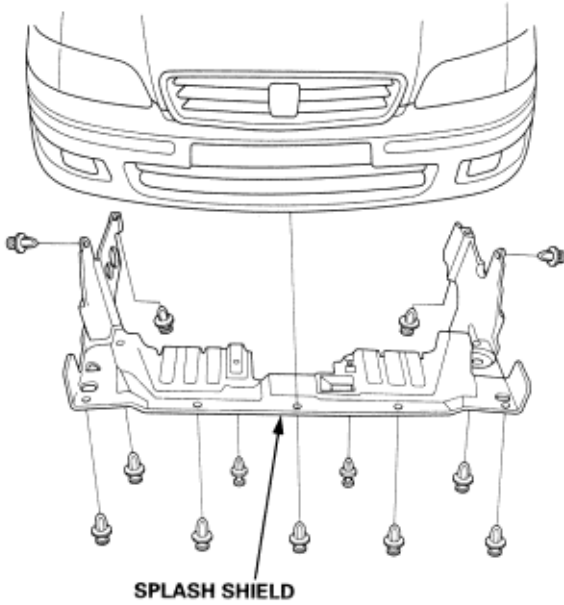
7. Remove the three upper transmission mounting bolts and the lower starter mounting bolt.



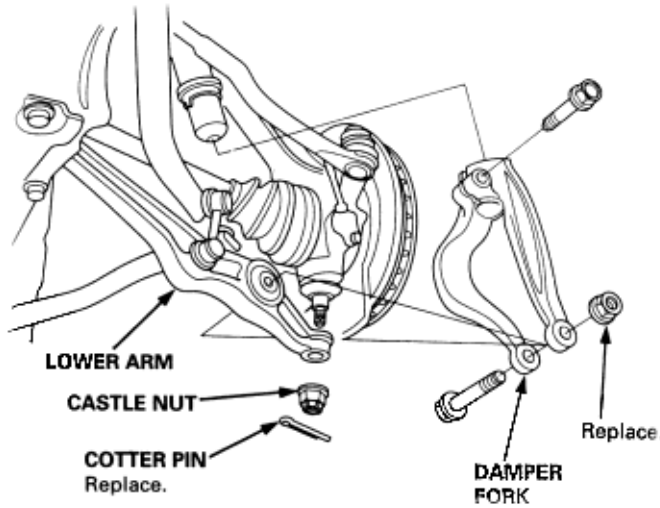
8. Remove the front engine stopper bracket and front engine support bracket.



9. Drain transmission fluid with a shop towel covering the front and rear beams to catch any spilled fluid (see page 13-3).
10. Remove the splash shield.

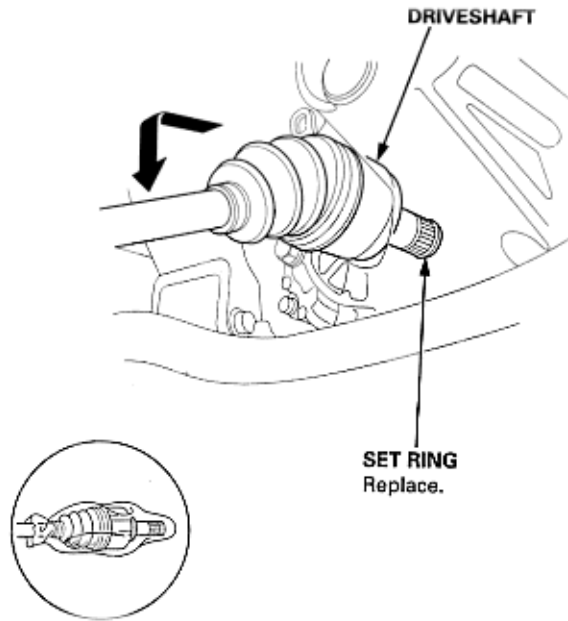


11. Remove the cotter pins, and loosen the castle nuts, then separate the ball joints and lower arms on both sides (see section 18).

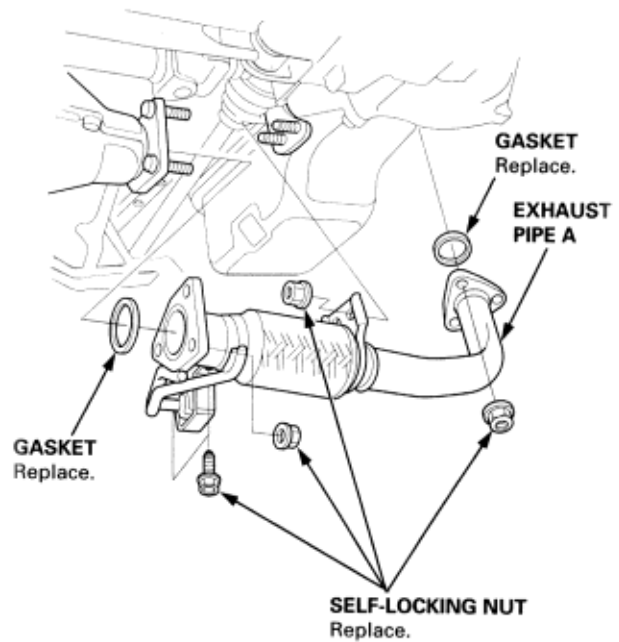


12. Remove both damper forks.

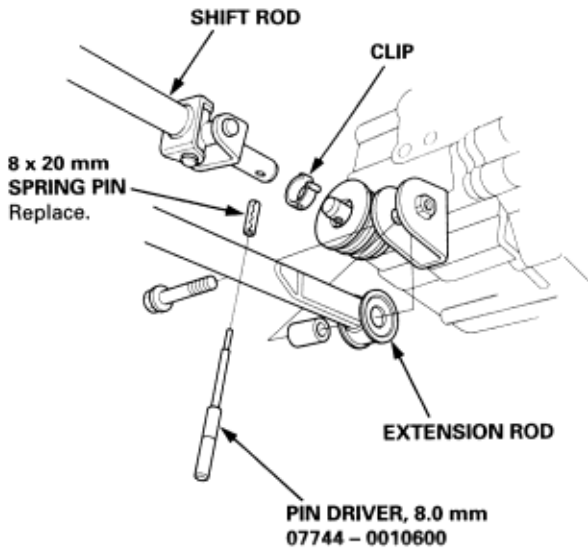
13. Remove the driveshafts from the differential (see section 16). Coat all the precision finished surfaces with clean engine oil grease. Tie bags over the driveshaft ends.



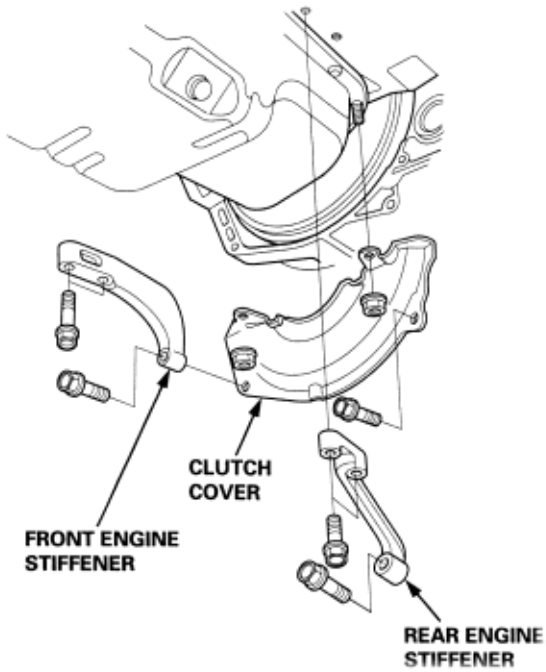
14. Remove the exhaust pipe A.



15. Remove the shift rod and extension rod.

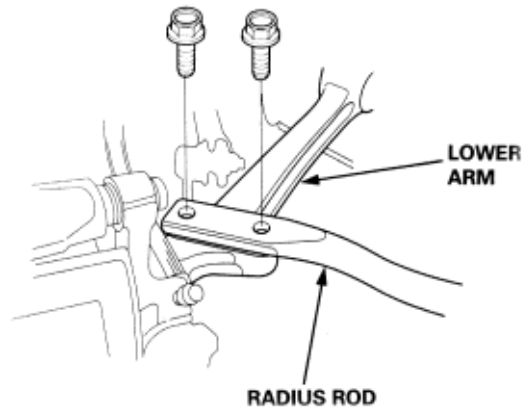


16. Remove the front and rear engine stiffeners.

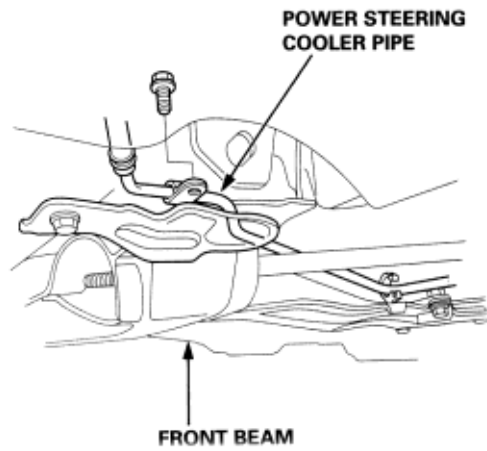


17. Remove the clutch cover.

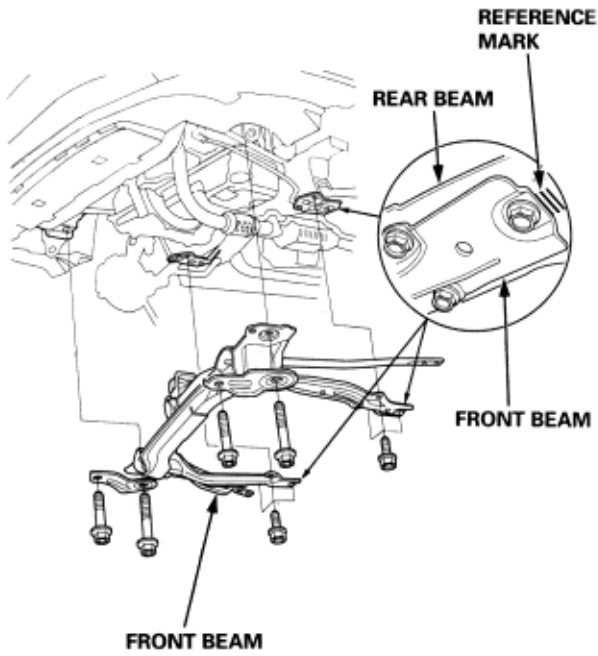
18. Remove both radius rods mounting bolts from the lower arm.



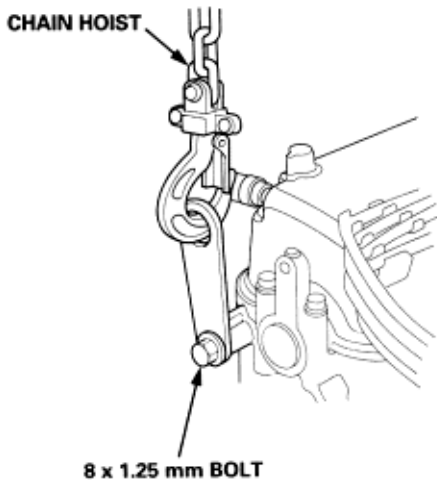
19. Remove the power steering cooler pipe from the front beam.



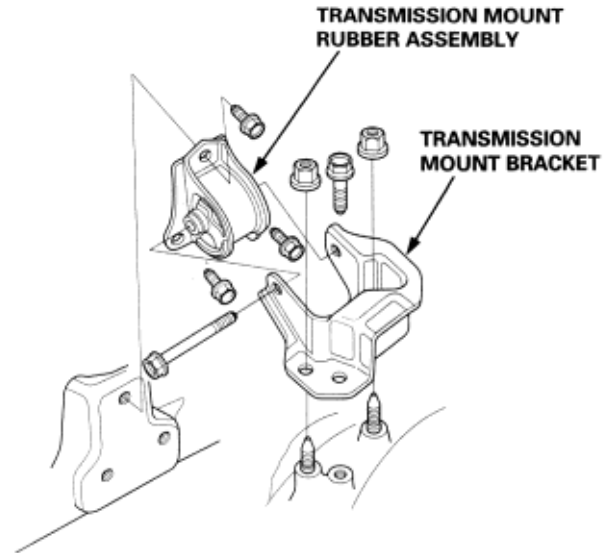
20. Make reference marks on the rear and front beam, then remove the front beam.



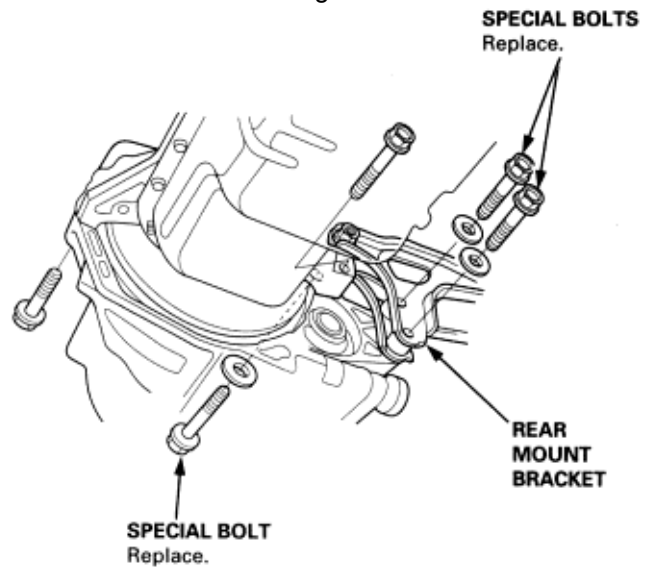
21. Remove the distributor.
22. Attach the chain hoist to the engine, then lift the engine slightly.



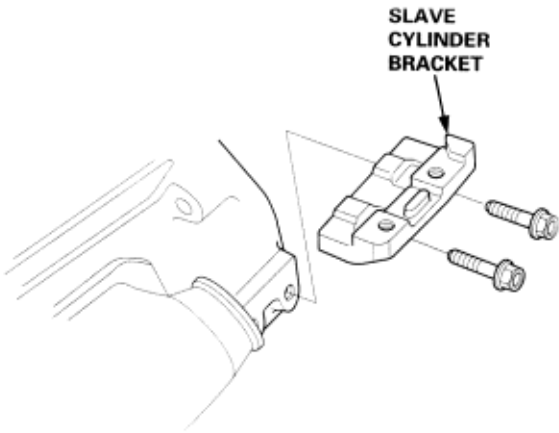
23. Place a floor jack under the transmission, and raise the transmission just enough to take the weight off of the mounts.
24. Remove the transmission mount bracket and transmission mount rubber assembly.



25. Remove the rear engine mount bracket bolts and transmission mounting bolts.



26. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack. Take care not to bend the clutch line.
27. Remove the slave cylinder bracket from the transmission.



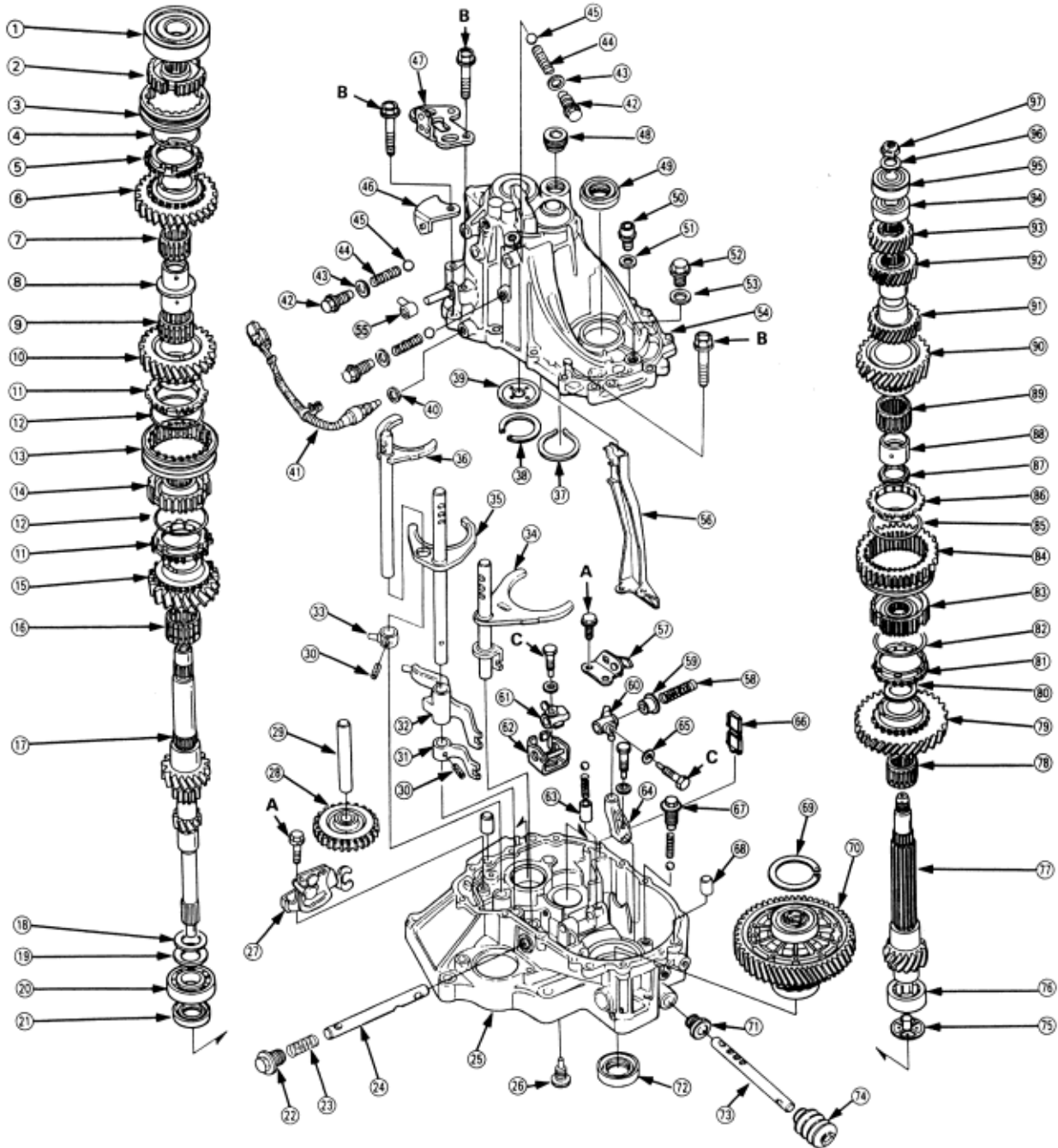
Refer to the drawing below for transmission disassembly/reassembly.
Clean all the parts thoroughly in solvent and dry with compressed air.



Lubricate all the parts with oil before reassembly.

NOTE:

- ♦ This transmission uses no gaskets between the major housings; use liquid gasket (P/N 08C70-K0234M).
- ♦ Always clean the magnet (66) whenever the transmission housing is disassembled.
- ♦ Inspect all the bearings for wear and operation.



Torque Value
A - 15 Nm (1.5 kgf/m, 11 lbf/ft)
B - 27 Nm (2.8 kgf/m, 20 lbf/ft)
C - 31 Nm (3.2 kgf/m, 23 lbf/ft)

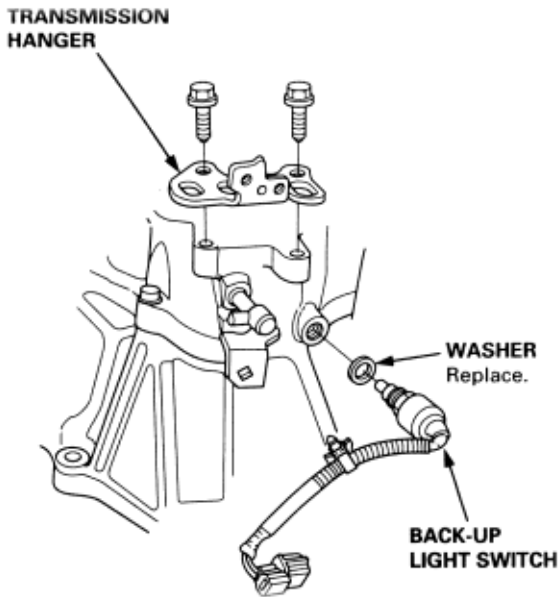
- | | | |
|--|--|--|
| 1 Ball bearing | 36 5th/Reverse shift fork | 69 80 mm Thrust shim
Selection (see page 13-34) |
| 2 5th Synchro hub | 37 52 mm Snap ring | 70 Differential assembly
(see page 13-31) |
| 3 5th Synchro sleeve | 38 70 mm Thrust shim
Selection (see page 13-39) | 71 14 x 25 x 17.5 mm Oil seal.
Replace |
| 4 Synchro spring | 39 Oil guide plate | 72 35 x 55 8 mm Oil seal.
Replace |
| 5 Synchro ring | 40 Washer. replace | 73 Shift rod |
| 6 5th gear | 41 Back-up light switch 25 Nm (2.5 kgf/m, 18 lbf/ft) | 74 Boot |
| 7 32 x 37 x 23.5 mm Needle bearing | 42 Set screw 22 Nm (2.2 kgf/m, 16 lbf/ft) | 75 Oil guide plate |
| 8 Spacer collar | 43 Washer. Replace | 76 30 x 55 x 21 mm Needle bearing |
| 9 34 x 39 x 23 mm Needle bearing | 44 Spring L. 26.0 mm (1.02 in) | 77 Countershaft |
| 10 4th gear | 45 Steel ball (5/16 in) | |
| 11 Synchro ring | 46 Back-up light switch harness stay | 78 36 x 41 x 25.5 mm Needle bearing
Check for wear and operation |
| 12 Synchro spring | 47 Transmission hanger | 79 1st gear |
| 13 3rd/4th synchro sleeve | 48 32 mm sealing bolt 25 Nm (2.5 kgf/m, 18 lbf/ft) | 80 Friction damper |
| 14 3rd/4th synchro hub | 49 35 x 62 x 8 mm oil seal
Replace | 81 Synchro ring |
| 15 3rd gear | 50 Oil drain plug 39 Nm (4.0 kgf/m, 29 lbf/ft) | 82 Synchro spring |
| 16 34 x 39 x 27.5 mm Needle bearing | 51 Washer. Replace | 83 1st/2nd synchro hub |
| 17 Mainshaft | 52 Filler plug 44 Nm (4.5 kgf/m, 33 lbf/ft) | 84 Reverse gear |
| 18 Washer | 53 Washer. Replace | 85 Synchro spring |
| 19 Spring washer | 54 Transmission housing | 86 Synchro ring |
| 20 Ball bearing | 55 Breather cap | 87 Friction damper |
| Check for wear and operation | | |
| 21 26 x 42 x 7 mm Oil seal
Replace | 56 Oil gutter plate | 88 Spacer |
| 22 28 mm Plug bolt | 57 Reverse lock cam | 89 39 x 44 x 27 mm Needle bearing |
| 23 1st/2nd select spring L. 36.26 mm (1.428 in) | 58 Reverse select spring L. 63.4 mm (2.496 in) | 90 2nd gear |
| 24 Shift arm shaft | 59 Reverse select retainer | 91 3rd gear |
| 25 Clutch housing | 60 Shift arm C | 92 4th gear |
| 26 Interlock guide bolt 39 Nm (4.0 kgf/m, 29 lbf/ft) | 61 Shift arm B | 93 5th gear |
| 27 Reverse shift holder | 62 Interlock | 94 Needle bearing |
| 28 Reverse idler gear | 63 Collar | 95 Ball bearing |
| 29 Reverse idler gear shaft | 64 Shift arm A | 96 Spring washer |
| 30 5 x 22 mm Spring pin
Replace | 65 Spring washer | 97 Locknut. Replace
108 to 0 to 108 Nm
(11.0 to 0 to 11.0 kgf/m, 79.6 to 0 to 79.6 lbf/ft) |
| 31 3rd/4th Shift piece | 66 Magnet | |
| 32 5th/reverse shift piece | 67 Set ball spring bolt 22Nm (2.2kgf/m, 16 lbf/ft) | |
| 33 MBS shift piece | 68 14 x 20 mm Dowel pin | |
| 34 1st/2nd Shift fork | | |
| 35 3rd/4th Shift fork | | |

Transmission Housing Removal

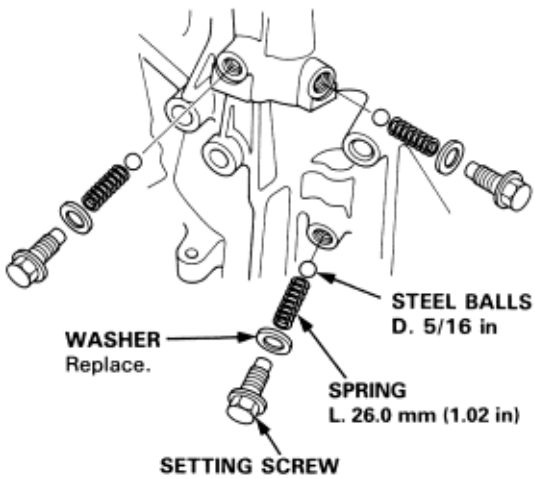
13-14

NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

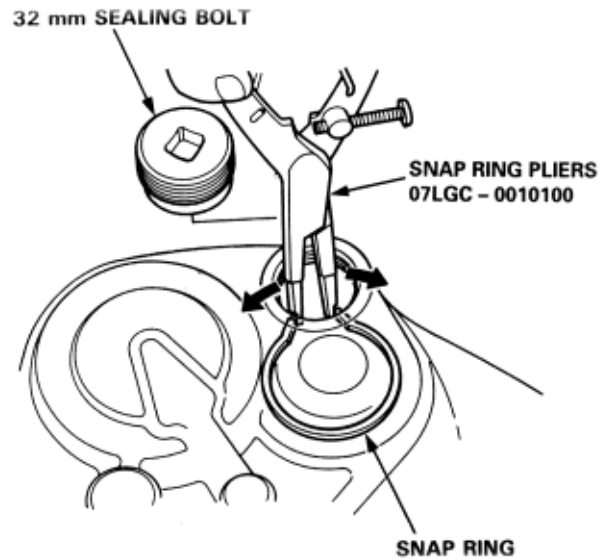
1. Remove the back-up light switch.
2. Remove transmission hanger.



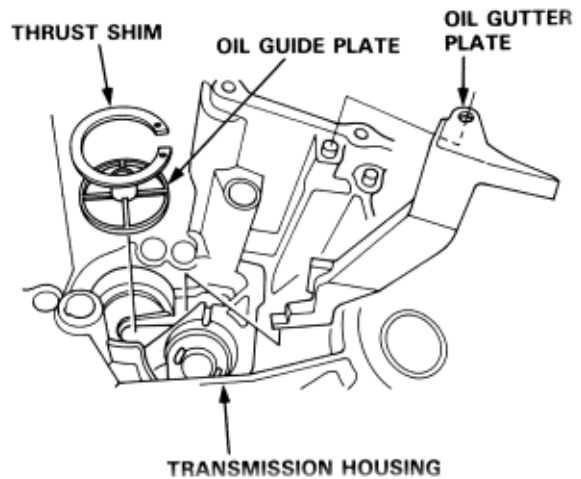
3. Remove the setting screws, washers, springs, and steel balls.



4. Loosen the transmission housing attaching bolts in a crisscross pattern in several steps, then remove them.
5. Remove the 32 mm sealing bolt.
6. Expand the snap ring on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.



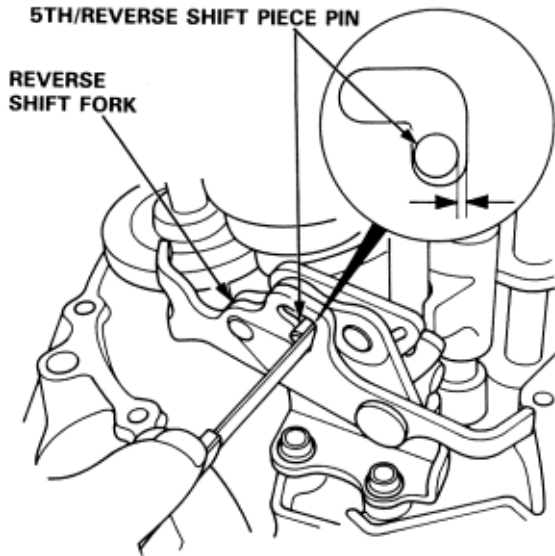
7. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.
8. Remove the thrust shim, oil guide plate, and oil gutter plate from the transmission housing.



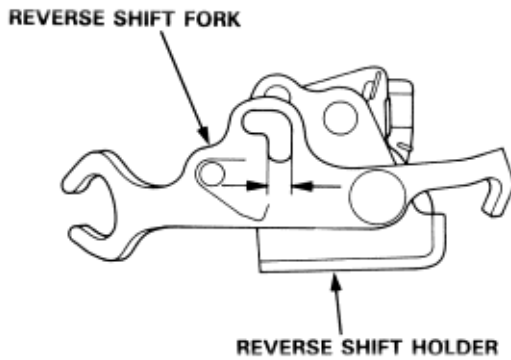
Reverse Shift Holder Clearance Inspection

13-15

1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.
Standard: 0.05-0.35 mm (0.002-0.014 in)
Service Limit: 0.5 mm (0.020 in)

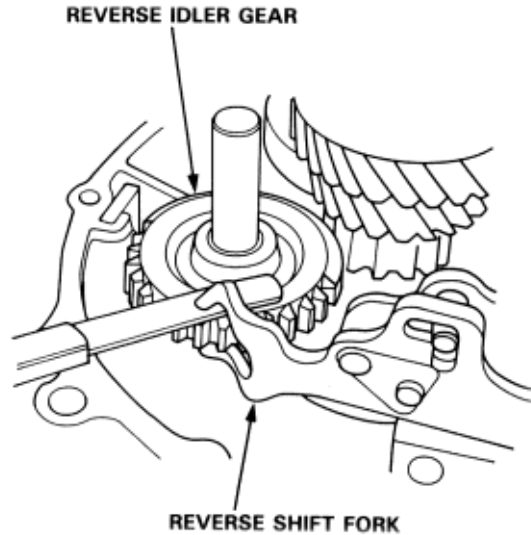


2. If the clearances are more than the service limit, measure the widths of the groove in the reverse shift fork.
Standard: 7.05-7.25 mm (0.278-0.285 in)

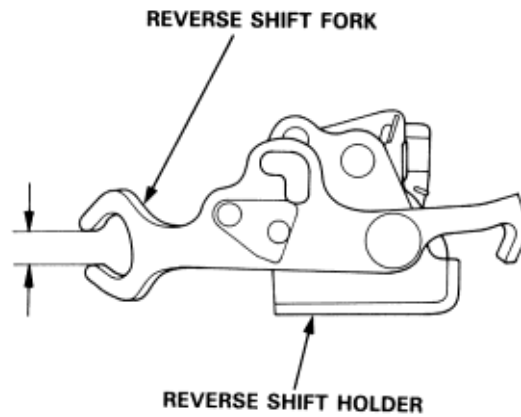


- ♦ If the widths of the grooves are not within the standard, replace the reverse shift holder with a new one.
- ♦ If the width of the grooves are within the standard, replace the 5th/reverse shift piece with a new one.

3. Measure the clearance between the reverse idler gear and the reverse shift fork.
Standard: 0.5-1.1mm (0.02-0.04 in)
Service Limit: 1.8 mm (0.07 in)



4. If the clearance is more than the service limit, measure the width of the reverse shift fork.
Standard: 12.7-13.0 mm (0.500-0.512 in)



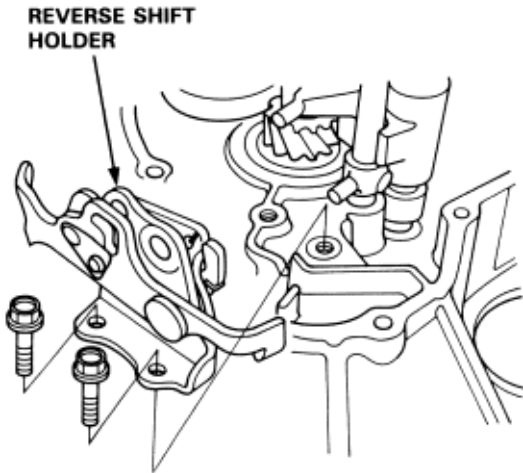
- ♦ If the width is not within the standard, replace the reverse shift holder with a new one.
- ♦ If the width is within the standard, replace the reverse idler gear with a new one.

**Reverse Idler Gear
Removal**

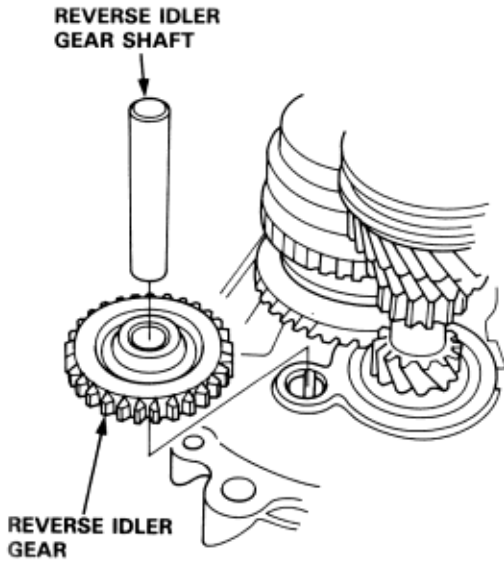
13-16

**Mainshaft, Countershaft,
Shift Fork
Disassembly**

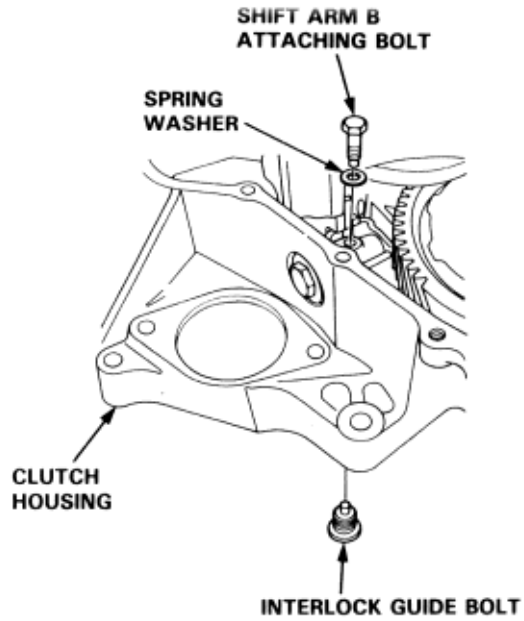
1. Remove the reverse shift holder.



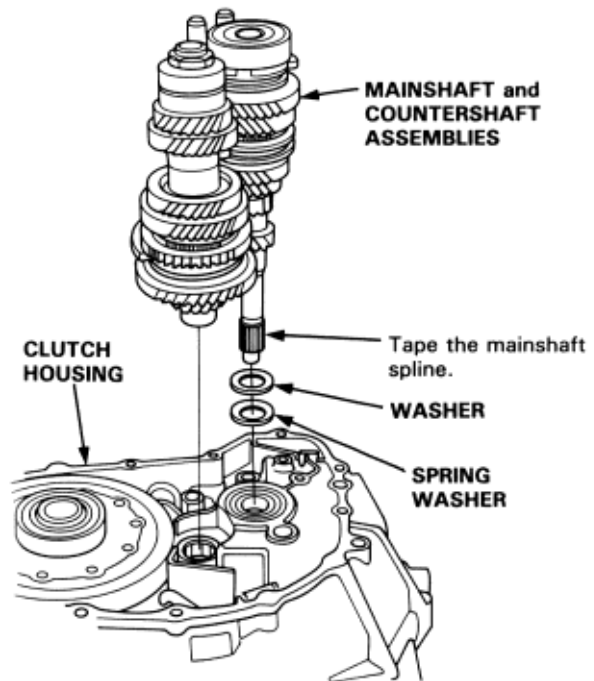
2. Remove the reverse idler gear shaft and reverse idler gear.



1. Remove the interlock guide bolt from under the clutch housing.
2. Remove the shift arm B attaching bolt.



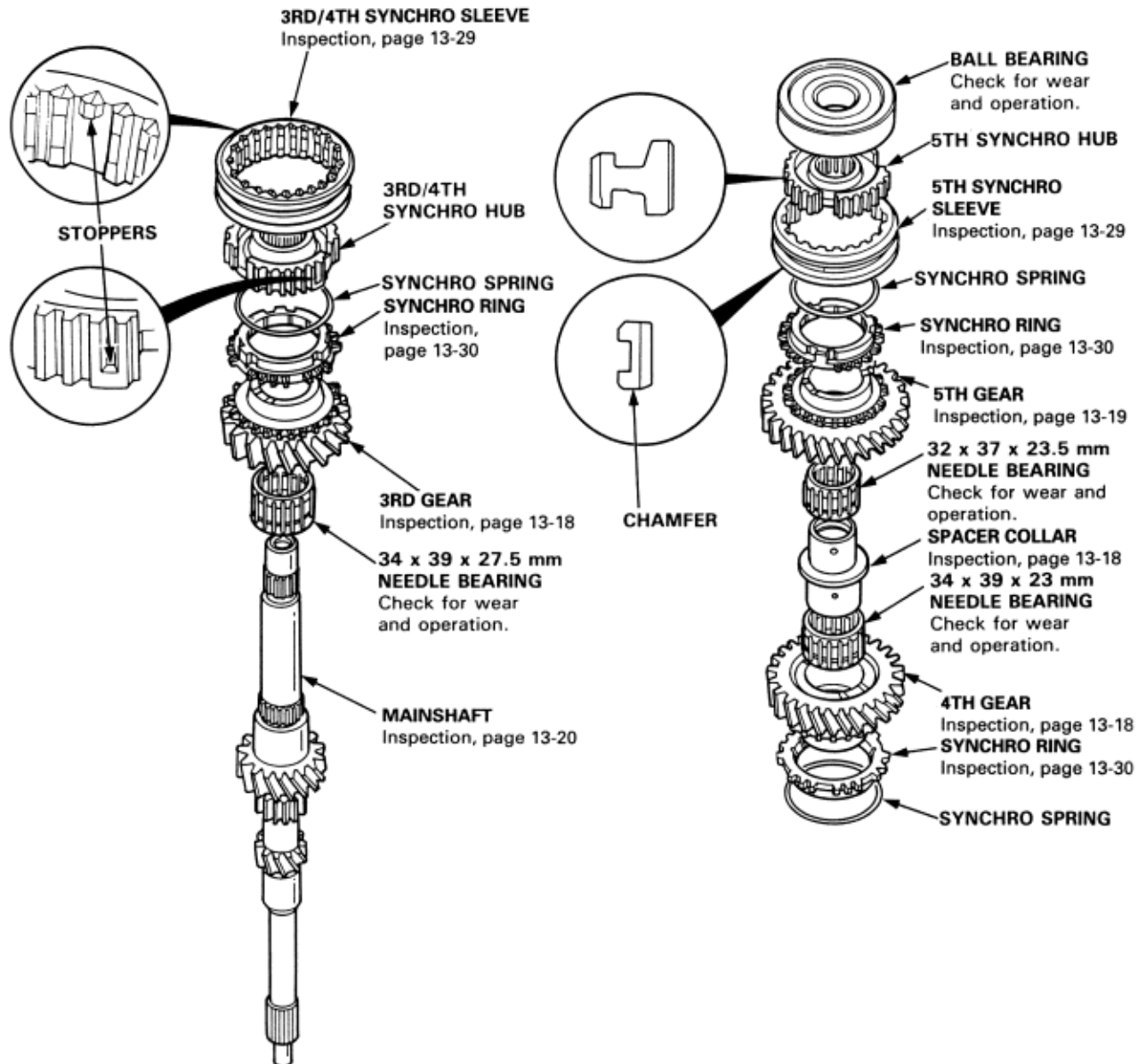
3. Remove the mainshaft and countershaft assemblies with the shift fork from the clutch housing.
NOTE: Before removing the mainshaft and countershaft assemblies, tape the mainshaft spline to protect it.



NOTE: The 3rd/4th and 5th synchro hubs are installed with a press.



Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd/4th and 5th synchro hubs, however, should be installed with a press before lubricating them.



To go to the pages referenced on the diagram above, click on the following:

(See page 13-29)

(See page 13-30)

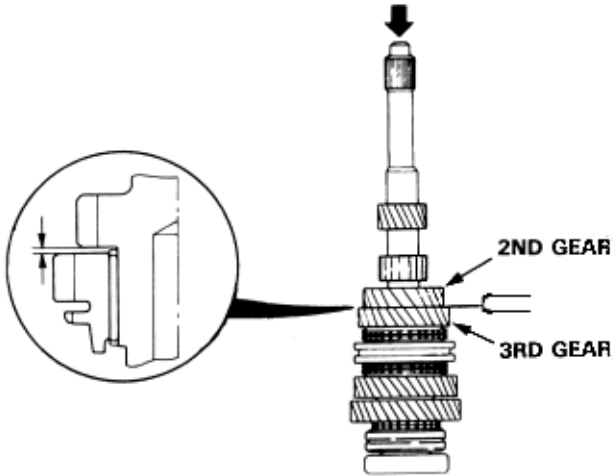
(See page 13-18)

(See page 13-20)

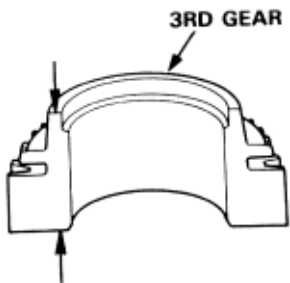
(See page 13-19)

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Measure the clearance between 2nd and 3rd gears.
Standard: 0.06-0.21 mm (0.002-0.008 in)
Service Limit: 0.33 mm (0.013 in)

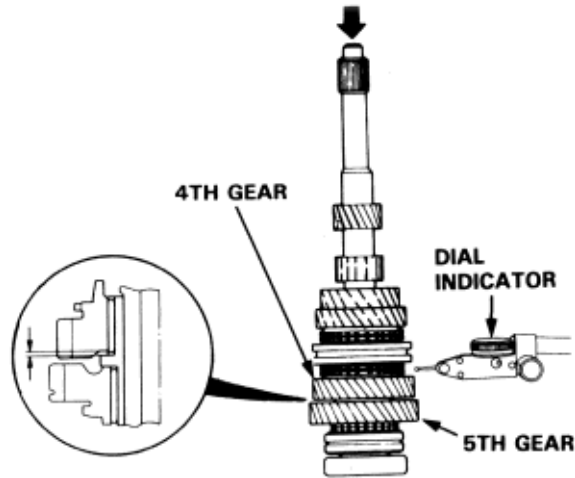


2. If the clearance is more than the service limit, measure the thickness of 3rd gear.
Standard: 30.22-30.27 mm (1.190-1.192 in)
Service Limit: 30.15 mm (1.187 in)

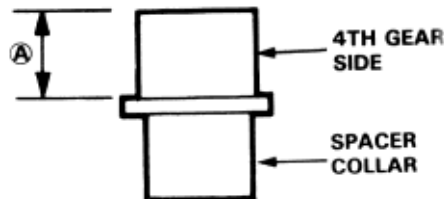


- ♦ If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
- ♦ If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

3. Measure the clearance between 4th gear and the spacer collar.
Standard: 0.06-0.19 mm (0.002-0.007 in)
Service Limit: 0.31 mm (0.012 in)

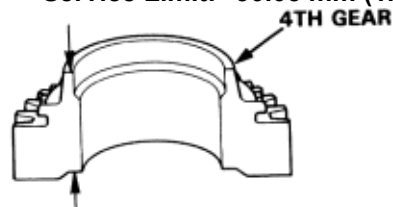


4. If the clearance is more than the service limit, measure distance A on the spacer collar.
Standard: 22.83-22.86 mm (0.898-0.900 in)
Service Limit: 22.81 mm (0.898 in)



5. If distance A is less than the service limit, replace the spacer collar with a new one. If distance A is within the service limit, measure the thickness of 4th gear.

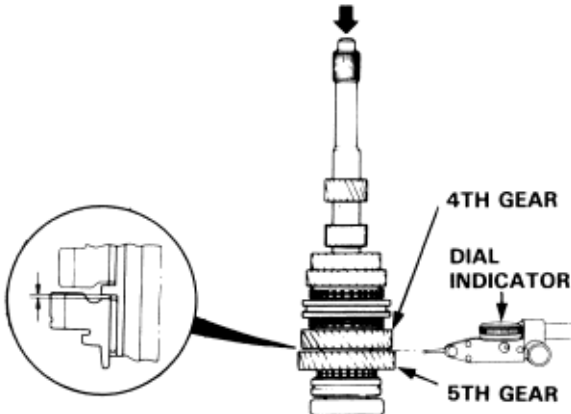
- Standard:** 30.12-30.17 mm (1.186-1.188 in)
Service Limit: 30.05 mm (1.183 in)



- ♦ If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
- ♦ If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

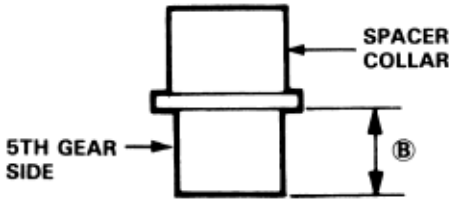
6. Measure the clearance between the spacer collar and 5th gear.

Standard: 0.06-0.19 mm (0.002-0.007 in)
Service Limit: 0.31 mm (0.012 in)



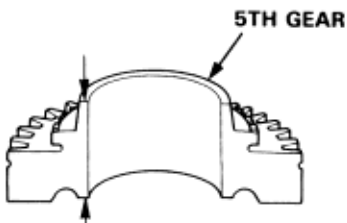
7. If the clearance is more than the service limit, measure distance **B** on the spacer collar.

Standard: 23.53-23.56 mm
 (0.926-0.928 in)
Service Limit: 23.51 mm (0.926 in)



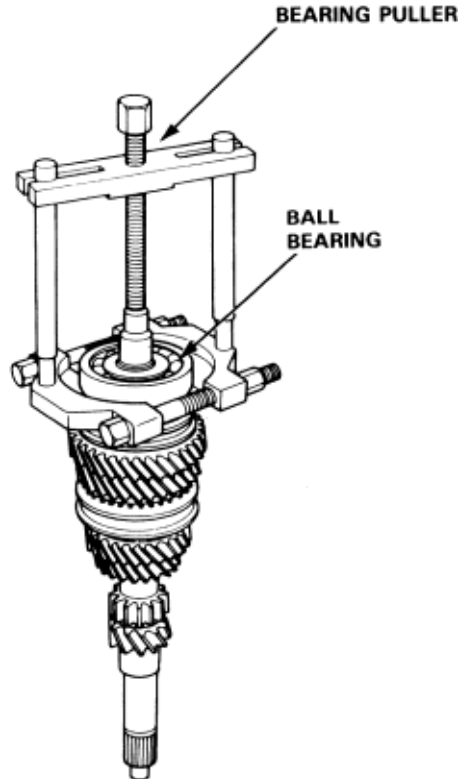
8. If distance **B** is less than service limit, replace the spacer collar with a new one. If distance **B** is within the service limit, measure thickness of 5th gear.

Standard: 28.42-28.47 mm
 (1.119-1.121 in)
Service Limit: 28.35 mm (1.116 in)



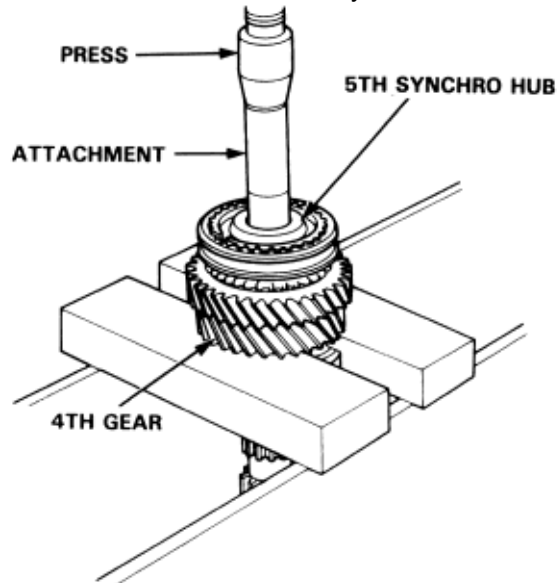
- ♦ If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
- ♦ If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

1. Remove the ball bearing using a bearing puller as shown.

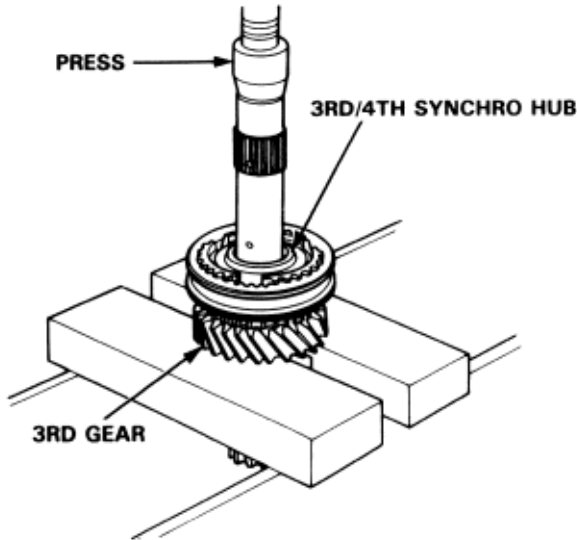


CAUTION
 Remove the synchro hubs using a press and steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

2. Support 4th gear on steel blocks, and press the mainshaft out of the 5th synchro hub as shown.



3. Support the 3rd gear on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub as shown.



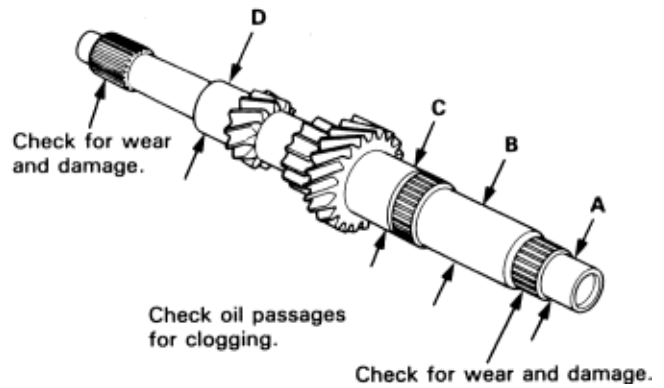
1. Inspect the gear surface and the bearing surface for wear and damage, then measure the mainshaft at points A, B, C, and D.

Standard:

A:	21.987-22.000 mm (0.8656-0.8661 in)
B:	26.980-26.993 mm (1.0622-1.0627 in)
C:	33.984-34.000 mm (1.3380-1.3386 in)
D:	25.977-25.990 mm (1.0227-1.0232 in)

Service Limit:

A:	21.930 mm (0.8634 in)
B:	26.930 mm (1.0602 in)
C:	33.930 mm (1.3358 in)
D:	25.920 mm (1.0205 in)



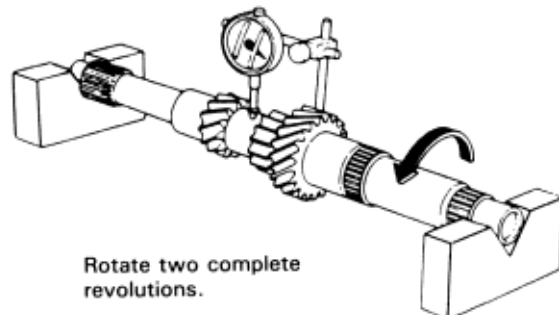
- ♦ If any part of the mainshaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: 0.02 mm (0.001 in) max.

Service Limit: 0.05 mm (0.002 in)

NOTE: Support the mainshaft at both ends as shown.



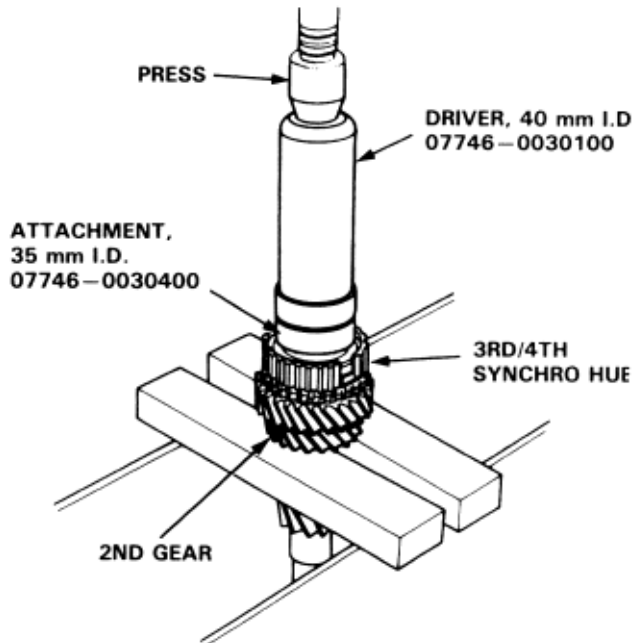
- ♦ If the runout is more than the service limit, replace the mainshaft with a new one.

CAUTION

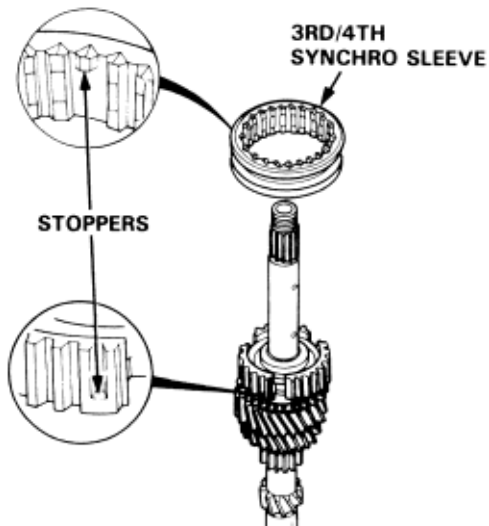
When installing the 3rd/4th and 5th synchro hubs, support the shaft on steel blocks, and install the synchro hubs using a press.

NOTE: For reassembly sequence (see page 13-17).

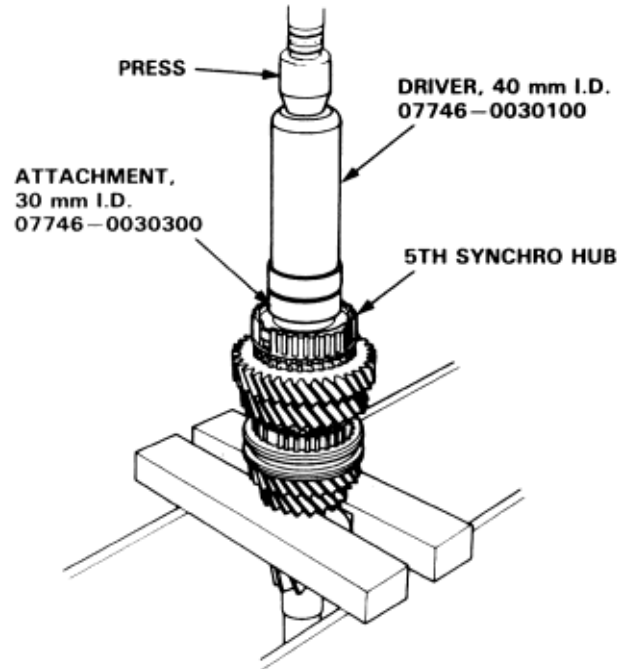
1. Support 2nd gear on steel blocks, then install the 3rd/4th synchro hub using the special tools and a press as shown.



2. Install the 3rd/4th synchro sleeve by aligning the stoppers of the 3rd/4th synchro sleeve and hub. NOTE: After installing, Check the operation of the 3rd/4th synchro hub set.

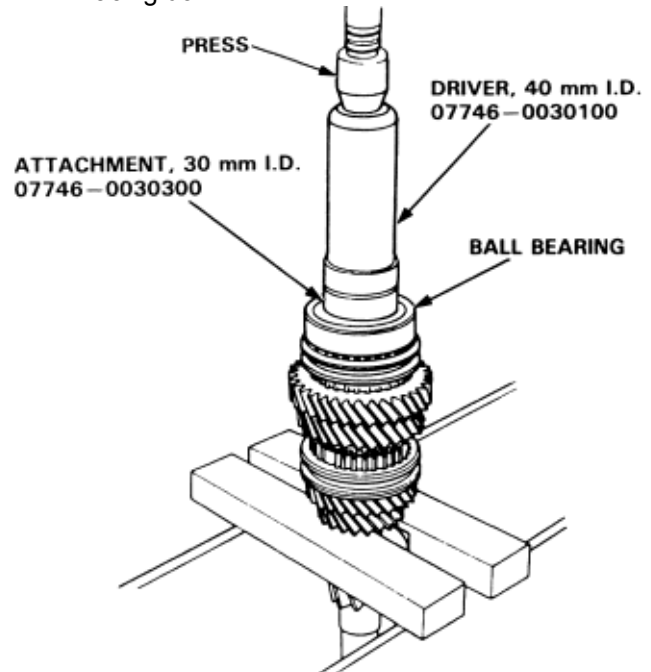


3. Install the 5th synchro hub using the special tools and a press as shown.




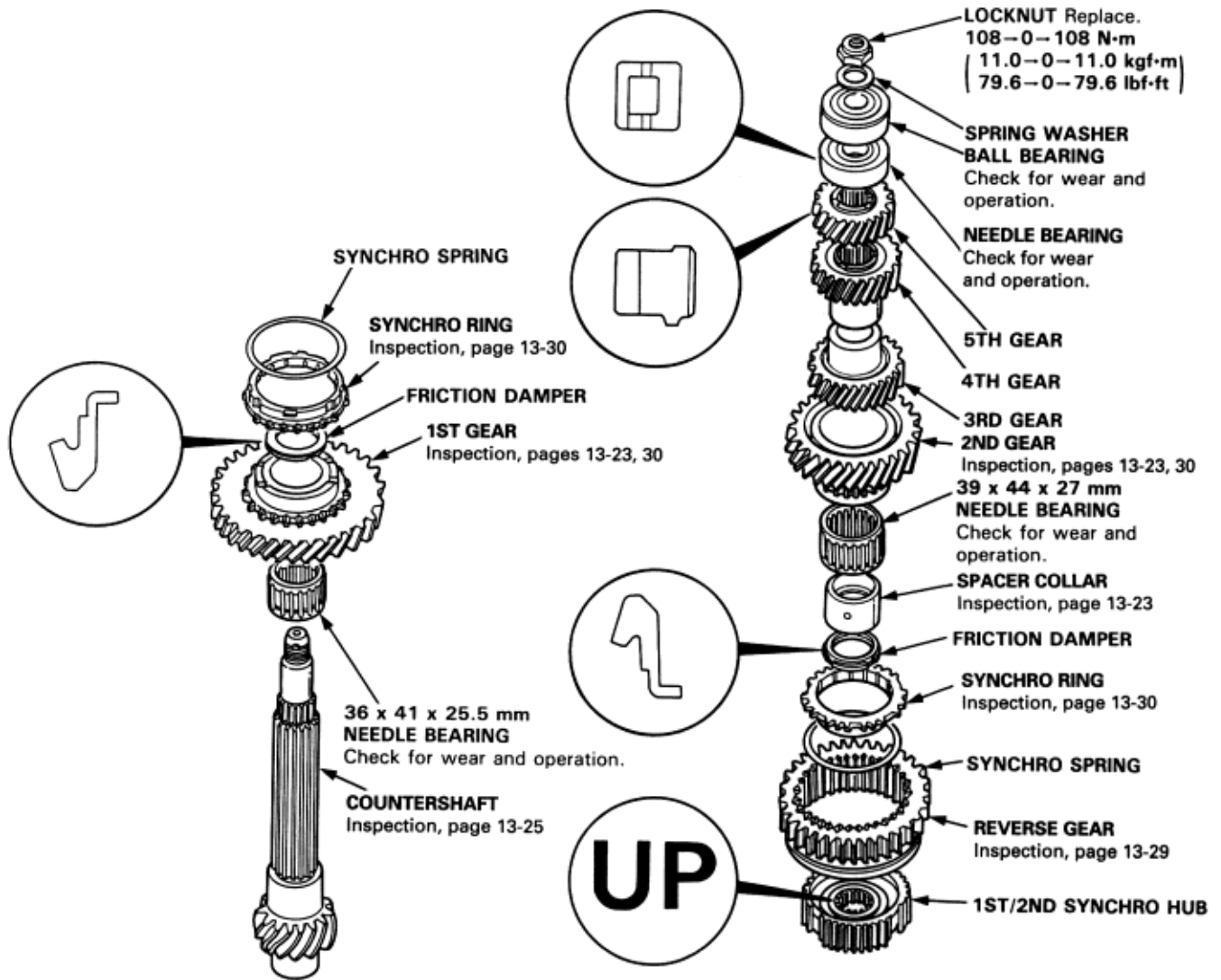
4. Install the ball bearing using the special tools and a press as shown.

NOTE: Install the ball bearing with the tapered end facing down.



NOTE: The 3rd, 4th, and 5th gears are installed with a press.

 Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd, 4th, and 5th gears., however, should be installed with a press before lubricating them.



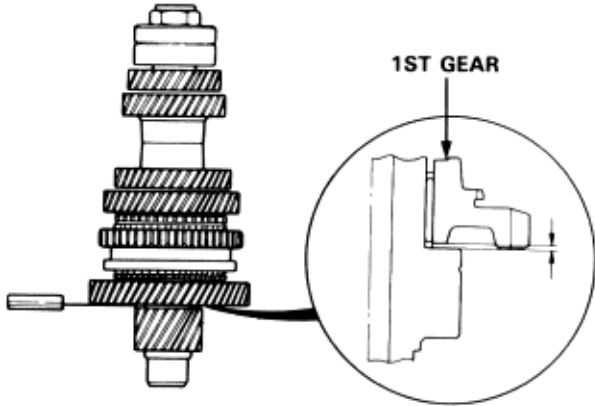
To go to the pages referenced on the diagram above, click on the following:

- (See page 13-30)
- (See page 13-23)
- (See page 13-25)
- (See page 13-29)

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

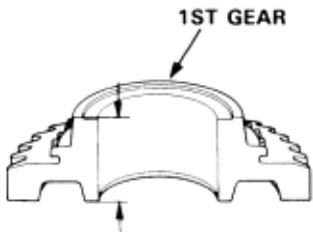
1. Measure the clearance between the countershaft and 1st gear.

Standard: 0.03-0.10 mm
(0.001-0.004 in)
Service Limit: 0.22 mm (0.009 in)



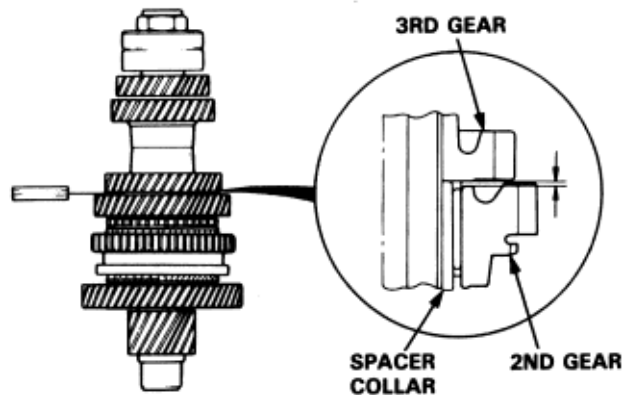
2. If the clearance is more than the service limit, measure the thickness of 1st gear.

Standard: 30.41-30.44 mm
(1.197-1.198 in)
Service Limit: 30.36 mm (1.195 in)

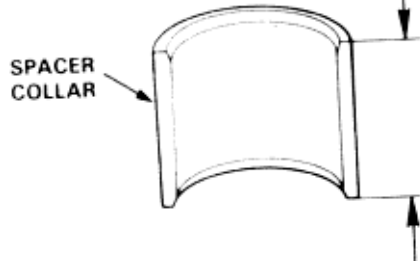


- ♦ If the thickness of 1st gear is less than the service limit, replace 1st gear with a new one.
- ♦ If the thickness of 1st gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

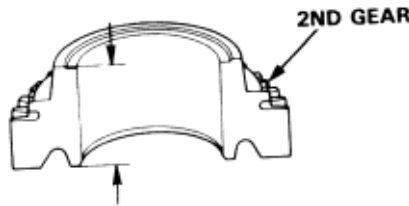
3. Measure clearance between 2nd and 3rd gears.
Standard: 0.04-0.12 mm (0.002-0.005 in)
Service Limit: 0.24 mm (0.009 in)



4. If the clearance is more than the service limit, measure the thickness of the spacer collar.
Standard: 32.03-32.06 mm (1.261-1.262 in)
Service Limit: 32.01 mm (1.260 in)



5. If the thickness is less than the service limit, replace the spacer collar with a new one. If the thickness is within the service limit, measure the thickness of 2nd gear.
Standard: 31.91-31.96mm (1.256-1.258 in)
Service Limit: 31.85 mm (1.254 in)



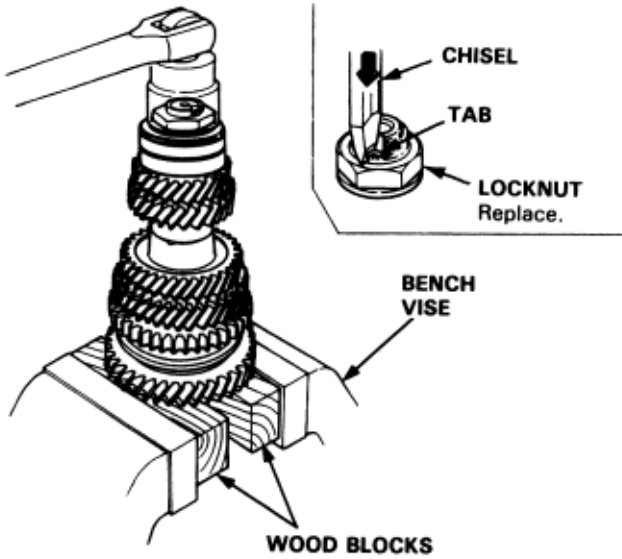
- ♦ If the thickness of 2nd gear is less than the service limit, replace 2nd gear with a new one.
- ♦ If the thickness of 2nd gear is within the service limit, replace the 1st/2nd synchro hub with a new one.



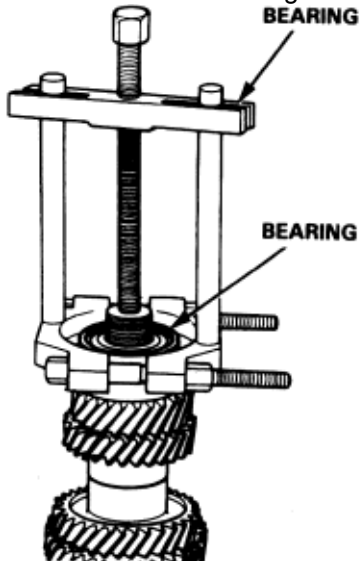
CAUTION

Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

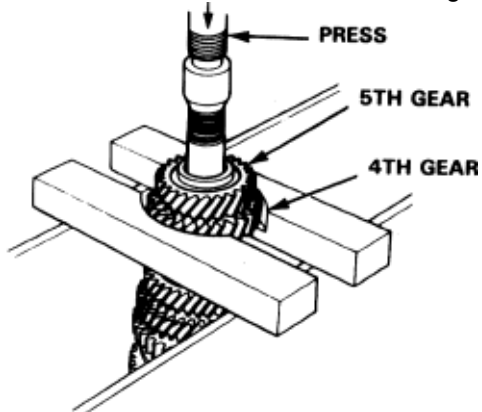
1. Securely clamp the countershaft assembly in a bench vice with wood blocks.
2. Raise the locknut tab from the groove of the countershaft, then remove the locknut and the spring washer.



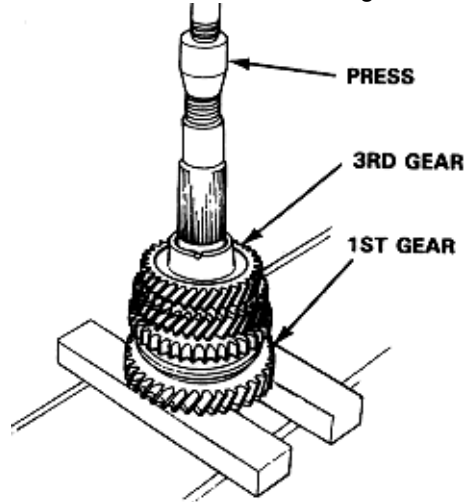
3. Remove the bearings using a bearing puller as shown.



4. Support 4th gear on steel blocks, and press the countershaft out of 5th and 4th gears as shown.



5. Support 1st gear on steel blocks, and press the countershaft out of 3rd gear as shown.



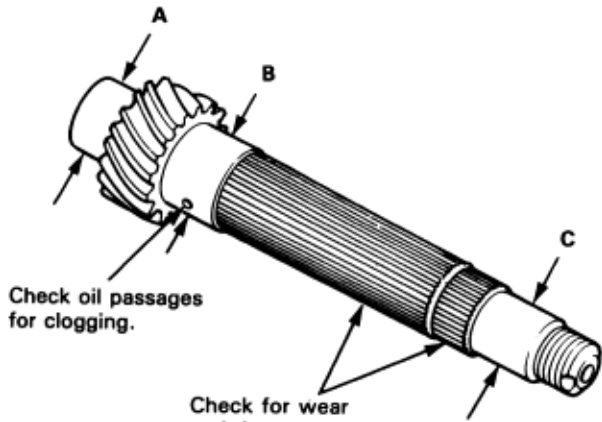
1. Inspect the gear surfaces and bearing surfaces for wear and damage, then measure the countershaft at points A, B, and C.

Standard:

- A:** 30.000-30.015 mm (1.1811-1.1817 in)
- B:** 35.984-36.000mm (1.4167-1.4173 in)
- C:** 24.980-24.993 mm (0.9835-0.9840 in)

Service Limit:

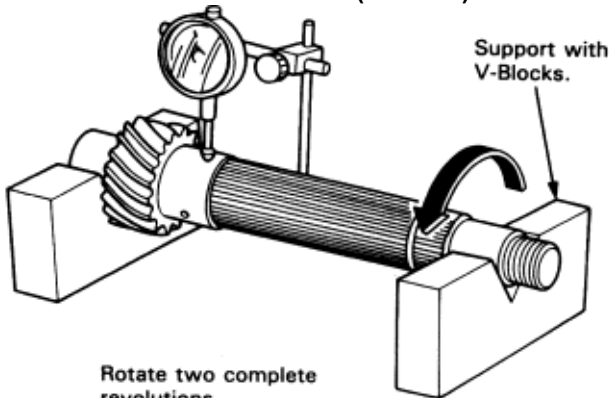
- A:** 29.950 mm (1.1791 in)
- B:** 35.930 mm (1.4146 in)
- C:** 24.930 mm (0.9815 in)



- ♦ If any part of the countershaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: 0.02 mm (0.001 in) max.
Service Limit: 0.05 mm (0.002 in)



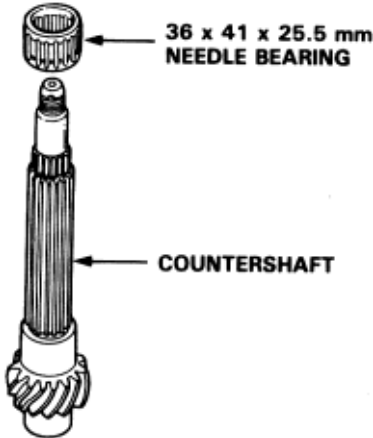
- ♦ If the runout is more than the service limit, replace the countershaft with a new one.

CAUTION

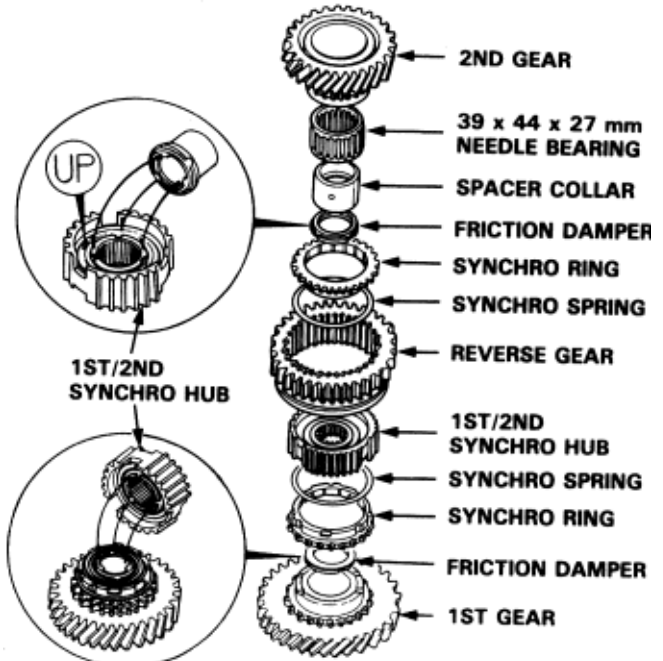
- ♦ Press the 3rd, 4th, and 5th gears on the countershaft without lubrication.
- ♦ When installing the 3rd, 4th, and 5th gears, support the shaft on steel blocks and install the gears using a press.

NOTE: For reassembly sequence (see page 13-22).

1. Install the needle bearing on the countershaft.

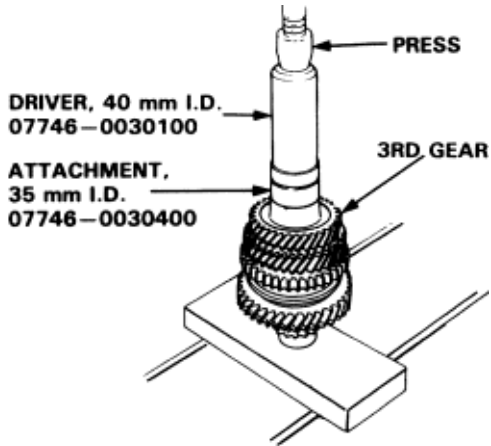


2. Assemble the parts below as shown.
NOTE: Check that the fingers of the friction damper are securely set in the grooves of the 1st/2nd synchro hub.

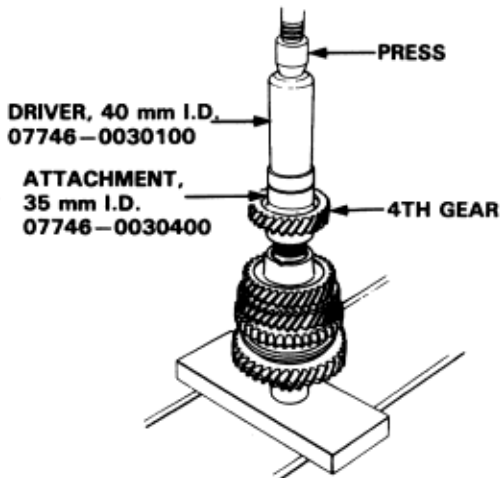


3. Install the parts on the countershaft.

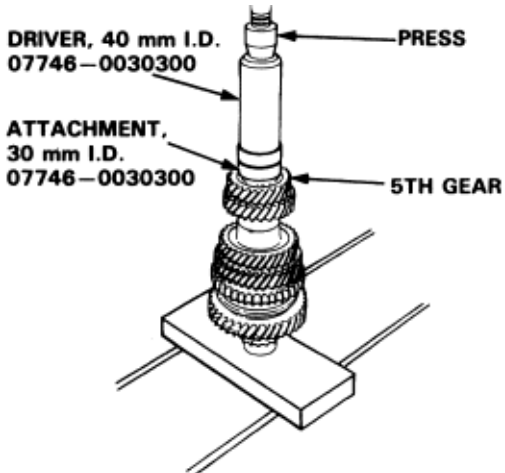
4. Support the countershaft on a steel block as shown and install 3rd gear using the special tools and a press as shown.



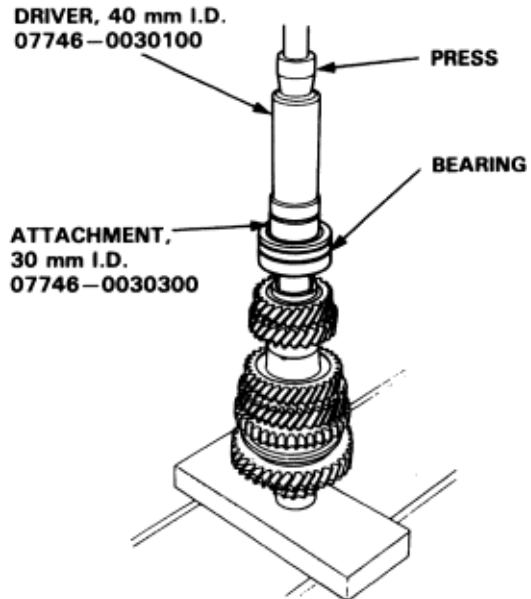
5. Install 4th gear using the special tools and a press as shown.



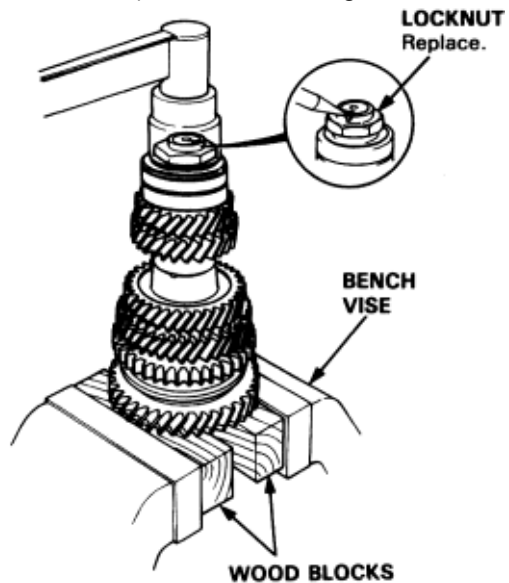
6. Install 5th gear using the special tools and a press as shown.



7. Install the bearings using the special tools and a press as shown.

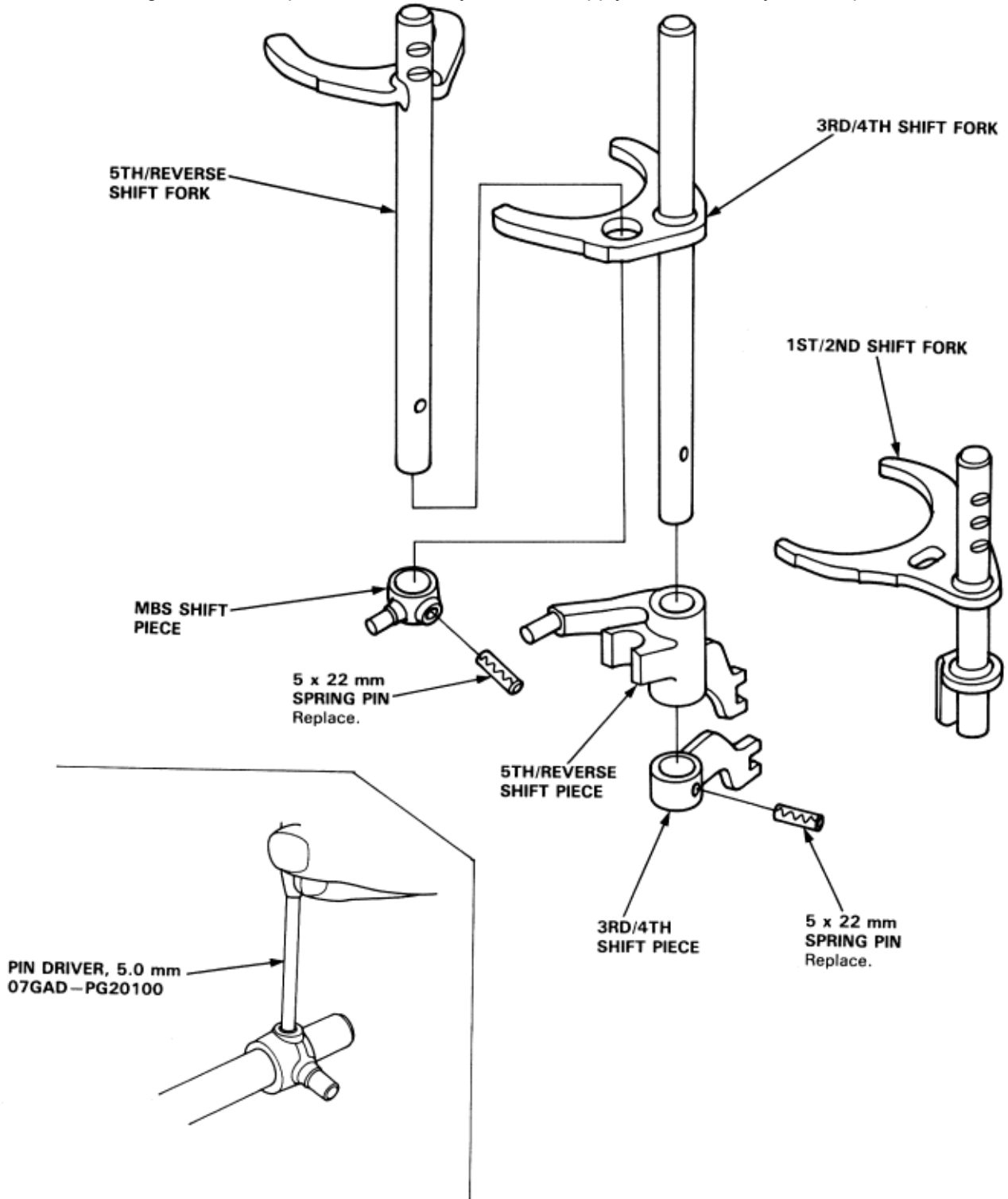


8. Securely clamp the countershaft assembly in a bench vice with wood blocks.
9. Install the spring washer, tighten the locknut, then stake the locknut tab into groove.
LOCKNUT
108 to 0 to 108 Nm
(11.0 to 0 to 11.0 kgf-m, 79.6 to 0 to 79.6 lbf-ft)





Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



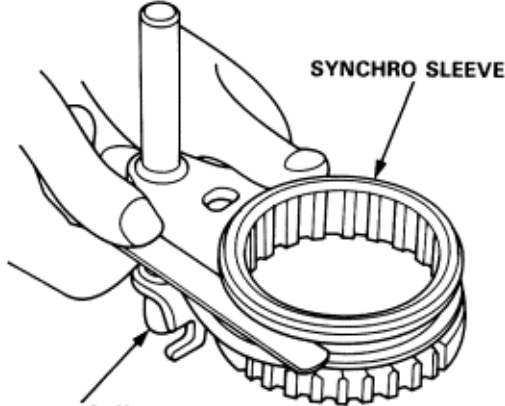
Shift Fork Assembly Clearance Inspection

13-28

NOTE: The synchro sleeve and the synchro hub should be replaced as a set.

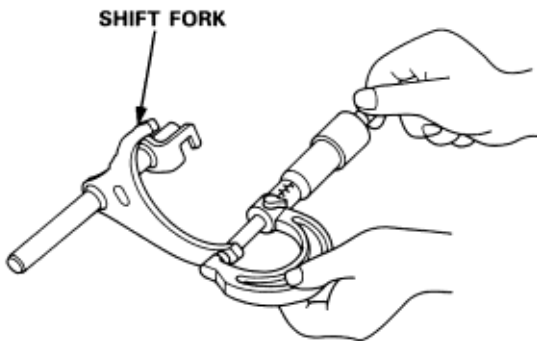
1. Measure the clearance between each shift fork and its matching synchro sleeve.

Standard: 0.35-0.65 mm (0.014-0.026 in)
Service Limit: 1.0 mm (0.04 in)



2. If the clearance is more than the service limit, measure the thickness of the shift fork fingers.

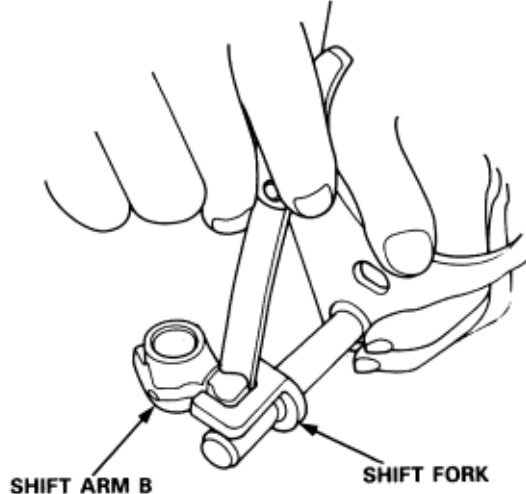
Standard:
3rd/4th: 7.4-7.6 mm (0.291-0.299 in)
1st/2nd, 5th: 6.2-6.4 mm (0.244-0.252 in)



- ♦ If the thickness of the shift fork fingers is not within the standard, replace the shift fork with a new one.
- ♦ If the thickness of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

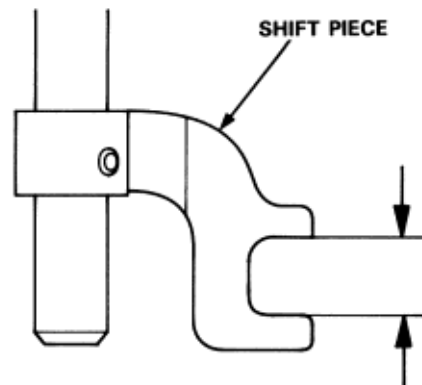
3. Measure the clearance between the shift piece or shift fork and the shift arm B.

Standard: 0.2-0.5 mm (0.008-0.02 in)
Service Limit: 0.6 mm (0.024 in)



4. If the clearance is more than the service limit, measure the groove of the shift piece or shift fork.

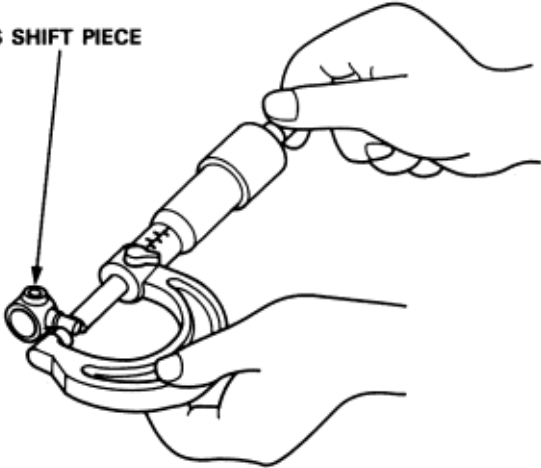
Standard: 13.2-13.4 mm (0.520-0.528 in)



- ♦ If the groove of the shift piece or shift fork is not within the standard, replace the shift piece or shift fork with a new one.
- ♦ If the groove of the shift piece or shift fork is within the standard, replace the shift arm B with a new one.

1. Measure the width of the MBS shift piece.
Standard: 6.9-7.1 mm (0.27-0.28 in)

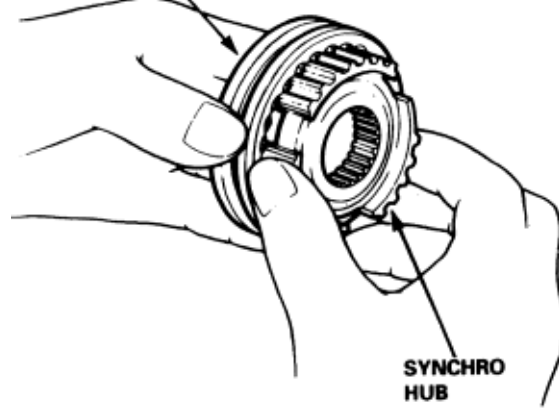
MBS SHIFT PIECE



- ♦ If the width of the MBS shift piece is not within the standard, replace the MBS shift piece.

1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicate wear.
2. Install each synchro hub in its mating synchro sleeve, and check for freedom of movement.
NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.

SYNCHRO SLEEVE

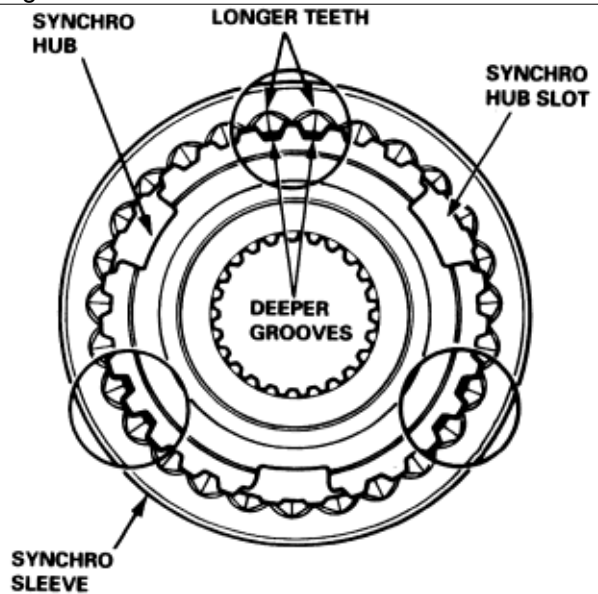


3. When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.



CAUTION

Do not install the synchro sleeve with its longer teeth in the synchro hub slots because it will damage the spring ring.

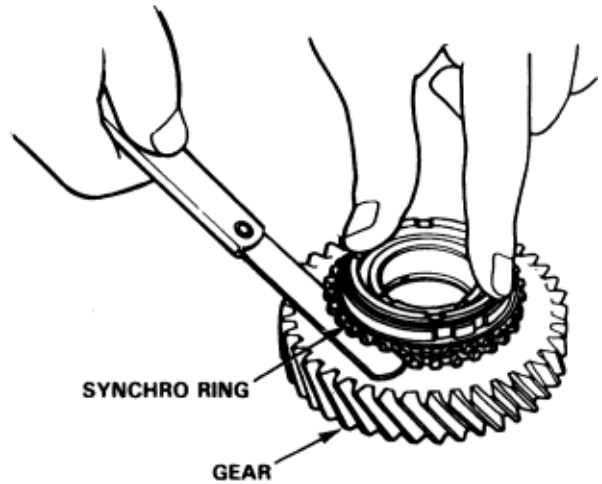
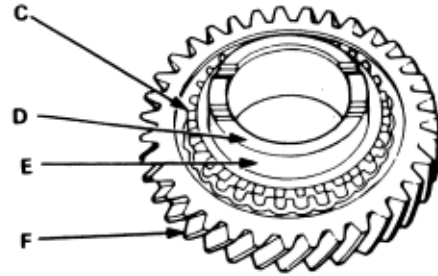
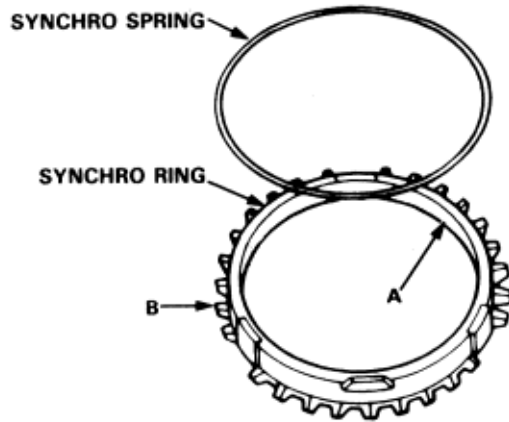


1. Inspect the synchro ring and gear.
 - A: Inspect the inside of the synchro ring for wear.
 - B: Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).
 - C: Inspect the synchro sleeve teeth and matching teeth on the gear for wear (rounded off).
 - D: Inspect the gear hub thrust surface for wear.
 - E: Inspect the cone surface for wear and roughness.
 - F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.
2. Coat the cone surface of the gear with oil, and place the synchro ring on the matching gear. Rotate the synchro ring, making sure that it does not slip. Measure the clearance between the synchro ring and gear all the way around.

NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

Synchro Ring-to-Gear Clearance
Standard: 0.73-1.18 mm (0.029-0.046 in)
Service Limit: 0.4mm (0.016 in)

If the clearance is less than the service limit, replace the synchro ring and synchro cone.



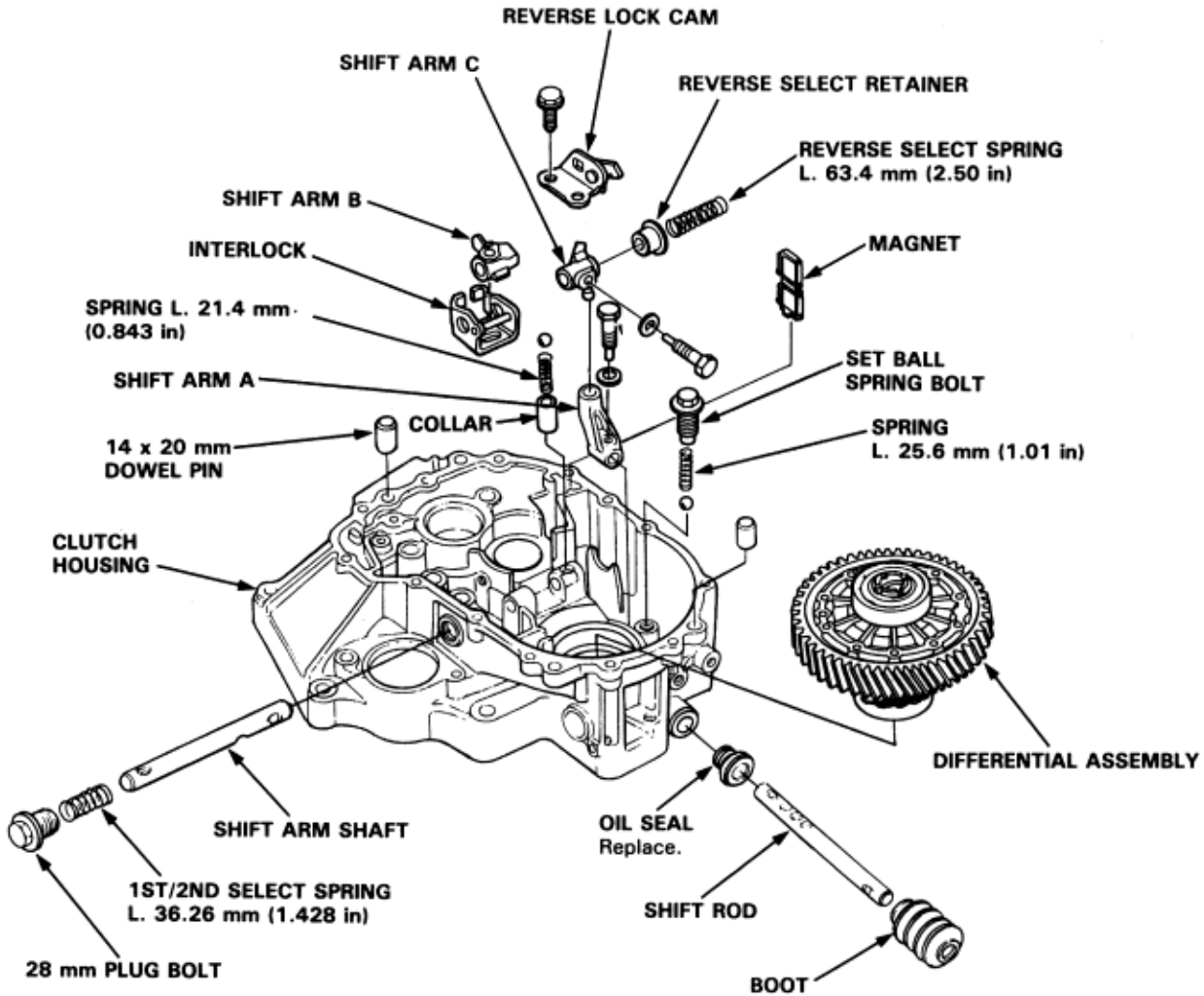
Shift Rod Removal

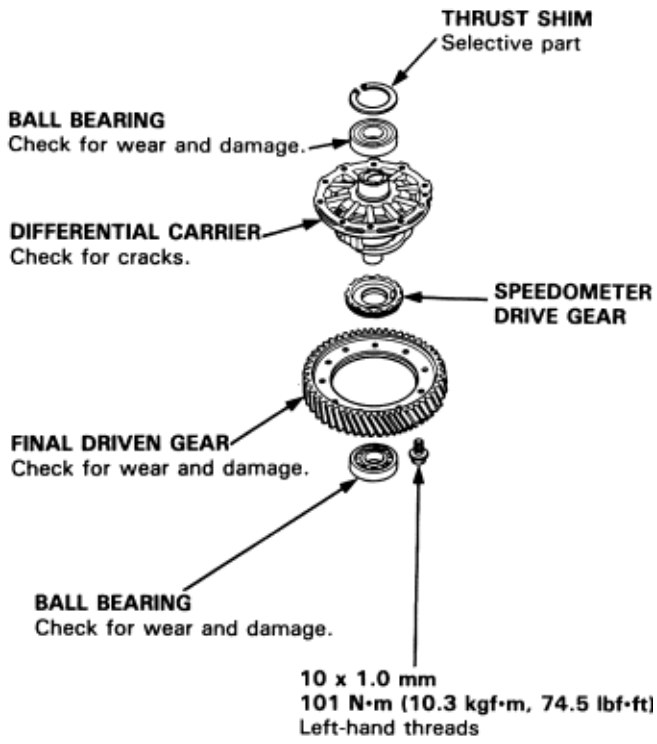
13-31

NOTE: The steel balls are all of the same size (5/16 in).

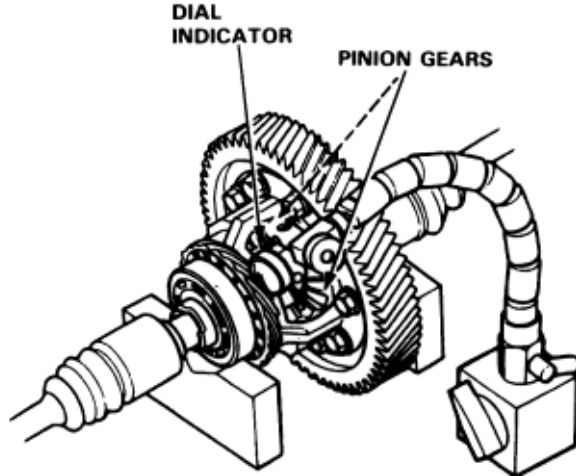
1. Remove the differential assembly.
2. Remove the 28 mm plug bolt and 1st/2nd select spring.
3. Remove the shift arm C attaching bolt.
4. Remove the shift arm shaft.
NOTE: Be careful not to lose the steel ball.
5. Remove the steel ball, spring, and collar.

6. Remove shift arms C and B, and the interlock, then remove the reverse select spring and retainer.
7. Remove the shift arm A attaching bolt, the set ball spring bolt, set spring, and steel ball.
8. Remove the shift rod, then remove the shift arm A.
9. Remove the reverse lock cam.
10. Remove the magnet.





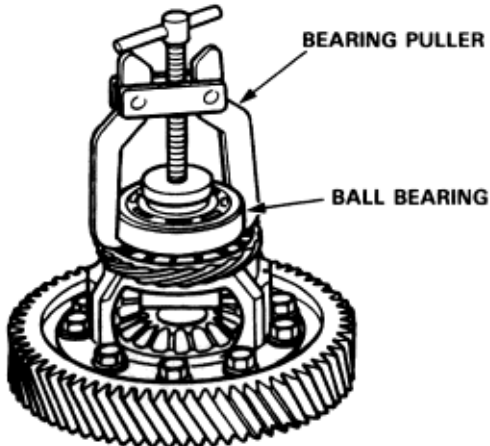
1. Place differential assembly on V-blocks and install both driveshafts.
2. Measure the backlash of both pinion gears.
Standard (NEW): 0.05-0.15 mm (0.002-0.006 in)



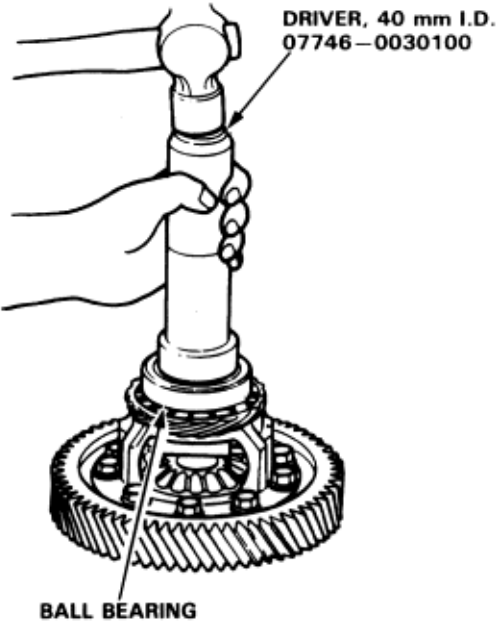
3. If the backlash is not within the standard, replace the differential carrier.

NOTE: Check bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove ball bearings using a bearing puller as shown.



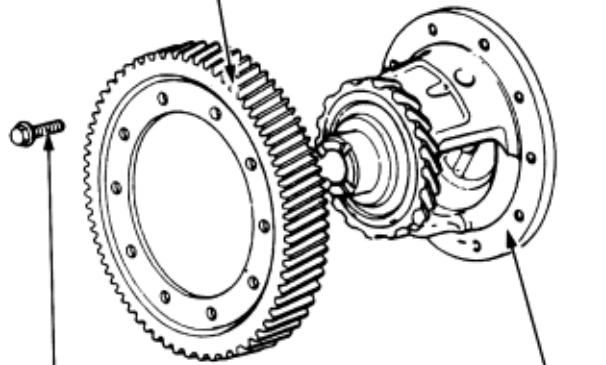
2. Install new ball bearings using the special tool as shown. NOTE: Drive the bearings squarely until they bottom against the carrier.



1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear from the differential carrier.

NOTE: The final driven gear bolts have left-hand threads.

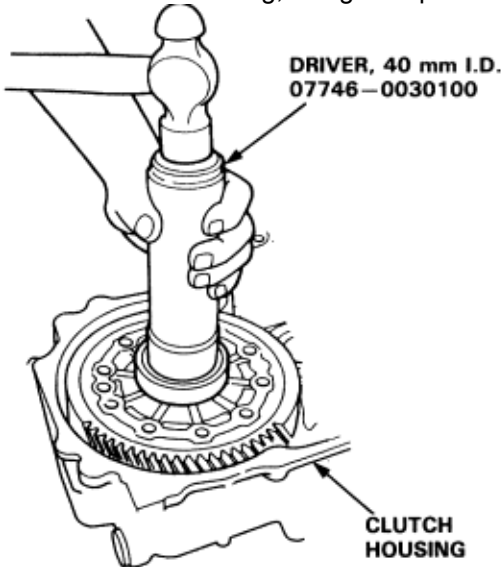
FINAL DRIVEN GEAR
Chamfer on inside diameter of final driven gear faces carrier.



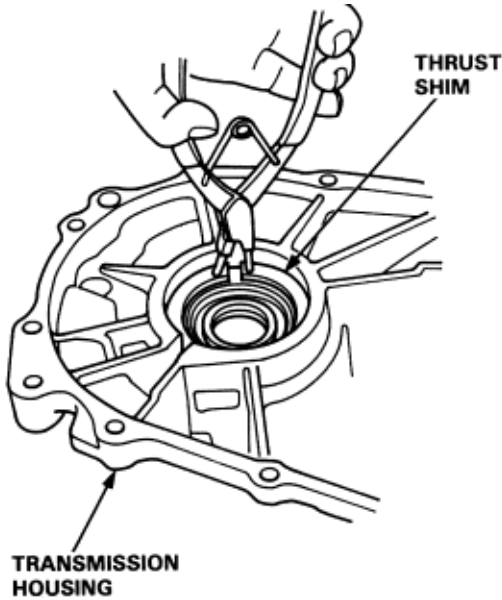
10 x 1.0 mm BOLT
101 N·m (10.3 kgf·m, 74.5 lbf·ft)
Left-hand threads.

2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

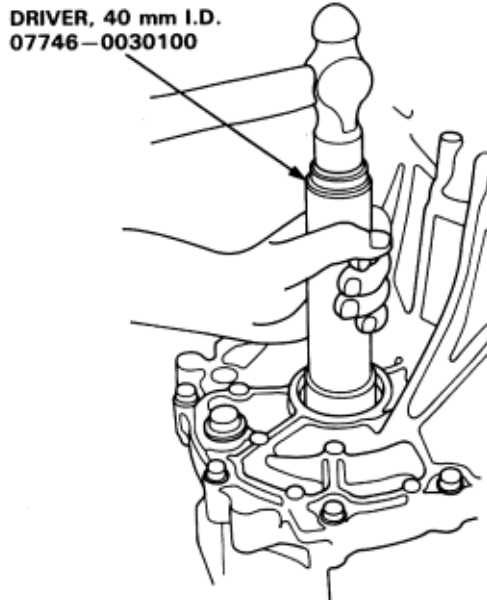
1. Install the differential assembly, making sure it bottoms in the clutch housing, using the special tool as shown.



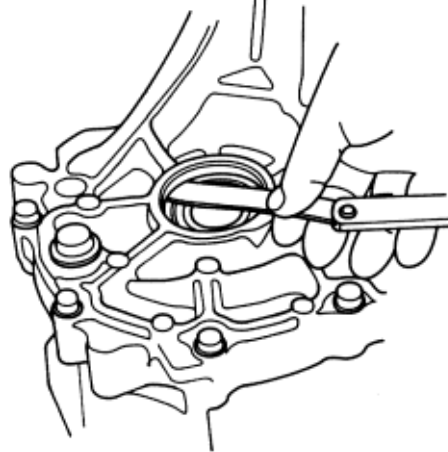
2. Install the thrust shim.
NOTE: Install the same size thrust shim that was removed.



3. Install the transmission housing (see page 13-43).
NOTE: Do not apply liquid gasket to the mating surface of the clutch housing.
4. Tighten the transmission housing attaching bolts (see page 13-44).
8 x 1.25mm
27 Nm (2.8 kgf/m, 20 lbf/ft)
5. Use the special tool to bottom differential assembly in the clutch housing.



6. Measure clearance between thrust shim and bearing outer race in transmission housing.



7. If the clearance is more than the standard, select a new thrust shim from the following table.

NOTE: If the clearance measured in step 6 is within the standard, go to step 10.

Standard: 0-0.10 mm (0-0.004 in)

80 mm THRUST SHIM

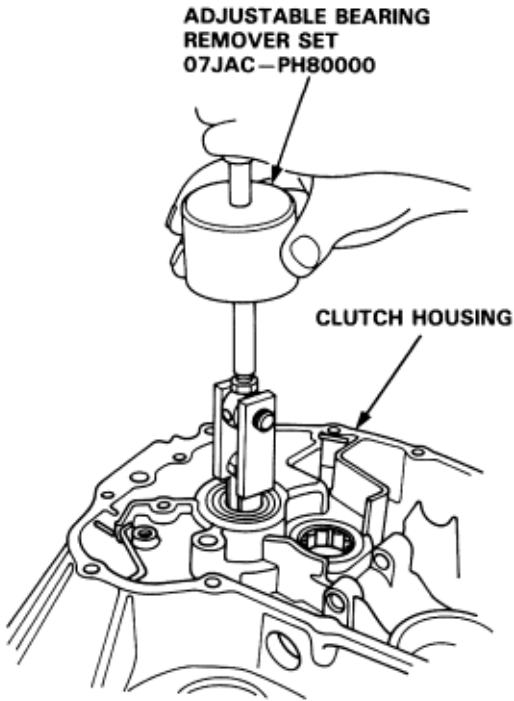
Part Number	Thickness
41441-PL3-B00	1.0 mm (0.394 in)
41442-PL3-B00	1.1 mm (0.0433 in)
41443-PL3-B00	1.2 mm (0,0472 in)
41444-PL3-B00	1.3 mm (0.0512 in)
41445-PL3-B00	1.4 mm (0.0551 in)
41446-PL3-B00	1.5 mm (0.0591 in)
41447-PL3-B00	1.6 mm (0.0630 in)
41448-PL3-B00	1.7 mm (0.0669 in)
41449-PL3-B00	1.8 mm (0.0709 in)
41450-PL3-B00	1.05 mm (0.0413 in)
41451-PL3-B00	1.15 mm (0.0453 in)
41452-PL3-B00	1.25 mm (0.0492 in)
41453-PL3-B00	1.35 mm (0.0532 in)
41454-PL3-B00	1.45 mm (0.0571 in)
41455-PL3-B00	1.55 mm (0.0610 in)
41456-PL3-B00	1.65 mm (0.0650 in)
41457-PL3-B00	1.75 mm (0.0689 in)

8. Remove the bolts and transmission housing.
9. Replace the thrust shim selected in step 7, then recheck the clearance.
10. Remove the bolts and transmission housing. Apply liquid gasket to the surface of the transmission housing and reassemble.

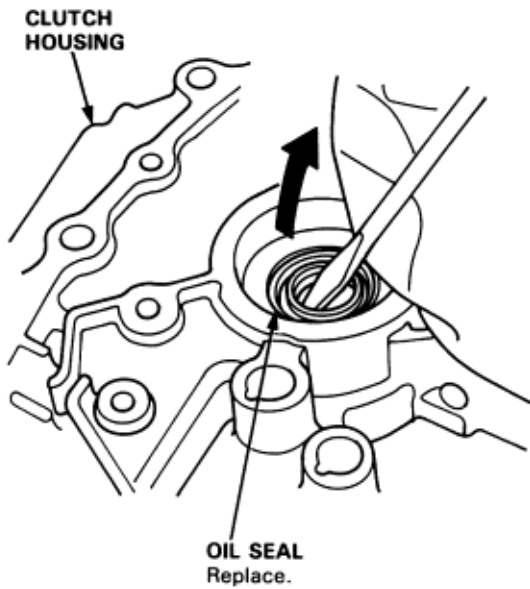
Clutch Housing Bearing Replacement

Mainshaft

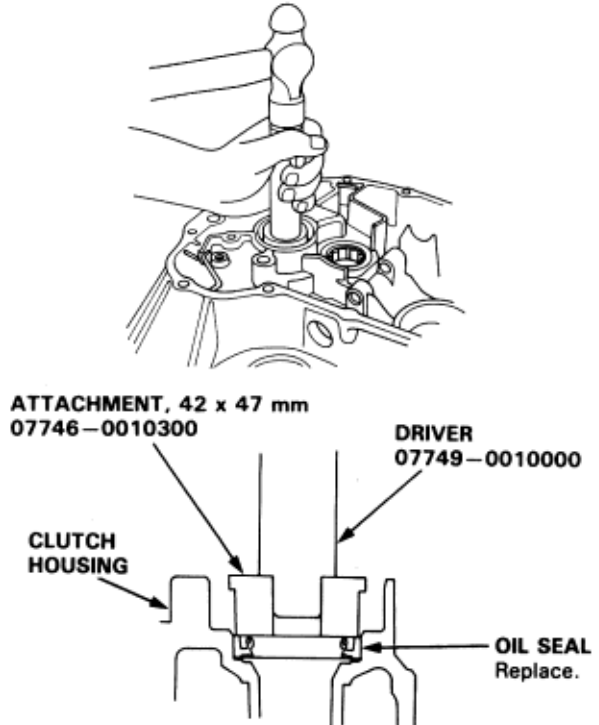
1. Remove the ball bearing using the special tool as shown.



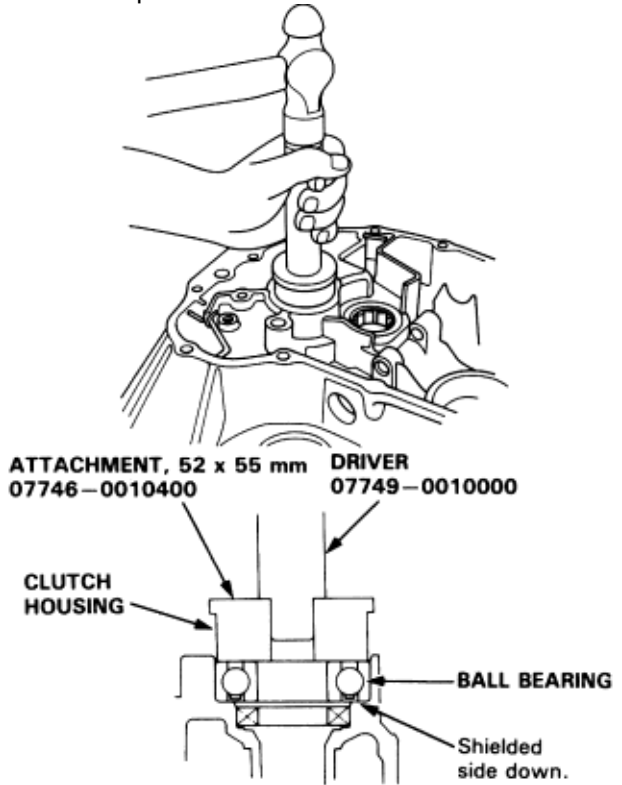
2. Remove the oil seal from the clutch housing.



3. Drive the new oil seal into the clutch housing using the special tools as shown.

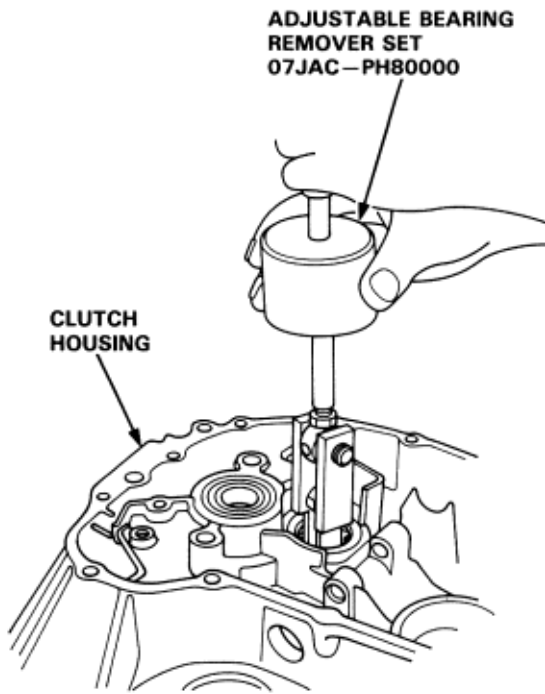


4. Drive the ball bearing into the clutch housing using the special tools as shown.

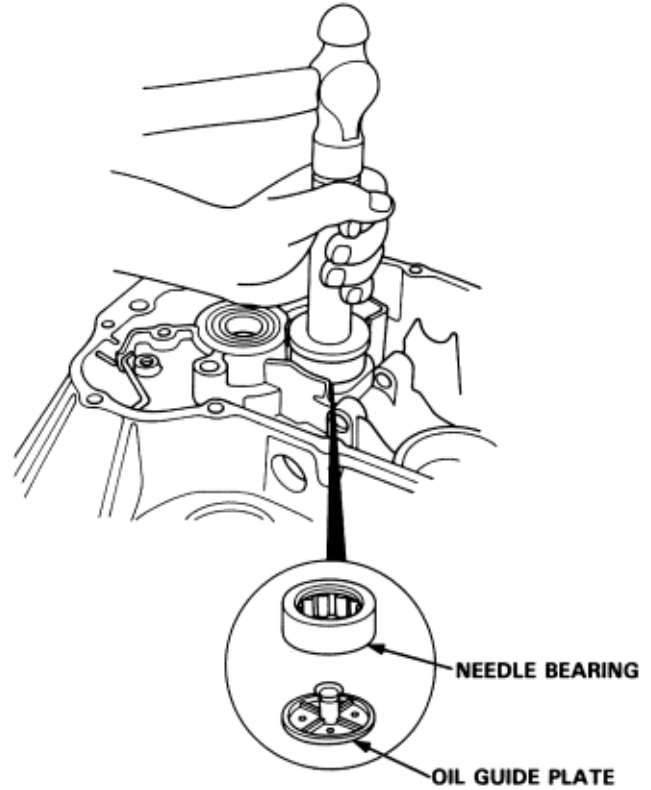


Countershaft

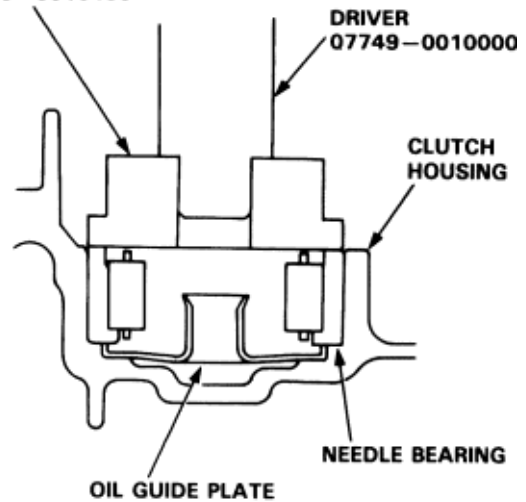
1. Remove the needle bearing using the special tool as shown, then remove the oil guide plate.



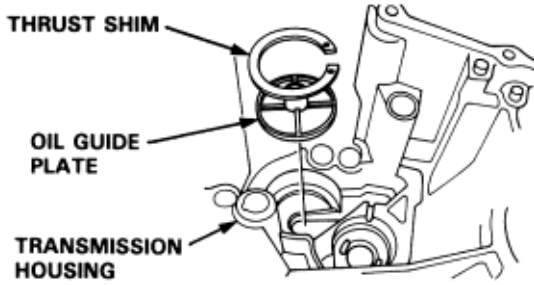
2. Install the oil guide plate, then drive the needle bearing into the clutch housing using the special tools as shown.



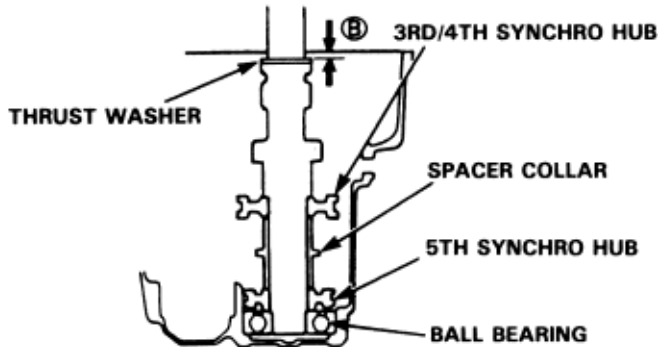
ATTACHMENT, 52 x 55 mm
07746-0010400



1. Remove the thrust shim and oil guide plate from the transmission housing.



2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, ball bearing, and thrust washer on the mainshaft. Install the assembly in the transmission housing.



3. Measure the distance (B) between the end of the transmission housing and thrust washer.

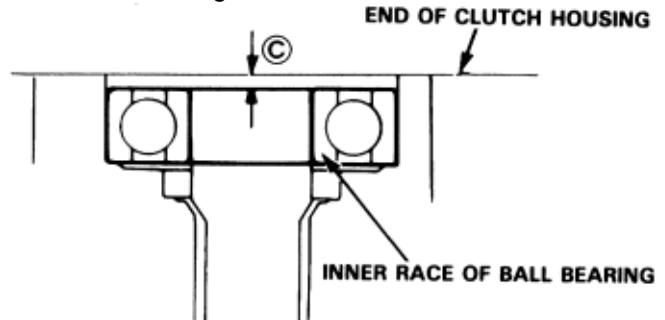
NOTE:

- ♦ Use a straight edge and vernier calliper.
- ♦ Measure at three locations and average the readings.

4. Measure the distance (C) between the surfaces of the clutch housing and bearing inner race.

NOTE:

- ♦ Use a straight edge and depth gauge.
- ♦ Measure at three locations and average the readings.



5. Select the proper shim on the basis of the following calculations:

NOTE: Use only one thrust shim.

(Basic Formula)

$$(B) + (C) - 0.95 = \text{shim thickness}$$

Example of calculation:

$$\text{Distance (B) (2.00 mm) + Distance (C) (0.09 mm)} \\ = 2.09 \text{ mm}$$

subtract the spring washer height (0.95 mm) = the required thrust shim (1.14 mm)

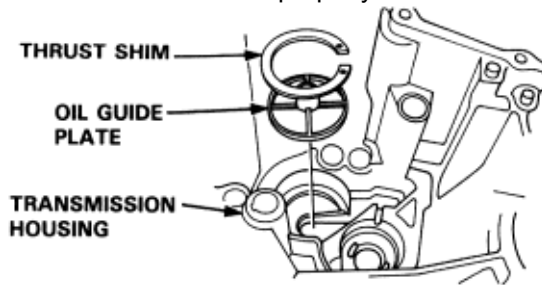
70 mm THRUST SHIM

	Part Number	Thickness
A	23931-PL3-B00	0.60 mm (0.0236 in)
B	23932-PL3-B00	0.63 mm (0.0248 in)
C	23933-PL3-B00	0.66 mm (0.0260 in)
D	23934-PL3-B00	0.69 mm (0.0272 in)
E	23935-PL3-B00	0.72 mm (0.0283 in)
F	23936-PL3-B00	0.75 mm (0.0295 in)
G	23937-PL3-B00	0.78 mm (0.0307 in)
H	23938-PL3-B00	0.81 mm (0.0319 in)
I	23939-PL3-B00	0.84 mm (0.0331 in)
J	23940-PL3-B00	0.87 mm (0.0343 in)
K	23941-PL3-B00	0.90 mm (0.0354 in)
L	23942-PL3-B00	0.93 mm (0.0366 in)
M	23943-PL3-B00	0.96 mm (0.0378in)
N	23944-PL3-B00	0.99 mm (0.0390 in)
O	23945-PL3-B00	1.02 mm (0.0402 in)
P	23946-PL3-B00	1.05 mm (0.0413in)
Q	23947-PL3-B00	1.08 mm (0.0425 in)
R	23948-PL3-B00	1.11mm (0.0437 in)
S	23949-PL3-B00	1.14mm (0.0449 in)
T	23950-PL3-B00	1.17mm 10.0461 in)
U	23951-PL3-B00	1.20 mm (0.0472 in)
V	23952-PL3-B00	1.23 mm (0.0484 in)
W	23953-PL3-B00	1.26 mm (0.0496 in)
X	23954-PL3-B00	1.29 mm (0.0508 in)
Y	23955-PL3-B00	1.32 mm (0.0520 in)
Z	23956-PL3-B00	1.35 mm (0.0531 in)
AA	23957-PL3-B00	1.38 mm (0.0543 in)
AB	23958-PL3-B00	1.41 mm (0.0555 in)
AC	23959-PL3-B00	1.44 mm (0.0567 in)
AD	23960-PL3-B00	1.47 mm (0.0579 in)
AE	23961-PL3-B00	1.50 mm (0.0591 in)
AF	23962-PL3-B00	1.53 mm (0.0602 in)
AG	23963-PL3-B00	1.56 mm (0.0614 in)
AH	23964-PL3-B00	1.59 mm (0.0626 in)
AI	23965-PL3-B00	1.62 mm (0.0638 in)
AJ	23966-PL3-B00	1.65 mm (0.0650 in)
AK	23967-PL3-B00	1.68 mm (0.0661 in)
AL	23968-PL3-B00	1.71 mm (0.0673 in)
AM	23969-PL3-B00	1.74 mm (0.0685 in)
AN	23970-PL3-B00	1.77 mm (0.0697 in)
AO	23971-PL3-B00	1.80 mm (0.0709 in)

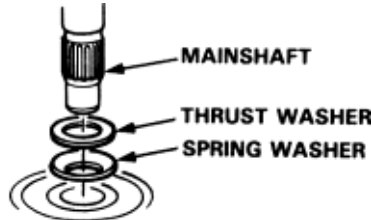
6. Install the oil guide plate and selected thrust shim in the transmission housing.

NOTE:

- ♦ Clean the thrust washer, spring washer and thrust shim thoroughly before installation.
- ♦ Install the thrust washer, spring washer and thrust shim properly.



7. Install the thrust washer and spring washer in the mainshaft



8. Install the mainshaft in the clutch housing.
9. Place the transmission housing over the mainshaft and onto the clutch housing
10. Tighten the clutch and transmission housings with several 8 mm bolts.

NOTE: It is not necessary to use sealing agent between the housings.

8 x 1.25mm

27 Nm 12.8 kgf/m. 20 lbf/ft

11. Tap the mainshaft with a plastic hammer.

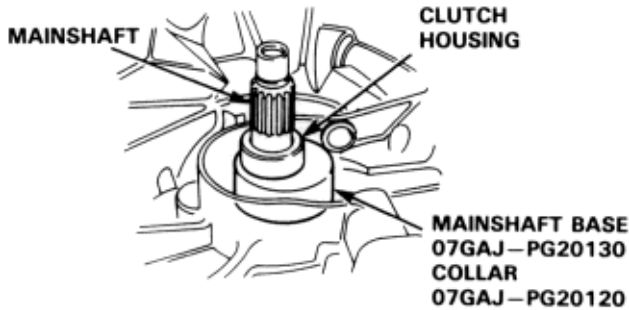
12. Check the thrust clearance in the manner described below.



CAUTION

Measurement should be made at room temperature.

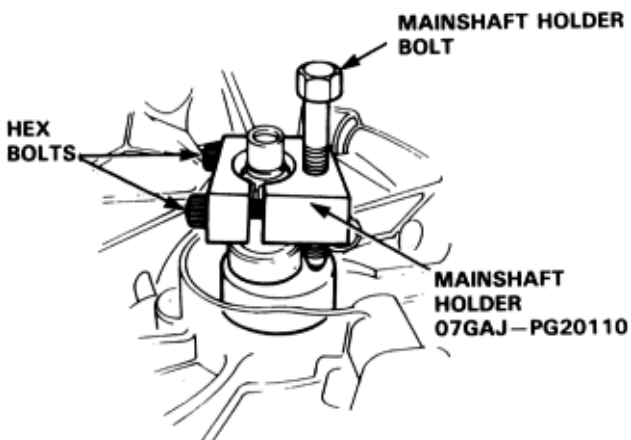
- a. Slide the mainshaft base and the collar over the mainshaft.



- b. Attach the mainshaft holder to the mainshaft as follows:

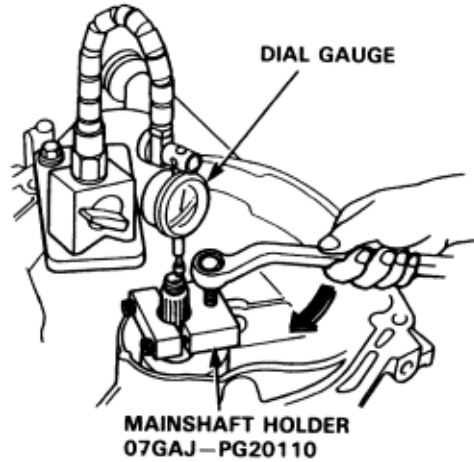
NOTE:

- Back-out the mainshaft holder bolt and loosen the two hex bolts.
- Fit the holder over the mainshaft so its lip is towards the transmission,
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



- c. Seat the mainshaft fully by tapping its end with a plastic hammer.
d. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.

- e. Zero a dial gauge on the end of the mainshaft.



- f. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.



CAUTION

Turning the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.

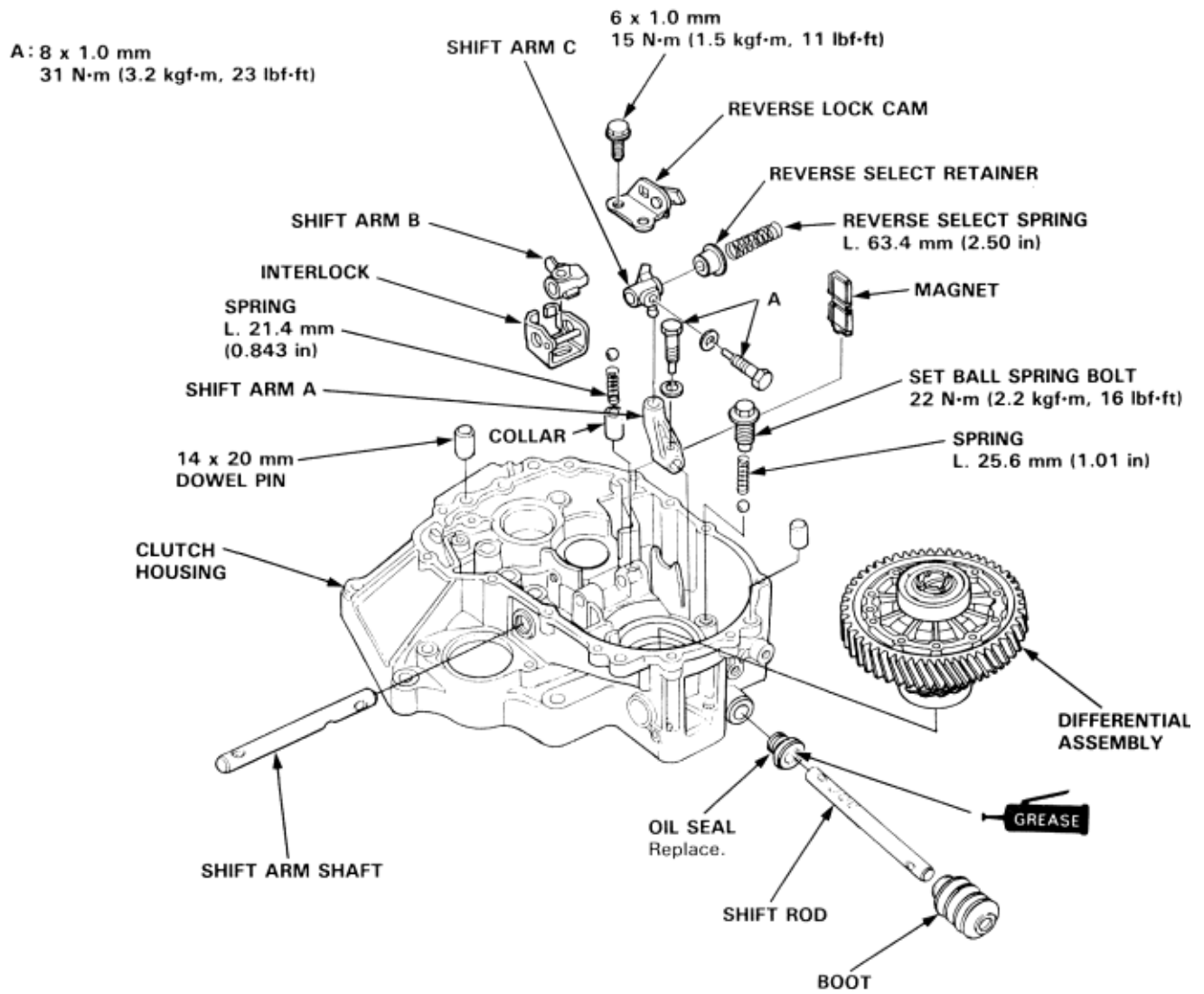
- g. If the reading is within the standard, the clearance is correct.

If the reading is not within the standard, recheck the shim thickness.

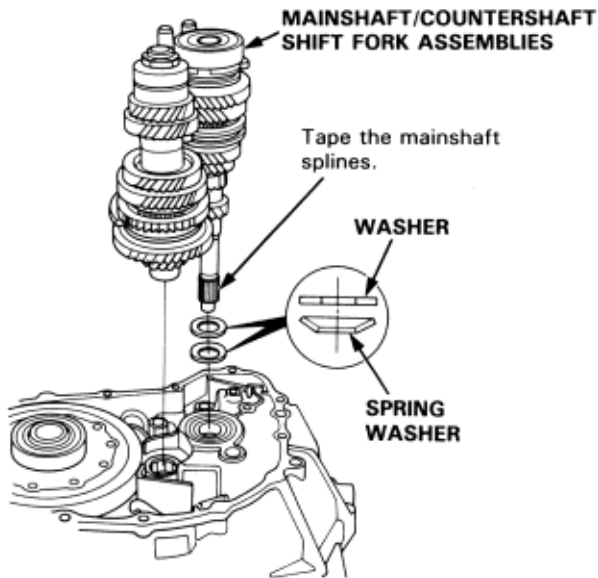
Standard: 0.11-0.18mm (0.004-0.007 in)

NOTE: The steel balls are all of the same size (5/16 in).

1. Install the magnet and reverse lock cam.
2. Set shift arm A on the clutch housing, then install the shift rod.
3. Install the spring washer and shift arm A attaching bolt.
4. Install the steel ball, spring, and set ball spring bolt.
5. Install shift arm B in the interlock, then set it on the clutch housing.
6. Insert shift arm shaft in the clutch housing.
7. Install the collar, spring, and steel ball into the case. Compress the ball and insert the shift arm shaft.
8. Install shift arm C in shift arm A, then insert the shift arm shaft.
9. Install the reverse select retainer and reverse select spring onto shift arm shaft.
10. Install the differential assembly.



11. Set the 36mm spring washer and washer.
12. Install the mainshaft, countershaft, and shift fork assemblies.
 NOTE: Align the finger of the interlock with the groove in the shift fork shaft.

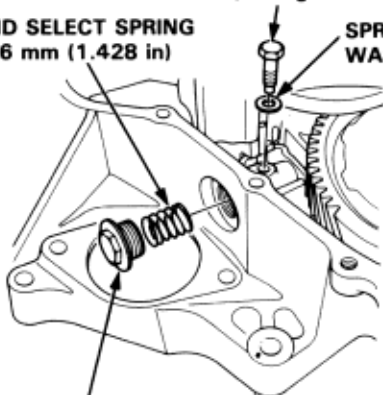


13. Install the spring washer and shift arm 8 attaching bolt.
14. Install the 1st/2nd select spring, 28 mm plug bolt, and interlock guide bolt.
 NOTE: Apply liquid gasket P/N 08C70-K0234M to the threads of the 28 mm plug bolt and interlock guide bolt.

8 x 1.0 mm
 31 N·m (3.2 kgf·m, 23 lbf·ft)

1ST/2ND SELECT SPRING
 L. 36.26 mm (1.428 in)

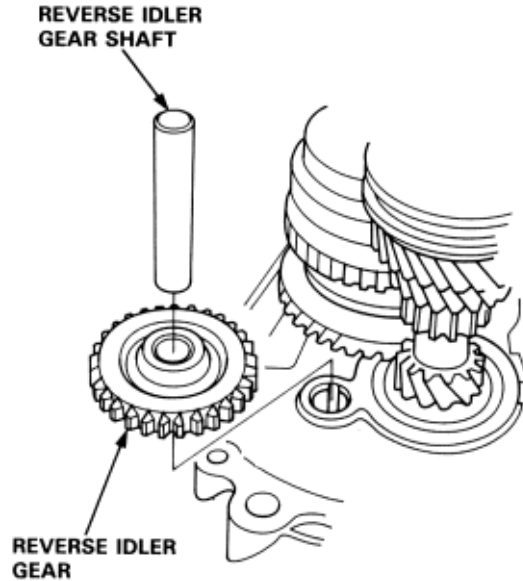
SPRING WASHER



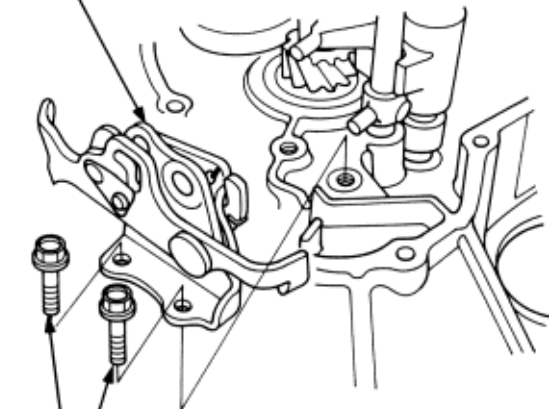
28 mm PLUG BOLT
 54 N·m (5.5 kgf·m,
 40 lbf·ft)

INTERLOCK GUIDE BOLT
 39 N·m (4.0 kgf·m, 29 lbf·ft)

15. Install the reverse idler gear and reverse idler gear shaft.

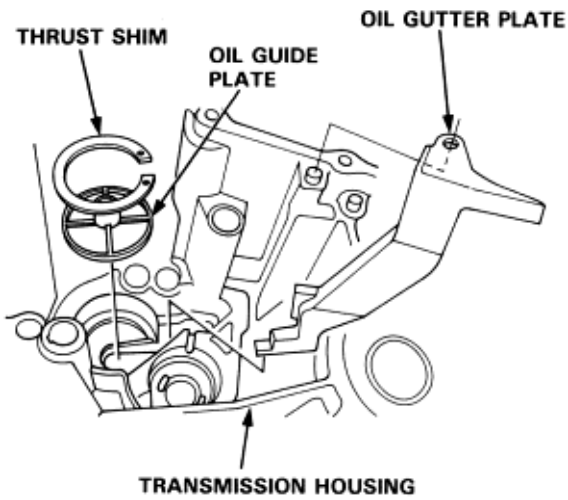


16. Install the reverse shift holder.

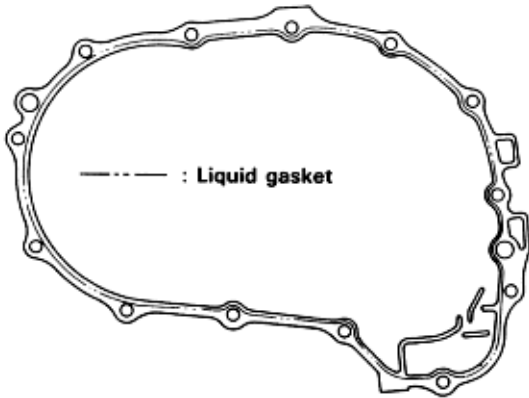


6 x 1.0 mm
 15 N·m (1.5 kgf·m,
 11 lbf·ft)

17. Install the oil gutter plate.
18. Install the oil guide plate and thrust shim on the transmission housing.

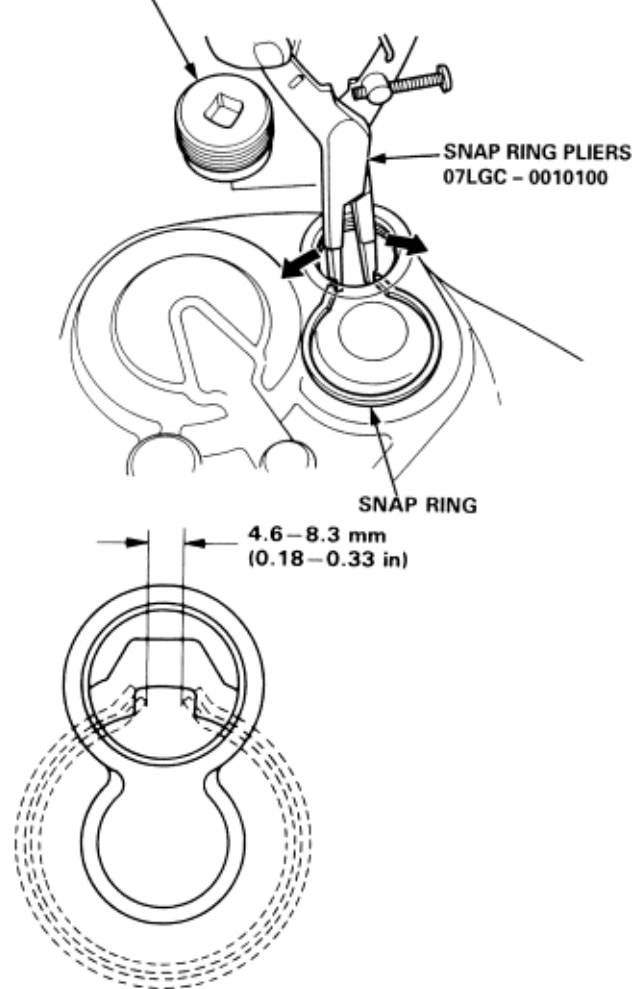


19. Apply liquid gasket to the surface of the transmission housing mating with the clutch housing as shown.
NOTE:
 - ♦ Use liquid gasket P/N 08C70-K0234M.
 - ♦ Remove the dirty oil from the sealing surface.
 - ♦ If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings.
 - ♦ Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

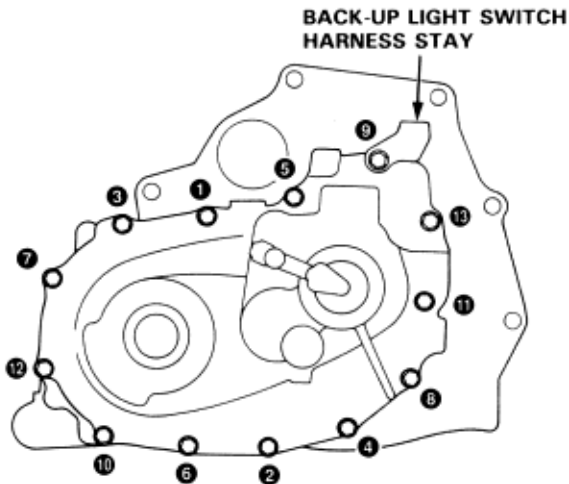


20. Install the dowel pins and the transmission housing.
21. Lower the transmission housing with the snap ring pliers, and set the snap ring into the groove of the countershaft bearing.
NOTE: Check that the snap ring is securely seated in the groove of the countershaft bearing.
22. Install the 32 mm sealing bolt.
NOTE: Apply liquid gasket P/N 08C70-K0234M to the threads.

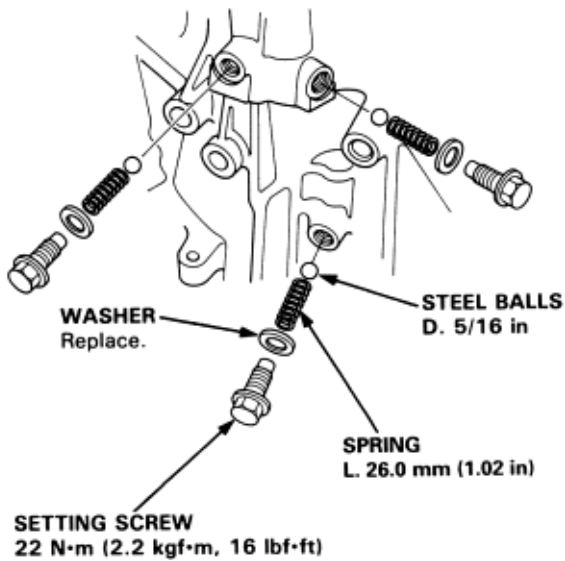
32 mm SEALING BOLT
25 N·m (2.5 kgf·m, 18 lbf·ft)



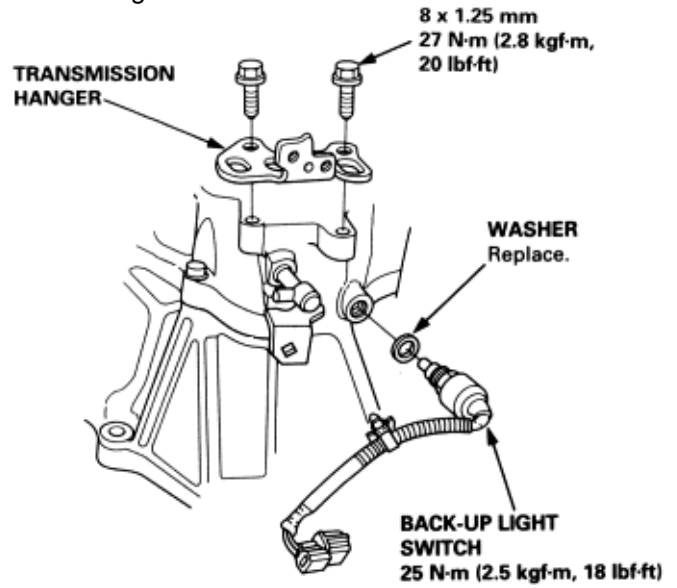
23. Tighten the transmission housing attaching bolts in the numbered sequence in several steps shown below.
8 x 1.25 mm
Torque: 27 Nm (2.8 kgf-m 20 lbf-ft)
8 x 1.25 mm
Torque: 27 N-m (2.8 kgf-m 20 lbf-ft)



24. Install the steel balls, springs, and set screws.

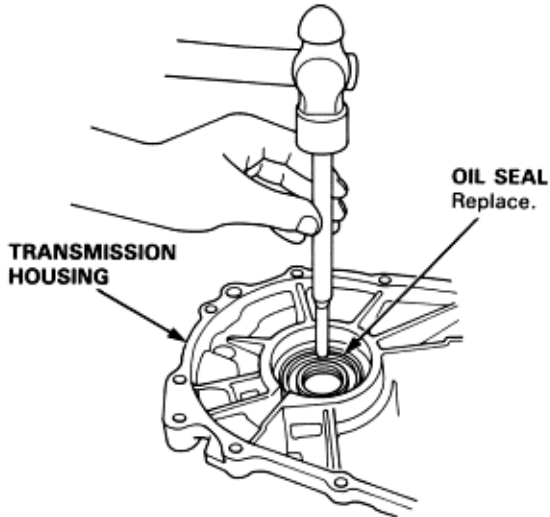


25. Install the back-up light switch and transmission hanger.

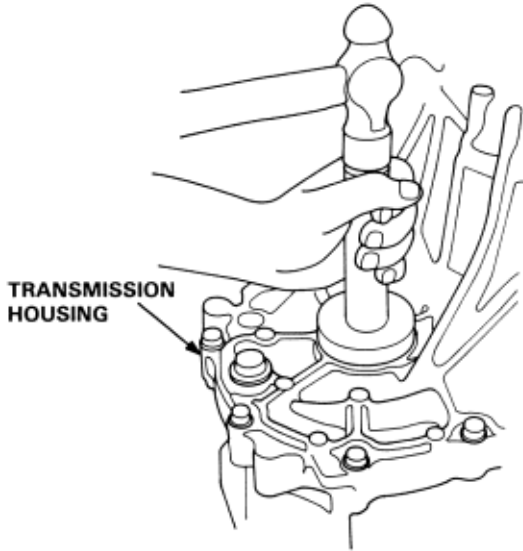


Transmission Housing:

1. Remove the oil seal from the transmission housing.

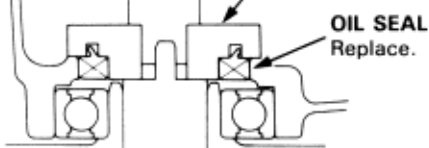


2. Install the oil seal into the transmission housing using the special tools as shown.



DRIVER
07749-0010000

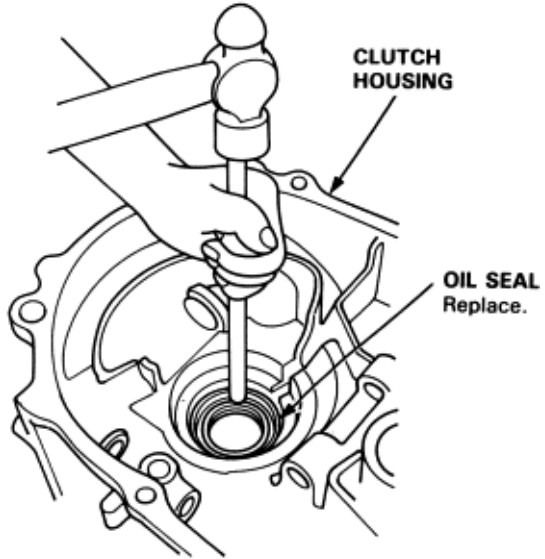
**SEAL DRIVER
ATTACHMENT**
07947-6110501 or
07947-6110500



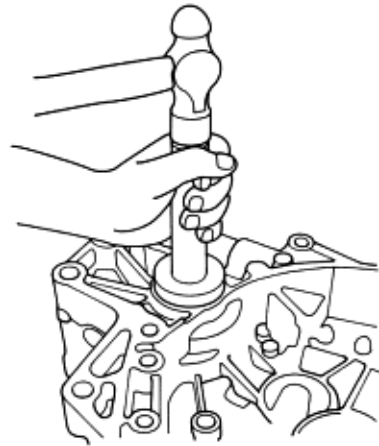
PILOT, 26 x 30 mm
07JAD-PH80200

Clutch Housing:

1. Remove the oil seal from the clutch housing.

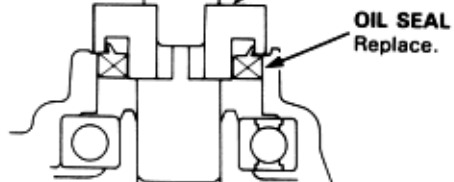


2. Install the oil seal into the clutch housing using the special tools as shown.



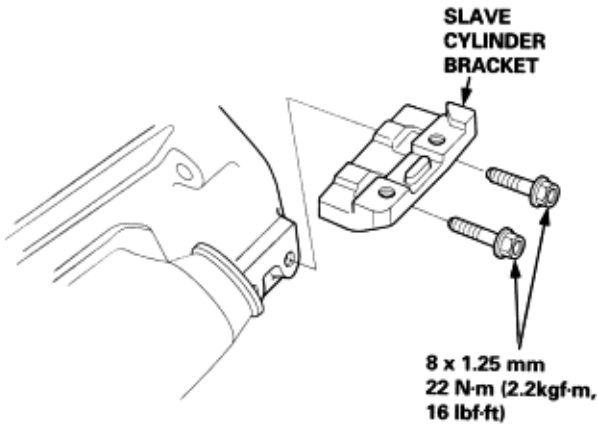
DRIVER
07749-0010000

DRIVER ATTACHMENT
07JAD-PH80101

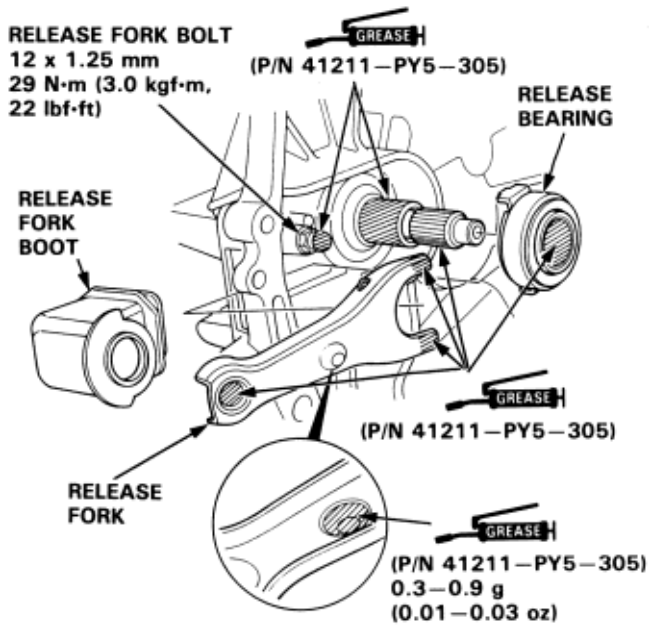


PILOT, 26 x 30 mm
07JAD-PH80200

1. Check the two dowel pins are installed in the clutch housing.
2. Install the slave cylinder bracket to the transmission assembly.

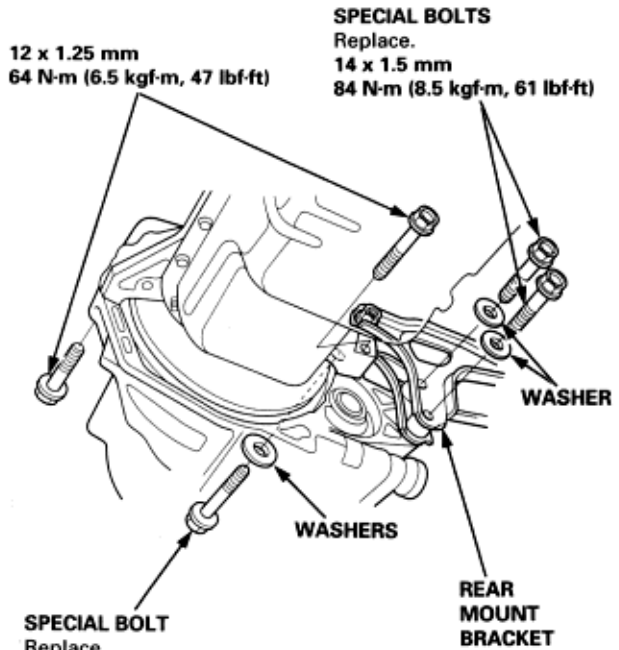


3. Apply HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305) to the release fork, the release fork bolt, the release bearing, and the release bearing guide in the shaded areas.

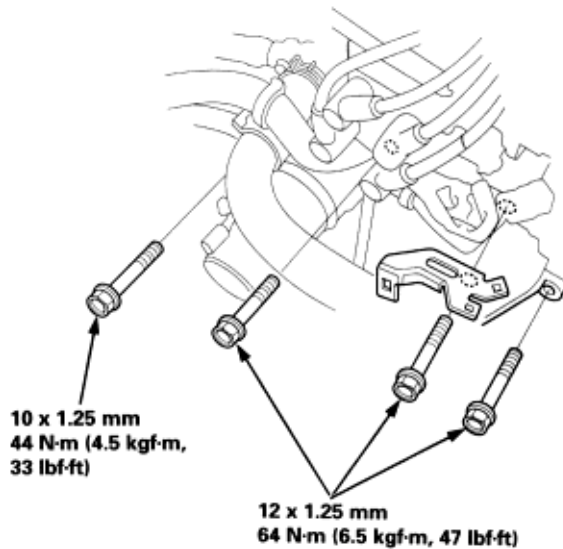


4. Install the release bearing, release fork, and boot on the transmission.

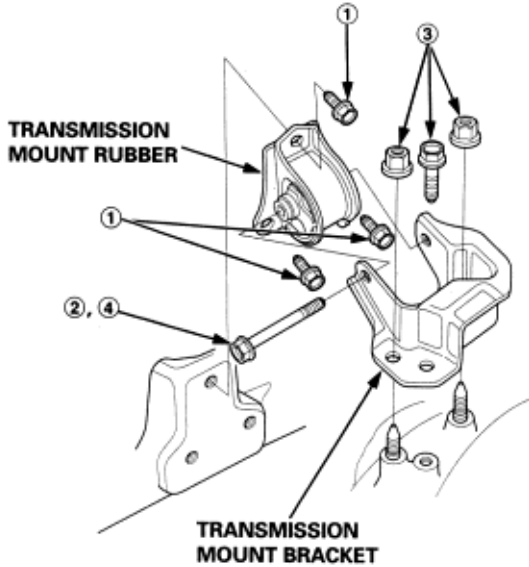
5. Place the transmission on the transmission jack, and raise it to the engine level.
6. Install the transmission mounting bolts and rear mount bracket bolts.



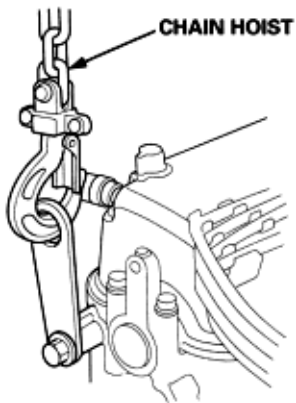
7. Install the three upper transmission mounting bolts and lower starter motor mounting bolt.



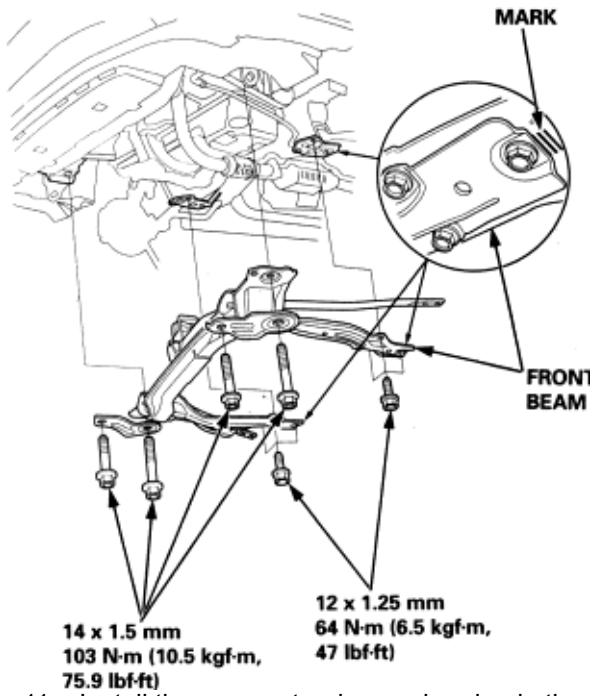
8. Raise the transmission, then install the transmission mount rubber assembly and transmission mount bracket.
- ♦ Torque the mounting bolts and nut in the sequence shown.
 - ♦ Make sure the bushings are not twisted or offset.
- 1 : 12 x 1.25 mm 64Nm (6.5kgf/m,47lbf/ft)
2 : Temporary tightening
3 : 12 x 1.25 mm 64 Nm (6.5 kgf/m, 47lbf/ft)
4 : 10 x 1.25 mm 64 Nm (6.5 kgf/m, 47lbf/ft)



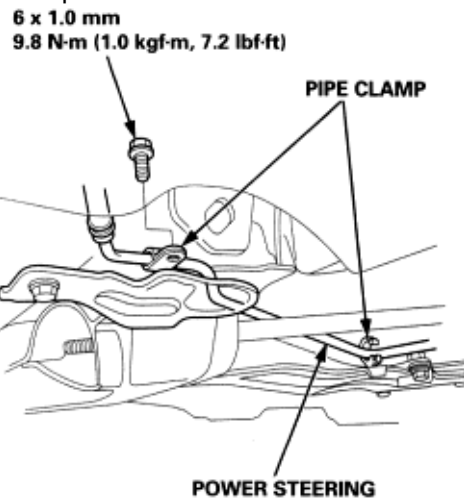
9. Remove the chain hoist.



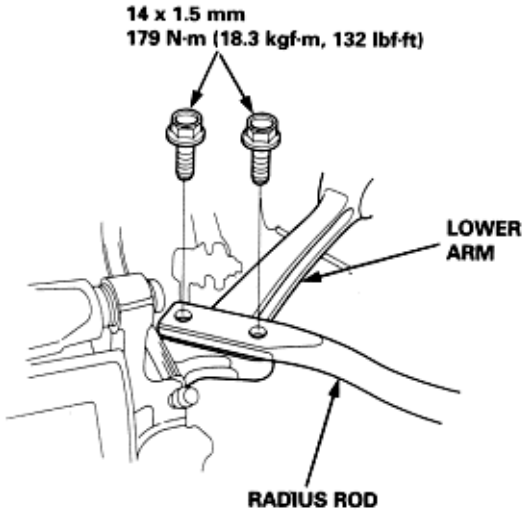
10. Install the front beam by aligning the marks.



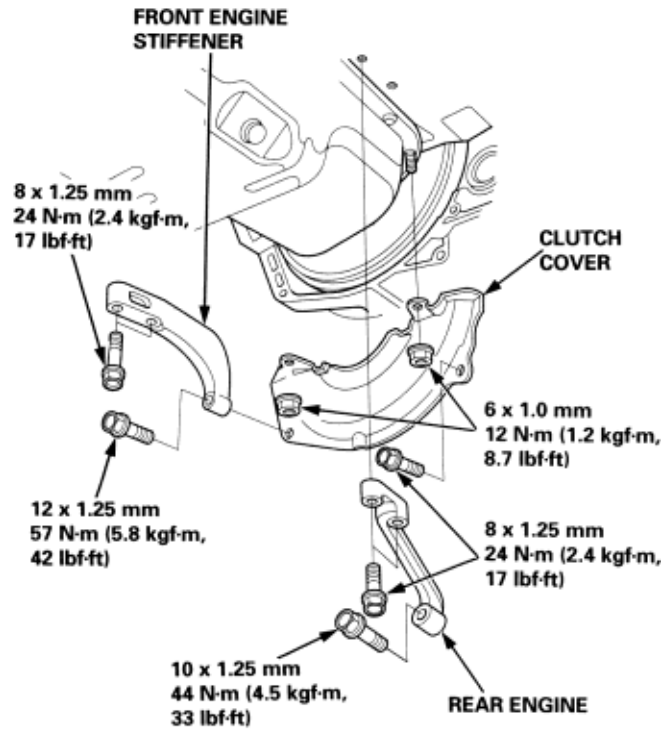
11. Install the power steering cooler pipe in the pipe clamps.



12. Install both radius rods with new mounting bolts on the lower arm.



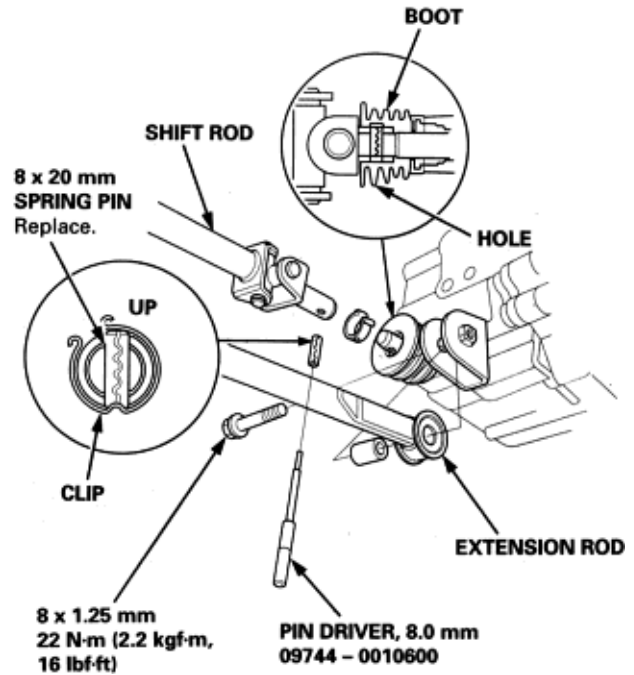
13. Install the clutch cover.
14. Install the front and rear engine stiffeners.



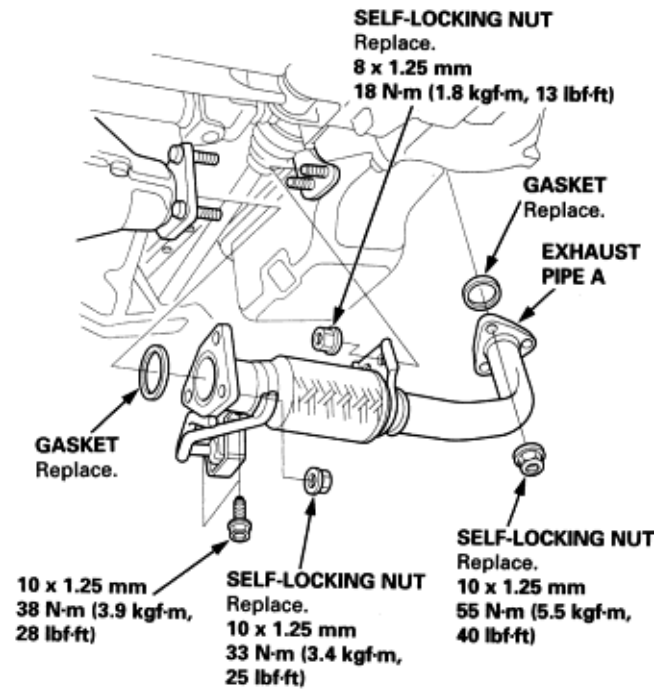
15. Install the shift rod, spring pin, and clip as shown.

NOTE:

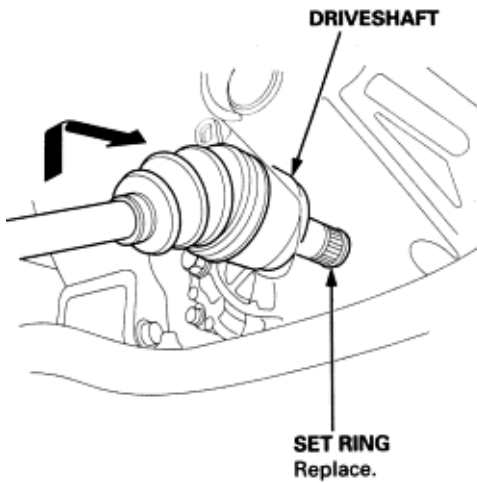
- ♦ Turn the boot so the hole is facing down.
- ♦ Make sure the boot is installed on the shift rod.



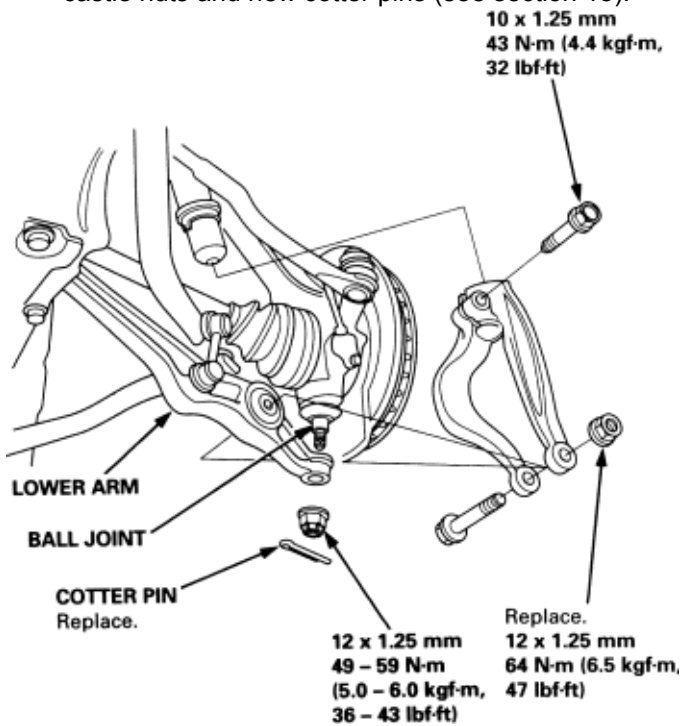
16. Install the extension rod.
17. Install the exhaust pipe A.



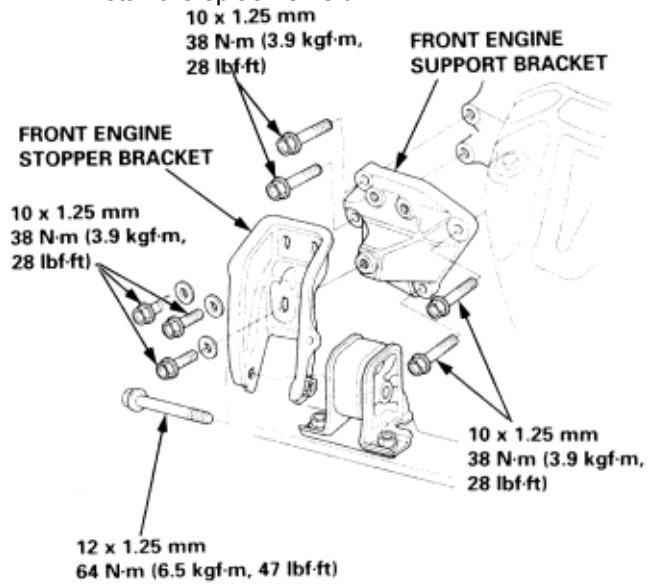
18. Install the driveshafts with new set rings (see section 16).



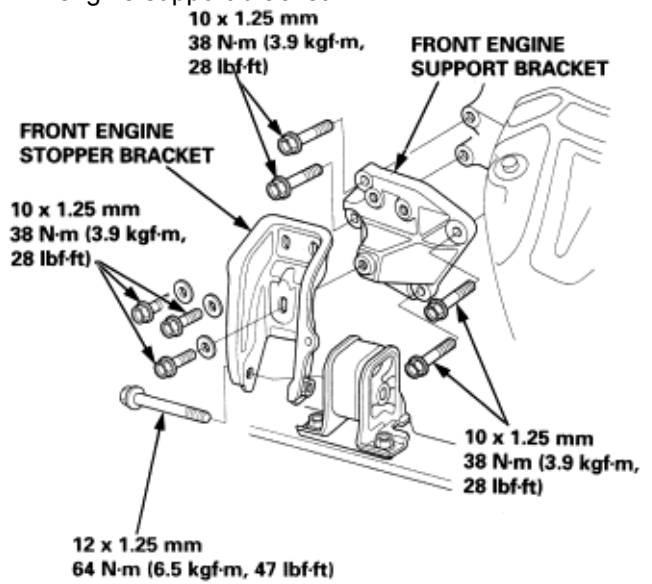
19. Install both the damper forks with new locknuts (see section 19).
20. Install the ball joint onto the lower arms, then install the castle nuts and new cotter pins (see section 18).



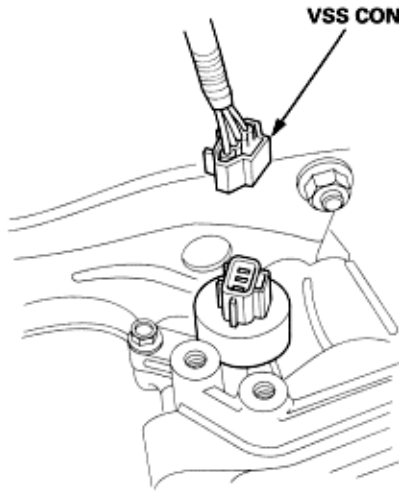
21. Install the splash shield.



22. Install the front engine stopper bracket and front engine support bracket.

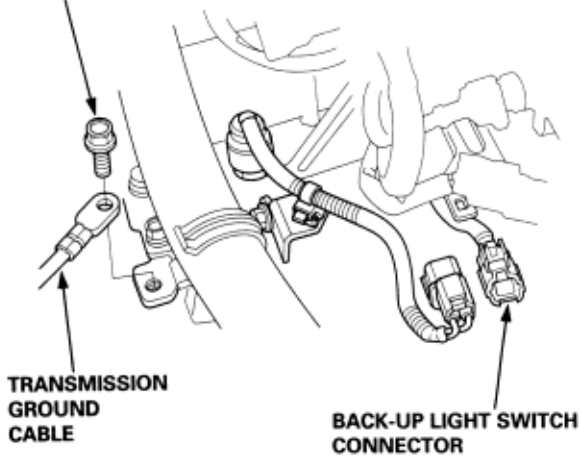


23. Connect the vehicle speed sensor (VSS) connector.



24. Connect the back-up light switch connector.

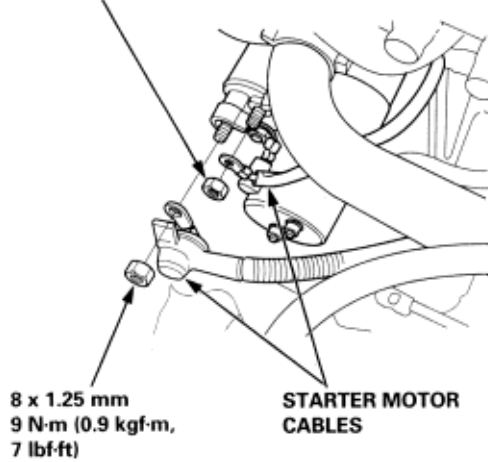
6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)



25. Install the transmission ground.

26. Connect the starter motor cables. Make sure the crimped side of the ring terminals is facing out.

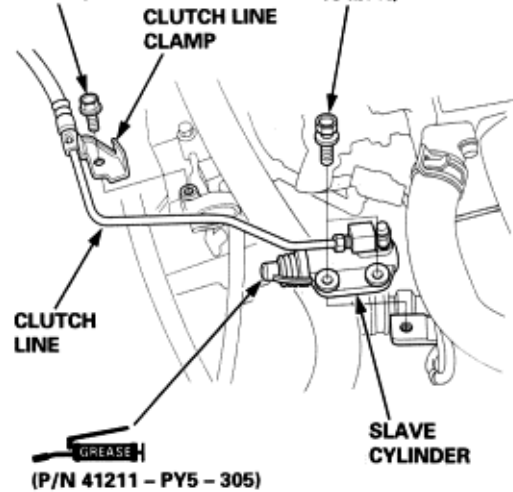
6 x 1.0 mm
3.4 N·m (0.35 kgf·m,
2.5 lbf·ft)



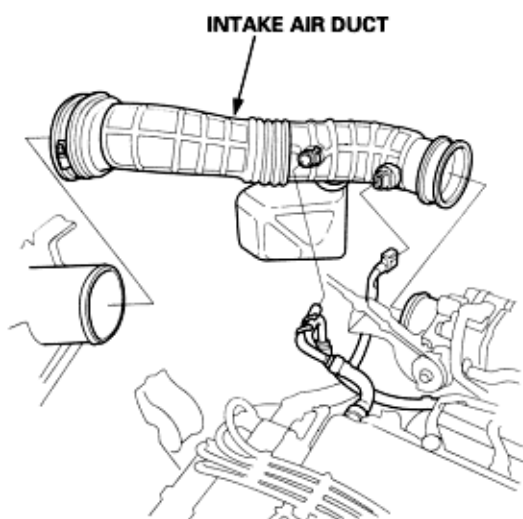
27. Apply HONDA Genuine Urea Grease UM 264 (P/N41211-PY5-305) to the end of the slave cylinder rod. Install the slave cylinder and clutch line clamp so as not to bend the clutch line.

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

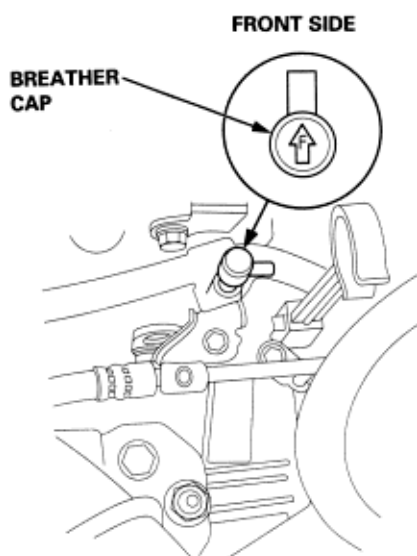
8 x 1.25 mm
22 N·m (2.2 kgf·m,
16 lbf·ft)



28. Install the intake air duct.



29. Turn the breather cap so that the "F" mark points toward the front of the vehicle.

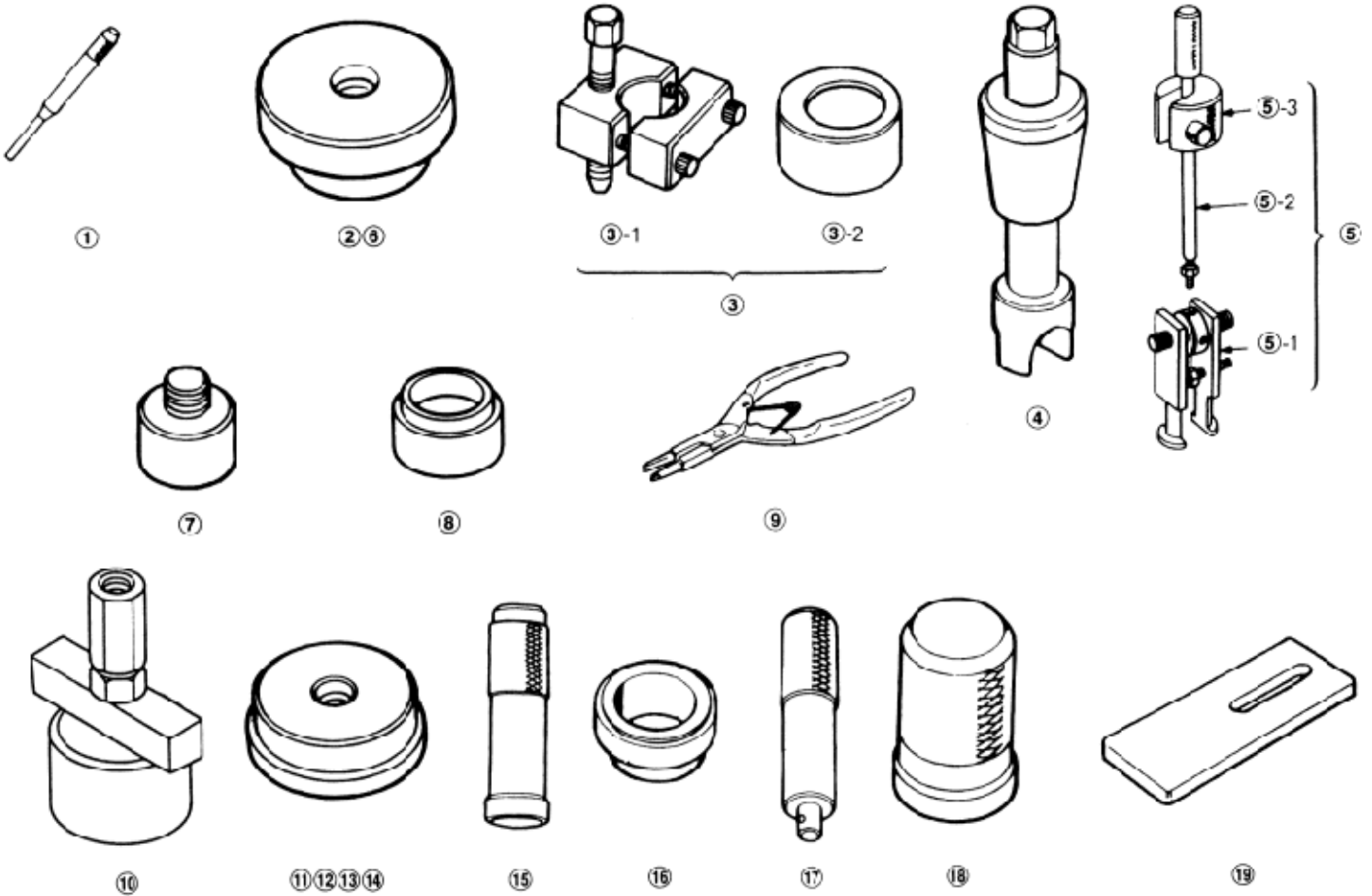


30. Install the distributor, then check the ignition timing (see section 23).
31. Connect the positive (+) cable first, then the negative (-) cable to the battery.
32. Refill the transmission fluid (**see page 13-3**).
33. Check the transmission and check for smooth operation.
34. Check the clutch operation.
35. Check the front wheel alignment (see section 18).
36. Loosen the three mounting bolts on the front engine stopper bracket, then torque the three mounting bolts in step 21. Make sure the bushings are not twisted or offset.

Special Tools

13-54

Ref No.	Tool Number	Description	Qty	Remark
1	07GAD - PG20100	Pin Driver, 5.0 mm	1	
2	07GAD - PG40100	Driver Attachment	1	
3	07GAJ - PG20102	Mainshaft Clearance Inspection Tool Set	1	
3-1	07GAJ - PG20110	Mainshaft Holder	(1)	
3-2	07GAJ - PG20130	Mainshaft Base	(1)	
4	07HAJ - PK40201	Preload Inspection Tool	1	
5	07JAC - PH80000	Adjustable Bearing Remover Set	1	
5-1	07JAC - PH80100	Bearing Remover Attachment	(1)	
5-2	07JAC - PH80200	Remover Handle Assembly	(1)	
5-3	07741 - 0010201	Remover Weight	(1)	
6	07JAD - PH80101	Driver Attachment	1	
7	07JAD - PH80400	Pilot, 28 x 30 mm	1	
8	07LAD - PW50601	Bearing Attachment	1	
9	07LGC - 0010100	Snap Ring Pliers	1	
10	07TAJ - ST70100	Preload Inspection Tool	1	
11	07746 - 0010300	Driver Attachment, 42 x 47 mm	1	
12	07746 - 0010400	Driver Attachment, 52 x 55 mm	1	
13	07746 - 0010500	Driver Attachment, 62 x 68 mm	1	
14	07746 - 0010600	Driver Attachment, 72 x 75 mm	1	
15	07746 - 0030100	Driver, 40 mm I.D.	1	
16	07746 - 0030400	Attachment, 35 mm I.D.	1	
17	07749 - 0010000	Handle Driver	1	
18	07947 - 6890100	Oil Seal Driver	1	
19	07979 - PJ40001	Magnet Stand Base	1	



Description

Limited Slip Differential (LSD) (HA22A7 engine model)

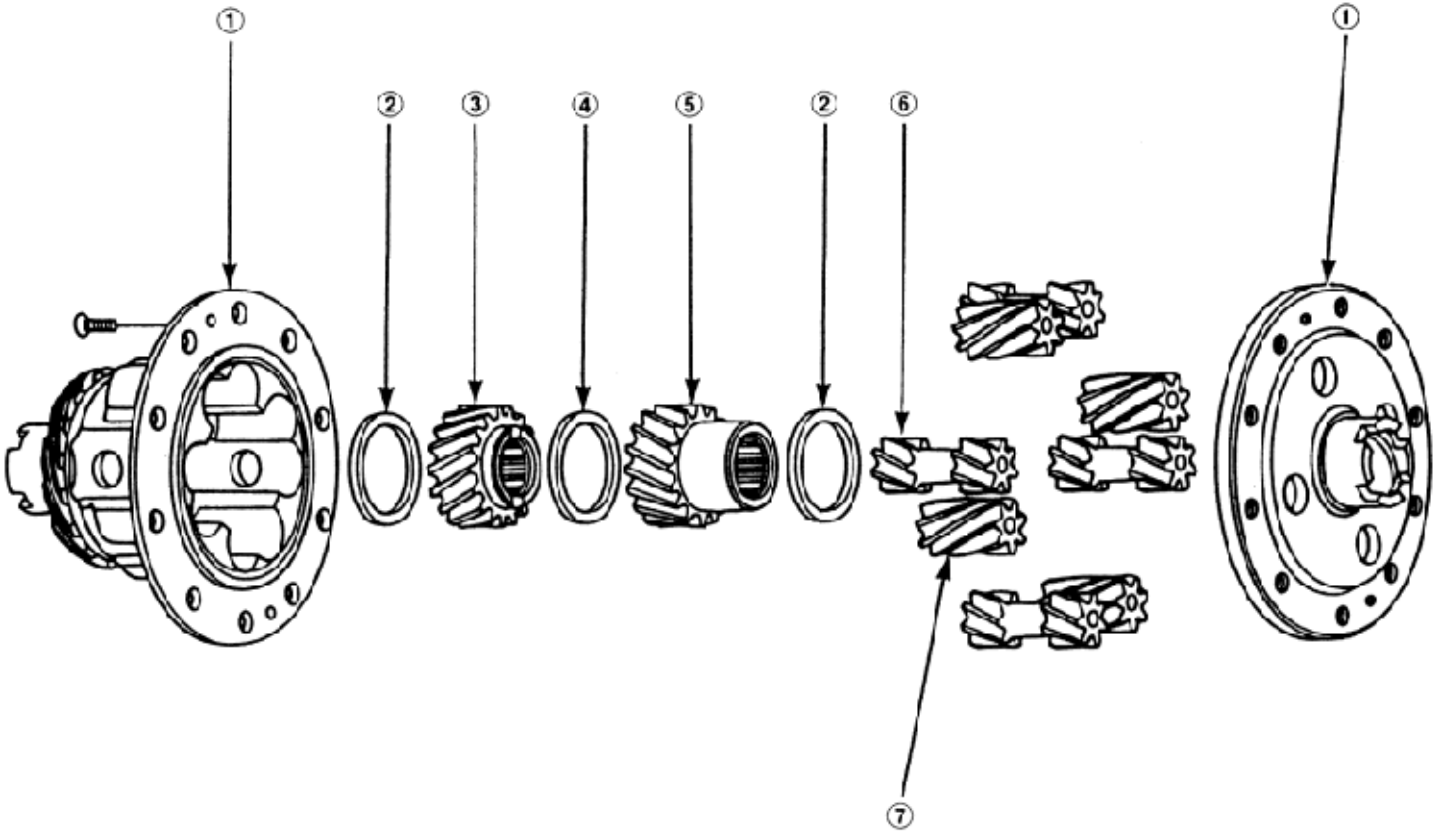
13-55

Function

Operation of the helical type limited slip differential (LSD) is dependent upon the eight pinion gears that are in mesh with the two side gears. They transfer the driving power to the driving axles as well as permit the outside wheel to turn more times than the inside wheel when the vehicle goes around a turn. All gears are helically cut so that this differential action is limited by the friction created between each gear and differential carrier when either wheel slips.

Construction

The unit consists of the two side gears, four short pinion gears, four long pinion gears, two thrust washers, a center washer, and a carrier that houses the gears and washers. One short and one long pinion gear are in mesh with each other and are allowed to walk around the side gears.



- 1 Differential carrier
- 2 Thrust washer
- 3 Left side gear
- 4 Center washer
- 5 Right side gear
- 6 Pinion gear (long)
- 7 Pinion gear (short)

Operation

♦ Straight-load driving

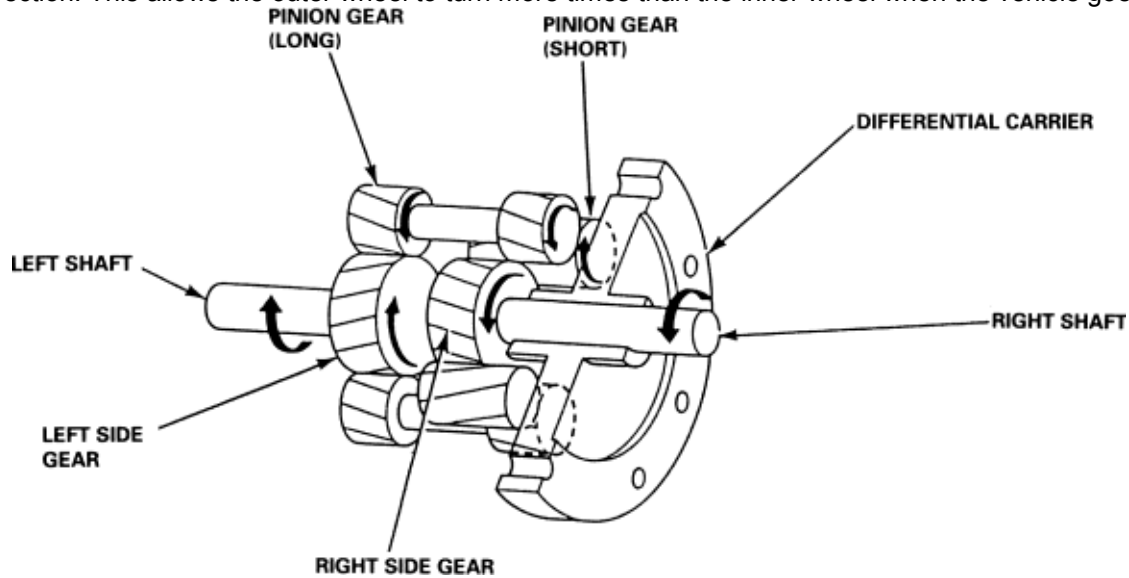
The differential carrier and gears rotate together as a unit when both wheels rotate at the same speed. Turning effort from the final driven gears are directly transmitted to both wheels.

Description

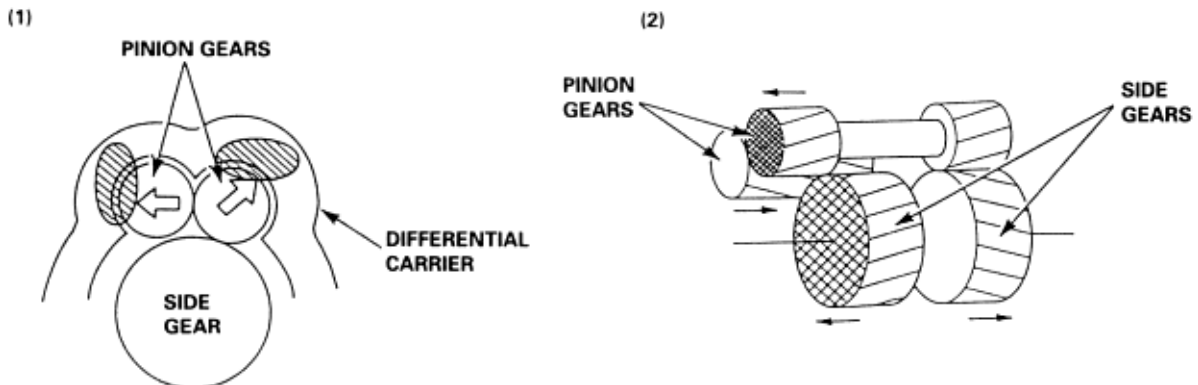
Limited Slip Differential (LSD) (HA22A7 engine model) (cont'd)

13-56

- When rounding a curve
When the vehicle rounds a curve, the differential allows the outer wheel to rotate a little faster than the inner wheel. When this takes place, the short and long pinion gears rotate, and walk around the side gears in the directions shown. If, for example, the right shaft is rotated in a counterclockwise direction with the differential carrier held stationary, the force is transmitted through the right side gear, short pinion gears and long pinion gears to the left side gear, causing the left shaft to rotate in a clockwise direction. This allows the outer wheel to turn more times than the inner wheel when the vehicle goes around a turn.



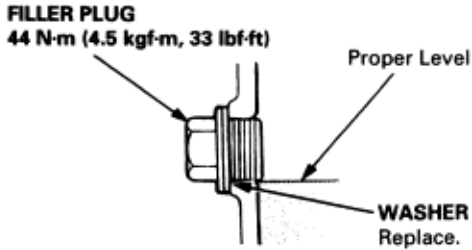
- When limiting differential action
The limited slip differential (LSD) acts to limit the differential action when either wheel slips on ice or snow or on turn. This is done by using the friction created between each gear and differential case:
 - The pinions are forced against the differential carrier by the force as they are rotated and repelled outward in engagement.
 - The ends of the pinion gears are held firmly against the differential carrier due to the side thrust from the helically cut gears.



With the pinion gears locked, the torque applied to the slipping wheel is reduced and the torque delivered to the other wheel is increased.

NOTE: Check the fluid with the engine OFF and vehicle on level ground.

1. Remove the filler plug, then check the level and condition of the fluid.

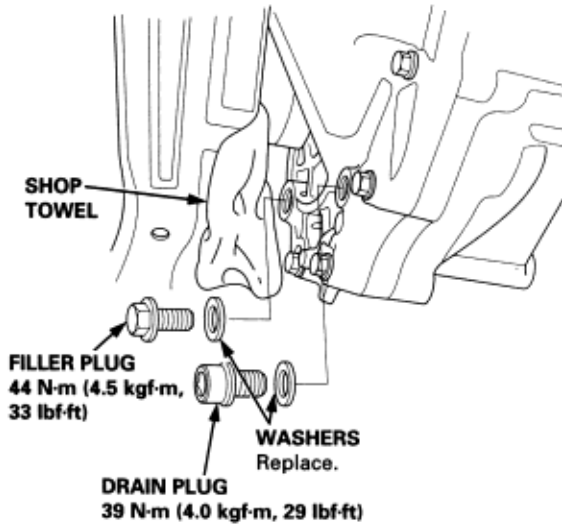


2. The fluid level must be up to the filler hole. If it is below the hole, add fluid until it runs out, then reinstall the filler plug with a new washer.
3. If the transmission fluid is dirty, remove the drain plug and drain the fluid. Cover the front and rear beams with a shop towel to catch any spilled fluid.
4. Reinstall the drain plug with a new washer, and refill the transmission fluid to the proper level.
NOTE: The drain plug washer should be replaced at every fluid change.
5. Reinstall the filler plug with a new washer.

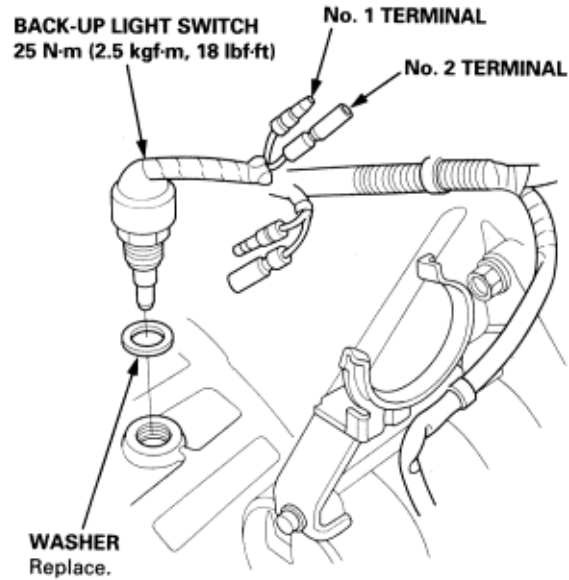
Fluid Capacity

1.9 / (2.0 US qt, 1.7 Imp qt) at fluid change
2.0 / (2.1 US qt, 1.8 Imp qt) at overhaul

Always use genuine Honda Manual Transmission fluid (MTF). If it is not available, you may use an API service SG or SH grade motor oil with a viscosity of SAE 10 W-30 or 10 W-40 as a temporary replacement.



1. Disconnect the connectors from the switch.



2. Check for continuity between the No. 1 and No. 2 terminals.
 - ♦ There should be continuity when the shift lever into reverse.
 - ♦ There should be no continuity when the shift lever in position except reverse.
3. If necessary, replace the switch.

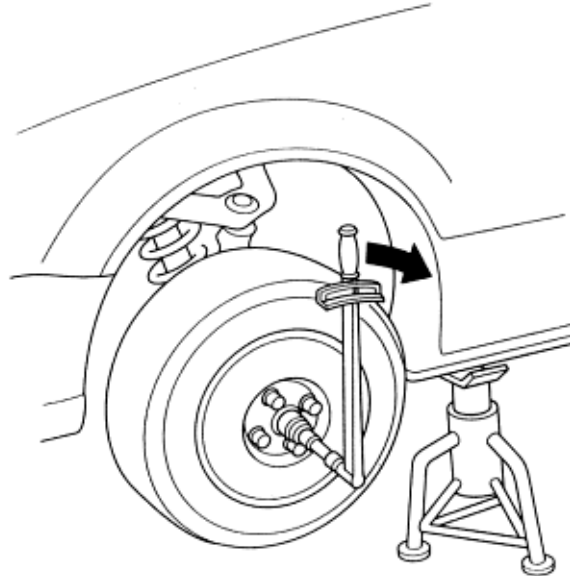


CAUTION

The helical type limited slip differential (LSD) distributes optimum power between the two driving axles according to difference in torque as demanded by the driving wheels. Under no circumstances should the engine be started with either wheel raised off the ground, such as when adjusting wheel balance with an on-the-vehicle wheel balancer or when transporting the vehicle in the event of accident.

1. Set the parking brake and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
3. With the engine off, shift the transmission into 1st gear.
4. Rotate either front wheel by hand and check that the other wheel rotates in the opposite direction.
5. If the opposite front wheel does not rotate, or if you cannot spin the front wheels at all, the limited slip differential is faulty and should be replaced.

1. Setting parking brake and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in proper locations (see section 1).
3. With the engine off, shift the transmission into Neutral.
4. Measure the rotating torque with a beam-type torque wrench in the direction shown. Rotate the torque wrench more than two complete turns and take the maximum reading.



5. Shift the transmission into 1st gear and measure the rotating torque again.
6. Calculate the rotating torque:
Service Limit:
Measurement from step 5 >2.5
Measurement from step 4
7. Repeat step 3 through 6 for the other wheel.
8. Replace the limited slip differential assembly if the rotating torque is lower than the service limit.

⚠ WARNING

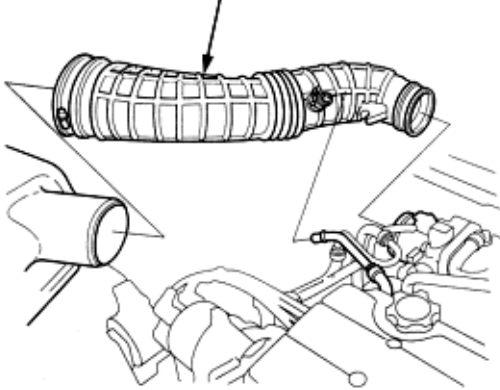
- ♦ Make sure jacks and safety stands are placed properly (see section 1).
- ♦ Apply parking brake and block rear wheels so vehicle will not roll off stands and fall on you while working under it.

⚠ CAUTION

Use fender covers to avoid damaging painted surfaces.

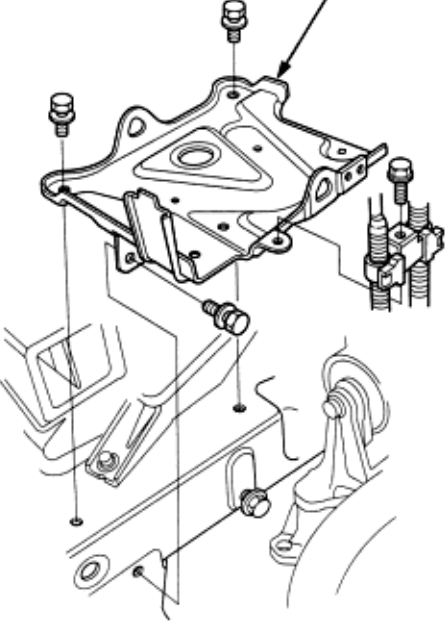
1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery. Remove the battery.
2. Remove the intake air duct.

INTAKE AIR DUCT

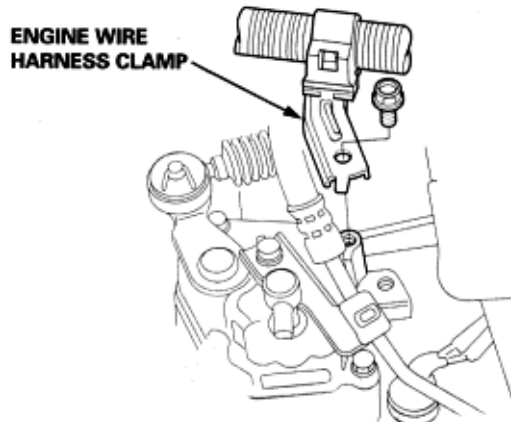


3. Remove the battery tray.

BATTERY TRAY



4. Remove the engine wire harness clamp.

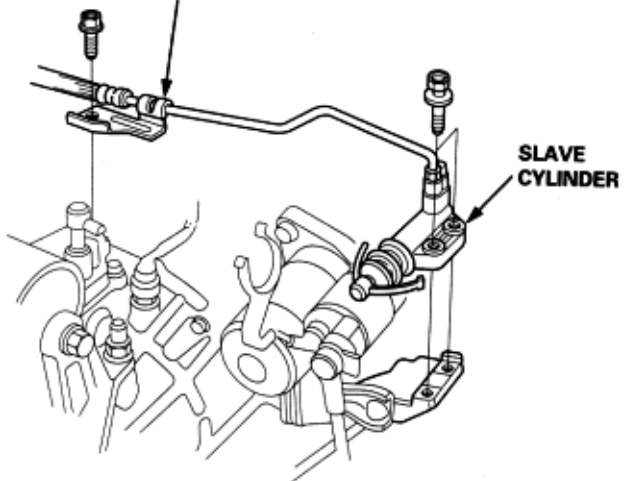


5. Carefully remove the slave cylinder and clutch line clamp so as not to bend the clutch line.

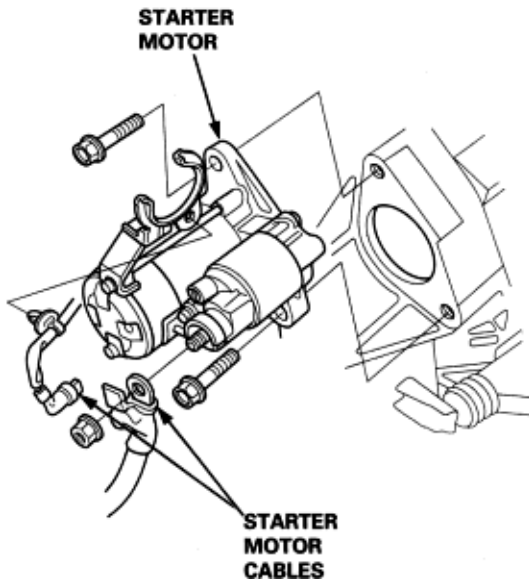
⚠ CAUTION

- ♦ Do not operate the clutch pedal once the slave cylinder has been removed.

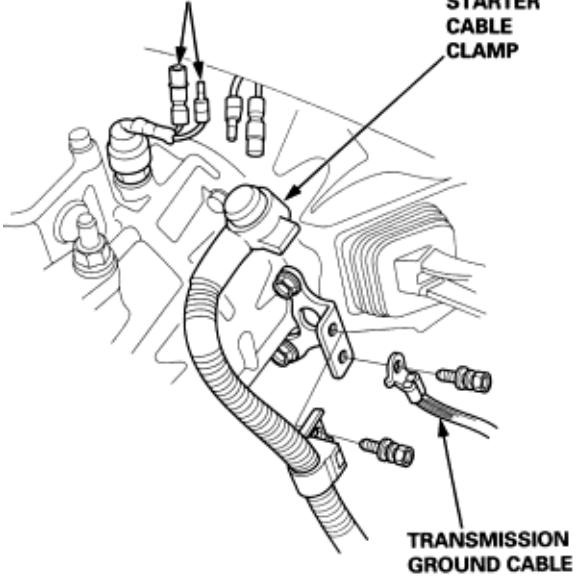
**CLUTCH
LINE
CLAMP**



6. Disconnect the starter motor cables, then remove the starter motor.

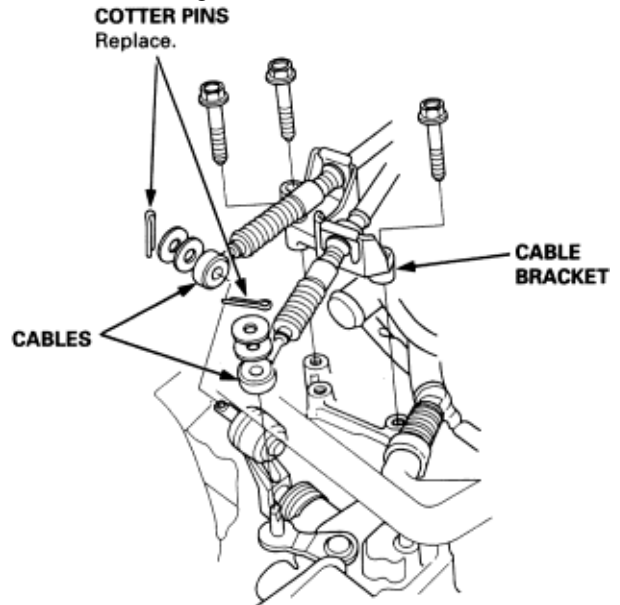


7. Disconnect the back-up light switch connectors.

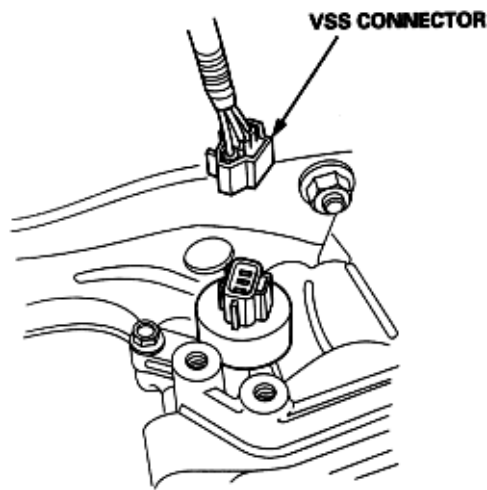


8. Remove the transmission ground cable and starter

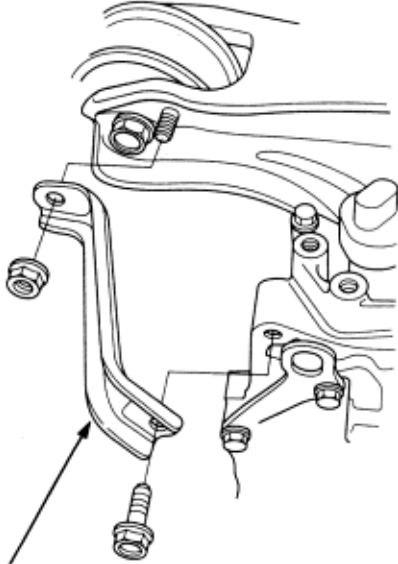
9. First remove the cable bracket, then disconnect the cables from the top of the transmission housing. Carefully remove both cables and the bracket together so as not to bend cables.



10. Disconnect the vehicle speed sensor (VSS) connector.

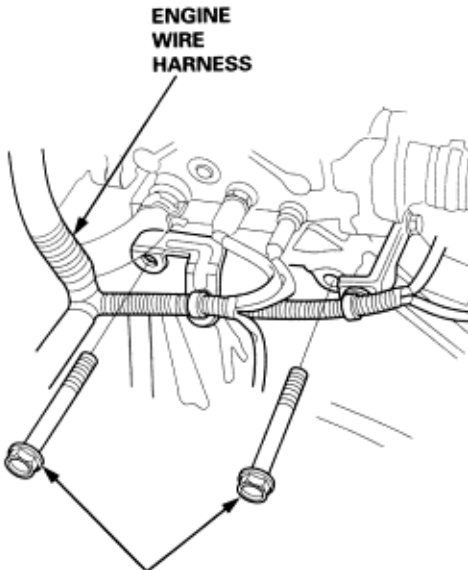


11. Remove the rear engine mount bracket brace.



**REAR ENGINE
MOUNT BRACKET
BRACE**

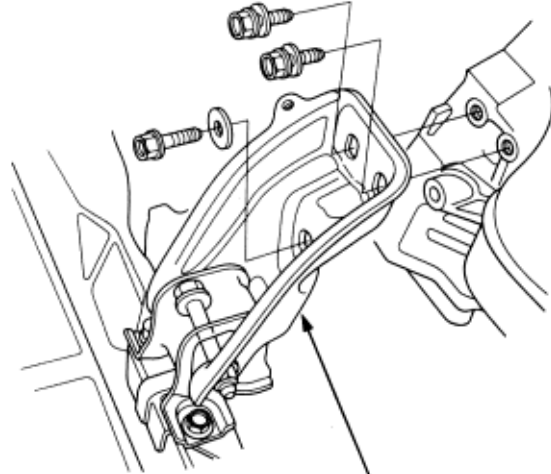
12. Remove the two upper transmission mounting bolts.



**UPPER TRANSMISSION
MOUNTING BOLTS**

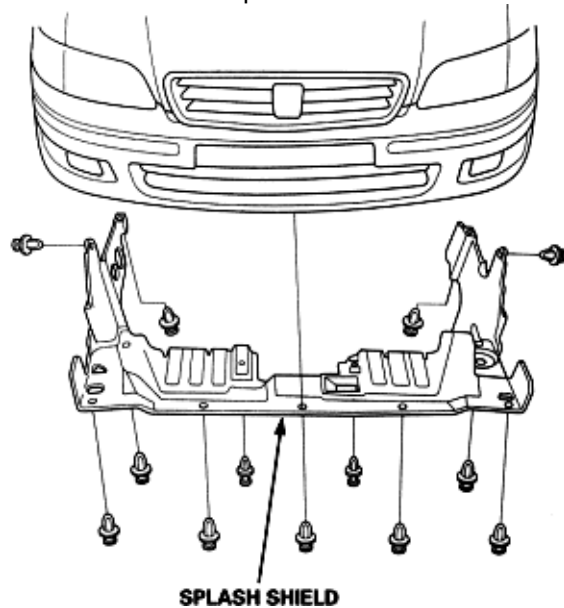
**ENGINE
WIRE
HARNESS**

13. Remove the front engine stopper bracket's three mounting bolts.



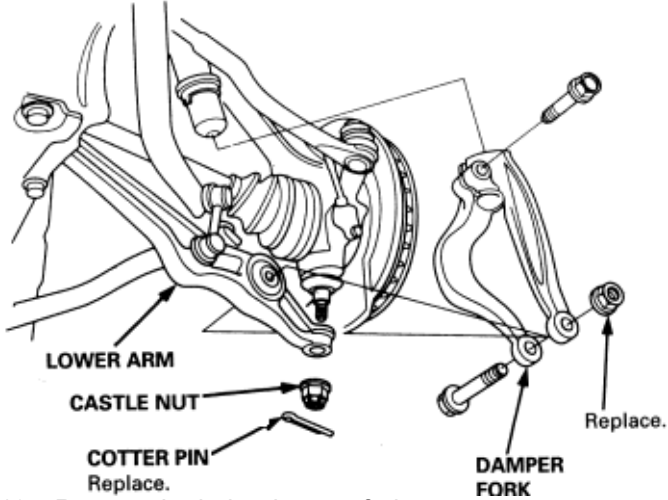
**FRONT ENGINE
MOUNT BRACKET**

14. Raise vehicle and make sure it is securely supported.
15. Drain transmission fluid, with a shop towel covering the front and rear beams to catch any spilled fluid (see page 13-57).
16. Remove the splash shield.

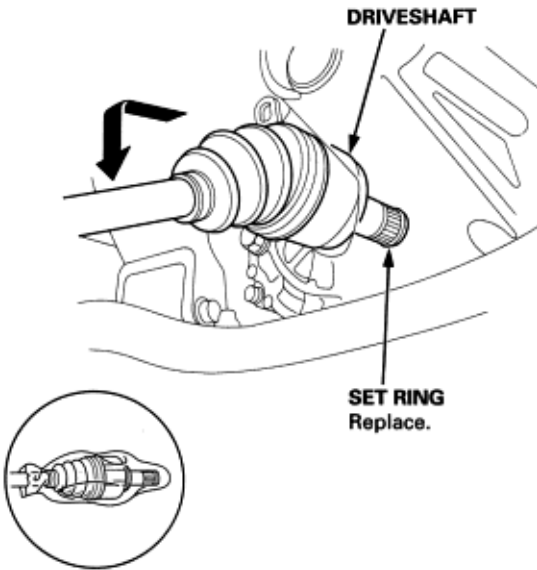


SPLASH SHIELD

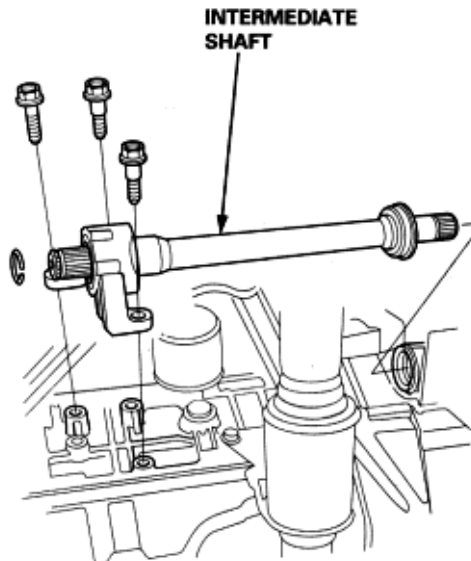
17. Remove the cotter pins, and loosen the castle nuts, then separate the ball joints and lower arms on both sides (see section 18).



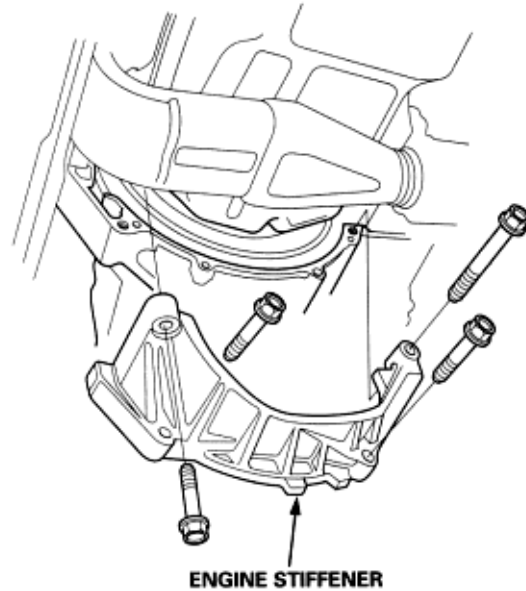
18. Remove both the damper forks.
19. Remove the driveshafts from the intermediate shaft and differential (see section 16). Coat all the precision finished surfaces with clean engine oil grease. Tie bags over the driveshaft ends.



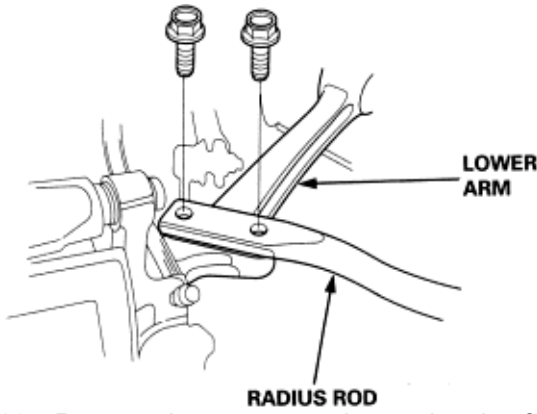
20. Remove the intermediate shaft. Coat all the precision finished surfaces with clean engine oil grease. Tie bags over the shaft end.



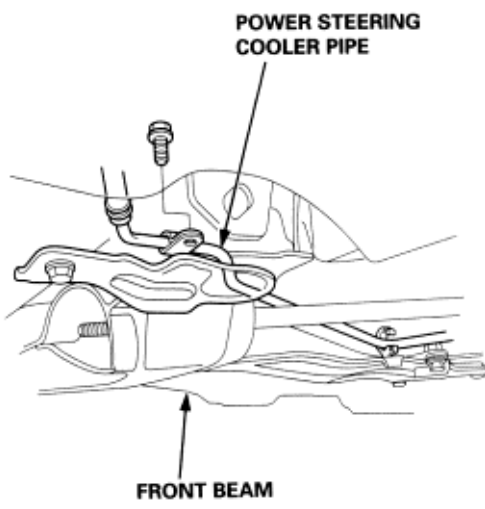
21. Remove the engine stiffener.



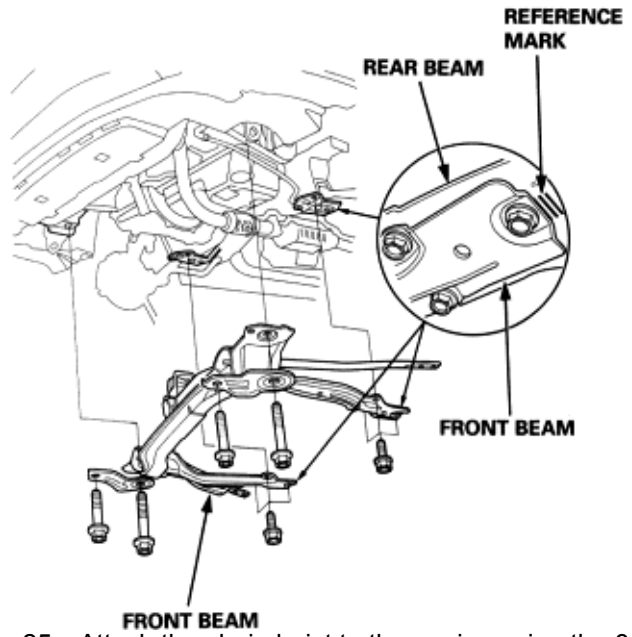
22. Remove both the radius rods mounting bolts from the lower arm.



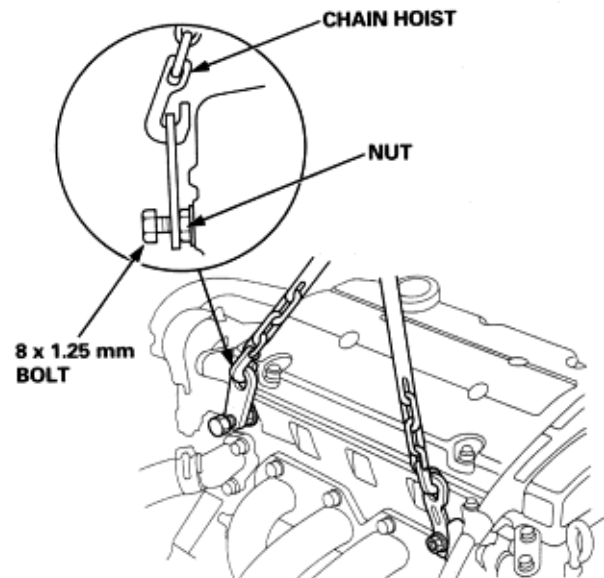
23. Remove the power steering cooler pipe from the front beam.



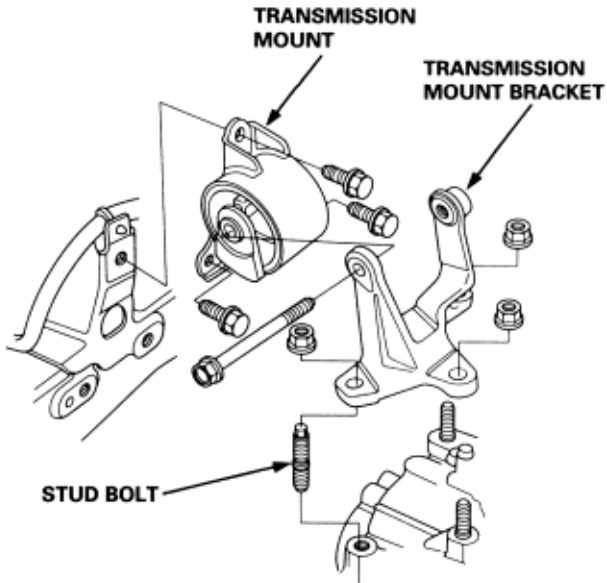
24. Make reference marks on the rear and front beam, then remove the front beam.



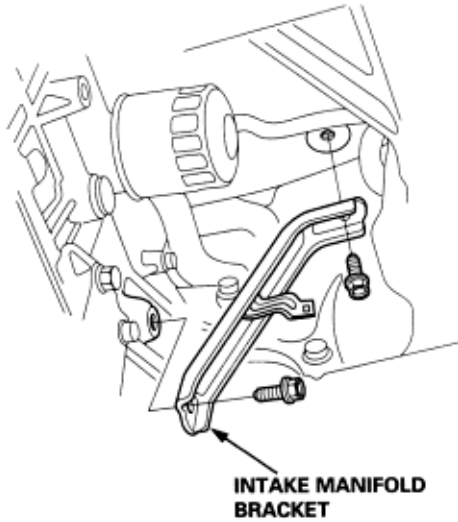
25. Attach the chain hoist to the engine using the 8 x 1.25 mm bolts and nut as shown.



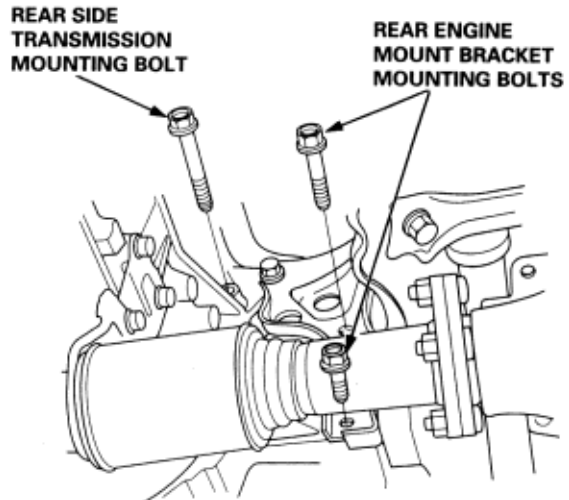
26. Place a floor jack under the transmission, and raise the transmission just enough to take weight off of the mounts.
27. Remove the transmission mount bracket and transmission mount rubber.



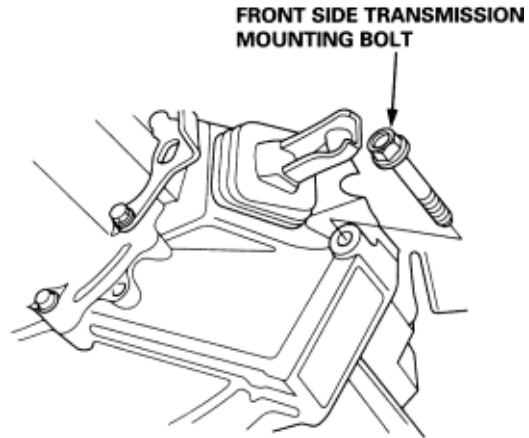
28. Remove the transmission mount stud bolt on the transmission housing.
29. Remove the intake manifold bracket.



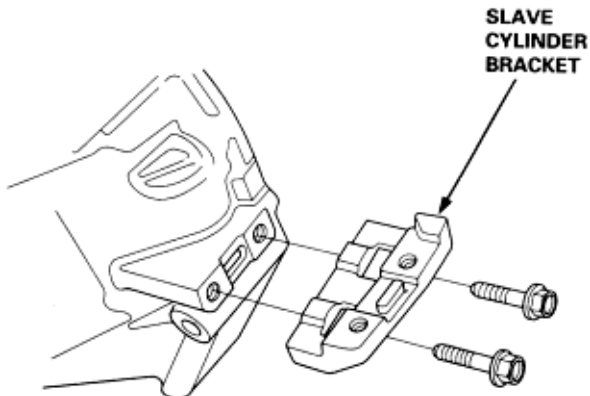
30. Remove the two rear engine mount bracket mounting bolts.



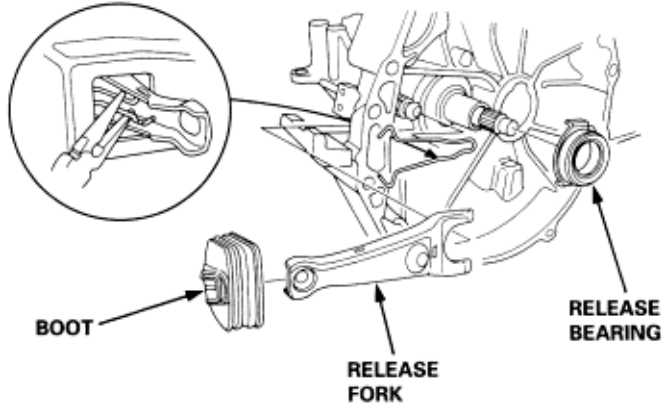
31. Remove the rear side transmission mounting bolt.
32. Remove the front side transmission mounting bolt.



33. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack. Take care not to bend the clutch line.
34. Remove the slave cylinder bracket from the transmission.



35. Remove the boot, the release fork, and the release bearing from the transmission.



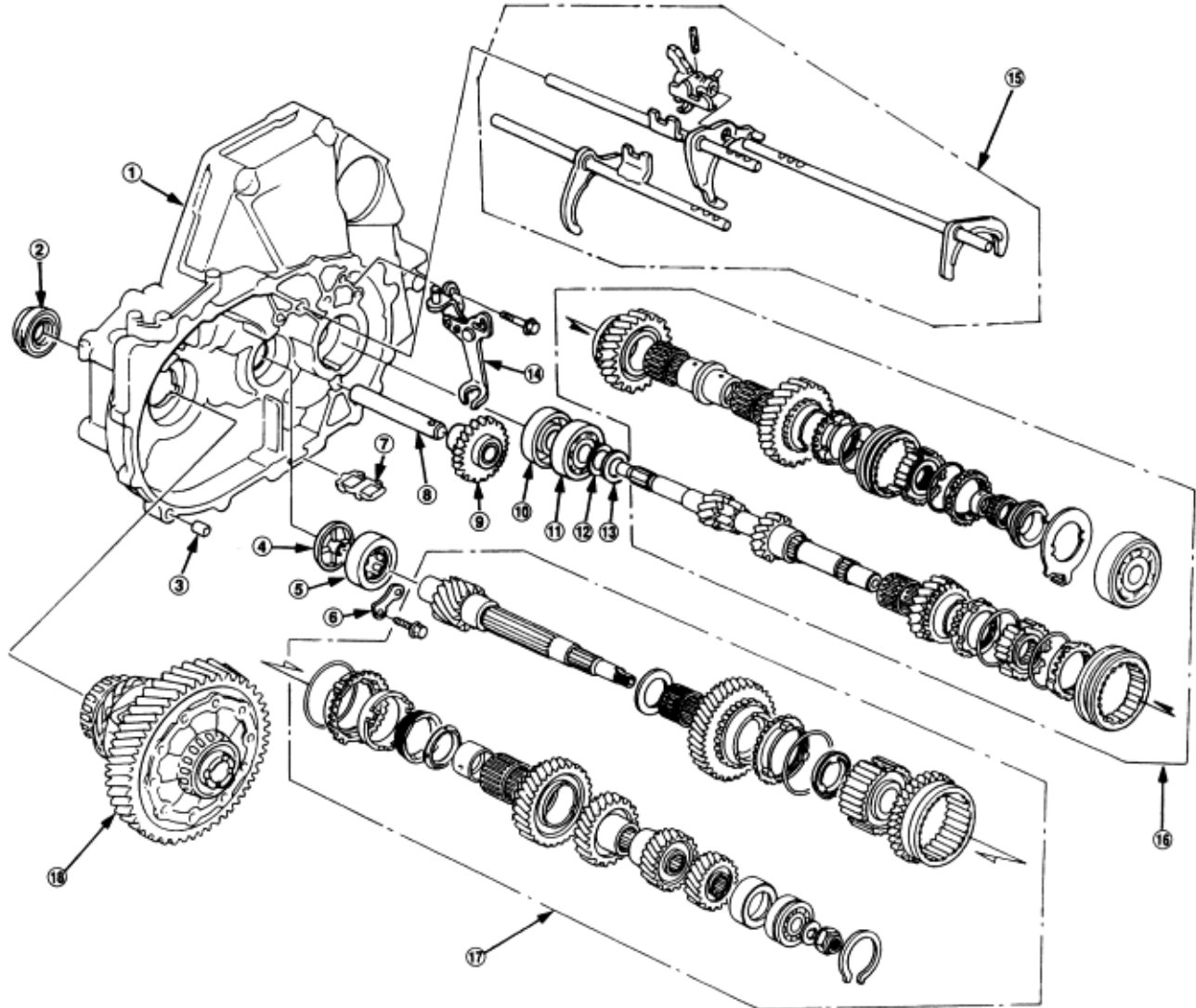
Refer to the drawing below for the transmission disassembly/reassembly. Clean all the parts thoroughly in solvent, and dry with compressed air.



Lubricate all the parts with oil before reassembly.

NOTE:

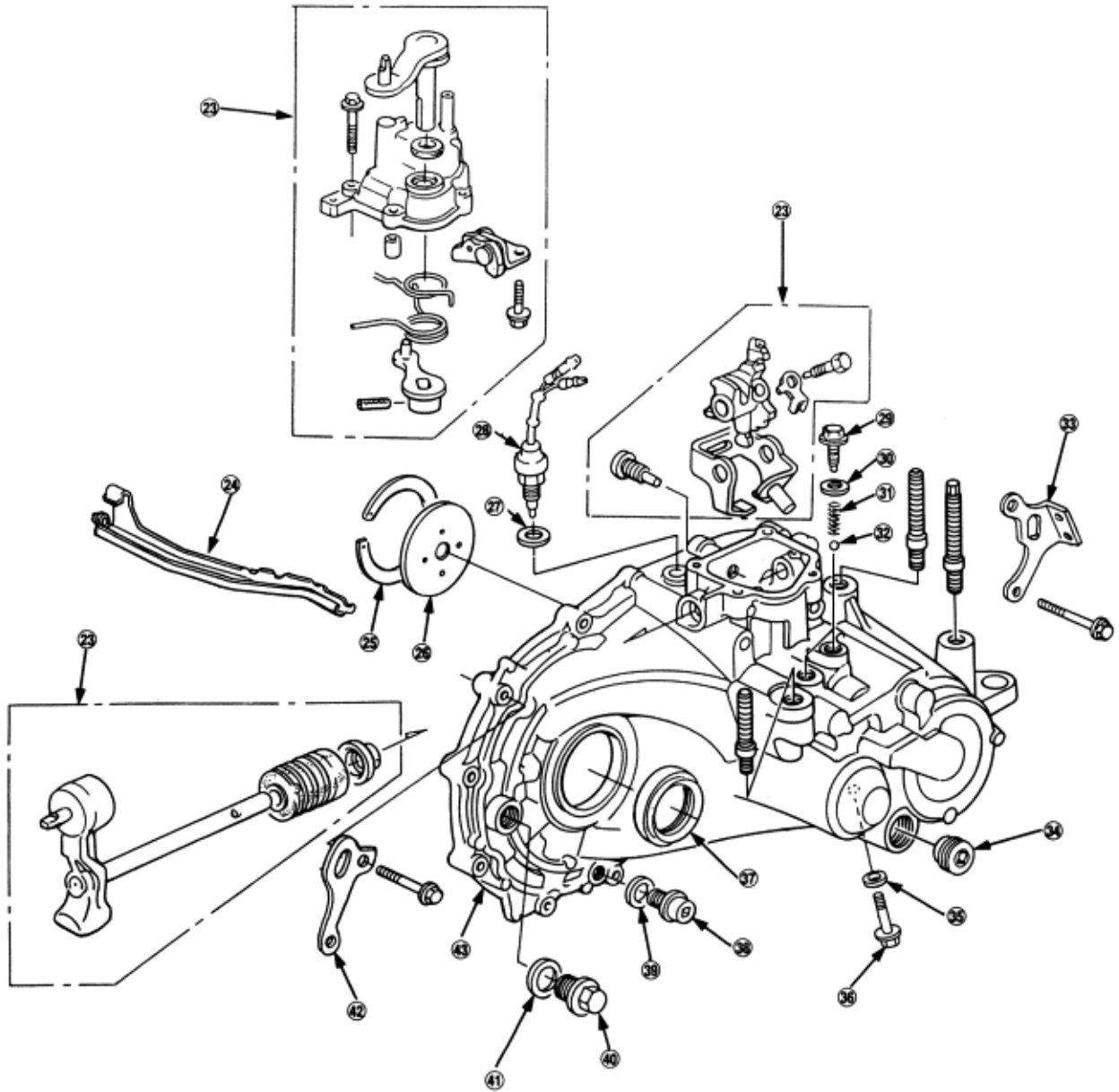
- This transmission uses no gaskets between the major housings; use liquid gasket P/N 08C70-K0234M (**see page 13-70**) and (**see page 13-113**)
- Always clean the magnet (7) whenever the transmission housing is disassembled.
- Inspect all the bearings for wear and operation.



- 1 Clutch housing
- 2 Oil seal. Replace
- 3. 14 x 20 mm Dowel pin
- 4 Oil guide plate
- 5 Needle bearing
- 6 Retaining plate
- 7 Magnet

- 8 Reverse idler gear shaft
- 9 Reverse idler gear
- 10 Oil seal. Replace
- 11 Ball bearing
- 12 Spring washer
- 13 Washer
- 14 Reverse shift fork

- 15 Shift fork assembly
(**See page 13-95**)
- 16 Mainshaft assembly
(**See page 13-74**) (**See page 13-75**)
- 17 Countershaft assembly
Index (**See page 13-81**) (**See page 13-87**)
- 18 Differential assembly
Index (**See page 13-99**)



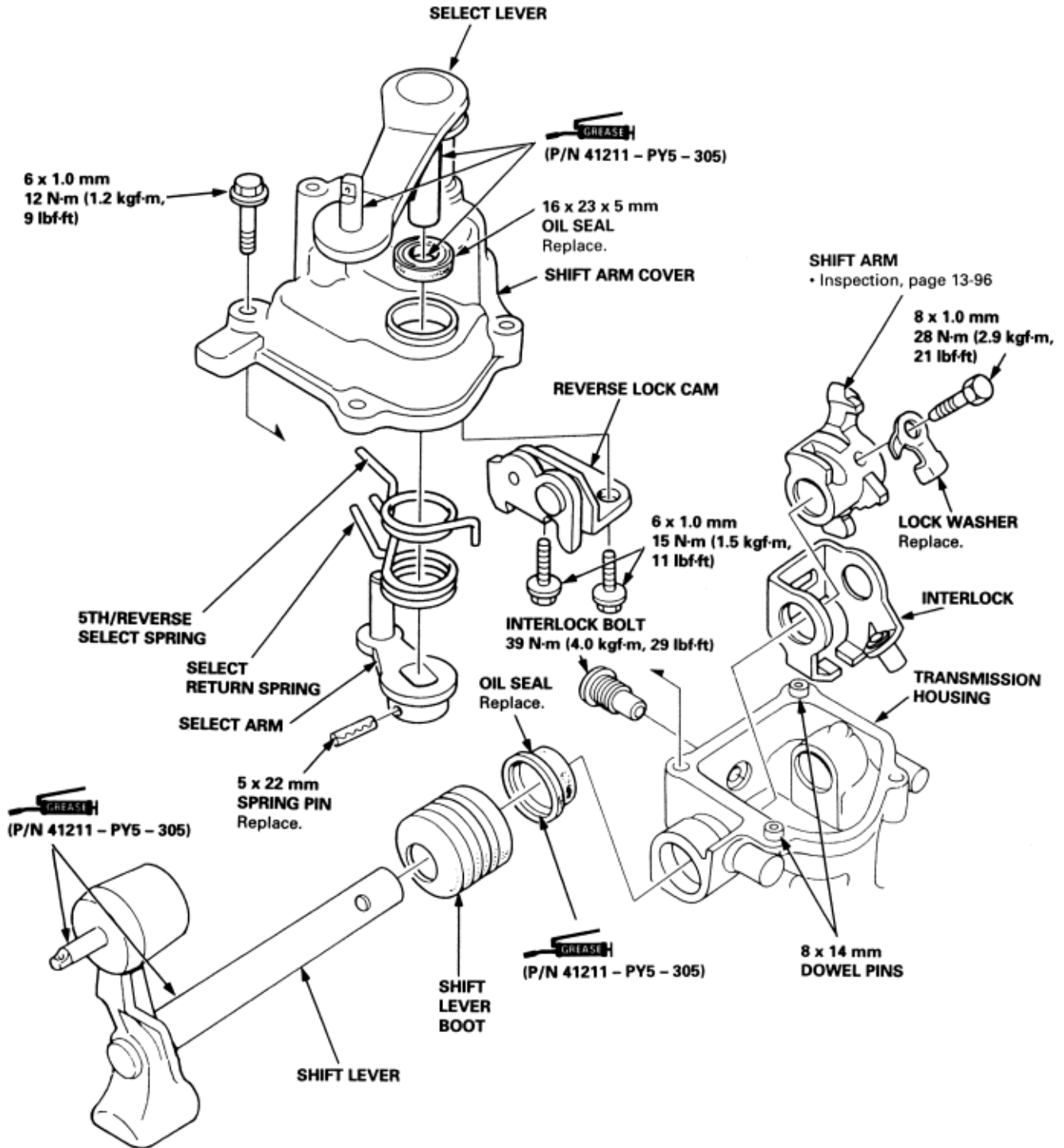
- 23 Shift arm assembly
Index (**See page** 13-68)
- 24 Oil gutter plate
- 25 78 mm Shim
Selection (**See page** 13-109)
- 26 Oil guide plate
- 27 Washer. Replace
- 28 Back-up light switch
- 29 Setting screw

- 30 Washer. Replace
- 31 Spring L.26 mm (1.02 in)
- 32 Steel ball D.5/16 in
- 33 Transmission hanger A
- 34 32 mm sealing bolt
- 35 Washer. Replace
- 36 Reverse idler gear shaft bolt
- 37 Oil seal. Replace

- 38 Drain plug
- 39 Washer. Replace
- 40 Filler plug
- 41 Washer. replace
- 42 Transmission hanger B
- 43 Transmission housing

NOTE:

- ♦ The shift arm cover can be removed and installed with the transmission in the vehicle.
- ♦ Lubricate all moving and sliding surfaces with the specified grease.
- ♦ Turn the shift lever boot so the hole is facing down.
- ♦ Use only HONDA Genuine Urea Grease UM264 (P/N41211-PY5-305).

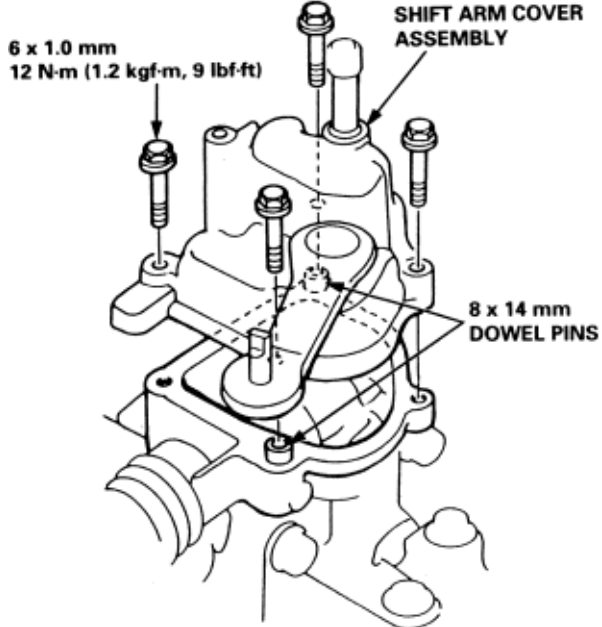


To go to the page referenced on the diagram above, click on the following:
(See [page 13-96](#))

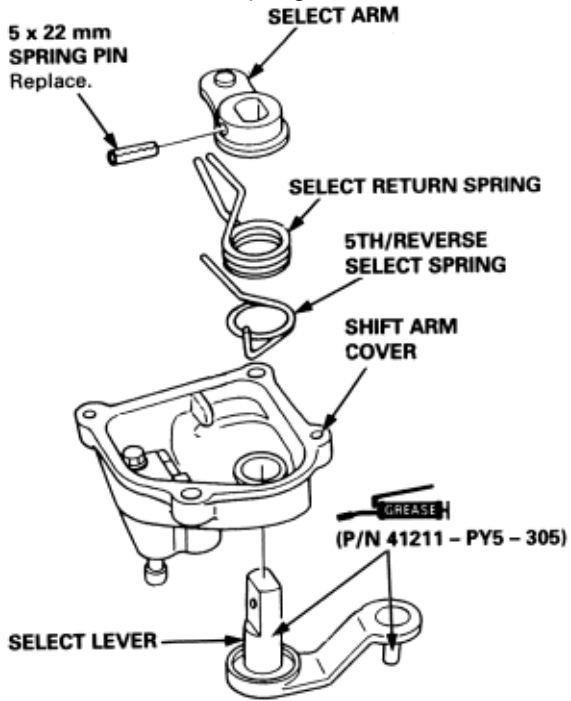
NOTE:

- ♦ During reassembly, grease all sliding parts.
- ♦ Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).

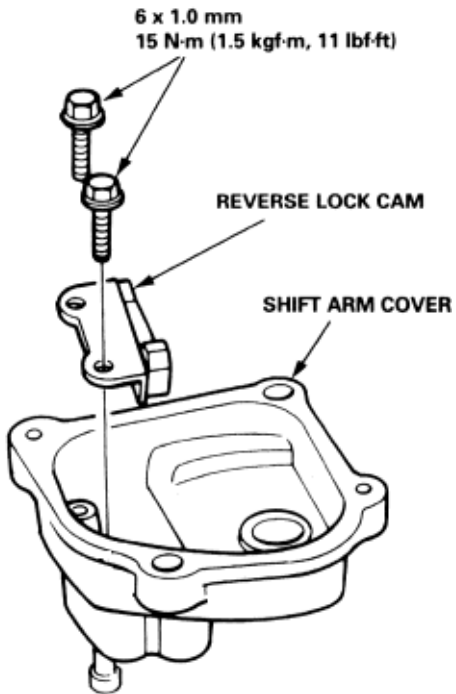
1. Remove the shift arm cover assembly.



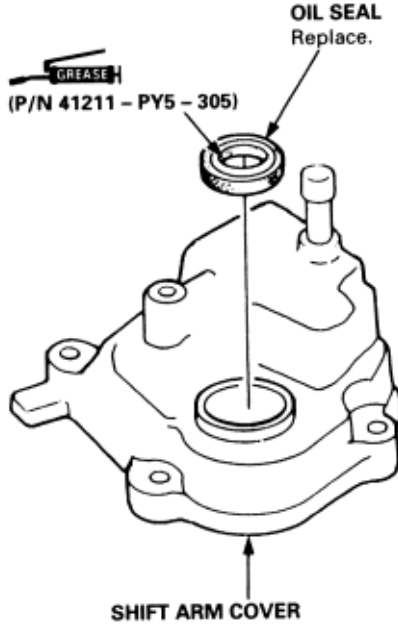
2. Remove the spring pin, then remove the select lever, select arm and springs.



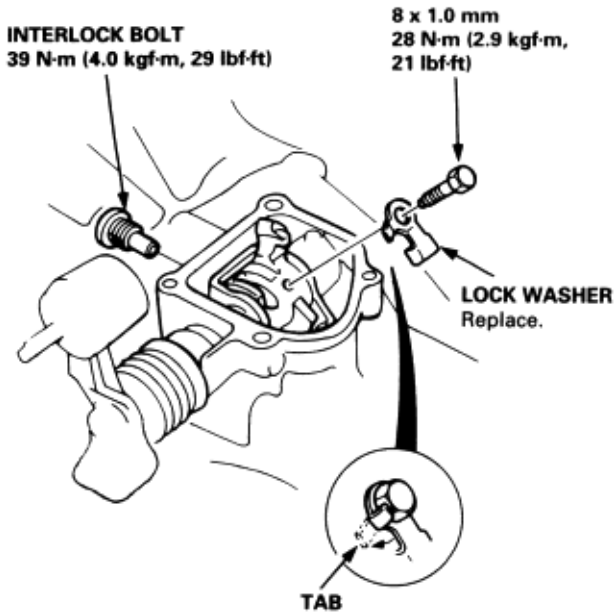
3. Remove the reverse lock cam.



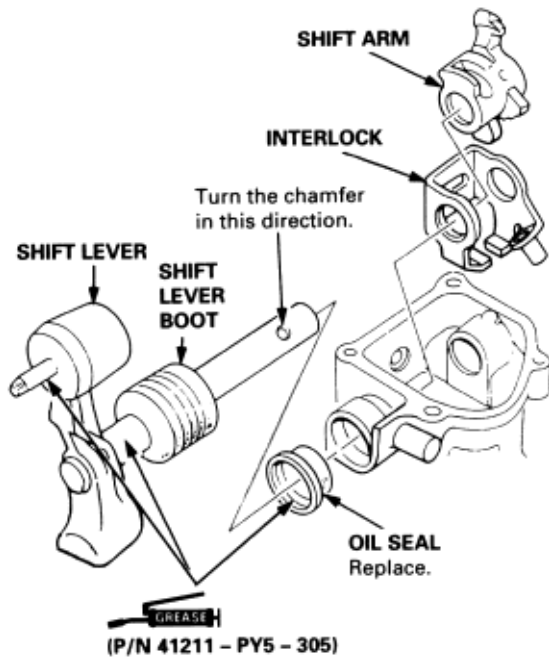
4. Remove the oil seal.



5. Raise the tab of the lock washer, then remove the bolt.
6. Remove the interlock bolt.
NOTE: Apply liquid gasket (P/N 08C70-K0234M) to the threads before reassembly.



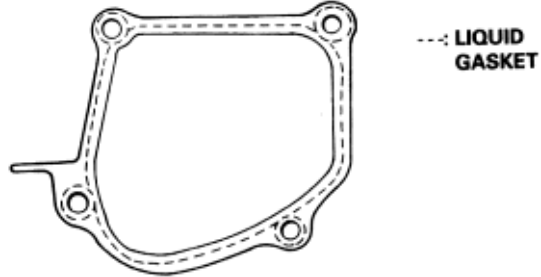
7. Remove the shift lever, shift arm, and interlock.
NOTE: Turn the chamfer in this direction.



8. Install the shift arm assembly in the reverse order of removal.

NOTE:

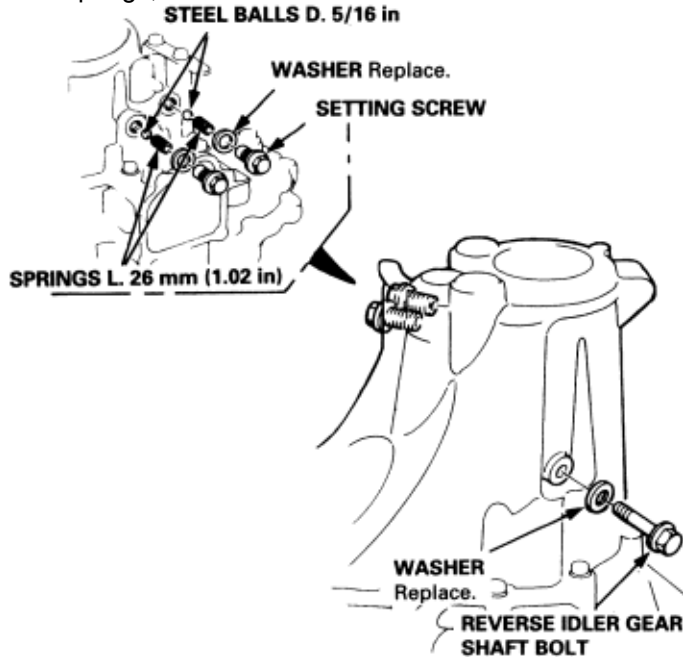
- ♦ Use liquid gasket (P/N 08C70-K0234M).
- ♦ Remove the dirty fluid from the sealing surface.
- ♦ Seal the entire circumference of the bolt holes to prevent fluid leakage.
- ♦ If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with fluid.



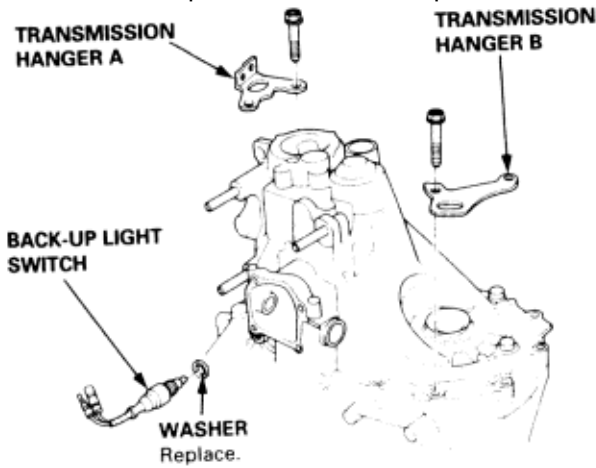
NOTE:

- ♦ If the transmission housing or clutch housing are replaced, the bearing preload must be adjusted.
- ♦ Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

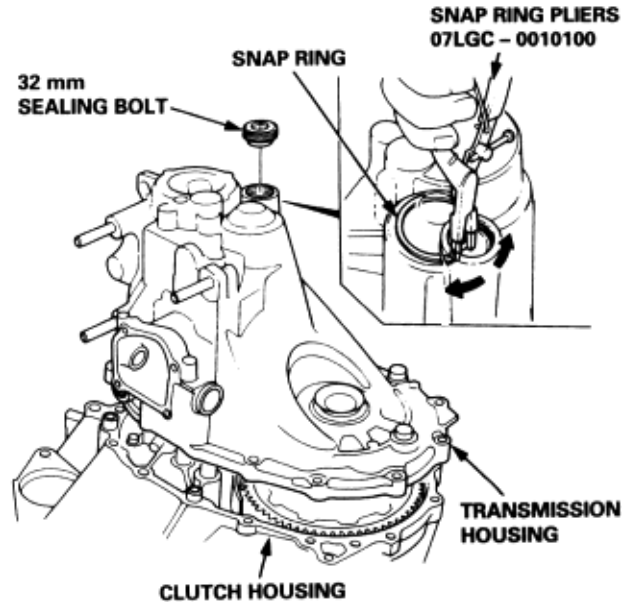
1. Remove the shift arm cover assembly (see page 13-69).
2. Remove the reverse idler gear shaft bolt.
3. Remove the setting screws, then remove the washers, springs, and steel balls.



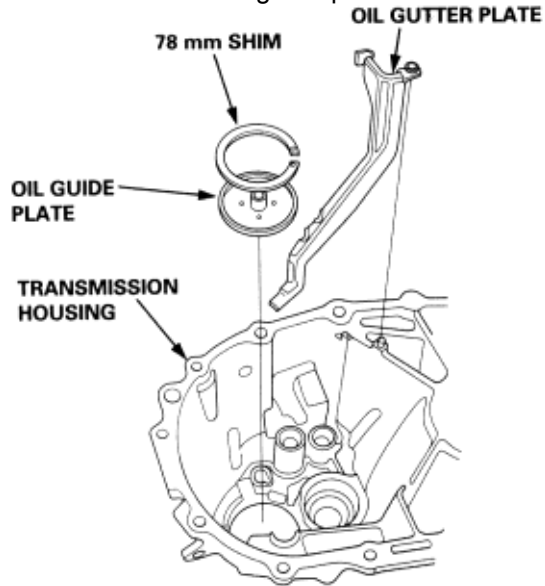
4. Remove the back-up light switch.
5. Remove the 10 mm bolts and 8 mm bolts in a criss-cross pattern in several steps.



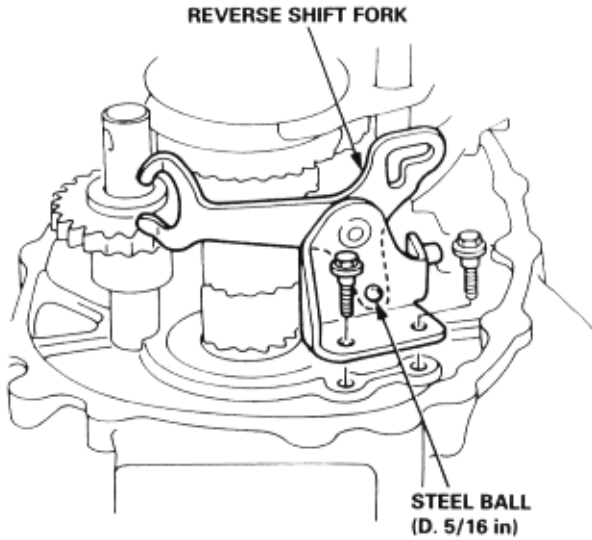
6. Remove the 32 mm sealing bolt.
7. Expand the snap ring on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.
8. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.



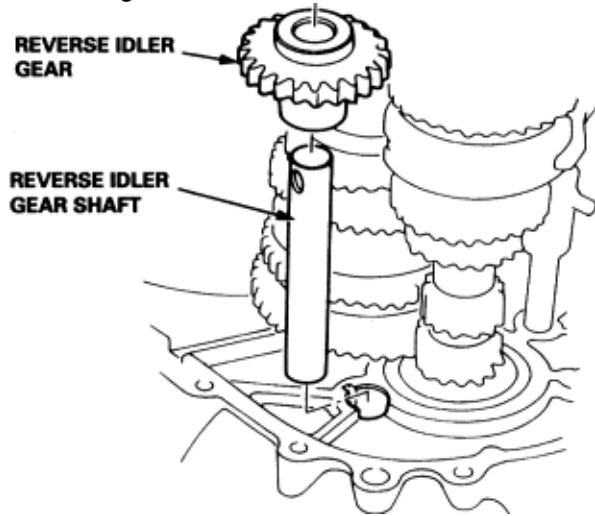
9. Remove the 78 mm shim and oil guide plate, then remove the oil gutter plate.



10. Remove the reverse shift fork. Be careful not to lose the steel ball.

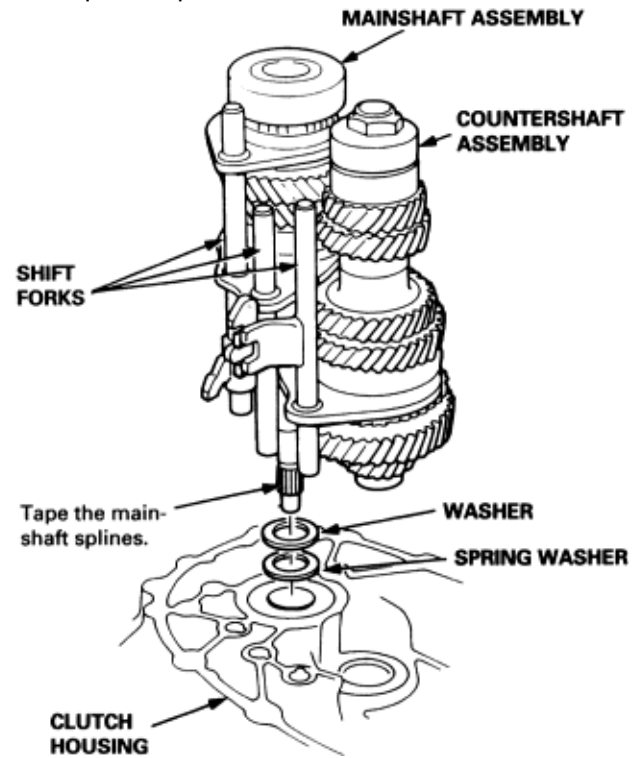


11. Remove the reverse idler gear shaft and the reverse idler gear.

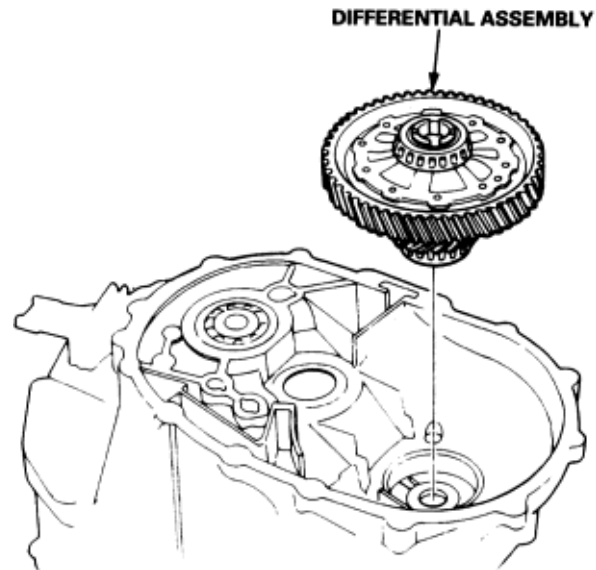


12. Remove the mainshaft and countershaft assemblies with the shift forks from the clutch housing.

NOTE: Before removing the mainshaft and counter shaft assemblies, tape the mainshaft spline to protect it.

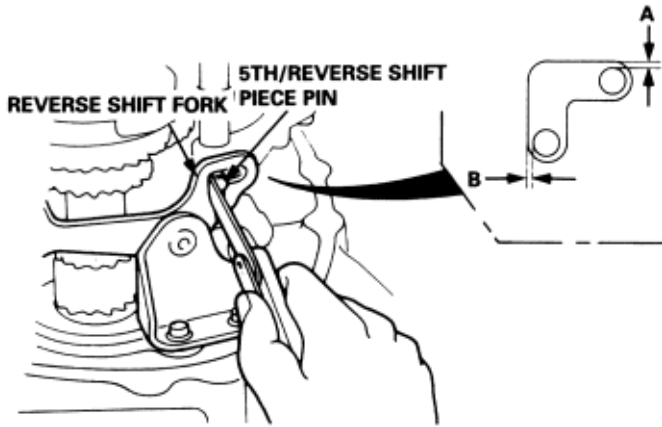


13. Remove the differential assembly.



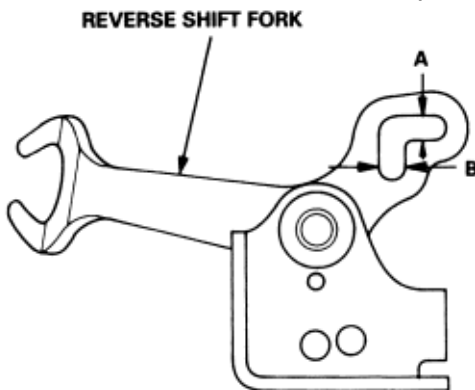
1. Measure the clearances between the reverse shift fork and 5th/reverse shift piece pin.
 - ♦ If the clearances are more than the service limit, go to step 2.
 - ♦ If the clearances are within the service limit, go to step 3.

Standard: A: 0.05-0.35 mm (0.002-0.014 in)
B: 0.4-0.8 mm (0.02-0.03 in)
Service Limit: A: 0.5 mm (0.02 in)
B: 1.0 mm (0.04 in)



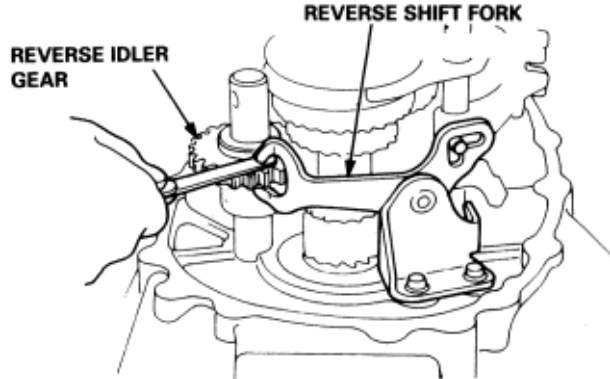
2. Measure the widths of the groove in the reverse shift fork.
 - ♦ If the widths of the grooves are not within the standard, replace the reverse shift fork with a new one.
 - ♦ If the widths of the grooves are within the standard, replace the 5th/reverse shift piece with a new one.

Standard: A: 7.05-7.25 mm (0.278-0.285 in)
B: 7.4-7.7 mm (0.29-0.30 in)



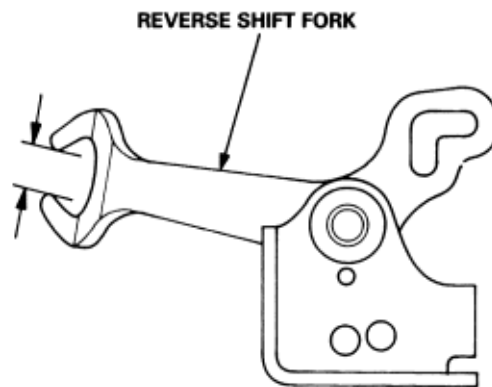
3. Measure the clearance between the reverse idler gear and reverse shift fork.
If the clearance is more than the service limit, go to step 4.

Standard: 0.5-1.1 mm (0.02-0.04 in)
Service Limit: 1.8 mm (0.07 in)




4. Measure the width of the reverse shift fork.
 - ♦ If the width is not within the standard, replace the reverse shift fork with a new one.
 - ♦ If the width is within the standard, replace the reverse idler gear with a new one.

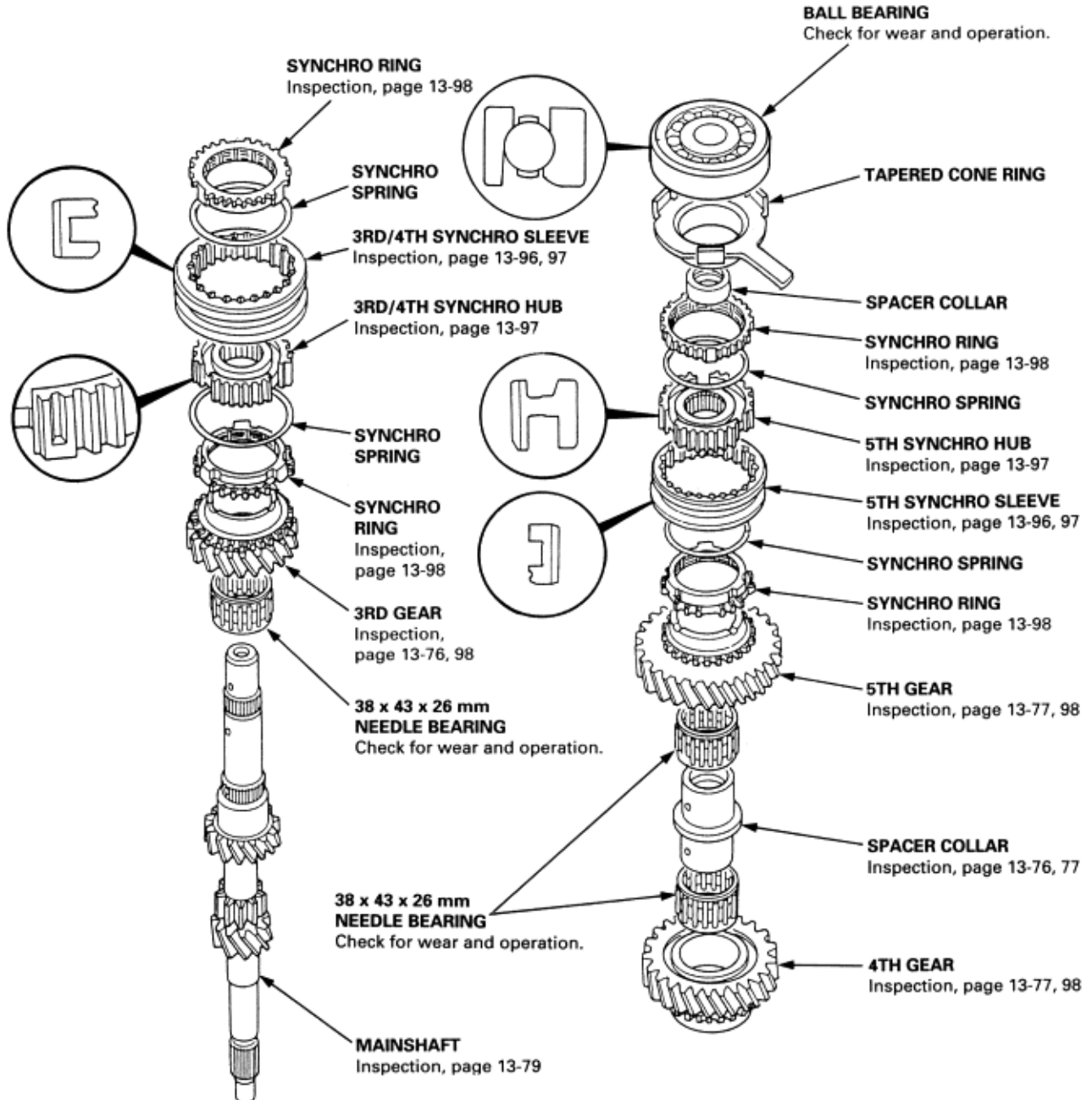
Standard: 13.0-13.3 mm (0.51-0.52 in)



NOTE: The 3rd/4th and 5th synchro hubs, and the ball bearing are installed with a press.

 Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.

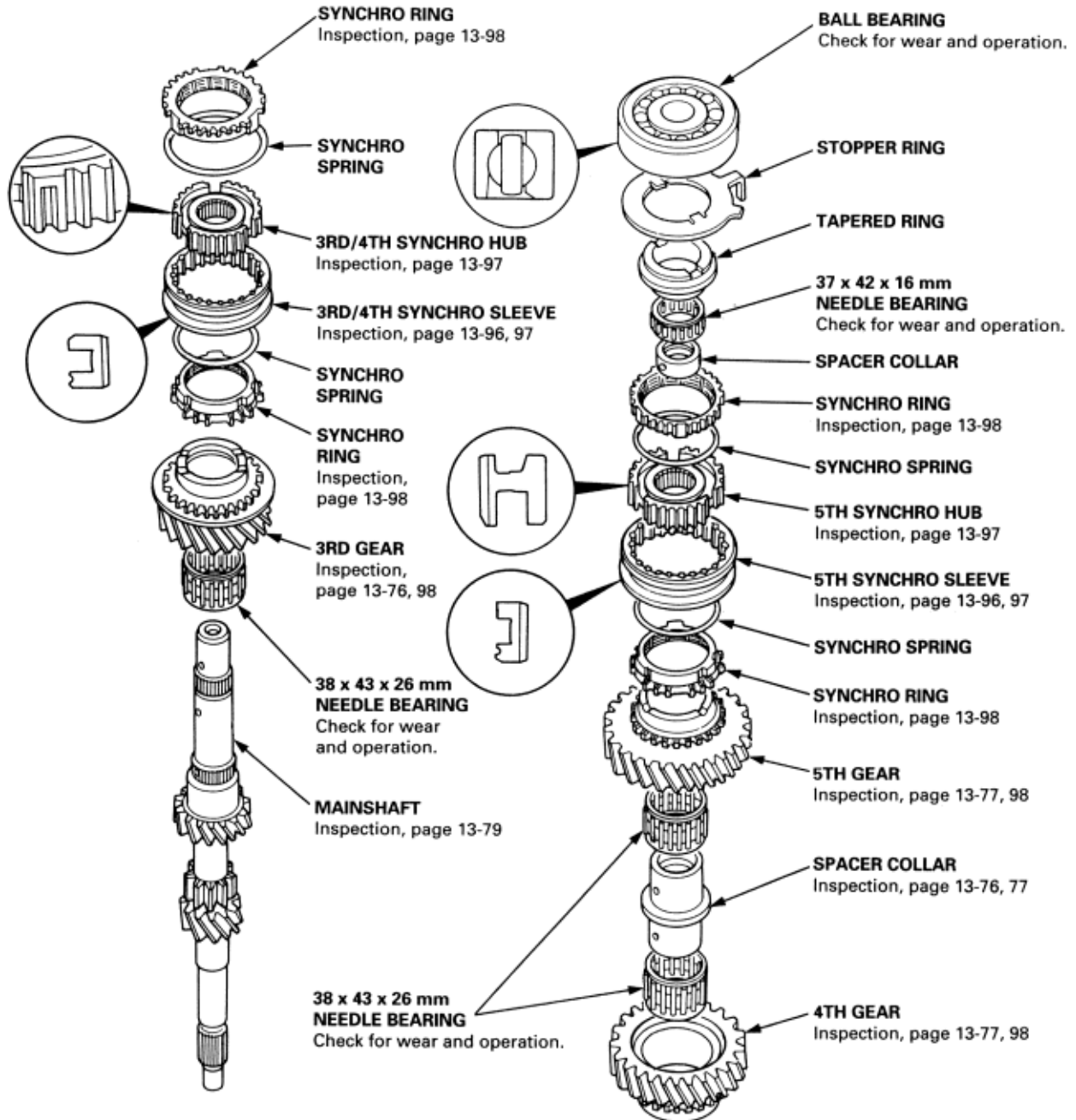
U2J4, U2G5 Transmissions:



To go to the pages referenced on the diagram above, click on the following:

- (See page 13-98)
- (See page 13-96)
- (See page 13-97)
- (See page 13-76)
- (See page 13-79)
- (See page 13-77)

U2Q7 Transmission:



To go to the pages referenced on the diagram above, click on the following:

- (See page 13-98)
- (See page 13-96)
- (See page 13-97)
- (See page 13-76)
- (See page 13-79)
- (See page 13-77)

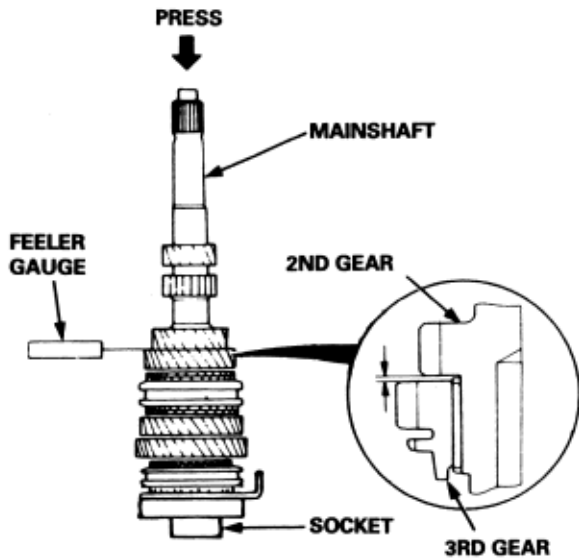
Mainshaft Assembly Clearance Inspection

13-76

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

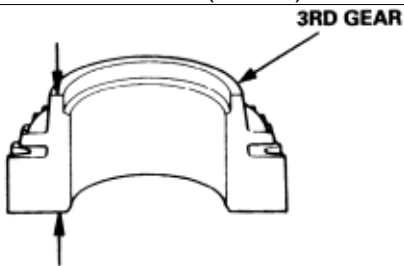
- Support the bearing inner race with a socket, and push down on the mainshaft.
- Measure the clearance between 2nd and 3rd gears with a feeler gauge.
 - If the clearance is more than the service limit, go to step 3.
 - If the clearance is within the service limit, go to step 4.

Standard: 0.06-0.21 mm (0.002-0.008 in)
Service Limit: 0.3 mm (0.012 in)



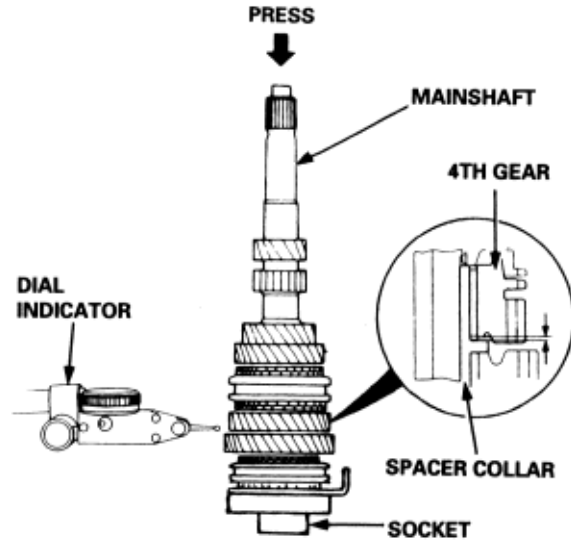
- Measure the thickness of 3rd gear.
 - If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
 - If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

Transmission Type	U2Q7	U2J4, U2G5
Standard	34.92-34.97 mm (1.375-1.377 in)	32.42-32.47 mm (1.276-1.278 in)
Service Limit	34.8 mm (1.37 in)	32.3 mm (1.27 in)



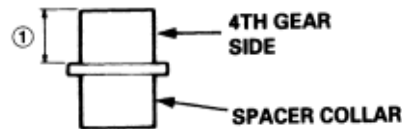
- Measure the clearance between 4th gear and the spacer collar with a dial indicator. If the clearance is more than the service limit, go to step 5.

Standard: 0.06-0.21 mm (0.002-0.008 in)
Service Limit: 0.30 mm (0.012 in)



- Measure distance (1) on the spacer collar.
 - If distance (1) is less than the service limit, replace the spacer collar with a new one.
 - If distance (1) is within the service limit, go to step 6.

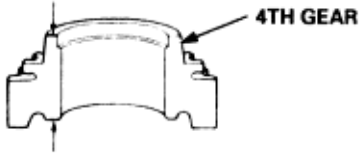
Standard: 26.03-26.08 mm (1.025-1.027 in)
Service Limit: 26.01 mm (1.024 in)



Mainshaft Assembly
Clearance Inspection (cont'd)

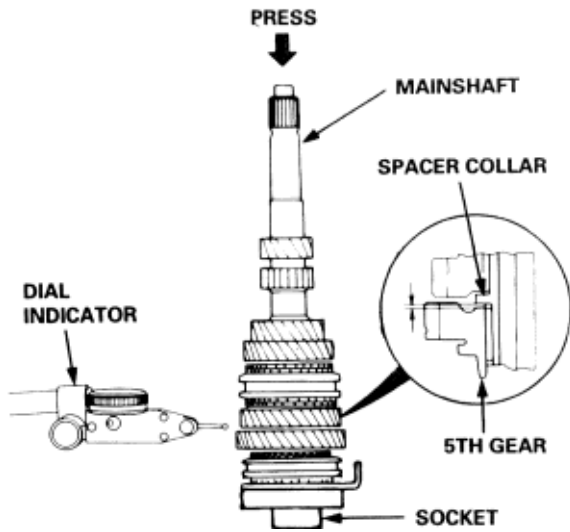
6. Measure the thickness of 4th gear.
- ♦ If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
 - ♦ If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

Transmission Type	U2Q7	U2J4, U2G5
Standard	31.42-31.47 mm (1.237-1.234 in)	30.92-30.97 mm (1.217-1.219 in)
Service Limit	31.3 mm (1.23 in)	30.8 mm (1.21 in)



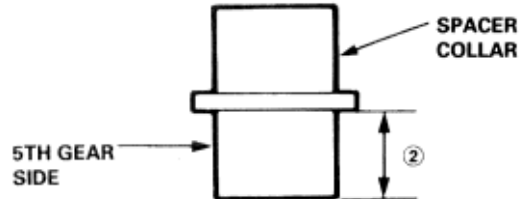
7. Measure the clearance between 5th gear and the spacer collar with a dial indicator. If the clearance is more than the service limit, go to step 8.

Standard: 0.06-0.21 mm (0.002-0.008 in)
Service Limit: 0.30 mm (0.12 in)



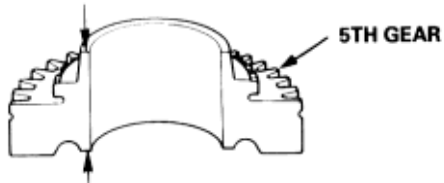
8. Measure distance (2) on the spacer collar.
- ♦ If distance (2) is less than the service limit, replace the spacer collar with a new one.
 - ♦ If distance (2) is within the service limit, go to step 9.

Standard: 26.03-26.08 mm (1.025-1.027 in)
Service Limit: 26.01 mm (1.024 in)



9. Measure the thickness of 5th gear.
- ♦ If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
 - ♦ If the thickness of 5th gear is within the service limit, replace the 5th gear synchro hub with a new one.

Standard: 30.92-30.97 mm (1.217-1.219 in)
Service Limit: 30.8 mm (1.21 in)

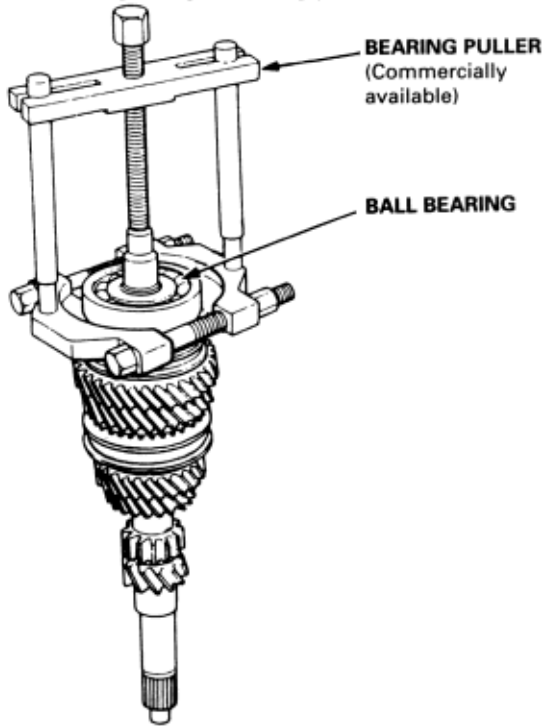




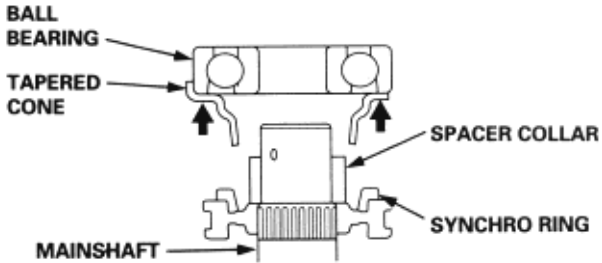
CAUTION

Remove the synchro hubs using a press and steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

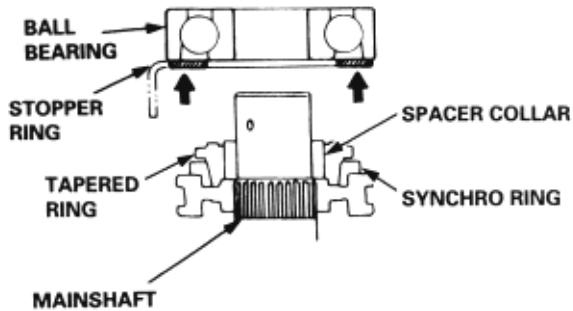
1. Remove the ball bearing and tapered cone ring or stopper ring using a bearing puller as shown.



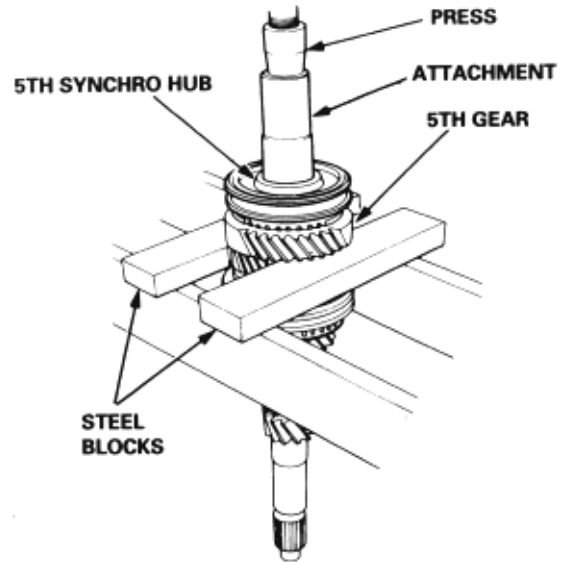
U2J4, U2G5 Transmissions:



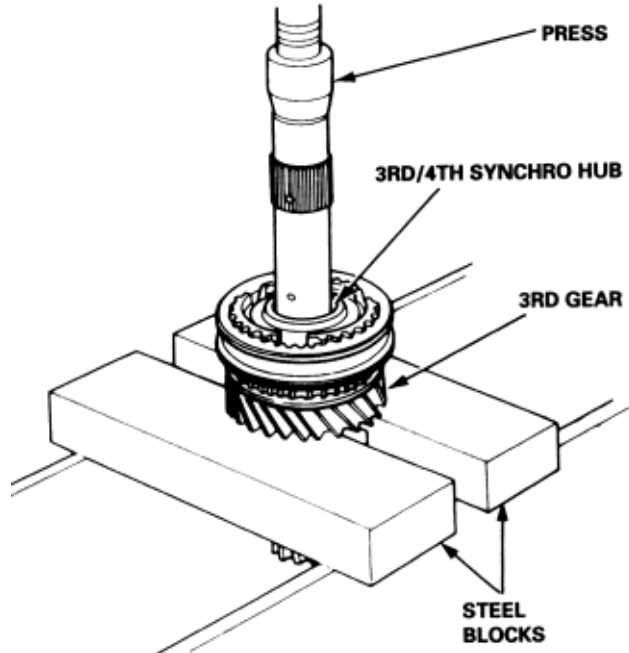
U2Q7 Transmission:



2. Remove the spacer collar, tapered ring, and synchro ring.
3. Support 5th gear on steel blocks, and press the mainshaft out of the 5th synchro hub, as shown.



4. In the same manner as above, support the 3rd gear on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub, as shown.



1. Inspect the gear surface and bearing surface for wear and damage, then measure the mainshaft at points A, B, and C.

If any part of the mainshaft is less than the service limit, replace it with a new one.

Standard:

A (Ball bearing surface): 27.987-28.000 mm
(1.1018-1.1024 in)

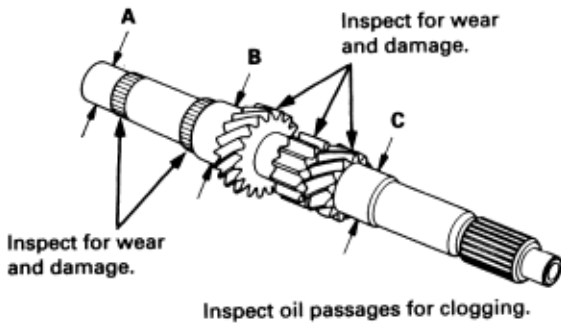
B (Needle bearing surface): 37.984-38.000 mm
(1.4954-1.4961 in)

C (Ball bearing surface): 27.977-27.990 mm
(1.1015-1.1020 in)

Service Limit: A: 27.94 mm (1.100 in)

B: 37.93 mm (1.493 in)

C: 27.93 mm (1.100 in)

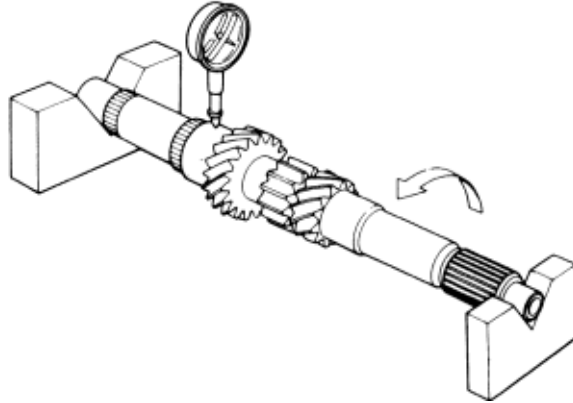


2. Inspect the runout by supporting both ends of the mainshaft. Rotate the mainshaft two complete revolutions when measuring the runout.

If the runout is more than the service limit, replace the mainshaft with a new one.

Standard: 0.02 mm (0.001 in) max.

Service Limit: 0.05 mm (0.002 in)





CAUTION

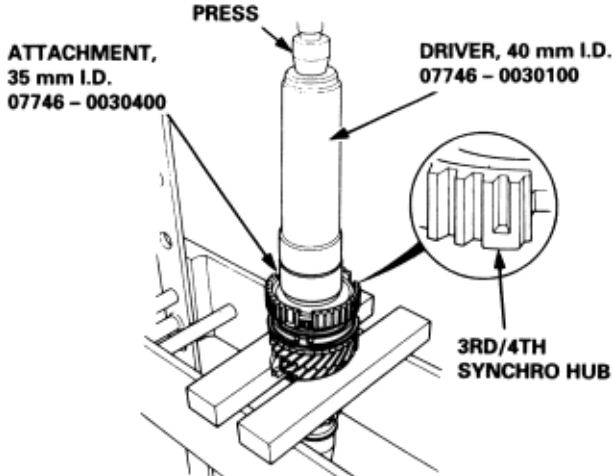
When installing the 3rd/4th and 5th synchro hubs support the shaft on steel blocks, and install the synchro hubs using a press.

NOTE: For reassembly sequence (see page 13-74) and (see page 13-75).

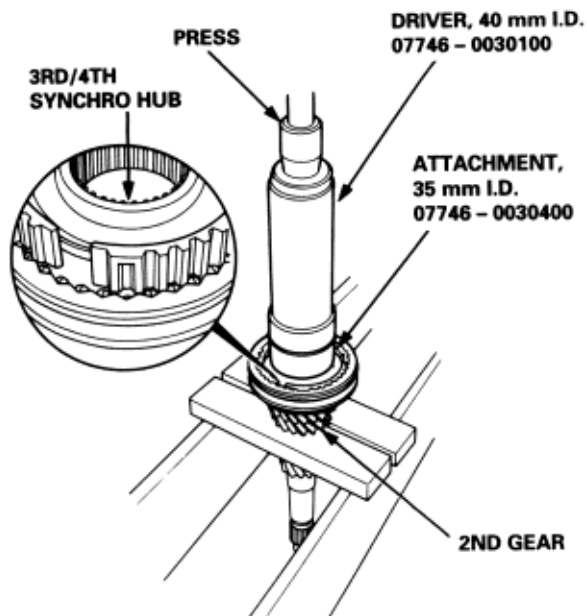
1. Support 2nd gear on steel blocks as shown, then install the 3rd/4th synchro hub using the special tools and a press as shown.

NOTE: After installing, inspect the operation of the 3rd/4th synchro hub set.

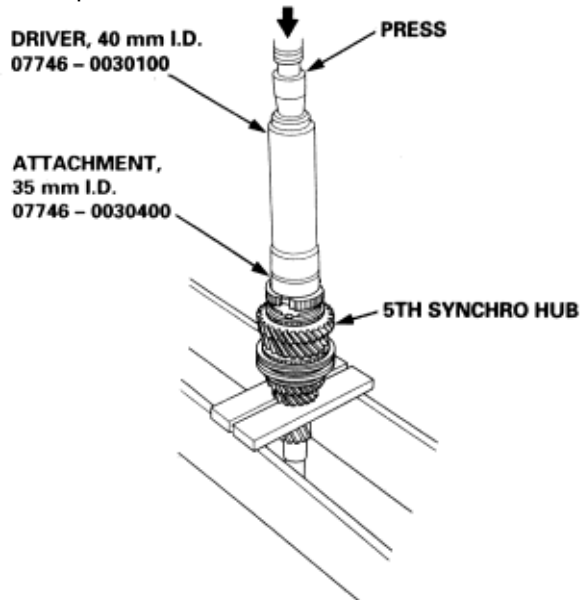
U2J4, U2G5 Transmissions:



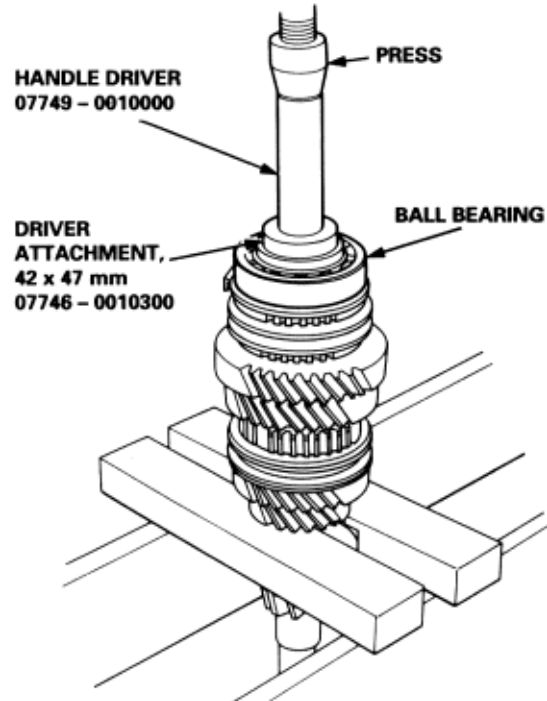
U2Q7 Transmission:



2. Install the 5th synchro hub using the special and a press as shown.

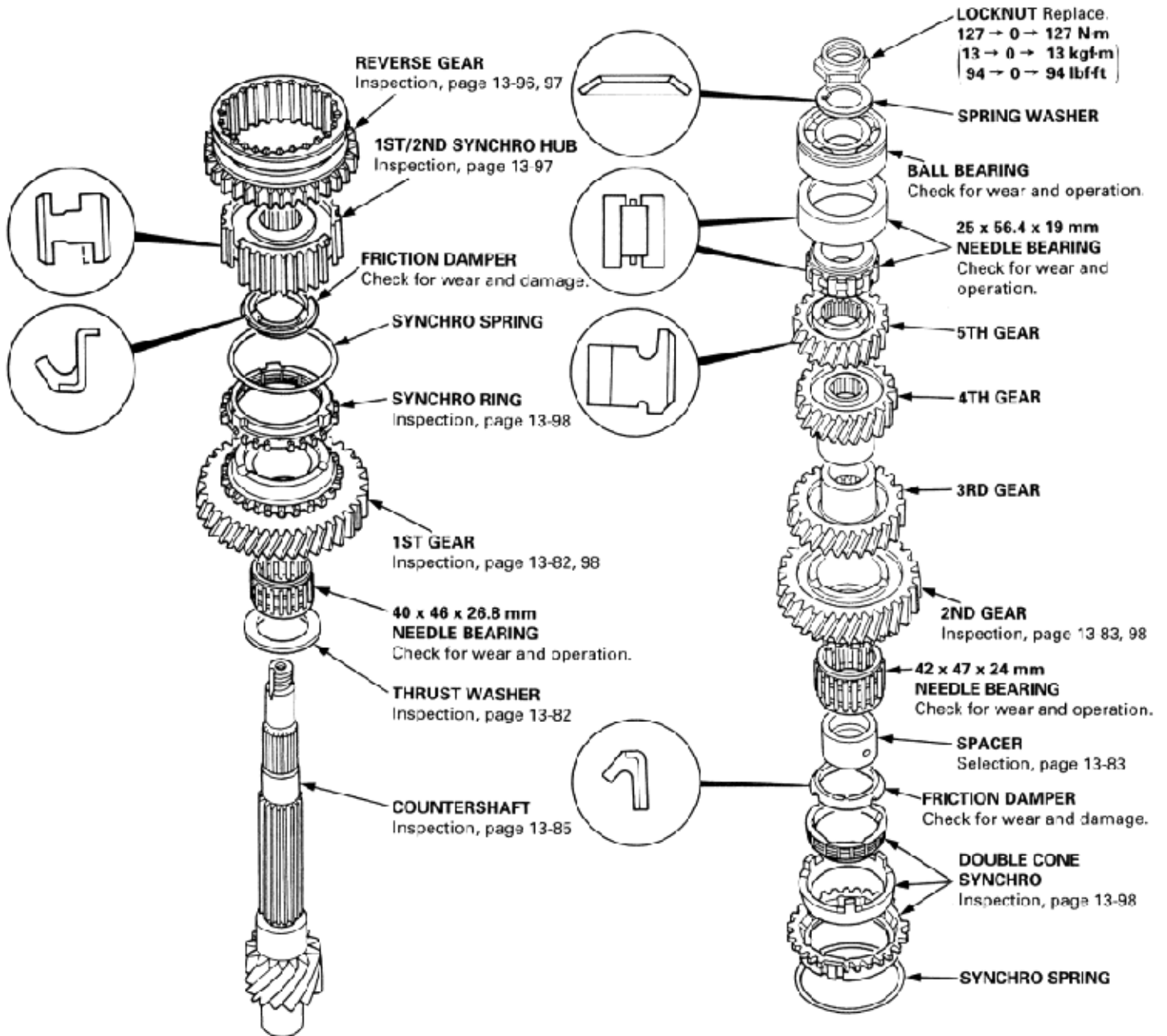


3. Install the ball bearing with the thin-edge outer race facing down. Use the special tools and a press as shown.





Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact surfaces.



To go to the pages referenced on the diagram above, click on the following:
 (See page 13-98)
 (See page 13-96)
 (See page 13-97)
 (See page 13-82)
 (See page 13-85)
 (See page 13-83)

Transmissions

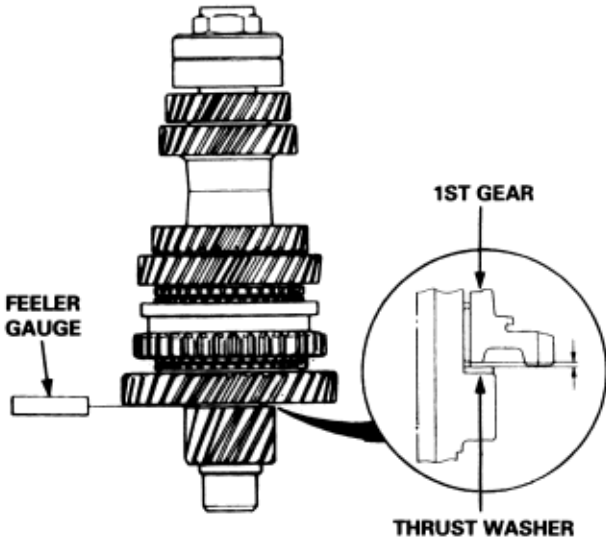
Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Measure the clearance between the 1st gear and the thrust washer with a feeler gauge. If the clearance is more than the service limit, go to step 2.

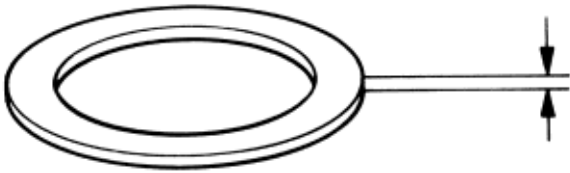
Standard: 0.06-0.23 mm (0.002-0.009 in)

Service Limit: 0.23 mm (0.009 in)



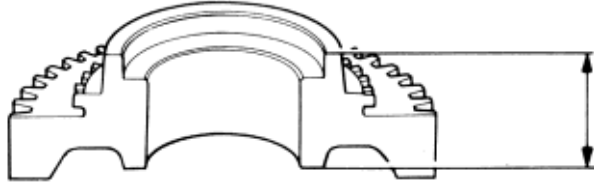
2. Measure the thickness of the thrust washer.
 - ♦ If the thickness is less than the standard, replace the thrust washer with a new one.
 - ♦ If the thickness is within the standard, go to step 3.

Standard: 1.95-1.97 mm (0.077-0.078 in)



3. Measure the thickness of the 1st gear.
 - ♦ If the thickness of 1st gear is less than the standard, replace 1st gear with a new one.
 - ♦ If the thickness of 1st gear is within the standard replace 1st/2nd synchro hub with a new one.

Standard: 32.95-33.00 mm (1.297-1.299 in)



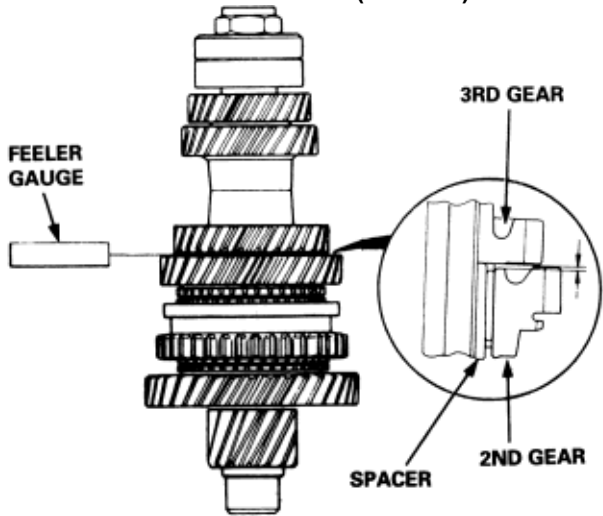
Transmissions

Clearance Inspection (cont'd)

4. Measure the clearance between the 2nd gear and 3rd gear with a feeler gauge. If the clearance is more than the service limit, go to step 5.

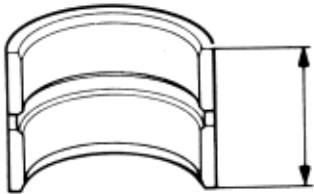
Standard: 0.10-0.15 mm (0.004-0.006 in)

Service Limit: 0.18 mm (0.007 in)



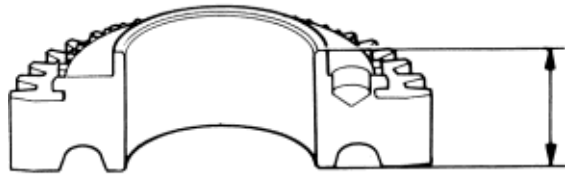
5. Measure the thickness of the spacer.
- ♦ If the thickness is less than the standard, replace the spacer with a new one.
 - ♦ If the thickness is within the standard, go to step 6.

Standard: 29.07-29.09 mm (1.144-1.145 in)



6. Measure the thickness of the 2nd gear.
- ♦ If the thickness of 2nd gear is less than the standard, replace 2nd gear with a new one.
 - ♦ If the thickness of 1st gear is within the standard, replace 1st/2nd synchro hub with a new one.

Standard: 28.94-28.97 mm (1.1394-1.141 in)

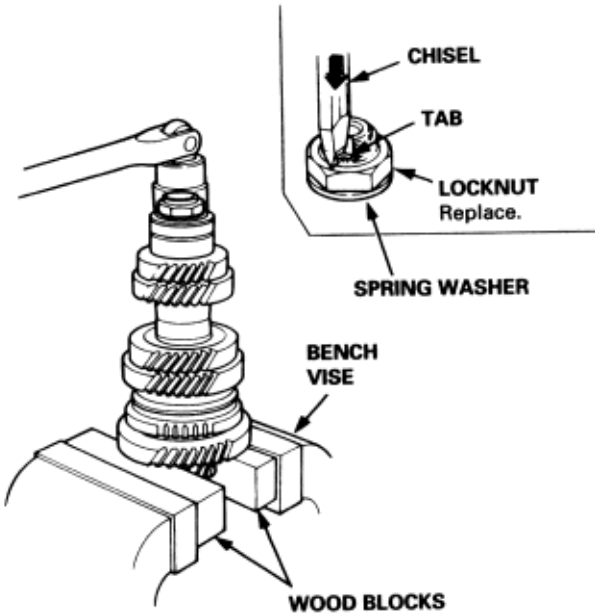




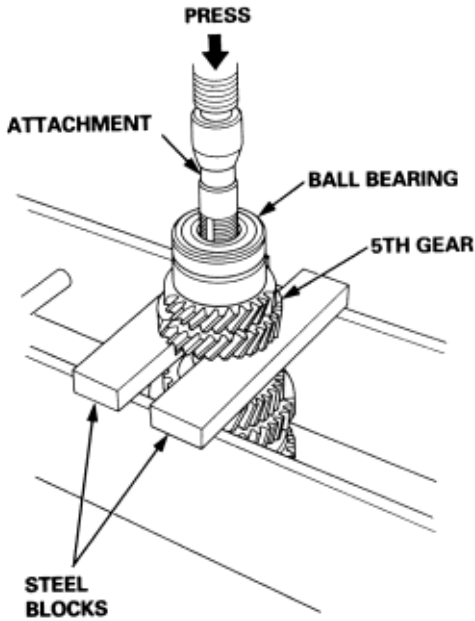
CAUTION

Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

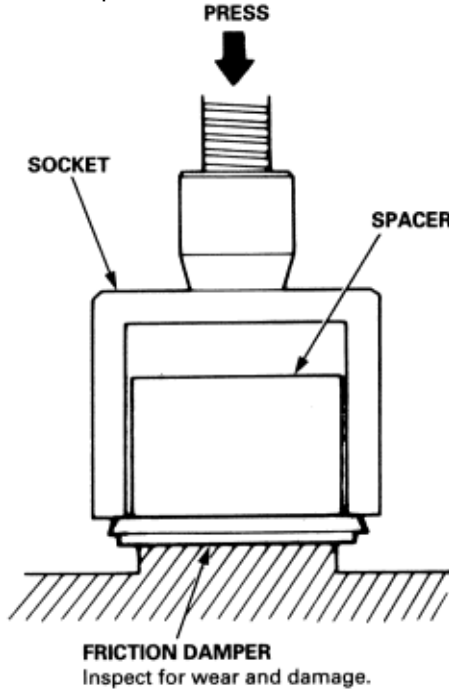
1. Securely clamp the countershaft assembly in a bench vice with wood blocks.
2. Raise the locknut tab from the groove in the countershaft, then remove the locknut and the spring washer.



3. Remove the ball bearing using a press as shown.

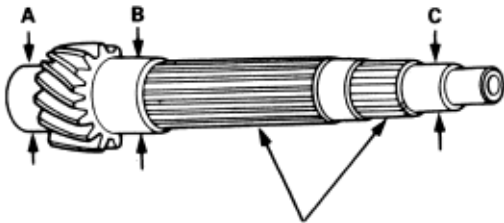


4. Remove the friction damper from the spacer using a press and a socket as shown.



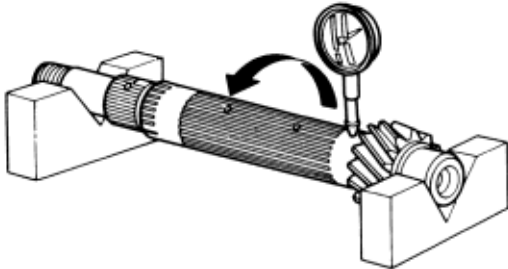
1. Inspect the gear surface and bearing surface for wear and damage, then measure the countershaft at points A, B, and C.
If any part of the countershaft is less than the service limit, replace it with a new one.

Standard: **A: 38.000-38.015 mm**
 (1.4961-1.4967 in)
 B: 39.984-40.000 mm
 (1.5742-1.5748 in)
 C: 24.987-25.000 mm
 (0.9837-0.9843 in)
Service Limit: **A: 37.95 mm (1.494 in)**
 B: 39.93 mm (1.572 in)
 C: 24.94 mm (0.982 in)

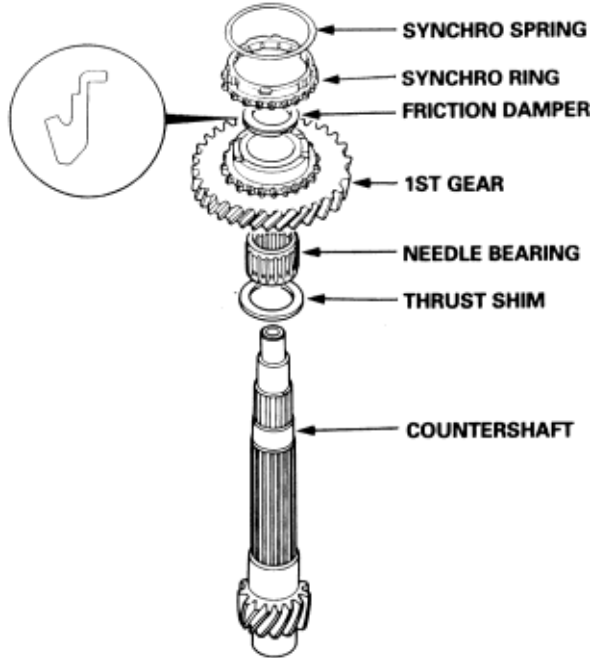


Inspect for wear and damage.

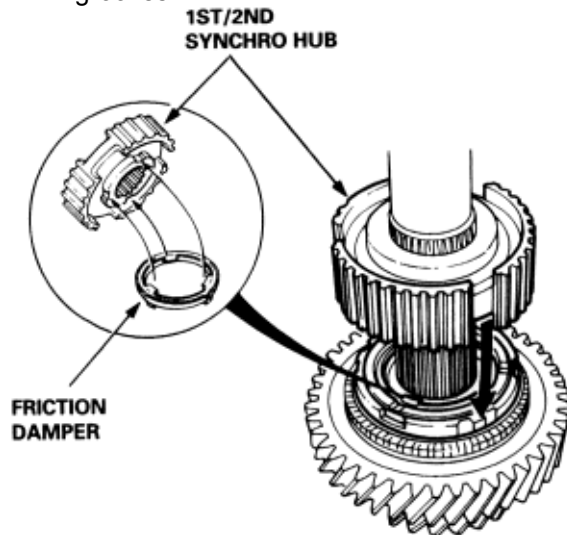
2. Inspect for runout.
If the runout exceeds the service limit, replace the countershaft with a new one.
Standard: 0.02 mm (0.001 in) max.
Service Limit: 0.05 mm (0.002 in)
NOTE: Support the countershaft at both ends as shown.
Rotate two complete revolutions.



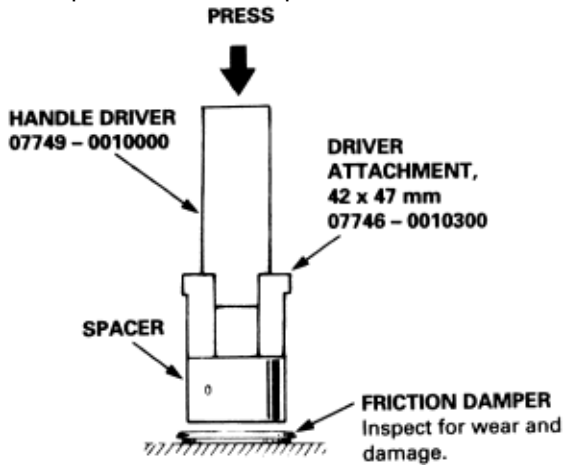
- NOTE: For reassembly sequence (See page 13-81).
1. Install the thrust shim, needle bearing, 1st gear, friction damper, synchro ring, and synchro spring.
NOTE: Reassemble the 1st gear and friction damper before installation.



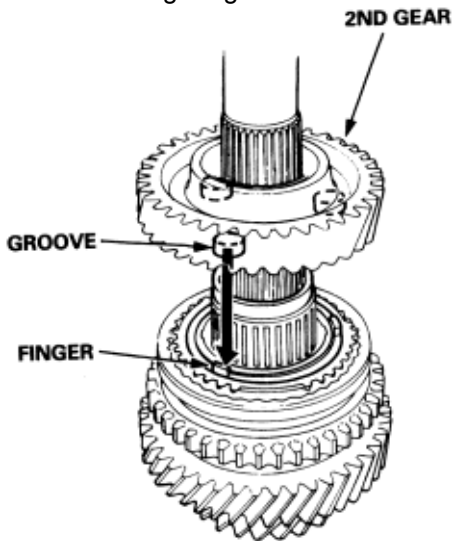
2. Install the 1st/2nd synchro hub by aligning the friction damper fingers with 1st/2nd synchro hub grooves.



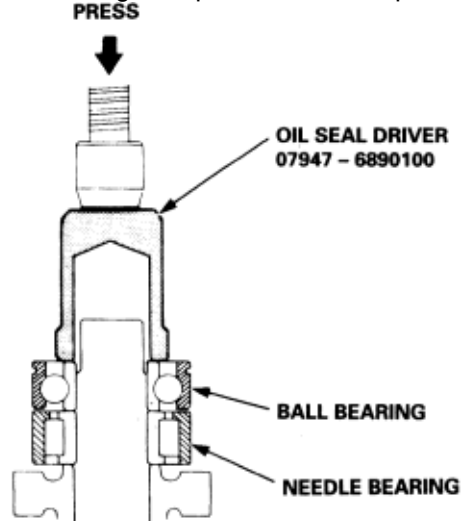
3. Install the friction damper on the spacer using the special tools and a press as shown.



4. Install the 2nd gear by aligning the synchro cone fingers with 2nd gear grooves.

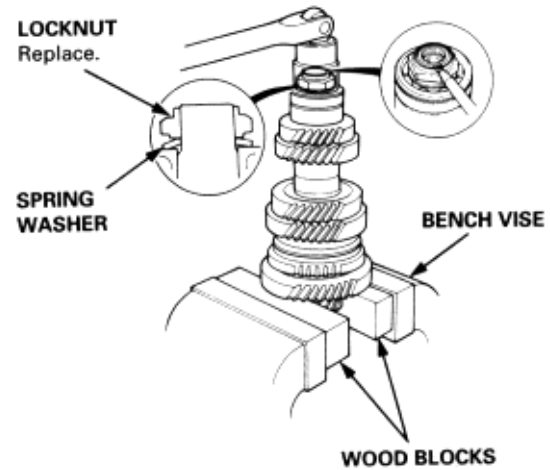


5. Install the needle bearing and the ball bearing using the special tool and a press as shown;




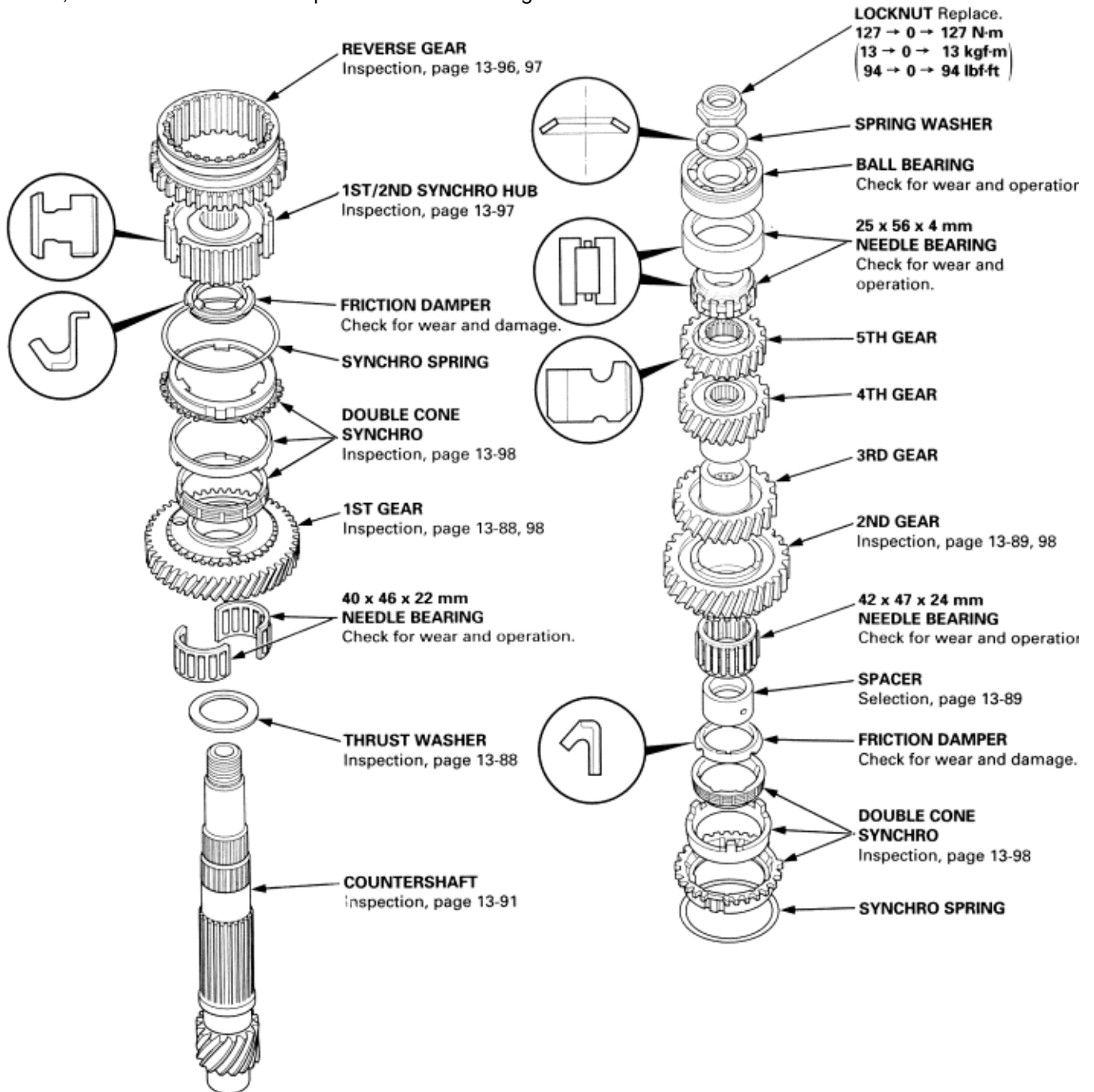
6. Securely clamp the countershaft assembly in a bench vice with wood blocks.
7. Install the spring washer.
8. Tighten the new locknut to the specified-value, then stake the locknut tab into the groove.

Torque: 127 → 0 → 127 N·m (13 → 0 → 13 kgf·m,
94 → 0 → 94 lbf·ft)



NOTE: The 4th and 5th gears are installed with a press.

 Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 4th and 5th gears, however, should be installed with a press before lubricating them.



To go to the pages referenced on the diagram above, click on the following:

- (See page 13-98)
- (See page 13-96)
- (See page 13-97)
- (See page 13-88)
- (See page 13-91)
- (See page 13-89)

Transmission

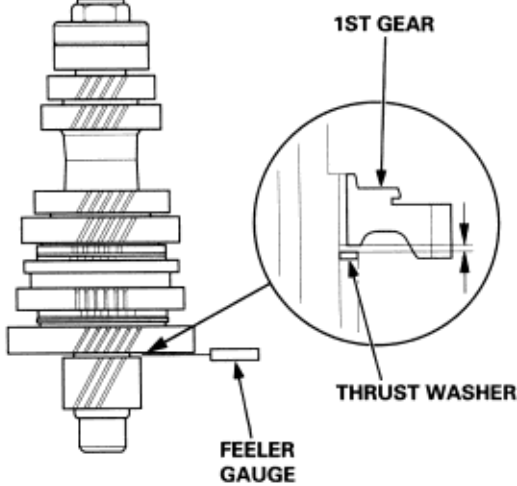
Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Measure the clearance between the 1st gear and the thrust washer with a feeler gauge.
If the clearance is more than the service limit, go to step 2.

Standard: 0.06-0.18 mm (0.002-0.007 in)

Service Limit: 0.23 mm (0.009 in)



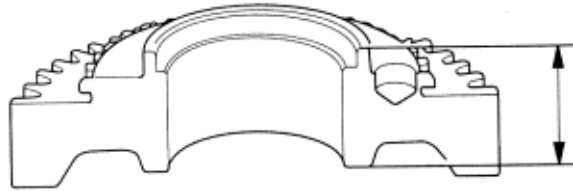
2. Measure the thickness of the thrust washer.
 - ♦ If the thickness is less than the standard, replace the thrust washer with a new one.
 - ♦ If the thickness is within the standard, go to step 3.

Standard: 1.95-1.97 mm (0.077-0.078 in)



3. Measure the thickness of the 1st gear.
 - ♦ If the thickness of 1st gear is less than the standard, replace 1st gear with a new one.
 - ♦ If the thickness of 1st gear is within the standard replace 1st/2nd synchro hub with a new one.

Standard: 26.95-27.00 mm (1.061-1.063)



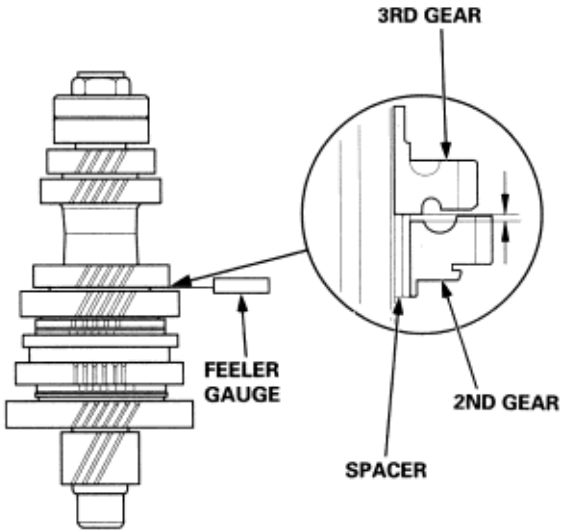
Transmission

Clearance Inspection (cont'd)

4. Measure the clearance between the 2nd gear and 3rd gear with a feeler gauge. If the clearance is more than the service limit, go to step 5.

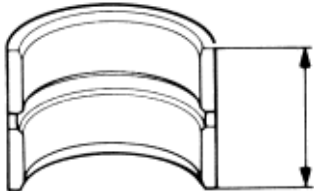
Standard: 0.10-0.15 mm (0.004-0.006 in)

Service Limit: 0.18 mm (0.007 in)



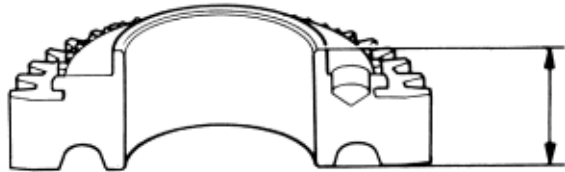
5. Measure the thickness of the spacer.
- If the thickness is less than the standard, replace the spacer with a new one.
 - If the thickness is within the standard, go to step 6.

Standard: 29.07-29.09 mm (1.144-1.145 in)



6. Measure the thickness of the 2nd gear.
- If the thickness of 2nd gear is less than the standard, replace 2nd gear with a new one.
 - If the thickness of 1st gear is within the standard, replace 1st/2nd synchro hub with a new one.

Standard: 28.94-28.97 mm (1.1394-1.1405 in)

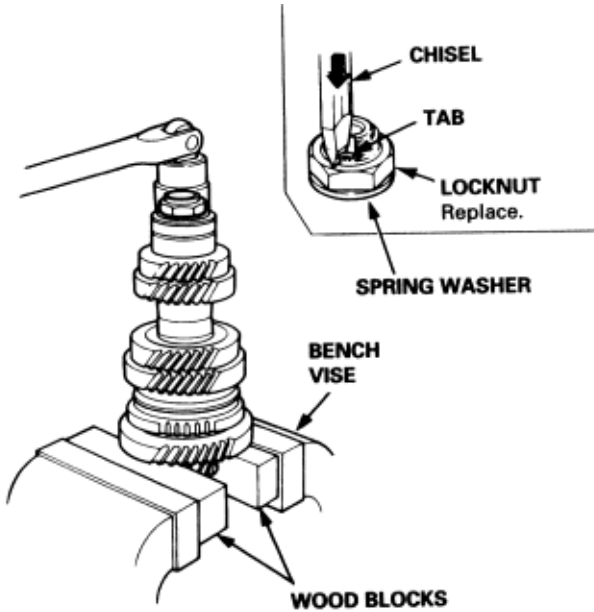




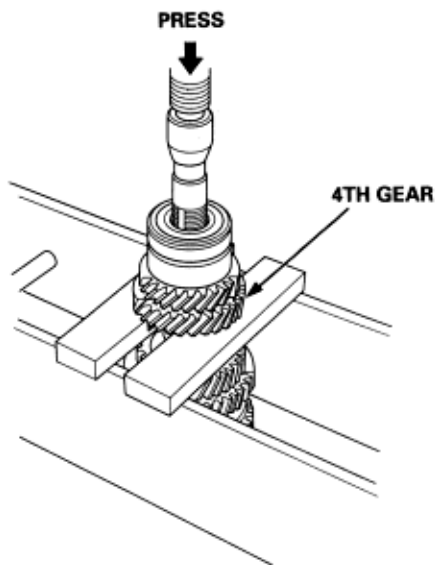
CAUTION

Remove the gears using a press and the steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

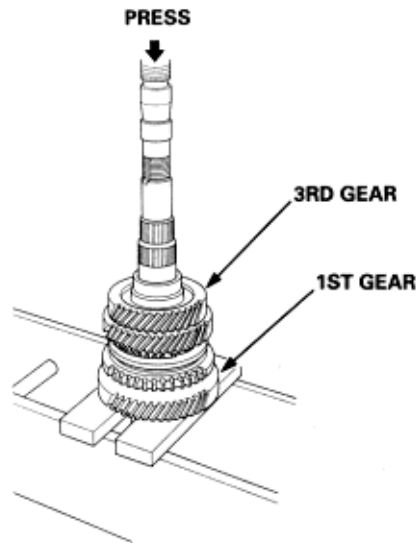
1. Securely clamp the countershaft assembly in a bench vice with wood blocks.
2. Raise the locknut tab from the groove in the countershaft, then remove the locknut and the spring washer.



3. Support 4th gear on steel blocks, and press the countershaft out of ball bearing, needle bearing, 5th gear, and 4th gear.



4. Support 1st gear on steel blocks, and press the countershaft out of 3rd gear.



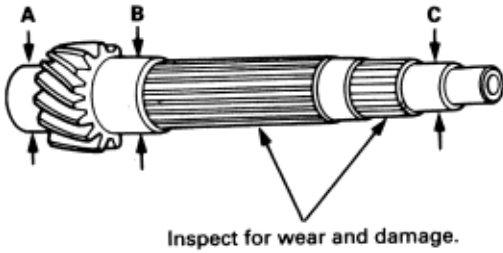
5. Remove the needle bearing and thrust washer from the countershaft.

**Transmission
Inspection**

1. Inspect the gear surface and bearing surface for wear and damage, then measure the countershaft at points A, B, and C.
If any part of the countershaft is less than the service limit, replace it with a new one.

Standard: **A: 38.000-38.015 mm**
 (1.4961-1.4967 in)
 B: 39.984-40.000 mm
 (1.5742-1.5748 in)
 C: 24.987-25.000 mm
 (0.9837-0.9843 in)

Service Limit: **A: 37.95 mm (1.494 in)**
 B: 39.93 mm (1.572 in)
 C: 24.94 mm (0.982 in)



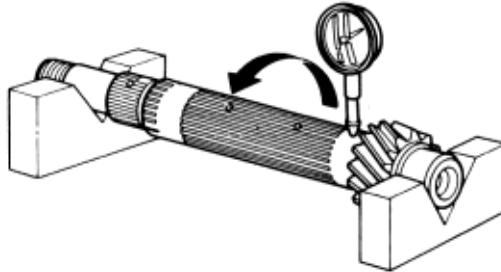
2. Inspect for runout.
If the runout exceeds the service limit, replace the countershaft with a new one.

Standard: 0.02 mm (0.001 in) max.

Service Limit: 0.05 mm (0.002 in)

NOTE: Support the countershaft at both ends as shown.

Rotate two complete revolutions.



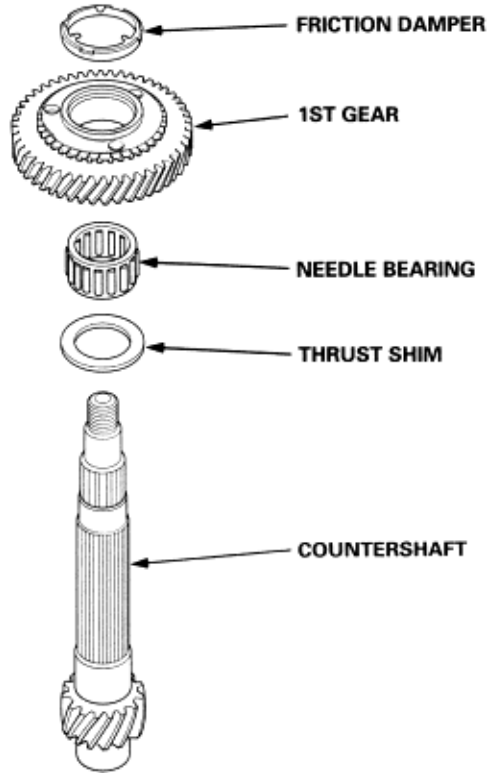


CAUTION

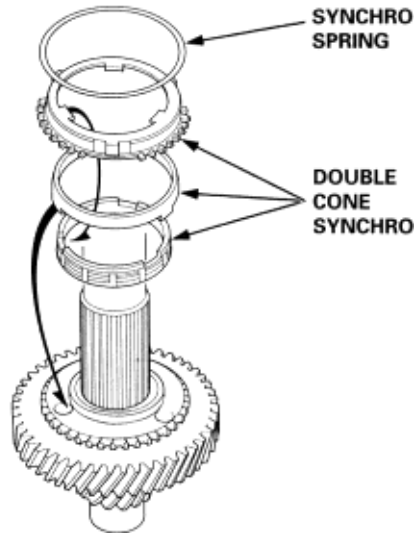
- ♦ Press 3rd and 4th gears on the countershaft without lubrication.
- ♦ When installing 3rd and 4th gears, support the shaft on steel blocks, and install the gears using a press.

NOTE: For reassembly sequence (See page 13-87).

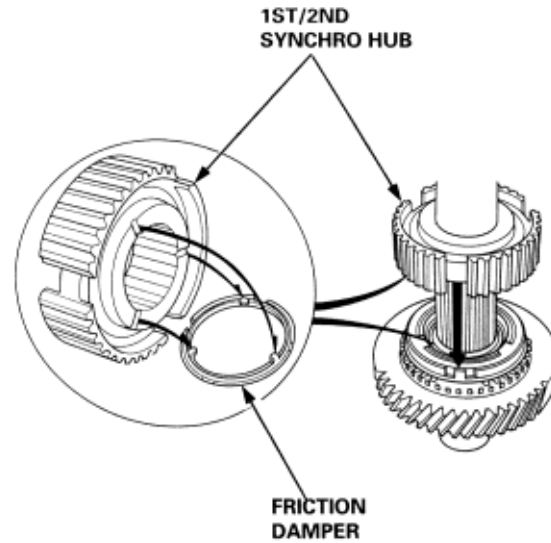
1. Install the thrust washer, needle bearing, 1st gear, and friction damper on the countershaft.



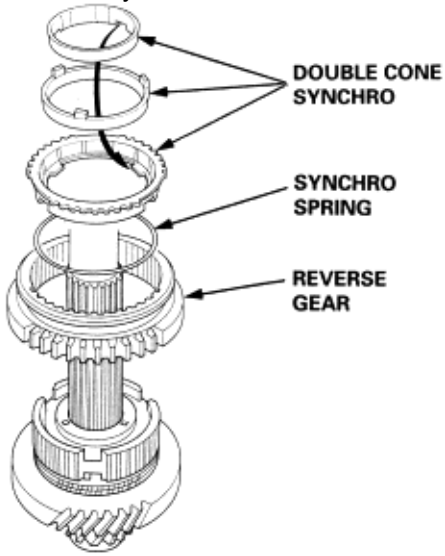
2. Install the double cone synchro and synchro spring as shown.



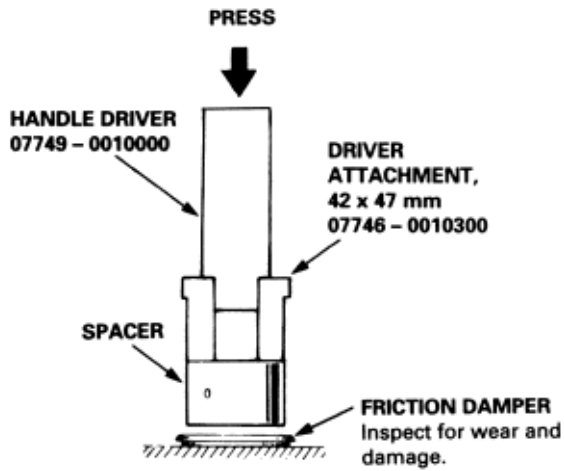
3. Install the 1st/2nd synchro hub as shown.



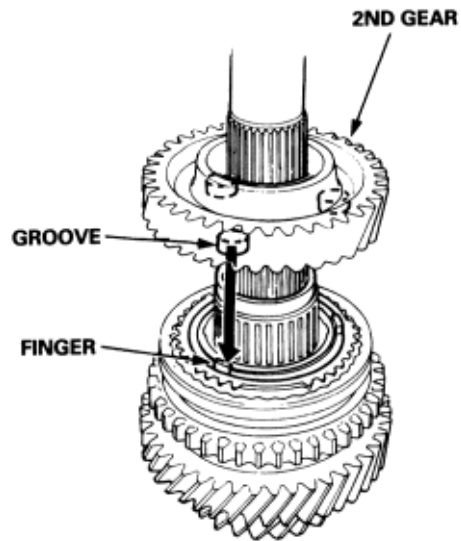
4. Install the reverse gear, synchro spring, and double cone synchro as shown.



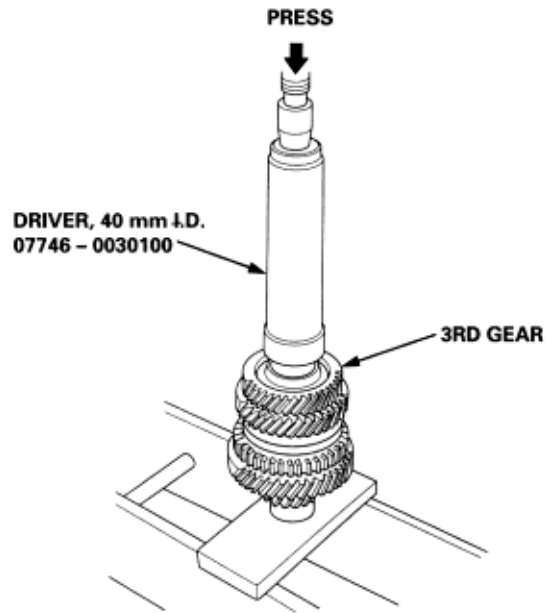
5. Install the friction damper on the spacer using the special tools and press as shown.



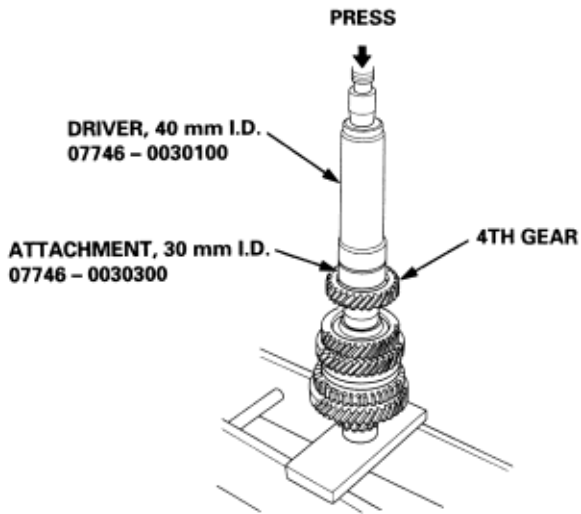
6. Install the distance collar and needle bearing.
7. Install the 2nd gear by aligning the synchro cone fingers with 2nd gear grooves.



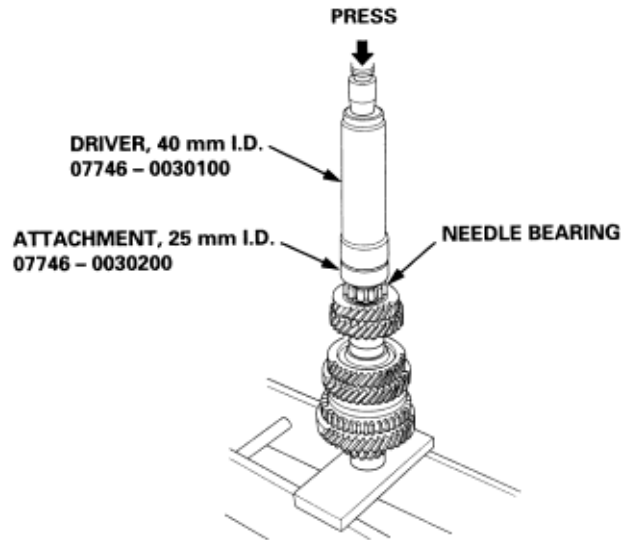
8. Support the countershaft on a steel block, and install 3rd gear using the special tools and a press, as shown.



9. Support the countershaft on a steel block, and install 4th gear using the special tools and a press, as shown.

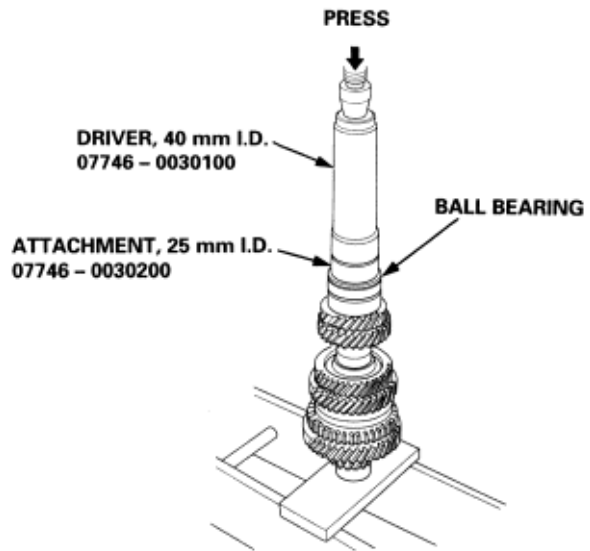


10. Install the 5th gear.
11. Support the countershaft on a steel block, and install needle bearing using the special tools and a press, as shown.



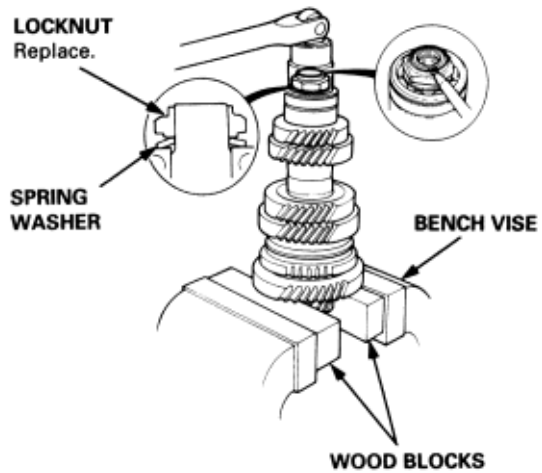
12. Install the needle bearing outer race.

13. Support the countershaft on a steel block, and install ball bearing using the special tools and a press, as shown.



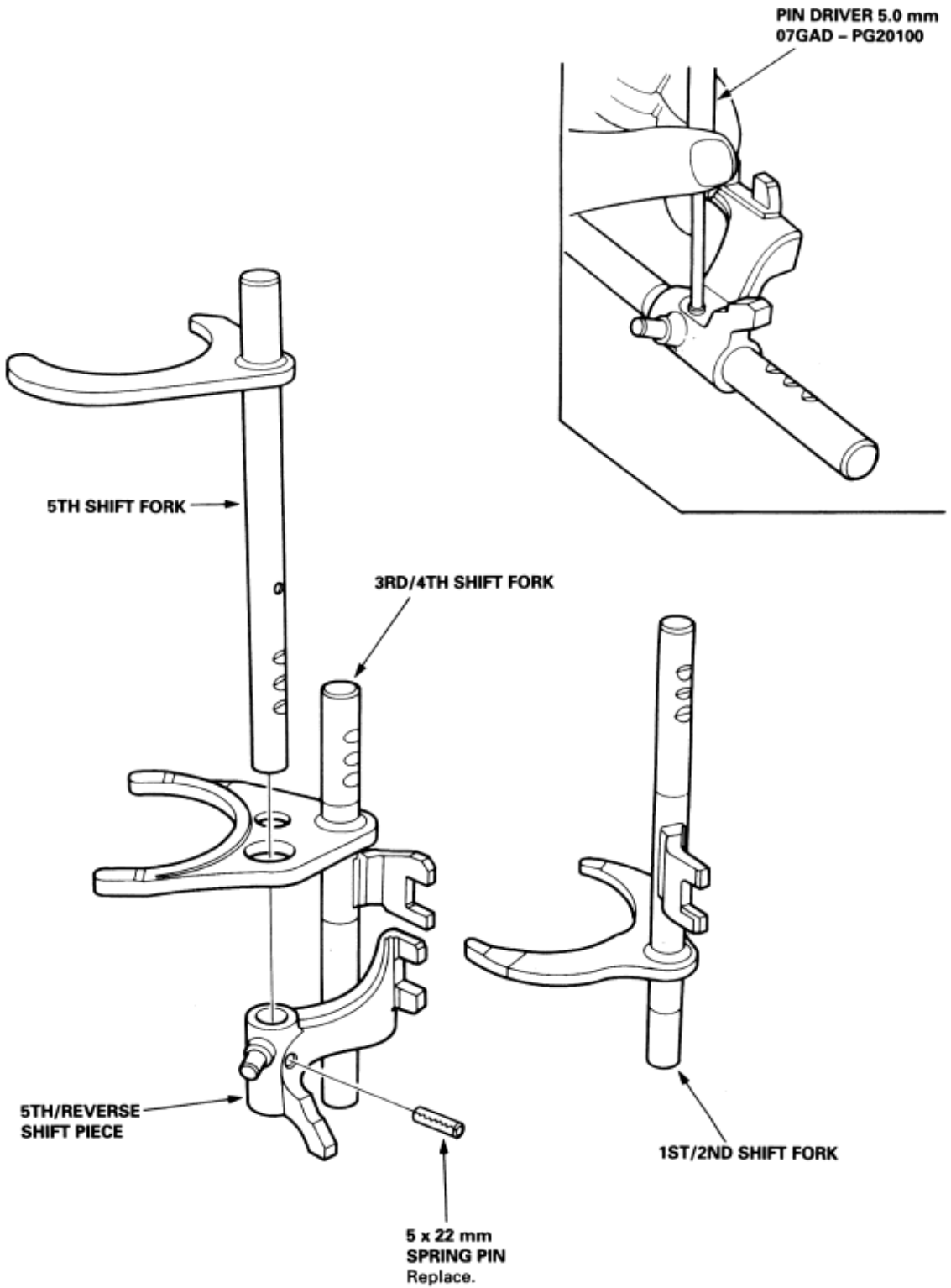
14. Securely clamp the countershaft assembly in a bench vice with wood blocks.
15. Install the spring washer.
16. Tighten the new locknut to the specified value then stake the locknut tab into the groove.

Torque: 127 to 0 to 127 Nm
(13 to 0 to 13 kgf/m,
94 to 0 to 94 lbf/ft)



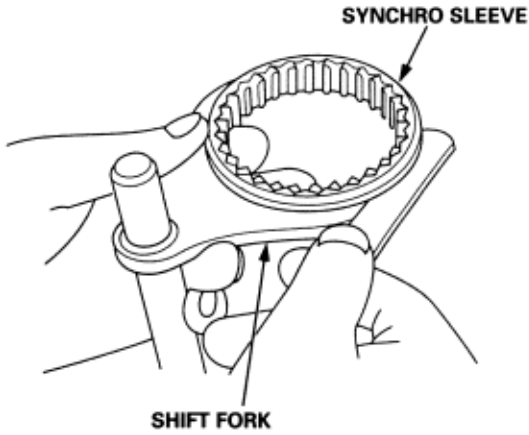


Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



NOTE: The synchro sleeve and synchro hub should be replaced as a set.

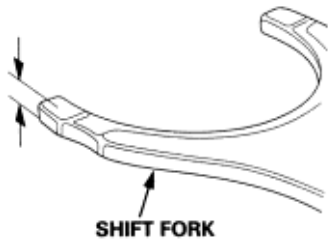
1. Measure the clearance between each shift fork and its matching synchro sleeve.
If the clearance exceeds the service limit, go to step 2.
Standard: 0.35-0.65 mm (0.014-0.026 in)
Service Limit: 1.00 mm (0.039 in)



2. Measure the thickness of the shift fork fingers.
 - ♦ If the thickness of the shift fork finger is less than the standard, replace the shift fork with a new one.
 - ♦ If the thickness of the shift fork finger is within the standard, replace the synchro sleeve with a new one.

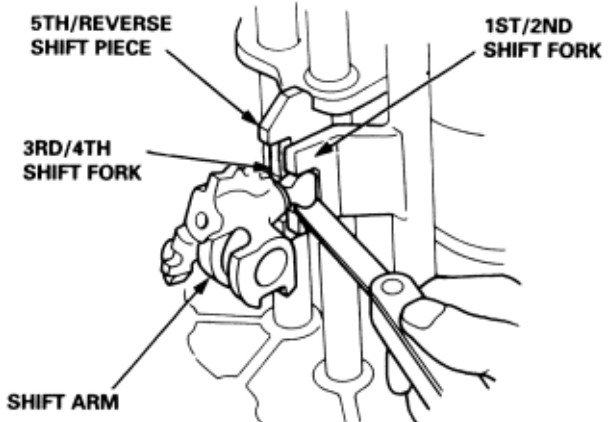
Standard:

3rd/4th shift fork	7.4-7.6 mm (0.29-0.30 in)
1st/2nd shift fork	6.2-6.4 mm
5th shift fork	(0.24-0.25 in)



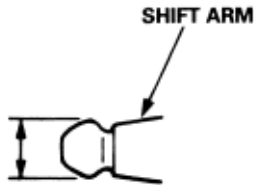
3. Measure the clearance between the shift fork and the shift arm.
If the clearance exceeds the service limit, go to step 4

Standard: 0.2 - 0.5 mm (0.008-0.020 in)
Service Limit: 0.6 mm (0.024 in)



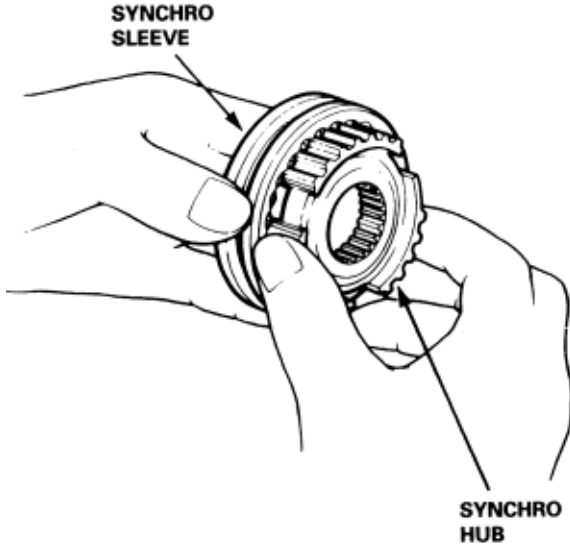
4. Measure the width of the shift arm.
 - ♦ If the width of the shift arm is less than the standard, replace the shift arm with a new one.
 - ♦ If the width of the shift arm is within the standard, replace the shift fork or shift piece with a new ones.

Standard: 12.9-13.0 mm (0.508-0.512 in)



1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicate wear.
2. Install each synchro hub in its mating synchro sleeve, and check for freedom of movement.

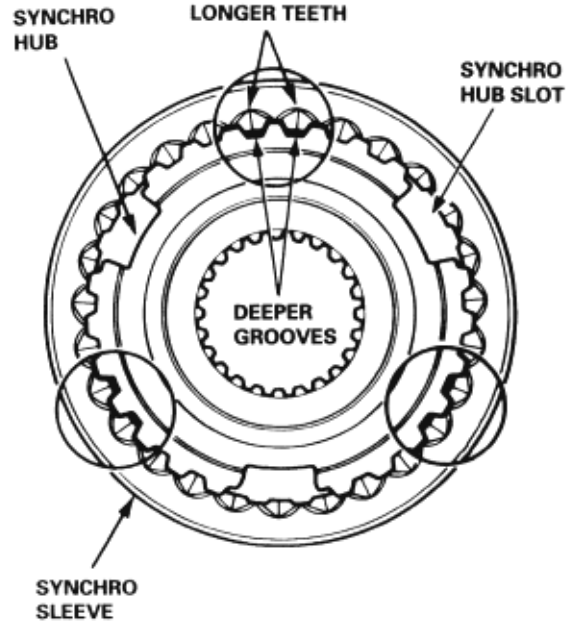
NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.

CAUTION

Do not install the synchro sleeve with its longer teeth in the synchro hub slots because it will damage the spring ring.



1. Inspect the synchro ring and gear.
 - A: Inspect the inside of the synchro ring for wear.
 - B: Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).



GOOD WORN

- C: Inspect the synchro sleeve teeth and matching teeth on the gear for wear (rounded off).



GOOD WORN

- D: Inspect the gear hub thrust surface for wear.
- E: Inspect the cone surface for wear and roughness.
- F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.

2. Coat the cone surface of the gear with oil, and place the synchro ring on the matching gear. Rotate the synchro ring, making sure that it does not slip. Measure the clearance between the synchro ring and gear all the way around.

NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

Synchro Ring-to-Gear Clearance

Standard: 0.85-1.10 mm (0.033-0.043 in)

Service Limit: 0.40 mm (0.016 in)

Double Cone Synchro-to-Gear Clearance

Standard:

(A): (Outer Synchro Ring to Synchro Cone)
0.5-1.0 mm (0.02-0.04 in)

(B): (Synchro Cone to Gear)
0.5-1.0 mm (0.02-0.04 in)

(C): (Outer Synchro Ring to Gear)
0.95 -1.68 mm (0.037-0.066 in)

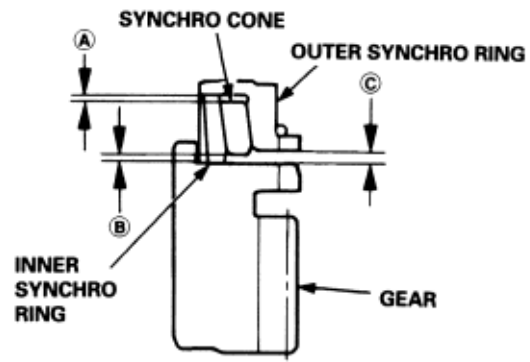
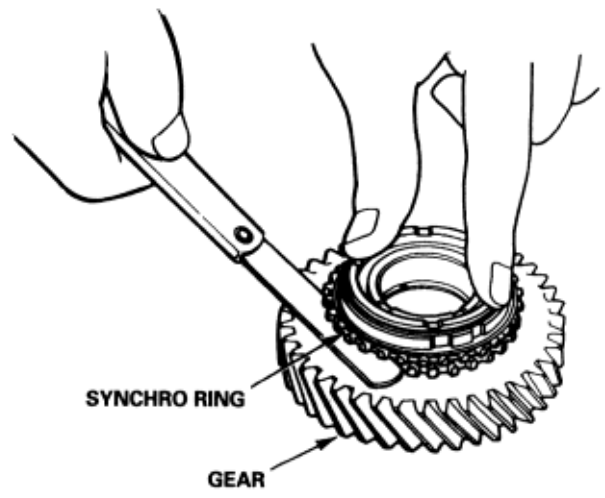
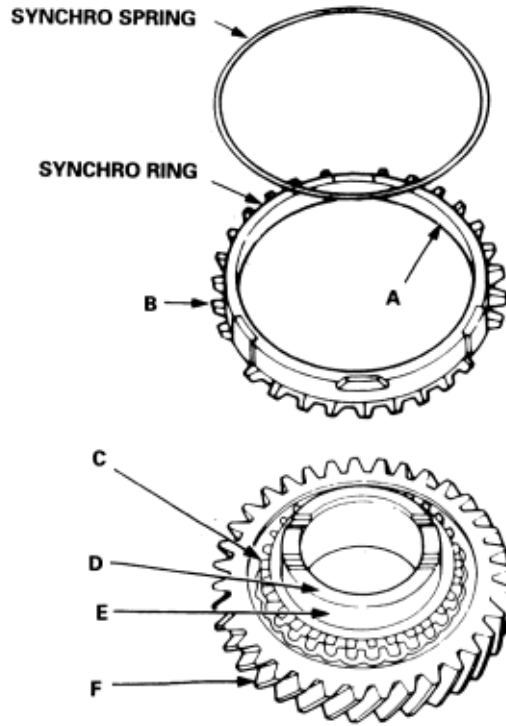
Service Limit:

(A): 0.3 mm (0.01 in)

(B): 0.3 mm (0.01 in)

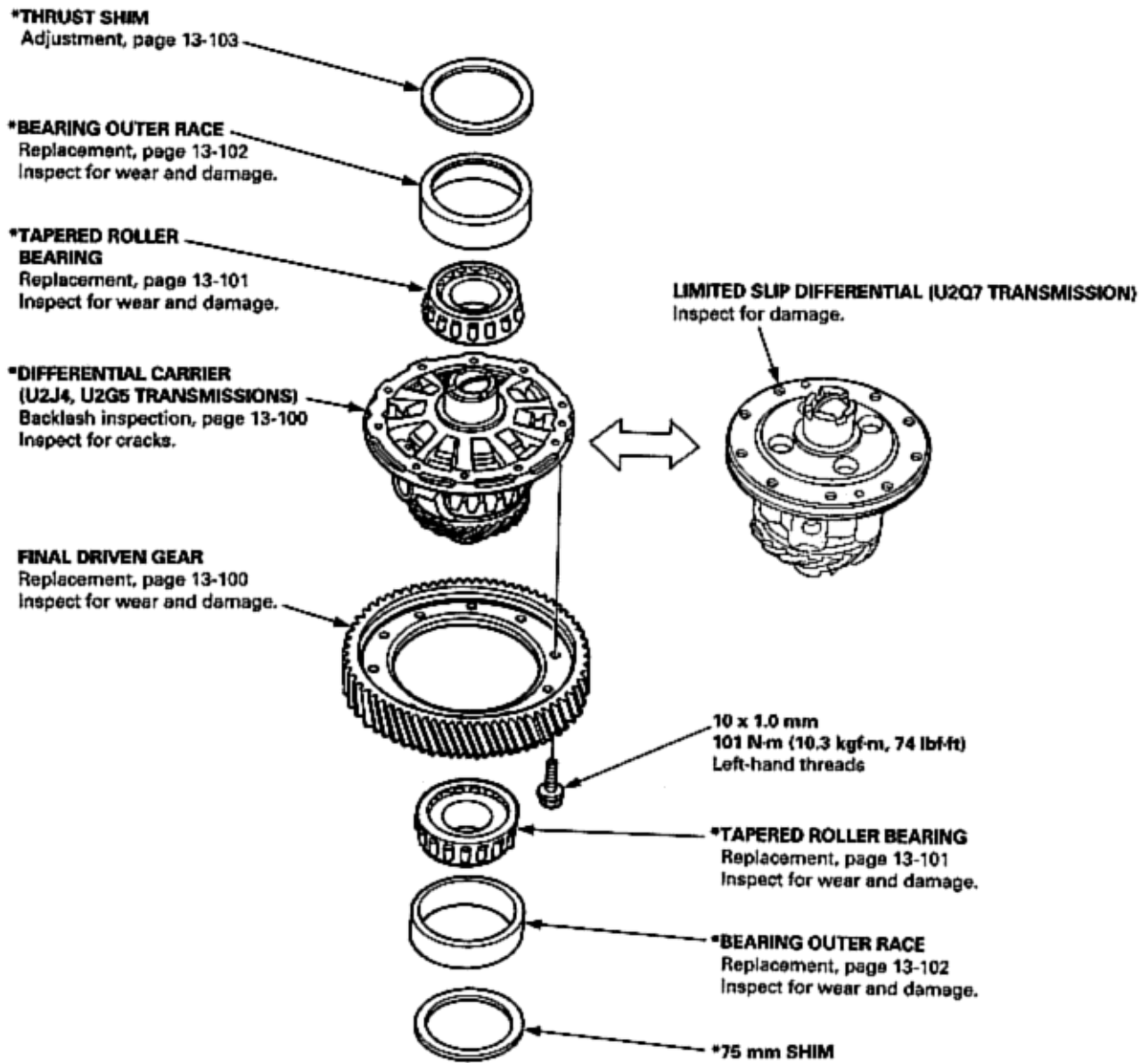
(C): 0.6 mm (0.02 in)

If the clearance is less than the service limit, replace the synchro ring and synchro cone.



NOTE:

- ♦ If parts marked with an asterisk(*) were replaced, the tapered roller bearing preload must be adjusted ([see page 13-103](#)).
- ♦ The limited slip differential assembly is non-rebuildable, replace it if it is damaged.



To go to the pages referenced on the diagram above, click on the following:
[\(See page 13-103\)](#)
[\(See page 13-102\)](#)
[\(See page 13-101\)](#)
[\(See page 13-100\)](#)

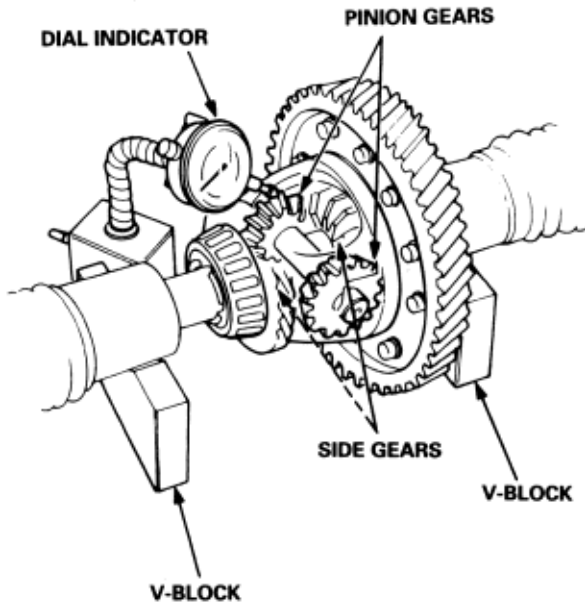
Differential

Backlash Inspection - U2J4, U2G5 Transmissions

13-100

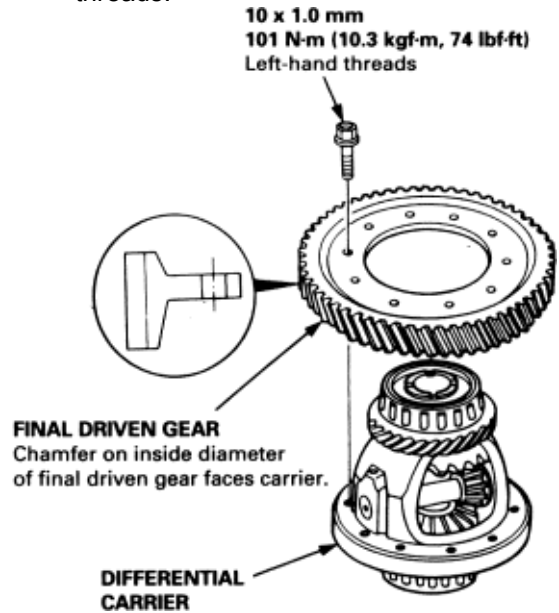
Final Driven Gear Replacement

1. Place the differential assembly on V-blocks and install both axles.
2. Measure the backlash of both pinion gears. If the backlash is not within the standard, replace the differential carrier.
Standard (New): 0.05-0.15 mm (0.002-0.006 in)



1. Remove the bolts in a crisscross pattern in several steps, and remove the final driven gear from the differential carrier.

NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear with the chamfer on the inside diameter facing the carrier. Tightening the bolts in a crisscross pattern in several steps.

Differential

Tapered Roller Bearing Replacement

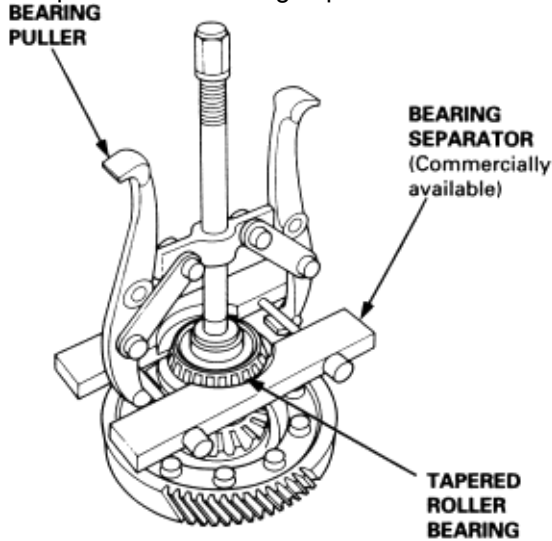
13-101

Oil Seal Replacement

NOTE:

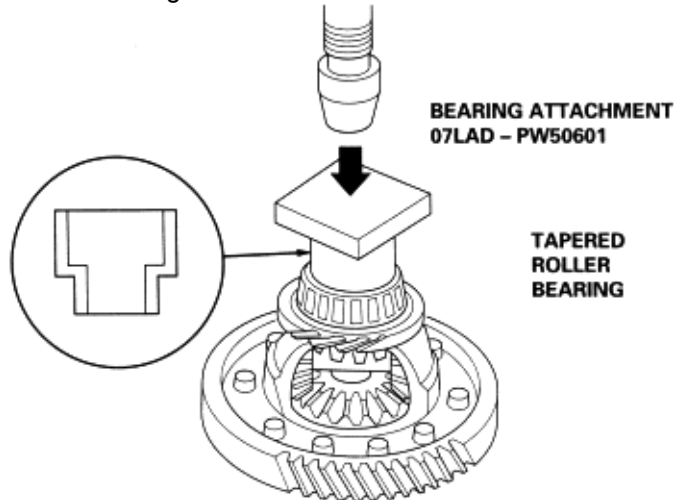
- The tapered roller bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
- Check the tapered roller bearings for wear and rough rotation. If the tapered roller bearings are OK, removal is not necessary.

1. Remove the tapered roller bearings using a bearing puller and a bearing separator as shown.

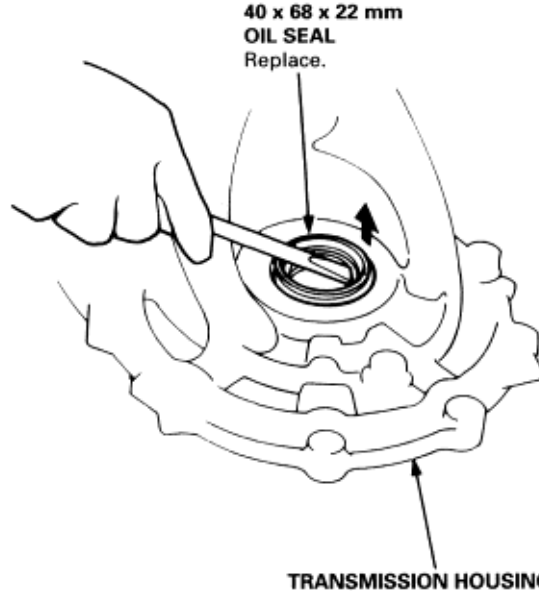


2. Install new tapered roller bearings using the special tool as shown.

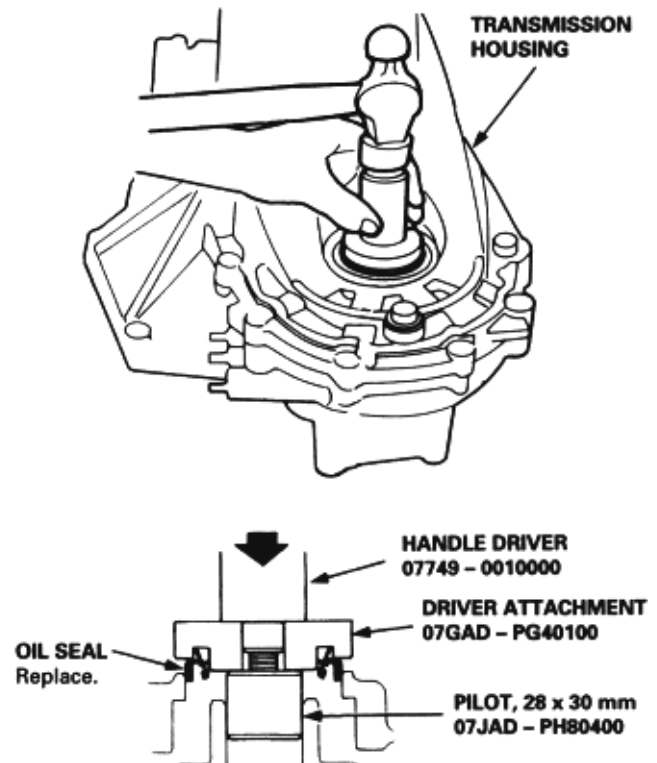
NOTE: Drive the tapered roller bearings on until they bottom against the differential carrier.



1. Remove the oil seal from the transmission housing.

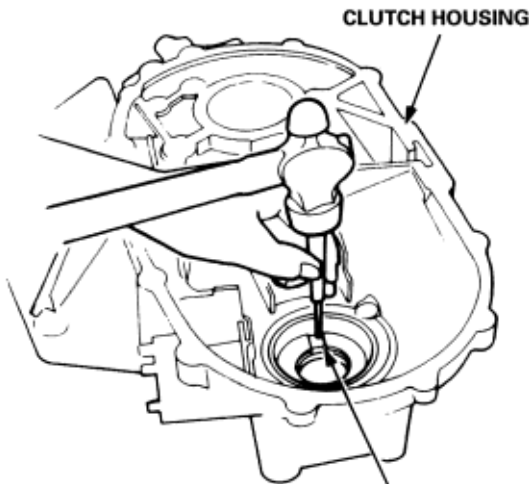


2. Install the new oil seal into the transmission housing using the special tools as shown.

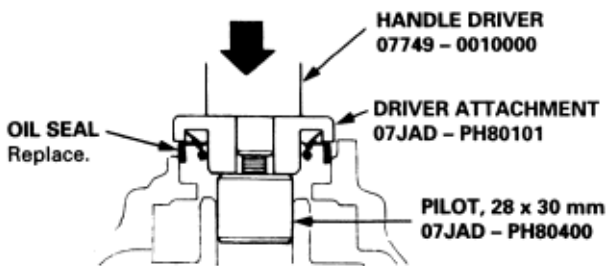
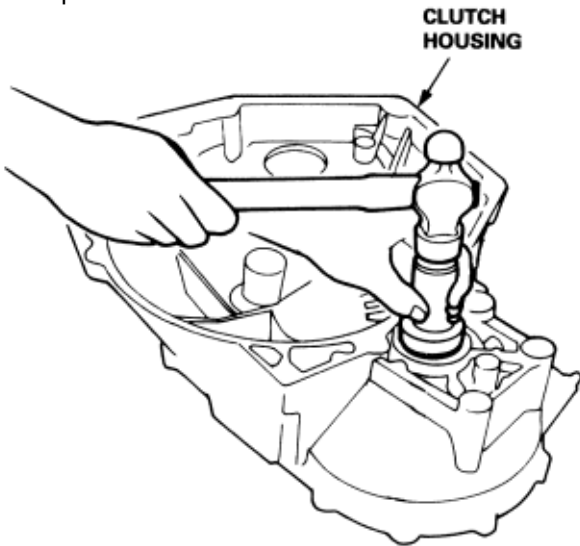


Clutch Housing:

1. Remove the oil seal from the clutch housing.



2. Install the new oil seal into the clutch housing using the special tools as shown.



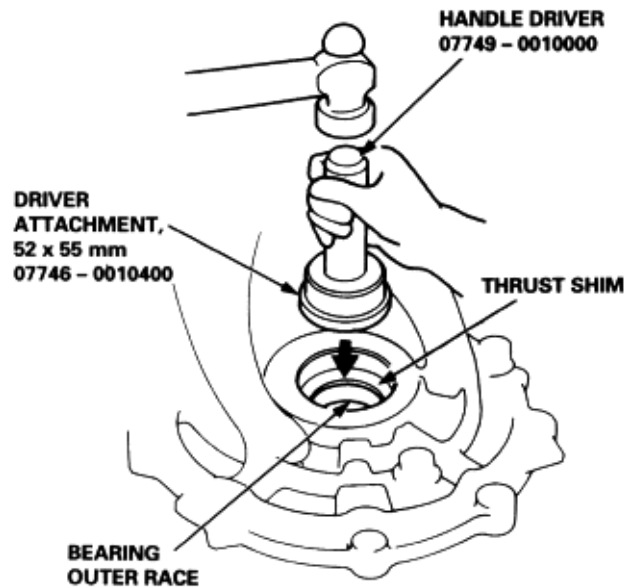
NOTE:

- ♦ The bearing outer race and tapered roller bearing should be replaced as a set.
 - ♦ Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
1. Remove the oil seals from the transmission housing and clutch housing (**see page 13-101**).
 2. Drive the bearing outer race and thrust shim out of the transmission housing, or remove the bearing outer race and 75 mm shim from the clutch housing by heating the clutch housing to about 212°F (100°C) with a heat gun.

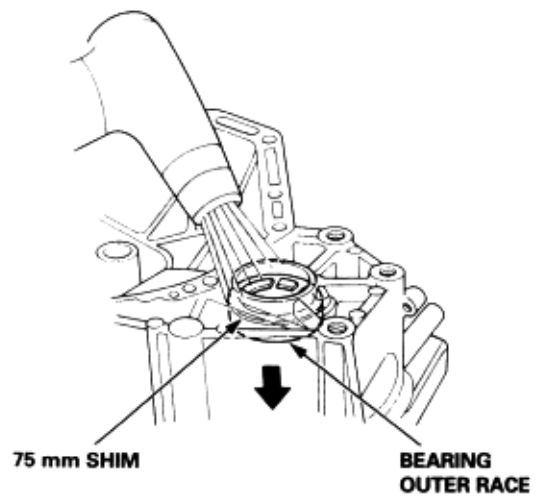
CAUTION

Do not reuse the thrust shim if the outer race was driven out.

TRANSMISSION HOUSING:



CLUTCH HOUSING:



Differential

Bearing Outer Race Replacement (cont'd)

13-103

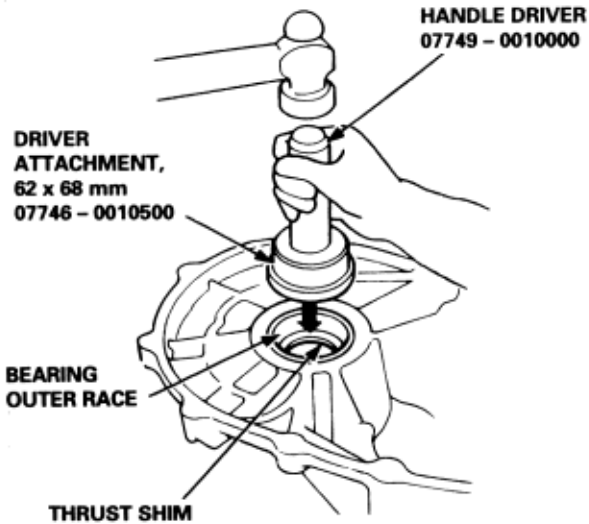
Tapered Roller Bearing Preload Adjustment

3. Install the thrust shim or 75 mm shim and the bearing outer race in the transmission housing and clutch housing using the special tools as shown.

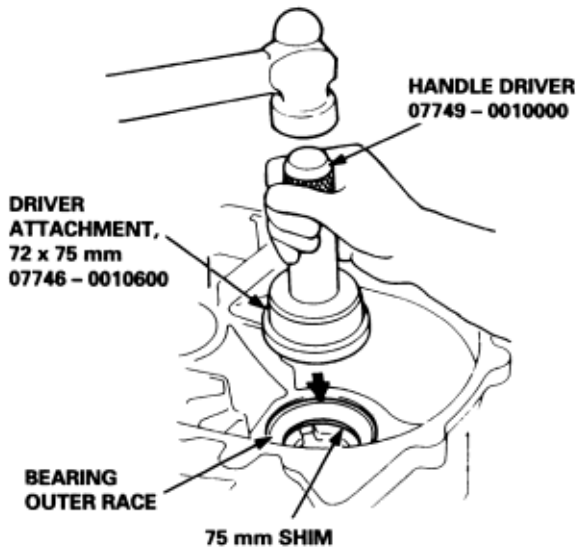
NOTE:

- ♦ Install the bearing outer race squarely.
- ♦ Check that there is no clearance between the bearing outer race, thrust shim or 75 mm shim and housing

TRANSMISSION HOUSING:



CLUTCH HOUSING:



4. Install the oil seal (see page 13-48)

NOTE: If any of the items listed below were replaced, the tapered roller bearing preload must be adjusted.

- ♦ Transmission housing
- ♦ Clutch housing
- ♦ Differential carrier
- ♦ Tapered roller bearing and bearing outer race
- ♦ Thrust shim
- ♦ 75 mm shim

1. Remove the bearing outer race and thrust shim from the transmission housing (see page 13-102).

NOTE: Install the thrust shim only on the transmission housing side.

CAUTION

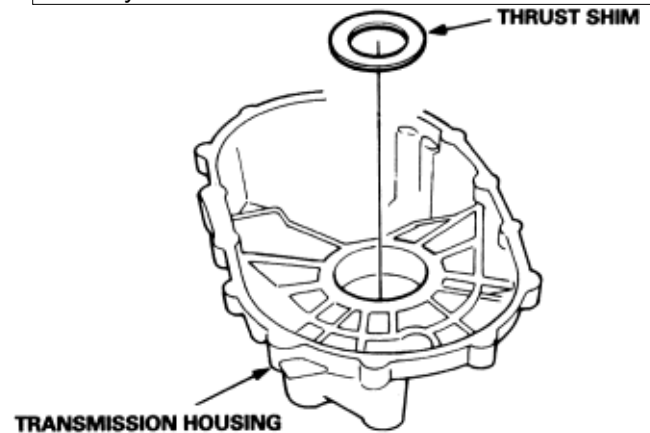
Do not reuse the thrust shim if the bearing outer race was driven out.

NOTE: Before adjusting the tapered roller bearing preload, let the transmission cool to room temperature if the bearing outer race was removed by heating the clutch housing.

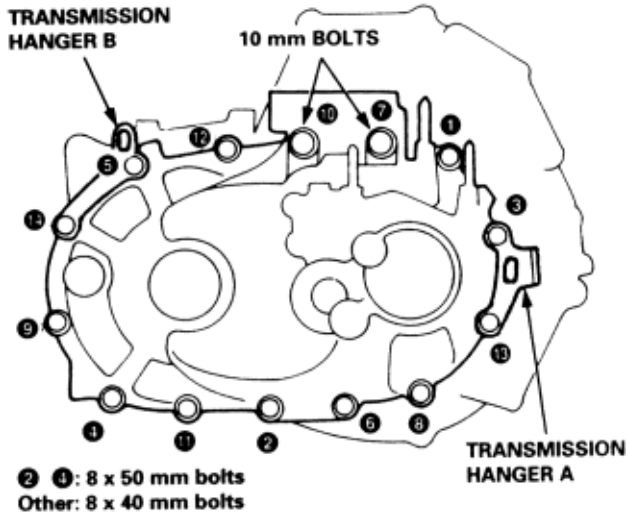
2. First try the same size thrust shim that was removed

CAUTION

Use only one thrust shim.



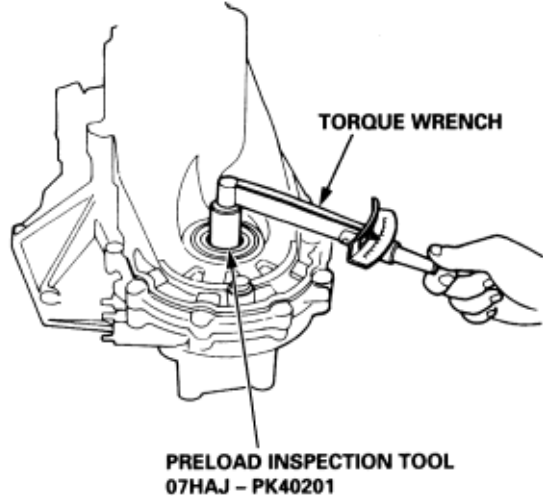
3. After installing the thrust shim install the bearing outer race in the transmission housing (see page 13-102).
NOTE:
 - ♦ Install the bearing outer race squarely.
 - ♦ Check that there is no clearance between the bearing outer race, thrust shim and transmission housing.
4. With the mainshaft and countershaft removed, install the differential assembly, and torque the clutch housing and transmission housing.
NOTE: It is not necessary to use sealing agent between the housings.
8 x 1.25 mm bolts: 27 Nm 12.8 kgf/m 20 lbf/ft)
10 x 1.25 mm bolts: 47 Nm 14.8 kgf/m, 35 lbf/ft)



5. Rotate the differential assembly in both directions to seat the tapered roller bearings.
6. Measure the starting torque of the differential assembly with the special tool and a torque wrench.
NOTE:
 - ♦ Measure the tapered roller bearing preload at normal room temperature.
 - ♦ Measure the tapered roller bearing preload in both directions.

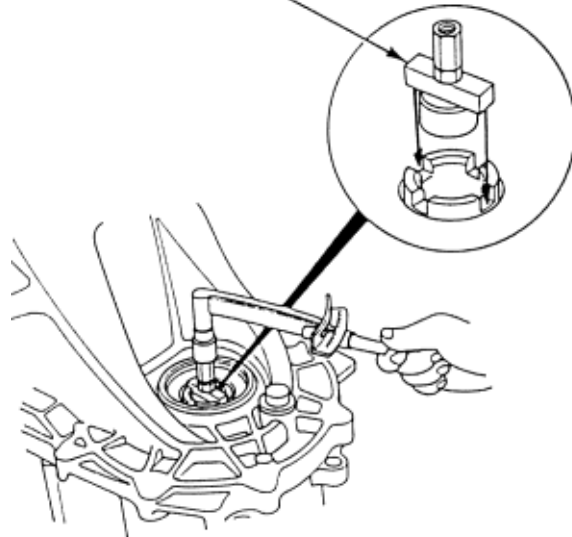
STANDARD: 1.4-2.5 Nm
(14-26 kgf/cm, 12-23 lbf/in)

U2J4, 2G5 Transmission:



U2Q7 Transmission:

Preload Inspection Tool
07TAJ - ST70100



7. If the tapered roller bearing preload is not within the standard, select the thrust shim which will give the correct tapered roller bearing preload from the following table.

NOTE: Changing the thrust shim to the next size will increase or decrease tapered roller bearing preload about 0.3-0.4 Nm (3-4 kgf/cm, 2.6-3.5 lbf/in).

THRUST SHIM

	Part Number	Thickness
A	41381-PX5-000	1.90 mm (0.0748 in)
B	41382-PX5-000	1.93 mm (0.0760 in)
C	41383-PX5-000	1.96 mm (0.0772 in)
D	41384-PX5-000	1.99 mm (0.0783 in)
E	41385-PX5-000	2.02 mm (0.0795 in)
F	41386-PX5-000	2.05 mm (0.0807 in)
G	41387-PX5-000	2.08 mm (0.0819 in)
H	41388-PX5-000	2.11 mm (0.0831 in)
I	41389-PX5-000	2.14 mm (0.0843 in)
J	41390-PX5-000	2.17 mm (0.0854 in)
K	41391-PX5-000	2.20 mm (0.0866 in)
L	41392-PX5-000	2.23 mm (0.0878 in)
M	41393-PX5-000	2.26 mm (0.0890 in)
N	41394-PX5-000	2.29 mm (0.0902 in)
O	41395-PX5-000	2.32 mm (0.0913 in)
P	41396-PX5-000	2.35 mm (0.0925 in)
Q	41397-PX5-000	2.38 mm (0.0937 in)
R	41398-PX5-000	2.41 mm (0.0949 in)
S	41399-PX5-000	2.44 mm (0.0961 in)
T	41400-PX5-000	2.47 mm (0.0972 in)

8. Recheck the tapered roller bearing preload.

9. How to select the correct thrust shim:

-1)

Compare the tapered roller bearing preload you get with the thrust shim that was removed, with the specified preload of 1.4-2.5 Nm (14-26 kgf/cm, 12-23 lbf/in).

-2)

If your measured tapered roller bearing preload is less than specified, subtract yours from the specified.

If yours is more than specified, subtract the specified from your measurement.

For example with a 2.17 mm (0.0854 in) thrust shim:

(A) specified 2.5 Nm (26 kgf/cm, 23 lbf/in)

- you measure 0.6 Nm 16 kgf/cm, 5 lbf/in

1.9 Nm (20 kgf/cm, 18 lbf/in)

less

(B) you measure 3.3 Nm (34 kgf/cm, 30 lbf/in)

- specified 2.5 Nm (26 kgf/cm, 23 lbf/in)

0.8 Nm (8 kgf/cm, 7 lbf/in)

more

- 3) Each shim size up or down from standard makes about 0.3-0.4 Nm (3-4 kgf/cm, 2.6-3.5 lbf/in) difference in tapered roller bearing preload.

- In example (A) your measured tapered roller bearing preload was 1.9 Nm (20 kgf/cm, 18 lbf/in) less than standard so you need a thrust shim five sizes thicker than standard (try the 2.32 mm (0.0913 in) thrust shim, and recheck).

- In example (B) your measurement was 0.8 Nm (8 kgf/cm, 7 lbf/in) more than standard, so you need a thrust shim two sizes thinner (try the 2.11 mm (0.0831 in) thrust shim, and recheck).

10. After adjusting the tapered roller bearing preload, assemble the transmission and install the transmission housing (**see page** 13-57).

TORQUE:

10 x 1.25 mm: 47 Nm (4.8 kgf/m 35 lbf/ft)

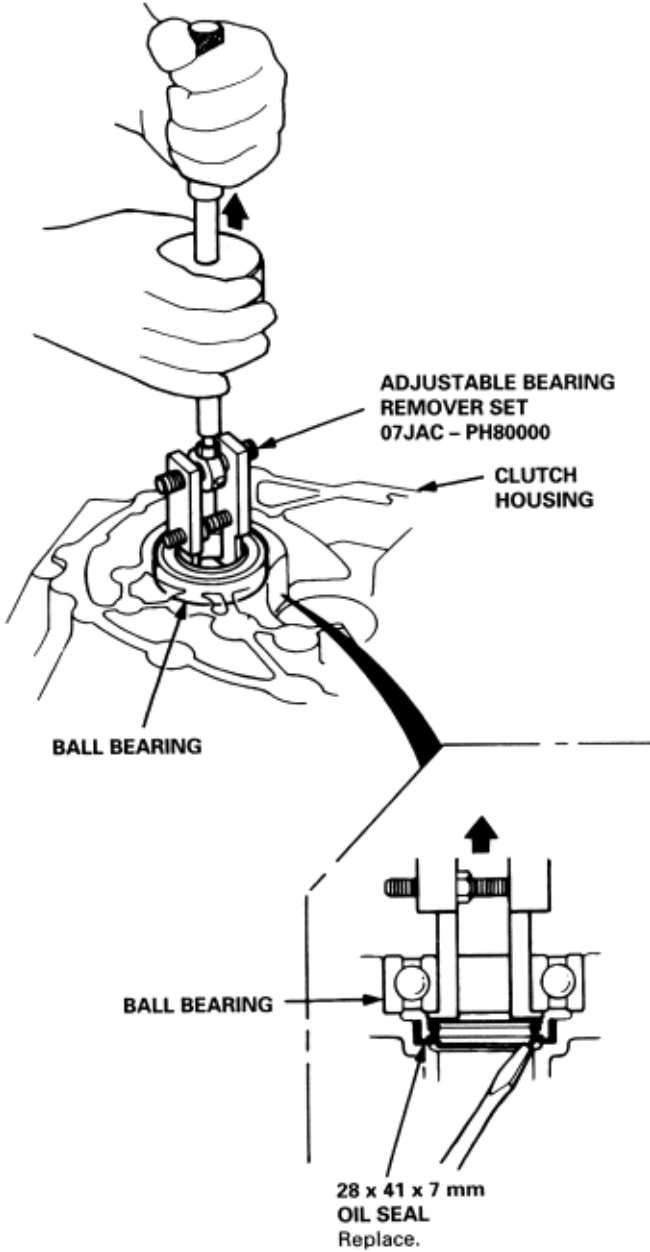
8 x 1.25 mm: 27 Nm (2.8 kgf/m. 20 lbf/ft)

11. Rotate the differential assembly in both directions to seat the tapered roller bearings.

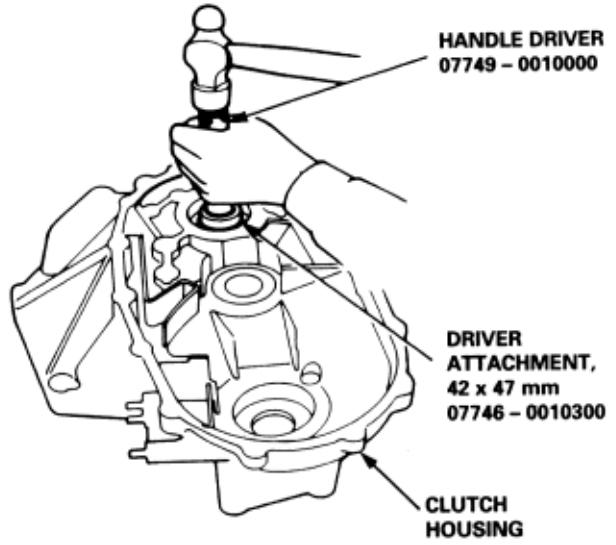
**Main Bearing/Oil Seal
Replacement**

13-106

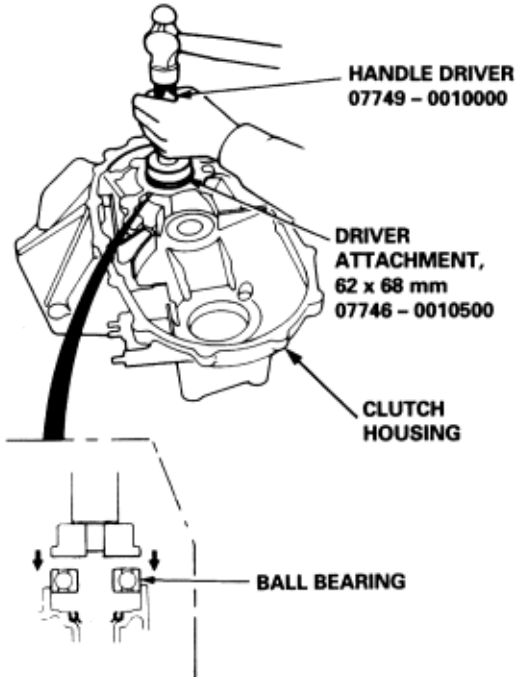
1. Remove the differential assembly.
2. Remove the ball bearing using the special tool as shown.
3. Remove the oil seal from the clutch side.



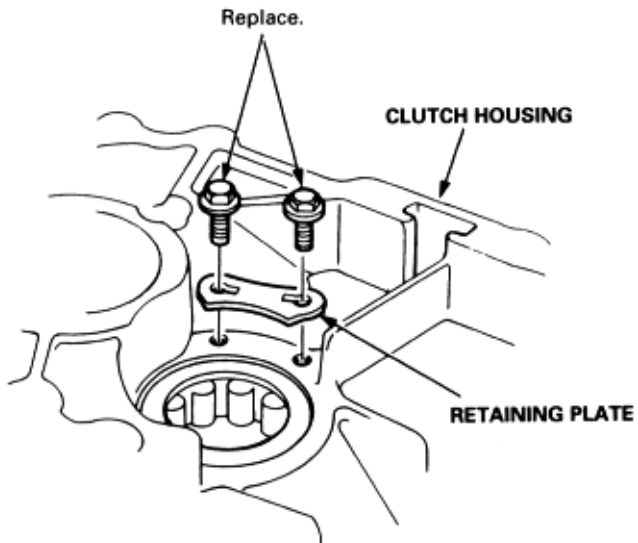
4. Drive the new oil seal in from the transmission side using the special tools as shown.



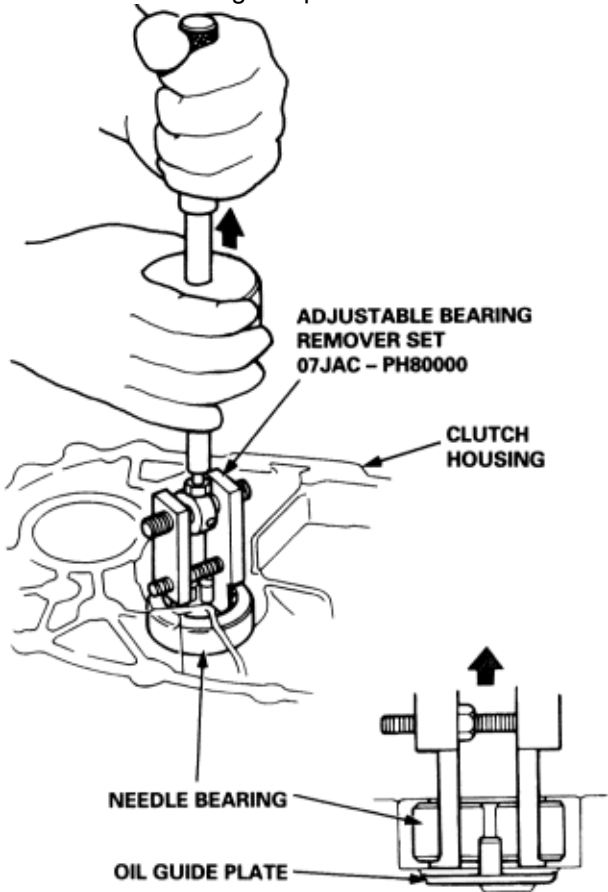
5. Drive the new ball bearing in from the transmission side using the special tools as shown.



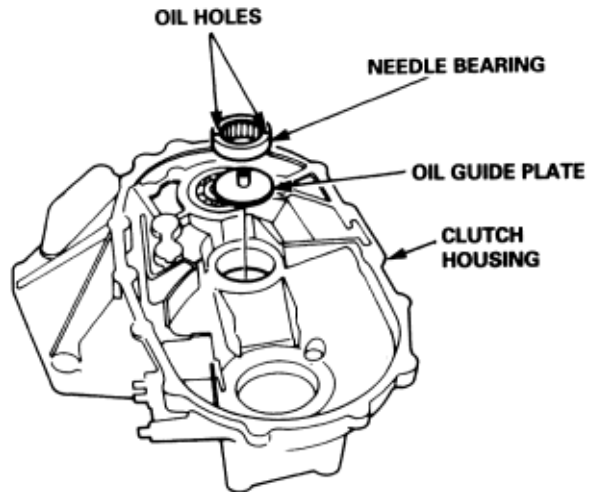
1. Remove the retaining plate from the clutch housing.



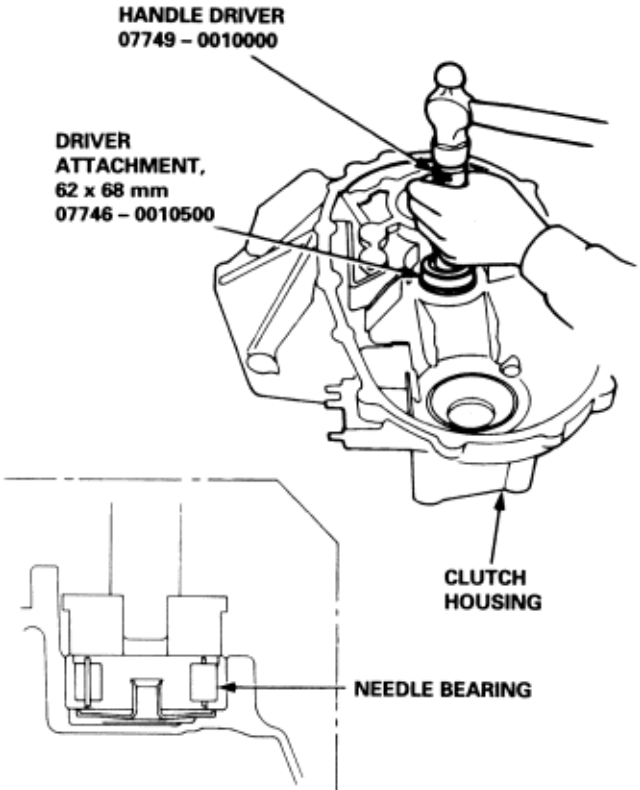
2. Remove the needle bearing using the special tool, then remove the oil guide plate.



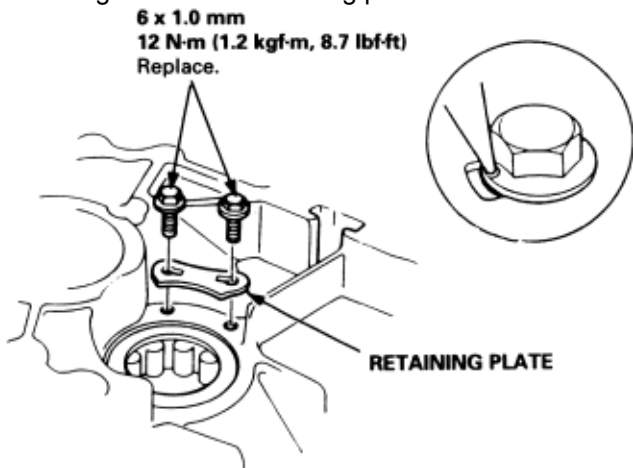
3. Position the oil guide plate and new needle bearing in the bore of the clutch housing.
NOTE: Position the needle bearing with the oil hole facing up.



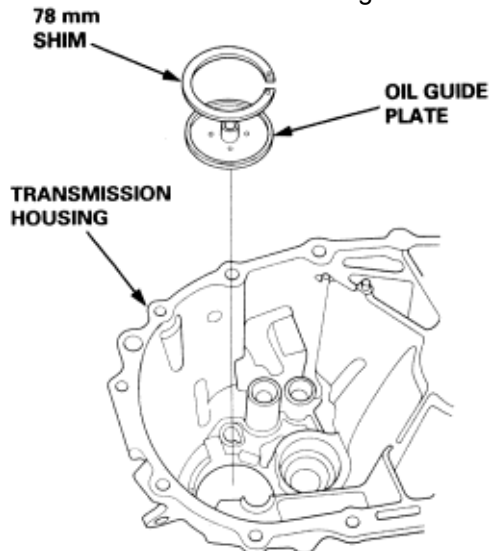
4. Drive the needle bearing using the special tools as shown.



5. Install the retaining plate, and stake the bolt heads into the groove in the retaining plate.



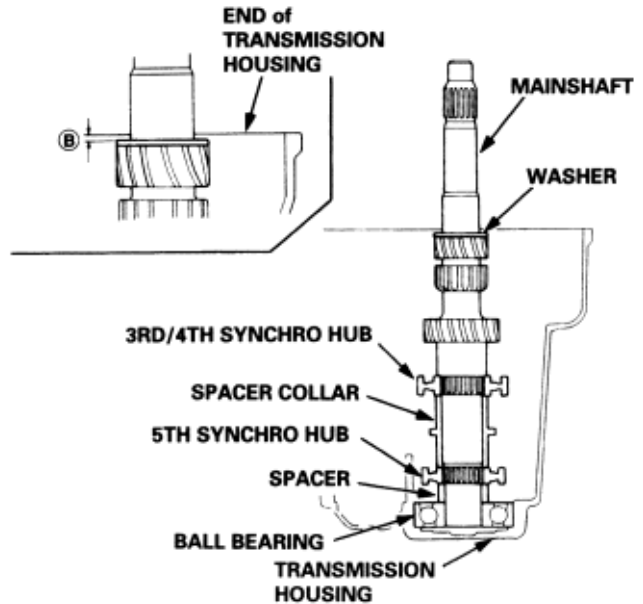
1. Remove the 78 mm shim and oil guide plate from the transmission housing.



2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, spacer, and ball bearing on the mainshaft, then install the assembled mainshaft in the transmission housing.
3. Install the washer on the mainshaft.
4. Measure distance (B) between the end of the transmission housing and washer

NOTE:

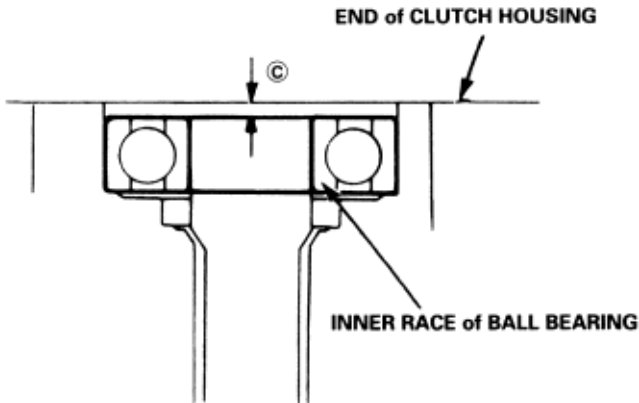
- ♦ Use a straight edge and vernier calliper.
- ♦ Measure at three locations and average the reading.



5. Measure distance (C) between the end of the clutch housing and bearing inner race.

NOTE:

- ♦ Use a straight edge and depth gauge.
- ♦ Measure at three locations and average the readings.



6. Select the proper 78 mm shim from the chart by using the formula below.

Shim Selection Formula:

From the measurements you made in steps 4 and 5:

- 1. Add distance (C) (step 5) to distance (B) (step 4).
- 2. From this number, subtract 0.93 (which is the midpoint of the flex range of the clutch housing bearing spring washer).
- 3. Take this number and compare it to the available shim sizes in the chart.

(for example)

$$\begin{array}{r}
 \text{B: } 2.39 \qquad 2.61 \\
 + \text{ C: } \underline{0.22} \qquad - \underline{0.93} \\
 = \quad 2.61 \qquad = 1.68
 \end{array}$$

- ♦ Try the 1.68 mm (0.0661 in) shim.

78 mm SHIM

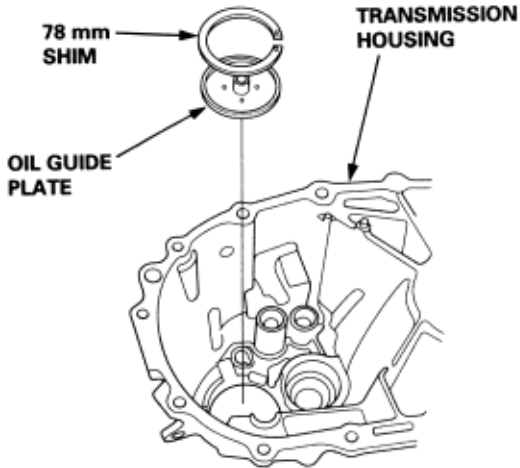
	Part Number	Thickness
A	23941-P16-000	1.20 mm (0.0472 in)
B	23942-P16-000	1.23 mm (0.0484 in)
C	23943-P16-000	1.26 mm (0.0496 in)
D	23944-P16-000	1.29 mm (0.0508 in)
E	23945-P16-000	1.32 mm (0.0520 in)
F	23946-P16-000	1.35 mm (0.0531 in)
G	23947-P16-000	1.38 mm (0.0543 in)
H	23948-P16-000	1.41 mm (0.0555 in)
I	23949-P16-000	1.44 mm (0.0567 in)
J	23950-P16-000	1.47 mm (0.0579 in)
K	23951-P16-000	1.50 mm (0.0591 in)
L	23952-P16-000	1.53 mm (0.0602 in)
M	23953-P16-000	1.56 mm (0.0614 in)
N	23954-P16-000	1.59 mm (0.0626 in)
O	23955-P16-000	1.62 mm (0.0638 in)
P	23956-P16-000	1.65 mm (0.0650 in)
Q	23957-P16-000	1.68 mm (0.0661 in)
R	23958-P16-000	1.71 mm (0.0673 in)
S	23959-P16-000	1.74 mm (0.0685 in)
T	23960-P16-000	1.77 mm (0.0697 in)
U	23961-P16-000	1.80 mm (0.0709 in)
V	23962-P16-000	1.83 mm (0.0720 in)
W	23963-P16-000	1.86 mm (0.0732 in)
X	23964-P16-000	1.89 mm (0.0744 in)
Y	23965-P16-000	1.92 mm (0.0756 in)
Z	23966-P16-000	1.95 mm (0.0768 in)
AA	23967-P16-000	1.98 mm (0.0780 in)
AB	23968-P16-000	2.01 mm (0.0791 in)
AC	23969-P16-000	2.04 mm (0.0803 in)
AD	23970-P16-000	2.07 mm (0.0815 in)
AE	23971-P16-000	2.10 mm (0.0827 in)
F	23972-P16-000	2.13 mm (0.0839 in)
AG	23973-P15-000	2.16 mm (0.0850 in)
AH	23974-P16-000	2.19 mm (0.0862 in)
AI	23975-P16-000	2.22 mm (0.0874 in)
AJ	23976-P16-000	2.25 mm (0.0885 in)
AK	23977-P16-000	2.28 mm (0.0898 in)
AL	23978-P16-000	2.31 mm (0.0909 in)
AM	23979-P16-000	2.34 mm (0.0921 in)
AN	23980-P16-000	2.37 mm (0.0933 in)

Mainshaft Thrust Clearance Adjustment (cont'd)

13-110

NOTE: Measurement should be made at normal room temperature.

7. Install the 78 mm shim selected and oil guide plate the transmission housing.

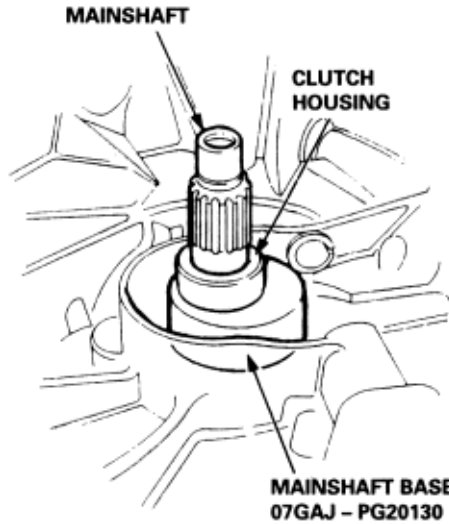


8. Thoroughly clean the spring washer and washer before installing them on the ball bearing. Note the installation direction of the spring washer.



9. Install the mainshaft in the clutch housing.
10. Place the transmission housing over the mainshaft and onto the clutch housing.
11. Tighten the clutch and transmission housings with several 8 mm and 10 mm bolts.
NOTE: It is not necessary to use sealing agent between the housings.
12. Tap the mainshaft with a plastic hammer.

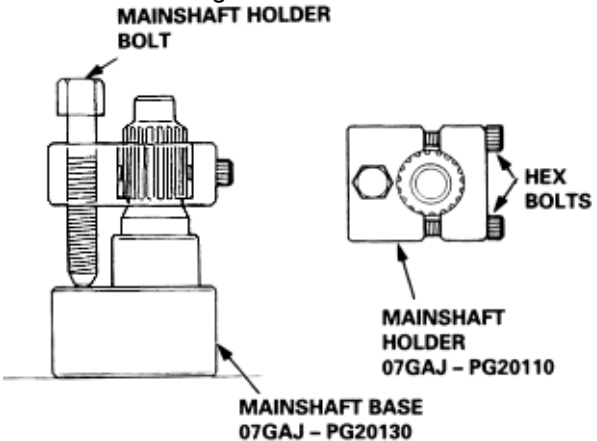
13. Slide the mainshaft base over the mainshaft.



14. Attach the mainshaft holder to the mainshaft as follows:

NOTE:

- ♦ Back-out the mainshaft holder bolt and loosen the two hex bolts.
- ♦ Fit the holder over the mainshaft so its lip is towards the transmission.
- ♦ Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



15. Seat the mainshaft fully by tapping its end with a plastic hammer.
16. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.
17. Zero a dial gauge on the end of the mainshaft.

18. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

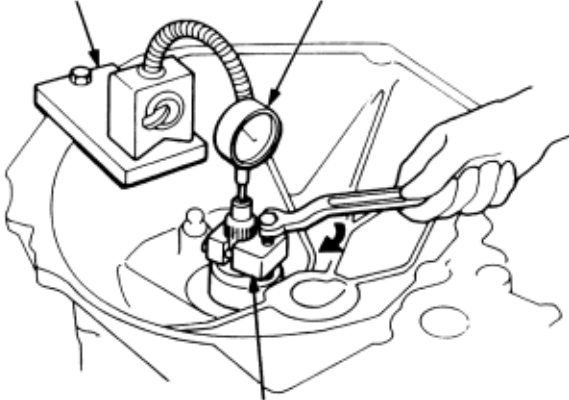


CAUTION

Turning the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.

**MAGNET STAND BASE
07979 - PJ40001**

DIAL GAUGE



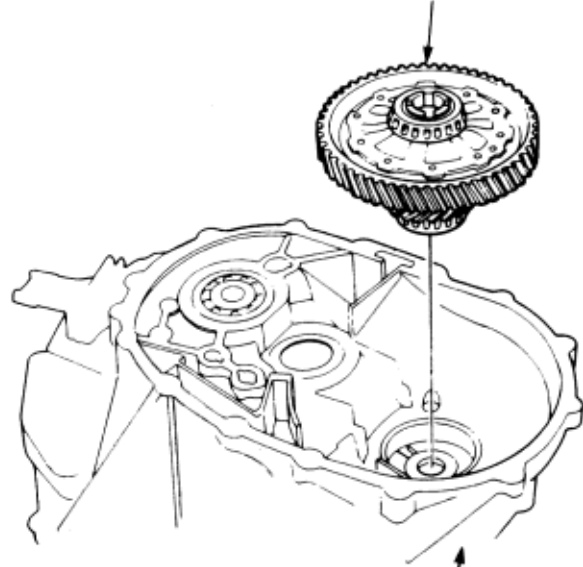
**MAINSHAFT HOLDER
07GAJ - PG20110**

19. If the reading is within the standard, the clearance is correct.
If the reading is not within the standard, recheck the shim thickness.

Standard: 0.10-0.16 mm (0.004-0.006 in)

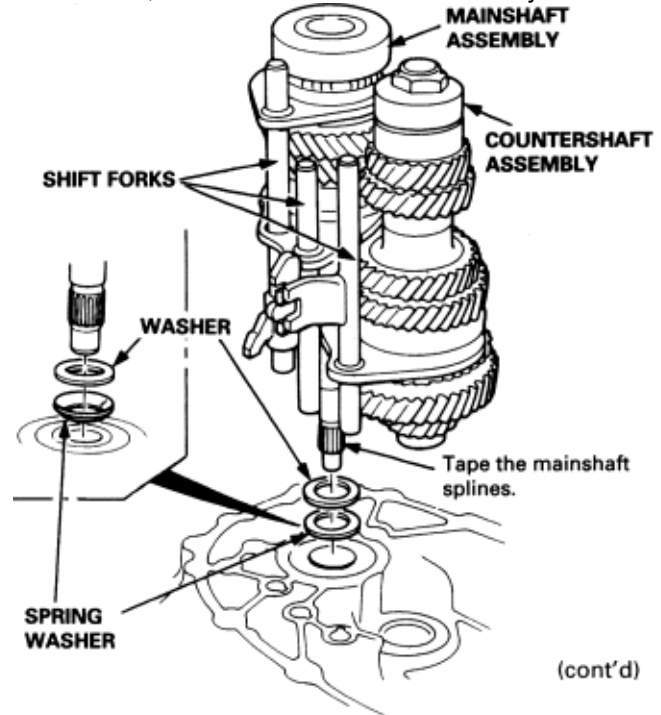
1. Install the differential assembly in the clutch housing.

DIFFERENTIAL ASSEMBLY



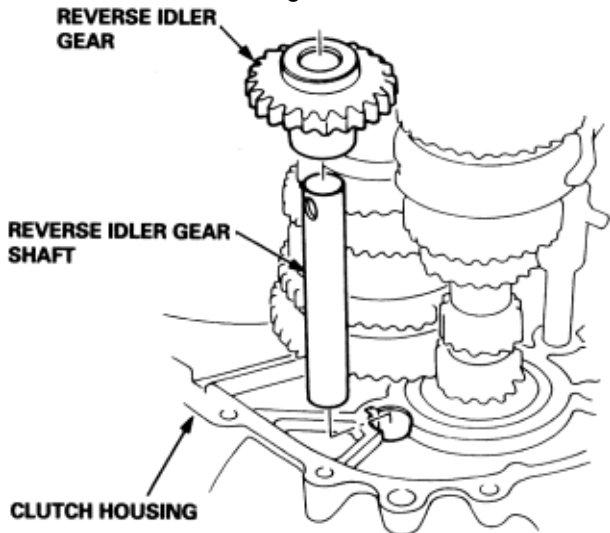
CLUTCH HOUSING

2. Install the spring washer and washer over the ball bearing. Note the installation direction of the spring washer.
3. Tape the splines of the mainshaft with vinyl tape to protect the seal.
Insert the mainshaft and countershaft into the shift forks, and install them as an assembly.



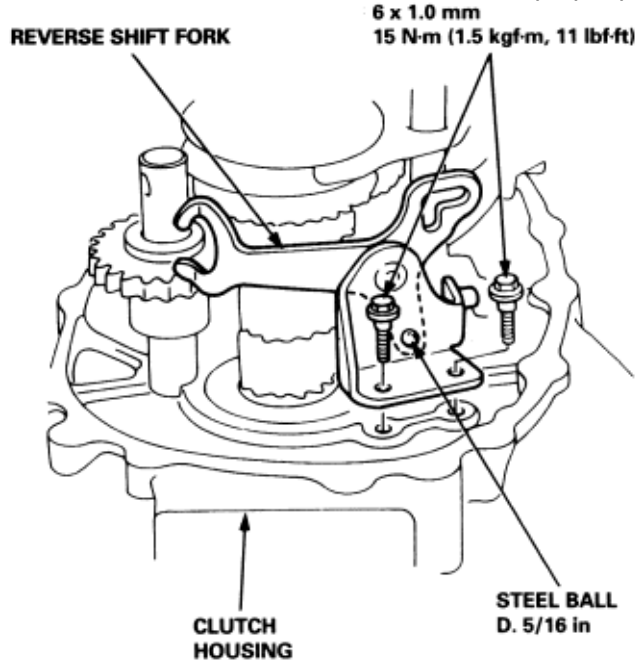
(cont'd)

4. Install the reverse idler gear and reverse idler gearshaft in the clutch housing.

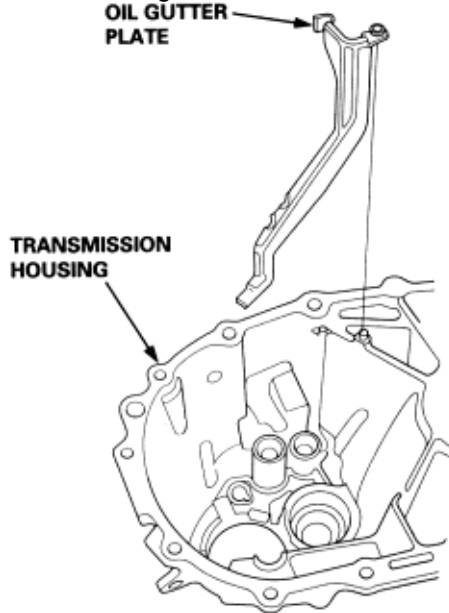


5. Install the reverse shift fork in the clutch housing with the 5th/reverse shift piece pin positioned in the slot of the reverse shift fork.

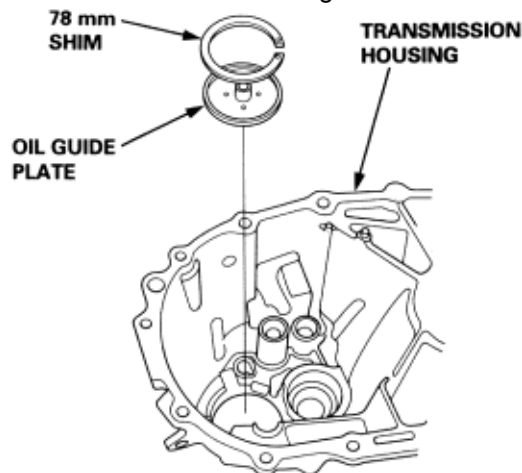
NOTE: Check that the steel ball is in the proper position.



6. Install the oil gutter plate in the transmission housing.



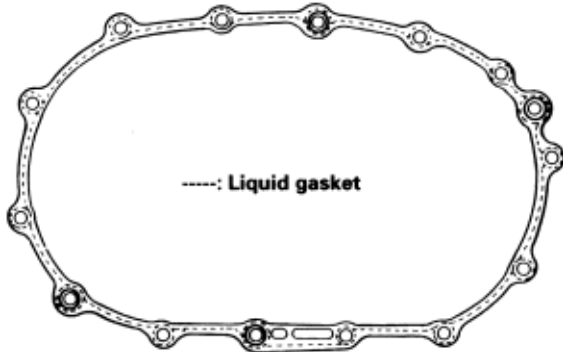
7. Select the proper size 78 mm shim according to the measurements made during the Mainshaft Thrust Clearance Adjustment, (see page 13-108).
8. Install the oil guide plate and 78 mm shim into the transmission housing.



9. Remove the dirt and oil from the transmission housing sealing surface. Apply liquid gasket to the sealing surface of the transmission housing as shown.

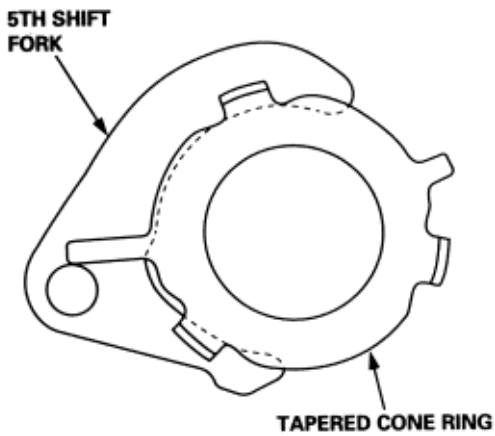
NOTE:

- ♦ Use liquid gasket P/N 08C70-K0234M.
- ♦ Remove the dirty oil from the sealing surface.
- ♦ Seal the entire circumference of the bolt holes to prevent oil leakage.
- ♦ If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.



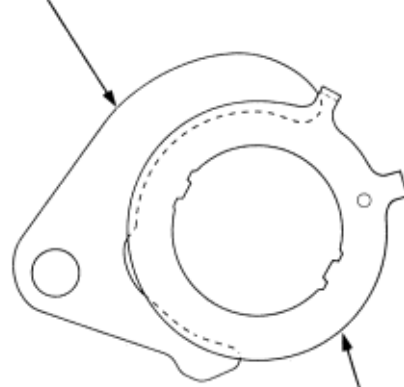
10. Install the 14 x 20 mm dowel pins.
11. Set the tapered cone ring or stopper ring as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.

U2J4 U2G5 TRANSMISSIONS:

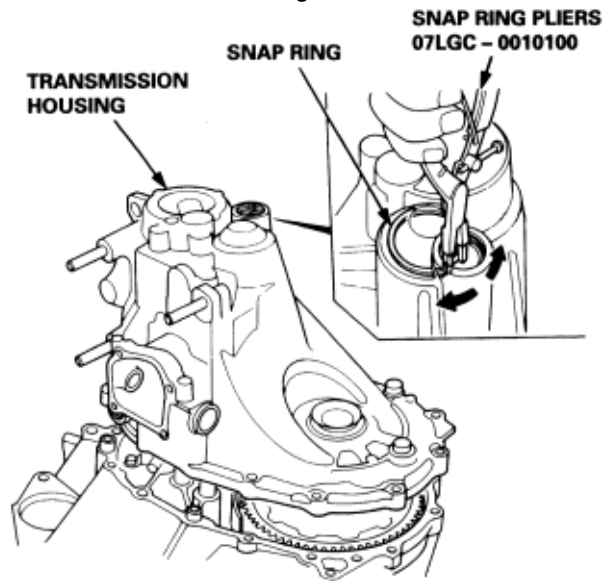


U2Q7 TRANSMISSIONS:

5TH SHIFT FORK



12. Lower the transmission housing with the snap ring pliers, and set the snap ring into the groove of the countershaft bearing.

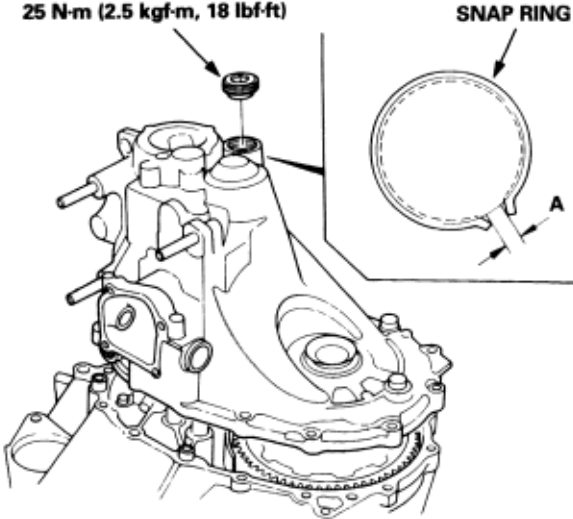


13. Check that the snap ring is securely seated in the groove of the countershaft bearing.

Dimension A as installed: 3.6 - 6.3 mm
(0.142-0.248 in)

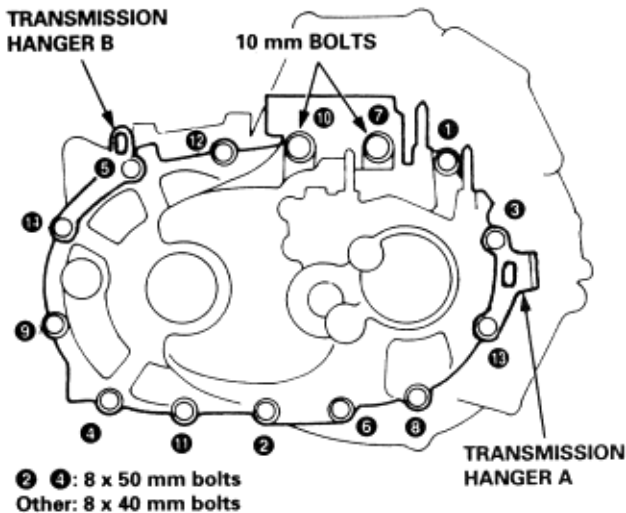
14. Install the 32 mm sealing bolt
 NOTE: Apply liquid gasket P/N 08C70-K0234M to the threads.

32 mm SEALING BOLT
25 N-m (2.5 kgf-m, 18 lbf-ft)

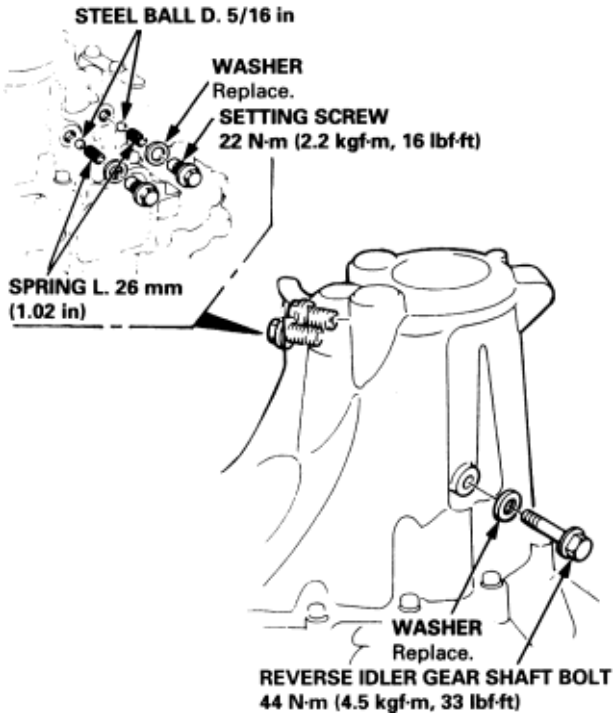


15. Install transmission hangers A and B, then tighten the bolts in a crisscross pattern in several steps as shown.

8 x 1.25 mm bolts: 27 Nm (2.8 kgf/m, 20 lbf/ft)
10 x 1.25 mm bolts: 47 Nm (4.8 kgf/m, 35 lbf/ft)



16. Install the reverse idler gear shaft bolt.
 17. Install the steel balls, springs, washers and setting screws.

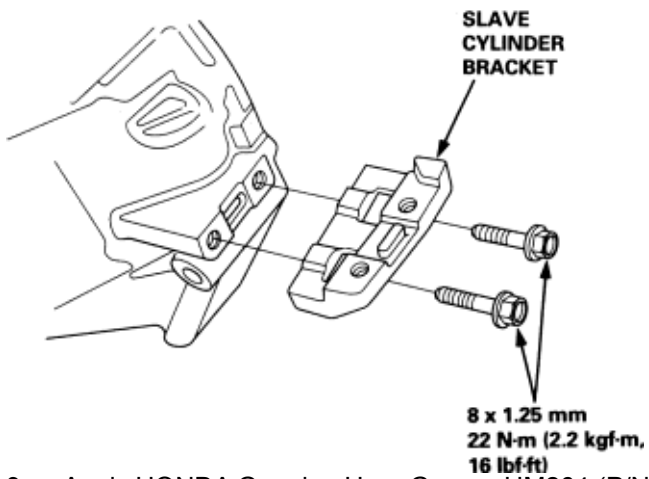


18. Install the shift arm cover assembly ([see page 13-69](#)).
 19. Shift the transmission through all the gears before installing it.

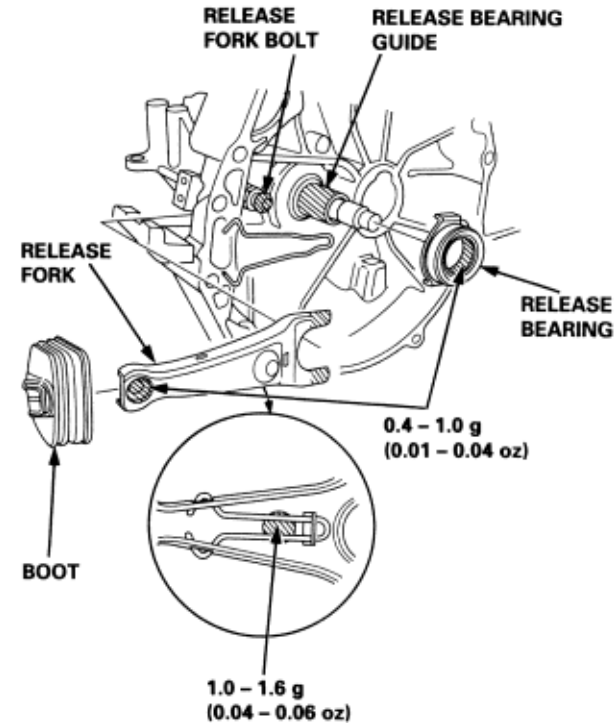
Transmission Installation

13-115

1. Check the dowel pins are installed in the clutch housing.
2. Install the slave cylinder bracket to the transmission assembly.

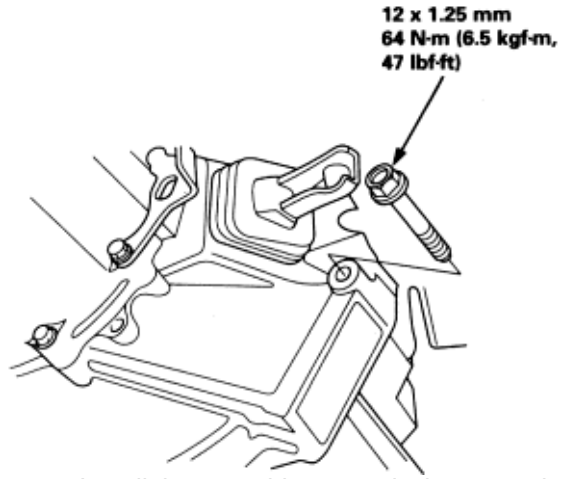


3. Apply HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305) to the release fork, the release fork bolt, the release bearing, and the release bearing guide in the shaded areas.

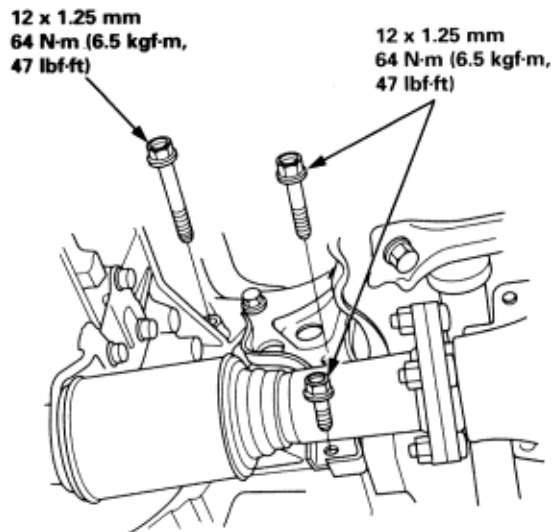


4. Install the release bearing, release fork, and boot on the transmission.

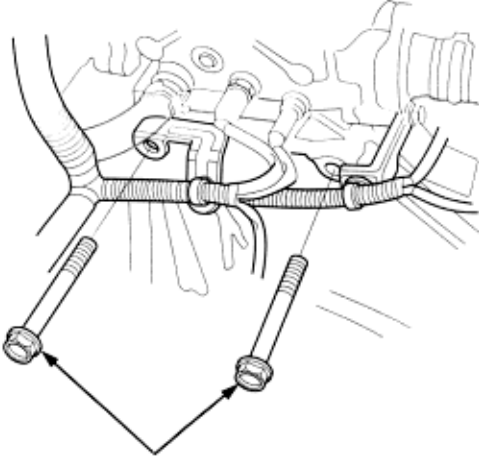
5. Place the transmission on the transmission jack, and raise it to the engine level.
6. Install the front side transmission mounting bolt.



7. Install the rear side transmission mounting bolt
8. Install the two engine mount bracket new mounting bolts.

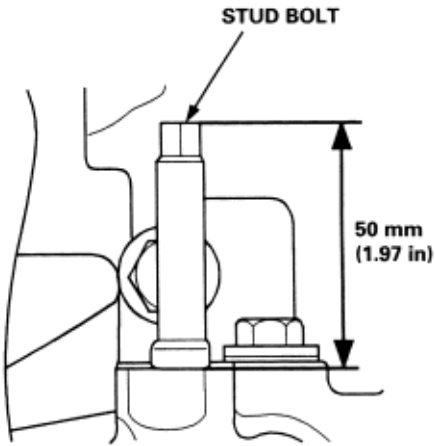


9. Install the two upper transmission mounting bolts.



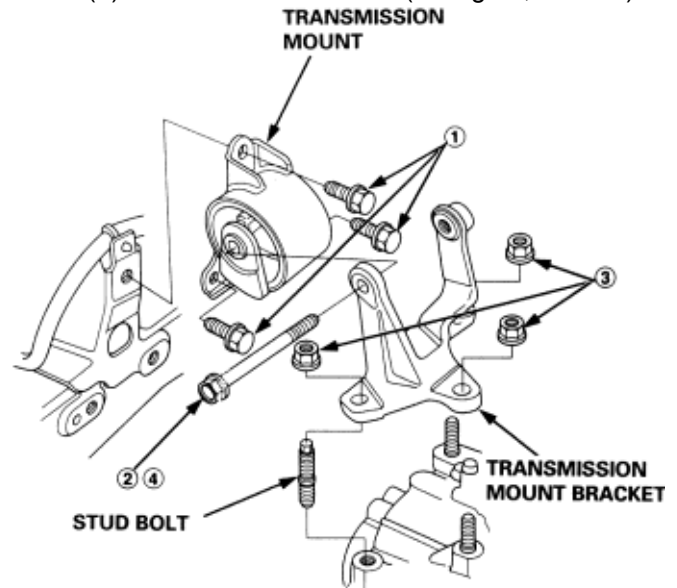
12 x 1.25 mm
64 N·m (6.5 kgf·m,
47 lbf·ft)

10. Install the transmission mount stud bolt on the transmission housing.

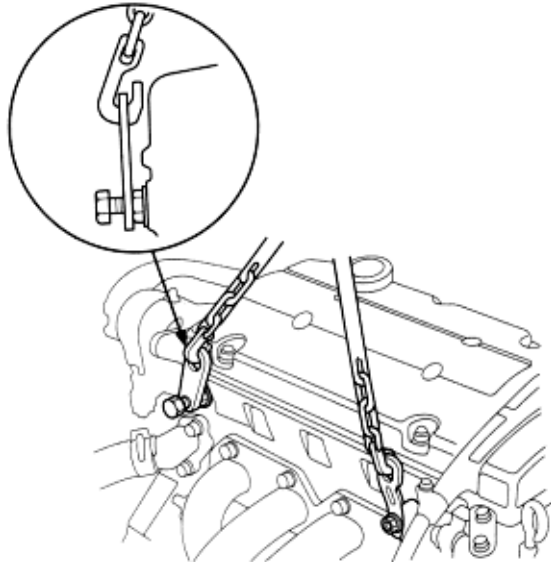


11. Raise the transmission, then install the transmission mount rubber assembly and transmission mount bracket
- ♦ Torque mounting bolts and nut in the sequence shown.
 - ♦ Make sure the bushings are not twisted or offset

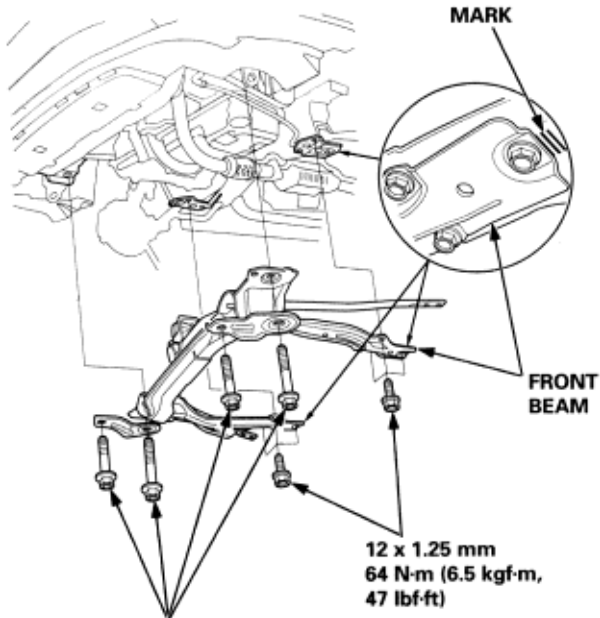
(1): 12 x 1.25 mm 64 Nm (6.5 kgf/m, 47 lbf/ft)
(2): Temporary tightening
(3): 10 x 1.25 mm 38 Nm (3.9 kgf/m, 28 lbf/ft)
(4): 12 x 1.25 mm 64 Nm (6.5 kgf/m, 47 lbf/ft)



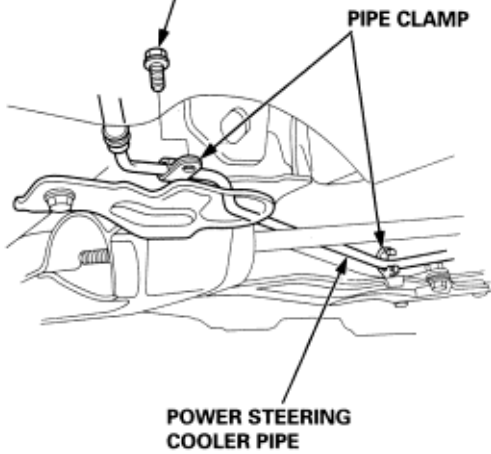
12. Remove the chain hoist.



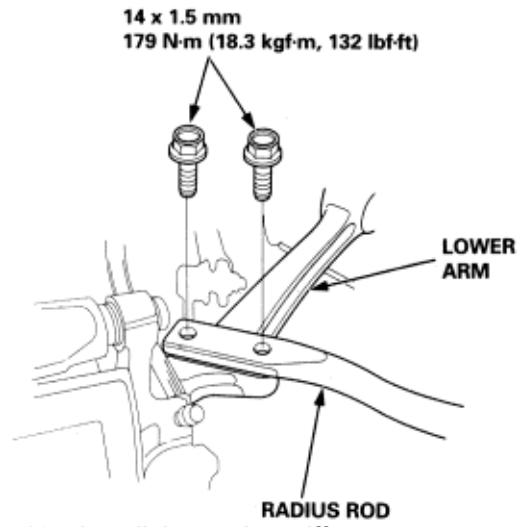
13. Install the front beam by aligning the marks.



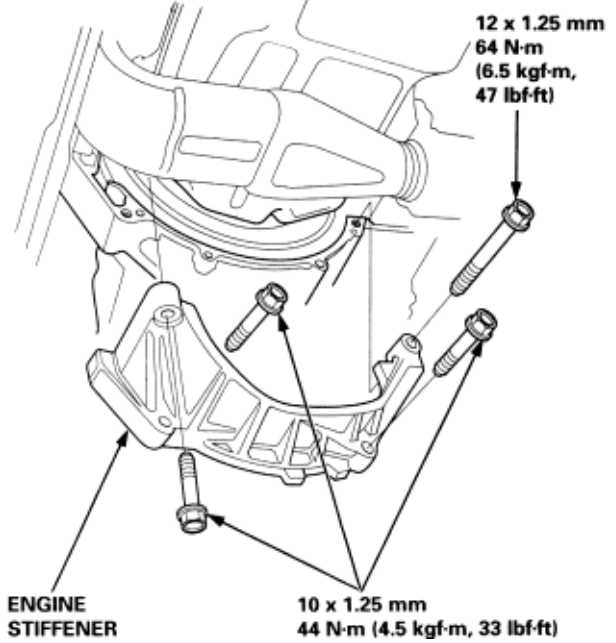
- 14 x 1.5 mm**
103 N-m (10.5 kgf-m,
75.9 lbf-ft)
14. Install the power steering cooler pipe in the pipe clamps.
- 6 x 1.0 mm**
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)



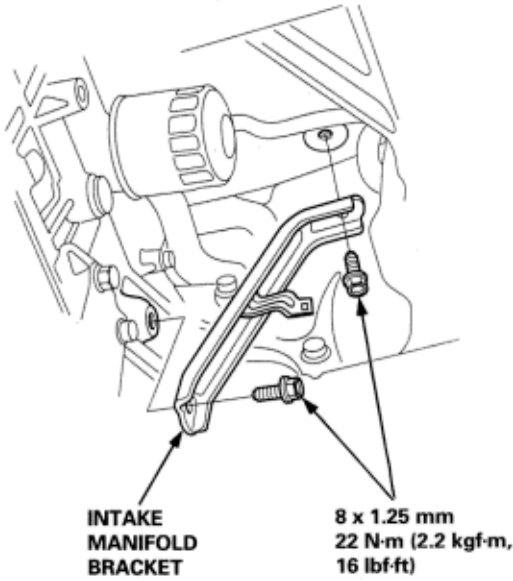
15. Install both radius rods with new mounting bolts on the lower arm.



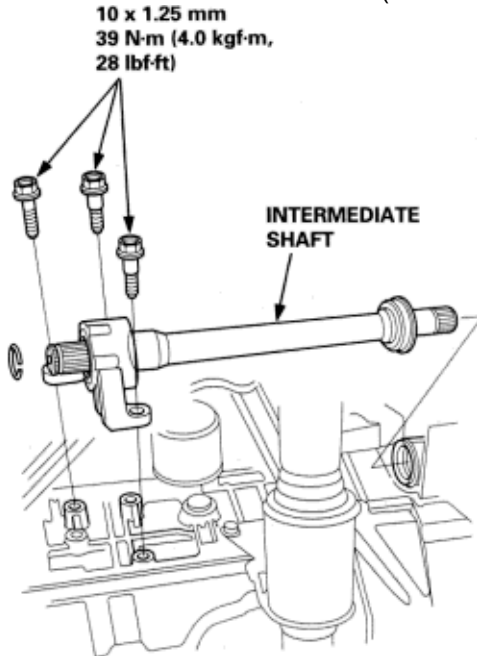
16. Install the engine stiffener.



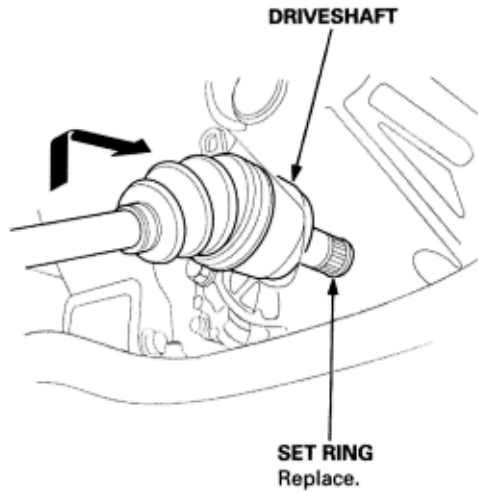
17. Install the intake manifold bracket.



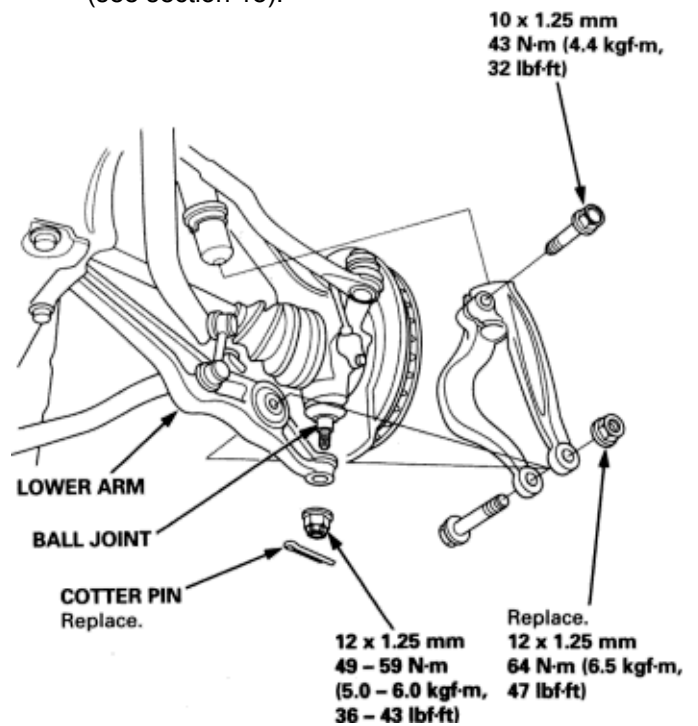
18. Install the intermediate shaft (see section 16).



19. Install the driveshafts with new set rings (see section 16).

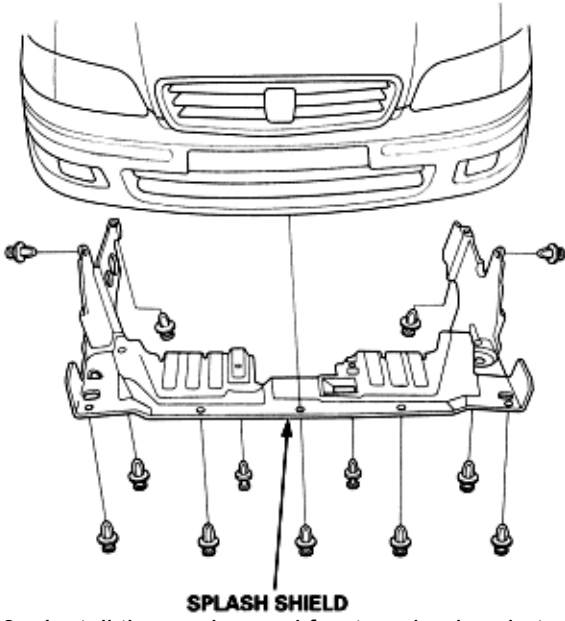


20. Install both the damper forks with new locknuts (see section 18).

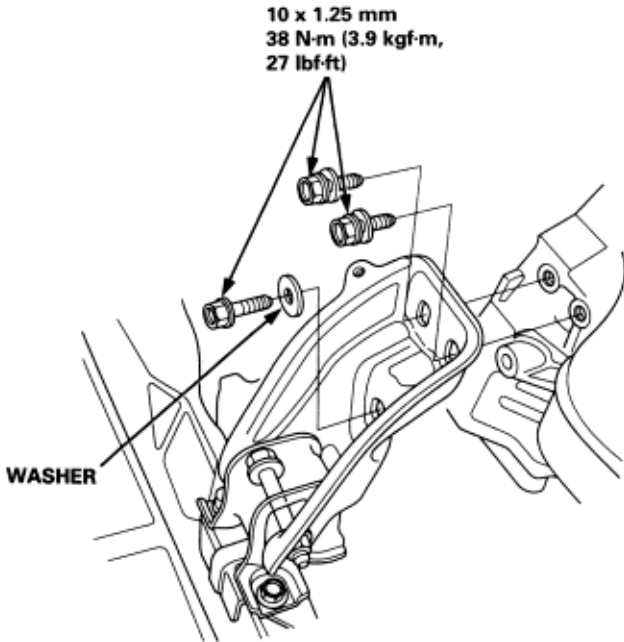


21. Install the ball joint onto the lower arms, then install the castle nuts and new cotter pins (see section 18).

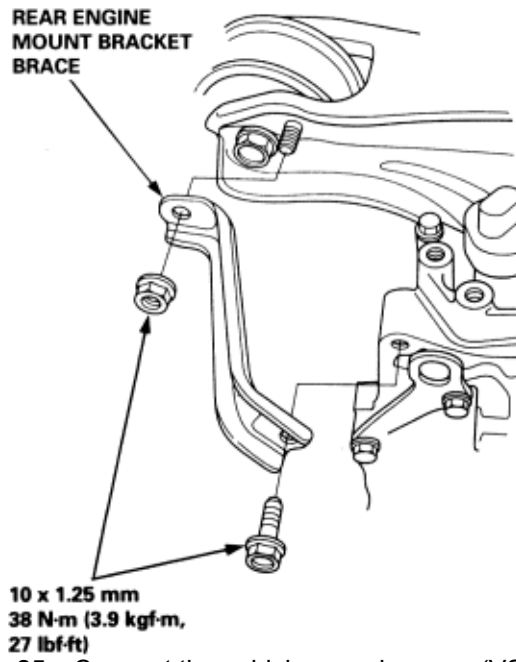
22. Install the splash shield.



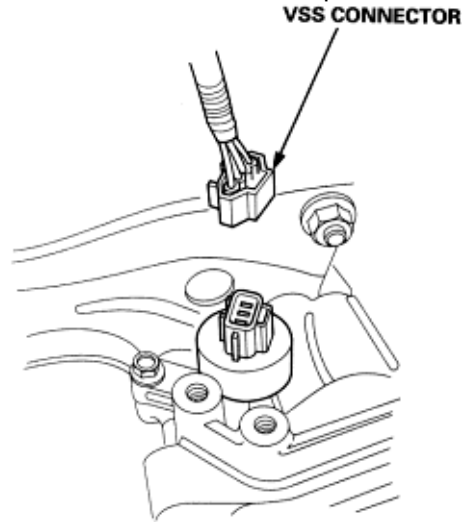
23. Install the washer and front engine bracket mounting bolts.



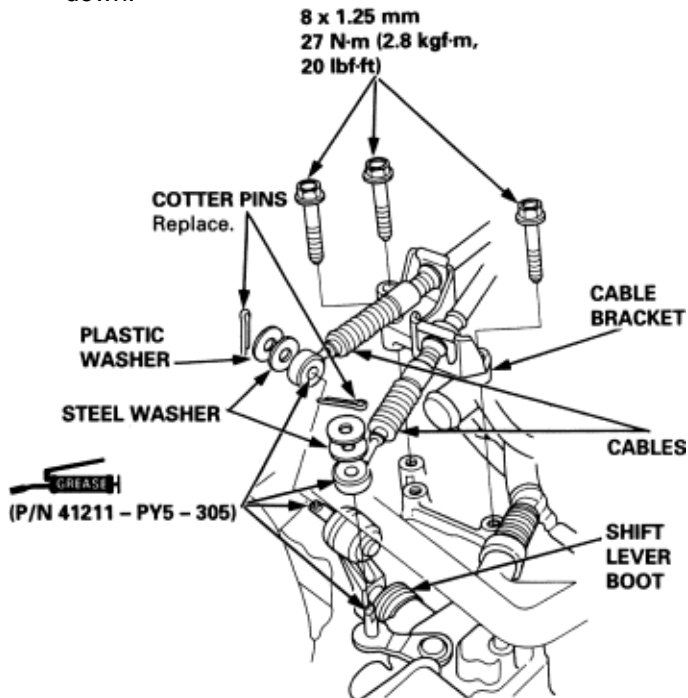
24. Install the rear engine mount bracket brace.



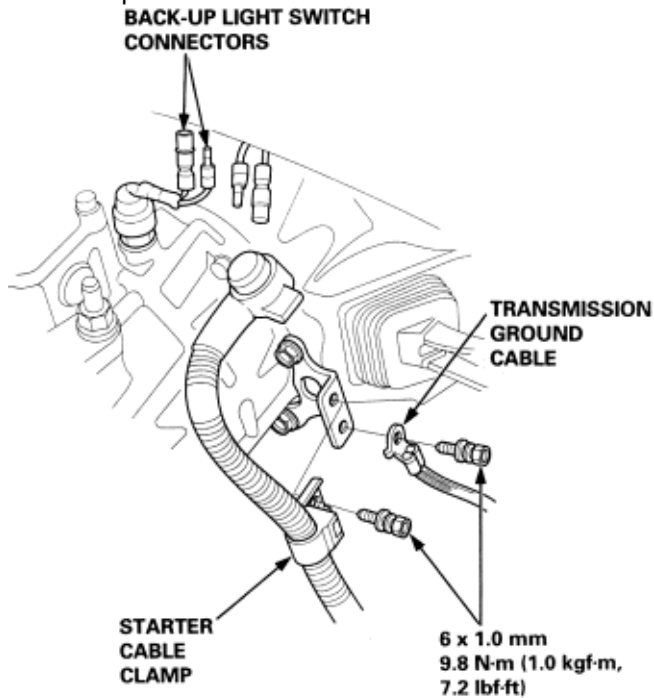
25. Connect the vehicle speed sensor (VSS) connector.



26. Install the cables to the levers, then install the cable bracket. Turn the shift lever boot so the hole is facing down.

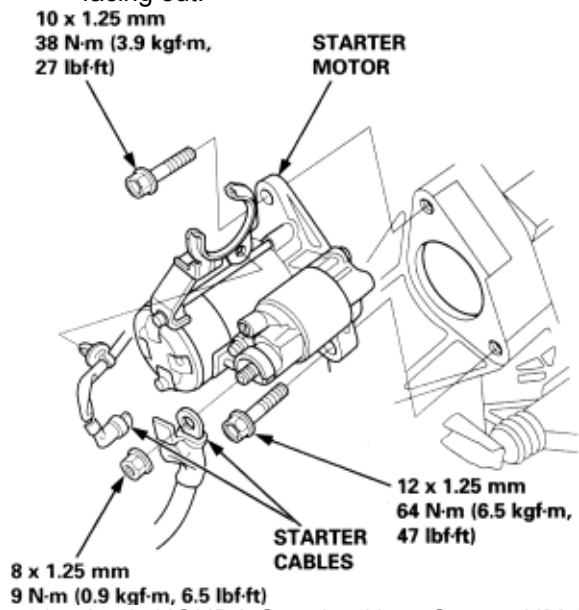


27. Install the transmission ground cable and starter cables clamp.

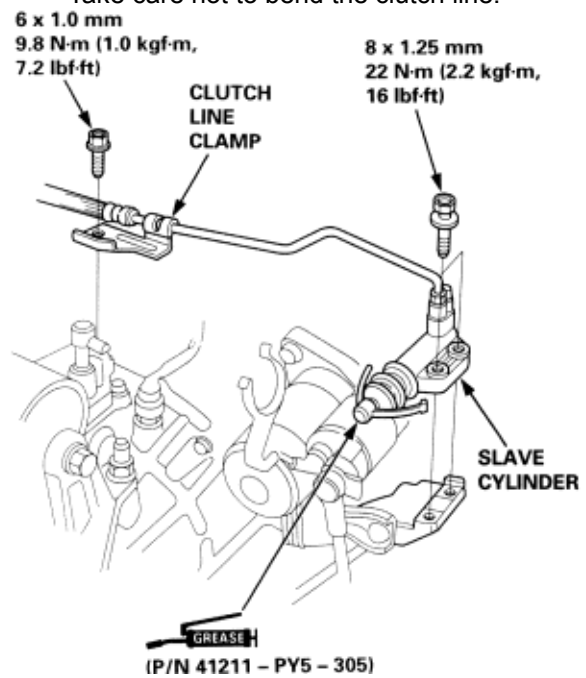


28. Connect the back-up light switch connectors.

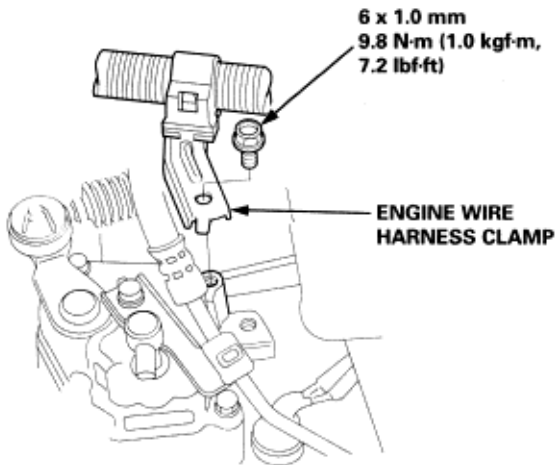
29. Install the starter motor, then connect the cables. Make sure the crimped side of the ring terminals is facing out.



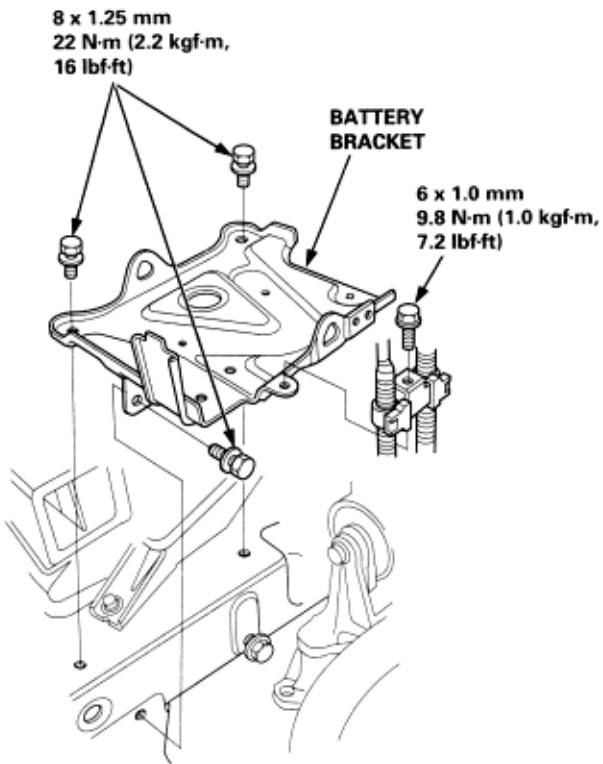
30. Apply HONDA Genuine Urea Grease UM 264 (P/N 41211-PY5-305) to the end of the slave cylinder rod. Install the slave cylinder and clutch line clamp. Take care not to bend the clutch line.



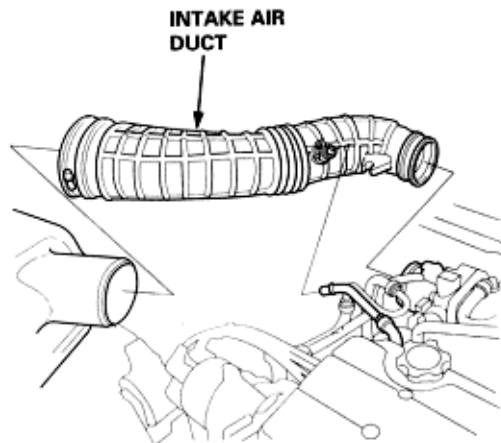
31. Install the engine wire harness clamp.



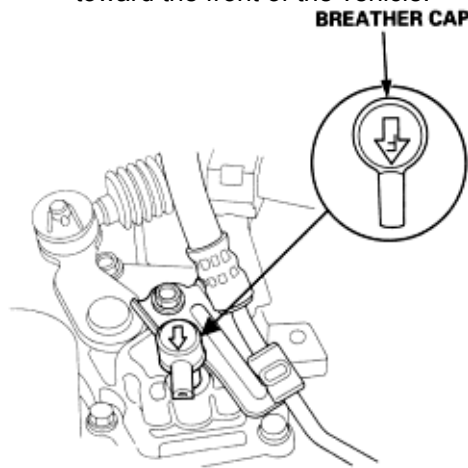
32. Install the battery bracket.



33. Install the intake air duct.



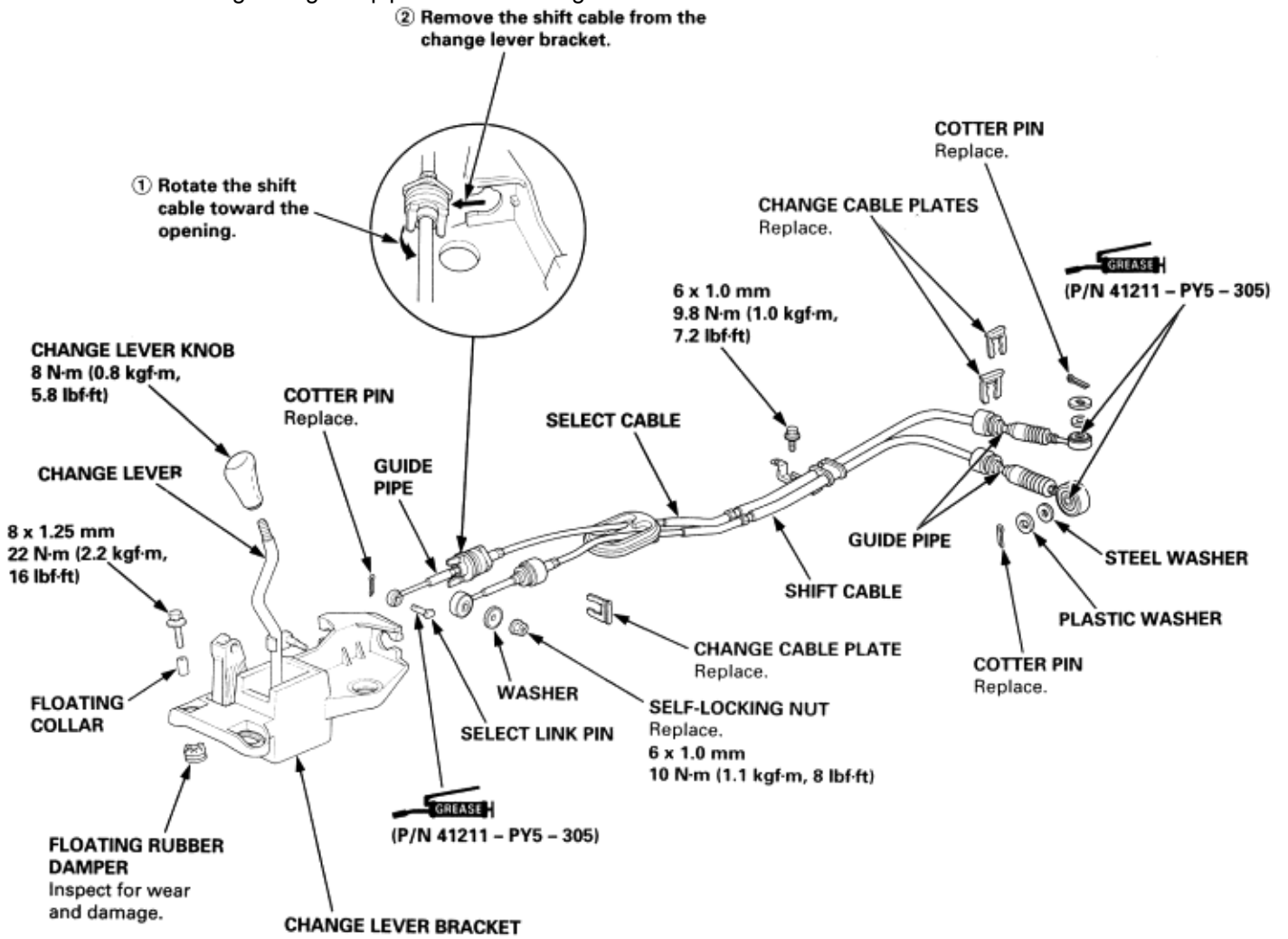
34. Turn the breather cap so that the "F" mark points toward the front of the vehicle.



35. Connect the positive (+) cable first, then the negative (-) cable to the battery.
36. Refill the transmission fluid (**see page** 13-57).
37. Check the transmission and check for smooth operation.
38. Check the clutch operation.
39. Check the front wheel alignment (see section 18).
40. Loosen the three mounting bolts on the front engine stopper bracket, then torque the three mounting bolts in step 21. Make sure the bushings are not twisted or offset.

NOTE:

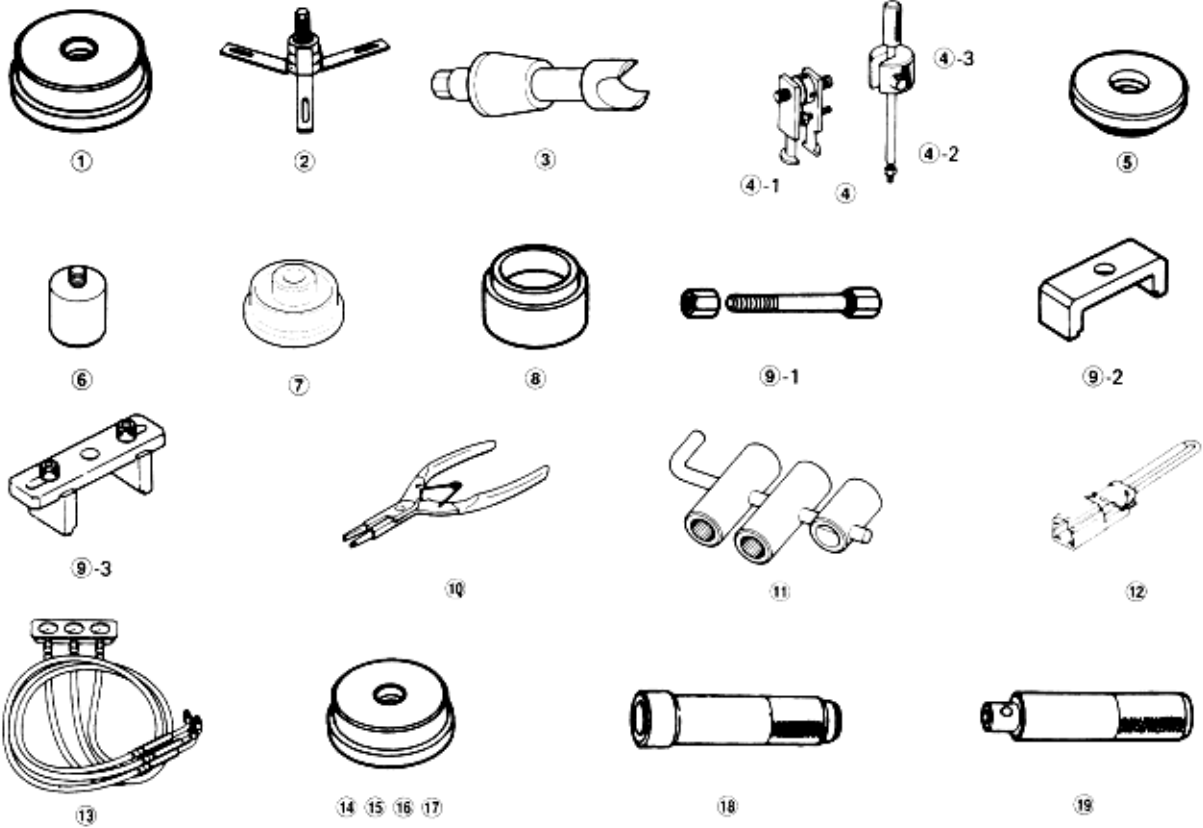
- ♦ Inspect rubber parts for wear and damage when disassembling.
- ♦ Check that the new cotter pin is seated firmly.
- ♦ Be careful not to damage the guide pipe when removing the cables.



Special Tools

14-2

Ref No.	Tool Number	Description	Qty	Remark
1	07GAZ - SD40101	Driver Attachment, 78 x 90 mm	1	
2	07HAC - PK40101	Housing Puller	1	
3	07HAJ - PK40201	Preload Inspection Tool	1	
4	07JAC - PH80000	Adjustable Bearing Remover Set	1	
4-1	07JAC - PH80100	Bearing Remover Attachment	1	
4-2	07JAC - PH80200	Remover Handle Assembly	1	
4-3	07741 - 0010201	Remover Weight	1	
5	07JAD - PH80101	Driver Attachment, 58 mm	1	
6	07JAD - PH80400	Pilot, 28 x 30 mm	1	
7	07JAD - SH30100	Driver Attachment, 65 x 65 mm	1	
8	07LAD - PW50601	Attachment, 40 x 50 mm	1	
9	07LAE - PX40000	Clutch Spring Compressor Set	1	
9-1	07GAE - PG40200	Clutch Spring Compressor Bolt Assembly	1	
9-2	07HAE - PL50100	Clutch Spring Compressor Attachment	1	
9-3	07LAE - PX40100	Clutch Spring Compressor Attachment	1	
10	07LGC - 0010100	Snap Ring Pliers	1	
11	07PAB - 0010000	Mainshaft Holder Set	1	
12	07PAZ - 0010100	SCS Short Connector	1	
13	07406 - 0020004	A/T Oil Pressure Gauge Set	1	
14	07746 - 0010100	Driver Attachment, 32 x 35 mm	1	
15	07746 - 0010300	Driver Attachment, 42 x 47 mm	1	
16	07746 - 0010500	Driver Attachment, 62 x 68 mm	1	
17	07746 - 0010600	Driver Attachment, 72 x 75 mm	1	
18	07746 - 0030100	Driver, 40 mm I.D.	1	
19	07749 - 0010000	Handle Driver	1	



The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears and Clutches

The torque converter consists of a pump, turbine and stator assembly in a single unit. They are connected to the engine crankshaft so they turn together as a unit as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft. The transmission has three parallel shafts: the main-shaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft. The mainshaft includes the 3rd and 4th clutches, and gears for 3rd, 4th, reverse and idler (reverse gear is integral with the 4th gear). The countershaft includes the final drive, 1st, 3rd, 4th, reverse, 2nd, parking and idler gears (the final drive gear is integral with the countershaft). The secondary shaft includes the 1st and 2nd clutches, and gears for 1st, 2nd and idler. The counter-shaft 4th gear and the countershaft reverse gear can be locked to the countershaft at its center, providing 4th gear or reverse, depending with which way the selector moved. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft and the secondary shaft to the countershaft to provide **D4**, **D3**, **2**, **1** and **R** positions.

Electronic Control

The electronic control system consists of the Powertrain Control Module (PCM), sensors, and six solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dash-board, under the front lower panel behind the center console.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, the servo body and the accumulator body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the shift valve E, the servo control valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the lock-up control valve, the cooler check valve and the ATF pump gears. The regulator valve body contains the regulator valve, the lock-up timing valve and the relief valve. The servo body contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B, the 3rd and 4th accumulators. The accumulator body contains the 1st and 2nd accumulators and the lubrication check valve. Fluid from the regulator passes through the manual valve to the various control valves. The 1st, 3rd and 4th clutches receive fluid from their respective feed pipes, and the 2nd clutch receives fluid from the internal hydraulic circuit.

Shift Control Mechanism

The PCM controls the shift control solenoid valves A, B and C, and the A/T clutch pressure control solenoid valves A and B while receiving input signal from various sensors located throughout the vehicle. The shift control solenoid valves shift the positions of the shift valves to switch the port leading the hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A and B control the CPC valves A and B to shift smoothly between lower gear and higher gear. This pressurises a line to one of the clutches, engaging the clutch and its corresponding gear.

Lock-up Mechanism

In **D4** position, in 2nd, 3rd and 4th, and **D3** position in 3rd, pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimises the timing of the lock-up mechanism. When lock-up control solenoid valve activates, modulator pressure changes to switch lockup on and off. The lock-up control valve and the lock-up timing valve control the range of lock-up according to the A/T clutch pressure control solenoid valves A and B. The lock-up control solenoid valve is mounted on the torque converter housing and the A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing. They are controlled by the PCM.

Gear Selection

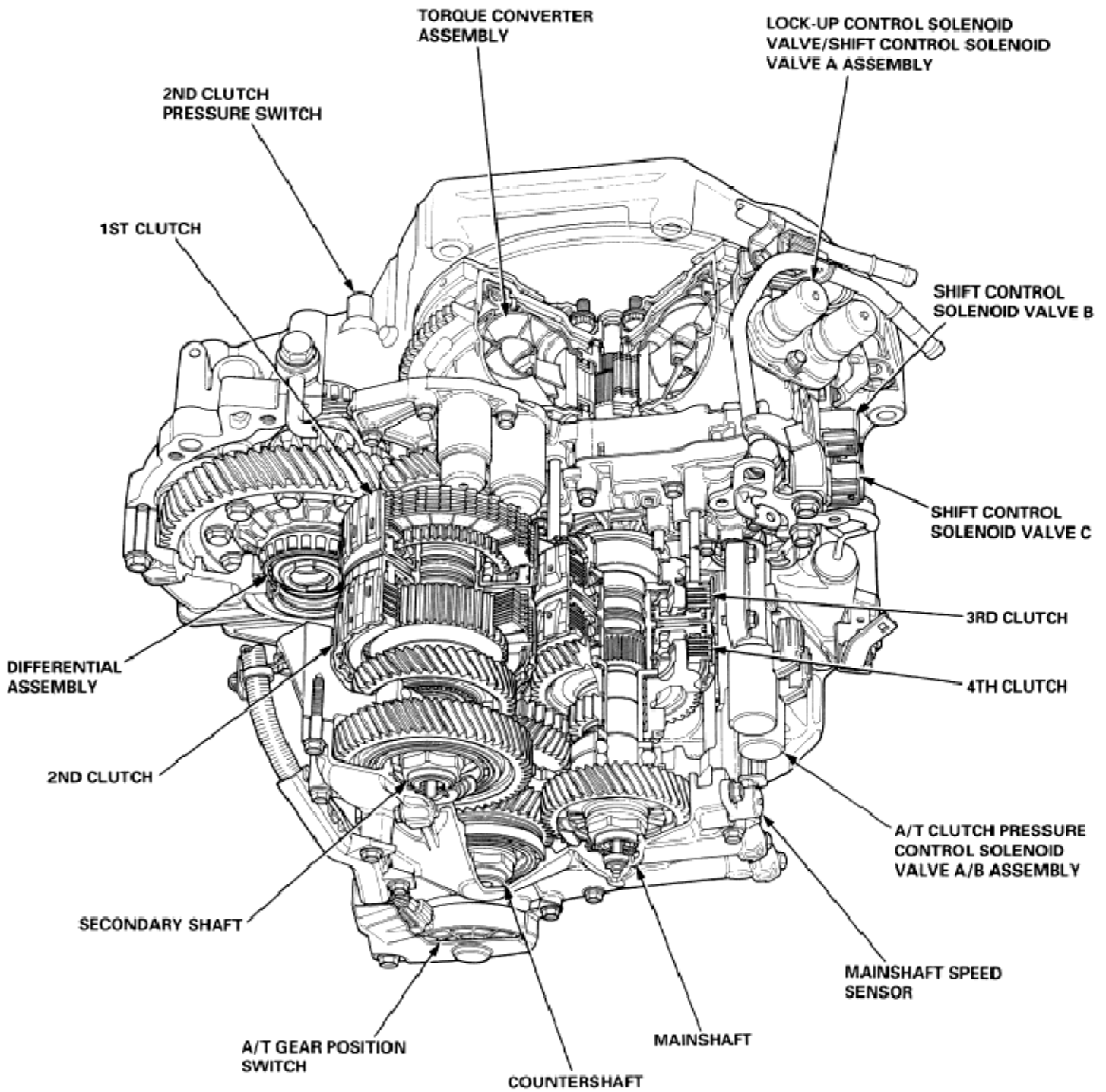
The shift lever has eight positions: **P**, PARK, **R** REVERSE, **N** NEUTRAL, **D4** 1st through 4th gear ranges, **D3** 1st through 3rd gear ranges, **2** 2nd gear and **1** 1st gear. Also manual mode has been adopted in **D4** position.

Position	Description
P PARK	Front wheels locked; parking brake pawl engaged with the parking gear on the countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch engaged.
N NEUTRAL	All clutches released.
D4 DRIVE (1st through 4th; automatic shifting)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshift through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd and 4th gear.
(1st through 4th; manual shifting) or or 2 or 1 DRIVE	Manual shifting driving; shift gears between 1st and 4th with the shift lever operation, much like a manual transmission. The transmission will automatically downshift from 4th to 3rd gear to get more power when climbing or to provide engine braking when going down a steep hill. When the vehicle decelerates to a stop, the transmission shifts to 1st gear automatically. The lock-up mechanism comes into operation in 2nd, 3rd and 4th gear.
D3 DRIVE (1st through 3rd)	For rapid acceleration at highway speeds and general driving; up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to a stop. The lock-up mechanism operates in 2nd and 3rd gear.
2 SECOND	Driving in 2nd gear; stays in 2nd gear, does not shift up and down. For engine braking or better traction starting off on loose slippery surface.
1 FIRST	Driving in 1st gear, stays in 1st gear, does not shift up. For engine braking.

Starting is possible only in **P** and **N** positions through use of a slide-type, neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator

A/T gear position indicator in the instrument panel shows what gear has been selected without looking down at the console. With the shift lever in the , **D4** position manual shifting mode, the indicator light next to the **D4** indicator light in the instrument panel will display the gear selected.



The four-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gear. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction disc and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft transmitting no power.

1st Clutch

The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is joined back-to-back to the 2nd clutch. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft

2nd Clutch

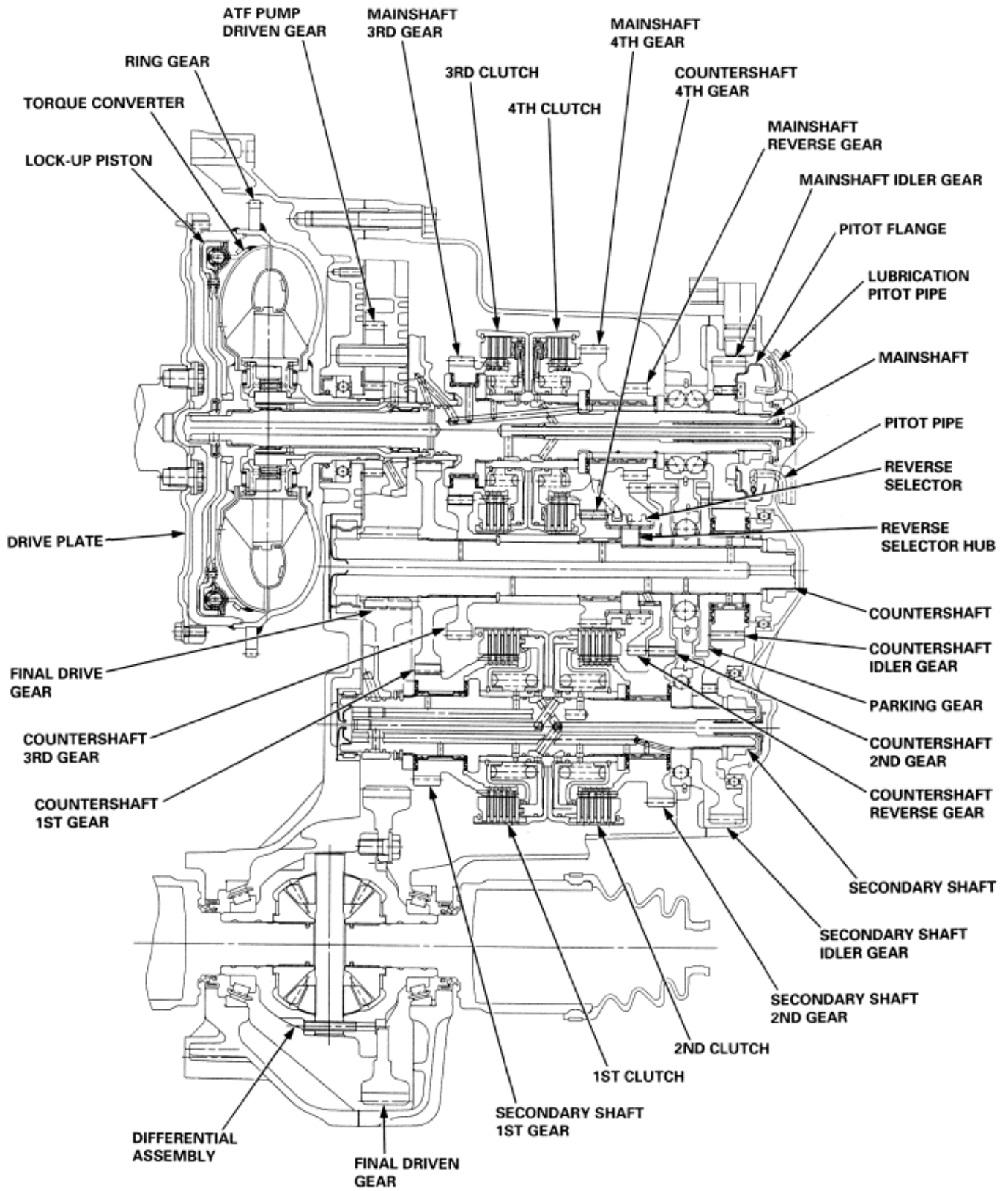
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the middle of the mainshaft. The 3rd clutch is joined back-to-back to the 4th clutch. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

4th Clutch

The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.



POSITION \ PART	TORQUE CONVERTER	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH		REVERSE GEAR	PARKING GEAR
					GEAR	CLUTCH		
P	○	×	×	×	×	×	×	○
R	○	×	×	×	×	○	○	×
N	○	×	×	×	×	×	×	×
D₄	1ST	○	○	×	×	×	×	×
	2ND	○	×	○	×	×	×	×
	3RD	○	×	×	○	×	×	×
	4TH	○	×	×	×	○	○	×
D₃	1ST	○	○	×	×	×	×	×
	2ND	○	×	○	×	×	×	×
	3RD	○	×	×	○	×	×	×
2	○	×	○	×	×	×	×	×
1	○	○	×	×	×	×	×	×

○: Operates

×: Doesn't operate

Gear Operation

Gears on the mainshaft:

- The 3rd gear is engaged/disengaged with the mainshaft by the 3rd clutch.
- The 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- The reverse gear is engaged/disengaged with the mainshaft by the 4th clutch.
- The idler gear is splined with the mainshaft and rotates with the mainshaft.

Gears on the countershaft:

- The final drive gear is integral with the countershaft.
- The 1st gear, 3rd gear, 2nd gear and parking gear are splined with the countershaft, and rotate with the countershaft.
- The 4th gear and reverse gear rotate freely from the countershaft. The reverse selector engages the 4th gear or the reverse gear with the reverse selector hub. The reverse selector hub is splined with the countershaft so that the 4th gear or reverse gear engage with the countershaft.
- The idler gear rotates freely from the countershaft.

Gears on the secondary shaft:

- The 1st gear is engaged/disengaged with the secondary shaft by the 1st clutch.
- The 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- The idler gear is splined with the secondary shaft and rotates with the secondary shaft.

Description
Power Flow (cont'd)

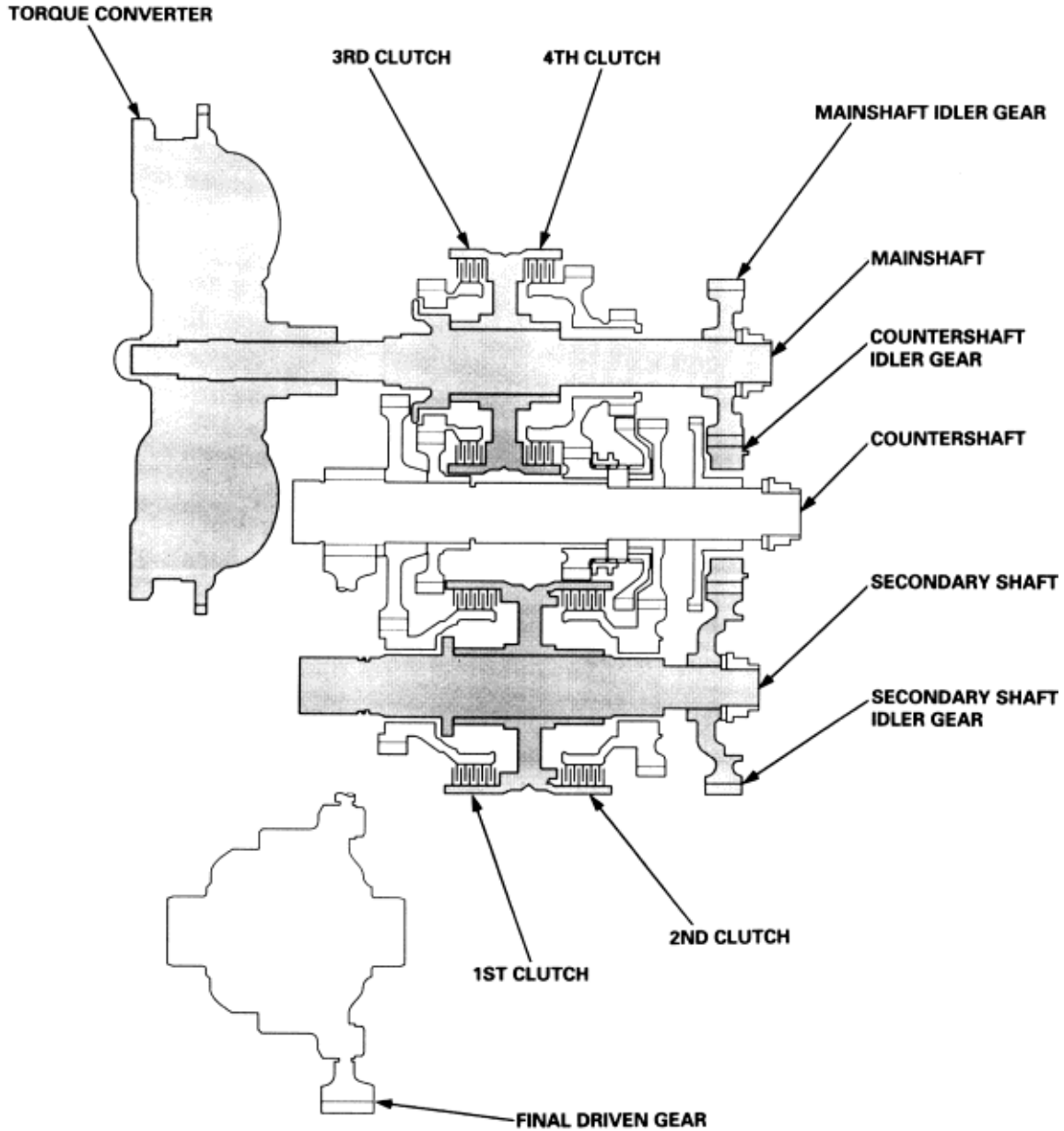
14-9

P Position

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the parking brake pawl interlocking the parking gear.

N Position

Engine power transmitted from the torque converter drives the mainshaft idler gear and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. power is not transmitted to the countershaft. the countershaft 4th gear is engaged with the reverse selector hub and the countershaft by the reverse selector when the shift lever is shifted in **N** position from **D4** position. The countershaft reverse gear is engaged when shifted from **R** position.



Description

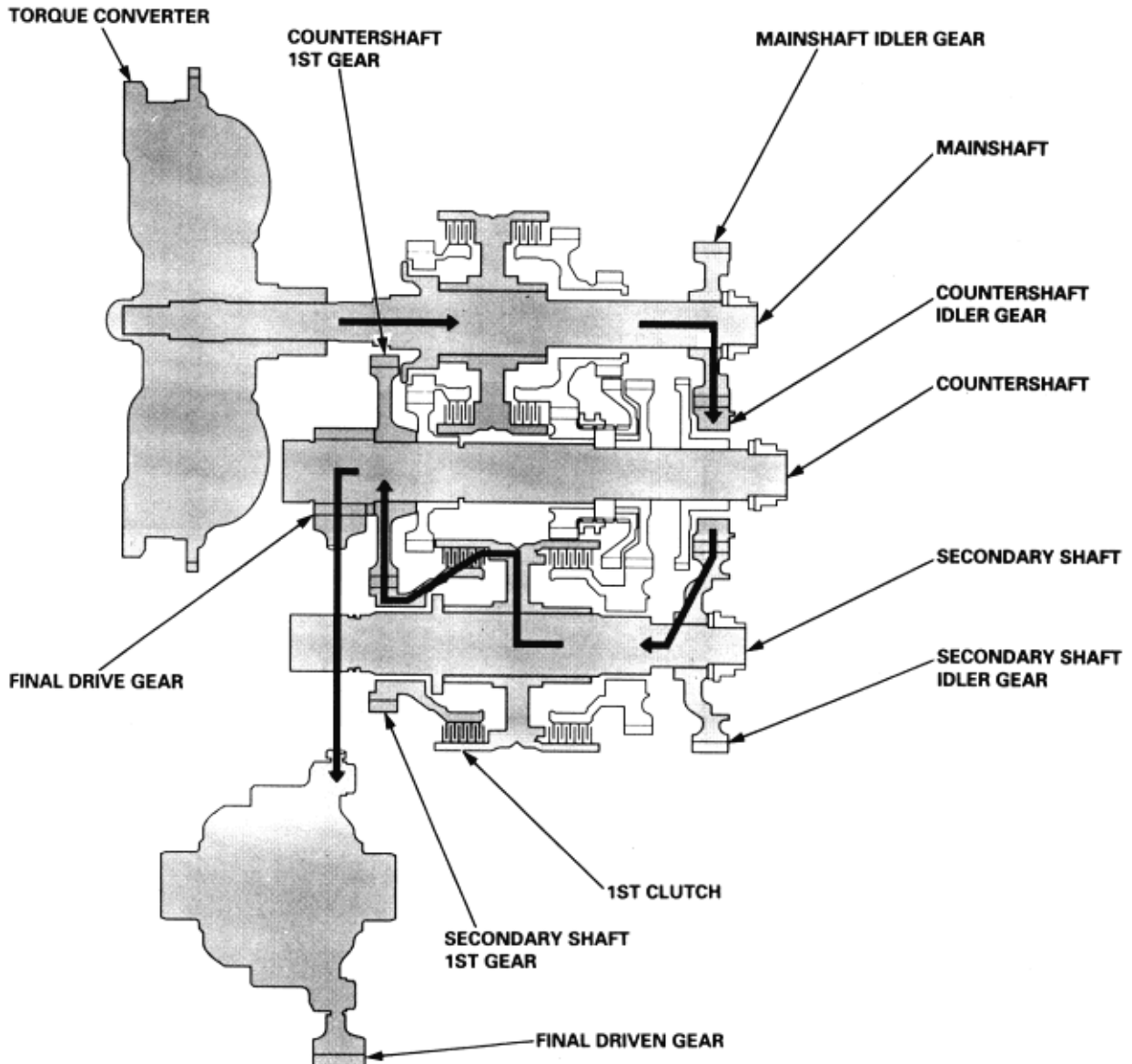
Power Flow (cont'd)

14-10

In **D4** or **D3** position, the optimum gear is automatically selected from the 1st, 2nd, 3rd and 4th gears, according to conditions such as the balance between the throttle opening (engine loading) and vehicle speed.

D4 or **D3** Position in 1st gear and **1** Position

1. Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
2. The mainshaft idler gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
3. The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
4. Power is transmitted to the final drive gear, which in turn drives the final driven gear.



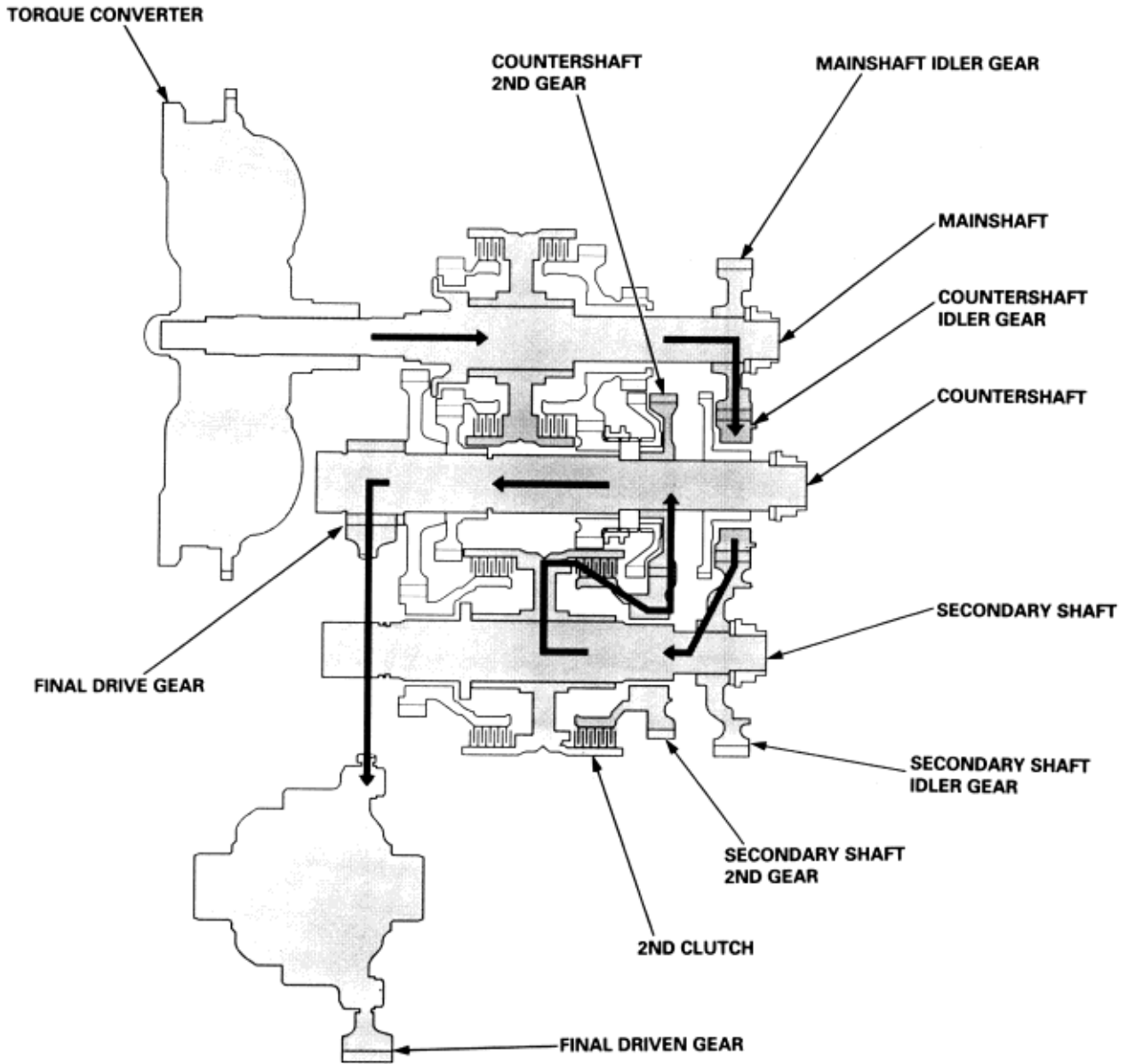
Description

Power Flow (cont'd)

14-11

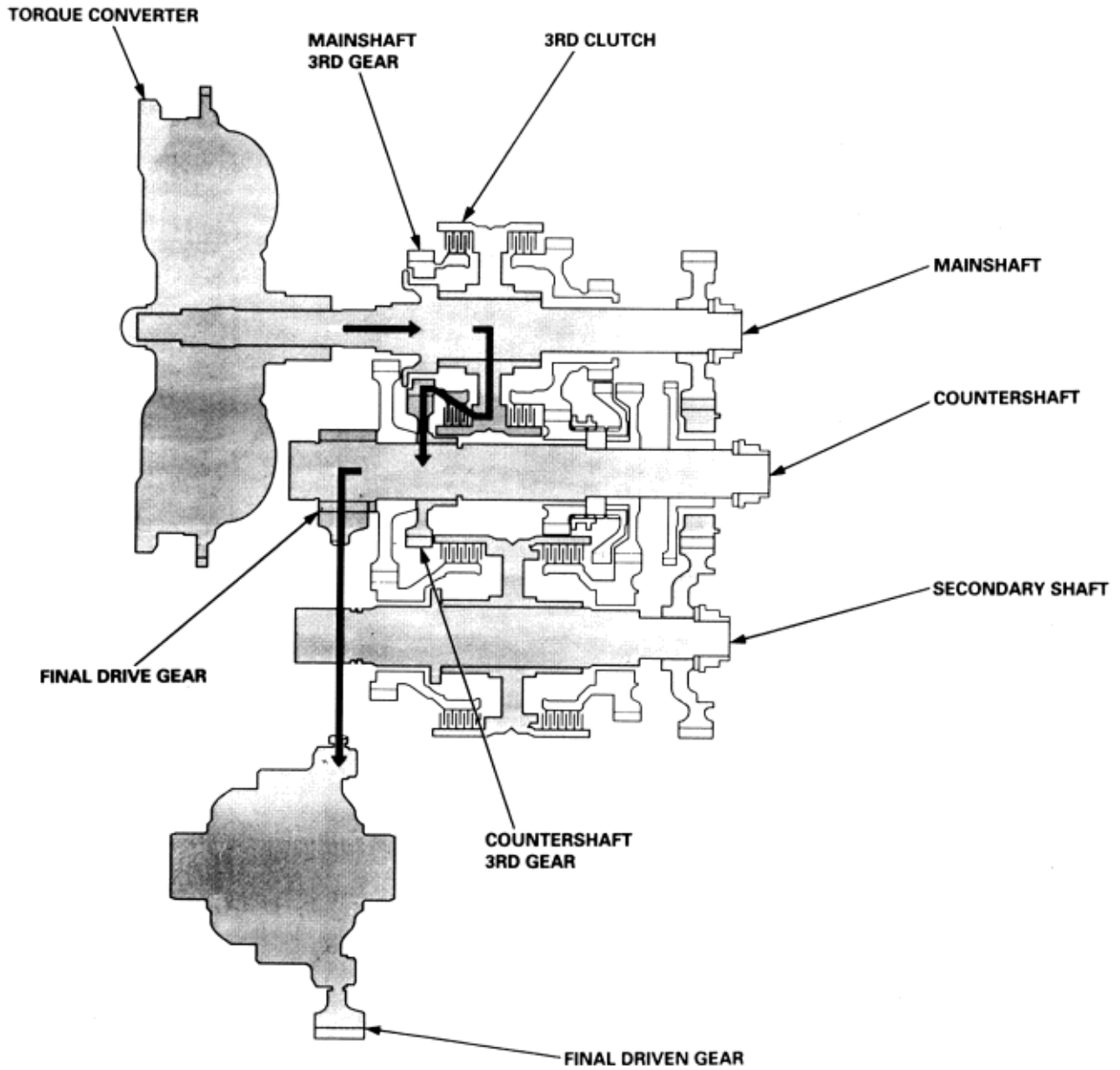
D4 or **D3** Position in 2nd gear and **2** Position

1. Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
2. The mainshaft idler gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
3. The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
4. Power is transmitted to the final drive gear, which in turn drives the final driven gear.



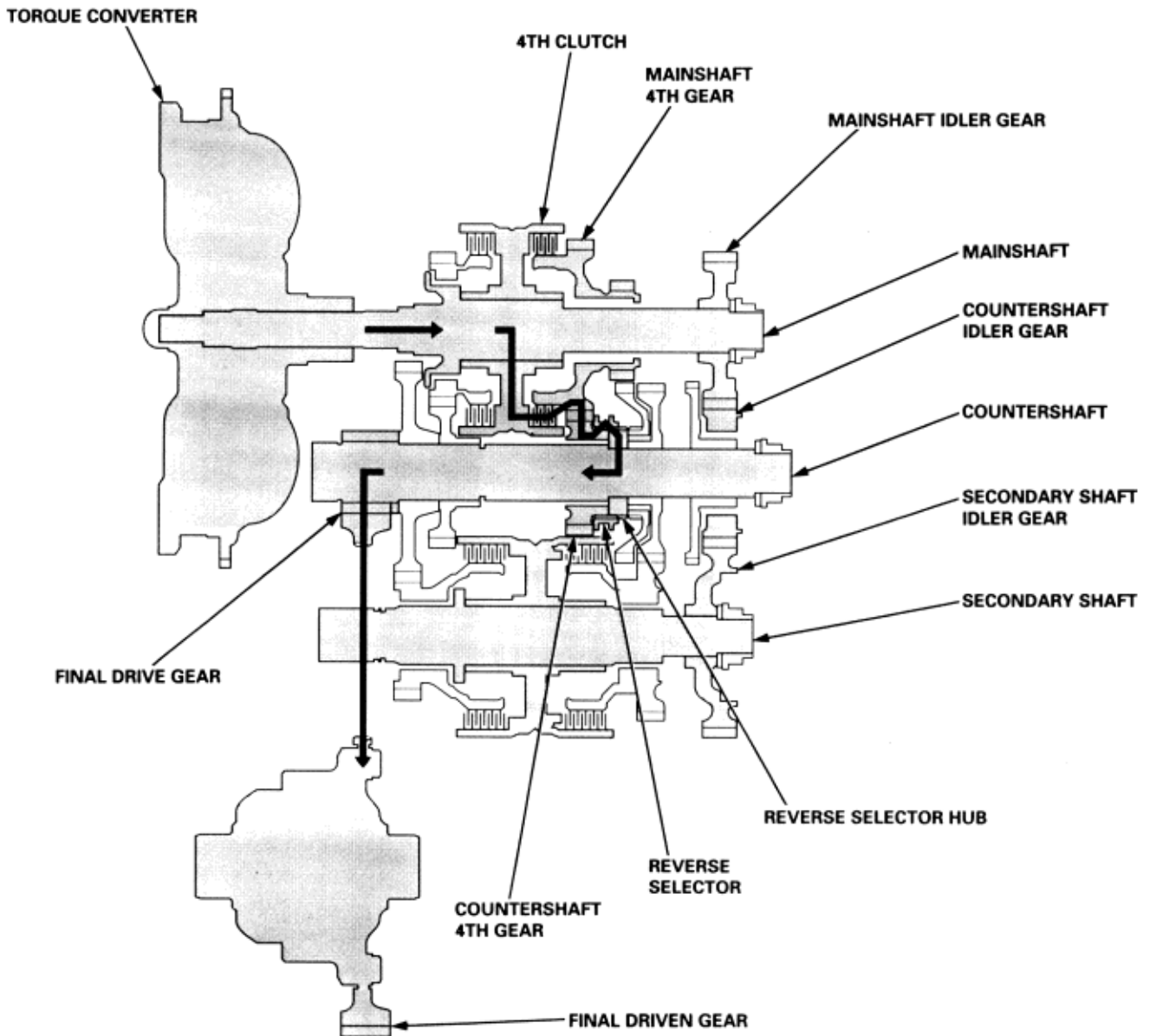
D4 or **D3** Position in 3rd gear

1. Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the mainshaft 3rd gear with the mainshaft.
2. The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
3. Power is transmitted to the final drive gear, which in turn drives the final driven gear.



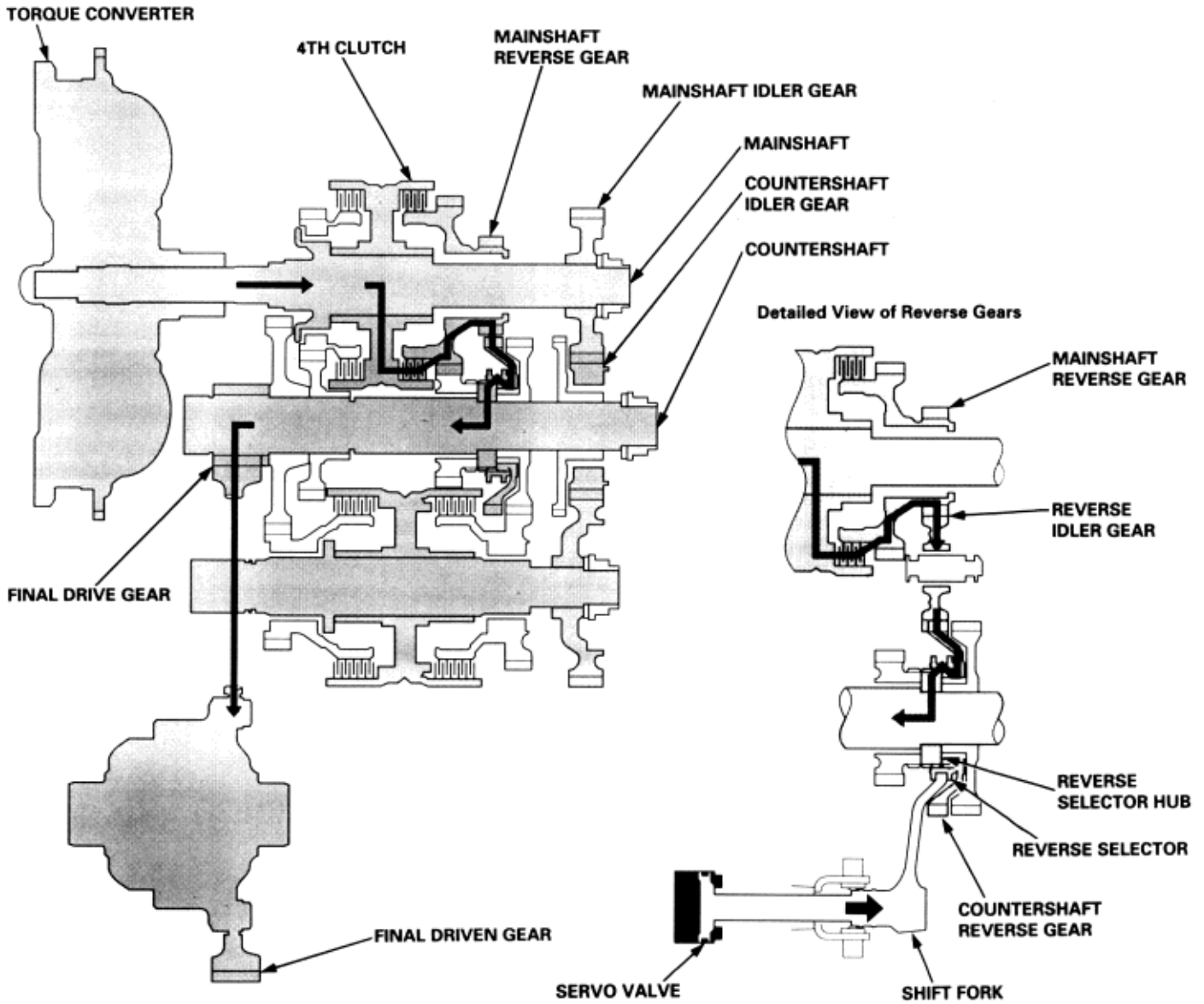
D4 Position in 4th gear

1. Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 4th gear while the shift lever is in the forward range (D4, D3, 2 and 1 position).
2. Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
3. The mainshaft 4th gear drives the countershaft 4th gear, which drives the reverse selector hub and the countershaft.
4. Power is transmitted to the final drive gear, which in turn drives the final driven gear.



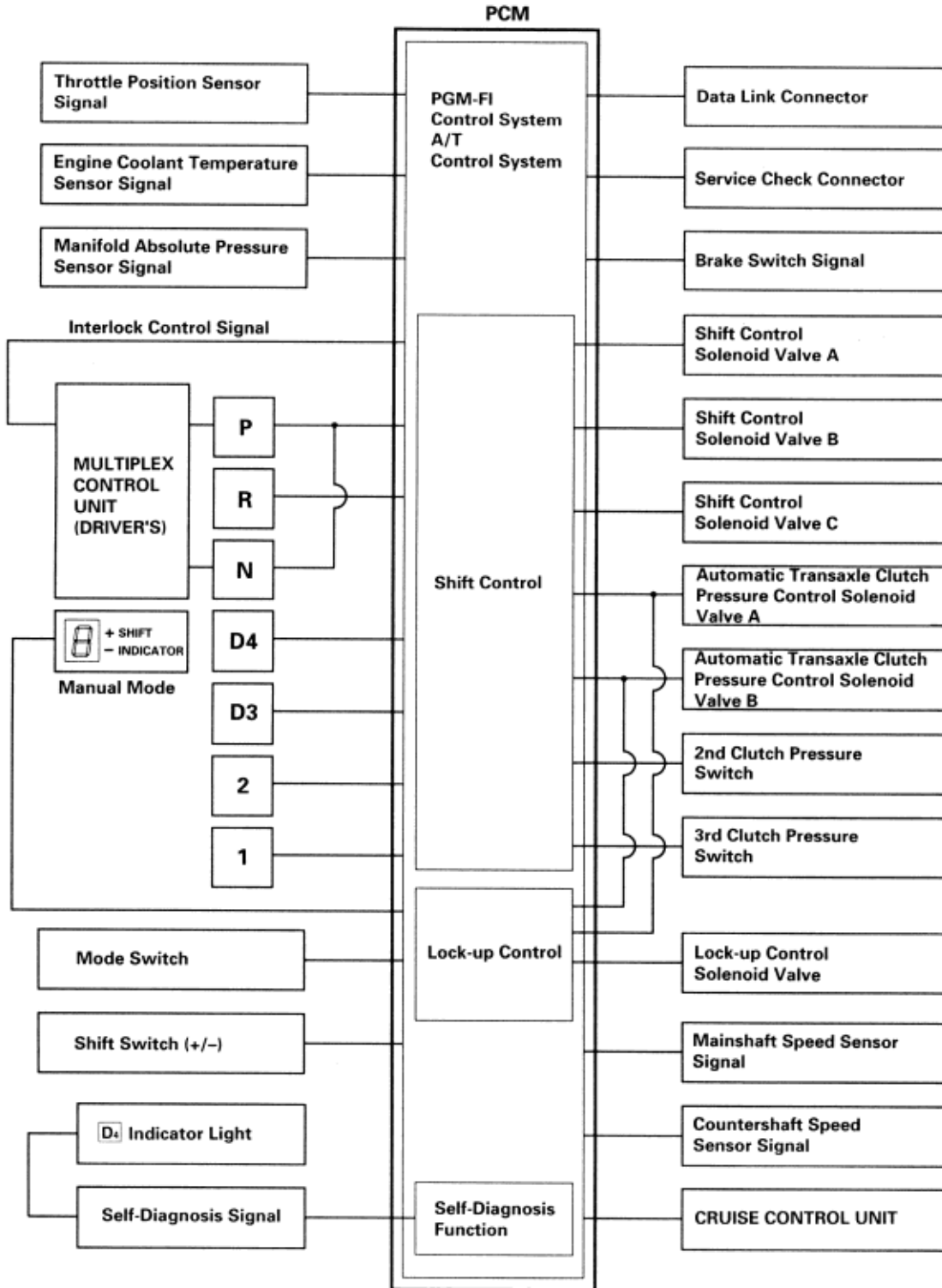
R Position

1. Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft reverse gear while the shift lever is in the **R** position.
2. Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft reverse gear with the mainshaft.
3. The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
4. The rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
5. Power is transmitted to the final drive gear, which in turn drives the final driven gear.



Electronic Control

The electronic control system consists of the Powertrain Control Module (PCM), sensors and six solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel behind the center console.



Shift Control

Shifting is related to engine torque through the A/T clutch pressure control solenoids which are controlled by the PCM. The PCM instantly determines which gear should be selected by various signals sent from sensors, and actuates the shift control solenoid valves A, B and C to control shifting. Also, a Grade Logic Control System has been adopted to control shifting in **D4** and **D3** while the vehicle is ascending or descending a slope, or reducing speed.

The combination of driving signals to shift control solenoid valves A, B and C is shown in the table below.

Position	Gear position	Shift control solenoid valves		
		A	B	C
D4 , D3	Shifting from N position	ON	ON	ON
D4 , D3	Stays in 1st	OFF	ON	ON
D4 , D3	Shifting gears between 1st and 2nd	ON	ON	ON
D4 , D3	Stays in 2nd	ON	ON	OFF
D4 , D3	Shifting gears between 2nd and 3rd	ON	OFF	OFF
D4 , D3	Stays in 3rd	ON	OFF	ON
D4	Shifting gears between 3rd and 4th	OFF	OFF	ON
D4	Stays in 4th	OFF	OFF	OFF
2	2nd	ON	ON	OFF
1	1st	OFF	ON	ON
R	Shifting from N and P position	OFF	ON	ON
R	Stays in reverse	OFF	ON	OFF
P	Parking	OFF	ON	OFF
N	Neutral	OFF	ON	OFF

Manual mode

In **D4** position with sliding the shift lever to the manual mode position, the driver can use the shift lever to shift gears up and down; much like a manual transmission.

- Pushing the shift lever toward the "+" mark: Transmission upshifts to the next higher gear.
- Pulling the shift lever toward the "-" mark: Transmission downshifts.

The number of the selected gear is displayed in the shift indicator next to the **D4** indicator.

The transmission does not automatically upshift and downshift, and remains in the selected gear position (4th, 3rd 2nd and 1st). However, the transmission will automatically downshift as follows:

- Downshift from 4th gear to 3rd gear to get more power when climbing or to provide engine braking when going down a steep hill.
- Downshift to 1st gear when the vehicle comes to stop.

To prevent engine over-revving, the transmission has 4-3, 3-2 and 2-1 downshift allowable speeds. When the vehicle is coasting over the 4-3 downshift allowable speed, 3-2 downshift allowable speed and 2-1 downshift allowable speed, the PCM does not input the downshift signal from the shift switch, and the transmission does not downshift. When the vehicle is coasting over the 4-3 downshift allowable speed in 4th gear, and the 3-2 downshift allowable speed in 3rd gear, the PCM inputs the signal to wait until it reaches the downshift allowable speed, then the shift indicator blinks to indicate the lower gear position several times.

Description

Electronic Control System (cont'd)

14-17

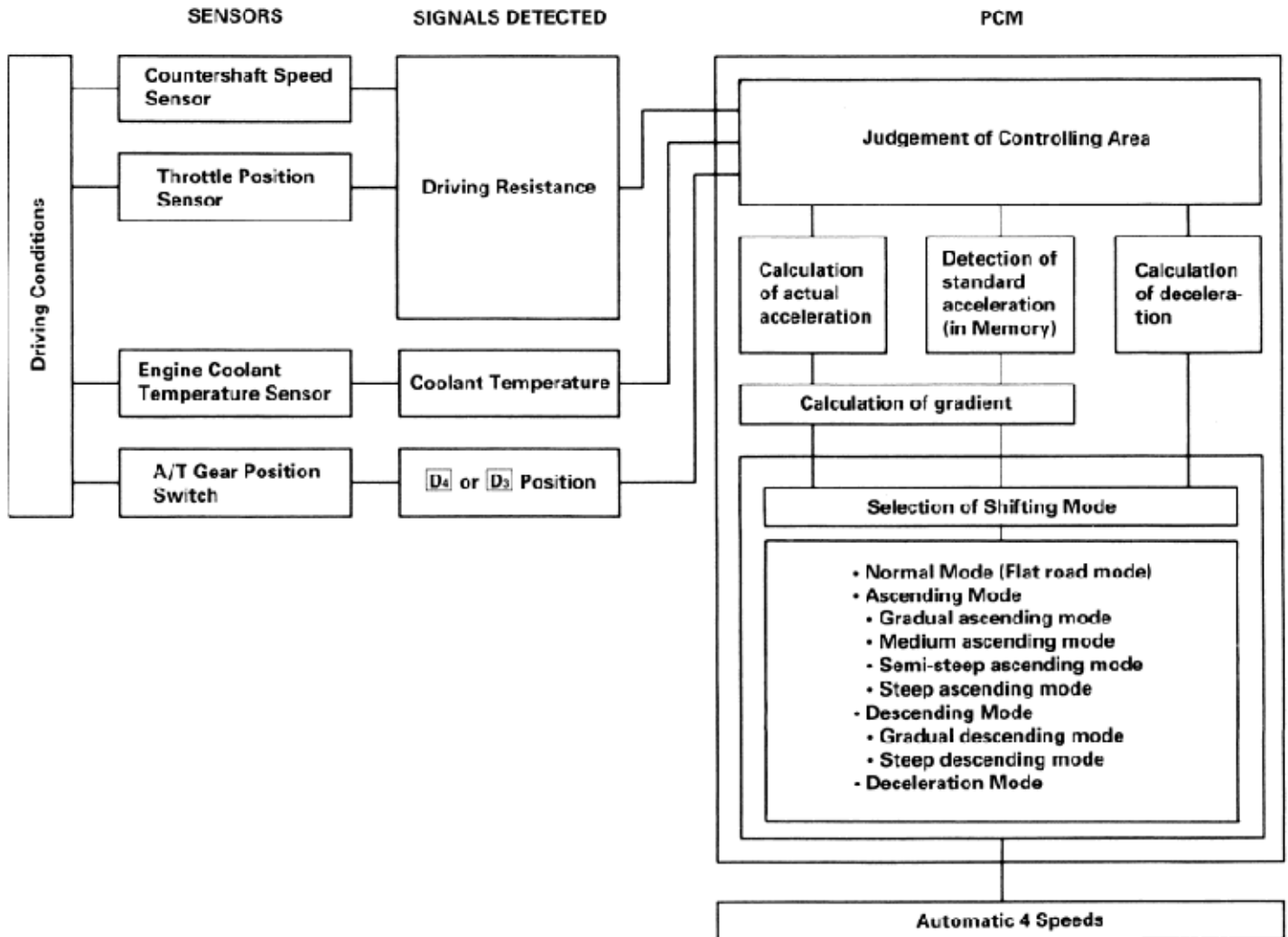
Lock-up Control

The lock-up control solenoid valve controls the modulator pressure to switch the lock-up shift valve and lock-up ON and OFF. The PCM controls the lock-up control solenoid valve and the A/T clutch pressure control solenoid valves A and B. When the lock-up control solenoid valve is turned ON, the condition of lock-up starts. The A/T clutch pressure control solenoid valves A and B regulate the A/T clutch pressure control solenoid pressure, and apply pressure to the lock-up control valve and the lock-up timing valve. The lock-up control mechanism operates in 2nd, 3rd and 4th gear **D4** position, and in 3rd gear, in **D3** position.

Grade Logic Control System

How it works:

The PCM compares actual driving conditions with memorized driving conditions, based on the input from the vehicle speed signal, the throttle position sensor, the engine coolant temperature sensor, the brake switch signal, and the shift lever position signal, to control shifting while the vehicle is ascending or descending a slope, or reducing speed.



Description

Electronic Control System (cont'd)

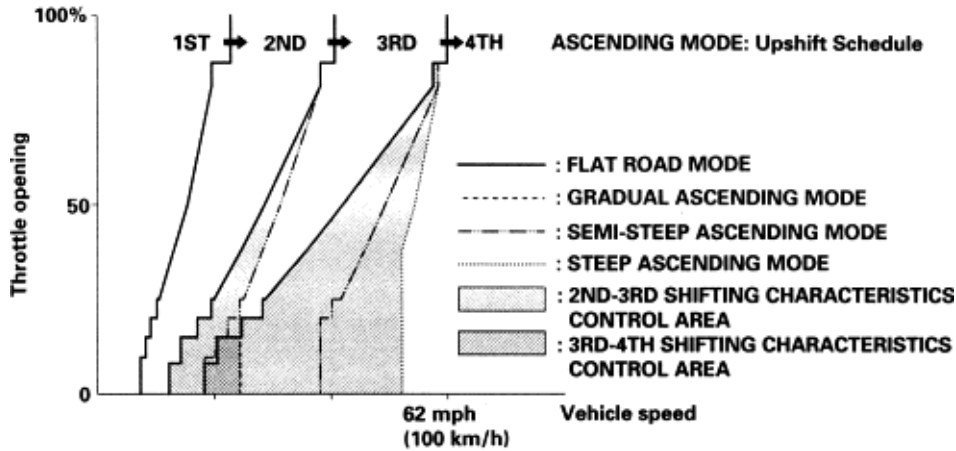
14-18

Ascending Control

When the PCM determines that the vehicle is climbing a hill in **D4** and **D3** positions, the system extends the engagement area of 2nd gear and 3rd gear to prevent the transmission from frequently shifting between 2nd and 3rd gears, and between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

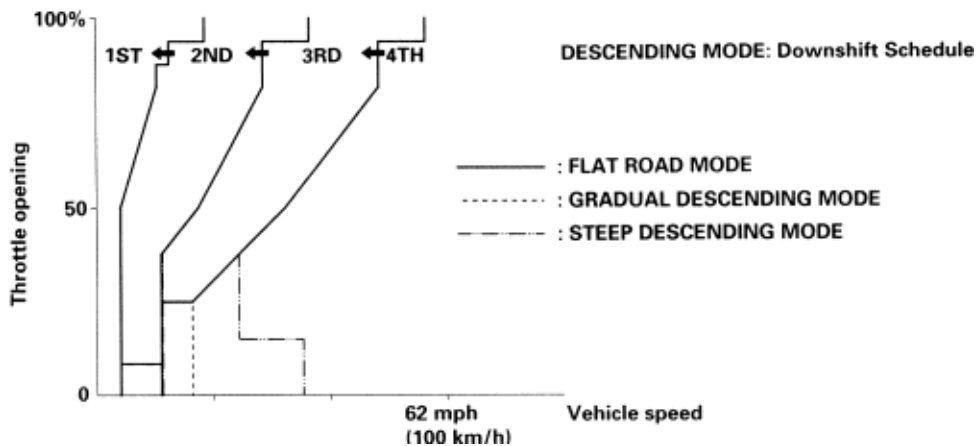
NOTE:

- Shift schedules stored in the PCM between 2nd and 3rd gears, and between 3rd and 4th gears, enable the PCM's fuzzy logic to automatically select the most suitable gear according to the magnitude of a gradient.
- Fuzzy logic is a form of artificial intelligence that lets computers respond to changing conditions much like a human



Descending Control

When the PCM determines that the vehicle is going down a hill in **D4** and **D3** positions, the shift-up speed from 3rd to 4th gear and from 2nd to 3rd (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 3rd gear and 2nd gear driving areas. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 3rd gear driving areas and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 4th gear, and you are decelerating when you are applying the brakes on a steep hill, the transmission will downshift to 3rd gear. When you accelerate, the transmission will then return to higher gear.

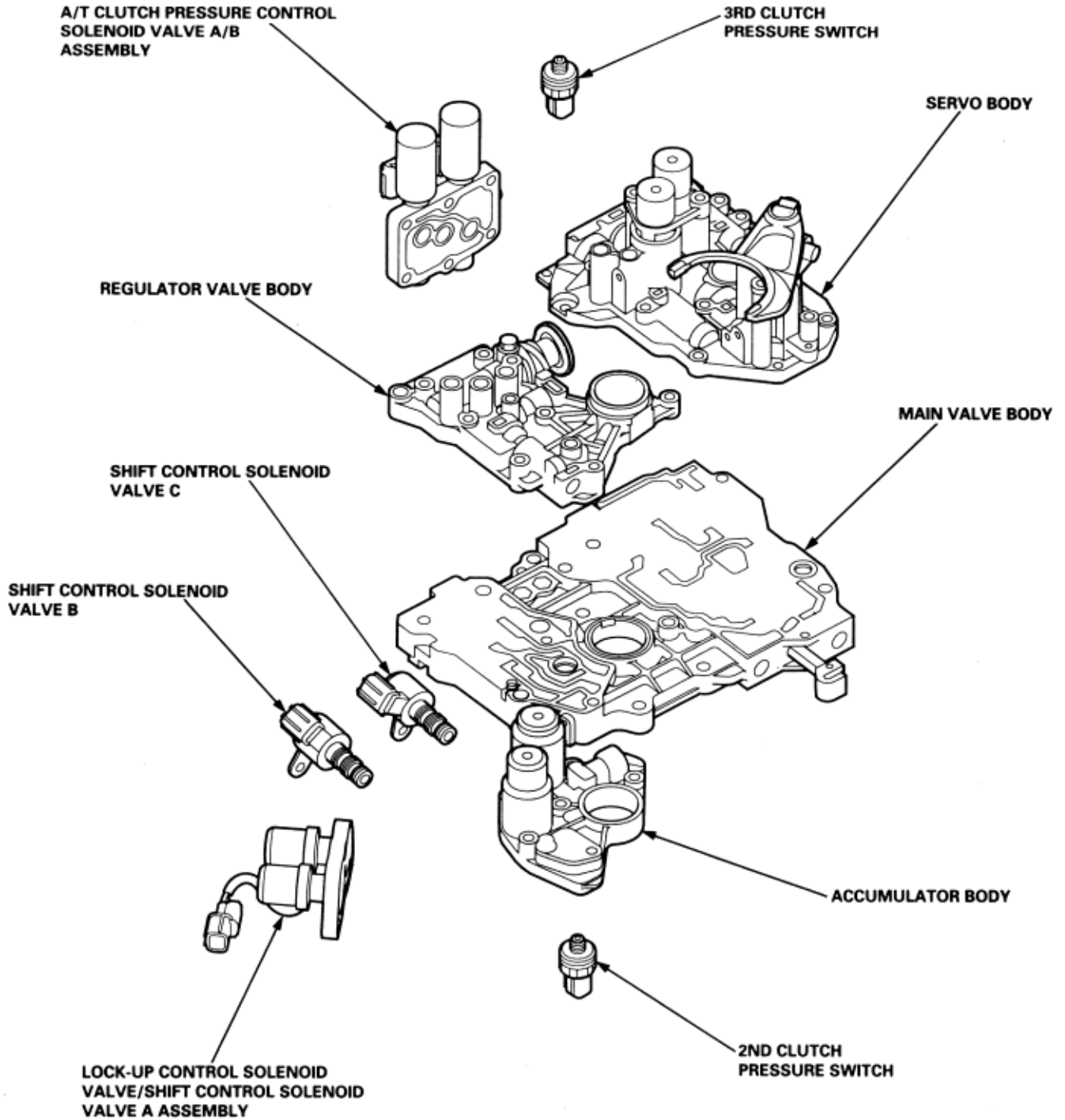


Deceleration Control

When the vehicle goes around a corner, and needs to decelerate first and then accelerate, the PCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 27 mph (43 km/h), the PCM shifts the transmission from 4th to 2nd earlier than normal to cope with upcoming acceleration.

Hydraulic Control

The valve body includes the main valve body, the regulator valve body, the servo body and the accumulator body. The ATF pump is driven by splines on the right end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body, to the manual valve directing pressure to each of the clutches. The shift control solenoid valves B and C mounted on the outside of the torque converter housing. The shift control solenoid valve A and the lock-up control solenoid valve are mounted on the torque converter housing as an assembly. The A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing.



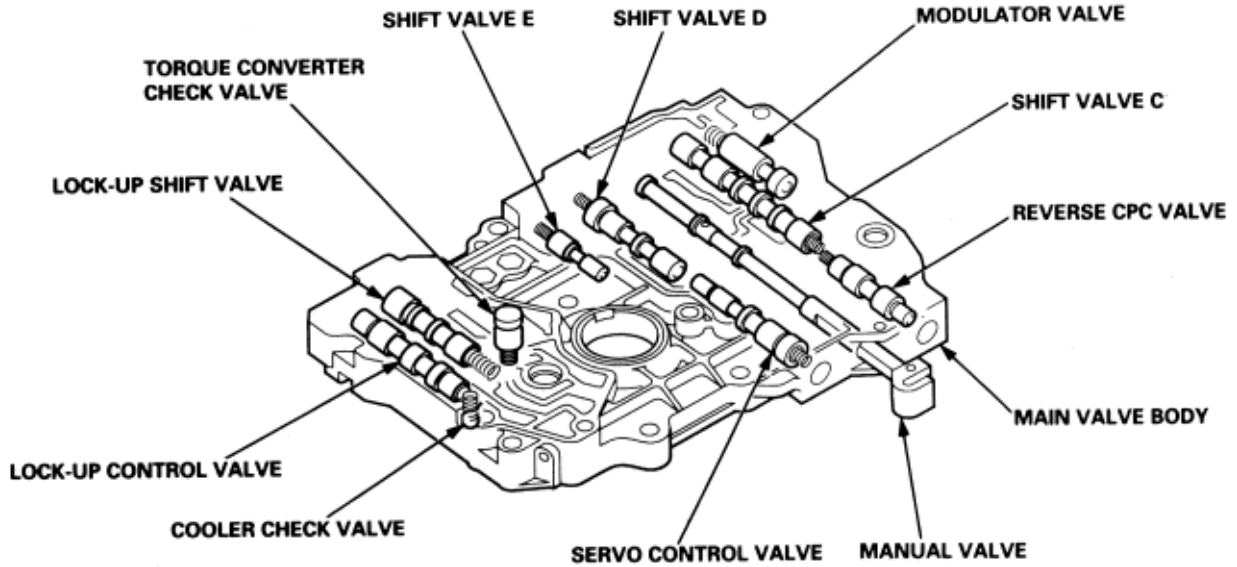
Description

Hydraulic Control (cont'd)

14-21

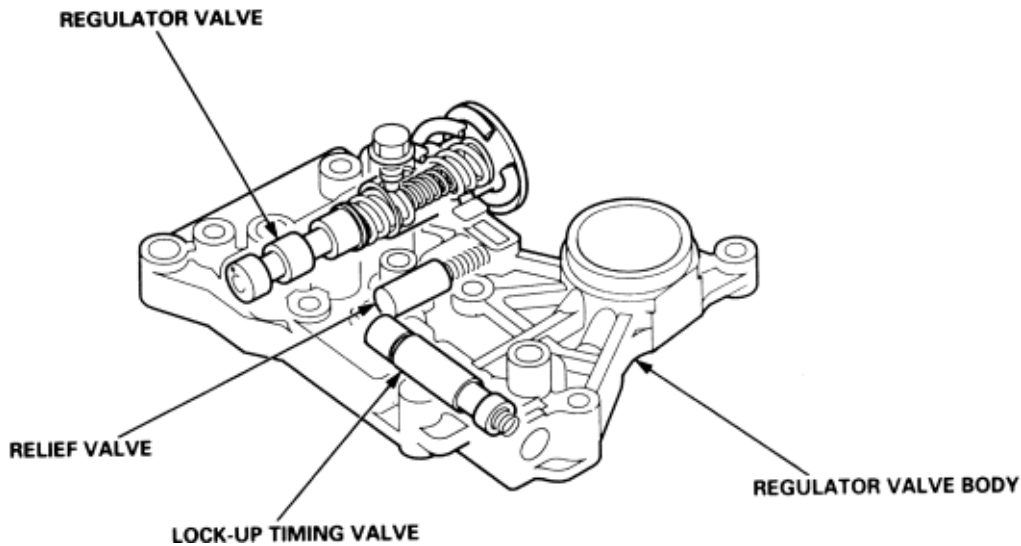
Main Valve Body

The main valve body contains the manual valve, the modulator valve, the shift valve C, the shift valve D, the shift valve E, the servo control valve, the torque converter check valve, the reverse CPC valve, the lock-up shift valve, the lock-up control valve, the cooler check valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

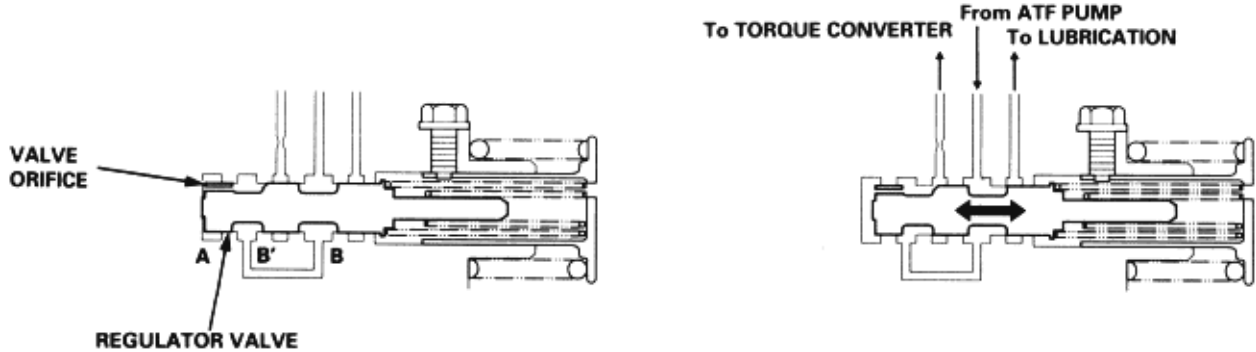
The regulator valve body is located on the main valve body. The regulator valve body contains the regulator valve, the lock-up timing valve and the relief valve.



Regulator Valve

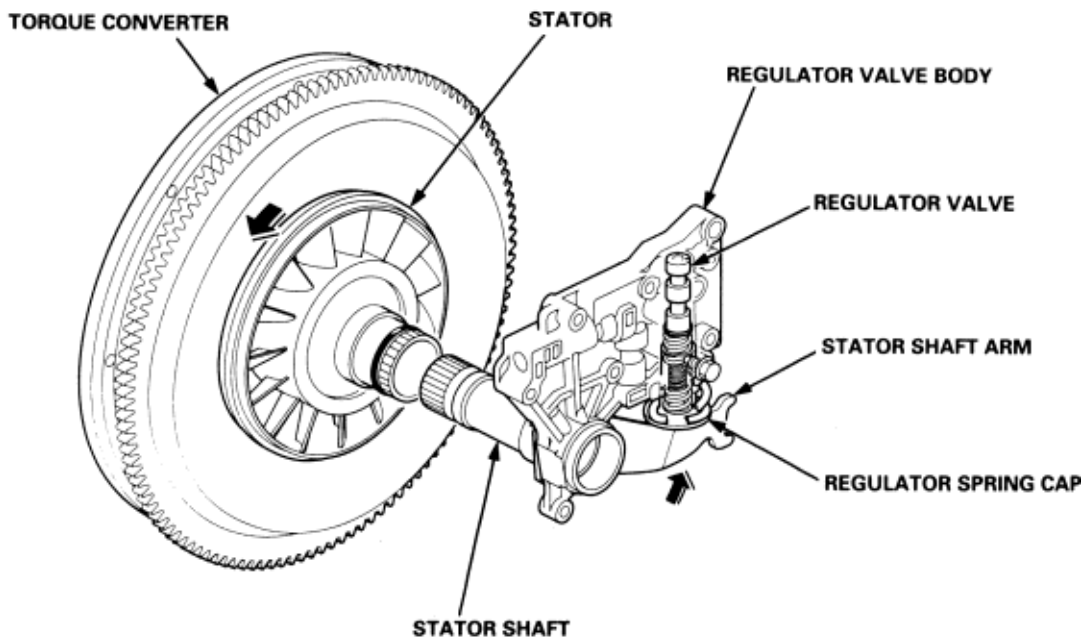
The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. The fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through torque converter also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Stator Reaction Hydraulic Pressure Control

Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined with the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



Description
Hydraulic Control (cont'd)

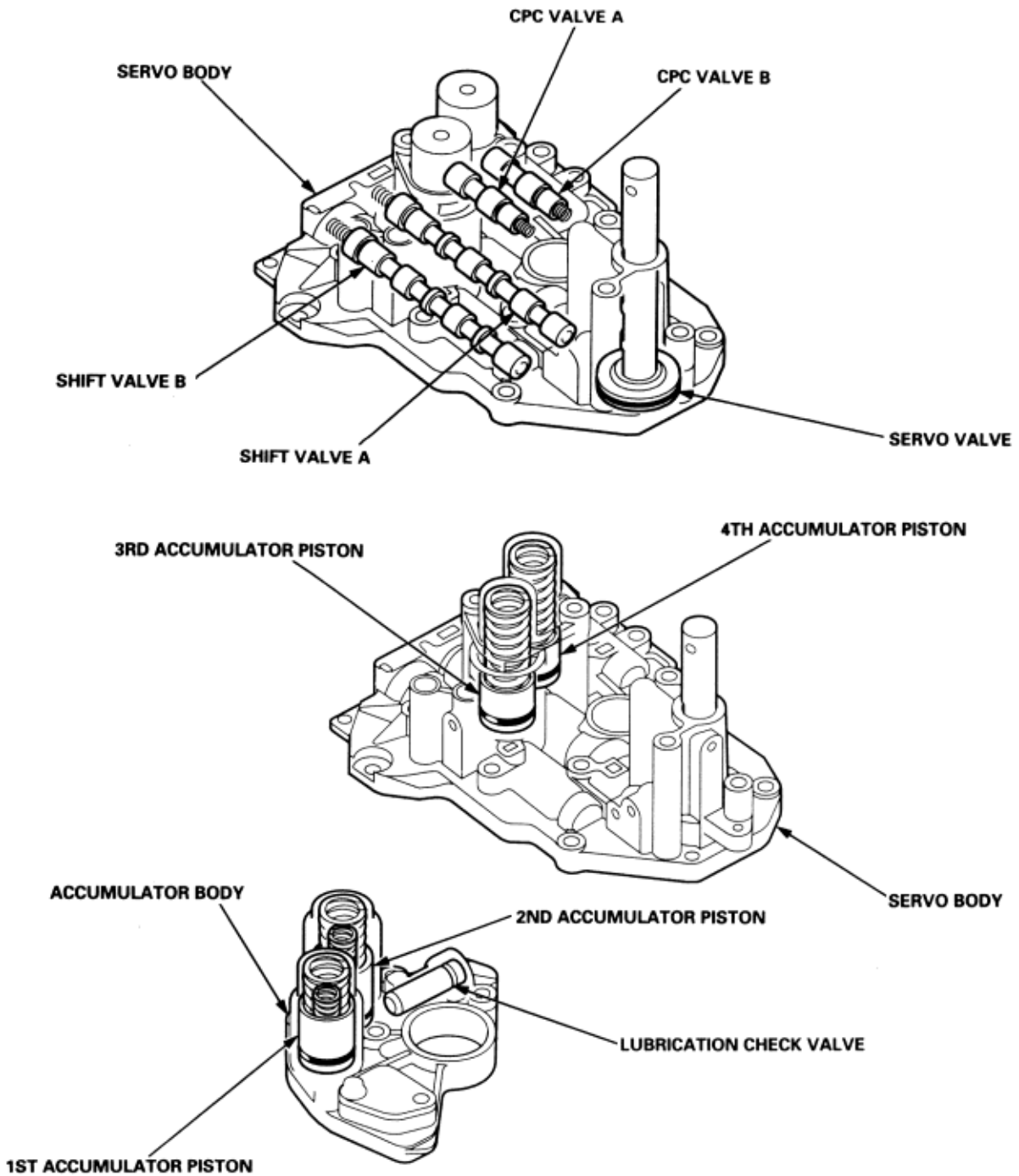
14-23

Servo Body

The servo body is on the main valve body. it contains the servo valve, the shift valve A, the shift valve B, the CPC valves A and B, the 3rd and 4th accumulators.

Accumulator Body

The accumulator body is on the torque converter housing, next to the main valve body. It contains the 1st and 2nd accumulators and the lubrication check valve.



Hydraulic Flow

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve, and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising. The PCM controls the shift control solenoid valves ON and OFF, and the shift control solenoid valves apply shift control solenoid pressure to the shift valves. Applying shift control solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of hydraulic pressure. The PCM also controls A/T clutch pressure control solenoid valves A and B. The A/T clutch pressure control solenoid valves regulate A/T clutch pressure control solenoid pressure and apply A/T clutch pressure control solenoid pressure to CPC valves A and B.

When shifting between upper gear and lower gear, the clutch is engaged by pressure from the CPC pressure mode. The PCM controls one of the shift control solenoid valves to move the position of the shift valve. This movement switches the port of the CPC and line pressure. Line pressure is then applied to the clutch, and CPC pressure is intercepted. Engaging the clutch with line pressure happens when shifting is completed.

Hydraulic pressure at the ports are as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	5H	CPC B or LINE	57	LS B
3	LINE	5J	CPC B or LINE	58	LS A or LS B
3'	LINE	5K	CPC B or LINE	90	TORQUE CONVERTER
3"	LINE	5K'	CPC B or LINE	90'	TORQUE CONVERTER
4	LINE	6	MODULATE	91	TORQUE CONVERTER
4'	LINE	SA	SH A	91'	TORQUE CONVERTER
4"	LINE	SB	SH B	92	TORQUE CONVERTER
4A	CPC A	SC	SH C	93	ATF COOLER
4B	CPC B	LA	LC	94	TORQUE CONVERTER
5A	CPC A	9	LINE	95	LUBRICATION
5D	CPC B	10	1ST CLUTCH	95'	LUBRICATION
5B	CPC A or LINE	20	2ND CLUTCH	96	TORQUE CONVERTER
5E	CPC A or LINE	25	LINE	97	TORQUE CONVERTER
5F	CPC A or LINE	30	3RD CLUTCH	99	SUCTION
5F'	CPC A or LINE	40	4TH CLUTCH	X	DRAIN
5C	CPC B or LINE	41	4TH CLUTCH	HX	HIGH POSITION DRAIN
5G	CPC B or LINE	56	LS A	AX	AIR DRAIN

NOTE:

- ◆ CPC: Clutch Pressure Control pressure
- ◆ SH: Shift Control Solenoid pressure
- ◆ LS: A/T Clutch Pressure Control solenoid pressure
- ◆ LC: Lock-up Control Solenoid pressure

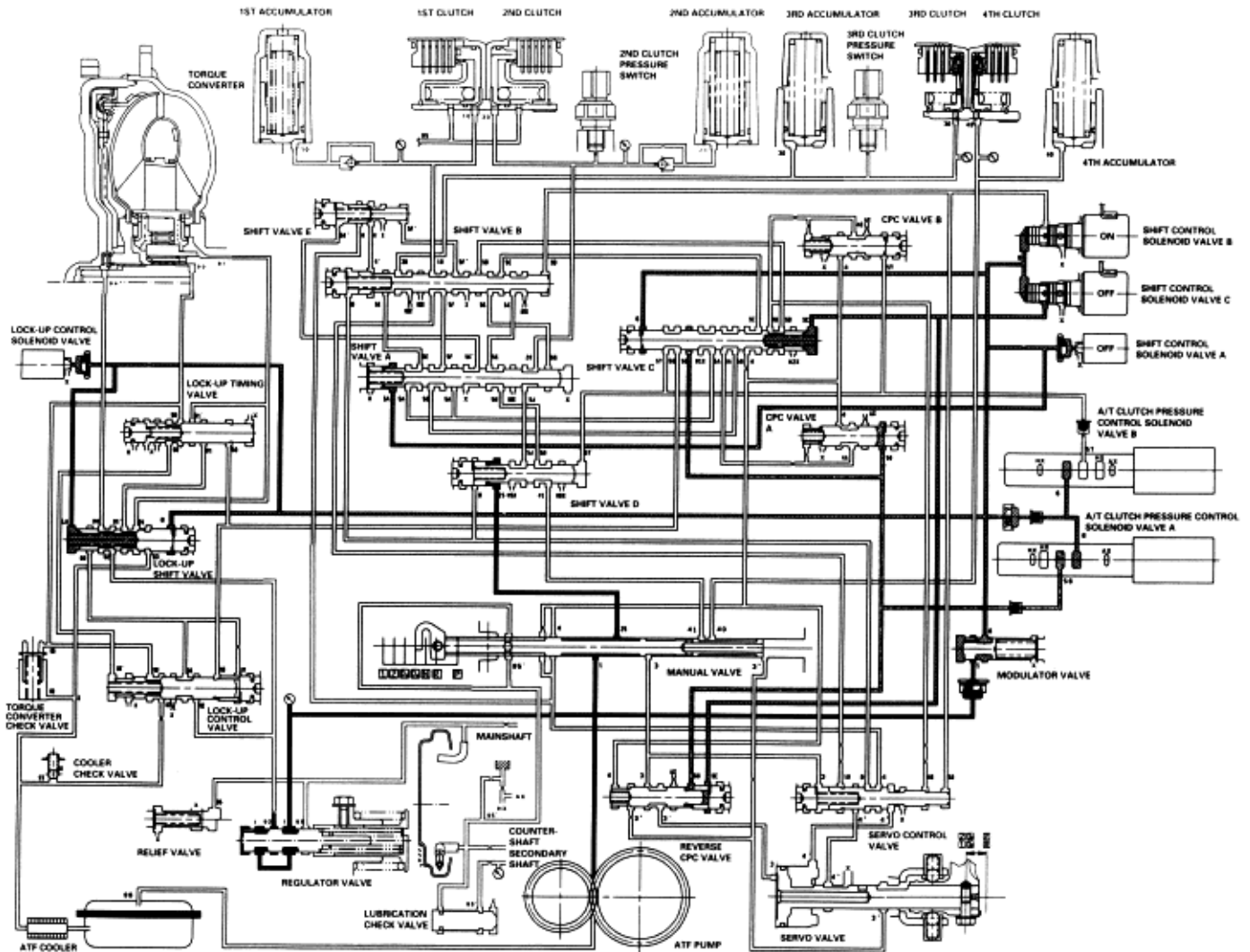
N Position

The PCM controls the shift control solenoid valves. The conditions of the shift control solenoid valve and positions of the shift valve are as follows:

- Shift control solenoid valve A is turned OFF, and the shift valve A is moved to the left side.
- Shift control solenoid valve B is turned ON, and the shift valve B remains in the right side.
- Shift control solenoid valve C is turned OFF, and the shift valve C remains in the left side.

Line pressure (1) passes through the manual valve and stops at the shift valve D. Line pressure (1) also flows to the modulator valve, and becomes modulator pressure (6). Modulator pressure (6) flows to the shift control solenoid valves and the A/T clutch pressure control solenoid valves. Under this condition, hydraulic pressure is not applied to the clutches.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

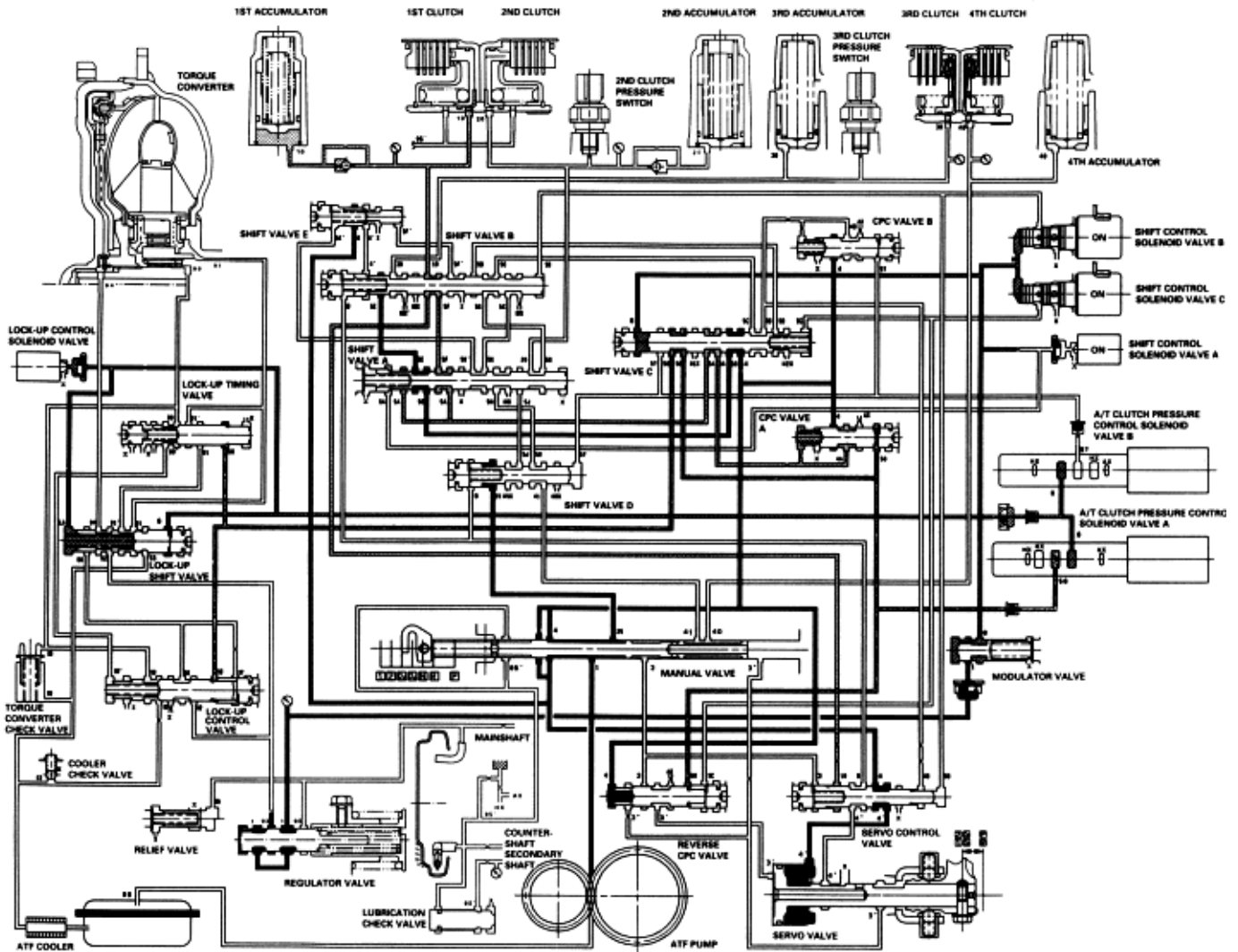


D4 Position

1. 1st gear at shifting from **N** position

The PCM turns shift control solenoid valves A and C ON when shifting to **D4** position from **N**. Shift control solenoid valve B remains ON. Shift control solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released, then shift valve C is moved to the right side. Shift control solenoid valve A is turned ON, and SH A pressure (SA) in the left side of shift valve A is released, then shift valve A is moved to the right side. The A/T clutch pressure control solenoid valve A regulates LS A pressure (56), and applies it to the CPC valve A. Line pressure (1) becomes line pressure (4) at the manual valve, and flows to the shift valve C and the CPC valve A. Line pressure (4A) becomes CPC A pressure (4A) and passes through the shift valve C, A and B, then CPC A pressure (4A) becomes 1st clutch pressure (10) at shift valve B. 1st clutch pressure (10) is applied to the 1st clutch, then the 1st clutch is engaged with pressure of the CPC pressure mode. Line pressure (4) passes through shift valve A and B, and stops at shift valve B.

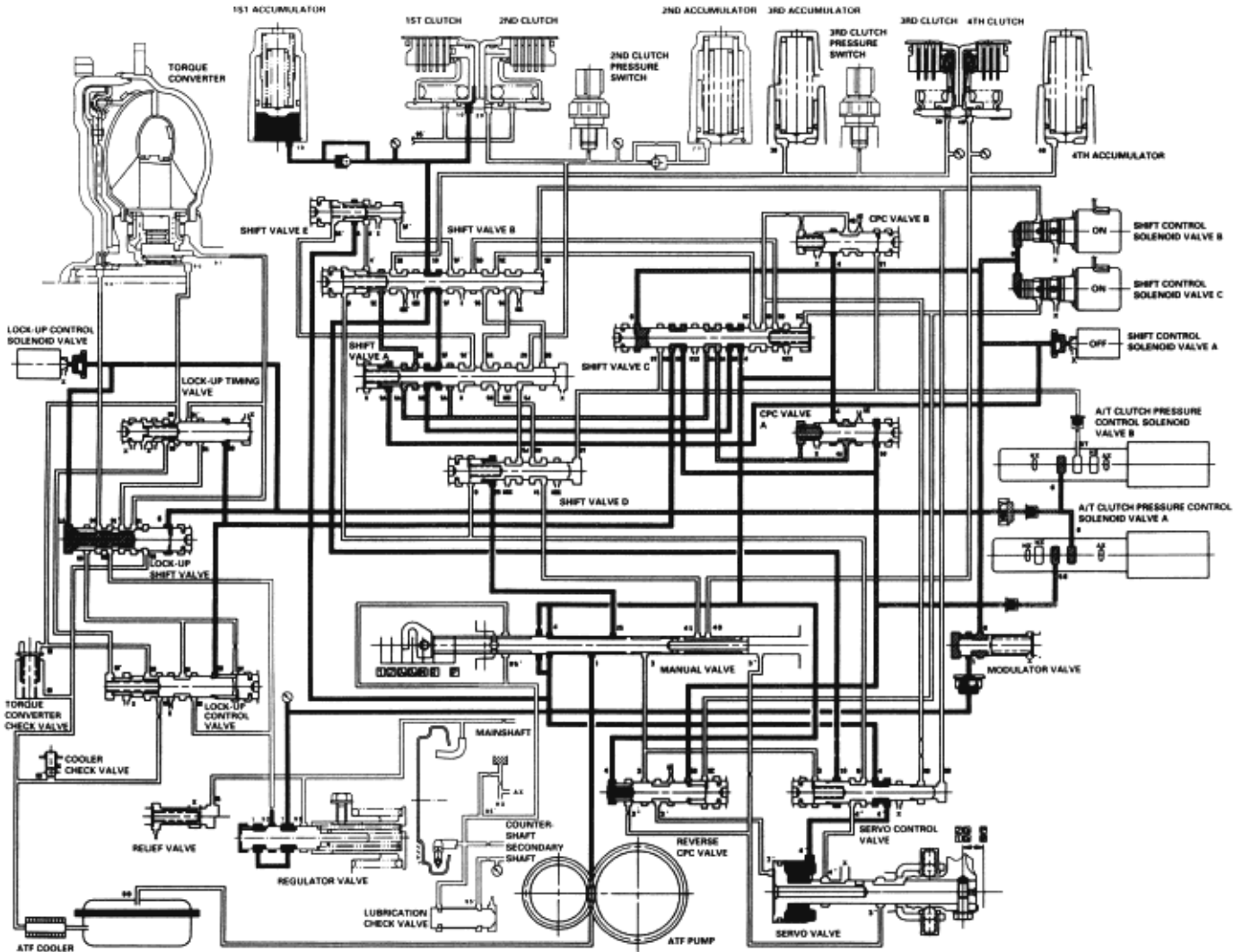
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



2. Driving in 1st gear

The PCM turns shift control solenoid valve A OFF, but shift control solenoid valves B and C remain ON. SH A pressure (SA) is applied to the left side of shift valve A, then shift valve A is moved to the left side. This movement switches the port of line pressure and CPC pressure on shift valve A. The 1st clutch pressure is changed to line pressure mode, and the 1st clutch is engaged securely. The CPC A pressure (5E) stops at shift valve B.

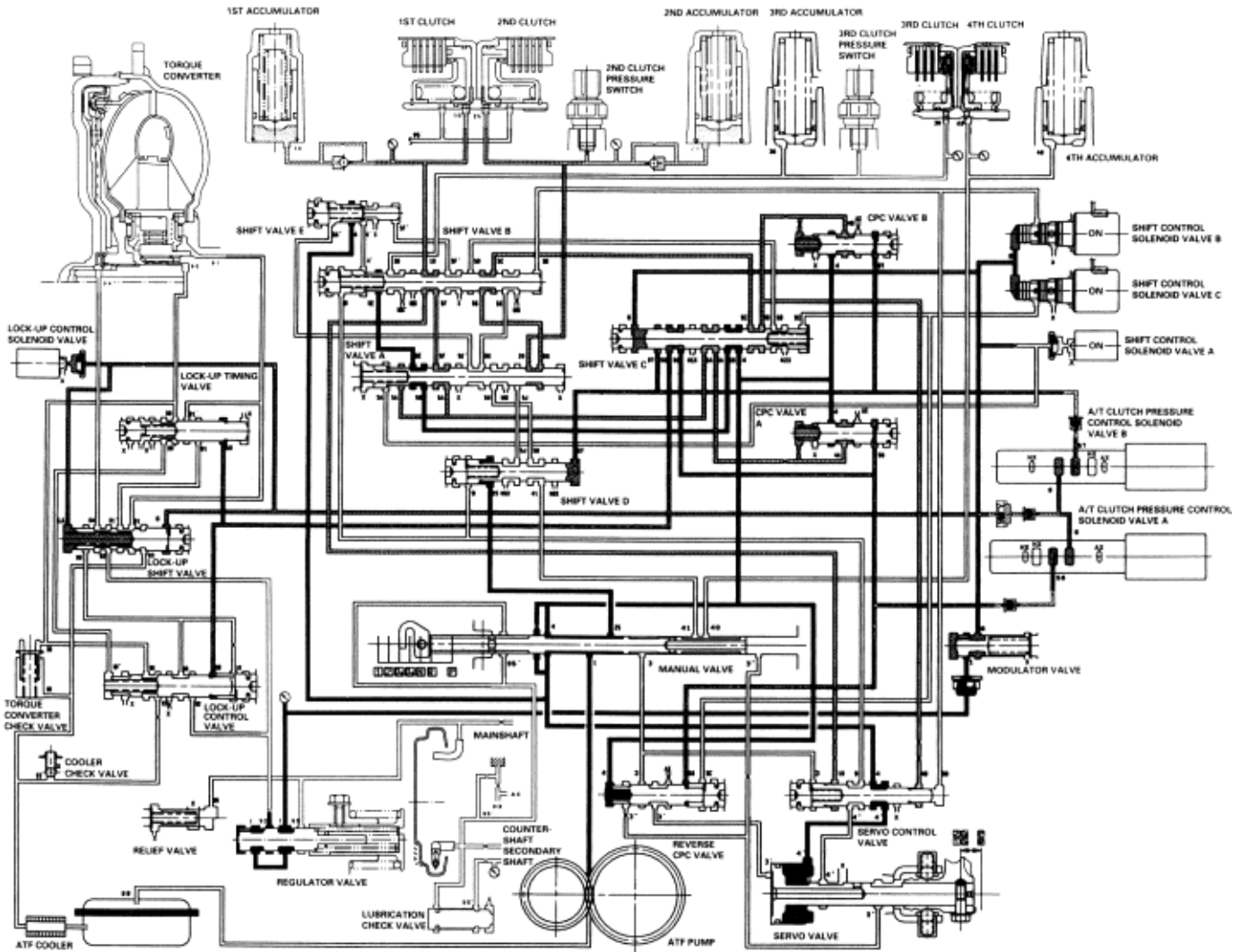
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



3. Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve A ON. Shift control solenoid valves B and C remain ON. Shift control solenoid valve A is turned ON, and SH A pressure (SA) in the left side of the shift valve A is released. Then shift valve A is moved to the right side to switch the port of line pressure and CPC pressure. The PCM also controls the A/T clutch pressure control solenoid valves. The A/T clutch pressure control solenoid valves A and B apply their pressure to the CPC valves A and B. Line pressure (4) becomes CPC B pressure (4B) at the CPC valve B, and CPC B pressure passes through shift valves C, B, and A, to become 2nd clutch pressure. The 1st and 2nd clutches are engaged with the CPC pressure mode.

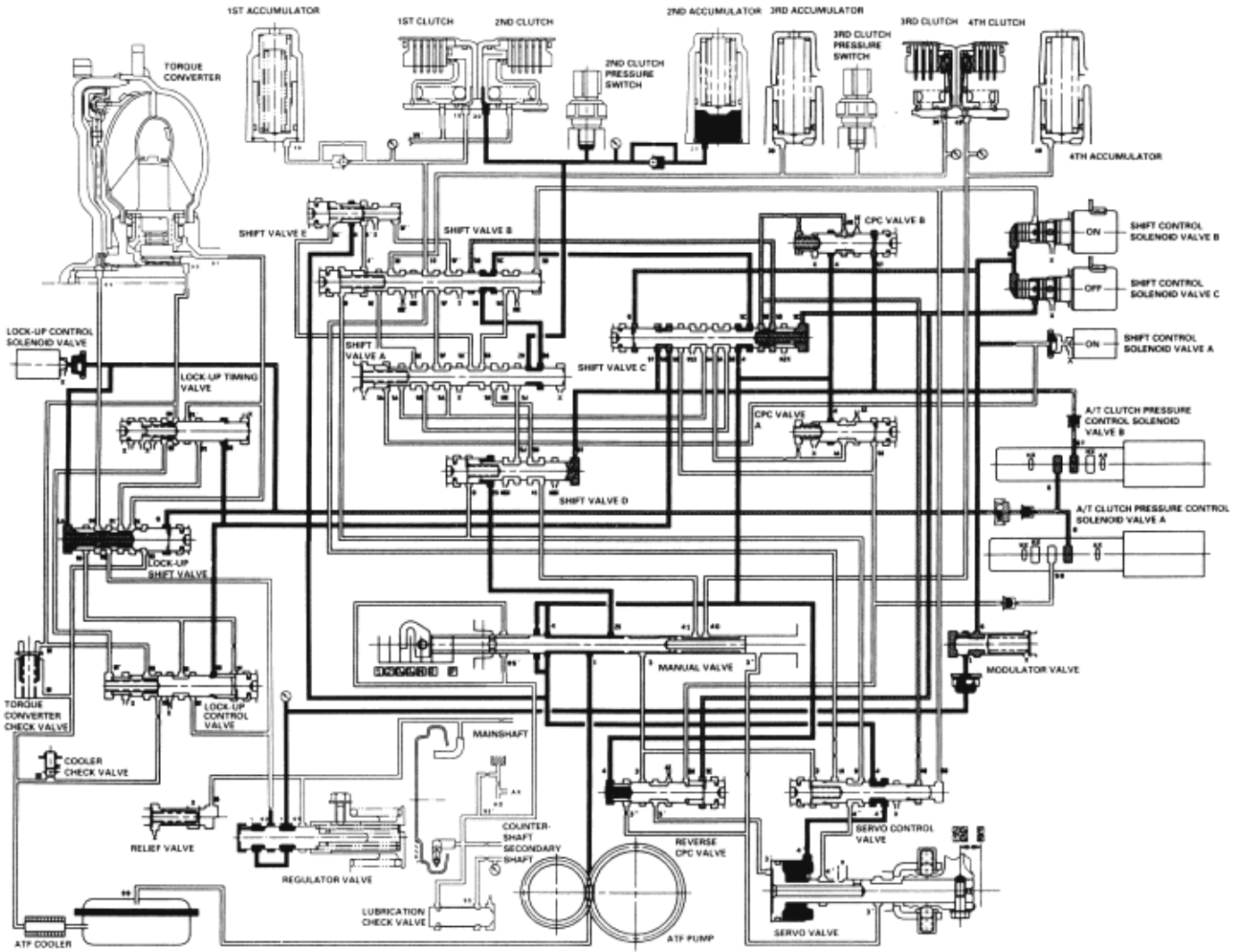
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



4. Driving in 2nd gear

The PCM turns shift control solenoid valve C OFF, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56). The shift control solenoid valves A and B remain ON. Releasing LS A pressure in the CPC valve A releases CPC A pressure in the 1st clutch pressure circuit. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of it. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. The 2nd clutch pressure is changed to line pressure mode, and the 2nd clutch is engaged securely. The CPC B pressure (5D) stops at shift valve B.

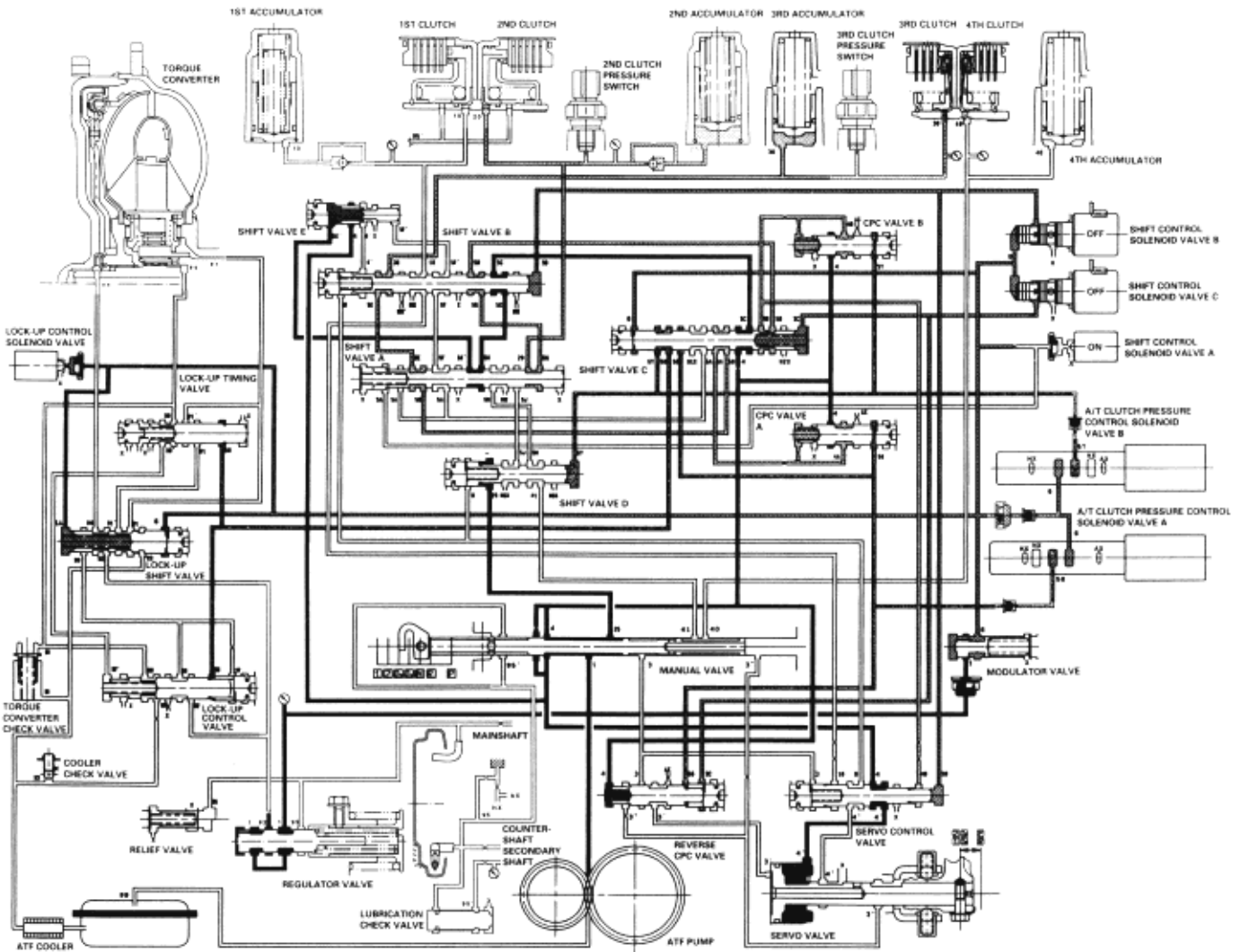
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



5. Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve B OFF. The PCM also controls A/T clutch pressure control solenoid valve A to apply LS A pressure (56) to the CPC valve A. Shift control solenoid valve A remains ON, and C remains OFF. Shift control solenoid valve B is turned OFF, and SH B pressure (SB) is applied to the right side of shift valve B. Then shift valve B is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC A pressure (4A) at the CPC valve A. The CPC A pressure (4A) becomes 3rd clutch pressure (30) at shift valve B, and flows to the 3rd clutch. The 2nd clutch pressure is changed to CPC pressure mode by switching the position of shift valve B.

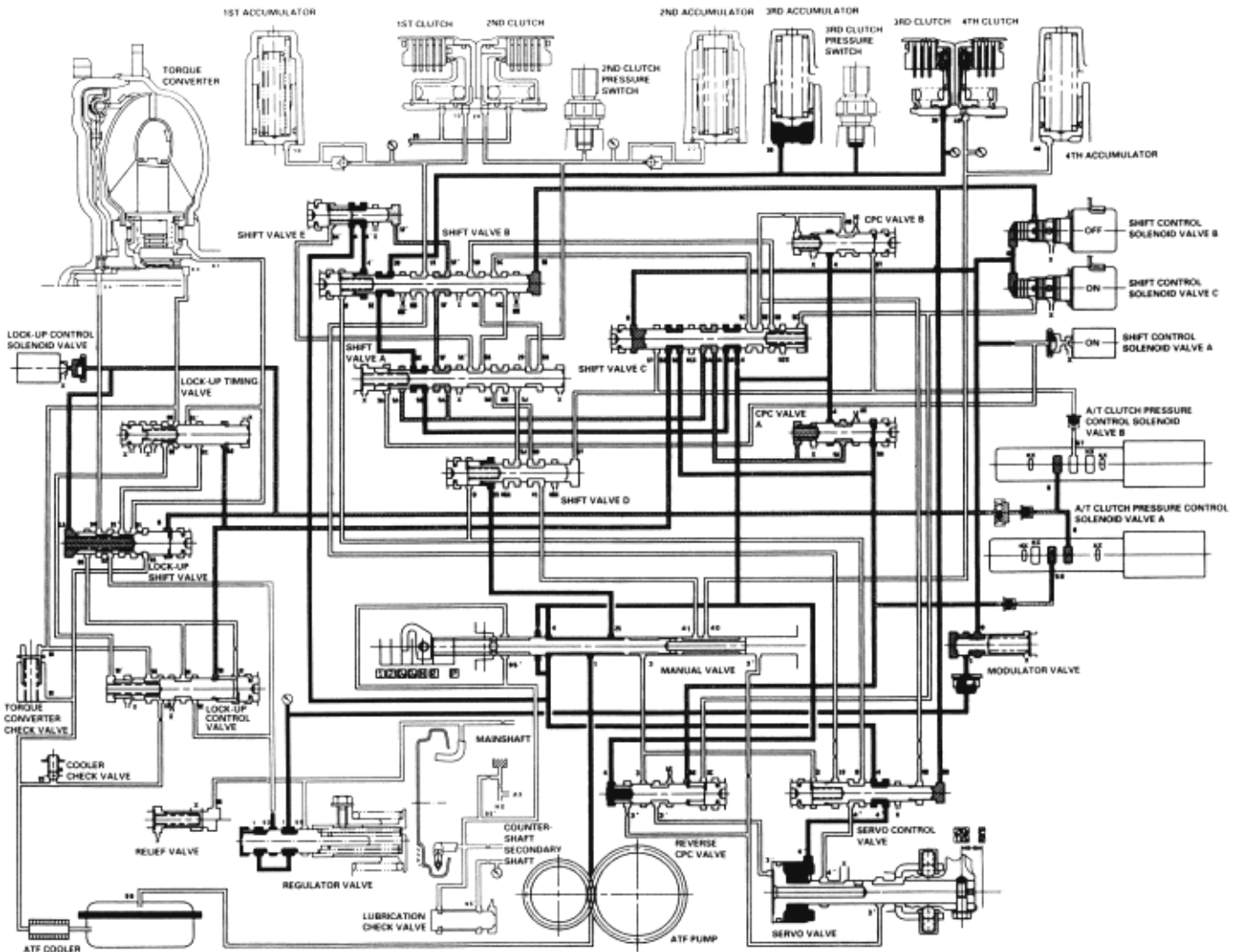
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



6. Driving in 3rd gear

The PCM turns shift control solenoid valve C ON, and controls A/T clutch pressure control solenoid valve B to release LS B pressure (67). Shift control solenoid valve A remains ON, and B remains OFF. Releasing LS B pressure in the CPC valve B releases CPC B pressure in the 2nd clutch pressure circuit. Shift control solenoid valve C is turned ON, and SH C pressure (SC) in the right side of shift valve C is released. Then shift valve C is moved to the right side to switch the port of line pressure and CPC pressure. 3rd clutch pressure is changed to line pressure mode, and the 3rd clutch is engaged securely. The CPC A pressure (4A) stops at shift valve E.

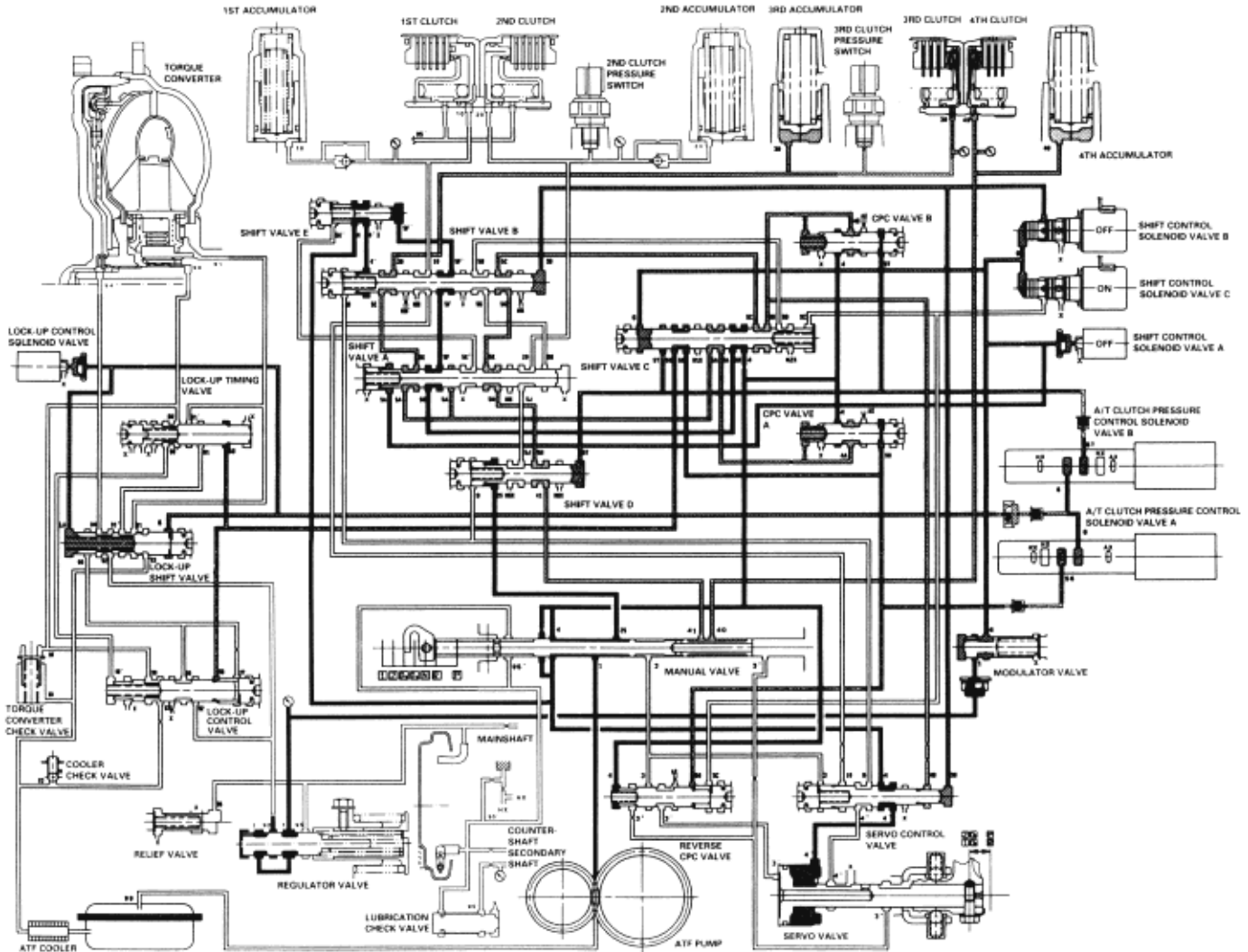
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



7. Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift control solenoid valve A OFF. The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Shift control solenoid valve B remains OFF, and C remains ON. Shift control solenoid valve A is turned OFF, and SH A pressure (SA) is applied to the left side of shift valve A. Then shift valve A is moved to the left side to switch the port of line pressure and CPC pressure. Line pressure (4) becomes CPC B pressure (4B) at CPC valve B. The CPC B pressure (4B) becomes 4th clutch pressure (41) at shift valve D, and flows to the 4th clutch via the manual valve. The 3rd clutch pressure is changed to CPC pressure mode by switching the position of shift valve A.

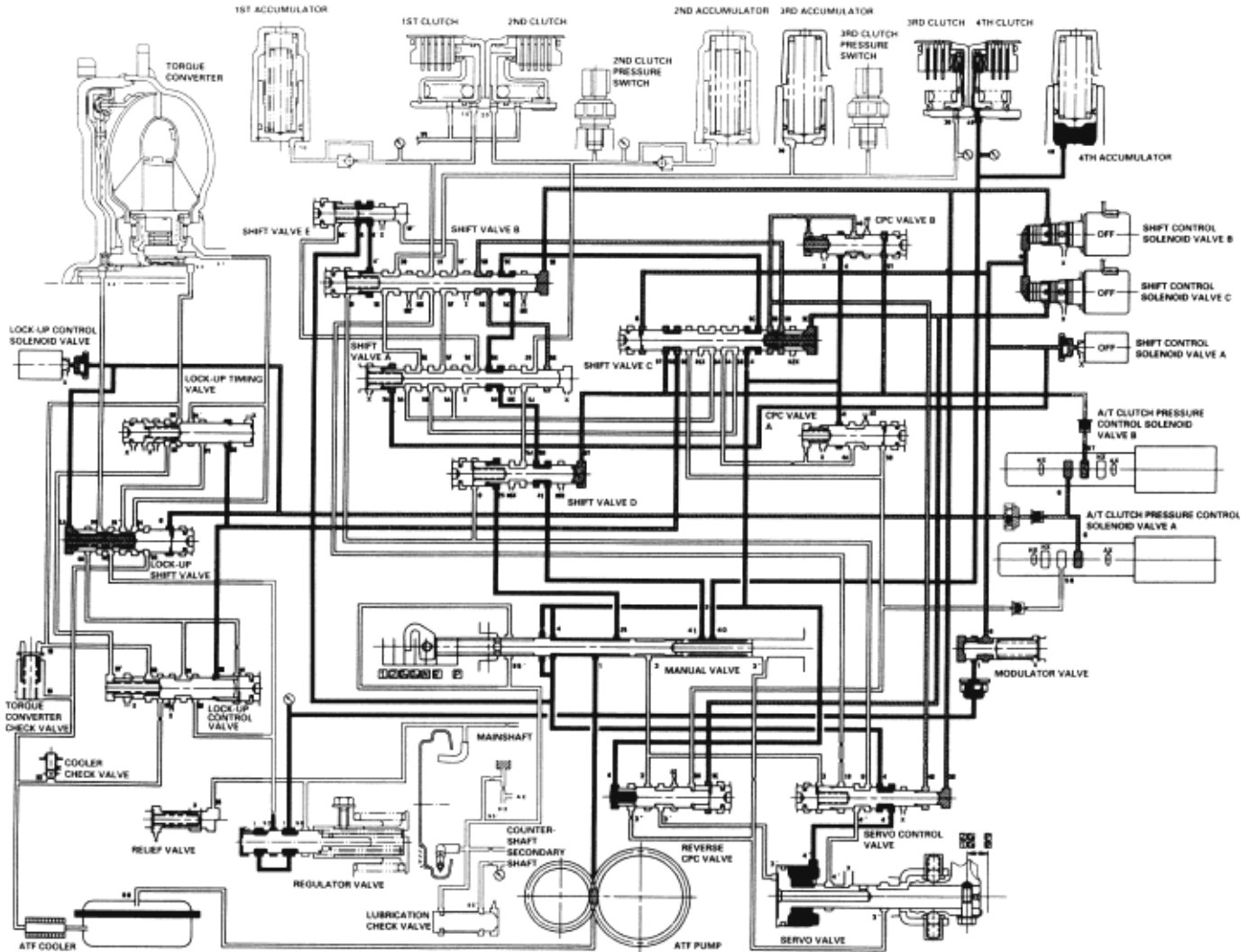
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



8. Driving in 4th gear

The PCM turns shift control solenoid valve C OFF, and controls A/T clutch pressure control solenoid valve A to release LS A pressure (56). Shift control solenoid valves A and B remain OFF. Releasing LS A pressure (56) releases CPC A pressure in the 3rd clutch pressure circuit. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of shift valve C. Then shift valve C is moved to the left side to switch the port of line pressure and CPC pressure. The CPC B pressure (5B) changes to line pressure (5B) at shift valve C, and flows to the 4th clutch via shift valve C, shift valve B, shift valve D, and the manual valve. The 4th clutch pressure is changed to line pressure mode by switching the position of shift valve A, shift valve C, and 4th clutch is engaged securely. The CPC B pressure (5D) stops at shift valve A.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



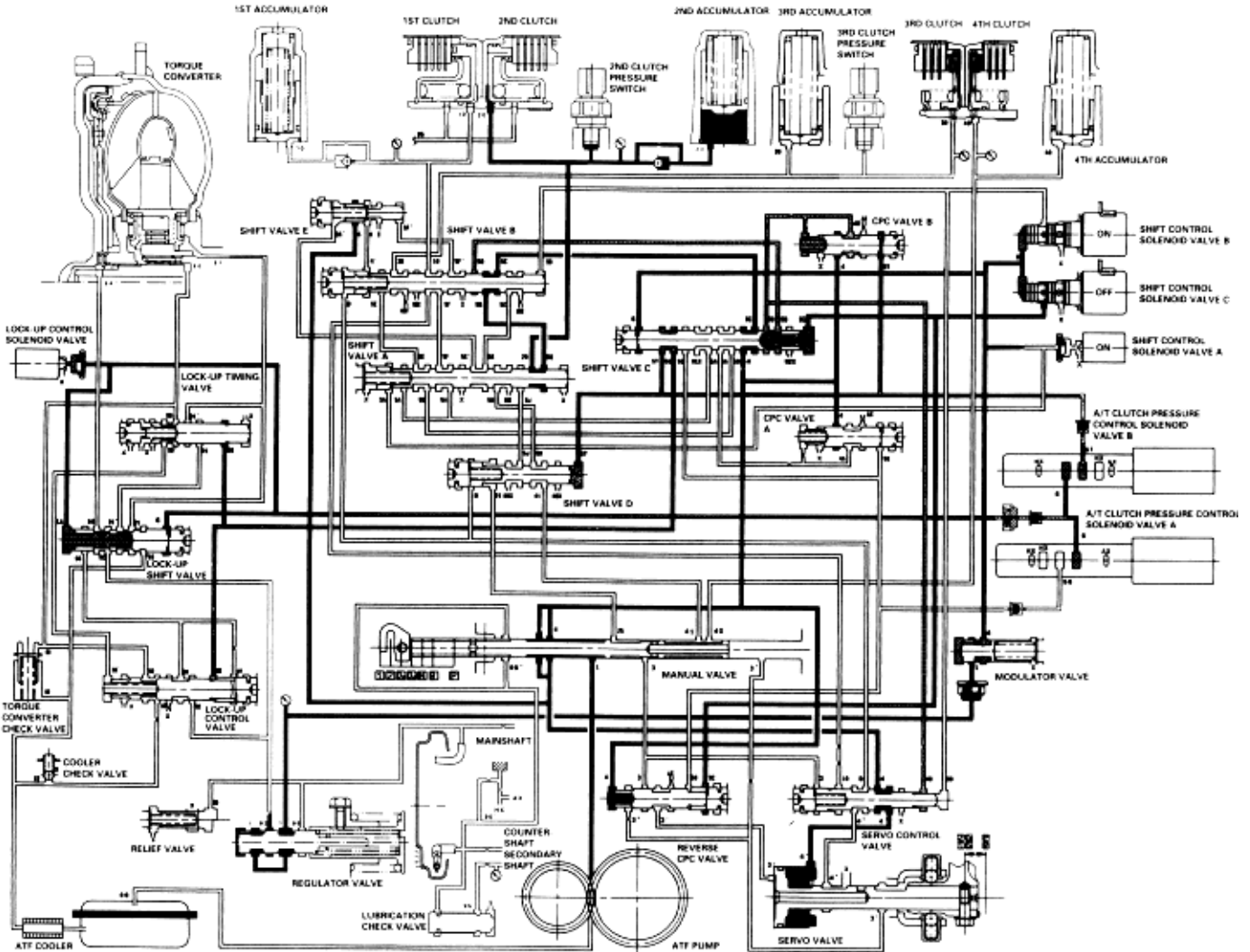
2 Position

The PCM controls the shift control solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift control solenoid valves and the positions of the shift valves are as follows:

- Shift control solenoid valve A is turned ON, and shift valve A is in the right side.
- Shift control solenoid valve B is turned ON, and shift valve B is in the right side.
- Shift control solenoid valve C is turned OFF, and shift valve C is moved to the left side.

The PCM also controls A/T clutch pressure control solenoid valve B to apply LS B pressure (57) to CPC valve B. Line pressure (4) from the manual valve becomes line pressure (5C) at shift valve C. Line pressure (50) flows to shift valve A via shift valve B, and becomes 2nd clutch pressure (20). The 2nd clutch pressure is applied to the 2nd clutch, and 2nd clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



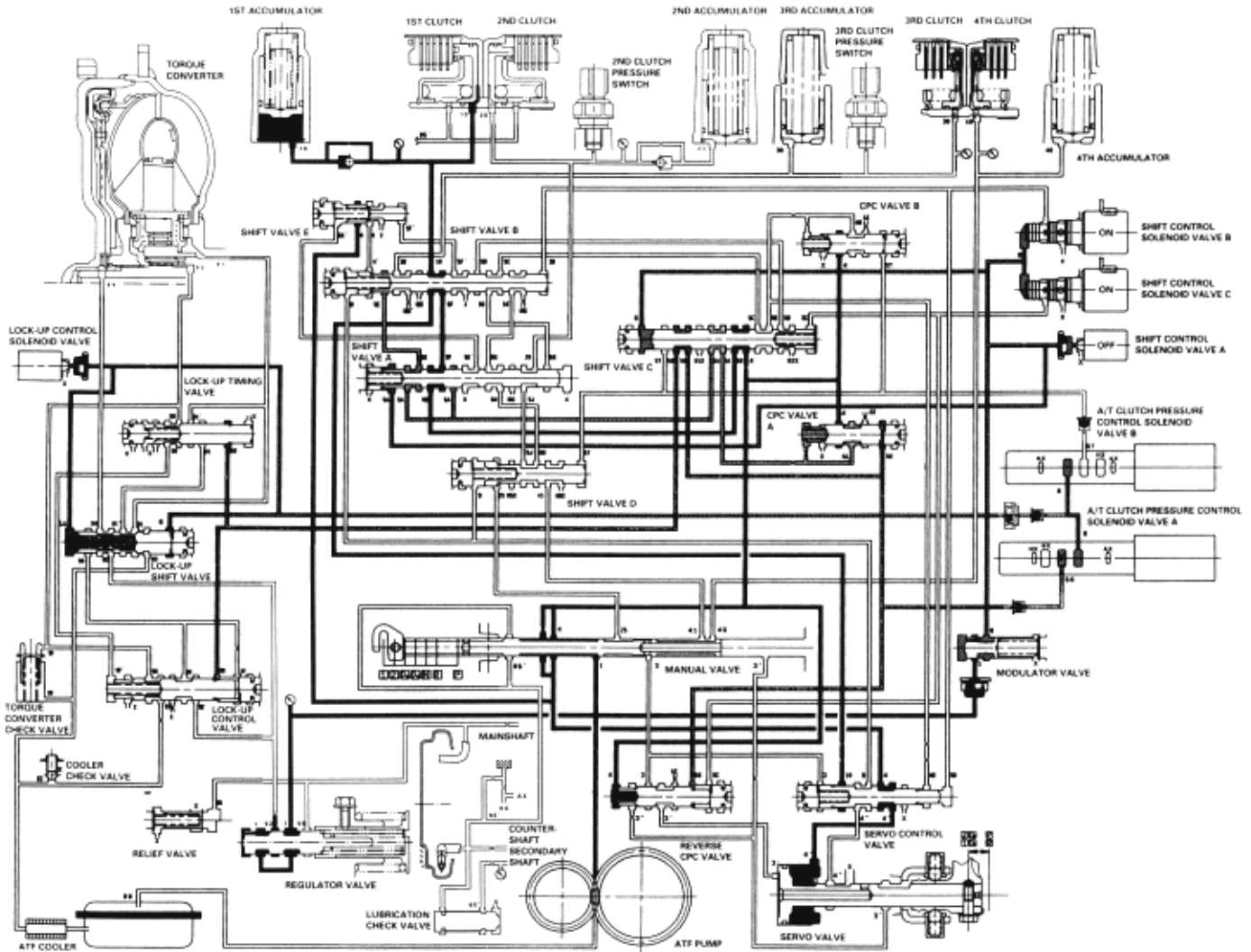
1 Position

The PCM controls the shift control solenoid valves and the A/T clutch pressure control solenoid valves. The conditions of the shift control solenoid valves and the positions of the shift valves are as follows:

- ♦ Shift control solenoid valve A is turned OFF, and shift valve A is moved to the left side.
- ♦ Shift control solenoid valve B is turned ON, and shift valve B is in the right side.
- ♦ Shift control solenoid valve C is turned ON, and shift valve C is in the right side.

Line pressure (4) becomes line pressure (5B) at shift valve C. Line pressure (5C) flows to shift valve B via shift valve A, and becomes 1st clutch pressure (10). 1st clutch pressure (10) is applied to the 1st clutch, and 1st clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Description
Hydraulic Flow (cont'd)

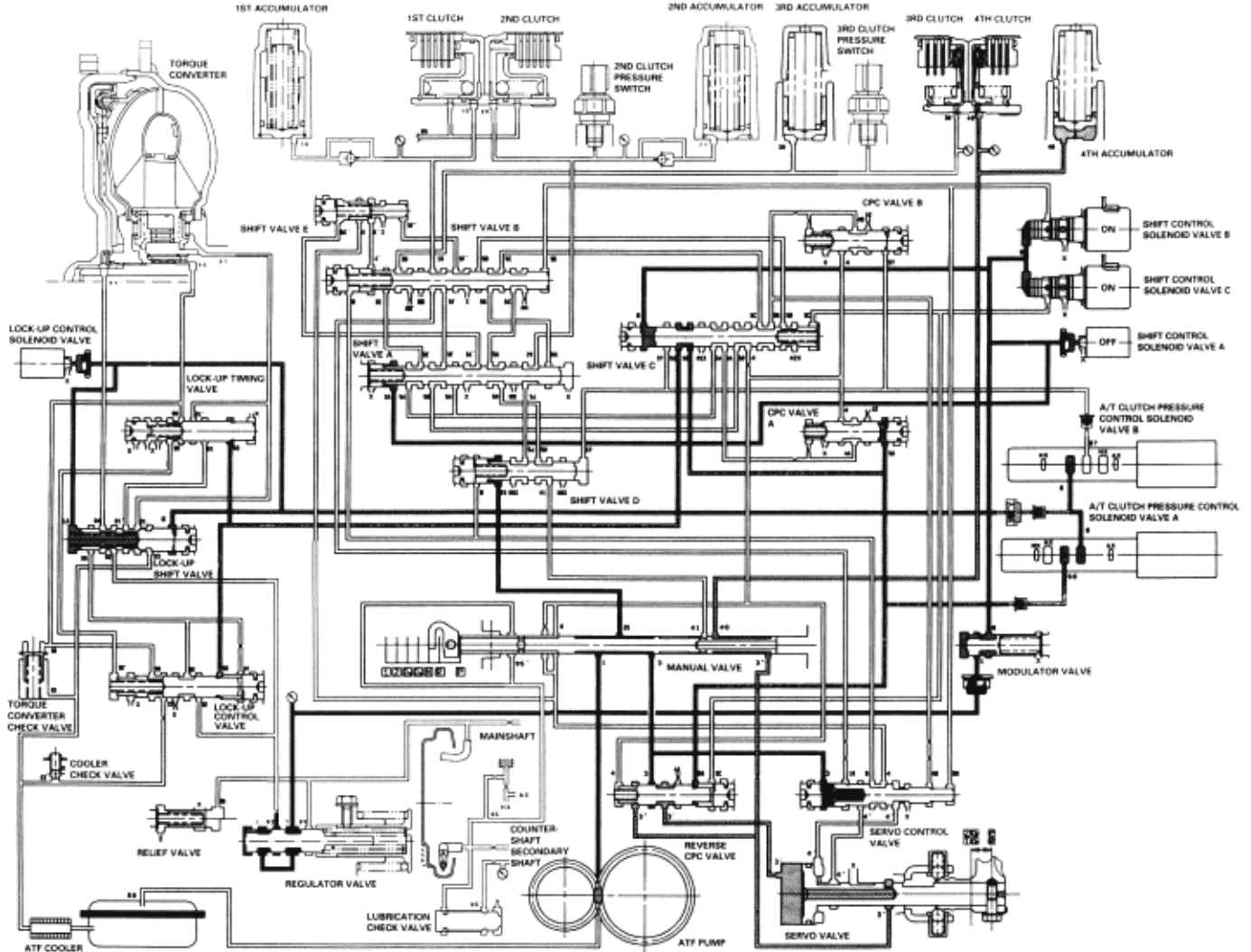
14-36

R Position

1. Shifting to **R** position from **P** or **N** position

Line pressure (1) becomes line pressure (3) at the manual valve, and flows to the reverse CPC valve. Line pressure (3) is regulated by the reverse CPC valve and becomes line pressure (3'). Line pressure (3') pushes the servo valve to the reverse position, passes through the servo valve, and flows to the manual valve. Line pressure (3') becomes 4th clutch pressure (40). The 4th clutch pressure (40) is applied to the 4th clutch, and 4th clutch is engaged with the reverse CPC pressure mode.

NOTE: When used, "left" or "right" indicates direction on hydraulic circuit.



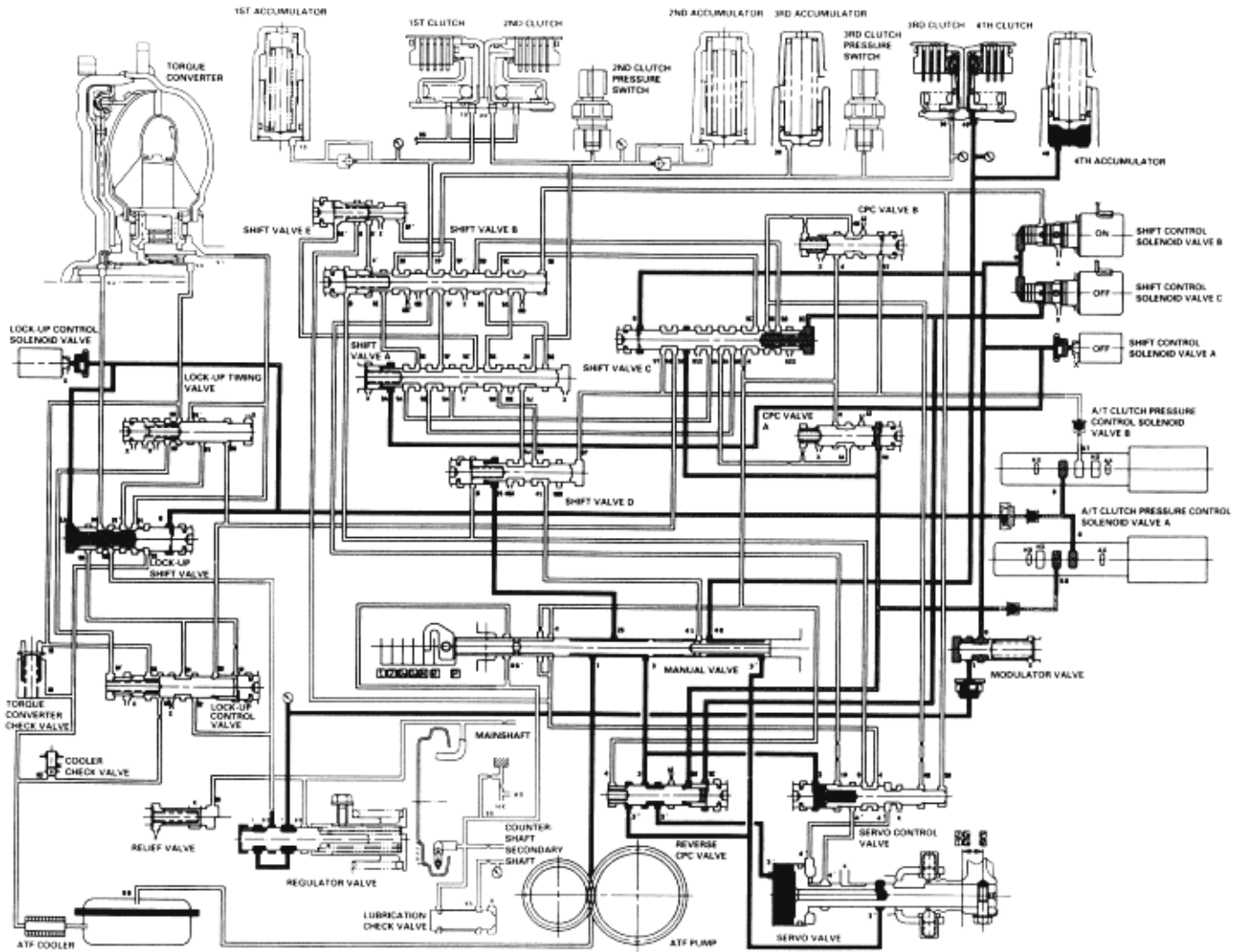
Description
Hydraulic Flow (cont'd)

14-37

2. Driving in reverse gear

The PCM turns shift control solenoid valve C OFF. Shift control solenoid valve A remains OFF, and B remains ON. Shift control solenoid valve C is turned OFF, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve moves to the left side and full the port leading to line pressure. Line pressure to the 4th clutch is the same as in **R** position, and 4th clutch pressure increases. The 4th clutch is engaged with line pressure mode.

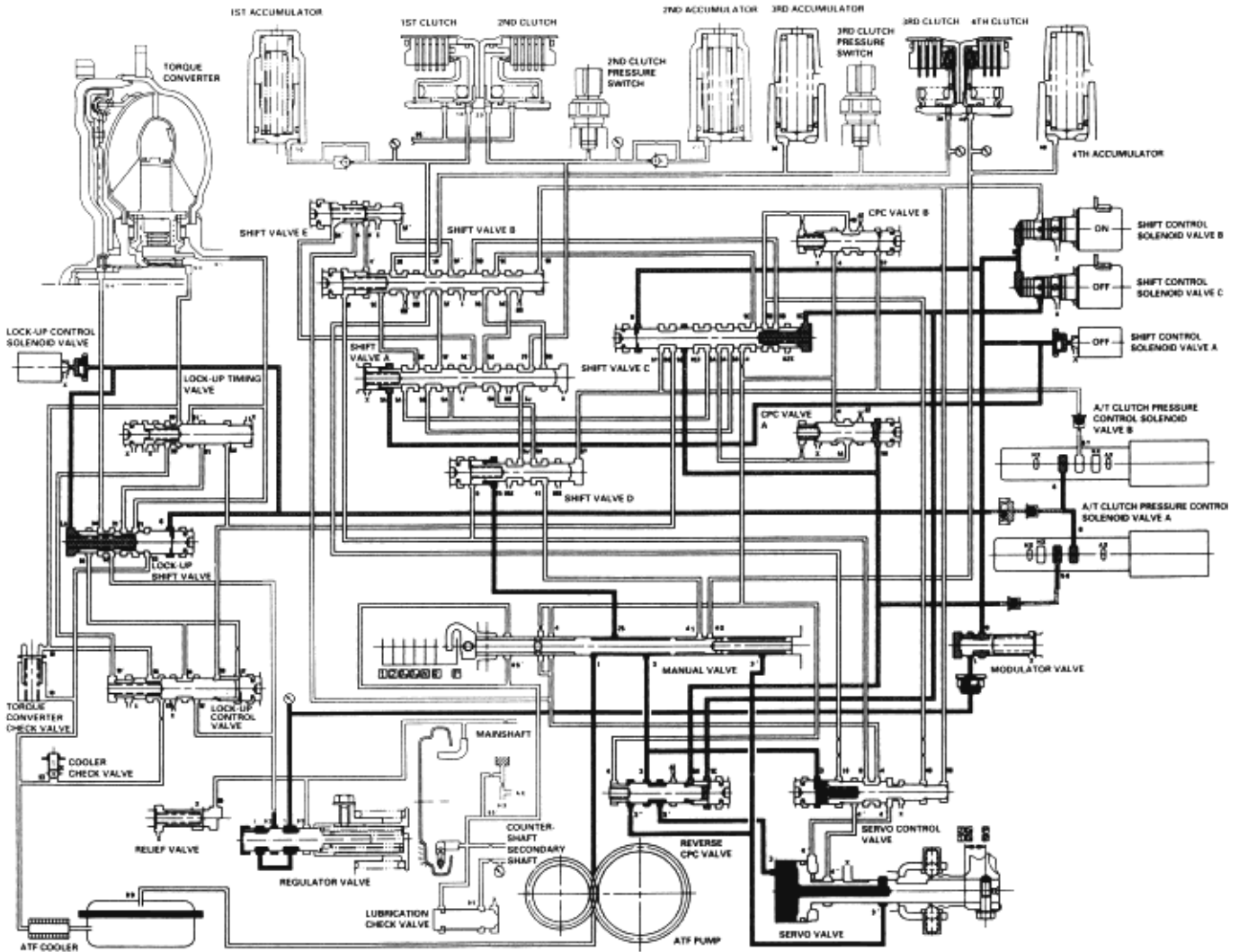
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



P Position

Shift control solenoid valve C is turned OFF by the PCM, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve is moved to the left side to uncover the port leading line pressure (3) to the servo valve. Line pressure (3') passes through the servo valve and flows to the manual valve. Line pressure (3') is intercepted at the manual valve, and is not applied to the clutches.

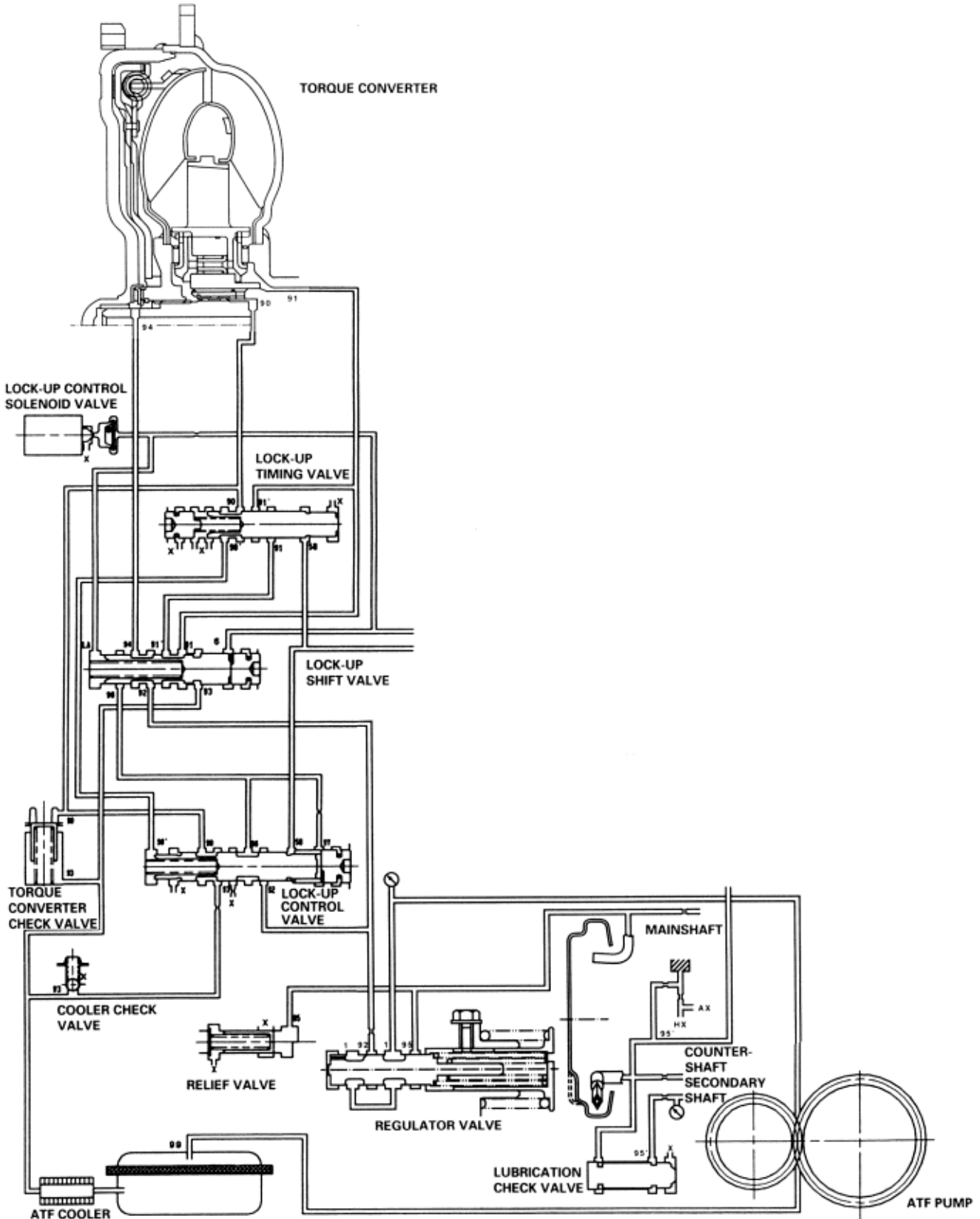
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



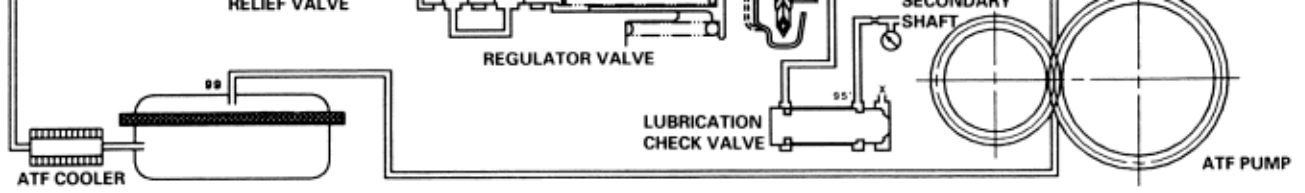
Description
Lock-up System

14-39

In **D4** position (2nd, 3rd and 4th) and **D3** position (3rd), pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, the PCM optimizes the timing of the lock-up mechanism. When the lock-up control solenoid valve activates, modulator pressure changes to switch lock-up ON and OFF. The lock-up control valve and the lock-up timing valve control the range of lock-up according to A/T clutch pressure control solenoid valves A and B. The lock-up control solenoid valve is mounted on the torque converter housing, and A/T clutch pressure control solenoid valves A and B are mounted on the transmission housing. They are controlled by the PCM. The table below shows the lock-up conditions for lock-up control solenoid valve and A/T clutch pressure control solenoid A or B pressure.



Lock-up Conditions	Lock-up Control Solenoid Valve	A/T Clutch Pressure Control Solenoid A or B Pressure
Lock-up OFF	OFF	Low
Lock-up, Partial	ON	Low
Lock-up, Half		Medium
Lock-up, Full		High
Lock-up during deceleration		Medium



Lock-up Conditions	Lock-up Control Solenoid Valve	A/T Clutch Pressure Control Solenoid A or B Pressure
Lock-up OFF	OFF	Low
Lock-up, Partial	ON	Low
Lock-up, Half		Medium
Lock-up, Full		High
Lock-up during deceleration		Medium

General Operation

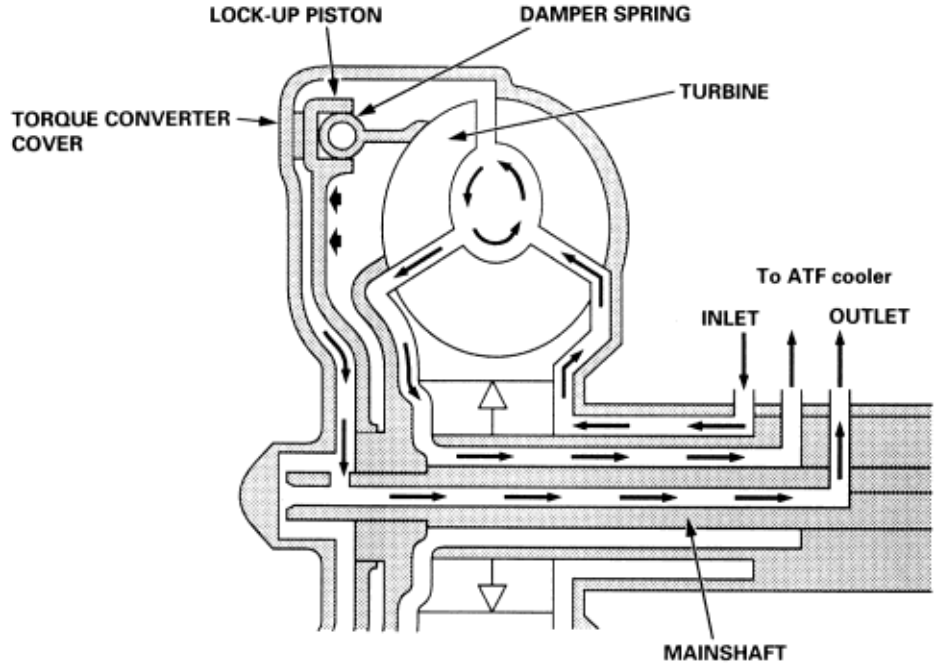
1. Operation (clutch on)

With the lock-up clutch on, fluid in the chamber between the torque converter cover and the lock-up piston is drained off, and the converter fluid exerts pressure through the piston against the torque converter cover. As a result, the converter turbine is locked to the converter cover. The effect is to bypass the converter, placing the vehicle in direct drive.

Power flow

The power flows by way of:

- Engine
- ↓
- Drive plate
- ↓
- Torque converter cover
- ↓
- Lock-up piston
- ↓
- Damper spring
- ↓
- Turbine
- ↓
- Mainshaft

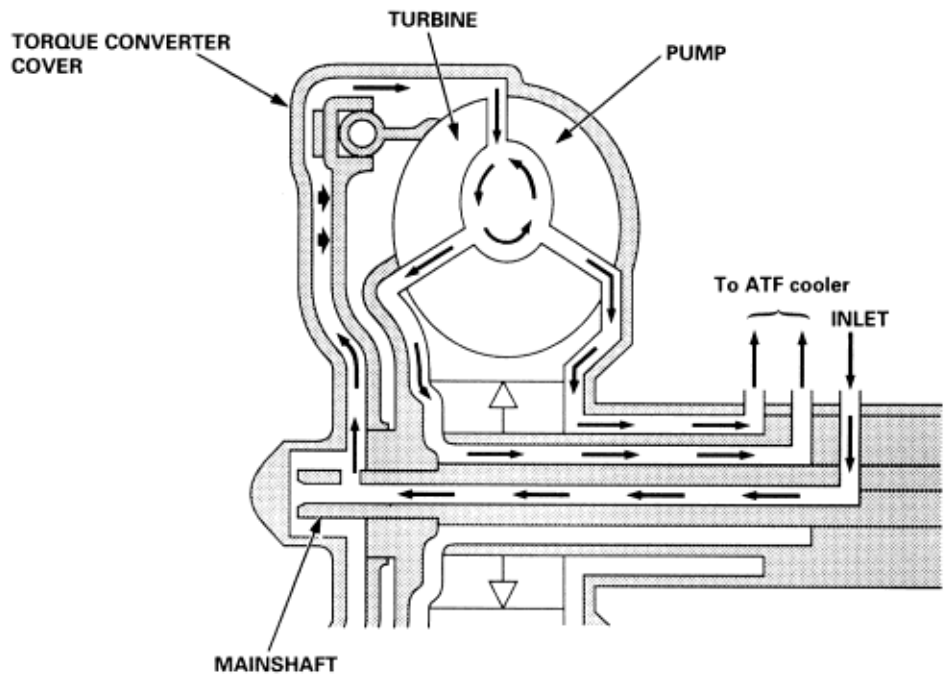


2. Operation (clutch off)

With the lock-up clutch off, fluid flows in the reverse of CLUTCH ON. As a result, the lock-up piston moves away from the converter cover, and torque converter lock-up is released.

Power flow

- Engine
- ↓
- Drive plate
- ↓
- Torque converter cover
- ↓
- Pump
- ↓
- Turbine
- ↓
- Mainshaft



Description

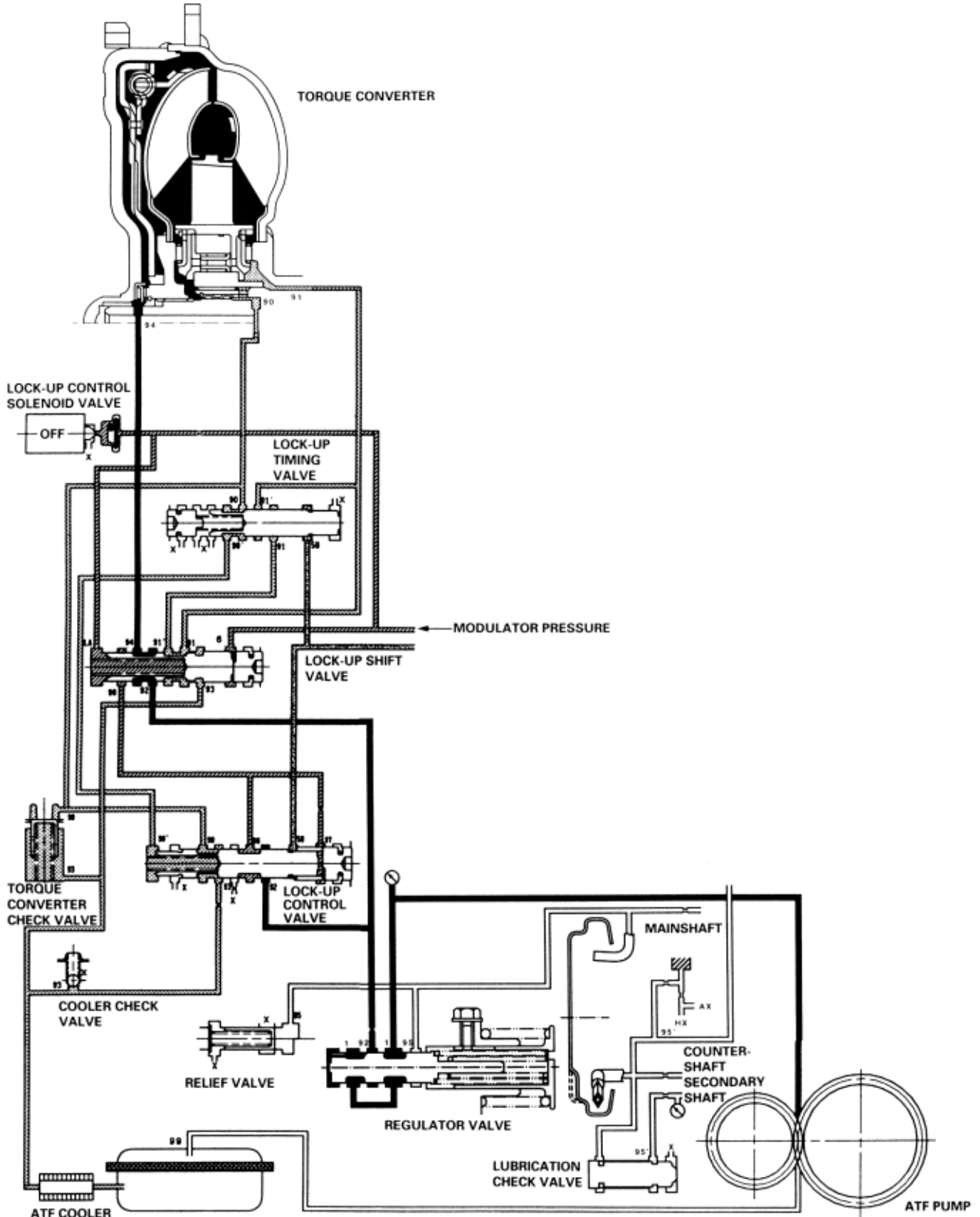
Lock-up System (cont'd)

No Lock-up

The lock-up control solenoid valve is turned OFF by the PCM.

The lock-up shift valve receives LC pressure (LA) on the left side, and modulator pressure (6) on the right side. The lockup shift valve is in the right side to uncover the port leading torque converter pressure (92) to the left side of the torque converter. Torque converter pressure (92) becomes torque converter pressure (94), and enters into the left side of the torque converter (to disengage the lock-up clutch). The lock-up clutch is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

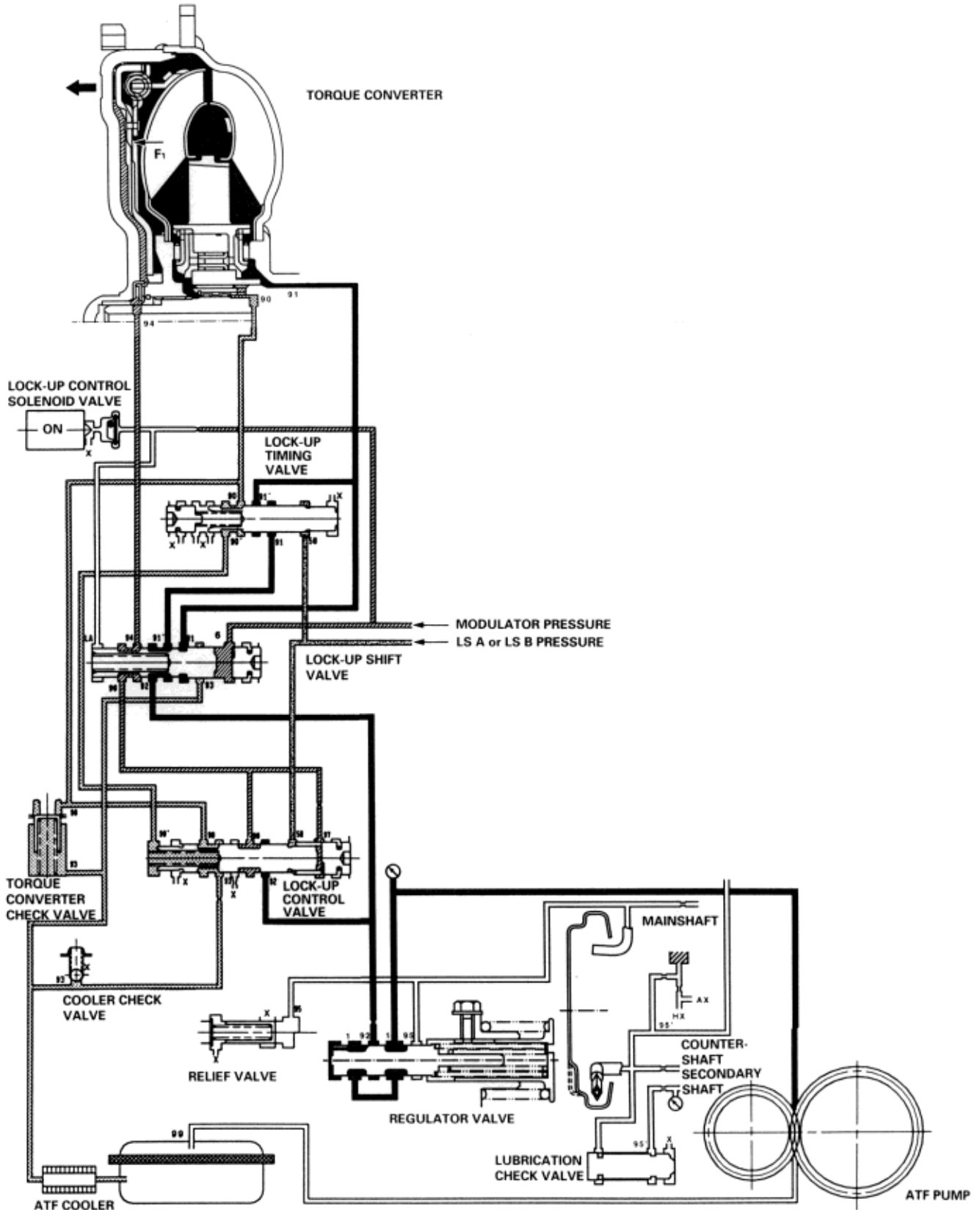


Description

Lock-up System (cont'd)

Partial Lock-up

As the speed of the vehicle reaches the prescribed value, the lock-up control solenoid valve is turned ON by the PCM to release LC pressure (LA) in the left side of the lock-up shift valve. The lock-up shift valve is moved to the left side to switch the port leading torque converter pressure to the left side and right side of the torque converter. Torque converter pressure (92) flows to the right side of the torque converter to engage the lock-up clutch. The PCM also controls A/T clutch pressure control solenoid valves A and B, and LS A or LS B pressure is applied to the lock-up control valve and the lock-up timing valve. The position of the lock-up control valve depends on torque converter pressure and LS A or LS B pressure. When LS A or LS B pressure (58) is lower, torque converter pressure (92) from the regulator valve passes through the lock-up control valve, and flows to the left side of the torque converter to disengage the lock-up clutch. Under this condition, the torque converter receives pressure from the right side (to engage the lock-up clutch) and the left side (to disengage the lock-up clutch); the lock-up clutch is in partial lock-up condition. NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



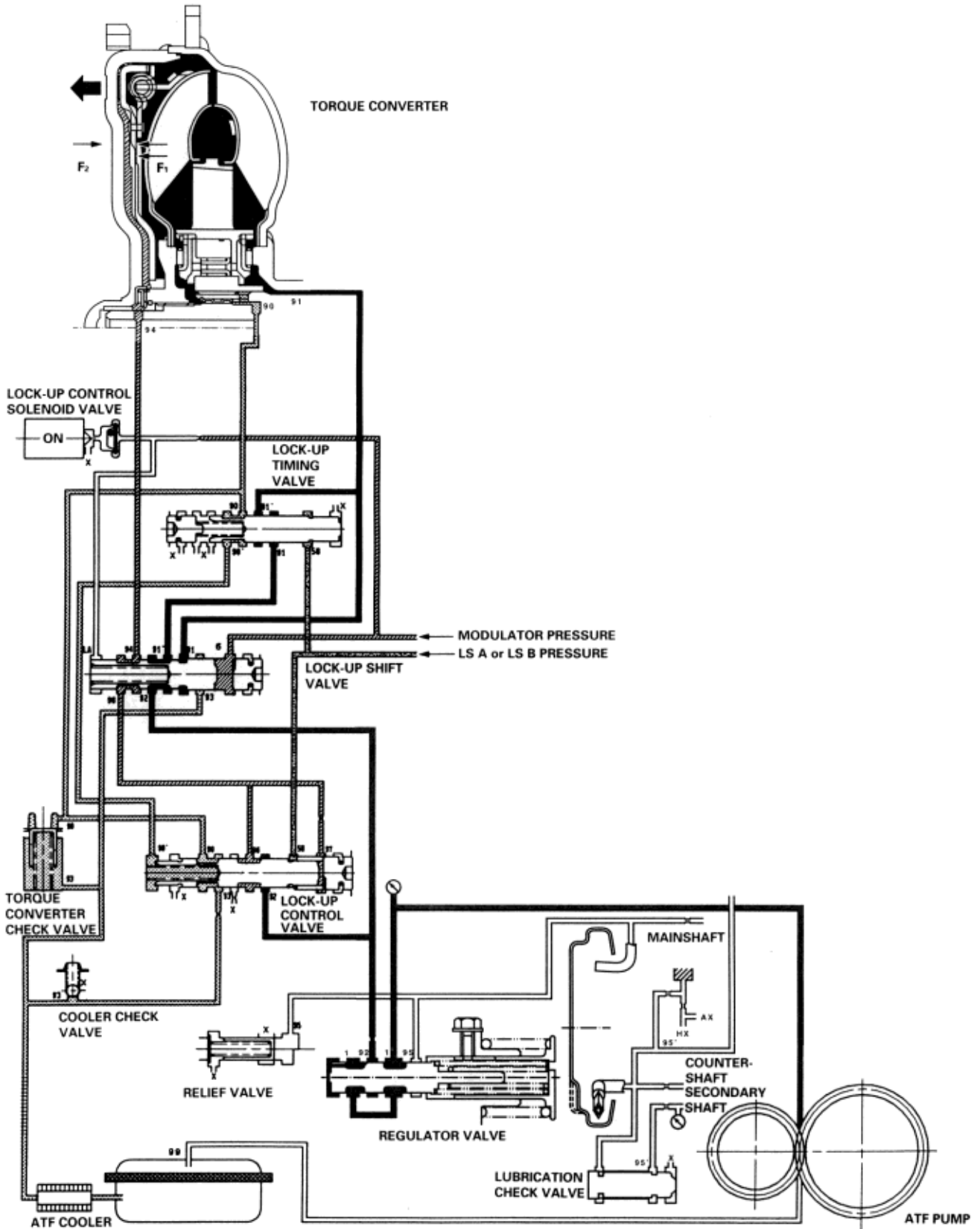
Description

Lock-up System (cont'd)

Half Lock-up

As the speed of the vehicle reaches the prescribed value, the PCM controls A/T clutch pressure control solenoid valves A and B. Higher LS A or LS B pressure (58) is applied to the lock-up control valve to release torque converter back pressure (f1). Torque converter back pressure (f1) goes lower, and this allows a greater amount of pressure (F1) to work on the lock-up clutch to engage the lock-up clutch. Back pressure (f1), which still exists, prevents the clutch from fully engaging.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



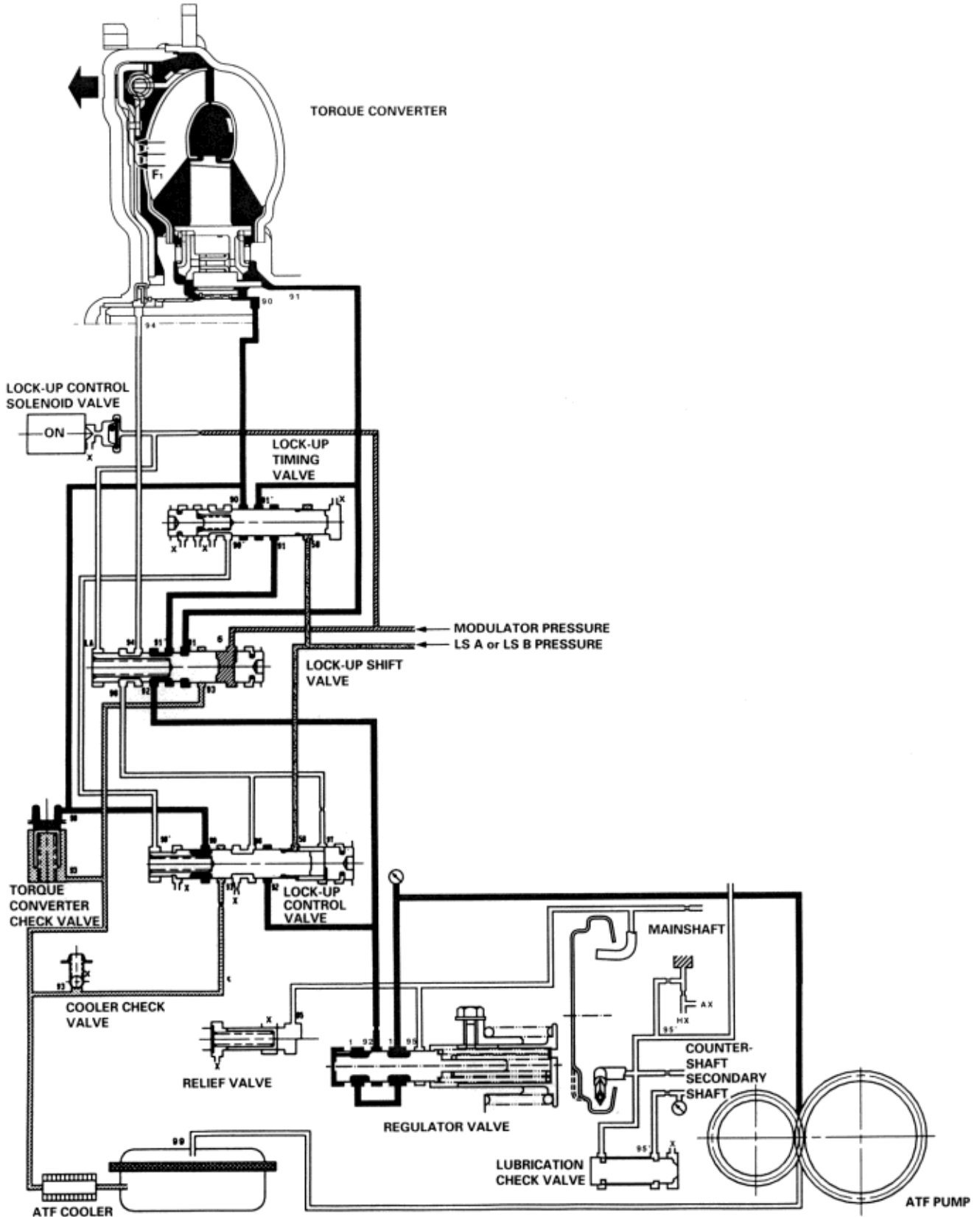
Description

Lock-up System (cont'd)

Full Lock-up

When the vehicle speed further increases, the PCM controls A/T clutch pressure control solenoid valves A and B to increase LS A or LS B pressure (58). The LS A or LS B pressure (58) is applied to the lock-up control valve and the lock-up timing valve, and moves them to the left side. Under this condition, torque converter back pressure (f1) is fully released, causing the lock-up clutch to be fully engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



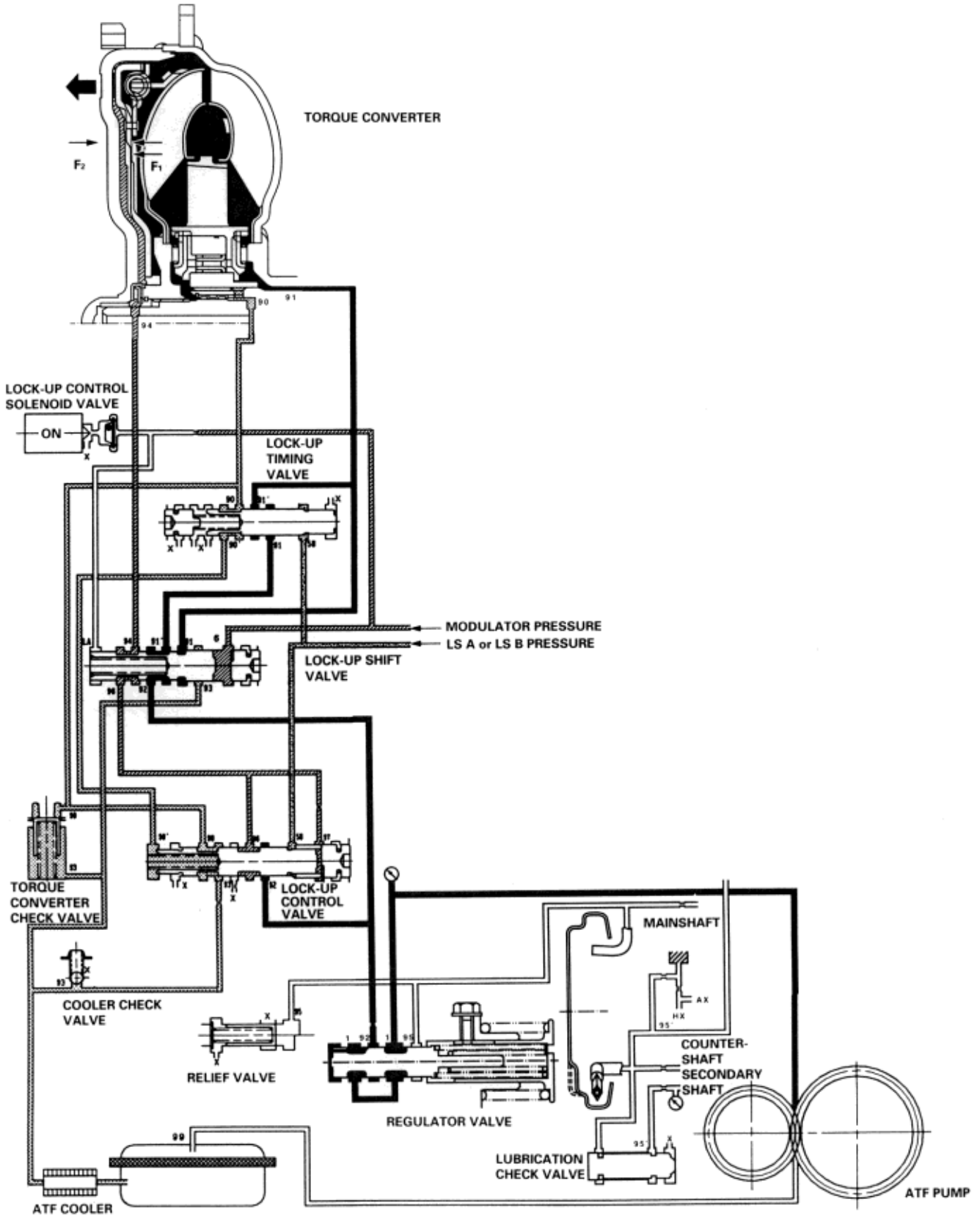
Description

Lock-up System (cont'd)

Deceleration Lock-up

When decelerating, the PCM controls the lock-up control solenoid valve and the A/T clutch pressure control solenoid valve A or B to activate the same as in half lock-up conditions. Medium LS A or LS B pressure (58) is applied to the lock-up control valve to release torque converter back pressure (f1). Torque converter back pressure (f1) goes lower, and this allows a greater amount of pressure (F1) to work on the lock-up clutch to engage the lock-up clutch. Back pressure (f1), which still exists, prevents the clutch from fully engaging.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



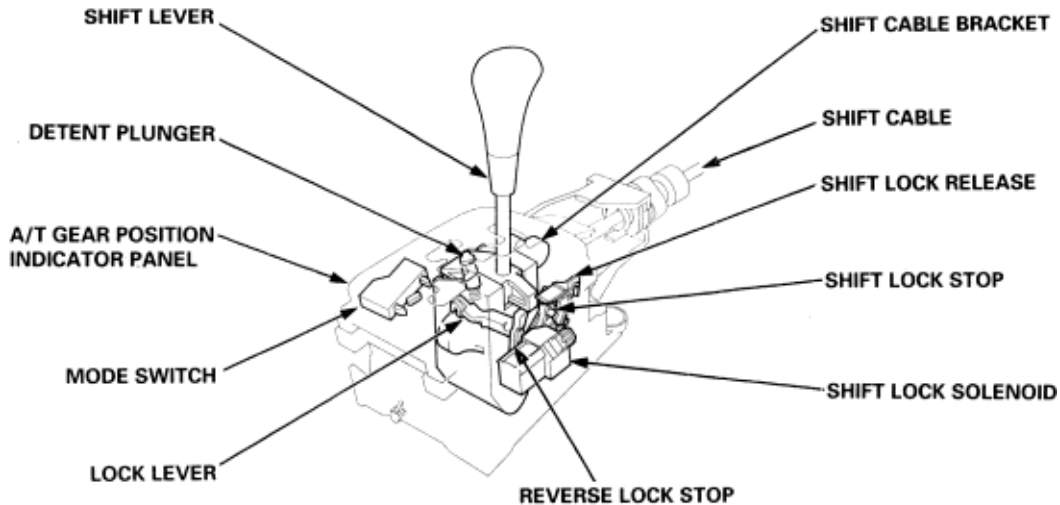
Description

Shift Lever/Manual Mode Mechanism

14-46

The shift lever has eight positions: **P**, **R**, **N**, **D4**, **D3**, **2**, **1**, positions and the manual mode position. The shift lever shifts between the positions along the gate in the A/T gear position indicator panel. The shift lever can shift out from the **P** position and shift to the **R** position without depressing the shift lever, however, the shift lock/reverse mechanism is built as an alternative to those of the shift lever mechanism.

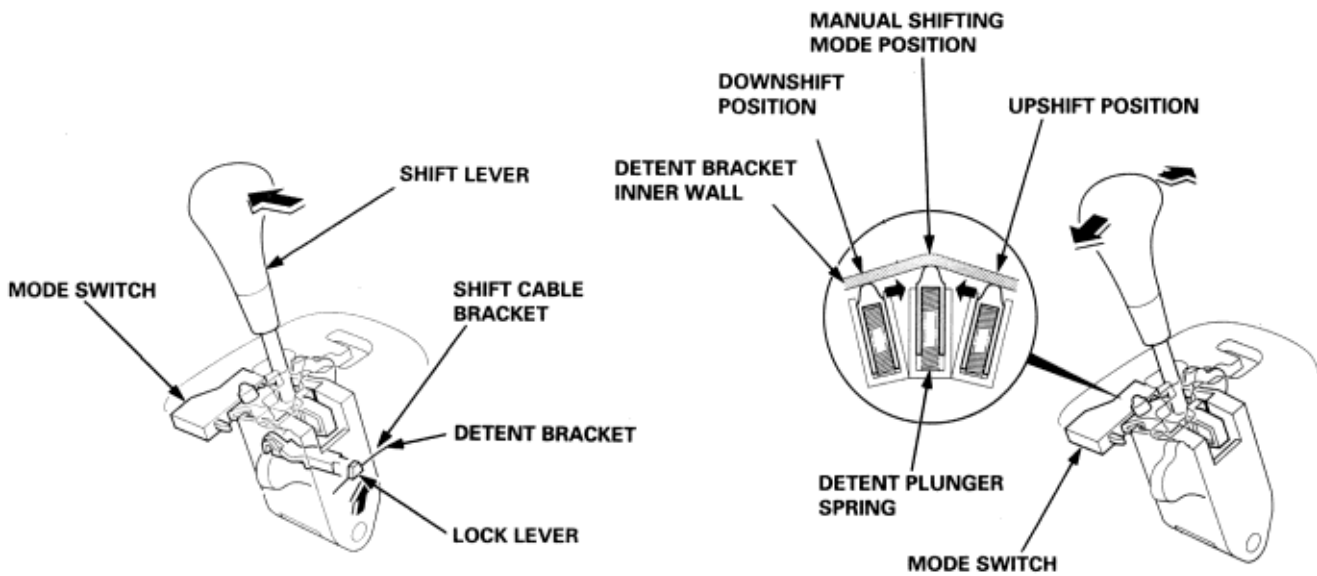
The shift lever is engaged with the shift cable bracket in the **P**, **R**, **N**, **D4**, **D3**, **2**, **1** positions, and this unit shifts the transmission shifting positions using the shift cable between the shift cable bracket and the transmission control shaft. In the manual mode position, the shift lever is disengaged from the shift cable bracket, and the shift lever can be used to shift the gears electronically with the mode switch between 1st through 4th much like manual transmission.



When the shift lever shifts to the manual mode position, the shift lever releases the lock lever, and the lock lever pops up to engage the shift cable bracket to the detent bracket; the shift cable bracket and the shifting positions in the transmission are held in the **D4** position.

The lock lever receives its spring load, pops up in the manual mode position, and is depressed by the shift lever and does not engage the shift cable bracket to the shift lever base bracket in any position except manual mode.

The shift lever has the detent plunger which receives the detent plunger spring load to fit in the manual mode position. When shifting to upshift or downshift positions, the detent plunger is depressed by the detent bracket inner wall, and the detent plunger spring puts the shift lever back into the position. The detent plunger also works **P** position.



Description

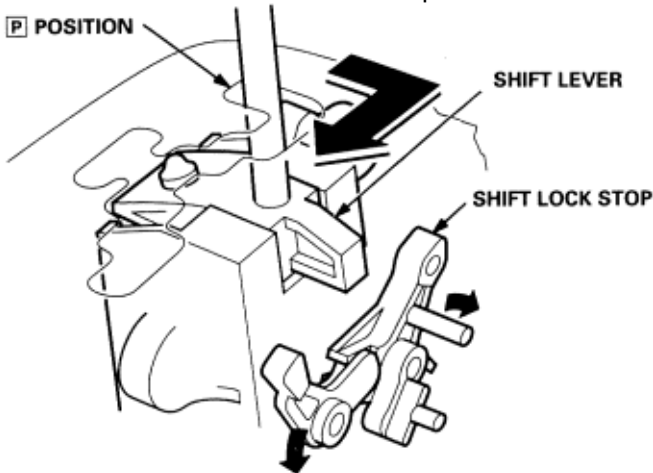
Shift Lock/Reverse Lock Mechanism

14-47

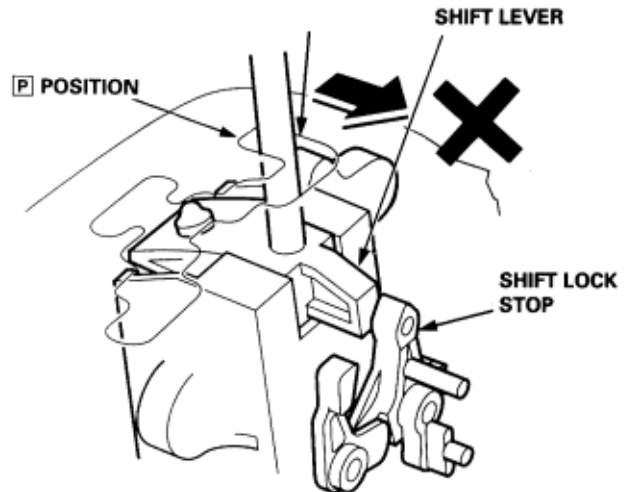
The shift lock system reduces the risk of unintentional engine starting. Starting the engine is possible only in the **P** and **N** positions. The shift lock system and the key interlock system are the interlock control system. The key interlock mechanism is located in the steering lock assembly.

The shift lock mechanism consists of the shift lock solenoid, shift lock stop, shift lock release and related parts. The reverse lock mechanism shares the shift lock solenoid with the shift lock mechanism, and the reverse lock stop and the shift lock stop are interlocked with the shift lock solenoid operation. The shift lock solenoid is electronically controlled by these shift lock control system signals; brake switch signal, interlock control signal, and A/T gear position switch **P** position signal. If the shift lock solenoid does not operate, shift lock/reverse lock mechanism can be released by depressing the shift lock release.

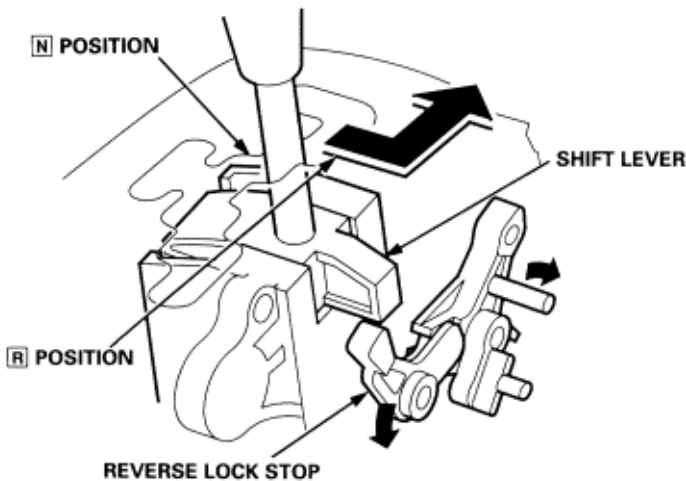
In **P** position while depressing the brake pedal, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the shift lock stop. This allows the shift lever to be moved from **P** position.



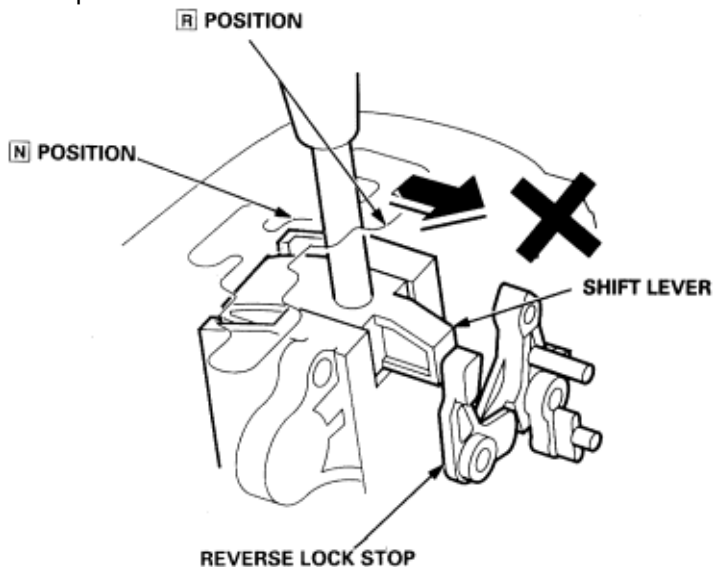
When the brake pedal is released, the shift lock solenoid remains OFF, and the shift lock stop locks to block the shift lever in the **P** position.



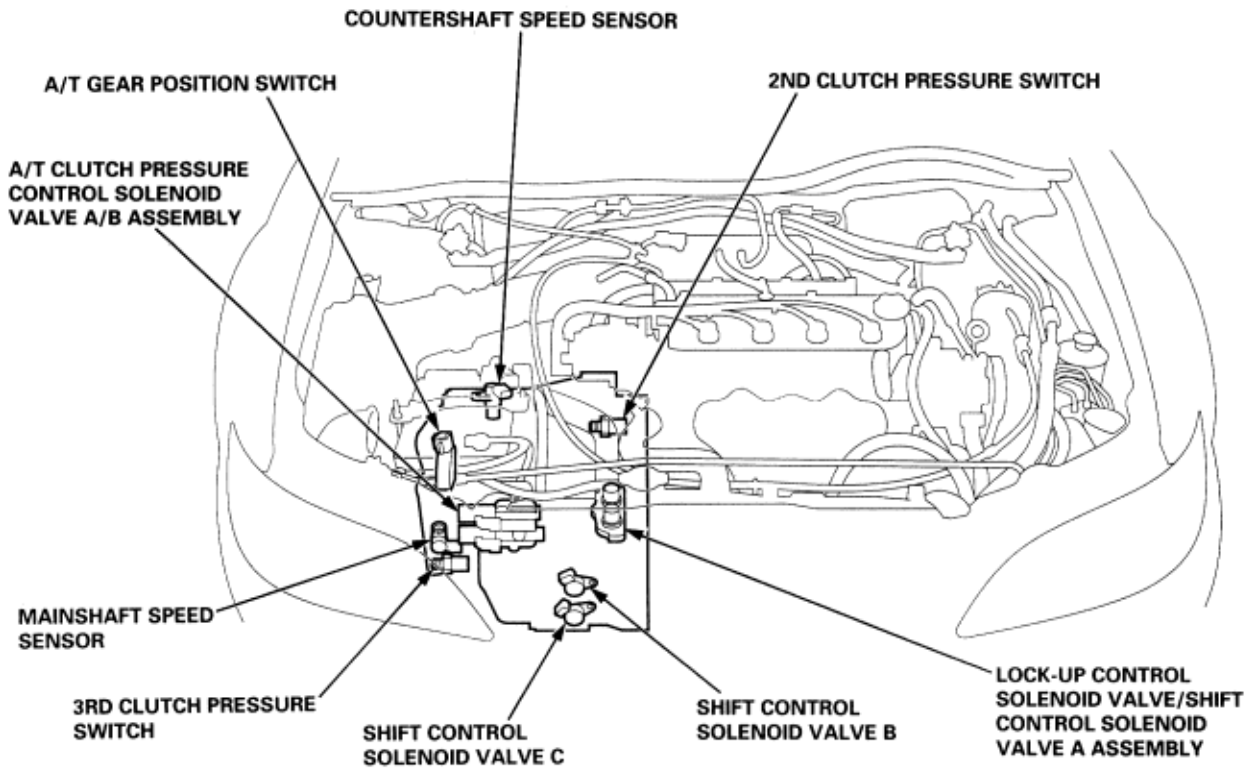
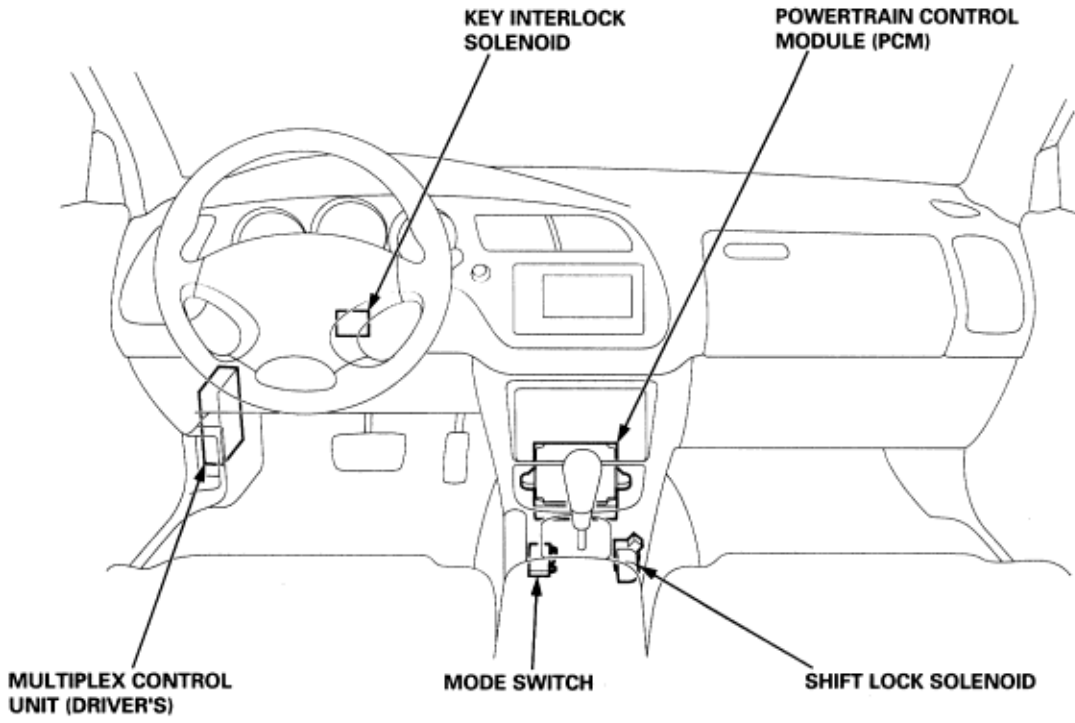
When the shift lever is shifted to **R** position from **D4** position and **N** position (under certain conditions), the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to **R** position.



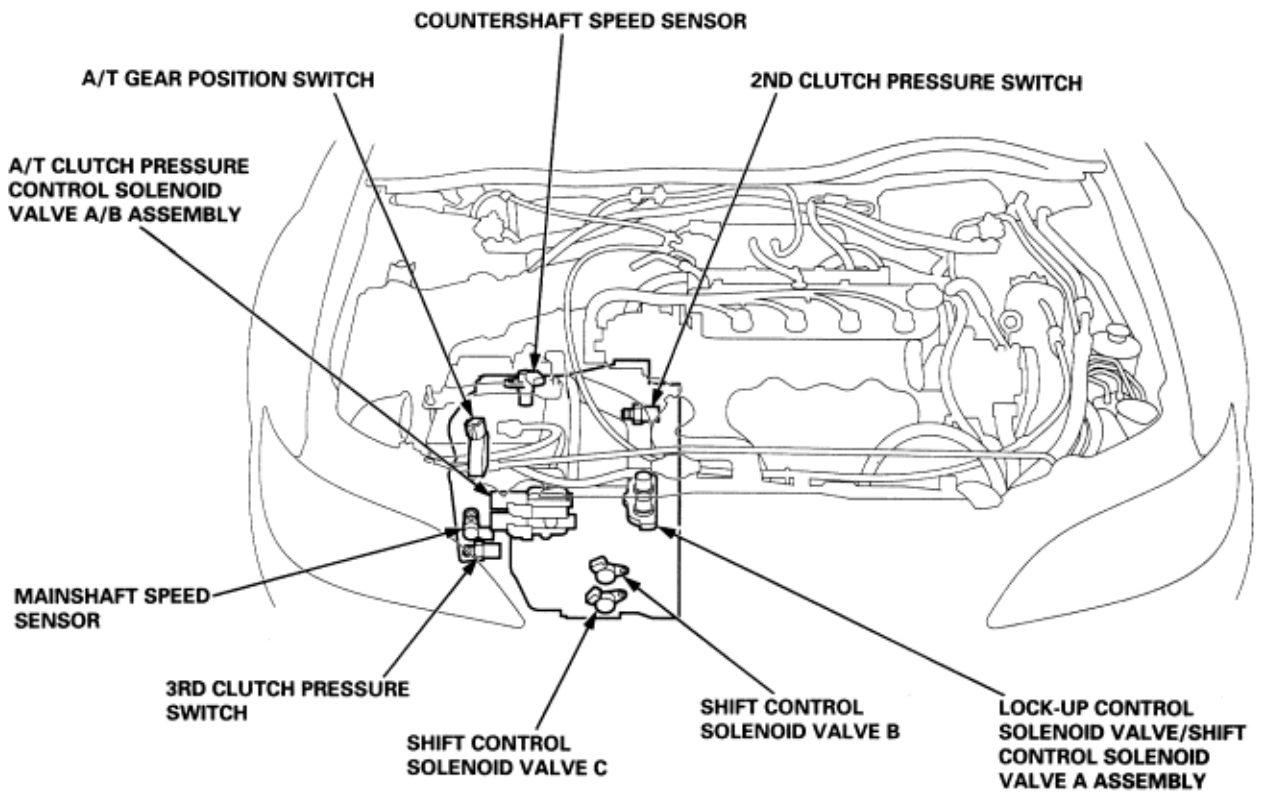
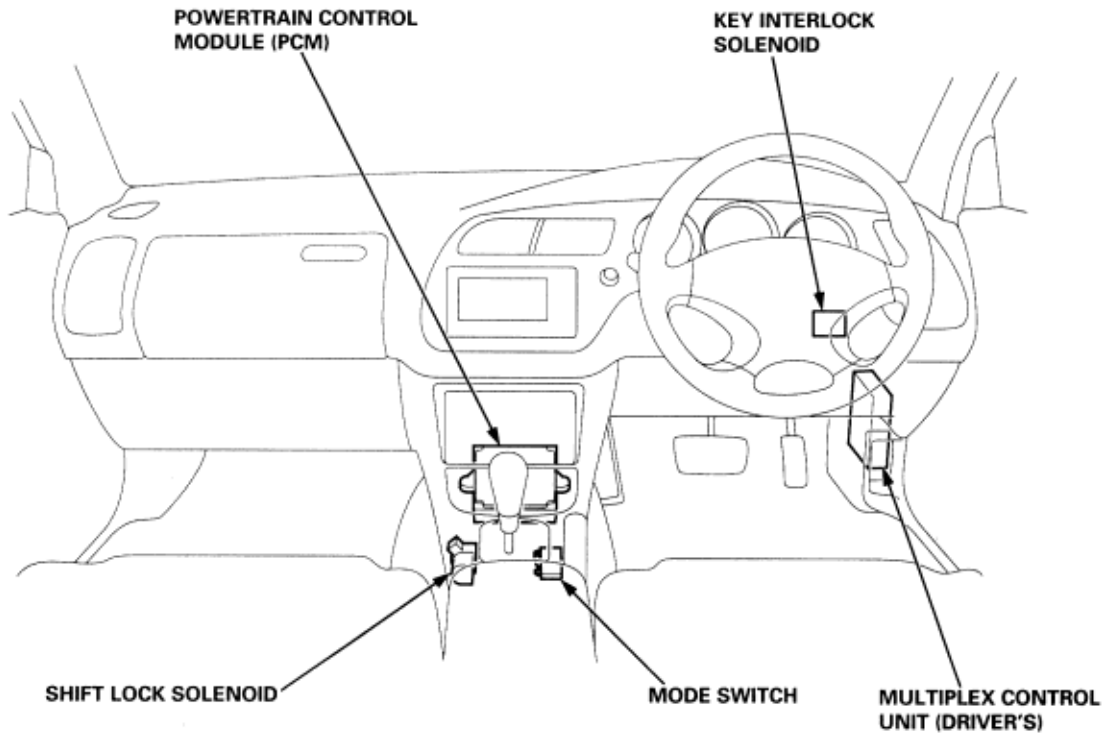
If the allowable conditions of turning ON the solenoid are not met, the shift lock solenoid remains OFF, and the reverse lock stop locks to block the shift lever in the **N** position.



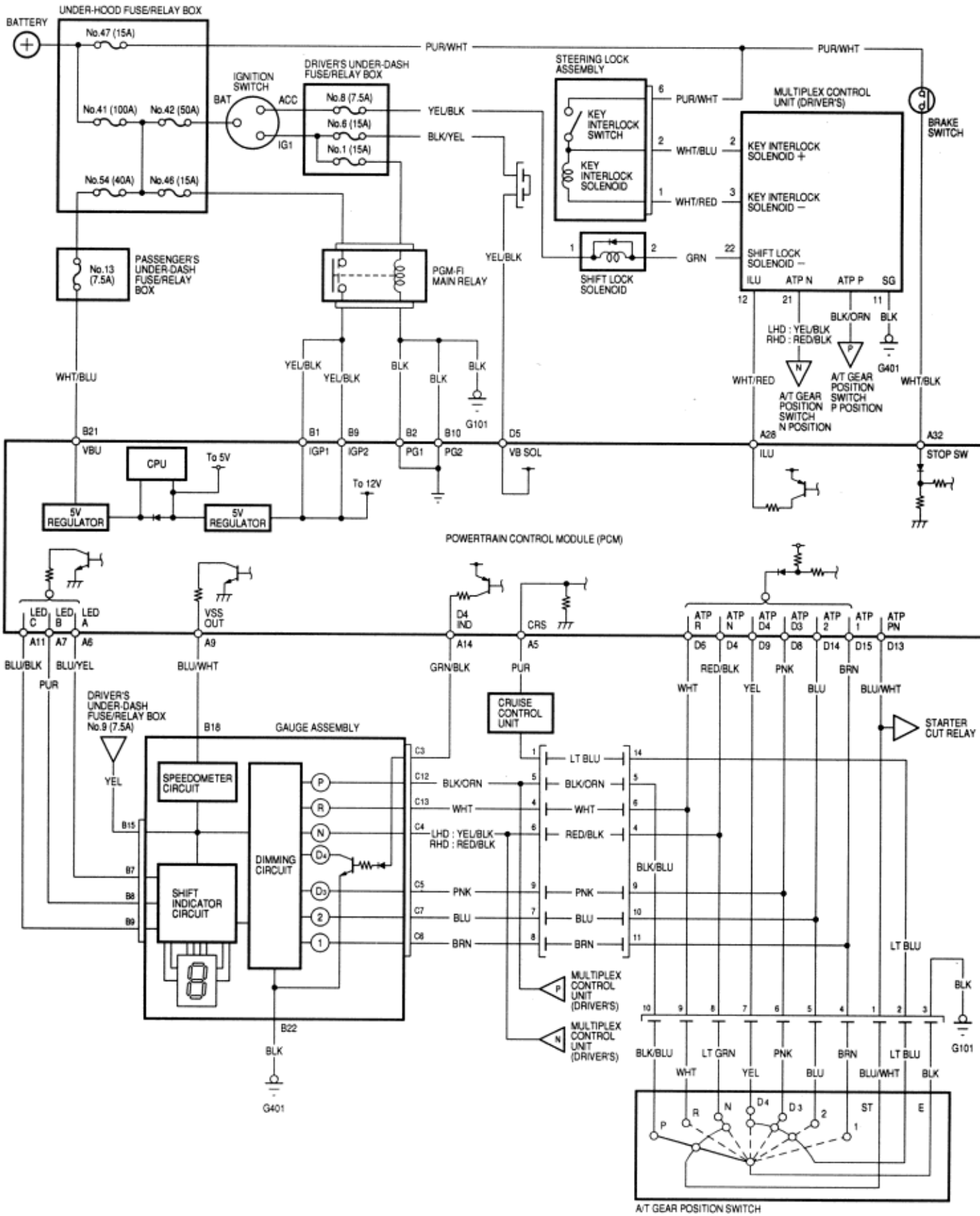
LHD:



RHD:

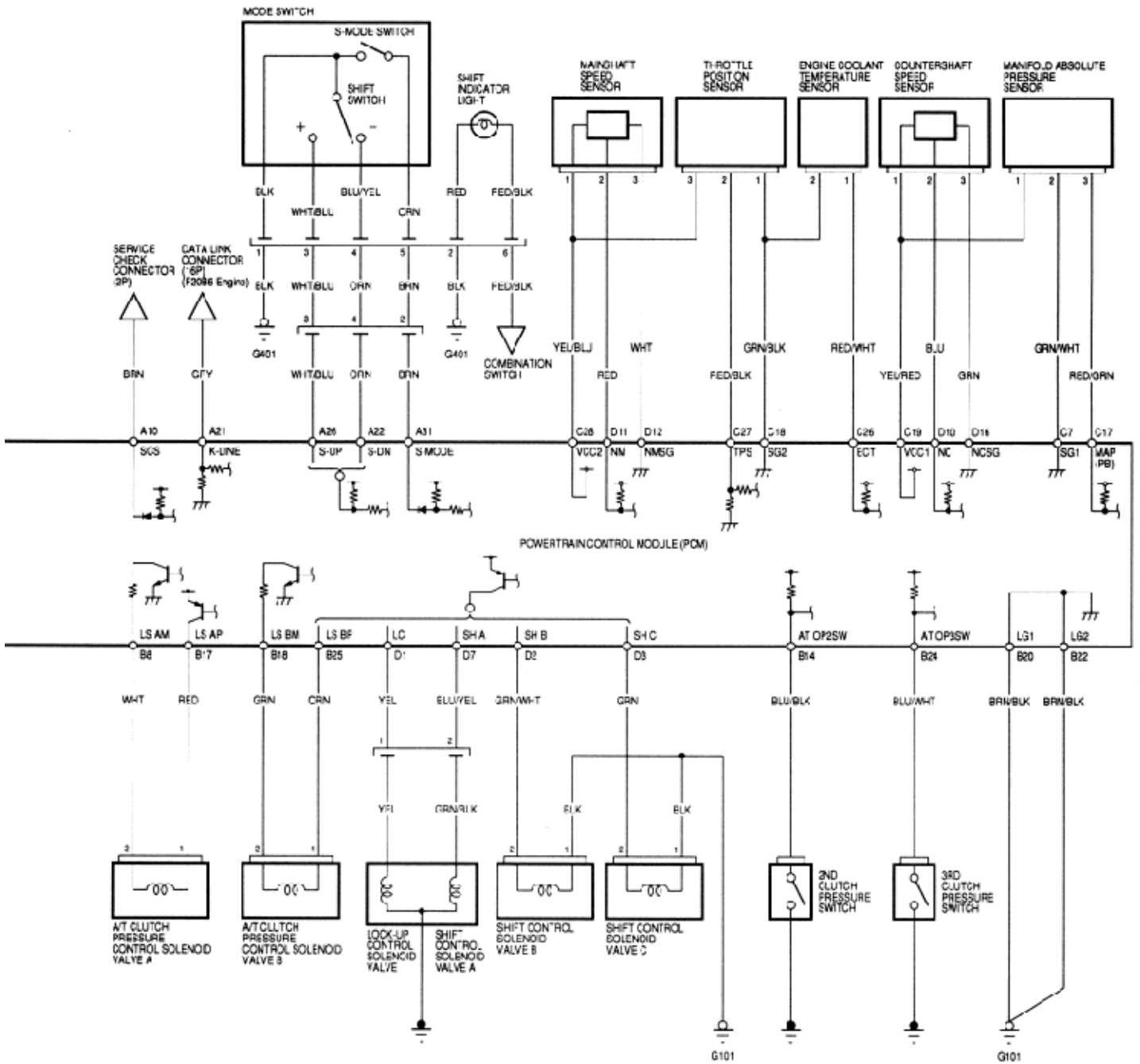


PCM Circuit Diagram (A/T Control System) 14-50



- NOTE:
- ◆ Data link connector and its circuit are applied on F20B6 engine.
 - ◆ Cruise control circuit and device are applied to some types.

PCM Circuit Diagram (A/T Control System) 14-51
 (cont'd)



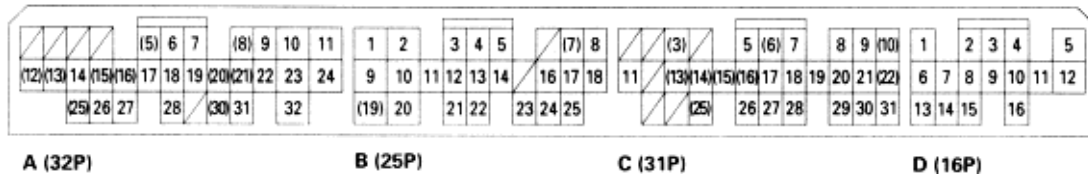
PCM Connector Terminal Locations



**PCM Terminal Voltage/Measuring
Conditions**
A/T Control System

14-52

The PCM terminal voltage and measuring conditions are shown for the connector terminals that are related to the A/T control system. The other PCM terminal voltage and measuring conditions are described in section 11.



PCM CONNECTOR A(32P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
A5	CRS	Downshift signal input cruise control unit	When cruise control is used: Pulsing signal
A6	LED A	Shift indicator light control	In manual mode: • In 4th gear position: Battery voltage • In 1st, 2nd and 3rd gear positions: 0V
A7	LED B	Shift indicator light control	In manual mode: • In 2nd and 3rd gear positions: Battery voltage • In 1st and 4th gear positions: 0V
A9	VSS OUT	Vehicle speed signal detected from countershaft speed sensor	Depending on vehicle speed: Pulsing signal
A10	SCS	Timing and adjustment service check signal	With ignition switched ON (II) and service check connector open: 5V With ignition switch ON (II) and service check connector connected with special tool: 0V
A11	LED C	Shift indicator light control	In manual mode: • In 1st and 3rd gear positions: Battery voltage • In 2nd and 4th gear positions: 0V
A14	D4 IND	D4 indicator light control	When ignition switch is first turned ON (II): Battery voltage for two seconds. In D4 position: Battery voltage
A21	K-LINE	Data communication; Diagnostic trouble code input	With ignition switch ON (II): Approx. 5V
A22	S-DN	Downshift switch signal input	In manual mode and shift lever pushed toward downshift position (marked with "-"): 0V In manual mode and shift lever in neutral position: Battery voltage

**PCM Terminal Voltage/Measuring
Conditions**
A/T Control System (cont'd)

14-53

PCM CONNECTOR A(32P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
A26	S-UP	Upshift switch signal input	In manual mode and shift lever pushed toward upshift position (marked with "+"): 0V In manual mode and shift lever in neutral position: Battery voltage
A28	ILU	Interlock control	When ignition switch ON (II), brake pedal depressed and accelerator pedal released: Battery voltage
A31	S-MODE	Manual mode switch signal input	In manual mode (shift lever is positioned in manual mode): 0V In other than manual mode: Battery voltage
A32	STOP SW	Brake switch signal input	Brake pedal depressed: Battery voltage Brake pedal released: 0V

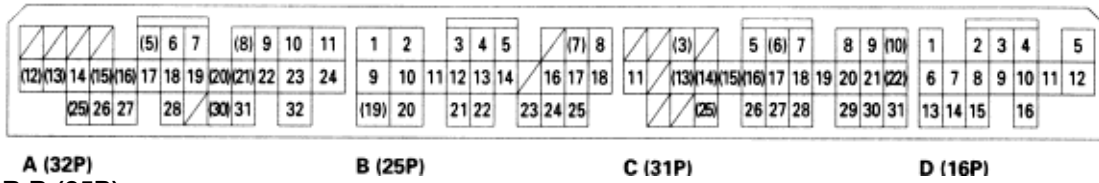
PCM CONNECTOR B(25P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
B1	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
B2	PG1	Ground	
B8	LS AM	A/T clutch pressure control solenoid valve A power supply negative electrode	
B9	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
B10	PG2	Ground	
B14	AT OP2SW	A/T 2nd clutch pressure switch signal input	With ignition switch ON (II): Battery voltage (No 2nd clutch pressure)
B17	LS AP	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulsing signal
B18	LS BM	A/T clutch pressure control solenoid valve B power supply negative electrode	
B20	LG1	Ground	

**PCM Terminal Voltage/Measuring
Conditions**
A/T Control System (cont'd)

14-54

PCM Connector Terminal Locations



PCM CONNECTOR B (25P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
B21	VBU	Back-up power supply	Always battery voltage
B22	LG2	Ground	
B24	AT OP3SW	A/T 3rd clutch pressure switch signal input	With ignition switch ON (II) Battery voltage (No 3rd clutch pressure)
B25	LS BP	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulsing signal

PCM CONNECTOR C(31P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
C19	VCC1	Power supply for sensors	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
C28	VCC2	Power supply for sensors	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V

PCM CONNECTOR D(16P)

Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
D1	LC	Lock-up control solenoid valve control	During partial, half and full lock-up conditions, and during deceleration condition: Battery voltage During no lock-up condition: 0V
D2	SH B	Shift control solenoid valve B control	Battery voltage in following positions: <ul style="list-style-type: none"> • 1 and 2 positions • D4 and D3 positions in 1st and 2nd gear • P, R and N positions 0V in following positions: <ul style="list-style-type: none"> • D4 and D3 in 3rd gear • D4 position in 4th gear

**PCM Terminal Voltage/Measuring
Conditions**
A/T Control System (cont'd)

14-55

PCM CONNECTOR D (16P)

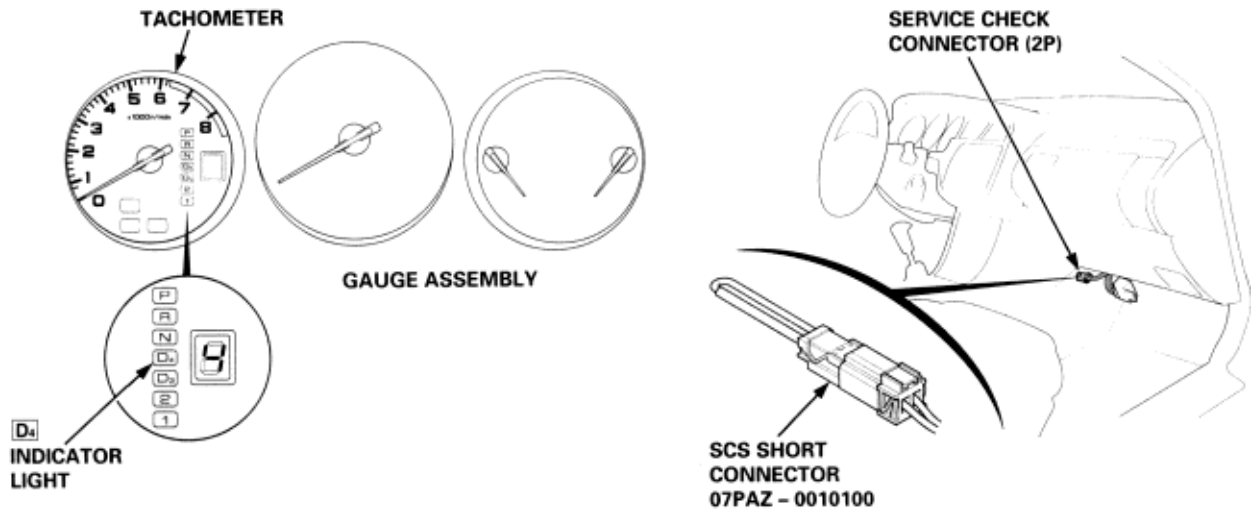
Terminal No.	Signal	Description	Measuring Conditions/Terminal Voltage
D3	SH C	Shift control solenoid valve C control	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4 and D3 positions in 1st and 3rd gear 0V in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4 and D3 position in 2nd gear ♦ D4 position in 4th gear ♦ P, R and N positions
D4	ATP N	A/T gear position switch N position input	In N position: 0V In other than N position: Battery voltage
D5	VB SOL	Power supply for solenoid valves	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0V
D6	ATP R	A/T gear position switch R position input	In R position: 0V In other than R position: Battery voltage
D7	SH A	Shift control solenoid valve A control	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4 and D3 positions in 2nd and 3rd gear 0V in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4 and D3 position in 1st gear ♦ D4 position in 4th gear ♦ P, R and N positions
D8	ATP D3	A/T gear position switch D3 position input	In D3 position: 0V In other than D3 position: Battery voltage
D9	ATP D4	A/T gear position switch D4 position input	In D4 position: 0V In other than D4 position: Battery voltage
D10	NC	Countershaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx. 0V
D11	NM	Mainshaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx. 0V
D12	NMSG	Mainshaft speed sensor ground	
D13	ATP PN	A/T gear position switch P and N positions	In P and N positions: 0V In other than P and N position: Battery voltage
D14	ATP 2	A/T gear position switch 2 position input	In 2 position: 0V In other than 2 position: Battery voltage
D15	ATP 1	A/T gear position switch 1 position input	In 1 position: 0V In other than 1 position: Battery voltage
D16	NCSG	Countershaft speed sensor ground	

Checking the Diagnostic Trouble Code (DTC)

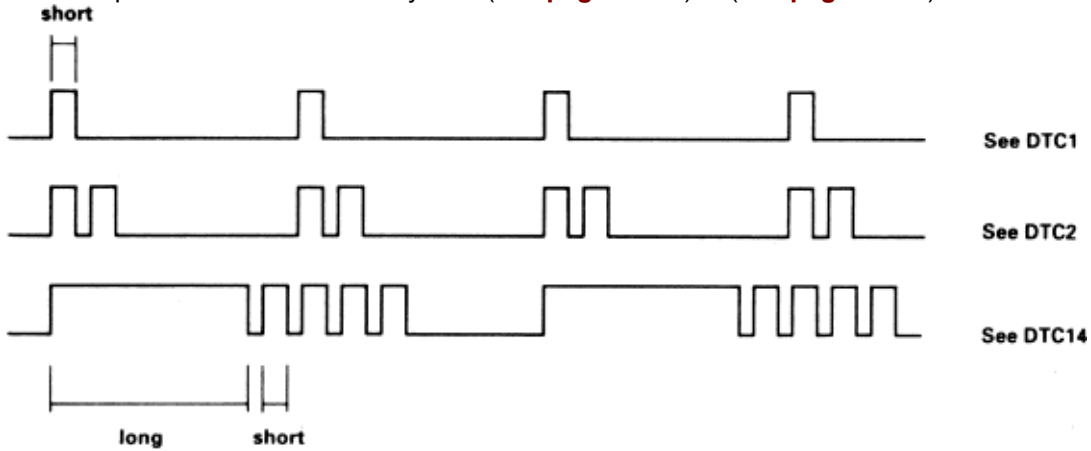
Connecting with the Special Tool to the Service Check Connector for All Models

When the PCM senses an abnormality in the input or output systems, the **D4** indicator light in the gauge assembly will blink. When the Service Check Connector (located under the dash on the passenger side) is connected with the special tool as shown, the **D4** indicator light will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the **D4** indicator light has been reported on, connect the Service Check Connector with the special tool. The turn ON (II) the ignition switch and observe the **D4** indicator light.



Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the Symptom to Component Chart Electrical System (see page 14-59) to (see page 14-61)



NOTE:

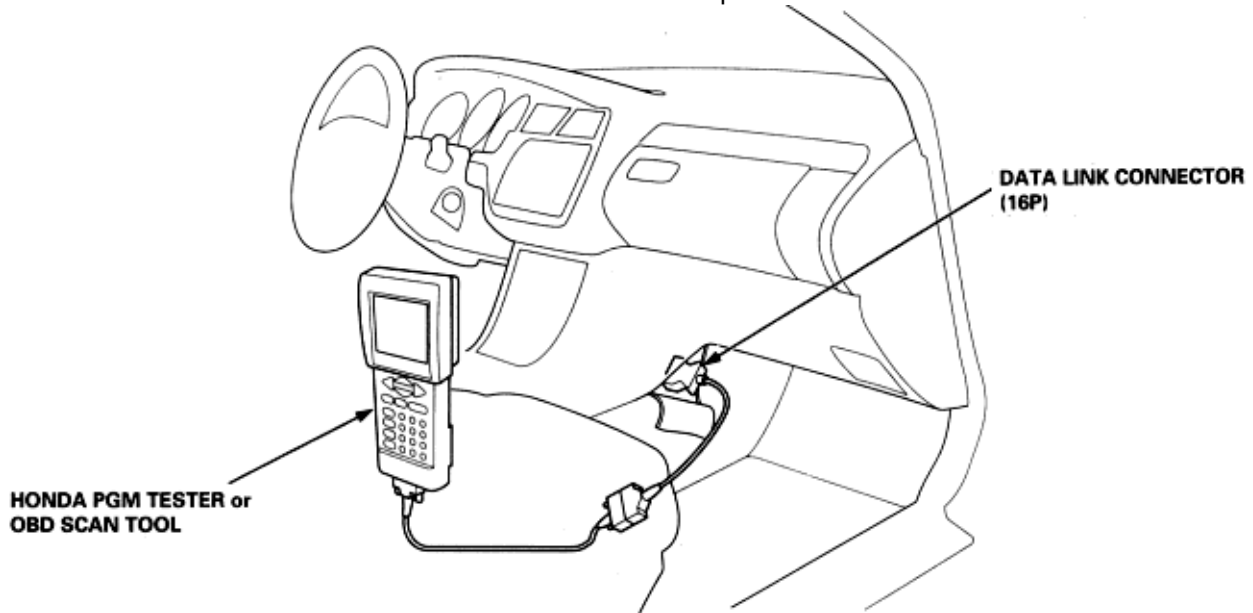
- ♦ If the **D4** indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow these procedures:
 1. Record the DTCs for the fuel/emissions and A/T systems.
 2. Check the fuel and emission system indicated by the DTC.
 3. Write down the numbers of the customer's radio station presets.
 4. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-hood fuse/relay box for more than 10 seconds.
 5. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), and then recheck the DTCs.
- ♦ Disconnecting the BACK UP fuse also cancels the radio station presets and the clock setting.

Checking the Diagnostic Trouble Code (DTC) with an OBD Scan Tool or the Honda PGM Tester for F20B6 Engine

When the PCM senses an abnormality in the input or output systems, the **D4** indicator light in the gauge assembly will blink. When the 16P Data Link Connector (DLC) (located under the dash on the passenger side) is connected to the OBD Scan Tool or Honda PGM Tester as shown, the scan tool or tester will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the **D4** indicator light has been reported on, connect the OBD Scan Tool or Honda PGM Tester to the DLC (16P). Turn the ignition switch ON (II), and observe the DTC on the screen of the Scan Tool or Honda PGM Tester. After determining the DTC, refer to the Symptom-to-Component Chart Electrical System ([see page 14-59](#)) to ([see page 14-61](#)).

NOTE: See the OBD Scan Tool or Honda PGM Tester user's manual for specific instructions.

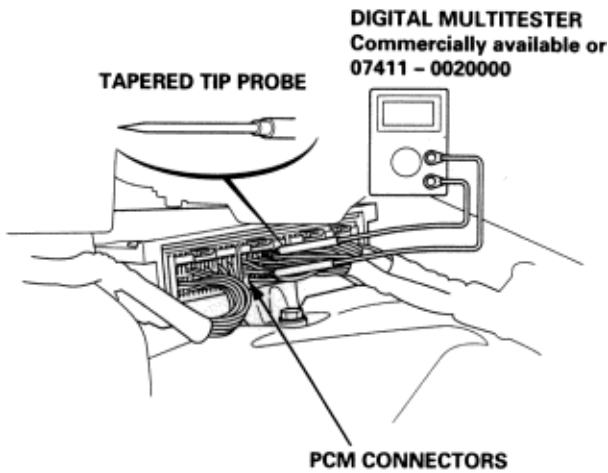


NOTE:

- ♦ If the **D4** indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow these procedures:
 1. Record the DTCs for the fuel/emissions and A/T systems.
 2. Check the fuel and emission system indicated by the DTC.
 3. Write down the numbers of the customer's radio station presets.
 4. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-hood fuse/relay box for more than 10 seconds.
 5. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), and then recheck the DTCs.
- ♦ Disconnecting the BACK UP fuse also cancels the radio station presets and the clock setting.

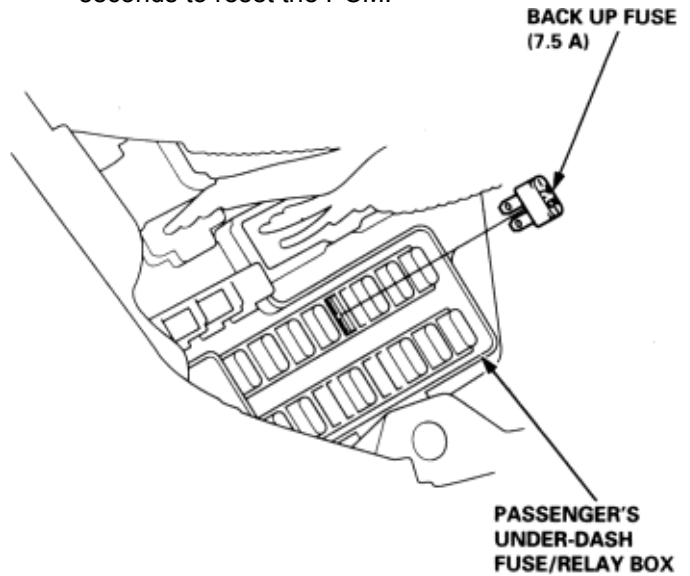
SRS component are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Pull back the carpet from passenger's side of the center console to expose the PCM.
2. Inspect the circuit on the PCM according to the troubleshooting flowchart with a digital multimeter and a tapered tip probe as shown



♦ **PCM Reset Procedure**

1. Turn the ignition switch OFF.
2. Remove the BACK UP fuse (7.5 A) from the passenger's under-dash fuse/relay box for 10 seconds to reset the PCM.



NOTE: Disconnecting the BACK UP fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.

♦ **Final Procedure**

NOTE: This procedure must be done after any troubleshooting.

1. Remove the special tool from the Service Check Connector.
2. Reset the PCM.
3. Set the radio preset stations and clock setting.

*: F20B6 engine only

When PCM senses abnormality, D4 indicator light	Number of D4 Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Page
Blinks	1 1-1 P1753	<ul style="list-style-type: none"> ♦ Lock-up clutch does not engage ♦ Fails to shift (stuck in 4th gear) 	<ul style="list-style-type: none"> ♦ Disconnected lock-up control solenoid valve/shift control solenoid valve A assembly connector ♦ Short or open in lock-up control solenoid valve wire ♦ Faulty lock-up control solenoid valve ♦ Open in VB SOL wire 	(See page 14-62)
Blinks	5 5-1 P1705	<ul style="list-style-type: none"> ♦ Fails to shift other than 2nd/3rd gears ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Short in A/T gear position switch connector ♦ Faulty A/T gear position switch 	(See page 14-64)
Does not blink	6 6-1 P1706	No specific symptom appears	<ul style="list-style-type: none"> ♦ Disconnected A/T gear position switch connector ♦ Open in A/T gear position switch wire ♦ Faulty A/T gear position switch 	(See page 14-68)
Blinks	7 7-1 P0753	Fails to shift (stuck in 4th gear)	<ul style="list-style-type: none"> ♦ Disconnected lock-up control solenoid valve/shift control solenoid valve A assembly connector ♦ Short or open in lock-up control solenoid valve A wire ♦ Faulty lock-up control solenoid valve A ♦ Open in VB SOL wire 	(See page 14-71)
Blinks	8 8-1 P0758	Fails to shift (stuck in 4th gear)	<ul style="list-style-type: none"> ♦ Disconnected shift control solenoid valve B assembly connector ♦ Short or open in lock-up control solenoid valve B wire ♦ Faulty lock-up control solenoid valve B ♦ Open in VB SOL wire 	(See page 14-73)
Blinks	9 9-1 P0720	<ul style="list-style-type: none"> ♦ Fails to shift (between 2nd/3rd, downshift to 3rd gear only) ♦ Speedometer does not operate ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected countershaft speed sensor connector ♦ Short or open in countershaft speed sensor wire ♦ Faulty countershaft speed sensor 	(See page 14-75)

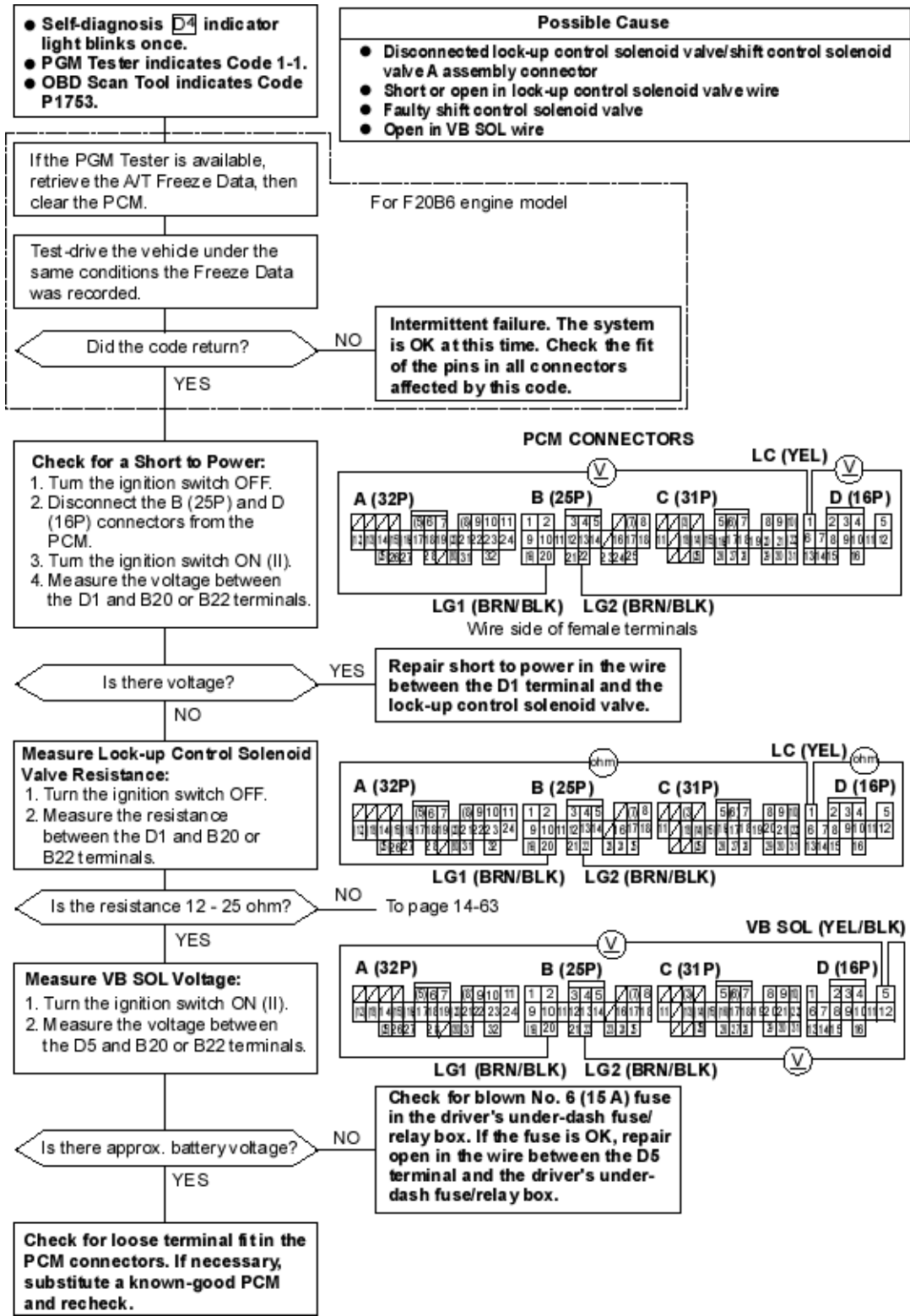
When PCM senses abnormality, D4 indicator light	Number of D4 Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Page
Blinks	15 15-1 P0715	<ul style="list-style-type: none"> ♦ Fails to shift (between 2nd/3rd, downshift to 3rd gear only) ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected mainshaft speed sensor connector ♦ Short or open in mainshaft speed sensor wire ♦ Faulty mainshaft speed sensor 	(See page 14-79)
Blinks	16 16-1 P1768	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected A/T clutch pressure control solenoid valve A connector ♦ Short or open in A/T clutch pressure control solenoid valve A wire ♦ Faulty A/T clutch pressure control solenoid valve A ♦ Open in VB SOL wire ♦ Open in PG1 or PG2 wires or poor ground (101) 	(See page 14-83)
Blinks	22 22-1 P0763	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) 	<ul style="list-style-type: none"> ♦ Disconnected shift control solenoid valve C connector ♦ Short or open in shift control solenoid valve C connector ♦ Faulty shift control solenoid valve C ♦ Open in VB SOL wire 	(See page 14-85)
Blinks	23 23-1 P1773	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected A/T clutch pressure control solenoid valve B connector ♦ Short or open in A/T clutch pressure control solenoid valve B wire ♦ Faulty A/T clutch pressure control solenoid valve B ♦ Open in VB SOL wire ♦ Open in PG1 or PG2 wires or poor ground (101) 	(See page 14-87)
Blinks	24 24-1 P1709	Transmission does not shift into manual mode	<ul style="list-style-type: none"> ♦ Disconnected mode switch connector ♦ Short or open in mode switch wire ♦ Faulty mode switch 	(See page 14-89)
Does not blink	25 25-1 P1738	No specific symptom appears	<ul style="list-style-type: none"> ♦ Disconnected 2nd clutch pressure switch connector ♦ Short or open in 2nd clutch pressure switch wire ♦ Faulty 2nd clutch pressure switch 	(See page 14-91)

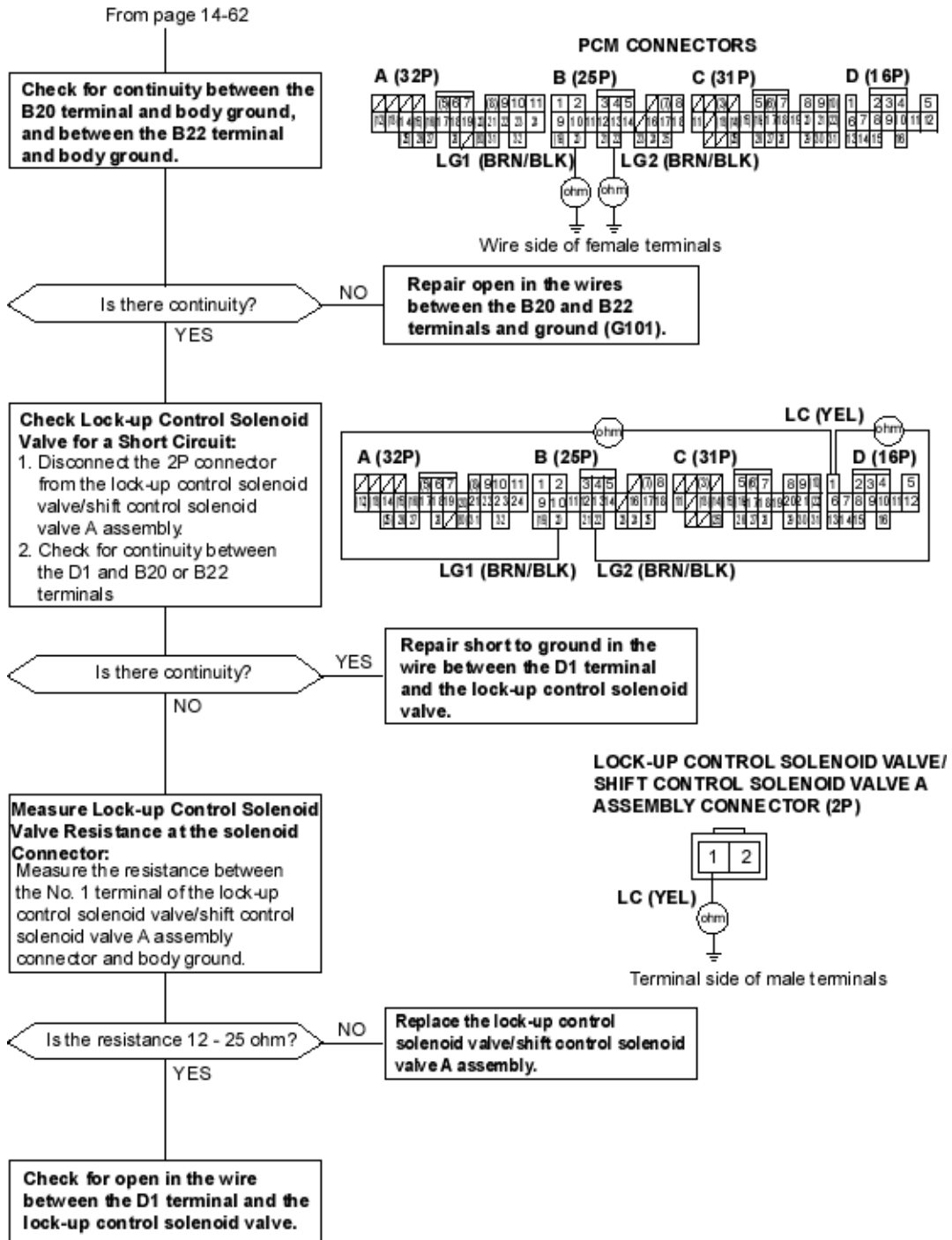
*: F20B6 Engine only

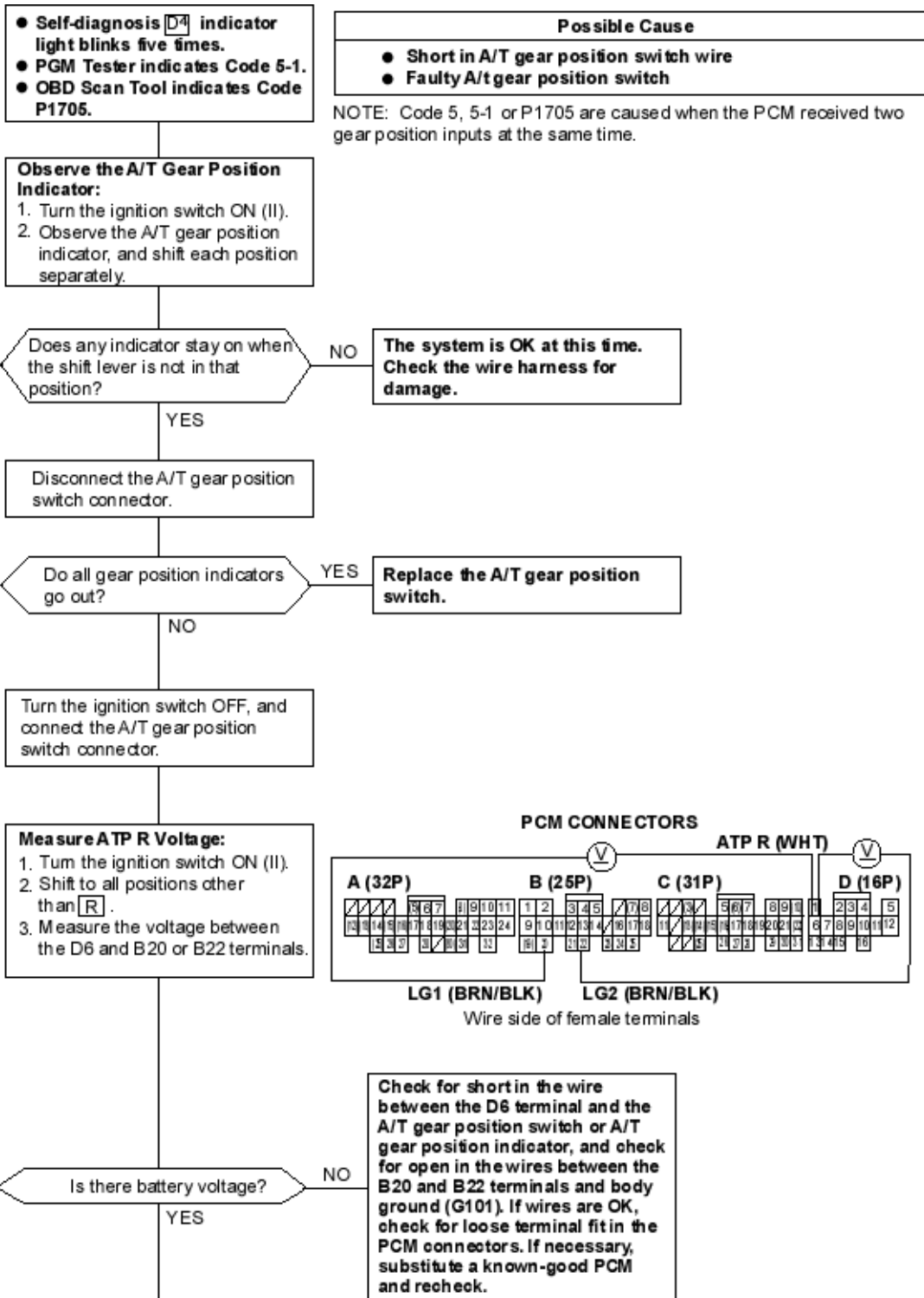
When PCM senses abnormality, D4 indicator light	Number of D4 Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Page
Does not blink	26 26-1 P1739	No specific symptom appears	<ul style="list-style-type: none"> ♦ Disconnected 3rd clutch pressure switch connector ♦ Short or open in 3rd clutch pressure switch wire ♦ Faulty 3rd clutch pressure switch 	(See page 14-93)
Does not blink	41 41-1 P0730	For F20B6 engine model: <ul style="list-style-type: none"> ♦ Fails to shift (between 1st/2nd, 1st/2nd/3rd, 1st/3rd/4th or 2nd/3rd/4th gears only) ♦ Fails to shift (stuck in 4th gear) 	Faulty shift control system	(See page 14-95)

The following symptom appears if the self-diagnostic **D4** indicator light does not blink, perform an inspection according to the table below.

Symptom	Possible Cause	Page
D4 indicator light is on constantly (not blinking) whenever the ignition switch is ON (II)	-	(see page 14-97)
D4 indicator light does not come on for two seconds after ignition switch is first turned ON (II)	-	(see page 14-98)
Transmission does not shift up and down when operating the shift lever in the manual mode position	Check shift switch	(see page 14-100)
Shift indicator does not indicate selected gear while shift lever is in the manual mode position	Check shift indicator circuit	(see page 14-103)
Shift lever cannot be moved from P position with the brake pedal depressed	Check interlock system - Shift lock system	(see page 14-104)
Shift lever cannot pass through R position from N position	Check interlock circuit - Reverse lock system	(see page 14-107)
Ignition key cannot be moved from ACC (I) position to LOCK (0) position while pushing the ignition key with the shift lever in P position	Check interlock system - Key interlock system	(see page 14-109)



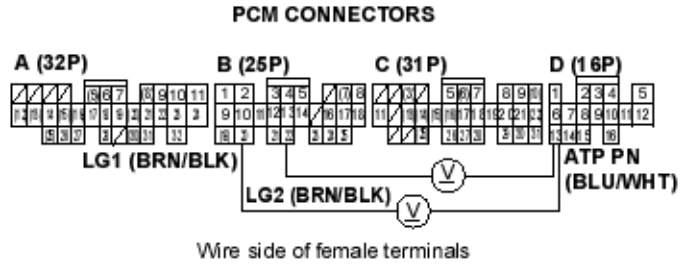




To page 14-65

From page 14-64

Measure ATP PN Voltage:
 1. Shift to all positions other than **P** or **N**.
 2. Measure the voltage between the D13 and B20 or B22 terminals.



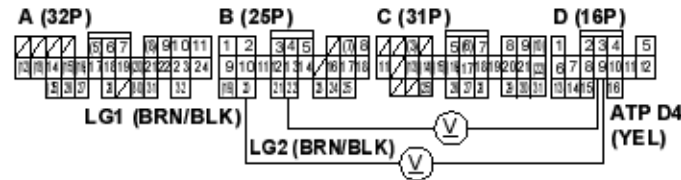
Is there approx. 5 V?

NO

YES

Check for short in the wire between the D13 terminal and the A/T gear position switch, and in the **P and **N** position signal wires between the A/T gear position indicator and the A/T gear position switch. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.**

Measure ATP D4 Voltage:
 1. Shift to all positions other than **D4**.
 2. Measure the voltage between the D9 and B20 or B22 terminals.



Is there approx. 5 V?

NO

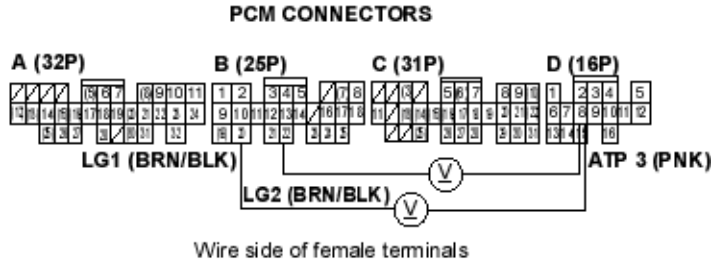
YES

Check for short in the wire between the D9 terminal and the A/T gear position switch. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

To page 14-66

From page 14-65

Measure ATP D3 Voltage:
 1. Shift to all positions other than **D3**.
 2. Measure the voltage between the D8 and B20 or B22 terminals.



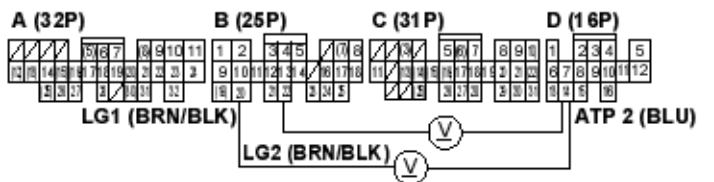
Is there battery voltage?

NO

Check for short in the wire between the D8 terminal and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

YES

Measure ATP 2 Voltage:
 1. Shift to all positions other than **D2**.
 2. Measure the voltage between the D14 and B20 or B22 terminals.



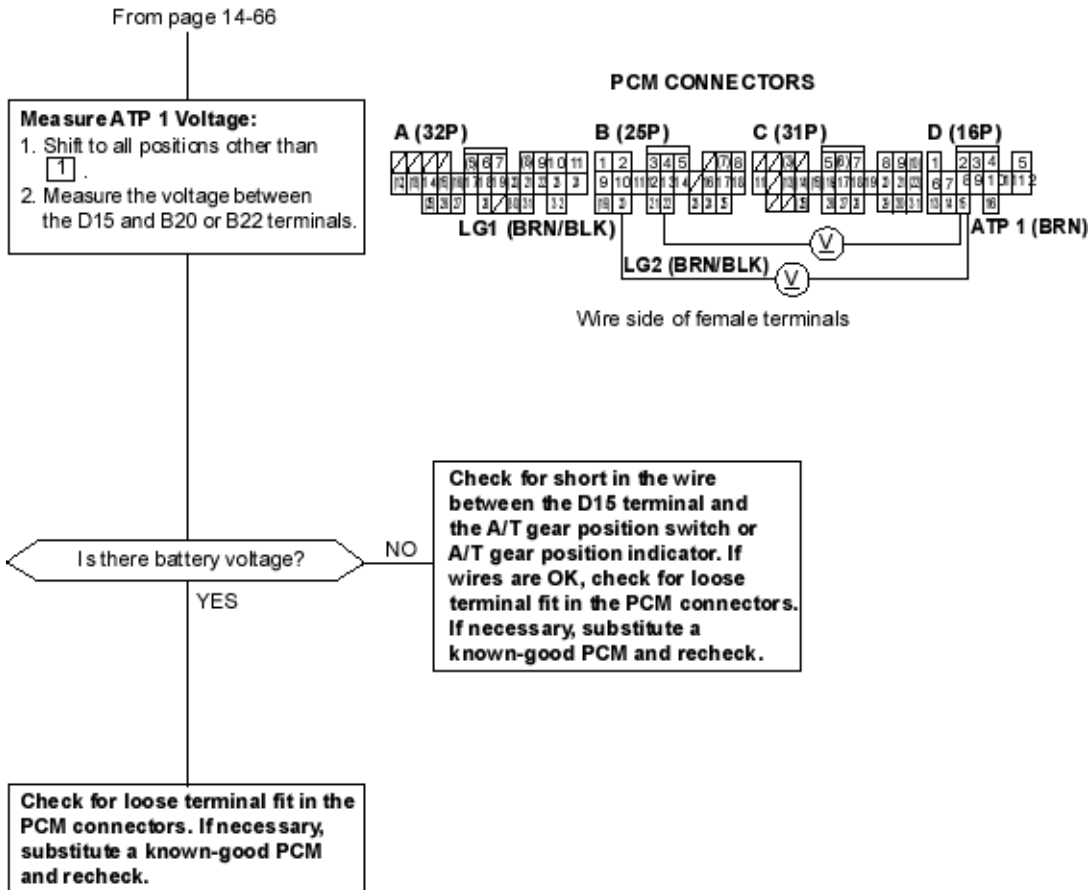
Is there battery voltage?

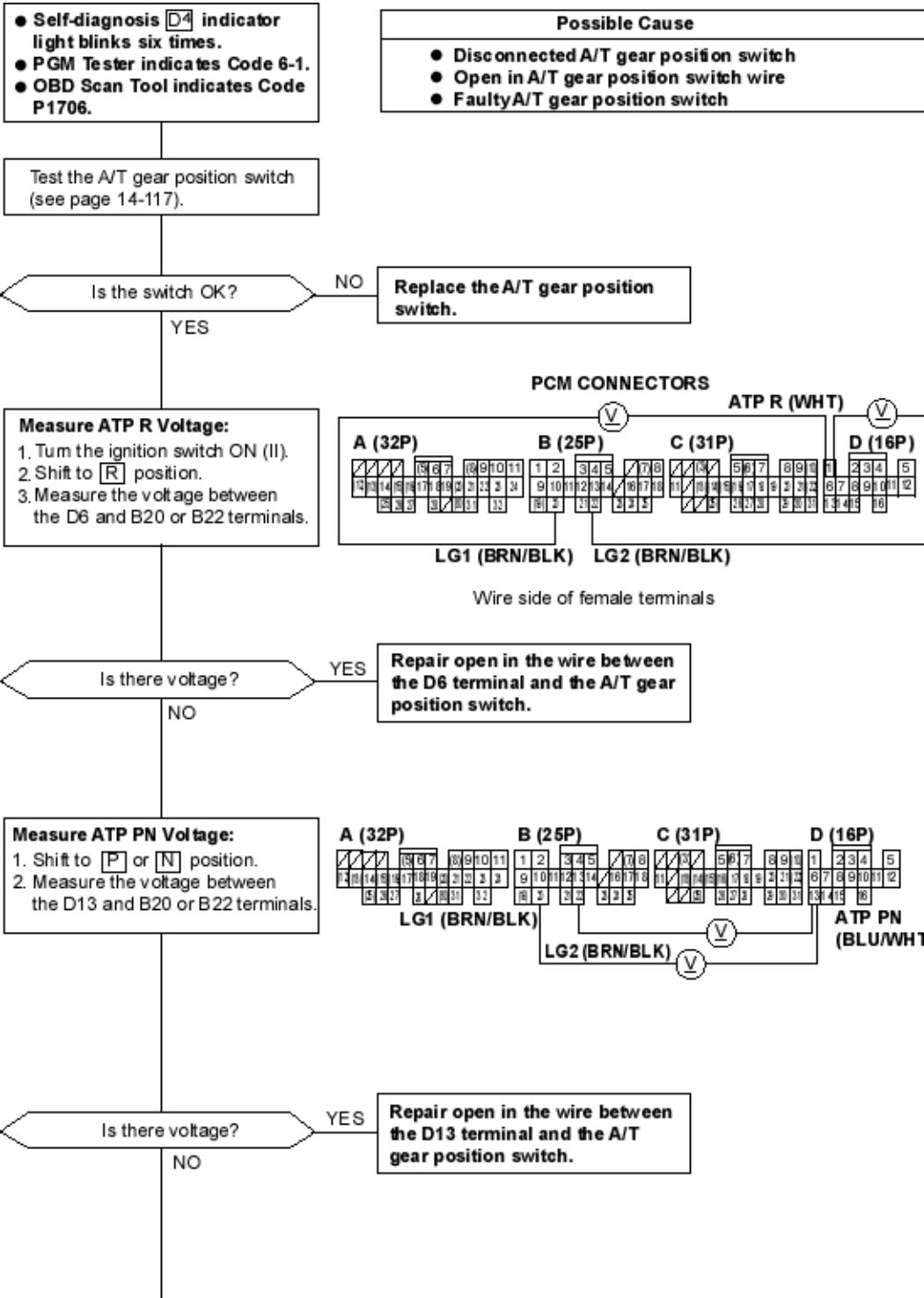
NO

Check for short in the wire between the D14 terminal and the A/T gear position switch or A/T gear position indicator. If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

YES

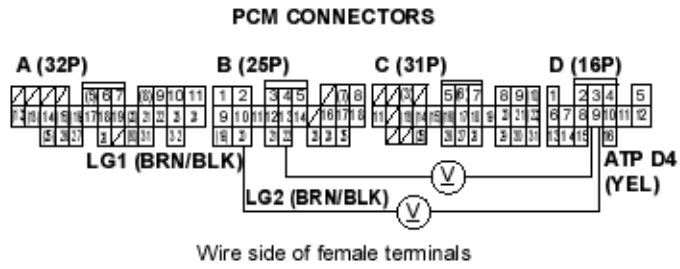
To page 14-67





From page 14-68

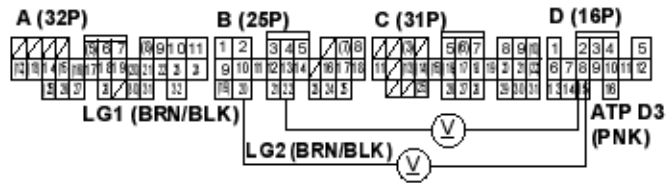
Measure ATP D4 Voltage:
 1. Shift to **D4** position.
 2. Measure the voltage between the D9 and B20 or B22 terminals.



Is there voltage? YES → **Repair open in the wire between the D9 terminal and the A/T gear position switch.**

NO

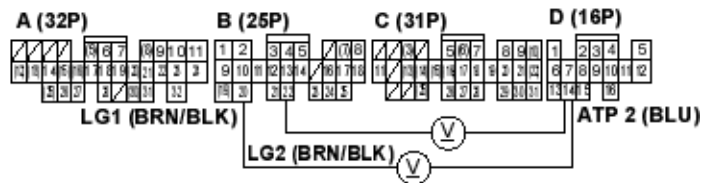
Measure ATP D3 Voltage:
 1. Shift to **D3** position.
 2. Measure the voltage between the D8 and B20 or B22 terminals.



Is there voltage? YES → **Repair open in the wire between the D8 terminal and the A/T gear position switch.**

NO

Measure ATP 2 Voltage:
 1. Shift to **2** position.
 2. Measure the voltage between the D14 and B20 or B22 terminals.



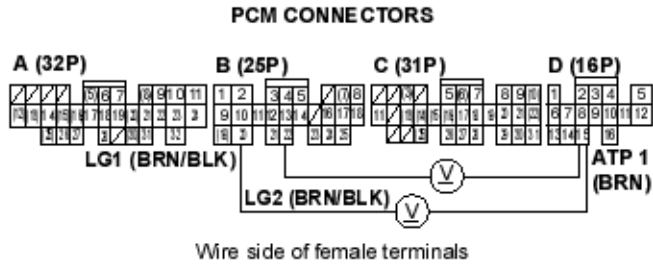
Is there voltage? YES → **Repair open in the wire between the D14 terminal and the A/T gear position switch.**

NO

To page 14-70

From page 14-69

Measure ATP 1 Voltage:
 1. Shift to **1** position.
 2. Measure the voltage between the D15 and B20 or B22 terminals.

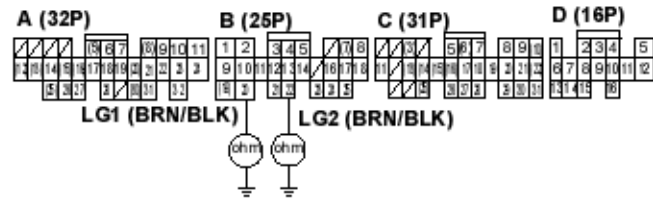


Is there voltage? YES

Repair open in the wire between the D15 terminal and the A/T gear position switch.

NO

Check LG Wire for an Open Circuit
 1. Turn the ignition switch OFF.
 2. Check for continuity between the B20 terminal and body ground, and between the B22 terminal and body ground.

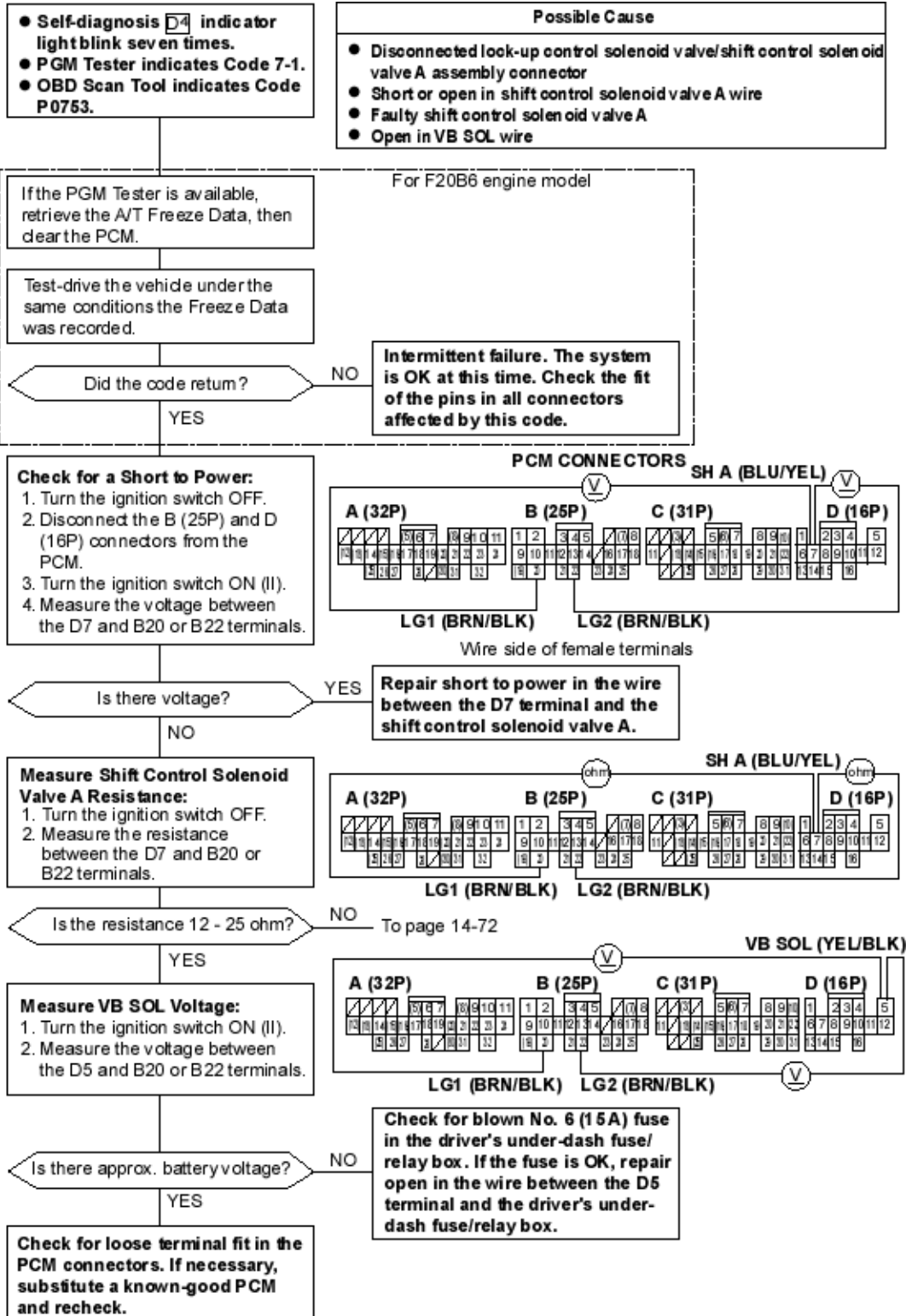


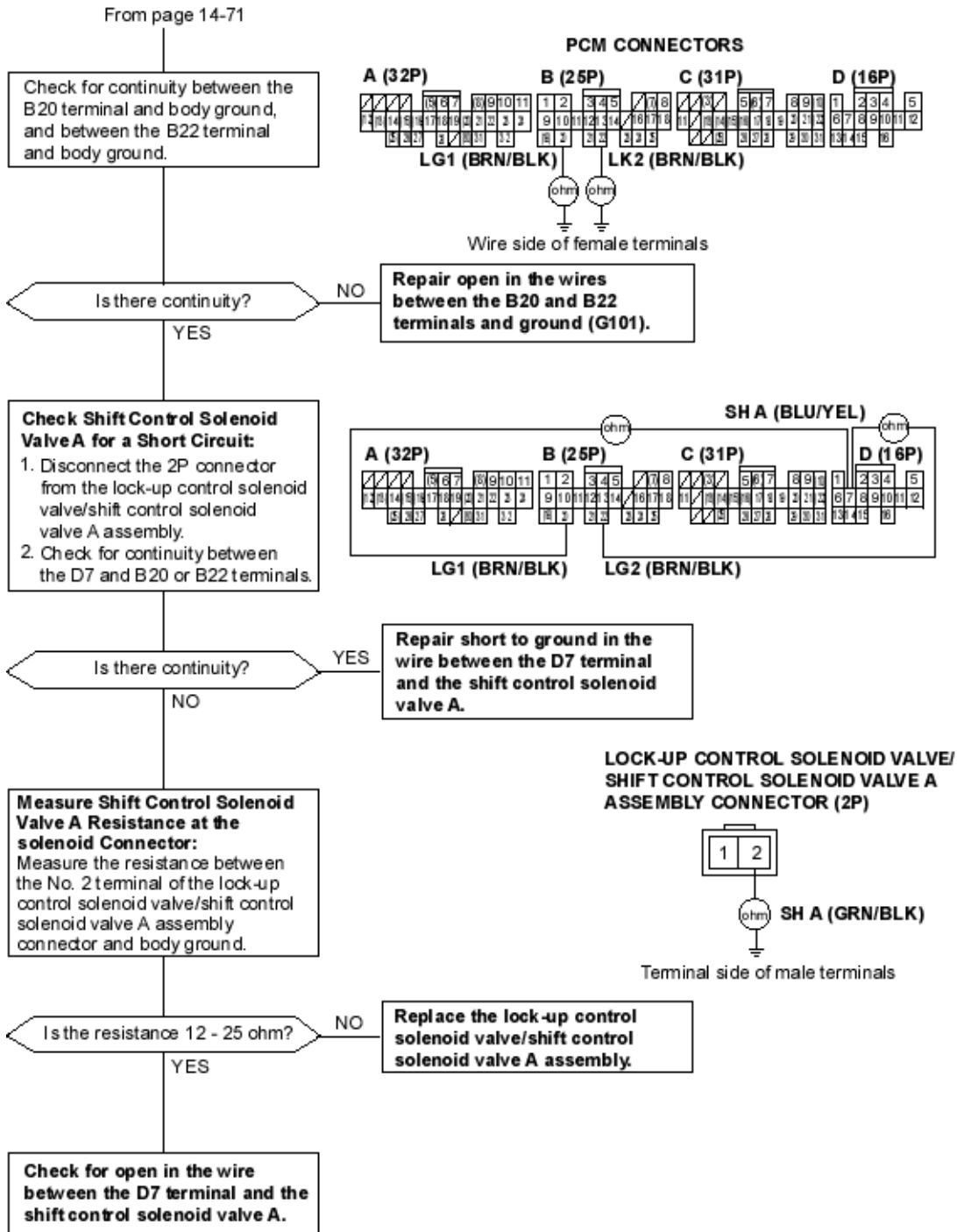
Is there continuity? NO

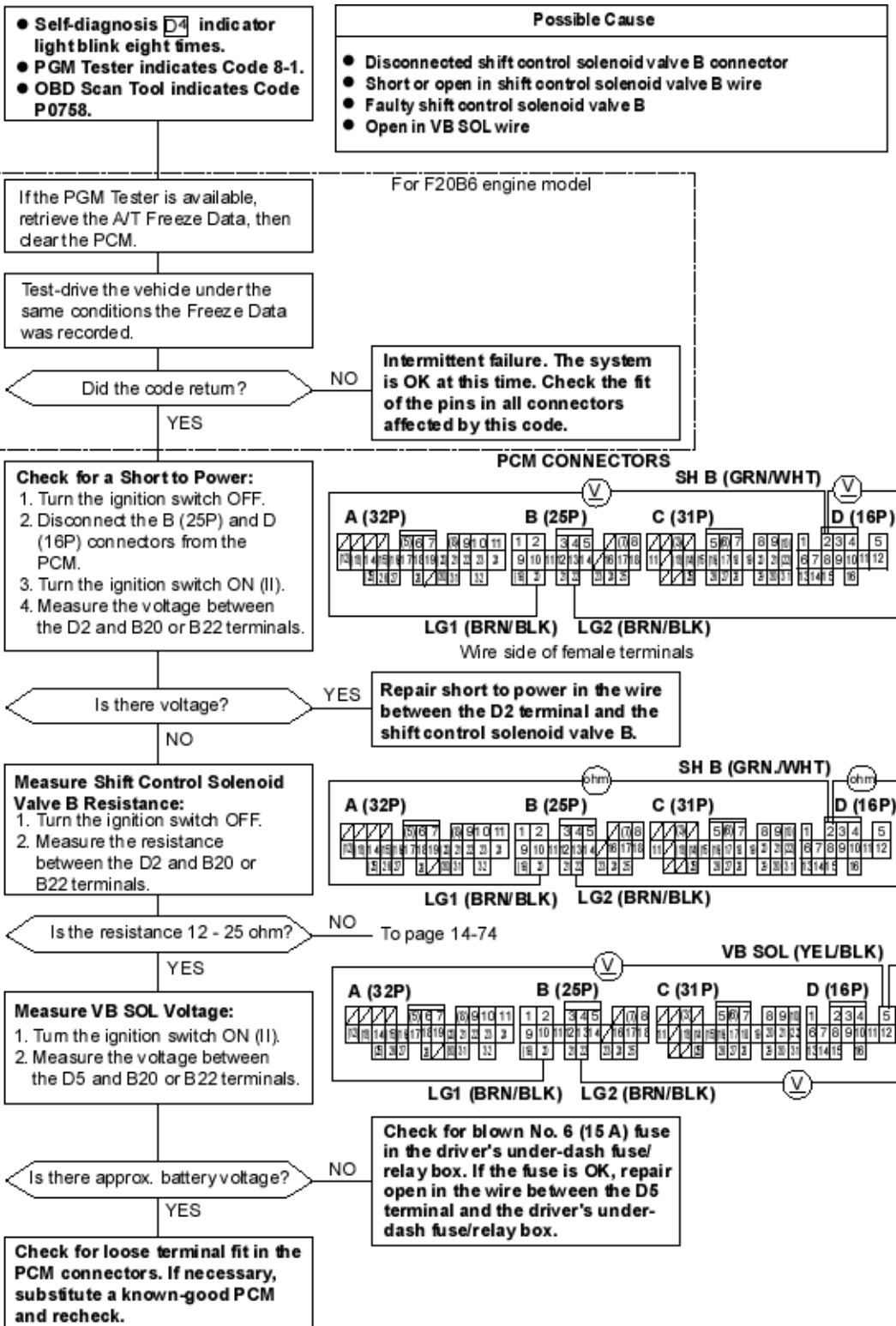
Repair open in the wires between the B20 and B22 terminals and body ground, and repair poor ground (G101).

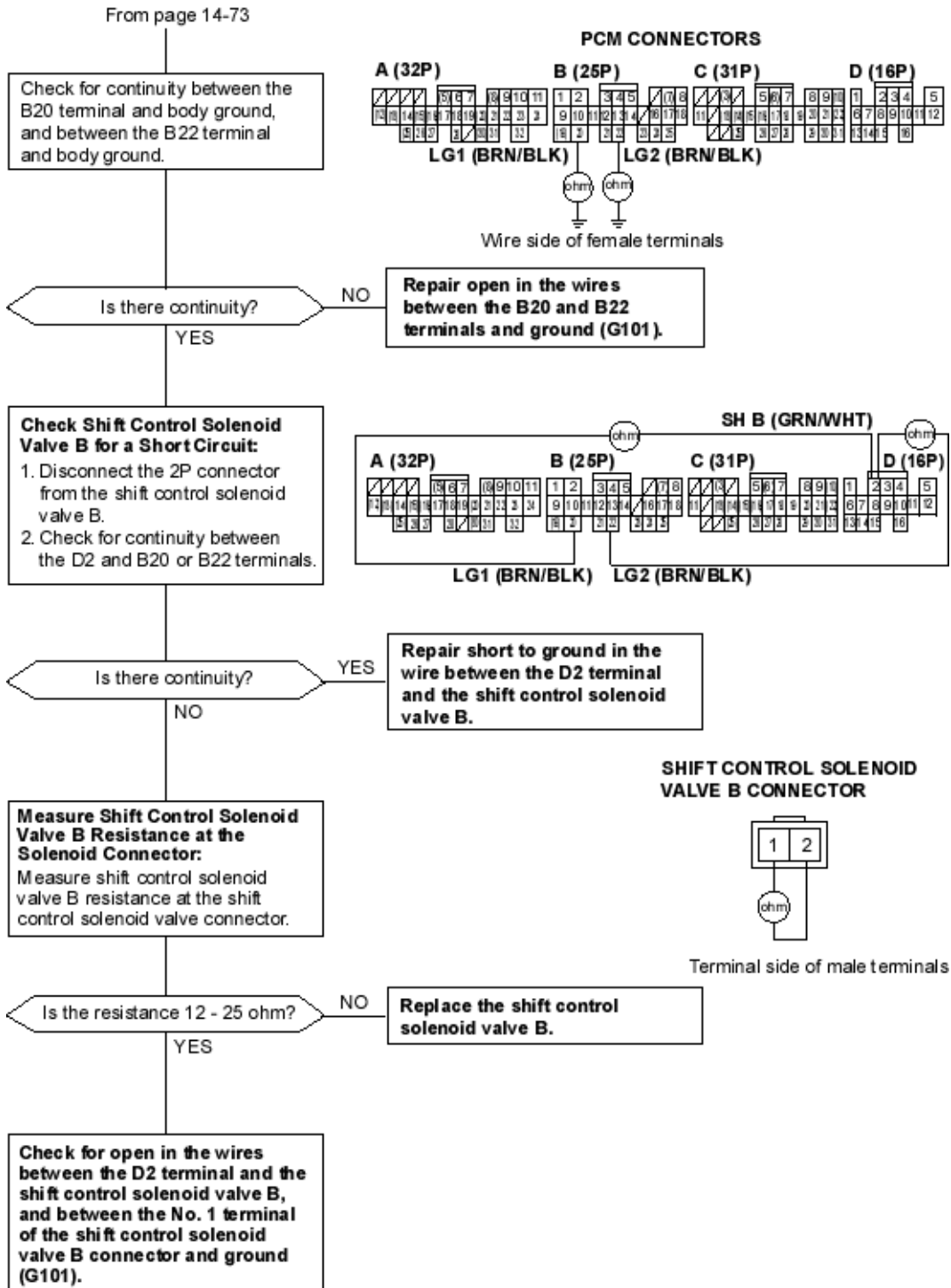
YES

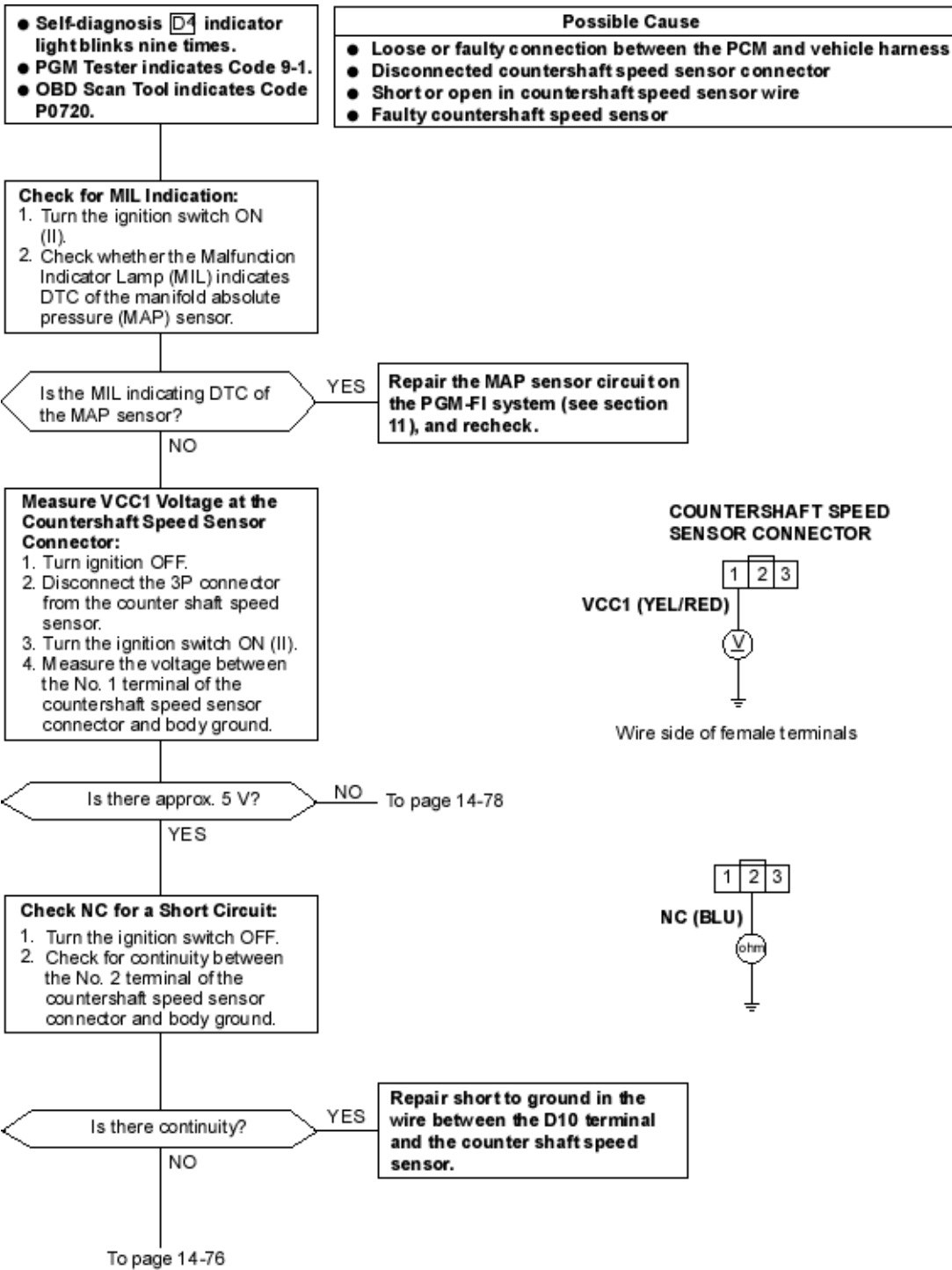
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

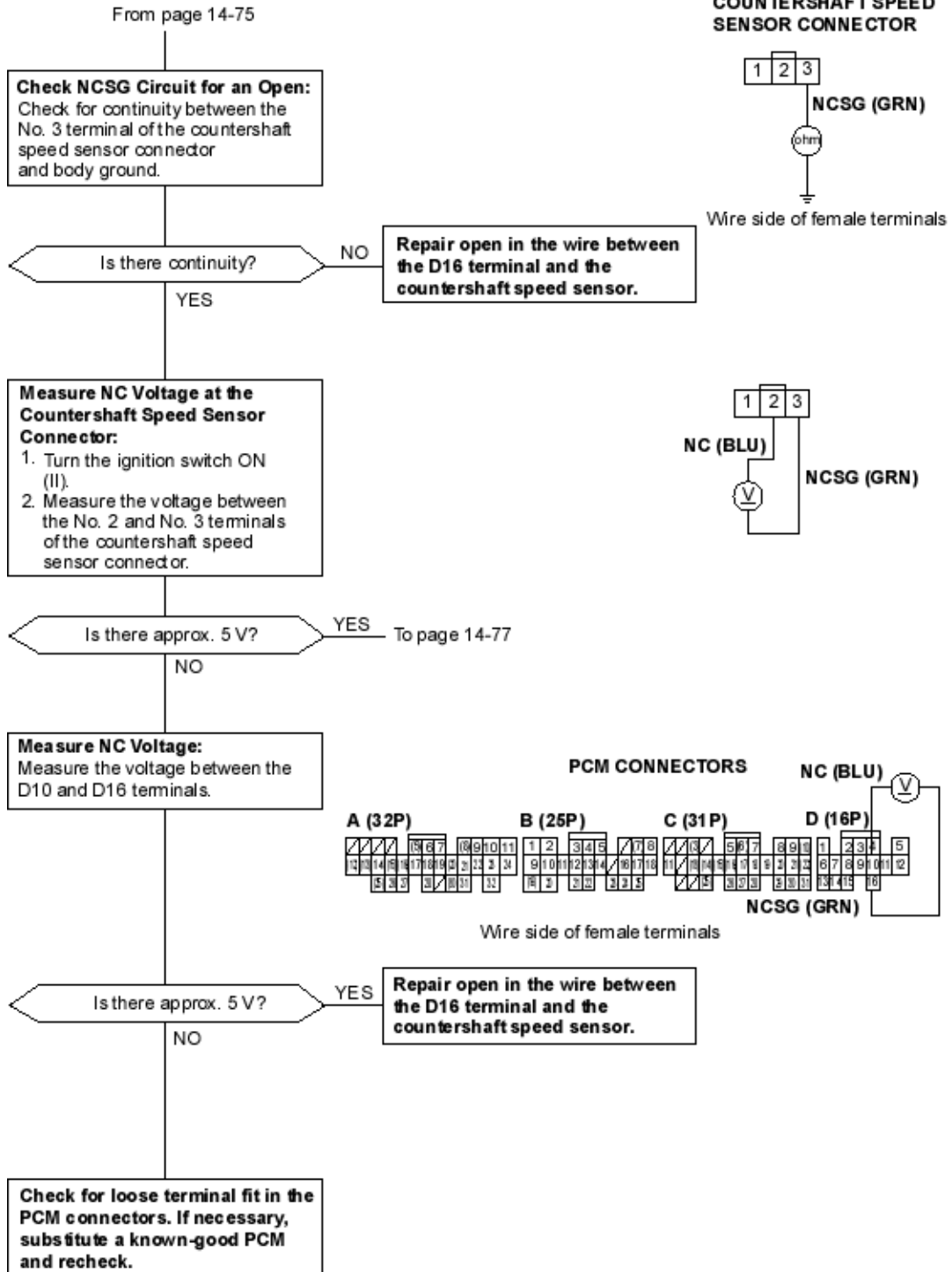






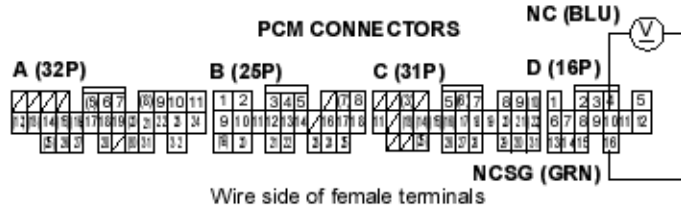






From page 14-76

Measure NC Voltage:
 1. Connect the countershaft speed sensor connector.
 2. Measure the voltage between the D10 and D16 terminals.

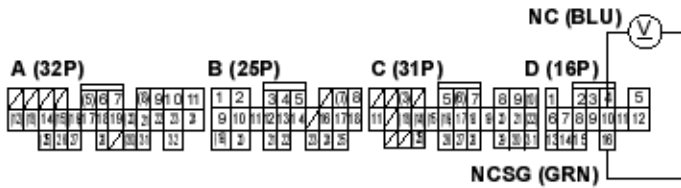


Is there approx. 5 V or 0 V?

NO **Replace the countershaft speed sensor.**

YES

Measure NC Voltage with Engine Running:
 1. Raise the front of the vehicle, and make sure it is securely supported.
 2. Set the parking brake, and block both rear wheels securely.
 3. Start the engine, then shift to **D4** position and drive the vehicle.
 4. Measure the voltage between the D10 and D16 terminals.

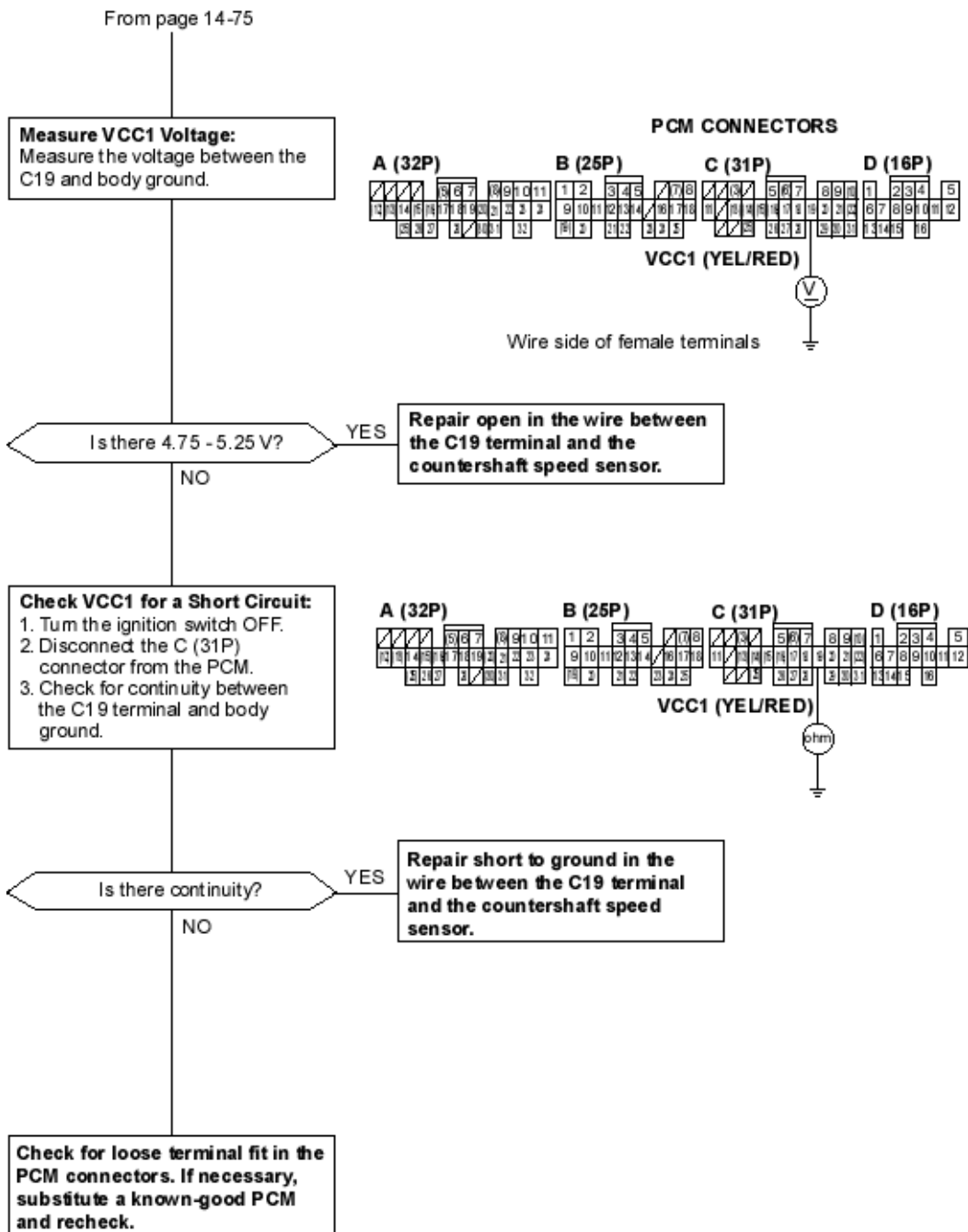



Is there 1.5 - 3.5 V?

NO **Replace the countershaft speed sensor.**

YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



● Self-diagnosis  indicator light indicates Code 15.
 ● PGM Tester indicates Code 15-1.
 ● OBD Scan Tool indicates Code P1715.

Possible Cause

- Disconnected mainshaft speed sensor connector
- Short or open in mainshaft speed sensor wire.
- Faulty mainshaft speed sensor

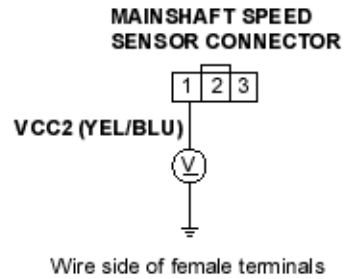
NOTE: Code 15, 15-1 or P0715 on the PCM doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code 15, 15-1 or P0715 may also indicate a mechanical problem in the transmission. Any problem causing irregular countershaft to mainshaft speed difference can cause this code.

Check for MIL Indication:
 1. Turn the ignition switch ON (II).
 2. Check whether the Malfunction Indicator Lamp (MIL) indicates DTC(s) of the throttle position (TP) sensor or the engine coolant temperature (ECT) sensor.

Is the MIL indicating DTC of the TP sensor or ECT sensor?

YES
Repair the TP sensor or ECT sensor circuit on the PGM-FI system (see section 11), and recheck.

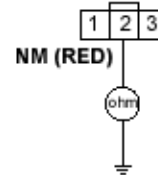
Measure VCC2 Voltage at the Mainshaft Speed Sensor Connector:
 1. Turn the ignition switch OFF.
 2. Disconnect the 3P connector from the mainshaft speed sensor.
 3. Turn the ignition switch ON (II).
 4. Measure the voltage between the No. 1 terminal of the mainshaft speed sensor connector and body ground.



Is there approx. 5V?

NO To page 14-82

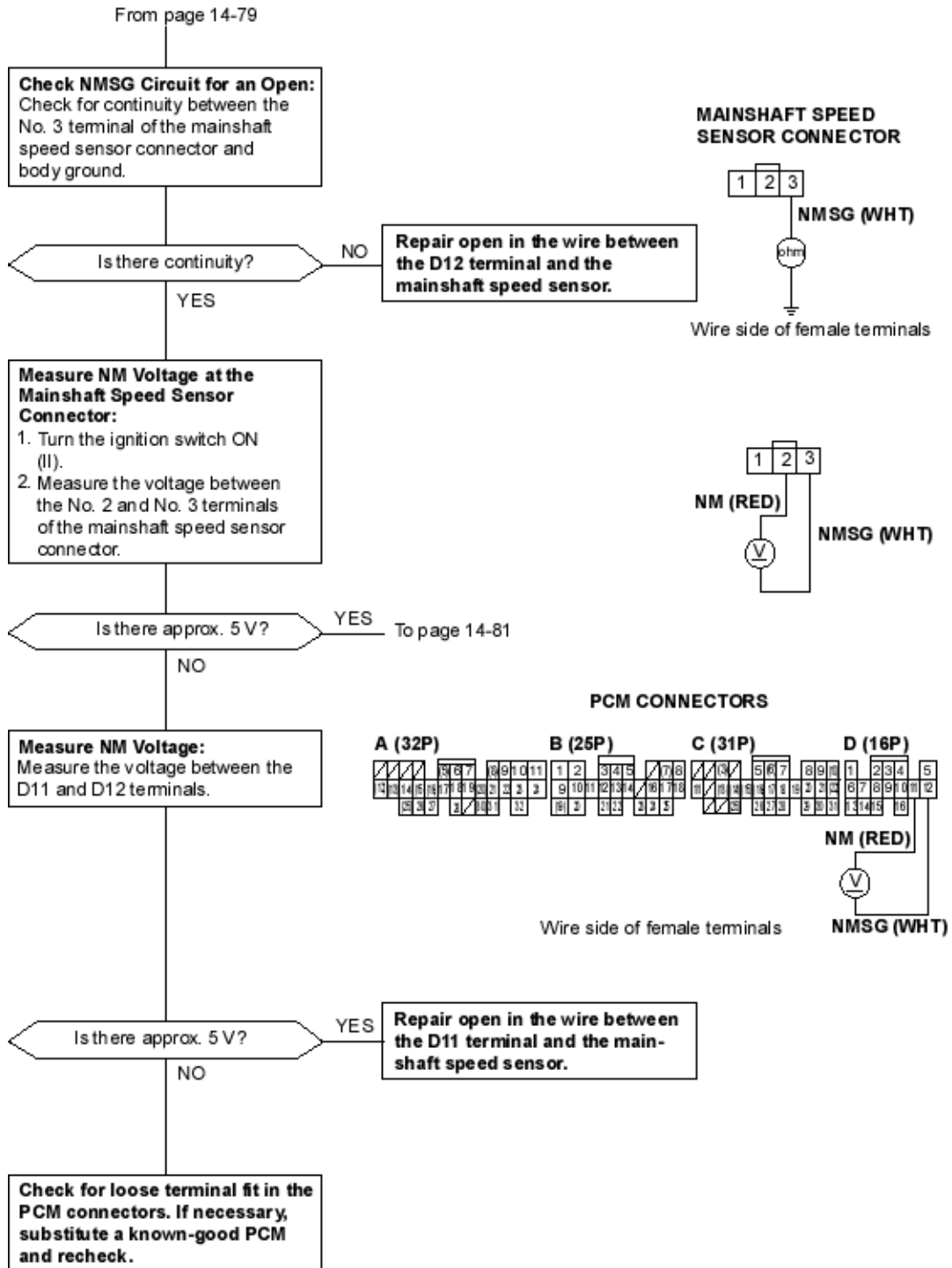
Check NM for a Short Circuit:
 1. Turn the ignition switch OFF.
 2. Check for continuity between the No. 2 terminal of the mainshaft speed sensor connector and body ground.



Is there continuity?

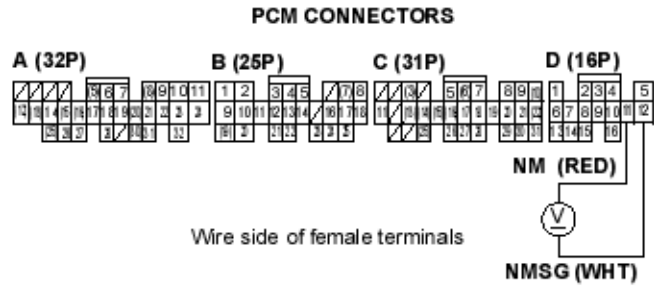
YES
Repair short to ground in the wire between the D11 terminal and the mainshaft speed sensor.

NO
 To page 14-80



From page 14-80

Measure NM Voltage:
 1. Connect the mainshaft speed sensor connector.
 2. Measure the voltage between the D11 and D12 terminals.

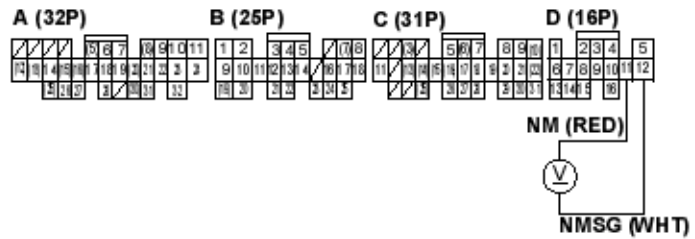


Is there approx. 5 V or 0 V?

NO **Replace the mainshaft speed sensor.**

YES

Measure NM Voltage at Idling:
 1. Start the engine, and run it at idle in **P** position.
 2. Hold the engine at idle, and measure the voltage between the D11 and D12 terminals.

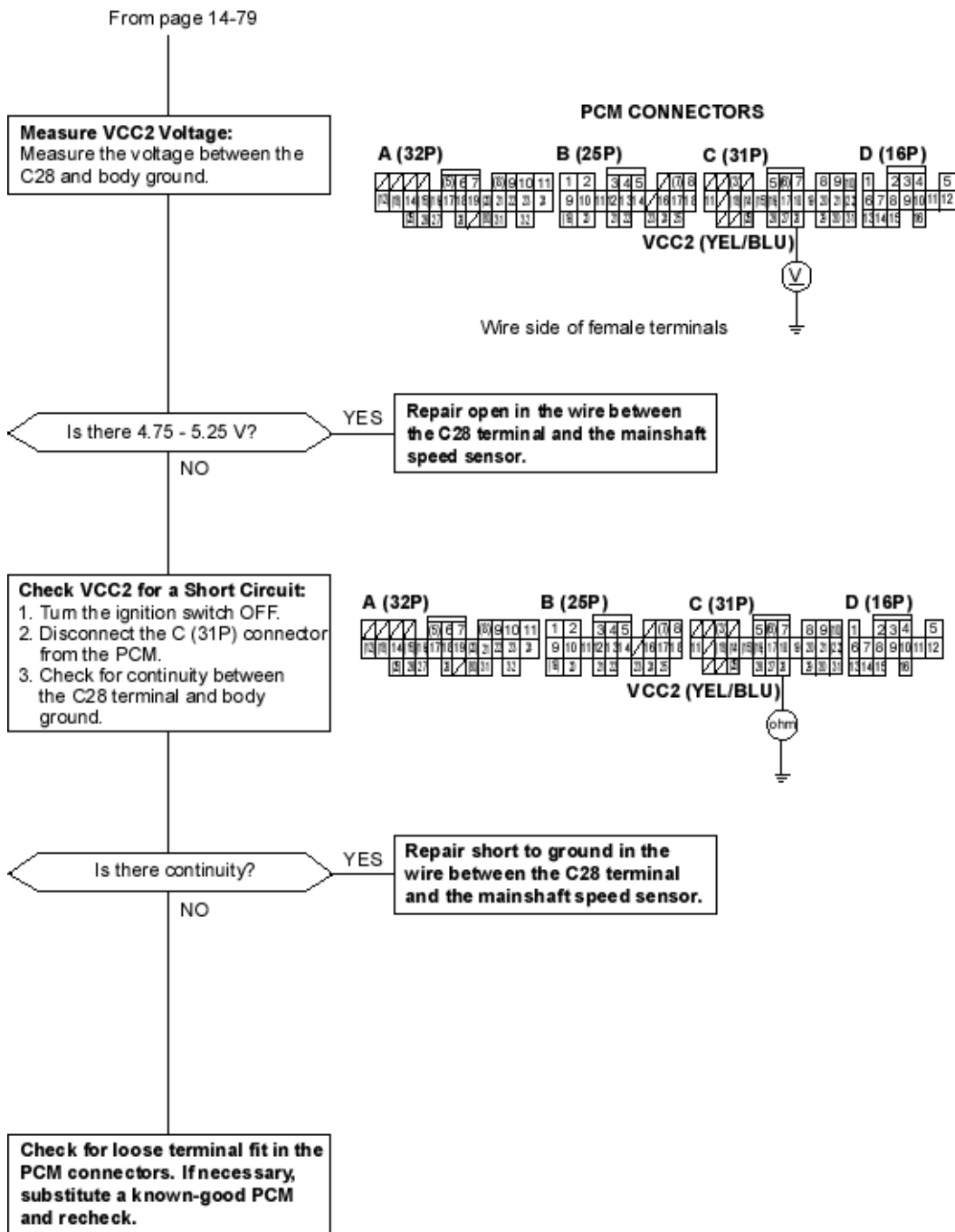



Is there 1.5 - 3.5 V?

NO **Replace the mainshaft speed sensor.**

YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



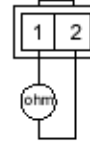
- Self-diagnosis  indicator light indicates Code 16.
- PGM Tester indicates Code 16-1.
- OBD Scan Tool indicates Code P1768.

- Possible Cause**
- Disconnected A/T clutch pressure control solenoid valve A connector
 - Short or open in A/T clutch pressure control solenoid valve A wire
 - Faulty A/T clutch pressure control solenoid valve A
 - Open in VB SOL wire
 - Open in PG1 and PG2 wires or poor ground (G101).

Measure A/T Clutch Pressure Control Solenoid Valve A Resistance at the Solenoid Connector:

1. Disconnect the 2P connector from the A/T clutch pressure control solenoid valve A.
2. Measure A/T clutch pressure control solenoid resistance at the solenoid connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

Is the resistance approx. 5 ohm?

NO

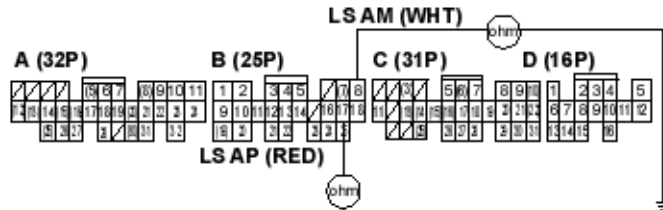
Replace the A/T clutch pressure control solenoid valve A/B assembly.

YES

Check A/T Clutch Pressure Control Solenoid Valve A for a Short Circuit:

1. Disconnect the B (25P) connector from the PCM.
2. Check for continuity between body ground and the B8 terminal and the B17 terminal individually.

PCM CONNECTORS



Wire side of female terminals

Is there continuity?

YES

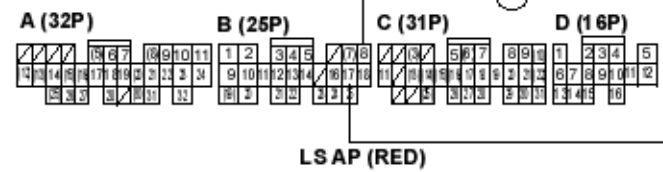
Repair short to ground in the wires between the B8 and B17 terminals and the A/T clutch pressure control solenoid valve A.

NO

Measure A/T Clutch Pressure Control Solenoid Valve A Resistance:

1. Connect the A/T clutch pressure control solenoid valve A Connector.
2. Measure the resistance between the B8 and B17 terminals.

LS AM (WHT)



LS AP (RED)

Is the resistance approx. 5 ohm?

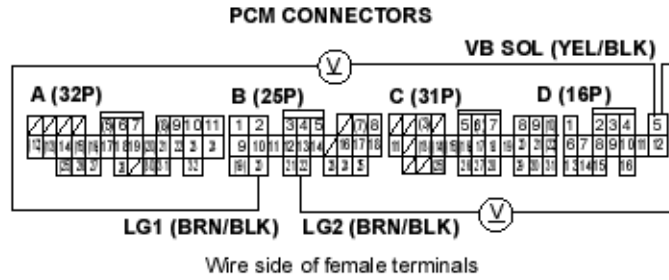
NO

Repair loose terminal or open in the wires between the B8 and B17 terminals and the A/T clutch pressure control solenoid valve A.

YES

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Measure VB SOL Voltage:
 1. Disconnect the D (16P) connector from the PCM.
 2. Turn the ignition switch ON (II).
 3. Measure the voltage between the D5 and B20 or B22 terminals.



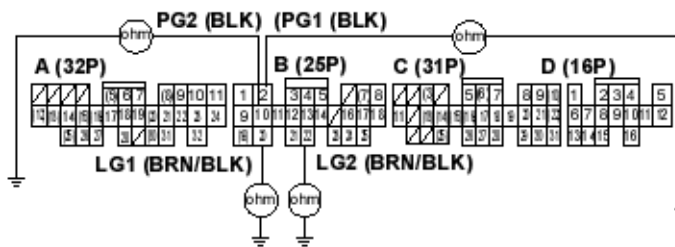
Is there approx. battery voltage?

NO

Check for blown No. 6 (15 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the D5 terminal and the driver's under-dash fuse/relay box.

YES

Check LG and PG for an Open Circuit:
 1. Turn the ignition switch OFF.
 2. Check for continuity between the B2 terminal and body ground, B10 terminal and body ground, between the B20 terminal and body ground, and between the B22 terminal and body ground.



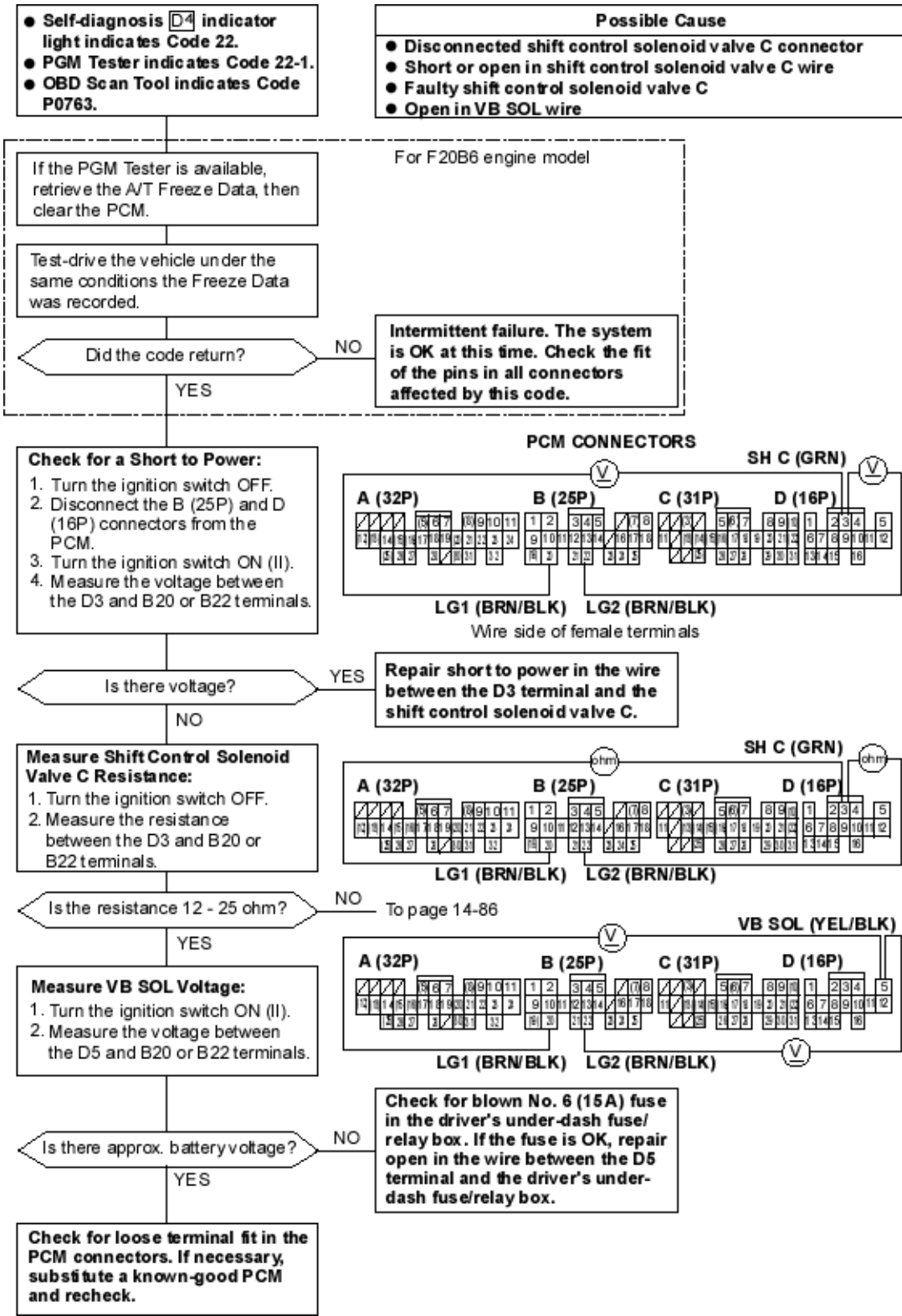
Is there continuity?

NO

Repair open in the wires between the B2, B10, B20 and B22 terminals and body ground, and repair poor ground (G101).

YES

Check for loose terminal fit in the PCM connectors if necessary, substitute a known-good PCM and recheck.



PCM CONNECTORS

A (32P)

B (25P)

C (31P)

D (16P)

SH C (GRN) V

LG1 (BRN/BLK) LG2 (BRN/BLK)

Wire side of female terminals

ohm

A (32P)

B (25P)

C (31P)

D (16P)

SH C (GRN) ohm

LG1 (BRN/BLK) LG2 (BRN/BLK)

V

A (32P)

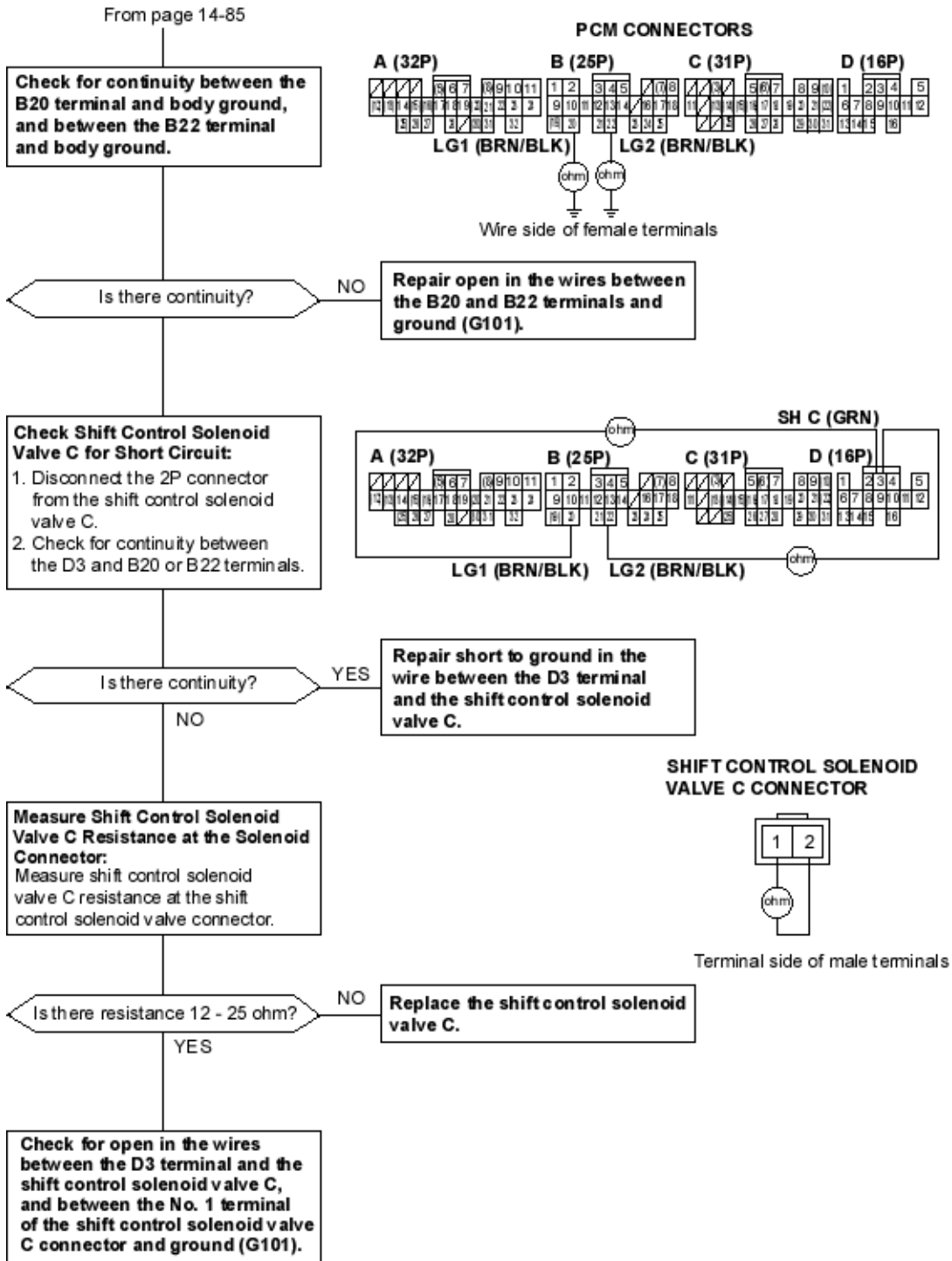
B (25P)

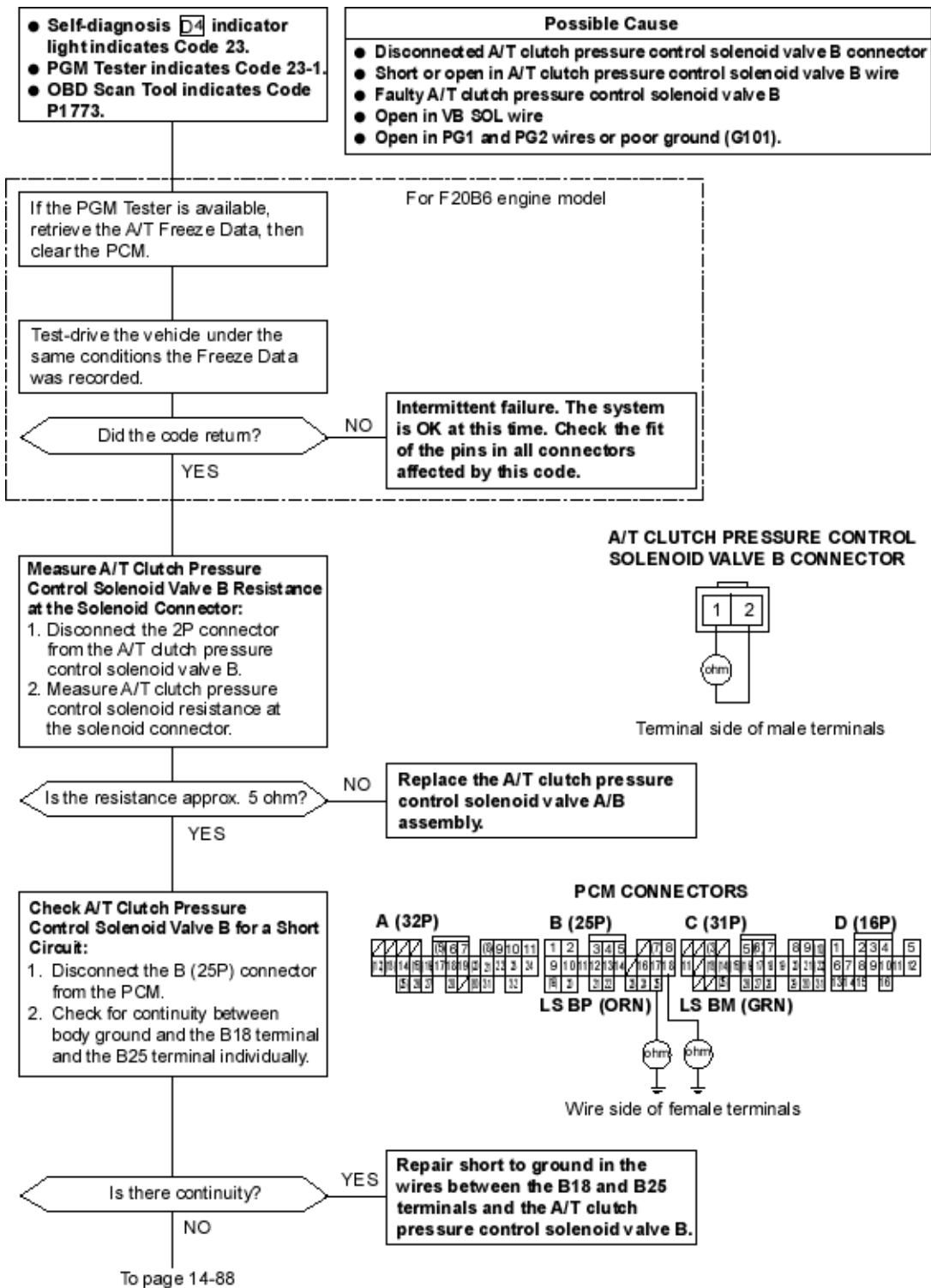
C (31P)

D (16P)

VB SOL (YEL/BLK) V

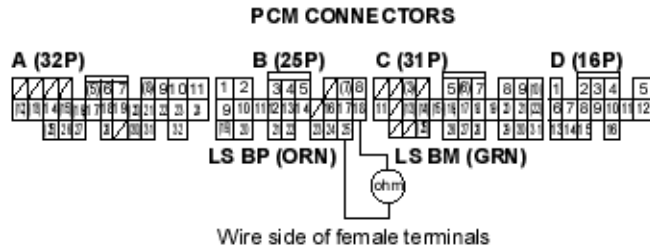
LG1 (BRN/BLK) LG2 (BRN/BLK)





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Measure A/T Clutch Pressure Control Solenoid Valve B Resistance:
 1. Connect the A/T clutch pressure control solenoid valve B connector.
 2. Measure the resistance between the B18 and B25 terminals

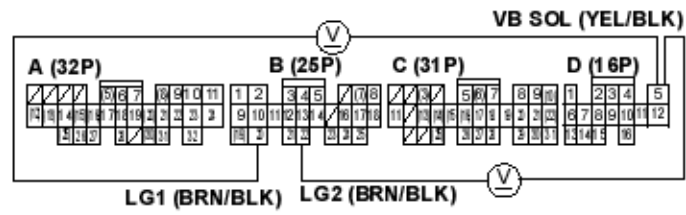


Is the resistance approx. 5 ohm?

NO
 Repair loose terminals open in the wires between the B8 and B17 terminals and the A/T clutch pressure control solenoid valve B.

YES

Measure VB SOL Voltage:
 1. Disconnect the D (16P) connector from the PCM.
 2. Turn the ignition switch ON (II).
 3. Measure the voltage between the D5 and B20 or B22 terminals.

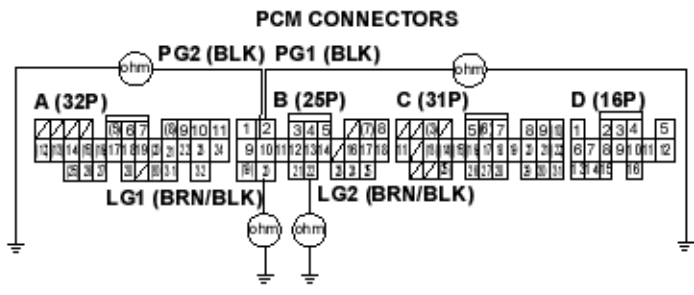


Is there approx. battery voltage?

NO
 Check for blown No. 6 (15) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the D5 terminal and the driver's under-dash fuse/relay box.

YES

Check LG and PG for an Open Circuit
 1. Turn the ignition switch OFF.
 2. Check for continuity between the B2 terminal and body ground, between the B10 terminal and body ground, between the B20 terminal and body ground, and between the B22 terminal and body ground.

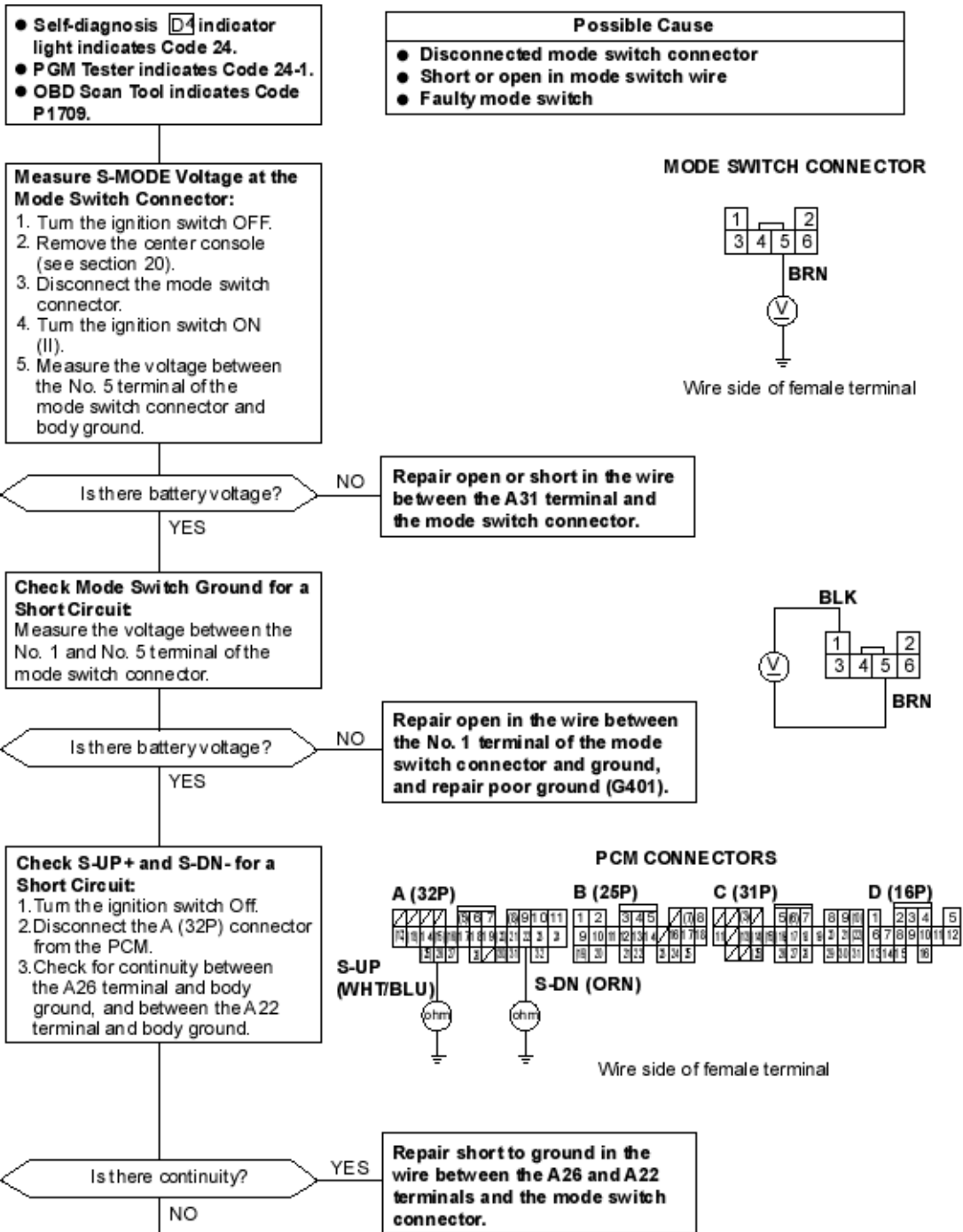


Is there continuity?

NO
 Repair open in the wires between the B2, B10, B20 and B22 terminals and body ground, and repair poor ground (G101).

YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

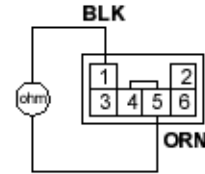


To page 14-90

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Check Mode Switch:
Measure the resistance between the No. 5 and No. 1 terminals of the mode switch connector while the shift lever in the manual mode position and releasing from the manual mode position.

MODE SWITCH CONNECTOR



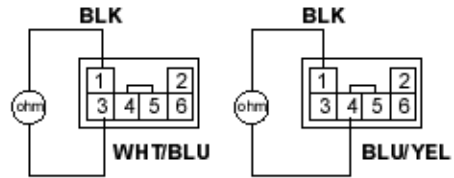
Terminal side of male terminal

Is there resistance 0 ohm in the manual mode position, and 10 Mohm or more out from the manual mode position?

NO **Replace the mode switch**

YES

Check shift Switch of the Mode Switch:
1. Shift the shift lever into the manual mode position.
2. Measure the resistance between the No. 3 and No. 1 terminals of the mode switch connector while pushing the shift lever toward the "+" mark on the A/T gear position indicator panel; then measure the resistance in neutral position.
3. Measure the resistance between the No. 4 and No. 1 terminals while pulling the shift lever toward "-" mark; then measure the resistance in neutral position.

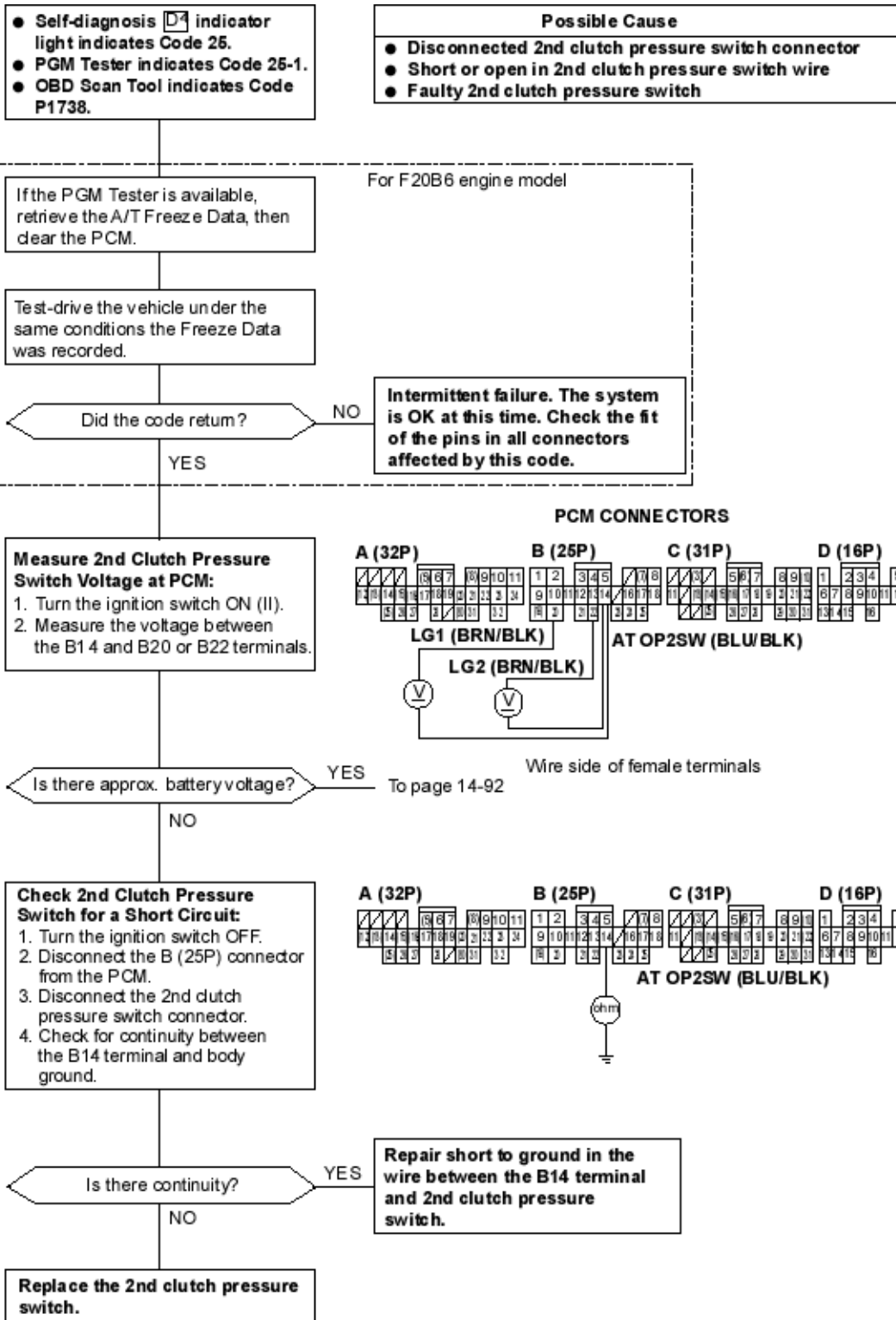


Is the resistance 0 ohm with the shift lever pushing toward the "+" mark, and pulling toward the "-" mark, and 10 Mohm or more with it released?

NO **Replace the mode switch**

YES

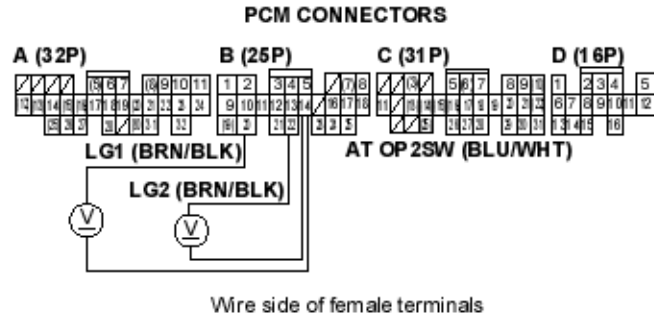
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



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Measure 2nd Clutch Pressure Switch Voltage with Engine Running in 2 Position:

1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Start the engine, then shift to 2 position and drive for more than five seconds.
4. Measure the voltage between the B 14 and B20 or B22 terminals.



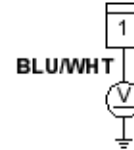
Is there approx. 0 V?

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

Measure 3rd Clutch Pressure Switch Voltage at the Switch Connector:

1. Turn the ignition switch OFF.
2. Disconnect the 2nd clutch pressure switch connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the 2nd clutch pressure switch connector terminal and body ground.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

Is there approx. battery voltage?

Repair open in the wire between the 2nd clutch pressure switch and the PCM.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



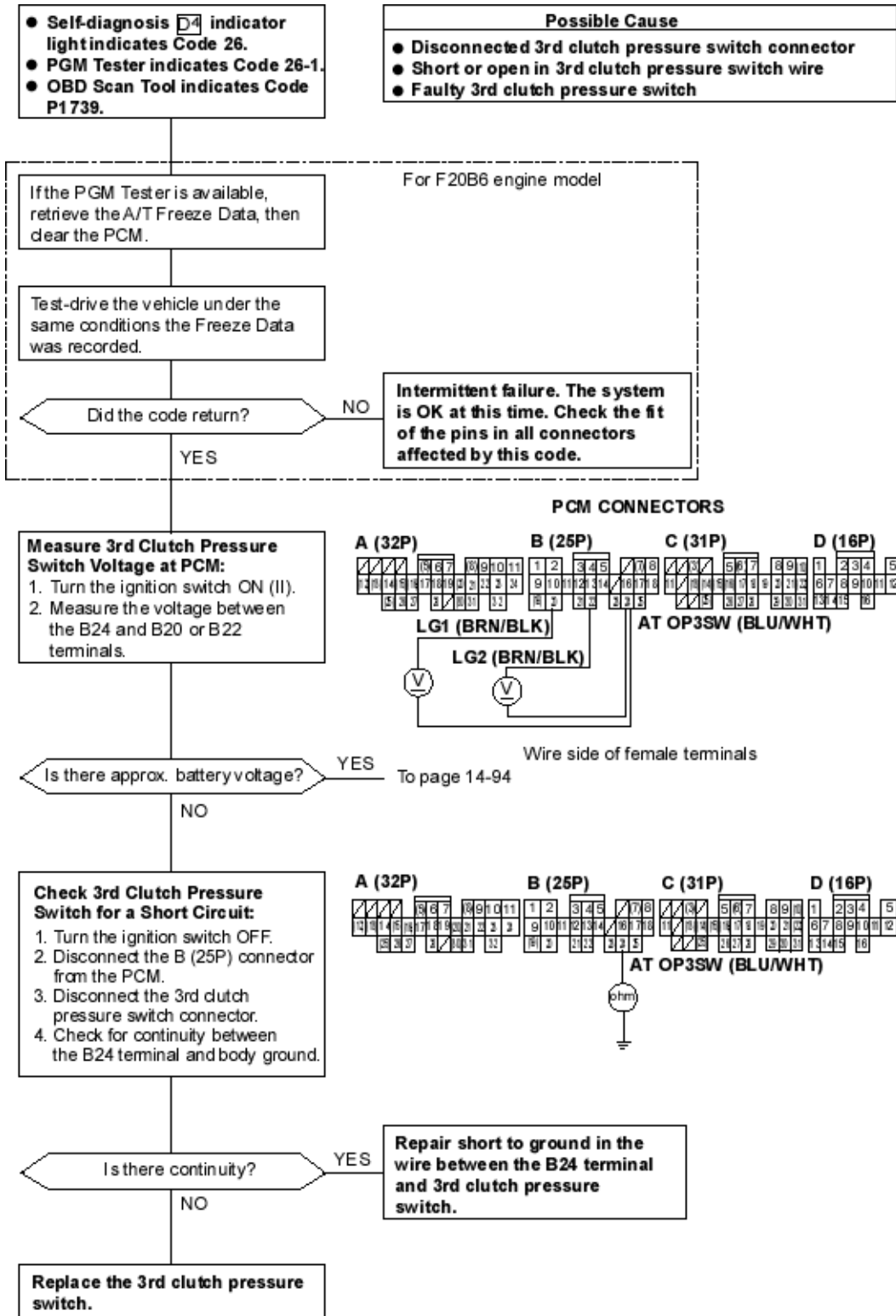
Terminal side of male terminal

Check 2nd Clutch Pressure Switch:
Measure the resistance between the 2nd clutch pressure switch connector and body ground.

Is there resistance 10 Mohm and more?

Replace the 2nd clutch pressure switch.

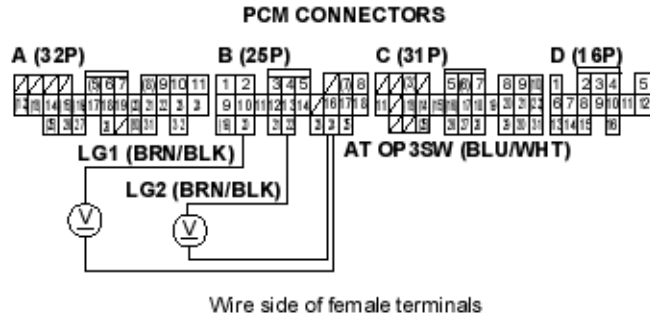
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



From page 14-93

Measure 3rd Clutch Pressure Switch Voltage with Engine Running in D_3 Position:

1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Start the engine, then shift to D_3 position and drive for more than five seconds.
4. Measure the voltage between the B24 and B20 or B22 terminals.



Is there approx. 0 V?

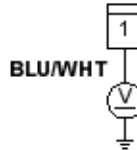
YES → **Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.**

NO →

Measure 3rd Clutch Pressure Switch Voltage at the Switch Connector:

1. Turn the ignition switch OFF.
2. Disconnect the 3rd clutch pressure switch connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

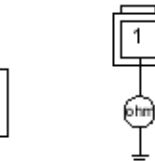
Is there approx. battery voltage?

NO → **Repair open in the wire between the 3rd clutch pressure switch and the PCM.**

YES →

Check 3rd Clutch Pressure Switch:
 Measure the resistance between the 3rd clutch pressure switch connector and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



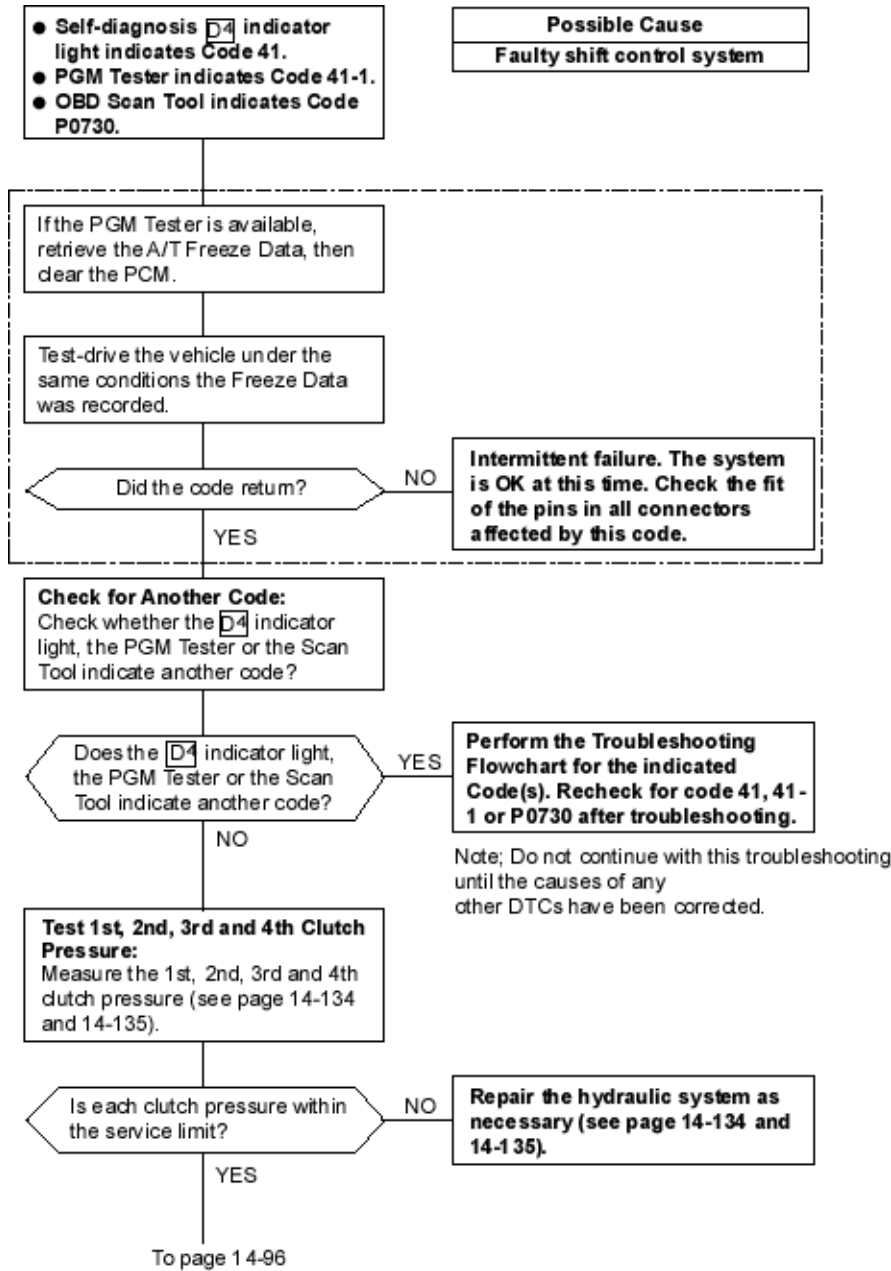
Terminal side of male terminal

Is there resistance 10 Mohm and more?

NO → **Replace the 3rd clutch pressure switch.**

YES →

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



From page 14-95

Replace the Solenoid Assembly and Recheck:

1. Replace the solenoid assembly set (lock-up control/shift control solenoid valve A assembly and shift control solenoid valve B and C).
2. Turn the ignition switch OFF, then reset the PCM memory by removing the BACK UP fuse in the passenger's underdash fuse/relay box for more than 10 seconds.
3. Drive the vehicle at speed over 12 mph (20 km/h) in 1st, 2nd, 3rd and 4th gear in **D4** position for more than 30 seconds.
4. Recheck for code 41, 41-1 or P0730.

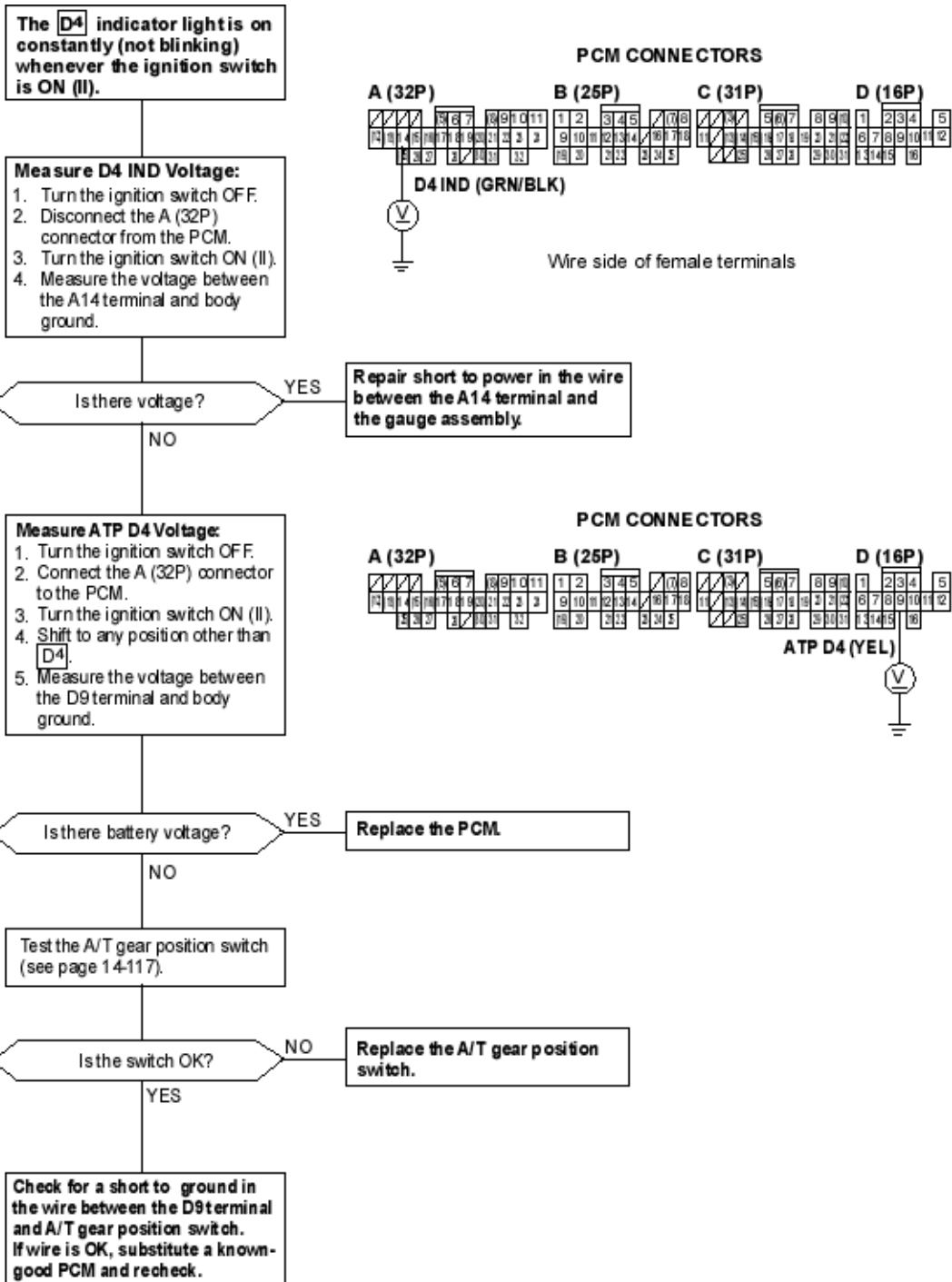
Does the **D4** indicator light, the PGM Tester or the Scan Tool indicate code 41, 41-1 or P0730.

NO

The system is OK at this time.

YES

Replace the transmission.



The **D4** indicator light does not come on when the ignition switch is first turned ON (II). It should come on for about two seconds).

Check the Service Check Connector:
 Make sure the special tool (SCS Short Connector) is not connected to the service check connector.

Is the special tool (SCS Short Connector) connected to the service check connector?

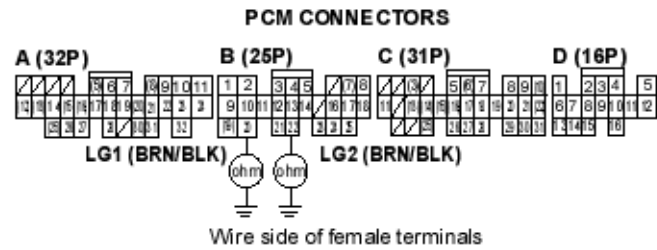
YES Disconnect the special tool from the service check connector and recheck.

Check the **D4 Indicator Light**
 Shift to **D4** position.

Does the **D4** indicator light come on?

YES Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

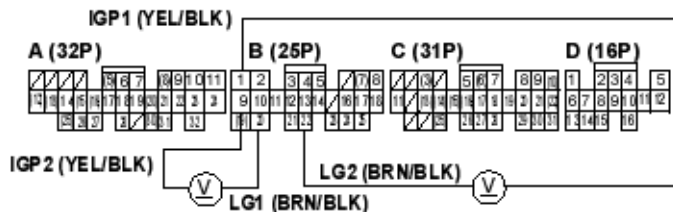
Check the Ground Circuit
 1. Turn the ignition switch OFF.
 2. Disconnect the B (25P) connector from the PCM.
 3. Check for continuity between the B20 terminal and body ground, and between the B22 terminal and body ground.



Is there continuity?

NO Repair open in the wires between the B20 and B22 terminals and ground (G101), and repair poor ground (G101).

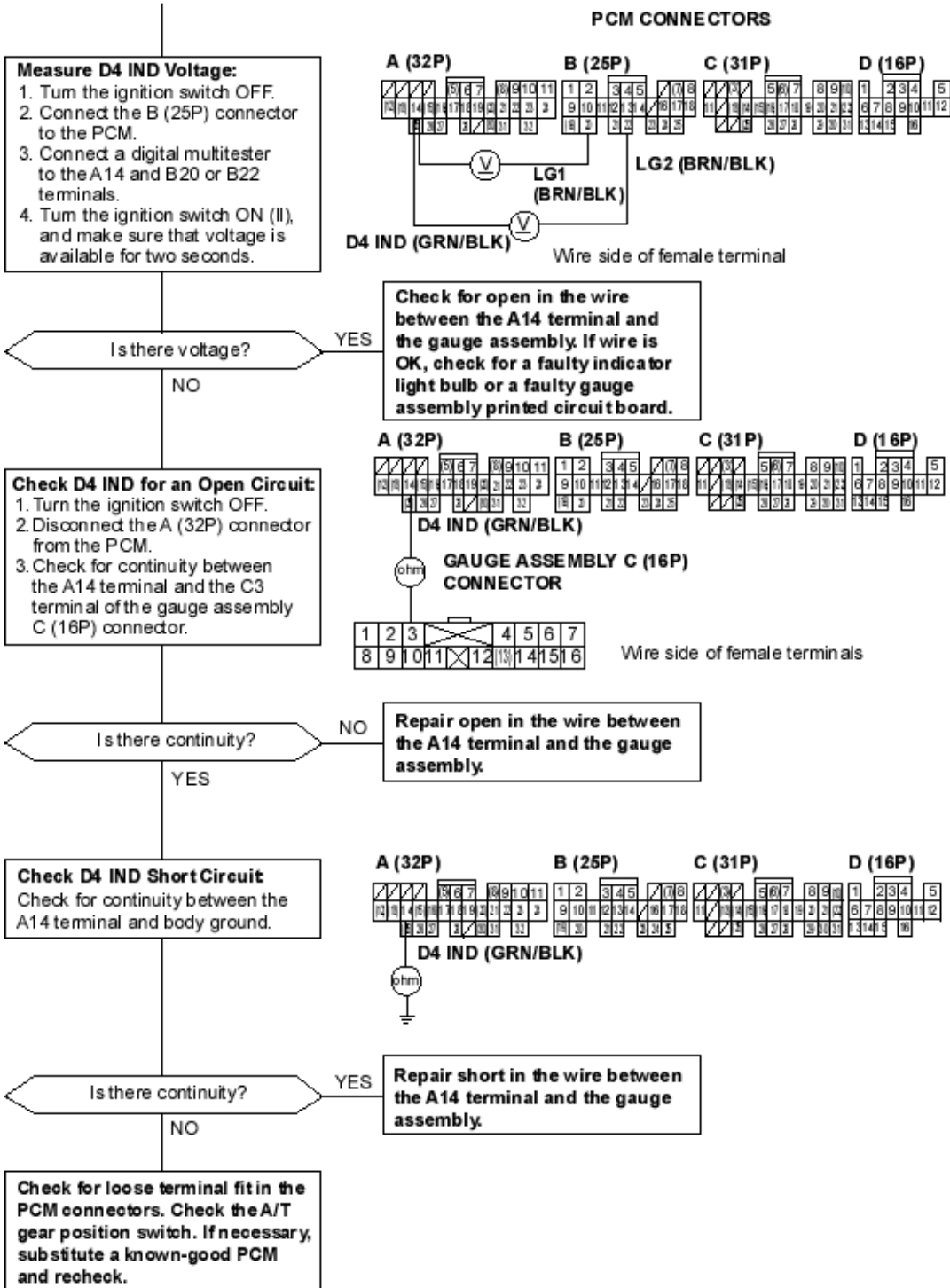
Measure Power Supply Circuit Voltage:
 1. Turn the ignition switch ON (II).
 2. Measure the voltage between terminals B1 and B20 and between terminals B9 and B22.




Is there battery voltage?

NO Repair open or short in the wire between the B1 and/or B9 terminals and the PGM-FI main relay, and between the PGM-FI main relay and the under-hood fuse/relay box.




From page 14-98




Transmission does not shift up and down when operating the shift lever in the manual mode position.

Number of  indicator Light indicates	DTC on Honda PGM Tester	DTC on OBD Scan Tool
7	7-1	P0753
8	8-1	P0758
22	22-1	P0763
24	24-1	P1709

NOTE: It takes a long to detect the code 24, 24-1 and P1709 under some trouble conditions.

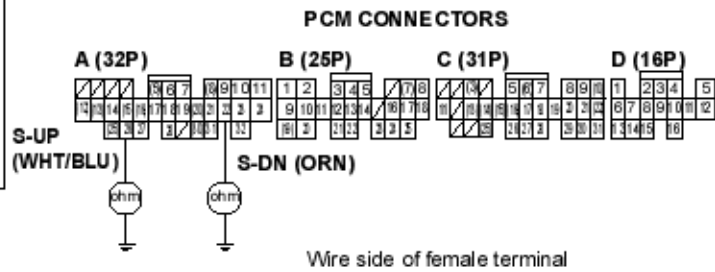
Test-drive in  Position and Recheck DTC:
 1. Test-drive the vehicle in  position, and check whether the transmission shifts up and down normally.
 2. Check whether the  indicator light, the PGM tester or the Scan Tool indicates Code.

Does the  indicator light, the PGM tester or the Scan Tool indicate the Code(s) in the table on the upper right?

YES **Perform the Troubleshooting Flowchart for the indicated Code(s).**

NO

Measure S-UP Voltage and S-DN Voltage:
 1. Turn the ignition switch ON (II).
 2. Measure the voltage between the A22 terminal and body ground, and between the A26 terminal and body ground.



Is there battery voltage?

NO **Run the Troubleshooting Flowchart for code 24, 24-1 and P1709 (see page 14-89).**

YES

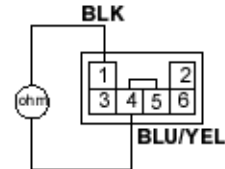
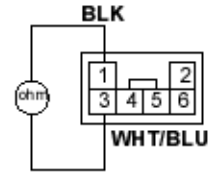
To page 14-101

From page 14-100

Check Shift Switch of the Mode Switch:

1. Turn the ignition switch OFF.
2. Remove the center console (see section 20)
3. Disconnect the mode switch connector.
4. Shift the shift lever into the manual mode position.
5. Check for continuity between the No. 3 and No. 1 terminals of the mode switch connector while pushing the shift lever towards the "+" mark on the A/T gear position indicator panel; then check for continuity between the No. 4 and No. 1 terminals while pulling the shift lever toward the "-" mark.

MODE SWITCH CONNECTOR



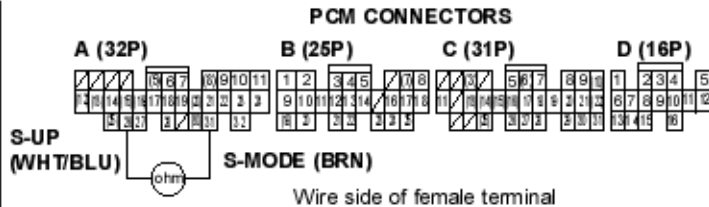
Terminal side of male terminal

Is there continuity? **NO** → **Replace the mode switch**

YES

Check S-UP for an Open Circuit:

1. Connect the mode switch connector.
2. Disconnect the A (32P) connector from the PCM.
3. Check for continuity between the A26 and A31 terminals while pushing the shift lever towards the "+" mark.

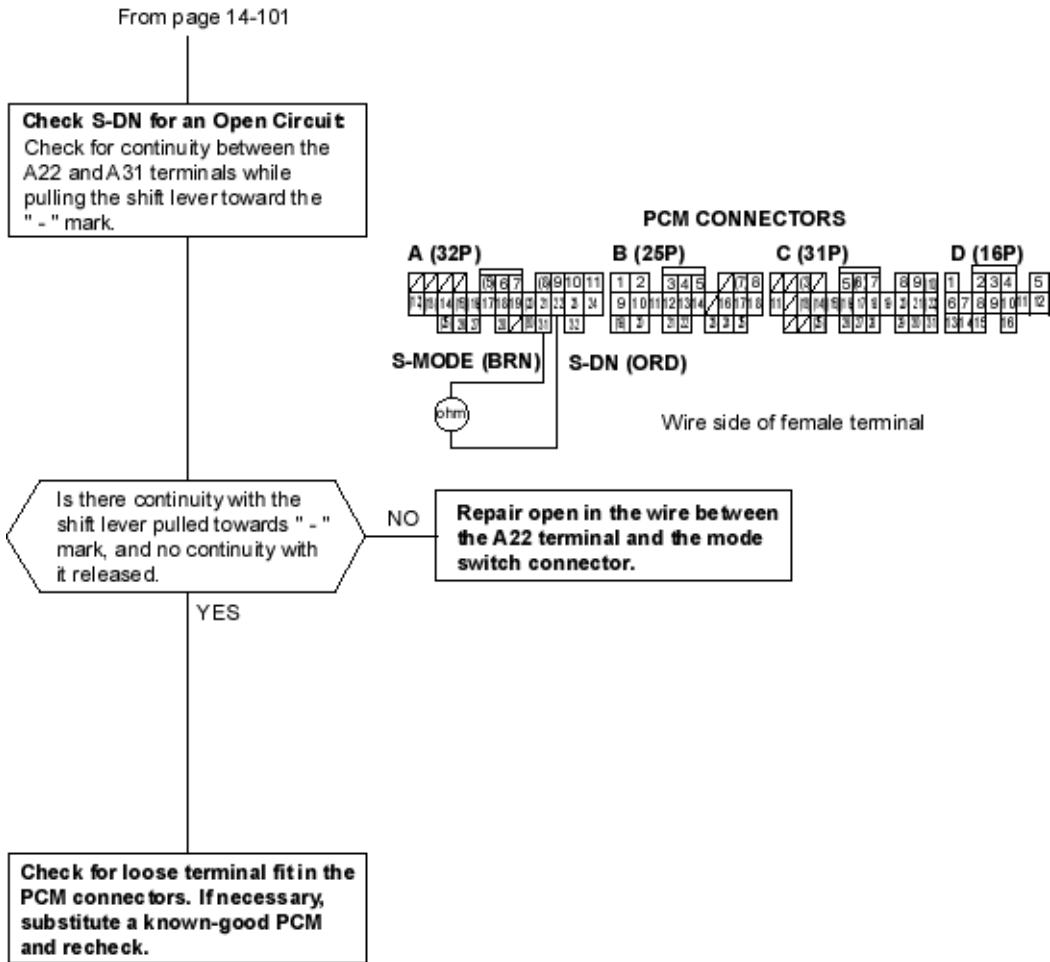


Wire side of female terminal

Is there continuity with the shift lever pushed toward "+" and no continuity with it released? **NO** → **Repair open in the wire between the A26 terminal and the mode switch connector.**

YES

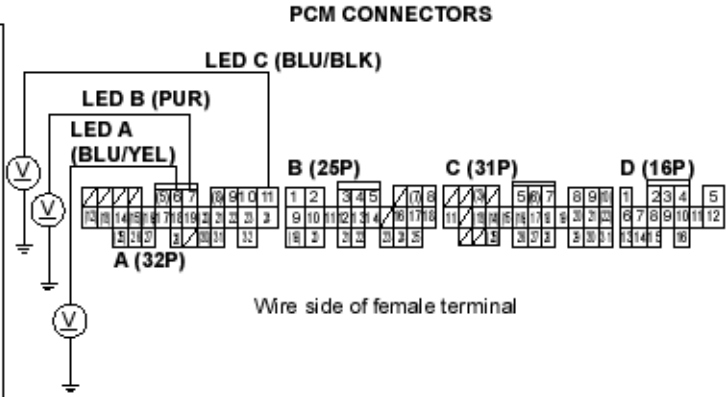
To page 14-102



The shift indicator does not indicate selected gear in the manual mode.

Measure LEDs Voltage:

1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Start the engine and shift the shift lever to **D** position, then into the manual mode position.
4. Measure the voltage between the A6, A7 and A11 terminals and body ground individually in all four manual mode gear positions.



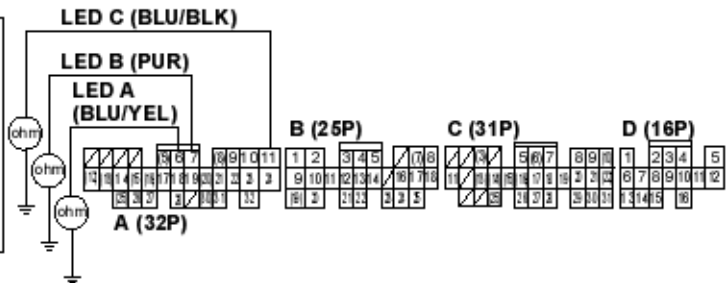
Manual Mode Gear Position	Terminal Voltage		
	A6 Terminal	A7 Terminal	A11 Terminal
1st	0V	0V	Battery voltage
2nd	0V	Battery voltage	0V
3rd	0V	Battery voltage	Battery voltage
4th	Battery voltage	0V	0V

Does the voltage match the table? **YES** Replace the A/T shift indicator in the gauge assembly.

NO

Check LEDs for a Short Circuit:

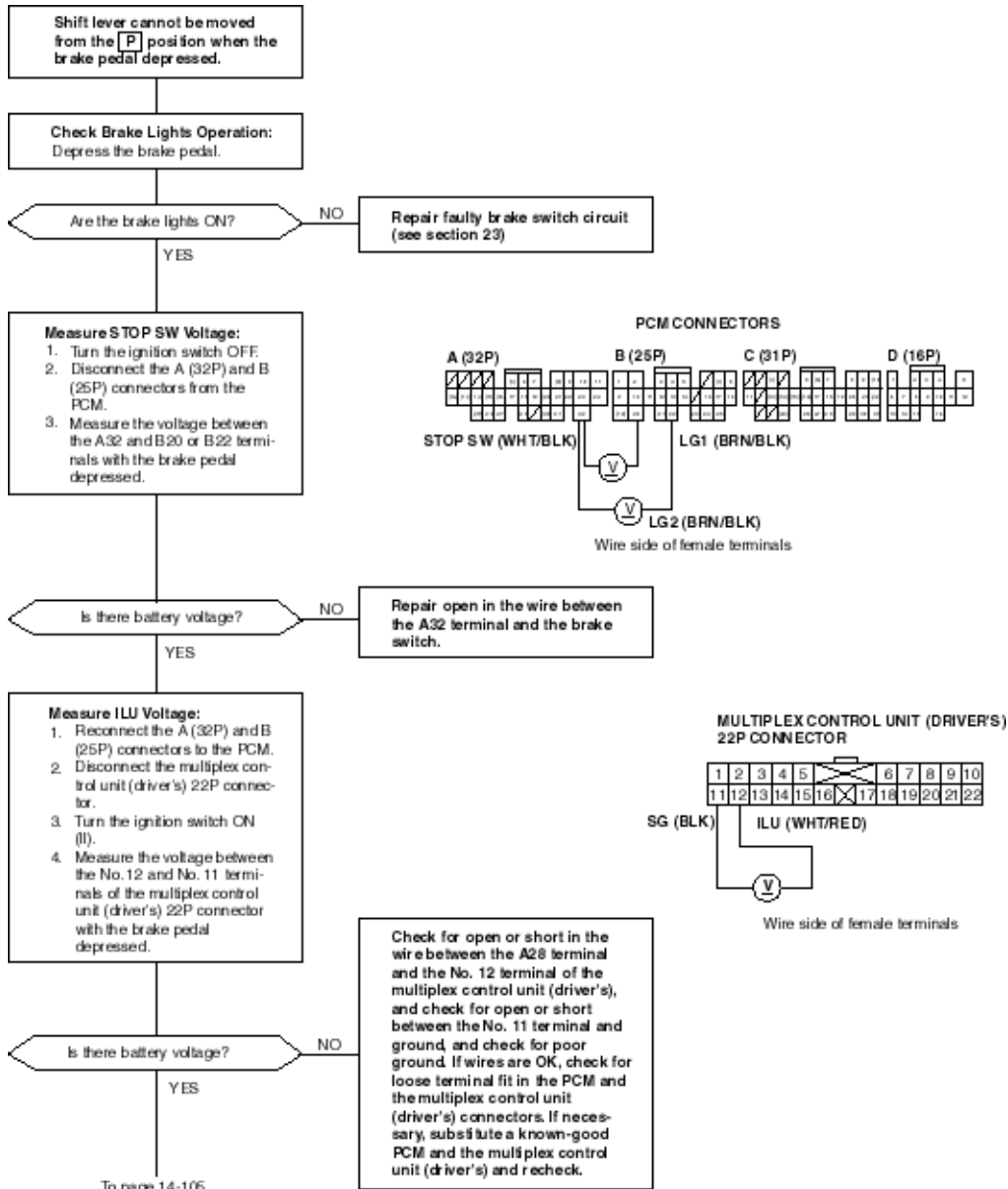
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) connector from the PCM.
3. Disconnect the gauge assembly B (22P) connector.
4. Check for continuity between the A6, A7 and A11 terminals and body ground individually.



Is there continuity? **YES** Repair short to ground in the wires between the A6, A7 and A11 terminals and the gauge assembly.

NO

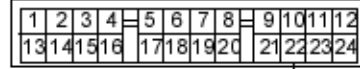
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.



From page 14-104

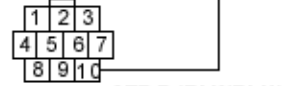
Check ATP P for an Open Circuit
 1. Turn the ignition switch OFF.
 2. Remove the multiplex control unit (driver's) from the driver's under-dash fuse/relay box.
 3. Check for continuity between the No. 22 terminal of the multiplex control unit (driver's) 24P connector on the driver's under-dash fuse/relay box and the No. 10 terminal of the A/T gear position switch connector.

MULTIPLEX CONTROL UNIT (DRIVER'S) 24P CONNECTOR



Terminal side of male terminals **ATP P**

A/T GEAR POSITION SWITCH CONNECTOR



ATP P (BLK/BLU)

Wire side of female terminals

Is there continuity?

NO

YES

Repair open in the wire between the No. 22 terminal of the multiplex control unit (driver's) 24P connector and the A/T gear position switch connector. If the wire is OK, check for continuity A/T gear position switch terminal (see page 14-115).

Check Shift Lock Solenoid for an Open Circuit:
 1. Disconnect the shift lock solenoid connector.
 2. Check for continuity between the No. 2 terminal of the shift lock solenoid connector and the No. 22 terminal of the multiplex control unit (driver's) 22P connector.

MULTIPLEX CONTROL UNIT (DRIVER'S) 22P CONNECTOR



SHIFT LOCK SOLENOID-(GRN)

ohm

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there continuity?

NO

YES

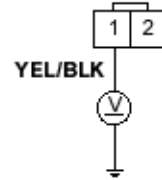
Repair open in the wire between the No. 22 terminal of the multiplex control unit (driver's) 22P connector and the shift lock solenoid connector.

To page 14-106

From page 14-1 05

Measure Power Supply Voltage to Shift Lock Solenoid:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 1 terminal of the shift lock solenoid and body ground.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

Is there battery voltage?

NO

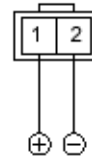
Check for blown No. 8 (7.5 A) fuse in the driver's under-dash fuse/relay box. If the fuse is OK, repair open or short in the wire between the No. 1 terminal of the shiftlock solenoid connector and the driver's under-dash fuse/relay box.

YES

Check Shift Lock Solenoid Operation:
1. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminals
2. Check that the shift solenoid operates.

NOTE: Do not connect the No. 2 terminal to the battery positive terminal, or you will damage the diode inside the shift lock solenoid.

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals

Does the shift lock solenoid operate properly?

NO

Replace the shiftlock solenoid

YES

Check for loose terminal fit in the multiplex control unit (driver's) connectors. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.

Shift lever cannot pass through **R position from **N** position while operating the shift lever.**

Measure ATP N Voltage at the Multiplex Control Unit (driver's):
 1. Turn the ignition switch ON (II).
 2. Measure the voltage between the No. 21 and No. 11 terminals of the multiplex control unit (driver's) 22P connector.

MULTIPLEX CONTROL UNIT (DRIVER'S) 22P CONNECTOR



SG (BLK) ATP N
 LHD: (YEL/BLK)
 RHD: (RED/BLK)

Wire side of female terminals

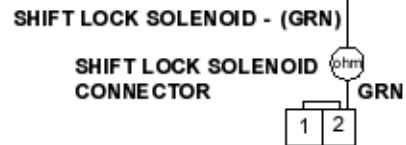
Is there voltage? YES

Repair open in the wire between the No. 21 terminal of the multiplex control unit (driver's) 22P connector and the A/T gear position switch connector. If the wire is OK, check for continuity A/T gear position switch terminal (see page 14-117).

NO

Check Shift Lock Solenoid for an Open Circuit:
 1. Turn the ignition switch OFF.
 2. Disconnect the shift lock solenoid connector.
 3. Check for continuity between the No. 2 terminal of the shift lock solenoid connector and the No. 22 terminal of the multiplex control unit (driver's) 22P connector.

MULTIPLEX CONTROL UNIT (DRIVER'S) 22P CONNECTOR



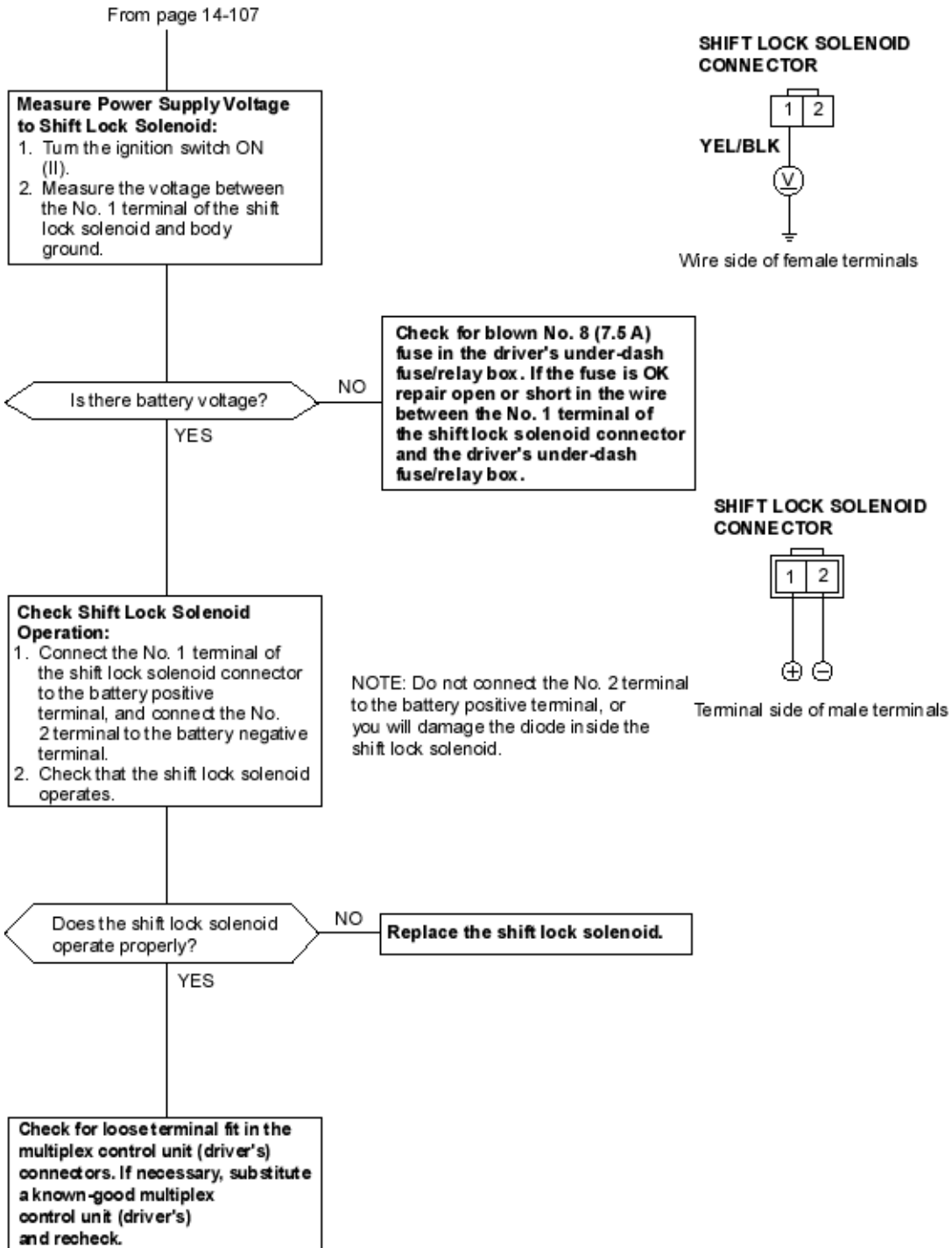
Wire side of female terminals

Is there continuity? NO

Repair open in the wire between the No. 22 terminal of the multiplex control unit (driver's) 22P connector and the shift lock solenoid connector.

YES

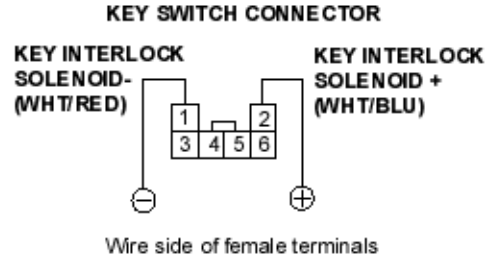
To page 14-108



Ignition key cannot be moved from ACC (I) position to LOCK (0) position while pushing the ignition key with the shift lever in P position.

Check Key Interlock Solenoid Operation:

1. Disconnect the key switch connector from the steering lock assembly
2. Connect the No. 2 terminal of the key switch connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal.
3. Check the key interlock solenoid operation. A clicking sound should be heard.



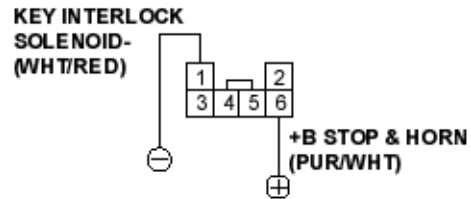
Does the key interlock solenoid operate properly?

NO **Faulty key interlock solenoid. Replace the ignition key cylinder/steering lock assembly.**

YES

Check Key Interlock Switch Operation:

1. Connect the No. 6 terminal of the key switch connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal.
2. Turn the ignition switch to ACC (I), then push the ignition key
3. Check the key interlock solenoid operation. A clicking sound should be heard while pushing the ignition key, and no sound should be heard when releasing the key.



Does the key interlock solenoid operate properly?

NO **Faulty key interlock switch. Replace the ignition key cylinder/steering lock assembly.**

YES

To page 14-110

From page 14-109

Check Key Interlock Solenoid for a Short Circuit:
 1. Turn the ignition switch OFF.
 2. Disconnect the multiplex control unit (driver's) 22P connector.
 3. Check for continuity between the No. 2 terminal of the multiplex control unit (driver's) 22P connector and body ground, and between the No. 3 terminal and body ground.

Is there continuity?

YES

Repair short in the wire between the No. 2 or No. 3 terminal of the multiplex control unit (driver's) 22P connector and the key switch connector.

NO

Check ATP P for an Open Circuit
 1. Remove the multiplex control unit (driver's) from the driver's under-dash fuse/relay box.
 2. Check for continuity between the No. 22 terminal of the multiplex control unit (driver's) 24P connector on the driver's under-dash fuse/relay box and the No. 10 terminal of the A/T gear position switch connector.

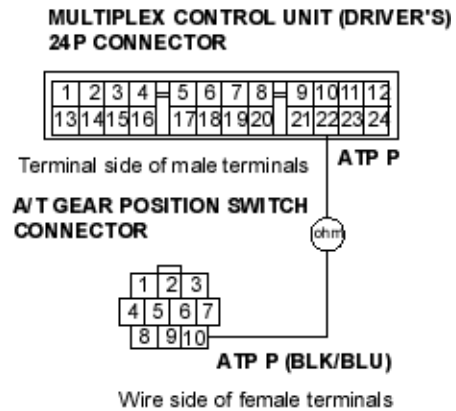
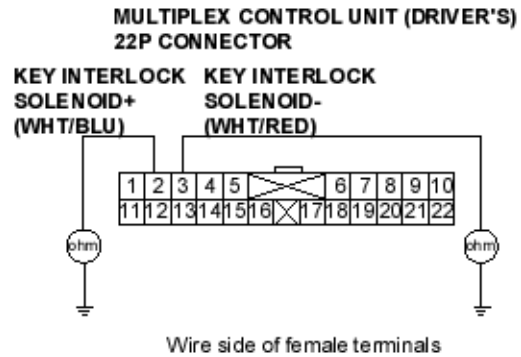
Is there continuity?

NO

Repair open in the wire between the No. 22 terminal of the multiplex control unit (driver's) 24P connector and the A/T gear position switch connector.

YES

Check for loose terminal fit in the multiplex control unit (driver's) connectors. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.



**Lock-up Control Solenoid Valve/Shift
Control Solenoid Valve A Assembly
Test**

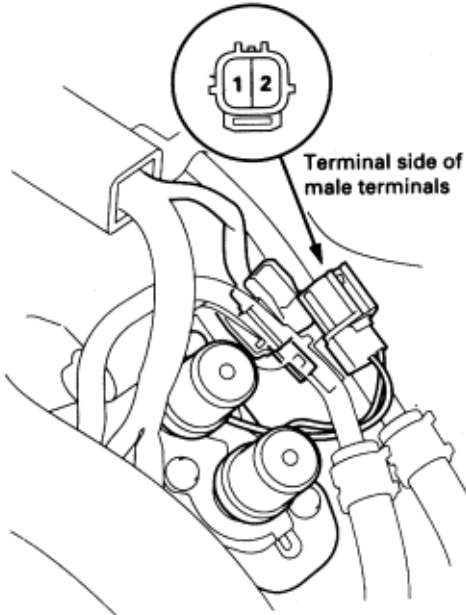
14-111

Replacement

1. Disconnect the 2P connector from the lock-up control solenoid valve/shift control solenoid valve A assembly.
2. Measure the resistance of the lock-up control solenoid valve between the No. 1 terminal of the 2P connector and body ground.
3. Measure the resistance of the shift control solenoid valve A between the No. 2 terminal of the 2P connector and body ground.

STANDARD: 12 – 25 Ω

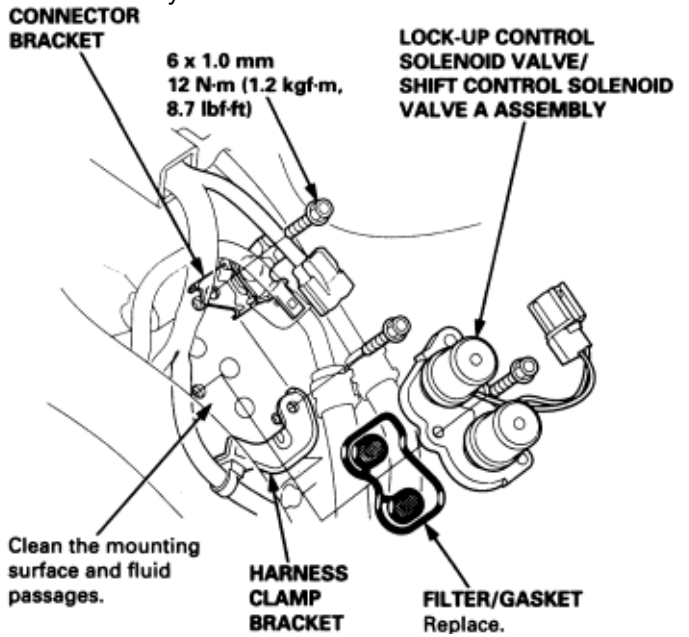
**LOCK-UP CONTROL
SOLENOID VALVE/
SHIFT CONTROL
SOLENOID VALVE A
ASSEMBLY CONNECTOR**



4. Replace the lock-up control solenoid valve/shift control solenoid valve A assembly if either resistance is out of specification.
5. If the resistance is within the standard, connect the No. 1 terminal of the 2P connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 2 terminal to the battery positive terminal. A clicking sound should be heard. Replace the lock-up control solenoid valve/shift control solenoid valve A assembly if no clicking sound is heard when connecting either terminal to the battery positive terminal.

NOTE: Lock-up control solenoid valve/shift control solenoid valve A must be removed/replaced as an assembly.

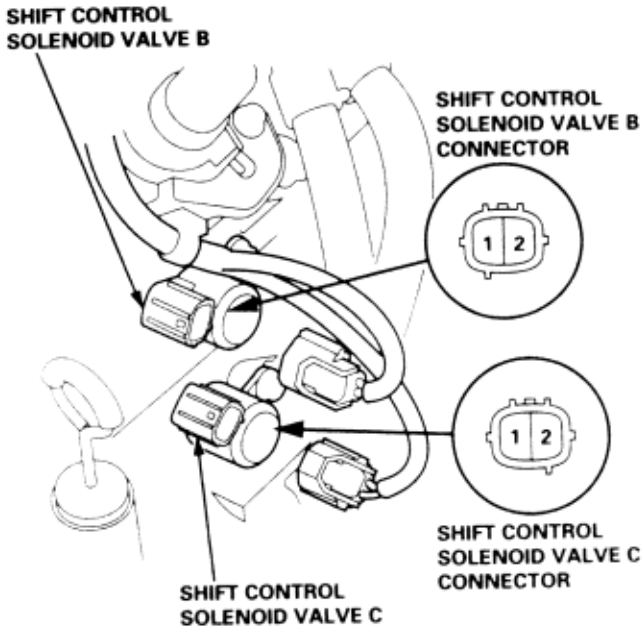
1. Remove the mounting bolts and lock-up control solenoid valve/shift control solenoid valve A assembly.



2. Clean the mounting surface and fluid passage of the lock-up control solenoid valve/shift control solenoid valve A assembly, and install a new lock-up control solenoid valve/shift control solenoid valve A assembly with a new filter/gasket.
3. Install the bolts with the connector bracket and the clamp bracket, and tighten the bolts.
4. Check the connector for rust, dirt or oil, then reconnect the connector securely.

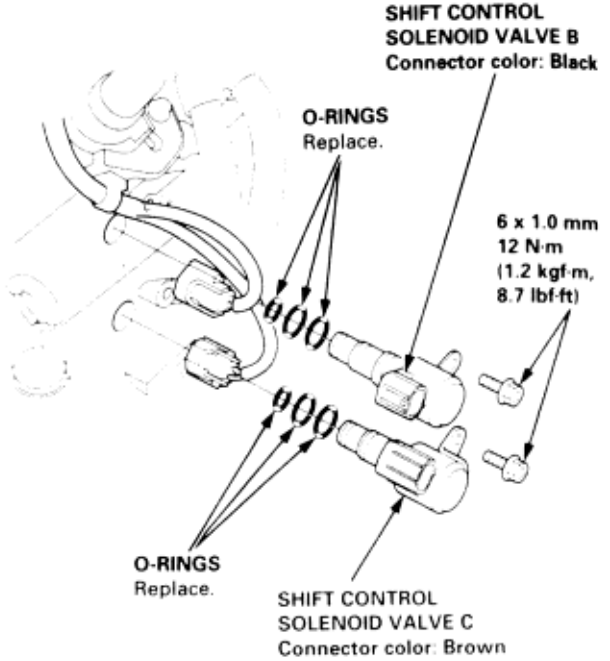
Test

1. Disconnect the shift control solenoid valve B or C connector.
2. Measure the resistance between the No. 1 terminal and No. 2 terminal of the shift control solenoid valve B or C.



3. Replace the shift control solenoid valve B or C if the resistance is out of specification.
4. If the resistance is within the standard, connect the No. 2 terminal of the shift control solenoid valve B or C connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace the shift control solenoid valve B or C if no clicking sound is heard.

NOTE: If the shift control solenoid valves B and C are replaced or removed at the same time, be sure to reinstall them correctly. The connector color of shift control solenoid valve B is black, and the connector color of shift control solenoid valve C is brown.



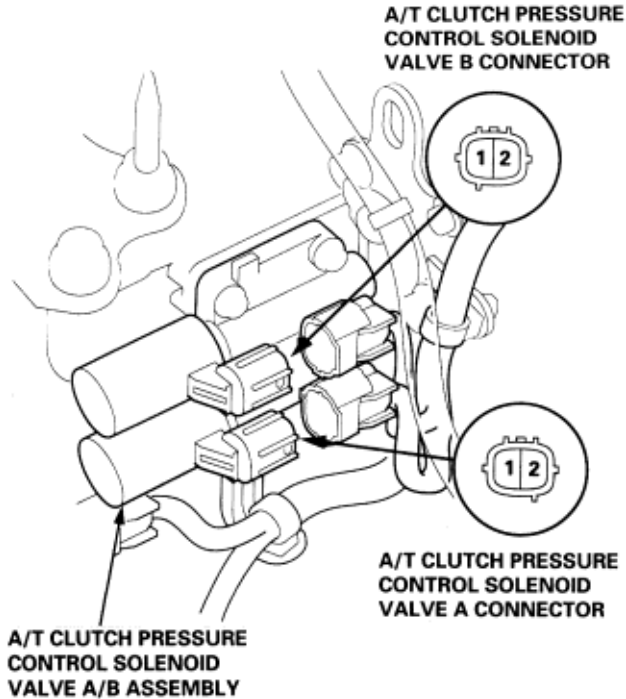
1. Remove the mounting bolt and the shift control solenoid valve B or C.
2. Install a new shift control solenoid valve B or C with new O-rings. While installing the shift control solenoid valves, do not allow dust or other foreign particles to enter the transmission.
3. Check the connector for rust, dirt or oil, then reconnect the connector securely.

**A/T Clutch Pressure Control Solenoid
Valve A/B Assembly
Test**

14-113

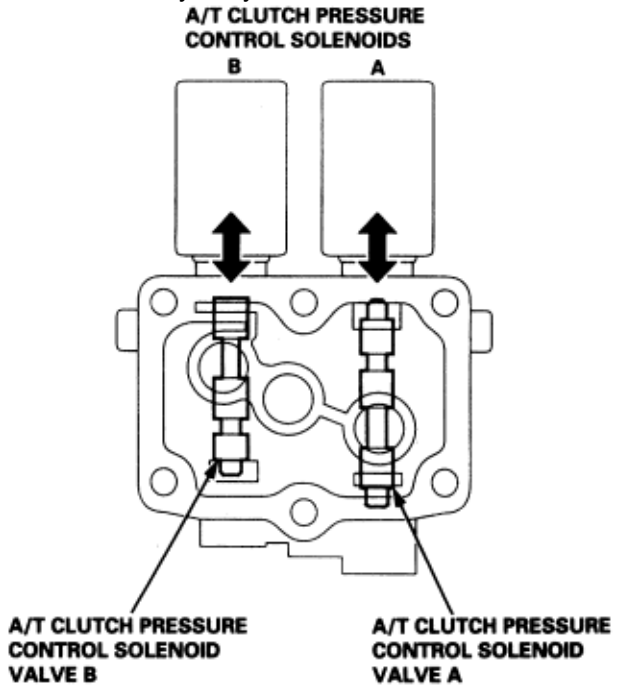
1. Disconnect the A/T clutch pressure control solenoid valve A and B connectors.
2. Measure the resistance between the No. 1 and No. 2 terminals of the A/T clutch pressure control solenoid valve A and B.

STANDARD: Approx. 5 Ω



3. If the resistance of either A/T clutch pressure control solenoid is out of specification, replace the A/T clutch pressure control solenoid valve A/B assembly.
4. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valve A (and B) to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. A clicking sound should be heard.
5. If not, remove the A/T clutch pressure control solenoid valve A/B assembly.
6. Check the fluid passage of the A/T clutch pressure control solenoid valves for dust and dirt.

7. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valve A (and B) to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Check the A/T clutch pressure control solenoid valves movement.
8. Disconnect one of the battery terminals and check the valve movement.
NOTE: You can see the valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valve A/B assembly body.



9. If either valve binds, or moves sluggishly, or if the A/T clutch pressure control solenoid does not operate, replace the A/T clutch pressure control solenoid valve A/B assembly.

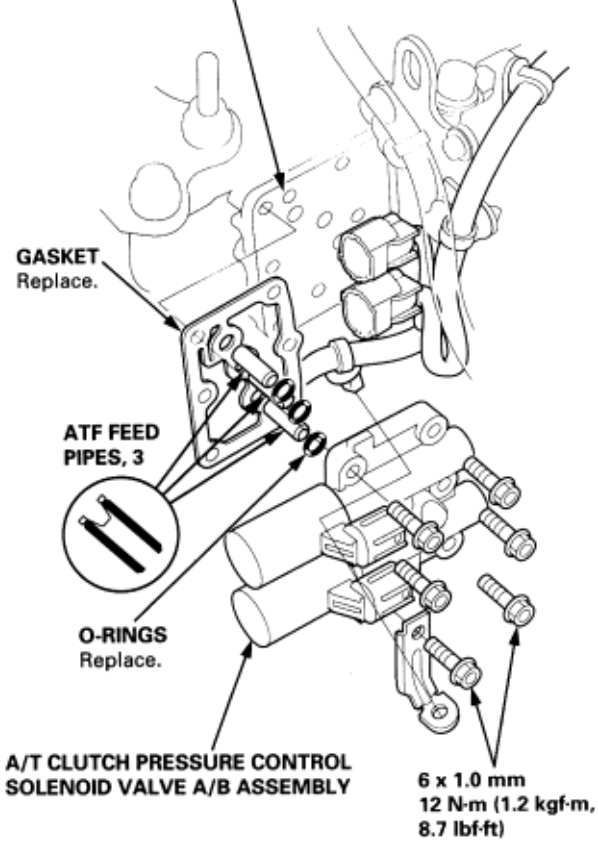
**A/T Clutch Pressure Control Solenoid
Valve A/B Assembly
Replacement**

14-114

**Mainshaft/Countershaft
Speed Sensors
Replacement**

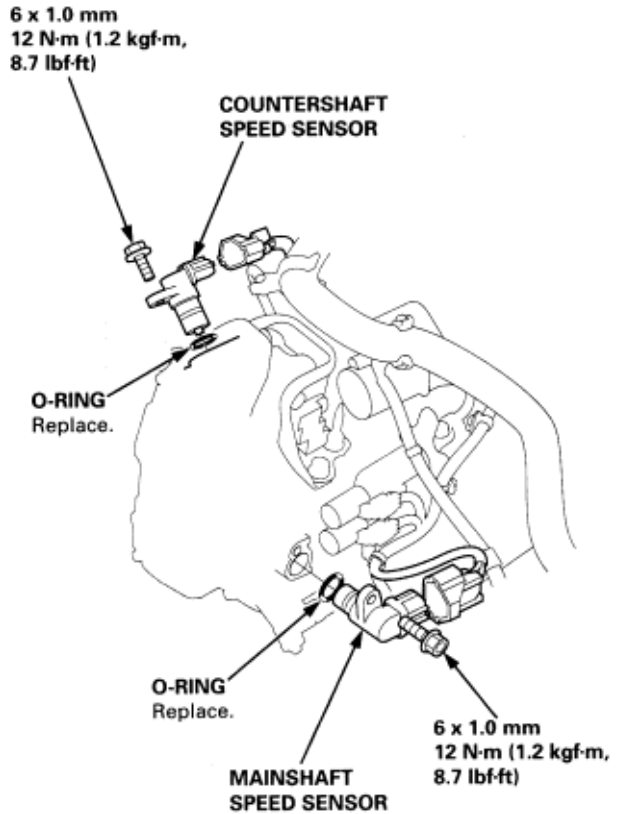
1. Remove the mounting bolts and the A/T clutch pressure control solenoid valve A/B assembly.

Clean mounting surface
and fluid passages.



2. Clean the mounting surface and fluid passage of the A/T clutch pressure control solenoid valve A/B assembly and transmission housing.
3. Install a new A/T clutch pressure control solenoid valve A/B assembly with a new gasket, new O-rings, ATF feed pipes, and harness clamp bracket.
NOTE: Install the filter side of the ATF feed pipes in the transmission housing.
4. Check the A/T clutch pressure control solenoid valve connectors for rust, dirt or oil, and connect them securely.

1. Remove the 6 mm bolt and the mainshaft speed sensor from the right side cover.
2. Remove the 6 mm bolt and the countershaft speed sensor from the transmission housing.
3. Replace the O-ring with a new one before installing the countershaft speed sensor or the mainshaft speed sensor.
4. Install the mainshaft speed sensor and the countershaft speed sensor, then connect the connectors.



2nd Clutch Pressure Switch Replacement

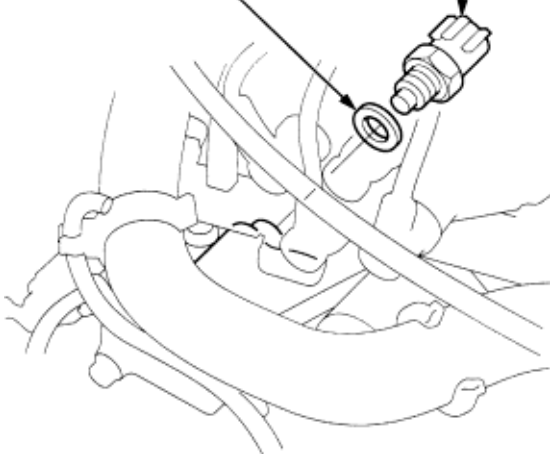
14-115

3rd Clutch Pressure Switch Replacement

1. Disconnect the connector from the 2nd clutch pressure switch.
2. Replace the 2nd clutch pressure switch, then install a new one with a new sealing washer. Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

2ND CLUTCH PRESSURE SWITCH
20 N·m (2.0 kgf·m, 14 lbf·ft)

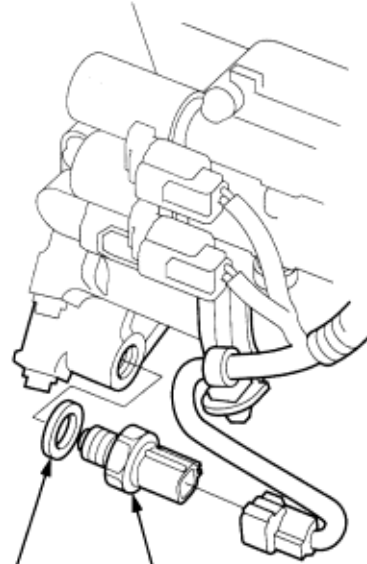
SEALING WASHER
Replace.



1. Disconnect the connector from the 3rd clutch pressure switch.
2. Replace the 3rd clutch pressure switch, then install a new one with a new sealing washer. Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.

SEALING WASHER
Replace.

3RD CLUTCH PRESSURE SWITCH
20 N·m (2.0 kgf·m, 14 lbf·ft)



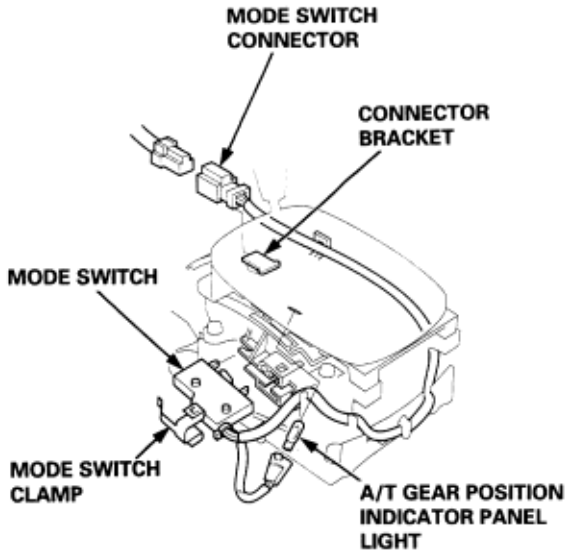
Mode Switch Replacement

14-116

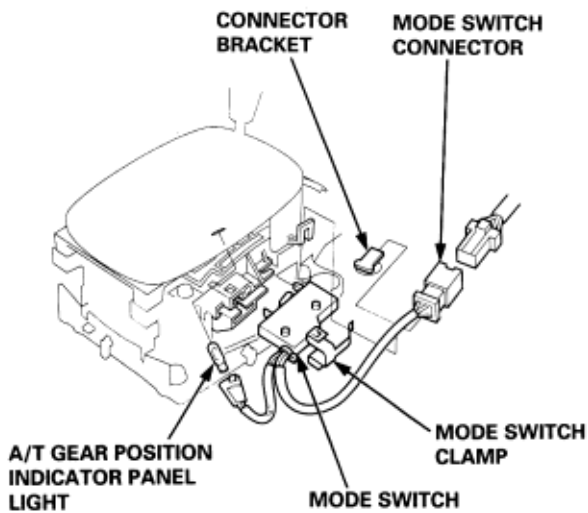
PCM Replacement

1. Remove the center console (see section 20).
2. Remove the AT gear position indicator panel light.
3. Disconnect the mode switch connector, then remove it from the connector bracket.
4. Pry the mode switch clamp with a screwdriver, then remove the mode switch.

LHD:



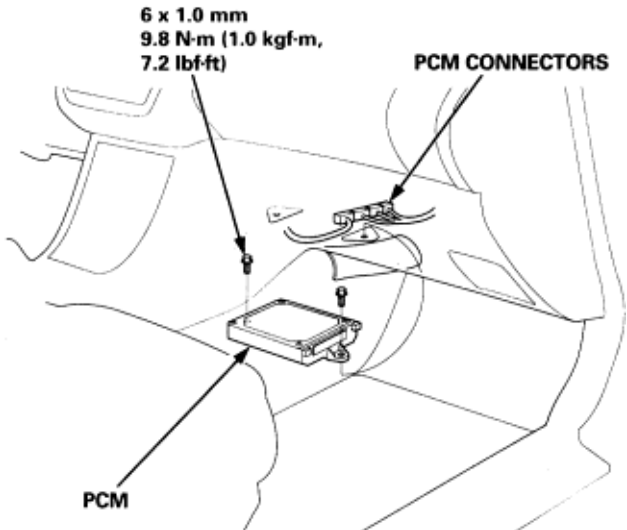
RHD:



5. Install the new mode switch in the reverse order of removal.

1. Remove the foot rest.
2. Pull the carpet from the passengers side of the center console to expose the PCM.
3. Disconnect the PCM connectors, and remove the PCM.

NOTE: LHD is shown, RHD is symmetrical.



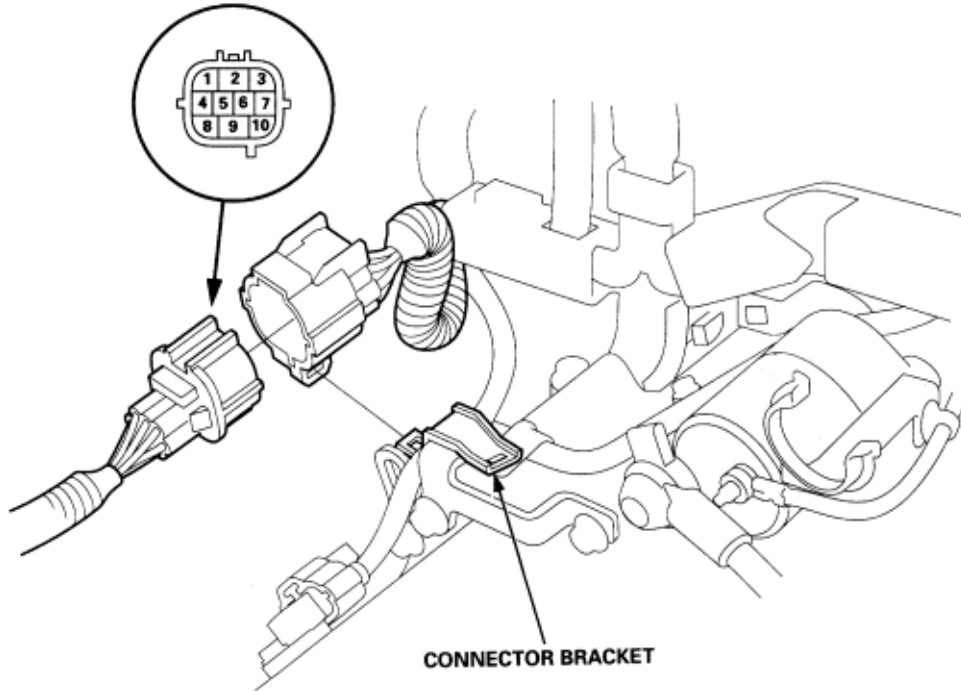
4. Install the new PCM in the reverse order of removal.
5. Write the code for the immobilizer on the new PCM using the PGM Tester (see section 11).

A/T Gear Position Switch
Test

14-117

1. Remove the A/T gear position switch connector from the connector bracket, then disconnect the A/T gear position switch connector.
2. Check for continuity between the terminals in each switch position according to the table below.

A/T GEAR POSITION SWITCH CONNECTOR



A/T Gear Position Switch Continuity check

Terminal Position	1	2	3	4	5	6	7	8	9	10
P	○		○							○
R			○						○	
N	○		○					○		
D₁		○	○				○			
D₂		○	○			○				
2		○	○		○					
1			○	○						

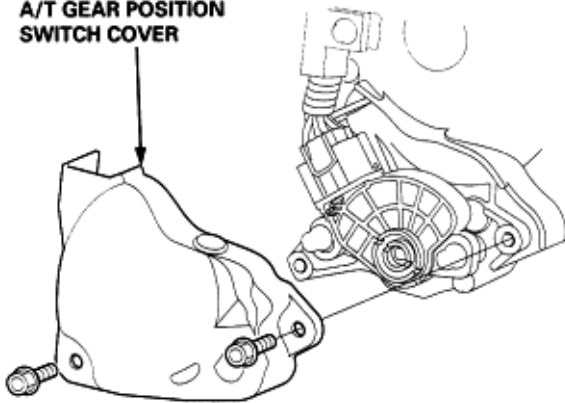
NOTE: Terminal No. 1: Neutral position switch

⚠ WARNING

Make sure lifts, jacks and safety stands are placed properly (see section 1).

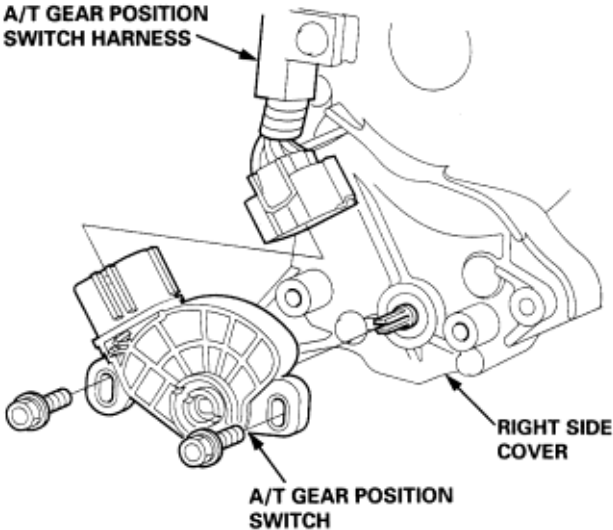
1. Raise the front of the vehicle, and make sure it is securely supported.
2. Set the parking brake, and block both rear wheels securely.
3. Shift to **N** position.
4. Remove the A/T gear position switch cover.

A/T GEAR POSITION SWITCH COVER



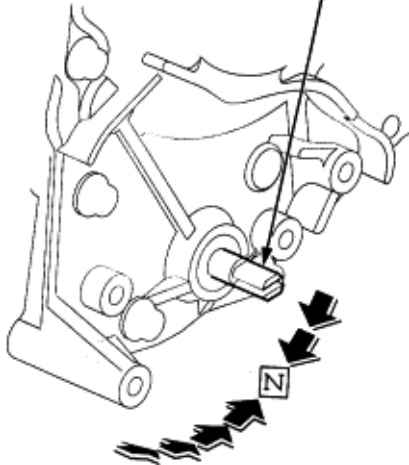
5. Remove the two bolts securing the A/T gear position switch, then disconnect the connector and remove the A/T gear position switch from the right side cover.
NOTE: Remove the bolt securing the A/T gear position switch harness on the right side cover, if it is tight to disconnect the connector from the A/T gear position switch.

A/T GEAR POSITION SWITCH HARNESS



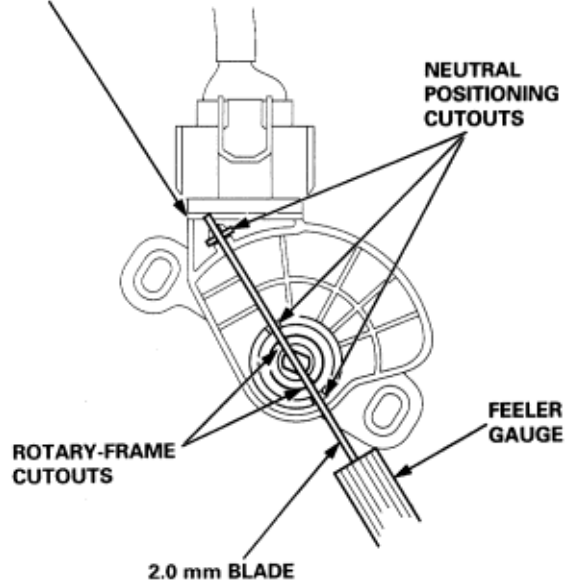
6. Replace the new A/T gear position switch.
7. Set the control shaft to **N** position.

CONTROL SHAFT



8. Align the cutouts on the rotary-frame with the neutral positioning cutouts on the A/T gear position switch, then put the 2.0 mm blade of the feeler gauge in the cutouts to hold the **N** position.
NOTE: Be sure to use the 2.0 mm blade or an equivalent when holding the **N** position on the A/T gear position switch.

A/T GEAR POSITION SWITCH



A/T Gear Position Switch Replacement (cont'd)

14-119

9. Loosely connect the connector, then install the A/T gear position switch gently on the control shaft with holding the **N** position with the 2.0 mm blade.
- NOTE: Take care not to move the A/T gear position switch when tightening the bolts.

A/T GEAR POSITION SWITCH HARNESS CONNECTOR

A/T GEAR POSITION SWITCH

CONTROL SHAFT

**6 x 1.0 mm
12 N·m (1.2 kgf·m,
8.7 lbf·ft)**

**2.0 mm BLADE
FEELER GAUGE**

10. Tighten the bolts on the A/T gear position switch with remaining the 2.0 mm blade to hold the **N** position.

A/T GEAR POSITION SWITCH

**6 x 1.0 mm
12 N·m (1.2 kgf·m,
8.7 lbf·ft)**

**2.0 mm BLADE
FEELER GAUGE**

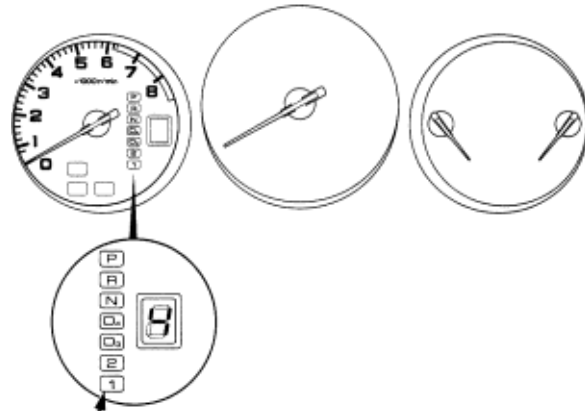
11. Connect the connector securely, then install the A/T gear position switch cover.

A/T GEAR POSITION SWITCH COVER

**6 x 1.0 mm
12 N·m (1.2 kgf·m,
8.7 lbf·ft)**

12. Turn the ignition switch ON (II), then verify the shift position indicator indicates the **N** position.
13. Move the shift lever through all gear positions, and check the A/T gear position switch synchronization with the A/T gear position indicator.

GAUGE ASSEMBLY



SHIFT POSITION INDICATOR

14. Start the engine. Move the shift lever through all gear positions, and verify the following:
- ♦ The engine will not start in any position, other than **N** or **P**.
 - ♦ The back-up lights comes on when the shift lever is in **P** position.

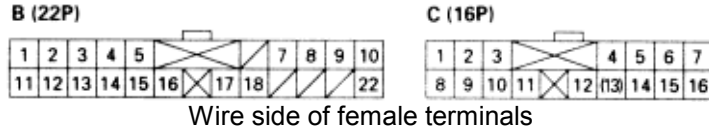
**A/T Gear Position Indicator
Indicator Input Test**

14-120

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or servicing.

1. Remove the meter panel (see section 20).
2. Remove the gauge assembly from the dashboard, then disconnect the B (22P) and C (16P) connectors from the gauge assembly (see section 23).
3. Inspect the connectors and connector terminals to be sure they are making good contact.
4. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
5. Perform the following input tests at the gauge assembly B (22P) and C (16P) connectors.

GAUGE ASSEMBLY CONNECTORS



Cavity	Wire Colour	Test Condition	Test: Desired Result	Possible Cause (if result is not obtained)
B15	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
B22	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
C3	GRN/BLK	Ignition switch ON (II) and shift lever in D4	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ Faulty PCM ♦ An open in the wire

Cavity	Wire Colour	Test Condition	Test: Desired Result	Possible Cause (if result is not obtained)
C4	LHD: YEL/BLK RHD: RED/BLK	Ignition switch ON (II) and shift lever in N	Check for voltage to ground: There should be 1V or less NOTE: There should be no battery voltage in any other shift position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire
C5	PNK	Ignition switch ON (II) and shift lever in D3	Check for voltage to ground: There should be 1V or less NOTE: There should be no battery voltage in any other shift position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire
C6	BRN	Ignition switch ON (II) and shift lever in 1	Check for voltage to ground: There should be 1V or less NOTE: There should be no battery voltage in any other shift position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire
C7	BLU	Ignition switch ON (II) and shift lever in 2	Check for voltage to ground: There should be 1V or less NOTE: There should be no battery voltage in any other shift position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire
C12	BLK/ORN	Ignition switch ON (II) and shift lever in P	Check for continuity to ground: There should be no continuity in any other shift lever position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire
C13	WHT	Ignition switch ON (II) and shift lever in R	Check for voltage to ground: There should be 1V or less NOTE: There should be no battery voltage in any other shift position	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ An open in the wire

6. Connect the B (22P) and C (16P) connectors to the gauge assembly, then perform the following input tests.

Cavity	Wire Colour	Test Condition	Test: Desired Result	Possible Cause (if result is not obtained)
B7	BLU/YEL	Start the engine and shift lever in manual mode 1st gear position	Check for voltage to ground: There should be 0V	<ul style="list-style-type: none"> ♦ Faulty PCM ♦ Faulty mode switch ♦ Faulty shift indicator ♦ An open in the wire
B8	PUR	Start the engine and shift lever in manual mode 1st gear position	Check for voltage to ground: There should be 0V	<ul style="list-style-type: none"> ♦ Faulty PCM ♦ Faulty mode switch ♦ Faulty shift indicator ♦ An open in the wire
B9	BLU/BLK	Start the engine and shift lever in manual mode 1st gear position	Check for voltage to ground: There should be 5V	<ul style="list-style-type: none"> ♦ Faulty PCM ♦ Faulty mode switch ♦ Faulty shift indicator ♦ An open in the wire

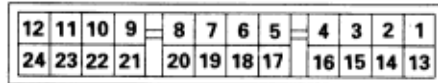
7. If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or servicing.

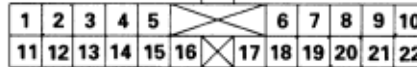
1. Disconnect the 22P connector from the multiplex control unit (driver's), then remove the multiplex control unit (driver's) from the driver's under-dash fuse/relay box.
2. Inspect the connectors and connector terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the multiplex control unit (driver's) connectors.
 - If a test indicates a problem, find a correct the cause, then recheck the system.
 - If all the input tests prove OK, substitute a known-good multiplex control unit (driver's), and recheck the system. If the system is OK, the multiplex control unit (driver's) must be faulty; replace it.

NOTE: If the shift lock solenoid clicks when the ignition switch is turned ON (II) while depressing the brake pedal with the shift lever in **P** position, the shift lock system is OK. If the shift lever cannot be shifted from **P** position, test the A/T gear position switch.

A (24P)



B (22P)



Multiplex Control Unit (Driver's) 24P Connector

Cavity	Wire Colour	Test Condition	Test: Desired Result	Possible Cause (if result is not obtained)
A1	-	Ignition switch turned ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A22	-	Shift lever in P	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ Poor ground (G401) ♦ An open in the wire

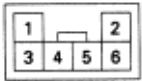
Interlock System**Control Unit Input Test (cont'd)****14-123****Multiplex Control Unit (Driver's) 22P Connector**

Cavity	Wire Colour	Test Condition	Test: Desired Result	Possible Cause (if result is not obtained)
B2	WHT/BLU	Ignition switch turned to ACC (I): ignition key pushed all the way in	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Faulty steering lock assembly (key interlock switch) ♦ An open in the wire
B3	WHT/RED	Ignition switch turned to ACC (I): ignition key pushed all the way in	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Faulty steering lock assembly (key interlock switch) ♦ An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
B12	WHT/RED	Ignition switch ON (I): and brake pedal pushed Ignition switch (ON(II): brake pedal and accelerator pedal pushed at the same time	Check for voltage to ground: There should be battery voltage Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ Faulty PCM ♦ An open in the wire
B21	LHD: YEL/BLK RHD: RED/BLK	Shift lever in N	Check for continuity to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch ♦ Faulty PCM ♦ An open in the wire
B22	GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 8 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ Faulty shift lock solenoid ♦ An open in the wire

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or servicing.

1. Remove the driver's dashboard lower cover (see section 20).
2. Disconnect the key switch connector from the steering lock assembly.
3. Check for continuity between the No. 1 and No. 2 terminals of the key switch connector.
4. Check for continuity between terminals No. 6 and No. 1 and between terminals No. 6 and No. 2 when the key is pushed, and check for no continuity when the key is released.

KEY SWITCH CONNECTOR



Terminal side of male terminal

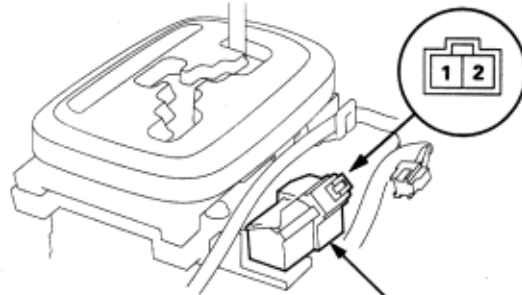
5. Check that the key cannot be removed with power connected to the No. 6 terminal and ground connected to the No. 1 terminal.
 - ♦ If the key cannot be removed, the key interlock solenoid is OK.
 - ♦ If the key can be removed, replace the steering lock assembly (the key interlock solenoid is not available separately).

1. Remove the center console (see section 20).
2. Disconnect the shift lock solenoid connector.
3. Connect the No. 1 of the shift lock solenoid connector terminal to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
4. Check that the shift lever can be moved from the **P** position. Release the battery terminals from the shift lock solenoid connector. Move the shift lever back to the **P** position, and make sure it locks.

NOTE: Do not connect the battery positive terminal to the No. 2 terminal, you will damage the diode inside the solenoid.
5. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
6. If the solenoid does not work, replace it.

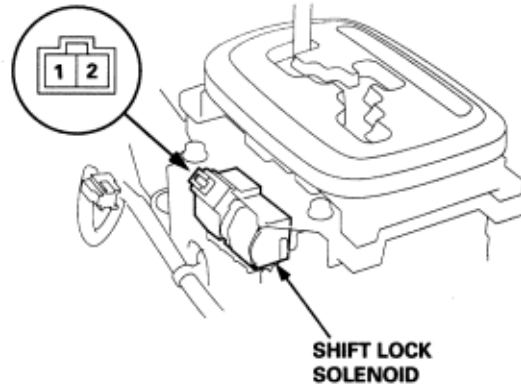
LHD:

SHIFT LOCK SOLENOID CONNECTOR



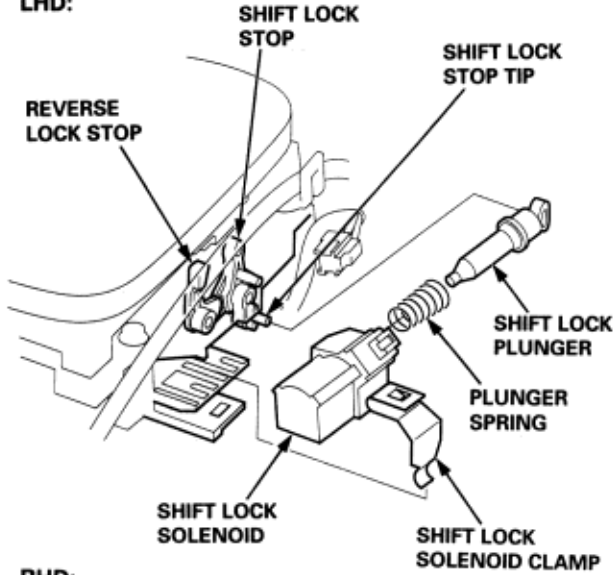
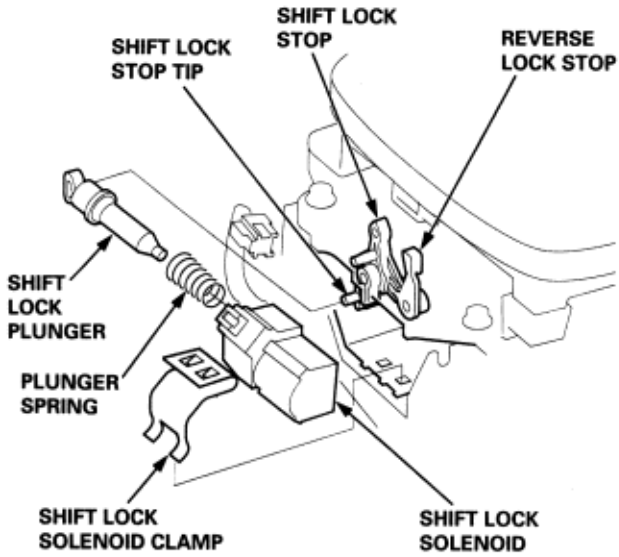
RHD:

SHIFT LOCK SOLENOID CONNECTOR



Shift Lock Solenoid Replacement

1. Remove the center console (see section 20).
2. Disconnect the shift lock solenoid connector.
3. Pry the shift lock solenoid clamp with a screwdriver, then remove the shift lock solenoid.
4. Install the shift lock solenoid plunger and plunger spring in the new shift lock solenoid.
5. Install the shift lock solenoid by aligning the joint of the shift lock solenoid with the tip of the shift lock stop.
6. Secure the shift lock solenoid with the clamp, then connect the shift lock solenoid connector.

LHD:**RHD:**

Symptom-to-Component Chart
Hydraulic System

14-126

Before troubleshooting a problem on Hydraulic System, check the self-diagnosis **D4** indicator light indication. If the **D4** indicator light indicates a trouble code, perform the electrical troubleshooting according to the Electrical System to Component Chart. If the **D4** indicator light does not indicate a trouble code and a failure is not found on the electrical troubleshooting, perform the hydraulic troubleshooting following this chart.

Symptom	Check these items on the PROBABLE CAUSE List	Check these items on the NOTES List
Engine runs, but vehicle does not move in any gear	1, 11, 12, A, B, U, a, b	C, H, I, J, M, N, O, R, S
Vehicle moves in 2, R , but not in D4, D3 or 1 positions	O, d, e	P, T
Vehicle moves in D4, D3, 1, R but not in 2 position	3, H, P, f, g	D, P, T
Vehicle moves in D4, D3, 2, 1 but not in R position	C, D, N, R, I, j	J, K, L, Q, T
Poor acceleration: flares on starting off in D4 and D3 positions		
Stall speed high in D4, D3, 2 and 1 positions	1, 11, A, B, U, V	C, H, I, R
Stall speed high in D4, D3 and 1 positions	11, e	H, T
Stall speed high in 2 position	11, g	H, T
Stall speed is in specification in D4, D3, 2 and 1 positions but high in R position	i	T
Stall speed low	6, T1, T3, T4, W	
Engine idle vibration	1, 6, T2, T3, T4, A, W	B, C
Vehicle moves in N position	2, G, e, g, h, i, l, m, n	C, T
Late shift from N position to D4 and D3 positions, or excessive shock	5, 7, 11, 12, C, E, G, J, M, O, S, e	D, E, H, L
Late shift from N position to R position, or excessive shock	5, 7, 11, 12, C, G, N, R, i	D, E, H, L, T
No shift	D	J
Erratic shifting gears		
Fails to shift in D4 position; does not upshift to 4th	3, 13, 14, H, K	D, F
Fails to shift in D4 and D3 positions; between 1st and 2nd	4, C, I, M	D, K
Fails to shift in D4, D3 and 1 positions; starts off in 3rd	4, I, L	D
Excessive shock or flares in all shift lever positions	7, E, F, G	E, L
Excessive shock or flares on 1-2 upshift or 2-1 downshift	5, 9, G, J, O, P, S, T, e, g	D, G, T
Excessive shock or flares on 2-3 upshift or 3-2 downshift	5, 10, G, J, P, Q, T, g, h	D, T
Excessive shock or flares on 3-4 upshift or 4-3 downshift	5, G, J, Q, R, h, i	D, L, T
Noise from transmission in all shift lever positions	A, p	I, U
Vehicle does not accelerate more than 31 mph (50 km/h)	T1	
Vibration in all shift lever positions	T2	B
Shift lever does not operate smoothly	8, 1, 12	F, H
Transmission does not shift into P position	11, 12, r	H, V
Lock-up clutch does not disengage	6, 7, T4, W, X, Y	E
Lock-up clutch does not operate smoothly	6, 7, T4, V, W, X, Y	E
Lock-up clutch does not engage	6, 7, 13, 14, T4, V, W, X	E
A/T gear position indicator does not indicate shift lever positions	8, 11, 12	F, H
Speedometer does not operate	14	

Symptom-to-Component Chart
Hydraulic System (cont'd)

14-127

PROBABLE CAUSE			
Electronic Devices		Torque Converter	
1	Low ATF	T1	Torque converter one-way clutch defective
2	Excessive ATF	T2	Drive plate defective or transmission mis-assembled
3	Shift control solenoid valve A defective	T3	Engine output low
4	Shift control solenoid valve B defective	T4	Lock-up clutch piston defective
5	Shift control solenoid valve C defective	Transmission	
6	Lock-up control solenoid valve defective	a	Mainshaft worn/damaged
7	A/T clutch pressure control solenoid valves A/B defective	b	Final gears worn/damaged (2 gears)
8	A/T gear position switch defective or out of adjustment	d	1st gears worn/damaged (2 gears)
9	2nd clutch pressure switch defective	e	1st clutch defective
10	3rd clutch pressure switch defective	f	2nd gears worn/damaged (2 gears)
11	Shift cable broken/out of adjustment	g	2nd clutch defective
12	Joint in shift cable and transmission or body worn	h	3rd clutch defective
13	Mainshaft speed sensor defective	i	4th clutch defective
14	Countershaft speed sensor defective	j	Reverse gears worn/damaged (3 gears)
Hydraulic Controls		l	Clutch clearance incorrect
A	ATF pump worn or binding	m	Needle bearing seized up poor worn/damaged
B	Regulator valve stuck or spring worn	n	Thrust washer seized up or worn/damaged
C	Shift fork shaft stuck	p	Torque converter housing or transmission housing bearing worn/damaged
D	Modulator valve defective	r	Parking brake mechanism defective
E	CPC valve A defective		
F	CPC valve B defective		
G	Foreign material in separator plate orifice		
H	Shift valve A defective		
I	Shift valve B defective		
J	Shift valve C defective		
K	Shift valve D defective		
L	Shift valve E defective		
M	Servo control valve defective		
N	Reverse CPC valve defective		
O	1st accumulator defective		
P	2nd accumulator defective		
Q	3rd accumulator defective		
R	4th accumulator defective		
S	1st check ball stuck		
T	2nd check ball stuck		
U	ATF strainer clogged		
V	Torque converter check valve defective		
W	Lock-up shift valve defective		
X	Lock-up control valve defective		
Y	Lock-up timing valve defective		

Symptom-to-Component Chart
Hydraulic System (cont'd)

14-128

The following symptom can be caused by improper repair or assembly	Check these items
Vehicle creeps in N position	<ul style="list-style-type: none">♦ Improper clutch clearance♦ Improper gear clearance
Transmission locks up in P position	Improper clutch clearance
Excessive drag in transmission	<ul style="list-style-type: none">♦ ATF pump binding and seizure Use proper tools when replacing the ATF pump gears and be careful not to damage the ATF pump when torque down the main valve body <ul style="list-style-type: none">♦ Check that the shift fork bolt is not installed to the shift fork shaft
Excessive vibration, rpm related	Torque converter not fully seated in ATF pump
Mainshaft oil seal pops out	<ul style="list-style-type: none">♦ Mainshaft oil seal improperly installed♦ Install the mainshaft oil seal flush with the torque converter housing until the mainshaft oil seal is installed into the torque converter housing until it bottoms, it will block the fluid return passage and result in damage
Various shifting problems	<ul style="list-style-type: none">♦ Springs improperly installed♦ Valves improperly installed
Harsh upshift	Check valve balls not installed

Symptom-to-Component Chart
Hydraulic System (cont'd)

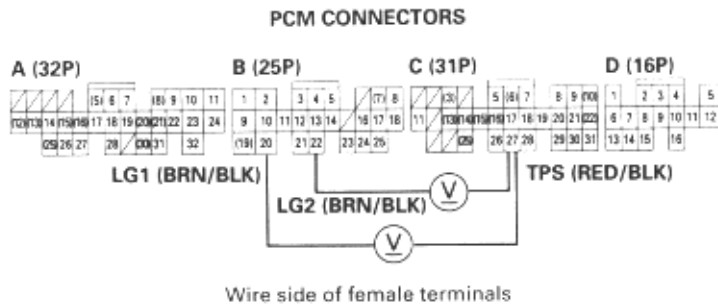
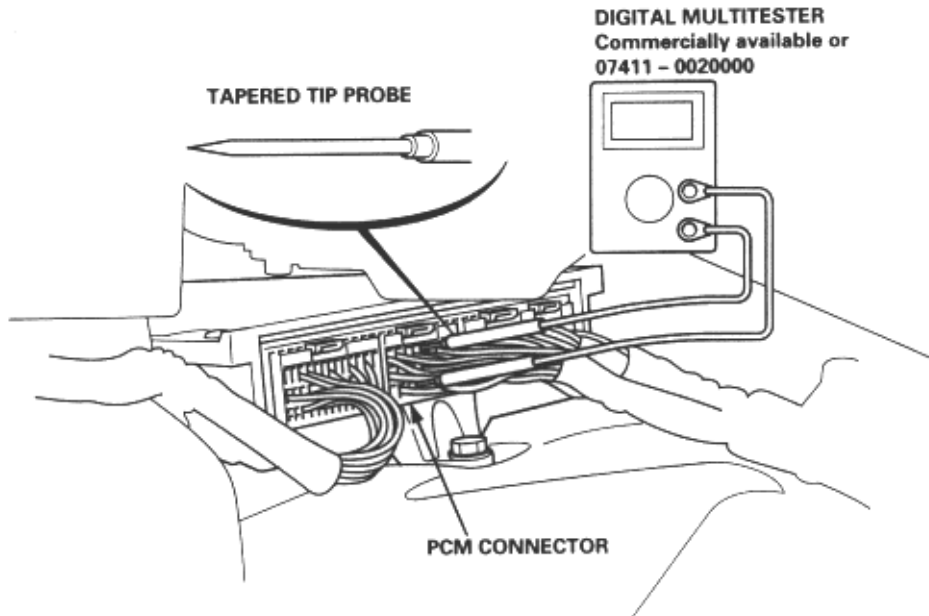
14-129

NOTES	
B	Set idle RPM in gear to specified idle speed. If still no good, adjust motor mounts as outlined in engine section of this manual
C	Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines.
D	Check that the D4 indicator light indication and check for loose connectors. Inspect the O-ring and the shift control solenoid valve seizure.
E	Check that the D4 indicator light indication and check for loose connectors. Inspect the A/T clutch pressure control solenoid valve body gasket and ATF feed pipes for wear and damage. If the A/T clutch pressure control solenoid valve is stuck, inspect the CPC valves.
F	Check that the D4 indicator light indication and check for loose connector. Inspect the A/T gear position switch. If the A/T gear position switch is faulty, replace it. If the A/T gear position switch is put of adjustment, adjust it and the shift cable.
G	Check that the D4 indicator light indication and check for loose connector. Check that the outlet is not clogged inside the connector.
H	Check for loose joint of the shift cable on the shift lever and transmission control shaft.
I	Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly rpm related ticking noise or a high pitched squeak.
J	Measure line pressure.
K	Check that the shift fork bolt is not installed to the shift fork shift.
L	If the ATF strainer is clogged with particles of steel or aluminium, inspect the ATF pump. If the ATF pump is OK, and no cause for the contamination is found, replace the torque converter,
M	If the 4th clutch feed pipe guide in the right side cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If the ball bearing is OK, replace the right side cover as it is dented. The O-ring under the guide is probably worn.
N	Replace the mainshaft, if the bushing for the 3rd and 4th clutch feed pipes are loose or damaged. If the 4th clutch feed pipe is damaged or out of round, replace it. If the 3rd clutch feed pipe is damaged or out of round, replace the right side cover.
O	Inspect the differential pinion shaft for wear under pinion gears. If differential pinion shaft is worn, overhaul differential assembly, and replace ATF strainer, and thoroughly clean transmission, flush torque converter, cooler and line.
P	Inspect the secondary shaft and 1st/2nd clutch assembly for wear and damage.
Q	Inspect the reverse selector gear teeth chamfers of the countershaft 4th gear and reverse gear. replace the reverse gears and reverse selector are worn or damaged. If transmission makes clicking grinding or whirring noise, also replace mainshaft 4th gear, reverse idler gear and countershaft 4th gear.
R	Be very careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools.
S	Install the mainshaft oil seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
T	Inspect the clutch piston, clutch piston check valve and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs and plates are worn and damaged, replace them as a set. If they are OK, adjust the clearance with the clutch end plate.
U	Inspect the contact area of countershaft and secondary shaft with the bearings. Check the ATF guide plates for damage and wear. Inspect the 1st clutch feed pipe for damage and out of round. If the 1st clutch feed pipe is damaged or out of round, replace it. Replace the secondary shaft if the bushing for the 1st clutch fed pipe is damaged or out of round.
V	Check the parking brake pawl spring installation, and the parking brake lever spring installation. If installation is incorrect, install the springs correctly in place. Check that the parking brake stop is installed upside down. Check the distance between the parking brake pawl and the parking brake roller pin. If the distance is out of tolerance, adjust the distance with the parking brake stop.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block both rear wheels securely. Start the engine, then shift to **D4** position while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat the same test in **D3** position.
4. Test-drive the vehicle on a flat road in **D4** position. Check that the shift points occur at the approximately speed shown. Also check for abnormal noise and clutch slippage.

NOTE: Throttle position sensor voltage represents the throttle opening.

- 1. Pull back the carpet from passenger's side of the center console to expose the PCM.
- 2. Set the digital multimeter to monitor voltage between the C27 (+) terminal and B20 (-) or B22 (-) terminal of the PCM for the throttle position sensor.



D4 Position:

Upshift

Throttle Opening	Unit of Speed	1st to 2nd	2nd to 3rd	3rd to 4th	Lock-up ON
Throttle position sensor voltage: 0.8V	mph km/h	10-12 16-19	18-20 29-32	25-27 40-44	32-35 52-56
Throttle position sensor voltage: 2.25V	mph km/h	22-25 35-40	43-46 69-74	64-67 103-108	75-79 121-127
Fully opened throttle, throttle position sensor voltage: 4.5V	mph km/h	34-38 55-61	62-66 100-106	91-95 146-153	102-106 164-171

Downshift

Throttle Opening	Unit of Speed	Lock-up OFF	4th to 3rd	3rd to 2nd	2nd to 1st
Throttle position sensor voltage: 0.8V	mph km/h	22-25 35-40	19-21 31-34	-	5-7 (3rd to 1st) 8-12 (3rd to 1st)
Throttle position sensor voltage: 2.25V	mph km/h	64-67 103-108	-	-	-
Fully opened throttle, throttle position sensor voltage: 4.5V	mph km/h	95-99 153-159	85-89 137-143	54-58 87-93	26-30 42-48

5. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th then shift from **D4** position to **2** position. The vehicle should immediately begin slowing down from engine braking.

6. Check for abnormal noise and clutch slippage in the following positions.

1 (1st Gear) Position

- a. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- b. Upshifts should not occur with the shift lever in this position.

2 (2nd Gear) Position

- a. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- b. Upshifts and downshifts should not occur with the shift lever in this position.

R (Reverse) Position

Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

7. Test in **P** (Parking) Position

Park the vehicle on a slope (approx. 160), apply the parking brake, and shift into **P** position. Release the brake; the vehicle should not move.

**Stall Speed
Test**

14-132

1. Engage the parking brake, and block the front wheels.
2. Connect a tachometer to the engine, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift into **2** position.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed. Do not move the shift lever while raising engine speed.
6. Allow two minutes for cooling, then repeat the test in **D4**, **2**, **1** and **R** positions.

NOTE:

- ♦ Do not test stall speed for more than 10 seconds at a time.
- ♦ Stall speed tests should be used for diagnostic purposes only.
- ♦ Stall speed should be the same in **D4**, **1** and **R** positions.
- ♦ Do not test stall speed with the A/T pressure gauges installed.

Stall Speed RPM:

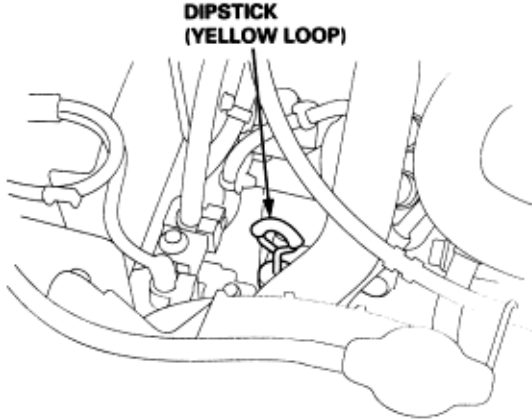
F20B6 Engine: **Specification: 2,250 rpm (min-1)**
 Service Limit: 1,950 - 2,550 rpm (min-1)

F18B2 Engine: **Specification: 2,450 rpm (min-1)**
 Service Limit: 2,150 - 2,750 rpm (min-1)

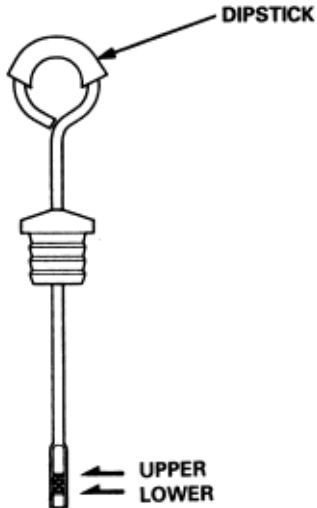
TROUBLE	PROBABLE CAUSE
Stall rpm high in D4 , 2 , 1 and R positions.	<ul style="list-style-type: none"> ♦ Low fluid level or ATF pump output ♦ Clogged ATF strainer ♦ Pressure regulator valve stuck closed ♦ Slipping clutch
Stall rpm high in 1 , position	<ul style="list-style-type: none"> ♦ Slippage of 1st clutch
Stall rpm high in 2 , position	<ul style="list-style-type: none"> ♦ Slippage of 2nd clutch
Stall rpm high in R , position	<ul style="list-style-type: none"> ♦ Slippage of 4th clutch
Stall rpm low in D4 , 2 , 1 and R positions.	<ul style="list-style-type: none"> ♦ Engine output low ♦ Torque converter one-way clutch slippage

NOTE: Keep all foreign particles out of the transmission.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on the level ground. Turn off the engine.
3. Remove the dipstick (yellow loop) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick into the transmission.
5. Remove the dipstick and check the fluid level. It should be between the upper mark and lower mark.

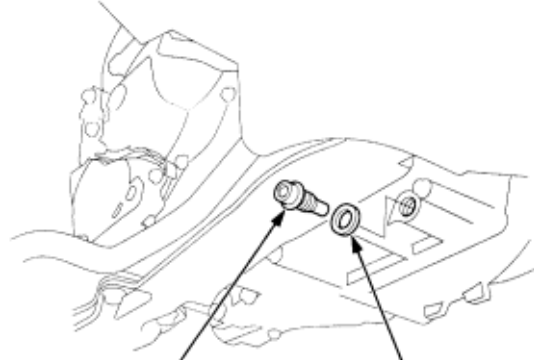


6. If the level is below the lower mark, pour the recommended fluid into the filler hole to bring it to the upper mark. Use Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or an equivalent quality DEXRON® II or III ATF only. Using a non-Honda ATF can affect shift quality.
7. Insert the dipstick back into the transmission.

NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on the level ground, and turn the engine off.
3. Remove the drain plug, and drain the automatic transmission fluid (ATF).
4. Reinstall the drain plug with a new sealing washer, then refill the transmission with the recommended fluid into the filler hole to the upper mark on the dipstick. Use Genuine Honda ATE PREMIUM (Automatic Transmission Fluid-PREMIUM) or an equivalent quality DEXRON® II or III ATE only. Using a non-Honda ATF can affect shift quality.

Automatic Transmission Fluid Capacity:
2.5 l (2.6 US qt, 2.2 Imp qt) at changing
6.1 l (6.4 US qt, 5.4 Imp qt) at overhaul



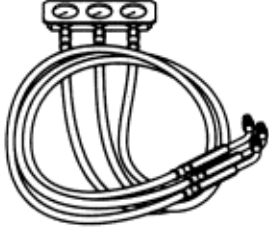
DRAIN PLUG
18 x 1.5 mm
49 N·m (5.0 kgf·m, 36 lbf·ft)

SEALING WASHER
Replace.

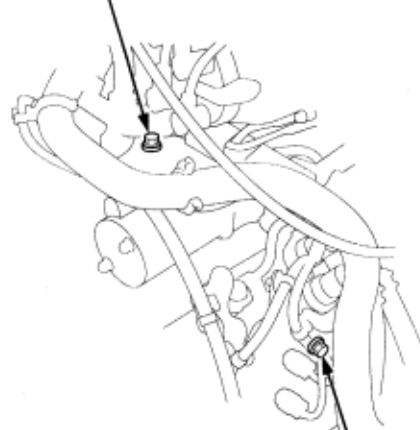
1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Raise the front of the vehicle, and make sure it is securely supported.
3. Set the parking brake, and block rear wheels securely.
4. Allow the front wheels to rotate freely.
5. Warm up the engine (the radiator fan comes on), then stop it and connect a tachometer.
6. Connect the special tool to line pressure and clutch pressure inspection holes securely, and do not allow dust or other particles to enter the holes.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

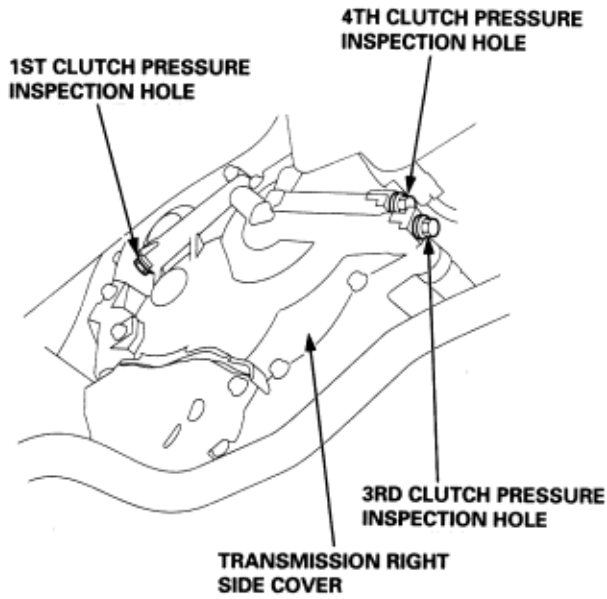
**A/T OIL PRESSURE GAUGE SET
07406 - 0020004**



**2ND CLUTCH PRESSURE
INSPECTION HOLE**



**LINE PRESSURE
INSPECTION HOLE**



**1ST CLUTCH PRESSURE
INSPECTION HOLE**

**4TH CLUTCH PRESSURE
INSPECTION HOLE**

**3RD CLUTCH PRESSURE
INSPECTION HOLE**

**TRANSMISSION RIGHT
SIDE COVER**

7. Start the engine, and run it at 1,500 rpm (min-1).
8. Shift to **N** or **P** position, and measure line pressure at the line pressure inspection hole.
NOTE: Higher pressure may be indicated if measurements are made in shift lever positions other than to **N** or **P**.
9. Shift to **1** position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole.
10. Shift to **2** position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole.
11. Shift to **P** position, then depress the brake pedal and hold it.
12. Shift to **D4** position, and release the brake pedal (the transmission is in 1st gear).
13. Accelerate the engine to 2,500 rpm (min-1) (the transmission will be shifted to 2nd gear).
14. Release the accelerator for more than five seconds after the transmission is shifted to 2nd gear, the engine will be come down to approx. 1,000 rpm (min-1) in 2nd gear.
15. Depress the accelerator slowly to rev up the engine to 2,000 rpm (min-1) in more than five seconds, then hold it.
16. Measure 3rd and 4th clutch pressure at the 3rd clutch pressure inspection hole, and the 4th clutch pressure inspection hole, as the transmission will be shifted from 2nd gear to 3rd gear, then to 4th gear.

Pressure	Shift lever Position	Symptom	Probable cause	Fluid Pressure	
				Standard	Service Limit
Line	N or P	No (or low) pressure	Torque converter, ATF pump, pressure regulator valve, torque converter check valve	850-910 kPa (8.7-9.3 kgf/cm ² , 120-130 psi)	800 kPa (8.2 kgf/cm ² , 120 psi)
1st clutch	1	No low or 1st pressure	1st clutch	840-920 kPa (8.6-9.4 kgf/cm ² , 120-130 psi)	790 kPa (8.1kgf/cm ² , 120 psi)
2nd clutch	2	No low or 2nd pressure	2nd clutch	840-920 kPa (8.6-9.4 kgf/cm ² , 120-130 psi)	790 kPa (8.1kgf/cm ² , 120 psi)
3rd clutch	D4	No low or 3rd pressure	3rd clutch	840-920 kPa (8.6-9.4 kgf/cm ² , 120-130 psi)	790 kPa (8.1kgf/cm ² , 120 psi)
4thclutch	R	No low or 4th pressure	4th clutch Servo valve or 4th clutch	840-920 kPa (8.6-9.4 kgf/cm ² , 120-130 psi)	790 kPa (8.1kgf/cm ² , 120 psi)

17. Install the sealing bolt with a new sealing washer, and tighten the bolt to the specified torque.
TORQUE: 18Nm (1.8 kgf/m, 13 lbf/ft)
Note: Do not reuse the old sealing washer.

⚠ WARNING

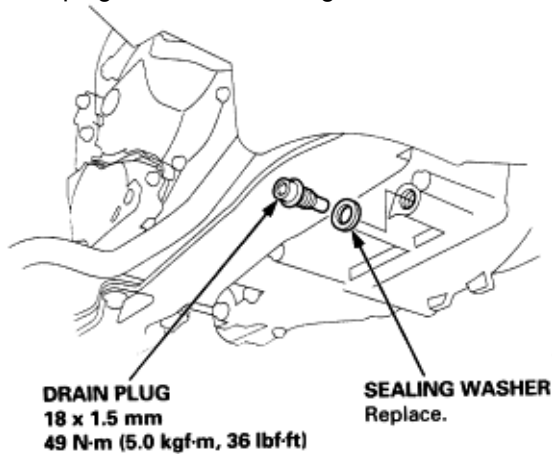
- ♦ Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).
- ♦ Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

⚠ CAUTION

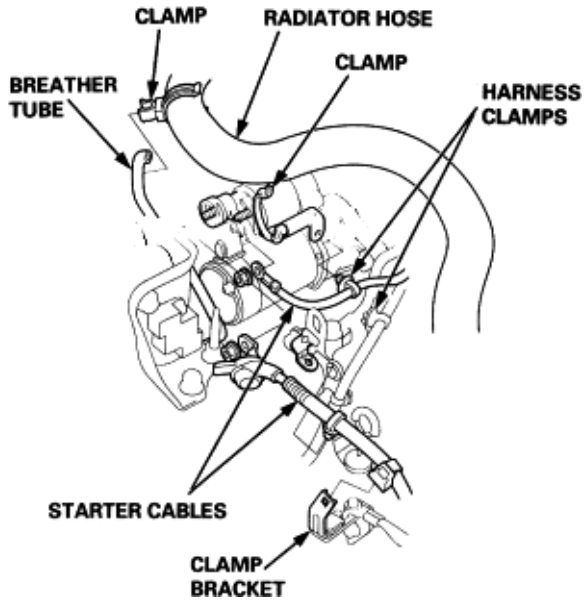
Use fender covers to avoid damaging painted surfaces.

NOTE: If the vehicle has the anti-theft code for the radio, write down the code and frequencies for the radio's preset buttons before disconnecting power.

1. Disconnect the battery negative terminal, then remove the positive terminal.
2. Remove the battery hold-down bracket, then remove the battery and battery tray.
3. Remove the battery cable clamps from the battery base.
4. Remove the battery base.
5. Remove the intake air duct and air cleaner housing assembly.
6. Raise the vehicle, and make sure it is securely supported. Remove the drain plug, and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer.

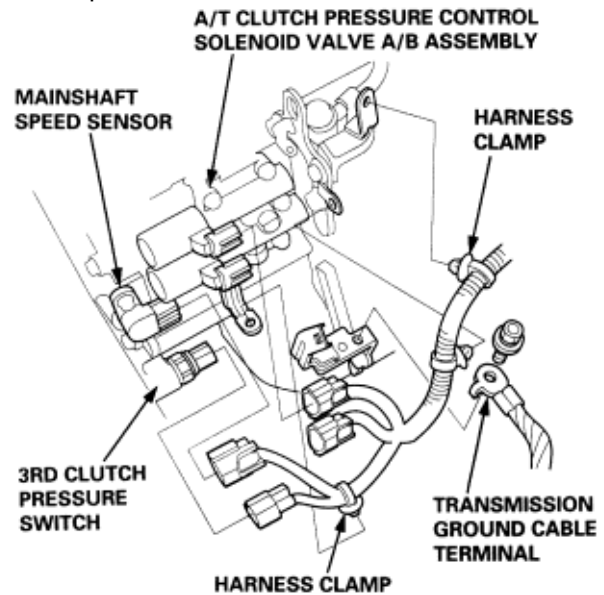


7. Remove the starter cables and harness clamps, and remove the breather tube and radiator hose from the clamps.

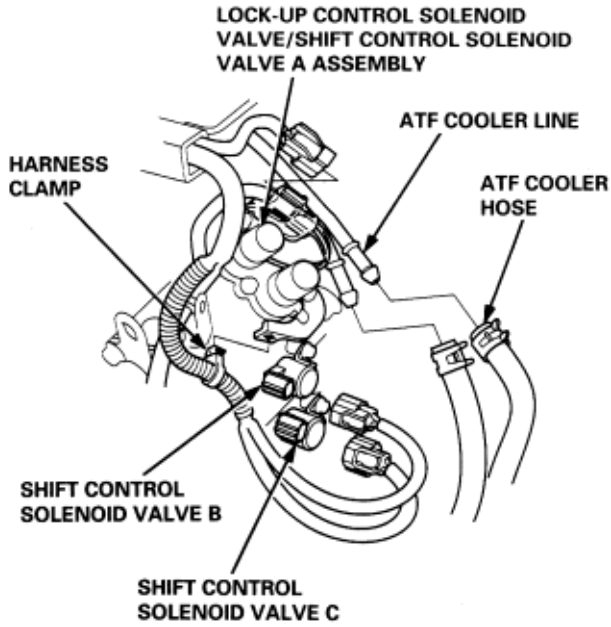


8. Remove the transmission ground cable terminal, and disconnect the connectors from the A/T clutch pressure control solenoid valve A/B assembly, mainshaft speed sensor and 3rd clutch pressure switch, then remove the harness clamps from the clamp brackets.

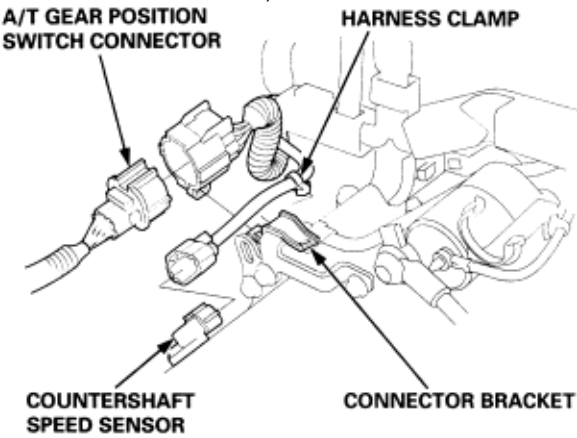
NOTE: Do not allow water, fluid, oil, dust, or other foreign particles to get inside the 3rd clutch pressure switch connector.



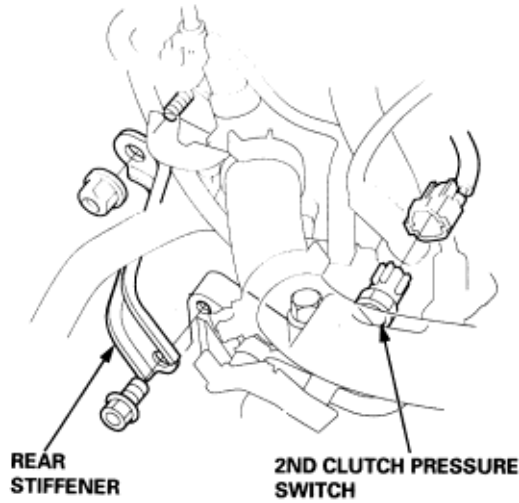
9. Disconnect the lock-up control solenoid valve/shift control solenoid valve A assembly connector.
10. Remove the ATF cooler hoses from the ATF cooler lines. Turn the ends of the ATF cooler hoses and lines up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.
NOTE: Check for any signs of leakage at the hose joints.
11. Disconnect the shift control solenoid valve B connector, and C connector, then remove the harness clamp from the clamp bracket.



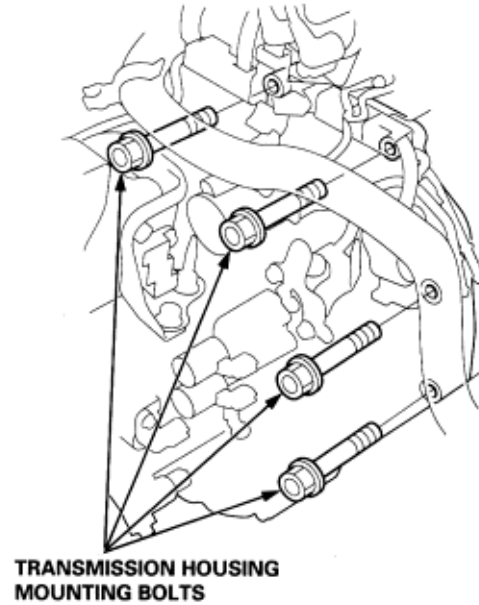
12. Disconnect the countershaft speed sensor connector, and remove the harness clamp from the clamp bracket.
13. Remove the A/T gear position switch connector from the connector bracket, then disconnect it.



14. Disconnect the 2nd clutch pressure switch connector, then remove the rear stiffener.
NOTE: Do not allow water, fluid, oil, dust, or other foreign particles to get inside the connector.



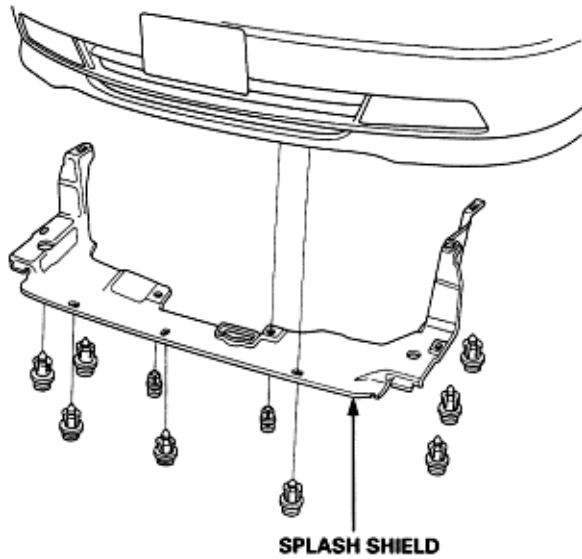
15. Remove the transmission housing bolts.



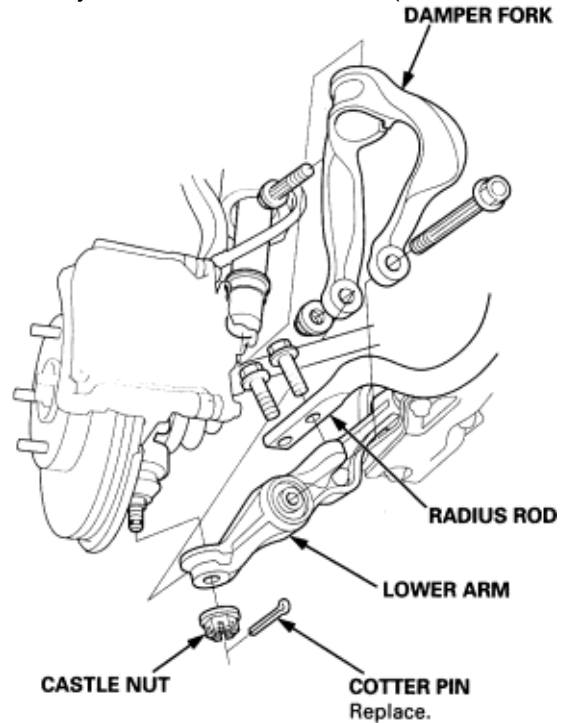
16. Remove the front mount bracket bolts.



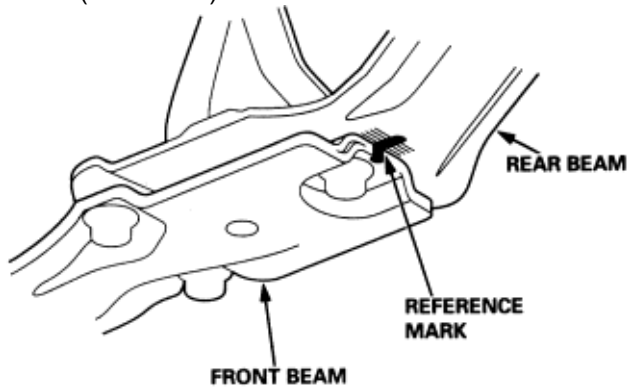
17. Remove the splash shield.



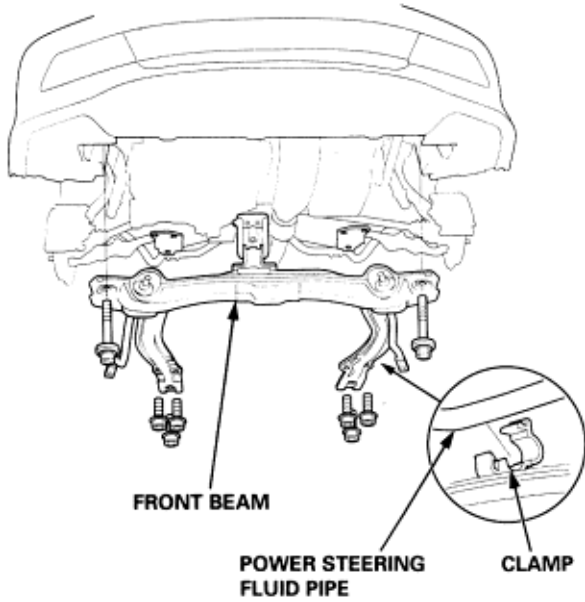
18. Remove the cotter pins and castle nuts, and remove the damper forks, then separate the ball joints from the lower arms (see section 18).



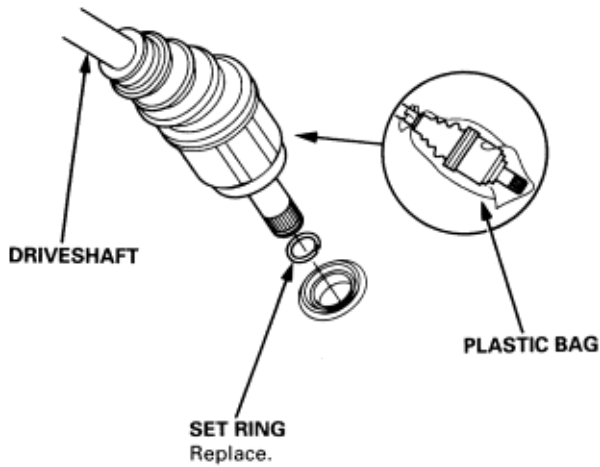
19. Remove the bolts securing the radius rods, then separate the radius rods from the lower arms.
20. Pry the driveshaft out of the differential (see section 16).
21. Make a reference mark across the front beam (both sides) and the rear beam.



22. Unclamp the power steering fluid pipe from the clamp on the front beam, then remove.

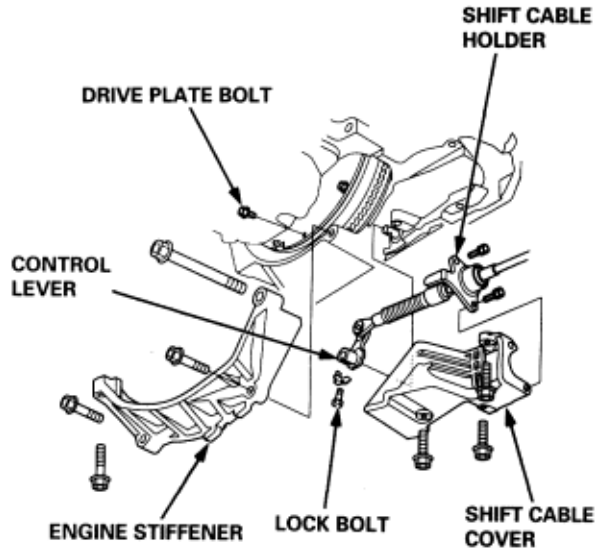


23. Pull on the inboard joints to remove the driveshafts from the differential (see section 16).

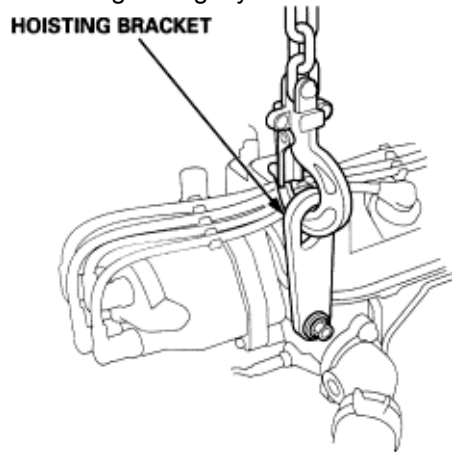


24. Coat all precision finished surfaces with clean engine oil, then tie plastic bags over the driveshaft ends.

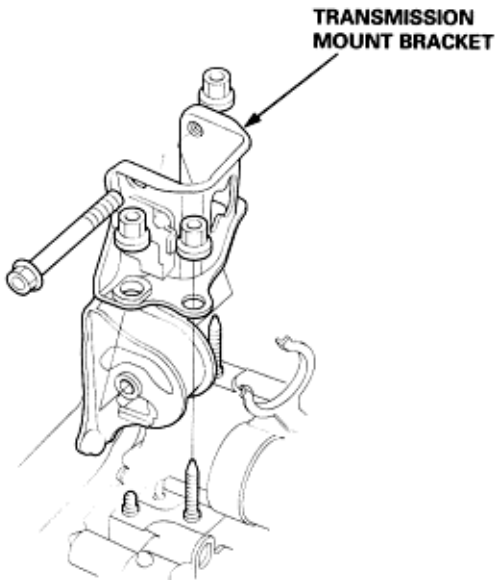
25. Remove the engine stiffener.



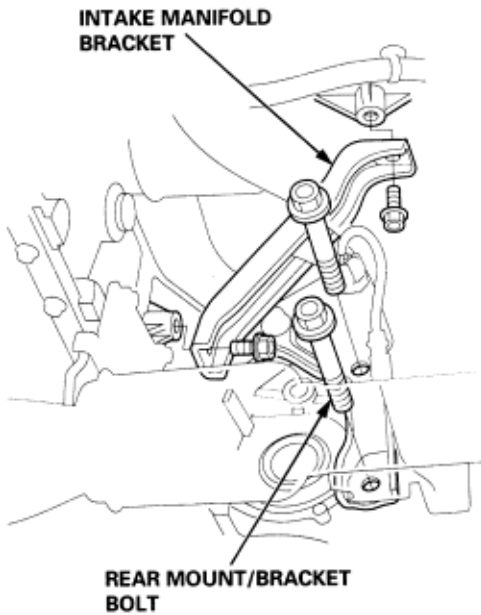
26. Remove the bolts securing the shift cable holder, then remove the shift cable cover.
NOTE: To prevent damage to the control lever joint, remove the bolts securing the shift cable holder before removing the bolts securing the shift cable cover.
27. Remove the lock bolt securing the control lever, then remove the shift cable with the control lever. Do not bend the shift cable excessively.
28. Remove the eight drive plate bolts one at a time while rotating the crankshaft pulley.
29. Attach a hoisting bracket to the engine, then lift the engine slightly.



30. Place a jack under the transmission.
31. Remove the transmission mount bracket.

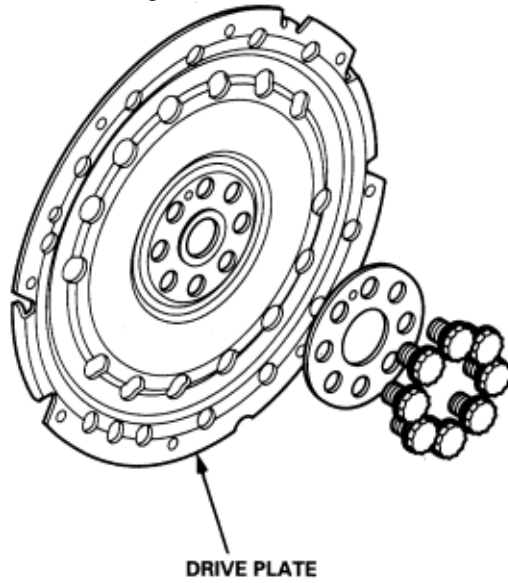


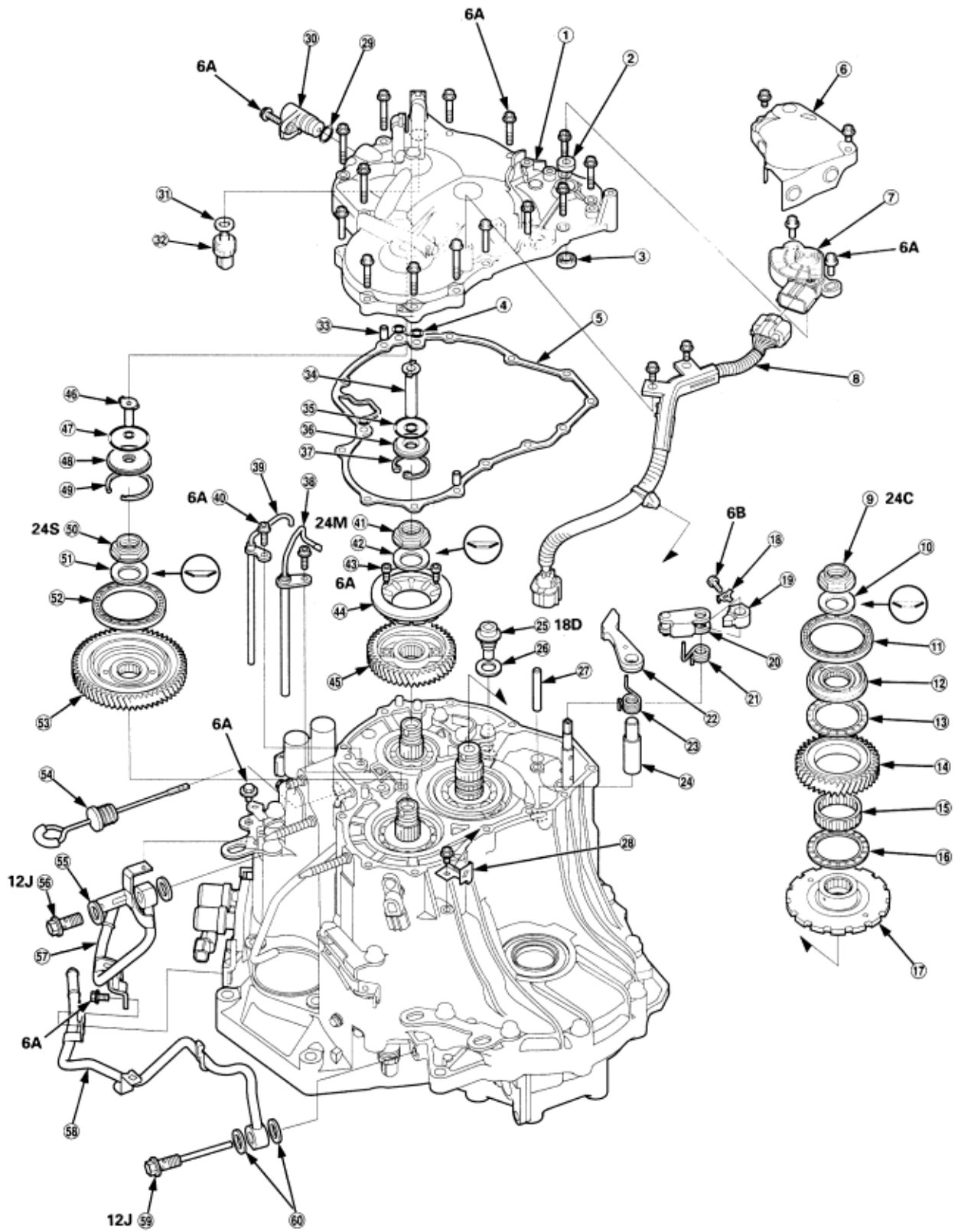
32. Remove the bolts securing the intake manifold bracket.



33. Remove the rear mount/bracket bolts.

34. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the transmission jack.
35. Remove the torque converter assembly.
36. Remove the starter from the torque converter housing.
37. Inspect the drive plate, and replace it if it's damaged.



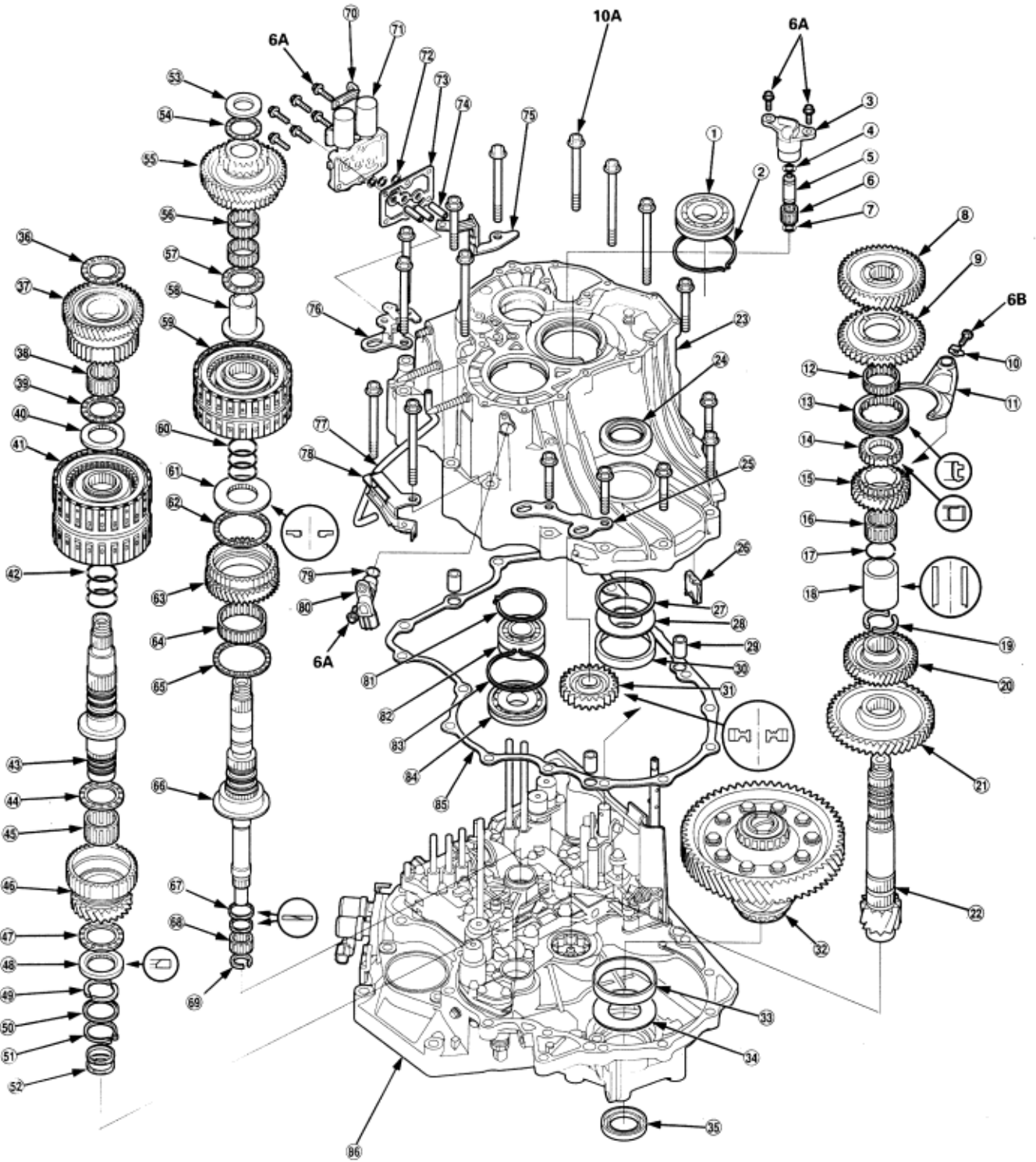


- | | |
|--|---|
| <p>1 Right side cover
 2 Oil seal. Replace
 3 Ball bearing
 4 O-ring. replace
 5 Right side cover gasket. Replace
 6 A/T gear position switch cover
 7 A/T gear position switch
 8 A/T gear position switch harness
 9 Countershaft locknut 24 x 15 mm. (Flange nut) Replace
 10 Conical spring washer. Replace
 11 Ball bearing
 12 Bearing hub. Selective part
 13 Thrust needle bearing
 14 Countershaft idler gear
 15 Needle bearing
 16 Thrust needle bearing
 17 Parking gear

 18 Lock washer. replace
 19 Parking brake stop. Selective part
 20 Parking brake lever
 21 Parking brake lever spring
 22 Parking brake pawl
 23 Parking brake pawl spring
 24 Parking brake pawl shaft
 25 Drain plug
 26 Sealing washer. Replace
 27 Parking brake pawl stop
 28 Harness clamp bracket
 29 O-ring. Replace
 30 Mainshaft speed sensor
 31 Sealing washer. replace
 32 3rd clutch pressure switch
 33 Dowel pin</p> | <p>34 4th clutch feed pipe
 35 O-rings. Replace
 36 Feed pipe guide
 37 Snap ring
 38 Pitot pipe
 39 Lubrication pitot pipe
 40 Hex head bolt 6 x 10 mm
 41 Mainshaft locknut 24 x 1.25 mm. (Flange nut) Replace
 42 Conical spring washer. Replace
 43 Hex head bolt 6 x 1.0 mm
 44 Pitot flange
 45 Mainshaft idler gear
 46 1st clutch feed pipe
 47 O-rings. replace
 48 Feed pipe guide
 49 Snap ring
 50 Secondary shaft locknut 24 x 1.5 mm (Flange nut) Replace
 51 Conical spring washer. Replace
 52 Ball bearing
 53 Secondary shaft idler gear
 54 ATF dipstick
 55 Sealing washer. replace
 56 Line bolt
 57 ATF cooler line (outlet)
 58 ATF cooler line (inlet)
 59 Line bolt
 60 Sealing washer. replace.</p> |
|--|---|

TORQUE SPECIFICATIONS

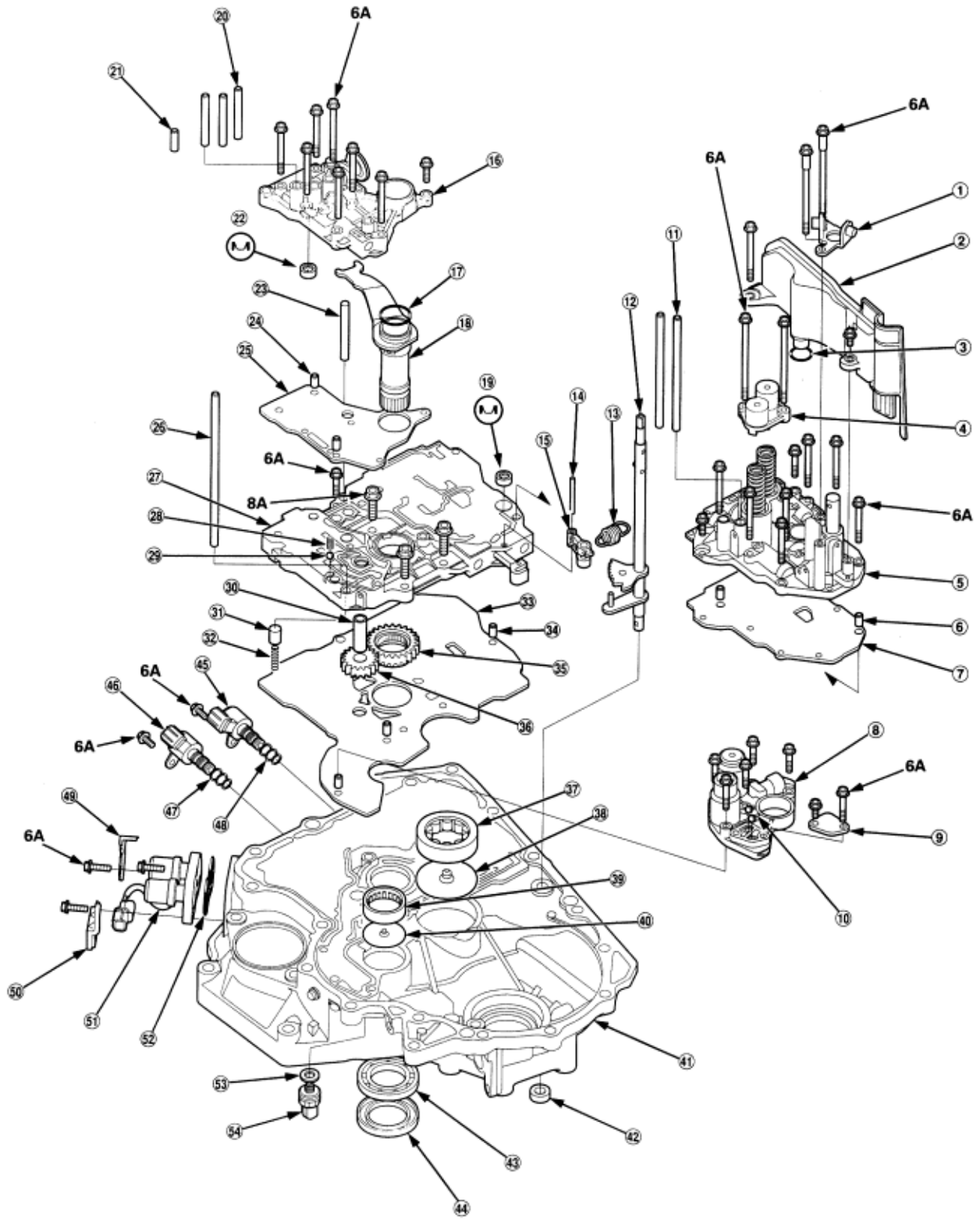
Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 Nm (1.2 kgf/m, 8.7 lbf/ft)	6 x 1.0 mm	
6B	14 Nm (1.4 kgf/m, 10 lbf/ft)	6 x 1.0 mm	
12J	28 Nm (2.9 kgf/m, 21 lbf/ft)	12 x 1.25 mm	Line bolt
18D	49 Nm (5.0 kgf/m, 36 lbf/ft)	18 x 1.5 mm	Drain plug
24M	226 Nm (23.0 kgf/m, 166 lbf/ft) to 0 to 167 Nm (17.0 kgf/m, 123 lbf/ft)	24 x 1.25 mm	Mainshaft locknut Left-hand threads
24C	226 Nm (23.0 kgf/m, 166 lbf/ft) to 0 to 167 Nm (17.0 kgf/m, 123 lbf/ft)	24 x 1.25 mm	Countershaft locknut
24S	226 Nm (23.0 kgf/m, 166 lbf/ft) to 0 to 167 Nm (17.0 kgf/m, 123 lbf/ft)	24 x 1.25 mm	Secondary shaft locknut



- | | |
|---|---|
| 1 Countershaft transmission housing bearing | 46 Secondary shaft 1st gear |
| 2 Snap ring | 47 Thrust needle bearing |
| 3 Reverse idler gear shaft holder | 48 Splined washer, 38 x 56.5 mm. Selective part |
| 4 O-ring. Replace | 49 Cotters, 32 mm |
| 5 Reverse idler gear shaft | 50 Cotter retainer |
| 6 Needle bearing | 51 Snap ring |
| 7 O-ring. Replace | 52 Sealing rings |
| 8 Countershaft 2nd gear | 53 Thrust washer, 27 x 47 x 5 mm |
| 9 Countershaft reverse gear | 54 Thrust needle bearing |
| 10 Lock washer. Replace | 55 Mainshaft 4h gear |
| 11 Reverse shift fork | 56 Needle bearings |
| 12 Needle bearing | 57 Thrust needle bearing |
| 13 Reverse selector | 58 4th gear collar |
| 14 Reverse selector hub | 59 3rd/4th clutch assembly |
| 15 Countershaft 4th gear | 60 O-rings. replace |
| 16 Needle bearing | 61 Thrust shim, 41 x 72 mm. Selective part |
| 17 Snap ring | 62 Thrust needle bearing |
| 18 Distance collar | 63 Mainshaft 3rd gear |
| 19 Cotters, 31 mm | 64 Needle bearing |
| 20 Countershaft 3rd gear | 65 Thrust needle bearing |
| 21 Countershaft 1st gear | 66 Mainshaft |
| 22 Countershaft | 67 Sealing rings |
| 23 Transmission housing | 68 Needle bearing |
| 24 Oil seal. Replace | 69 Set ring |
| 25 Transmission hanger | 70 Harness clamp bracket |
| 26 Transmission magnet | 71 A/T clutch pressure control solenoid valve A/B assembly |
| 27 Thrust shim, 76 mm. Selective part | 72 O-rings. Replace |
| 28 Thrust washer, 76.2 mm | 73 A/T clutch pressure control solenoid valve gasket. Replace |
| 29 Dowel pin | 74 ATF feed pipes |
| 30 Tapered roller bearing outer race | 75 Transmission ground terminal bracket/connection bracket |
| 31 Reverse idler gear | 76 Transmission hanger |
| 32 Differential assembly | 77 Breather tube |
| 33 Tapered roller bearing outer race | 78 Transmission hanger/connector bracket |
| 34 Thrust washer | 79 O-ring. Replace |
| 35 Oil seal. Replace | 80 Countershaft speed sensor |
| 36 Thrust needle bearing | 81 Snap ring |
| 37 Secondary shaft 2nd gear | 82 Mainshaft transmission housing bearing |
| 38 Needle bearing | 83 Snap ring |
| 39 Thrust needle bearing | 84 Secondary shaft transmission housing bearing |
| 40 Thrust shim, 37 x 55 mm. Selective part | 85 Transmission housing gasket. replace |
| 41 1st/2nd clutch assembly | 86 Torque converter housing |
| 42 O-rings. Replace | |
| 43 Secondary shaft | |
| 44 Thrust needle bearing | |
| 45 Needle bearing | |

TORQUE SPECIFICATIONS

Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 Nm (1.2 kgf/m, 8.7 lbf/ft)	6 x 1.0 mm	
6B	14 Nm (1.4 kgf/m, 10 lbf/ft)	6 x 1.0 mm	
10A	4 Nm (4.5 kgf/m, 33 lbf/ft)	10 x 1.25 mm	



- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Detent base 2 ATF strainer 3 O-ring. replace 4 Accumulator cover 5 Servo body 6 Dowel pin 7 Servo separator plate 8 Accumulator body 9 Accumulator body cover 10 Check balls 11 ATF feed pipes 12 Control shaft 13 Detent arm spring 14 Detent arm shaft 15 Detent arm 16 Regulator valve body 17 O-ring. Replace 18 Stator shaft 19 Filter. Replace
 20 ATF feed pipe, 8 x 71 mm
 21 ATF feed pipe, 8 x 27 mm 22 Filter. Replace 23 Stator shaft stop 24 Dowel pin 25 Regulator separator plate 26 ATF feed pipe 27 Main valve body 28 Cooler check valve spring 29 Cooler check valve (steel ball) 30 ATF pump driven gear shaft 31 Torque converter check valve 32 Torque converter check valve spring | <ul style="list-style-type: none"> 33 Main separator plate 34 Dowel pin 35 ATF pump drive gear 36 ATF pump driven gear 37 Countershaft torque converter housing bearing 38 ATF guide plate 39 Secondary shaft torque converter housing bearing 40 ATF guide plate 41 Torque converter housing 42 Oil seal. Replace 43 Mainshaft torque converter housing bearing 44 Mainshaft oil seal. Replace 45 Shift control solenoid valve C 46 Shift control solenoid valve B 47 O-rings. Replace 48 O-rings. Replace 49 Harness clamp bracket 50 Connector bracket 51 Lock-up control solenoid valve/shift control solenoid valve A assembly 52 Lock-up control solenoid valve/shift control solenoid valve A filter/gasket 53 Sealing washer. replace 54 2nd clutch pressure switch |
|--|---|

TORQUE SPECIFICATIONS

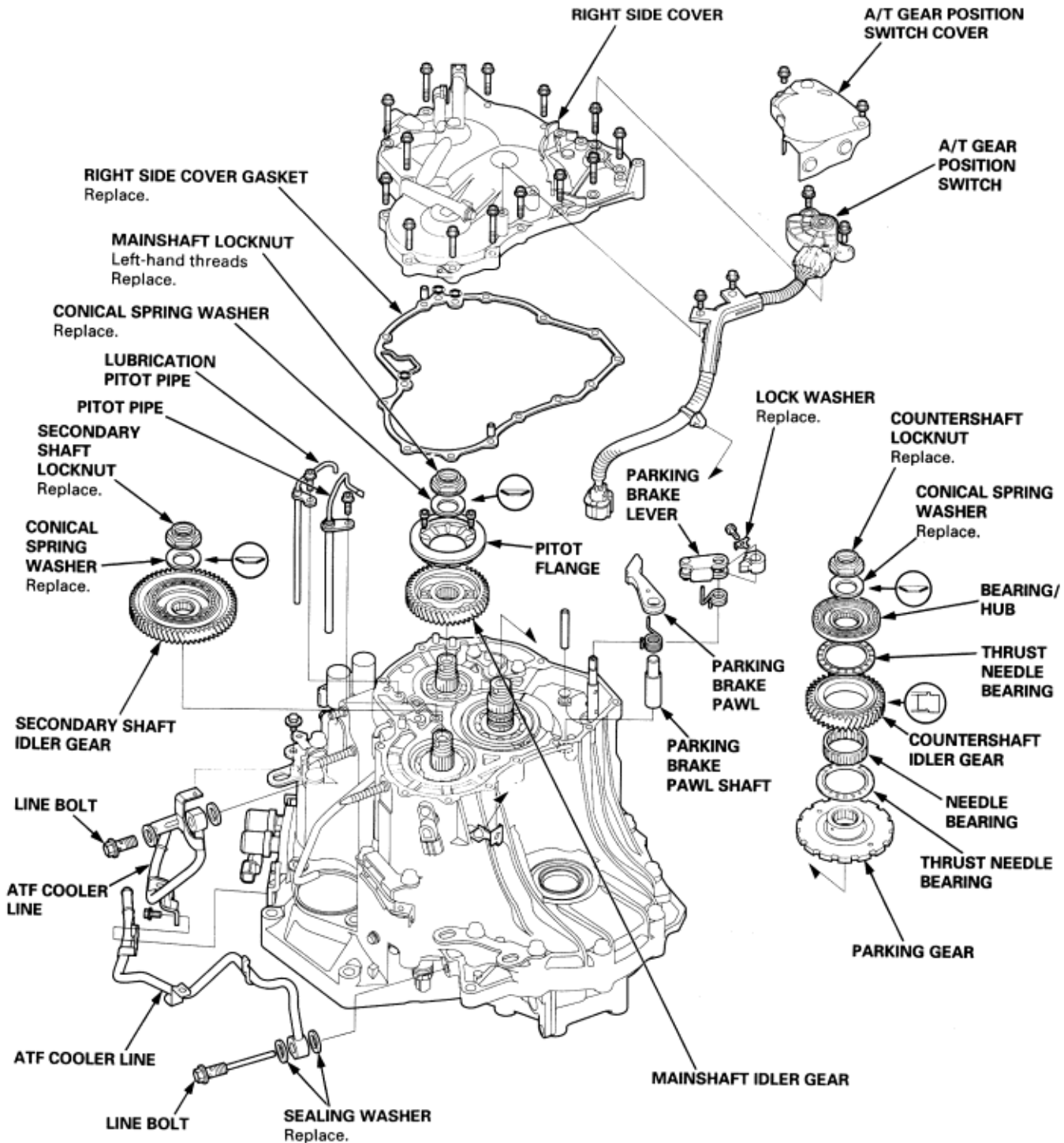
Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 Nm (1.2 kgf/m, 8.7 lbf/ft)	6 x 1.0 mm	
8A	18 Nm (1.8 kgf/m, 13 lbf/ft)	8 x 1.25 mm	

Right Side Cover Removal

14-148

NOTE:

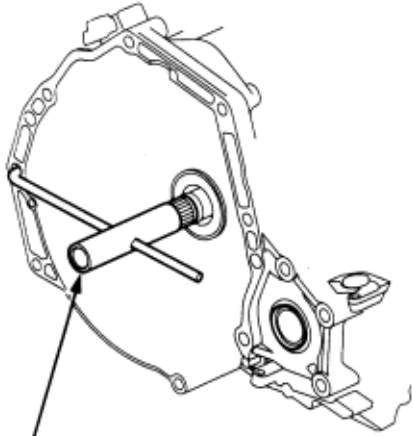
- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry with compressed air.
- ♦ Blow out all passages.
- ♦ When removing the transmission right side cover, replace the following:
 - Right side cover gasket
 - Each shaft locknut and conical spring washer
 - Sealing washer
 - Lock washer
 - O-rings



Right Side Cover Removal (cont'd)

14-149

1. Remove the A/T gear position switch cover.
2. Remove the bolts securing the harness clamp (two bolts), then remove the A/T gear position switch.
3. Remove the bolts securing the right side cover (fourteen bolts). then remove the right side cover.
4. Remove the lubrication pitot pipe and the pitot pipe, then remove the pitot flange from the mainshaft 1st gear.
5. Slip the special tool onto the mainshaft as shown.

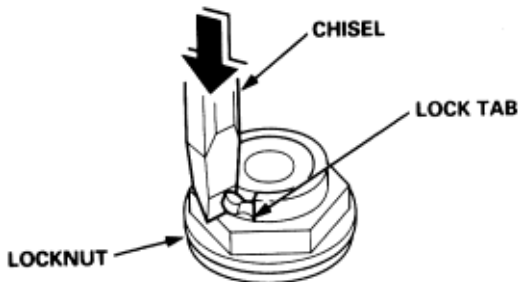


**MAINSHAFT HOLDER SET
07PAB - 0010000**

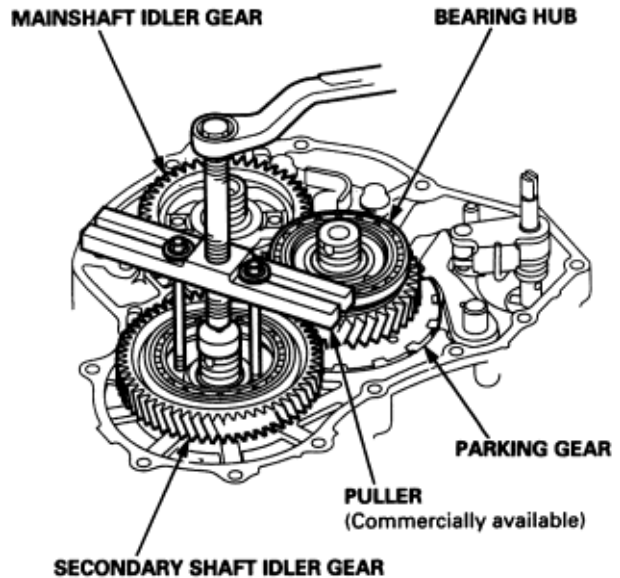
6. Engage the parking brake pawl with the parking gear.
7. Cut the lock tabs of each shaft locknut using a chisel as shown. Then remove the locknuts and conical spring washers from each shaft. Keep all of the chiseled particles out of the transmission.

NOTE:

Mainshaft locknut has left-hand threads.
Clean the old locknuts; they are used to install the press fit idler gears on the mainshaft and secondary shaft, and the parking gear and bearing hub on the countershaft.



8. Remove the special tool (mainshaft holder) from the mainshaft.
9. Remove the mainshaft idler gear and the secondary shaft idler gear using a puller as shown.
10. Remove the bearing hub using the puller from the countershaft, then remove the countershaft idler gear and bearings.
11. Remove the parking gear using the puller.



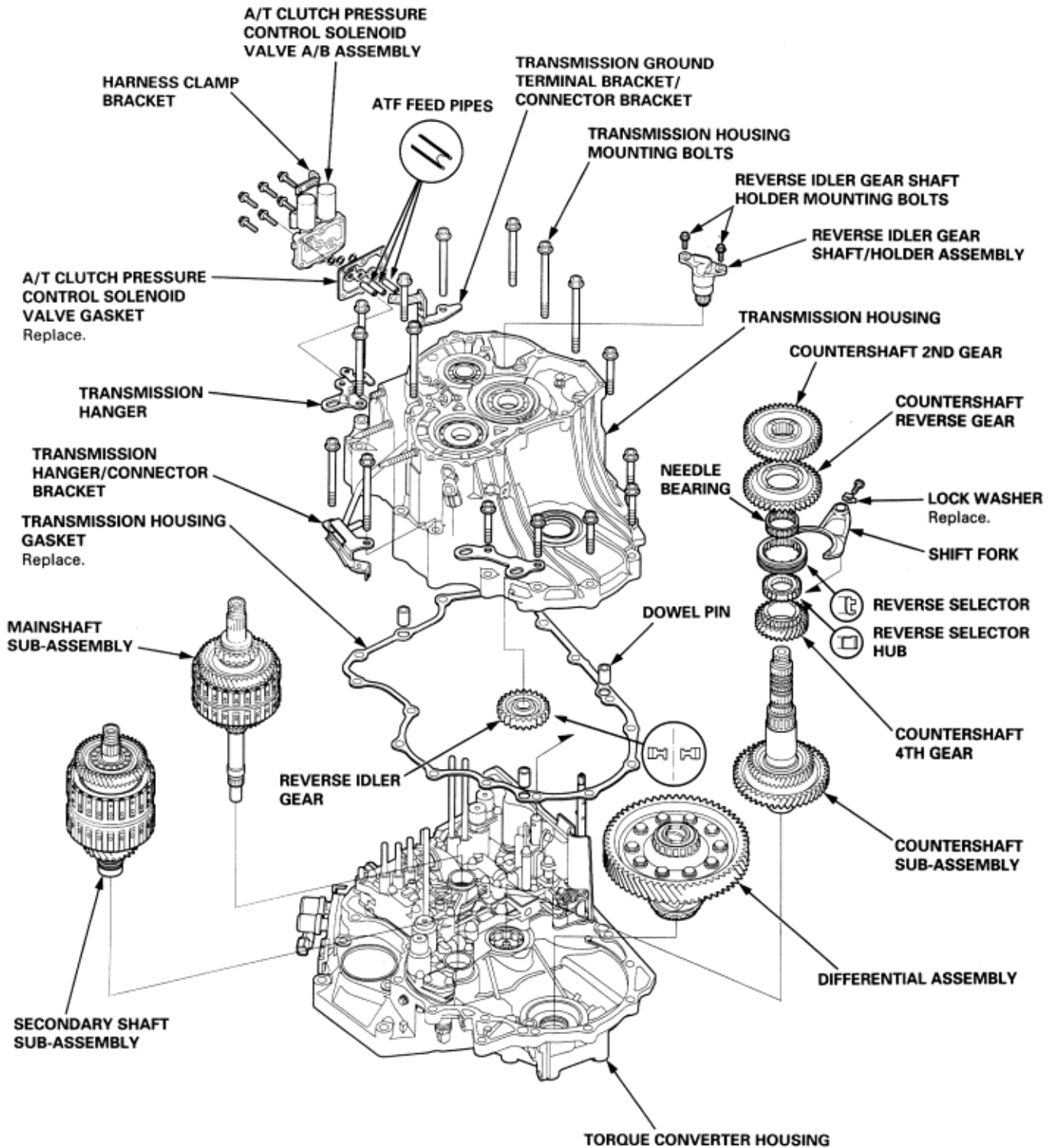
12. Remove the parking brake pawl, spring, shaft, and shaft stop.
13. Remove the parking brake lever from the control shaft.
14. Remove the line bolts, then remove the ATF cooler lines.

Transmission Housing Removal

14-150

NOTE:

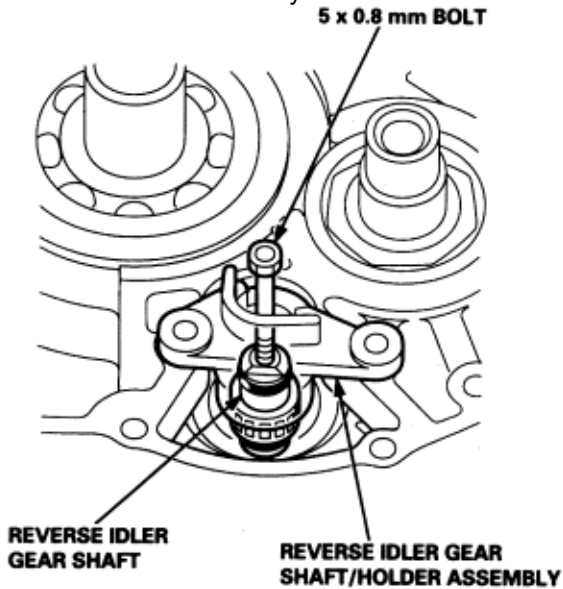
- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry with compressed air.
- ♦ Blow out all passages.
- ♦ When removing the transmission right side cover, replace the following:
 - Transmission housing gasket
 - Linear solenoid valve gasket
 - Lock washer
 - O-rings



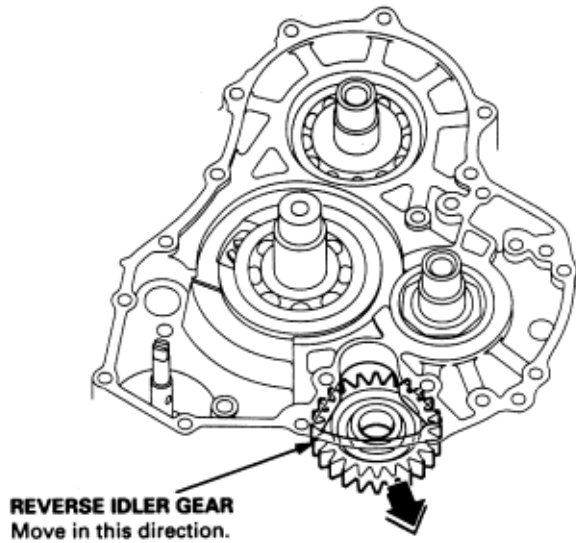
Transmission Housing Removal (cont'd)

14-151

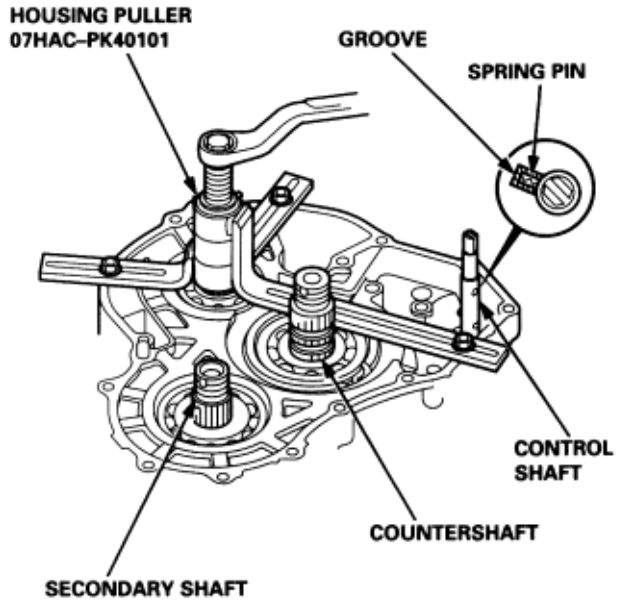
1. Remove the A/T clutch pressure control solenoid valve A/B assembly.
2. Remove the transmission housing mounting bolts (16 bolts), and hangers and brackets.
3. Remove the two bolts securing the reverse idler gear shaft holder.
4. Install a 5 x 0.8 mm bolt in the reverse idler gear shaft as shown, then remove the reverse idler gear shaft/holder assembly.



5. Move the reverse idler gear out of way of the countershaft 2nd gear in the direction shown when removing the transmission housing from the torque converter housing.
NOTE: The transmission housing will not separate from the torque converter housing if the reverse idler gear is moved.



6. Align the spring pin on the control shaft with the transmission housing groove by turning the control shaft.
7. Install the special tool over the mainshaft, then remove the transmission housing as shown.



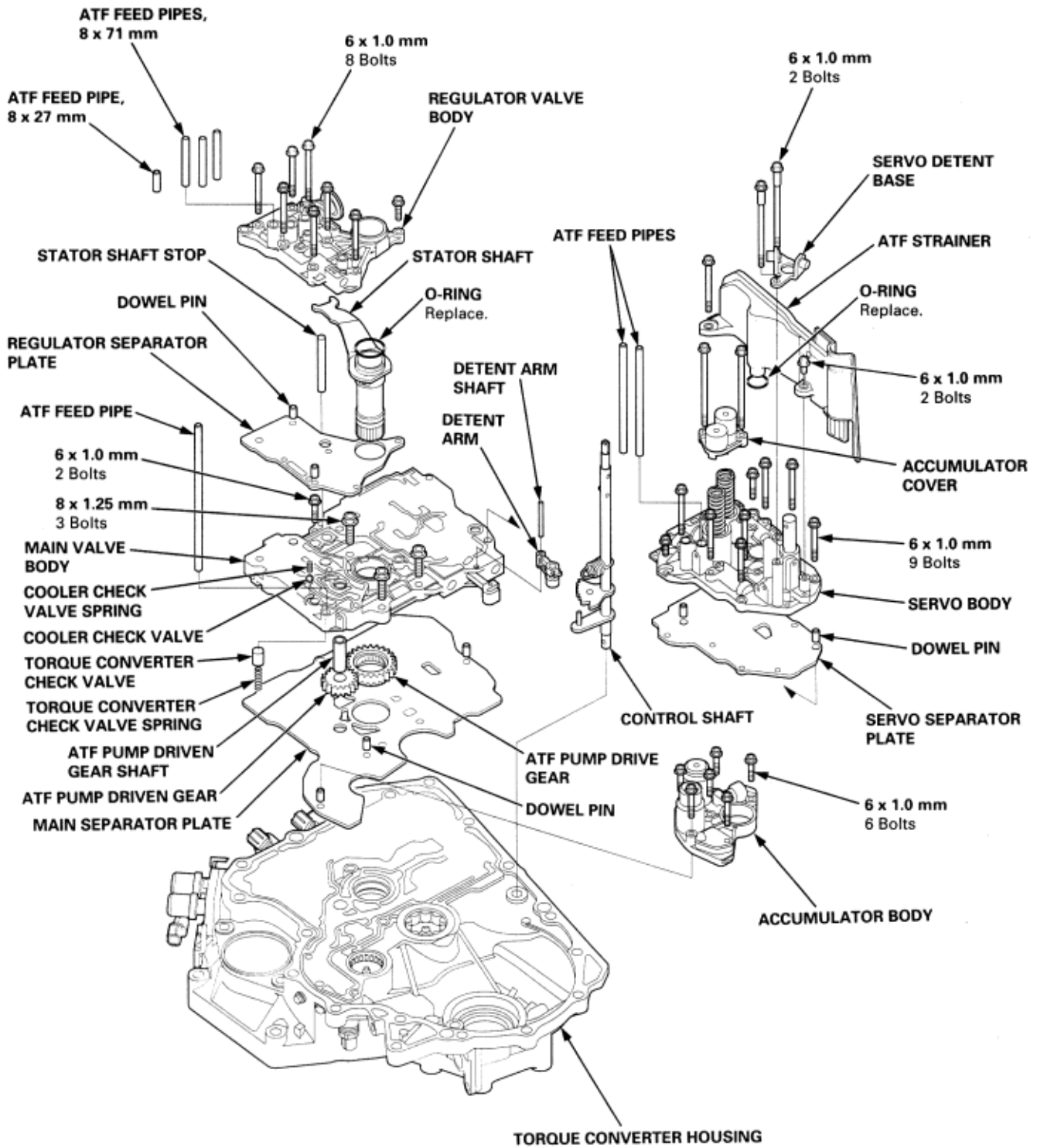
8. Remove the reverse idler gear from the transmission housing.
9. Remove the countershaft 2nd gear, then slide and remove the countershaft reverse gear and the needle bearing.
10. Remove the bolt securing the shift fork, then remove the shift fork, reverse selector, reverse selector hub and countershaft 4th gear.
11. Remove the secondary shaft sub-assembly.
12. Remove the mainshaft sub-assembly.
13. Remove the countershaft sub-assembly.
14. Remove the differential assembly.

Torque Converter Housing/Valve Body Removal

14-152

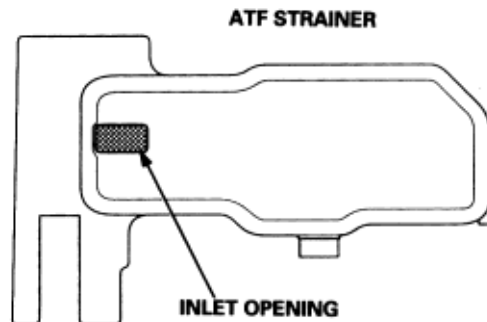
NOTE:

- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry with compressed air.
- ♦ Blow out all passages.
- ♦ When removing the valve body, replace the O-rings.



1. Remove the ATF feed pipes from the main valve body, regulator valve body and servo body.
2. Remove the servo detent base (two bolts).
3. Remove the ATF strainer (two bolts).
4. Remove the accumulator cover (two bolts).
NOTE: The accumulator cover is spring loaded. To prevent stripping the threads in the servo body, press down on the accumulator cover while unscrewing the bolts in a crisscross pattern.
5. Remove the bolts securing the servo body (nine bolts), then remove the servo body, and separator plate.
6. Remove the accumulator body (six bolts).
7. Remove the regulator valve body (eight bolts).
8. Remove the stator shaft and stator shaft stop.
9. Unhook the detent spring from the detent arm, then remove the detent arm shaft, detent arm and control shaft.
10. Remove the cooler check valve spring and cooler check valve (steel ball).
11. Remove the main valve body (four bolts).
12. Remove the torque converter check valve and spring.
13. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
14. Remove the main separator plate and dowel pins (three).

15. Clean the inlet opening of the ATF strainer thoroughly with compressed air, then check that it is in good condition, and the inlet opening is not clogged.



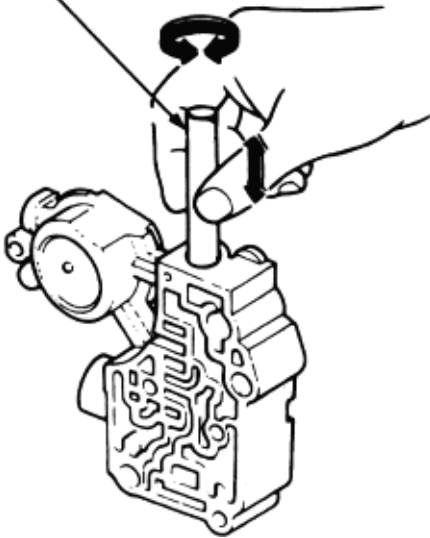
16. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace if it is clogged or damaged.
NOTE: The ATF strainer can be reused if it is not clogged.

NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

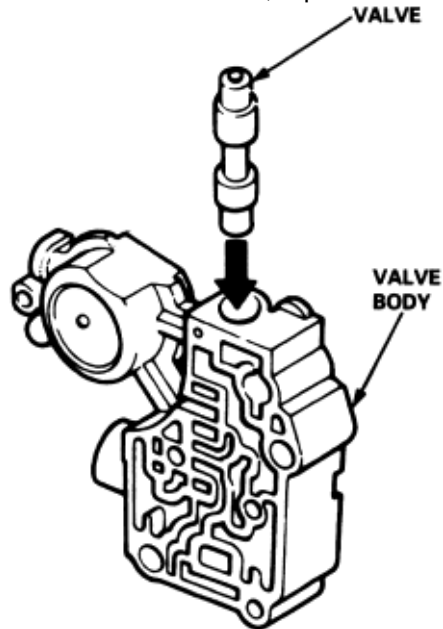
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked #600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

NOTE: The valve body is aluminium and doesn't require much polishing to remove any burrs.

ATF-soaked
#600 abrasive
paper



5. Remove the #600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4, then retest. If the valve still sticks, replace the valve body.

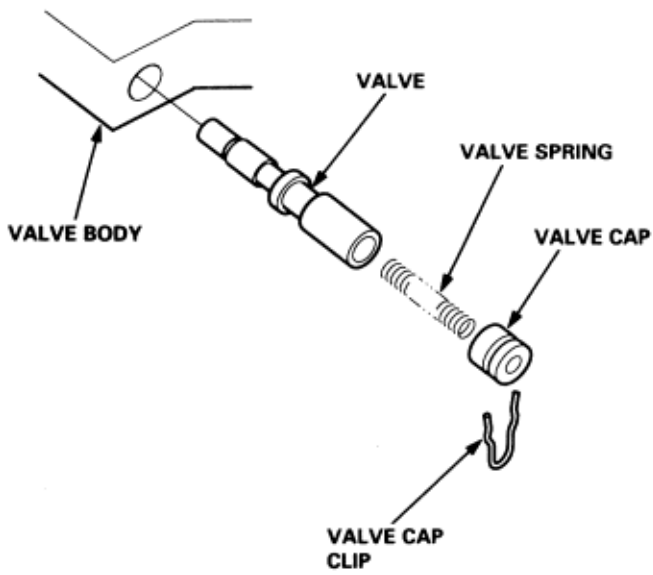
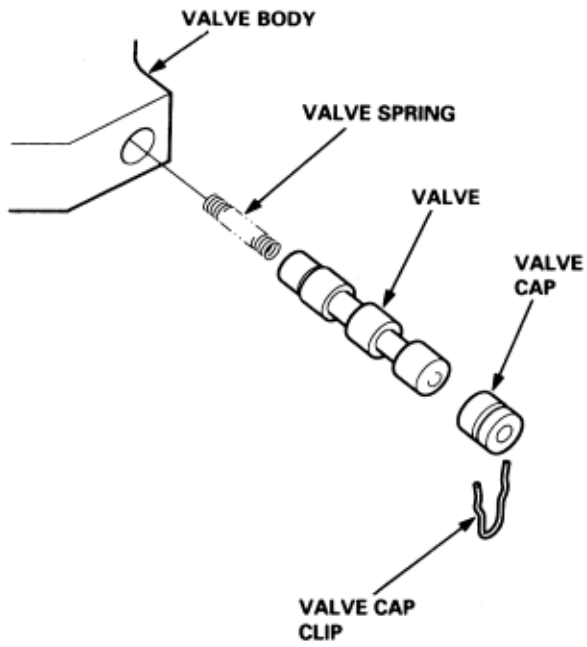


7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

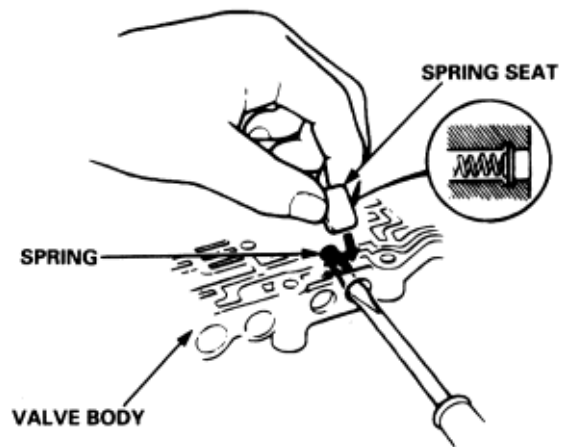
**Valve
Assembly**

NOTE: Coat all parts with ATF before assembly.

- ♦ Install the valve, valve spring and valve cap in the valve body, then secure with the valve cap clip.



- ♦ Set the spring in the valve, then install them in the valve body. Push the spring in with a screwdriver then install the spring seat.



Valve Caps

Description

14-156

- ♦ Caps with one projected tip and one flat end are installed with the flat end toward the inside of the valve body.
- ♦ Caps with a projected tip on each end are installed with the smaller tip toward the inside of the valve body. The small tip is a spring guide.

TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

- ♦ Caps with one projected tip and a hollow end are installed with the tip toward the inside of the valve body. The tip is a spring guide.
- ♦ Caps with one projected tip and flat end are installed with the tip toward the inside of the valve body. The tip is a spring guide. The groove is a valve cap clip guide.

TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

- ♦ Caps with hollow ends are installed with the hollow end away from the inside of the valve body.
- ♦ Caps with notched ends are installed with the notch toward the inside of the valve body.
- ♦ Caps with flat ends and a hole through the center are installed with the smaller hole toward the inside of the valve body.

TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

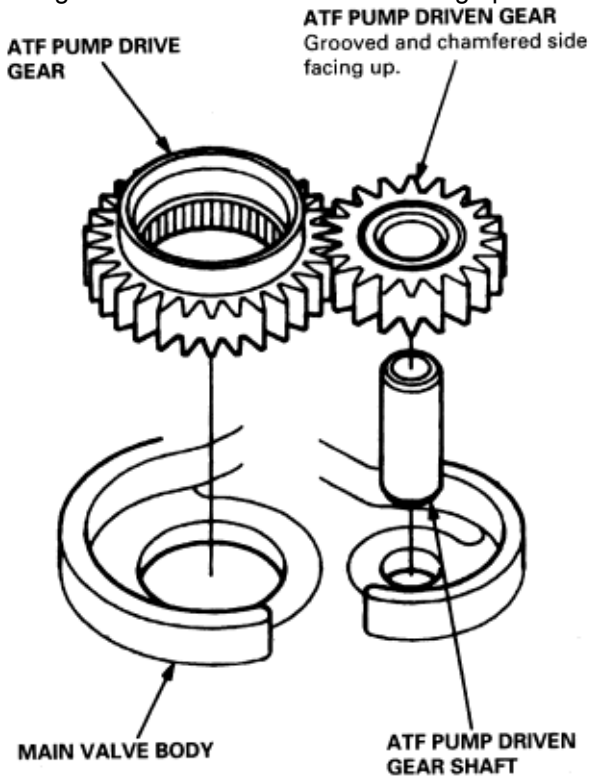
- ♦ Caps with flat ends and a groove around the cap are installed with the grooved side toward the outside of the valve body.

TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

1. Install the ATF pump gears and ATF pump driven gear shaft in the main valve body. Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



2. Measure the side clearance of the ATF pump drive and driven gears.

ATF Pump Gears Side (Radial) Clearance:

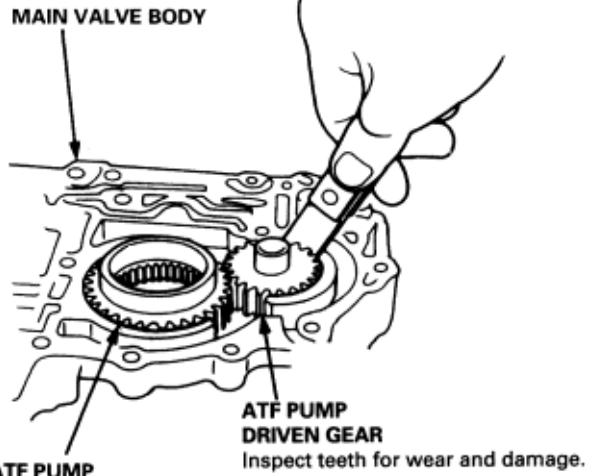
Standard (New):

ATF Pump Drive Gear

0.105-0.1325 mm (0.004-0.005 in)

ATF Pump Driven Gear

0.035-0.0625 mm (0.0014-0.0025 in)



**ATF PUMP
DRIVE GEAR**

Inspect teeth for wear and damage.

3. Remove the ATF pump driven gear shaft. Measure the thrust clearance of the ATF pump driven gear to-valve body.

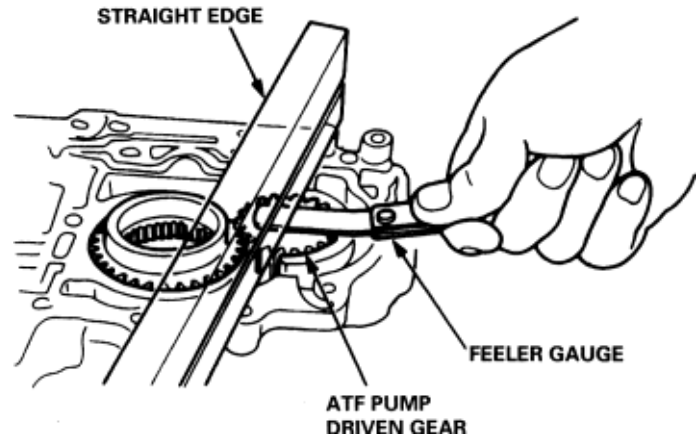
ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:

Standard (New):

0.03-0.05 mm (0.001-0.002 in)

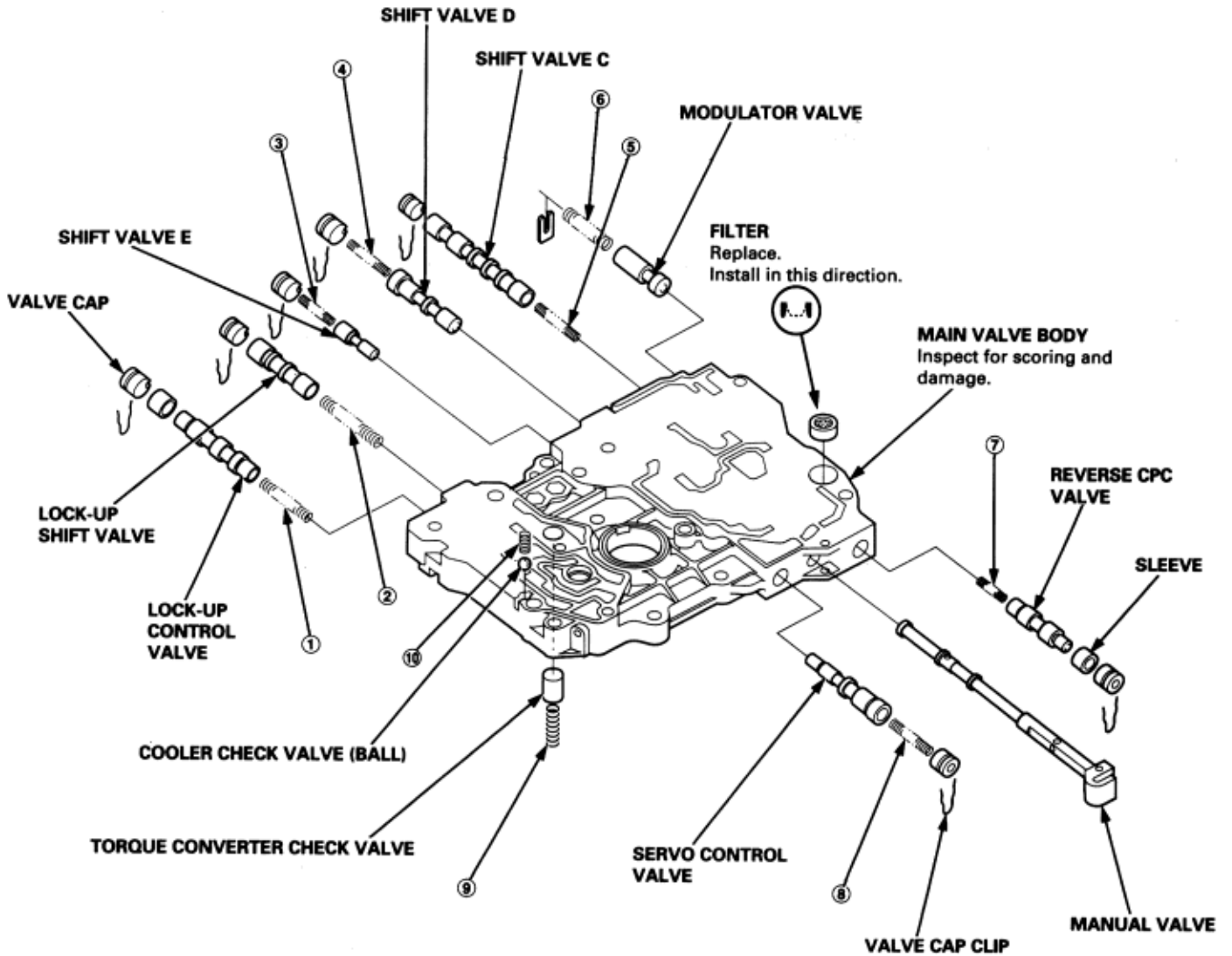
Service Limit:

0.07 mm (0.003 in)

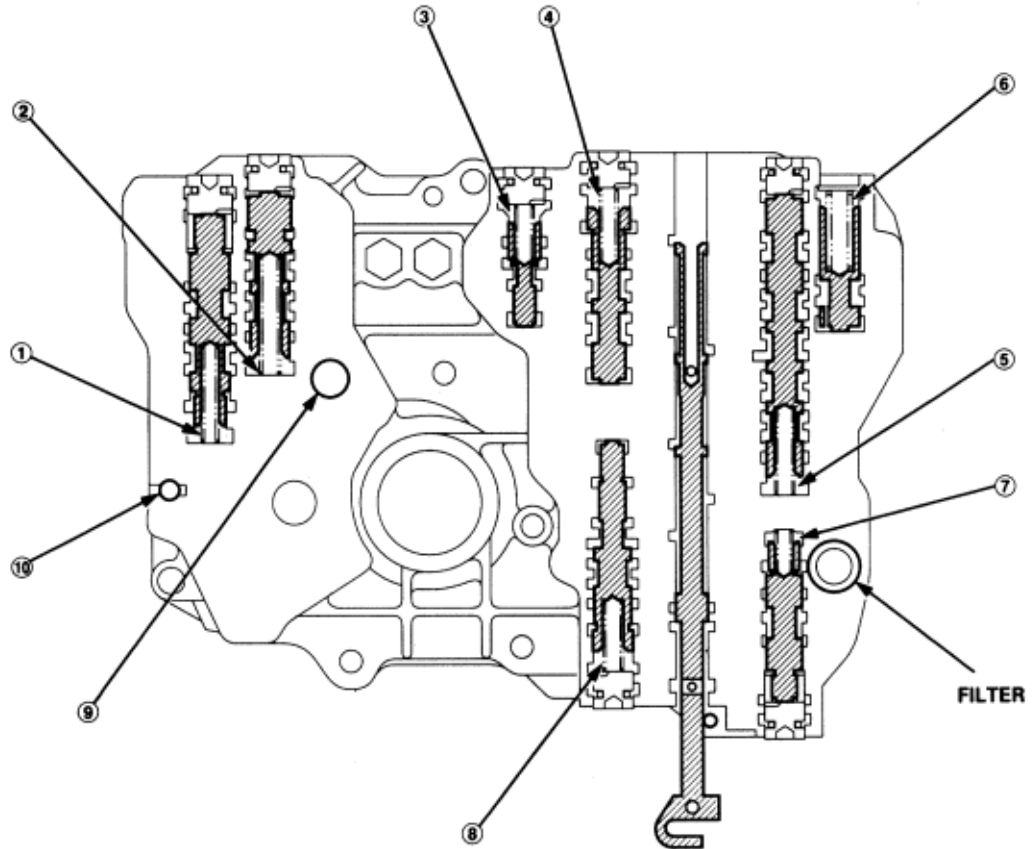


NOTE:

- ♦ Do not use a magnet to remove the check valve ball; it may magnetise the ball.
- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry them with compressed air. Blow out all passages.
- ♦ Check all valves for free movement. If any fail to slide freely, for Valve Body repair (**see page 14-154**).
- ♦ Replace the valve body as an assembly if any parts are worn or damaged.
- ♦ Coat all parts with ATF during assembly.
- ♦ Install the filter in the direction shown.



Sectional View



SPRING SPECIFICATIONS

Unit: mm (in)

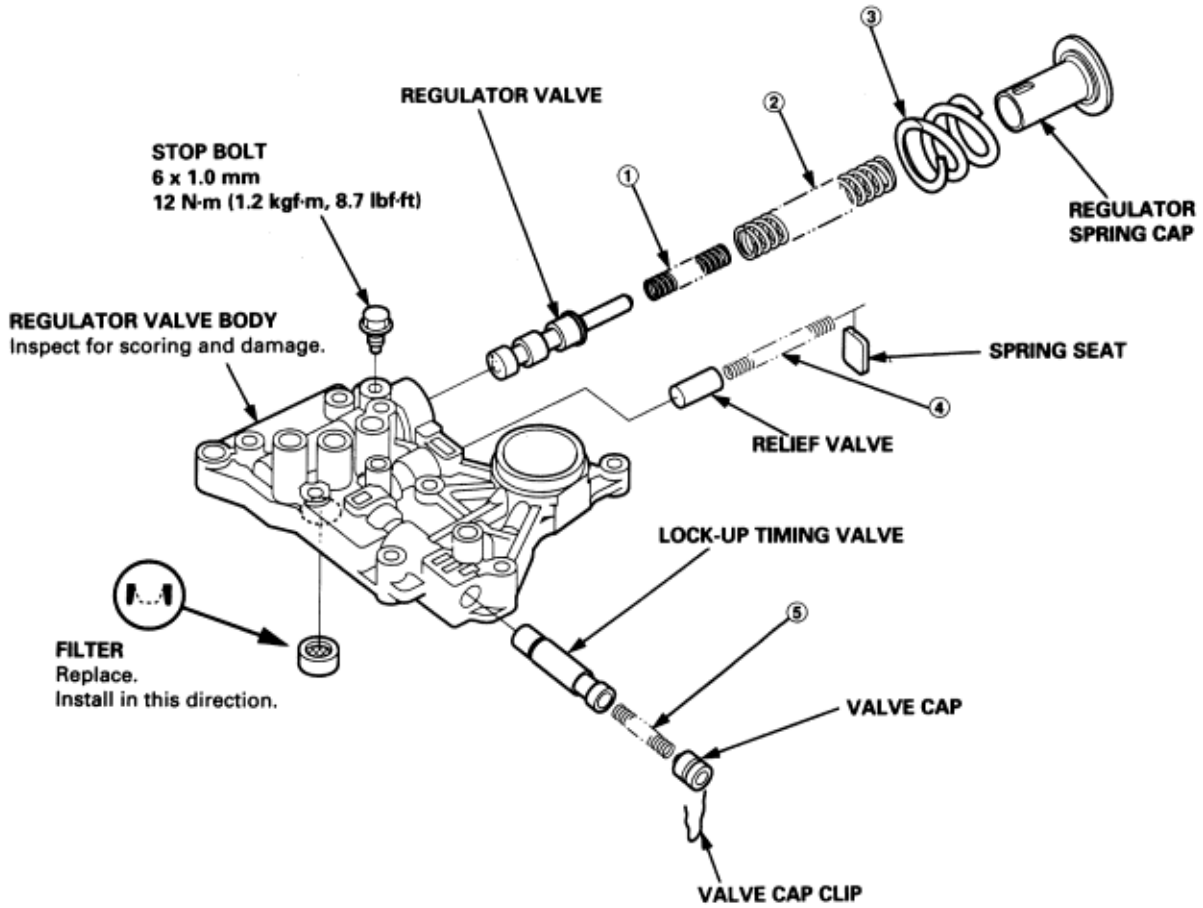
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
1	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
2	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
3	Shift valve E spring	0.7 (0.028)	6.6 (0.260)	32.2 (1.268)	13.4
4	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
5	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
6	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
7	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
8	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
9	Torque converter check valve spring	1.1 (0.043)	8.4 (0.31)	38.2 (1.504)	14.0
10	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8

NOTE:

- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry them with compressed air. Blow out all passages.
 - ♦ Check all valves for free movement. If any fail to slide freely, for Valve Body repair (see page 14-154).
 - ♦ Replace the valve body as an assembly if any parts are worn or damaged.
1. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
 2. Reassembly is the reverse of the disassembly procedure. Install the filter in the direction shown.

NOTE:

- ♦ Coat all parts with ATF during assembly.
- ♦ Install the filter in the direction shown.



SPRING SPECIFICATIONS

Unit: mm (in)

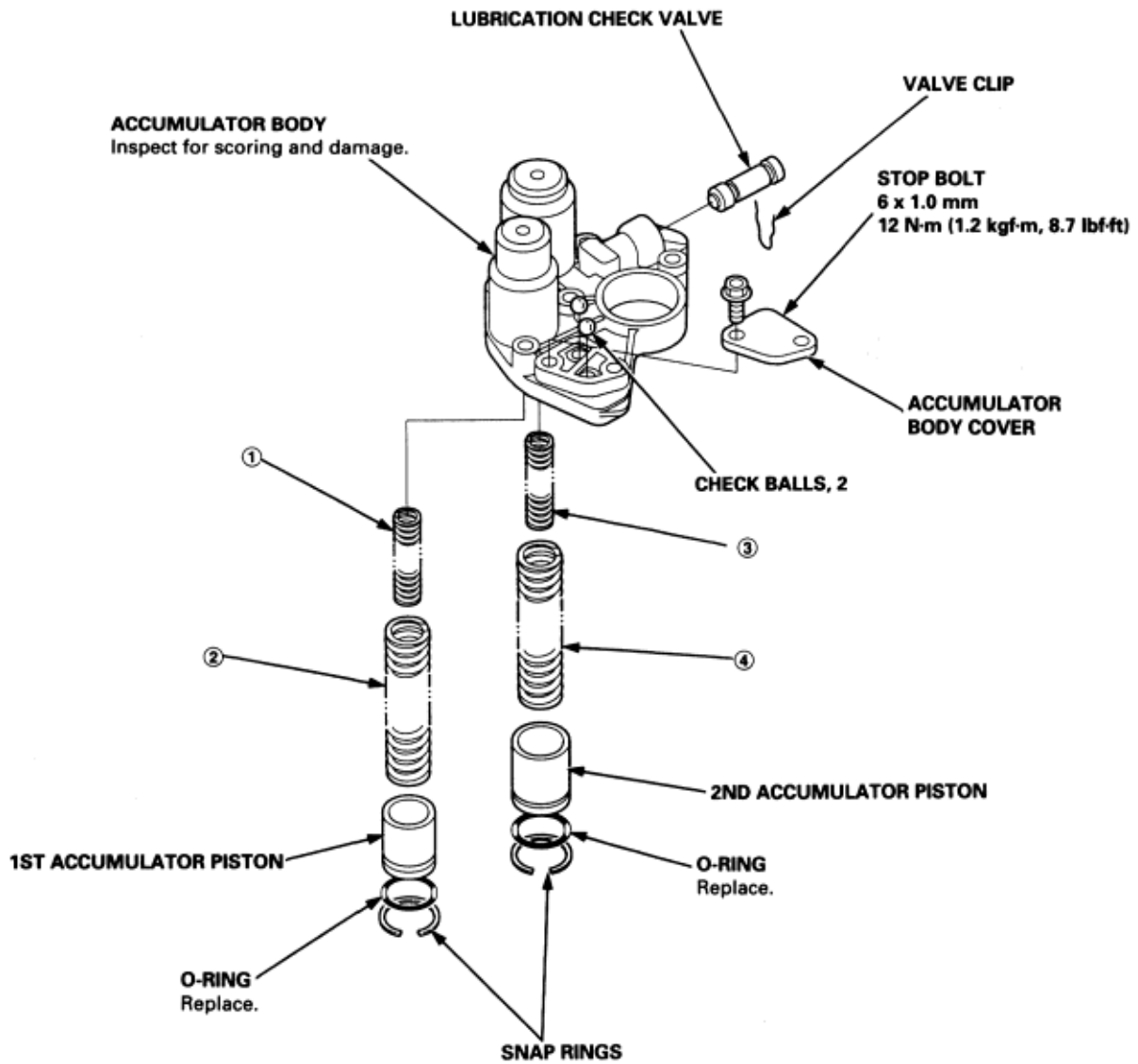
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
1	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
2	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
3	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
4	Relief valve spring	0.9 (0.035)	6.6 (0.260)	39.8 (1.567)	20.4
5	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6

Accumulator Body
Disassembly/Inspection/Reassembly

14-161

NOTE:

- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry them with compressed air. Blow out all passages.
- ♦ Coat all parts with ATF during assembly.



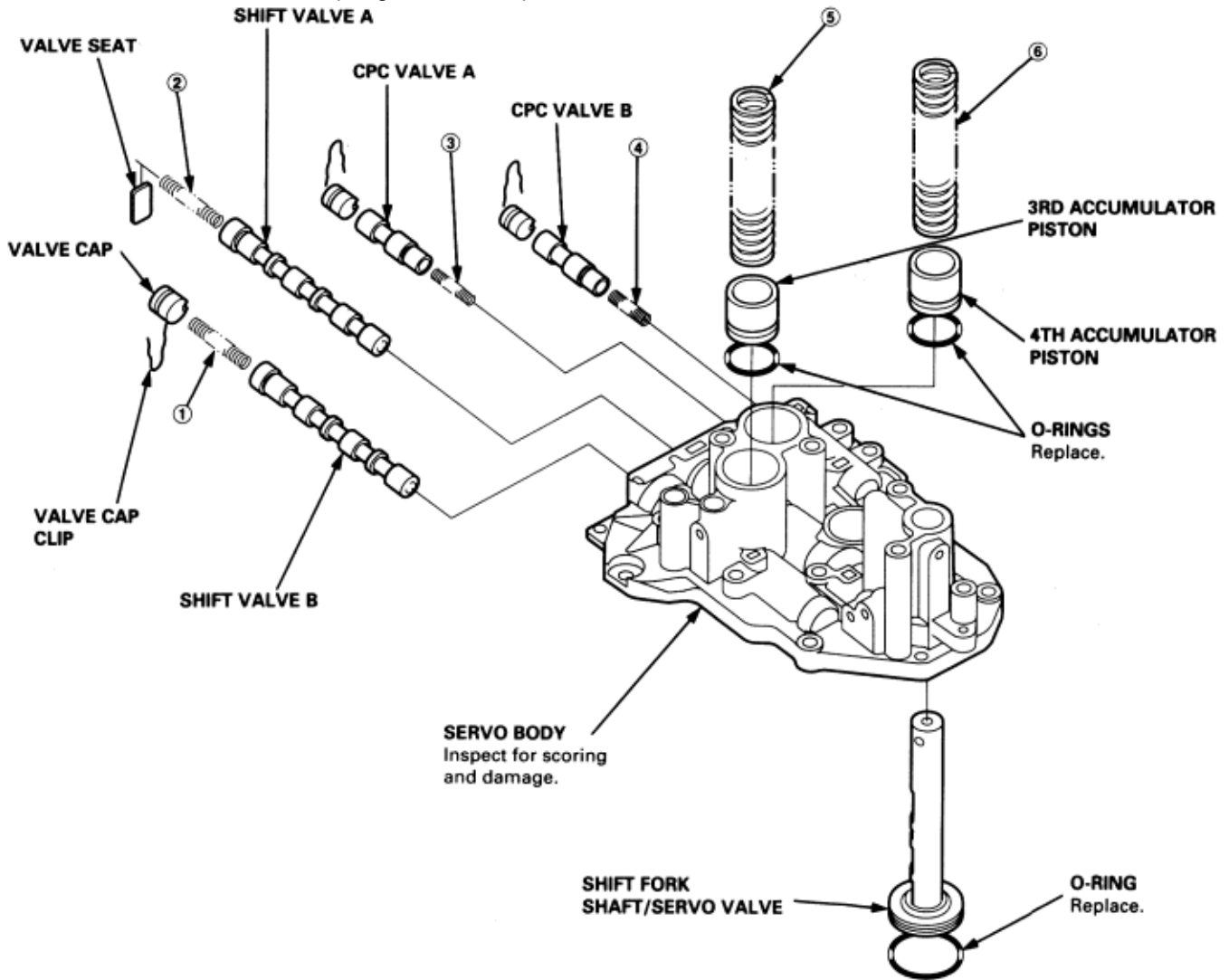
SPRING SPECIFICATIONS

Unit: mm (in)

No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
1	1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5
2	1st accumulator spring A	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
3	2nd accumulator spring B	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6
4	2nd accumulator spring A	2.6 (0.102)	21.6 (0.850)	73.2 (2.882)	10.0

NOTE:

- ♦ Clean all parts thoroughly in solvent or carburettor cleaner, and dry them with compressed air. Blow out all passages.
- ♦ Check all valves for free movement. If any fail to slide freely, for Valve Body repair (see page 14-154).
- ♦ Replace the valve body as an assembly if any parts are worn or damaged.
- ♦ Coat all parts with ATF during assembly.
- ♦ Replace the CPC valve springs A and B, and the A/T clutch pressure control solenoid valve A/B assembly as a set, if replacement of either CPC valve spring A or B is required.



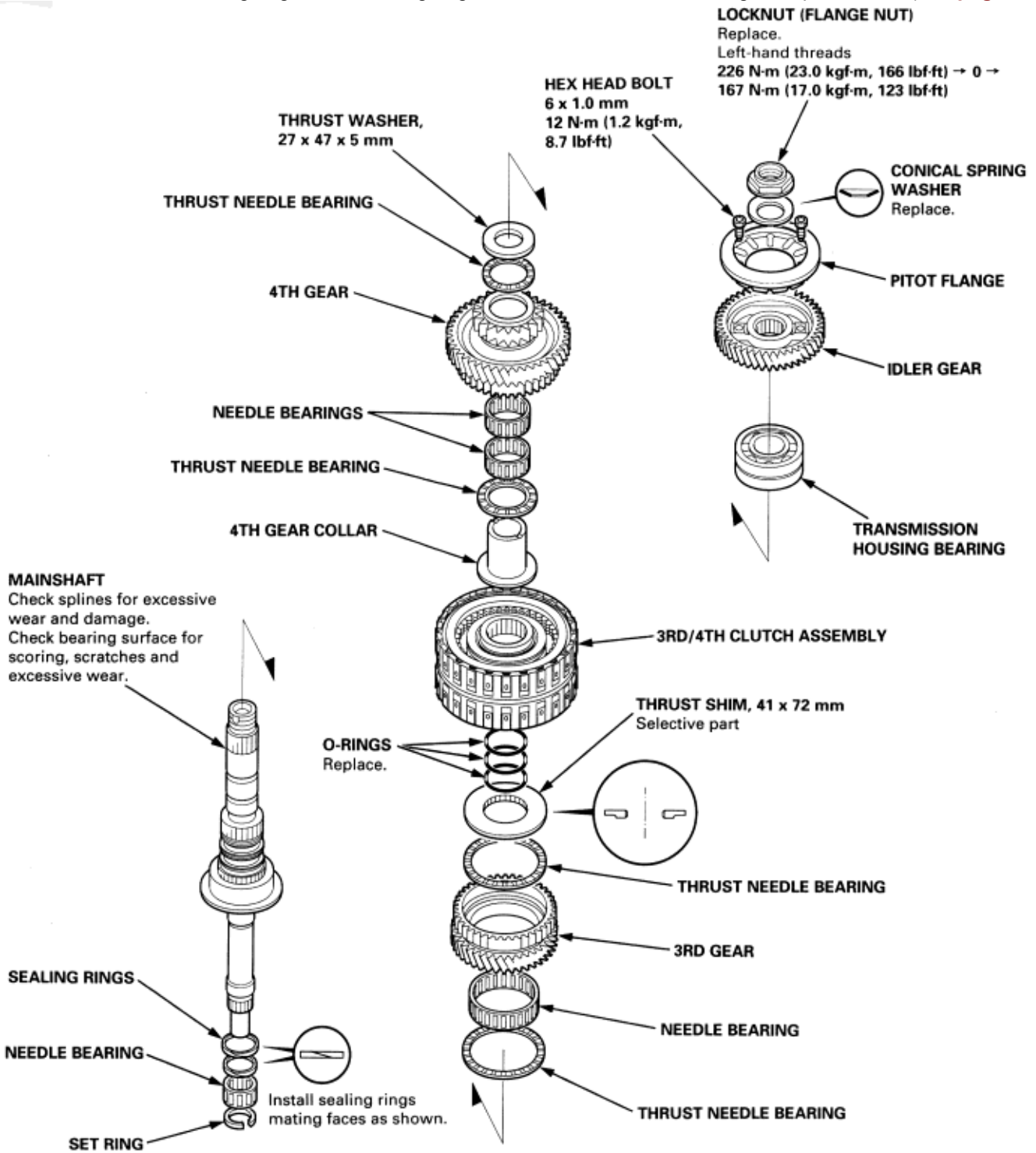
SPRING SPECIFICATIONS

Unit: mm (in)

No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
1	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
2	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
3	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
4	CPC valve B spring	0.7 (0.028)	6.1 (.240)	17.8 (0.701)	7.9
5	3rd accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8
6	4th accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8

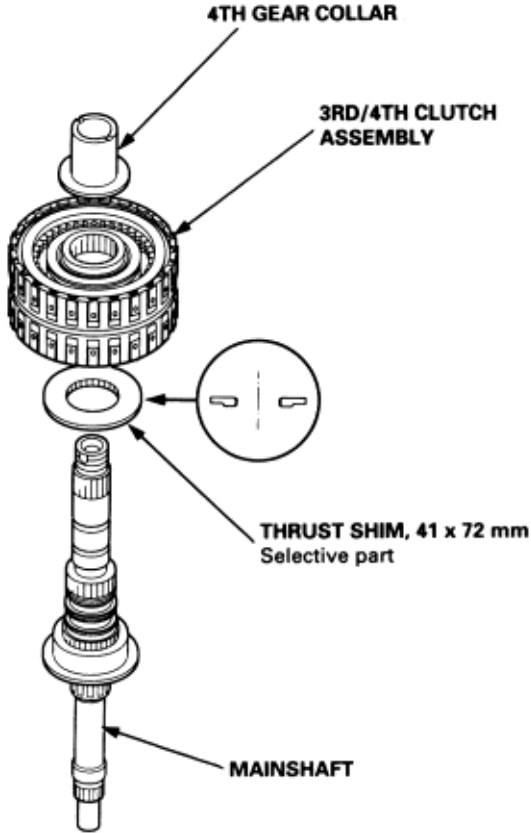
NOTE:

- ♦ Lubricate all parts with ATF during assembly.
- ♦ Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
- ♦ Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
- ♦ Locknut has left-hand threads.
- ♦ Install the conical spring washer and the 41 x 72 mm thrust shim in the direction shown.
- ♦ Inspect condition of the sealing rings. if the sealing rings are worn, distorted or damaged, replace them (see page 14-165).



NOTE: Lubricate all parts with ATF during assembly.

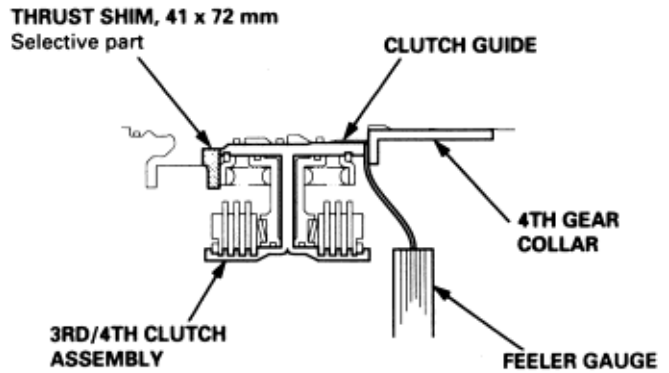
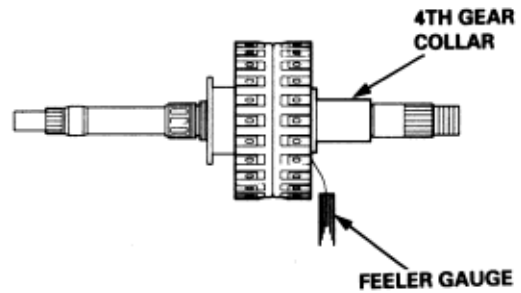
1. Assemble the parts below on the mainshaft.
NOTE: Do not assemble the O-rings during inspection.



2. Hold the 4th gear collar against the clutch assembly, then measure the clearance between the clutch guide and the 4th gear collar with a feeler gauge as shown.

STANDARD: 0.03 - 0.11 mm (0.001 - 0.004 in)

NOTE: Take measurement in at least three places, and use the average as the actual clearance.



3. If the clearance is out of standard, remove the thrust shim and measure its thickness.
4. Select and install a new shim, then recheck.

No.	Part Number	Thickness
1	90414 - P6H - 010	6.35 mm (0.250 in)
2	90415 - P6H - 010	6.40 mm (0.252 in)
3	90416 - P6H - 010	6.45 mm (0.254 in)
4	90417 - P6H - 010	6.50 mm (0.256 in)
5	90418 - P6H - 010	6.55 mm (0.258 in)
6	90419 - P6H - 010	6.60 mm (0.260 in)

5. After replacing the thrust shim, make sure the clearance is within standard.

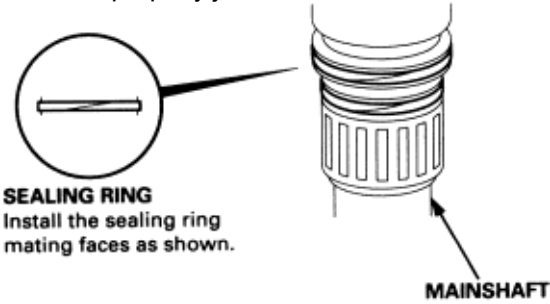
The sealing rings on the mainshaft are synthetic resin with chamfered ends. Check condition of the sealing rings, and replace them only if they are worn, distorted or damaged.

NOTE: Lubricate all parts with ATF during assembly.

1. For better fit, squeeze the sealing ring together slightly before installing them.

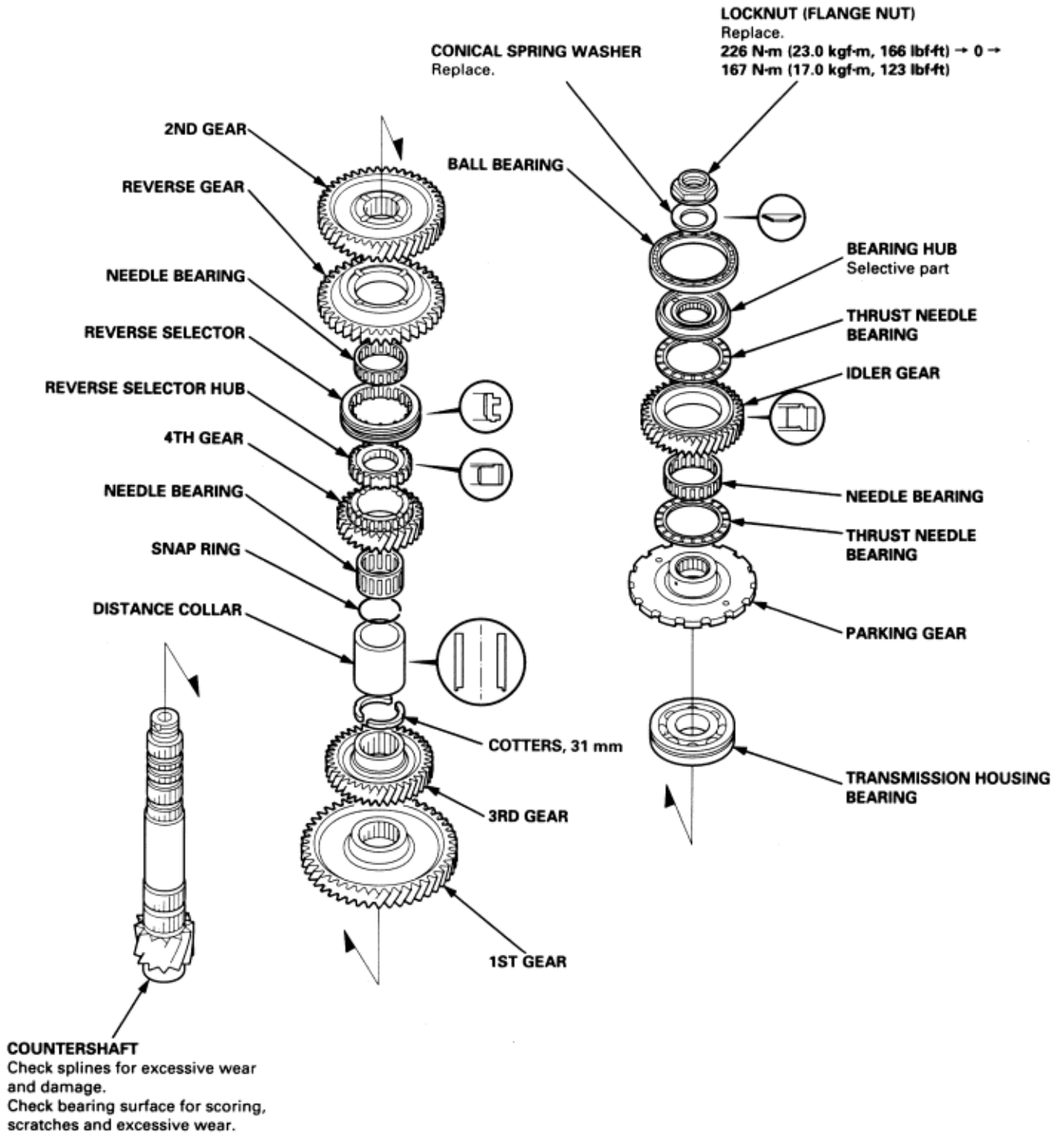


2. Install new sealing rings on mainshaft.
3. After installing the sealing rings, verify the following:
 - ♦ The sealing rings are fully seated in the groove.
 - ♦ The sealing rings are not twisted.
 - ♦ The chamfered ends of the sealing ring are properly joined.



NOTE:

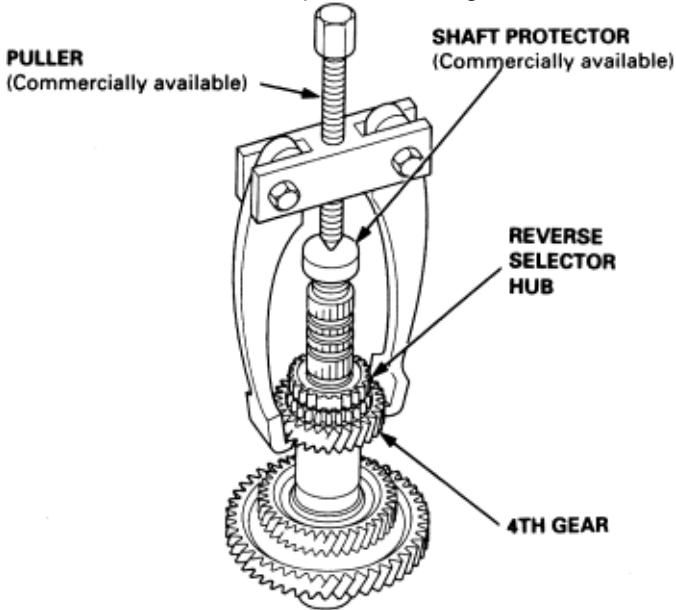
- ♦ Lubricate all parts with ATF during reassembly.
- ♦ Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
- ♦ Install the conical spring washer, the idler gear, the reverse selector, the reverse selector hub, and the distance collar in the direction shown.



1. Remove the reverse selector hub and the 4th gear using a puller as shown.

NOTE:

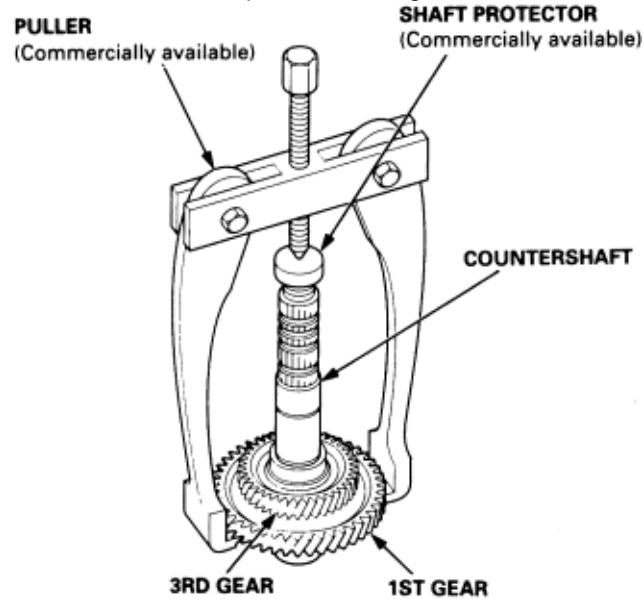
- ♦ Some of the reverse selector hubs are not press-fitted, and can be removed without using a puller.
- ♦ Place a shaft protector between the puller and countershaft to prevent damage to the countershaft.



2. Remove the needle bearing, snap ring, distance collar coters from the countershaft.

3. Remove the 1st gear and 3rd gear together from the countershaft using a puller as shown.

NOTE: Place a shaft protector between the puller and countershaft to prevent damage to the countershaft.



NOTE: Lubricate all parts with ATF during assembly.

1. Align the shaft spline with those on 1st gear, then press the countershaft into the 1st gear using a press as shown.

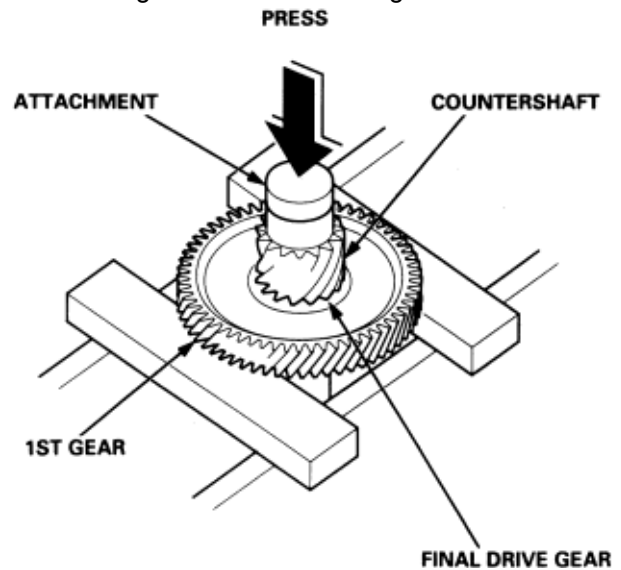
NOTE:

- ♦ Place an attachment between the press and countershaft to prevent damaging the counter-shaft.
- ♦ Stop pressing the countershaft when the 1st gear contacts the final drive gear.

2. Align the shaft spline with those on 3rd gear, then press the countershaft into the 3rd gear using a press as shown.

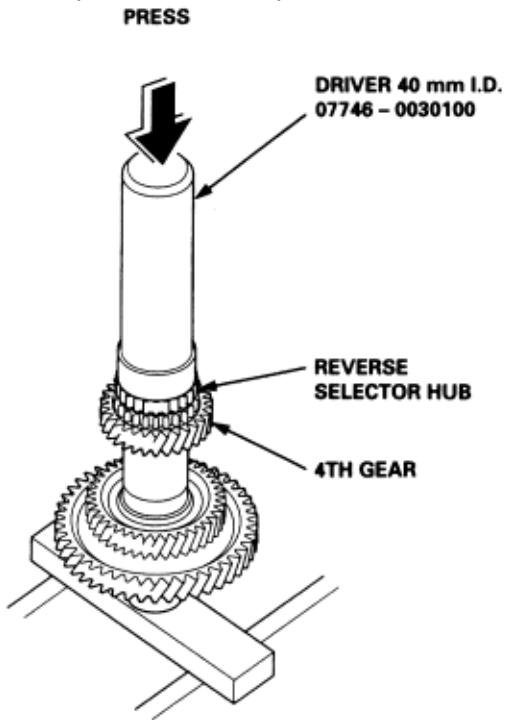
NOTE:

- ♦ Place an attachment between the press and countershaft to prevent damaging the countershaft.
- ♦ Stop pressing the countershaft when the 3rd gear contacts the 1st gear.



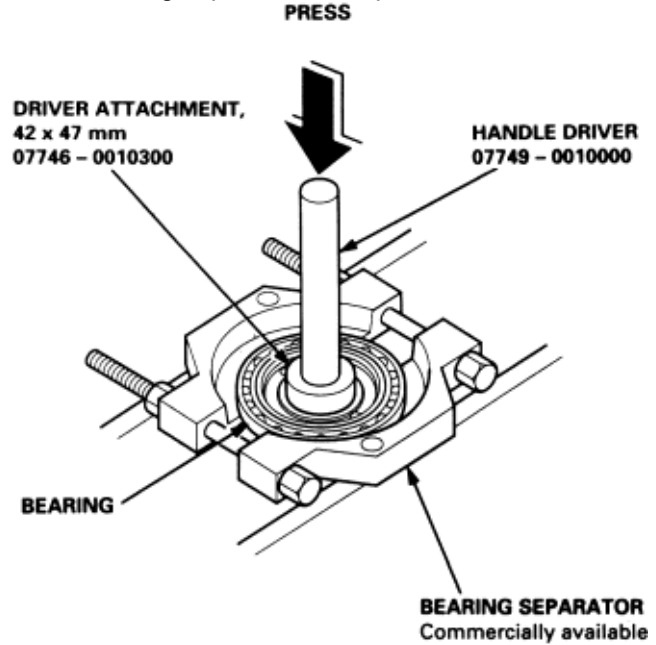
3. Install the 31 mm cotters, distance collar, snap ring, needle bearing, and 4th gear on the countershaft.
4. Install the reverse selector hub, the countershaft, and then press the reverse selector hub using the special tool and a press as shown.

NOTE: Some of the reverse selector hubs are not press-fitted, and can be installed without using the special tool and a press.

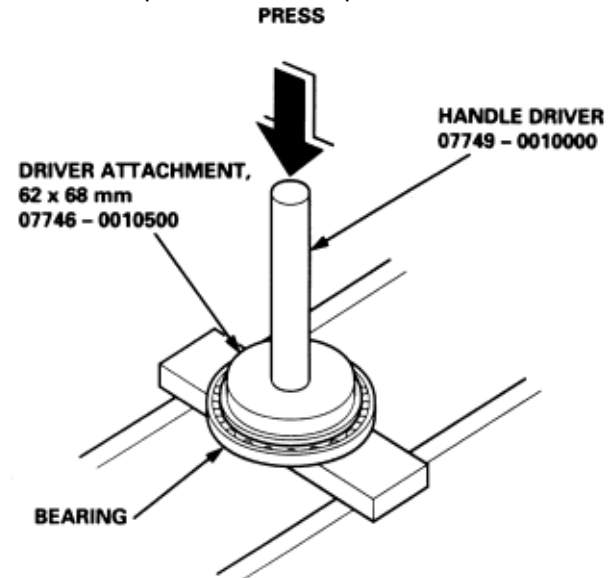


NOTE: Check the bearing for wear, damage and rough movement. If the bearing is worn or damaged, replace the bearing.

1. Remove the bearing from the bearing hub using a bearing separator and a press as shown.

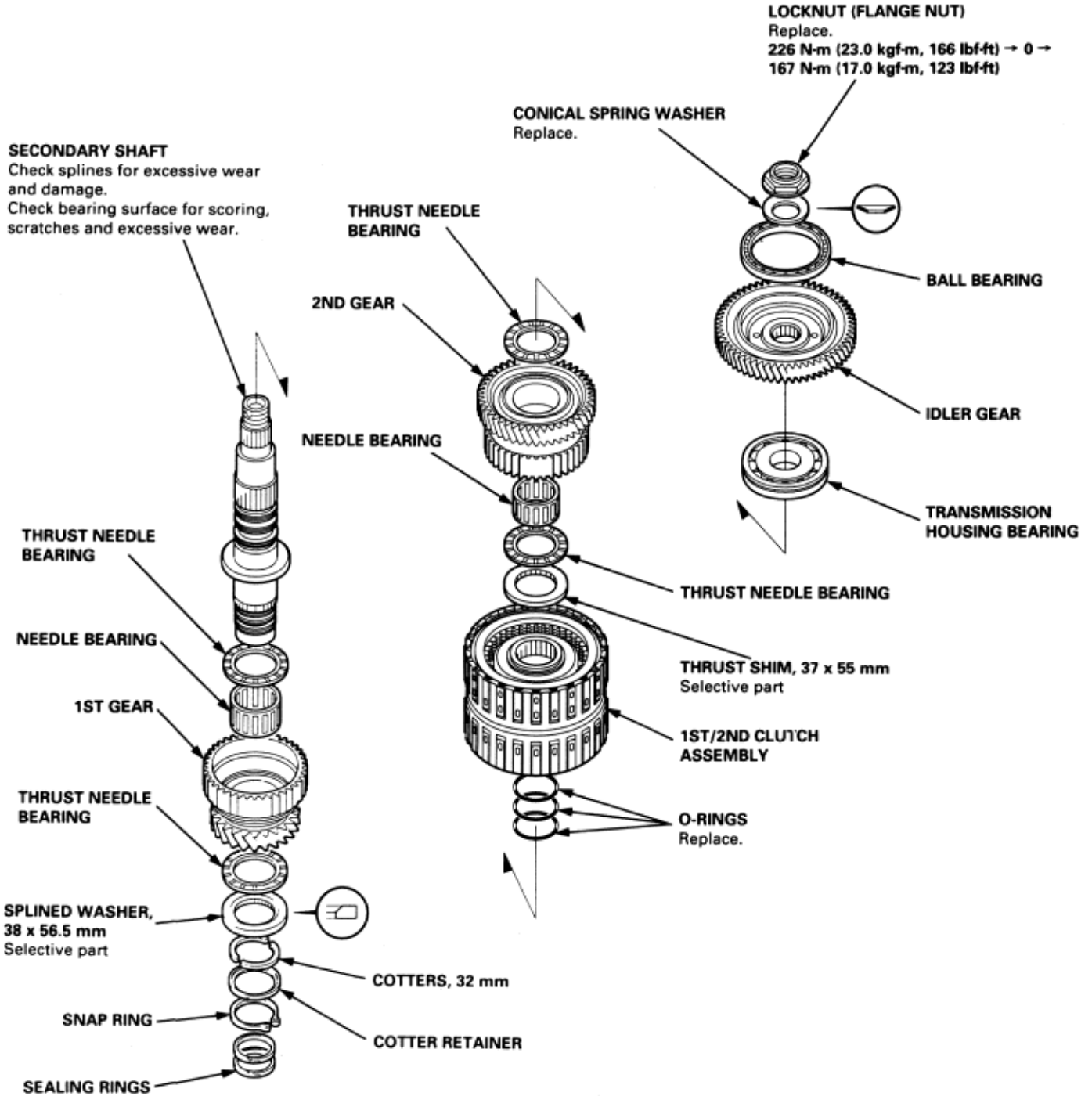


2. Install the new bearing on the bearing hub using the special tool and a press as shown.



NOTE:

- ♦ Lubricate all parts with ATF during reassembly.
- ♦ Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
- ♦ Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
- ♦ Install the conical spring washer and the 38 x 56.5 mm splined washer in the direction shown.

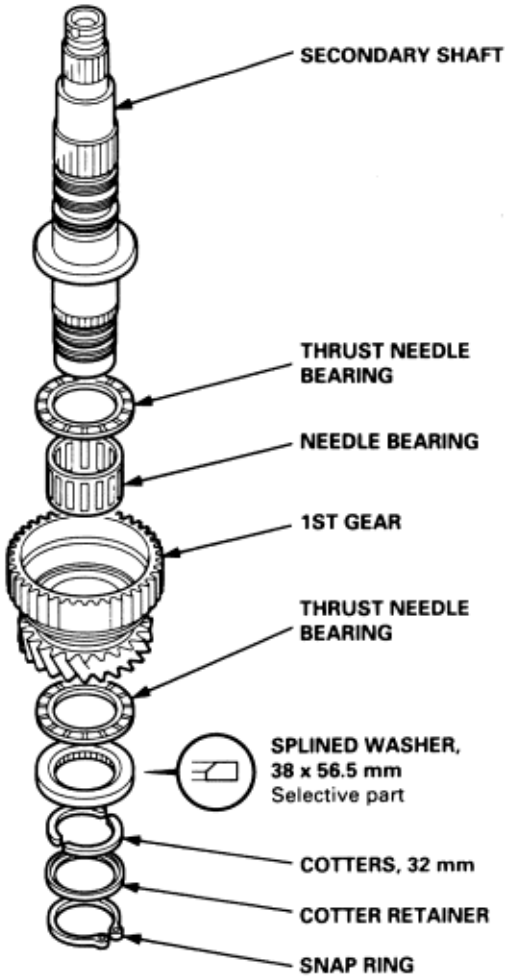


Secondary Shaft Inspection

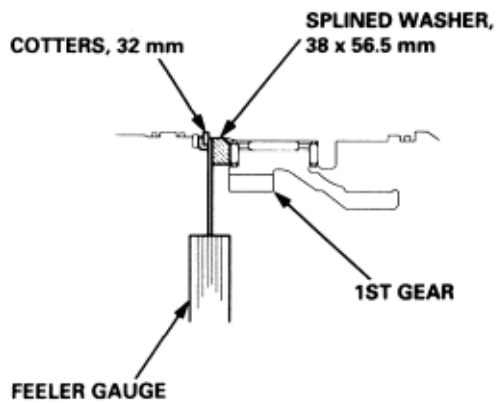
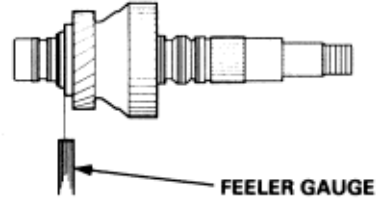
14-170

NOTE: Lubricate all parts with ATF during assembly.

1. Assemble the parts below on the secondary shaft.



2. Measure the clearance between the 38 x 56.5 mm splined washer and cotters with a feeler gauge. **STANDARD: 0.07 - 0.15 mm (0.003 - 0.006 in)**
NOTE: Take measurements in at least three places, and use the average as the actual clearance.



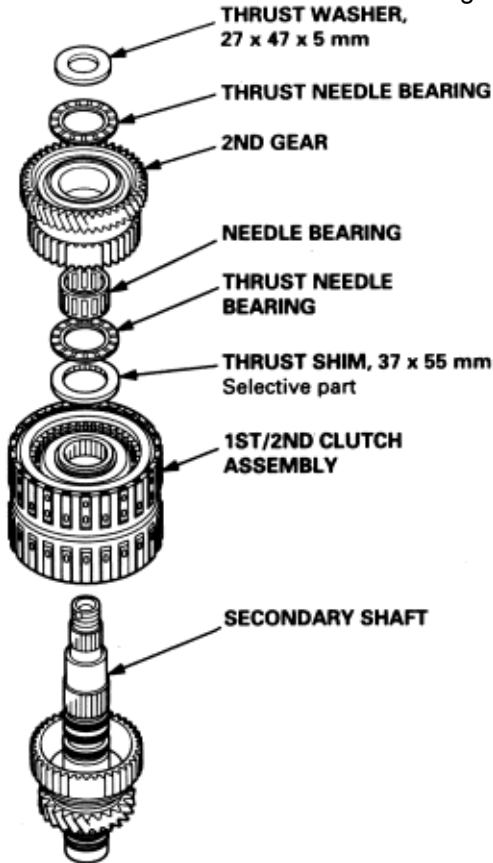
3. If the clearance is out of standard, remove the splined washer, and measure its thickness.
4. Select and install a new splined washer, then recheck.

SPLINED WASHER, 38 x 56.5 mm

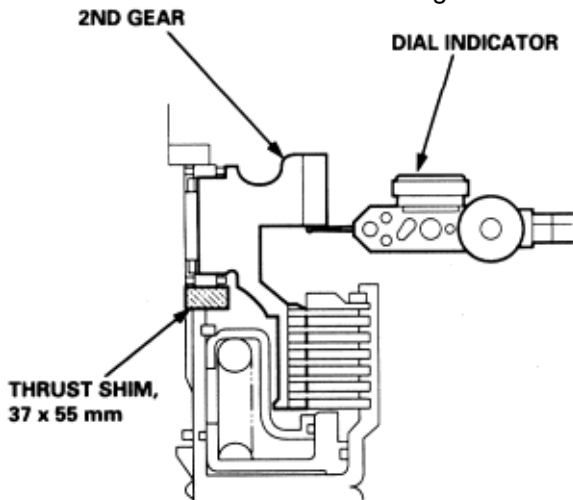
No.	Part Number	Thickness
1	90502 - P0Z - 000	6.85 mm (0.270 in)
2	90503 - P0Z - 000	6.90 mm (0.272 in)
3	90504 - P0Z - 000	6.95 mm (0.274 in)
4	90505 - P0Z - 000	7.00 mm (0.276 in)
5	90506 - P0Z - 000	7.05 mm (0.278 in)
6	90507 - P0Z - 000	7.10 mm (0.280 in)

5. After replacing the splined washer, make sure that the clearance is within standard.

6. Remove the 27 x 47 x 5 mm thrust washer from the mainshaft.
7. Assemble the parts below on the secondary shaft.
NOTE: Do not assemble the O-rings during inspection.



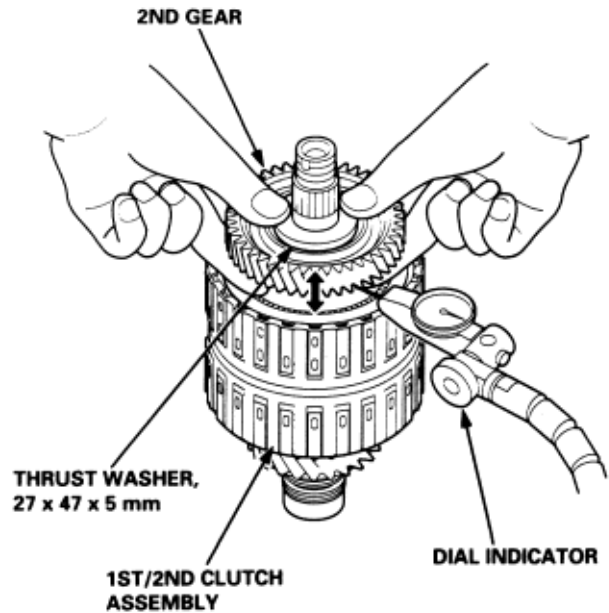
8. Set the dial indicator to the 2nd gear as shown.



9. Hold the 27 x 47 x 5 mm thrust washer against the clutch assembly, and measure the 2nd gear axial clearance while moving the 2nd gear.

STANDARD: 0.04 - 0.12 mm (0.002 - 0.005 in)

NOTE: Take measurements in at least three places, and use the average as the actual clearance.



10. If the clearance is out of standard, remove the 37 x 55 mm thrust shim and measure its thickness.
11. Select and install a new thrust shim, then recheck.

THRUST SHIM, 37 x 55 mm

No.	Part Number	Thickness
1	90406 - P0Z - 000	4.90 mm (0.193 in)
2	90407 - P0Z - 000	4.95 mm (0.195 in)
3	90408 - P0Z - 000	5.00 mm (0.197 in)
4	90409 - P0Z - 000	5.05 mm (0.199 in)
5	90410 - P0Z - 000	5.10 mm (0.201 in)
6	90411 - P0Z - 000	5.15 mm (0.203 in)
7	90412 - P0Z - 000	5.20 mm (0.205 in)

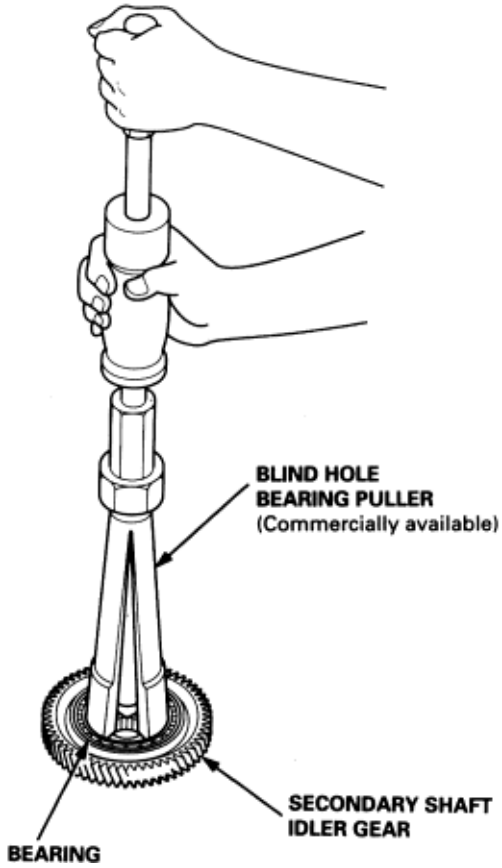
12. After replacing the thrust shim, make sure that the clearance is within standard.
13. Be sure to install the 27 x 47 x 5 mm thrust washer on the mainshaft.

Secondary Shaft Idler Gear Bearing Replacement

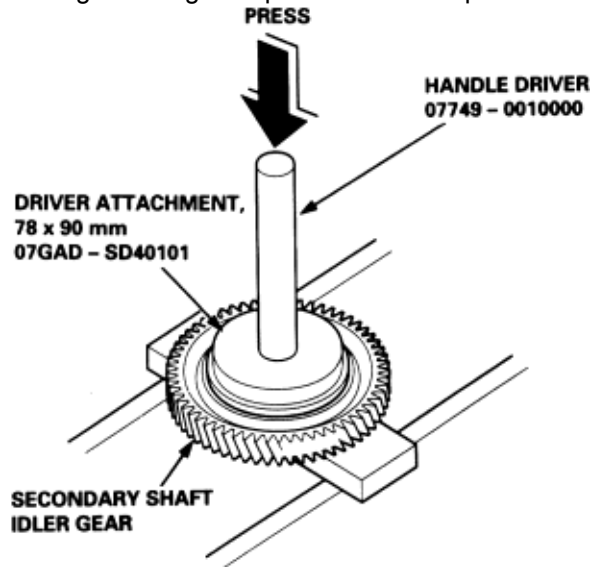
14-172

NOTE: Check the bearing for wear, damage and rough movement. If the bearing is worn or damaged, replace the bearing.

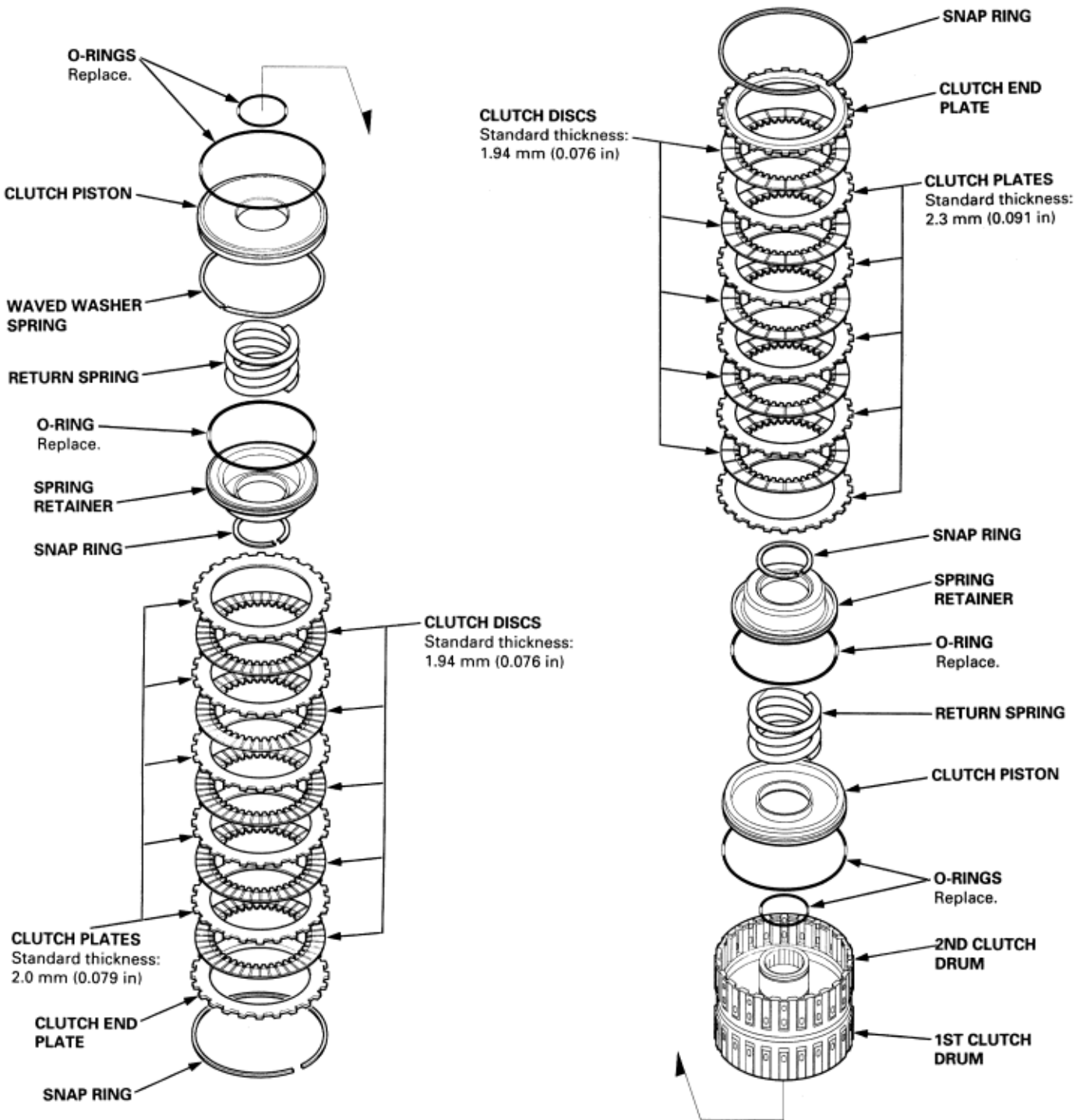
1. Place the secondary shaft idler gear in a vice with soft jaws.
2. Remove the bearing from the secondary shaft idler gear using a bearing puller.



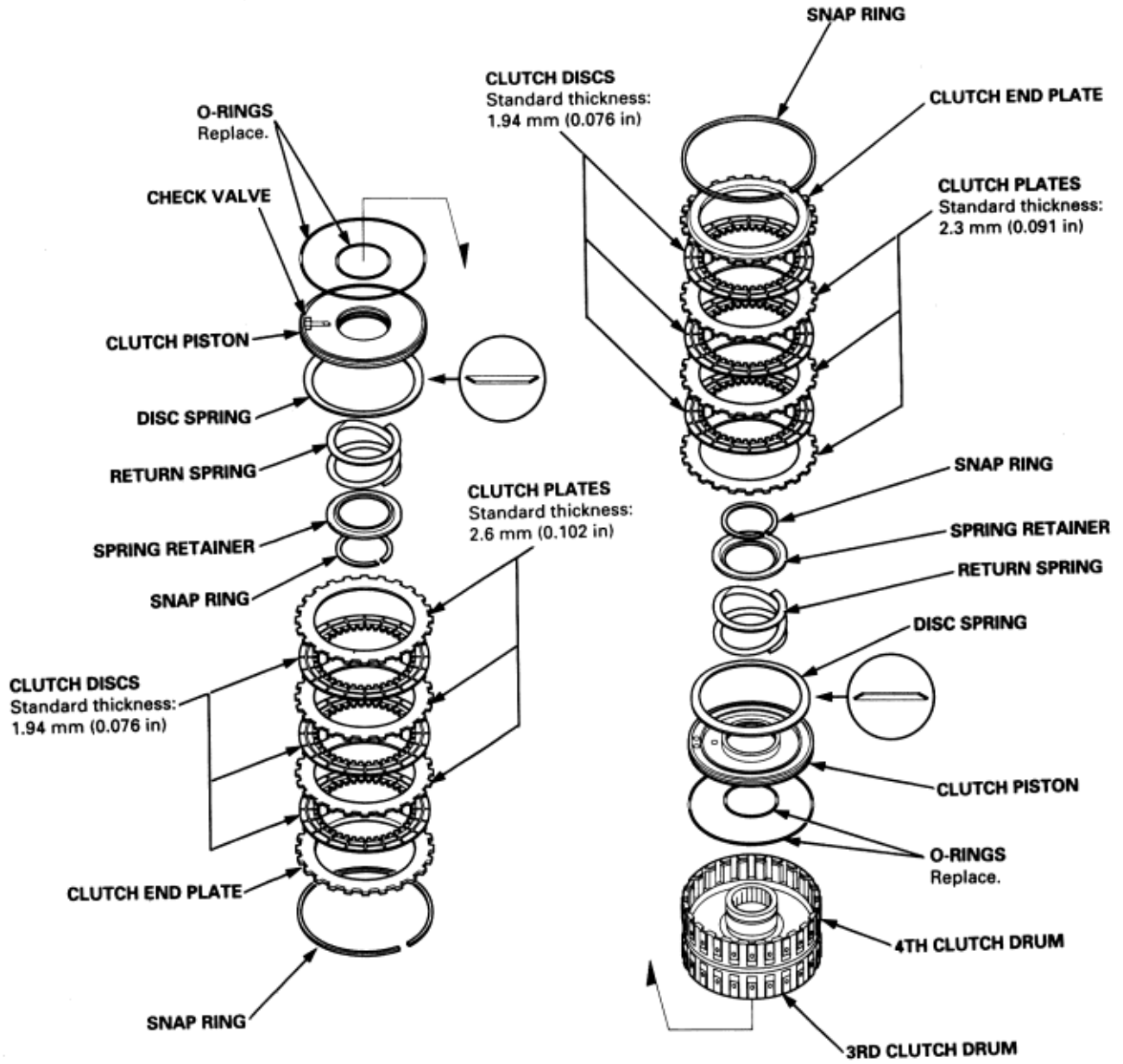
3. Install the new bearing on the secondary shaft idler gear using the special tool and a press as shown.



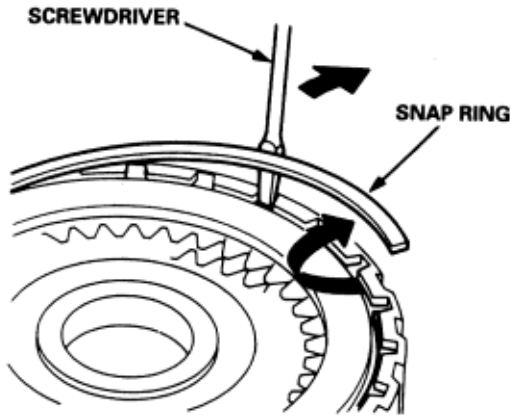
1ST/2ND CLUTCH



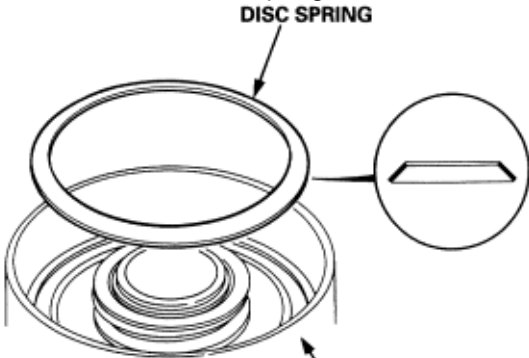
3RD/4TH CLUTCH



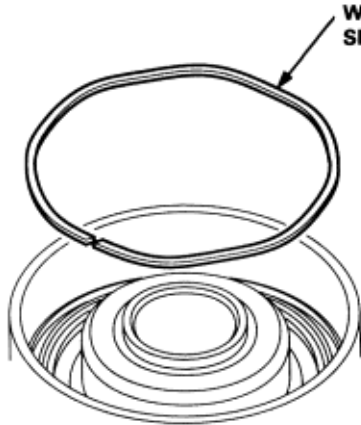
1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.



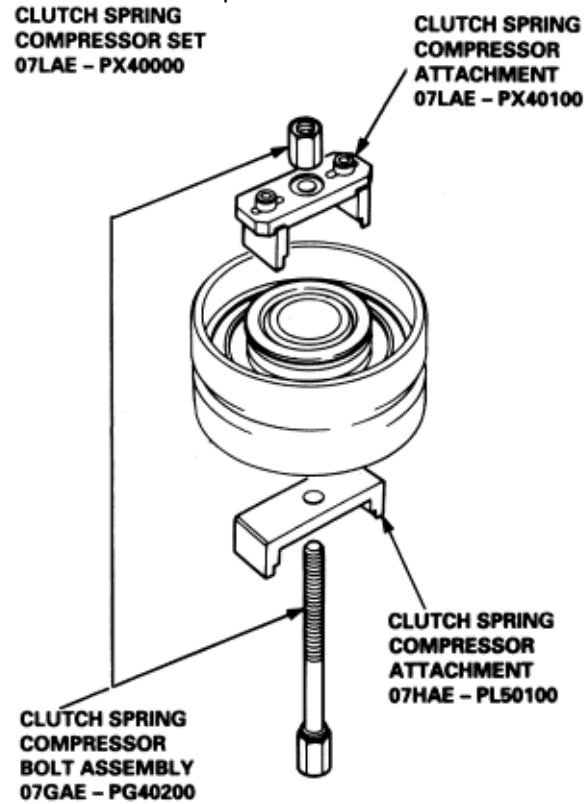
2. Remove the disc spring from the 3rd and 4th clutches.



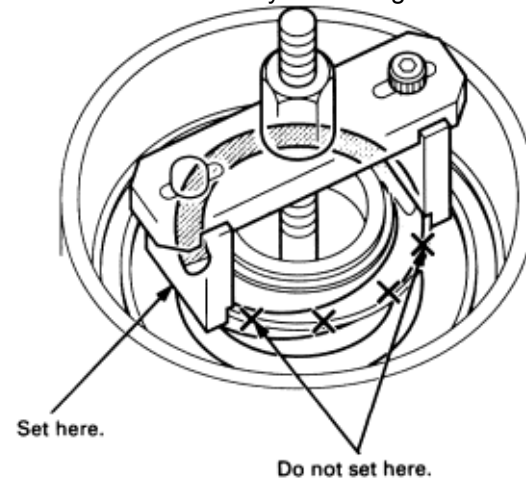
3. Remove the wavy washer spring from the 1st clutch.



4. Install the special tools as shown.



NOTE: Be sure the special tool is adjusted to have full contact with the spring retainer. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.

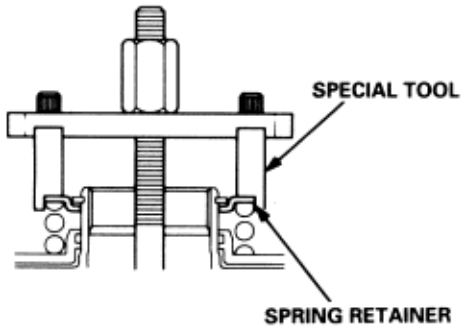


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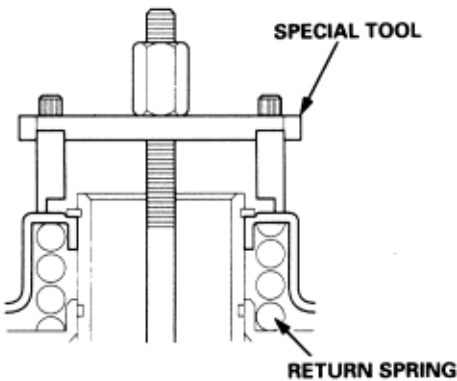
NOTE:

- ♦ Be sure the special tool is adjusted to have full contact with the spring retainer on the 3rd and 4th clutches.
- ♦ Set the special tool on the spring retainer of the 1st and 2nd clutch in such a way that the special tool works on the clutch return spring.

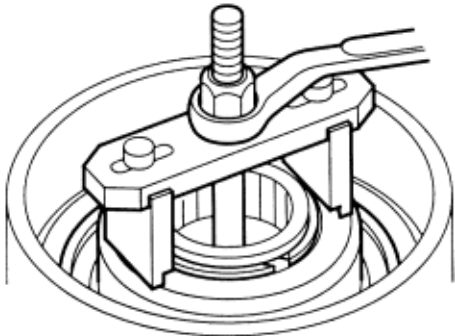
For 3rd and 4th clutches:



For 1st and 2nd clutches:

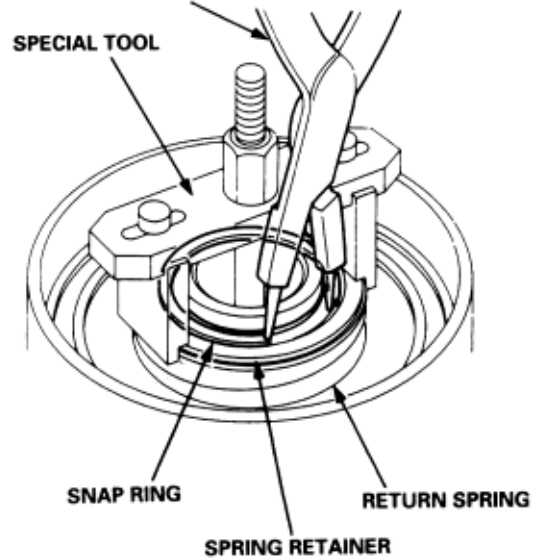


5. Compress the return spring with the special tool.

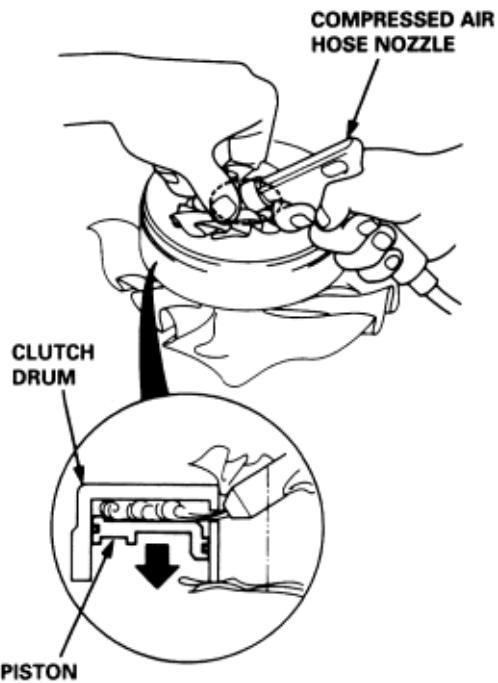


6. Remove the snap ring. Then remove the special tools, spring retainer and return spring.

SNAP RING PLIERS
07LGC - 0010100



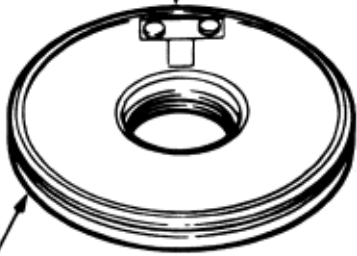
7. Wrap a shop rag around the clutch drum, and apply air pressure to the oil passage to remove the piston. Place a finger on the other end while applying air pressure.



NOTE:

- ♦ Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
 - ♦ Blow out all passages.
 - ♦ Lubricate all parts with ATF before assembly.
1. Inspect the check valve of the 3rd and 4th clutches, if it's loose, replace the piston.

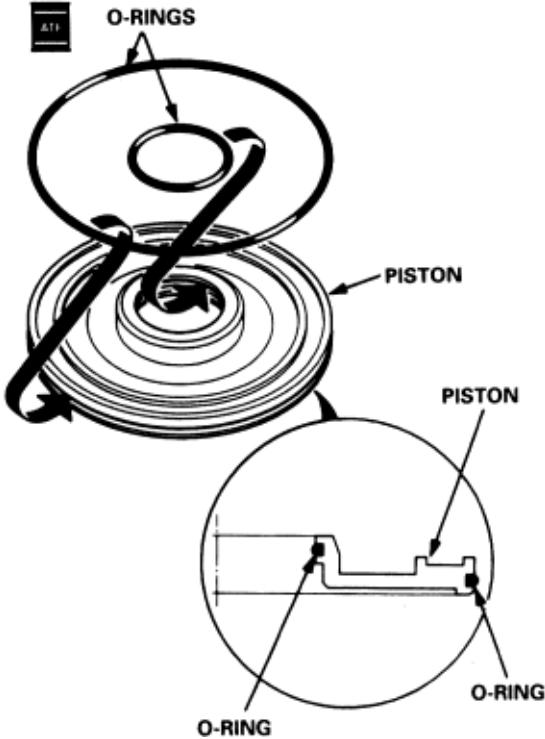
CHECK VALVE



PISTON

2. Install new O-rings on the piston and the spring retainers of the 1st and 2nd clutches.

O-RINGS



PISTON

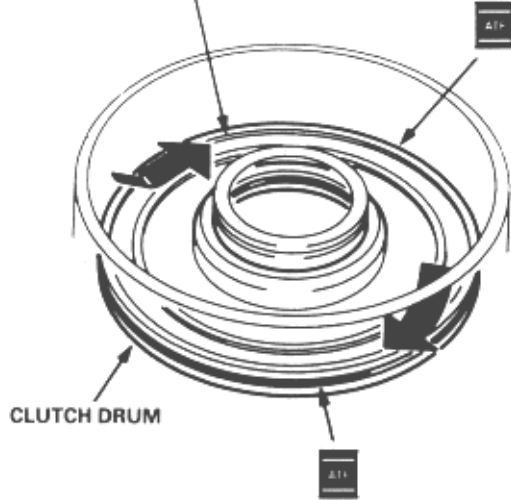
PISTON

O-RING

O-RING

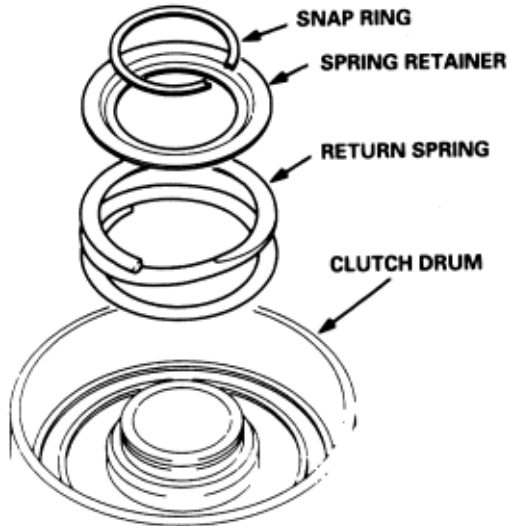
3. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating. Lubricate the piston O-ring with ATF before installing. NOTE: Do not pinch the O-ring by installing the piston with too much force.

PISTON



CLUTCH DRUM

4. Install the return spring and spring retainer, and position the snap ring on the retainer.



SNAP RING

SPRING RETAINER

RETURN SPRING

CLUTCH DRUM

5. Install the special tools as shown.

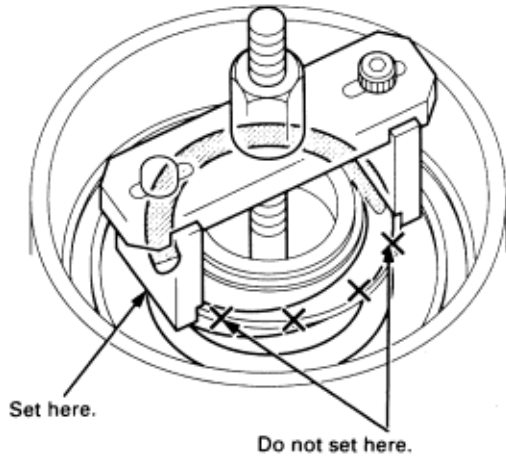
**CLUTCH SPRING
COMPRESSOR SET
07LAE - PX40000**

**CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07LAE - PX40100**

**CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07HAE - PL50100**

**CLUTCH SPRING
COMPRESSOR
BOLT ASSEMBLY
07GAE - PG40200**

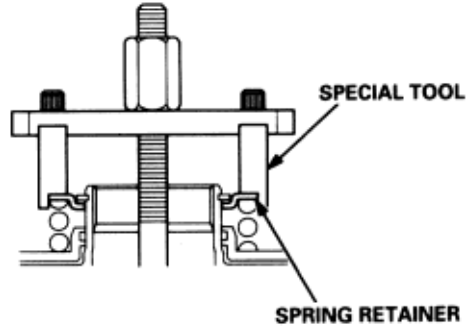
NOTE: Be sure the special tool is adjusted to have full contact with the spring retainer. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



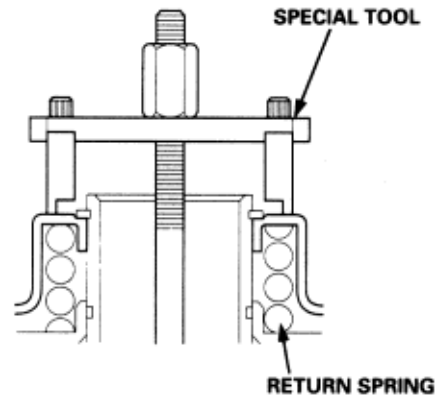
NOTE:

- ♦ Be sure the special tool is adjusted to have full contact with the spring retainer on the 3rd and 4th clutches.
- ♦ Set the special tool on the spring retainer of the 1st and 2nd clutch in such a way that the special tool works on the clutch return spring.

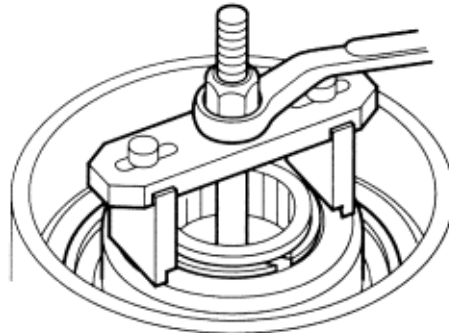
For 3rd and 4th clutches:



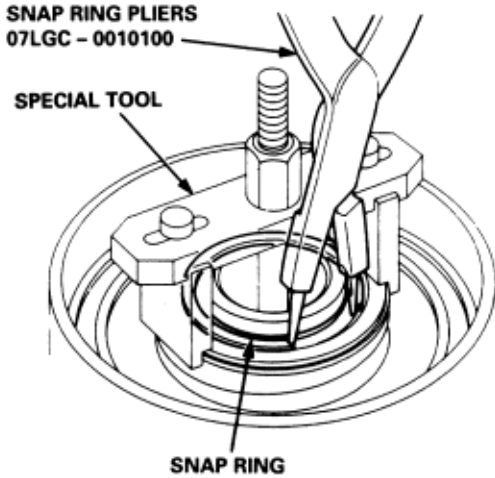
For 1st and 2nd clutches:



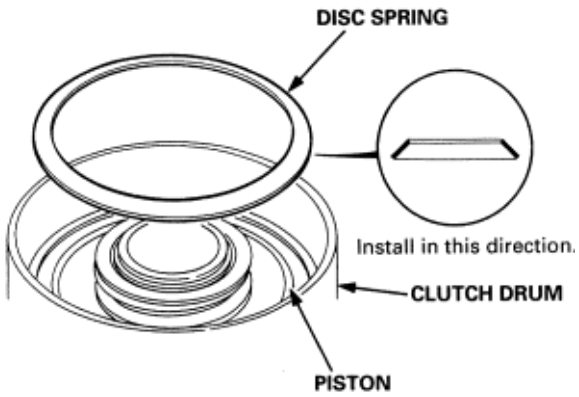
6. Compress the return spring with the special tool.



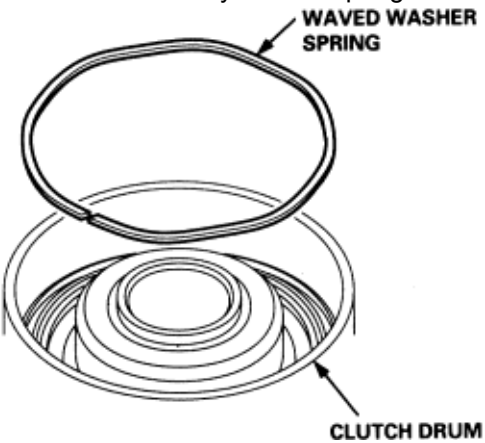
7. Install the snap ring.



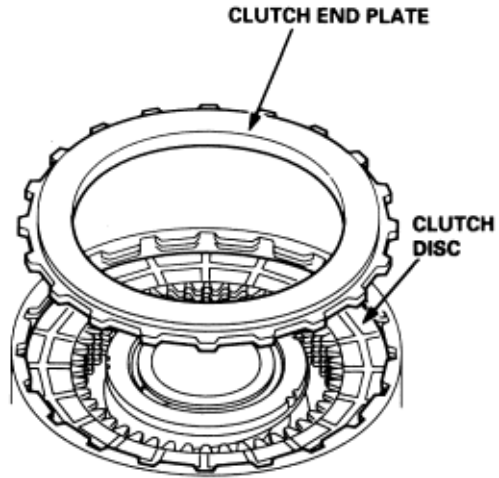
8. Remove the special tools.
9. Install the disc spring in the 3rd and 4th clutches in the direction shown.



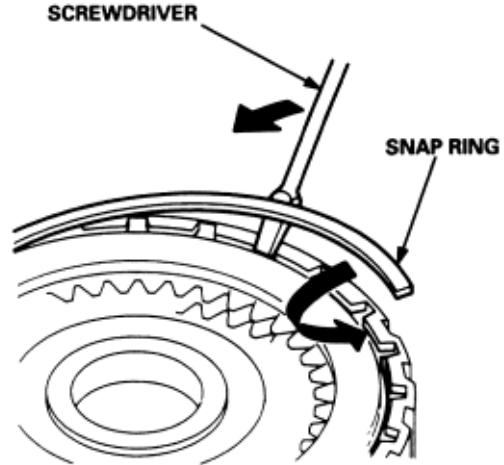
10. Install the wavy washer spring in the 1st clutch.



11. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes. Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt and other foreign matter.
12. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with the flat side toward the disc.



13. Install the snap ring.

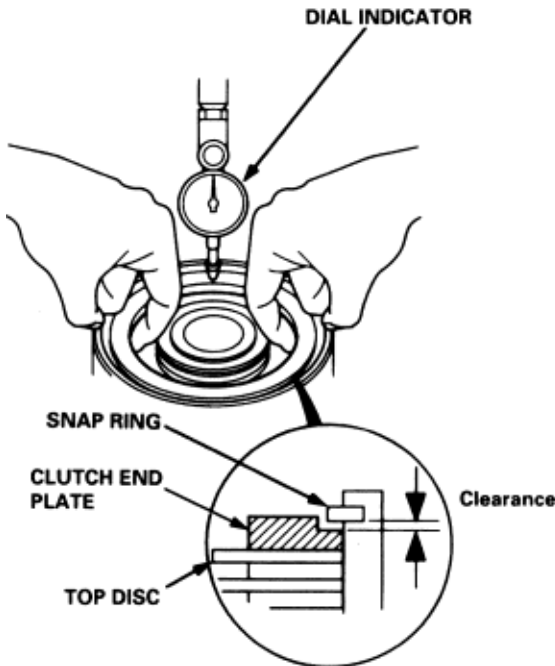


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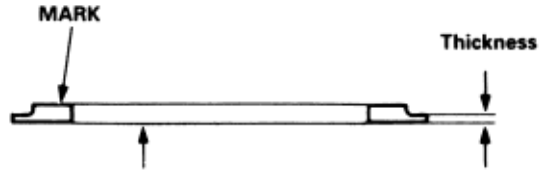
14. Measure the clearance between the clutch end plate and top disc with a dial indicator. Zero the dial indicator with the clutch end plate lowered, and lift it up to the snap ring. The distance that the clutch end plate moves is the clearance between the clutch end plate and top disc.
NOTE: Take measurements in at least three places, and use the average as the actual clearance.

Clutch End Plate-to-Top Disc Clearance

Clutch	Service Limit
1st	1.15 – 1.35 mm (0.045 – 0.053 in)
2nd	0.7 – 0.9 mm (0.028 – 0.035 in)
3rd	0.6 – 0.8 mm (0.024 – 0.031 in)
4th	0.4 – 0.6 mm (0.016 – 0.024 in)



15. If the clearance is not within the service limits, select a new clutch end plate from the following table.
NOTE: If the thickest clutch end plate is installed, but the clearance, is still over the standard, replace the clutch discs and clutch plates.



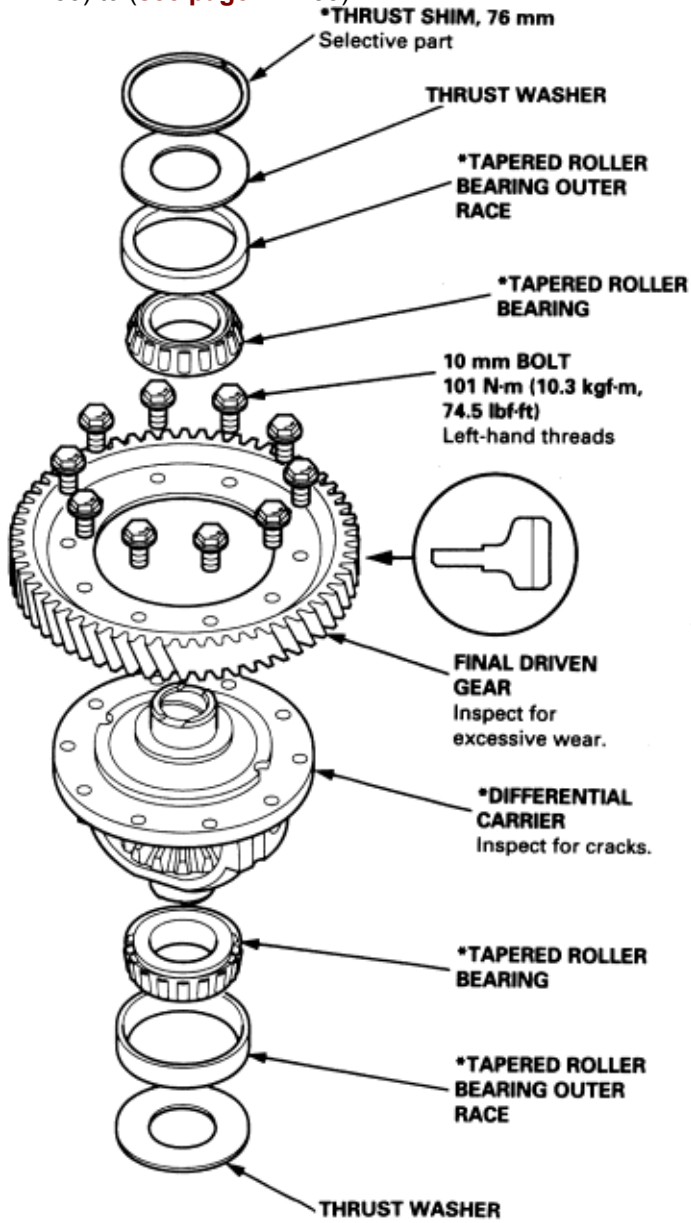
1ST and 2ND CLUTCH END PLATES

Mark	Part Number	Thickness
6	22551 – P6H – 003	2.6 mm (0.102 in)
7	22552 – P6H – 003	2.7 mm (0.106 in)
8	22553 – P6H – 003	2.8 mm (0.110 in)
9	22554 – P6H – 003	2.9 mm (0.114 in)
0	22555 – P6H – 003	3.0 mm (0.118 in)
1	22556 – P6H – 003	3.1 mm (0.122 in)
2	22557 – P6H – 003	3.2 mm (0.126 in)
3	22558 – P6H – 003	3.3 mm (0.130 in)
4	22559 – P6H – 003	3.4 mm (0.134 in)

3RD and 4TH CLUTCH END PLATES

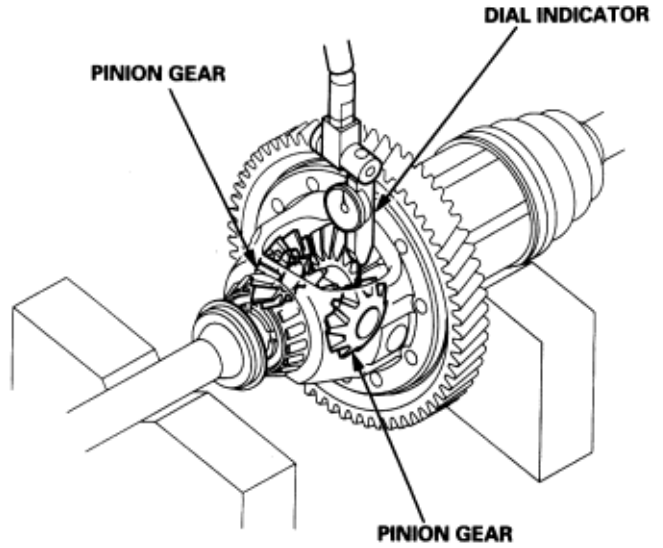
Mark	Part Number	Thickness
1	22551 – PX4 – 003	2.1 mm (0.083 in)
2	22552 – PX4 – 003	2.2 mm (0.087 in)
3	22553 – PX4 – 003	2.3 mm (0.091 in)
4	22554 – PX4 – 003	2.4 mm (0.094 in)
5	22555 – PX4 – 003	2.5 mm (0.098 in)
6	22556 – PX4 – 003	2.6 mm (0.102 in)
7	22557 – PX4 – 003	2.7 mm (0.106 in)
8	22558 – PX4 – 003	2.8 mm (0.110 in)
9	22559 – PX4 – 003	2.9 mm (0.114 in)

NOTE: If the transmission housing, torque converter housing or any parts marked with an asterisk (*) were replaced, the tapered roller bearing preload must be adjusted (see page 14-183) to (see page 14-185).



1. Place the differential assembly on V-blocks, and install both axes.
2. Check the backlash of both pinion gears with a dial indicator.

STANDARD: 0.05 - 0.15 (0.002 - 0.006)

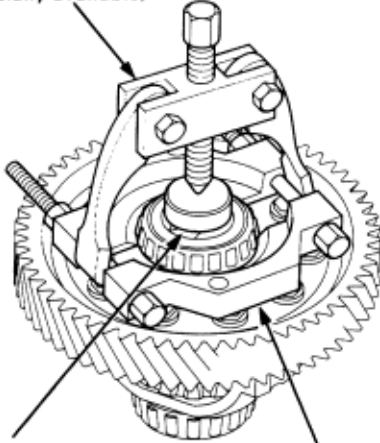


3. If the backlash is out of standard, replace the differential carrier.

NOTE: Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.

1. Remove the tapered roller bearing with a bearing puller and a bearing separator.

BEARING PULLER
(Commercially available)



DRIVER ATTACHMENT,
32 x 35 mm
07746 - 0010100
Use with a collar or a
shaft protector.

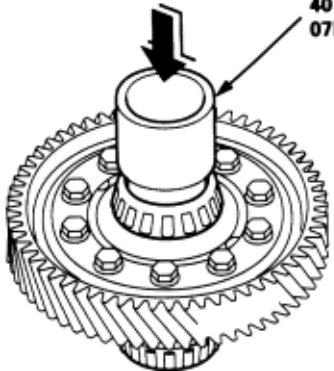
BEARING SEPARATOR
(Commercially available)

2. Install the new tapered roller bearings with the special tool and a press.

NOTE:

- ♦ Press the bearings on until they bottom.
- ♦ Use the small end of the special tool to install the bearing.

ATTACHMENT,
40 x 50 mm
07LAD - PW50601

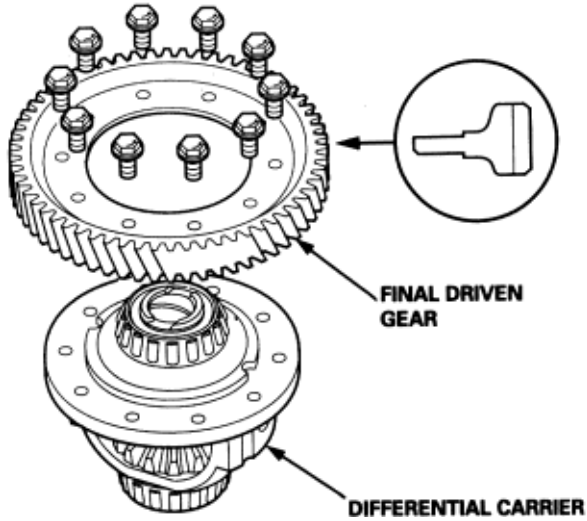


NOTE:

- ♦ The bearing and outer race should be replaced as a set.
- ♦ Inspect and adjust the bearing preload whenever bearing is replaced.
- ♦ Press the bearings on securely so there is no clearance between the bearings and the differential carrier.

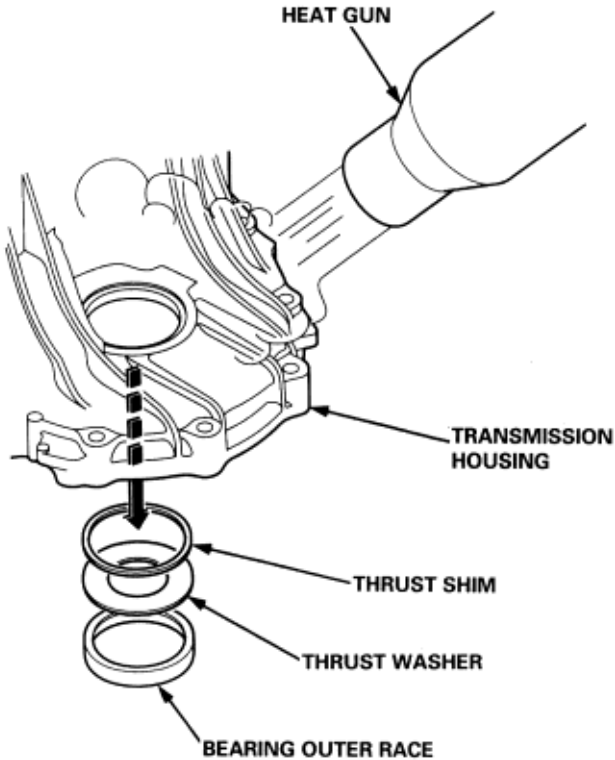
1. Remove the final driven gear from the differential carrier.
NOTE: The final driven gear bolts have left-hand threads.
2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.
3. Tighten the bolts to the specified torque in a crisscross Pattern.

TORQUE: 101 N·m (10.3 kgf·m, 74.5 lbf·ft)



NOTE: If the transmission housing, torque converter housing, differential carrier, tapered roller bearing, outer race, or thrust shim were replaced, the bearing preload must be adjusted.

1. Remove the bearing outer race, thrust washer and thrust shim from the transmission housing by heating the housing to 100°C (212°F) with a heat gun. Do not heat the housing in excess of 100°C (212°F)
 NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.
2. Replace the tapered roller bearing when the outer race is to be replaced.
3. Do not use a shim on the torque converter housing side.

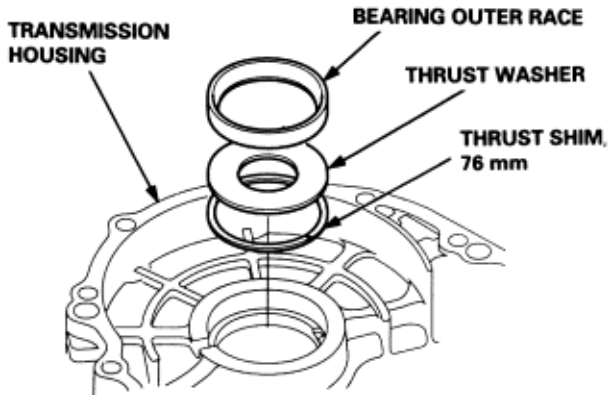


4. Select the 2.60 mm (0.102 in) thrust shim from the middle of the table below.

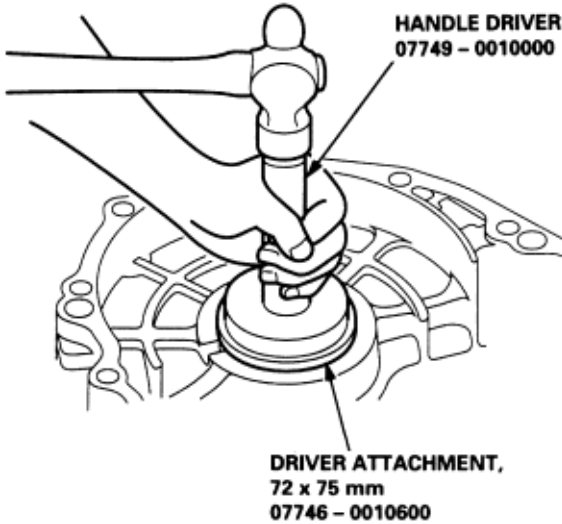
THRUST SHIM, 76 mm

No.	Part Number	Thickness
S	41438 - PX4 - 700	2.05 mm (0.081 in)
T	41439 - PX4 - 700	2.10 mm (0.083 in)
U	41440 - PX4 - 700	2.15 mm (0.085 in)
A	41441 - PK4 - 000	2.20 mm (0.087 in)
B	41442 - PK4 - 000	2.25 mm (0.089 in)
C	41443 - PK4 - 000	2.30 mm (0.091 in)
D	41444 - PK4 - 000	2.35 mm (0.093 in)
E	41445 - PK4 - 000	2.40 mm (0.094 in)
F	41446 - PK4 - 000	2.45 mm (0.096 in)
G	41447 - PK4 - 000	2.50 mm (0.098 in)
H	41448 - PK4 - 000	2.55 mm (0.100 in)
I	41449 - PK4 - 000	2.60 mm (0.102 in)
J	41450 - PK4 - 000	2.65 mm (0.104 in)
K	41451 - PK4 - 000	2.70 mm (0.106 in)
L	41452 - PK4 - 000	2.75 mm (0.108 in)
M	41453 - PK4 - 000	2.80 mm (0.110 in)
N	41454 - PK4 - 000	2.85 mm (0.112 in)
O	41455 - PK4 - 000	2.90 mm (0.114 in)
P	41456 - PK4 - 000	2.95 mm (0.116 in)
Q	41457 - PK4 - 000	3.00 mm (0.118 in)
R	41458 - PK4 - 000	3.05 mm (0.120 in)

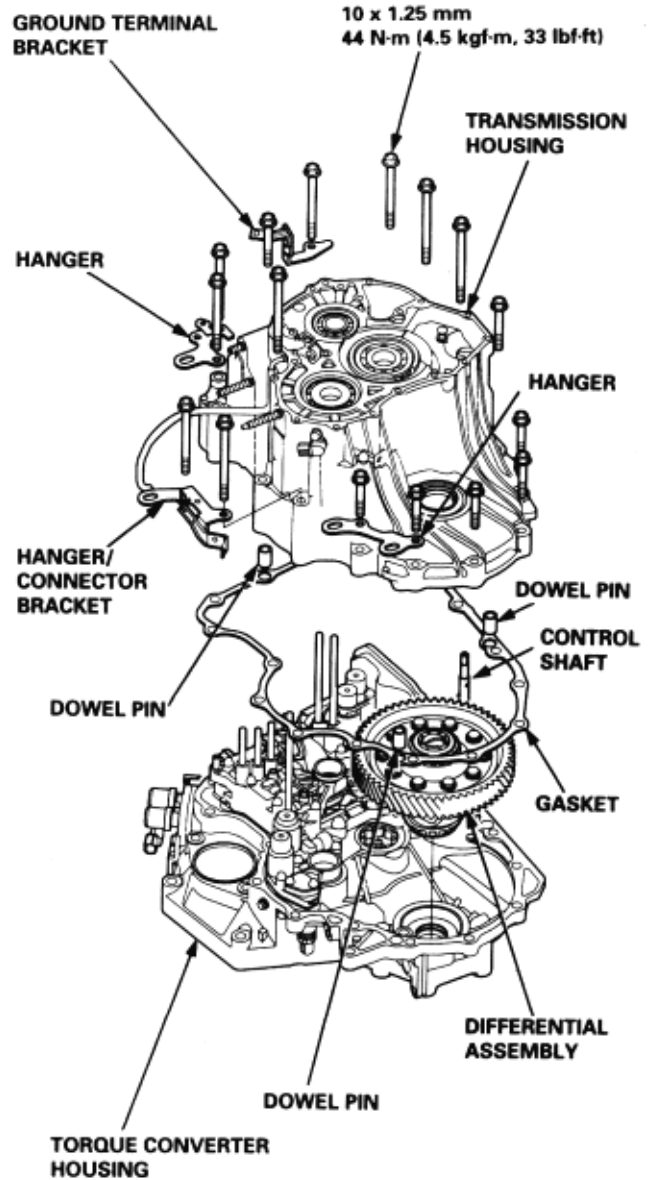
5. Install the thrust shim, thrust washer and bearing outer race in the transmission housing.



6. Drive the outer race with the special tools, and install it securely in the transmission housing.
7. Check that there is no clearance between the thrust washer, outer race, shim and transmission housing.



8. Install the differential assembly, gasket, and dowel pins on the torque converter housing. Align the spring pin on the control shaft with the transmission housing groove.
9. Install the transmission housing with the transmission hangers, hanger/connector bracket, and ground terminal bracket, and tighten the bolts.



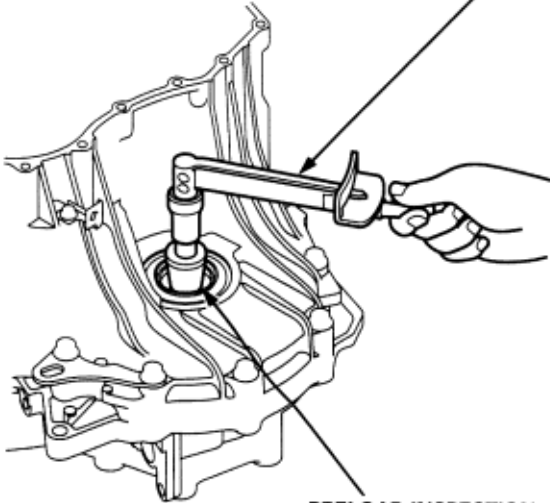
10. Rotate the differential assembly in both directions to seat the bearings.
11. Measure the starting torque of the differential assembly with the special tools and a torque wrench. Measure the starting torque at normal room temperature in both directions.

STANDARD:

New bearings: 2.7 - 3.9 Nm
(28 - 40 kgf cm, 24- 35 lbf in)

Reused bearings: 2.5 - 3.6 Nm
(25 - 37 kgf cm, 22-32 lbf in)

TORQUE WRENCH

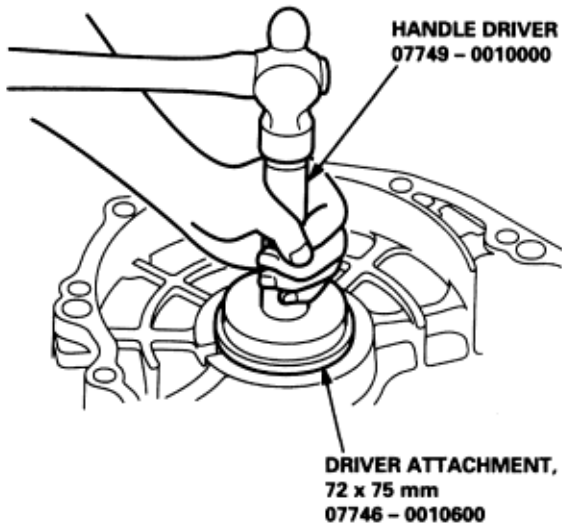
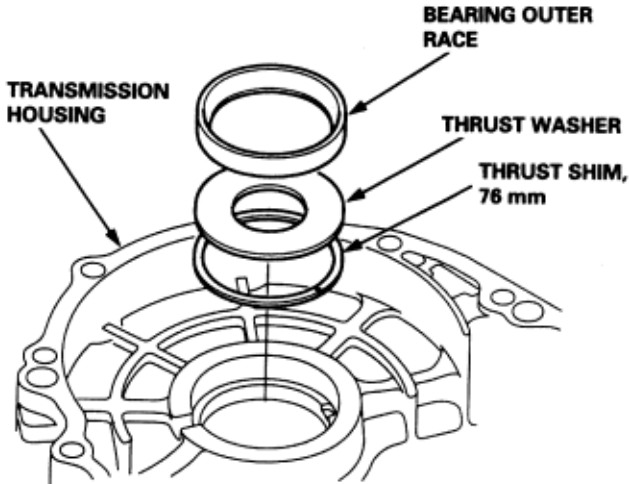


PRELOAD INSPECTION
TOOL
07HAJ - PK40201

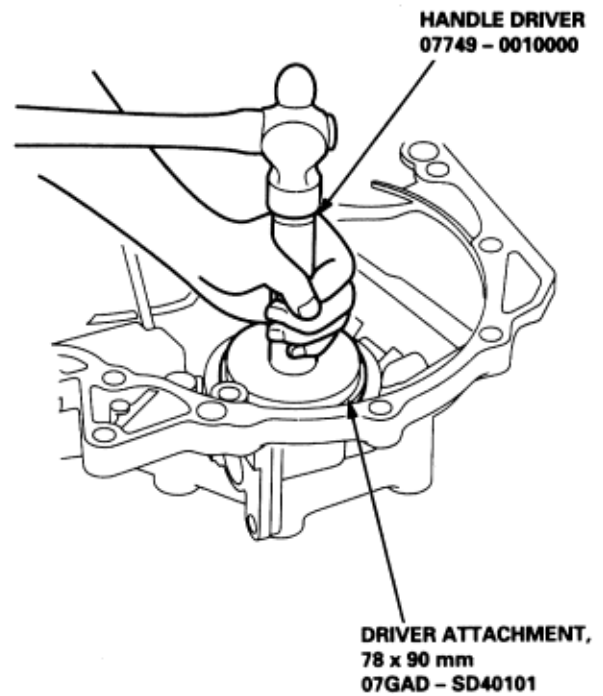
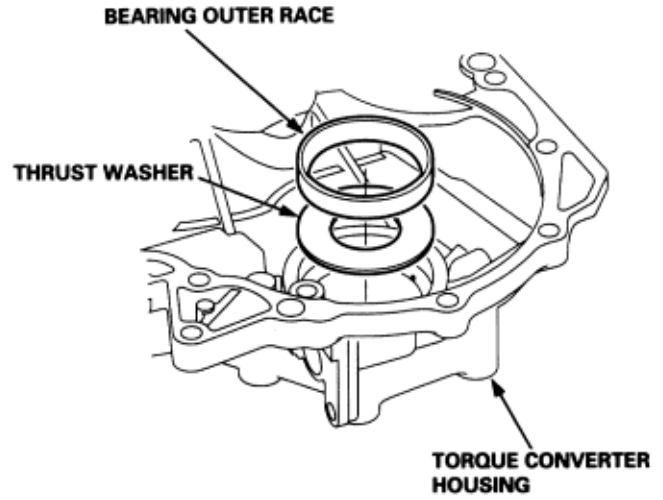
12. To increase the starting torque, increase the thickness of the shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3 - 0.4 Nm (3 - 4 kgf cm, 3 - 3 lbf in).

NOTE:

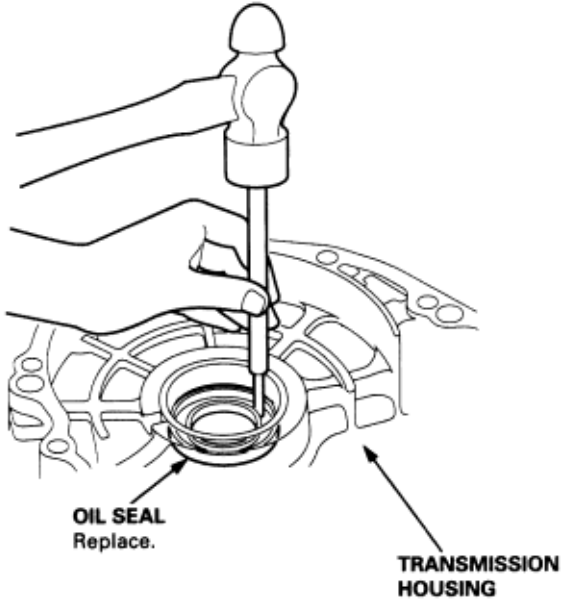
- ♦ Replace the bearing with a new one whenever the outer race is to be replaced.
 - ♦ Do not use shim(s) on the torque converter housing side.
 - ♦ Adjust preload after replacing the bearing and outer race.
 - ♦ Coat all parts with ATF during installation.
1. Remove the bearing outer race from the transmission housing by heating the housing to about 100°C (212°F) with a heat gun.
 2. Remove the bearing outer race from the torque converter housing.
 3. Install the thrust shim, thrust washer and outer race in the transmission housing with the special tools.



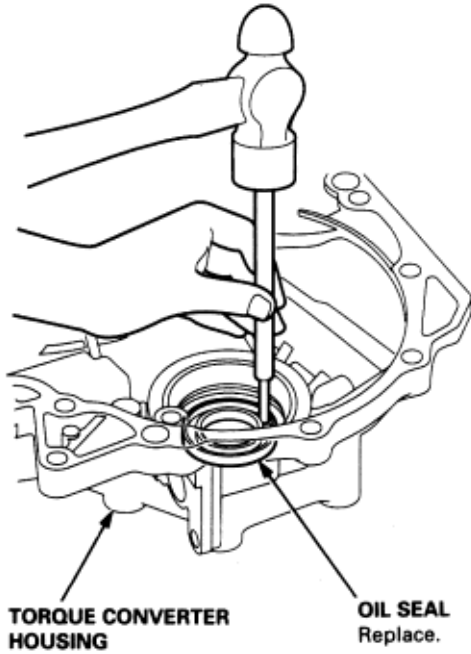
4. Install the thrust washer and outer race in the torque converter housing, and be sure to install the outer race until it bottoms in the housing with the special tools.



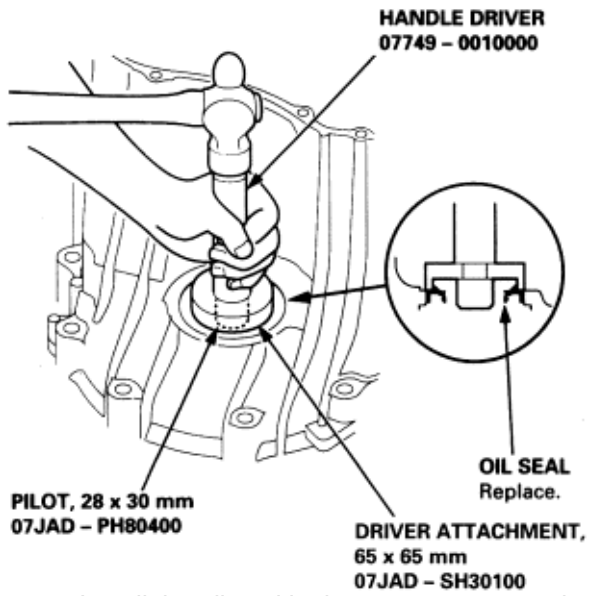
1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



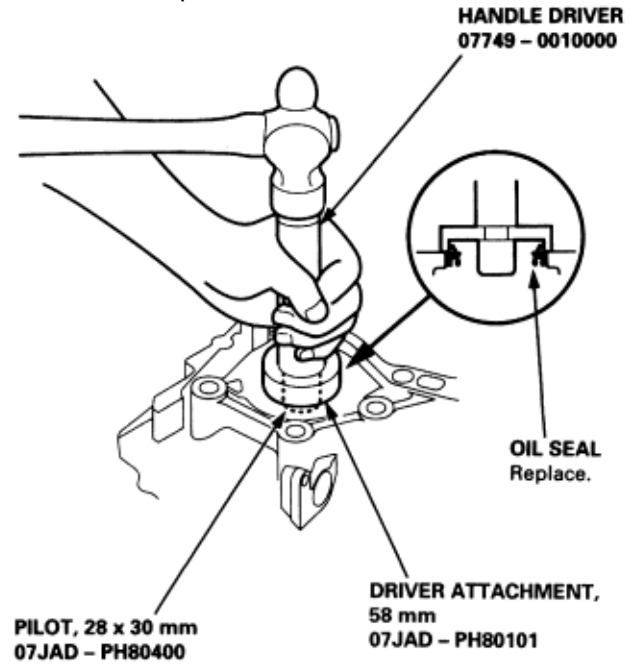
3. Remove the oil seal from the torque converter housing.



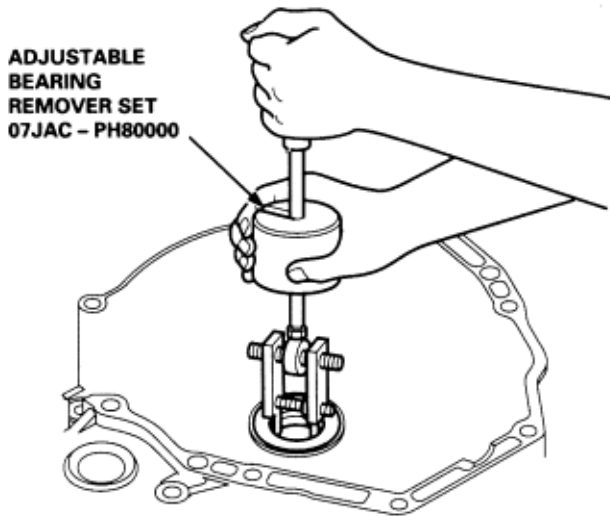
4. Install the oil seal in the transmission housing with the special tools.



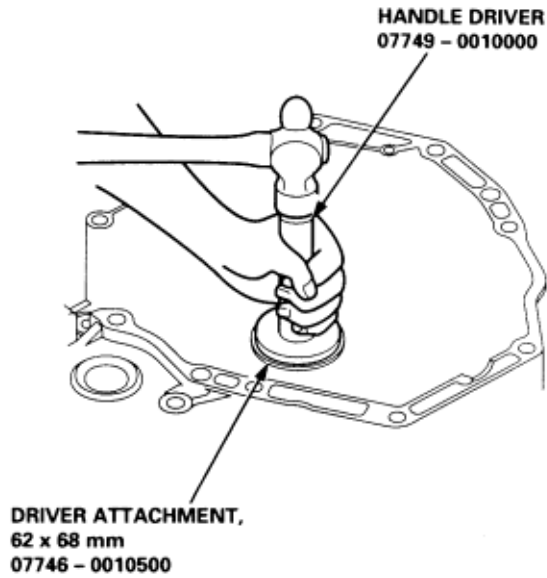
5. Install the oil seal in the torque converter housing with the special tools.



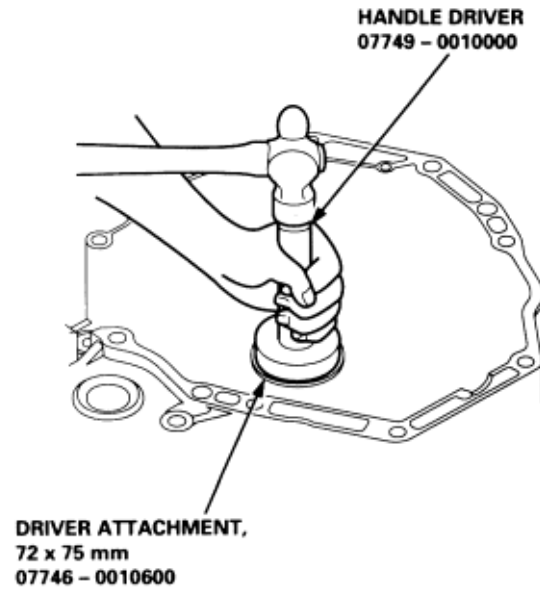
1. Remove the mainshaft bearing and oil seal using the special tool as shown.



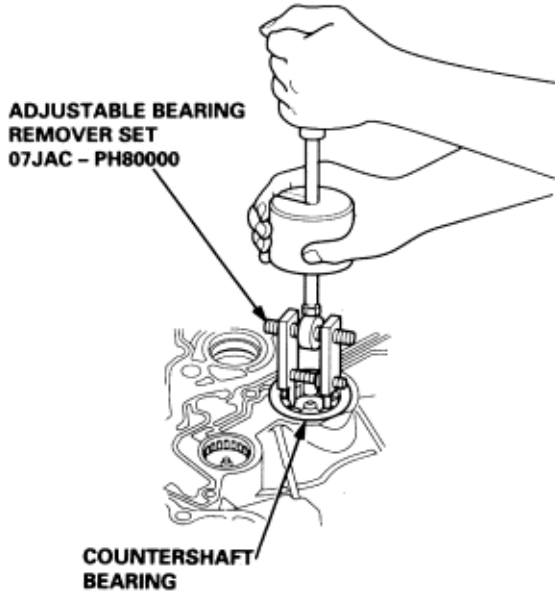
2. Drive in the new mainshaft bearing until it bottoms in the housing using the special tools as shown.



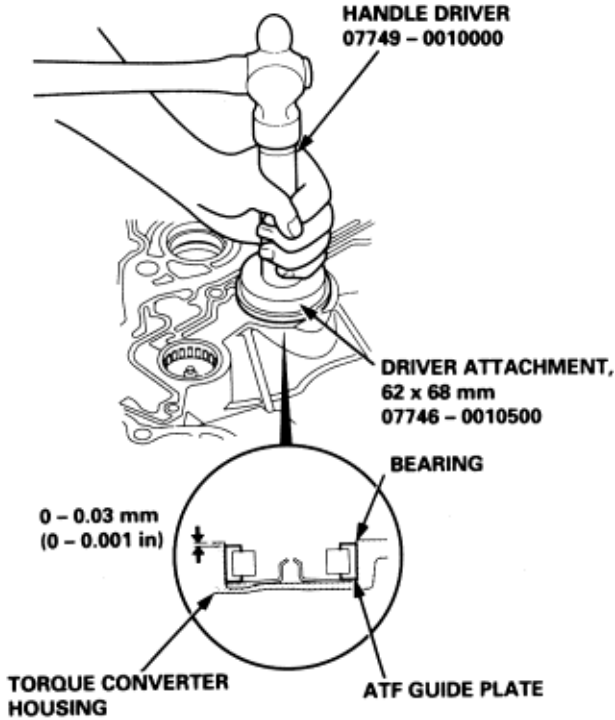
3. Install the new oil seal flush with the housing using the special tools as shown.



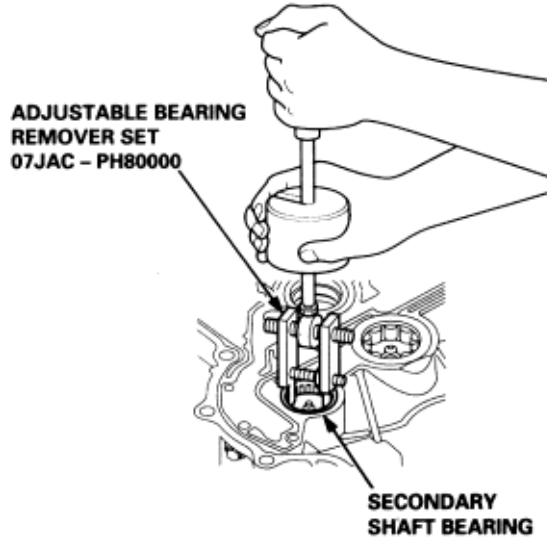
1. Remove the countershaft bearing using the special tool as shown.



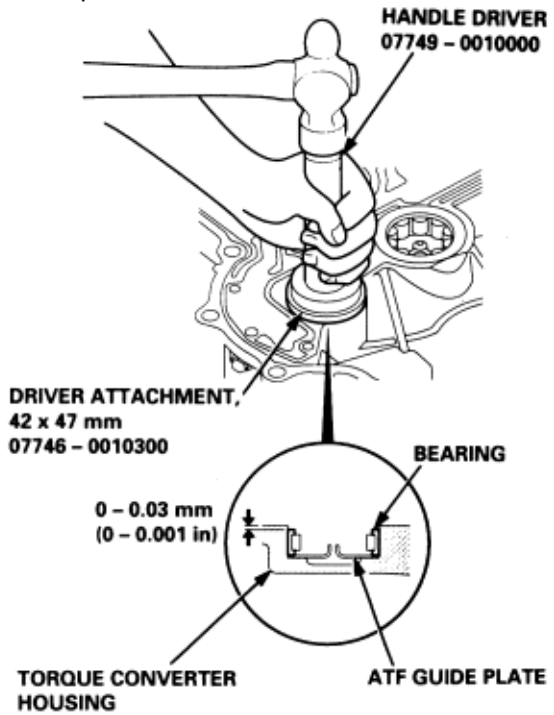
2. Install the ATF guide plate.
3. Install the new bearing into the housing using the special tools as shown.



1. Remove the secondary shaft bearing using the special tool as shown.



2. Install the ATF guide plate.
3. Install the new bearing into the housing using the special tools as shown.



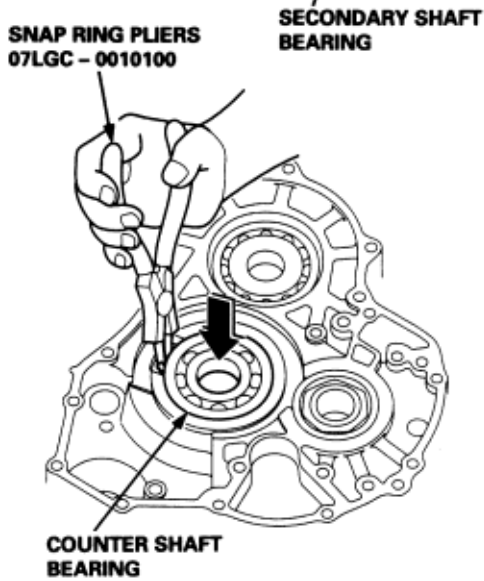
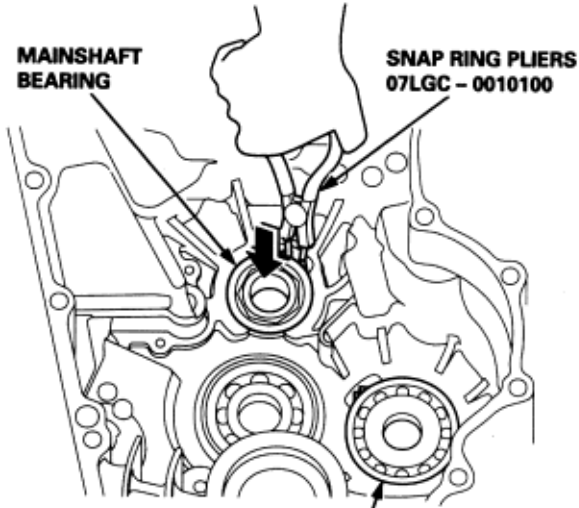
NOTE: Coat all parts with ATF before assembly.

1. To remove the mainshaft, countershaft and secondary shaft bearings from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out using the following special tools and a press as shown.

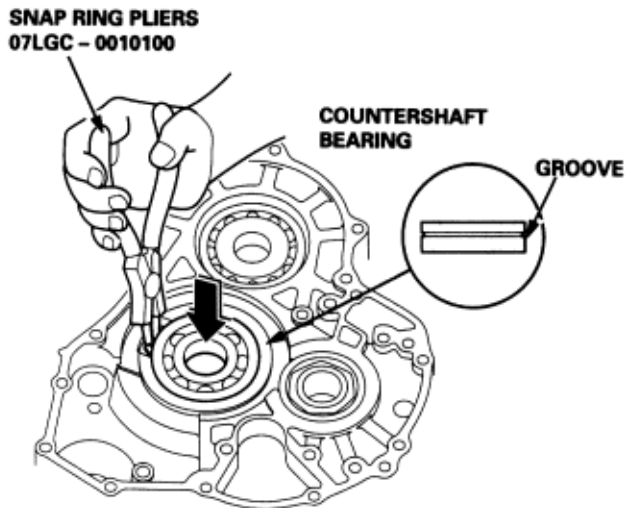
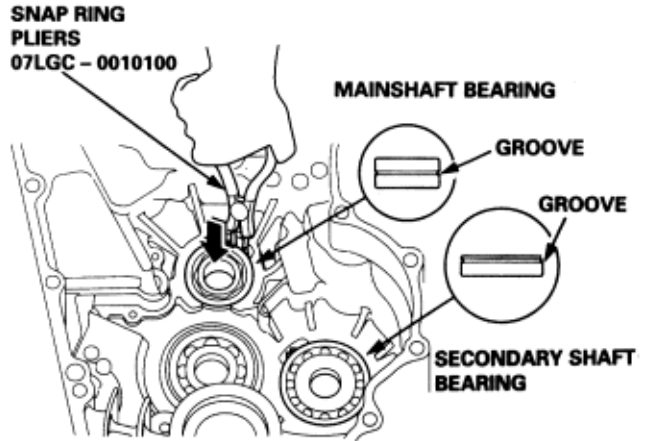
NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.

Special Tools for Transmission Housing Bearings Removal/Installation Use with Handle Driver (07749 - 0010000):

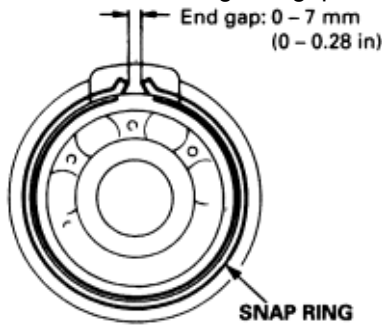
- ♦ **Mainshaft:**
Driver Attachment, 58 mm (07JAD - PH80101)
- ♦ **Countershaft and Secondary Shaft:**
Driver Attachment, 72 x 75 mm (07748 - 0010600)



2. Install the bearings in the direction shown.
3. Expand each snap ring with the snap ring pliers, and insert the bearing part-way into the housing using the special tools and a press as shown.
4. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

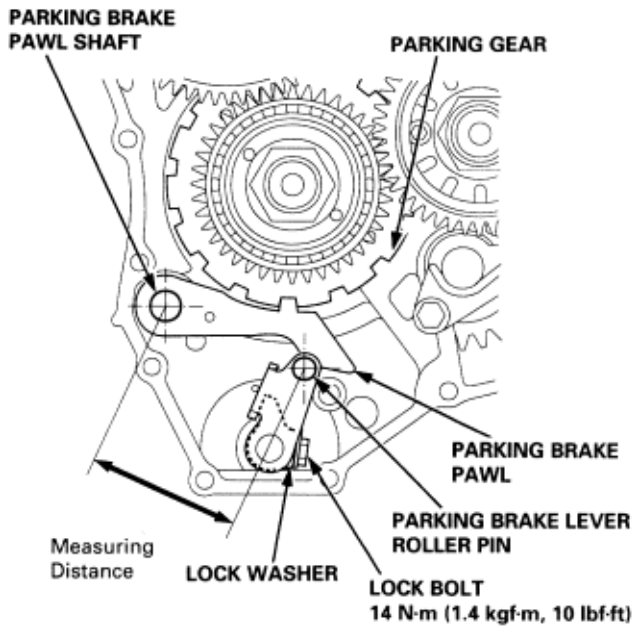


5. After installing the bearings verify the following:
 - ♦ The snap rings are seated in the bearing and housing grooves.
 - ♦ The ring end gaps are correct.

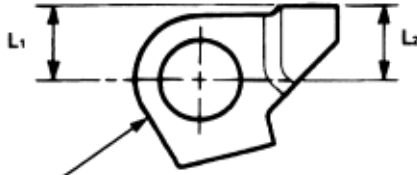


1. Set the parking brake lever in the **P** position.
2. Measure the distance between the parking brake pawl shaft and the parking brake lever roller pin as shown.

STANDARD: 69.5 – 70.5 mm (2.74 – 2.78 in)



3. If the measurement is out of tolerance, select and install the appropriate parking brake stop from the table below.



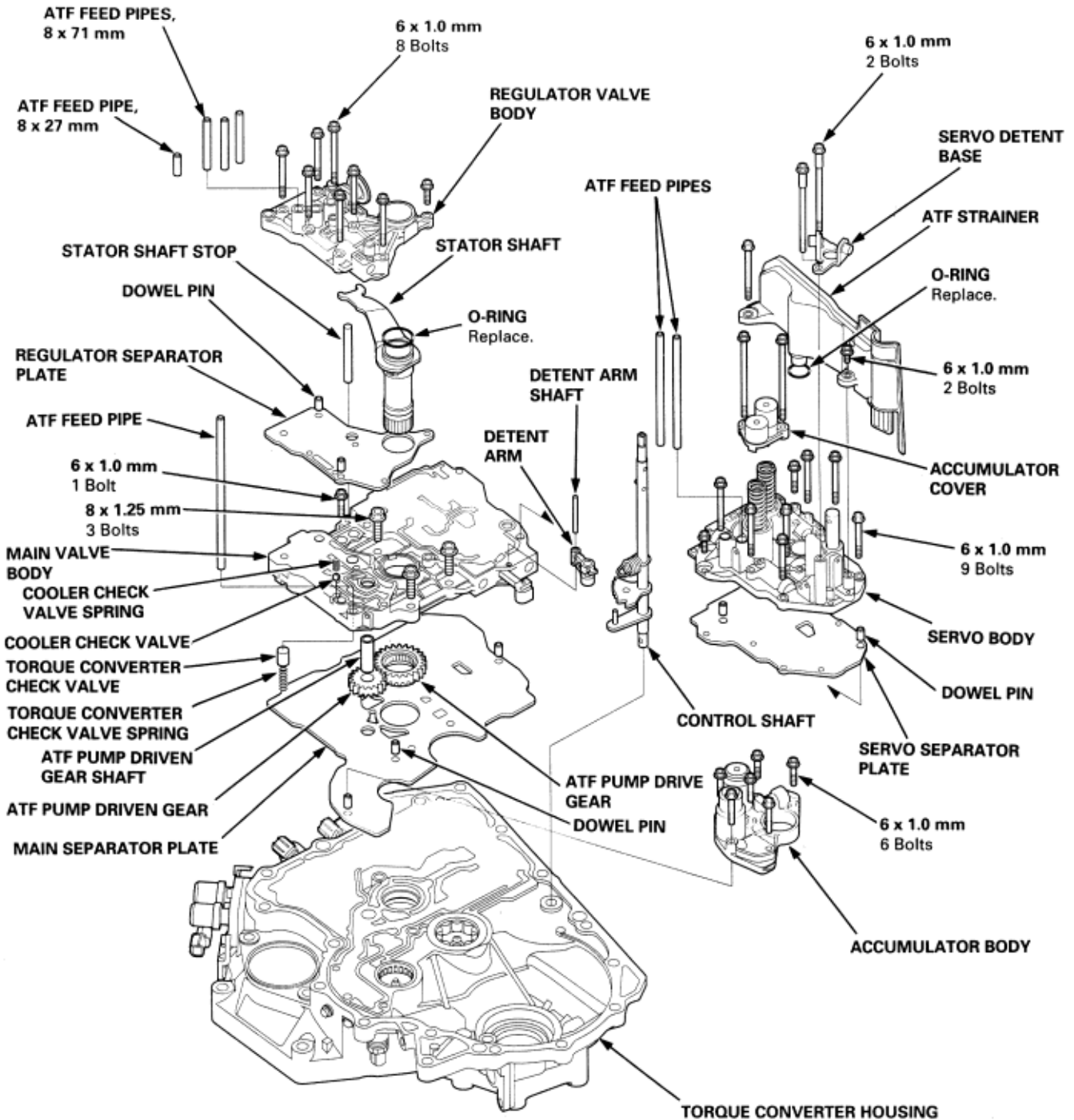
PARKING BRAKE STOP

Mark	Part Number	L ₁	L ₂
1	24537 – PA9 – 003	11.00 mm (0.433 in)	11.00 mm (0.433 in)
2	24538 – PA9 – 003	10.80 mm (0.425 in)	10.65 mm (0.419 in)
3	24539 – PA9 – 003	10.60 mm (0.417 in)	10.30 mm (0.406 in)

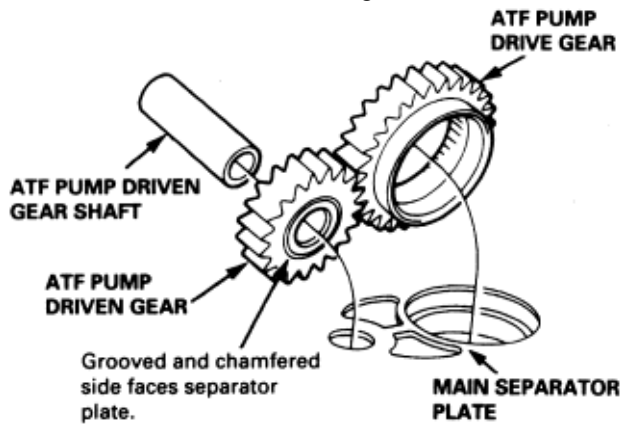
4. After replacing the parking brake stop, make sure the distance is within tolerance.

NOTE:

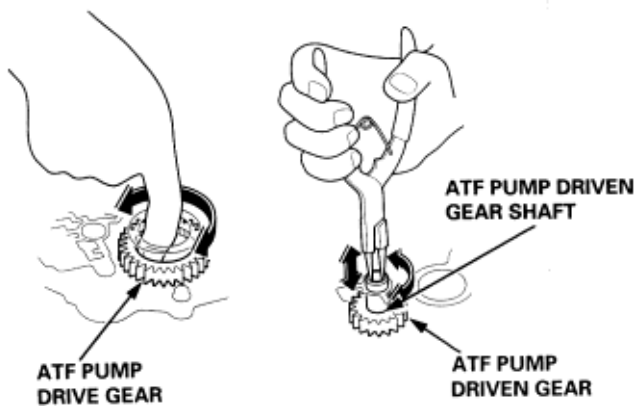
- ♦ Coat all parts with ATF.
- ♦ Replace the following parts:
 - O-rings
 - Lock washers
 - Gaskets
 - Locknuts and conical spring washers
 - Sealing washers
- ♦ **Torque:**
 - 6 x 1.0 mm: 12 Nm (1.2 kgf/m, 8.7 lbf/ft)
 - 8 x 1.25 mm: 18 Nm (1.8 kgf/m, 13 lbf/ft)



1. Install the main separator plate and three dowel pins on the torque converter housing. Then install the ATF pump gears and ATF pump driven gear shaft.
 NOTE: Install the ATF pump driven gear with its grooved and chamfered side facing down.

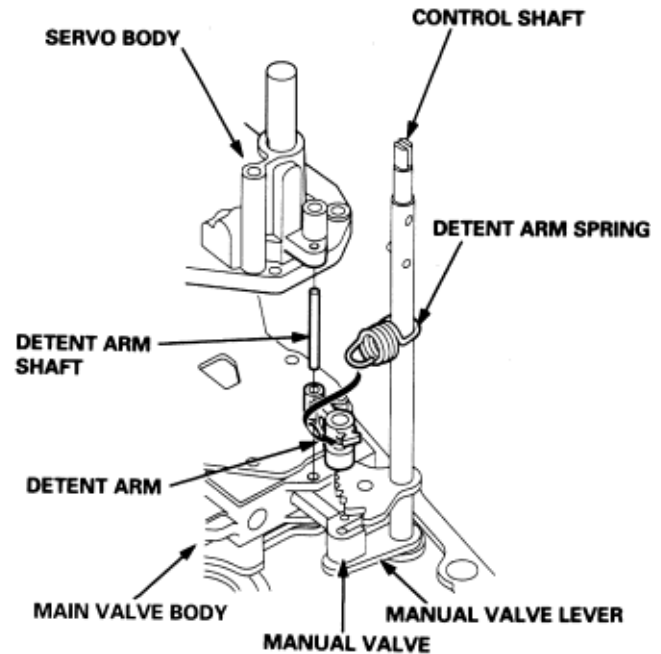


2. Install the torque converter check valve and spring, then install the main valve body (one 6 mm bolt and three 8 mm bolts). Make sure the ATF pump drive gear rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft moves smoothly in the axial and normal operating direction.

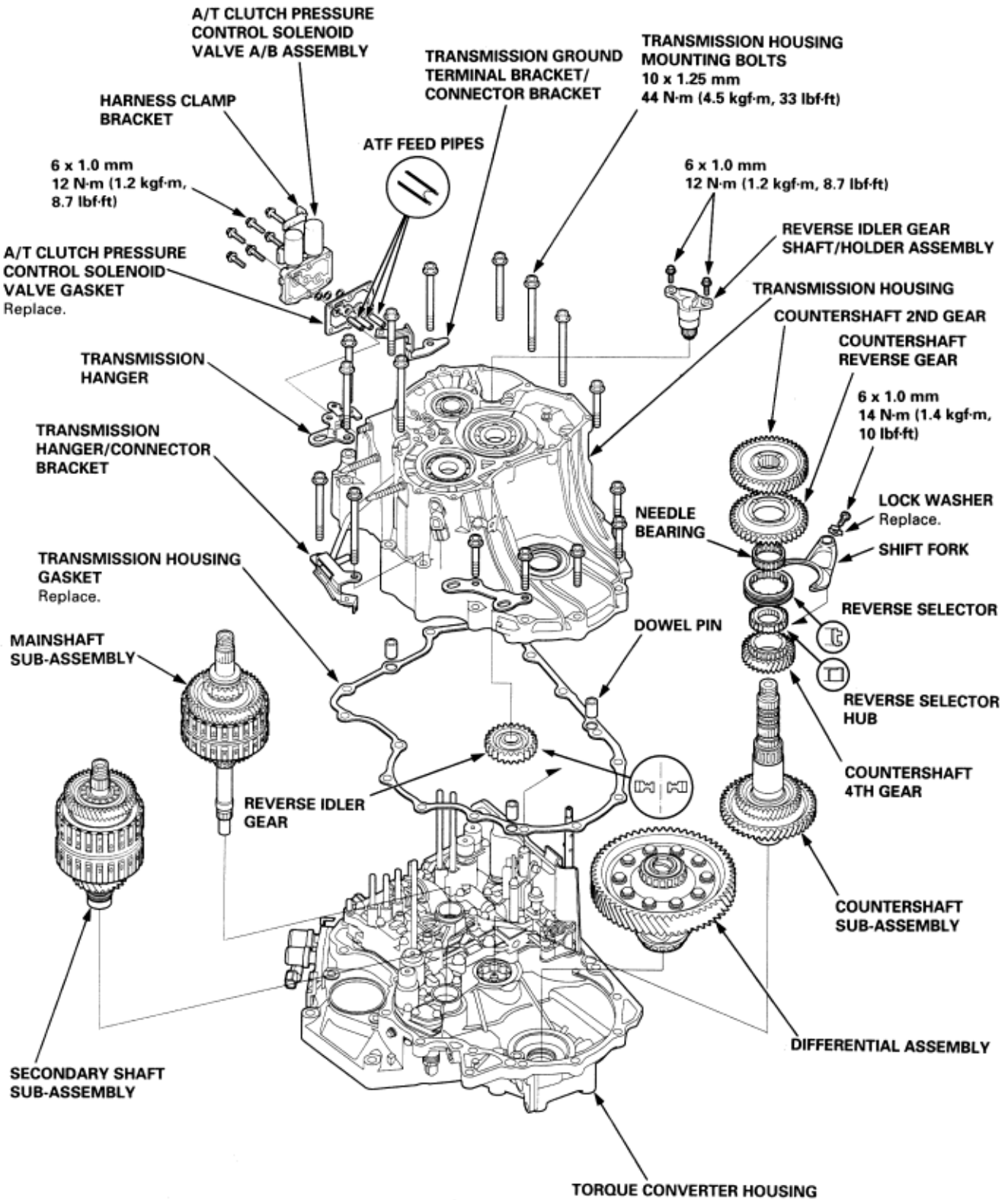


3. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly, will result in a seized ATF pump drive gear or ATF pump driven gear shaft.

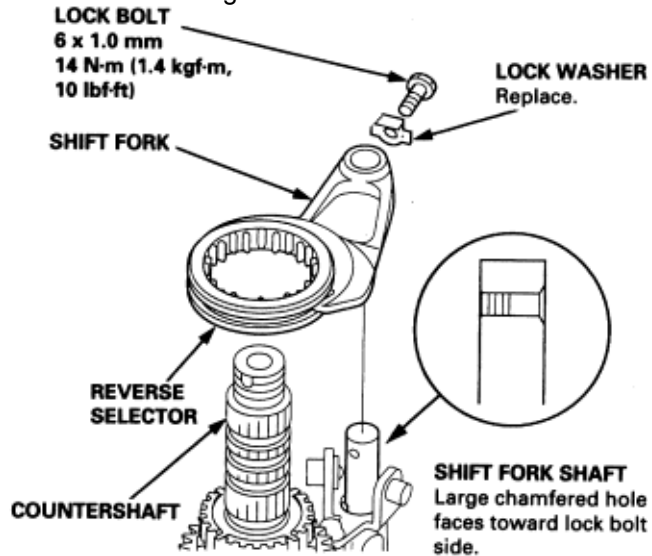
4. Install the cooler check valve and spring on the main valve body, then install the two dowel pins and the regulator separator plate.
5. Install the stator shaft and stator shaft stop.
6. Install the regulator valve body (eight bolts).
7. Install the two dowel pins and the servo separator plate on the main valve body.
8. Install the control shaft in the torque converter housing, along with the manual valve.
9. Install the detent arm and arm shaft in the main valve body, then hook the detent arm spring to the detent arm.



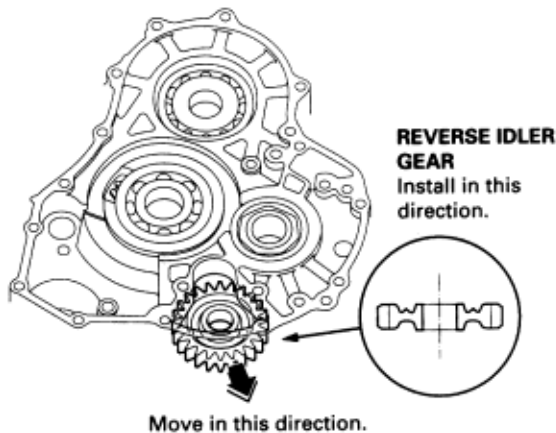
10. Install the servo body (nine bolts).
11. Install the accumulator cover (two bolts).
12. Install the ATF strainer (two bolts).
13. Install the servo detent base (two bolts).
14. Install the accumulator body (six bolts).
15. Install the two ATF feed pipes in the servo body, four pipes in the regulator valve body, and one pipe in the main valve body.



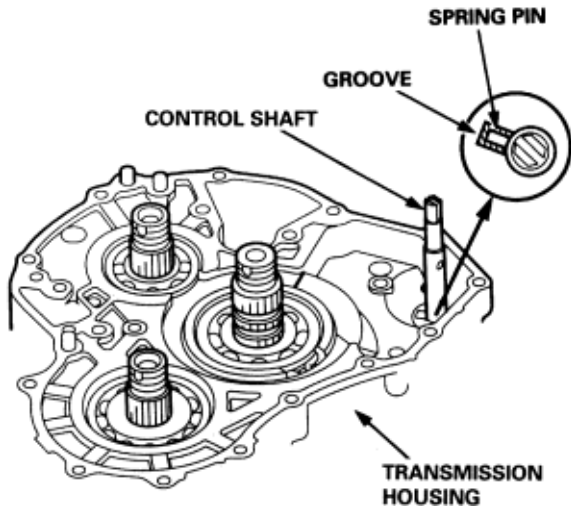
16. Install the countershaft 4th gear and reverse selector hub on the countershaft. If the reverse selector hub is a press-fitted type, for the installation (see page 14-167) and (see page 14-168).
17. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly and secondary shaft sub-assembly in the torque converter housing.
18. Turn the shift fork shaft so the large chamfered hole is facing the fork bolt hole. Then install the shift fork and reverse selector together on the shift fork shaft and countershaft. Secure the shift fork to the shift fork shaft with the lock bolt and a new lock washer, then bend the lock washer against the bolt head.



19. Install the needle bearing, countershaft reverse gear and countershaft 2nd gear on the countershaft.
20. Install the reverse idler gear in the transmission housing in the direction shown, then slip it the direction as shown.

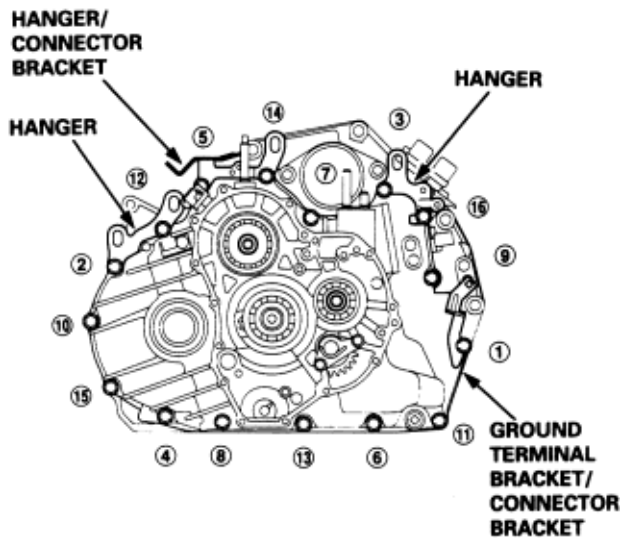


21. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.



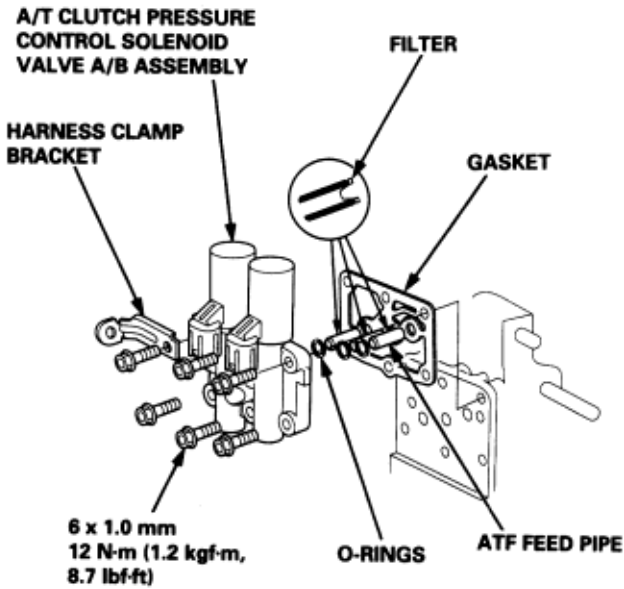
22. Install three dowel pins and a new gasket on the torque converter housing.
23. Place the transmission housing on the torque converter housing.
24. Install the transmission housing mounting bolts along with the transmission hanger/connector bracket, transmission hangers, connector bracket and transmission ground terminal bracket/connector bracket. Tighten the bolts in two or more steps in the sequence shown.

TORQUE: 44 N-m (4.5 kgf-m, 33 lbf-ft)

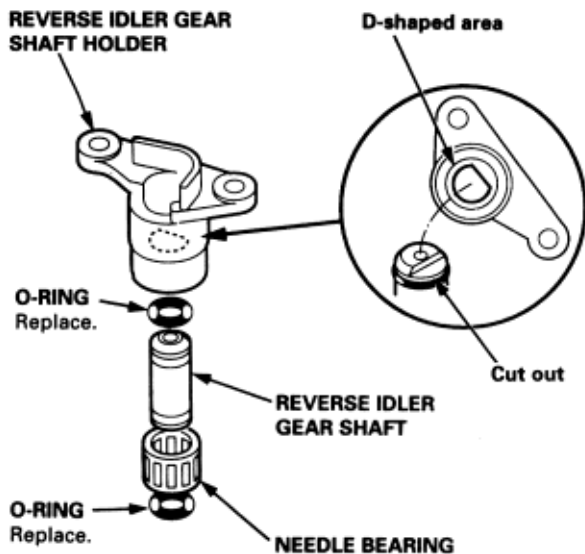


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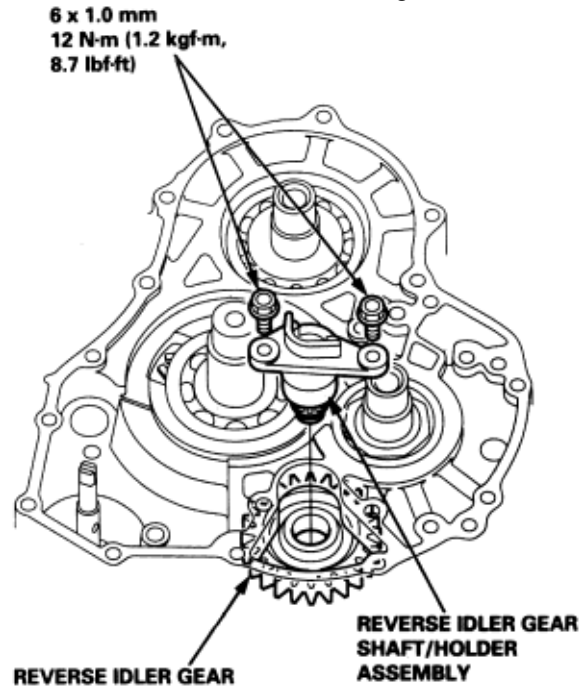
25. Install the ATF feed pipes with their filter side into the transmission housing, then install new O-rings, new gasket, harness clamp bracket and the A/T clutch pressure control solenoid valve A/B assembly over the ATF feed pipes on the transmission housing.



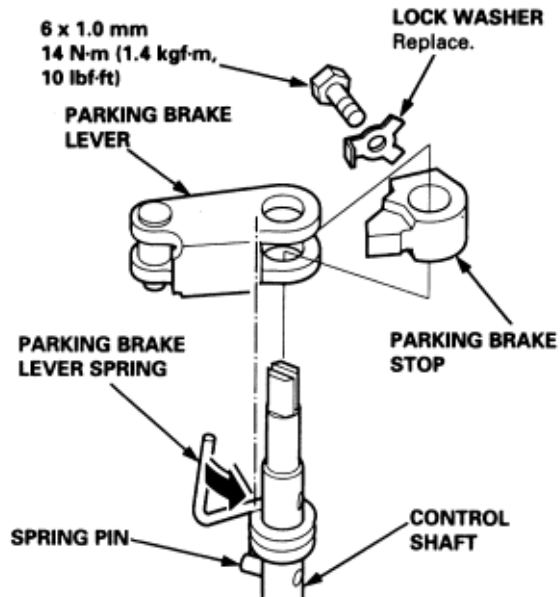
26. Coat the reverse idler gear shaft, needle bearing and new O-rings with lithium grease lightly. Assemble new O-rings and needle bearing on the reverse idler gear shaft, then install the reverse idler gear shaft in the reverse idler gear shaft holder. Align the D-shaped cut out of the shaft with the D-shaped area of the holder.



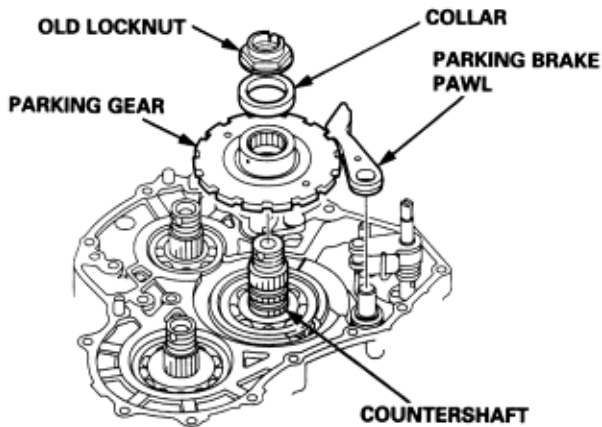
27. Engage the reverse idler gear with the countershaft reverse gear and mainshaft reverse gear, then install the reverse idler gear shaft/holder assembly on the transmission housing.



28. Install the parking brake lever on the control shaft then install the lock bolt with a new lock washer. **NOTE:** Do not bend the lock tab of the lock washer in this step, bend it after checking parking brake pawl engagement step 51.



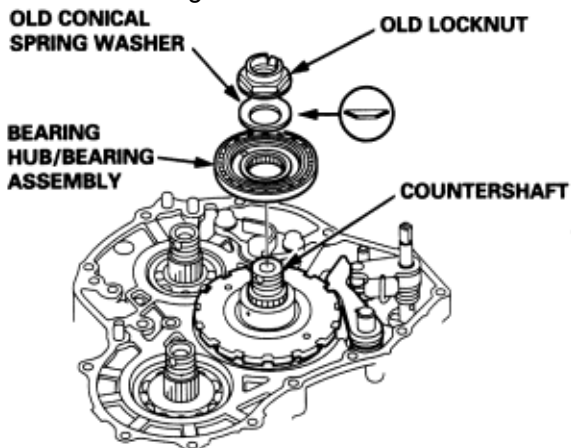
29. Coat the following parts with ATF:
- ♦ Splines of the countershaft, the parking gear and the old locknut.
 - ♦ Threads of the countershaft and the old locknut.
 - ♦ Old conical spring washer.
 - ♦ Collar for installing the parking gear.
30. Install the parking gear using the old locknut and a collar. Hold the parking brake pawl to engage with the parking gear, then tighten the old locknut until the shaft splines come out slight amount of the splines over the parking gear.



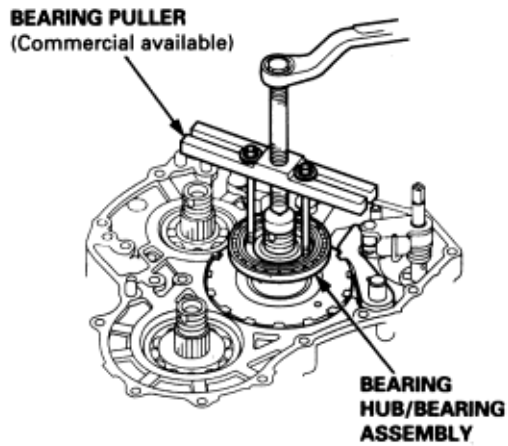
31. Remove the locknut and the collar, then install the bearing hub/bearing assembly and old conical spring washer. Tighten the old locknut to seat the parking gear to the specified torque, then loosen and remove the locknut and conical spring washer.

TORQUE: 226 Nm (23.0 kgf/m, 166 lbf/ft)

NOTE: Do not use impact wrench, always use a torque wrench to tighten the locknut.



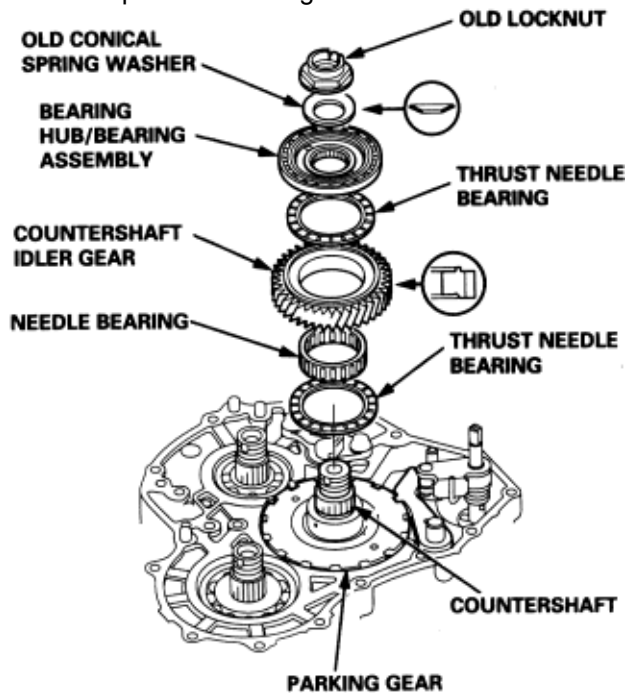
32. Remove the bearing hub/bearing assembly using a puller as shown.



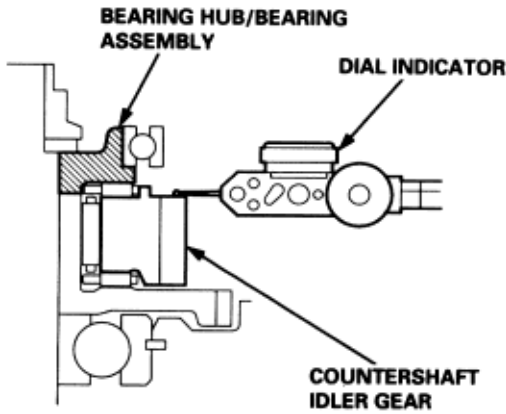
33. Install the thrust needle bearing, needle bearing, countershaft idler gear, thrust needle bearing, bearing hub/bearing assembly and the old conical spring washer. Then tighten the old locknut to seat the bearing hub/bearing assembly to the specified torque.

TORQUE: 167 Nm (17.0 kgf/m, 123 lbf/ft)

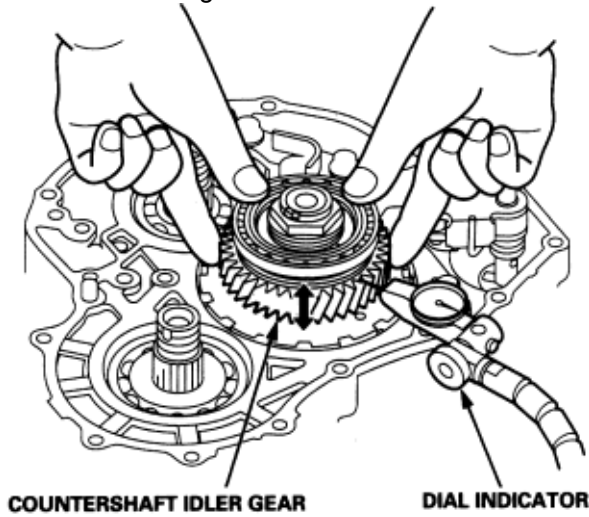
NOTE: Do not use impact wrench, always use a torque wrench to tighten the locknut.



34. Set the dial indicator to the countershaft idler gear as shown.

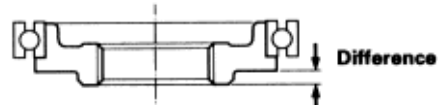


35. Measure the countershaft idler gear axial clearance while moving the countershaft idler gear.
STANDARD: 0.015 - 0.045 mm (0.0006 - 0.0018 in)
 NOTE: Take measurements in at least three places, and use the average as the actual clearance.



36. If the clearance is out of standard, remove the bearing hub/bearing assembly using a puller.
 37. Select and install the new bearing hub/bearing assembly, then recheck.

BEARING HUB/BEARING ASSEMBLY



38. After replacing the bearing hub/bearing assembly, make sure that the clearance is within standard.
 39. Remove the old locknut and old conical spring washer from the countershaft.
 40. Install the special tool onto the mainshaft as shown.

BEARING HUB

Mark	Part Number	Difference
A	90520 - P6H - 000	3.503 mm (0.1379 in)
B	90521 - P6H - 000	3.490 mm (0.1374 in)
C	90522 - P6H - 000	3.477 mm (0.1369 in)
D	90523 - P6H - 000	3.464 mm (0.1364 in)

41. Coat the following parts with ATF:
 - ♦ Splines of the mainshaft, secondary shaft, and those idler gears.
 - ♦ Threads of the mainshaft, secondary shaft.
 - ♦ Threads of the old mainshaft locknut and the old secondary shaft locknut.
 - ♦ Old conical spring washers.
42. Install the mainshaft idler gear and the old conical spring washer on the mainshaft. Tighten the old locknut to seat the idler gear to the specified torque, then loosen and remove the locknut and the conical spring washer.

TORQUE: 226 Nm (23.0 kgf/m, 166 lbf/ft)

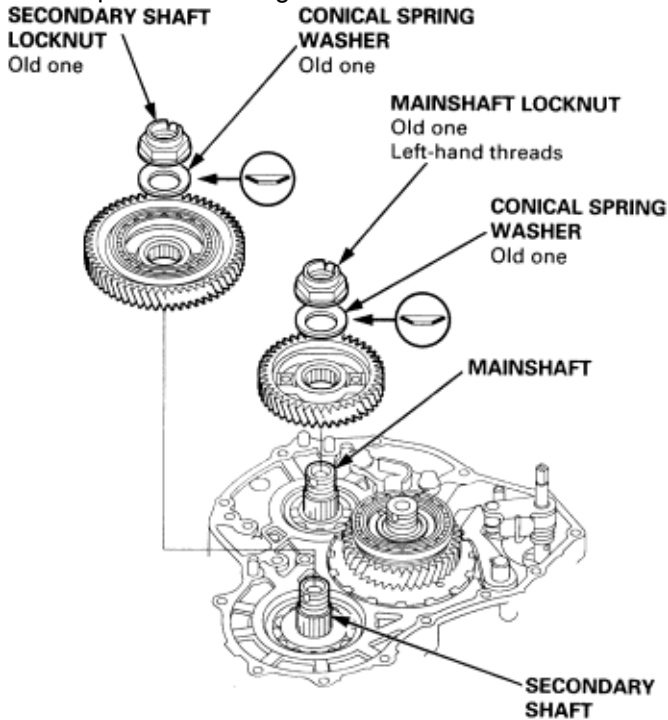
NOTE:

- ♦ Do not use an impact wrench, always use a torque wrench to tighten the locknut.
- ♦ Mainshaft locknut has left-hand threads.

43. Install the secondary shaft idler gear and the old conical spring washer on the secondary shaft. Tighten the old locknut to seat the idler gear to the specified torque, then loosen and remove the locknut and the conical spring washer.

TORQUE: 226 Nm (23.0 kgf/m, 166 lbf/ft)

NOTE: Do not use an impact wrench, always use a torque wrench to tighten the locknut.

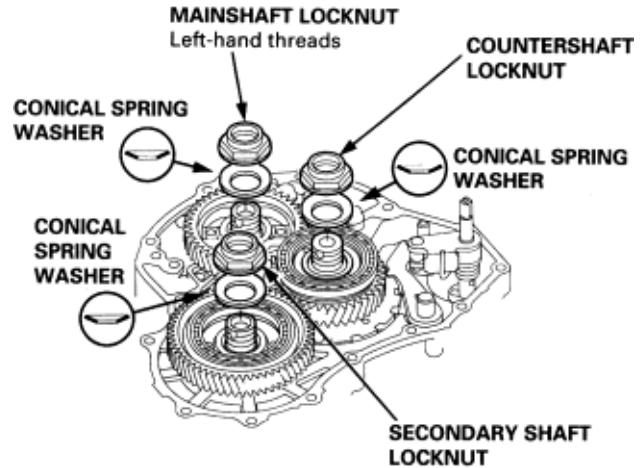


44. Coat the threads of each shaft and the new locknut, and the new conical spring washers with ATF.
 45. Install the new conical spring washers and the new locknuts on each shaft.
- NOTE: Install the conical spring washer in the direction shown.
46. Tighten the locknuts to the specified torque using a torque wrench.

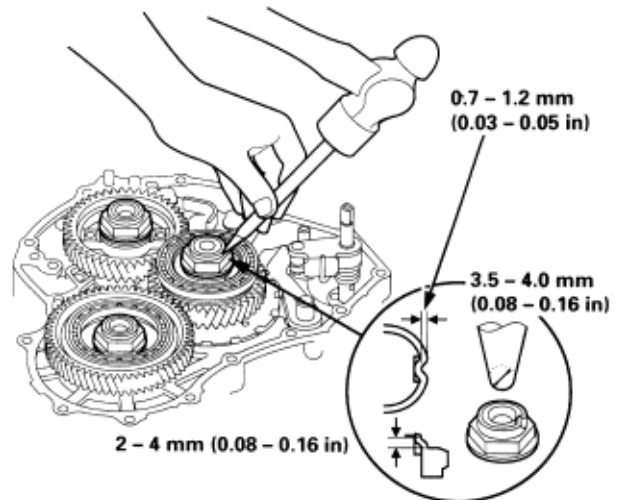
TORQUE: 167 Nm (17.0 kgf/m, 123 lbf/ft)

NOTE:

- ♦ Do not use an impact wrench, always use a torque wrench to tighten the locknut.
- ♦ Mainshaft locknut has left-hand threads.

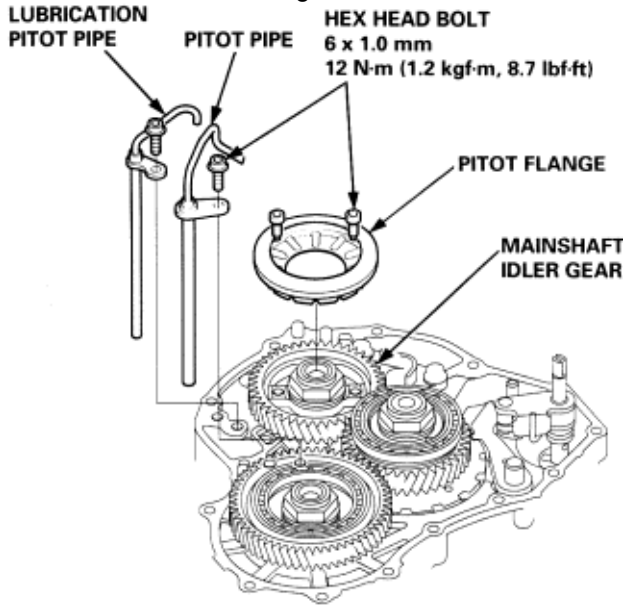


47. Stake each locknut into its shaft using a 3.5 mm punch as shown.

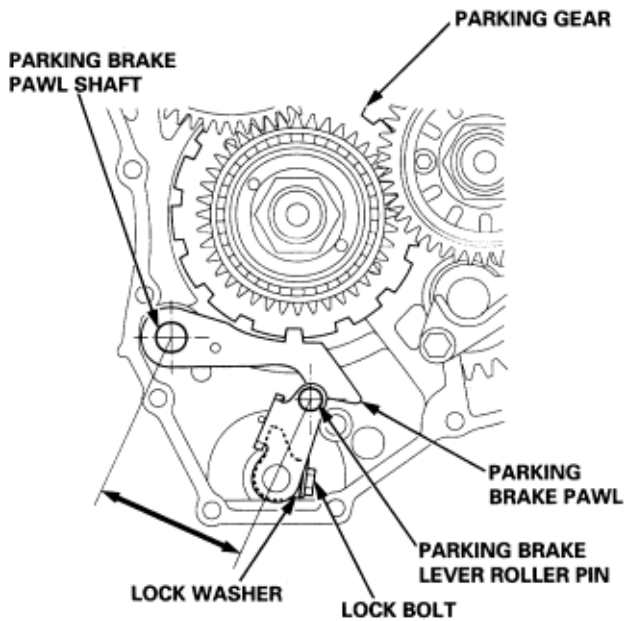


(cont'd)

48. Install the pitot flange on the mainshaft idler gear, then install the lubrication pitot pipe and the pitot pipe on the transmission housing.

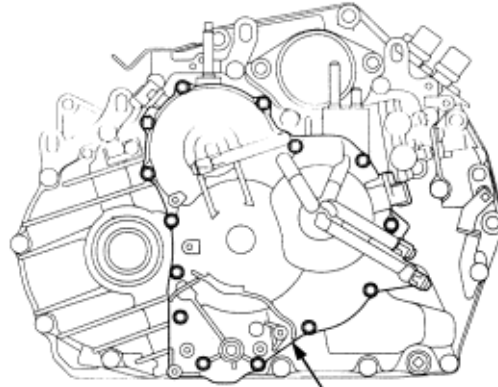


49. Set the parking brake lever in the **P** position, then verify that the parking brake pawl engages the parking gear.
50. If the parking brake pawl does not engage fully, check the distance between the parking brake pawl shaft and the parking brake lever roller pin (see page 14-191).
51. Tighten the lock bolt, and bend the lock tab against the lock bolt head.

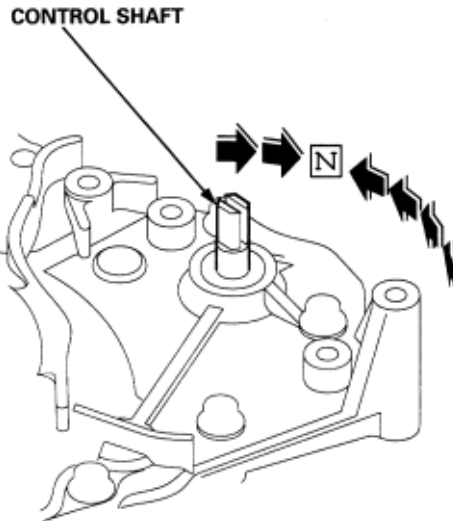


52. Install the right side cover with two dowel pins and new O-rings (14 bolts).

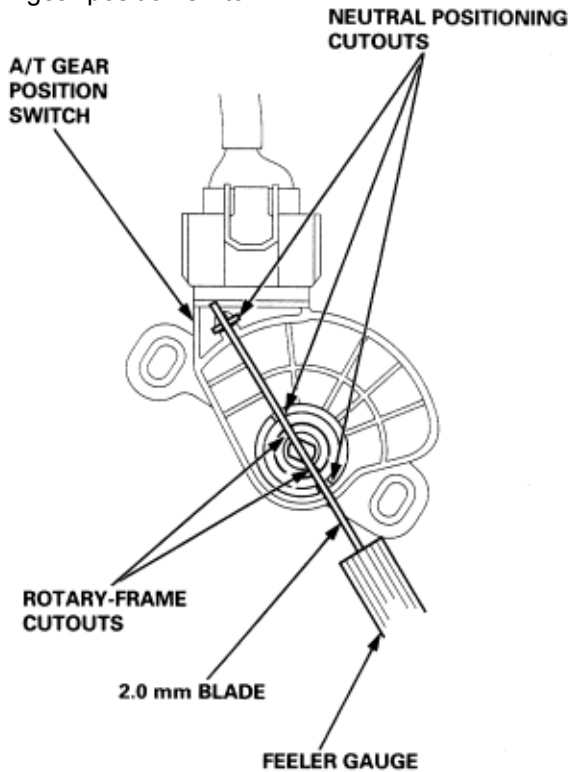
TORQUE: 12 N-m (1.2 kgf-m, 8.7 lbf-ft)



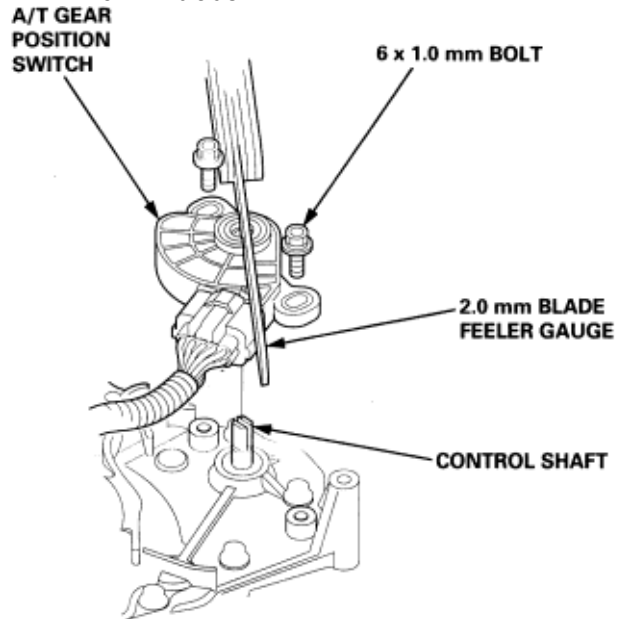
53. Set the control shaft in the **N** position by turning the control shaft.



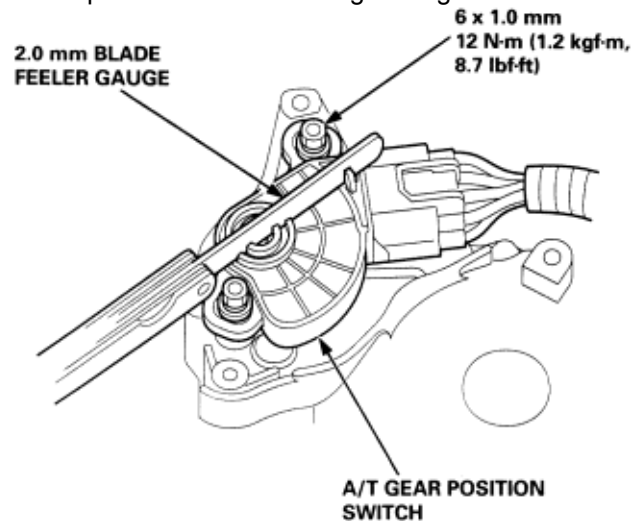
54. Connect the A/T gear position switch harness to the switch connector.
55. Align the cutouts on the rotary-frame with the neutral positioning cutouts on the A/T gear position switch, then put the 2.0 mm blade of the feeler gauge in the cutouts to hold the **N** position.
NOTE: Be sure to use the 2.0 mm blade or an equivalent when holding the **N** position on the A/T gear position switch.



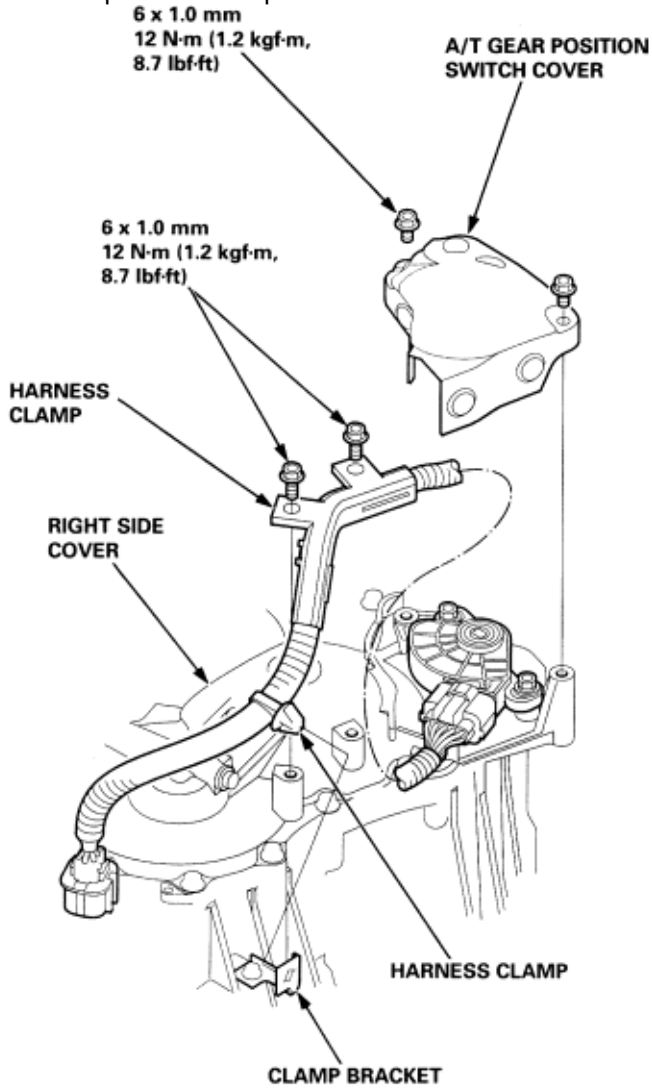
56. Install the A/T gear position switch gently on the control shaft with holding the **N** position with the 2.0 mm blade.



57. Tighten the bolts on the A/T gear position switch with remaining the 2.0 mm blade to hold the **N** position.
NOTE: Take care not to move the A/T gear position switch when tightening the bolts.



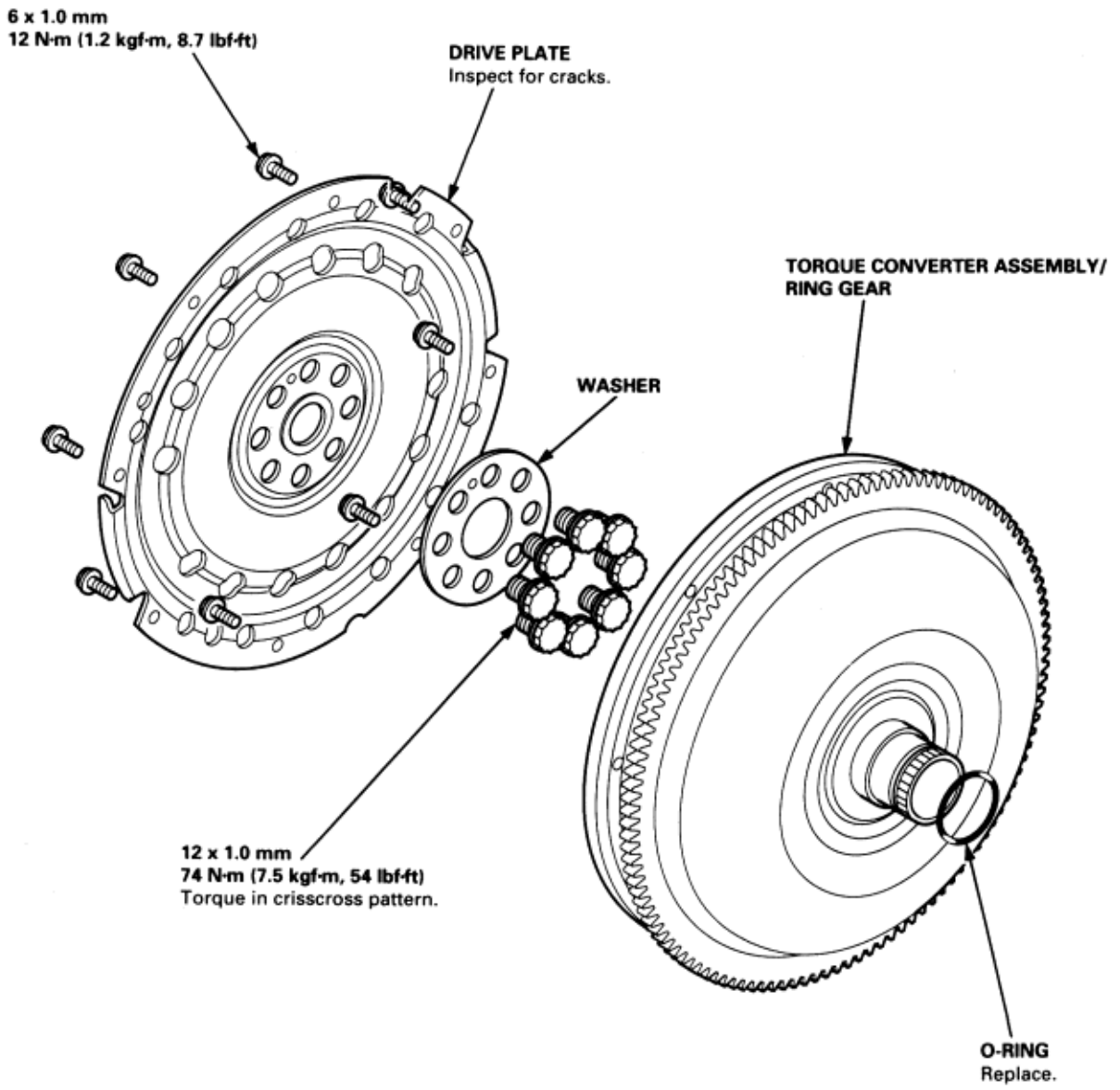
58. Install the A/T gear position switch cover, then secure the harness clamp with the bolts, and install the harness clamp on the clamp bracket.



59. Install the ATF cooler lines with new sealing washers.

TORQUE: 28 Nm (2.9 kgf/m, 21 lbf/ft)

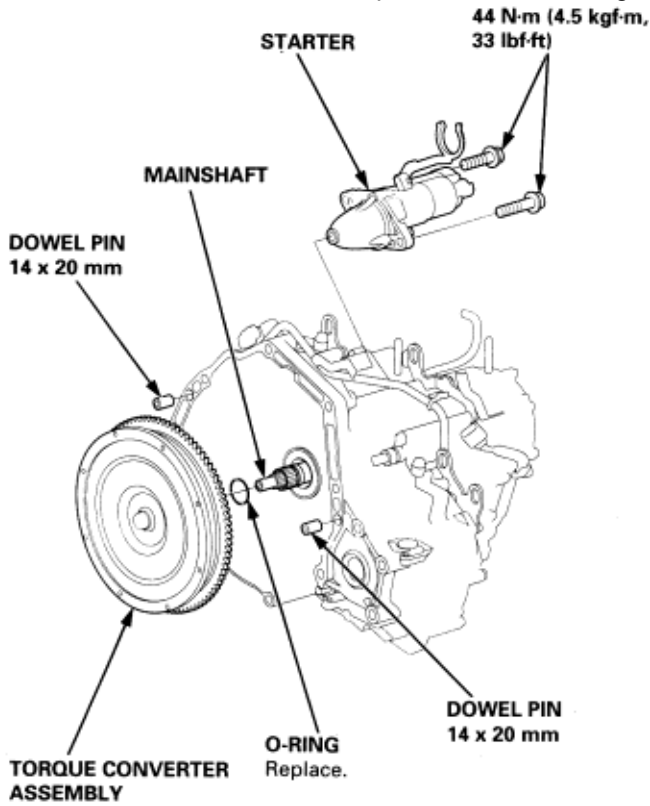
60. Install the breather tube.
61. Install the ATF dipstick.



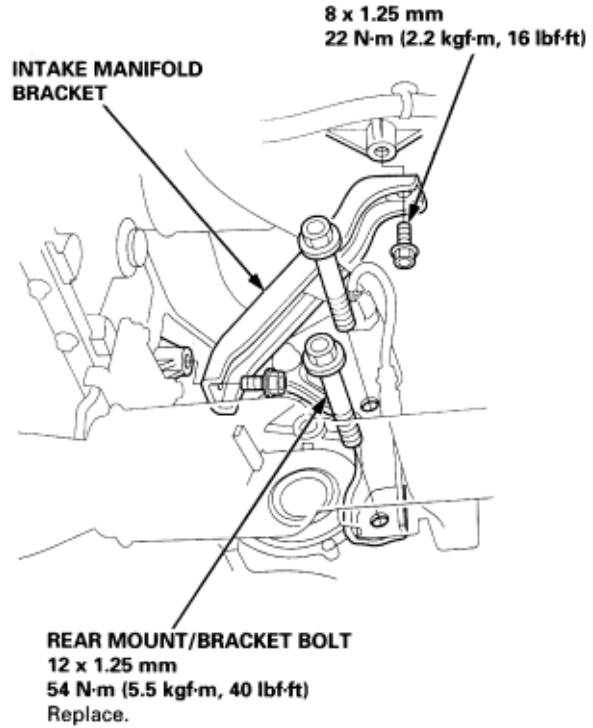
Transmission Installation

14-204

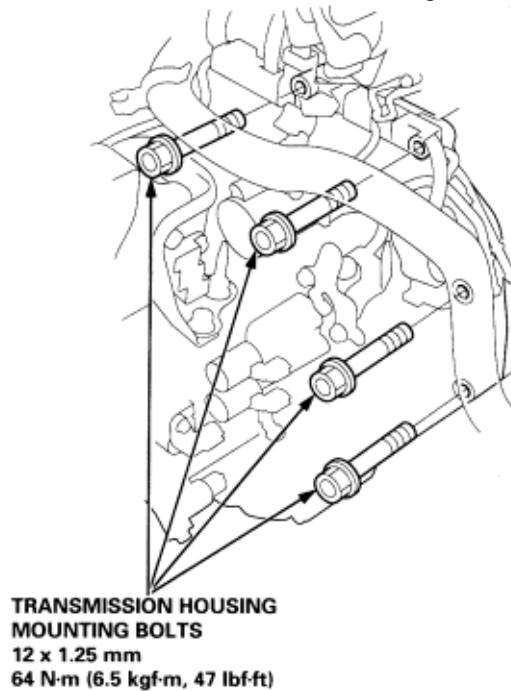
1. Install the torque converter assembly on the mainshaft with a new O-ring.
2. Install the 14 mm dowel pins in the torque converter housing.
3. Install the starter on the torque converter housing.



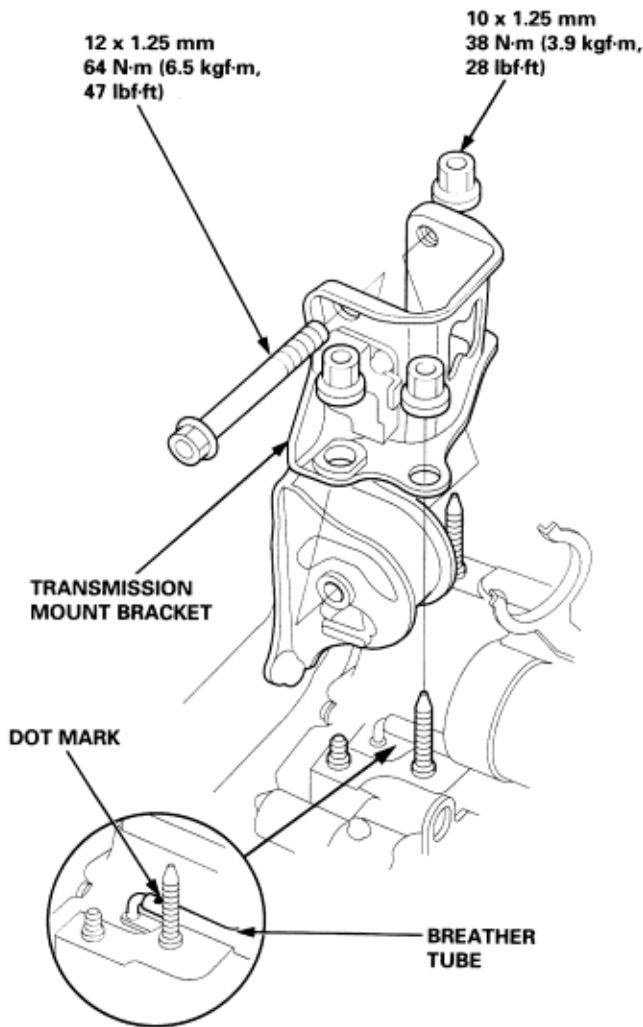
4. Place the transmission on a jack, and raise it to engine level.
5. Attach the transmission to the engine, then install the rear mount/bracket bolts and intake manifold bracket bolts.



6. Install the transmission housing mounting bolts.

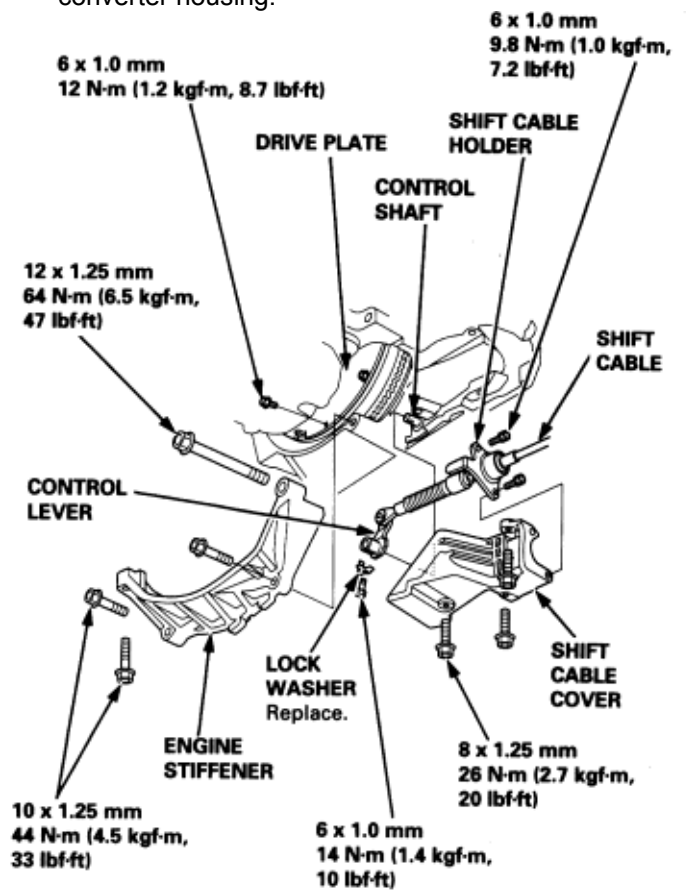


7. Face the dot mark on the breather tube up.



8. Install the transmission mount brackets. Tighten the bolt loosely, and tighten the nuts to the specified torque, then tighten the bolt to the specified torque.
9. Remove the transmission jack and hoist bracket.

10. Attach the torque converter to the drive plate with eight bolts. Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.
11. Tighten the crankshaft pulley bolt as necessary (see section 6).
12. Install the control lever with the shift cable on the control shaft. Do not bend the shift cable excessively.
13. Install the lock bolt with a new lock washer, then bend the lock washer against the bolt.
14. Install the engine stiffener.
15. Install the shift cable cover, then install the shift cable holder on the shift cable cover.
- NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.

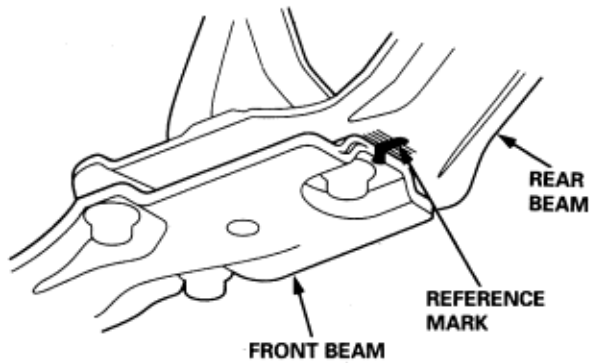
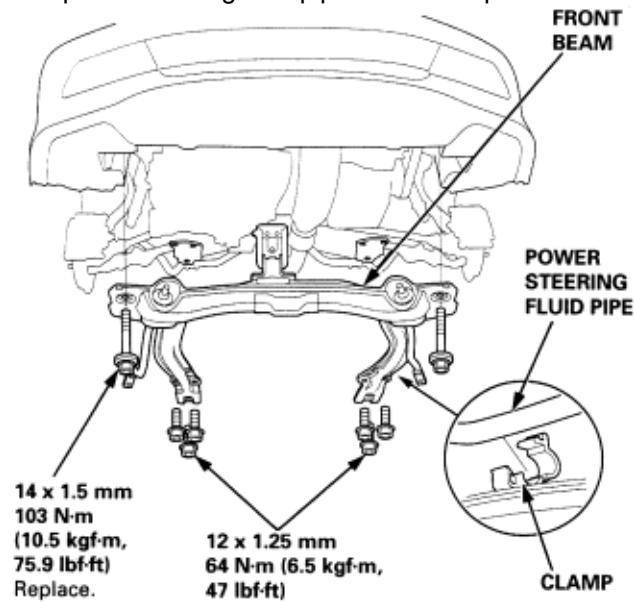


16. Install new set rings on the right and left drive-shafts.
17. Install the right and left driveshaft (see section 16). While installing the driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

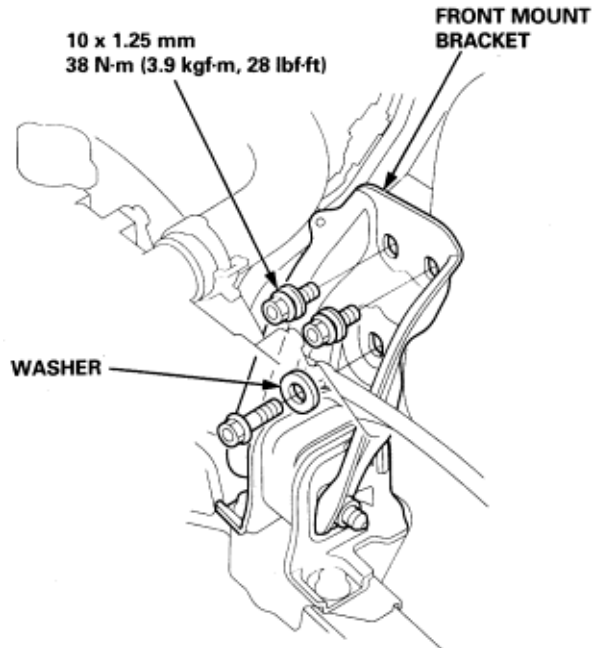
NOTE:

- ♦ Clean the areas where the driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
- ♦ Turn the right and left steering knuckle fully outward, and slide the driveshaft into the differential until you feel its spring clip engage the side gear.

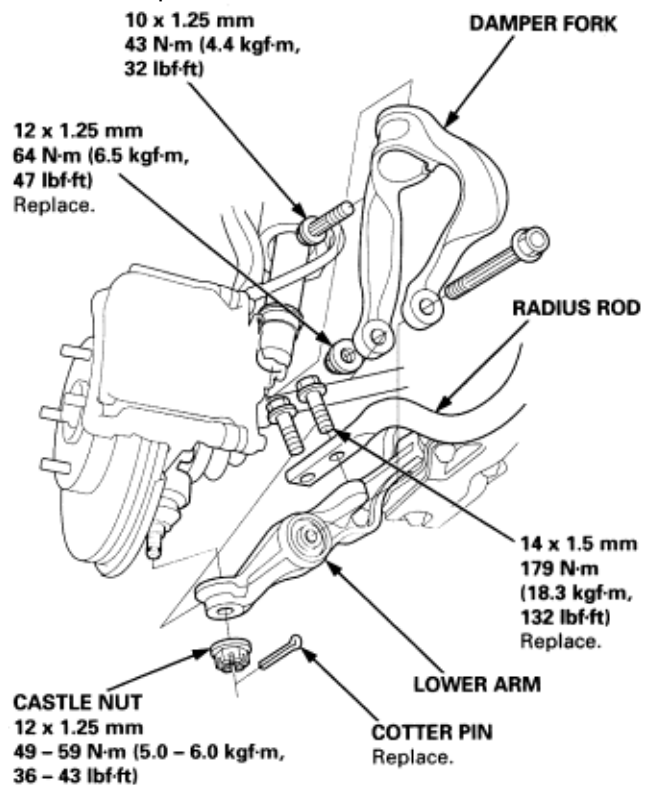
18. Install the front beam by aligning both reference marks on the rear beam, then tighten the bolts. Install the power steering fluid pipe on its clamp.



19. Install the front mount bracket bolts.

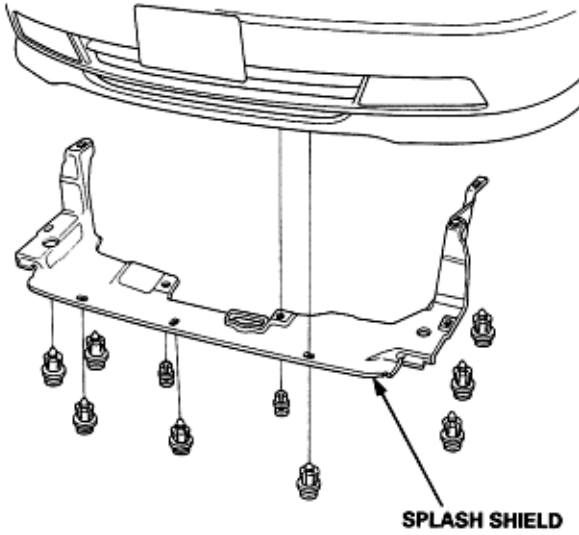


20. Install the damper forks, then install the ball joints on each lower arms with the castle nuts and new cotter pins.



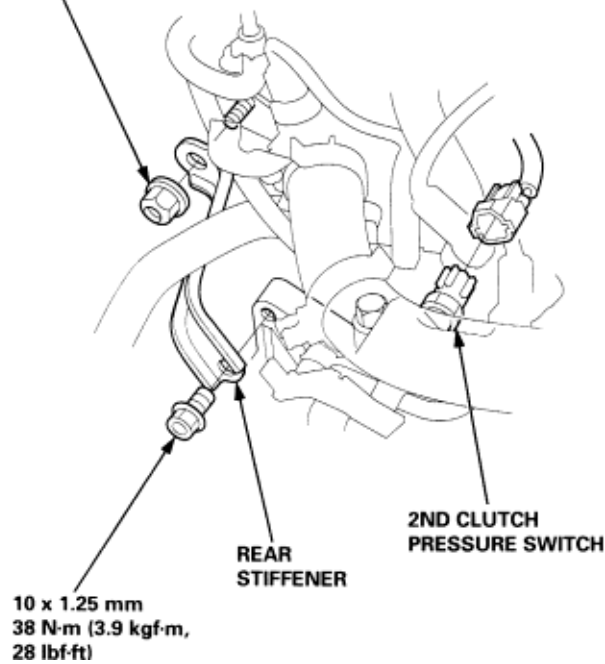
21. Install the radius rods and damper forks on each lower arm.

22. Install the splash shield.



23. Connect the 2nd clutch pressure switch connector, and install the rear stiffener. Do not allow water, fluid, oil, dust, or other foreign particles to get inside the 2nd clutch pressure switch connector.

10 x 1.25 mm
38 N·m (3.9 kgf·m,
28 lbf·ft)

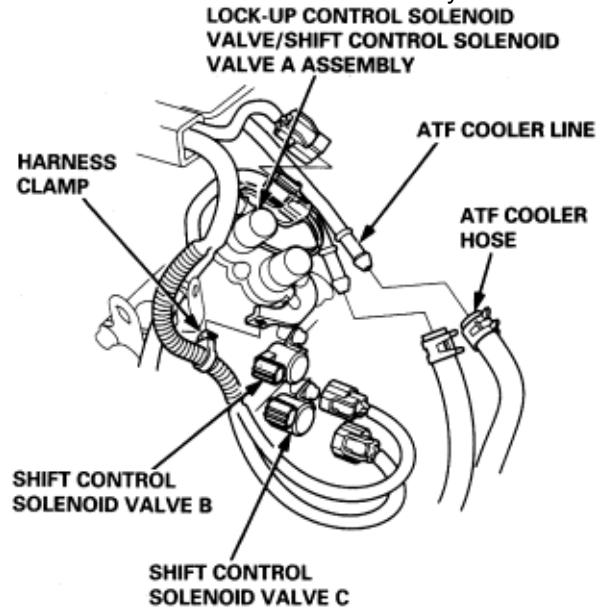


REAR
STIFFENER

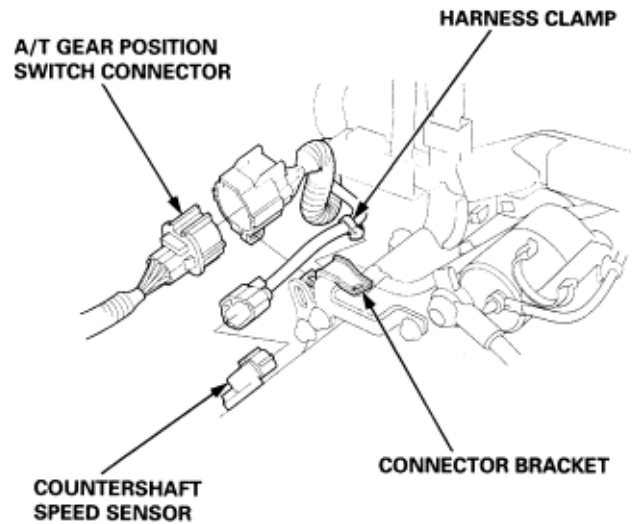
2ND CLUTCH
PRESSURE SWITCH

10 x 1.25 mm
38 N·m (3.9 kgf·m,
28 lbf·ft)

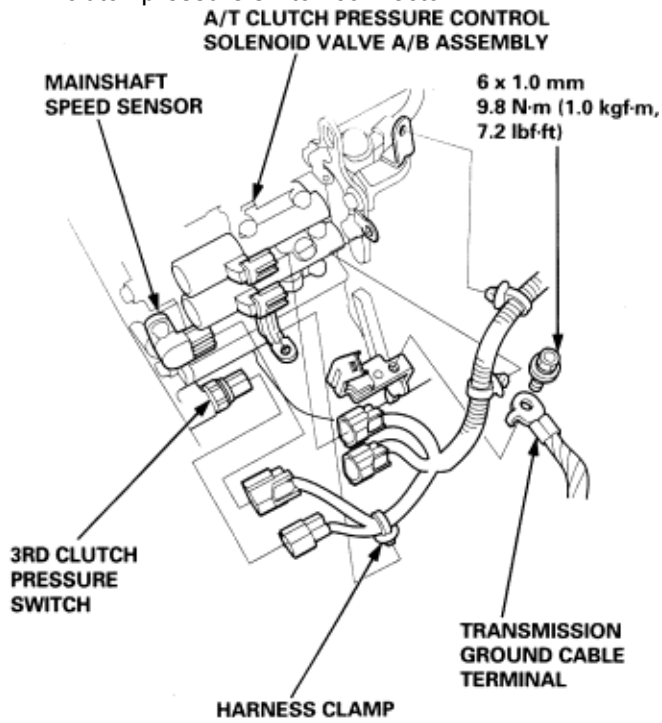
24. Connect the connectors to the shift control solenoid valves B and C, and install the clamp on the clamp bracket.
25. Connect the ATF cooler hoses to the cooler lines (see page 14-209)
26. Connect the lock-up control solenoid valve/shift control solenoid valve A assembly connector.



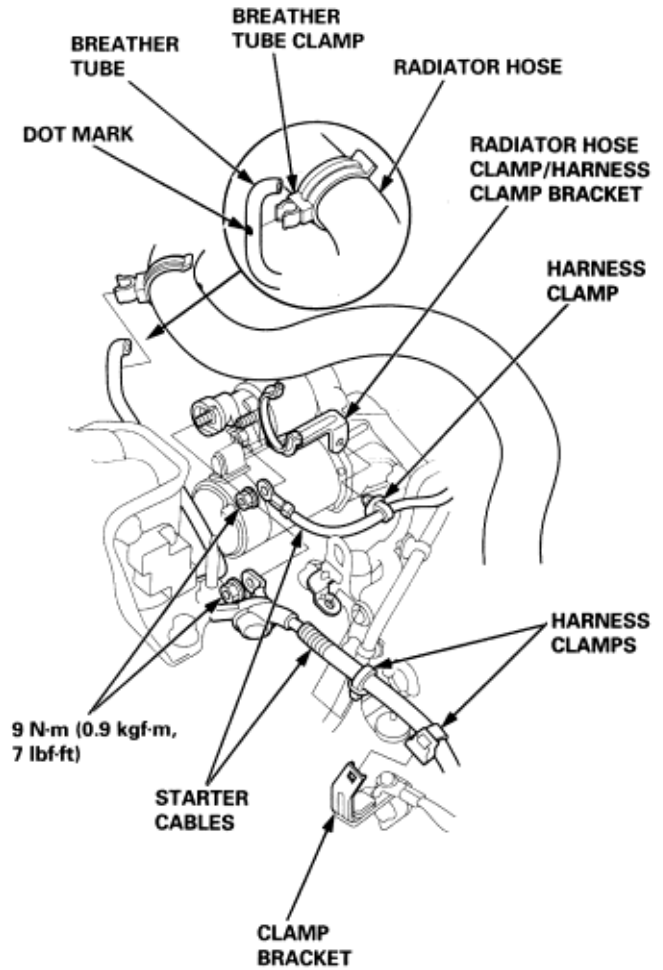
27. Connect the connector to the countershaft speed sensor and A/T gear position switch, and install the harness clamps on the clamp bracket and A/T gear position switch connector on the connector brackets.



28. Install the transmission ground cable terminal.
29. Connect the connectors to the mainshaft speed sensor, A/T clutch pressure control solenoid valve A/B assembly and 3rd clutch pressure switch, and install the harness clamps on the clamp brackets. Do not allow water, fluid, oil, dust, or other foreign particles to get inside the 3rd clutch pressure switch connector.

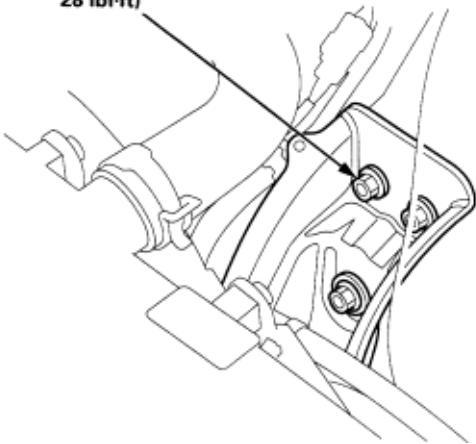


30. Install the starter cables with crimped side of the ring terminal is facing out.
31. Install the harness clamps on the clamp brackets.
32. Install the radiator hose on the clamp.
33. Install the breather tube at the dot on the clamp.



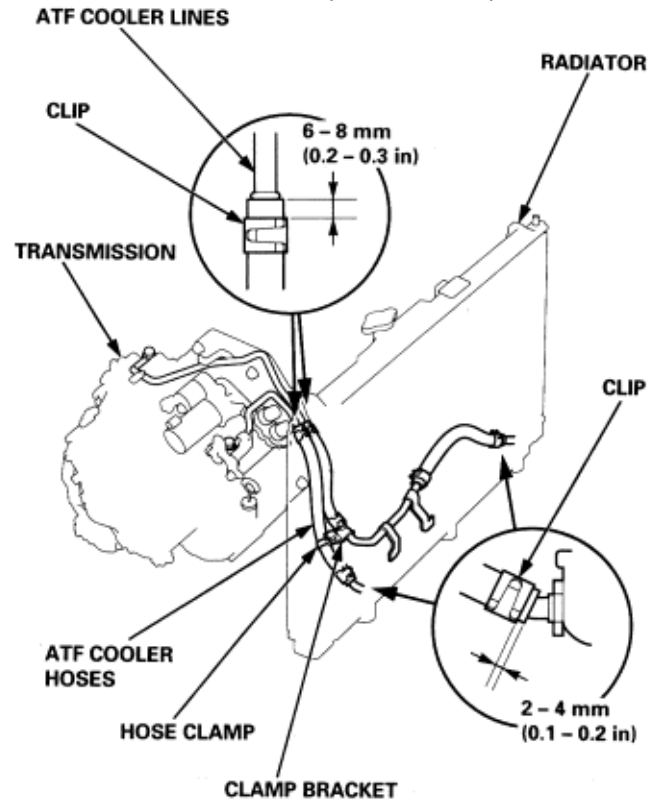
34. Install the battery base.
35. Install the battery cable clamps on the battery base.
36. Install the battery tray and battery, then secure the battery with its hold-down bracket.
37. Install the intake air duct and air cleaner housing assembly.
38. Refill the transmission with ATF (**see page 14-133**).
39. Connect the battery positive terminal, then connect the negative terminal.
40. Set the parking brake. Start the engine, and shift the transmission through all gears three times.
41. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.
42. Check and adjust the front wheel alignment (see section 18).
43. Let the engine reach normal operating temperature (the radiator fan comes on) with the transmission in **P** or in **N** position, then turn it off and check the ATF level (**see page 14-133**).
44. Perform a road test (**see page 14-130**) to (**see page 14-131**).
45. Loosen the front mount bracket bolts after the road test, then retighten the bolts to the specified torque.

10 x 1.25 mm
38 N·m (3.9 kgf·m,
28 lbf·ft)



46. Enter the anti-theft code for the radio for some types, and enter the customer's radio station presets.

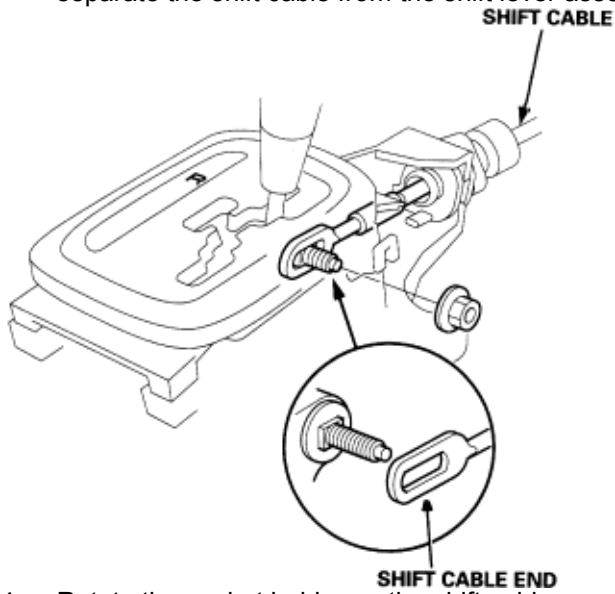
1. Connect the ATF cooler hoses to the ATF cooler lines and ATF cooler, and secure them with the clips as shown.
2. Install the hose clamp on the clamp bracket.



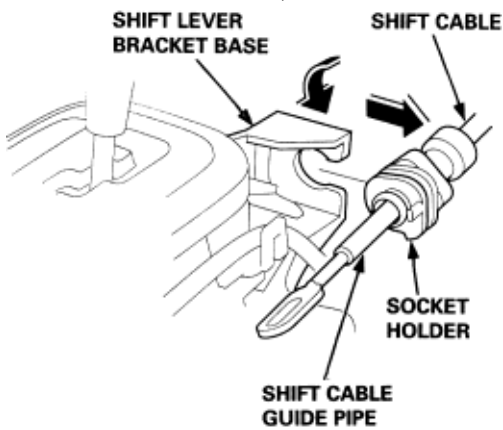
Shift Lever Removal

14-210

1. Shift the transmission into **R** position.
2. Remove the center console (see section 20).
3. Remove the nut securing the shift cable end, then separate the shift cable from the shift lever assembly.

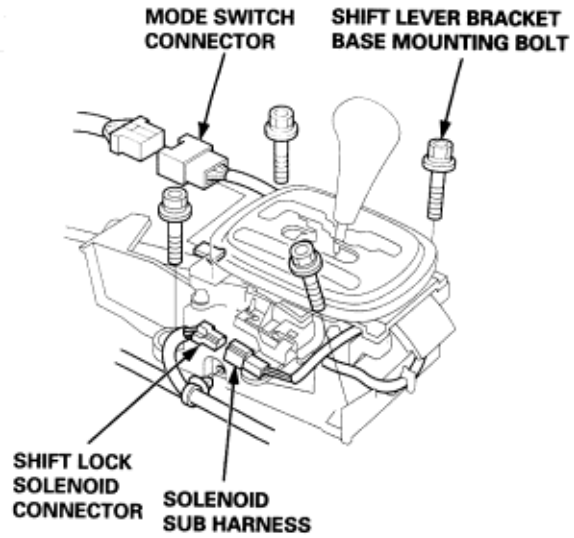


4. Rotate the socket holder on the shift cable counter-clockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base. **NOTE:** Do not remove the shift cable by the shift cable guide pipe. Remove the four bolts securing the shift lever bracket base, then remove the shift lever assembly.

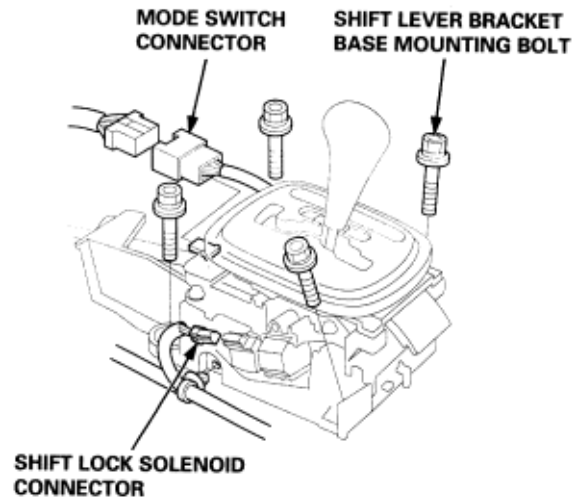


5. Disconnect the mode switch connector.
6. Disconnect the shift lock solenoid connector:
LHD: From the solenoid sub-harness.
RHD: From the solenoid.

LHD:



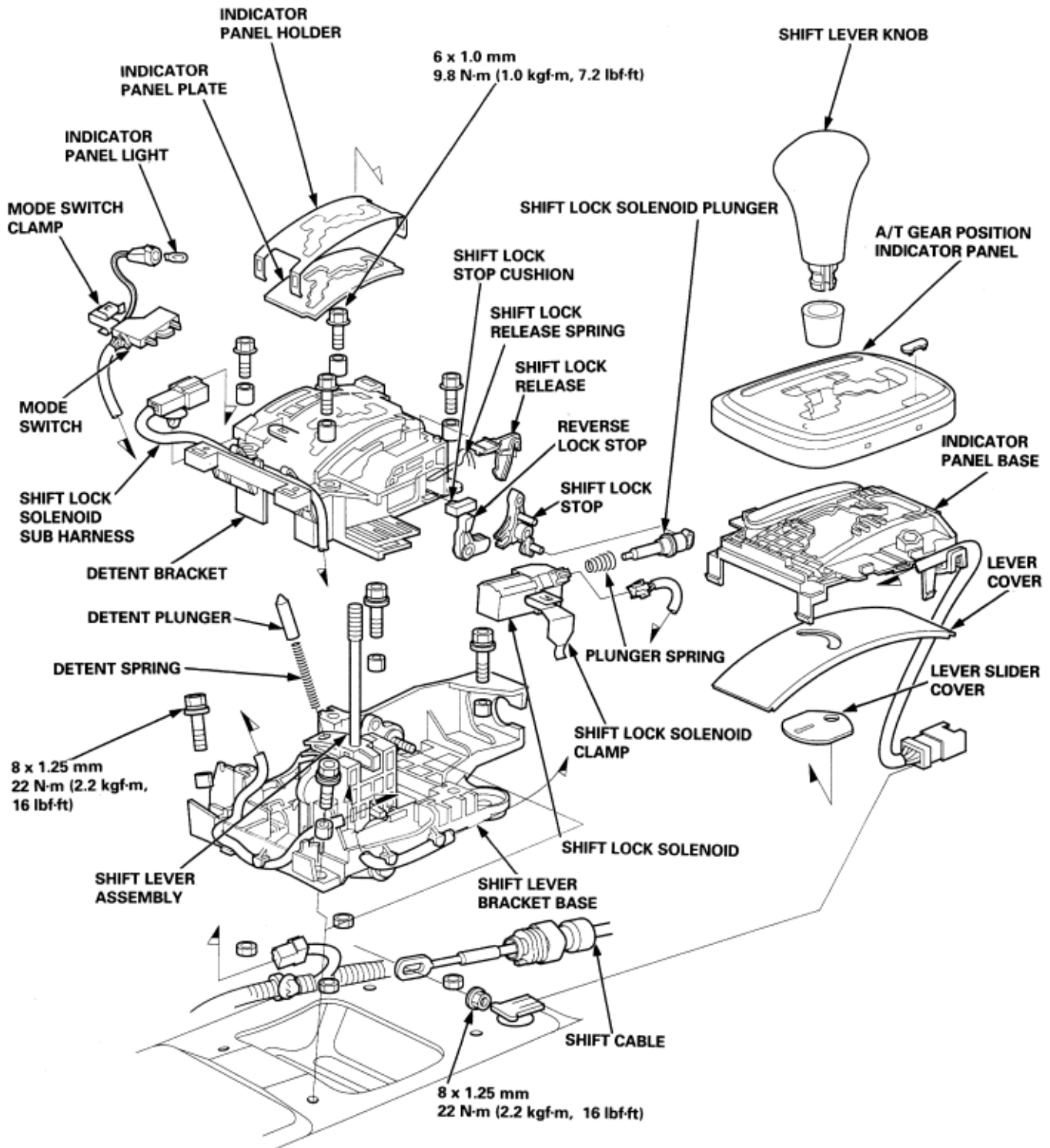
RHD:



7. Remove the four bolts securing the shift lever bracket base, then remove the shift lever assembly.

NOTE: Apply silicone grease to the following parts:

- ♦ Movable parts of the shift lever.
- ♦ Movable parts of the shift lock/reverse lock mechanism.
- ♦ Sliding surfaces on the opening of the indicator panel and panel holder.
- ♦ Sliding surfaces of the detent plunger.
- ♦ Contacting surfaces of the shift lever assembly with the shift lock stop.
- ♦ Detent plunger and detent spring.

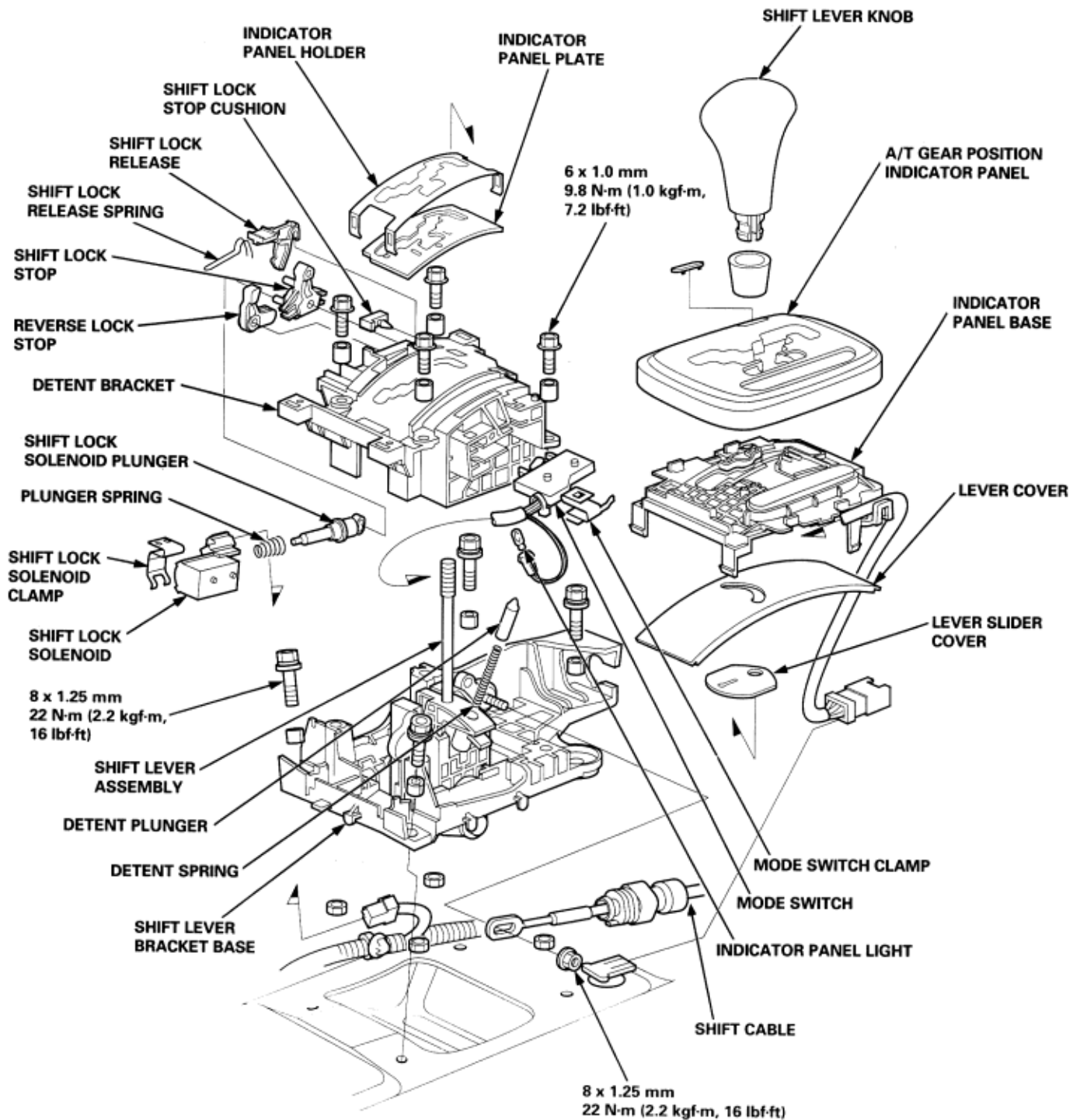


Shift Lever Disassembly/Reassembly - RHD

14-212

NOTE: Apply silicone grease to the following parts:

- ♦ Movable parts of the shift lever.
- ♦ Movable parts of the shift lock/reverse lock mechanism.
- ♦ Sliding surfaces on the opening of the indicator panel and panel holder.
- ♦ Sliding surfaces of the detent plunger.
- ♦ Contacting surfaces of the shift lever assembly with the shift lock stop.
- ♦ Detent plunger and detent spring.



Shift Lever

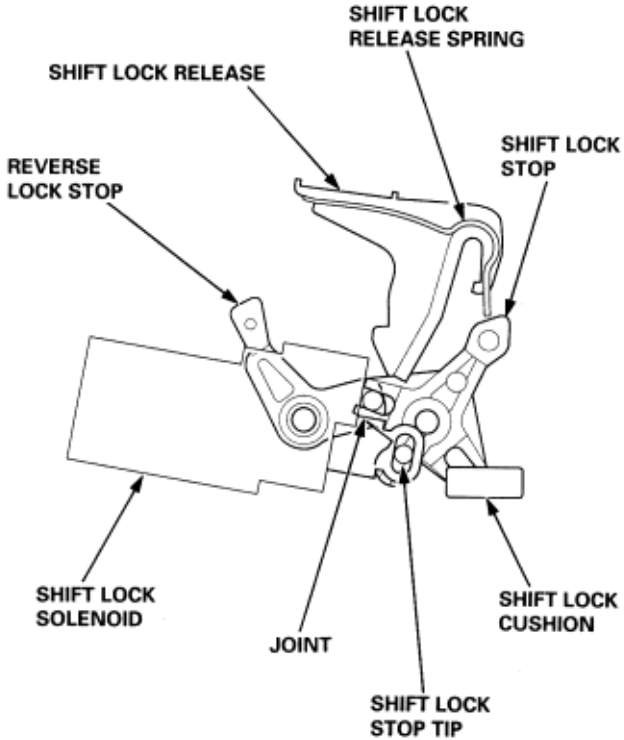
Shift Lock/Reverse Lock Mechanism

14-213

Installation

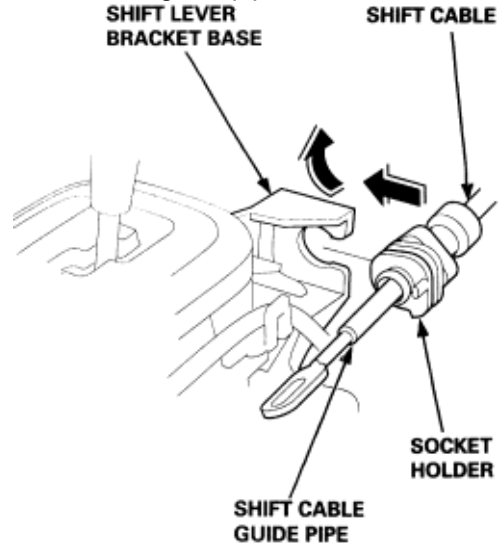
NOTE: Shift Lock/reverse lock mechanism is assembled incorrectly, shift lever will not operate normally.

1. Install the shift lock stop and reverse lock stop together with aligning their joint.
2. Install the shift lock release spring on the shift lock release.
3. Make sure the installation direction of the shift lock stop cushion in the direction shown.
4. Install the shift lock solenoid with aligning the shift lock solenoid plunger with the tip of the shift lock stop.

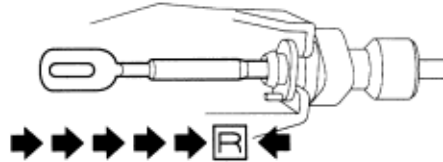


1. Install the shift lever assembly.
2. Rotate the socket holder on the shift cable clockwise a quarter turn, then slide the holder to install the shift cable on the shift lever bracket base. Rotate the socket holder counterclockwise a quarter turn to secure the shift cable.

NOTE: Do not install the shift cable by the shift cable guide pipe.



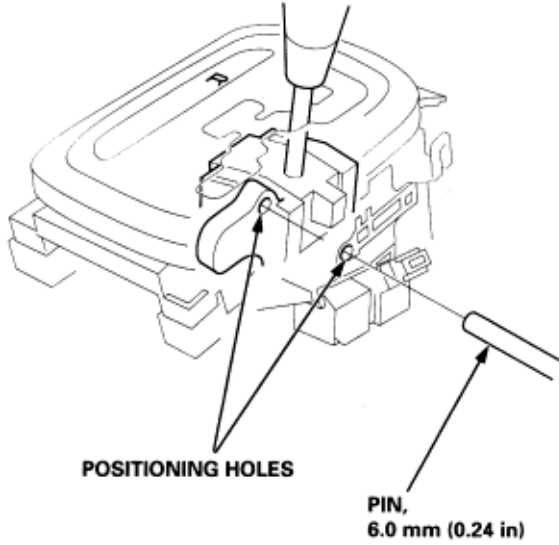
3. Turn the ignition switch ON (II), and verify that the **R** position indicator light comes on.
4. If necessary, push the shift cable until stops, then release your hand. Pull the shift cable back one step so that the shift position is in the **R**.



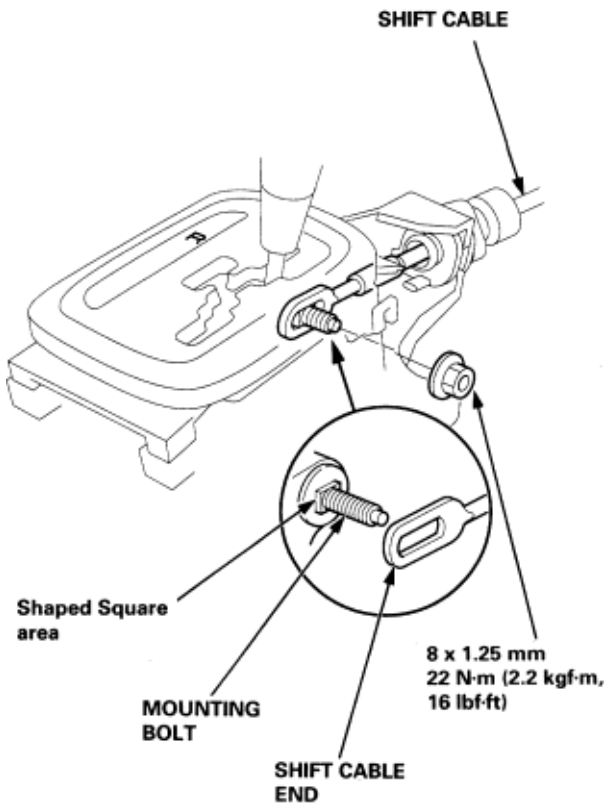
Shift Lever Installation (cont'd)

14-214

5. Insert a 6.0 mm (0.24 in) pin into the positioning hole on the shift lever bracket base through the positioning hole on the shift lever assembly.



6. Install the shift cable end to the mounting bolt, aligning its flat surfaces with the square shape at the bottom of the mounting bolt.

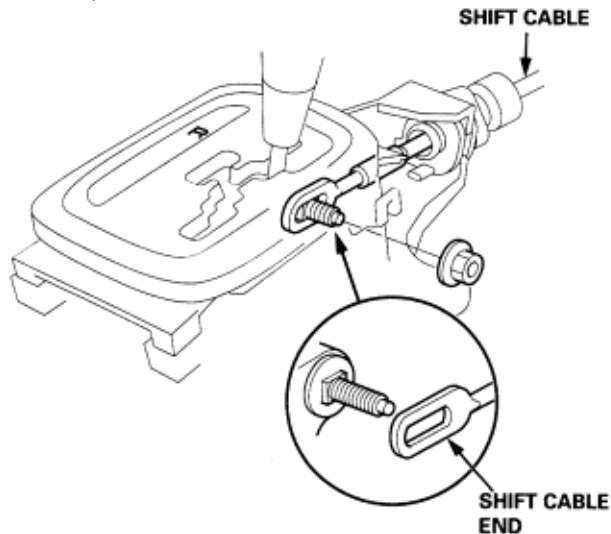


7. Install and tighten the nut to the specified torque.
8. Remove the 6.0 mm (0.24 in) pin that was installed to hold the shift lever.
9. Connect the mode switch connector and the shift lock solenoid connector.
10. Move the shift lever to each gear position, and verify that the A/T gear position indicator follows the A/T gear position switch.
11. Push the shift lock release, and verify that the shift lock is released and shift lock is locked when released the shift lock release.

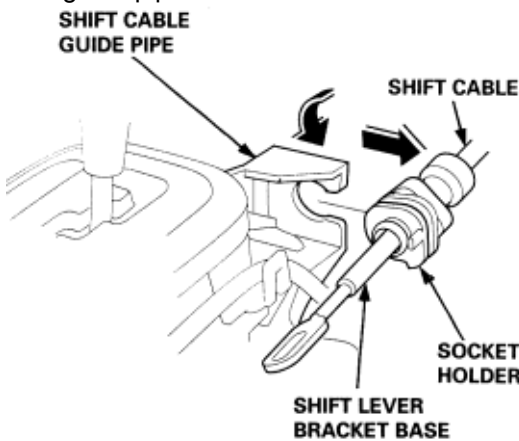
⚠ WARNING

Make sure lifts, jacks and safety stands are placed properly (see section 1).

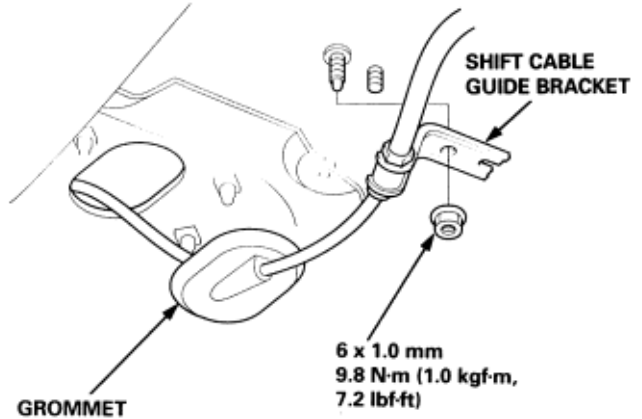
1. Raise the front of the vehicle, and make sure it is securely supported (see section 1).
2. Set the parking brake, and block both rear wheels securely.
3. Shift the transmission into **R** position.
4. Remove the center console (see section 20).
5. Remove the nut securing the shift cable end, then separate the shift cable from the shift lever assembly.



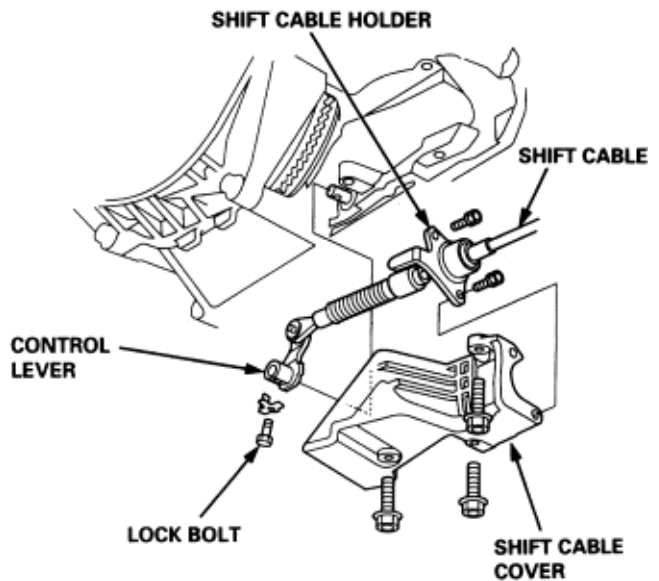
6. Rotate the socket holder on the shift cable counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base. **NOTE:** Do not remove the shift cable by the shift cable guide pipe.



7. Remove the floor heat shield.
8. Remove the shift cable guide bracket and grommet.



9. Remove the bolts securing the shift cable holder, then remove the shift cable cover. **NOTE:** To prevent damage to the control lever joint, remove the bolts securing the shift cable holder before removing the bolts securing the shift cable cover.

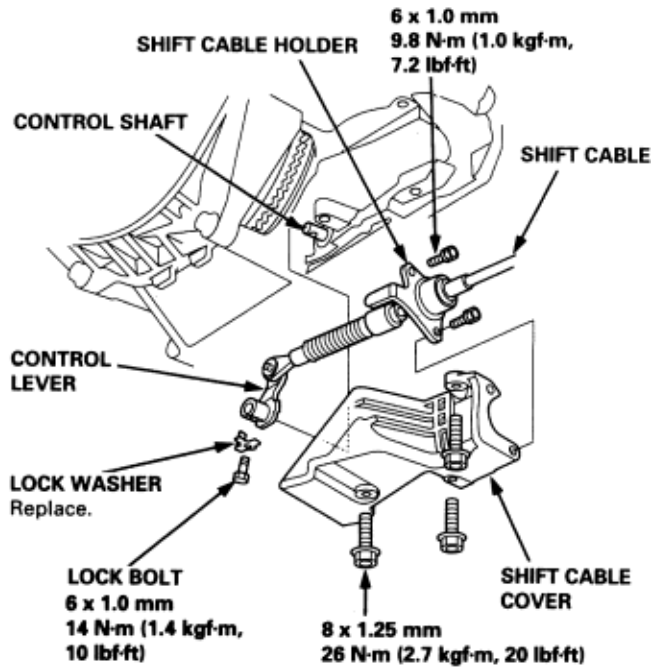


10. Remove the lock bolt securing the control lever, then remove the shift cable with the control lever.

Shift Cable Replacement (cont'd)

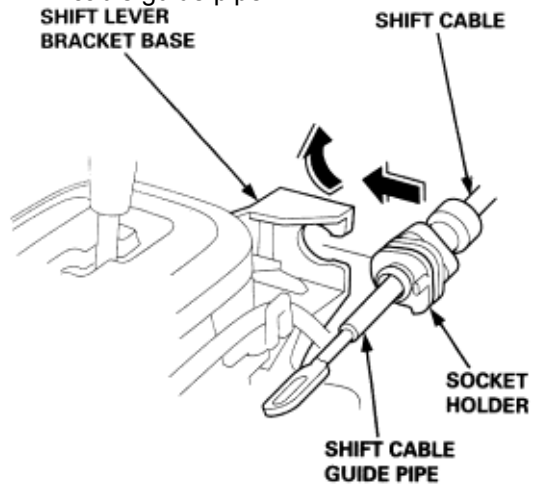
14-216

11. Insert the new shift cable through the grommet hole, then install the shift cable guide bracket.
12. Verify that the transmission is in **R** position on the control shaft.
13. Install the control lever with the shift cable on the control shaft. Do not bend the shift cable excessively.

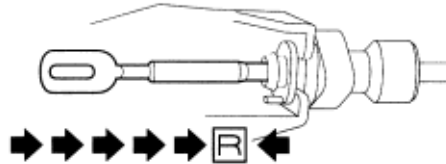


14. Install the lock bolt with a new lock washer, then bend the lock washer tab against the bolt.
15. Install the shift cable cover, then install the shift cable holder on the shift cable cover.
NOTE: To prevent damage to the control lever joint, be sure to install the shift cable holder after installing the shift cable cover to the torque converter housing.
16. Install the floor heat shield.

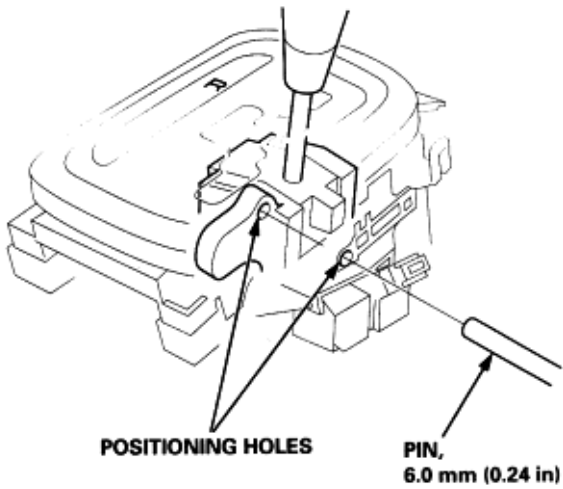
17. Rotate the socket holder on the shift cable counterclockwise a quarter turn, then slide the holder to install the shift cable on the shift lever bracket base. Rotate the socket holder clockwise a quarter turn to secure the shift cable.
NOTE: Do not install the shift cable by the shift cable guide pipe.



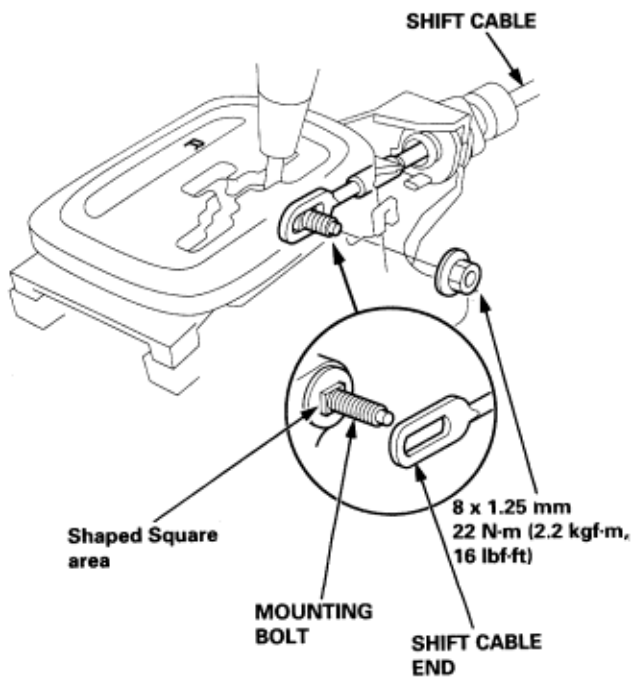
18. Turn the ignition switch ON (II), and verify that the **R** position indicator light comes on.
19. If necessary, push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in the **R** position.



20. Insert a 6.0 mm (0.24 in) pin into the positioning hole on the shift lever bracket base through the positioning hole on the shift lever assembly.



21. Install the shift cable end to the mounting bolt, aligning its flat surfaces with the square shape at the bottom of the mounting bolt.

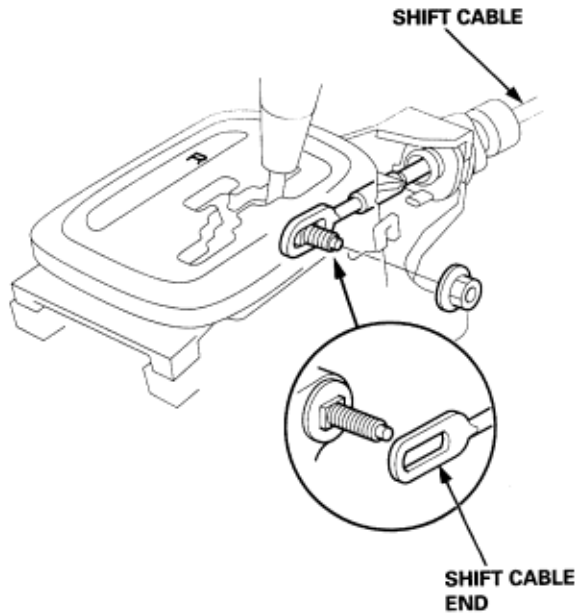


22. Install and tighten the nut to the specified torque.
23. Remove the 6.0 mm (0.24 in) pin that was installed to hold the shift lever.
24. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the A/T gear position switch.
25. Start the engine, and check the shift lever operation in all gears.

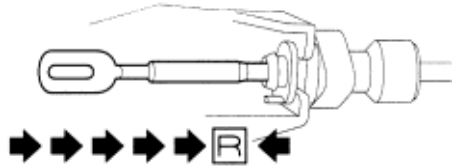
Shift Cable Adjustment

14-218

1. Shift the transmission into **R** position.
2. Remove the center console (see section 20).
3. Remove the nut securing the shift cable end, then separate the shift cable from the shift lever assembly.

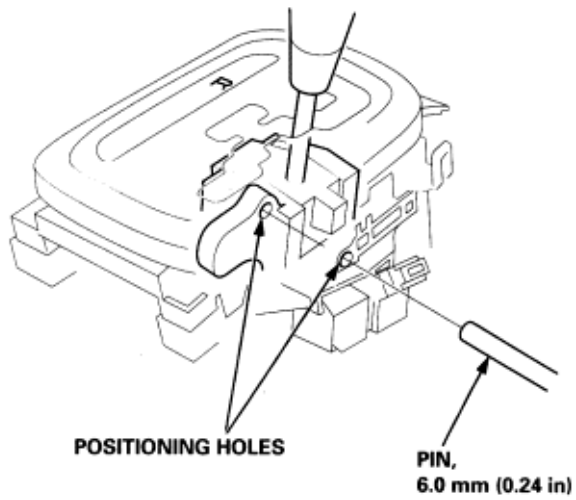


4. Push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in the **R**.

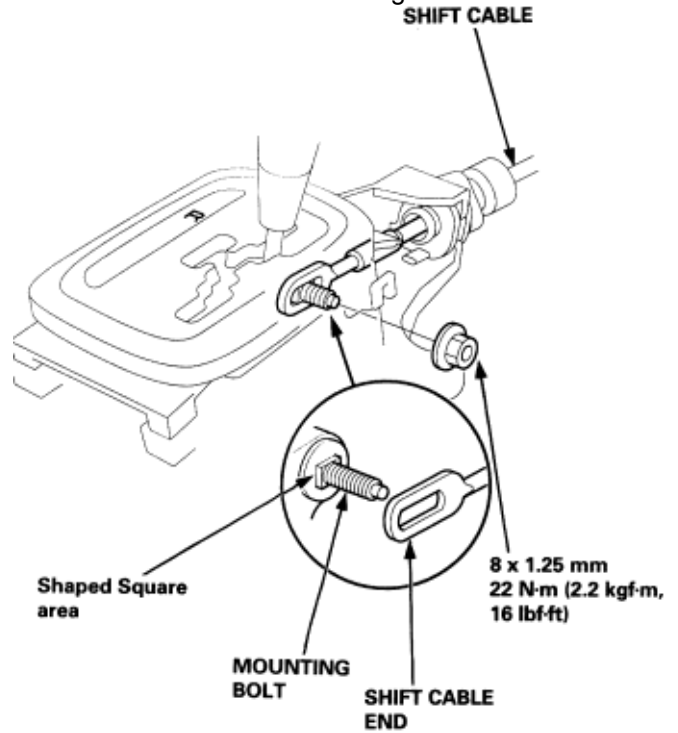


5. Turn the ignition switch ON (II), and verify that the position indicator light comes on.

6. Insert a 6.0 mm (0.24 in) pin into the positioning hole on the shift lever bracket base through the positioning hole on the shift lever assembly.

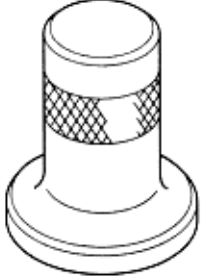


7. Install the shift cable end to the mounting bolt, aligning its flat surfaces with the square shape at the bottom of the mounting bolt.



8. Install and tighten the nut to the specified torque.
9. Remove the 6.0 mm (0.24 in) pin that was installed to hold the shift lever.
10. Move the shift lever to each gear position, and verify that the A/T gear position indicator follows the A/T gear position switch.
11. Push the shift lock release, and verify that the shift lock is released and shift lock is locked when releasing the shift lock release.

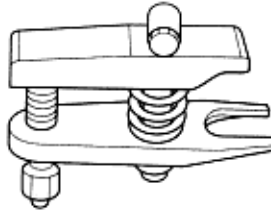
Ref No.	Tool Number	Description	Qty	Remark
1	07GAD - PH70201	Oil Seal Driver	1	
2	07HMD - MR70100	Attachment, 35 mm, I.D.	1	
3	07MAC - SL00200	Ball Joint Remover, 28 mm	1	
4	07XAC - 010100	Threaded Adapter, 22 x 1.5 mm	1	
5	07XAC - 010200	Threaded Adapter, 24 x 1.5 mm	1	
6	07746 - 0010200	Attachment, 37 x 40 mm	1	
7	07746 - 0010400	Attachment, 52 x 55 mm	1	
8	07749 - 0010000	Driver	1	
9	07936 - 5790001	Sliding Hammer Set	1	



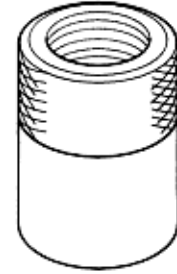
①



②



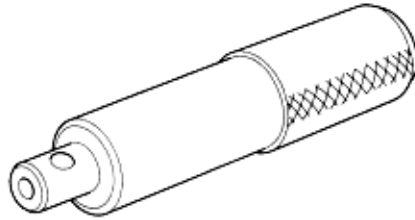
③



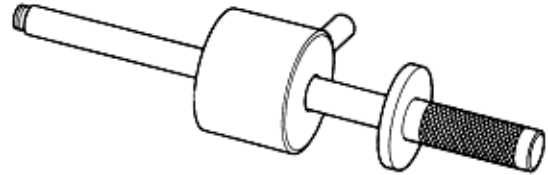
④ ⑤



⑥ ⑦



⑧



⑨

Driveshaft Boot

Check the inboard boot and the outboard boot on the driveshaft for cracks, damage, leaking grease and loose boot bands.

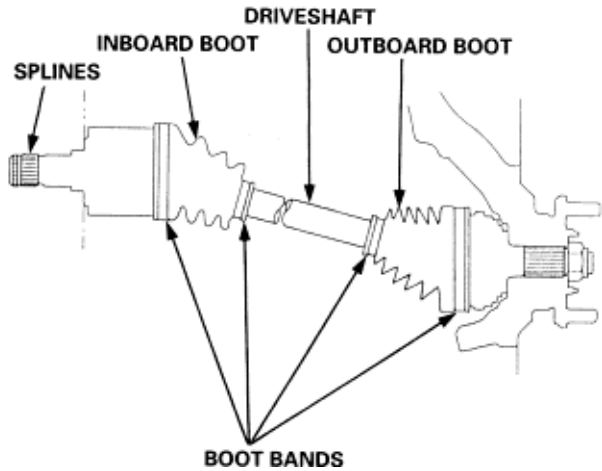
If any damage is found, replace the boot and boot bands.

Loose Splines

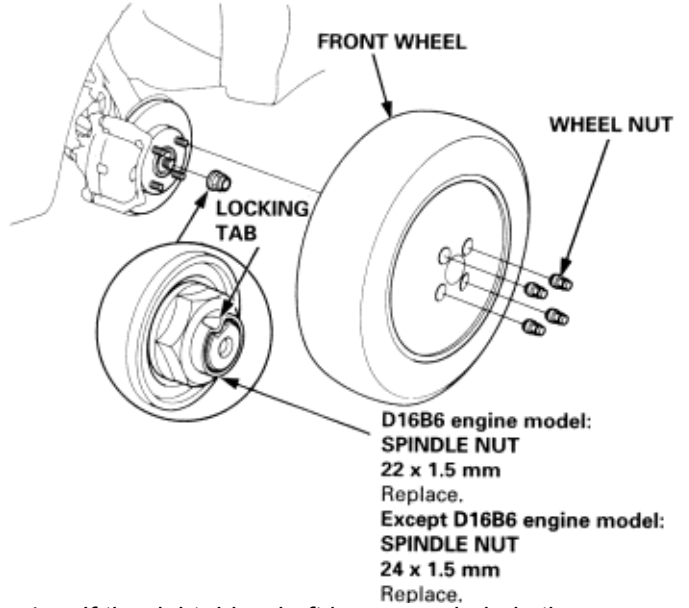
Turn the driveshaft by hand, and make sure the splines and joint are not excessively loose.

Twisted or Cracked

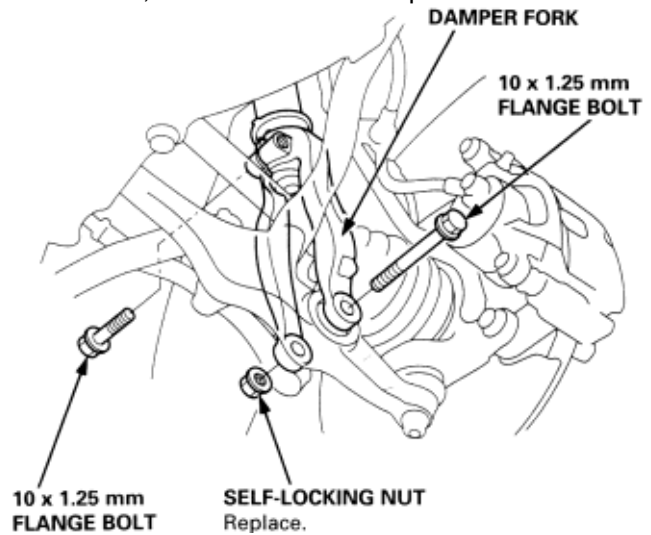
Make sure the driveshaft is not twisted or cracked. Replace it if necessary.



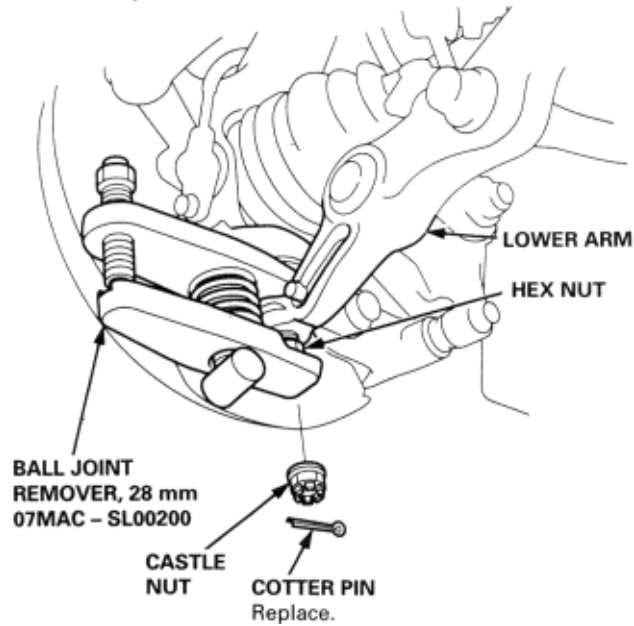
1. Loosen the wheel nuts slightly.
2. Raise the front of vehicle, and support it with safety stands in the proper locations (see section 1)
3. Remove the wheel nuts and front wheels.



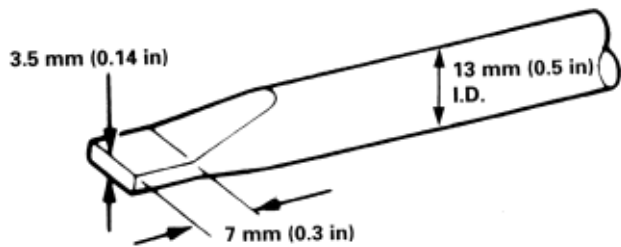
4. If the right driveshaft is removed, drain the transmission fluid (see section 13 or 14). It is not necessary to drain the transmission fluid when the left driveshaft is removed (for vehicle's with intermediate shaft).
5. Raise the locking tab on the spindle nut, then remove the nut.
6. Remove the self-locking nut and 10 mm flange bolts, then remove the damper fork.



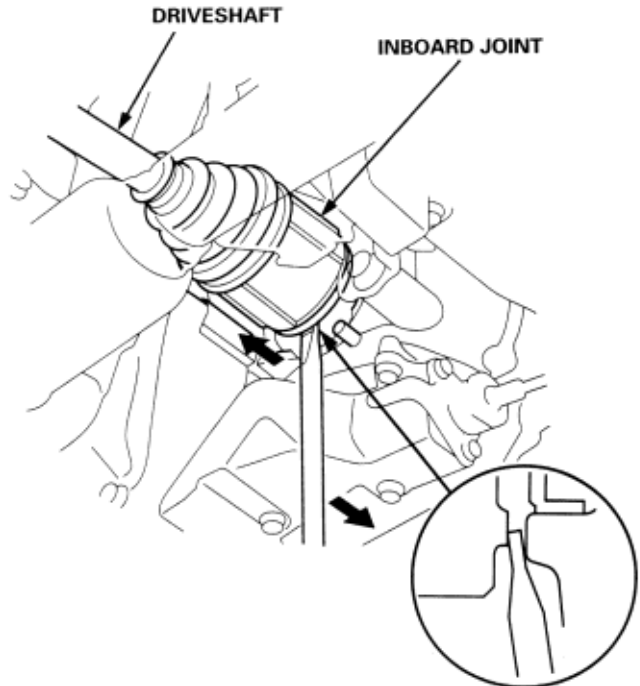
7. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.



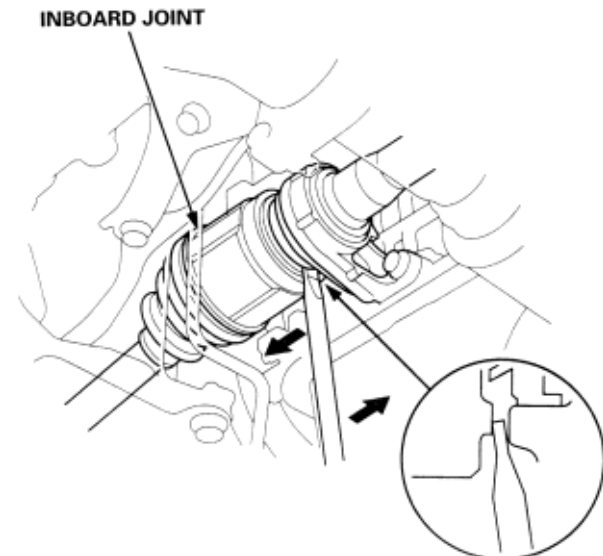
8. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.
9. Use the special tool as shown, to use the tool as shown, to separate the ball joint and lower arm. Be careful not to damage the ball joint boot. If necessary, apply penetrating type lubricant to loosen the ball joint.
10. Pry the driveshaft assembly with a screwdriver as shown, to force the set ring at the driveshaft end past the groove. Be careful not to damage the oil seals when prying.



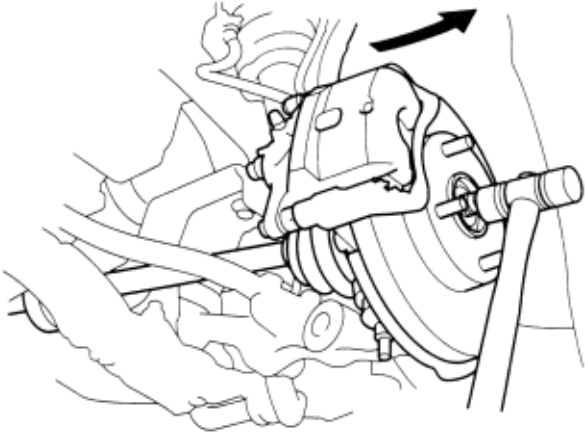
11. Pull the inboard joint, and remove the driveshaft from the differential case or hearing support as an assembly. Do not pull on the driveshaft the inboard joint may come apart. Pull the driveshaft straight out to avoid damaging the differential oil seal or the intermediate shaft outer seal.



Driveshaft with intermediate shaft:

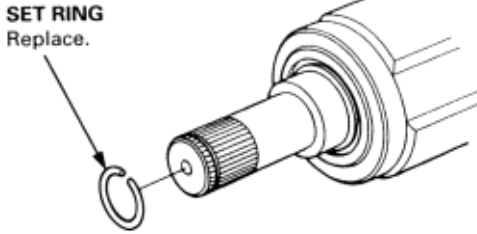


12. Pull the knuckle outward, and remove and driveshaft outboard joint from the front wheel hub using a plastic hammer.



Inboard Joint Side

1. Remove the set ring from the inboard joint

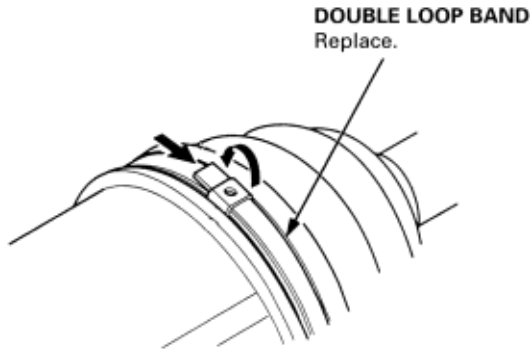


2. Remove the boot bands. Take care not to damage the boot and dynamic damper.

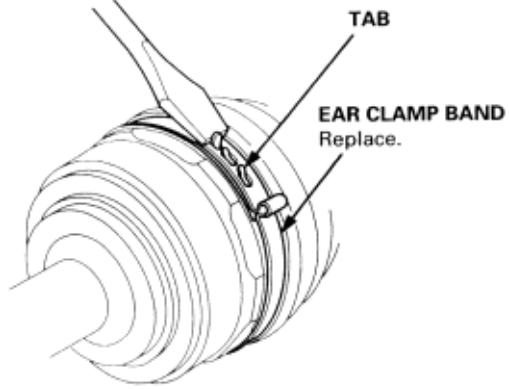
NOTE:

- ♦ If the boot band is a double loop type, raise the band bend.
- ♦ If the boot band is an ear clamp type, raise the three tabs with a screwdriver.
- ♦ If the boot band is a welded type, cut the boot band.
- ♦ If the boot band is the locking tabs type, pry up the tabs with a screwdriver and raise the end of the band.

Double Loop Type:



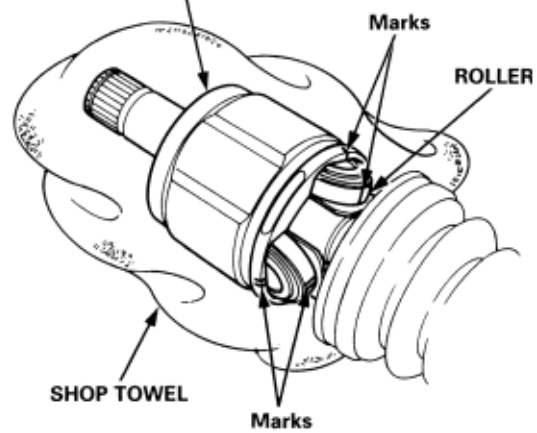
Ear Clamp Type:



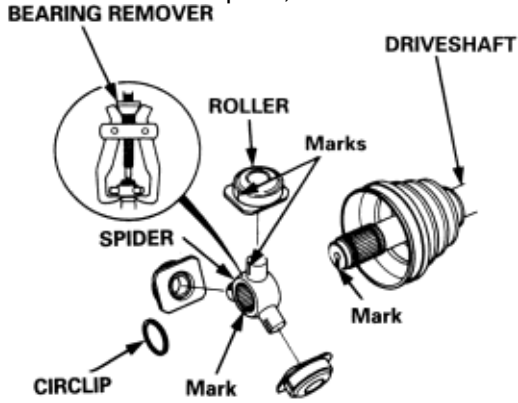
3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel. Be careful not to drop the rollers when separating them from the inboard joint.

INBOARD JOINT

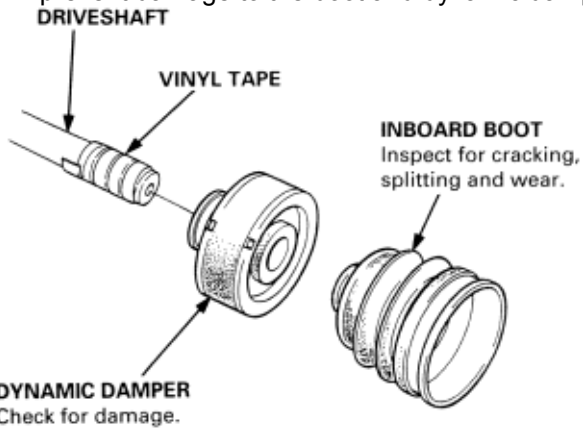
Check splines for wear or damage.
Check inside bore for wear.
Inspect for cracks.



4. Mark the rollers and spider to identify the locations of rollers on the spider, then remove the rollers.

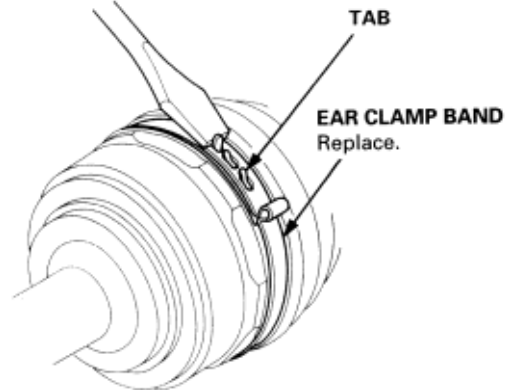


5. Remove the circlip.
6. Mark the spider and driveshaft to identify the position of the spider on the shaft.
7. Remove the spider using a commercially available bearing remover.
8. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boot and dynamic damper.

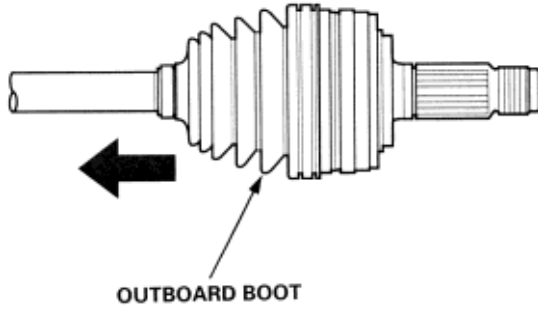


9. Remove the inboard boot and dynamic damper.

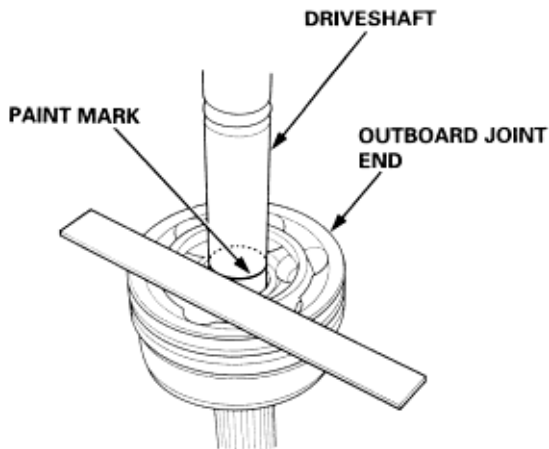
1. Raise the three tabs with a screwdriver, then remove the boot bands. Take care not to damage the boot.



2. Slide the outboard boot to the inboard joint side.

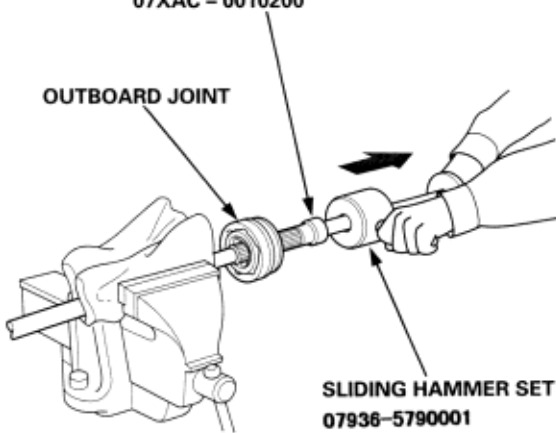


3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
4. Mark the driveshaft at the same position of the outboard joint end with paint.



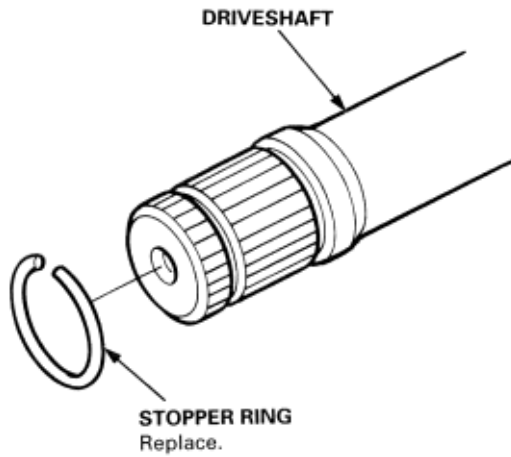
5. Carefully clamp the driveshaft in a vice.

D16B6 engine model:
THREADED ADAPTER, 22 x 1.5 mm
07XAC - 0010100
Except D16B6 engine model:
THREADED ADAPTER, 24 x 1.5 mm
07XAC - 0010200



6. Remove the outboard joint using a special tool as shown.

7. Remove the driveshaft from the vice.
8. Remove the stopper ring from the driveshaft.



Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- ♦ Thoroughly pack both joints and boots with the joint grease included in the new driveshaft set.
- ♦ The uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the car clamp type boot band in the outboard joint boot set.

D16B6 engine model:

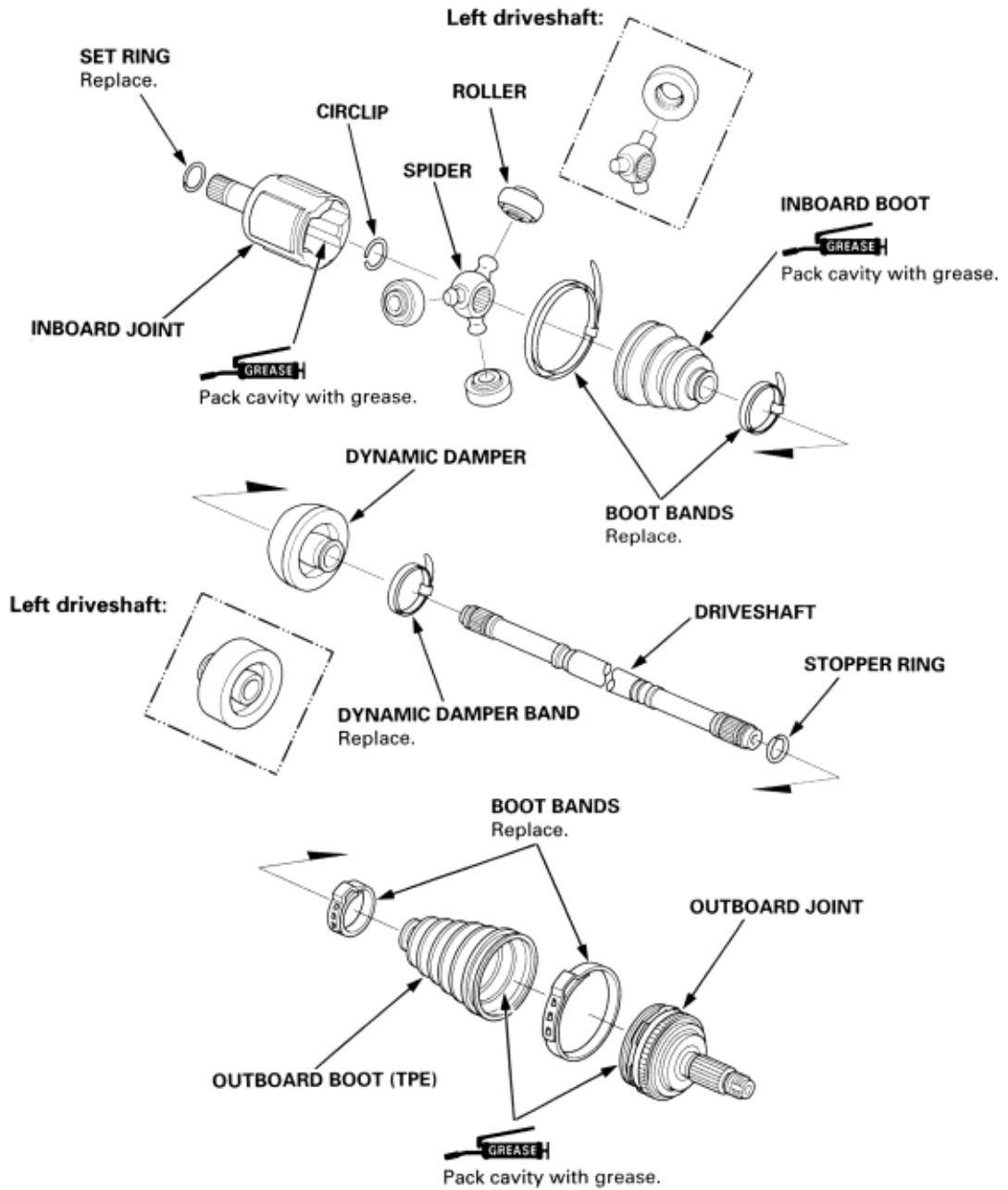
Grease quantity

Inboard joint:

Left side: 125.5-135.5 g (4.4-4.8 oz)

Right side: 120-130 g (4.2-4.6 oz)

Outboard joint: 85.5-103.5 g (3.0-3.7 oz)



Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- ♦ Thoroughly pack both joints and both joint boots with the joint grease included in the new driveshaft set.
- ♦ The uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the car clamp type boot band in the outboard joint boot set.

F18B2 F18B3 F20B6 H22A7 engine model

Grease quantity

Inboard joint:

F18B2 F18B3, F20B6 engine model: 120-130 g (4.2-4.6 oz)

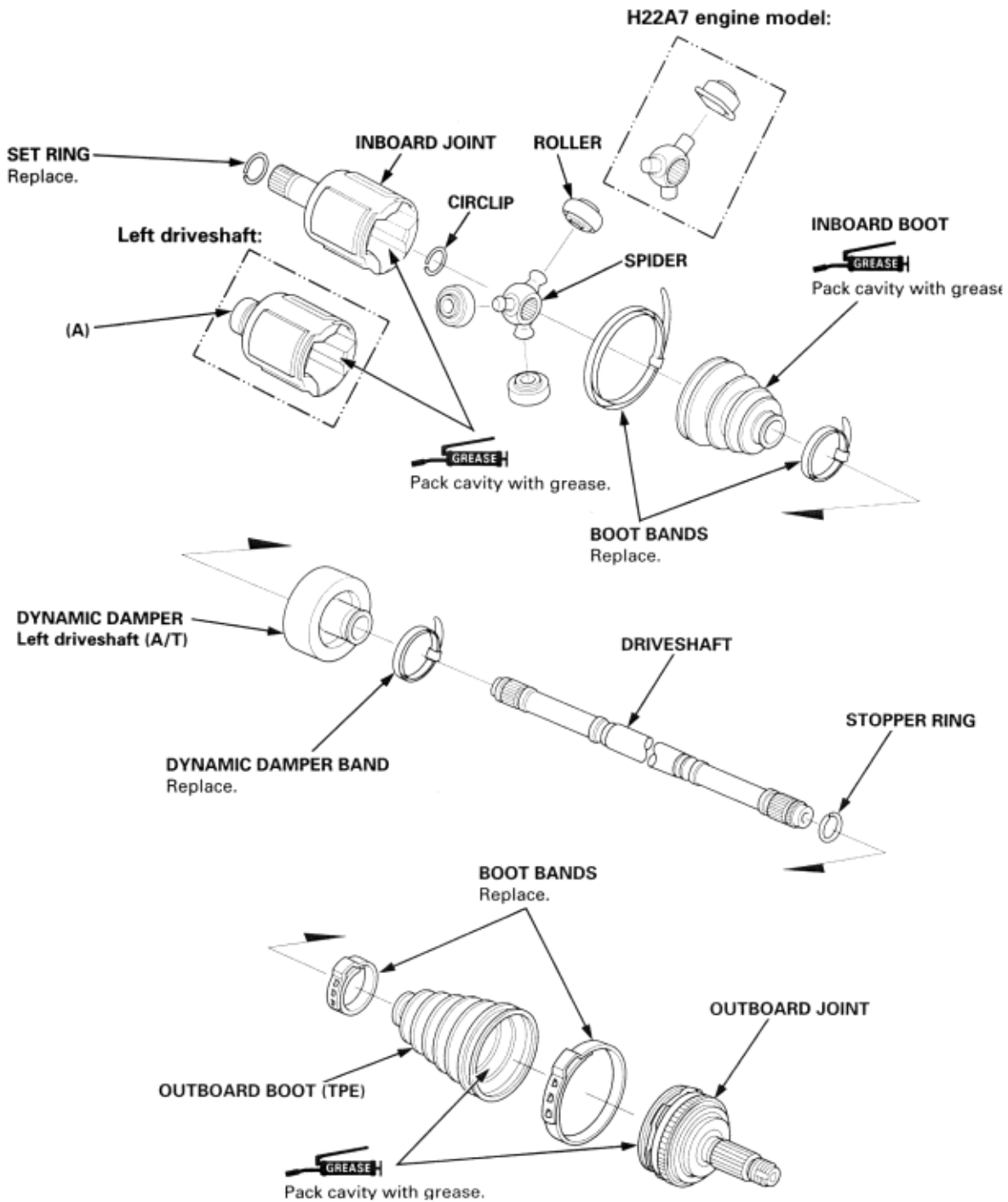
H22A7 engine model: 130-140 g (4.6-4.9 oz)

Outboard joint

F18B2, F18B3, F20B6 engine model: 72.4-90.5 g (2.6-3.2 oz)

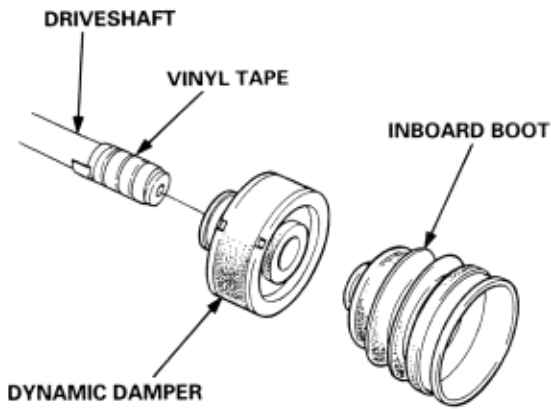
H22A7 engine model: 140-150 g (4.9-5.3 oz)

Inboard joint spline (A): 0.5-1 .0 g (0.018-0.035 oz).

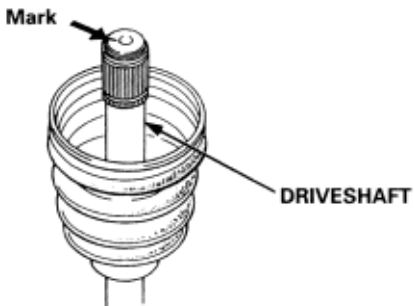
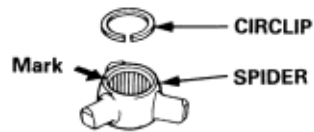


Inboard Joint Side:

1. Wrap the splines with vinyl tape prevent damage to the boot and dynamic damper

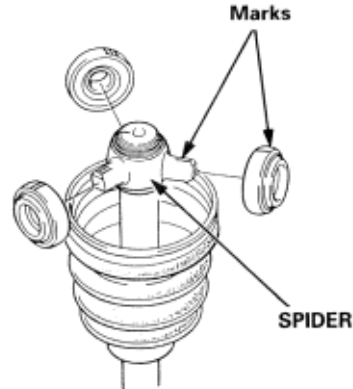


2. Install the dynamic damper and inboard drive shaft, then remove the vinyl tape. Take care not to damage the boot and dynamic damper.
3. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.

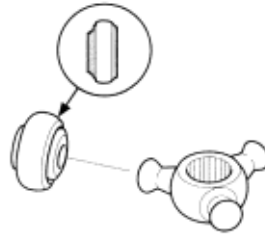


4. Fit the circlip into the driveshaft groove. Always rotate the circlip in its groove to be sure it is fully seated.

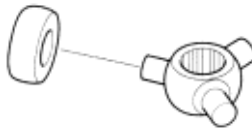
5. Fit the rollers to the spider with their high shoulders facing outward, and note these items;
 - ♦ Reinstall the rollers in their original positions on the spider by aligning the marks.
 - ♦ Hold the driveshaft pointed up to prevent the rollers from facing off.



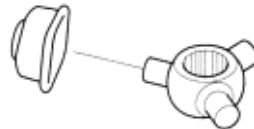
D16B6 (Right driveshaft), F18B2, F18B3, F20B6 engines model:



D16B6 engine (Left driveshaft model):



H22A7 engine model:



6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity

Inboard joint:

D16B6 engine model:

Left side: 125.5-135.5 g (4.4-4.8 oz)

Right side: 120-130 g (4.2-4.6 oz)

F18B2, F18B3, F20B6 engine models:

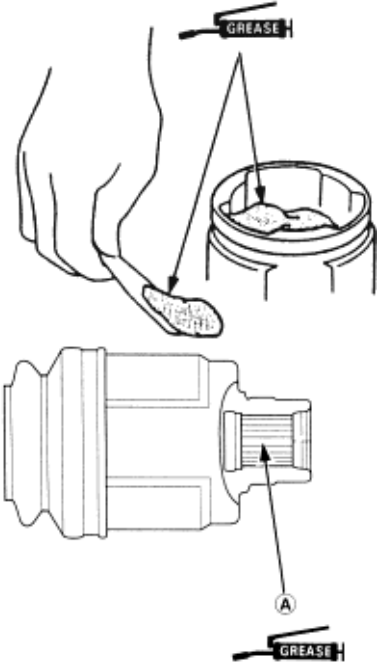
120-130 g (4.2-4.6 oz)

H22A7 engine model:

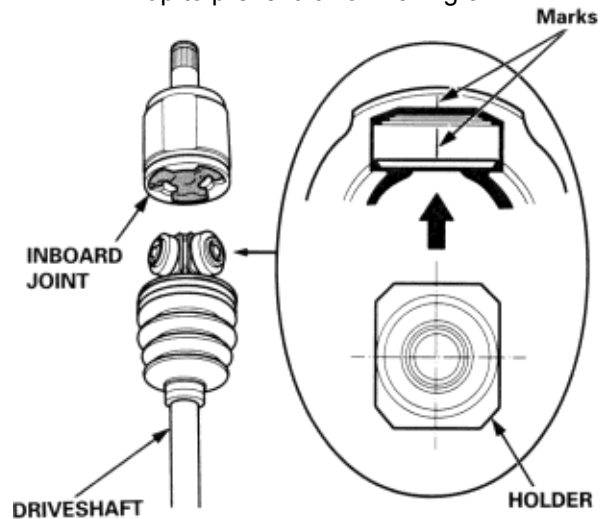
130-140g (4.6-4.9 oz)

Inboard joint spline A:

0.5-1.0g (0.018-0.035 oz)



7. Fit the inboard joint onto the driveshaft, and note these items;
- ♦ Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint and the rollers.
 - ♦ Hold the driveshaft so the inboard joint points up to prevent it from falling off.



8. Adjust the length of the driveshafts to the figure below, then adjust the boot to halfway between full compression and full extension. Make sure the ends of boots seat in the groove of the driveshaft and joint.

D16B6 engine model:

Left: 802-807 mm (31.6-31.8 in)

Right: 523-528 mm (20.6-20.8 in)

F18B2, F18B3, F20B6 engine models:

Left: M/T:476-481 mm (18.7-18.9 in)

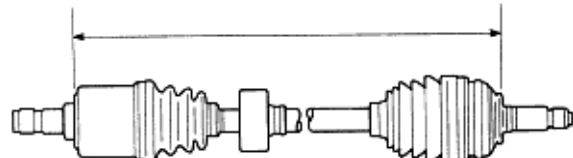
A/T: 842-847 mm (33.1-33.3 in)

Right: 485-490 mm (19.1-19.3 in)

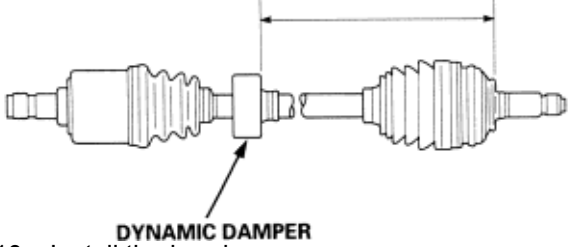
H22A7 engine model:

Left: 478-483 mm (18.8-19.0 in)

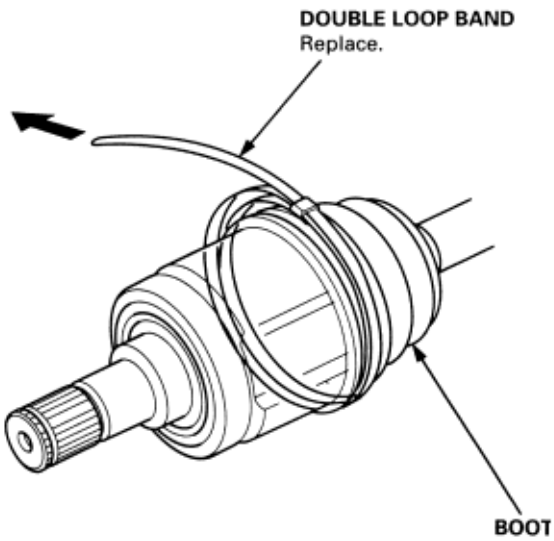
Right: 485-490 mm (19.1-19.3 in)



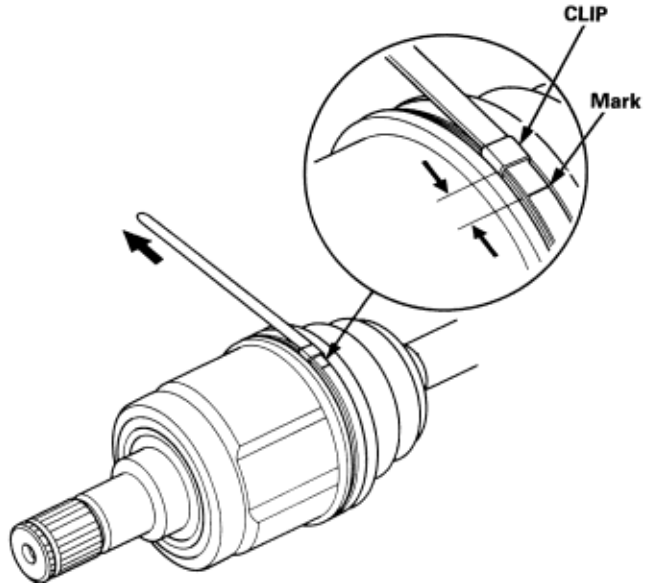
9. Position the dynamic damper as shown below.
D16B6 engine model:
Left: 519,3-524 mm (20,4-20,6in)
Right: 279.7-284.7 mm (11.0-11.2 in)
F18B2, F18B3, F20B6 engine models:
484 mm-488 mm (19.10-19.2 in) 19.2 in)



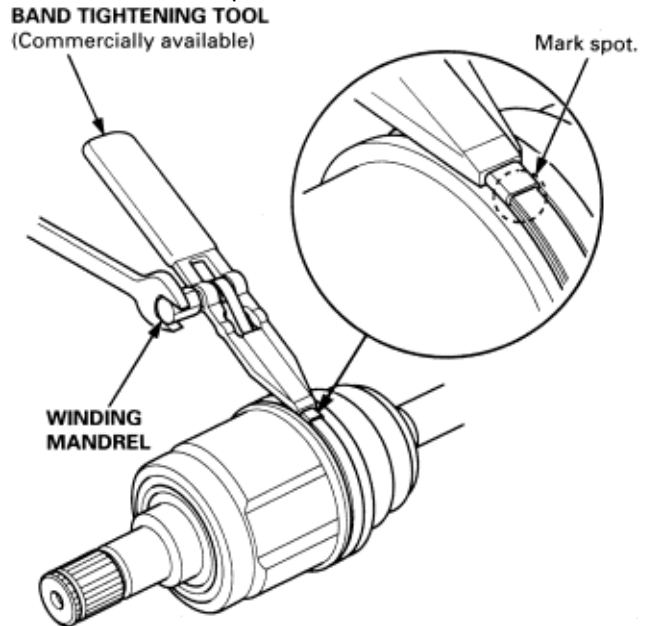
10. Install the bands.
-1. Set the double loop band onto the boot and dynamic damper with the band end toward to front of the vehicle.



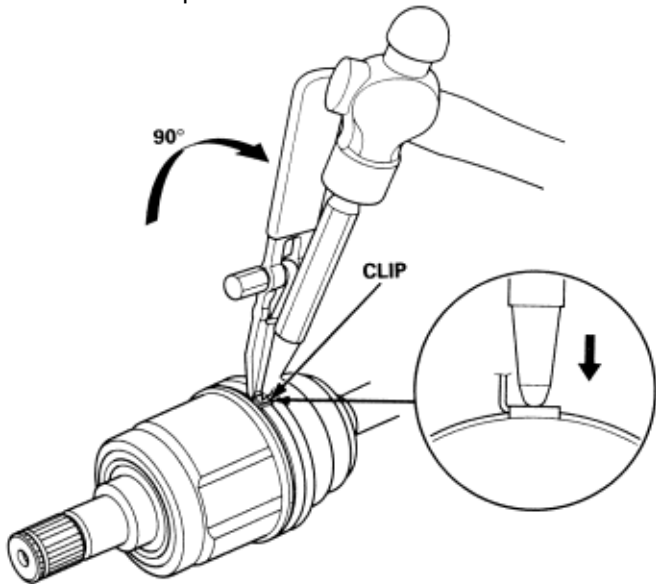
- 2. Pull up the slack in the band by hand.



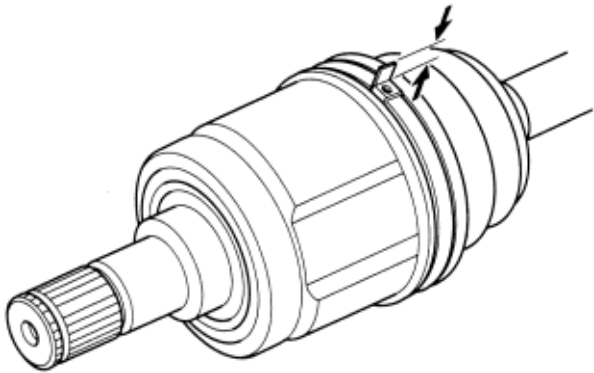
- 3. Mark a position on the band 10-14 mm (0.4-0.6 in) from the clip.
-4. Thread the free end of the band through the nose section of the commercially available band tightening tool, and into the slot on the winding mandrel.
-5. Place a wrench on the winding mandrel of the band tightening tool, and tighten the band until the marked spot on the band meets the edge of the clip.



- 6. Raise up the band tightening tool to bend the free end of the band 90 degrees to the clip. Center punch the clip, then fold over the remaining tail onto the clip.



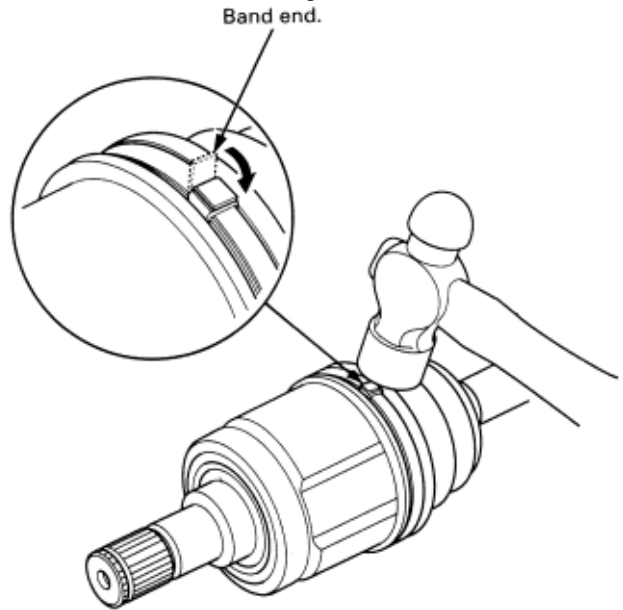
- 7. Unwind the band tightening tool, and cut off the excess free end of the band to leave a 5-10 mm (0.2-0.5 in) tail protruding from the clip.



- 8. Bend the band end by tapping it down with a hammer.

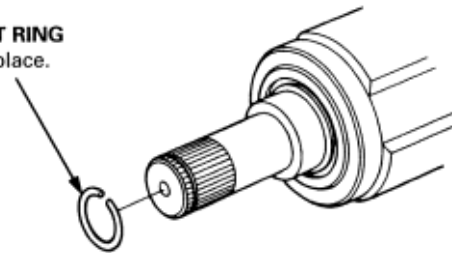
NOTE:

- ♦ Make sure the band and clip does not interfere with anything, and the band does not move.
- ♦ Remove any grease remaining in the surrounding surfaces



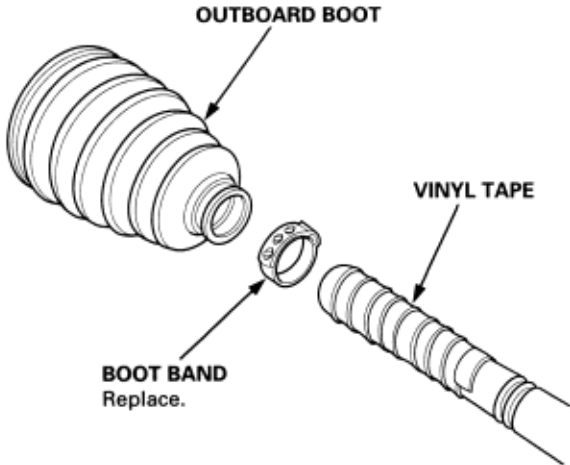
- 9. Install the new set ring.

SET RING
Replace.

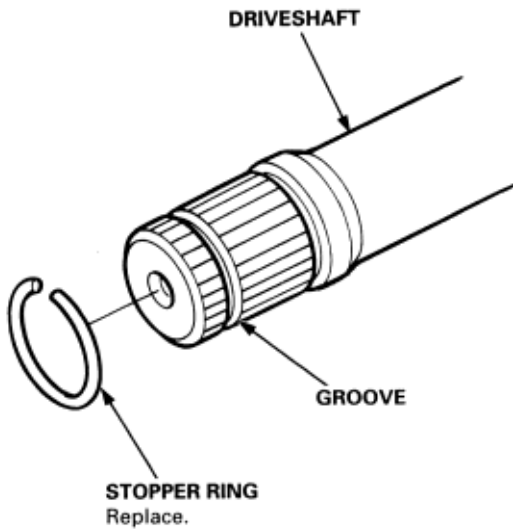


Outboard Joint Side:

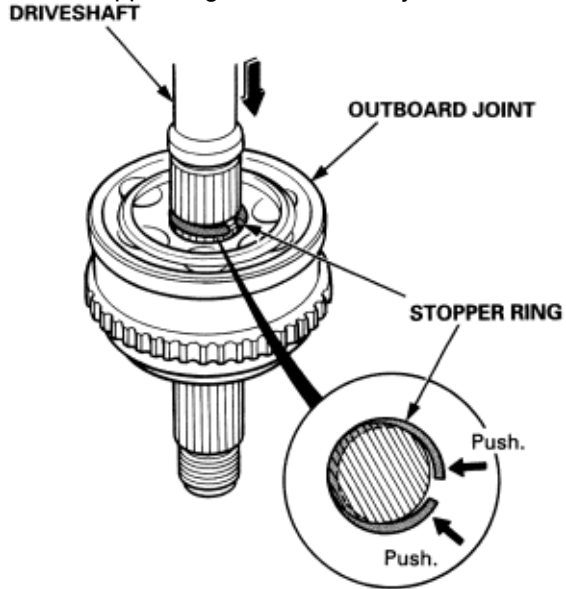
1. Wrap the splines with vinyl tape to prevent damage to the boot.



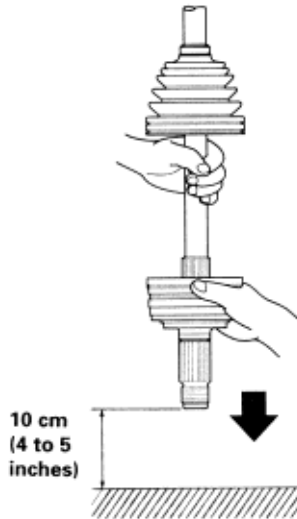
2. Install the boot band and outboard boot, then remove the vinyl tape. Take care not to damage the boot.
3. Install the stopper ring into the driveshaft groove.



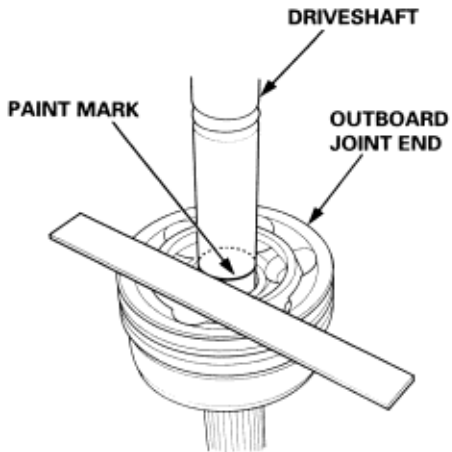
4. Insert the driveshaft in the outboard joint until the stopper ring is close on the joint.



5. To drive the outboard joint on the rest of the way, pick up the driveshaft and joint, and let them fall from about 10 cm (4 to 5 inches) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.



6. Check that the paint mark aligns with the outboard joint end.



7. Pack the outboard joint with the joint grease included in the new joint boot set.

Grease quantity

Outboard joint:

D16B6 engine model:

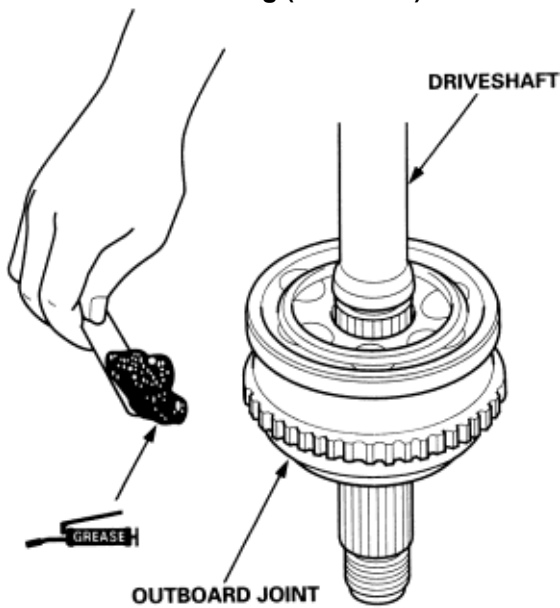
85.5-103.5 g (3.0-3.7 oz)

F1882, F18B3, F20B6 engine models:

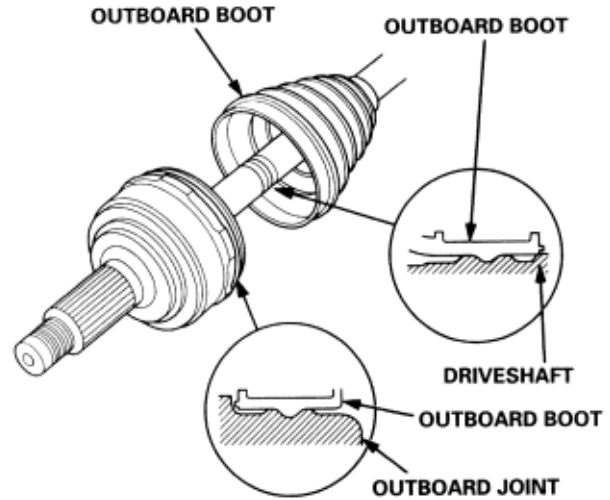
72.4-90.5 g (2.6-3.2 oz)

H22A7 engine model:

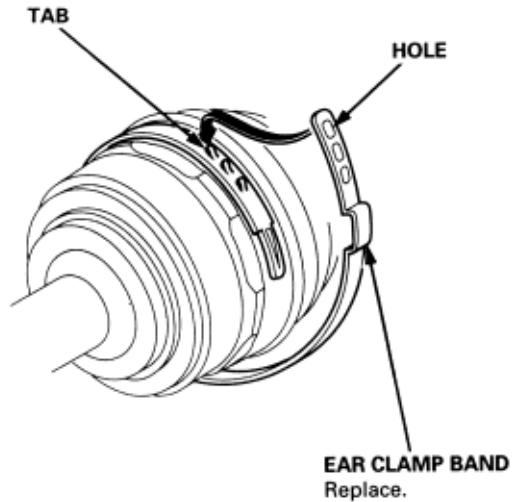
140-150 g (4.9-5.3 oz)



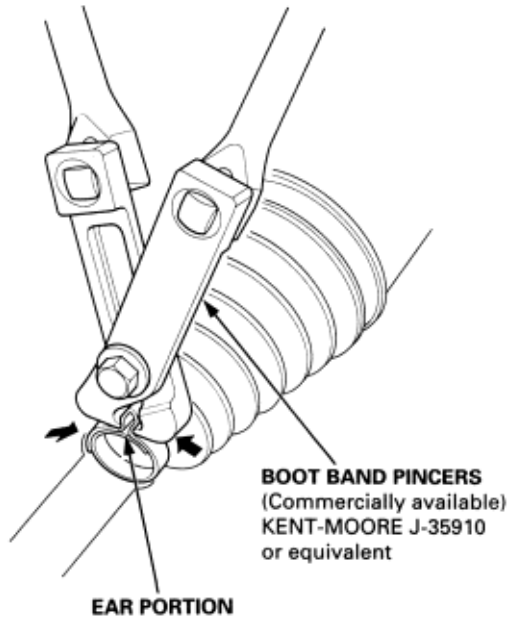
8. Fit the boot ends onto the driveshaft and outboard joint.



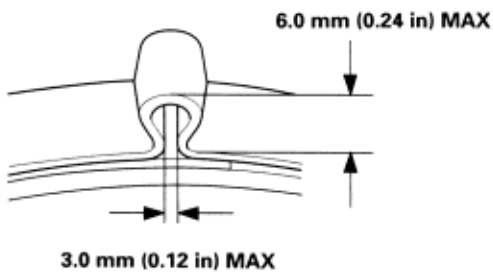
9. Set the ear clamp band by caught the tab into holes of the band.



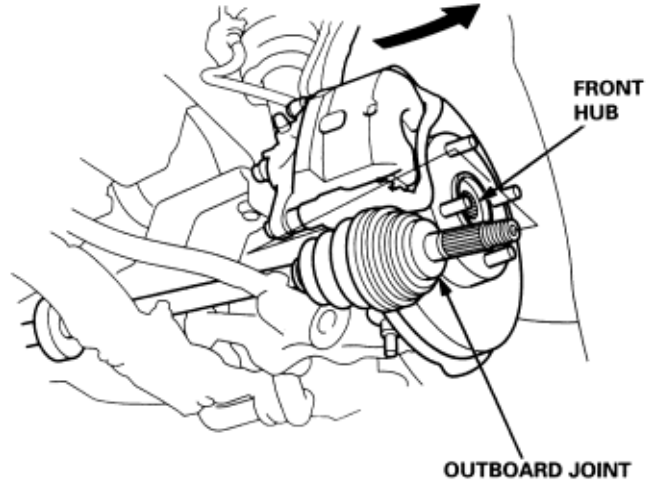
10. Close the ear portion of the band with commercially available boot band pincers.



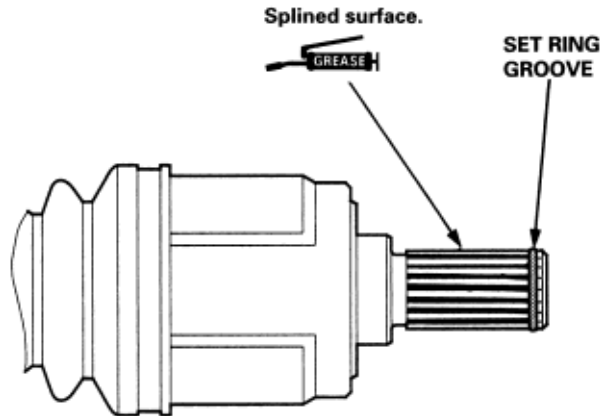
11. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.



1. Install the outboard joint into the front hub.

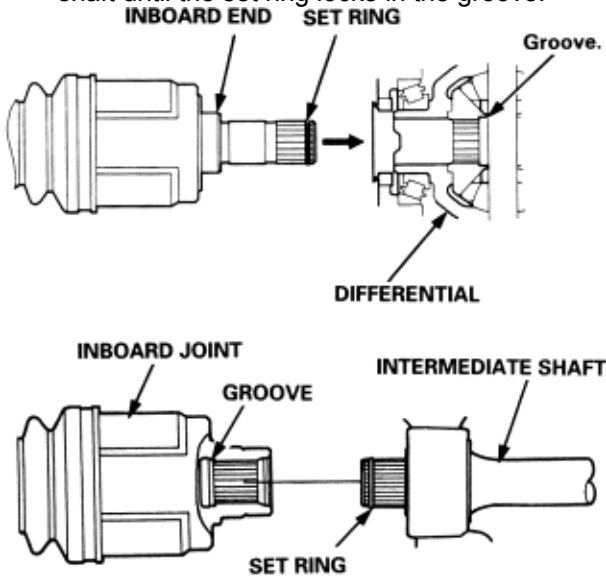


2. Apply 0.3-1.0 g (0.01-0.04 oz) of specified grease to the whole splined surface of the left driveshaft, (for vehicles with intermediate shaft). After applying grease, remove the grease from the splined grooves at intervals of 2-3splines and from the set ring groove so air can bleed from the intermediate shaft.

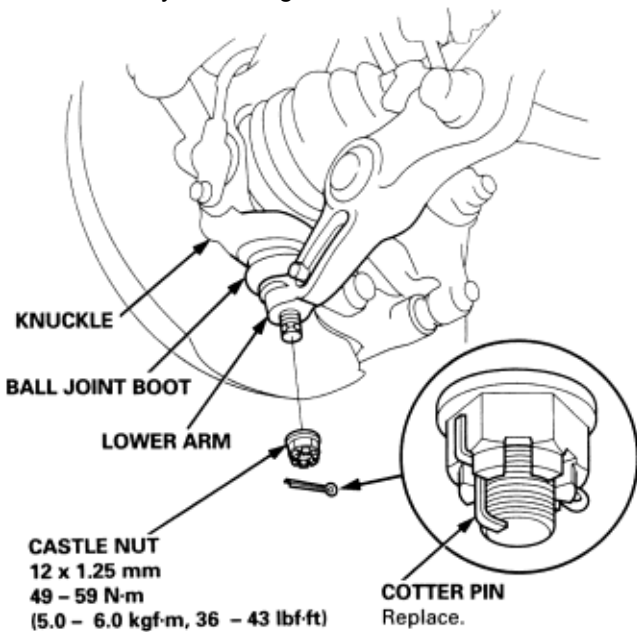


3. Install a new set ring onto the set ring groove of the driveshaft.

4. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or carburettor cleaner, and dry with compressed air. Insert the inboard end of the driveshaft into the differential or intermediate shaft until the set ring locks in the groove.

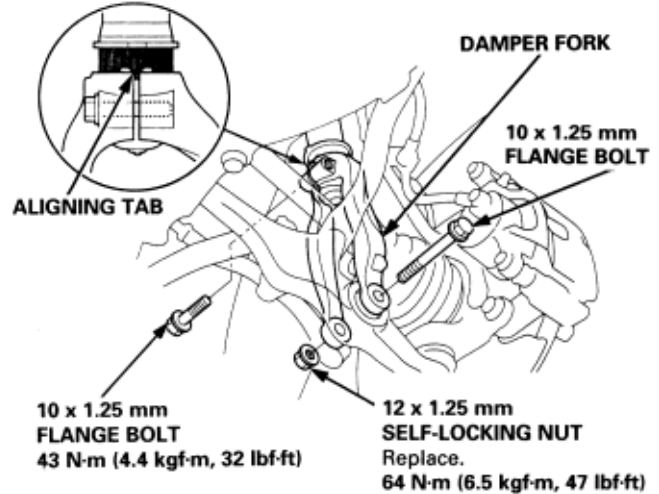


5. Install the knuckle on the lower arm. Be careful not to damage the ball joint boot. Wipe off the grease before tightening the nut at the ball joint. Torque the castle nut to the lower torque specification, then tighten it only enough to align the slot with the pin hole. Do not align the nut by loosening.

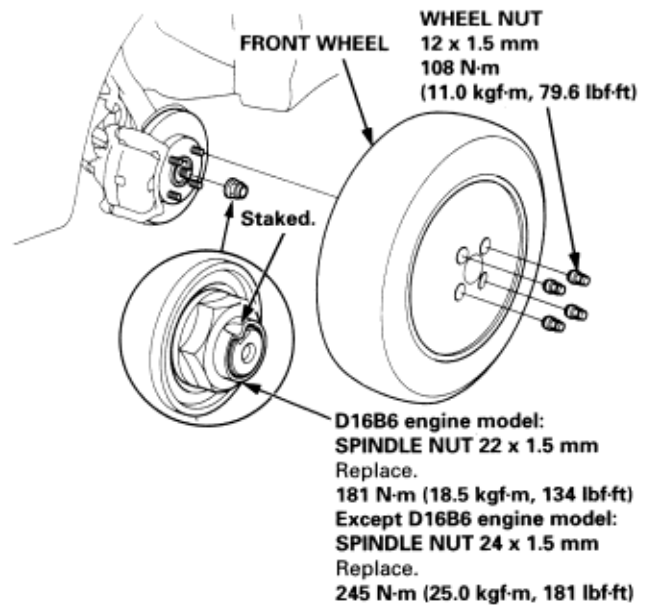


6. Install the new cotter pin into the pin hole, and bend the cotter pin as shown.

7. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork. Loosely install the flange bolt.



8. Loosely install the flange bolt and a new self locking nut.
9. Install a new spindle nut, then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.

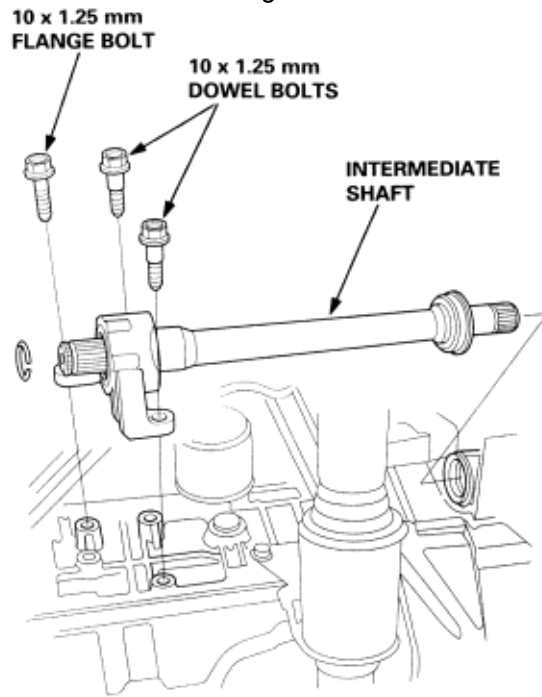


FRONT WHEEL
WHEEL NUT
12 x 1.5 mm
108 N-m
(11.0 kgf-m, 79.6 lbf-ft)

D16B6 engine model:
SPINDLE NUT 22 x 1.5 mm
Replace.
181 N-m (18.5 kgf-m, 134 lbf-ft)
Except D16B6 engine model:
SPINDLE NUT 24 x 1.5 mm
Replace.
245 N-m (25.0 kgf-m, 181 lbf-ft)

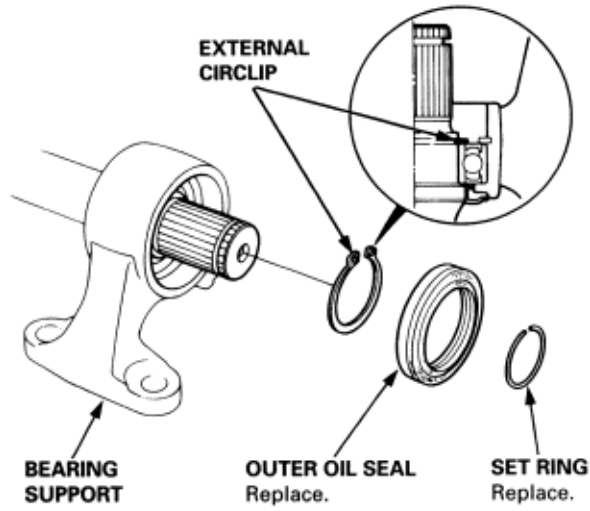
10. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.
11. Tighten the flange bolts and the self-locking nut with the vehicle's weight on the damper.
12. Refill the transmission with recommended fluid (see section 14).
13. Check the front wheel alignment and adjust if necessary (see section 18).

1. Remove the left driveshaft (See Page 16-3).
2. Remove the flange bolt and two dowel bolts.

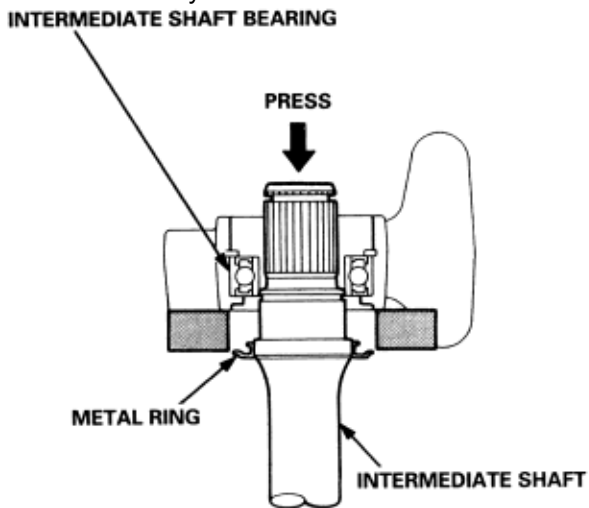


3. Remove the intermediate shaft from the differential. Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal.

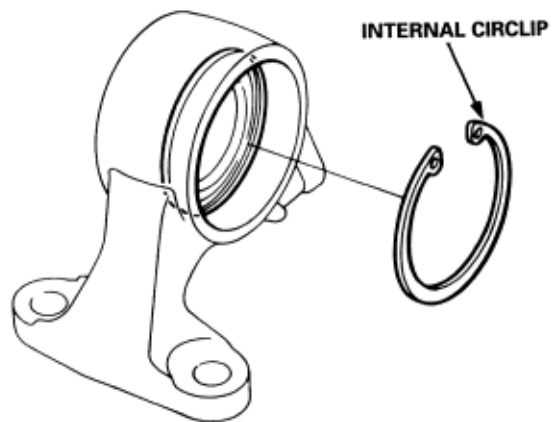
1. Remove the set ring from the intermediate shaft.



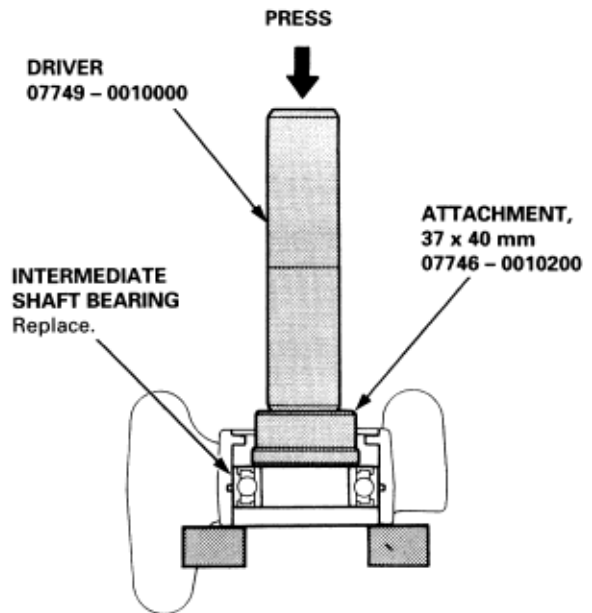
2. Remove the intermediate shaft outer oil seal from bearing support.
3. Remove the external circlip.
4. Press the intermediate shaft out of the Intermediate shaft bearing using a press. Be careful not to damage the metal rings on the intermediate shaft during disassembly.



5. Remove the internal circlip.



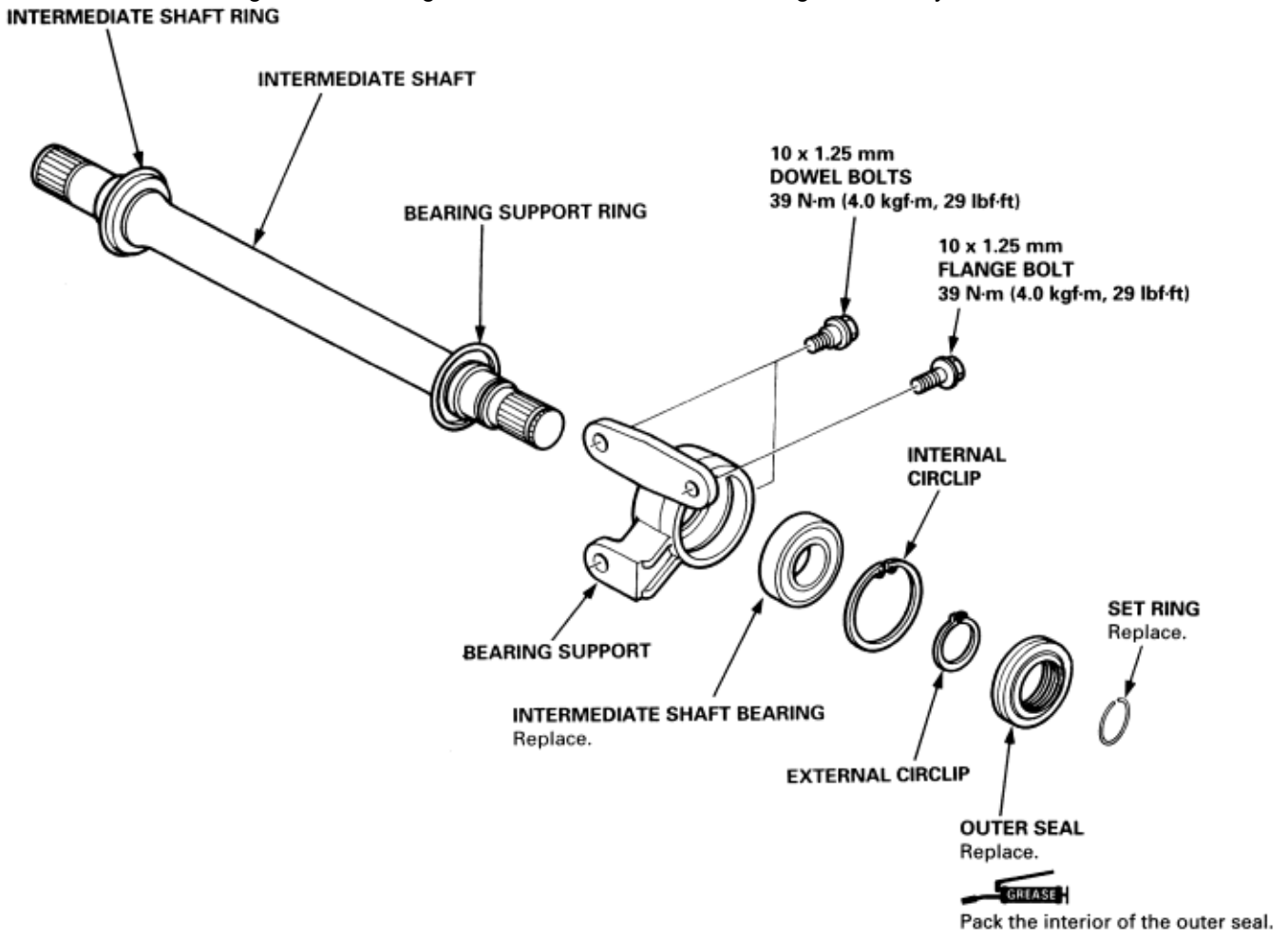
6. Press the intermediate shaft bearing out of the bearing support using a special tool and a press.



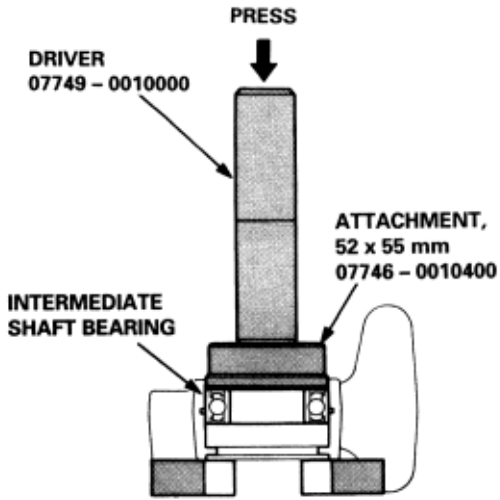
**Intermediate Shaft
Reassembly**

16-21

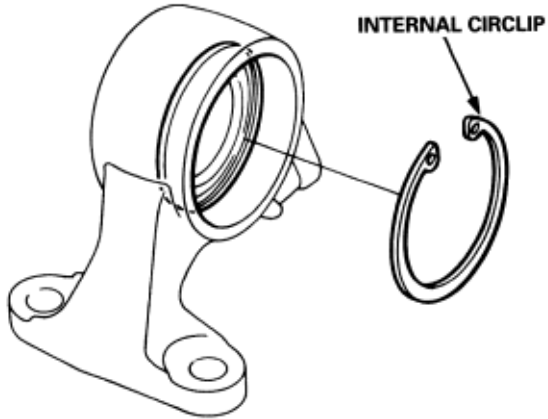
Clean the disassembled parts with solvent and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
NOTE: Be careful not to damage the metal rings on the intermediate shaft during reassembly.



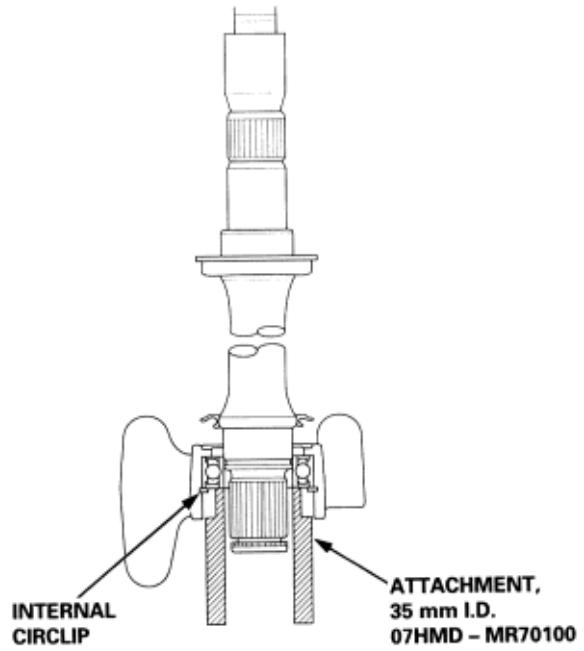
1. Press the intermediate shaft bearing into the bearing support using the special tools and a press.



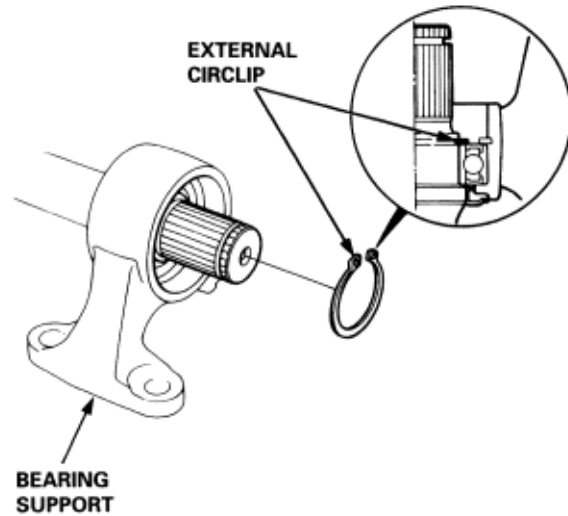
2. Seat the internal circlip in the groove of the bearing support.



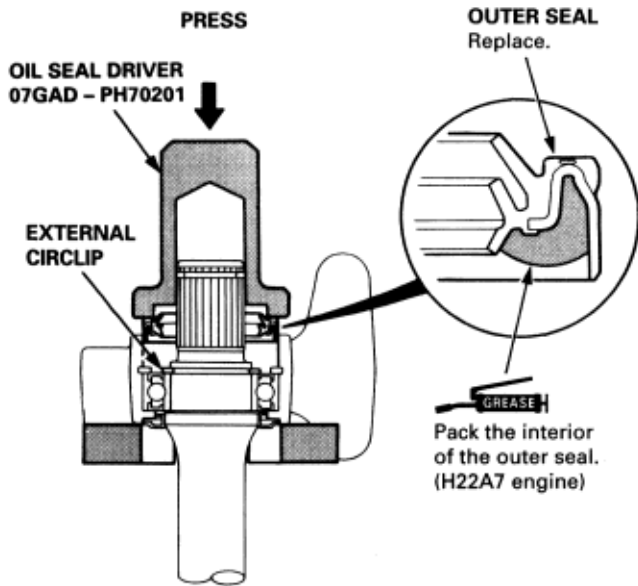
3. Press the intermediate shaft into the bearing support using the special tools and a press.



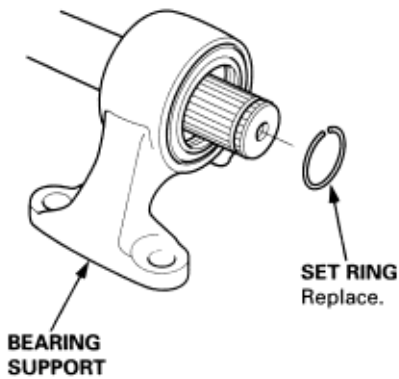
4. Seat the external circlip in the groove of the intermediate shaft.



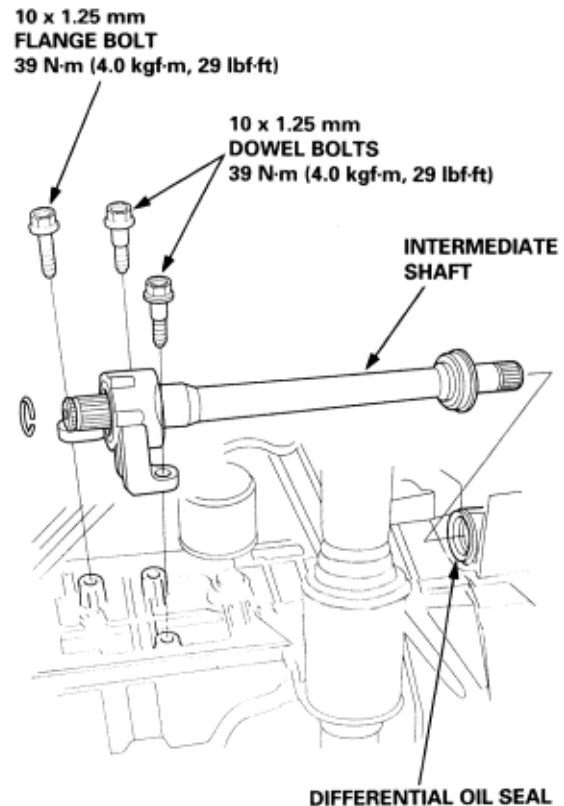
5. Install the outer seal into the bearing support using the tools and a press.



6. Pack the grease to interior of the outer seal (H22A7 engine model)
7. Install the set ring to the intermediate shaft.



1. Clean the areas where the intermediate shaft contacts the transmission (differential) thoroughly with solvent or carburettor cleaner, and dry with compressed air. Insert the intermediate shaft assembly into the differential. Hold the intermediate shaft horizontal to prevent damage to the differential oil seal.



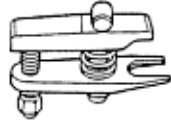
2. Install the flange bolt and two dowel bolts.
3. Install the left driveshaft (**See Page 16-18**).

Special Tools**17-2**

Ref No.	Tool Number	Description	Qty	Remark
1	07JGG - 0010100	Belt Tension Gauge	1	
2	07MAC - SL00200	Ball Joint Remover, 28 mm	1	
3	07QAD - P0A0100	Drive Attachment, 42 mm	1	
4	07RAK - S040110	P/S Joint Adapter (Pump)	1	
5	07RAK - S040120	P/S Joint Adapter (Hose)	1	
6	07XAA - S1A0100	Locknut Wrench, 46 mm	1	
7	07406 - 0010200	P/S Pressure Gauge	1	
8	07406 - 0010300	Pressure Control Valve	1	
9	07406 - 0010400	Pressure Gauge	1	



①



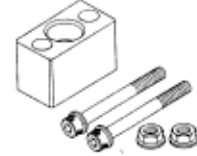
②



③



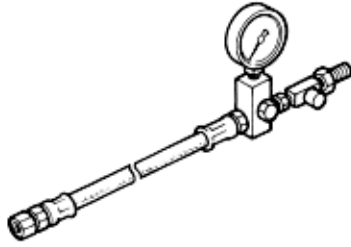
④



⑤



⑥



⑦



⑧

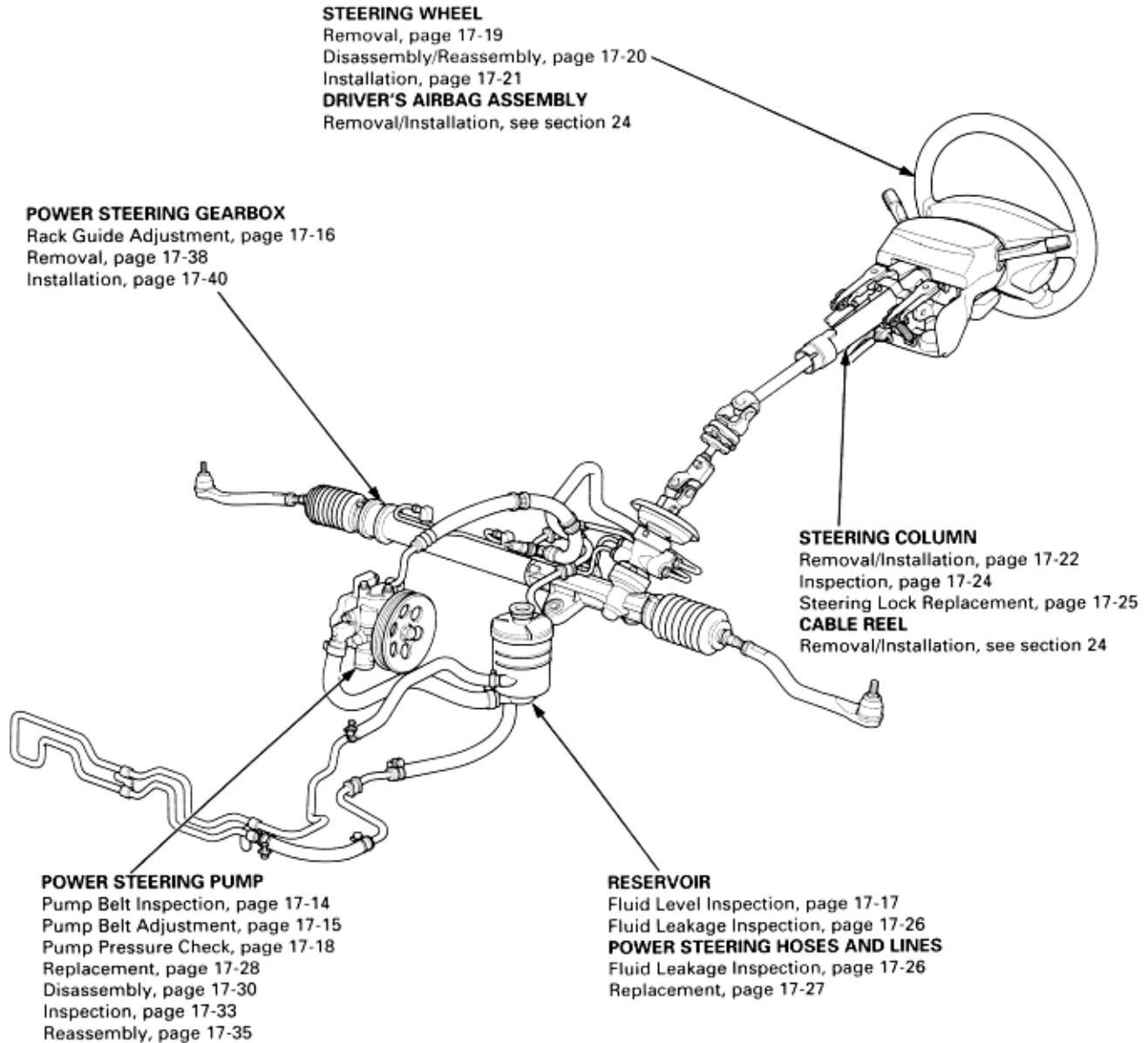


⑨

Note these items during disassembly:

- ♦ If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 24).
- ♦ Before removing the gearbox, remove the driver's airbag assembly and steering wheel.
- ♦ After installing the gearbox, check the wheel alignment and adjust if necessary.
- ♦ LHD type is shown, RHD type is symmetrical.

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS (section 24) before performing repairs or service.



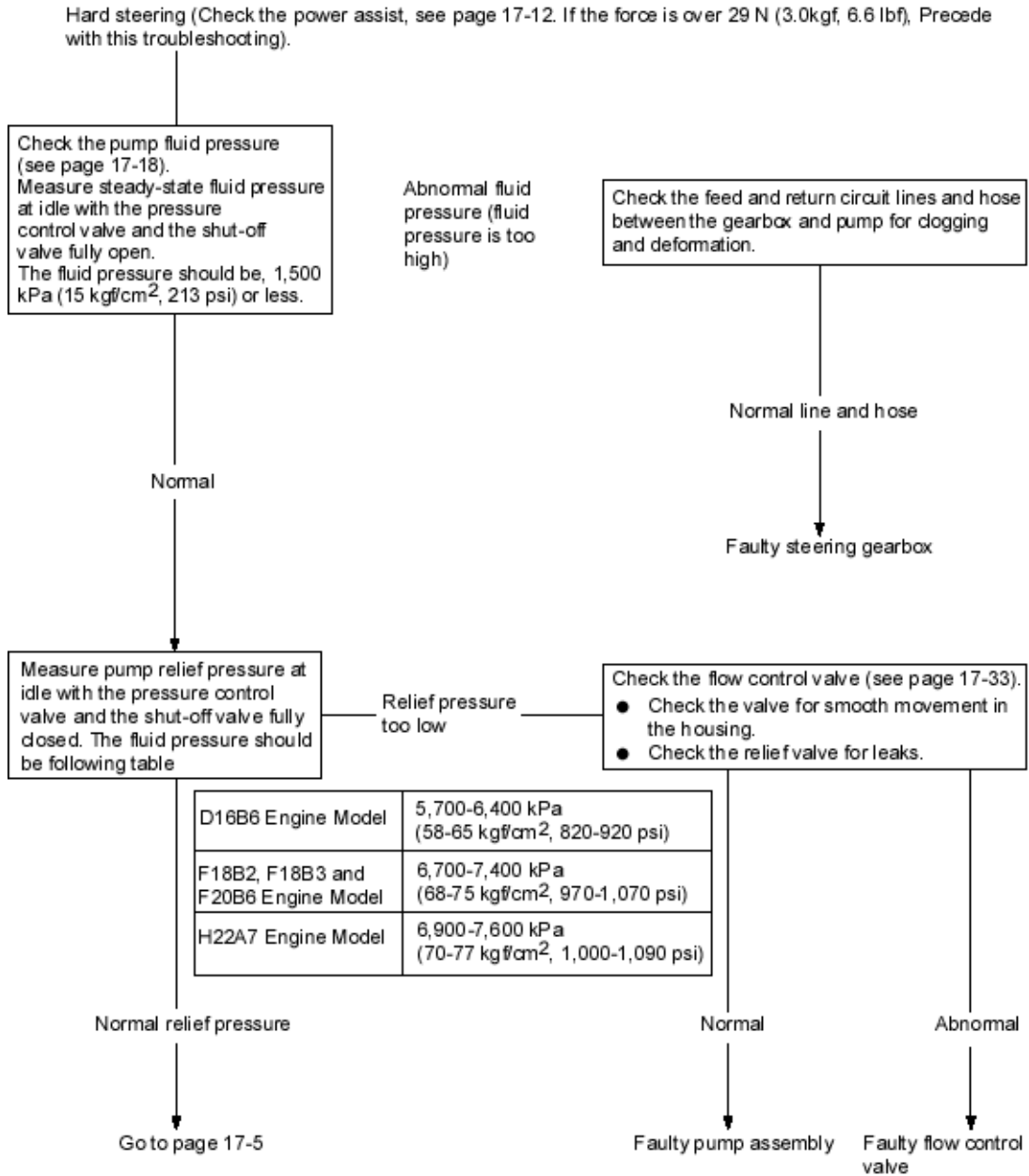
To go to the pages referenced on the diagram above, click on the following:

- (See Page 17-19)
- (See Page 17-20)
- (See Page 17-21)
- (See Page 17-16)
- (See Page 17-38)
- (See Page 17-40)
- (See Page 17-14)
- (See Page 17-15)
- (See Page 17-18)
- (See Page 17-28)
- (See Page 17-30)
- (See Page 17-33)
- (See Page 17-35)
- (See Page 17-22)
- (See Page 17-24)
- (See Page 17-25)
- (See Page 17-17)
- (See Page 17-26)
- (See Page 17-27)

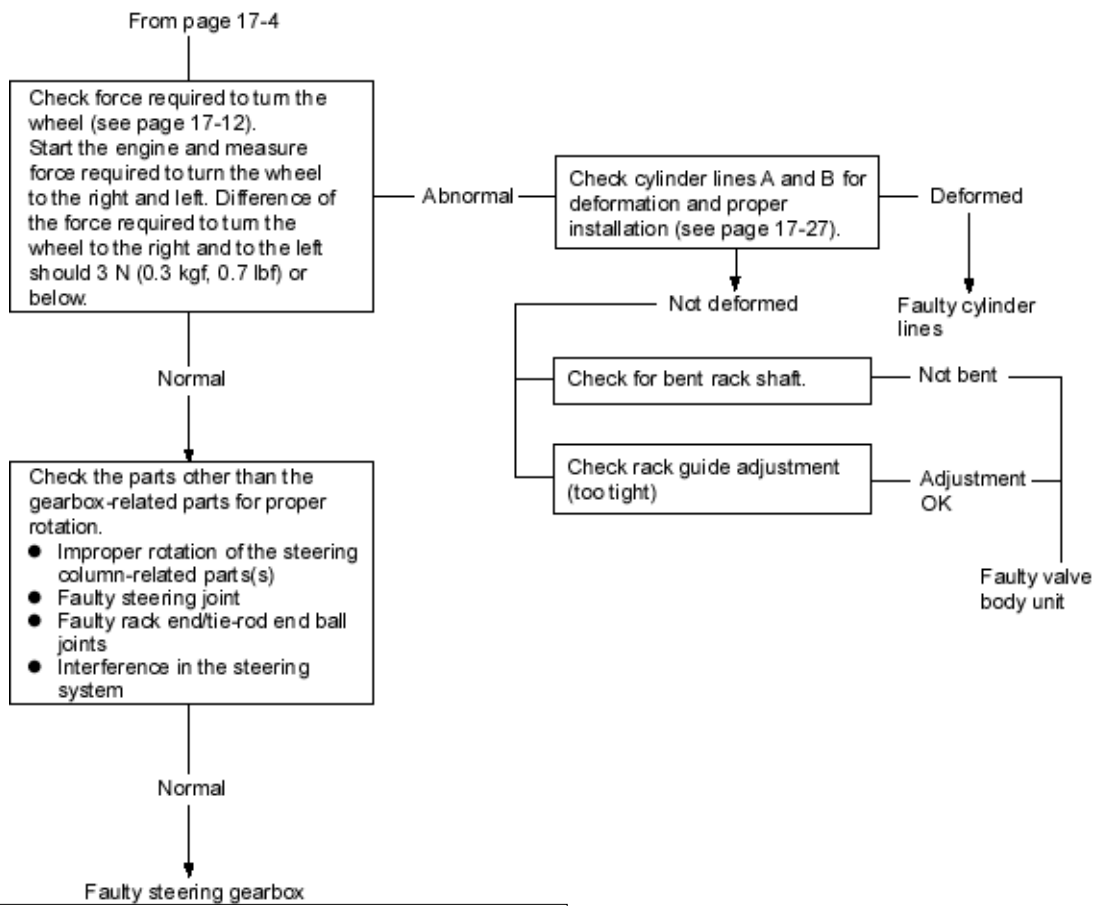
Check the following before you begin:

- ♦ Has the suspension been modified in a way that would affect steering?
- ♦ Are tyre sizes, tyre variety and air pressure correct?
- ♦ Is the steering wheel original equipment?
- ♦ Is the power steering pump belt properly adjusted?
- ♦ Is steering fluid reservoir fitted to proper level?
- ♦ Is the engine idle speed correct and steady?

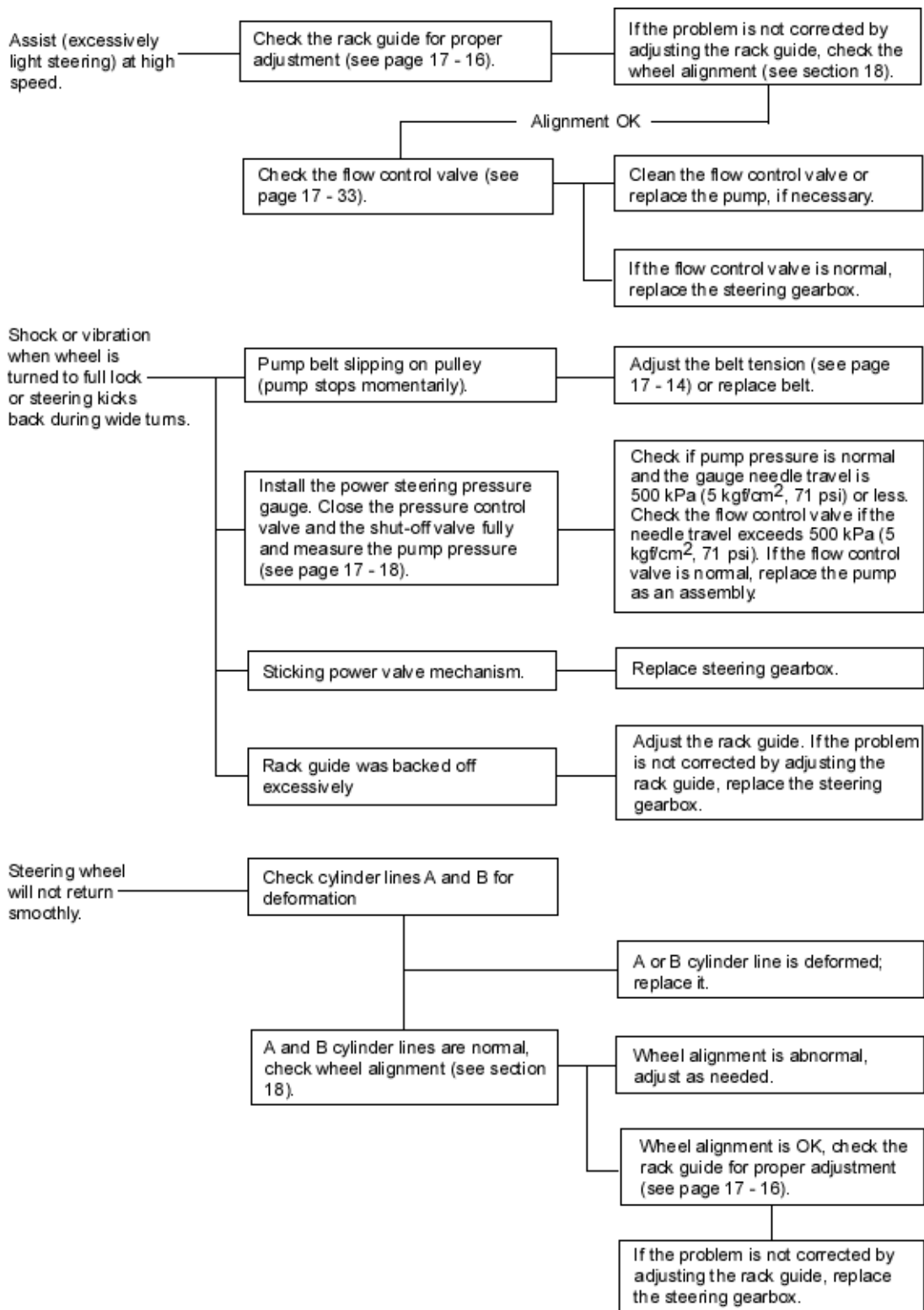
Hard Steering (Check the power assist, (See Page 17-12). If the force is over 29 Nm (3.0 kgf, 6.6 lbf), proceed with this troubleshooting.)



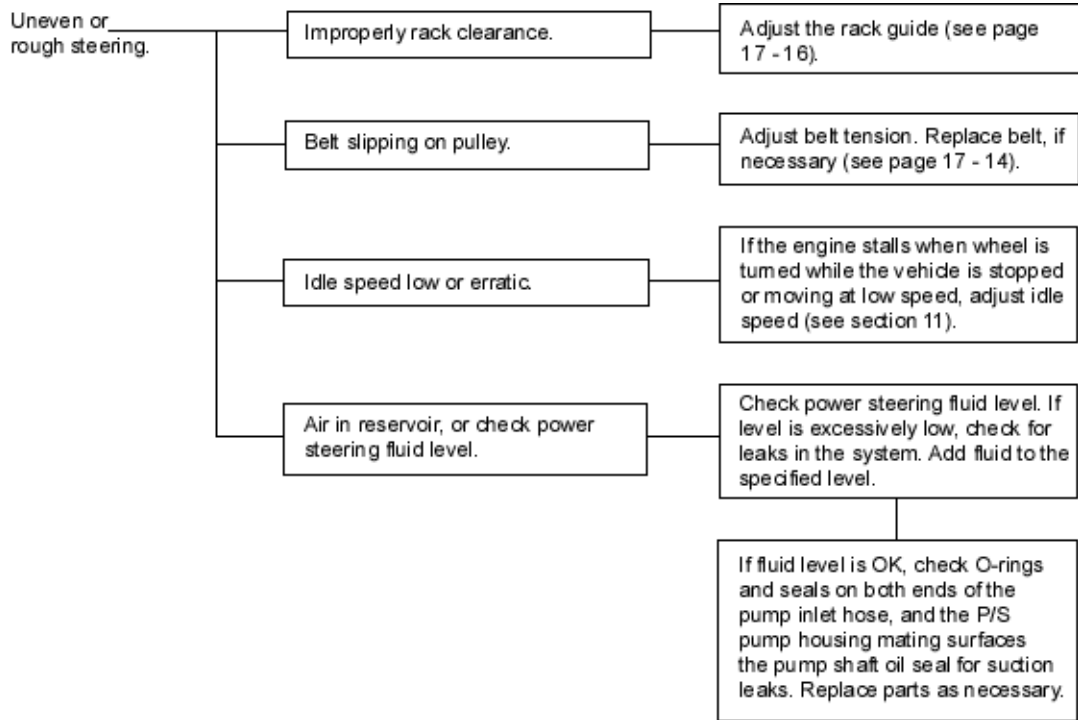
To go to the pages referenced on the diagram above, click on the following:
 (See Page 17-18)
 (See Page 17-33)



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 17-12\)](#)
[\(See Page 17-27\)](#)

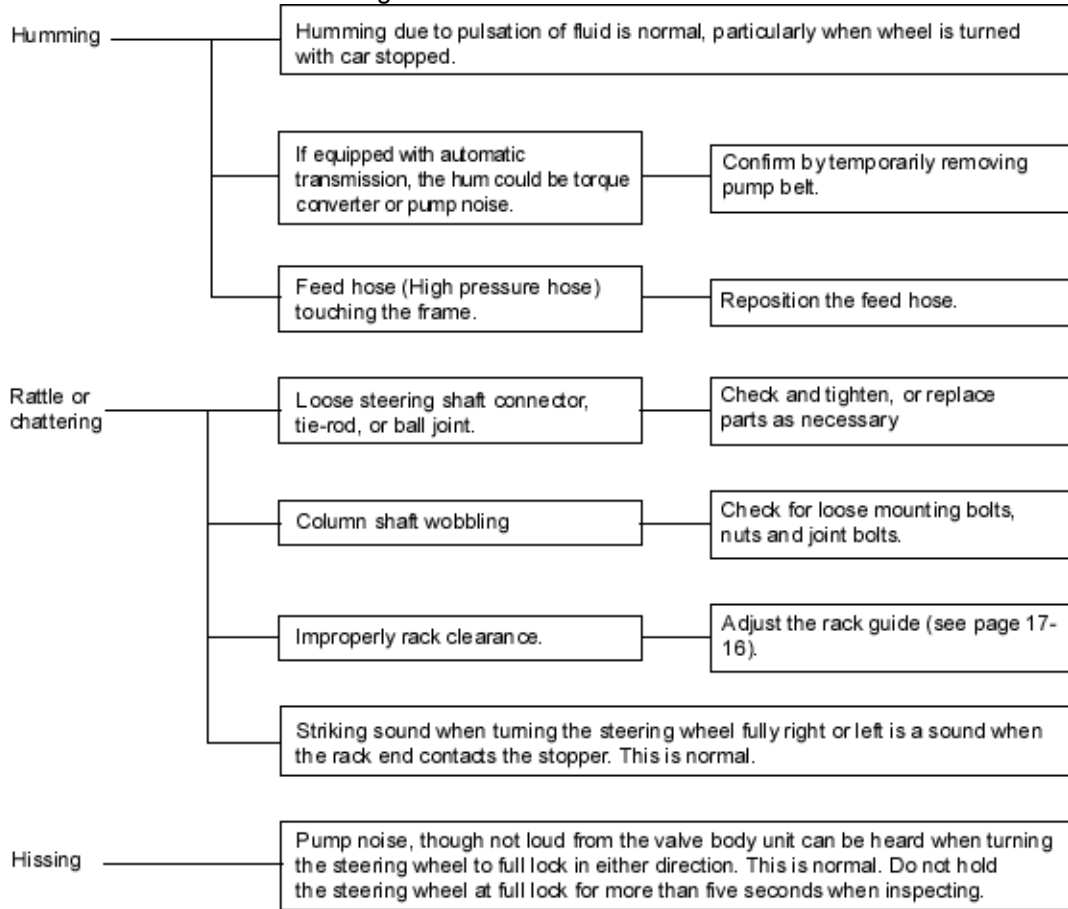


To go to the pages referenced on the diagram above, click on the following:
 (See Page 17-16)
 (See Page 17-33)
 (See Page 17-14)
 (See Page 17-18)

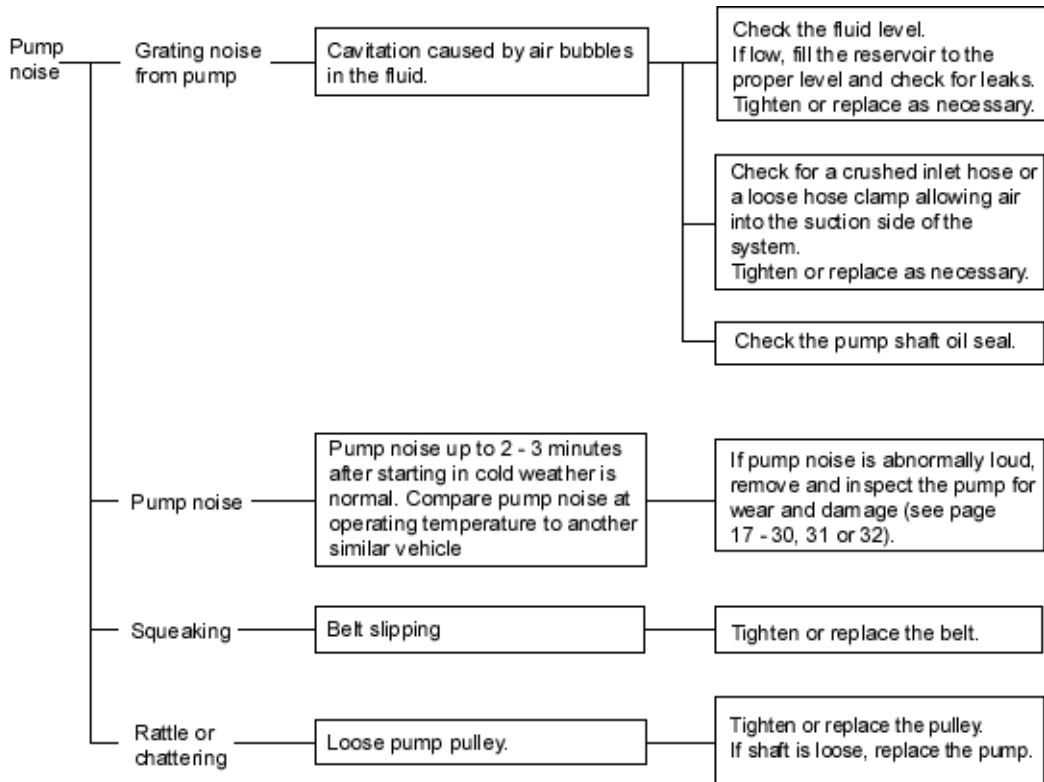


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 17-16\)](#)
[\(See Page 17-14\)](#)

NOTE: Pump noise in first 2 - 3 minutes after starting in cold weather is normal.



To go to the pages referenced on the diagram above, click on the following:
(See Page 17-16)

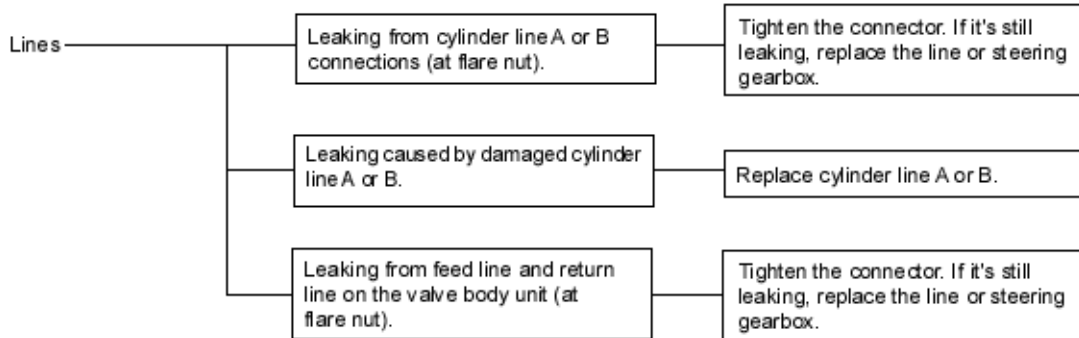


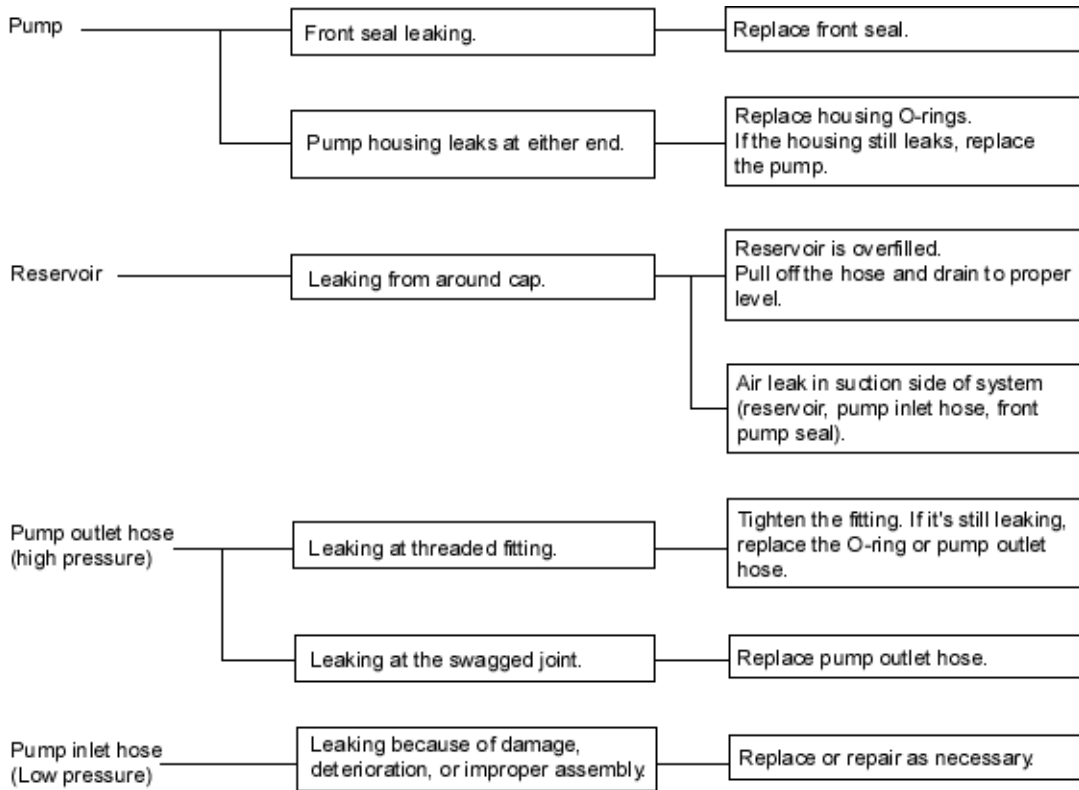
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 17-30\)](#)
[\(See Page 17-31\)](#)
[\(See Page 17-32\)](#)

Steering Gearbox ————— Check the gearbox assembly for fluid leaks carefully. Fluid can leak out of various points, depending on location of the faulty oil seals/seal rings.

If leaking from the following sections on the steering gearbox, replace the whole gearbox as an assembly. Do not try to disassemble to gearbox.

- Leaking from the oil seal on the top of the valve housing.
- Leaking from the cylinder and into left or right tie-rod boots.
- Leaking from the shaft upper and section or pin engagement section of the pinion shaft.
- Leaking from the mating surface of the valve body unit and gearbox.

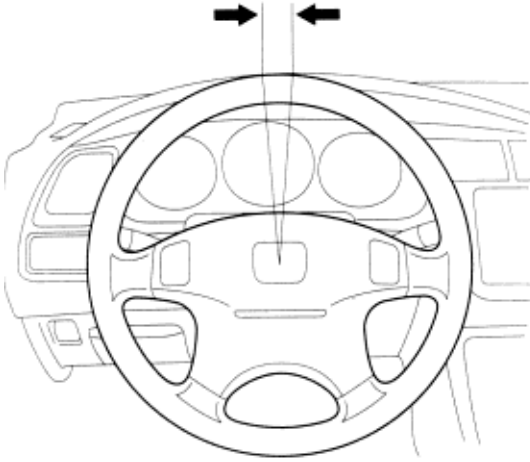




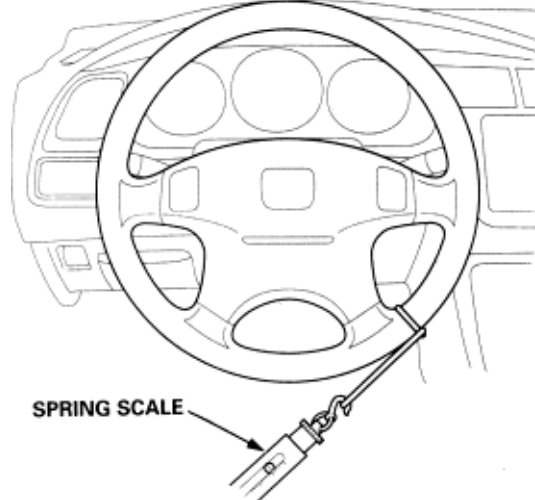
Place the front wheels in the straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.

If the play exceeds the service limit, inspect the steering linkage and gearbox (**See Page 17-13**).

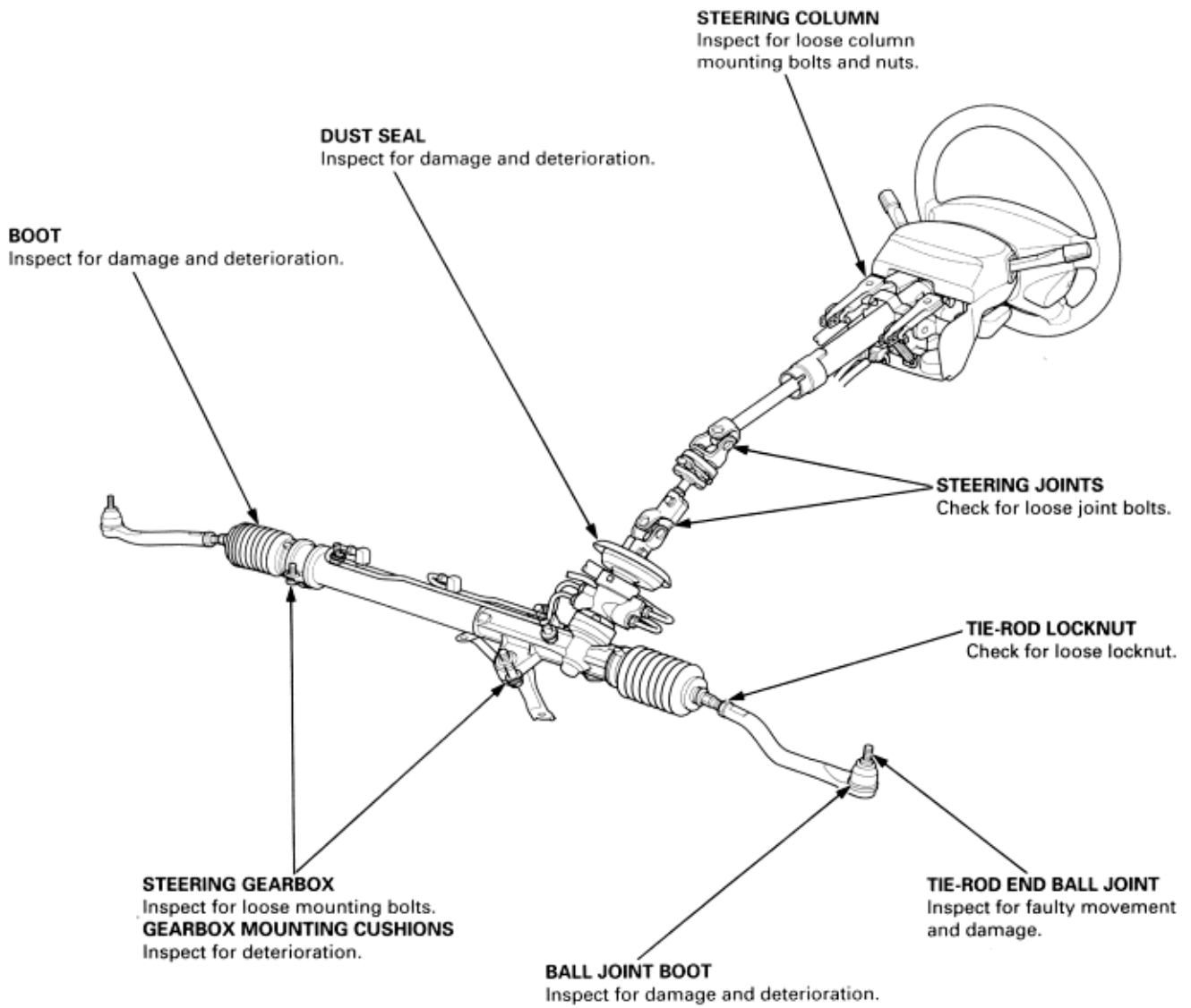
ROTATIONAL PLAY: 0 – 10 mm (0 – 0.39 in)



1. Check the power steering fluid level (**See Page 17-17**) and pump belt tension (**See Page 17-14**).
2. Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock, several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tyres begin to turn.



4. The scale should read no more than 29 Nm (3.0 kgf, 6.6 lbf). If it reads more check the gearbox and pump.



When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Inspection

Note these items during inspection:

- ♦ If there are cracks or any damage evident on the belt, replace it with a new one.
 - ♦ Follow the manufacturer's instructions for the tension gauge.
1. Remove the P/S reservoir from the bracket, and set it aside.
 2. Attach the belt tension gauge to the belt with the gauge facing towards the engine, and measure the tension of the belt.
 3. Remove the belt tension gauge carefully to avoid hitting the gauge reset lever.

Tension:

D16B6 Engine Model:

Used Belt: 345 - 490 N (35 - 50 kgf, 77 - 110 lbf)

New Belt: 640 - 780 N (65 - 80 kgf, 143 - 176 lbf)

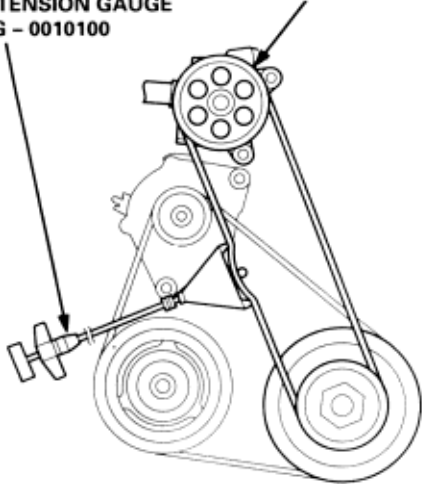
Other Engine Model:

Used Belt: 340 - 540 N (40 - 55 kgf, 88 - 121 lbf)

New Belt: 740 - 880 N (75 - 90 kgf, 165 - 198 lbf)

POWER STEERING PULLEY

BELT TENSION GAUGE
07JGG - 0010100



Measurement without Belt Tension Gauge:

Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump and the crankshaft pulley.

Deflection:

D16B6 Engine Model:

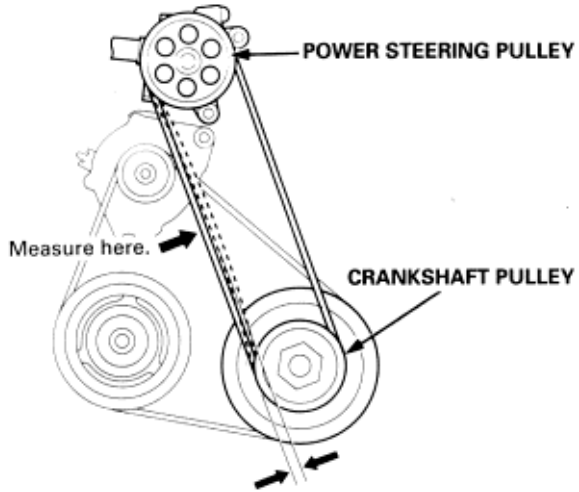
Used Belt: 10.5 - 14.0 mm (0.41 - 0.55 in)

New Belt: 7.5 - 10.0 mm (0.30 - 0.39 in)

Other Engine Model:

Used Belt: 13.0 - 16.5 mm (0.51 - 0.65 in)

New Belt: 8.5 - 11.0 mm (0.33 - 0.43 in)



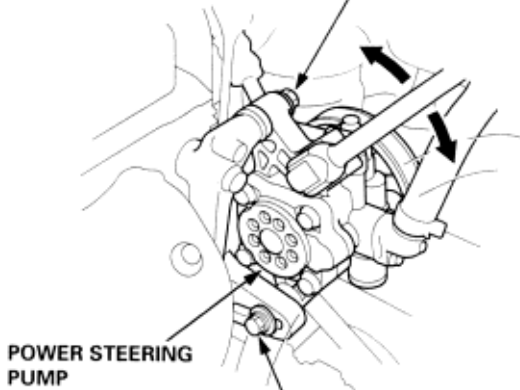
Pump Belt (cont'd)

Adjustment

1. Loosen the power steering pump mounting bolt and pump lock bolt.

D16B6 Engine Model:

PUMP MOUNTING BOLT
24 N-m (2.4 kgf-m, 17 lbf-ft)



PUMP LOCK BOLT
24 N-m (2.4 kgf-m, 17 lbf-ft)

F18B2, F18B3 and F20B6 Engine Models:

PUMP MOUNTING BOLT
24 N-m (2.4 kgf-m, 17 lbf-ft)



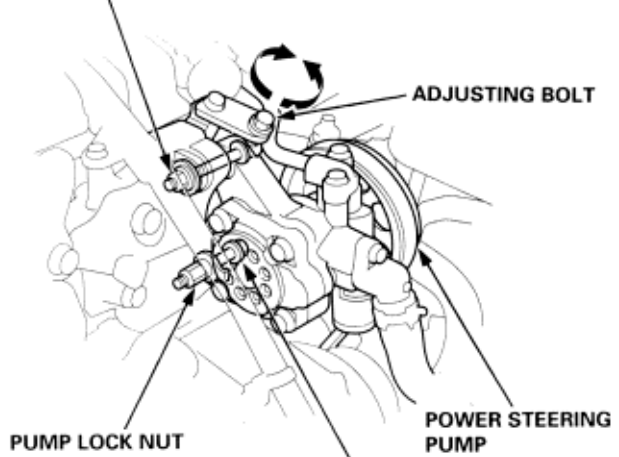
PUMP LOCK BOLT
24 N-m (2.4 kgf-m, 17 lbf-ft)

2. Adjust the belt tension by moving the power steering pump with a 1/2" drive breaker bar to obtain the proper belt tension, then retighten the mounting bolt and lock bolt.
3. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.

H22A7 Engine Model:

1. Loosen the power steering pump mounting nut and pump lock bolt.

PUMP MOUNTING NUT
24 N-m (2.4 kgf-m, 17 lbf-ft)

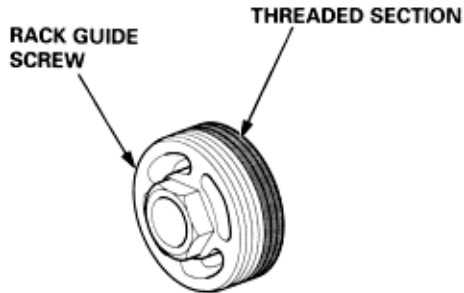


PUMP LOCK BOLT
24 N-m (2.4 kgf-m, 17 lbf-ft)

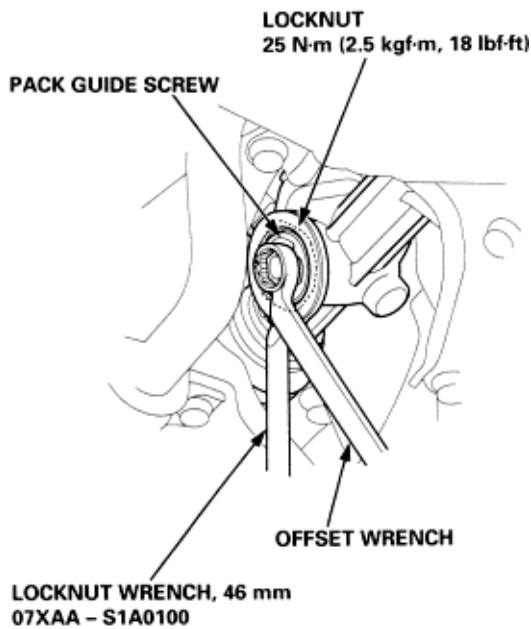
2. Turn the adjusting bolt to get the proper belt tension, then retighten the mounting nut and lock bolt.
3. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.

Rack Guide Adjustment

1. Set the wheel in the straight ahead position.
2. Loosen the rack guide screw locknut with the special tool, then remove the rack guide screw.
3. Remove the old sealant from rack guide screw threaded section, and apply new sealant to the first threads. Loosely install the rack guide screw on the gearbox



4. Tighten the rack guide screw to 5 Nm (0.5 kgf/m, 4 lbf/ft) then back it off to half turn.



5. Retighten the rack guide screw to 1.5 - 2.0 Nm (0.15 - 0.20 kgf/m, 1.08 - 1.44 lbf/ft), then back it off to specified angle 5 - 10 degrees).
6. Tighten the locknut while holding the rack guide screw.
7. Check for tight or loose steering through the complete turning travel.
8. Check for steering operation and power assist with the vehicle parked (**See Page 17-12**).

Check the reservoir at regular intervals, and add fluid as necessary.



CAUTION

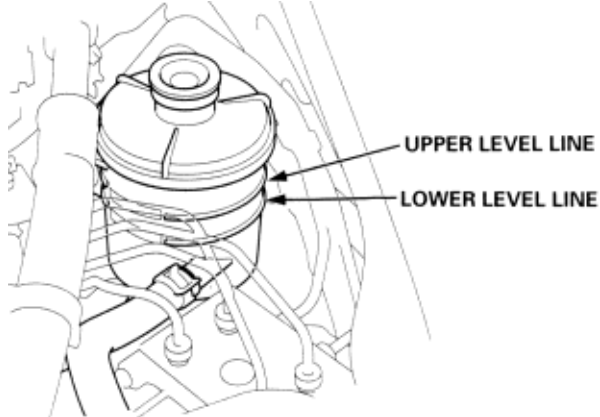
Use only Genuine Honda Power Steering Fluid S. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

SYSTEM CAPACITY:

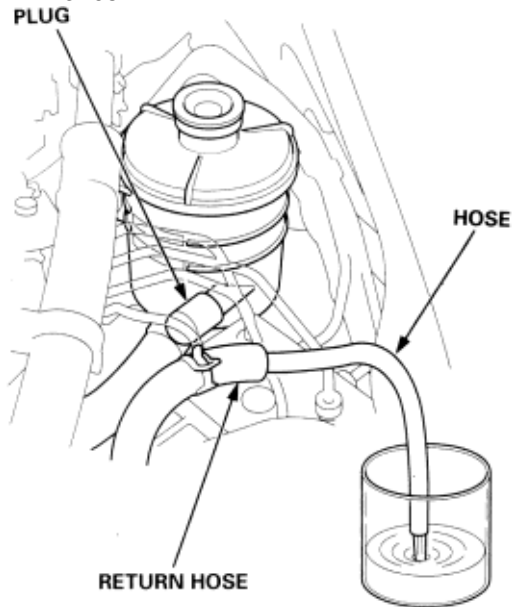
LHD: 1.0 litre (1.06 US. qt, 0.88 Imp. qt)

RHD: All except D16B6 Engine Model:
1.1 litre (1.16 US. qt., 0.96 Imp. qt)

D16B6 Engine Model:
1.0 litre (1.06 US qt., 0.88 Imp. qt)



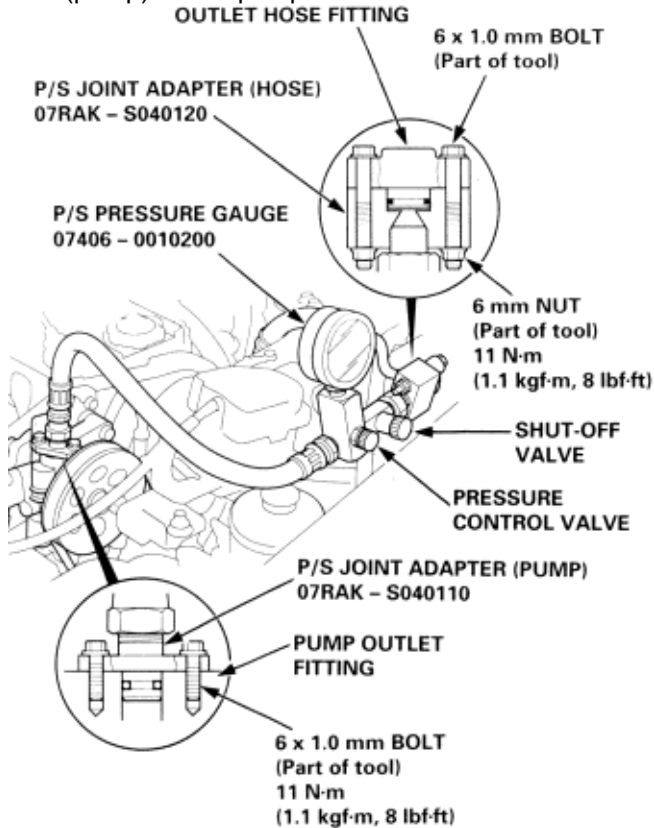
1. Raise the reservoir and disconnect the return hose to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off spilled fluid at once.



2. Connect hose of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of hose, shut off the engine. Discard the fluid.
4. Refit the return hose on the reservoir.
5. Fill the reservoir to the upper level line.
6. Start the engine and run it fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add some if necessary. Do not fill the reservoir beyond the upper level line.

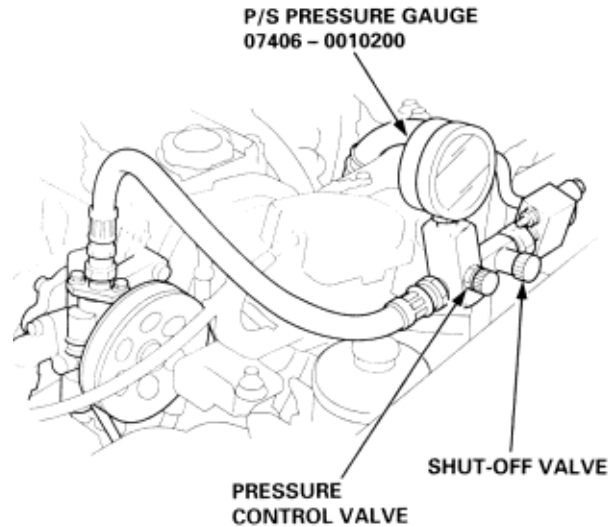
Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (See Page 17-17) and pump belt tension (See Page 17-14).
2. Disconnect the pump outlet hose from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, then install the P/S joint adapter (pump) on the pump outlet.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose to the P/S joint adapter (hose).
4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Fully open the shut-off valve.



6. Fully open the pressure control valve.
7. Start the engine and let it idle.
8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read less than 1,500 kPa (15 kgf/cm², 213 psi). If it reads high, check the outlet hose or valve body unit (see General Troubleshooting).
10. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.

CAUTION

Do not keep the pressure control valve closed more than 5 seconds or the pump could be damaged by overheating.

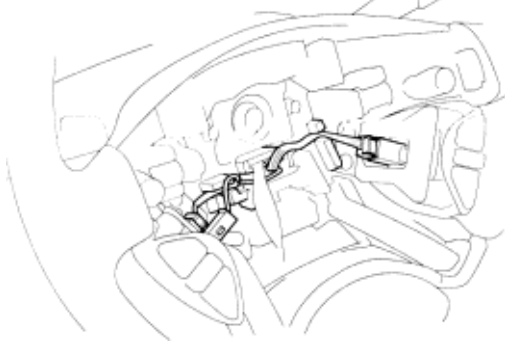
11. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least as follows:
D16B6 Engine Model:
5,700 - 6,400 kPa (58 - 65 kgf/cm², 820 - 920 psi)
F18B2 ,F18B3 and F20B6 Engine Models:
6700 - 7,400 kPa (68 - 75 kgf/cm², 970 - 1,070 psi)
H22A7 Engine Model:
6,800 - 7,500 kPa (6,900 - 7,600 kgf/cm², 1,000 - 1,090 psi).
 A low reading means pump output is too low for full assist repair or replace the pump.

Steering Wheel Removal

17-19

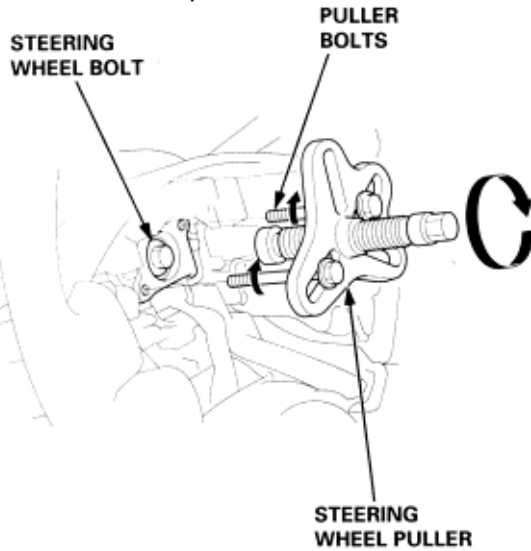
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Align the front wheels straight ahead, then remove the driver's airbag assembly from the steering wheel (see section 24).
2. Disconnect the radio remote switches connector and cruise control switches connector if equipped.



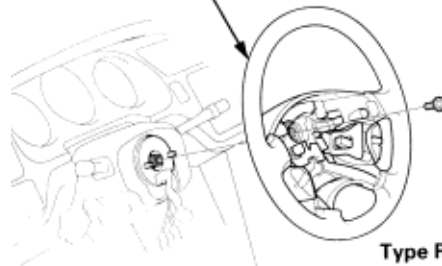
3. Loosen the steering wheel bolt, then install steering wheel puller on the steering wheel and remove it. Note these items when removing the steering wheel:

- ♦ Do not tap on the steering wheel or the column shaft when removing the steering wheel.
- ♦ If you thread the puller bolts into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller bolt.



STEERING WHEEL

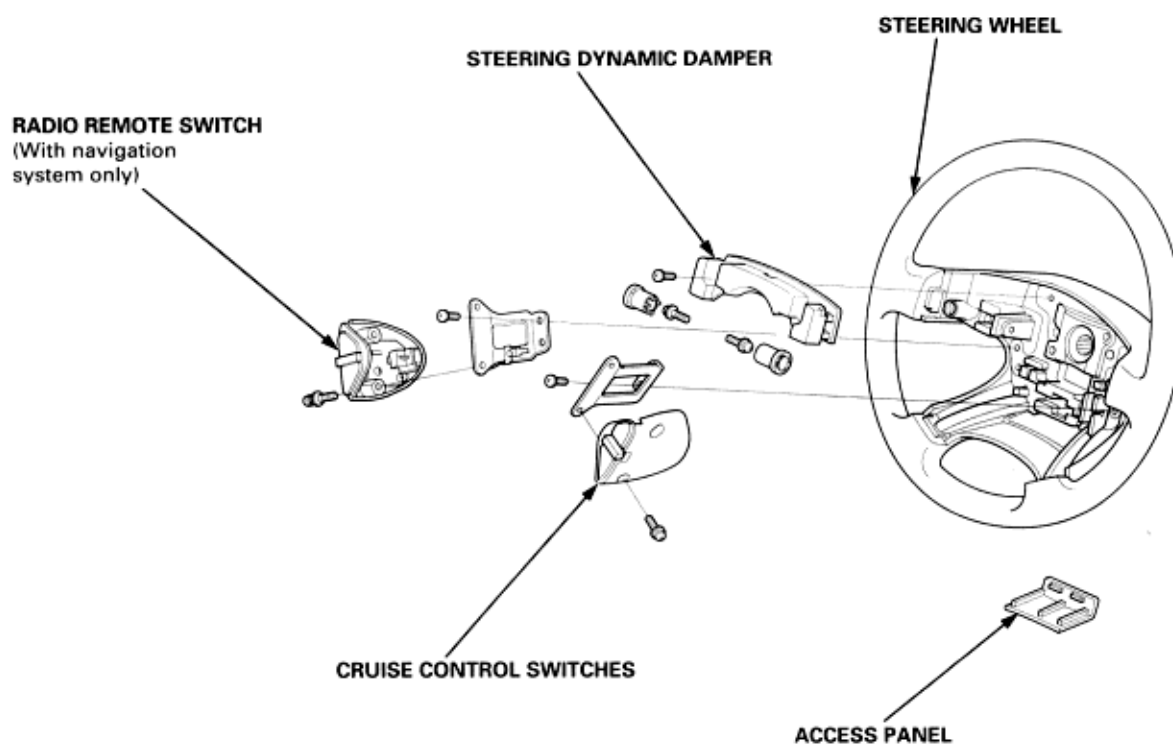
L, LS and ES Models:



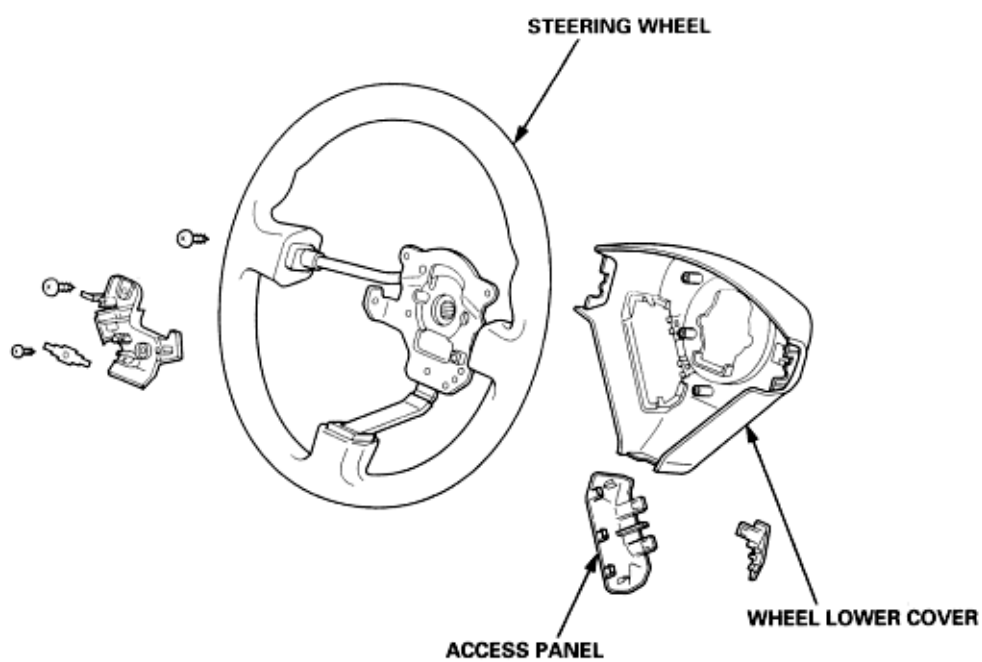
Type R Model:



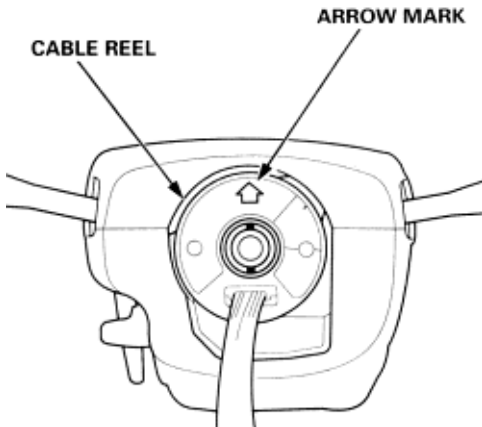
Type L, LS and ES:



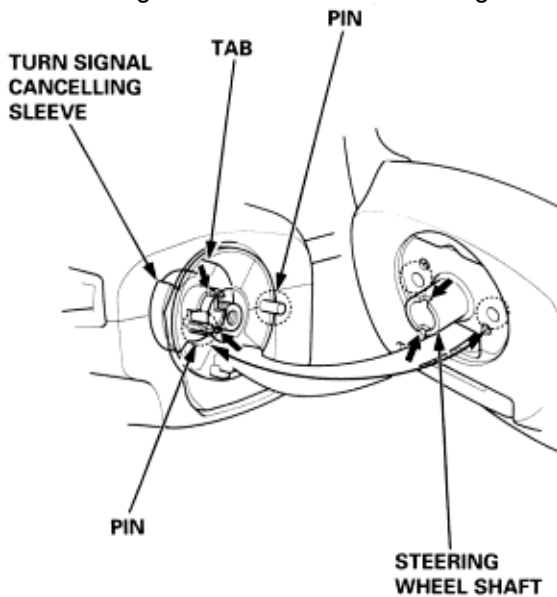
Type R:



1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel. Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise approximately two and half turns. The arrow mark on the cable reel label point should point straight up.



2. Position the two tabs of the turn signal cancelling sleeve as shown, and install the steering wheel on to the steering column shaft, making sure the steering wheel shaft engages the pins of the cable reel and tabs of the cancelling sleeve. Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



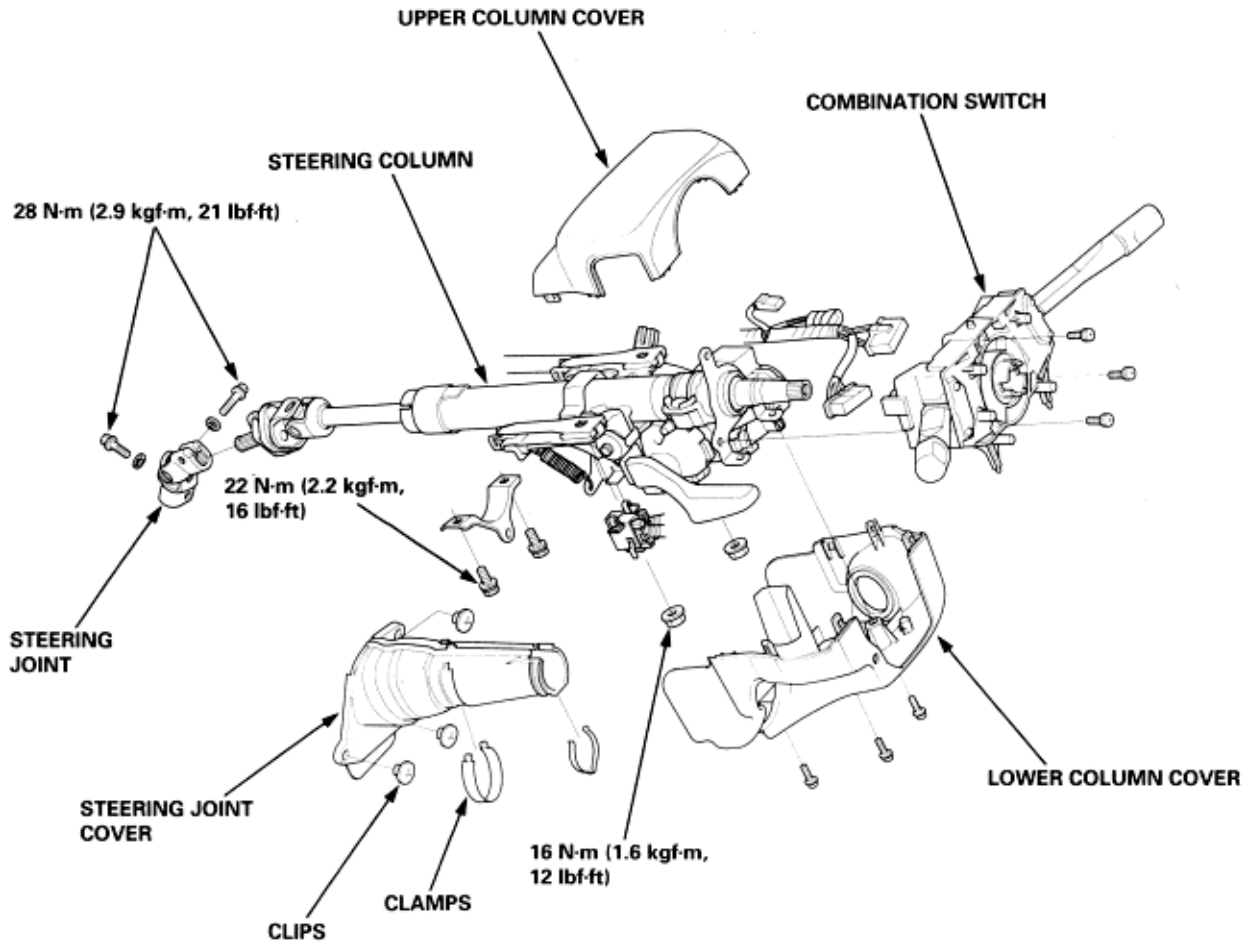
3. Install the steering wheel bolt and tighten it to 39 Nm (4.0kgf/m, 29lbf/ft).
4. Connect the radio remote switches connector and cruise control switches connector if equipped.
5. Install the driver's airbag assembly, and confirm that the system is operating properly (see section 24).
6. Check the horn, radio remote switches, cruise control set/resume switches and turn signal cancelling for proper operation.

Steering Column Removal/Installation

17-22

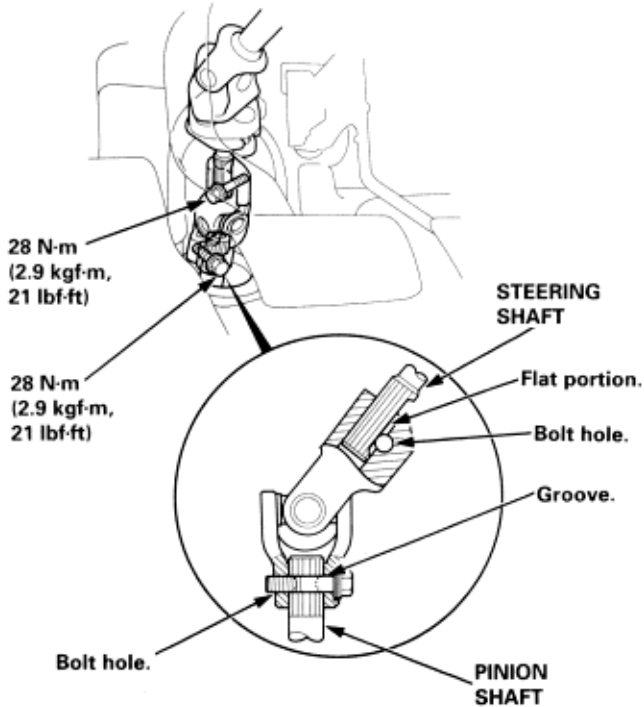
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the driver's airbag assembly and cable reel (see section 24).
2. Remove the steering wheel (**See Page** 17-19).
3. Remove the driver's dashboard lower cover (see section 20).
4. Remove the column covers.



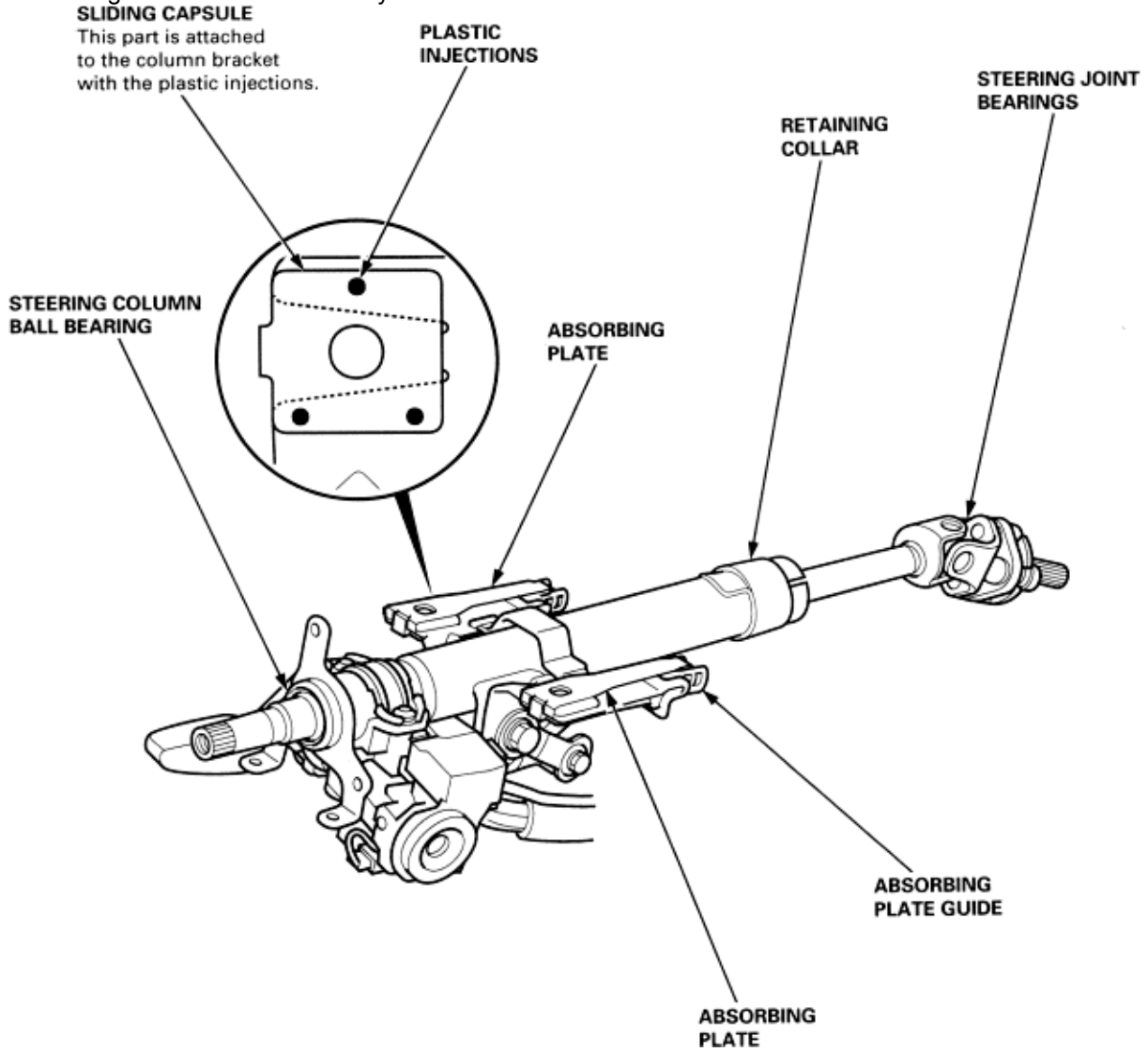
5. Remove the combination switch assembly from the steering column shaft by disconnecting the connectors.
6. Disconnect the ignition switch connectors.
7. Remove the steering joint cover.
8. Disconnect the steering joint, and remove it from the column shaft.
9. Remove the steering column by removing the attaching nuts and bolts.

10. Install the steering column in the reverse of removal, and note these items:
- ♦ Be sure the wires are not caught or pinched by any parts when installing the column.
 - ♦ Make sure the wire harness is routed and fastened properly.
 - ♦ Make sure the connectors are properly connected.
 - ♦ Make sure the steering joint is connected as follows:
 - Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole with the flat groove in the pinion on the shaft).



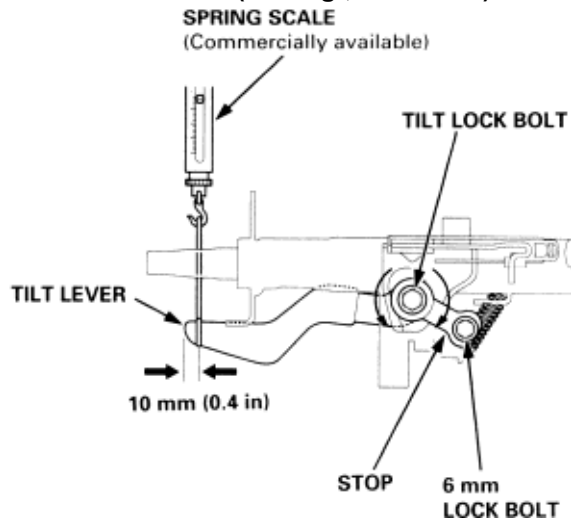
- Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove the around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
- Pull on the steering joint to make sure that the joint is full seated. Then install the upper joint bolt and tighten it.

- ♦ Check the steering column ball bearing and the steering joint bearings for play and proper movement. If there is noise or if there is excessive play, replace the steering column as an assembly.
- ♦ Check the retaining collar for damage, if it is damaged, replace the steering column as an assembly.
- ♦ Check the absorbing plates, absorbing plate guides and sliding capsules for distortion breakage. If there is distortion breakage replace the steering column as an assembly.



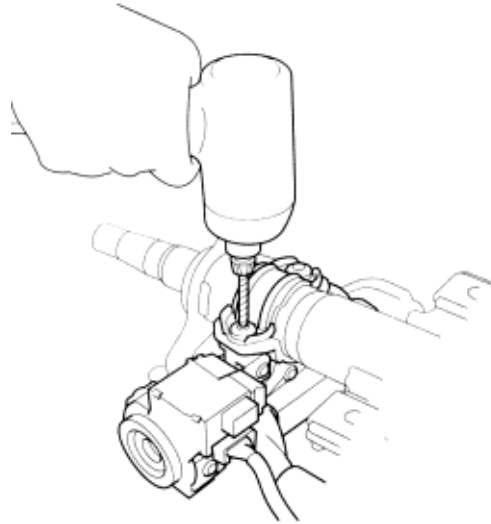
1. Move the tilt lever from the loose position to the lock position 3 to 5 times; then measure the tilt lever preload 10 mm (0.4 in) from the end of the tilt lever.

Preload: 70 - 90 N (7 - 9 kgf, 15 - 20 lbf).

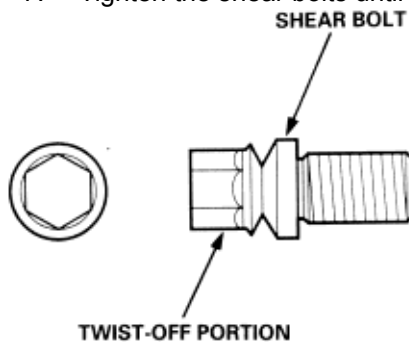


2. If the measurement is out of the specification, adjust the preload using the following procedures.
 - ♦ Loosen the tilt lever, and set the steering column in the neutral position.
 - ♦ Remove the 6 mm lock bolt, and remove the stop. Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.
 - ♦ Adjust the preload by turning the tilt lock bolt left or right.
 - ♦ Pull up the tilt lever to the uppermost position, and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures to adjust.

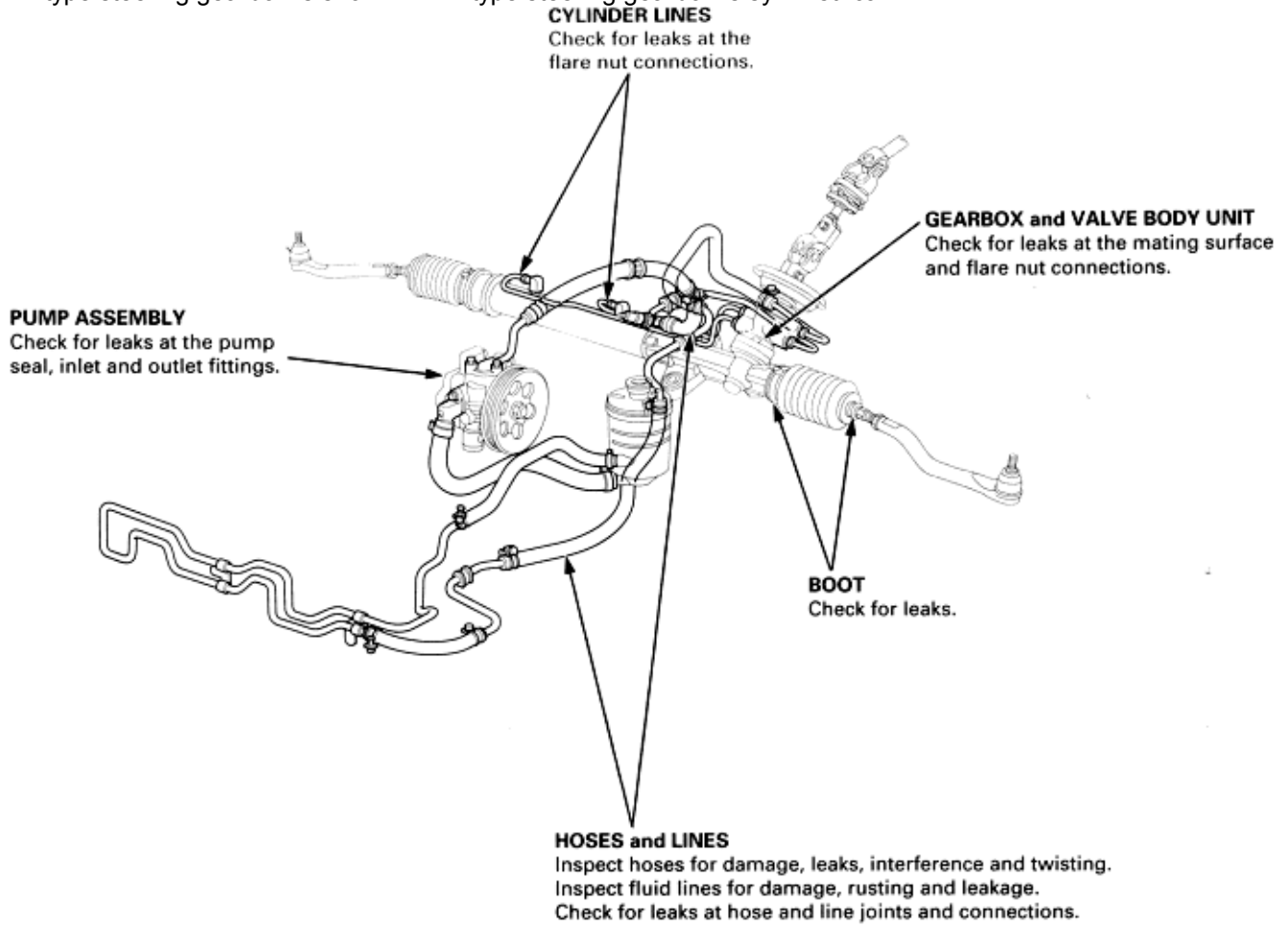
1. Remove the steering column (See Page 17-22).
2. Center punch each of the two shear bolts, and drill their heads off with a 5 mm (3/16 in) drill bit. Be careful not to damage the switch body when removing the shear bolts.



3. Remove the shear bolts from the switch body.
4. Install the switch body without the key inserted.
5. Loosely tighten the new shear bolts.
6. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
7. Tighten the shear bolts until the hex heads twist off.



NOTE: LHD type steering gearbox is shown. RHD type steering gearbox is symmetrical.



Note these items during installation:

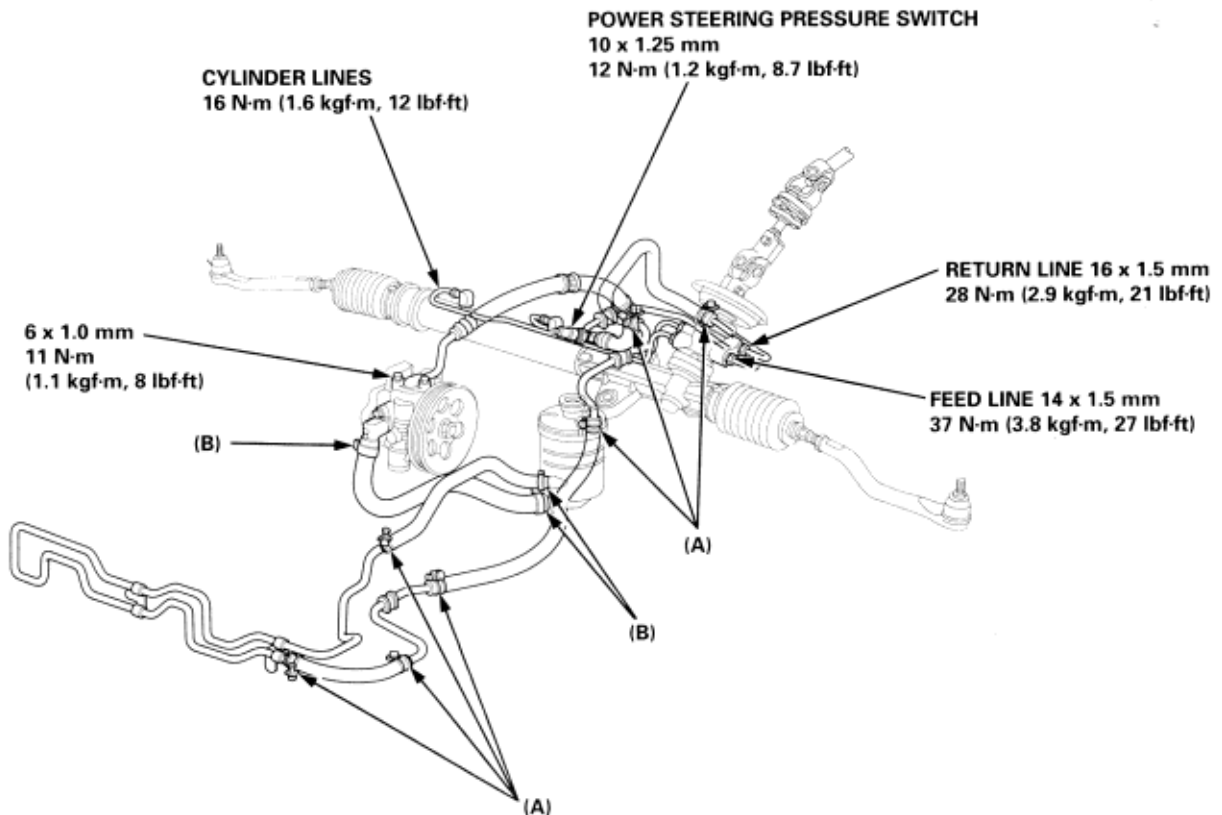
- ♦ Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- ♦ Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.
- ♦ Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.

ADJUSTABLE HOSE CLAMP: (A)

- ♦ Position the adjustable hose clamps at the point indicated by (A) in the drawing.
- ♦ Slide the hose over the line until it contacts the stop.

HOSE CLAMP: (B)

- ♦ Position the hose clamps at the point indicated by (B) in the drawing.
- ♦ Slide the hose over the line until it contacts the stop.

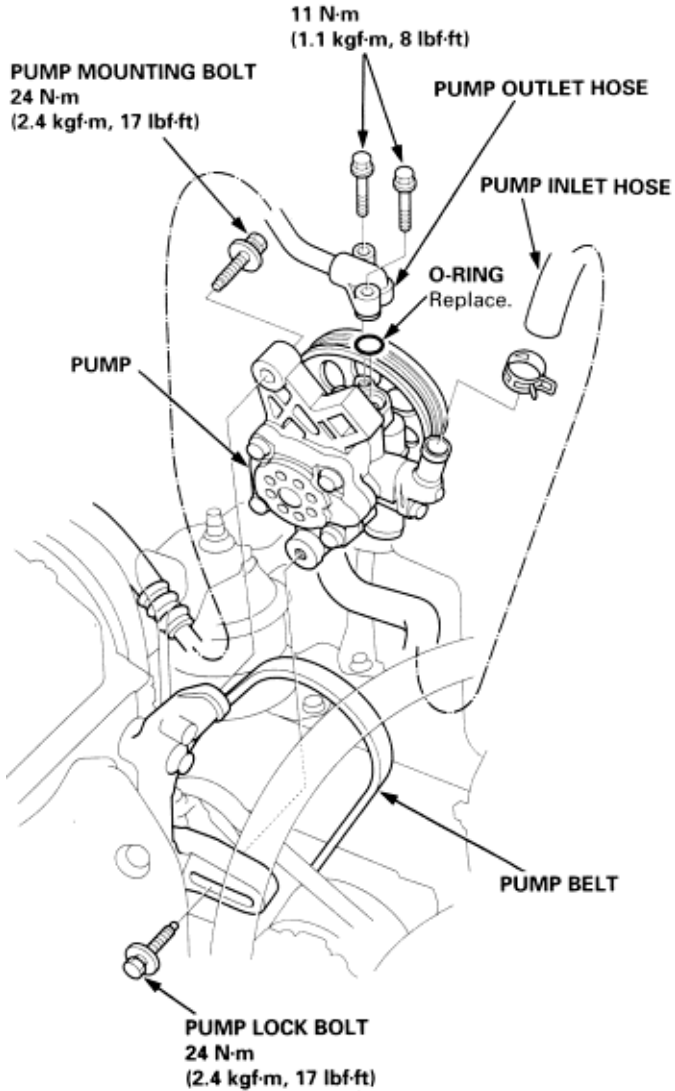


Power Steering Pump Replacement

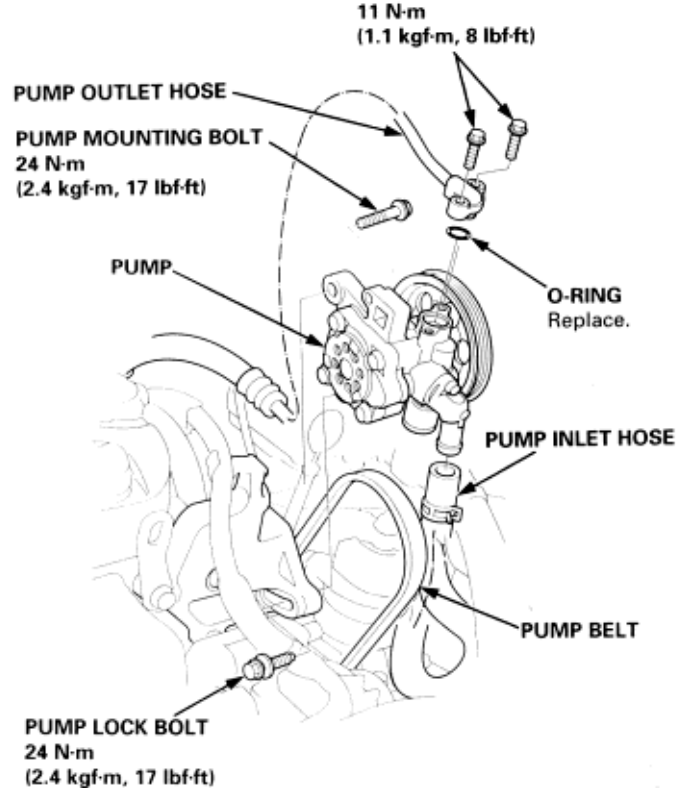
17-28

1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir.
3. Remove the belt by loosening the adjusting bolt (H22A7 engine model only), pump mounting (nut) and pump lock bolt (nut).
4. Cover the A/C compressor or alternator with several shop towels to protect it from spilled power steering fluid. Disconnect the pump inlet hose and pump outlet hose from the pump, and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.

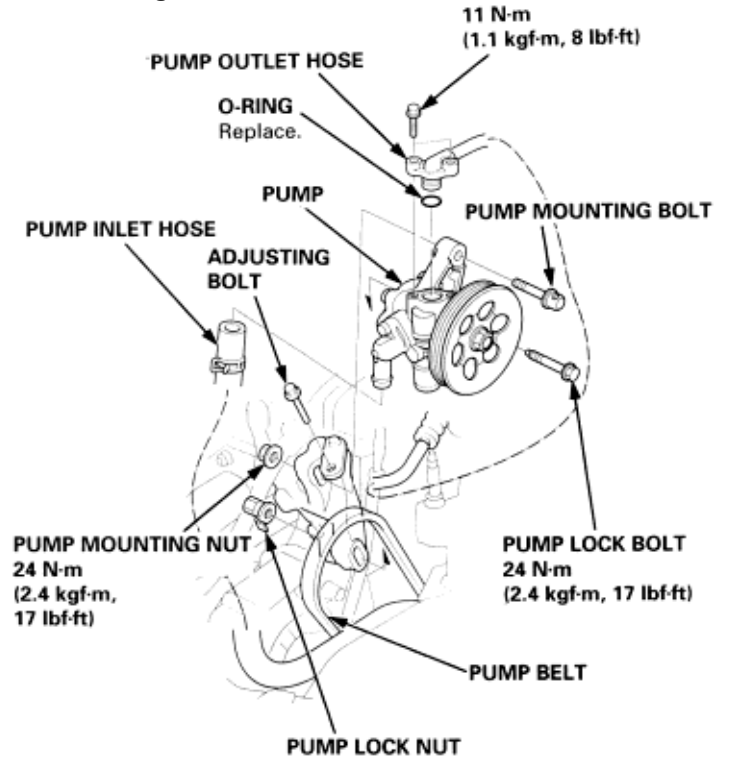
D16B6 Engine Model:



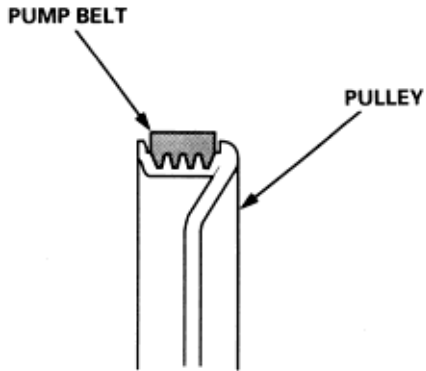
F18B2, F18B3 and F20B6 Engine Models:



H22A7 Engine Model:



5. Remove the pump mounting bolt (nut) and pump lock bolt, (nut) then remove the pump. Do not turn the steering wheel with the pump removed.
6. Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.
7. Connect the pump inlet hose and pump outlet hose. Tighten the pump fittings securely.
8. Loosely install the pump in the pump bracket with the mounting bolt and lock bolt.
9. Install the pump belt.
Note these items during belt installation:
 - ♦ Make sure that the power steering belt is properly positioned on the pulleys.
 - ♦ Do not get power steering fluid or grease on the power steering belt or pulley faces. Clean off any fluid or grease before installation.

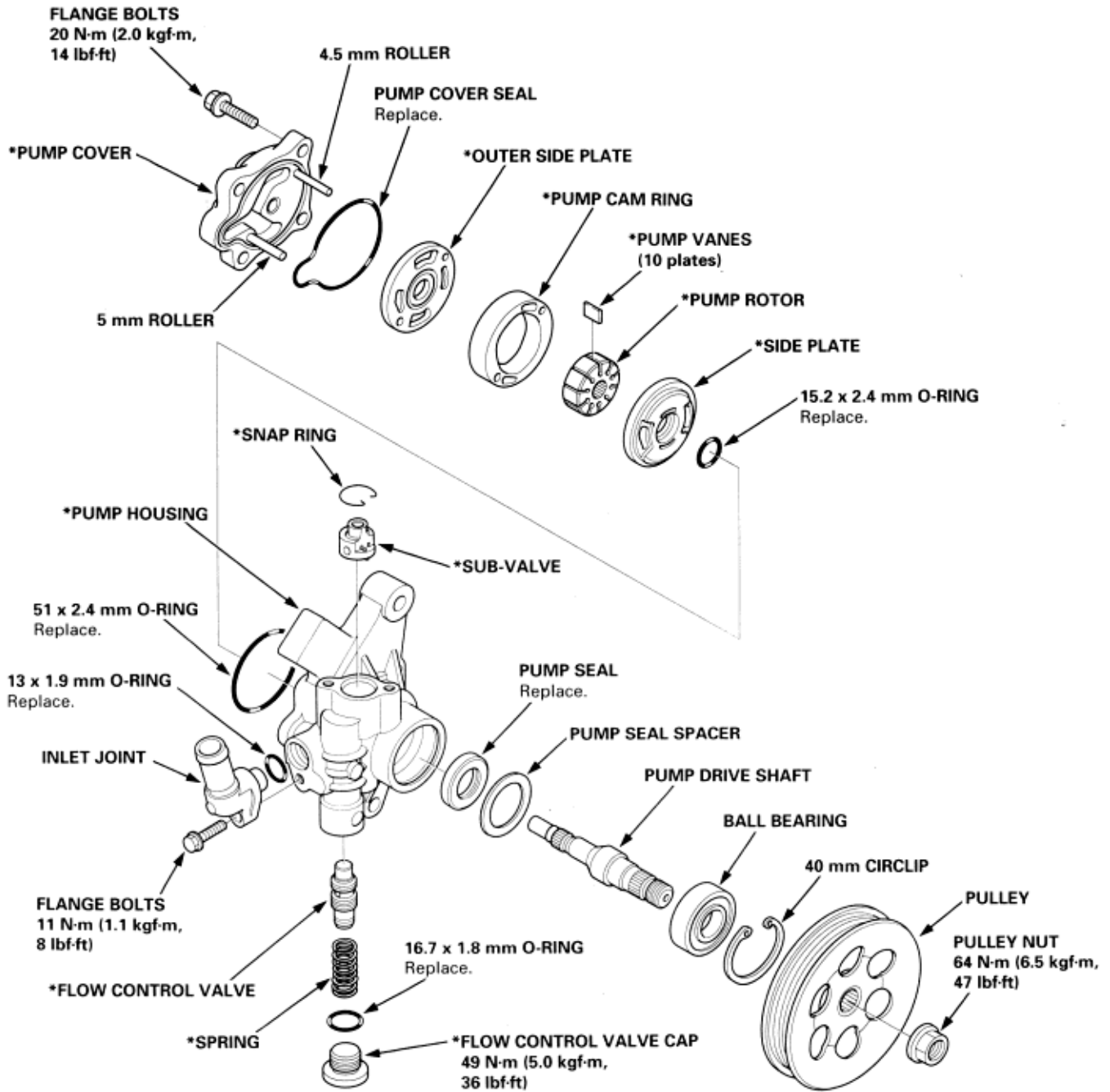


10. Adjust the pump belt adjustment (**See Page 17-15**).
11. Fill the reservoir to the upper level line(**See Page 17-17**).

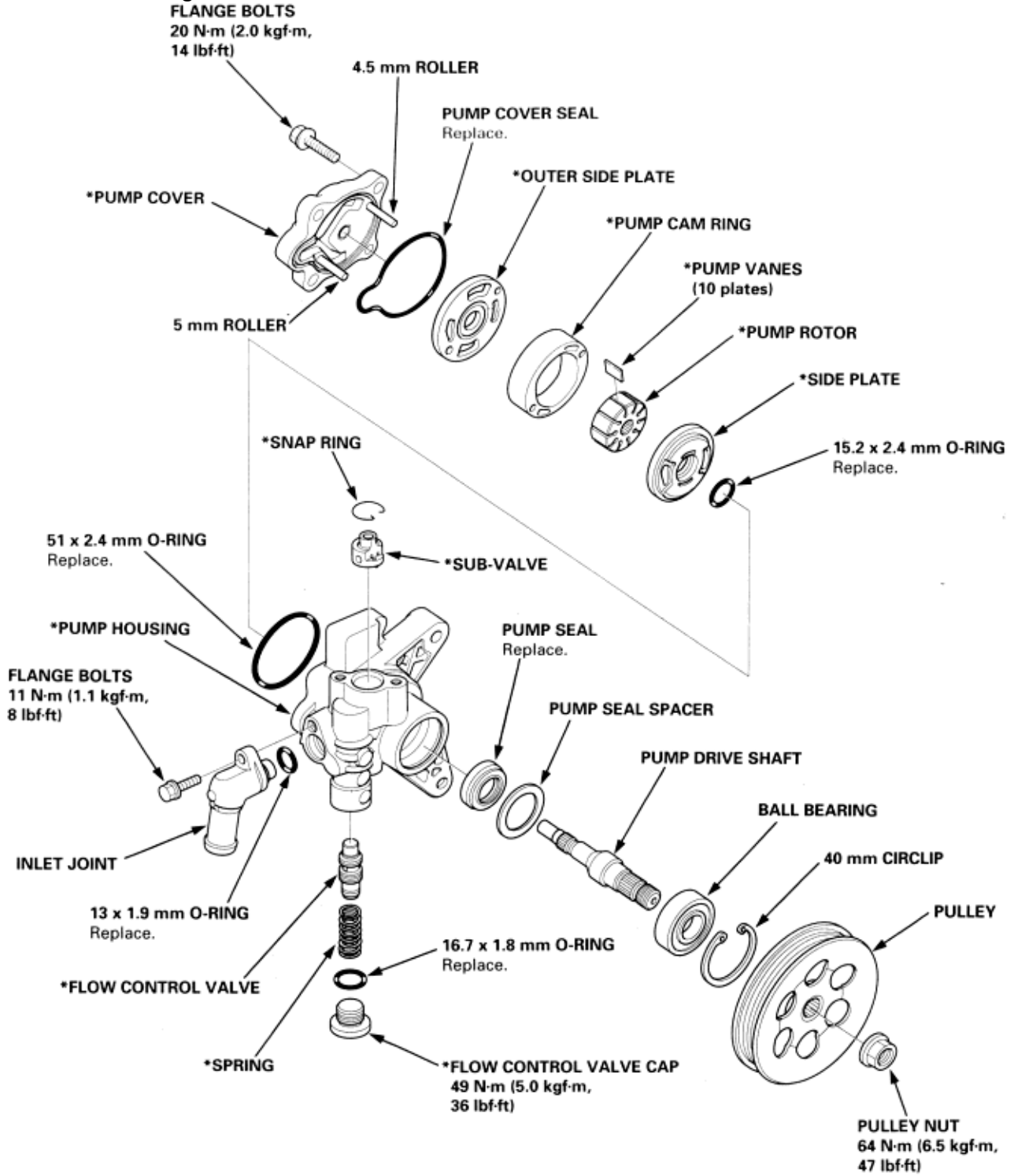
Note these items during disassembly:

- ♦ The power steering components are made of aluminium. Avoid damaging the components during assembly.
- ♦ Clean the disassembled parts with a solvent, and dry them with compressed air. Do not dip the rubber parts in a solvent.
- ♦ Always replace the O-rings and rubber seals with new ones before assembly.
- ♦ Apply recommended power steering fluid to the parts indicated in the assembly procedures.
- ♦ Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- ♦ Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.

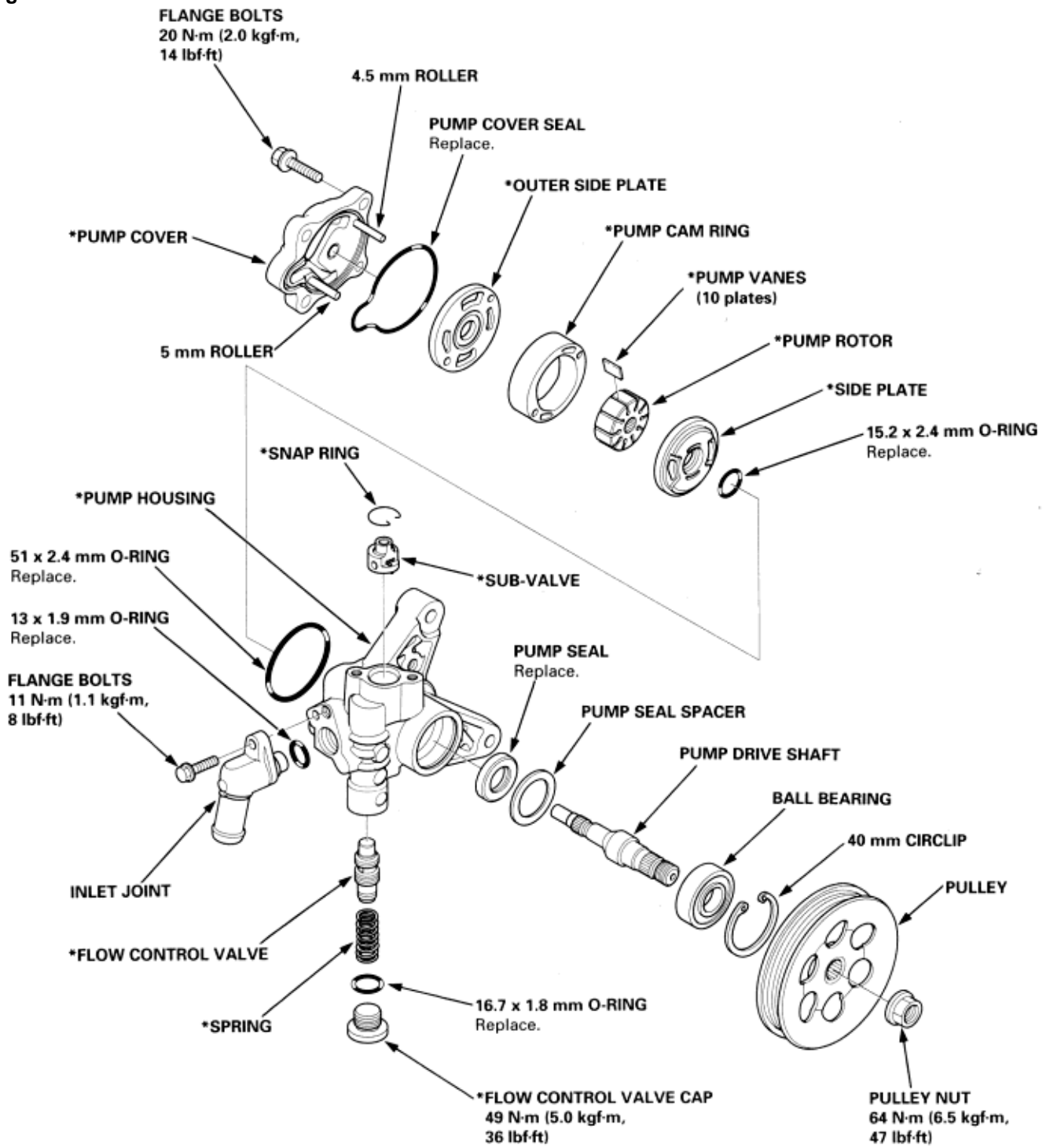
D16B6 Engine Model:



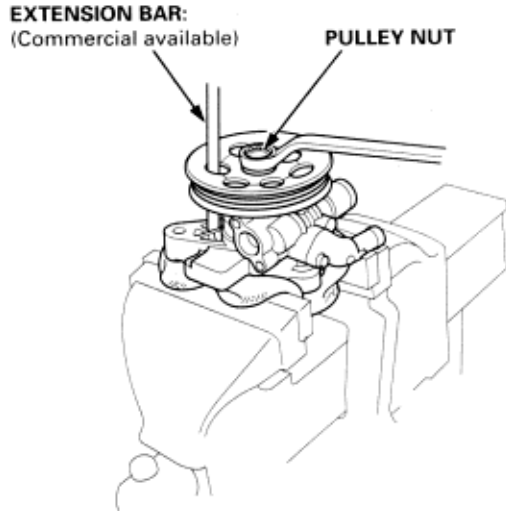
F18B2, F18B3 and F20B6 Engine Models:



H22A7 Engine Model:



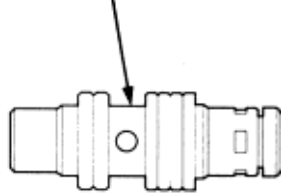
1. Drain the fluid from the pump.
2. Hold the steering pump in a vice with soft jaws, hold the pulley with the extension bar, and remove the pulley nut and pulley. Be careful not to damage the pump housing with the jaws of the vice.



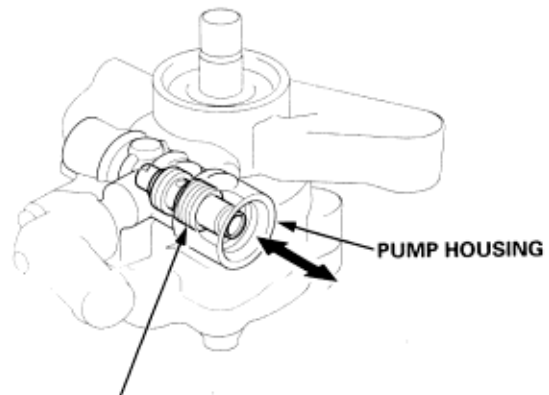
3. Remove the inlet joint and O-ring.
4. Loosen the flow control valve cap with a hex wrench, and remove it.
5. Remove the O-ring, flow control valve and spring
6. Remove the pump cover and pump cover seal.
7. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.
8. Remove the snap ring, then remove the sub-valve from the pump housing.
9. Remove the circlip, then remove the pump drive shaft by tapping the shaft end with the plastic hammer.
10. Remove the pump seal spacer and pump seal.

1. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.

FLOW CONTROL VALVE



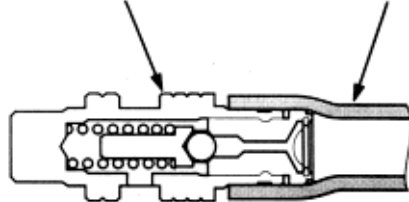
2. Inspect the bore of the flow control valve on the pump housing for scratches or wear.
3. Slip the flow control valve back in the pump housing, and check that it moves in and out smoothly. If OK, go to step 4, if not, replace the pump as an assembly. The flow control valve is not available separately.



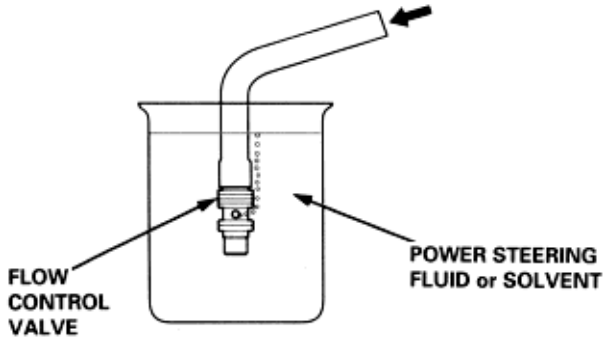
FLOW CONTROL VALVE

4. Test the flow control valve by attaching a hose to the end of the valve as shown.

FLOW CONTROL VALVE **HOSE**

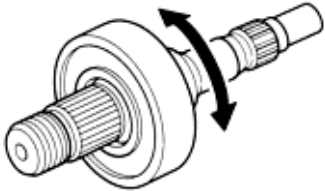


5. Submerge the flow control valve in a container of power steering fluid or solvent, and blow in the hose. If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), replace the pump as an assembly. If the flow control valve tests OK, reinstall it in the pump. If the flow control valve still leaks air, replace the pump as an assembly. The flow control valve is not available separately.

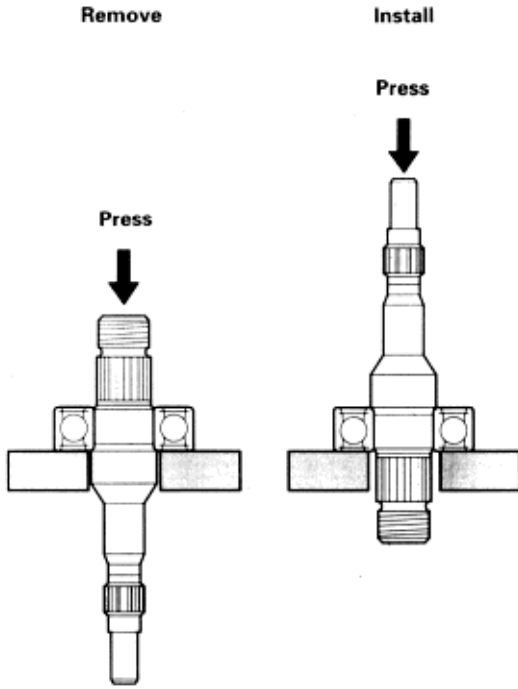


Ball Bearing:

1. Inspect the ball bearing by rotating the outer race slowly. If any play or roughness is felt, replace the ball bearing.

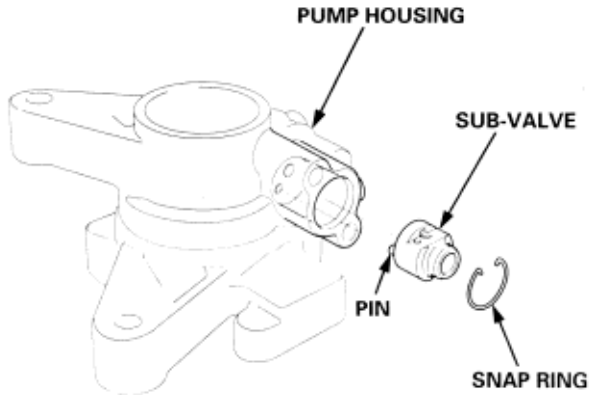


2. Replace the ball bearing using a press.

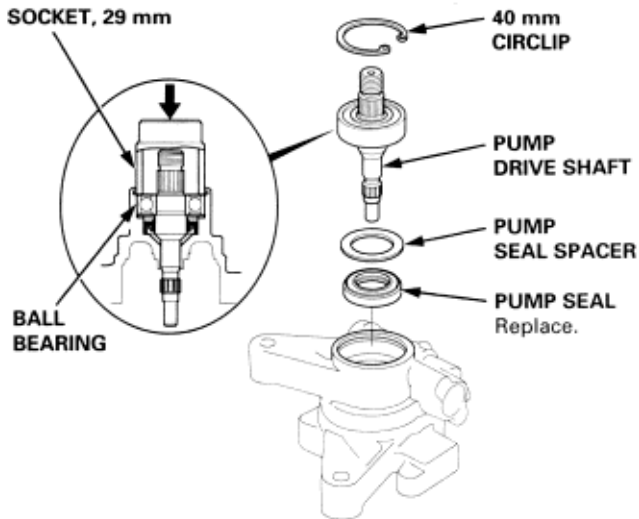


Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in a solvent.
 - ♦ Always replace the O-rings and rubber seals with new ones before reassembly.
1. Align the pin of the sub-valve with the oil passage in pump housing, and push down the sub-valve. Install the snap ring properly.

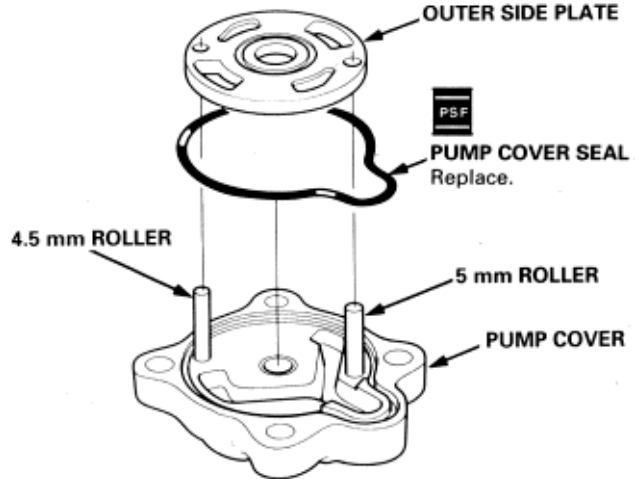


2. Install the new pump seal (with its grooved side facing in) into the pump housing by hand, then install the pump seal spacer.

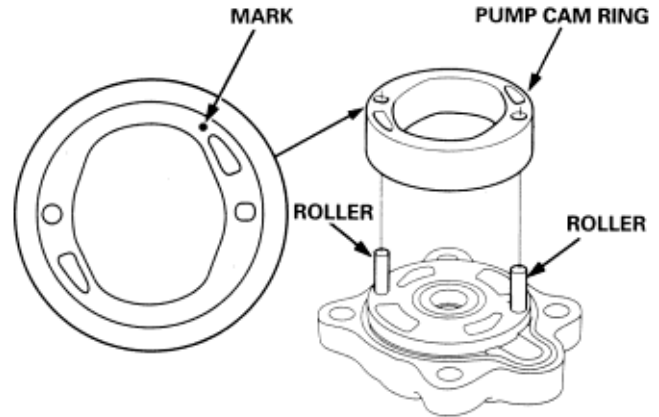


3. Position the pump drive shaft in the pump housing, then drive it using a 29 mm socket as shown.
4. Install the 40 mm circlip with its radiused side facing out.

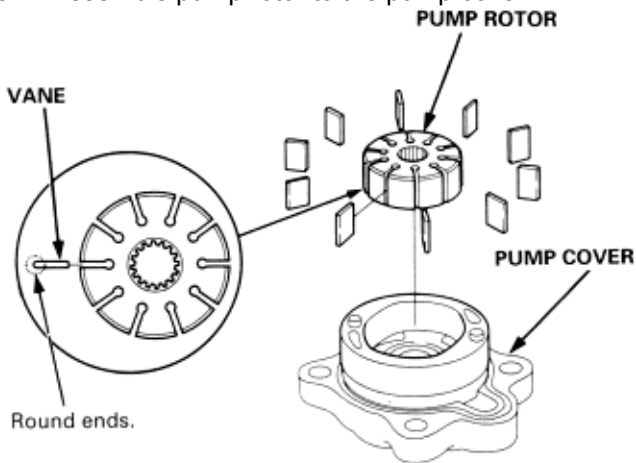
5. Coat the pump cover seal with power steering fluid and install it into the groove in the pump cover.



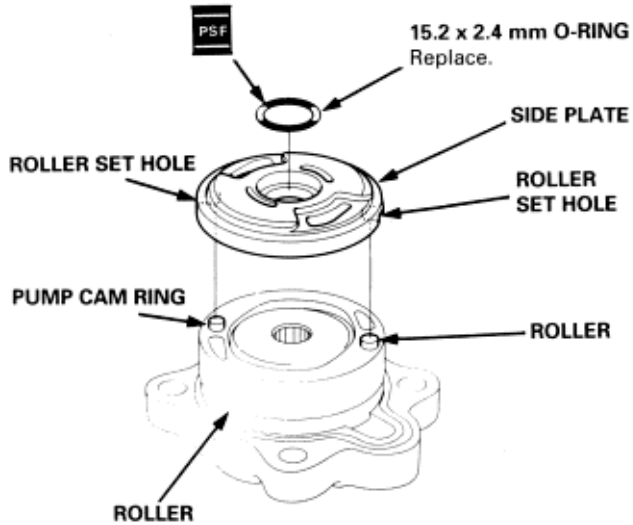
6. Install the outer side plate over the two rollers.
7. Set the pump cam ring over the two rollers with the "♦" mark on the cam ring upward.



8. Assemble pump rotor to the pump cover.

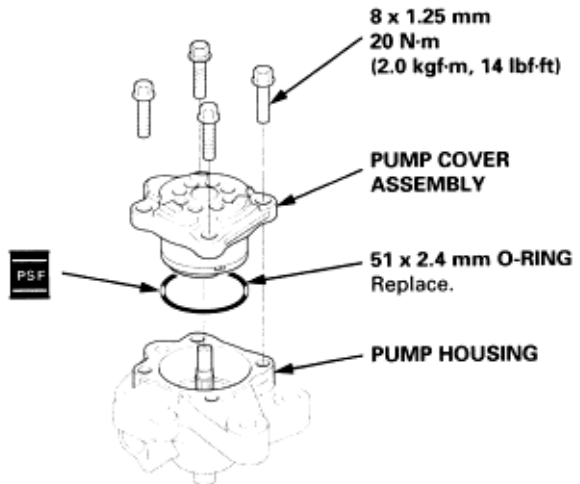


9. Set the 10 vanes in the grooves in the rotor. Make sure that the round ends of the vanes are in contact with the sliding surface of the cam ring.
10. Coat the O-ring with power steering fluid, and install it into the grooves in the side plate.

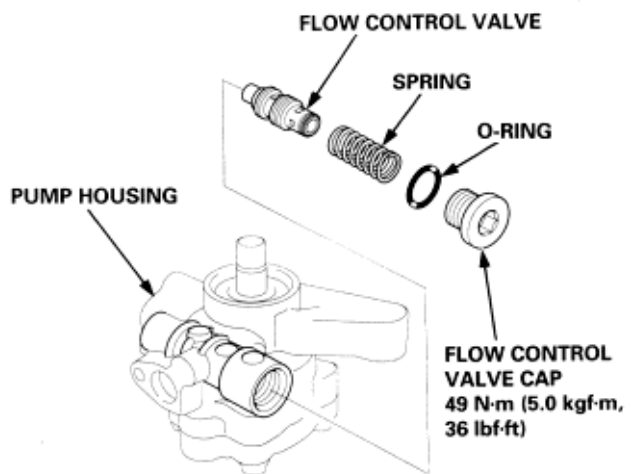


11. Install the side plate on the cam ring by aligning the roller set holes in the side plate with the rollers.

12. Coat the O-ring with power steering fluid, and position it into the pump housing.

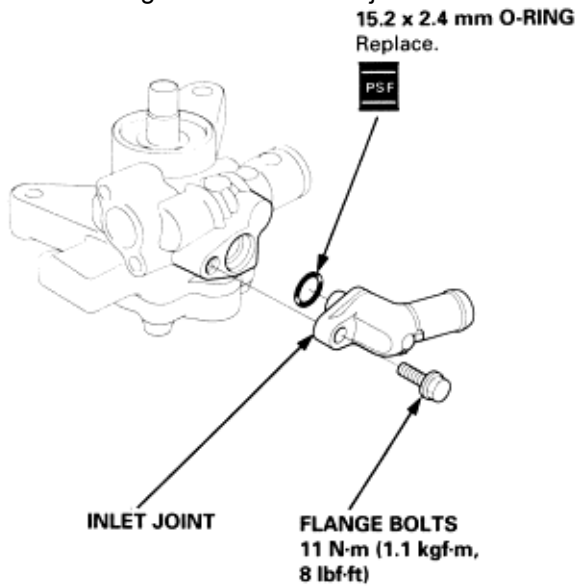


13. Install the pump cover assembly in the pump housing.
14. Coat the flow control valve with power steering fluid.

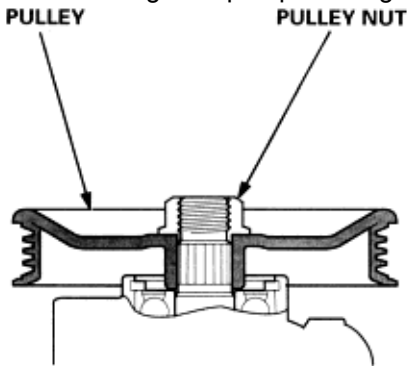


15. Install the flow control valve and spring in the pump housing.
16. Coat the O-ring with power steering fluid, and install it on the flow control valve unit cap.
17. Install the flow control valve cap on the pump housing, and tighten it.

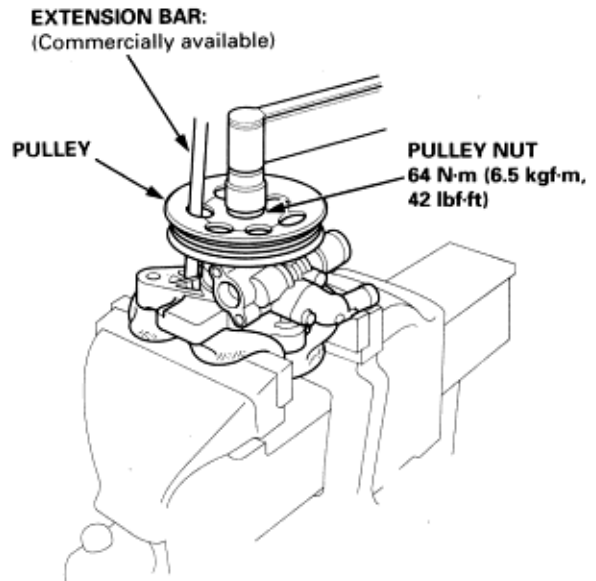
18. Coat the O-ring with power steering fluid, and install it into the grooves in the inlet joint.



19. Install the pulley, then loosely install the pulley nut. Hold the steering pump in a vice with soft jaws. Be careful not to damage the pump housing with the jaws of the vice.



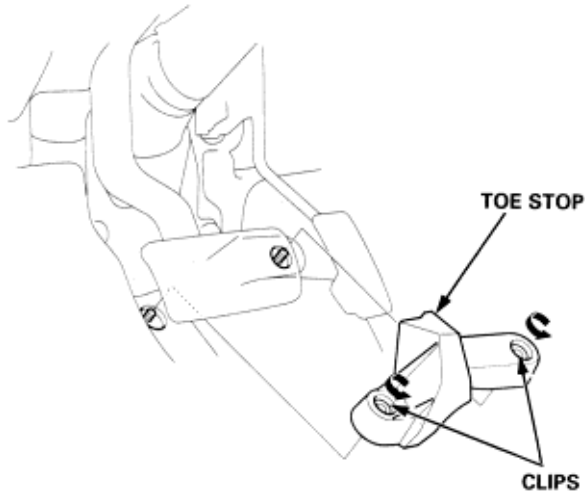
20. Hold the pulley with the extension bar, and tighten the pulley up.



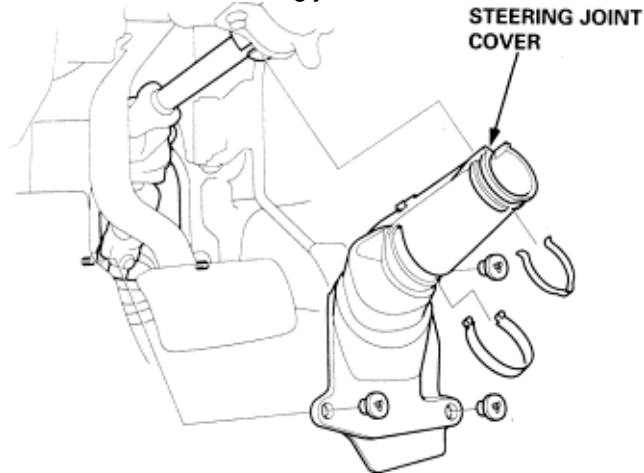
21. Check that the pump turns smoothly by turning the pulley by hand.

Note these items during removal:

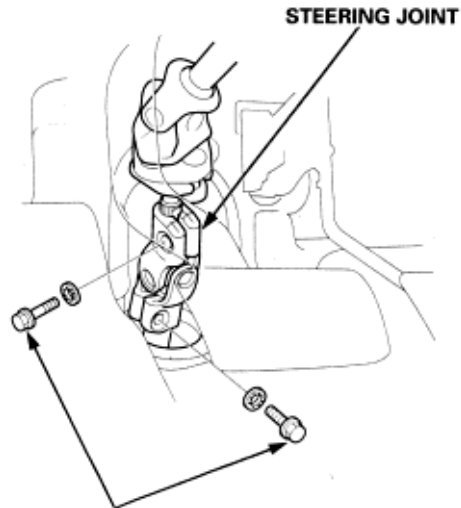
- ♦ Using solvent and a brush, wash any oil and dirt off the valve body unit its lines, and the end if the gearbox. Blow dry with compressed air.
 - ♦ Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.
1. Drain the power steering fluid (**See Page 17-17**).
 2. Raise the vehicle, and make sure it is securely supported. Remove the front wheels.
 3. Remove the driver's airbag assembly (see section 24)
 4. Remove the steering wheel (**See Page 17-19**).
 5. Turn the clips using the hex wrench, and remove the toe stop.



6. Remove the steering joint cover.

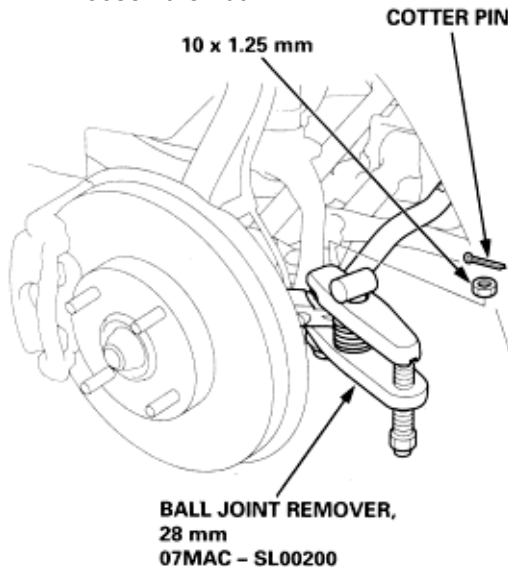


7. Remove the steering joint bolts, disconnect the steering joint by moving the steering joint toward the column.



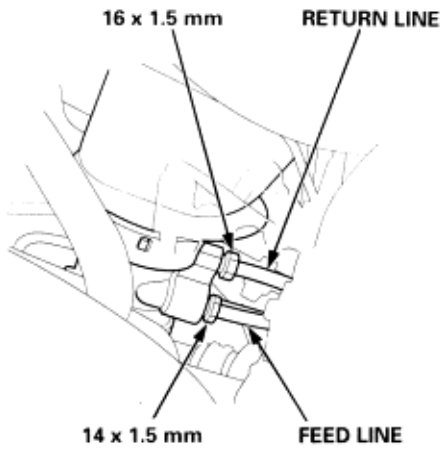
STEERING JOINT BOLTS

8. Remove the cotter pin from the 10 mm nut and loosen the nut.

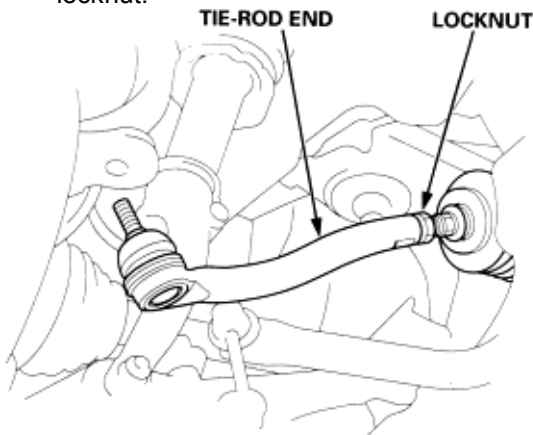


9. Separate the tie-rod ball joint and knuckle using the special tool (**See Page 18-13**) for tool instructions.

10. Loosen the 14 mm flare nut, and disconnect the feed line.

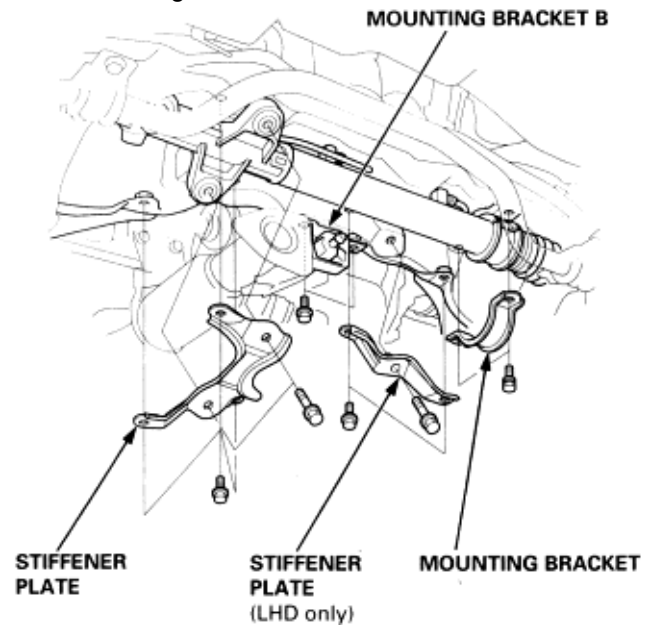


11. Loosen the 16 mm flare nut, and disconnect the return line.
12. After disconnecting the lines, plug or seal them with a piece of tape or equivalent to prevent foreign materials from entering.
NOTE: Do not loosen the cylinder line A and B between the valve body unit and cylinder.
13. Grasp the right tie-rod and pull the rack all the way to the right, then remove the right and left tie-rod ends, and locknut.

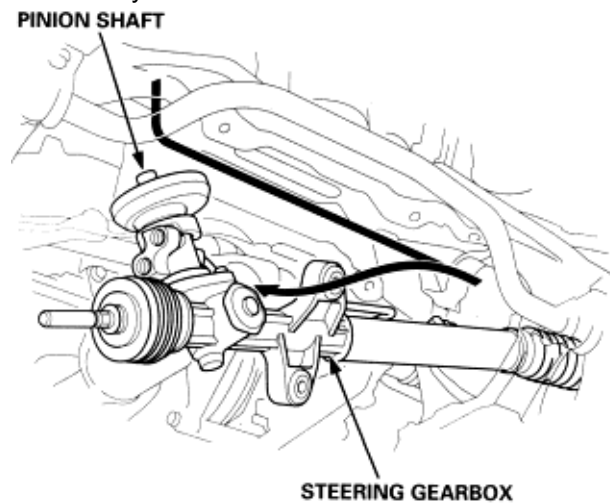


14. Separate the mounting bracket B of the exhaust pipe A from the frame, and remove the three-way catalytic converter (see section 9).
15. Disconnect the shift linkage from the transmission (M/T: see section 13, A/T: see section 14).

16. Remove the stiffener plates, then remove the mounting brackets.

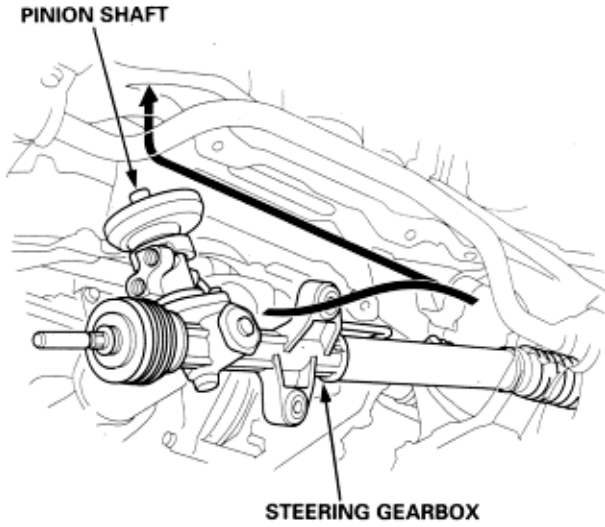


17. Pull the steering gearbox all the way down to the pinion shaft from the bulkhead, and remove the pinion shaft grommet from the top of the valve body unit.

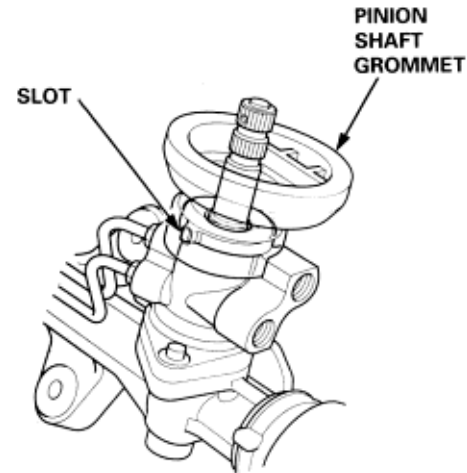


18. Move the steering gearbox to the right so the left rack end clears the rear beam, then place the left rack end below the rear beam.
19. Move the steering gearbox to the left, and tilt the left side down to remove it from the vehicle. Do not try to disassemble to steering gear box. If the gearbox is faulty, replace the whole gearbox as an assembly.

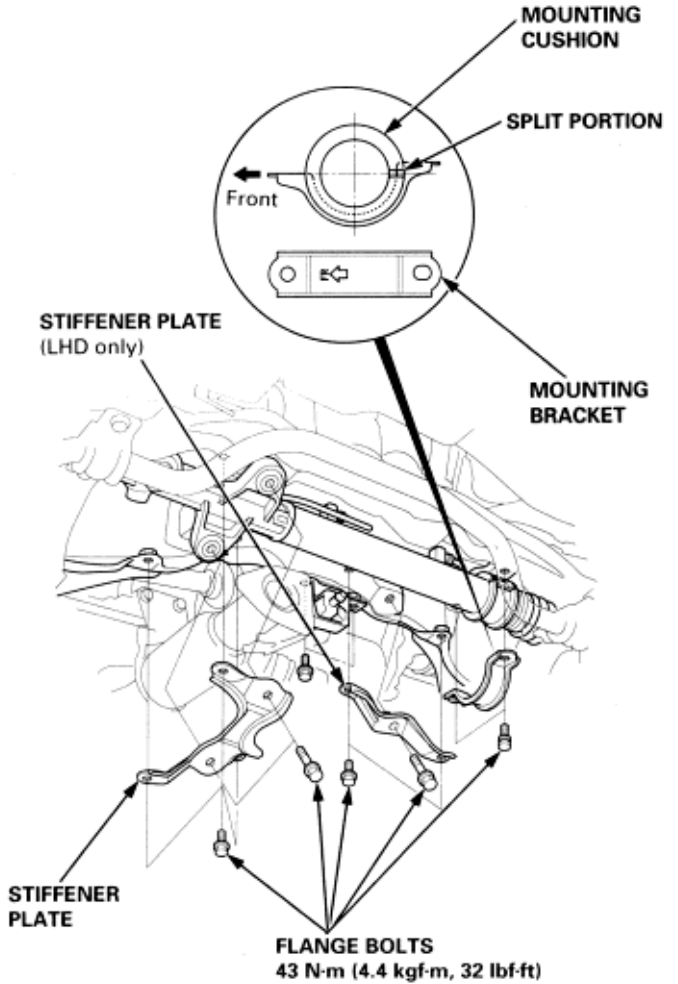
1. Before installing the gearbox, slide the rack all the way to the right.
2. Pass the right side of the steering gearbox above and through the right side of the rear beam. Be careful not to bend or damage the two power steering lines and cylinder lines when installing the gearbox.



3. Raise the left side of the steering gearbox above and through the left side of the rear beam.
4. Install the pinion shaft grommet. Align the slot in the pinion shaft grommet with the lug portion on the valve housing. Then insert the pinion shaft up through the bulkhead.



5. Install the mounting cushion on the steering gearbox.

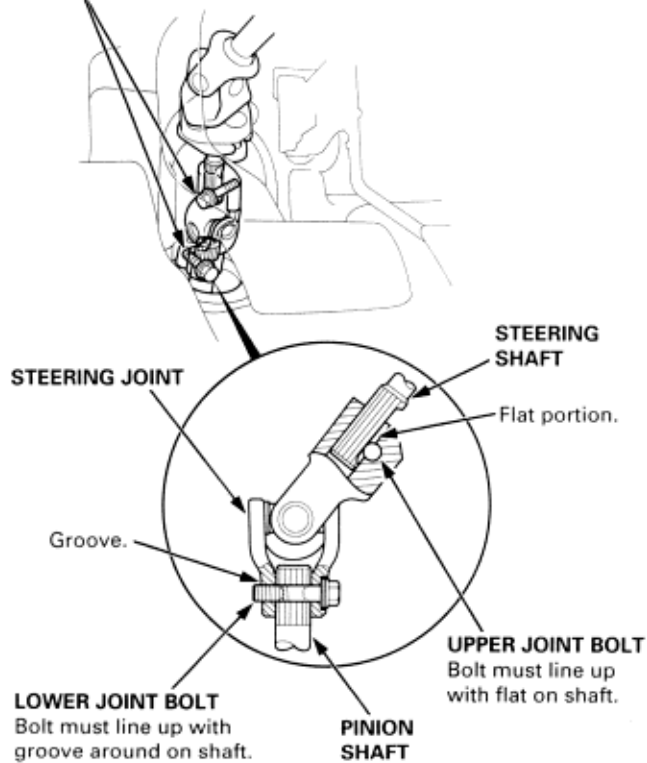


6. Install the mounting bracket over the mounting cushion, then install the two gearbox mounting bolts. Position the split portion of the mounting cushion as shown.
7. Install the stiffener plates with the two gearbox mounting bolts and six stiffener plate attaching bolts. Install the bolts loosely first, then tighten them securely.
8. Center the steering rack within its stroke.

9. Install the steering joint, and reconnect the steering shaft and pinion shaft.

- ♦ Make sure the steering joint is connected as follows:
 - Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole with the flat portion on the shaft).

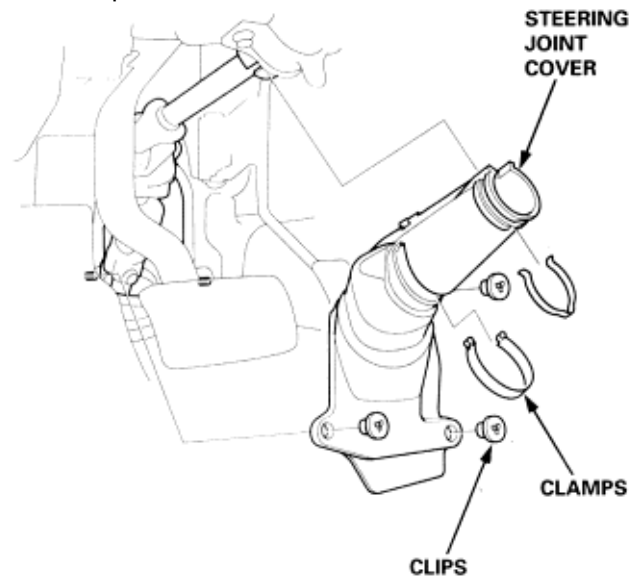
STEERING JOINT BOLTS
28 N·m (2.9 kgf·m,
21 lbf·ft)



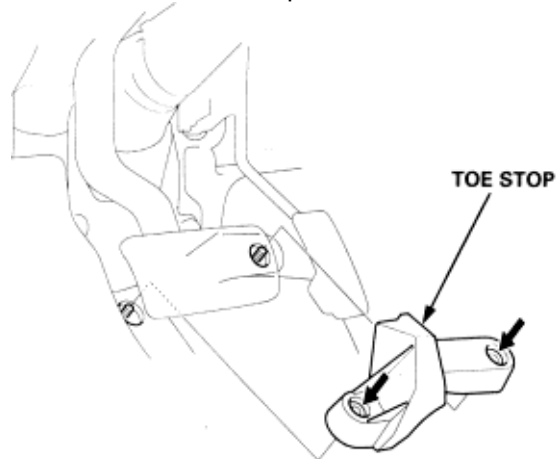
- Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
- Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it.

10. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately two turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (**See Page 17-21**).

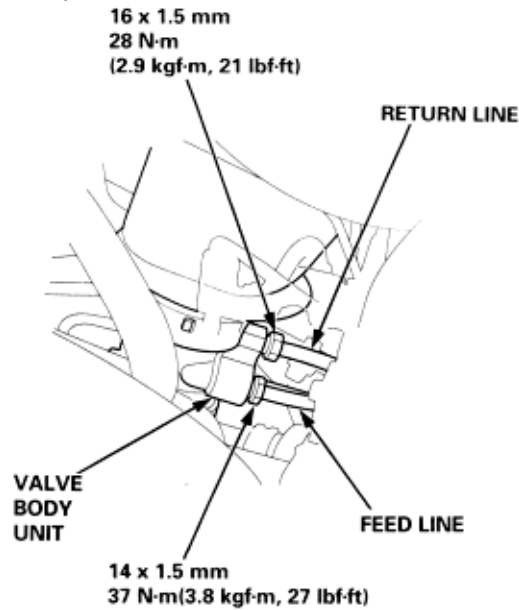
11. Install the steering joint over with the clamps and clips.



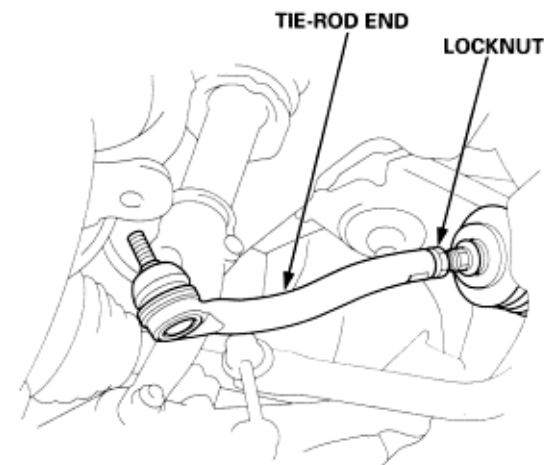
12. Install the toe stop.



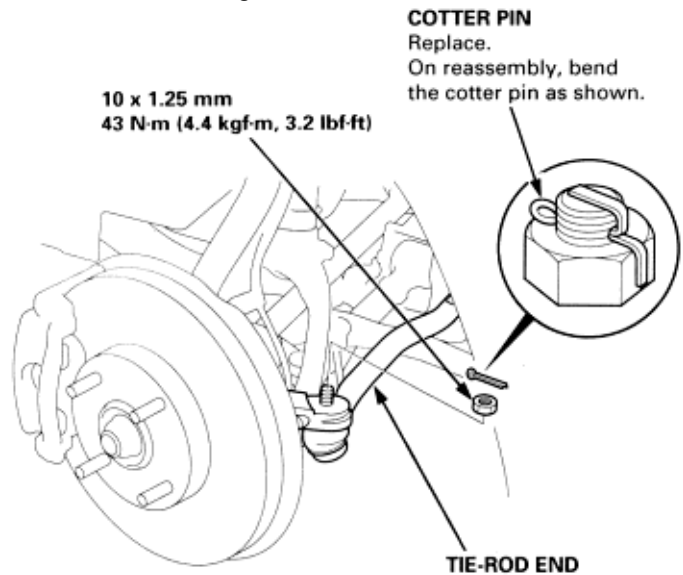
13. Connect the return line and feed line to the valve body unit. After connecting the fluid lines, make sure that there is no interference between the lines and other parts.



14. Thread the right and left tie-rod ends and locknut onto the rack an equal number of turns.

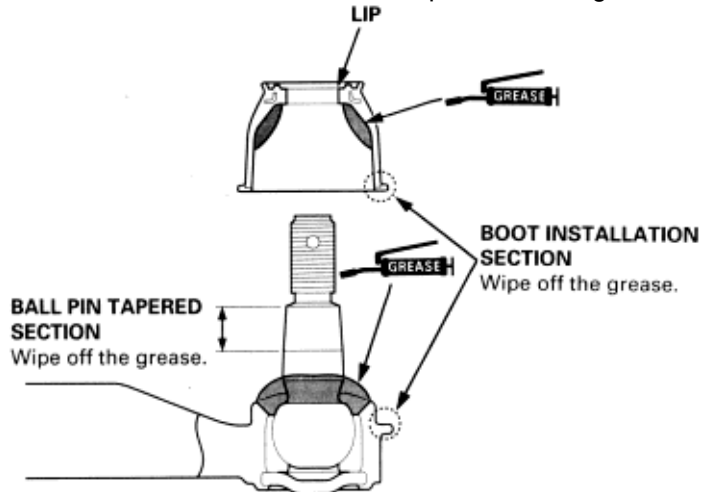


15. Wipe off any grease contamination from the ball joint tapered section and threads then reconnect tie-rod ends to the steering knuckles. Install the 10 mm nut and tighten it.

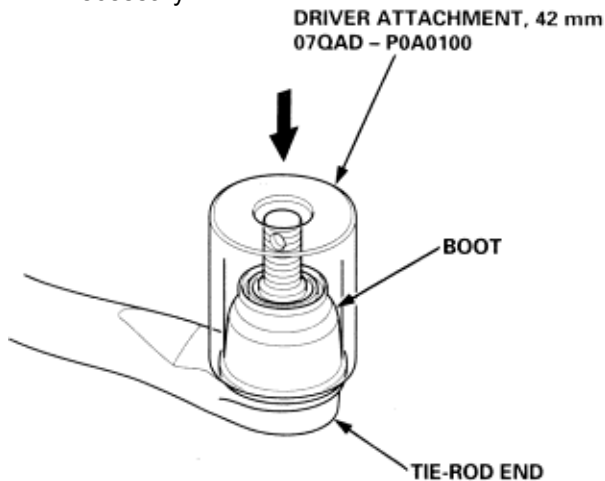


16. Install the new cotter pin and bend it as shown.
17. Connect the shift linkage from the transmission. (M/T: see section 13, A/T: see section 14).
18. Install the three-way catalytic converter and the mounting bracket B (see section 9).
19. Install the front wheels.
20. Fill the system with power steering fluid, and bleed air from the system (**See Page 17-17**).
21. After installation, perform the following checks.
- ♦ Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times warm up the fluid. Check the gearbox for leaks (**See Page 17-26**).
 - ♦ Adjust the front toe (see section 18).
 - ♦ Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods equally, if necessary.

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
2. Pack the lower area of the ball pin with fresh grease.



3. Pack the interior of the new boot and lip with fresh grease.
Note these items when installing new grease:
 - ♦ Keep grease off the boot installation section and the tapered section of the ball pin.
 - ♦ Do not allow dust, dirt, or other foreign materials to enter the boot.
4. Install the new boot using the special tool. The boot must not have a gap at the boot installation sections. After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



Special Tools

18-2

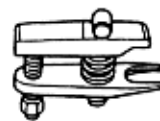
Ref No.	Tool Number	Description	Qty	Remark
1	07GAF - SE00100	Hub Dis/Assembly Tool	1	
2	07GAG - SD40700	Ball Joint Boot Clip Guide	1	
3	07MAC - SL00200	Ball Joint Remover, 28 mm	1	
4	07MGK - 0010100	Wheel Alignment Gauge Attachment	1	
5	07965 - SA00600	Bearing Driver Attachment	1	
6	07749 - 0010000	Driver	1	
7	07947 - 6340201	Attachment, 58 x 72 mm	1	
8	07965 - SD90100	Support Base	1	



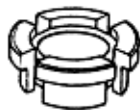
①



②



③



④



⑤/⑦



⑥



⑧

Wheel Alignment (see page 18-4)

Front Suspension

FRONT DAMPER

- Removal, page 18-17
- Disassembly/Inspection, page 18-17
- Reassembly, page 18-18
- Installation, page 18-19

UPPER ARM

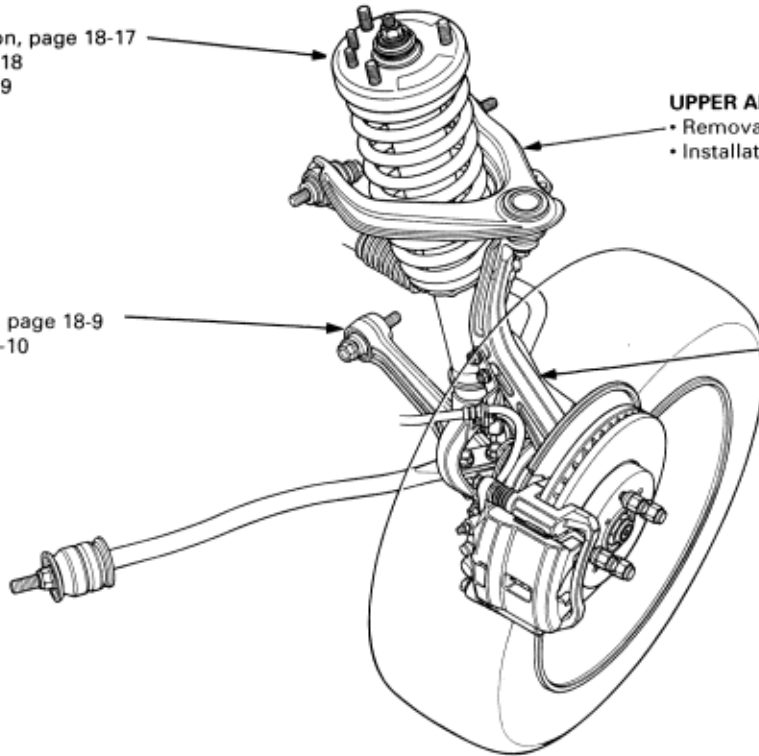
- Removal/Inspection, page 18-9
- Installation, page 18-10

LOWER ARM

- Removal/Inspection, page 18-9
- Installation, page 18-10

KNUCKLE/HUB

- Replacement, page 18-11



Rear Suspension

REAR DAMPER

- Removal, page 18-25
- Disassembly/Inspection, page 18-26
- Reassembly, page 18-26
- Installation, page 18-27
- Damper Disposal, page 18-27

CONTROL ARM

- Removal/Inspection, page 18-20
- Installation, page 18-21

UPPER ARM

- Removal/Inspection, page 18-20
- Installation, page 18-21

LEADING ARM

- Removal/Inspection, page 18-20
- Installation, page 18-21

LOWER ARM

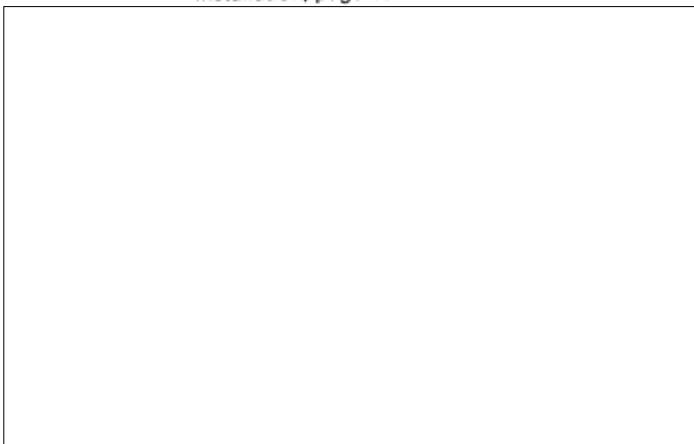
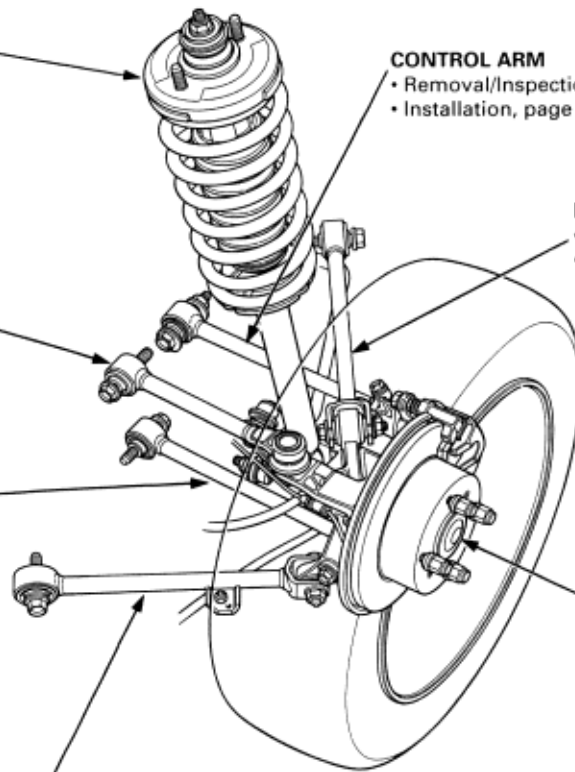
- Removal/Inspection, page 18-20
- Installation, page 18-21

HUB BEARING UNIT

- Removal/Inspection, page 18-20
- Installation, page 18-21

TRAILING ARM

- Removal/Inspection, page 18-20
- Installation, page 18-21





TRAILING ARM

- Removal/Inspection, page 18-20
- Installation, page 18-21

To go to the pages referenced on the diagram above, click on the following:

- ([See Page 18-4](#))
- ([See Page 18-17](#))
- ([See Page 18-18](#))
- ([See Page 18-19](#))
- ([See Page 18-9](#))
- ([See Page 18-10](#))
- ([See Page 18-11](#))
- ([See Page 18-25](#))
- ([See Page 18-26](#))
- ([See Page 18-27](#))
- ([See Page 18-20](#))
- ([See Page 18-21](#))

NOTE: For proper inspection/adjustment of the wheel alignment, check and adjust the following before checking the alignment.

- ♦ Check that the suspension is not modified.
- ♦ Check the tyre size and tyre pressure.
- ♦ Check the runout of the wheels and tyres.
- ♦ Check the suspension ball joints. (Hold the wheel with your hands, then move it up and down, and right and left to check for wobbling.)

Wheel alignment adjustment procedure

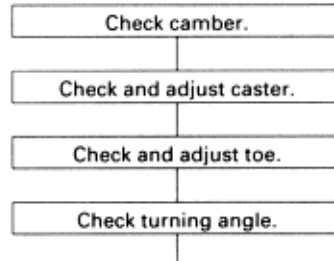
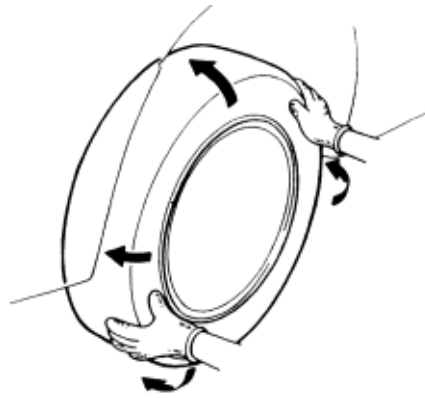
Each of the wheel alignment elements relates to the other. Therefore, the total adjustment of the front/rear wheel alignment is required whenever either one of elements (camber, caster, toe, and/or turning angle) is adjusted.

Special Tool Information

Wheel alignment gauge attachment:

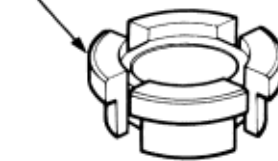
NOTE:

- ♦ As the wheel alignment gauge attachment can be installed by magnetic force of camber/caster gauge, make sure the wheel hubs are clean and rust-free before installing the wheel alignment gauge attachment.
- ♦ When installing the special tool, align the special tool groove and mating surface groove of the camber/caster gauge, to make the most of the magnetic force of the camber/caster gauge.
- ♦ For accurate readings, measure the wheel alignment at the vehicle must be level.



If any of the above needed adjustment, recheck all.

**WHEEL ALIGNMENT
GAUGE ATTACHMENT
07MGK - 0010100**



Inspection

1. Remove the wheel cap.
2. On the aluminium wheels, remove the center cap from the inside of the wheel.
3. Remove the hub cap from the rear wheel hub (**see page 18-3**).
4. Install the wheel.
5. Install the wheel alignment gauge attachment and camber/caster gauge on the wheel hub.
6. Turn the front wheels to the straight ahead position.
7. Read the camber on the gauge with the bubble at the center of the gauge.

Camber angle:

Front: $-0 \text{ degrees } 15' \pm 1 \text{ degrees}$ (H22A7 engine)

$-0 \text{ degrees } 00' \pm 1 \text{ degrees}$ (Except H22A7 engine)

$-0 \text{ degrees } 10' \pm 1 \text{ degrees}$ (KY model)

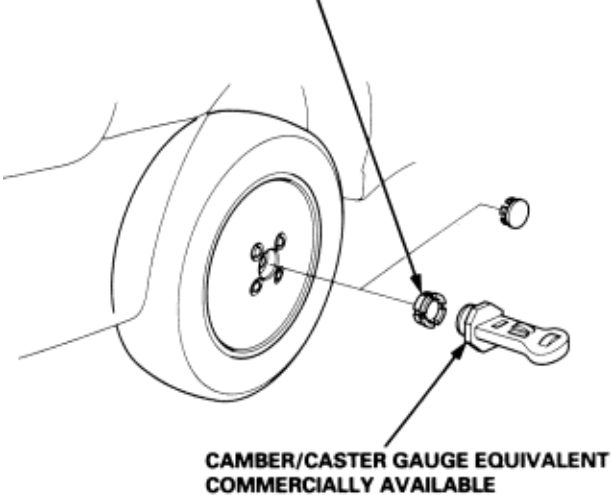
Rear: $-1 \text{ degrees } 15' \pm 30'$ (H22A7 engine)

$-1 \text{ degrees } 00' \pm 30'$ (Except H22A7 engine)

$-0 \text{ degrees } 50' \pm 30'$ (KY model)

8. If out of specification, check for bent or damaged suspension components.

WHEEL ALIGNMENT GAUGE ATTACHMENT
07MGK - 0010100



Inspection

1. Remove the wheel.
2. On the aluminium wheels, remove the center cap from the inside of the wheel.
3. Install the wheel.
4. Raise the car and set the turning radius gauges beneath the front wheels, and place boards under the rear wheels the same thickness as one of the turning radius gauges, then lower the car.
NOTE: Be sure that the car is parallel to the ground with the wheels on the turning radius gauges and boards.
5. Install the wheel alignment gauge attachment and camber/caster gauge on the wheel hub, and apply the front brake.
6. Turn the front wheel 20 degrees outwards, then turn the adjustment screw so that the bubble in the camber/caster gauge is at 0 degrees.
7. Turn the wheel 20 degrees inwards and read the caster on the gauge with the bubble at the center of the gauge.

Caster angle:

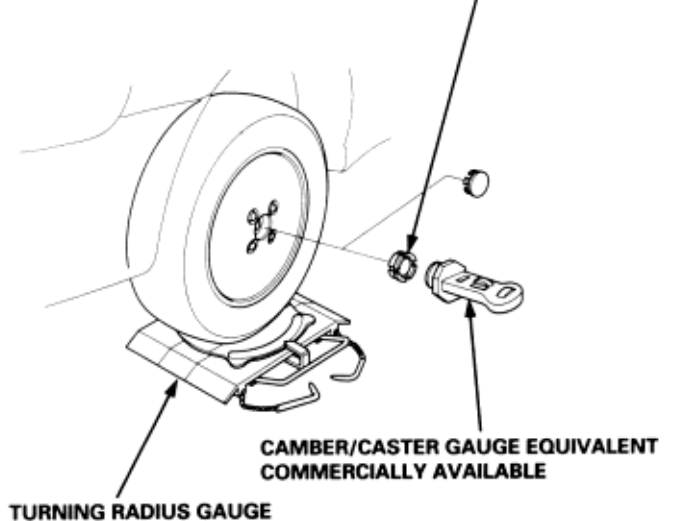
Front: $-3 \text{ degrees } 00' \pm 1 \text{ degrees}$ (H22A7 engine)

$-2 \text{ degrees } 50' \pm 1 \text{ degrees}$ Except H22A7 engine

$-2 \text{ degrees } 45' \pm 1 \text{ degrees}$ (KY model)

8. If out of specification, record the caster reading, then adjust the caster.

WHEEL ALIGNMENT GAUGE ATTACHMENT
07MGK - 0010100



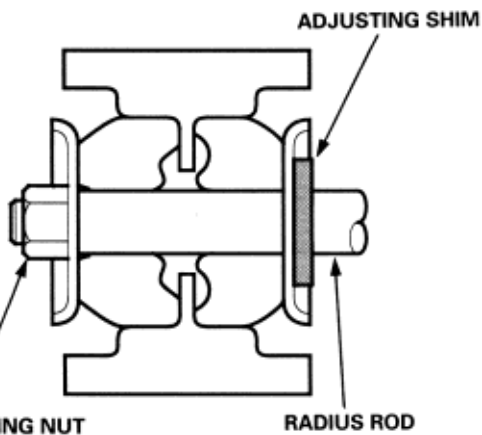
Adjustment

NOTE: Caster angle can be adjusted by increasing or decreasing the number of the adjusting shims. Remove and install the radius rod each time the caster angle is adjusted.

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
2. Remove the self-locking nut on the end of the radius rod.
3. Remove the flange bolts at the radius rod on the lower arm, then remove the radius rod (see page 18-9).
4. Adjust the caster angle by increasing or decreasing the adjusting shims.

NOTE:

- ♦ Do not use more than two adjusting shims.
- ♦ One adjusting shim changes the caster angle by 35' and the caster angle can be adjusted by 1 degrees 10' maximum.
- ♦ One adjusting shim is 3.2 mm (0.13 in) in thickness.



SELF-LOCKING NUT
12 x 1.25 mm
54 N·m (5.5 kgf·m, 40 lbf·ft)
Replace.

5. After the adjustment, install the radius rod onto the lower arm, then tighten the flange bolts (see page 18-10).
6. Tighten the new self-locking nut to specified torque.

Inspection

1. Center steering wheel spokes.
NOTE: Measure difference in toe measurements with the wheels pointed straight ahead.
2. Check the front toe.

Front toe: 0 ± 2 mm (0 ± 0.08 in)

- If adjustment is required, go on to step 3.
- If no adjustment is required, remove alignment equipment.

Adjustment

3. Loosen the tie-rod locknuts, then turn both tie-rods in the same direction until the front wheels are in straight ahead position.
4. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
5. After adjusting, tighten the tie-rod locknuts.
NOTE: Reposition the tie-rod boot if it is twisted or displaced.



TIE-ROD LOCKNUT
14 x 1.5 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)

Wheel Alignment

Rear Toe Inspection/Adjustment

18-7

Turning Angle Inspection

Inspection

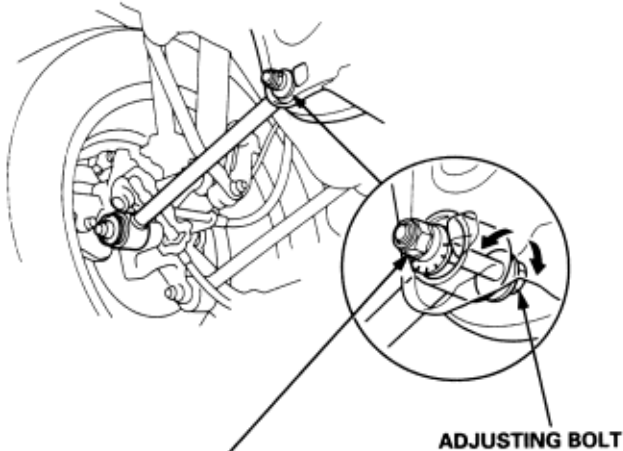
1. Release parking brake.
NOTE: If the parking brake is engaged, you may get an incorrect reading.
2. Check the rear toe.

Rear toe-in: 2 ± 2 mm (0.08 ± 0.08 in)

- If adjustment is required, go on to step 3.
- If no adjustment is required, remove alignment equipment.

Adjustment

3. Hold the adjusting bolt on the rear control arm and loosen the self-locking nut.
4. Adjust the rear toe by turning the adjusting bolt until toe is correct.
5. Install the self-locking nut, and tighten if while holding the adjusting bolt.



SELF-LOCKING NUT
10 x 1.25 mm
54 N·m (5.5 kgf·m, 40 lbf·ft)
Replace.

1. Jack up the front of the car. Set the turning radius gauges beneath the front wheels, then lower the car.
2. Jack up the rear of the car. Place boards that are the same thickness as the turning radius gauges under the rear wheels, then lower the vehicle.
NOTE: For accurate readings, the car must be level.
3. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

Turning angle:

Inward wheel:

36 degrees 06' \pm 2 degrees (H22A7 engine)

39 degrees 10' \pm 2 degrees (Except H22A7 engine)

39 degrees 17' \pm 2 degrees (KY model)

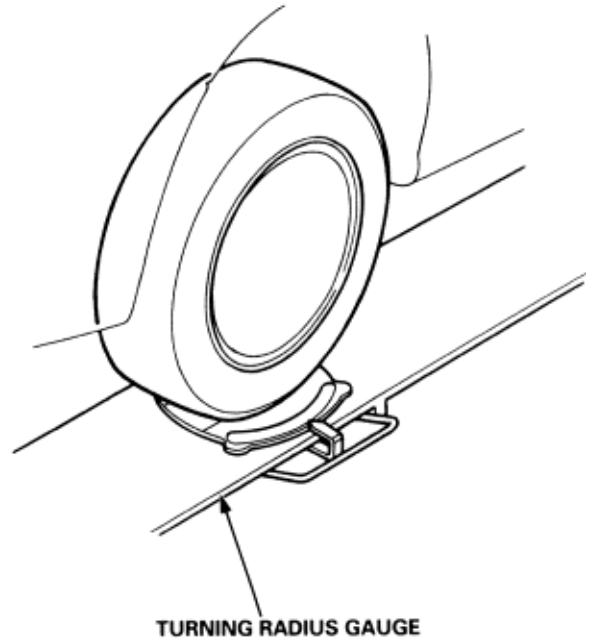
Outward wheel (reference):

29 degrees 12' (H22A7 engine)

30 degrees 58' (Except H22A7 engine)

31 degrees 14' (KY model)

4. If the turning angle is not within the specifications, check for bent or damaged suspension components.



Wheel/Hub Inspection

Bearing End Play

18-8

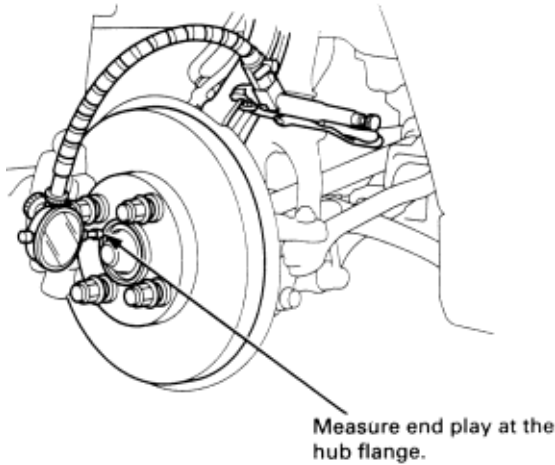
Wheel Runout

1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge as shown.
4. Measure the bearing end play by moving the disc in or outward.

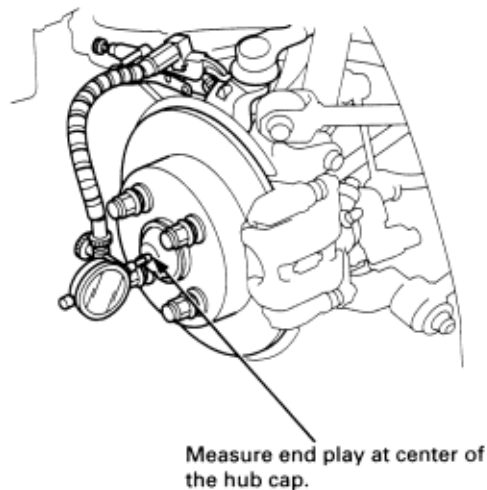
Front/Rear:

Standard: 0-0.05 mm (0-0.002 in)

Front:



Rear:



5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Check for bent or deformed wheels.
3. Attach the dial gauge as shown.
4. Measure the wheel runout by turning the wheel.

Front and Rear Wheel Axial Runout:

Standard:

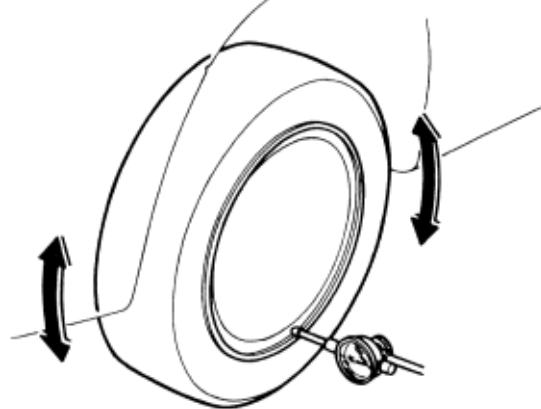
Steel Wheel:

0-1.0 mm (0-0.04 in)

Aluminium Wheel: 0-0.7 mm (0-0.03 in)

Service Limit:

2.0 mm (0.08 in)



Front and Rear Wheel Radial Runout:

Standard:

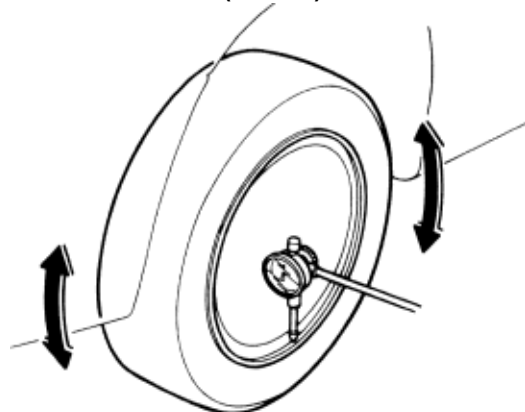
Steel Wheel:

0-1.0 mm (0-0.04 in)

Aluminium Wheel: 0-0.7 mm (0-0.03 in)

Service Limit:

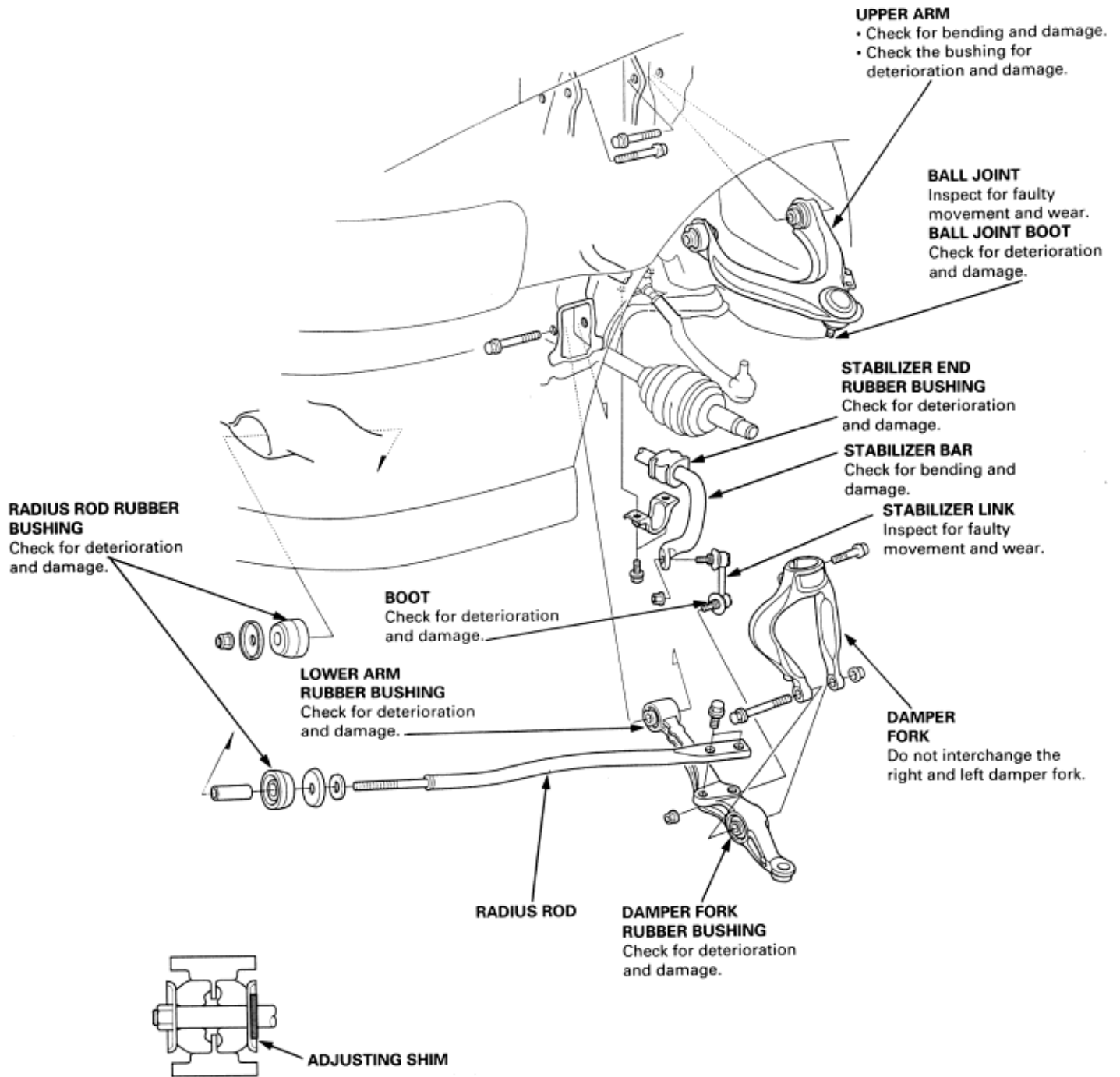
1.5 mm (0.06 in)



5. If the wheel runout is more than the service limit, replace the wheel.

CAUTION

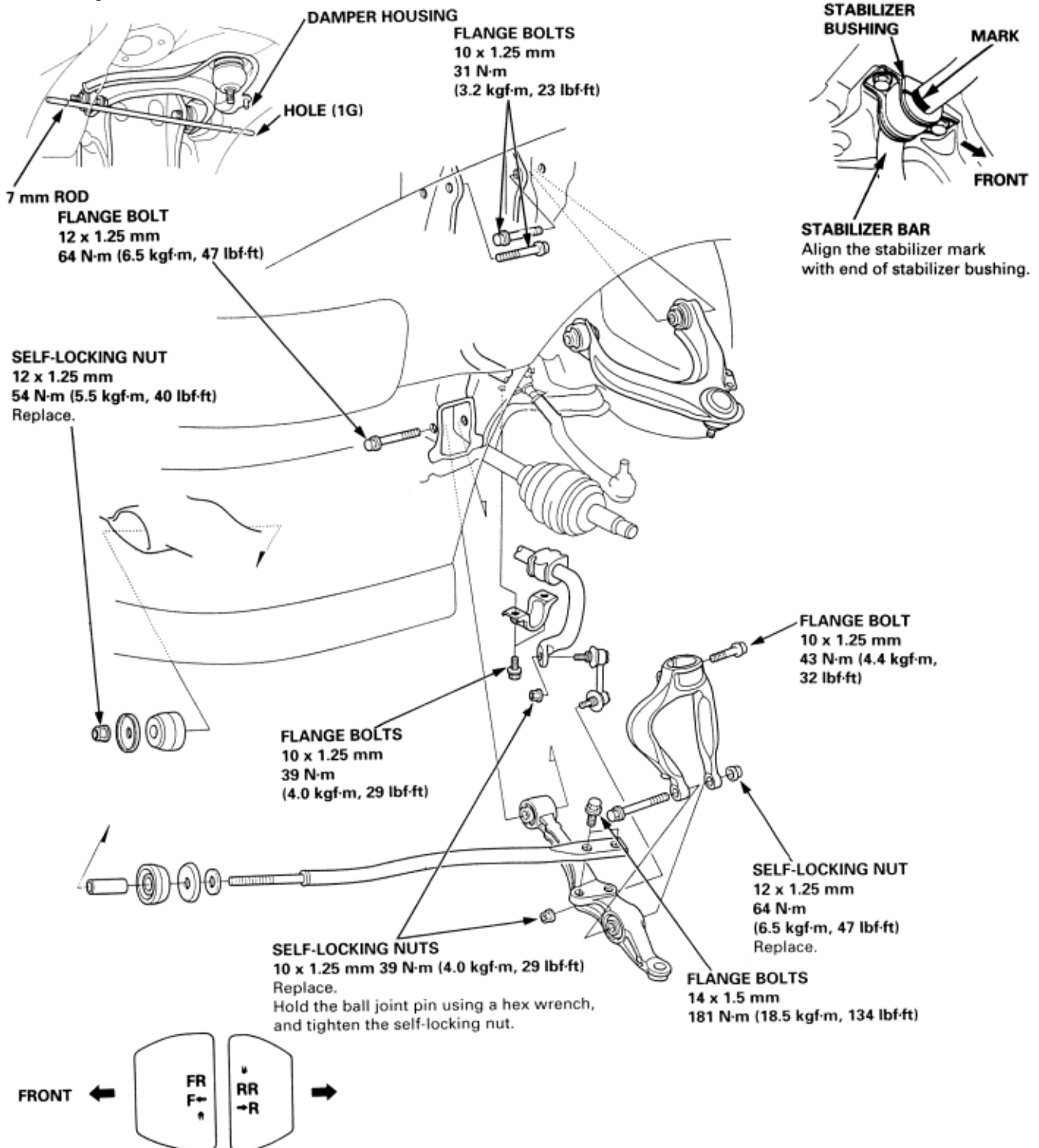
- Replace the self-locking nuts after removal.
- Be careful not to damage the ball joint boot.
- The front damper must be removed before you remove the front upper arm.



NOTE: Adjust the caster angle by increasing/decreasing the adjusting shims (See Page 18-4)

NOTE:

- ♦ Wipe off the dirt, oil and grease on the threads before tightening the fasteners.
- ♦ After installing the suspension arm, check the front wheel alignment and adjust if necessary (see page 18-4).
- ♦ The upper arm cannot be tightened to the body under the weight of the vehicle. Before tightening, insert a rod (7 mm in dia.) through the holes in the damper housing and place the upper arm on the rod, so the upper arm can be torqued to the body under the weight of the vehicle.

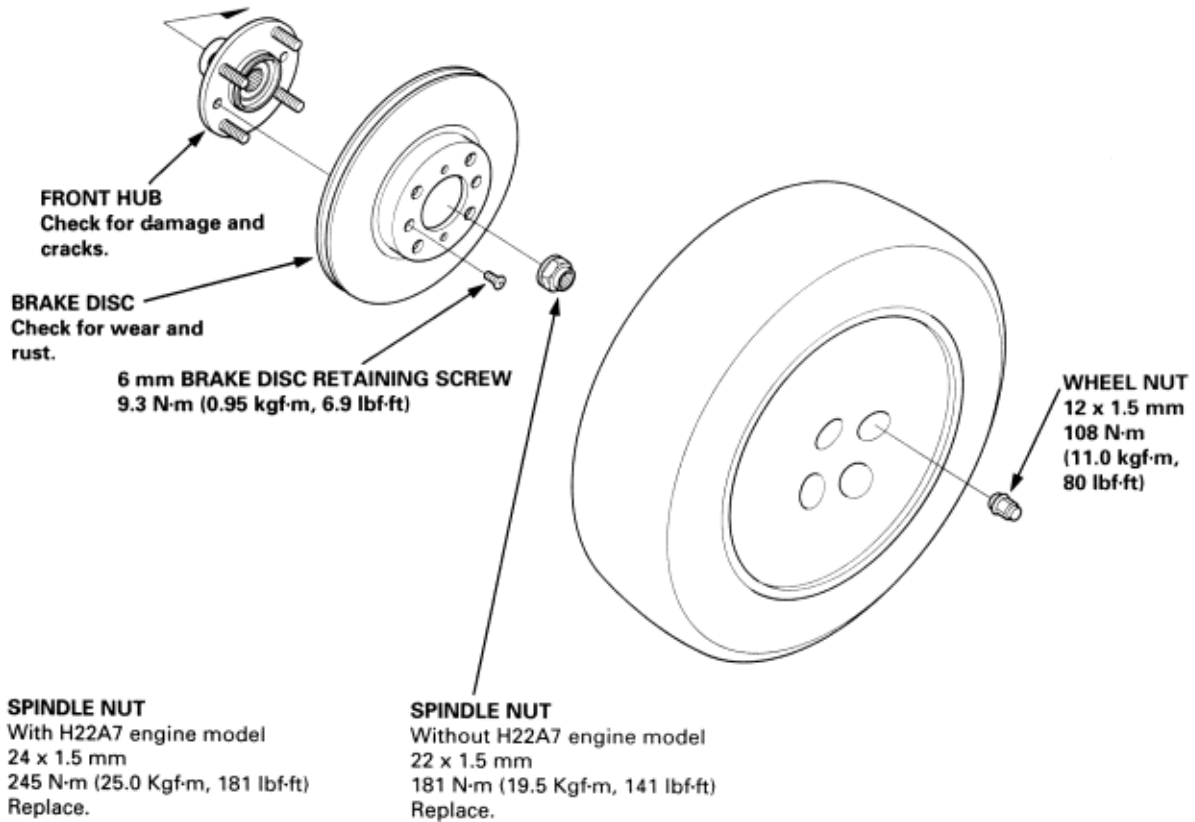
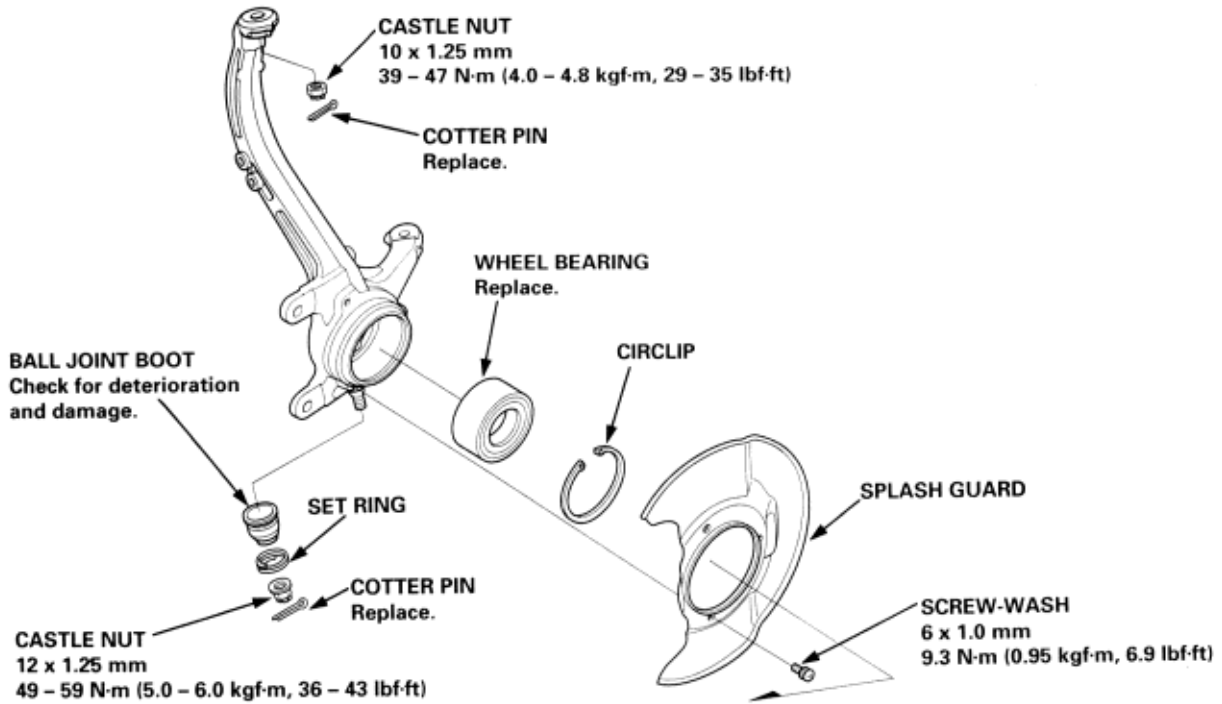


CAUTION

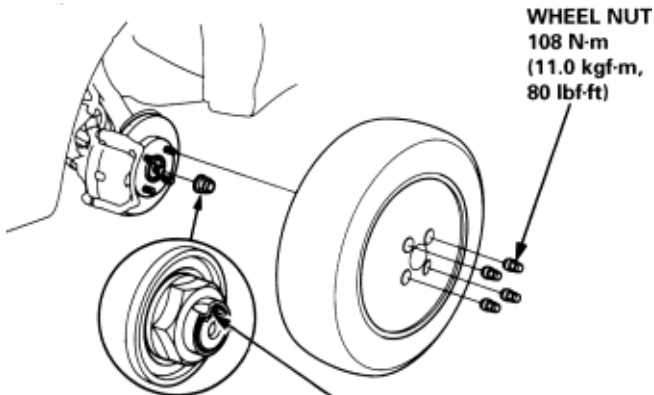
Do not interchange the radius rod rubber bushings.

NOTE:

- ♦ Before installing the spindle nut, apply engine oil to the seating surface of the nut.
- ♦ After tightening, use a drift to stake the spindle nut shoulder against the spindle.



1. Loosen the wheel nuts slightly.
2. Raise the front of vehicle and make sure it is securely supported.
3. Remove the wheel nuts and front wheel.
4. Raise the locking tab on the spindle nut, then remove the nut.



WHEEL NUT
 108 N·m
 (11.0 kgf·m,
 80 lbf·ft)

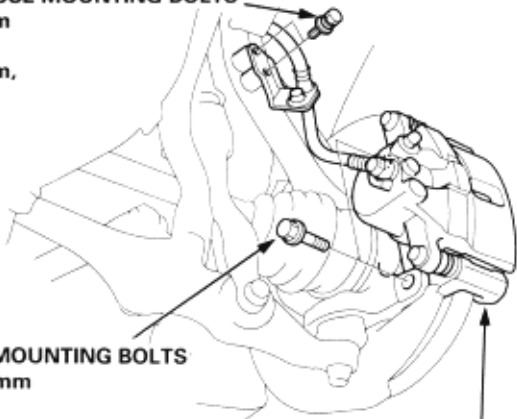
SPINDLE NUT
Spindle nut
With H22A7 engine
 24x1.5 mm
 245 Nm (25.0 kgf/m
 181 lbf/ft)
Replace

SPINDLE NUT
Spindle nut
Without H22A7 engine
 22x1.5 mm
 181 Nm (19.5 kgf/m
 141 lbf/ft)
Replace

- ♦ Before installing the spindle nut, apply engine oil to the seating surface of the nut.
- ♦ After tightening, use a drift to stake the spindle nut shoulder against the spindle.

5. Remove the brake hose mounting bolts.

BRAKE HOSE MOUNTING BOLTS
 6 x 1.0 mm
 9.3 N·m
 (0.95 kgf·m,
 6.9 lbf·ft)



CALIPER MOUNTING BOLTS
 12 x 1.25 mm
 108 N·m
 (11.0 kgf·m, 80 lbf·ft)

CALIPER

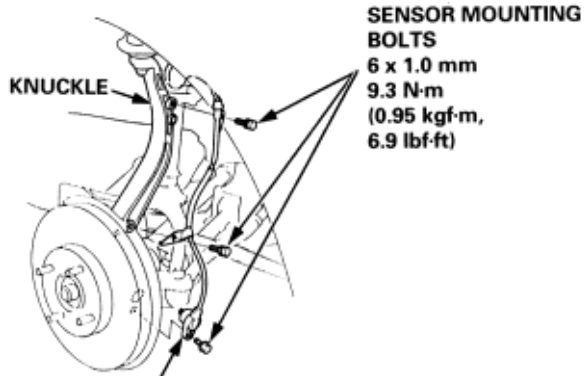
6. Remove the caliper mounting bolts and hang the caliper assembly to one side. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.



CAUTION

To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

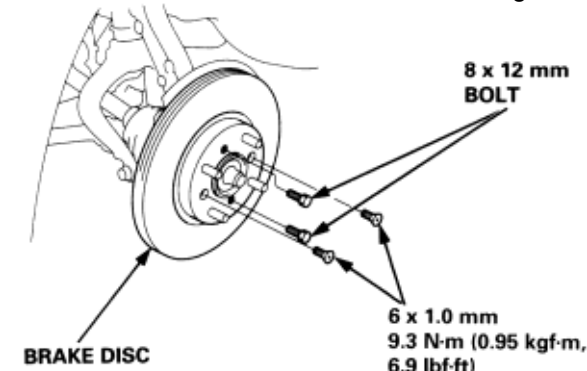
7. Remove the wheel sensor from the knuckle (for vehicles with ABS). Do not disconnect the wheel sensor connector.



SENSOR MOUNTING BOLTS
 6 x 1.0 mm
 9.3 N·m
 (0.95 kgf·m,
 6.9 lbf·ft)

WHEEL SENSOR

8. Remove the 6mm brake disc retaining screws.



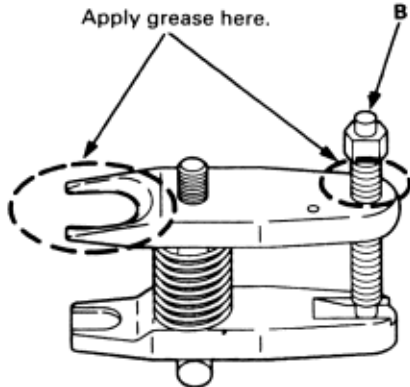
8 x 12 mm BOLT

BRAKE DISC

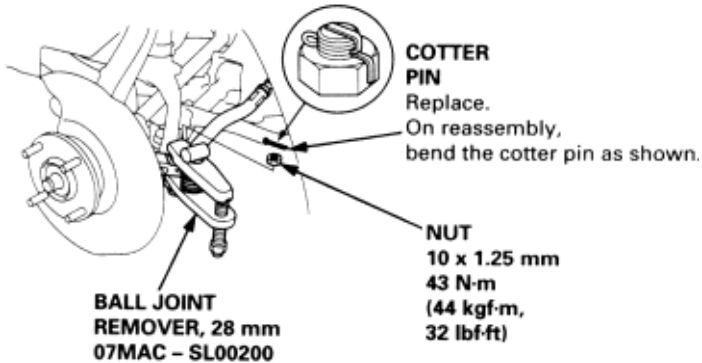
6 x 1.0 mm
 9.3 N·m (0.95 kgf·m,
 6.9 lbf·ft)

9. Screw two 8 x 1.25 mm bolts into the disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.
10. Remove the brake disc from the knuckle.
11. Check the front hub for damage and cracks.
12. Clean any dirt or grease off the ball joint.
13. Remove the cotter pin from the ball joint nut, and remove the nut.

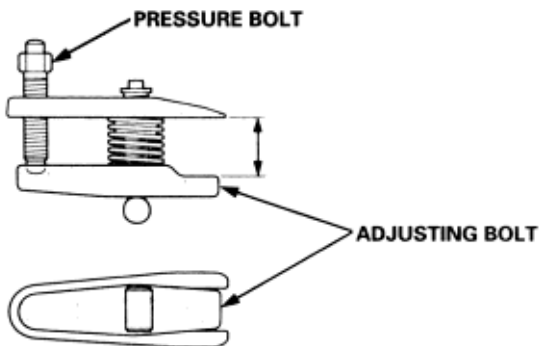
14. Install a hex nut on the threads of the ball joint. Be sure that the nut is flush with the ball joint pin end to prevent damage to the threaded end of the ball joint.
15. Apply grease to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt threads.



16. Install the special tool as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt. NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



17. Once the special tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt, and recheck the jaws to make sure they are still parallel.



NOTE: After making the adjustment to the adjusting bolt, be sure the head of the adjusting bolt is in this position to allow the jaw to pivot.

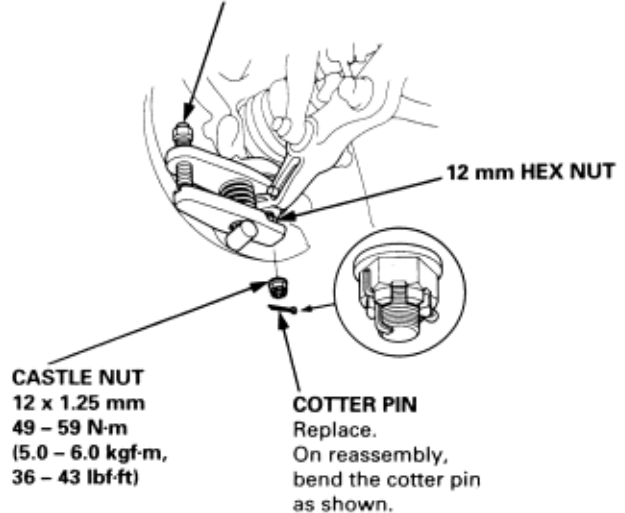
18. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

WARNING

Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris in your eyes.

19. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot and replace it if damaged.
20. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.

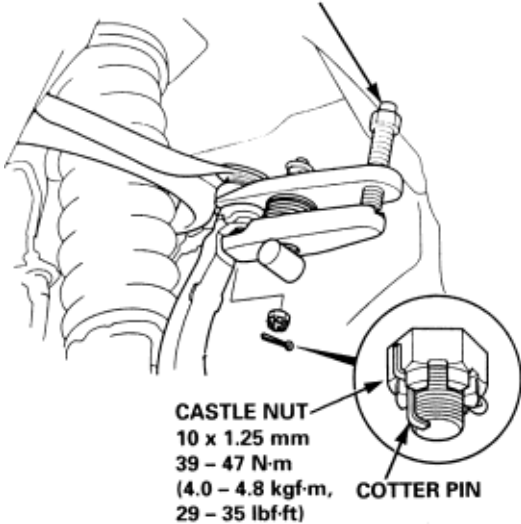
BALL JOINT REMOVER, 28 mm
07MAC - SL00200



21. Remove the lower ball joint from the knuckle using the special tool.

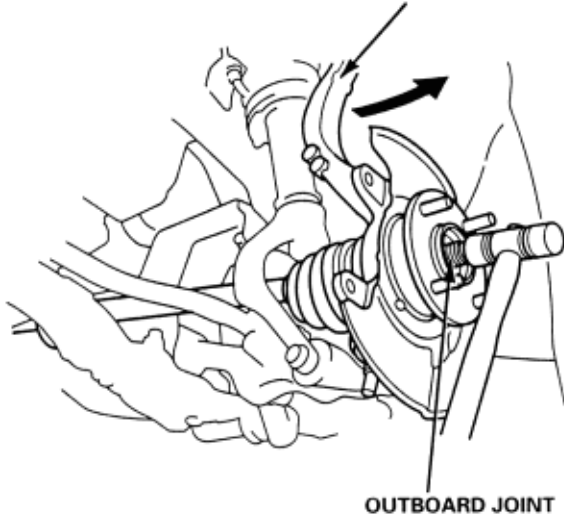
22. Remove the cotter pin from the upper ball joint castle nut and remove the nut.

BALL JOINT REMOVER, 28 mm
07MAC - SL00200



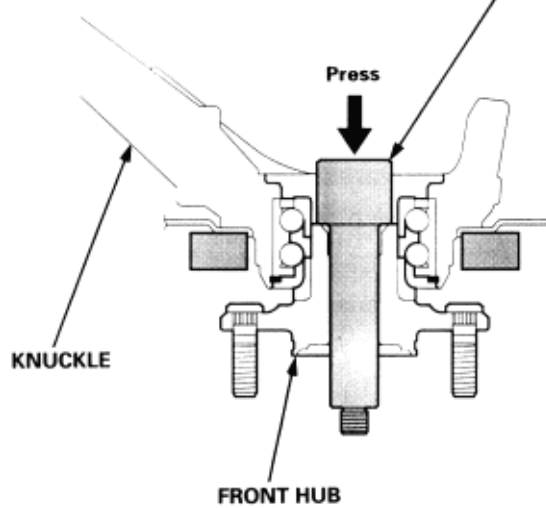
23. Remove the upper ball joint from the knuckle using the special tool.
24. Pull the knuckle outward, and remove the driveshaft outboard joint from the knuckle by tapping the driveshaft end with a plastic hammer, then remove the knuckle.

KNUCKLE
Check for damage.

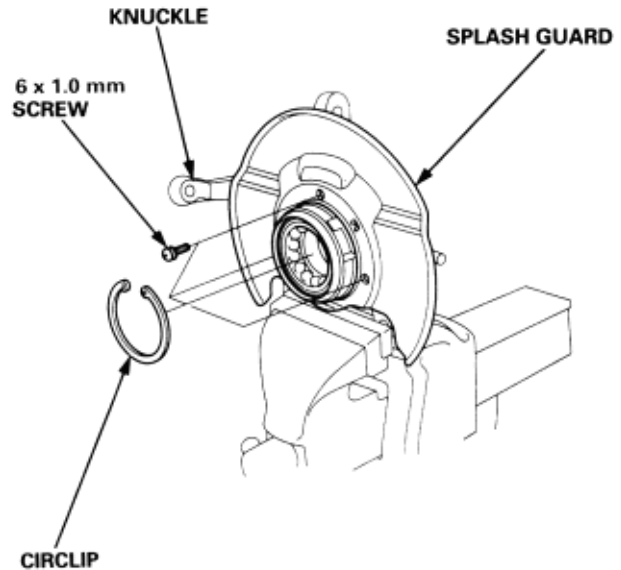


25. Separate the hub from the knuckle using the special tool and a hydraulic press. Take care not to distort the splash guard. Hold onto the hub to keep it from falling when pressed clear.

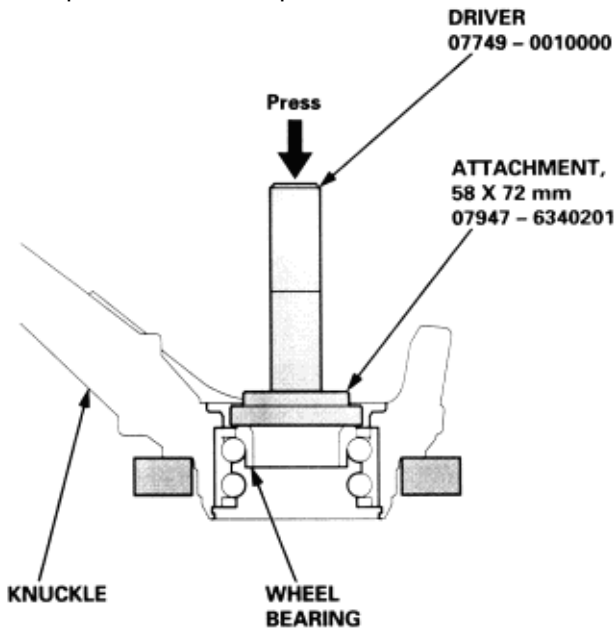
HUB DIS/ASSEMBLY TOOL
07GAF - SE00100



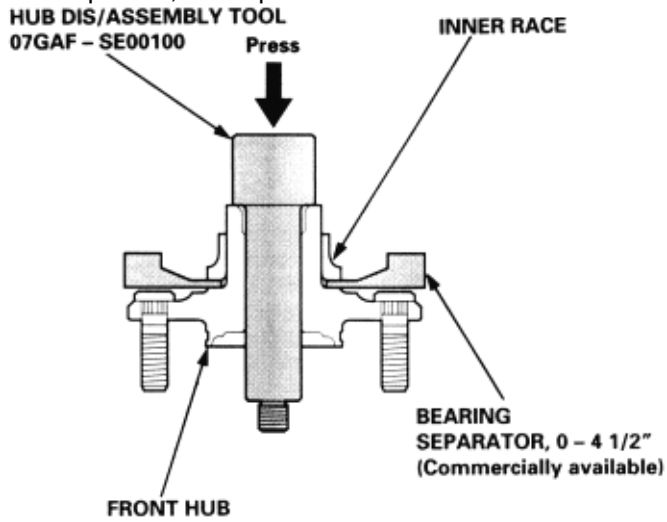
26. Remove the circlip and the splash guard from the knuckle.



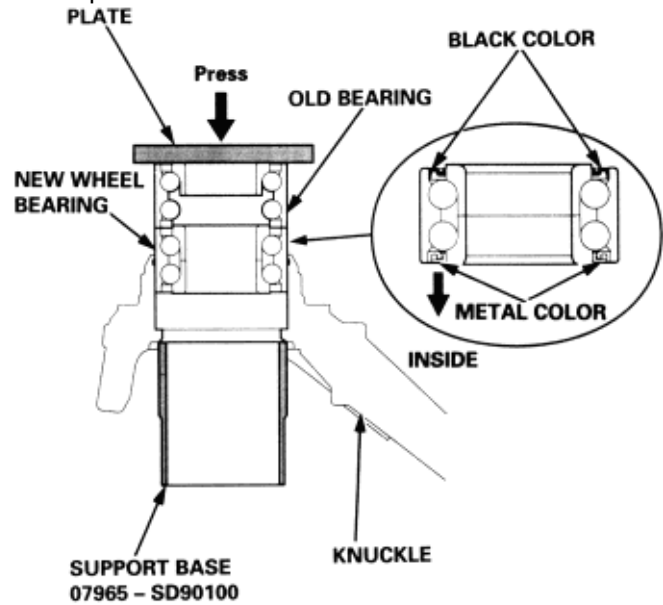
27. Press the wheel bearing out of the knuckle using the special tools and a press.



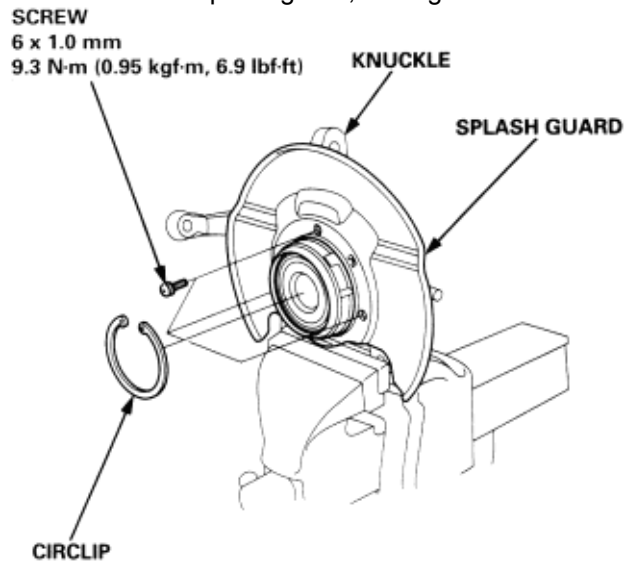
28. Press the wheel bearing inner race from the hub using the special tool, a commercially available bearing separator, and a press.



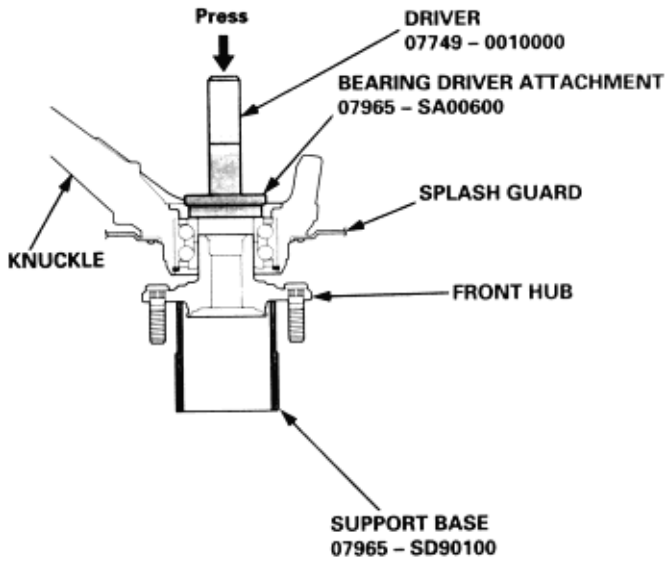
29. Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.
 30. Press a new wheel bearing into the knuckle using the old bearing, a steel plate, the special tool and a press. Place the wheel bearing on the knuckle with the pack seal side facing (metal colour) toward the inside. Be careful not to damage the sleeve of the pack seal.



31. Install the circlip securely in the knuckle.
 32. Install the splash guard, and tighten the screws.



33. Install the hub on the knuckle using the special tools shown and a hydraulic press. Be careful not to distort the splash guard.



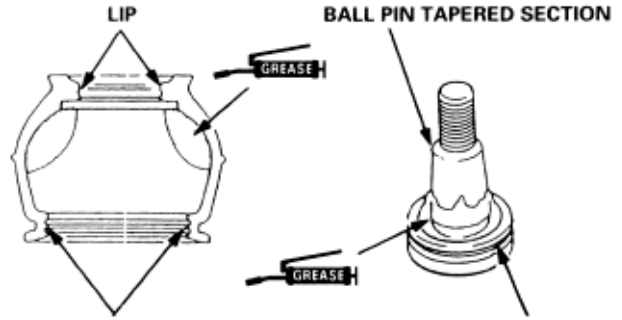
34. Install the knuckle in the reverse order of removal, and pay particular attention to the following items.
- ♦ Be careful not to damage the ball joint boots when installing the knuckle.
 - ♦ Torque all mounting hardware to the specified torque values.
 - ♦ Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
 - ♦ Install new cotter pins on the castle nuts after torquing.
 - ♦ Avoid twisting the sensor wires when installing the wheel sensor.
 - ♦ Before installing the brake disc, clean the mating surface of the front hub and the inside of the brake disc.
 - ♦ Before installing the spindle nut, apply a small amount of motor oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
 - ♦ Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
 - ♦ Check the front wheel alignment, and adjust it if necessary (see page 18-4).

1. Remove the set ring and the boot.

CAUTION

Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.



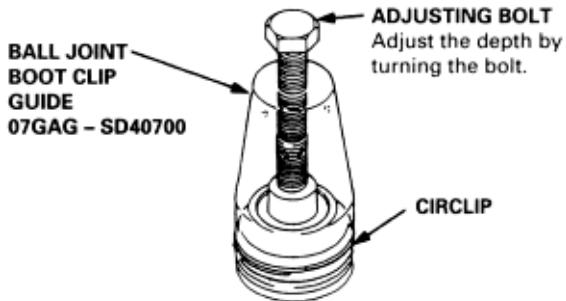
BOOT INSTALLATION SECTION Wipe off the grease. **BOOT INSTALLATION SECTION** Wipe off the grease.

3. Wipe the grease off the sliding surface of the ball pin and pack with fresh grease.

CAUTION

- ♦ Keep grease off the boot installation section and the tapered section of the ball pin.
- ♦ Do not allow dust, dirt, or other foreign materials to enter the boot.

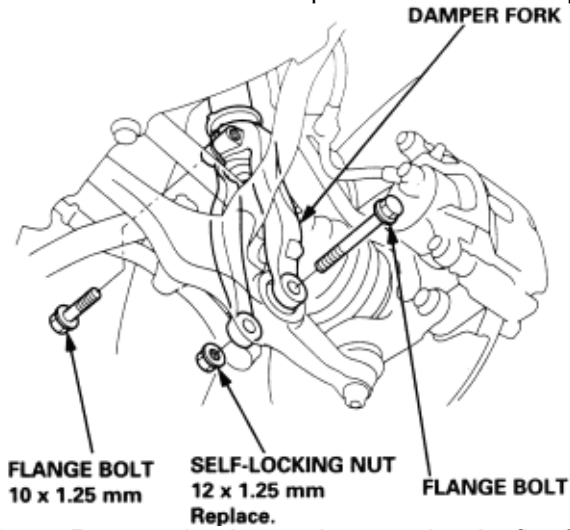
4. Install the boot in the groove of the boot installation section securely, then bleed air.
5. Install the upper and lower ball joint boot set rings using the special tool as follows: Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the set ring over the tool and into position.



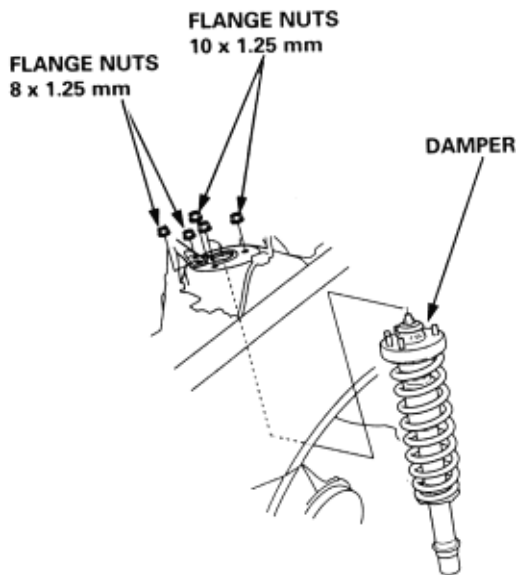
CAUTION

After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

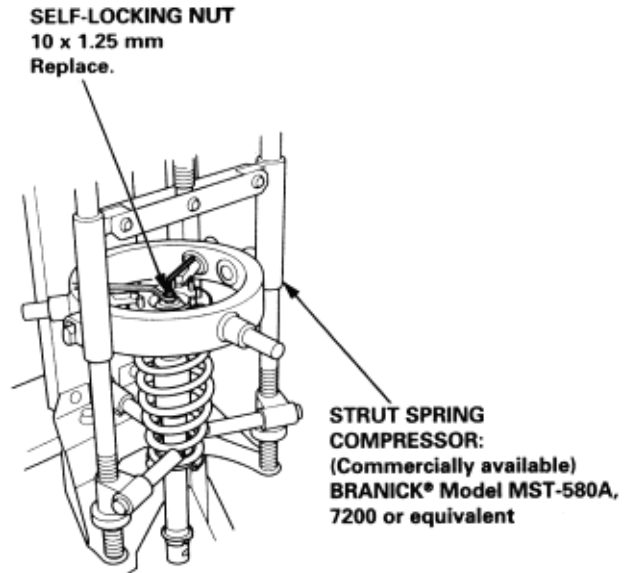
1. Raise the front of the vehicle and make sure it is securely supported.
Remove the front wheel.
2. Remove the damper fork.
 - 1. Remove the damper pinch bolt.
 - 2. Remove the lower bolt and self-locking nut from the damper fork.
 - 3. Remove the damper fork from the damper.



3. Remove the damper by removing the five flange nuts.

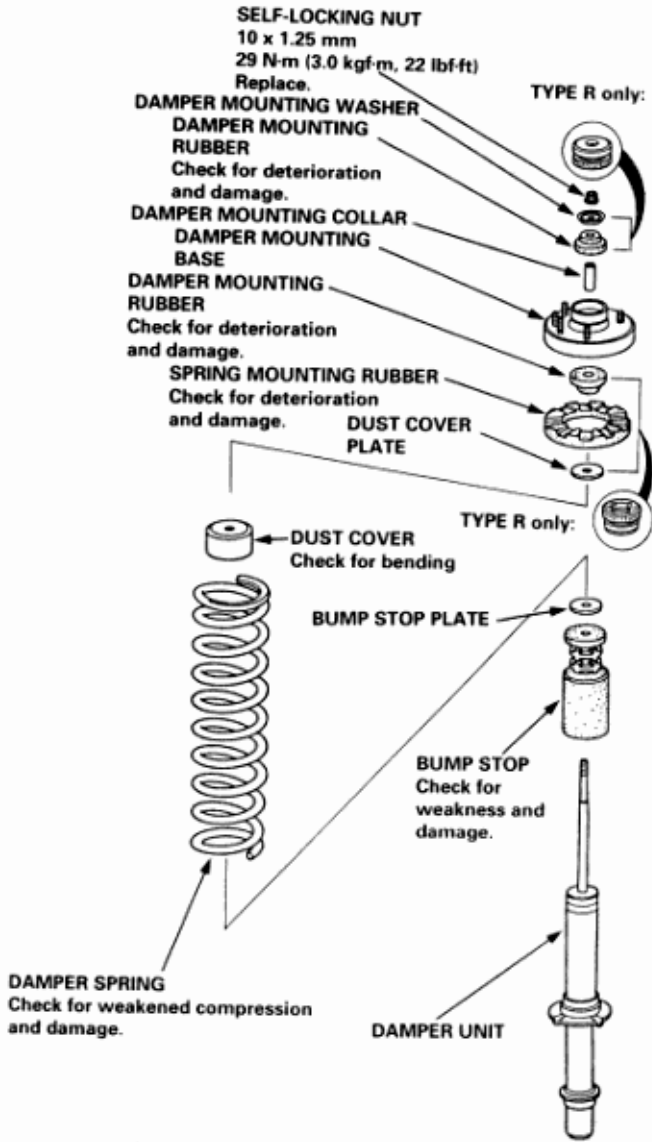


1. Compress the damper spring with the commercially available strut spring compressor according to the manufacturer's instructions, then remove the self-locking nut. Do not compress the spring more than necessary to remove the nut.

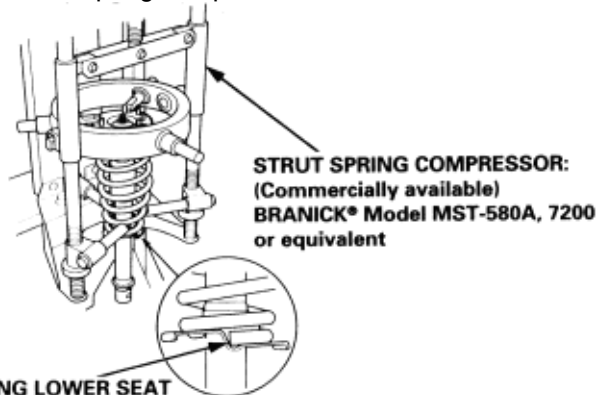


2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the next page.
3. Reassemble all parts, except the spring.
4. Compress the damper assembly by hand and check for smooth operation through a full stroke, both compression and extension the damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.
5. Check for oil leaks, abnormal noises or binding during these tests.

The damper springs are different left and right. Be sure to mark the springs R and L before disassembling the dampers.

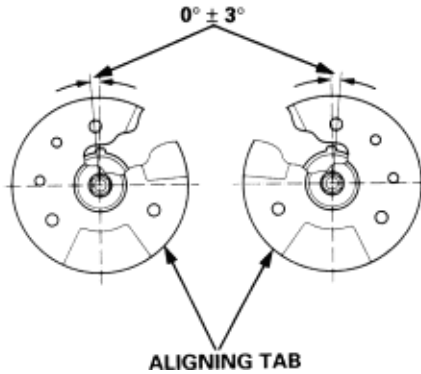


1. Install the damper unit on a commercially available strut spring compressor.

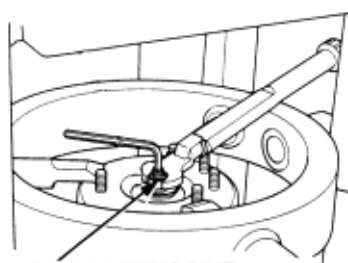


SPRING LOWER SEAT

2. Assemble the damper in reverse order of removal except for the damper mounting washer and self-locking nut. Align the bottom of damper spring and spring lower seat.
3. Position the damper mounting base on the damper unit.



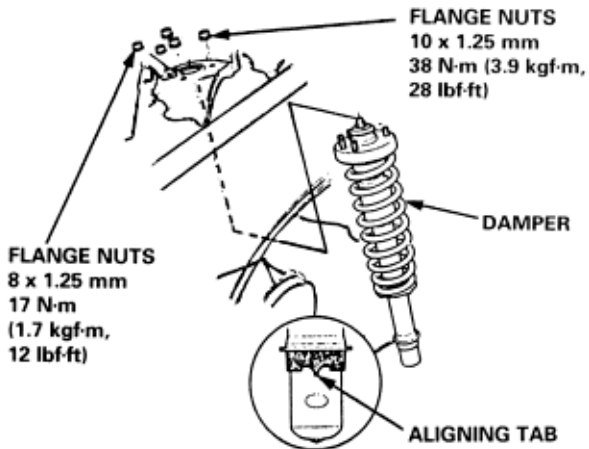
4. Compress the damper spring with the spring compressor.
5. Install the damper mounting rubber, damper mounting washer and a new 10 mm self-locking



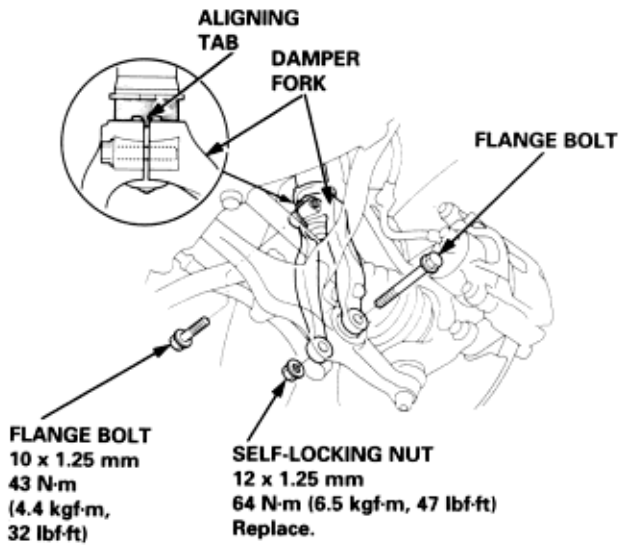
SELF-LOCKING NUT
Replace.
10 x 1.25 mm
29 N-m (3.0 kgf-m, 22 lbf-ft)

6. Hold the damper shaft, and tighten the 10 mm self-locking nut.

1. Loosely install the damper on the frame with the aligning tab facing inside, then loosely install the five flange nuts.



2. Install the damper fork over the driveshaft and onto the lower arm. Install the front damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.



3. Loosely install the damper pinch bolt into the damper fork.
4. Loosely install a new self-locking nut with the flange bolt.
5. Raise the knuckle with a floor jack until the vehicle just lifts of the safety stand.
6. Tighten damper pinch bolt.
7. Tighten the flange bolt and the self-locking nut.
8. Tighten the flange nuts on the top of the damper to the specified torque.
9. Install the front wheel (**see page 18-13**).

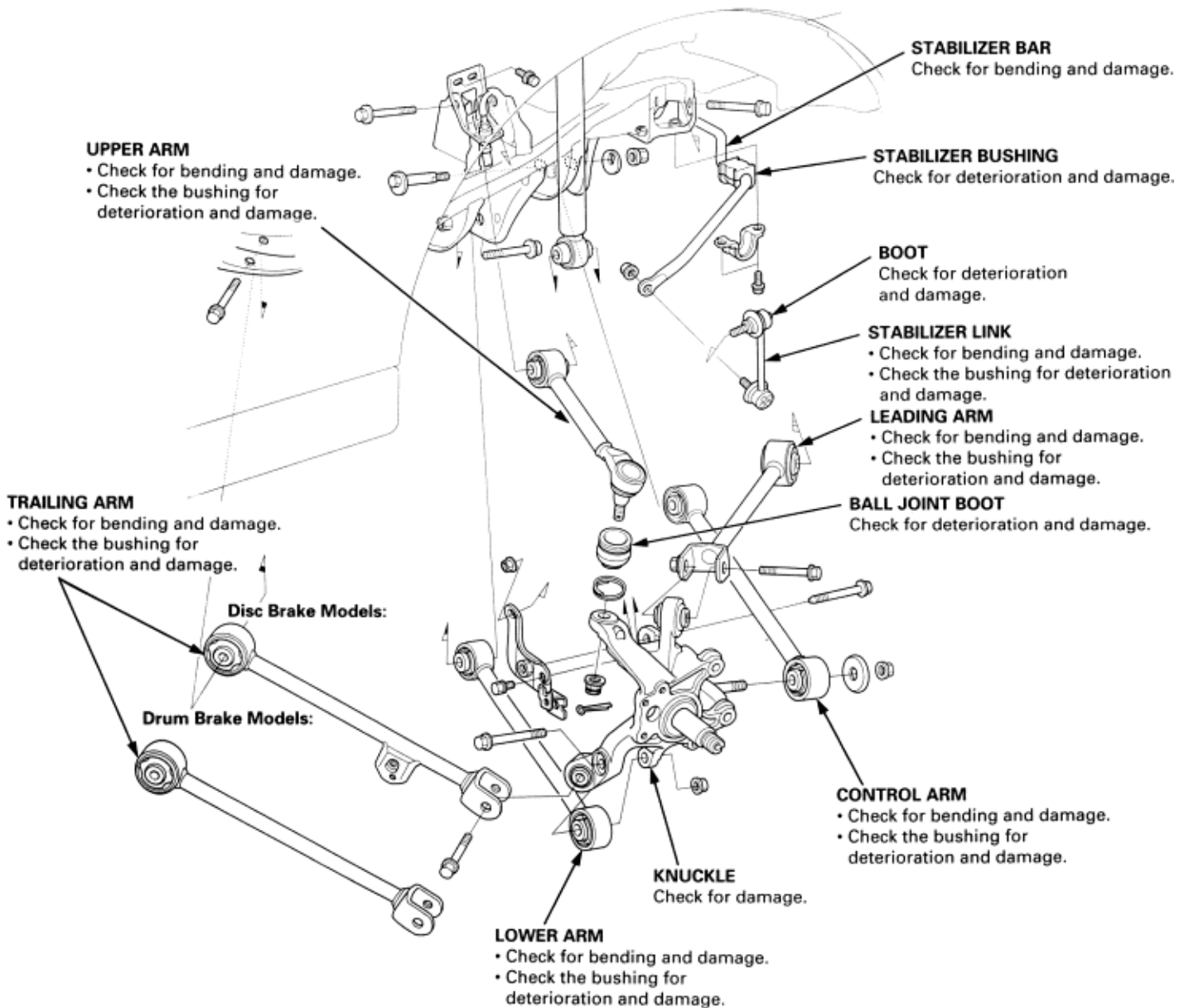
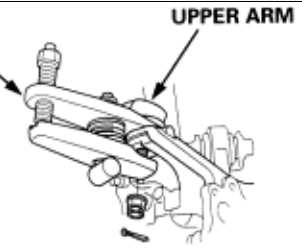
Removal/Inspection



CAUTION

- ♦ Replace the self-locking nuts after removal.
- ♦ Be careful not to damage the ball joint boot.

BALL JOINT REMOVER, 28 mm
07MAC - SL00200
See page 18-13 for how to
use the ball joint remover.



To go to the page referenced on the diagram above, click on the following:
(See Page 18-13)

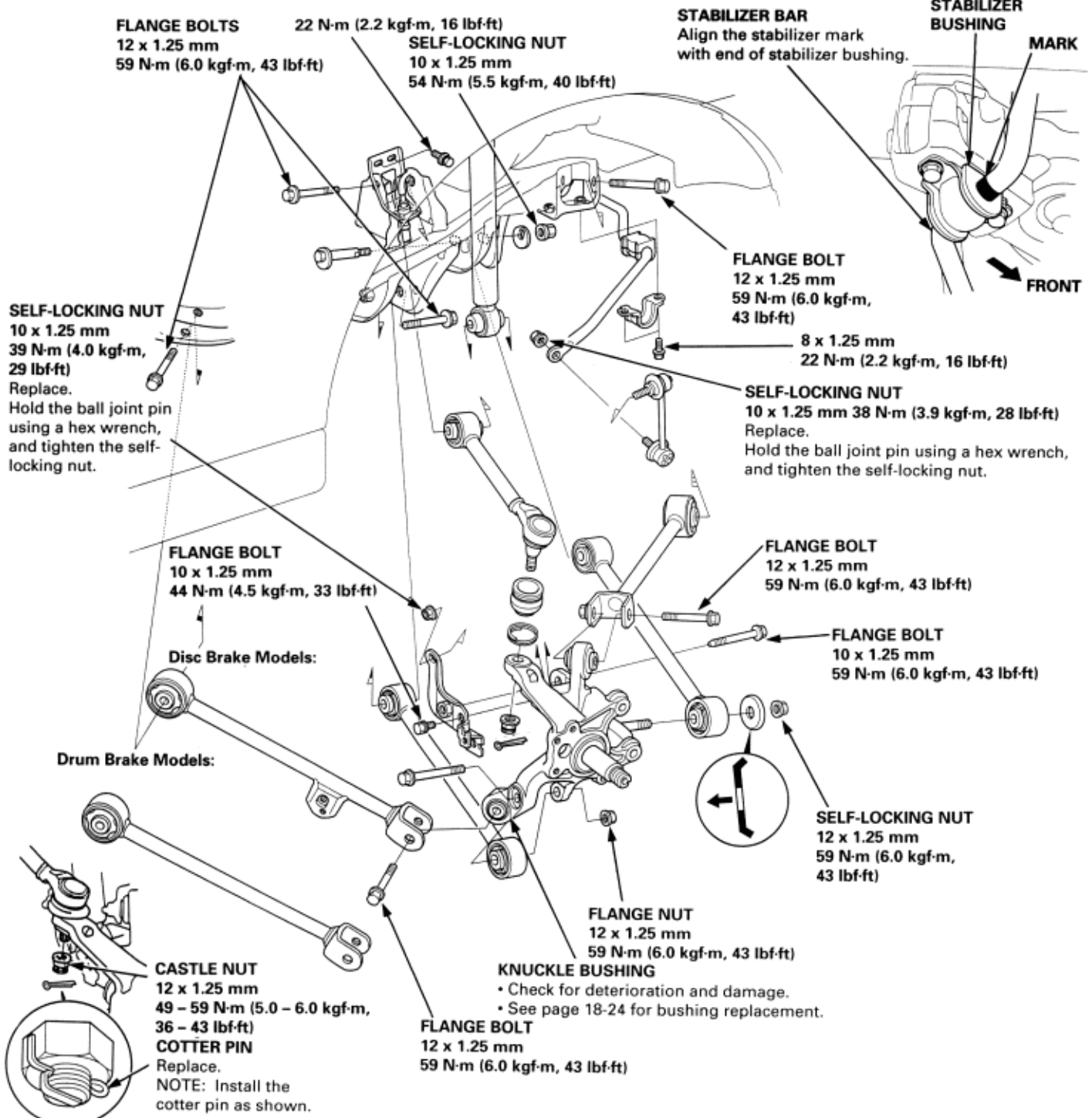
Installation

CAUTION

- ♦ Any bolts or nuts connected to rubber mounts or bushings should be tightened with the vehicle on the ground.
- ♦ Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

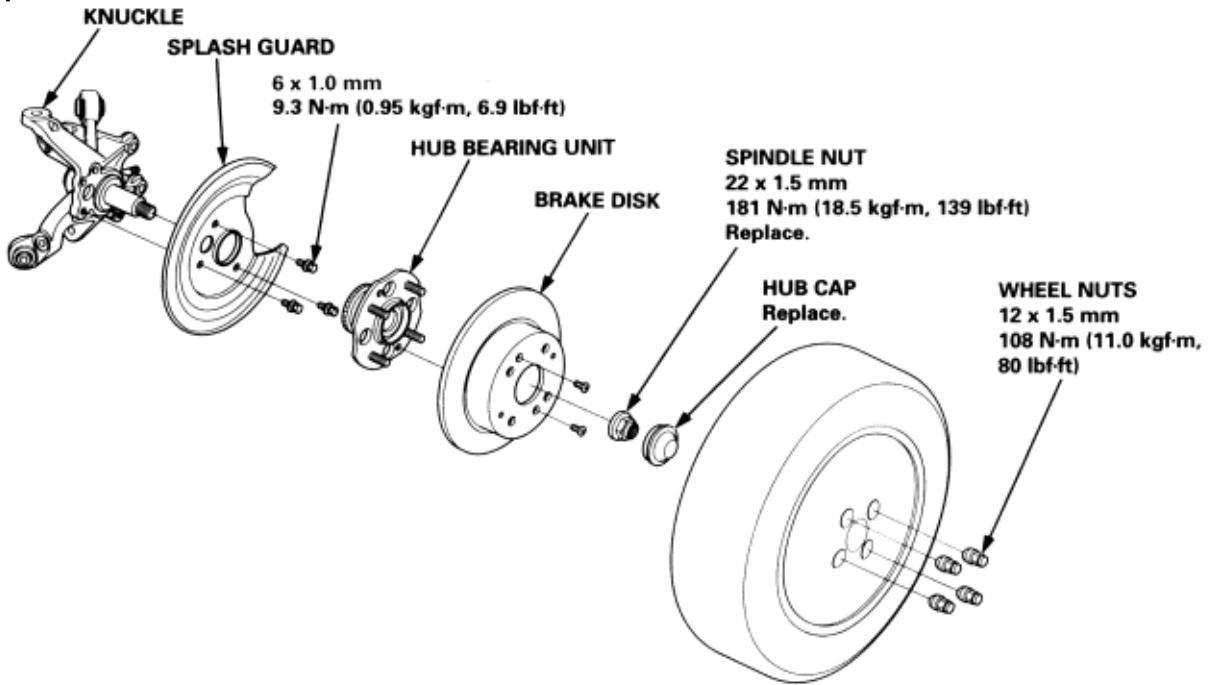
NOTE:

- ♦ Wipe off the oil, dirt or grease from the threads before tightening the fasteners.
- ♦ After installing the suspension arm, check the rear wheel alignment, and adjust if necessary ([see page 18-4](#)).

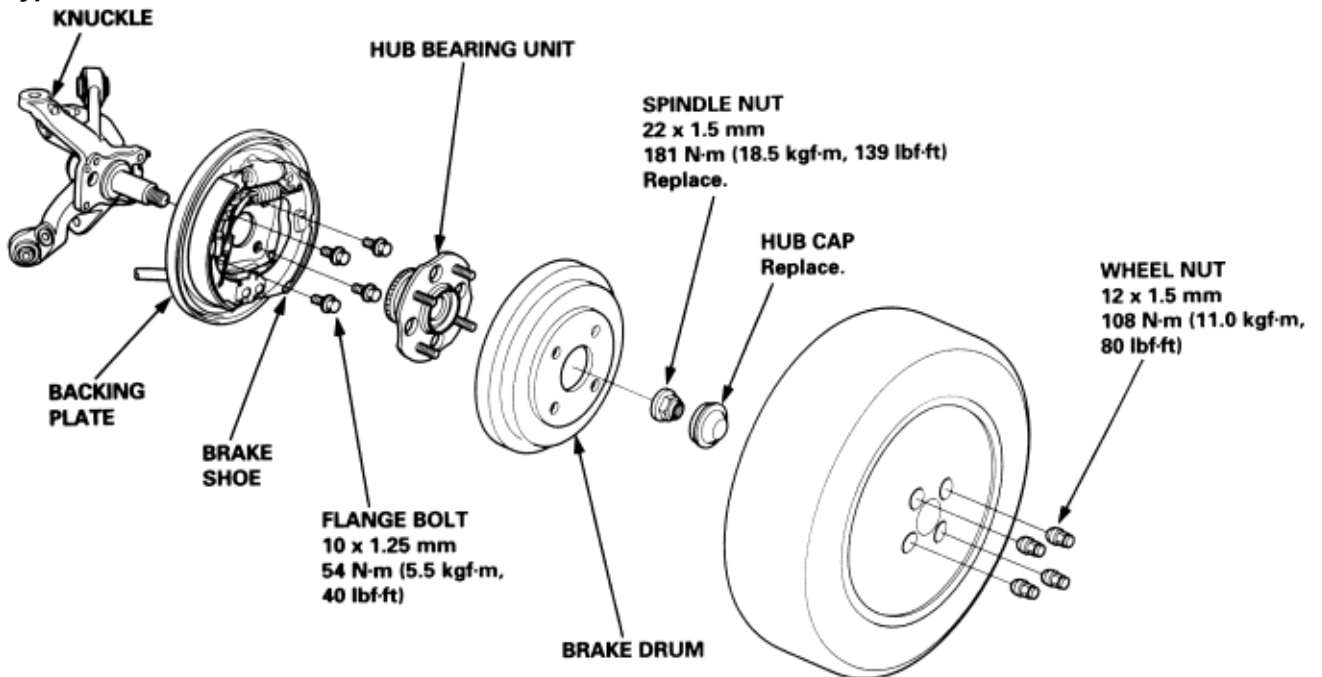


To go to the page referenced on the diagram above, click on the following:
[\(See Page 18-24\)](#)

Disc Brake Type:



Drum Brake Type:



Rear Suspension

Hub Bearing Unit Replacement (cont'd)

18-23

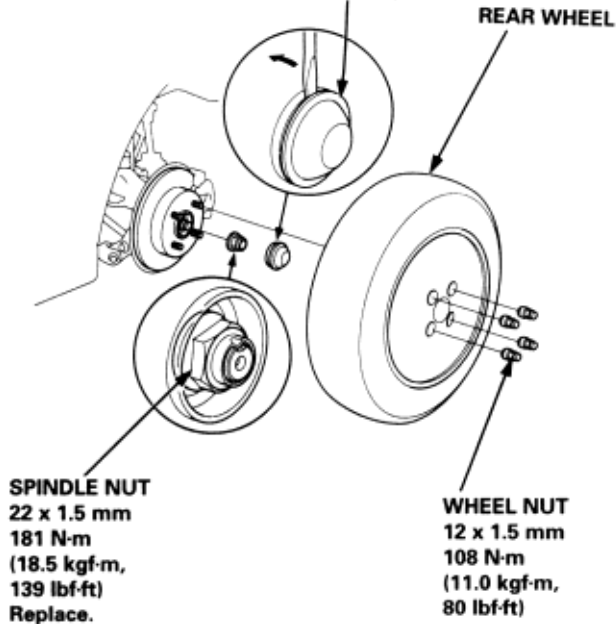
Disk Brake Type

1. Raise the rear of the vehicle and make sure it is securely supported.
2. Remove the wheel nuts and rear wheel.

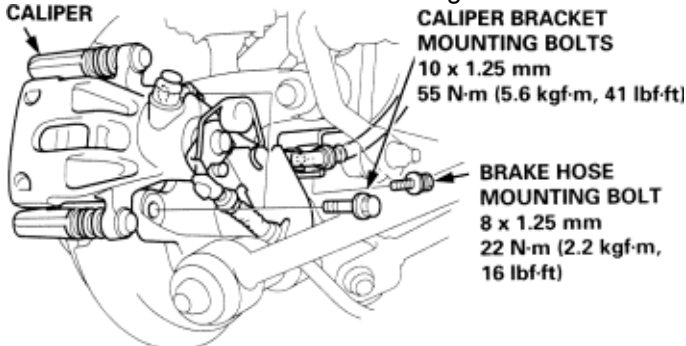
HUB CAP

Replace.

NOTE: Take care not to damage the hub unit on disassembly.

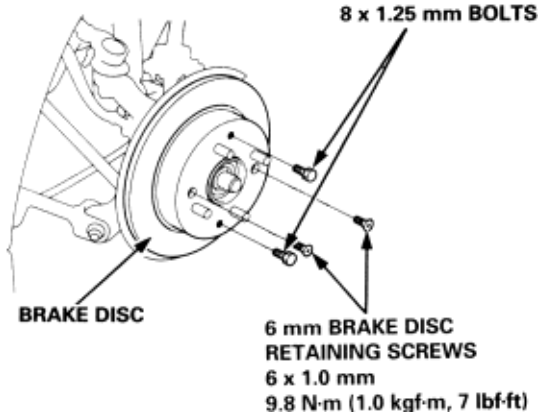


3. Pull the parking brake lever up.
4. Remove the hub cap.
5. Raise the locking tab on the spindle nut, then remove the nut.
6. Release the parking brake lever.
7. Remove the brake hose mounting bolt.

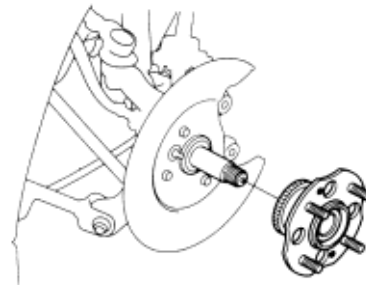


8. Remove the caliper bracket mounting bolts and hang the caliper to one side. To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

9. Remove the 6 mm brake disc retaining screws.



10. Screw two 8 x 1.25 mm bolts into the disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.
11. Remove the hub bearing unit from the knuckle.



12. Install the knuckle in the reverse order of removal, and pay particular to the following items.
 - ♦ Before installing the brake disc, clean the mating surfaces of the rear hub and brake disc.
 - ♦ Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.
 - ♦ To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.
 - ♦ After tightening, use a drift to stake the spindle nut shoulder against the spindles

Rear Suspension

Hub Bearing Unit Replacement (cont'd)

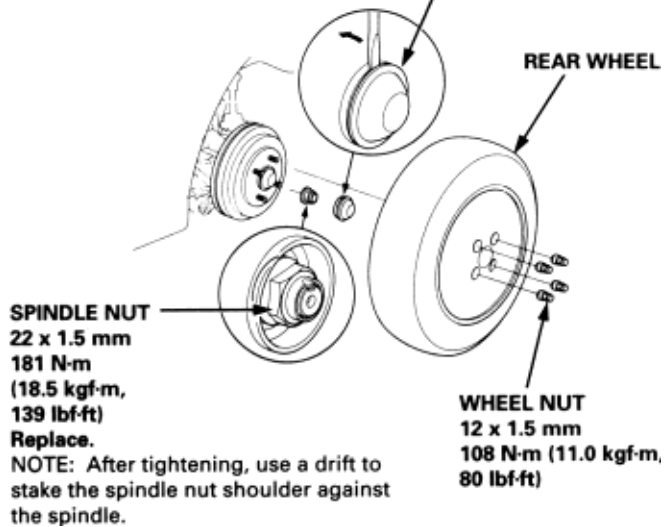
Drum Brake Type

1. Raise the rear of the vehicle and make sure it is securely supported.
2. Remove the wheel nuts and rear wheel.

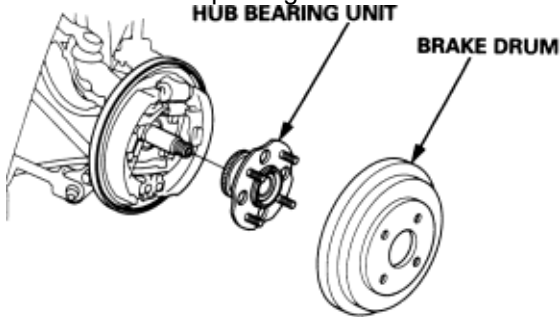
HUB CAP

Replace.

NOTE: Take care not to damage the hub unit on disassembly.



3. Pull the parking brake lever up.
4. Remove the hub cap.
5. Raise the locking tab on the spindle nut, then remove the nut.
6. Release the parking brake lever.



7. Remove the brake drum, hub bearing unit.
8. Install the knuckle in the reverse order of removal, and pay particular to the following items.
 - ♦ Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.
 - ♦ After tightening, use a drift to stake the spindle nut shoulder against the spindle.

18-24

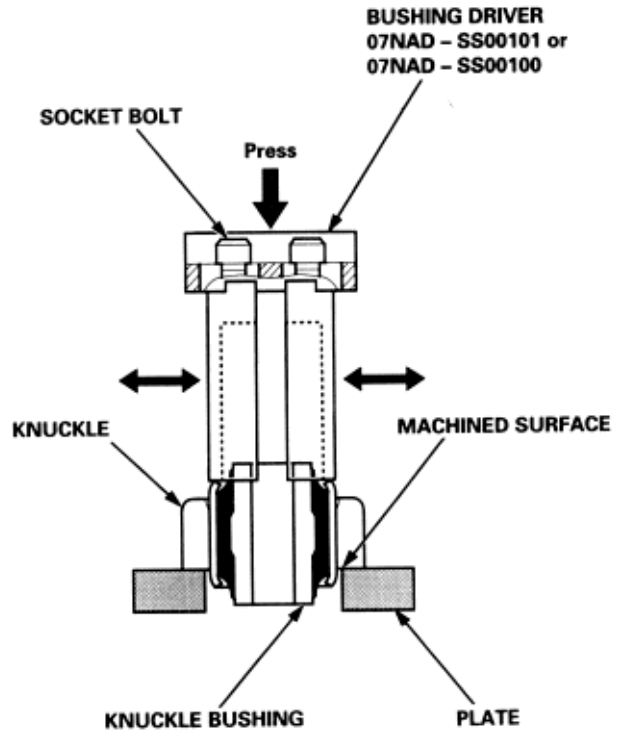
Knuckle Bushing Replacement

1. Position the knuckle on the press with the machined surface facing down.
2. Adjust the bushing driver so that it matches the inner diameter of the bushing hole, then tighten the socket bolt securely.
3. Position the bushing driver on the bushing.
4. Remove the bushing by pressing on the bushing driver with a press as shown.



CAUTION

- ♦ Support the knuckle at machine surface as shown.
- ♦ Be careful not to damage the inside of the bushing hole while pressing on the bushing.



Rear Suspension

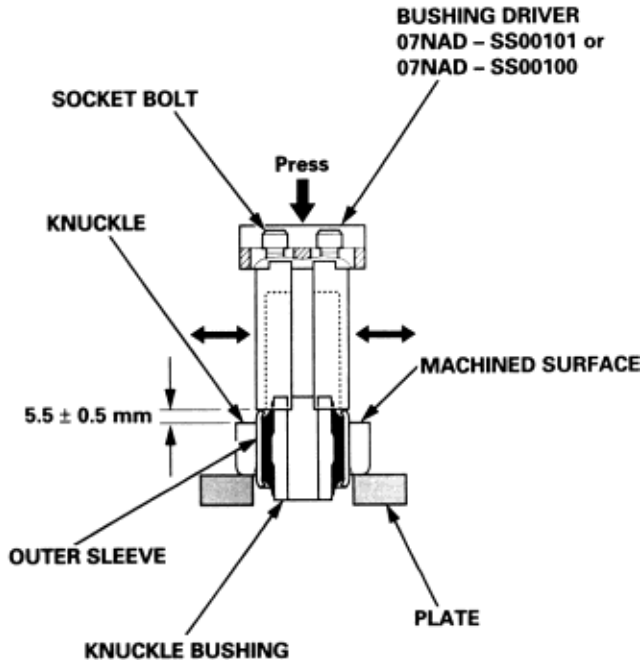
Knuckle Bushing Replacement (cont'd)

18-25

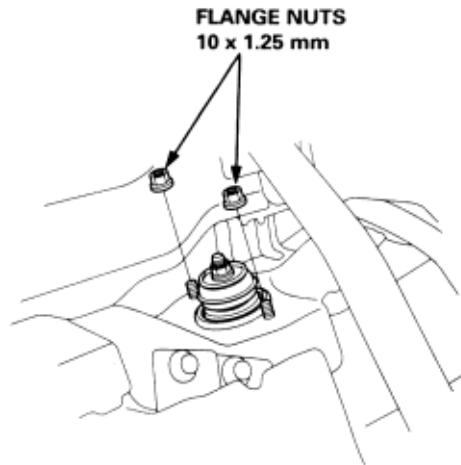
Rear Damper

Removal

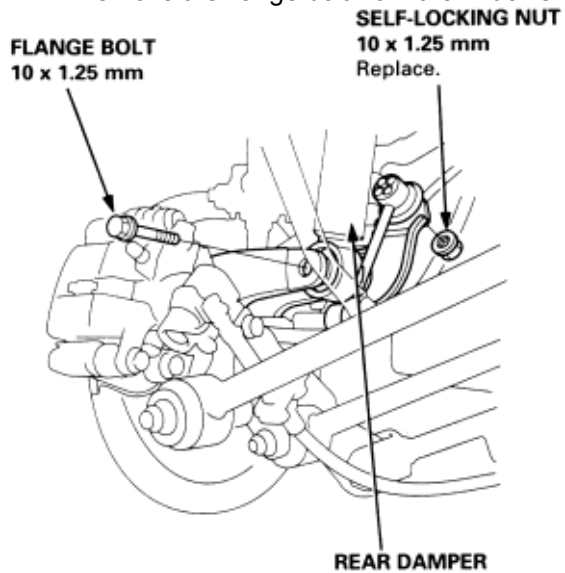
5. Position the knuckle on the press with the machined surface facing down.
6. Adjust the bushing driver so that it matches with the outer diameter of the bushing.
7. Position the bushing driver on the outer sleeve of the bushing.
8. Press the bushing into the knuckle using the bushing driver and a press until the edge of the bushing aligns with machined surface on the knuckle as shown.



1. Raise the rear of the vehicle and make sure it is securely supported.
Remove the rear wheel.
2. Remove the rear bulkhead cover (see section 20).
3. Remove the two flange nuts.

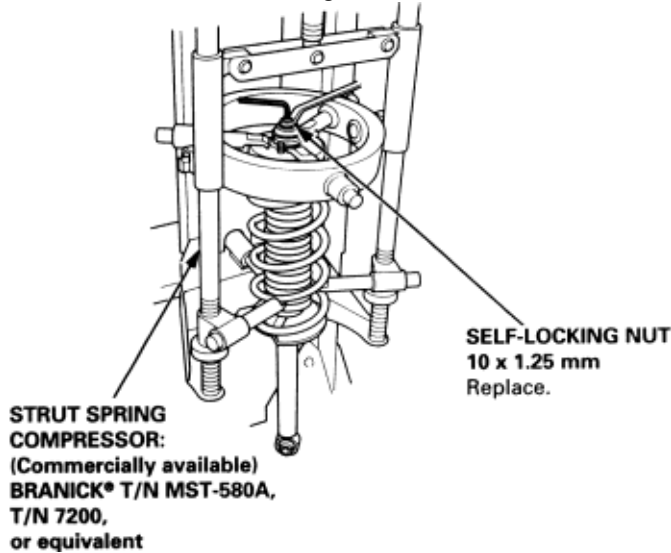


4. Remove the flange bolt from the knuckle.



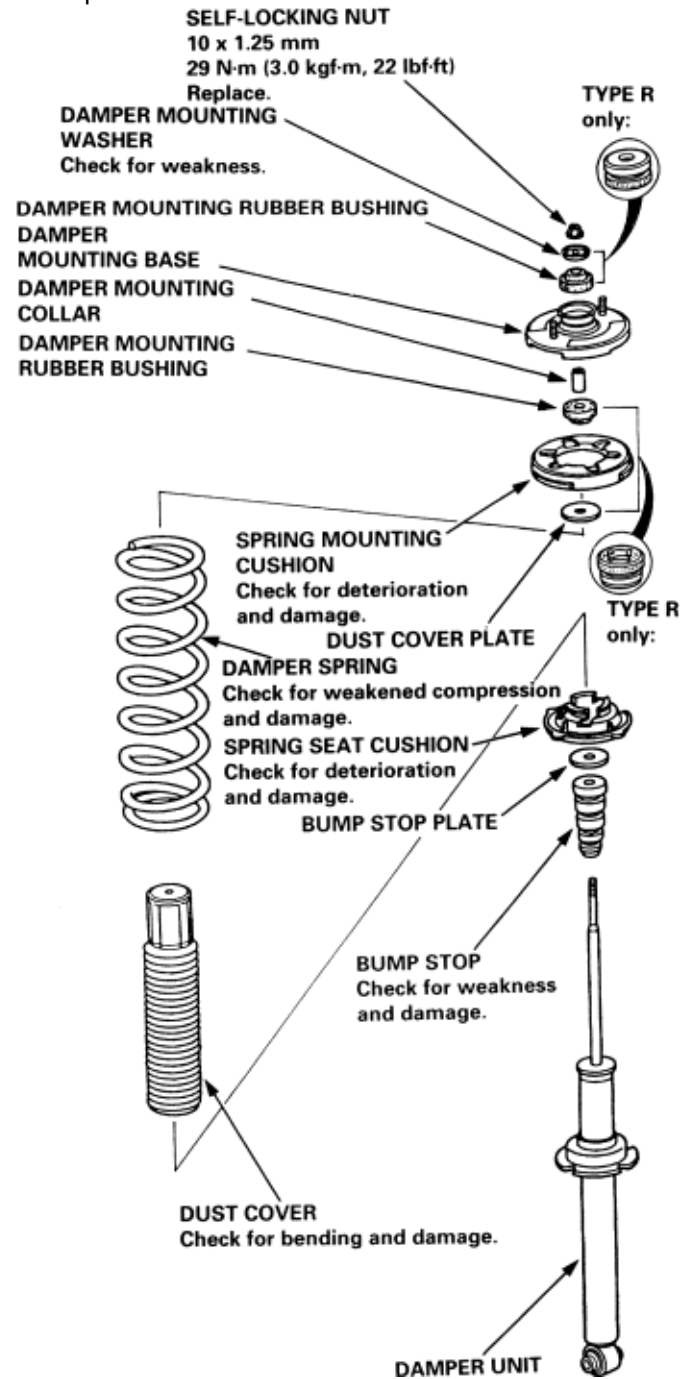
5. Remove the flange nut from the stabilizer link.
6. Lower the rear suspension and remove the damper from the vehicle.

1. Compress the damper spring with the commercially available strut spring compressor according to the manufacturer's instructions, then remove the self-locking nut. Do not compress the spring more than necessary to remove the self-locking nut.



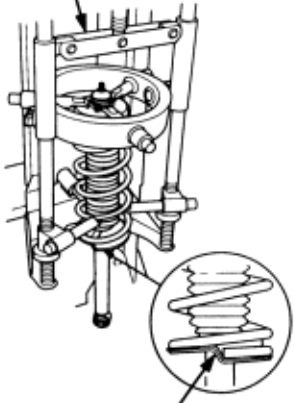
2. Release the pressure from the strut spring compressor, then disassemble the damper, (see page 18-28).
3. Reassemble all parts, except the spring.
4. Compress the damper by hand and check for smooth operation through a full stroke, both compression and extension. The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.
5. Check for oil leaks, abnormal noises and binding during these tests.

The damper springs are different left and right. Be sure to mark the springs R and L before disassembling the dampers.



1. Install the damper unit on a commercially available strut spring compressor.
2. Assemble the damper in reverse order of disassembly, except for the damper mounting washer and self-locking nut. Align the bottom of damper spring and spring lower seat.

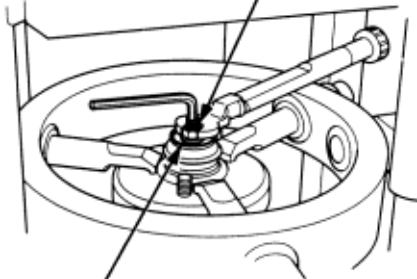
STRUT SPRING COMPRESSOR:
(Commercially available)
BRANICK® T/N MST-580A,
7200, or equivalent



SPRING LOWER SEAT

3. Position the damper mounting base on the damper unit.
4. Compress the damper spring with the spring compressor.
5. Install the damper mounting washer, and loosely install a new self-locking nut.

SELF-LOCKING NUT
10 x 1.25 mm
29 N-m (3.0 kgf-m, 22 lbf-ft)

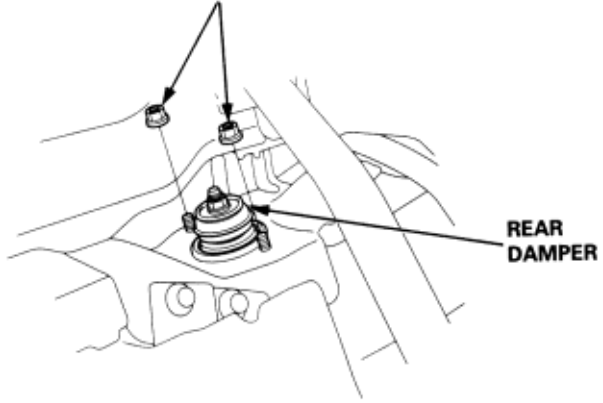


DAMPER MOUNTING WASHER

6. Hold the damper shaft with a hex wrench, and tighten the self-locking nut.

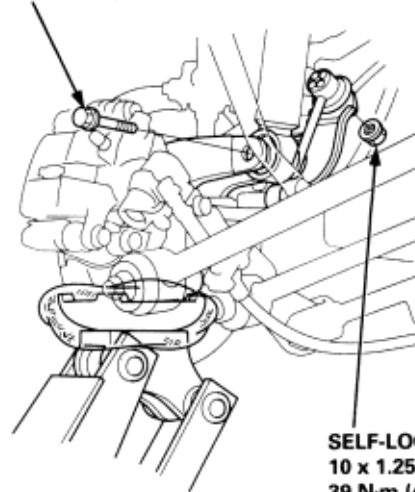
1. Lower the rear suspension, and position the damper and loosely install the two flange nuts.

FLANGE NUTS
10 x 1.25 mm
38 N-m (3.9 kgf-m, 28 lbf-ft)



2. Loosely install the flange bolt and nut.

FLANGE BOLT
10 x 1.25 mm
59 N-m (6.0 kgf-m, 43 lbf-ft)



SELF-LOCKING NUT
10 x 1.25 mm
39 N-m (4.0 kgf-m,
29 lbf-ft)

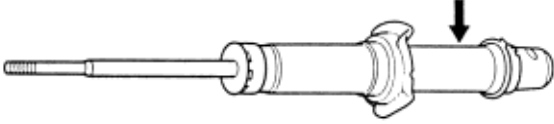
3. Raise the rear suspension with a floor jack until the vehicle just lifts off the safety stand.
4. Tighten the flange bolt and nut on the bottom of the damper to the specified torque.
5. Tighten the two flange nuts on top of the damper to the specified torque.
6. Install the rear bulkhead cover (see section 20).
7. Install the rear wheels (**see page 18-23**).
8. Check the rear wheel alignment and adjust if necessary (**see page 18-4**).

⚠ WARNING

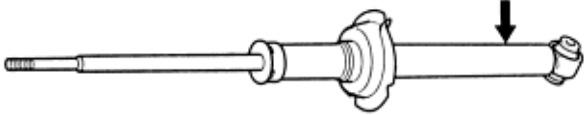
The dampers contain nitrogen gas and oil under pressure. The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.

Place the damper on a level surface with its rod extended and drill a hole of 2-3 mm (0.078-0.118 in) diameter in the body to release the gas.

Front Damper:



Rear Damper:



⚠ WARNING

Always wear eye protection to avoid getting metal shavings in your eyes when the damper pressure is relieved.

Special Tools

19-A-2

Ref No.	Tool Number	Description	Qty	Remark
1	07JAG - SD40100	Pushrod Adjustment Gauge	1	
2	07404 - 5790301	Vacuum Gauge	1	
3	07406 - 5790201	Pressure Gauge	2	
4	07410 - 5790101	Pressure Gauge Attachment C	1	
5	07410 - 5790501	Tube Joint Adapter	1	
6	07510 - 6340101	Pressure Gauge Joint Pipes	2	



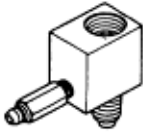
①



②



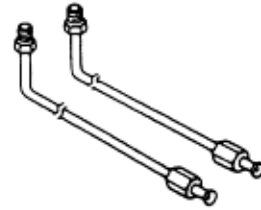
③



④

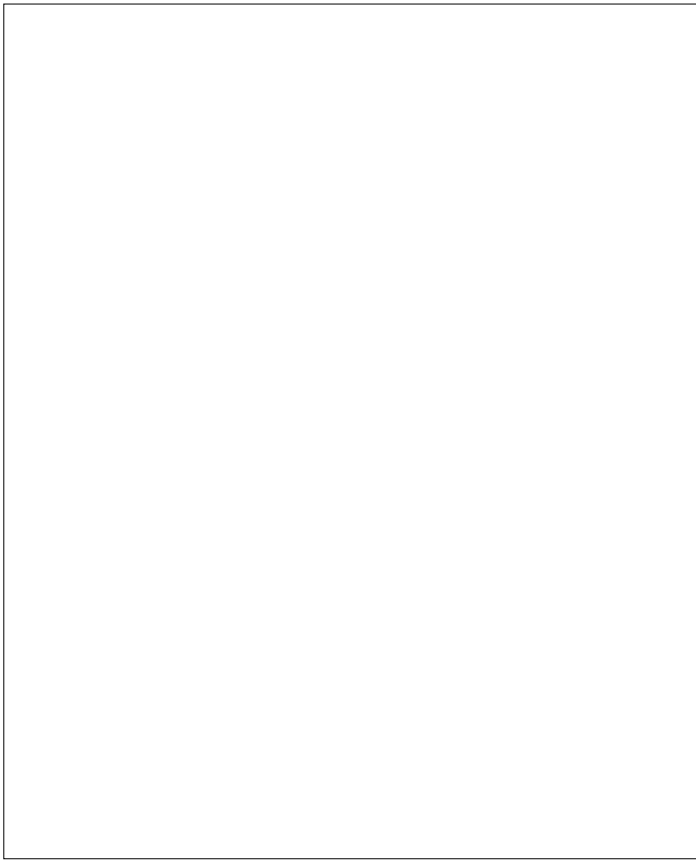
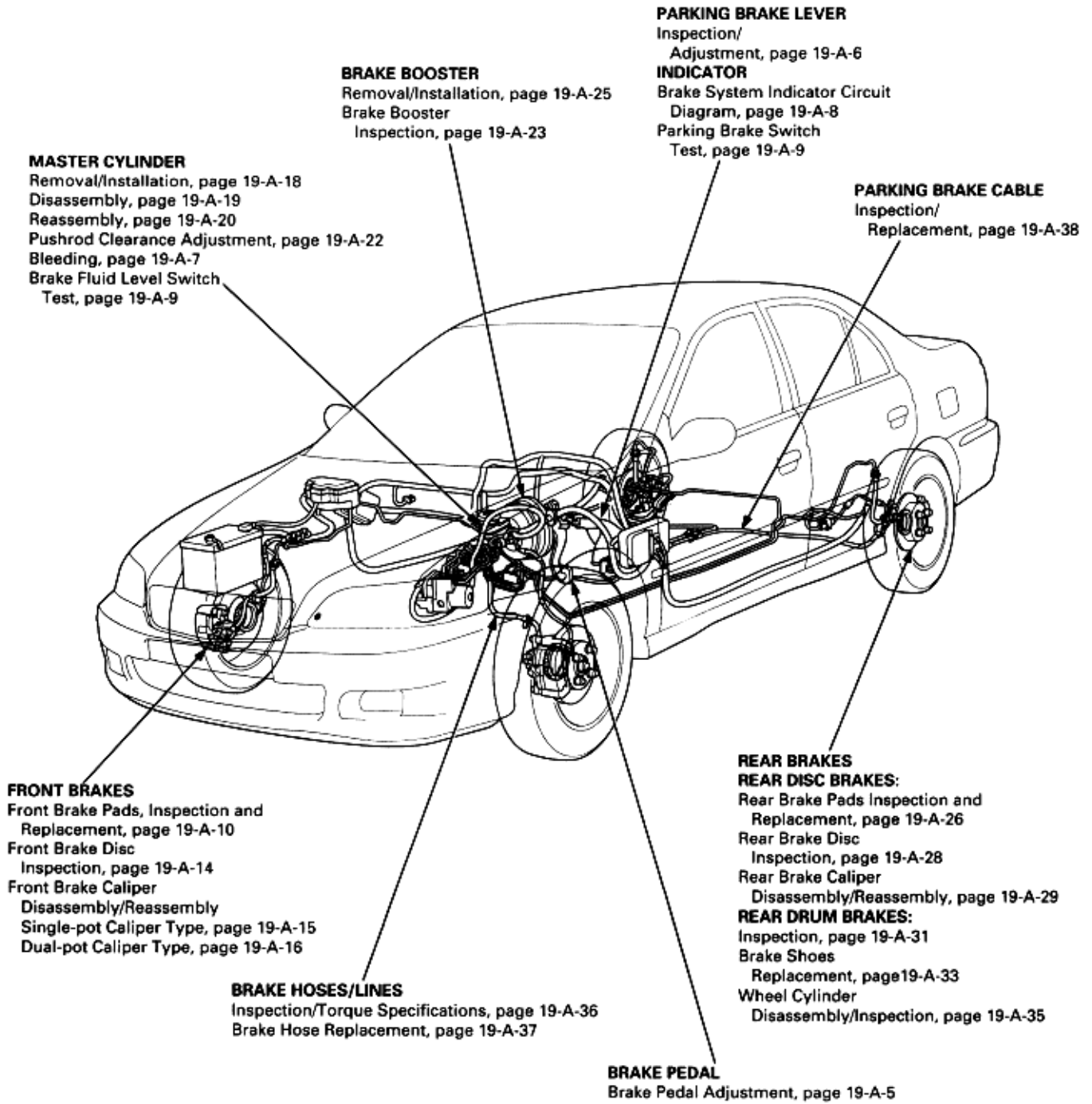


⑤



⑥

The parts with asterisk (*): LHD type is shown, RHD type is symmetrical.



BRAKE HOSES/LINES

Inspection/Torque Specifications, page 19-A-36
Brake Hose Replacement, page 19-A-37

Replacement, page 19-A-33
Wheel Cylinder
Disassembly/Inspection, page 19-A-35

BRAKE PEDAL

Brake Pedal Adjustment, page 19-A-5

To go to the pages referenced on the diagram above,
click on the following:

- (See Page 18-A-25)
- (See Page 19-A-23)
- (See Page 19-A-18)
- (See Page 19-A-19)
- (See Page 19-A-20)
- (See Page 19-A-22)
- (See Page 19-A-7)
- (See Page 19-A-9)
- (See Page 19-A-10)
- (See Page 19-A-14)
- (See Page 19-A-15)
- (See Page 19-A-16)
- (See Page 19-A-36)
- (See Page 19-A-37)
- (See Page 19-A-6)
- (See Page 19-A-8)
- (See Page 19-A-23)
- (See Page 19-A-38)
- (See Page 19-A-26)
- (See Page 19-A-28)
- (See Page 19-A-29)
- (See Page 19-A-31)
- (See Page 19-A-33)
- (See Page 19-A-35)
- (See Page 19-A-5)

A Brake Booster

Check brake operation by applying the brakes. If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.

B Piston Cup and Pressure Cup Inspection

- ♦ Check brake operation by applying the brakes. Visually check for damage or signs of fluid leakage. If the pedal does not work properly or if there is damage or signs of fluid leakage, disassemble and inspect the master cylinder. Replace the secondary piston and primary piston as an assembly whenever the master cylinder is disassembled.
- ♦ Check for a difference in brake pedal stroke between quick and slow brake applications. If there is a difference in pedal stroke, disassemble and inspect the master cylinder. Replace the secondary piston and primary piston as an assembly whenever the master cylinder is disassembled.

NOTE: LHD type is shown. RHD type is symmetrical.

C Brake Hose

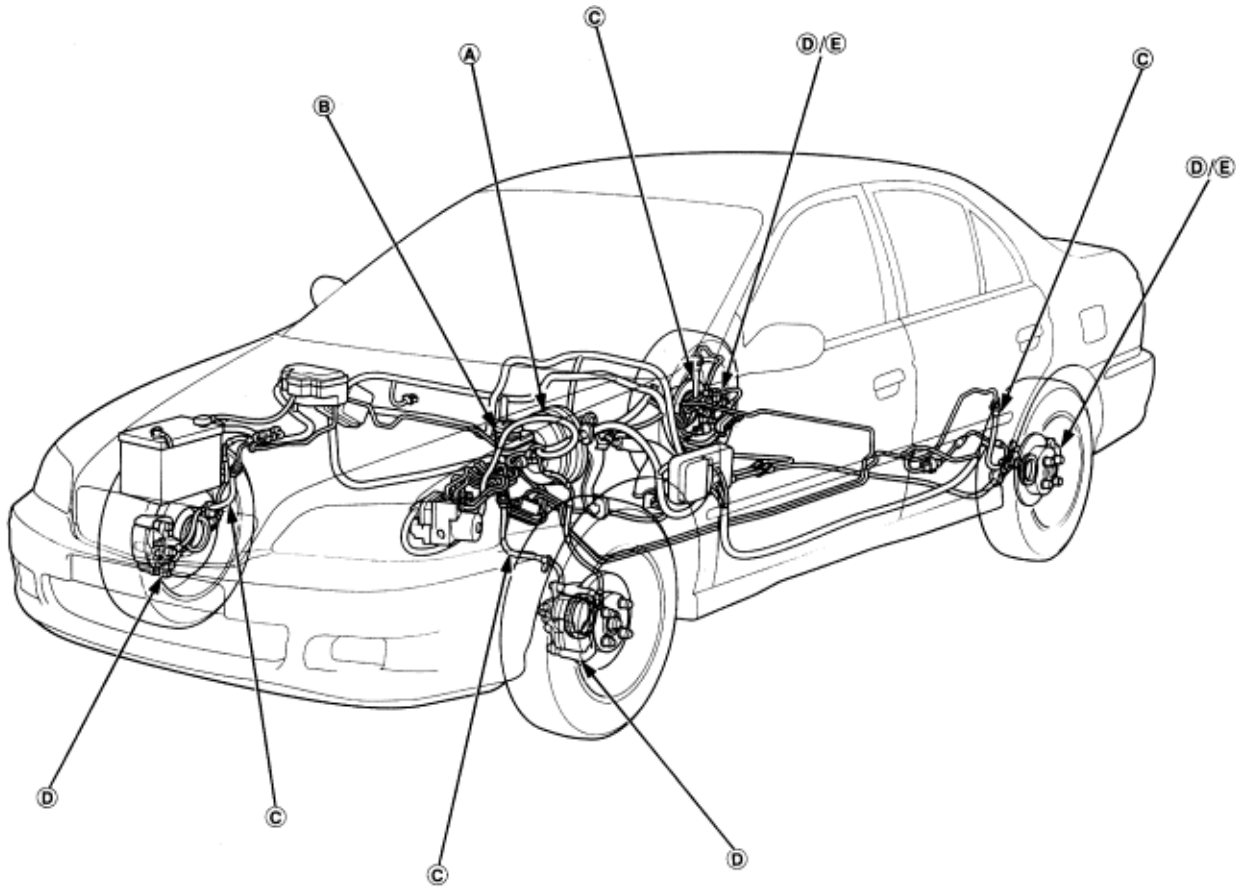
Visually check for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.

D Caliper Piston Seal and Piston Boots

Check brake operation by applying the brakes. Visually check or damage or signs of fluid leakage. If the pedal does not operate properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.

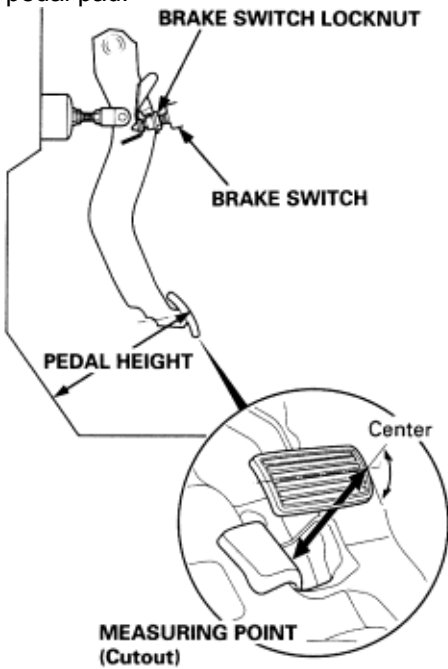
E Wheel Cylinder Piston Clip and Dust Cover

Check brake operation by applying the brakes. Visually check or damage or sings of fluid leakage. If the pedal does not operate properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the wheel cylinder. Replace the piston cups and dust covers with new ones whenever the wheel cylinder is disassembled.



Pedal Height

1. Disconnect the brake switch connector, loosen the brake switch locknut, and back off the brake switch until it is no longer touching the brake pedal.
2. Turn up the carpet. At the insulator cutout, measure the pedal height from the middle of the left side center of the pedal pad.

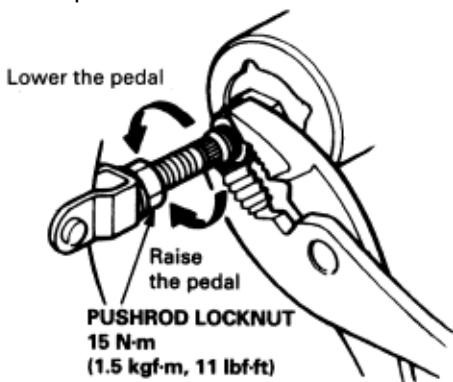


Standard Pedal Height (with carpet removed):

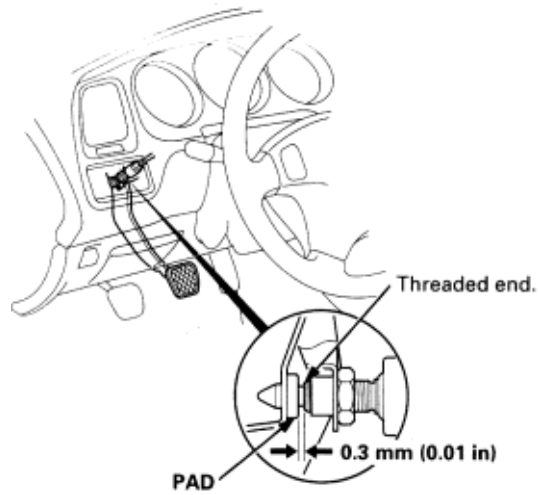
M/T model: 168.5 mm (6.63 in)

A/T model: 173.5 mm (6.83 in)

3. Loosen the pushrod locknut, and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly. Do not adjust the pedal height with the pushrod depressed.



4. Screw in the brake switch until its plunger is fully depressed (threaded end touching the pad on the pedal arm). Then back off the switch 1/4 turn make 0.3 mm (0.01in) of clearance between the threaded end and pad. Tighten the locknut firmly. Connect the brake switch connector. Make sure that the brake lights go off when the pedal is released.

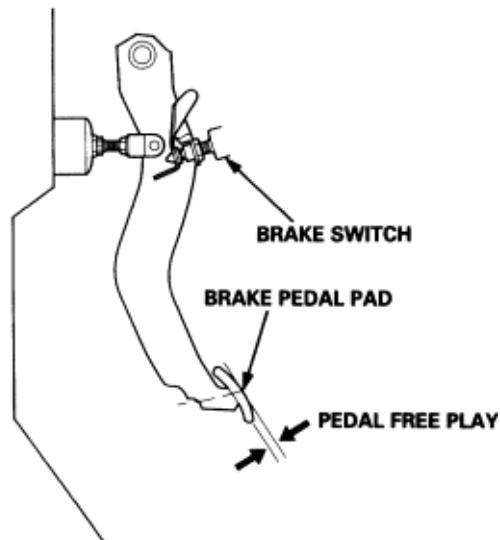


5. Check the brake pedal free play as described below.

Pedal Free Play

1. With the engine off, inspect the play on the pedal pad by pushing the pedal by hand.

Free Play: 1 – 5 mm (0.04 – 0.20 in)

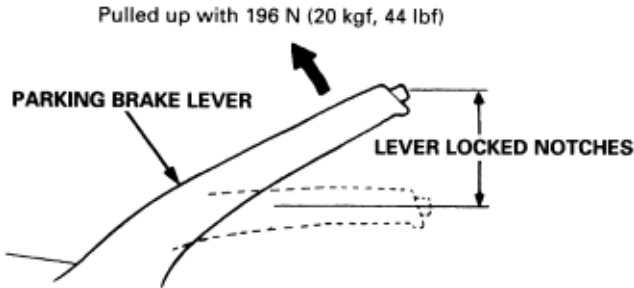


2. If the pedal free play is out of specification, adjust the brake switch. If the pedal free play is insufficient, it may result in brake drag.

Inspection

1. Pull the parking brake lever with 196 N (20 kgf, 44 lbf) force to fully apply the parking brake. The parking brake lever should be locked within the specified notches.

Lever Locked Notches: 6 – 9



2. Adjust the parking brake if the lever notches are out of specification.

Adjustment

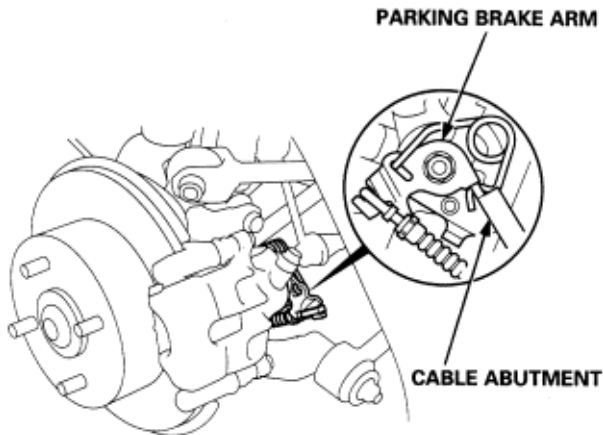
NOTE: After rear brake caliper servicing, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

1. Raise the rear of the vehicle and make sure it is securely supported.

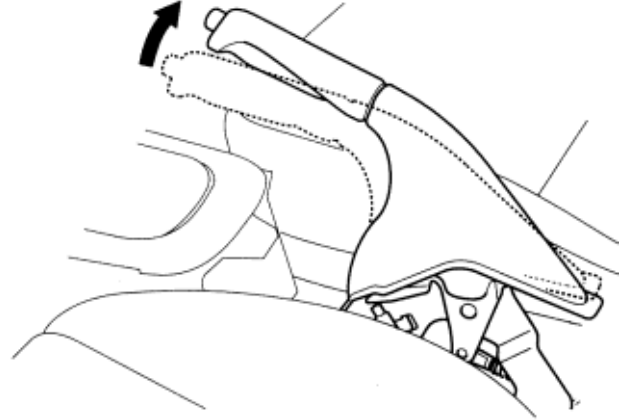
WARNING

Block the front wheels before jacking up the rear of the vehicle.

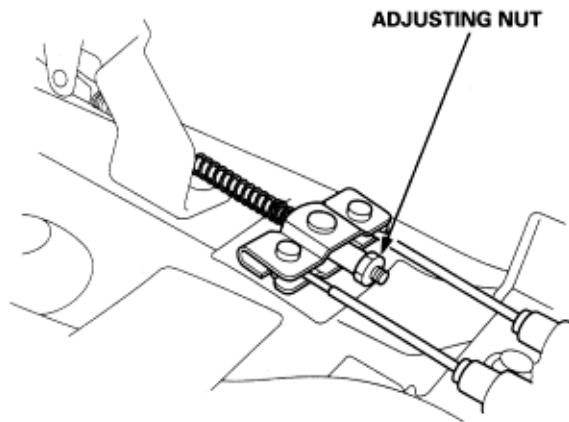
2. Make sure the parking brake arm on the rear brake caliper contacts the cable abutment.



3. Remove the rear console end cover (see section 20).
4. Pull the parking brake lever up one notch.



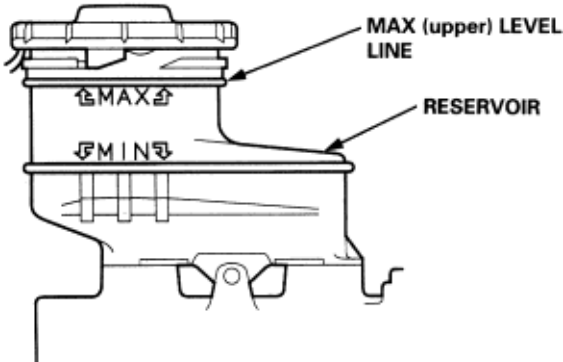
5. Tighten the adjusting nut until the parking brakes drag slightly when the rear wheels are turned.



6. Release the parking brake lever fully, and check that the parking brakes do not drag when the rear wheels are turned. Readjust if necessary.
7. Make sure the parking brakes are fully applied when the parking brake lever is pulled up fully.
8. Reinstall the rear console end cover.

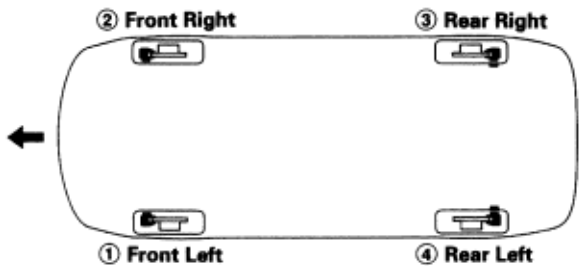
NOTE:

- ♦ Do not reuse the drained fluid.
 - ♦ Use only clean Genuine Honda brake fluid or an equivalent DOT 3 or DOT 4 brake fluid.
 - ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
 - ♦ Do not spill brake fluid on the vehicle, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
 - ♦ The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.
1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line.



2. Have someone slowly pump the brake pedal several times, then apply steady pressure.
3. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
4. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the fluid.
5. Refill the master cylinder reservoir to the MAX (upper) level line.

BLEEDING SEQUENCE:



FRONT:

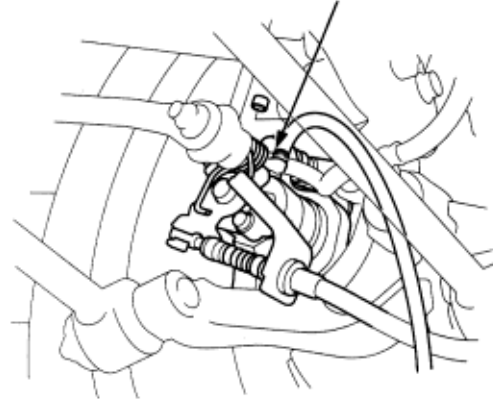
All Except Type R Model:
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)
Type R Model:
9 N-m (0.9 kgf-m, 6.5 lbf-ft)



REAR:

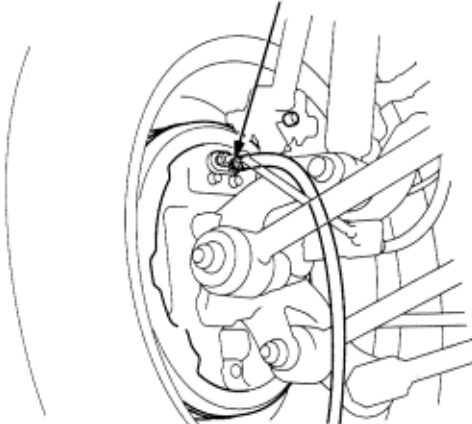
REAR DISC BRAKE:

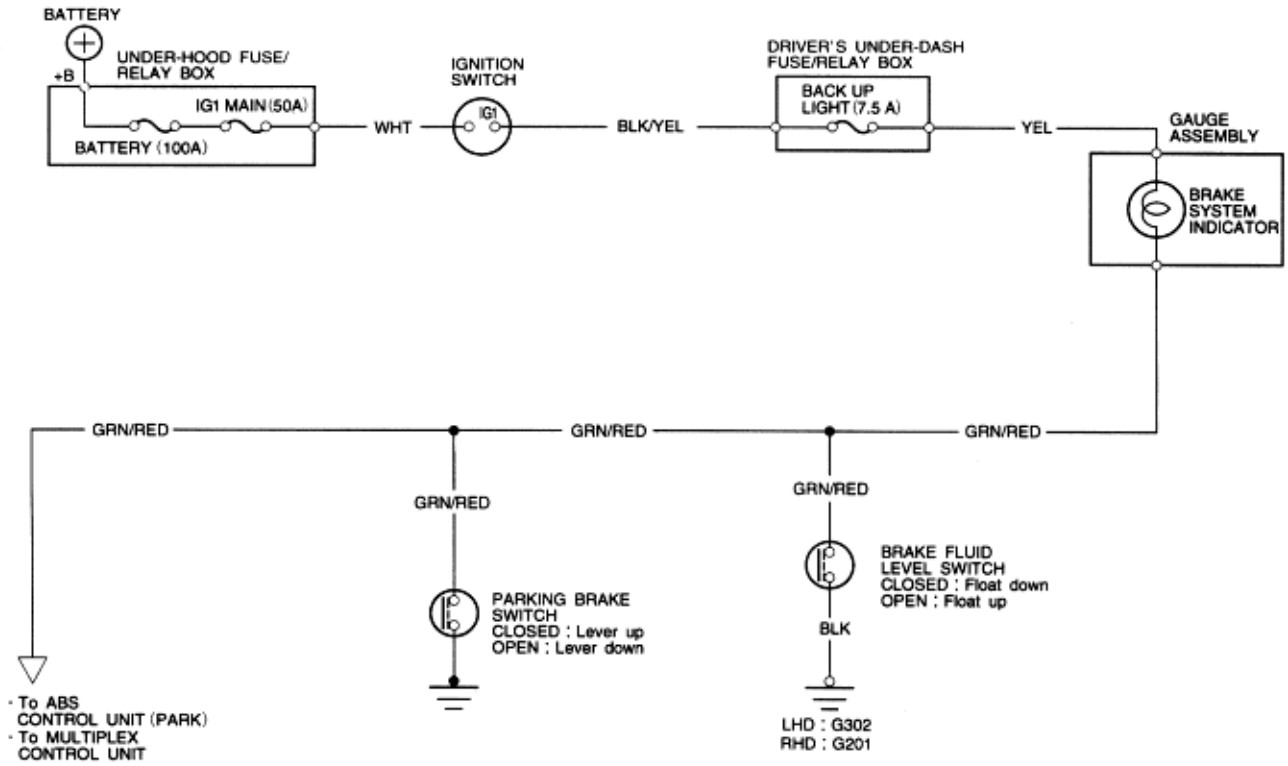
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)



REAR DRUM BRAKE:

9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)

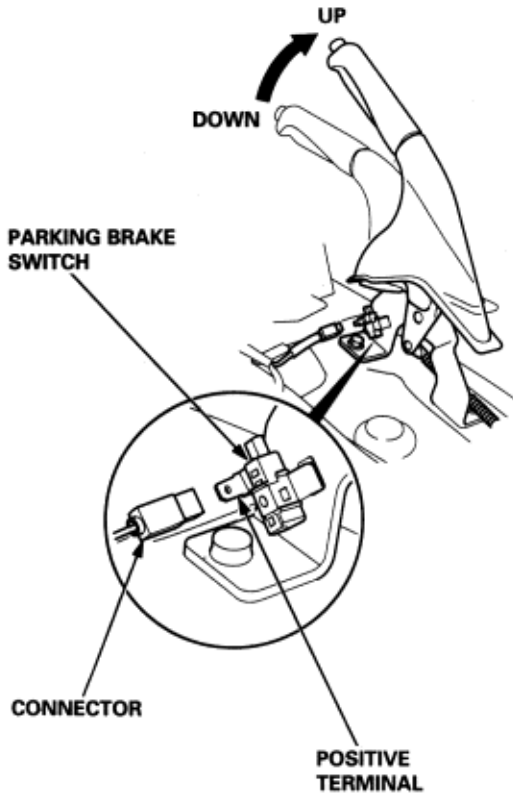




Inspection and Adjustment

Parking Brake Switch Test

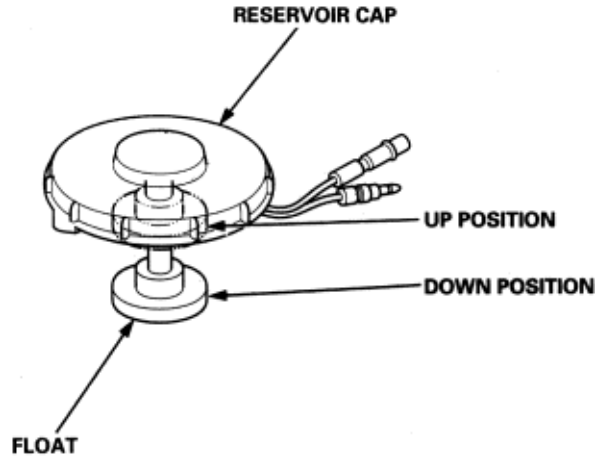
1. Remove the rear console, and disconnect the connector from the switch.
2. Check for continuity between the positive terminal and body ground:
 - ♦ With the brake lever up, there should be continuity.
 - ♦ With the brake lever down, there should be no continuity.



19-A-9

Brake Fluid Level Switch Test

1. Remove the reservoir cap. Check that the float moves up and down freely; if it doesn't, replace the reservoir cap assembly.
2. Check for continuity between the terminals with the float in the down position and the up position:
 - ♦ With the float up, there should be no continuity.
 - ♦ With the float down, there should be continuity.



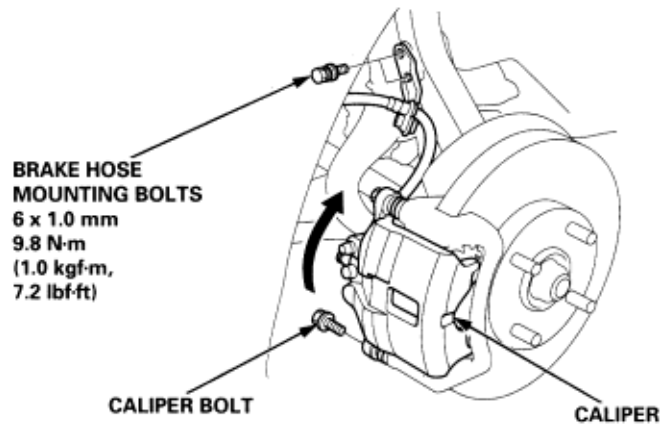
Except type R (Single - Pot Caliper):

CAUTION

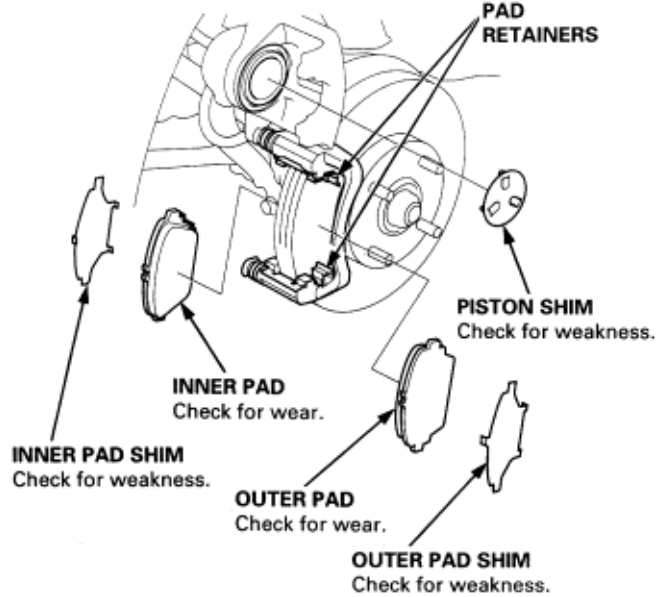
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

1. Loosen the front wheel nuts slightly. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake hose mounting bolts from the knuckle.
3. Remove the caliper bolt, and pivot the caliper up out of the way. Check the hoses and pin boots for damage and deterioration.



4. Remove the pads, shims (if equipped) and pad retainers.

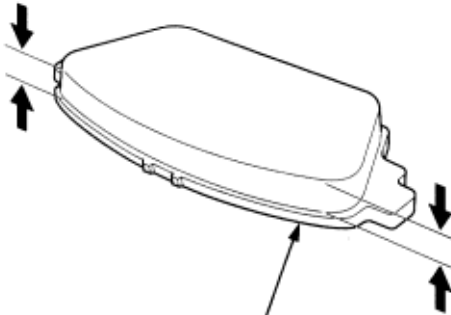


5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

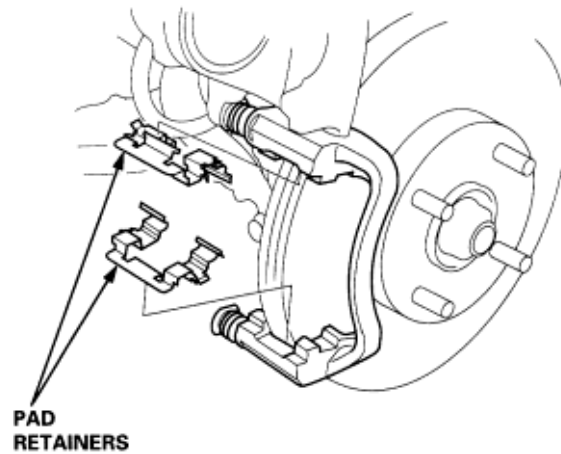
Brake Pad Thickness:

Standard: 10.5-11.5 mm (0.41-0.45 in)

Service Limit: 1.6 mm (0.06 in)



6. If the brake pad thickness is less than service limit, replace the front pads and shims together as a set.
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.

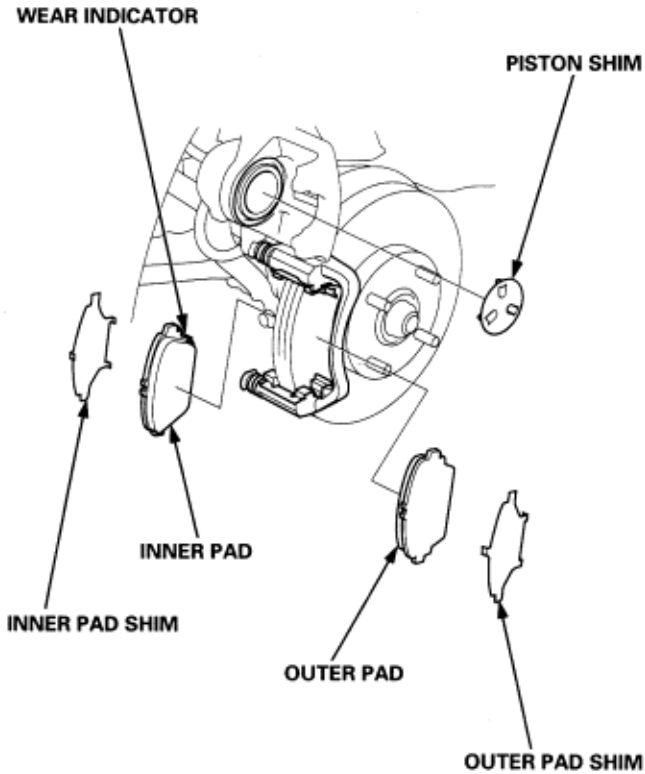


10. Install the brake pads and shims (if equipped) correctly. Install the pad with the wear indicator on the inside.

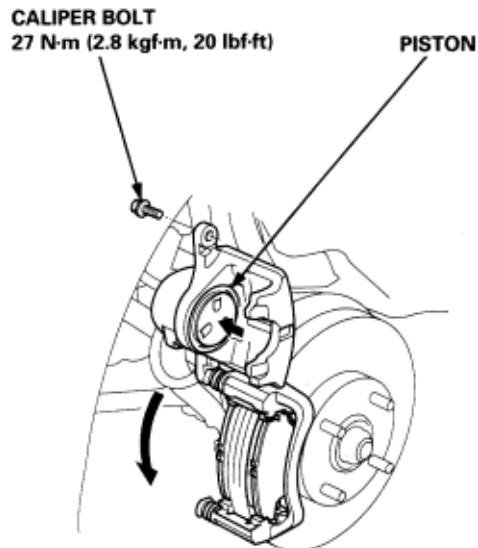


WARNING

- ♦ When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- ♦ Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads..



11. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.



12. Pivot the caliper down into position, being careful not to damage the pin boot. Install the caliper bolt and torque it to proper specification.
13. Install the brake hose on to the knuckle.
14. Depress the brake pedal several times to make sure the brakes work, then road-test.
NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the break pedal will restore the normal pedal stroke.
15. After installation, check for leaks at hose and line joints and connections, and retighten if necessary.

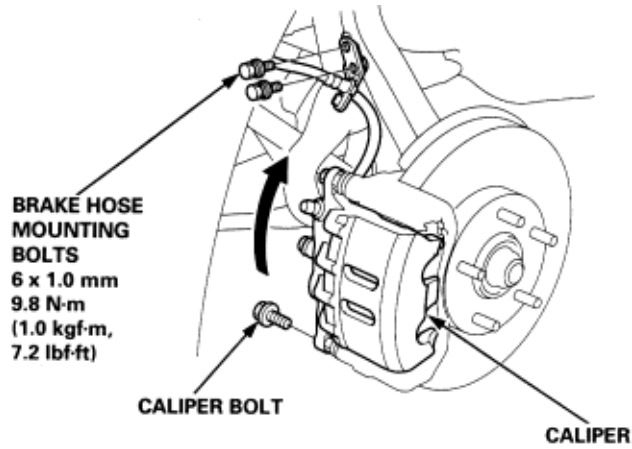
Type R Model: (Dual - pot caliper):

CAUTION

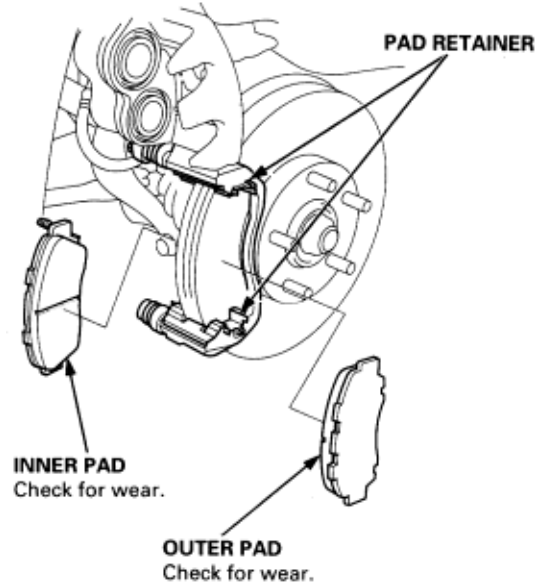
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

1. Loosen the front wheel nuts slightly. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake hose mounting bolts from the knuckle.
3. Remove the caliper bolt, and pivot the caliper up out of the way. Check the hoses and pin boots for damage and deterioration.



4. Remove the pads and pad retainers.

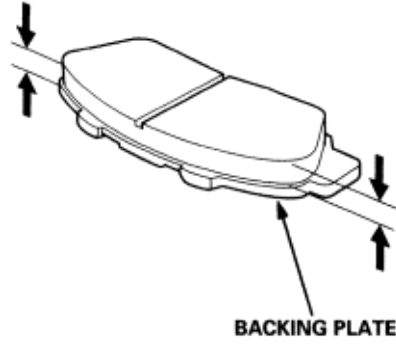


5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

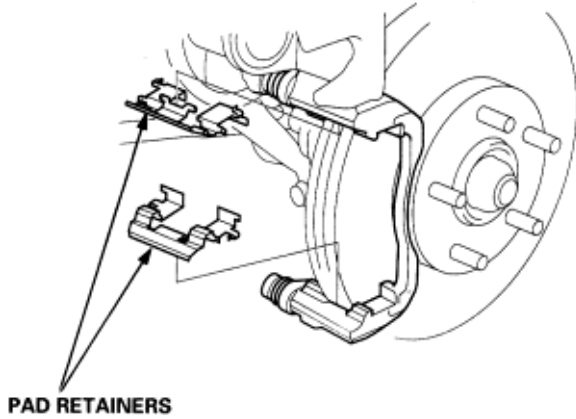
Brake Pad Thickness:

Standard: 10.5-11.5mm (0.41-0.45 in).

Service Limit: 1.6 mm (0.06 in).



6. If the brake pad thickness is less than service limit, replace the front pads and shims together as a set.
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.



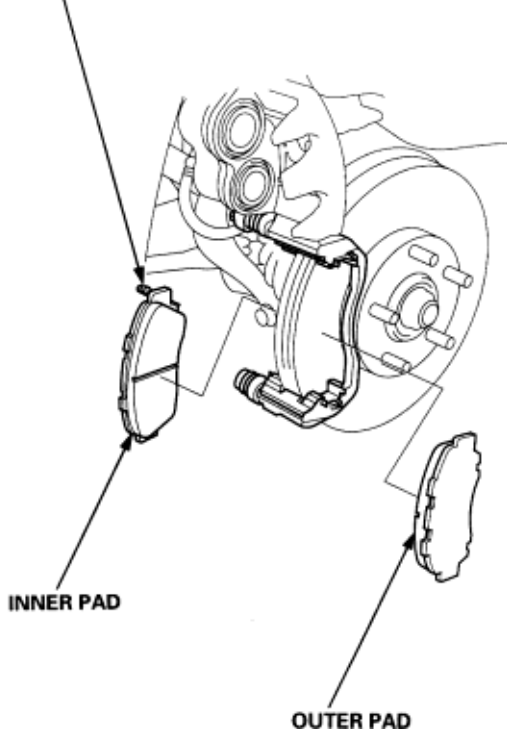
10. Install the brake pads correctly.
Install the pad with the wear indicator on the inside.



WARNING

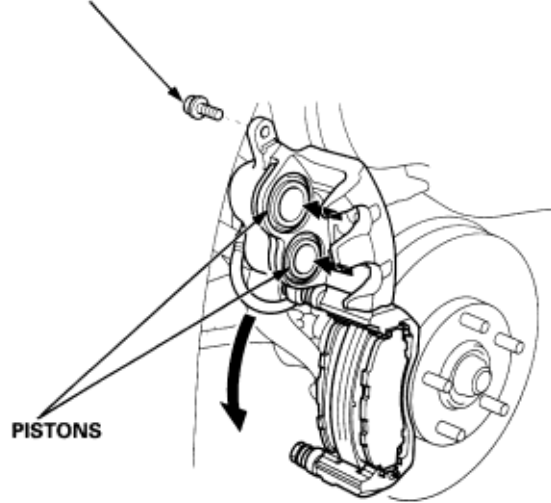
- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads..

WEAR INDICATOR



11. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position prevent damaging it when pivoting the caliper down.

CALIPER BOLT
49 N·m (5.0 kgf·m, 38 lbf·ft)



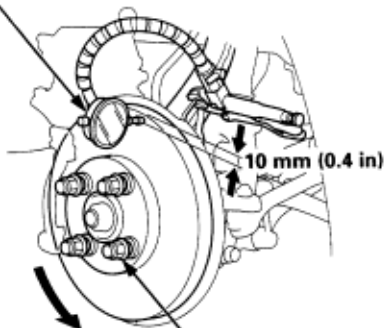
12. Pivot the caliper down into position. Hold the caliper pin with a wrench, being careful not to damage the pin boot. Install the caliper bolt with another wrench and torque it to proper specification.
13. Install the brake hose on to the knuckle.
14. Depress the brake pedal several times to make sure the brakes work, then road-test.
NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the pedal stroke.
15. After installation, check for leaks at hose and line joints and connections, and retighten if necessary.

1. Loosen the front wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (**See Page 19-A-10**)
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable flat washers to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout at 10 mm (0.4 in) from the outer edge of the disc.

Brake Disc Runout:

Service Limit: 0.10 mm (0.004 in)

DIAL INDICATOR



**WHEEL NUT and
FLAT WASHER**
108 N·m
(11 kgf·m, 80 lbf·ft)

5. If the disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

When the vehicle is equipped with a limited slip differential, (Type R) is equipped with a limited slip differential, do not use an engine driven on-car brake lathe. Use only a motor-driven on-car brake lathe.

Max. Refinish Limit:

D16B6 Engine Model: 21.0mm (0.83 in).

F18B2, F18B3 and

F20B6 Engine Models: 23.0mm(0.91 in).

H22A7 Engine Model: 26.0mm(1.02).

NOTE:

- ♦ See section 18 for brake disc replacement.
- ♦ A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in).

1. Loosen the front wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (**See Page 19-A-10**)
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

Brake Disc Thickness:

D16B6 Engine Model:

Standard: 22.9-23.1 mm (0.90-0.91 in)

Max. refinishing limit:

26.0mm (0.83 in)

F18B2, F18B3 and F120B6 Engine models:

Standard: 24.9-25.1mm (0.98-0.99 in)

Max. Refinishing limit:

23.0 mm (0.91 in)

H22A7 Engine Model:

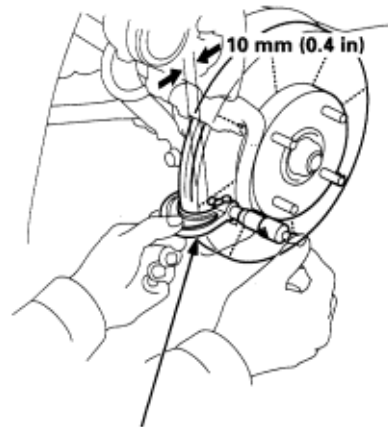
Standard: 27.9-28.1 mm (1.10-1.11 in)

Max. Refinishing Limit:

26.0 mm (1.02 in)

Brake Disc Parallelism:

0.015 mm (0.0006 in) max.



MICROMETER

NOTE: This is the maximum allowable difference between the thickness measurements.

4. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

When the vehicle is equipped with a limited slip differential (Type R), do not use an engine-driven on-car brake lathe. Use only a motor-driven on-car brake lathe.

NOTE: See section 18 for brake disc replacement.



CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.


NOTE:

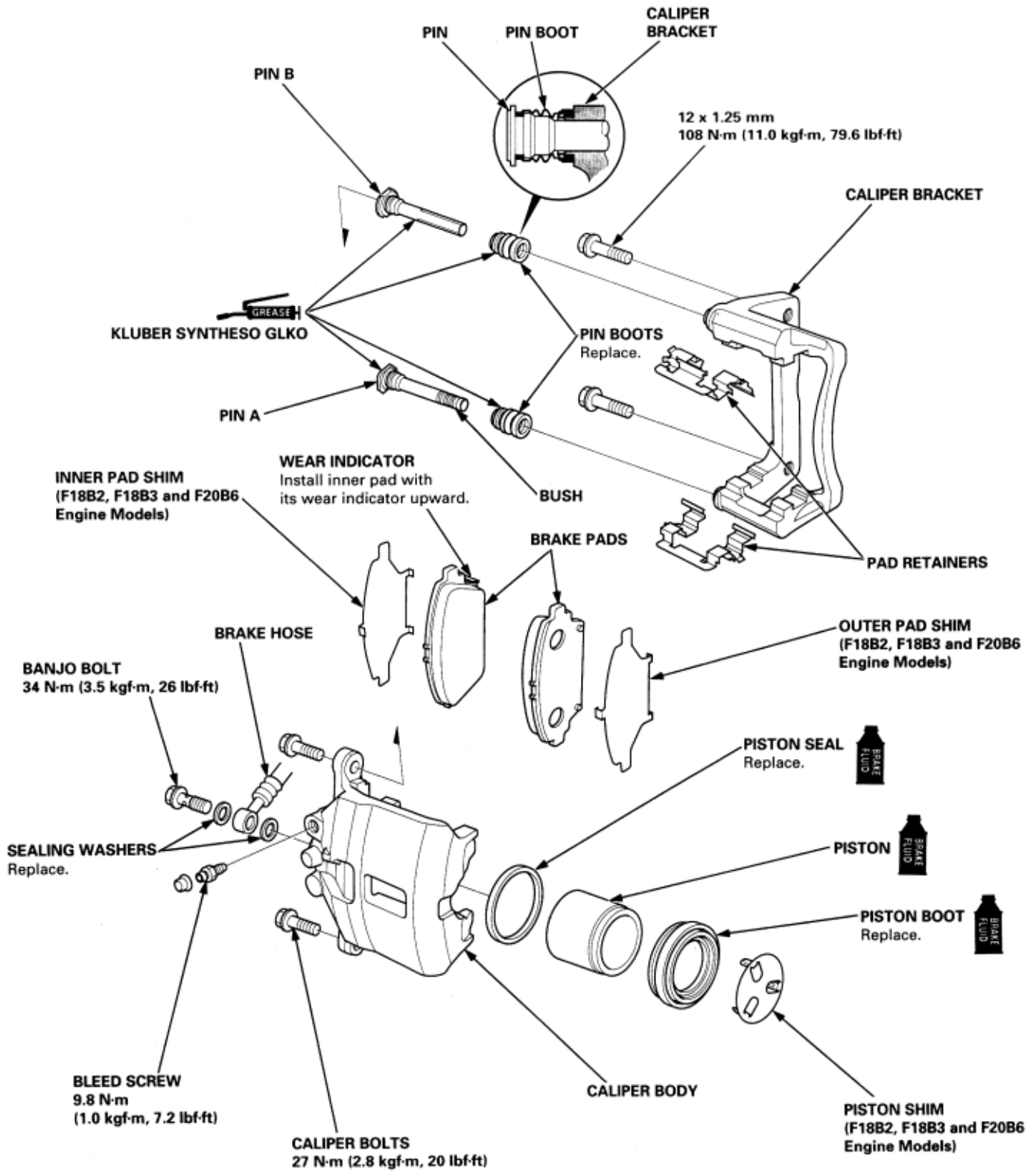
- ♦ Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ To prevent spills, cover the hose joints with rags or shop towels.
- ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
- ♦ Replace parts with new ones whenever specified to do so.
- ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- ♦ Contaminated brake discs or pads reduce stopping ability.
- ♦ When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- ♦ Do not reuse the drained fluid.
- ♦ Use only clean Genuine Honda brake fluid or an equivalent DOT3 or DOT4 brake fluid.
- ♦ Coat the piston, piston seal, and caliper bore with clean brake fluid.
- ♦ Replace all rubber parts with new ones whenever disassembled.
- ♦ After installing the front brake caliper.
 - Check for leaks at hose and line joints and connections, and retighten if necessary.
 - Check the brake hoses for interference and twisting.

Front Brake Caliper
Disassembly/Reassembly (cont'd)

19-A-16

All except Type R Model (Single-pot Caliper)

 Use recommended seal and grease and pin grease in the caliper seal set.



Front Brake Caliper
Disassembly/Reassembly (cont'd)

19-A-17

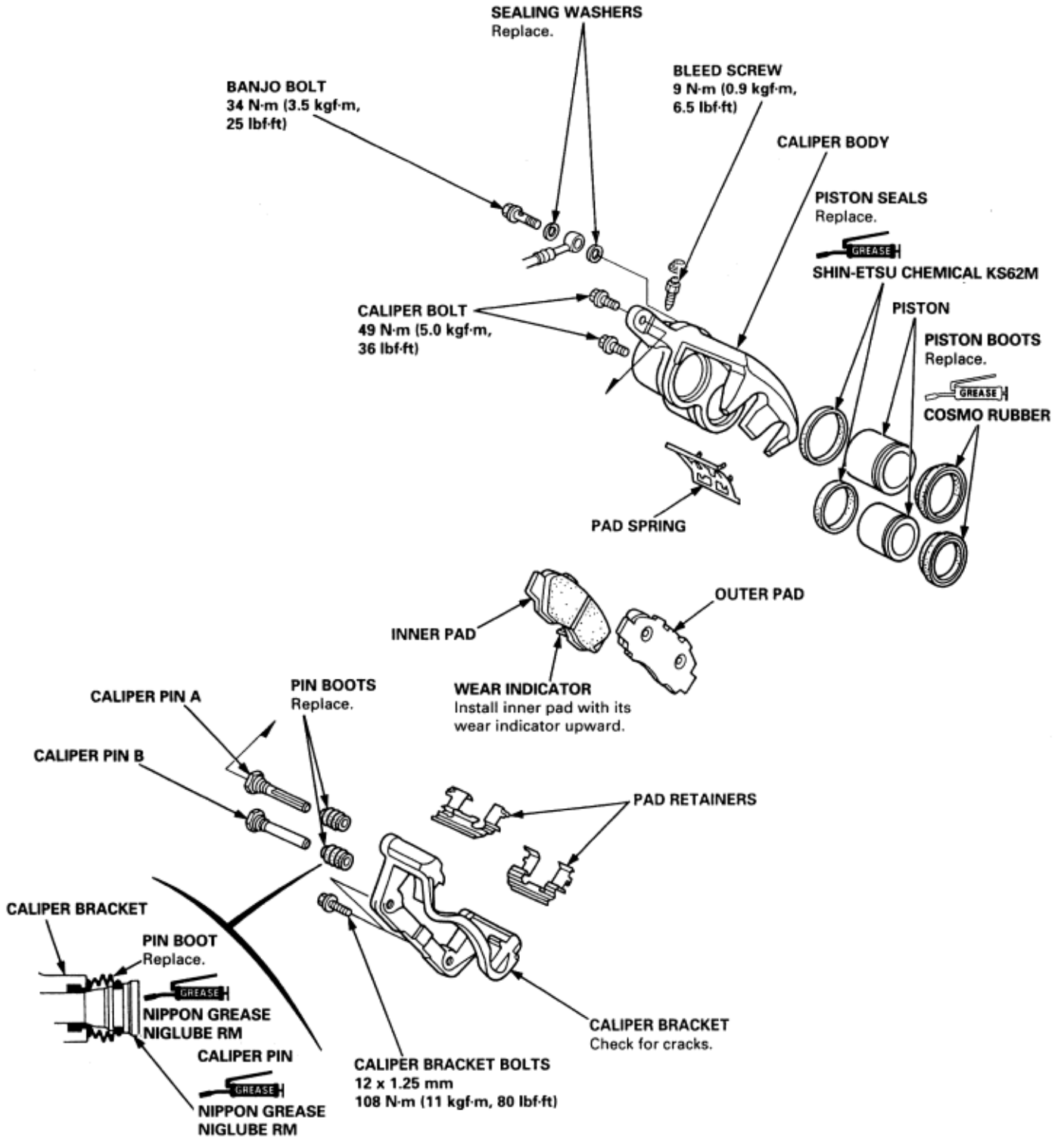
Type R Model (Dual-pot Caliper)



Rubber grease (Use recommended grease in the caliper set).



Silicone grease (Use recommended seal grease and pin grease in the caliper set).

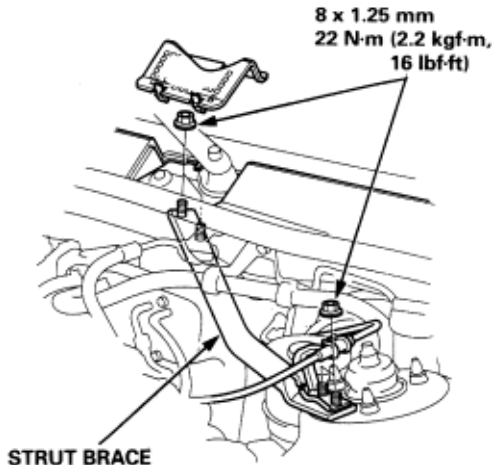




CAUTION

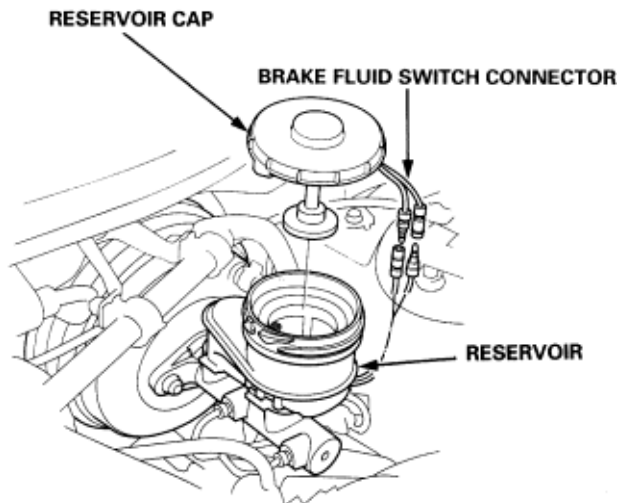
Do not spill brake fluid on the vehicle, it may damage the paint. If brake fluid does contact the paint, wash it off immediately with water.

1. Remove the 8 mm flange nuts.



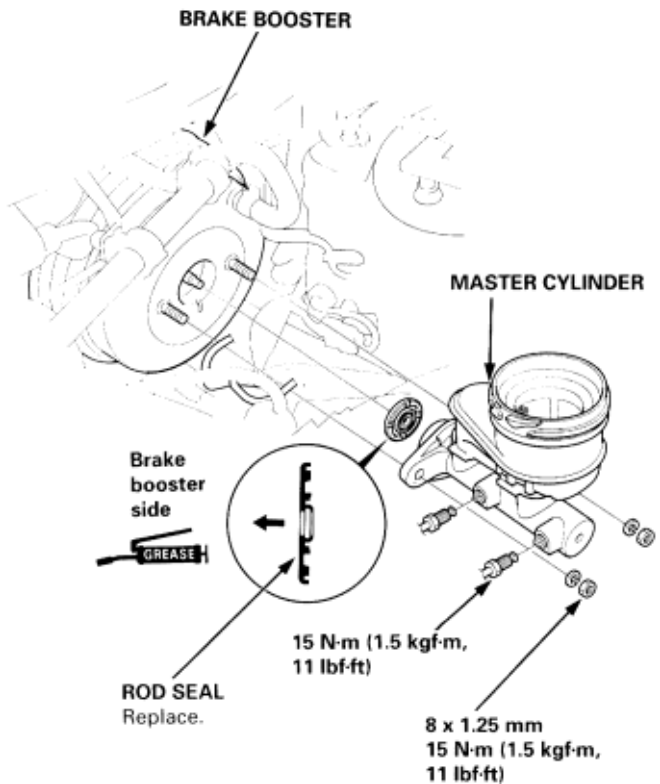
STRUT BRACE

2. Remove the strut brace.
3. Disconnect the brake fluid level switch connectors and remove the reservoir cap.



4. Remove the brake fluid from the master cylinder reservoir with a syringe.

5. Disconnect the brake lines from the master cylinder. To prevent spills, cover the hose joints with rags or shop towels



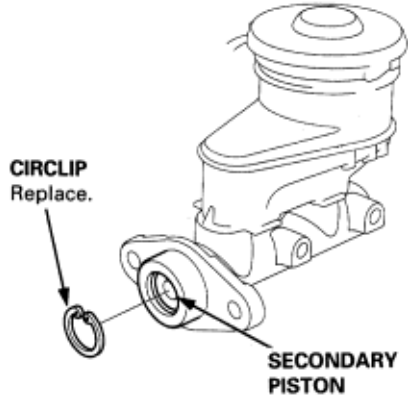
6. Remove the master cylinder mounting nuts and washers.
7. Remove the master cylinder from the brake booster. Be careful not to bend or damage the brake lines when removing the master cylinder.
8. Remove the rod seal from the brake booster.
9. Install the master cylinder in the reverse order of removal, and note these items:
 - ♦ Replace all rubber parts with new ones whenever removed.
 - ♦ Coat the lip of the new rod seal with recommended seal grease in the master cylinder.
 - ♦ Install the rod seal onto the brake booster with its grooved side toward the master cylinder.

Master Cylinder Disassembly

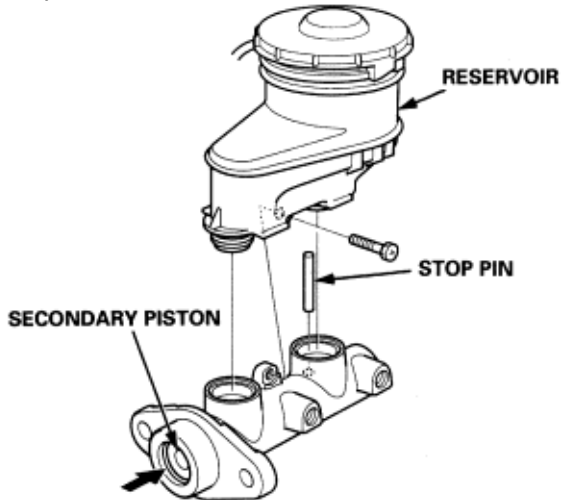
19-A-19

NOTE:

- ♦ Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
 - ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
1. Remove the master cylinder (See Page 19-A-18)
 2. Remove the circlip while pushing in the secondary piston.



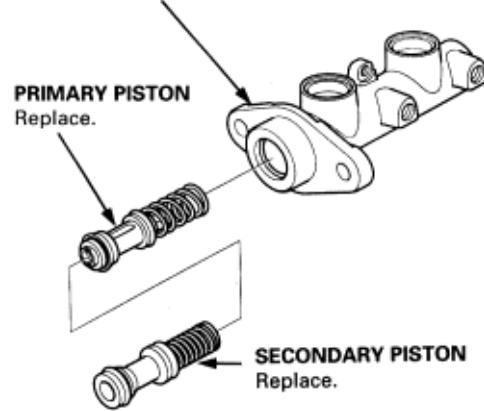
3. Remove the reservoir.
4. Remove the stop pin while pushing in the secondary piston.



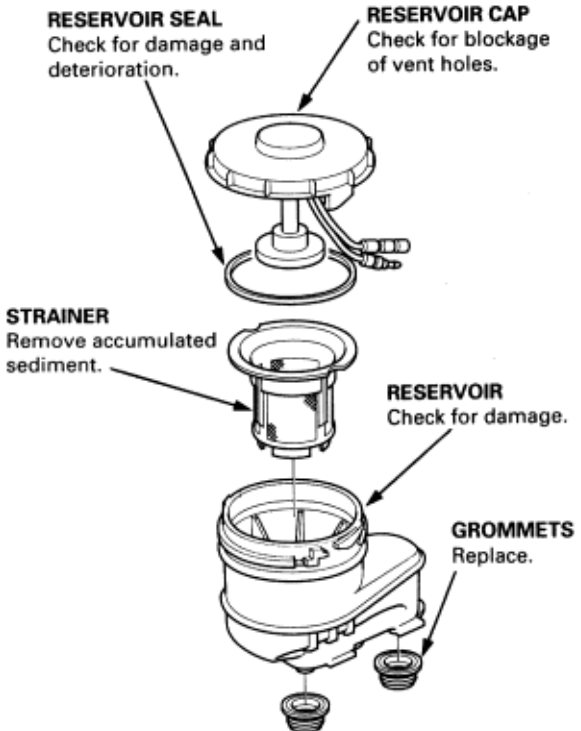
5. Remove the secondary piston and primary piston.

MASTER CYLINDER

Check bore for wear, rust and damage.



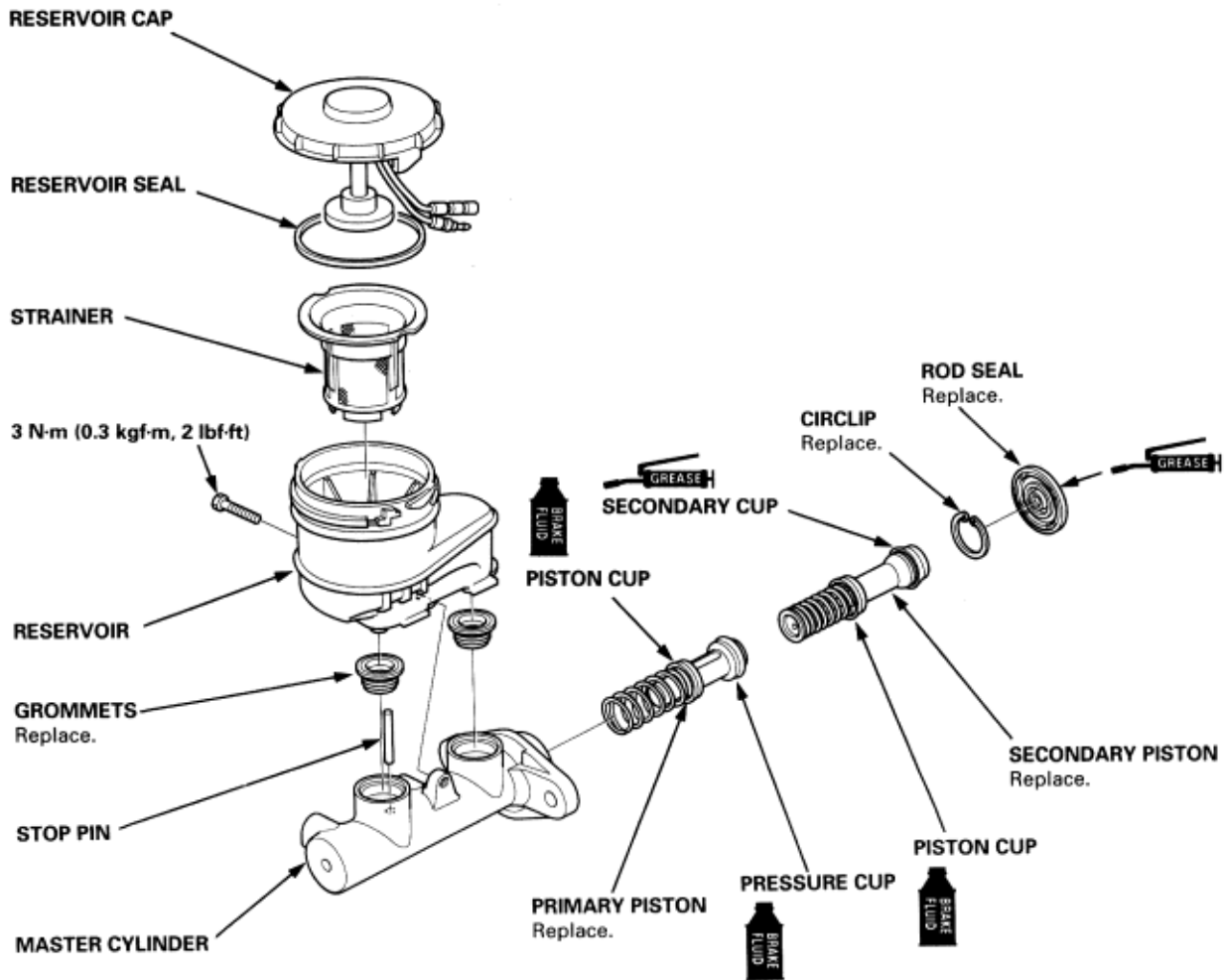
6. Remove the reservoir seal from the reservoir cap.
7. Remove the grommets from the reservoir.



NOTE: When the reservoir and master cylinder body are separated, replace the grommets with new ones.

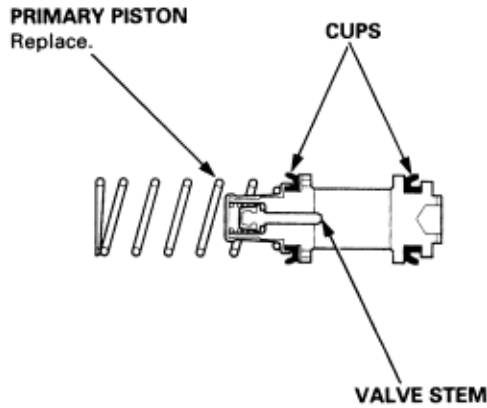
NOTE:

- ♦ If replacing the primary piston, secondary piston or master cylinder body, check and adjust the pushrod clearance before installing the master cylinder (**See Page 19-A-22**).
 - ♦ Do not spill brake fluid on the vehicle; it may damage the paint; if brake does contact the paint, wash it off immediately with water.
 - ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
 - ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
 - ♦ Replace parts with new ones whenever specified to do so.
 - ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
 - ♦ Do not mix different brands of brake fluid as they may not be compatible.
 - ♦ Do not reuse the drained fluid. Use only clean Genuine Honda brake fluid or an equivalent DOT 3 or DOT 4 brake fluid.
 - ♦ Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.
 - ♦ Coat the piston cups, pressure cup and master cylinder bore with clean brake fluid.
 - ♦ Use recommended greases in the master cylinder seal set.
1. Install the reservoir seal in the groove of the reservoir cap.
 2. Install the strainer and reservoir cap on the reservoir.
 3. Install the new grommets on the reservoir.

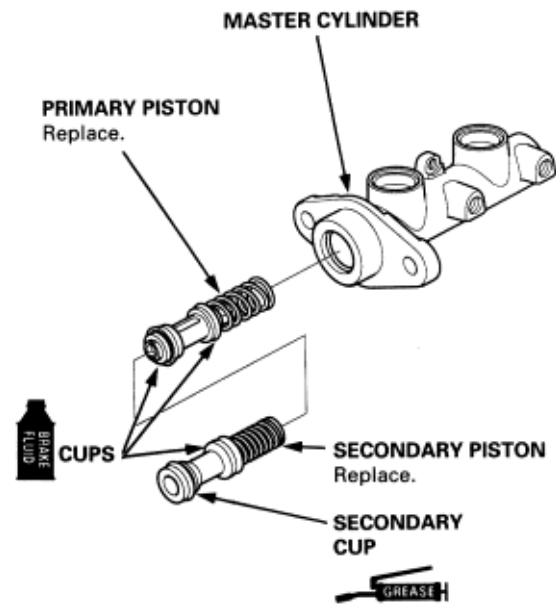


- Coat the cups of a new primary piston with clean brake fluid, then install the primary piston into the master cylinder.

NOTE: Before installation, check that the valve stem moves smoothly by lightly pushing it through the slot in the piston. Install the piston so that the slot in the piston aligns with the stop pin hole in the master cylinder.

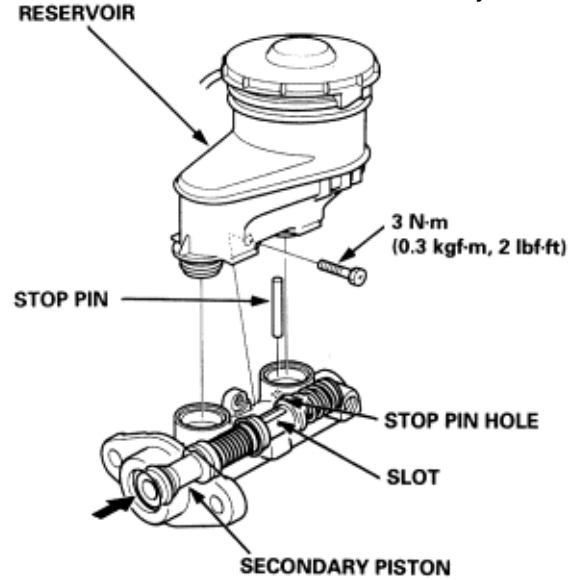


- Apply the recommended seal grease in the master cylinder seal set to the secondary cup of a new secondary piston.

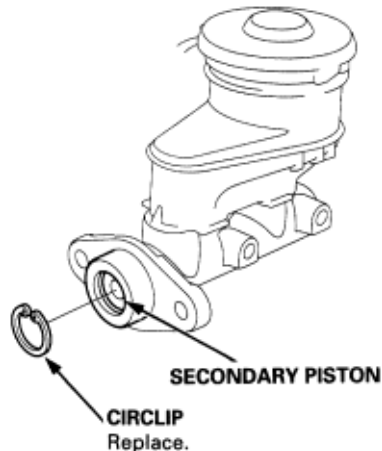


- Coat the piston cup of a new secondary piston with clean brake fluid, then install the secondary piston.

- Align the slot in the primary piston with the stop pin hole by pushing the secondary piston in.
- Install the reservoir to the master cylinder.



- Install a new circlip while pushing in the secondary piston.
- Adjust the pushrod clearance (See Page 19-A-22)



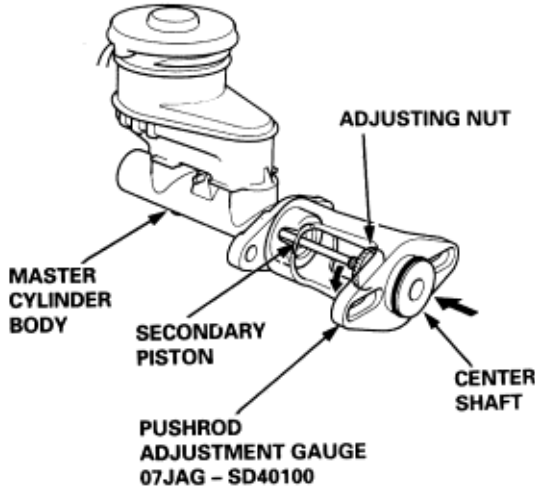
- Install the master cylinder (See Page 19-A-18).

Master Cylinder Pushrod Clearance Adjustment

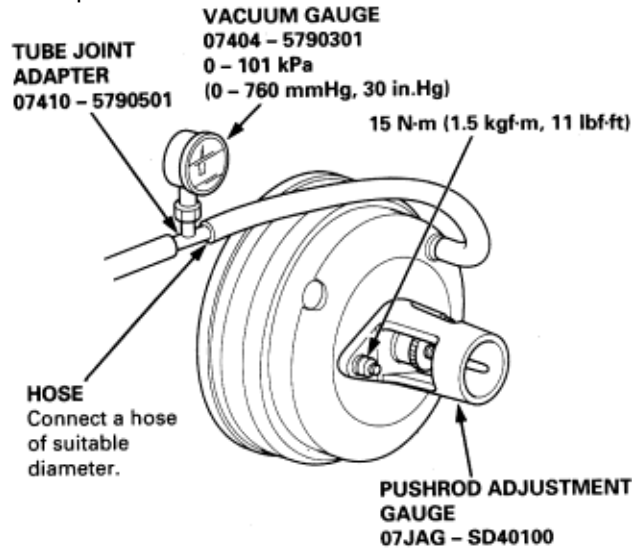
19-A-22

NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before

1. Set the special tool on the master cylinder body, push in the center shaft until the top of it contacts the end of the secondary piston by turning the adjusting nut.



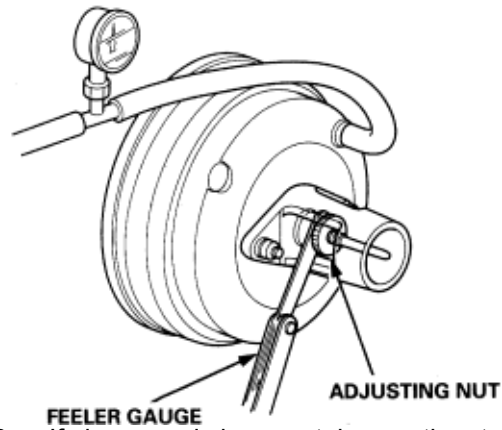
2. Without disturbing the center shaft's position, install the special tool backwards on the booster.



3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge 0-101 kPa (0-760 mm Hg, 30 in Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mm Hg, 20 in Hg) vacuum.

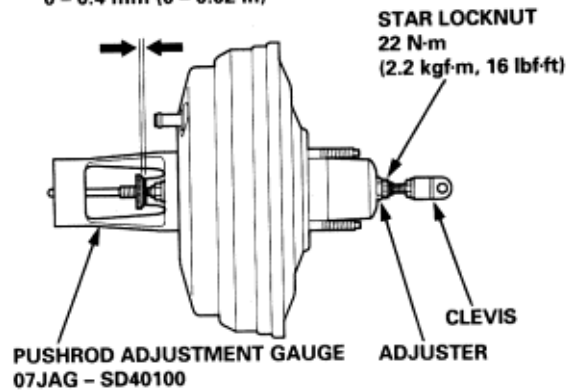
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut as shown. If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in) or more. Therefore it must be adjusted and rechecked.

Clearance: 0 - 0.4 mm (0 - 0.02 in)



6. If clearance is incorrect, loosen the star locknut and turn the adjuster in or out to adjust.
 - ♦ Adjust the clearance while the specified vacuum is applied to the booster.
 - ♦ Hold the clevis while adjusting.

0 - 0.4 mm (0 - 0.02 in)



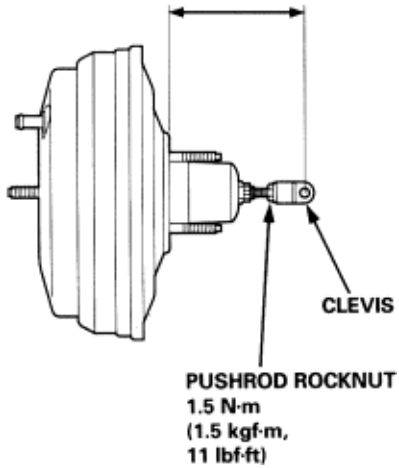
7. Tighten the star locknut securely.
8. Remove the special tool.

Master Cylinder

Pushrod Clearance Adjustment (cont'd)

9. Check the pushrod length as shown if the booster is removed. If the length is incorrect, loosen the pushrod locknut and turn the clevis in or out to adjust

116 ± 0.5 mm
(4.6 ± 0.02 in)



10. Install the master cylinder (See Page 19-A-18).

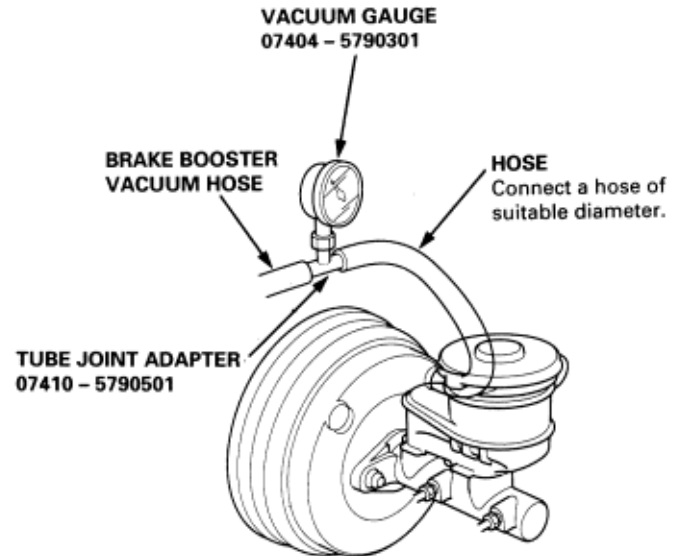
19-A-23

Brake Booster

Brake Booster Inspection

Leak Test

1. Install the vacuum gauge between the brake booster and check valve.



2. Start the engine, adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 40.0-66.7 kPa (300-500 mm Hg, 11.8-19.7 in Hg), then stop the engine.
3. Read the vacuum gauge.
If the vacuum reading decreases 2.7 kPa (20 mm Hg, 0.8 in Hg) or more after 30 seconds, check the following parts for leaks.
- ♦ Check valve
 - ♦ Vacuum hose, line
 - ♦ Seals
 - ♦ Brake booster
 - ♦ Master cylinder

NOTE: Do not try to disassemble the brake booster. Replace the brake booster as an assembly with new one.

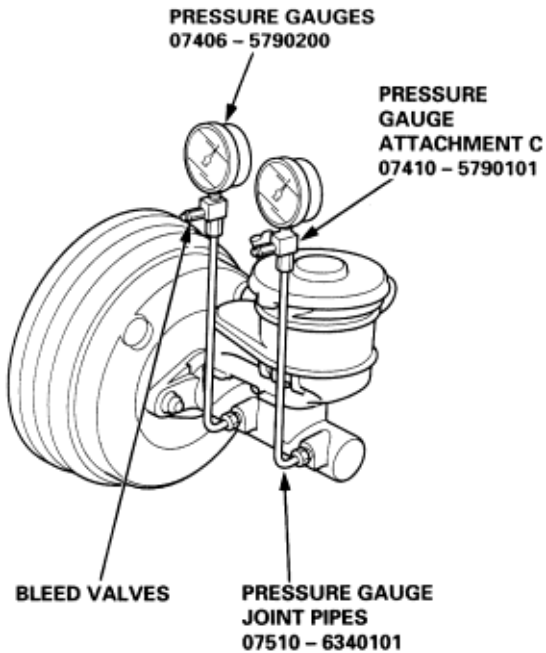
Brake Booster

Brake Booster Inspection (cont'd)

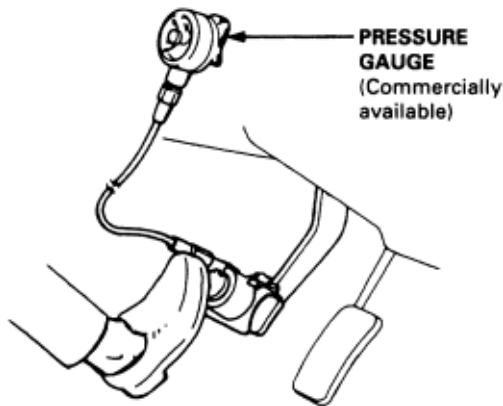
19-A-24

Function Test

1. Install the vacuum gauge as same as the leak test.
2. Connect the oil pressure gauges to the master cylinder using the attachments (special tools) as shown.
3. Bleed air through the valves.



4. Start the engine and let it idle.
5. Have an assistant depress the brake pedal with 98 N (10 kgf, 22 lbf) and 294 N (30 kgf, 66 lbf) of pressure.



6. The following pressures should be observed at the pressure gauges in each vacuum.

B16B6 Engine Model

Vacuum kPa (mmHg, in.Hg)	N (kgf, lbf)	kPa (kgf/cm ² , psi)
0 (0, 0)	98 (10, 22)	0 (0, 0)
	294 (30, 66)	1,470 (15, 213)
66.7 (500, 19.7)	98 (10, 22)	3,040 (31, 441)
	294 (30, 66)	6,865 (70, 995)

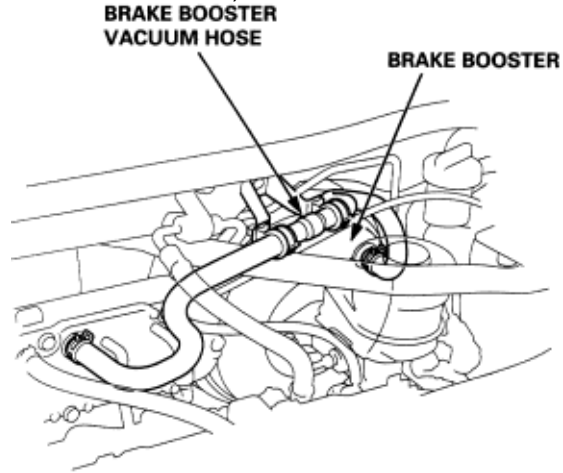
All Except B16B6 Engine Model

Vacuum kPa (mmHg, in.Hg)	N (kgf, lbf)	kPa (kgf/cm ² , psi)
0 (0, 0)	98 (10, 22)	0 (0, 0)
	294 (30, 66)	1,275 (13, 185)
66.7 (500, 19.7)	98 (10, 22)	3,825 (39, 555)
	294 (30, 66)	8,238 (84, 1,194)

7. Inspect the master cylinder for leaks if the readings do not fall within the limits shown above.

Booster Check Valve Test

1. Disconnect the brake booster vacuum hose (check valve built in) at the booster.

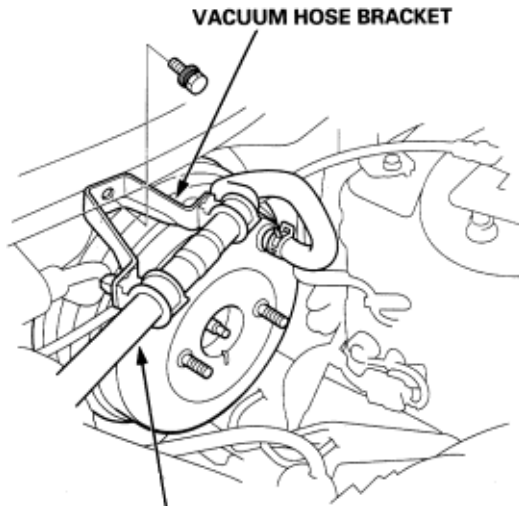


2. Start the engine and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve and retest.

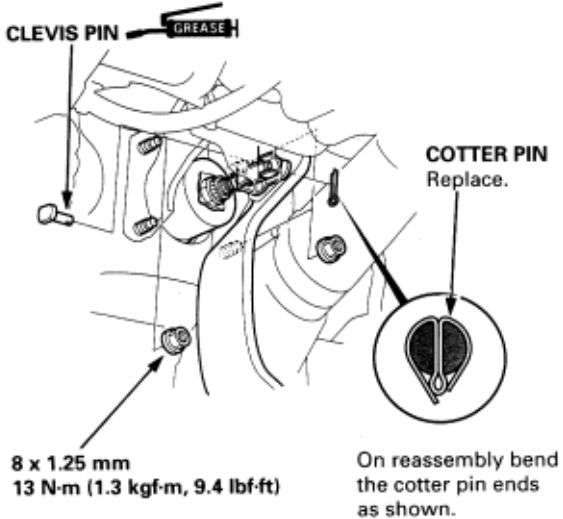
Brake Booster Removal/Installation

19-A-25

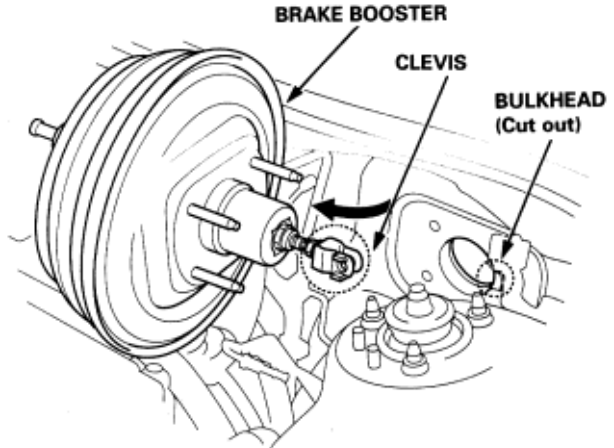
1. Remove the master cylinder (**See Page** 19-A-18).
2. For Type R model only, remove the intake manifold (see section 9).
3. Remove the P/S feed hose clamp (LHD only).
4. Remove the power relay (LHD only).
5. For M/T model only, remove the clutch reservoir and reservoir bracket. Do not disconnect the clutch hose from the reservoir.
6. Disconnect the vacuum hose from the brake booster, then remove the vacuum hose bracket.



7. Remove the lock pin and clevis pin.



8. Remove the four booster mounting nuts.
9. Pull the brake booster forward, then turn it to right until the clevis is clear of the bulkhead.



10. Remove the brake booster from the engine compartment.
11. Install the brake booster in the reverse order of removal, and note these items:
 - ♦ Adjust the pushrod length before installing brake booster.
 - ♦ After installation, adjust the brake pedal and brake pedal free play (**See Page** 19-A-5).
 - ♦ Use a new lock pin.

CAUTION

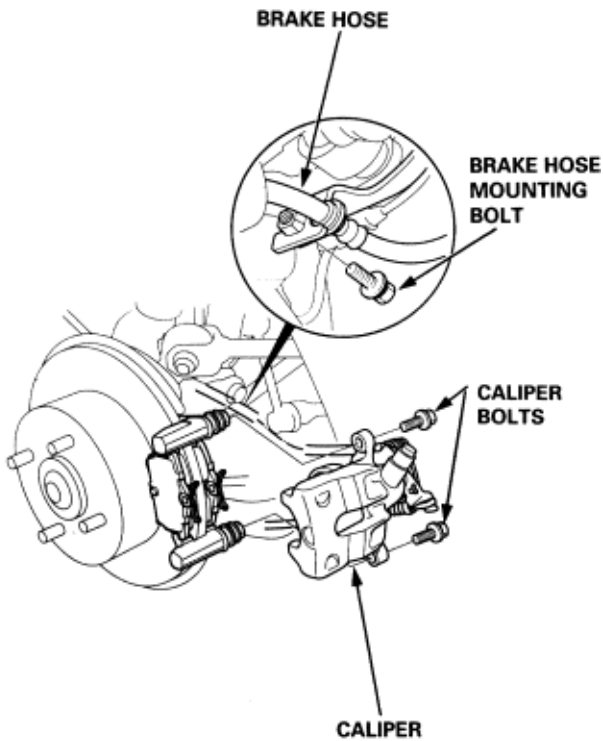
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

1. Raise the rear of the vehicle and make sure it is securely supported. Remove the rear wheel.
2. Release the parking brake.
3. Remove the brake hose from the suspension arm by removing the mounting bolt.

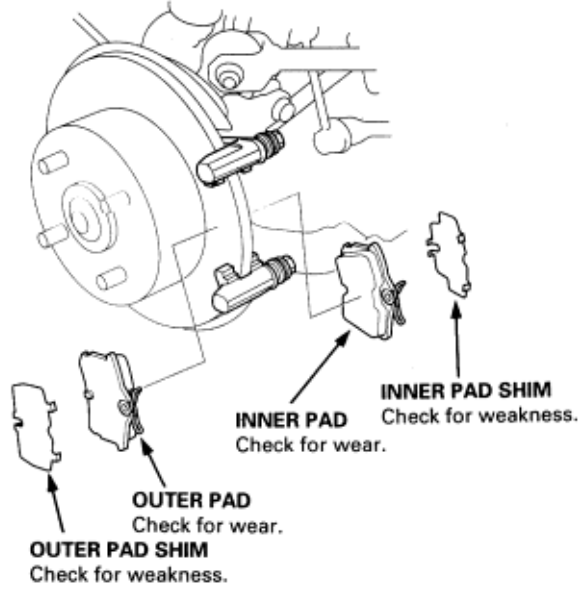
CAUTION

- ♦ Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.
- ♦ Support the caliper with a piece of wire so that it does not hang from the brake hose.



4. Hold the caliper pin with a wrench, being careful not to damage the pin boot. Remove the two caliper bolts with another wrench and caliper from the bracket.

5. Remove the pad shims and brake pads.

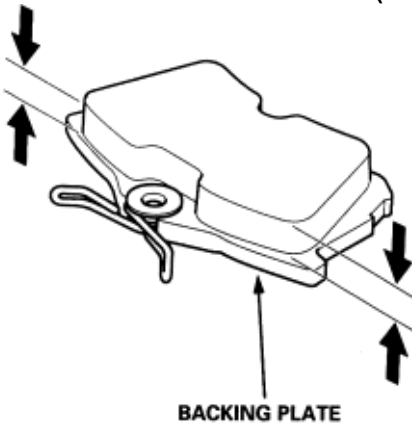


6. Using vernier calipers, measure the thickness of each brake pad lining. Measurement does not include pad backing plate thickness.

Brake Pad Thickness:

Standard: 8.5-9.5 mm (0.33-0.37 in)

Service Limit: 1.6 mm (0.06 in)



Rear Brake Pads Inspection and Replacement (cont'd)

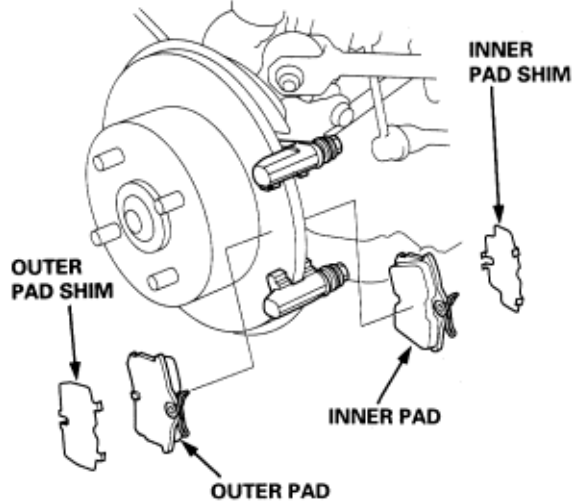
19-A-27

7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the brake pads and pad shim on the caliper bracket. Install the inner pad with its wear indicator facing down ward.

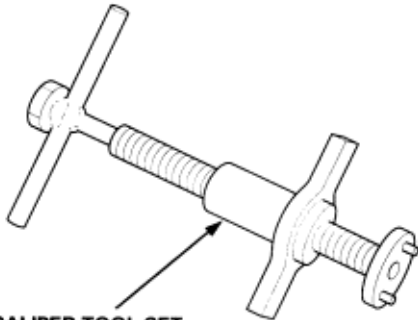


WARNING

- ♦ When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- ♦ Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

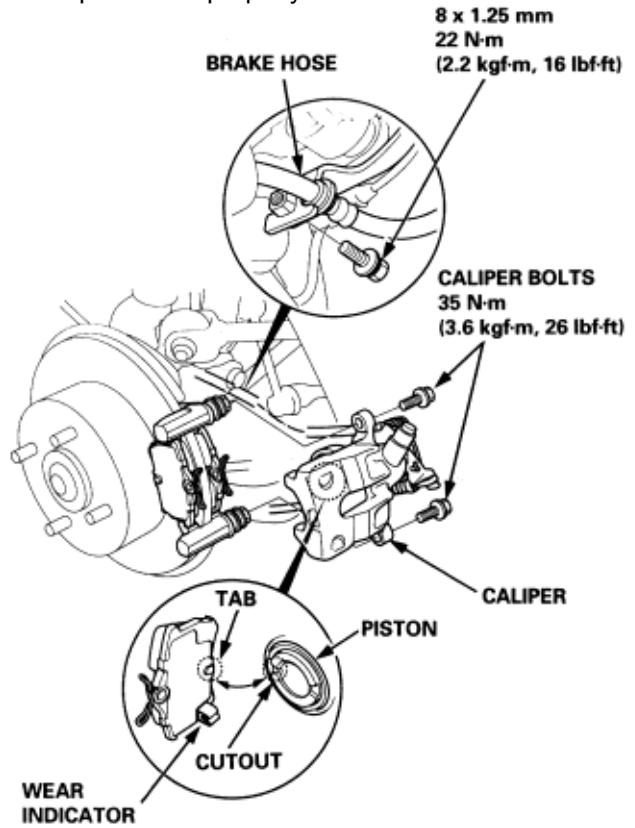


10. Push the caliper piston in to the cylinder with commercially available brake caliper tool set.



BRAKE CALIPER TOOL SET
Commercially Available
(Lucas No. YCB241 or equivalent)

11. Align the cutout in the piston with the inner pad by turning the piston back. Lubricate the boot with rubber grease to avoid twisting the piston boot. If the piston boot is twisted. Back it out so it is positioned properly.



12. Install the brake caliper on the caliper bracket.
13. Hold the caliper pin with a wrench not to damage the pin boot. Install bolt with another wrench and torque bolts to proper specification.
14. Install the brake hose onto the suspension arm with the mounting bolt.
15. After installation, check for leaks line joints and connections, and necessary.
16. Depress the brake pedal several sure the brakes work, then road-test.
NOTE: Engagement of the brake may require greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore normal pedal stroke.

Rear Brake Disc Disc Runout Inspection

19-A-28

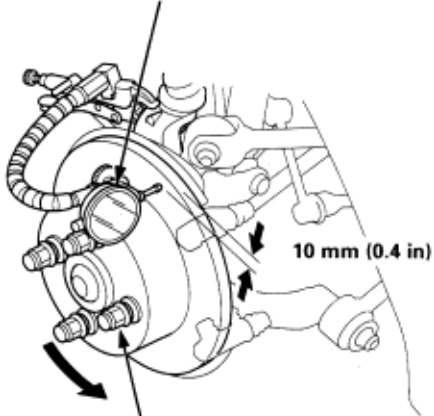
Disc Thickness and Parallelism Inspection

1. Loosen the rear wheel nuts slightly, then raise the rear of the vehicle, and make sure it is securely supported.
2. Remove the brake pads (**See Page 19-A-26**).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable flat washers to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout at 10 mm (0.4 in) from the outer edge of the disc.

Brake Disc Runout:

Service Limit: 0.10 mm (0.004 in)

DIAL INDICATOR



WHEEL NUT and
FLAT WASHER

108 N·m (11 kgf·m, 80 lbf·ft)

5. If the disc is beyond the service limit, refinish the brake disc.

Max. Refinishing Limit: 8.0 mm (0.31 in)

NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in).

1. Loosen the rear wheel nuts slightly, then raise the vehicle and support it on safety stands. Remove the rear wheels.
2. Remove the brake pads (**See Page 19-A-26**).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in) in from the outer edge of the disc. Replace the brake disc if the smallest measurement is less than the max. Refinishing limit.

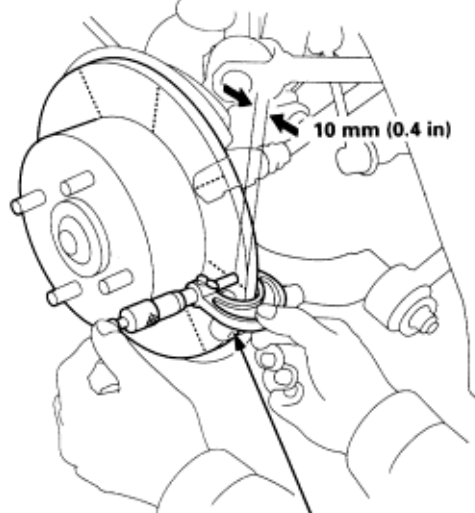
Brake Disc Thickness:

Standard: 9.9-10.1mm (0.390-0.398 in).

Max. Refinishing Limit: 8.0mm (0.31 in).

Brake disc parallelism: 0.015mm (0.0006 in) max.

NOTE: This is the maximum allowable difference between the thickness measurements.



MICROMETER

4. If the disc is beyond the service limit for parallelism, refinish the brake disc.
NOTE: See section 18 for brake disc replacement.



CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.


- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

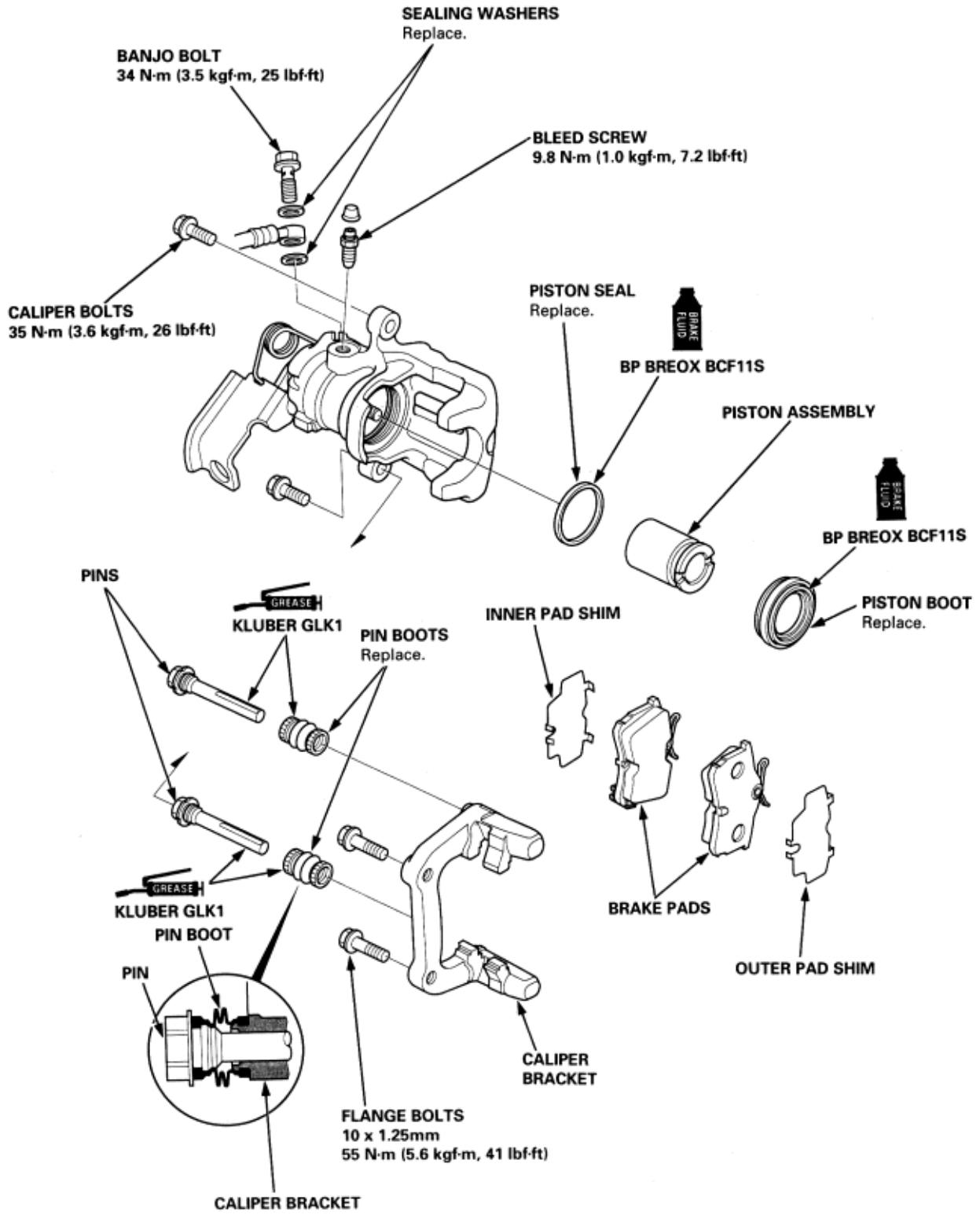
NOTE:

- ♦ Do not spill brake fluid on the vehicle; It may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ♦ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
- ♦ Replace parts with new ones whenever specified to do so.
- ♦ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- ♦ Contaminated brake discs or pads reduce stopping ability.
- ♦ When reusing the pads, install them in their original positions to prevent loss of braking efficiency.
- ♦ Do not reuse the drained fluid.
- ♦ Use only clean Genuine Honda brake fluid or an equivalent DOT3 or DOT4 brake fluid.
- ♦ Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- ♦ Replace all rubber parts with new ones whenever disassembled.
- ♦ After installing the rear brake caliper.
 - Check for leaks at hose and line joints and connections, and retighten if necessary.
 - Check the brake hoses for interference and twisting.

Rear Brake Caliper
Disassembly/Reassembly (cont'd)

19-A-30

 Use recommended pin grease in the caliper seal set.



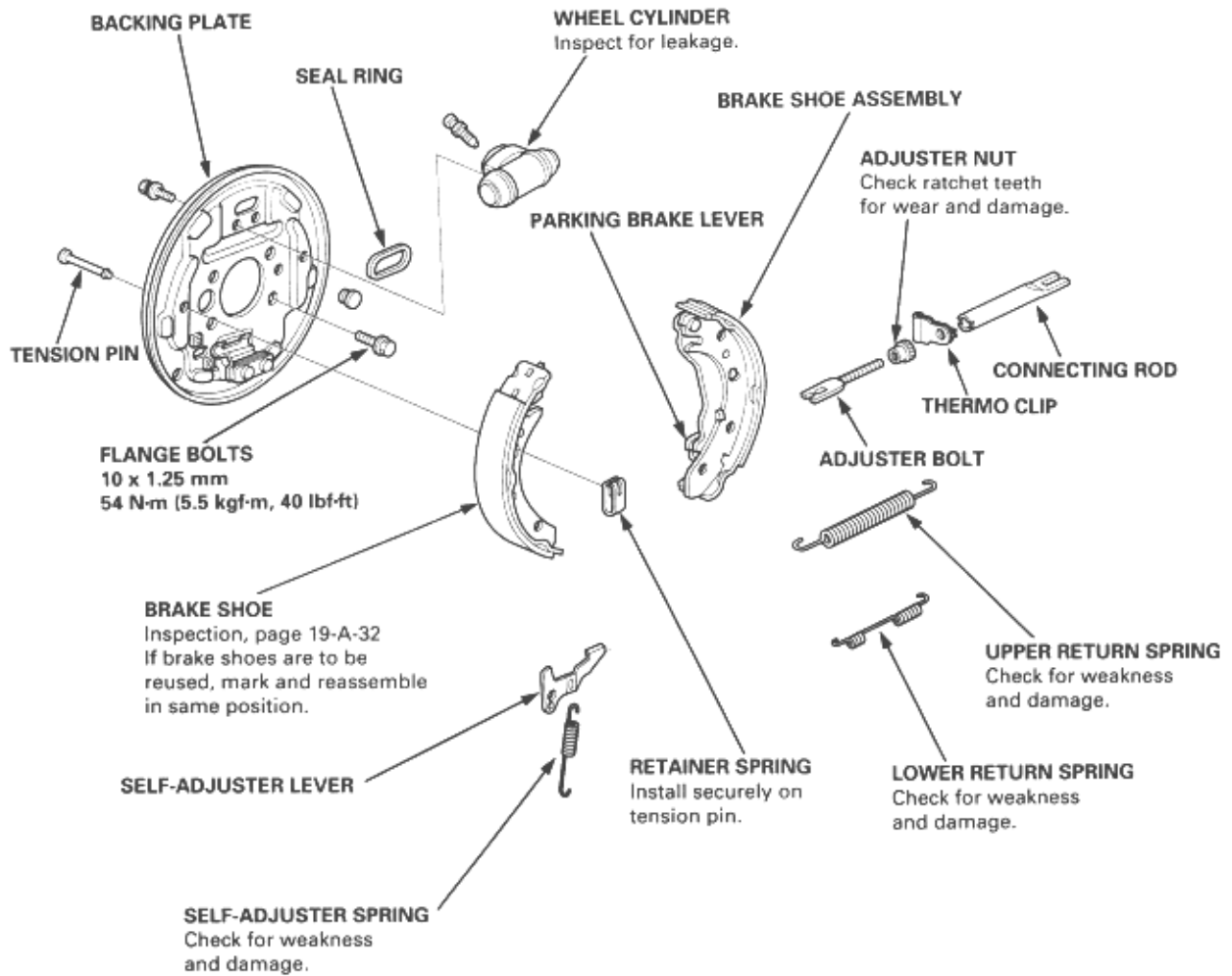
CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

NOTE:

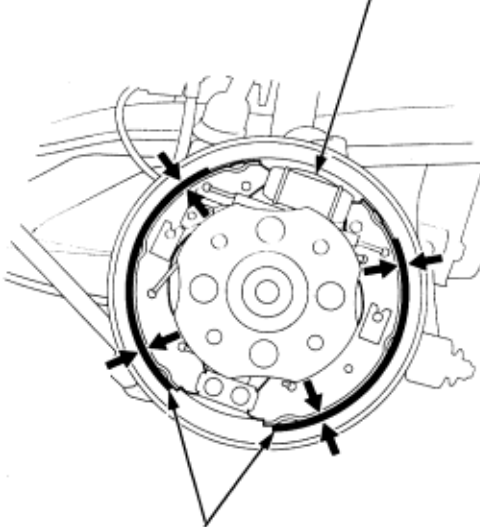
- ♦ Contaminated brake linings or drums reduce stopping ability.
 - ♦ Block the front wheels before jacking up the rear of the vehicle.
1. Raise the rear of the vehicle, and make sure it is securely supported.
 2. Release the parking brake, and remove the rear brake drum (see section 18).



To go to the page referenced on the diagram above, click on the following:
[\(See Page 18-A-32\)](#)

3. Check the wheel cylinder for leakage.

WHEEL CYLINDER



BRAKE LININGS

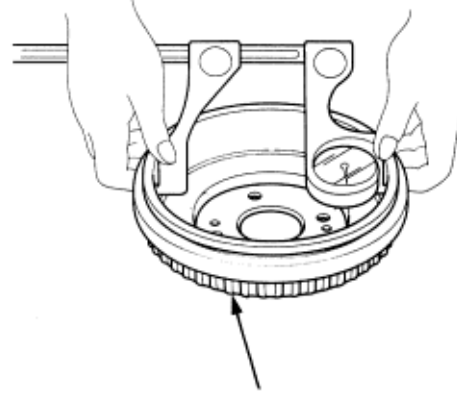
4. Check the brake linings for cracking, glazing, wear and contamination.
5. Measure the brake lining thickness. Measurement does not include brake shoe thickness.
- Brake Lining Thickness:**
Standard: 5 mm (0.20 in)
Service Limit: 2.0 mm (0.08 in)
6. If the brake lining thickness is less than the service limit, replace the brake shoes as a set.
7. Check the bearings in the hub unit for smooth operation; if the bearings require servicing, see section 18.

8. Measure the inside diameter of the brake drum with inside vernier calipers.

Drum Inside Diameter:

Standard: 228.6-228.7 mm (9.000-9.004 in)

Service Limit: 229.6 mm (9.D39 in)



BRAKE DRUM

9. If the inside diameter of the brake drum is more than service limit, replace the brake drum.
10. Check the brake drum for scoring, grooves and cracks.

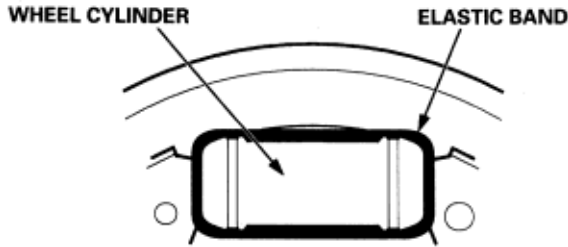


CAUTION

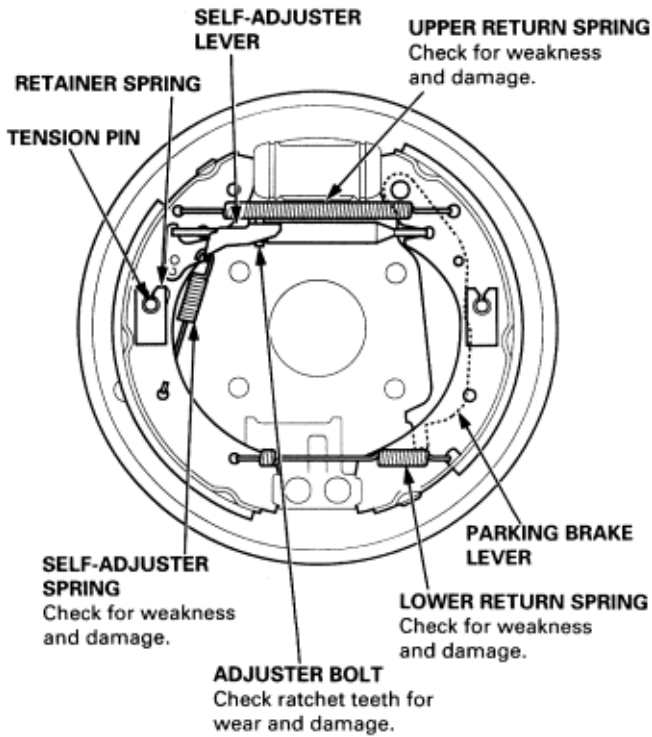
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner.

1. Remove the tension pins by pushing the retainer spring and turning them.
2. To prevent the wheel cylinder pistons from being accidentally ejected or over pushing, fit a suitable elastic band.



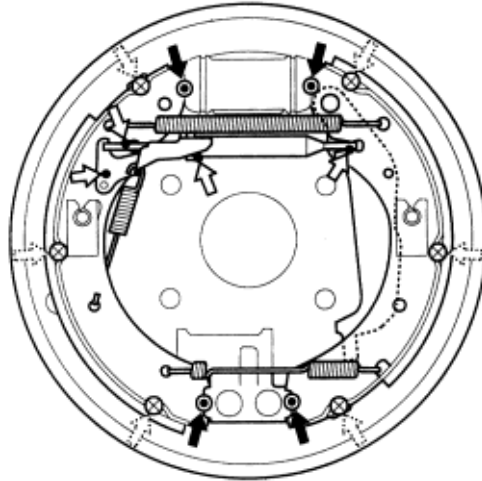
3. Remove the brake shoe lower ends from the anchor by expanding the bottom ends of the brake shoes together. Do not over push the wheel cylinder piston to one side, when expanding the shoes.
4. Remove the lower return spring.



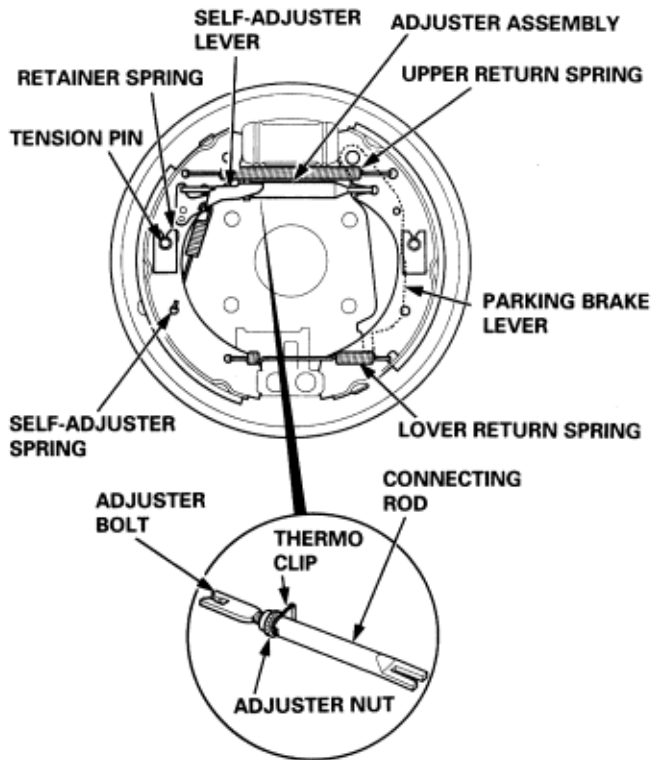
5. Expand the upper ends of the brake shoes and remove them from the wheel cylinder. Make sure not to damage the dust covers on the wheel cylinder. Do not depress the brake pedal while the shoes are removed.
6. Remove the upper return spring.
7. Remove the adjuster assembly, self-adjuster spring and lever on the brake shoe.
8. Disconnect the parking brake cable from the brake lever on the brake shoe.
9. Inspect all parts for worn, rust, and damage.
10. Apply grease on each sliding surface. Keep grease or oil off the brake linings. Wipe any excess grease off the parts.

Greasing Symbols:

- ➔ ● Brake shoe ends
- ➔ ⊗ Opposite the edge of the shoe
- ➔ ● Sliding surface



11. Connect the parking brake cable to the parking brake lever on the brake shoe.
12. Install the self-adjuster lever on the brake shoe.
13. Hook the self-adjuster spring to the lever first, then to the brake shoe.
14. Clean the threaded portions of adjuster bolt and nut. Coat the threads of the adjuster bolt with grease. Install the adjuster nut, thermo clip and connecting rod on the adjuster bolt. To shorten the adjuster bolt, turn the adjuster nut assembly between the shoe and parking brake lever. Noting the installation direction.



15. Set the upper ends of the brake shoes on the wheel cylinder pistons. Connect the upper return spring on the brake shoes. Do not over push the wheel cylinder piston to one side.
16. Connect the lower return spring on the brake shoes, noting the installation direction.
17. Position the brake shoe lower ends on the anchor by expanding the bottom ends of the brake shoes together. Do not over push the wheel cylinder piston to one side, when expanding the shoes.
18. Install the tension pins and the retainer springs.

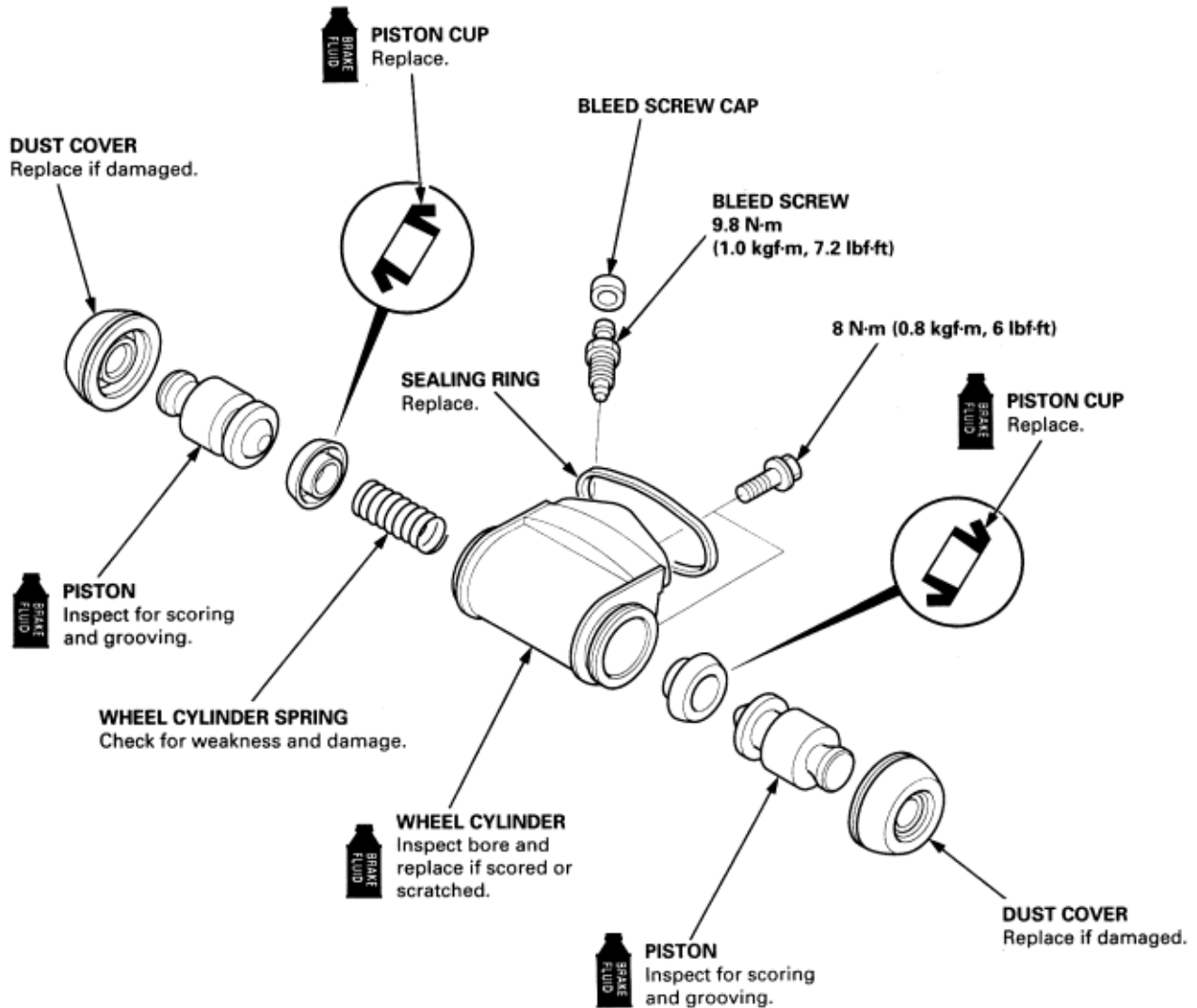
19. After servicing the brake shoes, remove the elastic band from the wheel cylinder. Carefully pull lower edges of wheel cylinder boots away from cylinders to see. If the interior of the cylinder is wet with brake fluid, wipe it off.
20. Install brake drum.
21. If the wheel cylinder has been removed, bleed the brake system (**See Page 19-A-7**).
22. Depress the brake pedal several times to set the self-adjusting brake.
23. Adjust the parking brake (**See Page 19-A-6**).

Wheel Cylinder Disassembly/Inspection

19-A-35

NOTE:

- ◆ Do not spill brake fluid on the vehicle; It may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- ◆ Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- ◆ Before reassembling, check that all parts are free of dust and other foreign particles.
- ◆ Replace parts with new ones whenever specified to do so.
- ◆ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- ◆ Do not reuse the drained fluid.
- ◆ Use only clean Genuine Honda brake fluid or an equivalent DOT3 or DOT4 brake fluid.
- ◆ Lubricate all parts with clean brake fluid during reassemble.
- ◆ Replace all rubber parts with new ones whenever disassembled.



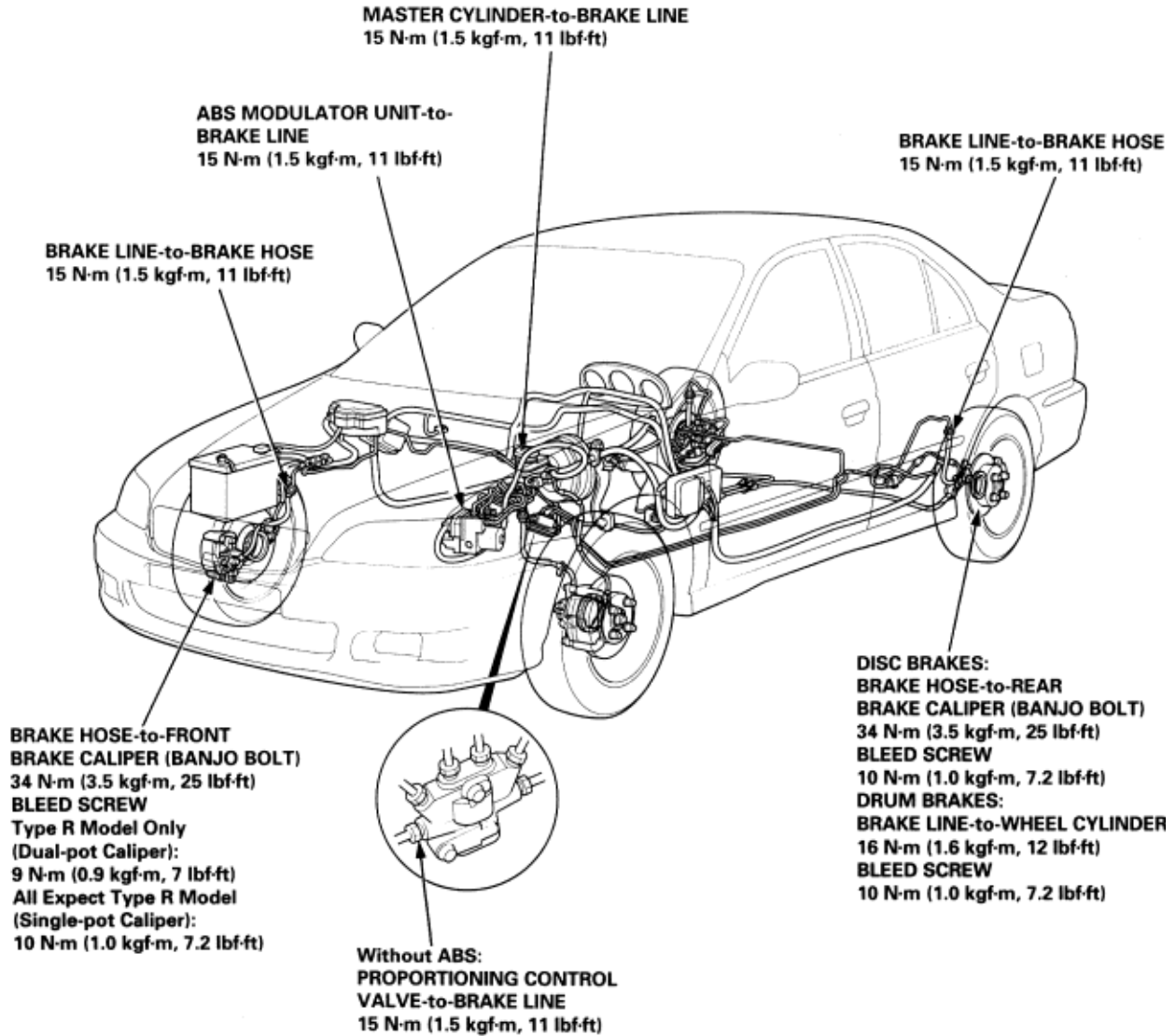
Brake Hose and Line Inspection/Torque Specifications

19-A-36

1. Inspect the brake hoses for damage, deterioration, leaks, interference and twisting.
2. Check the brake lines for damage, rusting and leakage. Also check for bent brake lines.
3. Check for teaks at hose and line joints or connections, and retighten if necessary.
4. Check the master cylinder, proportioning control valve and ABS modulator unit for damage and leakage.

NOTE:

- ♦ Replace the brake hose clip whenever the brake hose is serviced.
- ♦ LHD type is shown, RHD type is symmetrical.

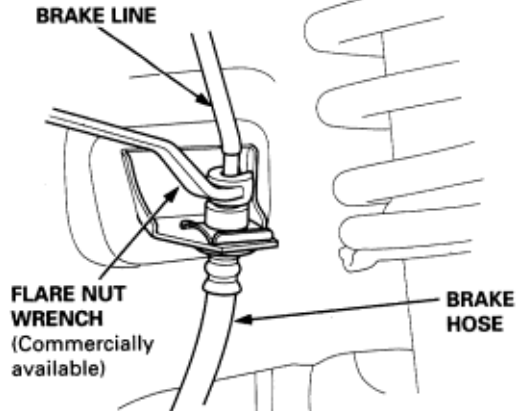


Brake Hose and Line Brake Hose Replacement

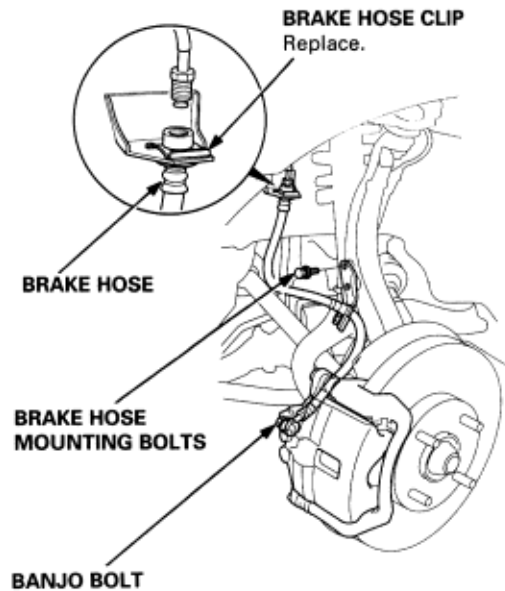
19-A-37

NOTE:

- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
 - ♦ Replace parts with new ones whenever specified to do so.
 - ♦ Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
1. Replace the brake hose if the hose is twisted, cracked, or if it leaks.
 2. Disconnect the brake hose from the brake line using a 10 mm flare-nut wrench.

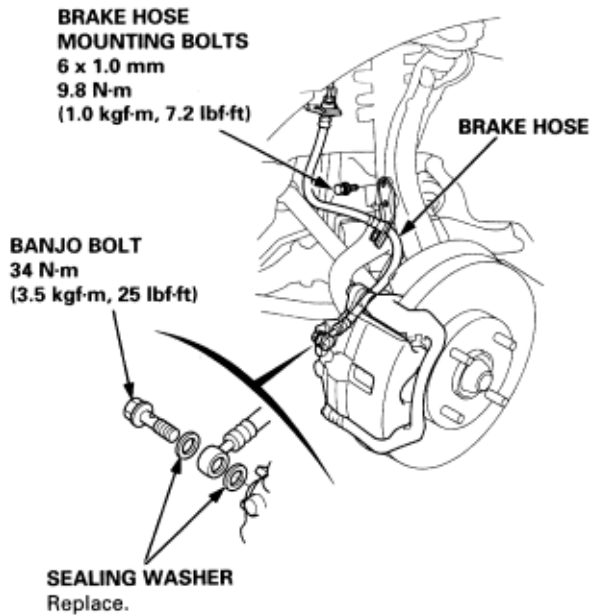


3. Remove and discard the brake hose clip from the brake hose

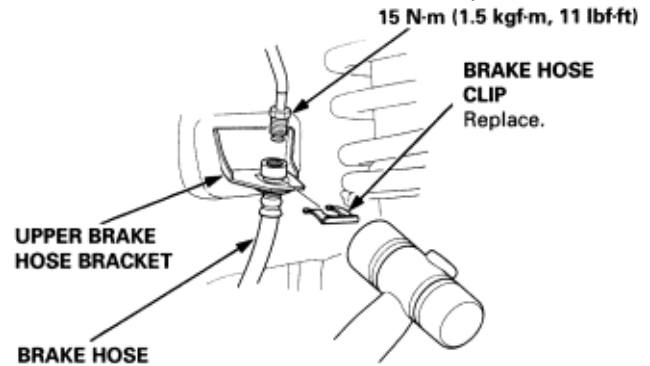


4. Remove the banjo bolt, and disconnect the brake hose from the caliper.
5. Remove the brake hose from the knuckle.

6. Install the brake hose on the knuckle with two 6 mm brake hose mounting bolts first, then connect the brake hose to the caliper with the banjo bolt and new sealing washers.



7. Install the brake hose on the upper brake hose bracket with a new brake hose clip.



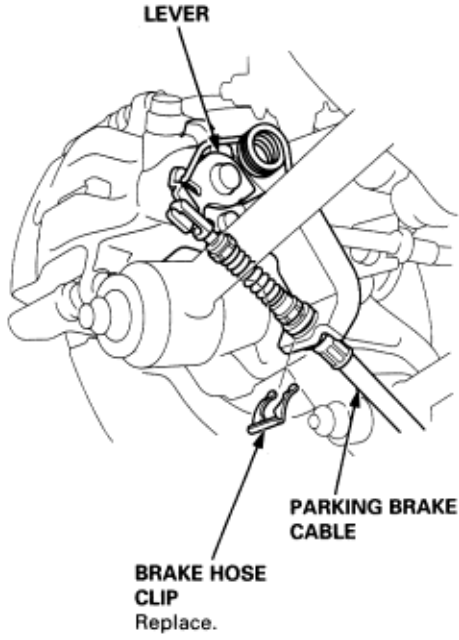
8. Connect the brake line to the brake hose.
9. After installing the brake hose, bleed the brake system. (See Page 19-A-7).
10. Perform the following checks.
 - ♦ Check the brake hose and line joint for leaks, and tighten if necessary.
 - ♦ Check the brake hoses for interference and twisting.

Parking Brake Cable Inspection/Replacement

19-A-38

Rear Disc Brake:

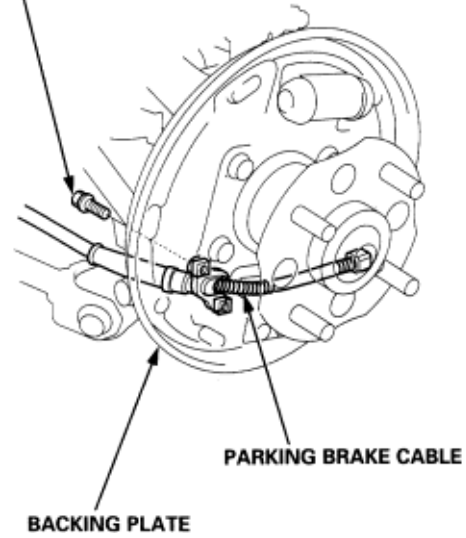
1. Release the parking brake lever fully, and remove the brake hose clip from the parking brake cable.
2. Disconnect the parking brake cable from the lever.



Rear Drum Brake:

1. Remove the brake shoe assembly (See Page 19-A-33).
2. Remove the parking brake cable mounting bolts from the backing plate.
3. Remove the parking brake cable

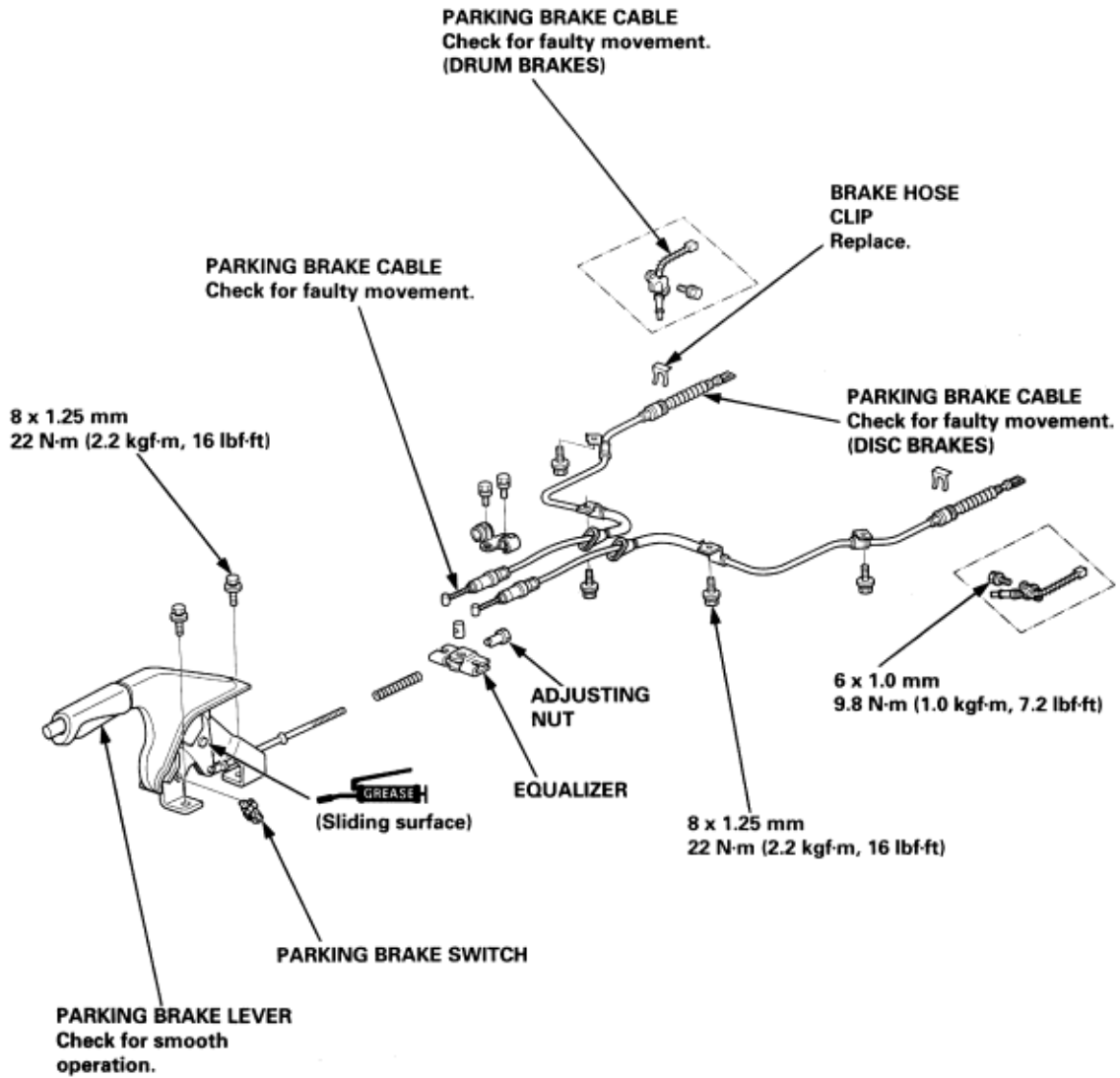
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



Parking Brake Cable
Inspection/Replacement (cont'd)

19-A-39

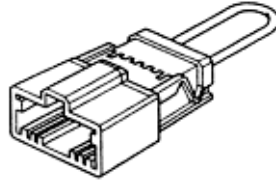
NOTE: The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature cable failure.



Special Tools

19-B-1

Ref No.	Tool Number	Description	Qty	Remark
1	07TAZ - ST30100	ABS Short Connector	1	

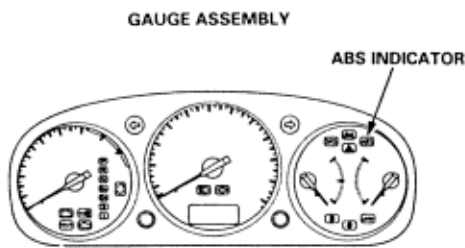
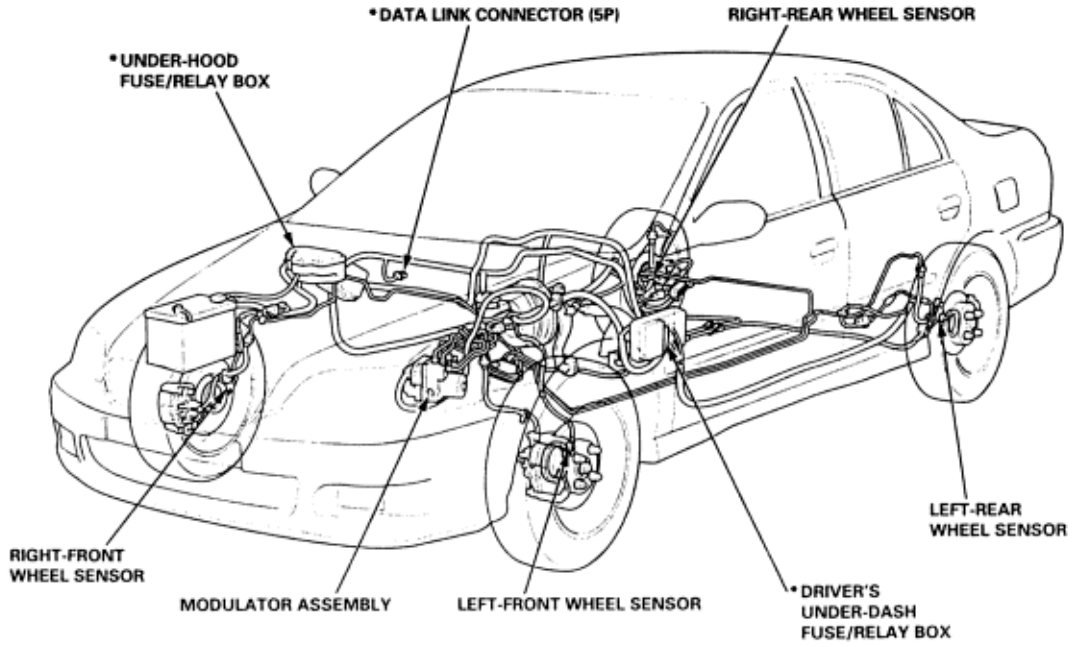


①

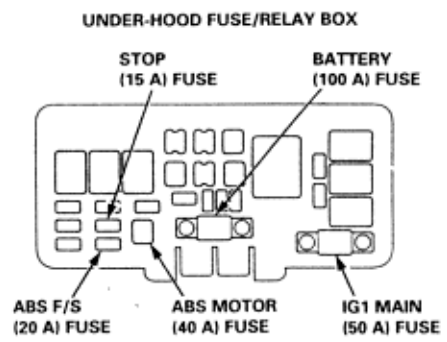
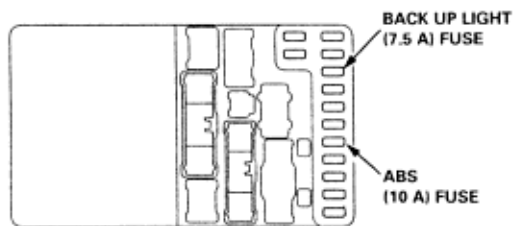
Component Location

19-B-2

The parts with asterisk (*): LHD type is shown, RHD type is symmetrical.



DRIVER'S UNDER-DASH FUSE/RELAY BOX



When the brake pedal is depressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the manoeuvrability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced (tailslide) if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, and it thereby ensures manoeuvrability and stability of the vehicle.

ABS Control Unit**Main Control**

The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The ABS control unit detects the vehicle speed at deceleration by slowing down from the vehicle speed before deceleration at a certain rate.

The ABS control unit calculates the slip rate of each wheel and it transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The pressure reduction circuit is the three control channels system of each front wheel and both rear wheels.

The pressure reduction control has three modes: pressure reduction, pressure retaining, and pressure intensifying.

The wheel sensor signal is four channels system from each wheel.

Self-diagnosis Function

The ABS control unit equips the watch dog timer.

The ABS control unit equips the main CPU and sub CPU, that checks each other for problems.

The CPU's check the circuit of the system.

On-board Diagnosis Function

The ABS control unit equips the data link connector (5P).

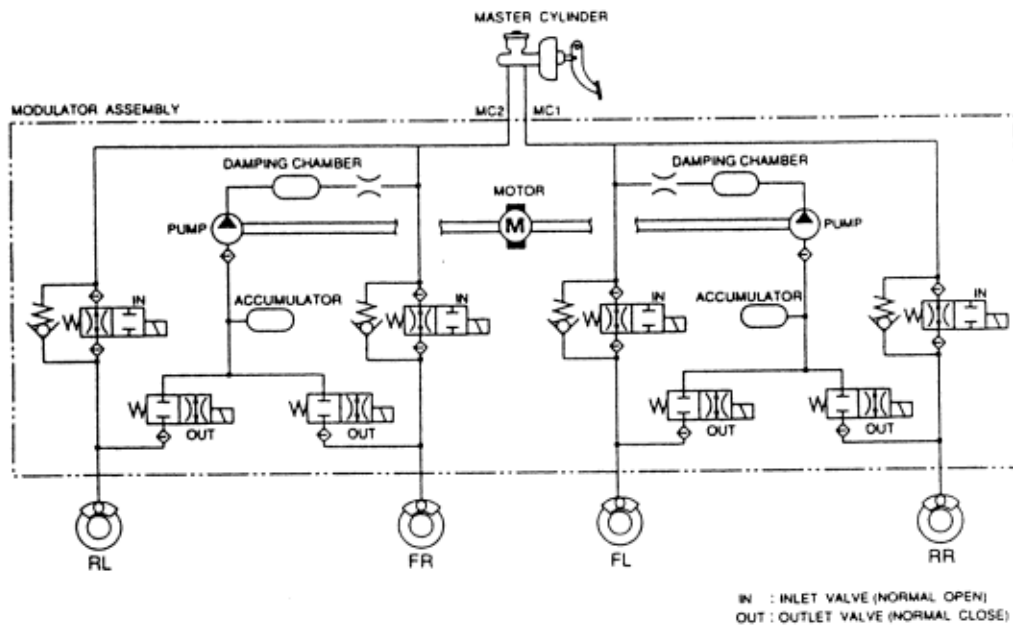
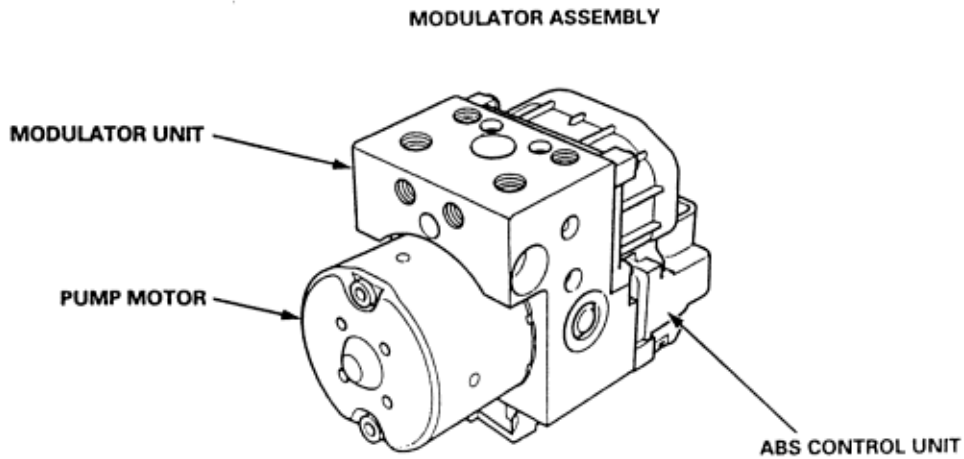
The ABS can be diagnosed with HONDA PGM TESTER.

The ABS Modulator Unit

The ABS modulator unit of the inlet solenoid valve, outlet solenoid valve, accumulator pump, pump motor and the damping chamber.

The direct pressure reducing control type that reduces the caliper fluid pressure directly is adopted for the modulator, which is also referred as the circulating type because the brake fluid circulates through the caliper, reservoir and the master cylinder.

The hydraulic control has the three modes of pressure reduction, pressure retaining and pressure intensifying modes. The hydraulic circuit is an independent four channel system from each wheel.



Wheel Sensor

The four wheel sensors are the magnetic contactless type.

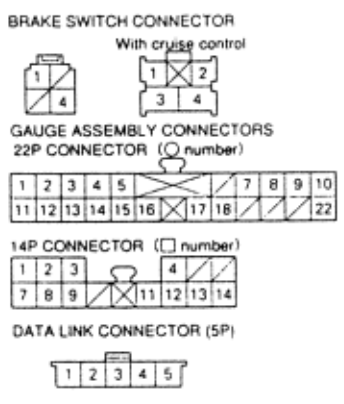
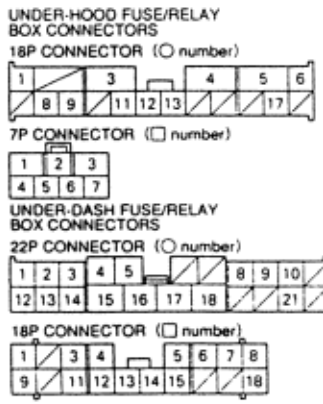
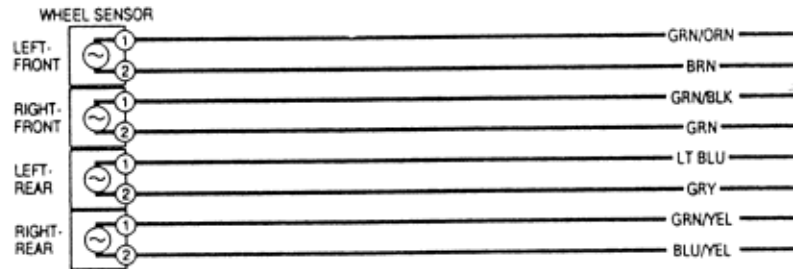
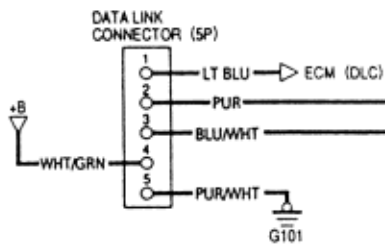
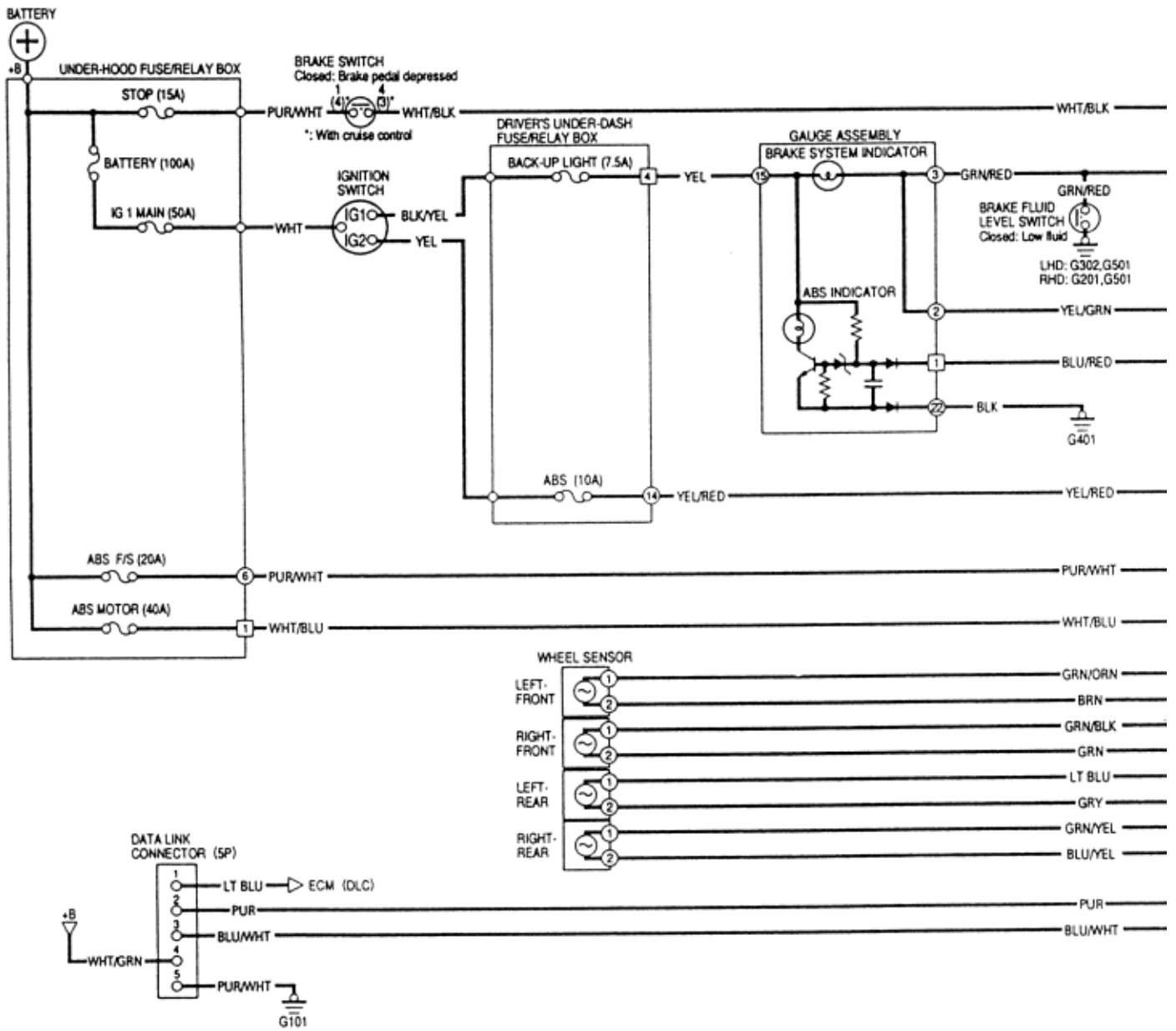
As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.



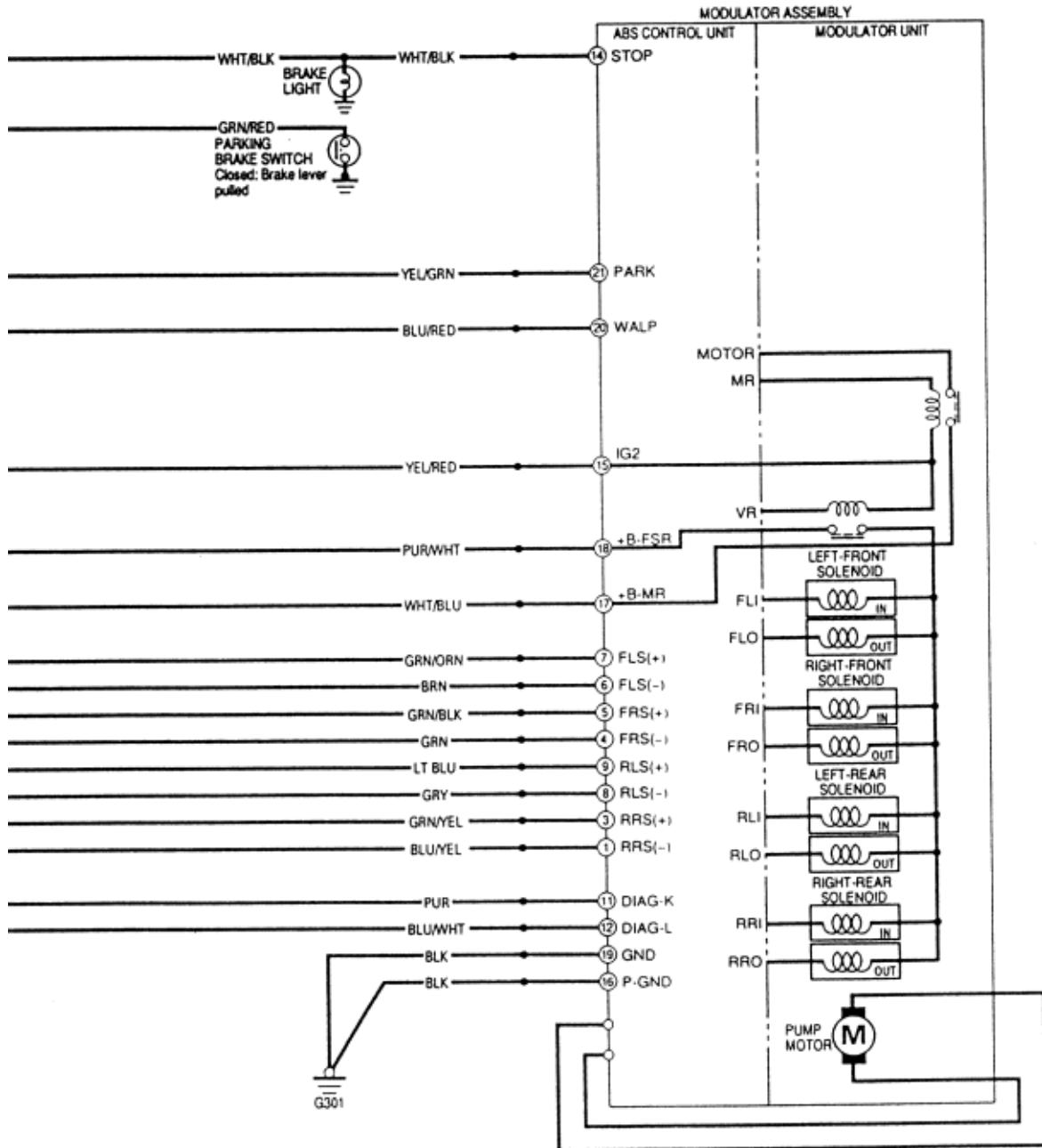
The EBD is a function that distributes the brake force better to adjust the rear brake force before the ABS is operated. The EBD functions by the ABS control unit, which controls the modulator based on the wheel sensor signal. The ABS control unit holds the brake fluid pressure by closing the inlet valve when rear wheel speed is down less than front wheel speed. Then the ABS control unit decreases the brake fluid pressure by opening the outlet valve for a moment, as the rear wheel speed is reduced. When the rear wheel speed returns, the ABS control unit increases the brake fluid pressure by opening the inlet valve for a moment. The ABS control unit repeats this control quickly, and the ABS control unit controls the rear brake fluid pressure individually. During these EBD functions, brake pedal kickback occurs.

Self-Diagnosis function

The ABS control unit turns the brake system indicator on, when the ABS control unit detects the problem that affects the EBD during self-diagnosis. At this time, the ABS control unit also turns the ABS indicator on.



Wire side of female terminals

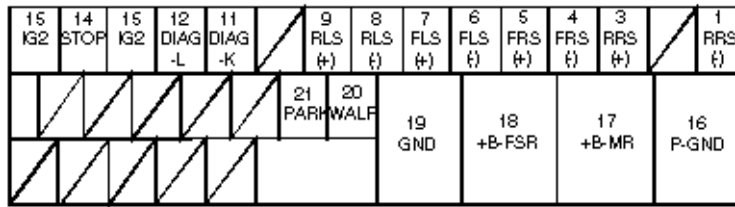


MODULATOR ASSEMBLY CONNECTOR

15	14	12	11	9	8	7	6	5	4	3	1
				21	20	19	18	17	16		

Terminal side of female terminals

MODULATOR ASSEMBLY CONNECTOR



Terminal side of female terminals

Terminal No.	Wire colour	Terminal sign (Terminal name)	Description	Measurement			
				Terminal	Conditions (Ignition switch ON (II))		Voltage
1	BLU/YEL	RRS (-) (Right rear signal negative)	Detects right rear wheel sensor signal	1-3	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
3	GRN/YEL	RRS (+) (Right rear signal positive)	Detects right rear wheel sensor signal	1-3	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
4	GRN	FRS (-) (Front right signal negative)	Detects right front wheel sensor signal	4-5	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
5	GRN/BLK	FRS (+) Front right signal positive)	Detects right front wheel sensor signal	4-5	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
6	BRN	FLS (-) (Front left signal negative)	Detects left front wheel sensor signal	6-7	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
7	GRN/ORN	FLS (+) (Front left signal positive)	Detects left front wheel sensor signal	6-7	Wheel	Turn wheel at 1 turn/second	AC: 0.053V or above Oscilloscope: 0.15 Vp-p or above
8	GRY	RLS (-) (Rear left signal negative)	Detects left rear wheel sensor signal	8-9	Wheel	Stops	Approx. 2.5V
9	LT BLU	RLS (+) (Rear left signal positive)	Detects left rear wheel sensor signal	8-9	Wheel	Stops	Approx. 2.5V
11	PUR	DIAG-K (Diagnosis K terminal)	Communicate with Honda PGM tester	-	-	-	-
12	BLU/WHT	DIAG-L (Diagnosis L terminal)	Diagnostic trouble code indication	12-GND	ABD short connector	Connected Disconnected	0V Approx. 5V
14	WHT/BLK	STOP	Detects brake switch signal	14-GND	Brake pedal	Depressed Released	Battery voltage 0V
15	YEL/RED	IG2 (Ignition 2)	Detects ignition switch 2 signal (system activate signal)	15-GND	-	-	Battery voltage
16	BLK	P-GND (Pump ground)	Ground for the pump motor	16-GND	-	-	Below 0.3V
17	WHT/BLU	+B-MR (+B motor relay)	Power source for the pump motor	17-GND	-	Every time	Battery voltage
18	PUR/WHT	+B-FSR (+B fail safe relay)	Power source for the solenoid valve and motor relay coil	18-GND	-	Every time	Battery voltage
19	BLK	GND (Ground)	Ground for the modulator assembly	19-GND	-	-	Below 0.3V
20	BLU/RED	WALP (Warning lamp)	Drives ABS indicator	20-GND	ABS indicator	ON OFF	Approx. 11V Below 1V
21	YEL/GRN	PARK (Parking)	Drives brake system indicator	21-GND	Engine running, parking brake	Pulled Released	Below 0.3V Battery voltage

ABS Indicator

1. The ABS indicator comes on when the ABS control unit detects a problem in the system. However, even though the system is operating properly, the ABS indicator will come on, under the following conditions.
 - ♦ Disturbance signal
 - ♦ Wheel spin
 - ♦ Only drive wheels rotate
 - ♦ Battery voltage fluctuates
 - ♦ Disconnected modulator assembly connector.To determine the actual cause of problem, question the customer about the problem, taking these conditions into consideration.
2. When a problem is detected and the ABS indicator comes on, the indicator can stay on until the ignition switch is turned off and it can automatically go off depending on the mode.
 - ♦ Light stays on until the ignition switch is turned off. When the system is in the system down mode.
 - ♦ Light automatically goes off, when the system is in the control inhibition mode.
3. In certain modes, the ABS indicator stays on when the system is reactivated without erasing the DTC after correcting the problem, but it goes off after starting the vehicle.

When the wheel sensor system is faulty and the ABS indicator comes on, the algorithm of the system automatically turns off the ABS indicator after the wheel speed signal returns to the normal speed. While, when the DTC is erased, the CPU is reset and the ABS indicator goes off when the system checked out normal by the initial diagnosis.

Therefore, test-drive the vehicle after servicing the wheel sensor system and be sure that the ABS indicator does not come on.
4. When the ABS control unit outputs battery voltage to gauge assembly, the ABS indicator goes off.
5. When both the brake system indicator and ABS indicators are ON, troubleshoot the ABS system first.

Diagnostic Trouble Code (DTC)

1. The diagnostic trouble code (DTC) is memorised when a problem is detected and the ABS indicator does not go off or when the ABS indicator comes on.

Therefore, the DTC can not be memorised when the ABS indicator comes on unless the CPU is activated.
2. The DTCs can be memorised until three DTC. However, when the same DTC is detected twice or more, the later one is written over the old one.

Therefore, when the same problem is detected repeatedly, it is recorded as the one DTC.
3. The DTCs are indicated from last memorised DTC.
4. The DTCs are memorised in the EEPROM (non-volatile memory).

Therefore, the memorised DTCs cannot be cancelled with the battery. Perform the specified procedures to erase.

Self-diagnosis

Self-diagnosis can be classified into four categories as listed below.

- ♦ Initial diagnosis: Performed right after the engine starts and until the ABS indicator goes off.
- ♦ Except ABS control: Performed when the ABS is not functioning.
- ♦ During ABS control: Performed when the ABS is functioning.
- ♦ During warning: Performed when the ABS indicator is ON.

Kickback

1. The motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback.
Therefore, the brake pedal must be kept depressed when the kickback occurs as it is performed during the ordinary brake operation.
2. The ABS control unit operates the solenoid valve when the brake pedal is released after the initial diagnosis. You can hear the faint solenoid valve operation sound this time, but it is normal.
3. Pedal kickback also occurs during EBD functioning, before ABS operates.

Pump Motor

1. The pump motor operates when the ABS is functioning.
2. The ABS control unit checks the pump motor operation when starting the vehicle at first time. You can hear the faint operation sound this time, but it is normal.
3. The pump motor operates for a moment when you release the brake pedal, after EBD function stopped.

Brake Fluid Replacement/Air Bleeding

1. Brake fluid replacement and air bleeding procedure are same as vehicles without ABS. To ease bleeding, start with the front wheels.

Troubleshooting

1. The troubleshooting flowcharts explain the procedures on the assumption that the cause of the problem lasts and the ABS indicator does not go off or it stays on.
Note that the troubleshooting following the flow chart when the ABS indicator does not come on can result in incorrect judgement.
2. Question the condition when the problem occurred and produce the same conditions as much as possible for troubleshooting. Self-diagnosis is made at various times such as the initial diagnosis, except ABS control, during ABS control, during acceleration, during the specified vehicle speed, etc. Therefore, the symptom cannot be checked unless the check conditions match with the problem conditions.
3. When the ABS indicator does not come on during the test-drive but the troubleshooting is performed with the DTC, check for the loose connector, poor contact of the terminal, etc, before troubleshooting.
4. After troubleshooting, erase the DTC and test-drive the vehicle. Be sure that the ABS indicator does not come on.
5. The connector symbol shown in the connector illustration represents the female terminals with the single outline and the male terminals with the double outlines.

Diagnostic Trouble Code (DTC)
DTC Indication

19-B-11

NOTE: You can also read and reset DTC's with Honda PGM Tester connected to data link connector (5P).

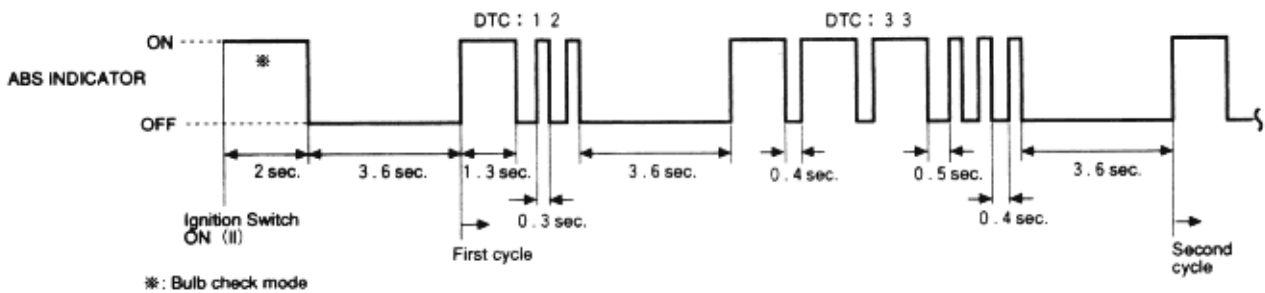
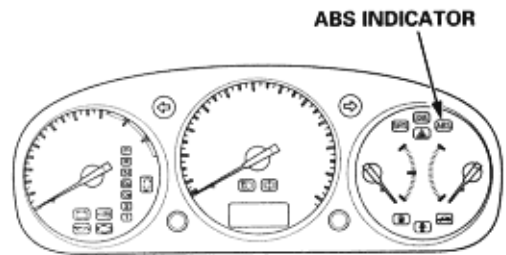
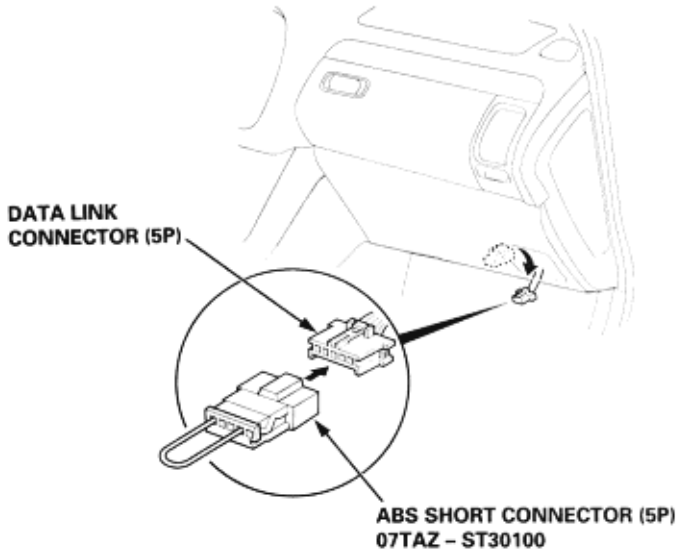
1. Connect the ABS short connector to the data link connector under dash of passenger's side.
2. Turn the ignition switch ON (II), but do not start the engine.
NOTE: Do not depress the brake pedal when turning the ignition switch.
3. Record the blinking frequency of the ABS indicator. The blinking frequency indicates DTC.
4. Turn the ignition switch OFF, and remove the ABS short connector.
5. Erase the DTC by cycling the ignition switch 20 times or more.

Condition for DTC indication

- The vehicle is stopped.
- The ABS short connector is connected before the ignition switch is turned ON (II).
- The brake pedal is not depressed.
- The ABS short connector is not disconnected during this service.

The DTC indication is finished and ABS control unit executes the software function if at least one of the following conditions is satisfied.

- The vehicle is not stopped.
- The ABS short connector is disconnected during this service.

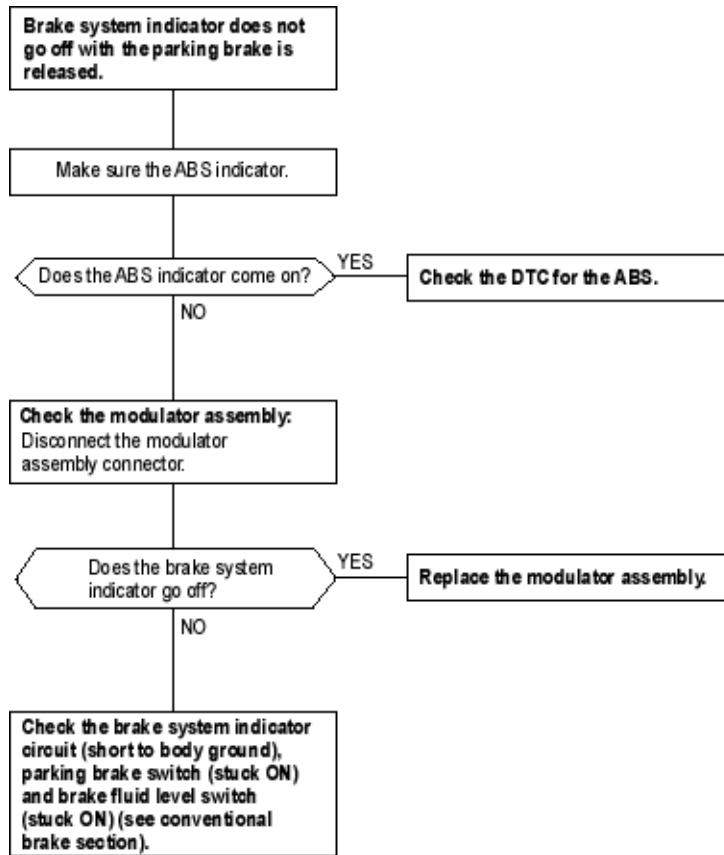


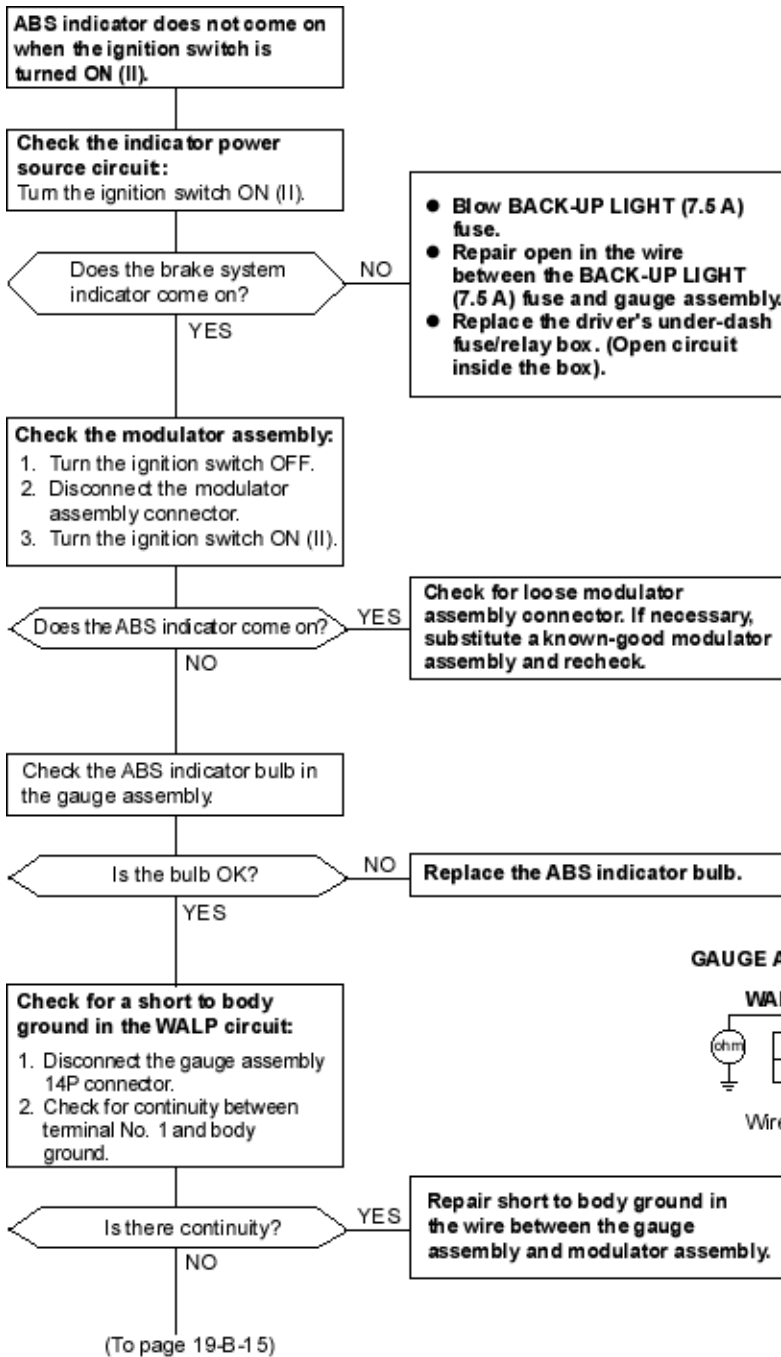
DTC	ABS Indicator	Brake System Indicator	Diagnosis/Symptom		Problem Location	Refer to Page
No DTC	-	ON	Brake system indicator does not go off		-	(see page 19-B-13)
No DTC	ON	-	ABS indicator does not come on		-	(see page 19-B-14)
No DTC	ON	-	ABS indicator does not go off (no DTC)		-	(see page 19-B-16)
11	ON	OFF	Wheel sensor (open/short to power)		FR	(see page 19-B-18)
13	ON	OFF	Wheel sensor (open/short to power)		FL	(see page 19-B-18)
15	ON	OFF	Wheel sensor (open/short to power)		RR	(see page 19-B-18)
17	ON	OFF	Wheel sensor (open/short to power)		RL	(see page 19-B-18)
12	ON	OFF	Faulty wheel sensor pulse		FR	(see page 19-B-18)
14	ON	OFF	Faulty wheel sensor pulse		FL	(see page 19-B-18)
16	ON	OFF	Faulty wheel sensor pulse		RR	(see page 19-B-18)
18	ON	OFF	Faulty wheel sensor pulse		RL	(see page 19-B-18)
21	ON	ON	Continuous operation (chipped pulser)		-	(see page 19-B-18)
31	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		FRI	(see page 19-B-20)
32	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		FRO	(see page 19-B-20)
33	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		FLI	(see page 19-B-20)
34	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		FRO	(see page 19-B-20)
35	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		RRI	(see page 19-B-20)
36	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		RRO	(see page 19-B-20)
37	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		RLI	(see page 19-B-20)
38	ON	ON	Solenoid (open/short to body ground/short to power/stuck)		RLO	(see page 19-B-20)
51	ON	OFF	Motor lock		-	(see page 19-B-20)
52	ON	OFF	Motor stuck off		-	(see page 19-B-21)
53	ON	OFF	Motor stuck on		-	(see page 19-B-21)
54	ON	ON	Main relay stuck off		-	(see page 19-B-22)
61	ON	OFF ON	Ignition voltage (low voltage)	Above 7V Below 7V	-	(see page 19-B-20)
81	ON	ON OFF	CPU	Problem occurs except valve relay (VR) stuck on Valve relay (VR) stuck on	-	(see page 19-B-20)

Troubleshooting

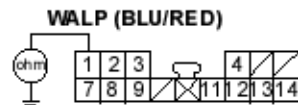
**ABS Indicator Light Does Not Go Off (EU model:
With EBD)**

19-B-13





GAUGE ASSEMBLY 14P CONNECTOR

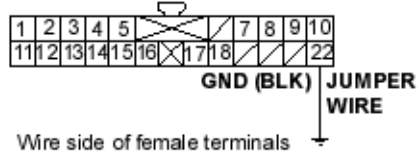


Wire side of female terminals

(From page 19-B-14)

Check for an open in the indicator GND circuit:
1. Turn the ignition switch OFF.
2. Connect the gauge assembly 14P connector.
3. Connect the gauge assembly 22P connector terminal No. 22 and body ground with a jumper wire.
4. Turn the ignition switch ON (II).

GAUGE ASSEMBLY 22P CONNECTOR



Does the ABS indicator come on?

- Repair open in the wire between the gauge assembly and body ground.
- Repair poor ground (G401).

Replace the printed circuit board in the gauge assembly.

– With engine running, the ABS indicator is ON.
 – With the ABS short connector connected (see page 19-B-11), no DTC indicated.

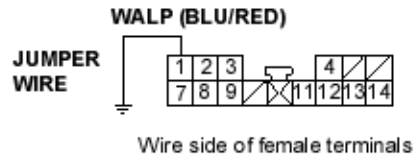
Check the ABS (10 A) fuse in the driver's under-dash fuse relay box and reinstall the fuse if it is OK.

Is the fuse OK? **NO** Replace the fuse and recheck.

YES

Check the gauge assembly:
 1. Connect the gauge assembly 14P connector terminal No. 1 and body ground with a jumper wire.
 2. Turn the ignition switch ON (II).

GAUGE ASSEMBLY 14P CONNECTOR

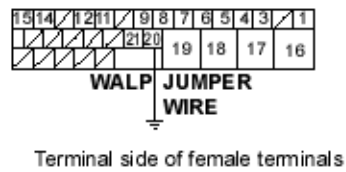


Does the ABS indicator go off? **NO** Replace the printed circuit board in the gauge assembly

YES

Check for an open in the WALP circuit:
 1. Turn the ignition switch OFF.
 2. Disconnect the modulator assembly connector.
 3. Connect the terminal No. 20 and body ground with a jumper wire.
 4. Turn the ignition switch ON (II).

MODULATOR ASSEMBLY CONNECTOR



Does the ABS indicator go off? **NO** Repair open in the wire between the gauge assembly and modulator assembly.

YES

Check for open in the IG2 circuit:
 Measure the voltage between the modulator assembly connector terminal No. 15 and body ground.



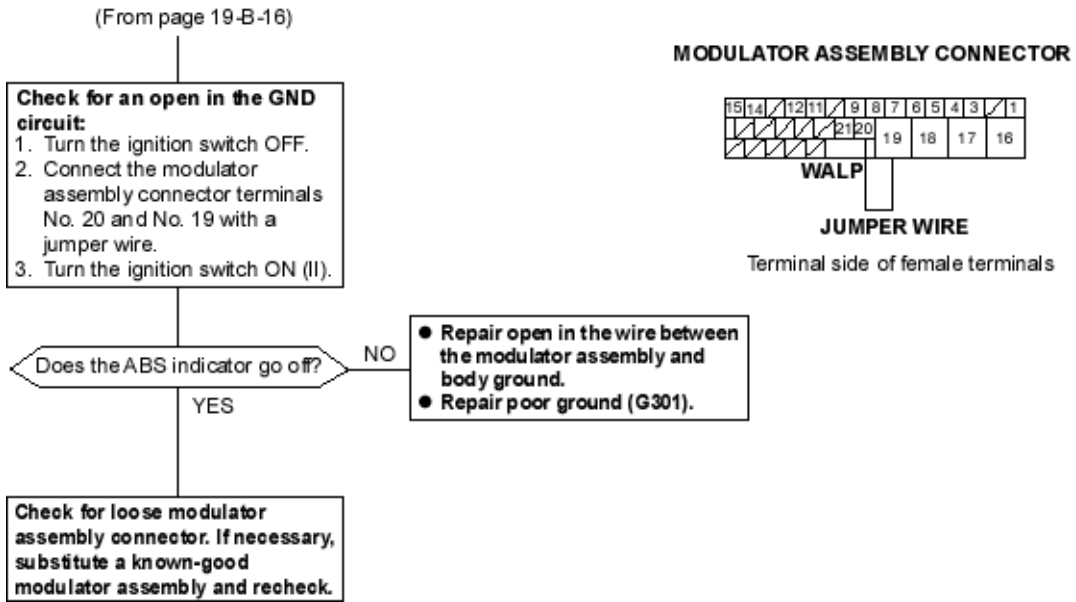
Is there battery voltage? **NO** Repair open in the wire between the ABS (10A) fuse and the modulator assembly.

(To page 19-B-17)

Troubleshooting

ABS Indicator Light Does Not Go Off (No DTC) (cont'd)

19-B-17

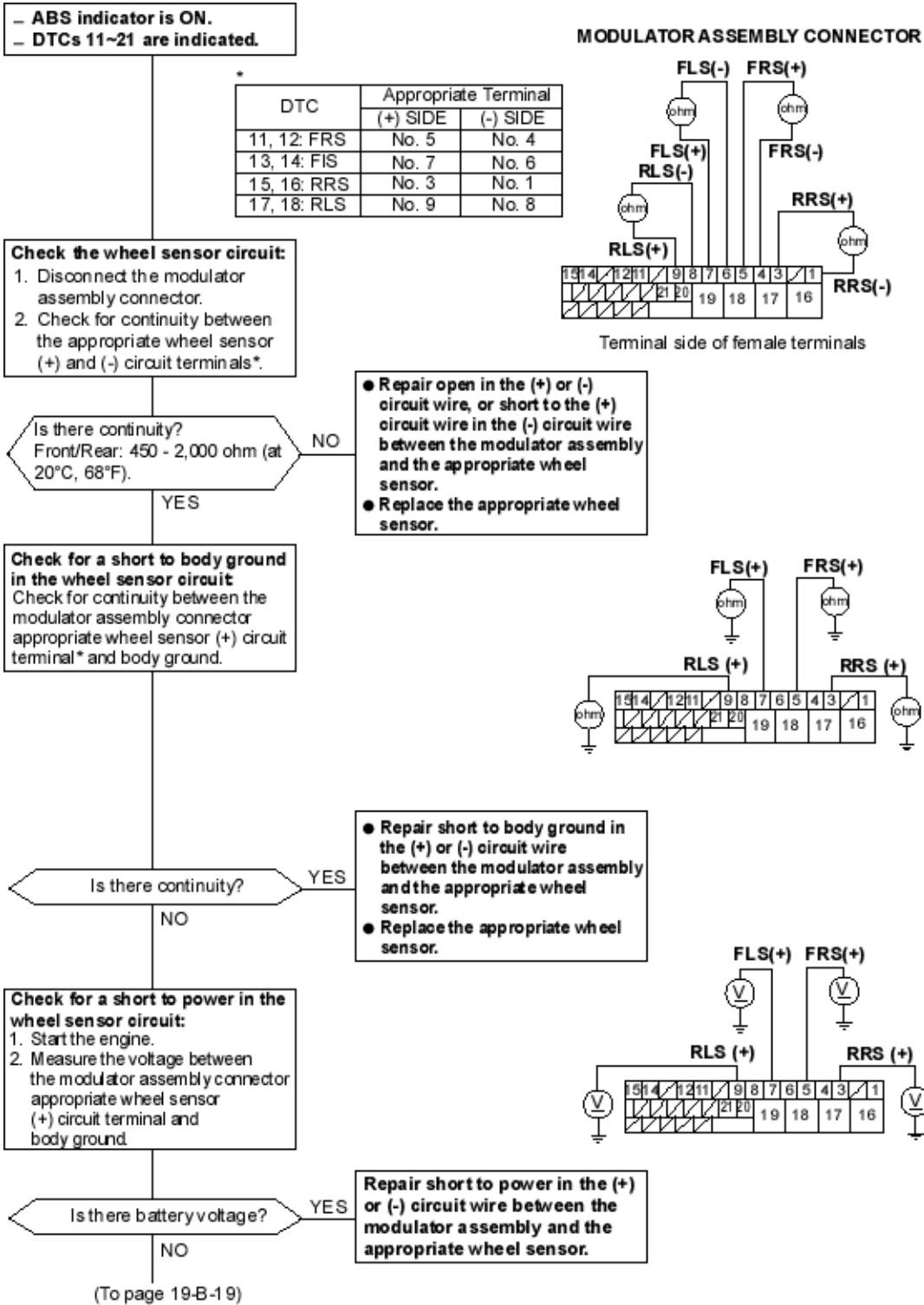


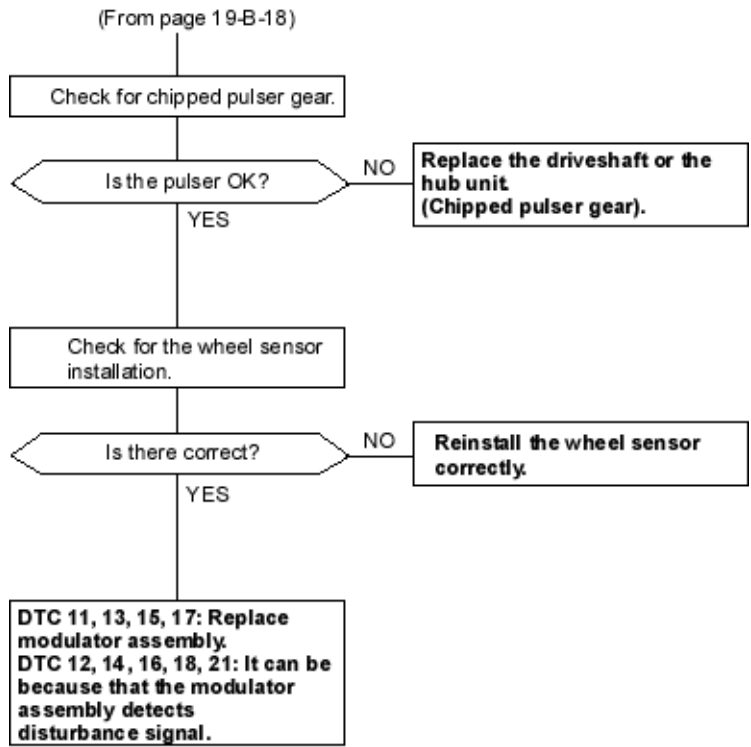
Troubleshooting

19-B-18

DTC: 11, 12, 13, 14, 15, 16, 17, 18, 21

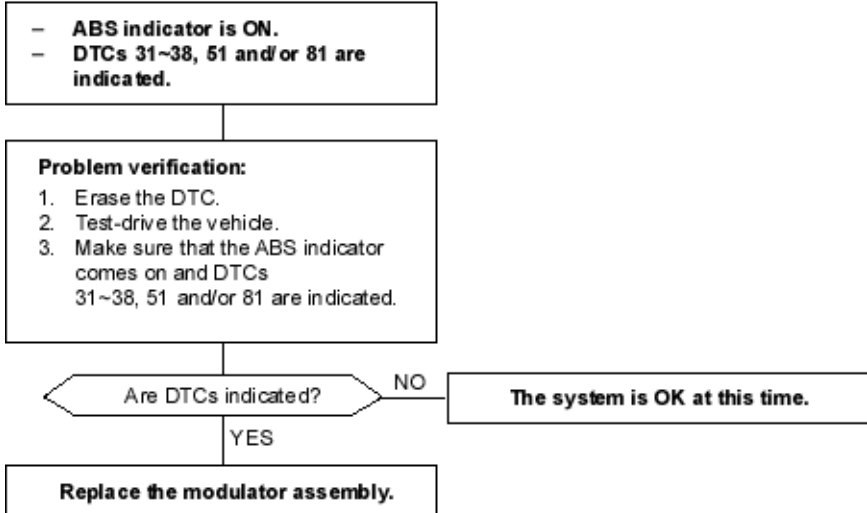
NOTE: The ABS indicator comes on when only drive wheel is turning, and detects disturbance signal etc. Therefore, test drive the vehicle at a speed of 31 mph (50 km/h) or more after turning the ignition switch OFF to ON (II), if the ABS indicator does not come on, the system is OK.



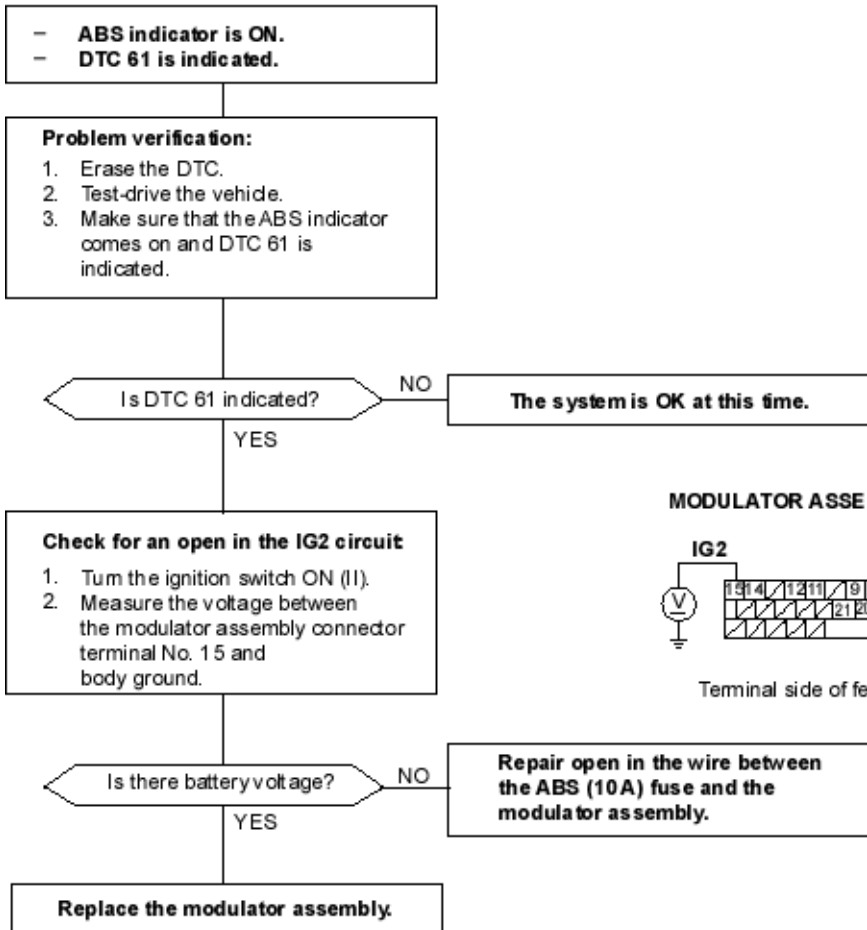


DTC: 31, 32, 33, 34, 35, 36, 37, 38, 51, 81

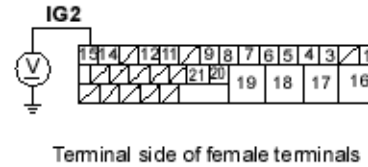
DTC: 31, 32, 33, 34, 35, 36, 37, 38, 51, 81



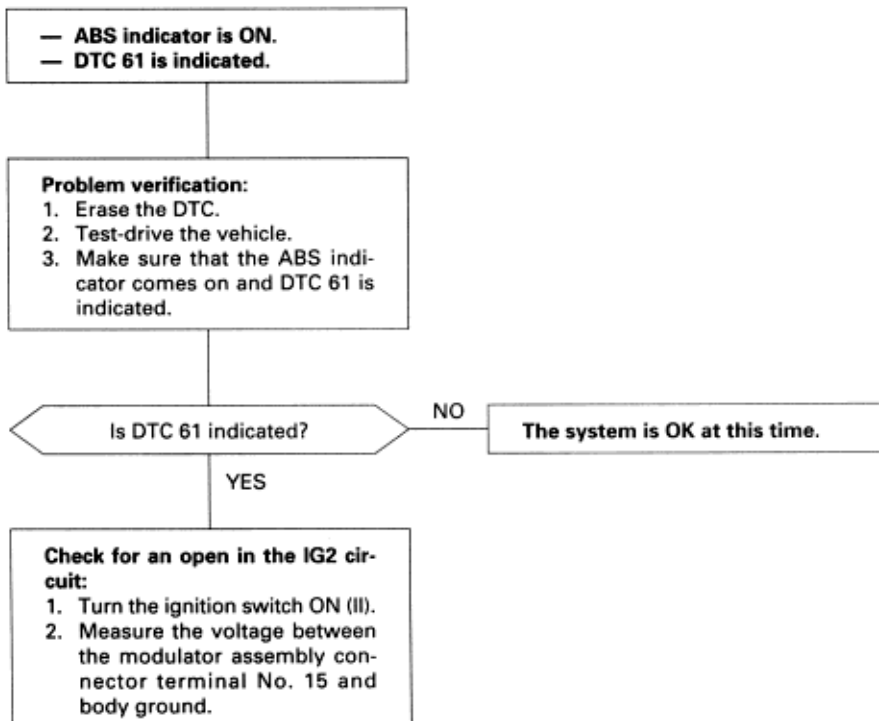
DTC: 61



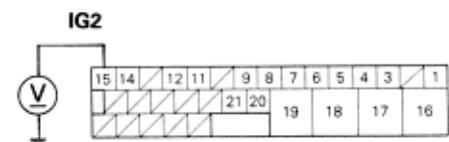
MODULATOR ASSEMBLY CONNECTOR



DTC: 61



MODULATOR ASSEMBLY CONNECTOR



— ABS indicator is ON.
— DTC 61 is indicated.

Problem verification:
1. Erase the DTC.
2. Test-drive the vehicle.
3. Make sure that the ABS indicator comes on and DTC 61 is indicated.

Is DTC 61 indicated? NO **The system is OK at this time.**

YES

Check for an open in the IG2 circuit:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the modulator assembly connector terminal No. 15 and body ground.

Is there battery voltage? NO **Repair open in the wire between the ABS (10 A) fuse and the modulator assembly.**

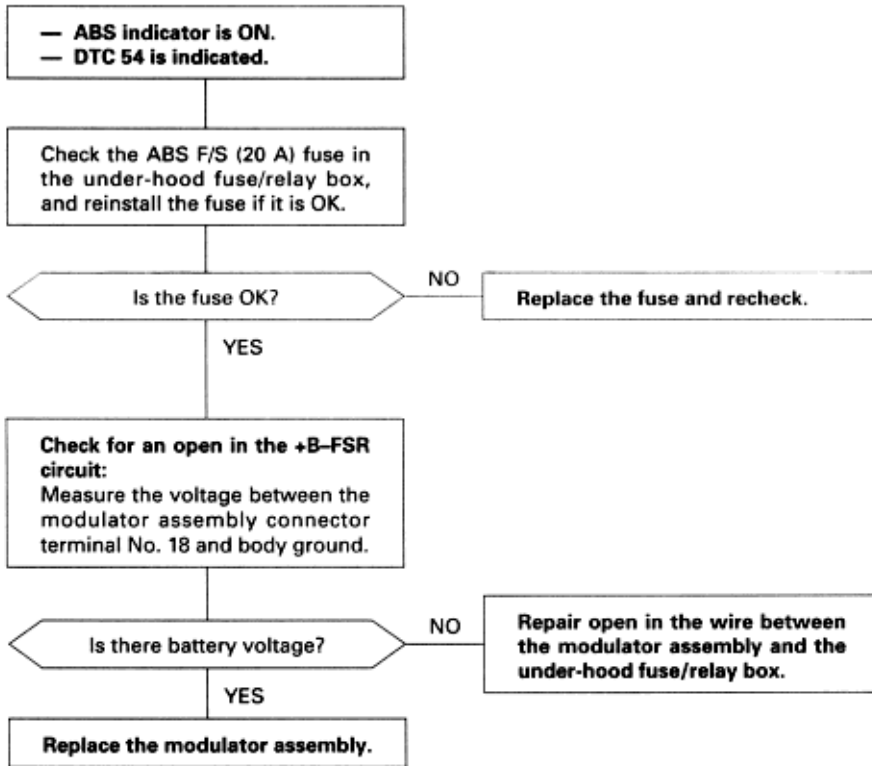
YES

Replace the modulator assembly.

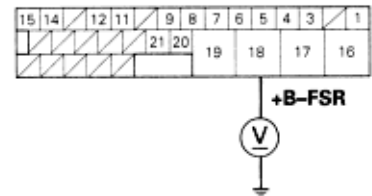
MODULATOR ASSEMBLY CONNECTOR



Terminal side of female terminals



MODULATOR ASSEMBLY CONNECTOR



Terminal side of female terminals

NOTE:

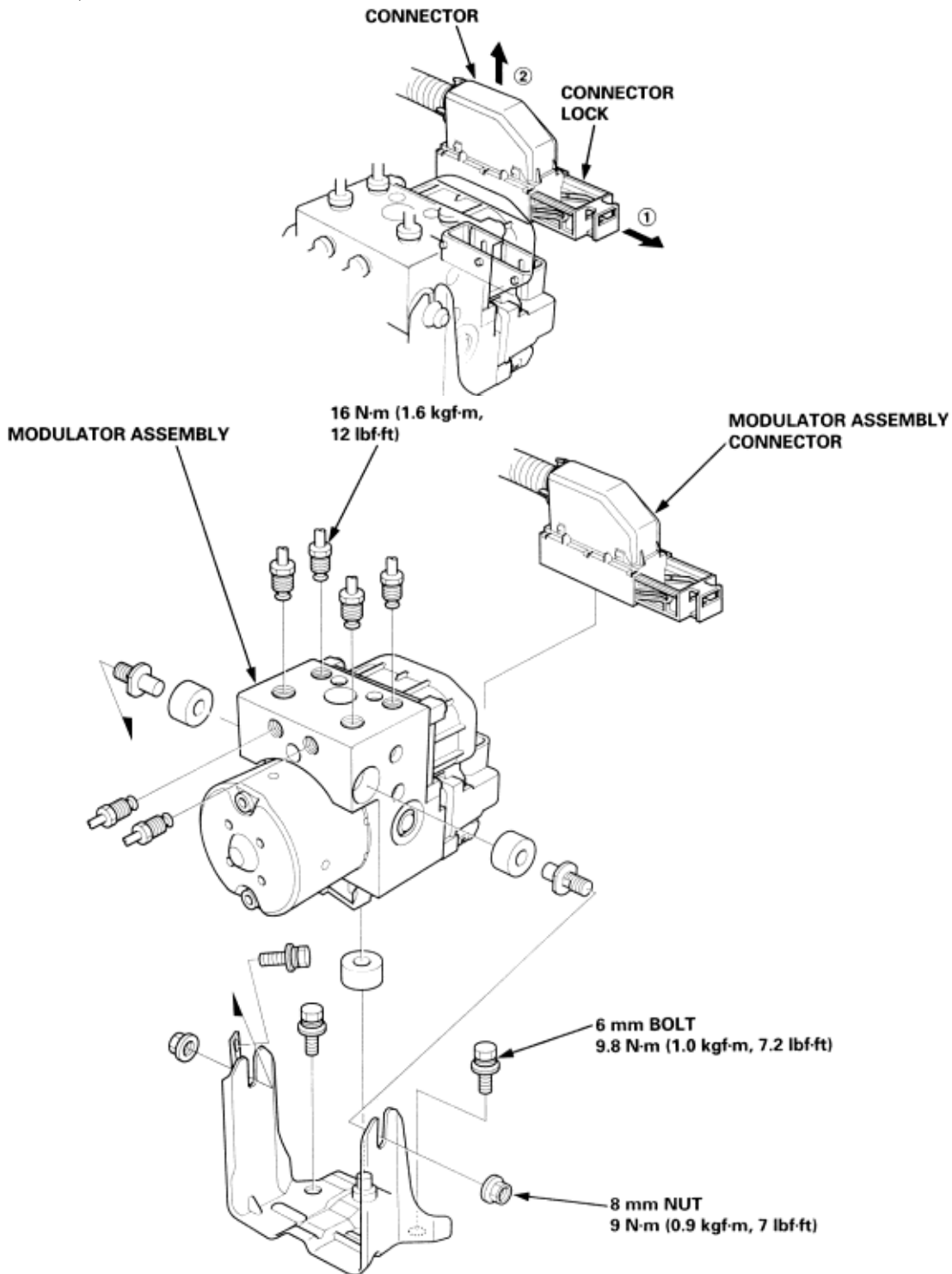
- ♦ Do not spill brake fluid on the vehicle; it may damage the paintwork; if brake fluid does contact the paintwork, wash it off immediately with water.
- ♦ Take care not to damage or deform the brake lines during removal and installation.
- ♦ To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

1. Disconnect the modulator assembly connector as described below.
 - (1) Pull the connector lock.
 - (2) Disconnect the connector.
2. Disconnect the brake pipes, then remove the modulator assembly.

Installation

1. Install the modulator assembly, then connect the brake pipes.
2. Connect the modulator assembly connector in the reverse order of disconnection.
3. Bleed the brake system, starting with the front wheels.
4. Start the engine, and check that the ABS indicator goes off.
5. Test-drive the vehicle, and check that the ABS indicator does not come on.



Pulsers/Wheel Sensors Inspection

19-B-24

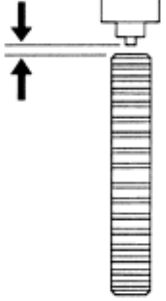
Wheel Sensor Replacement

1. Check the front and rear pulser for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser. If the air gap exceeds 1.0 mm (0.4 in), check for a bent suspension arm.

Standard:

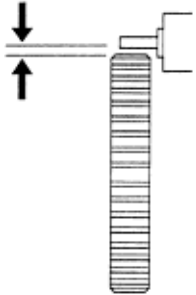
Front: 0.4-1.2 mm (0.02-0.05 in)

Rear: 0.19-1.14 mm (0.01-0.04 in)

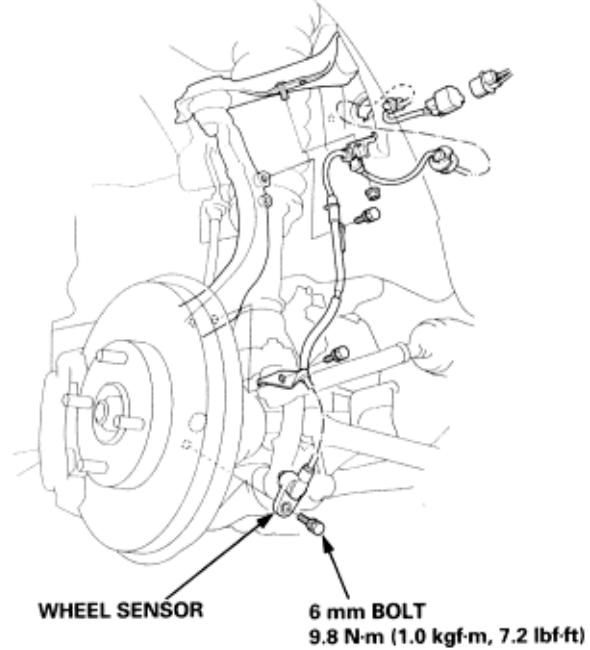


Rear:

Remove the rear brake disc to inspect the rear wheel sensor air gap.

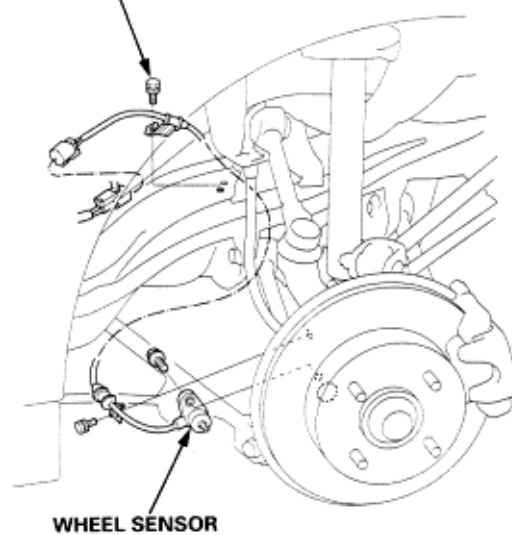


Install the sensors carefully to avoid twisting the wires.
Front:



Rear:

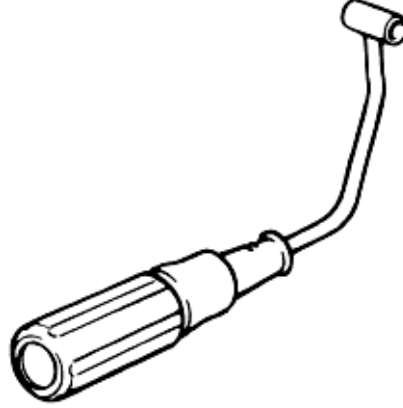
6 mm BOLT
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)



Special Tools

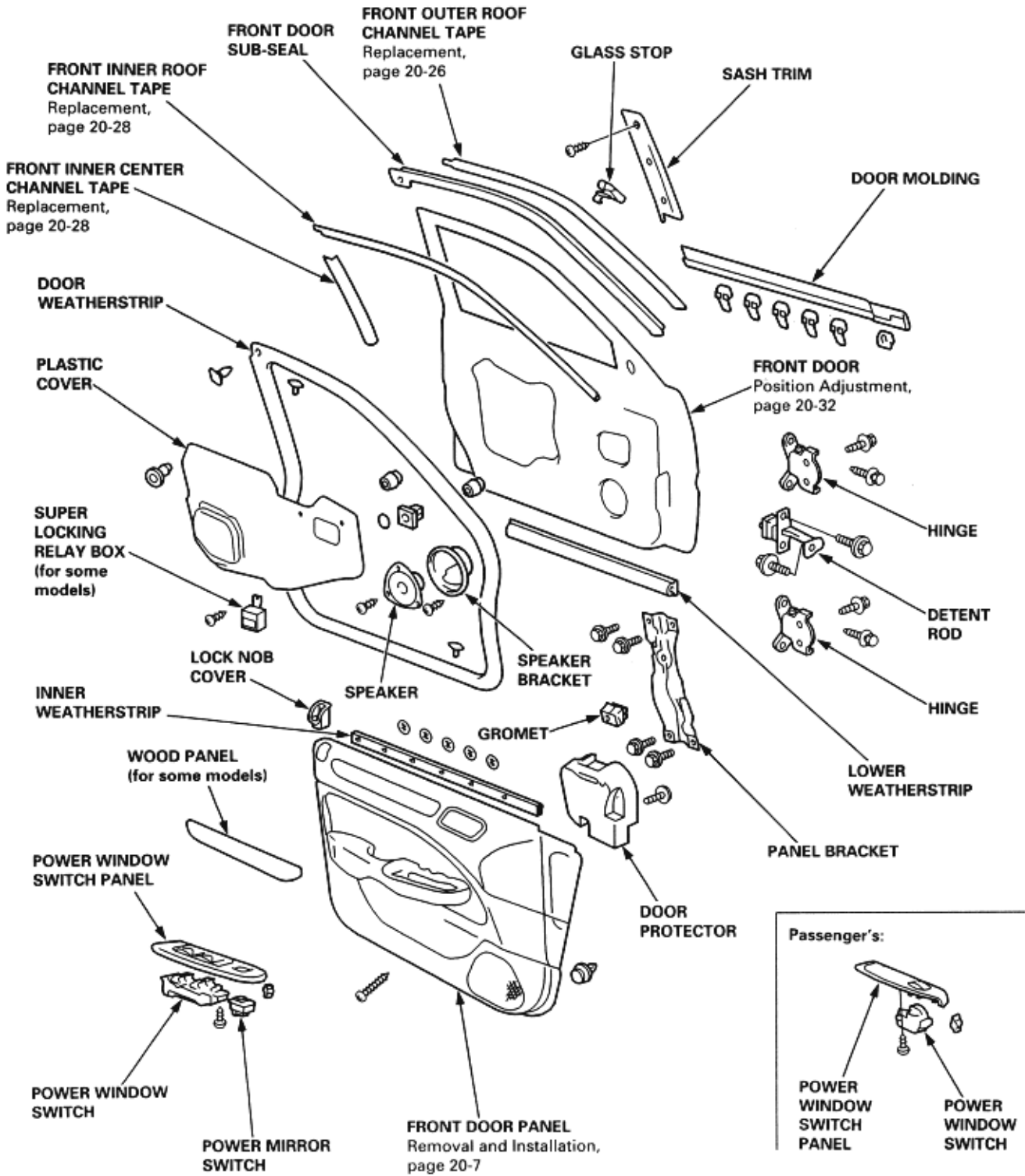
20-2

Ref No.	Tool Number	Description	Qty	Remark
1	07GAZ - SE30100	Torsion Bar Assembly Tool	1	



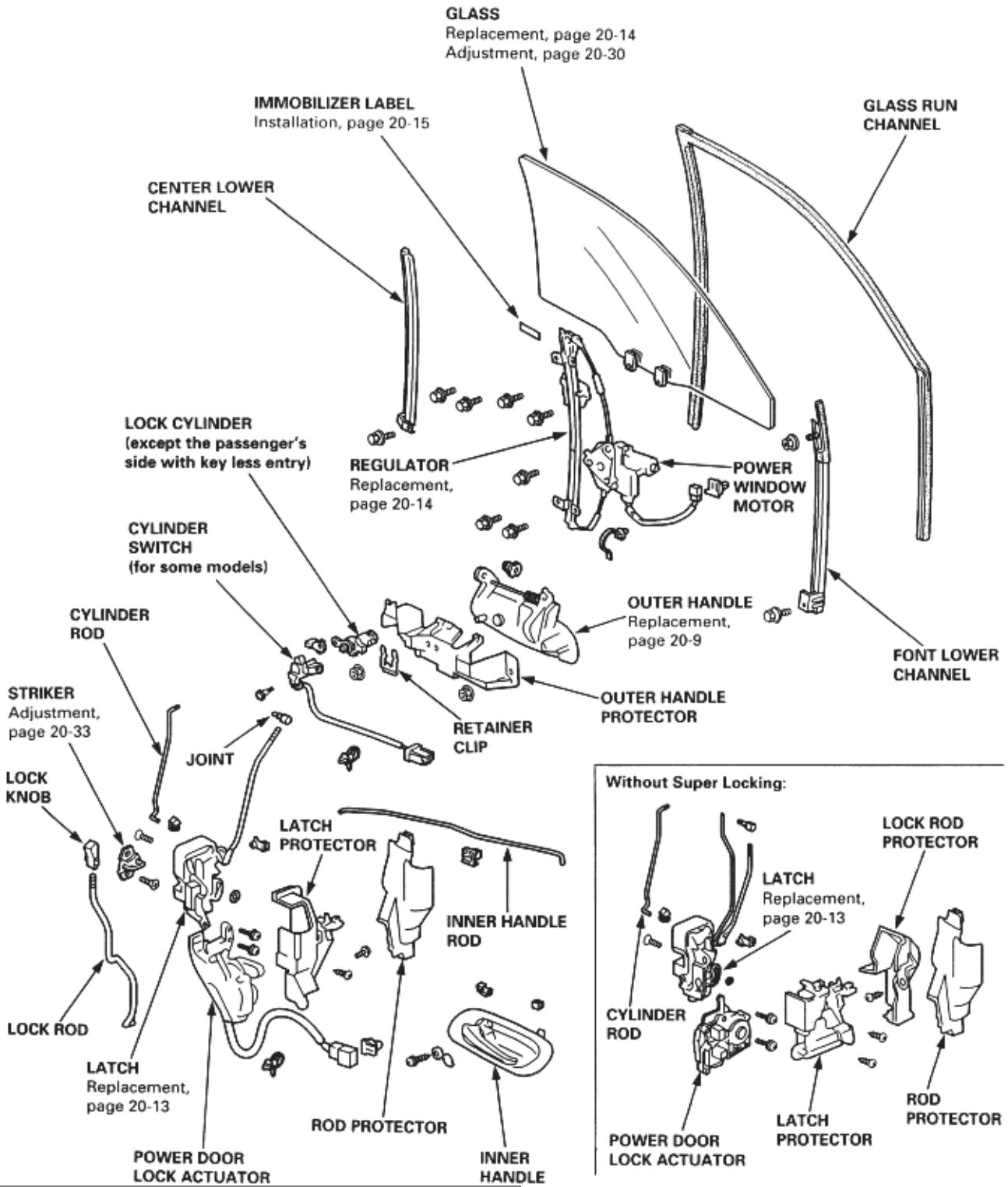
①

Front Door:



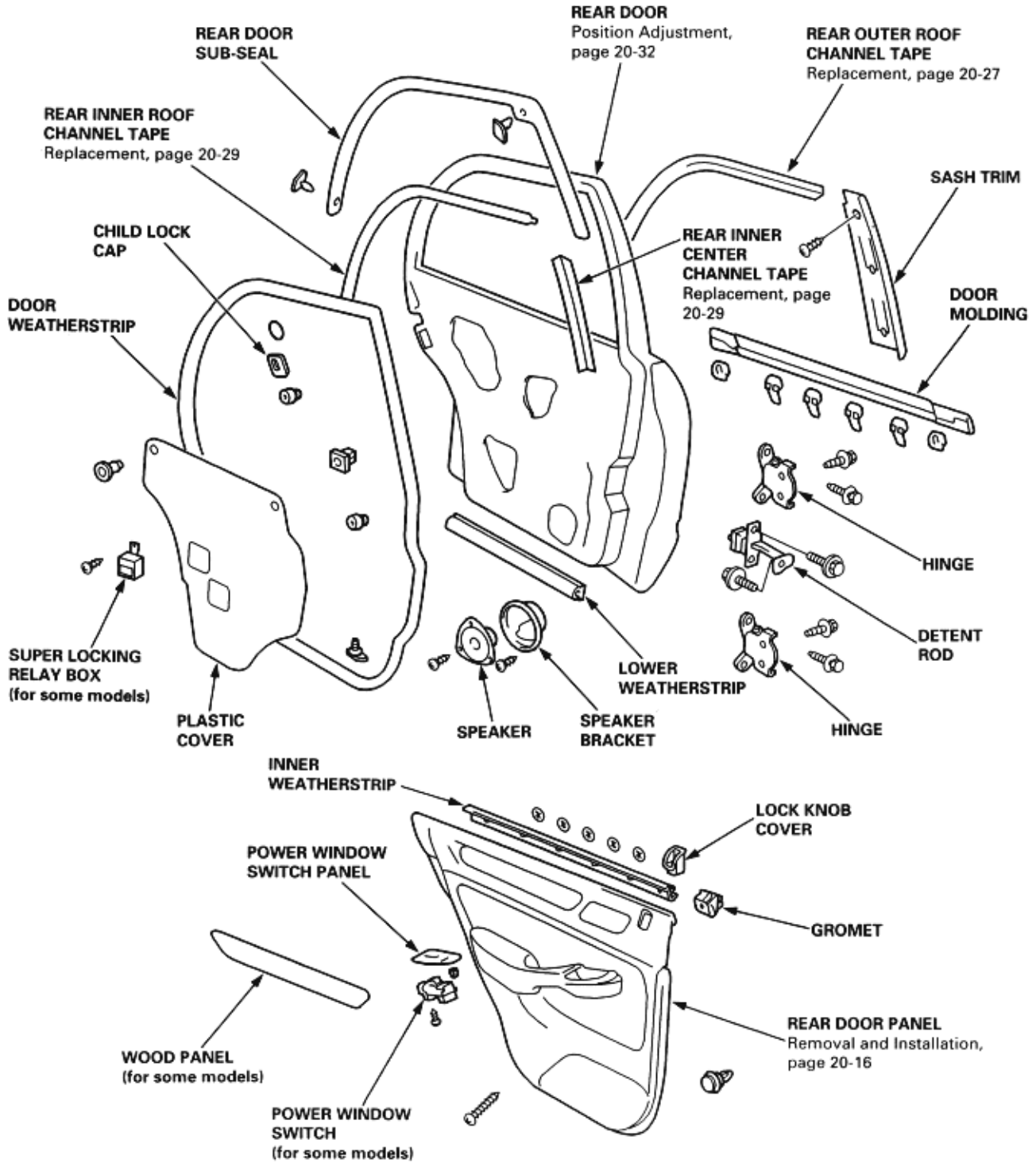
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 20-26\)](#)
[\(See Page 20-28\)](#)
[\(See Page 20-32\)](#)
[\(See Page 20-7\)](#)

**Front Door:
With Super Locking**



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 20-14\)](#)
[\(See Page 20-30\)](#)
[\(See Page 20-15\)](#)
[\(See Page 20-14\)](#)
[\(See Page 20-9\)](#)
[\(See Page 20-33\)](#)
[\(See Page 20-13\)](#)

Rear Door:



To go to the pages referenced on the diagram above, click on the following:

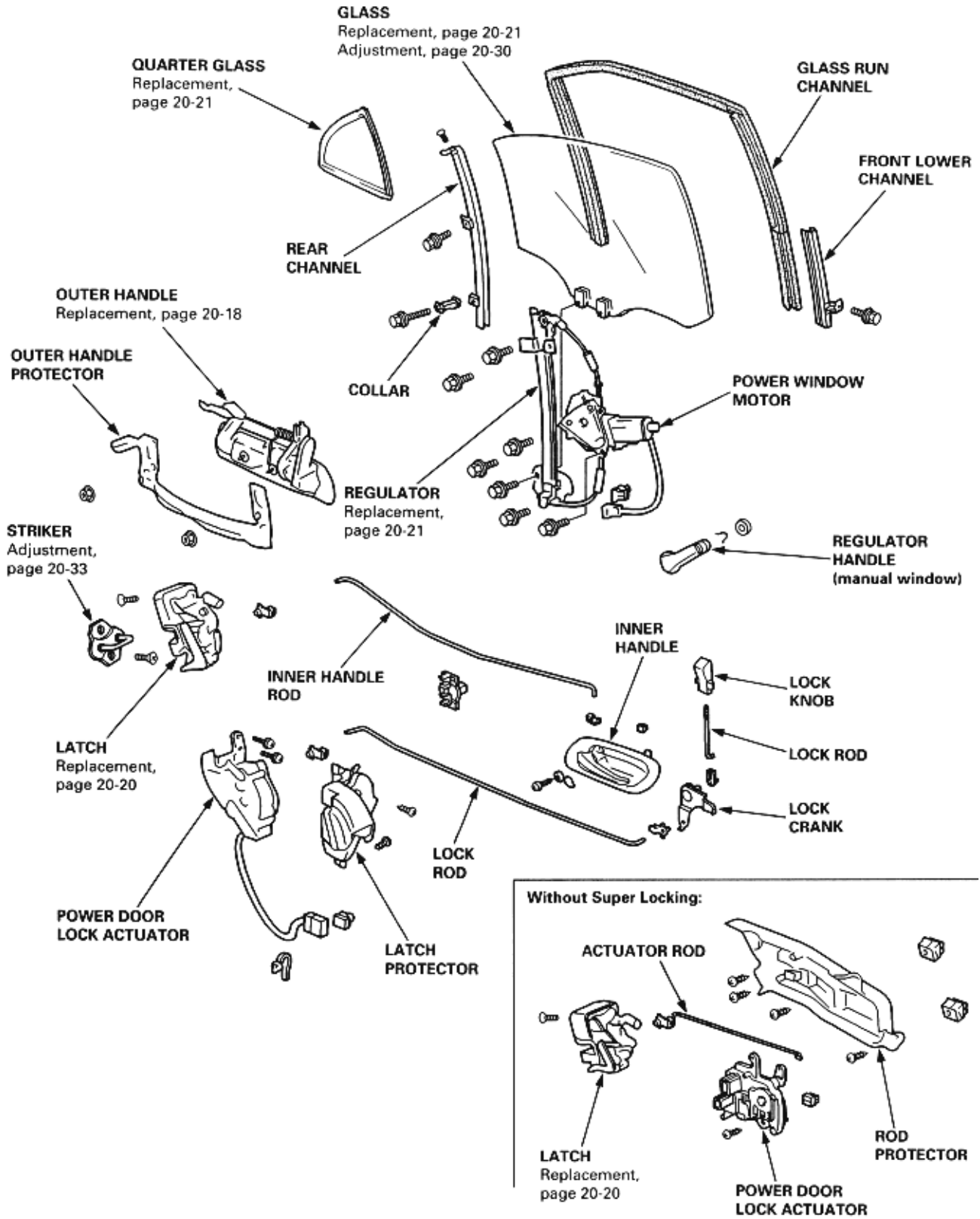
(See Page 20-32)

(See Page 20-27)

(See Page 20-29)

(See Page 20-16)

**Rear Door:
With Super Locking**



To go to the pages referenced on the diagram above, click on the following:

(See Page 20-21)

(See Page 20-30)

(See Page 20-18)

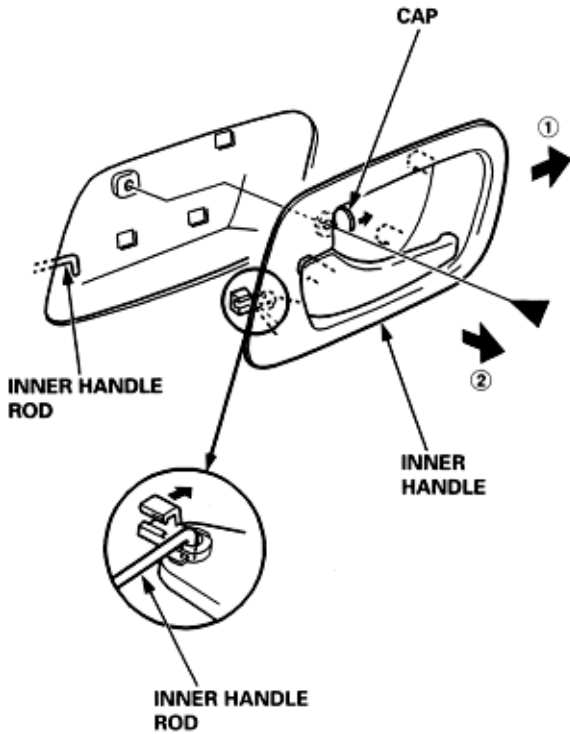
(See Page 20-33)

(See Page 20-20)

Front Door Panel Removal and Installation

1. Lower the glass fully.
2. Remove the mirror mount cover (See Page 20-35). Take care not to scratch the door panel.
3. Remove the inner handle. Take care not to scratch the door panel.
 - 1. Pry out the cap, and remove the screw.
 - 2. Pull the inner handle forward and out half-way.
 - 3. Disconnect the inner handle rod.

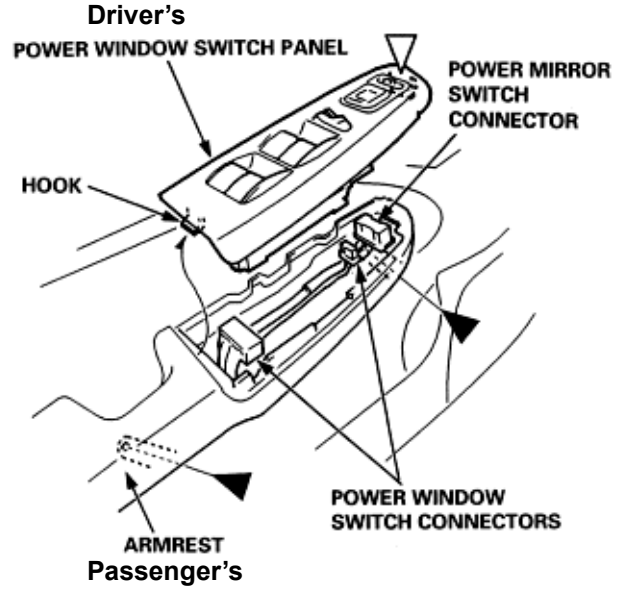
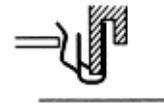
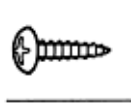
►: Screw location, 1



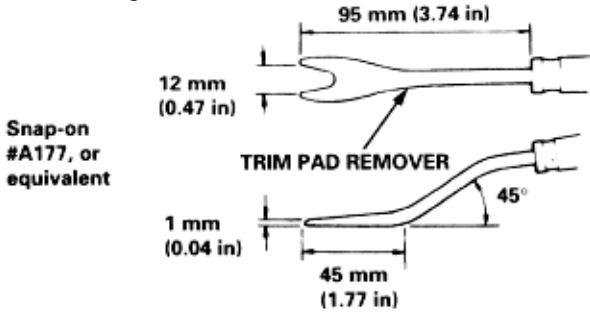
4. Remove the power window switch panel. Take care not to scratch the door panel.
 - 1. Pull the power window switch panel out half-way.
 - 2. Disconnect the power window switch connector, and the power mirror switch connector, driver's side only.
5. Remove the screws from lower portion of the armrest.

►: Screw locations, 2

▷: Clip location, 1



- Release the clips that hold the door panel with a trim pad remover (commercially available), then remove the door panel by pulling it upwards. Remove the door panel with as little bending as possible to avoid creasing or breaking it.



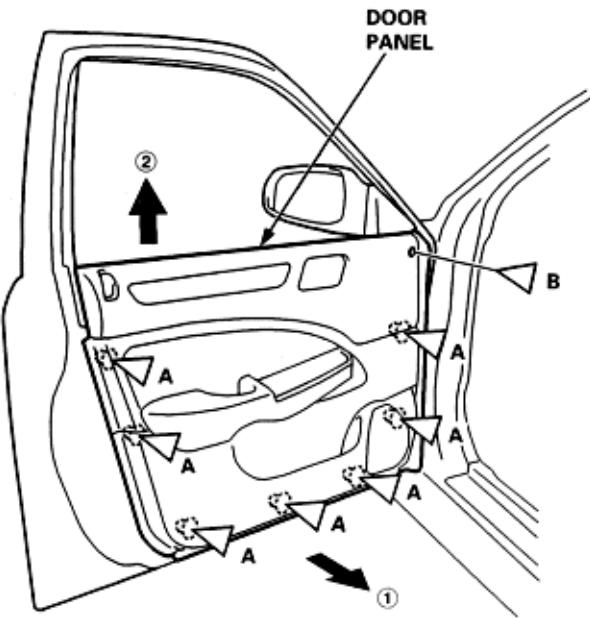
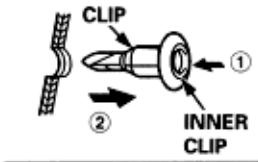
Snap-on #A177, or equivalent

▷: Clip locations
A ▷, 7



B ▷, 1

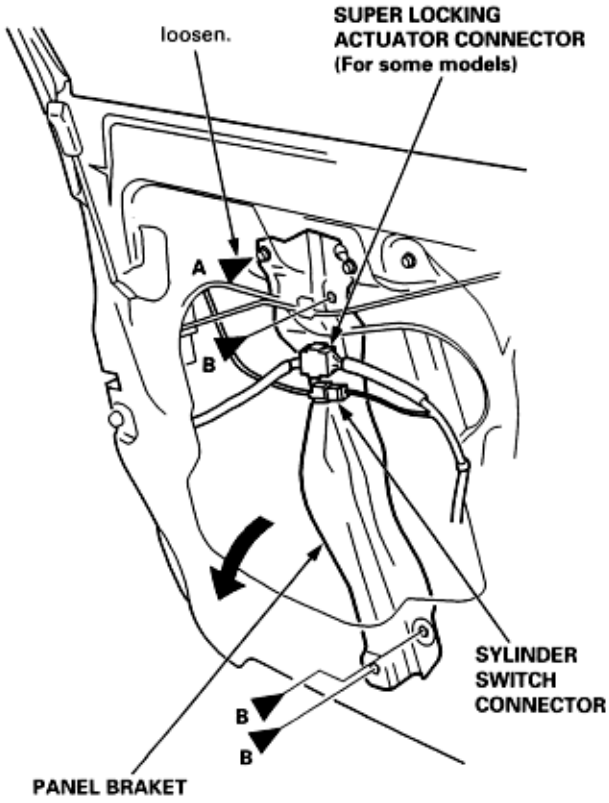
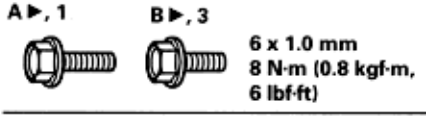
NOTE: Do not push the inner clip in too far.



- Install in the reverse order of removal, and make sure the connectors are plugged in properly, and the rod is connected properly.

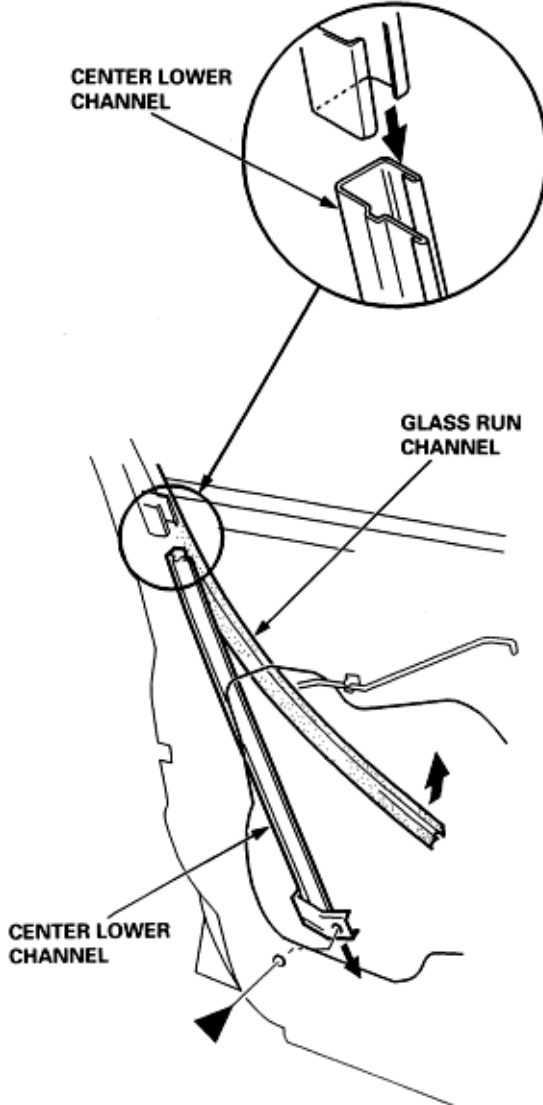
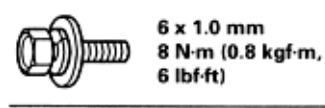
1. Raise the glass fully.
2. Remove:
 - ♦ Door panel (See Page 20-7).
 - ♦ Plastic cover, as necessary (See Page 20-3).
3. Detach the connectors from the panel bracket. Remove the B bolts and loosen the A bolt, then remove the panel bracket through the hole in the door. Wear gloves to protect your hands.

►: Bolt locations

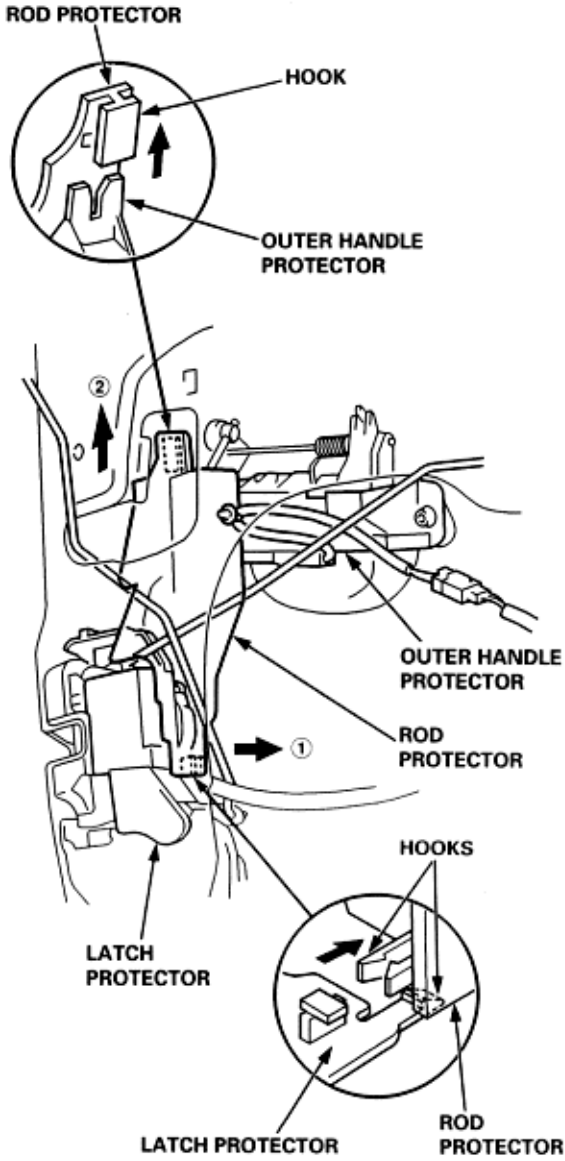


4. Remove the bolt. Pull the glass run channel away as needed from the center lower channel, then remove the center lower channel by pulling it downwards. Wear gloves to protect your hands.

►: Bolt location, 1

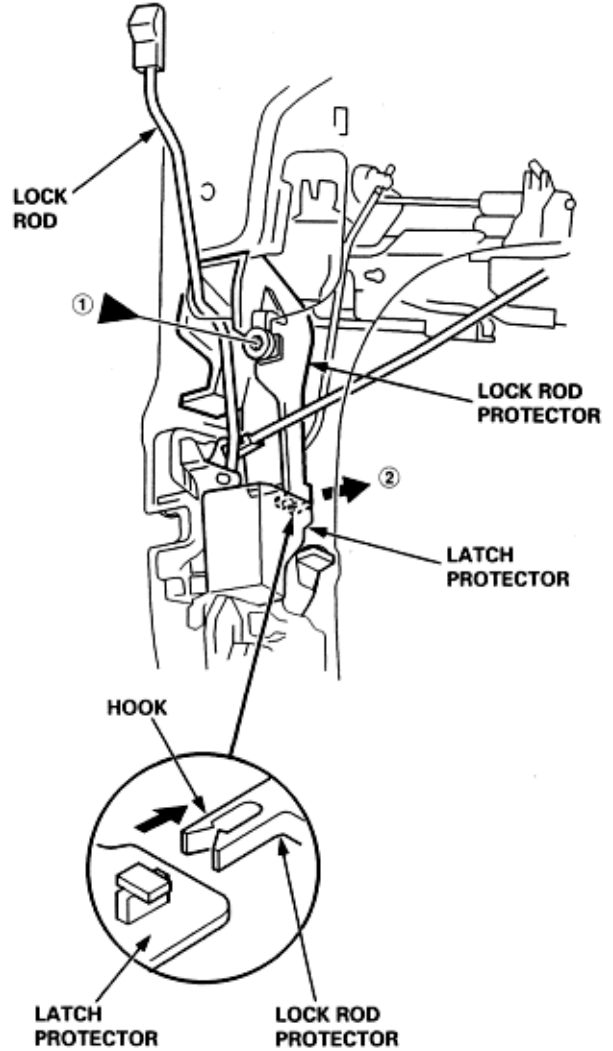
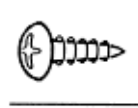


- 5. Remove the key rod protector.
 - 1. Release the hook by pulling the lower portion of the key rod protector forwards.
 - 2. Slide the key rod protector upward to release it from the outer handle protector.

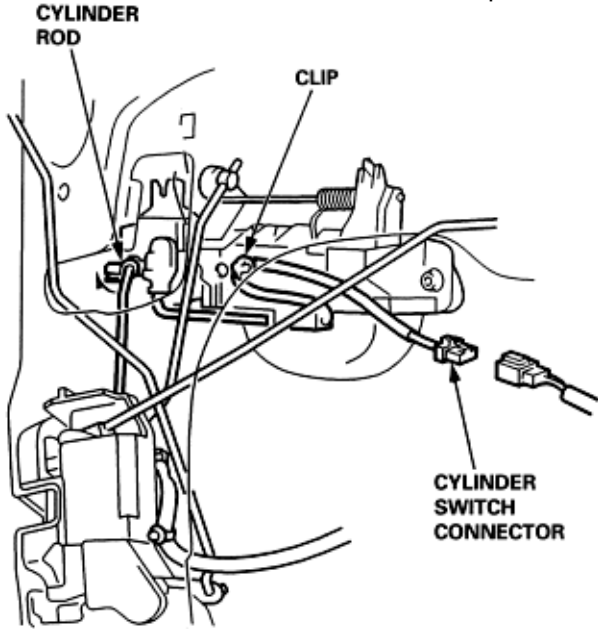


- 6. Without Super Locking: Remove the lock rod protector.
 - 1. Remove a screw securing the lock rod protector to the door.
 - 2. Release the hook by pulling the lock rod protector forward.

►: Screw location, 1




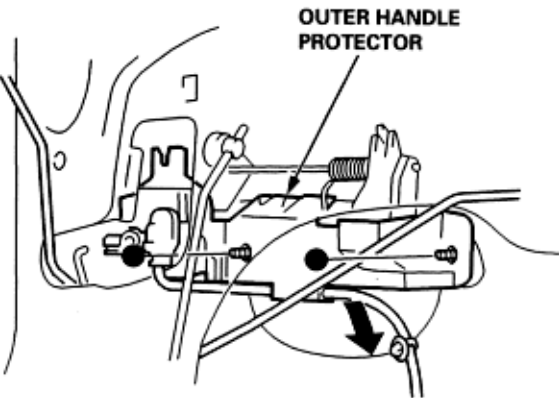
7. Disconnect the cylinder rod, the cylinder switch connector and detach the harness clip.



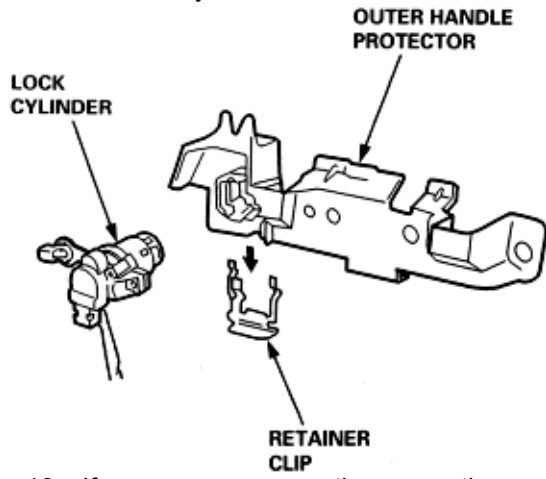
8. Remove the nuts securing the outer handle, then remove the outer handle protector.

●: Nut locations, 2

 **6 x 1.0 mm**
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

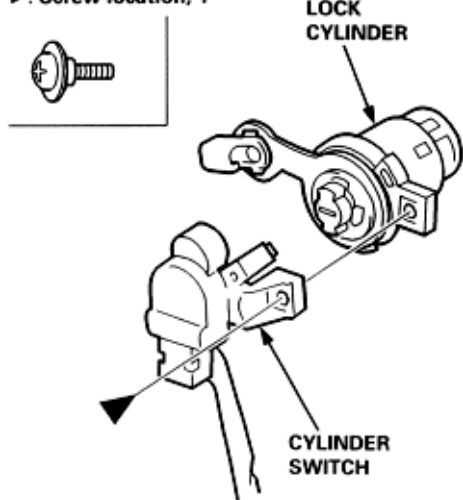


9. If necessary, release the retainer clip, then remove the lock cylinder.




10. If necessary, remove the screw, then separate the lock cylinder and cylinder switch.

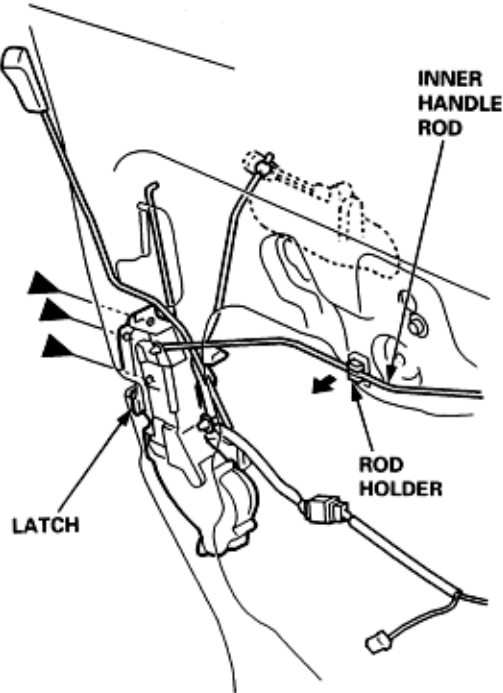
▶: Screw location, 1



11. Release the inner handle rod from the rod holder and remove the screws.

►: Screw locations, 3

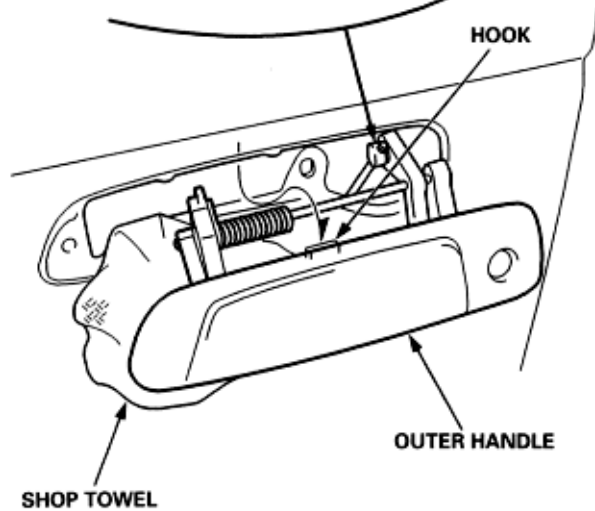
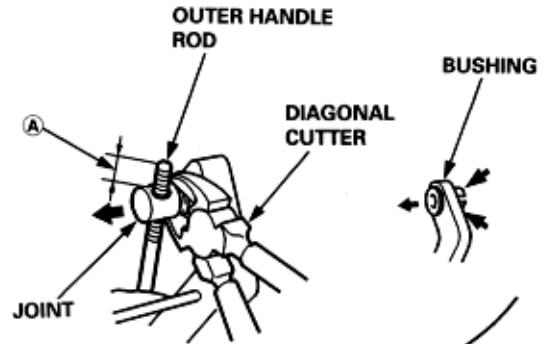
 6 x 1.0 mm
6 N-m (0.6 kgf-m,
4 lbf-ft)



12. Pull out the outer handle by releasing the hook. Pry the outer handle rod out of its joint using a diagonal cutter.

NOTE:

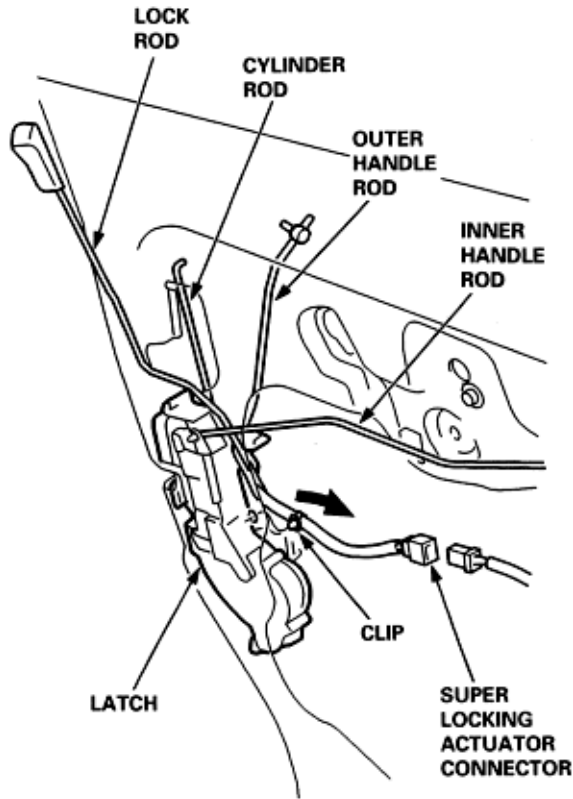
- ♦ To ease reassembly, note the distance (A) of the outer handle rod on the joint before disconnecting it.
- ♦ Take care not to bend the outer handle rod.
- ♦ Use a shop towel to protect the opening in the door.



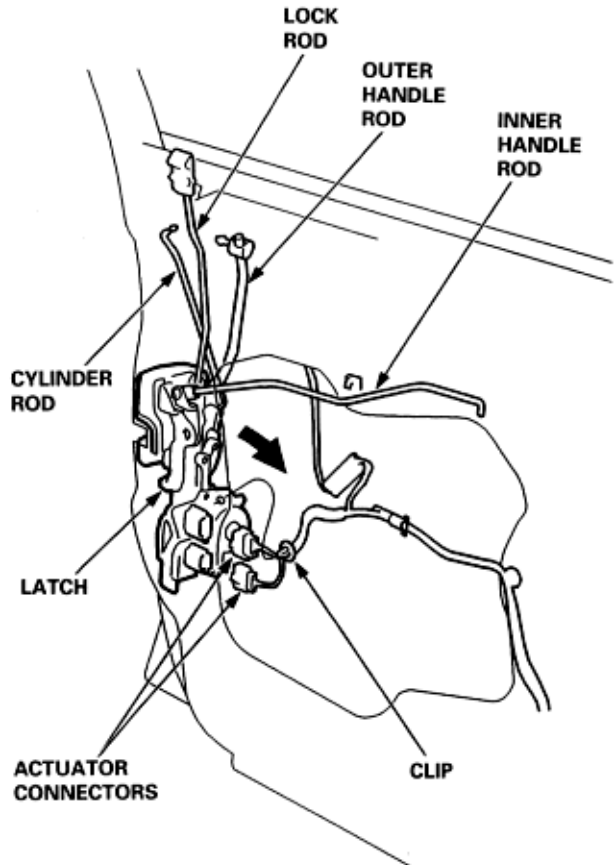
13. Replace the bushing on the outer handle.
14. Install in the reverse order of removal, and note these items:
- ♦ Make sure the cylinder switch harness is routed properly.
 - ♦ Make sure the connector is plugged in properly, and each rod is connected separately.
 - ♦ Make sure the door locks and opens properly.

1. Raise the glass fully.
2. Remove:
 - ♦ Door panel (See Page 20-7).
 - ♦ Plastic cover, as necessary (See Page 20-3).
 - ♦ Outer handle (See Page 20-9).
3. Detach the clip and disconnect the actuator connector(s).

With Super Locking:



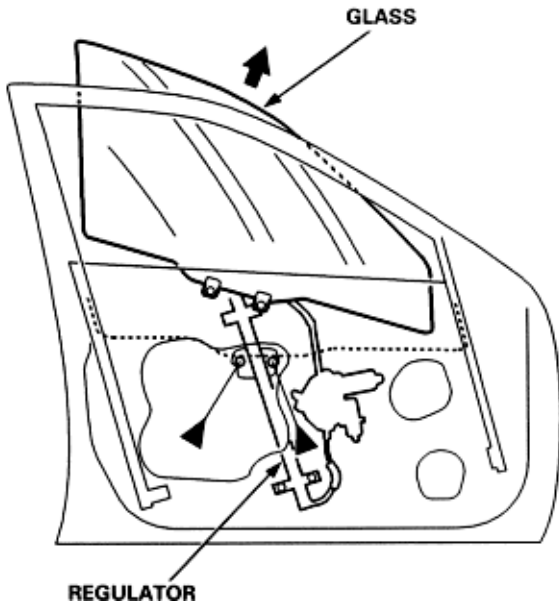
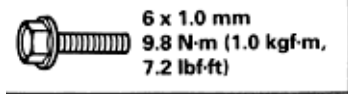
Without Super Locking:



4. Remove the latch through the hole in the door. Take care not to bend the outer handle rod, cylinder rod, lock rod and inner handle rod. Wear gloves to protect your hands.
5. Install in the reverse order of removal, and note the following items:
 - ♦ Make sure the actuator connector(s) are plugged in properly, and each rod is connected securely.
 - ♦ Make sure the door locks and opens properly.

1. Remove:
 - ♦ Door panel (See Page 20-7).
 - ♦ Plastic cover, as necessary (See Page 20-3).
 - ♦ Panel bracket (See Page 20-9).
2. Carefully move the glass down until you can see the bolts, then remove them. Carefully pull the glass out through the window slot. Take care not to drop the glass inside the door.

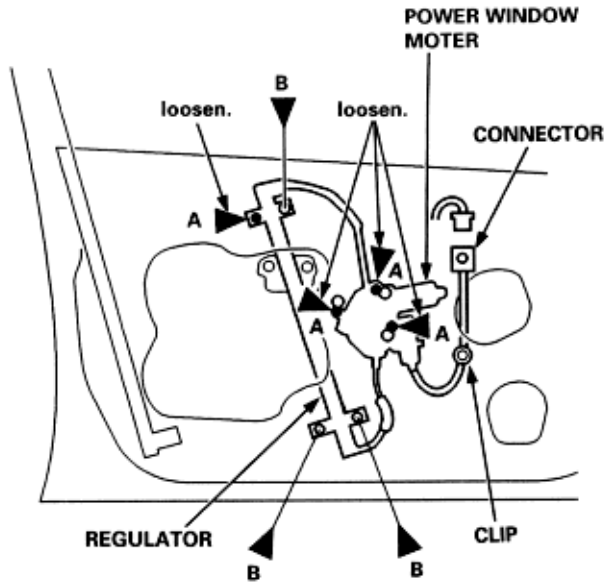
►: Bolt locations, 2



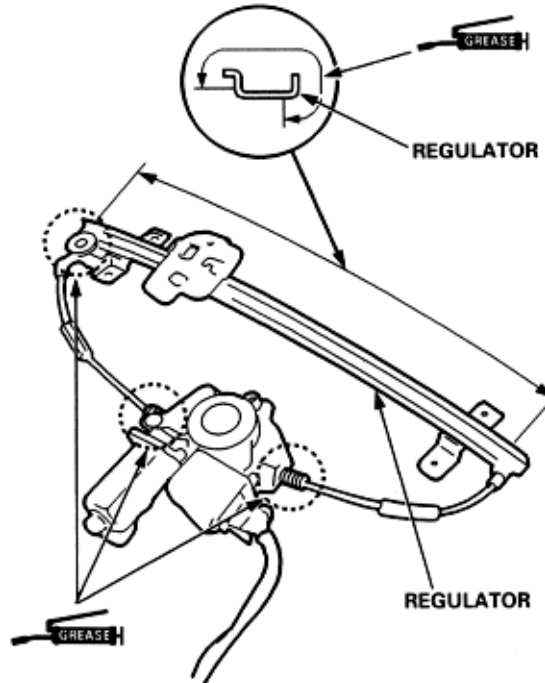
3. Disconnect and detach the connector and clip from the door. Remove the B bolts and loosen the A bolts, then remove the regulator through the hole in the door.

►: Bolt locations

A ►, 4 B ►, 3



4. Grease the area at the points indicated by the arrows.

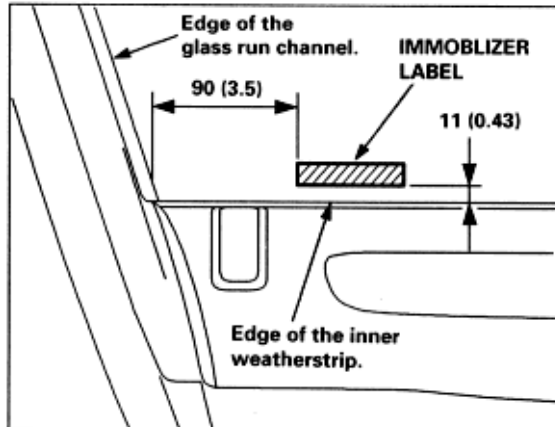


5. Install in the reverse order of removal, and note the following items:
 - ♦ Roll the glass up and down to see if it moves freely without binding.
 - ♦ Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
 - ♦ Adjust the position of the glass as necessary (**See Page 20-30**).

For some models:

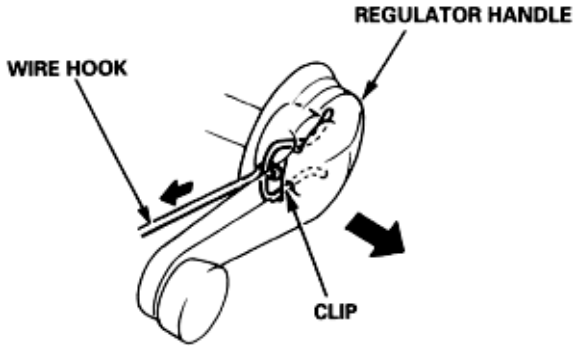
1. Raise the glass fully.
2. Apply the immobilizer label on the inside face of the front door glass where shown.

Unit: mm (in)



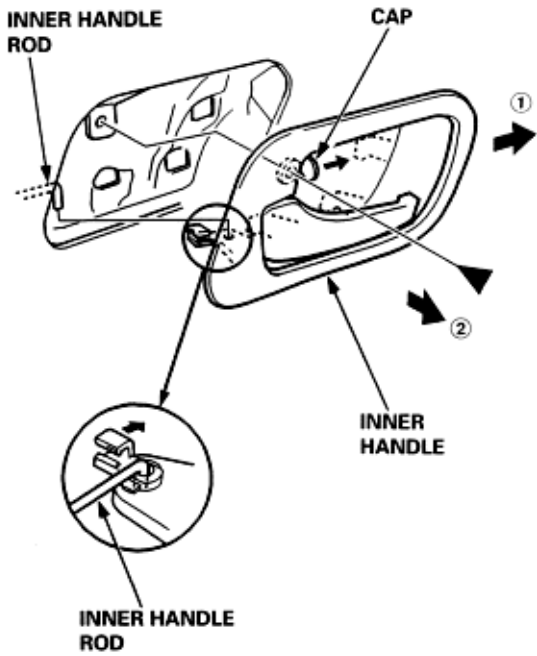
Rear Door Panel Removal and Installation

1. If applicable, remove the regulator handle by pulling the clip out of the wire hook.



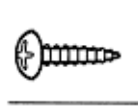
2. Remove the inner handle. Take care not to scratch the door panel.
 - 1. Pry out the cap and remove the screw.
 - 2. Move the inner handle forwards and half-way out, then disconnect the inner handle rod.

►: Screw location, 1

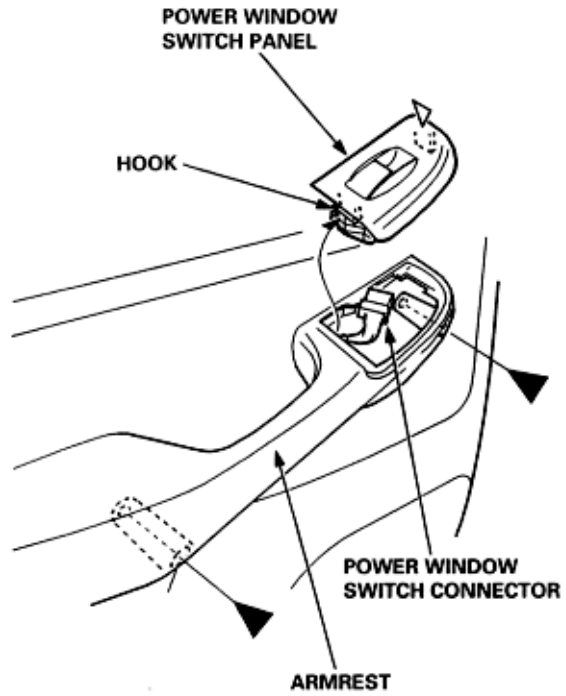
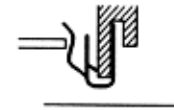


3. With power window: Remove the power window switch panel. Take care not to scratch the door panel.
 - 1. Pull the power window switch panel out half-way.
 - 2. Disconnect the power window switch connector.
4. Remove the screw from the lower portion of the armrest.

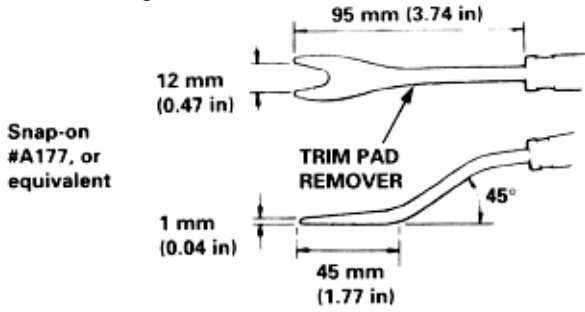
►: Screw location, 2



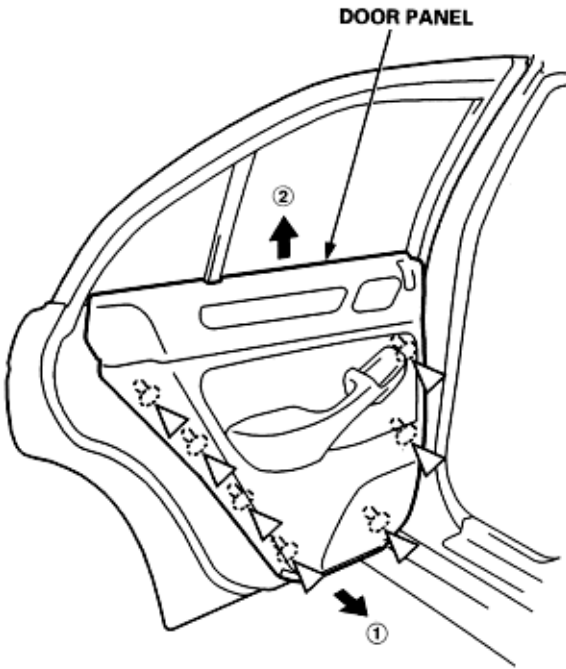
▷: Clip location, 1



5. Release the clips that hold the door panel with a trim pad remover (commercially available), then remove the door panel by pulling it upwards. Remove the door panel with as little bending as possible to avoid creasing or breaking it.

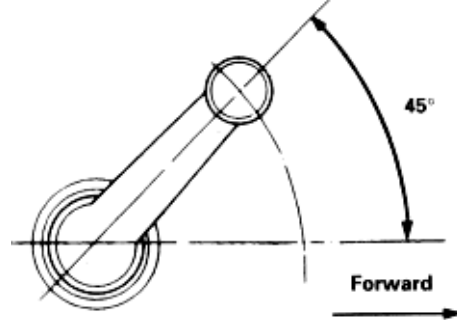


▷: Clip locations, 7



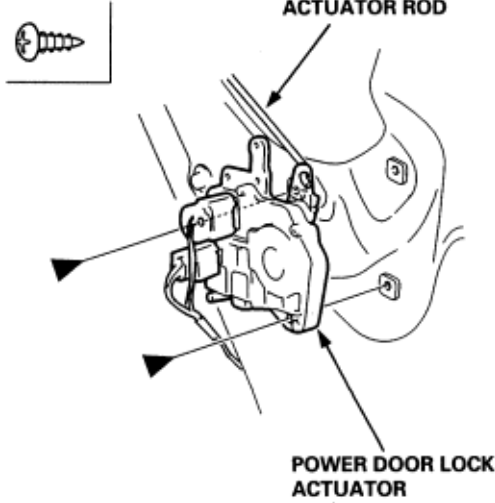
6. Install in the reverse order of removal, and note the following items:

- If applicable, make sure the connector is plugged in properly, and the rod is connected properly.
- If applicable, install the regulator handle so it points forward and up at a 45 degree angle with the glass fully closed.

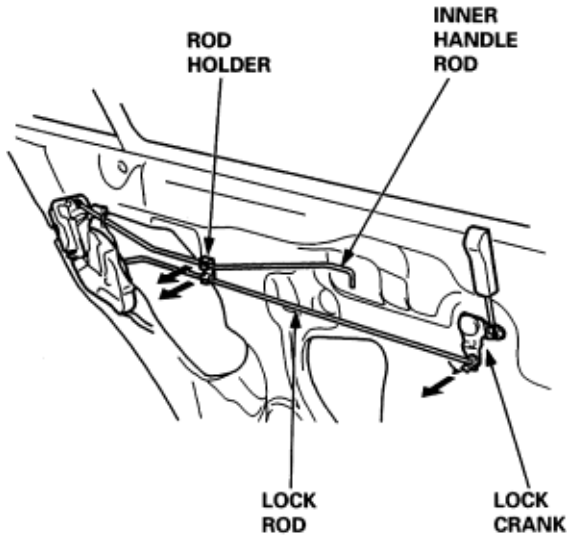


- Remove:
 - ♦ Door panel (See Page 20-16).
 - ♦ Plastic cover, as necessary (See Page 20-5).
- Raise the glass fully.
- Without Super Locking: Remove the screws, then remove the power door lock actuator from the door. Take care not to bend the actuator rod.

►: Screw locations, 2

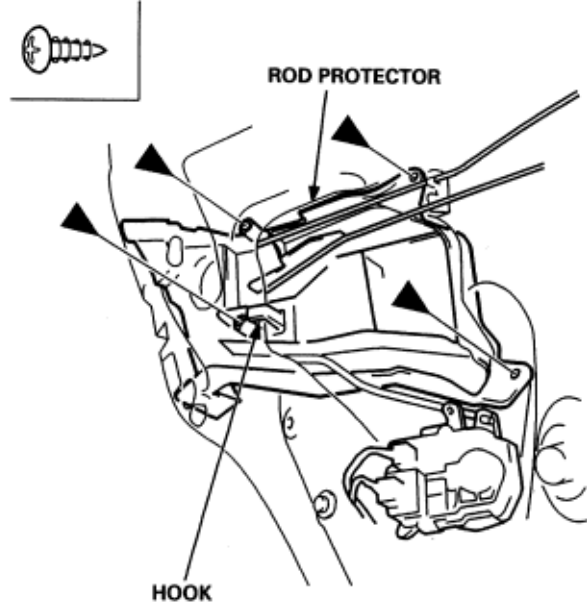


- Disconnect the lock rod from the lock crank, and release the inner handle rod and lock rod from the rod holder.



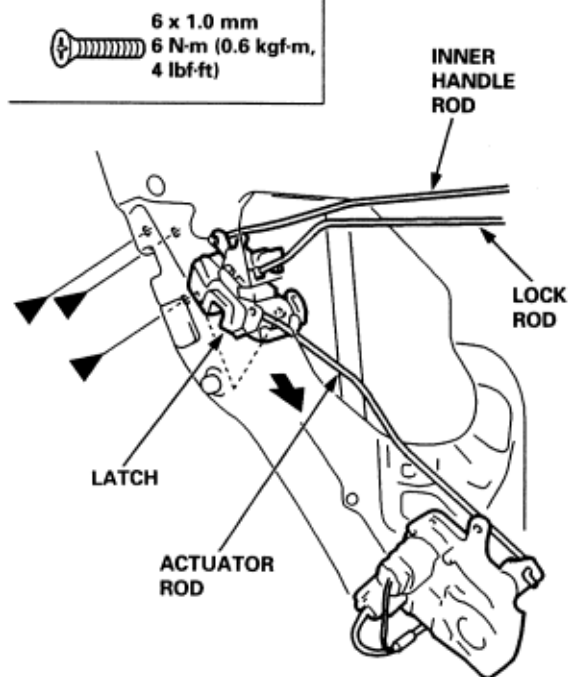
- Without Super Locking: Remove the screws, then remove the rod protector.

►: Screw locations, 4



- Remove the screws, then move the latch down. Take care not to bend the inner handle rod, lock rod and actuator rod. Without Super Locking model is shown. The other model is similar.

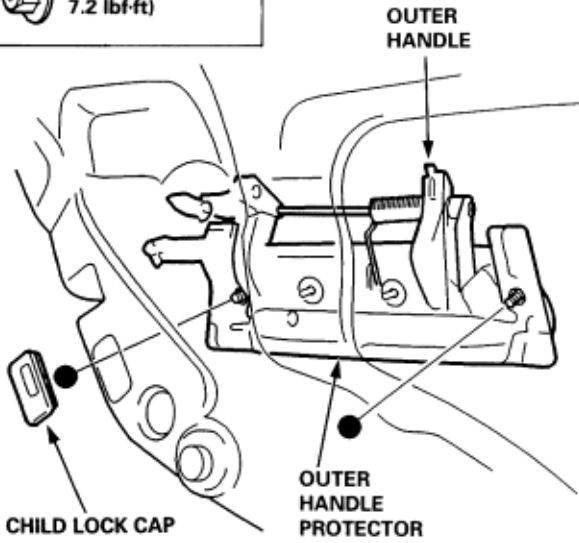
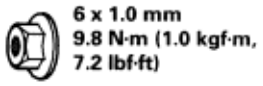
►: Screw locations, 3



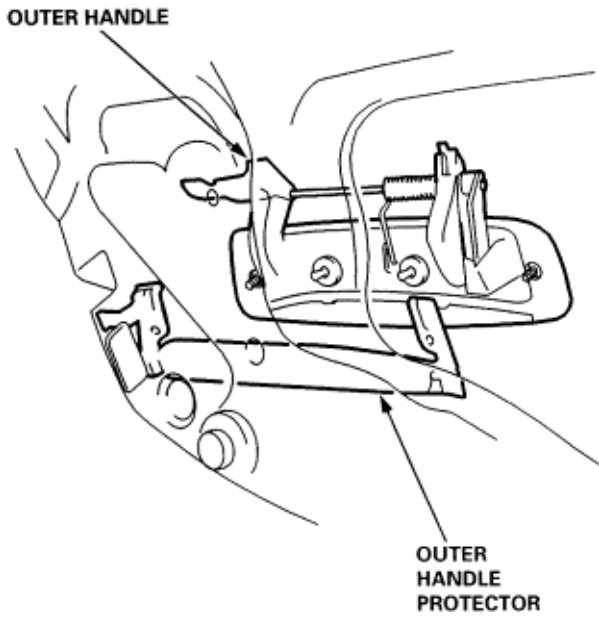
Rear Door Outer Handle Replacement (cont'd)

7. Remove the child lock cap and remove the bolts securing the outer handle protector and outer handle.

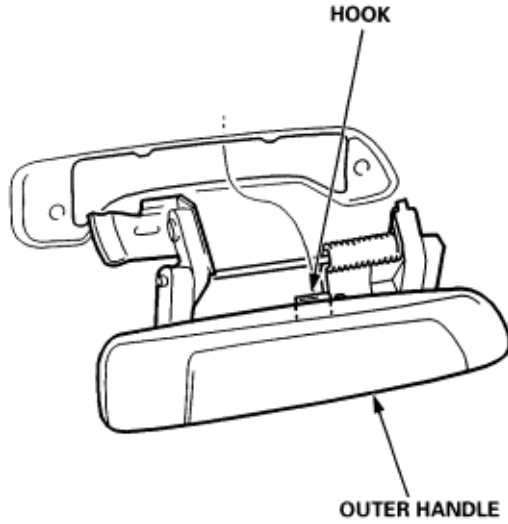
●: Nut locations, 2



8. Remove the outer handle protector from the outer handle.



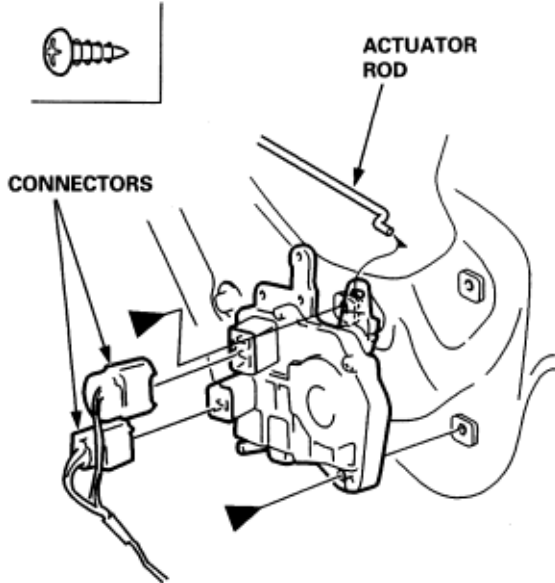
9. Pull out the outer handle by releasing the hook.



10. Install in the reverse order of removal, and make sure the door locks and opens properly.

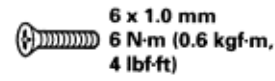
- Remove:
 - Door panel (See Page 20-16).
 - Plastic cover, as necessary (See Page 20-5).
- Raise the glass fully.
- Disconnect the lock rod from the lock crank, and release the inner handle rod and lock rod from the rod holder (See Page 20-18).
- Without Super Locking: Remove the rod protector (See Page 20-18).
- Without Super Locking: Disconnect the connectors and actuator rod, remove the screws, then remove the power door lock actuator.

►: Screw locations, 2

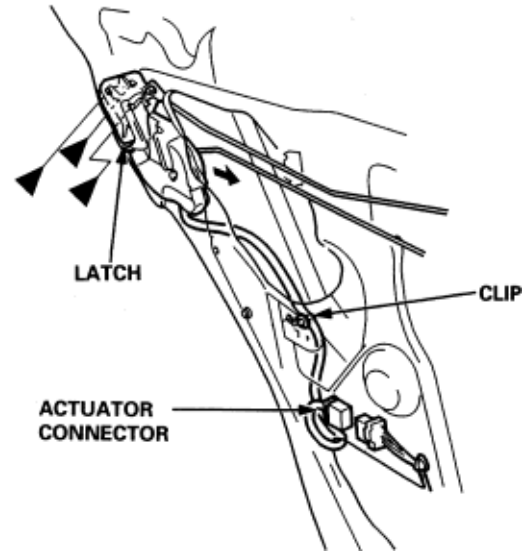


- With Super Locking: Detach the clip and disconnect the actuator connector.
- Remove the screws, then remove the latch through the hole in the door. Take care not to bend the lock rod, and actuator rod. Wear gloves to protect your hands.

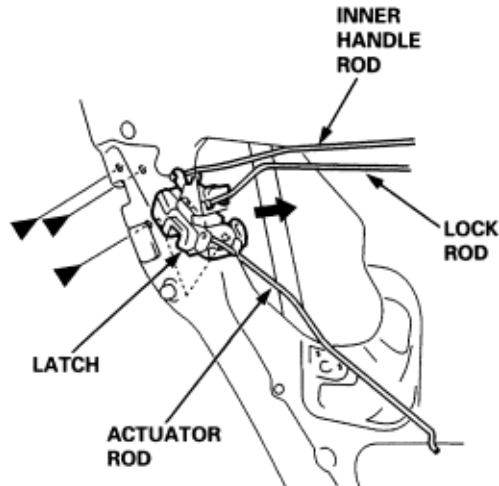
►: Screw locations, 3



With Super Locking:



Without Super Locking:



Doors

Rear Door Latch Replacement (cont'd)

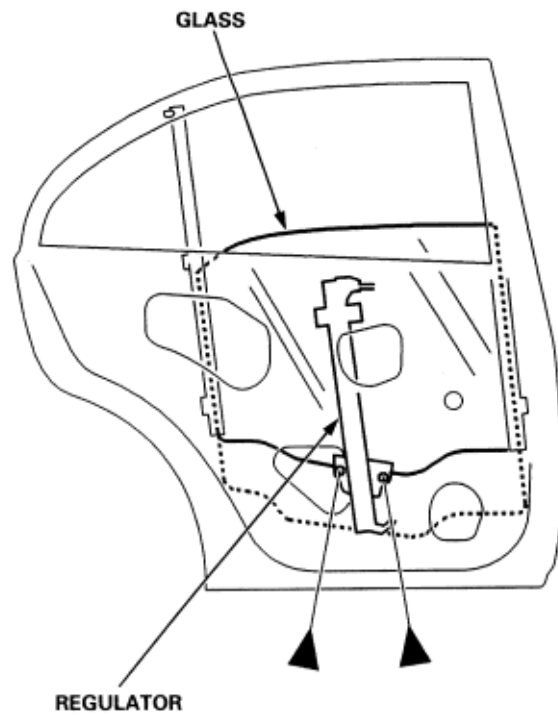
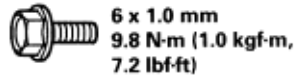
20-21

Rear Door Glass, Quarter Glass and Regulator Replacement

8. Install in the reverse order of removal, and note these items:
 - ♦ Make sure the connectors are plugged in properly and each rod is connected securely.
 - ♦ Make sure the door locks and opens properly.

1. Remove:
 - ♦ Door panel (**See Page 20-16**).
 - ♦ Plastic cover, as necessary (**See Page 20-5**).
 - ♦ Rod protector, as necessary (**See Page 20-18**).
2. Carefully move the glass until you can see the bolts, loosen them and carefully lower the glass. Wear gloves to protect you hands. Take care not to drop the glass inside the door.

►: Bolt locations, 2



Doors

Rear Door Glass, Quarter Glass and Regulator Replacement (cont'd)

20-22

3. Remove the bolts and collar from the rear channel. Pull the sub-seal away as needed, and remove the screw. Pull the glass run channel away as needed from the rear channel.

►: Bolt locations

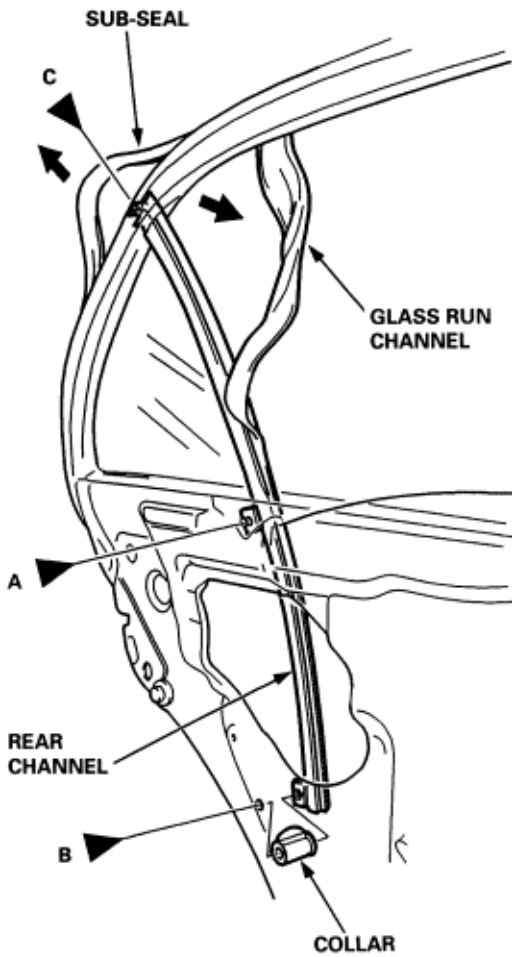
A ►, 1 B ►, 1



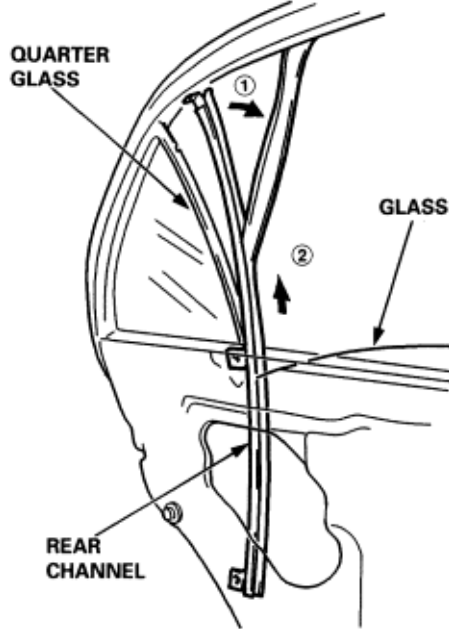
6 x 1.0 mm
8 N-m (0.8 kgf-m,
6 lbf-ft)

C ►, 1

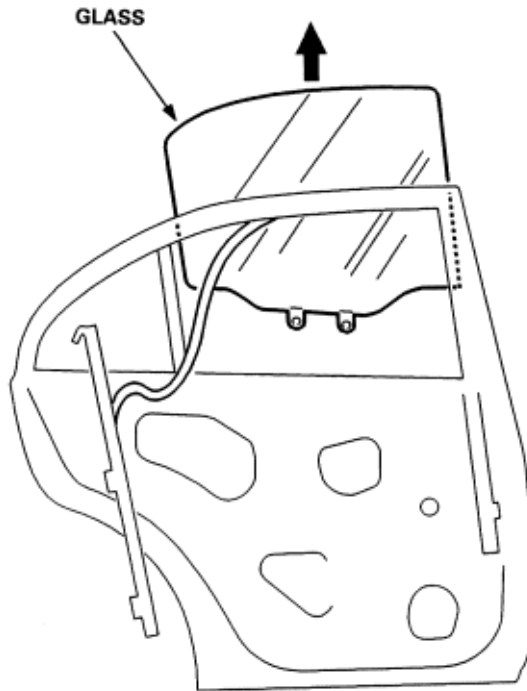
4 x 0.8 mm
4 N-m (0.4 kgf-m,
3 lbf-ft)



4. Move the rear channel away from the quarter glass and the rear door glass, then carefully remove the rear channel out through the window slot.



5. Carefully remove the glass out through the window slot. Take care not to drop the glass inside the door.

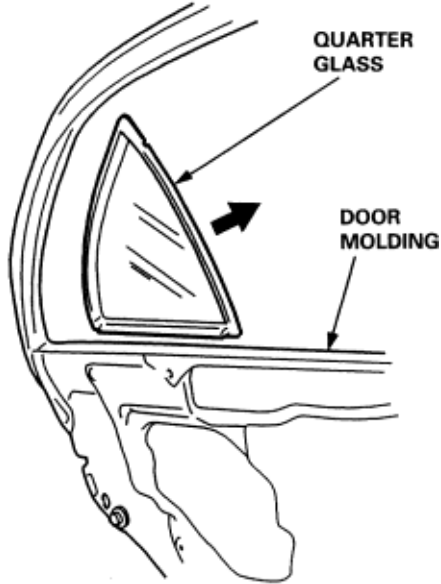


Doors

Rear Door Glass, Quarter Glass and Regulator Replacement (cont'd)

20-23

6. Remove the quarter glass, take care not to damage the door molding.

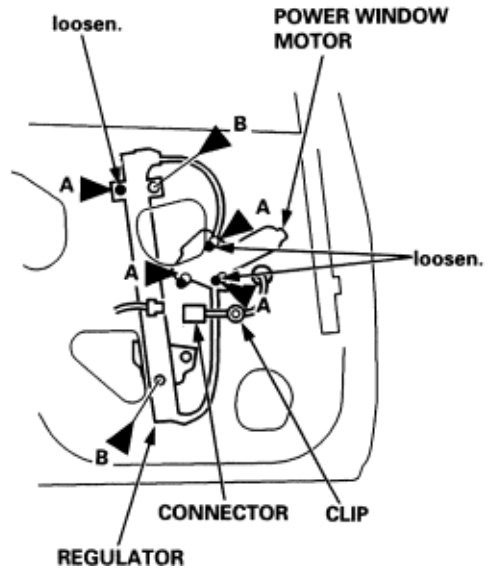


7. Disconnect and detach the connector and clip from the door. Remove the B bolts and loosen the A bolts, then remove the regulator through the hole in the door.

With power window:

▶: Bolt locations

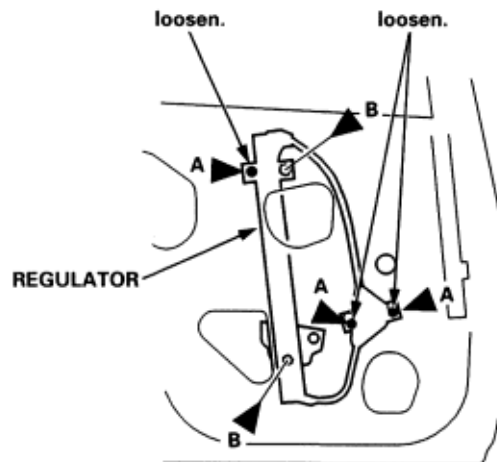
A ▶, 4 B ▶, 2



Without power window:

▶: Bolt locations

A ▶, 3 B ▶, 2



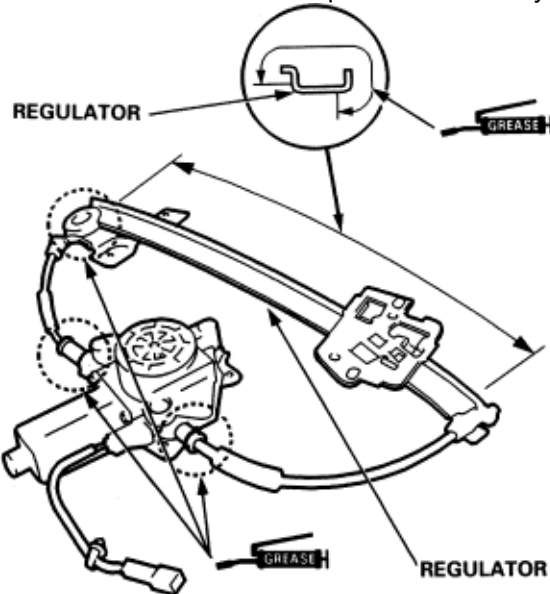
Doors

Rear Door Glass, Quarter Glass and Regulator Replacement (cont'd)

20-24

Front and Rear Door Channel Tape Replacement

8. Grease the area at the points indicated by the arrows.



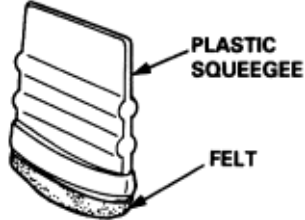
9. Install in reverse order of removal, and note the following items:
- ♦ Roll the glass up and down to see if it moves freely without binding.
 - ♦ Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
 - ♦ Adjust the position of the glass as necessary (**See Page 20-30**).

NOTE:

- ♦ Keep dust away from the working area.
- ♦ When working at lower temperatures, heat the door channel and door channel tape with a hair dryer.
Door channel: about 15°C (59°F).
Door channel tape: about 30°C (86°F).
- ♦ When heating the door channel tape, heat it evenly and gradually to prevent deformation.
- ♦ When pressing the door channel tape, slowly press it from the corner to prevent air bubbles and wrinkles.
- ♦ If there are air bubbles in the door channel, prick them with a pin, then release the air with your finger or a plastic squeegee.



- ♦ If the air bubble is more than 10 mm (0.4 in) in diameter, peel up the door channel tape then reapply it.
1. The following tools are required to replace the door channel tape.
- ♦ Plastic squeegee
 - ♦ Alcohol
 - ♦ Sponge or shop towel
 - ♦ Hair dryer
 - ♦ Pin.



2. Remove the following parts:

Front door outer roof channel tape replacement:

- ♦ Power mirror (**See Page** 20-35).
- ♦ Glass run channel, as necessary (**See Page** 20-4).
- ♦ Glass stop (**See Page** 20-3).
- ♦ Sash trim (**See Page** 20-3).
- ♦ Sub seal (**See Page** 20-4).

Front door inner roof channel tape replacement:

- ♦ Mirror mount cover (**See Page** 20-35).
- ♦ Door weatherstrip, as necessary (**See Page** 20-3).
- ♦ Glass run channel, as necessary (**See Page** 20-4).

Front door inner center channel tape replacement

- ♦ Door panel (**See Page** 20-7).
- ♦ Door weatherstrip as necessary (**See Page** 20-3).
- ♦ Glass run channel, as necessary (**See Page** 20-4).

Rear door outer roof channel tape replacement

- ♦ Door molding (**See Page** 20-5).
- ♦ Quarter glass (**See Page** 20-21).
- ♦ Glass run channel, as necessary (**See Page** 20-6).
- ♦ Sash trim (**See Page** 20-5).
- ♦ Sub-seal (**See Page** 20-5).

Rear door inner roof and center channel tape replacement

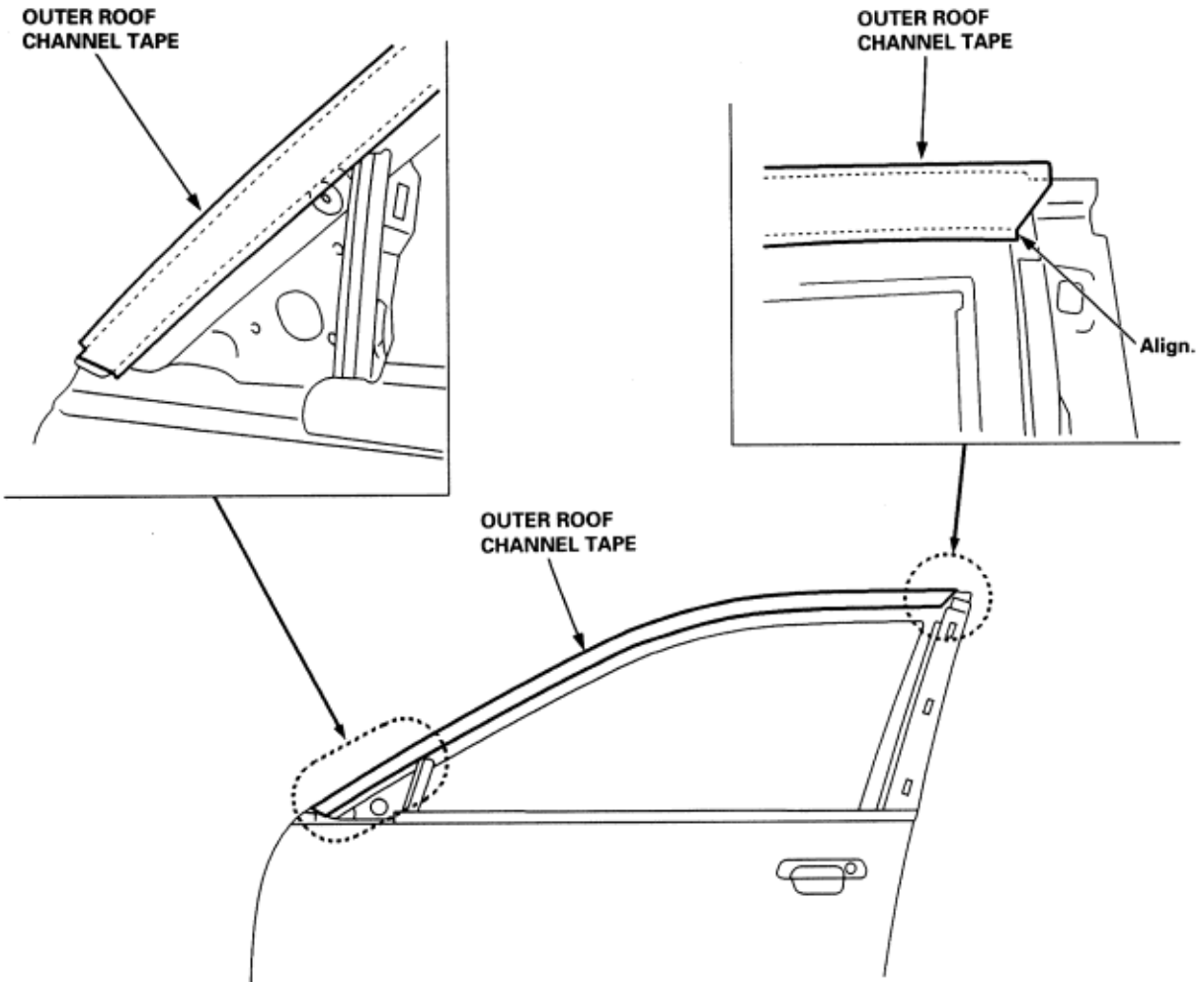
- ♦ Quarter glass (**See Page** 20-21).
- ♦ Door weatherstrip, as necessary (**See Page** 20-5).
- ♦ Glass run channel, as necessary (**See Page** 20-6).

3. Slowly peel up the old door channel tape while heating it with a hair dryer.
4. Clean the door channel bonding surface with a sponge dampened in alcohol.
NOTE: After cleaning, keep oil, grease and water from getting on the surface.
5. Attach the door channel tape.
- 1. Peel the edge of the adhesive backing from the channel tape.
 - 2. Fit the door channel tape to the door channel.
 - 3. Apply the door channel tape to the door channel while peeling the adhesive backing from it a little at a time. Check that the channel tape is parallel with the door channel.
 - 4. Push firmly on the door channel tape with a plastic squeegee (felt side).
- NOTE: To prevent air bubbles, slowly press the door channel tape around the door frame corner.
6. As necessary, repeat the preceding steps.
7. Reinstall all remaining removed parts.
8. Check that the body color on the door channel is covered by the door channel tape.
9. Check for water leaks. Do not squeeze the tip of the hose.

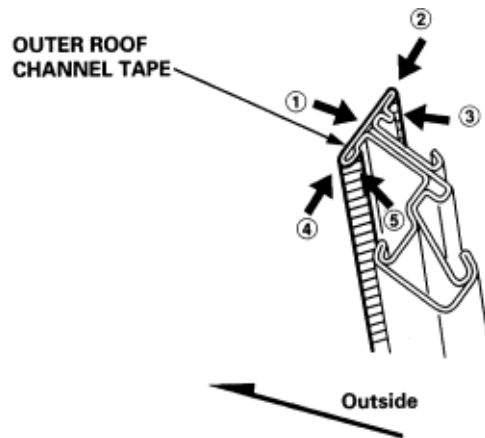
Doors

**Front and Rear Door Channel Tape Replacement
(cont'd)**

Front door outer roof channel tape:



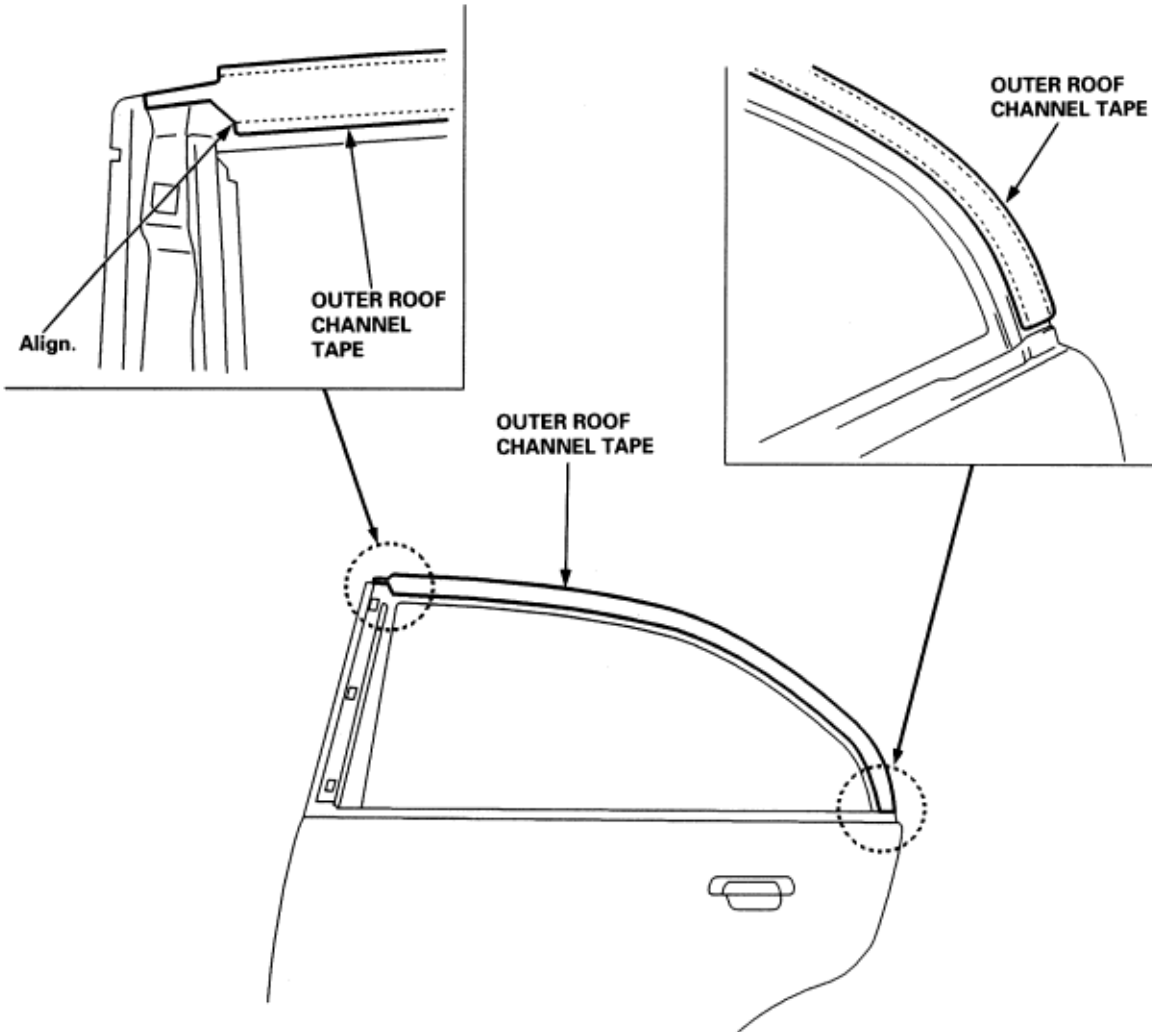
NOTE: Press in numbered sequence.



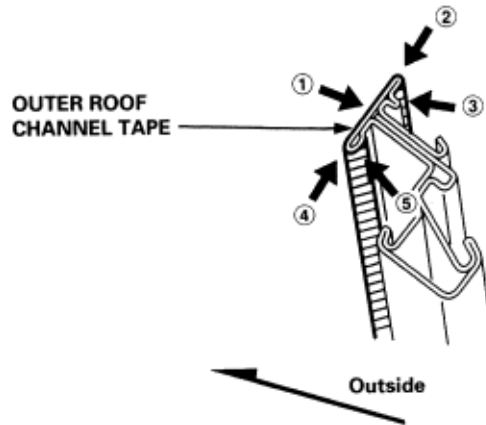
Doors

**Front and Rear Door Channel Tape Replacement
(cont'd)**

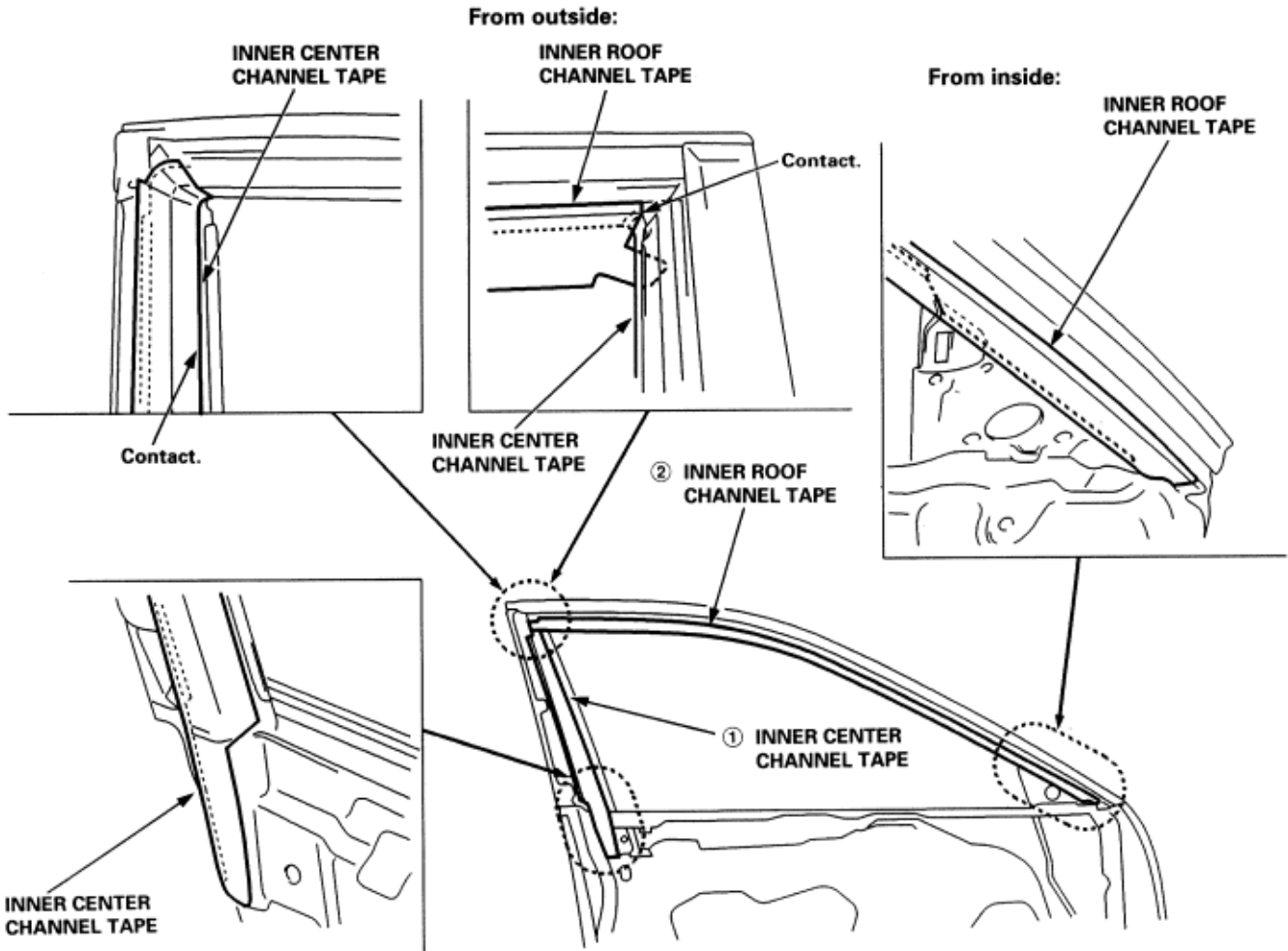
Rear door outer roof channel tape:



NOTE: Press in numbered sequence.

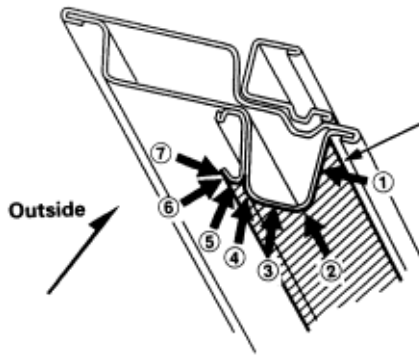


Front door inner roof and center channel tape:
Apply in numbered sequence.

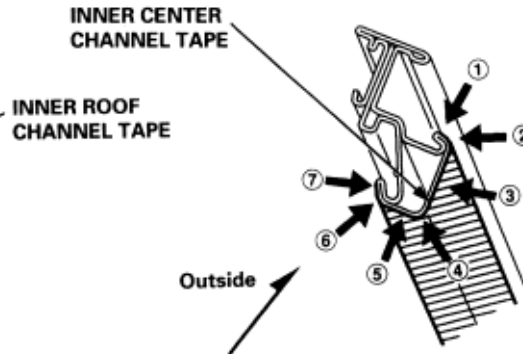


NOTE: Press in numbered sequence.

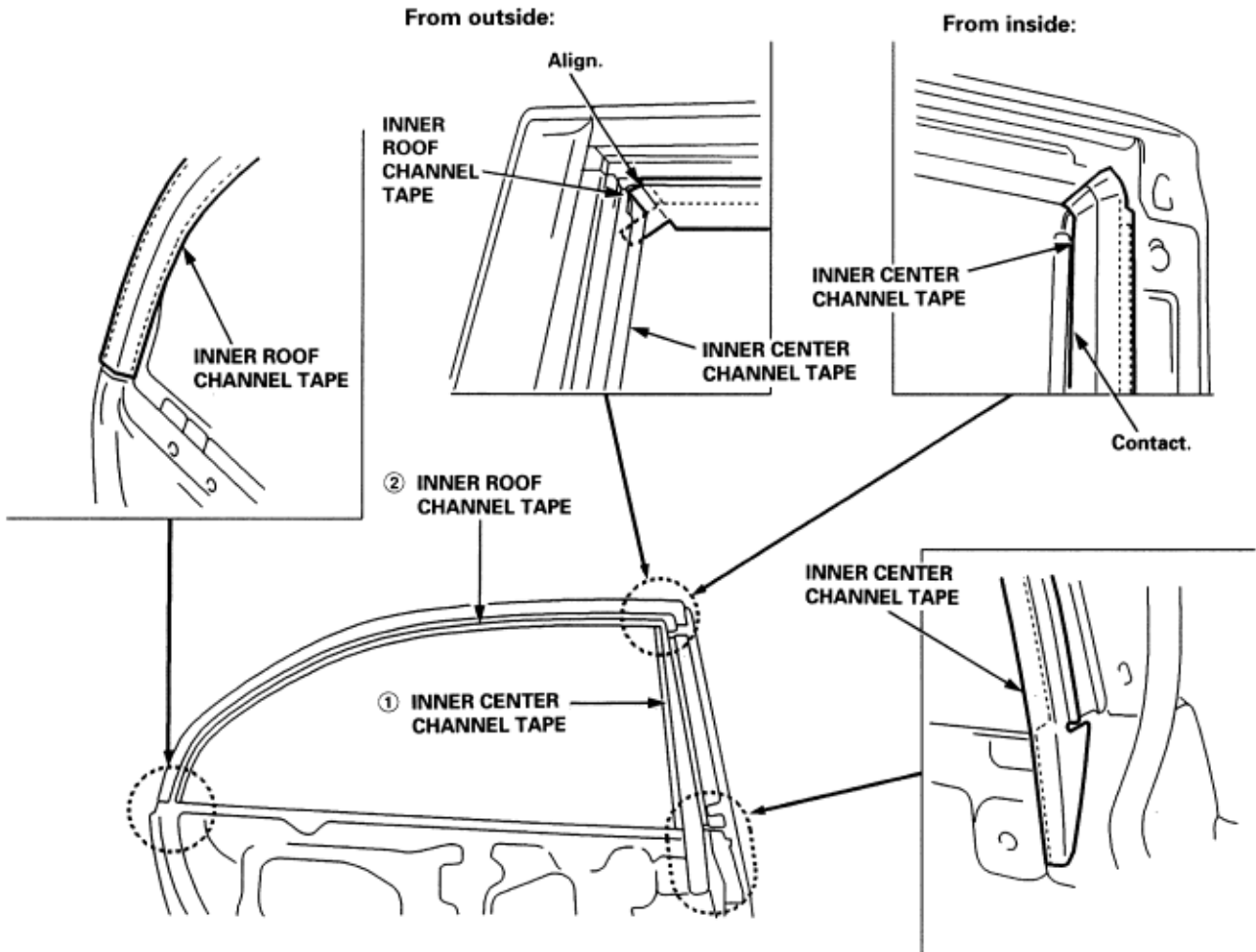
Center channel portion:



Roof channel portion:

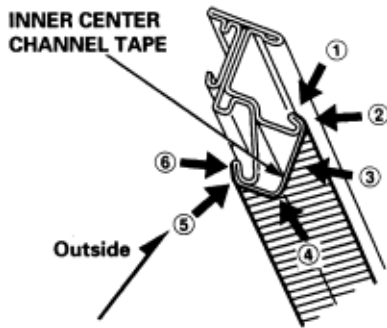


Rear door inner roof and center channel tape:
Apply in numbered sequence.

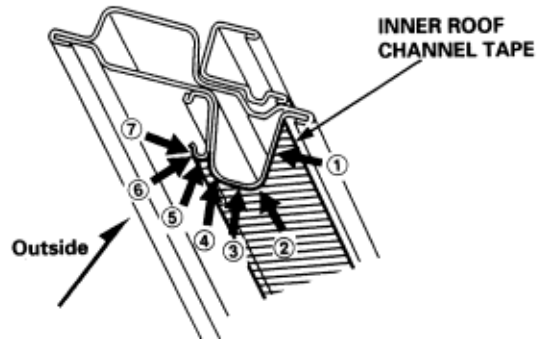


NOTE: Press in numbered sequence.

Roof channel portion:



Center channel portion:



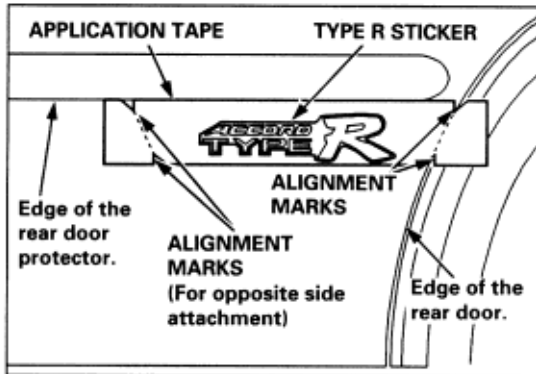
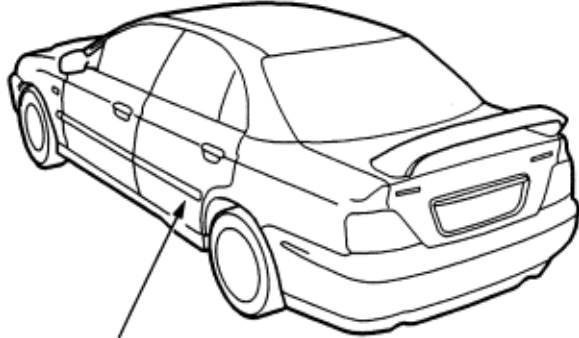
Type R:

Apply the sticker where shown.

NOTE:

- Before applying, clean the rear door surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- This drawing shows left side. Right side is similar.

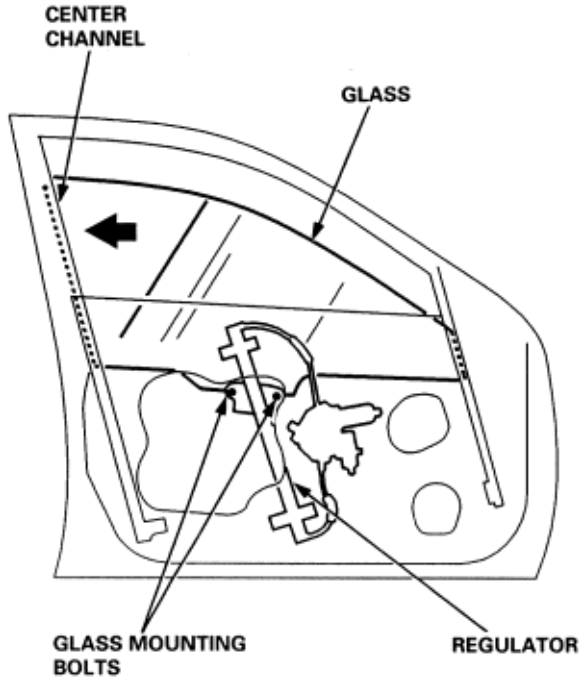
Attachment Point (Reference)



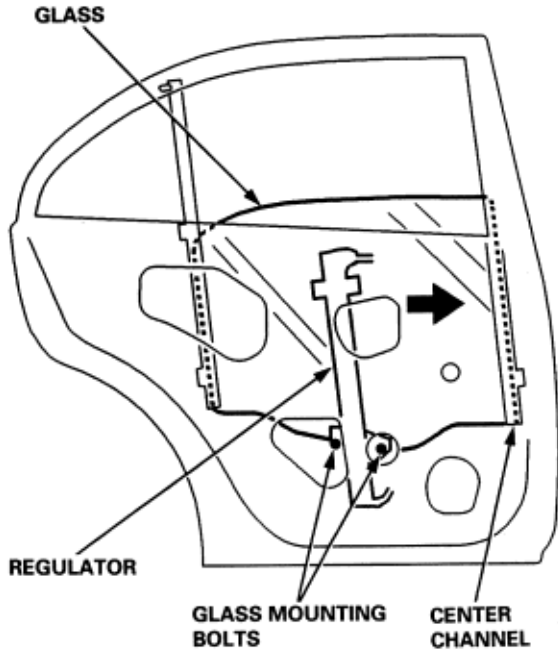
NOTE: Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.

1. Place the vehicle on a firm, level surface.
2. Remove:
 - Door panel (**See Page 20-7**) and (**See Page 20-16**).
 - Plastic cover, as necessary (**See Page 20-3**) and (**See Page 20-5**).
3. Carefully move the glass until you can see the glass mounting bolts, then loosen them.

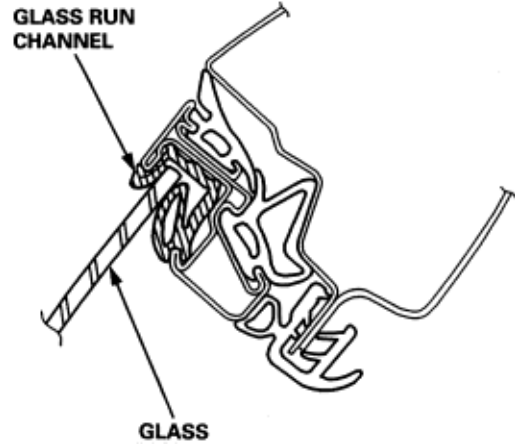
Front:



Rear:

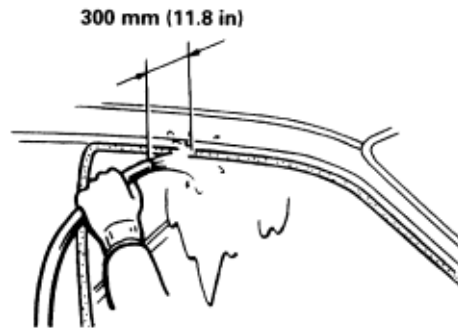
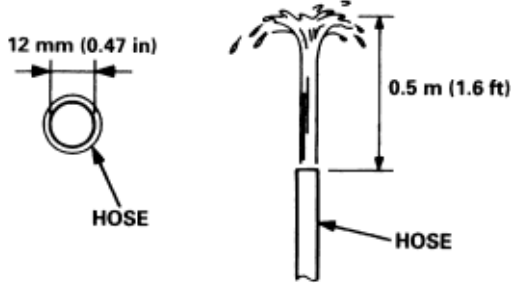


4. Push the glass against the center channel, then tighten the glass mounting bolts.
5. Check that the glass moves smoothly.
6. Raise the glass fully, and check for gaps. Check that the glass contacts the glass run channel evenly.



7. Check for water leaks. Spray water over the roof and on the sealing area as shown, and note the following items:

- ♦ Adjust the water pressure as shown.
- ♦ Do not squeeze the tip of the hose.

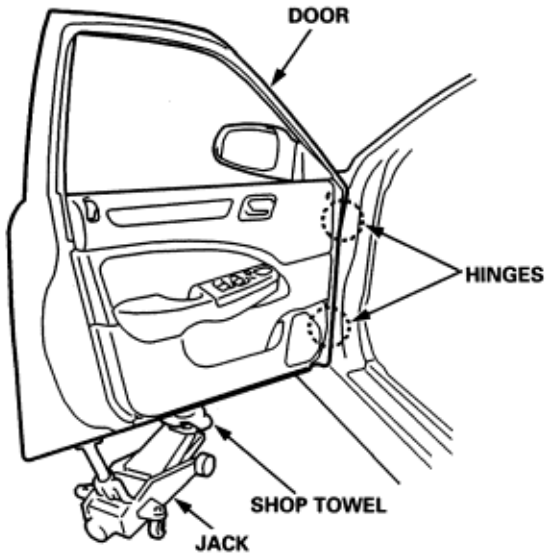
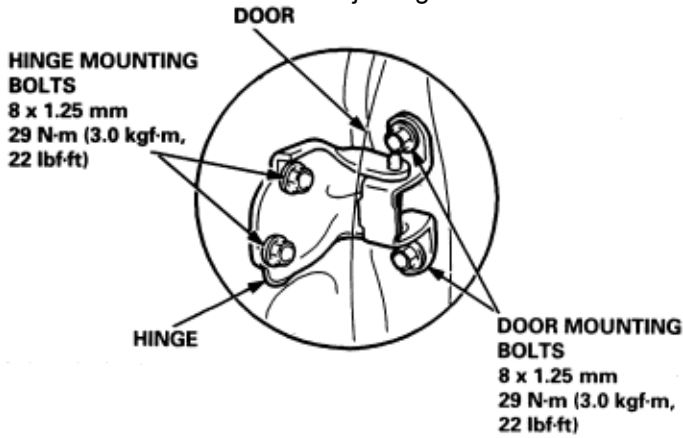


8. Attach the plastic cover, and install the door panel (**See Page 20-7**) and (**See Page 20-16**).

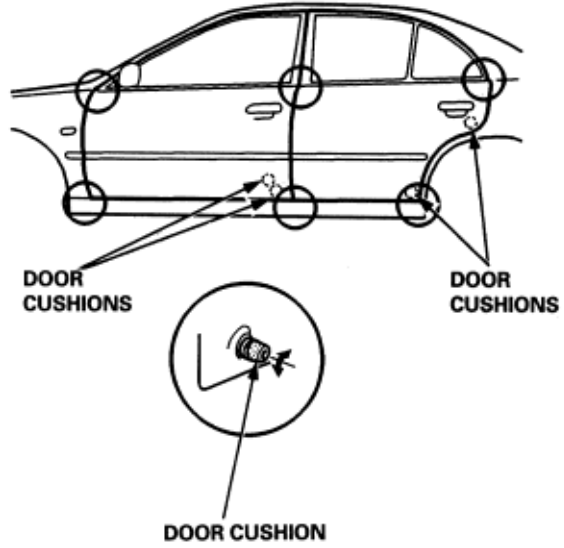
Front and Rear Door Position Adjustment

NOTE: After installing the door, check for a flush fit with the body, then check for equal gaps between the front, rear and bottom door edges and the body. Check that the door and body edges are parallel. Before adjusting, replace the mounting bolts.

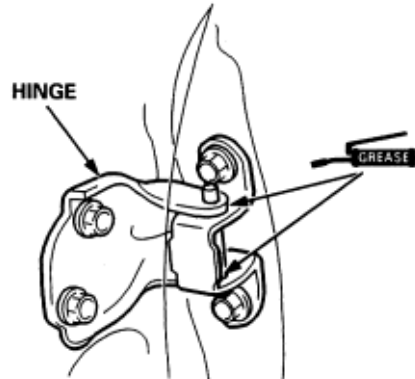
1. Place the vehicle on a firm, level surface when adjusting the doors.
2. Adjust at the hinges:
 - ♦ Loosen the door mounting bolts slightly, and move the door IN or OUT until it is flush with the body.
 - ♦ Remove the inner fender (See Page 20-147), loosen the hinge mounting bolts slightly, and move the door BACKWARD or FORWARD, UP or DOWN as necessary to equalise the gaps.
 - ♦ Place a shop towel on the jack to prevent damage to the door when adjusting the door.



3. Check that the door and body edges are parallel. If necessary, adjust the door cushions.



4. Grease the pivot portions of the hinges indicated by the arrows.

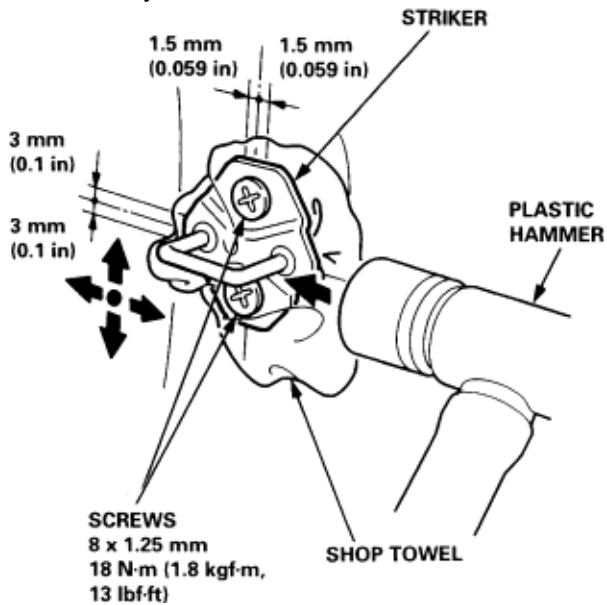


5. Check for water leaks. Do not squeeze the tip of the hose.

Front and Rear Door Striker Adjustment

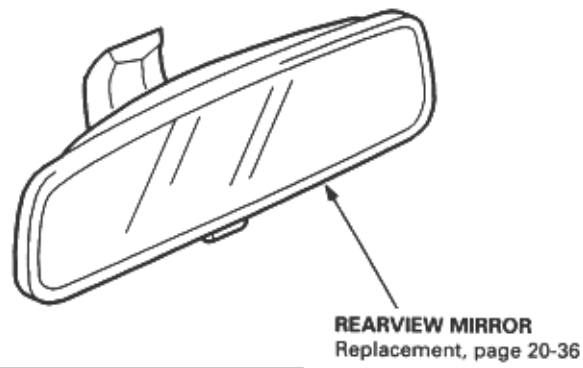
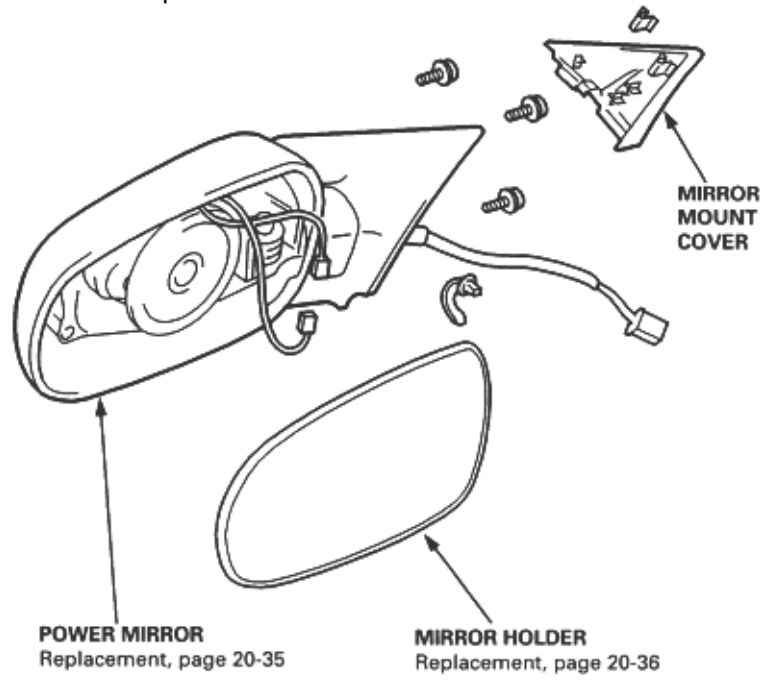
Make sure the door latches securely without slamming it. If necessary, adjust the door striker. The striker nuts are fixed. The striker can be adjusted 3 mm (0.1 in) up or down, and 1.5 mm (0.059 in) in or out.

1. Loosen the screws, then insert a shop towel between the body and striker.



2. Lightly tighten the screws.
3. Wrap the striker with a shop towel, then adjust the striker by tapping it with a plastic hammer. Do not tap the striker too hard.
4. Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit. If the door latches properly, loosen the screws, then remove the shop towel. Tighten the screws and recheck.

See section 23 for the power mirror actuator replacement.



To go to the pages referenced on the diagram above,
click on the following:
(See Page 20-35)
(See Page 20-36)

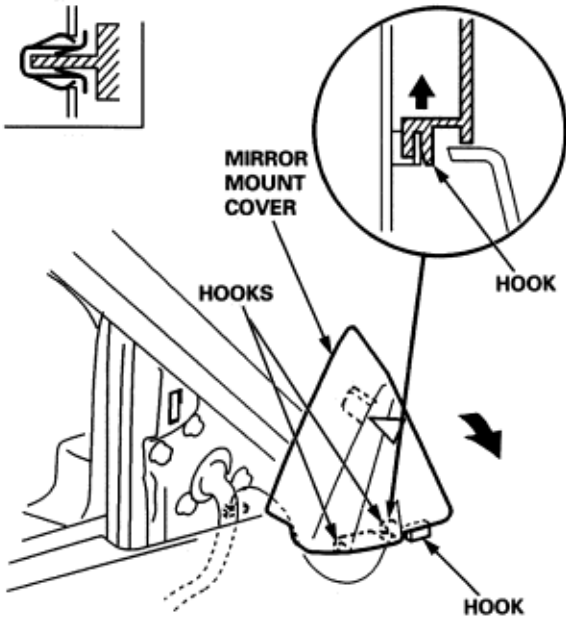
Mirrors

Power Mirror Replacement

20-35

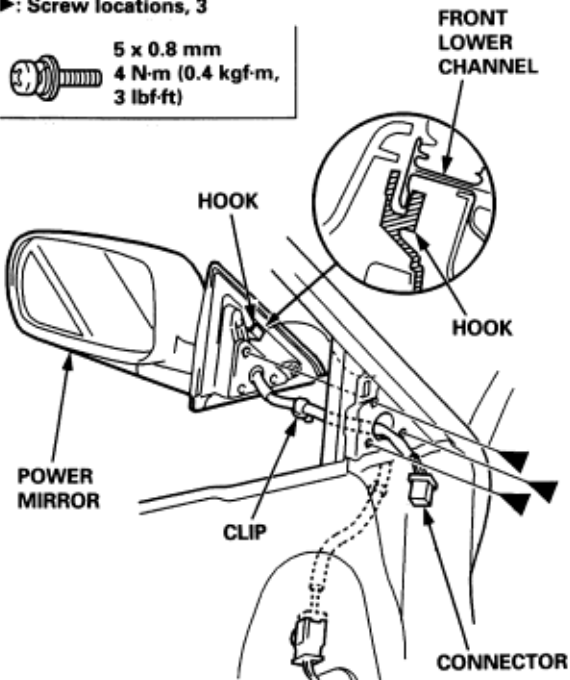
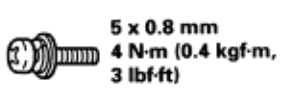
1. Lower the door glass fully.
2. Carefully pry out the mirror mount cover by hand.

▷: Clip location, 1



3. Remove the door panel ([See Page 20-7](#)).
4. Disconnect the connector, detach the harness clip, and remove the screws securing the power mirror, then remove the power mirror while holding it. Take care not to scratch the door.

▷: Screw locations, 3



5. Install in the reverse order of removal, and note these items:
 - ♦ Make sure the connector is plugged in properly.
 - ♦ Attach the harness clip.

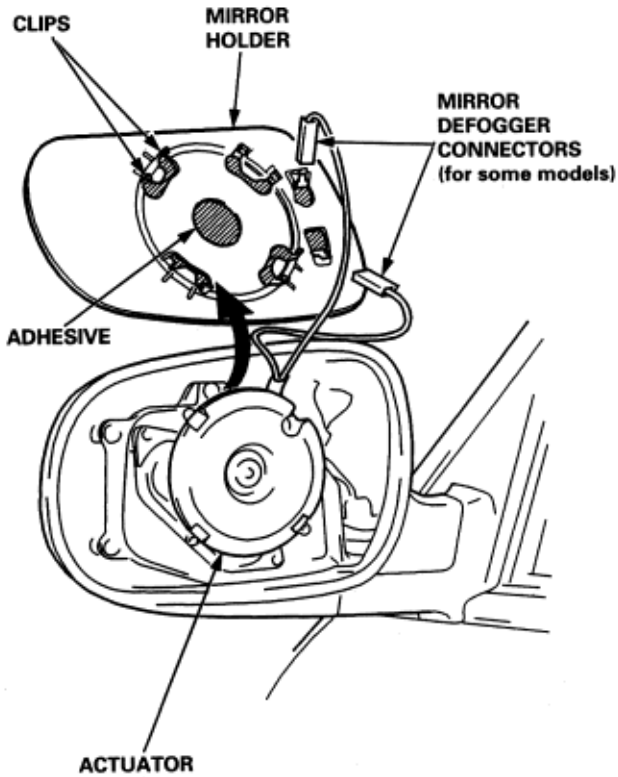
Mirrors

Mirror Holder Replacement

20-36

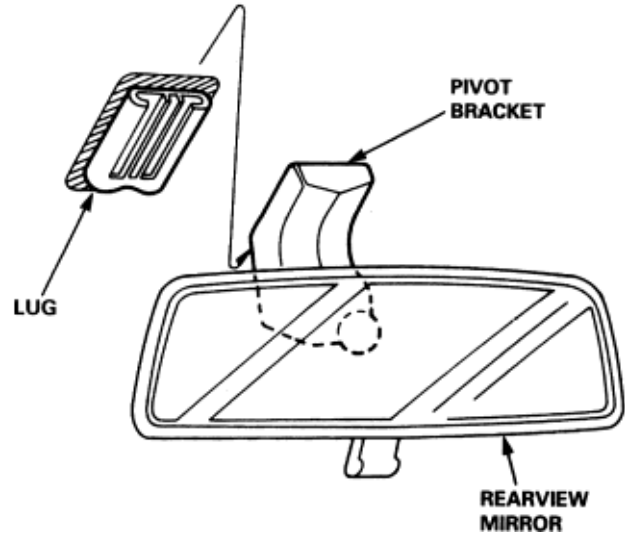
Rearview Mirror Replacement

1. Carefully pull out the bottom edge of the mirror holder by hand. Take care not to scratch the mirror.



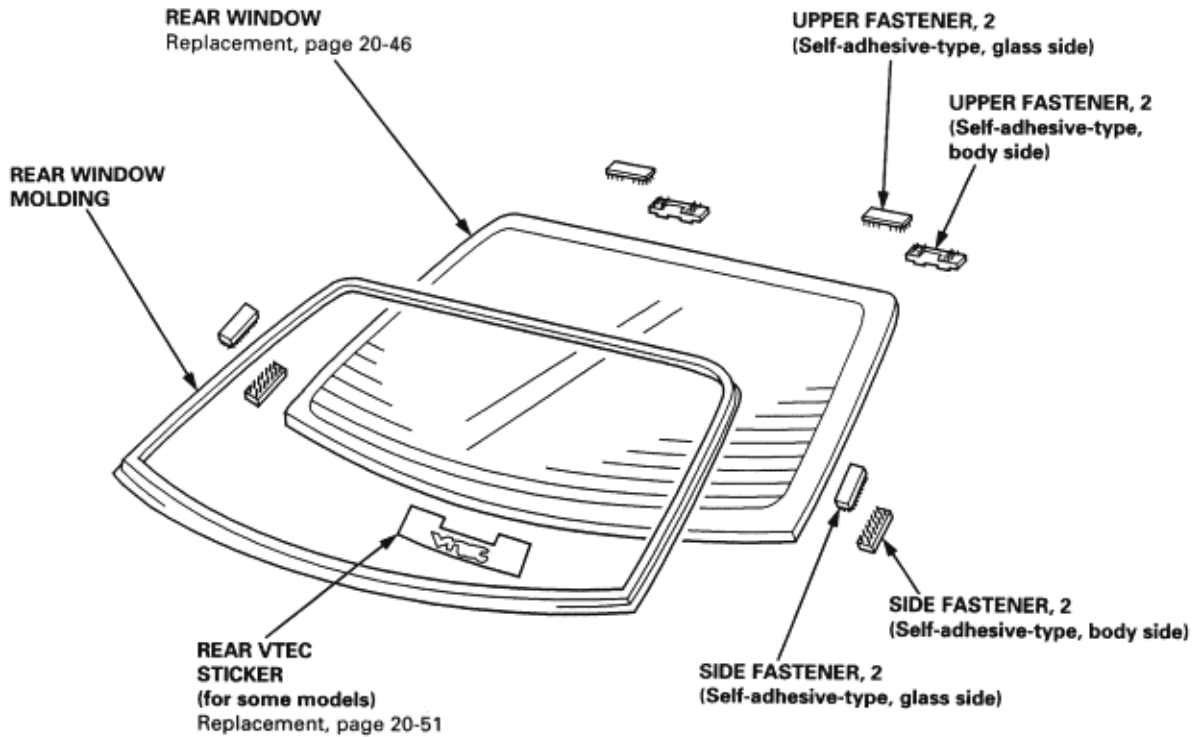
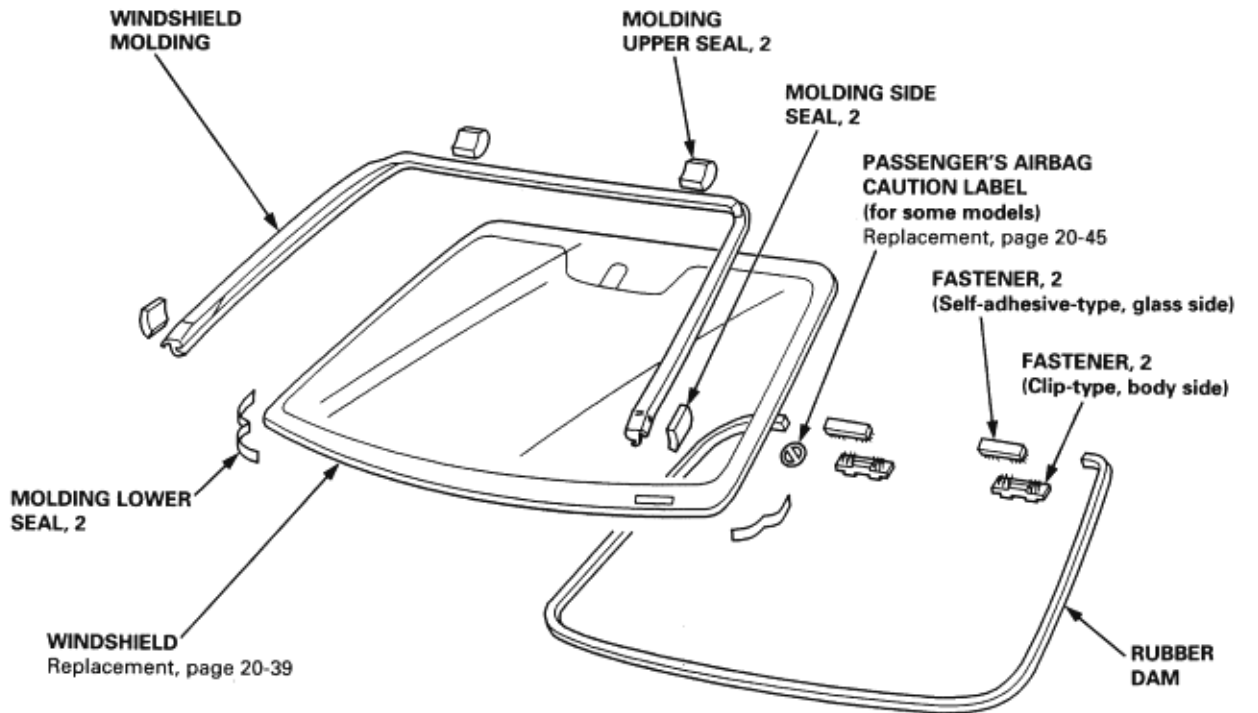
2. Separate the mirror holder from the actuator by slowly pulling them apart while removing the adhesive, and detaching the clips. If equipped, disconnect the mirror defogger connectors from the heater pad terminals.
3. If equipped, reconnect the mirror defogger connectors.
4. Reattach the clips of the mirror holder to the actuator, then position the mirror holder on the actuator. Carefully push the clip portions of the mirror holder until the mirror holder locks into place.
5. Check the operation of the actuator.

1. Slide the pivot bracket up towards the top of the windshield, then remove the rearview mirror from the lug. Take care not to scratch the pivot bracket.



2. Install in the reverse order of removal.

The numbers after the part names show the quantities of the parts used.



To go to the pages referenced on the diagram above, click on the following:

(See Page 20-45)

(See Page 20-39)

(See Page 20-46)

(See Page 20-51)

Parts:

Part Number	Contents	Comment
Adhesive kit - Low temperature) 08718-99960) High temperature) 08718-99961)	(Adhesive sealant 500 g (17.6 oz)	
	(Hardener 75 g (2.6 oz)	
	(Glass primer 20 g (0.7 oz)	
	(Body primer 20 g (0.7 oz)	
	(Piano wire Length: 1 m (3 ft)	
	(Diameter: 0.6 mm (0.02 in)	
	(Gauze	For adhesive For applying primers
	(Cartridge	
	(Sponge	

NOTE:

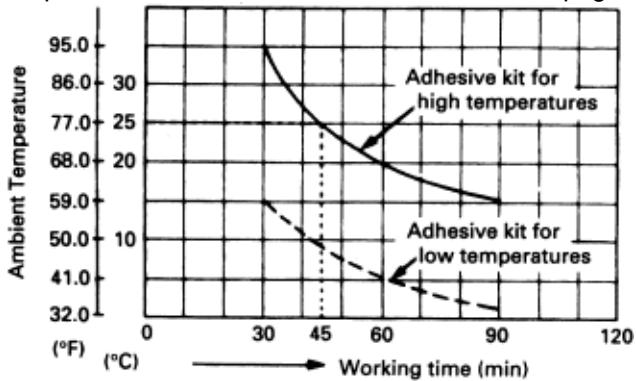
- ♦ Both kits have two types of adhesive primer: one for the body (metal), and one for glass.
- ♦ Always use new genuine Honda adhesive, or equivalent.
- ♦ Do not use the adhesive if six months have elapsed since date of manufacture.
- ♦ Store adhesive in a cool, dry place.
- ♦ Open only immediately before you are going to use it.

Tools:

Tool/Material	Remarks
Glass or steel plate	To mix adhesive and hardener on
Putty knife	To mix adhesive and remove excess
Caulking gun	To apply adhesive to windshield
Suction cups	To install windshield
Knife	To scrape bonding surface around window opening
Awl	To make hole through existing adhesive for piano wire
Two wood sticks	To hold piano wire
Toluene or alcohol	To clean bonding surfaces

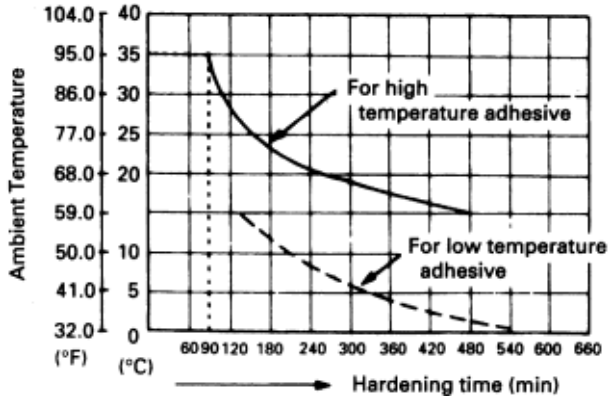
Workable Time:

Adhesive workable time varies widely according to temperature, so choose the correct adhesive kit for the temperature range you will be working in. After mixing and applying adhesive, you should install the windshield within the time shown on the chart. For example, when the ambient temperature is 25°C (77°F), the glass should be installed within 45 minutes using the high temperature type adhesive. Kit part numbers and contents are listed on the page before.



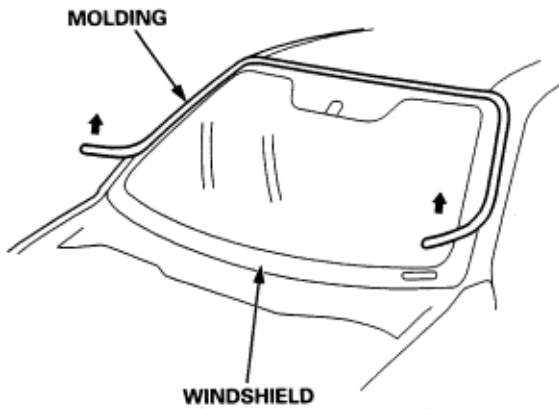
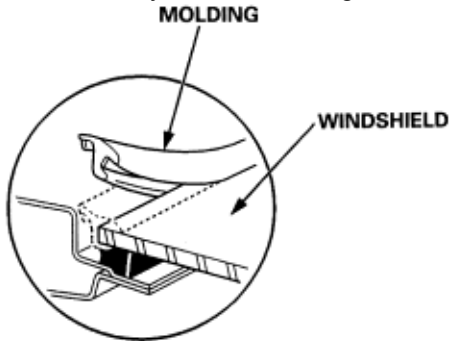
Hardening Time:

Hardening time can be shortened by heating with infrared light. For example, the adhesive will start to harden within 270 minutes mixing at 20°C (63°F). If however, it is heated to 35°C (95°F), it will start to harden within 90 minutes.



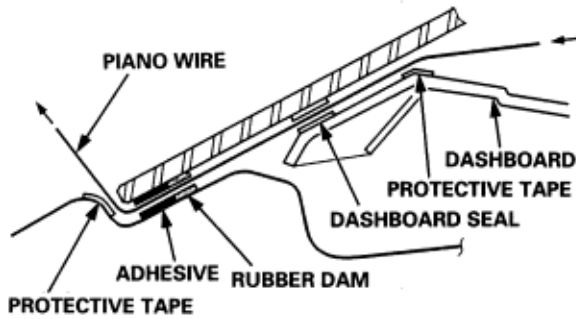
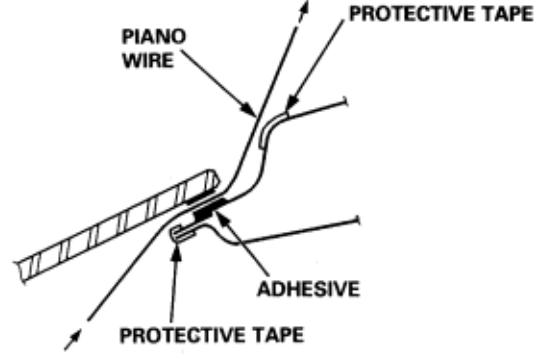
NOTE:

- ♦ Wear gloves to remove and install the windshield.
 - ♦ Use seat covers to avoid damaging any surfaces.
1. Remove:
 - ♦ Rearview mirror (**See Page 20-36**).
 - ♦ Sunvisors and holders, both sides (**See Page 20-70**).
 - ♦ Front ceiling light/spotlight (see section 23).
 - ♦ Grab handles, both sides (**See Page 20-70**).
 - ♦ Front door trim, both sides as necessary(**See Page 20-66**).
 - ♦ Front pillar trim, both sides (**See Page 20-66**).
 - ♦ Windshield wiper arms and cowl cover (see section 23)
 2. Remove the molding from the edge of the windshield. If necessary, cut the molding with a utility knife.

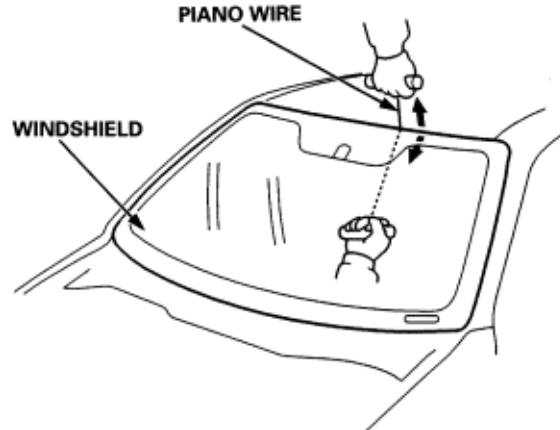


3. Pull down the front portion of the headliner (**See Page 20-70**). Take care not to bend the headliner excessively, or you may crease or break it.

4. Apply protective tape along the edge of the dashboard and body as shown. Using an awl, make a hole through the rubber dam adhesive and dashboard seal from inside the vehicle. Push piano wire through the hole, and wrap each end around a piece of wood.

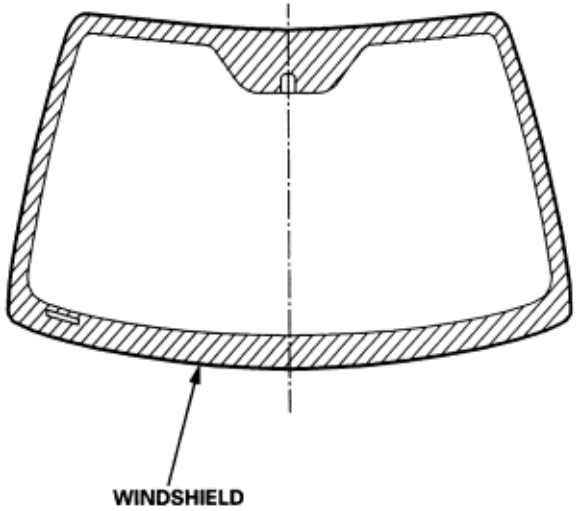


5. With a helper on the outside, pull the piano wire back and forth in a sawing motion. Hold the piano wire as close to the windshield as possible to prevent damage to the body and dashboard. Carefully cutting through the rubber dam and adhesive around the entire windshield.

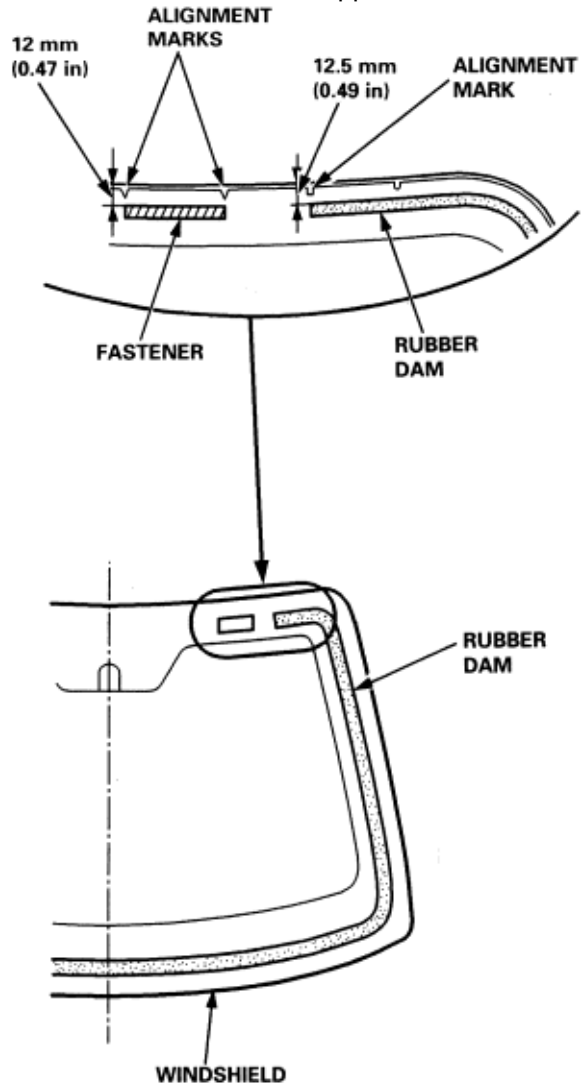


6. Carefully remove the windshield.

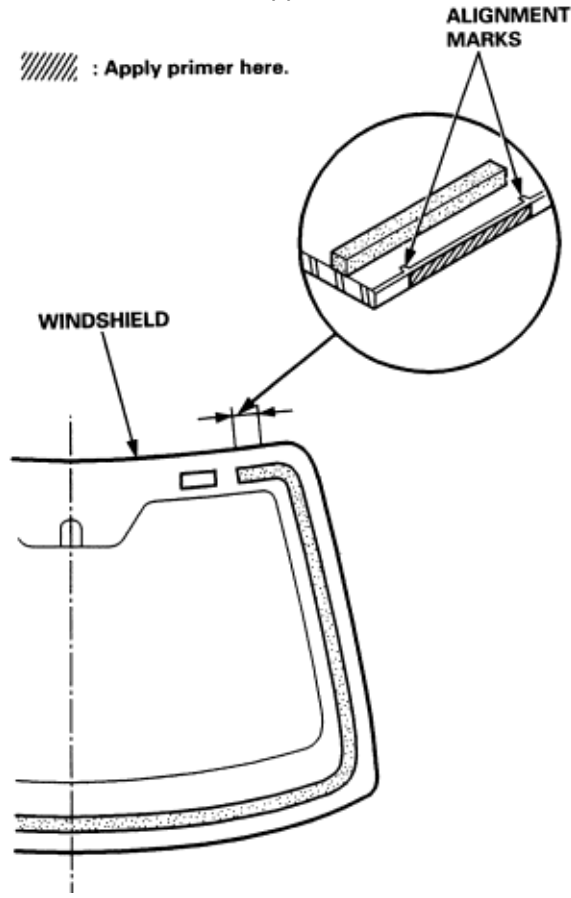
7. With a knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire windshield opening flange:
 - ♦ Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
 - ♦ Remove the rubber dam and fasteners from the body.
 - ♦ Mask off surrounding surfaces before painting.
8. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.
9. If the old windshield is to be reinstalled, use a putty knife to scrape off all traces of old adhesive and if necessary, removed molding lower seal from the windshield, the rubber dam and the dashboard seal. Then clean the windshield surface and edge with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil and grease.



10. Glue the rubber dam and fasteners to the inside face of the windshield as shown:
 - ♦ Be sure the rubber dam and fasteners line up with the alignment marks.
 - ♦ Be careful not to touch the windshield where adhesive will be applied.

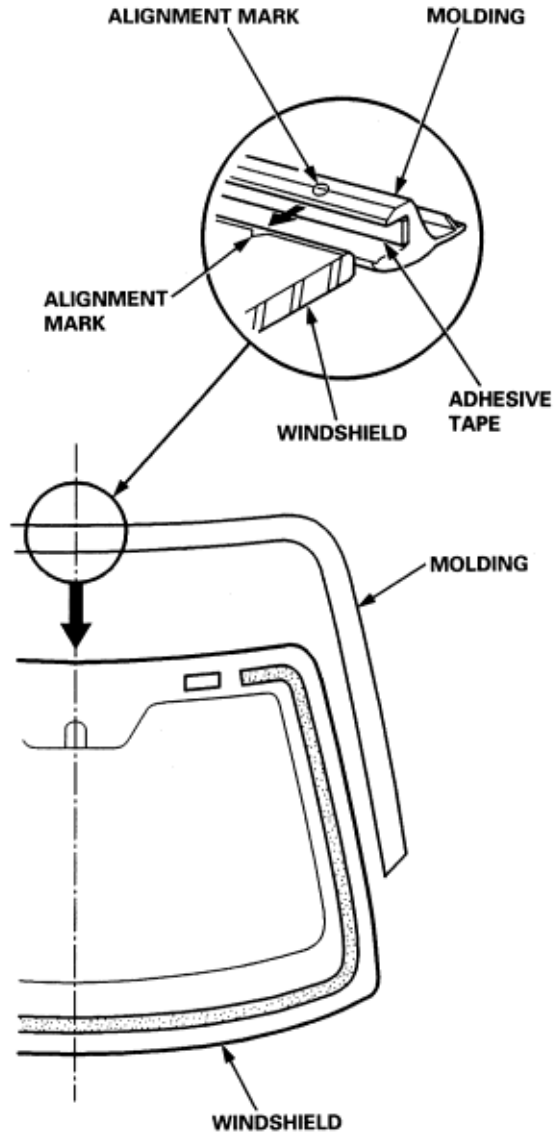


11. Apply primer (3M N-200, or equivalent) to the areas between the alignment marks, and glue the adhesive tape (NITTO 501, or equivalent) to the edge of the windshield. Be careful not to touch the windshield where adhesive will be applied.

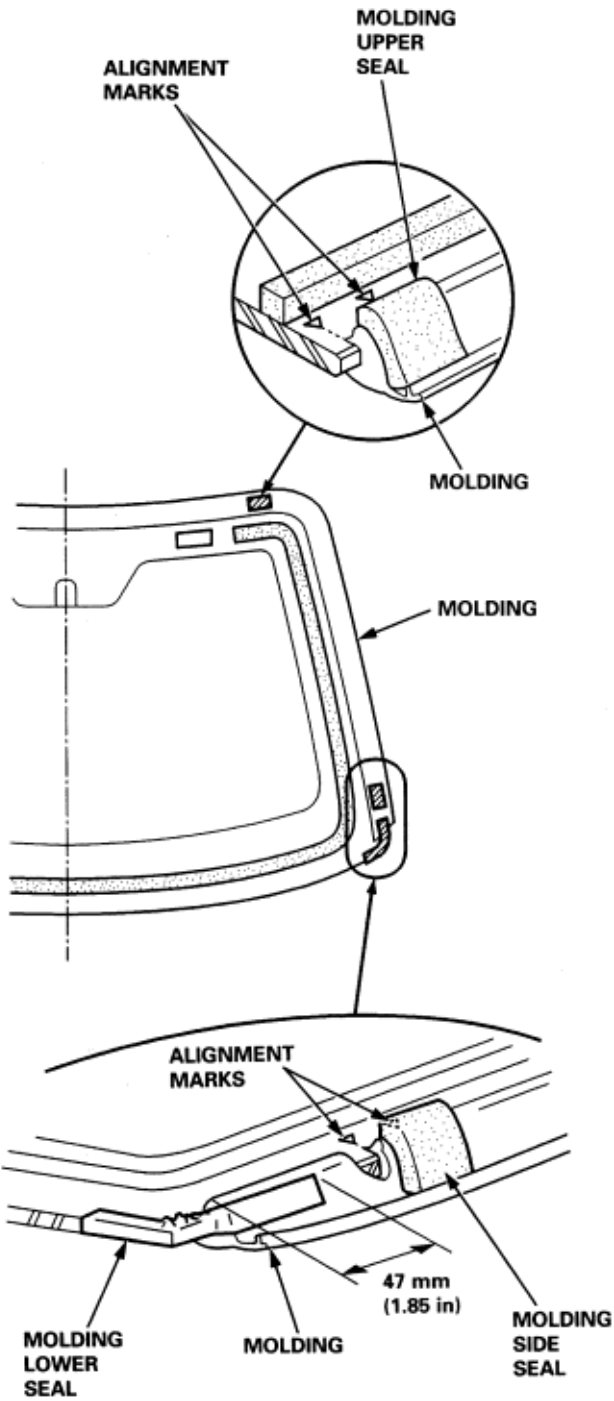


12. Glue the molding with adhesive tape to the edge of the windshield:

- ♦ Be sure the alignment mark of the molding lines up with the alignment mark of the windshield.
- ♦ Be careful not to touch the windshield where adhesive will be applied.

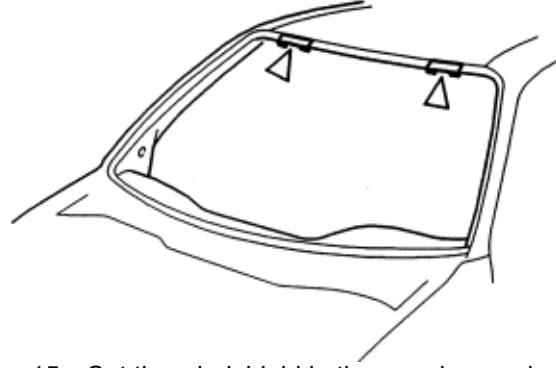
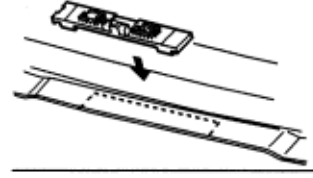


13. Glue the molding upper seal, molding side seal and molding lower seal to the molding. Be careful not to touch the windshield where adhesive will be applied.

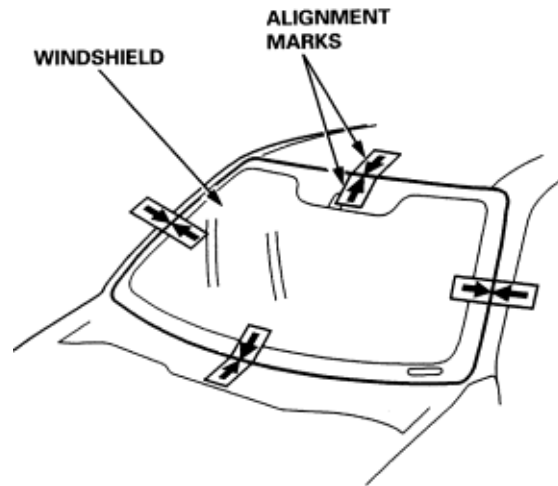


14. Install the fasteners to the body.

▷: Fastener locations, 2



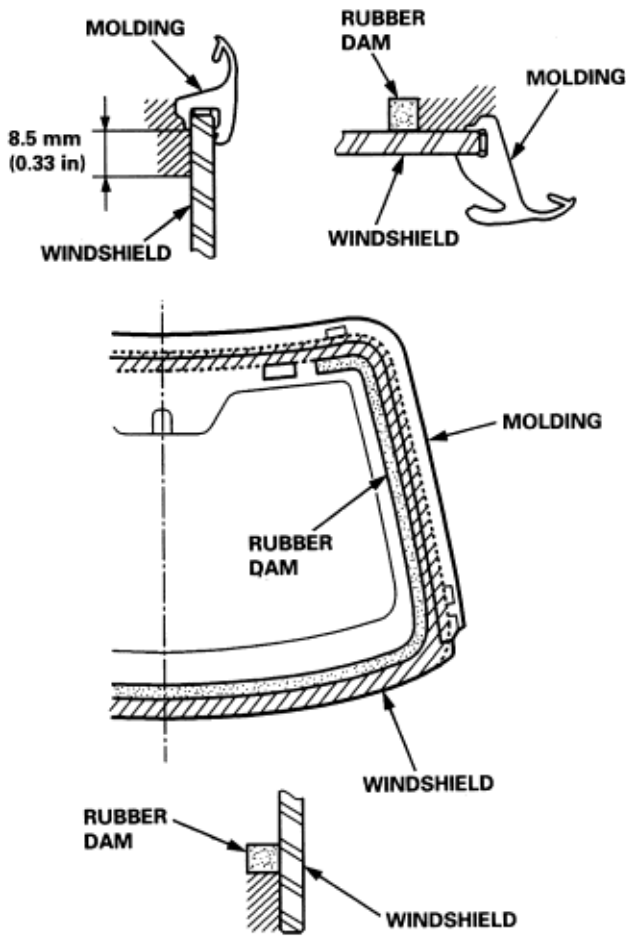
15. Set the windshield in the opening, and center it. Make alignment marks across the windshield and body with a grease pencil at the four points shown. Be careful not to touch the windshield where adhesive will be applied.




16. Remove the windshield.

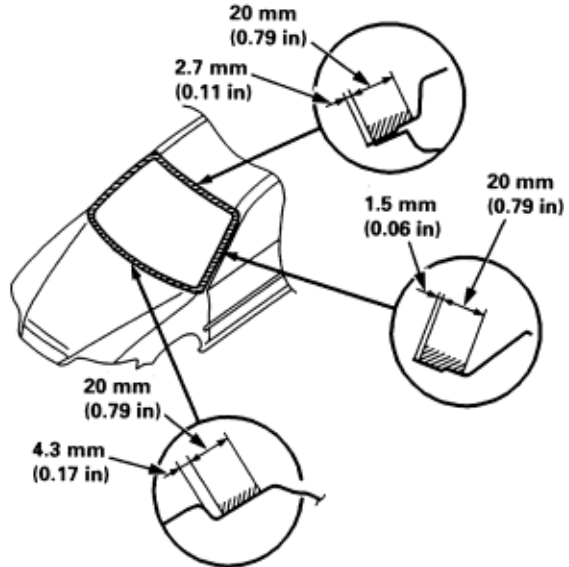
17. With a sponge, apply a light coat of glass primer around the edge of the windshield between the rubber dam and molding as shown, then lightly wipe it off with gauze or cheesecloth.
 - ♦ Apply glass primer to the molding.
 - ♦ Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
 - ♦ Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
 - ♦ Keep water, dust and abrasive materials away from the primed surface.

 : Apply glass primer here.

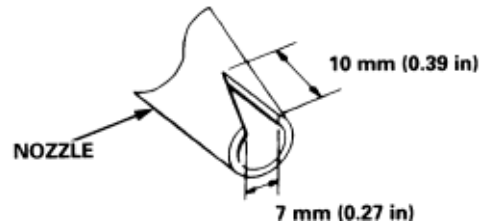


18. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for a least 10 minutes.
 - ♦ Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
 - ♦ Never touch the primed surfaces with your hands.
 - ♦ Mask off the dashboard before painting the flange.

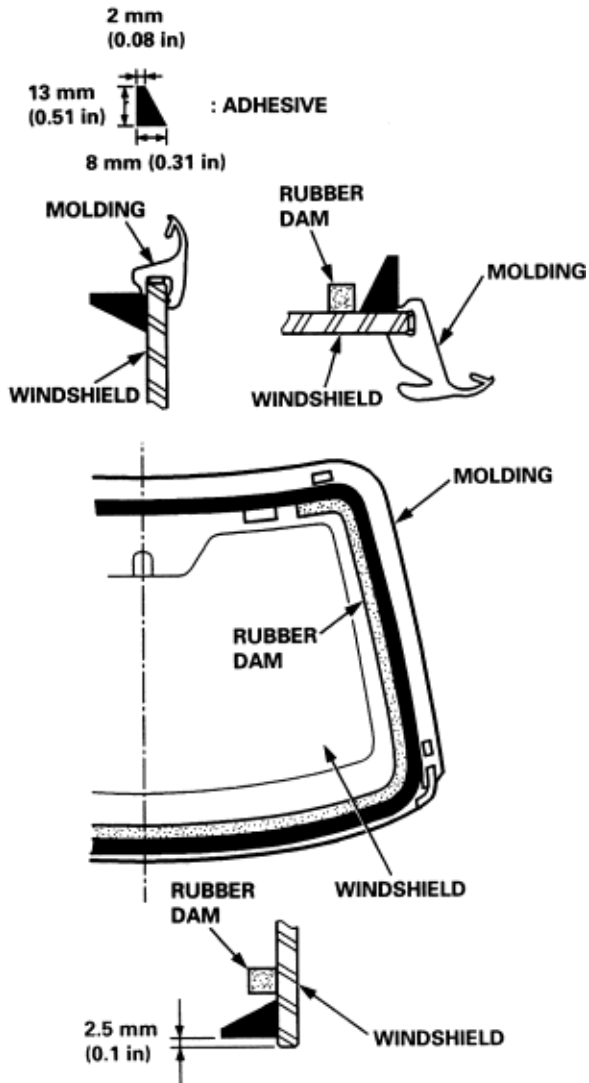
 : Apply body primer here.



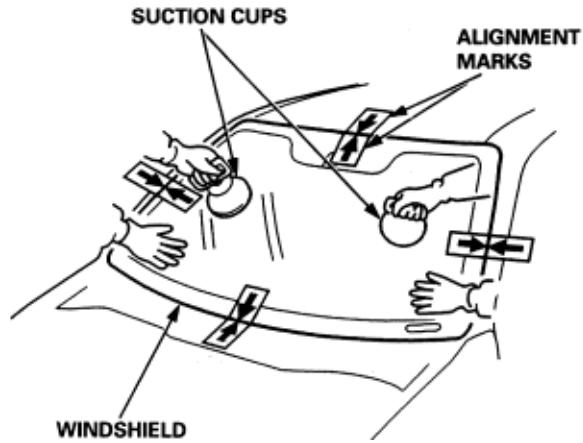
19. Thoroughly mix the adhesive and hardener together on a clean glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.
20. Before filling a cartridge, cut a "V" in the end of the nozzle as shown.



21. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the windshield between the rubber dam and molding as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



22. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 15, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



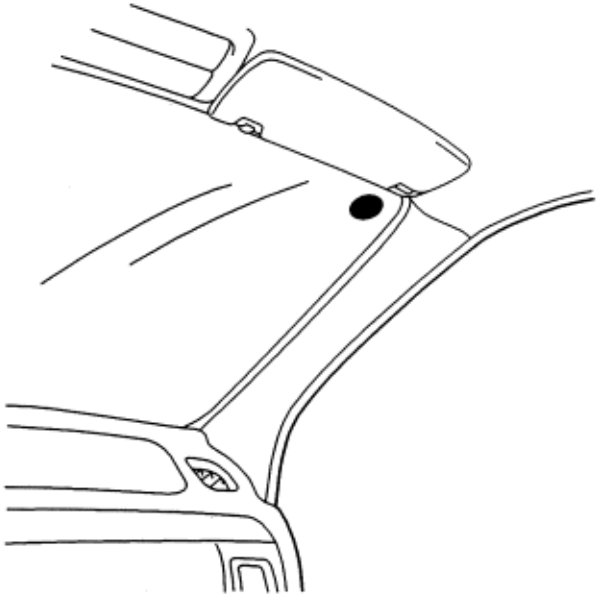
23. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.
24. Let the adhesive dry for at least one hour, then spray water over the windshield and check for leaks. Mark leaking areas and let the windshield dry, then seal with sealant.
- ♦ Let the vehicle stand for at least four hours after windshield installation. If the vehicle has to be used within the first four hours, it must be driven slowly.
 - ♦ Keep the windshield dry for the first hour after installation.
25. Reinstall all remaining removed parts. Install the rearview mirror after the adhesive has dried thoroughly. Advise customer not to do the following things for two to three days:
- ♦ Slam the doors with all the windows rolled up.
 - ♦ Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Apply the label in the area on the inside face of the windshield.

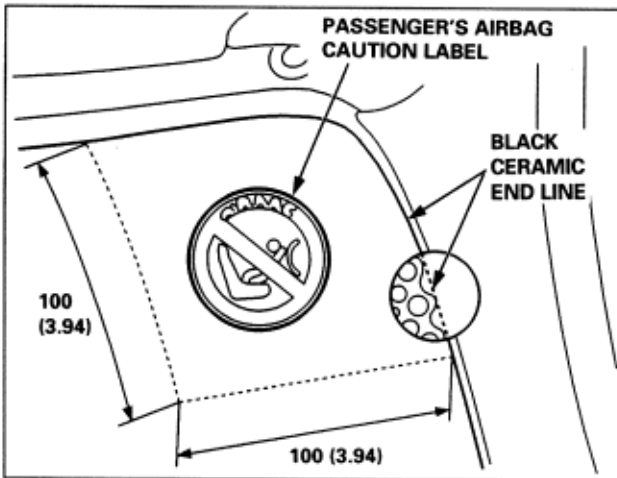
NOTE:

- Before applying, clean the front window surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.

Attachment Area (Reference):



Unit: mm (in)



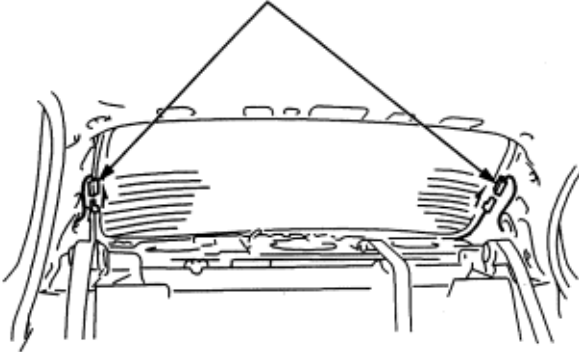
NOTE:

- ♦ Wear gloves to remove and install the rear window.
- ♦ Use seat covers to avoid damaging any surfaces.
- ♦ Do not damage the rear window defogger grid lines, window antenna grid lines and terminals.

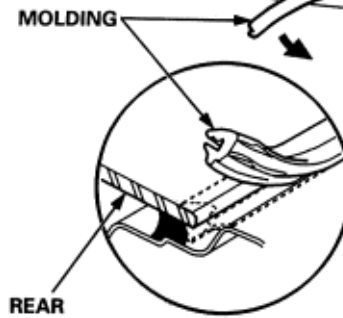
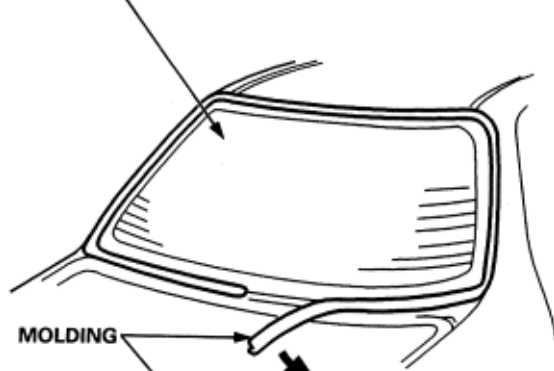
1. Remove:

- ♦ Trunk lid (**See Page 20-135**).
- ♦ Rear seat back, for fixed rear seat (**See Page 20-117**).
- ♦ Rear bulkhead cover, for fold down rear seat (**See Page 20-67**).
- ♦ Rear shelf (**See Page 20-67**).
- ♦ Headliner (**See Page 20-70**).

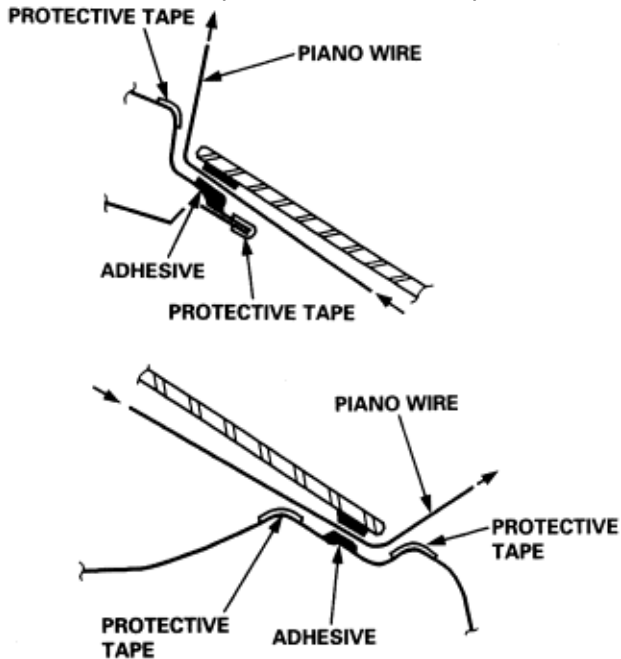
2. Disconnect the rear window defogger connectors.

**REAR WINDOW
DEFOGGER CONNECTORS**

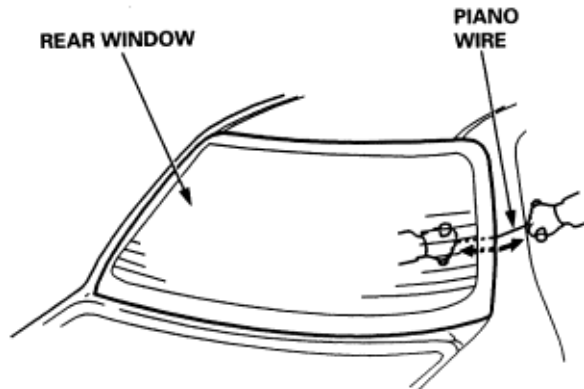
3. Remove the molding from the edge of the rear window. If necessary cut the molding with a utility knife.

REAR WINDOW**REAR
WINDOW**

4. Apply protective tape along the edge of the body as shown. Using an awl, make a hole through the adhesive from inside the vehicle. Push piano wire through the hole, and wrap each end around a piece of wood.

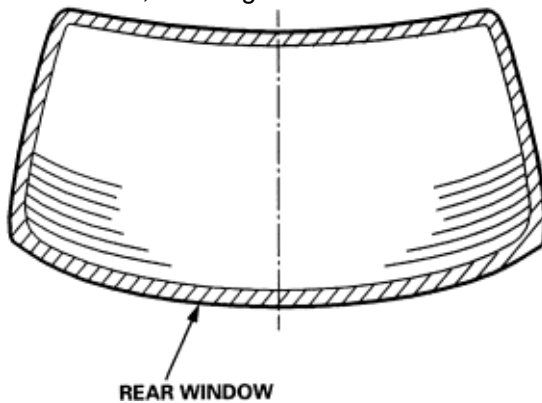


5. With a helper on the outside, pull the piano wire back and forth in a sawing motion. Hold the piano wire as close to the rear window as possible to prevent damage to the body, and carefully cut through the adhesive around the entire rear window.



6. Carefully remove the rear window.

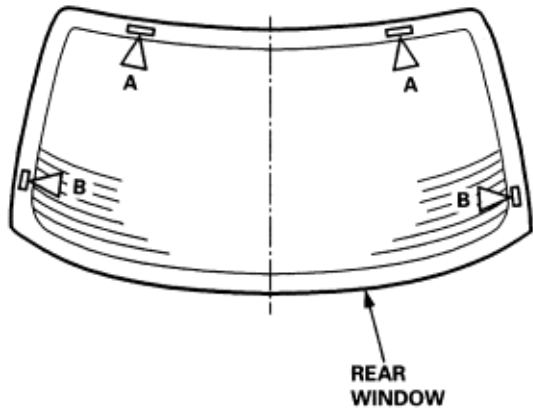
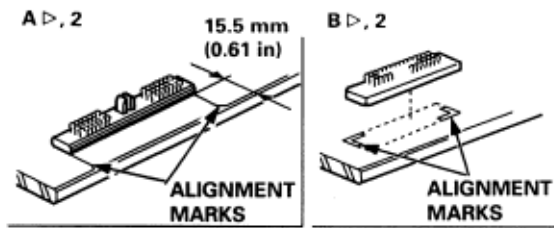
7. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire windshield opening flange:
- ♦ Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
 - ♦ Mask off surrounding surfaces before painting.
 - ♦ Remove the fasteners from the body.
8. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.
9. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the rear window surface and edge with alcohol where the new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil and grease.



10. Glue the fasteners to the inside face of the rear window as shown.

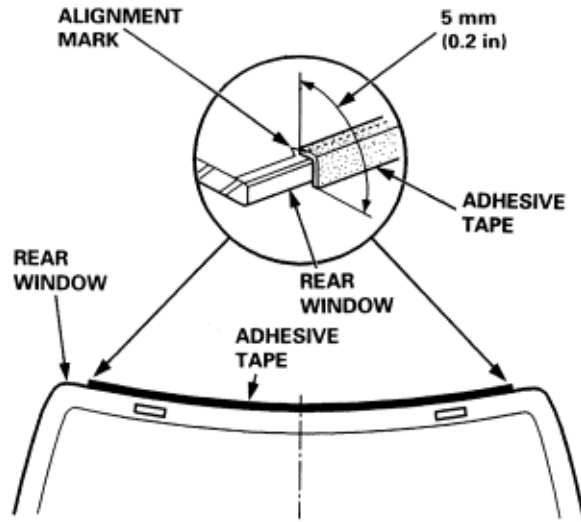
- ♦ Be sure the fasteners line up with the alignment marks.
- ♦ Be careful not to touch the rear window where adhesive will be applied.

▷: Fastener locations



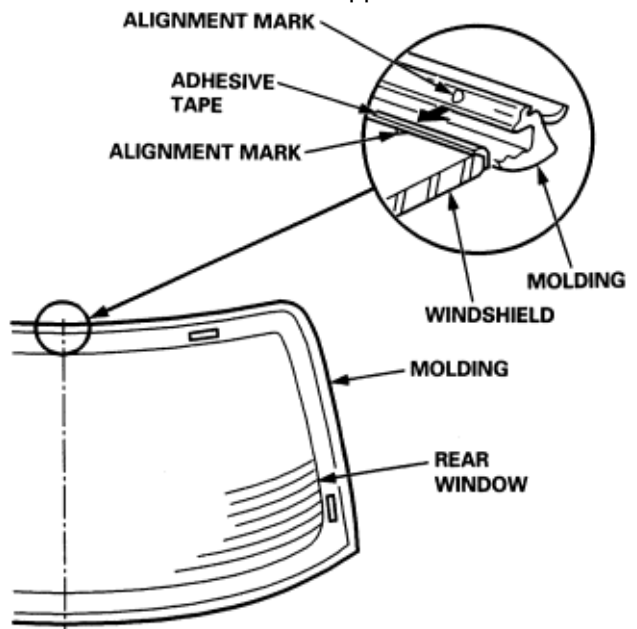
11. Apply the adhesive tape (3M 4216, or equivalent) to the edge of the rear window:

- ♦ Be sure the adhesive tape lines up with the alignment marks.
- ♦ Be careful not to touch the rear window where adhesive will be applied.



12. Glue the molding around the edge of the rear window:

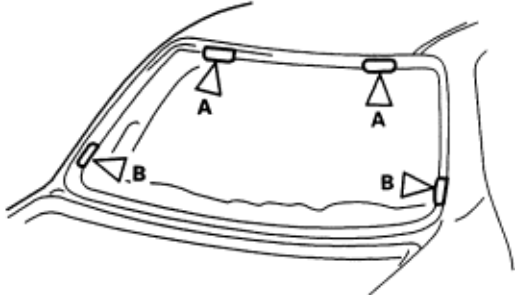
- ♦ Be sure the alignment mark of the molding lines up with the alignment mark of the rear window.
- ♦ Be careful not to touch the rear window where adhesive will be applied.



13. Install the upper fasteners, and glue the side fasteners to the body as shown.

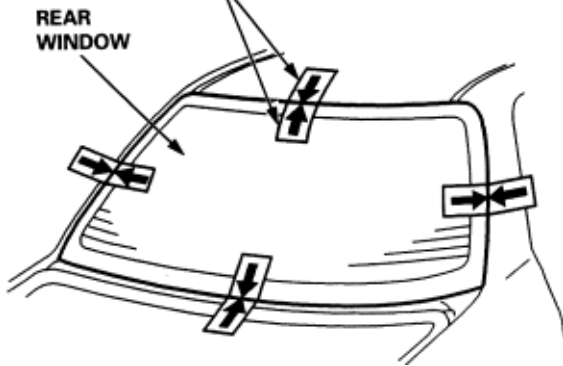
▷: Fastener locations

A ▷, 2 (Upper Fastener) B ▷, 2 (Side Fastener)



14. Set the rear window in the opening, and center it. Make alignment marks across the rear window and body with a grease pencil at the four points shown. Be careful not to touch the rear window where adhesive will be applied.

ALIGNMENT MARKS

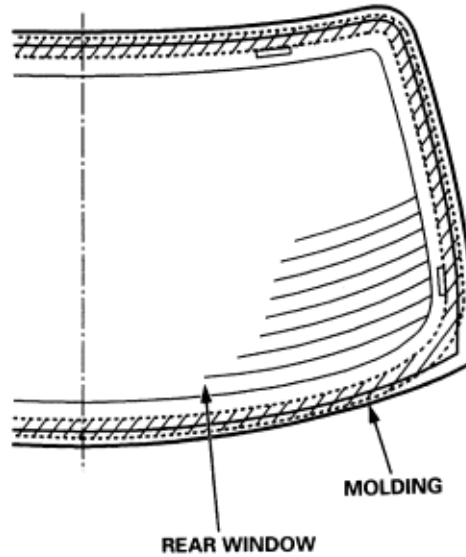
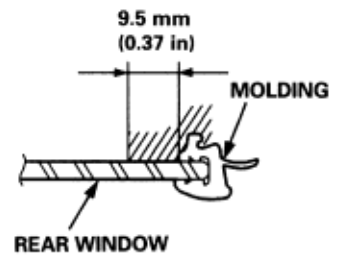


15. Remove the rear window.

16. With a sponge, apply a light coat of glass primer around the edge of the rear window and molding as shown, then lightly wipe it off with gauze or cheesecloth:


- ♦ Apply glass primer to the molding.
- ♦ Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
- ♦ Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- ♦ Keep water, dust and adhesive materials away from the primed surface.

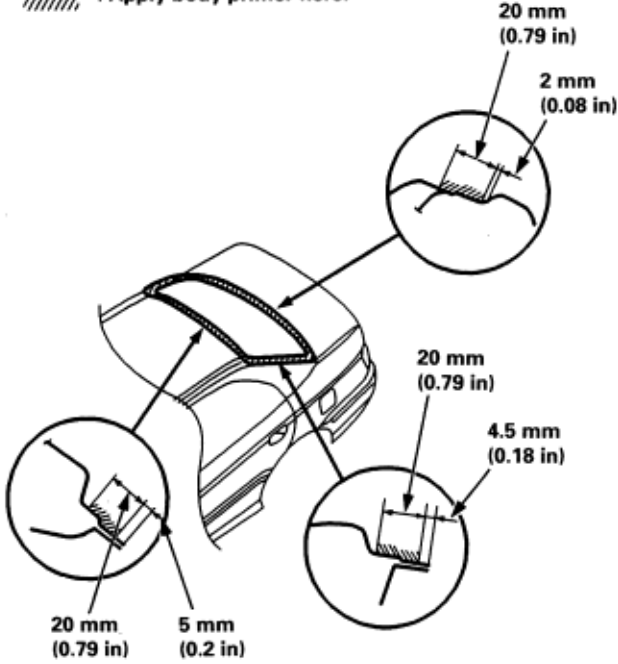
▨ : Apply glass primer here.



17. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for a least 10 minutes.

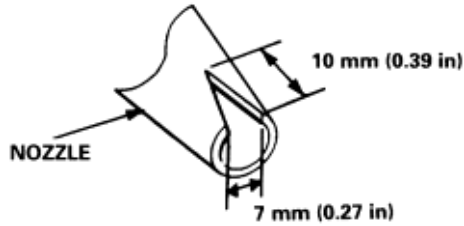
- ♦ Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- ♦ Never touch the primed surfaces with your hands.

 : Apply body primer here.

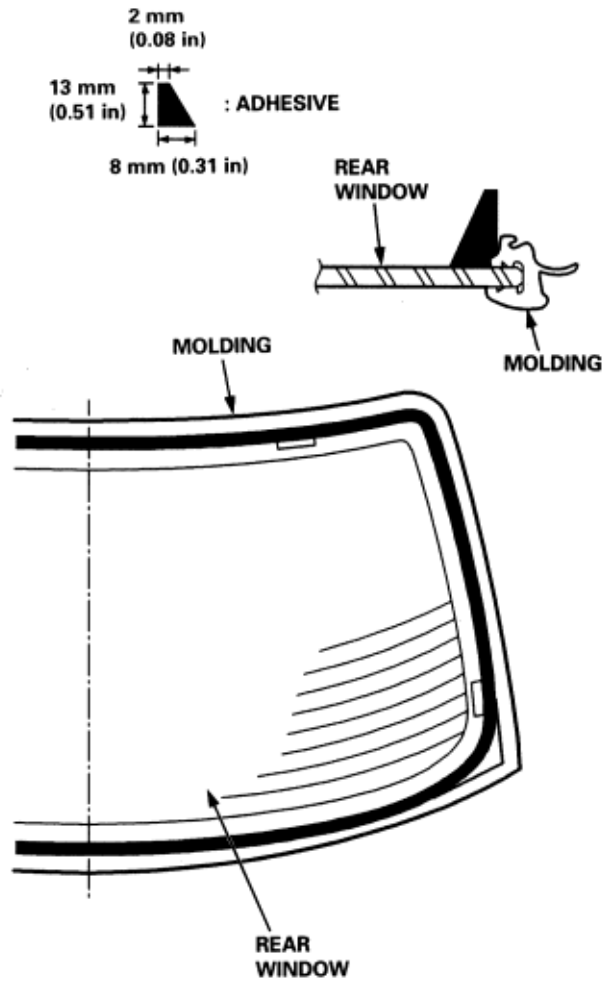


18. Thoroughly mix the adhesive and hardener together on a clean glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.

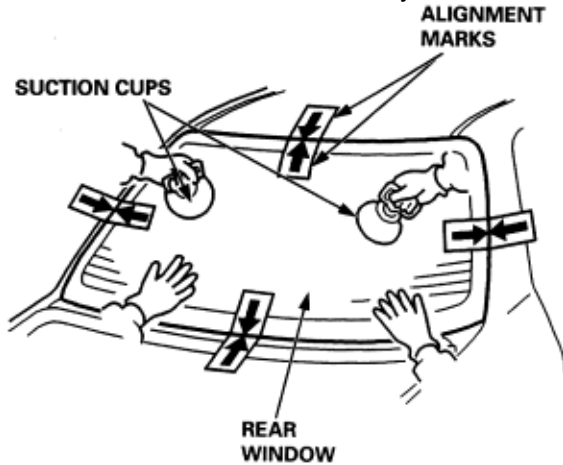
19. Before filling a cartridge, cut a "V" in the end of the nozzle as shown.



20. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the rear window as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



21. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 14, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



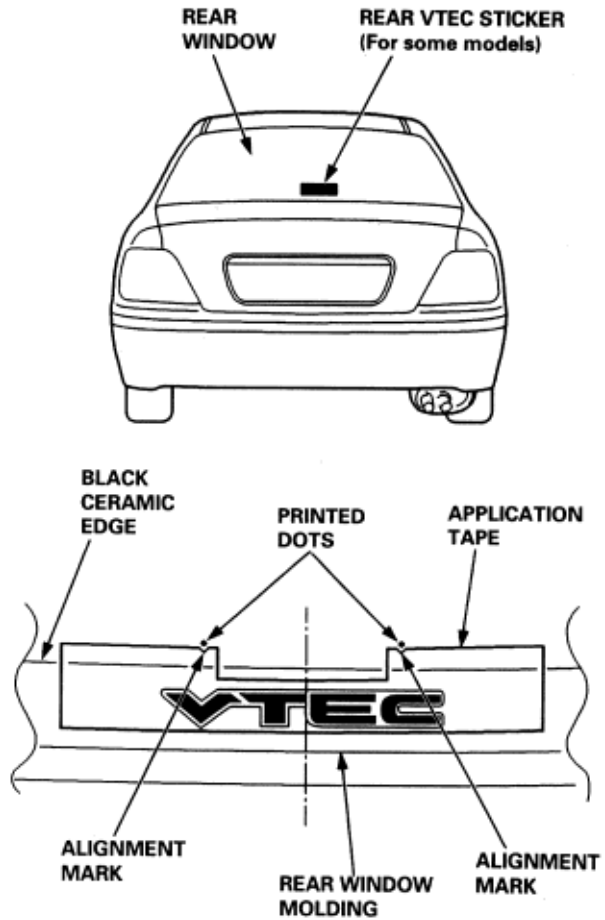
22. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, wipe with a soft shop towel dampened with alcohol.
23. Let the adhesive dry for at least one hour, then spray water over the rear window and check for leaks. Mark leaking areas and let the rear window dry, then seal with sealant. Let the vehicle stand for at least four hours after windshield installation. If the vehicle has to be used within the first four hours, it must be driven slowly.
24. Reinstall all remaining removed parts. Advise customer not to do the following things for two to three days:
- ♦ Slam the doors with all the windows rolled up.
 - ♦ Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

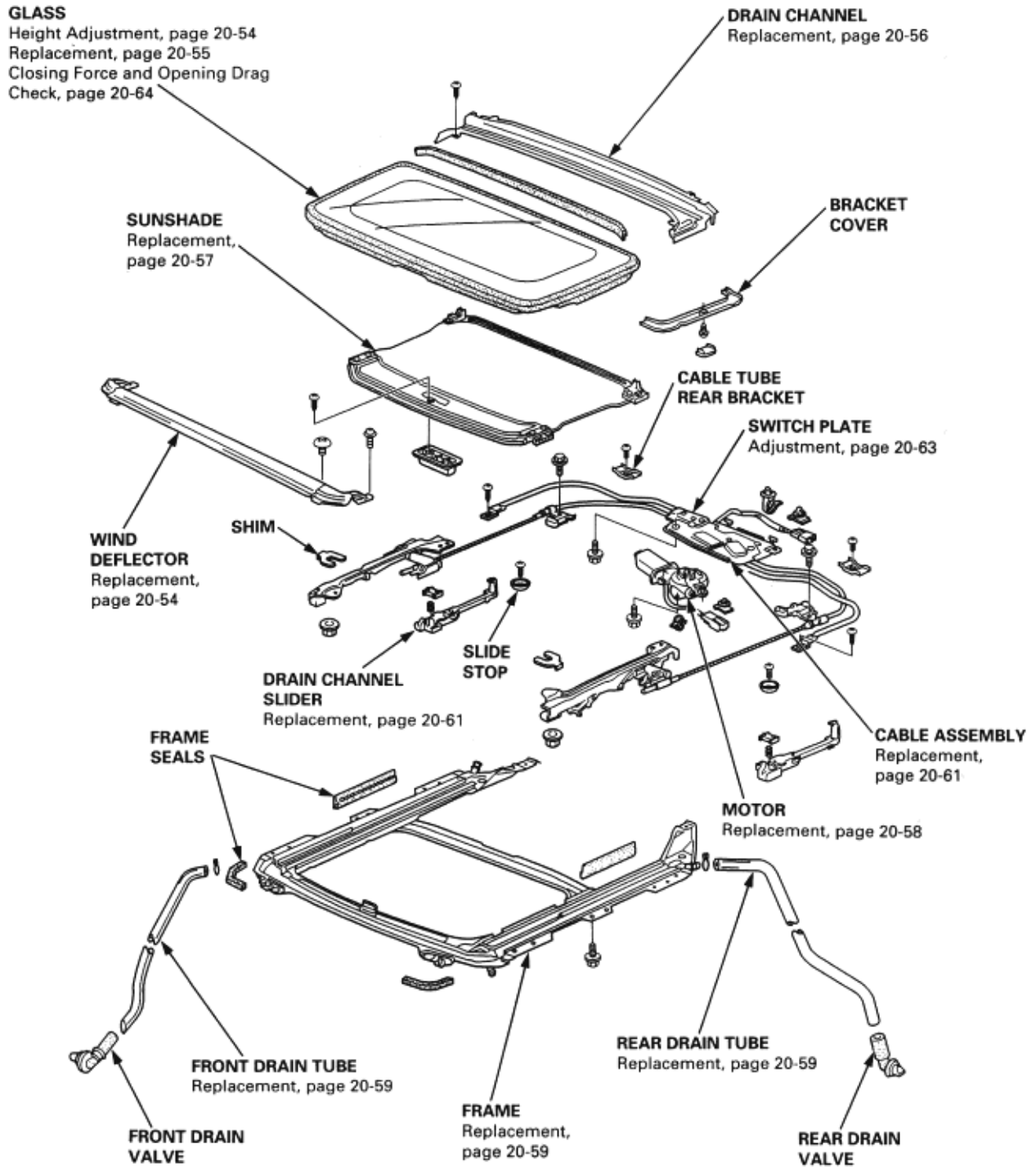
Apply the sticker where shown.

NOTE:

- ♦ Before applying, clean the rear window surface with a sponge dampened in alcohol.
- ♦ After cleaning, keep oil, grease and water from getting on the surface.

Attachment Point (Reference):





To go to the pages referenced on the diagram above,
click on the following:

(See Page 20-54)

(See Page 20-55)

(See Page 20-64)

(See Page 20-57)

(See Page 20-61)

(See Page 20-59)

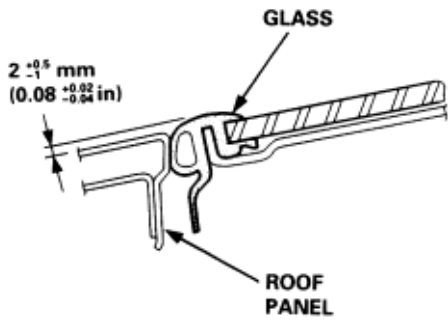
(See Page 20-56)

(See Page 20-63)

(See Page 20-58)

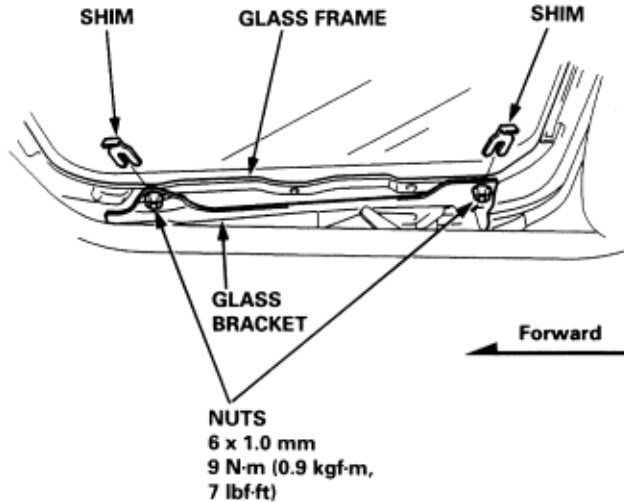
Symptom	Diagnostic procedure	Also check for
Water leaks	<ol style="list-style-type: none">1. Check for a clogged drain tube.2. Check for a gap between the glass weatherstrip and the roof panel.3. Check for a defective or an improperly installed glass weatherstrip.4. Check for a gap between the drain seal and the roof panel.	
Wind noise	<ol style="list-style-type: none">1. Check for excessive clearance between the glass weatherstrip and the roof panel.	
Deflector noise	<ol style="list-style-type: none">1. Check for an improper clearance between the deflector seal and frame seal.2. Check for an insufficient deflector extension.3. Check for a deformed deflector.	
Motor noise	<ol style="list-style-type: none">1. Check for a loose motor.2. Check for a worn gear or bearing.3. Check for a deformed cable assembly.	
Glass does not move, but motor turns	<ol style="list-style-type: none">1. Check for a defective gear or inner cable.2. Check for foreign matter stuck between the guide rail and the slider.3. Check for a loose inner cable.4. Make sure the cable assembly is attached properly.5. Check clutch adjustment.	
Glass does not move and motor does not turn (glass can be moved with sunroof wrench)	<ol style="list-style-type: none">1. Check for a blown fuse.2. Check for a faulty sunroof switch.3. Check the open/close-tilt/close switches.4. Check for a run down battery.5. Check for a defective motor.6. Check for a faulty relay.	

The roof panel should be even with the glass weatherstrip to within $2 + 0.5, - 1$ mm ($0.08 + 0.02, - 0.04$ in) all the way around. If not, open the glass fully and:



1. Remove the bracket cover.
2. Loosen the nuts and install the shims between the glass frame and glass bracket on each side.

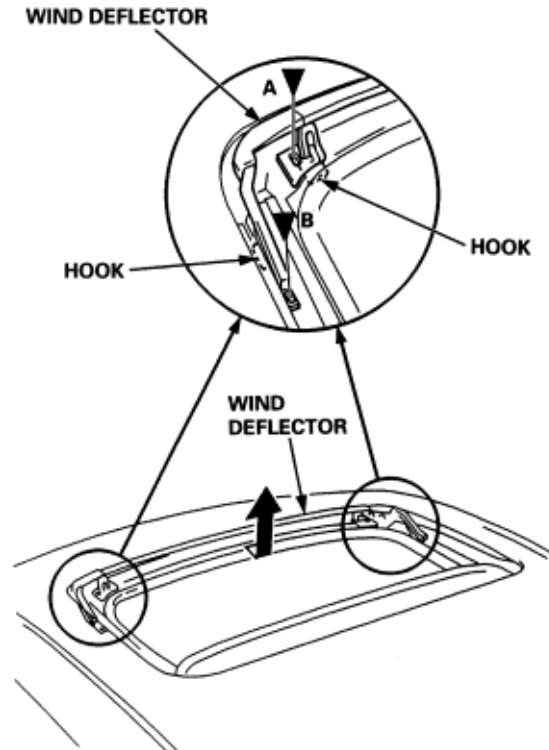
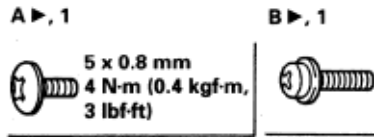
Shim thickness: Front and rear max. 2 mm (0.08 in)



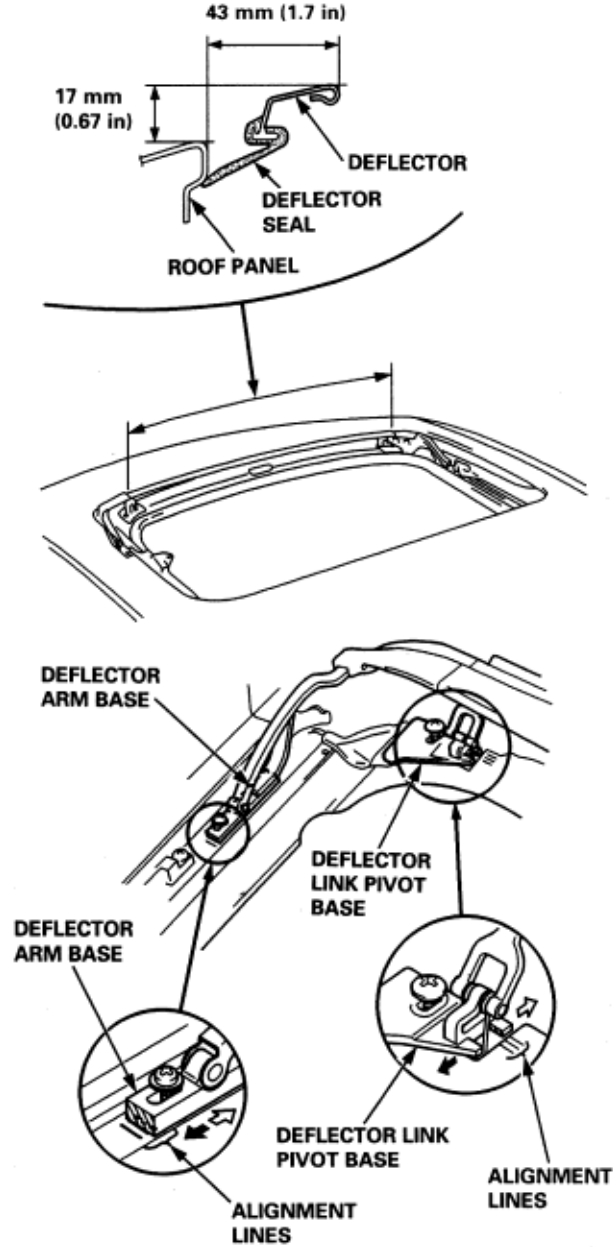
3. Repeat on opposite side if necessary.

1. Open the glass fully.
2. Remove the screws, then remove the wind deflector.

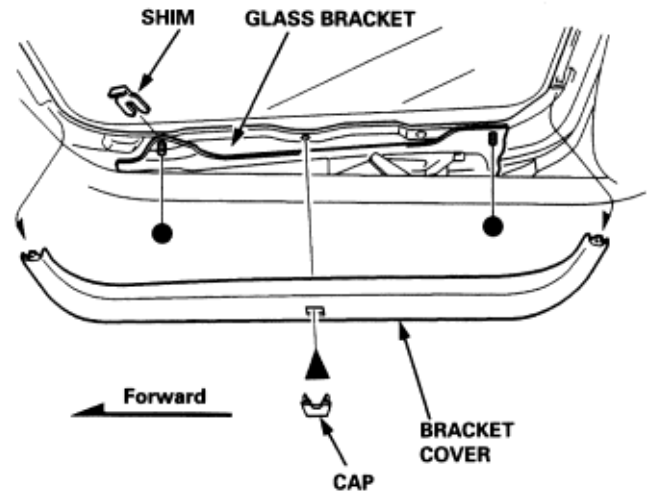
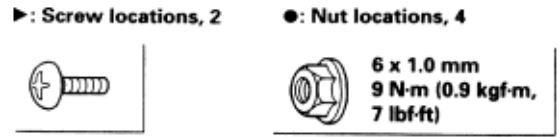
►: Screw locations



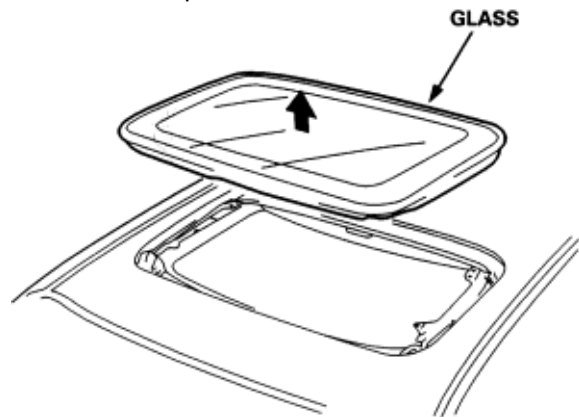
3. Install in the reverse order of removal, and check that the each base of wind deflector lines up with the same position of alignment lines. If necessary, adjust them forward or backward so the edge of the wind deflector touches the roof panel evenly. The bases must be moved same amount for adjustment.



1. Close the glass fully.
2. Slide the sunshade all the way back.
3. Remove the caps and screws, then remove both bracket covers. Remove the nuts and shims from both glass brackets.



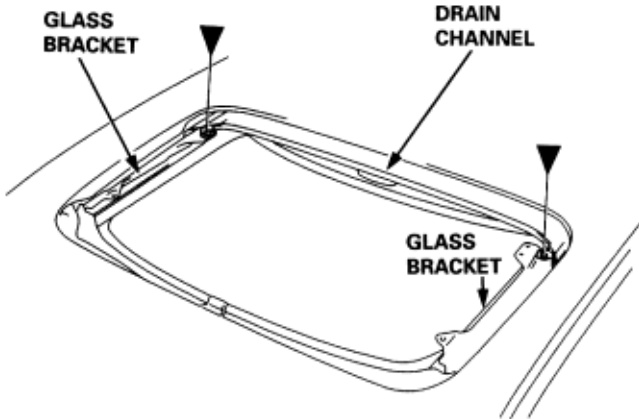
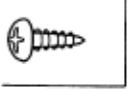
4. Remove the glass by lifting it up. Do not damage the roof panel.



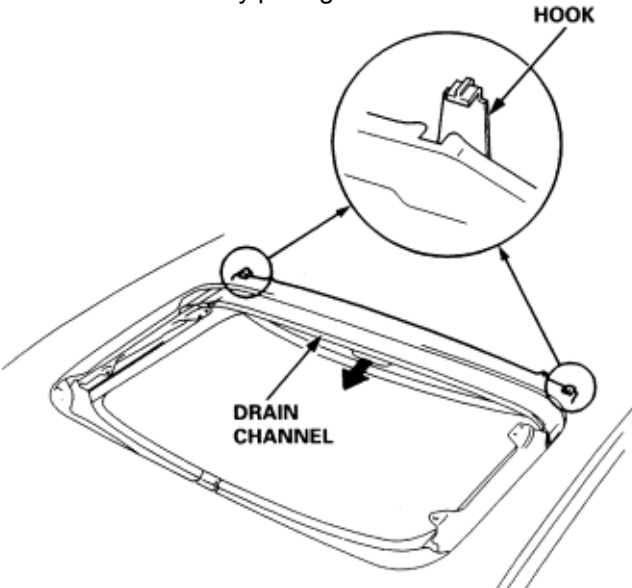
5. Install in the reverse order of removal, and adjust the glass height alignment.
6. Check for water leaks. Do not use high-pressure water.

1. Remove the glass.
2. With the sunroof wrench, move both glass brackets to the position where the sunroof normally pivots down, and remove the screws securing the drain channel.

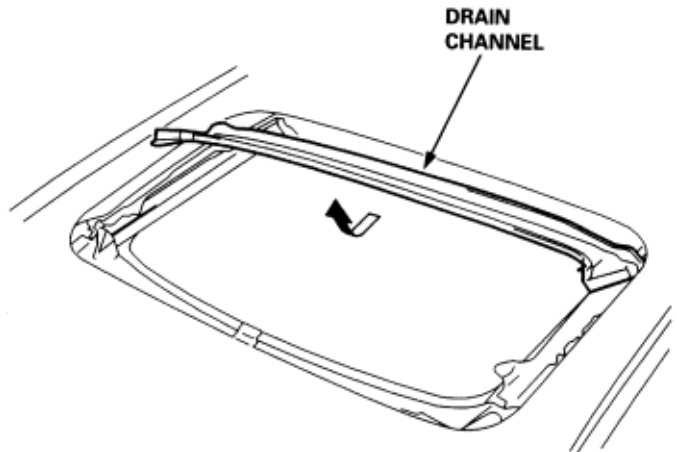
►: Screw locations, 2



3. Release the drain channel from both hooks of the drain channel slider by pulling the drain channel forward.



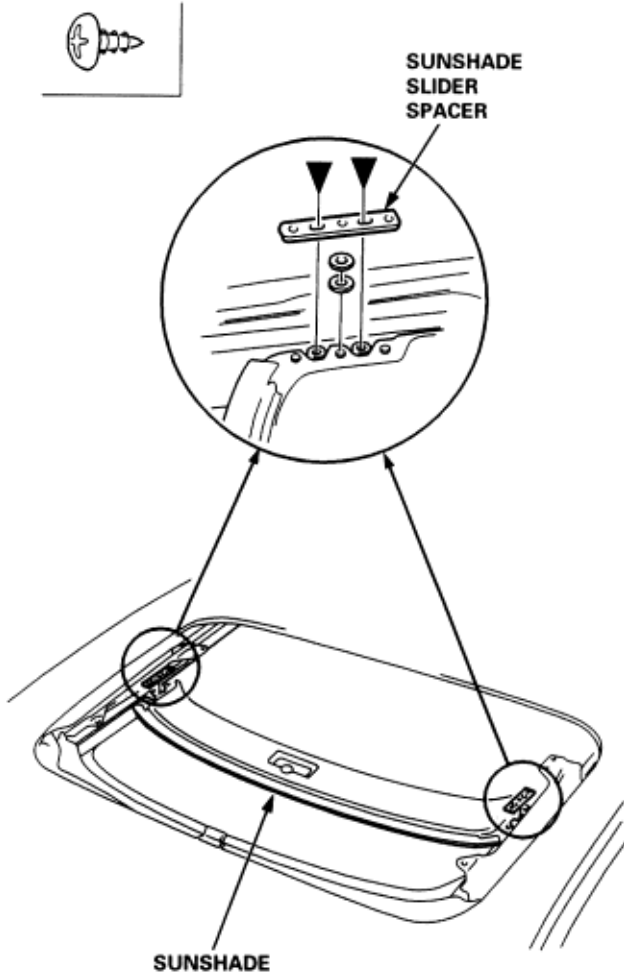
4. Remove the drain channel.



5. Install in the reverse order of removal, and note these items.
 - ♦ Push the drain channel to the hooks until a faint click is heard.
 - ♦ Check the glass height alignment.
6. Check for water leaks. Do not use high-pressure water.

1. Remove
 - ♦ Glass (**See Page** 20-55).
 - ♦ Drain channel (**See Page** 20-56).
2. Slide the sunshade until you can remove both sunshade slider spacers.

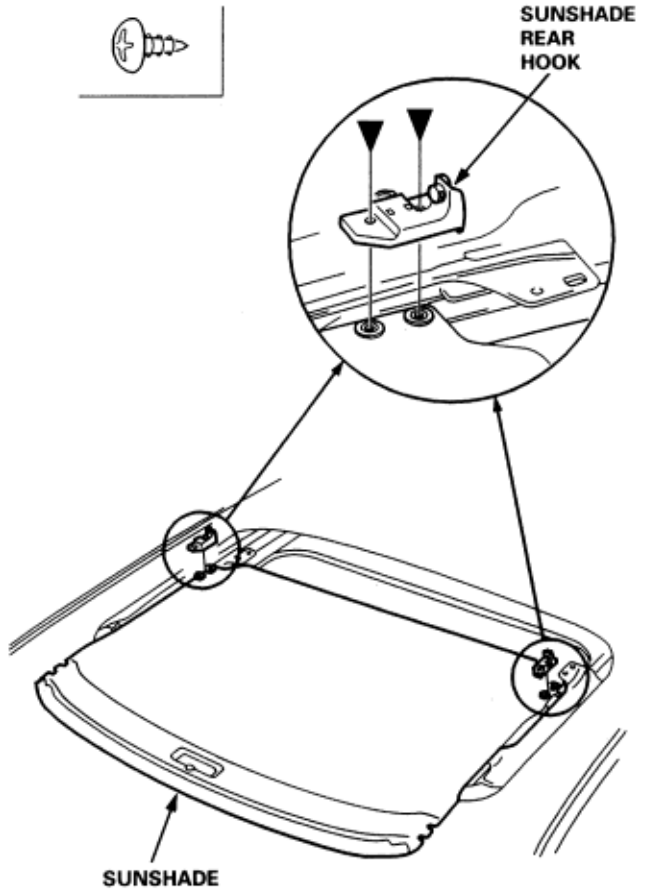
►: Screw locations, 4



3. Remove the screws, then remove both sunshade slider spacers.

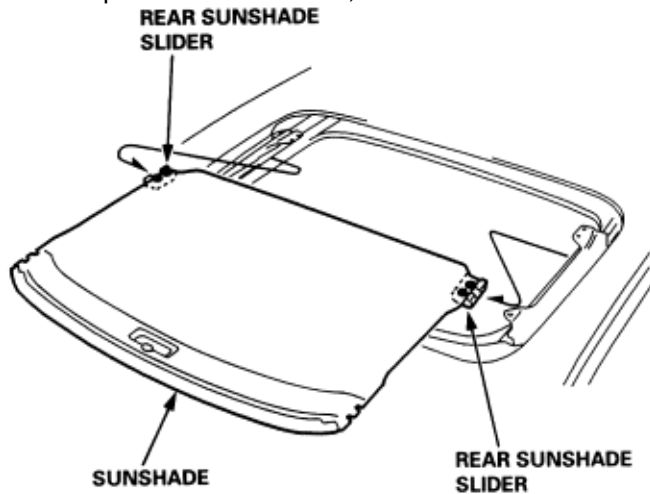
4. While lifting the front portion of the sunshade, move the sunshade forward until you can remove both sunshade rear hooks. Do not damage the sunshade and rear hooks.

►: Screw locations, 4

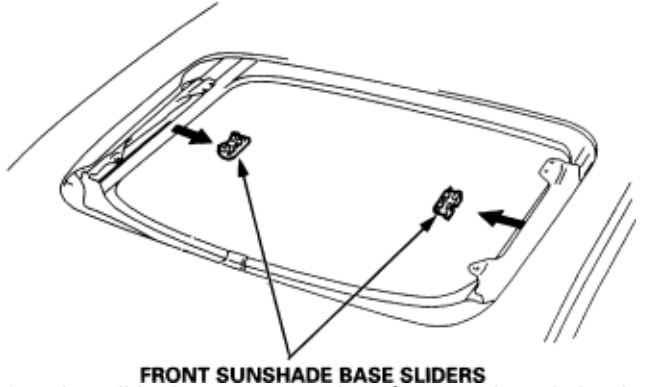


5. Remove the screws, then remove both sunshade rear hooks.

6. Release both rear sunshade base sliders from the guide rail portions of the frame, then remove the sunshade.



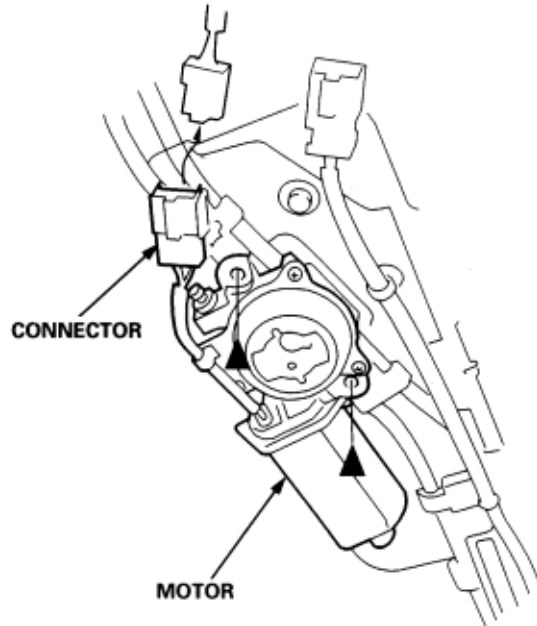
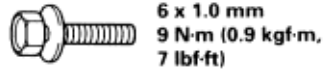
7. Remove both front sunshade base sliders.



8. Install in the reverse order of removal, and check the glass height alignment (See Page 20-54).
9. Check for water leaks. Do not use high-pressure water.

1. Remove the headliner (See Page 20-70).
2. Disconnect and detach the connector, and remove the bolts, then remove the motor. Wear gloves to protect your hands.

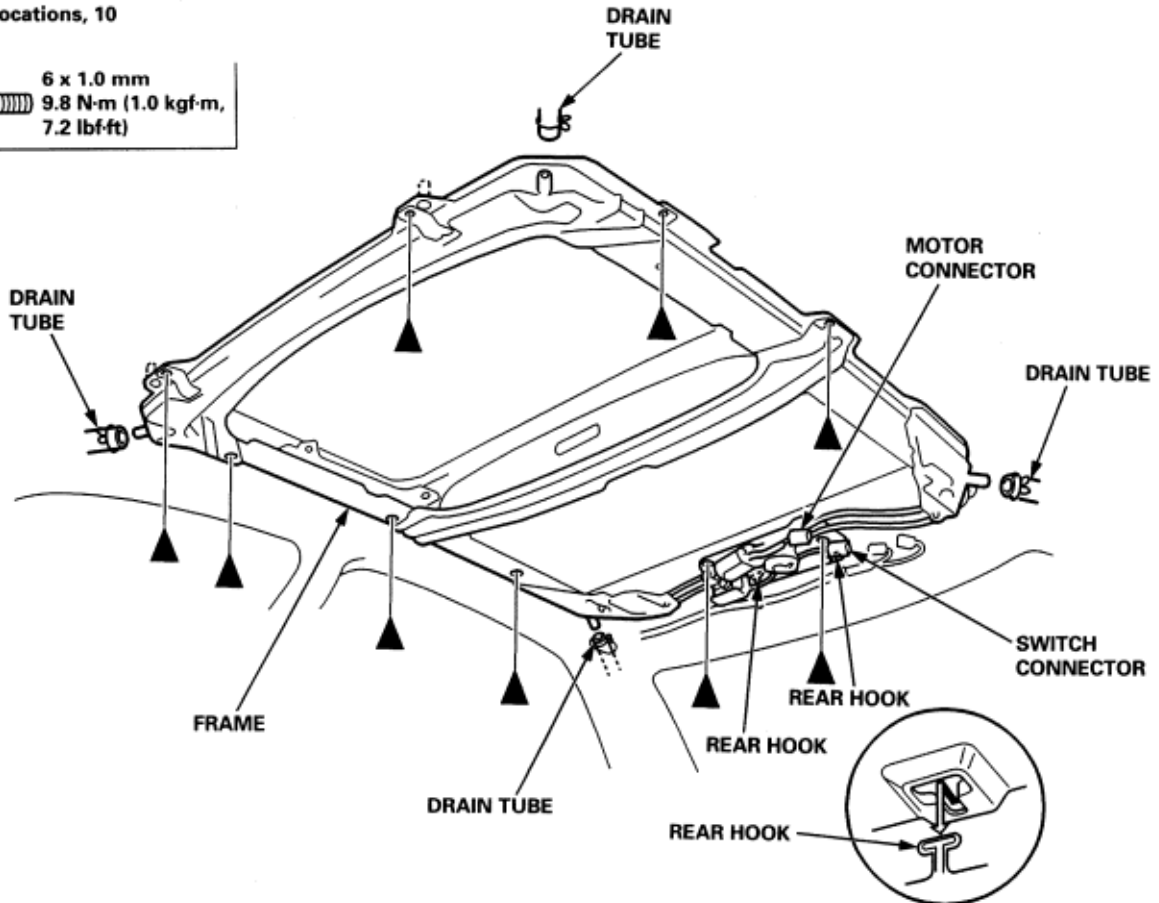
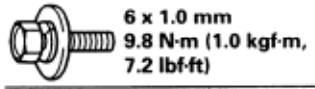
►: Bolt locations, 2



3. Install in the reverse order of removal and note the following items:
 - ♦ Make sure the connector is plugged in properly.
 - ♦ Check the motor operation.

1. Remove
 - ♦ Headliner (**See Page** 20-70).
 - ♦ Glass (**See Page** 20-55).
2. Disconnect the motor connector, open/close-tilt/close switch connector and the drain tubes. Wear gloves to protect your hands.

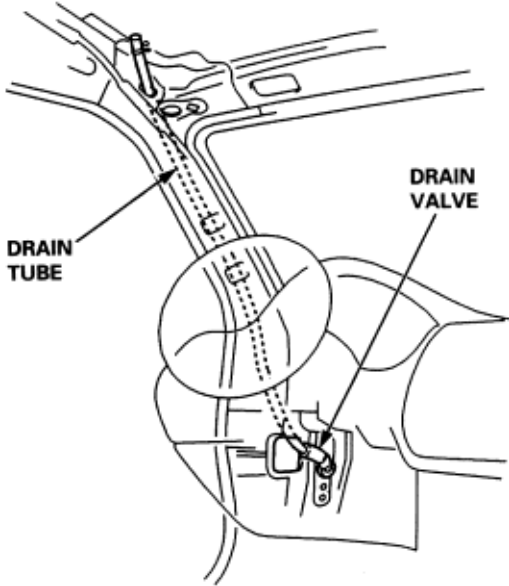
►: Bolt locations, 10



3. Remove the ceiling light harness by detaching the harness clips, then remove the harness cushion.
4. With an assistant holding the frame, remove the bolts and release the rear hooks by moving the frame forward, then remove the frame. Remove the front bolts last.
5. With the help of an assistant, carefully remove the frame through the door opening. Take care not to scratch the interior trim and body, or tear the seat covers.

6. Remove each drain valve from the body, and pull the drain tubes out of the front and rear pillars. Before pulling out the drain tube, tie a string to the end of it so it can be reinstalled.

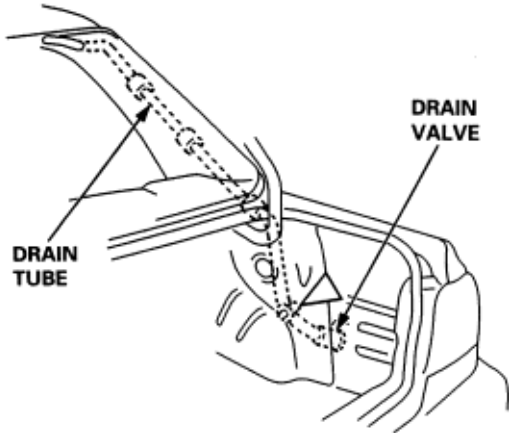
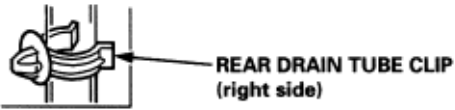
Front drain tube:



Rear drain tube:

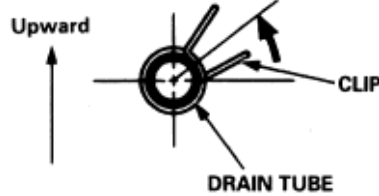
Pull the trunk side trim, both side as necessary (See Page 20-68) and (See Page 20-69).

▷: Clip location, 1



7. Install in the reverse order of removal, and note the following items:

- ♦ Before installing the frame, clear the drain tubes and drain valves using compressed air.
- ♦ Check the frame seal.
- ♦ Clean the surface of the frame.
- ♦ When installing the frame, first attach the rear hooks into the body holes.
- ♦ Make sure the connectors are plugged in properly.
- ♦ When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in).
- ♦ Install the tube clip to the drain tube as shown.



8. Check for water leaks. Do not use high-pressure water.

Sunroof

Drain Channel Slider and Cable Assembly Replacement

20-61

1. Remove the frame (See Page 20-59).
2. Remove the following parts from the frame:
 - ♦ Drain channel (See Page 20-56).
 - ♦ Sunshade (See Page 20-57).
 - ♦ Motor (See Page 20-58).
3. Remove the slide stops, cable tube rear brackets, cable tube side bracket mounting bolts and the cable tube mounting screws from both sides of the frame. Wear gloves to protect your hands.

►: Bolt, screw locations

A ►, 2



6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

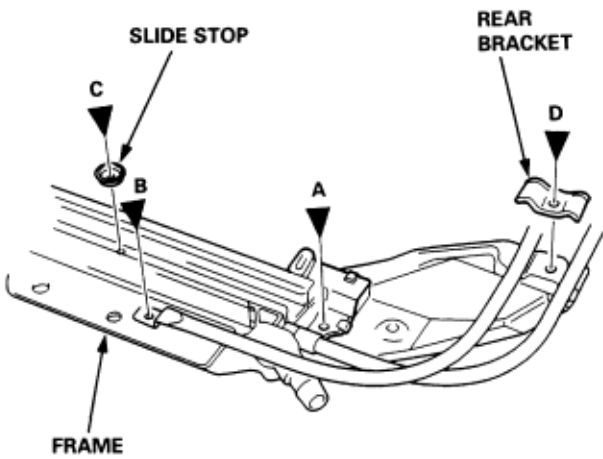
B ►, 2



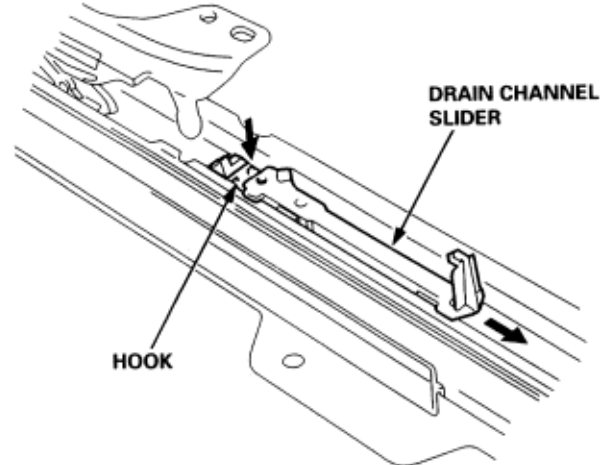
C ►, 2



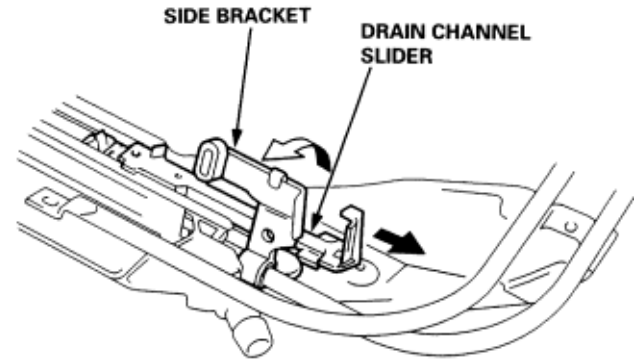
D ►, 2



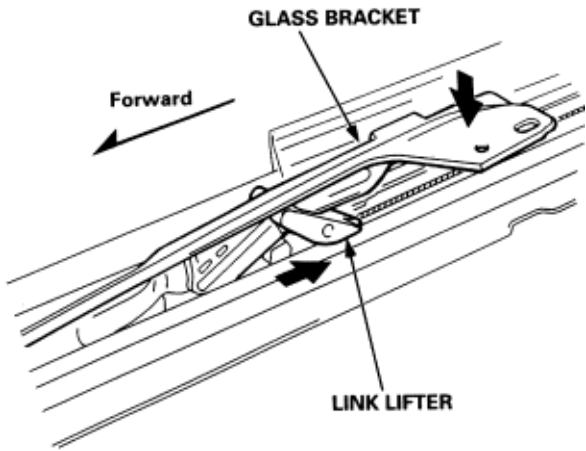
4. While pushing down on the hook, slide the drain channel sliders back on both sides.



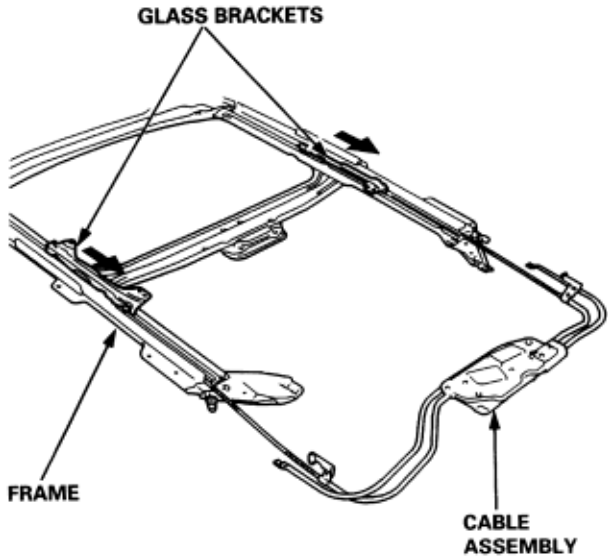
5. Turn both cable tube side brackets up, and remove the drain channel sliders.



6. Pivot the glass bracket down by sliding the link lifter back, then slide both glass brackets back with the lift lifter.

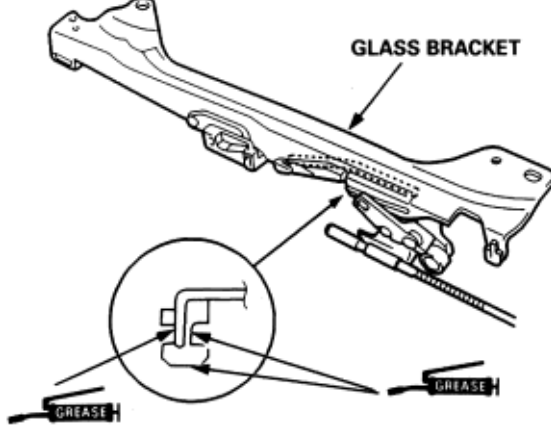


7. Slide the cable assembly and both glass brackets back, then remove them from the frame.

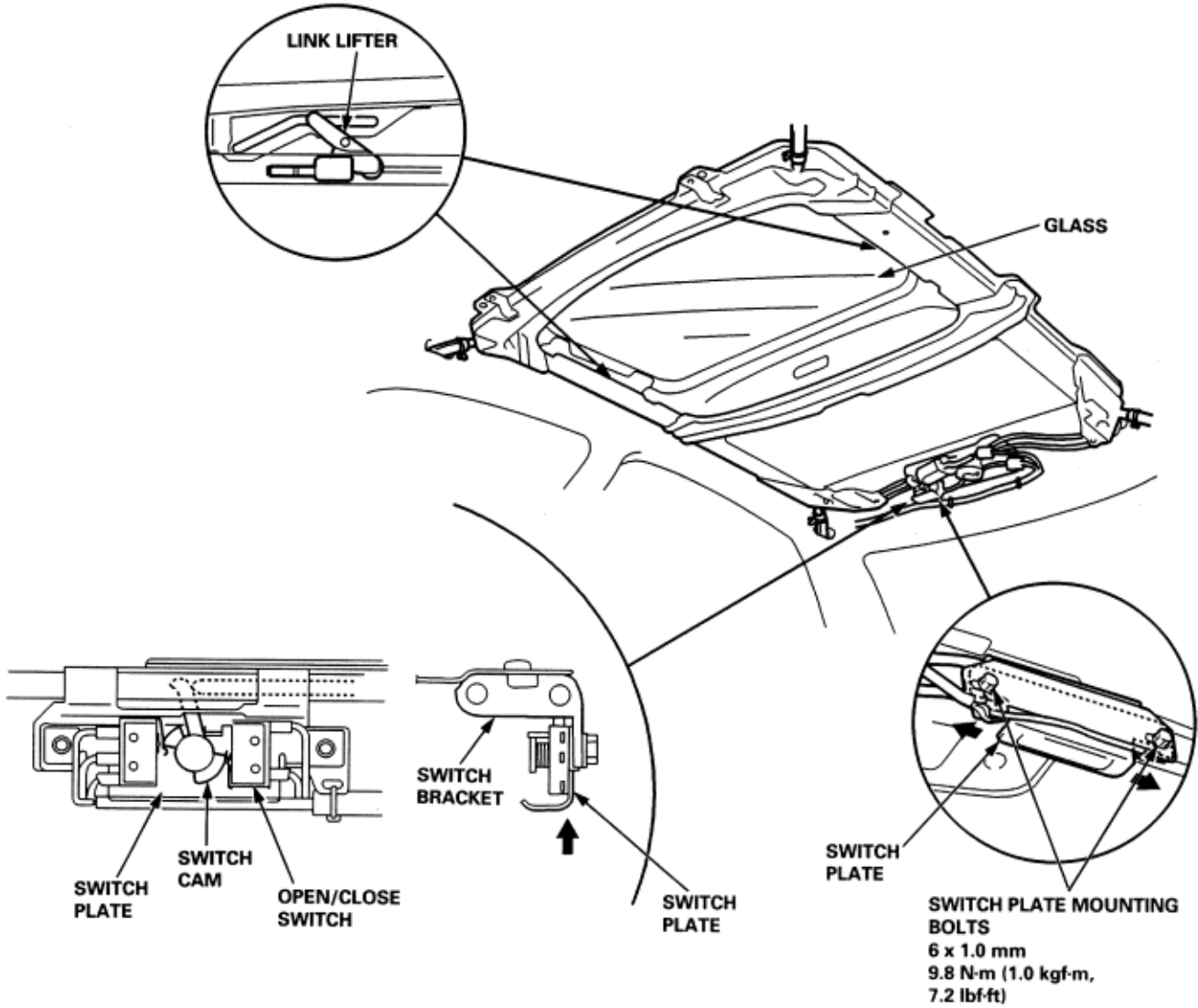


8. Install in the reverse order of removal, and note the following items:

- ♦ Damaged parts should be replaced.
- ♦ Apply multi-purpose grease to the glass bracket and guide rail portion of the frame indicated by the arrows.
- ♦ Before reinstalling the motor, make sure both link lifters are parallel, and in the fully closed position.
- ♦ Before reinstalling the motor, install the frame and glass, then check the opening drag (See Page 20-64).



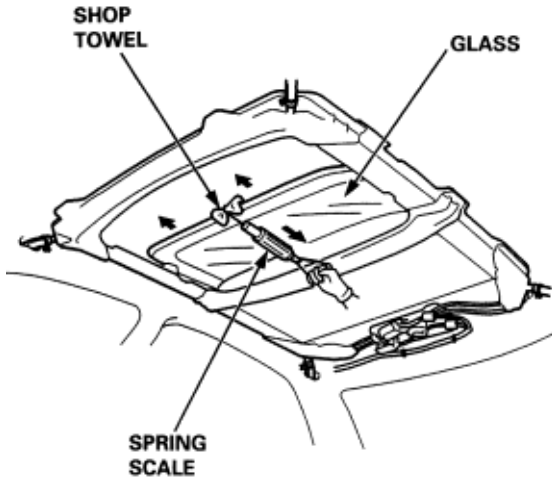
1. Remove the headliner (See Page 20-70).
2. With the sunroof wrench, close the glass fully:
 - Make sure both link lifters are parallel and in the position shown.
 - Check the glass fit to the roof panel and the glass height (See Page 20-54).



3. With an open-end wrench loosen the switch plate mounting bolts.
4. Adjust the switch plate position:
 - Move the switch plate a little at a time, then secure the switch plate at the position where the switch cam contacts the open/close switch; a faint click is heard.
 - Check that the switch plate contacts the switch bracket.
5. Check the operation of the glass (from tilt-up position to the fully closed position, from the fully open position to the fully closed position) by operating the sunroof switch.

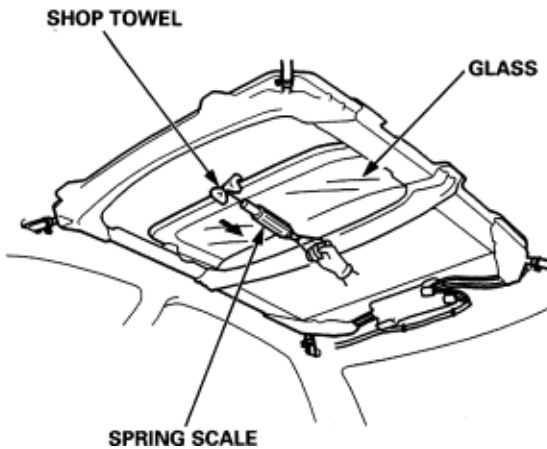
1. Remove the headliner (**See Page** 20-70).
2. Closing force check:
 - ♦ With a shop towel on the leading edge of the glass, attach a spring scale as shown.
 - ♦ Have an assistant hold the switch to close the glass while you measure the force required to stop it.
 - ♦ Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

**Closing Force: 200 - 290 N
(20 - 30 kgf, 44 - 66 lbf)**



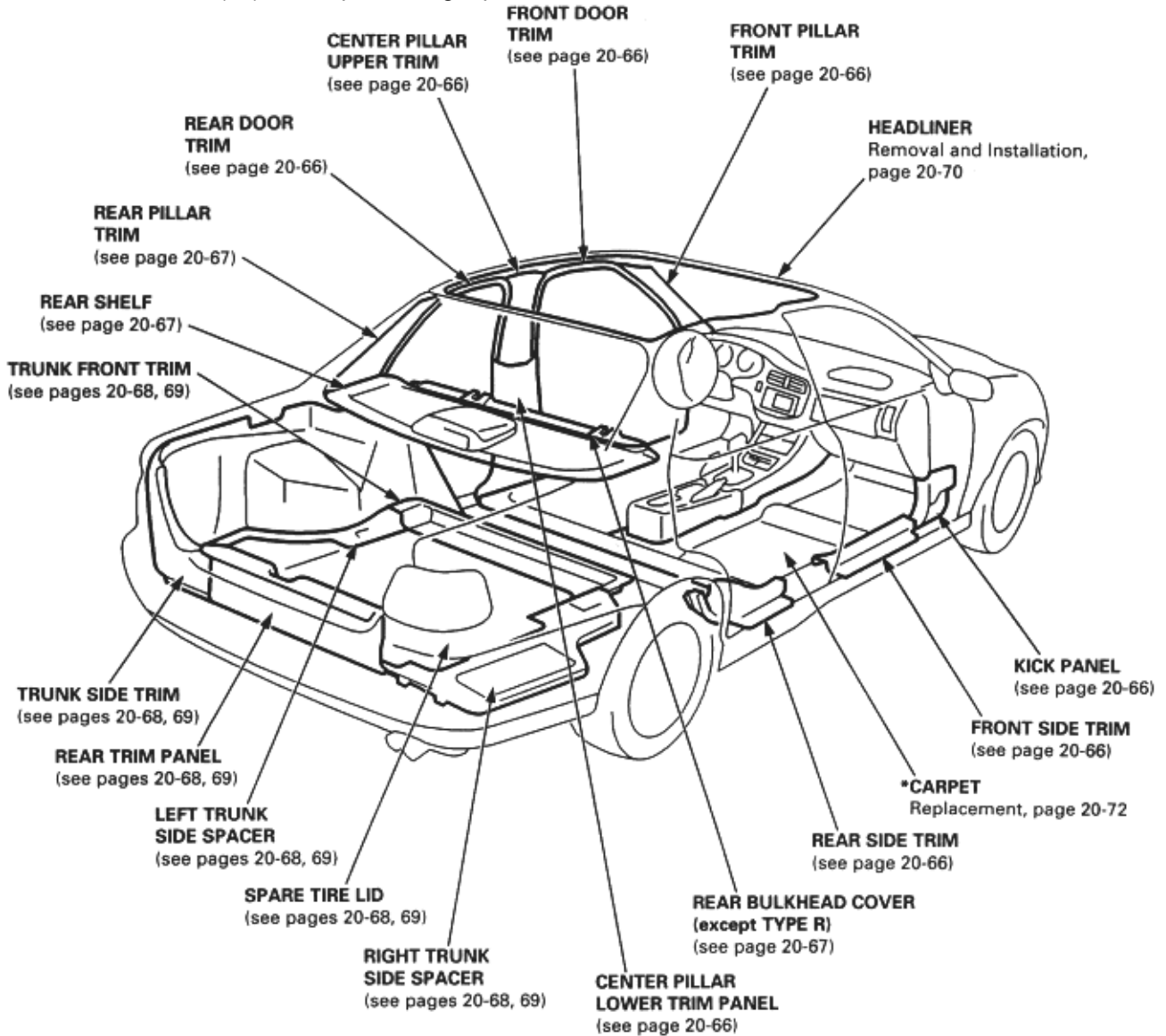
3. If the force is not within specification, remove the sunroof motor (**See Page** 20-58), then check:
 - ♦ The gear portion and the inner cable for breakage and damage. If the gear portion is broken, replace the motor. If the inner cable is damaged, remove the frame (**See Page** 20-59), and replace the cable assembly (**See Page** 20-61).
 - ♦ The sunroof motor (see section 23). If the motor fails to run or does not turn smoothly, replace it.
 - ♦ The opening drag.

4. Opening drag check: Protect the leading edge of the glass with a shop towel. Measure the effort required to open the glass using a spring scale as shown.



5. If the load is over 40 N (4 kgf, 9 lbf) check:
 - ♦ The side clearance and glass height adjustment (**See Page** 20-54).
 - ♦ For broken or damaged sliding parts. If any sliding parts are damaged, replace them.

SRS components are located in the areas marked with an asterisk (*). Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.



To go to the pages referenced on the diagram above, click on the following:

(See Page 20-66)

(See Page 20-67)

(See Page 20-68)

(See Page 20-69)

(See Page 20-70)

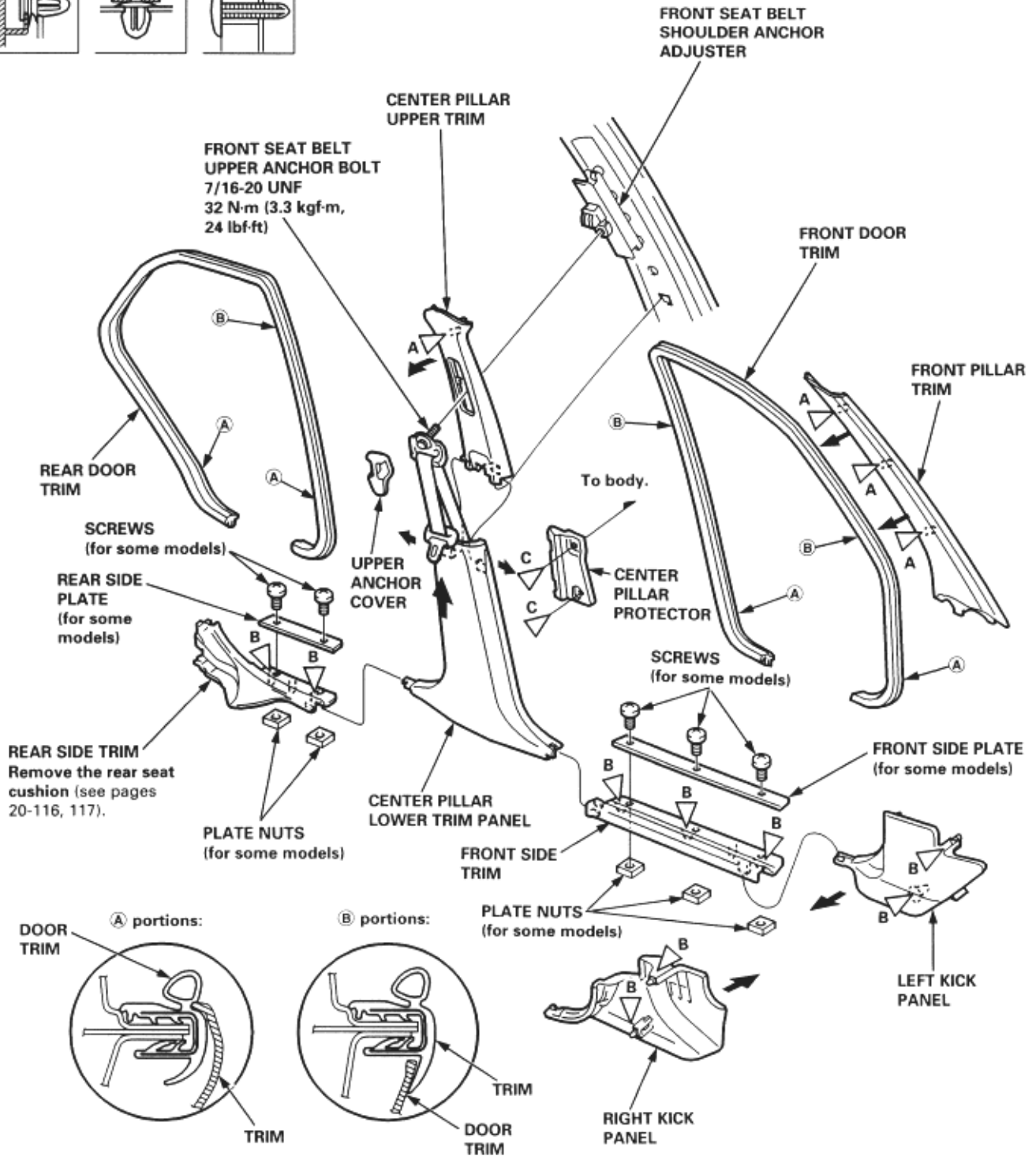
(See Page 20-72)

NOTE:

- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.
- Wear gloves to protect your hands.

▷: Clip locations

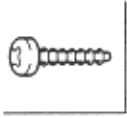
A ▷, 4 B ▷, 9 C ▷, 2



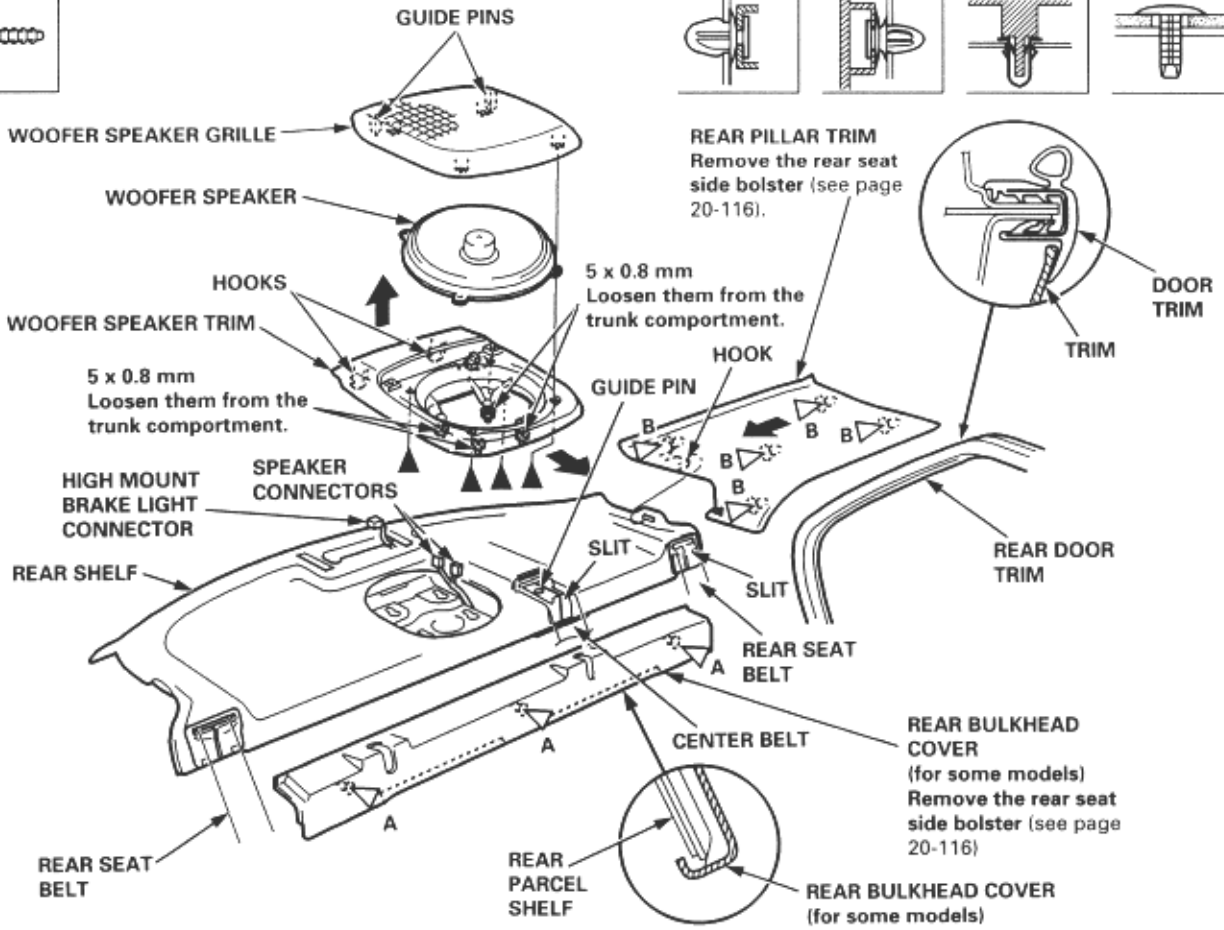
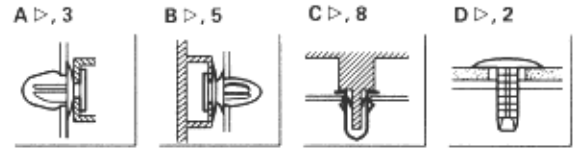
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 20-116\)](#)
[\(See Page 20-117\)](#)

With BOSE Sound System:

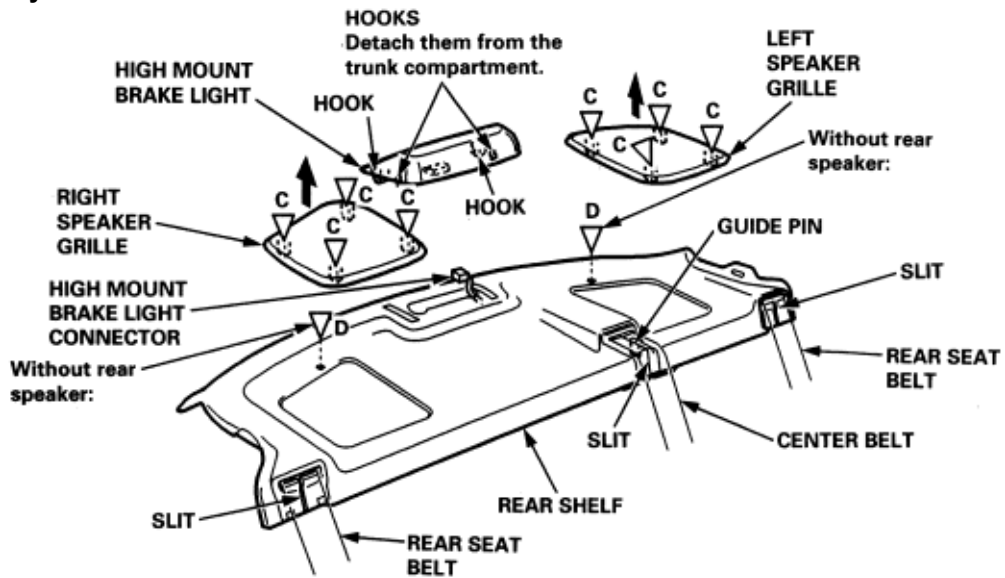
►: Screw locations, 4



▷: Clip locations



Without BOSE Sound System:



To go to the page referenced on the diagram above, click on the following:
[\(See Page 20-116\)](#)

With fold down rear seat:

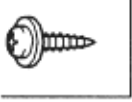
►: Screw locations, 2

▷: Clip locations

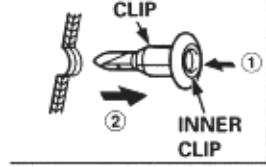
B ▷, 10

C ▷, 4

D ▷, 4



NOTE: Do not push the inner clip in too far.



REAR CENTER PIVOT COVER

HOOKS

LEFT TRUNK SIDE TRIM

Remove the following parts:

- Rear bulkhead cover (see page 20-67)
- Rear seat-back (see page 20-116)

TRUNK FRONT TRIM

Remove the rear seat-back (see page 20-116)

Install them with rear seat-back (see page 20-116)

RIGHT TRUNK SIDE TRIM

Remove the following parts:

- Rear bulkhead cover (see page 20-67)
- Rear seat-back (see page 20-116)

8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)
(for some models)
Use a Torx
T40 bit.

8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)
(for some models)
Use a Torx
T40 bit.

8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)
(for some models)
Use a Torx
T40 bit.

TIE DOWN
HOOK
(for some
models)

TIE DOWN
HOOK TRIM
(for some models)

REAR TRIM
PANEL

LEFT TRUNK
SIDE SPACER

TIE DOWN HOOKS
(for some models)

RIGHT TRUNK
SIDE SPACER

TOOL BOX

TIE DOWN HOOK
(for some models)

TIE DOWN
HOOK TRIM
(for some
models)

HOOKS

To go to the pages referenced on the diagram above, click on the following:

(See Page 20-67)

(See Page 20-116)

With fixed rear seat:

►: Screw locations, 2

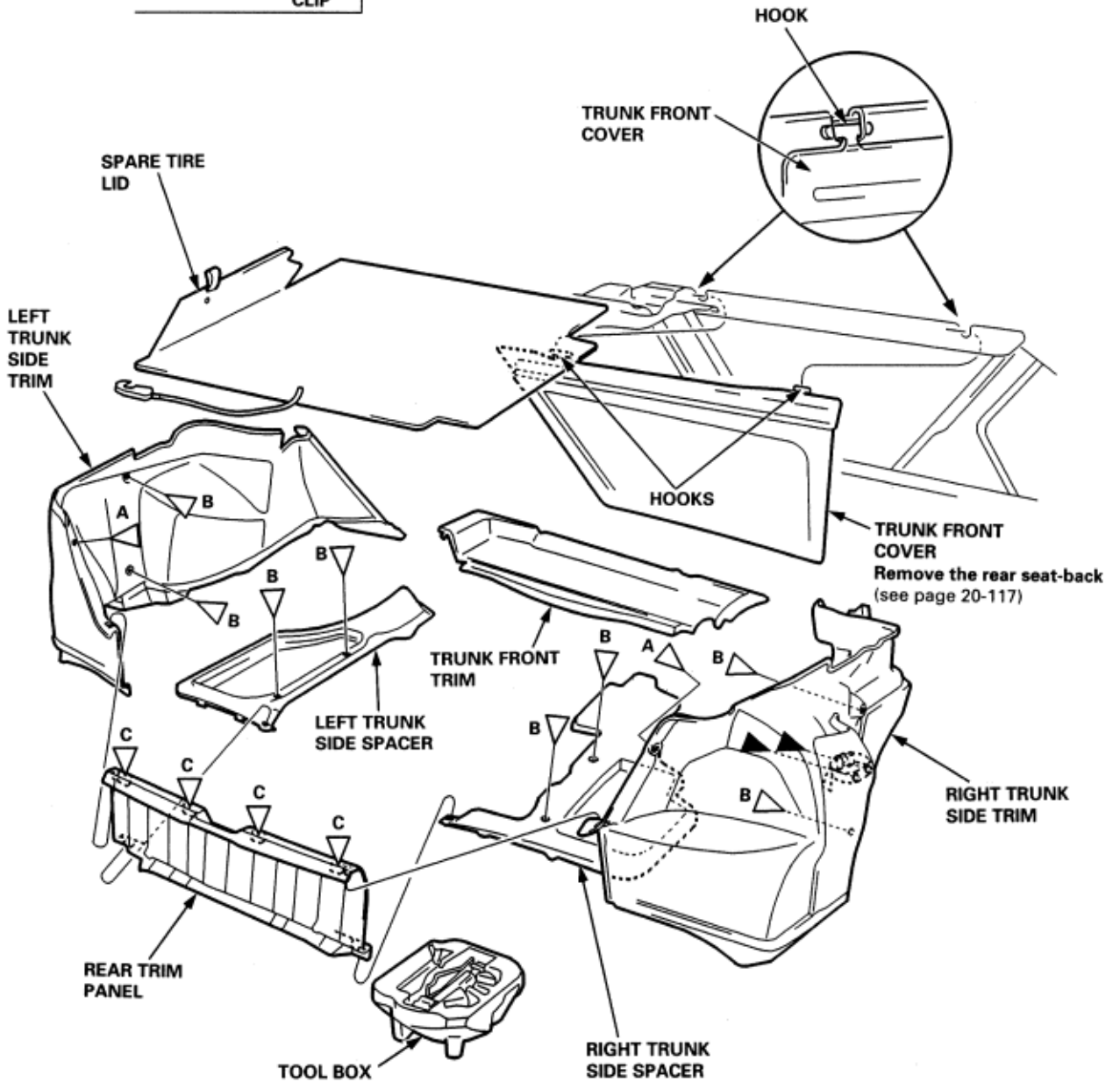
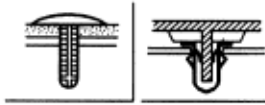
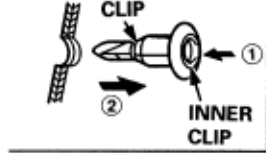
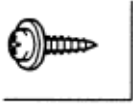
▷: Clip locations

A ▷, 2

B ▷, 8

C ▷, 4

NOTE: Do not push the inner clip in too far.



Install in the reverse order of removal, and note the following items:

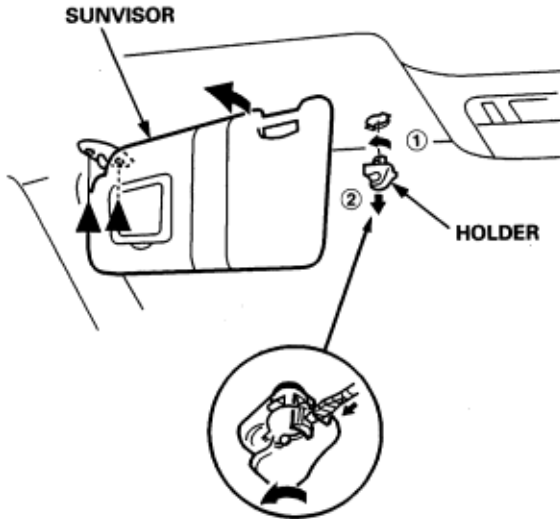
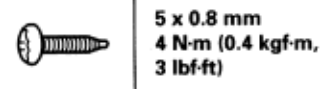
- ♦ Replace any damaged clips.
- ♦ Apply liquid thread lock to the front seat belt upper anchor bolt before reinstallation.
- ♦ Before installing the anchor bolts, make sure there are no twists or kinks in the seat belts.

NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
 - ♦ Take care not to bend and scratch the headliner.
 - ♦ Be careful not to damage the dashboard and other interior trim.
1. Remove:
- ♦ Front door trim, both sides as necessary (**See Page 20-66**).
 - ♦ Front pillar trim, both sides (**See Page 20-66**).
 - ♦ Rear door trim, both sides as necessary (**See Page 20-66**).
 - ♦ Front seat belt upper anchor bolt, both sides (**See Page 20-66**).
 - ♦ Center pillar upper trim, both sides (**See Page 20-66**).
 - ♦ Front ceiling light/spot light (see section 23).
 - ♦ Rear ceiling light (see section 23).

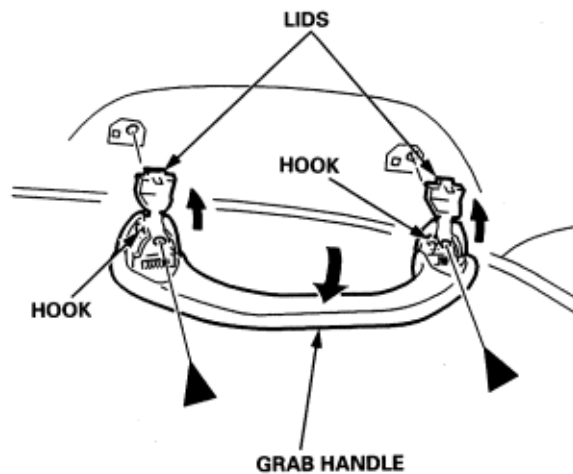
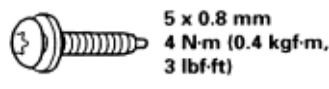
2. Remove the sunvisor and holder from each side.

►: ET screw locations, 4



3. Open the lids, remove the ET screws and release the hooks, then remove the grab handles (front and rear passenger's side).

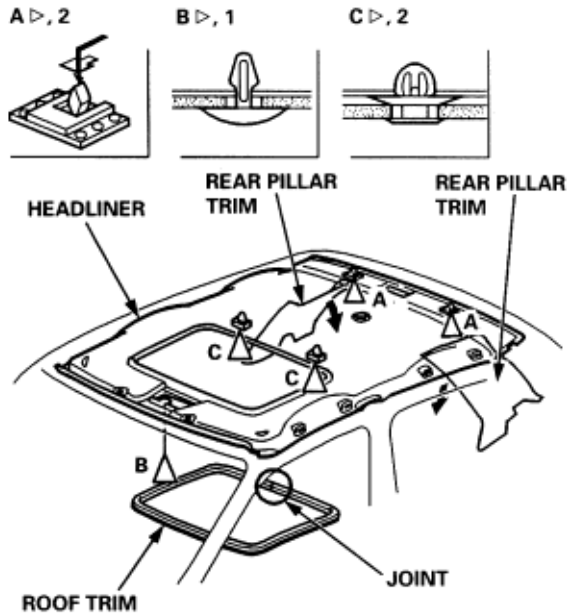
►: ET screw locations, 6



4. Remove the headliner.
 - 1. Remove the upper portion of the rear pillar trim from each side (See Page 20-67).
 - 2. With the help of an assistant, detach the clip(s) and slide the headliner forward to remove the rear clips from the roof panel, then lower the headliner.
 - 3. Remove the headliner through the passenger's door opening.

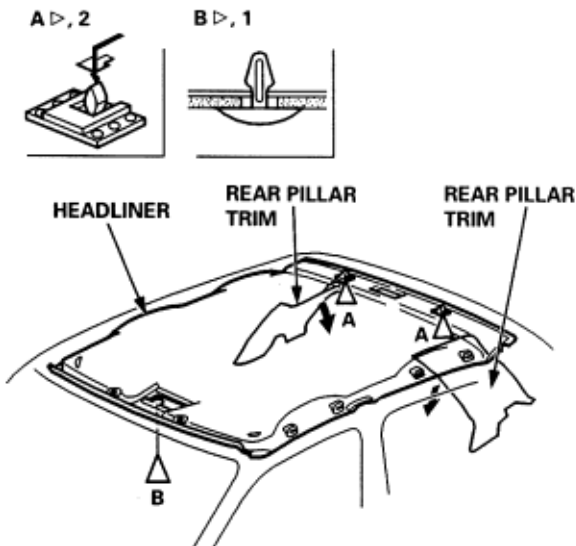
With sunroof:

▷: Clip locations, 3

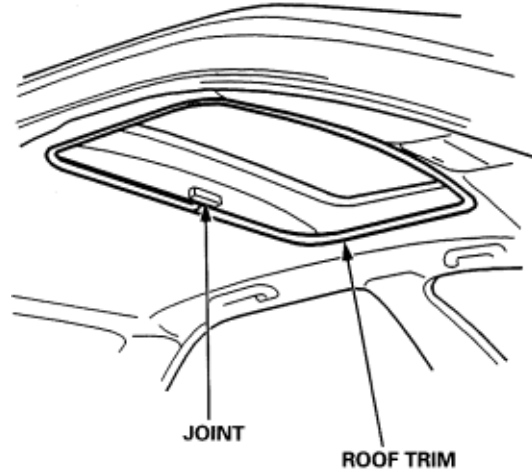


Without sunroof:

▷: Clip locations, 3



5. Install in the reverse order of removal, and note the following items:
 - ♦ When reinstalling the headliner through the door opening, be careful not to fold or bend it. Also be careful not to scratch the body.
 - ♦ With sunroof: When reinstalling the roof trim, install the joint toward the rear center.
 - ♦ If the thread in the ET screw is worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that both sides of the headliner are securely attached to the trim.



SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

NOTE:

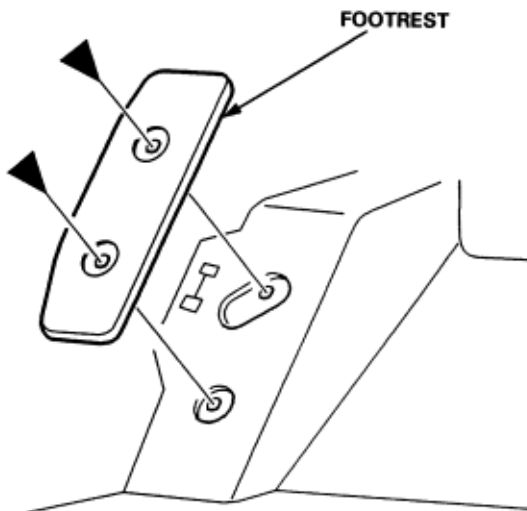
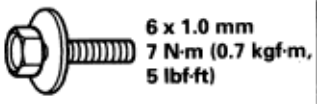
- ♦ Take care not to damage, wrinkle or twist the carpet.
- ♦ Be careful not to damage the dashboard or other interior trim pieces.
- ♦ LHD is shown, RHD is symmetrical.

1. Remove:

- ♦ Front seats, both sides (**See Page 20-93**).
- ♦ Driver's dashboard lower cover (**See Page 20-78**).
- ♦ Passenger's dashboard lower cover (**See Page 20-79**).
- ♦ Front console (**See Page 20-74**).
- ♦ Rear seat cushion (**See Page 20-116**) and (**See Page 20-117**).
- ♦ Front side trim, both sides (**See Page 20-66**).
- ♦ Rear side trim, both sides (**See Page 20-66**).
- ♦ Center pillar lower trim panel, both sides (**See Page 20-66**).
- ♦ Kick panel, both sides (**See Page 20-66**).
- ♦ Front seat belt lower anchor, both sides (see section 24).
- ♦ Trunk lid/fuel lid opener (**See Page 20-156**).

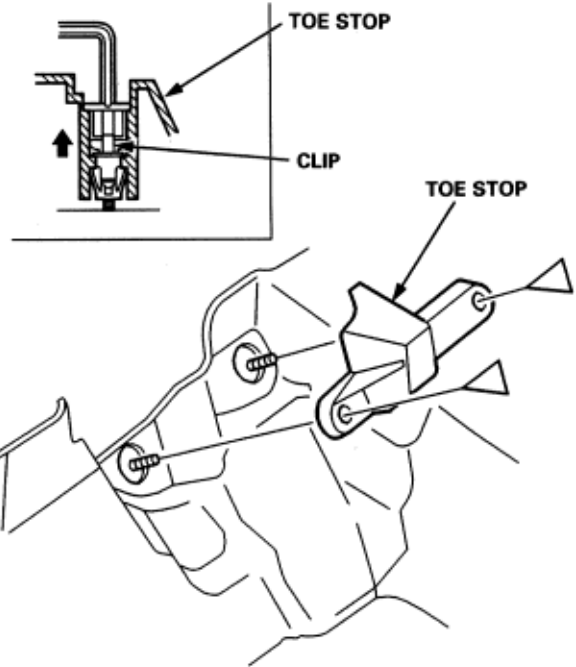
2. Remove the footrest.

►: Bolt locations, 2



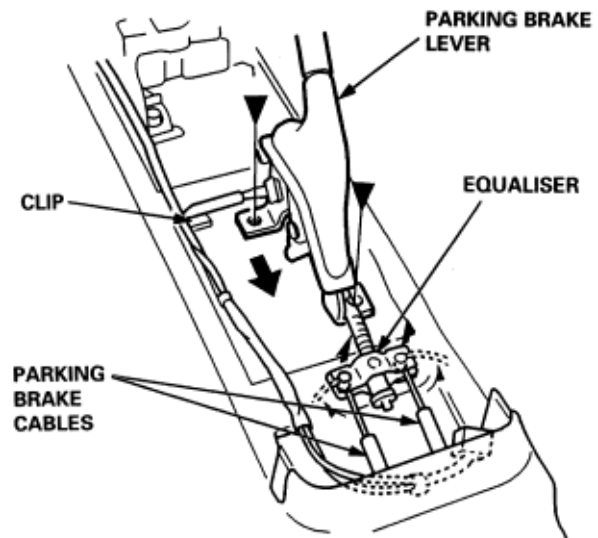
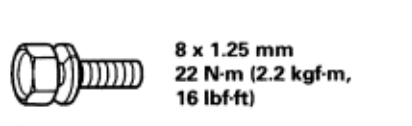
3. If equipped, remove the toe stop.

►: Clip locations, 2



4. Remove the bolts from the parking brake lever, then disconnect the parking brake cables, and detach the harness clip.

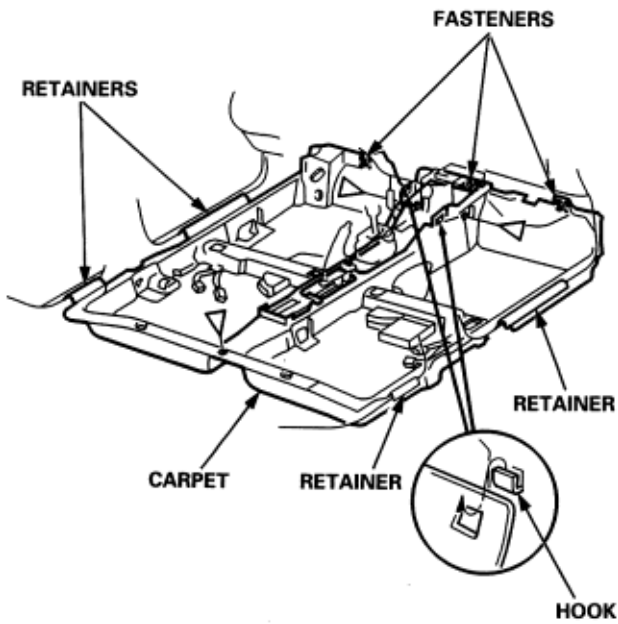
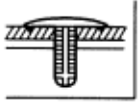
►: Bolt locations, 2



5. Remove the clips and release the retainers, hooks and fasteners, then remove the carpet. Wear gloves to protect your hands.

Except Type R:

▷: Clip locations, 3

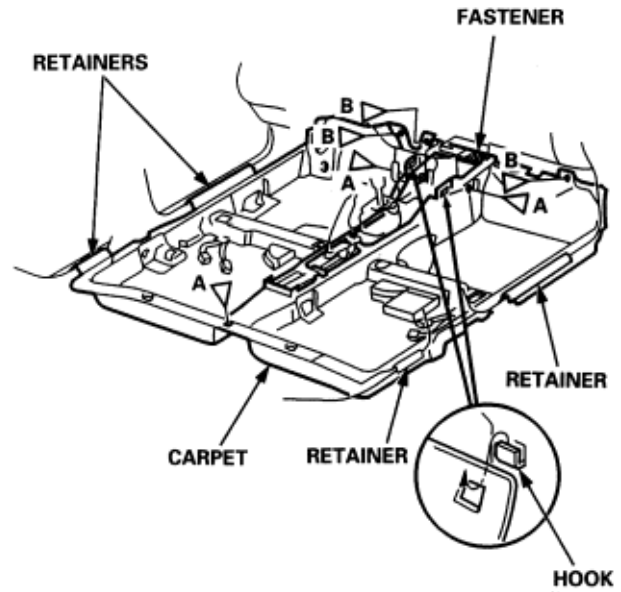


Type R:

▷: Clip locations

A ▷, 3

B ▷, 3

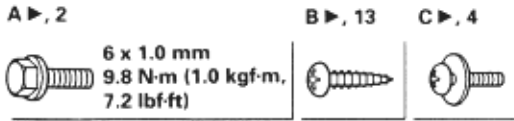


6. Install in the reverse order of removal, and note these items:
- ♦ Take care not to damage, wrinkle or twist the carpet.
 - ♦ Make sure the seat harness is routed correctly.
 - ♦ Make sure the parking brake cables are connected properly. If necessary, adjust the parking brake cables (see section 19).
 - ♦ Slip the slits in the carpet over the hooks.
 - ♦ Replace any damaged clips.

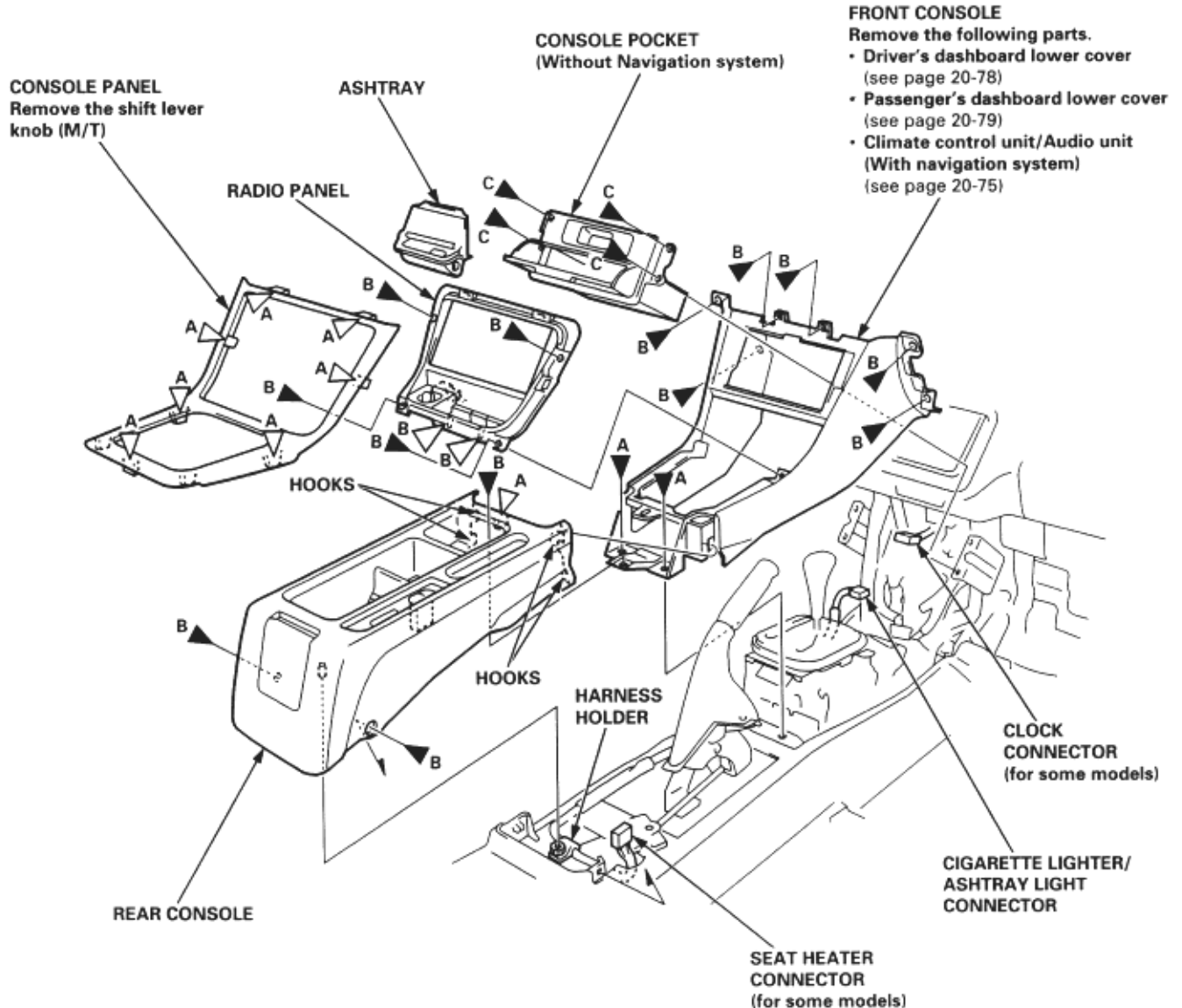
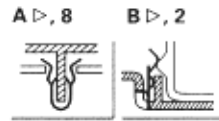
NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- ♦ Take care not to scratch the front seat, dashboard and related parts.
- ♦ Take care not to bend the parking brake cables.
- ♦ LHD type is shown, RHD type is symmetrical.

▶: Bolt and screw locations



▷: Clip locations



Install in the reverse order of removal, and note the following items:

- ♦ Replace any damaged clips.
- ♦ Make sure the connectors are plugged in properly.

To go to the pages referenced on the diagram above, click on the following:

(See Page 20-78)

(See Page 20-79)

(See Page 20-75)

Heater Control Unit - Climate Control Unit/Audio Unit Unit Removal and Installation

20-75

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

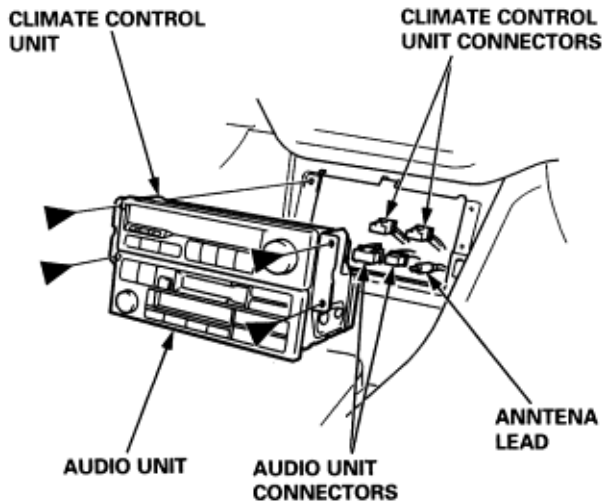
NOTE:

- ♦ Take care not to scratch the dashboard and related parts.
- ♦ Wear gloves to protect your hands.
- ♦ LHD is shown RHD is symmetrical.

With navigation system:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the radio panel (**See Page 20-74**).
4. Remove the screws, disconnect the connectors and the antenna lead, then remove the unit. Wear gloves to protect your hands.

►: Screw locations, 4

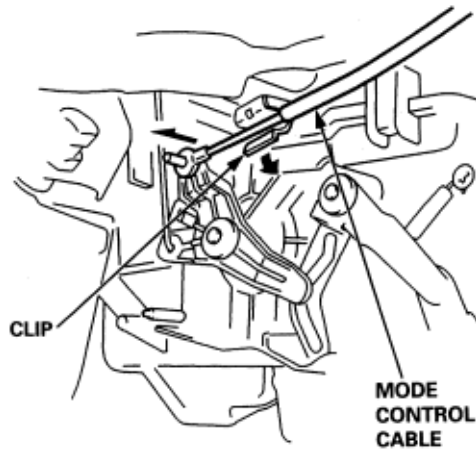


5. Install in the reverse order of removal, and note these items:
 - ♦ Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

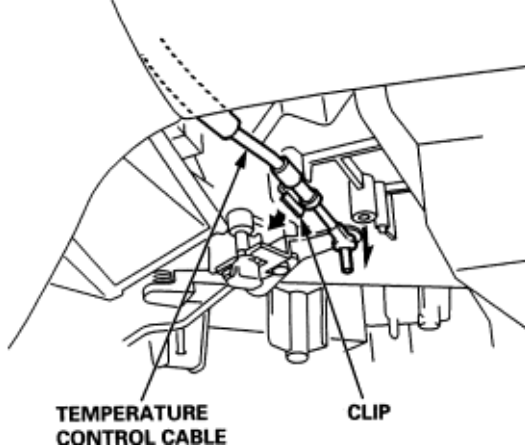
Without navigation system:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the following parts:
 - ♦ Driver's dashboard lower cover, with heater control unit (**See Page 20-78**).
 - ♦ Instrument panel (**See Page 20-77**).
4. With heater control unit: From under the dash, disconnect the mode control cable and the temperature control cable from the heater unit.

Driver's side:



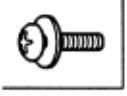
Passenger's side:



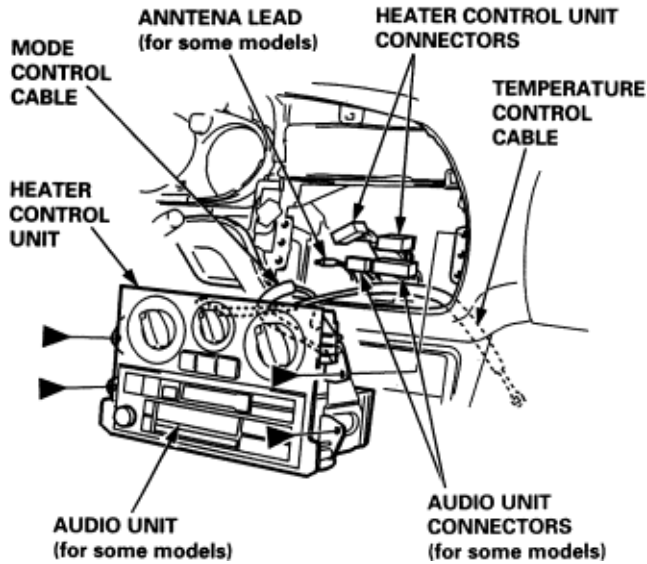
**Heater Control Unit - Climate Control
Unit/Audio Unit
Unit Removal and Installation (cont'd)**

5. Remove the screw, disconnect the connectors and if equipped, the antenna lead, then remove the unit. Wear gloves to protect your hands.

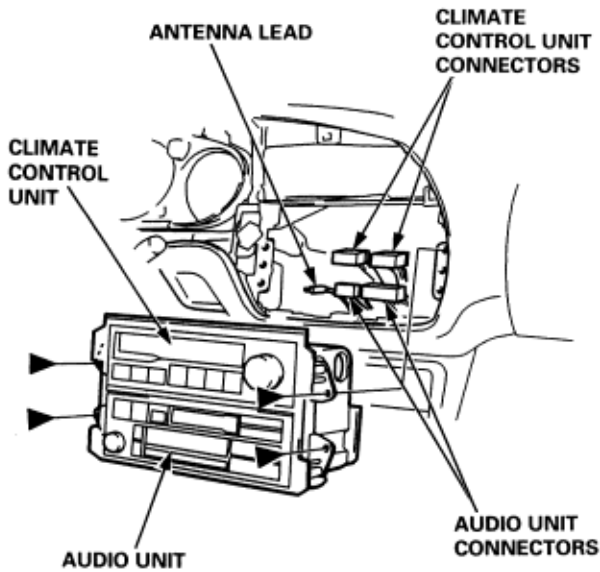
►: Screw locations, 4



With heater control unit:



With climate control unit:



6. Install in the reverse order of removal, and note these items:
- ♦ Make sure the connectors are plugged in properly, the antenna lead is connected properly, the mode control cable and the temperature control cable are connected properly.
 - ♦ If equipped, enter the anti-theft code for the radio, then enter the customer's radio station presets.

Instrument Panel Removal and Installation

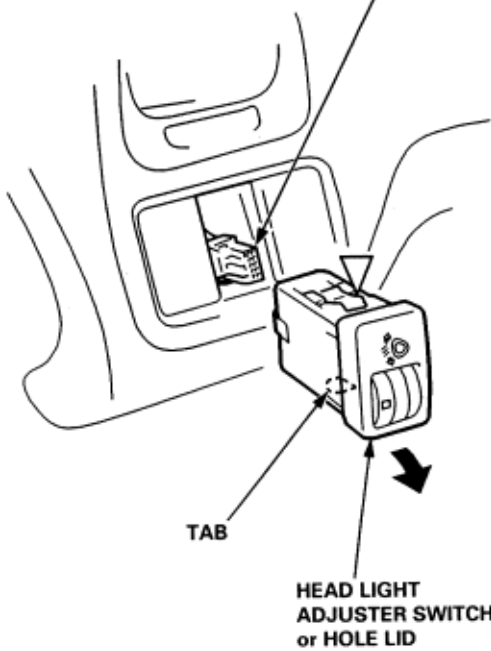
NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Tilt the steering column down.
 2. Remove the headlight adjuster switch or hole lid from the instrument panel, and if equipped, disconnect the connector.

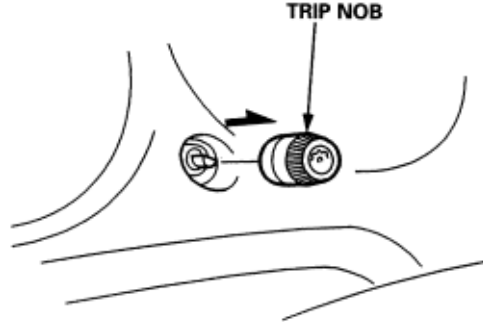
▷: Clip location



HEAD LIGHT ADJUSTER SWITCH CONNECTOR
(for some models)



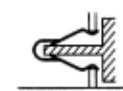
3. Remove the trip knob.



4. Remove the screws, detach the clips and disconnect the connectors, then carefully remove the panel.

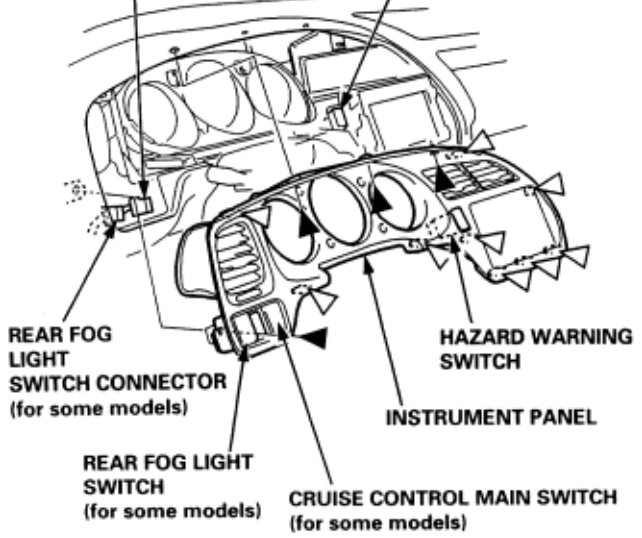
▶: Screw locations, 4

▷: Clip locations, 9



CRUISE CONTROL MAIN SWITCH CONNECTOR
(for some models)

HAZARD WARNING SWITCH CONNECTOR



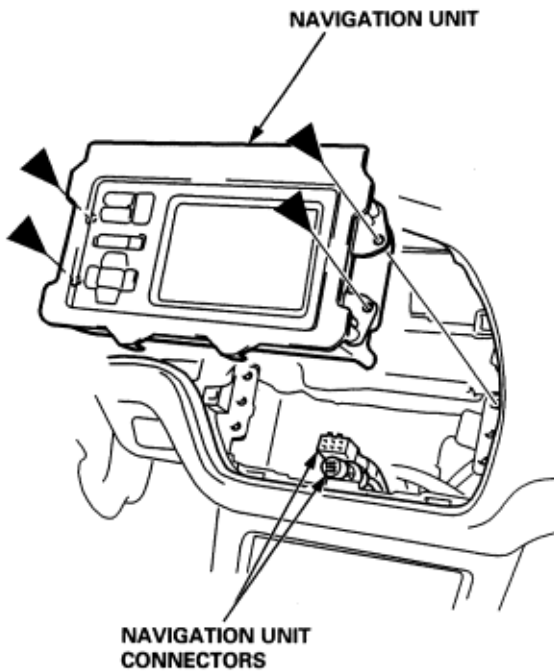
5. Install in the reverse order of removal, make sure the connectors are plugged in properly.

For some models:

NOTE:

- ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Remove the instrument panel (**See Page 20-77**).
 2. Remove the screws and disconnect the connectors, then remove the navigation unit.

►: Screw locations, 4



3. Install in the reverse order of removal, make sure the connectors are plugged in properly.

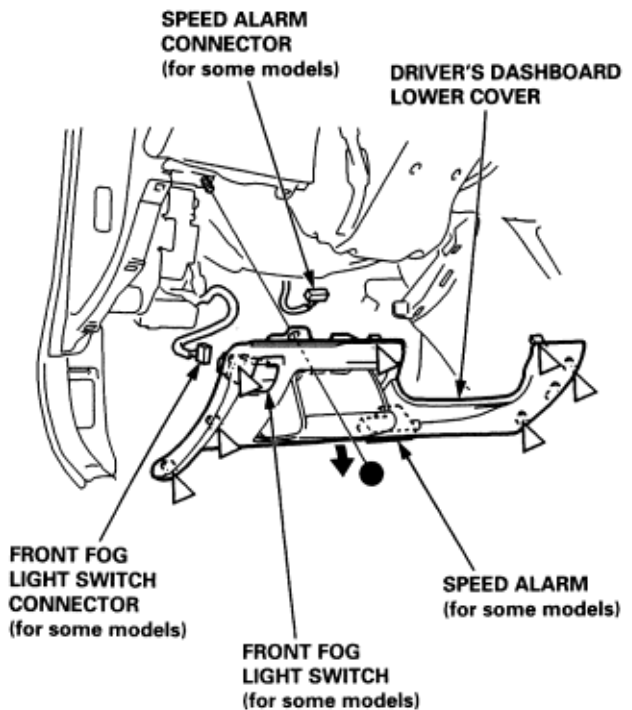
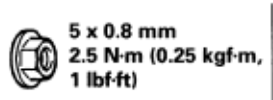
SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Remove the nut, detach the clips and if equipped, disconnect the connectors, then remove the driver's dashboard lower cover.

●: Nut location, 1

▷: Clip locations, 7



2. Install in the reverse order of removal, and if equipped, make sure the connectors are plugged in properly.

Dashboard

Passenger's Dashboard Lower Cover Removal and Installation

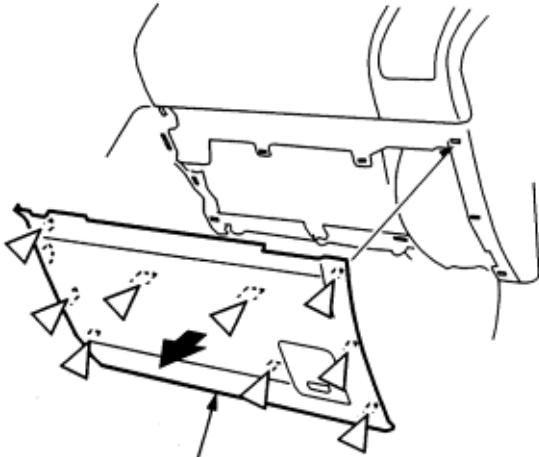
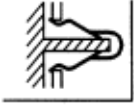
20-79

Glove Box Removal and Installation

NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Detach the clips, then remove the passenger's dashboard lower cover.

▷: Clip locations, 7



PASSENGER'S DASHBOARD LOWER COVER

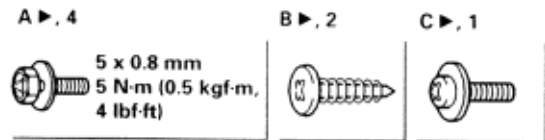
2. Install in the reverse order of removal.

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

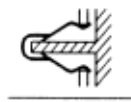
NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Remove passenger's dashboard lower cover.
 2. Remove the bolts, screws, detach the clips and remove the glove box light bulb socket, then remove the glove box.

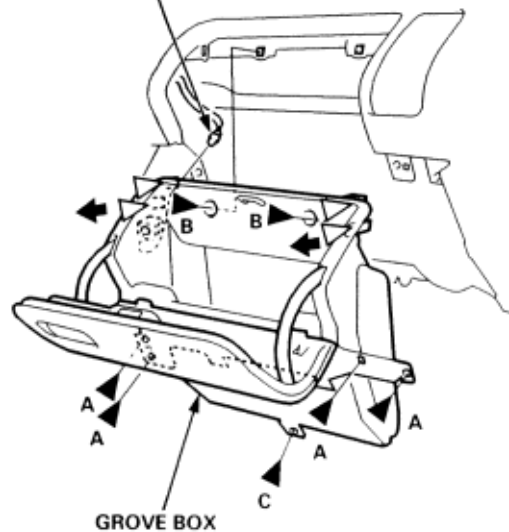
▷: Bolt screw locations



▷: Clip locations, 4



GROVE BOX LIGHT BULB SOCKET



3. Install in the reverse order of removal, make sure the glove box light connector is plugged in properly and glove box light bulb socket is connected properly.

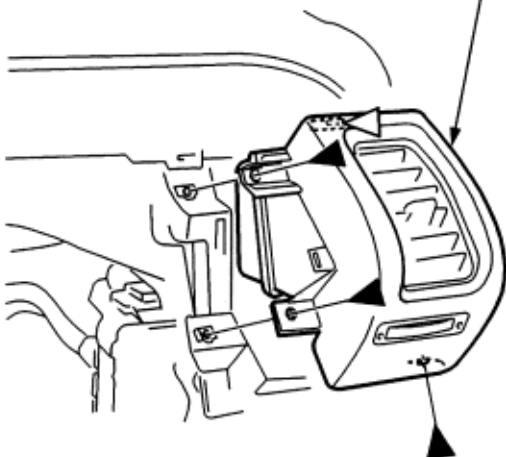
NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Remove the glove box (**See Page 20-79**).
 2. Remove the screws and detach the clip, then remove the passenger's side air vent.

▶: Screw locations, 3 ▷: Clip location, 1



PASSENGER'S SIDE AIR VENT



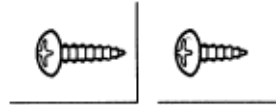
3. Install in the reverse order of removal.

NOTE:

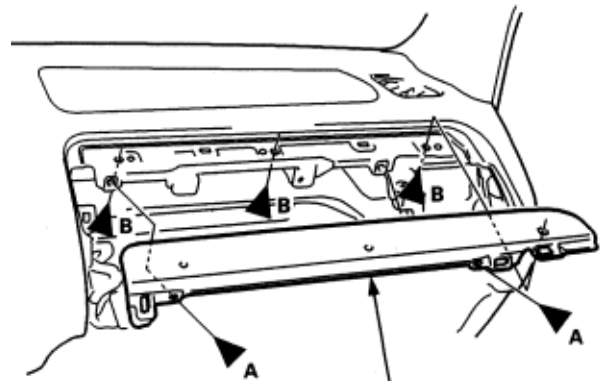
- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ LHD type is shown, RHD type is symmetrical.
1. Remove the passenger's side air vent.
 2. Remove the screws and detach the clips, then remove the passenger's dashboard panel.

▶: Screw locations

A ▶, 2 B ▶, 3



PASSENGER'S DASHBOARD PANEL

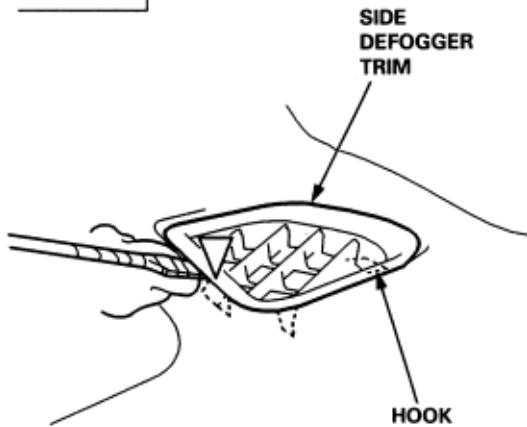
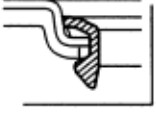


3. Install in the reverse order of removal.

NOTE: LHD is shown, RHD is symmetrical.

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip, and detach the clip by prying on the side defogger trim. Take care not to scratch the dashboard and related parts.

▷: **Clip location, 1**



2. Pull the side defogger trim out by releasing the hooks.
3. Install the hook portions of the side defogger trim, and securely push the clips into place.

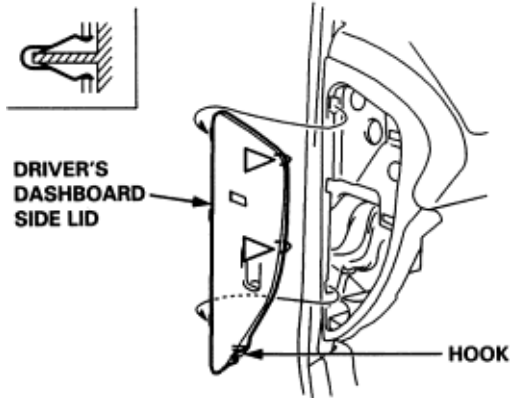
Dashboard Removal and Installation

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

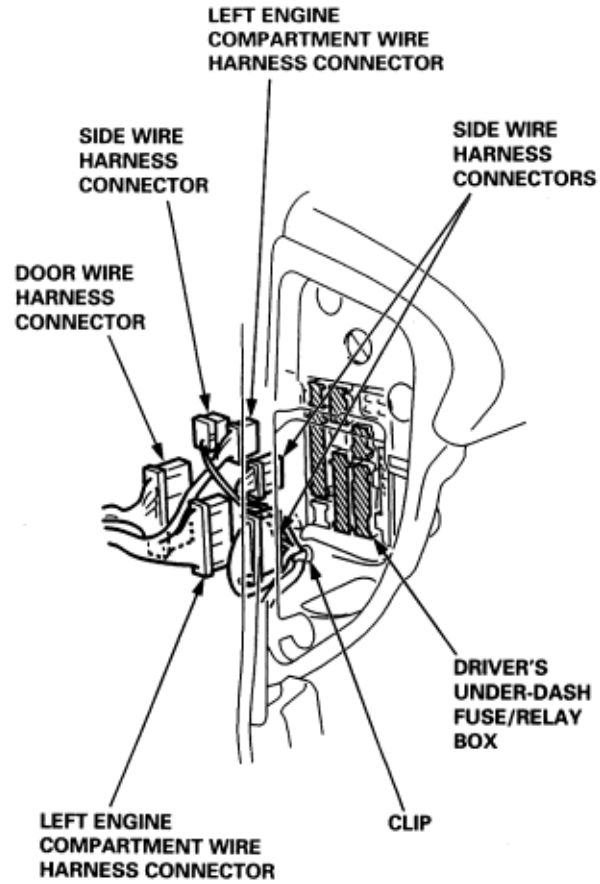
NOTE:

- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape and apply protective tape around the related parts to prevent damage.
 - ♦ An assistant is helpful when removing and installing the dashboard.
 - ♦ Take care not to scratch the dashboard and related parts.
 - ♦ Wear gloves to protect your hands.
 - ♦ LHD is shown RHD is symmetrical.
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
 2. Disconnect the negative cable from the battery.
 3. Remove:
 - ♦ Front console (**See Page 20-74**).
 - ♦ Climate control unit/audio unit, with navigation system (**See Page 20-75**).
 - ♦ Glove box (**See Page 20-79**).
 - ♦ Front door trim, both sides as necessary (**See Page 20-66**).
 - ♦ Front pillar trim, both sides (**See Page 20-66**).
 - ♦ Front side trim, both sides (**See Page 20-66**).
 - ♦ Kick panel, both sides (**See Page 20-66**).
 4. Disconnect the combination switch connectors, ignition switch connector and driver's airbag connector. If equipped, disconnect the cable reel connector and immobilizer unit connector, and lower the steering column (see section 17). To prevent damage to the steering column, wrap it with a shop towel.
 5. Remove the driver's dashboard side lid.

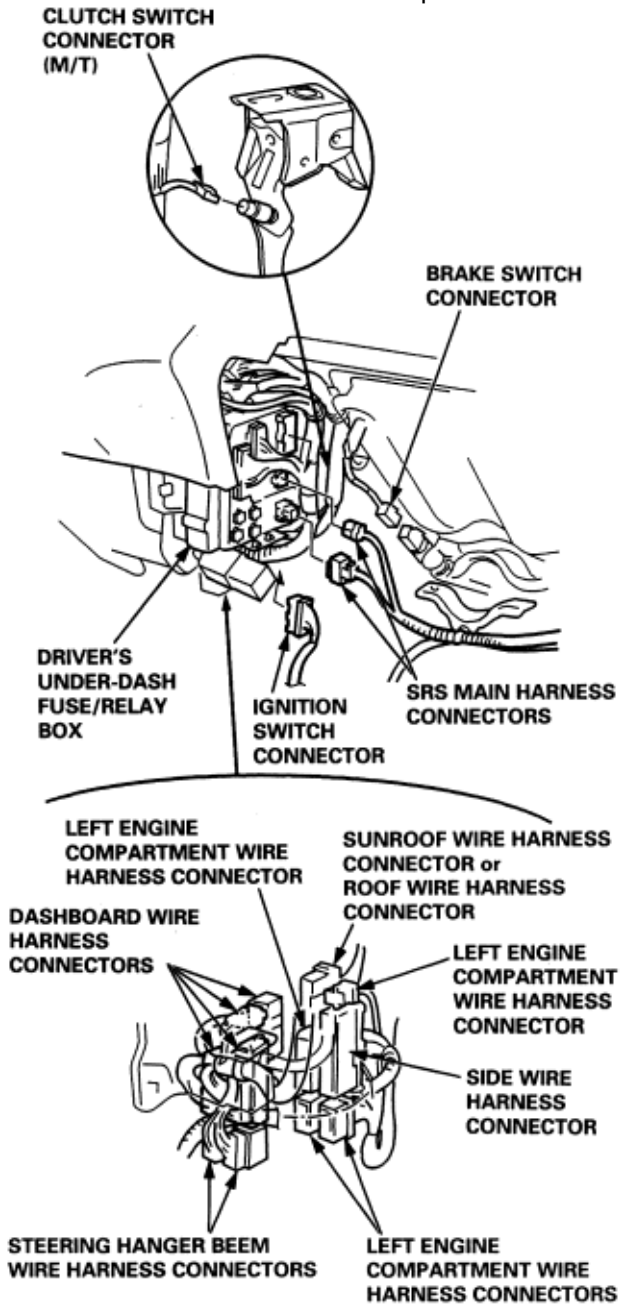
▷: **Clip locations, 2**



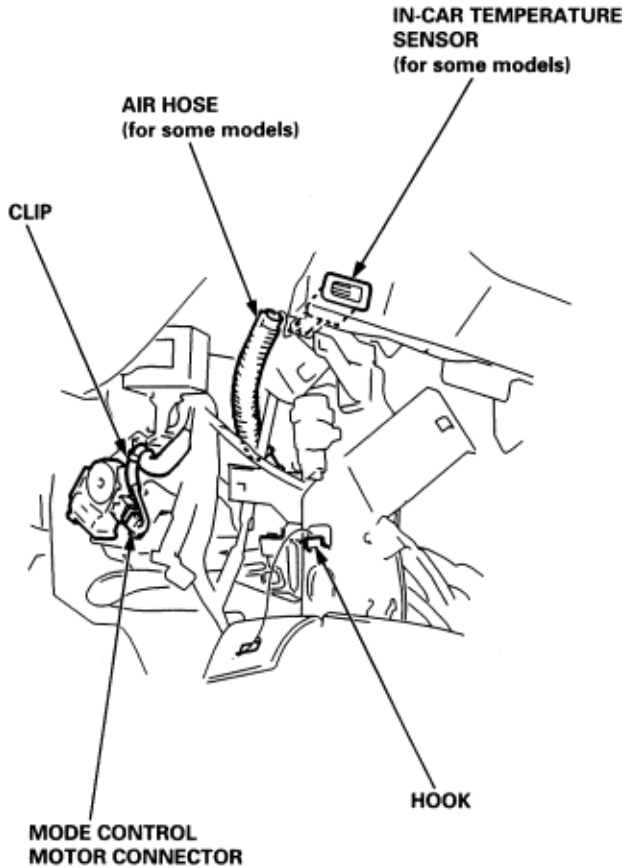
6. Drivers side:
 - 1. From outside the driver's door, disconnect the connectors.



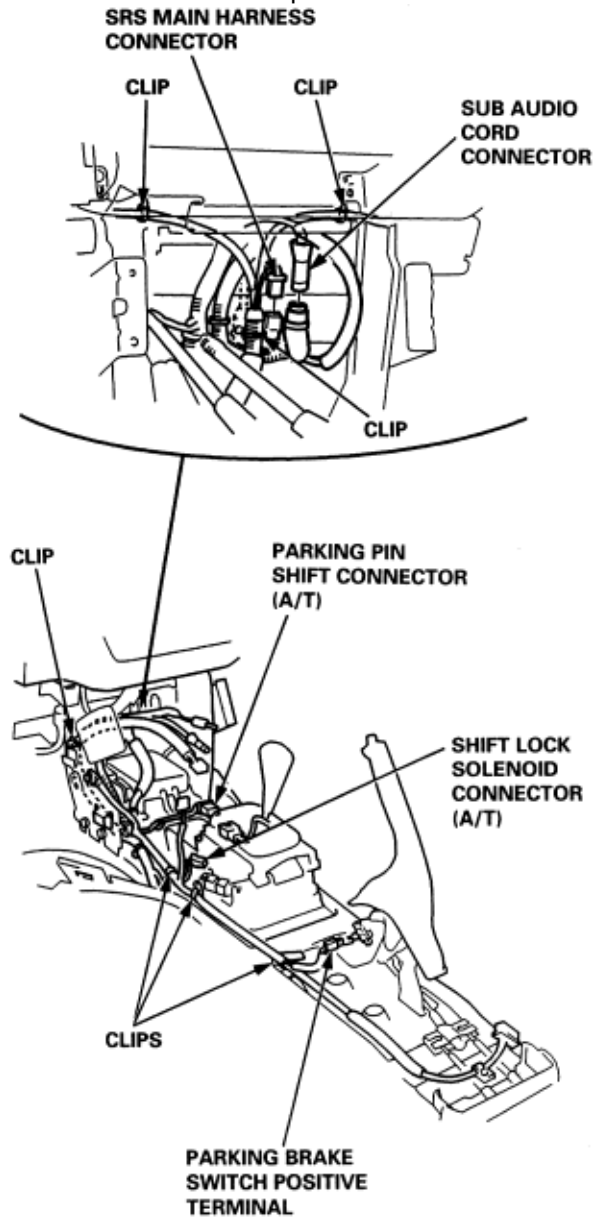
- 2. From under the dash, disconnect the connectors and detach the harness clip.



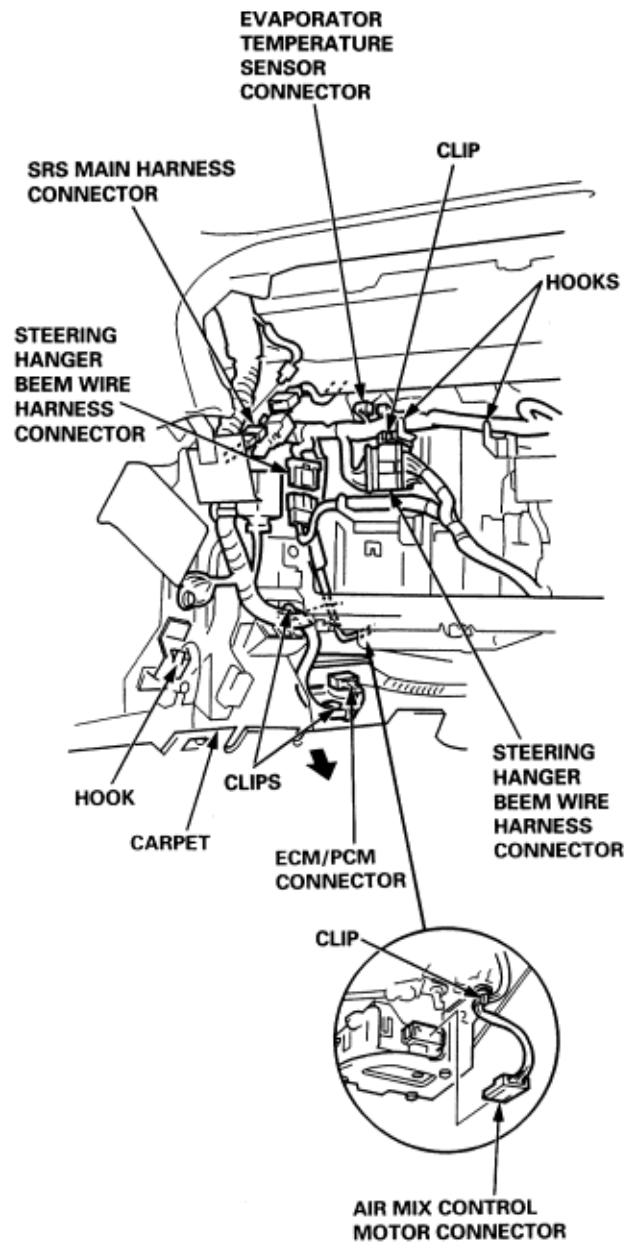
- 7. Center portion:
 - 1. From the driver's side, pull the carpet back as necessary, and disconnect the connector(s) and detach the harness clip. If equipped, disconnect the air hose from the in-car temperature sensor.



- 2. Disconnect the terminal, the connectors and detach the harness clips.

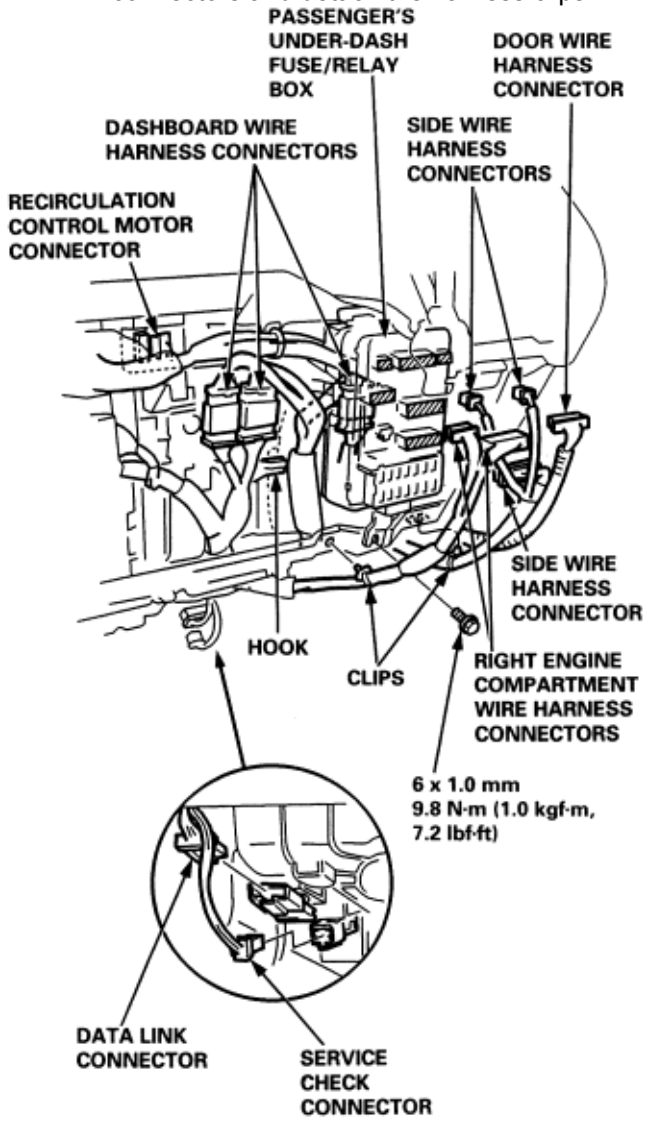


- 8. Passenger's side:
 - 1. From under the dash pull the carpet back as necessary, and disconnect the connectors and harness clips.

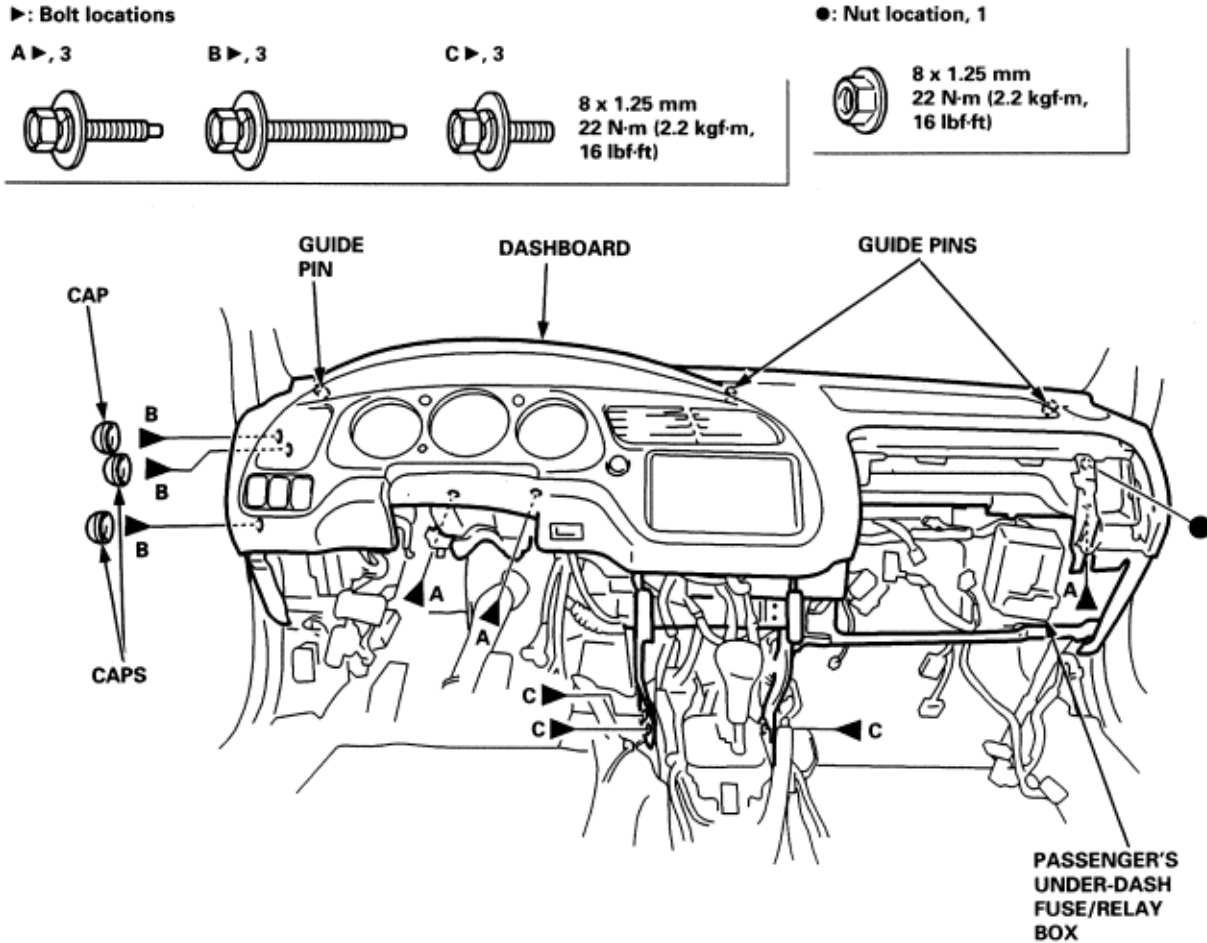


Dashboard Removal and Installation (cont'd)

- 2. From under the dash, remove the mounting bolt and pull the passenger's under-dash fuse/relay box away as necessary. Then disconnect the connectors and detach the harness clips.



9. From outside the driver's door, remove the caps, then remove the bolts and lift up on the dashboard to release from guide pins.



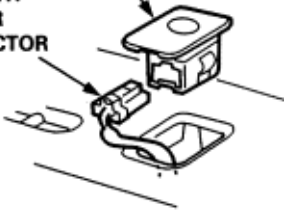
10. Carefully remove the dashboard through the door opening.
11. Install in reverse order of removal, and note the following items:
- ♦ Apply liquid thread lock to bolt C before installation.
 - ♦ Make sure the dashboard fits onto the guide pins correctly.
 - ♦ Before tightening the bolts, make sure the dashboard wire harnesses are not pinched.
 - ♦ Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
 - ♦ If equipped, enter the anti-theft code for the radio, then enter the customer's radio station presets.

NOTE:

- ♦ Wear gloves to protect your hands.
 - ♦ LHD is shown, RHD is symmetrical.
1. Remove the dashboard (**See Page 20-82**).
 2. Remove the following parts from the dashboard:
 - ♦ Instrument panel (**See Page 20-77**).
 - ♦ Gauge assembly (see section 23).
 - ♦ Navigation unit, for some models (**See Page 20-78**).
 3. If equipped, remove the sunlight sensor.

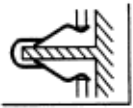
SUNLIGHT SENSOR

SUNLIGHT SENSOR CONNECTOR

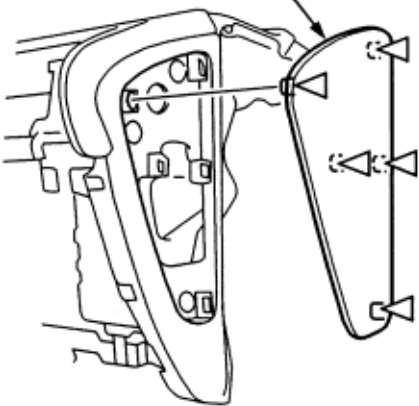


4. Remove the passenger's dashboard side lid.

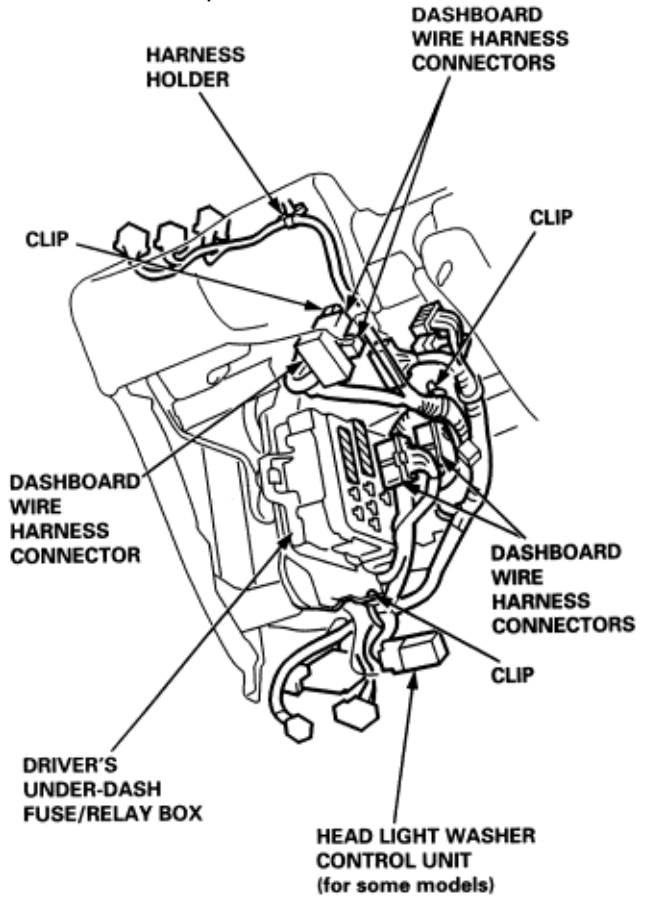
▷: **Clip locations, 5**



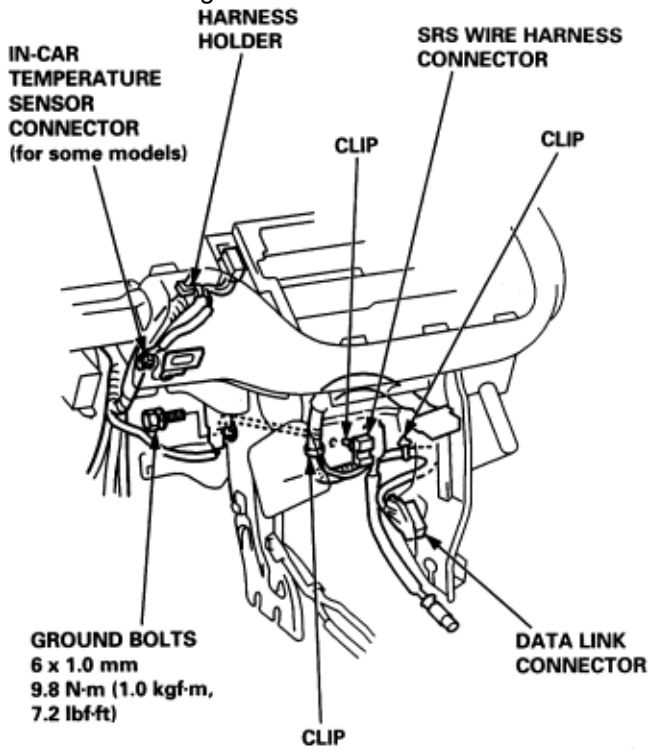
PASSENGER'S DASHBOARD SIDE LID



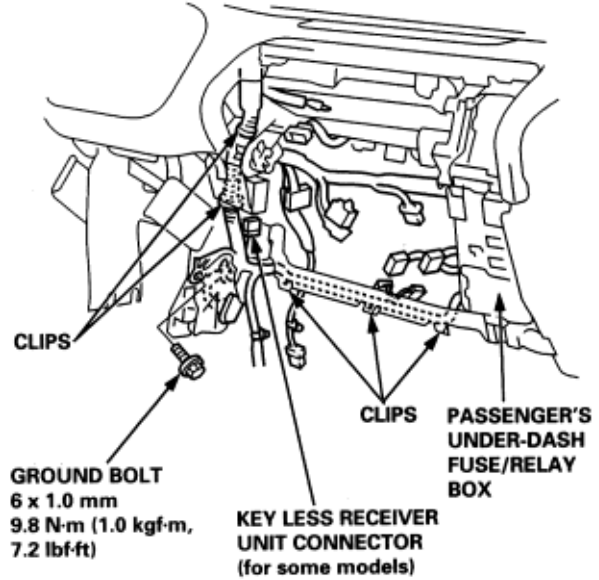
5. Driver's side: disconnect and remove the dashboard wire harness connectors. Detach the harness clips and harness holder.



6. Center portions from driver's side: if equipped, disconnect the in-car temperature sensor connector. Detach the harness clips and the harness holder, and remove the ground bolt.



7. Passenger's side: if equipped, disconnect the keyless unit connector. Detach the harness clips and remove the ground bolt.



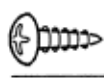
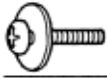
8. Remove the screws and the front passenger's airbag mounting nuts from the dashboard.

▶: Screw locations

●: Nut locations, 3

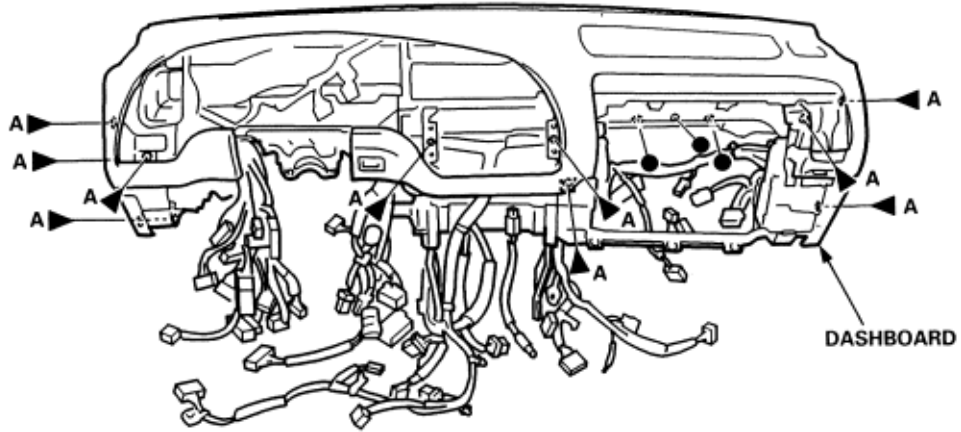
A ▶, 10

B ▶, 4

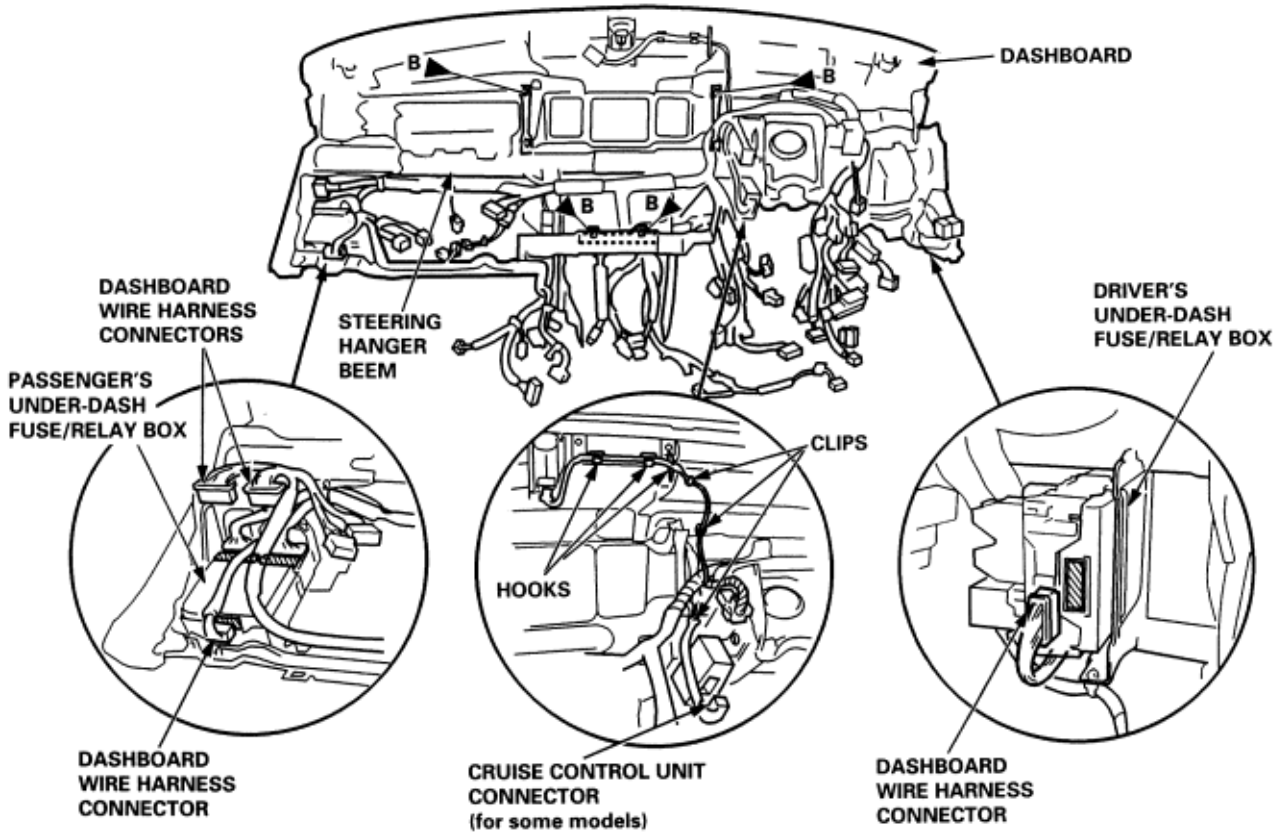


6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)

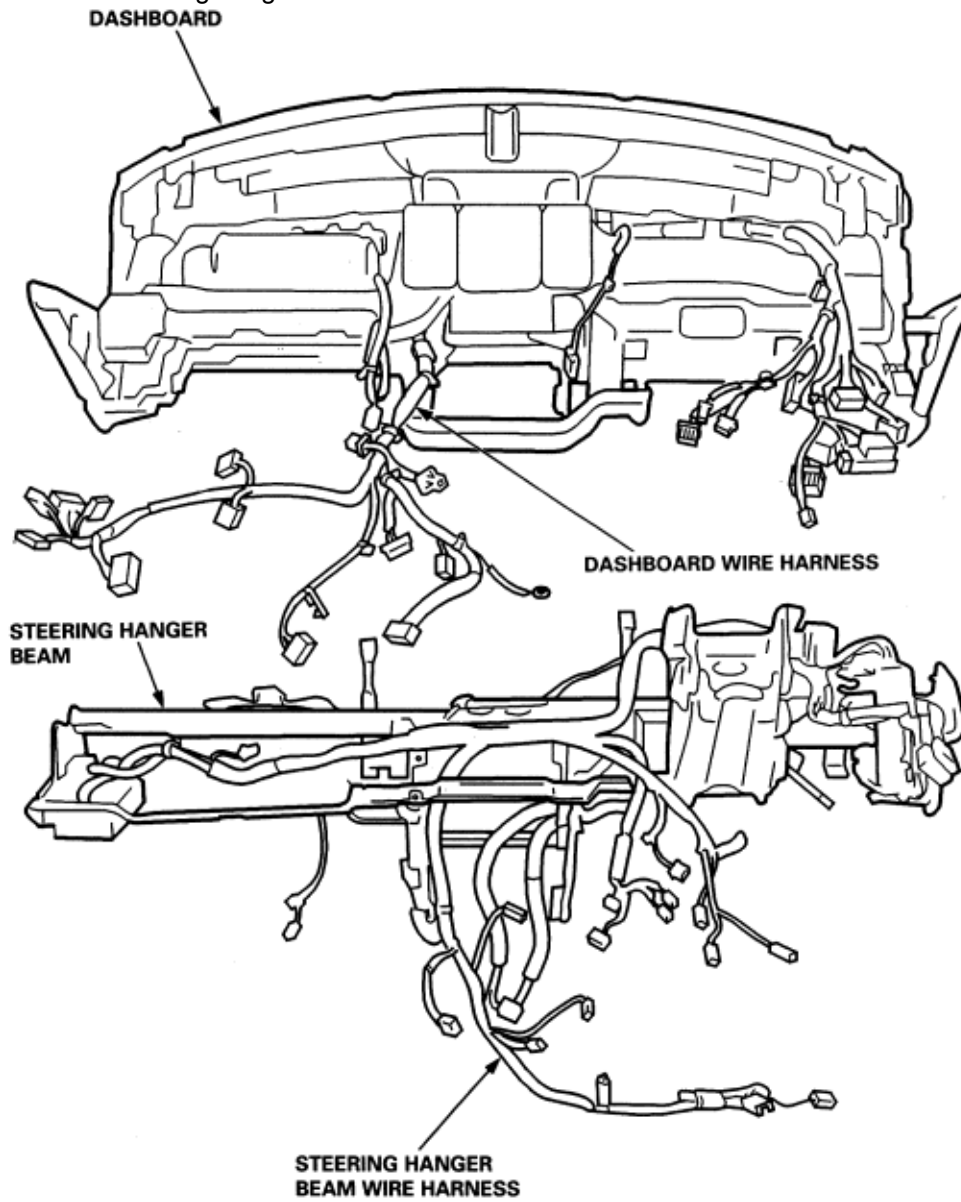
From in front of the dashboard:



From behind the dashboard:

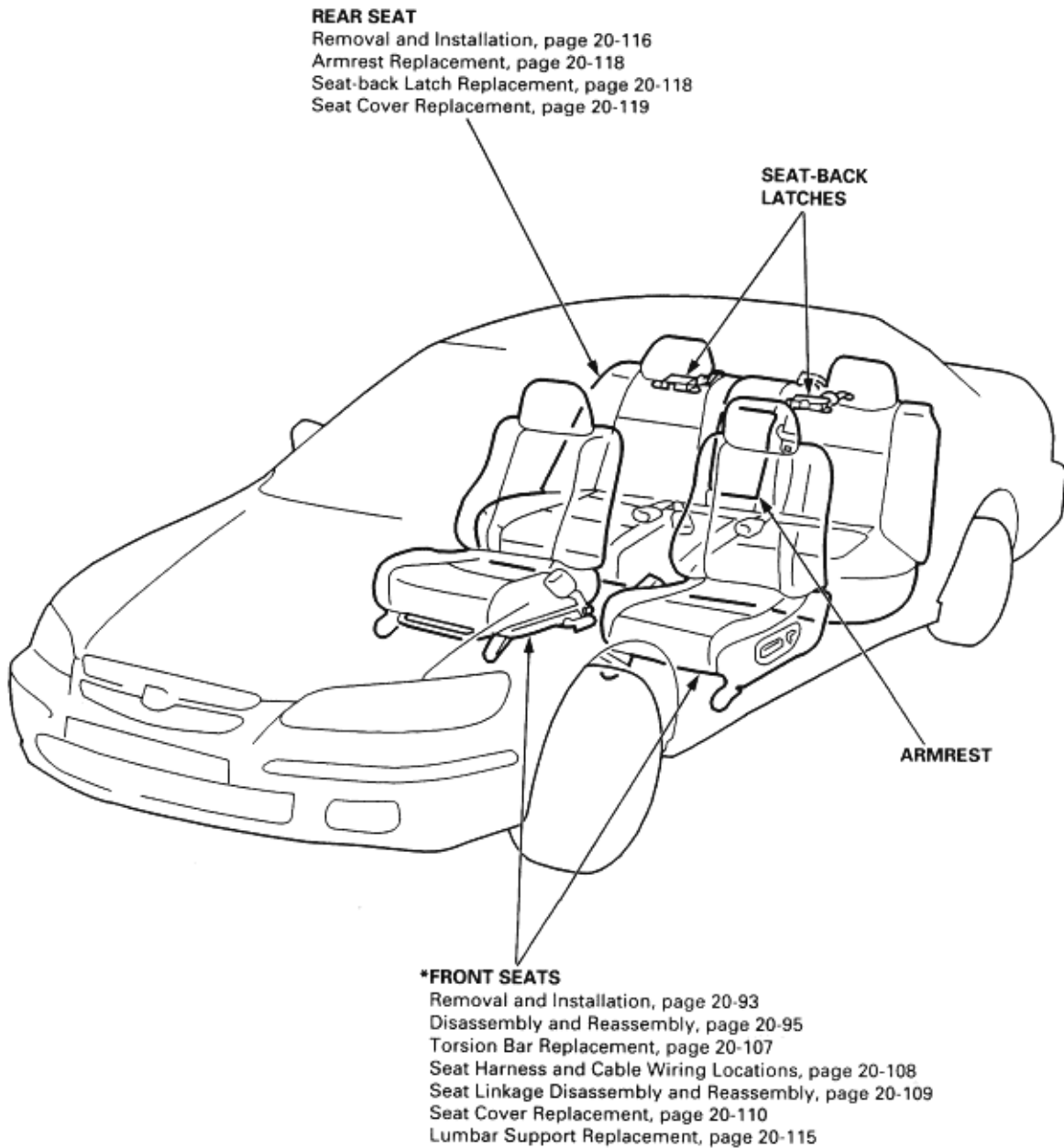


9. Separate the dashboard and steering hanger beam.



10. Install in the reverse order of removal, and note the following items:
- ♦ Make sure the dashboard wire harness and steering hanger beam wire harness are not pinched.
 - ♦ Make sure the connectors are plugged in properly.

SRS components are located in the areas marked with an asterisk (*). Review the SRS component locations, precautions and procedures in the SRS section (24) before performing any repairs or service.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 20-78)
- (See Page 20-79)
- (See Page 20-75)
- (See Page 20-93)
- (See Page 20-95)
- (See Page 20-107)
- (See Page 20-108)
- (See Page 20-109)
- (See Page 20-110)
- (See Page 20-115)

Seats

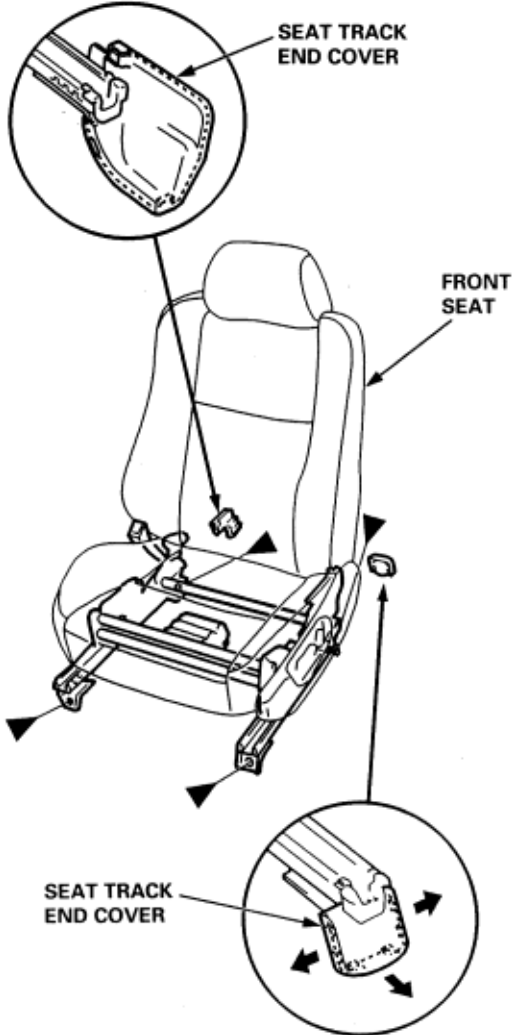
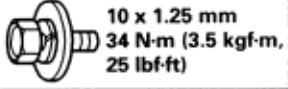
Front Seat Removal and Installation

20-93

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

1. Remove the seat track and covers and remove the bolts securing the front seat. When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage. Take care not to scratch the body or tear the seat covers.

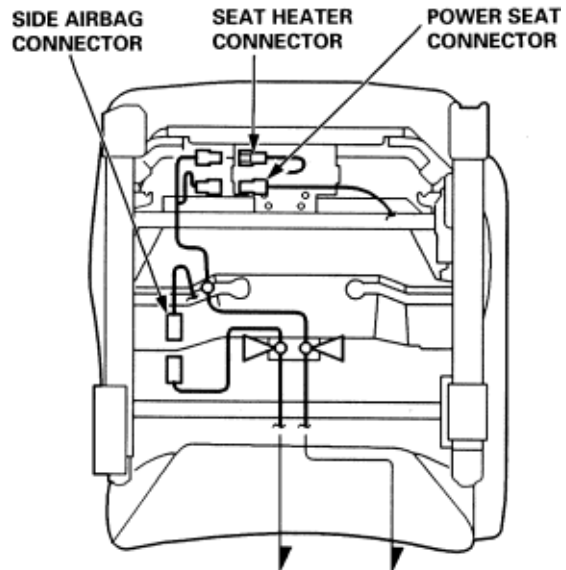
►: Bolt locations, 4



2. Lift up the front seat, then disconnect and detach the seat harness connectors and harness clips.

►: Harness clip locations

8-way power seat:

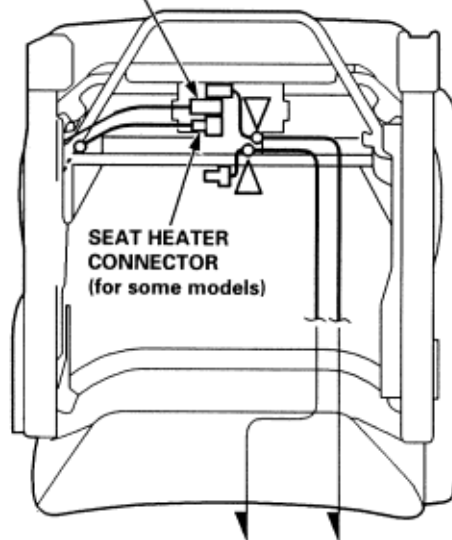


To body. To body.

With side airbag or heated seat:

NOTE: The driver's seat is shown, the passenger's seat is symmetrical.

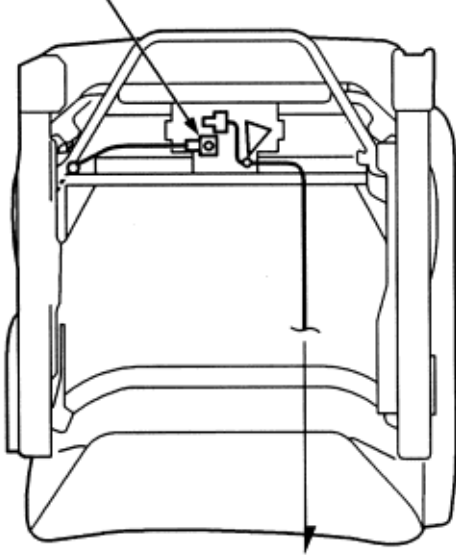
SIDE AIRBAG CONNECTOR
(for some models)



To body. To body.

With seatbelt switch:

**SEAT BELT SWITCH
CONNECTOR**



To body.

3. With the help of an assistant, carefully remove the front seat through the door opening.
4. Install in the reverse order of removal, and make sure the seat harness connector is plugged in properly.

SRS components are located in the areas marked with an asterisk (*). Review the SRS component locations, precautions and procedures in the SRS section (24) before performing any repairs or service.

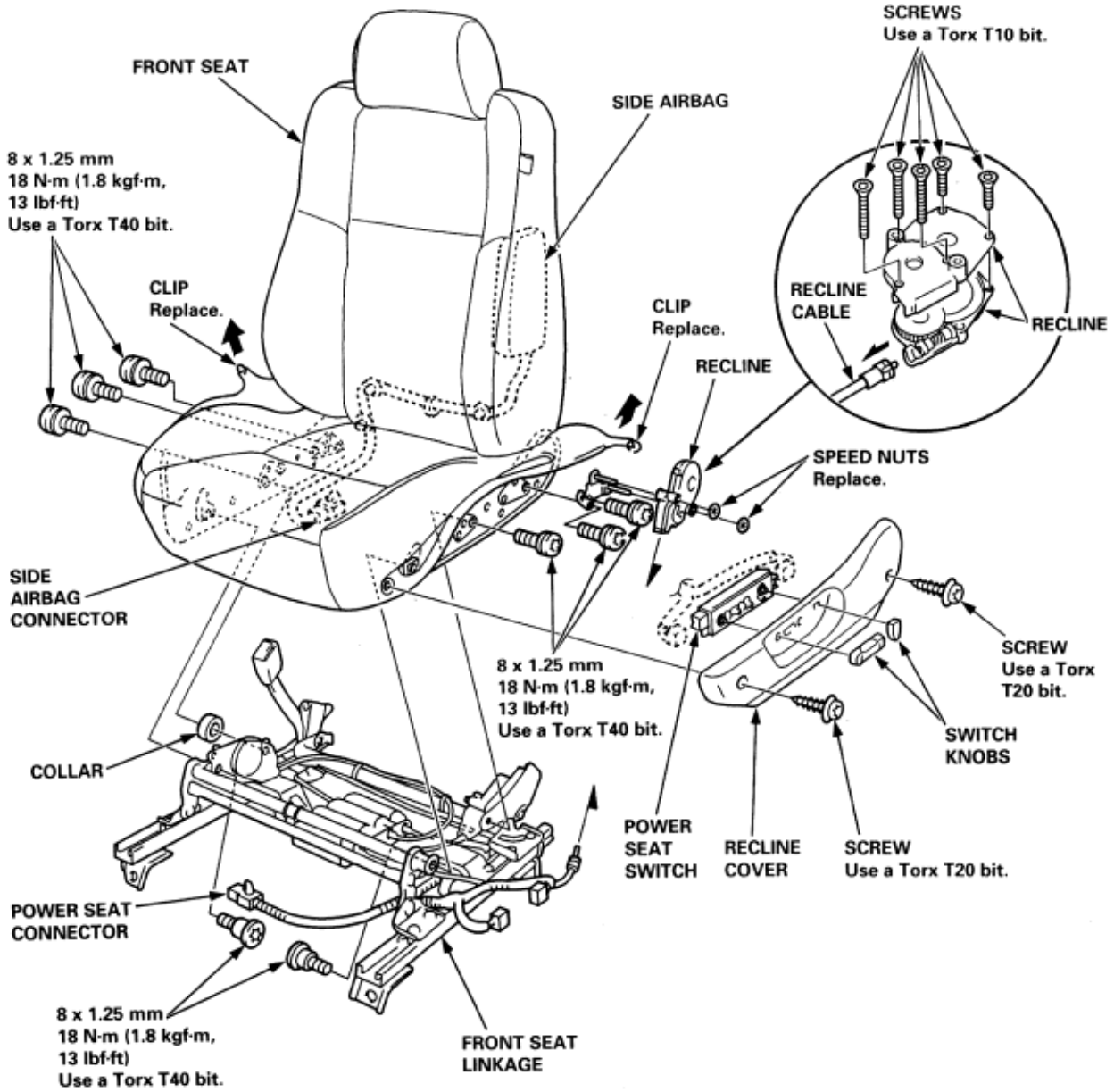
NOTE:

- ♦ Take care not to scratch the body or tear the seat covers.
- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

8-way power seat:

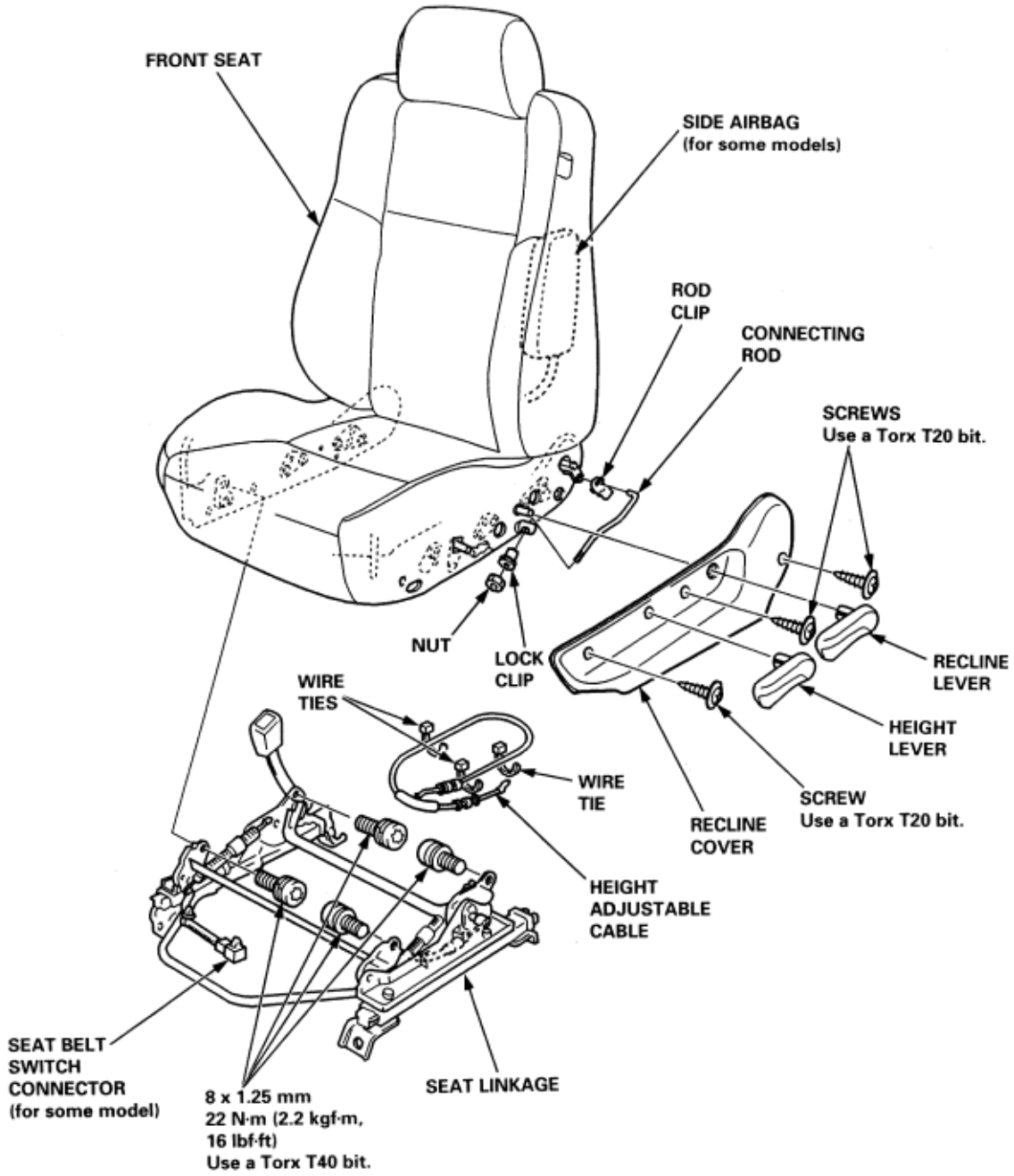
NOTE:

- ♦ For the wiring locations of the side air bag harness and power seat harness (See Page 20-108).

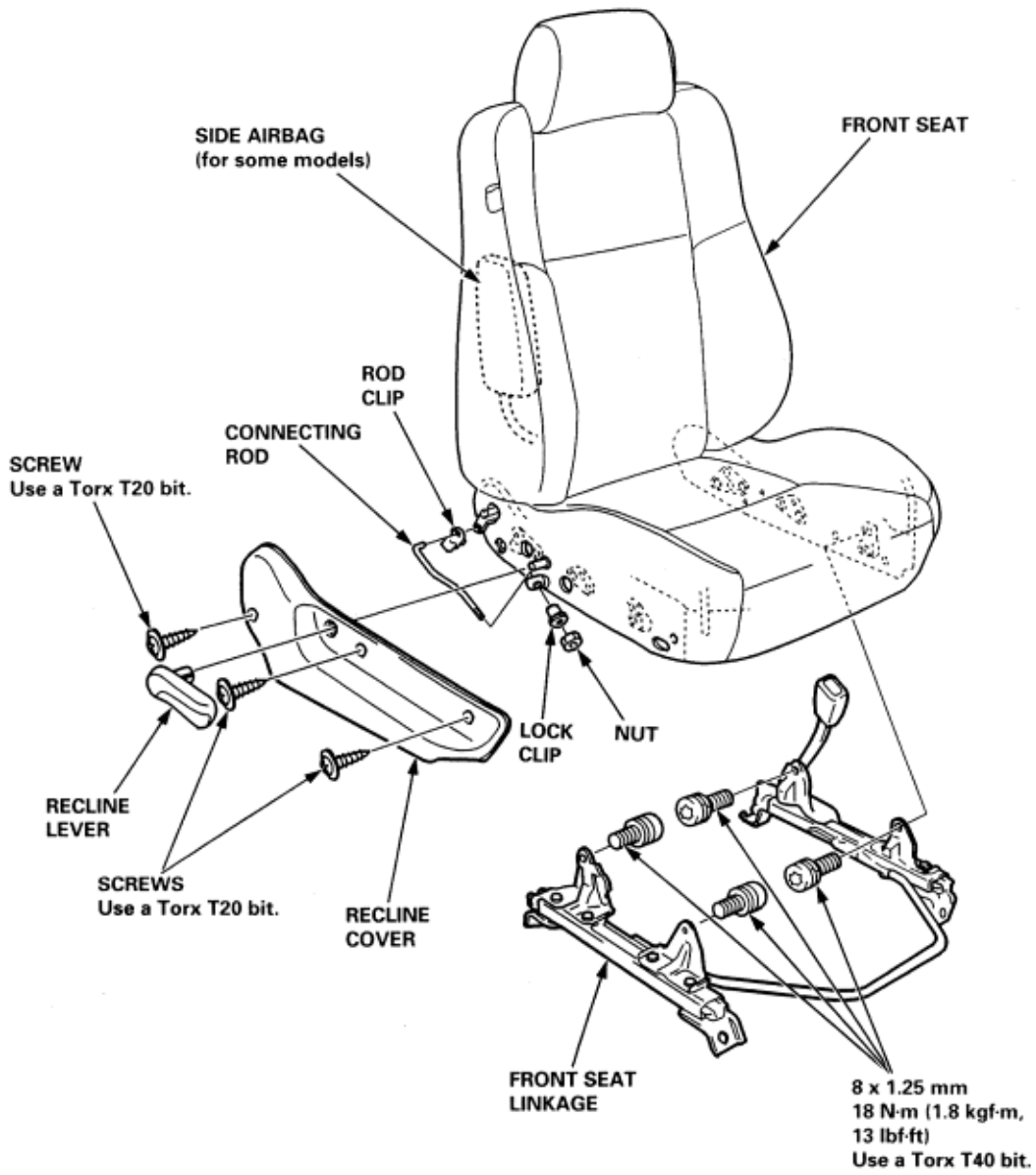


Manual height adjustable seat:

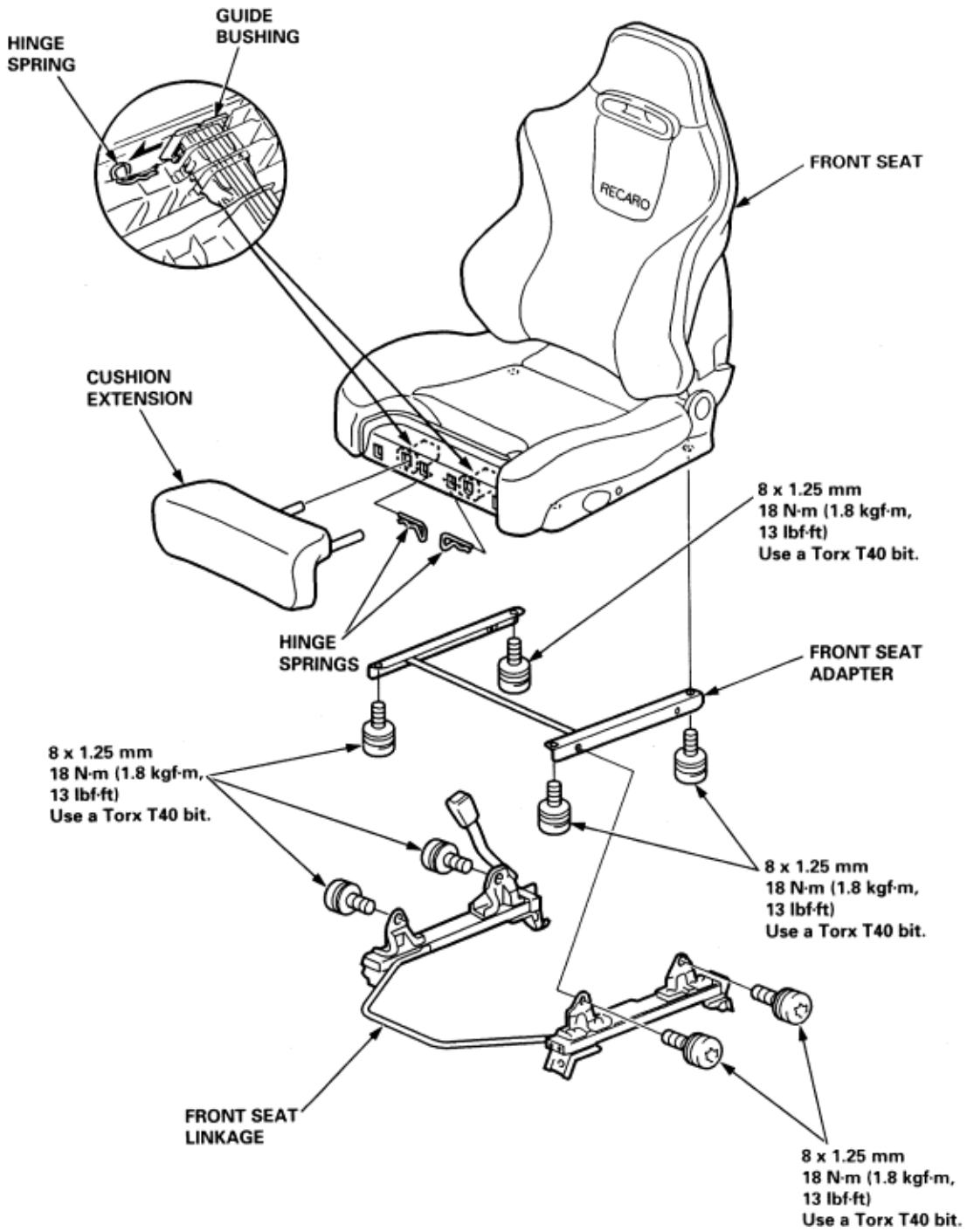
NOTE: For the wiring locations of the seat belt switch harness (some models) and height adjustable cable (See Page 20-108).



Manual seat:



RECARO seat:



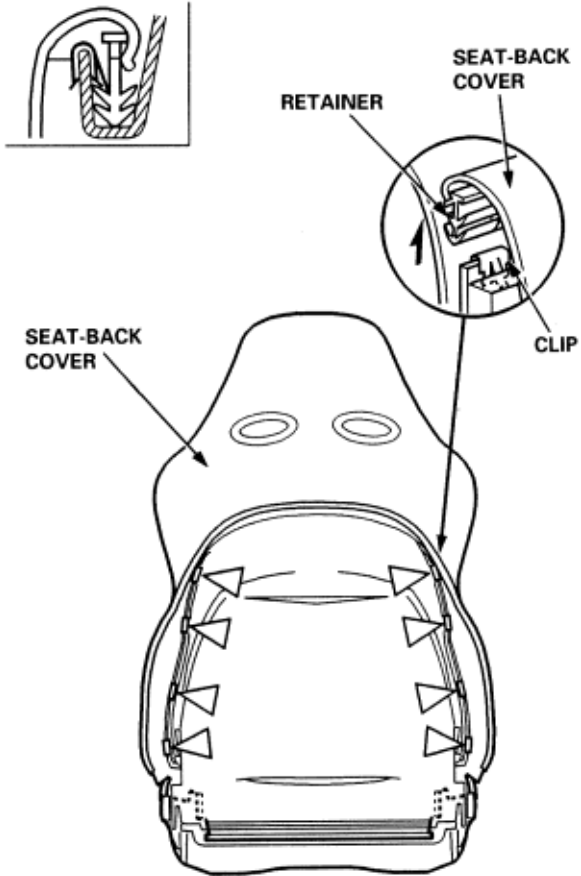
Seat back (Recaro):

1. Fold the seat-back forward.



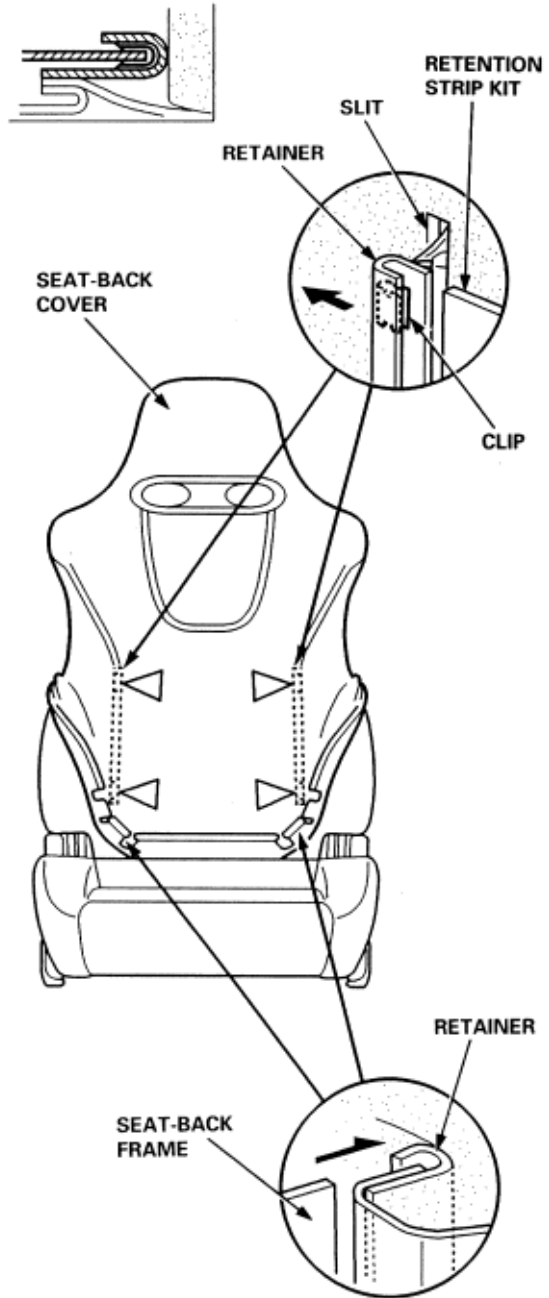
2. From behind the seat-back, pull the edge of the seat-back cover all the way around.

▷: Clip locations, 8



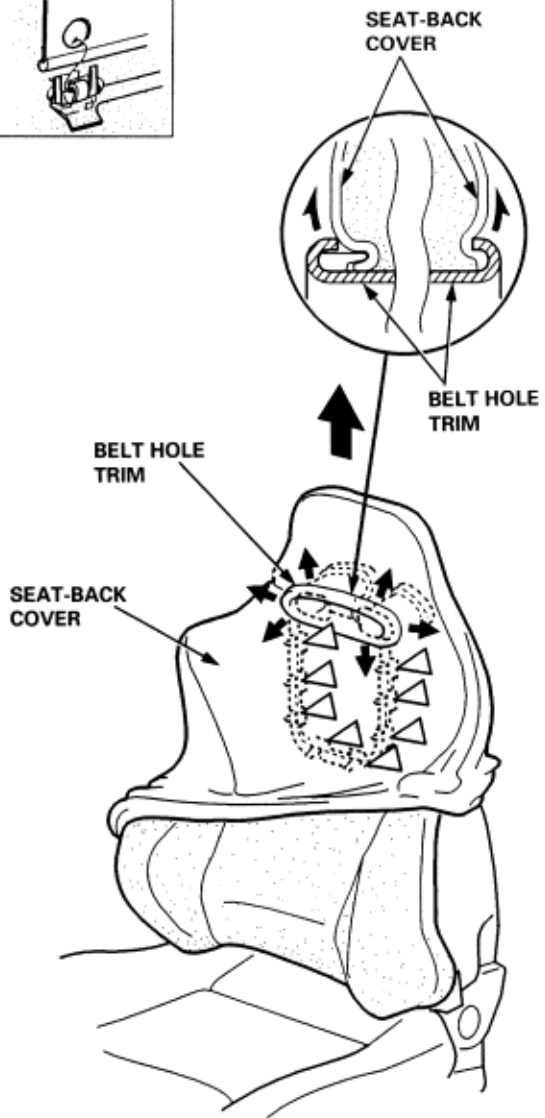
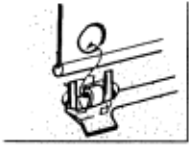
3. Raise the seat-back and pull back the edge of the seat-back cover as necessary, then release the retainers.

▷: Clip locations, 4

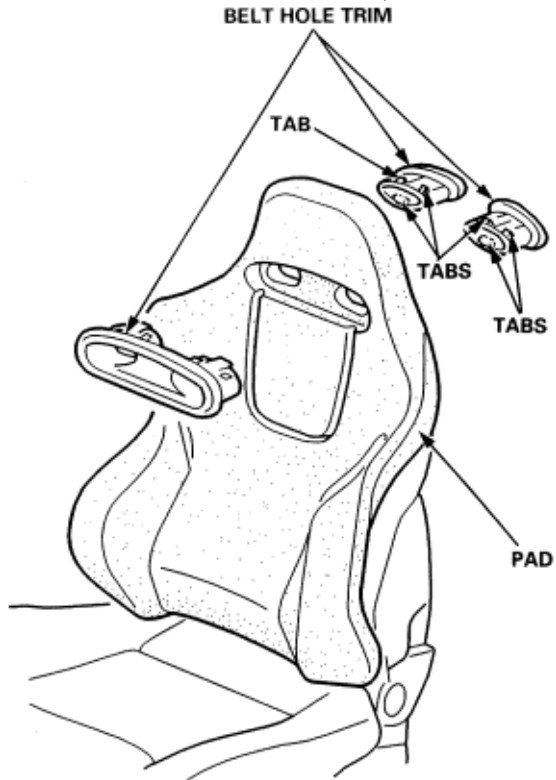


4. Pull back the edge of the seat-back cover all the way around, release the clips and pull the seat-back cover out of the belt hole trim, then remove the seat-back cover.

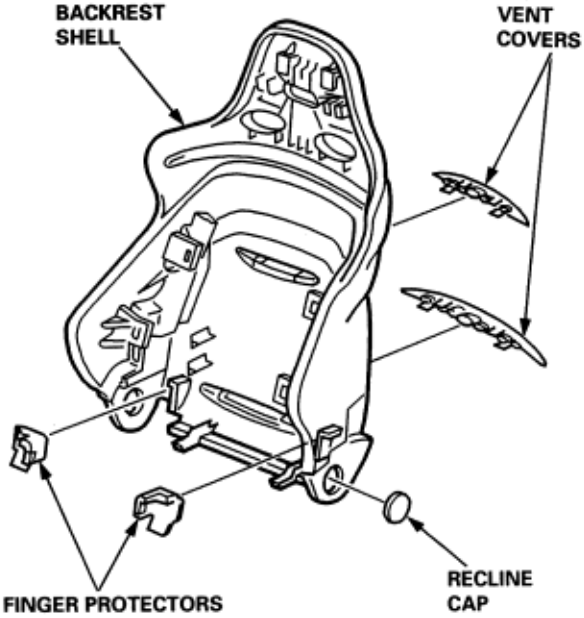
▷: Clip locations, 8



5. Remove the belt hole trim, then remove the pad.



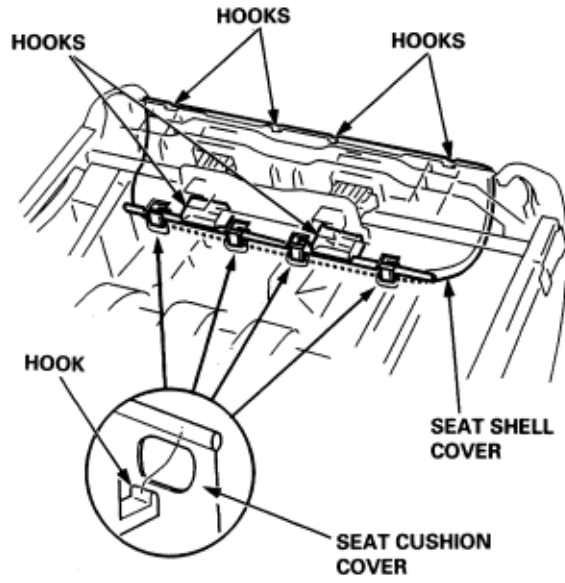
- Remove the vent covers, the finger protectors and the recline cap from the backrest shell.



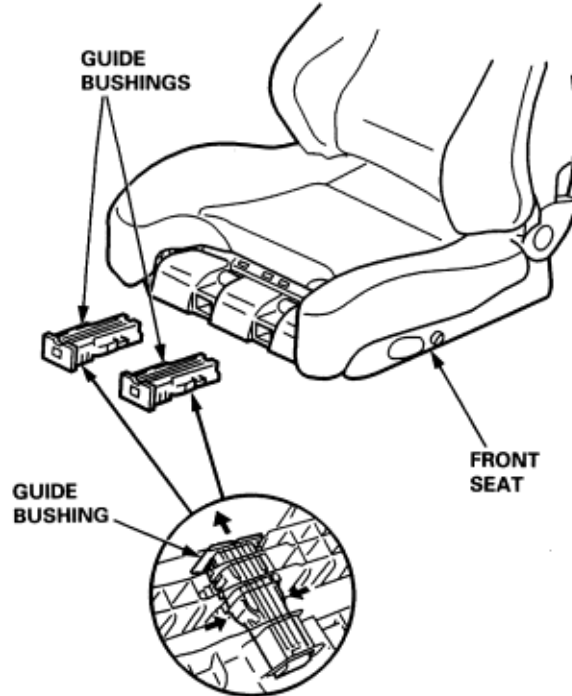
- Reassembly is in the reverse order of disassembly except the following: reassemble the seat-back cover before the belt hole trim reinstallation.
NOTE: To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the clips and retainers.

Seat cushion (RECARO):

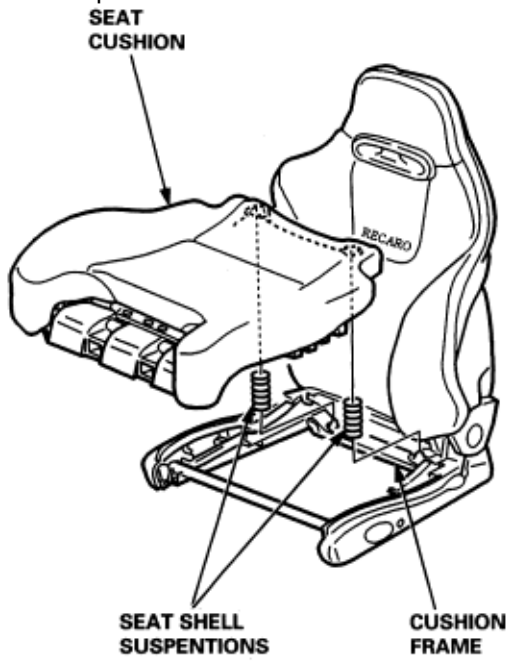
- Release the hooks from under the seat cushion, then remove the seat shell cover.



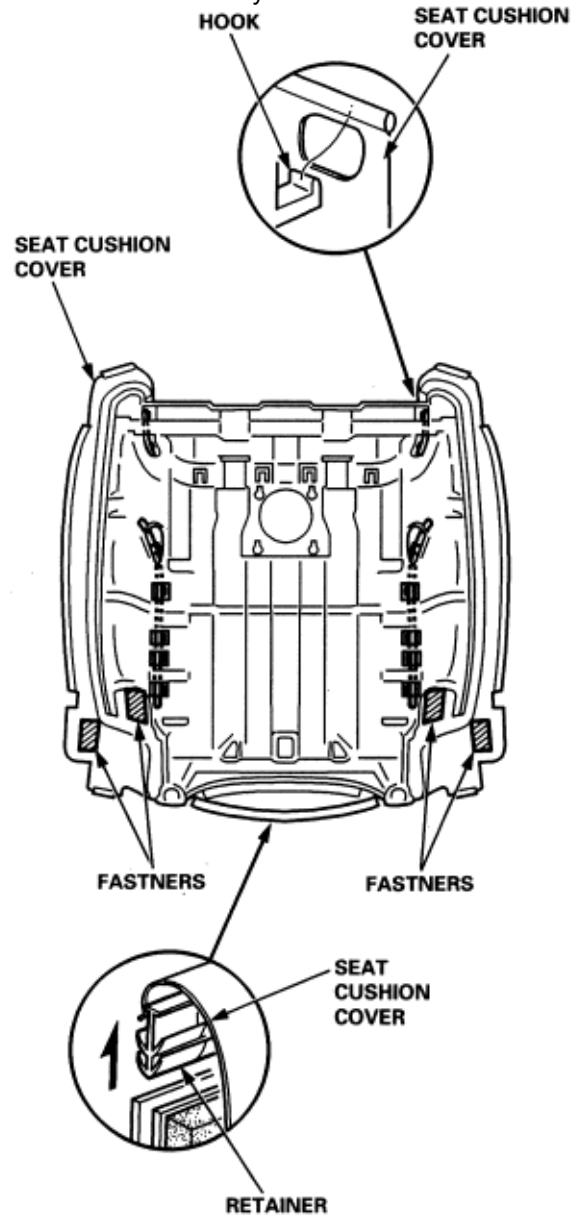
- Remove the guide bushings.



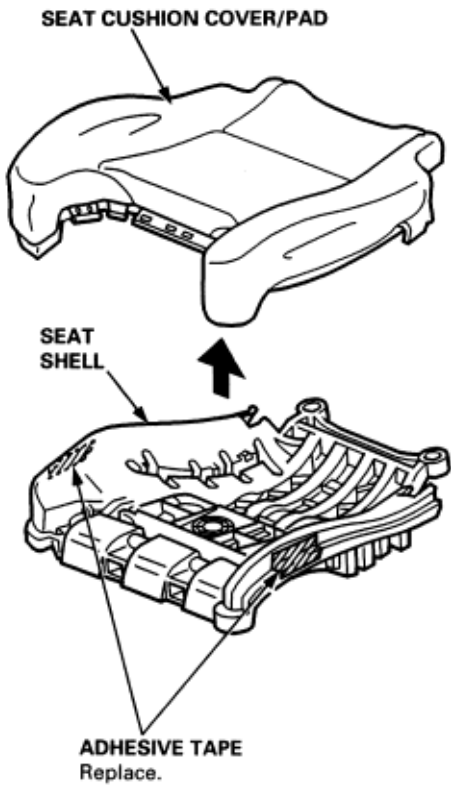
3. Remove the seat cushion and the seat shell suspensions from the cushion frame.



4. From under the seat cushions, release the hooks, the fasteners and pull back the edge of the seat cushion all the way around.

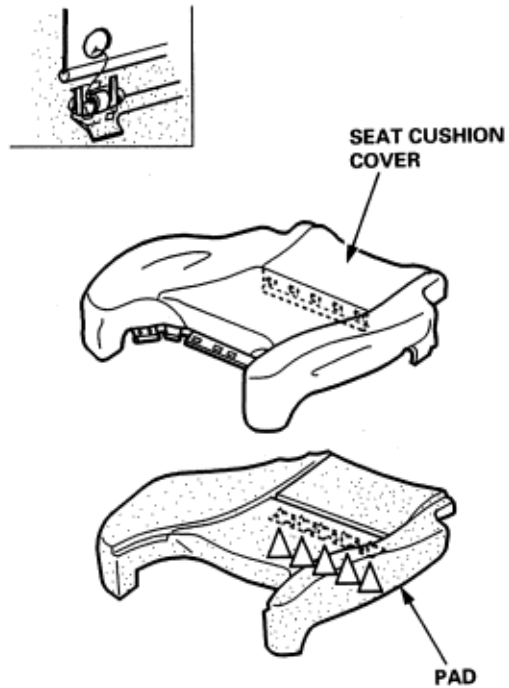


5. Remove the seat cushion cover/pad from the seat shell.



6. Separate the seat cushion cover and the pad by releasing the clips.

▷: Clip locations, 5

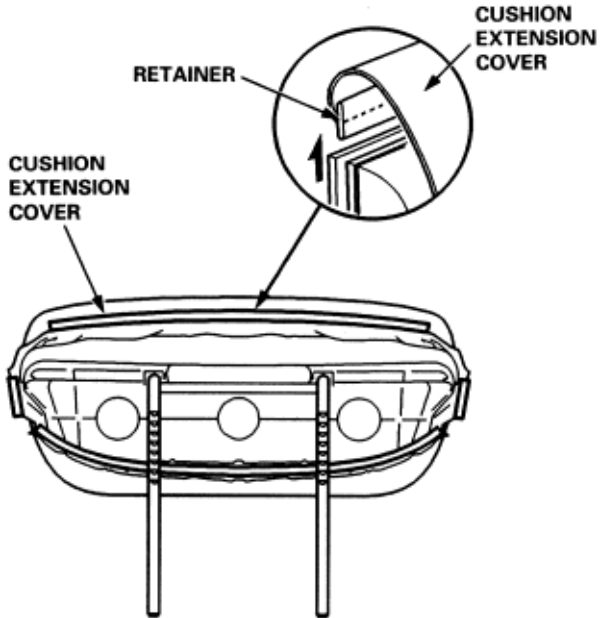


7. Reassembly is in the reverse order of disassembly, and note these items:

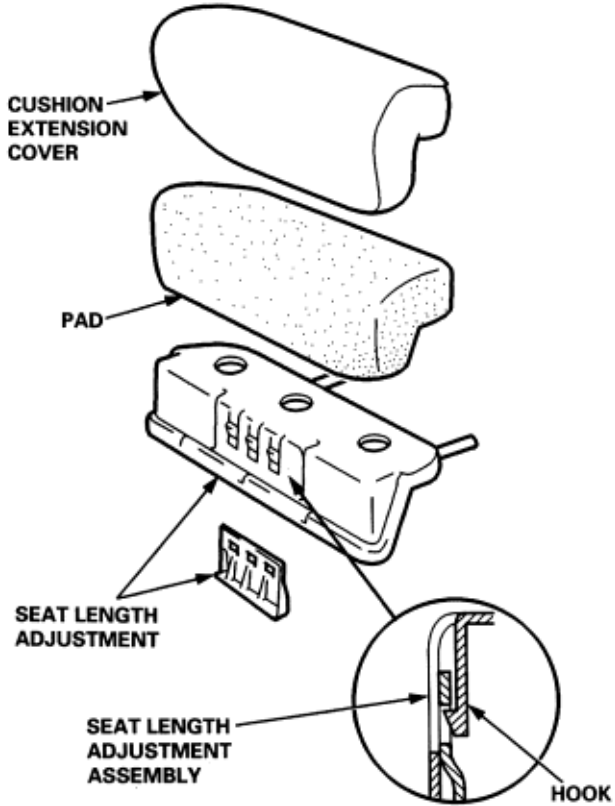
- ♦ To prevent wrinkle when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the fasteners, clips, hooks and retainers.
- ♦ Replace the adhesive tapes adhering the pad and the seat shell.

Cushion extension (RECARO):

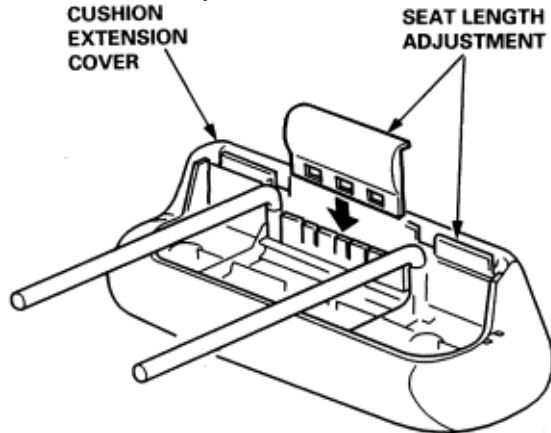
1. Pull back the cushion extension cover all the way around.



2. Disassemble the cushion extension.

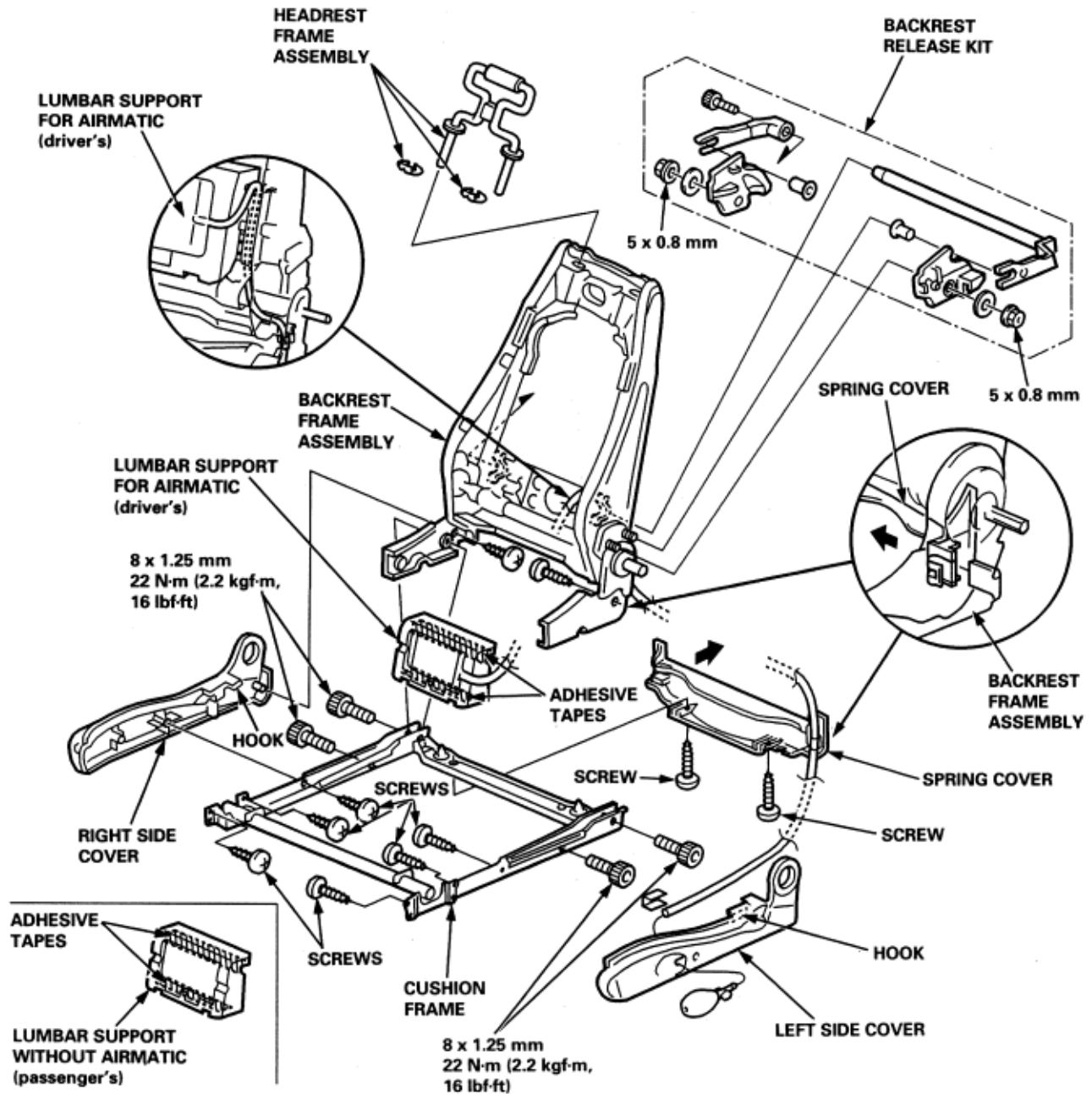


3. Reassembly is in the reverse order of disassembly except the following: reassemble the cushion extension cover before seat length adjustment reassembly.



NOTE: To prevent wrinkles when installing the cushion extension cover, make sure the material is stretched over the pad before securing the retainers.

Seat frame (RECARO):



Reassembly is in the reverse order of disassembly, and note the following items:

- ♦ Apply liquid thread locks to the bolts securing the backrest frame assembly and cushion frame.
- ♦ Apply multi-purpose grease to the sliding and pivot portions.
- ♦ Make sure the tube of air lumbar support for airmatic is not squashed.

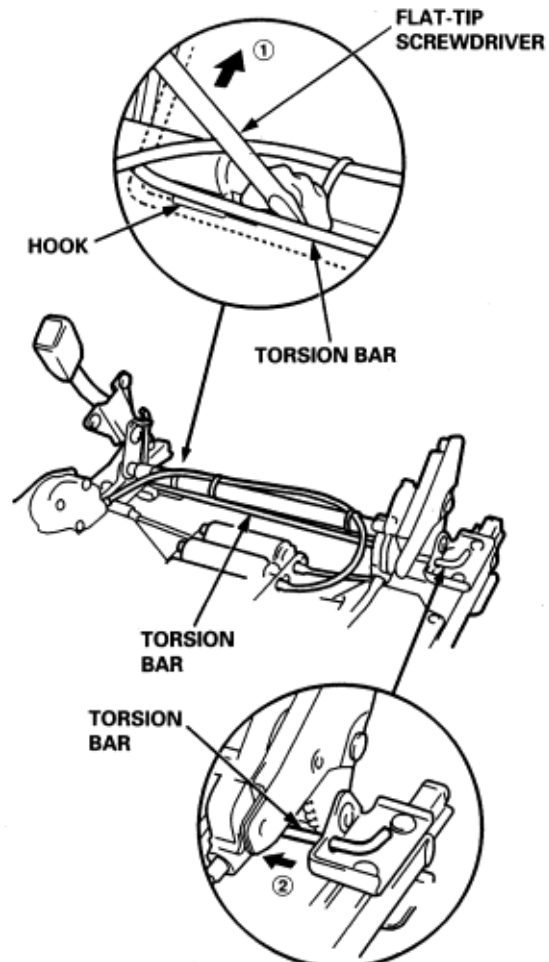
Reassemble in the reverse order of disassembly and note the following items:

- ♦ 8-way power seat: replace the cushion cover clips and speed nuts with new ones.
- ♦ To prevent wrinkles when installing the seat-back cover, make sure the material is stretched evenly over the pad.
- ♦ Apply multi-purpose grease to the moving portion of the seat track.

8-way power seat:

NOTE: Take care not to tear the seams or damage the seat covers.

1. Raise the seat cushion to its maximum height, then remove the front seat (**See Page 20-93**).
2. Remove the front seat linkage (**See Page 20-109**).
3. Remove the torsion bar from the hook with a flat-tip screwdriver, then pull out the torsion bar from the front seat linkage. Wear gloves to protect your hands.



4. Install in the reverse order of removal.

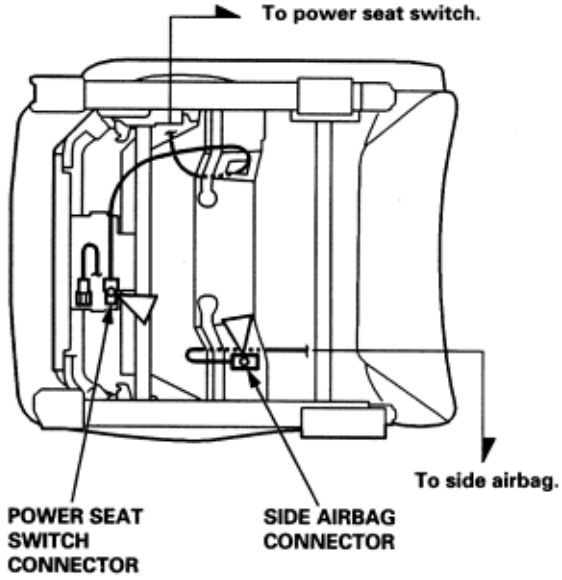
Seats

Front Seat Harness and Cable Wiring Locations

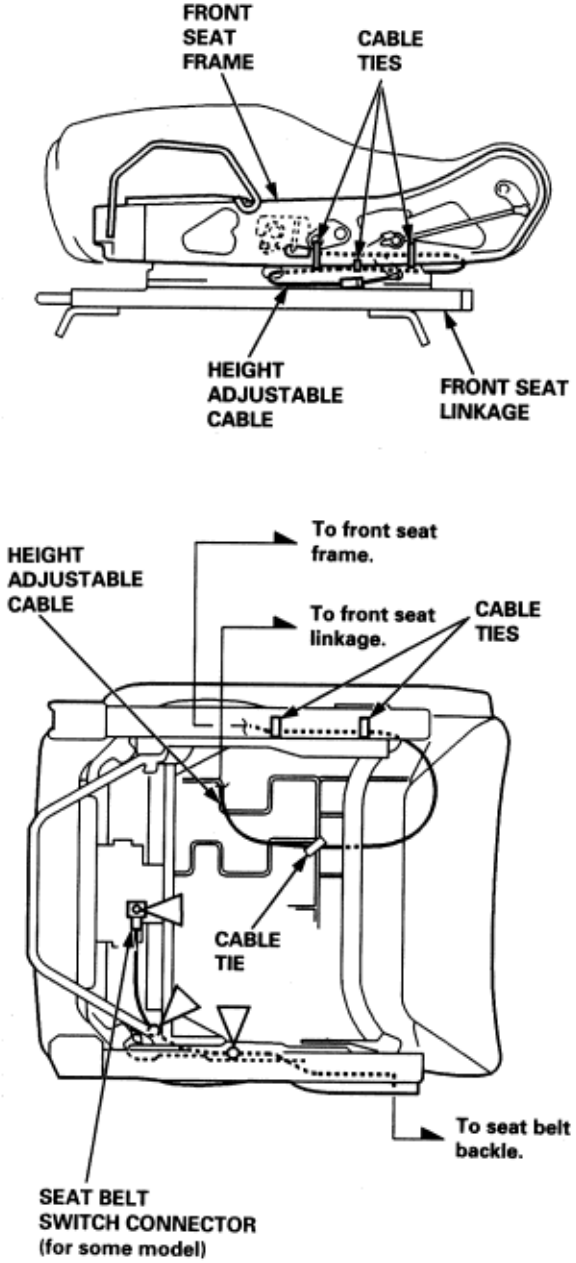
20-108

When assembling the front seat, make sure the seat belt switch harness, power seat harness, side airbag harness, connectors and height adjustable cable are fastened correctly.

8-way power seat:



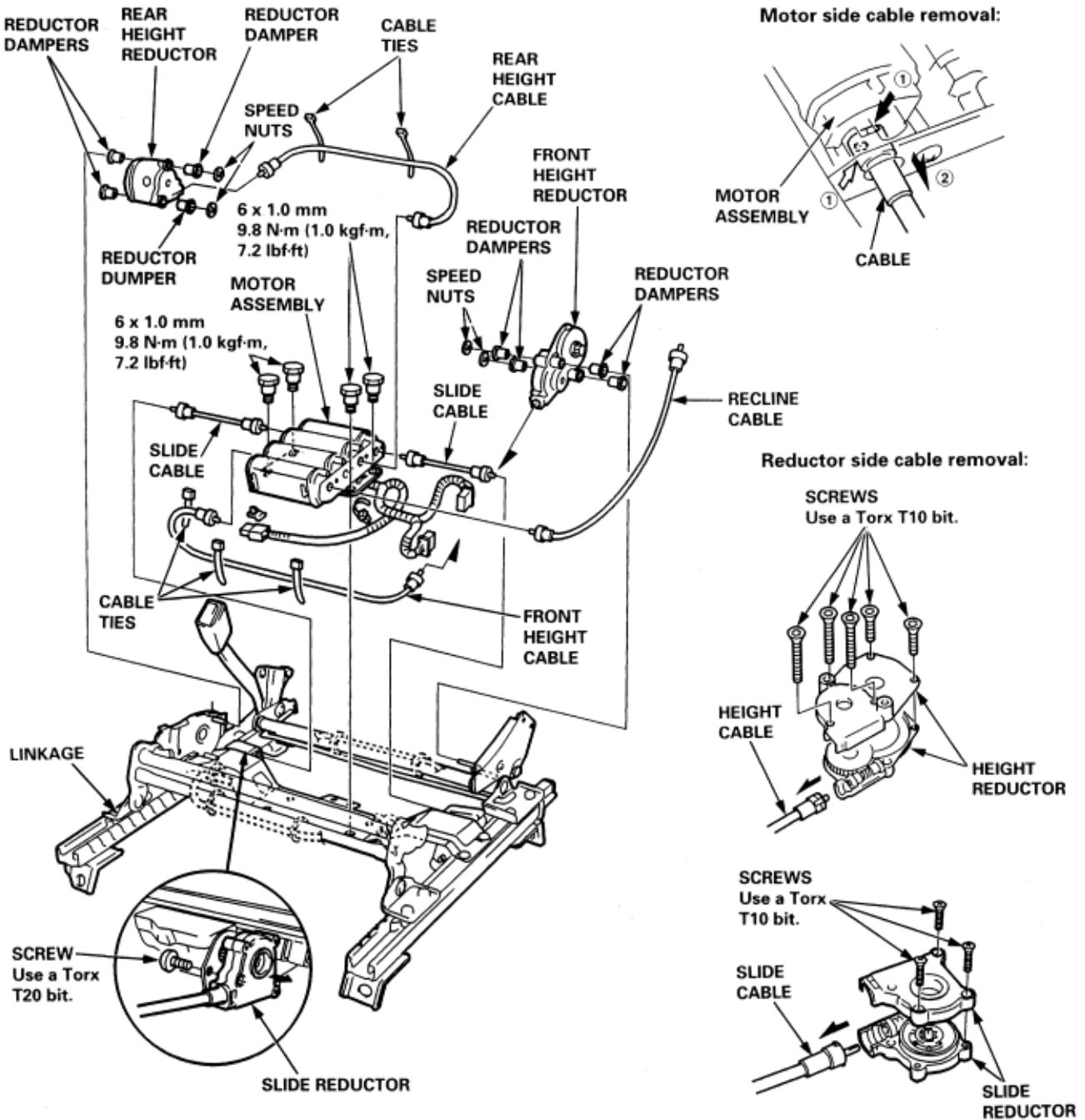
Manual height adjustable seat:



NOTE:

- ♦ Before removing the front seat, raise the seat cushion to its maximum height.
- ♦ Wear gloves to protect your hands.

8-way power seat:



Reassemble in the reverse order of disassembly, and note the following items:

- ♦ Apply multipurpose grease to the sliding and pivot portions.
- ♦ Check the recline adjuster and slide/up-down adjuster operations.

Seats

Front Seat Cover Replacement

20-110

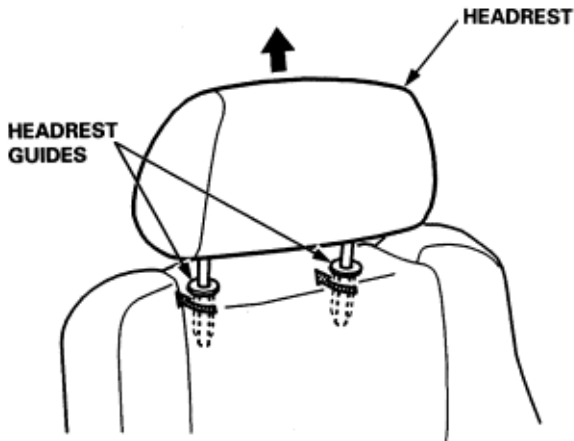
SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing any repairs or service.

NOTE:

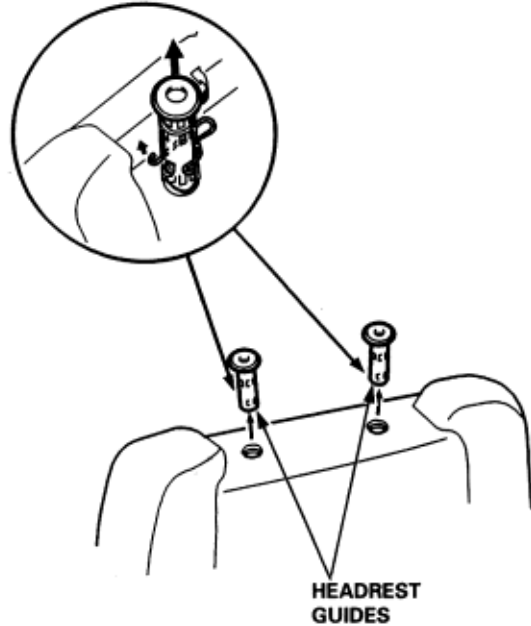
- ♦ To distinguish the two types of seats, the seat with an airbag is marked with side airbag on the surface of the seat-back. As the component parts (a seat-back cover, etc) are different from the types with side airbag and types without side airbag, if service is necessary be careful not to assemble the wrong parts.
- ♦ Do not repair tears or frayed spots of the seat-back cover. If necessary, replace the seat-back cover.
- ♦ Take care not to tear the seams or damage the seat covers.
- ♦ Wear gloves to protect your hands.

Seat-back cover:

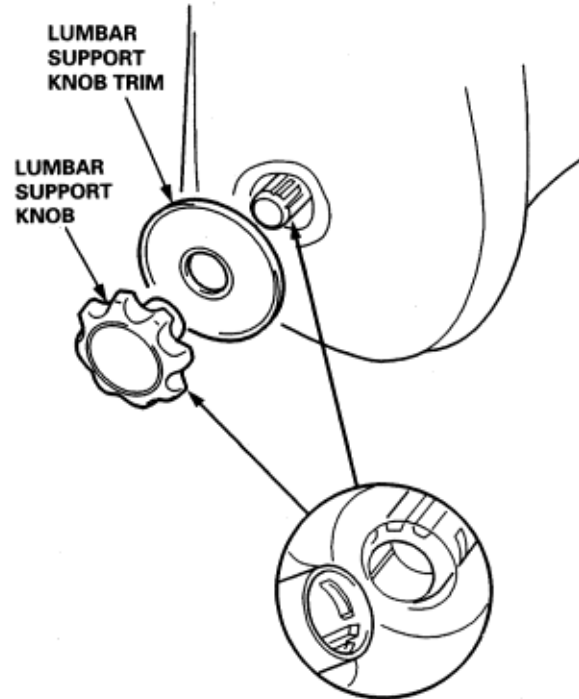
1. Remove the front seat ([See Page 20-93](#)).
2. Remove the headrest by turning the headrest guides.



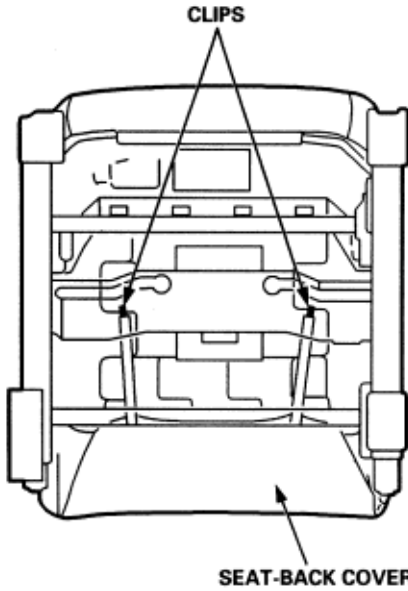
3. Remove the headrest guides by turning it.



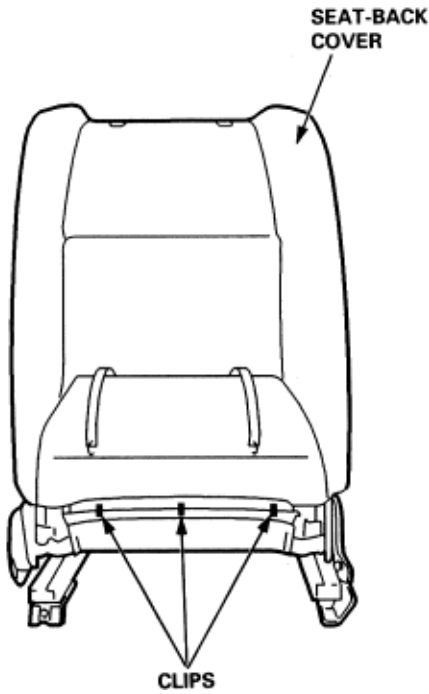
4. If equipped, remove the lumbar support knob and lumbar support knob trim.



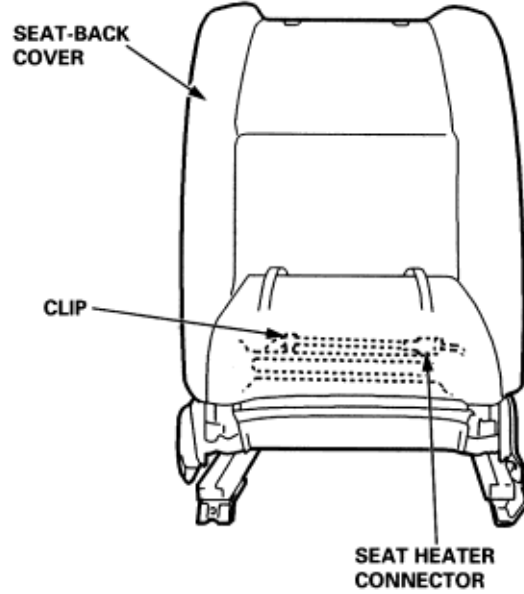
5. Release the clips from under the seat cushion.



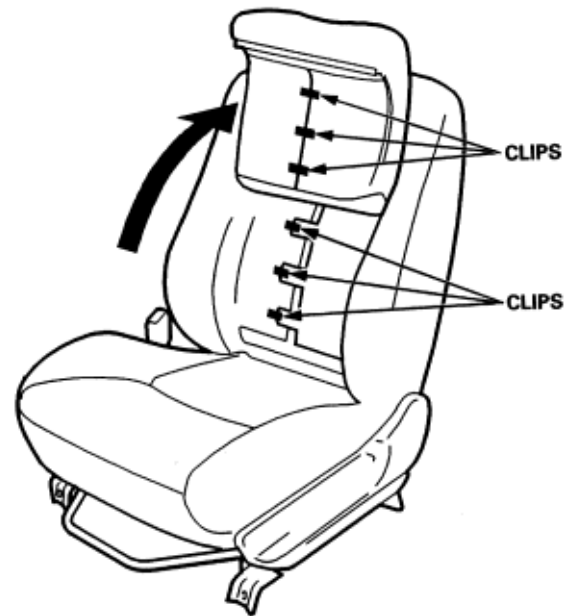
6. Release the clips from behind the seat-back.



7. With heated seat: Pull back the edge of the seat-back cover as necessary to disconnect the seat heater connector and to release the harness clip.



8. Turn a center portion of the seat-back upward as shown, then release the clips.

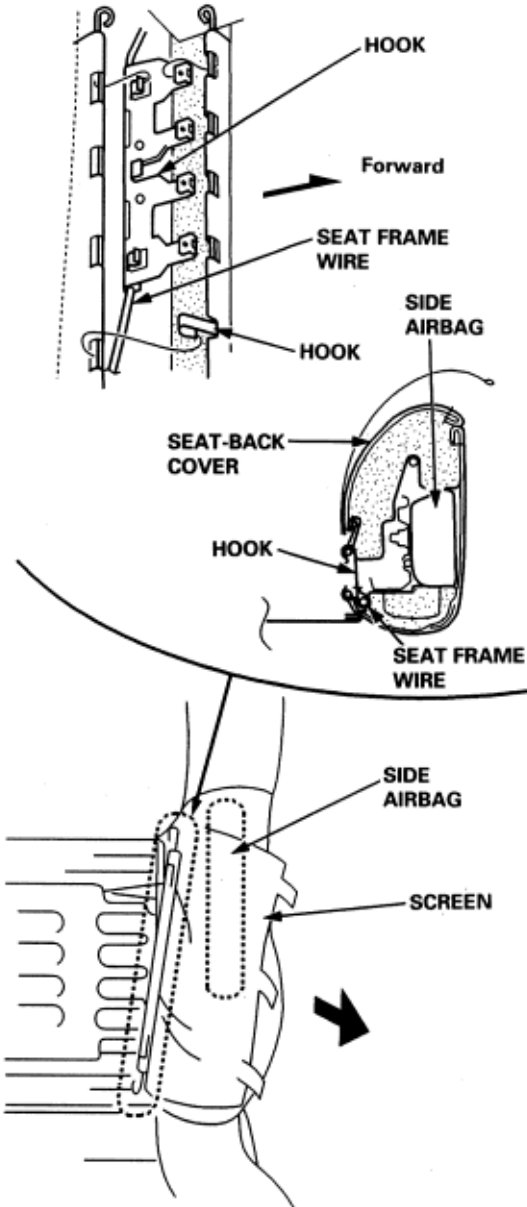


Seats

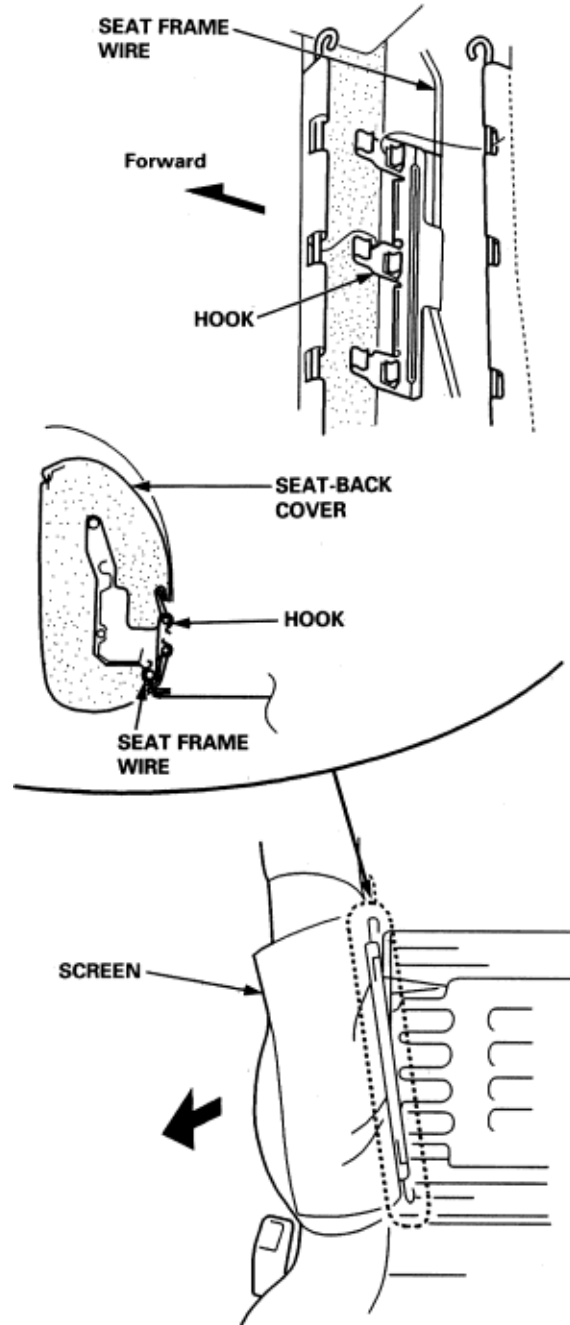
Front Seat Cover Replacement (cont'd)

9. While lifting the center portion of the seat-back upward, open the screens and release the hooks on both sides in seat-back opening.

Side airbag side:

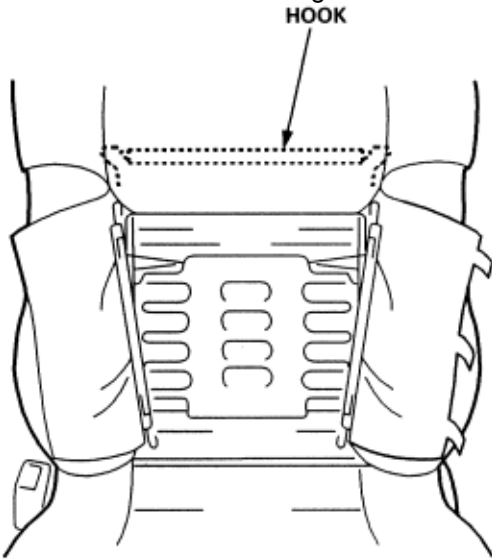


No side airbag side:

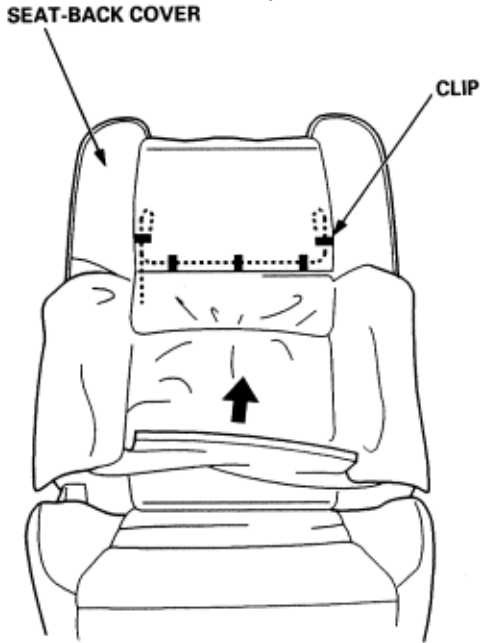


NOTE: If equipped with no side airbag, this side is symmetrical to a no side airbag side.

10. Release the hook through the seat-back opening.

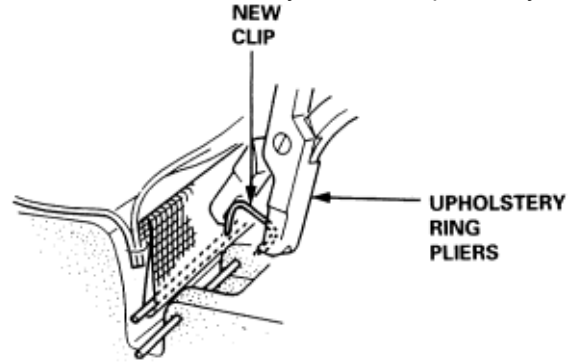


11. Pull back the edge of the seat-back all the way around, and release the clips, then remove the seat-back cover.



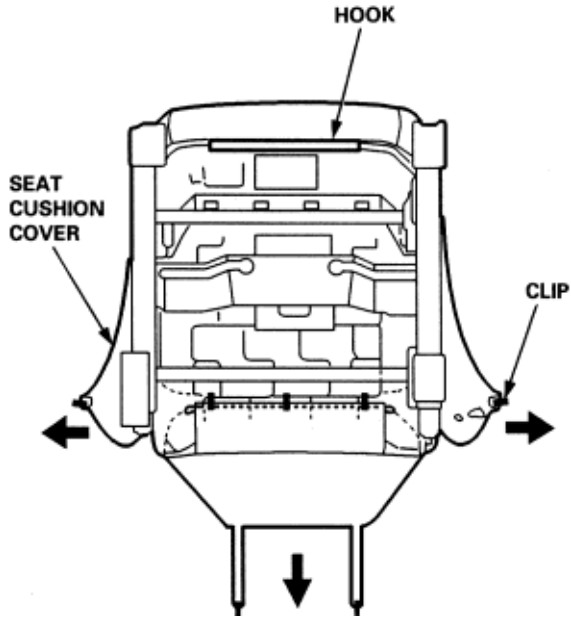
12. Install in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the hooks and clips.
- Replace the clips with new ones using commercially available upholstery ring pliers.

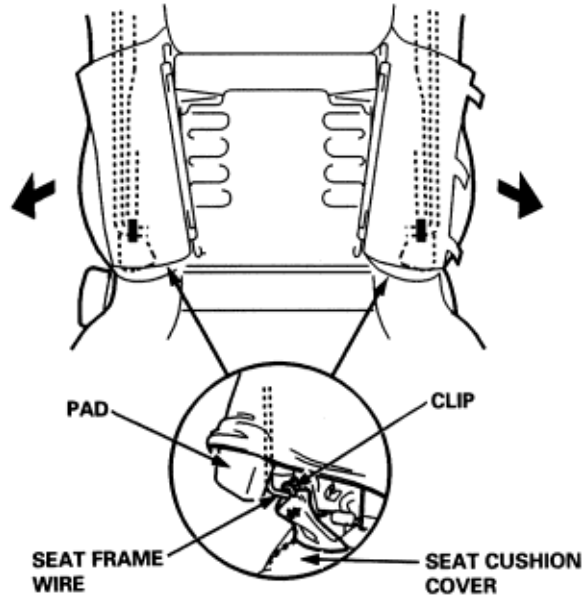


Seat cushion cover:

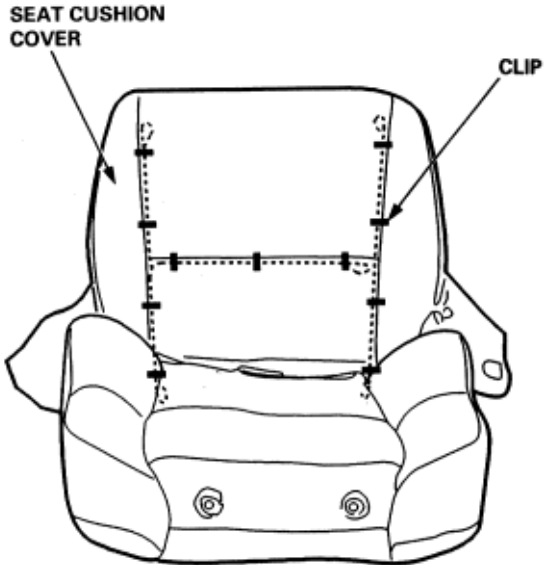
1. Remove the front seat (See Page 20-93).
2. Remove the following parts:
 - ♦ Recline cover (See Page 20-95), (See Page 20-96) and (See Page 20-97).
 - ♦ Seat-back cover, as necessary (See Page 20-110).
3. Release the clips and hook from under the seat cushion.



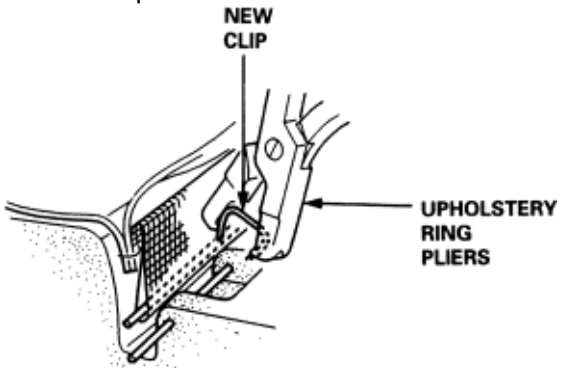
4. Release the clips from the seat frame wire.



5. Pull back the edge of the seat cushion cover all the way around, and release the clips, then remove the seat cushion cover.



6. Install is the reverse of removal, and note the following items:
 - ♦ To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
 - ♦ Replace the released clips with new ones using commercially available upholstery ring pliers.



Seats Lumbar Support Replacement

20-115

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing any repairs or service.

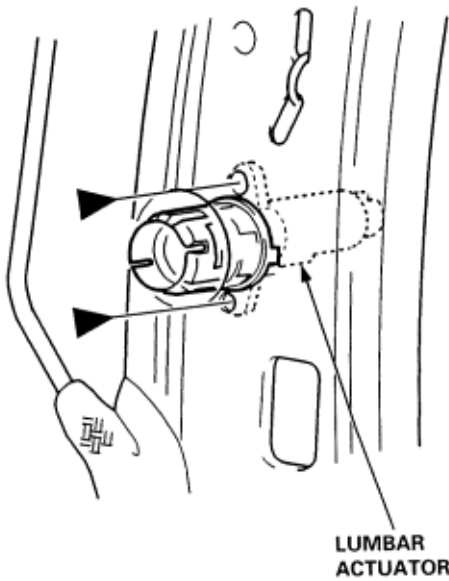
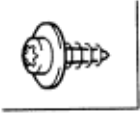
NOTE:

- ♦ Take care not to tear the seams or damage the seat covers.
- ♦ Wear gloves to protect your hands.

For some models:

1. Remove the seat-back cover and the pad (See Page 20-110).
2. Use a Torx T20 bit to remove the screws.

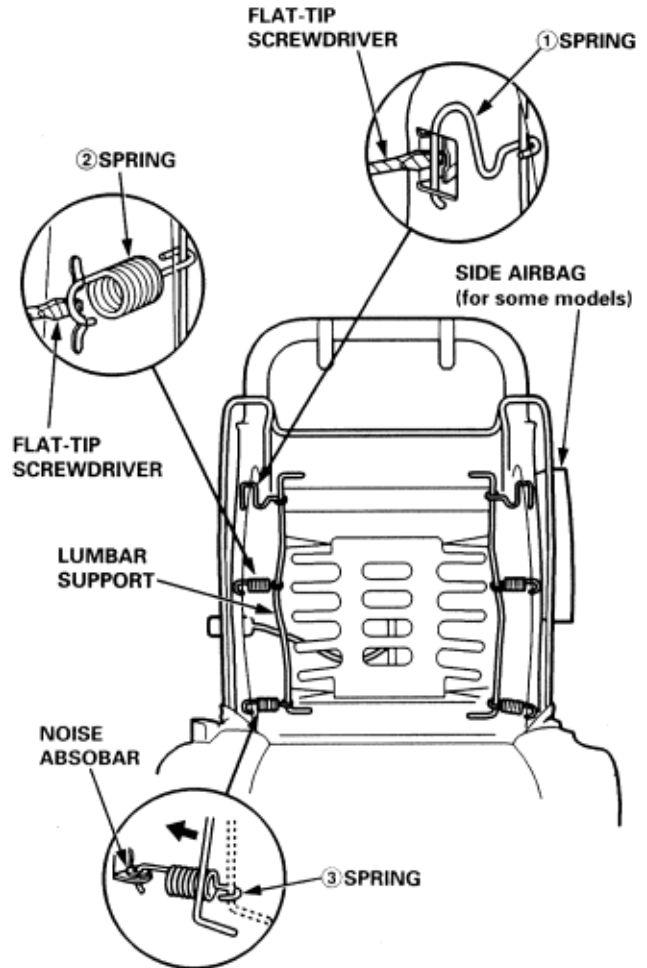
►: Screw locations, 2



3. Release the springs in numbered sequence. Then release the lumbar support.

NOTE:

- ♦ If equipped with side airbag, release the springs from the no side airbag side.
- ♦ Take care not to bend the lumbar cable.



4. Install in the reverse order of removal, and check the lumbar support operation.

Seats

20-116

Rear Seat Removal and Installation

NOTE: Take care not to scratch the body or tear the seat covers.

Fold down rear seat:

▶: Bolt locations

A ▶, 4

B ▶, 2

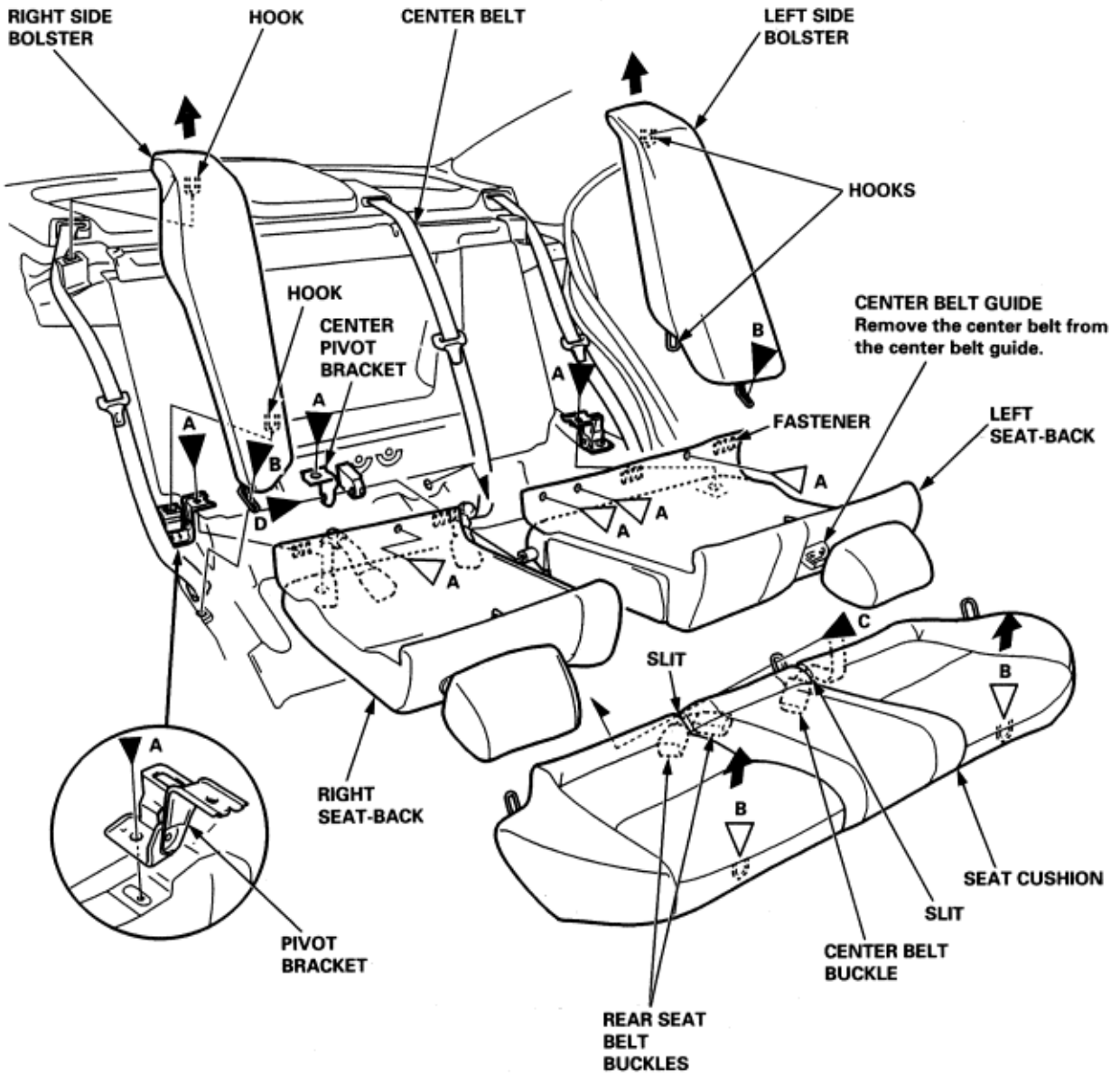
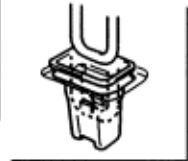
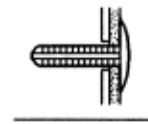
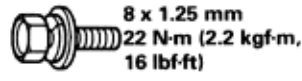
C ▶, 1

D ▶, 1

▷: Clip, hook locations

A ▷, 4

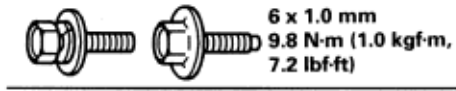
B ▷, 2



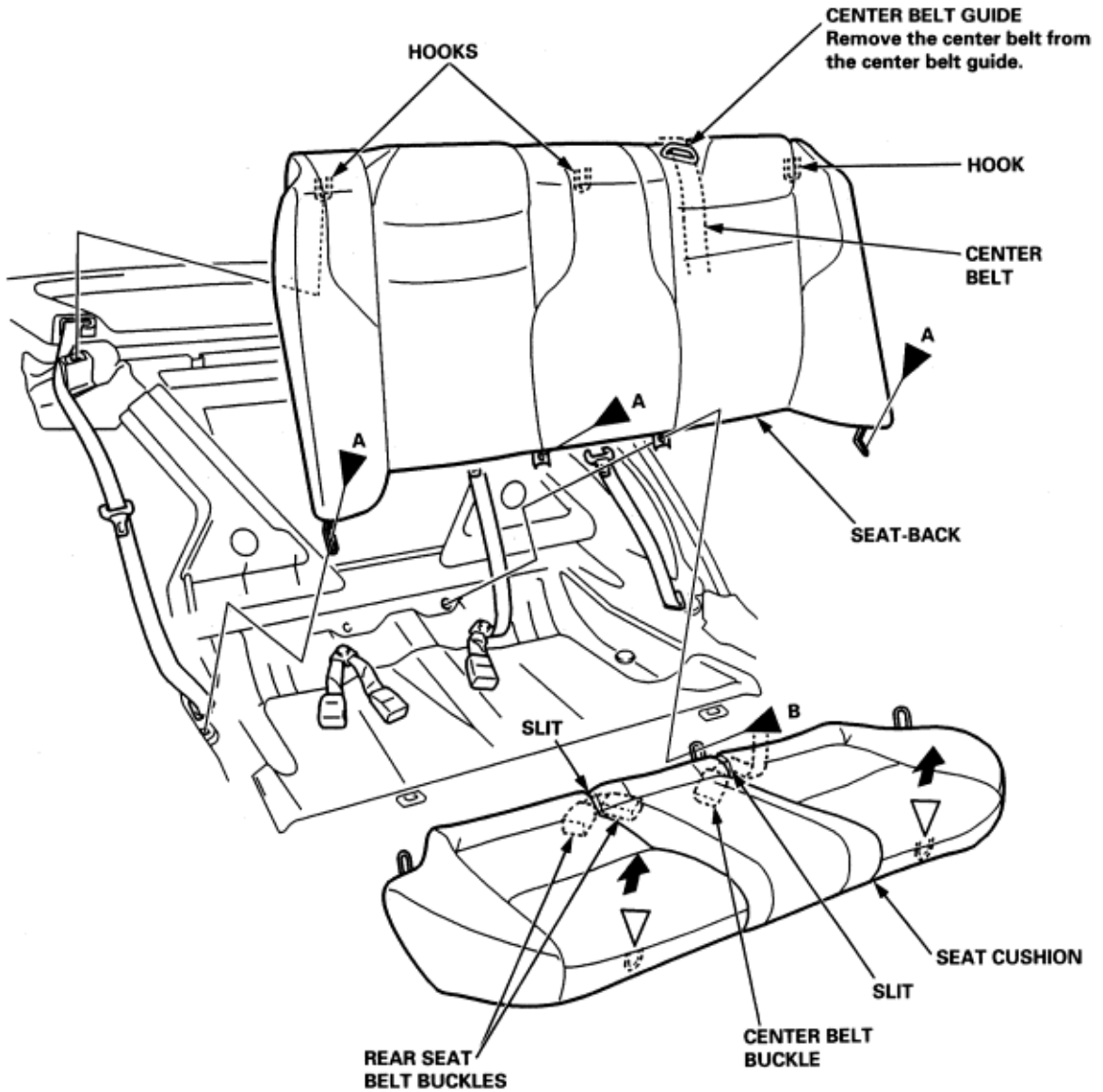
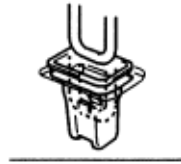
Fixed rear seat:

▶: Bolt locations

A ▶, 3 B ▶, 1



▷: Clip, hook locations, 2



Install in the reverse order of removal, and note the following items:

- ♦ Before attaching the rear seat-back and seat cushion, make sure there are no twists or kinks in the rear seat belts and center belt.
- ♦ When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.
- ♦ Make sure the seat-back locks securely (fold down rear seat).

Seats

Rear Seat Armrest Replacement

20-118

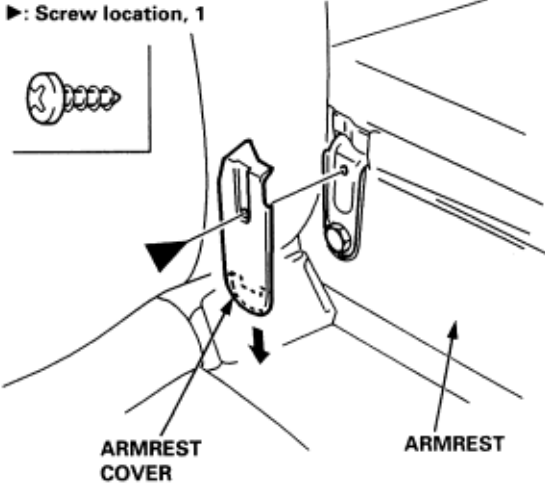
Rear Seat-back Latch Replacement

Fold down rear seat:

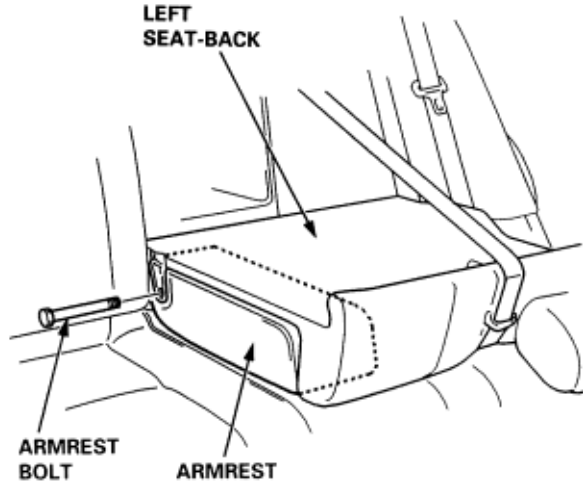
NOTE: Take care not to tear the seams or damage the seat covers.

1. Fold the left seat-back forward.
2. Remove the screw, then remove the armrest cover.

►: Screw location, 1



3. Remove the armrest bolt.

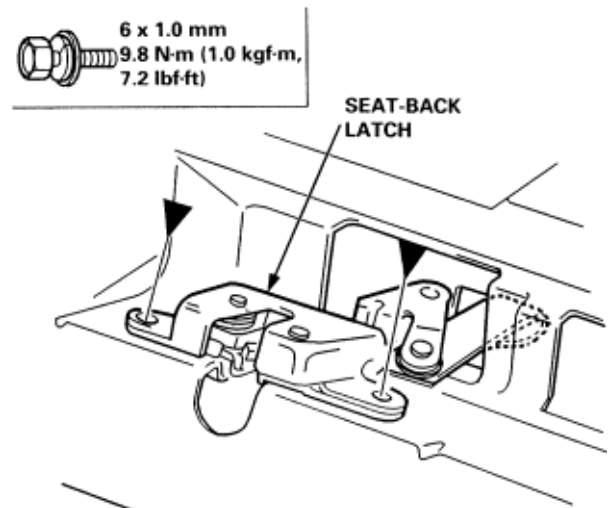


4. Raise the left seat-back and remove the armrest.
5. Install in the reverse order of removal.

Fold down rear seat:

1. Remove the rear bulkhead cover ([See Page 20-67](#)).
2. Remove the bolts, then remove the seat-back latch.

►: Bolt locations, 2



3. Install in the reverse order of removal and make sure the seat-back locks securely and opens properly.

Seats

Rear Seat Cover Replacement

20-119

NOTE:

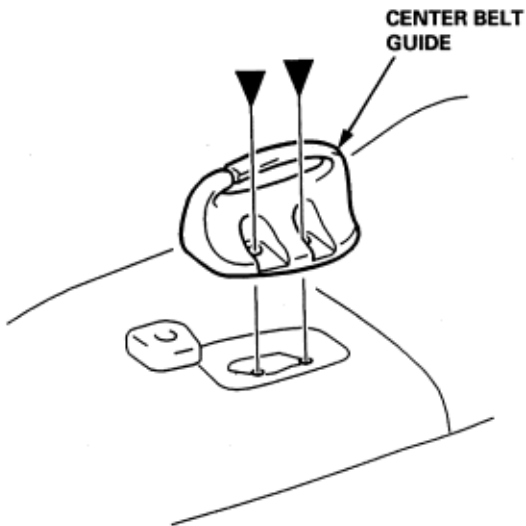
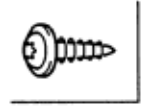
- ♦ Take care not to tear the seams or damage the seat covers.
- ♦ Wear gloves to protect your hands.

Seat-back cover:

Fold down rear seat:

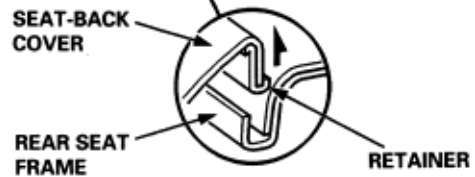
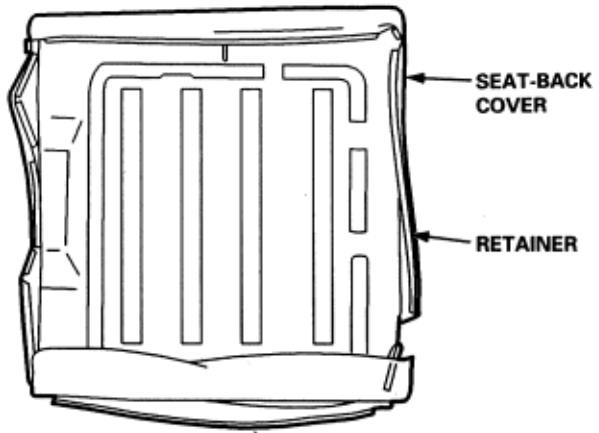
1. Remove the seat-back, both sides (**See Page** 20-116).
2. Remove the armrest (**See Page** 20-118).
3. Use a Torx T20 bit, to remove the screws, then remove the center belt guide.

►: Screw locations, 2

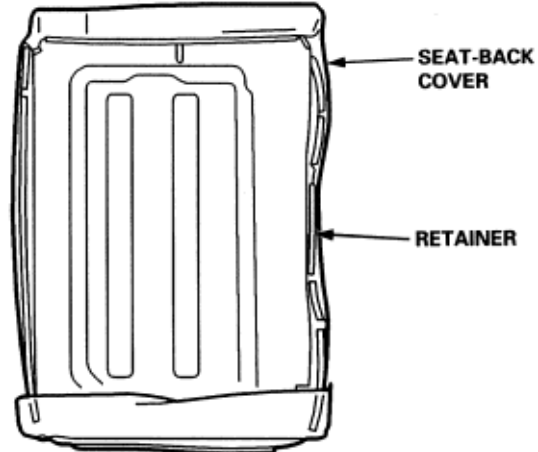


4. Push back the edge of the seat-back cover all the way around.

Left seat-back:

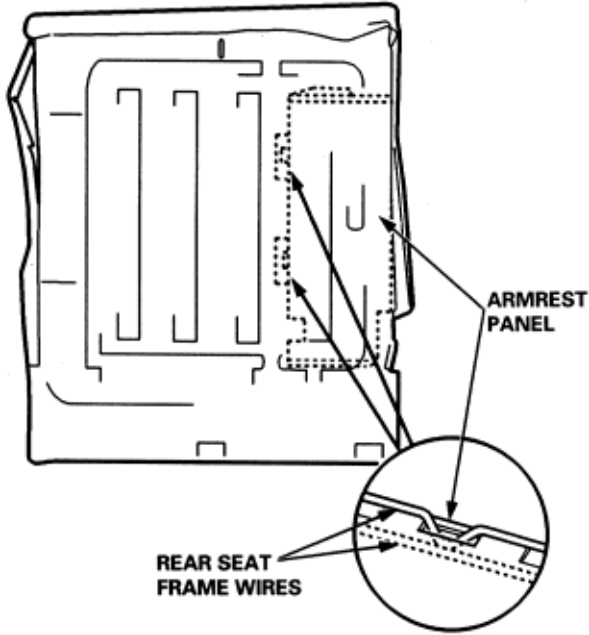


Right seat-back:

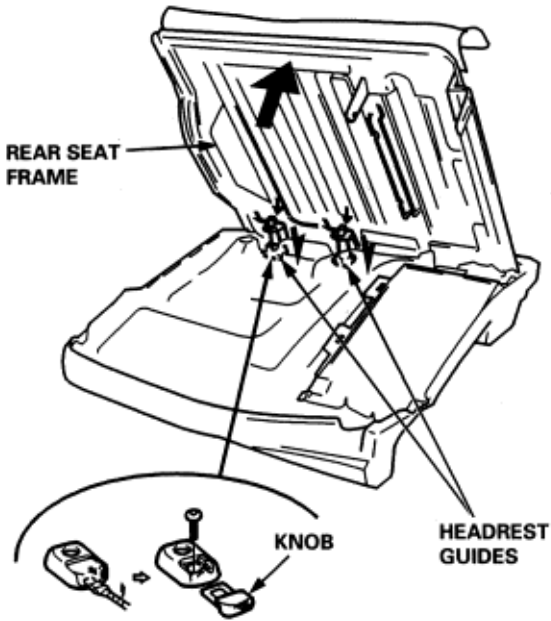


Rear Seat Cover Replacement (cont'd)

5. Left seat-back: Release the armrest panel from the seat frame wire.

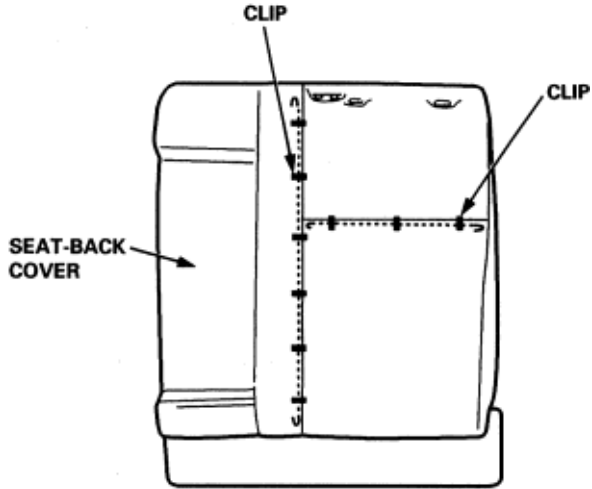


6. While lifting the bottom of the seat-back frame out of the pad, remove the headrest guides from the seat-back frame.

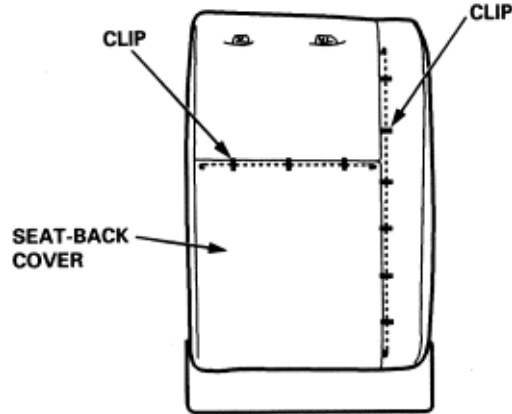


7. Pull back the edge of the seat-back cover all the way around, and release the clips, then remove the seat-back cover.

Left seat-back:



Right seat-back:



8. Install in the reverse order of removal, and note the following items.

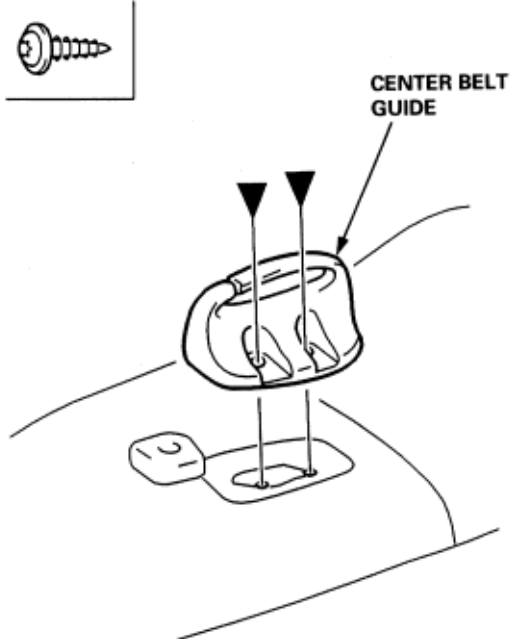
- ♦ To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before installing the armrest panel and securing the retainers and clips.
- ♦ Replace the released clips with new ones.

Rear Seat Cover Replacement (cont'd)

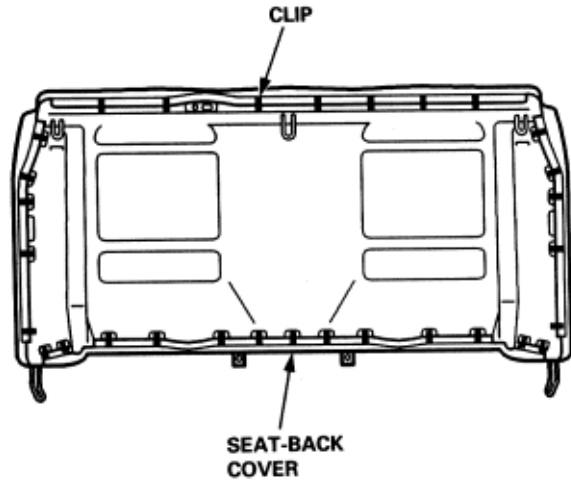
Fixed rear seat:

1. Remove the seat-back (See Page 20-117).
2. Use a Torx T20 bit, to remove the screws, then remove the center belt guide.

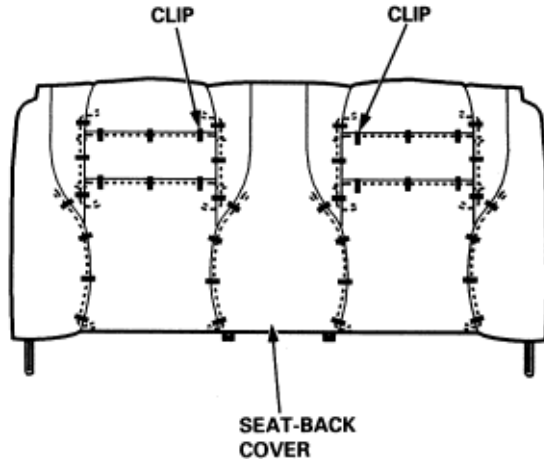
►: Screw locations, 2



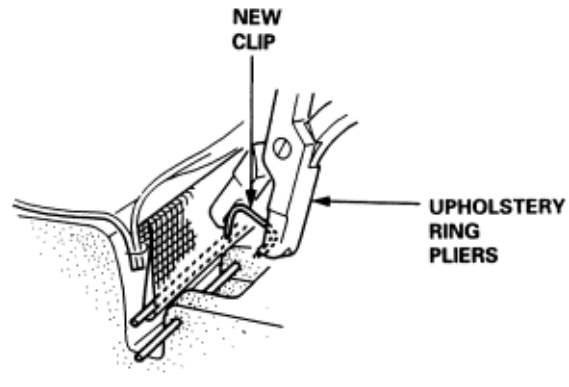
3. Release all the clips and hooks and fold back the seat-back cover.



4. Pull back the edge of the seat-back cover all the way around and release the clips, then remove the seat-back cover.



5. Install in the reverse order of removal, and note the following items:
 - ♦ To prevent wrinkles when installing a sea-back cover, make sure the material is stretched evenly over the pad before securing the clips.
 - ♦ Replace the released clips with new ones.

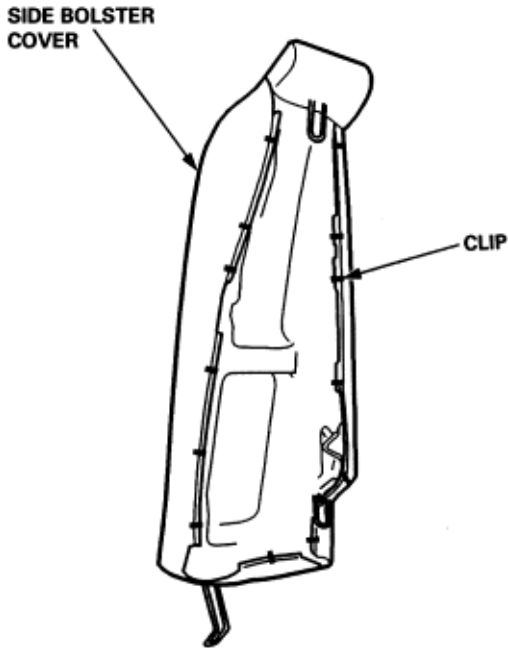


Rear Seat Cover Replacement (cont'd)

Seat side bolster cover:

Fold down rear seat:

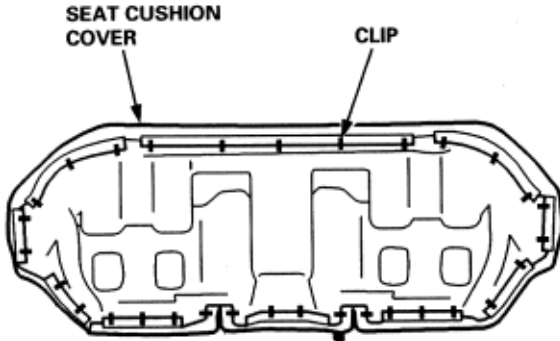
1. Remove the seat side bolster (**See Page 20-116**).
2. Release all the clips and fold back the seat side bolster cover and remove it.



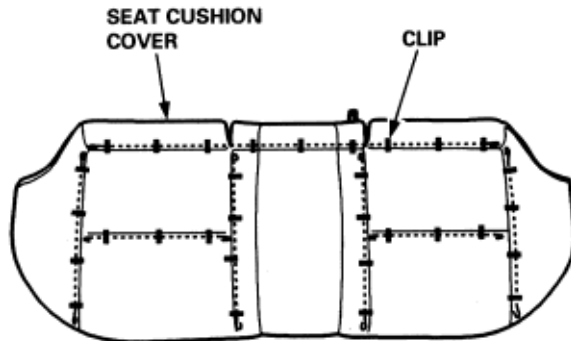
3. Install in the reverse order of removal, and note the following items:
 - ♦ To prevent wrinkles when installing a side bolster cover, make sure the material is stretched evenly over the pad before securing the clips.
 - ♦ Replace the released clips with new ones using commercially available upholstery ring pliers.

Seat cushion cover:

1. Remove the seat cushion (**See Page 20-116**) and (**See Page 20-117**).
2. Release all the clips from under the seat cushion and fold back the seat cushion cover.

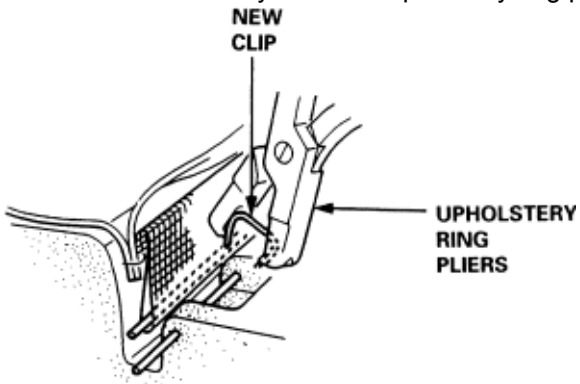


3. Pull back the edge seat cushion cover all the way around, and release the clips then remove the cushion cover.



Rear Seat Cover Replacement (cont'd)

3. Install in the reverse order of removal, and note the following items:
- ♦ To prevent wrinkles when installing a side bolster cover, make sure the material is stretched evenly over the pad before securing the clips.
 - ♦ Replace the released clips with new ones using commercially available upholstery ring pliers.



Bumpers

20-124

Front Bumper Removal and Installation

NOTE:

- ♦ An assistant is helpful when removing the front bumper.
- ♦ Take care not to scratch the front bumper and body.
- ♦ Wear gloves to protect your hands.

►: Bolt, screw locations

A ►, 2

B ►, 2

C ►, 2



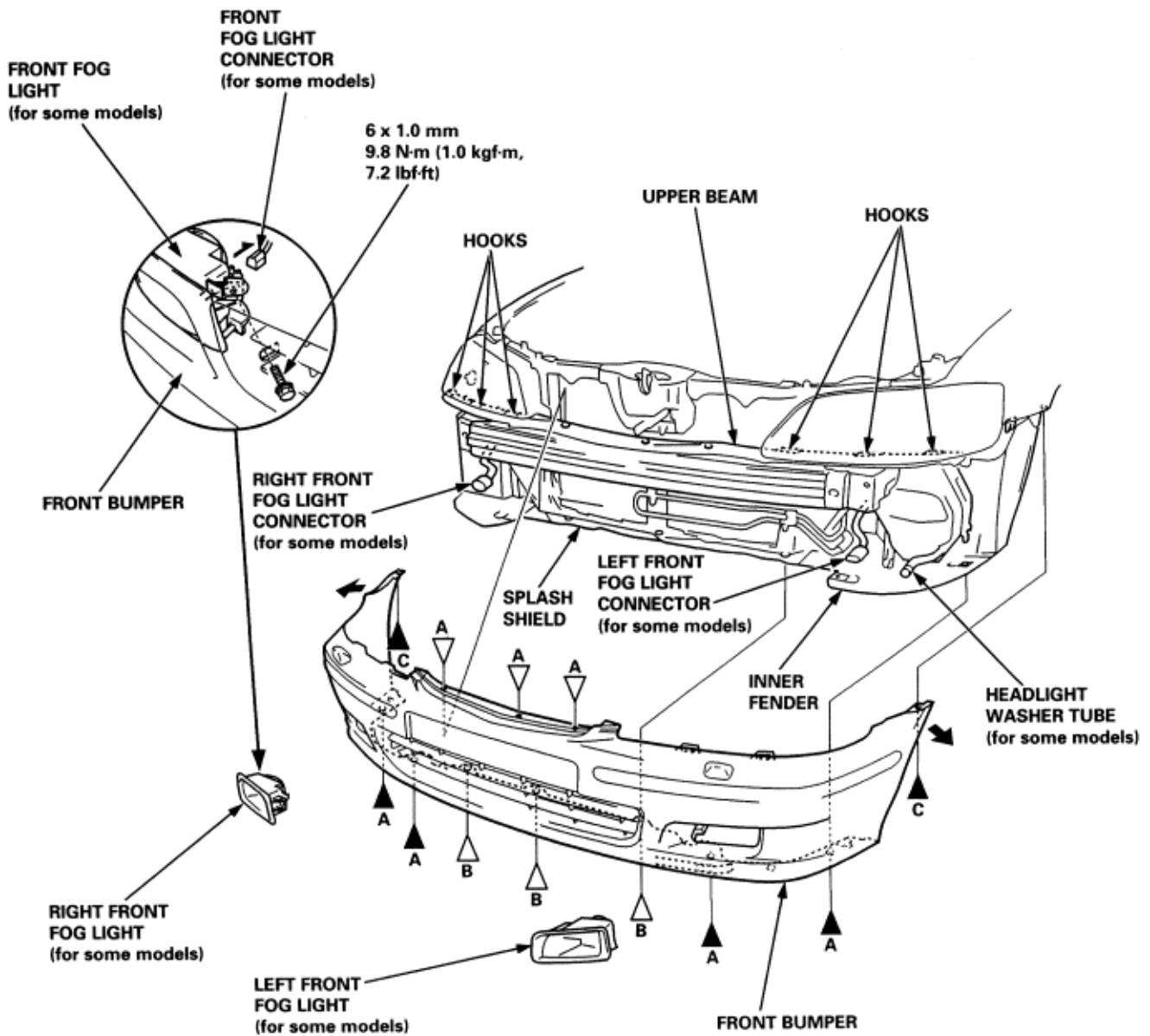
6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)



▷: Clip locations

A ▷, 3

B ▷, 3



Bumpers

Front Bumper Removal and Installation (cont'd)

20-125

▶: Bolt locations

A ▶, 8



6 x 1.0 mm
9.8 N-m (1.0 kgf-m,
7.2 lbf-ft)

B ▶, 4

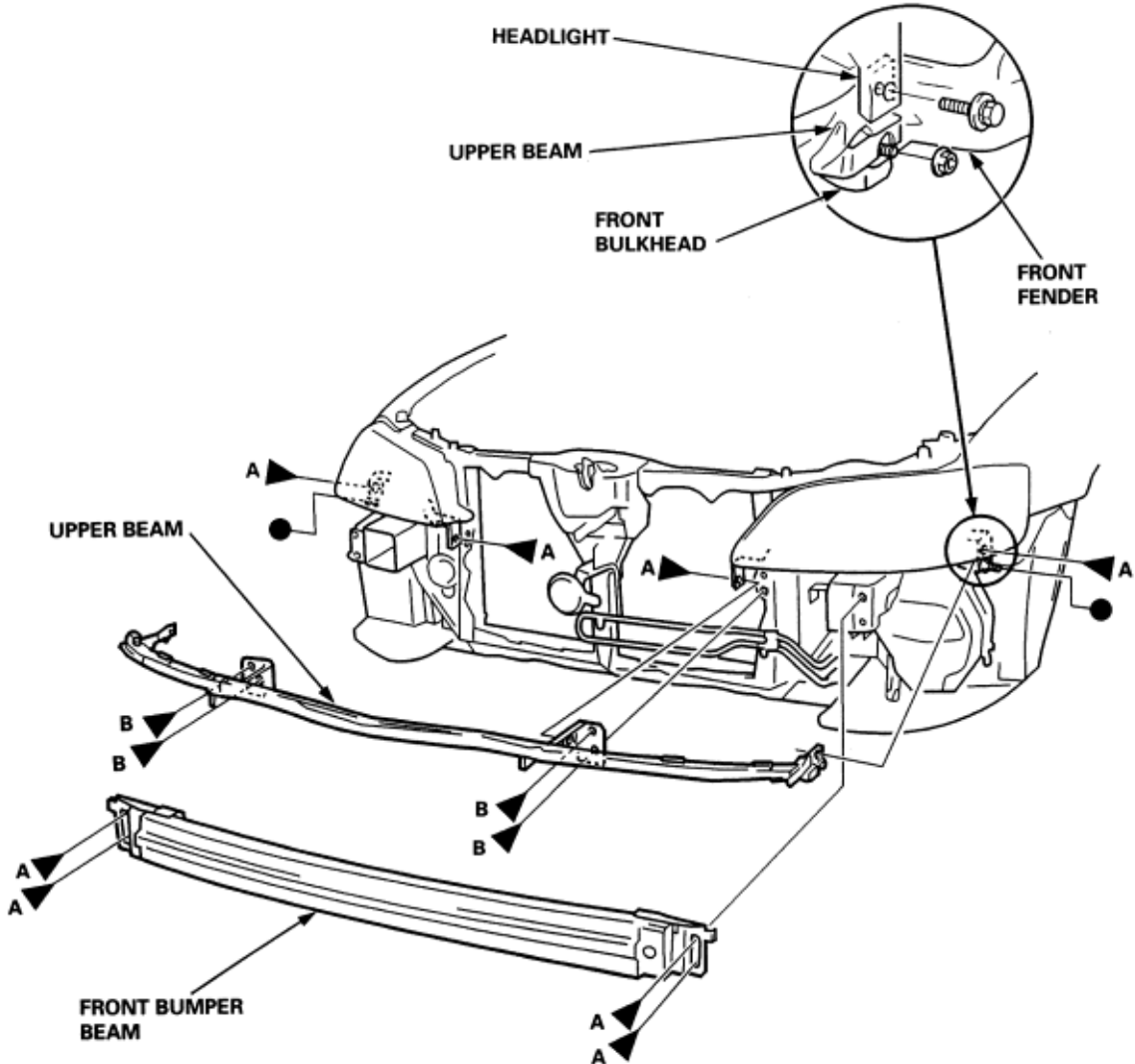


8 x 1.25 mm
22 N-m (2.2 kgf-m,
16 lbf-ft)

●: Nut locations, 2



6 x 1.0 mm
9.8 N-m (1.0 kgf-m,
7.2 lbf-ft)



Install in the reverse order of removal, and note the following items:

- After reinstalling the upper beam, adjust the aim of the headlights (see section 23).
- Make sure the front bumper engages the hooks of the center and corner upper beams securely.
- Replace any damaged clips.

Bumpers

Front Air Spoiler Replacement

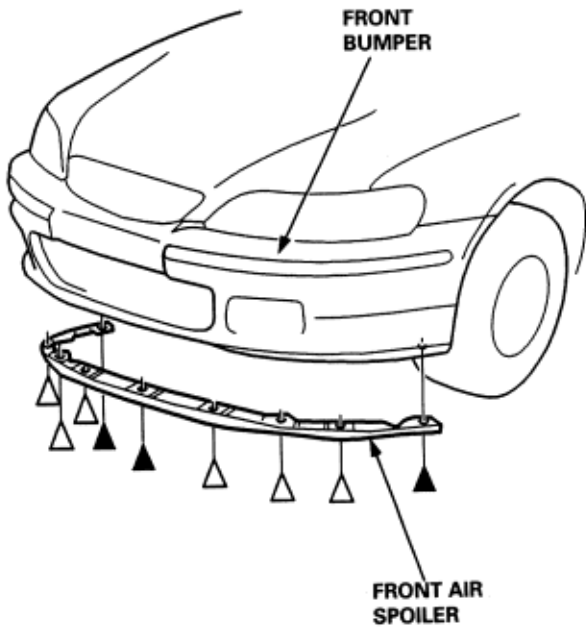
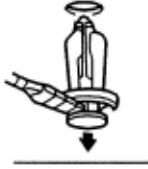
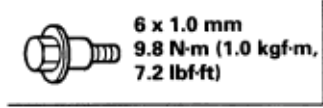
20-126

NOTE: Take care not to scratch the front bumper and front under spoiler.

For some models:

▶: Bolt locations, 3

▷: Clip locations, 6

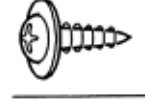
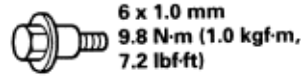


Type R:

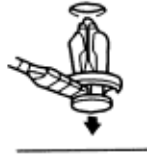
▶: Bolt screw locations

A ▶, 3

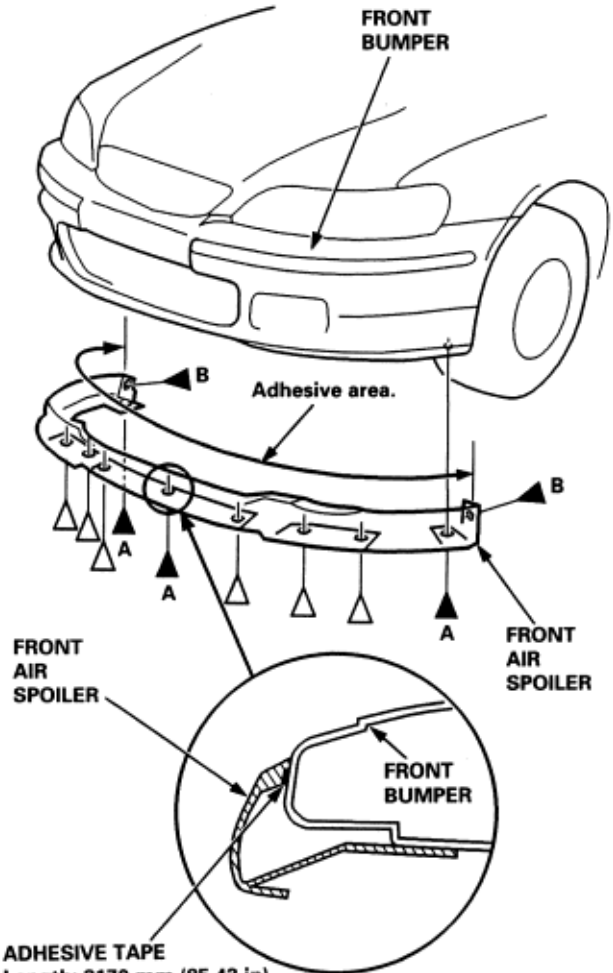
B ▶, 2



▷: Clip locations, 6



Adhesive tape: 3M 4210, or equivalent



ADHESIVE TAPE
Length: 2170 mm (85.43 in)
Width: 5 mm (0.2 in)
Thickness: 1.2 mm (0.5 in)

Install in the reverse order of removal.

Bumpers

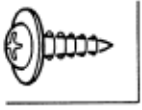
20-127

Rear Bumper Removal and Installation

NOTE:

- ♦ An assistant is helpful when removing the rear bumper.
- ♦ Take care not to scratch the rear bumper and body.
- ♦ Wear gloves to protect your hands.

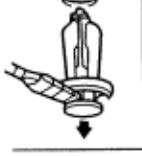
►: Screw locations
A ►, 2



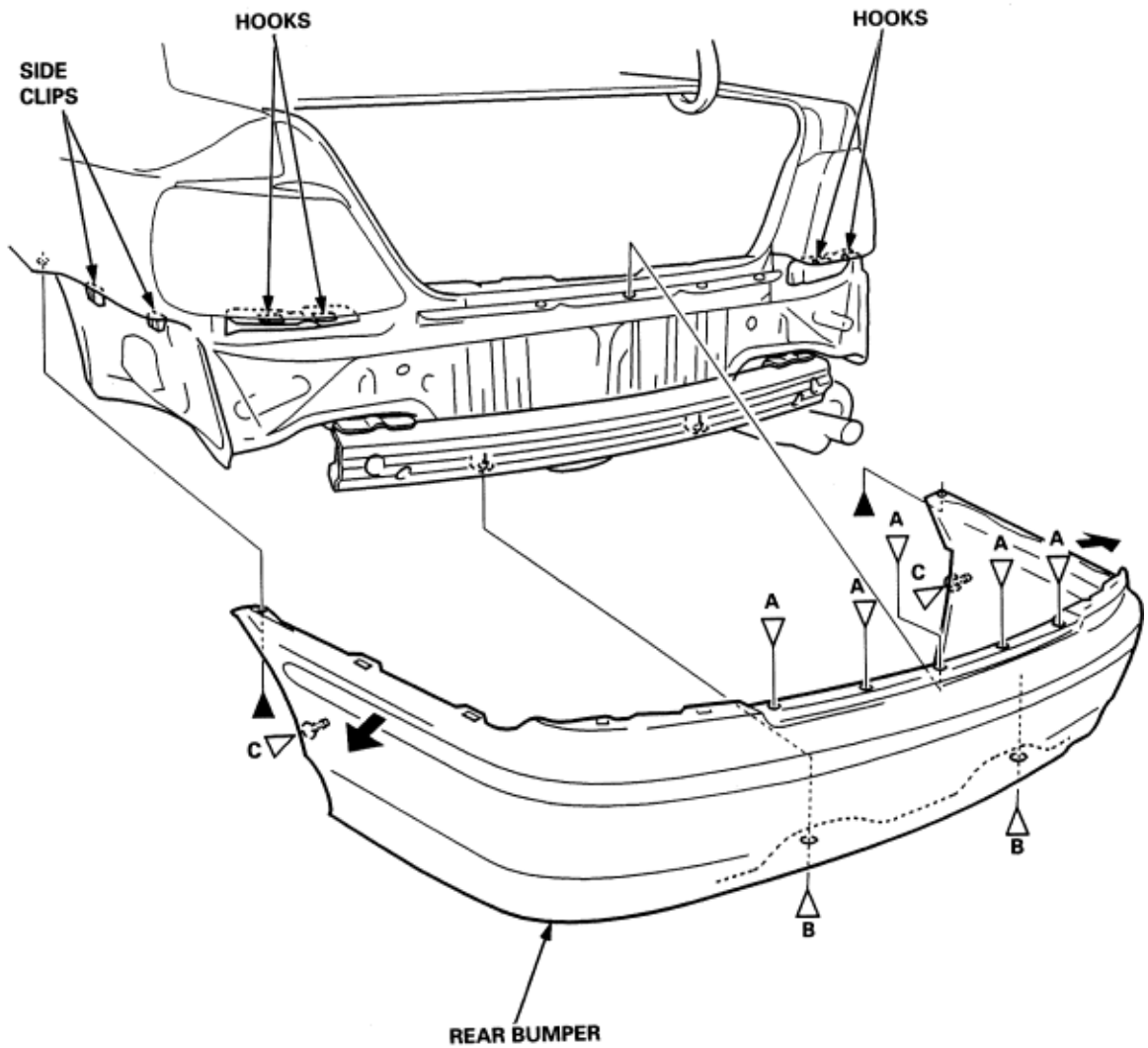
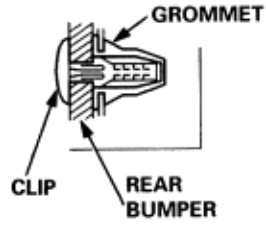
▷: Clip locations
A ▷, 5



B ▷, 2



C ▷, 2



Bumpers

Rear Bumper Removal and Installation (cont'd)

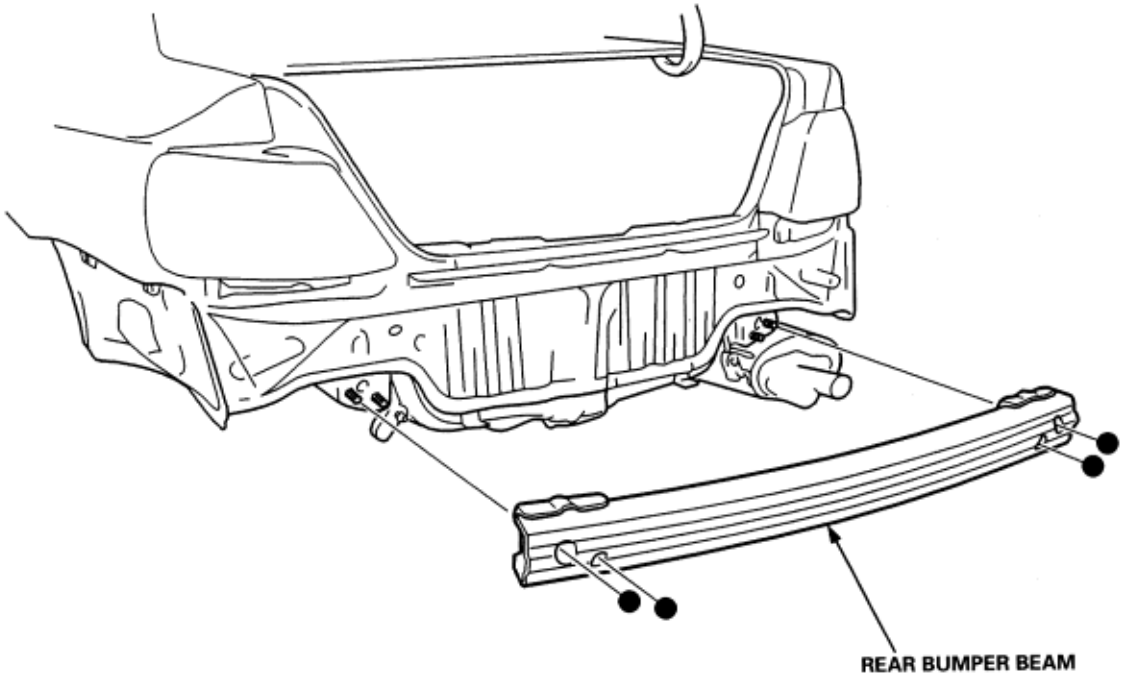
20-128

For some models:

●: Nut locations, 4



8 x 1.25 mm
22 N·m (2.2 kgf·m,
16 lbf·ft)



Install in the reverse order of removal, and note the following items:

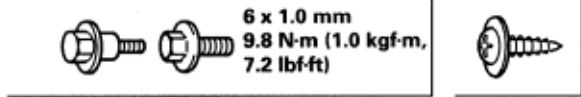
- ♦ Make sure the rear bumper engages the side spacers and the hooks of the rear panel side bracket on each side securely.
- ♦ Replace any damaged clips.

Type R:

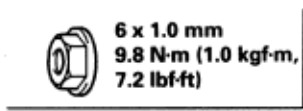
NOTE: Take care not to scratch the rear bumper and rear lower skirt.

▶: Bolt, screw locations

A ▶, 5 B ▶, 4 C ▶, 2



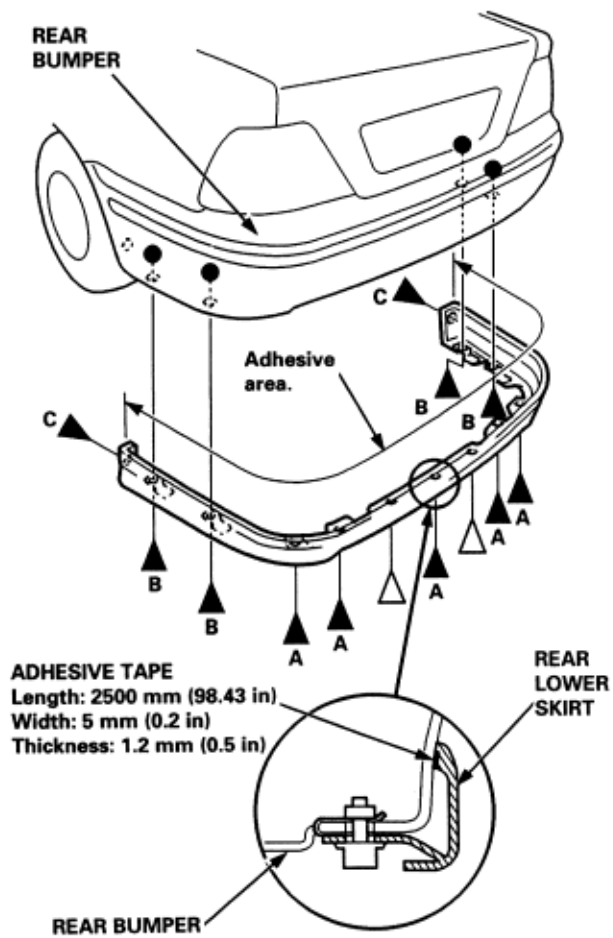
●: Nut locations, 4



▷: Clip locations, 2



Adhesive tape: 3M 4210, or equivalent

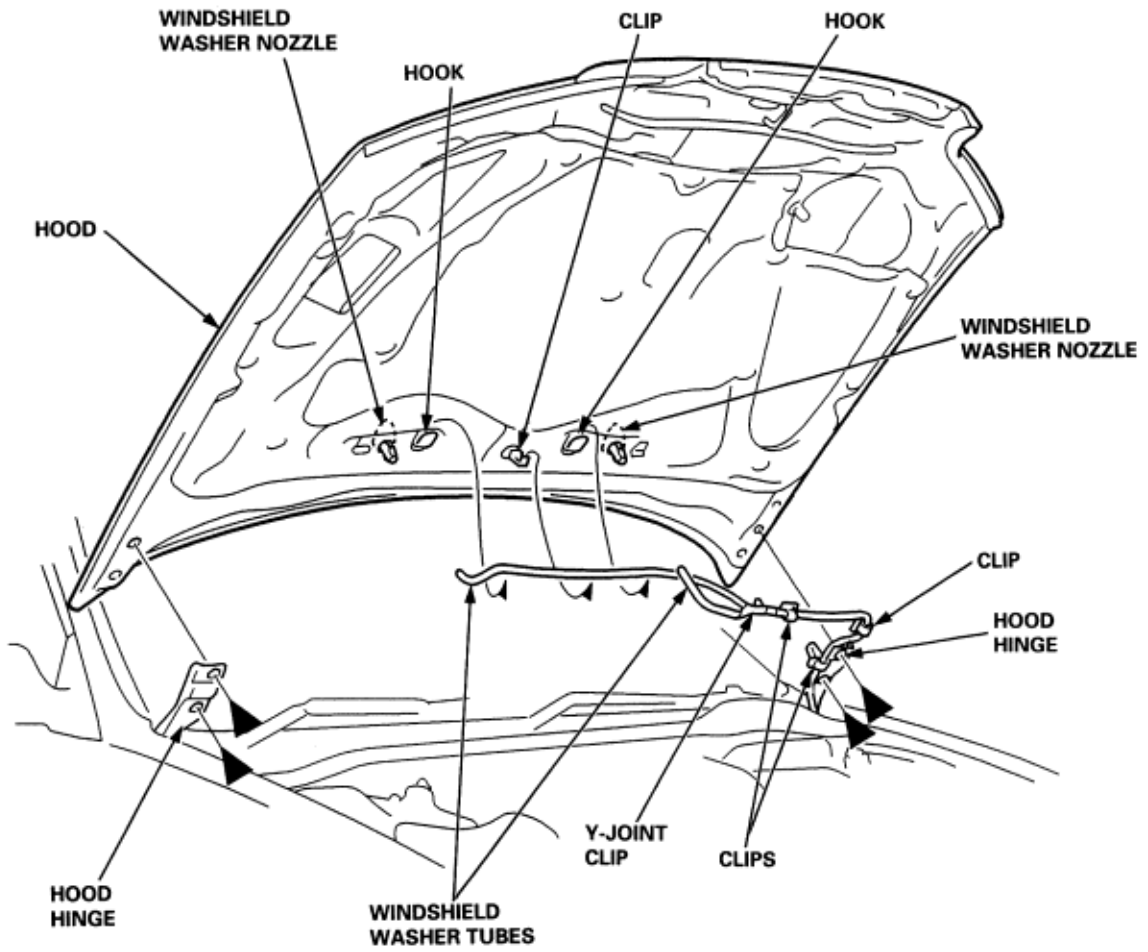
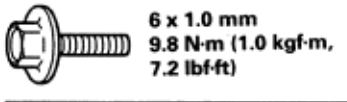


Install in the reverse order or removal.

NOTE:

- ♦ An assistant is helpful when removing and installing the hood.
- ♦ Take care not to damage the hood and body.

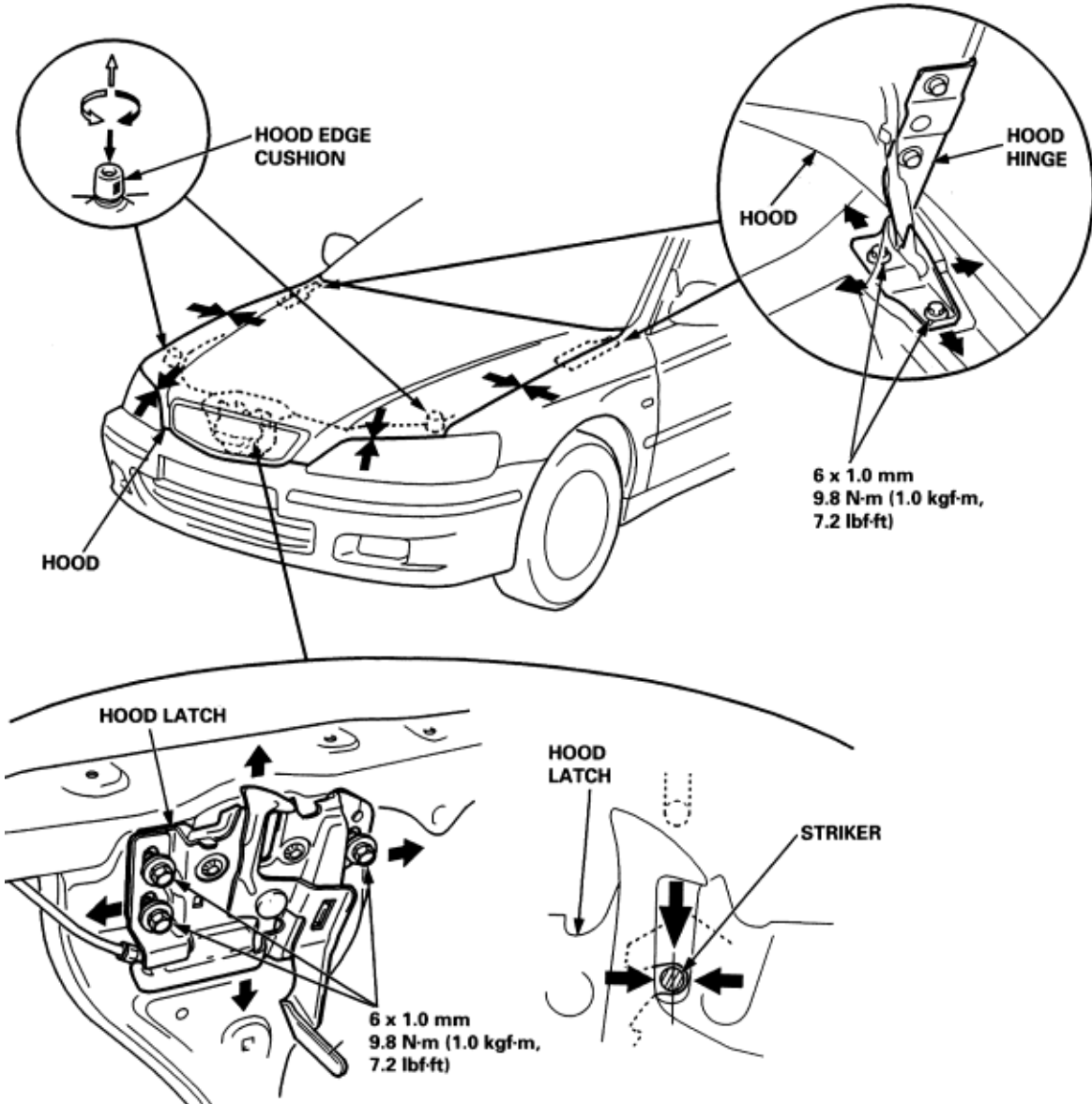
►: Bolt locations, 4



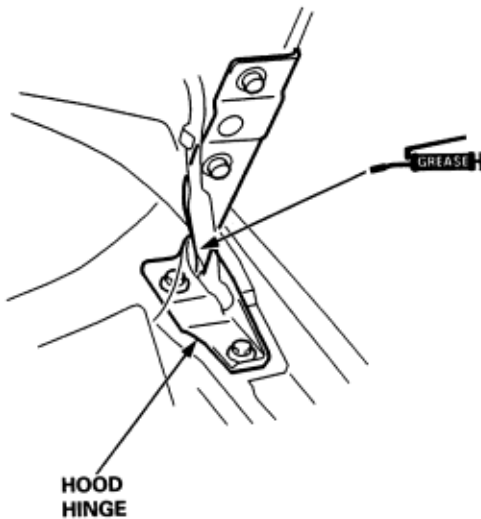
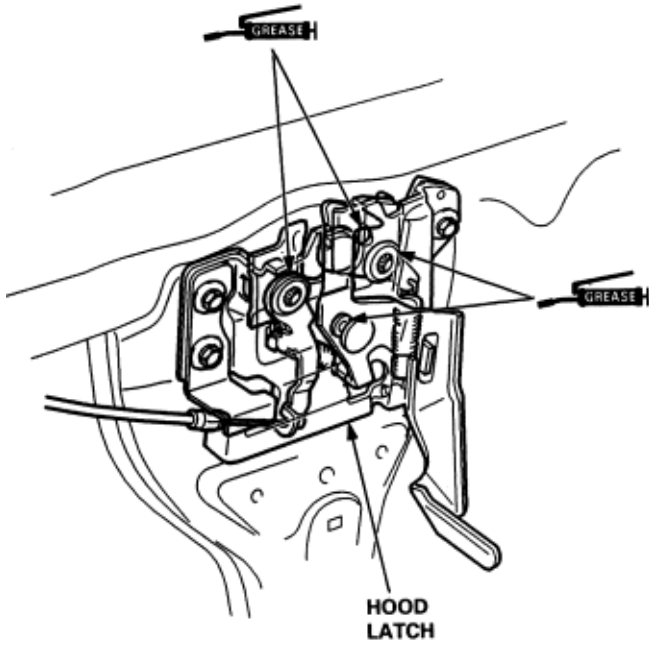
Install in the reverse order of removal, and note the following items:

- ♦ Make sure the hood opens properly and locks securely.
- ♦ Make sure the windshield washer tubes are connected properly.
- ♦ Adjust the hood alignment (**See Page 20-131**).

1. Slightly loosen each hood hinge bolt.
2. Adjust the hood alignment in this sequence:
 - Adjust the hood right and left, as well as fore and aft, by using the elongated holes on the hood hinge.
 - Turn the hood edge cushions, as necessary, to make the hood fit flush with the body at front and side edges.
 - Remove the hood latch cover (See Page 20-154). Then adjust the hood latch to obtain the proper height at the forward edge, and move the hood latch right or left until the striker is centered in the hood latch.



3. Tighten each bolt securely.
4. Check that the hood opens properly and locks securely.
5. Grease each location of the hood latch and hood hinge as indicated by the arrows.



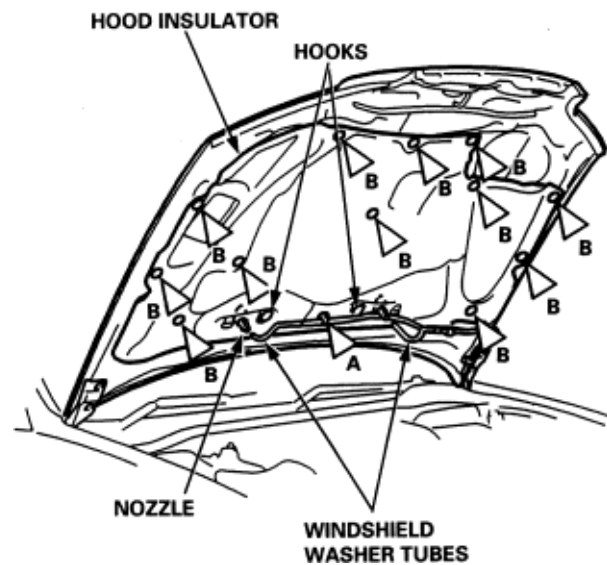
NOTE: Take care not to scratch the hood.

1. Remove the hood insulator.
 - 1. Disconnect the windshield washer tubes from the windshield washer nozzles.
 - 2. Release the windshield washer tube from the clips.
 - 3. Using a clip remover, detach the clips, release the hooks and remove the hood insulator.

▷: Clip locations

A ▷, 1

B ▷, 12



2. Install in the reverse order of removal, and note the following items:
 - ♦ Replace any damaged clips.
 - ♦ Make sure the washer tubes are connected properly.

Hood

Hood Seal Rubber and Hood Molding Replacement

20-133

Front Grille Replacement

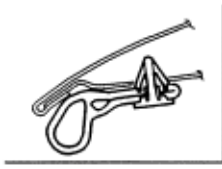
1. Using a clip remover, detach the clips, then remove the hood seal rubbers. Take care not to scratch the hood.

▷: Clip locations

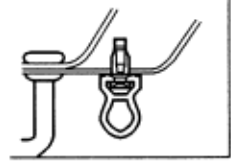
A ▷, 8



B ▷, 2

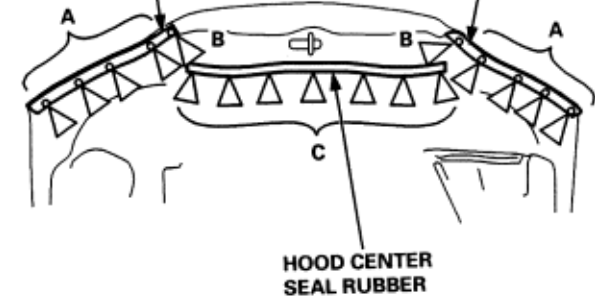


C ▷, 7



RIGHT HOOD CORNER
SEAL RUBBER

LEFT HOOD CORNER
SEAL RUBBER



HOOD CENTER
SEAL RUBBER

2. Install in the reverse order of removal, and replace any damaged clips.

NOTE: Take care not to scratch the hood.

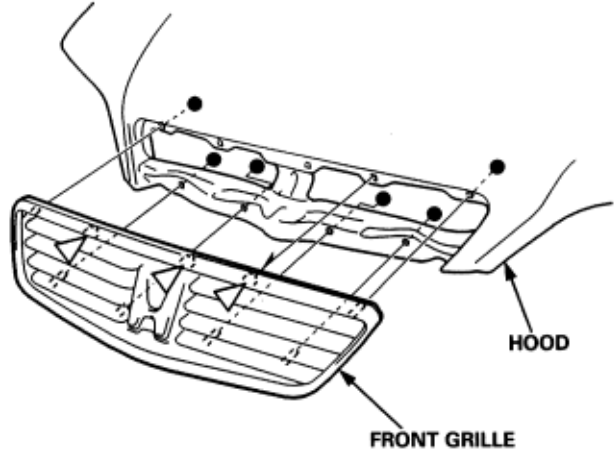
1. Remove the nuts securing the front grille.

●: Nut locations, 6

▷: Clip locations, 3



4 x 0.7 mm
4 N·m (0.4 kgf·m,
3 lbf·ft)



FRONT GRILLE

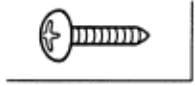
HOOD

2. Detach the clips, then remove the front grille.
3. Install in the reverse order of removal, and replace any damaged clips.

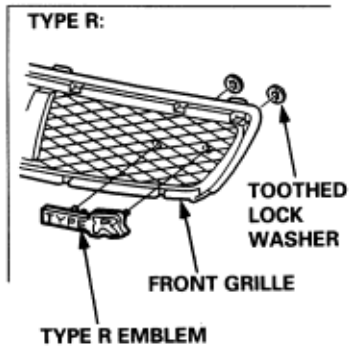
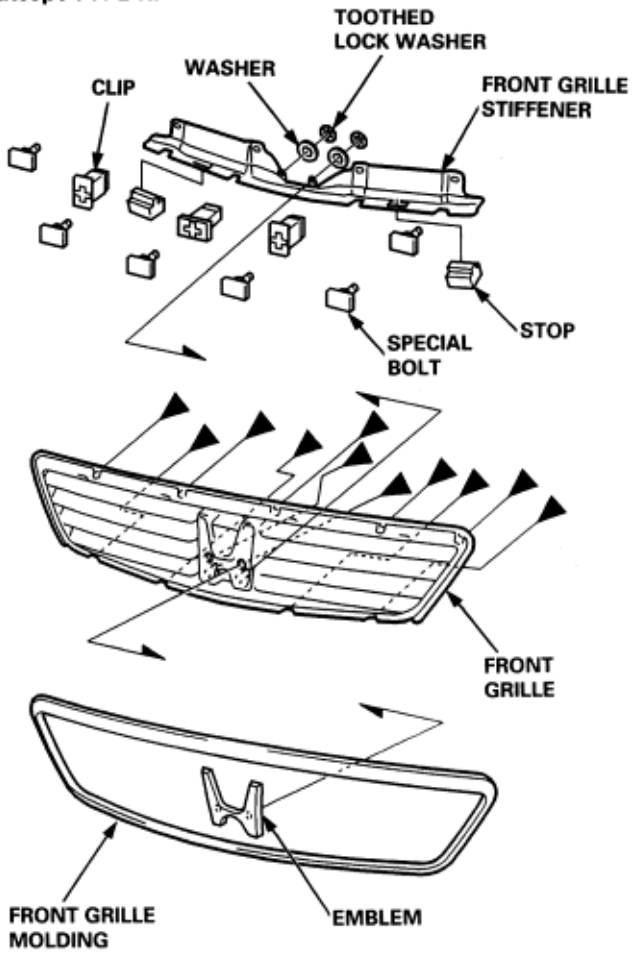
Front Grille Disassembly and Reassembly

NOTE: Take care not to scratch the front grille and front grille molding.

►: Screw locations, 11



Except TYPE R:



Reassemble in the reverse order of disassembly.

NOTE:

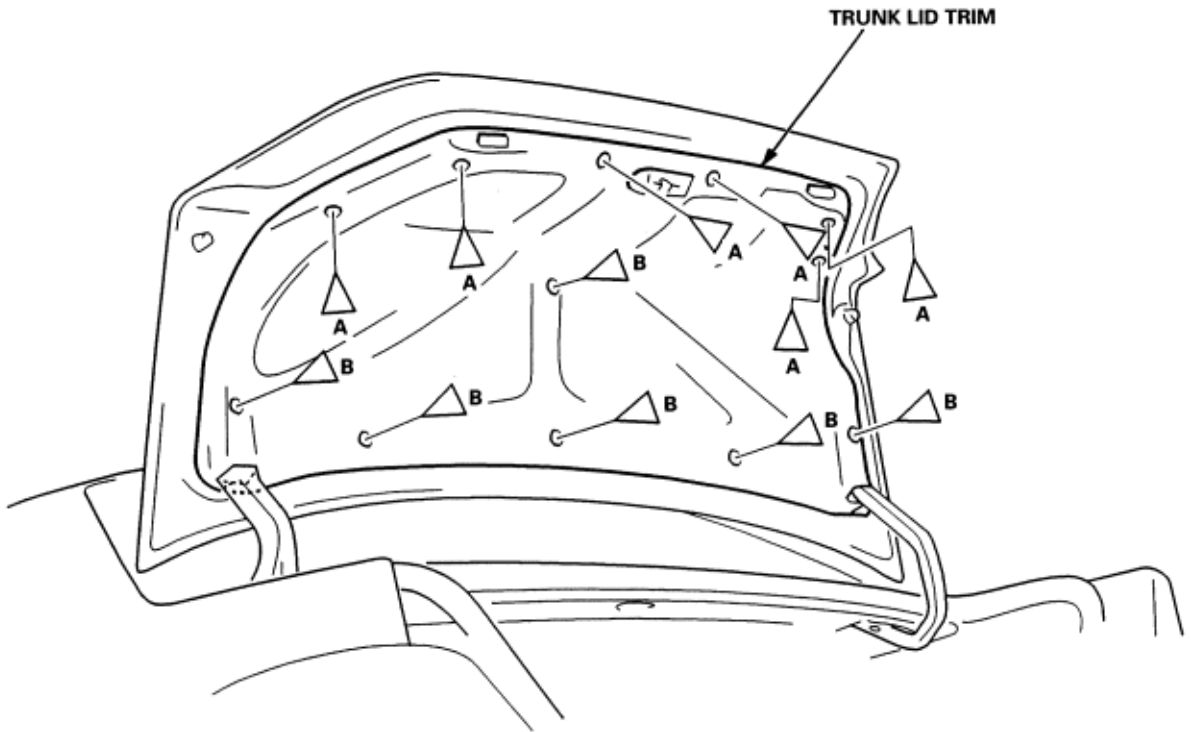
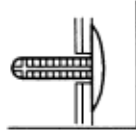
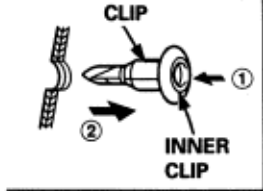
- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
 - ♦ Take care not to bend or scratch the trim.
 - ♦ Wear gloves to protect your hands.
1. If equipped, remove the trunk lid trim.

▷: **Clip locations**

A ▷, 6

B ▷, 6

NOTE: Do not push the inner clip in too far.



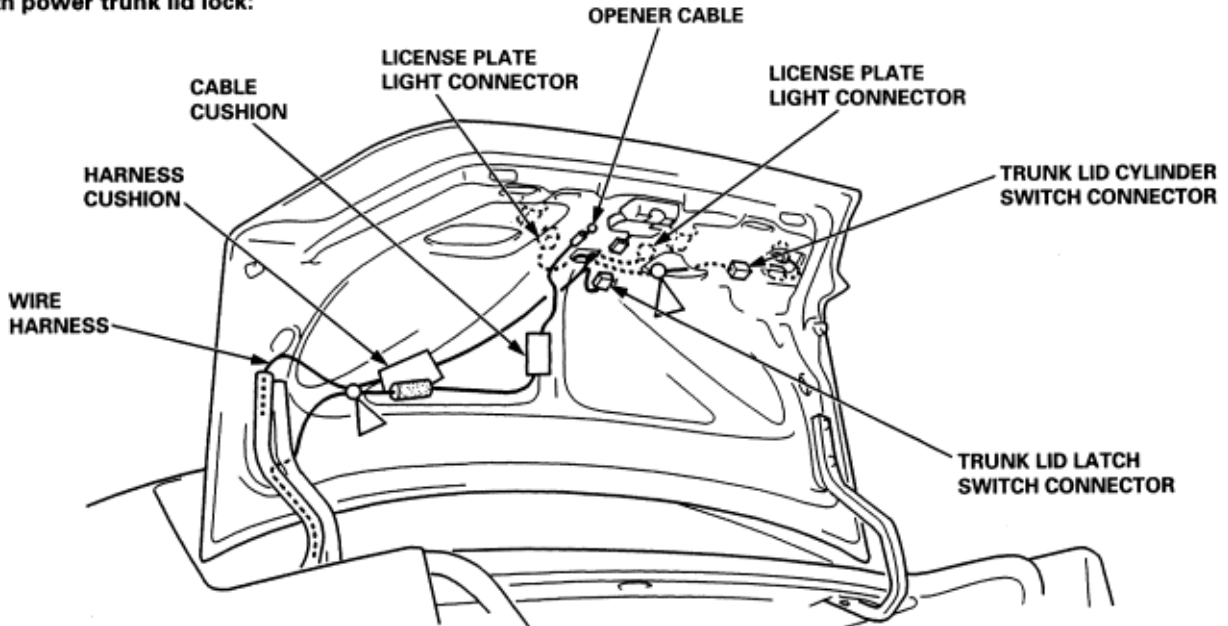
2. Disconnect the license plate light connectors, trunk lid latch switch connector, trunk lid cylinder switch connector and the trunk lid opener cable. Detach the harness clips, connector clips and if applicable remove the harness and cable cushions, then remove the wire harness and trunk lid opener cable from the trunk lid.

NOTE:

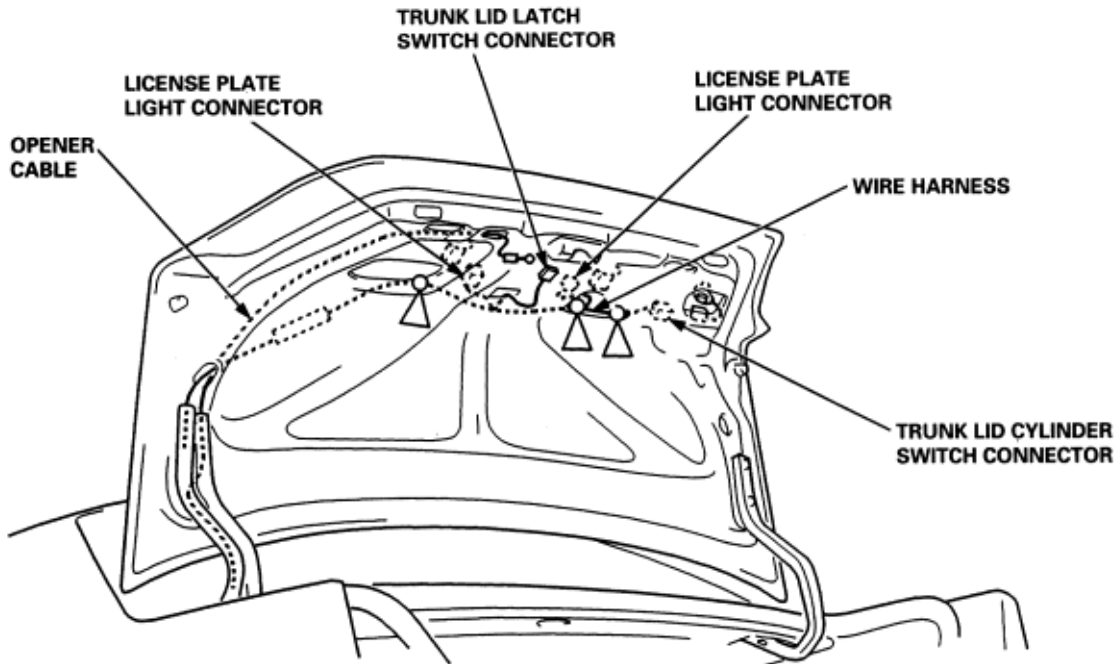
- ♦ Trunk lid opener cable locations (**See Page 20-153**).
- ♦ LHD type is shown, RHD type is similar.

▷: **Harness and connector clip locations**

With power trunk lid lock:

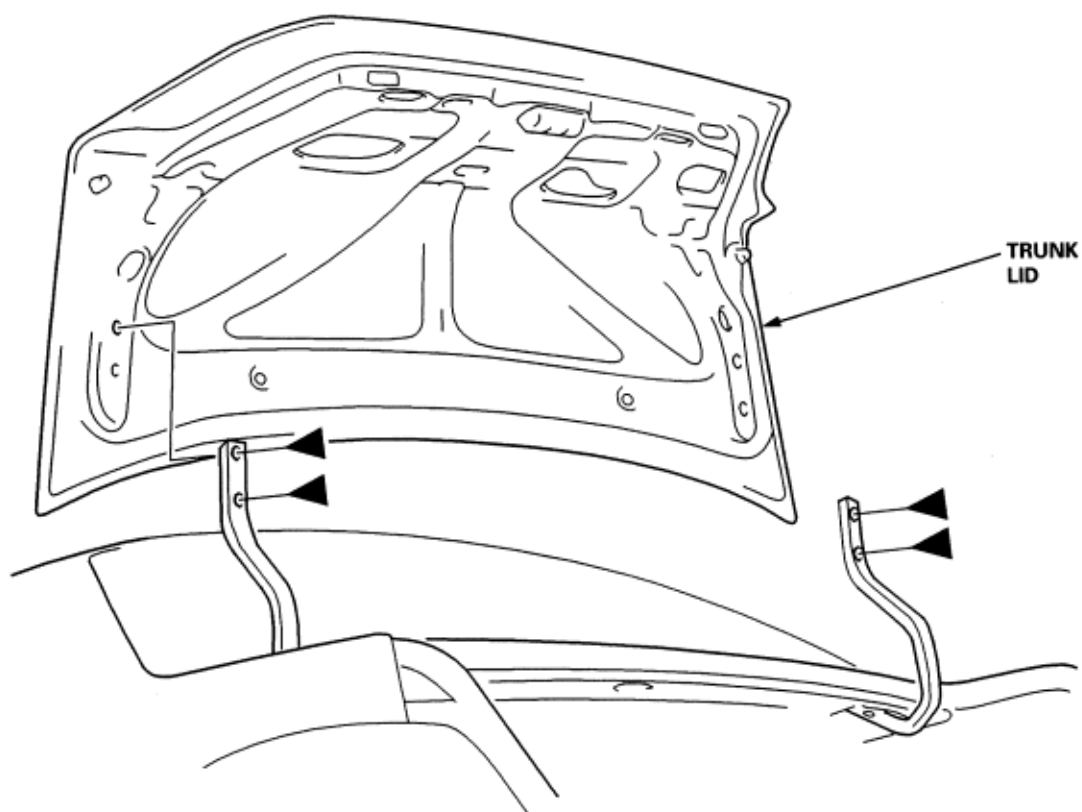
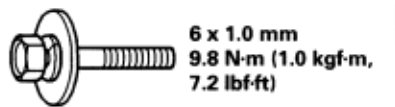


Without power trunk lid lock:



3. Remove the bolts, then remove the trunk lid.

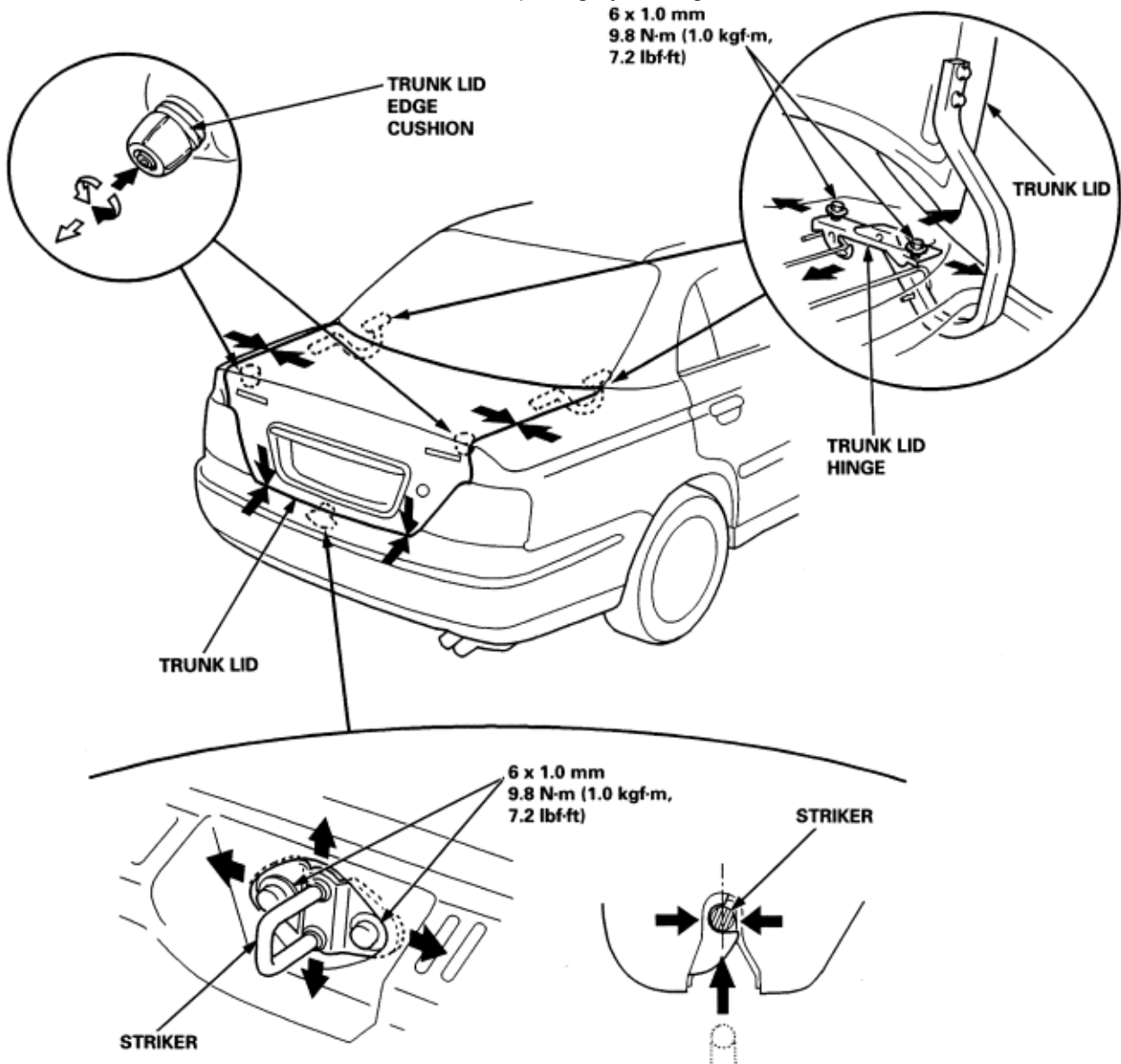
▶: Bolt locations, 4



4. Install in the reverse order of removal, and note the following items:

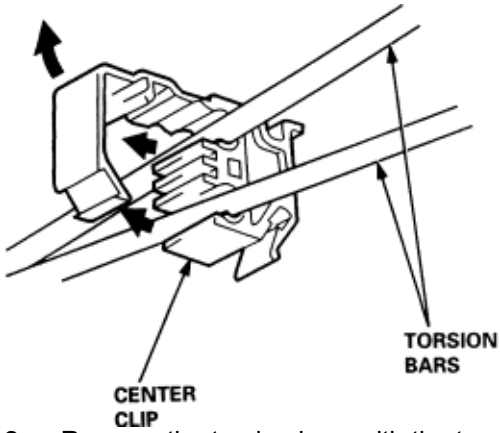
- ♦ Make sure the connectors and opener cable are connected properly, and the wire harness and opener cable are routed properly.
- ♦ Make sure the trunk lid opens properly and locks securely.
- ♦ Adjust the trunk lid alignment (**See Page 20-138**).

1. Slightly loosen each bolt.
2. Adjust the trunk lid alignment in the following sequence:
 - ♦ Remove the rear shelf (**See Page 20-67**), and adjust the trunk lid hinges right and left, as well as fore and aft, by using the elongated holes. Take care not to hit the rear window when loosening the bolts.
 - ♦ Turn the trunk lid edge cushions, as necessary, to make the trunk lid fit flush with the body at the rear and side edges.
 - ♦ Adjust the fit between the trunk lid and the trunk lid opening by moving the striker.

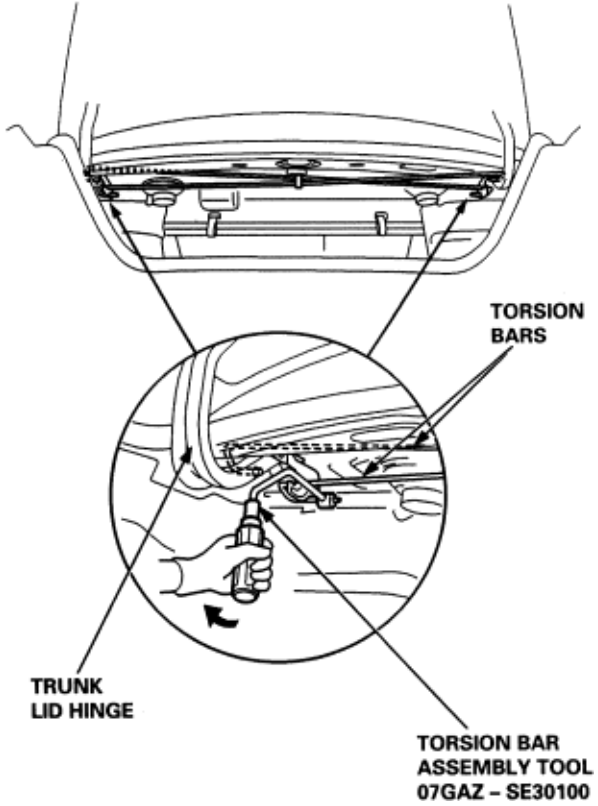


3. Tighten each bolt securely.
4. Make sure the trunk opens properly and locks securely.

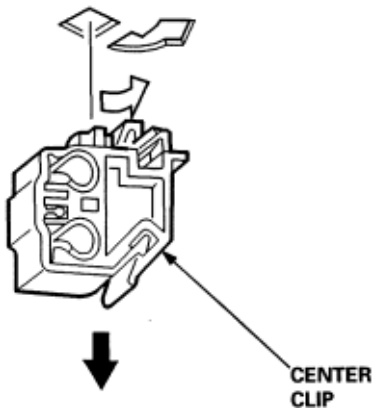
1. Remove the torsion bars from the torsion bar center clip.



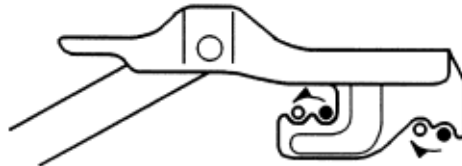
2. Remove the torsion bars with the torsion bar tool from both trunk lid hinges. Wear gloves to protect your hands.



3. Remove the torsion bar center clip from the body.



4. Install in the reverse order of removal, and note the following items:
- ♦ Adjust the torsion bars fore and aft with the torsion bar assembly tool.
 - ♦ Make sure the trunk lid opens properly and locks securely.



- = Normal position
- = Higher tension

Trunk Lid

Trunk Lid Spoiler Replacement

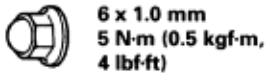
20-140

License Plate Trim Replacement

Type R:

NOTE: Take care not to scratch the trunk spoiler and body.

●: Nut locations, 4

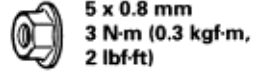


Install in the reverse order of removal.

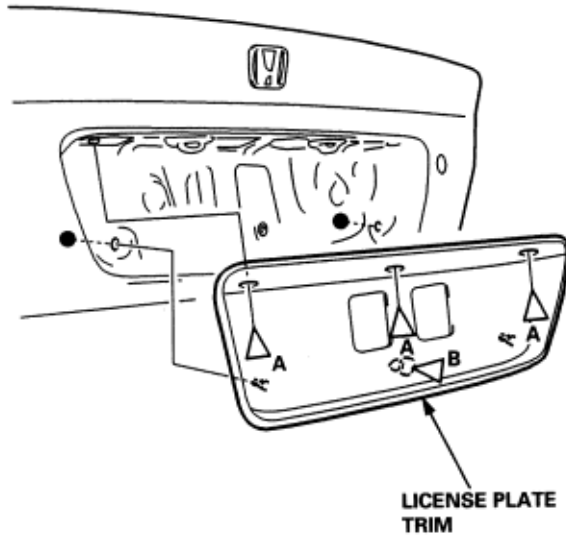
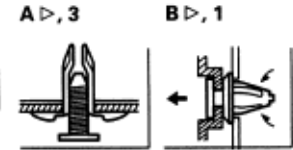
NOTE:

- ♦ Take care not to scratch the trunk lid.
 - ♦ Wear gloves to protect your hands.
1. If equipped, remove the trunk lid trim ([See Page 20-135](#)).
 2. Remove the nuts securing the license plate trim. Remove and detach the clips, then remove the license plate trim.

●: Nut locations, 2



▷: Clip locations



3. Install in the reverse order of removal and replace any damaged clips.

Trunk Lid

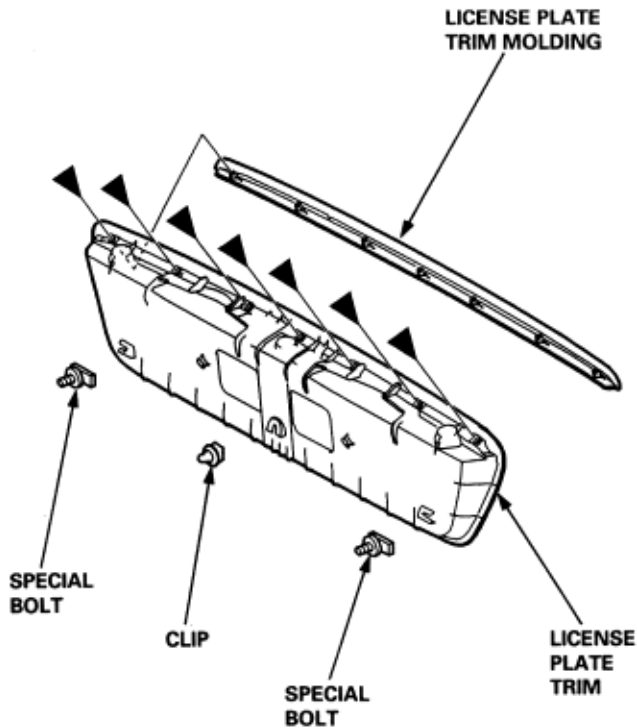
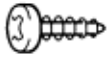
License Plate Trim Disassembly and Reassembly

20-141

Trunk Lid Weatherstrip Replacement

Take care not to bend the license plate trim and license plate trim molding.

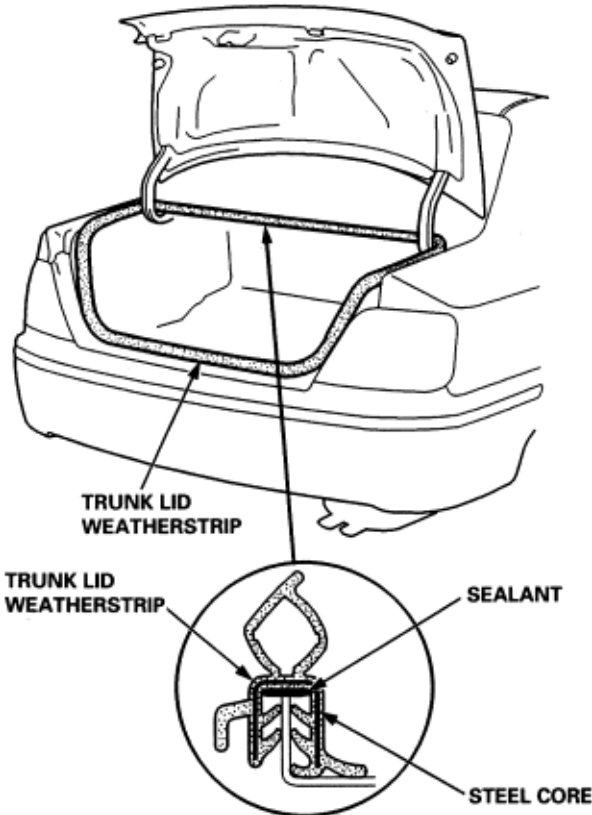
►: Screw locations, 7



Reassemble in the reverse order of disassembly.

1. Remove the trunk lid weatherstrip by pulling it out.
2. Apply clear sealant into the channel of the trunk lid weatherstrip all the way around.
3. Locate the painted alignment mark on the trunk lid weatherstrip. Align the painted mark with the alignment tab in the center of the trunk, and install the trunk lid weatherstrip all the way around in the direction shown. Make sure there are no wrinkles in the weatherstrip.

Sealant: Cemedine P/N 08712-0004, or equivalent



4. Check for water leaks.

**Trunk Lid
Emblem Replacement**

20-142

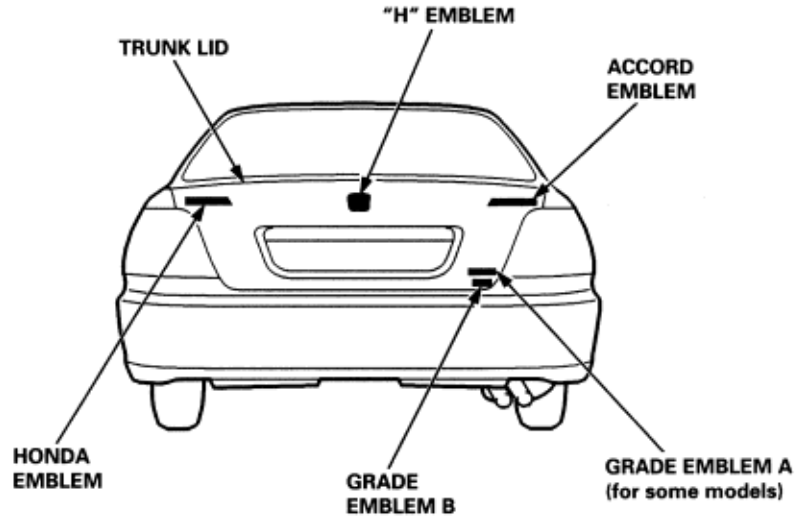
Apply the emblem where shown.

NOTE:

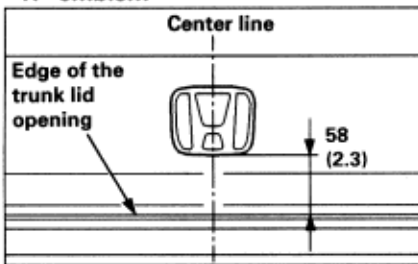
- Before applying, clean the trunk lid surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface

Attachment Point (Reference)

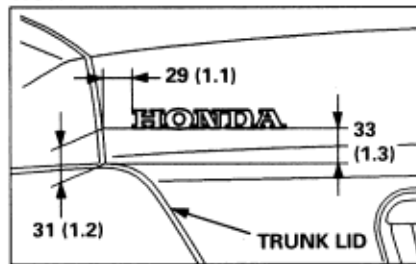
(Unit: mm (in))



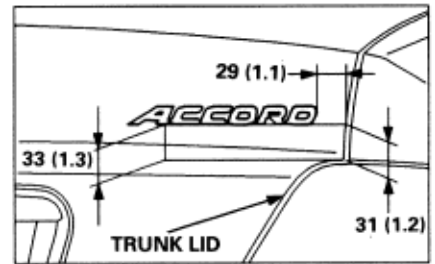
"H" emblem



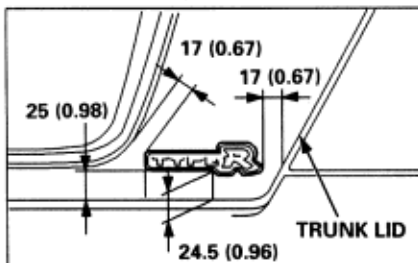
HONDA emblem



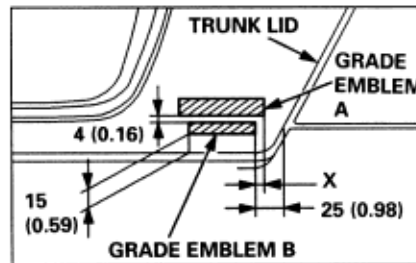
ACCORD emblem



Grade emblem (TYPE R)



Grade emblem A and B



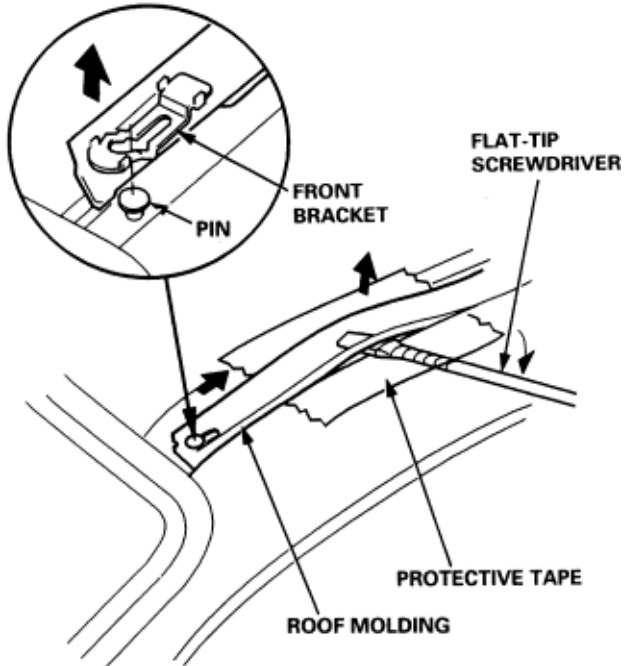
Grade emblem A	X
2.0 i	8 (0.3)
1.6 i, 1.8 i	2 (0.08)

Moldings

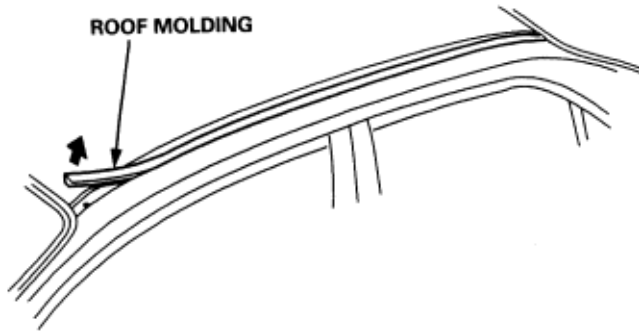
Roof Moldings Replacement

20-143

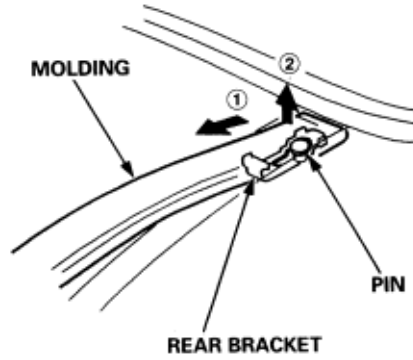
1. Using a flat-tip screwdriver wrapped with protective tape, pry up the roof molding. Use protective tape on the body. Take care not to scratch the body.



2. Pull up and slide the roof molding to release the front bracket from the pin.
3. Pull up the front portion of roof molding.



4. Pull up and release the rear bracket from the pin, then remove the roof molding.



5. Install in the reverse order of removal, and note the following items:
 - ♦ Take care not to damage the windshield and rear window moldings.
 - ♦ Make sure the roof molding is installed securely.



Moldings

Door and Side Moldings Replacement

20-144

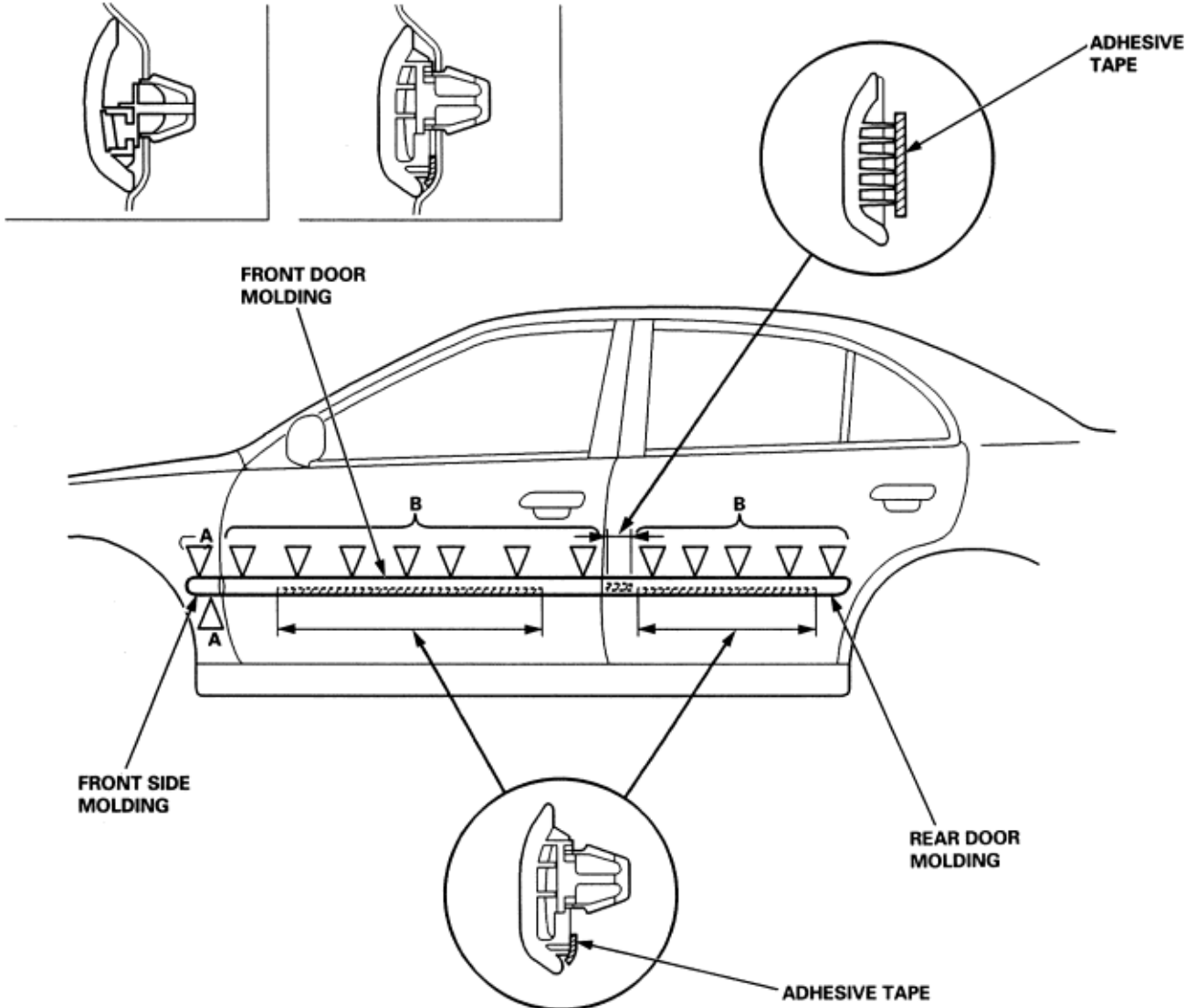
NOTE:

- ♦ Before prying, wrap the blade of your putty knife or flat-tip screwdriver with protective tape to prevent damage to the front fender and the door.
 - ♦ Be careful not to pry too far or you may bend the molding.
 - ♦ Wear gloves to protect your hands.
1. Prepare to release the molding clips from inside the vehicle.
 - ♦ To remove the front door molding, remove the front door panel and plastic cover (**See Page 20-7**).
 - ♦ To remove the rear door molding, remove the rear door panel and plastic cover (**See Page 20-16**).
 2. Release the clips, and gently pry the front door molding or rear door molding away from the door while removing the adhesive tape.

▷: Clip locations, 12

A ▷, 2

B ▷, 12



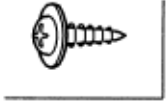
3. Install in the reverse order of removal, replace any damaged clips and adhesive tape.

Side Sill Panel Replacement

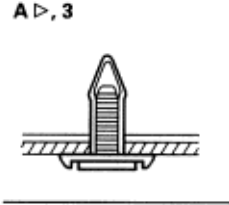
20-145

1. Remove the side sill panel.
 - 1. Pull the inner fender back as necessary, and remove the expansion clips.
 - 2. Slide the side sill panel forward and remove it. Side clips will stay in the body.
 - 3. Remove the side clips from the body.

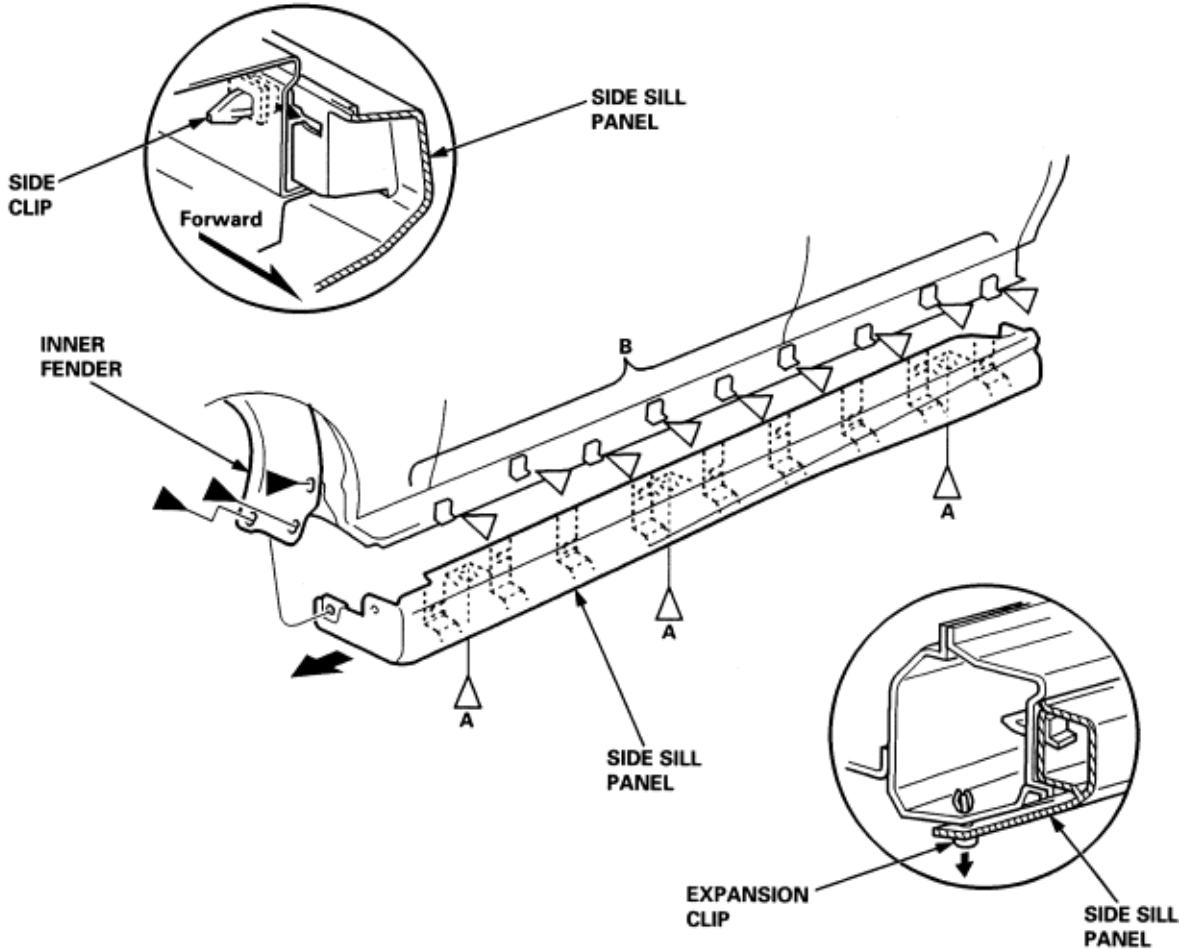
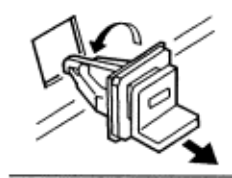
►: Screw locations, 3



▷: Clip locations



B ▷, 9

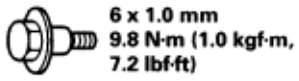


2. Replace any damaged clips.
3. Install the side clips on the side sill panel.
4. Hold the panel up, and fit all the side clips into the holes in the body, then push on the panel until the clips snap into place.
5. Install all the expansion clips.
6. Install the inner fender.

Take care not to scratch the body.

►: Bolt, screw locations

A ►, 2



B ►, 3



▷: Clip locations

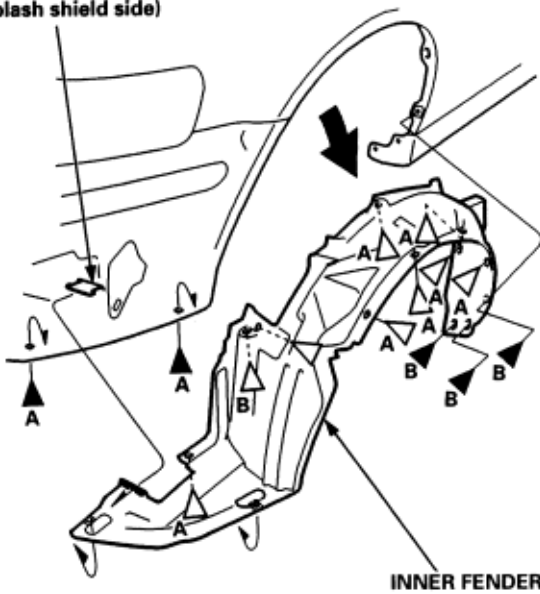
A ▷, 7



B ▷, 1



HOOK
(Splash shield side)

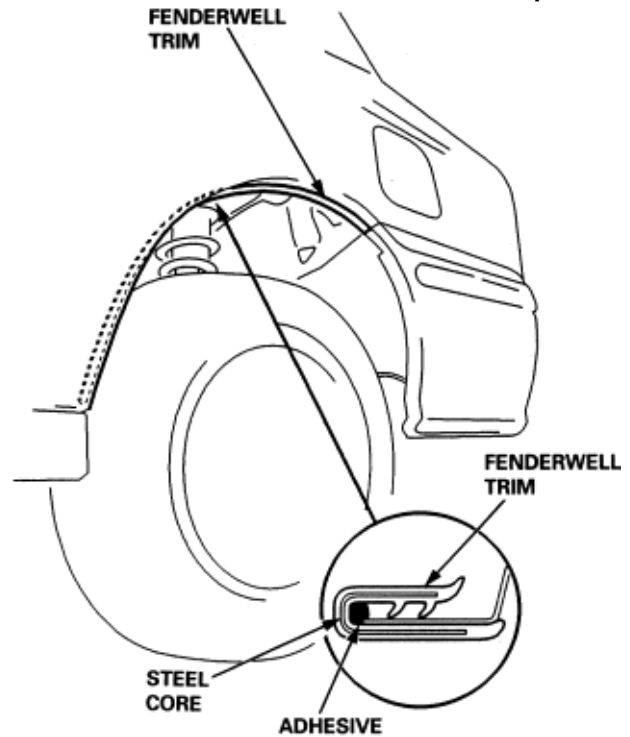


Install in the reverse order of removal, and replace any damaged clips.

NOTE: The steel core in the fenderwell trim cannot be restored to its original shape once it is bent. Replace the fenderwell trim when the steel core is bent.

1. Remove the fenderwell trim by pulling it out.
2. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.
3. Apply clear sealant into the channel of the fenderwell trim from end to end.
4. Install the fenderwell trim

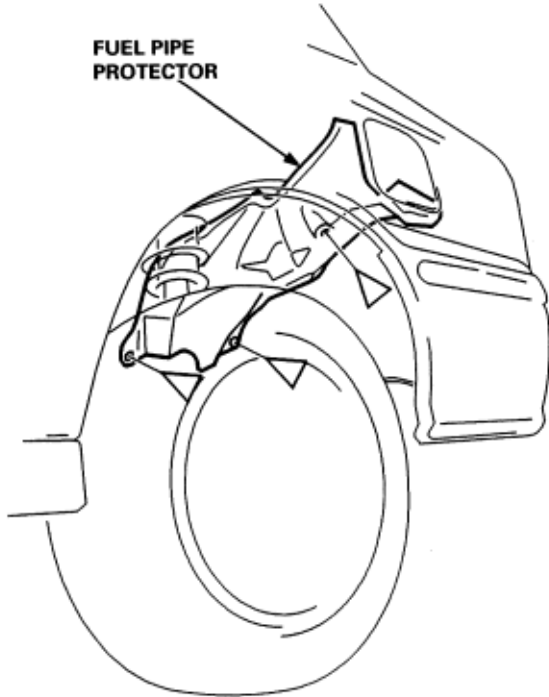
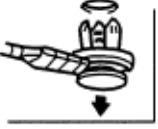
Sealant: **Cemedine P/N 08712-0004** or equivalent.



5. Scrape or wipe the excess sealant off with a towel. To remove sealant from a painted surface, wipe with a soft shop towel dampened in alcohol.

Take care not to scratch the body.

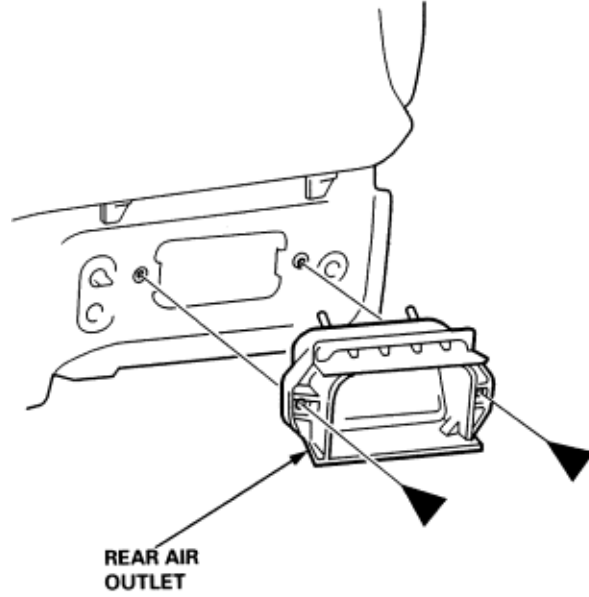
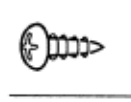
▷: **Clip locations, 3**



Install in the reverse order of removal, and replace any damaged clips.

1. Remove the rear bumper (**See Page 20-127**).
2. Remove the screws, then remove the rear air outlet. Take care not to scratch the body.

▶: **Screw locations, 2**



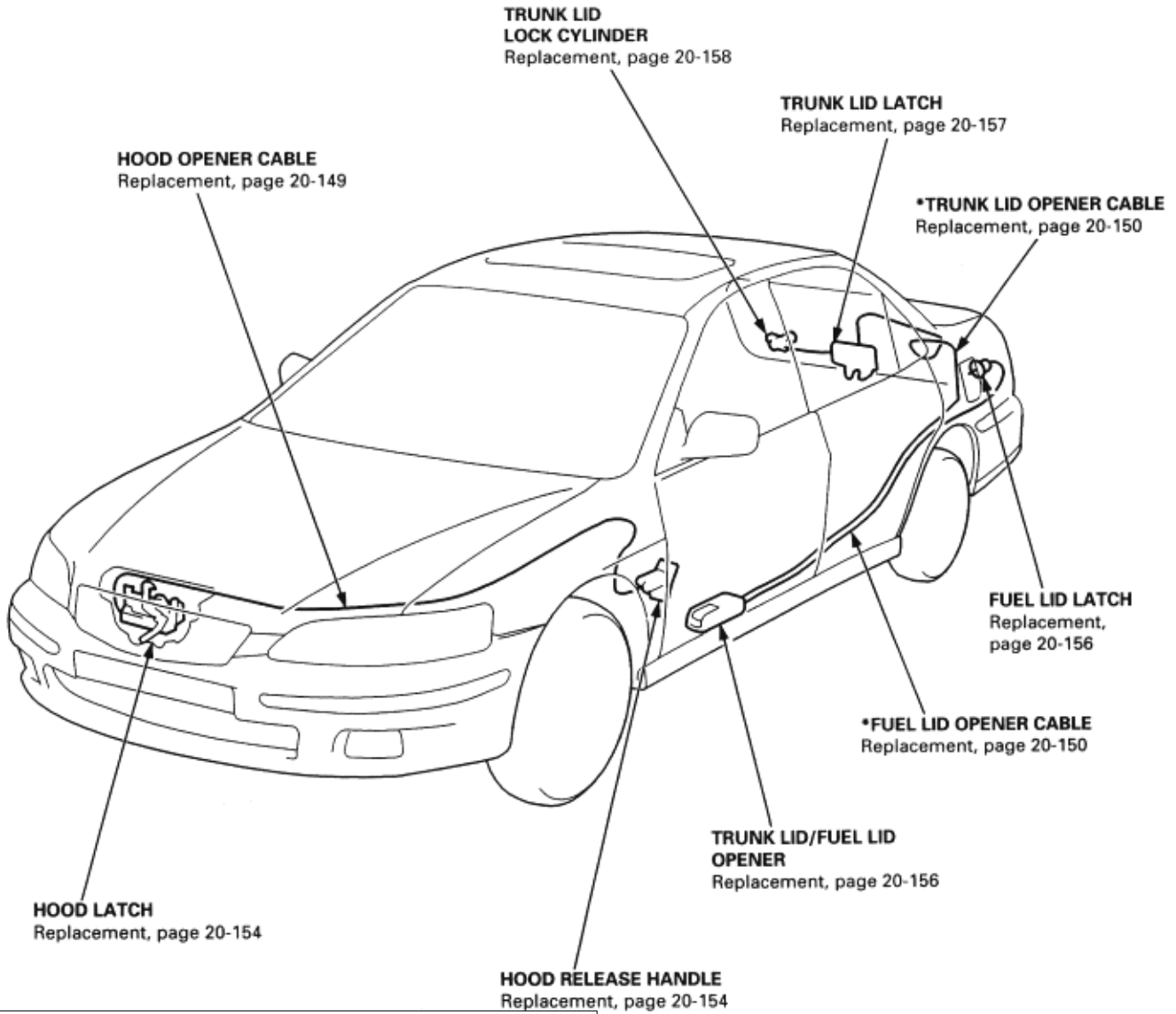
3. Install in the reverse order of removal.

Openers

Component Location Index

20-148

SRS components are located in the areas marked with an asterisk (*). Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.



To go to the pages referenced on the diagram above,
click on the following:

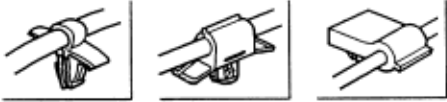
- (See Page 20-158)
- (See Page 20-149)
- (See Page 20-154)
- (See Page 20-157)
- (See Page 20-150)
- (See Page 20-156)

Hood Opener Cable Replacement

1. Remove the following parts from the left or right side of the vehicle.
 - ♦ Inner fender (**See Page 20-146**).
 - ♦ Kick panel (**See Page 20-66**).
2. Disconnect the hood opener cable from the hood latch and hood release handle (**See Page 20-154**).

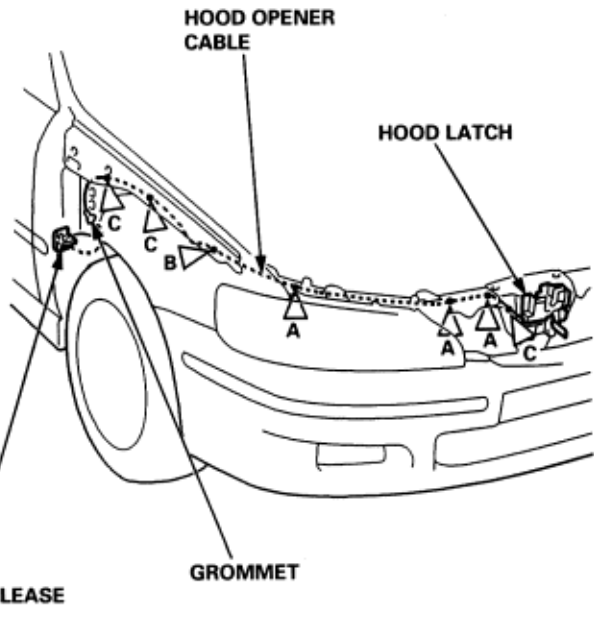
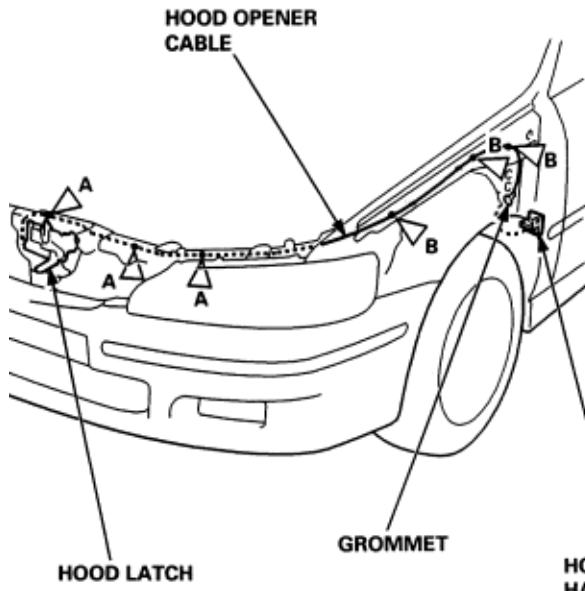
▷: **Clip locations**

- | | | |
|------------|------------|------------|
| A ▷ | B ▷ | C ▷ |
| LHD, 3 | LHD, 3 | RHD, 3 |
| RHD, 3 | RHD, 1 | |



LHD:

RHD:



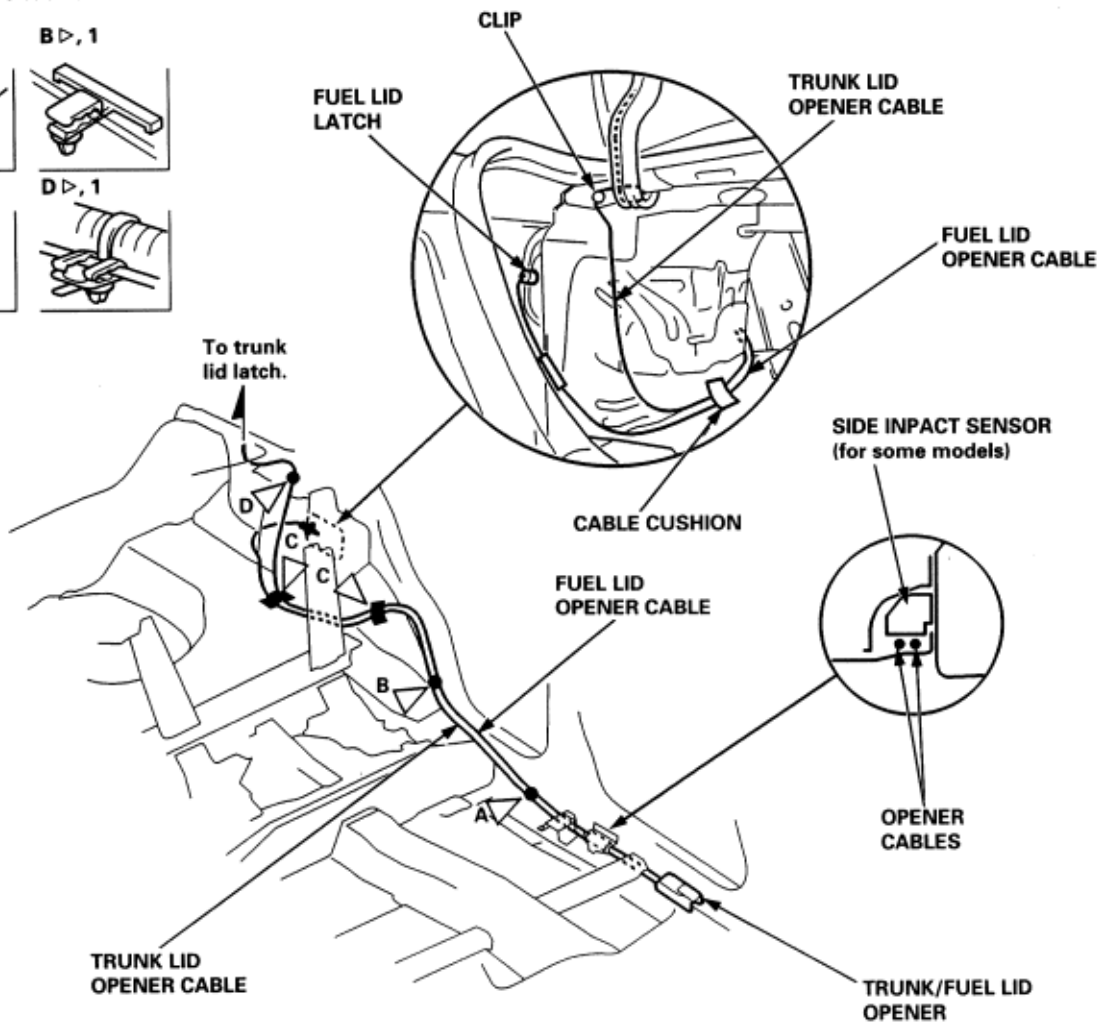
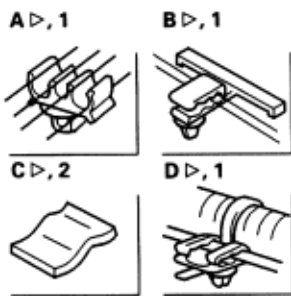
3. Using a clip remover, detach the clips from the body, then remove the hood opener cable from the vehicle. Take care not to bend the opener cable.
4. Install in the reverse order of removal, replace any damaged clips.

SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

1. Remove the following parts:
 - ♦ Rear seat-back, with fixed rear seat (See Page 20-117).
 - ♦ Rear seat side bolster, for fold down rear seat (See Page 20-116).
 - ♦ Front side trim (See Page 20-66).
 - ♦ Rear side trim (See Page 20-66).
 - ♦ Center pillar lower trim panel (See Page 20-66).
 - ♦ Front seat belt lower anchor bolt (see section 24).
 - ♦ Trunk side trim (See Page 20-68) and (See Page 20-69).
 - ♦ Trunk lid trim, with power trunk lid lock (See Page 20-135).
2. Pull the carpet back as necessary (See Page 20-72).
3. Disconnect the trunk lid opener/fuel lid opener cable from the trunk lid/fuel lid opener (See Page 20-157).

LHD:

▷: Clip, cable cushion locations



Openers

Trunk Lid/Fuel Lid Opener Cable Replacement (cont'd)

20-151

RHD with power trunk lid lock:

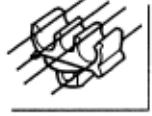
▷: Clip, cable cushion locations

A ▷, 1

B ▷, 6

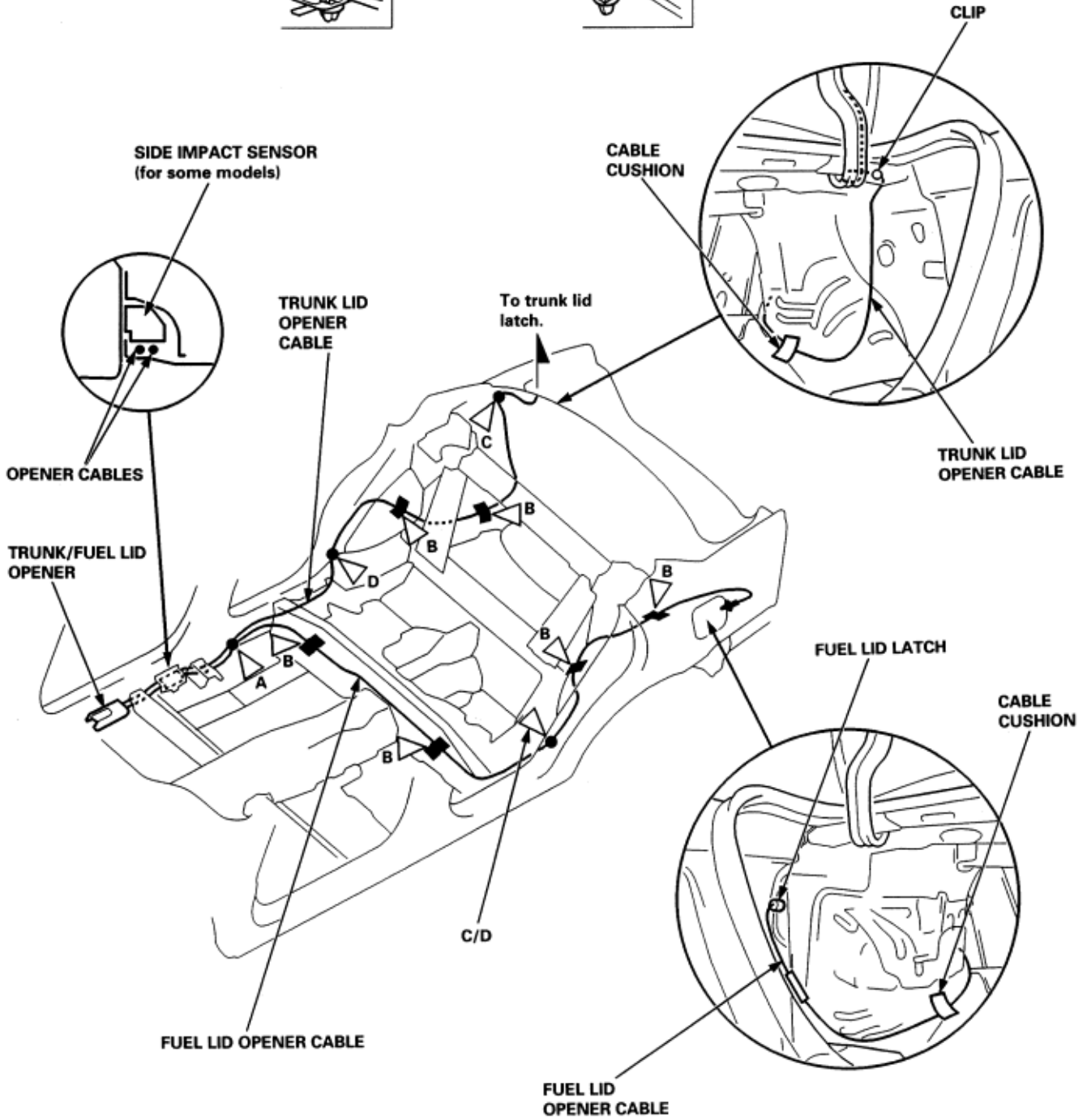
C ▷

D ▷



With navigation system, 2
Without navigation system, 1

With navigation system, 1
Without navigation system, 2



Openers

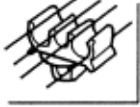
Trunk Lid/Fuel Lid Opener Cable Replacement (cont'd)

20-152

RHD without power trunk lid lock:

▷: Clip, cable cushion locations

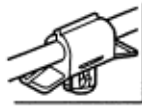
A ▷, 1



B ▷, 4

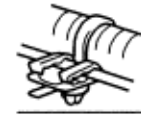


C ▷, 1



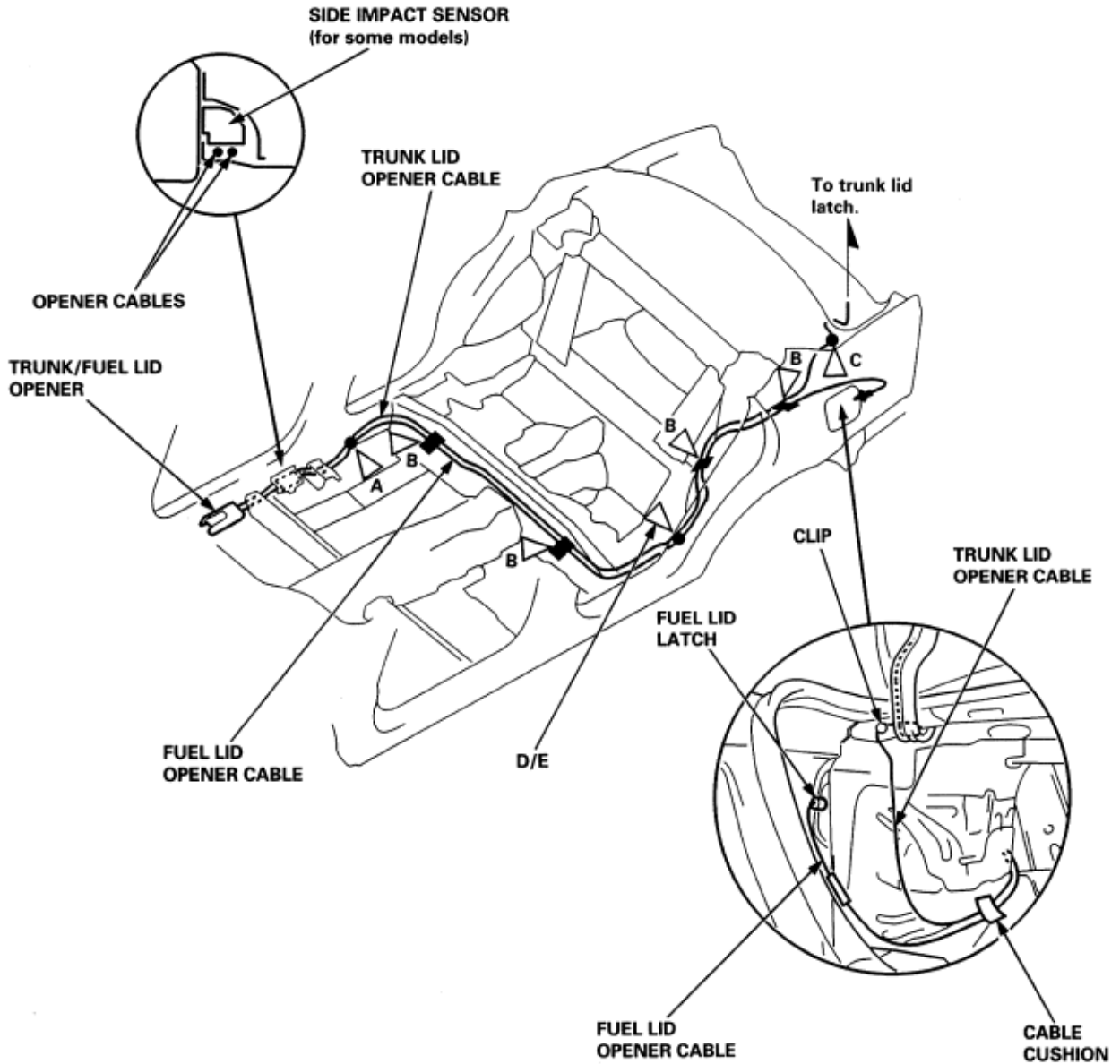
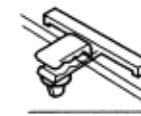
D ▷

With navigation system, 1



E ▷

Without navigation system, 1



4. Release the opener cable from the clips, and remove the cable cushion, then remove the fuel lid latch from the body.

Openers

Trunk Lid/Fuel Lid Opener Cable Replacement (cont'd)

20-153

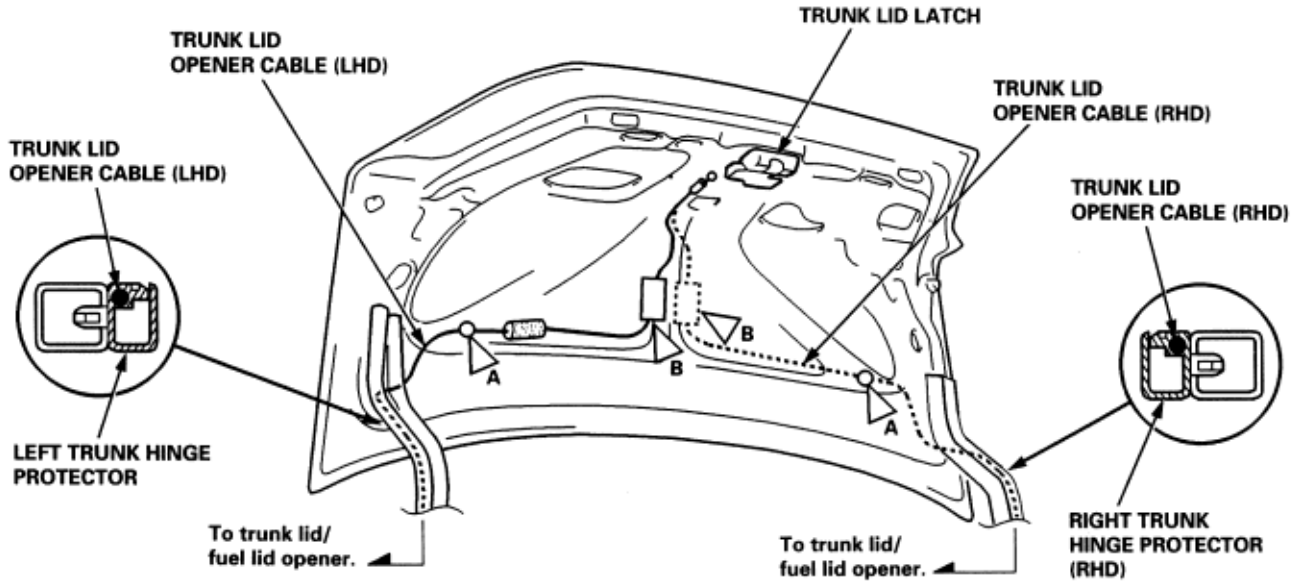
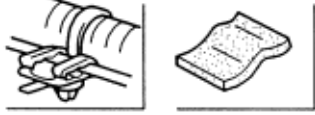
5. Disconnect the trunk lid opener cable from the trunk lid latch (See Page 20-157).

With power trunk lid lock:

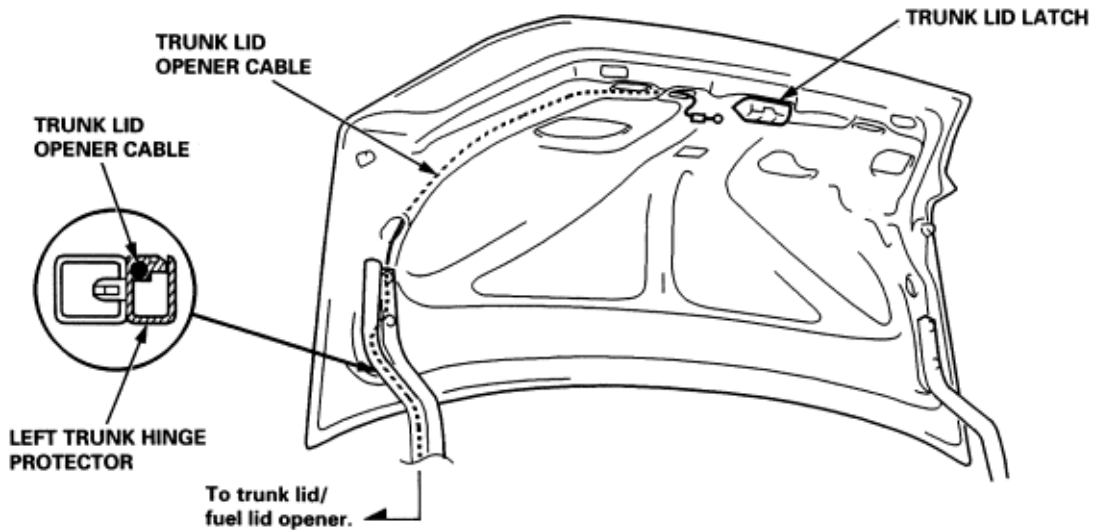
▷: Clip, cable cushion locations

A ▷, 1

B ▷, 1



Without power trunk lid lock:



6. Using a clip remover, detach the clips from the trunk lid, and pull the trunk lid opener cable out of the trunk lid hinge protector.
7. Remove the trunk lid opener/fuel lid opener cable from the vehicle. Take care not to bend the opener cable.
8. Install in the reverse order of removal, and replace any damaged clips.

Openers

Hood Release Handle Replacement

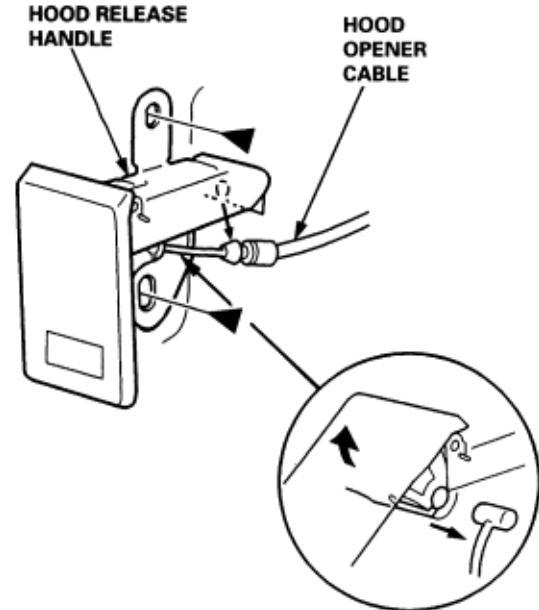
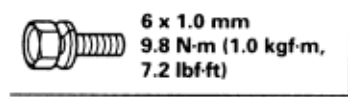
20-154

Hood Latch Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the left kick panel (See Page 20-66).
2. Disconnect the hood opener cable from the hood release handle. Take care not to bend the hood opener cable.

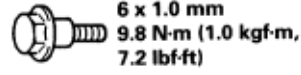
►: Bolt locations, 2



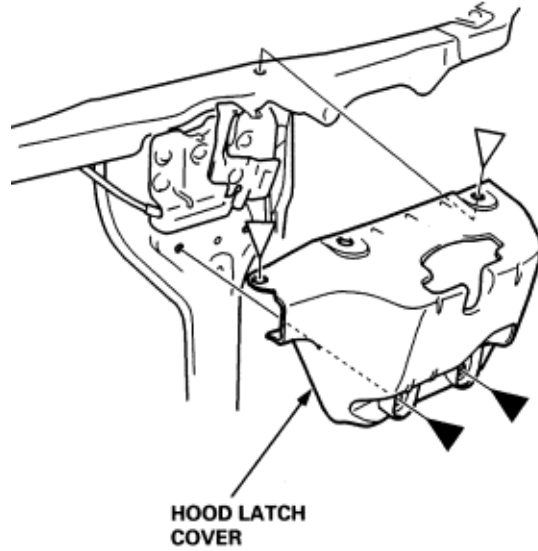
3. Remove the bolts, then remove the hood release handle.
4. Install in the reverse order of removal, and note the following items:
 - ♦ Make sure the hood opener cable is connected properly.
 - ♦ Make sure the hood opens properly.

1. Remove the bolts and clips, then remove the hood latch cover.

►: Bolt locations, 2



▷: Clip location, 2



2. Move the condenser to disconnect the hood latch switch connector (see section 22).

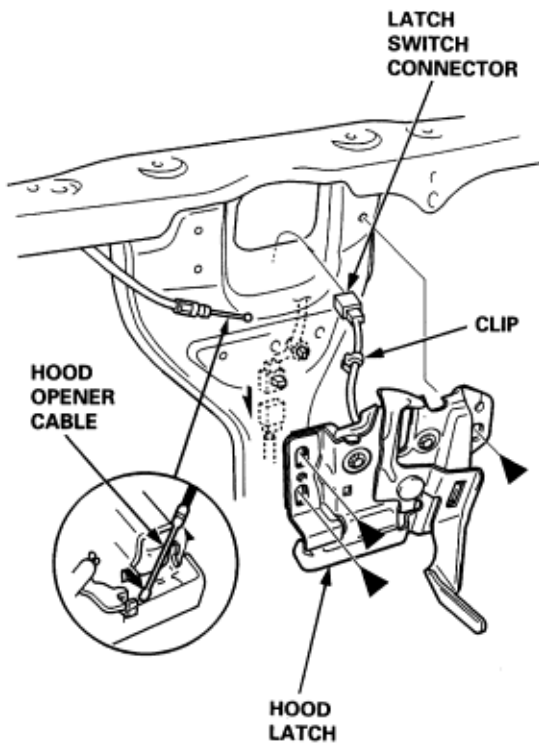
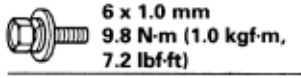
Openers

Hood Latch Replacement (cont'd)

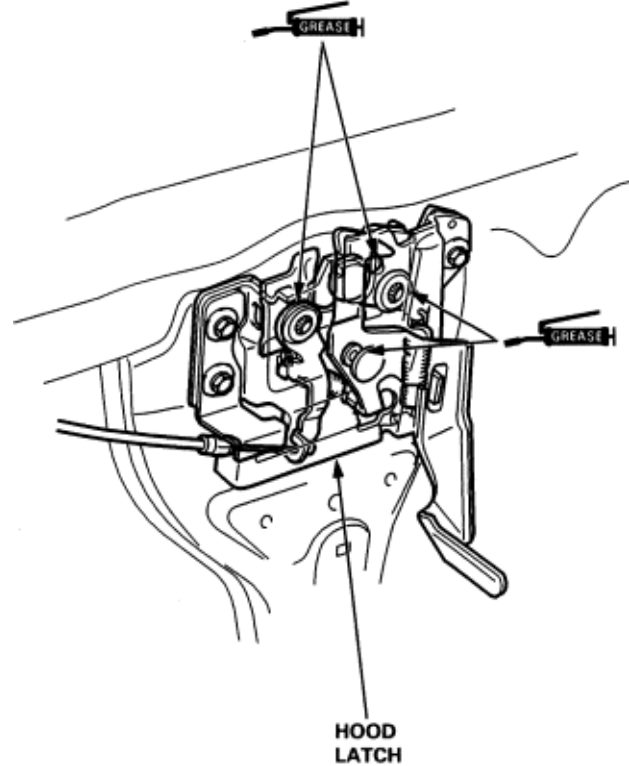
20-155

3. Remove the bolts, then remove the hood latch from the body.
4. Disconnect the hood opener cable and hood latch switch connector, then detach the hood latch switch connector and harness clip from the body. Take care not to bend the hood opener cable.

►: Bolt locations, 3



5. Install in the reverse order of removal, and note the following items:
 - ♦ Grease each location of the hood latch indicated by the arrows.
 - ♦ Make sure the hood opener cable is connected properly and hood latch switch connector is plugged in properly.
 - ♦ Adjust the hood latch alignment ([See Page 20-131](#)).
 - ♦ Make sure the hood locks securely.



Openers

Trunk Lid/Fuel Lid Opener Replacement

20-156

Fuel Lid Latch Replacement

NOTE:

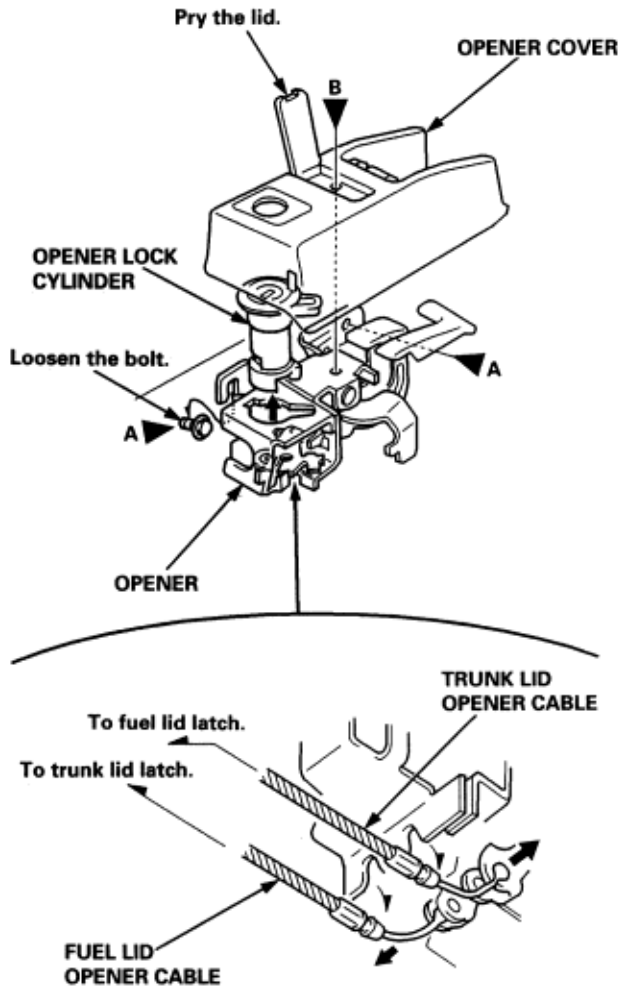
- ♦ Take care not to bend the opener cables.
- ♦ When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- ♦ LHD type is shown, RHD type is symmetrical.

►: Bolt, screw locations

A ►, 2

B ►, 1

6 x 1.0 mm
9.8 N·m (1.0 kgf·m,
7.2 lbf·ft)



Install in the reverse order of removal, and note these items:

- ♦ Make sure the opener cable is connected properly.
- ♦ Make sure the trunk lid and fuel lid open properly.

1. Remove the left trunk side spacer ([See Page 20-68](#)) and ([See Page 20-69](#)).
2. Pull the rear edge of the left trunk side trim back ([See Page 20-68](#)) and ([See Page 20-69](#)).
3. Turn the fuel latch 90 degrees and remove it.



Openers

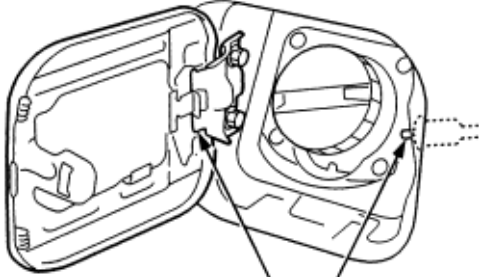
Fuel Lid Latch Replacement (cont'd)

20-157

Trunk Lid Latch Replacement

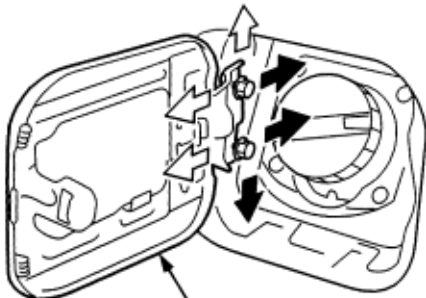
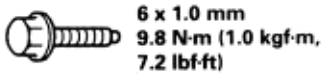
4. Install in the reverse order of removal, and note these items:

- ♦ Grease each location indicated by the arrows.
- ♦ Make sure the fuel lid opens properly and locks securely.



5. Check that the fuel lid fits flush against the body. If necessary, adjust it.

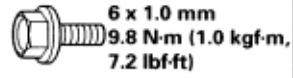
►: Bolt locations, 2



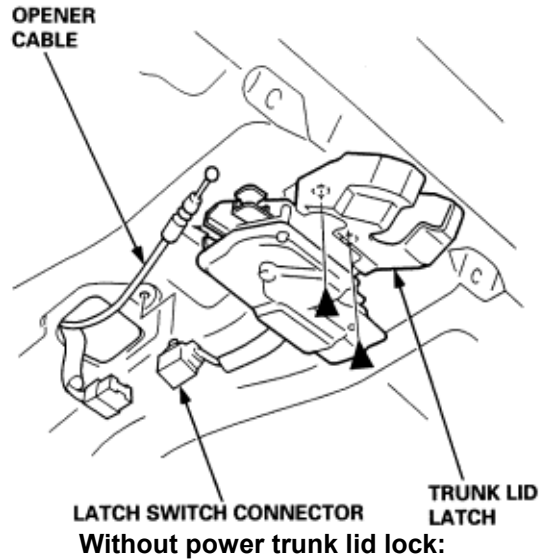
FUEL LID

1. Disconnect the cylinder rod from the lock cylinder (**See Page 20-158**).
2. Disconnect the trunk lid opener cable and trunk lid latch switch connector. If equipped with a power trunk lid lock, detach the trunk lid latch switch connector from the trunk lid. Take care not to bend the opener cable.

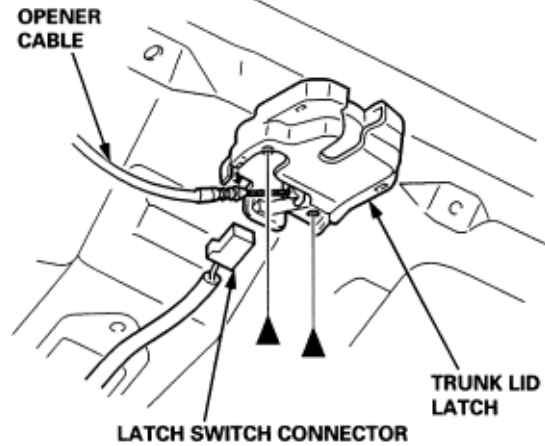
►: Bolt locations, 2



With power trunk lid lock:

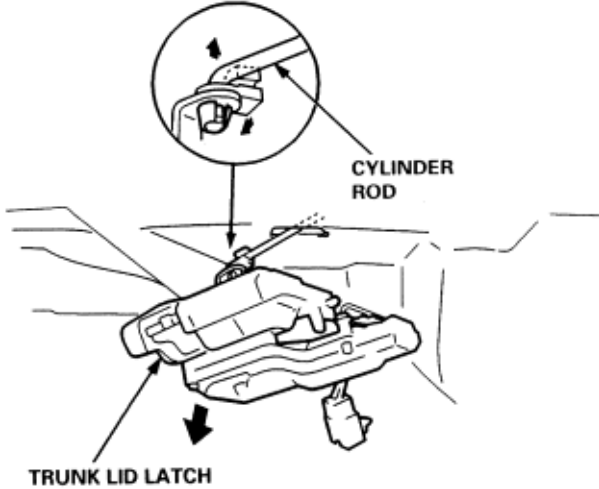


Without power trunk lid lock:

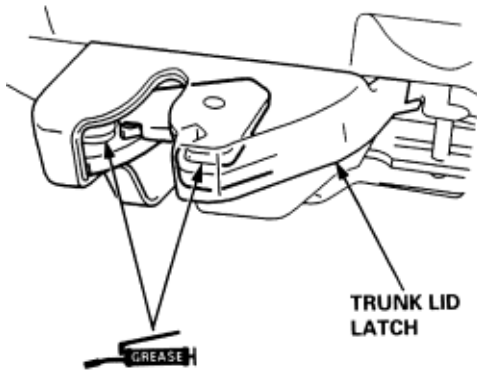


3. Remove the bolts from the trunk lid latch.

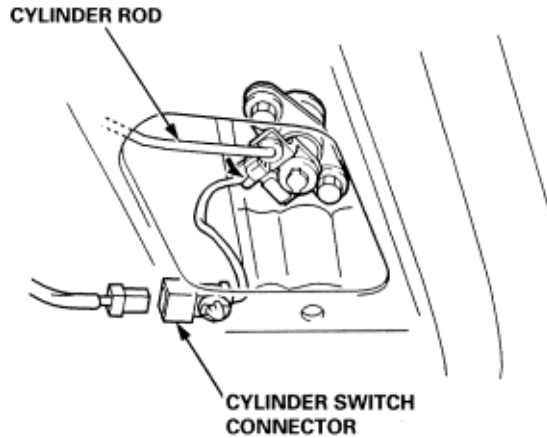
4. Pull the trunk lid latch out with the cylinder rod. Take care not to bend the cylinder rod.



5. Disconnect the cylinder rod from the trunk lid latch.
6. Install in the reverse order of removal, and note the following items:
 - ♦ Grease the location of the trunk lid latch indicated by the arrow.
 - ♦ Make sure the connector is plugged in properly and the cylinder rod is connected properly.
 - ♦ Make sure the trunk lid opens properly and locks securely.

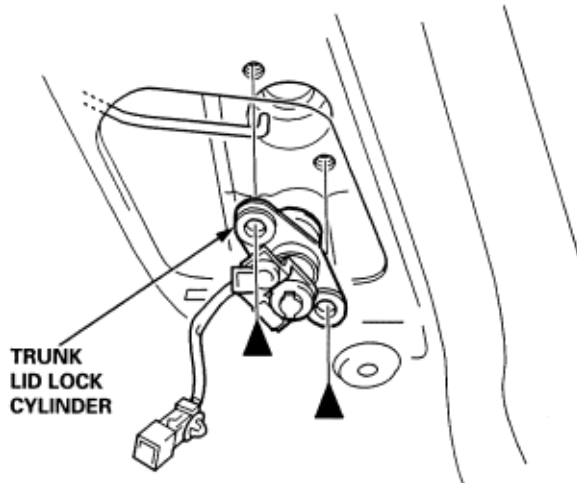
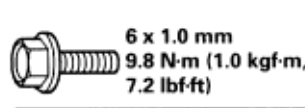


1. Disconnect the cylinder rod and cylinder switch connector, then detach the cylinder switch connector from the trunk lid.



2. Remove the bolt securing the lock cylinder and remove the trunk lid lock cylinder.

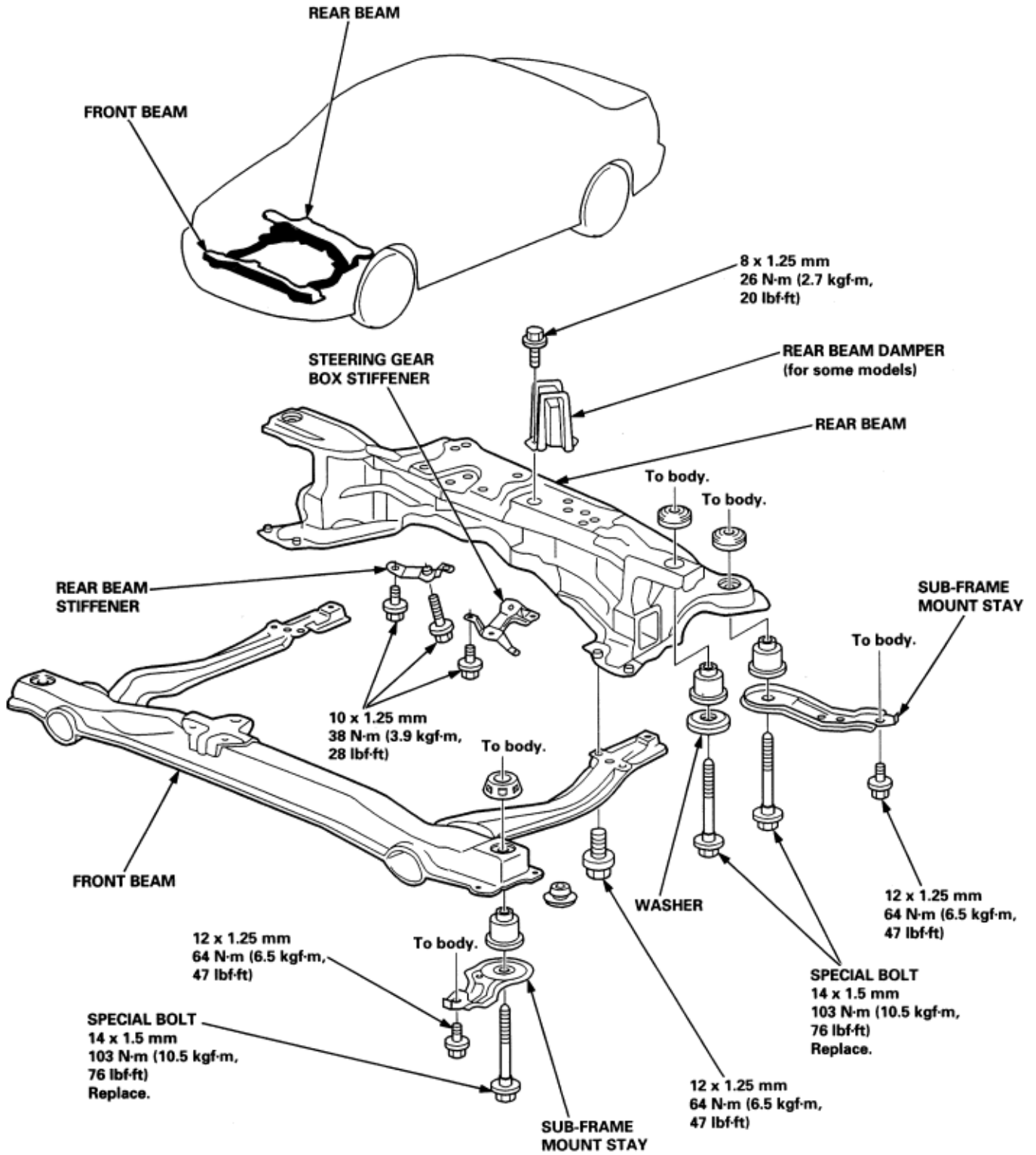
► Bolt location, 2

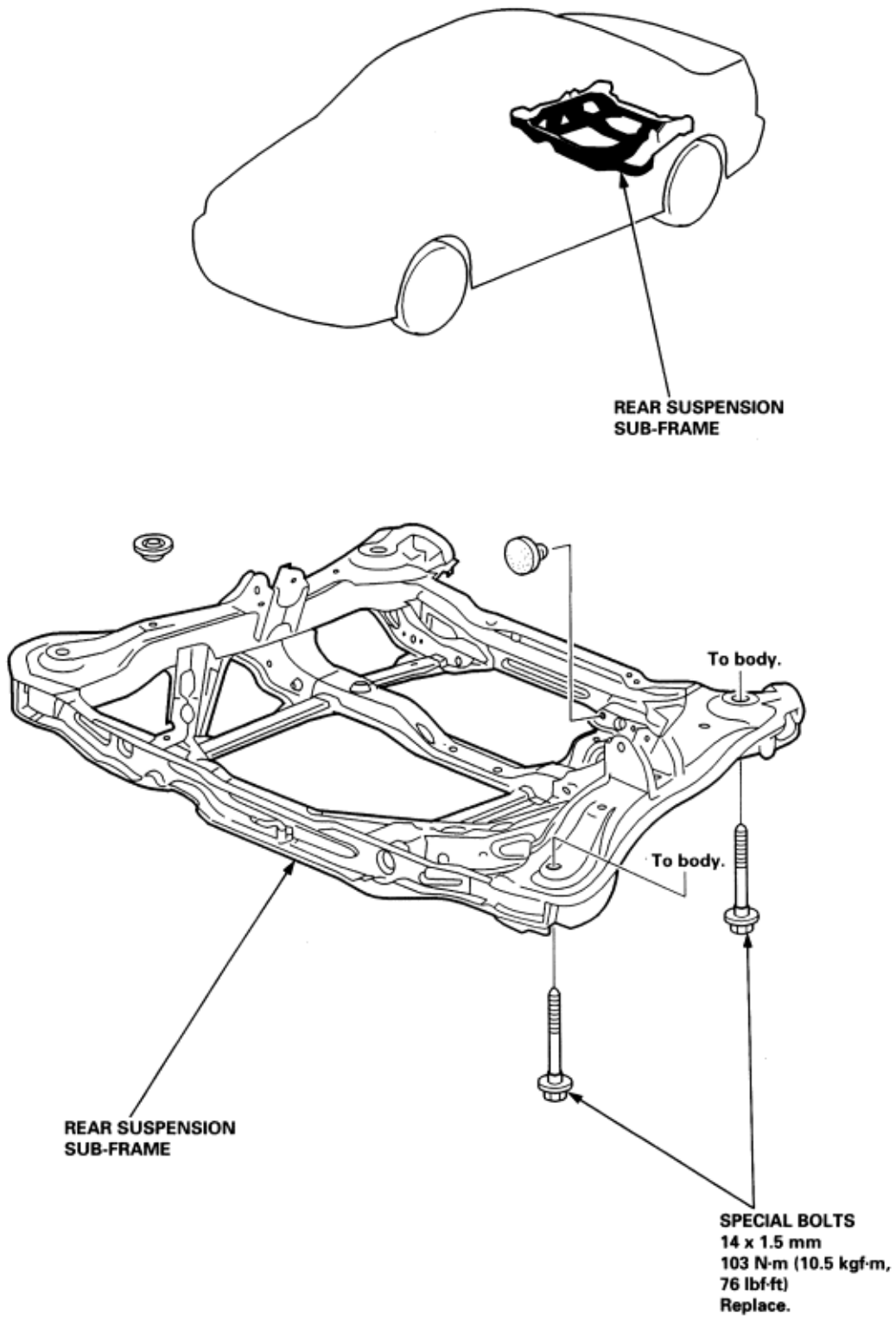


3. Install in the reverse order of removal, and note the following items:
 - ♦ Make sure the connector is plugged in properly and the cylinder rod is connected properly.
 - ♦ Make sure the trunk lid opens properly and locks securely.

Sub-frame Torque:

After loosening the sub-frame mounting bolts, be sure to replace them with new ones.

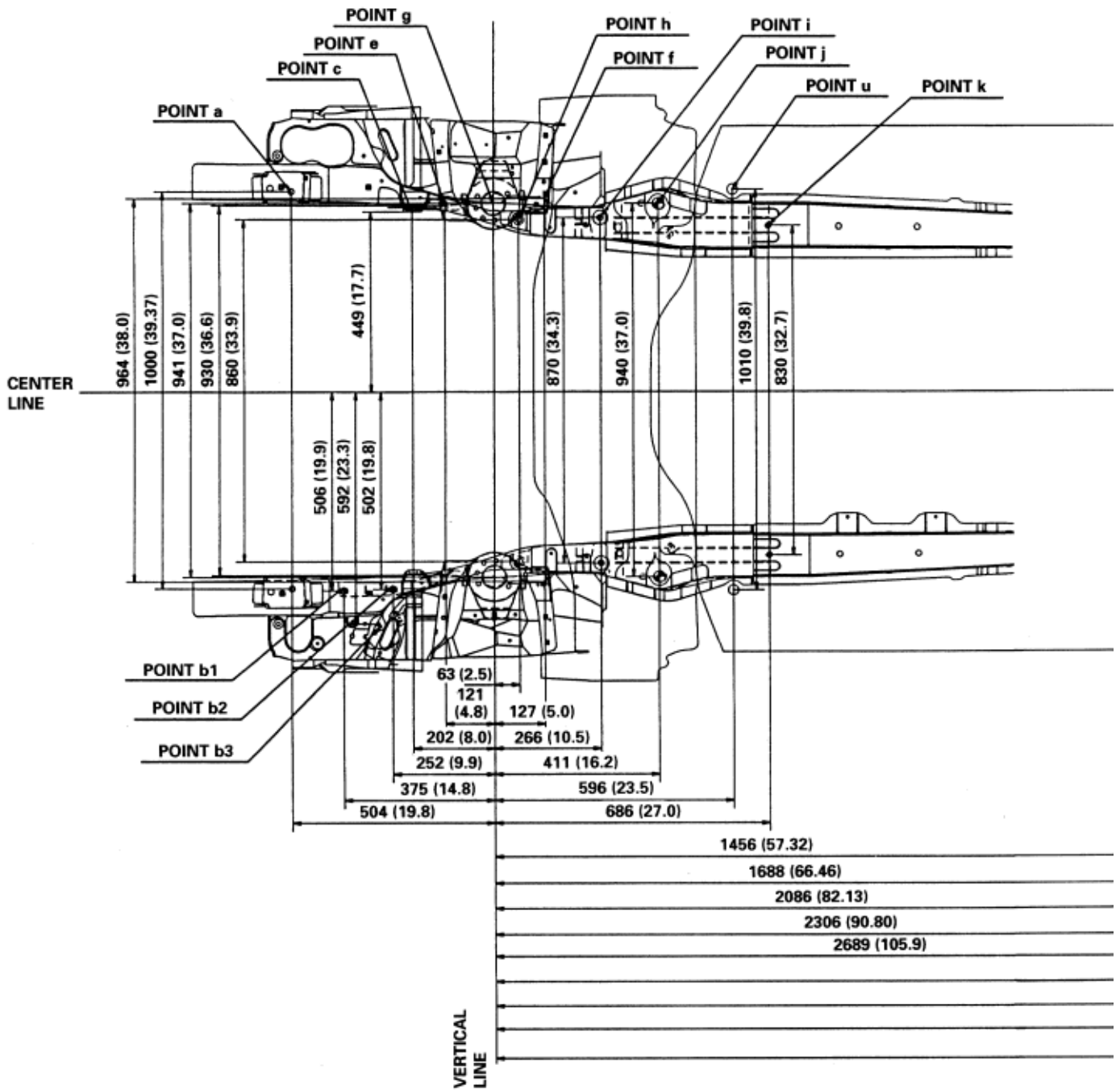


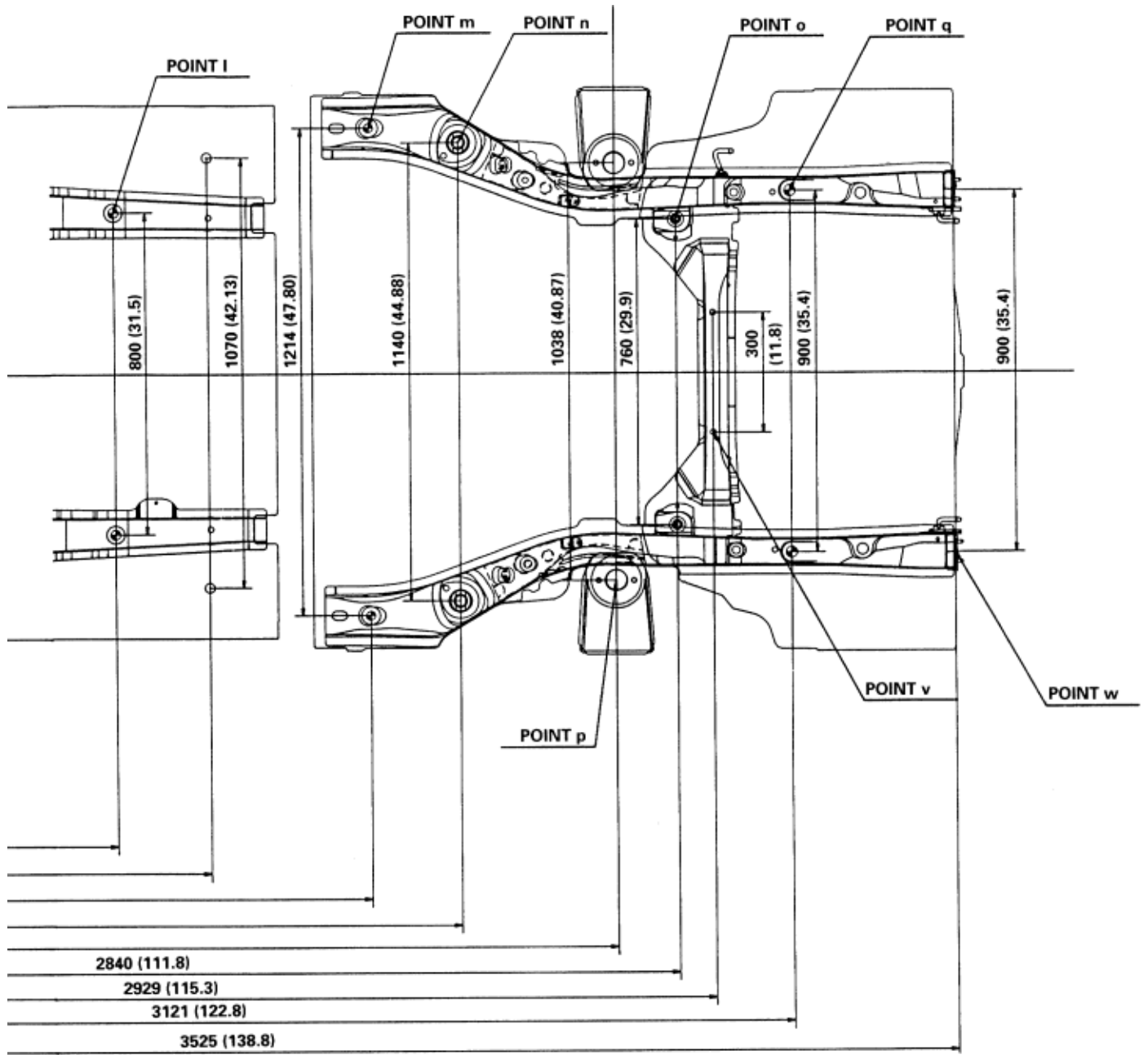


Top view:

Unit: mm (in)

⌀ = Inner diameter

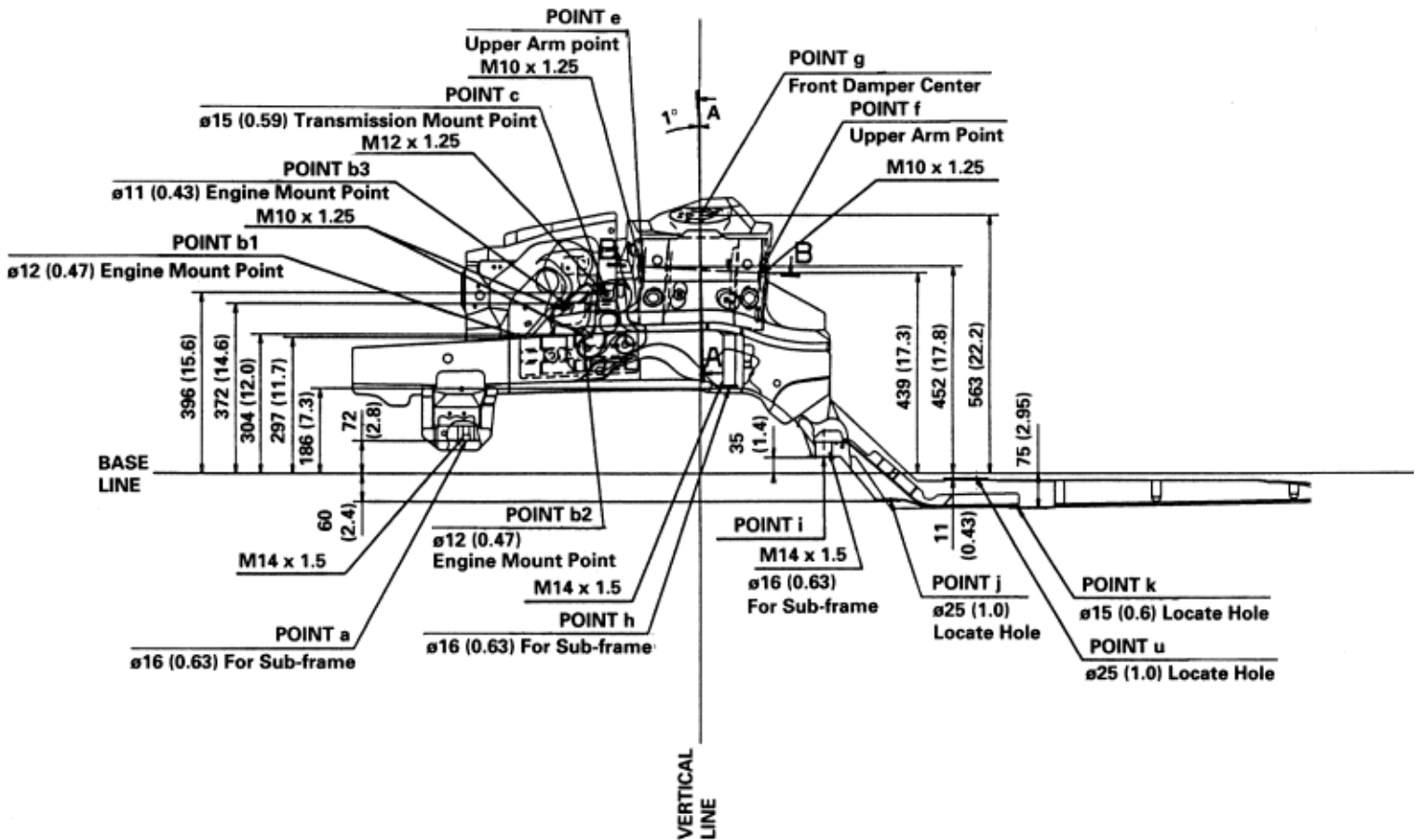
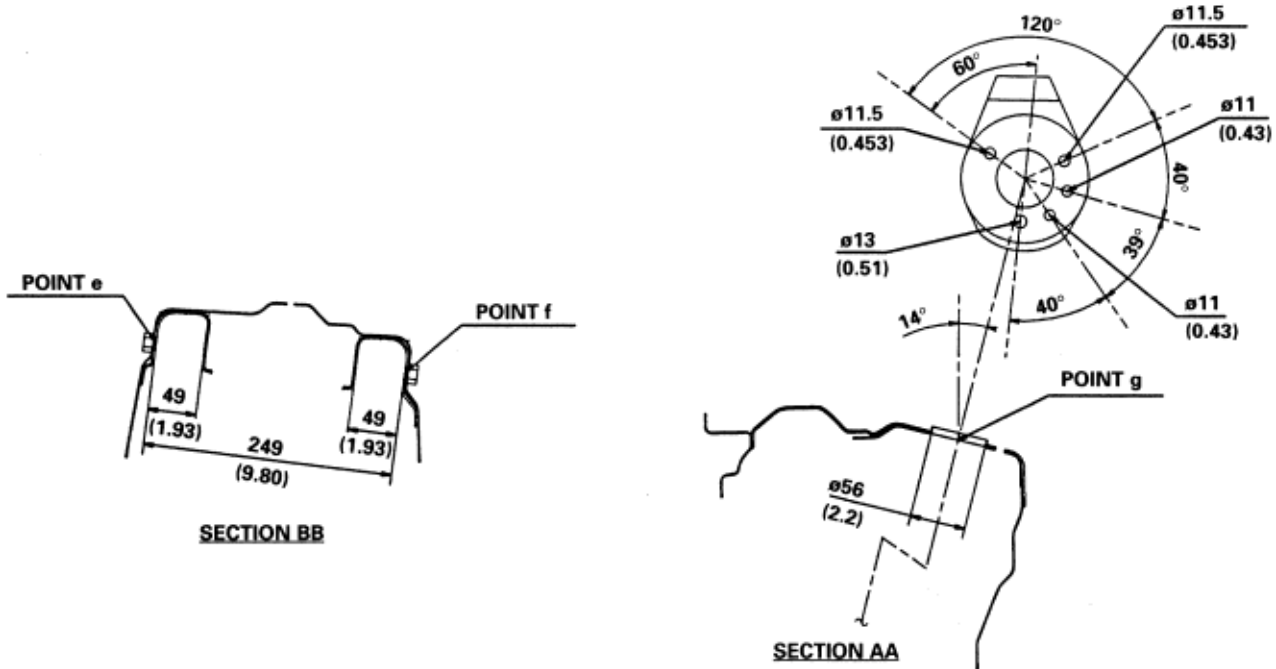


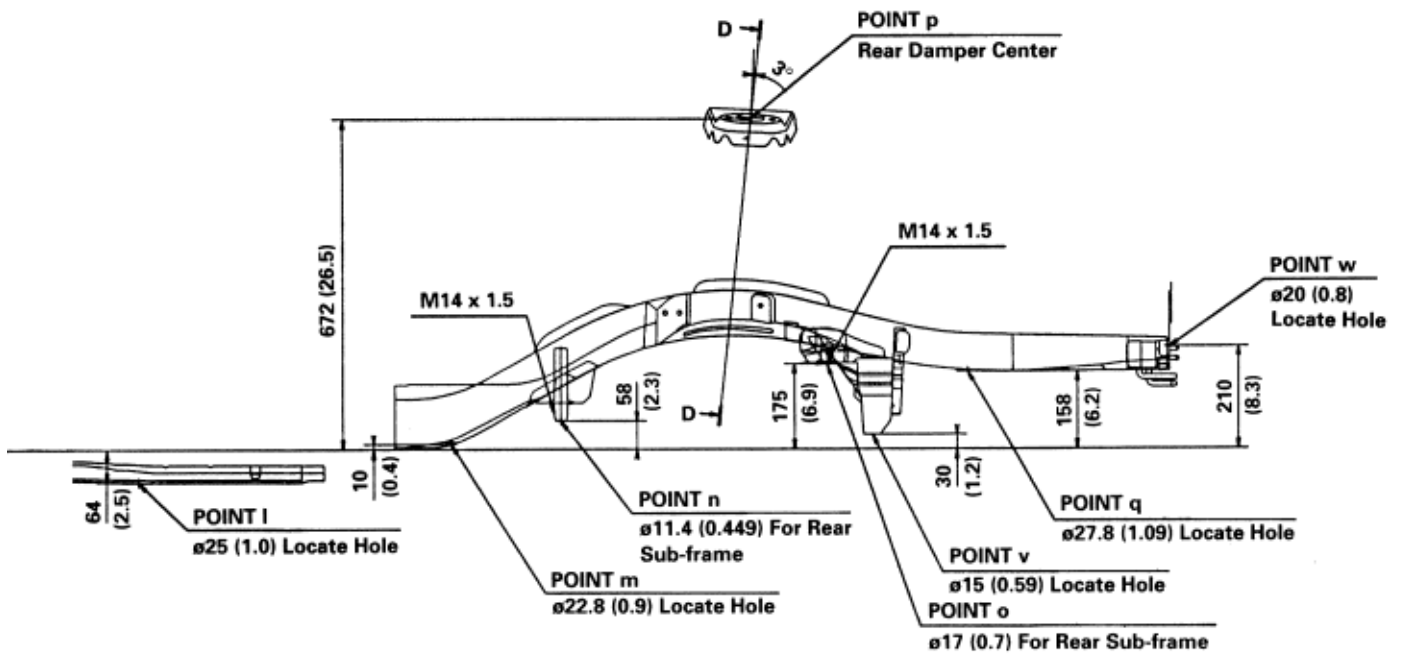
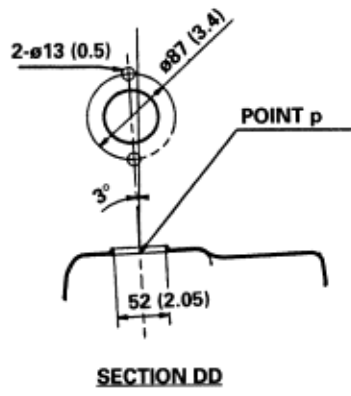


Side view:

Unit: mm (in)

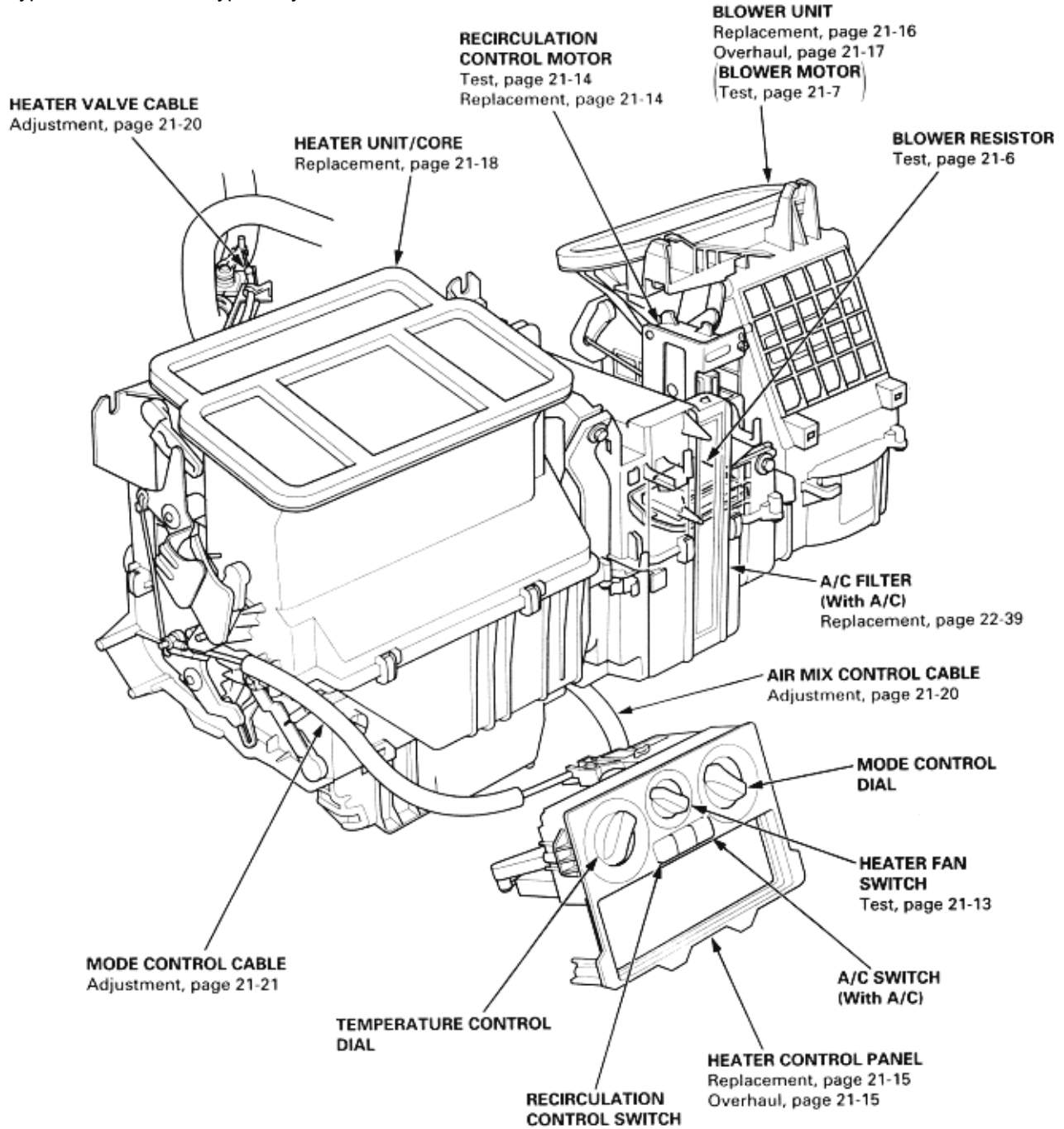
∅ = Inner diameter





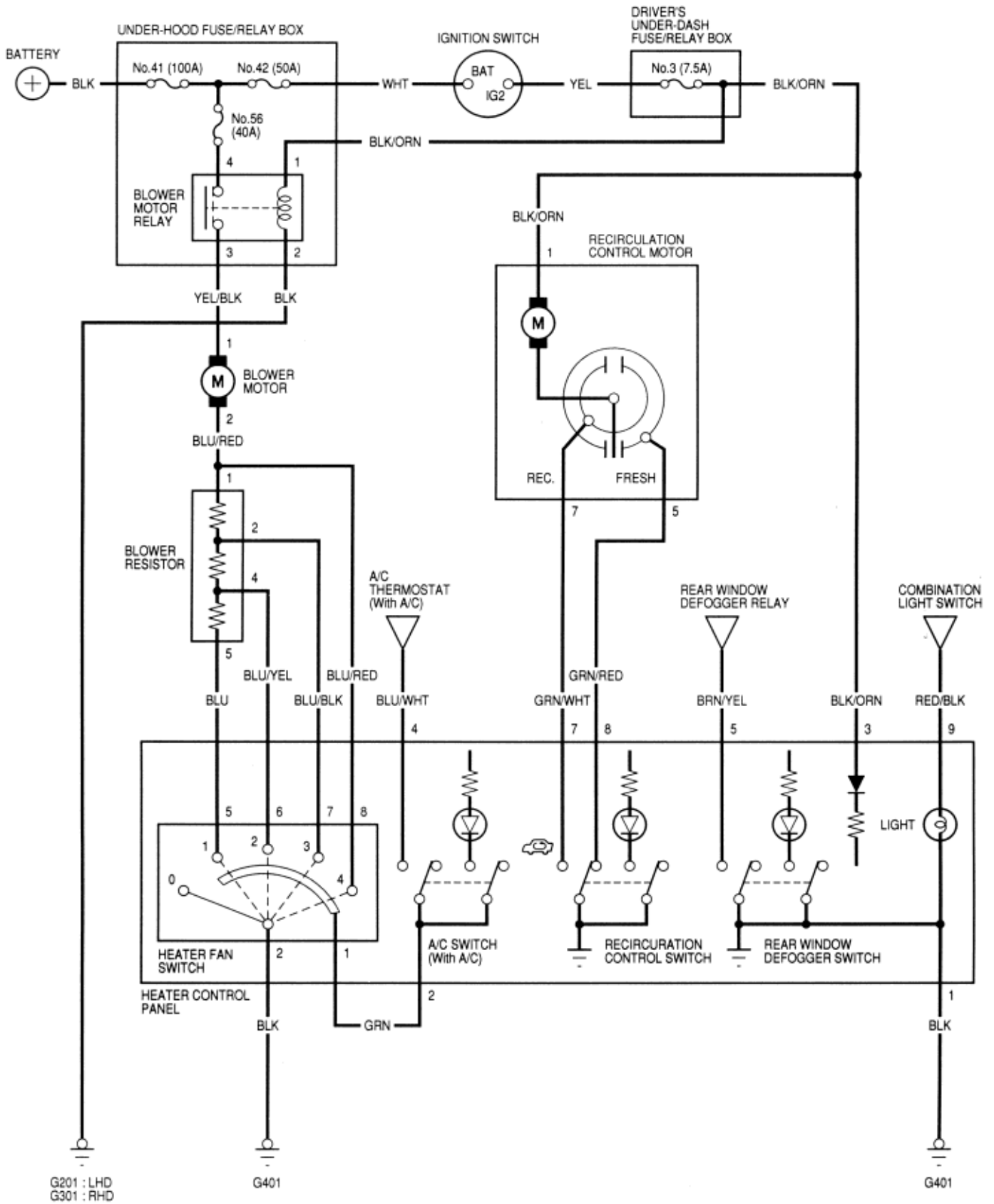
SRS Components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above, click on the following:

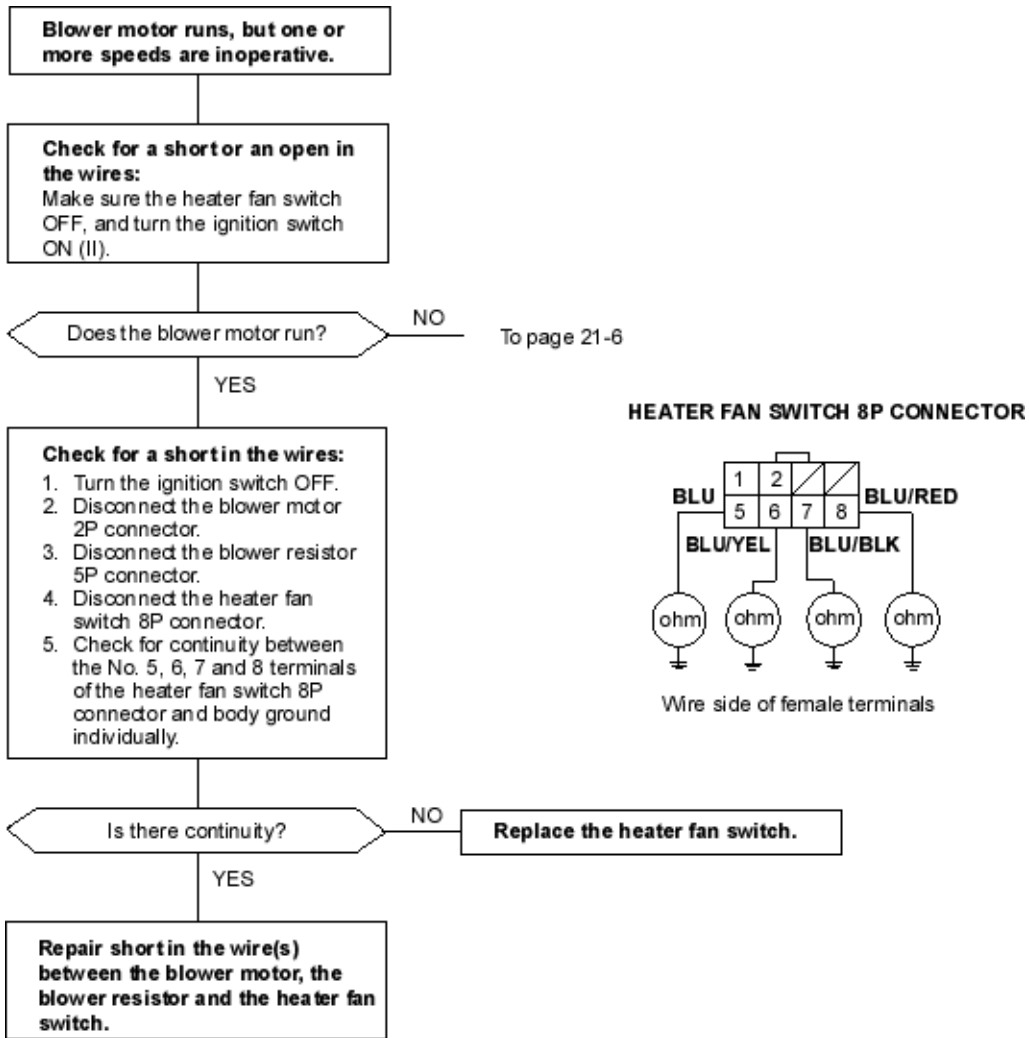
- (See Page 21-20)
- (See Page 21-18)
- (See Page 21-14)
- (See Page 21-16)
- (See Page 21-17)
- (See Page 21-7)
- (See Page 21-6)
- (See Page 21-39)
- (See Page 21-13)
- (See Page 21-15)
- (See Page 21-21)



Note these items before troubleshooting a symptom:

- ♦ Check the engine coolant level, and allow the engine to warm up before troubleshooting.
- ♦ Any abnormality must be corrected before continuing the test.
- ♦ Because of the precise measurements needed, use a digital circuit tester when testing.
- ♦ Before performing any troubleshooting procedures check:
 - Fuse No. 56(40A) in the under-hood fuse/relay box, and No. 3 (7.5 A) in the driver's under-dash fuse/relay box.
 - Grounds No. G201 (LHD), G301 (RHD), G401
 - Cleanliness and tightness of all connectors

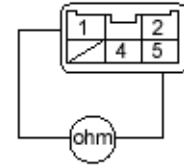
Symptom		Remedy
Hot air flow is low	Blower motor runs, but one or more speeds are inoperative Blower runs properly	Perform the procedures in the flowchart (See Page 21-5). Check for the following: <ul style="list-style-type: none"> ♦ Clogged heater duct ♦ Clogged heater outlet ♦ Incorrect door position
No hot air flow	Blower motor does not run at all Blower motor runs	Perform the procedures in the flowchart (See Page 21-7). Check for the following: <ul style="list-style-type: none"> ♦ Clogged heater duct ♦ Clogged heater outlet ♦ Clogged heater valve ♦ Faulty air mix door ♦ Heater valve cable adjustment (See Page 21-20) ♦ Air mix control cable adjustment (See Page 21-20) ♦ Faulty cooling system thermostat (see section 10) ♦ Clogged evaporator (with air conditioning) ♦ Frozen evaporator (with air conditioning)
Recirculation control doors do not change between fresh and recirculate		Perform the procedures in the flowchart (See Page 21-10)



From page 21-5

Check the blower resistor:
1. Turn the ignition switch OFF.
2. Disconnect the blower resistor 5P connector.
3. Measure the resistance between the No. 1 and No. 5 terminals of the blower resistor.

BLOWER RESISTOR



Is there approx. 2 - 3 ohms?

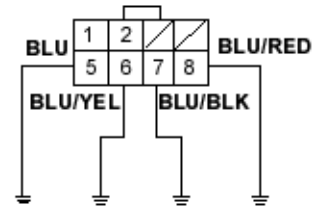
NO

Replace the blower resistor.

YES

Check for an open in the wires:
1. Reconnect the blower resistor 5P connector.
2. Disconnect the heater fan switch 8P connector.
3. Turn the ignition switch ON (II).
4. Ground each of the heater fan switch 8P connector terminals individually in the following order: No 5, 6, 7 and 8.

HEATER FAN SWITCH 8P CONNECTOR



Wire side of female terminals

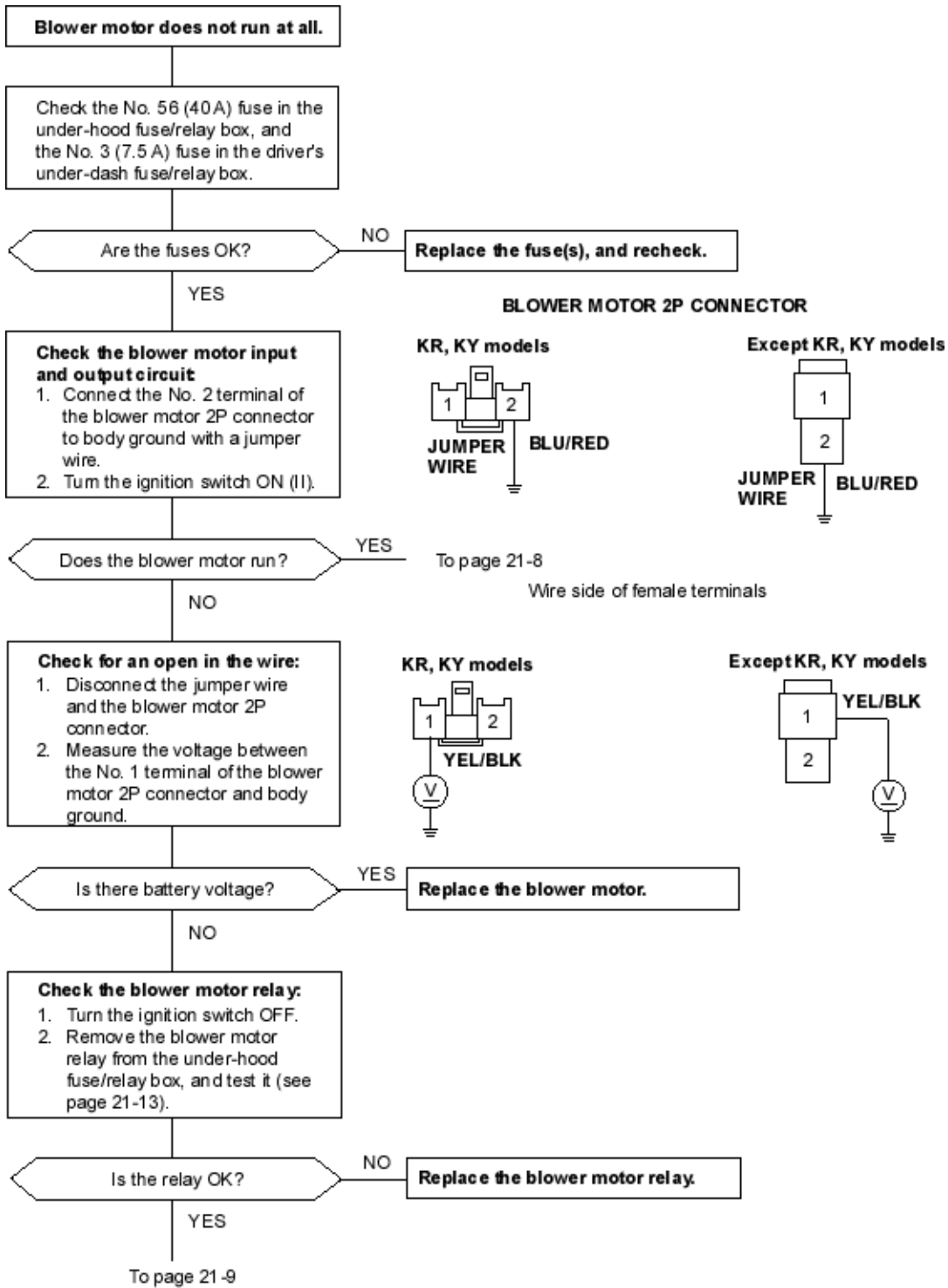
Does the blower motor run at progressively higher speeds?

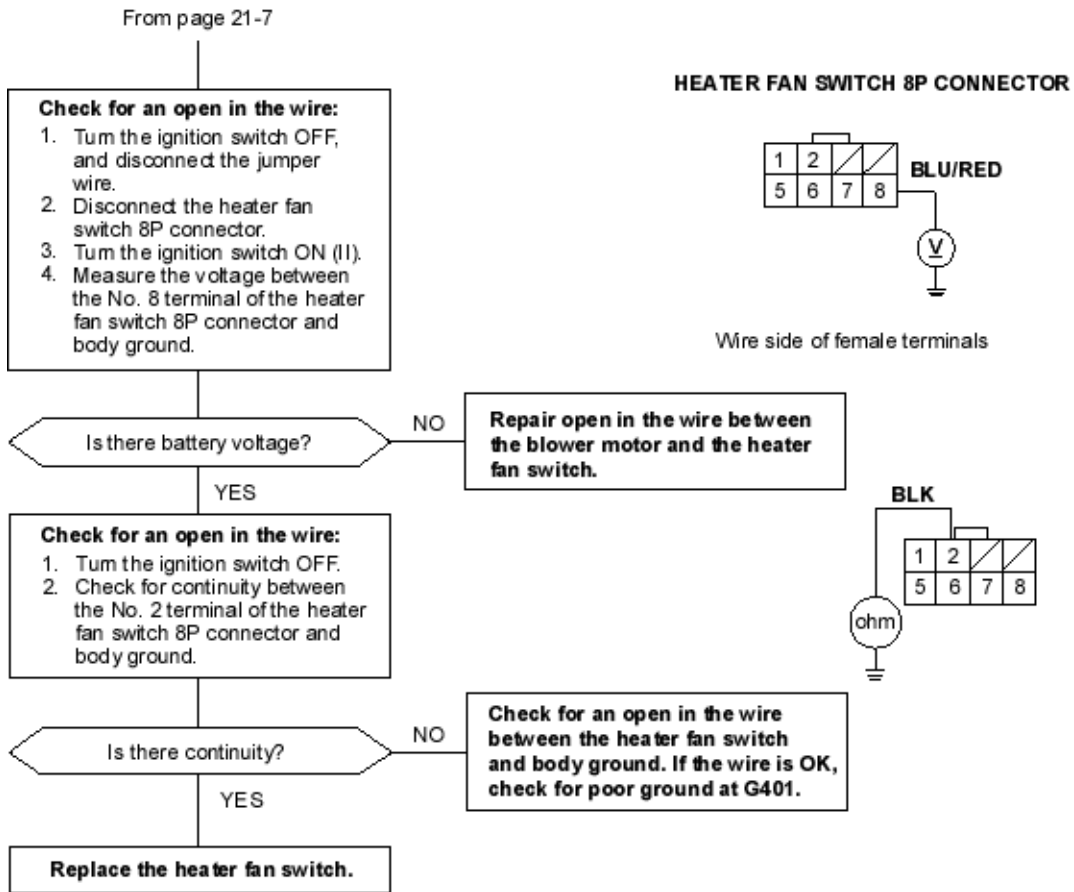
NO

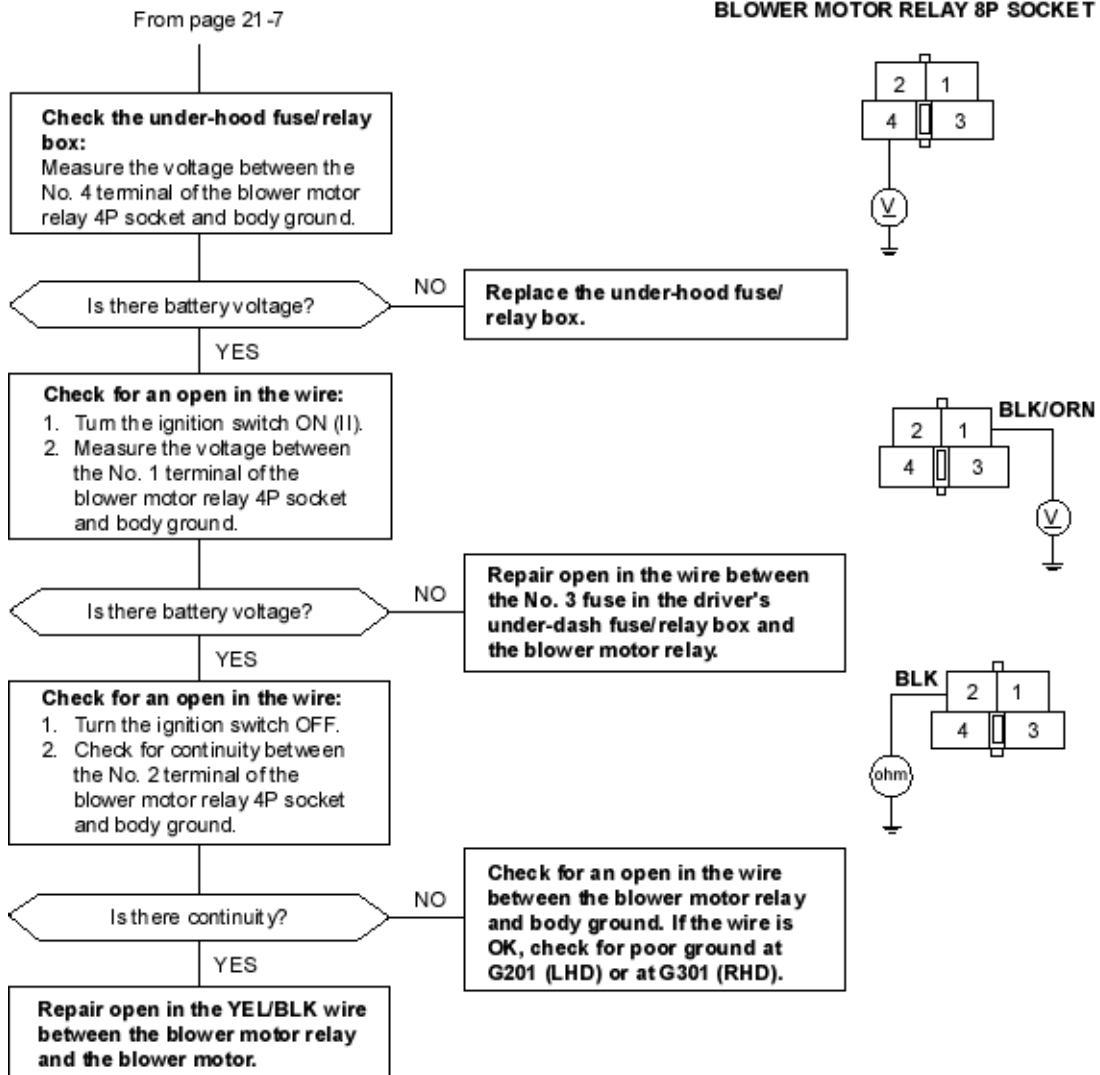
Repair open or cause of excessive resistance in the appropriate wire(s) between the blower resistor and the heater fan switch.

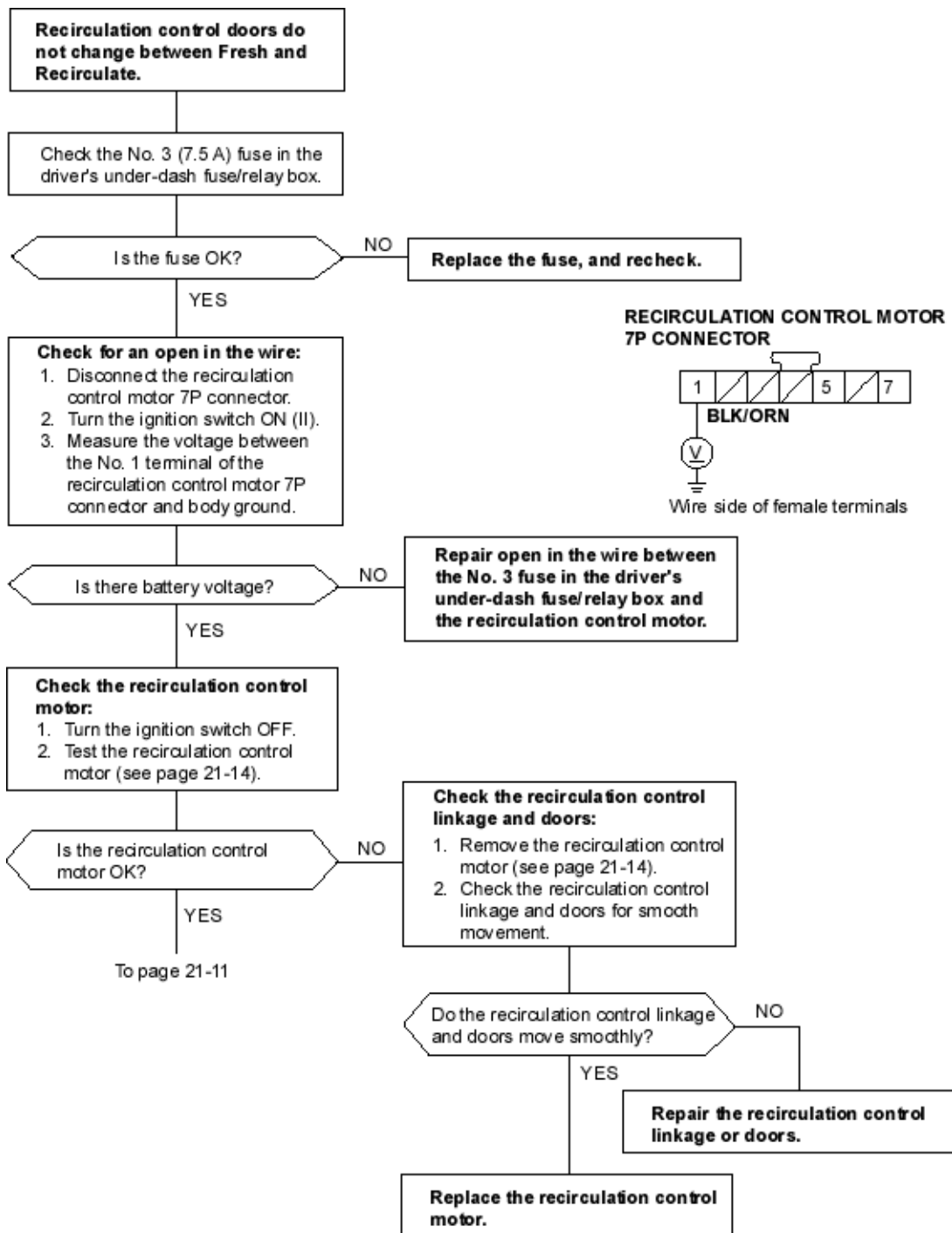
YES

Replace the heater fan switch.

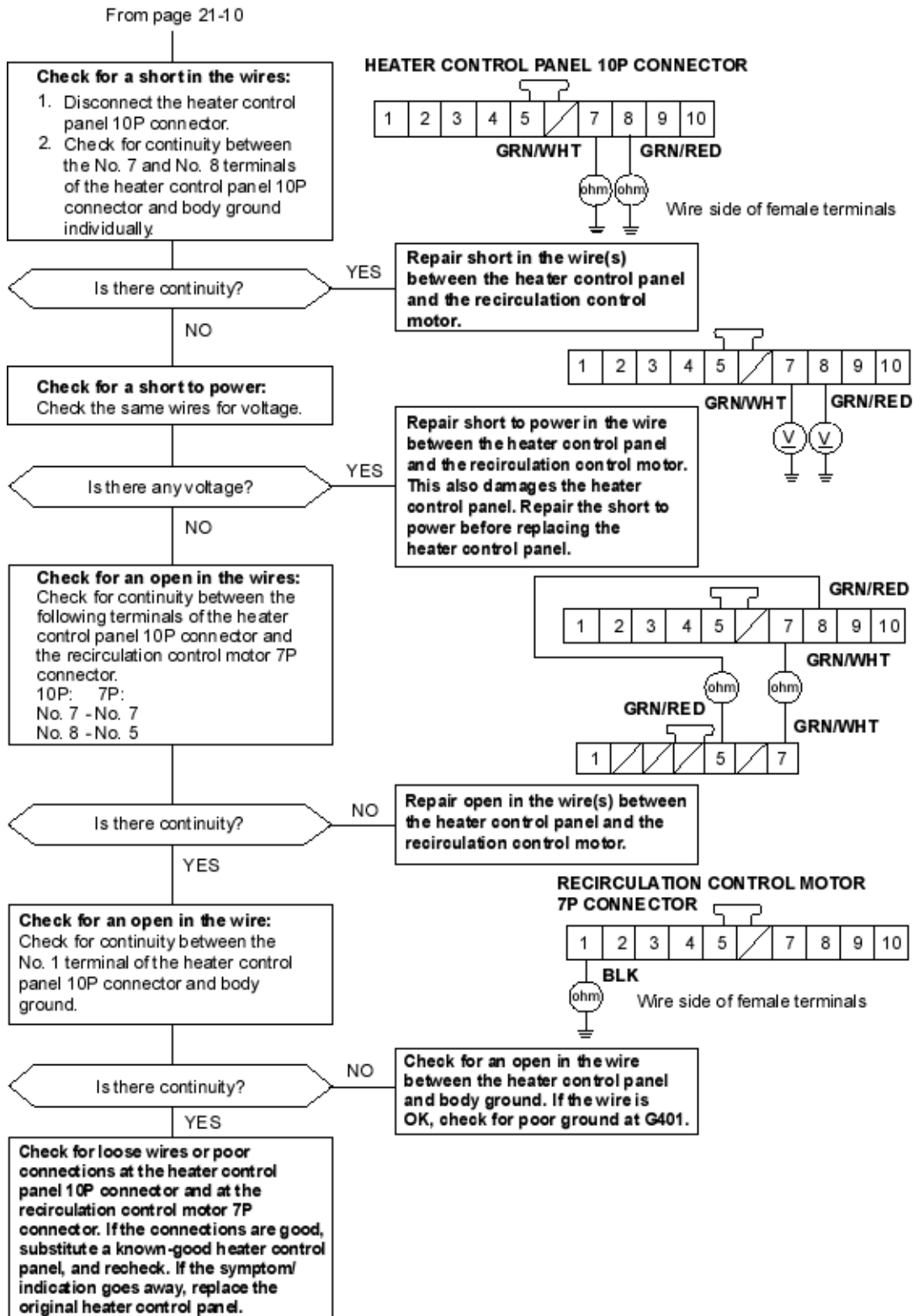




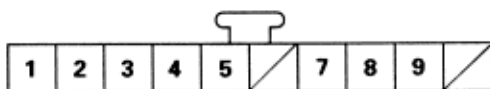




To go to the page referenced on the diagram above, click on the following:
 (See Page 21-14)



HEATER CONTROL PANEL 10P CONNECTOR



Wire side of female terminals

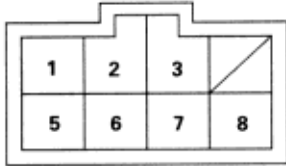
Cavity	Wire color	Signal		Cavity	Wire color	Signal	
1	BLK	GROUND	OUTPUT	6	/	/	/
2	GRN	HEATER FAN SWITCH	OUTPUT	7	GRN/WHT	RECIRCULATE	INPUT
3	BLK/ORN	IG2 (Power)	INPUT	8	GRN/RED	FRESH	INPUT
4	BLU/WHT	A/C THERMOSTAT (With A/C)	INPUT	9	RED/BLK	COMBINATION LIGHT SWITCH	INPUT
5	BRN/YEL	REAR WINDOW DEFOGGER RELAY	INPUT	10	/	/	/

Heater Fan Switch
Test

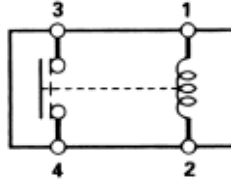
Relays
Test

Check for continuity between the terminals in each switch position according to the table.

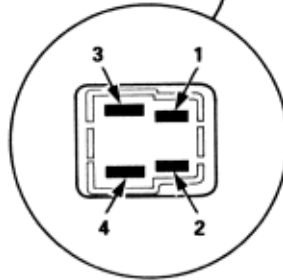
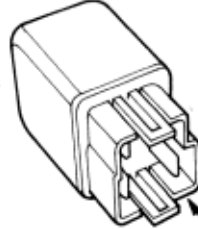
Terminal Position	1	2	3	4	5	6	7	8
0								
1	○	○			○			
2	○	○				○		
3	○	○					○	
4	○	○						○



There should be continuity between the No. 3 and No. 4 terminals when power and ground are connected to the No. 1 and No. 2 terminals, and there should be no continuity when power is disconnected.



◆ Blower motor relay

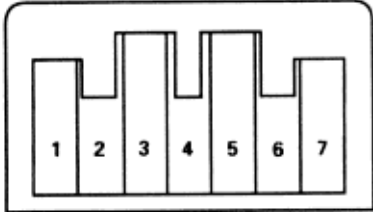


Recirculation Control Motor

Test

1. Disconnect the 7P connector from the recirculation control motor.
2. Connect battery power to the No. 1 terminal, and ground the No. 5 and No. 7 terminals; the recirculation control motor should run smoothly. To avoid damaging the recirculation control motor, do not reverse power and ground.

RECIRCULATION CONTROL MOTOR



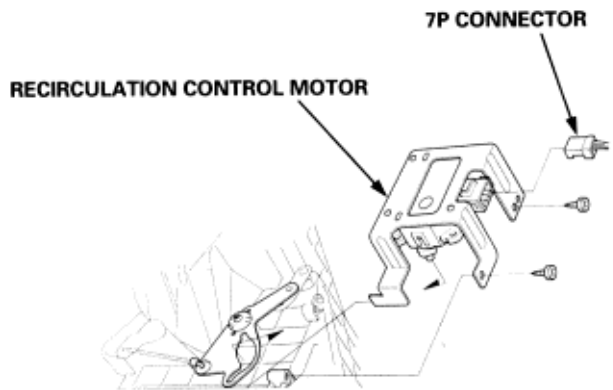
3. Disconnect the No. 5 and No. 7 terminals from ground; the recirculation control motor should stop at Fresh or Recirculate. Don't cycle the recirculation control motor for a long time.
4. If the recirculation control motor does not run in step 2, remove it then check the recirculation control linkage and doors for smooth movement. If they move smoothly, replace the recirculation control motor.

21-14

Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

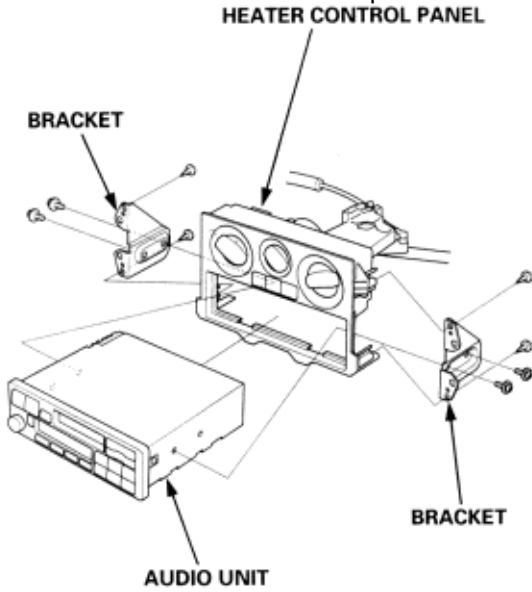
1. Disconnect the 7P connector from the recirculation control motor. Remove the self-tapping screws and the recirculation control motor from the blower unit.



2. Install in the reverse order of removal. After installation, make sure the recirculation control motor runs smoothly.

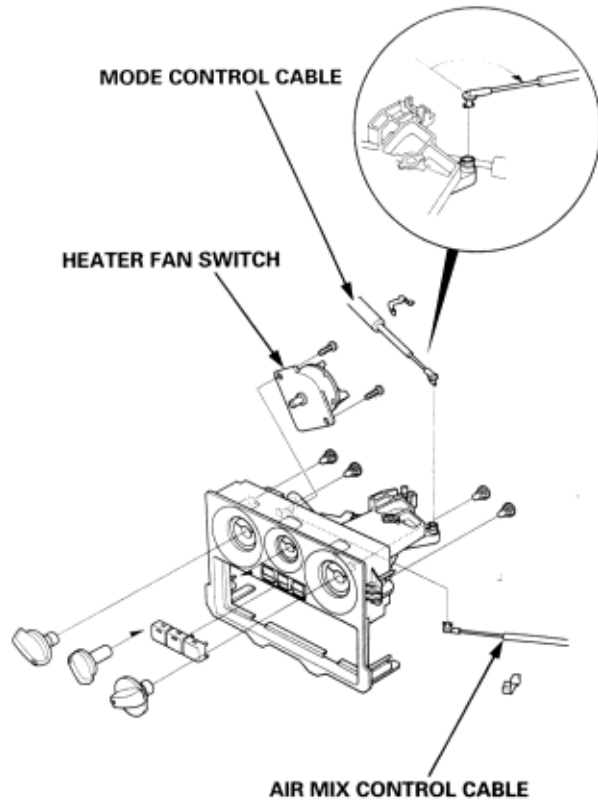
NOTE: LHD type is shown, RHD type is symmetrical.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radios preset buttons.
2. Remove the heater control pane together with the audio unit from the dashboard (see section 20).
3. Remove the self-tapping screws, brackets and the audio unit from the heater control panel.



4. Install in the reverse order of removal, and note these items:
 - ♦ Adjust the mode control cable (**See Page 21-21**) and the air mix control cable (**See Page 21-20**). If necessary, adjust the heater valve cable (**See Page 21-20**).
 - ♦ After installation, operate the heater control panel to see whether it works properly.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

NOTE: LHD type is shown, RHD type is symmetrical.
After installation, make sure that the temperature and the mode control dial move smoothly without binding



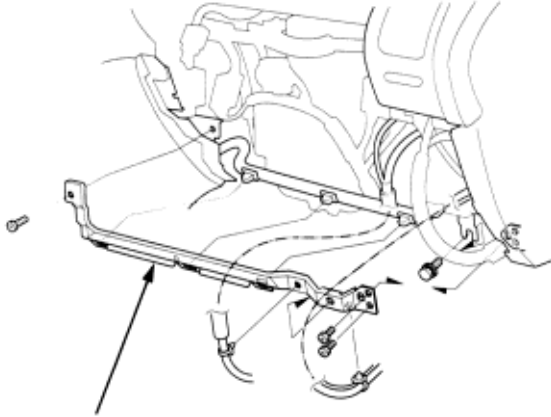
Blower Unit Replacement

21-16

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

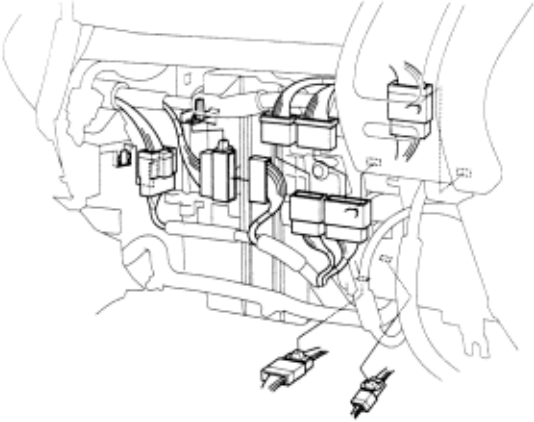
NOTE: LHD type is shown, RHD type is symmetrical.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the glove box (see section 20).
3. Remove the wire harness clips the bolts and the glove box frame.

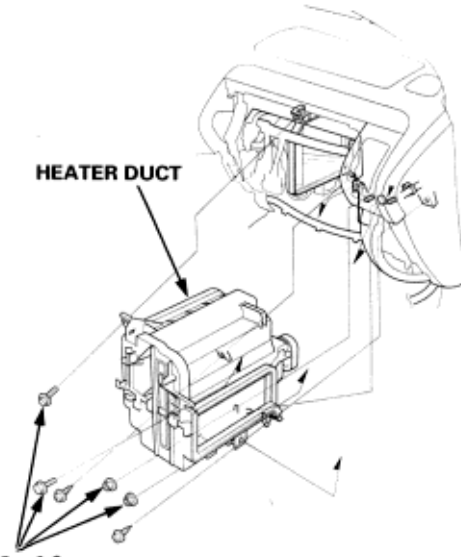


GLOVE BOX FRAME

4. Disconnect the wire harness connectors, then remove the wire harness clips.



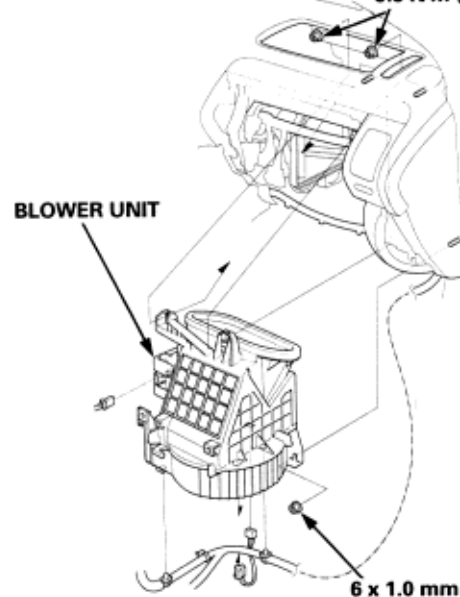
5. With air conditioning; remove the evaporator (See Page 22-36).
6. Without air conditioning; remove the self-tapping screws, the mounting nuts, the mounting bolts and duct.



6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

7. Remove the front passenger's airbag (see section 24).
8. Disconnect the connectors from the blower motor, the blower resistor and the recirculation control motor remove the wire harness clips. Remove the mounting nuts and the blower unit.

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

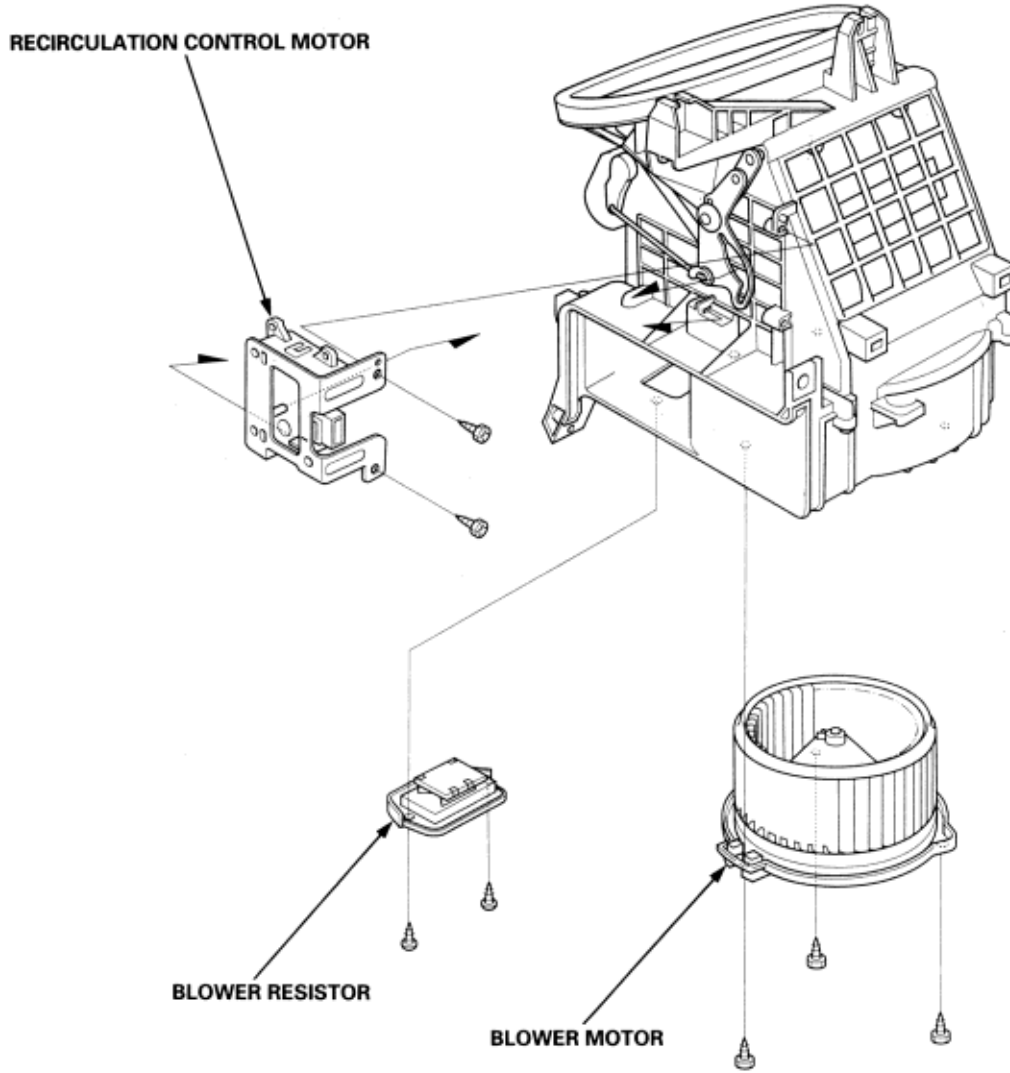


6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

9. Install in the reverse order of removal. And note these items:
 - ♦ Make sure that there is no air leakage.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Note these items when overhauling the blow unit

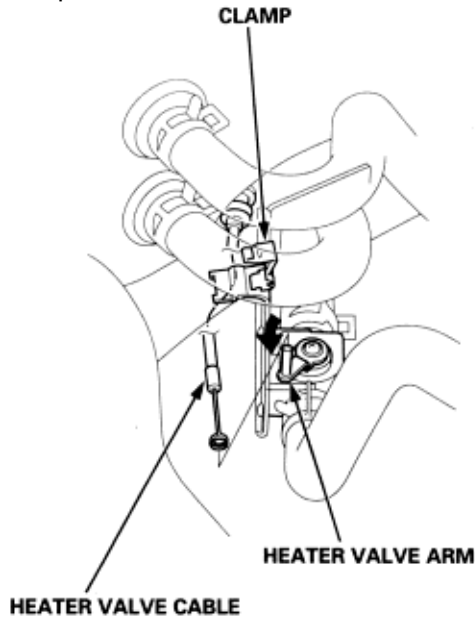
- ♦ LHD type is shown, RHD type is symmetrical.
- ♦ The recirculation control motor, the blower resistor and the blower motor can be replaced without removing the blower unit.
- ♦ Before reassembly, make sure that the recirculation control doors and linkage move smoothly without binding.
- ♦ After reassembly, make sure the recirculation control motor runs smoothly (**See Page 21-14**).
- ♦ Make sure that there is no air leakage.



SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section 124) before performing repairs or service.

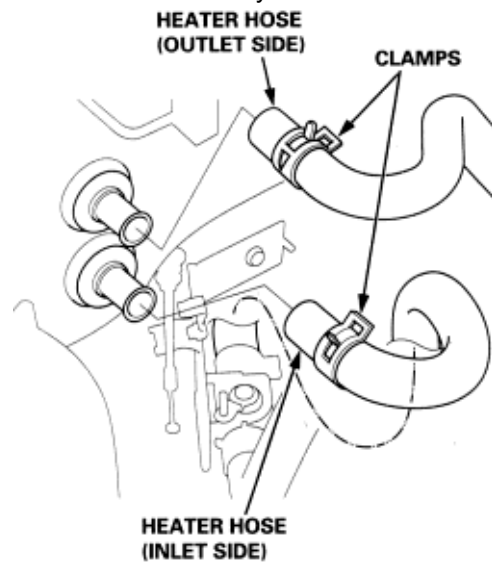
NOTE: LHD type is shown, RHD type is similar.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. From under the hood, open the cable clamp, then disconnect the heater valve cable from the heater valve arm. Turn the heater valve arm to the fully opened position as shown.

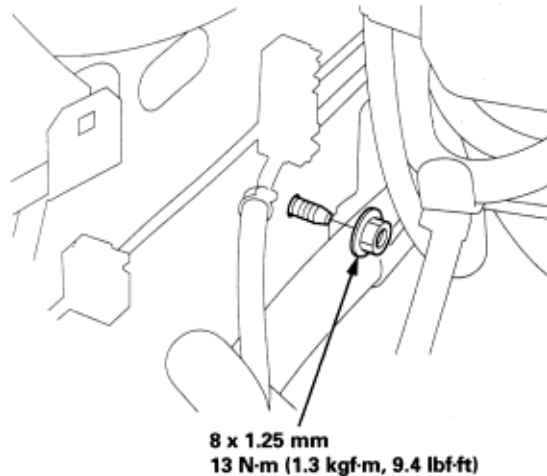


4. When the engine is cool, drain the engine coolant from the radiator (see section 10).

5. Slide the hose clamps back, then disconnect the inlet and let heater hoses from the heater unit. Engine cool will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.

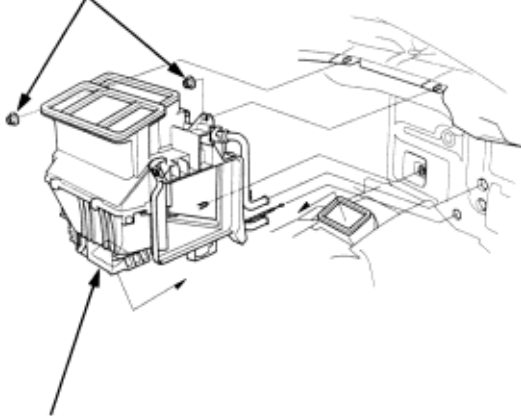


6. Remove the mounting nut from the heater unit. Take care not to damage or bend the fuel lines, the brake lines, etc.



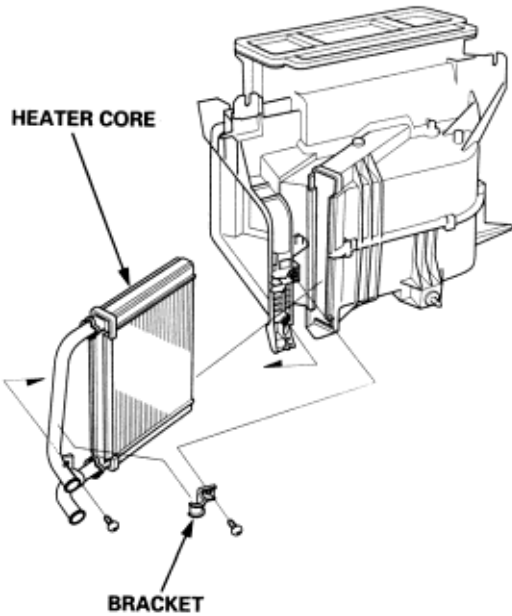
7. Remove the dashboard (see section 20).
8. Remove the heater duct (**See Page** 21-16).
9. Remove the mounting nuts and the heater unit.

6 x 1.0 mm
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)



HEATER UNIT

10. Remove the self-tapping screws and the bracket. Be careful not to bend the inlet and outlet pipes during heater core removal, and pull out the heater core.

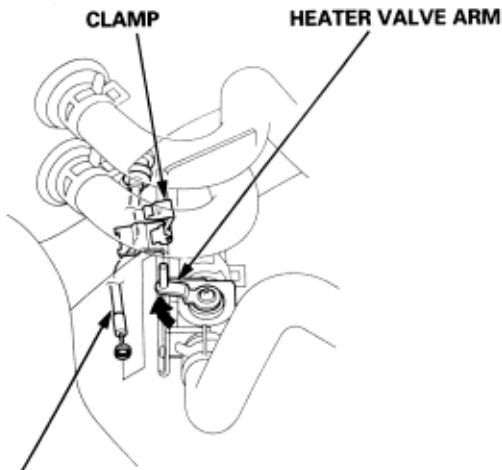


11. Install the heater core in the reverse order of removal.
12. Install the heater unit in the reverse order of removal, and note these items:
 - ♦ Apply sealant to the grommets.
 - ♦ Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
 - ♦ Refill the cooling system with engine coolant (see section 10.).
 - ♦ Adjust the air mix control cable and the heater valve cable (**See Page** 21-20), and adjust the mode control cable (**See Page** 21-21).
 - ♦ Make sure that there is no air leakage.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

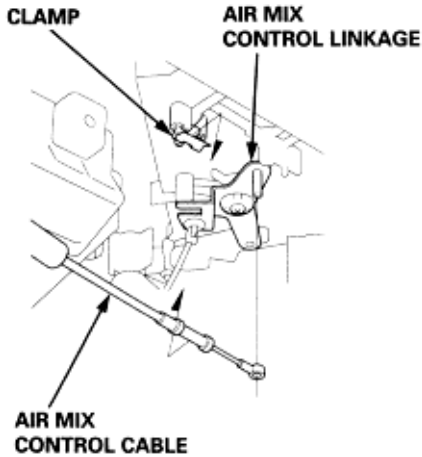
Air Mix Control Cable

NOTE: LHD type is shown, RHD type is symmetrical.

1. From under the hood, open the clamp, then disconnect the heater valve cable from the heater valve arm.



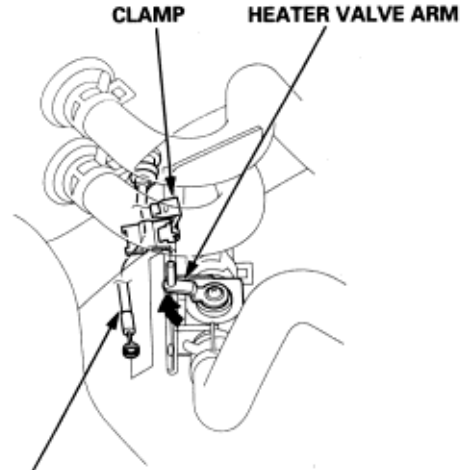
2. From under the dash, disconnect the air mix control cable housing from the clamp, and disconnect the air mix control cable from the air mix control linkage.



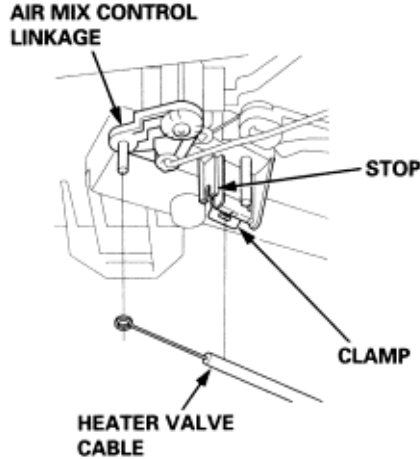
3. Set the temperature control dial to MAX COOL.
4. Turn the air mix control linkage fully counterclockwise as shown above, and hold it. Attach the air mix control cable to the air mix control linkage, then snap the air mix control cable housing into the clamp.
5. From under the hood, turn the heater valve arm to the fully closed position as shown above, and hold it. Attach the heater valve cable to the heater valve cable housing to take up any slack, then install the heater valve cable housing into the clamp.

Heater Valve Cable

1. From under the hood, open the clamp, then disconnect the heater valve cable from the heater valve arm.



2. From under the dash, disconnect the heater valve cable housing from the clamp, and disconnect the heater valve cable from the air mix control linkage.

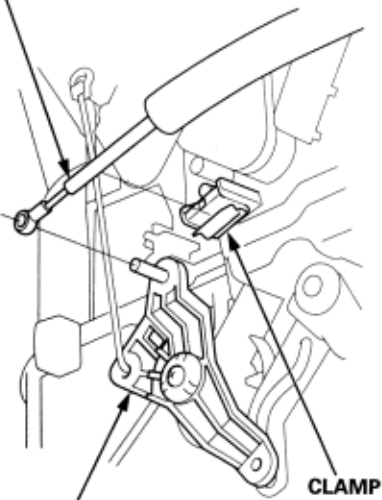


3. Set the temperature control dial to MAX COOL.
4. Turn the air mix control linkage fully clockwise as shown above, and hold it. Attach the heater valve cable to the air mix control linkage. Hold the end of the heater valve cable housing against the stop, then snap the heater valve cable housing into the clamp.
5. From under the hood, turn the heater valve arm to the fully closed position as shown above, and hold it. Attach the heater valve cable to the heater valve cable housing to take up any slack, then install the heater valve cable housing into the clamp.

NOTE: LHD type is shown, RHD type is symmetrical.

1. From under the dash, disconnect the mode control cable housing from the clamp, and disconnect the mode control cable from the mode control linkage.

**MODE CONTROL
CABLE**



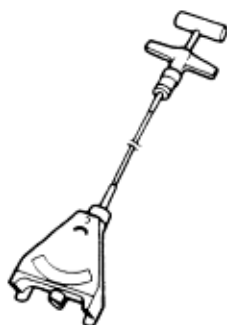
MODE CONTROL LINKAGE

2. Set the mode control dial to VENT.
3. Turn the mode control linkage fully clockwise as shown above, and hold it. Attach the mode control cable to the mode control linkage then snap the mode control cable housing into the clamp.

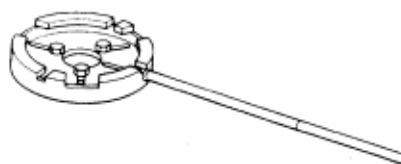
Special Tools

22-2

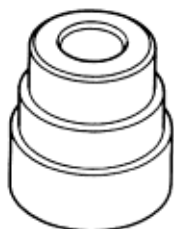
Ref No.	Tool Number	Description	Qty	Remark
1	07JGG - 0010100	Belt Tension Gauge	1	
2	07NAB - HAC0101	A/C Clutch Holder	1	
3	07947 - 6340300	Drive Attachment	1	
4	07965 - 6920500	Hub Assembly Guide Attachment	1	
5	07XAZ - SIA0300	ECM Test Harness	1	
6	07XAZ - 0010100	Test Pin Box (Pin Box 130 (Seem))	1	



①



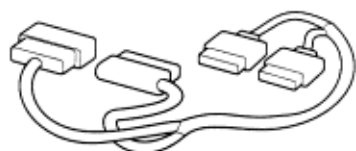
②



③



④

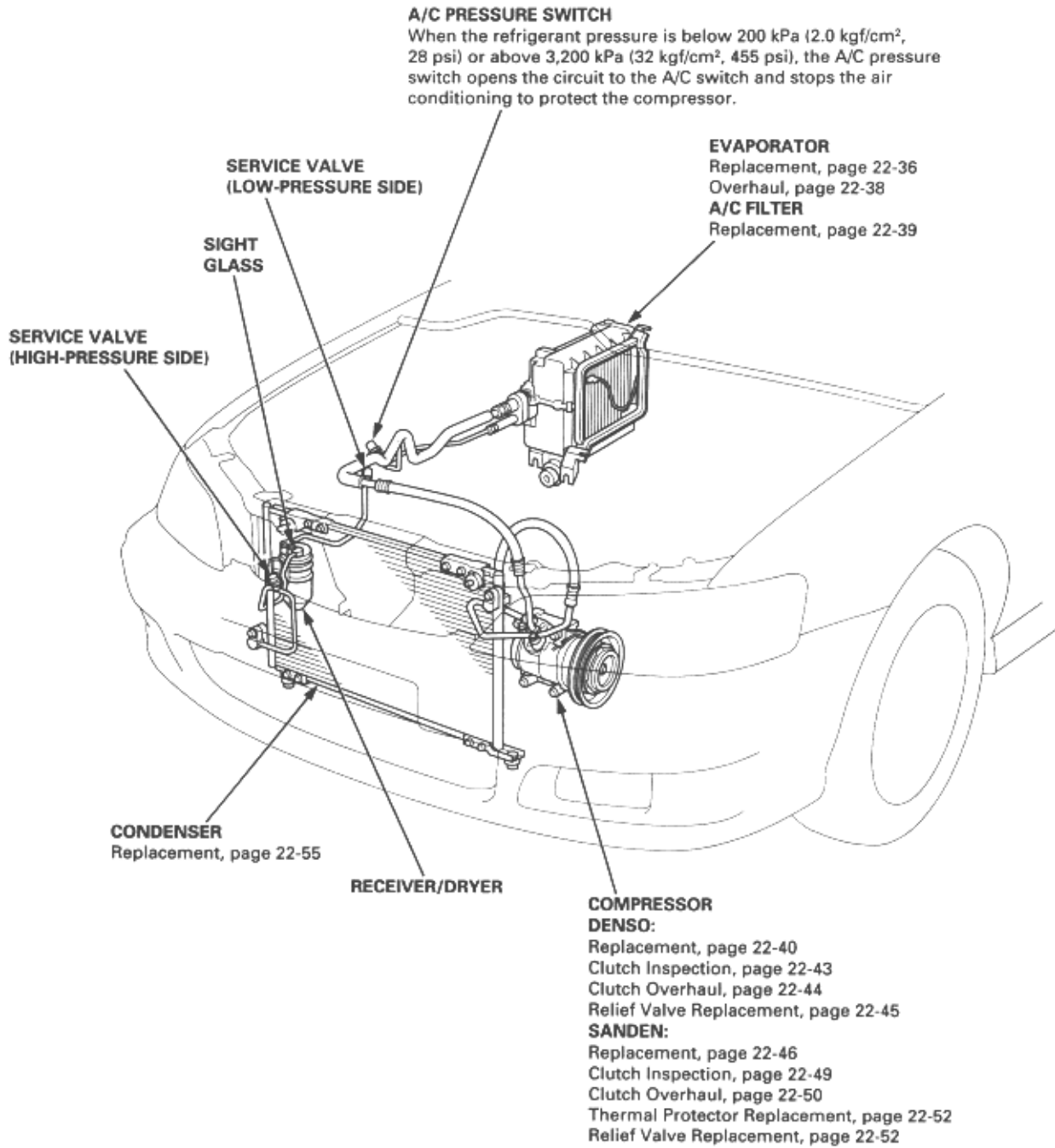


⑤



⑥

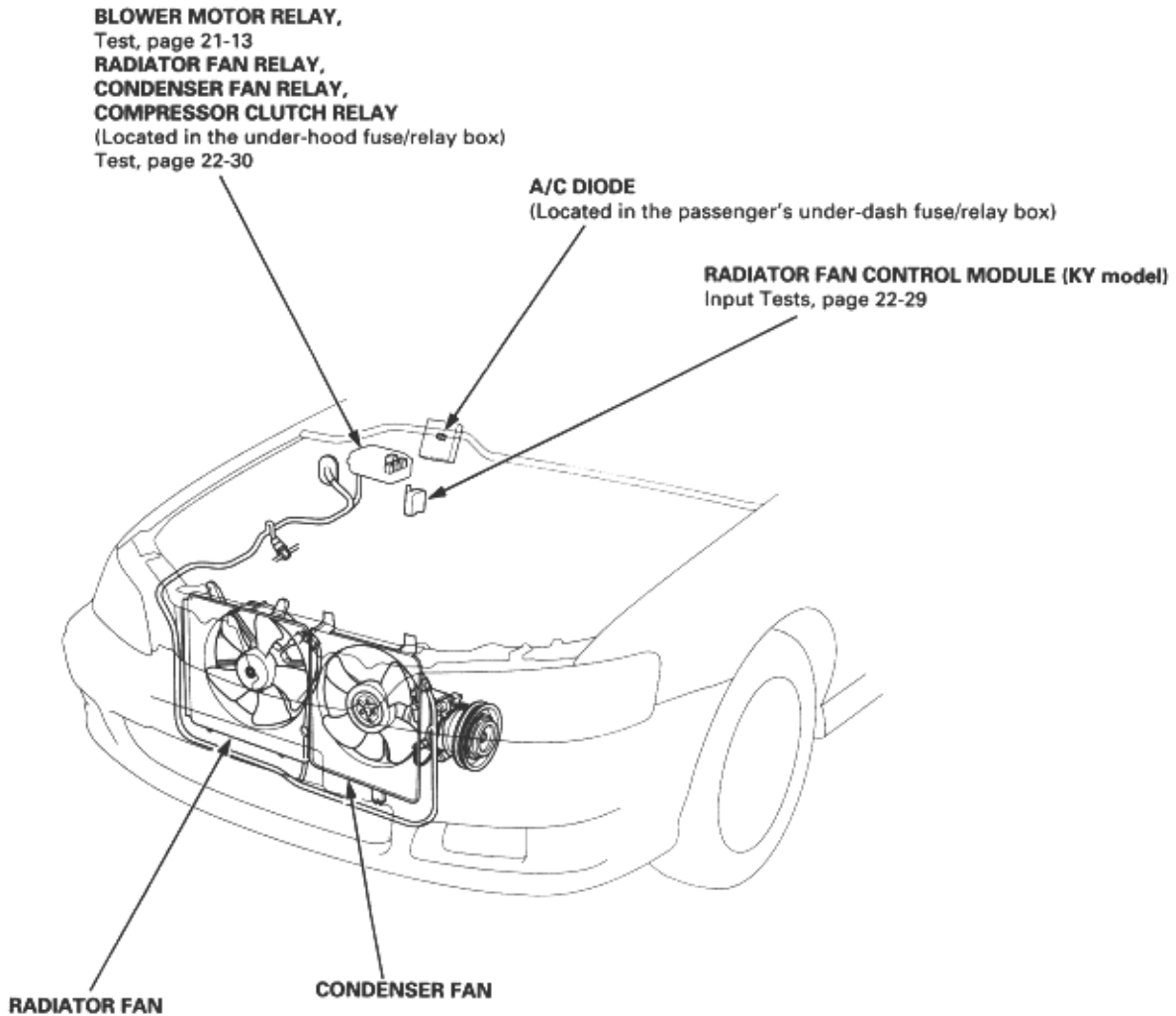
NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 22-36)
- (See Page 22-38)
- (See Page 22-39)
- (See Page 22-55)
- (See Page 22-40)
- (See Page 22-43)
- (See Page 22-44)
- (See Page 22-45)
- (See Page 22-46)
- (See Page 22-49)
- (See Page 22-50)
- (See Page 22-52)

NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above, click on the following:

(See Page 22-13)

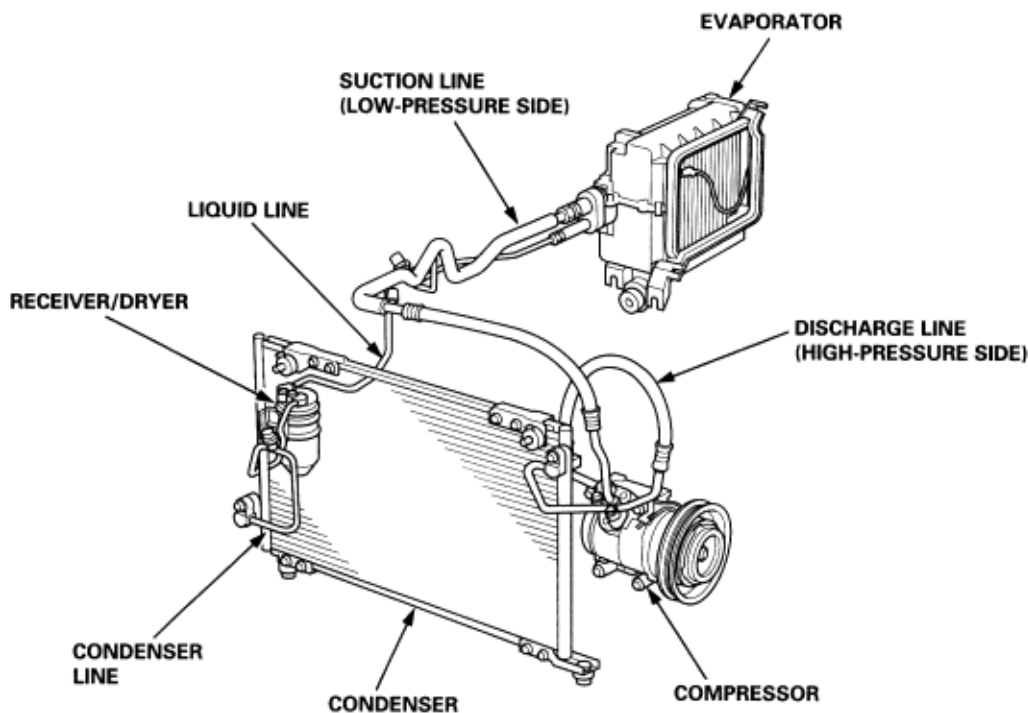
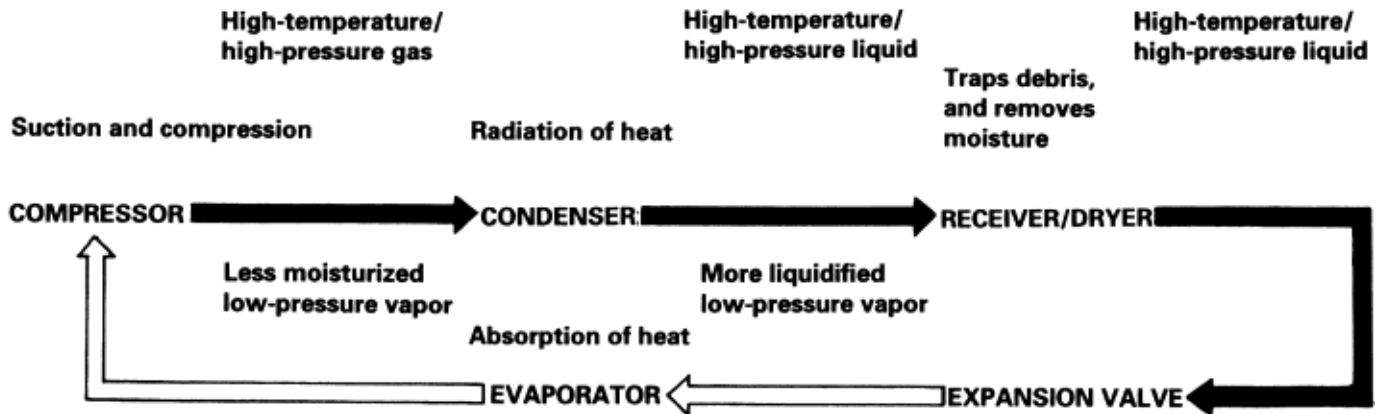
(See Page 22-30)

(See Page 22-29)

Description

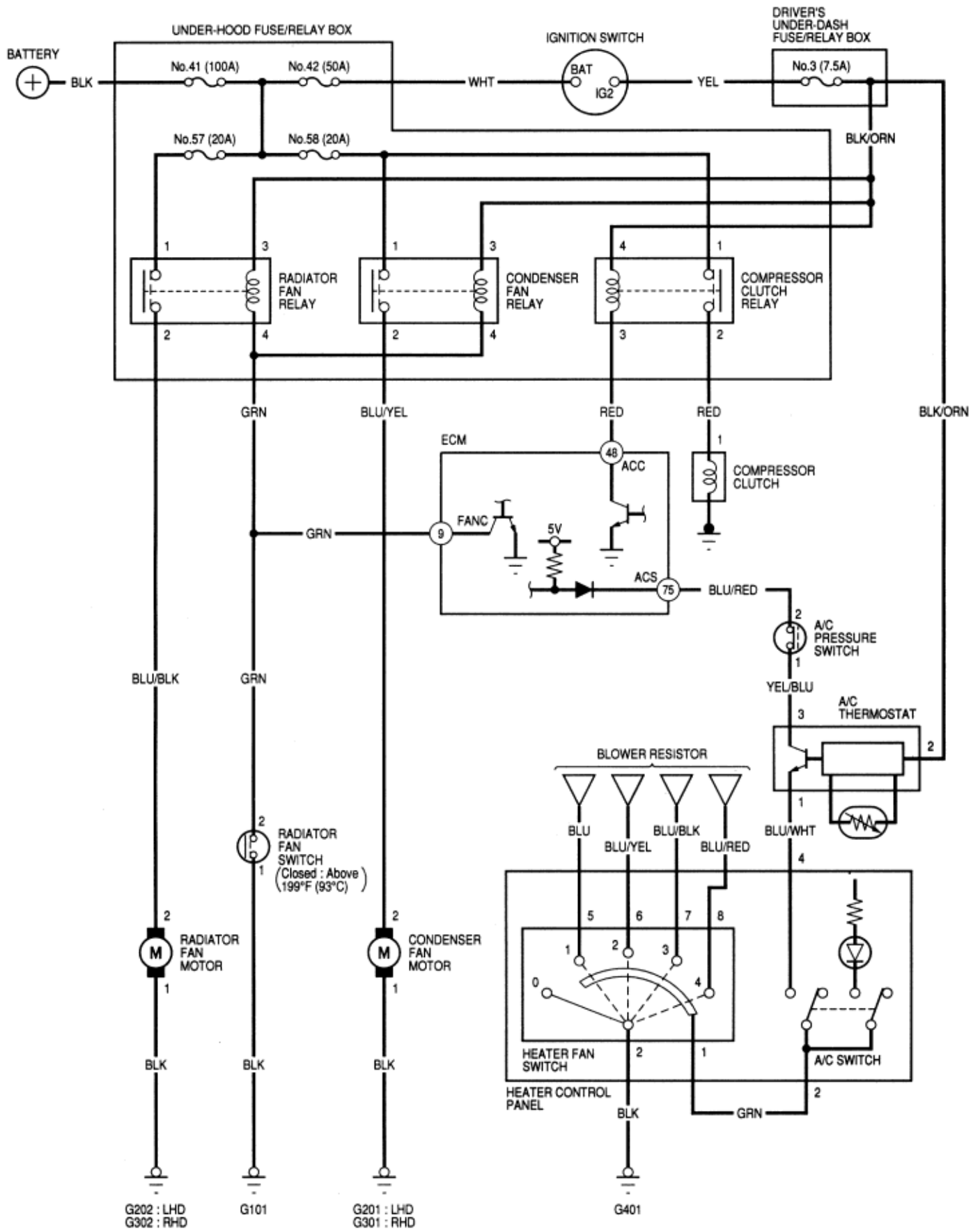
22-5

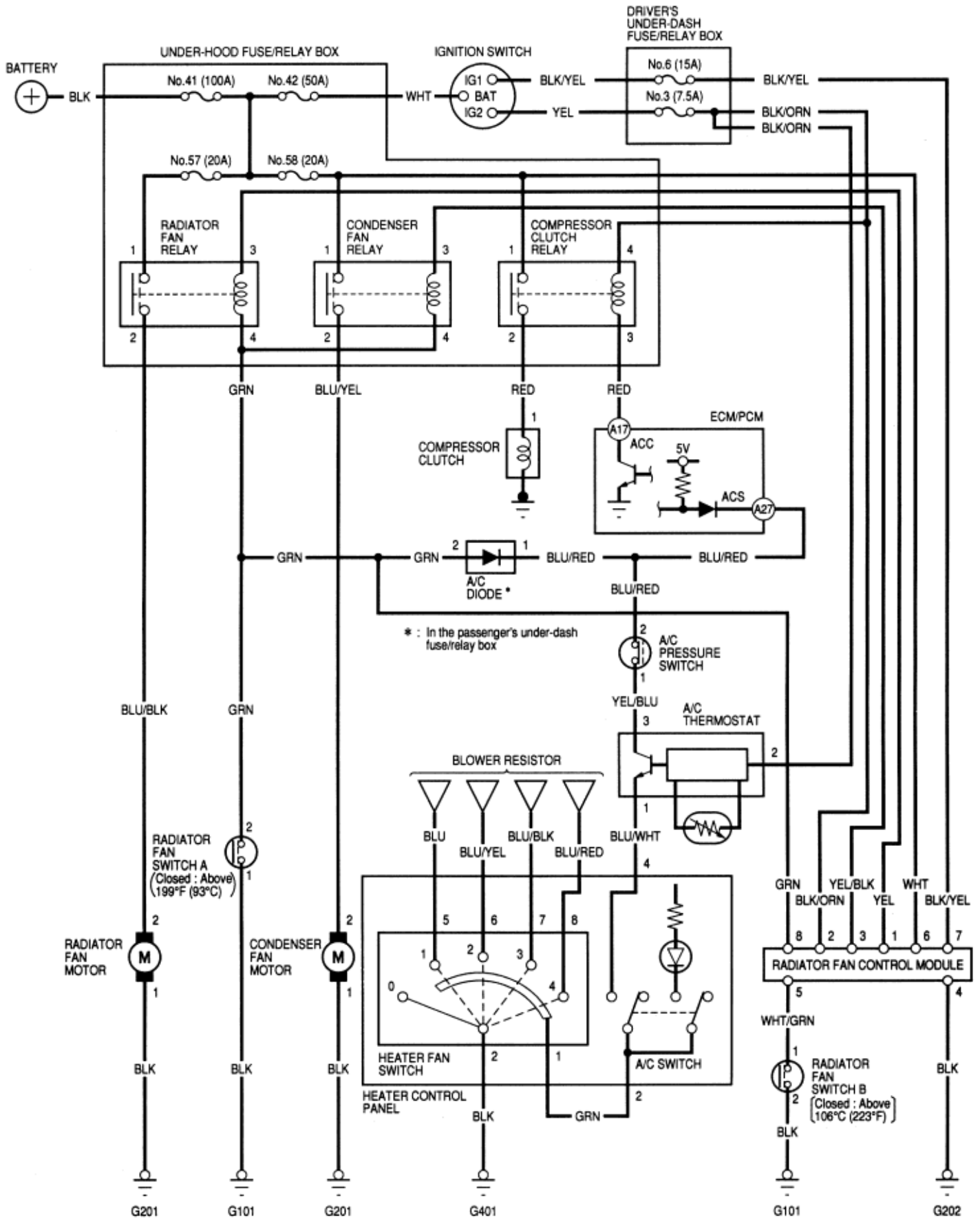
The air conditioner system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.

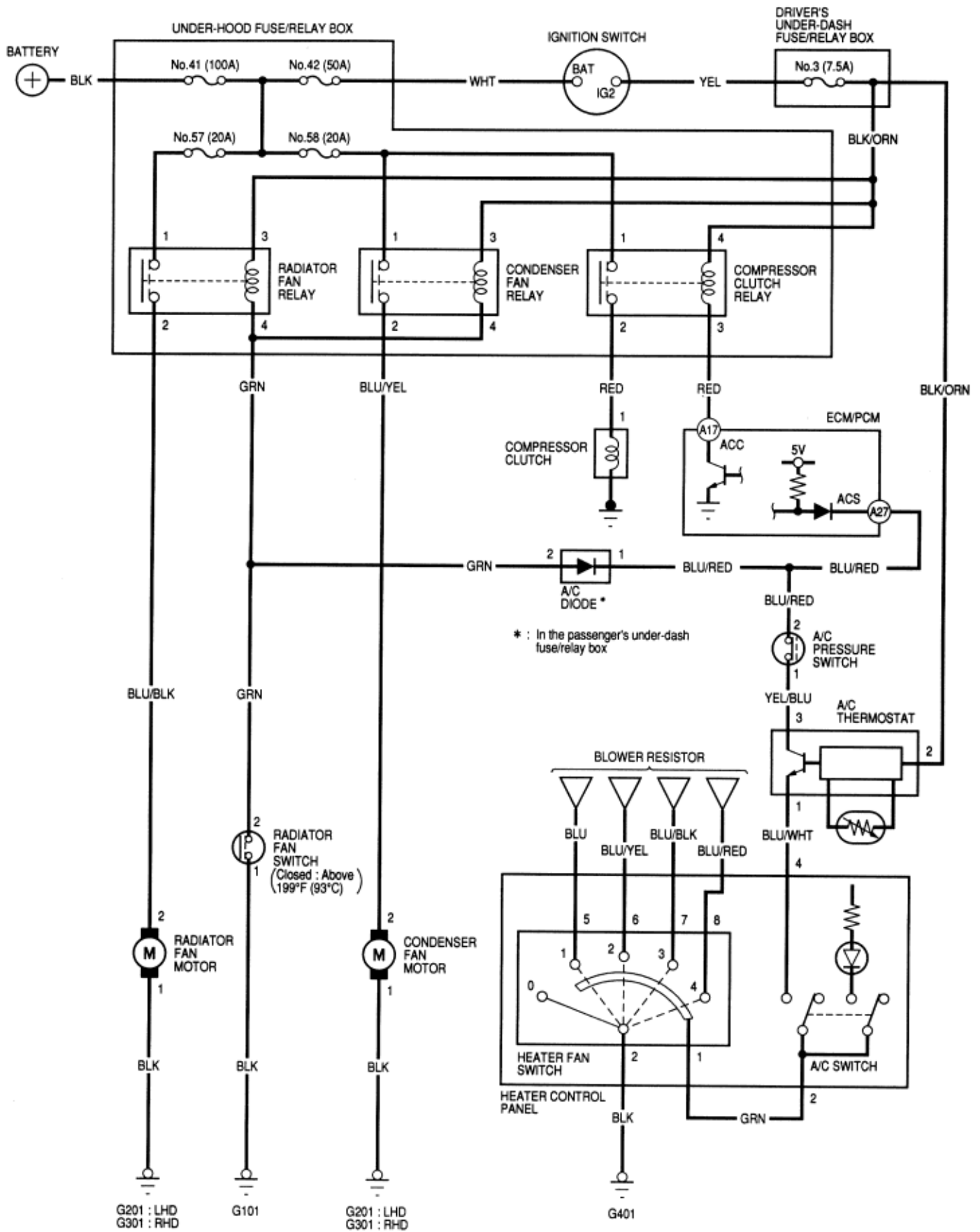


The vehicle uses HFC-134a (R-134a) refrigerant, which does not contain chlorofluorocarbons. Pay attention to the following service items:

- ♦ Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- ♦ Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (DENSO, ND-OIL 8 or SANDEN, SP-10) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- ♦ All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joint(s)) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- ♦ Use a halogen gas leak detector designed for refrigerant R-134a.
- ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
- ♦ Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.



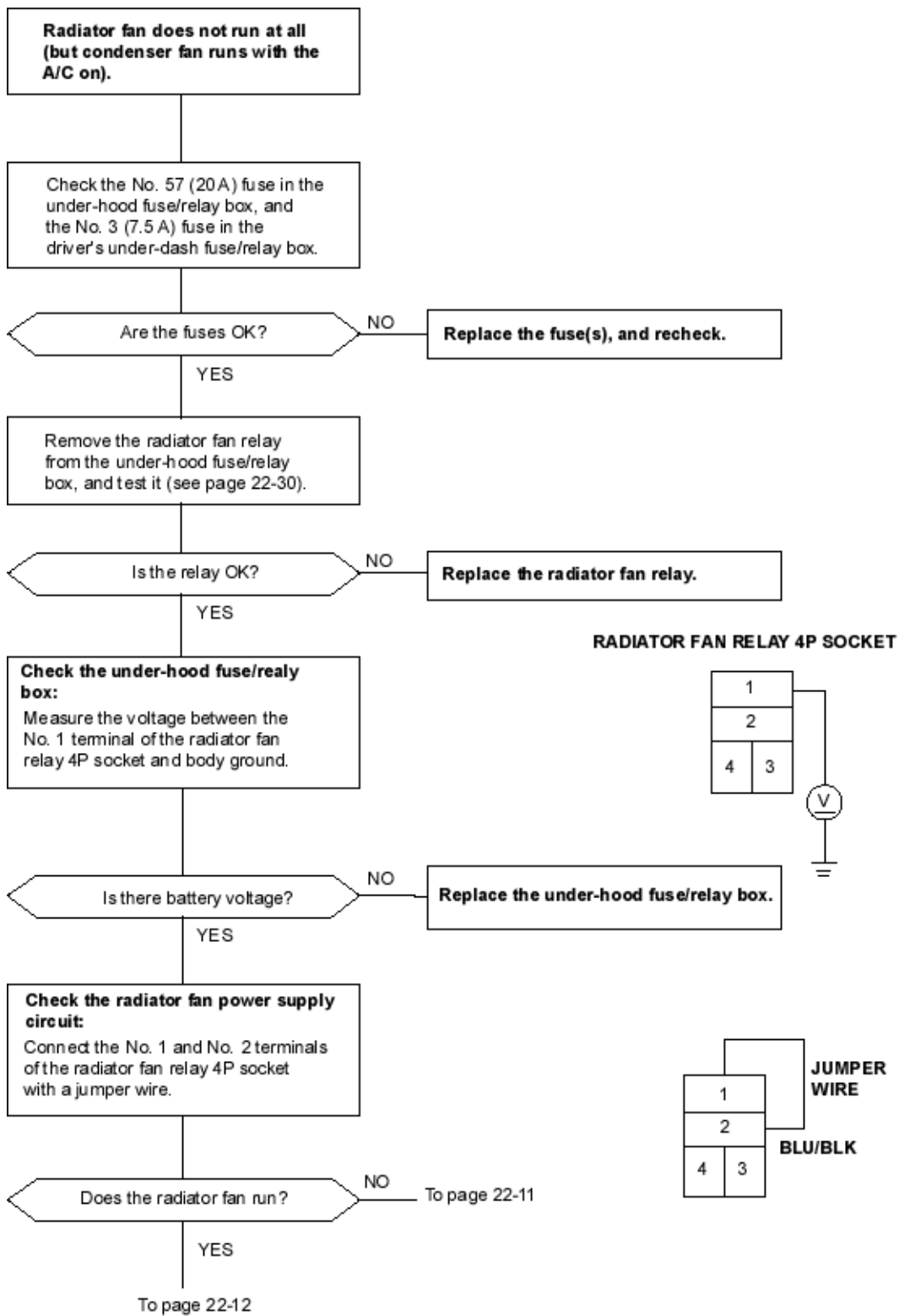


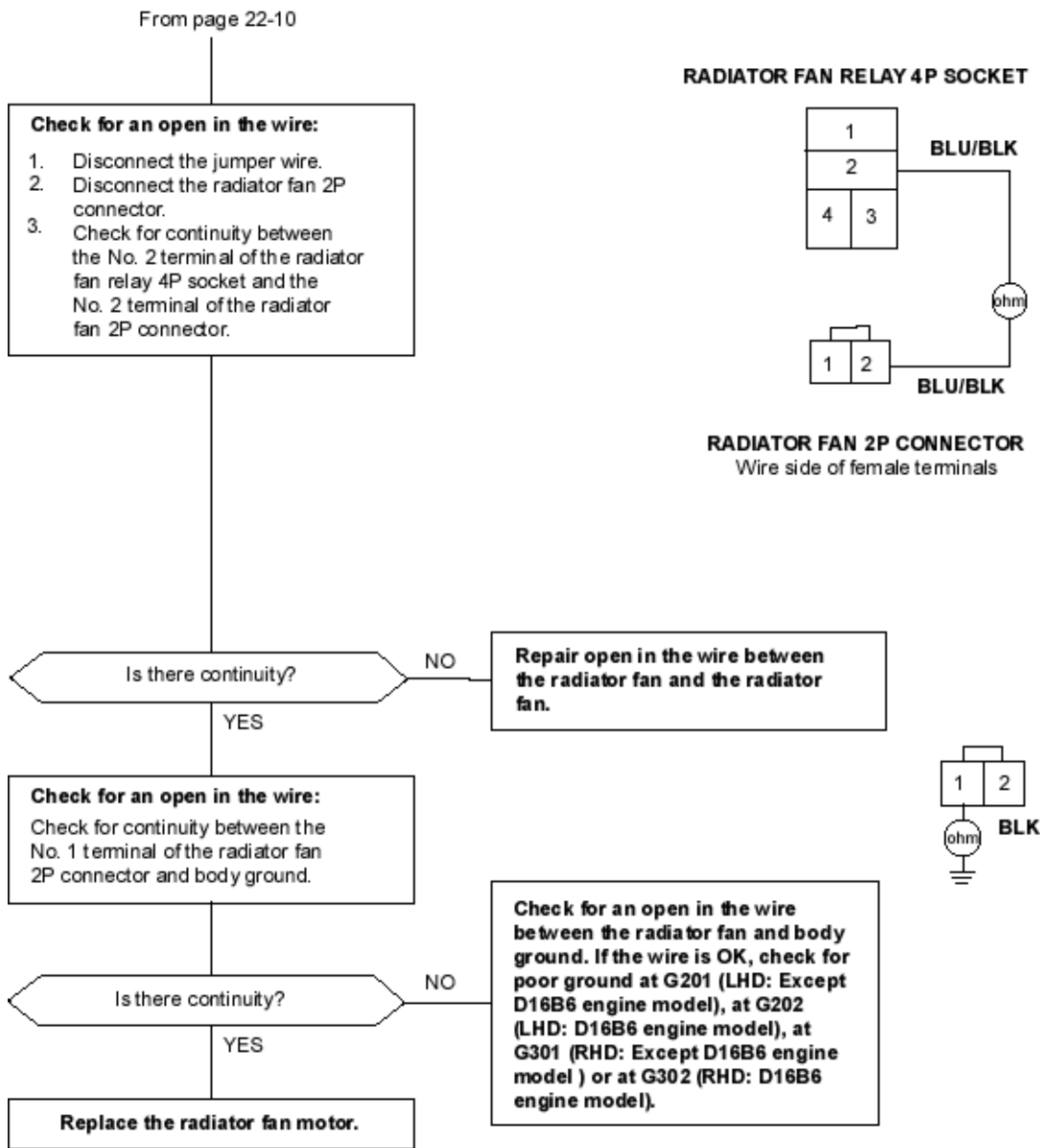


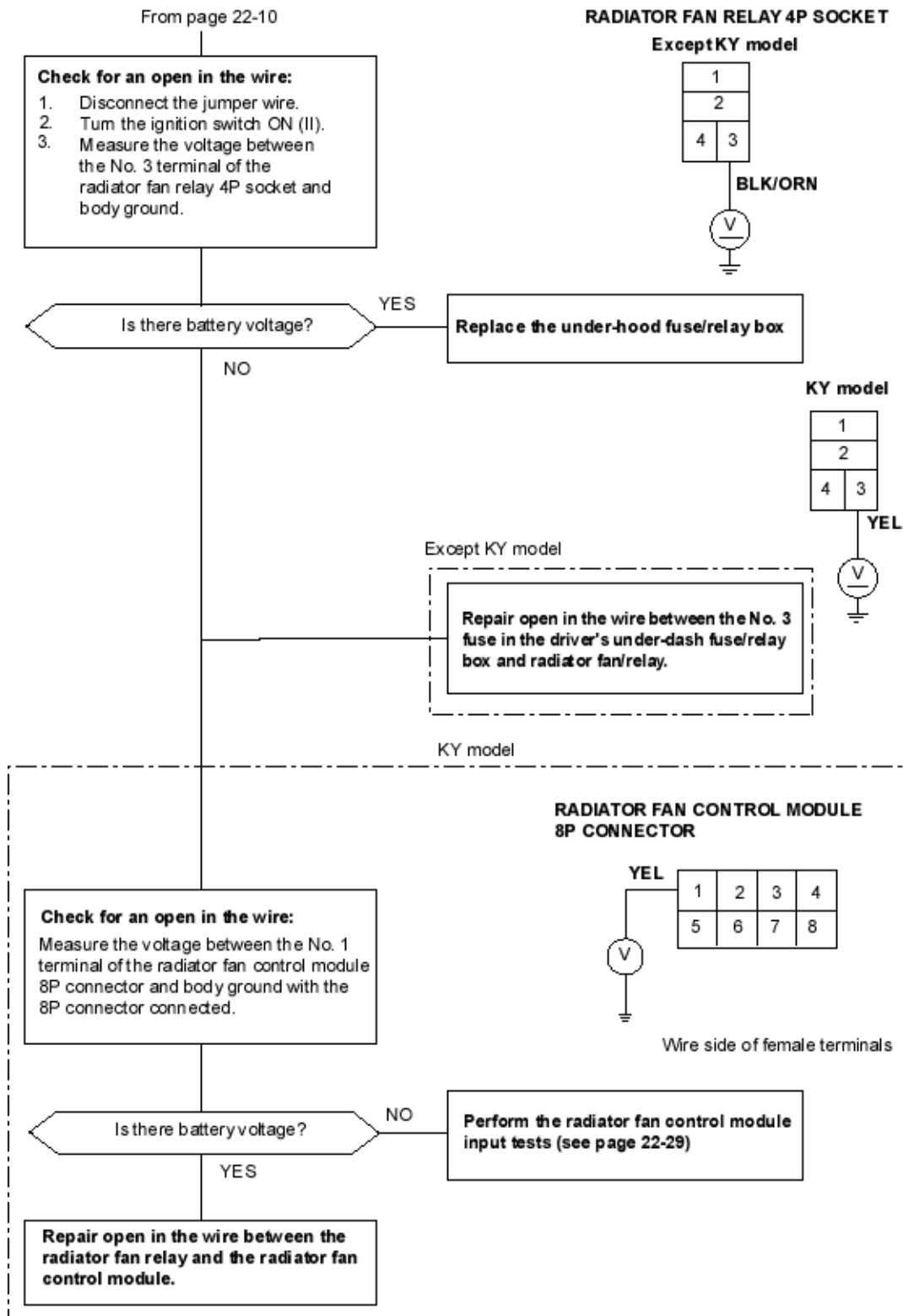
Note these items before troubleshooting a symptom.

- ♦ Check the engine coolant level, and allow the engine to warm up before troubleshooting.
- ♦ Any abnormality must be corrected before continuing the test.
- ♦ Because of the precise measurements needed, use a digital circuit tester when testing.
- ♦ Before performing any troubleshooting procedures check:
 - Fuses No. 57 (20 A), No. 58 (20 A) in the under-hood fuse/relay box, No. 3 (7.5 A) in the driver's under-dash fuse/relay box.
 - Grounds No. G101, G201 (LHD) G202 (LHD), G301 (RHD), G302 (RHD), G401
 - Cleanliness and tightness of all connectors

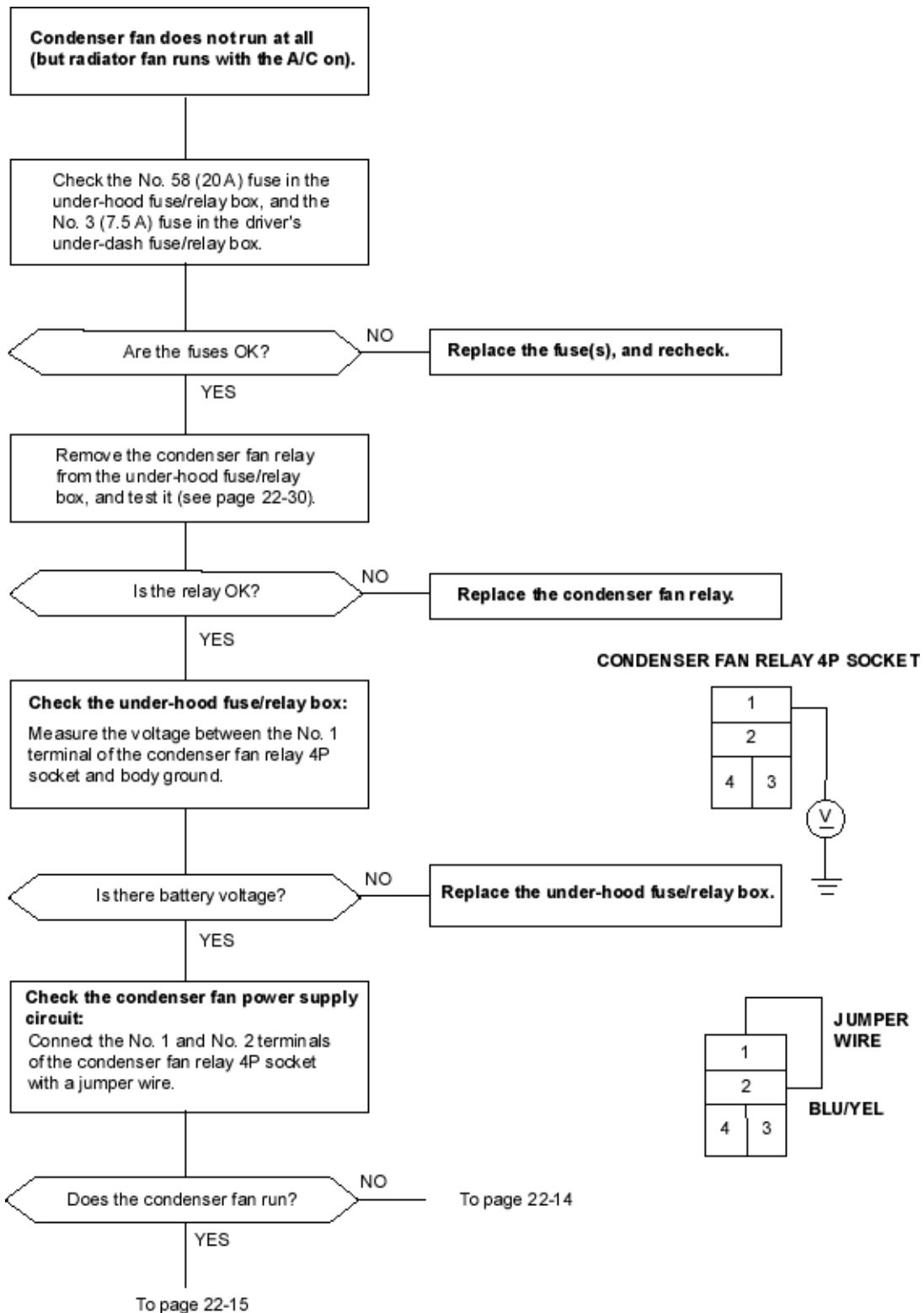
Symptom	See page
Radiator fan does not run at all (but condenser fan runs with A/C on).	(See Page 22-10)
Condenser fan does not run at all (but radiator fan runs with A/C on).	(See Page 22-13)
Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.	(See Page 22-16)
Both fans do not run with the A/C on.	(See Page 22-17)
Compressor clutch does not engage.	(See Page 22-21)
A/C system does not come on (both fans and compressor).	(See Page 22-25)



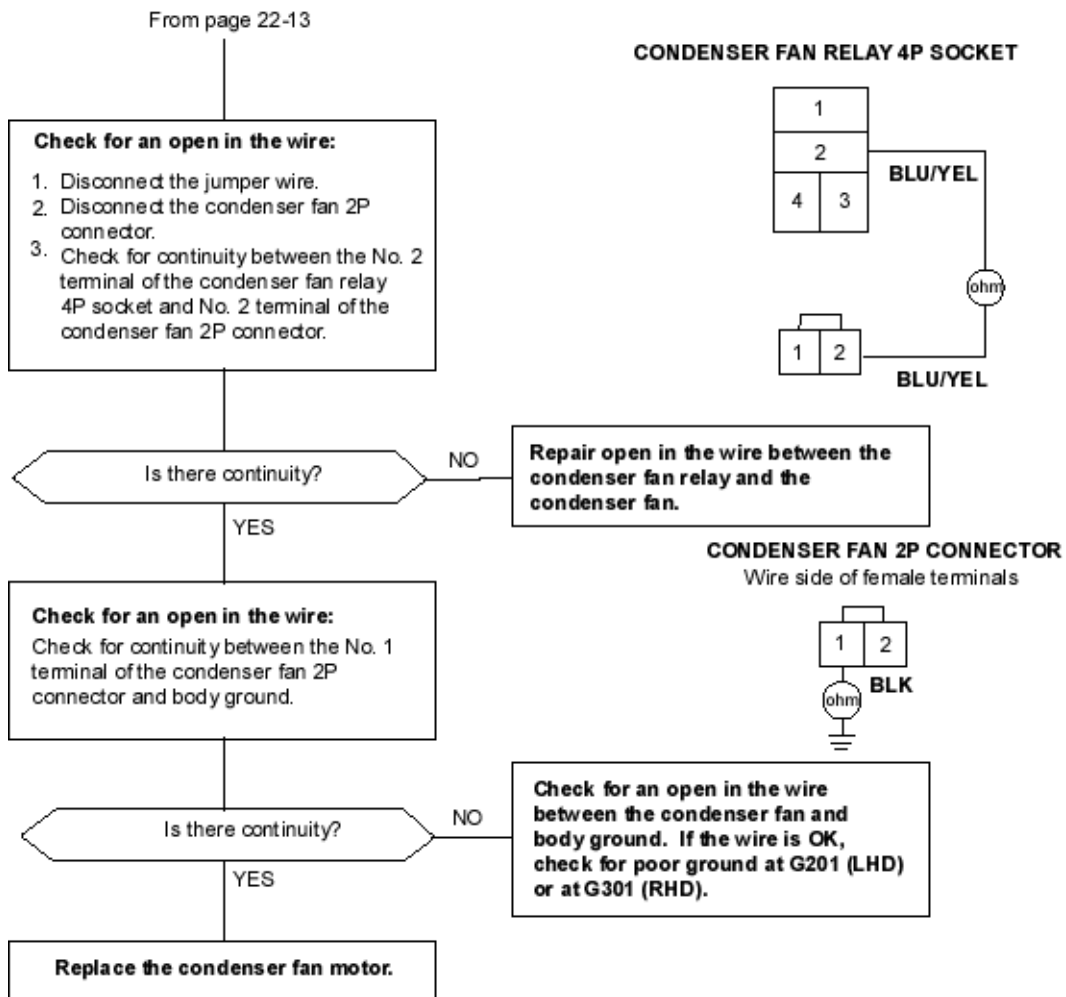


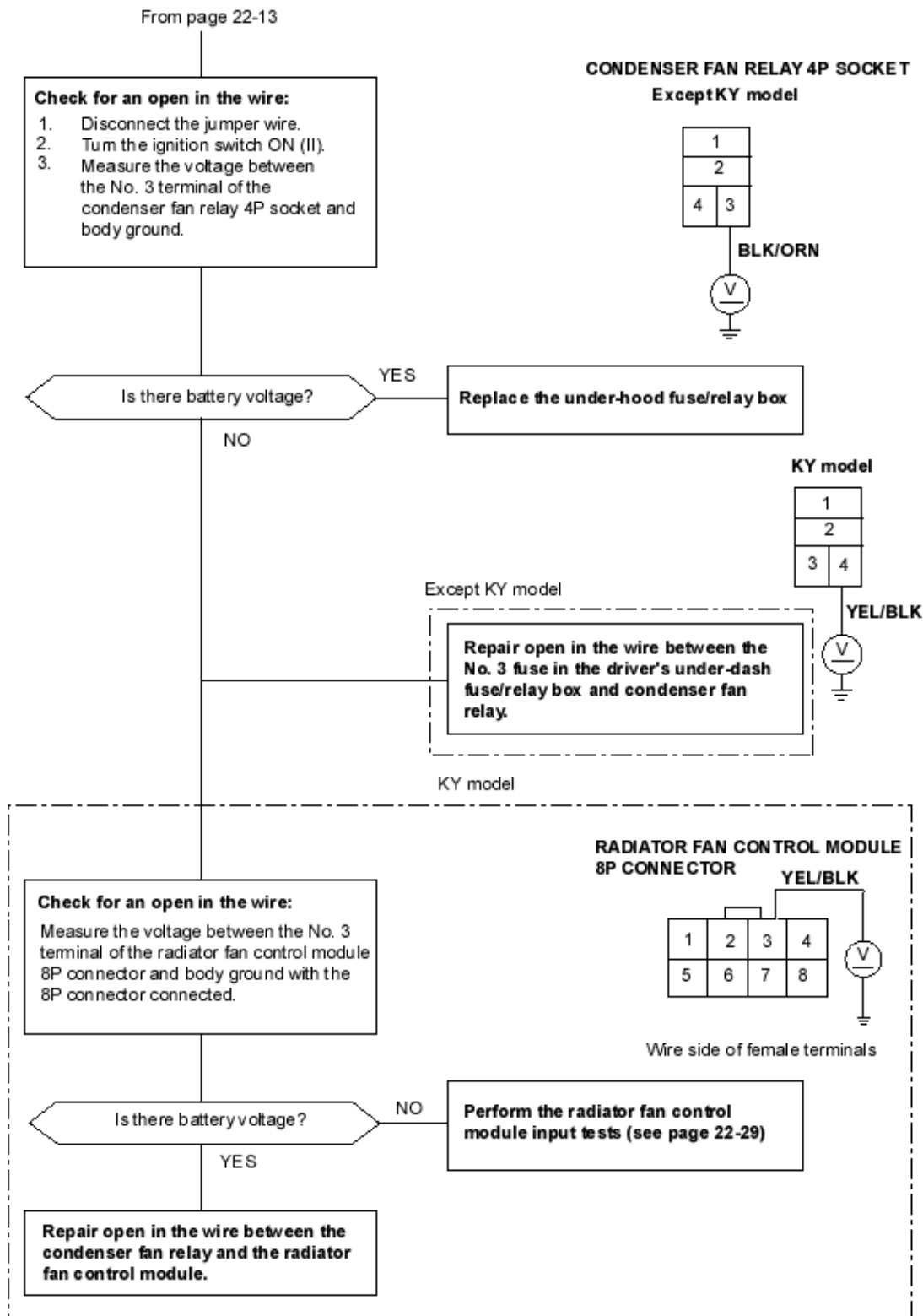


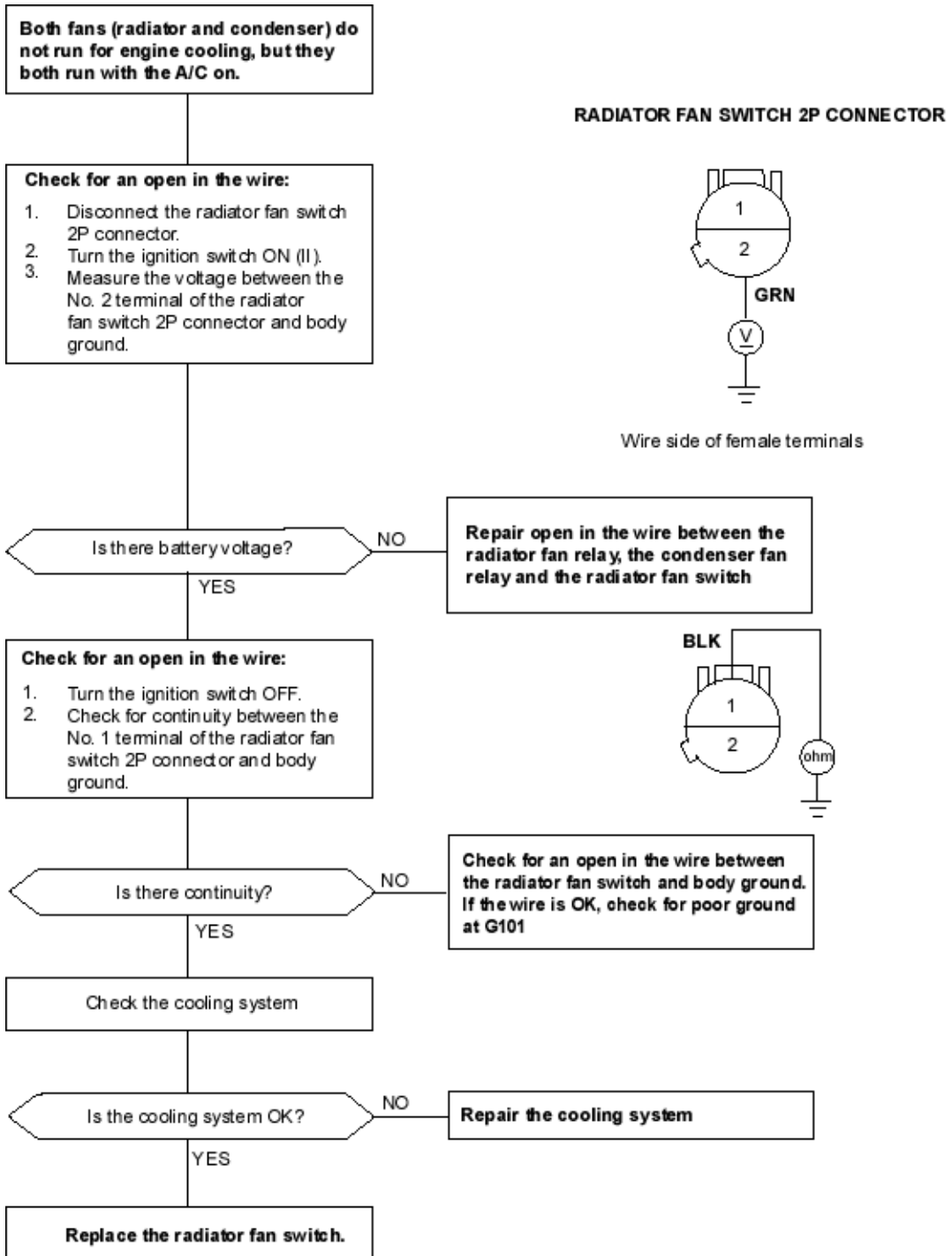
To go to the page referenced on the diagram above, click on the following:
(See Page 22-29)

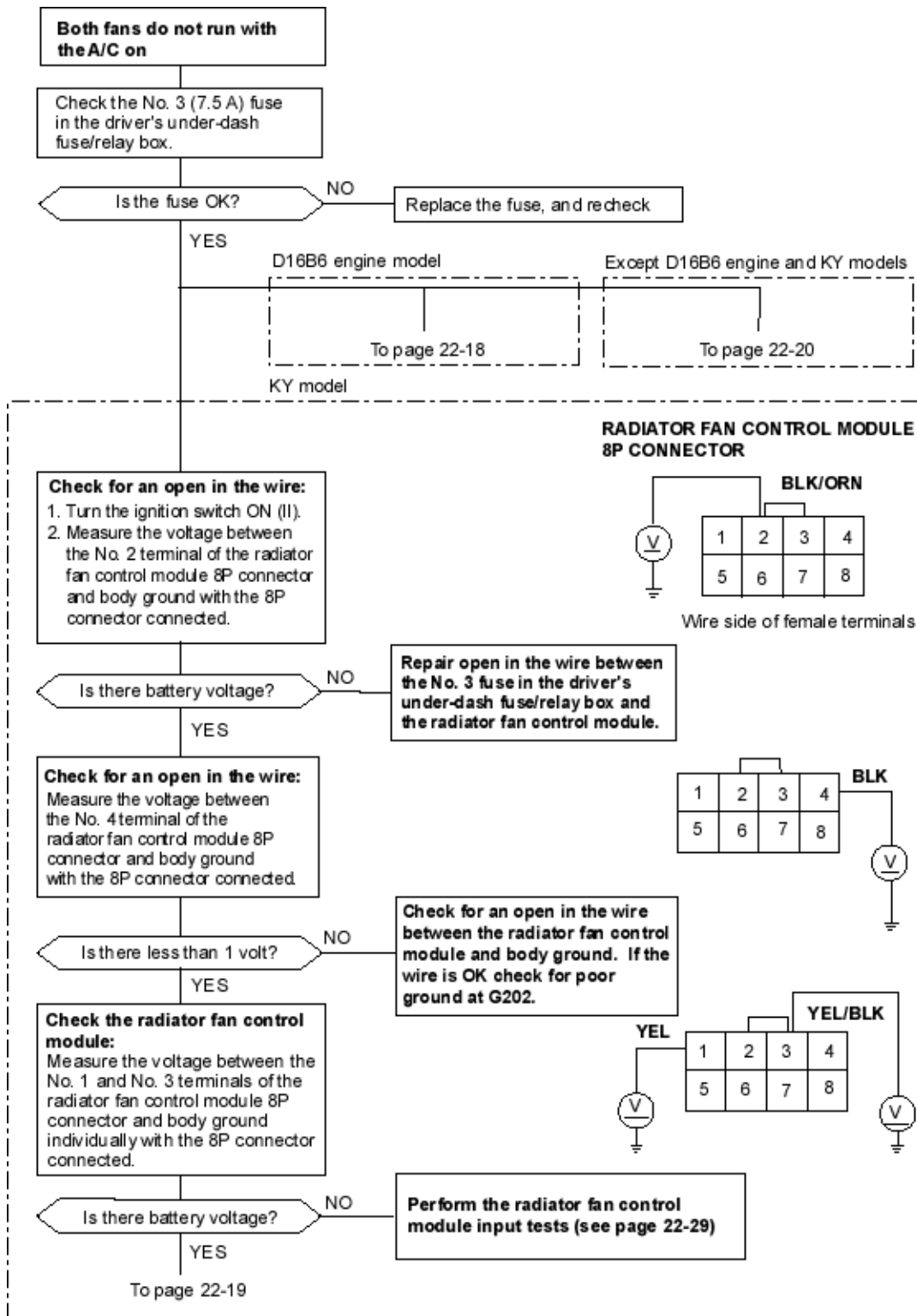


To go to the page referenced on the diagram above, click on the following:
(See Page 22-30)









To go to the pages referenced on the diagram above, click on the following:

(See Page 22-19)

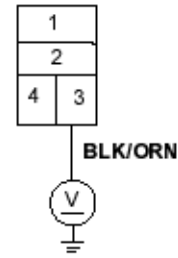
(See Page 22-20)

From page 22-17

Check for an open in the wire:

1. Remove the radiator fan relay from the under-hood fuse/relay box.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 3 terminal of the radiator fan relay 4P socket and body ground.

RADIATOR FAN RELAY 4P SOCKET



Is there battery voltage?

NO

Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the radiator fan relay.

YES

Check for an open in the wire:

1. Turn the ignition switch OFF, then reinstall the radiator fan relay.
2. Connect the ECM test harness and test pin box between the ECM and ECM connector (see section 11).
3. Make sure the A/C switch is OFF, then turn the ignition switch ON (II).
4. Measure the voltage between the No. 9 terminal of the test pin box and body ground.

Is there battery voltage?

NO

Repair open in the wire between the radiator fan relay, the condenser fan relay and the ECM.

YES

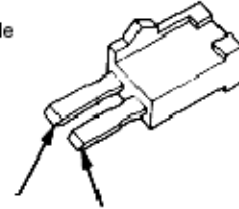
Check for loose wires or poor connections at the ECM connector. If the connections are good, substitute a known-good ECM, and recheck. If the symptom/indication goes away, replace the original ECM.

From page 22-17

Check the A/C diode:

1. Turn the ignition switch OFF.
2. Remove the A/C diode from the passenger's under-dash fuse/relay box.
3. Check for current flow in both directions between the A and B terminals.

NOTE: Use a circuit tester with diode checking capabilities.



Is there current flow in only one direction?

NO

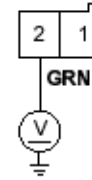
Replace the A/C diode.

YES

Check for an open in the wire:

1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 2 terminal of the A/C diode 2P socket and body ground.

A/C DIODE 2P SOCKET



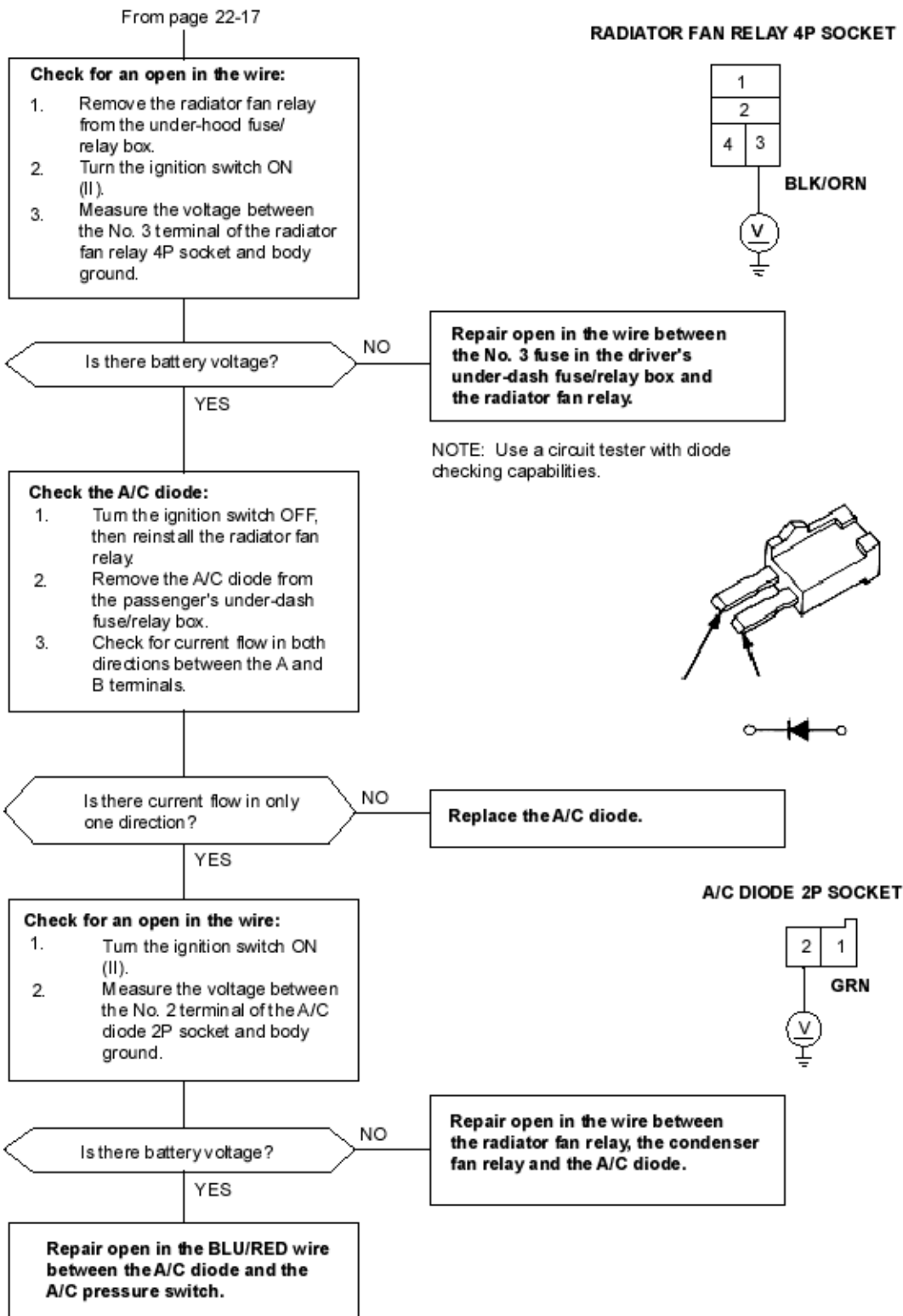
Is there battery voltage?

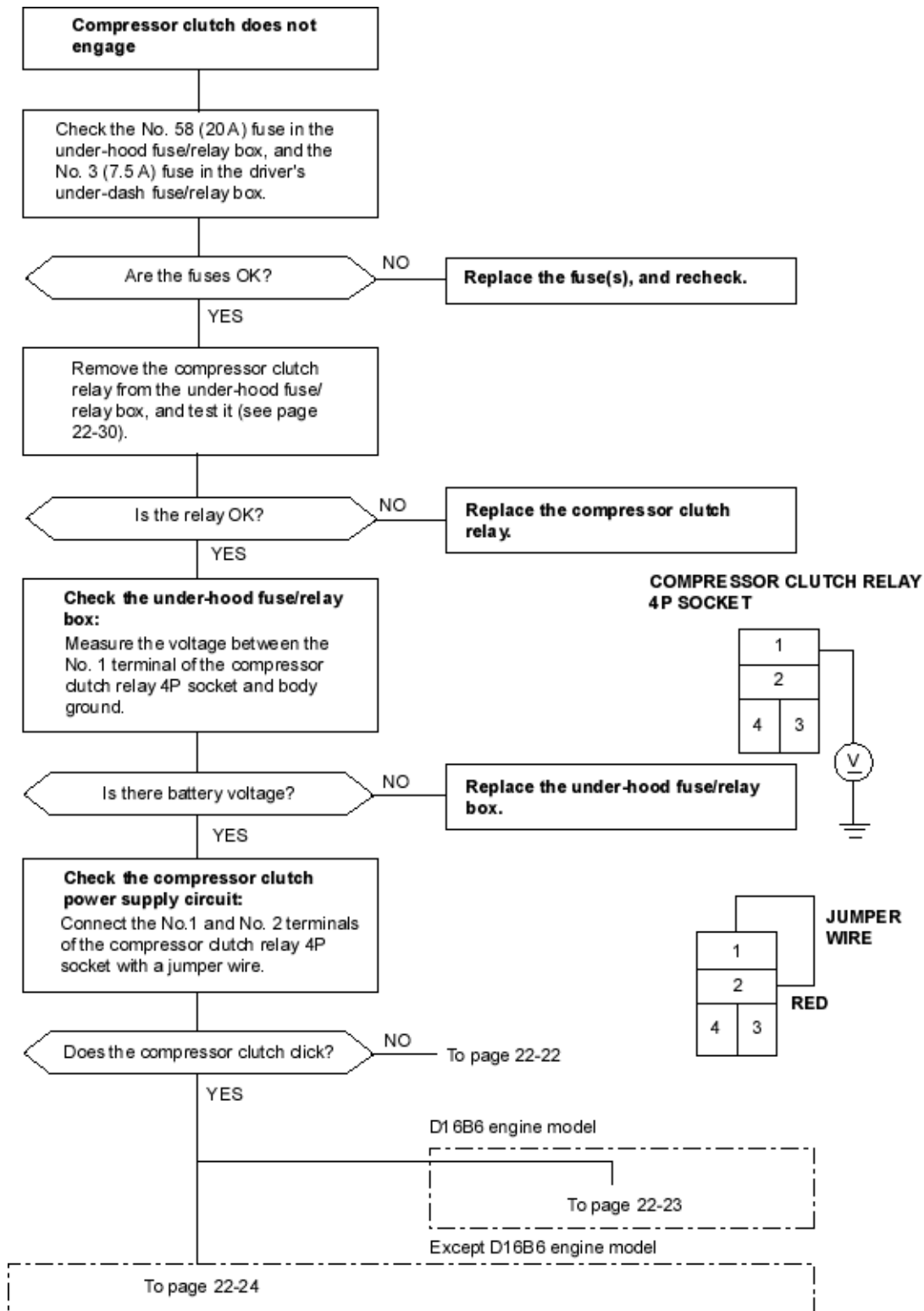
NO

Repair open in the wire between the radiator fan relay, the condenser fan relay and the A/C diode.

YES

Repair open in the BLU/RED wire between the A/C diode and the A/C pressure switch.



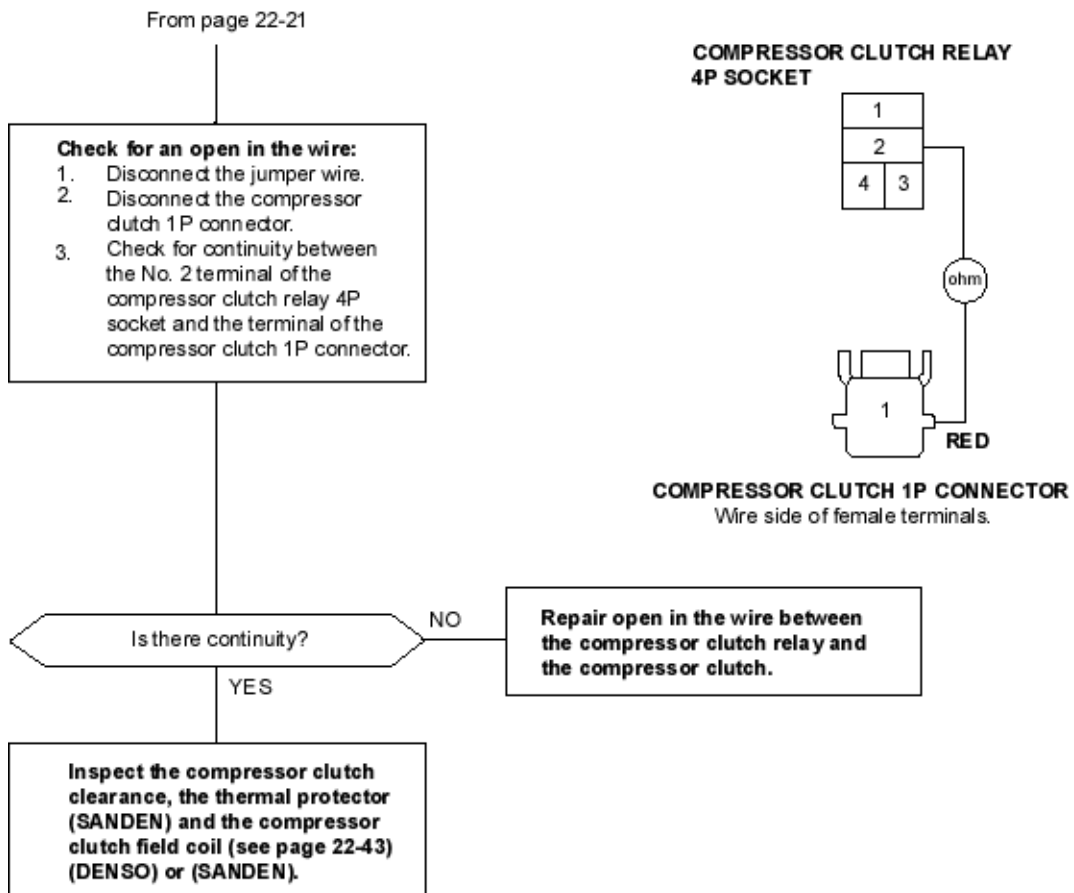


To go to the pages referenced on the diagram above, click on the following:

(See Page 22-30)

(See Page 22-23)

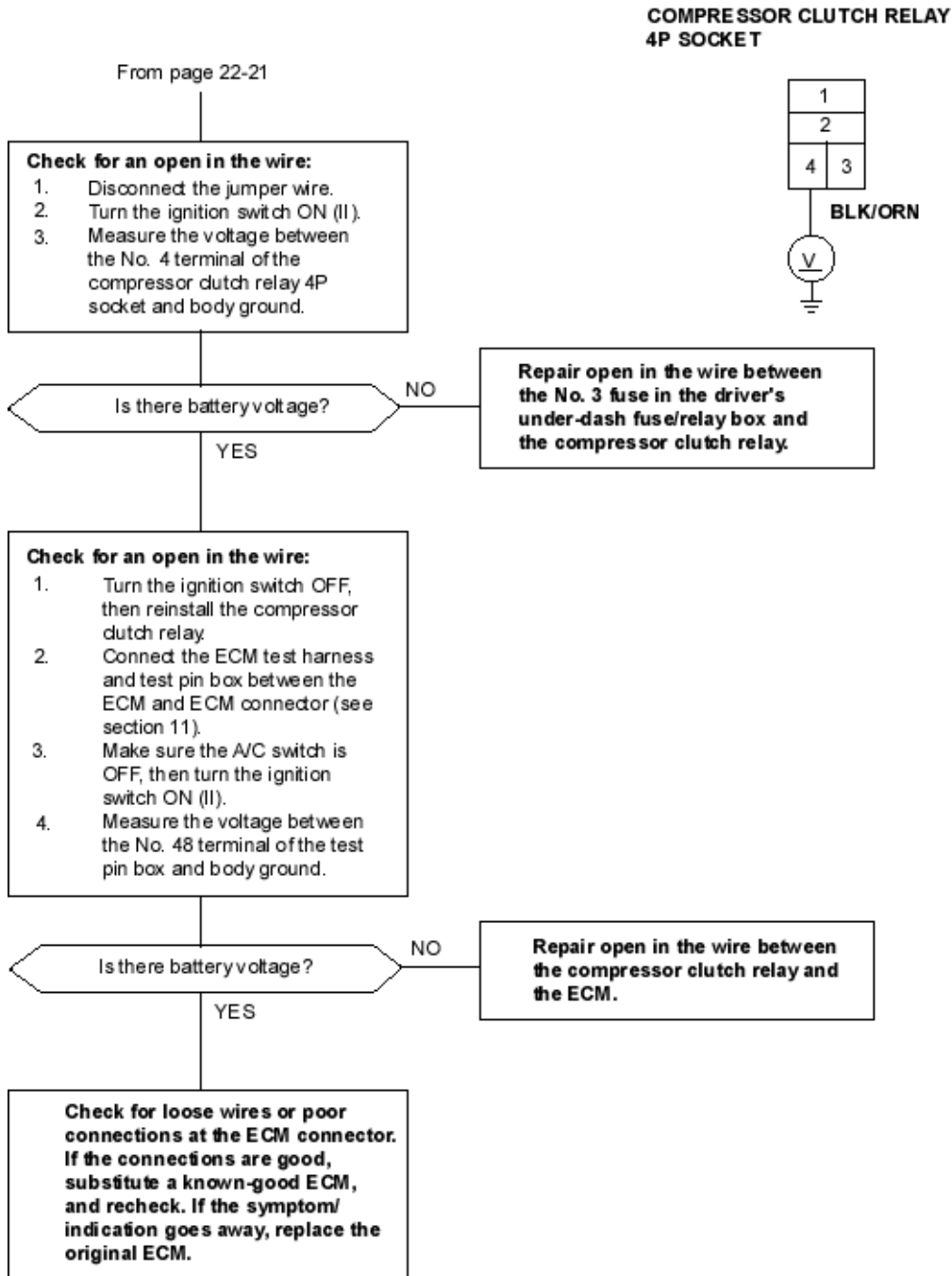
(See Page 22-24)

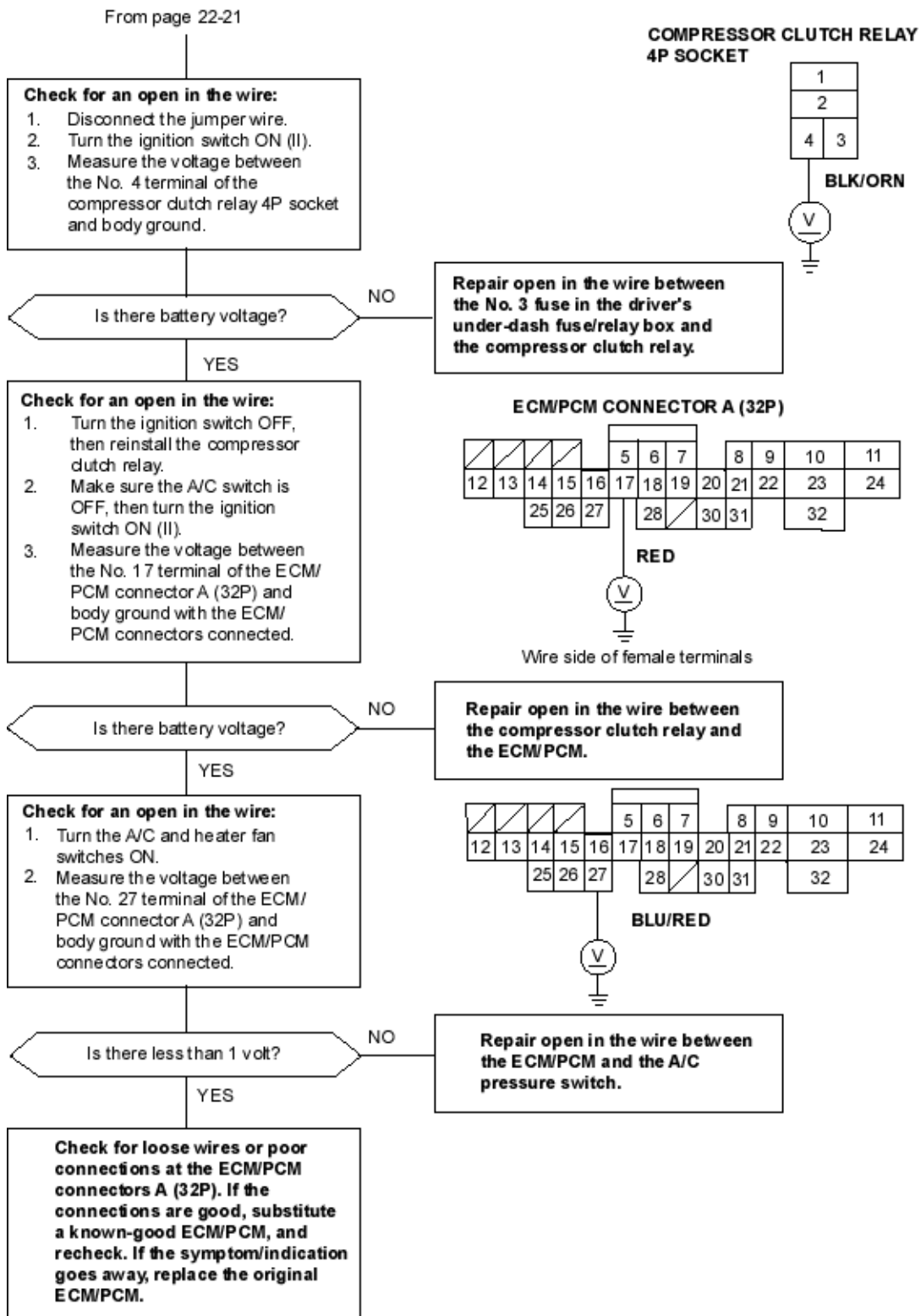


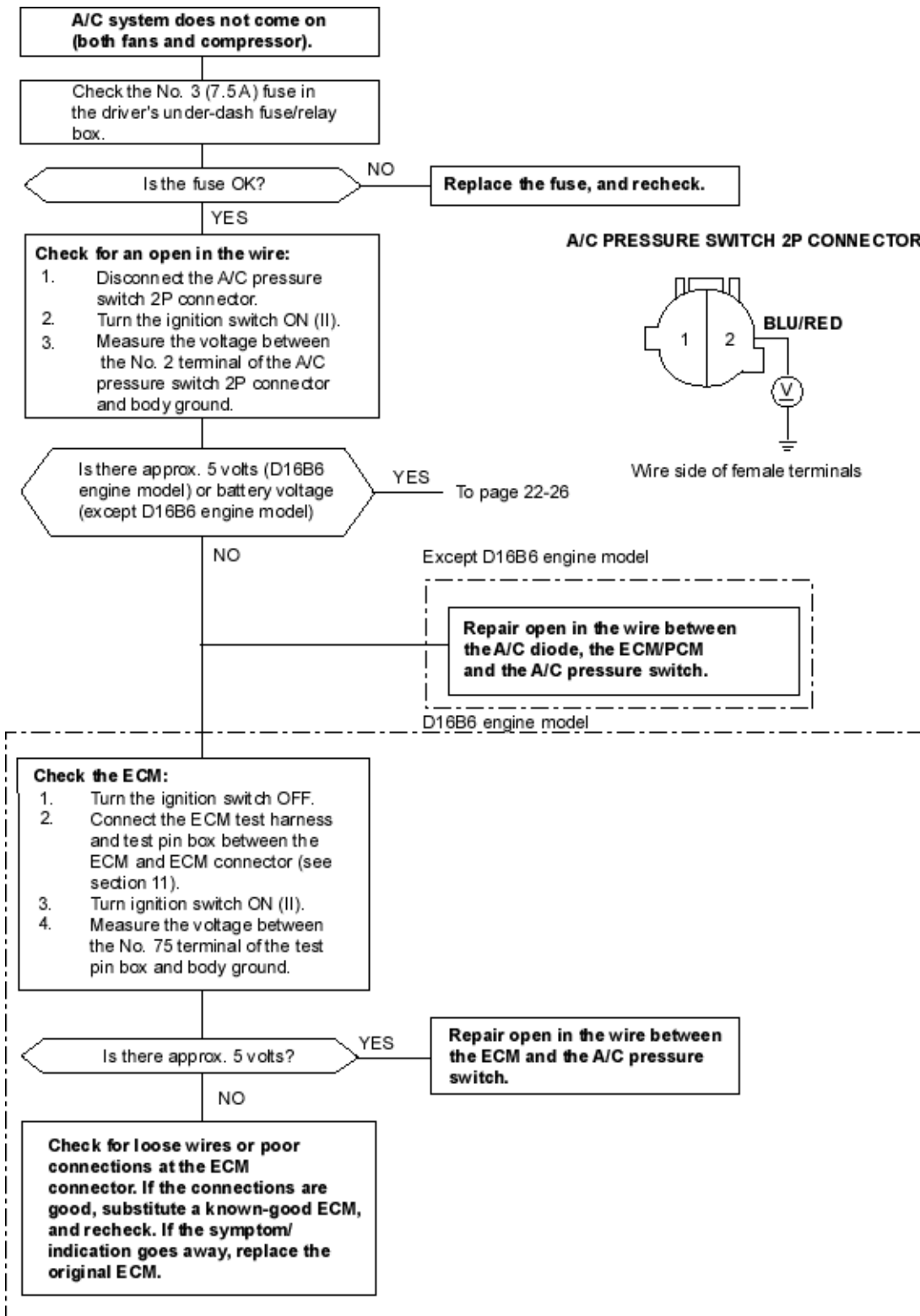
To go to the pages referenced on the diagram above, click on the following:

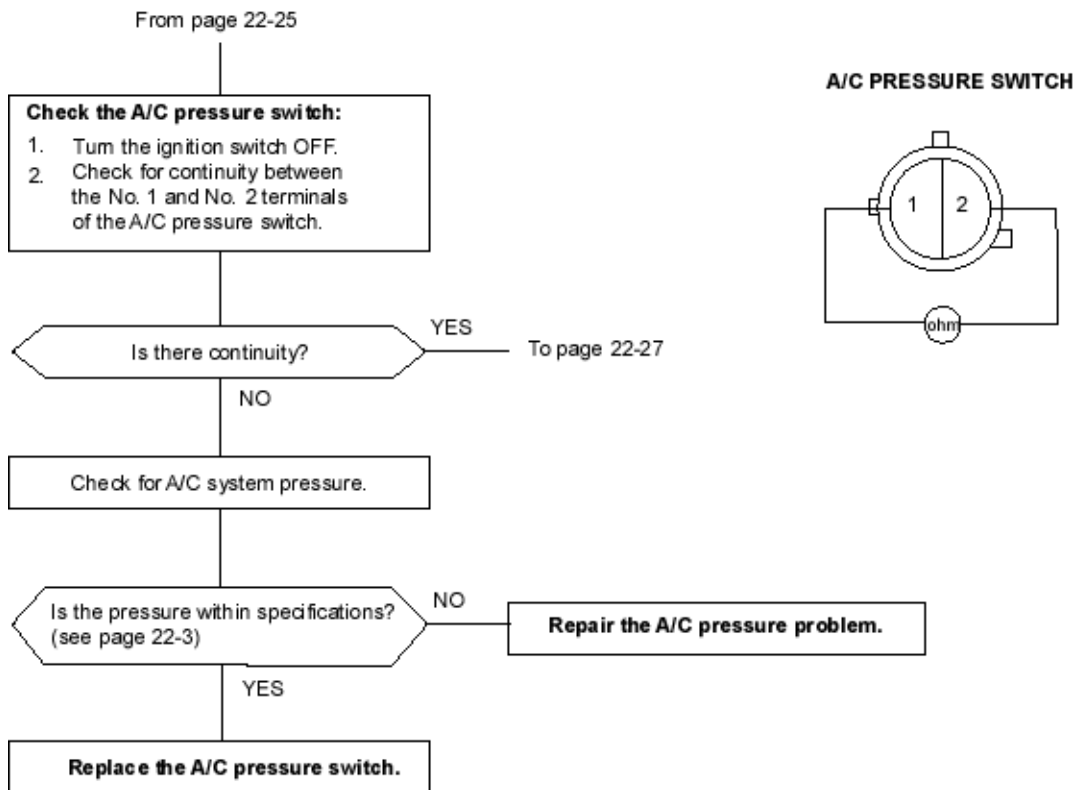
(See Page 22-43)

(See Page 22-49)









To go to the page referenced on the diagram above, click on the following:
(See Page 22-3)

From page 22-26

Check for an open in the wire:

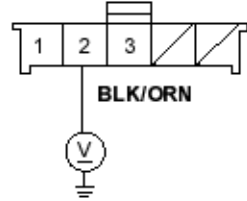
1. Reconnect the A/C pressure switch 2P connector.
2. Disconnect the A/C thermostat 5P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 2 terminal of the A/C thermostat 5P connector and body ground.

Is there a battery voltage?

NO

Repair open in the wire between the No. 3 fuse in the driver's under-dash fuse/relay box and the A/C thermostat.

A/C THERMOSTAT 5P CONNECTOR

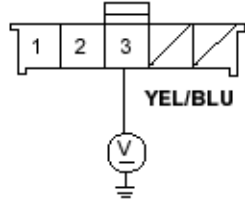


Check for an open in the wire:
Measure the voltage between the No. 3 terminal of the A/C thermostat 5P connector and body ground.

Is there approx. 5 volts (D16B6 engine model) or battery voltage (except D16B6 engine model)?

NO

Repair open in the wire between the A/C pressure switch and the A/C thermostat.



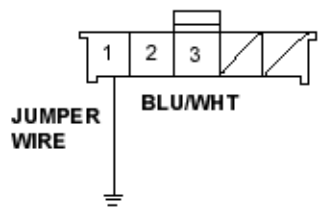
Check the A/C thermostat

1. Turn the ignition switch OFF.
2. Reconnect the A/C thermostat 5P connector.
3. Connect the No. 1 terminal of the A/C thermostat 5P connector to body ground with a jumper wire.
4. Start the engine.

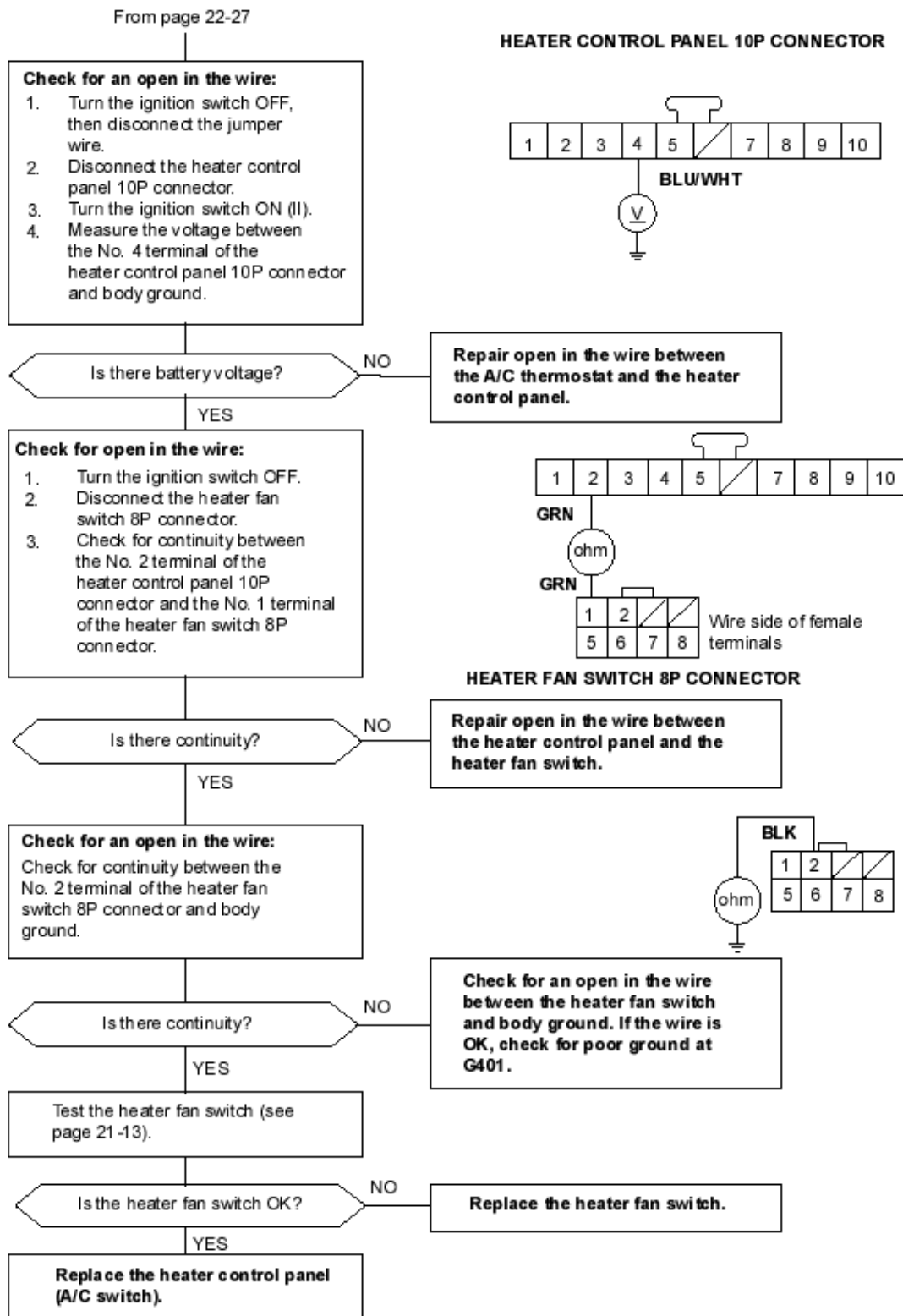
Do the radiator and condenser fans run and the compressor clutch engage?

NO

Replace the A/C thermostat.



To page 22-28



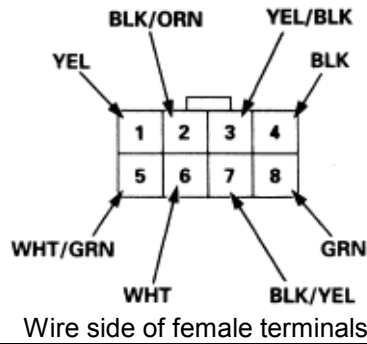
To go to the page referenced on the diagram above, click on the following:
(See Page 21-13)

Troubleshooting

22-29

Radiator Fan Control Module Input Tests (KY model)

NOTE: Perform the following tests with the radiator fan control module 8P connector connected, the ignition switch ON (II), and the A/C switch OFF. If you find the cause of a problem, correct it before you continue.



Cavity	Wire colour	Test condition	Desired result	Corrective action if desired results are not obtained
4	BLK	Check for voltage to body ground.	There should be less than one volt.	Repair open to body ground.
6	WHT	Check for battery voltage.	There should be battery voltage.	Check No. 58 (20A) fuse in the under-hood fuse/relay box; if OK, repair open in the WHT wire.
7	BLK/YEL	Check for battery voltage; Ignition switch ON (II)	There should be battery voltage.	Check No. 6 (15A) fuse in the driver's under-dash fuse/relay box; if OK, repair open in the BLK/YEL wire.
2	BLK/ORN	Check for battery voltage; Ignition switch ON (II)	There should be battery voltage.	Check No. 3 (7.5A) fuse in the driver's under-dash fuse/relay box; if OK, repair open in the BLK/ORN wire.
3	YEL/BLK	Check for battery voltage; Ignition switch ON (II)	There should be battery voltage.	Replace the radiator fan control module. Before you connect the new radiator fan control module, disconnect both fan relays. Check for continuity between the YEL/BLK (or YEL) wire and ground, using the 20 k ohm scale on your ohmmeter. There should be no continuity, If there is continuity, the new radiator fan control module will be damaged when you connect it.
1	YEL	Check for battery voltage; Ignition switch ON (II)	There should be battery voltage.	Replace the radiator fan control module. Before you connect the new radiator fan control module, disconnect both fan relays. Check for continuity between the YEL/BLK (or YEL) wire and ground, using the 20 k ohm scale on your ohmmeter. There should be no continuity, If there is continuity, the new radiator fan control module will be damaged when you connect it.
8	GRN	Connect to body ground; Ignition switch ON (II)	Condenser fan and radiator fan should come on.	Check for an open in the GRN wire between the radiator fan control module and the condenser fan relay and the radiator fan relay. If OK, check for an open in the YEL/BLK wire between the radiator fan control module and the condenser fan relay (or the YEL wire between the radiator fan control module and the radiator fan relay). If OK, test the condenser fan relay or the radiator fan relay.
5	WHT/GRN	Check for voltage.	Approx. 11V (engine coolant temperature below 106°C (223°F).	Faulty radiator fan switch B, short to body ground, or faulty radiator fan control module.

A/C Thermostat Test

22-30

Relays Test

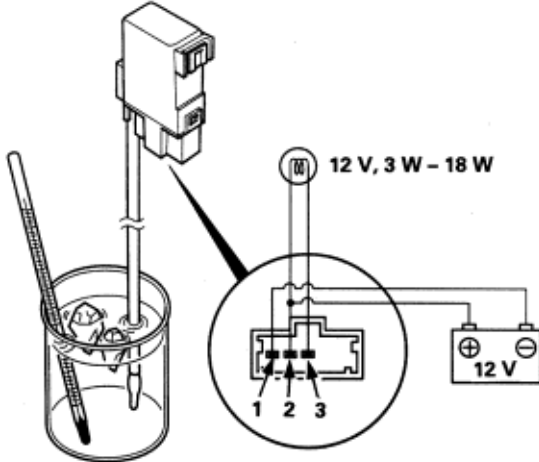
Connect battery power to the No. 2 terminal, ground the No. 1 terminal, and connect a test light between the No. 2 and No. 3 terminals.

NOTE: Use a 12 V, 3W-18W test light.

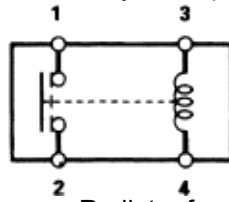
Dip the A/C thermostat into a cup filled with ice water, and check the test light.

The light should go off at 3°C (37°F) or less, and should come on at 4°C (39°F) or more.

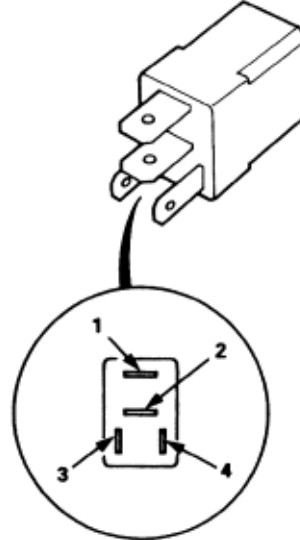
If the light doesn't come on and go off as specified, replace the A/C thermostat.



There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals, and there should be no continuity when power is disconnected.



- ♦ Radiator fan relay
- ♦ Condenser fan relay
- ♦ Compressor clutch relay



The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil *, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.

*DENSO, ND-OIL 8:

- ♦ P/N 38897-PR7-003: 120 ml (4 fl-oz, 4.2 Imp. oz)
- ♦ P/N 38898-PR7-003: 250 ml (8 1/3 fl-oz, 8.8 Imp. oz)
- ♦ P/N 38899-PR7-A01: 40 ml (1 1/3 fl-oz, 1.4 Imp. oz)

*SANDEN, SP-10

- ♦ P/N 38897-P13-003: 120 ml (4 fl-oz, 4.2 Imp. oz)
- ♦ P/N 38898-P13-003: 250 ml (8 1/3 fl-oz, 8.8 Imp. oz)
- ♦ P/N 38899-P13-A01: 40 ml (1 1/3 fl-oz, 1.4 Imp. oz)

Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

⚠
CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose or throat.
- ♦ Be careful when connecting service equipment
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service. R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

⚠
WARNING

- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, don't let refrigerant escape too fast; it will draw the compressor oil out of the system.
6. Add refrigerant oil after replacing the following parts:

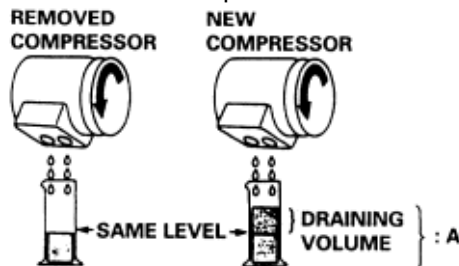
Note these items when handling refrigerant oil:

- ♦ To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

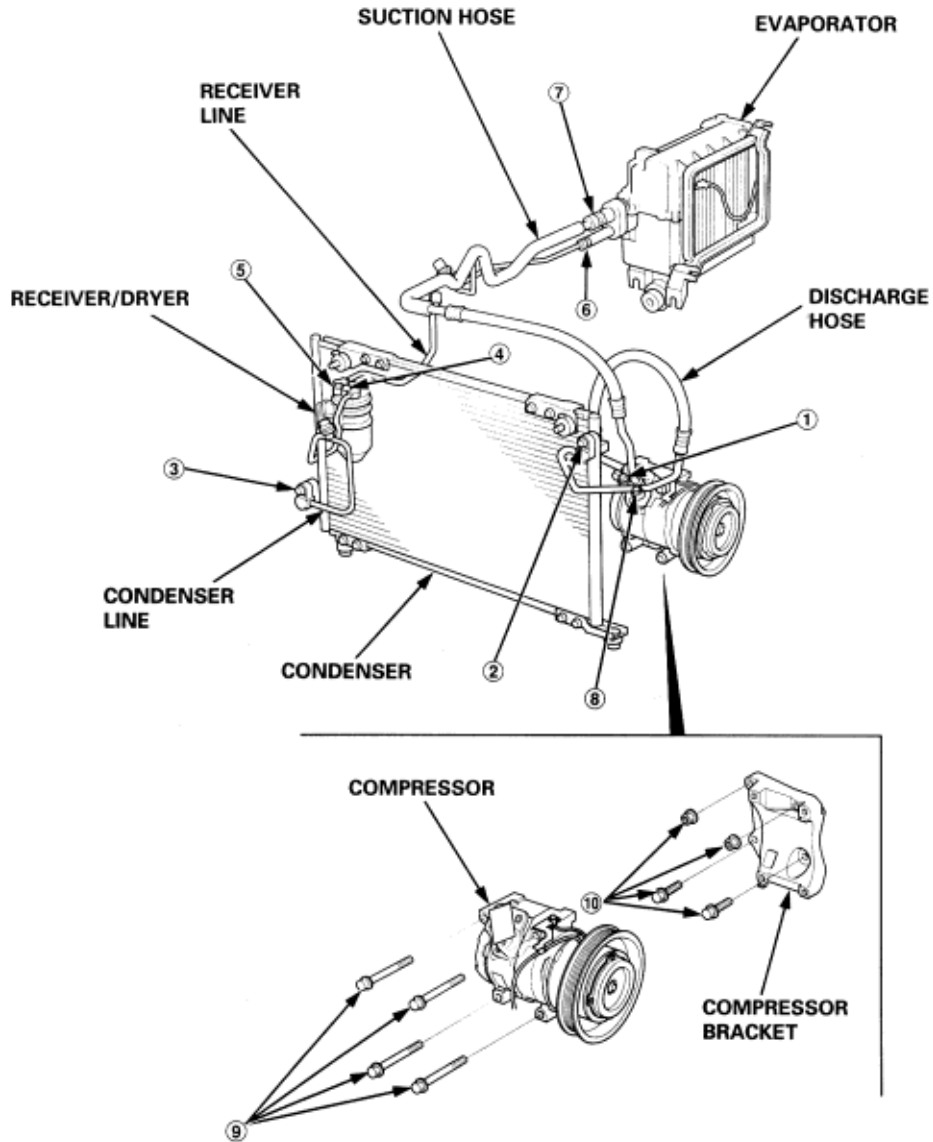
Condenser	25 ml (5/6 fl. oz, 0.9 Imp. oz)
Evaporator	40 ml (1 1/3 fl. oz, 1.4 Imp. oz)
Line or hose	10 ml (1/3 fl. oz, 0.4 Imp. oz)
Receiver/Dryer	10 ml (1/3 fl. oz, 0.4 Imp. oz)
Leakage repair	25 ml (5/6 fl. oz, 0.9 Imp-oz)
Compressor	For compressor replacement, subtract the volume of oil drained from the compressor A, and drain the calculated volume of oil from the new compressor: A - Volume of removed compressor = Volume to drain from new compressor.

A: SANDEN 130 ml (4 1/3 fl. oz, 4.6 Imp. oz), DENSO 160 ml (5 1/3 fl. oz, 5.6 Imp. oz).

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 ml (1 2/3 fl. oz, 1.8 Imp. oz) from the new compressor.



NOTE: LHD type is shown, RHD type is similar.



- | | | |
|----|--|--------------------------------|
| 1 | Discharge hose to the compressor (6 x 1.0 mm) | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 2 | Discharge hose to the condenser (6 x 1.0 mm) | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 3 | Condenser line to the condenser (6 x 10 mm) | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 4 | Condenser line to the receiver/dryer | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 5 | Receiver line to the receiver/dryer | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 6 | Receiver line to the evaporator | 13 Nm (1.3 kgf/m, 9.4 lbf/ft) |
| 7 | Suction hose to the evaporator | 31 Nm (3.2 kgf/m, 23 lbf/ft) |
| 8 | Suction hose to the compressor (6 x 1.0 mm) | 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft) |
| 9 | Compressor to compressor bracket (8 x 1.25 mm) | 22 Nm (2.2 kgf/m, 16 lbf/ft) |
| 10 | Compressor bracket top cylinder block (10 x 1.25 mm) | 49 Nm (5.0 kgf/m, 36 lbf/ft) |

NOTE: For performance test (See Page 22-34)

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 200 kPa (2.0 kgf/cm ² , 28 psi) quickly, and then falls gradually	Air in system	Discharge, evacuate, and recharge with specified amount. Evacuation: (See Page 22-57) Charging: (See Page 22-58)
Discharge (high) pressure abnormally high	No bubbles in sight glass when condenser is cooled by water.	Excessive refrigerant in system	Discharge, evacuate and recharge with specified amount.
Discharge (high) pressure abnormally high	Reduced or no air flow through condenser.	<ul style="list-style-type: none"> ♦ Clogged condenser or radiator fins. ♦ Condenser or radiator fan not working properly. 	<ul style="list-style-type: none"> ♦ Clean ♦ Check voltage and fan rpm ♦ Check fan direction
Discharge (high) pressure abnormally high	Line to condenser is excessively hot.	Restricted flow of refrigerant in system.	Restricted lines.
Discharge pressure abnormally low.	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant in system.	<ul style="list-style-type: none"> ♦ Check for leak. ♦ Charge system.
Discharge pressure abnormally low.	High or low pressures are balanced soon after stopping compressor. Low side is higher than normal.	<ul style="list-style-type: none"> ♦ Faulty compressor discharge valve. ♦ Faulty compressor seal. 	Replace the compressor.
Discharge pressure abnormally low.	Outlet of expansion valve is not frosted, and low pressure line is not cold. Low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> ♦ Faulty expansion valve. ♦ Moisture in system. 	<ul style="list-style-type: none"> ♦ Replace. ♦ Discharge, evacuate and recharge with specified amount.
Suction (low) pressure abnormally low.	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant in system.	<ul style="list-style-type: none"> ♦ Repair the leaks. ♦ Discharge, evacuate and recharge with specified amount. ♦ Charge as required.
Suction (low) pressure abnormally low.	Expansion valve is not frosted, and low pressure line is not cold. Low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> ♦ Frozen expansion valve (moisture in system) ♦ Faulty expansion valve 	<ul style="list-style-type: none"> ♦ Discharge, evacuate and recharge with specified amount. ♦ Replace the expansion valve.
Suction (low) pressure abnormally low.	Discharge temperature is low and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check evaporator temperature sensor.
Suction (low) pressure abnormally low.	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
Suction (low) pressure abnormally low.	Receiver/dryer outlet is cool, and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace
Suction pressure abnormally high.	Low pressure hose and check joint are cooler than the temperature around evaporator	<ul style="list-style-type: none"> ♦ Expansion valve open too long. ♦ Loose expansion capillary tube. 	Repair or replace.
Suction pressure abnormally high.	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system.	Discharge, evacuate and recharge with specified amount.
Suction pressure abnormally high.	High and low pressure are equalised as soon as the compressor is stopped, and both gauges fluctuate while running.	<ul style="list-style-type: none"> ♦ Faulty gasket. ♦ Faulty high pressure valve. ♦ Foreign particle stuck in high pressure valve. 	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser	<ul style="list-style-type: none"> ♦ Clogged condenser or radiator fins. ♦ Condenser or radiator fan not working properly. 	<ul style="list-style-type: none"> ♦ Clean ♦ Check voltage and fan rpm ♦ Check fan direction
Suction and discharge pressures abnormally high	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge, evacuate and recharge with specified amount
Suction and discharge	Low pressure hose and metal end areas are cooler	Clogged or kinked low pressure hose parts	Repair or replace

pressures abnormally low	than evaporator		
Suction and discharge pressures abnormally low	Temperature around expansion valve is too low compared with that around receiver/dryer	Clogged high pressure line	Repair or replace
Refrigerant leaks	Compressor clutch is dirty	Compressor high pressure line	Replace the compressor
Refrigerant leaks	Compressor bolt(s) dirty	Leaking around bolt(s)	Tighten bolt(s) or replace compressor
Refrigerant leaks	Compressor gasket is wet with oil	Gasket leaking	Replace the compressor

The performance test will help determine if the air conditioning system is operating within specifications.

NOTE:

- ♦ Use only a gauge set for refrigerant HFC-134a (R-134a).
- ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

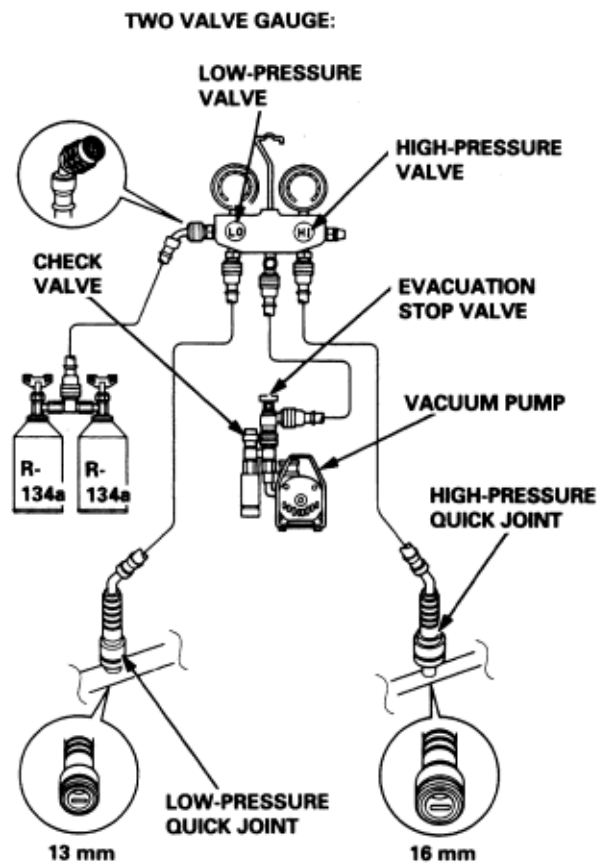
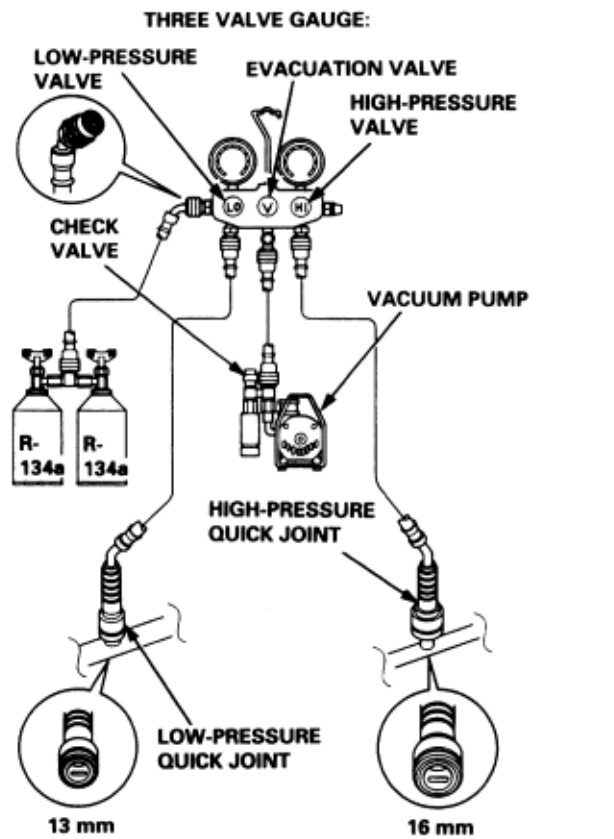
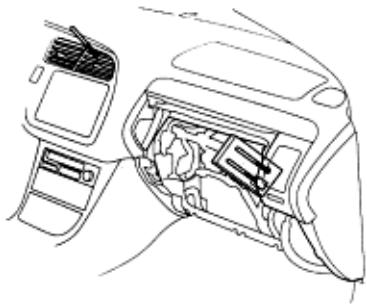
If accidental system discharge occurs, ventilate work area before resuming service.
R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

WARNING

- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

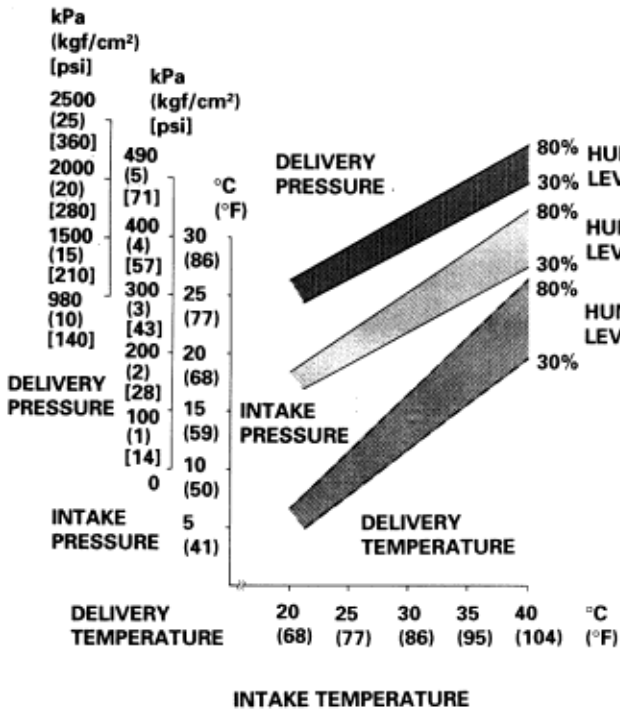
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect the R-134a gauge set as shown.
 2. Insert a thermometer in the centre air vent. Determine the relative humidity and air temperature.
 3. Test conditions:
 - ♦ Avoid direct sunlight.
 - ♦ Open hood.
 - ♦ Open front doors.
 - ♦ Set the temperature control dial to MAX COOL, the mode control dial to VENT and the recirculation control switch to RECIRCULATE.
 - ♦ Turn the A/C switch on and the fan switch to MAX.
 - ♦ Run the engine at 1,500 rpm (min-1).
 - ♦ No driver or passengers in vehicle.
 4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the centre air vent, the intake temperature near the blower unit behind the glove box and the high and low system pressure from the A/C gauges.
- NOTE: LHD type is shown, RHD type is symmetrical.

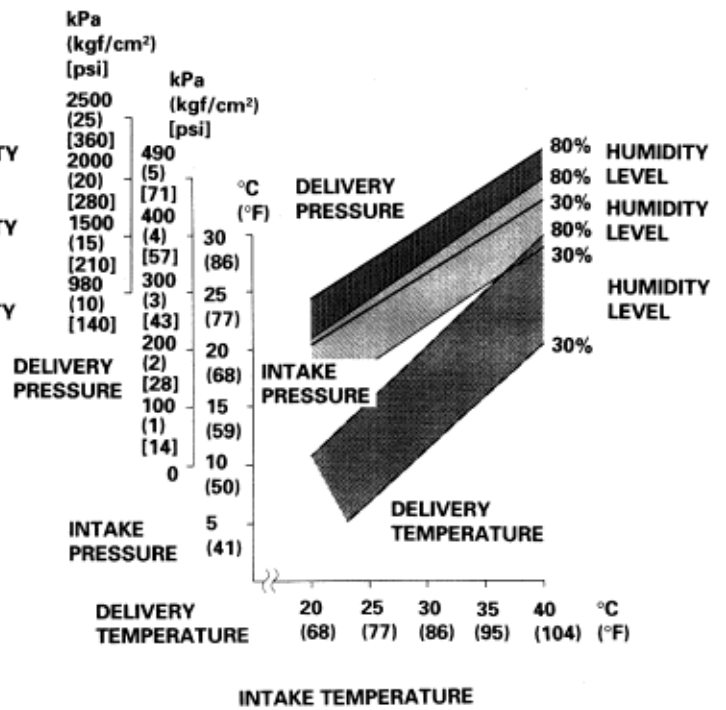


5. To complete the charts:
- ♦ Mark the delivery temperature along the vertical line.
 - ♦ Mark the intake temperature (ambient air temperature) along the bottom line.
 - ♦ Draw a line straight up from the air temperature to the humidity.
 - ♦ Mark a point 10% above and 10% below the humidity level.
 - ♦ From each point, draw a horizontal line across the delivery temperature.
 - ♦ The delivery temperature should fall between the two lines.
 - ♦ Complete the low-side pressure test and high-side pressure test in the same way.
 - ♦ Any measurements outside the line may indicate the need for further inspection.

With DENSO compressor:



With SANDEN compressor:

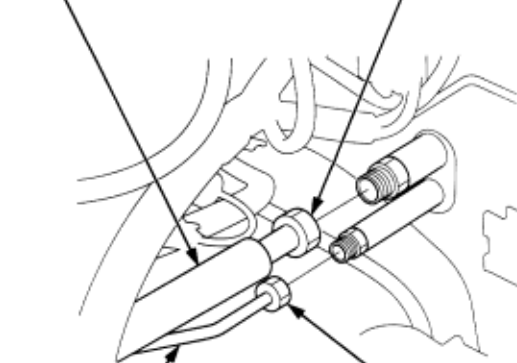


NOTE: LHD type is shown, RHD type is symmetrical.

1. Discharge the refrigerant (**See Page 22-56**).
2. Remove the under-hood fuse/relay box, but do not disconnect the connectors from it.
3. Disconnect the suction and receiver lines from the evaporator. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

31 N-m (3.2 kgf-m, 23 lbf-ft)

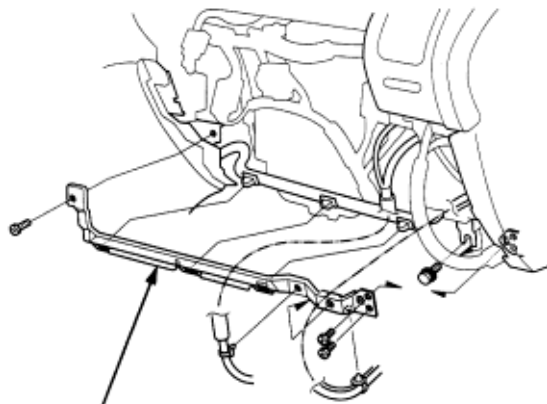
SUCTION LINE



13 N-m (1.3 kgf-m, 9.4 lbf-ft)

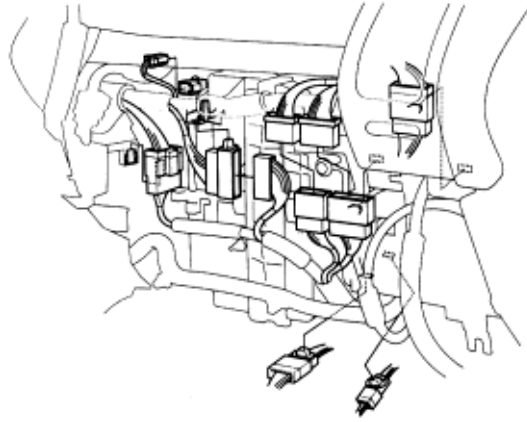
RECEIVER LINE

4. Remove the glove box (see section 20).
5. Remove the wire harness clips, the bolts and the glove box frame.

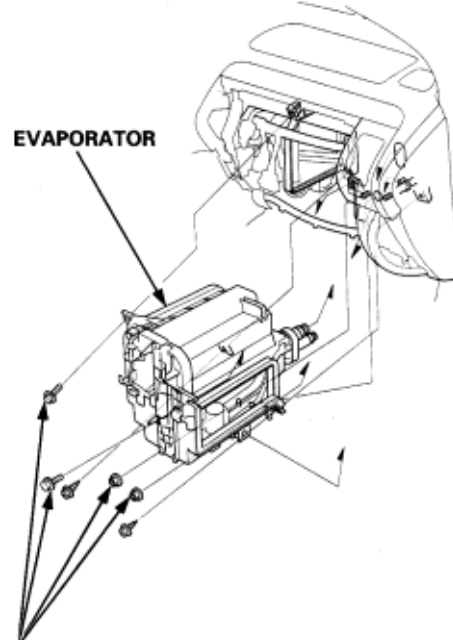


GLOVE BOX FRAME

6. Disconnect the wire harness connectors thermostat connector, then remove the wire harness clips.



7. Remove the self-tapping screws, the mounting nuts, the mounting bolts and the evaporator.



**6 x 1.0 mm
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)**

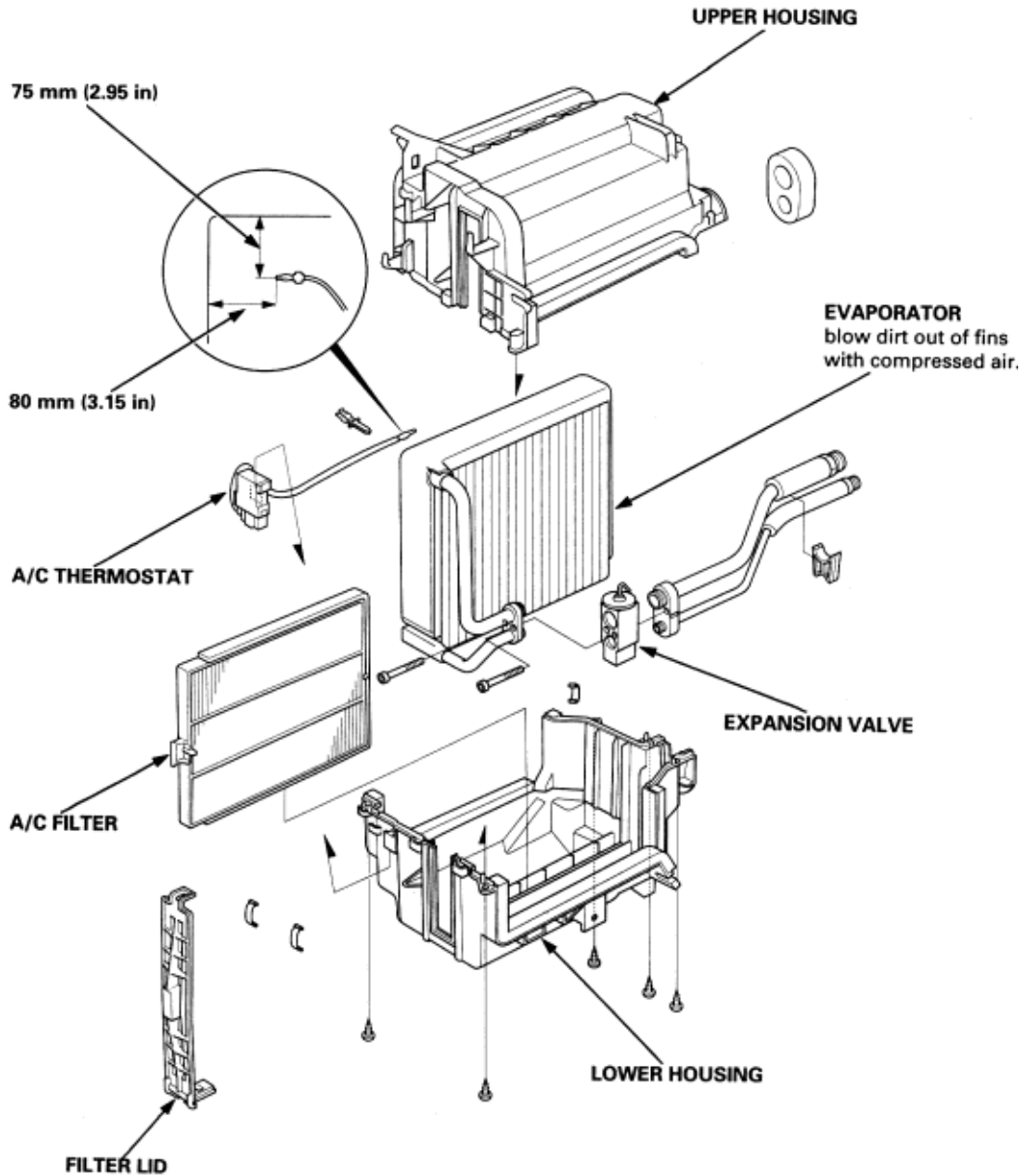
8. Install in the reverse order of removal, and note these items:
 - ♦ If you're installing a new evaporator, add refrigerant oil (DENSO ND-OIL 8 or SANDEN SP-20) (**See Page 22-31**).
 - ♦ Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
 - ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
 - ♦ Apply sealant to the grommets.
 - ♦ Make sure that there is no air leakage.
 - ♦ Charge the system (**See Page 22-58**), and test its performance (**See Page 22-34**).

Evaporator Overhaul

22-38

NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the filter lid, then pull out the A/C filter.
2. Pull out the A/C thermostat sensor from the evaporator fins.
3. Remove the self-tapping screws and the clamps. Carefully separate the upper and the lower housings, then remove the evaporator.
4. If necessary, remove two bolts and the expansion valve.
5. Reassemble the evaporator in the reverse disassembly, and note these items:
 - ♦ Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Reinstall the A/C thermostat sensor to its original location.
 - ♦ Make sure that there is no air leakage.

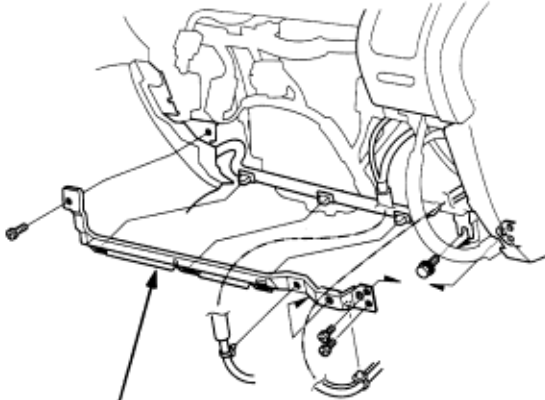


A/C Filter Replacement

22-39

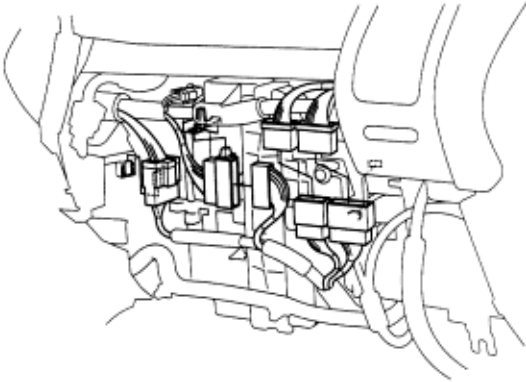
NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the glove box (see section 20).
2. Remove the wire harness clips, the bolts and the glove box frame.

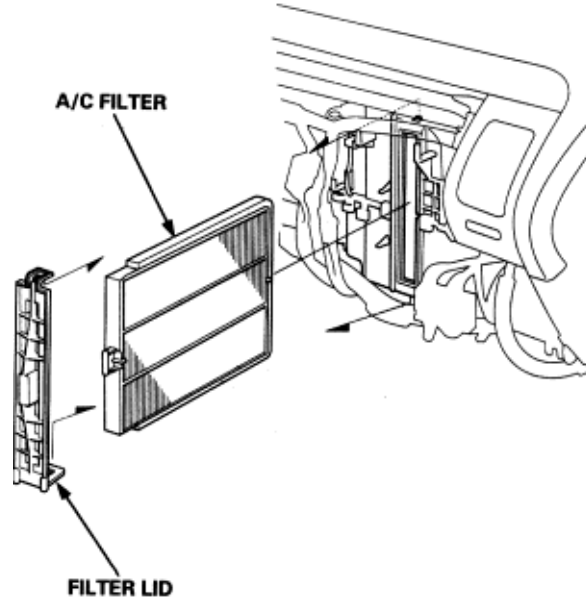


GLOVE BOX FRAME

3. Disconnect the wire harness connectors.



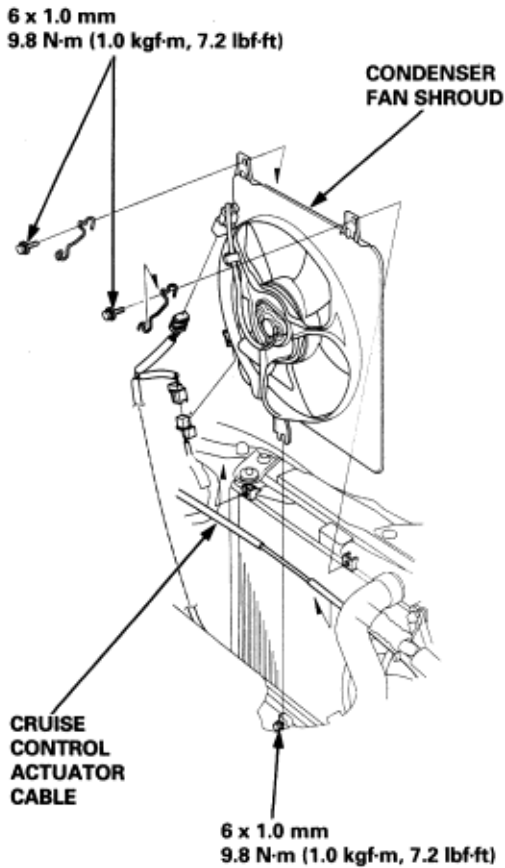
4. Remove the filter lid from the evaporator, then pull out the A/C filter. Replace the A/C filter according to the maintenance schedule in the owner's manual.



5. Install in the reverse order of removal. Make sure that there is no air leakage.

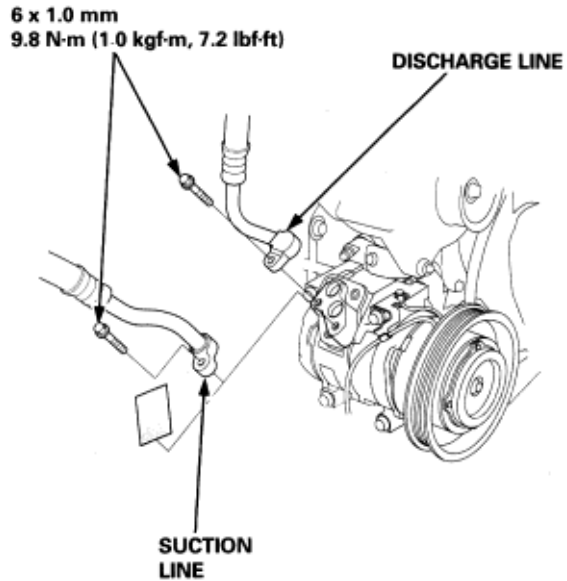
NOTE: LHD type is shown, RHD type is similar.

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
3. Disconnect the negative cable from the battery.
4. Discharge the refrigerant (**See Page 22-56**).
5. Remove the compressor clutch connector from the condenser fan shroud, then disconnect the compressor clutch connector. Disconnect the condenser fan connector. Remove the cruise control actuator cable from the clamp. Loosen the lower mounting bolt, then remove the upper mounting bolts and the condenser fan shroud. Be careful not to damage the radiator fins when removing the condenser fan shroud.

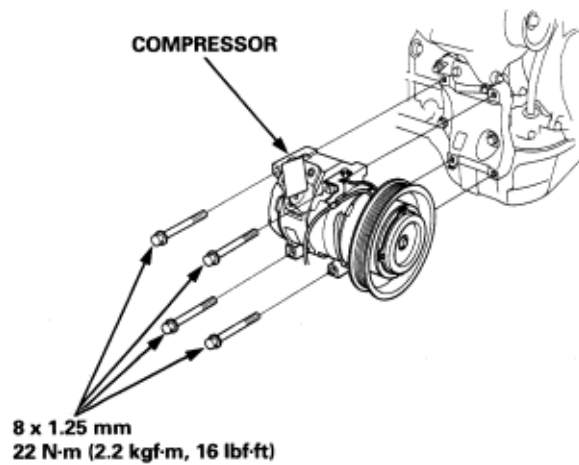


6. Loosen the A/C compressor belt (**See Page 22-54**).

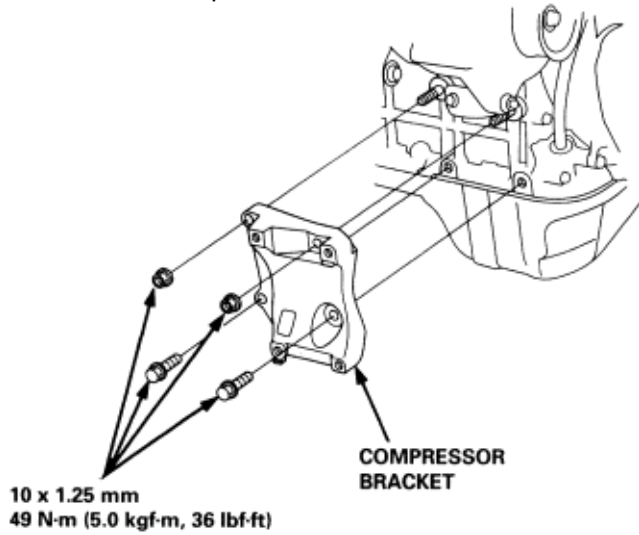
7. Remove each bolt then disconnect the suction and discharge lines from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



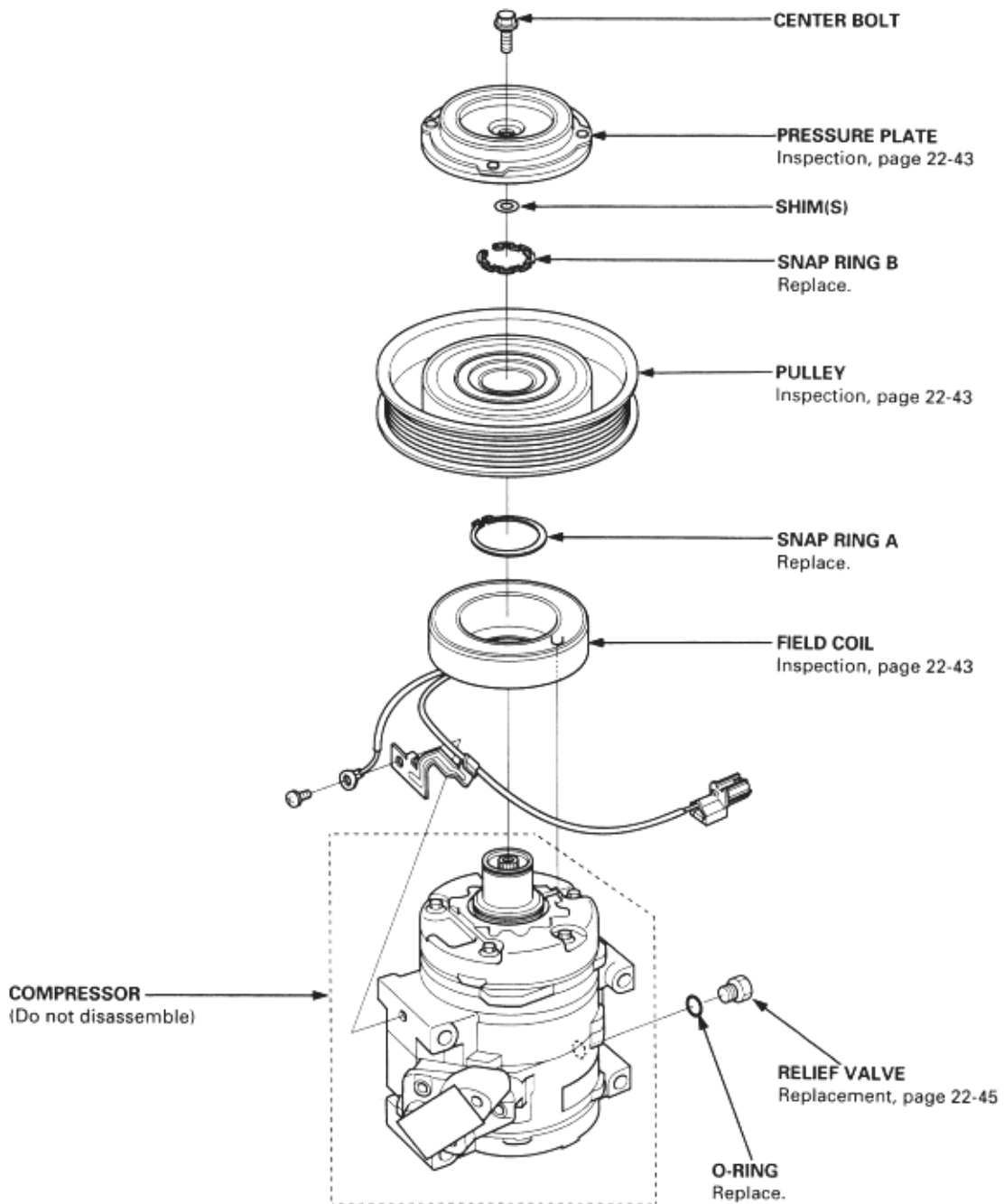
8. Remove the mounting bolts and the compressor. Be careful not to damage the radiator fins when removing the compressor.



9. If necessary, remove the mounting bolts, mounting nuts and the compressor bracket.



10. Install in the reverse order of removal, and note these items:
- ♦ If you are installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 160ml (5 1/3fl.oz, 5.6 Imp. oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
 - ♦ Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Use refrigerant oil (DENSO ND-OIL 8) for HFC-134a DENSO piston type compressor only.
 - ♦ To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
 - ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
 - ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
 - ♦ Be careful not to damage the radiator fins when installing the compressor and the condenser fan shroud.
 - ♦ Adjust the A/C compressor belt (**See Page 22-54**).
 - ♦ Charge the system (**See Page 22-58**), and test its performance (**See Page 22-34**).
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

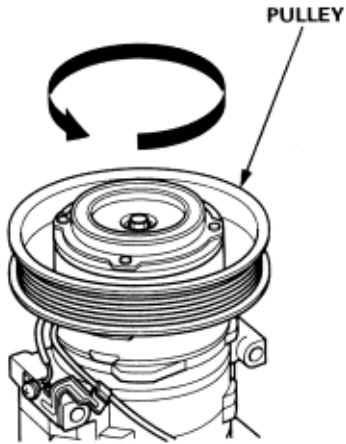


To go to the pages referenced on the diagram above, click on the following:

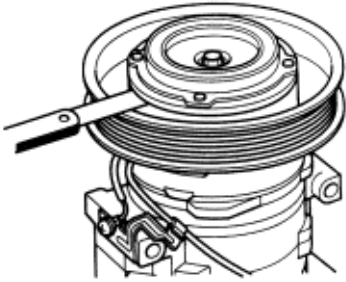
(See Page 22-43)

(See Page 22-45)

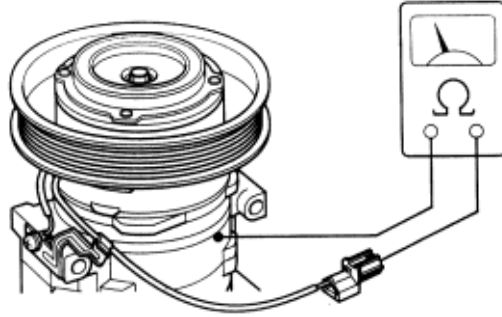
- ♦ Check the plated parts of the pressure plate for colour changes, peeling or other damage. If there is damage, replace the clutch set.
- ♦ Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



- ♦ Measure the clearance between the pulley and the pressure plate all the way around. If the clearance is not within specified limits, the pressure plate must be removed and shim(s) added or removed as required, following the required procedure (**See Page 22-44**).
Clearance: 0.45 +0.15, -0.10 mm (0.018 +0.006, -0.004 in)
NOTE: The shims are available in three thickness': 0.1mm, 0.3 mm and 0.5 mm.

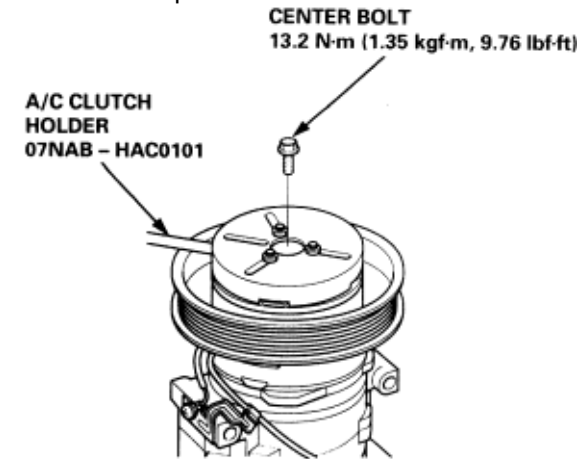


- ♦ Check resistance of the field coil. If resistance is not within specifications, replace the field coil.

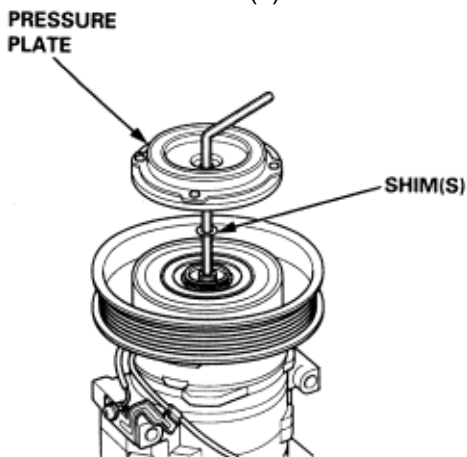


Field Coil Resistance 4.1 0.2 ohms at 20°C (68°F)

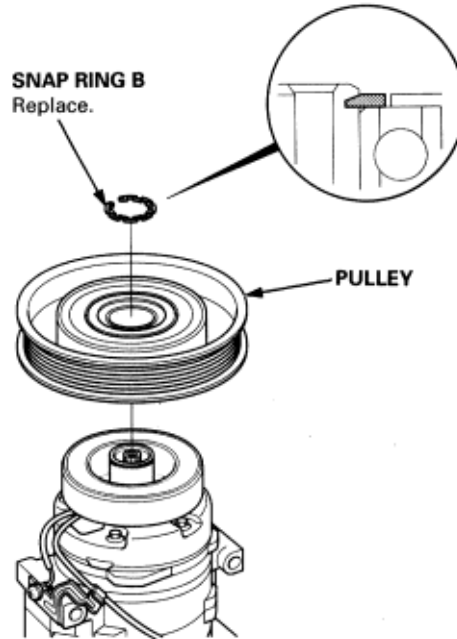
1. Remove the center bolt while holding the pressure plate with the special tool.



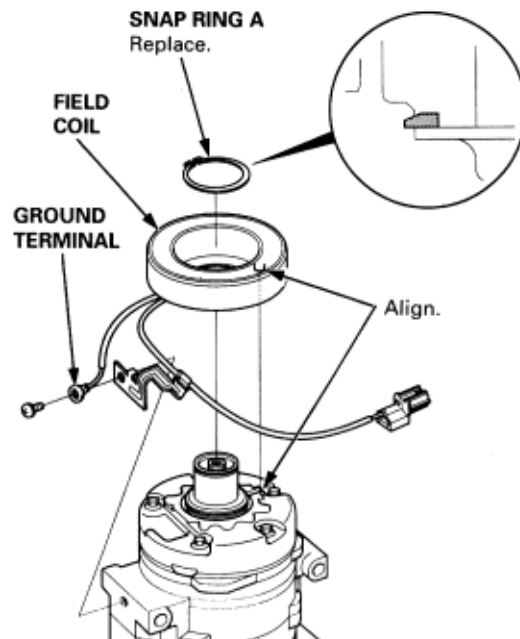
2. Remove the pressure plate and shim(s), taking care not to lose the shim(s).



3. Remove the snap ring B, with snap ring pliers, then remove the pulley. Be careful not to damage pulley and compressor.

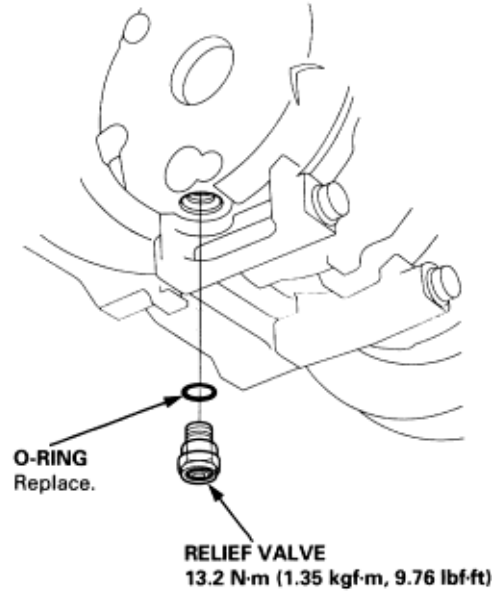


4. Remove the screw from the field coil ground terminal. Remove the snap ring A with snap ring pliers then remove the field coil. Be careful not to damage the field coil and compressor.



5. Reassemble the compressor clutch in the reverse order of disassembly, and note the following items:
 - ♦ Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the compressor.
 - ♦ Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
 - ♦ Install new snap rings, and make sure they are fully seated in the groove.
 - ♦ Make sure that the pulley turns smoothly after it's reassembled.
 - ♦ Route and clamp the wires properly or they can be damaged by the pulley.

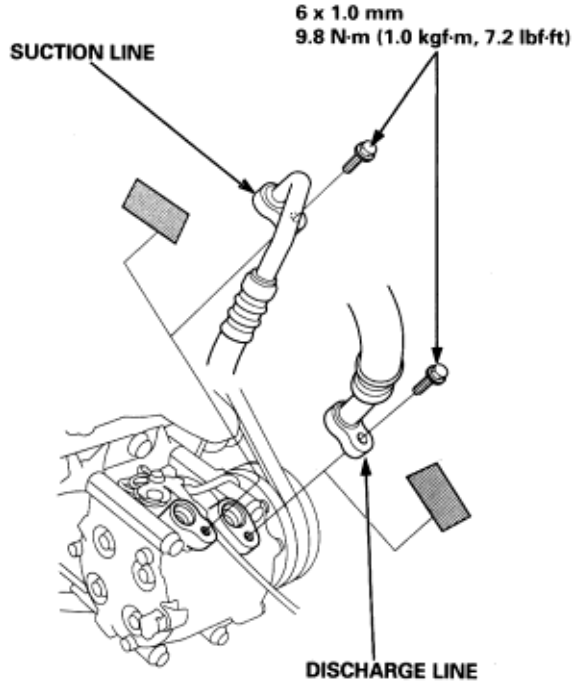
1. Discharge the refrigerant (**See Page 22-56**).
2. Remove the relief valve and the O-ring. Plug the opening to keep foreign matter from entering system and the compressor oil from running out.



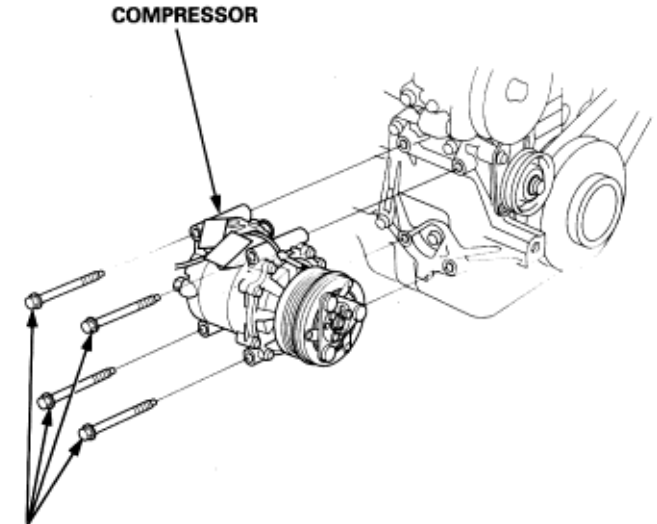
3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (**See Page 22-58**) and test its performance (**See Page 22-34**).

NOTE: LHD type is shown, RHD type is similar.

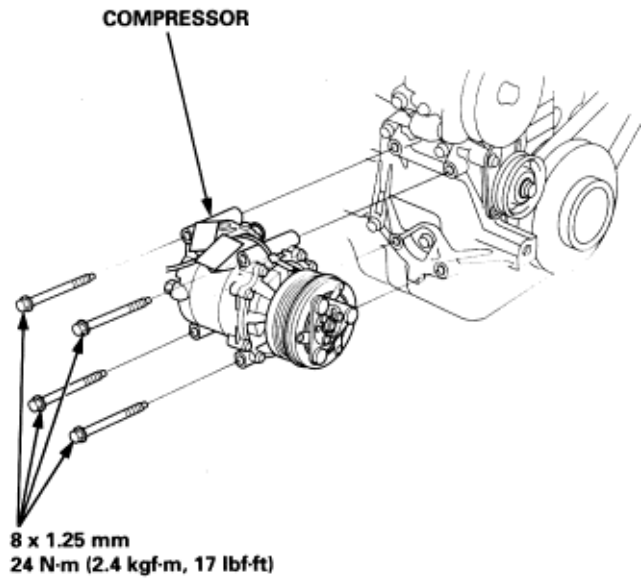
1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Discharge the refrigerant (**See Page 22-56**).
4. Remove the each bolt, then disconnect the suction and discharge lines from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



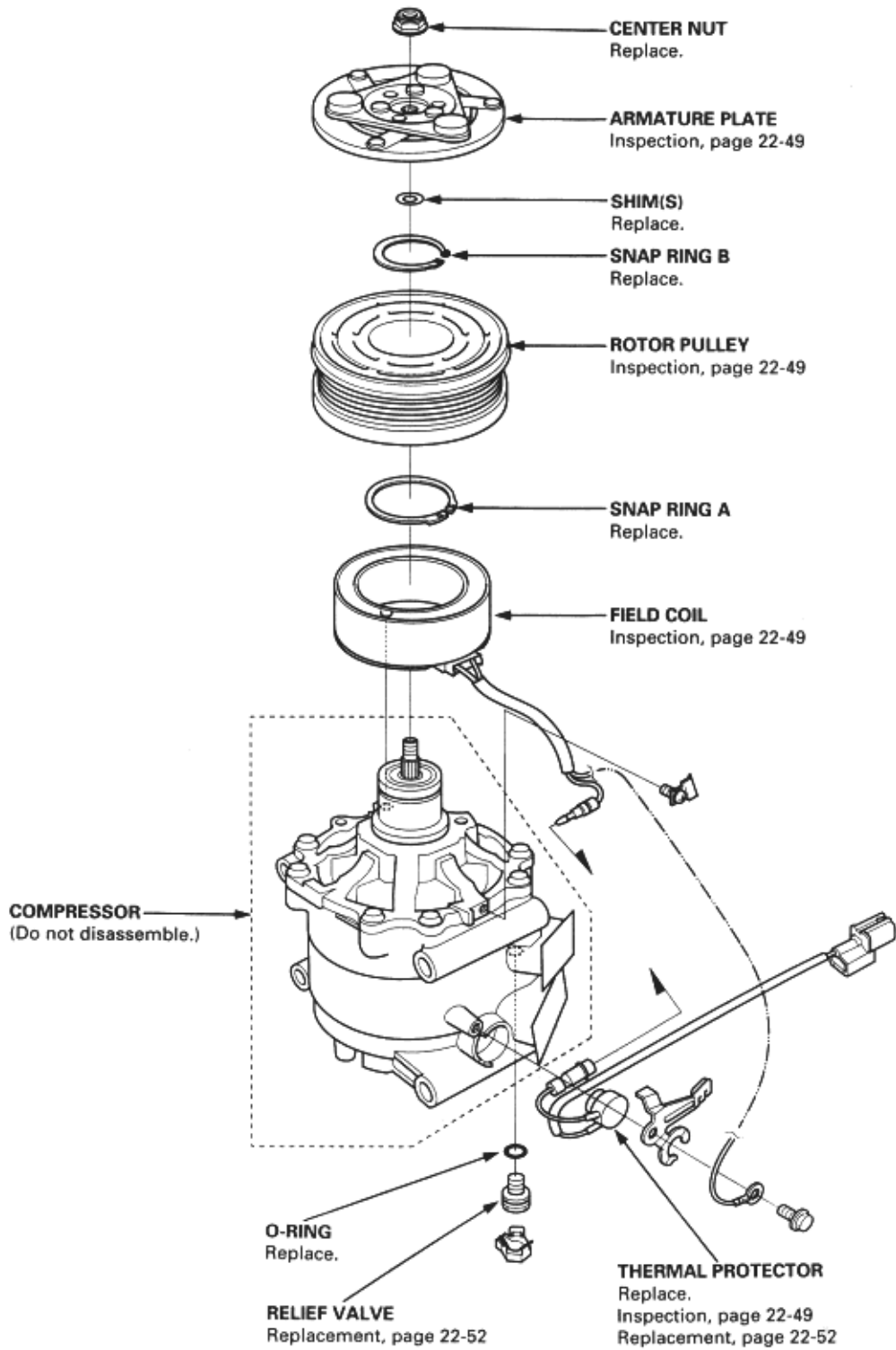
5. Loosen the A/C compressor belt (**See Page 22-53**). If necessary, remove the power steering pump belt (see section 17).
6. Disconnect the compressor clutch connector, then remove the mounting bolts and the compressor.



7. If necessary, remove the mounting bolts and the compressor bracket.



8. Install in the reverse order of removal, and note these items:
 - ♦ If you're installing a new compressor, drain all the refrigerant oil from the removed compressor and measure its volume. Subtract the volume drained oil from 130ml (4 1/3 fl .oz, 4.6 Imp. oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
 - ♦ Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Use refrigerant oil (SANDEN, SP-10) for HFC-134a SANDEN spiral type compressors only.
 - ♦ To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
 - ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
 - ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
 - ♦ Adjust the A/C compressor belt (**See Page 22-53**) and the power steering pump belt (see section 17).
 - ♦ Charge the system (**See Page 22- 58**), and test its performance (**See Page 22- 34**).

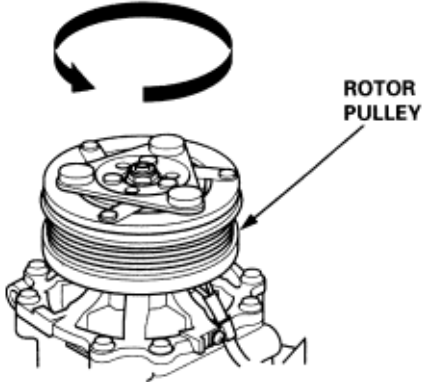


To go to the pages referenced on the diagram above, click on the following:

(See Page 22-49)

(See Page 22-52)

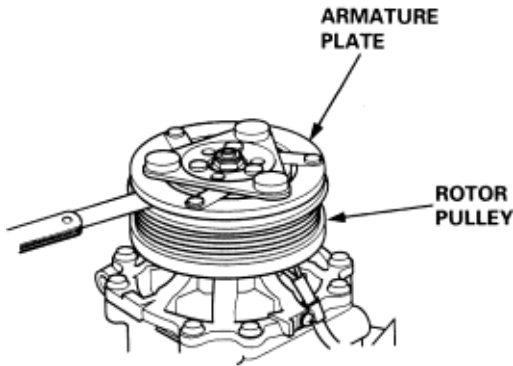
- ♦ Check the plated parts of the armature plate for colour changes, peeling or other damage. If there is damage, replace the clutch set.
- ♦ Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



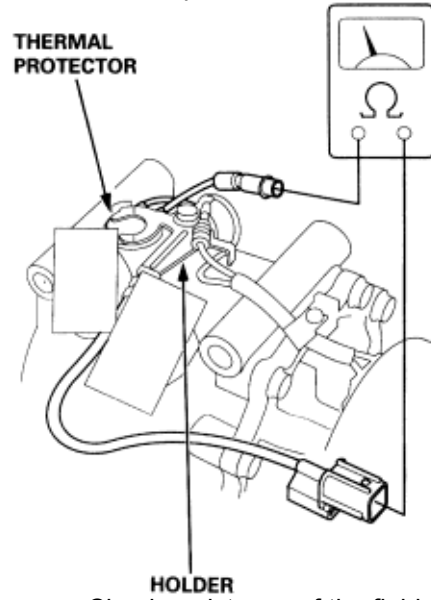
- ♦ Measure the clearance between the rotor pulley and the armature plate all the way around. If the clearance is not within specified limits, the armature plate must be removed and shim(s) added or removed as required, following the set procedure (See Page 22-50).

Clearance: 0.5 ± 0.15 mm (0.020 0.006 in)

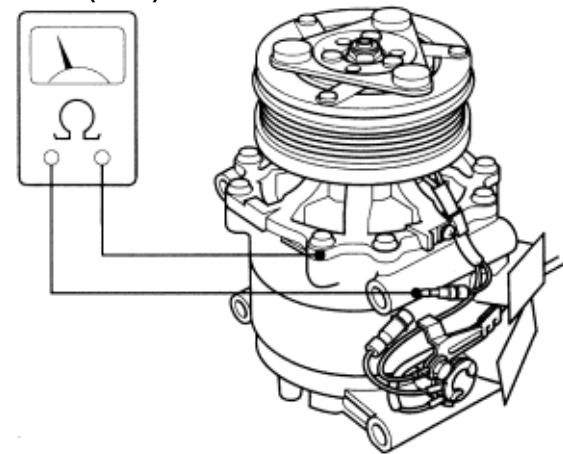
NOTE: The shims are available in four thickness':
0.1mm, 0.2 mm, 0.4 mm and 0.5 mm



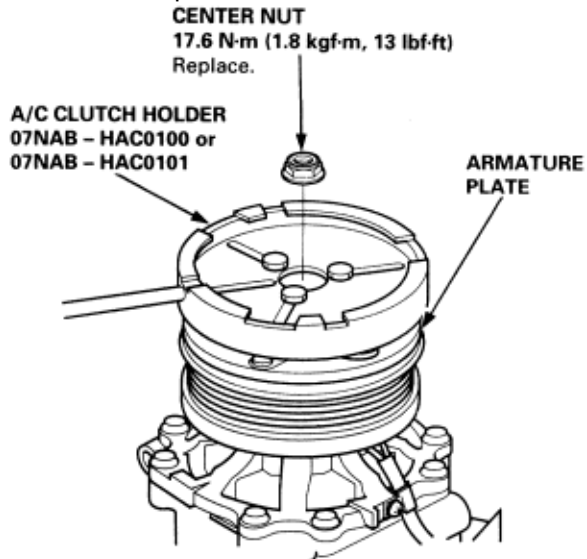
- ♦ Release the field coil connector from the holder, then disconnect it. Check the thermal protector for continuity. If there is no continuity, replace the thermal protector.



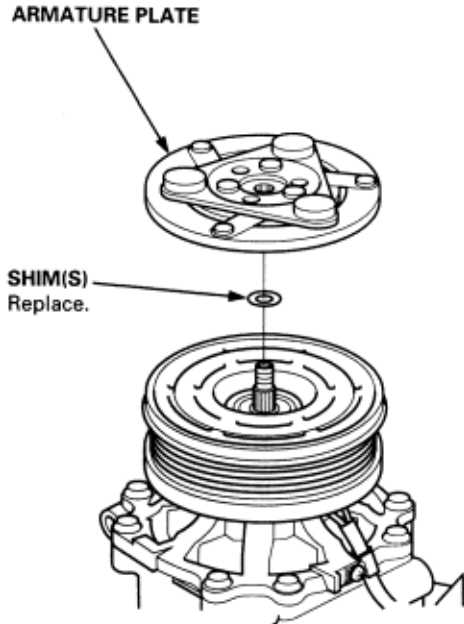
- ♦ Check resistance of the field coil. If resistance is not within specifications, replace the field coil.
Field Coil Resistance: 3.2 ± 0.15 ohms at 20°C (68°F)



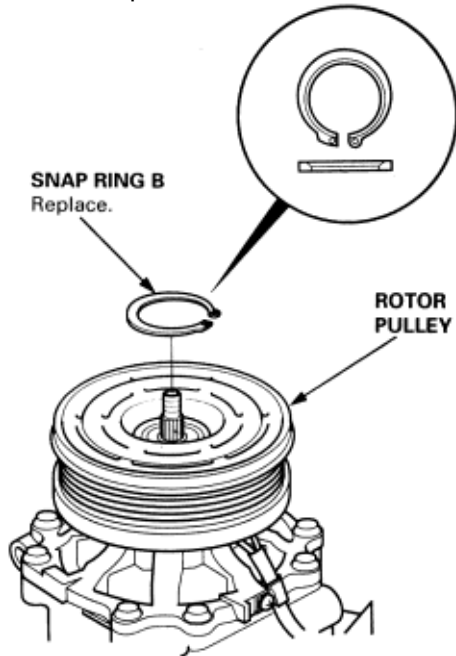
1. Remove the center nut while holding the armature plate with the special tool.



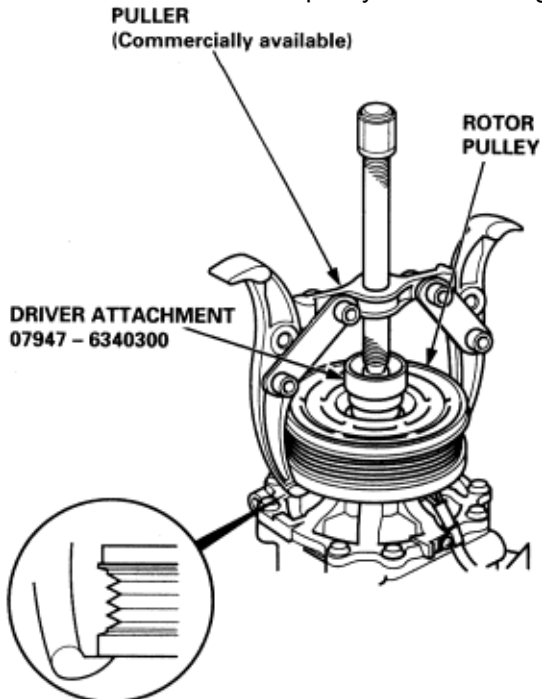
2. Remove the armature plate by pulling it up by hand.



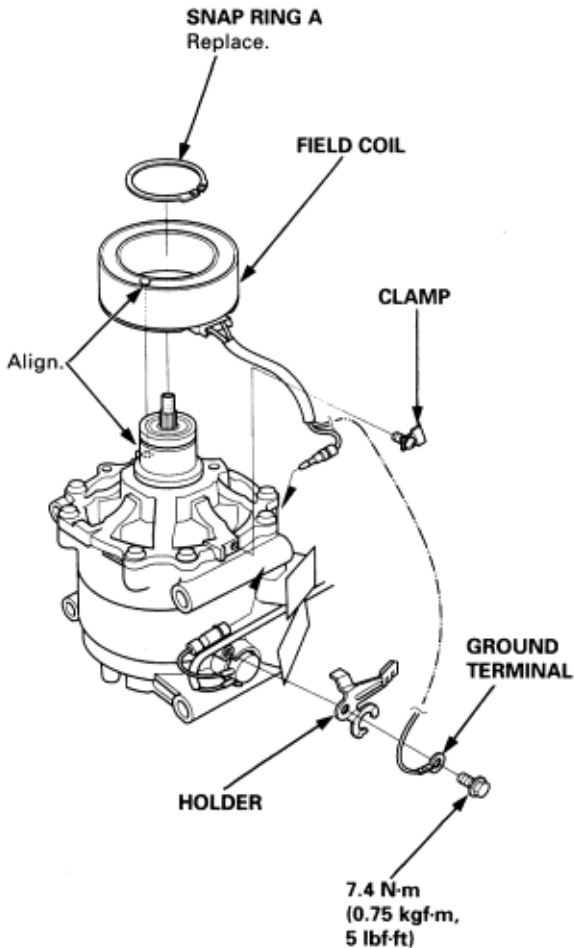
3. Remove the snap ring B, with snap ring pliers. Be careful not to damage the rotor pulley and compressor.



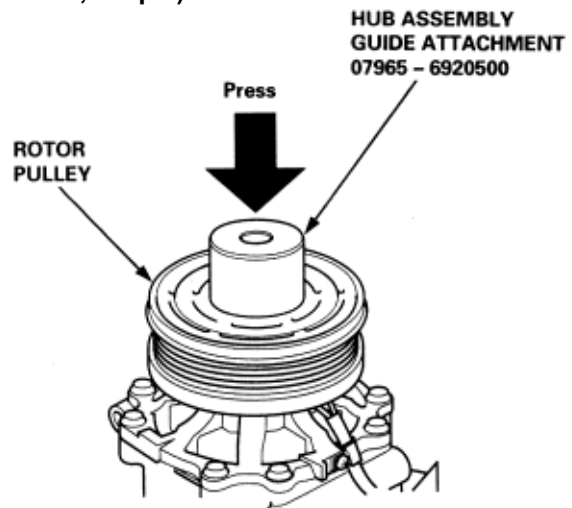
4. Remove the rotor pulley from the shaft with the tools. Be sure the claws of the puller are on the back of the rotor pulley, not on the belt area; otherwise the rotor pulley can be damaged.



5. Remove the bolt and holder, and screw and clamp, then disconnect the field coil connector. Remove the snap ring A with snap ring pliers, then remove the field coil. Be careful not to damage the field coil and compressor.

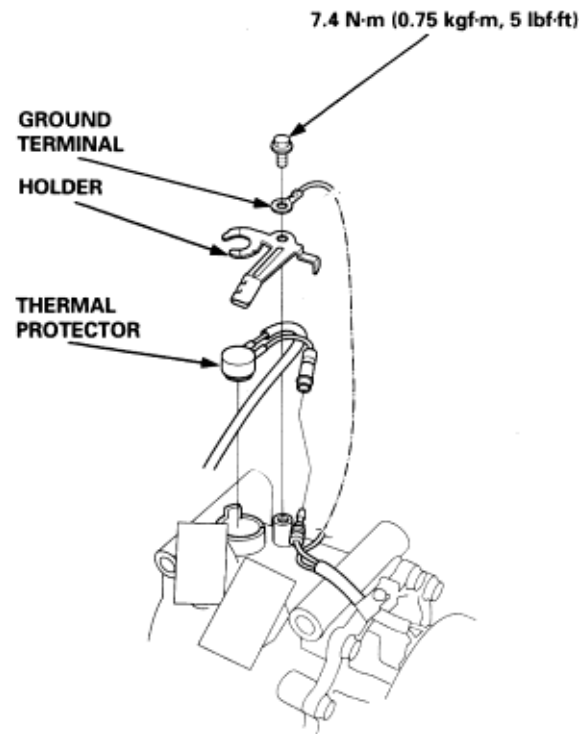


6. Position the rotor pulley squarely over the field coil. Press the rotor pulley onto the compressor boss with the special tool. If the rotor pulley does not press on straight, remove it, and check the rotor pulley and compressor boss for burrs or damage. **Maximum press load: 39,200 kPa (400 kgf/cm², 5,690 psi).**



7. Reassemble the compressor clutch in the reverse order of disassembly, and note these items:
- ♦ Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the compressor.
 - ♦ Clean the rotor pulley and compressor sliding surfaces with non-petroleum solvent.
 - ♦ Install new snap rings, and make sure they are fully seated in the groove.
 - ♦ Make sure that the rotor pulley turns smoothly after it's reassembled.
 - ♦ Route and clamp the wires properly or they can be damaged by the rotor pulley.

1. Remove the bolt, the ground terminal and the holder. Disconnect the field coil connector, then remove the thermal protector.

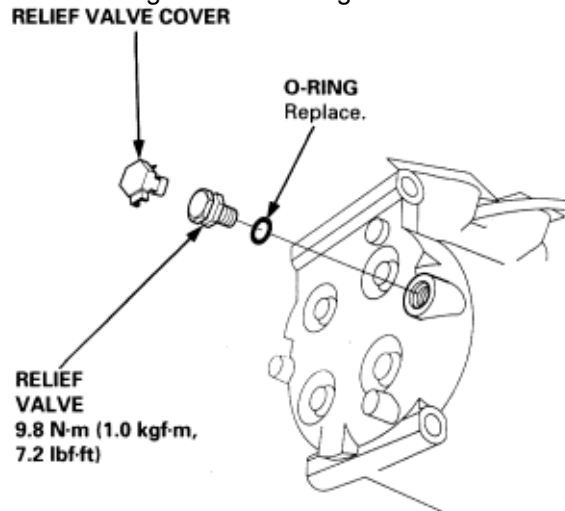


2. Replace the thermal protector with a new one, and apply silicone sealant to the bottom of the thermal protector.



3. Install in the reverse order of removal.

1. Discharge the refrigerant (**See Page 22-56**).
2. Remove the relief valve cover, the relief valve the O-ring. Plug the opening to keep foreign matter from entering the system and the compressor from running oil from running out.



3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the valve.
6. Put the cover on the relief valve.
7. Charge the system (**See Page 22-58**), and test its performance (**See Page 22-34**).

Deflection Method

1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection between the A/C compressor and the crankshaft pulley.

A/C Compressor Belt

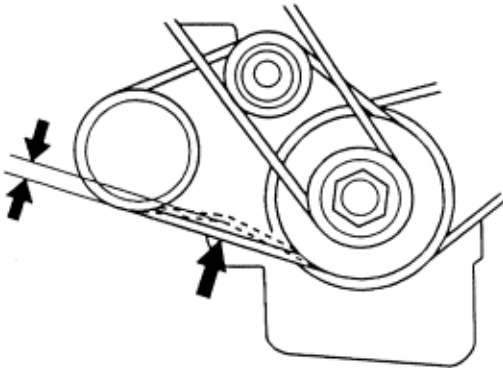
Used Belt: 7.5-9.5mm (0.30-0.37 in)

New Belt: 5.0-6.5 mm (0.20-0.26 in)

Note these items when adjusting belt tension:

- ♦ If there are cracks or any damage evident on the belt, replace it with a new one.
- ♦ "Used belt" means a belt, which has been used for five minutes or more.
- ♦ "New belt" means a belt, which has been used for less than five minutes.

2. Loosen the center nut of the idler pulley.
3. Turn the adjusting bolt to get proper belt tension.
4. Retighten the center nut of the idler pulley.
5. Recheck the deflection of the A/C compressor belt.



Tension Gauge Method

1. Attach the special tool to the A/C compressor belt as shown below, and measure the tension of the belt.

A/C Compressor Belt

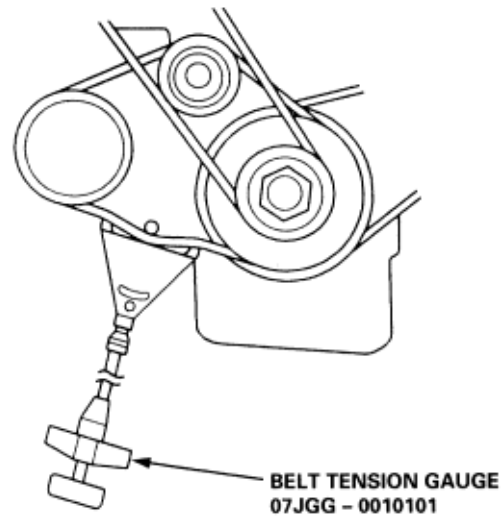
Used Belt: 340-490 N (35-50 Kgf, 77-110 lbf).

New Belt: 690-830 N (70-85 Kgf, 150-190 lbf).

Note these items when adjusting belt tension:

- ♦ Follow the manufacturer's instructions for the belt tension gauge.
- ♦ If there are cracks or any damage evident on the belt, replace it with a new one.
- ♦ "Used belt" means a belt, which has been used for five minutes or more.
- ♦ "New belt" means a belt, which has been used for less than five minutes.

2. Loosen the center of the nut of the idler pulley.
3. Turn the adjusting bolt to get proper belt tension.
4. Retighten the center nut of the idler pulley.
5. Recheck the tension of the A/C compressor belt.



NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Inspection with Deflection Method

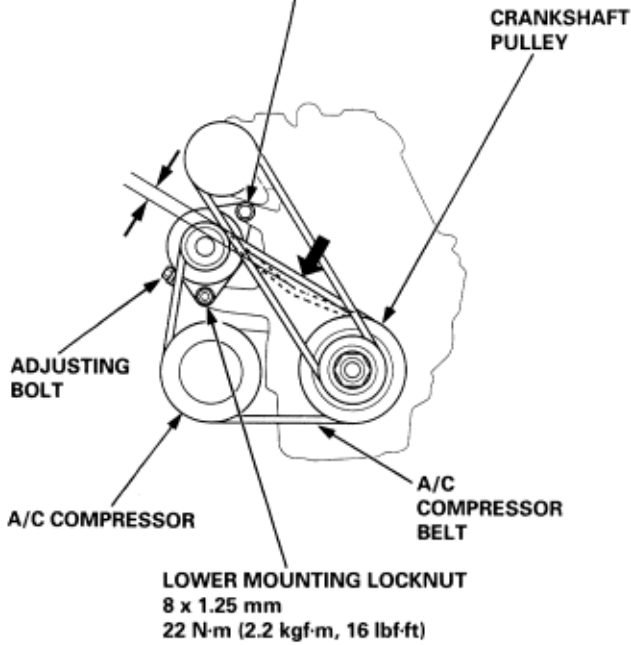
1. Apply a force of 98 N (10 Kgf, 22 lbf), and measure the deflection at the mid point between the alternator and A/C compressor. If the belt is worn or damaged, replace it.

Deflection:

Used Belt: 10.0-12.0 mm (0.39-0.47 in).

New Belt: 5.5-7.5 mm (0.22-0.30 in).

UPPER MOUNTING BOLT
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)



Adjustment

1. Loosen the upper mounting bolt and the lower mounting locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

Inspection with Belt tension gauge method

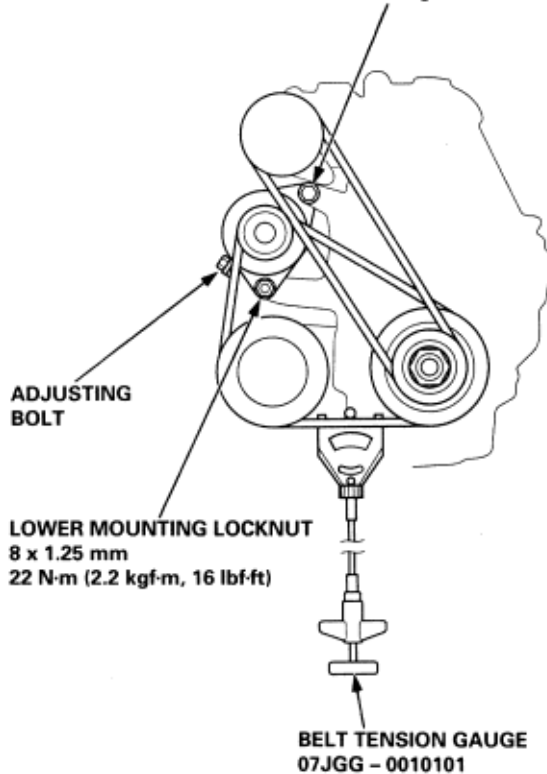
1. Attach the belt tension gauge to the belt and measure the tension. Follow the gauge manufacturer's instructions. If the belt is worn or damaged, replace it.

Tension:

Used Belt: 390-540 N (40-55 Kgf 88-120 lbf).

New Belt 880-030 N (90-105 Kgf 200-231 lbf).

UPPER MOUNTING BOLT
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)



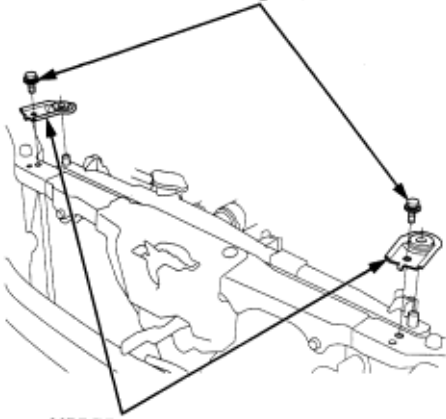
Adjustment

1. Loosen the upper mounting bolt and the lower mounting locknut.
2. Turn the adjusting bolt to obtain the proper belt tension, then retighten the locknut and mounting bolt.
3. Recheck the belt tension.

NOTE: LHD type is shown, RHD type is similar.

1. Discharge the refrigerant (**See Page 22-56**).
2. Remove the coolant reservoir, but do not disconnect the reservoir hose from the coolant reservoir and the radiator.
3. Remove the bolts, then remove the upper mount brackets from the radiator.

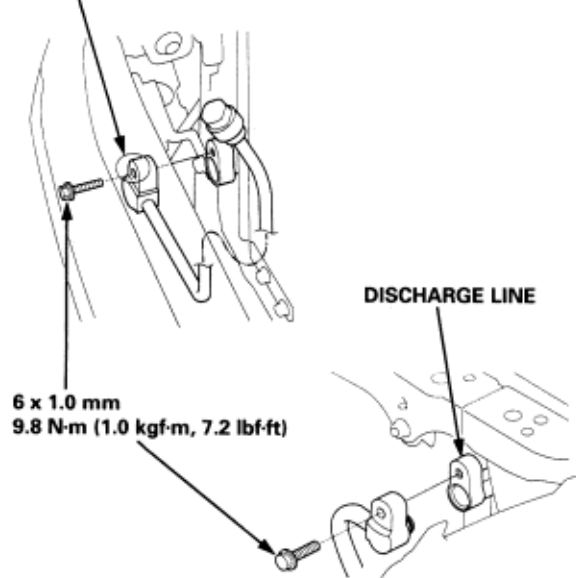
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



**UPPER MOUNT
BRACKETS**

4. Remove each bolt, then disconnect the discharge and condenser lines from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

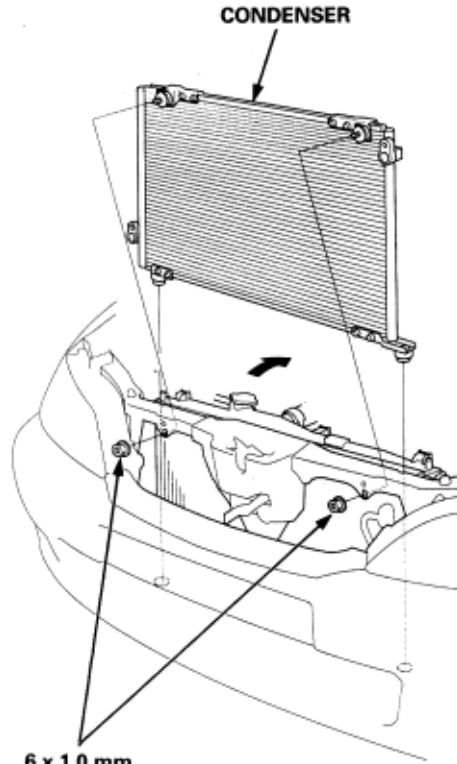
CONDENSER LINE



DISCHARGE LINE

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

5. Remove the mounting nuts, then remove the condenser by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser.



6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

6. Install in the reverse order of removal, and note these items:
 - ♦ If you're installing a new condenser, add refrigerant oil (DENSO ND-OIL 8 or SANDEN SP-10) (**See Page 22-31**).
 - ♦ Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Be careful not to damage the radiator and condenser.
 - ♦ Be sure to install the lower mount cushions of condenser securely into the holes.
 - ♦ Charge the system (**See Page 22-58**), and test its performance (**See Page 22-34**).



CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

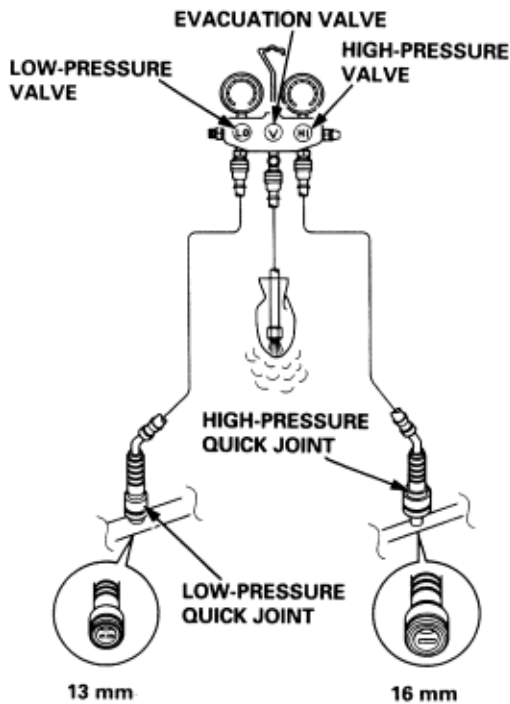


WARNING

- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

THREE VALVE GAUGE:



NOTE: Use only a gauge set for refrigerant HFC-134a (R-134a).

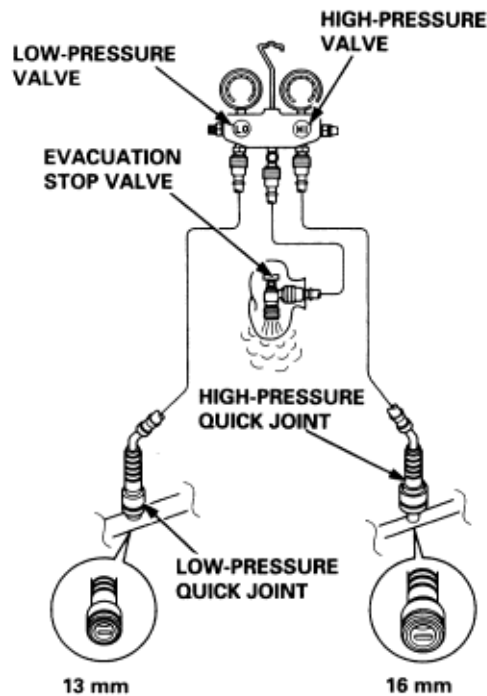
1. Connect the R-134a gauge set as shown.
2. Disconnect the center hose of the gauge set, and place the free end in a shop towel.
3. Open the evacuation valve (two valve gauge: evacuate stop valve).
4. Slowly open the high-pressure valve slightly to let refrigerant flow from the center hose only. Do not open the valve too wide. Check the shop towel to make sure no oil is being discharged with the refrigerant.

NOTICE

If refrigerant is allowed to escape too fast, compressor oil will be drawn out of the system.

5. After the high-pressure gauge reading has dropped below 980 kPa (10 kgf/cm², 140 psi), open the low side valve to discharge both high and low sides of the system.
6. Note the gauge reading, and as system pressure drops, gradually open both high and low side valves fully until both gauges indicate 0 kPa (0 kgf/cm², 0 psi).

TWO VALVE GAUGE:



NOTE:

- ♦ Use only a gauge set for refrigerant HFC-134a (R-134a).
- ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

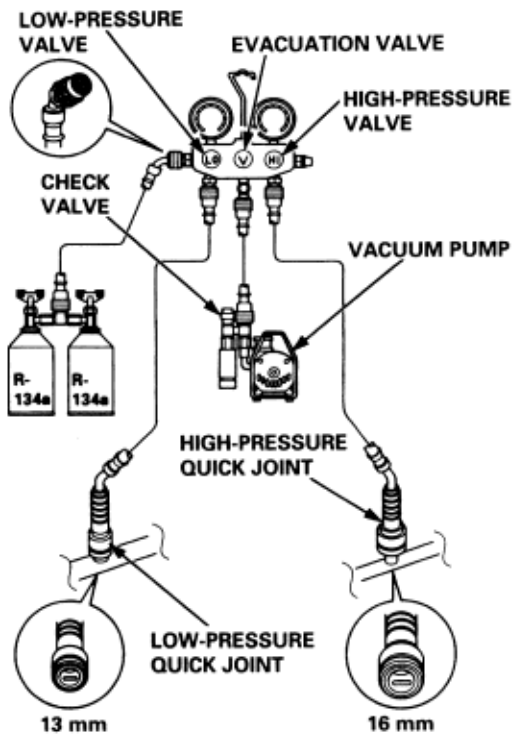
⚠ CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

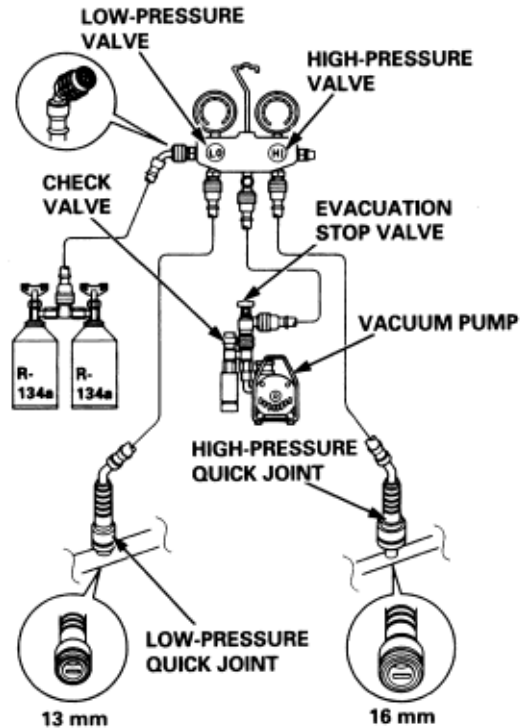
1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using an R-134a refrigerant vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced.)

THREE VALVE GAUGE:



2. Connect the R-134a gauge set, pump and refrigerant containers (cans of R-134a) as shown. **NOTE:** Do not open the cans.
3. Start the pump, then open both pressure valves the evacuation valve (two valve gauge: evacuation stop valve). Run the pump for about 15 minutes.
4. Close both pressure valves and the evacuation valve (two valve gauge: evacuation stop valve), and the pump. The low-pressure gauge should indicate above 93.3 kPa (700 mm Hg, 27.6 in. Hg), and remain steady with the valves closed. **NOTE:** If the low pressure does not reach more 93.3 kPa (700 mm Hg, 27.6 in Hg) in 15 minutes, is probably a leak in the system. Check for leaks, repair (see Leak Test).
5. If there are no leaks, open the valves and continue pumping for at least another 15 minutes. Then close both valves, and stop the pump.

TWO VALVE GAUGE:



NOTE:

- ♦ Use only a gauge set for refrigerant HFC-134a (R-134a).
- ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service.

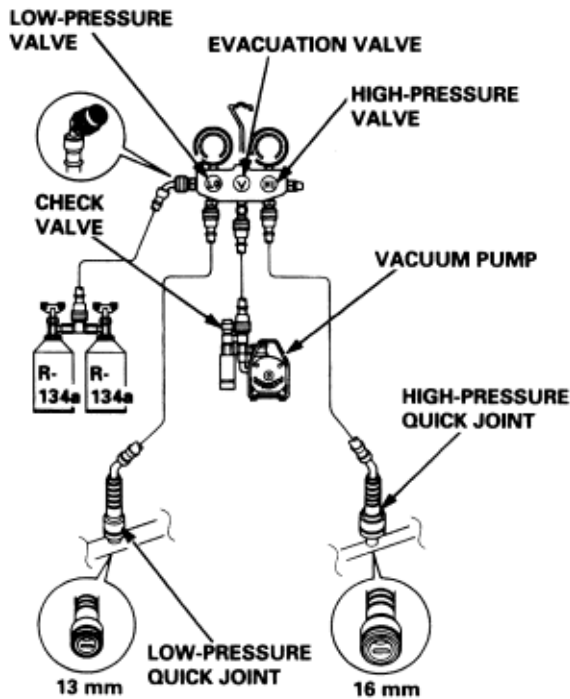
R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

WARNING

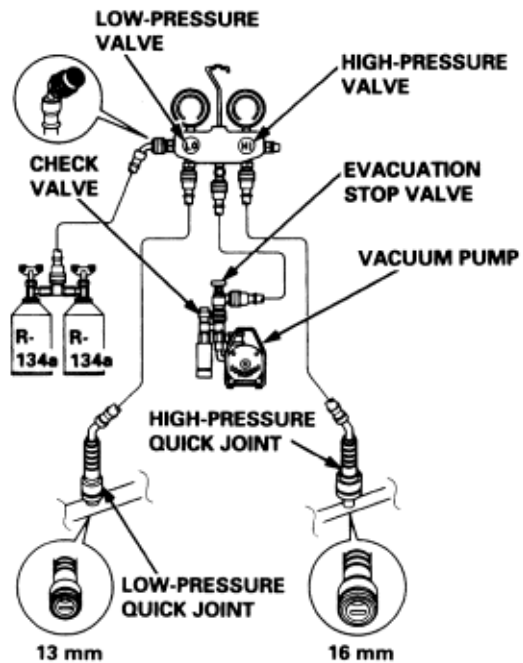
- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

THREE VALVE GAUGE:



TWO VALVE GAUGE:



1. After the leak test, check that the high-pressure valve is closed, and start the engine.
 NOTE: Run the engine below 1,500 rpm (min-1).
2. Open the front door.
 Turn the A/C switch ON.
 Set the temperature control dial to MAX COOL.
 Set the mode control dial to VENT.
 Turn the fan switch to MAX.
3. Open the low-pressure valve, and charge with R-134a refrigerant.

WARNING

- ♦ Do not open the high-pressure valve.
 - ♦ Do not turn the cans upside down.
4. Charge the system with refrigerant capacity. Do not overcharge the system; the compressor will be damaged.
 5. When fully charged, close the low-pressure valve and the refrigerant cans. Check the system.
 6. Stop the engine, and disconnect the charge hose quickly.
 7. Check the system for leaks using a leak detector proper to refrigerant R-134a.
 NOTE: Particularly check for leaks around the compressor, condenser and receiver/dryer.



CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

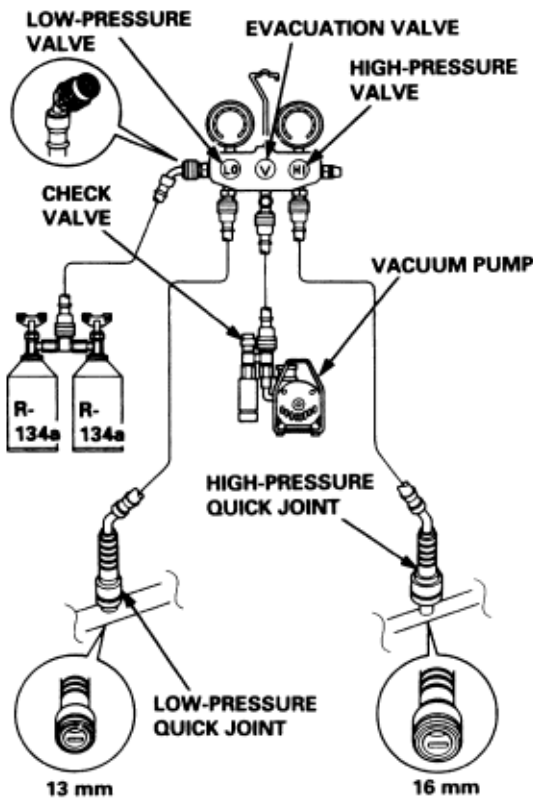


WARNING

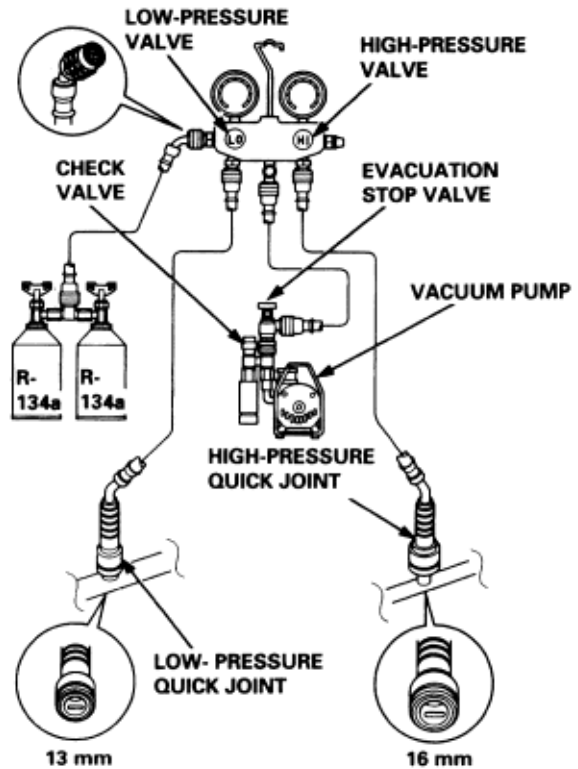
- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

THREE VALVE GAUGE:



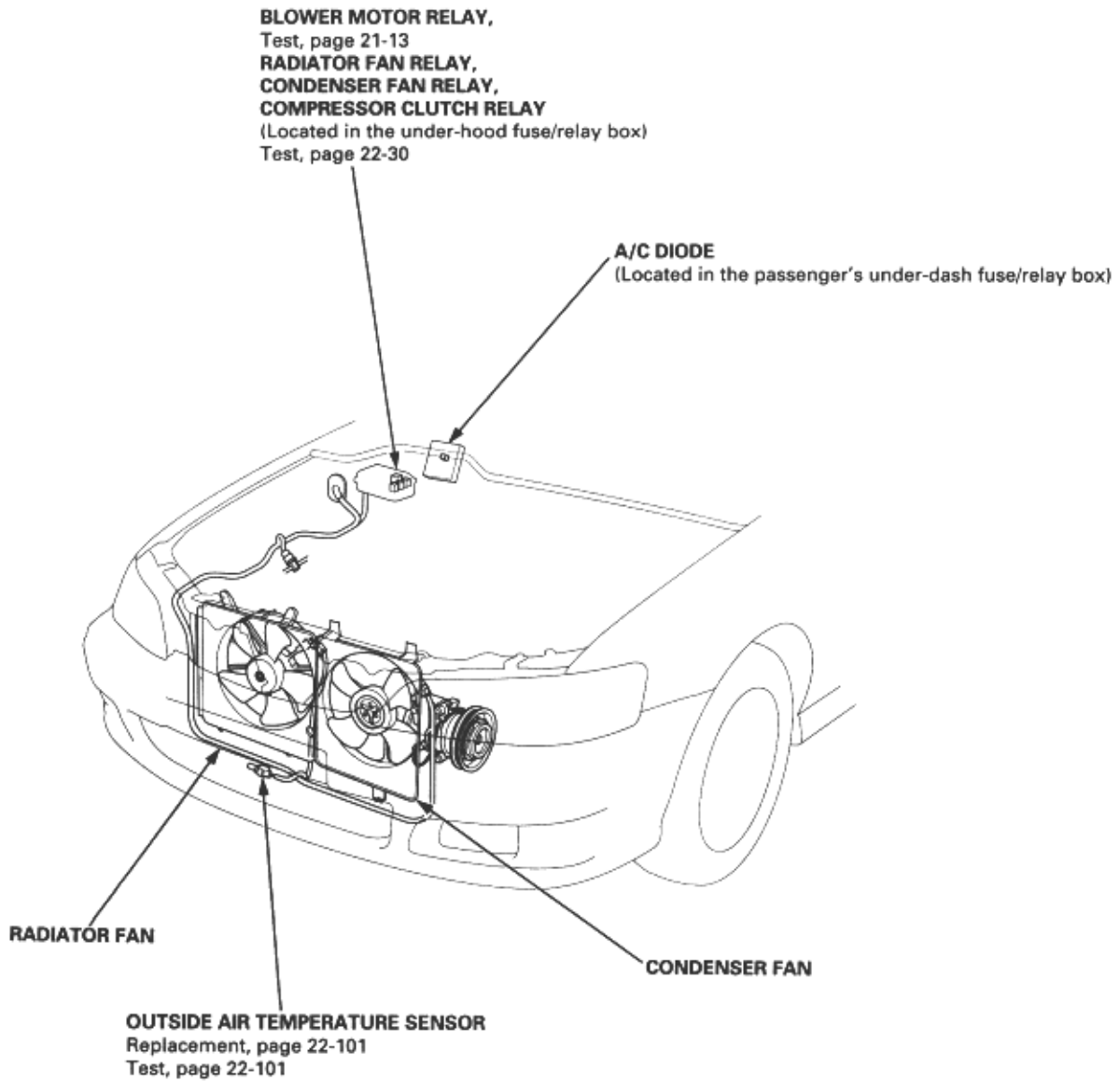
TWO VALVE GAUGE:



NOTE:

- ♦ Use only a gauge set for refrigerant HFC-134a (R-134a).
 - ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
1. Close the evacuation valve (two valve gauge: evacuation stop valve).
 2. Open the cans.
 3. Open the high-pressure valve to charge the system to about 98 kPa (1.0 kgf/cm², 14 psi), then close it. NOTE: Close the low-pressure valve.
 4. Check the system for leaks using a leak detector proper to refrigerant R-134a. NOTE: Particularly check for leaks around the compressor, condenser and receiver/dryer.
 5. If you find any leaks, tighten the joint nuts and bolts to the specified torque.
 6. Recheck the system for leaks using a leak detector.
 7. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.) release any charge in the system.
 8. After checking and repairing leaks, the system must be evacuated (System Evacuation (See Page 22-57)).

NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above, click on the following:

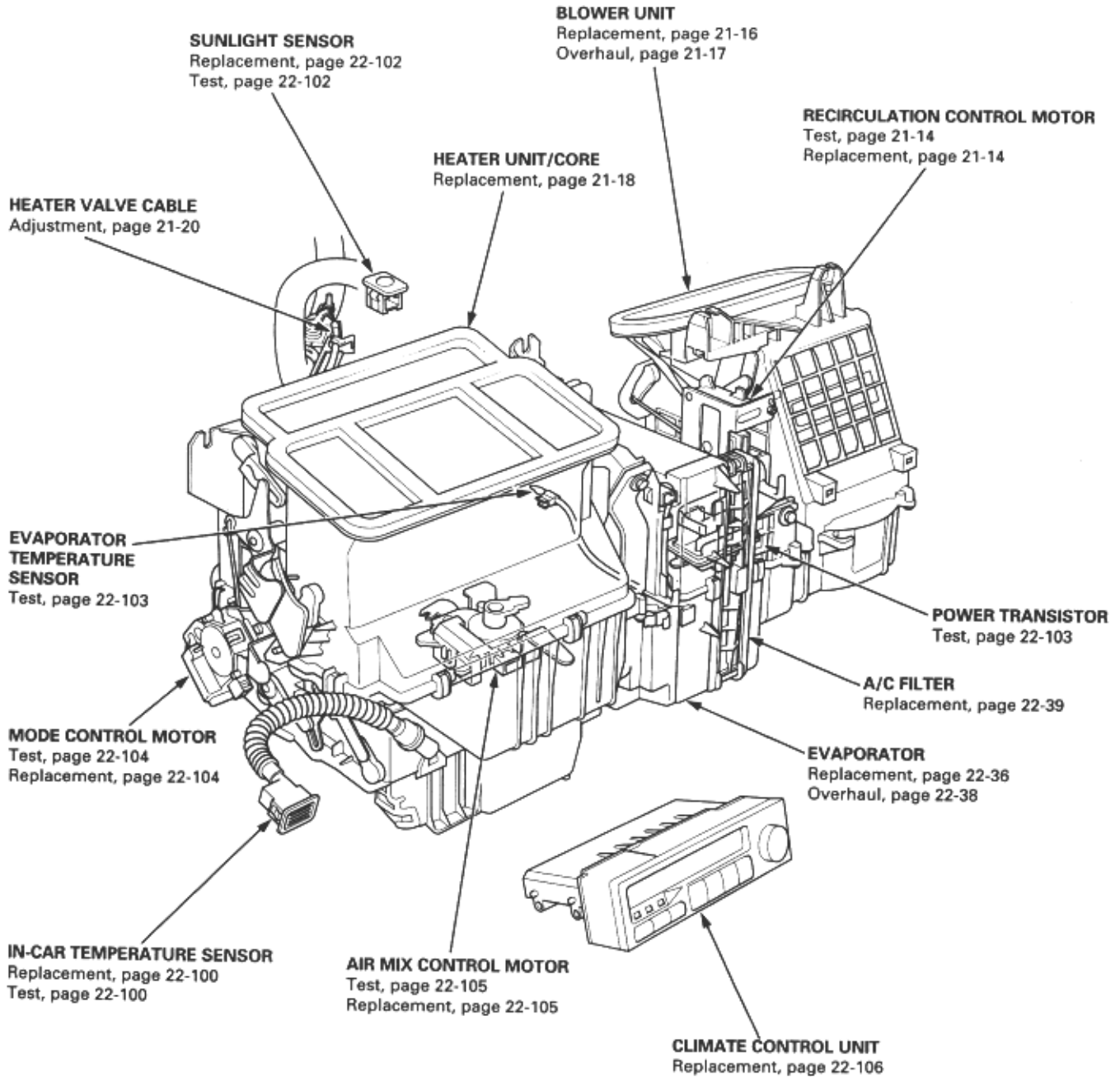
(See Page 22-13)

(See Page 22-30)

(See Page 22-101)

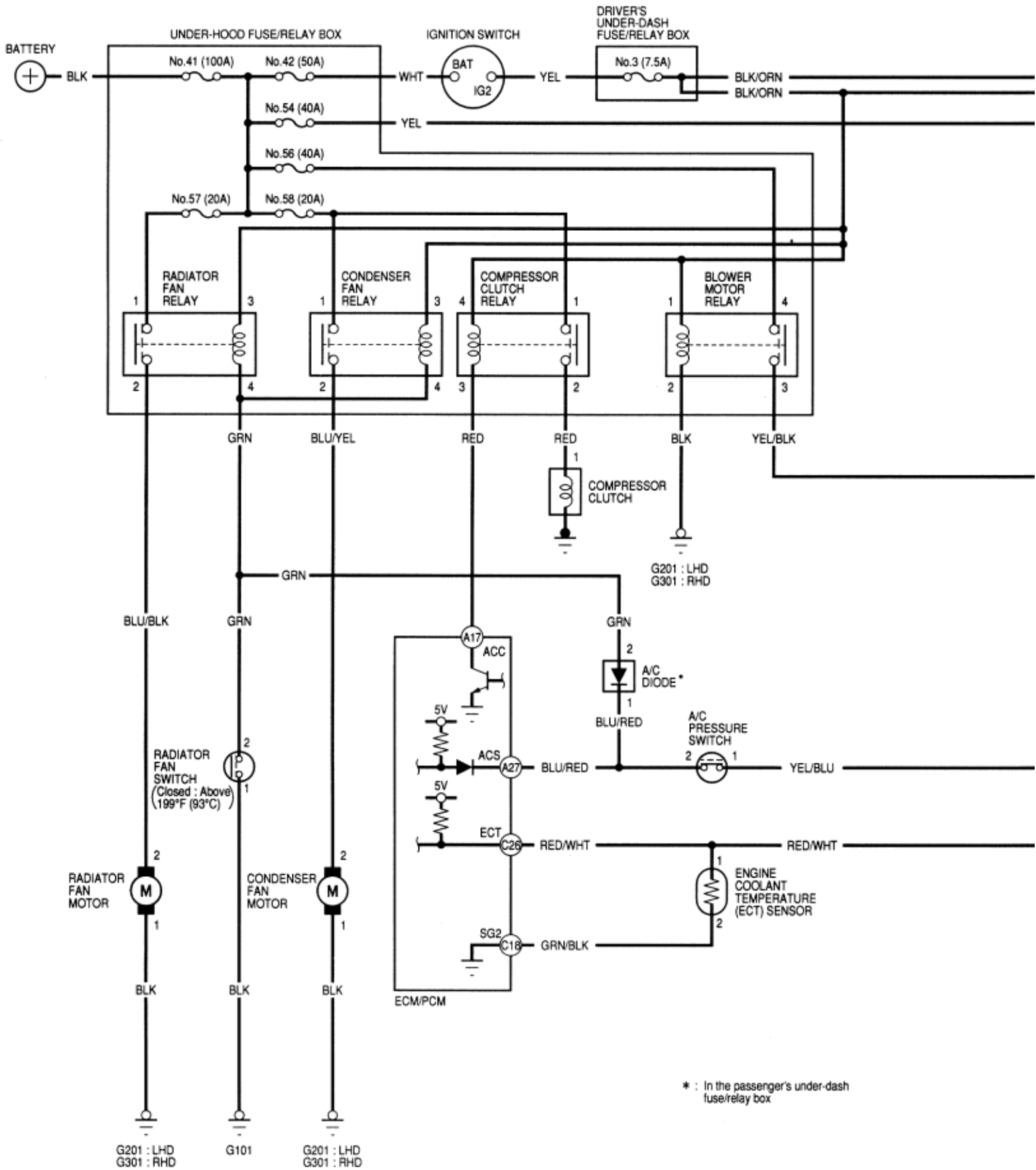
SRS components are located in this area. Review the SRS component locations, precautions and procedures in the SRS section (24) before performing repairs or service.

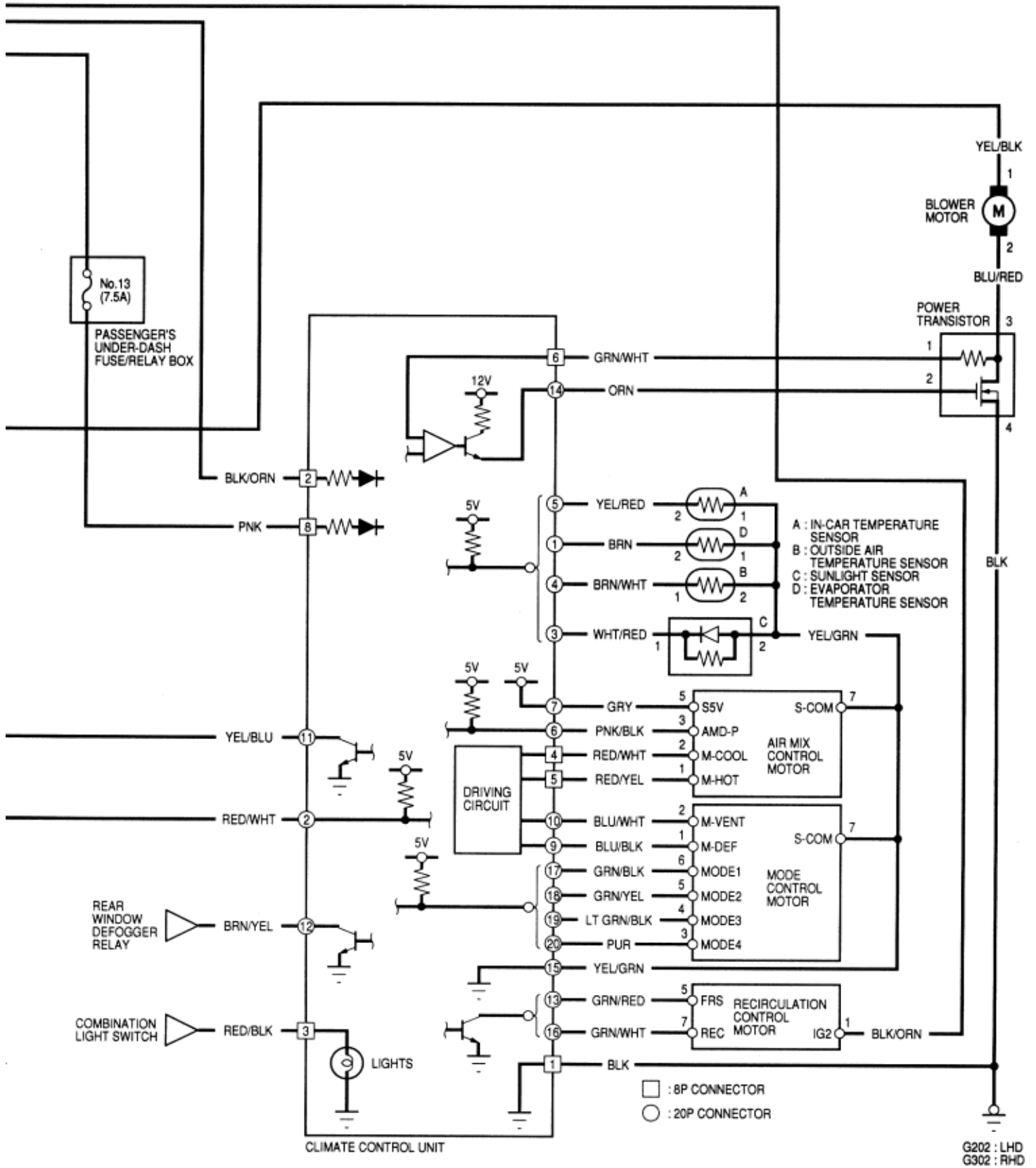
NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 22-102)
- (See Page 21-20)
- (See Page 22-103)
- (See Page 22-104)
- (See Page 22-100)
- (See Page 22-105)
- (See Page 21-16)
- (See Page 21-17)
- (See Page 21-14)
- (See Page 22-39)
- (See Page 22-36)
- (See Page 22-38)
- (See Page 22-106)





For electrical malfunctions, which are indicated by the self-diagnostic system, refer to self-diagnosis function (see next page). Note these items before troubleshooting a symptom.

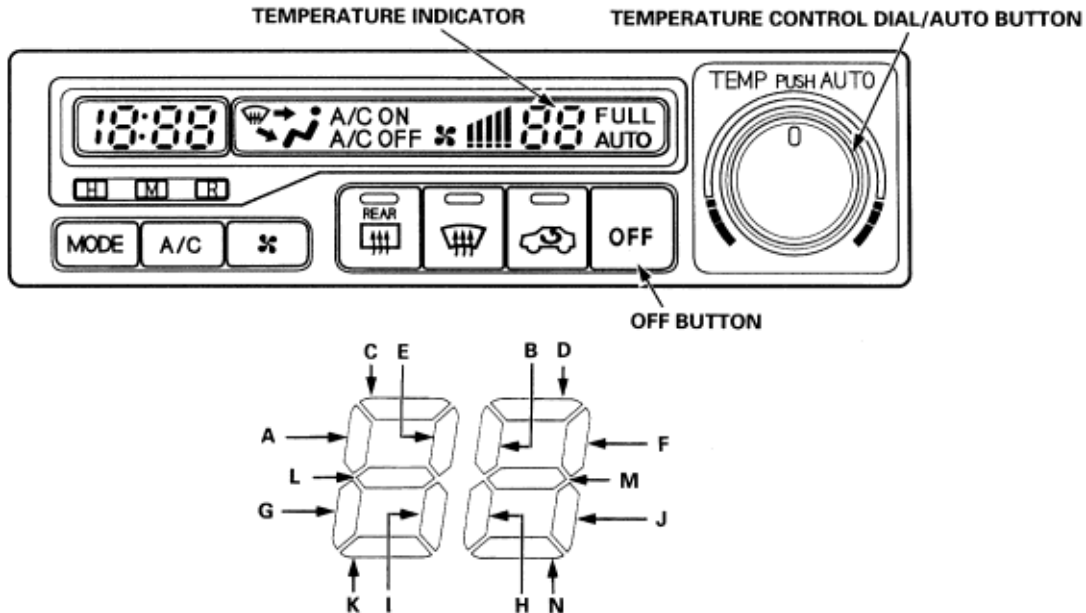
- ♦ Check the engine coolant level, and allow the engine to warm up before troubleshooting.
- ♦ Any abnormality must be corrected before continuing the test.
- ♦ Because of the precise measurements needed, use a digital circuit tester with an output of 1 mA or less at the 20 k ohms range when testing.
- ♦ Before performing any troubleshooting procedures check:
 - Fuses No. 56 (40 A), No. 57 (20 A), No. 58 (20 A) in the under-hood fuse/relay box, and No.3 (7.5 A) in the driver's under-dash fuse/relay box, and No. 13 (7.5 A) in the passenger's under-dash fuse/relay box.
 - Grounds No. G101, G201 (LHD), G202 (LHD), G301 (RHD), G302 (RHD).
 - Cleanliness and tightness of all connectors.

Symptom	See page
Recirculation control doors do not change between Fresh and Recirculate.	(See Page 22-92)
The blower motor does not run immediately even though the engine is fully warmed up (NOTE: The temperature control dial must be set between 18°C (61°F) and 32°C (89°F)).	(See Page 22-98)
Both heater and A/C do not work.	(See Page 22-94)
Radiator fan does not run at all (but condenser fan runs with the A/C on).	(See Page 22-10)
Condenser fan does not run at all (but radiator fan runs with the A/C on).	(See Page 22-13)
Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.	(See Page 22-16)
Both fans do not run with the A/C on.	(See Page 22-17)
Compressor clutch does not engage.	(See Page 22-21)
A/C system does not come on (both fans and compressor).	(See Page 22-96)

The climate control unit has a self-diagnosis function.

Running the Self-diagnosis Function

Turn the ignition switch ON (II), then press the AUTO button and sequentially the OFF button while continuing to press the AUTO button. If there is any abnormality in the system when both buttons are pressed, the temperature indicator will light up the segment (A to N) corresponding to the error. The temperature indicator will then alternate every second between displaying "88" (all segments lit) and the error segment. If there is no abnormality, the segments will not light up.



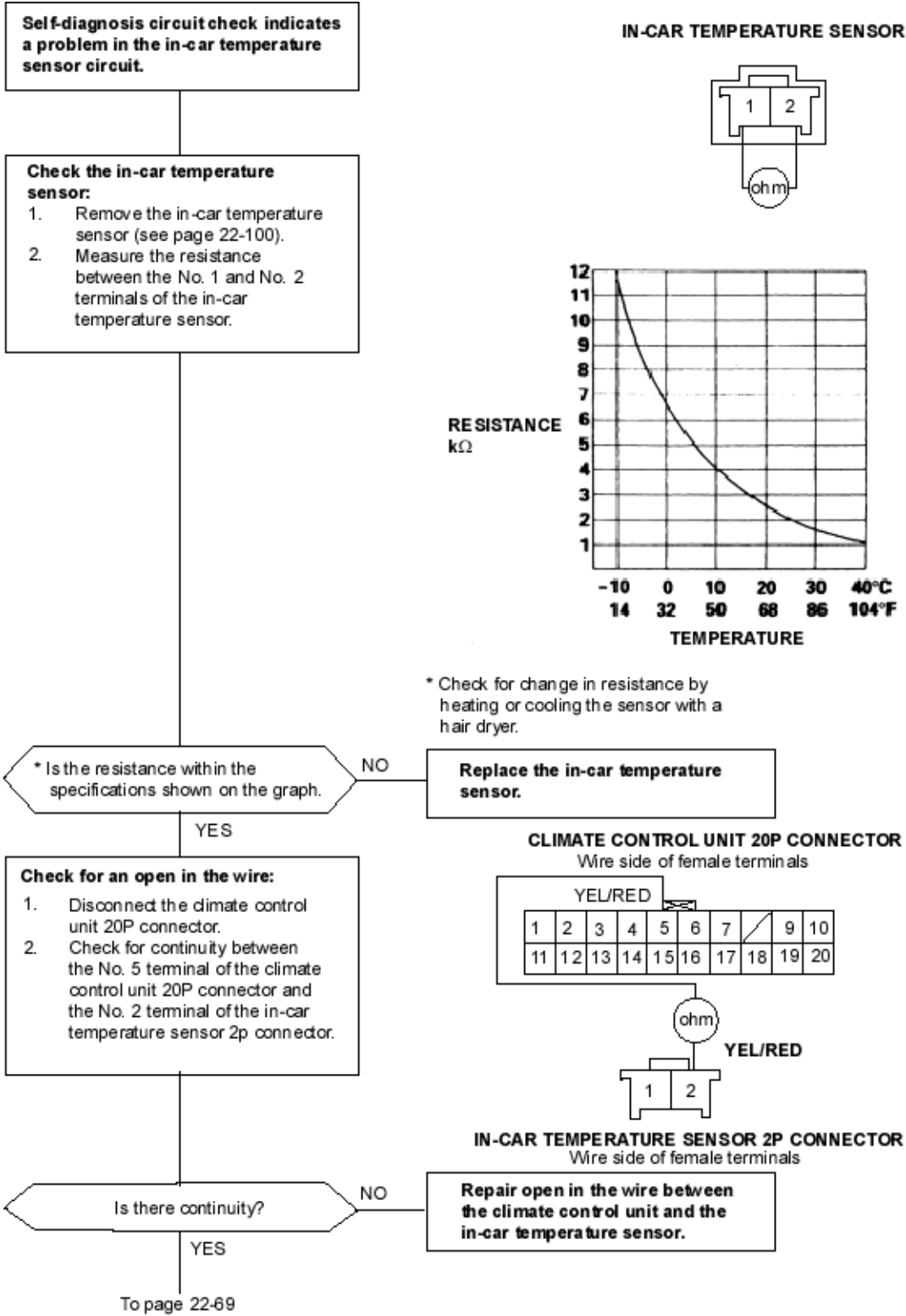
Indicator segment	Component with problem	Possible cause	See page
A	In-car temperature sensor	Open circuit, faulty sensor	(See Page 22-68)
B	In-car temperature sensor	Short circuit, faulty sensor	(See Page 22-70)
C	Outside air temperature sensor	Open circuit, faulty sensor	(See Page 22-71)
D	Outside air temperature sensor	Short circuit, faulty sensor	(See Page 22-73)
E	Sunlight sensor	Open circuit, faulty sensor	(See Page 22-74)
F	Sunlight sensor	Short circuit, faulty sensor	(See Page 22-75)
G	Evaporator temperature sensor	Open circuit, faulty sensor	(See Page 22-76)
H	Evaporator temperature sensor	Short circuit, faulty sensor	(See Page 22-78)
I	Air mix control motor	Open circuit	(See Page 22-79)
J	Air mix control motor	Short circuit	(See Page 22-80)
K	Air mix control motor	Obstructed door, faulty motor	(See Page 22-82)
L	Mode control motor	Open or short circuit	(See Page 22-84)
M	Mode control motor	Obstructed door, faulty motor	(See Page 22-86)
N	Blower motor	Open or short circuit, faulty motor	(See Page 22-88)

In case of multiple problems, the respective indicator segments will come on. If indicator segments A, C, E, G, I and L come on at the same time, there may be an open in the common ground wire of the sensors.

Resetting the Self-diagnosis Function

Turning the ignition switch OFF will cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are not other malfunctions.

Self diagnosis indicator light A comes on: A problem in the in-car temperature sensor circuit open.
 The in-car temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the temperature inside the vehicle increases.



From page 22-68

Check for an open in the wire:
Check for continuity between the No. 15 terminal of the climate control unit 20P connector and the No. 1 terminal of the in-car temperature sensor 2P connector.

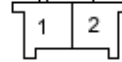
CLIMATE CONTROL UNIT 20P CONNECTOR
Wire side of female terminals

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

YEL/GRN



YEL/GRN



IN-CAR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

NO

Repair open in the wire between the climate control unit and the in-car temperature sensor.

YES

Check for loose wires or poor connections at the climate control unit 20P connector and at the in-car temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

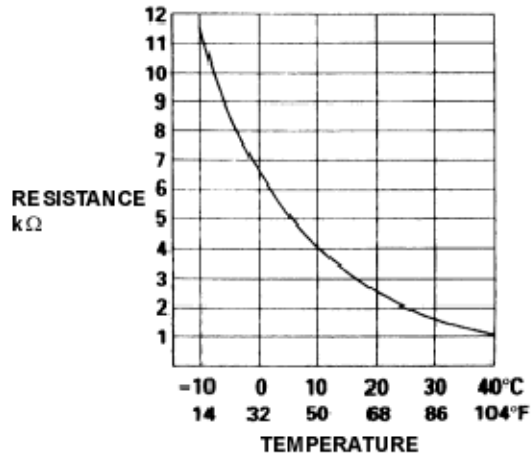
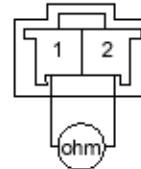
Self diagnosis indicator light B comes on: A problem in the in-car temperature sensor circuit short.
 The in-car temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the temperature inside the vehicle increases.

Self-diagnosis circuit check indicates a problem in the in-car temperature sensor circuit.

Check the in-car temperature sensor:

1. Remove the in-car temperature sensor (see page 22-100).
2. Measure the resistance between the No. 1 and No. 2 terminals of the in-car temperature sensor.

IN-CAR TEMPERATURE SENSOR



* Check for change in resistance by heating and cooling the sensor with a hair drier.

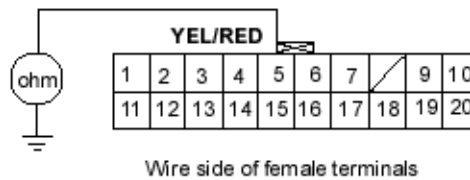
* Is the resistance within the specifications shown on the graph?

Replace the in-car temperature sensor.

Check for a short in the wire:

1. Disconnect the climate control unit 20P connector.
2. Check for continuity between the No. 5 terminal of the climate control unit 20P connector and body ground.

CLIMATE CONTROL UNIT 20P CONNECTOR



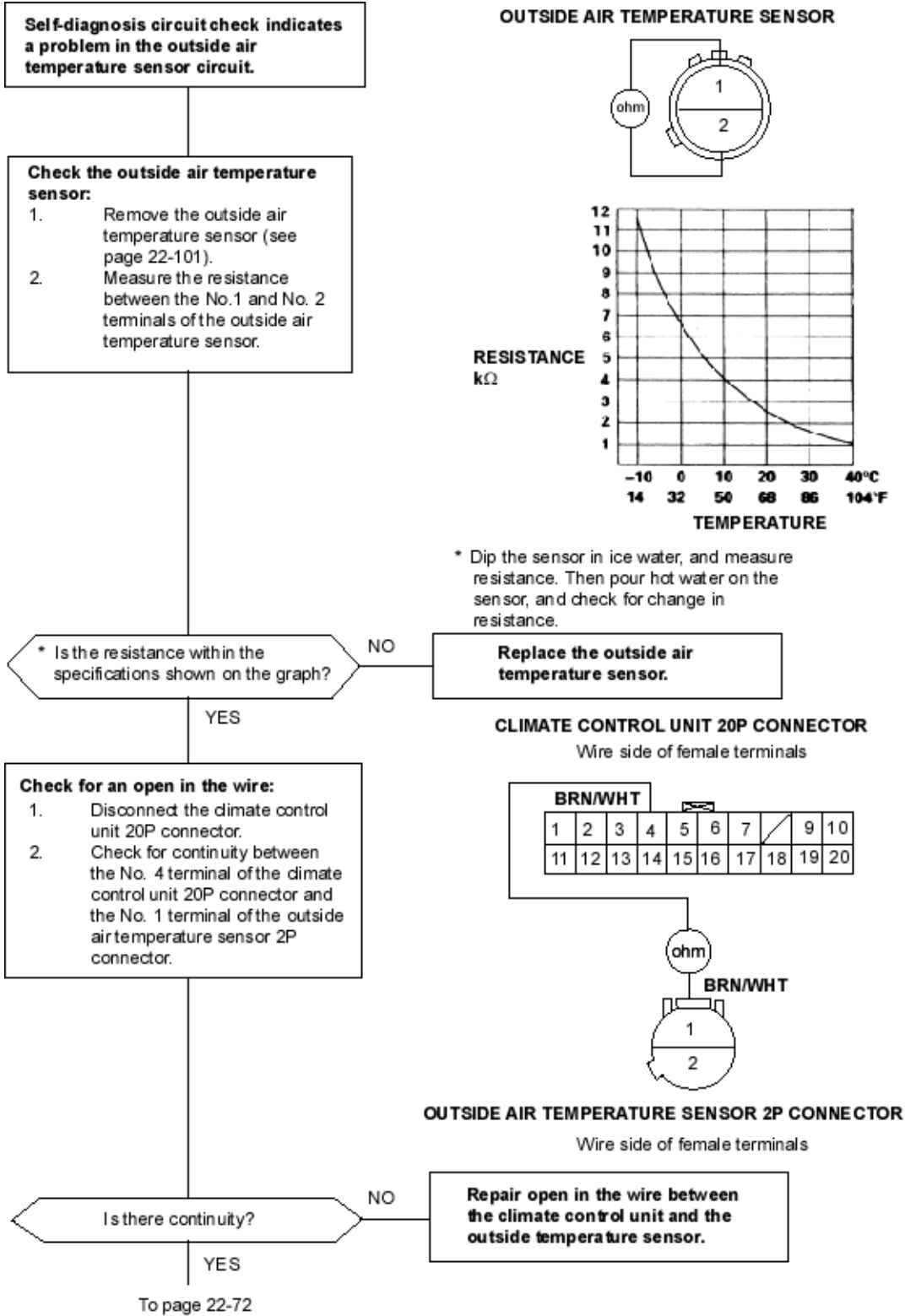
Is there continuity?

Repair short in the wire between the climate control unit and the in-car temperature sensor.

Check for loose wires or poor connections at the climate control unit 20P connector and at the in-car temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

Self diagnosis indicator light C comes on: A problem in the outside air temperature sensor circuit open.

The outside air temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the temperature outside the vehicle increases.

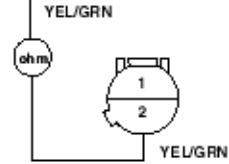


From page 22-71

Check for an open in the wire:
Check for continuity between the No. 15 terminal of the climate control unit 20P connector and the No. 2 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT 20P CONNECTOR
Wire side of female terminals

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20



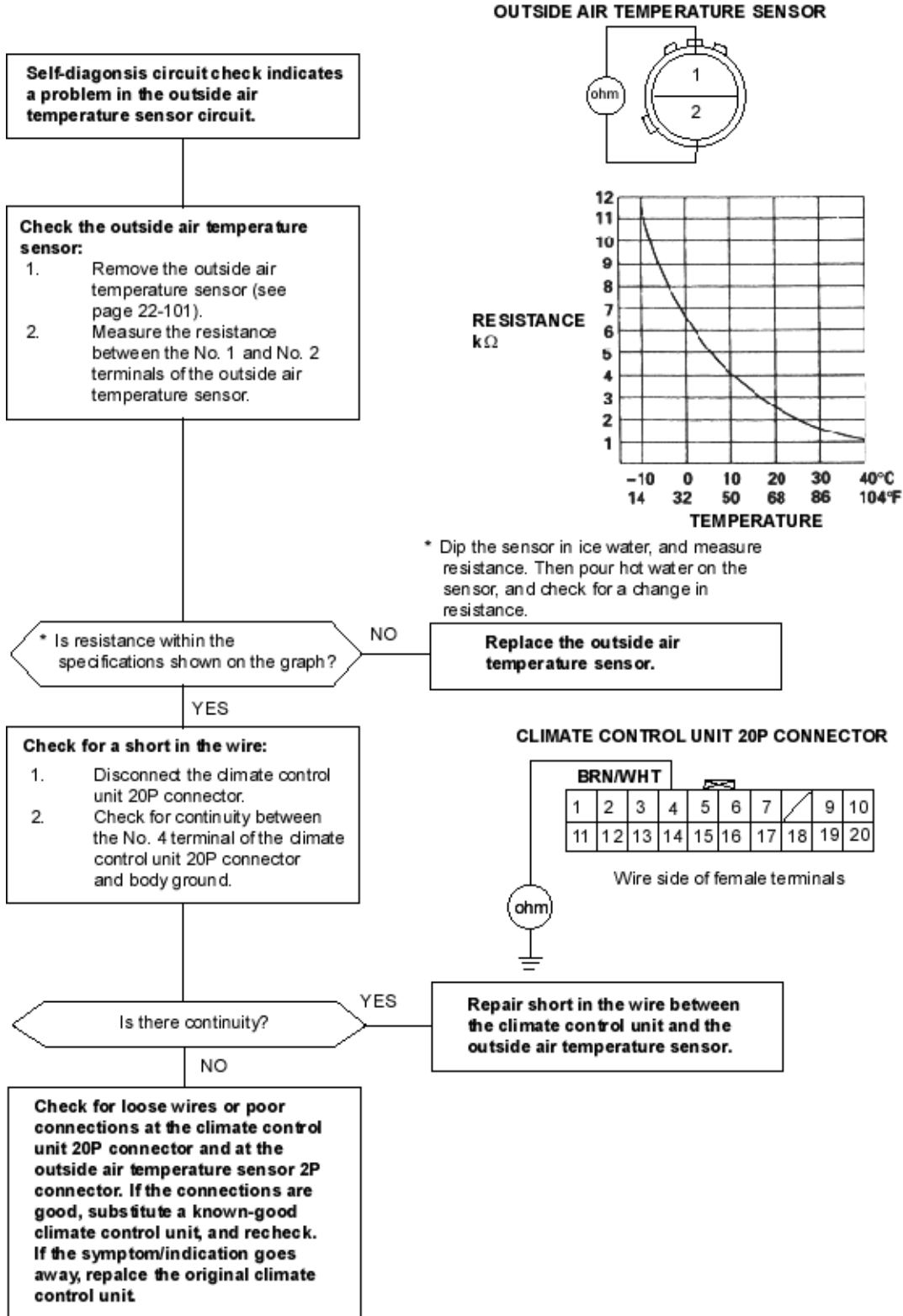
OUTSIDE AIR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

NO
Repair open in the wire between the climate control unit and the outside air temperature sensor.

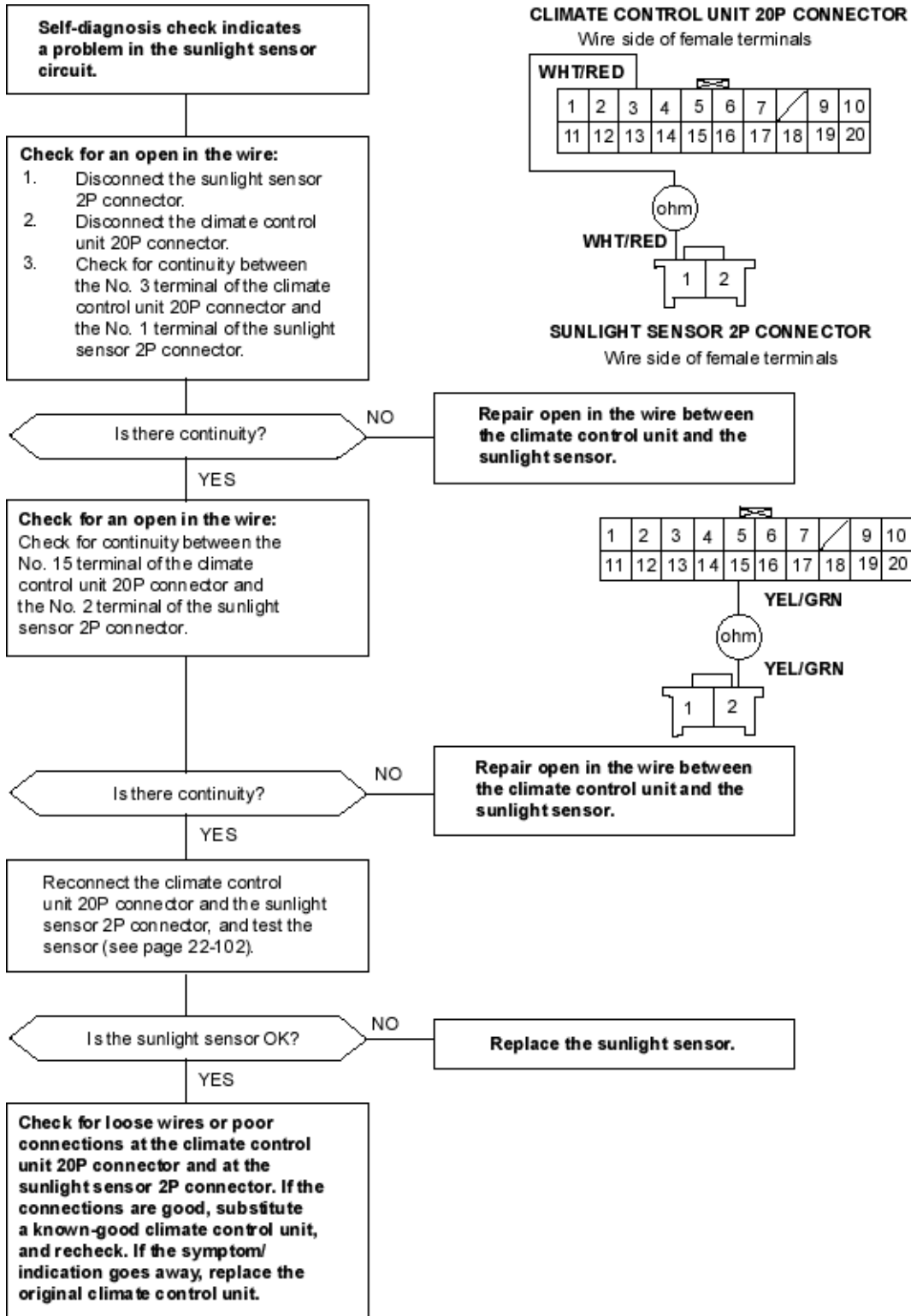
YES
Check for loose wires or poor connections at the climate control unit 20P connector and at the outside air temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom indication goes away, replace the original climate control unit.

Self diagnosis indicator light D comes on: A problem in the outside air temperature sensor circuit short. The outside air temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the temperature outside the vehicle increases.



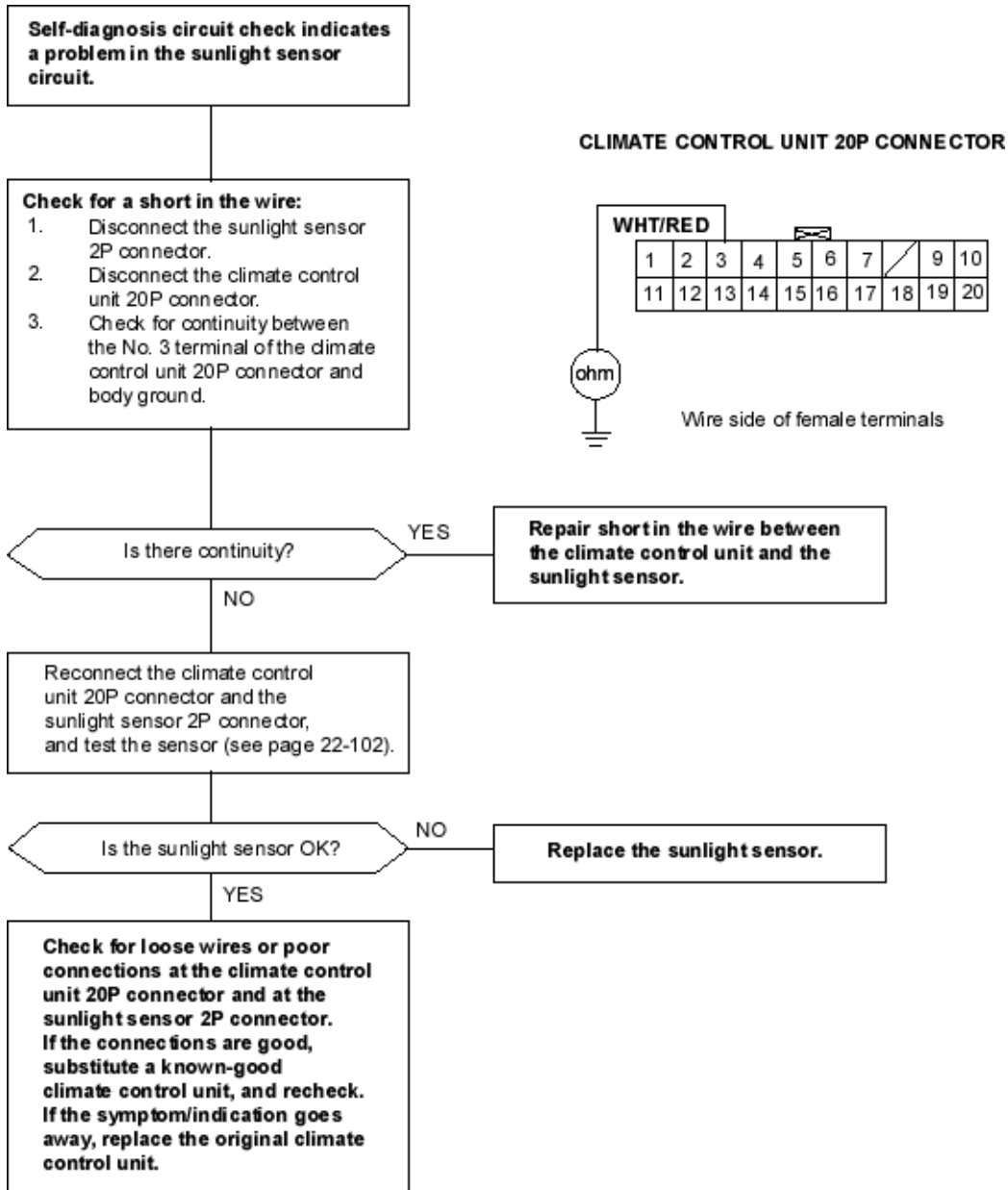
To go to the page referenced on the diagram above, click on the following:
 (See Page 22-101)

Self diagnosis indicator light E comes on: A problem in the sunlight sensor circuit open.
The sunlight sensor is a light sensitive, variable resistance diode. The resistance of the diode increases as the intensity of the light increases.



To go to the page referenced on the diagram above, click on the following:
(See Page 22-102)

Self diagnosis indicator light F comes on: A problem in the sunlight sensor circuit short.
 The sunlight sensor is a light sensitive, variable resistance diode. The resistance of the diode increases as the intensity of the light increases.



To go to the page referenced on the diagram above, click on the following:
 (See Page 22-102)

Self diagnosis indicator light G comes on: A problem in the evaporator temperature sensor circuit open. The evaporator temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the evaporator outlet air temperature increases.

Self-diagnosis circuit check indicates a problem in the evaporator temperature sensor circuit.

Check the evaporator temperature sensor:

1. Disconnect the evaporator temperature sensor 2P connector.
2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

Is the resistance within the specifications shown on the graph?

NO Replace the evaporator temperature sensor.

YES

Check for an open in the wire:

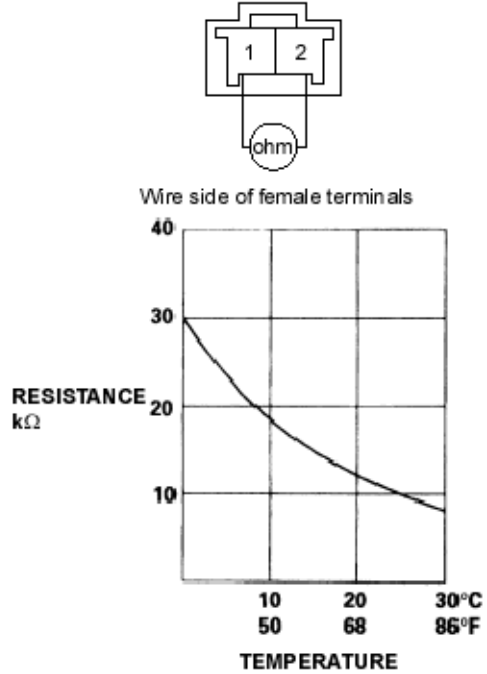
1. Disconnect the climate control unit 20P connector.
2. Check for continuity between the No. 1 terminal of the climate control unit 20P connector and the No. 2 terminal of the evaporator temperature sensor 2P connector.

Is there continuity?

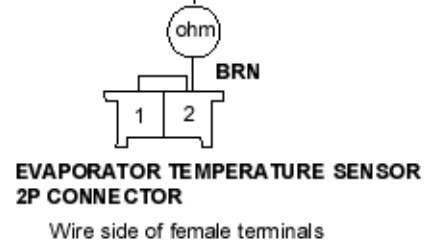
NO Repair open in the wire between the climate control unit and the evaporator temperature sensor.

To page 22-77

EVAPORATOR TEMPERATURE SENSOR



CLIMATE CONTROL UNIT 20P CONNECTOR
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

From page 22-76

Check for an open in the wire:
Check for continuity between the No. 15 terminal of the climate control unit 20P connector and the No. 1 terminal of the evaporator temperature sensor 2P connector.

CLIMATE CONTROL UNIT 20P CONNECTOR

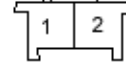
Wire side of female terminals

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

YEL/GRN



YEL/GRN



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR

Wire side of female terminals

Is there continuity?

NO

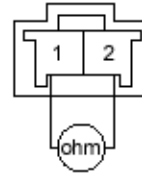
Repair open in the wire between the climate control unit and the evaporator temperature sensor.

YES

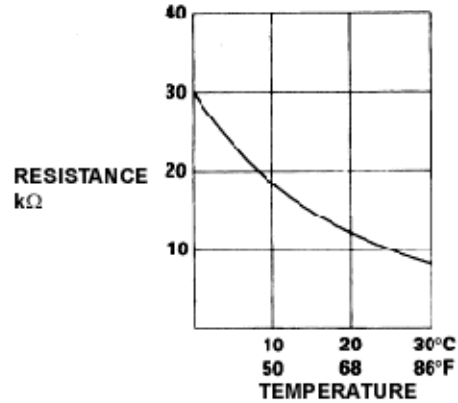
Check for loose wires or poor connections at the climate control unit 20P connector and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

Self diagnosis indicator light H comes on: A problem in the evaporator temperature sensor circuit short. The evaporator temperature sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the evaporator outlet air temperature increases.

EVAPORATOR TEMPERATURE SENSOR



Wire side of female terminals



Self-diagnosis circuit check indicates a problem in the evaporator temperature sensor circuit

Check the evaporator temperature sensor:

1. Disconnect the evaporator temperature sensor 2P connector.
2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

Is the resistance within the specifications shown on the graph?

NO → Replace the evaporator temperature sensor.

YES

Check for a short in the wire:

1. Disconnect the climate control unit 20P connector.
2. Check for continuity between the No. 1 terminal of the climate control unit 20P connector and body ground.

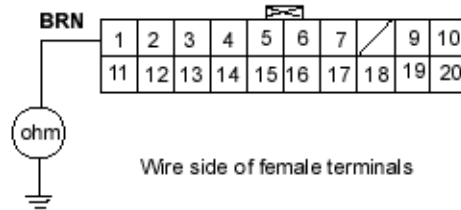
Is there continuity?

YES → Repair short in wire between the climate control unit and the evaporator temperature sensor.

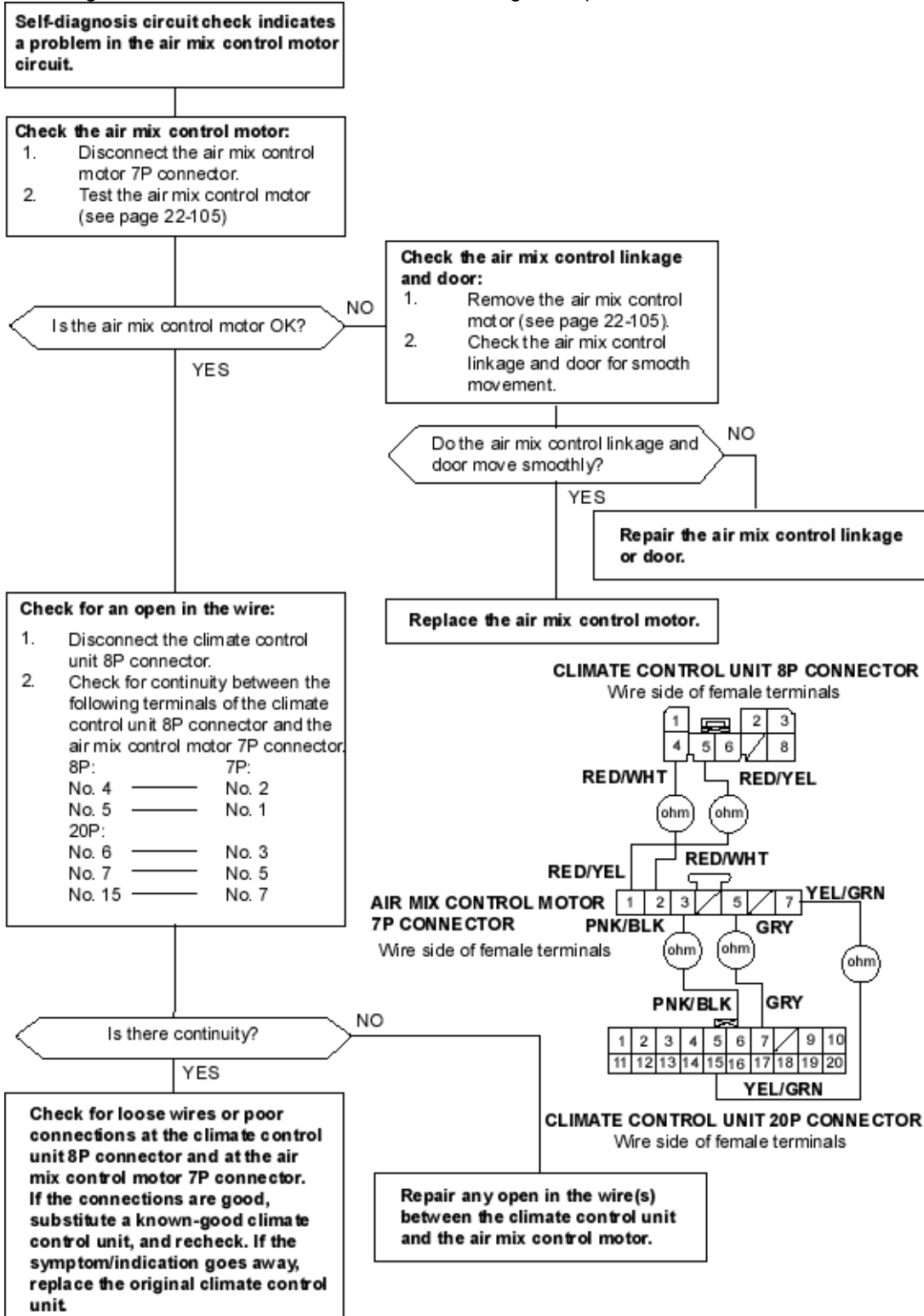
NO

Check for loose wires or poor connections at the climate control unit 20P connector and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

CLIMATE CONTROL UNIT 20P CONNECTOR

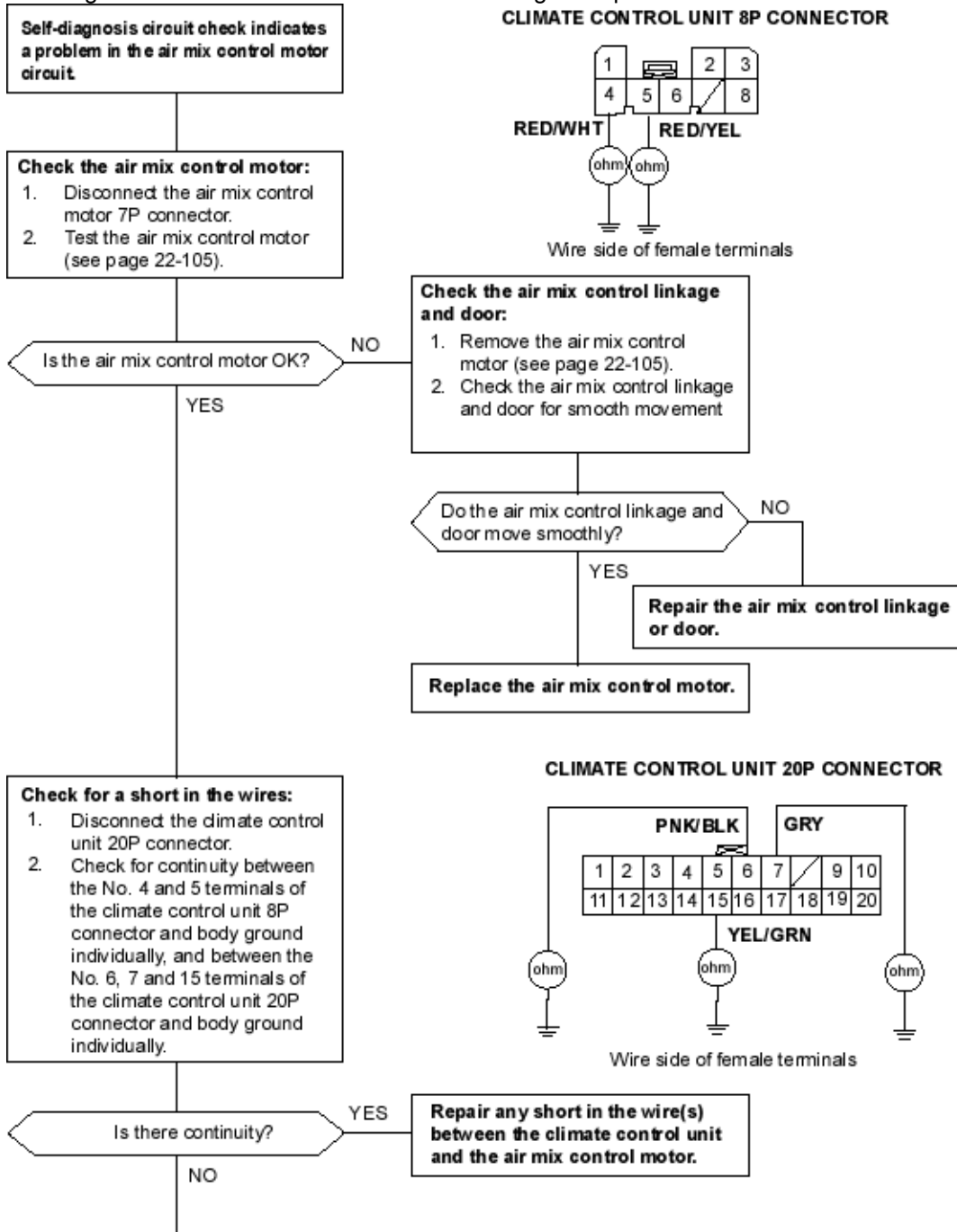


Self diagnosis indicator light I comes on: A problem in the air mix control motor circuit open.
 The air mix control motor regulates the mixture of cool/hot air according to output from the climate control unit.



To go to the page referenced on the diagram above, click on the following:
 (See Page 22-105)

Self diagnosis indicator light J comes on: A problem in the air mix control motor circuit short.
 The air mix control motor regulates the mixture of cool/hot air according to output from the climate control unit.



To go to the page referenced on the diagram above, click on the following:
 (See Page 22-105)

From page 22-80

Check for a short to power:
Check the same terminals for voltage.

Is there any voltage?

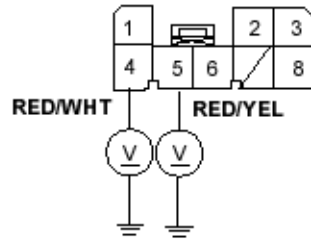
NO

YES

Check for loose wires or poor connections at the climate control unit 8P and 20P connectors and at the air mix control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

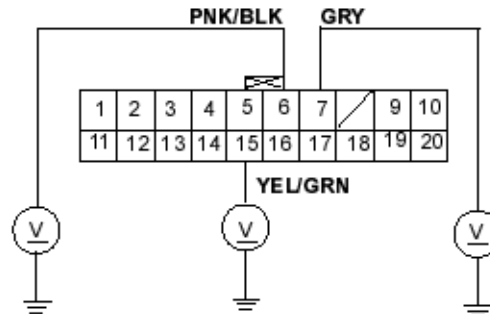
Repair short to power in the wire(s) between the climate control unit and air mix control motor. This also damages the climate control unit. Repair the short to power before replacing the climate control unit.

CLIMATE CONTROL UNIT 8P CONNECTOR



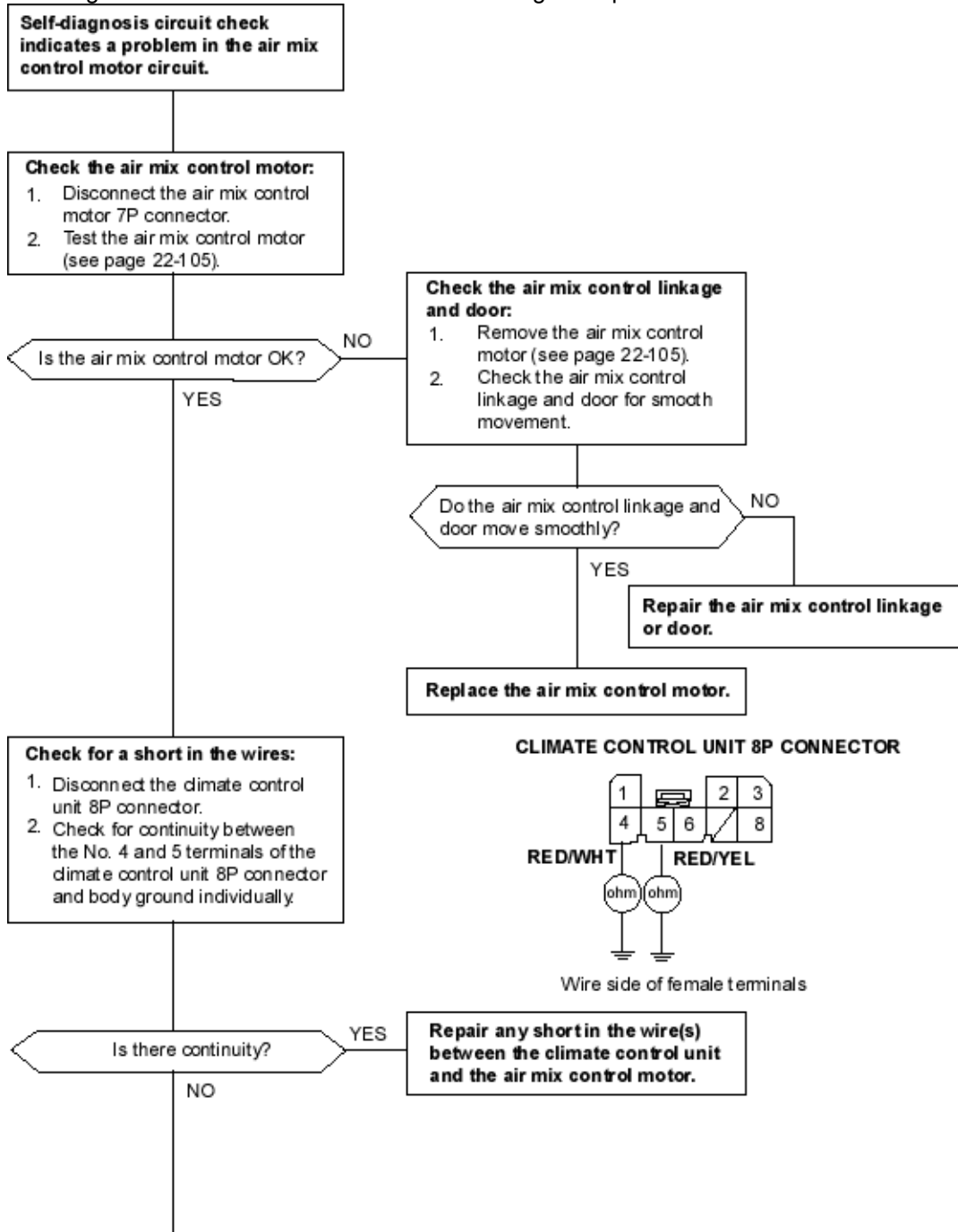
Wire side of female terminals

CLIMATE CONTROL UNIT 20P CONNECTOR



Wire side of female terminals

Self diagnosis indicator light K comes on: A problem in the air mix control linkage, door and motor.
 The air mix control motor regulates the mixture of cool/hot air according to output from the climate control unit.



To page 22-83

To go to the page referenced on the diagram above, click on the following:
 (See Page 22-105)

From page 22-82

Check for an open in the wire:
Check for continuity between the following terminals of the climate control unit 8P connector and the air mix control motor 7P connector.

8P:		7P:	
No. 4	—	No. 2	
No. 5	—	No. 1	

Is there continuity?

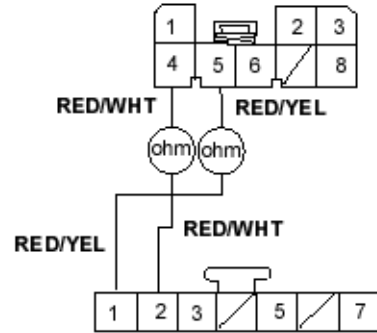
NO

Repair any open in the wire(s) between the climate control unit and air mix control motor.

Check for loose wires or poor connections at the climate control unit 8P connector and at the air mix control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

CLIMATE CONTROL UNIT 8P CONNECTOR

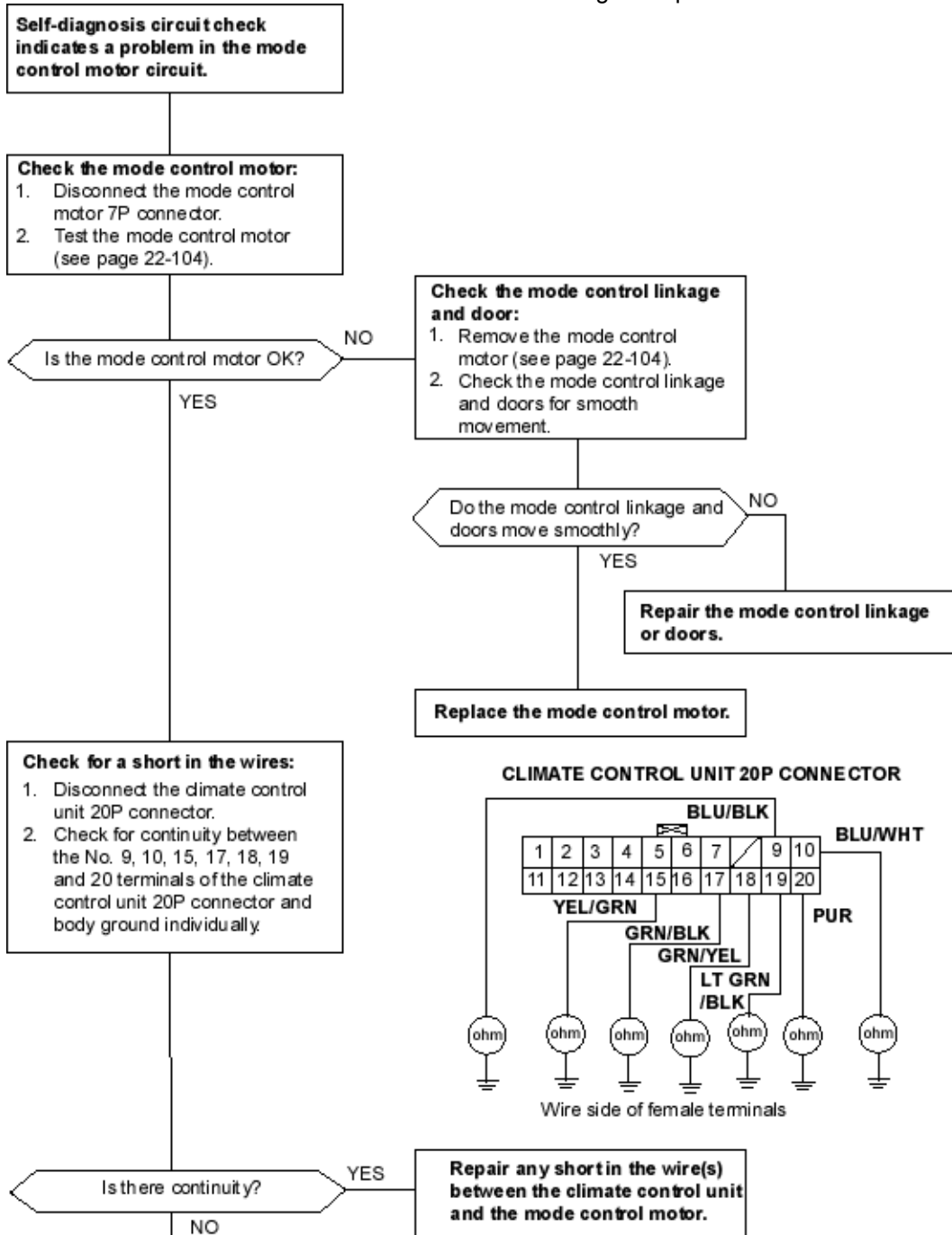
Wire side of female terminals



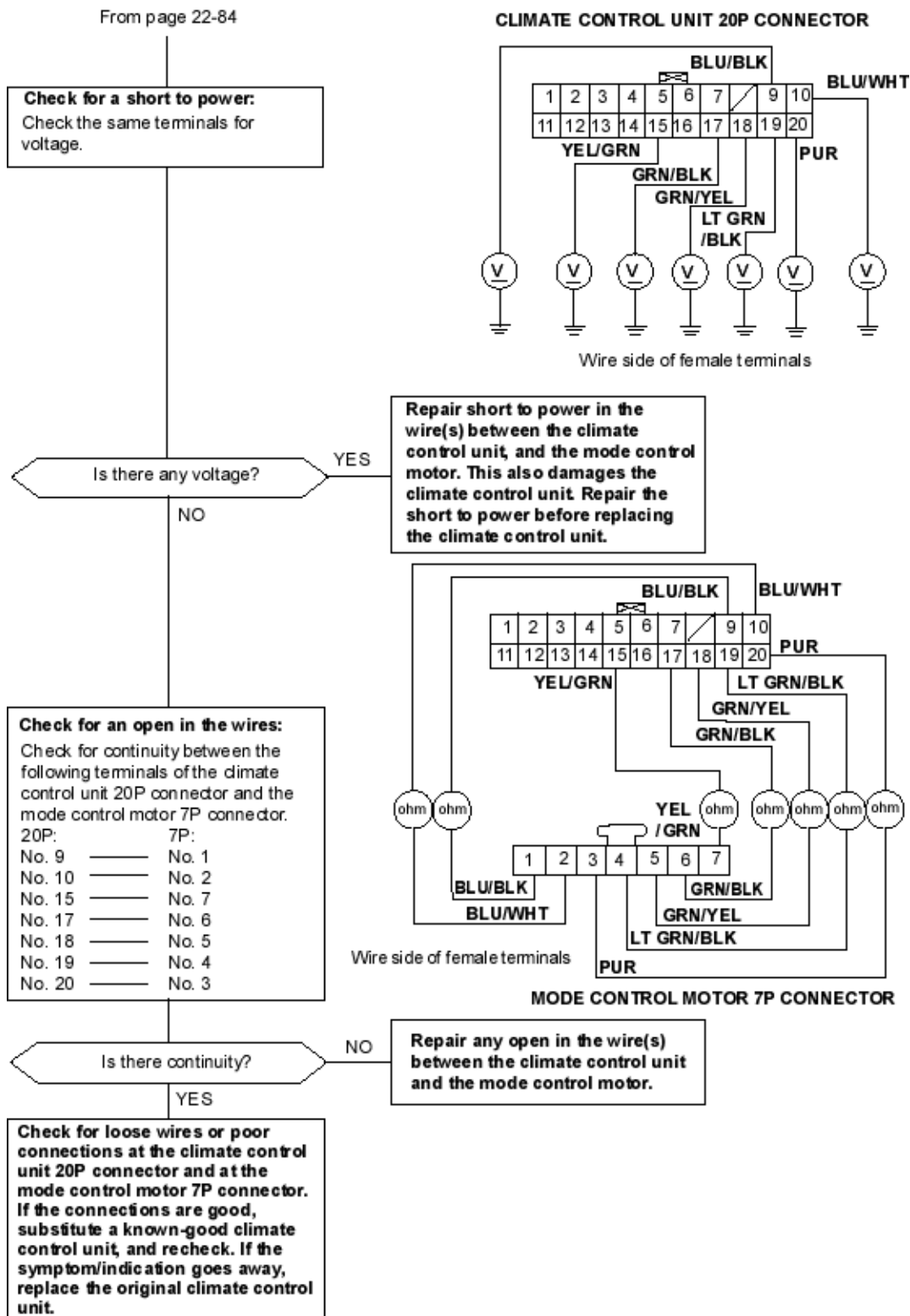
AIR MIX CONTROL MOTOR 7P CONNECTOR

Wire side of female terminals

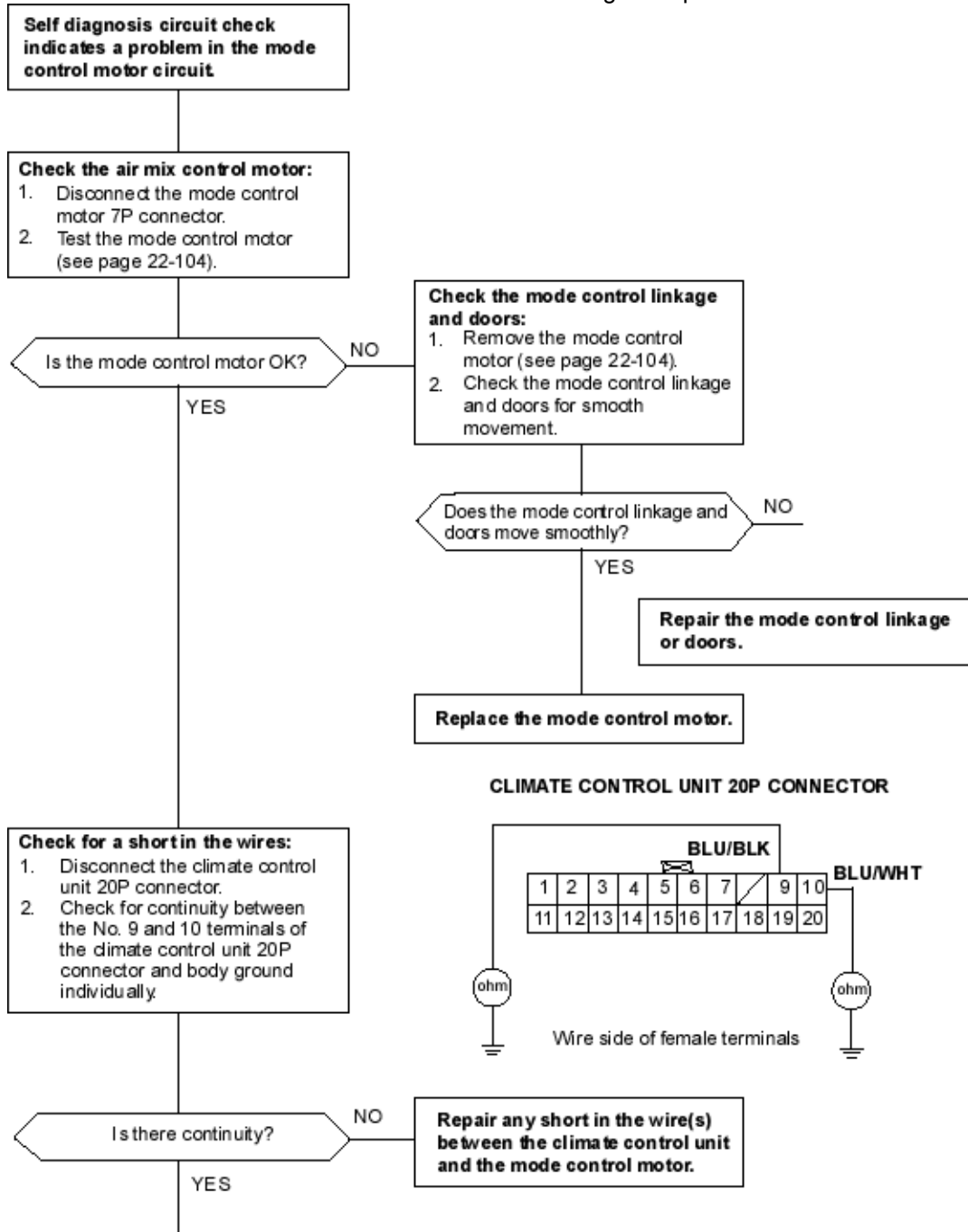
Self diagnosis indicator light L comes on: A problem in the mode control motor circuit open or short.
 The mode control motor controls the outlet air direction and volume according to output from the climate control unit.



To go to the page referenced on the diagram above, click on the following:
 (See Page 22-104)



Self diagnosis indicator light M comes on: A problem in the mode control linkage, doors and motor.
 The mode control motor controls the outlet air direction and volume according to output from the climate control unit.



To page 22-87

To go to the page referenced on the diagram above, click on the following:
 (See Page 22-104)

From page 22-86

Check for an open in the wires:
 Check for continuity between the following terminals of the climate control unit 20P connector and the mode control motor 7P connector.

20P:		7P:
No. 9	————	No. 1
No. 10	————	No. 2

Is there continuity?

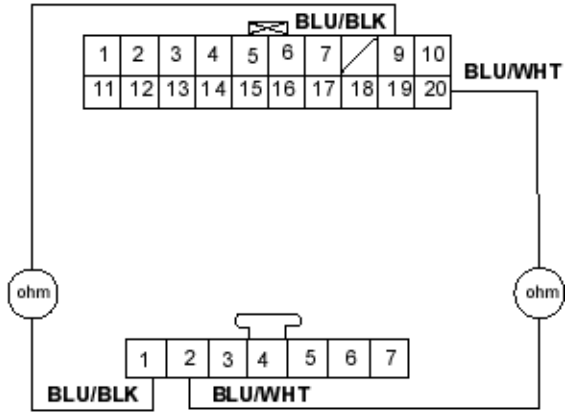
NO

Repair any open in the wire(s) between the climate control unit and mode control motor.

Check for loose wires or poor connections at the climate control unit 20P connector and at the mode control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

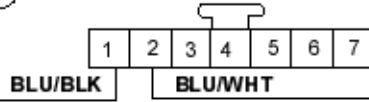
CLIMATE CONTROL UNIT 20P CONNECTOR

Wire side of female terminals

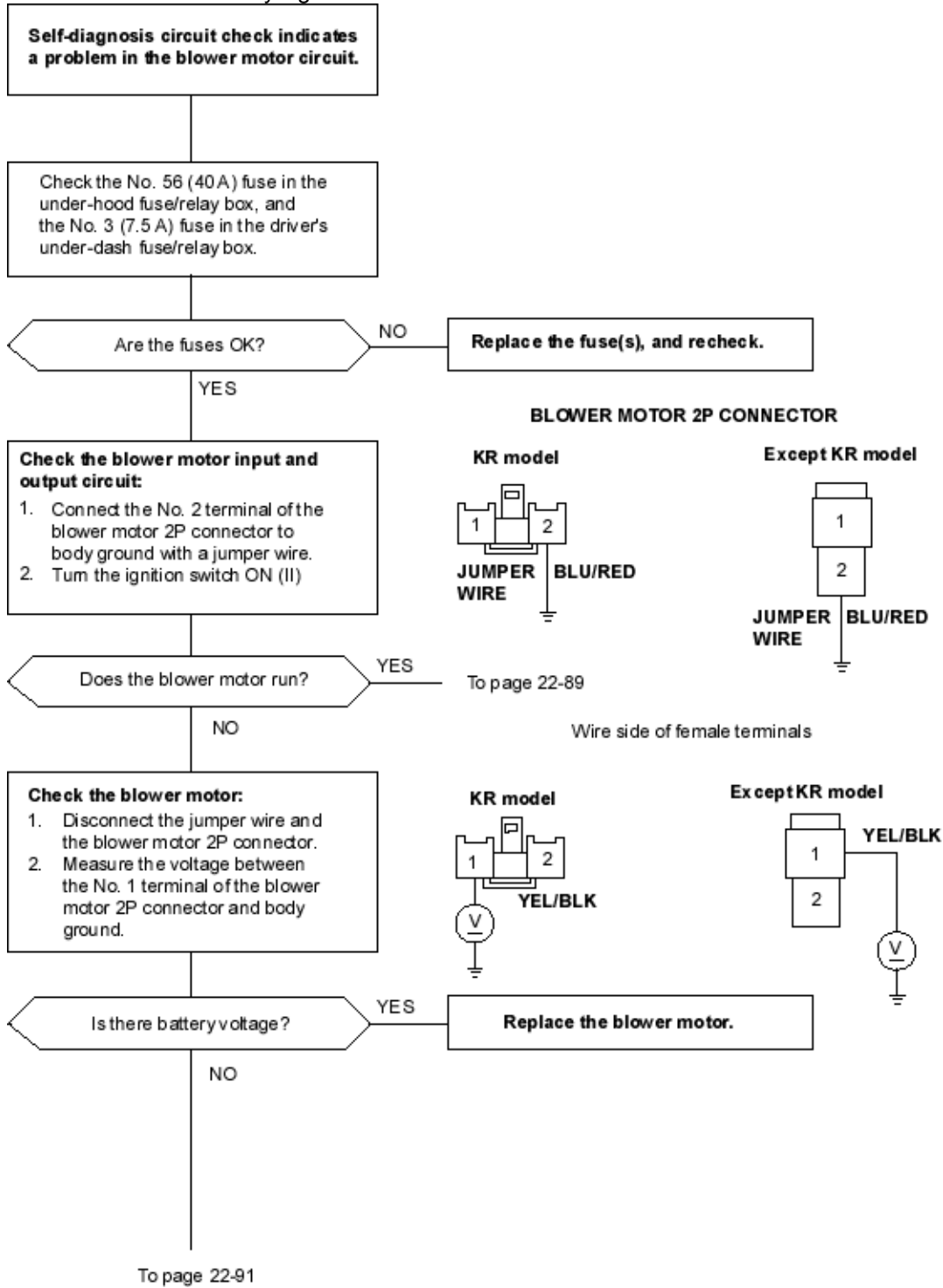


MODE CONTROL MOTOR 7P CONNECTOR

Wire side of female terminals



Self diagnosis indicator light N comes on: A problem in the blower motor circuit.
 The speed of the blower motor is controlled by signals sent from the climate control unit.



From page 22-88

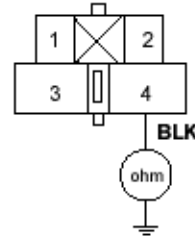
Check for an open in the wire:

1. Turn the ignition switch OFF, and disconnect the jumper wire.
2. Disconnect the power transistor 4P connector.
3. Check for continuity between the No. 4 terminal of the power transistor 4P connector and body ground.

Is there continuity? NO

Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G202 (LHD) or at G302 (RHD)

POWER TRANSISTOR 4P CONNECTOR

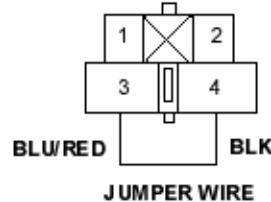


Wire side of female terminals

YES

Check for an open in the wire:

1. Connect the No. 3 and No. 4 terminals of the power transistor 4P connector with a jumper wire.
2. Turn the ignition switch ON (II).



JUMPER WIRE

Does the blower motor run at high speed? NO

Repair open in the wire between the power transistor and the blower motor.

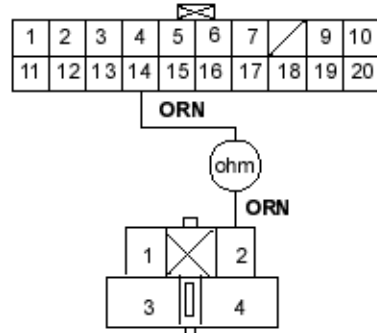
YES

Check for an open in the wire:

1. Turn the ignition switch OFF, and disconnect the jumper wire.
2. Disconnect the climate control unit 20P connector.
3. Check for continuity between the No. 14 terminal of the climate control unit 20P connector and the No. 2 terminal of the power transistor 4p connector.

CLIMATE CONTROL UNIT 20P CONNECTOR

Wire side of female terminals

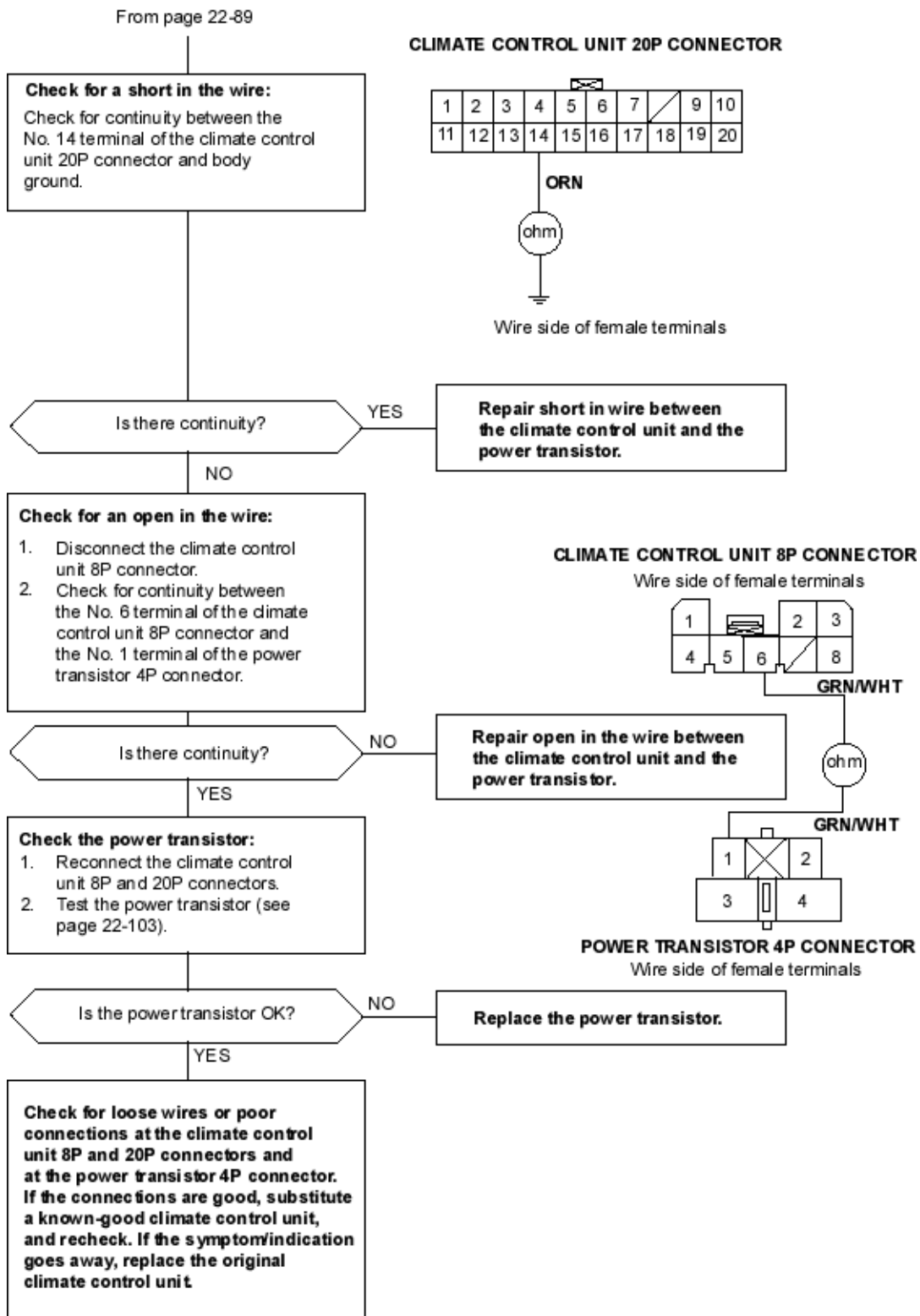


Is there continuity? NO

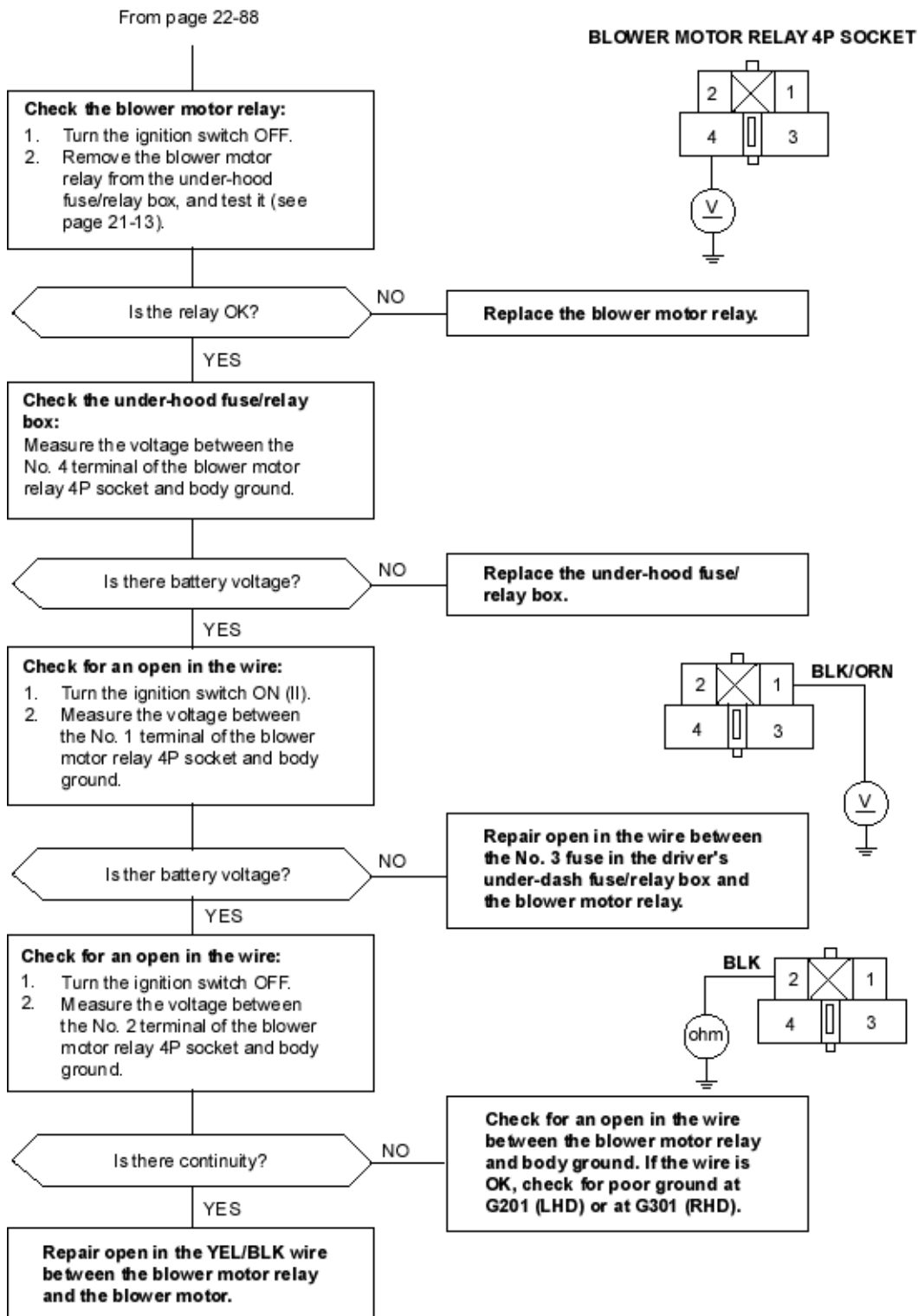
Repair open in the wire between the climate control unit and the power transistor.

YES

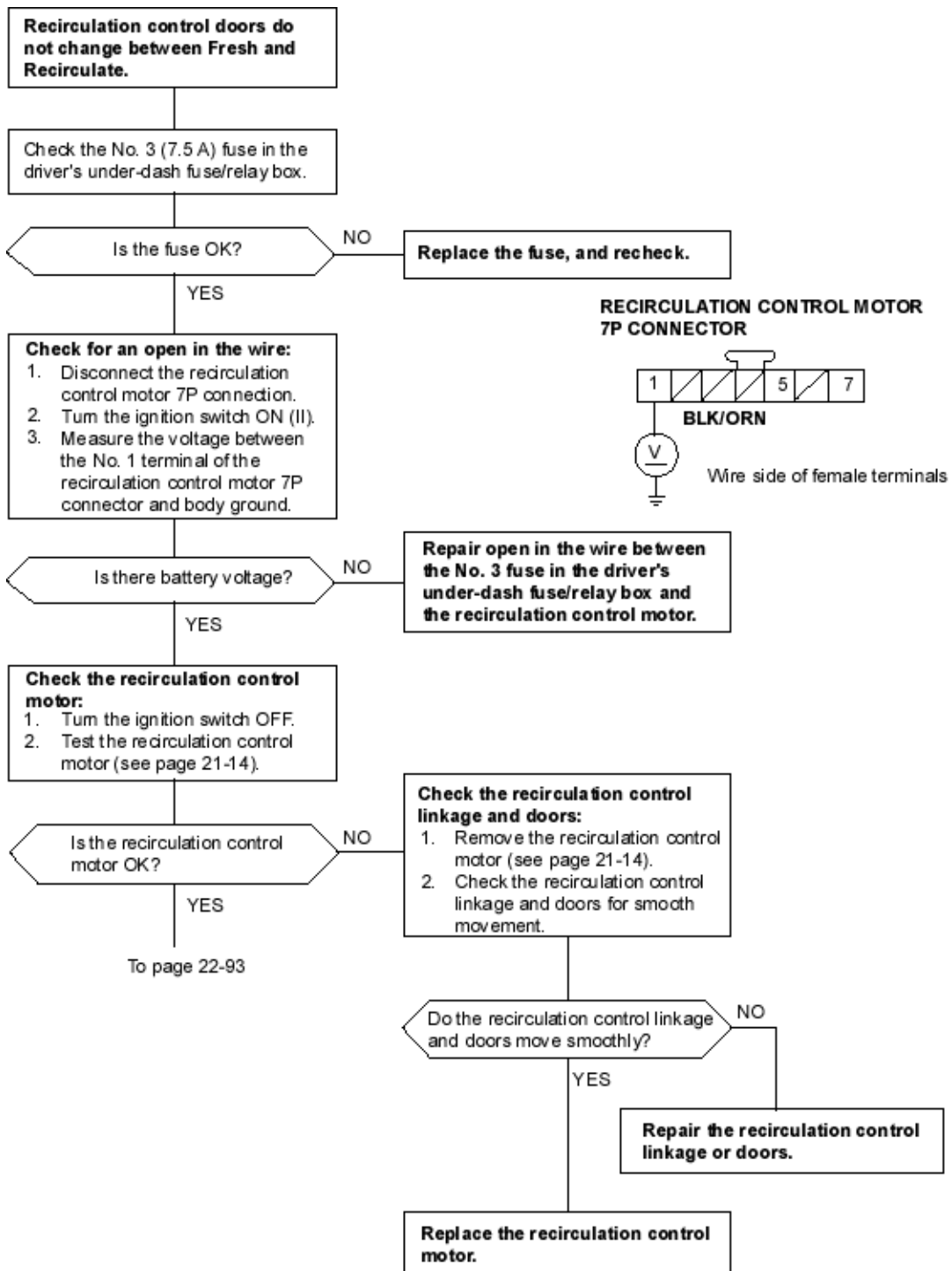
To page 22-90



To go to the page referenced on the diagram above, click on the following:
(See Page 22-103)



To go to the page referenced on the diagram above, click on the following:
(See Page 21-13)



To go to the page referenced on the diagram above, click on the following:
[\(See Page 21-14\)](#)

From page 22-92

Check for a short in the wires:
 1. Disconnect the climate control unit 20P connector.
 2. Check for continuity between the No. 13 and No. 16 terminals of the climate control unit 20P connector and body ground.

Is there continuity? YES

Repair short in the wire(s) between the climate control unit and the recirculation control motor.

NO

Check for a short to power:
 Check the same wires for voltage.

Is there any voltage? YES

Repair short to power in the wire between the climate control unit and the recirculation control motor. This also damages the climate control unit. Repair the short to power before replacing the climate control unit.

NO

Check for an open in the wires:
 Check for continuity between the following terminals of the recirculation control motor 7P connector and the climate control unit 20P connector.
 20P: 7P:
 No. 13 ——— No. 5
 No. 16 ——— No. 7

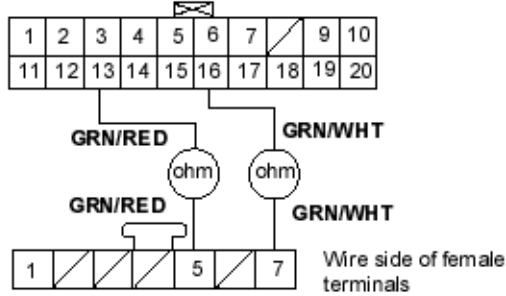
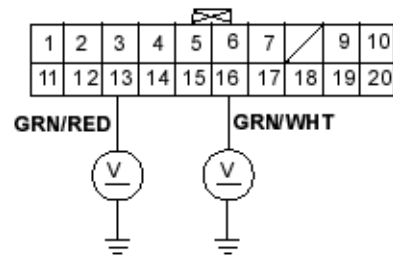
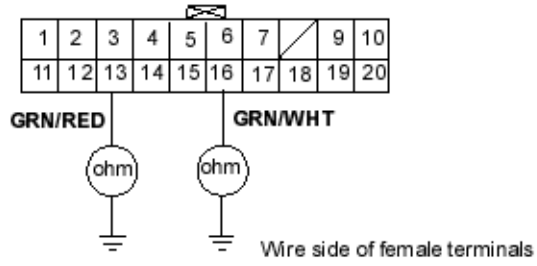
Is there continuity? NO

Repair open in the wire(s) between the climate control unit and the recirculation control motor.

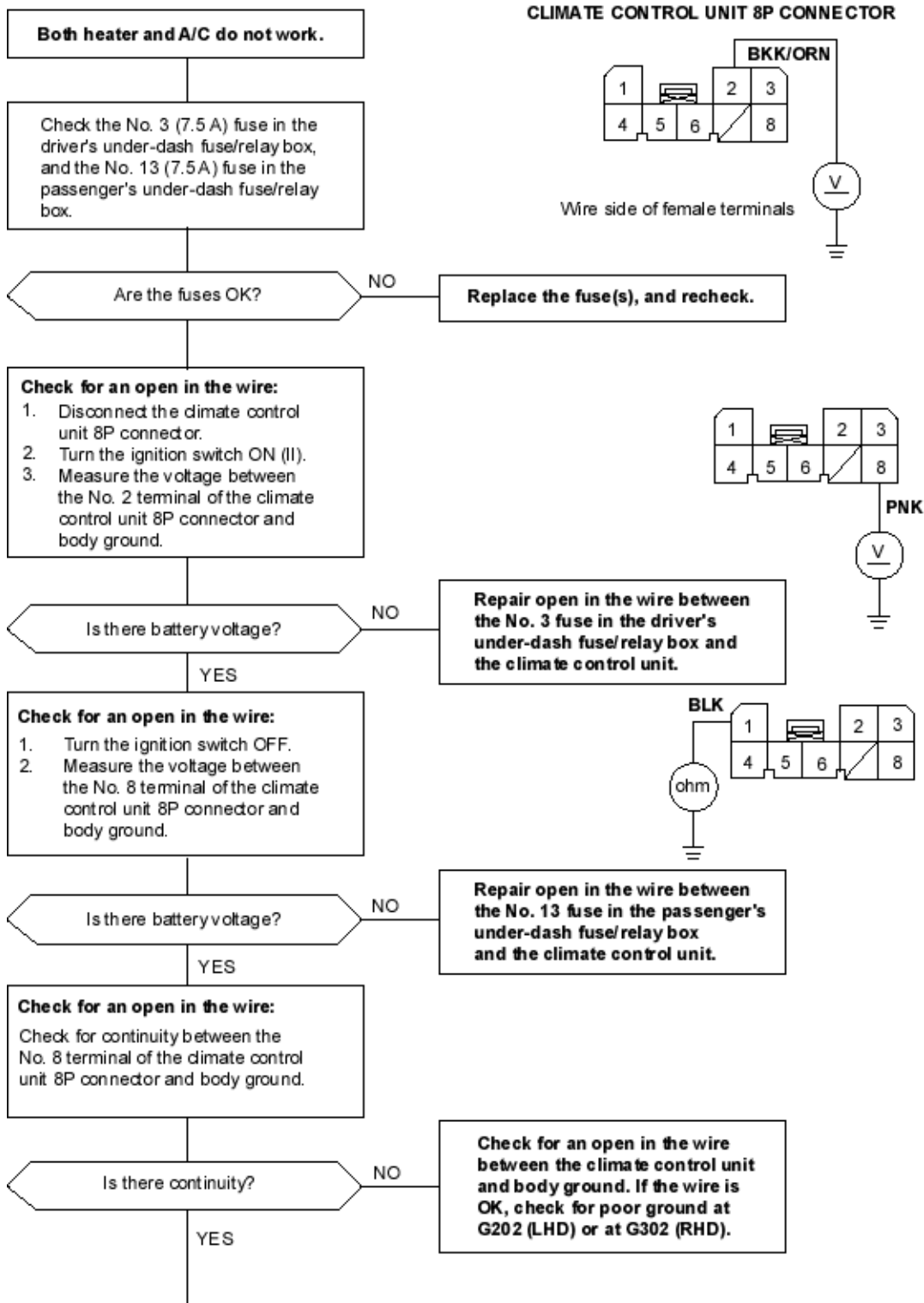
YES

Check for loose wires or poor connections at the climate control unit 20P connector and at the recirculation control motor 7P connector. If the connection are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

CLIMATE CONTROL UNIT 20P CONNECTOR



RECIRCULATION CONTROL MOTOR 7P CONNECTOR



From page 22-94

Check for a short in the wire:

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the climate control unit 20P connector.
3. Check for continuity between the No. 7 terminal of the climate control unit 20P connector and body ground.

Is there continuity?

YES

Repair any short in the wire between the climate control unit and the air mix control motor.

NO

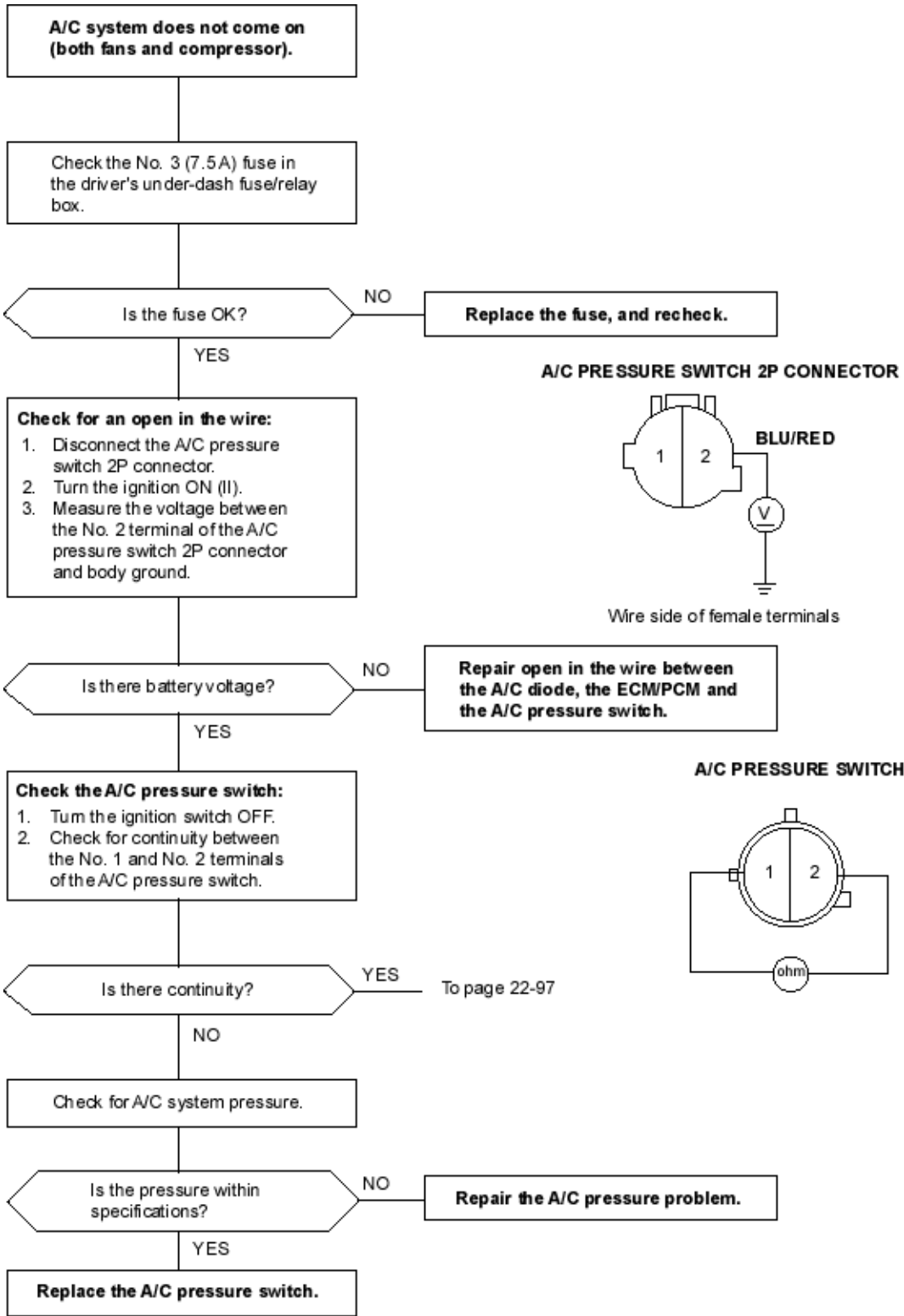
Check for loose wires or poor connections at the climate control unit 8P and 20P connectors. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.

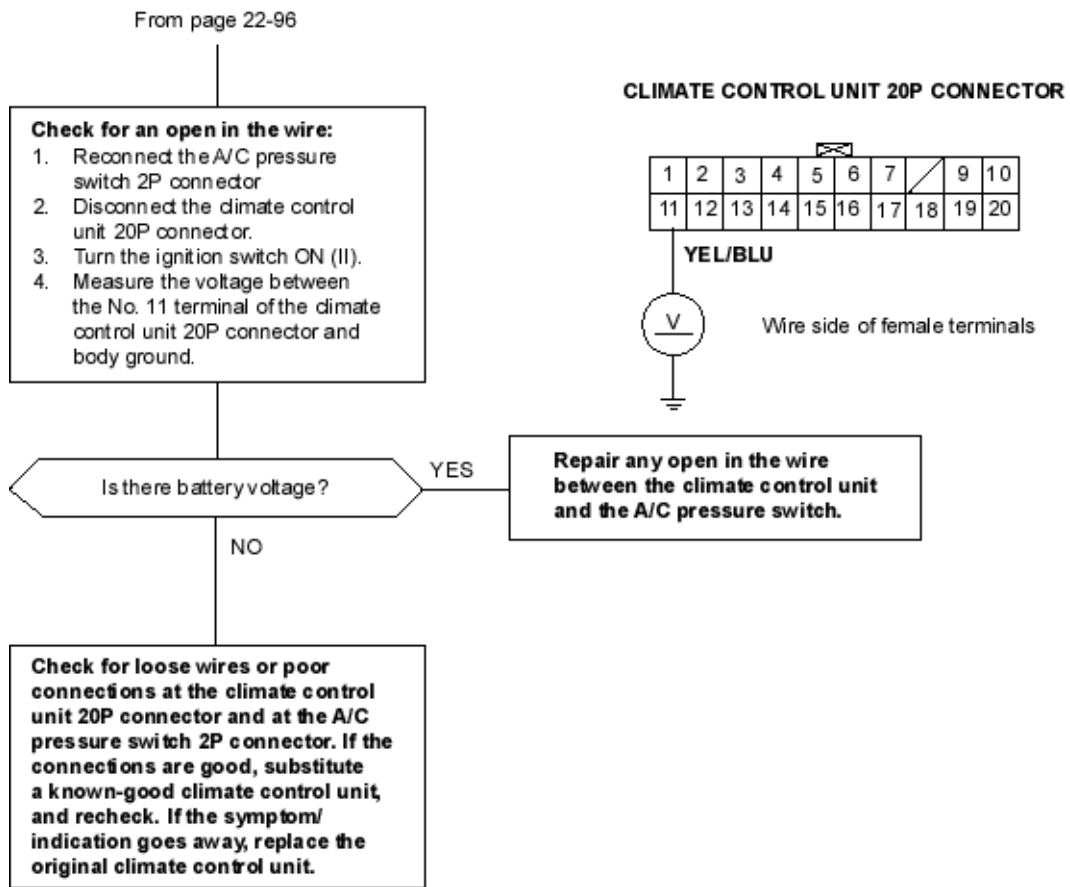
CLIMATE CONTROL UNIT 20P CONNECTOR

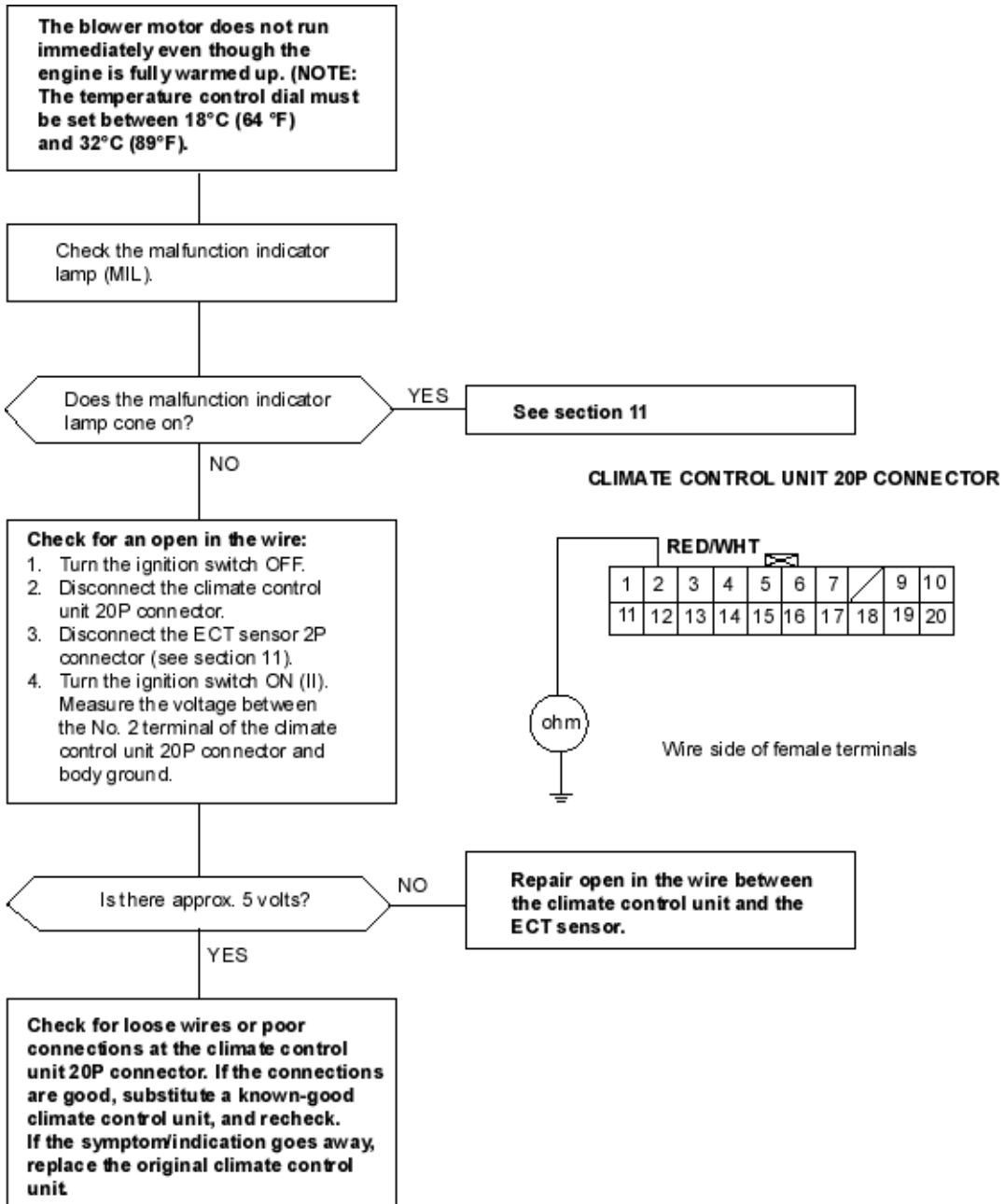
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Wire side of female terminals



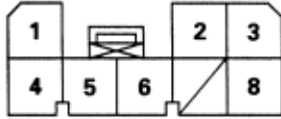




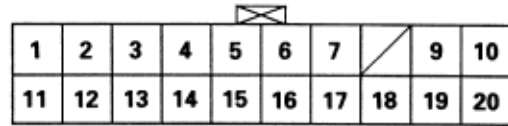


CLIMATE CONTROL UNIT CONNECTORS

8P CONNECTOR



20P CONNECTOR



Wire side of female terminals

8P CONNECTOR

Cavity	Wire color	Signal		Cavity	Wire color	Signal	
1	BLK	GROUND	OUTPUT	5	RED/YEL	AIR MIX HOT	OUTPUT
2	BLK/ORN	IG2 (Power)	INPUT	6	GRN/WHT	BLOWER FEEDBACK	INPUT
3	RED/BLK	COMBINATION LIGHT SWITCH	INPUT	7			
4	RED/WHT	AIR MIX COOL	OUTPUT	8	PNK	+B (Power)	INPUT

20P CONNECTOR

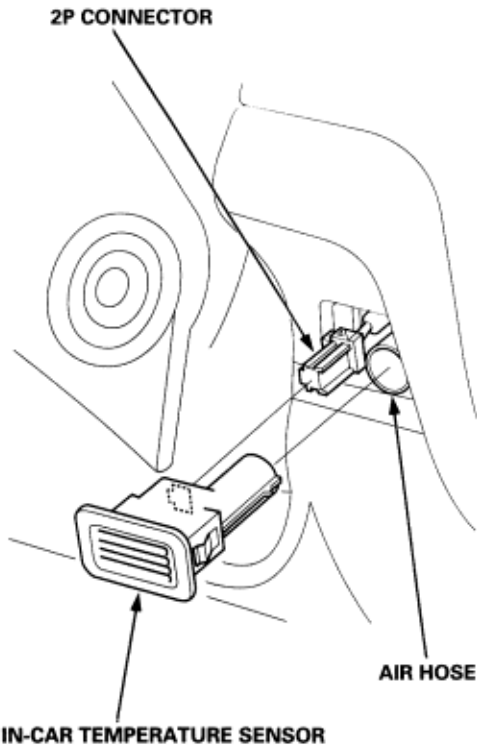
Cavity	Wire color	Signal		Cavity	Wire color	Signal	
1	BRN	EVAPORATOR TEMPERATURE SENSOR	OUTPUT	11	YEL/BLU	A/C PRESSURE SWITCH	INPUT
2	RED/WHT	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	OUTPUT	12	BRN/YEL	REAR WINDOW DEFOGGER RELAY	INPUT
3	WHT/RED	SUNLIGHT SENSOR	OUTPUT	13	GRN/RED	FRESH	INPUT
4	BRN/WHT	OUTSIDE AIR TEMPERATURE SENSOR	OUTPUT	14	ORN	POWER TRANSISTOR BASE	OUTPUT
5	YEL/RED	IN-CAR TEMPERATURE SENSOR	OUTPUT	15	YEL/GRN	SENSOR GROUND	INPUT
6	PNK/BLK	AIR MIX POTENTIAL	OUTPUT	16	GRN/WHT	RECIRCULATE	INPUT
7	GRY	AIR MIX POTENTIAL +5V	OUTPUT	17	GRN/BLK	MODE 1	OUTPUT
8				18	GRN/YEL	MODE 2	OUTPUT
9	BLU/BLK	MODE DEF	OUTPUT	19	LT GRN/BLK	MODE 3	OUTPUT
10	BLU/WHT	MODE VENT	OUTPUT	20	PUR	MODE 4	OUTPUT

In-car Temperature Sensor Replacement

22-100

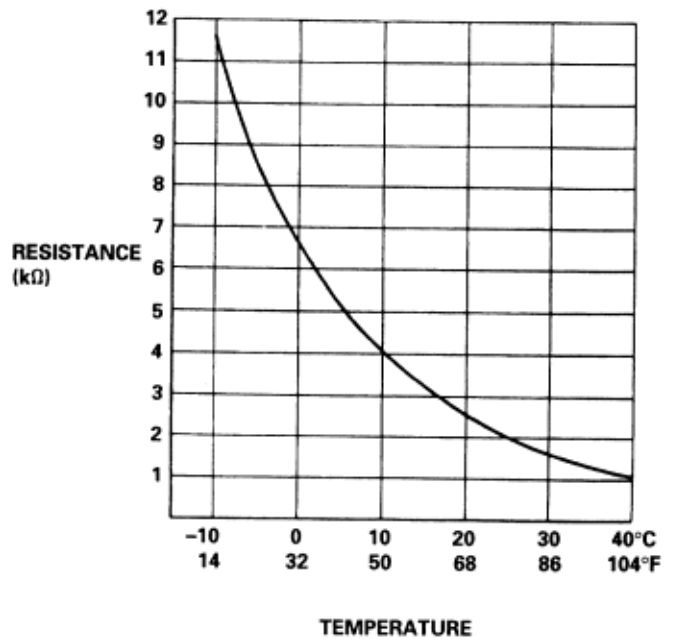
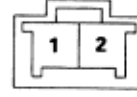
Test

1. Remove the in-car temperature sensor from the dashboard, then disconnect the 2P connector and the air hose. Be careful not to damage the sensor and the dashboard.



2. Install in the reverse order of removal. Be sure to connect the air hose securely.

Check for change in resistance by heating or cooling the sensor with a hair drier. Compare the resistance reading between the No. 1 and No. 2 terminals of the in-car temperature sensor with the specification shown in the following graph; the resistance should be within the specification.

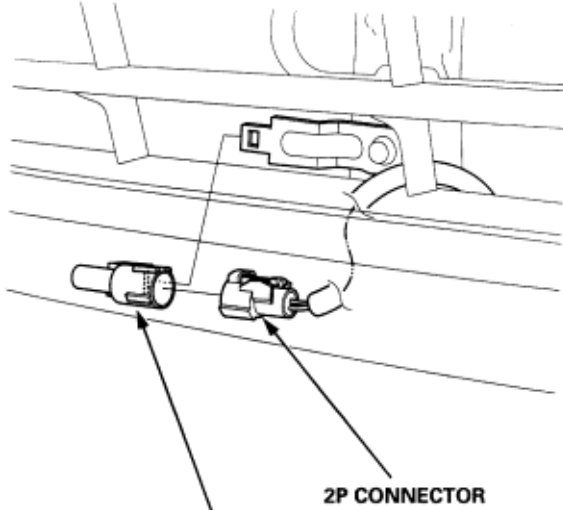


Outside Air Temperature Sensor Replacement

22-101

Test

1. Disconnect the 2P connector from the outside air temperature sensor. Release the lock, and remove the outside air temperature sensor.

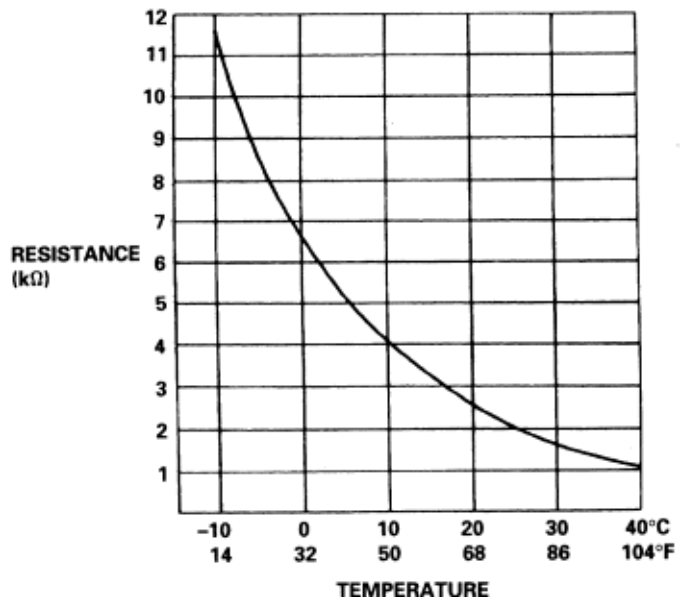


2. Install in the reverse order of removal.

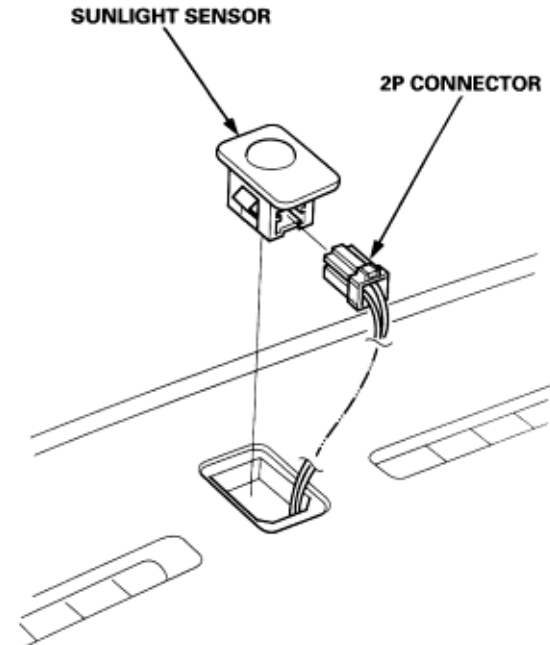
Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for change in resistance.

Compare the resistance reading between the No. 1 and No. 2 terminals of the outside air temperature sensor with the specifications shown in the following graph; the resistance should be within the specifications.

OUTSIDE AIR TEMPERATURE SENSOR



1. Remove the sunlight sensor from the dashboard, then disconnect the 2P connector. Be careful not to damage the sensor and the dashboard.

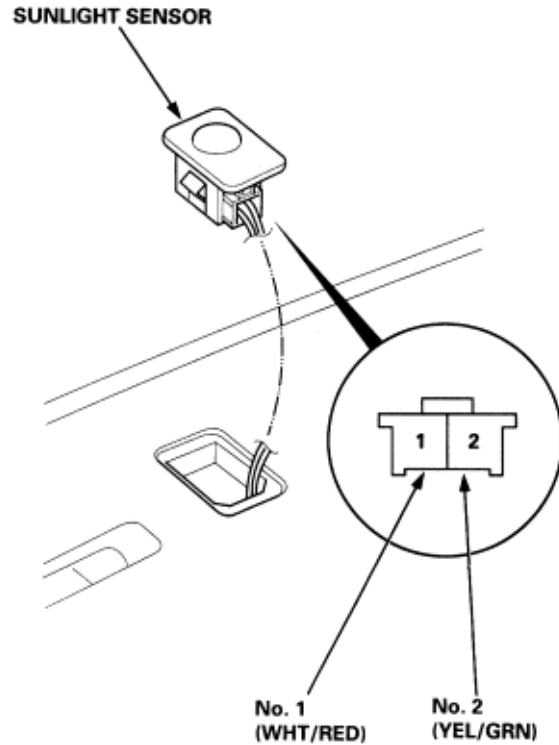


2. Install in the reverse order of removal

Turn the ignition switch ON (II). Measure the voltage between the terminals with the (+) probe on the No. 1 terminal and the (-) probe on the No. 2 terminal with the 2P connector connected. The voltage will not change under the light of a flashlight or a fluorescent lamp.

Voltage should be :

- ♦ 3.7 ± 0.2 V or more with the sensor out of direct sunlight.
- ♦ 3.6 ± 0.2 V or less with the sensor in direct sunlight.



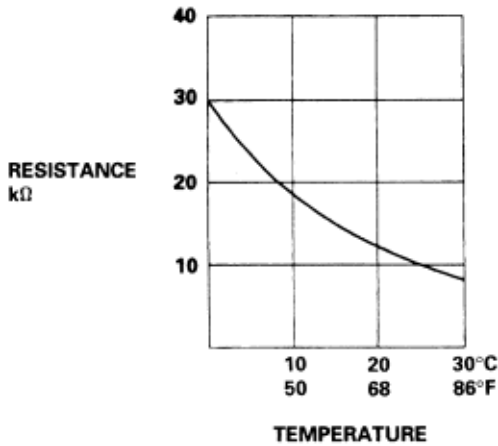
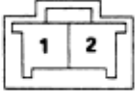
Evaporator Temperature Sensor Test

22-103

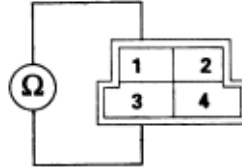
Power Transistor Test

Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for change in resistance.

Compare the resistance reading between the No. 1 and No. 2 terminals of the evaporator temperature sensor with the specifications shown in the following graph, the resistance should be within the specifications.

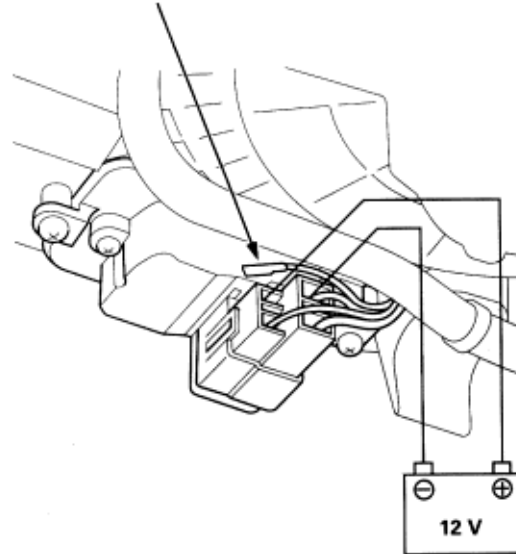


1. Disconnect the 4P connector from the power transistor.
2. Measure the resistance between the No. 1 and No.3 terminals for the power transistor. It should be approximately 1.5 k ohms \pm 1%.



3. Carefully release the lock tab on the No. 2 terminal (ORN) in the 4P connector, then remove the terminal and insulate it from body ground.

No. 2 TERMINAL (ORN)

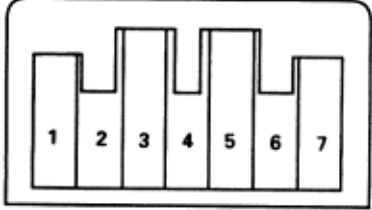


4. Reconnect the 4P connector to the power transistor.
5. Connect battery power to the No. 2 cavity, ground the No. 4 cavity as shown.
6. Turn the ignition switch ON (II), and check that the blower motor runs.

Mode Control Motor

Test

1. Disconnect the 7P connector from the mode control motor.
2. Connect battery power to the No. 2 terminal, and ground the No.1 terminal, the mode control motor should run smoothly, and stop at Vent. If it doesn't, reverse the connections; the mode control motor should run smoothly, and stop at Defrost. When the mode control motor stops running, disconnect battery power immediately.



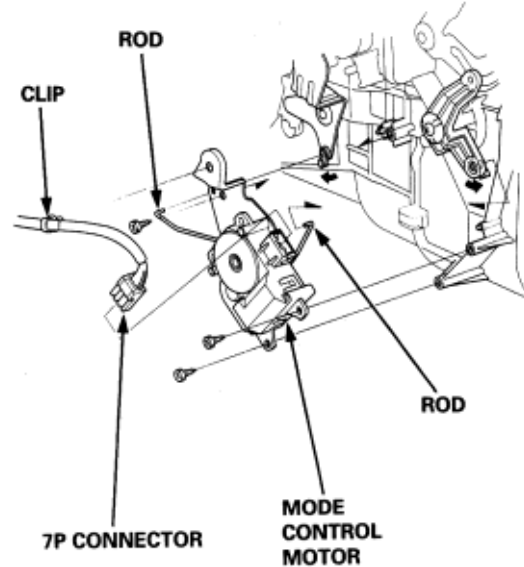
3. Using a digital circuit tester with an output of 1 mA or less at the 20 k ohms range. When the mode control motor running in step 2, check for continuity between the No.3 4, 5, 6 terminals and the No. 7 terminal individually. There should be continuity for a moment
4. If the mode control motor does not run in step 2 remove it, then check the mode control linkage and doors for smooth movement. If they move smoothly, replace the mode control motor.

22-104

Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the wire harness clip, then disconnect the 7P connector from the mode control motor. Remove the rods of the mode control motor from the mode control linkage. Remove the self-tapping screws and the mode control motor from the heater unit.

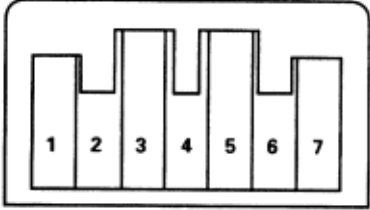


2. Install in the reverse order of removal. After installation, make sure the mode control motor runs smoothly.

Air Mix Control Motor

Test

1. Disconnect the 7P connector from the air mix control motor.
2. Connect battery power to the No. 1 terminal of the air mix control motor, and ground the N. 2 terminal; the air mix control motor should run, and stop at MAX HOT. If it doesn't reverse the connections; the air mix control motor should run, and stop at MAX COOL.
 - ♦ If the air mix control motor does not run, remove it, then check the air mix control linkage and door for smooth movement.
 - ♦ If they move smoothly, replace the air mix control motor.



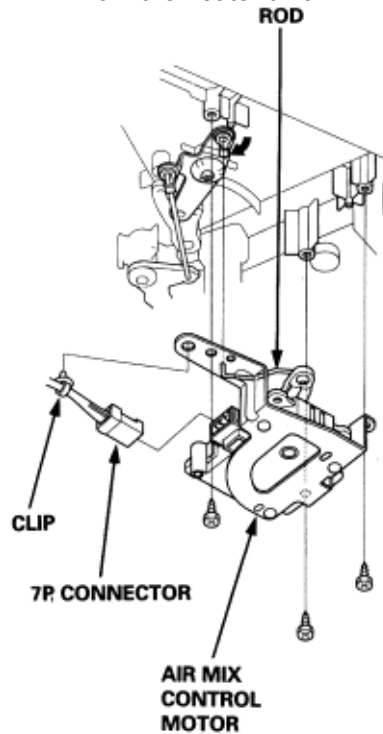
3. Measure the resistance between the No. 5 and No. 7 terminals. It should be approximately 6 k ohms \pm 30%.
4. Measure the resistance between the No. 3 and No. 7 terminals. It should be approximately 0.84 k ohms \pm 30% at MAX HOT and approximately 5.04 k ohms \pm 30% at MAX COOL.

22-105

Replacement

NOTE: LHD type is shown, RHD type is similar.

1. Remove the wire harness clip, then disconnect the 7P connector from the air mix control motor. Remove the rod of the air mix control motor from the air mix control linkage. Remove the self-tapping screws and the air mix control motor from the heater unit.



2. Install in the reverse order of removal. After installation, make sure the air mix control motor runs smoothly.

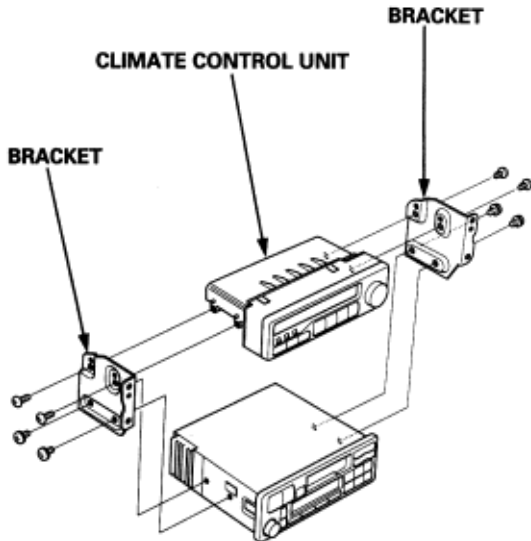
Climate Control Unit Replacement

22-106

With Navigation System:

NOTE: LHD type is shown, RHD type is similar.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the climate control unit together with the audio unit from the center console (see section 20).
3. Remove the self-tapping screws, the brackets and the climate control unit.

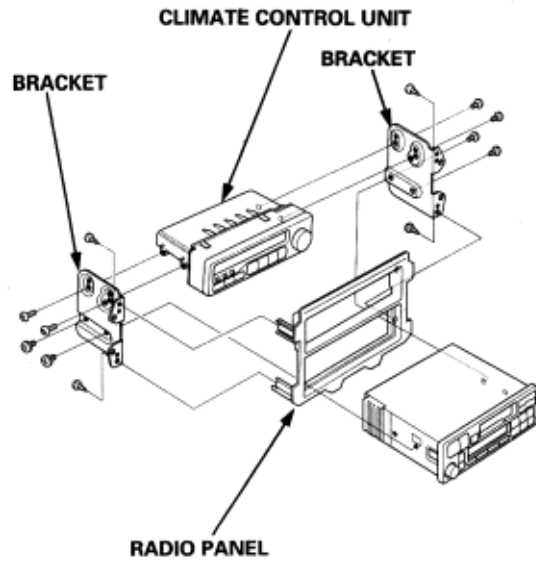


4. Install in the reverse order of removal, and note these items:
 - ♦ After installation, operate the climate control unit to see whether it works properly.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Without Navigation System:

NOTE: LHD type is shown, RHD type is similar.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the climate control unit together with the audio unit from the dashboard (see section 20).
3. Remove the self-tapping screws, the brackets, the radio panel and climate control unit.

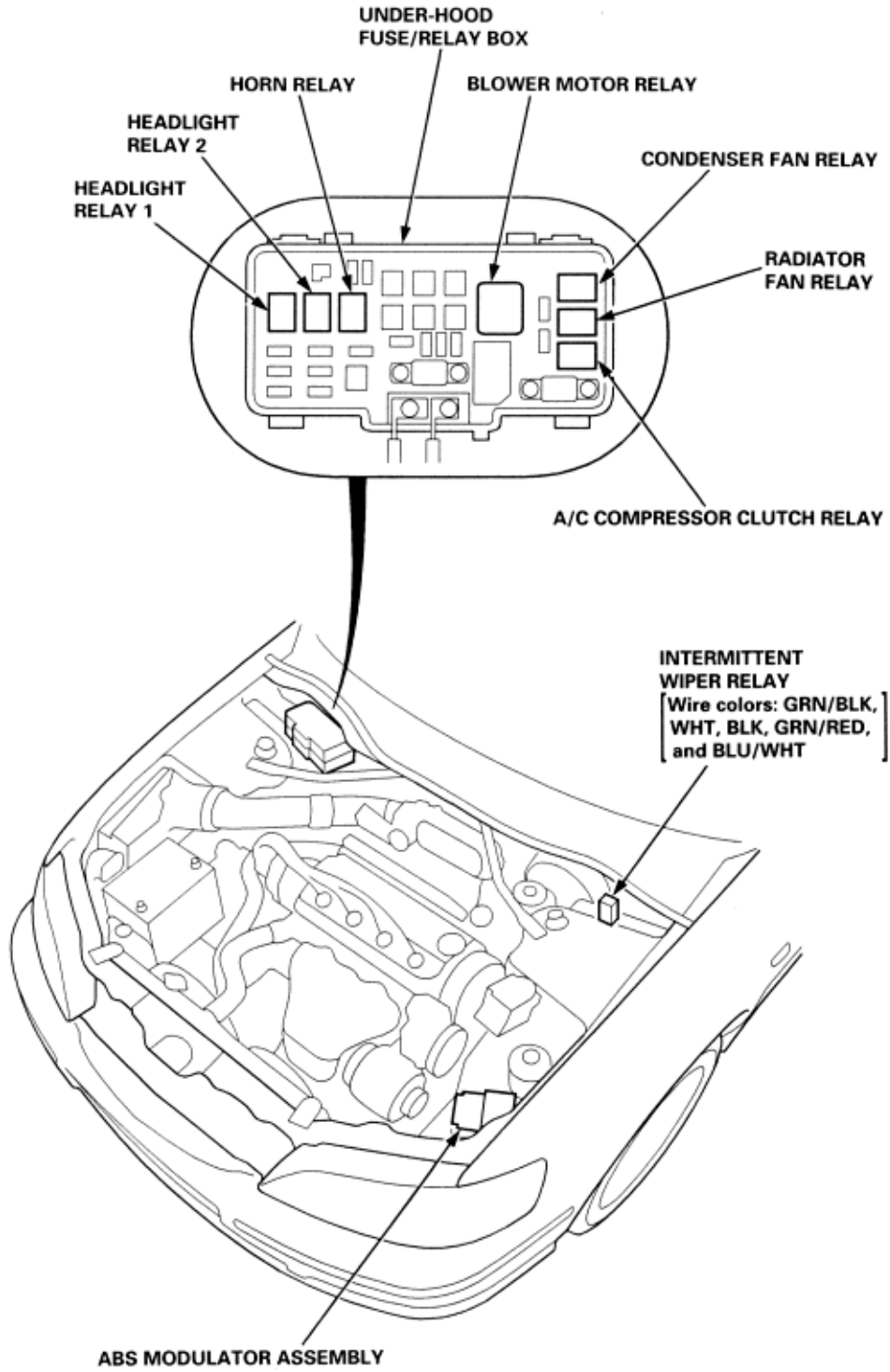


4. Install in the reverse order of removal, and note these items:
 - ♦ After installation, operate the climate control unit to see whether it works properly.
 - ♦ Enter the anti-theft code for the radio, then enter the customer's radio station presets.

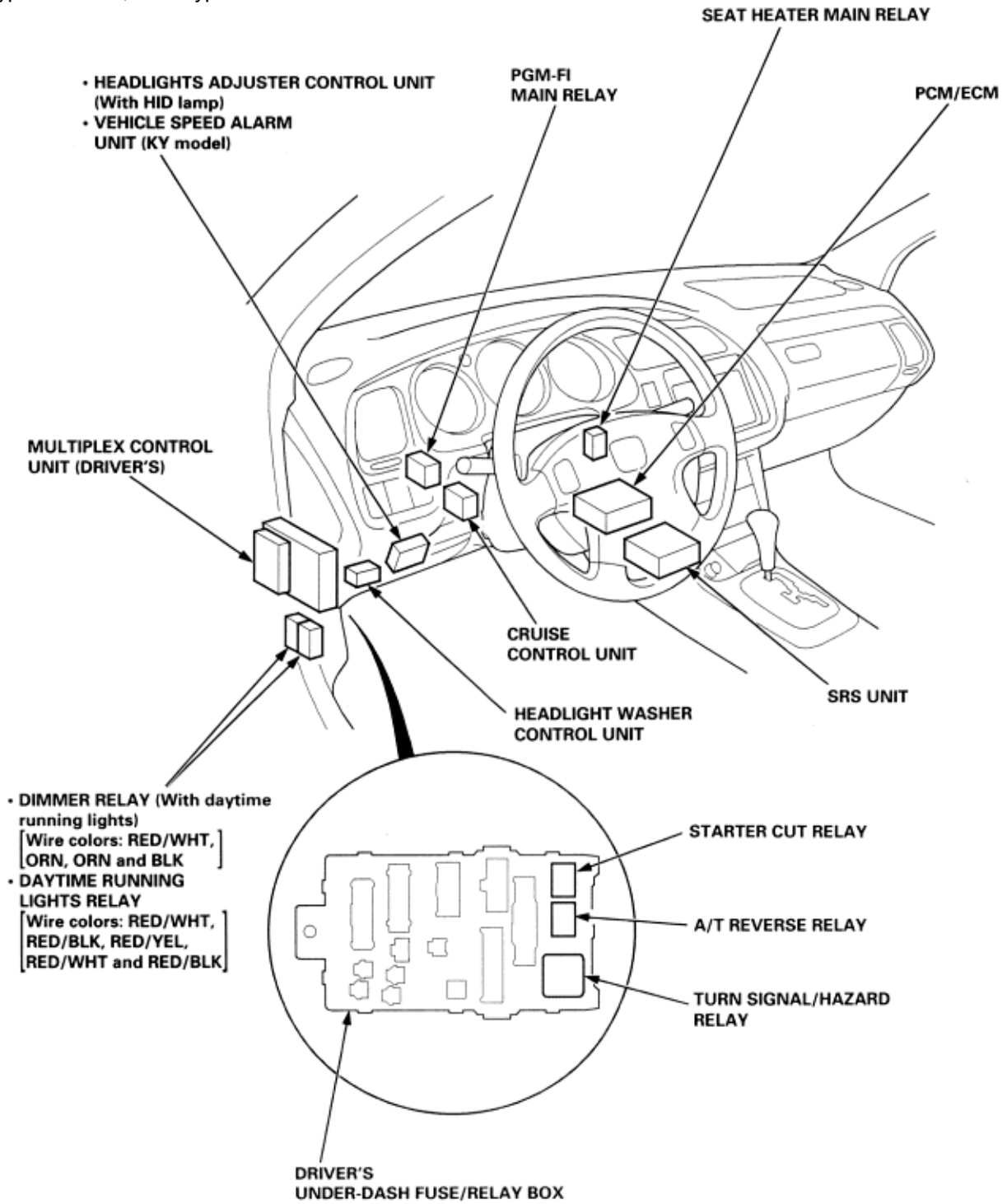
Relay and Control Unit Locations
Engine Compartment

23-A-2

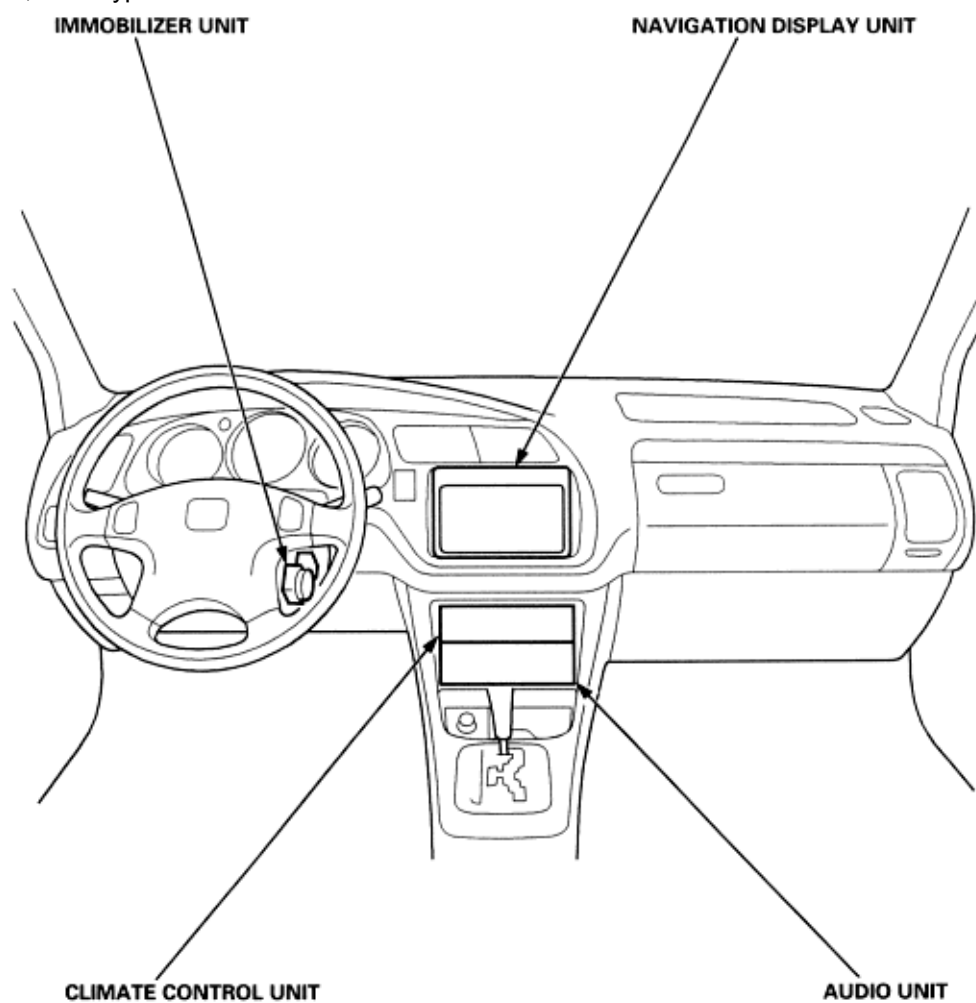
NOTE: LHD type is shown, RHD type is similar.



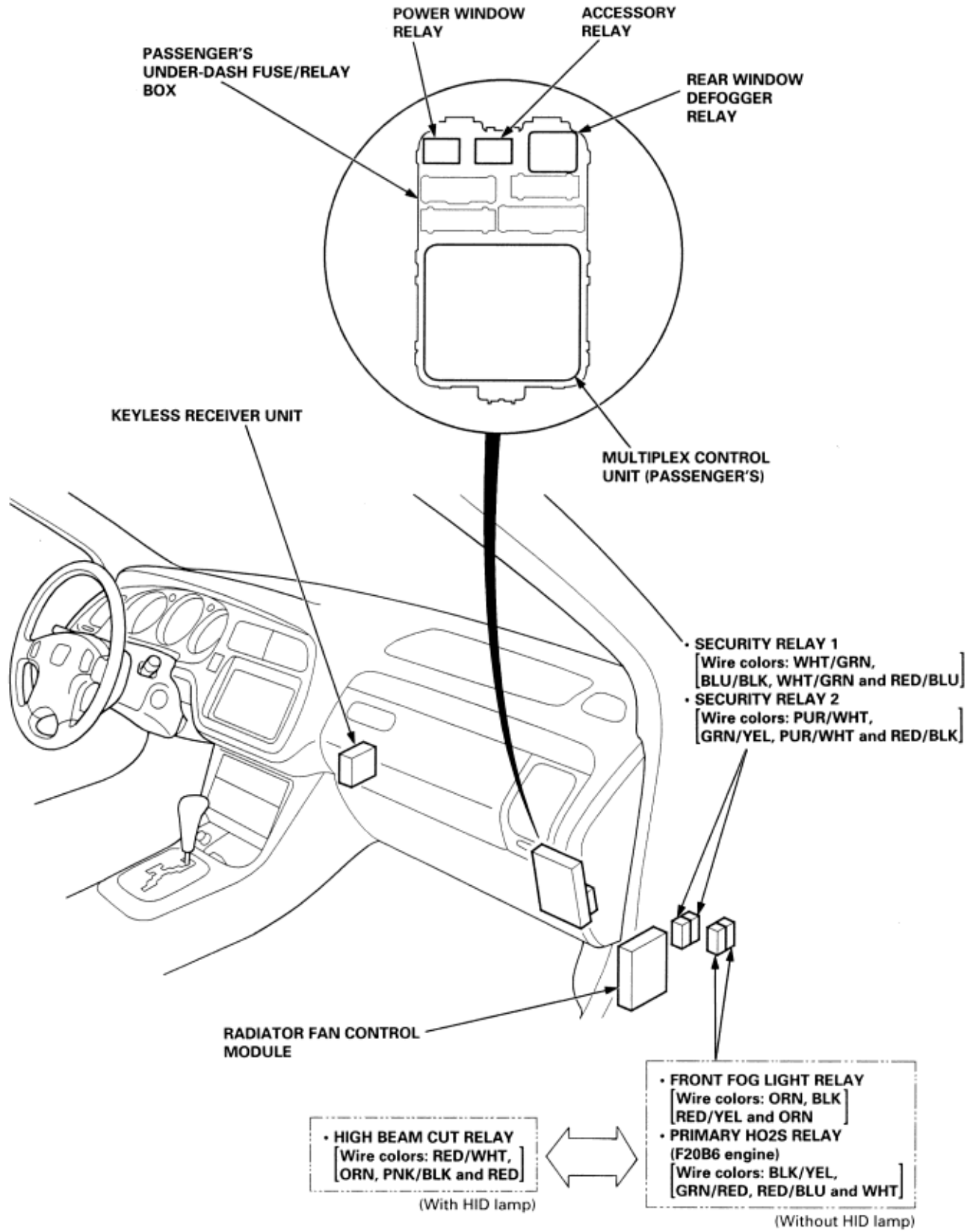
NOTE: LHD type is shown, RHD type is similar.



NOTE: LHD type is shown, RHD type is similar.



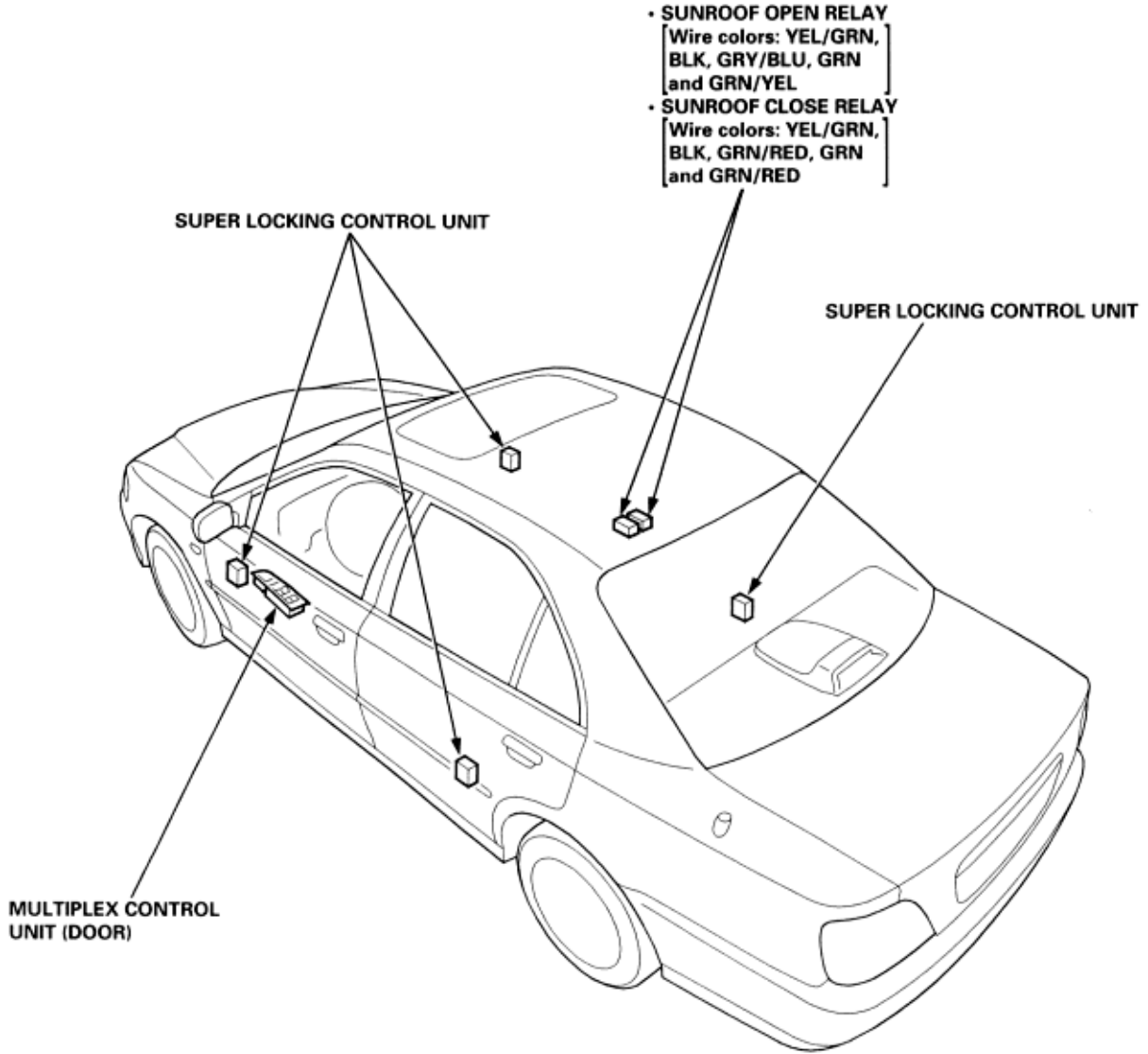
NOTE: LHD type is shown, RHD type is similar.

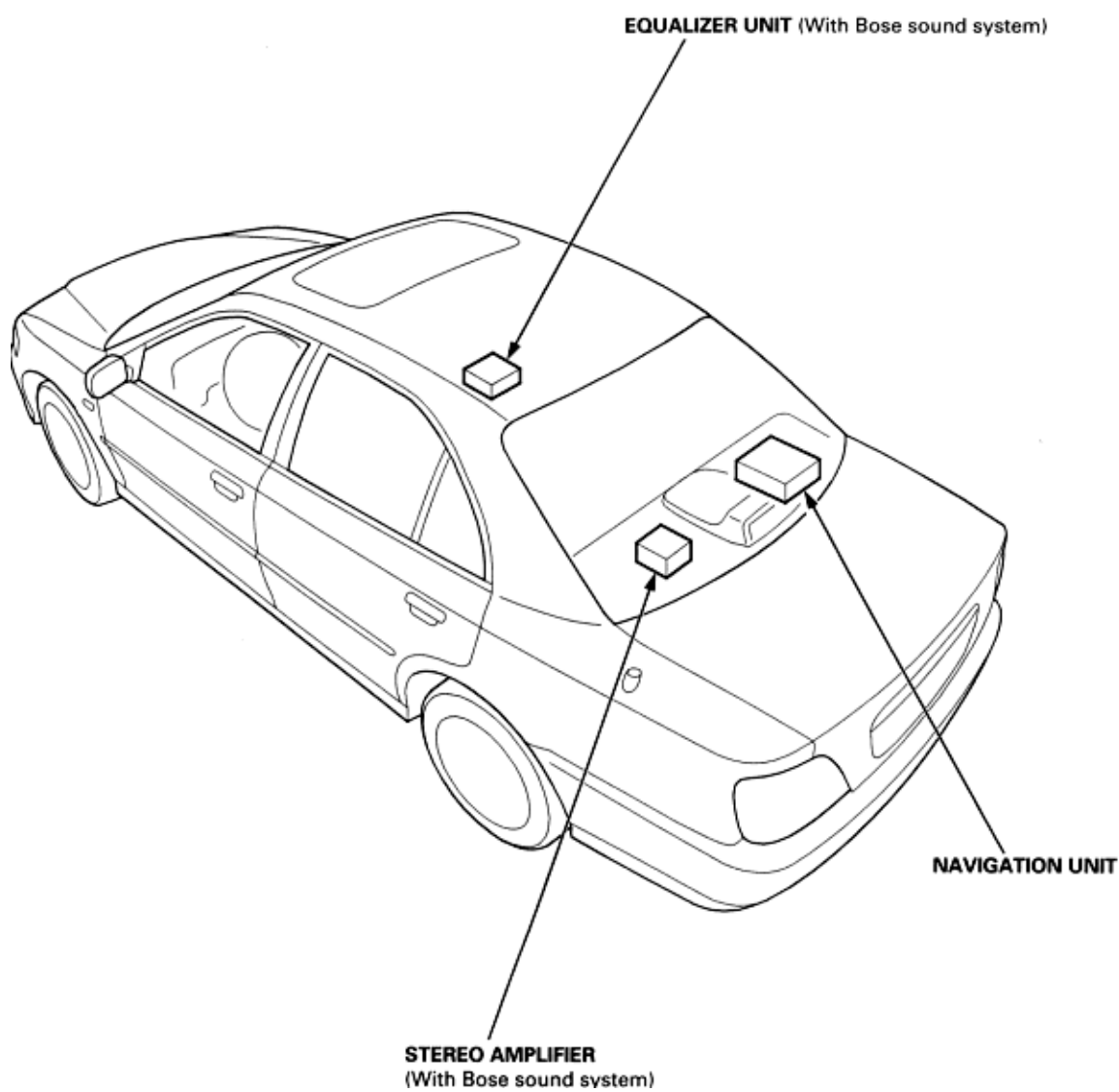


Relay and Control Unit Locations
Door and Roof

23-A-6

NOTE: LHD type is shown, RHD type is similar.

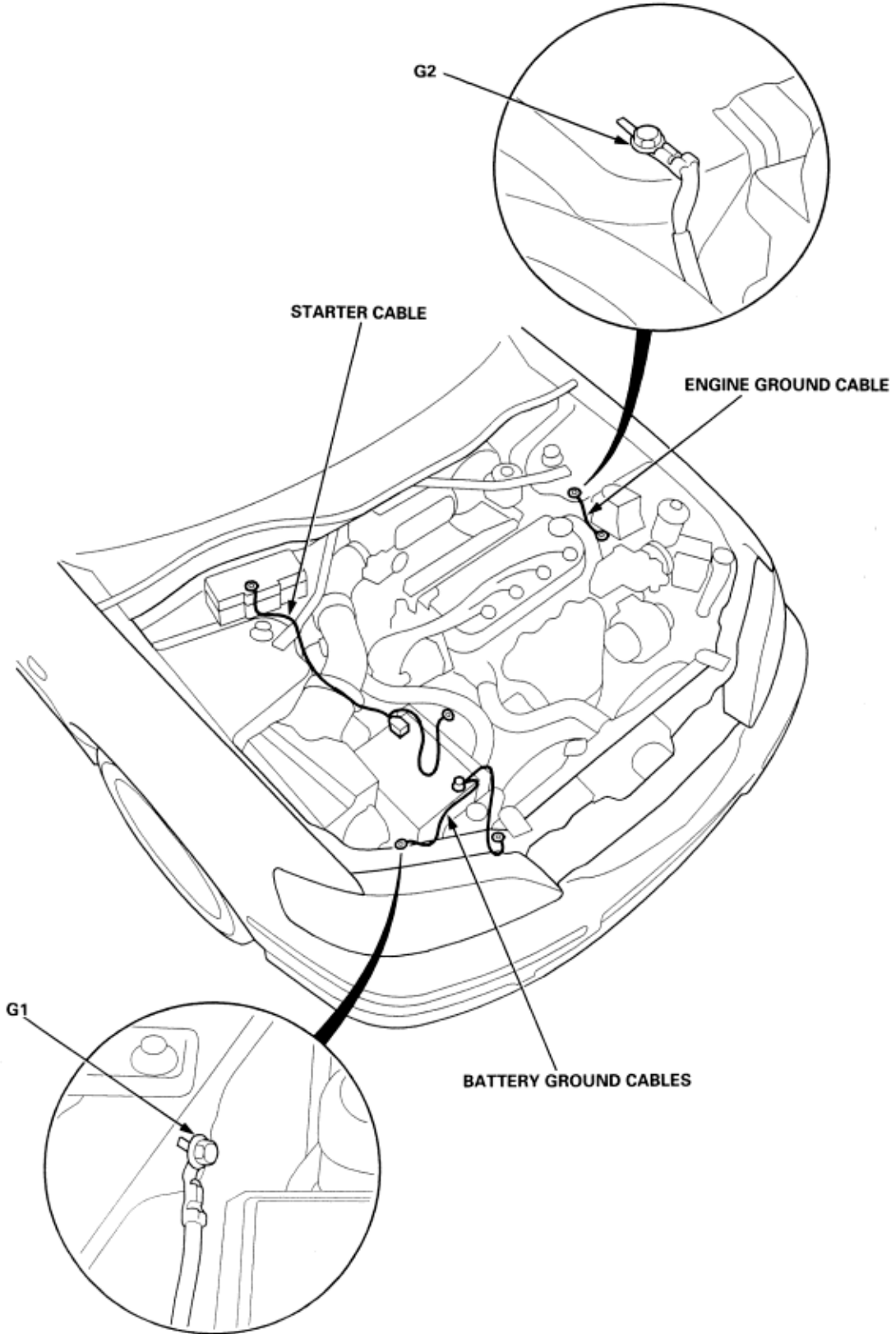




Wire Harness and Ground Locations
Engine Compartment

23-A-8

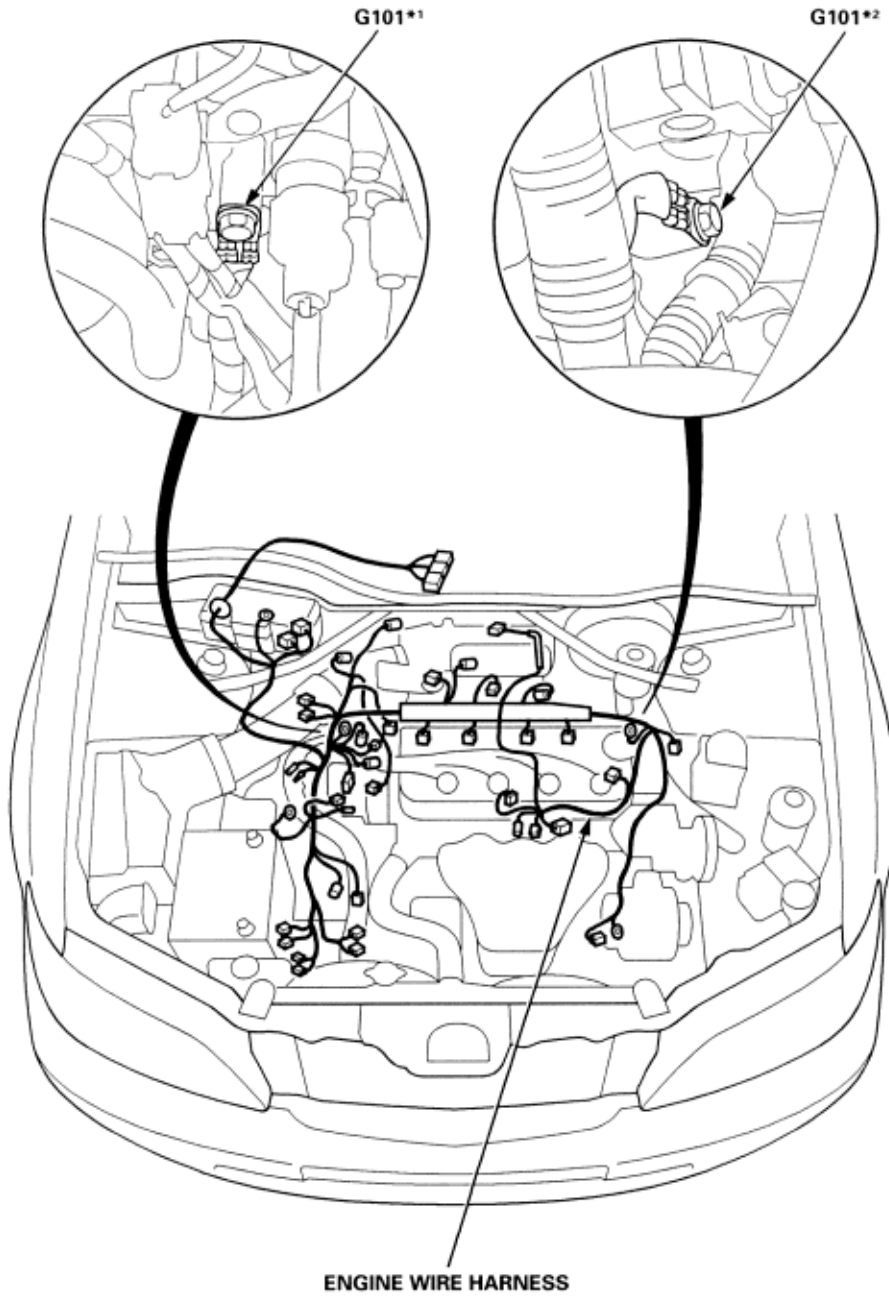
NOTE: LHD type is shown, RHD type is similar.



Wire Harness and Ground Locations
Engine Compartment (cont'd)

23-A-9

NOTE: LHD type is shown, RHD type is similar.



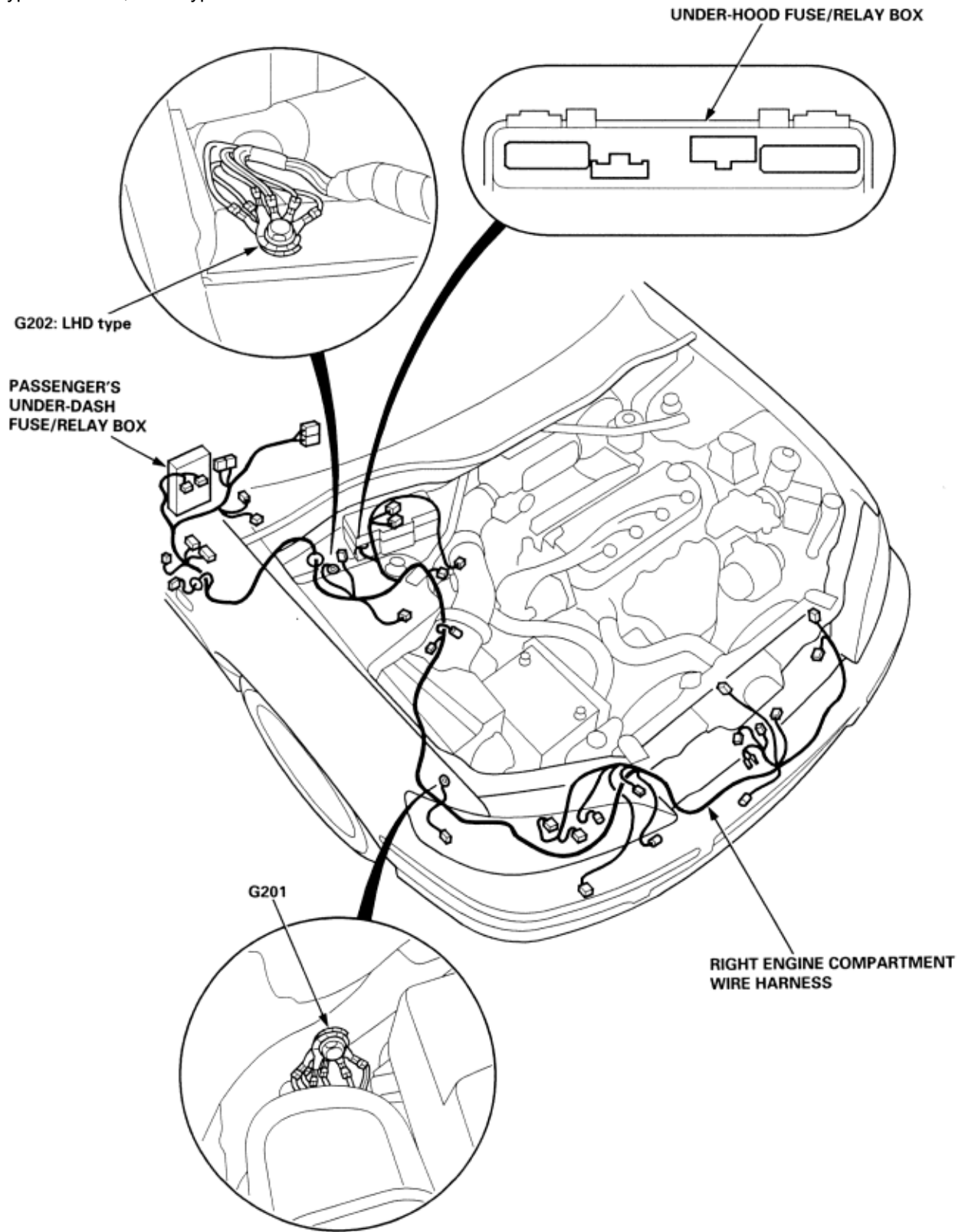
*1: H22A7 engine

*2: F18B2, F18B3, F20B6 engine

Wire Harness and Ground Locations
Engine Compartment (cont'd)

23-A-10

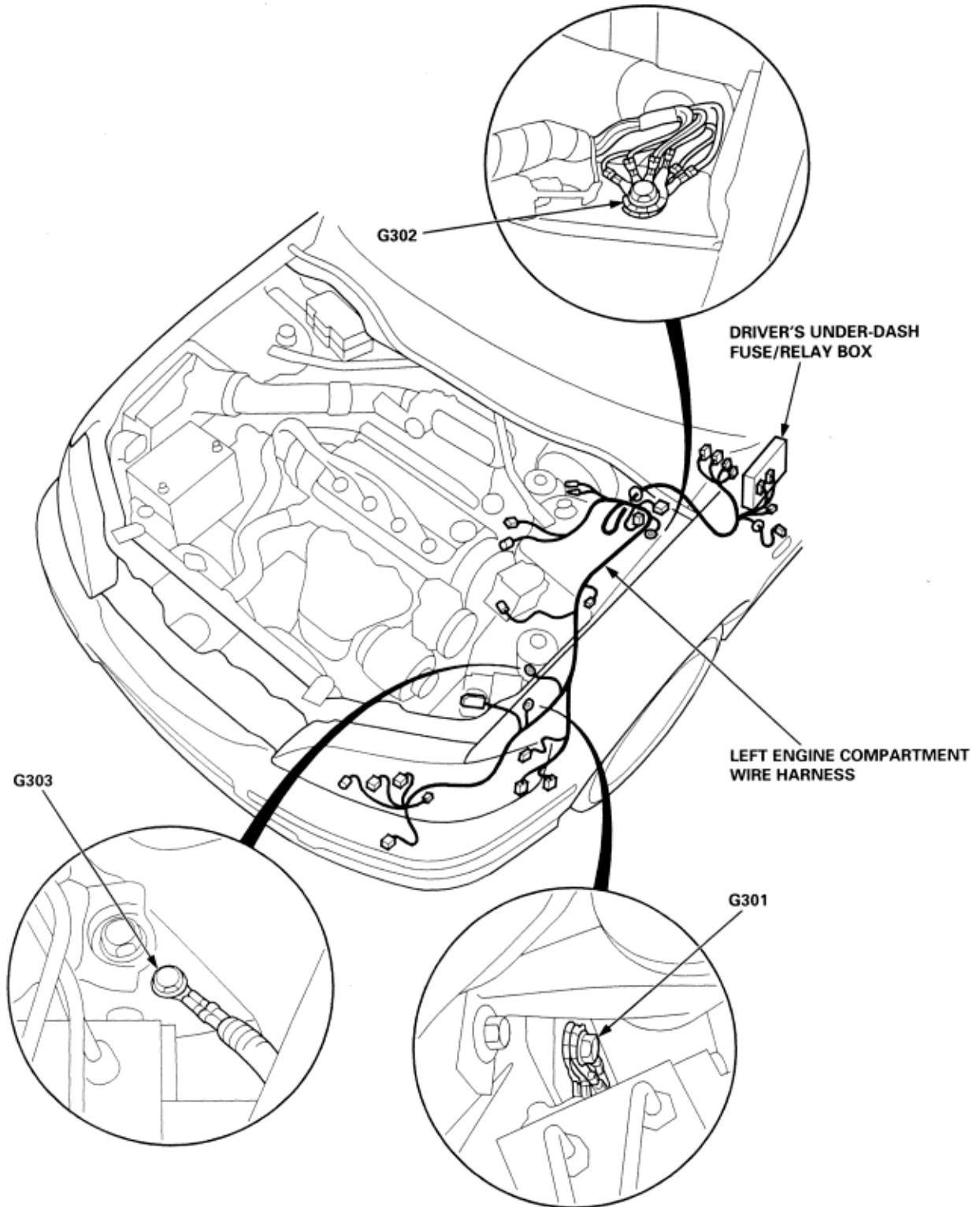
NOTE: LHD type is shown, RHD type is similar.



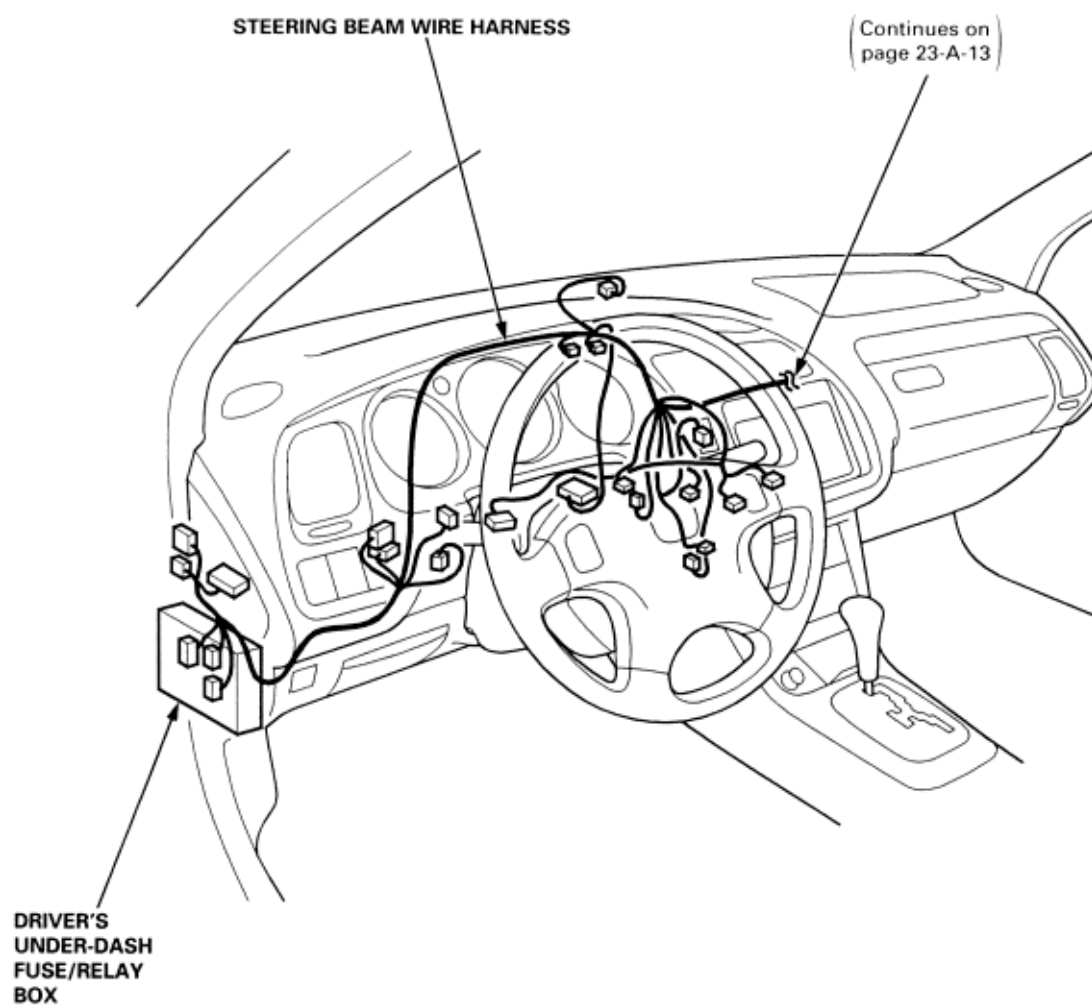
Wire Harness and Ground Locations
Engine Compartment (cont'd)

23-A-11

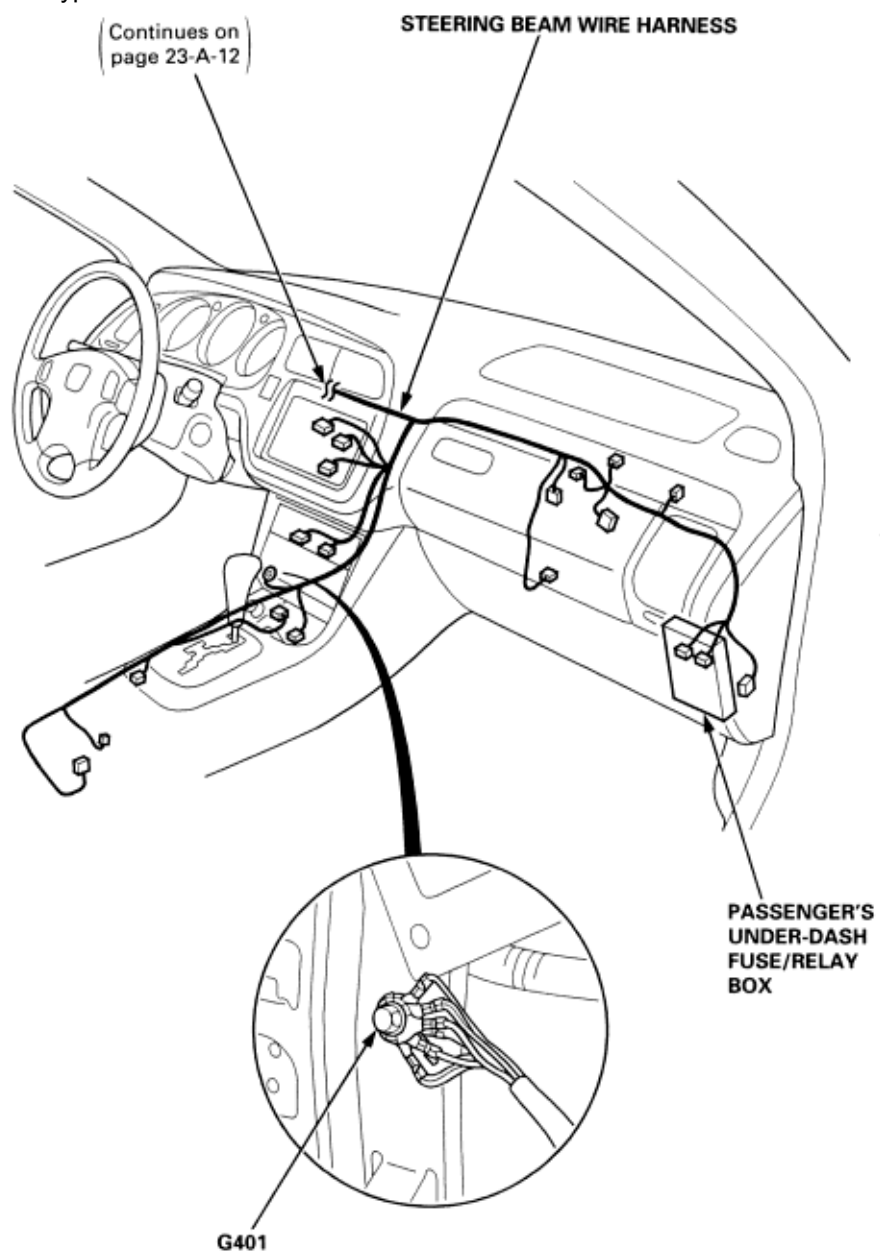
NOTE: LHD type is shown, RHD type is similar.



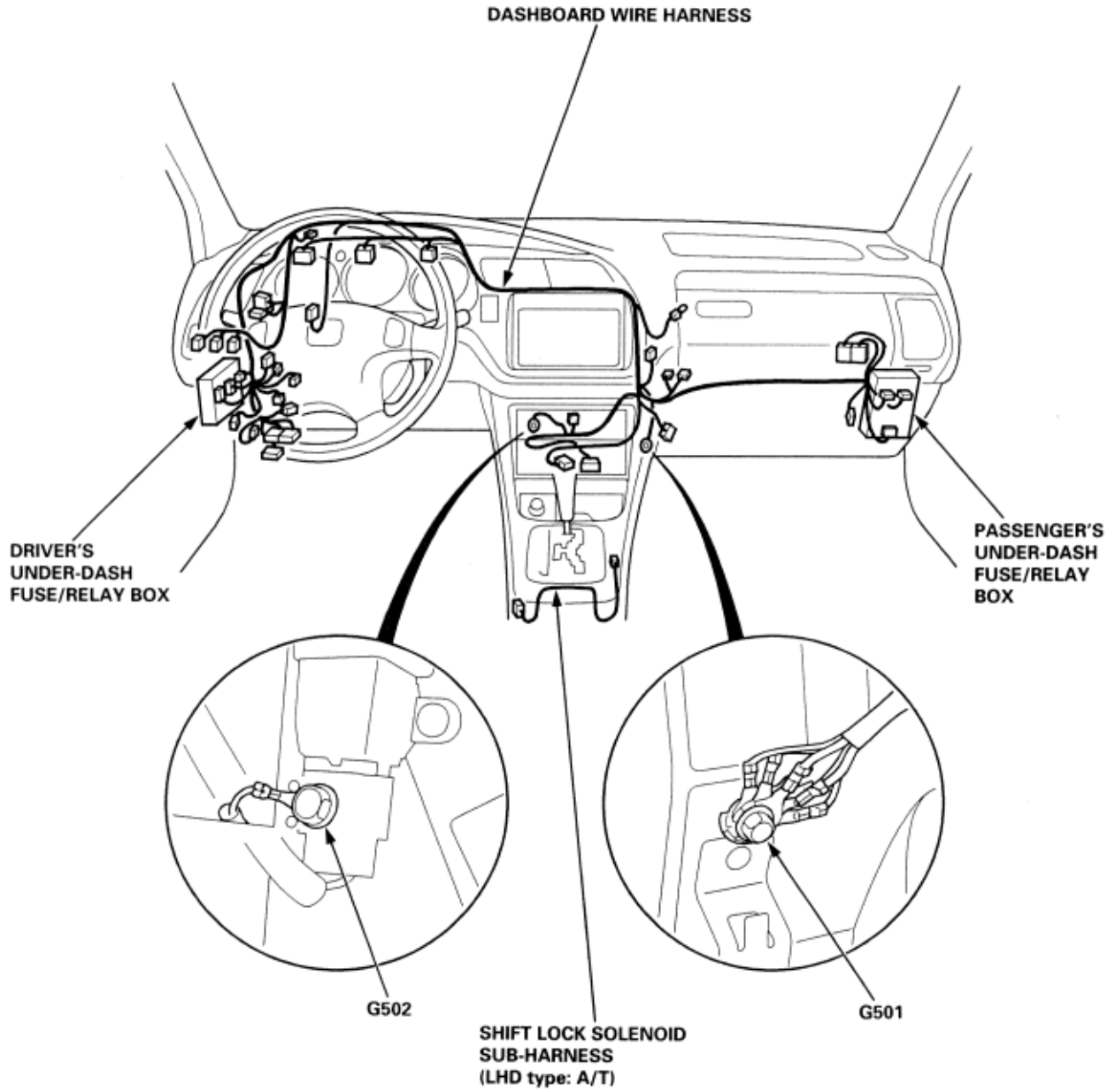
NOTE: LHD type is shown, RHD type is similar.



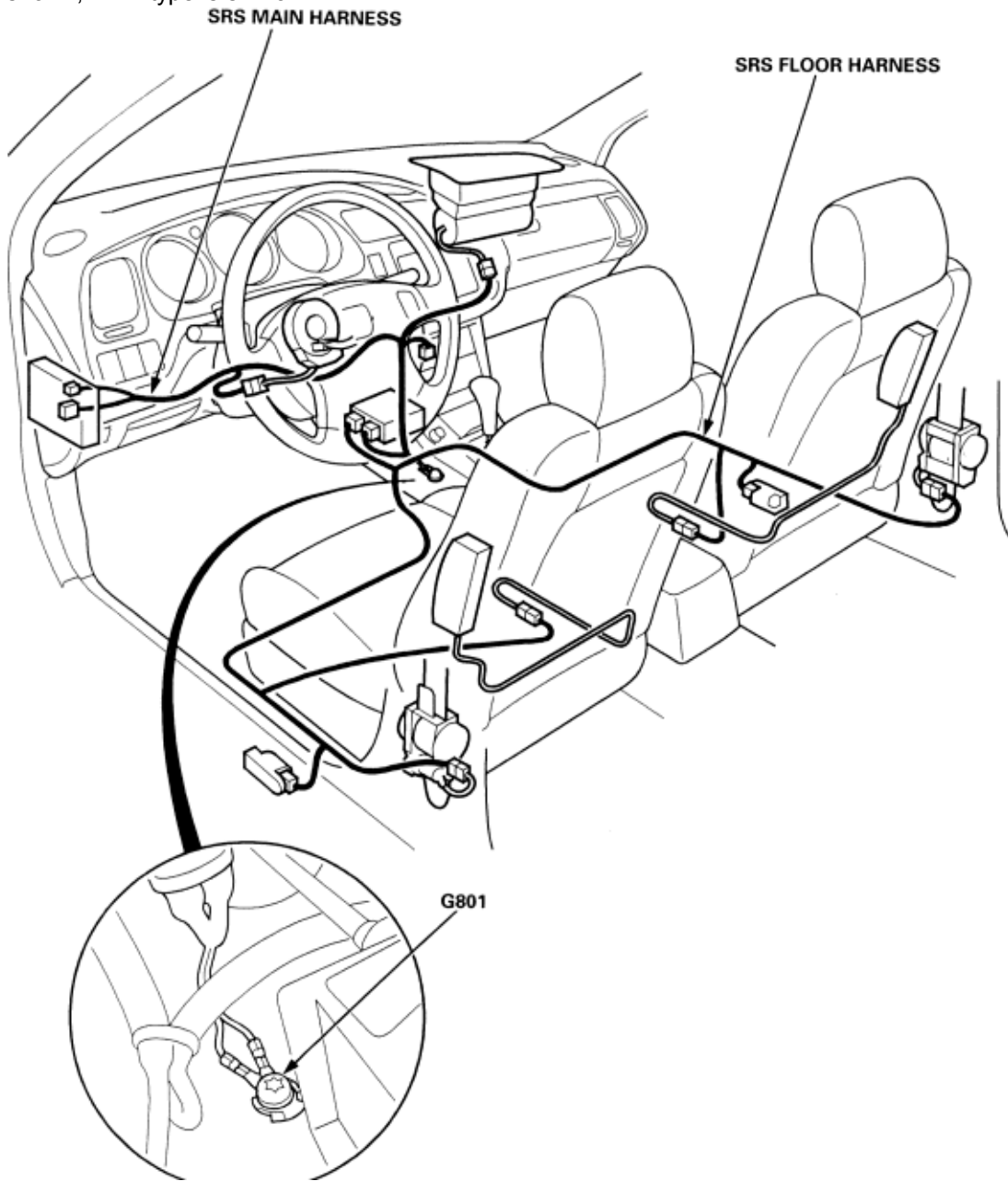
NOTE: LHD type is shown, RHD type is similar.



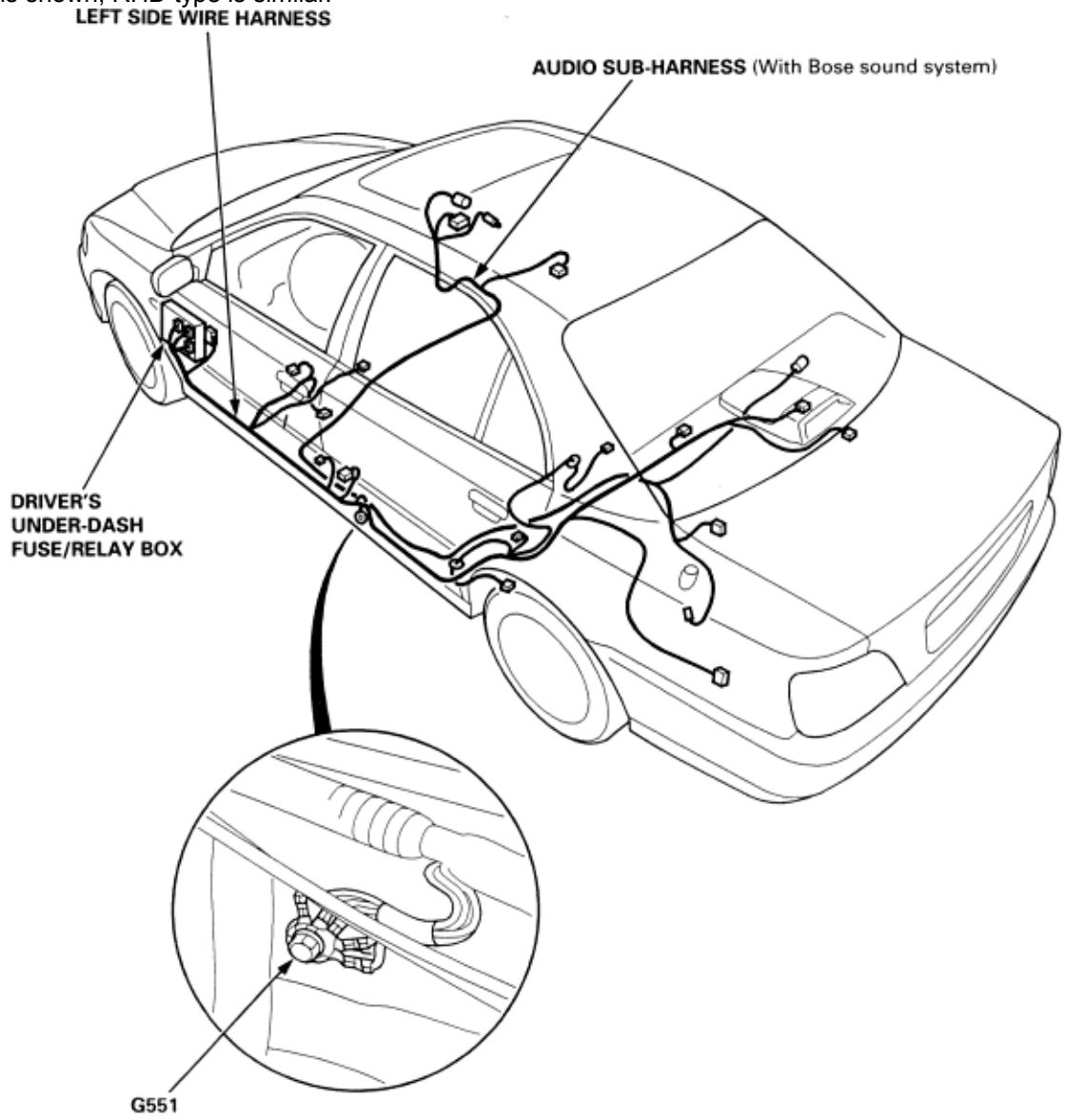
NOTE: LHD type is shown, RHD type is similar.



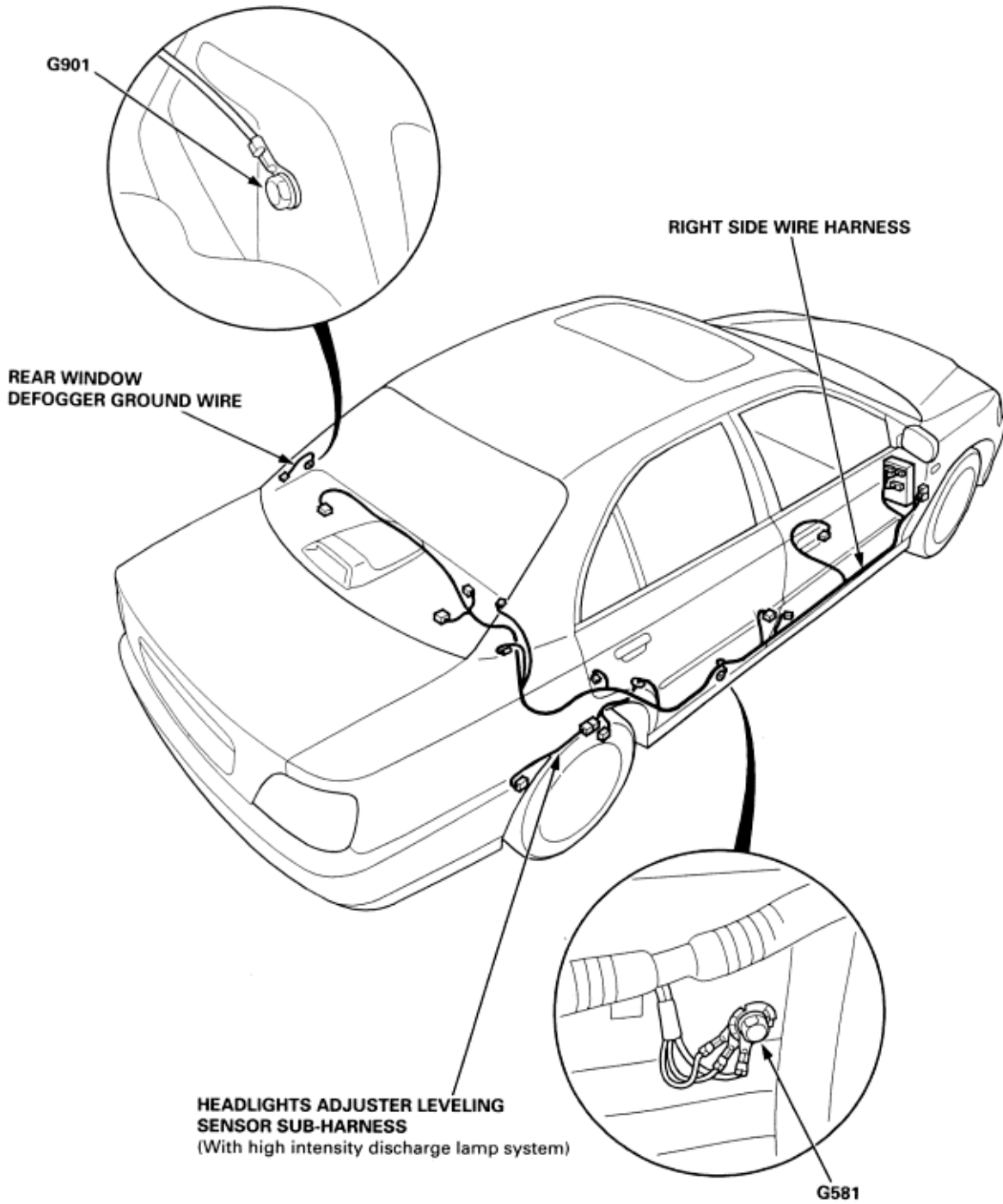
NOTE: LHD type is shown, RHD type is similar.



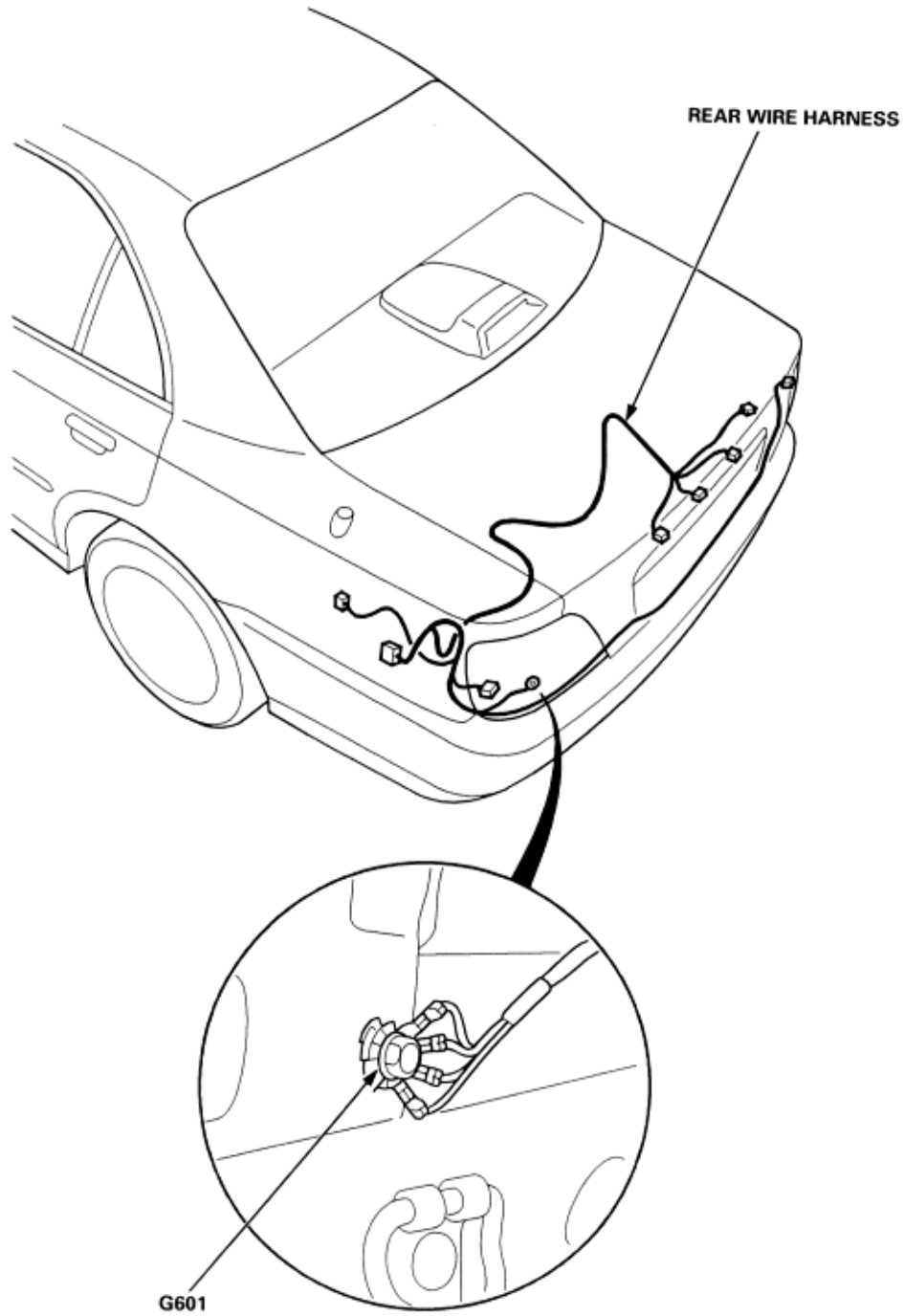
NOTE: LHD type is shown, RHD type is similar.



NOTE: LHD type is shown, RHD type is similar.



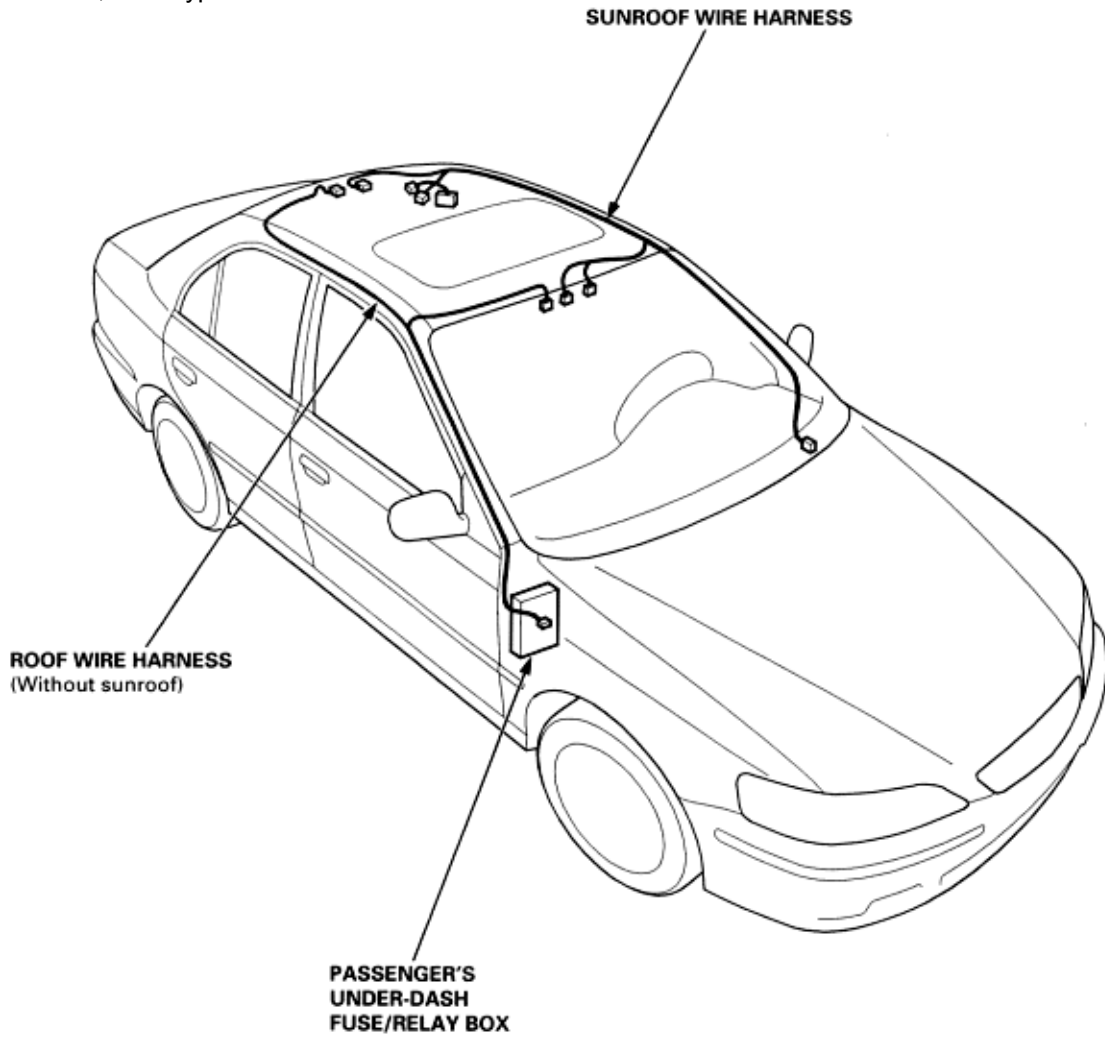
NOTE: LHD type is shown, RHD type is similar.



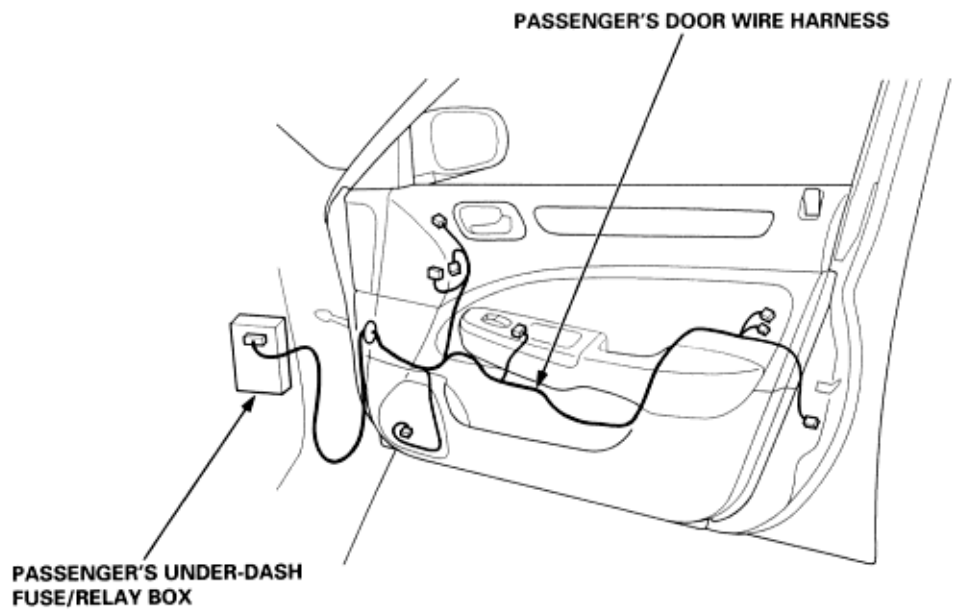
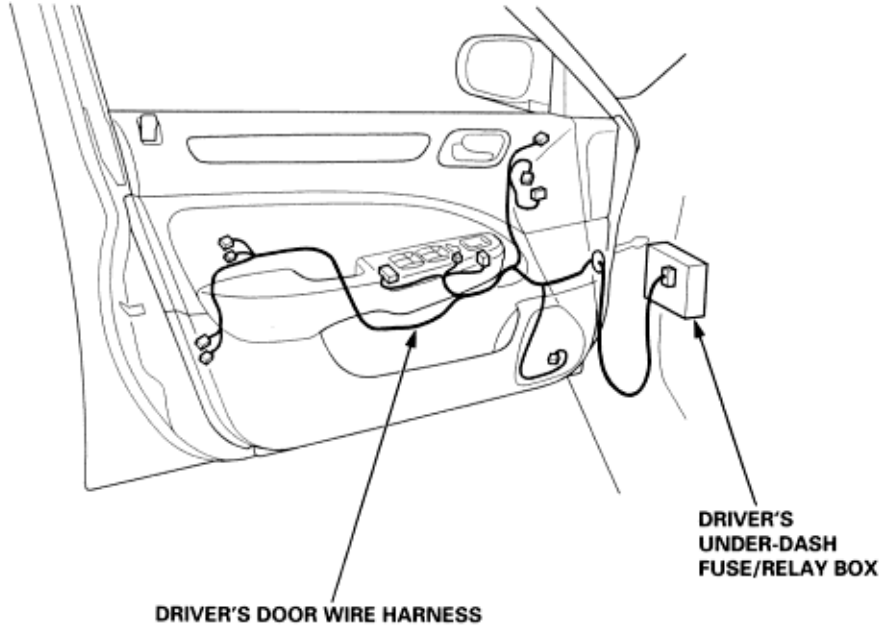
Wire Harness and Ground Locations
Roof

23-A-19

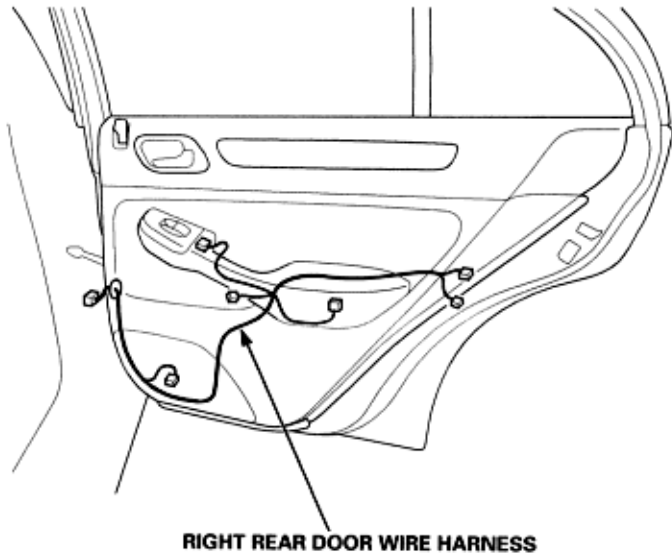
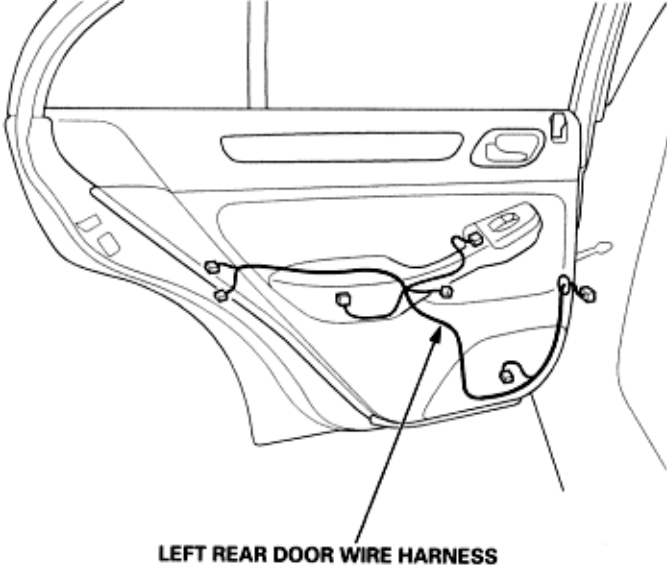
NOTE: LHD type is shown, RHD type is similar.



NOTE: LHD type is shown, RHD type is similar.



NOTE: LHD type is shown, RHD type is similar.



Battery Test

⚠ WARNING

A battery can explode if you do not follow the proper procedure, causing serious injury to anyone nearby. Follow all procedures carefully and keep sparks and open flames away from the battery.

NOTE:

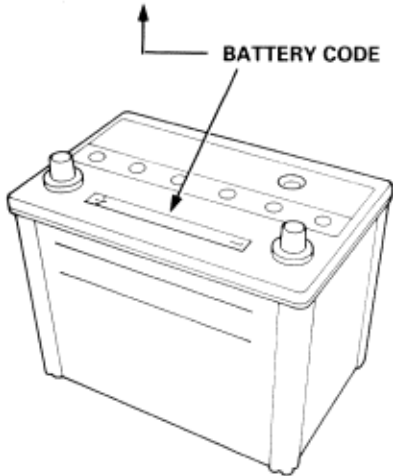
- ♦ To get accurate results, the temperature of the electrolyte must be between 21 and 38°C (70 and 100°F) before testing.
- ♦ The ECM/PCM memory must be reset after reconnecting the battery (see section 11).

Test Equipment Required:

- ♦ Battery Tester with:
Voltmeter with 0-18 V scale, ammeter with 0-100 A and 0-500 A scales, and a carbon pile with 0-300 W
- ♦ 12 V Battery Charger:
Fast charge capability of 50 A and slow charge capability of 5 A.

55 B24L (S) – MF: D16B6 engine
70 D23L – MF: Except D16B6 engine

BATTERY CODE



Test Procedure:

1. Check for damage: If the case is cracked or the terminals are loose, replace the battery.
2. Check indicator (for basic charge condition): Blue or Green is OK. If the indicator is red, peel the tape off, remove the caps, and add distilled water; then reinstall the caps and tape. If the indicator is clear, go to step 3.
3. Test battery load capacity by connecting a battery tester, and applying a load of three times the battery ampere hour rating.
When the load has been applied for exactly 15 seconds, the battery voltage reading should stay above 9.6 V.
 - ♦ If the reading stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - ♦ If the reading is between 6.5 and 9.6 V, connect a battery charger and charge the battery for three minutes at an initial rate of 40 amps.

⚠ CAUTION

Amperage will drop as voltage increases; do not increase the amperage to compensate or you may damage the battery.

- ♦ Watch the battery voltage during the entire three minutes; the highest reading should stay below 15.5 V.
 - If the reading stays below 15.5 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the reading exceeds 15.5 V any time during the three minutes of fast charge, the battery is not good; replace it.
- ♦ If the reading drops below 6.5 V, slow-charge the battery by connecting a battery, and charge at five amps for no more than 24 hours (or until the indicator shows full charge, or the specific gravity of the electrolyte is at least 1.270). Then test load capacity again.
 - If the voltage stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the voltage still drops below 6.5 V, the battery is not good; replace it.

Power Relays
Power Relay Test

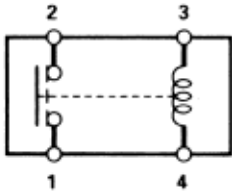
23-B-3

NOTE: For turn signal/hazard relay input test cover (see page 23-D-36).

Normally-open type A:

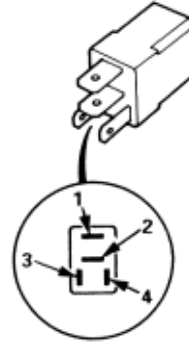
1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
 - ♦ There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.

Terminal	1	2
Power (No. 3 - No. 4)		
Disconnected		
Connected	○ — ○	○ — ○

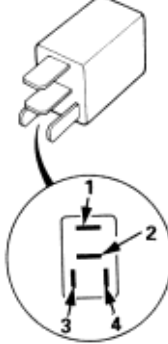


- ♦ Headlight relay 1
- ♦ Headlight relay 2
- ♦ Radiator fan relay
- ♦ Condenser fan relay
- ♦ A/C compressor clutch relay
- ♦ Horn relay
- ♦ Power window relay
- ♦ Cigarette lighter relay
- ♦ Starter cut relay
- ♦ Reverse relay
- ♦ Front fog light relay
- ♦ Seat heater main relay
- ♦ High beam cut relay
- ♦ Security relay 1
- ♦ Security relay 2
- ♦ Primary heated oxygen sensor relay

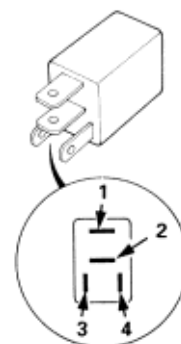
Type 1:



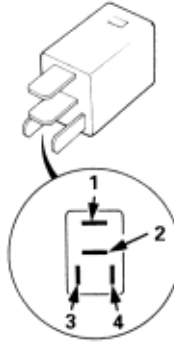
Type 2:



Type 3:



Type 4:





Power Relays

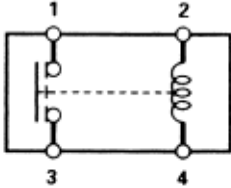
Power Relay Test (cont'd)

23-B-4

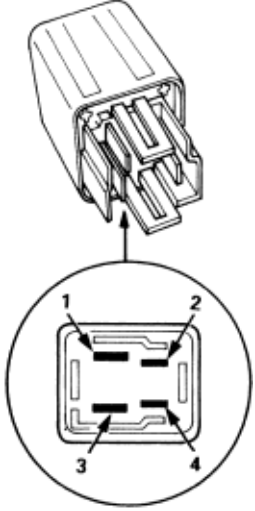
Normally-open type B:

1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
 - ♦ There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.

Terminal	1	3
Power (No. 2 - No. 4)		
Disconnected		
Connected		







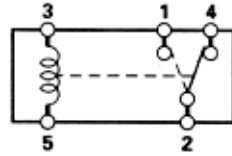
- ♦ Blower motor relay
- ♦ Rear window defogger relay



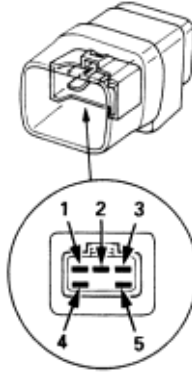
Five-terminal type A:

1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
 - ♦ There should be continuity between the No. 2 and No. 4 terminals when power is disconnected.

Terminal	1	2	4
Power (No. 3 - No. 5)			
Disconnected			
Connected			



- ♦ Windshield wiper intermittent relay



Power Relays

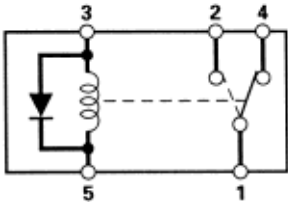
Power Relay Test (cont'd)

23-B-5

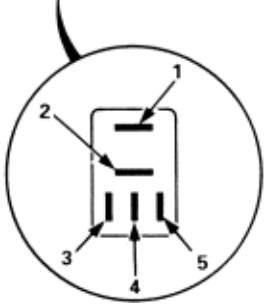
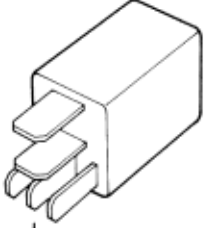
Five-terminal type:

1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
 - ♦ There should be continuity between the No. 1 and No. 4 terminals when power is disconnected

Terminal	1	2	4
Power (No. 3 – No. 5)			
Disconnected	○	○	○
Connected	○	○	



- ♦ Sunroof open relay
- ♦ Sunroof close relay
- ♦ Daytime running lights relay



Ignition Switch Test

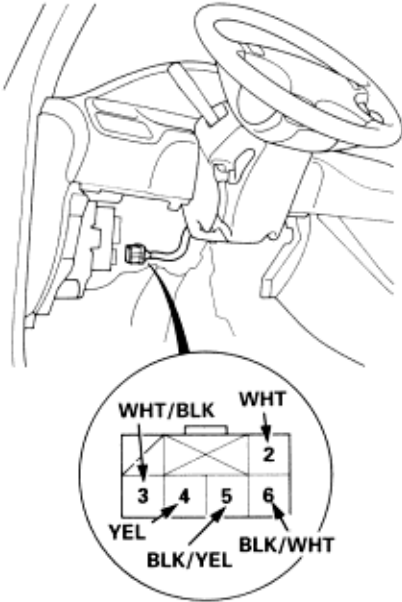
23-B-6

Electrical Switch Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedure in the SRS section (24) before performing repairs or service.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons (Except KY model).
2. Disconnect the battery negative cable.
3. Remove the dashboard lower cover (see section 20).
4. Disconnect the 6P connector from the driver's under-dash fuse/relay box.

NOTE: LHD type is shown, RHD type is similar.



Wire side of female terminals

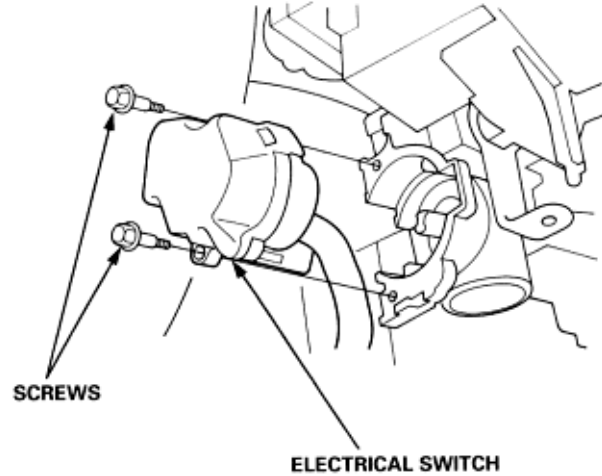
5. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	WHT/BLK (ACC)	WHT (BAT)	BLK/YEL (IG1)	YEL (IG2)	BLK/WHT (ST)
O (LOCK)					
I (ACC)	○—○				
II (ON)	○—○—○—○				
III (START)		○—○—○—○			

6. If the continuity checks do not agree with the table, replace the electrical switch.
7. After reconnecting the battery, enter the anti-theft code for the radio, then enter the customer's radio station presets (Except KY model).

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons (Except KY model).
2. Disconnect the battery negative cable.
3. Remove the steering column covers (see section 17).
4. Insert the ignition key, and turn it to "0".
5. Remove the two screws, and replace the electrical switch.



6. Install in the reverse order of removal.
7. After reconnecting the battery, enter the anti-theft code for the radio, then enter the customer's radio station presets (Except KY model).

Under-dash Fuse/Relay Box Removal/Installation

23-B-7

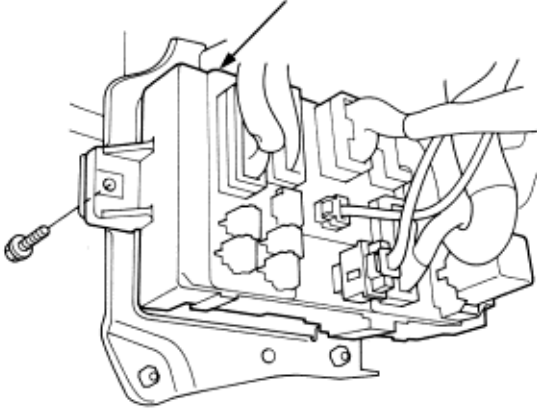
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

Removal:

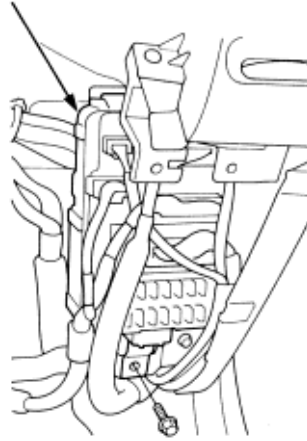
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons (Except KY model).
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Remove the dashboard lower cover (see section 20).
4. Remove the door sill molding, left or right kick panel and access panel (see section 20).
5. Remove the mounting bolt, and pull the driver's or passenger's under-dash fuse/relay box away from the body.

NOTE: LHD type is shown, RHD type is symmetrical.

DRIVER'S
UNDER-DASH
FUSE/RELAY BOX



PASSENGER'S
UNDER-DASH
FUSE/RELAY BOX



6. Disconnect the driver's or passenger's under-dash fuse/relay box connectors, and remove the driver's or passenger's under-dash fuse/relay box.

NOTE: The SRS main harness connector is a springloaded lock type (see section 24).

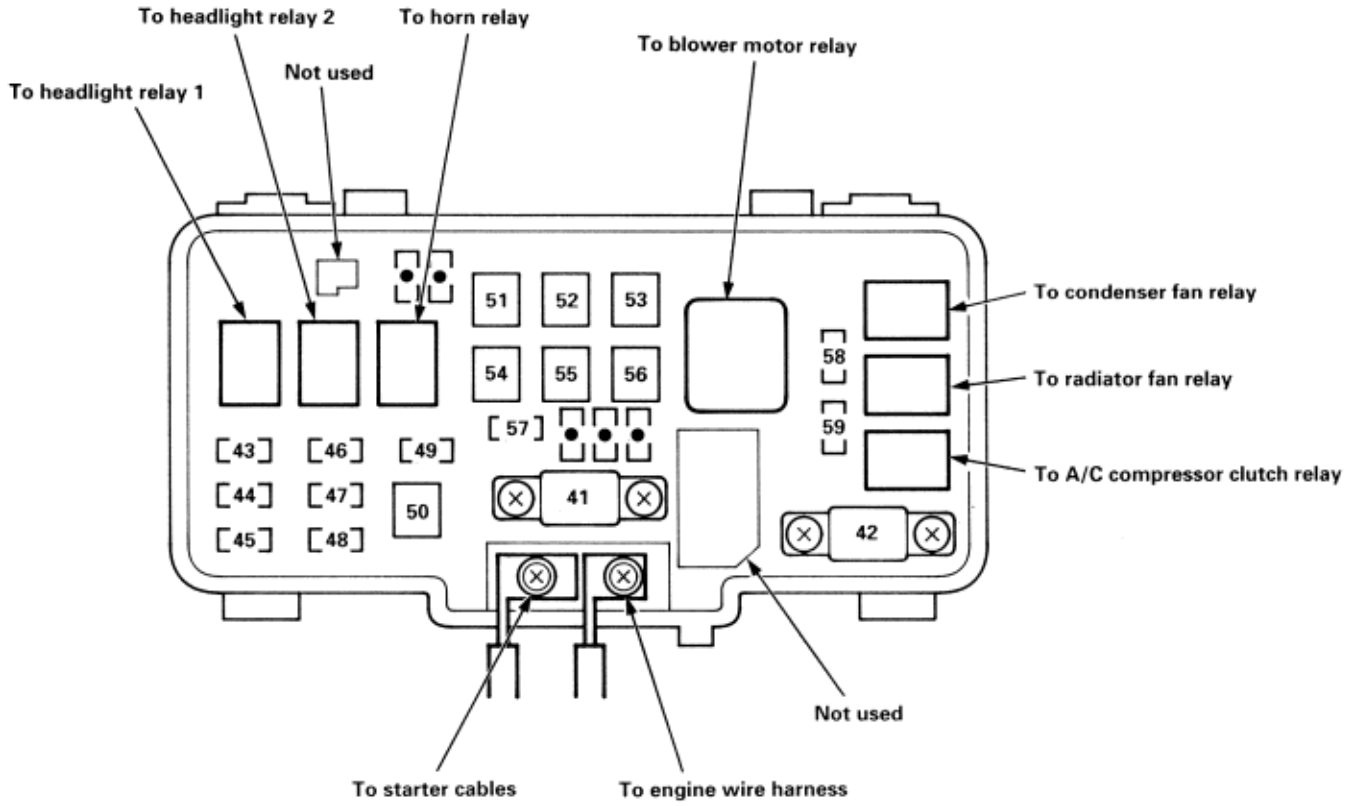
Installation:

1. Connect the connectors to the driver's or passenger's under-dash fuse/relay box, then install the driver's or passenger's under-dash fuse/relay box in the reverse order of removal.
NOTE: The SRS main harness connector is a springloaded lock type (see section 24).
2. Install the left or right kick panel and access panel, and the door sill molding.
3. Install the dashboard lower cover.
4. Connect both the negative cable and positive cable to the battery, enter the anti-theft code for the radio, then enter the customer's radio station presets.
5. Confirm that all systems work properly.

Fuses

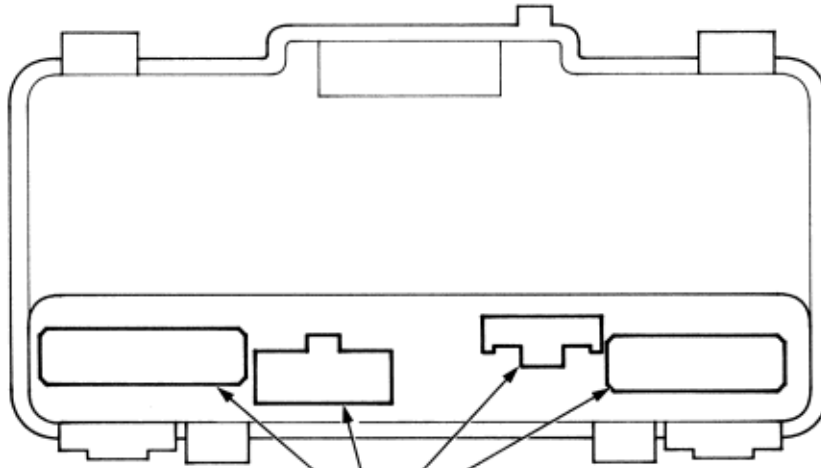
Under-hood Fuse Box/Relay Box

23-B-8



◆: Spare fuse

NOTE: View from the backside of under-hood fuse/relay box.



• To right engine compartment wire harness (LHD type)

Fuses**23-B-9****Under-hood Fuse/Relay Box (cont'd)**

Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
41	100A	-	Battery, power distribution
42	50A	WHT	Ignition switch (BAT)
43	20A	RED/WHT	Right headlight, High beam indicator light, Headlight adjuster control unit (RHD) *1, Headlight washer control unit
44	7.5A	RED/WHT [RED/GRN]	High beam cut relays *1, dimmer relay *2
45	20A	RED/YEL	Left headlight, High beam indicator light, Headlight adjuster control unit (LHD) *1, Headlight washer control unit
46	15A	WHT/GRN	PGM-FI main relay, data link connector (DLC)
47	15A	PUR/WHT	ABS modulator unit, Brake lights, Cruise control unit, ECM/PCM, Horns, Ignition key light, Key interlock solenoid (A/T), Security horn
48	20A	PUR/WHT	ABS modulator unit (FSR)
49	10A	WHT/GRN	Hazard warning lights, Turn signal/hazard lights (via relay)
50	40A	WHT/BLU	ABS modulator unit (+B MR)
51	40A	GRN [WHT/BLU]	No 1, 7, 8, 15 and 16 fuses (in passenger's under-dash fuse/relay box)
52	30A	YEL/RED	No 6 and 14 fuses (in passenger's under-dash fuse/relay box)
53	30A	WHT/GRN	Rear window defogger, Noise condenser
54	40A	YEL	No 9, 10, 11, 12 and 13 fuses (in passenger's under-dash fuse/relay box)
55	30A	YEL/GRN	No 2, 3, 4 and 5 fuses (in passenger's under-dash fuse/relay box)
56	40A	YEL/BLK	Blower motor
57	20A	BLU/BLK	Radiator fan motor
58	20A	WHT [RED] BLU/YEL RED	Radiator fan control module (KY) Condenser fan motor A/C compressor clutch
59	15A	RED/WHT	Ashtray lights, Cigarette lighter, Climate control lights, Hazard warning switch light, Mode switch light (A/T), Daytime running lights relay*2

[]: RHD type

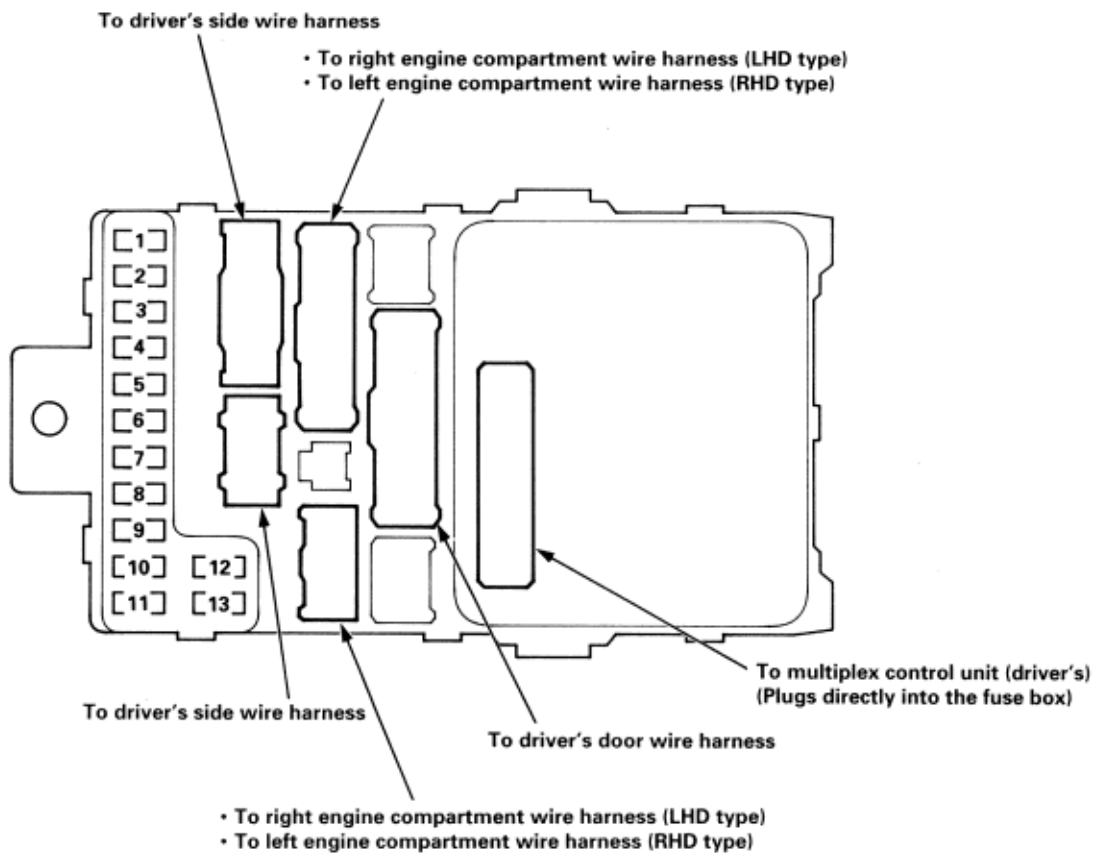
*1: With high intensity discharge lamp system

*2: KG with daytime running lights system

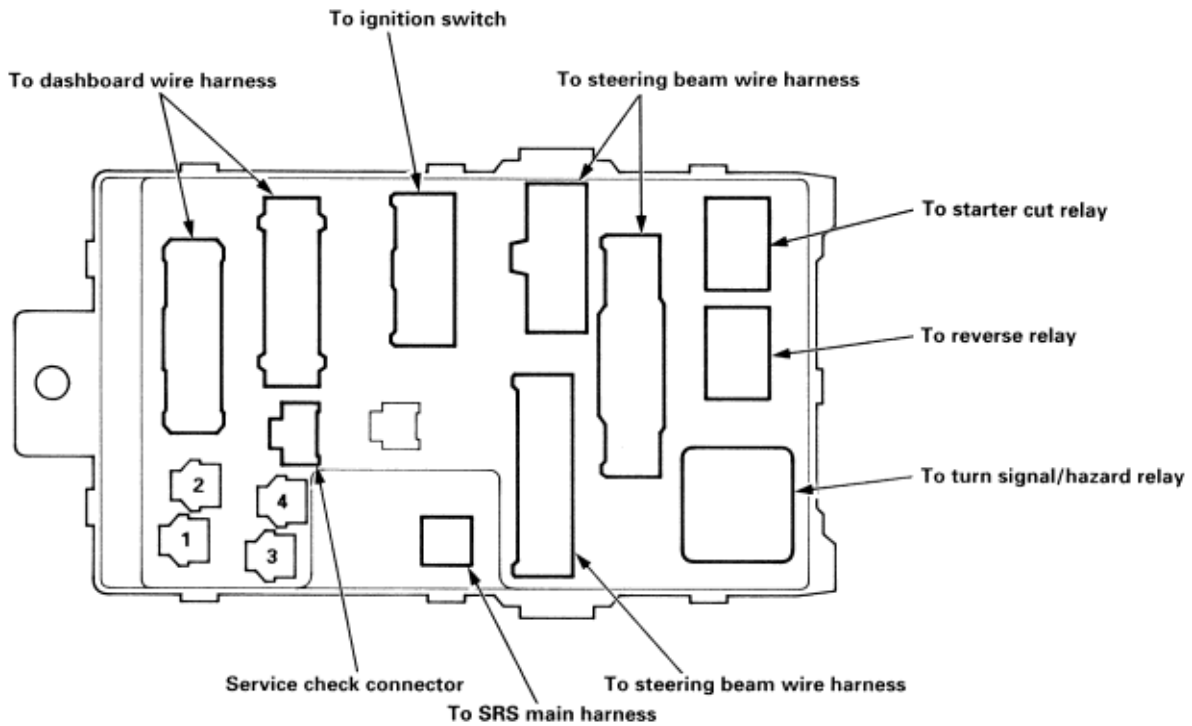
Fuses

Driver's Under-dash Fuse/Relay Box

23-B-10



NOTE: View from the backside of driver's under-dash fuse/relay box.



- 1: Option connector (AGC)
- 2: Option connector (IG2)
- 3: Option connector (+B)
- 4: Option connector

Fuses**23-B-11****Driver's Under-dash Fuse/Relay Box (cont'd)**

Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	15A	RED/WHT GRN (RED/WHT)	PGM-FI main relay, Inertia switch SRS unit (VA)
2	10A	GRN (BLK/RED)	SRS unit (VB)
3	7.5A	BLK/ORN	Climate control unit, Heater control panel, A/C thermostat, Recirculation control motor, Blower motor relay, Condenser fan motor, Radiator fan motor, Radiator control module (KY)
4	7.5A	YEL [YEL/BLK] Fuse/relay box socket	Power mirror actuators, Power mirror defoggers, Seat heater main relay, [Right power mirror defogger] Left power mirror defogger, Seat heater main relay Optional connector
5	10A	YEL/RED	ABS modulator unit (IG2)
6	15A	BLK/YEL	Alternator, Cruise control unit, Charging system light, Engine mount control solenoid valve (A/T), EVAP purge control solenoid valve, HO2S, Primary HO2S, Secondary HO2S, ECM/PCM, VSS (M/T), IAB control solenoid valve *3, Radiator fan control module (KY)
7	7.5A	YEL/GRN	Headlight adjuster control unit *1, Headlight adjuster units *2, Headlight adjuster switch, Sunroof relays, Multiplex control unit (driver's).
8	7.5A	YEL/BLK Fuse/relay box socket	Navigation unit, Shift lock solenoid (A/T), Multiplex control unit (driver's) (A/T) Optional connector
9	7.5A	YEL Fuse/relay box socket	Back-up lights (M/T), Clock, Gauge assembly, Keyless door lock control unit, Vehicle speed alarm unit (KY) Multiplex control unit (driver's), Reverse relay (A/T)
10	7.5A	YEL/RED	Turn signal/hazard relay
11	15A	BLK/YEK	Ignition coil
12	30A	GRN/BLK	Windshield wiper intermittent relay, Windshield wiper motor, Multiplex control unit (driver's)
13	7.5A	BLU/ORG	ECM/PCM *3, PGM-FI main relay *3

[]: RHD

*1: With high intensity discharge lamp system

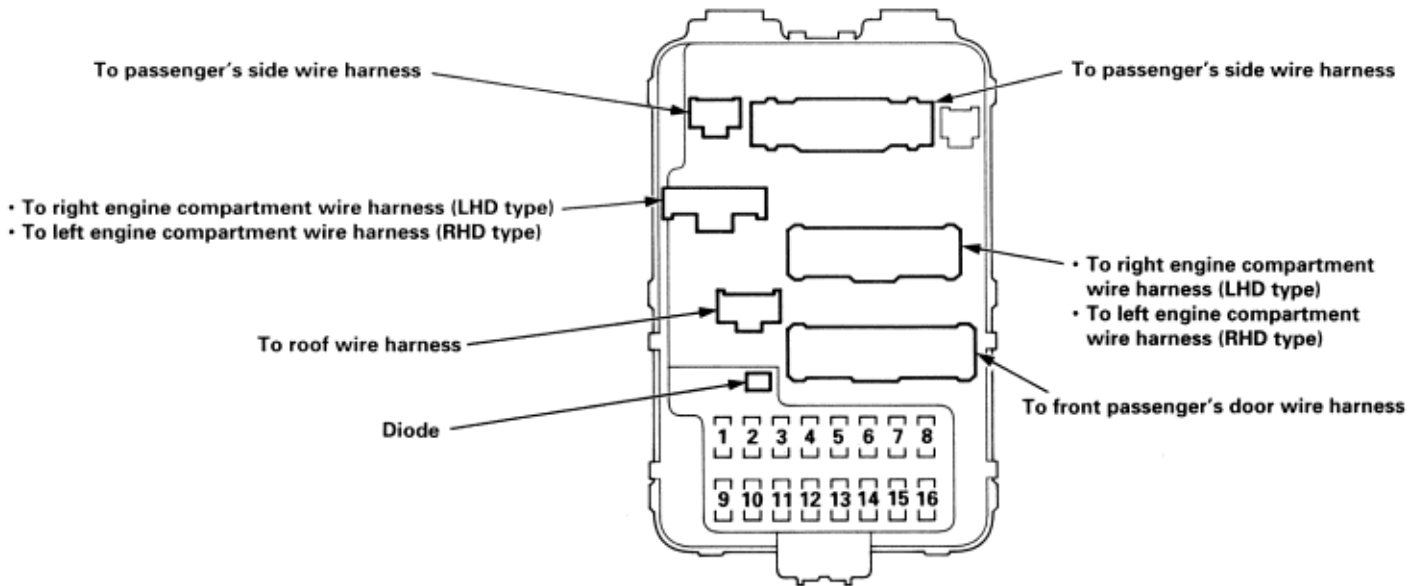
*2: Without high intensity discharge lamp system

*3: Except D16B6 engines

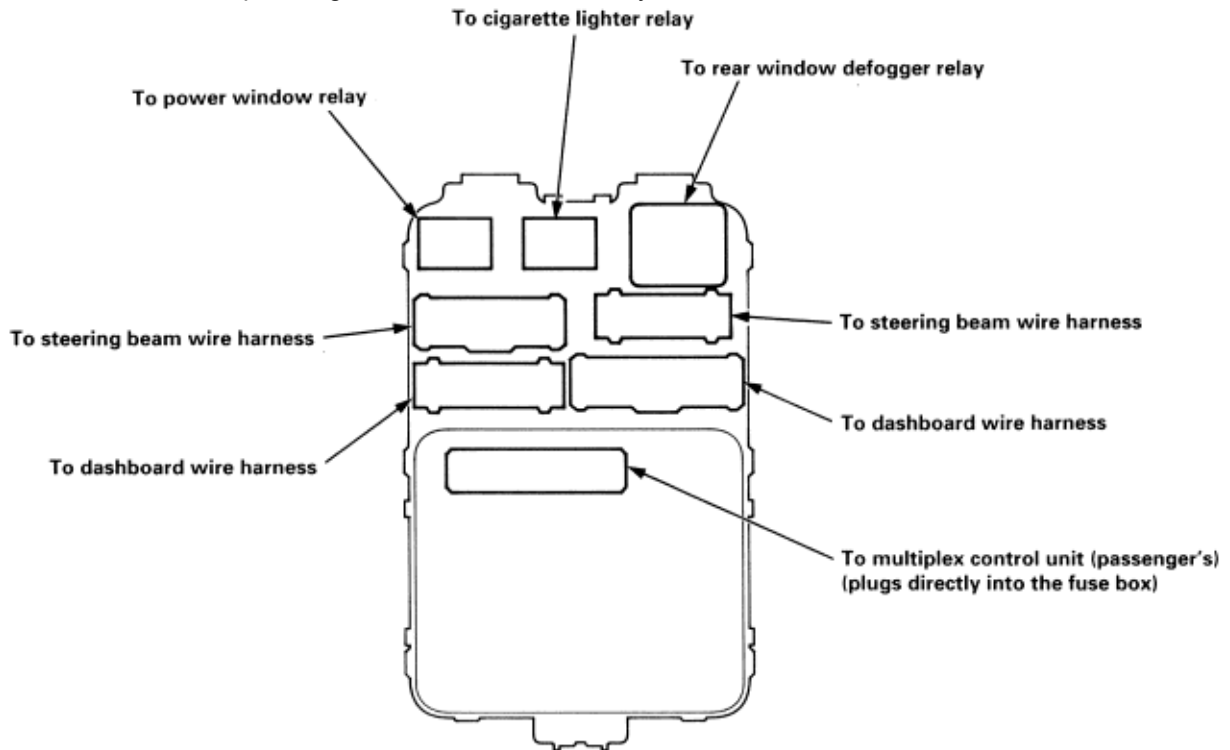
Fuses

Passenger's Under-dash Fuse/Relay Box

23-B-12



NOTE: View from the backside of passenger's under-dash fuse/relay box.



Fuses**23-B-13****Passenger's Under-dash Fuse/Relay Box (cont'd)**

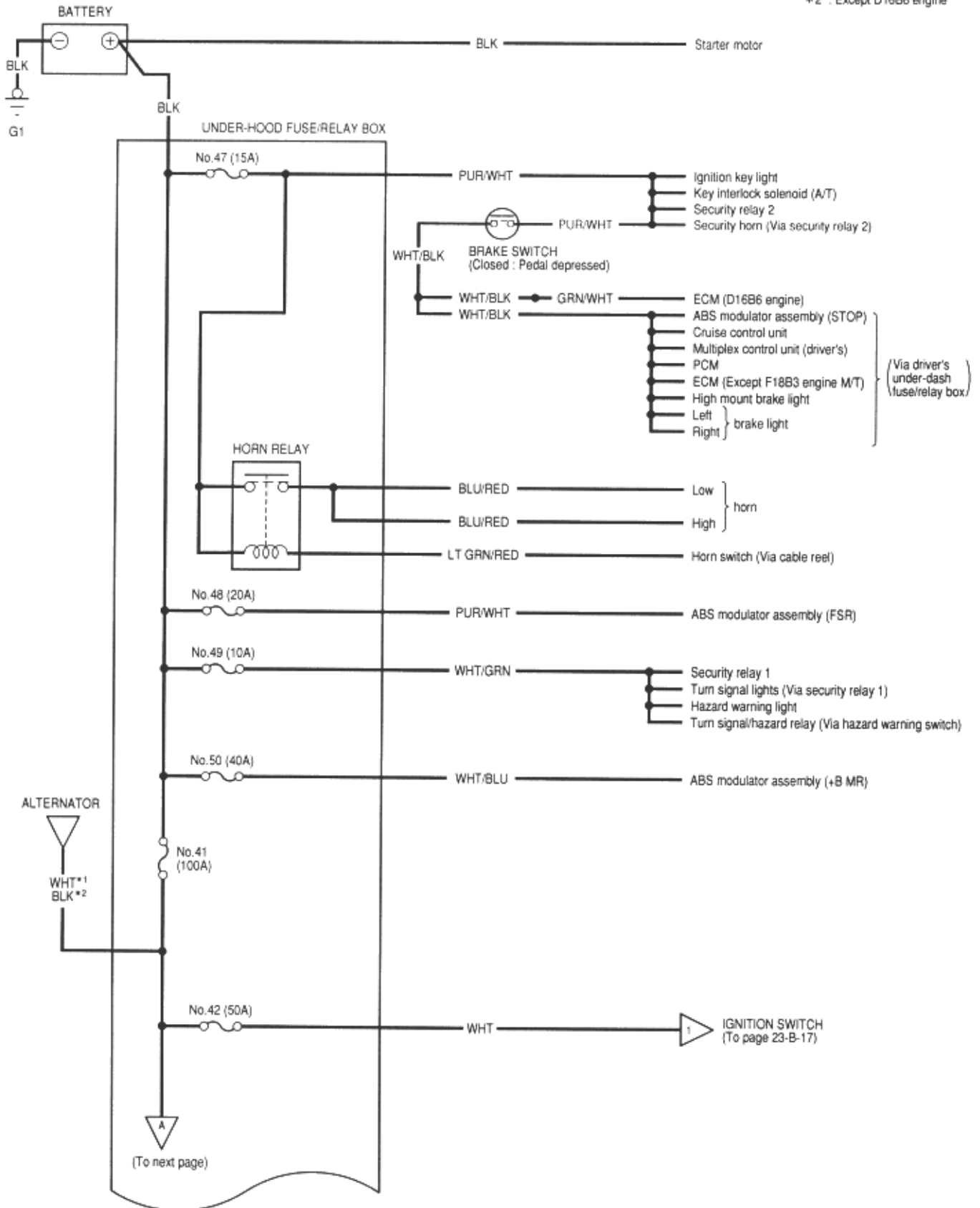
Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	20A	GRN/WHT	Power window control unit, Driver's power window motor
2	20A	RED	Power seat recline and rear up-down motors
3	30A	WHT/BLK	Headlight washer control unit
4	20A	BLU	Power seat slide and front up-down motors
5	20A	RED/YEL Fuse/relay box socket	Front fog lights Multiplex control unit (passenger's)
6	7.5A *1 20A *2	WHT/RED RED/BLU	ECM Primary HO2S
7	20A	WHT/GRN	Left [right] rear power window motor
8	20A	BLU/BLK	Front passenger's power window motor
9	15A	WHT/GRN Fuse/relay box socket	Audio unit Cigarette lighter
10	20A	WHT/BLU	BOSE amplifier
11	7.5A	WHT/BLU	Front ceiling light, Rear ceiling light, Spotlights, Trunklight, Power antenna motor
12	20A	WHT Fuse/relay box socket	Keyless door lock control unit Multiplex control unit (passenger's)
13	7.5A	PNK Fuse/relay box socket	Climate control unit, Clock, ECM/PCM, Navigation display and unit, Immobilizer indicator light, Security indicator light Multiplex control unit (passenger's)
14	20A	WHT/BLK	Seat heaters
15	30A	GRN	Sunroof motor
16	20A	WHT/BLK	Right [left] rear power window motor

[]: RHD

*1: D16B6 engine

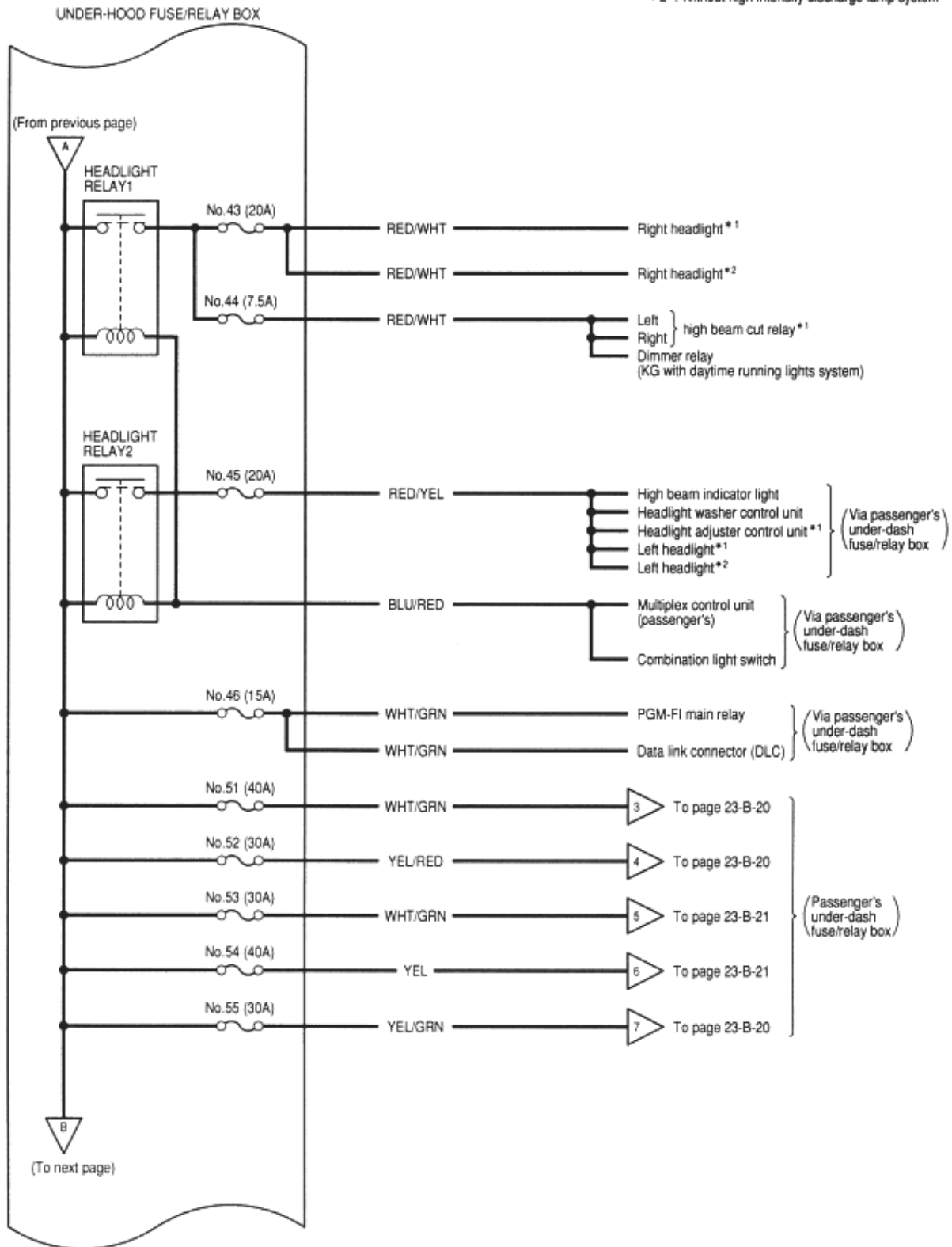
*2: F20B6 engine

*1 : D16B6 engine
 *2 : Except D16B6 engine



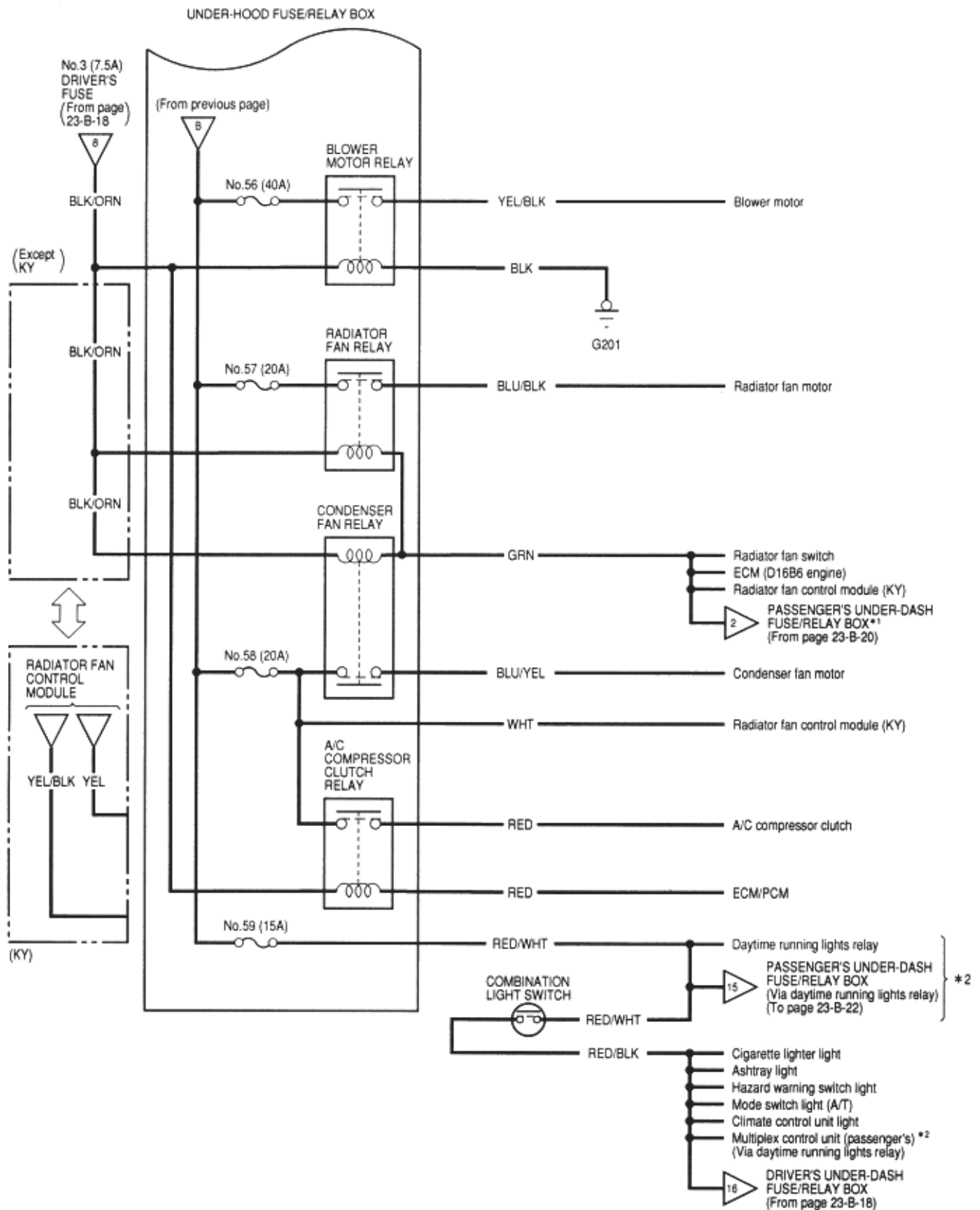
To go to the pages referenced on the diagram above,
 click on the following:
 (See Page 23-B-17)

* 1 : With high intensity discharge lamp system
 * 2 : Without high intensity discharge lamp system



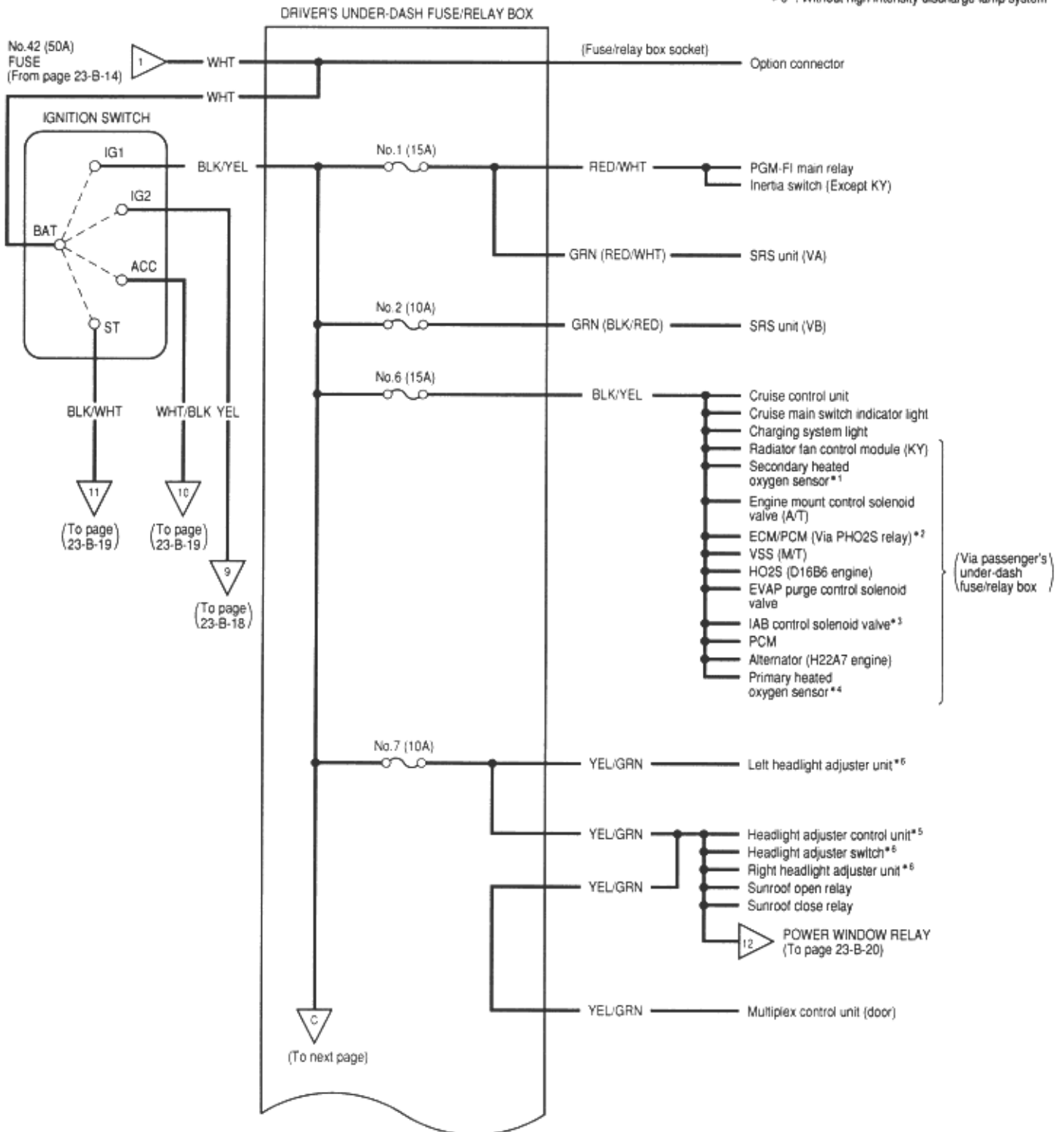
To go to the pages referenced on the diagram above,
 click on the following:
[\(See Page 23-B-20\)](#)
[\(See Page 23-B-21\)](#)

* 1 : Except D16B6 engine
 * 2 : KG with daytime running lights system



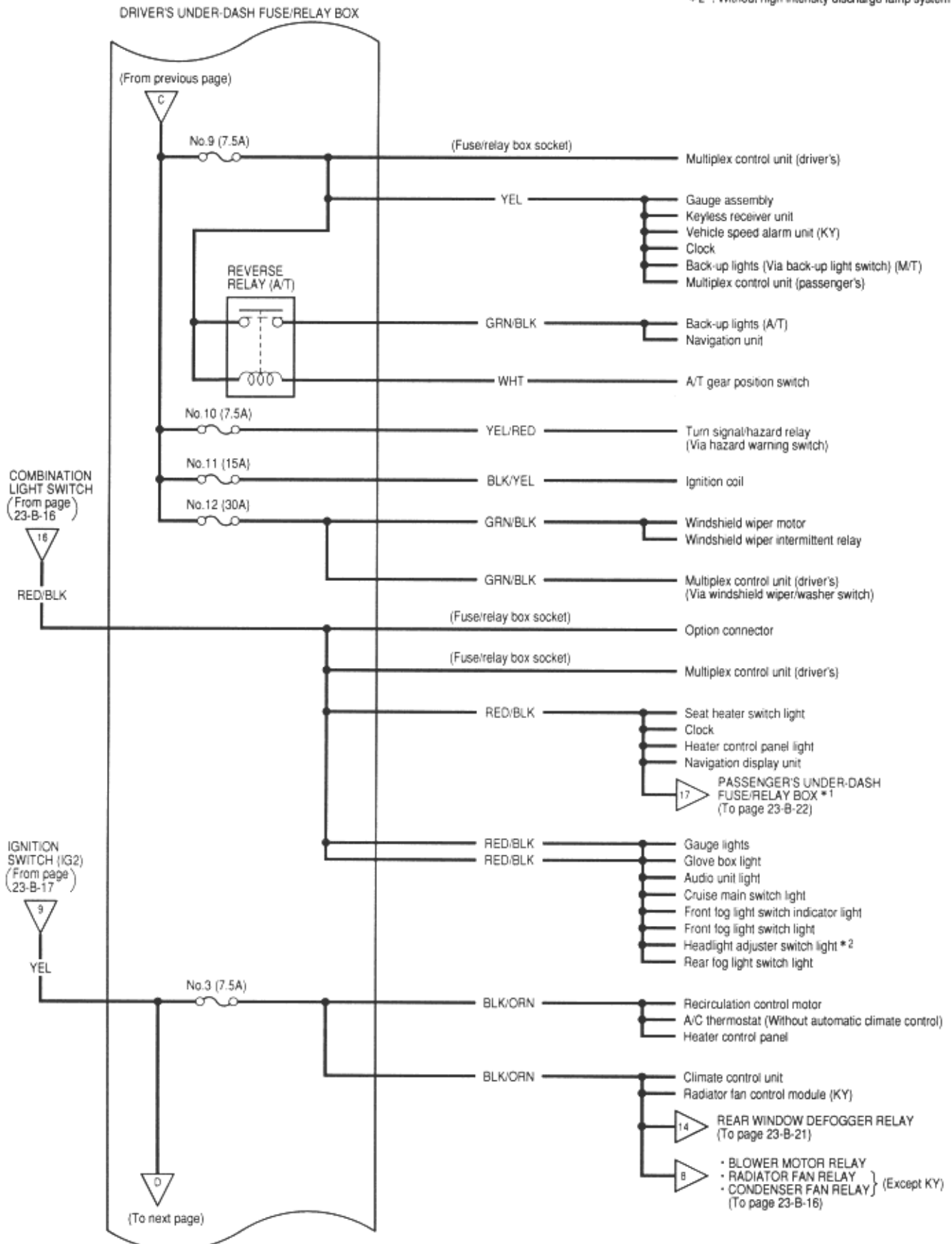
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-B-20\)](#)
[\(See Page 23-B-22\)](#)
[\(See Page 23-B-18\)](#)

- *1 : F18B2 engine A/T, F20B6 engine
- *2 : F20B6 engine
- *3 : Except D16B6 engine
- *4 : F18B2 engine, H22A7 engine
- *5 : With high intensity discharge lamp system
- *6 : Without high intensity discharge lamp system

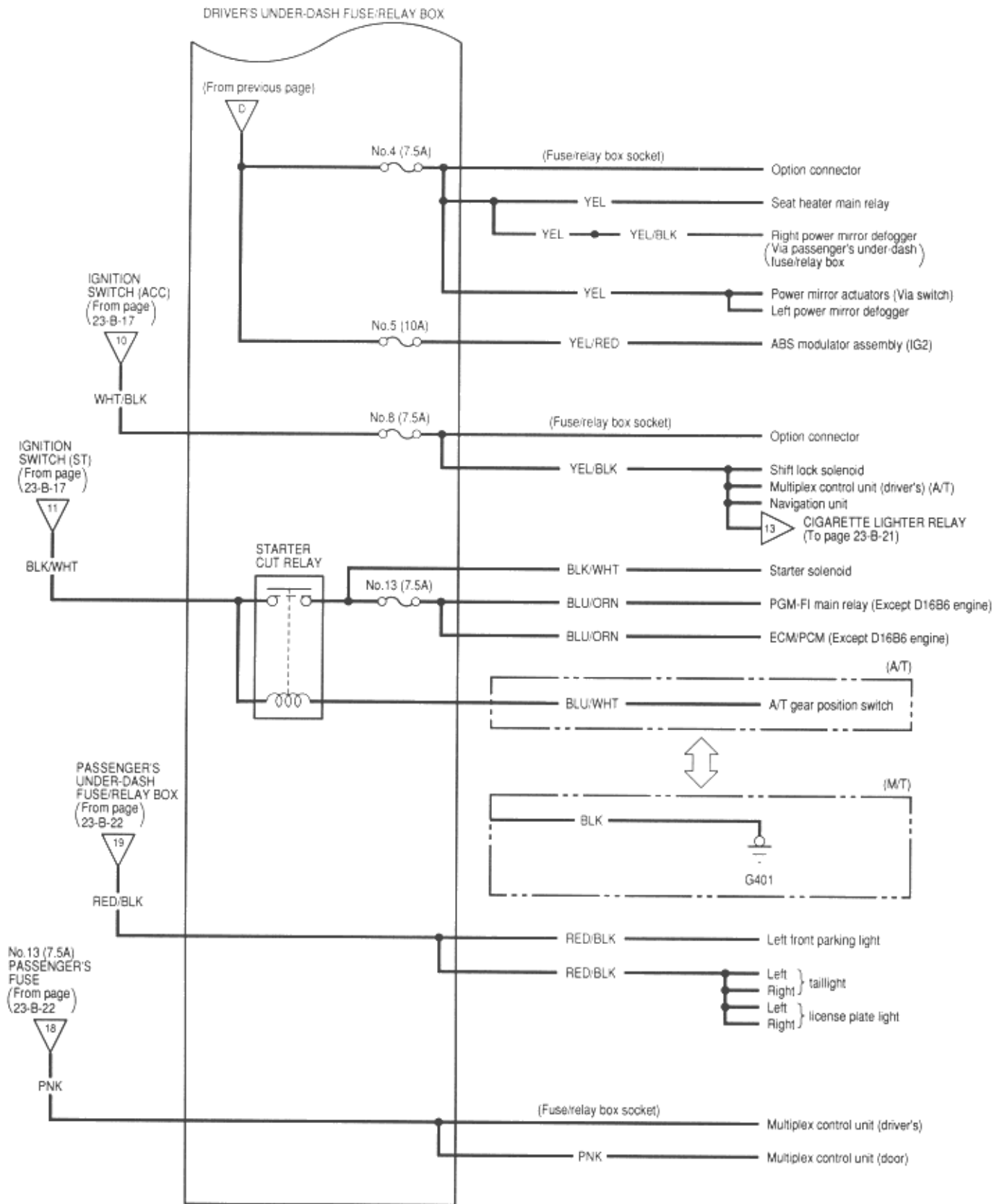


To go to the pages referenced on the diagram above, click on the following:
 (See Page 23-B-19)
 (See Page 23-B-18)
 (See Page 23-B-20)

*1 : Except KG with daytime running lights system
 *2 : Without high intensity discharge lamp system

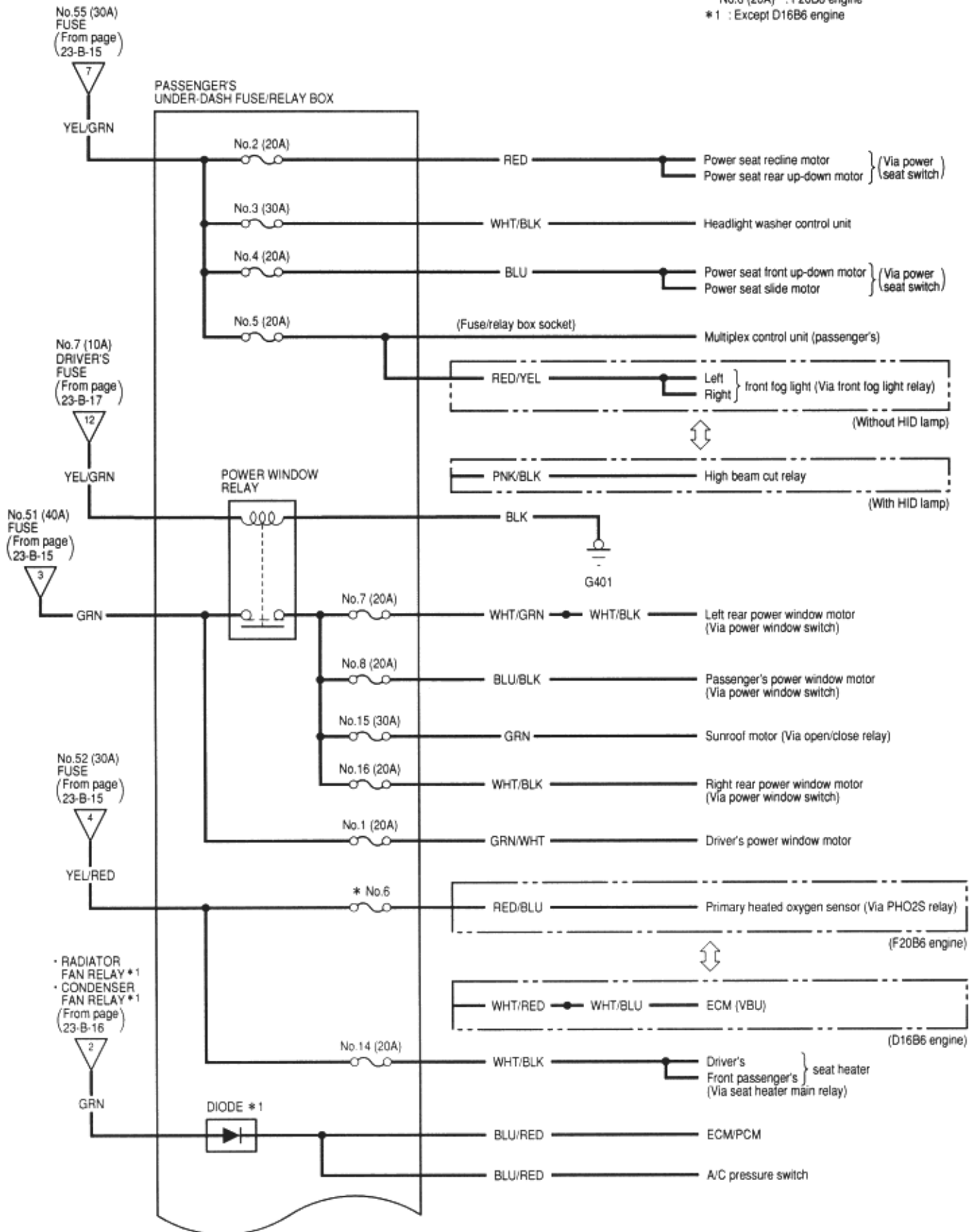


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-B-16\)](#)
[\(See Page 23-B-17\)](#)
[\(See Page 23-B-22\)](#)
[\(See Page 23-B-21\)](#)

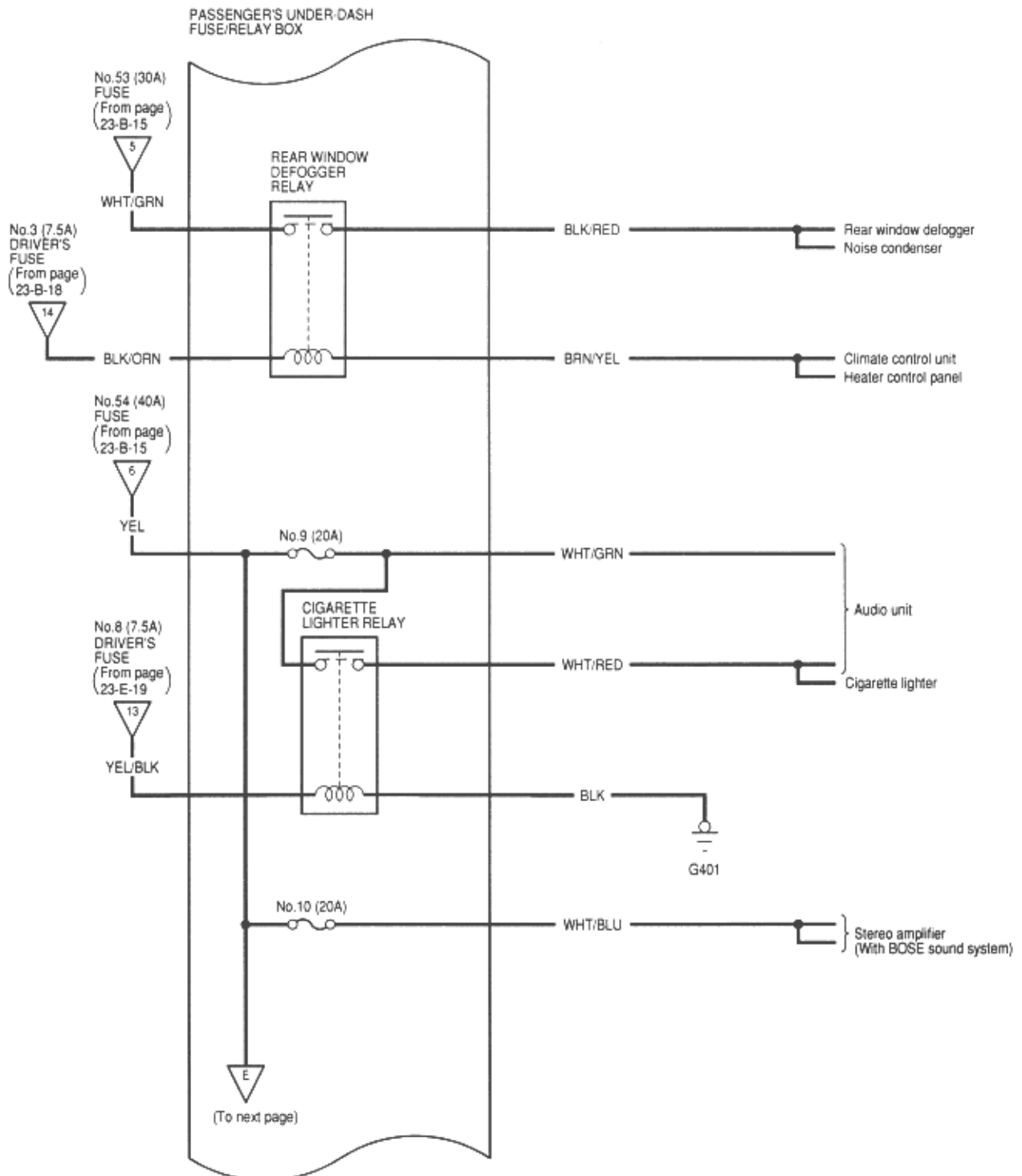


To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-17)
(See Page 23-B-22)
(See Page 23-B-21)

* No.6 (7.5A) : D16B6 engine
 No.6 (20A) : F20B6 engine
 * 1 : Except D16B6 engine

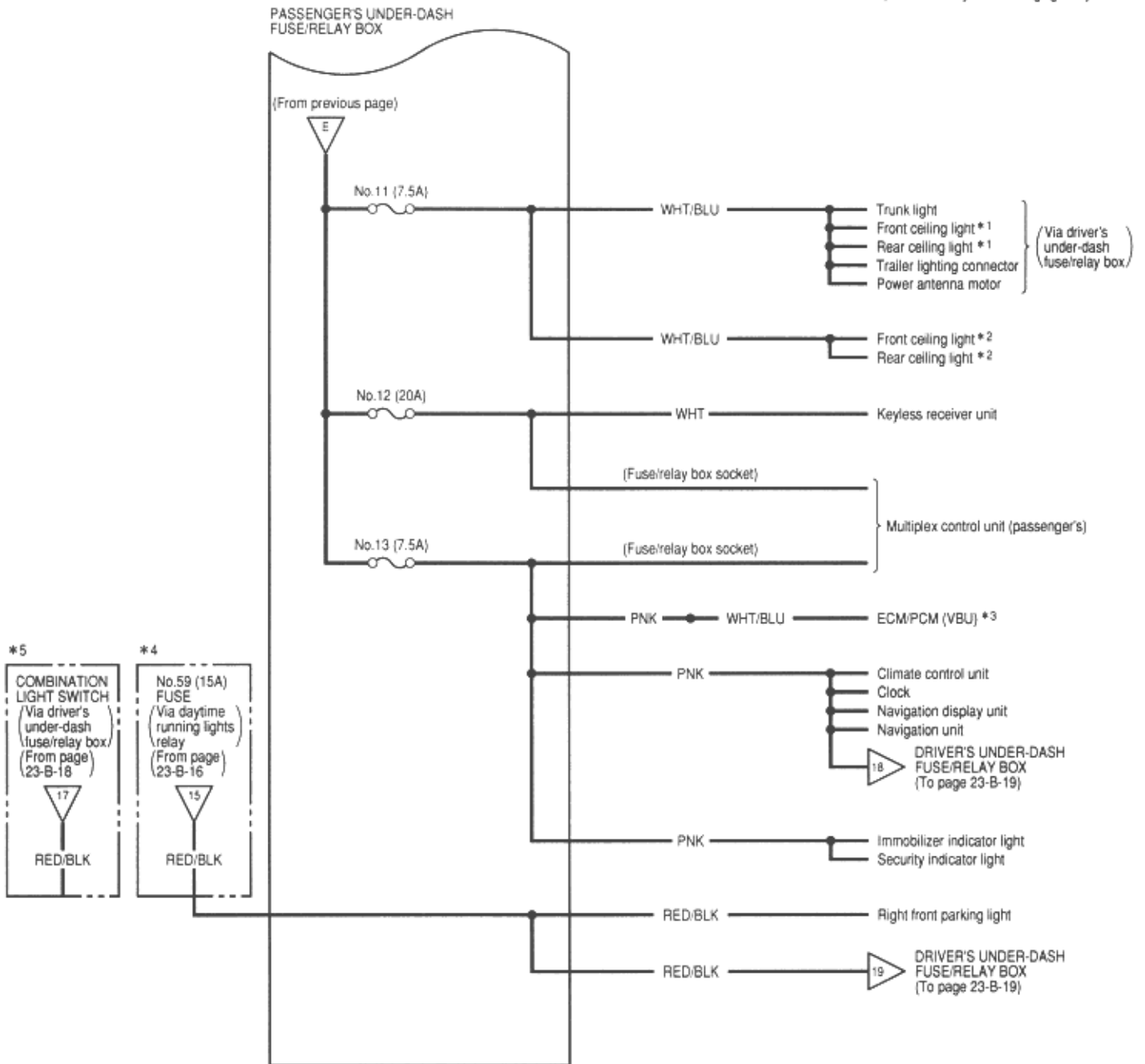


referenced on the diagram above, click on the following:
 (See Page 23-B-15)
 (See Page 23-B-17)
 (See Page 23-B-16)



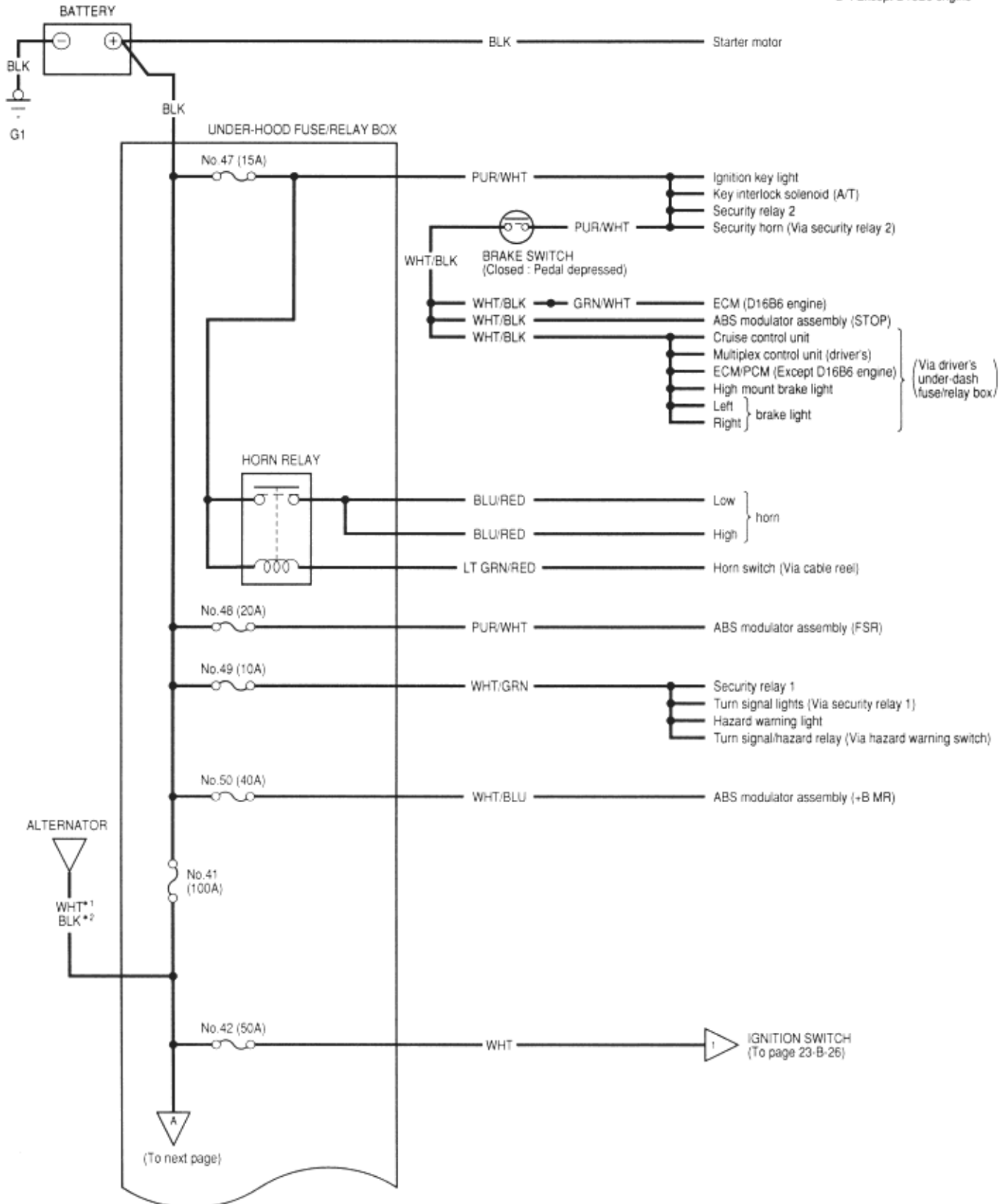
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-B-15\)](#)
[\(See Page 23-B-18\)](#)
[\(See Page 23-B-19\)](#)

- * 1 : With sunroof
- * 2 : Without sunroof
- * 3 : Except D16B6 engine
- * 4 : KG with daytime running lights system
- * 5 : Except KG with daytime running lights system



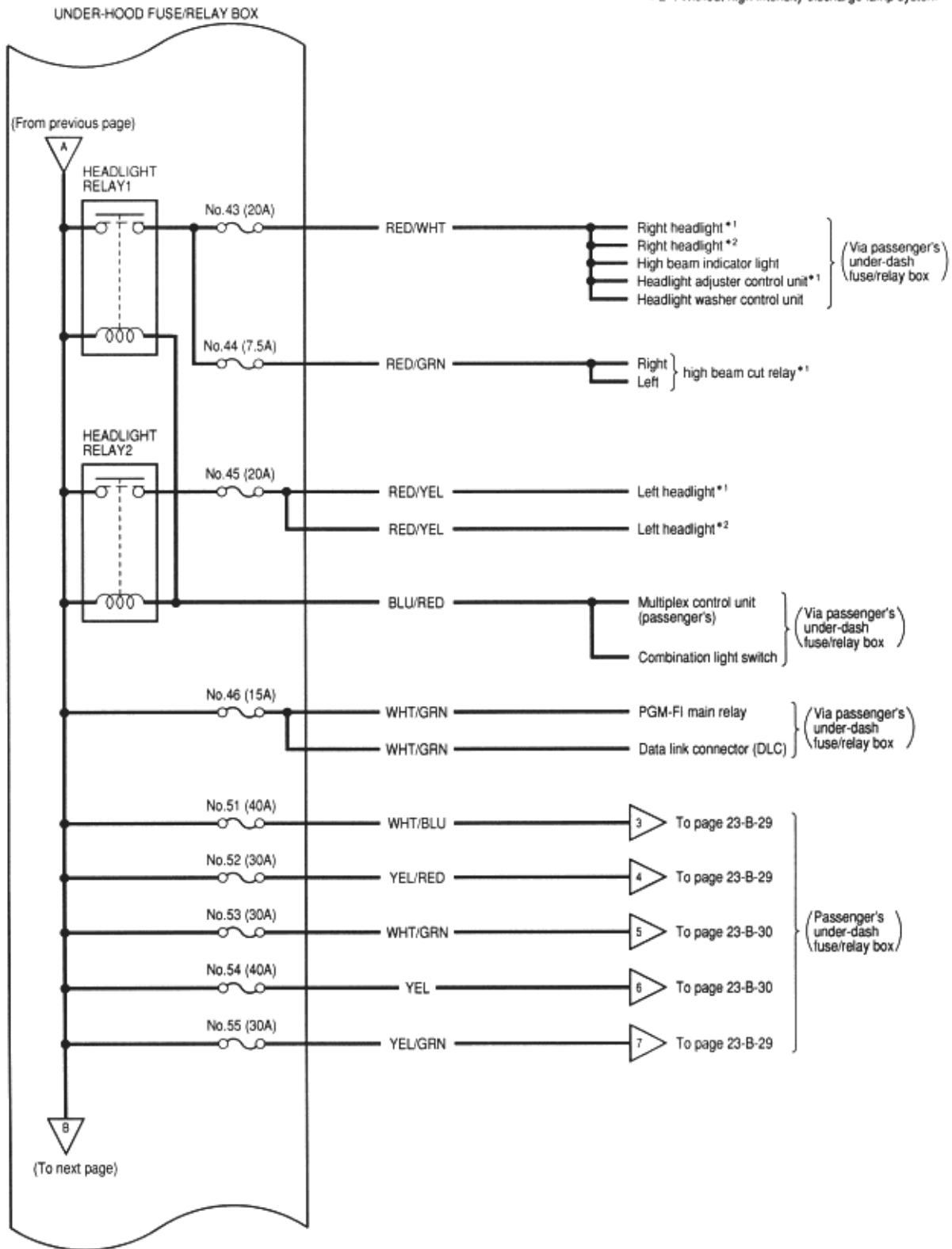
To go to the pages referenced on the diagram above,
 click on the following:
[\(See Page 23-B-16\)](#)
[\(See Page 23-B-18\)](#)
[\(See Page 23-B-19\)](#)

*1 : D16B6 engine
 *2 : Except D16B6 engine



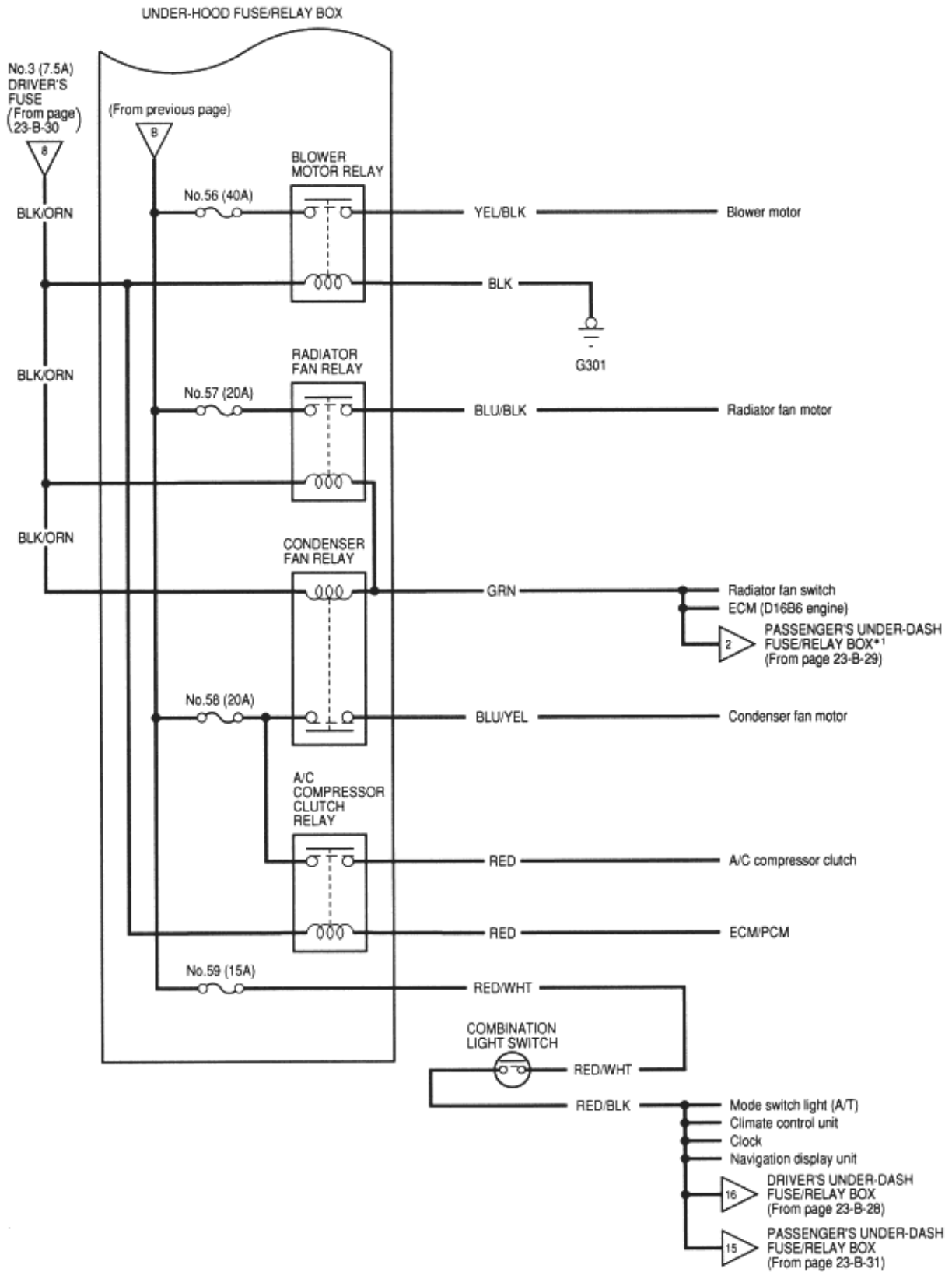
To go to the page referenced on the diagram above, click on the following:
(See Page 23-B-26)

- * 1 : With high intensity discharge lamp system
- * 2 : Without high intensity discharge lamp system



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-B-29\)](#)
[\(See Page 23-B-30\)](#)

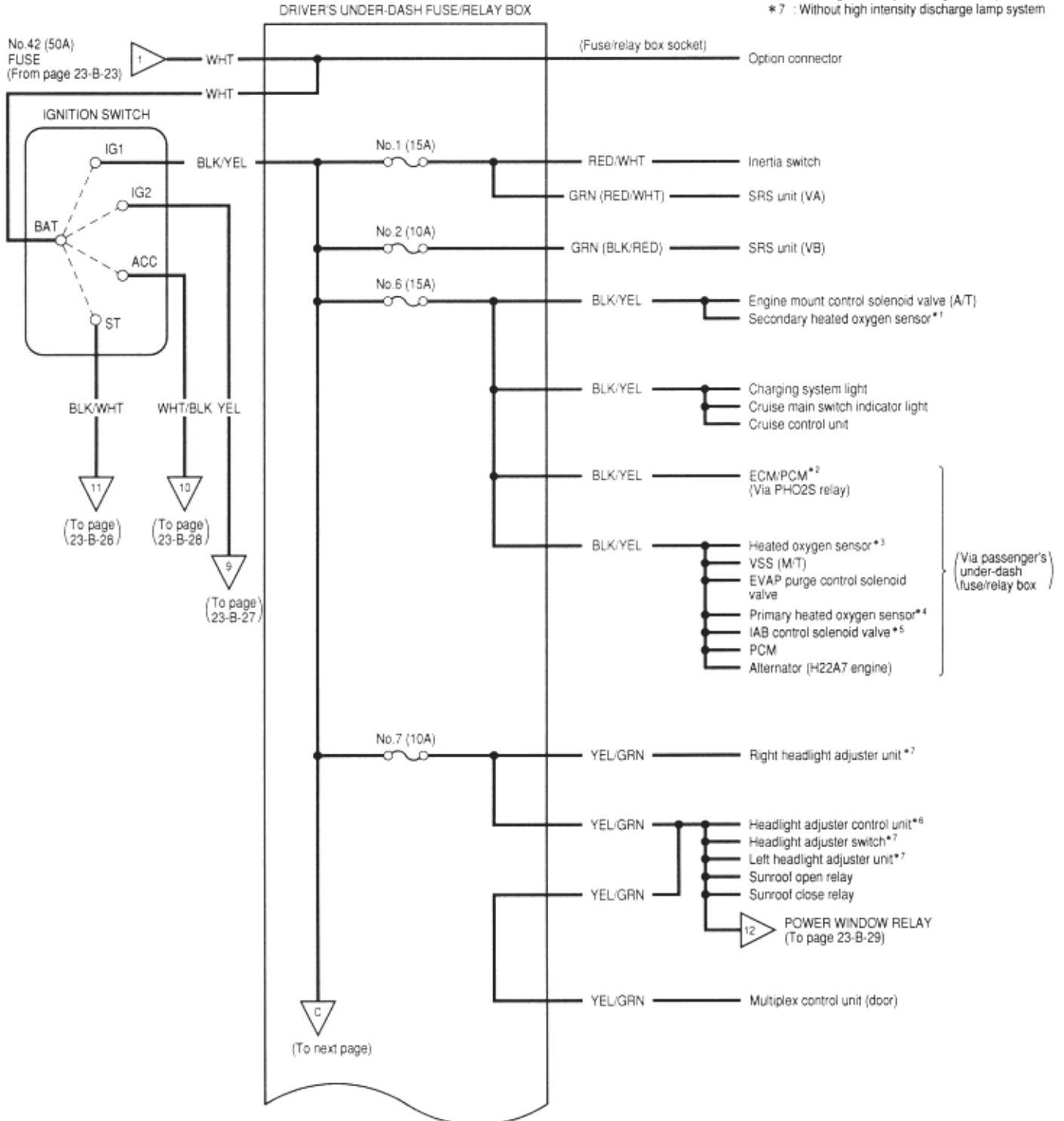
*1 : Except D16B6 engine



To go to the pages referenced on the diagram above, click on the following:

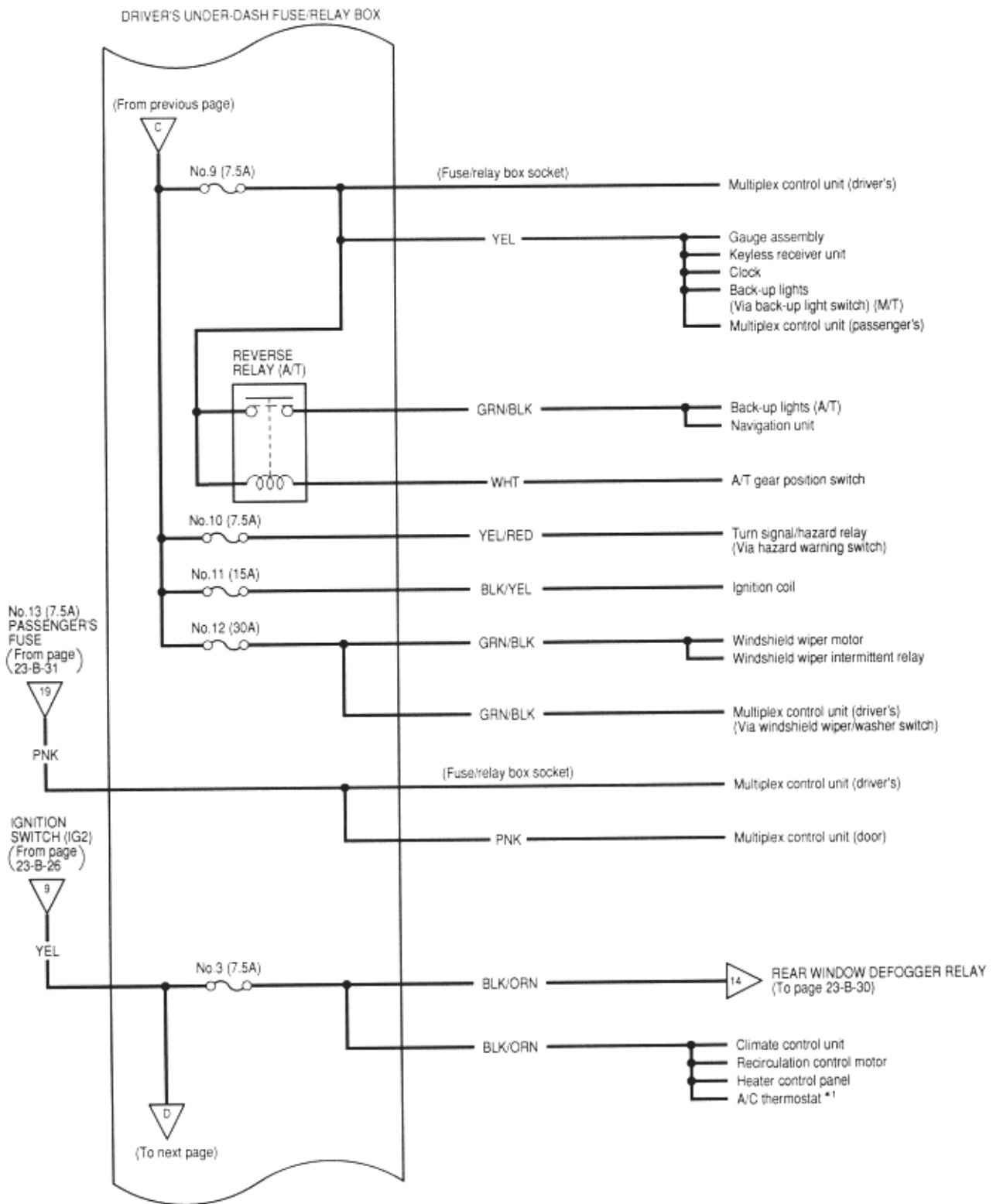
- (See Page 23-B-30)
- (See Page 23-B-29)
- (See Page 23-B-28)
- (See Page 23-B-31)

- *1 : F20B6 engine, H22A7 engine
- *2 : F20B6 engine
- *3 : D16B6 engine
- *4 : F18B2 engine, H22A7 engine
- *5 : Except D16B6 engine
- *6 : With high intensity discharge lamp system
- *7 : Without high intensity discharge lamp system

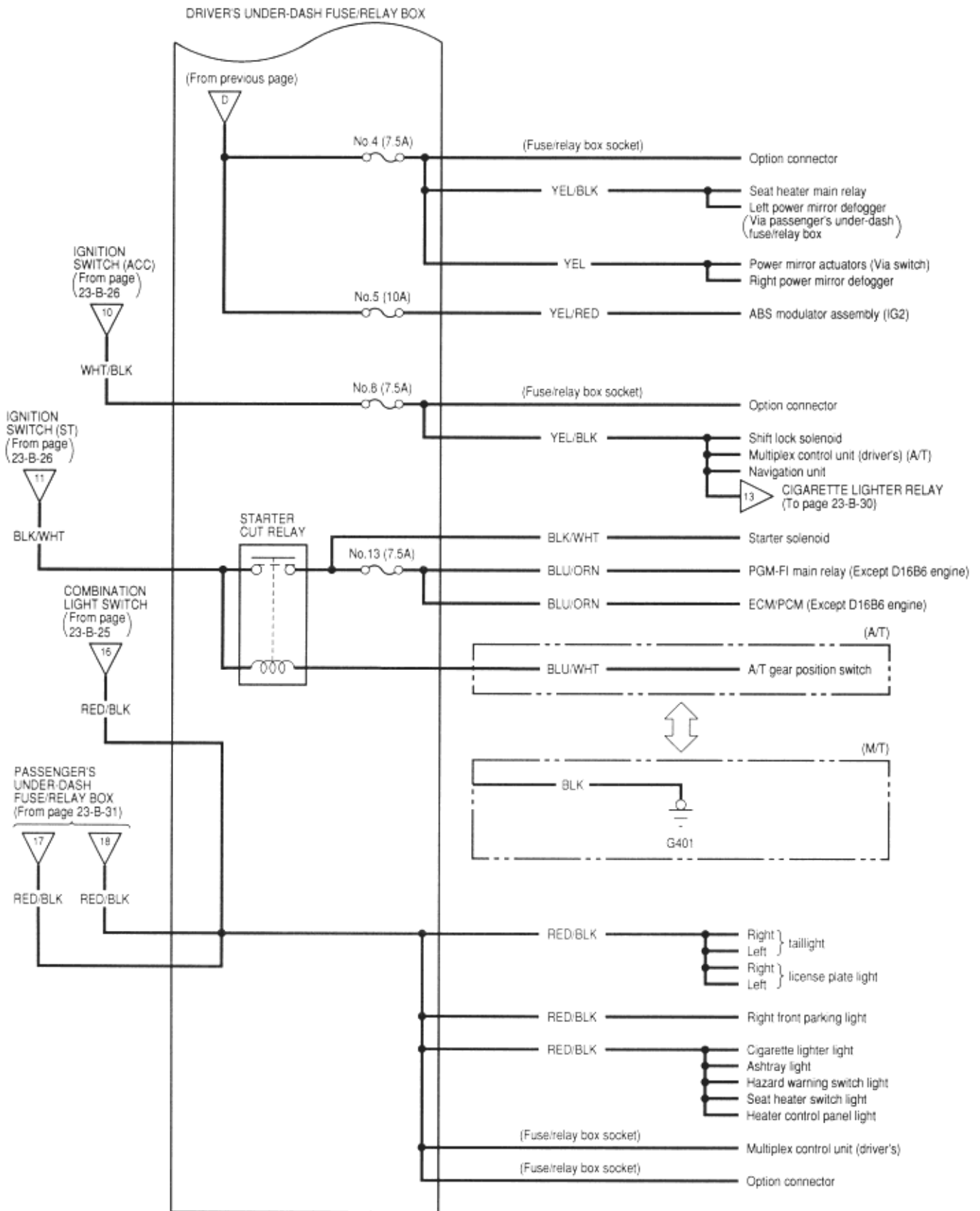


To go to the pages referenced on the diagram above,
 click on the following:
[\(See Page 23-B-23\)](#)
[\(See Page 23-B-28\)](#)
[\(See Page 23-B-27\)](#)
[\(See Page 23-B-29\)](#)

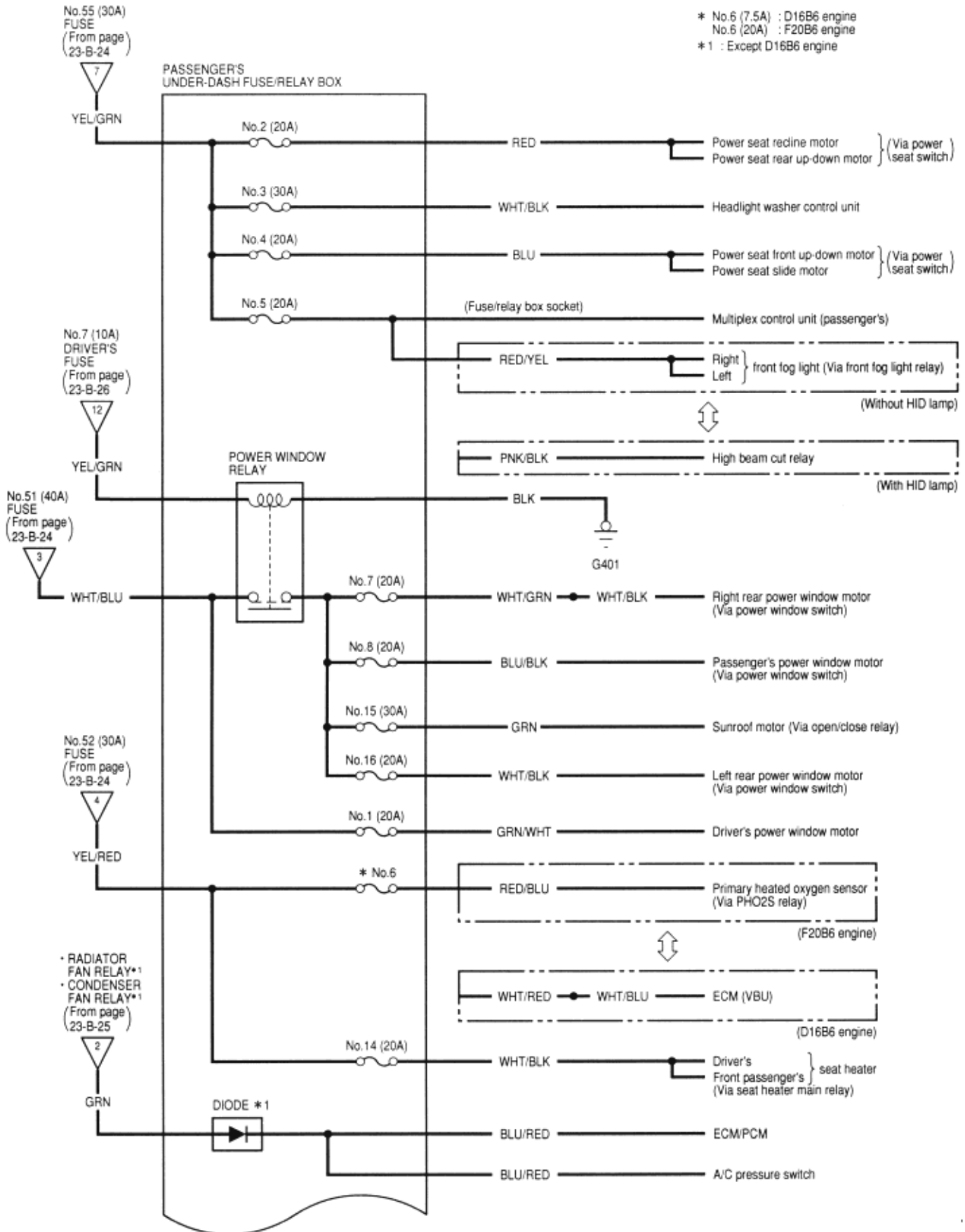
*1 : Without climate control unit



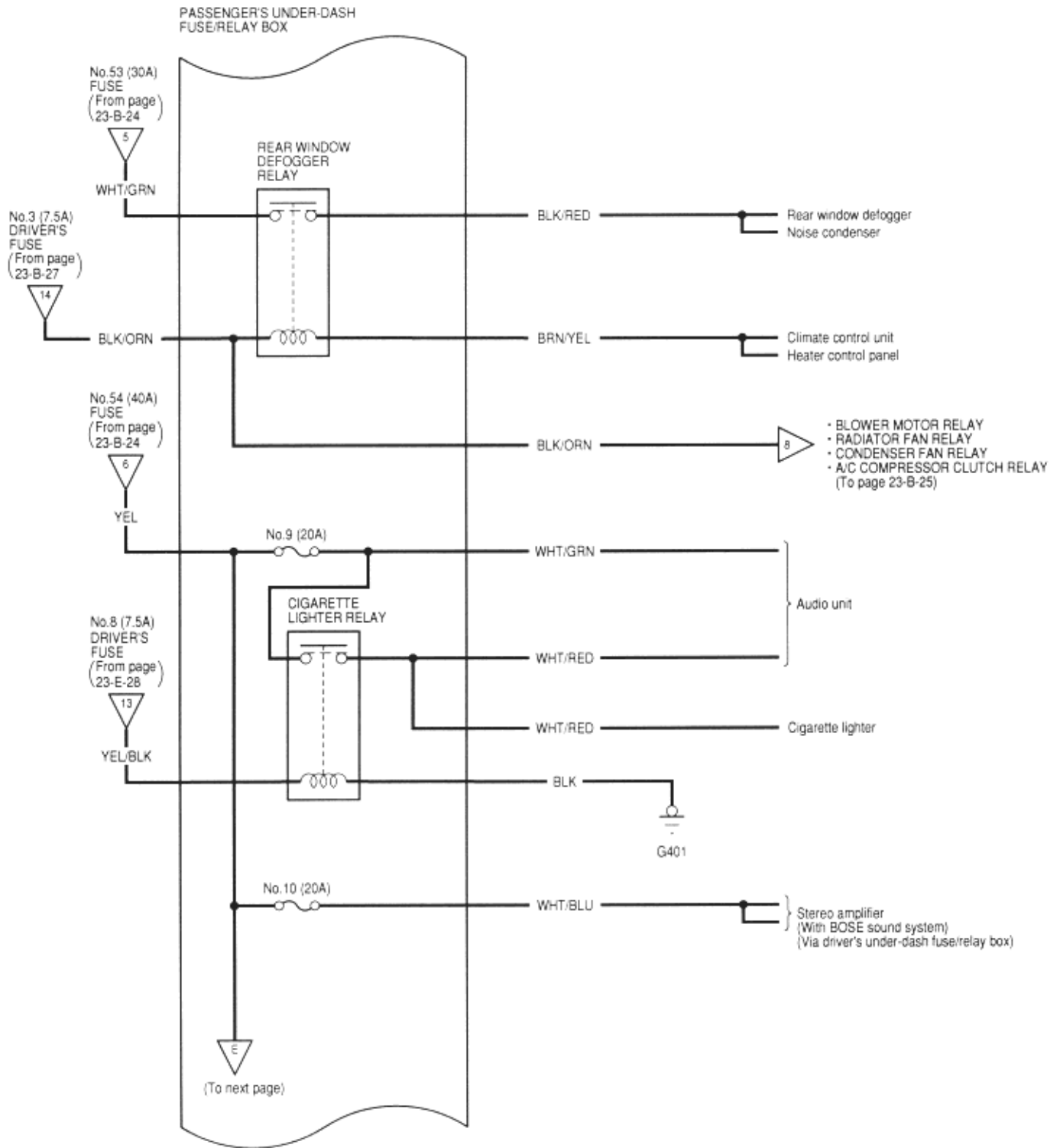
To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-31)
(See Page 23-B-26)
(See Page 23-B-30)



To go to the pages referenced on the diagram above, click on the following:
 (See Page 23-B-26)
 (See Page 23-B-25)
 (See Page 23-B-30)
 (See Page 23-B-31)

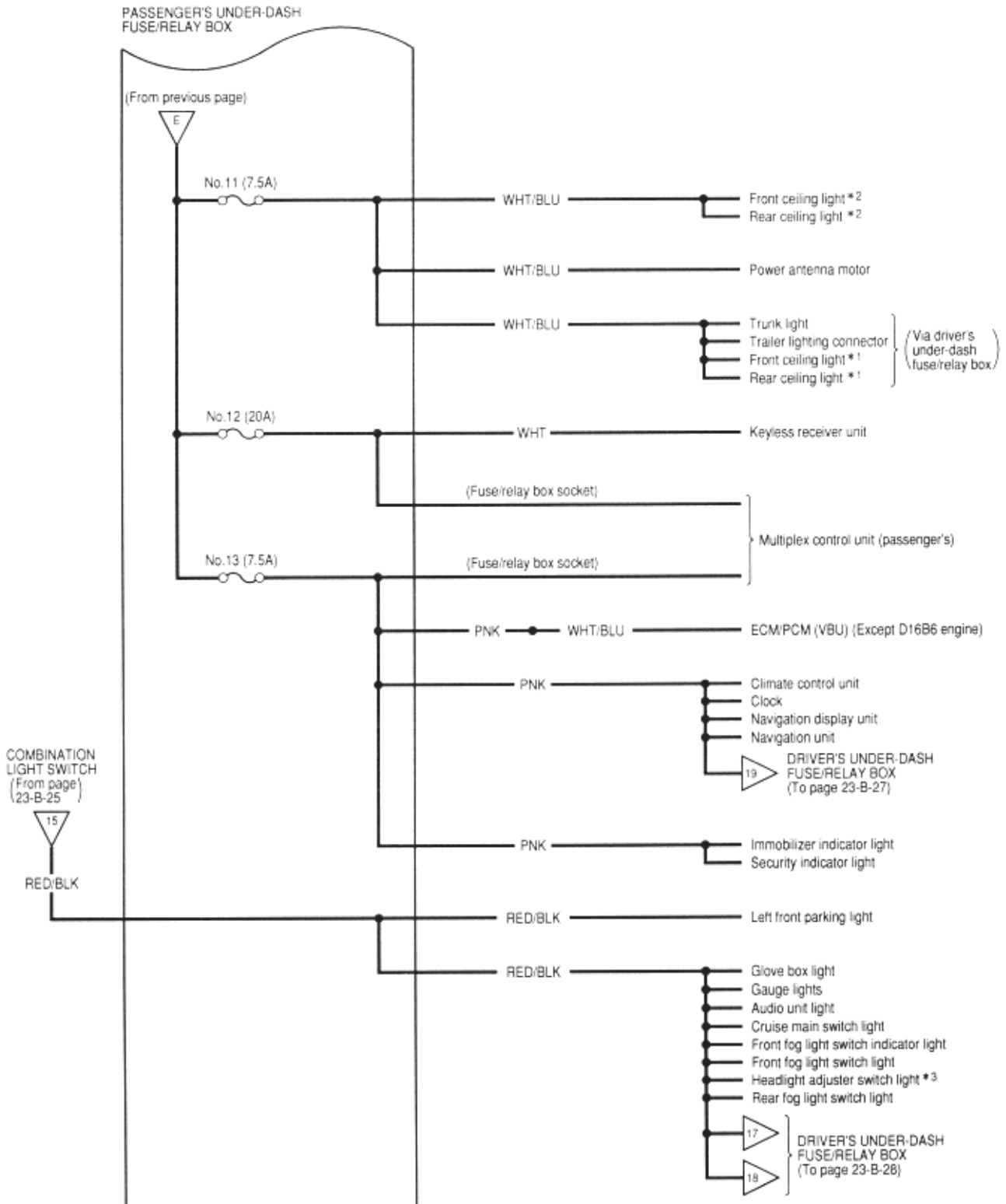


To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-B-24\)](#)
[\(See Page 23-B-26\)](#)
[\(See Page 23-B-25\)](#)

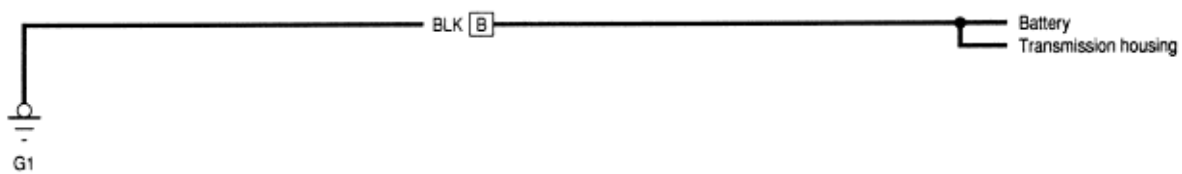


To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-24)
(See Page 23-B-27)
(See Page 23-B-28)
(See Page 23-B-25)

- * 1 : With sunroof
- * 2 : Without sunroof
- * 3 : Without high intensity discharge lamp system

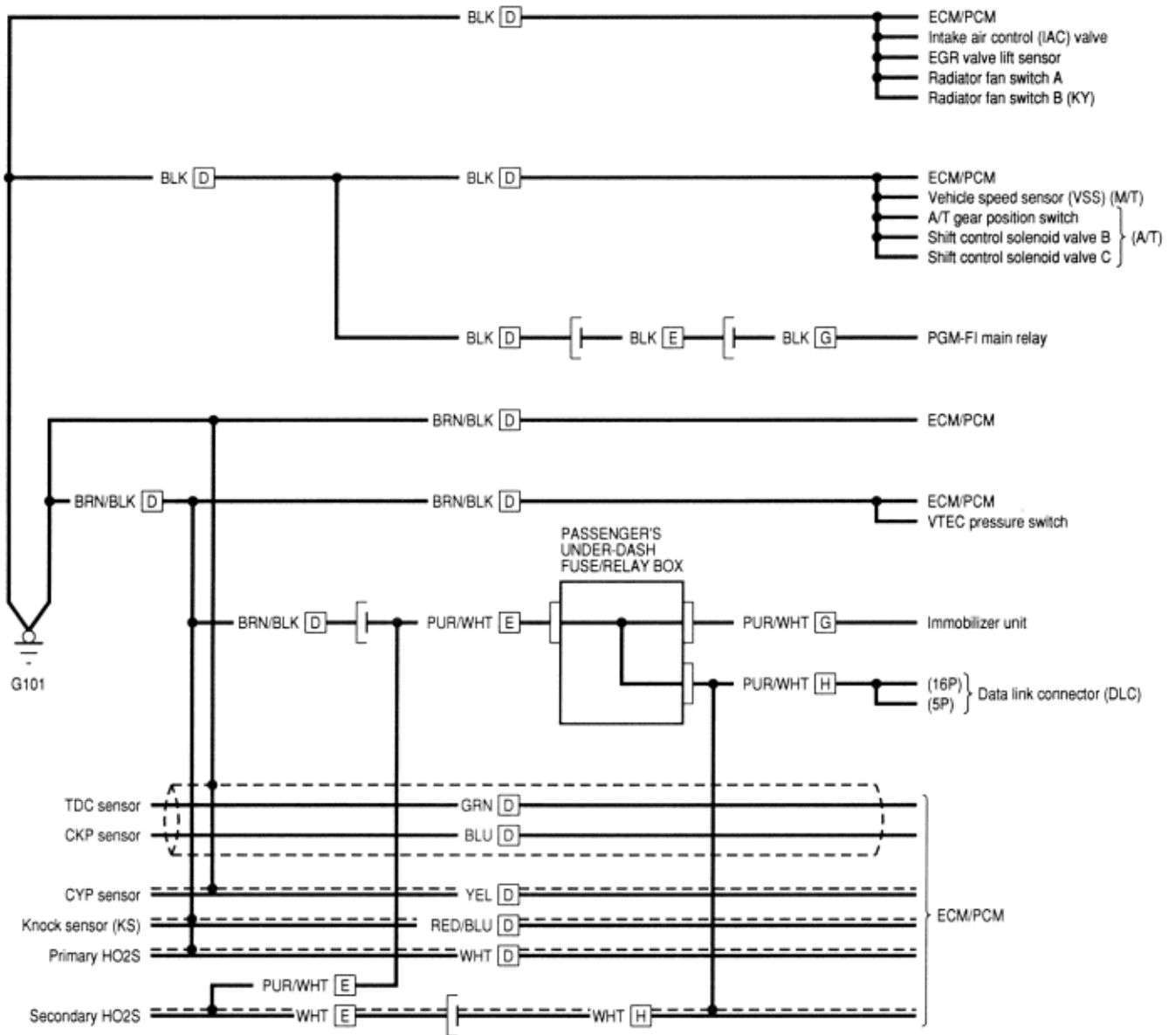


To go to the pages referenced on the diagram above, click on the following:
 (See Page 23-B-25)
 (See Page 23-B-27)
 (See Page 23-B-28)

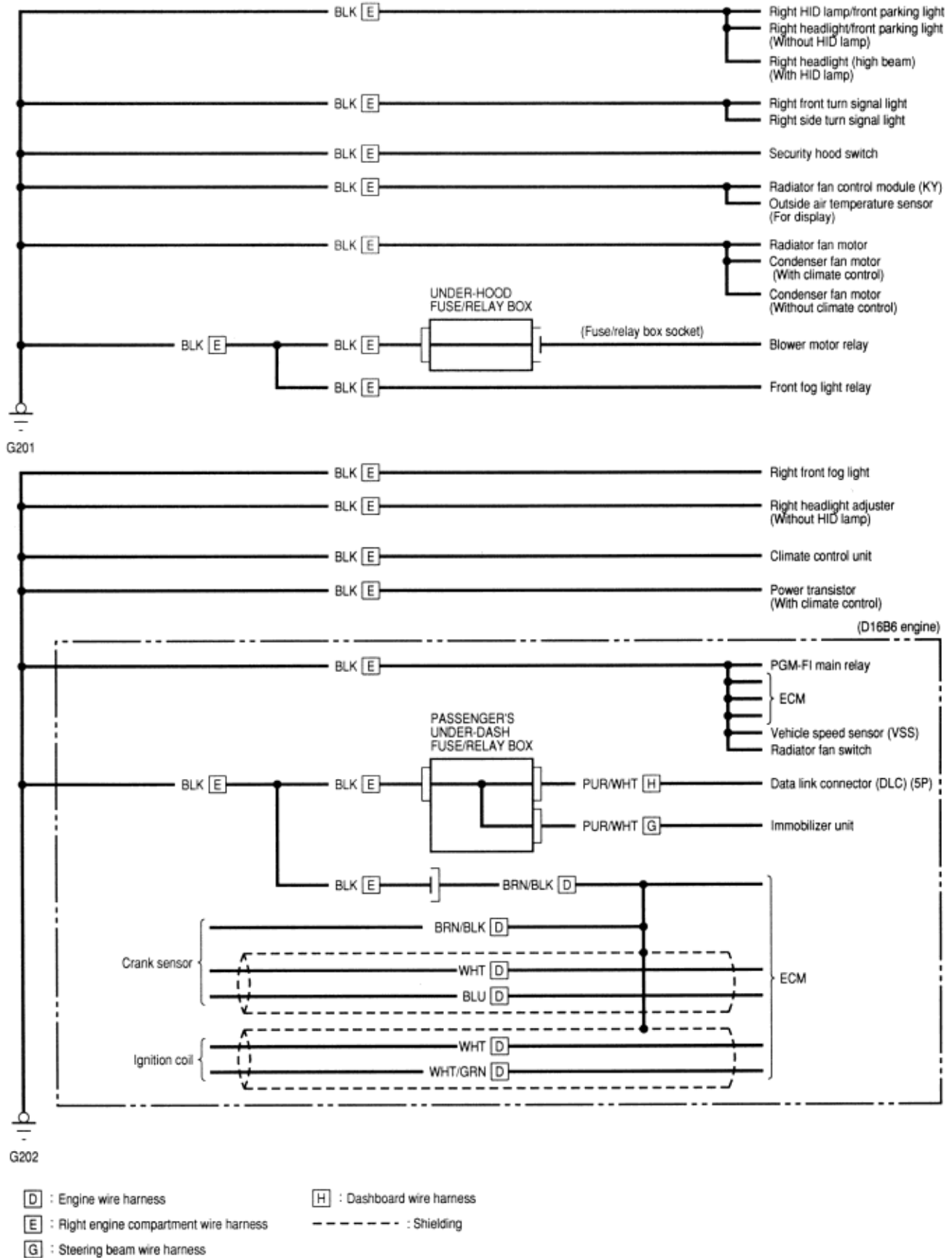


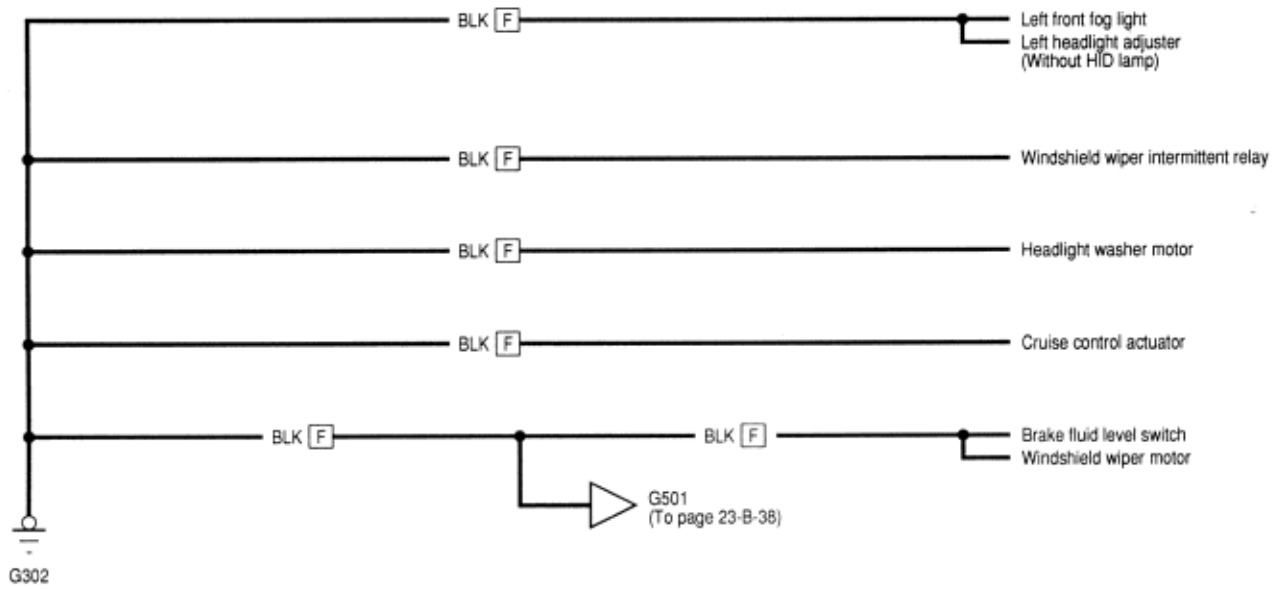
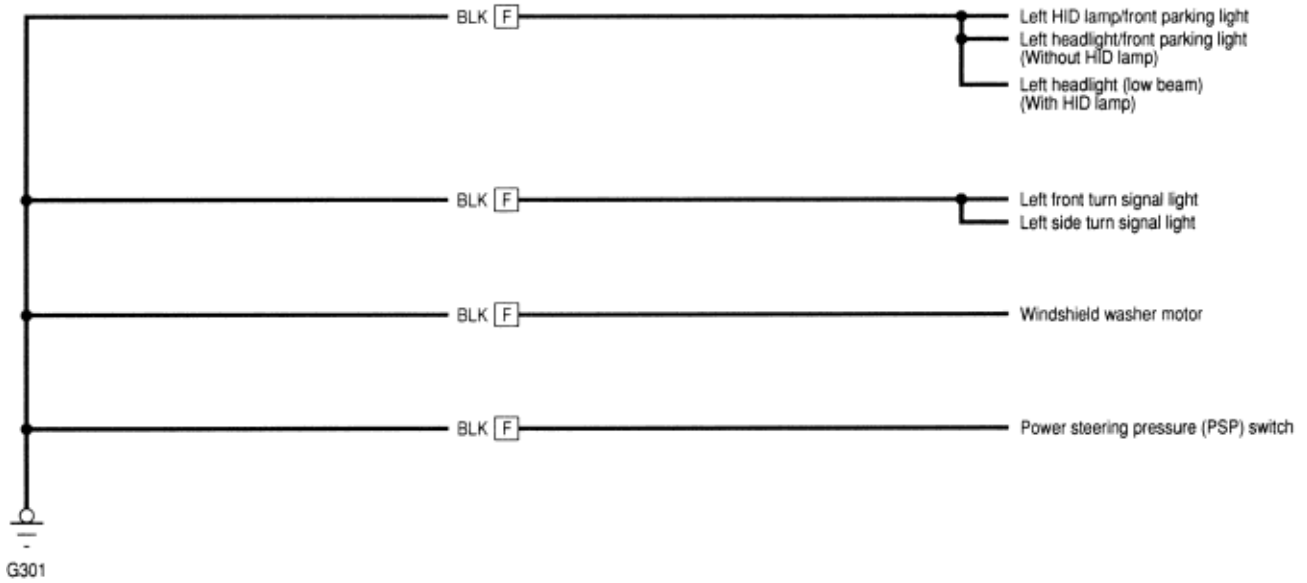
- B : Battery ground cables
- C : Engine ground cable

F18B2, F18B3, F20B6, H22A7 engines:

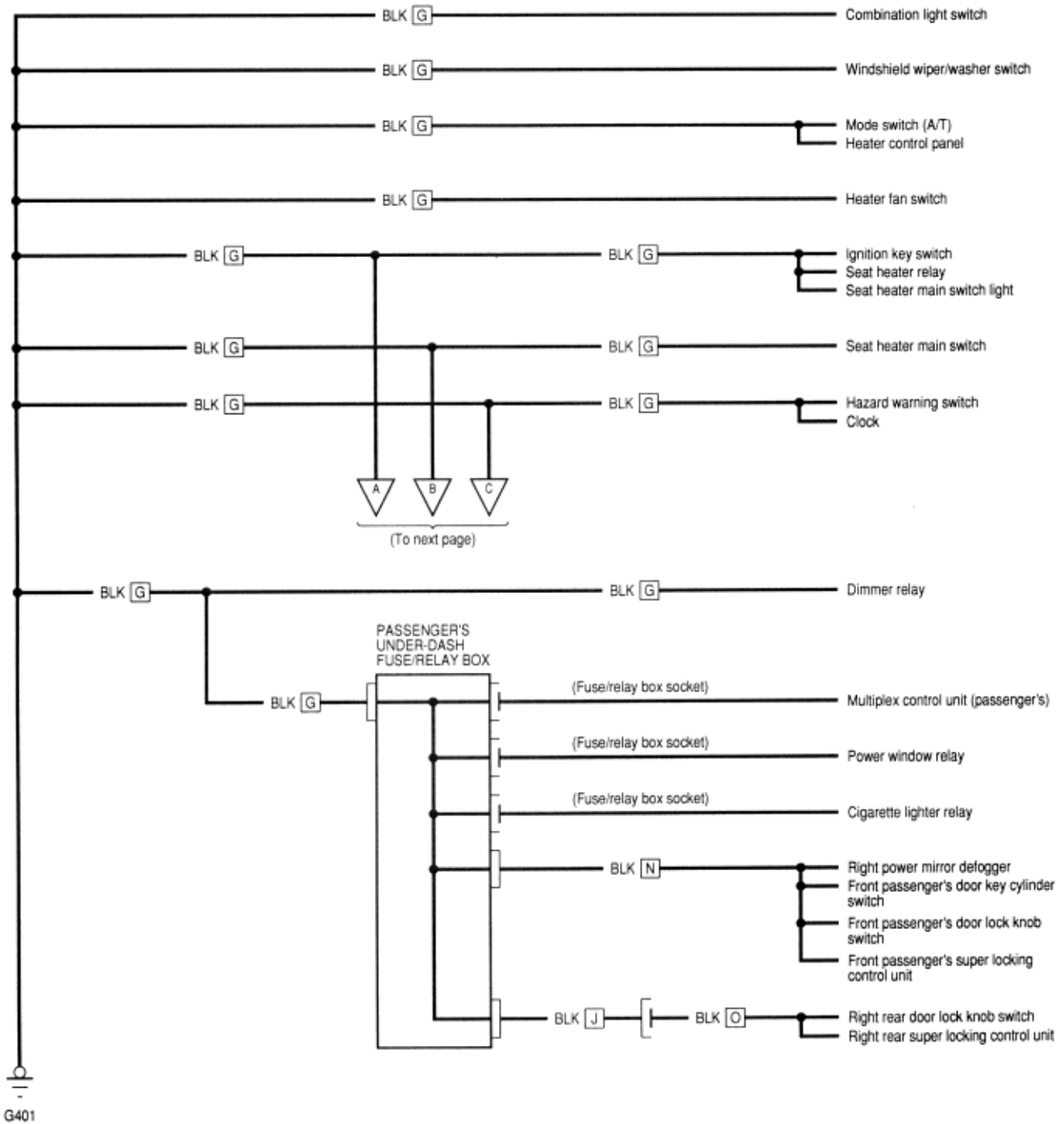


- D : Engine wire harness
- E : Right engine compartment wire harness
- G : Steering beam wire harness
- H : Dashboard wire harness
- - - - - : Shielding



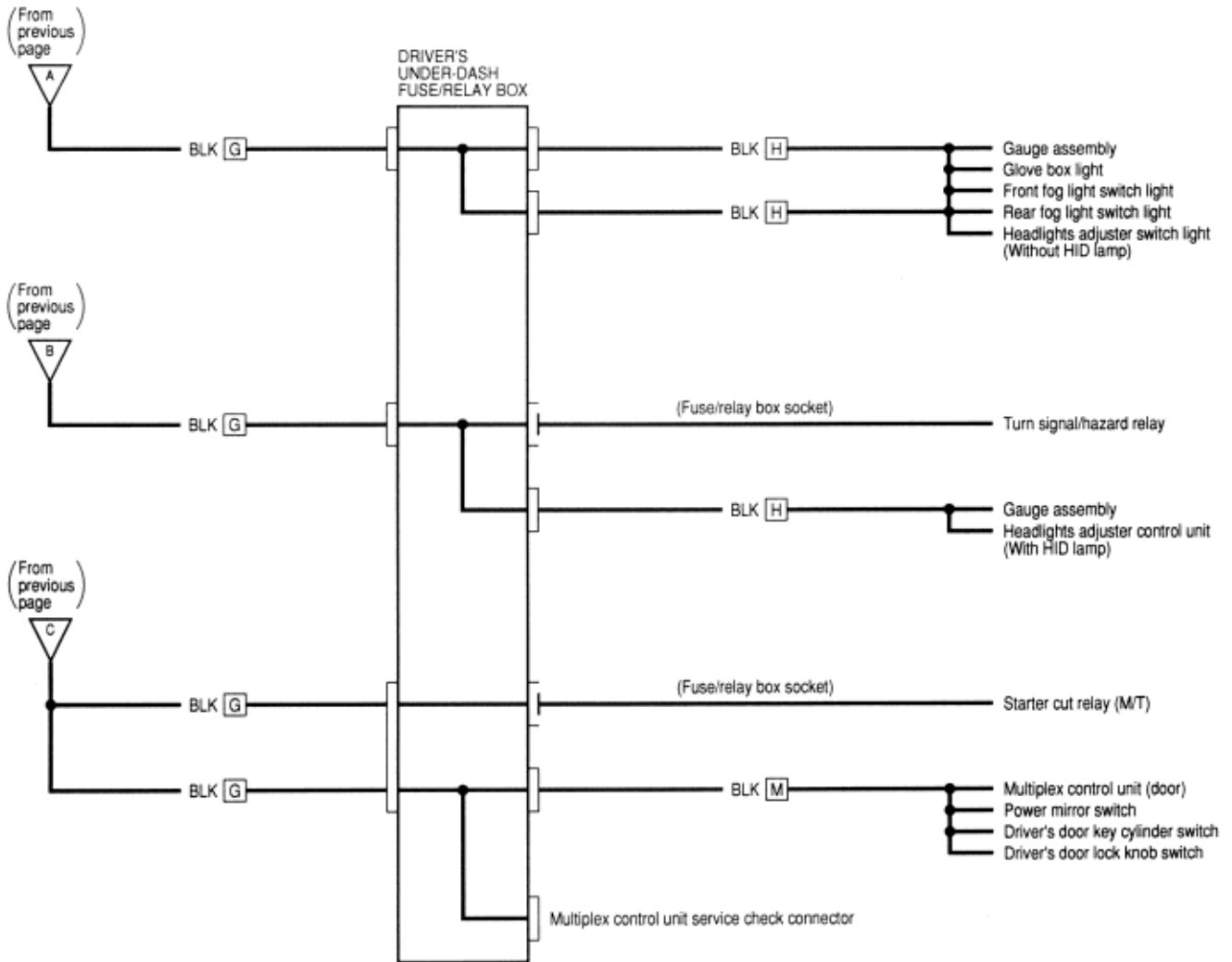


[F] : Left engine compartment wire harness

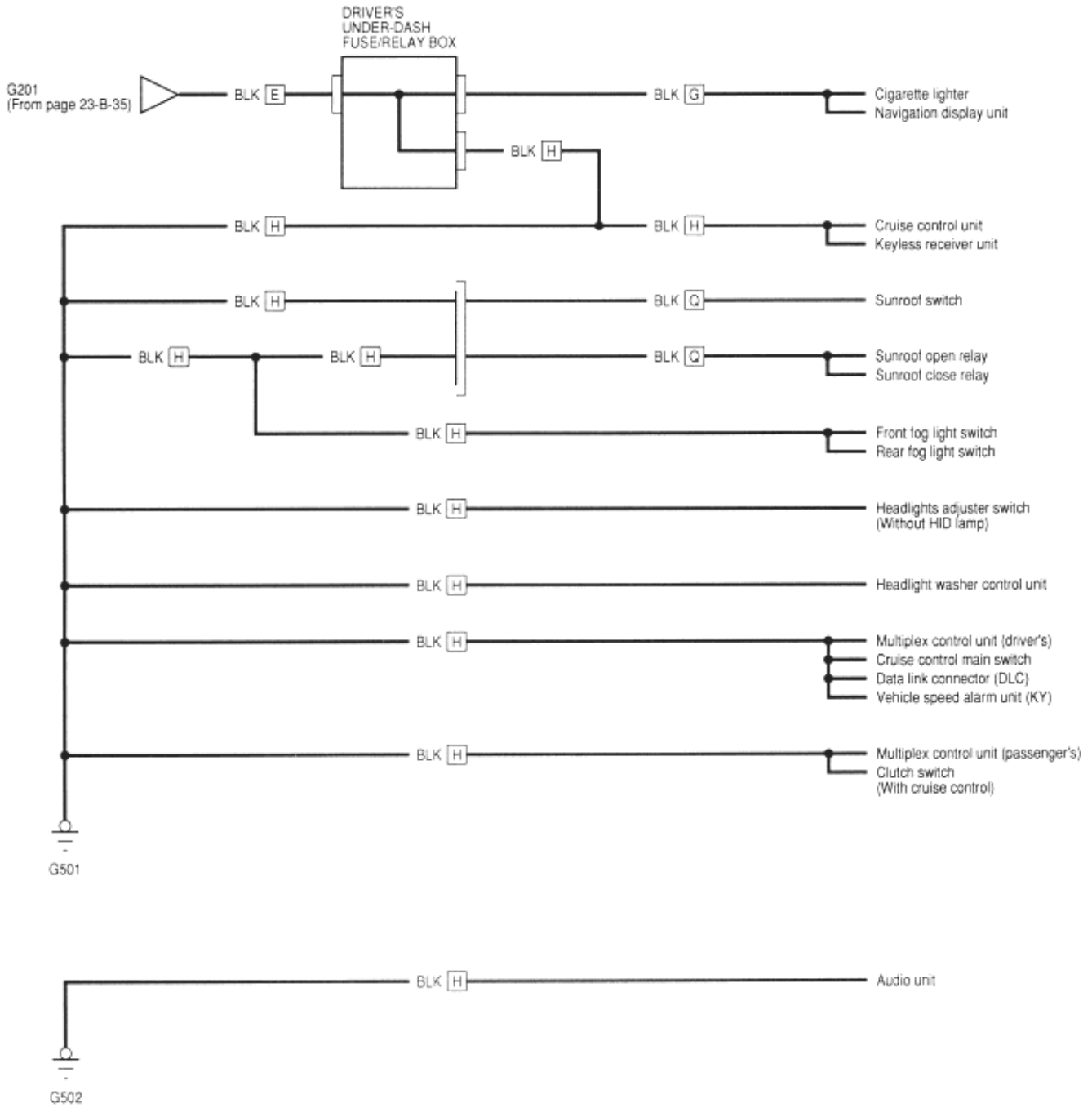


- G** : Steering beam wire harness
- J** : Front passenger's side wire harness
- N** : Front passenger's door wire harness

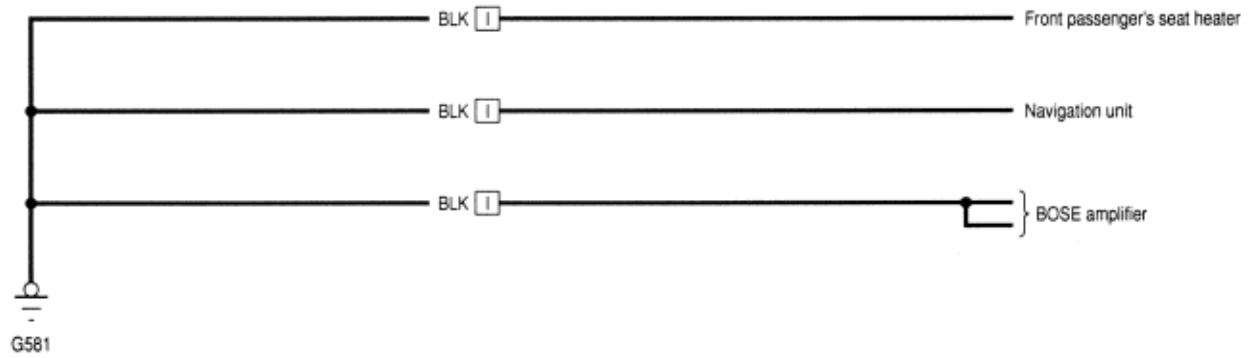
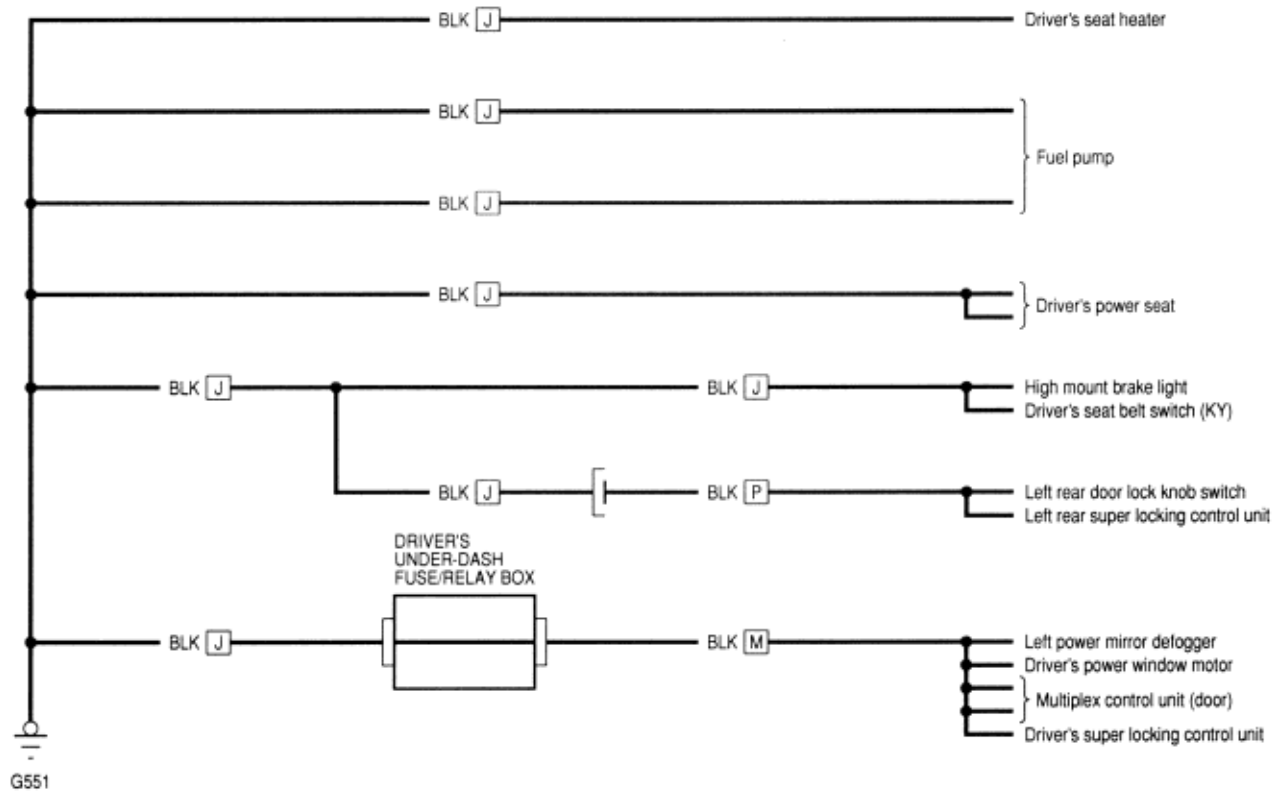
- O** : Right rear door wire harness



- G** : Steering beam wire harness
- H** : Dashboard wire harness
- M** : Driver's door wire harness

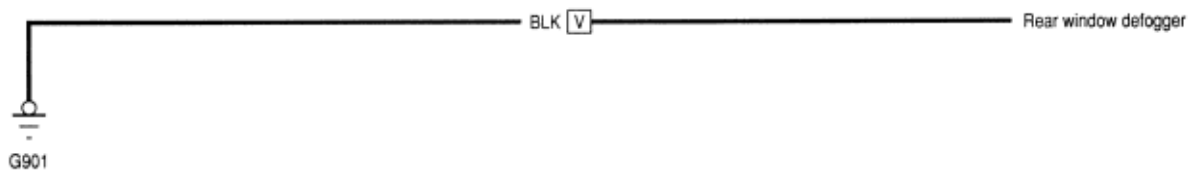
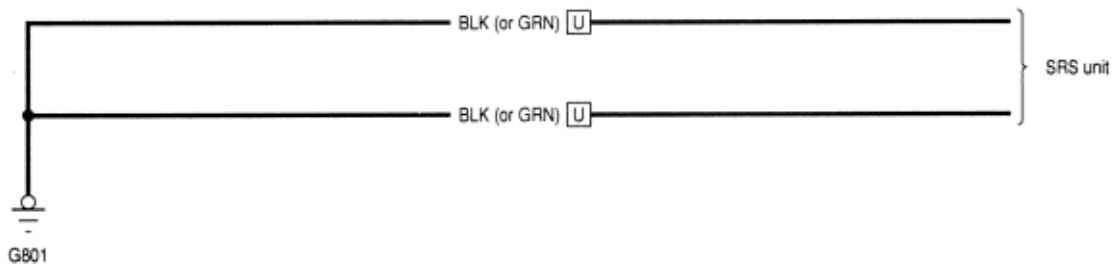
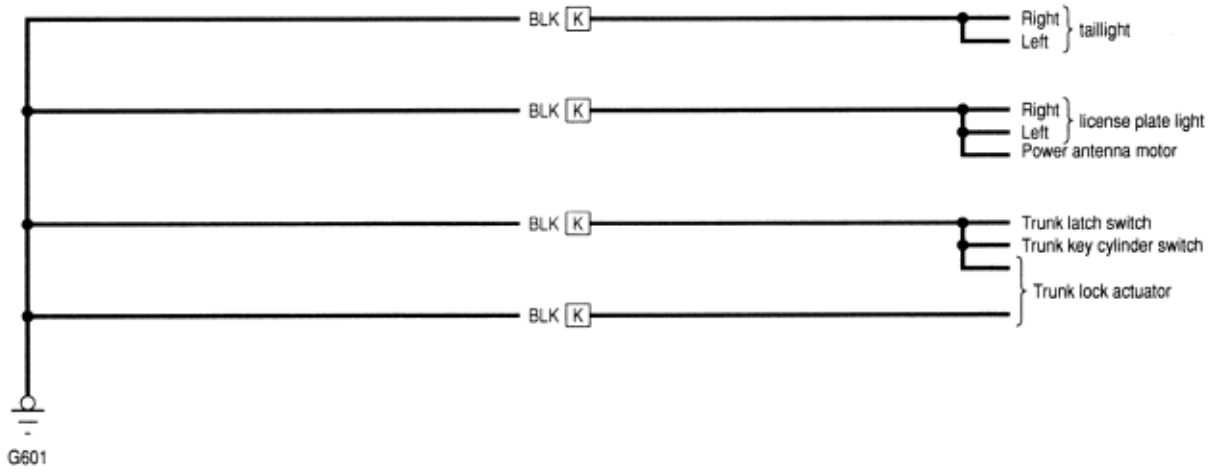


- [E] : Right engine compartment wire harness
- [G] : Steering beam wire harness
- [H] : Dashboard wire harness
- [Q] : Sunroof wire harness



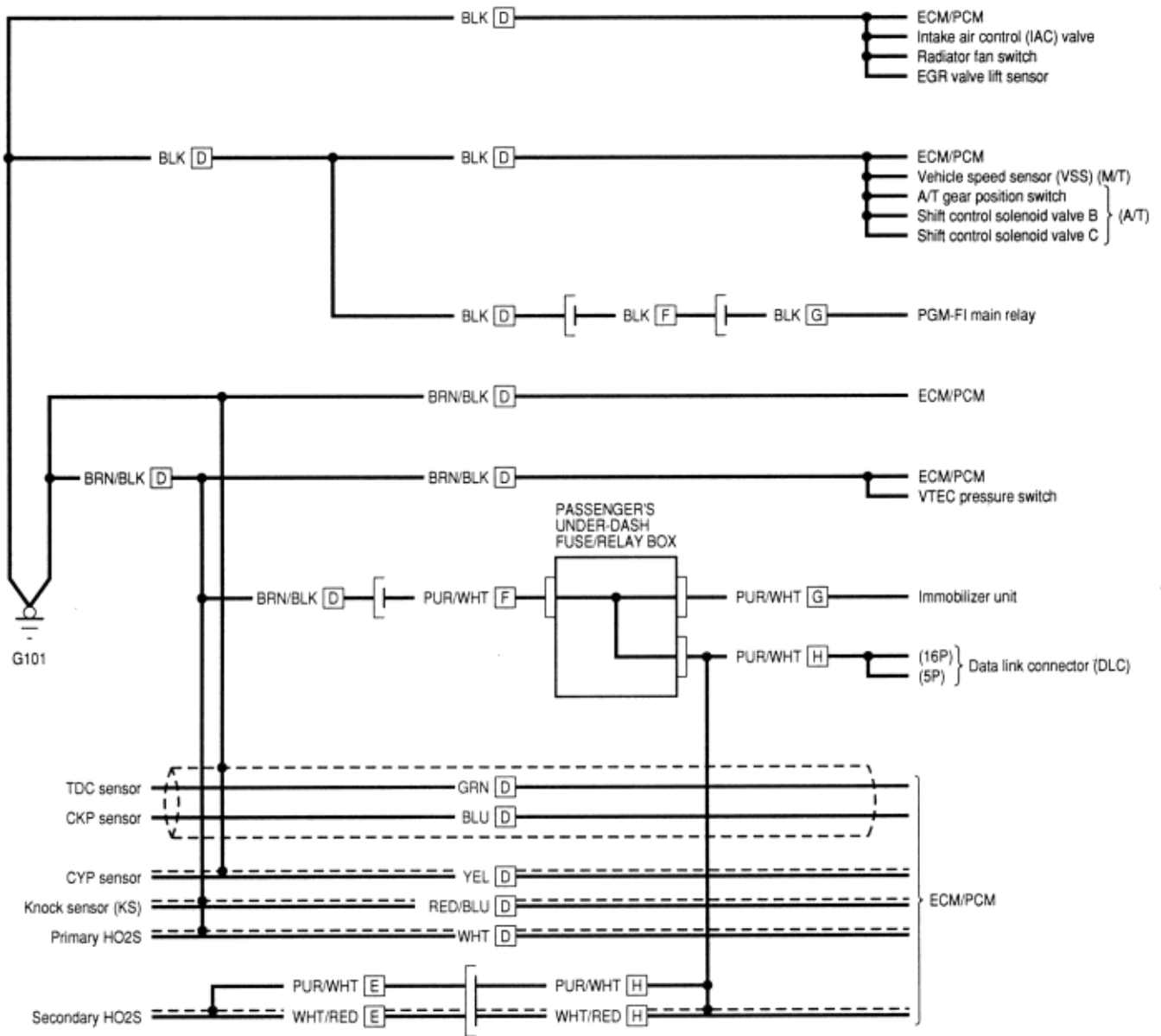
- I : Right side wire harness
- J : Left side wire harness
- M : Driver's door wire harness

- P : Left rear door wire harness

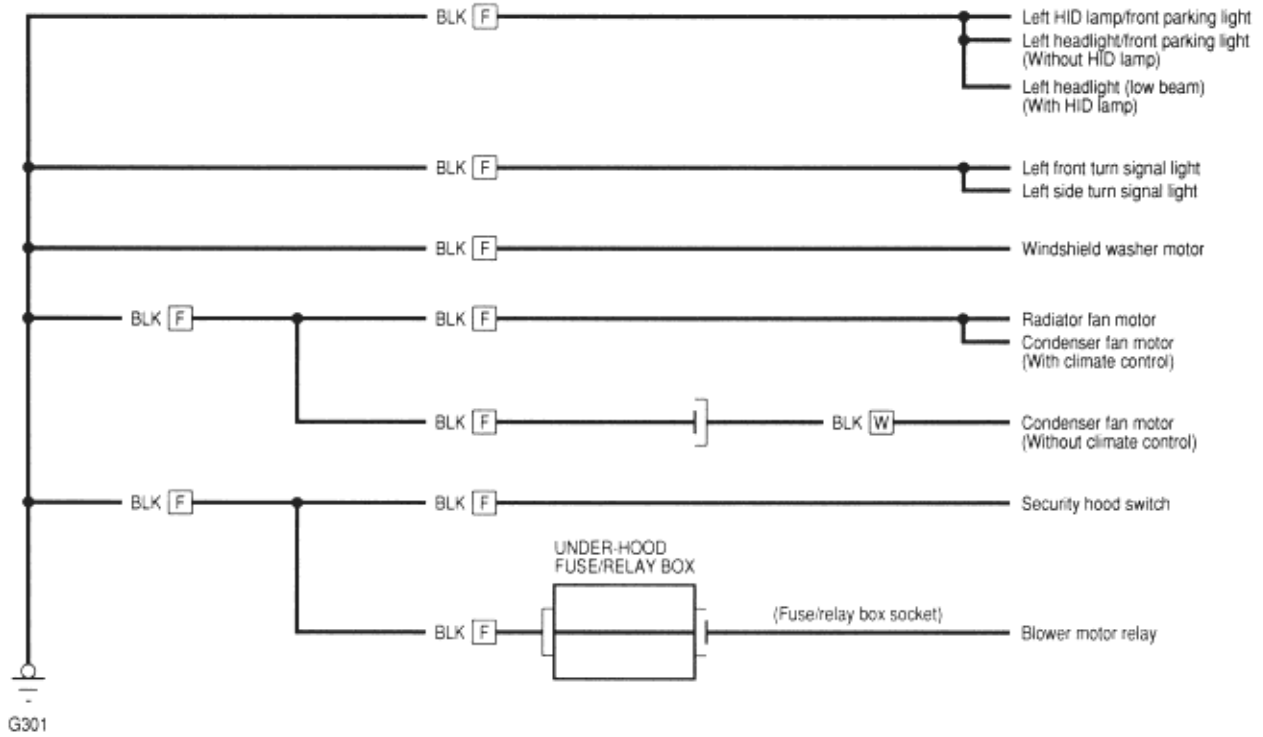
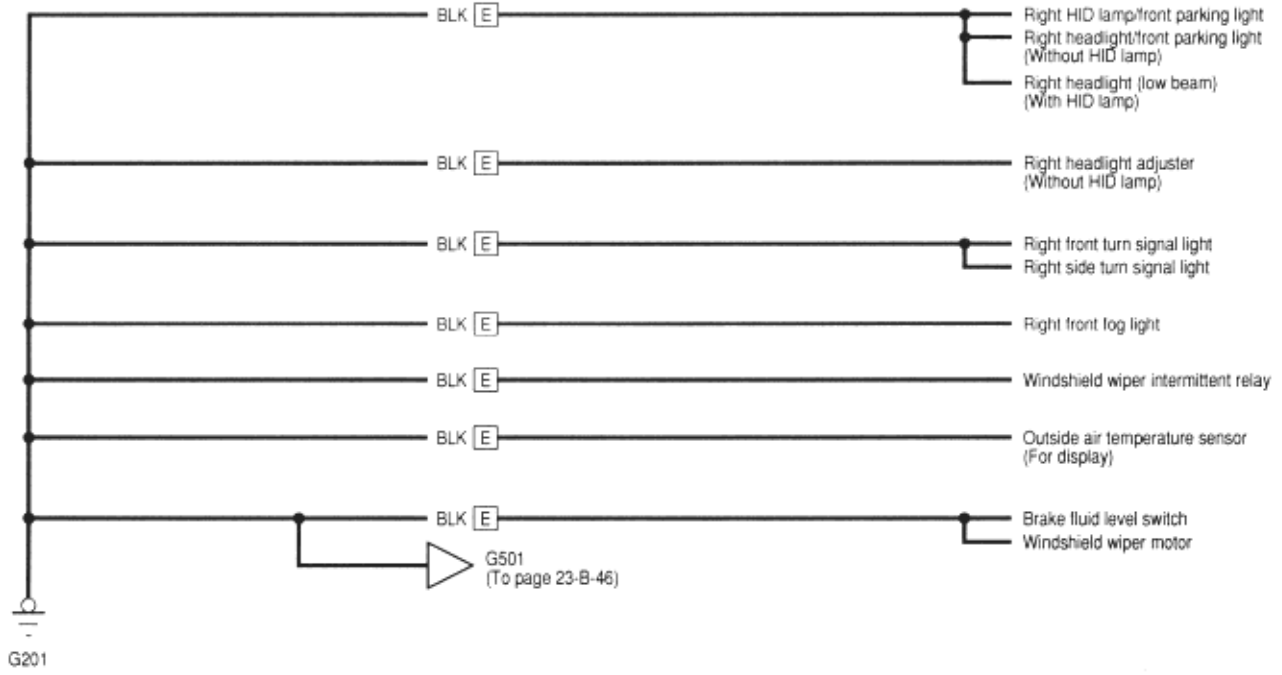


- [K] : Rear wire harness
- [U] : SRS main harness
- [V] : Rear window defogger ground wire

F18B2, F20B6, H22A7 engines:

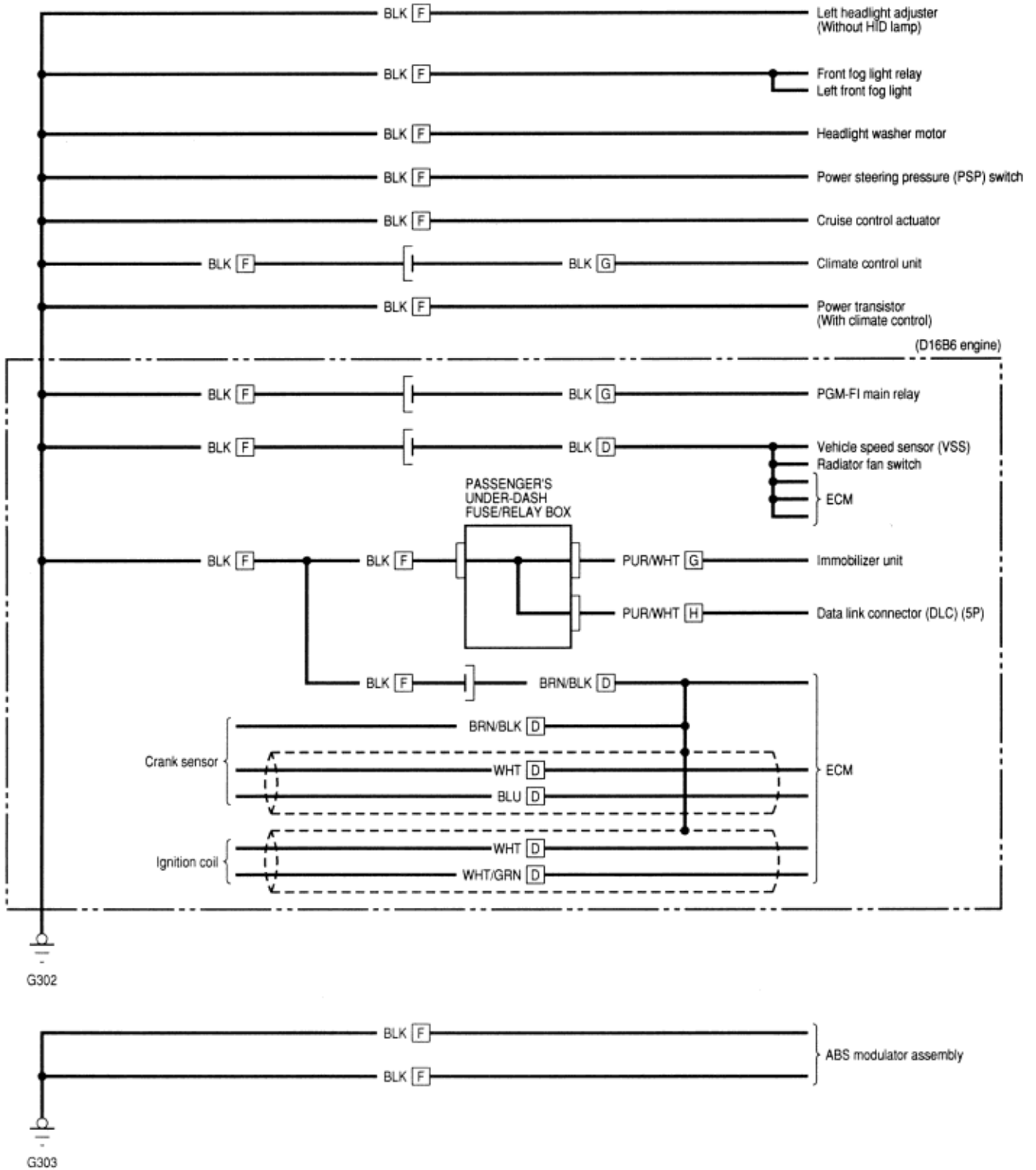


- | | |
|--|---------------------------------------|
| D : Engine wire harness | G : Steering beam wire harness |
| E : Right engine compartment wire harness | H : Dashboard wire harness |
| F : Left engine compartment wire harness | - - - - - : Shielding |

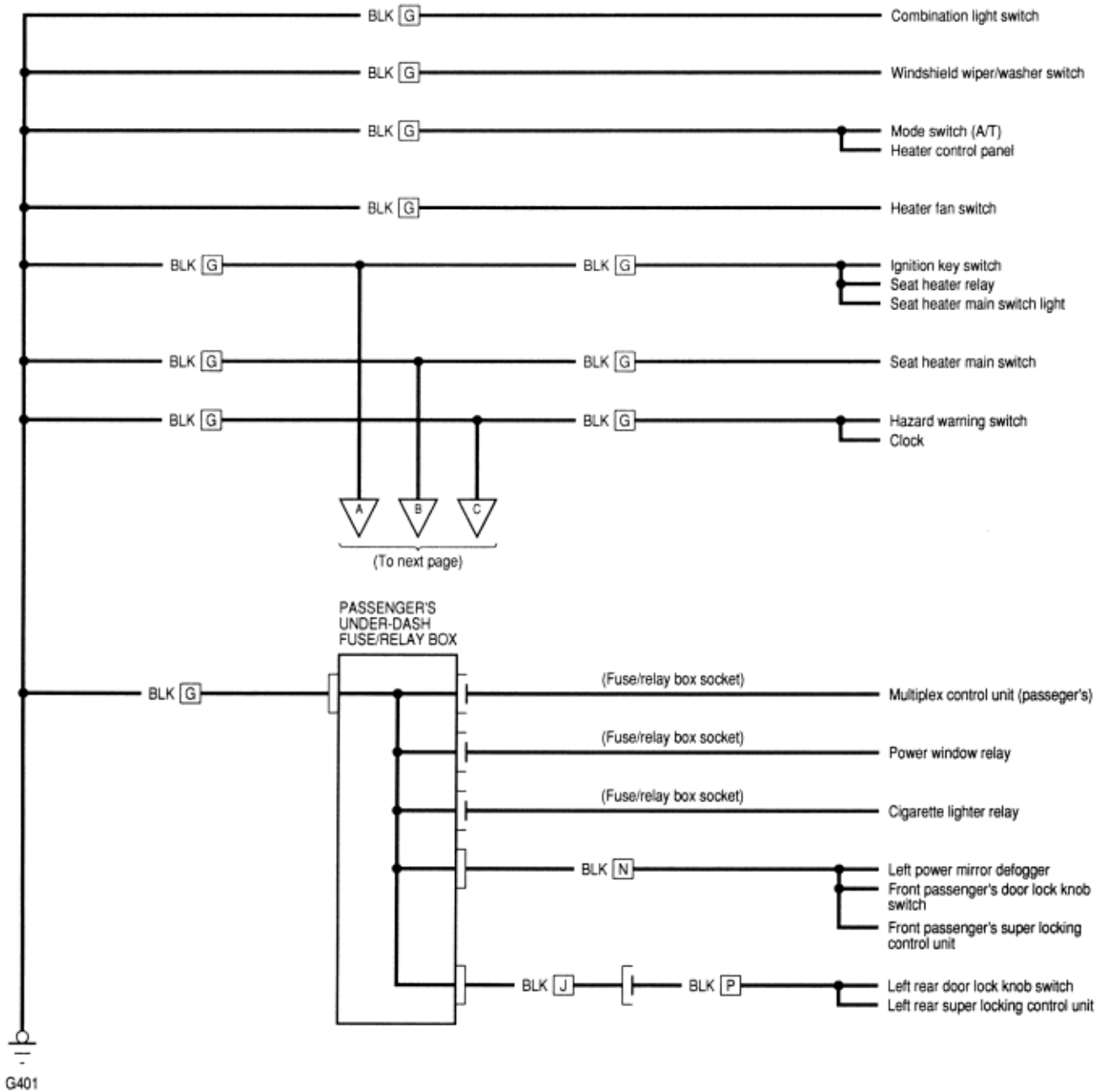


- E : Right engine compartment wire harness
- F : Left engine compartment wire harness
- W : A/C sub-harness

To go to the pages referenced on the diagram above,
 click on the following:
(See Page 23-B-46)

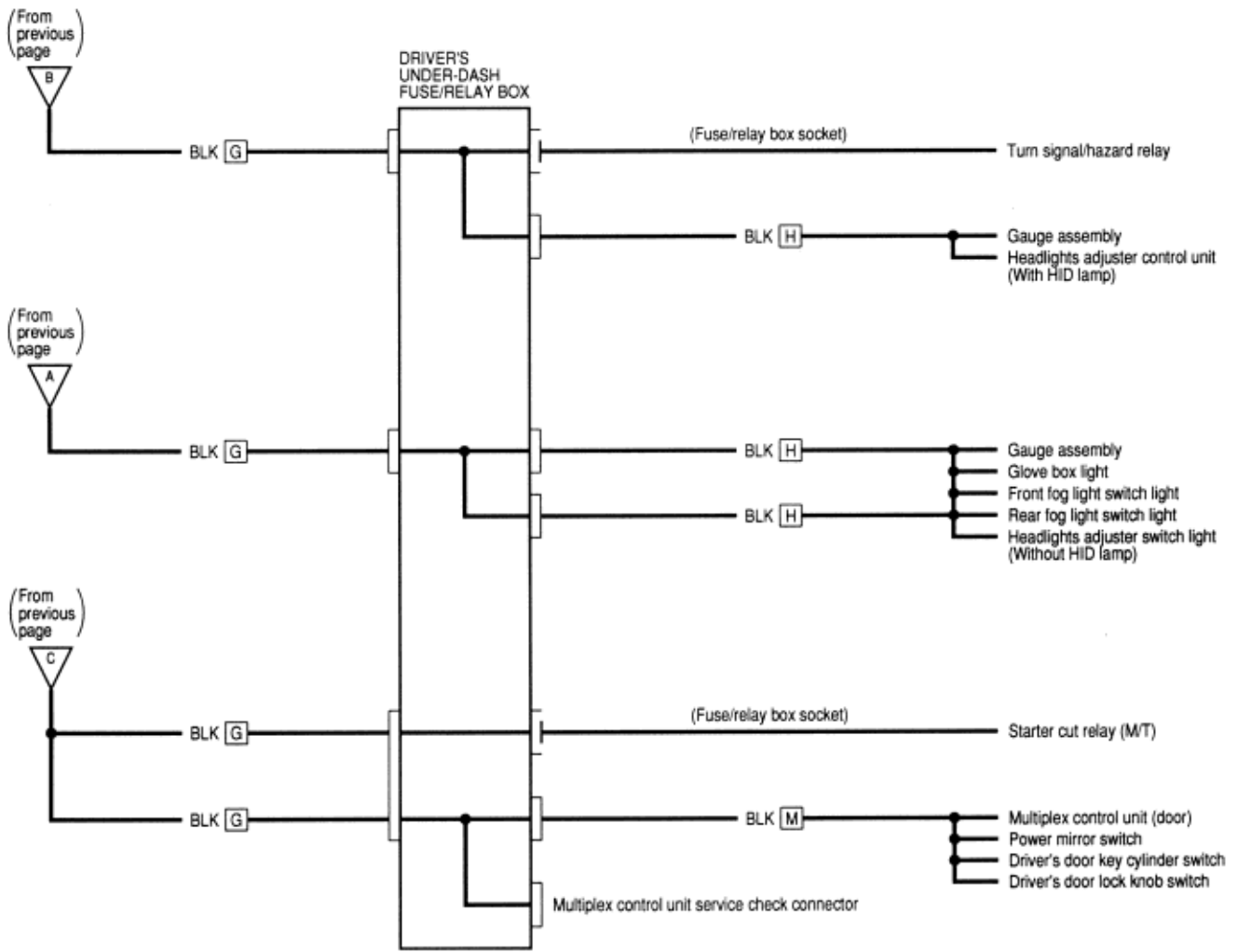


- [D] : Engine wire harness
- [F] : Left engine compartment wire harness
- [G] : Steering beam wire harness
- [H] : Dashboard wire harness
- : Shielding

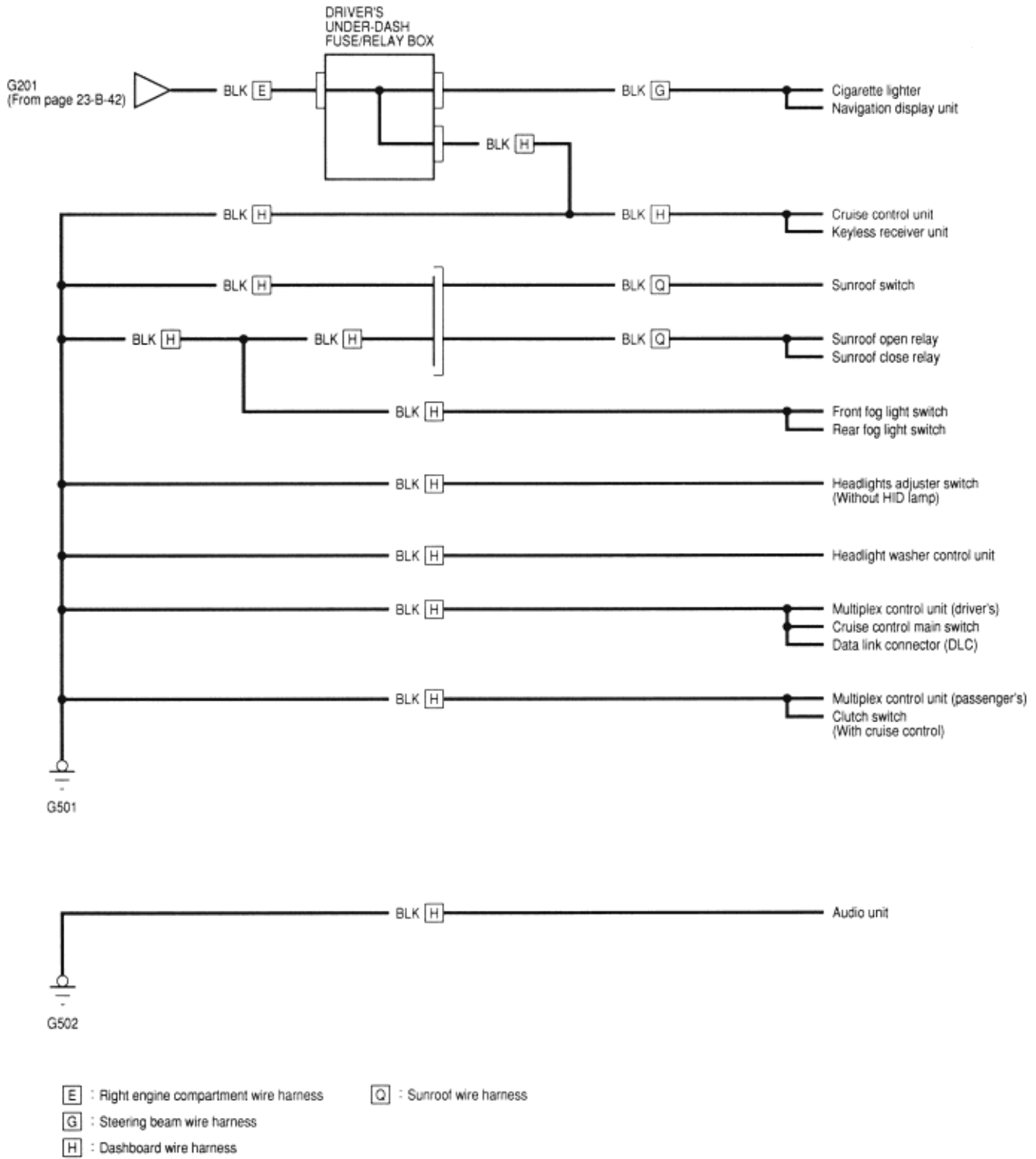


- G** : Steering beam wire harness
- J** : Front passenger's side wire harness
- N** : Front passenger's door wire harness

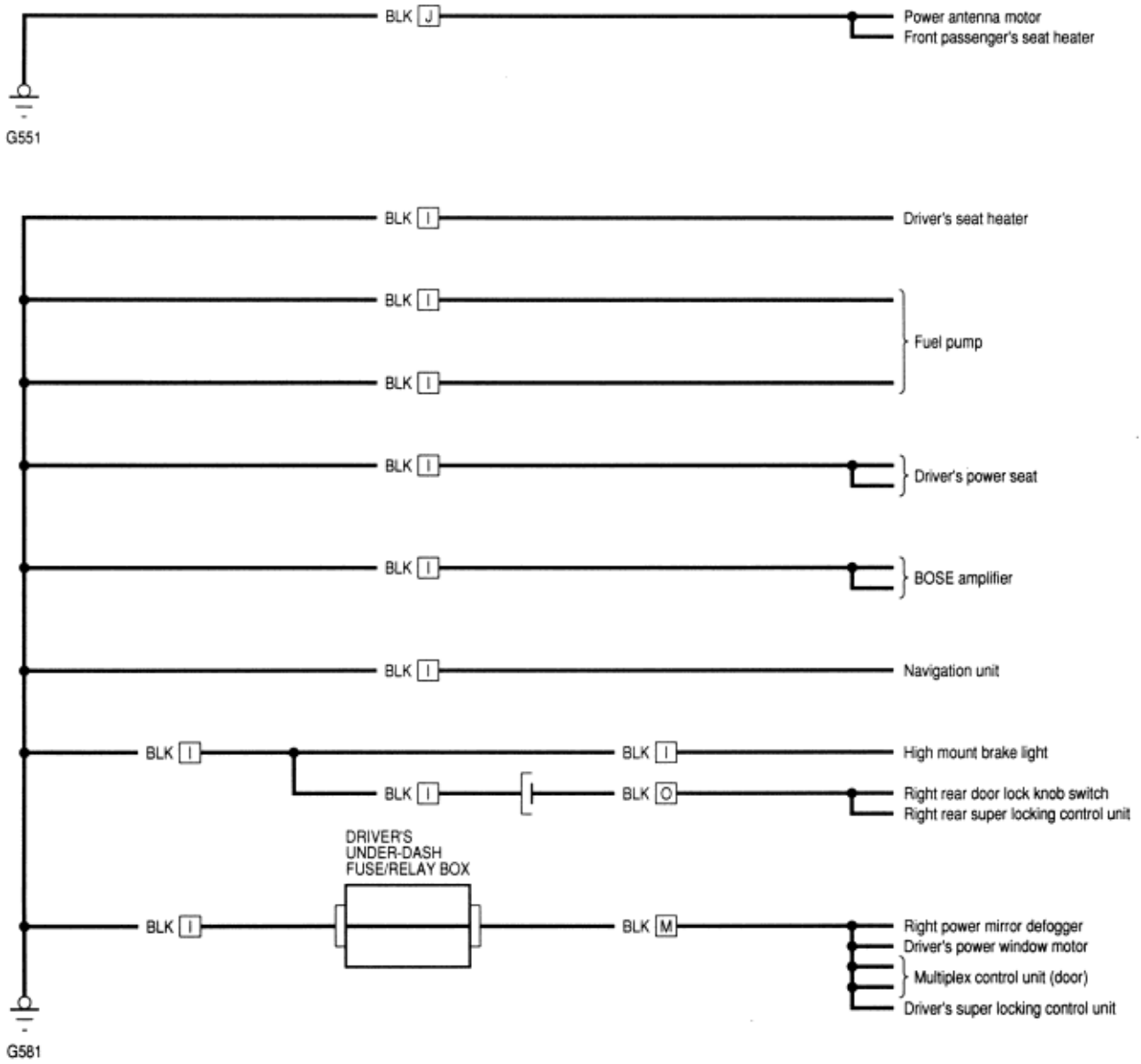
- P** : Left rear door wire harness



- G** : Steering beam wire harness
- H** : Dashboard wire harness
- M** : Driver's door wire harness

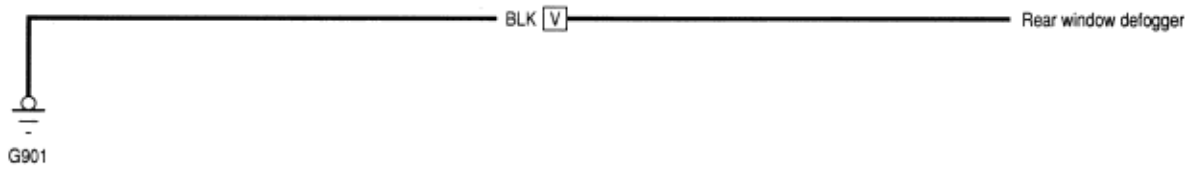
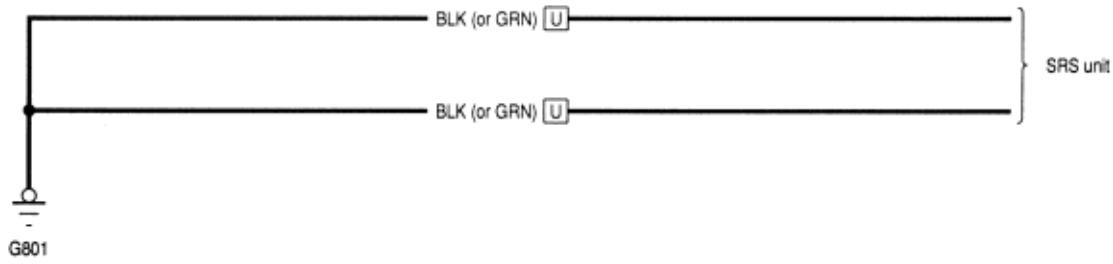


To go to the pages referenced on the diagram above,
 click on the following:
 (See Page 23-B-42)



- I : Right side wire harness
- J : Left side wire harness
- M : Driver's door wire harness

- O : Right rear door wire harness

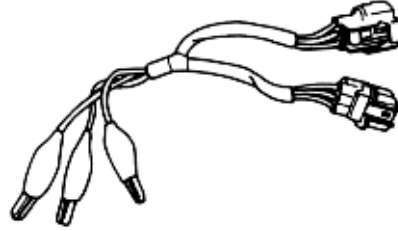


- [K] : Rear wire harness
- [U] : SRS main harness
- [V] : Rear window defogger ground wire

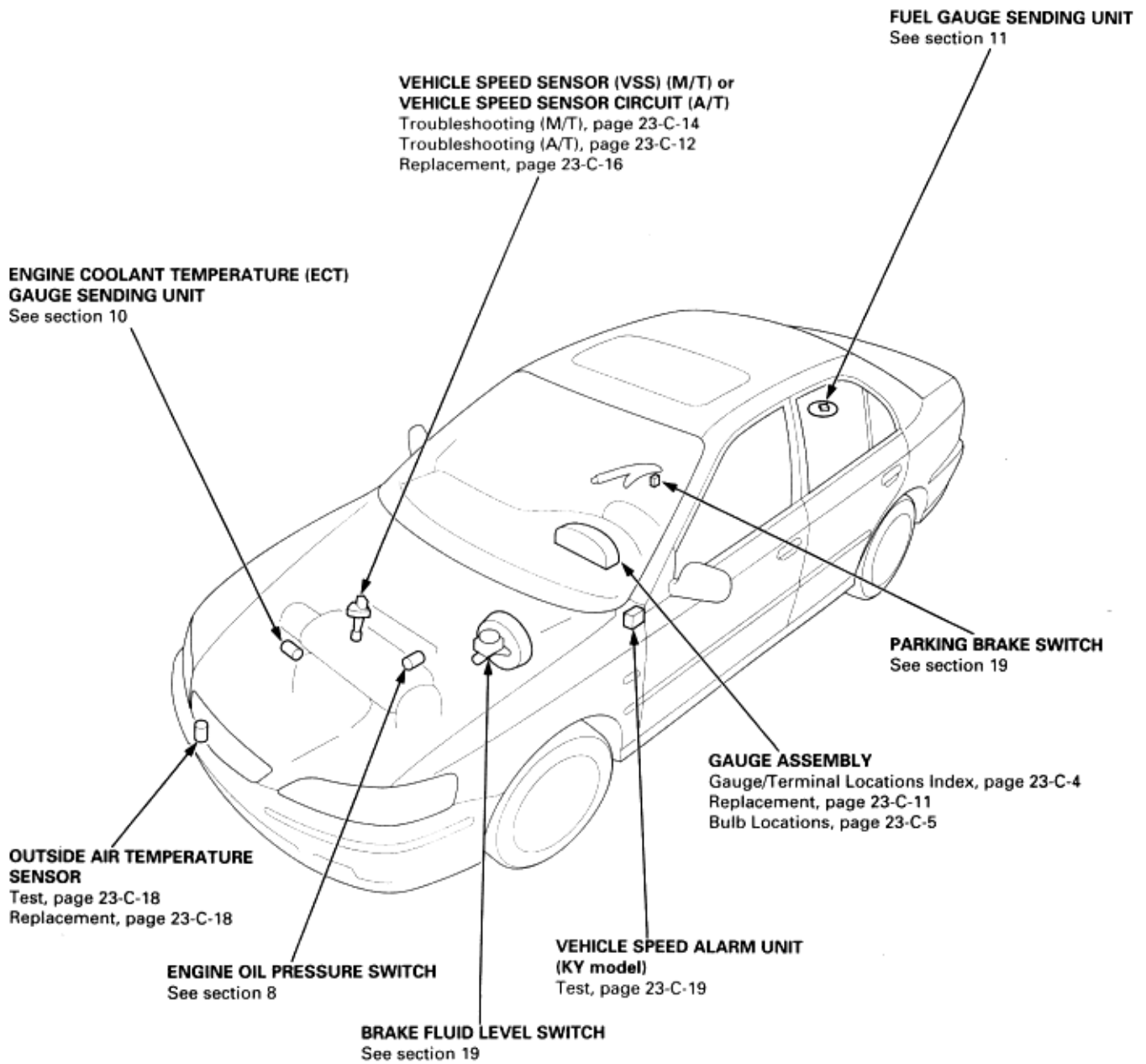
Special Tool

23-C-2

Ref No.	Tool Number	Description	Qty	Remark
1	07LAJ - PT30200	Test Harness	1	

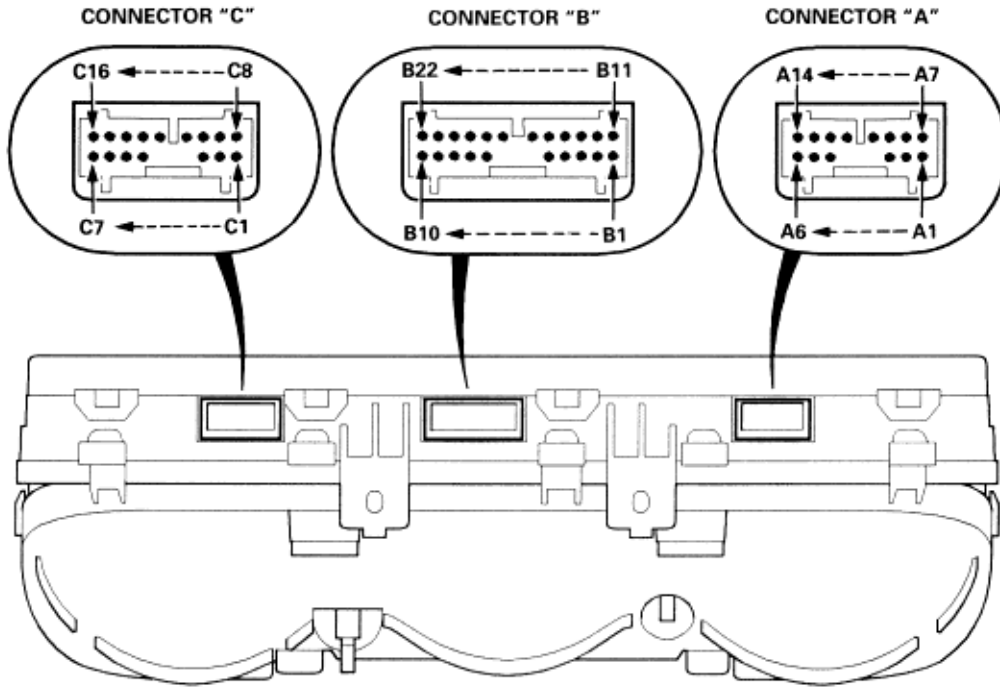


①



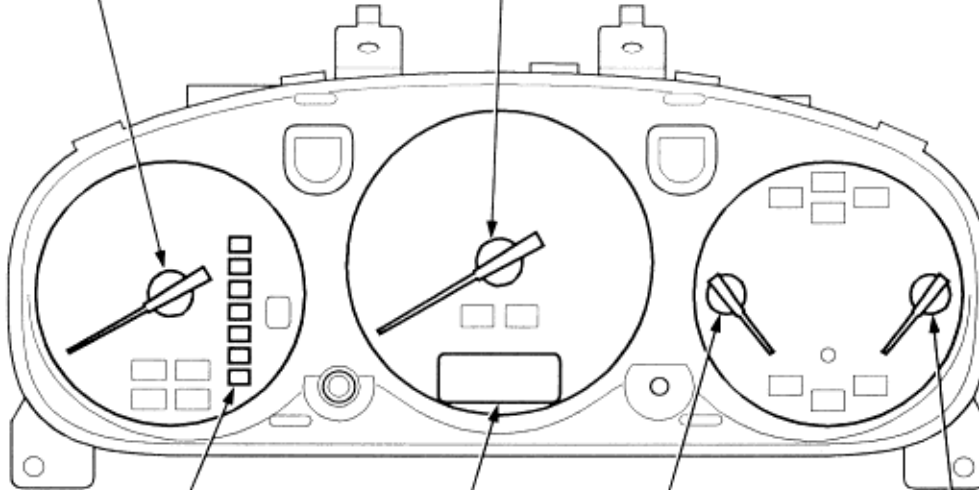
To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-C-14)
- (See Page 23-C-12)
- (See Page 23-C-16)
- (See Page 23-C-18)
- (See Page 23-C-4)
- (See Page 23-C-11)
- (See Page 23-C-5)
- (See Page 23-C-17)



TACHOMETER:
Indicates 100 rpm at 200 pulses per minute of the ignition control module (ICM).

SPEEDOMETER:
Indicates 60 km/h at 637 rpm (min⁻¹) or 60 mph at 1,026 rpm (min⁻¹) of the vehicle speed sensor (VSS): M/T or vehicle speed sensor (VSS) circuit in the PCM: A/T.



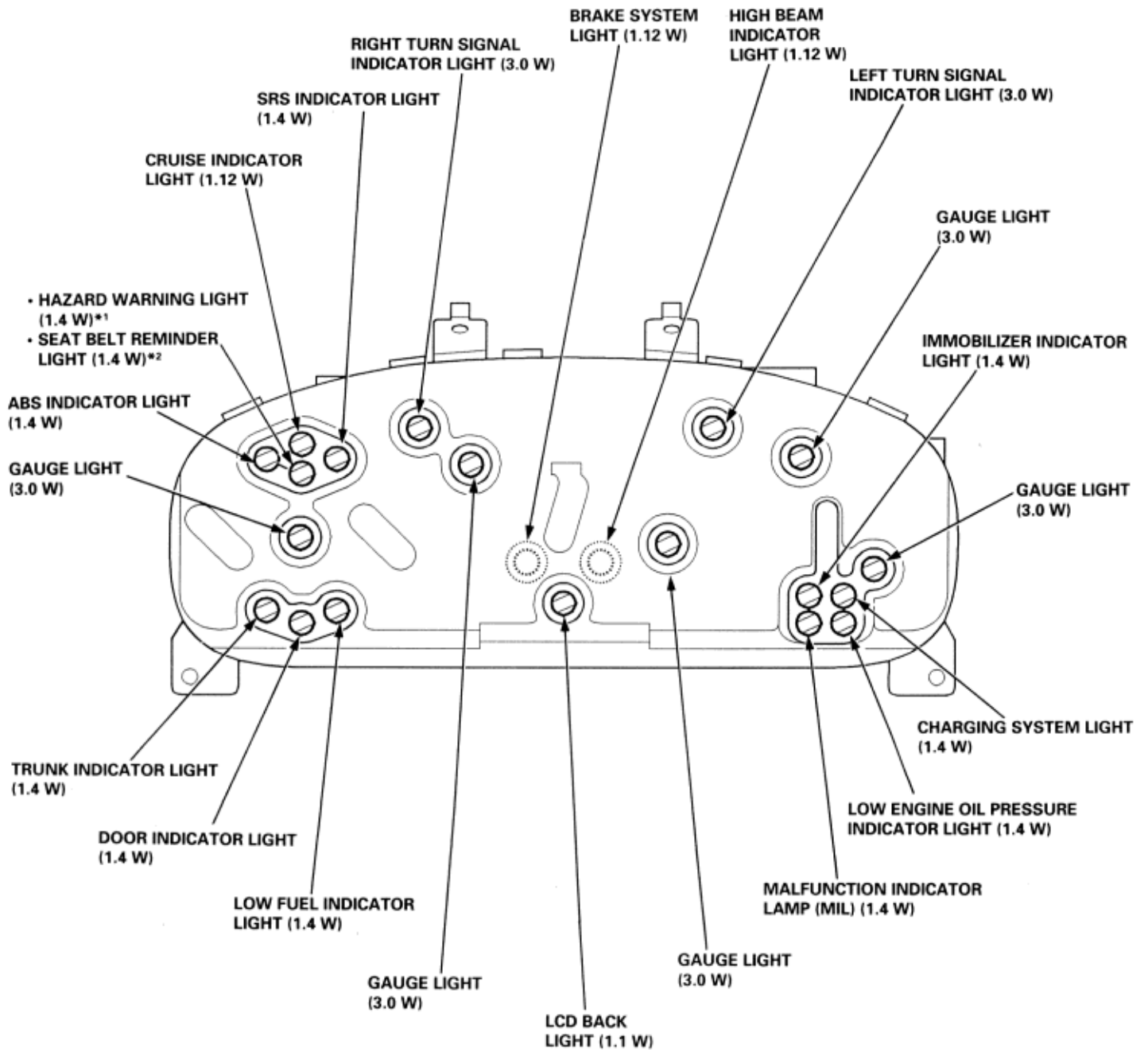
A/T GEAR POSITION INDICATOR
See section 14

ODO/TRIP METER/OUTSIDE AIR TEMPERATURE INDICATOR
See page 23-C-11

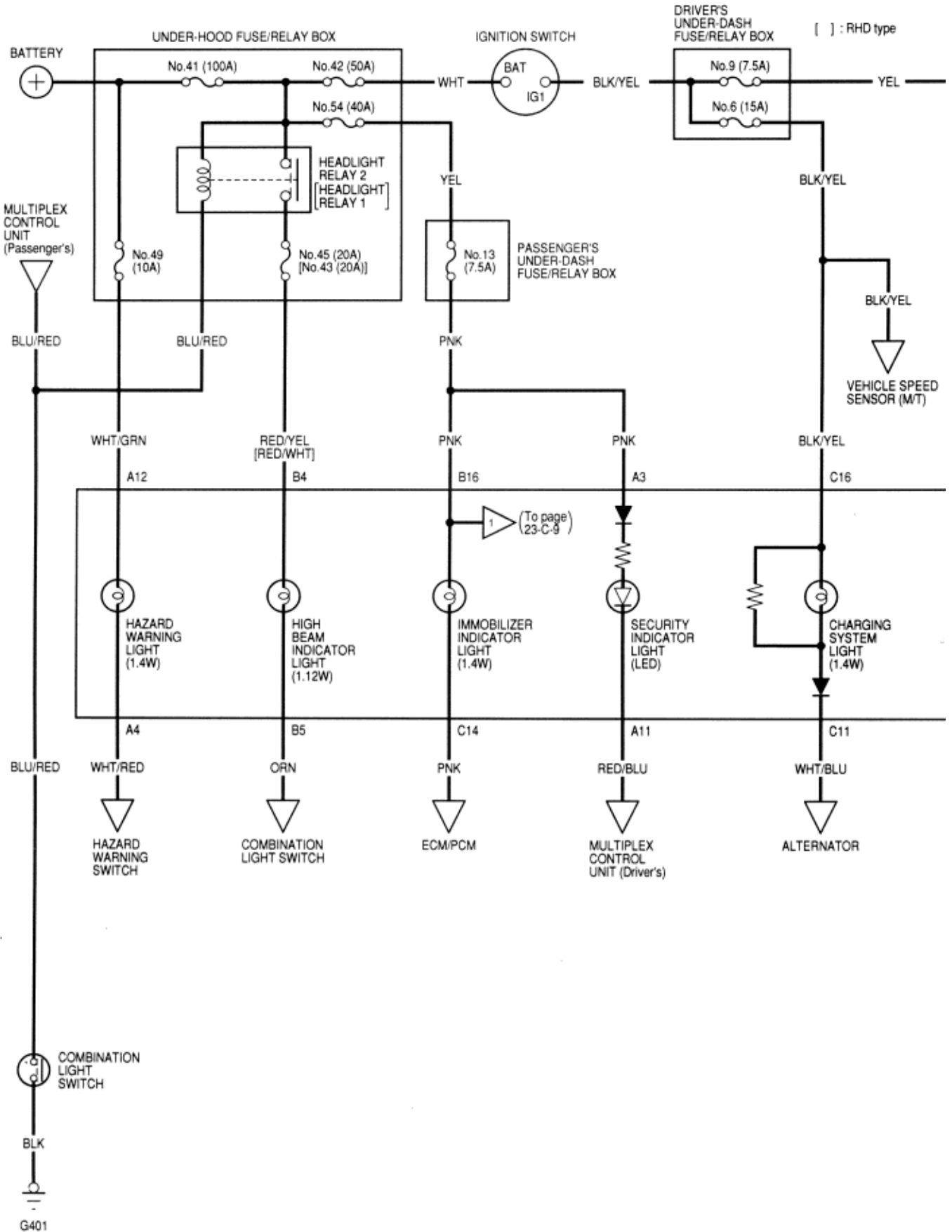
FUEL GAUGE
See section 11

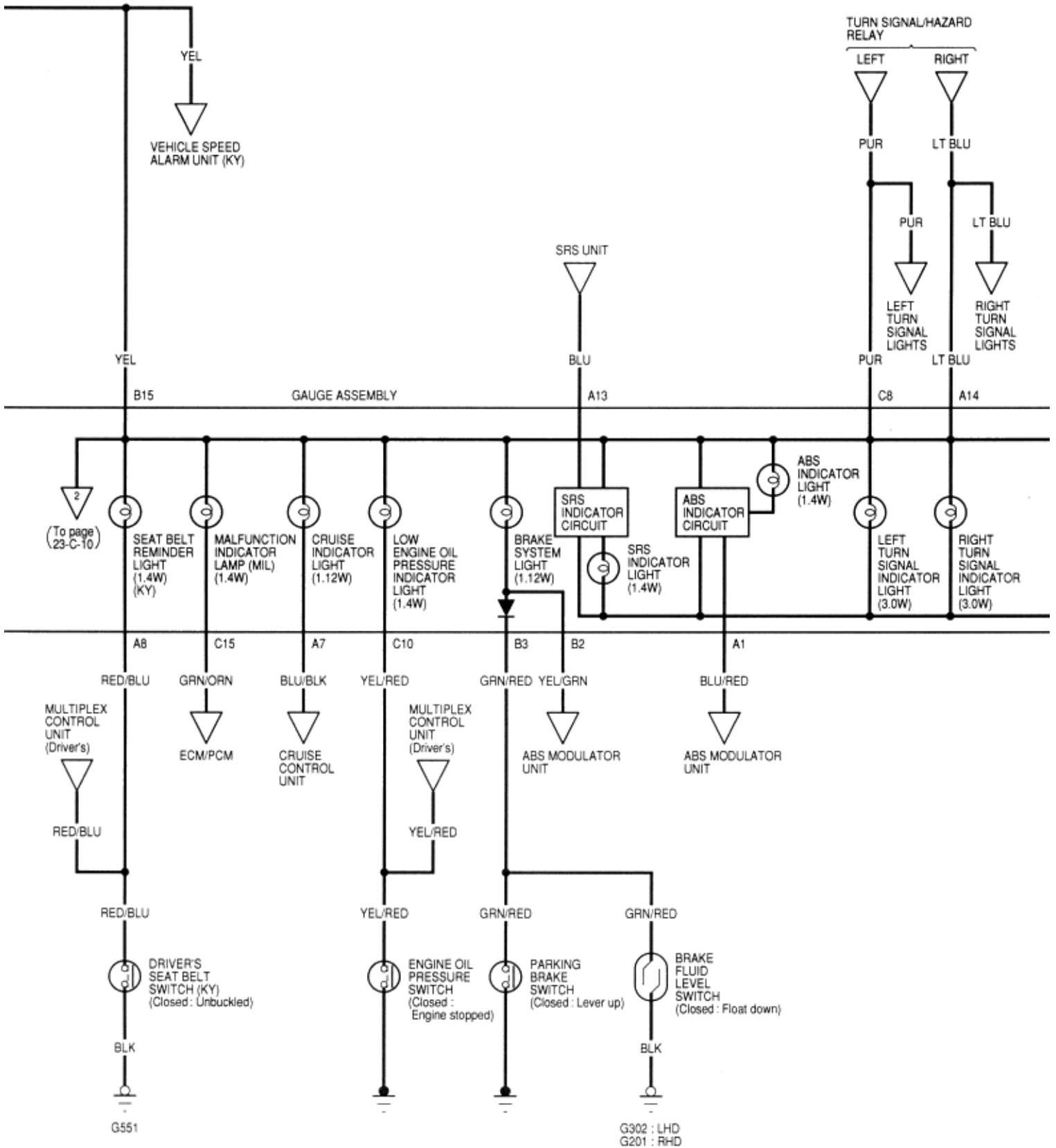
ENGINE COOLANT TEMPERATURE (ECT) GAUGE
See section 10

To go to the pages referenced on the diagram above, click on the following:
(See Page 23-C-11)

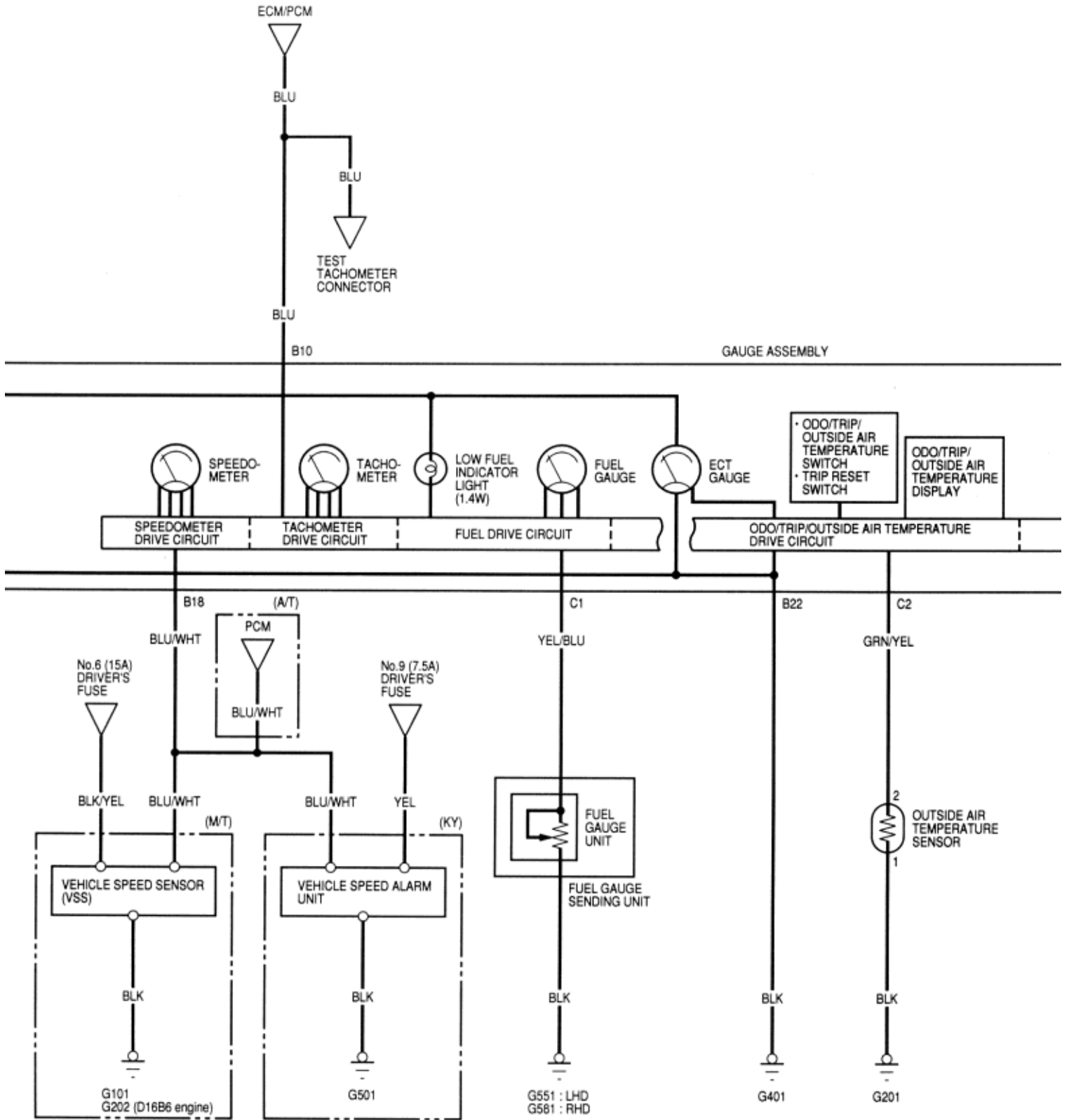


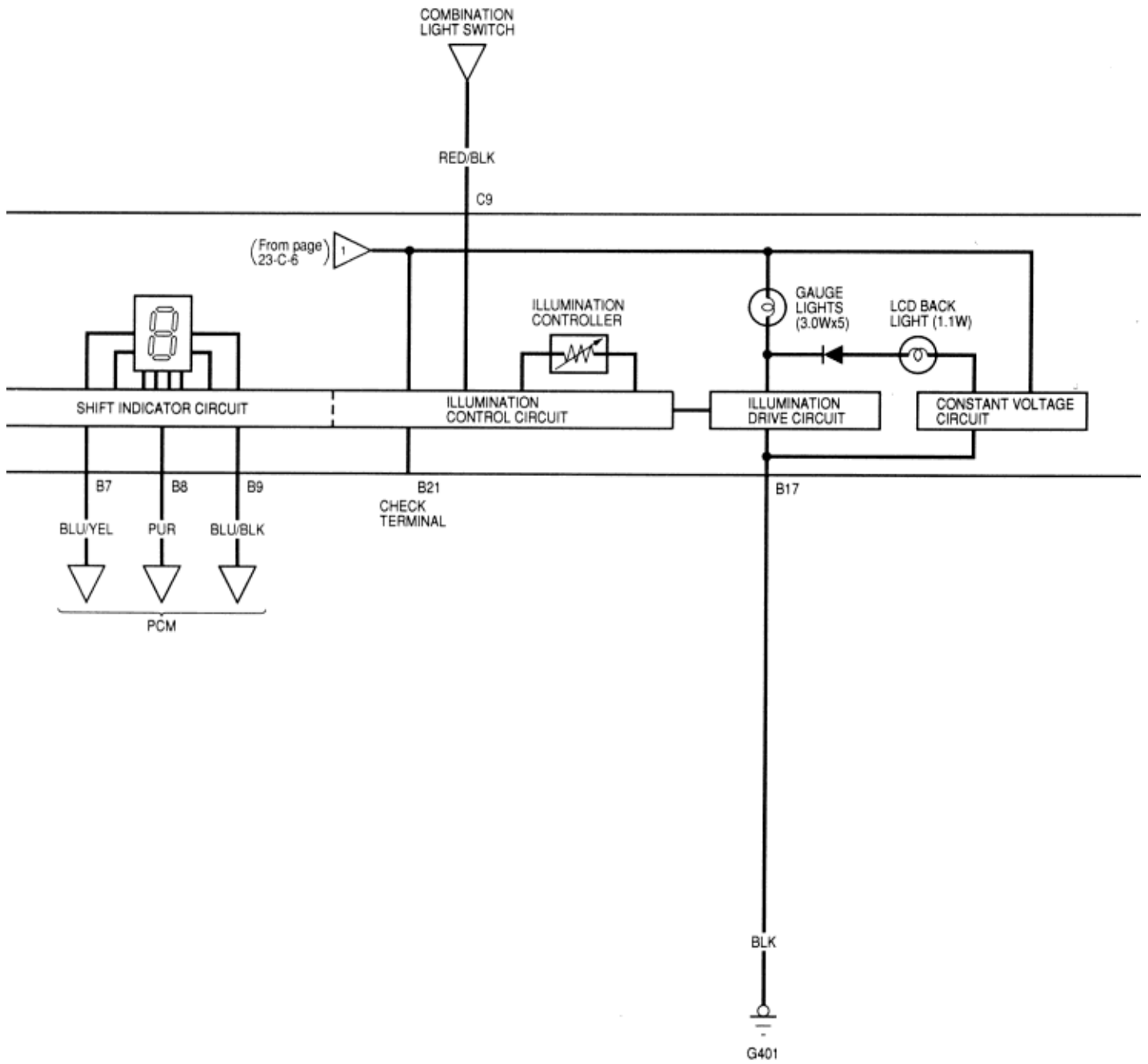
*1 : Except KY model
*2 : KY model



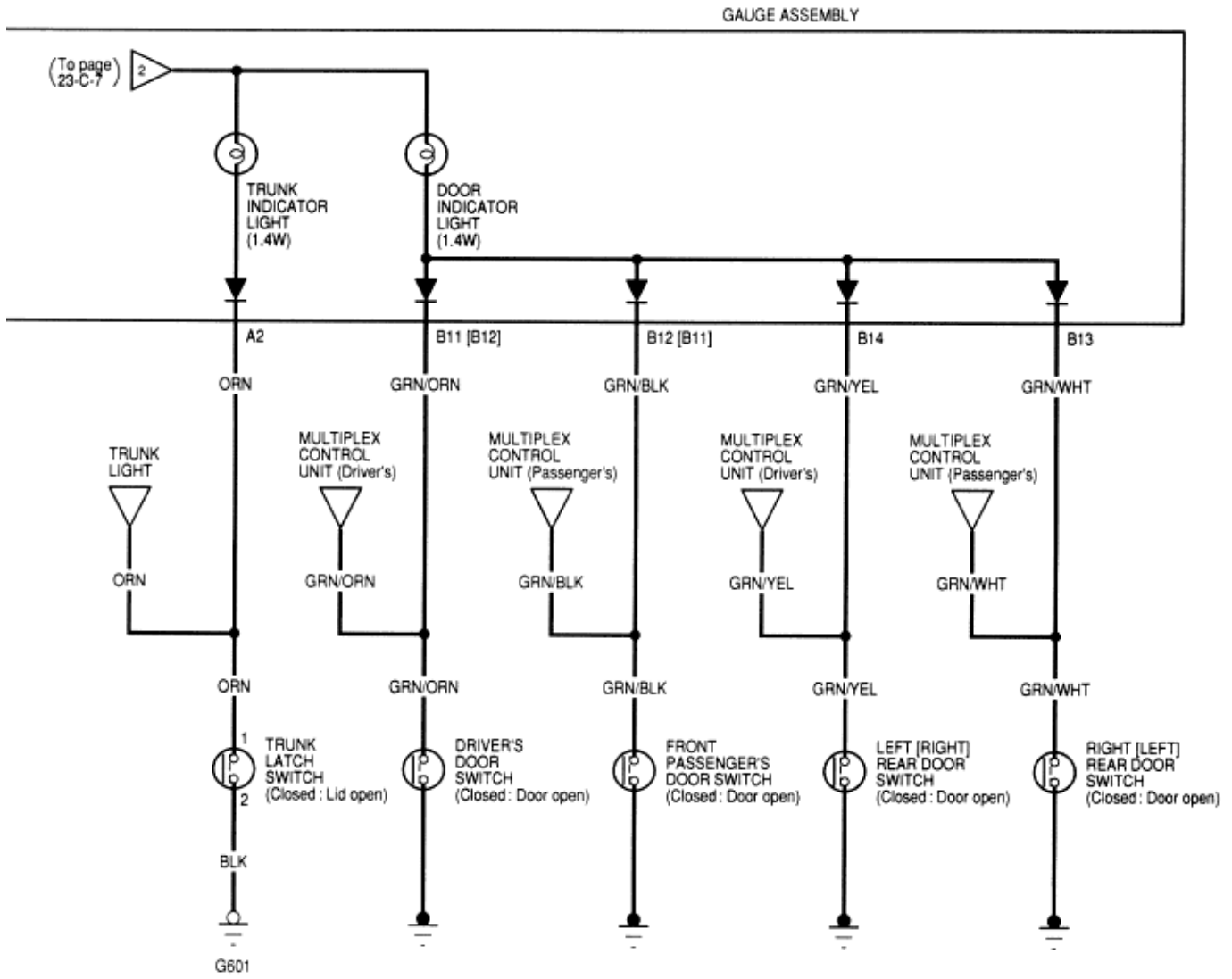


To go to the pages referenced on the diagram above, click on the following:
(See Page 23-C-10)





[]: RHD type

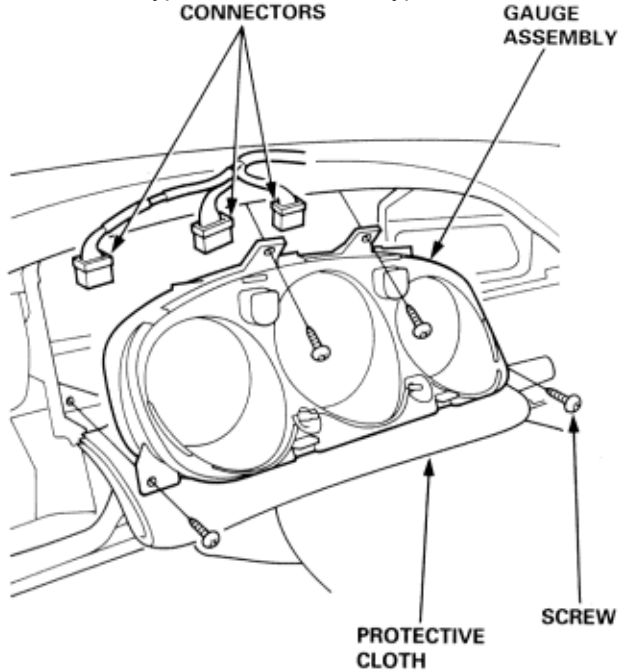


To go to the pages referenced on the diagram above, click on the following:
 (See Page 23-C-7)

NOTE: Be careful not to damage the meter.

1. Remove the instrument panel (see section 20).
2. Spread a protective cloth on the upper column cover, then remove the screws from the gauge assembly.

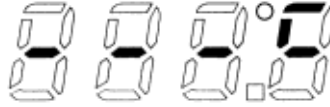
NOTE: LHD type is shown, RHD type is similar.



3. Disconnect the connectors, and remove the gauge assembly.
4. Install in the reverse order of removal.

Troubleshooting

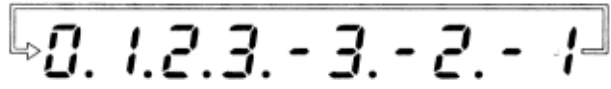
If the indicator displays "888.8", as shown, for more than two seconds after selecting the outside air temperature display mode, check for an open in the wire between the gauge and the outside air temperature sensor.



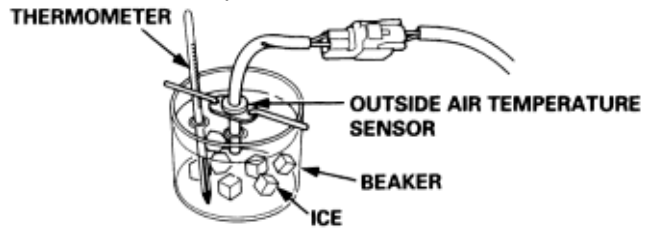
Calibration

The outside air temperature indicator's displayed temperature can be recalibrated $\pm 3^\circ$ to meet the customer's expectations.

1. Turn the ignition switch ON (II).
2. Select the outside air temperature mode, then push and hold the reset button for 10 seconds. While you continue to hold the reset button, the display will scroll through temperature settings from $+3^\circ$ to -3° as shown.



3. When the desired correction value appears on the display, release the reset button, and the recalibrated outside air temperature will be displayed.
NOTE: To recalibrate the display to the true temperature, remove the outside air temperature sensor, but leave it connected (**see page 23-C-18**). Submerge the sensor and a thermometer in a container of ice water. Select the calibration mode as described above, then recalibrate the display to the true temperature.



Before testing:

- Check to see if diagnostic trouble code P0720 (9) is indicated.
- Inspect the No. 6 (15A) fuse in the driver's under-dash fuse/relay box.
- Check for continuity between the B22 terminal and body ground (G501).

Test the Speedometer

1. Raise the vehicle and make sure its is securely supported.
2. Disconnect the 22P connector from the gauge assembly.
3. Connect the B18 terminal to the positive probe of a voltmeter and connect the negative probe to body ground. To prevent damage to the gauge assembly, lay the gauge on a shop rag.
4. Put the vehicle in neutral with the ignition switch ON (II).
5. Slowly rotate (over 2 km/h (3 mph)) one wheel with the other wheels blocked.

Does the voltage pulse from 0 to approx. 5 V or more.

NO **Replace the gauge assembly.**

Test the BLU/WHT wire:

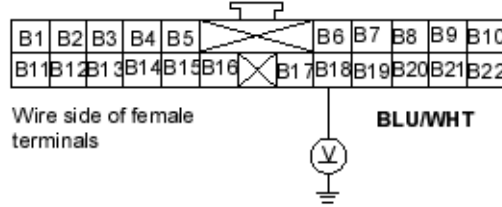
1. Connect the No. 9 terminal of the PCM 32P connector to the positive probe of a voltmeter and connect the negative probe to the body ground.
2. Put the vehicle in neutral with the ignition switch ON (II).
3. Slowly rotate (over 2 km/h (3 mph)) one wheel with other wheels blocked.

Does the voltage pulse from 0 to approx. 5 V or more.

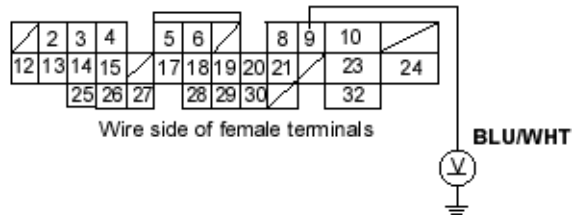
NO **Repair open in the BLU/WHT wire between the gauge assembly and the PCM, the cruise control unit, or the multiplex control unit (driver's).**

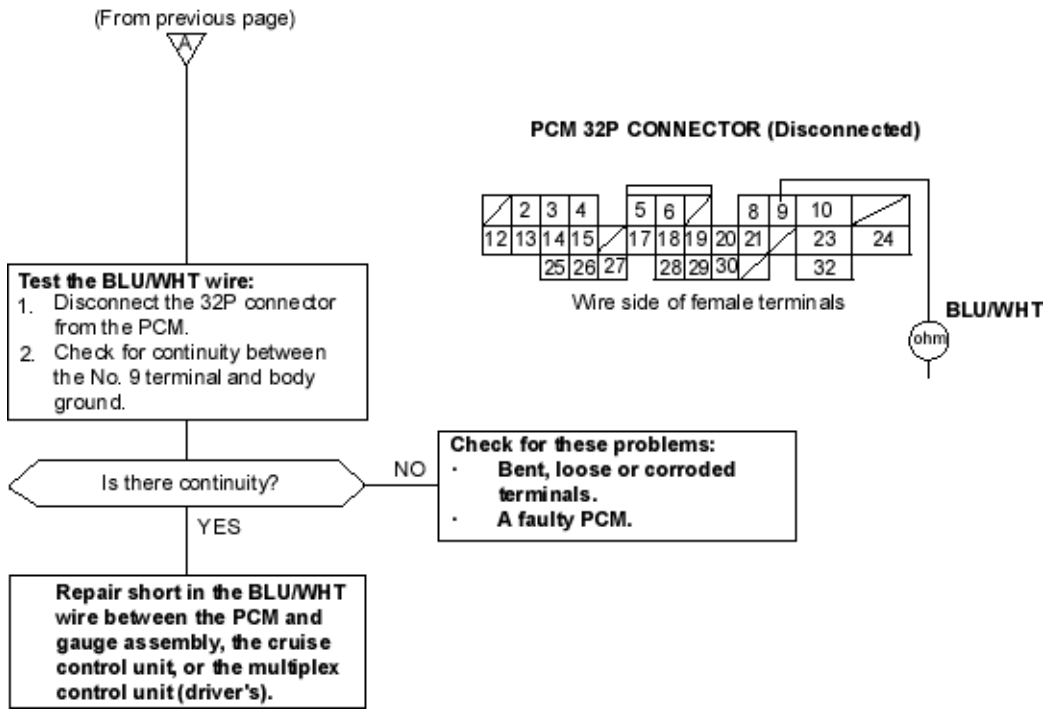
YES
A
(To next page)

**DASHBOARD WIRE HARNESS
22P CONNECTOR "B"**



PCM 32P CONNECTOR (Connected)





Before testing, inspect the No. 6 (15A) and No. 9 (7.5 A) fuses in the driver's under-dash fuse/relay box.

Test the BLK wire:

1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Connect the test harness (07LAJ-PT30200) only to the engine wire harness.
3. Connect the RED [WHT] test harness clip to the positive probe of an ohmmeter.
4. Check for continuity between the RED [WHT] test harness clip and body ground.

Is there continuity?

NO **Repair open in the BLK wire between the VSS and G101.**

YES

Test the BLK/YEL wire:

1. Connect the WHT [RED] test harness clip to the positive probe of a voltmeter, and connect the RED [WHT] test harness clip to the negative probe.
2. Turn the ignition switch ON (II).

Is there battery voltage?

NO **Repair open in the BLK/YEL wire between the VSS and the driver's under-dash fuse/relay box.**

YES

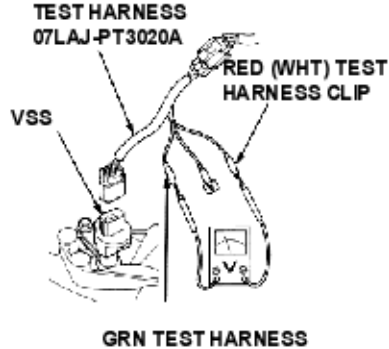
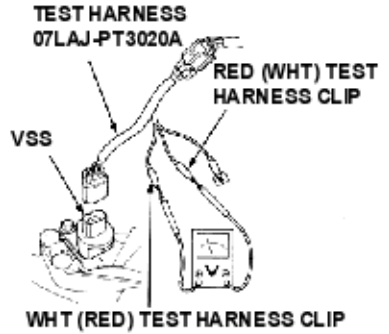
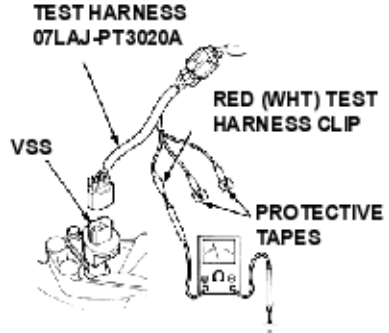
Test the BLU/WHT wire:
Connect the GRN test harness clip to the positive probe of a voltmeter, and connect the RED [WHT] test harness clip to the negative probe.

Is there about 5 V or more?

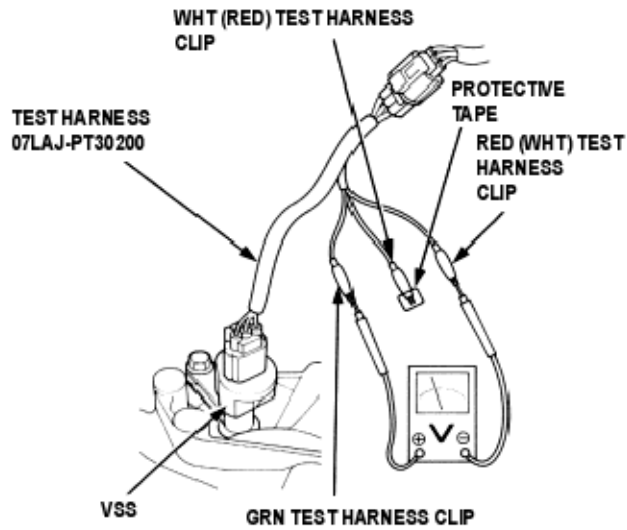
NO **Repair open in the BLU/WHT wire between the VSS and**
 - ECM, or
 - cruise control, or
 - multiplex control unit (driver's), or
 - headlight adjuster control unit, or
 - vehicle speed alarm unit (KY model).

YES

(To next page)

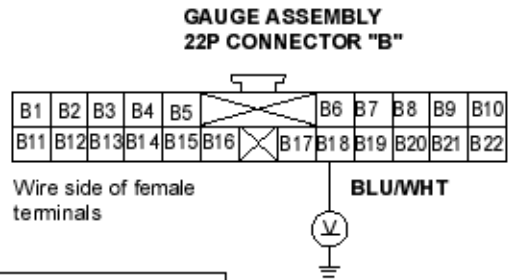


(From previous page)
Test the VSS:
 1. Turn the ignition switch OFF.
 2. Connect another test harness connector to the VSS.
 3. Raise the front of the car, and support it with safety stands.
 4. Put the car in neutral with the ignition switch on(II).
 5. Slowly rotate one wheel with the other wheels blocked.



Does voltage pulse from 0 to approx. 5 V or more?
 YES
 NO **Replace the VSS**

Speedometer Test
 1. Disconnect the 22P connector "B" from the gauge assembly.
 2. Touch a probe to the BLU/WHT wire, and connect it to body ground through a voltmeter.
 3. Slowly rotate one wheel with the other wheels blocked.



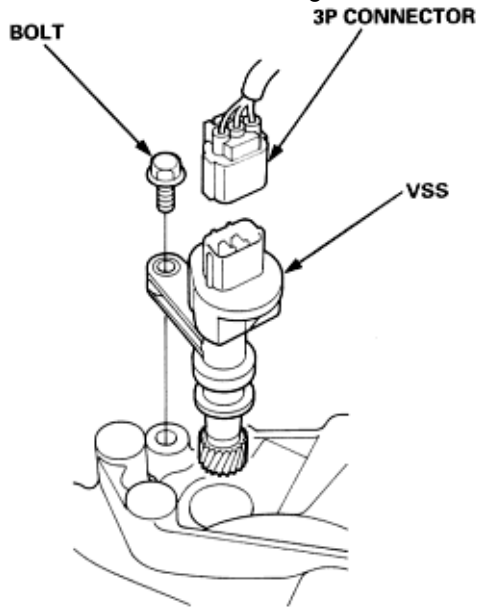
Does the meter indicate pulsing voltage?
 YES
 NO **Repair open in the BLU/WHT wire between the VSS and the speedometer.**

Replace the speedometer.

Vehicle Speed Sensor (VSS) (M/T)
Replacement

23-C-16

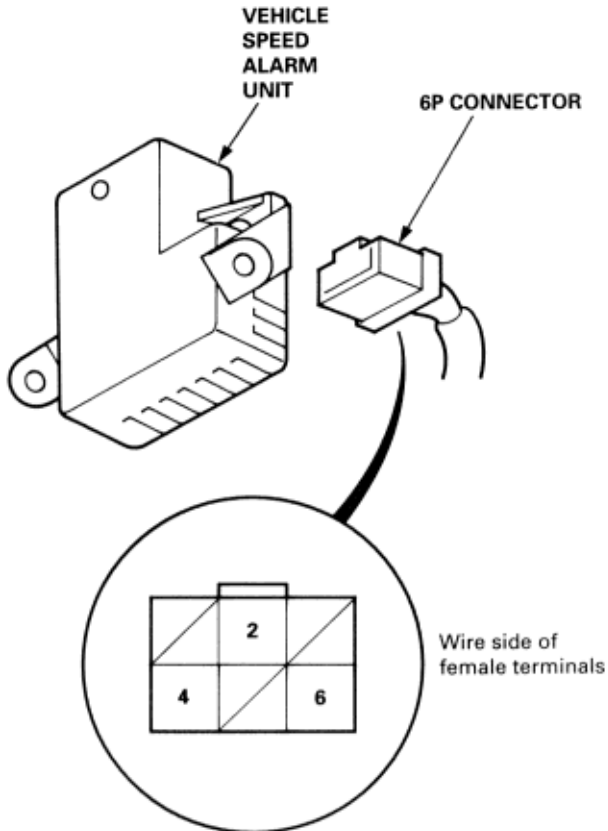
1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Remove the mounting bolt, then remove the VSS.



3. Install in the reverse order of removal.

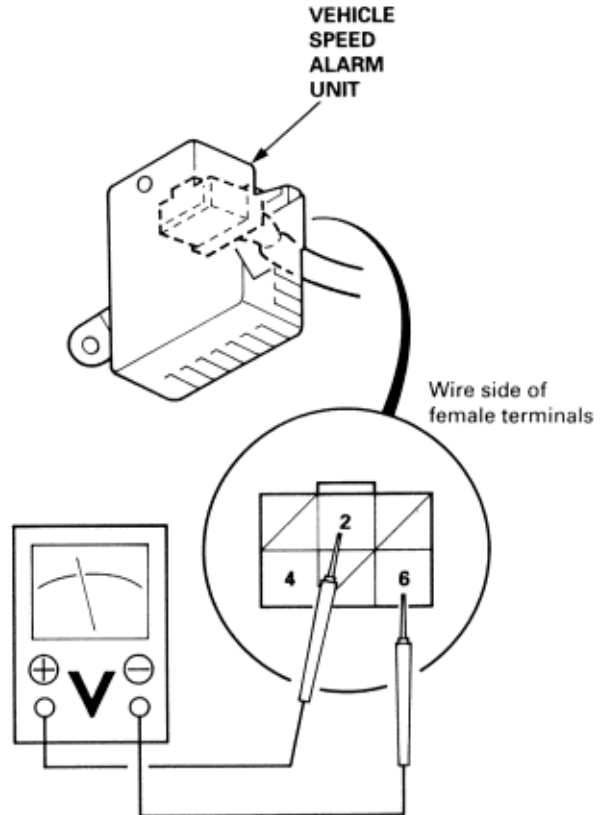
NOTE: Check for the No. 9 (7.5 A) fuse in the driver's under-dash fuse/relay box, before testing.

1. Carefully remove the dashboard lower cover.



2. Check for continuity between the No. 6 terminal and the body ground.
There should be continuity.
 - ♦ If there is no continuity, check for:
 - an open in the BLK wire.
 - poor ground (G501)
 - ♦ If there is continuity, go to step 3.
3. Check for voltage between the No. 4 terminal and the body ground with the ignition switch ON (II).
There should be battery voltage.
 - ♦ If there is no voltage, check for an open in the YEL wire.
 - ♦ If there is battery voltage, go to step 4.

4. Ignition switch OFF, reconnect the 6P connector to the speed alarm unit, and connect the voltmeter to the No. 2 wire terminal.



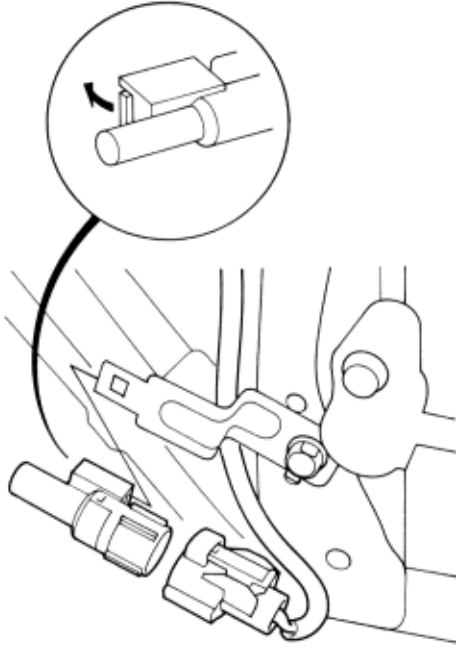
5. Raise the car and place safety stands in the proper locations (see section 1.)
6. Turn the ignition switch ON (II) again and rotate the front wheel slowly, then check to see the voltmeter indicator moves from 0V to about 5 V and then from about 5 V to 0V alternately.
 - ♦ If there is no voltage check for:
 - vehicle speed sensor (VSS) circuit (**see page 23-C-12**) and (**see page 23-C-14**).
 - an open in the BLU/ WHT wire.
7. Replace the speed alarm unit if the vehicle speed sensor (VSS) circuit is normal.

Outside Air Temperature Sensor

Test

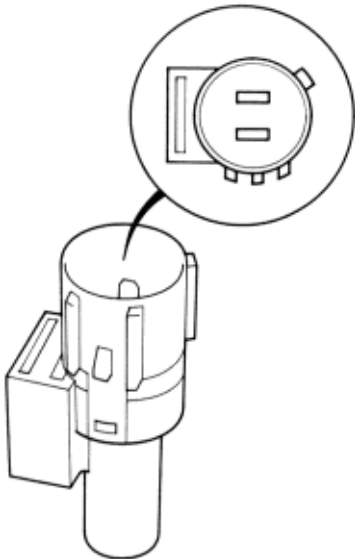
23-C-18

1. Disconnect the 2P connector from the outside air temperature sensor and remove the sensor.



OUTSIDE AIR TEMPERATURE SENSOR

2. Compare the resistance reading between the No. 1 and No. 2 terminals of the sensor with the specification shown in the following graph; resistance should be within specifications.



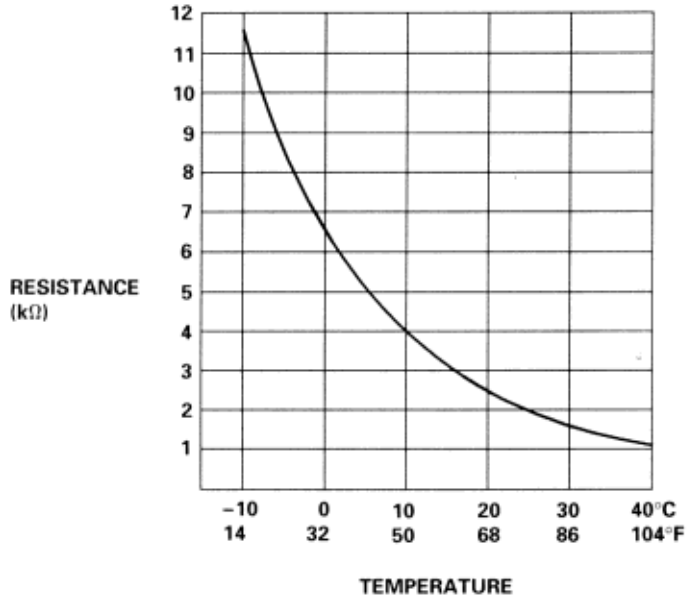
OUTSIDE AIR TEMPERATURE SENSOR
2P CONNECTOR



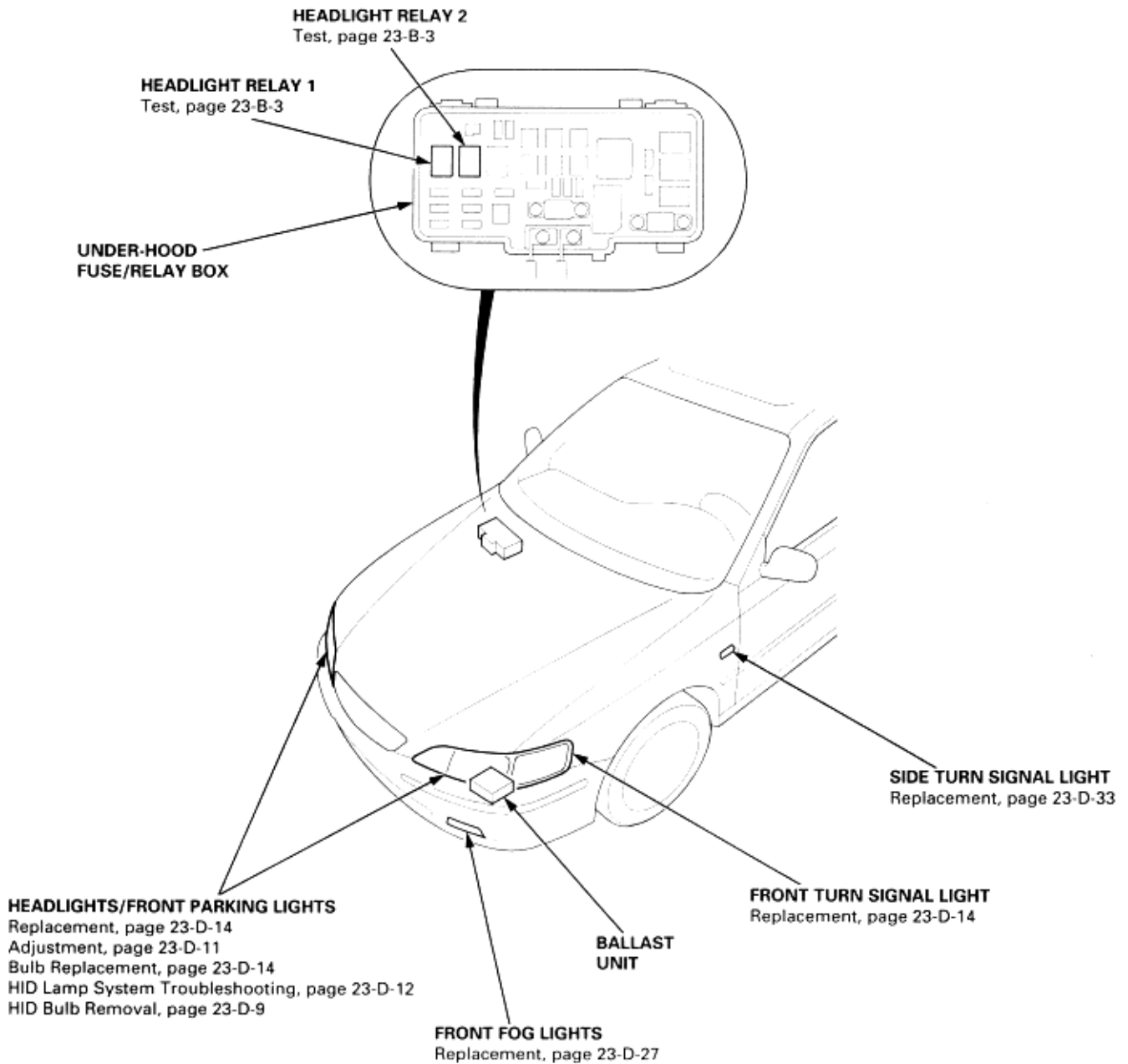
CAUTION

The sensor uses a thermistor which can be damaged if high current is applied during testing. Therefore, use a circuit tester with an output of 1 mA or less at the 20 k ohms range.

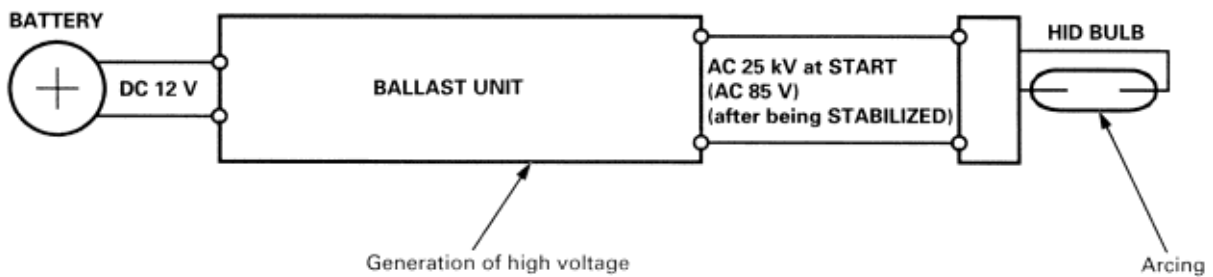
NOTE: Dip the sensor in ice water, and measure resistance. Then pour hot water on the sensor, and check for change in resistance.



NOTE: LHD type is shown, RHD type is similar.

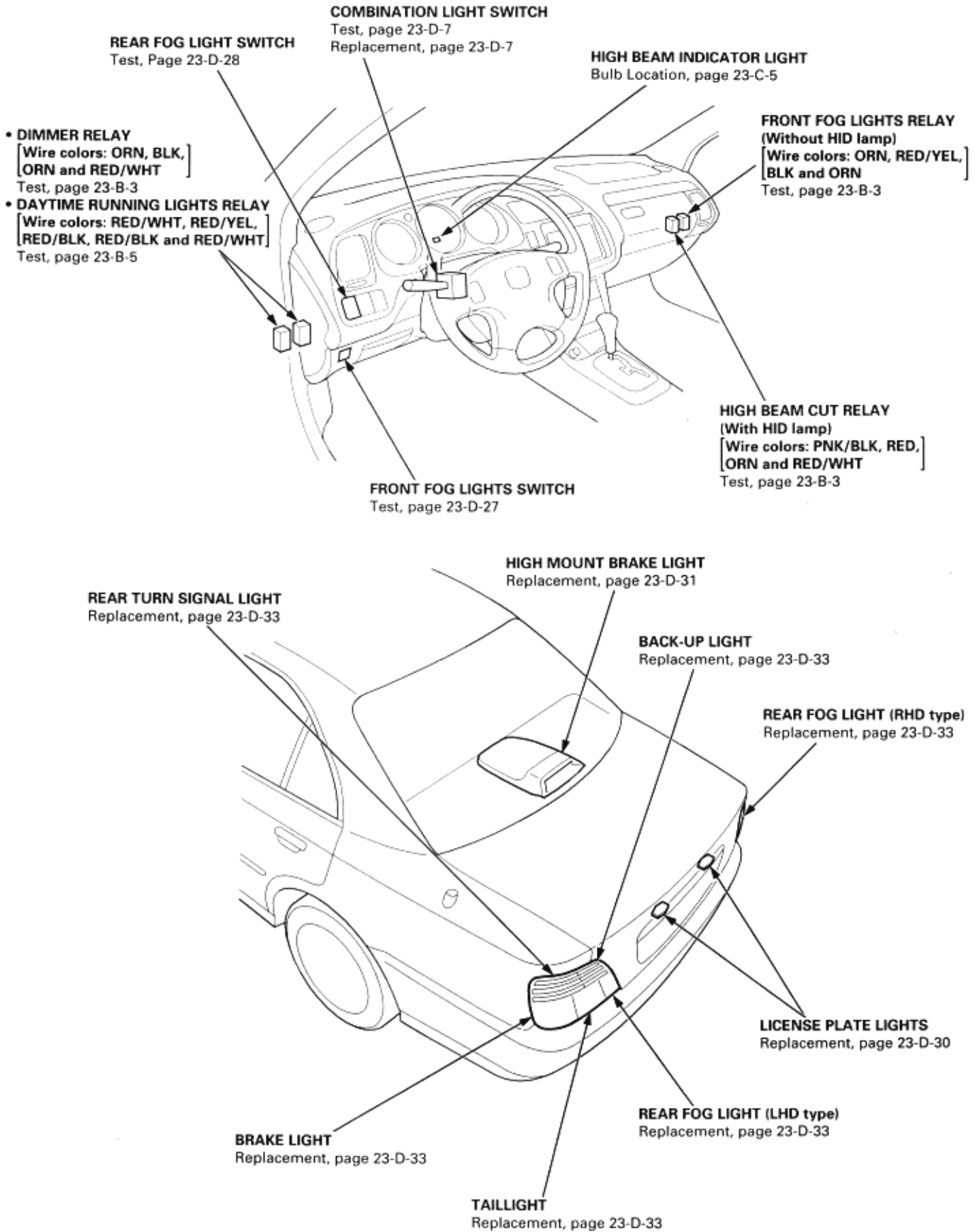


High Intensity Discharge (HID) Lamp System



To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-3)
- (See Page 23-D-33)
- (See Page 23-D-14)
- (See Page 23-D-27)
- (See Page 23-D-11)
- (See Page 23-D-12)
- (See Page 23-D-9)



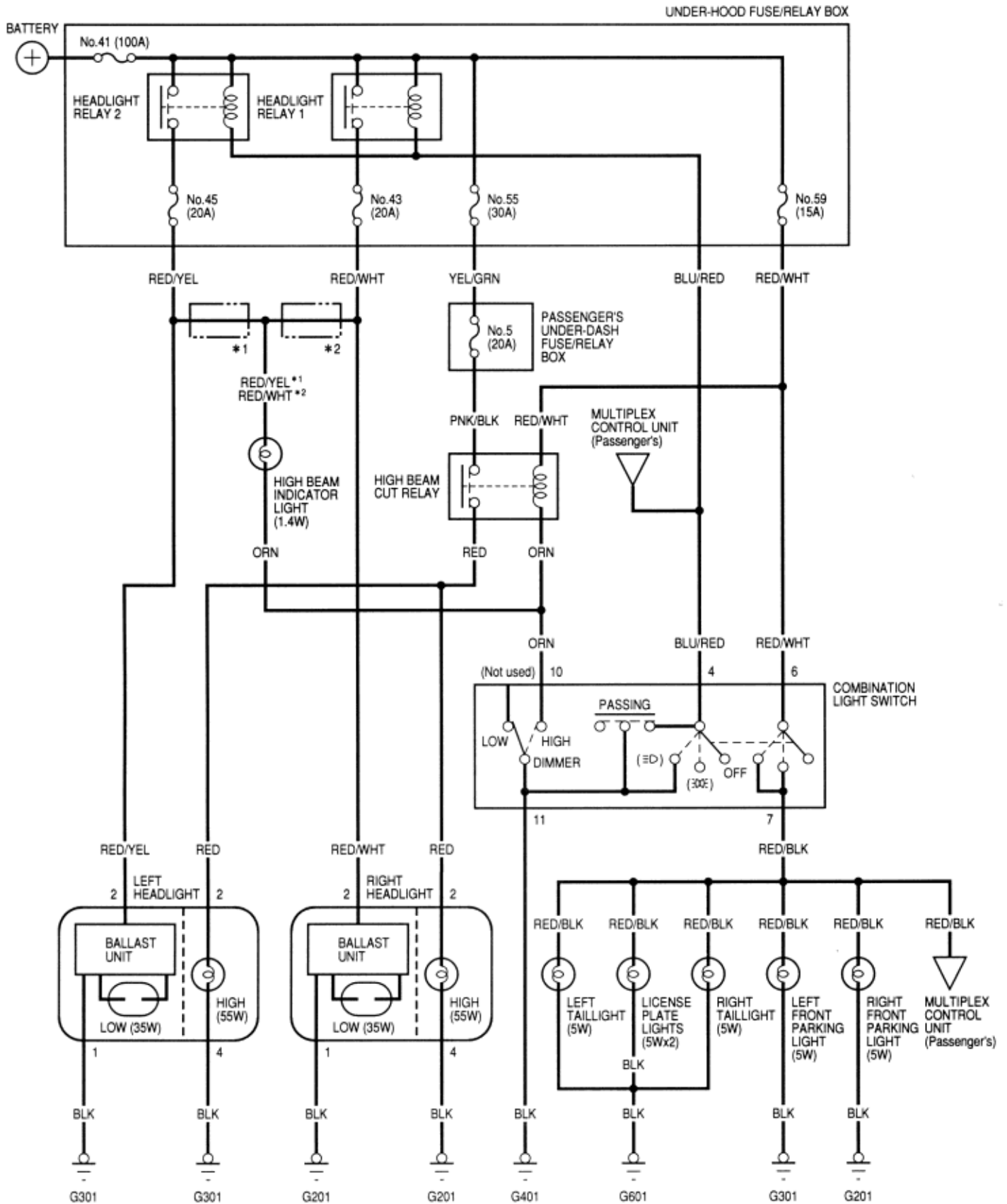
To go to the pages referenced on the diagram above, click on the following:

(See Page 23-B-3)
 (See Page 23-B-5)
 (See Page 23-D-28)
 (See Page 23-D-7)
 (See Page 23-C-5)
 (See Page 23-D-27)
 (See Page 23-D-33)
 (See Page 23-D-31)
 (See Page 23-D-30)

Lighting System
Circuit Diagram (With HID Lamp)

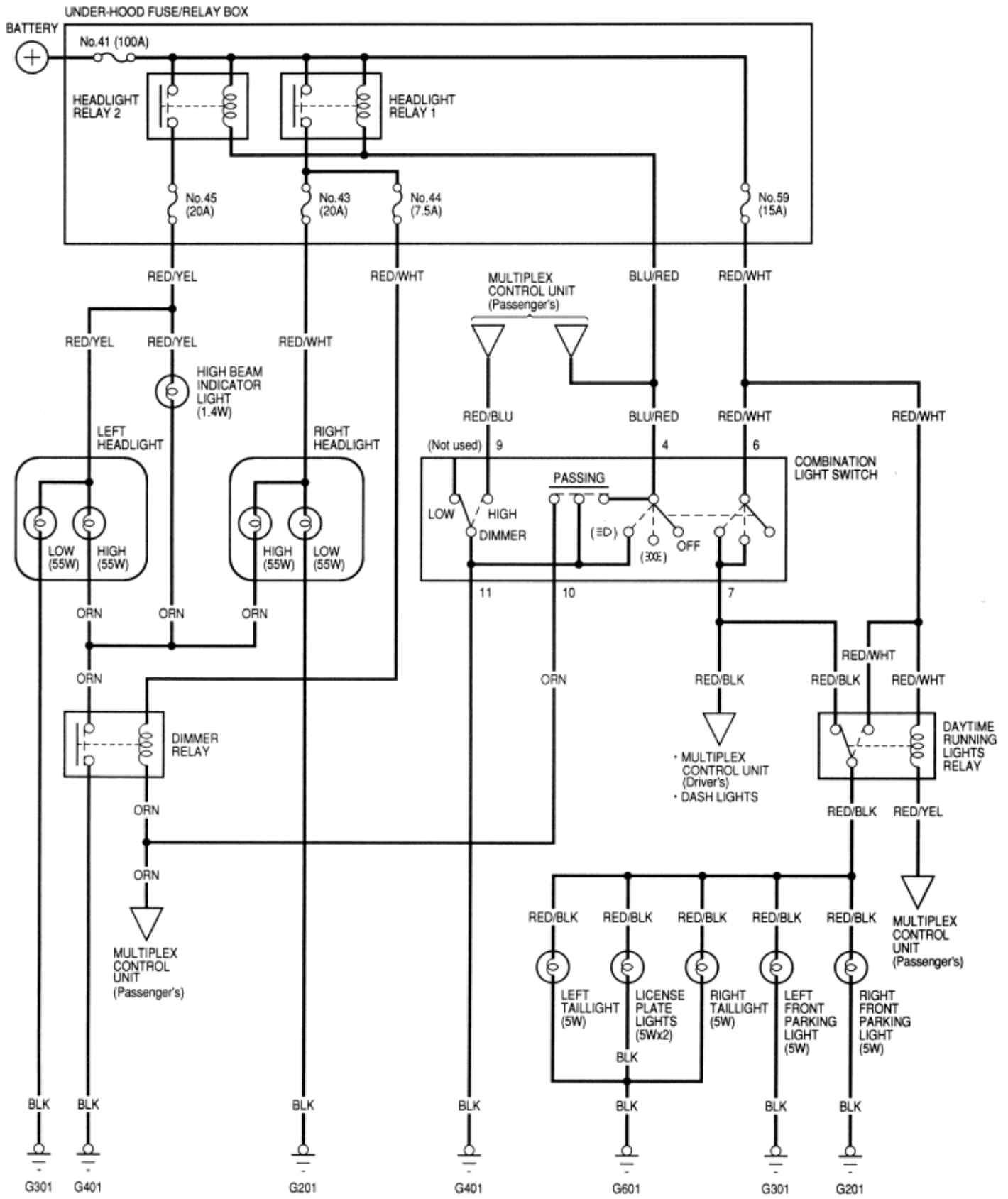
23-D-4

*1 : LHD type
 *2 : RHD type

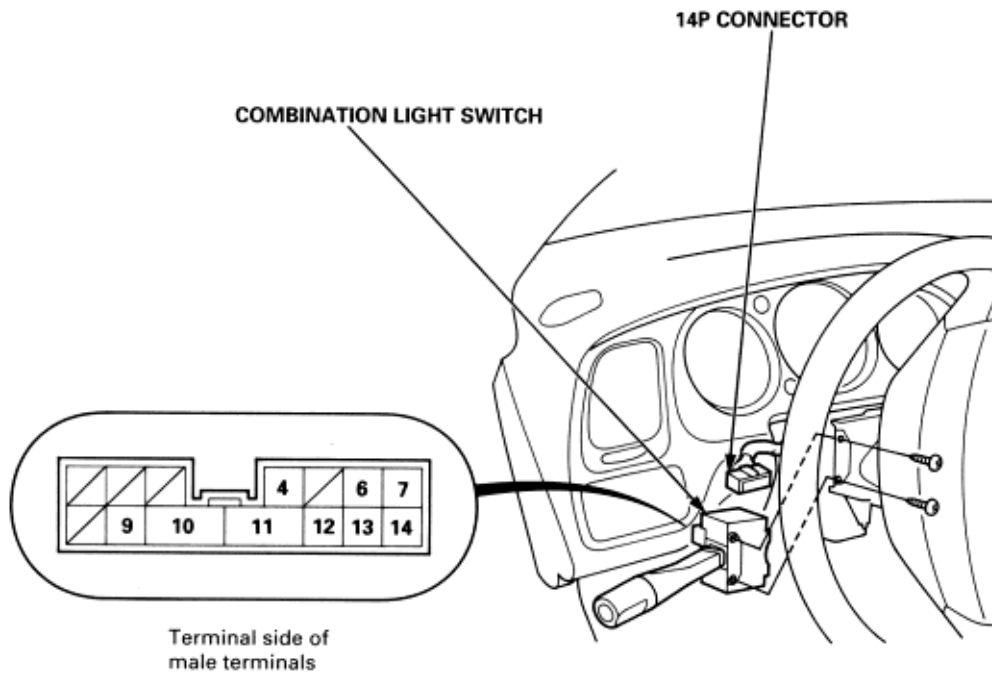


Lighting System
Circuit Diagram (With Daytime Running Lights)

23-D-6



1. Remove the driver's dashboard lower cover and steering column covers (see section 20).
2. Disconnect the 14P connector from the combination light switch.
3. Remove the two screws, then pull out the combination light switch.
4. Inspect the connector terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, check for continuity between them in each switch position according to the table.



Light switch (with daytime running lights)

Position		Terminal	4	9	10	11	6	7
Headlight switch	OFF							
							○	○
		LOW		○	○	○	○	○
		HIGH		○	○	○	○	○
Passing switch	OFF							
	ON		○	○	○			

Lighting switch

Position		Terminal	4	10	11	6	7
Headlight switch	OFF						
						○	○
		LOW		○	○	○	○
		HIGH		○	○	○	○
Passing switch	OFF						
	ON		○	○	○		

Turn signal switch

Position	Terminal	12	13	14
LEFT		○	○	
NEUTRAL				
RIGHT			○	○

Headlights Adjustment

23-D-9

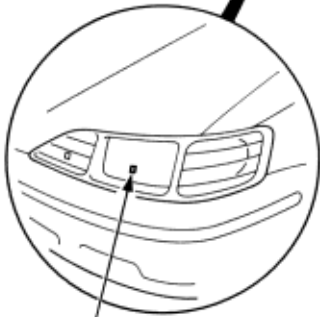
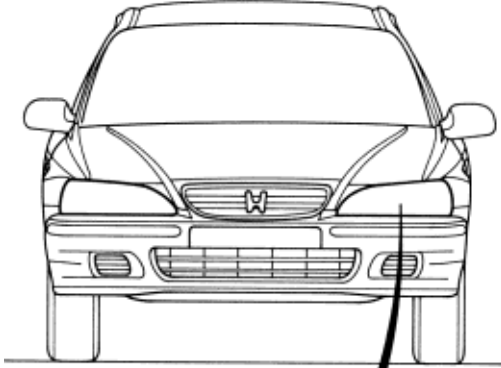


CAUTION

Headlights become very hot in use; do not touch them or attaching hardware immediately after they have been turned off.

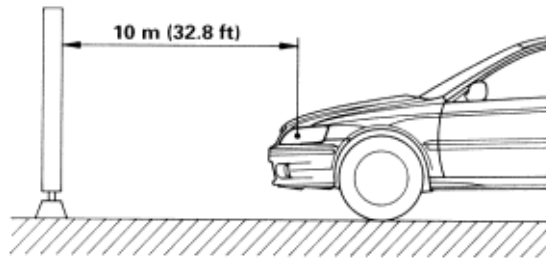
Before adjusting the headlights:

- Park the vehicle on level ground.
- Make sure the tyre air pressure is correct.
- The driver or someone who weighs the same should sit in the driver's seat.

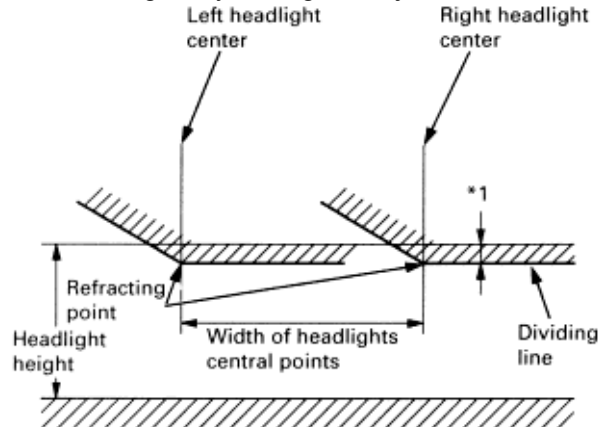


HEADLIGHT (LOW BEAM)
CENTRAL POINT

1. Set the vehicle in front of the screen as shown below.



2. Turn the headlights low beam on, and adjust the headlights by turning the adjusters.



- *1 130 mm (5.1 in): Fuel full
150 mm (5.9 in): Fuel empty



WARNING

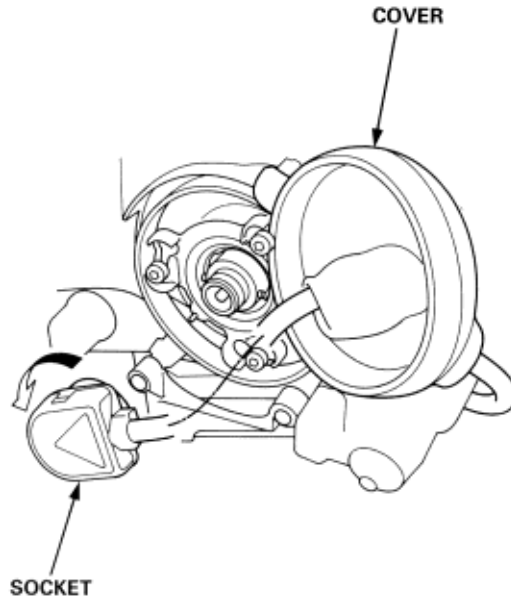
A transient high tension (25,000 V) occurs at the bulb sockets of the high intensity discharged (HID) lamps when the combination light switch is turned ON. It may cause serious electrical shock or electrocution if you do not observe the cautions.



CAUTION

- ♦ Never turn on the combination light switch before fitting the HID bulbs to their bulb sockets and completing the assembly of their headlight assembly.
- ♦ Do not service the headlights assembly in wet conditions, such as rain or snow, near a sprinkler system, or when your hands are wet to prevent electrocution.
- ♦ Do not touch the surface of the HID bulbs with your bare hands and do not stain it with any oils and fats.
- ♦ Do not disassemble the ballast unit.
- ♦ Do not turn on the HID bulb by using power source other than the battery mounted on your vehicle.

1. Combination light switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable.
3. Remove the screw from the caution label.
4. Remove the Torx bolt, then turn over the cover from the headlight assembly.
5. Turn the socket 45° counterclockwise to remove it from the bulb.

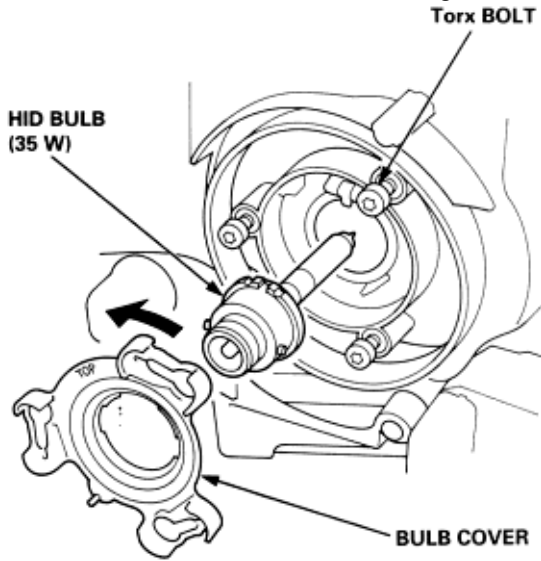


Headlights

HID Bulb Removal (cont'd)

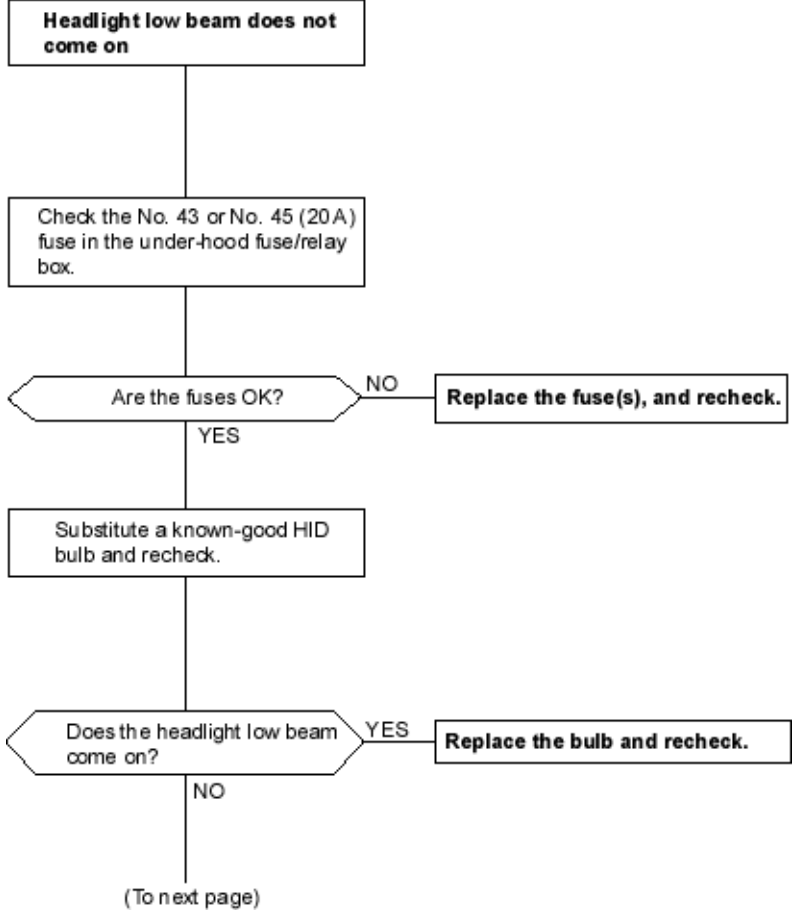
23-D-11

6. Loosen the three Torx bolts.
7. Turn the socket 45° counterclockwise to remove it from the headlight assembly.
8. Remove the bulb from the headlight assembly.



9. Install the new bulb in the reverse order of removal.

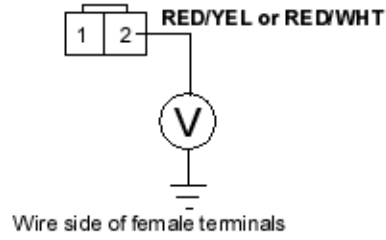
⚠ CAUTION
Never turn on the combination light switch before fitting the HID bulbs to their bulb sockets and completing the reassembly of their headlight assembly.



(From previous page)

Check for an open in the wire:
 1. Disconnect the 2P connector from the headlight (ballast unit).
 2. Turn the combination light switch ON.
 3. Measure voltage between the No. 2 terminal of the headlight 2P connector and body ground.

HEADLIGHT 2P CONNECTOR



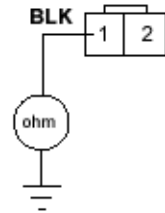
Is there battery voltage?

NO

- Faulty headlight relays.
- An open in the wire between the headlight and under-hood fuse/relay box.

YES

Check for an open in the ground wire:
 1. Turn the combination light switch OFF.
 2. Check for continuity between the No. 1 terminal of the headlight 2P connector and body ground.



Is there continuity?

NO

- An open in the wire.
- Poor ground G201 and G301.

YES

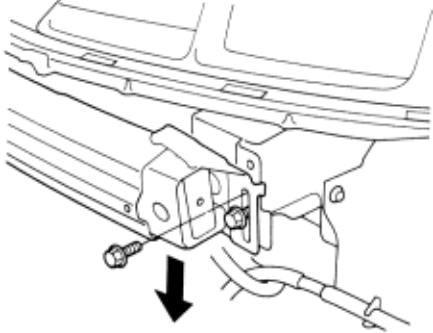
Substitute a known-good ballast unit and recheck. If the symptom/indication goes away, replace the original ballast unit.



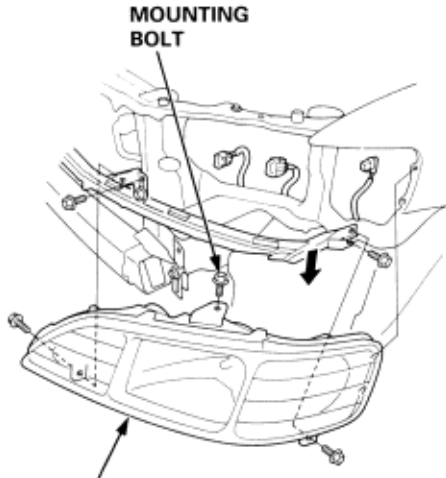
CAUTION

Headlights become very hot in use; do not touch them or attaching hardware immediately after they have been turned off.

1. Remove the front bumper (see section 20).
2. Remove the front bumper beam upper mounting bolt and loosen the front bumper beam lower mounting bolt (see section 20).



3. Disconnect each connector and remove the mounting bolts, then remove the headlight assembly.

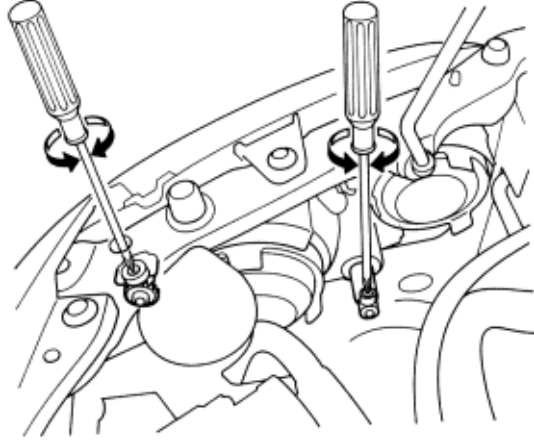


**HEADLIGHT/FRONT PARKING LIGHT/
TURN SIGNAL LIGHT ASSEMBLY**

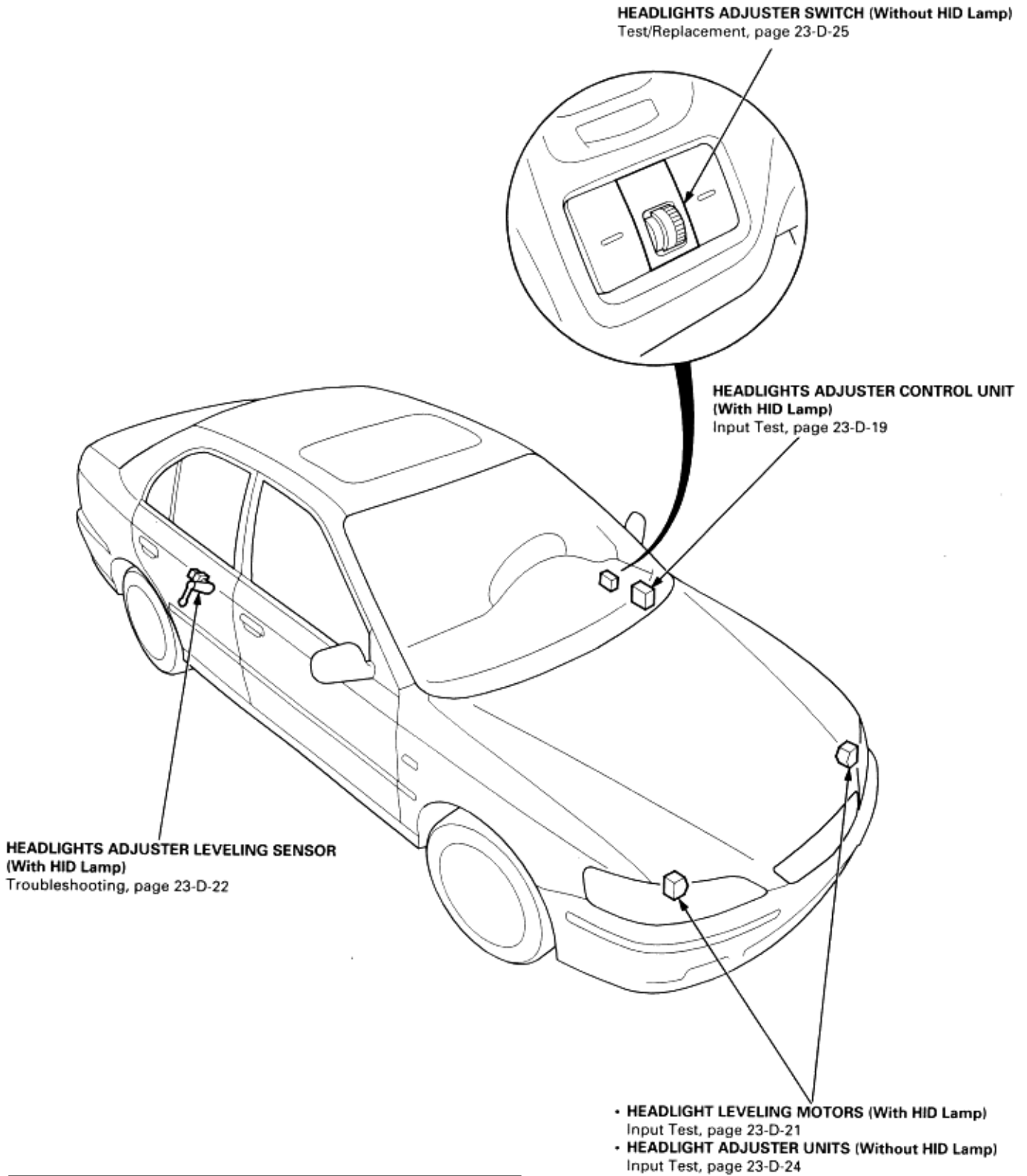
- HEADLIGHT: 55/35 W (with HID lamp)
55/55 W (without HID lamp)
- FRONT PARKING LIGHT : 5 W
- TURN SIGNAL LIGHT : 21 W

4. Install the headlight in the reverse order of removal.
5. After installing, adjust the headlights (see page 23-D-9).

NOTE: As the outer lenses are made of an acrylic-coated, polycarbonated material, do not cover the headlights when they are turned on.



NOTE: LHD type is shown, RHD type is similar.



To go to the pages referenced on the diagram above,
click on the following:

- (See Page 23-D-25)
- (See Page 23-D-19)
- (See Page 23-D-21)
- (See Page 23-D-22)
- (See Page 23-D-24)

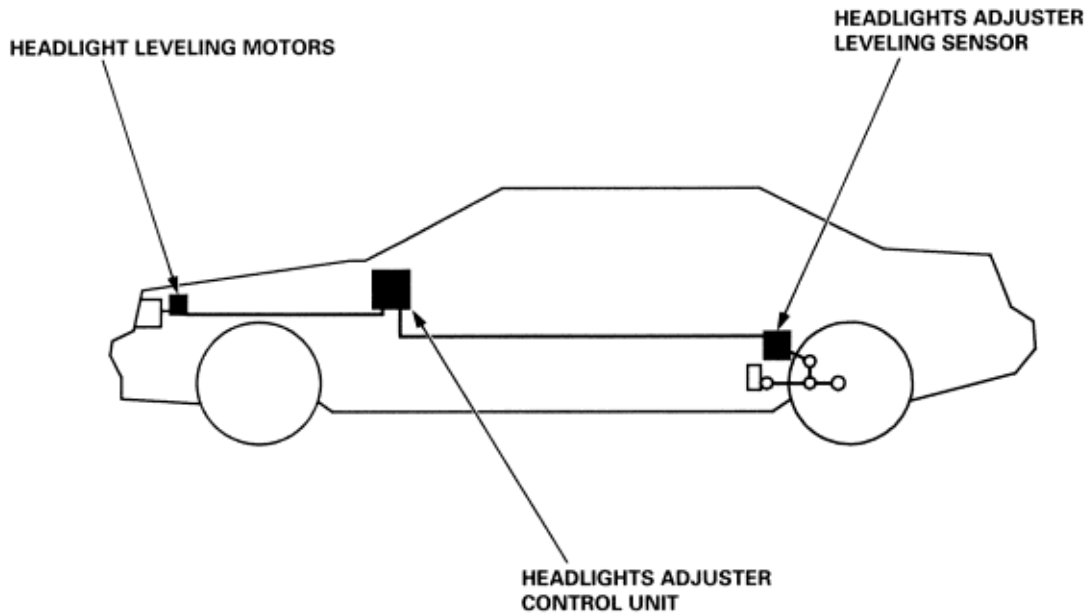
Headlights Adjuster Description

23-D-16

The automatic headlights adjuster system is composed of the headlights adjuster control unit, headlights adjuster levelling sensor, and left and right headlight levelling motors.

The system detects the vehicle posture every three minutes during running constantly with the headlight switch ON, and after eight seconds when the vehicle has stopped running with the ignition switch ON (II) and headlight switch ON.

If the vehicle posture has been changed, the headlight vertical position is automatically adjusted .



Headlights Adjuster Levelling Sensor:

The headlights adjuster levelling sensor is located between right rear suspension sub-frame and the right side control arm connected by the shaft, and detects the vehicle posture and sends a voltage signal (approximately 0.4 V to 4.6 V) to the headlights adjuster control unit.

Headlights Adjuster Control Unit:

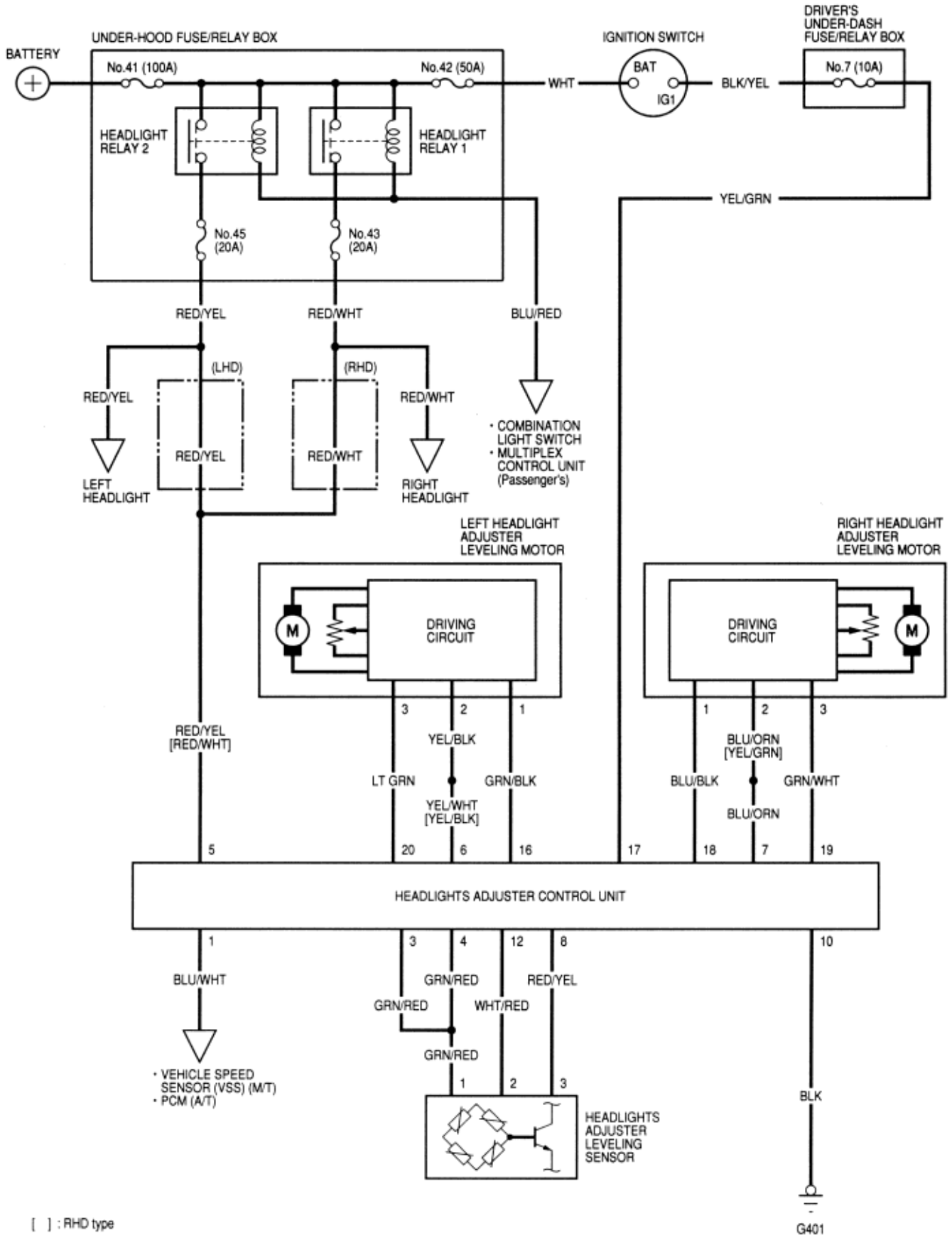
The headlights adjuster control unit is located in the driver's dashboard lower cover. The headlights adjuster control unit sends a voltage signal (approximately 2 V to 11 V) that is based on the voltage signal from the sensor to the left and right headlight levelling motors.

Headlight Levelling Motor:

The headlight levelling motor is located behind the left and right headlights and adjusts the headlights vertical position by receiving the voltage signal (approximately 2 V to 11 V) from the headlights adjuster control unit.

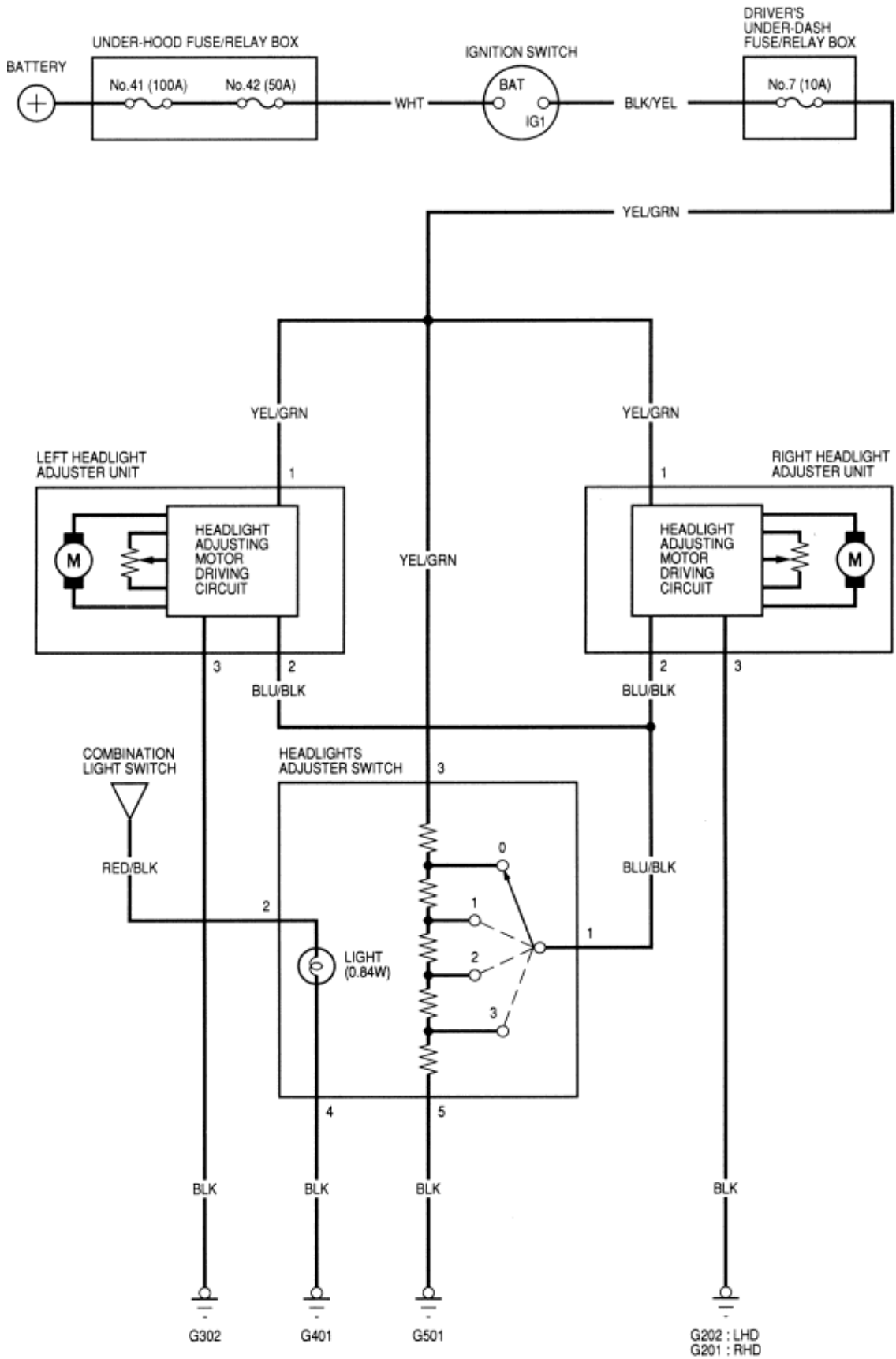
Headlights Adjuster
Circuit Diagram (With HID Lamp)

23-D-17



Headlights Adjuster
Circuit Diagram (Without HID Lamp)

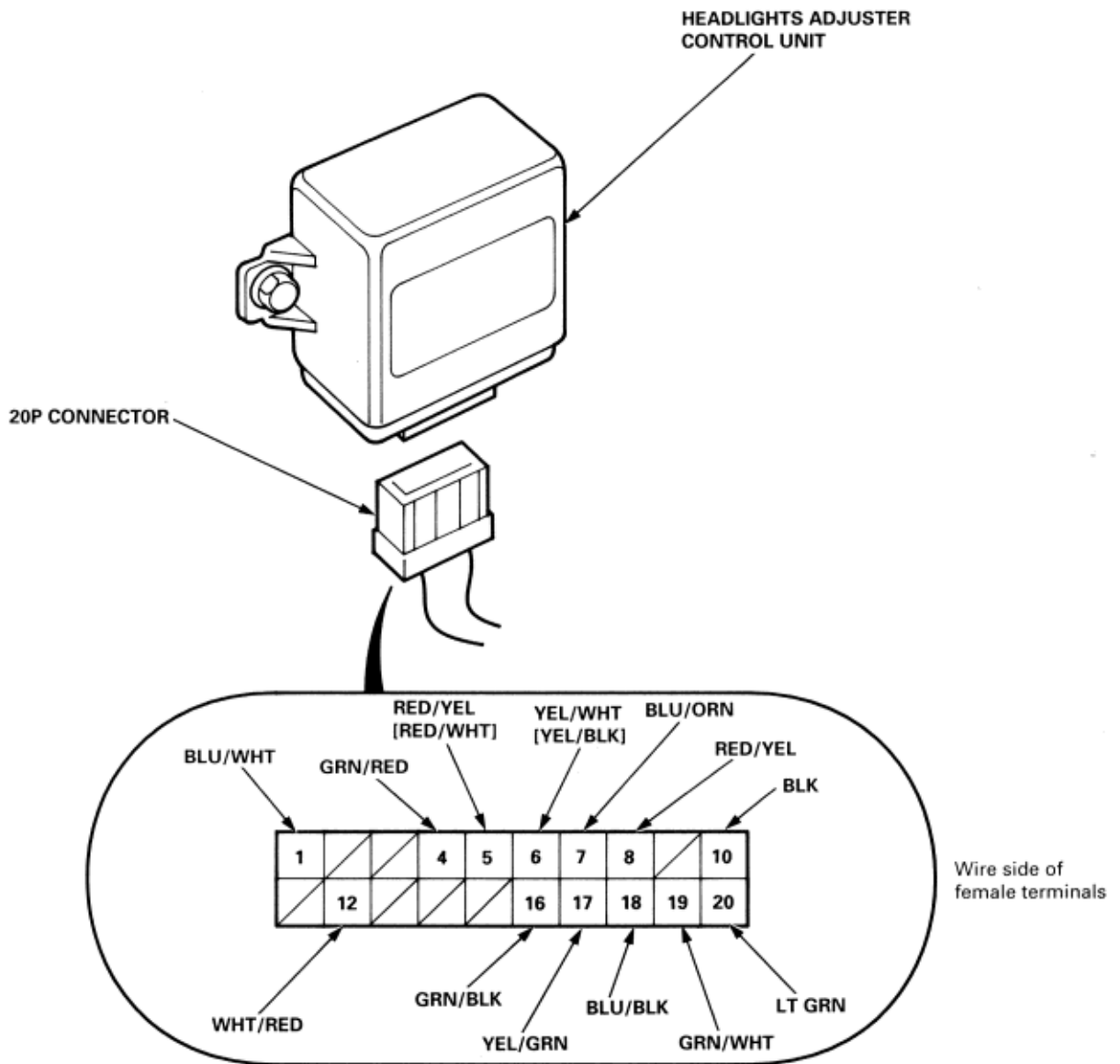
23-D-18



Headlights Adjuster Control Unit Input Test (With HID Lamp)

23-D-19

1. Remove the dashboard lower cover (see section 20).
2. Disconnect the 20P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty, replace it.



[]: RHD type

Headlights Adjuster**23-D-20****Control Unit Input Test (With HID Lamp) (cont'd)**

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
17	YEL/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 7 (10A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
5	RED/YEL [RED/WHT]	Headlights switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 45 (20A) [No 43 (20A)] fuse in the under-hood fuse/relay box. ♦ Faulty headlight relay 2 [1] ♦ An open in the wire
10	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire

Reconnect the 20P connector to the unit

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
12	WHT/RED	Ignition switch ON (II) and headlights switch ON	Check for voltage to ground: There should be 5V.	<ul style="list-style-type: none"> ♦ Faulty headlights adjuster control unit ♦ An open in the wire
8	RED/YEL	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
3 and 4	GRN/RED	Ignition switch ON (II), headlights switch ON and change the vehicle level from high to low*1	Check for voltage to ground: Voltage should change within approx. 0.4 to 4.5V.	<ul style="list-style-type: none"> ♦ Faulty headlights adjuster levelling sensor ♦ An open in the wire
16	GRN/BLK	Ignition switch ON (II) and headlights switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Faulty left headlight levelling motor ♦ An open in the wire
18	BLU/BLK	Ignition switch ON (II) and headlights switch ON.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Faulty right headlight levelling motor ♦ An open in the wire
19	GRN/WHT	Ignition switch ON (II)	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
20	LT GRN	Ignition switch ON (II),	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
6	YEL/WHT [YEL/BLK]	Ignition switch ON (II), headlights switch ON and change the vehicle level and hold for about ten seconds in each level position*1	Check for voltage to ground: Voltage should change in each level position within approx. 2V to 11V (headlights levelling motors should run)	<ul style="list-style-type: none"> ♦ Faulty left headlight levelling motor ♦ An open in the wire
7	BLU/ORN	Ignition switch ON (II), headlights switch ON and change the vehicle level and hold for about ten seconds in each level position*1	Check for voltage to ground: Voltage should change in each level position within approx. 2V to 11V (headlights levelling motors should run)	<ul style="list-style-type: none"> ♦ Faulty right headlight levelling motor ♦ An open in the wire

[]: RHD type

*1: You can test by removing the headlights adjuster levelling sensor mounting nut from the control arm and moving the shaft.

Headlights Adjuster

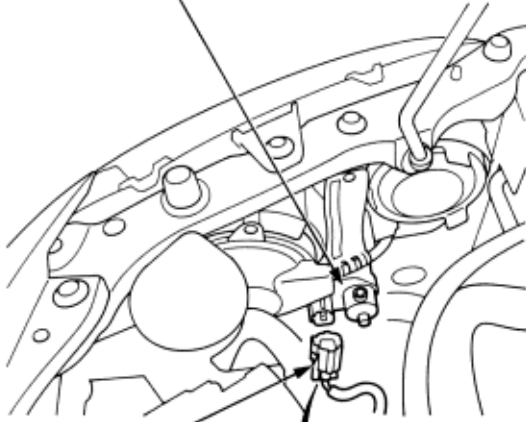
Headlight Levelling Motor Input Test

23-D-21

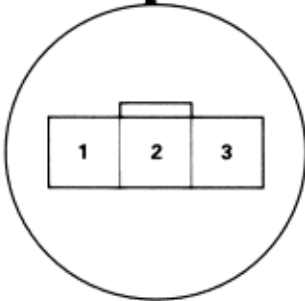
NOTE: Before testing, check for:

- a blown No.43 (20 A) or No.45 (20 A) fuse in the under-hood fuse/relay box, or
 - a blown No.7 (10 A) fuse in the drivers under-dash fuse/relay box, or
 - bent, loose, or corroded terminals.
1. Disconnect the 3P connector from the each headlight levelling motor.

HEADLIGHT LEVELLING MOTOR



3P CONNECTOR



Wire side of female terminals

2. Check for voltage between the No.1 terminal and body ground with the ignition switch ON (II). There should be battery voltage.
 - ♦ If there is no voltage, check for an open in the GRN/BLK [BLU/BLK] wire.
 - ♦ If there is battery voltage, go to step 3.

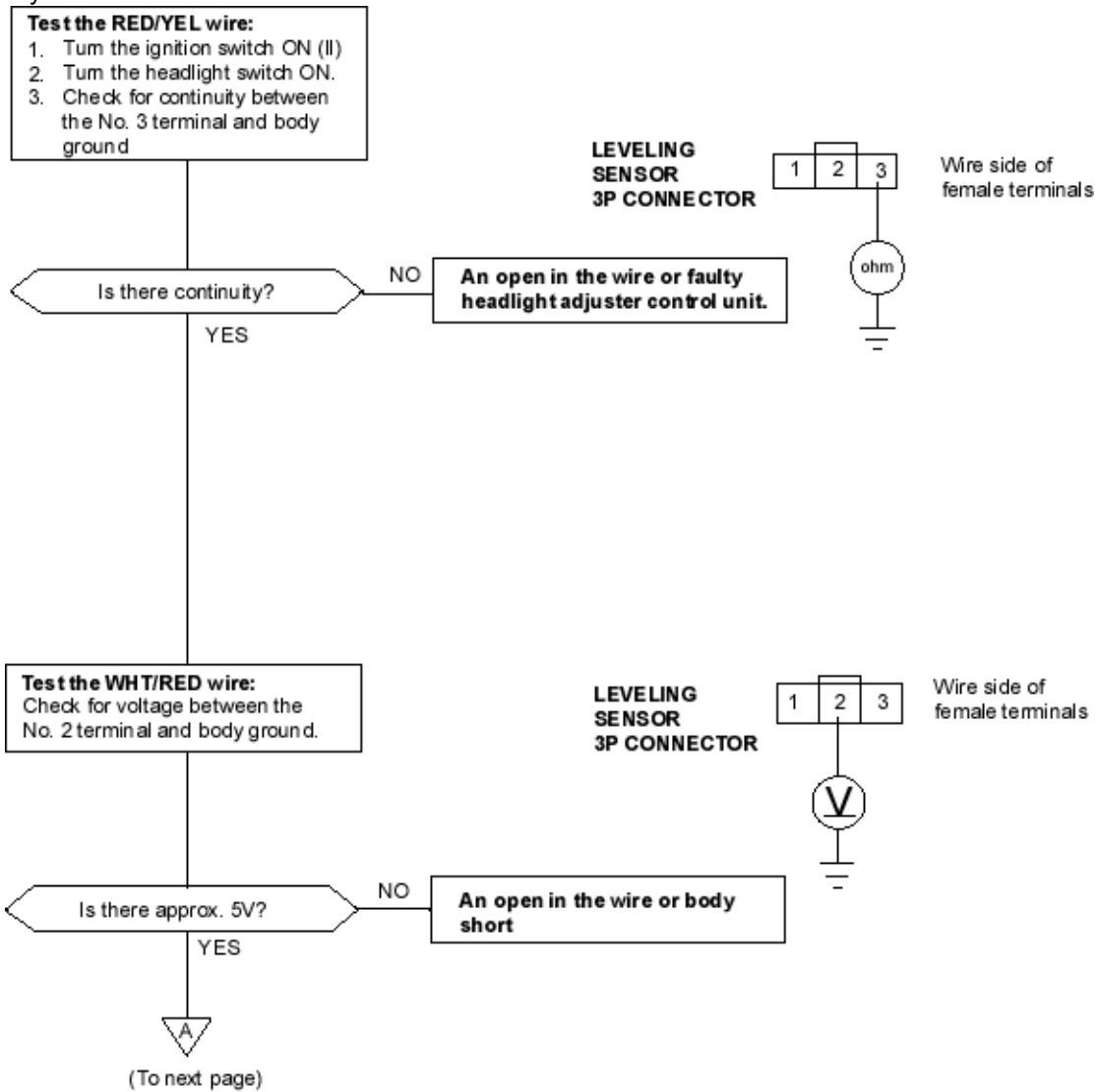
3. Check for continuity between the No.3 terminal and body ground. There should be continuity.
 - ♦ If there is no continuity, check for:
 - an open in the LT GRN [GRN/WHT] wire, or
 - a faulty headlights levelling motor.
 - ♦ If there is continuity, go to step 4.
4. Disconnect the 20P connector from the headlights adjuster control unit.
5. Check for continuity between the No.2 terminal of the left [right] headlight levelling motor and No.6 [No.7] terminal of the headlights adjuster control unit 20P connector. There should be continuity.
 - ♦ If there is no continuity, check for an open in the wire.
 - ♦ If there is continuity, go to step 6.
6. If all tests are normal, but the headlight does not work, check for frozen, stuck or improperly installed headlight levelling motor. If the mechanical check is OK, replace the headlight levelling motor and housing assembly.
7. After installing, recheck the system.
[]: Right headlight levelling motor.

Headlights Adjuster

Headlights Adjuster Levelling Sensor Troubleshooting (With HID Lamp)

23-D-22

Before testing, inspect No. 45 (20 A) [No. 43 (20 A)] fuse in the under-hood fuse/relay box and No. 7 (10 A) fuse in the driver's under-dash fuse/relay box.



Headlights Adjuster

Headlights Adjuster Levelling Sensor

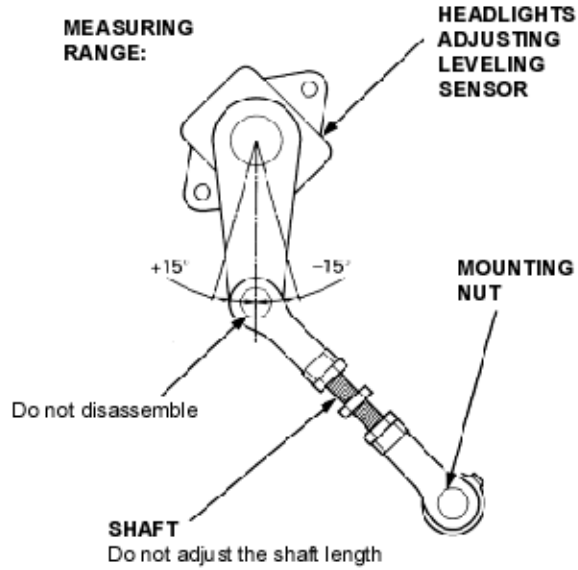
Troubleshooting (With HID Lamp) (cont'd)

23-D-23

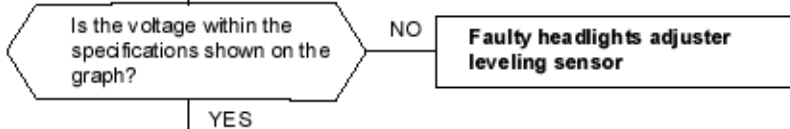
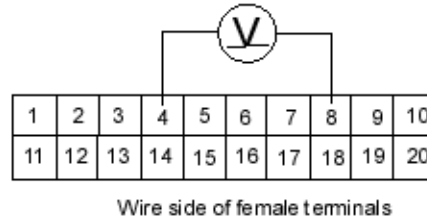
(From previous page)

Test the GRN/RED wire:

1. Raise the vehicle, and make sure it is securely supported.
2. Remove the headlights adjuster leveling sensor mounting nut from the control arm, and make the shaft move free.
3. Measure the voltage between the No. 4 and No. 8 terminals by moving the shaft slowly.

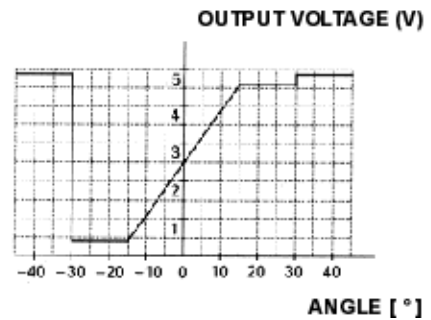


HEADLIGHTS ADJUSTER CONTROL UNIT 20P CONNECTOR



Faulty headlights adjuster leveling sensor

Check the headlights adjuster control unit.



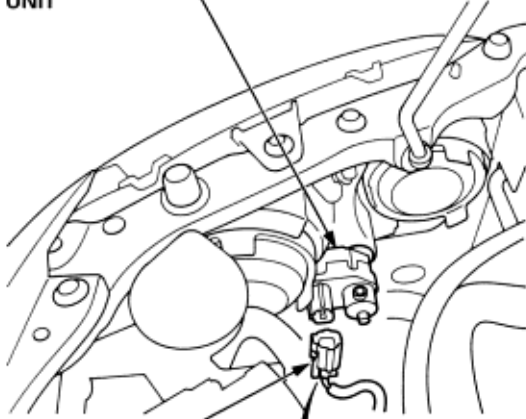
Without HID lamp:

NOTE: Before testing, check for:

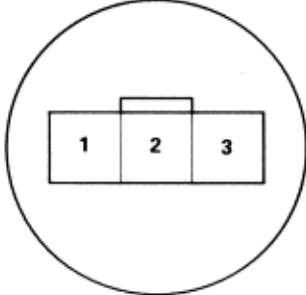
- a blown No.7 (10 A) fuse in the drivers under-dash fuse/relay box, or
- bent, loose, or corroded terminals.

1. Disconnect the 3P connector from the each headlight adjuster unit.

HEADLIGHT ADJUSTER UNIT



3P CONNECTOR



Wire side of female terminals

2. Check for voltage between the No.1 terminal and body ground with the ignition switch ON (II). There should be battery voltage.
 - ♦ If there is no voltage, check for an open in the YEL/GRN wire.
 - ♦ If there is battery voltage, go to step 3.

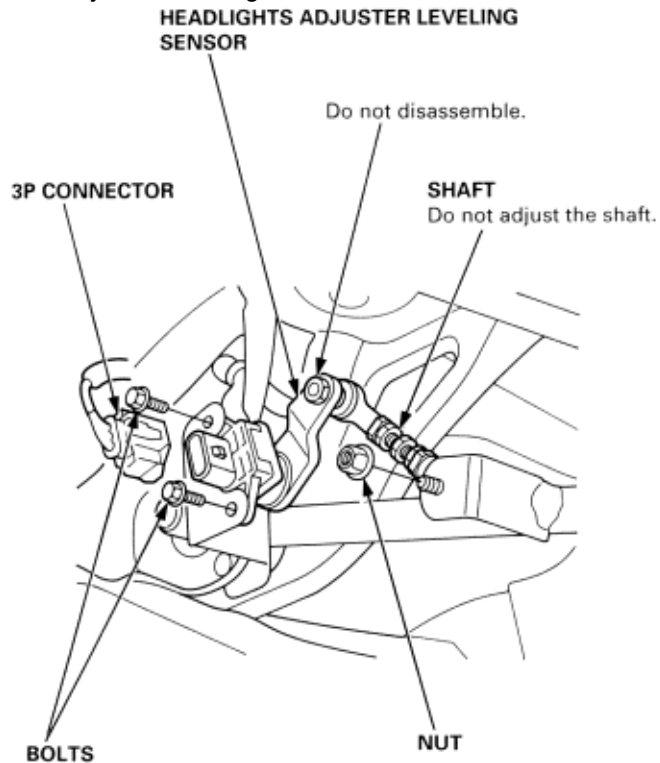
3. Check for continuity between the No.3 terminal and body ground. There should be continuity.
 - ♦ If there is no continuity, check for:
 - an open in the BLK wire, or
 - poor ground (G202, G302 [G201, G302]).
 - ♦ If there is continuity, go to step 4.
4. Using an ohmmeter, measure resistance between the No.2 terminal and body ground in position "0" of the headlight adjuster switch. There should be approximately 4,000 ohms.
 - ♦ If resistance is not within specification, check for:
 - open in the BLU/BLK wire, or
 - faulty headlight adjuster switch.
 - ♦ If resistance is within specification, go to step 5.
5. If all tests are normal, but the headlight adjuster unit does not work, check for frozen, stuck or improperly installed headlight adjuster unit. If the mechanical check is OK, replace the headlight adjuster unit and housing assembly.
6. After installing, recheck the system.
[]: RHD type.

Headlights Adjuster

Headlight Adjuster Levelling Sensor Replacement (With HID Lamp)

Replacement (With HID Lamp)

1. Raise the vehicle and support it with safety stands in proper location (see section 1).
2. Disconnect the 3P connector from the headlights adjuster levelling sensor.



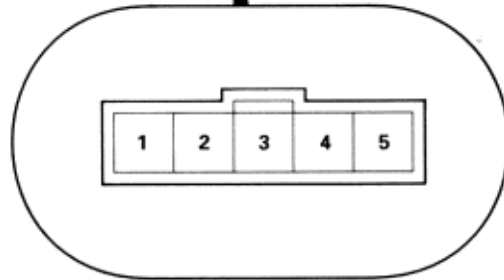
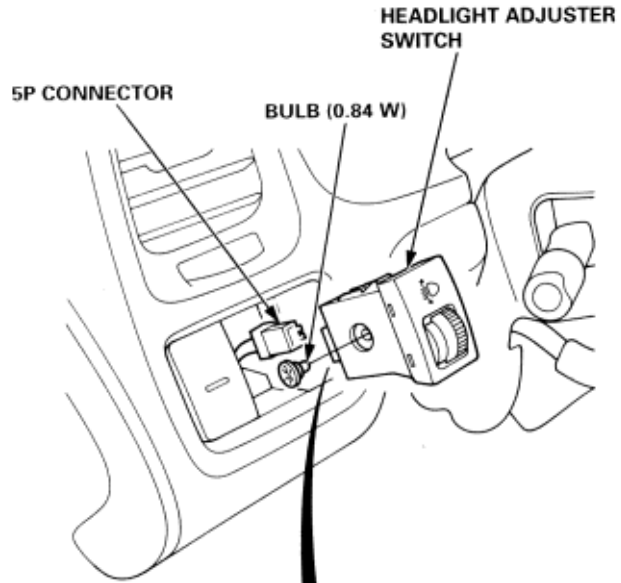
3. Remove the two mounting bolts and nut from the sensor
4. Install in the reverse order of removal.

NOTE: When installing, do not adjust the shaft.

23-D-25

Switch Test/Replacement (Without HID Lamp)

1. Remove the dashboard lower cover (see section 20).
2. Carefully push the switch out from behind the dashboard.



Terminal side
of male terminals

3. Disconnect the 6P connector from the switch.
4. Measure resistance between the No.3 and No.5 terminals and No.1 and No.3 terminals at positions 0, 1, 2 and 3 by moving the knob.

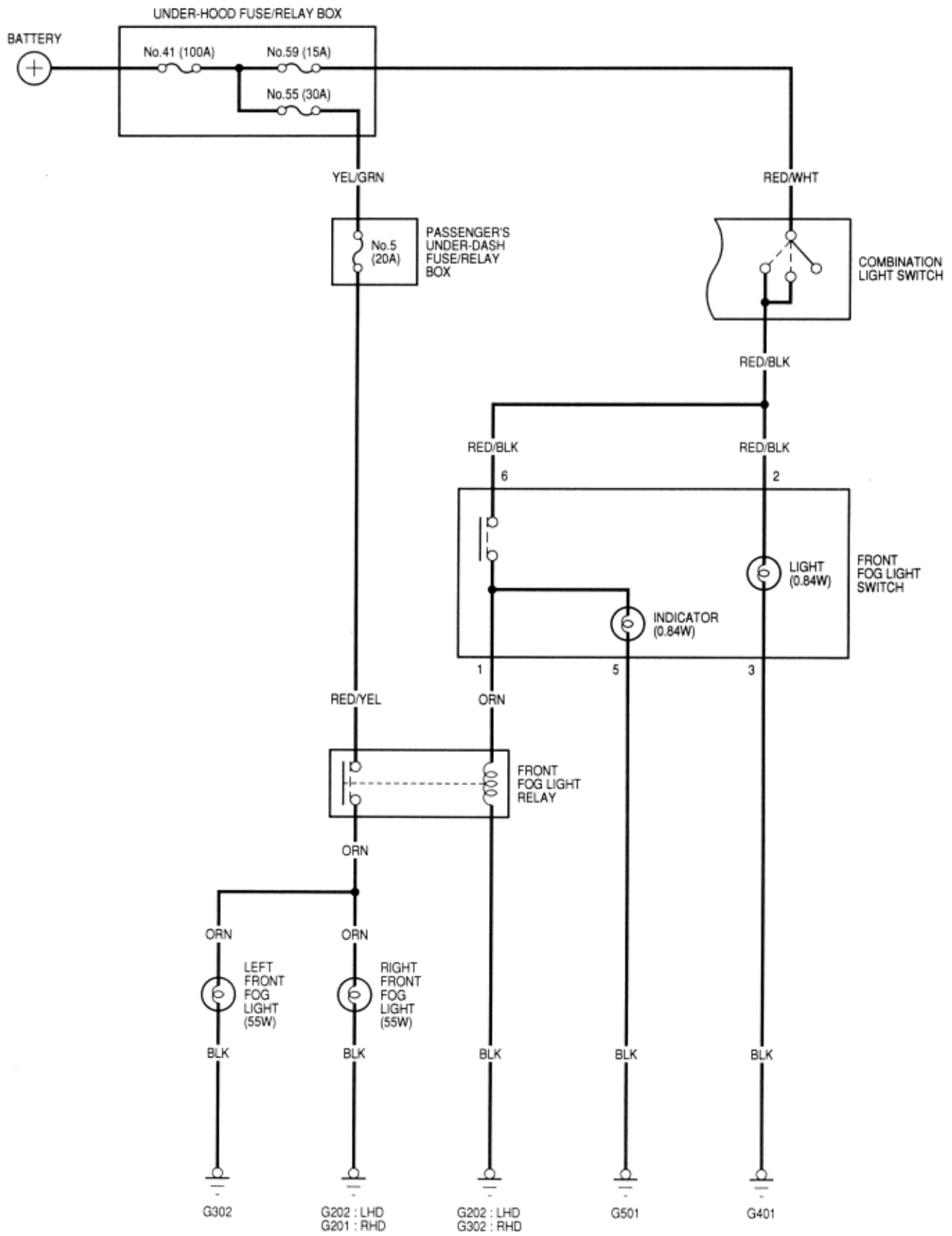
Between No.3 and No.5 terminals: Approx. 4.7 k ohm

Between No. 1 and No.3 terminals:

Knob position	0	1	2	3
Resistance [Approx. (k ohms)]	0.7	1.4	1.7	2.2

Front Fog Lights
Circuit Diagram

23-D-26

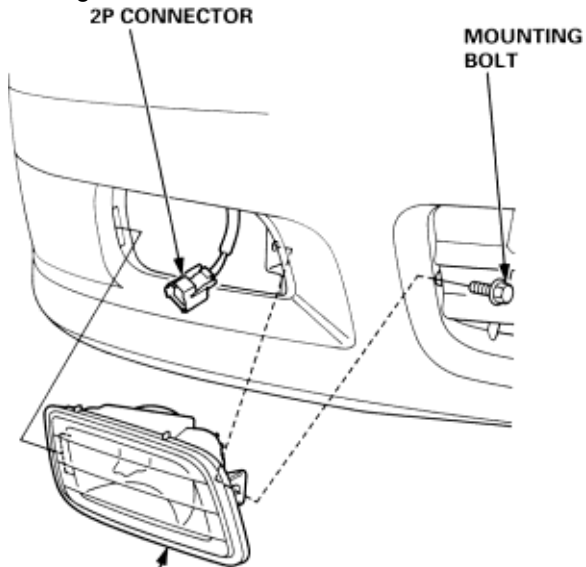


Front Fog Lights Replacement

23-D-27

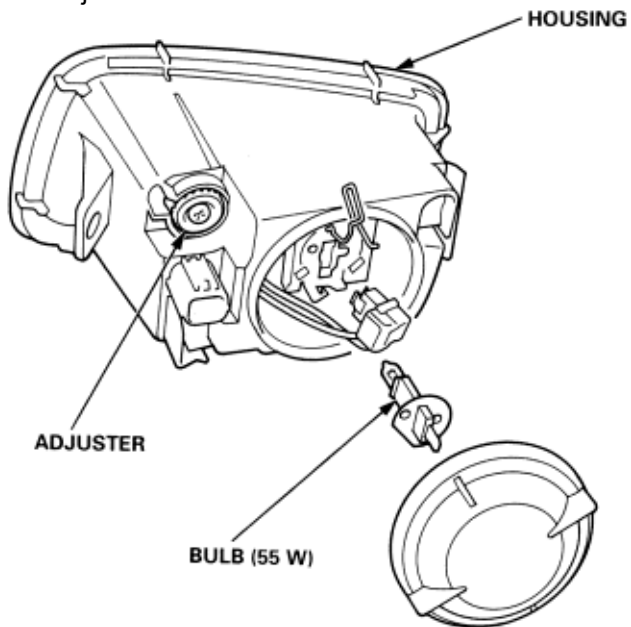
Switch Test

1. Remove the mounting bolt.
2. Disconnect the 2P connector, and remove the front fog light.

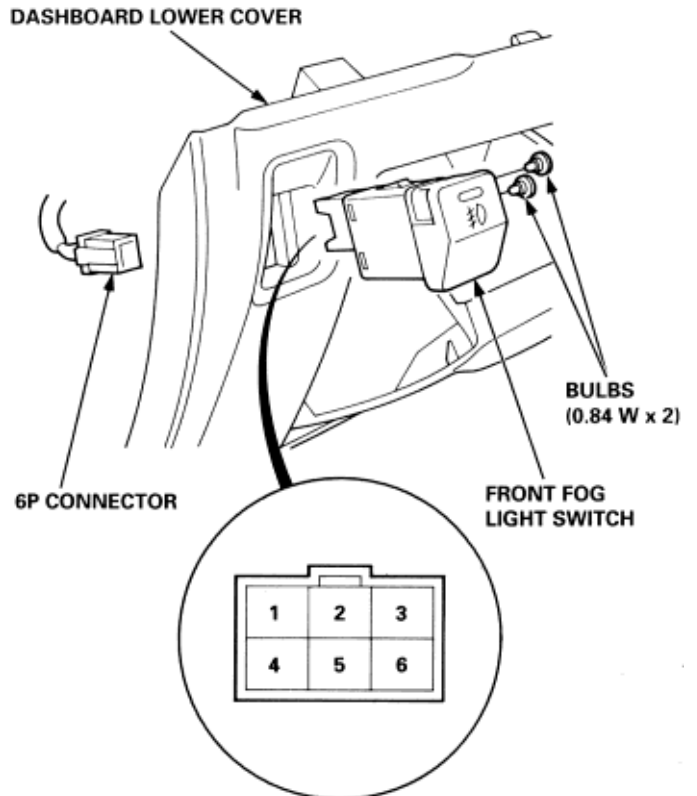


FRONT FOG LIGHT

3. Adjust the fog lights to local requirement by turning the adjusters.



1. Carefully push the switch out from behind the dashboard lower cover.



6P CONNECTOR

FRONT FOG LIGHT SWITCH

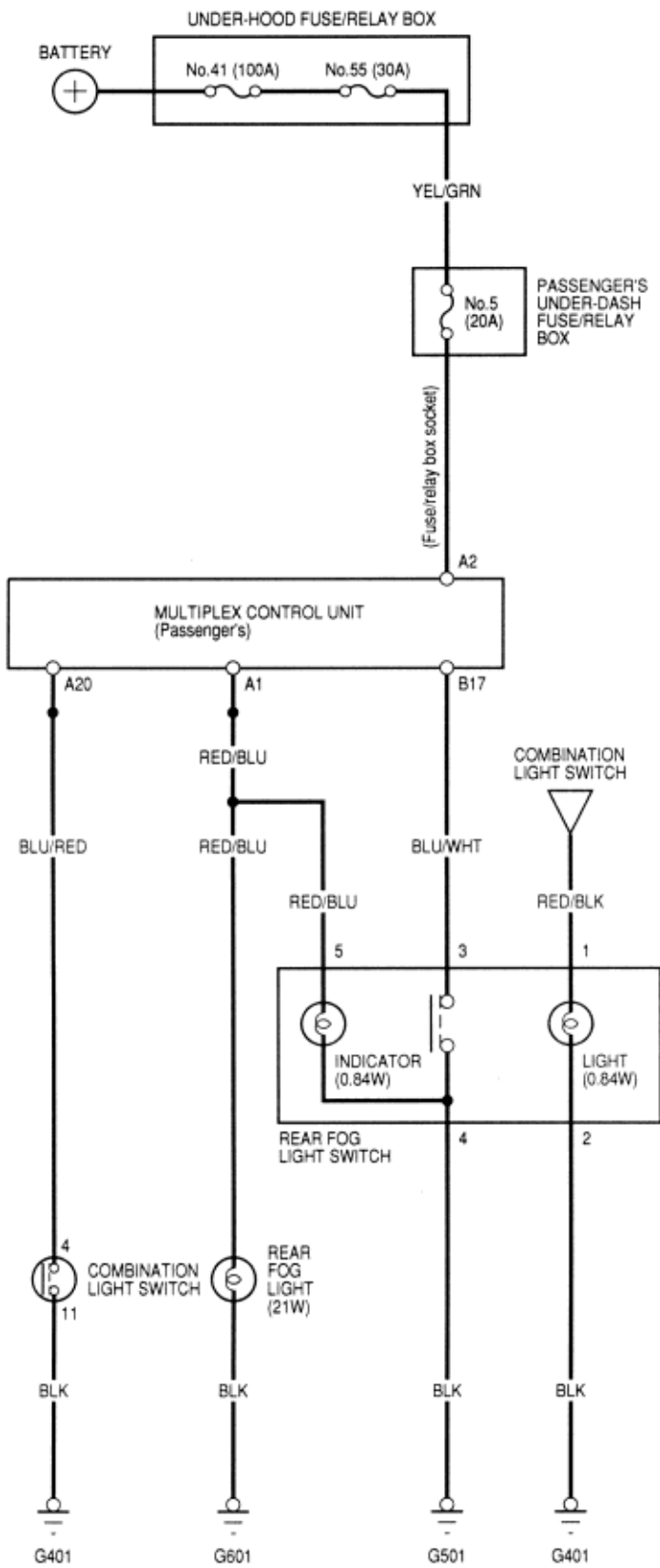
2. Disconnect the 6P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table below.

Terminal	1	5	6	2	3
Position					
OFF	○	⊕	○	○	⊕
ON	○	⊕	○	○	⊕

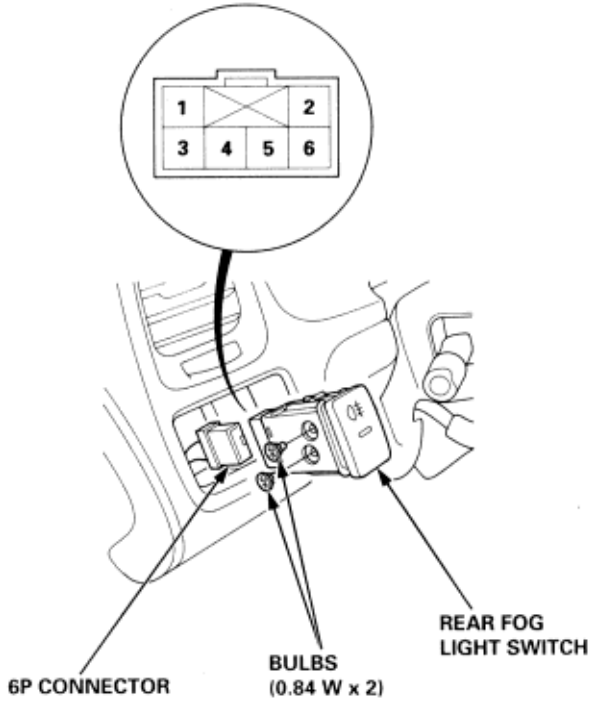
Rear Fog Light Circuit Diagram

23-D-28

Switch Test



1. Remove the dashboard lower cover (see section 20).
2. Carefully push the switch out from behind the dashboard.
NOTE: LHD type is shown, RHD type is similar.



3. Disconnect the 6P connector from the switch.
4. Check for continuity between the terminals in each switch position according to the table below.

Terminal	1	2	3	4	5
Position					
OFF	○	⊕	○	○	⊕
ON	○	⊕	○	○	⊕

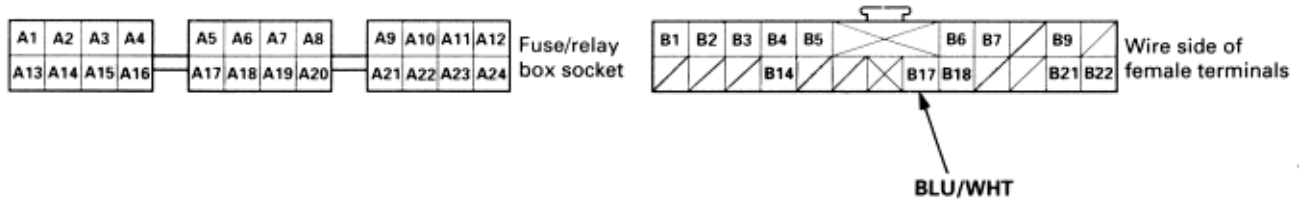
**Rear Fog Light
Control Unit Input Test**

23-D-29

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Passenger's):

1. Remove the passenger's under-dash fuse/relay box (see page 23-B-7).
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



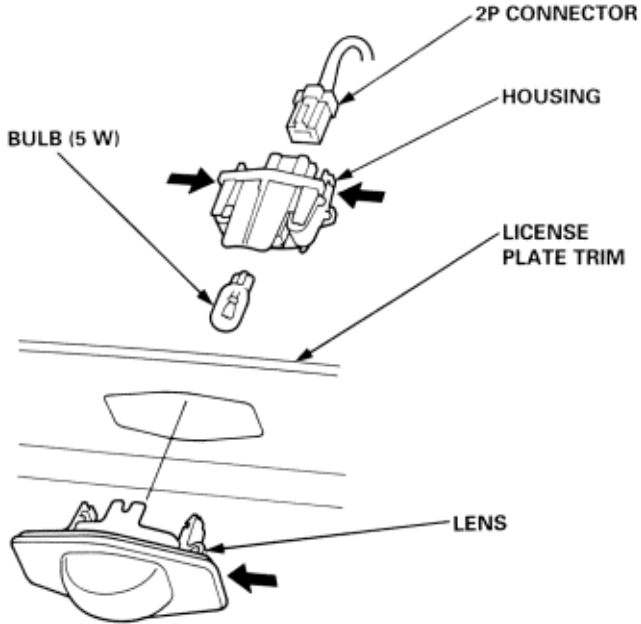
Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Blown bulb ♦ Poor ground (G601) ♦ An open in the wire
A2	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 5 (20A) fuse in the passenger's fuse/relay box.
A20	Fuse/relay box socket	Combination light switch ON	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty lighting switch ♦ Poor ground (G401) ♦ An open in the wire
B17	BLU/WHT	Rear fog light switch ON	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty rear fog light switch ♦ Poor ground (G501) ♦ An open in the wire

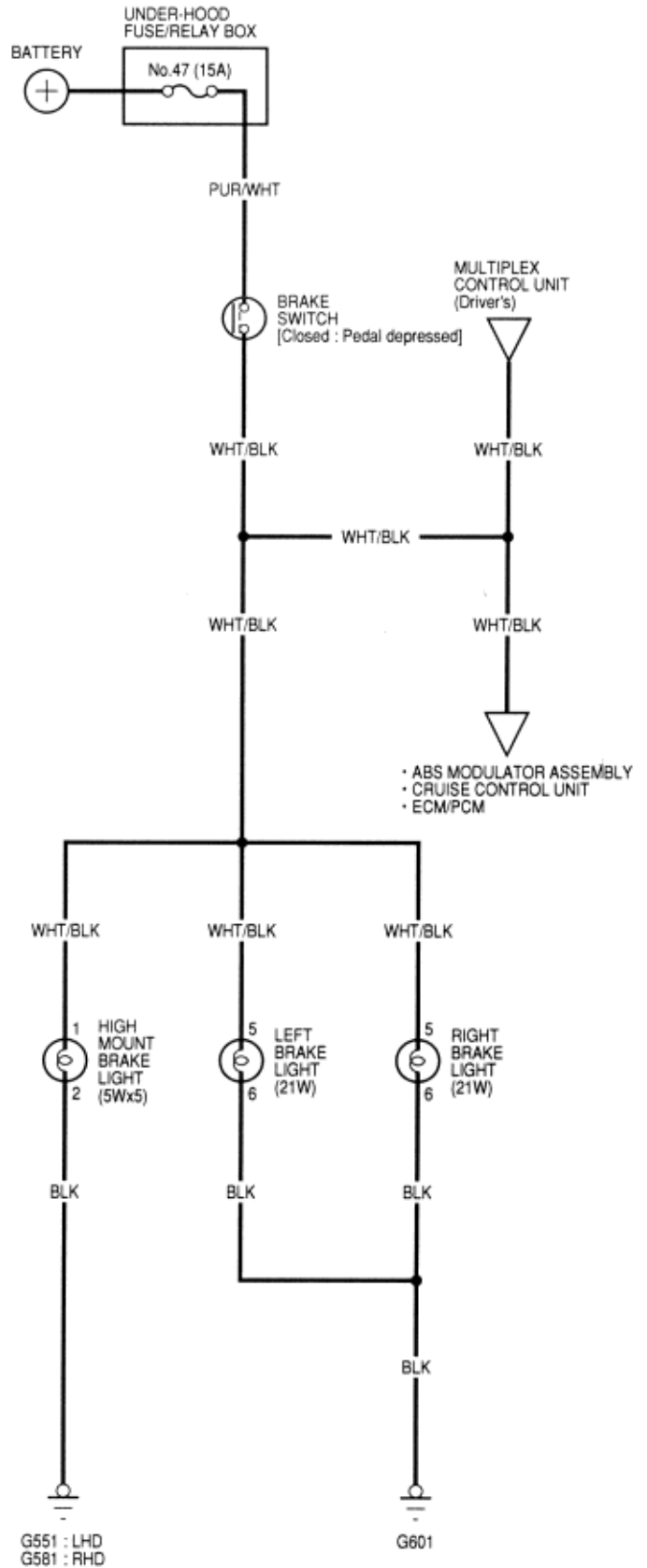
License Plate Lights Replacement

23-D-30 Brake Lights Circuit Diagram

1. Remove the license plate trim (see section 20).
2. Disconnect the 2P connector from the license plate light.



3. Separate the lens and housing.
NOTE: The bulb alone can be replaced by removing the light housing from inside of the trunk lid without removing the license plate trim.

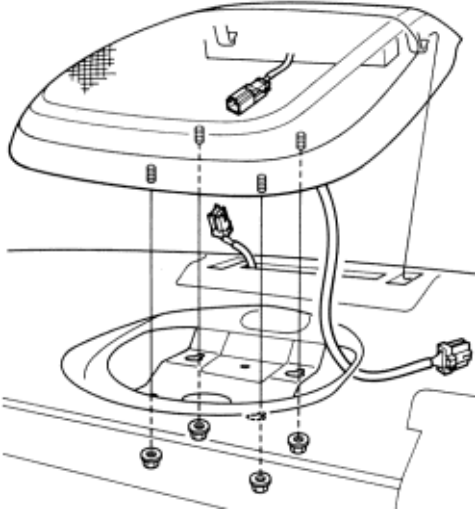


High Mount Brake Light Replacement

23-D-31

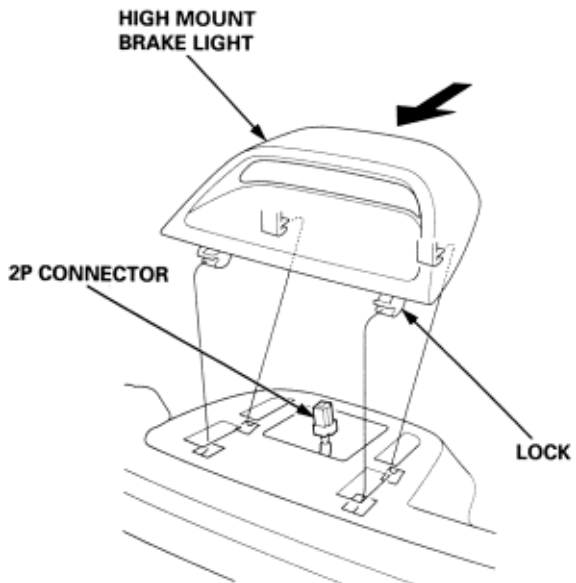
With BOSE sound system:

1. Remove the woofer speaker (see page 23-F-15).
2. Disconnect the 2P connector and remove the high mount brake light from the rear shelf.

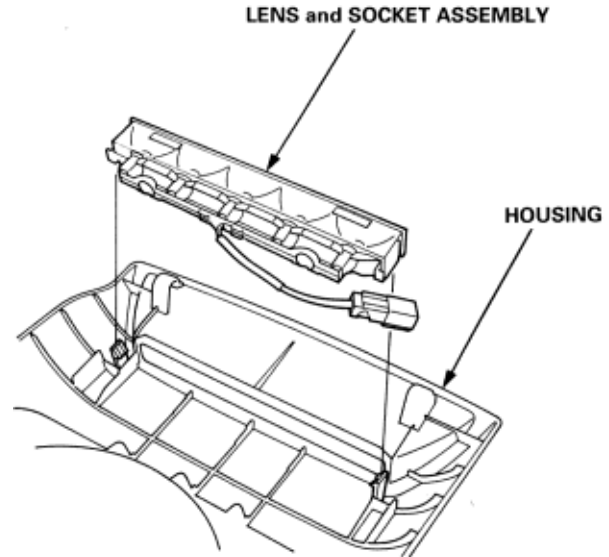


Without BOSE sound system:

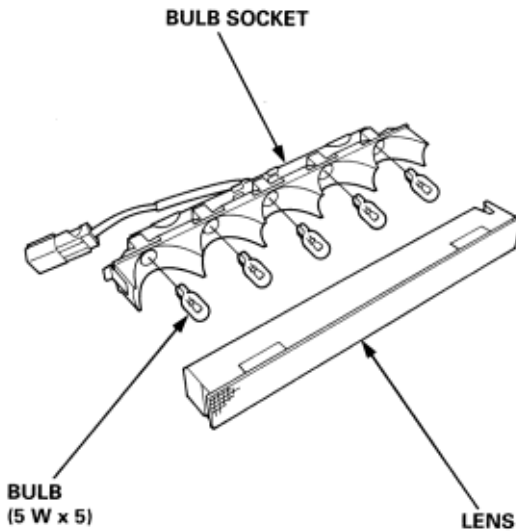
1. Push the light to take off the lock.
2. Pull the high mount brake light out, then disconnect the 2P connector from the light.



3. Remove the lens and socket assembly from the housing.



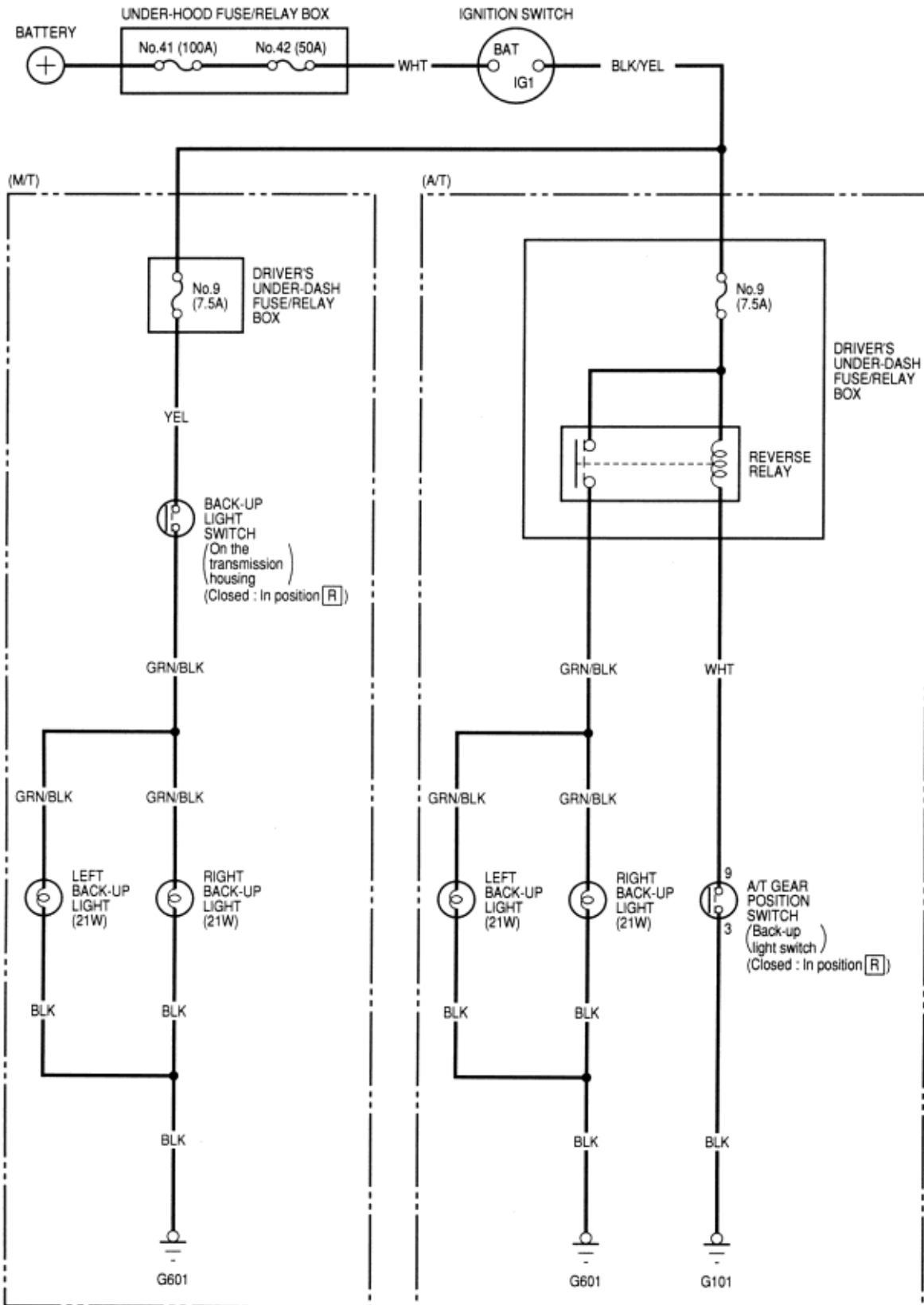
4. Separate the bulb socket and lens, and replace the bulb.



5. Clean the rear window glass, and install the light in the reverse order of removal.

Back-up Lights
Circuit Diagram

23-D-32



Side Turn Signal Lights Replacement

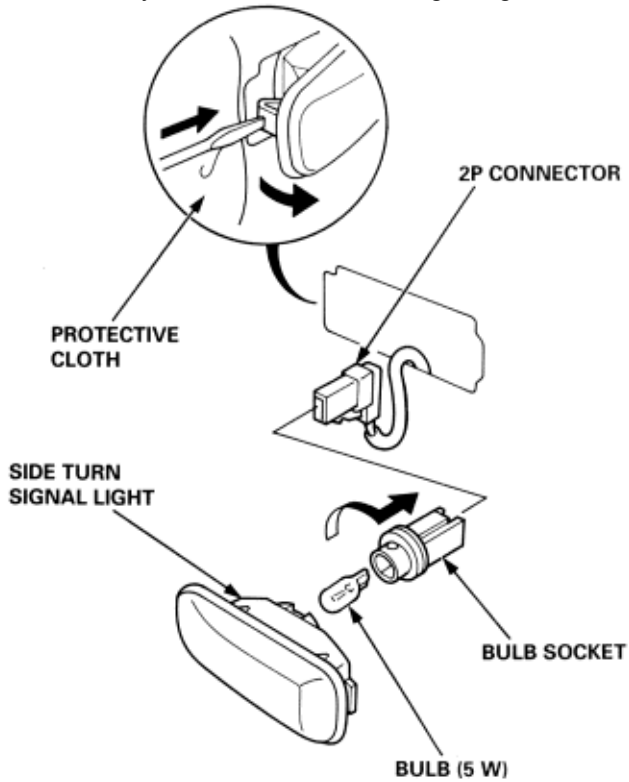
23-D-33 Taillights Replacement



CAUTION

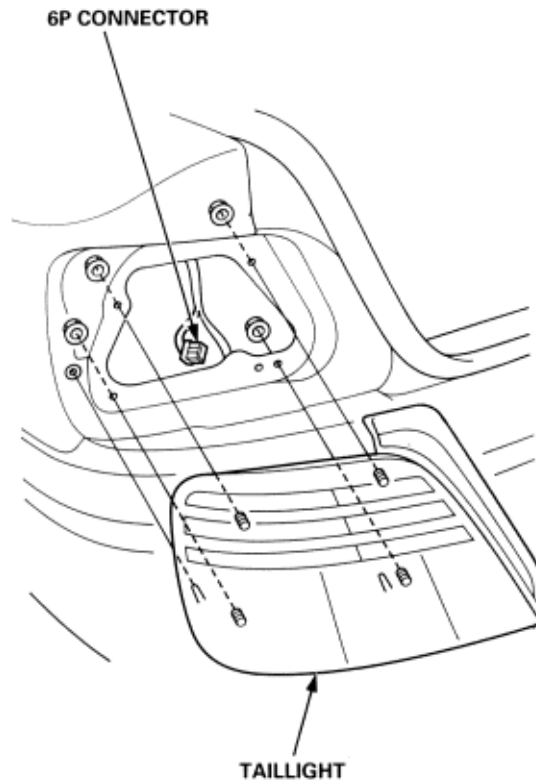
Be careful not to damage the front fender.

1. Carefully remove the side turn signal light.



2. Disconnect the 2P connector from the bulb socket.
3. Turn the bulb socket 45° counterclockwise to remove it from its housing.
4. Remove the bulb from the bulb socket.

1. Open the trunk lid and pull back the trunk side trim (see section 20).
2. Disconnect the 6P connector from the taillight.



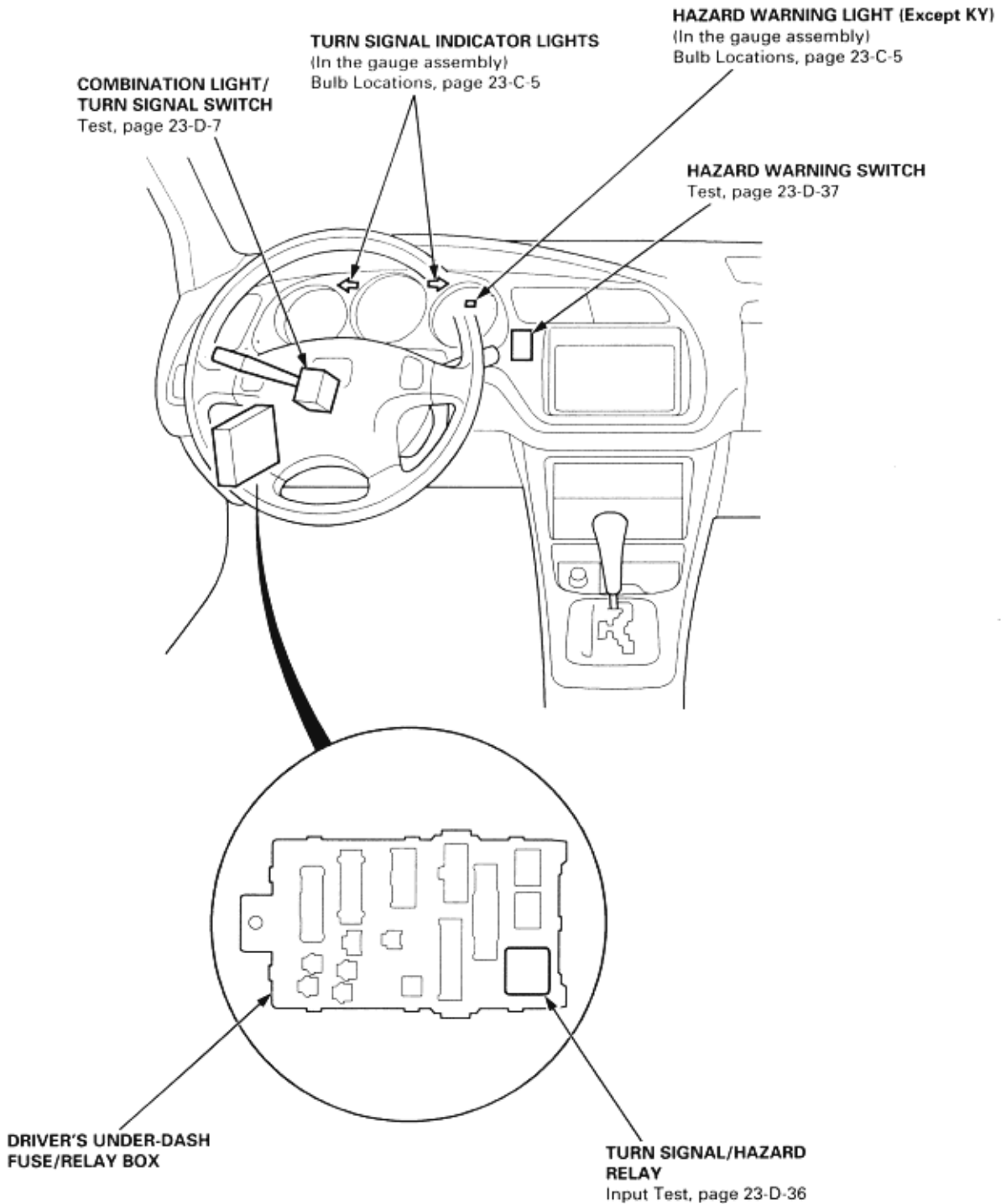
3. Remove the four mounting nuts, then pull out the taillight.

NOTE:

- ♦ Inspect the gasket; replace it if it is distorted or stays compressed.
- ♦ After installing the taillights, run water over them to make sure they do not leak.

BRAKE LIGHT :	21 W
TURN SIGNAL LIGHT:	21 W
BACK-UP LIGHT:	21 W
REAR FOG LIGHT:	21 W
PARKING LIGHT:	5 W

NOTE: LHD type is shown, RHD type is symmetrical.



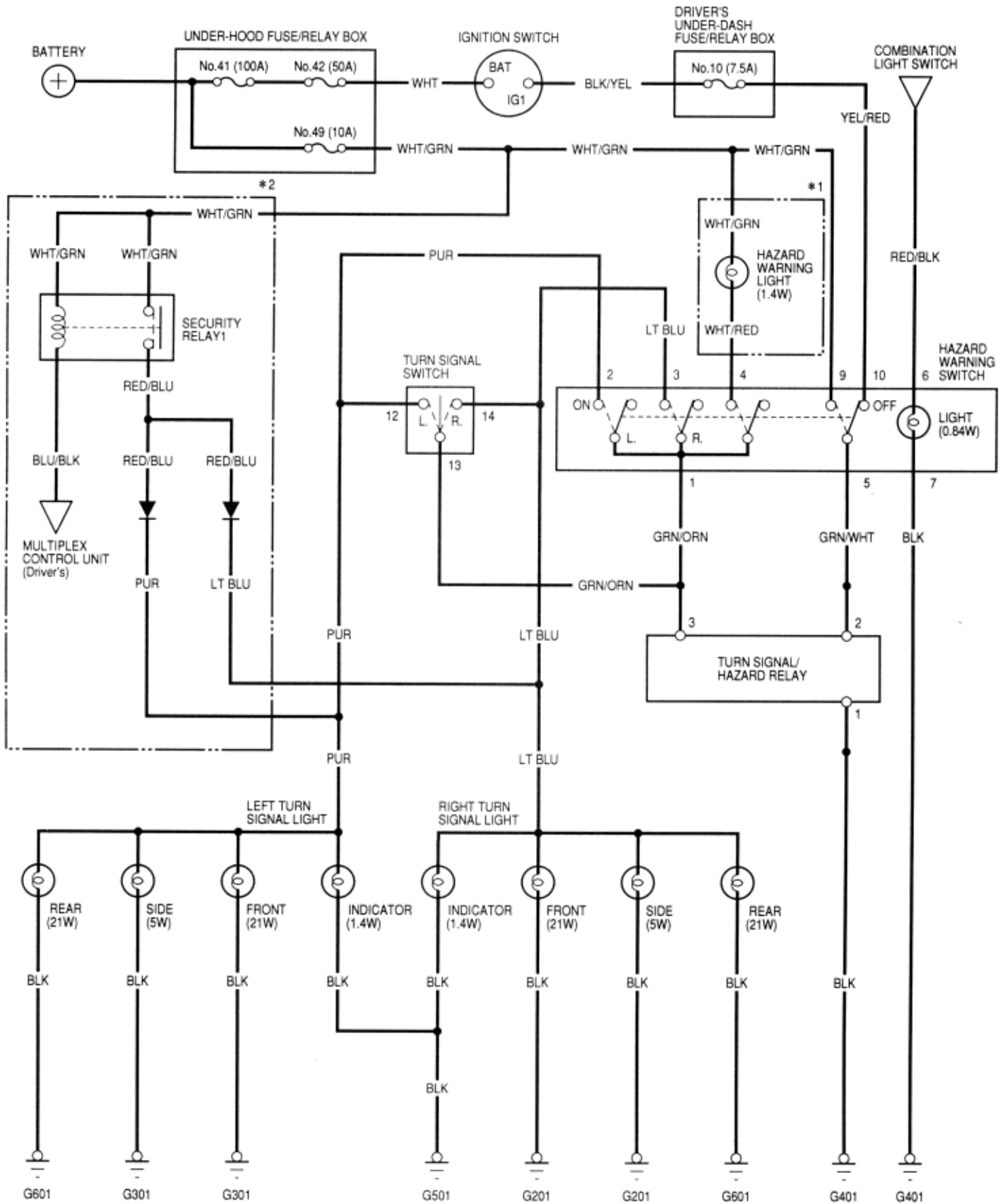
To go to the pages referenced on the diagram above,
click on the following:

(See Page 23-D-7)

(See Page 23-C-5)

(See Page 23-D-37)

(See Page 23-D-36)



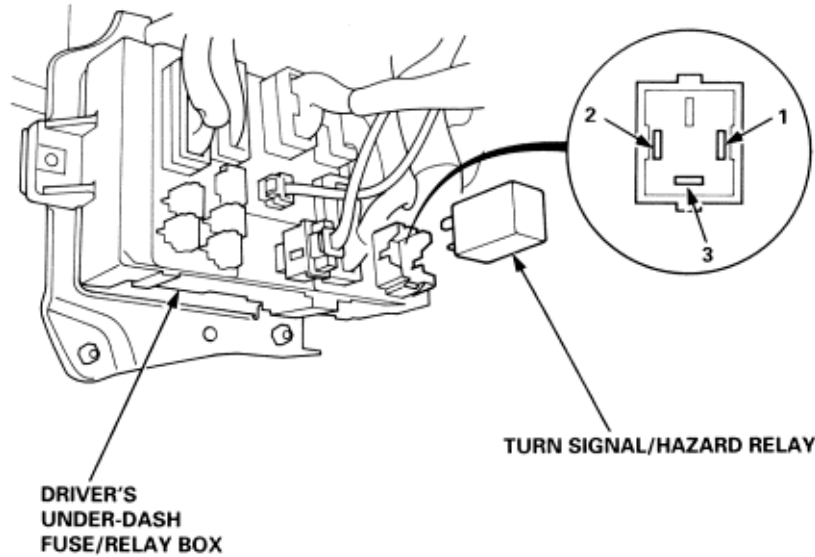
* 1: Except KY
* 2: With security system

Turn Signal/Hazard Flasher System
Turn Signal/Hazard Relay Input Test

23-D-36

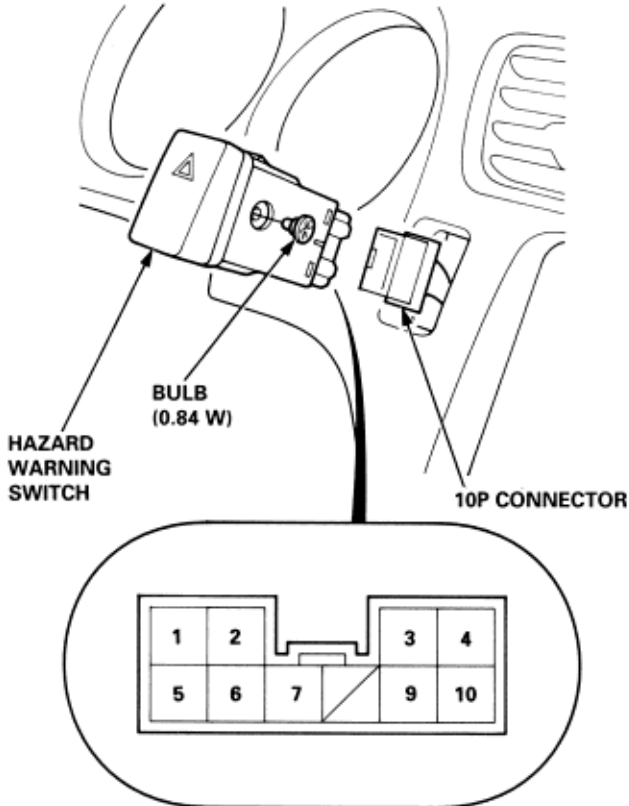
1. Remove the turn signal/hazard relay from the driver's under-dash fuse/relay box.
2. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system
 - ♦ If the terminals look OK, make the following input tests at the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

NOTE: LHD type is shown, RHD type is symmetrical.



Cavity	Test condition	Test: Desired result	Possible cause if result is not obtained
1	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
2	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 10 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire ♦ Faulty hazard warning switch ♦ Blown No 49 (10A) fuse in the under-hood fuse/relay box ♦ An open in the wire ♦ Faulty hazard warning switch
	Hazard warning switch ON	Check for voltage to ground: There should be battery voltage	
3	Hazard warning switch ON; connect the No 2 terminal to the No 3 terminal.	Hazard lights should come on	<ul style="list-style-type: none"> ♦ Poor ground (G201, G301, G501, G601) ♦ Faulty hazard warning switch ♦ An open in the wire ♦ Faulty turn signal switch ♦ An open in the wire
	Ignition switch ON (II) and turn signal switch in Right or Left; connect the No 2 terminal to the No 3 terminal	Right or left turn signal lights should come on	

- Carefully pry the hazard warning switch out of the center panel.
 NOTE: LHD type is shown, RHD type is similar.



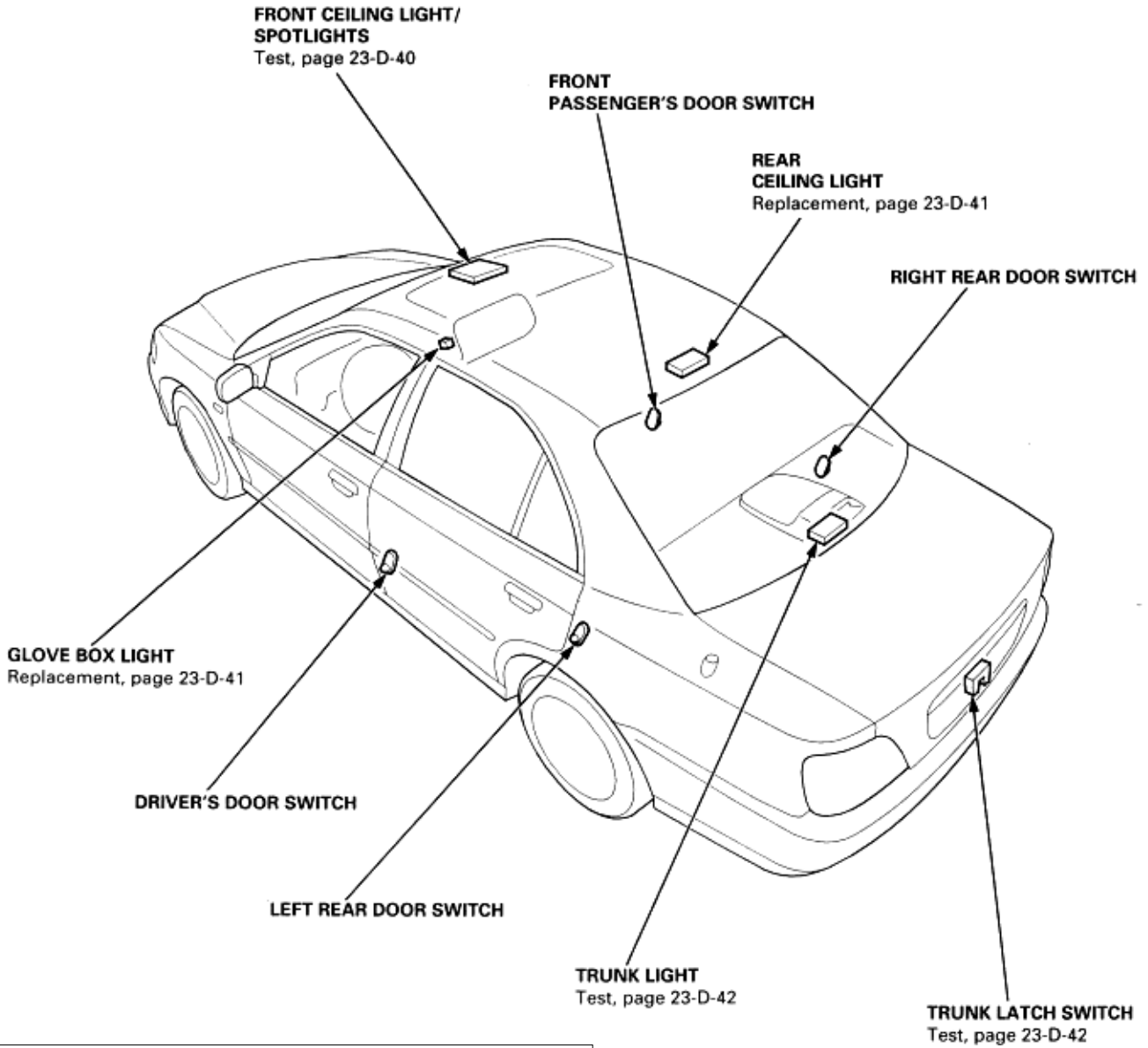
Terminal side of male terminals

- Disconnect the 10P connector from the hazard warning switch.
- Check for continuity between the terminals in each switch position according to the table.

Terminal Position	6	7	1	2	3	4 (*)	5	9	10
OFF	○	⊕	○				○	○	
ON	○	⊕	○	○	○	○	○	○	

*: Except KY

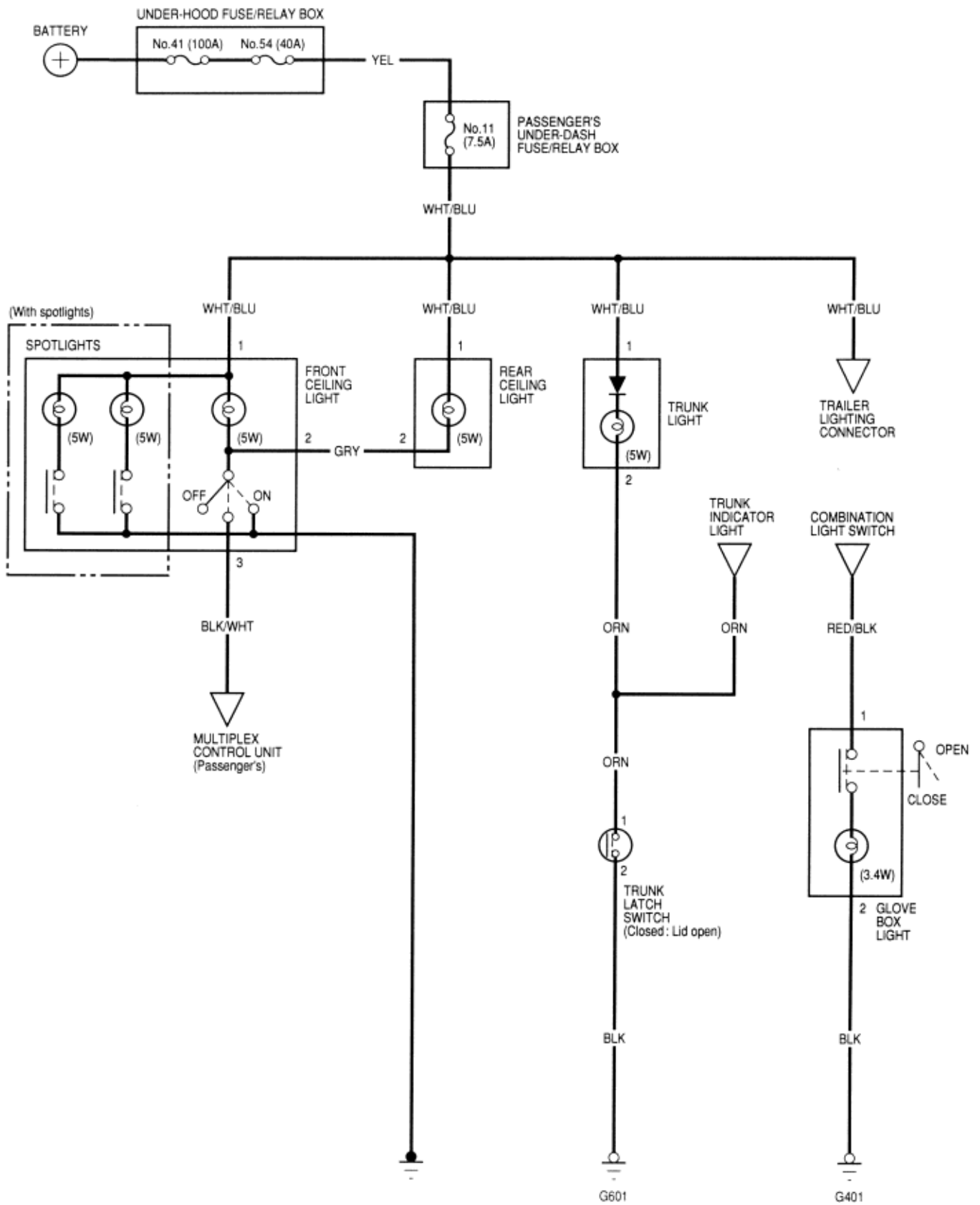
NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-D-40)
(See Page 23-D-41)
(See Page 23-D-42)

Interior Lights
Circuit Diagram

23-D-39

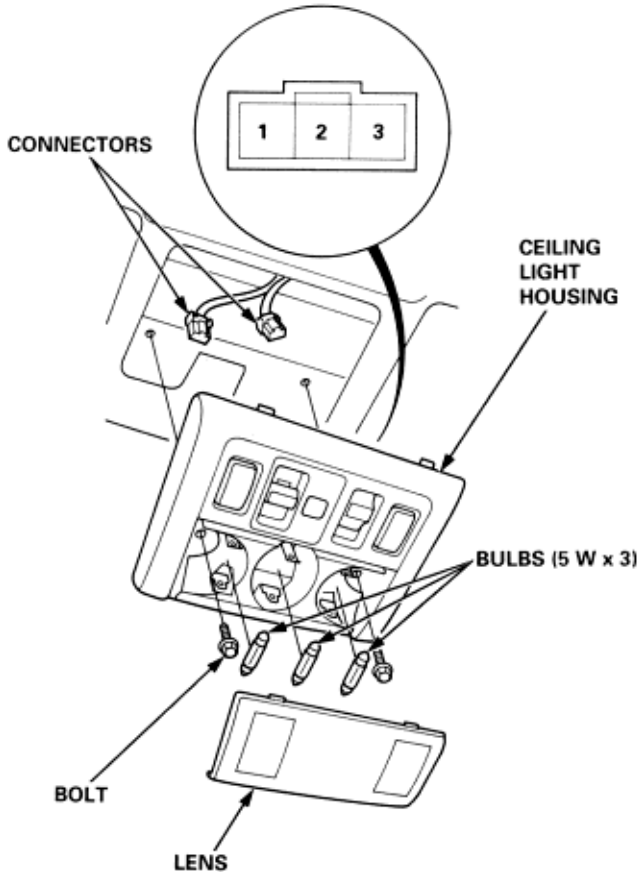


Interior Lights
Front Ceiling Light Test

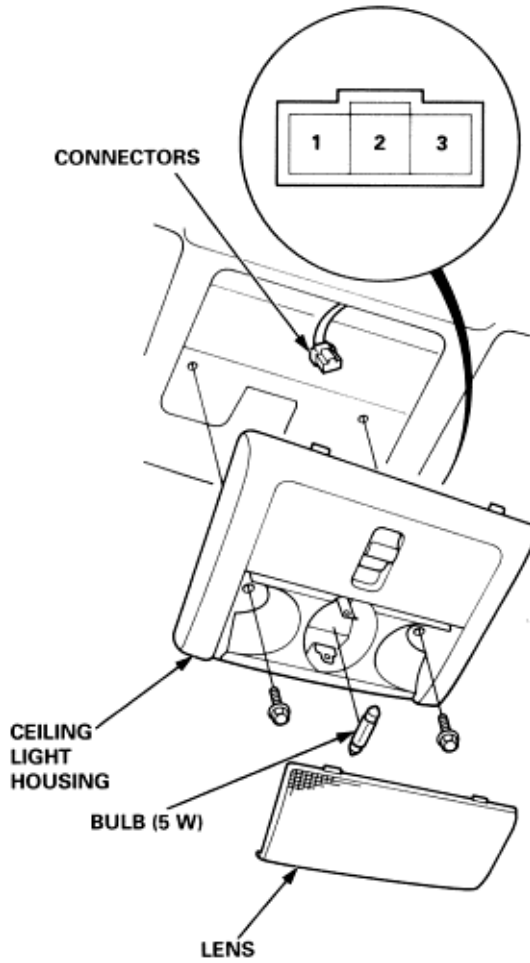
23-D-40

1. Turn the ceiling light switch OFF.
2. Pry off the lens.
3. Remove the two mounting bolts and the ceiling light housing.
4. Disconnect the connectors.

With Spotlights:



Without Spotlights:



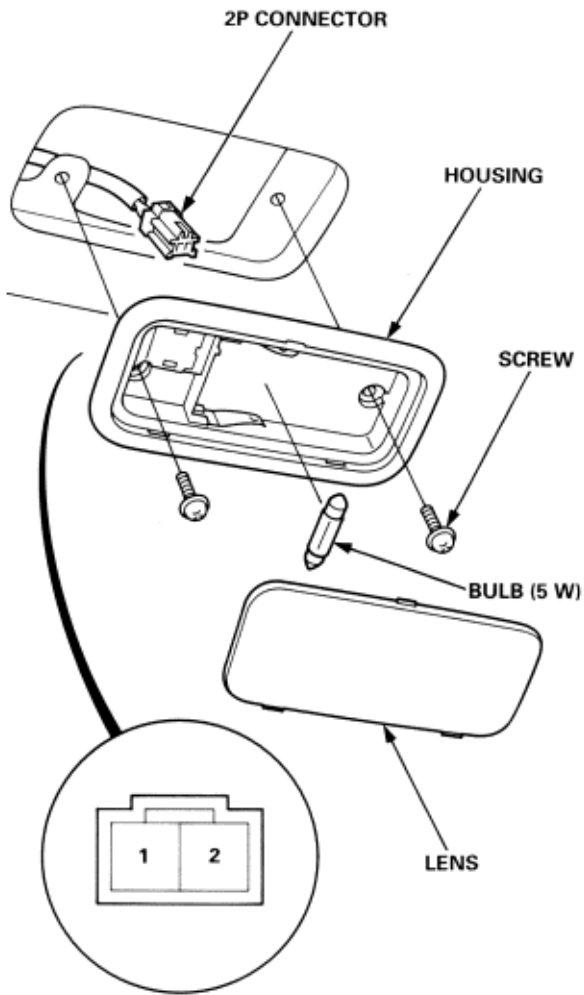
5. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1	2	3	Body ground
OFF	○	○	○	
(Middle)	○	○	○	
ON	○	○	○	○

Interior Lights

Rear Ceiling Light Test

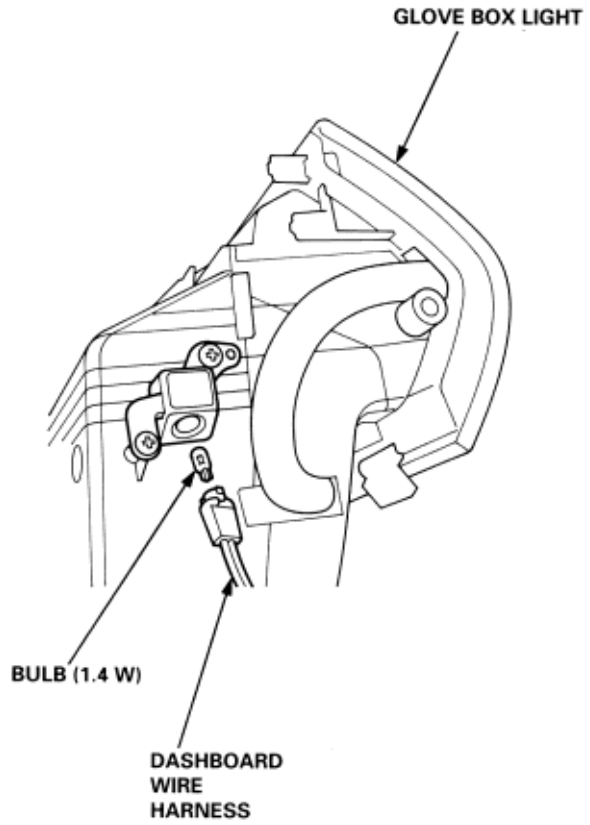
1. Pry off the lens.
2. Remove the two screws and the housing.
3. Disconnect the 2P connector from the housing.



23-D-41

Glove Box Light Replacement

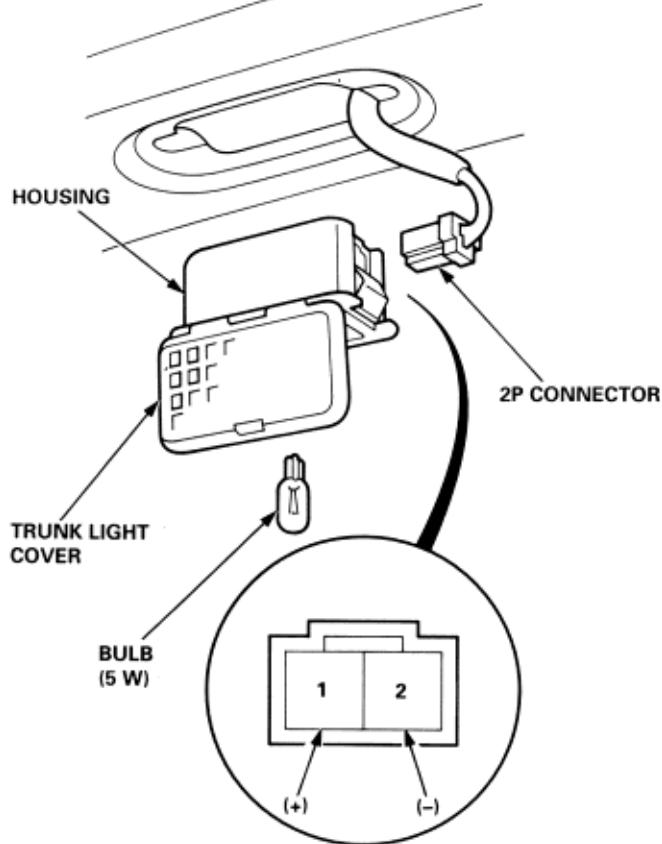
1. Remove the glove box (see section 20).
2. Turn the bulb socket, then replace the bulb.



Interior Lights
Trunk Light Test

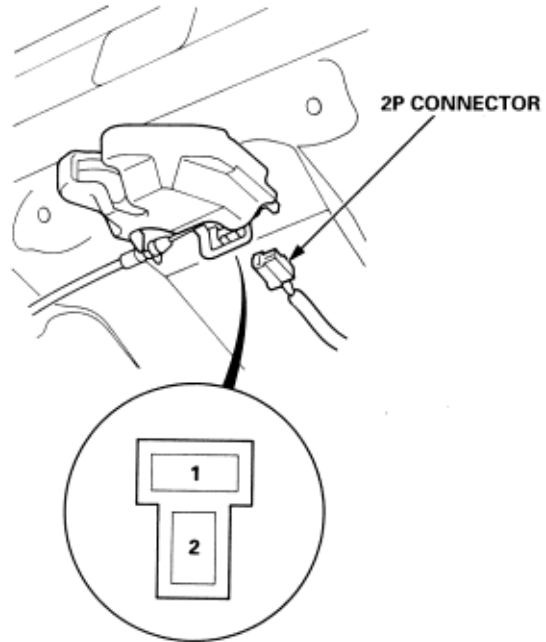
23-D-42 Trunk Light Switch Test
 (Without Keyless Entry/Security Alarm System)

1. Open the trunk lid.
2. Pry out the trunk light assembly.
3. Disconnect the 2P connector from the housing.



4. Open the trunk light cover.
5. Make sure that the bulb is OK. Check for continuity between the No. 1 and No. 2 terminals.

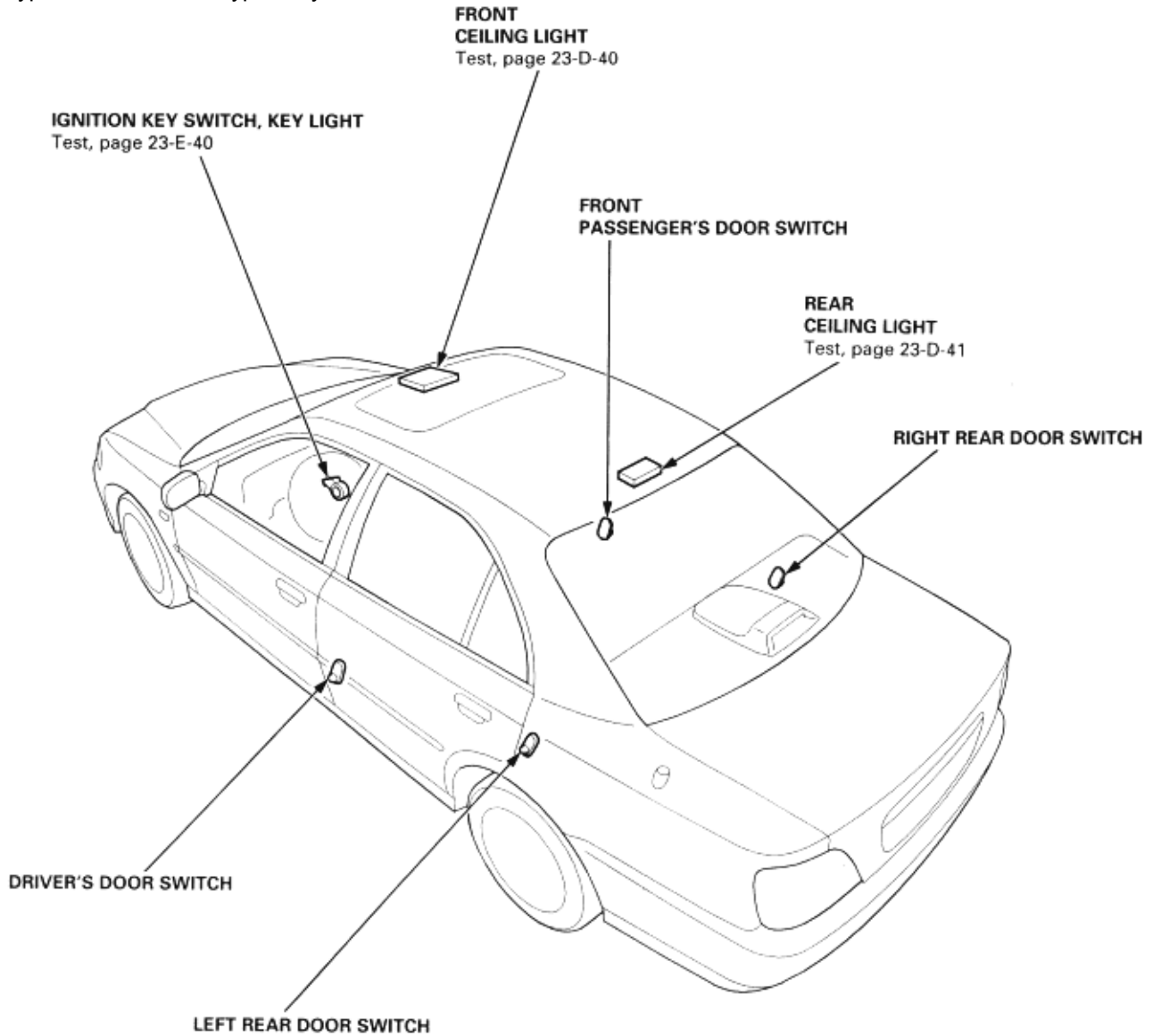
1. Open the trunk lid.
2. Disconnect the 2P connector from the trunk latch.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal	1	2
Position		
Trunk lid open	○	○
Trunk lid closed		

NOTE: LHD type is shown, RHD type is symmetrical.

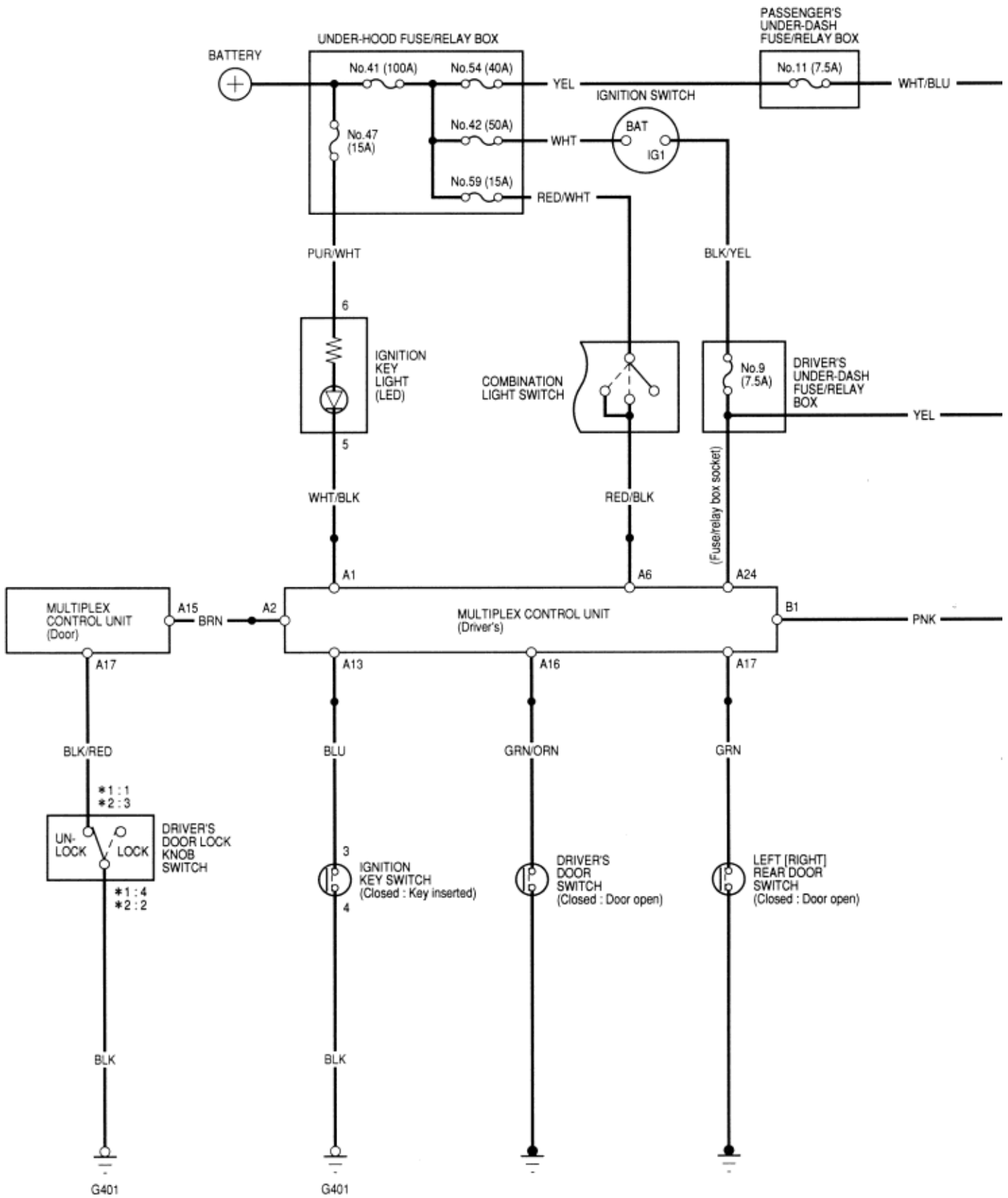


To go to the pages referenced on the diagram above,
click on the following:

- (See Page 23-D-40)
- (See Page 23-D-41)
- (See Page 23-E-40)

**Entry Light Control System
Circuit Diagram**

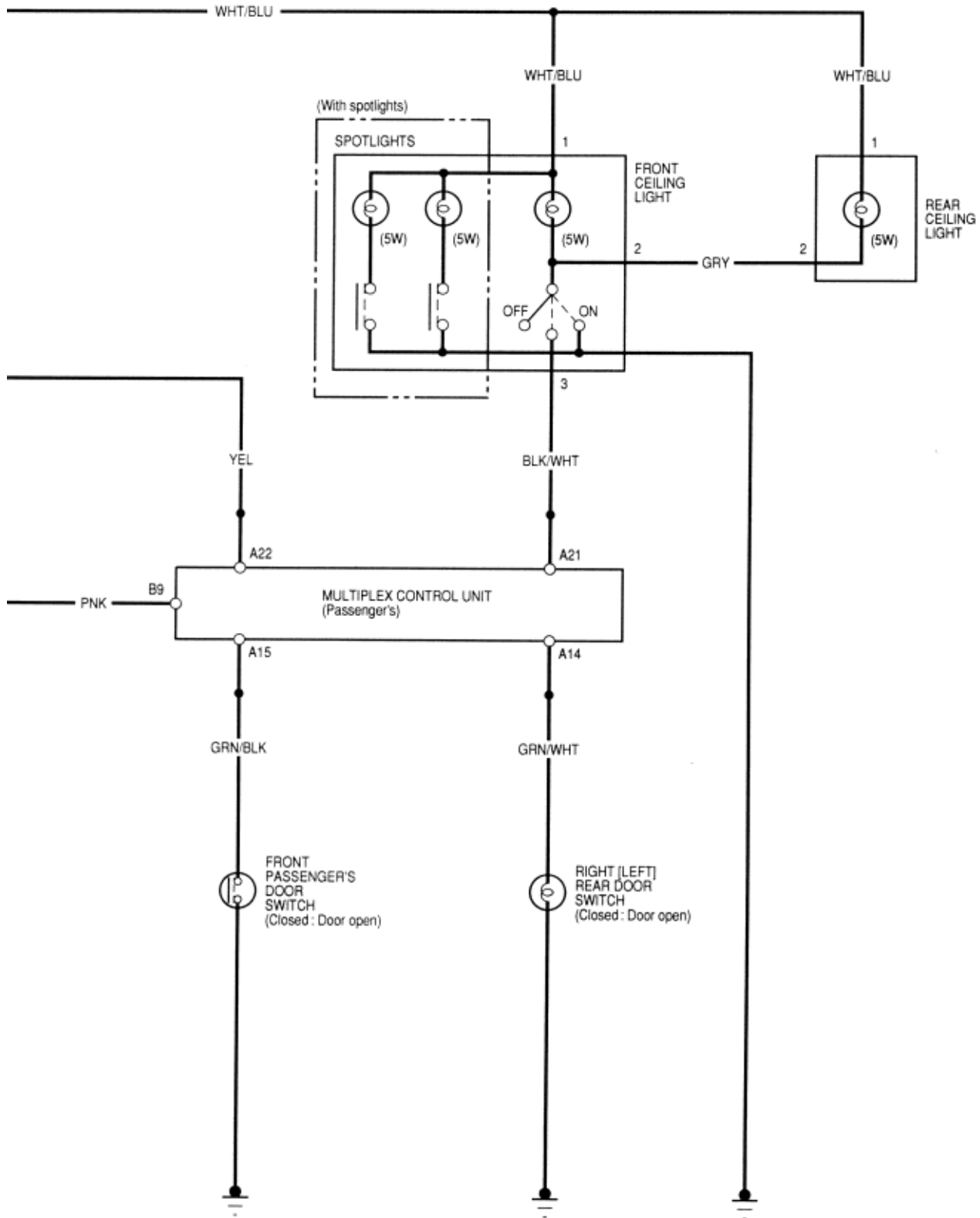
23-D-44



Entry Light Control System
Circuit Diagram (cont'd)

23-D-45

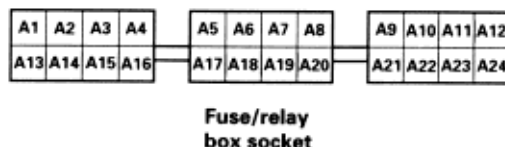
* 1 : With super locking system
 * 2 : Without super locking system
 [] : RHD type



NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (see page 23-B-7).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



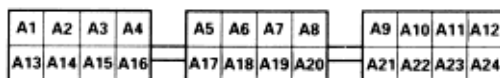
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	Fuse/relay box socket	Under all conditions	Attach to ground: The ignition key light should come on	<ul style="list-style-type: none"> ♦ Blown No 47 (15A) fuse in the under-hood fuse/relay box ♦ Blown LED ♦ An open in the wire
A6	Fuse/relay box socket	Combination light switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 59 (15A) fuse in the under-hood fuse/relay box ♦ An open in the wire ♦ Faulty combination light switch
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A13	Fuse/relay box socket	Ignition key is inserted into the ignition switch	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ Poor ground (G401) ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door opened	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire
A17	BLU/WHT	Left [right] rear door opened	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty left [right] rear door switch ♦ An open in the wire

[] : RHD type

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Passenger's):

1. Remove the passenger's under-dash fuse/relay box (see page 23-B-7).
2. Remove the passenger's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



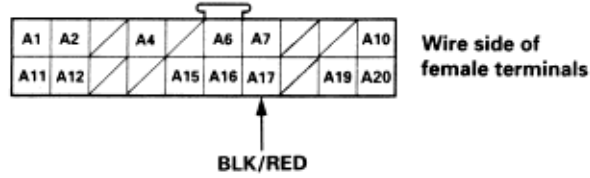
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A21	Fuse/relay box socket	Front ceiling light switch in middle position	Connect to ground: Ceiling lights should come on	<ul style="list-style-type: none"> ♦ Blown No 54 (40A) fuse in the under-hood fuse/relay box ♦ Blown No 11 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ Blown bulb ♦ Faulty ceiling light ♦ An open in the wire
A15	Fuse/relay box socket	Front passenger's door opened	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty passenger's door switch ♦ An open in the wire
A14	Fuse/relay box socket	Right [left] door opened	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty right [left] rear door switch ♦ An open in the wire

[] : RHD type

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Door):

1. Remove the driver's door panel, and disconnect the 20P connector from the door unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the power window master switch must be faulty; replace it.



Reconnect the connectors to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A17	BLK/RED	Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty driver's door lock actuator ♦ Poor ground (G401) ♦ An open in the wire

Special Tool

23-E-2

Ref No.	Tool Number	Description	Qty	Remark
1	07WAZ - 0010100	MPCS Short Switch	1	

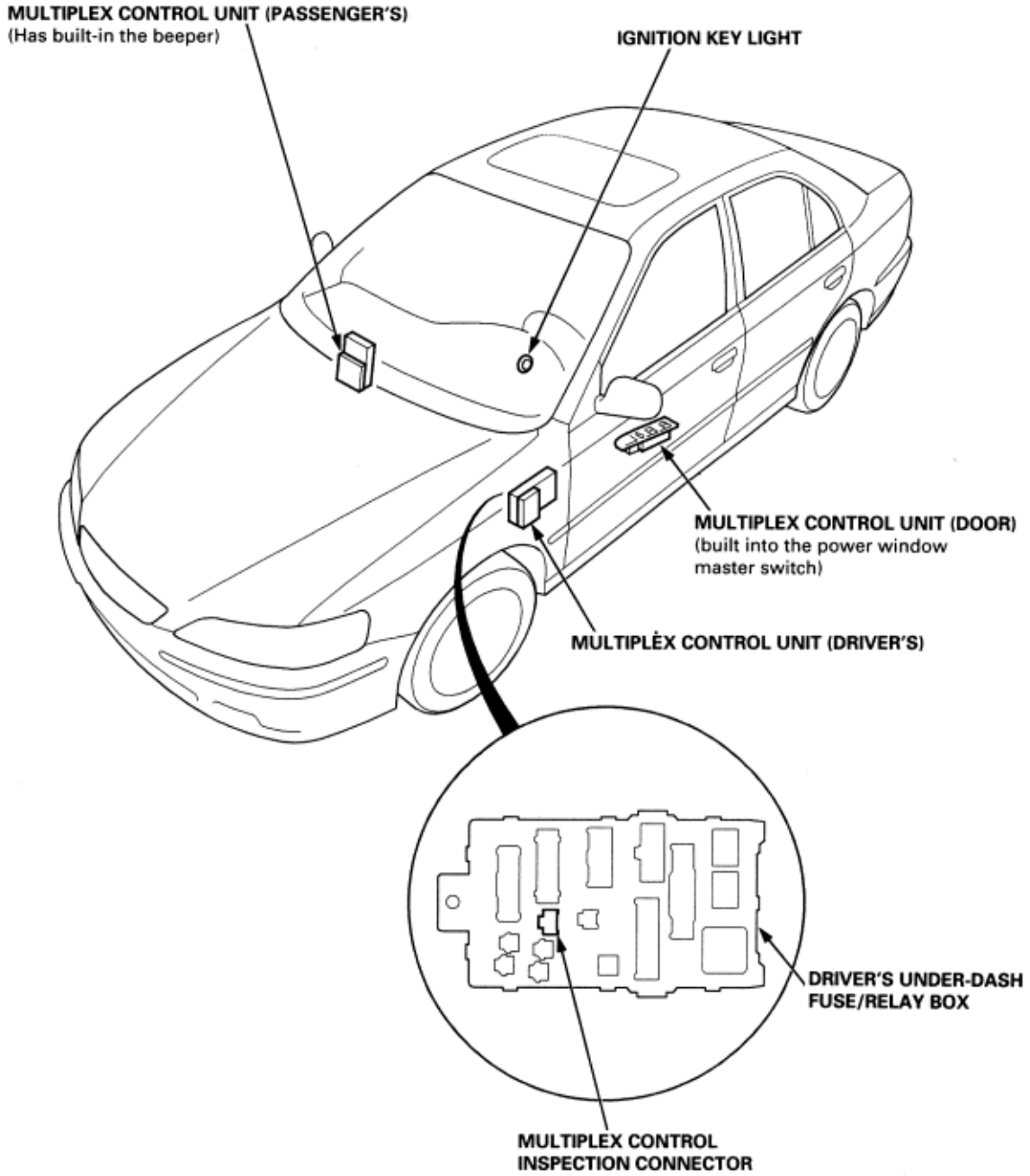


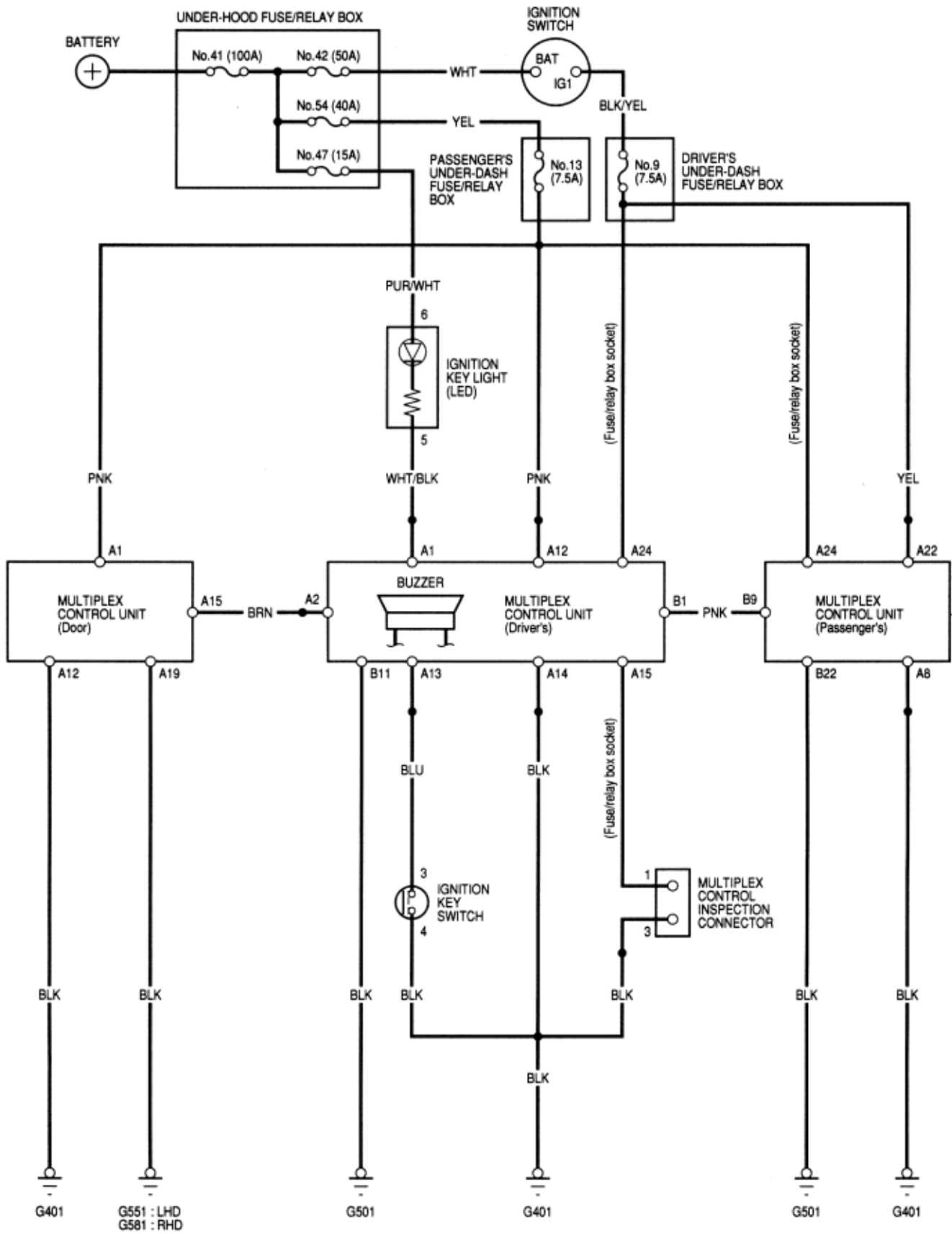
①

Multiplex Control System
Component Location Index

23-E-3

NOTE: LHD type is shown, RHD type is symmetrical.





- ♦ Multiplex Control System
 - Multiplex function
 - Wake up/sleep function
 - Fail-safe function
 - Self-diagnosis function
 - Mode 1:
Self-diagnosis for the multiplex control system.
 - Mode 2:
Failure diagnosis for the input line of each system.
 - ♦ Rear Fog Light Control
 - ♦ Seat Belt Reminder Circuit
 - ♦ Lights-on Reminder Circuit
 - ♦ Key-in Reminder Circuit
 - ♦ Key Light Timer Circuit
 - ♦ Entry Light Control System
 - ♦ Daytime Running Lights System*1
 - ♦ Power Door Locks
 - ♦ Power Window
 - ♦ Wiper/Washers (with speed respondent intermittent wiper)
 - ♦ Keyless Entry/Security Alarm System
 - ♦ Interlock System (see section 14)
- *1: KG model with daytime running lights system.

Multiplex Communication Functions

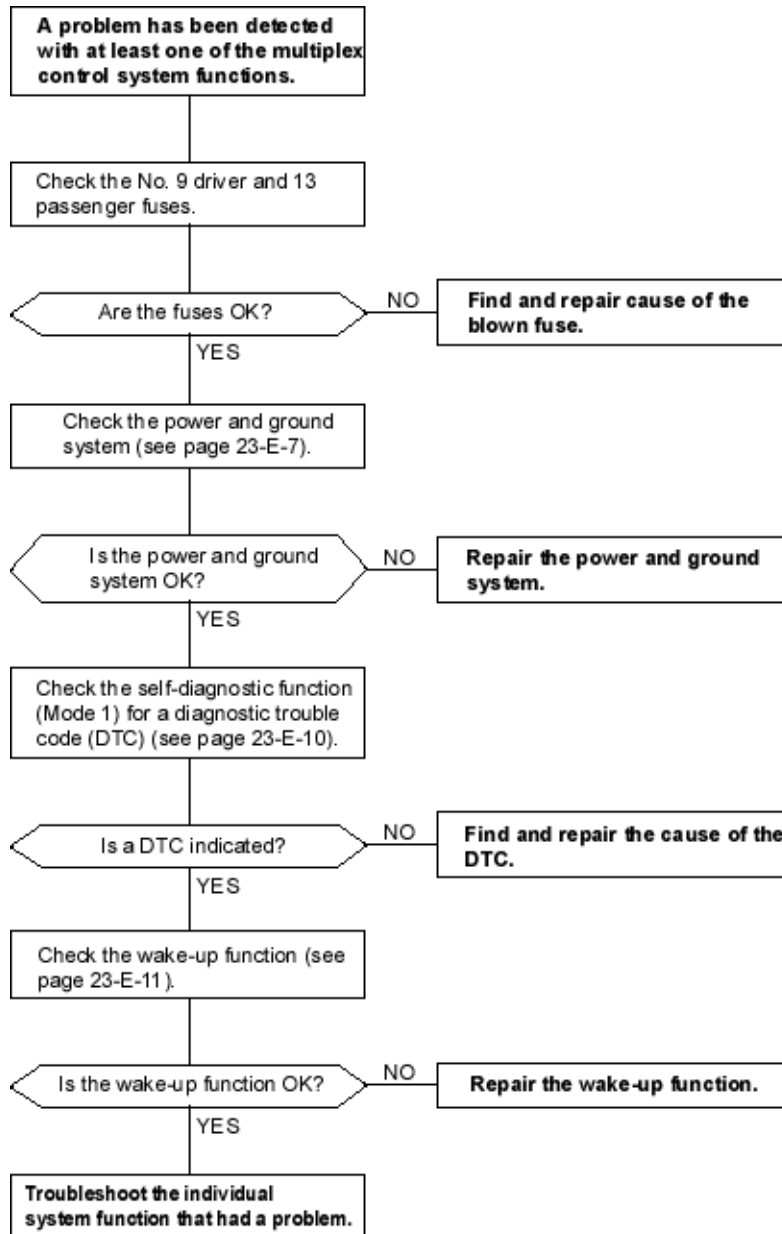
- ♦ To reduce the number of wire harnesses, digital signals are sent via shared multiplex communication lines rather than sending normal electrical signals through individual wires.
- ♦ The input signals from each switch are converted to digital signals at the central processing unit (CPU). The digital signals are sent from the transmitter unit to the receiver unit as serial signals.
- ♦ The transmitted signal is converted to a switch signal at the receiver unit, and it operates the related component.
- ♦ There are exclusive communication lines between each of the multiplex control units:
 - Door **to** Driver's (between the door and the driver's multiplex control units) Wire colour: BRN.
 - Driver's **to** Passenger's (between the driver's and the passenger's multiplex control units) Wire colour: PNK.
- ♦ The control units always communicate via these lines when the system is operating, and they stop communicating when the system is OFF.

Wake-up and Sleep Functions

- ♦ The multiplex control system has "wake-up" and "sleep" functions to decrease parasitic draw on the battery when the ignition switch is OFF.
- ♦ In the sleep mode, the multiplex control unit stops the functions (communication and CPU control) when it is not necessary for the system to operate.
- ♦ As soon as any operation is done (for example, a door is unlocked), the related control unit in the sleep mode wakes up and begins to function at once. This control unit also sends a wake-up signal to the other control units via the communication lines.
- ♦ When the ignition switch is turned OFF, and driver's or passenger's door opened, there is about a 10 second delay before the control units go from the wake-up mode to the sleep mode.
- ♦ If any door is open, the sleep mode will not function.

Fail-safe Functions

- ♦ To prevent improper operation, the multiplex control system has a fail-safe function. In the fail-safe mode, the output signal is fixed when any part of the system malfunctions (for example, a faulty control unit or communication line).
- ♦ Each control unit has a hardware fail-safe function that fixes the output signal when there is any CPU malfunction and a software fail-safe function that ignores the signal from the malfunctioning control unit and allows the system to operate normally.

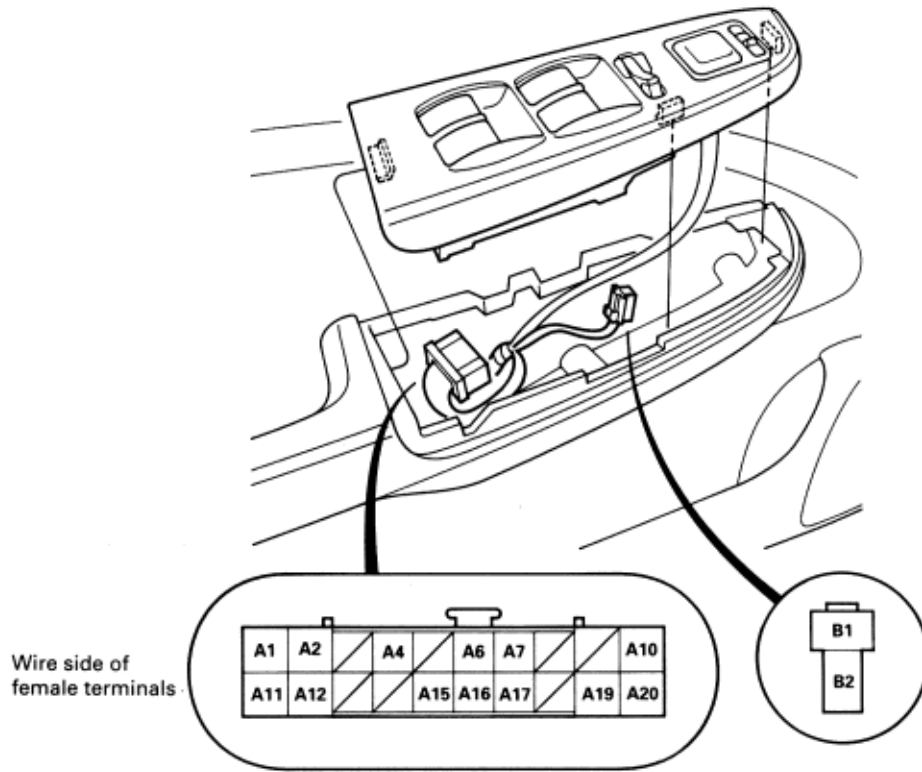


To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-E-7)
- (See Page 23-E-10)
- (See Page 23-E-11)

Multiplex Control Unit (Door):

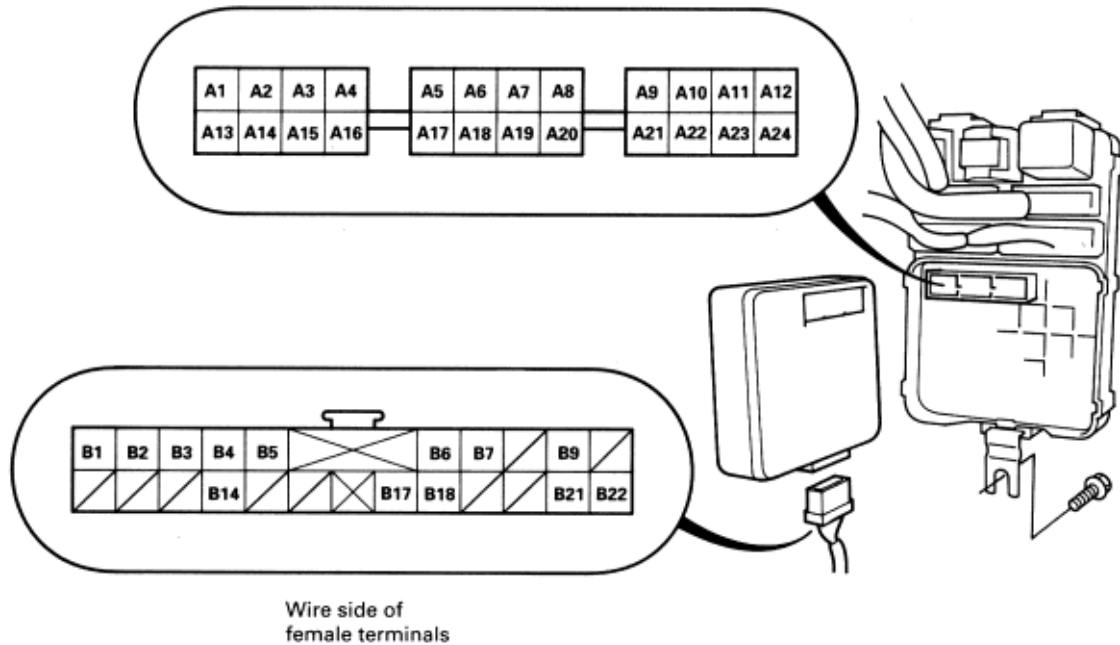
1. Remove the driver's door panel, and disconnect the connectors from the door unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the power window master switch must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A12	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A19	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G551: LHD, G581: RHD) ♦ An open in the wire

Multiplex Control Unit (Passenger's):

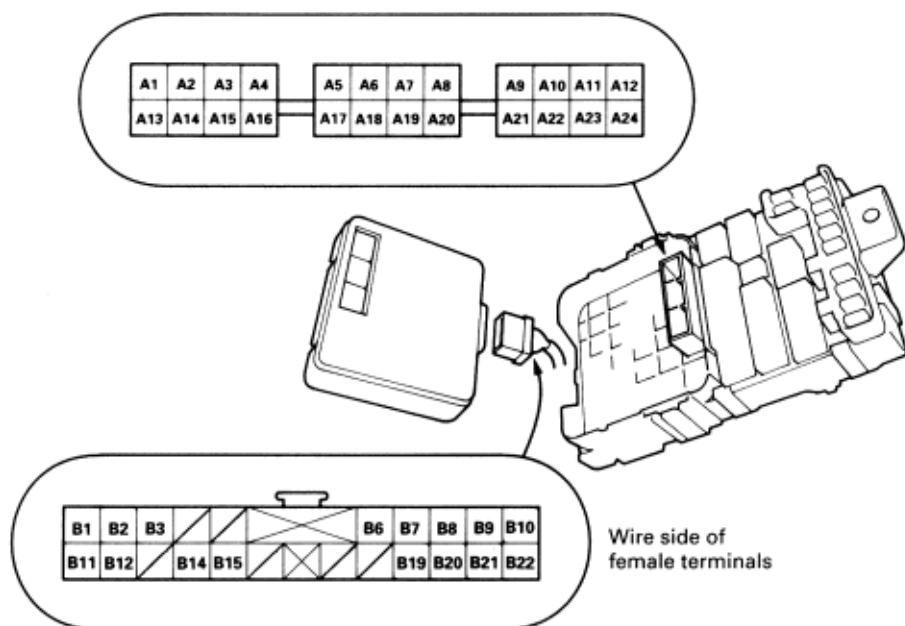
1. Remove the passenger's under-dash fuse/relay box (see section 20).
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
B22	BLK	Under all conditions	Check for voltage to ground: There should continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire

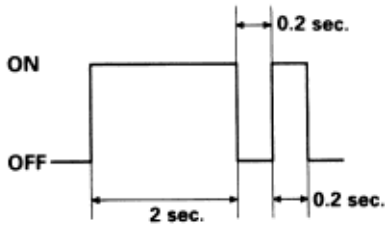
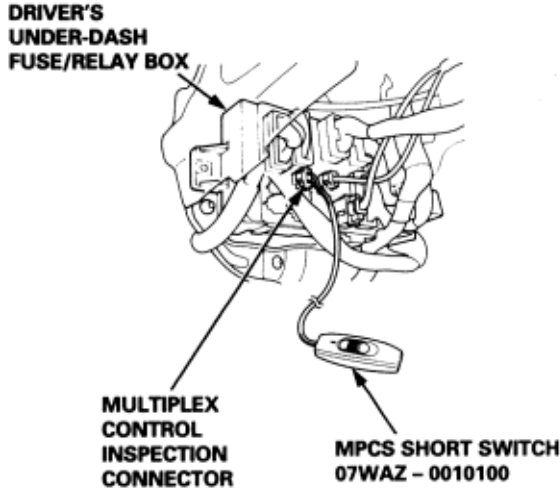
Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (**see page 23-B-7**).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
A14	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A13	Fuse/relay box socket	Ignition key is inserted into the ignition switch	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ Poor ground (G401) ♦ An open in the wire
A1	Fuse/relay box socket	Under all conditions	Attach to ground: Ignition key light should come on	<ul style="list-style-type: none"> ♦ Blown No 47 (15A) fuse in the under-hood fuse/relay box ♦ Blown LED ♦ An open in the wire
A15	Fuse/relay box socket	Short the multiplex control inspection connector terminals	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire

1. Connect the special tool to the multiplex control inspection connector, and turn the switch on by more than five seconds.



2. Turn the ignition switch ON (II).
Does the ignition key light and beeper come on?
YES - There is a DTC. Go to the diagnostic Trouble Code (DTC) Table to retrieve the DTC.
NO - Go to Mode 2 (see page **see page** 23-E-13).
 NOTE: If you know the system is abnormal, but the system does not indicate a DTC, check to see if the SCS circuit is working properly.
 - ♦ Check for continuity between the No. 1 terminal of the multiplex control inspection connector and the A15 terminal of the driver's multiplex control unit. If there is no continuity, repair the open in the wire, and recheck for DTCs.
 - ♦ Check for continuity between the No. 3 terminal of the multiplex control inspection connector and body ground. If there is no continuity, repair the open in the wire, and recheck for DTCs.

Diagnostic Trouble Code (DTC) Table

One second after you go into self-diagnosis function mode 1, the ignition key light and beeper indicate the diagnostic trouble code(s) (DTC), and repeat the DTC every three seconds. If there is more than one DTC, the system will indicate them in ascending order, beginning from the DTC with the lowest numerical value.

DTC	Possible Cause
1	The driver's unit is not able to receive signals from the door unit.
2	The driver's unit is not able to receive signal from the passenger's unit.
3	Multifunction in the driver's unit.
4	Signal from each unit do not match.
5	The passenger's unit is not able to receive signals from the other units.
6	The door unit is not able to receive signal from the other units.

Communication Line Test

1. Check for continuity according to the table.
 Is there continuity?
YES - Go to step 2.
NO - Check for an open in the wire.

Communication Line	Wire	Continuity	Voltage
Door-Driver's	BRN	YES	3.5 - 9.5
Driver's-Passenger's	PNK	YES	3.0 - 10.0

2. Turn the ignition switch ON (II), and check for voltage between the communication line and ground.
Does the voltage match the table?
YES - Communication line is OK.
NO - Go to step 3.
3. Repair the line according to the following.
 - ♦ If the voltage is too high:
 - Check for a short to another wire.
 - Check for poor contact at the connector on the receiver side unit.
 - Faulty circuit in the receiver side unit.
 - ♦ If the voltage is too low:
 - Check for a short to ground or to another wire.
 - Check for poor contact at the connector on the transmit side unit.
 - Faulty circuit in the transmit side unit.

- When the ignition switch is turned ON (II), all of the multiplex control units wake up at the same time. In this case, the communication lines are not related for wake up function.
- When a switch related to the multiplex control unit is operated:
 The control unit related to the operated switch wakes up, then the control unit wakes up the other unit.

Related Switch (Input):

The switches and input signals that can wake up the multiplex control unit are shown below:

Related Switch (Input) Table:

Multiplex Control Unit (Passenger's)	Multiplex Control Unit (Driver's)	Multiplex Control Unit (Door)
No. 9 (7.5A) driver's fuse	No. 9 (7.5A) driver's fuse	No. 13 (7.5A) passenger's fuse
Communication lines (BRN, PNK)		
Radio switch	Ignition key switch	Driver's door key cylinder switch (LOCK/UNLOCK)
Passenger's door switch	Lighting switch (SMALL)	Driver's door lock knob switch (LOCK/UNLOCK)
Passenger's key cylinder switch (LOCK/UNLOCK)	Driver's door switch	
Ultrasonic sensor (Optional security system)	Trunk latch switch	
Passenger's door lock switch (UNLOCK)	Trunk key cylinder switch	
Keyless transmitter (LOCK)	Engine hood switch	
Keyless transmitter (UNLOCK)	Left rear door switch (LHD type)	
Keyless transmitter (TRUNK)	Right rear door switch (RHD type)	
Right rear door switch (LHD type)	Left rear door lock knob switch (LHD type) (UNLOCK)	
Left rear door switch (RHD type)	Right rear door lock knob switch (RHD type) (UNLOCK)	
Right rear door lock knob switch (LHD type) (UNLOCK)		
Left rear door lock knob switch (RHD type) (UNLOCK)		

1. Shifting to the sleep mode:
 - 1) Turn the ignition switch OFF.
 - 2) Make sure that the exterior lights are off.
 - 3) If you do not operate the switches related to the multiplex control units within one minute after meeting the above conditions, the system function shifts to the sleep mode.
(All of the switches must be turned OFF except door lock knob switches.)
2. Confirming the sleep mode:
 - 1) Check for voltage between the communication line. There should be no voltage with the sleep mode ON.
There should be standard voltage with the sleep mode OFF (voltage test table) (**see page 23-E-10**).
 - 2) Check for voltage between each communication line and body ground while shifting to the sleep mode (**see page 23-E-10**).
There should be no voltage.
 - 3) Check the parasitic draw at the battery while shifting to the sleep mode. The ampere should change from about 70 through 80 mA to less than 10 mA.
3. Confirming the wake up mode:

After confirming the sleep mode, turn the related switch (see previous table) ON, and wake up each control unit. If all of the operations work properly, the wake up mode is OK.
(If any of the control units are faulty and cannot wake up, several parts of the system will not work at the same time.)

Open in the line:

If there is an open in a communication line, most of the systems will not operate because one of the control units cannot wake up the other control units. But the control unit that is not awake can wake up by operating a switch related to that control unit.

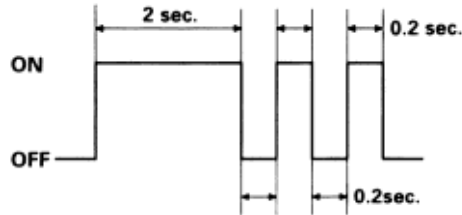
All of the control unit's wake up by turning the ignition switch ON (II).

Short in the line:

- ♦ Most of the systems do not operate because one of the control units cannot wake up the other control units.
- ♦ The control unit can wake up by a related switch operation, but the other control units cannot wake up.
- ♦ All of the control unit's wake up by turning the ignition switch ON (II).

From mode 1, turn the MPCS short switch off by five to ten seconds, then turn the switch on and the system goes from mode 1 to mode 2.

Mode 2:



To cancel mode 2, turn the MPCS short switch off by more than 10 seconds or turn the ignition switch OFF.

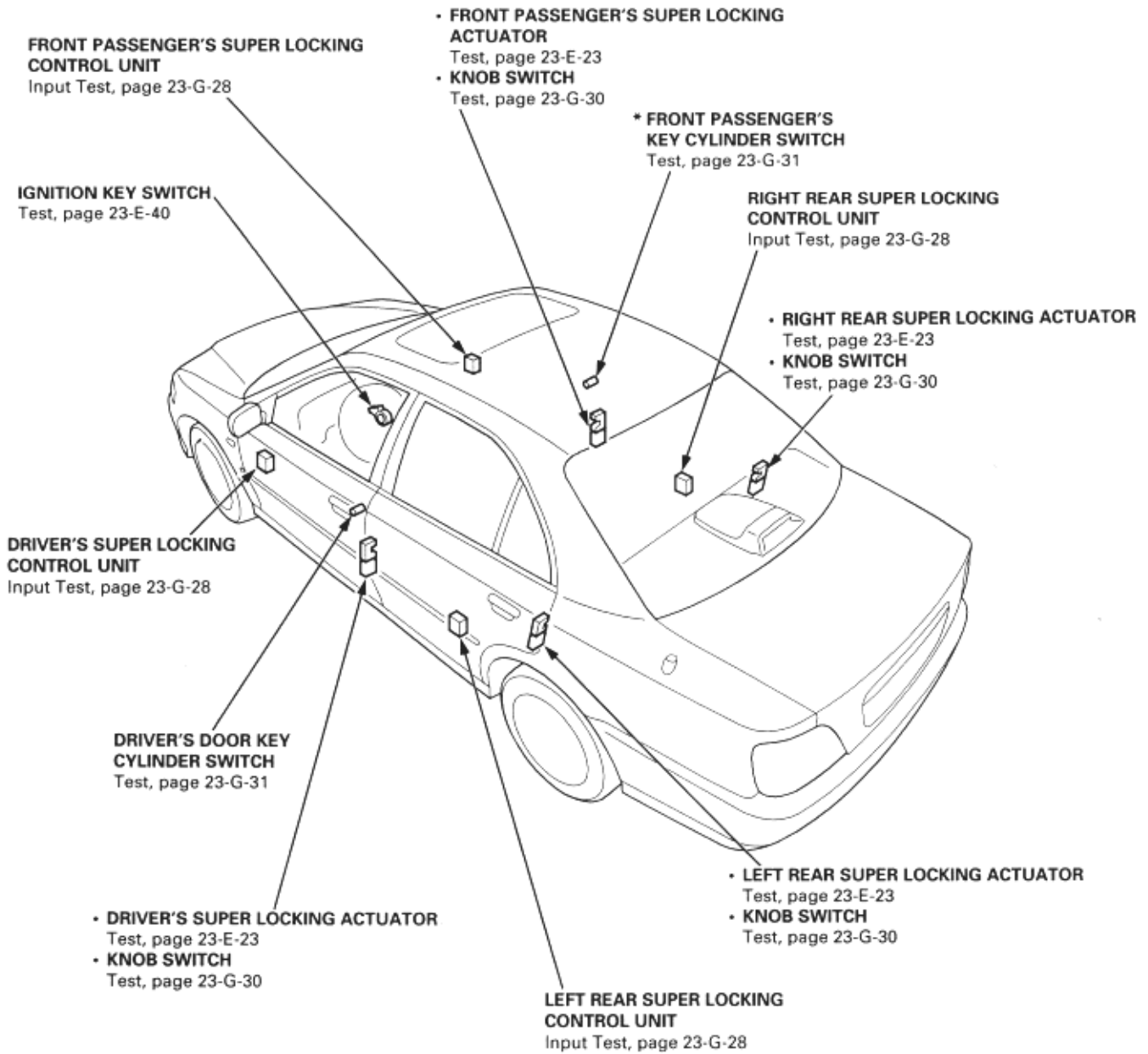
1. Operate the switches as shown below in mode: 2.
2. If the related circuit line of the switch is OK, the function indicates this by the ignition key light blinking once and the beeper sounding once. If the line is faulty, there should be no indication. Refer to the tests for each system.

Object Input Table:

Multiplex Control Unit (Passenger's)	Multiplex Control Unit (Driver's)	Multiplex Control Unit (Door)
Lighting switch (headlight switch)	Lighting switch (SMALL)	Driver's door key cylinder switch (LOCK/UNLOCK)
Radio switch	Driver's door switch	Driver's door lock knob switch (LOCK/UNLOCK)
Passenger's door switch	Trunk latch switch	Power window master switch (Passenger's switch UP/DOWN)
Passenger's key cylinder switch (LOCK/UNLOCK)	Trunk key cylinder switch	(Left rear switch UP/DOWN)
Front fog light switch	Driver's seat belt switch	(Right rear switch UP/DOWN)
Rear fog light switch	Windshield wiper/washer switch (except MIST switch)	
Passenger's door lock knob switch (UNLOCK)	Brake switch	
Keyless transmitter (LOCK button)	Vehicle speed sensor (VSS)	
Keyless transmitter (UNLOCK button)	Parking brake switch	
Keyless transmitter (TRUNK button)	A/T gear position switch <input type="checkbox"/> P	
Right rear door switch (LHD type)	Ignition key switch	
Left rear door switch (RHD type)	Engine hood switch	
Ultrasonic sensor (Optional security system)	Left rear door switch (LHD type)	
Right rear door lock knob switch (LHD type) (UNLOCK)	Right rear door switch (RHD type)	
Left rear door lock knob switch (RHD type) (UNLOCK)	Left rear door lock knob switch (LHD type) (UNLOCK)	
	Right rear door lock knob switch (RHD type) (UNLOCK)	

NOTE: If any control unit appears to be faulty, substitute a known-good control unit, then recheck. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely faulty control unit. then recheck. If the system works properly, that control unit is faulty; replace it.

NOTE: LHD type is shown, RHD type is symmetrical.



* : Without super locking system

To go to the pages referenced on the diagram above,
click on the following:

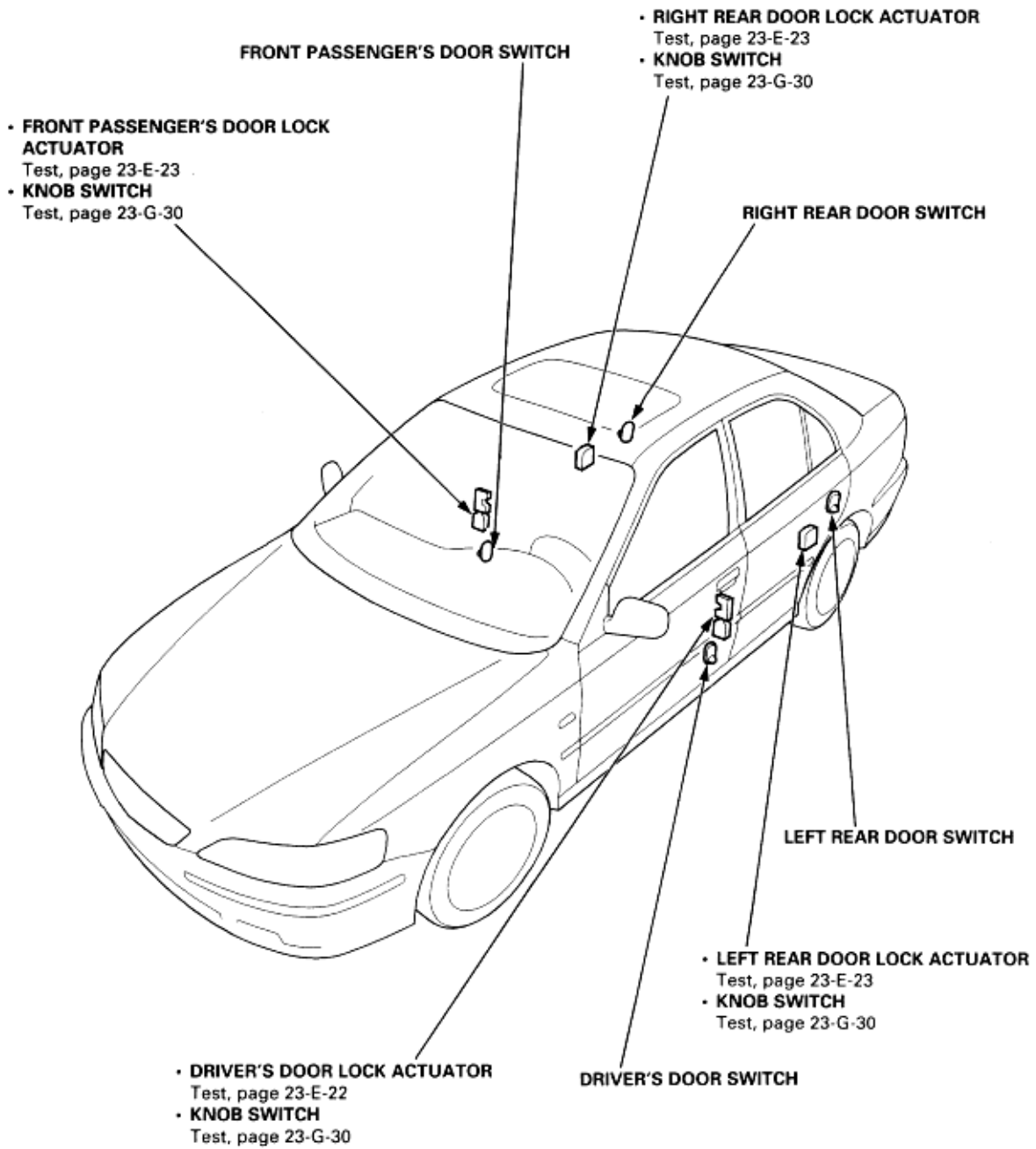
(See Page 23-E-23)

(See Page 23-G-30)

(See Page 23-G-28)

(See Page 23-E-40)

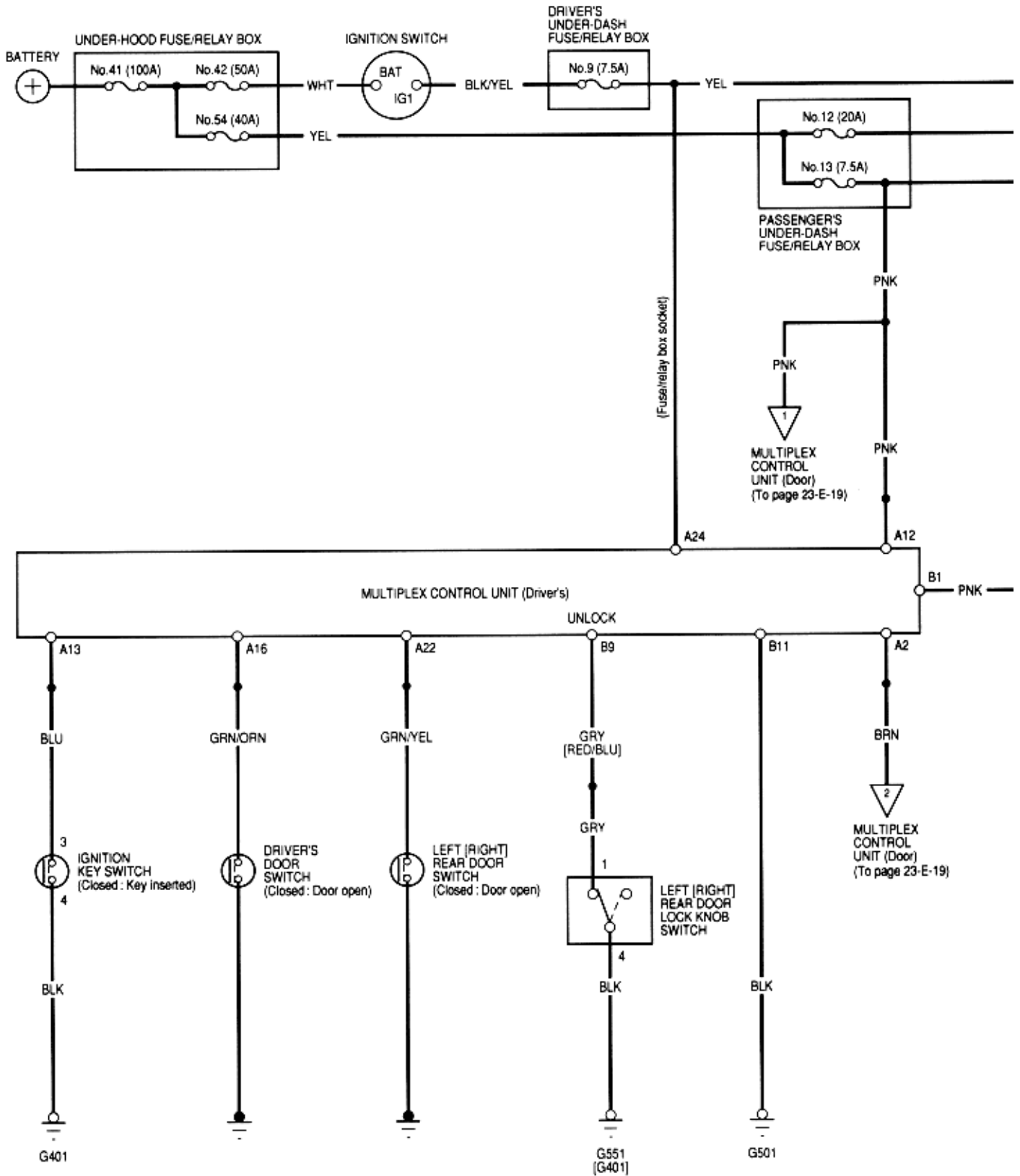
(See Page 23-G-31)



To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-E-23)
(See Page 23-G-30)
(See Page 23-E-22)

Power Door Locks
Circuit Diagram

23-E-16

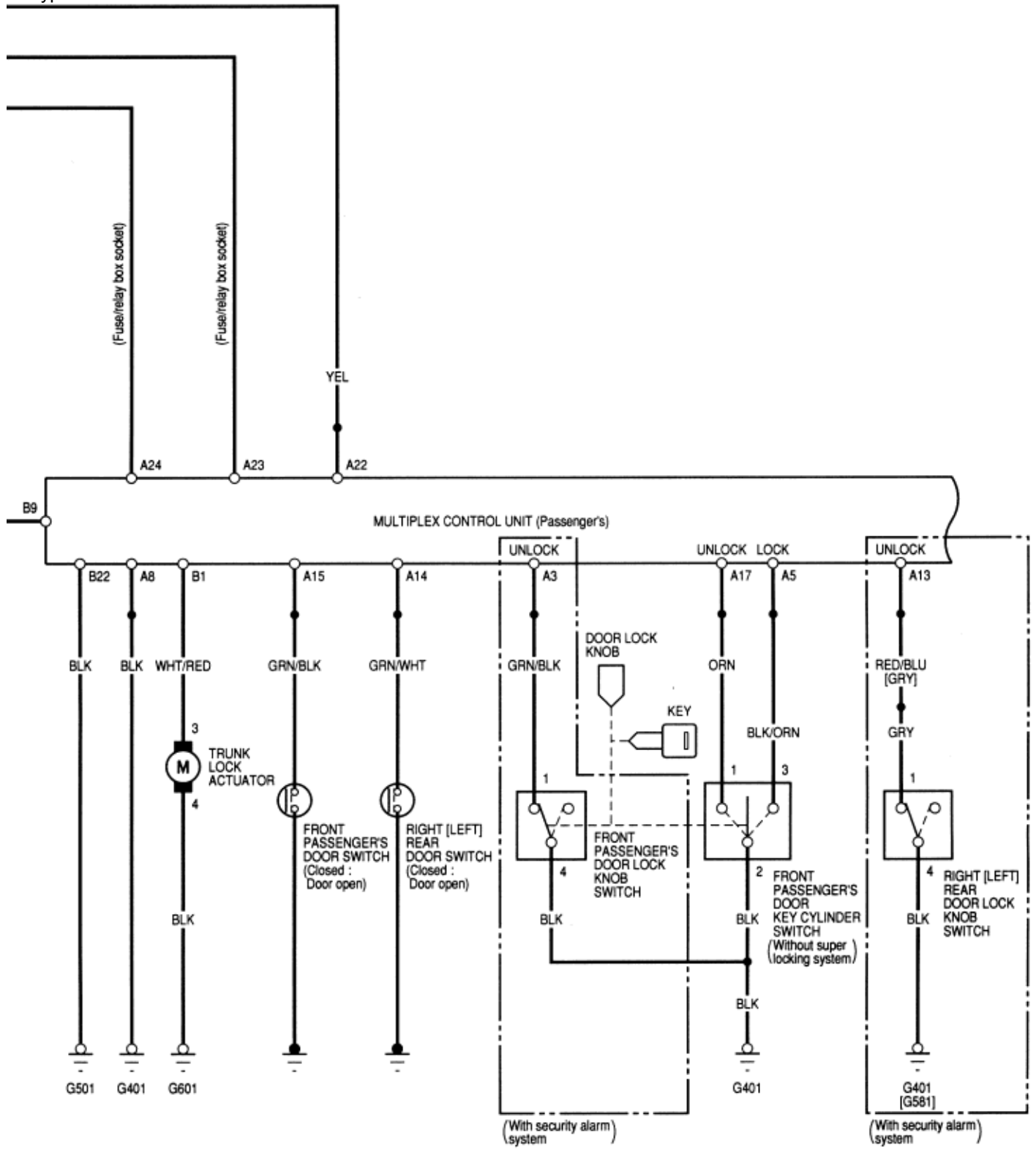


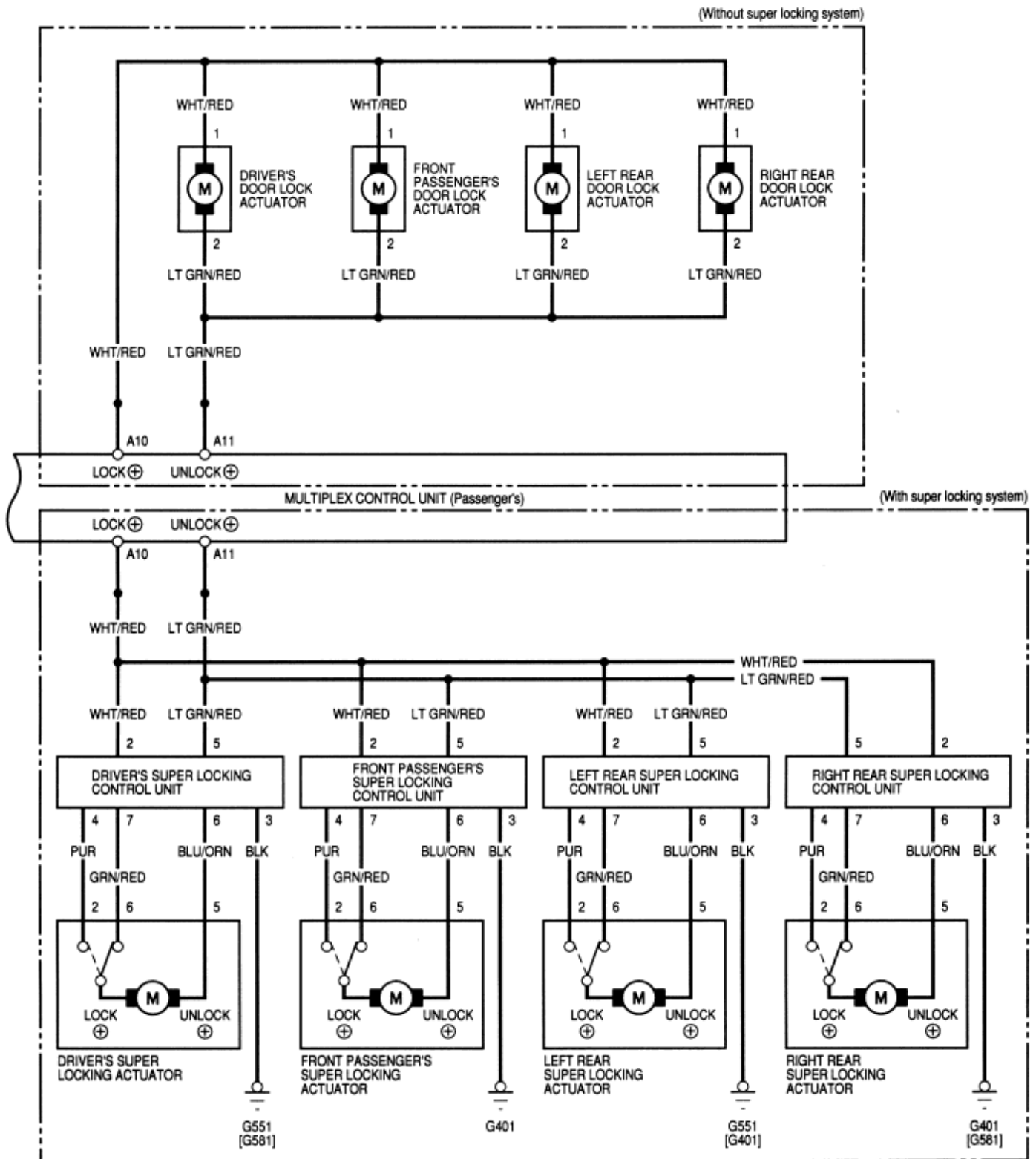
To go to the page referenced on the diagram above, click on the following:
(See Page 23-E-19)

Power Door Locks
Circuit Diagram (cont'd)

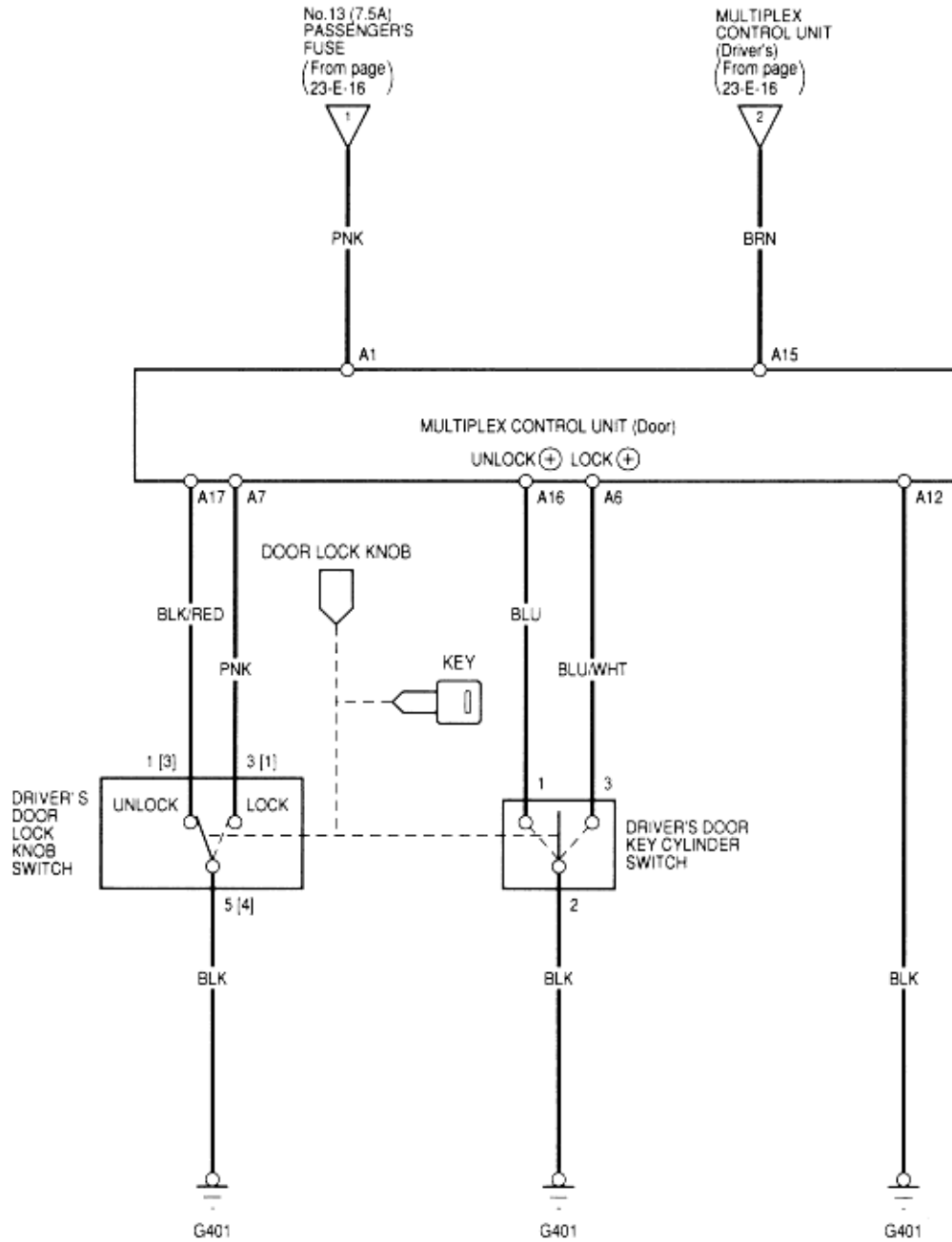
23-E-17

[]: RHD type





[]: Without super locking system



To go to the page referenced on the diagram above, click on the following:
(See Page 23-E-16)

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Item to be inspected		In the passenger's under-dash fuse/relay box		Driver's door lock knob switch	Ignition key switch	Driver's door switch	Passenger's door switch	Door lock actuator	Driver's door key cylinder switch	Passenger's door key cylinder switch	Control unit input	Super locking control unit (With super locking system)	Disconnected or obstructed door lock rod/linkage	Poor ground	Open circuit in wires, loose or disconnected terminals
		Blown No. 12 (20 A) fuse	Blown No. 13 (7.5 A) fuse												
Symptom		1	2								3	4			
Power door lock system does not work at all.		1	2								3	4			YEL, WHT/RED, LT GRN/RED
Doors don't lock or unlock with the driver's door lock knob.	All doors			1							2			G401	PNK, BLK/RED
	One door							2			3	1			
Doors don't lock or unlock with the driver's door key.	All doors (*)								1		2			G401	BLK/ORN, ORN
	One door							2			3	1			
Doors don't lock or unlock with the passenger's door key.	All doors									1	2				
	One door							2			3	1		G401	BLU, BLU/WHT
The door will lock when the ignition key is inserted and one of the doors is open					1	2	3				4			G401	BLU, GRN/BLK, GRN/WHT, GRN, GRN/ORN

(*) If the system is normal, all doors will unlock when the door key is kept in the unlock position (key cylinder switch and door lock knob switch turned ON) for one second or more.

Some types of the vehicle have a super locking system to improve anti-theft performance in normal door lock position, a mechanism which means the lock cannot be unlocked by manipulating the door inside lock knob.

Operation Method:

To set the super locking, push the ignition key into the driver's key cylinder and turn the key to lock position (towards the front of the vehicle) twice within five seconds.

On some types the super locking can be set with the keyless transmitter. To set it, push the LOCK button twice within five seconds.

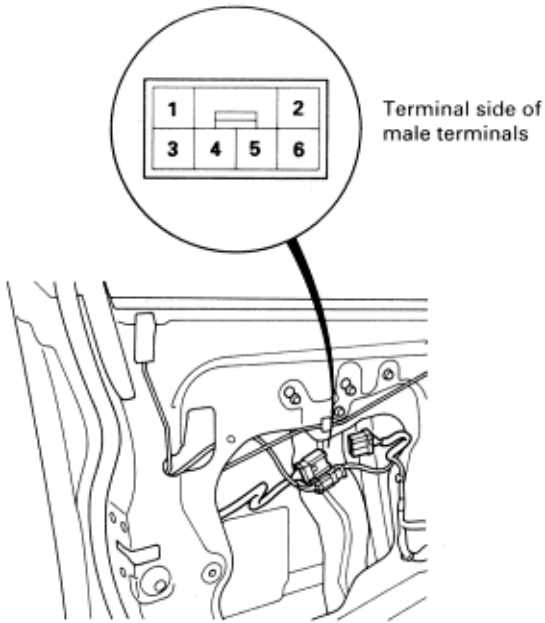
The super locking will be set even if any window or sunroof is open.

1. Open the all windows.
2. Set the super locking by following the operation method described before.
3. Pull any door lock knob from outside of the vehicle and make sure the doors cannot be unlocked by the door lock knobs.
 - ♦ If any door can be unlocked, check for:
 - door lock knob switch (**see page 23-G-30**), or
 - super locking control units input (**see page 23-G-28**).
 - ♦ If all doors can be unlocked, check for:
 - driver's key cylinder switch (**see page 23-G-31**), or
 - multiplex control unit input (**see page 23-E-3**).

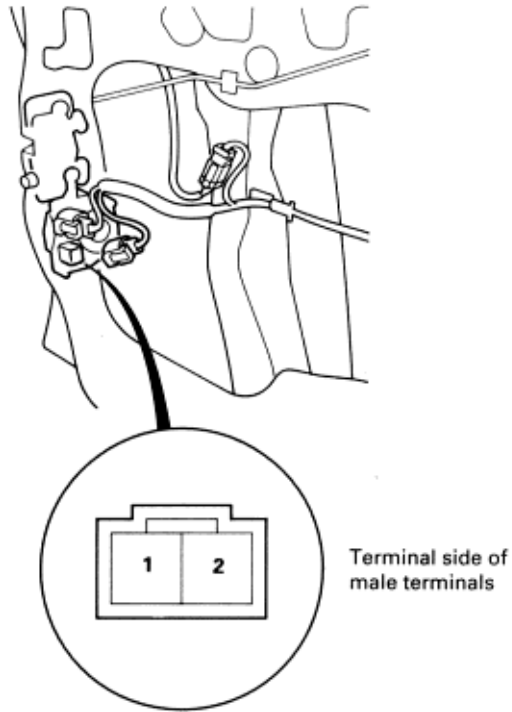
If all tests prove properly and the keyless/power door lock system works properly, replace the super locking actuator (see section 20).

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6P or 2P connector from the actuator.

With super locking system:



Without locking system:



3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal Position	6 [1]	5 [2]
LOCK	⊕	⊖
UNLOCK	⊖	⊕

[]: Without super locking system

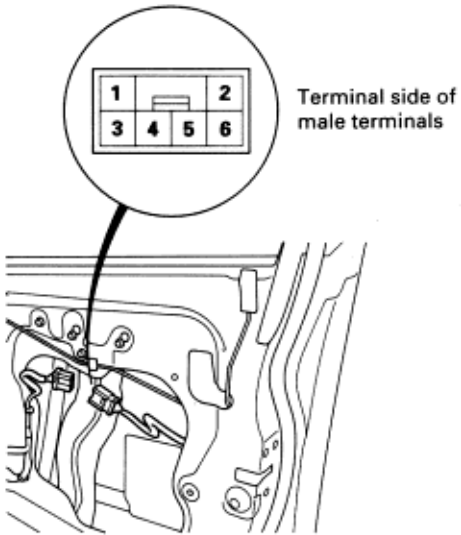
Power Door Locks

Passenger's Door Lock Actuator Test

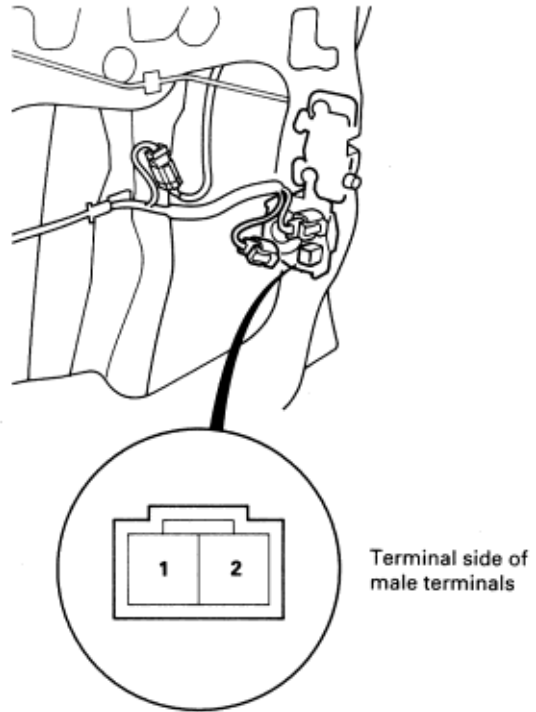
23-E-23

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6P or 2P connector from the actuator.

With super locking system:



Without super locking system:

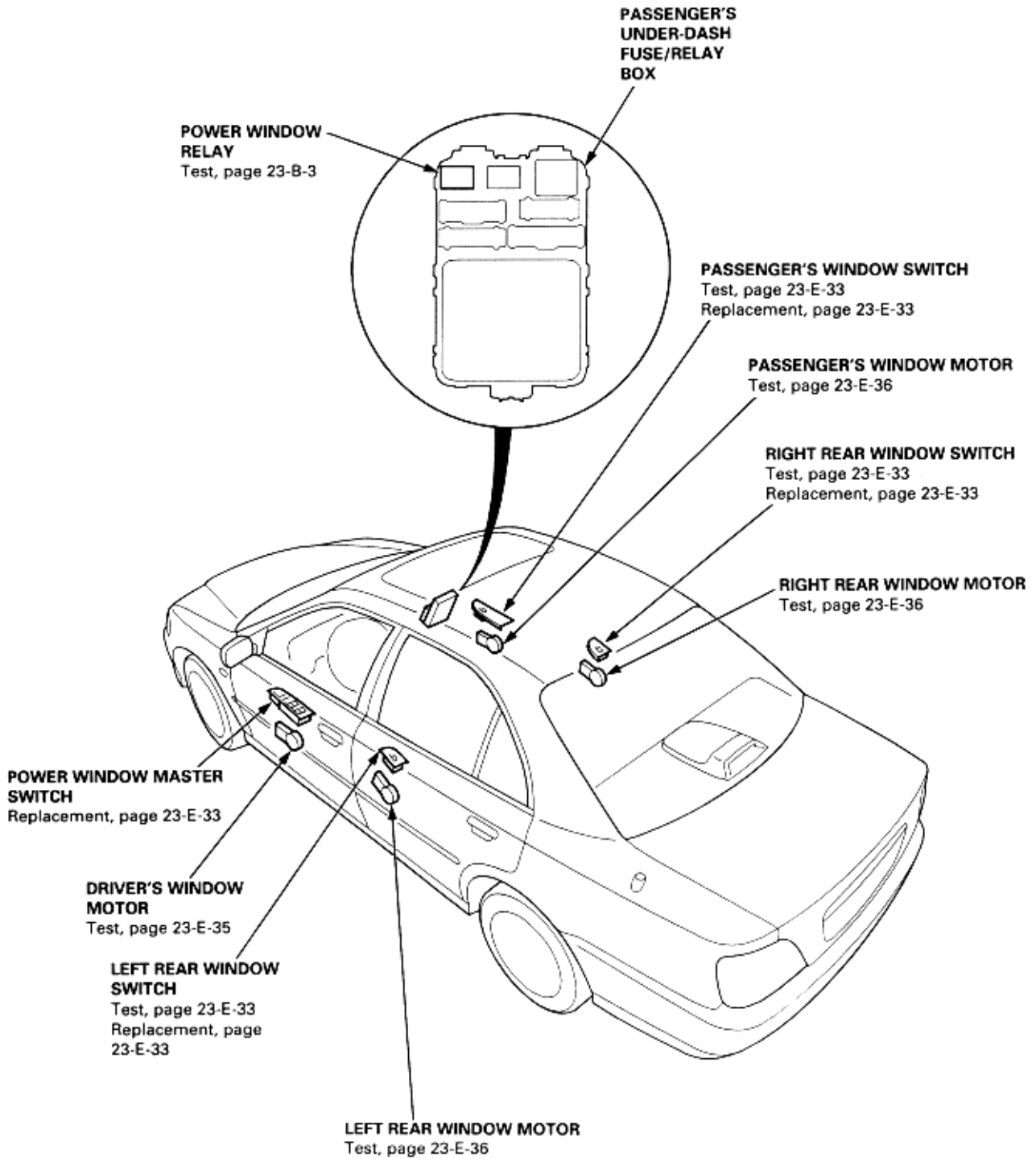


3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal	6 [1]	5 [2]
Position		
LOCK	⊕	⊖
UNLOCK	⊖	⊕

[1]:Without super locking system.

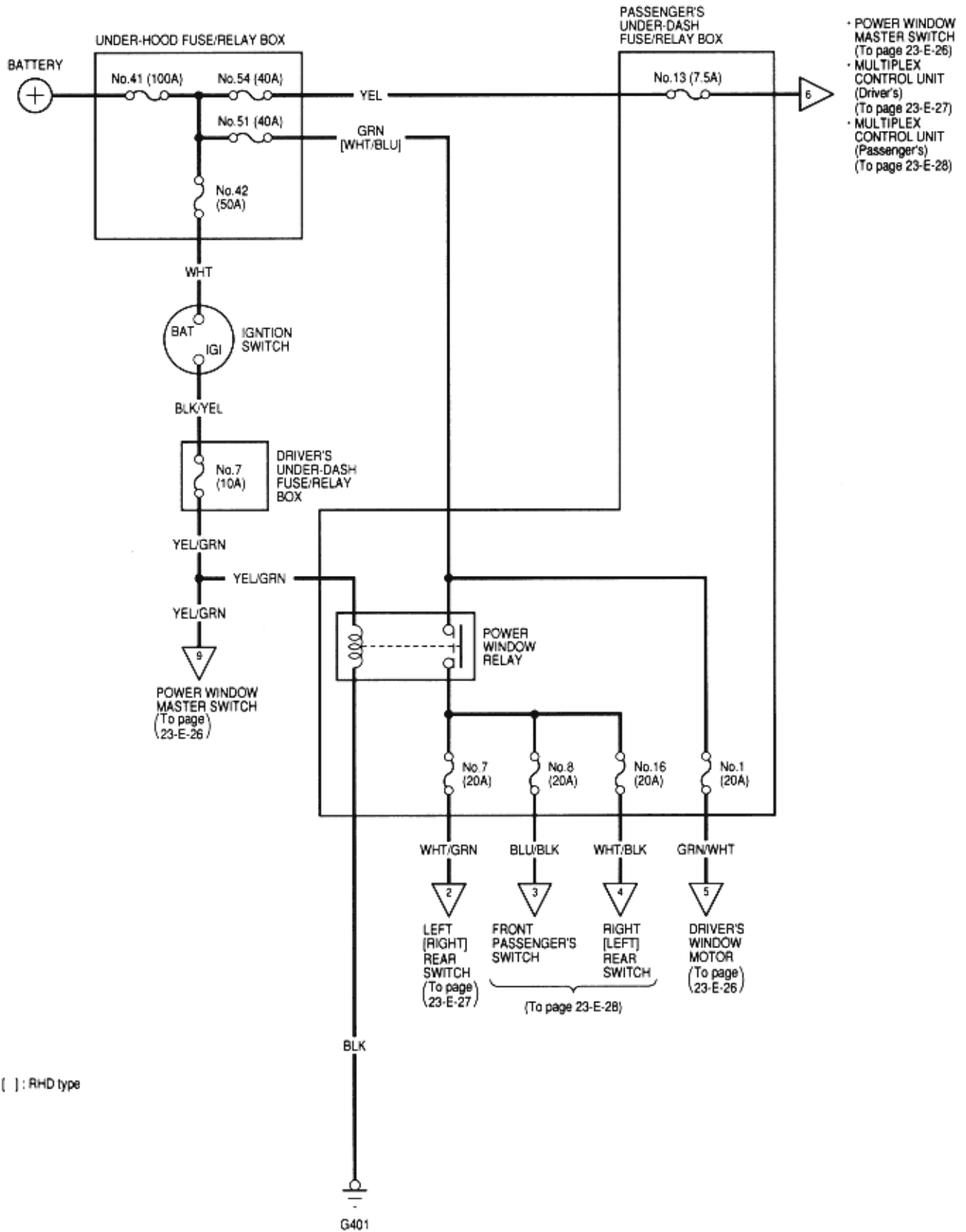
NOTE: LHD type is shown, RHD type is symmetrical.



Driver's Window Motor Description:

The driver's window will stop and automatically open, if you pinch your hand or something during auto-up operation.

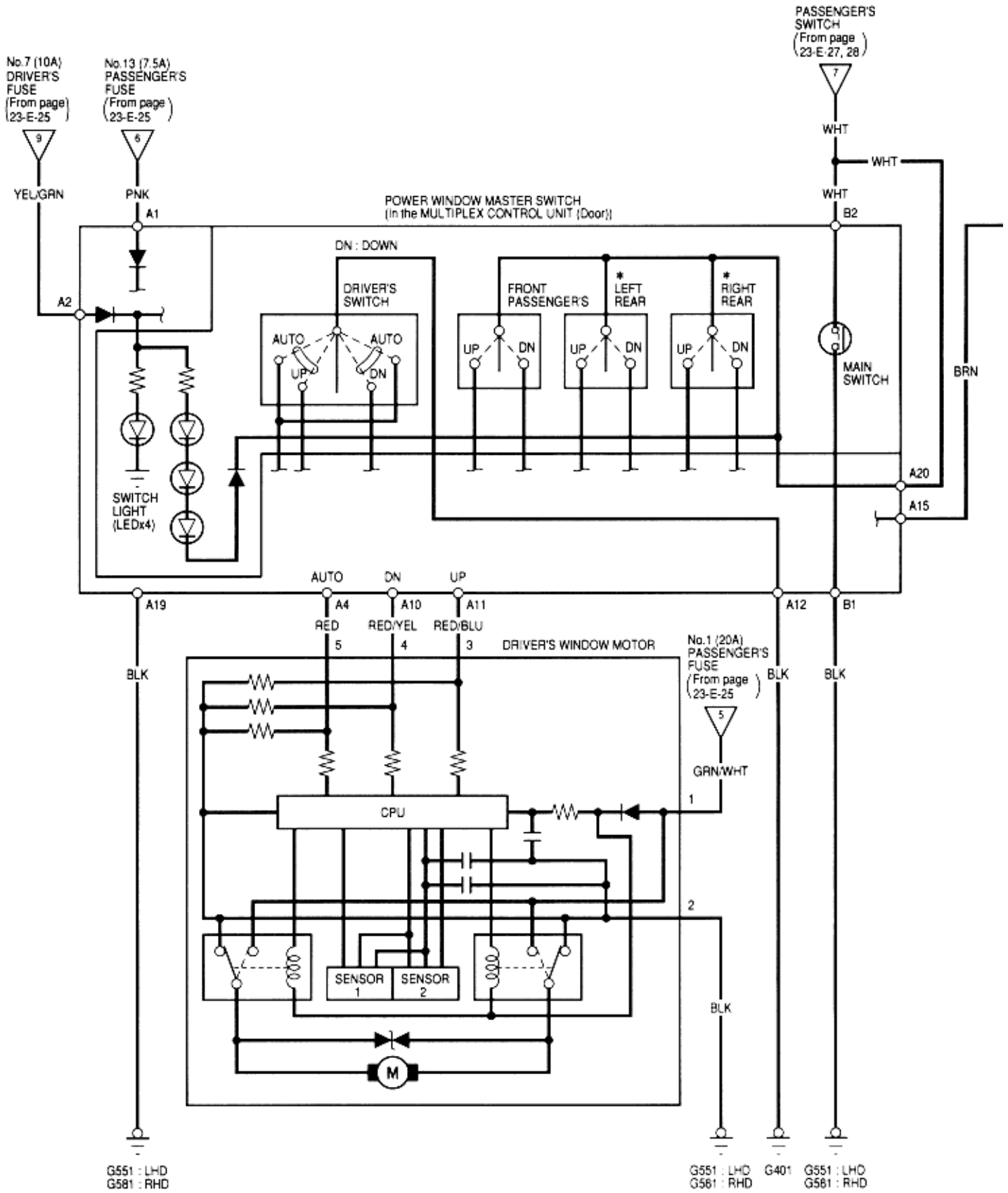
To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-B-3)
(See Page 23-E-33)
(See Page 23-E-35)
(See Page 23-E-36)



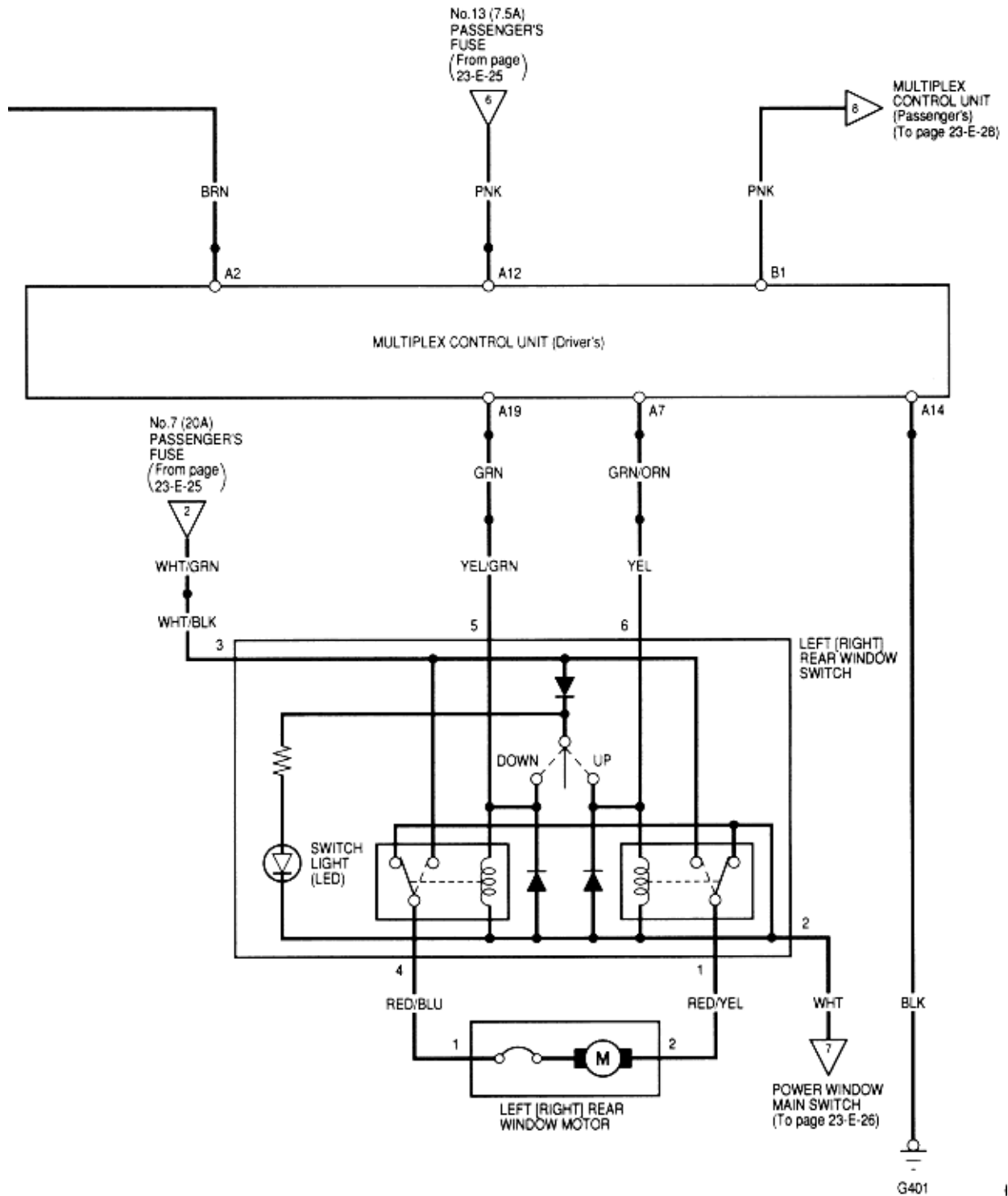
- POWER WINDOW MASTER SWITCH (To page 23-E-26)
- MULTIPLEX CONTROL UNIT (Driver's) (To page 23-E-27)
- MULTIPLEX CONTROL UNIT (Passenger's) (To page 23-E-28)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-E-26\)](#)
[\(See Page 23-E-27\)](#)
[\(See Page 23-E-28\)](#)

* : With rear power window

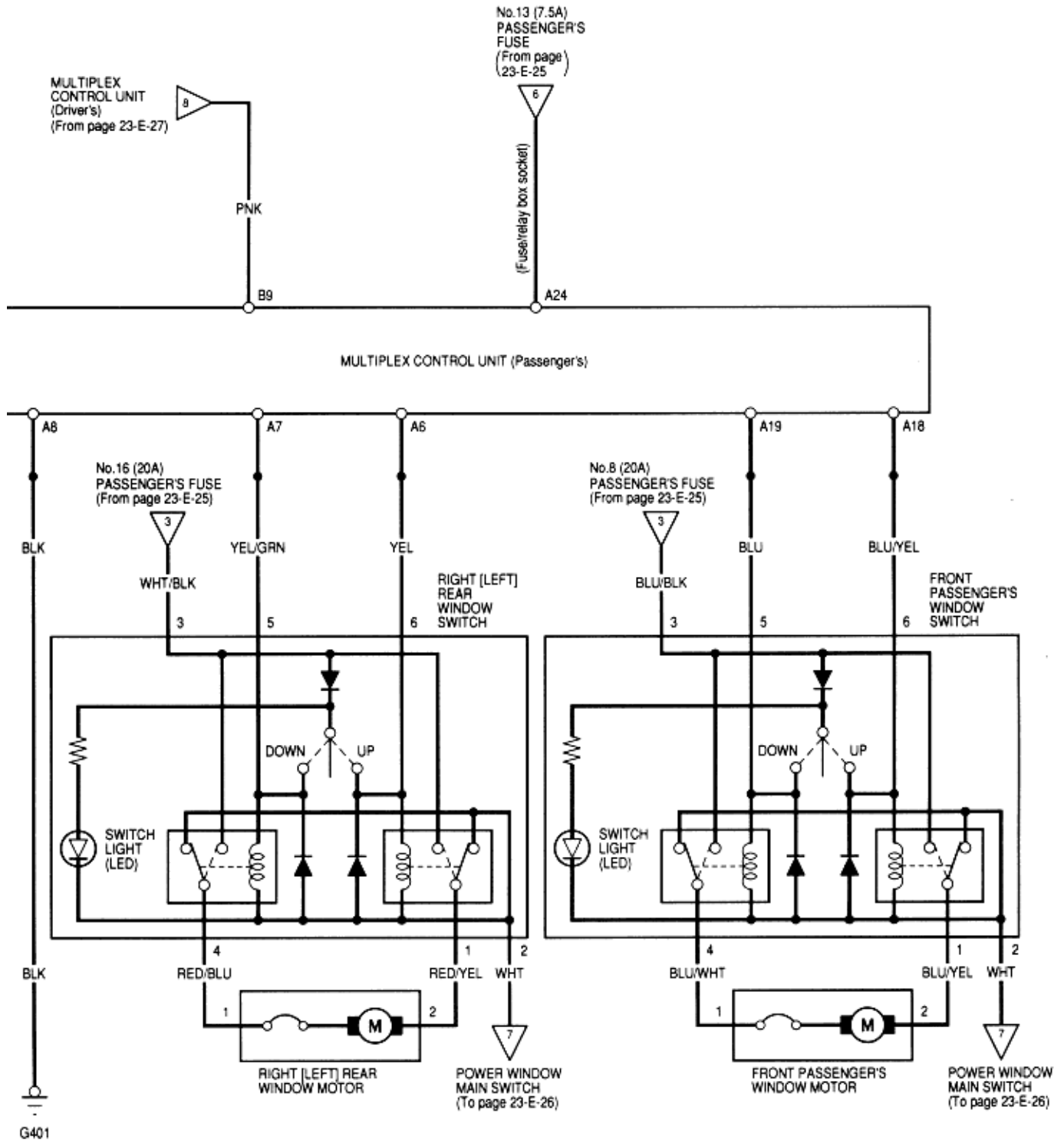


To go to the pages referenced on the diagram above,
click on the following:
[\(See Page 23-E-25\)](#)
[\(See Page 23-E-27\)](#)
[\(See Page 23-E-28\)](#)



[] : RHD type

To go to the pages referenced on the diagram above,
 click on the following:
[\(See Page 23-E-25\)](#)
[\(See Page 23-E-26\)](#)
[\(See Page 23-E-28\)](#)



To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-E-25\)](#)
[\(See Page 23-E-26\)](#)
[\(See Page 23-E-27\)](#)

NOTE:

- ◆ Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).
- ◆ The numbers in the table show the troubleshooting sequence.

Symptom	Item to be inspected		Blown No. 51 (40 A) fuse (In the under-hood fuse/relay box)	Power window relay	Passenger's under-dash fuse/relay box			Blown No. 7 (7.5 A) fuse (In the drivers under-dash fuse/relay box)	Power window master switch relay	Passenger's switch	Driver's motor	CPU (In driver's motor) or multiplex control unit (door)	Passenger's motor	Window regulator	Driver's window glass run channel	Control unit input	Poor ground	Open circuit in the wires, loose or disconnected terminals
	Blown No. 1 (20 A) fuse	Blown No. 8 (20 A) fuse			Blown No. 16 (20 A) fuse	Blown No. 7 (20 A) fuse												
All windows do not work.	1						2	3									G551	GRN, YEL/GRN [WHT/BLU]
Driver's window does not work.		1								2			4		3		G551	GRN/WHT, RED/YEL, RED/BLU
Driver's window does not work in AUTO.										3	1				2			RED
The driver's window proceeds to move automatically downward on the way during AUTO UP operation.										3	1			2				
The driver's window neither stop nor automatically open in spite of pinching your hand or something.										2	1							
Passenger's windows do not work.	Front passenger's		2	1						5			3	6	4		G551	BLU/BLK
	Left [Right] rear		2			1				5			3	6	4		G551	WHT/GRN
	Right [Left] rear		2			1				5			3	6	4		G551	WHT/BLK

[]: RHD type

Driver's Power Window Fail-safe Mode and Reset

Fail-safe mode

The power windows will be in the fail-safe mode:

- ◆ shutdown of the battery power.
- ◆ shutdown of the electric power caused by blown No. 1 (20 A) passenger's fuse or No. 51 (40 A) fuse.
- ◆ open circuit in the driver's door wire harness, loose or disconnected terminals.
- ◆ removal of the regulator, glass or glass run channel.

Reset the power window unit

1. Turn the ignition switch ON (II) to crank the engine.
2. Move the driver's window all the way down by using the driver's switch of the master switch by manual down.
3. Move the driver's window all the way up by using the driver's switch of the master switch more than one second.

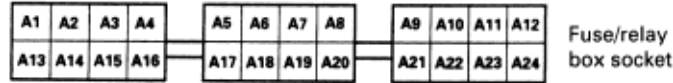
After resetting the power window unit, make sure the driver's window AUTO UP and AUTO DOWN operates properly.

- ◆ If the window does not work, reset the power window unit according to the above procedures again.
- ◆ If the window still does not work, proceed to the troubleshooting of the power window.

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (see page 23-B-7).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

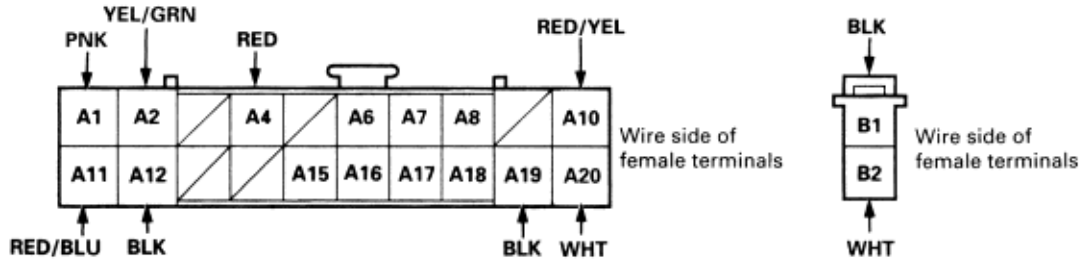
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A7	Fuse/relay box socket	Ignition switch ON (II) and left [right] switch on master switch down.	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire
A19	Fuse/relay box socket	Ignition switch ON (II) and left [right] switch on master switch up.	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire
A14	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire

[]: RHD type

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Door):

1. Remove the driver's door panel, and disconnect the 20P and 2P connectors from the door unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the power window master switch must be faulty; replace it.



Disconnect the connector from the control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A2	YEL/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 7 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A11	RED/BLU	Ignition switch ON (II) and driver's window switch in UP or AUTO UP position Master main switch OFF	Check for voltage between the A12 and A11 terminals: There should be battery voltage Check for voltage between the A12 and A11 terminals: There should be no voltage	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty master switch ♦ An open in the wire
A10	RED/YEL	Ignition switch ON (II) and driver's window switch in DOWN or AUTO DOWN position Master main switch OFF	Check for voltage between the A12 and A10 terminals: There should be battery voltage. Check for voltage between the A12 and A10 terminals: There should be no voltage	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty driver's window motor ♦ An open in the wire
A12, A19, B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G551: LHD, G581: RHD) ♦ An open in the wire

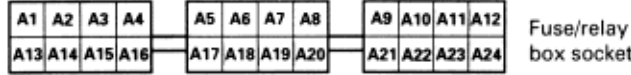
Reconnect the connector to the control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A4	RED	Ignition switch ON (II) and driver's window switch in AUTO UP position Ignition switch ON (II) and driver's window switch in AUTO DOWN position Master main switch OFF	Check for voltage the A4 and A12 terminals: There should be battery voltage Check for voltage between the A12 and A4 terminals: There should be no voltage	<ul style="list-style-type: none"> ♦ Blow No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty master switch ♦ An open in the wire
B2	WHT	With master main switch ON. Passenger's switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Faulty passenger's switch ♦ Poor ground (G551; LHD, G581; RHD). ♦ An open in the wire
A20	WHT	Ignition switch ON (II) and master switch ON	Check for voltage to ground: There should be battery voltage Switch light should come on	<ul style="list-style-type: none"> ♦ Faulty master switch ♦ Blown LED ♦ An open in the wire

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide ([see page 23-E-6](#)).

Multiplex Control Unit (Passenger's)

1. Remove the passenger's under-dash fuse/relay box ([see page 23-B-7](#)).
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connector from the control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A8	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor ground (G401). ♦ An open in the wire
A19	Fuse/relay box socket	Ignition switch ON (II) and front passenger's switch on master switch down	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 8 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire
A18	Fuse/relay box socket	Ignition switch ON (II) and front passenger's switch on master switch up	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 8 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire
A7 *	Fuse/relay box socket	Ignition switch ON (II) and right [left] rear switch on master switch down	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 16 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire
A6 *	Fuse/relay box socket	Ignition switch ON (II) and right [left] rear switch on master switch up	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 16 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty master switch ♦ An open in the wire

[]: RHD type

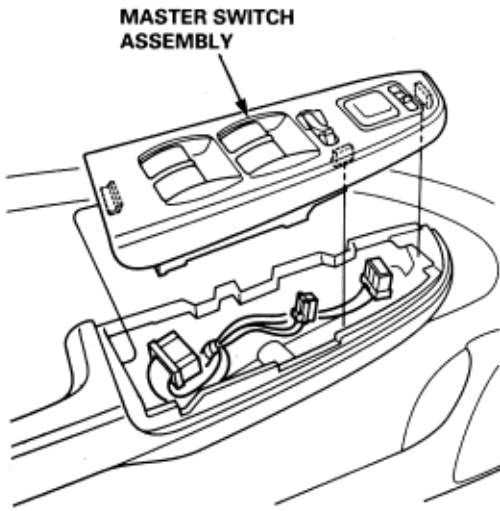
*: With rear power window

Power Windows
Master Switch Replacement

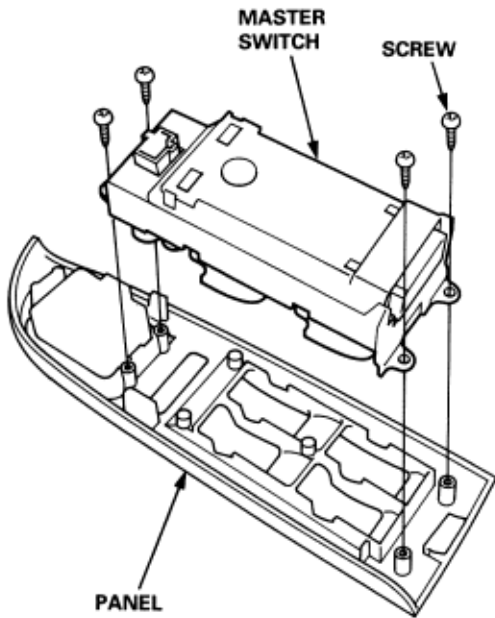
23-E-33

Passenger's Window Switch
Test/Replacement

1. Remove the master switch assembly from the armrest.

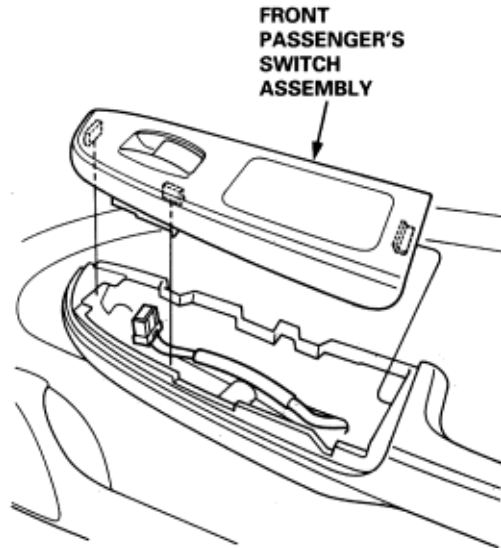


2. Remove the four mounting screws, then remove the master switch from the panel.

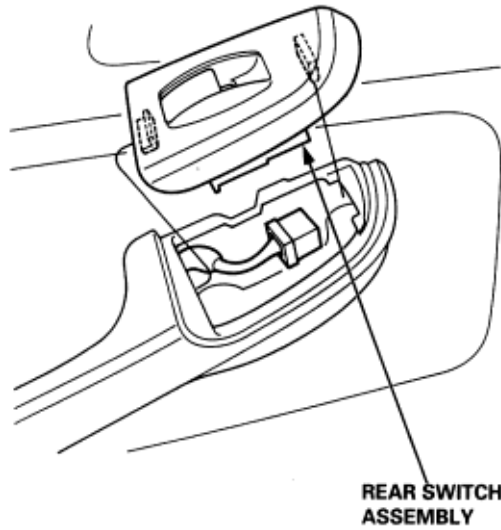


1. Remove the passenger's switch assembly from the armrest.

Front:



Rear:

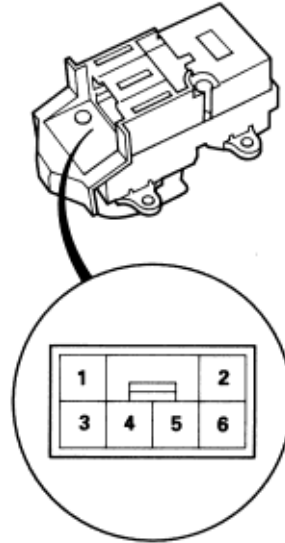
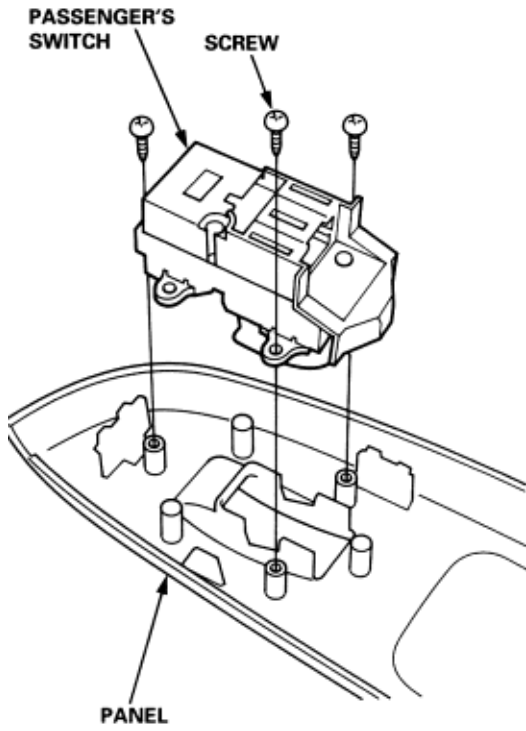


Power Windows

Passenger's Window Switch Test/Replacement (cont'd)

23-E-34

2. Remove the three mounting screws, then remove the passenger's switch from the panel.

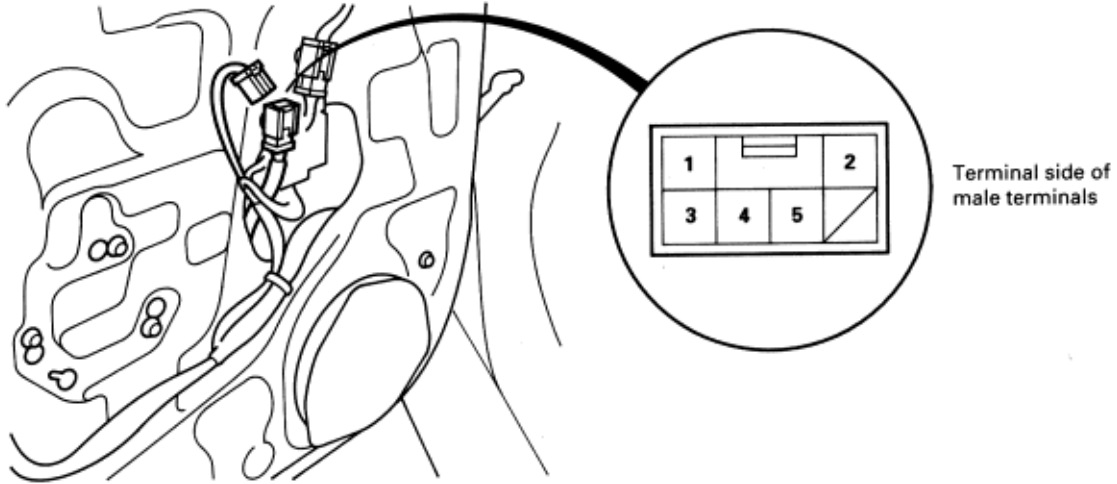


3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1	2	3	4	5	6
UP	○	○	○	○	○	○
OFF	○		○	○	○	○
DOWN	○	○	○	○	○	○

Motor Test:

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6P connector from the window motor.



3. Check for voltage between the No. 1 terminal and body ground.
 - ♦ If there is no battery voltage check for:
 - blown No. 1 (20 A) fuse in the passenger's under-dash fuse/relay box.
 - an open in the GRN/WHT wire.
 - ♦ If there is battery voltage, go to step 4.
4. Test the motor in each direction by connecting battery power to the No. 1 terminal and ground to the No. 2 terminal.
 - The motor should run (UP) when the battery power is connected to the No. 3 terminal.
 - The motor should run (DOWN) when battery power is connected to the No. 4 terminal.
 - The motor should stop running when the battery power is disconnected from No. 3 or No. 4 terminal.If the motor fails to run or does not run smoothly, replace it.

Power Windows

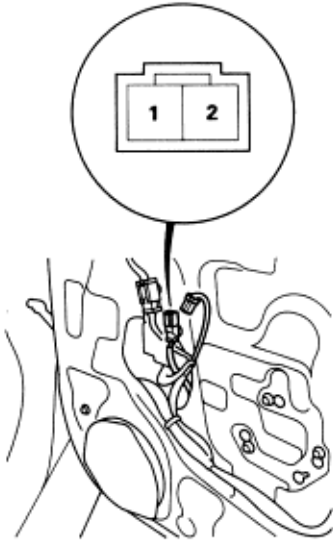
Driver's Window Motor Test (cont'd)

23-E-36

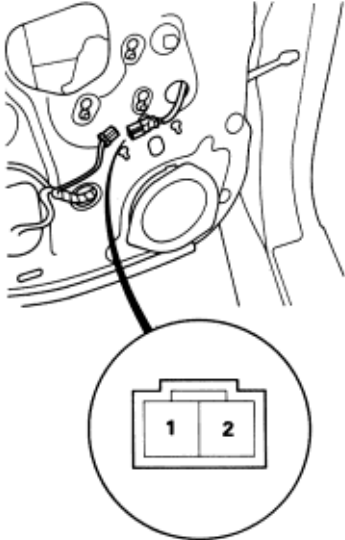
1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P connector from the window motor.

Front:

Terminal side of
male terminals



Rear:



Terminal side of
male terminals

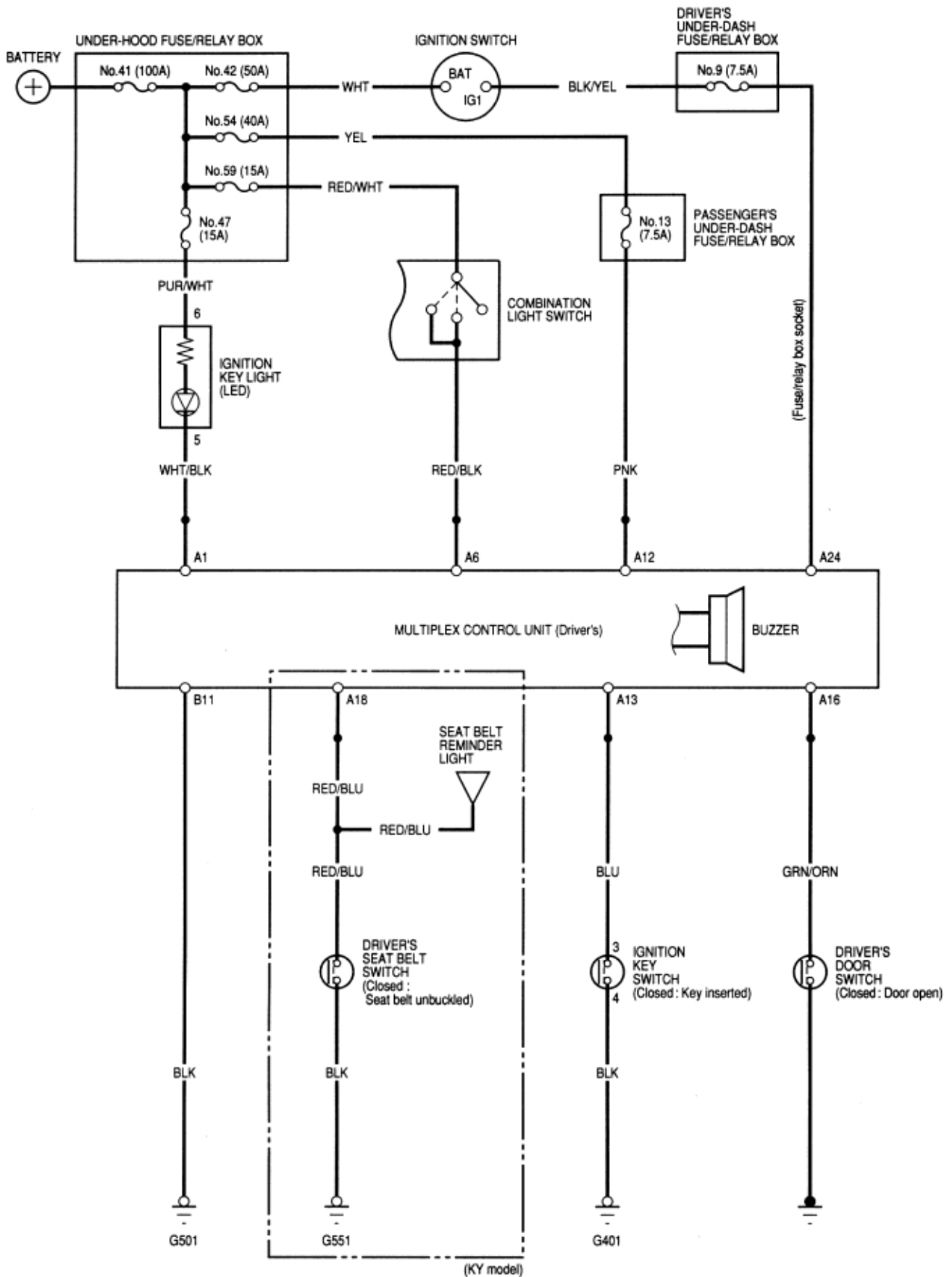
3. Check window motor operation by connecting power and ground according to the table. When the motor stops running, disconnect one lead immediately.

Terminal	1	2
Direction		
UP	⊖	⊕
DOWN	⊕	⊖

4. If the motor does not run or fails to run smoothly, replace it.

Lights On, Key-in, Seat Belt Reminder System
Circuit Diagram

23-E-37



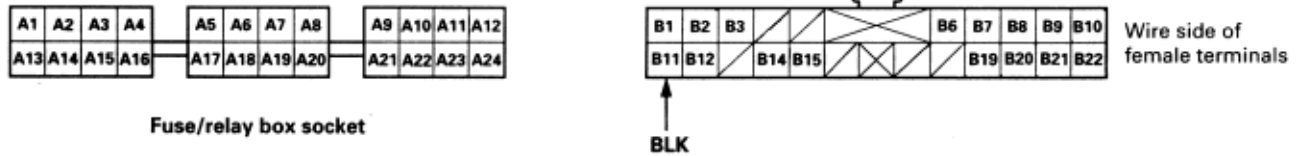
Lights On, Key-in, Seat Belt Reminder System
Control Unit Input Test

23-E-38

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (see page 23-B-7).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to make sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals lock OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Key Light Timer System:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for voltage to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A1	Fuse/relay box socket	Under all conditions	Attach to ground: Ignition key light should come on	<ul style="list-style-type: none"> ♦ Blown No. 47 (15A) fuse in the under-hood fuse/relay box ♦ Blown LED ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door open	Check for voltage to ground: There should be 1V or less	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire

Lights-on Reminder System:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A6	Fuse/relay box socket	Combination light switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 59 (15A) fuse in the under-hood fuse/relay box. ♦ Faulty combination light switch ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door open	Check for voltage to ground: There should be 1V or less	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire

Lights On, Key-in, Seat Belt Reminder System
Control Unit Input Test (cont'd)

23-E-39

Key-in Reminder System:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door open	Check for voltage to ground: There should be 1V or less	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire
A13	Fuse/relay box socket	Ignition key is inserted into the ignition switch	Check for voltage to ground: There should be 1V or less	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ An open in the wire ♦ Poor ground (G401)

Seat Belt Reminder System (KY model):

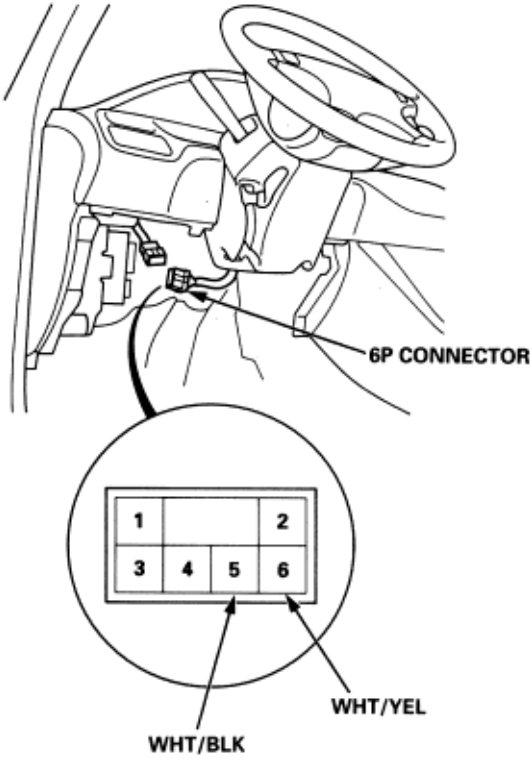
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A24	Fuse/relay box socket	Combination light switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ Faulty combination light switch ♦ An open in the wire
A18	RED/BLU	Driver's door open	Check for voltage to ground: There should be 1V or less	<ul style="list-style-type: none"> ♦ Faulty seat belt switch ♦ Poor ground (G551) ♦ An open in the wire

Lights On, Key-in, Seat Belt Reminder System
Ignition Key Light Test

23-E-40

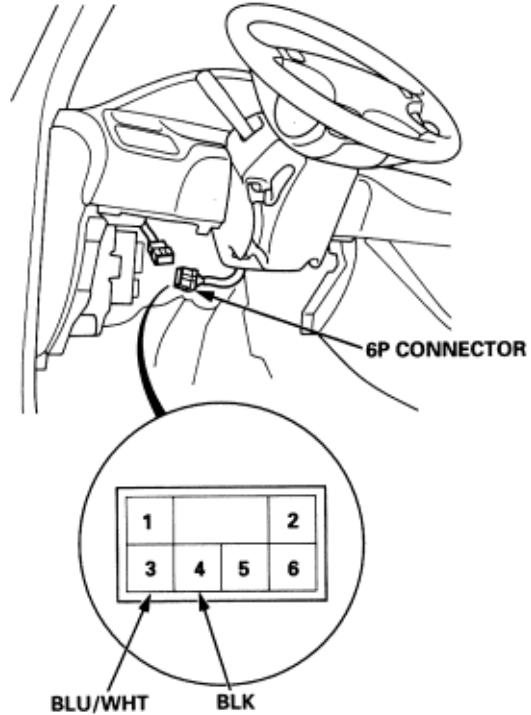
Ignition Key Switch Test

1. Remove the dashboard lower cover (see section 20).
2. Disconnect the 6P connector from the steering beam wire harness.



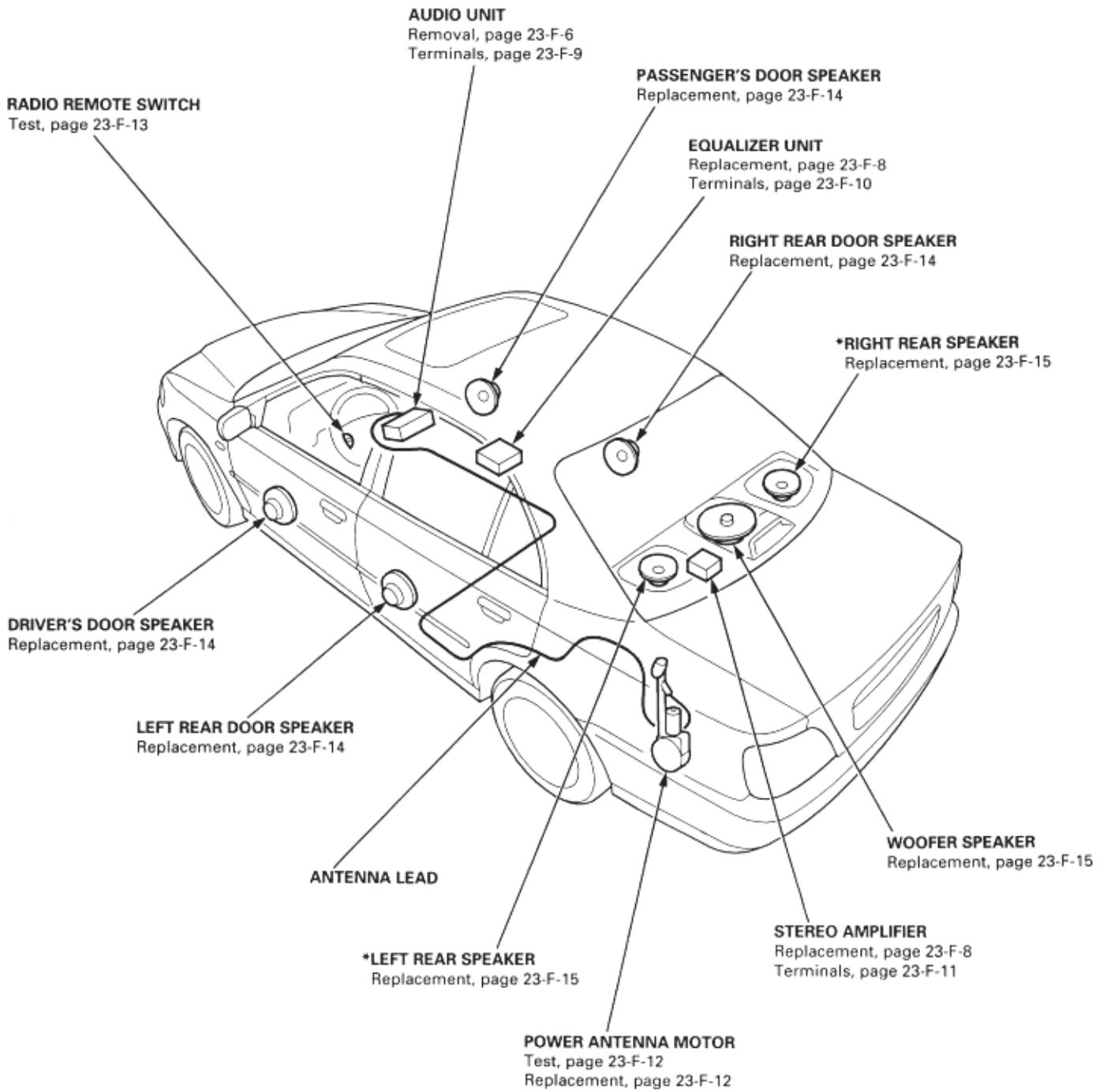
3. The ignition key light should come on when power is connected to terminal No.5 (WHT/BLK) and ground is connected to terminal No.6 (WHT/YEL).

1. Remove the dashboard lower cover (see section 20).
2. Disconnect the 6P connector from the steering beam wire harness.



3. Check for continuity between terminal No.3 (BLU/WHT) and No.4 (BLK).
 - ♦ There should be continuity with the key in the ignition switch.
 - ♦ There should be no continuity with the key removed.

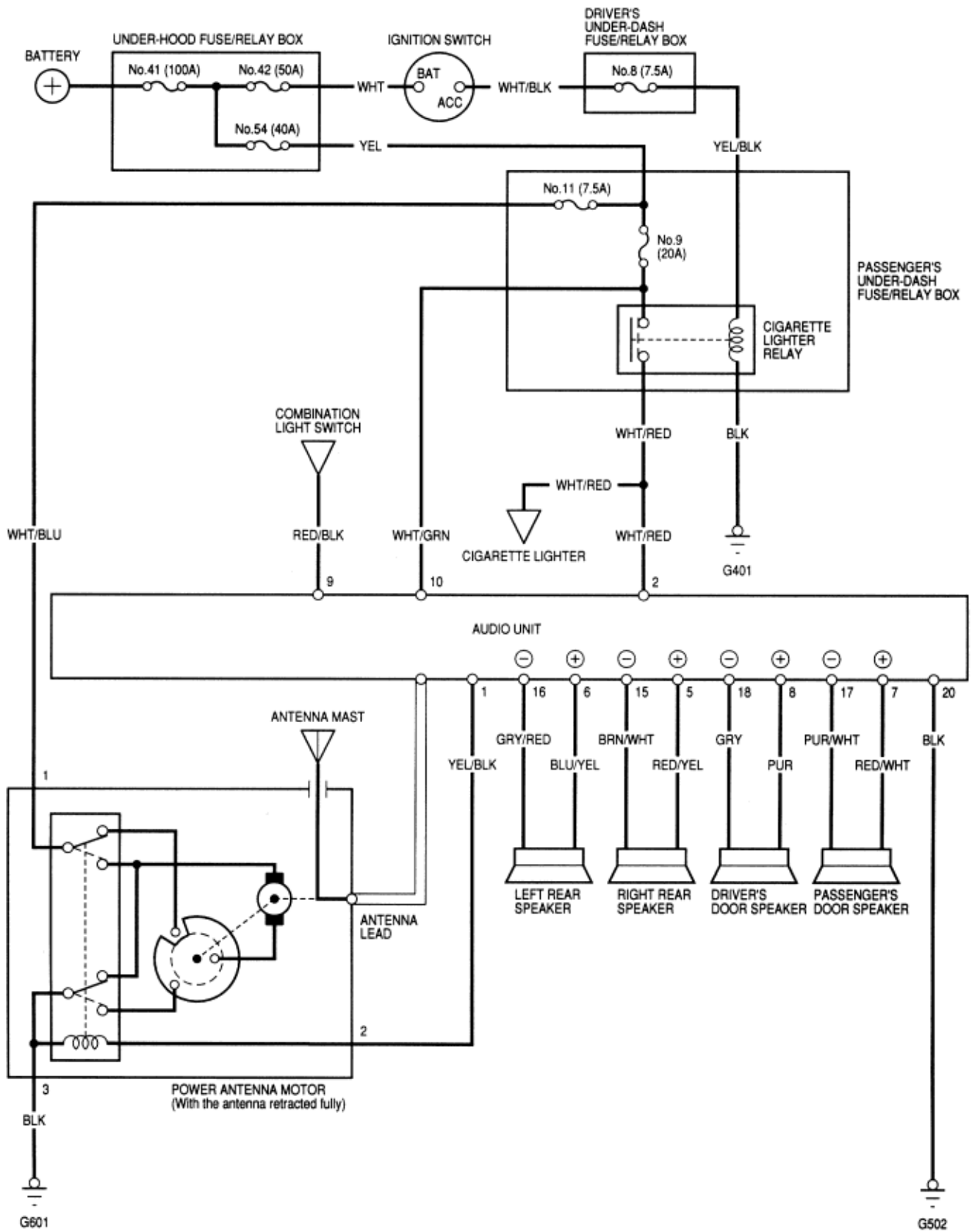
*: KY model



To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-F-6)
(See Page 23-F-9)
(See Page 23-F-13)
(See Page 23-F-14)
(See Page 23-F-15)
(See Page 23-F-12)
(See Page 23-F-8)
(See Page 23-F-10)
(See Page 23-F-11)

Stereo Sound System
Circuit Diagram (KY model)

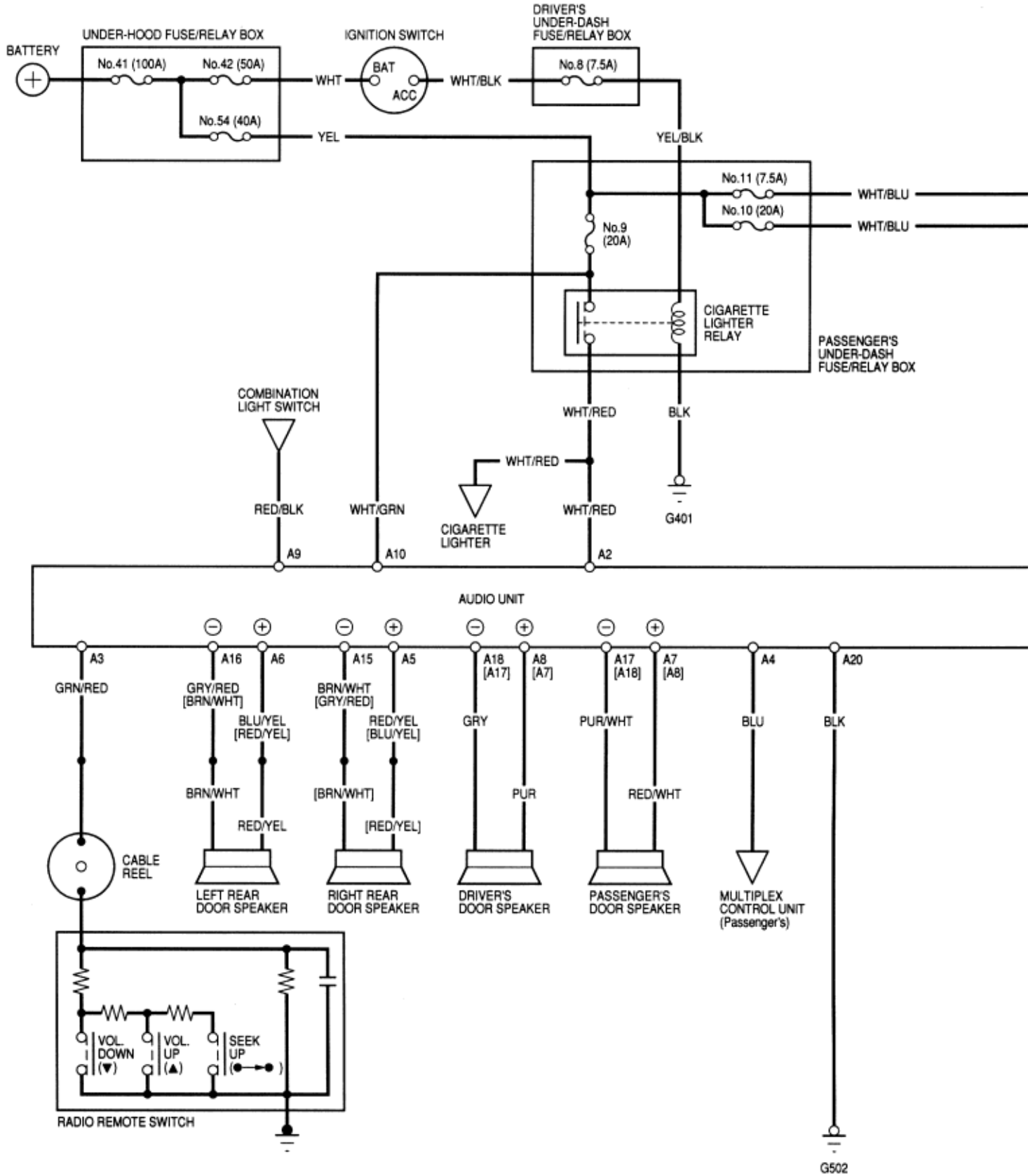
23-F-3

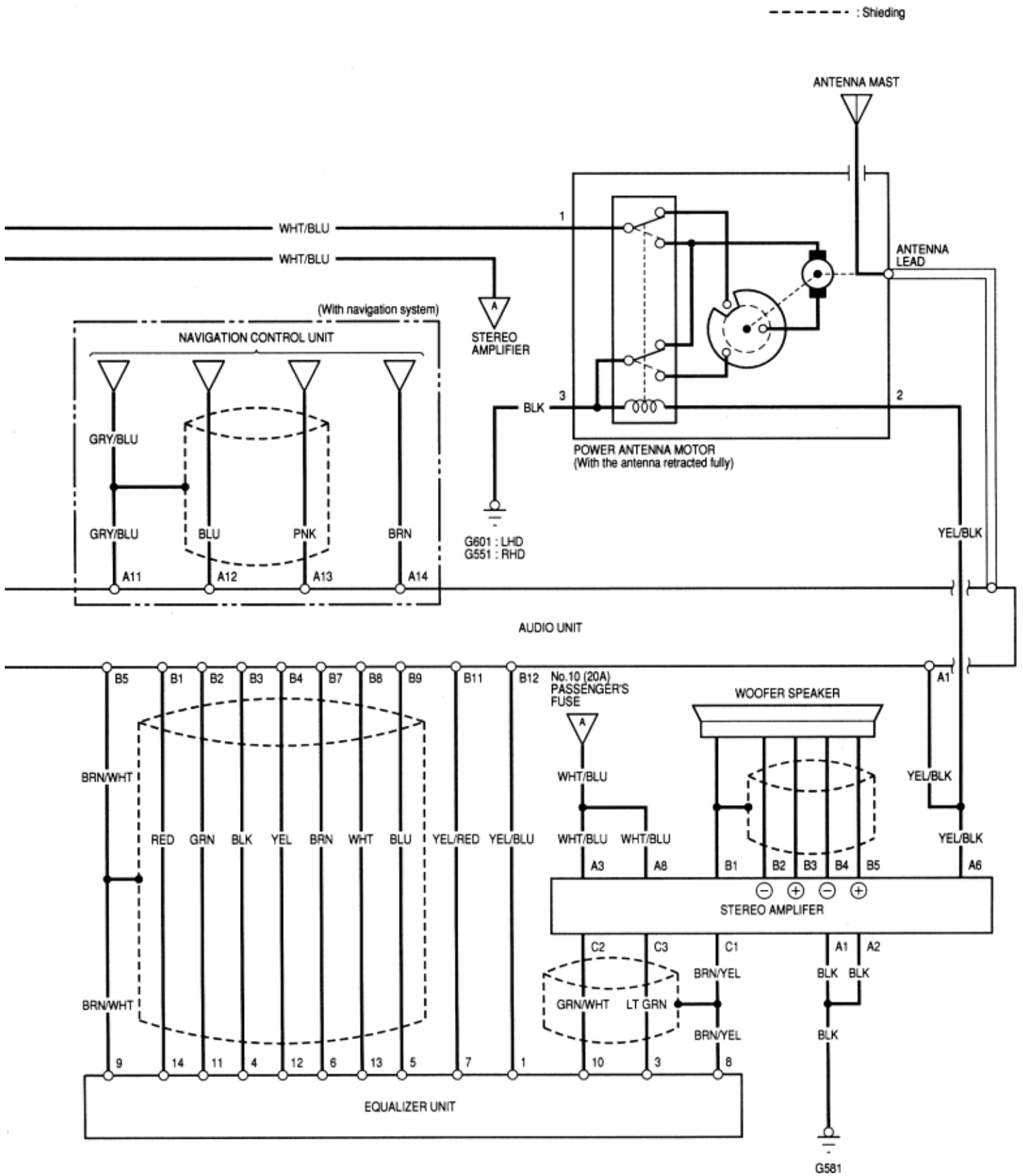


Stereo Sound System
Circuit Diagram (With Bose Sound System)

23-F-4

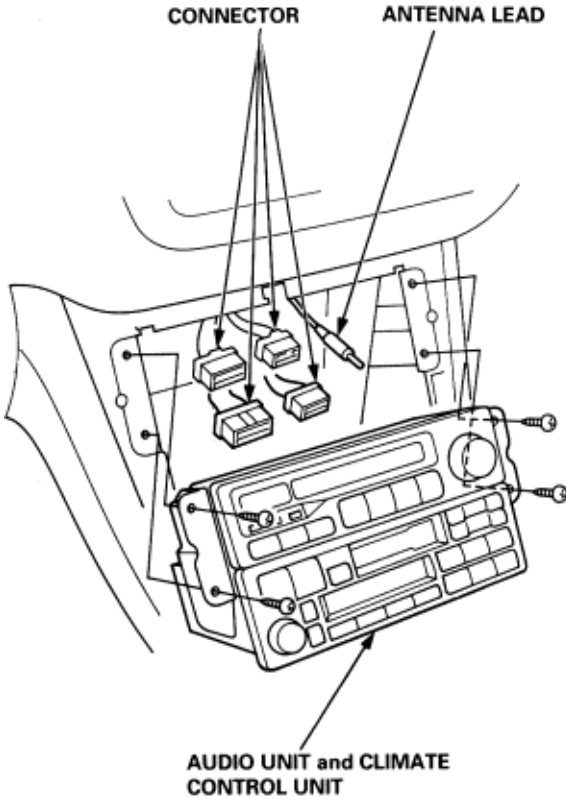
[] : RHD type



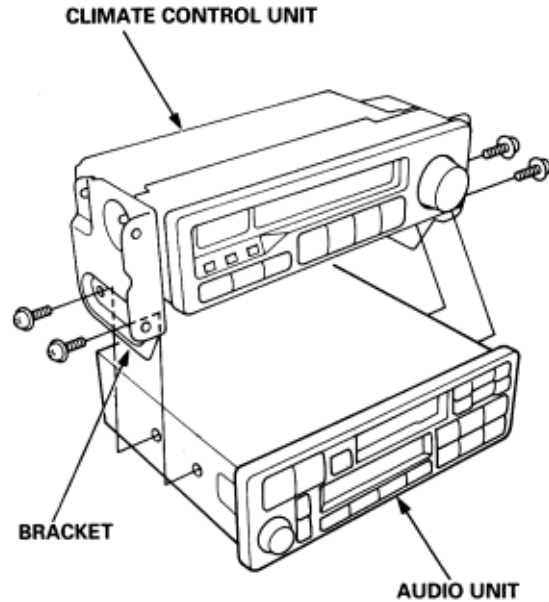


With Bose Sound System and Navigation System:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the front console panel (see section 20).
3. Remove the radio panel (see page 23-F-19).
4. Remove the screws and pull the audio unit and climate control unit.
5. Disconnect the connectors and antenna lead, and then remove the audio unit and climate control unit.



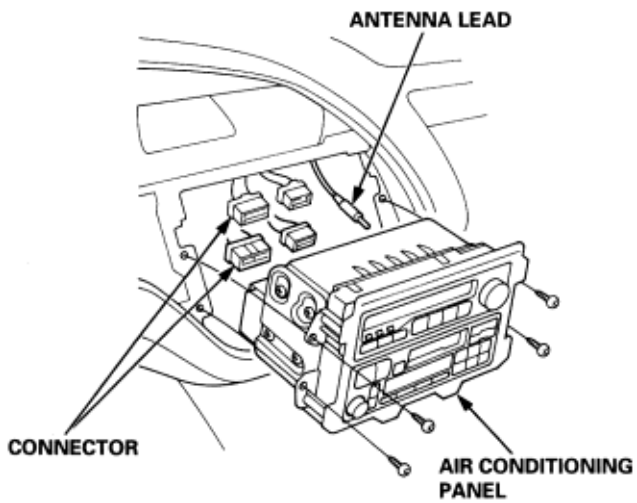
6. Remove the screws from the bracket, then remove the audio unit, from the bracket.



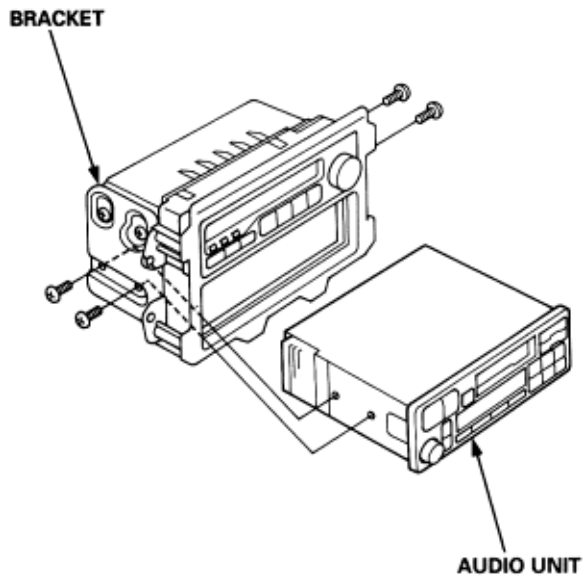
7. Install in the reverse order of removal.
8. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

With Bose Sound System:

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the instrument panel (see section 20).
3. Remove the screws from the air conditioning panel.
4. Disconnect the connectors and antenna lead, then remove the air conditioning panel



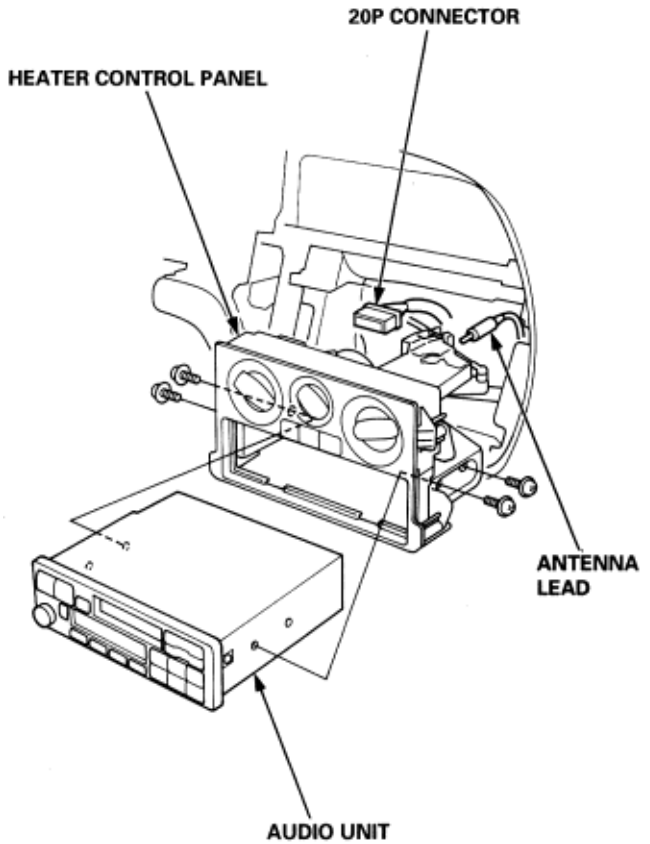
5. Remove the screws from the bracket, then remove the audio unit from the bracket.



6. Install in the reverse order of removal.
7. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

KY model:

1. Remove the instrument panel (see section 20).
2. Remove the heater control panel (see section 20)
3. Disconnect the 20P connector and antenna lead.
4. Remove the screws, then remove the audio unit from the brackets.



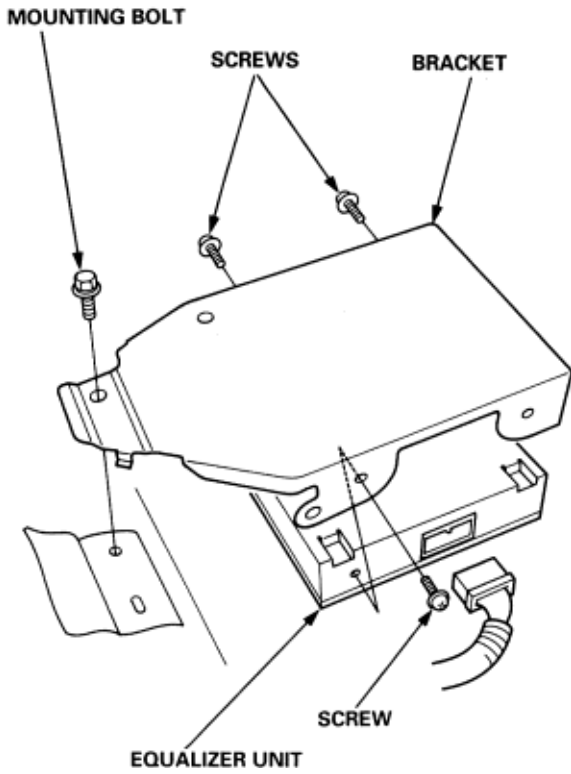
5. Install in reverse order of removal.

Stereo Sound System
Equaliser Unit Replacement

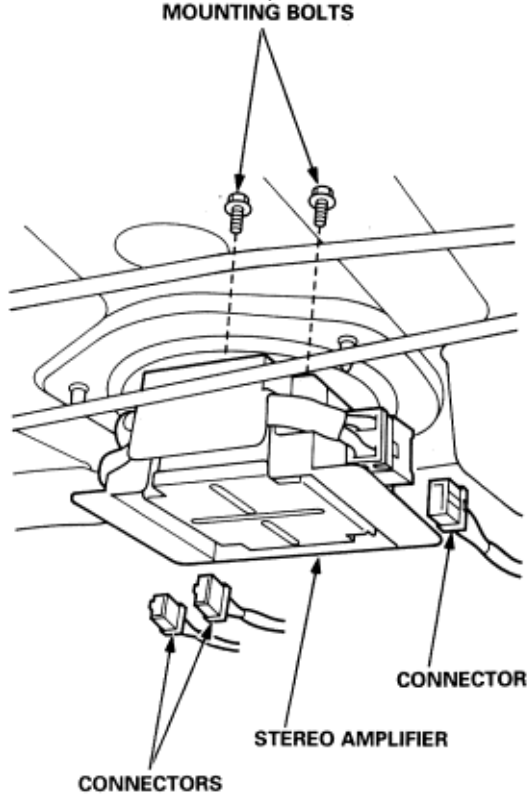
23-F-8

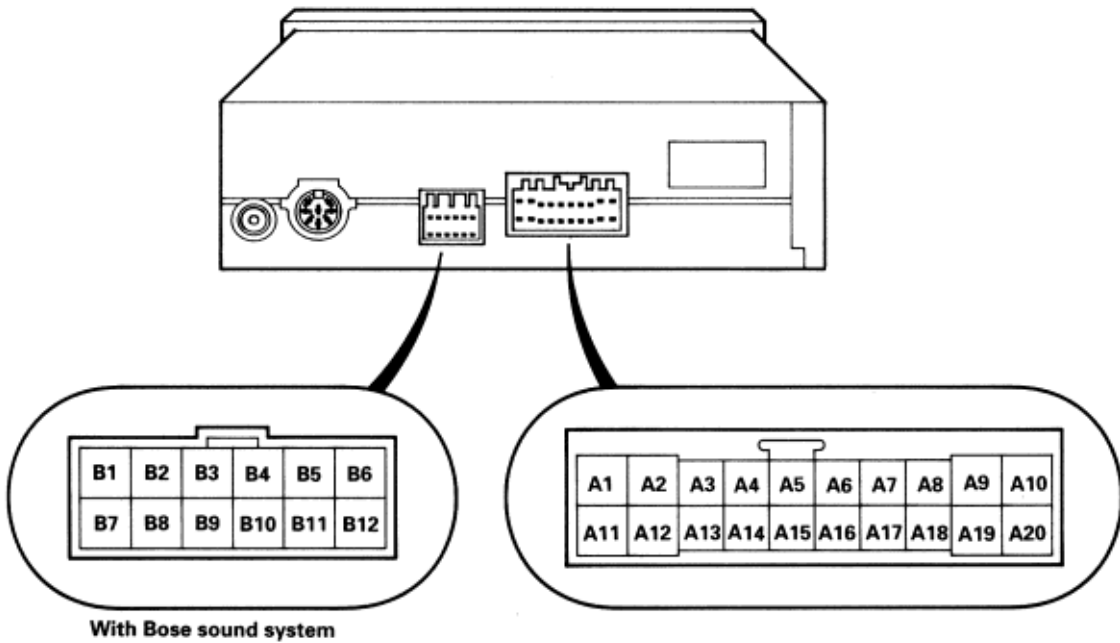
Stereo Amplifier Replacement

1. Remove the front seat (see section 20).
2. Remove the mounting bolt from the bracket.
3. Disconnect the connector from the unit.
4. Remove the screws, then remove the unit from the bracket.



1. Remove the rear shelf (see section 20).
2. Remove the mounting bolts from the amplifier.
3. Open the trunk lid.
4. Disconnect the connectors from the amplifier.
5. Remove the amplifier.

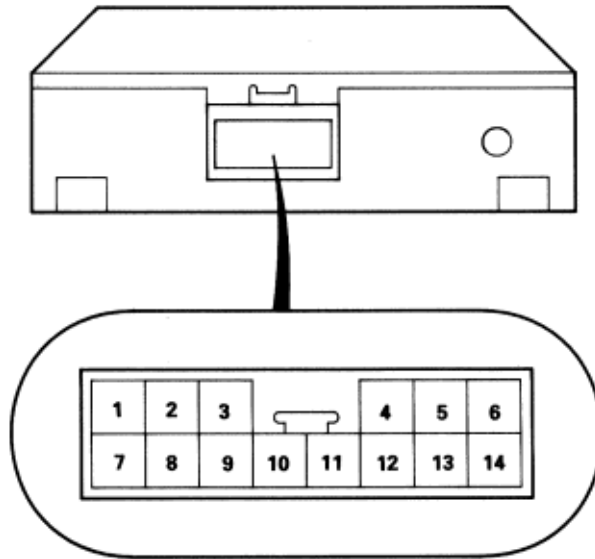




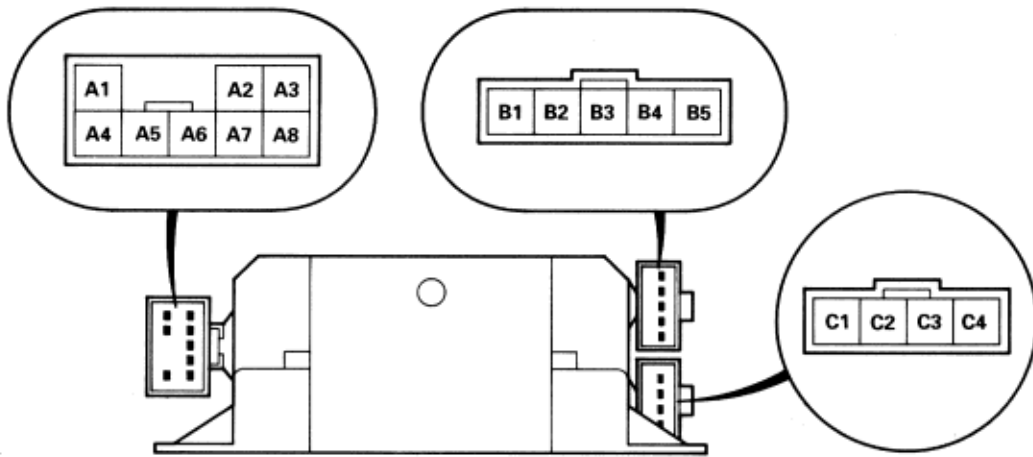
Cavity	Wire	Connect to
A1	YEL/BLK	Radio-switched power
A2	WHT/RED	ACC (main stereo power supply)
A3 *	GRN/RED	Radio remote switch
A4 *	BLU	Security in (passenger's MPCS unit)
A5	RED/YEL [BLU/YEL]	Right rear speaker (+)
A6	BLU/YEL [GRY/RED]	Left rear speaker (+)
A7	RED/WHT	Passenger's door speaker (+)
[A7]	[PUR]	Driver's door speaker (+)
A8	PUR	Driver's door speaker (+)
[A8]	[RED/WHT]	Passenger's door speaker (+)
A9	RED/BLK	Lights-on signal
A10	WHT/GRN	Constant power
A11 *	GRY/BLU	Navigation control unit (AF shielding)
A12 *	BLU	Navigation control unit (AF+)
A13 *	PNK	Navigation control unit (AF-)
A14 *	BRN	Navigation control unit (MUTE signal)
A15	BRN/WHT [GRY/RED]	Right rear speaker (-)
A16	GRY/RED [BRN/WHT]	Left rear speaker (-)
A17	PUR/WHT	Passenger's door speaker (-)
[A17]	[GRY]	Driver's door speaker (-)
A18	GRY	Driver's door speaker (-)
[A18]	[PUR/WHT]	Passenger's door speaker (-)
A19	-	Not used
A20	BLK	Ground (G502)
B1 *	RED	Equalizer unit (Left input)
B2 *	GRN	Equalizer unit (SUM input)
B3 *	BLK	Equalizer unit (Left output)
B4 *	YEL	Equalizer unit (COMMON output)
B5 *	BRN/WHT	Equalizer unit (Output shielding)
B6 *	-	Not used
B7 *	BRN	Equalizer unit (Right input)
B8 *	WHT	Equalizer unit (COMMON input)
B9 *	BLU	Equalizer unit (Right output)
B10 *	-	Not used
B11 *	YEL/RED	Equalizer unit (Ground)
B12 *	YEL/BLU	Equalizer unit (switched +BAT)

* : With Bose sound system

[] RHD type



Cavity	Wire	Connect to
1	YEL/BLU	Audio unit (Switched +BAT)
2	-	Not used
3	LT GRN	Stereo amplifier (BASS +)
4	BLK	Audio unit (Left output)
5	BLU	Audio unit (Right output)
6	BRN	Audio unit (Right input)
7	YEL/RED	Audio unit (Ground)
8	BRN/YEL	Stereo amplifier (BASS shielding)
9	BRN/WHT	Audio unit (Output shielding)
10	GRN/WHT	Stereo amplifier (BASS -)
11	GRN	Audio unit (SUM input)
12	YEL	Audio unit (COMMON output)
13	WHT	Audio unit (COMMON input)
14	RED	Audio unit (Left input)

Stereo Sound System**Stereo Amplifier Connector Terminals Identification****23-F-11**

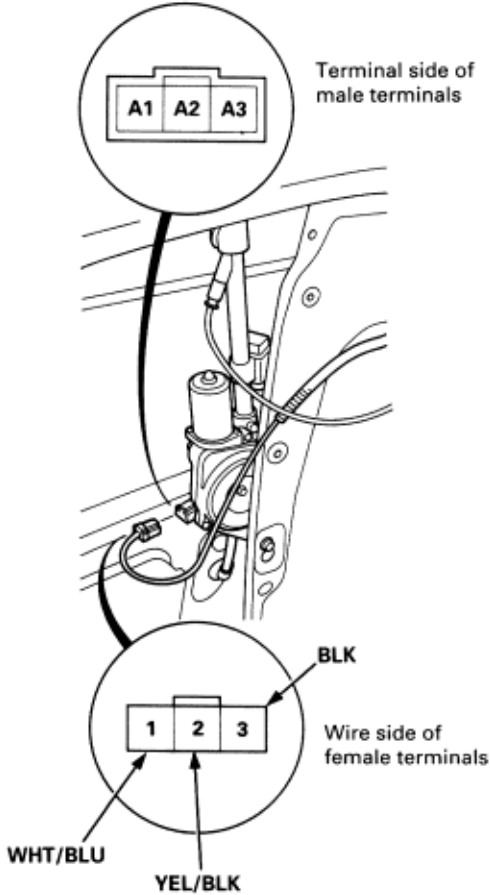
Cavity	Wire	Connect to	
A1	BLK	Ground (G581)	
A2	BLK	Ground (G581)	
A3	WHT/BLU	Constant power	
A4	-	Not used	
A5	-	Not used	
A6	YEL/BLK	Radio-switched power	
A7	-	Not used	
A8	WHT/BLU	Constant power	
B1	-	Woofers speaker (shielding)	
B2	-	Woofers speaker (-)	
B3	-	Woofers speaker (+)	
B4	-	Woofers speaker (-)	
B5	-	Woofers speaker (+)	
C1	BRN/YEL	Equalizer unit (BASS shielding)	
C2	GRN/WHT	Equalizer unit (BASS -)	
C3	LT GRN	Equalizer unit (BASS +)	
C4	-	Not used	

Stereo Sound System

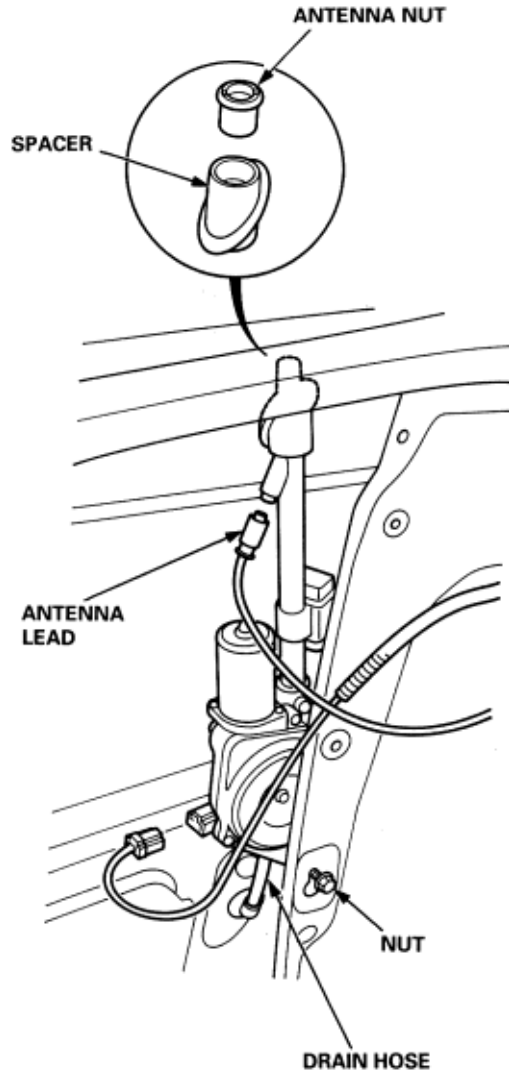
Power Antenna Motor Test/Replacement

23-F-12

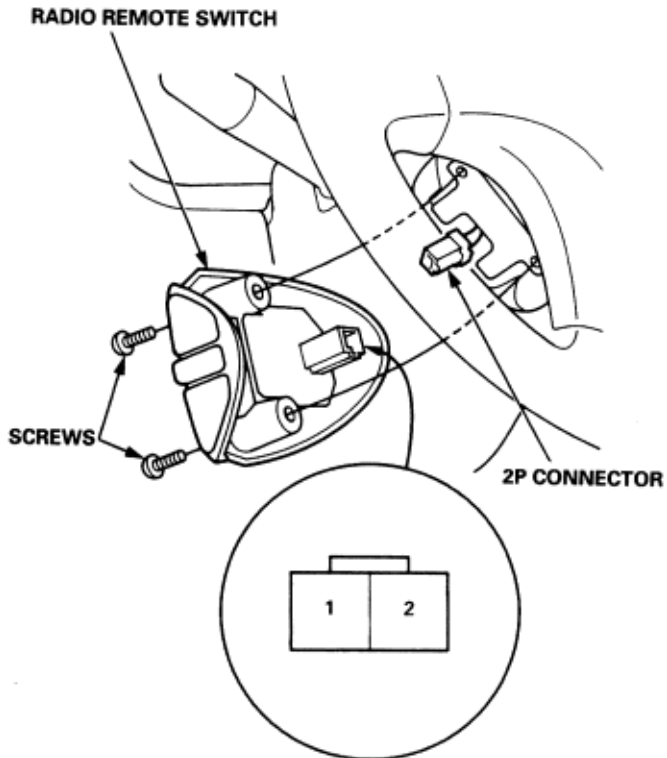
1. Remove the trunk side trim panel (see Section 20).
2. Disconnect the 3P connector from the motor, and remove the connector from its clamp.
3. Check the power to the motor at the connector terminals.
 - ♦ There should be battery voltage between the No. 1 (+) and No. 3 (-) terminals with ACC (I).
 - ♦ There should be battery voltage between the No. 2 (+) and No. 3 (-) terminals with ACC (I) and radio switched ON.
4. Test motor operation:
EXTEND: Connect battery power to the A1 and A2 terminals and ground the A3 terminal.
RETRACT: Then disconnect power from the A2 terminal.



5. Disconnect the antenna lead and drain hose.
6. Remove the antenna nut and spacer.
7. Loosen the nut from motor.
8. Remove the antenna motor assembly.



1. Remove the two screws from the radio remote switch.

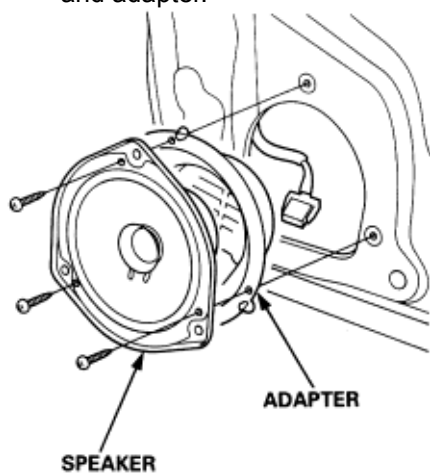


2. Remove the radio remote switch from the steering wheel by removing the two screws, and disconnect the 2P connector.
3. Measure resistance between the No. 1 and No. 2 terminals in each switch position according to the table.

Position	Resistance
OFF	Approx. 3.6 k Ω
● → ● (SEEK)	Approx. 990 Ω
▲ (VOL UP)	Approx. 370 Ω
▼ (VOL. DOWN)	Approx. 100 Ω

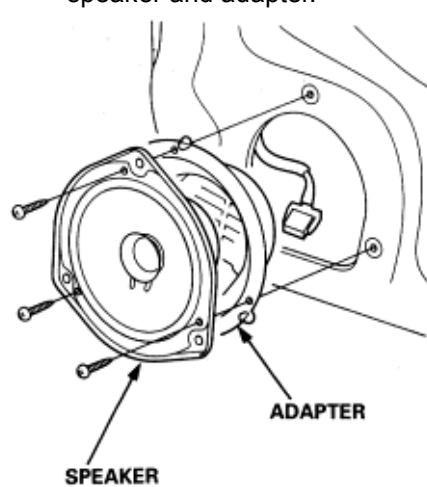
Front:

1. Remove the door panel (see section 20).
2. Remove the screws from the speaker.
3. Disconnect the 2P connector, then remove the speaker and adapter.



Rear (With Bose Sound System):

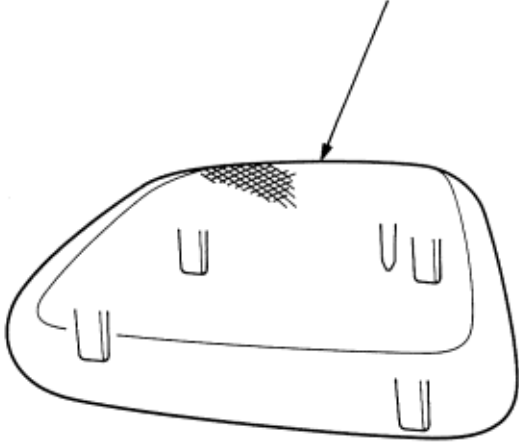
1. Remove the door panel (see section 20).
2. Remove the screws from the speaker.
3. Disconnect the 2P connector, then remove the speaker and adapter.



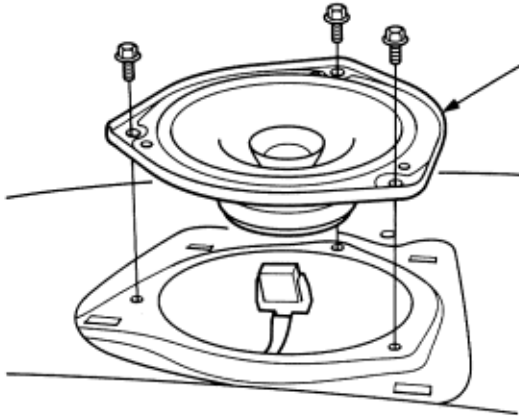
Rear (KY model):

1. Remove the speaker cover.
2. Remove the mounting bolts from the speaker.
3. Disconnect the 2P connector, then remove the speaker.

SPEAKER COVER

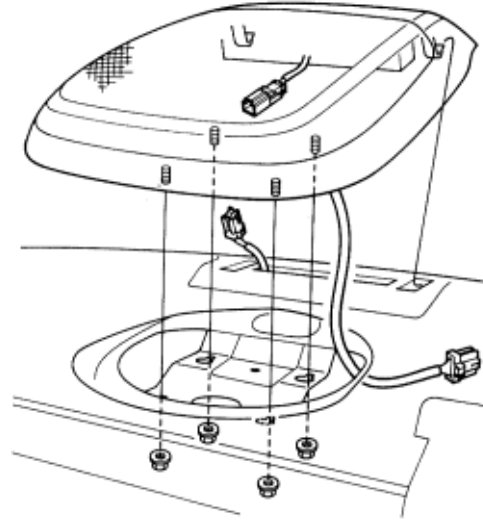


SPEAKER

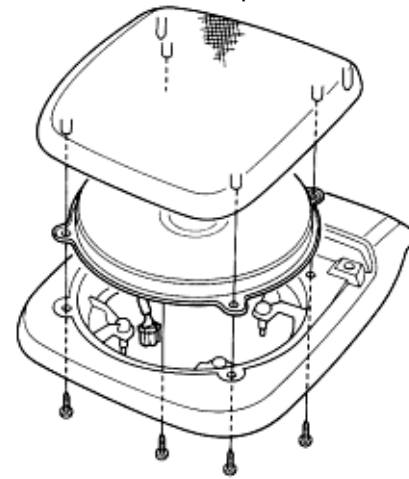


Woofer:

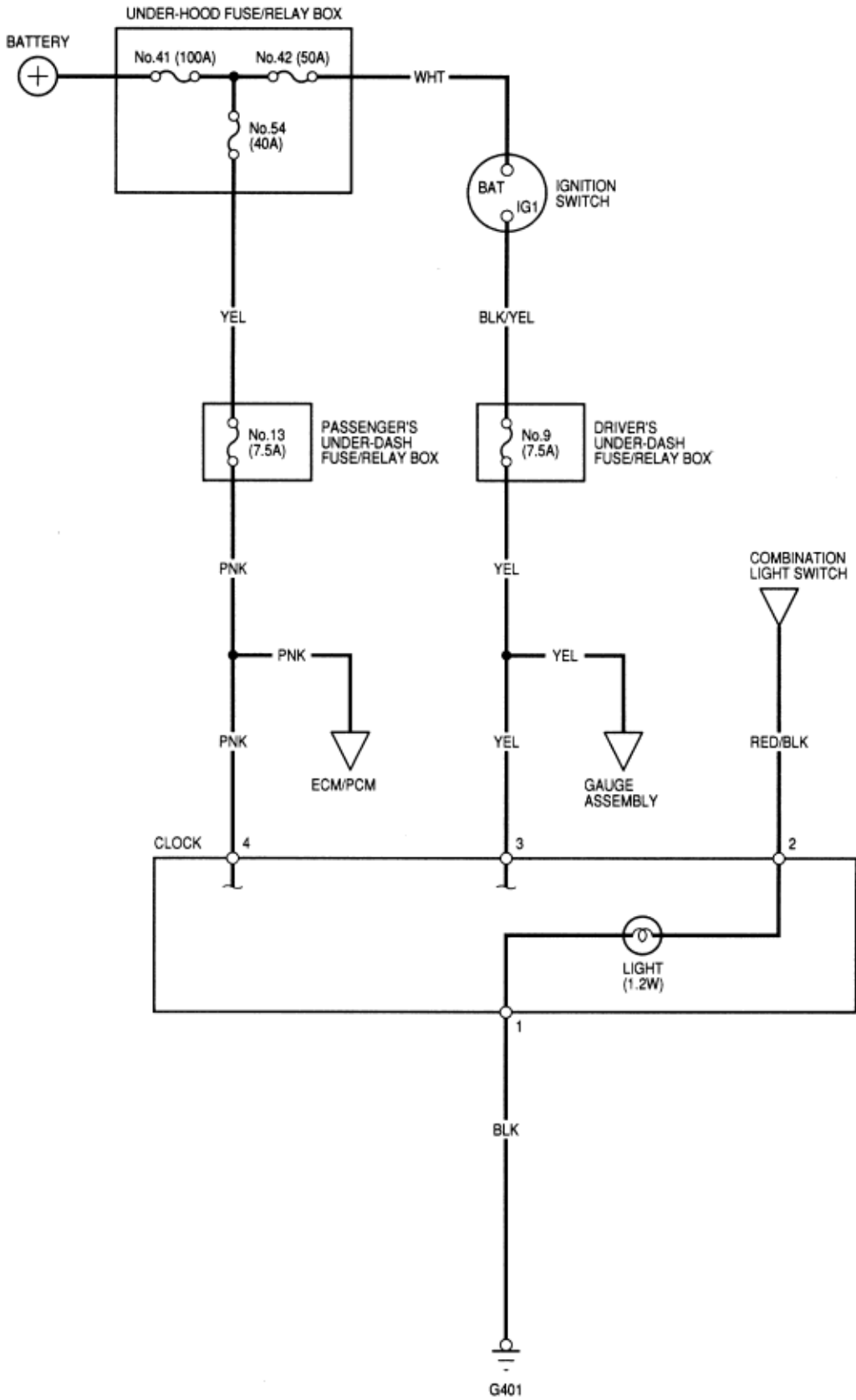
1. Open the trunk lid.
2. Disconnect the high mount brake light 2P connector and woofer speaker 5P connector.
3. Remove the mounting nuts, then remove the woofer speaker.



4. Remove the screws from the speaker cover, then remove the speaker cover and woofer speaker.

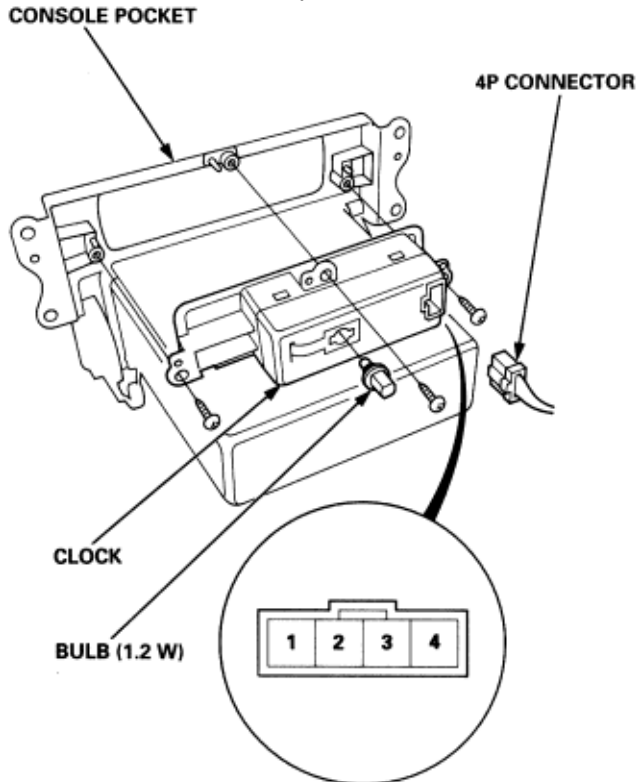


Clock (Without Automatic Climate Control) 23-F-16
Circuit Diagram



Clock (Without Automatic Climate Control) Replacement **23-F-17**

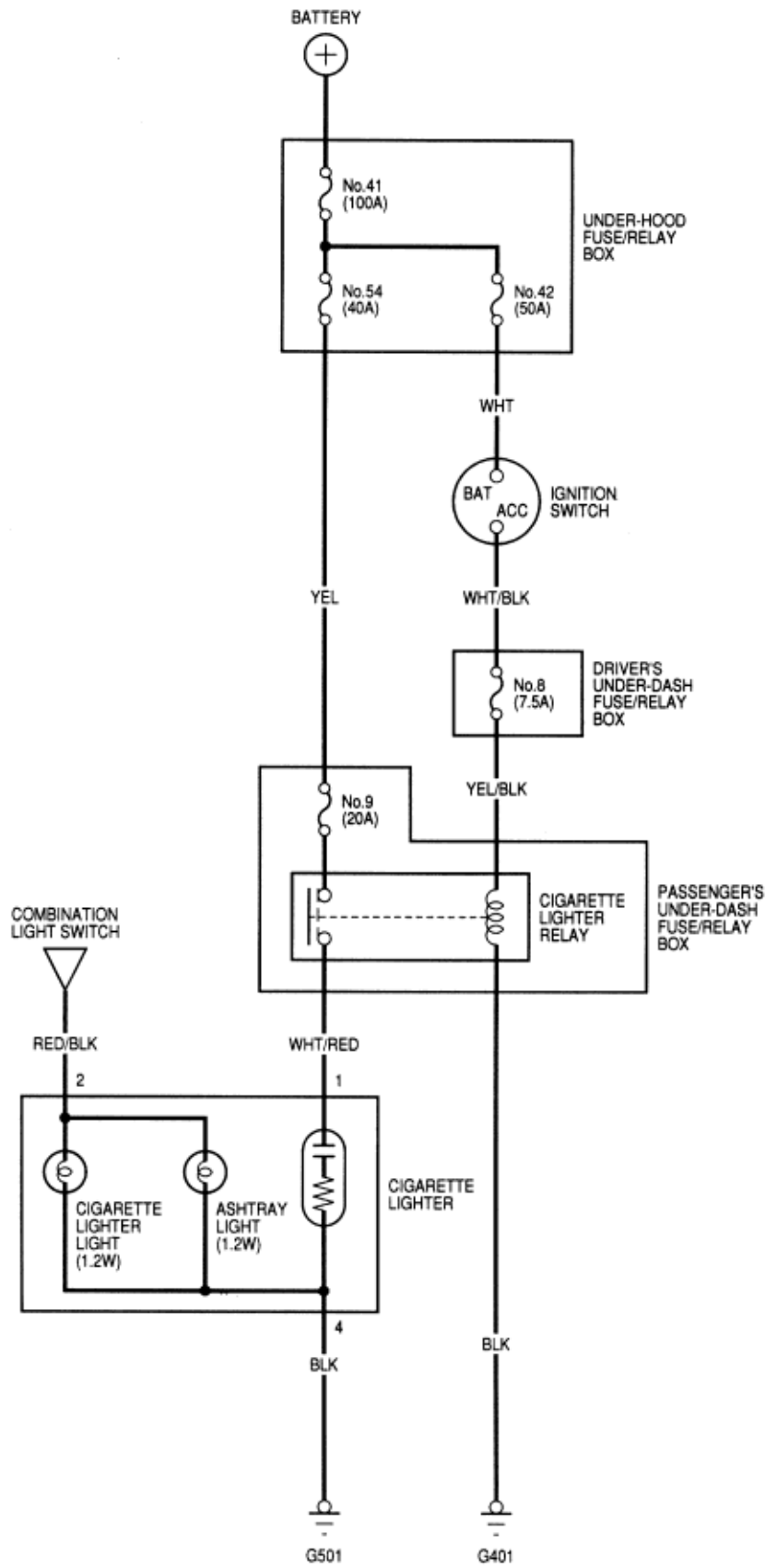
1. Remove the front console panel (see section 20).
2. Disconnect the 4P connector from the clock.
3. Remove the screws from the console pocket, then remove the console pocket from the front console.



4. Remove the clock from the console pocket.

Terminals

Cavity	Wire	Connect to
1	BLK	Ground (G401)
2	RED/BLK	Lights-on signal
3	YEL	IG1 (Main clock power supply)
4	PNK	Constant power



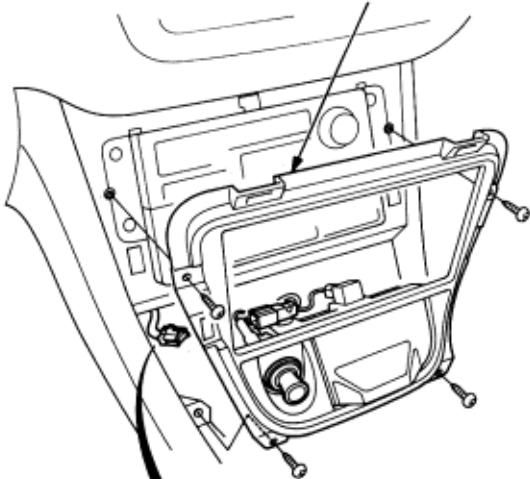
Cigarette Lighter

Cigarette Lighter Test/Replacement

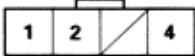
23-F-19

1. Remove the front console panel (see section 20).
2. Remove the radio panel.
3. Disconnect the 4P connector from the cigarette lighter.

RADIO PANEL



Wire side of female terminals

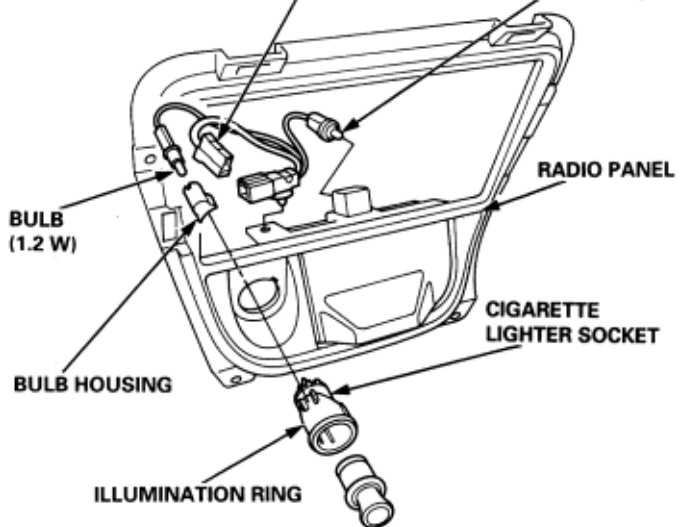


4. Inspect the connector terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, go to step 4.
5. Turn the ignition switch ON (II), and check for voltage between the No. 1 and No. 4 terminals.
 - ♦ There should be battery voltage.
 - ♦ If there is no battery voltage, check for:
 - blown No. 8 (7.5 A) driver's fuse in the under-dash fuse/relay box
 - poor ground (G401).
 - an open in the wire.

6. Turn the head light ON, and check for voltage between the No. 2 and No. 4 terminals.
 - ♦ There should be battery voltage.
 - ♦ If there is no battery voltage, check for:
 - blown No. 59 (15 A) fuse in the under-hood fuse/relay box.
 - faulty combination light switch.
 - an open in the wire.
7. If all the tests prove OK, replace the cigarette lighter.
8. Remove the screws from the radio panel, then remove the radio panel from the front console.
9. Disconnect the thermofuse housing from the socket.

THERMOFUSE HOUSING

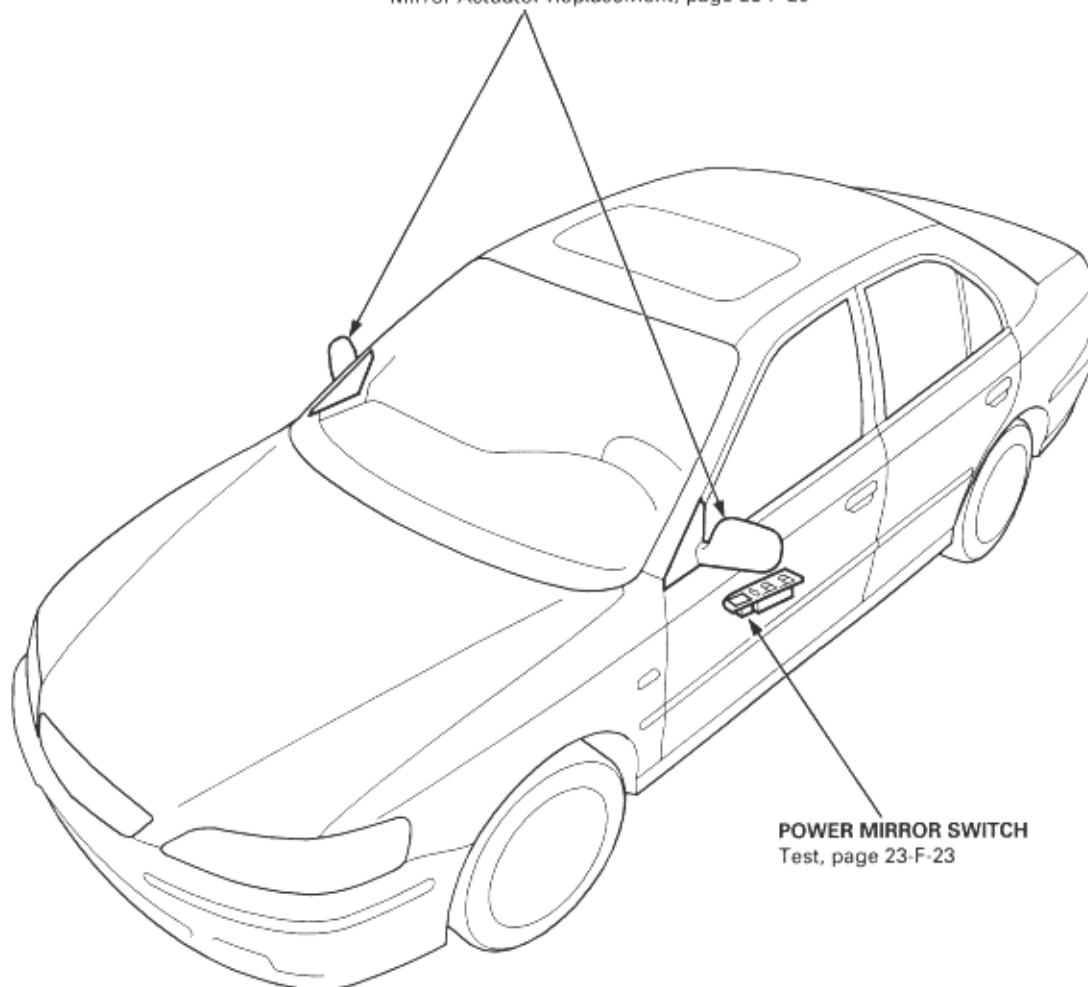
BULB (1.2 W)



10. Remove the bulb housing, and separate the cigarette lighter socket.
11. When installing the cigarette lighter, align each lug on the face panel, illumination ring, and cigarette lighter socket with the groove in the hole, then position the bulb housing on the illumination ring between the stops in the console panel.

NOTE: LHD type is shown, RHD type is symmetrical.

POWER MIRRORS
Function Test, page 23-F-22
Test, page 23-F-24
Replacement, section 20
Mirror Actuator Replacement, page 23-F-25



POWER MIRROR SWITCH
Test, page 23-F-23

To go to the pages referenced on the diagram above,
click on the following:

(See Page 23-F-22)

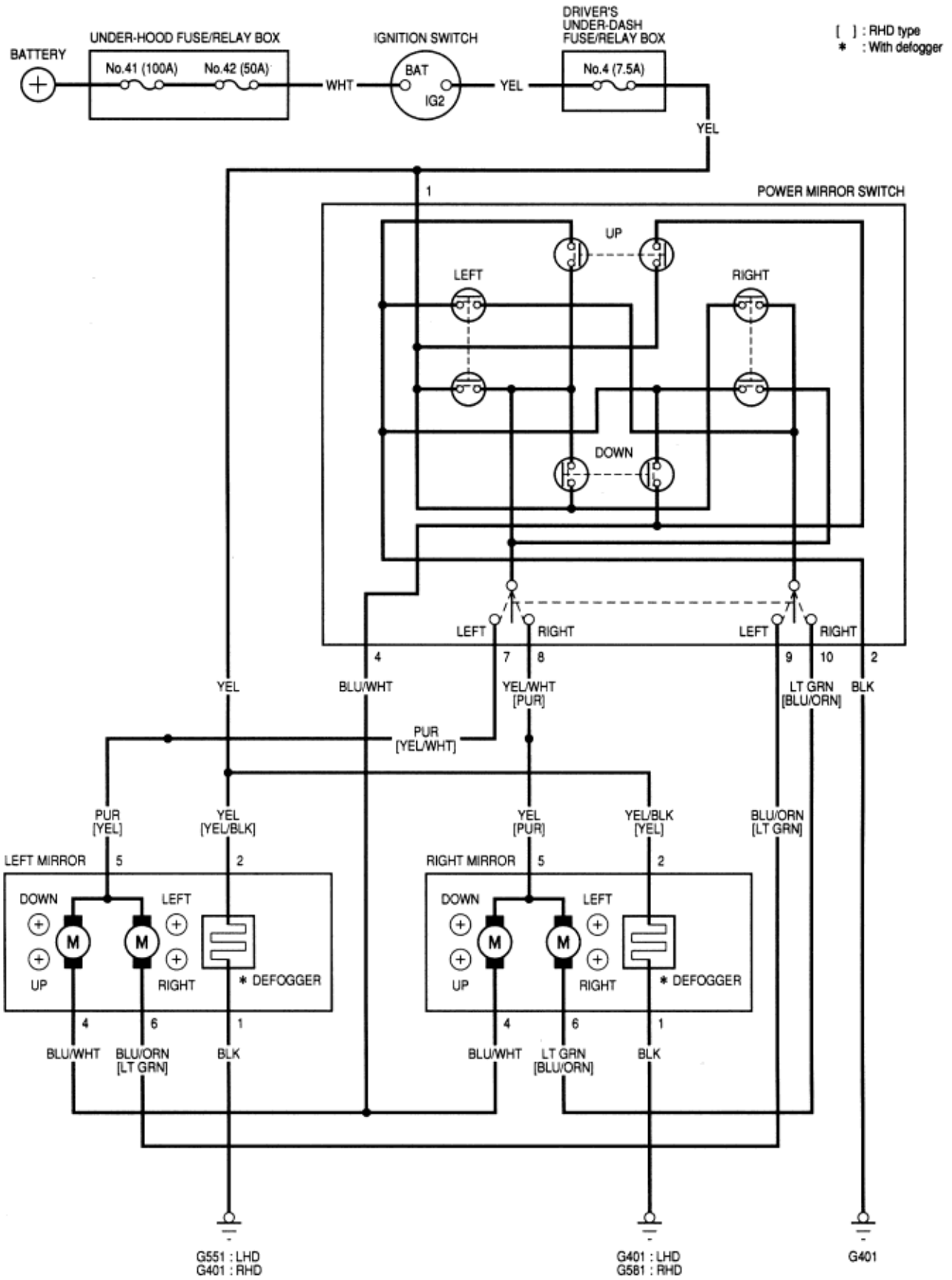
(See Page 23-F-24)

(See Page 23-F-25)

(See Page 23-F-23)

Power Mirrors
Circuit Diagram

23-F-21

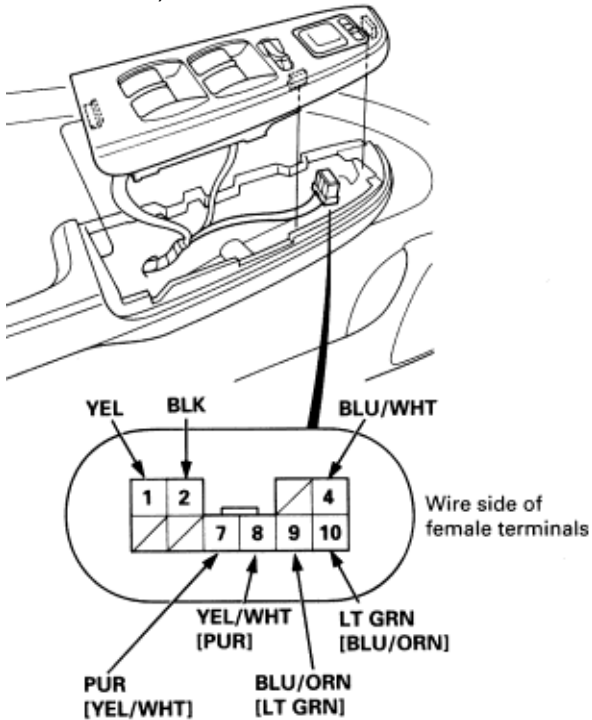


Power Mirrors

Function Test

23-F-22

1. Remove the driver's door switch panel (see page 23-E-23).



- []: RHD type
2. Disconnect the 10P connector from the power mirror switch.

Mirror Test

Both inoperative:

1. Check for voltage between the No. 1 terminal and body ground with the ignition switch ON (II). There should be battery voltage.
 - ♦ If there is no battery voltage, check for:
 - blown No. 4 (7.5 A) fuse in the driver's under-dash fuse/relay box.
 - an open in the YEL wire.
 - ♦ If there is battery voltage, go to step 2.
2. Check for continuity between the No. 2 terminal and body ground. There should be continuity.
 - ♦ If there is no continuity, check for:
 - an open in the BLK wire.
 - poor ground (G401).
 - ♦ If there is continuity, check both mirrors individually as described in the next column.

Left mirror inoperative:

Connect the No. 1 terminal to the No. 7 terminal, and the No. 4 (or No. 9) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch ON (II).

- ♦ If the mirror does not tilt down (or does not swing left), check for an open in the No.4 terminal (No. 9 terminal) wire between the left mirror and the 10P connector. If the wire is OK, check the left mirror actuator.
- ♦ If the mirror neither tilts down nor swings left, repair No.7 terminal wire.
- ♦ If the mirror works properly, check the mirror switch.

Right mirror inoperative:

Connect the No. 1 terminal to the No. 8 terminal, and the No. 4 (or No. 10) terminal to body ground with jumper wires. The right mirror should tilt down (or swing left) with the ignition switch ON (II).

- ♦ If the mirror does not tilt down (or does not swing left), check for an open in the No.4 terminal.(or No. 10 terminal) wire between the right mirror and the 10P connector. If the wire is OK, check the right mirror actuator.
- ♦ If the mirror neither tilts down nor swings left, repair the No 8 terminal wire.
- ♦ If the mirror works properly, check the mirror switch.

Defogger Test (With defogger)

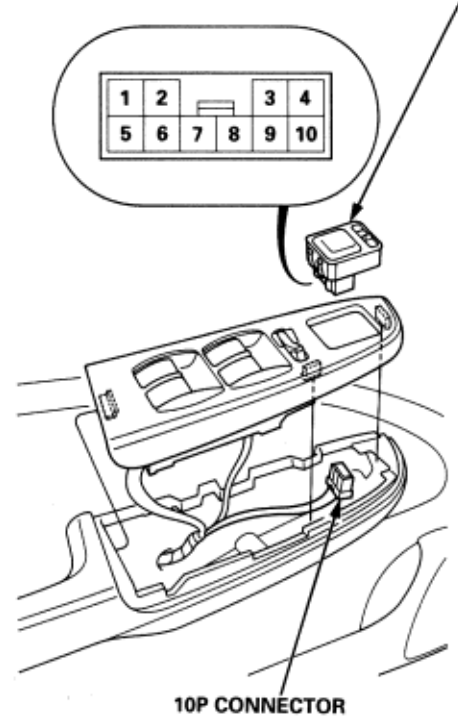
1. Check for voltage between the YEL/ BLK or YEL wire of the power mirror 6P connector and body ground with the ignition switch ON (II). There should be battery voltage and both mirrors should warm up
 - ♦ If there is no voltage or neither warms up, check for:
 - an open in the YEL/BLK or YEL wire.
 - blown No. 4 (7.5 A) in the driver's under-dash fuse/relay box.
 - poor ground G401,G551,G581).
 - ♦ If only one fails to warm up, check its defogger.

Power Mirrors
Switch Test

23-F-23

1. Remove the driver's switch panel (see page 23-E-23).
2. Disconnect the 10P connector from the power mirror switch.

POWER MIRROR SWITCH



10P CONNECTOR

3. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

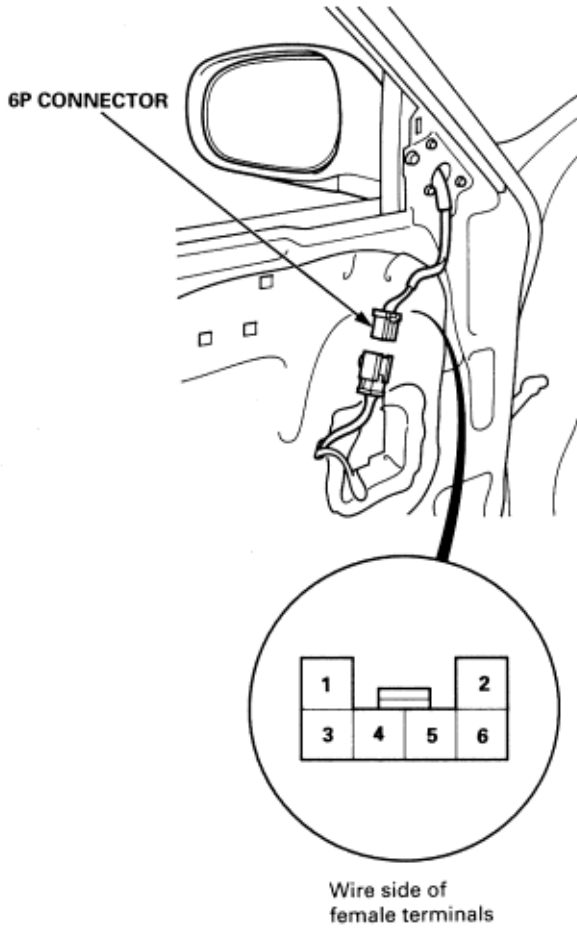
Terminal Position	1	2	4	7	8	9	10
L	UP	○	○				
	DOWN	○	○	○			
	LEFT	○	○	○		○	
	RIGHT	○	○	○		○	
R	UP	○	○		○		
	DOWN	○	○	○			
	LEFT	○	○	○			○
	RIGHT	○	○	○			○

Power Mirrors

Power Mirror Actuator Test

23-F-24

1. Remove the door panel (see section 20).
2. Disconnect the 6P connector from the power mirror.



3. Check actuator operation by connecting power and ground according to the table.

Terminal	4	5	6
Position			
TILT UP	⊕	⊖	
TILT DOWN	⊖	⊕	
SWING LEFT		⊕	⊖
SWING RIGHT		⊖	⊕

Defogger Test:

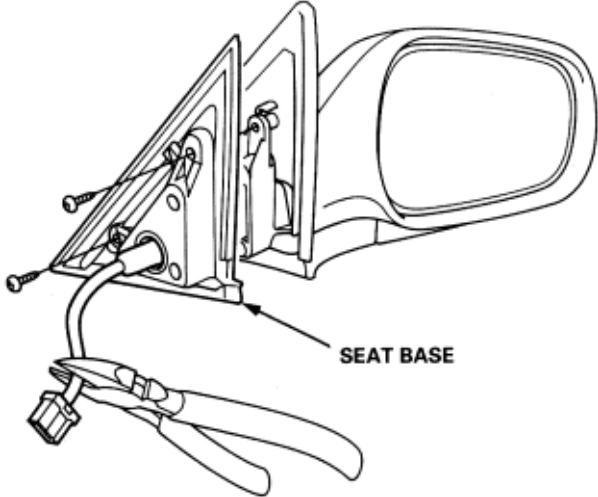
4. Check for continuity between the No. 1 and No. 2 terminals of the 6P connector. There should be continuity.
5. If the mirror fails to work properly, replace the mirror actuator.

Power Mirrors

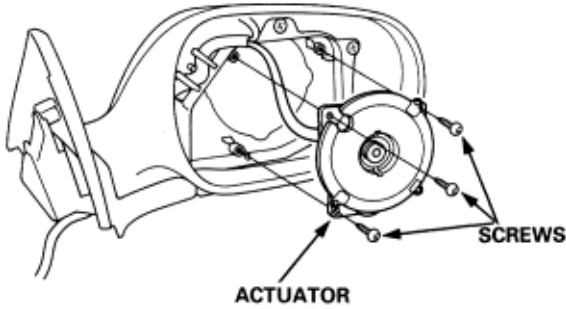
Power Mirror Actuator Replacement

23-F-25

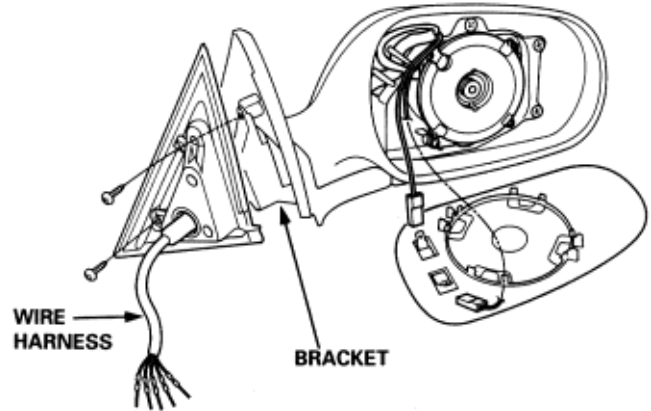
1. Remove the power mirror from the door (see section 20), and disconnect the connector.
2. Cut the wire harness with wire cutters.



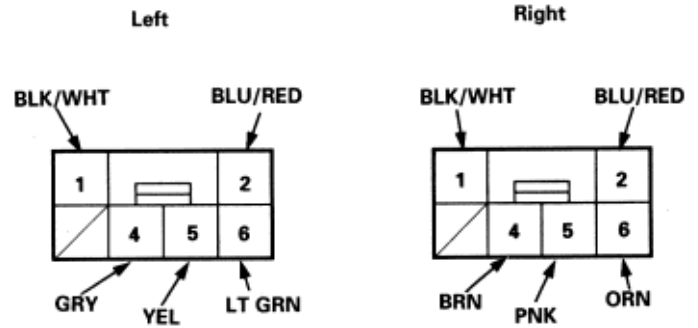
3. Remove the seat base.
4. Remove the mirror holder (see section 20).
5. Remove the screws and the actuator from the housing.



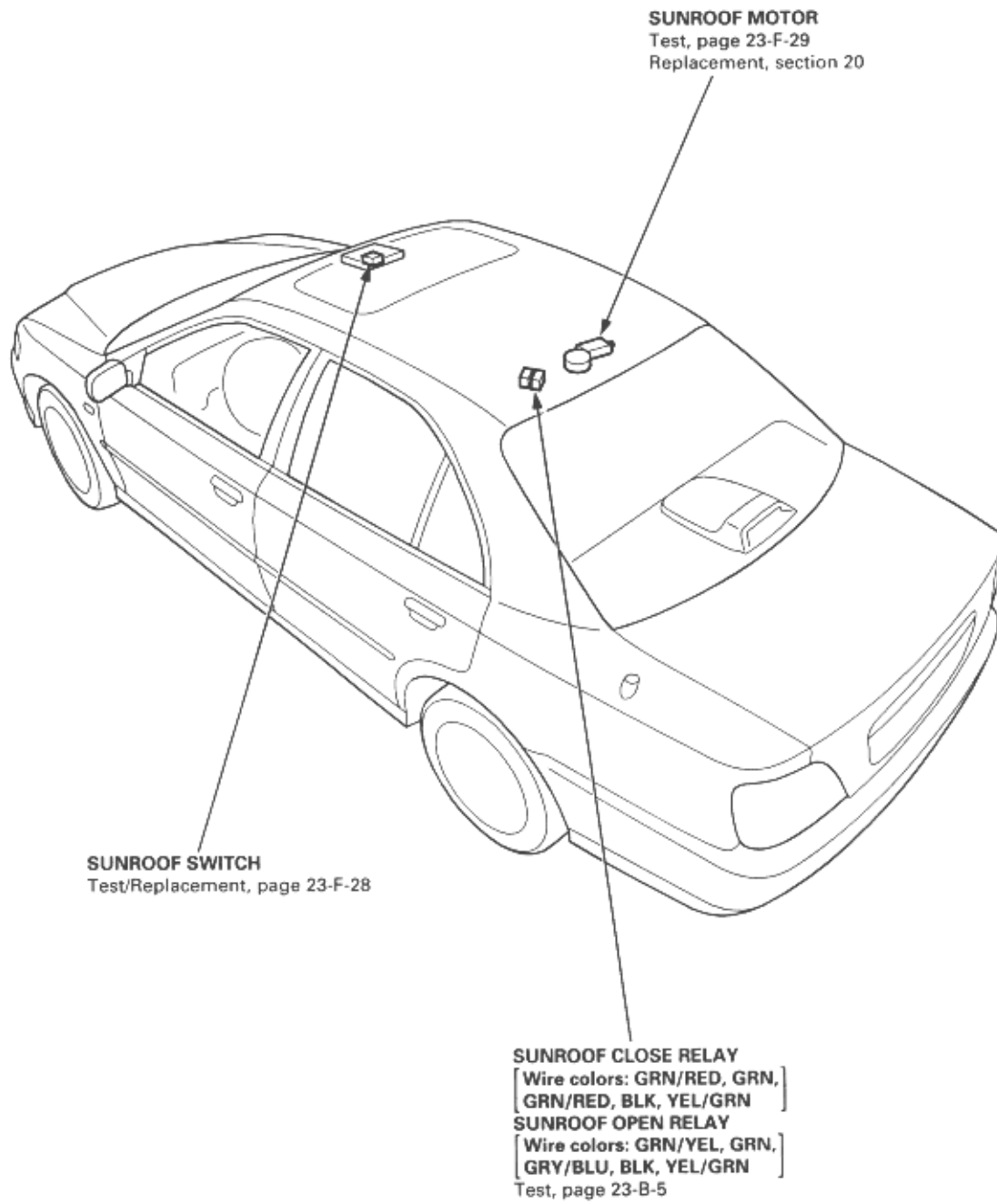
6. Route the wire harness of the new actuator through the hole in the bracket.



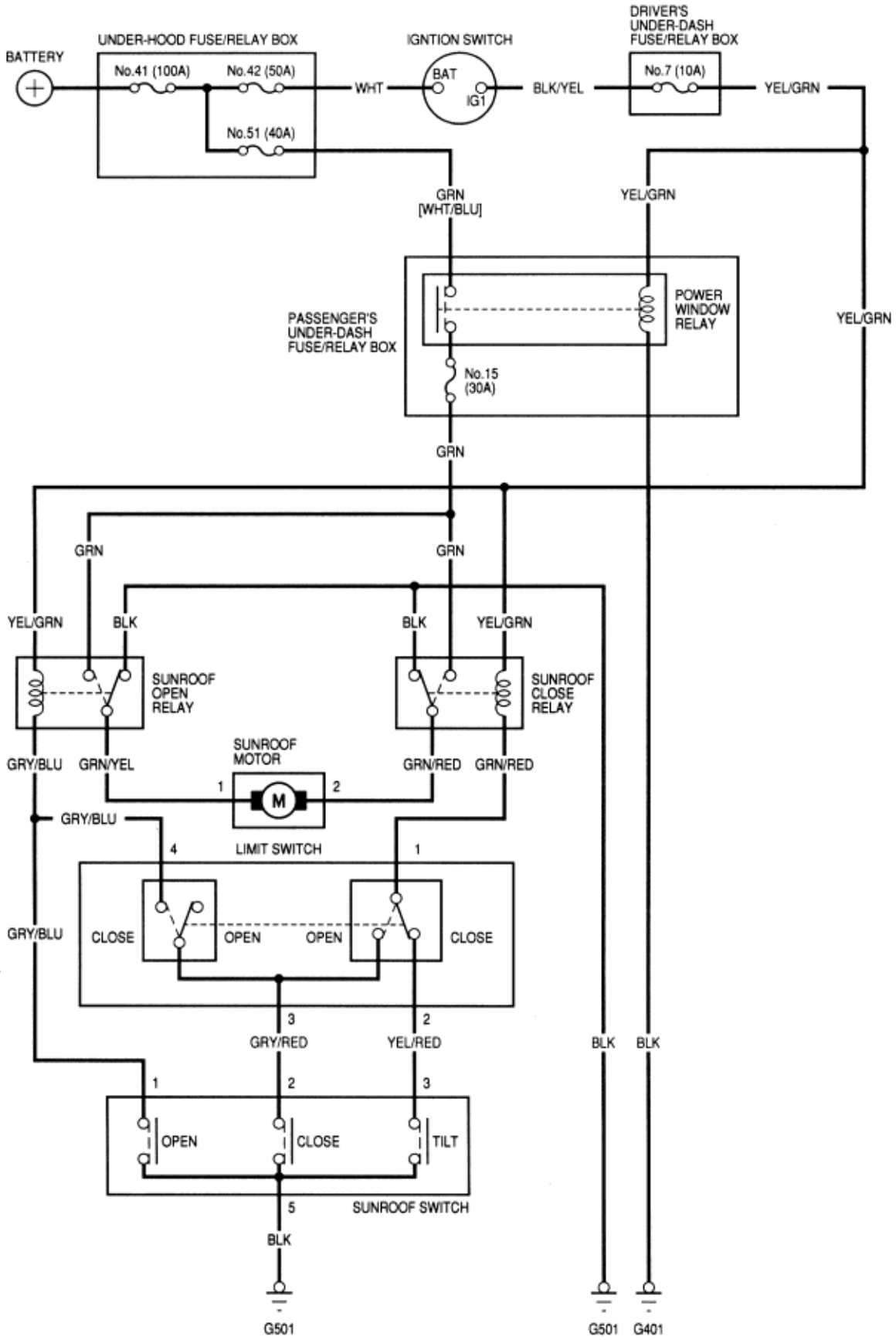
7. Insert the terminals into the connector in the original arrangement as shown below.



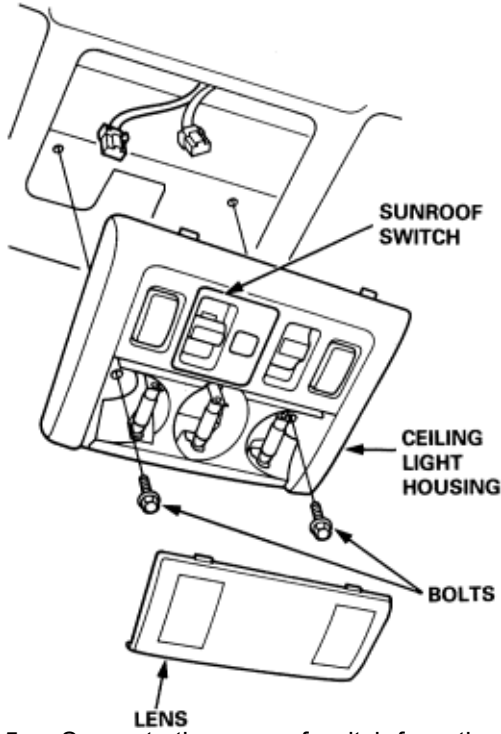
8. Apply tape to seal the intersection of the wire harness.
9. Reassemble in the reverse order of disassembly. Be careful not to break the mirror when reinstalling it to the actuator.
10. Reinstall the mirror assembly to the door.
11. Operate the power mirror to check that the actuator works smoothly.



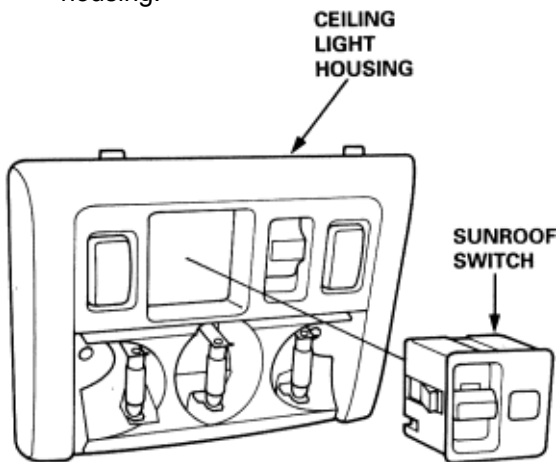
To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-F-29)
(See Page 23-F-28)
(See Page 23-B-5)



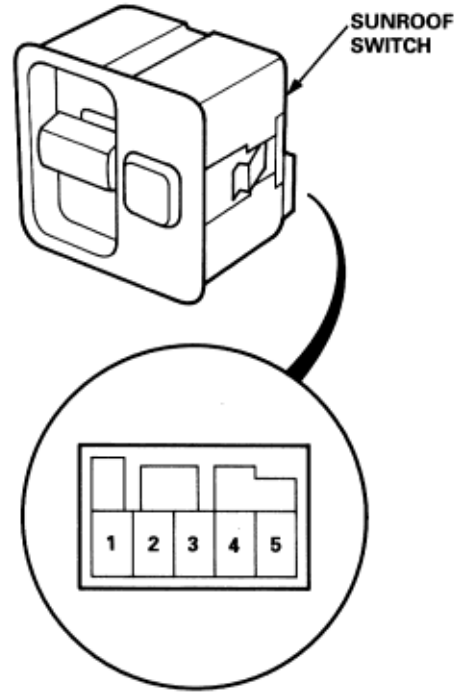
1. Turn the front ceiling light switch OFF.
2. Pry the ceiling light lens off from the light housing.
3. Remove the two bolts and the light housing.
4. Disconnect the connectors from the light housing.



5. Separate the sunroof switch from the ceiling light housing.

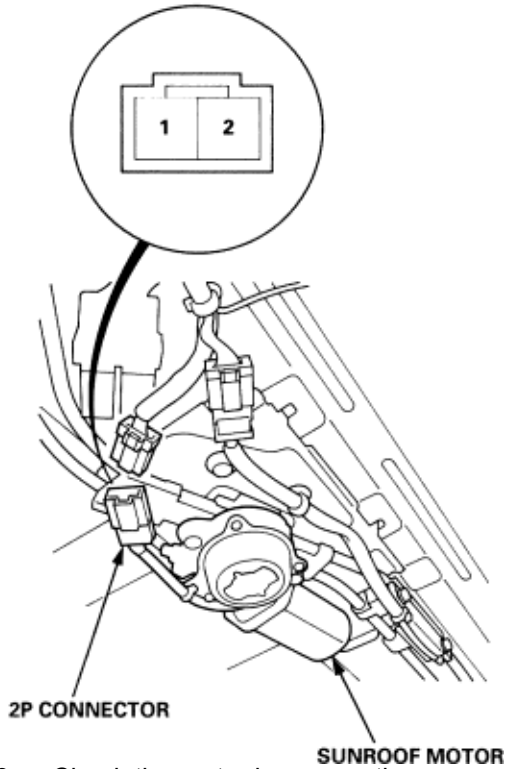


6. Check for continuity between the terminals in each switch position according to the table.



Terminal	1	2	3	5
Position				
TILT			○ — ○	
CLOSE		○ — ○		○ — ○
OPEN	○ — ○			○ — ○

1. Remove the headliner (see section 20).
2. Disconnect the 2P connector from the sunroof motor.

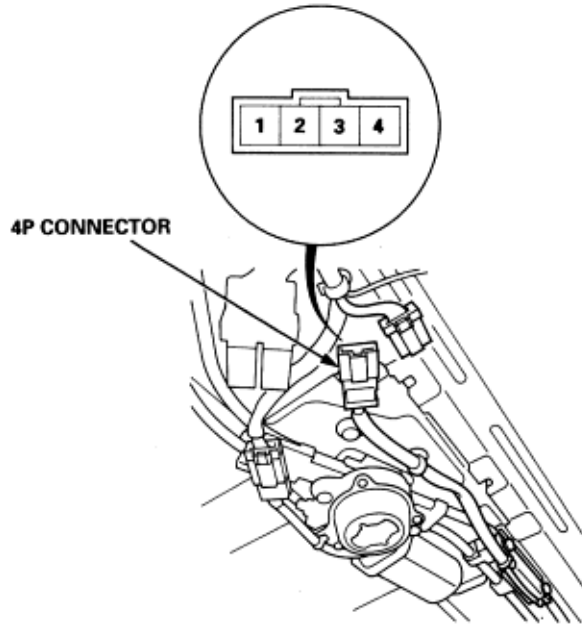


3. Check the motor by connecting power and ground according to the table.

Terminal	1	2
Position		
OPEN	⊕	⊖
CLOSE	⊖	⊕

4. If the motor does not run, replace it.
NOTE: See closing force check (see section 20) for motor clutch test.

1. Remove the roof lining (see section 20).
2. Disconnect the 4p connector from the motor.
3. Check for continuity between the terminals in each switch position according to the table.
NOTE: Turn the motor by hand with the wrench.

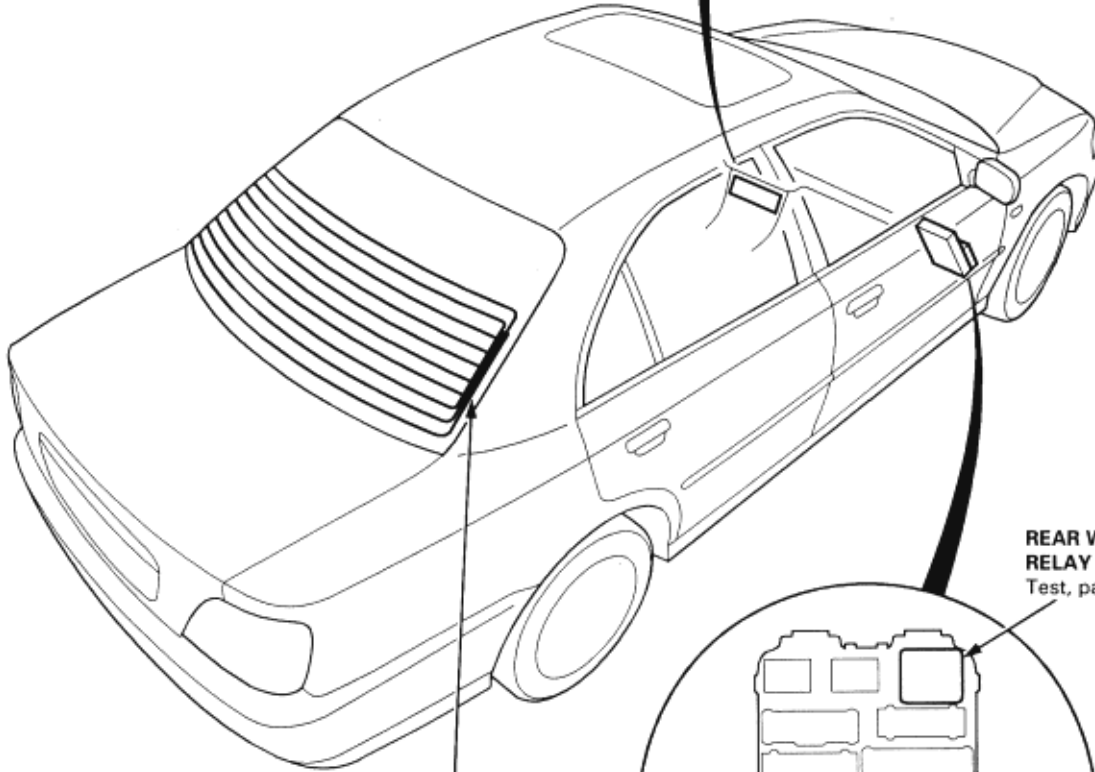
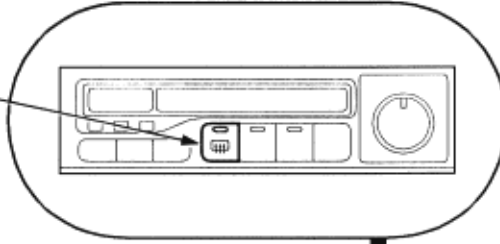


Terminal	1	2	3	4
Sunroof position				
Tilted up	○—○		○—○	
Fully closed	○—○			
Fully open			○—○	

4. If there is no continuity, replace the sunroof motor assembly.

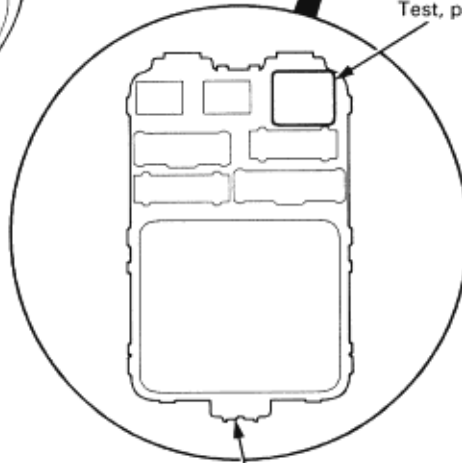
NOTE: LHD type is shown, RHD type is symmetrical.

REAR WINDOW DEFOGGER SWITCH
See section 22



REAR WINDOW DEFOGGER
Function Test, page 23-F-32
Defogger Wire Repair, page 23-F-32

REAR WINDOW DEFOGGER RELAY
Test, page 23-B-4



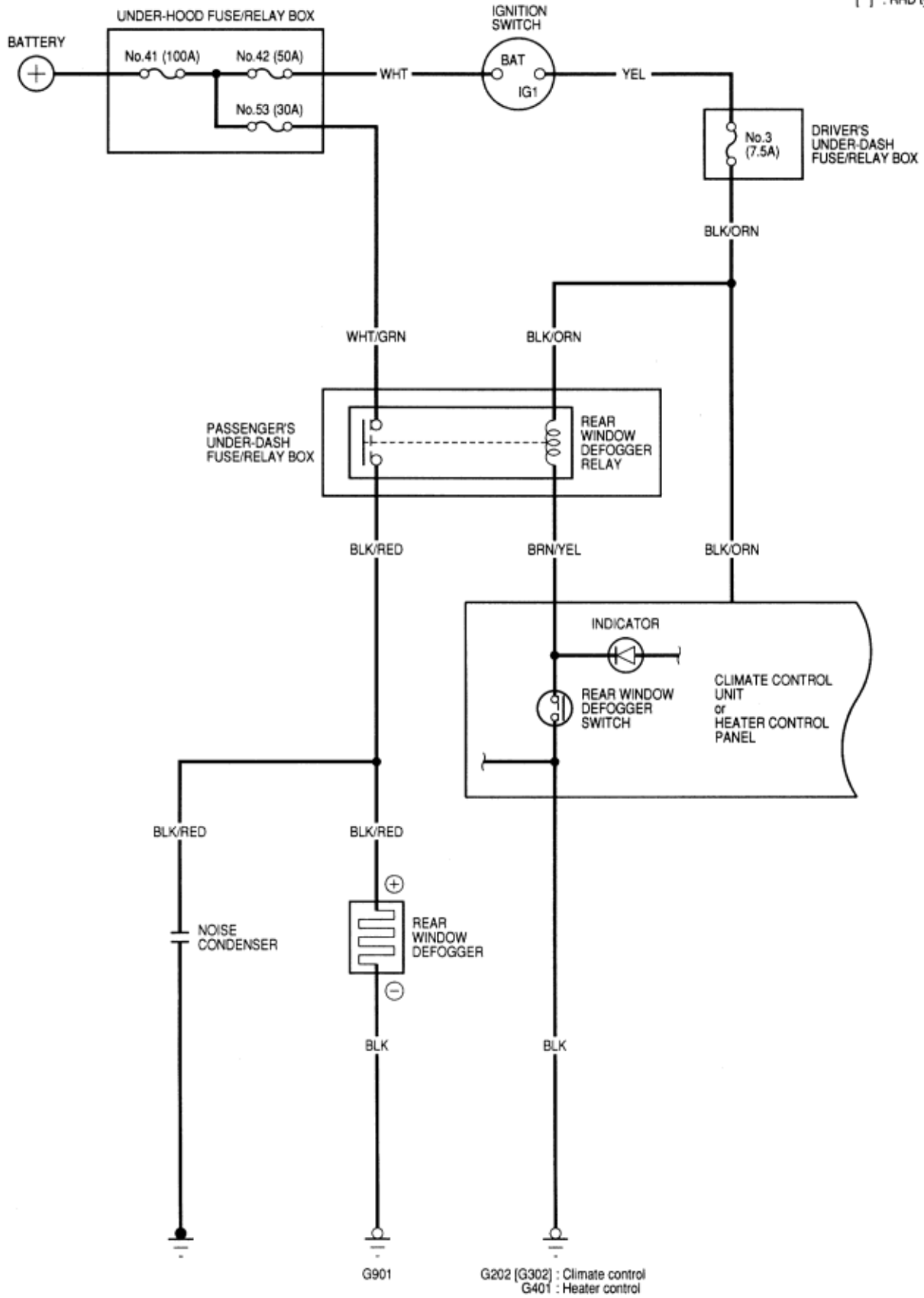
PASSENGER'S UNDER-DASH FUSE/RELAY BOX

To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-F-32)
(See Page 23-B-4)

**Rear Window Defogger
Circuit Diagram**

23-F-31

[] : RHD type



Rear Window Defogger

Function Test

23-F-32

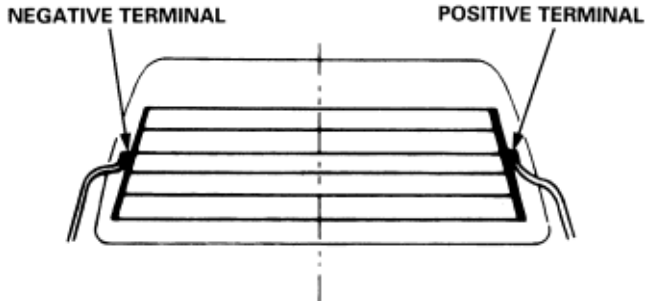
Defogger Wire Repair

NOTE: Be careful not to scratch or damage the defogger wires with the tester probe.

1. Check for voltage between the positive terminal and body ground with the ignition switch and defogger switch ON.

There should be battery voltage.

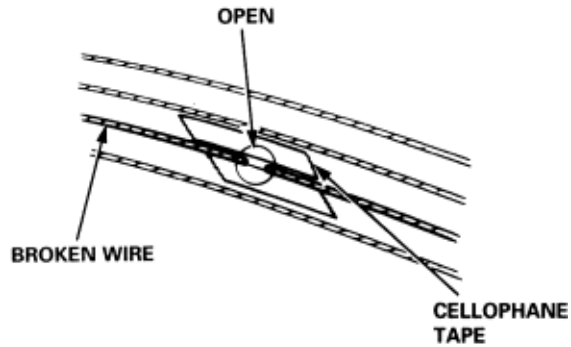
- ♦ If there is no voltage, check for:
 - faulty defogger relay.
 - an open in the BLK/RED wire.
- ♦ If there is battery voltage, go to step 2.



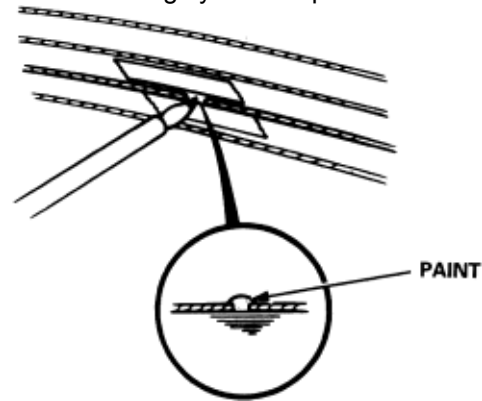
2. Check for continuity between the negative terminal and body ground. If there is no continuity, check for an open in the defogger ground wire.
3. Touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.
There should be approximately 6 V with the ignition switch and the defogger switch ON.
 - ♦ If the voltage is as specified, the defogger wire is OK.
 - ♦ If the voltage is not as specified, repair the defogger wire.
 - If it is more than 6 V, there is a break in the negative half of the wire.
 - If it is less than 6 V, there is a break in the positive half of the wire.

NOTE: To make an effective repair, the broken section must be no longer than one inch.

1. Lightly rub the area around the broken section with fine steel wool, then clean it with alcohol.

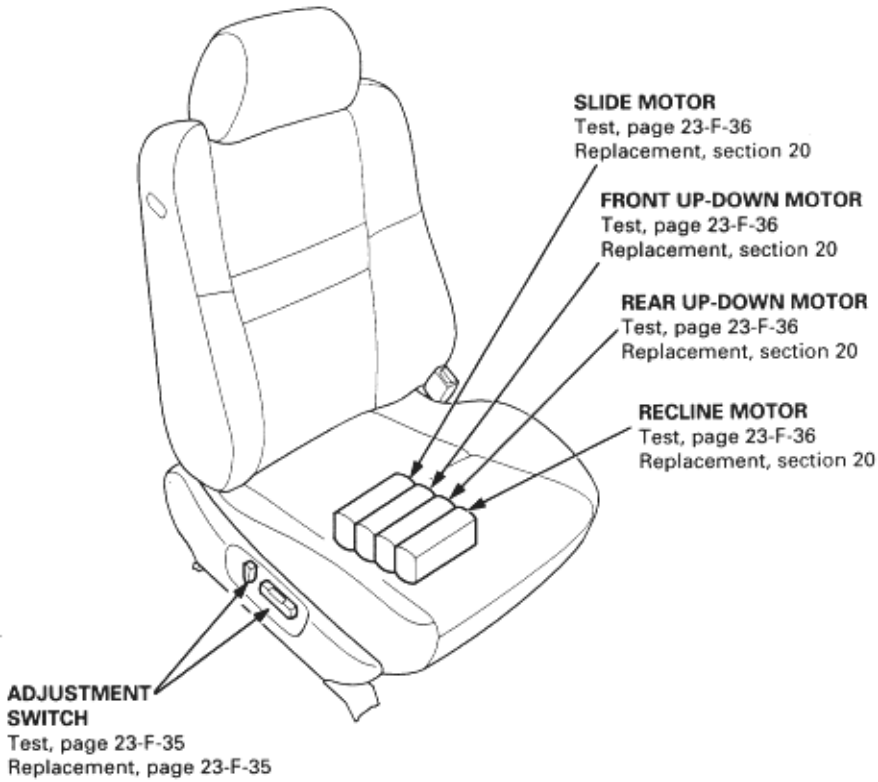


2. Carefully mask above and below the broken portion of the defogger wire with cellophane tape.
3. Using a small brush, apply a heavy coat of silver conductive paint extending about 1/8" on both sides of the break. Allow 25 minutes to dry. Thoroughly mix the paint before use.

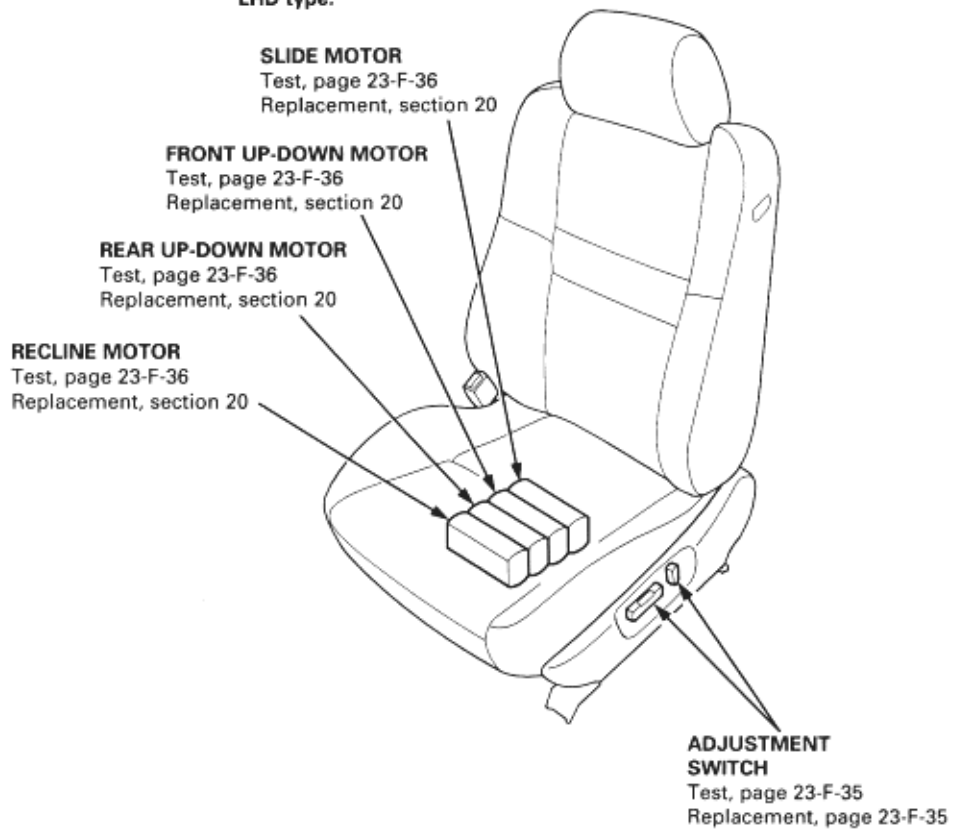


4. Check for continuity in the repaired wire.
5. Apply a second coat of paint in the same way. Let it dry three hours before removing the tape.

RHD type:



LHD type:

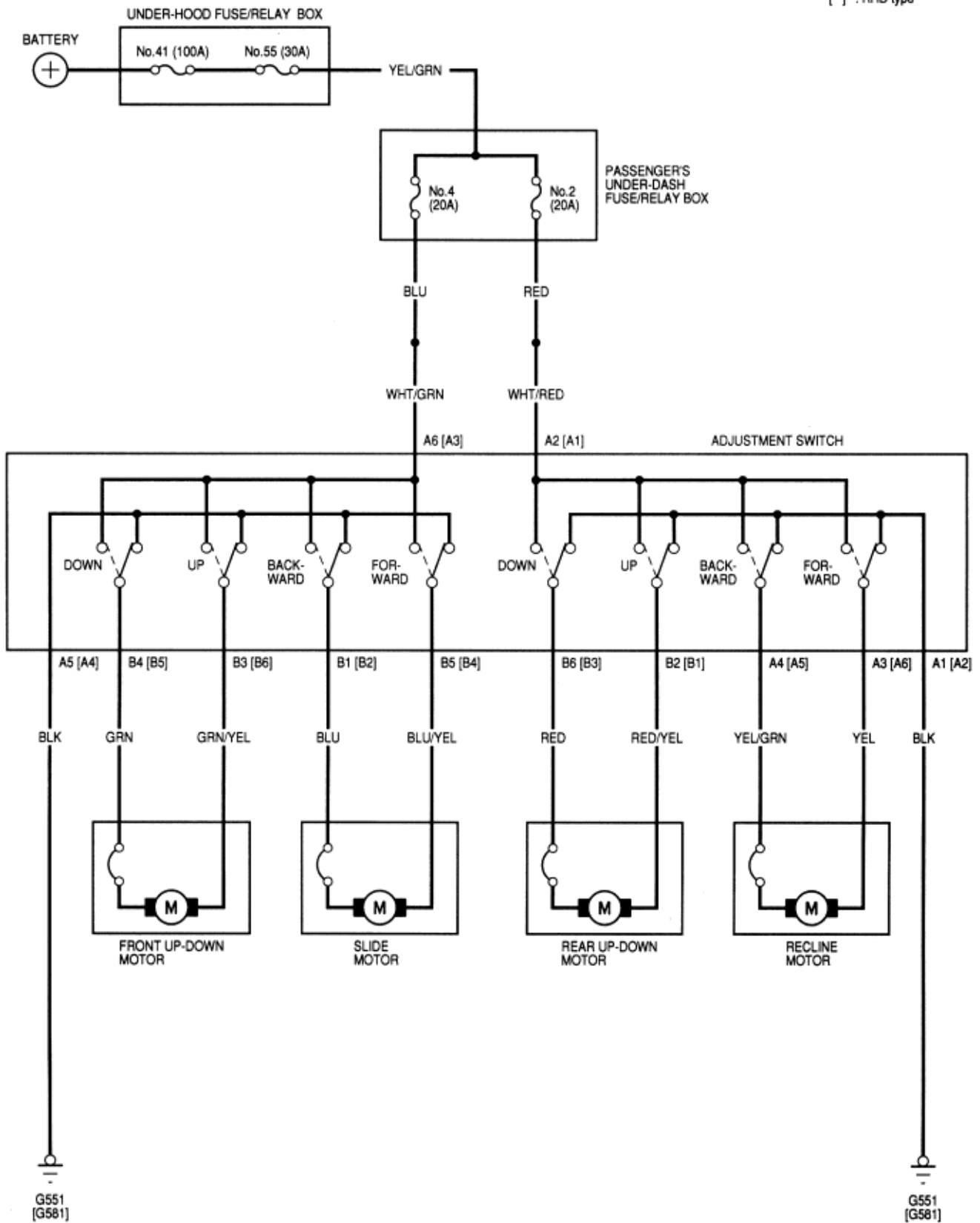


To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-F-36)
(See Page 23-F-35)

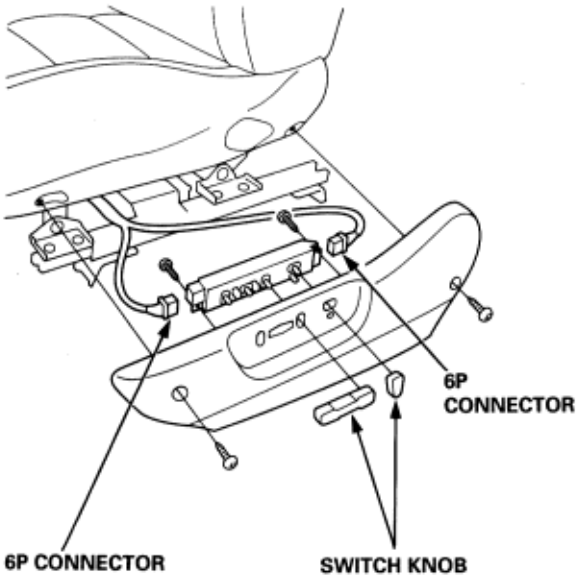
Driver's Power Seat
Circuit Diagram (8-way Power Adjustable)

23-F-34

[] : RHD type

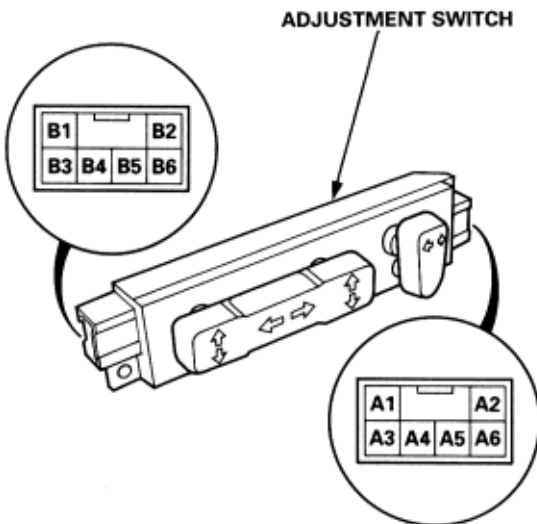


1. Remove the adjustment switch cover from the driver's seat by removing the screws (see section 20), and pulling off the adjustment switch knobs.



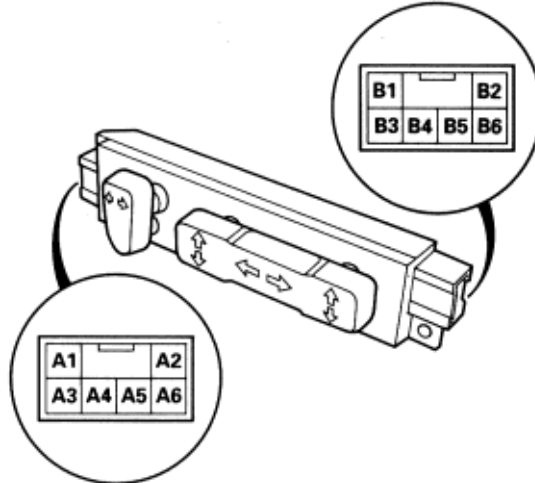
2. Disconnect the 6P connectors from the adjustment switch, then remove the switch from the cover by removing its two mounting screws.
3. Check for continuity between the terminals in each switch position according to the table.

LHD type:



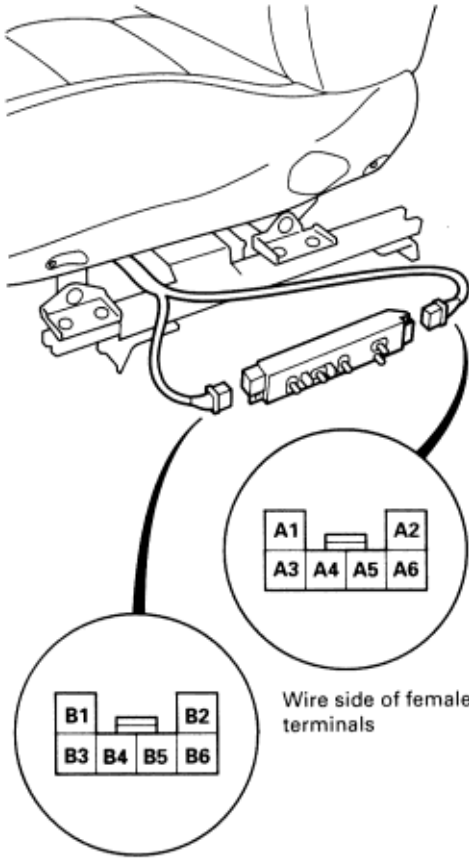
Terminal		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6
Position													
SLIDE SWITCH	FORWARD						○	○	○	○			
	BACKWARD						○	○					
RECLINE SWITCH	FORWARD	○	○										
	BACKWARD	○	○										
FRONT UP-DOWN SWITCH	UP						○	○	○	○			
	DOWN						○	○	○	○			
REAR UP-DOWN SWITCH	UP	○	○						○				
	DOWN	○	○										○

RHD type:



CAUTION
Some types of this vehicle have a side airbag located in the driver's seat. See section 24 before servicing the driver's seat.

1. Remove the driver's seat (see section 20).
2. Disconnect the 6P connector from the power seat switch.
NOTE: LHD type is shown, RHD type is similar.



3. Test the motors at the harness side of the connectors by connecting power and ground as shown.

NOTE: When a motor stops running, disconnect battery power immediately.

Recline motor:

		Terminal	
Position		A4 [A5]	A3 [A6]
RECLINE MOTOR	FORWARD	⊖	⊕
	BACKWARD	⊕	⊖

Slide motor:

		Terminal	
Position		B1 [B2]	B5 [B4]
SLIDE MOTOR	FORWARD	⊖	⊕
	BACKWARD	⊕	⊖

Front up-down motor:

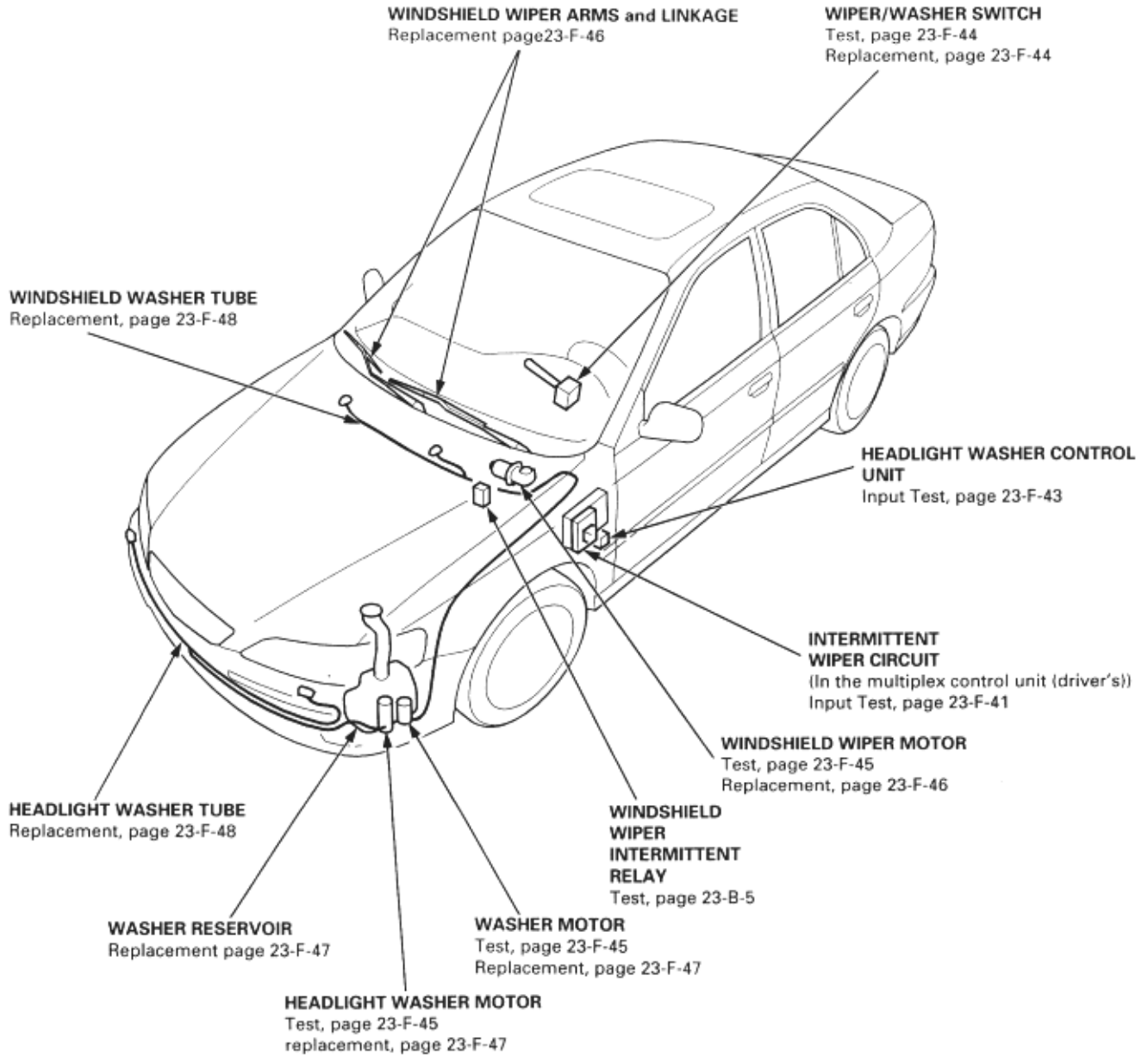
		Terminal	
Position		B4 [B5]	B3 [B6]
FRONT UP-DOWN MOTOR	UP	⊖	⊕
	DOWN	⊕	⊖

Rear up-down motor:

		Terminal	
Position		B2 [B1]	B6 [B3]
REAR UP-DOWN MOTOR	UP	⊕	⊖
	DOWN	⊖	⊕

[]: RHD type

4. If the motor does not run or fails to run smoothly, check for continuity of the power seat harness between the 6P connector and each motor. If there is continuity, replace the motor (see section 20).

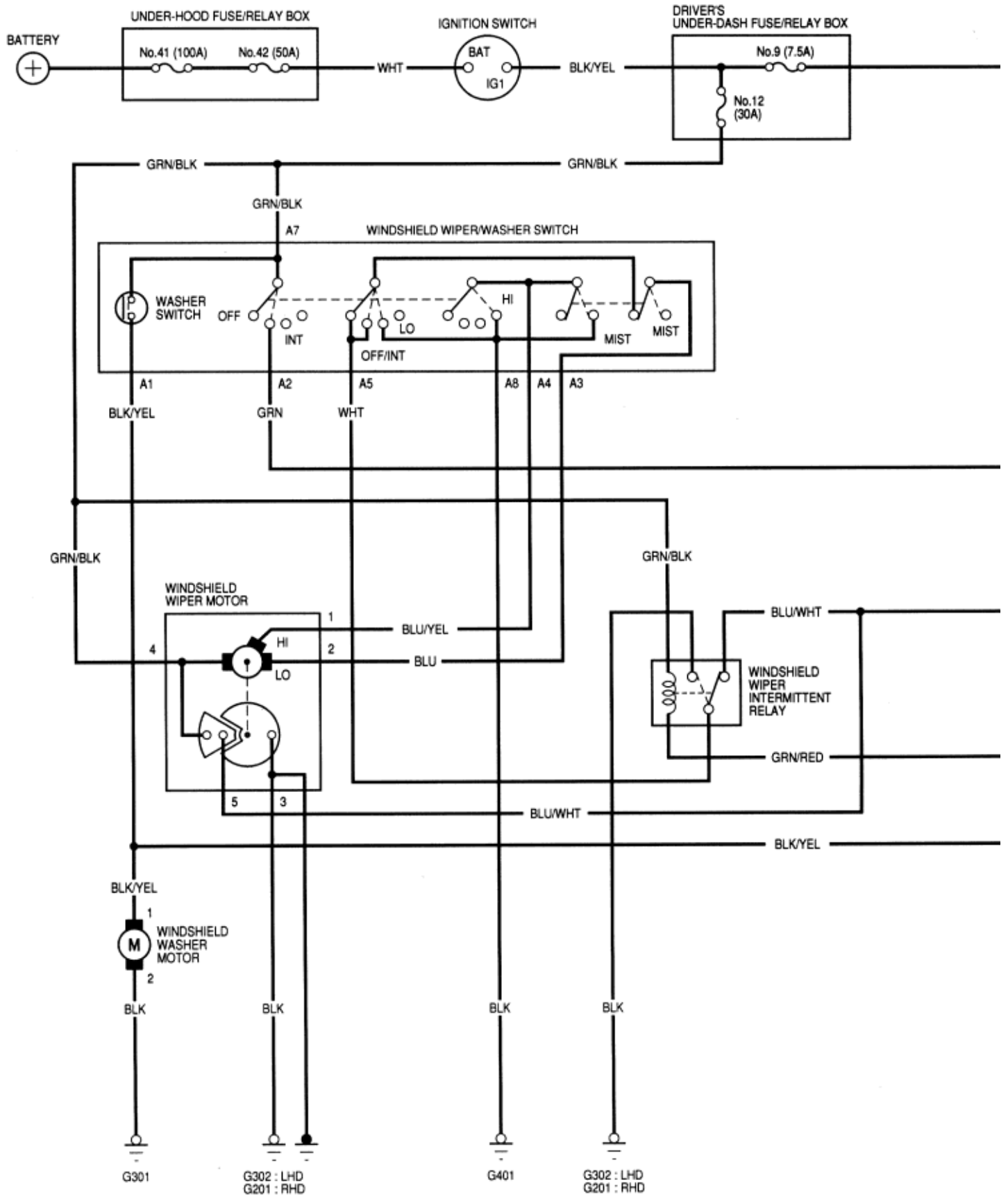


To go to the pages referenced on the diagram above,
click on the following:

- (See Page 23-F-46)
- (See Page 23-F-44)
- (See Page 23-F-48)
- (See Page 23-F-43)
- (See Page 23-F-47)
- (See Page 23-F-45)
- (See Page 23-F-41)
- (See Page 23-b-5)

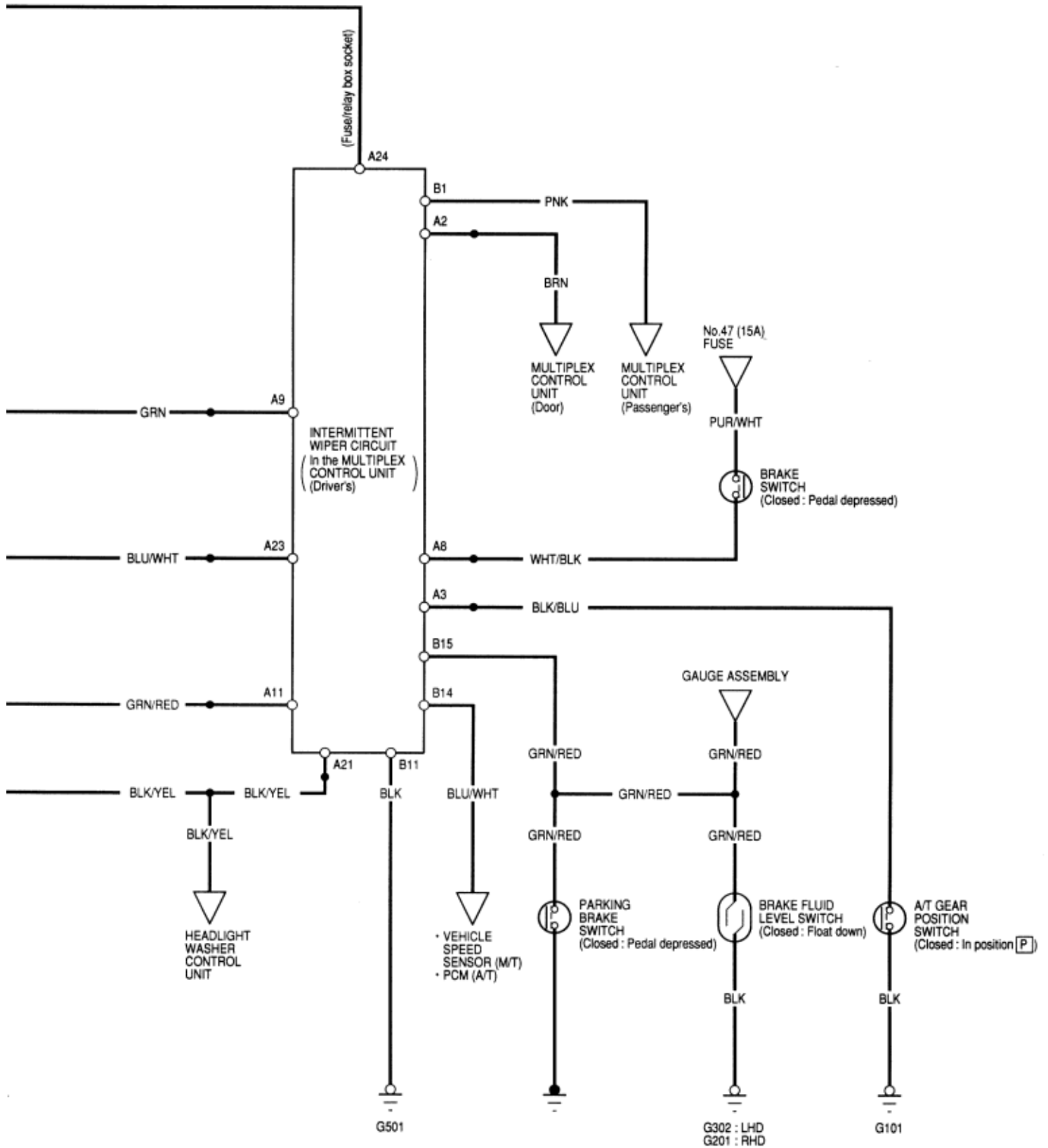
Wipers/Washers
Circuit Diagram

23-F-38



Wipers/Washers
Circuit Diagram (cont'd)

23-F-39

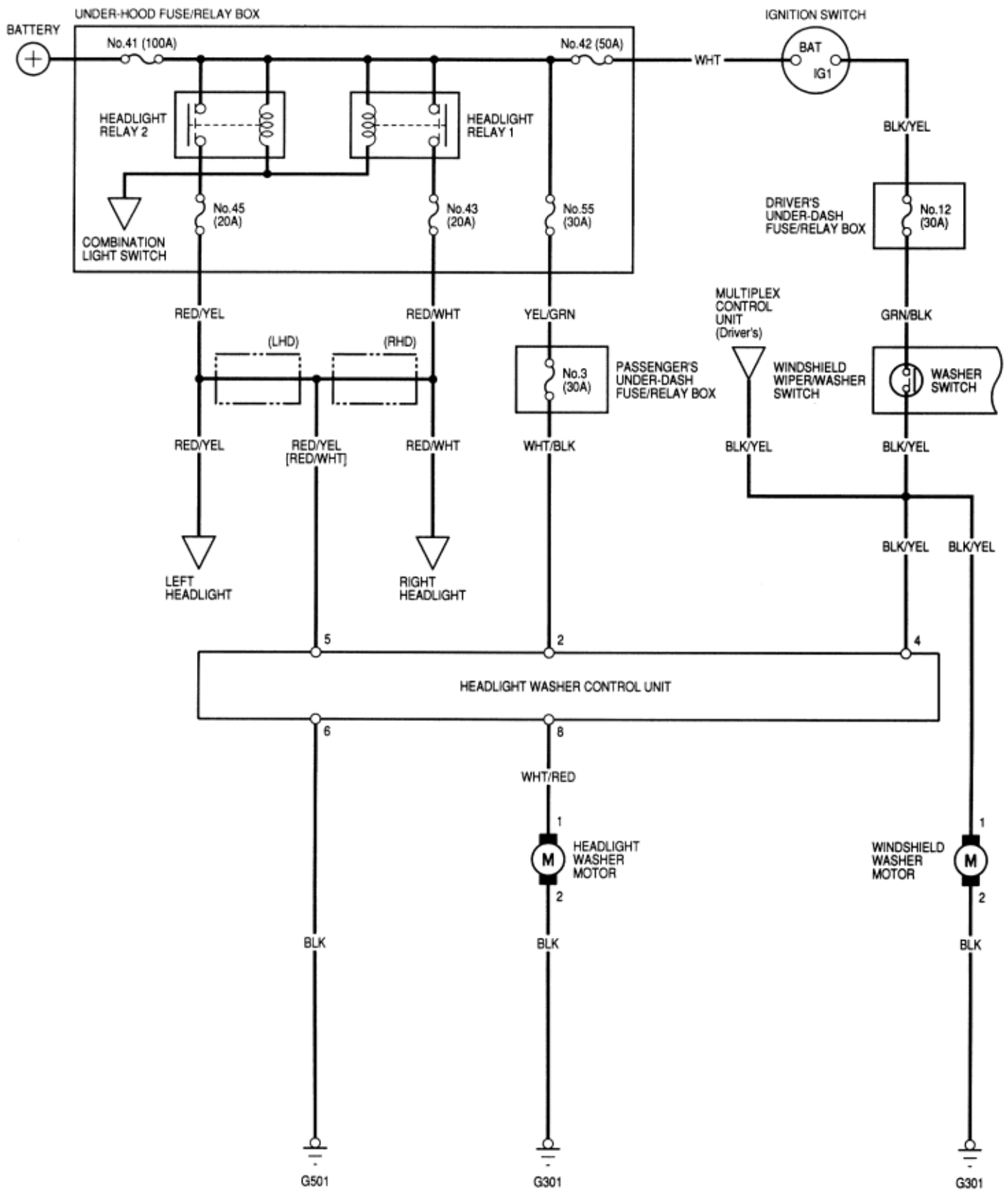


Wipers/Washers

Circuit Diagram (With Headlight Washer)

23-F-40

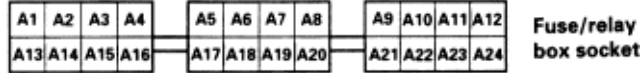
[] : RHD type



NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

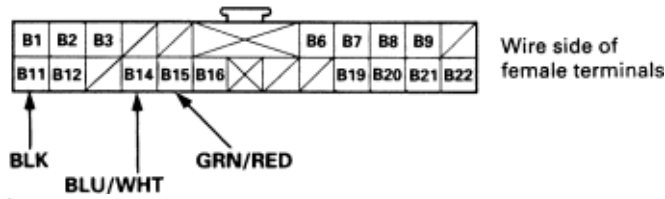
Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (see page 23-B-7).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connector from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A9	Fuse/relay box socket	Ignition switch ON (II) and wiper switch at INT	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (30A) fuse in the driver's under-dash fuse/relay box. ♦ Faulty wiper switch ♦ An open in the wire
A8	Fuse/relay box socket	Brake pedal pushed	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 47 (15A) fuse in the under-hood fuse/relay box. ♦ An open in the wire
A11	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (30A) fuse in the driver's under-dash fuse/relay box. ♦ Faulty intermittent wiper relay ♦ An open in the wire
A21	Fuse/relay box socket	Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (30A) fuse in the driver's under-dash fuse/relay box. ♦ Faulty washer switch ♦ An open in the wire
A23	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (30A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A3	Fuse/relay box socket	Shift lever in P	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty A/T gear position switch. ♦ Poor ground (G101). ♦ An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire



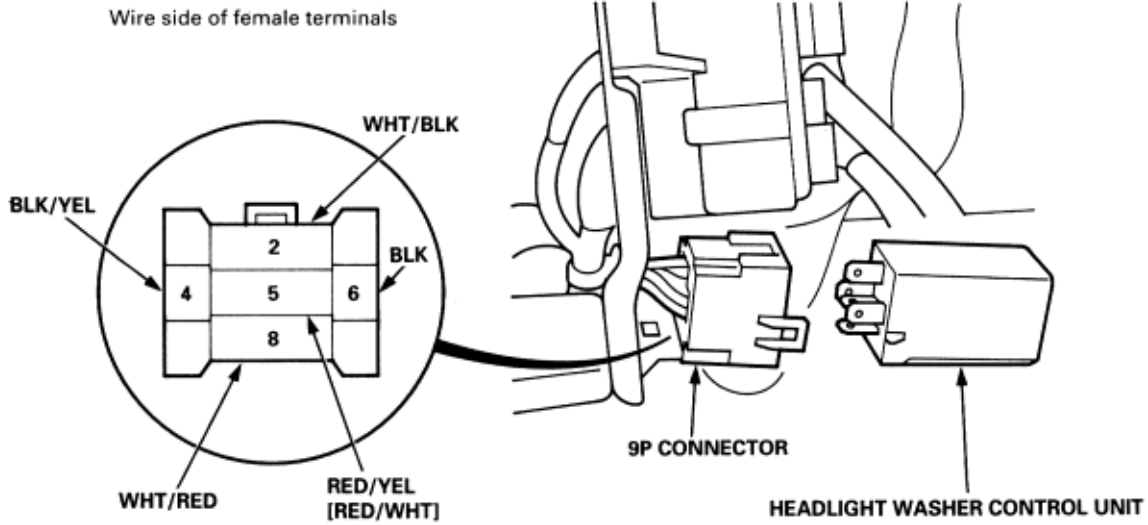
Disconnect the connector to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501). ♦ An open in the wire
B15	GRN/RED	Parking brake pedal depressed	Check for voltage to ground: There should be less than 1V	<ul style="list-style-type: none"> ♦ Faulty parking brake switch ♦ An open in the wire

Reconnect the connector to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B14	BLU/WHT	Rotate one wheel slowly with the other wheel blocked/	Check for voltage to ground: There should be 0 to approx. 5 V or more repeatedly	<ul style="list-style-type: none"> ♦ Faulty vehicle speed sensor ♦ An open in the wire

1. Remove the driver's side, kick panel (see section 20).
2. Disconnect the 9P connector from the headlight washer control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary ,and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	WHT/BLK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 3 (30A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
6	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
5	RED/YEL [RED/WHT]	Headlight switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 45 [No.43](20A) fuse in the under-hood fuse/relay box. ♦ Faulty headlight relay 2 [1] ♦ An open in the wire
4	BLK/YEL	Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (30A) fuse in the driver's under-dash fuse/relay box. ♦ Faulty washer switch ♦ An open in the wire
8	WHT/RED	Connect the WHT/BLK terminal to the WHT/RED terminal with a jumper wire.	Check the washer motor: It should run	<ul style="list-style-type: none"> ♦ Faulty headlight washer motor. ♦ Poor ground (G501). ♦ An open in the wire

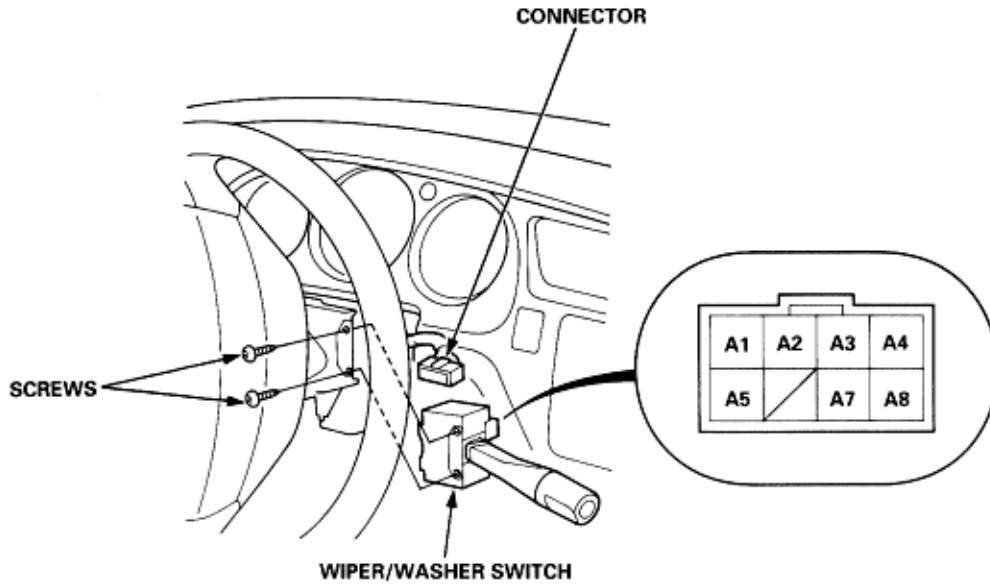
[]: RED type

Wipers/Washers

Wipers/Washers Switch Test/Replacement

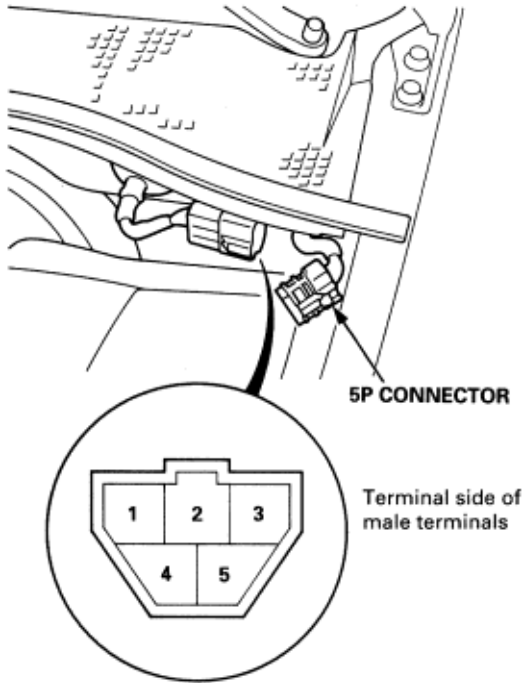
23-F-44

1. Remove the driver's dashboard lower cover (see section 20).
2. Remove the steering column covers (see section 17).
3. Disconnect the connector from the wiper/washer switch, then remove the two screws and the switch.
4. Check for continuity between the terminals in each switch position, according to the table, if there is no continuity, replace the switch.



Terminal	A1	A2	A3	A4	A5	A7	A8	B1		B2
Position										
OFF			○	○	○					
INT		○	○	○	○	○				
LO			○	○	○	○	○			
HI				○	○	○	○			
Mist switch "ON"				○	○	○	○			
Washer switch "ON"	○	○				○				

1. Open the hood.
2. Disconnect the 5P connector from the wiper motor.



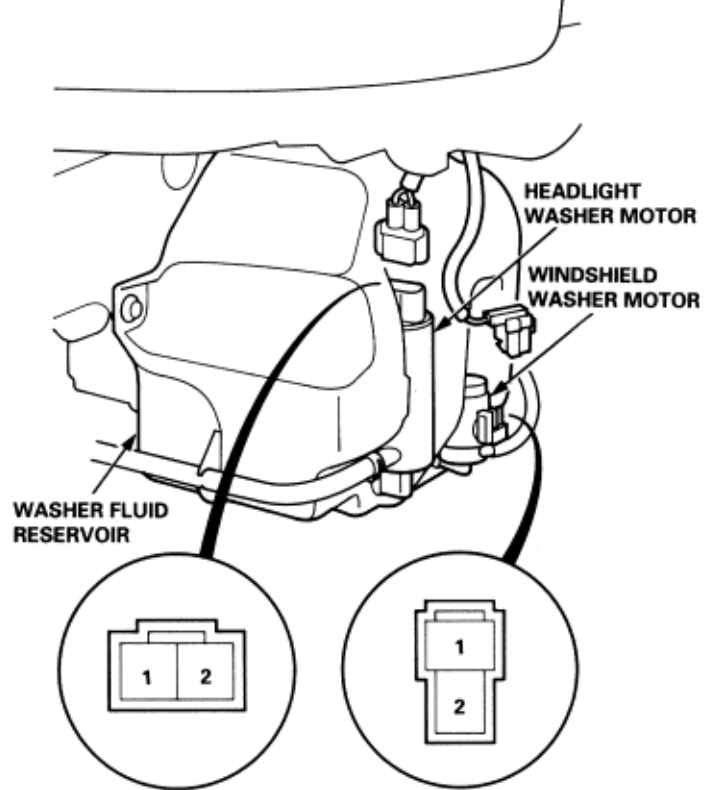
3. Test the motor by connection battery power and ground according to the table.

Terminal Position	1	2	4
LOW SPEED		⊖	⊕
HIGH SPEED	⊖		⊕

If the motor does not run or fails to run smoothly, replace it.

4. Connect an analogue voltmeter between the No. 5 (+) and No. 3 (-) terminals, and run the motor at low or high speed. The voltmeter should indicate 0 V and 4 V or less alternately.

1. Remove the left inner fender (see section 20).
2. Disconnect the 2P connector from the washer motor.



3. Test the washer motor by connecting battery power and ground according to the table.

Battery	Terminal 1	Terminal 2
Disconnected		
Connected	⊕	⊖

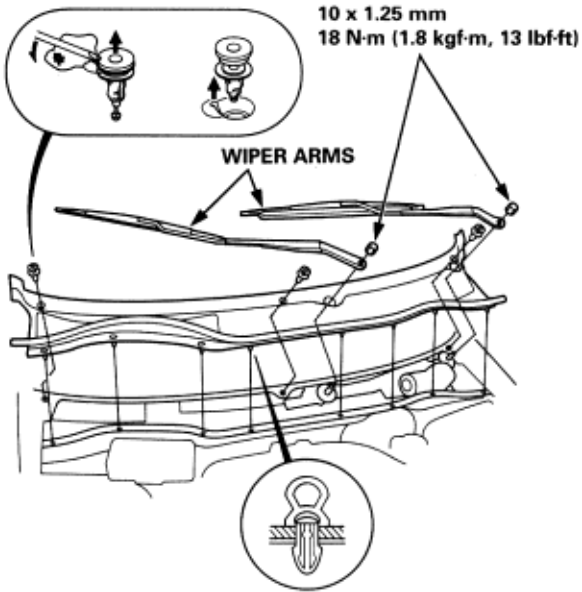
- If the motor fails to run smoothly, replace it.
- If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

Wipers/Washers

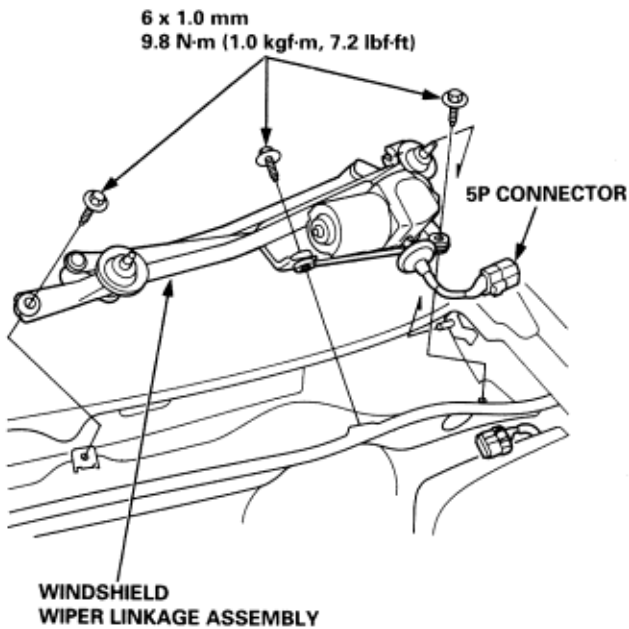
Windshield Wiper Motor Replacement

23-F-46

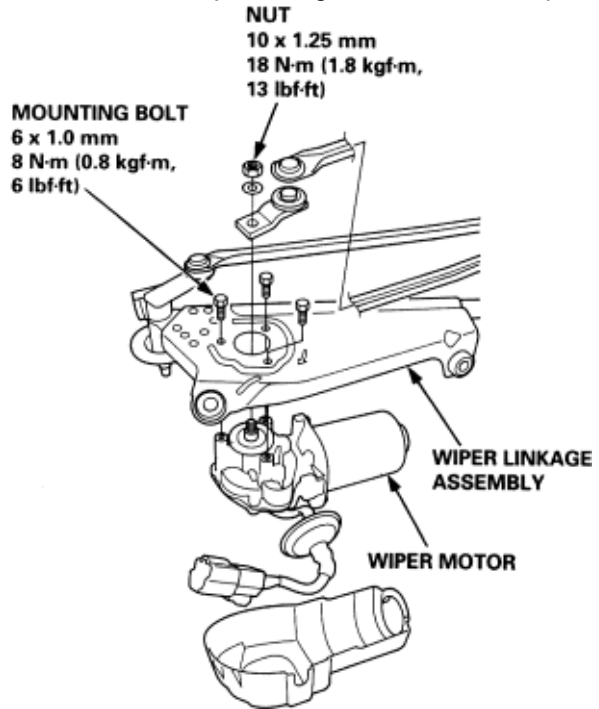
1. Open the hood and remove the cap nuts and the wiper arms.
NOTE: Remove the wiper arms carefully without damaging the hood.



2. Remove the hood seal and cowl cover.
3. Remove the bolts and windshield wiper linkage assembly.



4. Remove the three mounting bolts and one nut from the wiper linkage to remove the wiper motor.



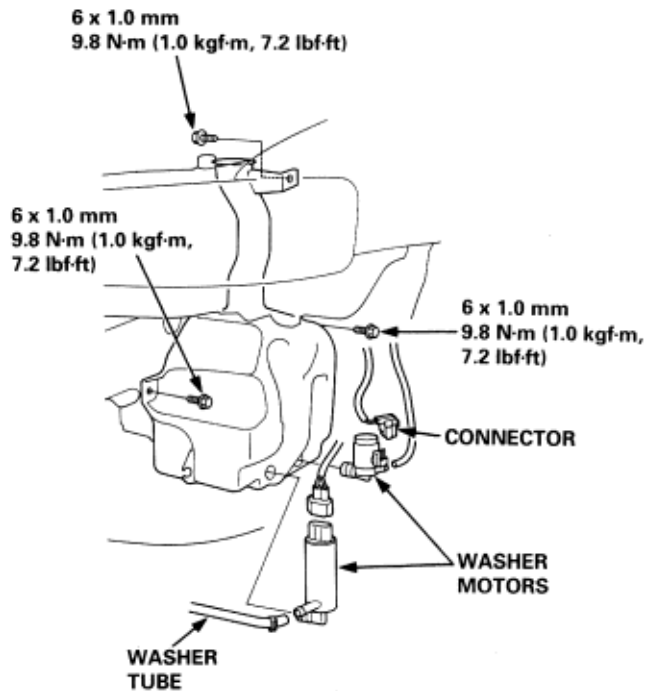
5. Install in the reverse order of removal. Grease the moving parts. If necessary, replace any damaged clips. Check the wiper motor operation.

Wipers/Washers

Washer Reservoir Replacement

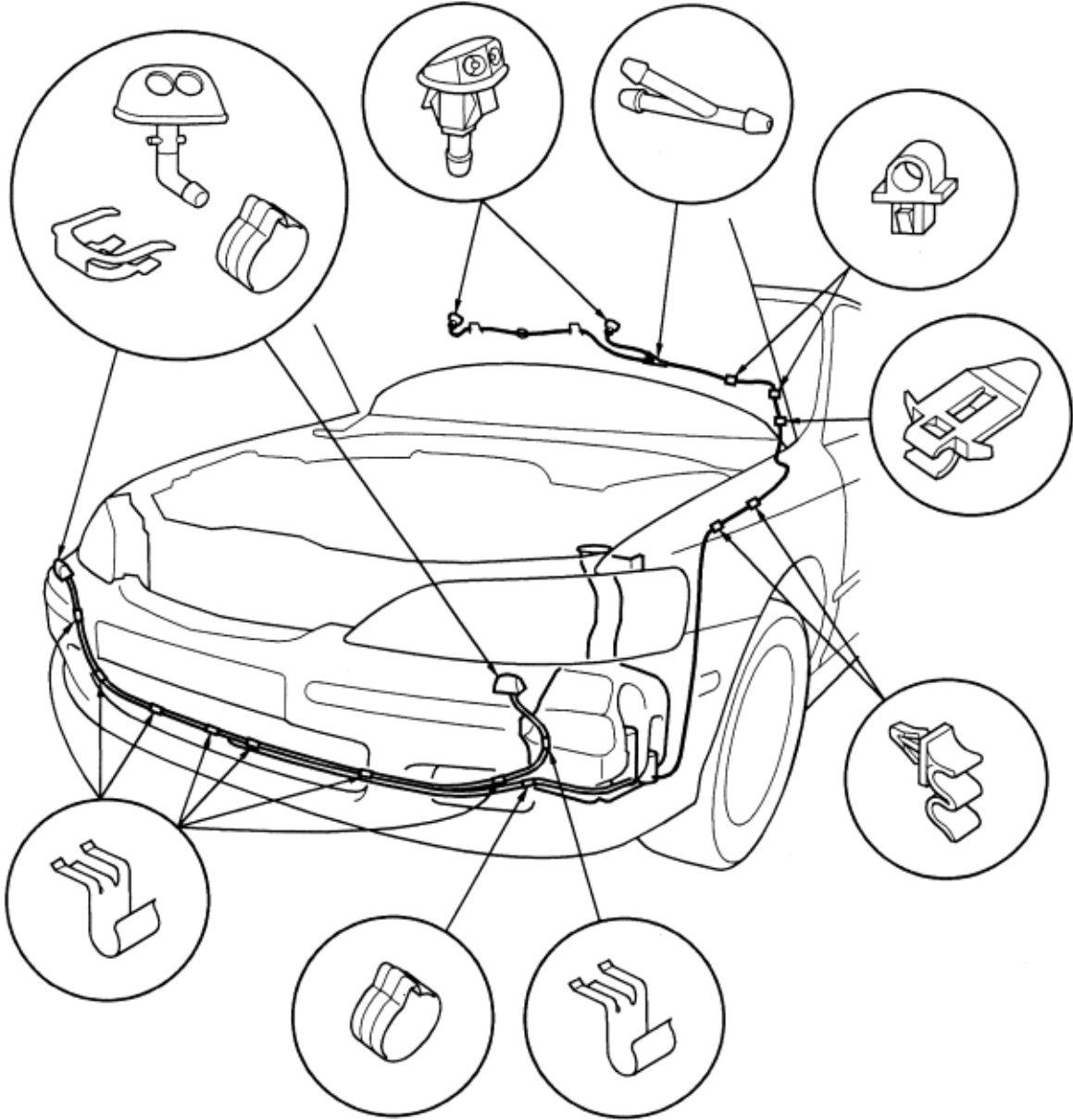
23-F-47

1. Pull away the left inner fender (see section 20).
2. Disconnect the washer tube(s) and washer motor connector(s).



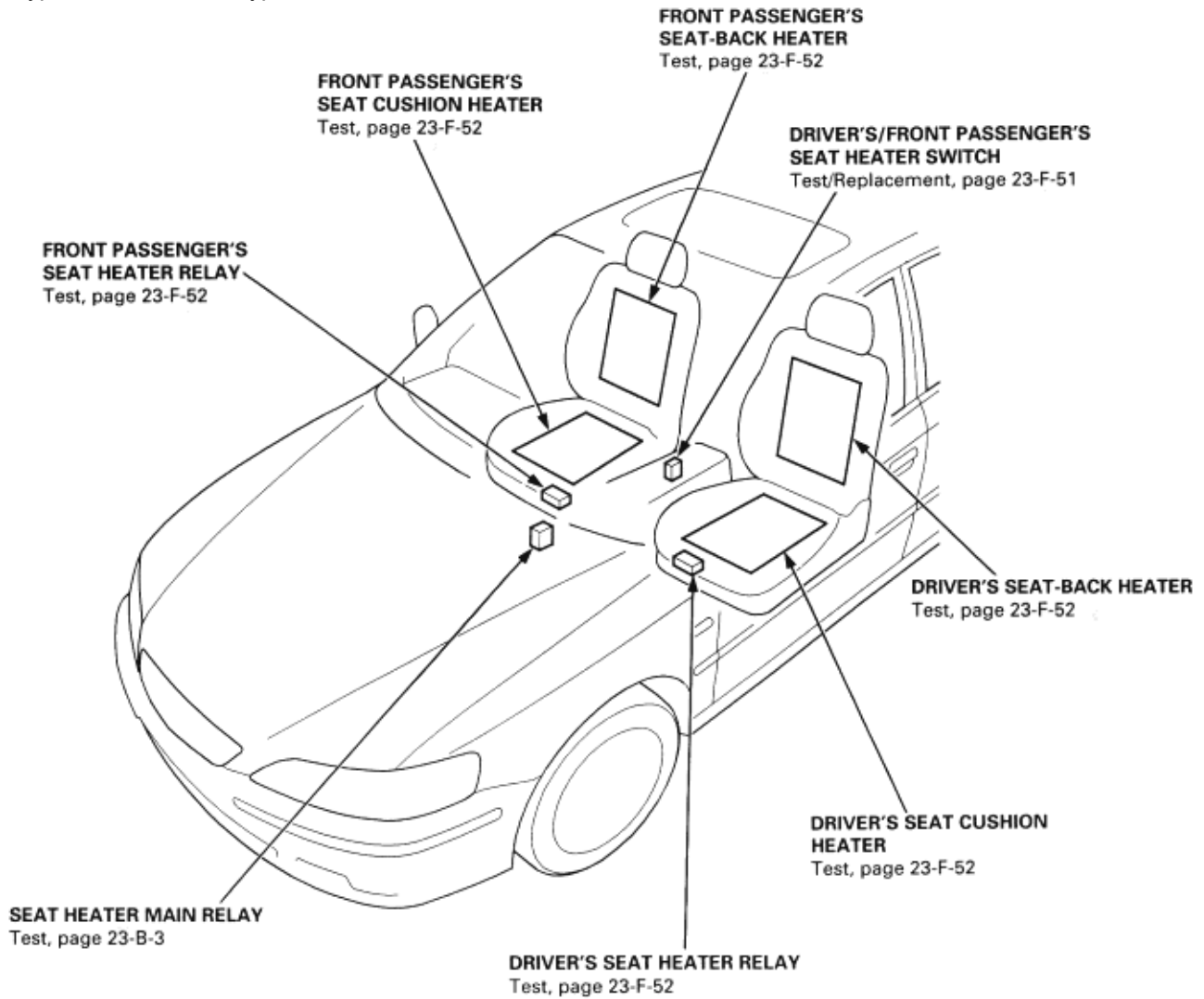
3. Remove the three bolts and washer reservoir.
4. Install in the reverse order of removal. Check the washer motor operation.

1. Remove the left inner fender (see section 20).
2. Remove the windshield washer nozzles and clips, then remove the tube.



3. Install in the reverse order of removal. Take care not to pinch the washer tube. Check the windshield washer operation.

NOTE: LHD type is shown, RHD type is similar.



To go to the pages referenced on the diagram above,
click on the following:

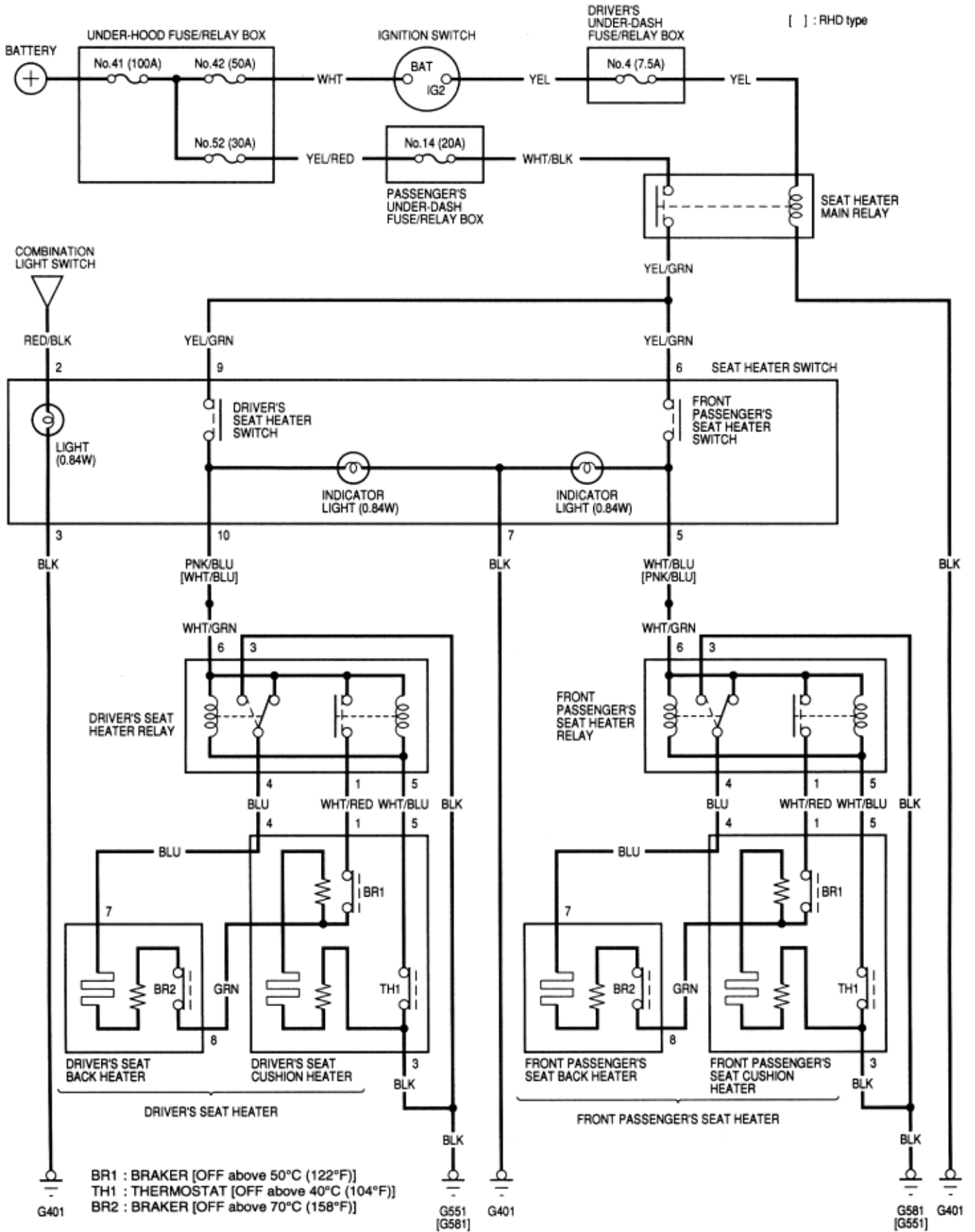
([See Page 23-F-52](#))

([See Page 23-F-51](#))

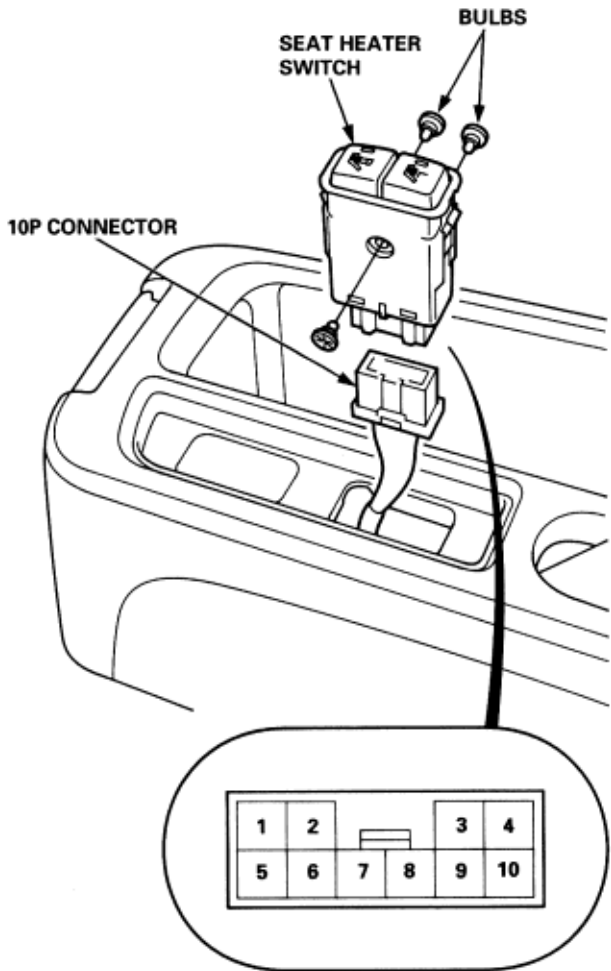
([See Page 23-B-3](#))

Seat Heaters
Circuit Diagram

23-F-50



1. Remove the seat heater switch from the center console.
2. Disconnect the 10P connector and remove the switch.



Terminal side of male terminals

3. Check for continuity between the terminals in each switch position according to the table.

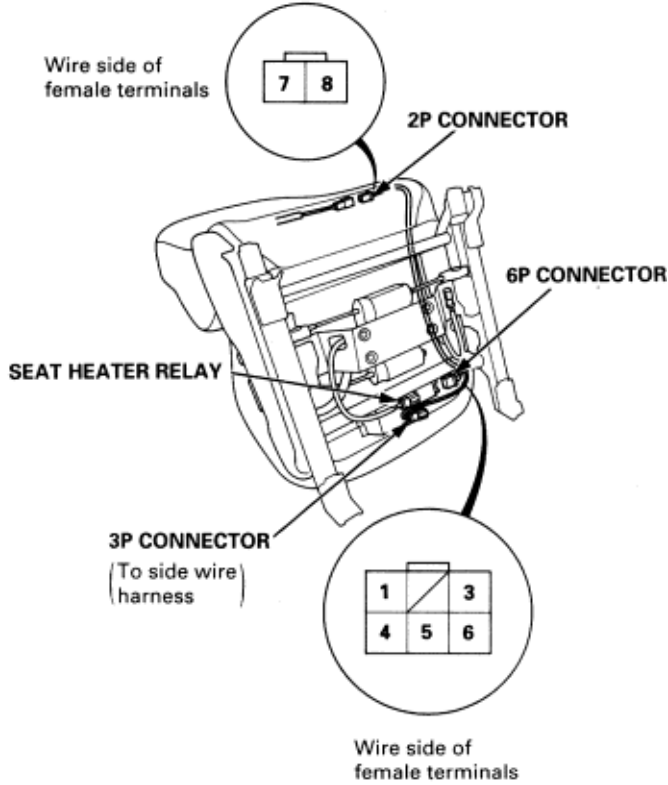
Terminal	2	3	5	6	7	9	10
Position							
ON	○	⊕	○	○	⊕	○	○
OFF	○	⊕	○	○	⊕	○	○



CAUTION

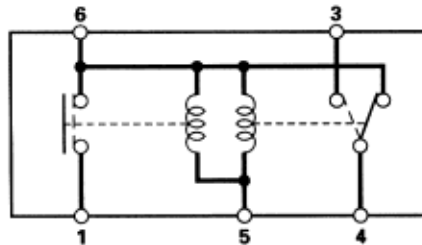
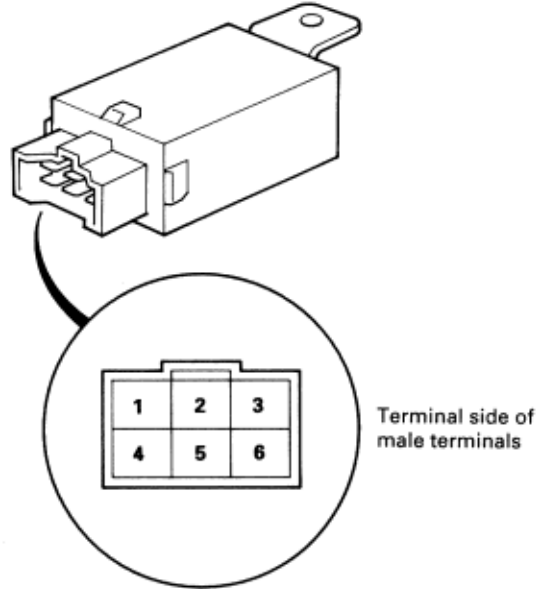
Some types of this vehicle have a side airbag in each front seat. See section 24 before servicing in this area.

1. Disconnect the 2P and 6P connectors as shown below.



2. **Seat Cushion Heater:**
Check for continuity between the No. 1 and No. 5 terminals (R x 103 scale). There should be continuity.
3. **Seat Back Heater:**
Check for continuity between the No.7 and No.8 terminals (R x 103 scale). There should be continuity.

1. Disconnect the 6P connector from the seat heater relay.
2. Check for continuity between the terminals. There should be continuity between the No. 3 and No. 4 terminals and should be battery voltage to the No. 1 terminal when power and ground are connected to the No. 5 and No. 6 terminals.
3. When power is disconnected, there should be continuity between the No. 4 and No. 6 terminals, and should be no continuity between the No. 1 and No. 6 terminals.



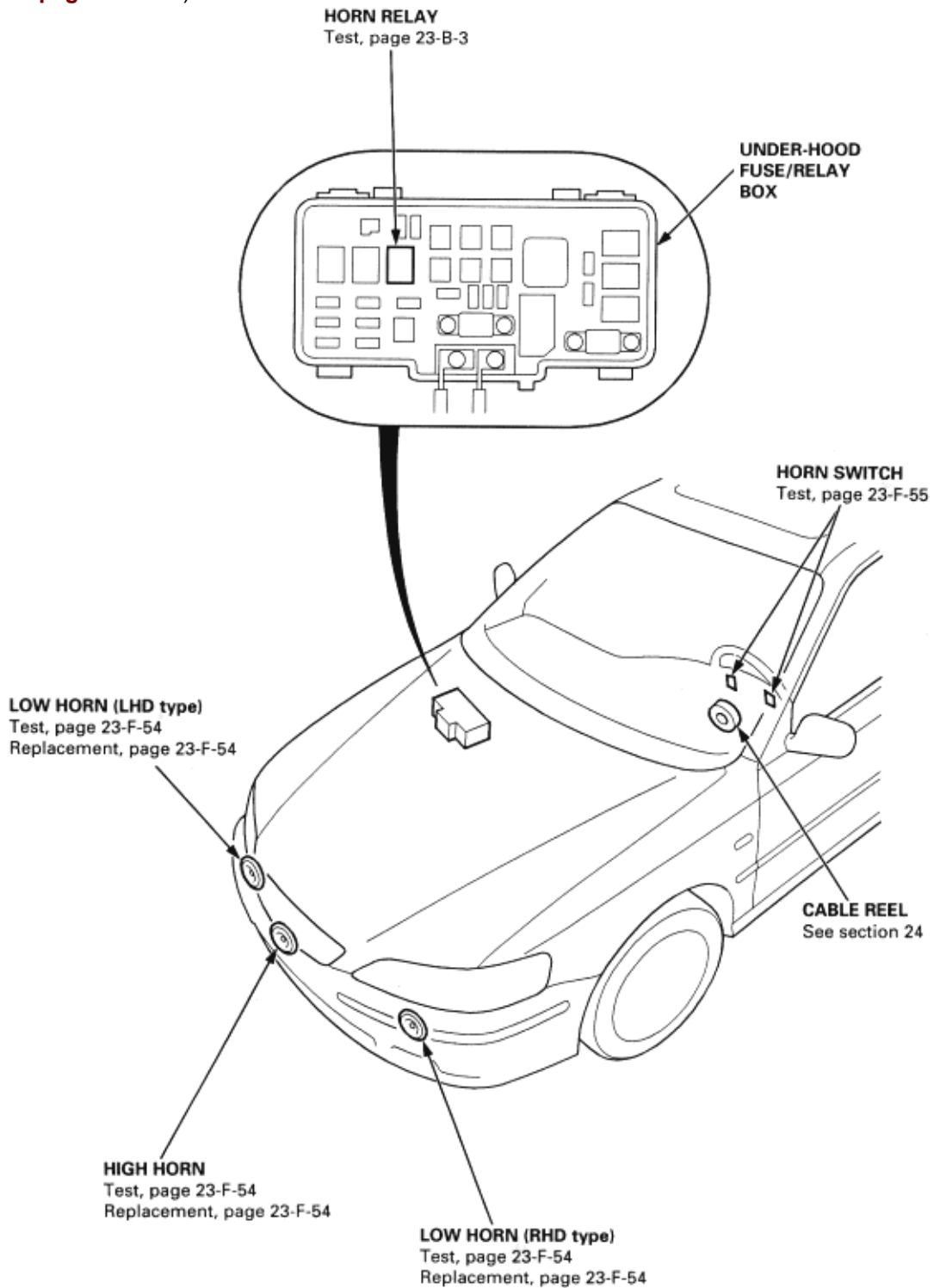
Horns

Component Location Index

23-F-53

NOTE:

- ♦ LHD type is shown, RHD type is symmetrical.
- ♦ Security horn ([see page 23-G-33](#)).



To go to the pages referenced on the diagram above,
click on the following:

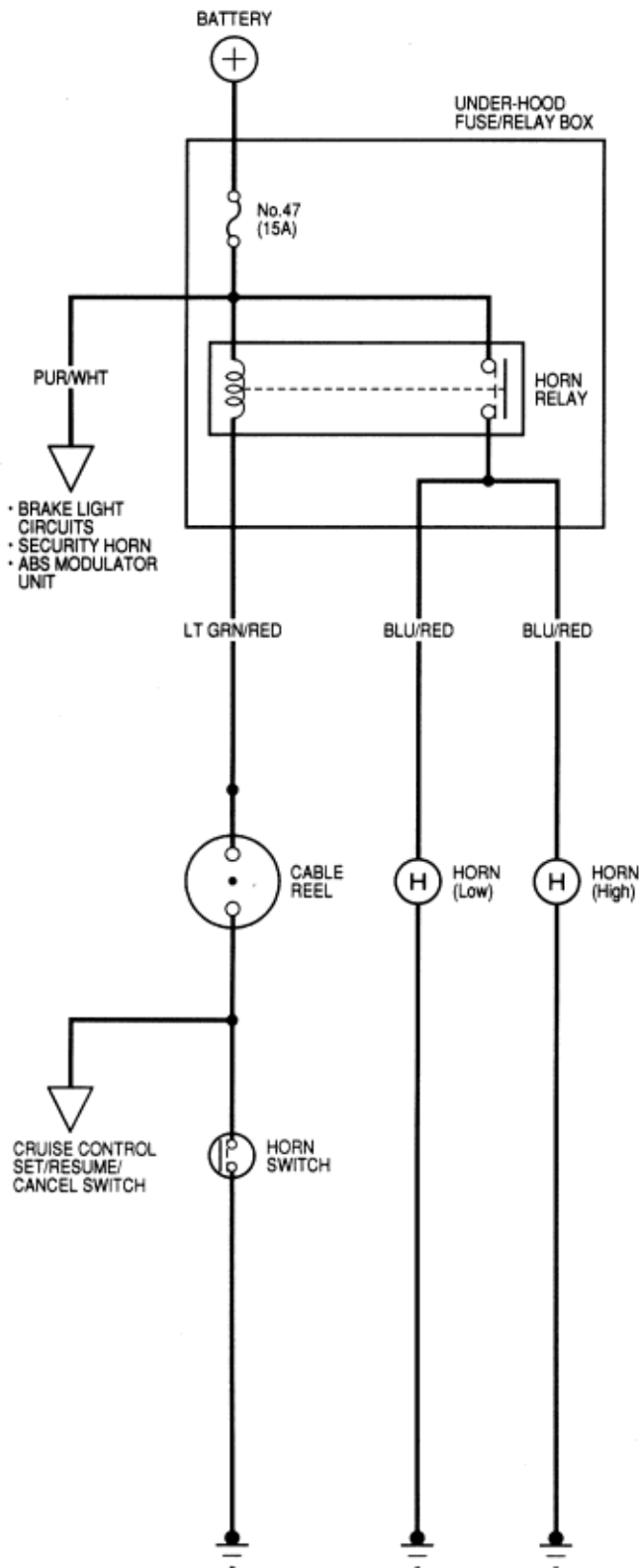
([See Page 23-B-3](#))

([See Page 23-F-55](#))

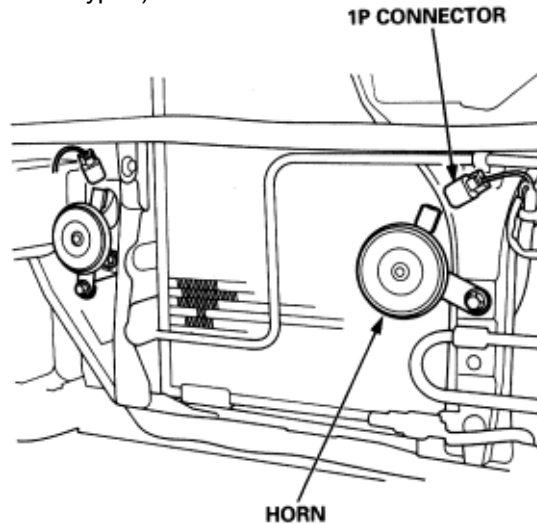
([See Page 23-F-54](#))

Horns Circuit Diagram

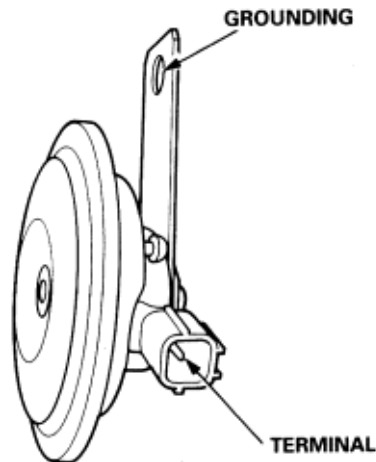
23-F-54 Horn Test and Replacement



1. Open the hood.
2. Disconnect the 1P connector, and remove the horn.
NOTE: High horn is shown, low horn (on some types) is similar.



3. Test the horn by connecting battery power to the terminal and grounding the bracket. The horn should sound.

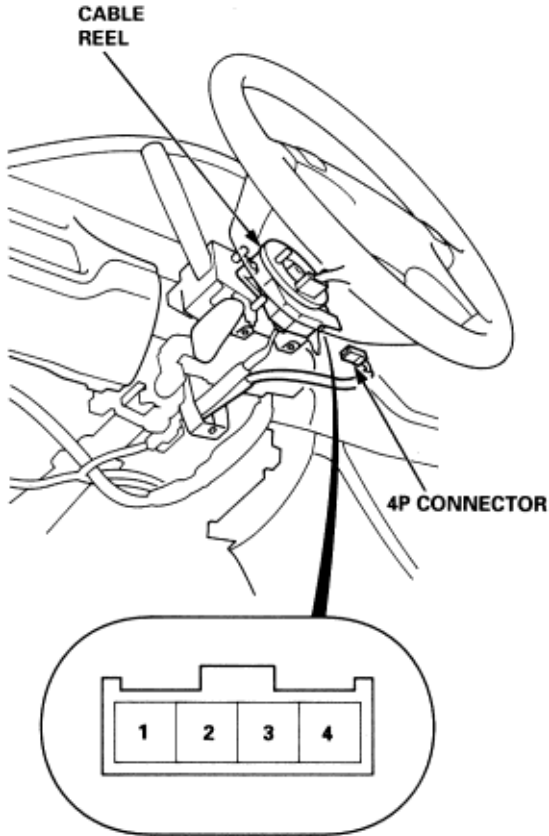


4. If it fails to sound, replace it.

Horns
Switch Test

23-F-55

1. Remove the dashboard lower cover (see section 20).
2. Remove the steering column upper and lower covers (see section 20).
3. Disconnect the steering beam wire harness 4P connector from the cable reel.



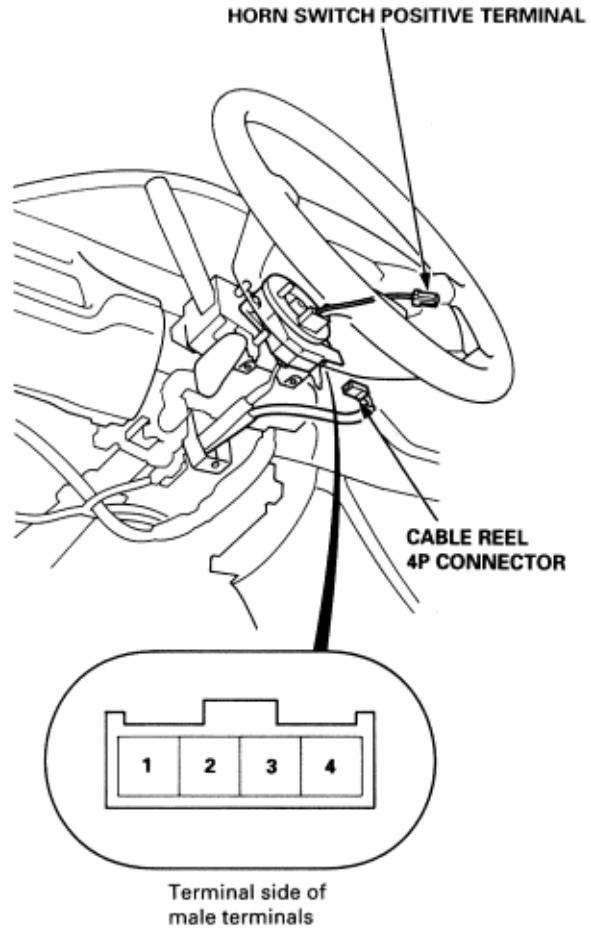
4. Check for continuity between the cable reel No. 3 terminal and body ground in each switch position.

Terminal Position	3	Body ground
Pushed	○ — ○	○ — ○
Released		

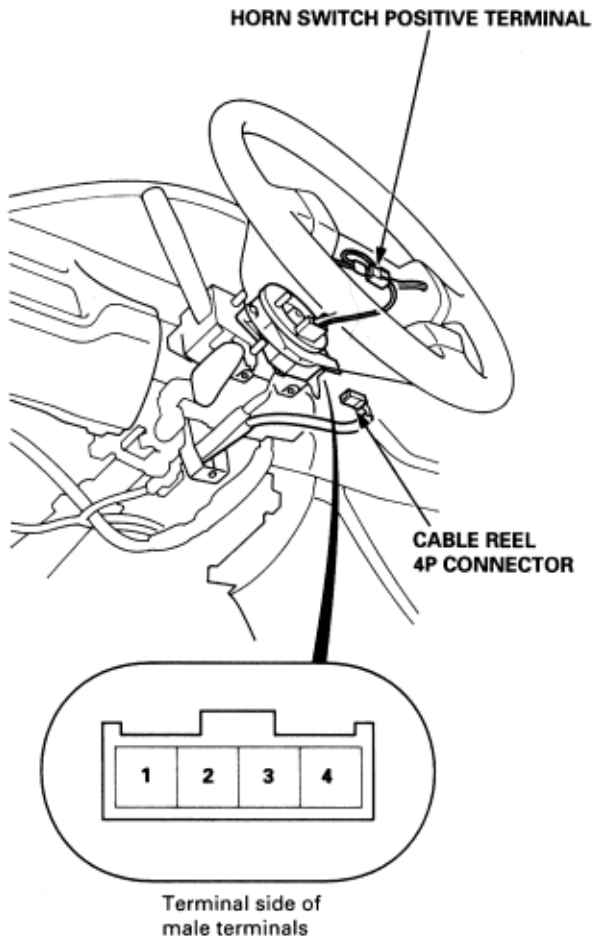
- ♦ If there is continuity, the horn switch is OK.
- ♦ If there is no continuity, go to step 5.

5. Remove the driver's airbag assembly (see section 24).
6. Check for continuity between the cable reel No. 3 terminal and the horn switch positive terminal.

Except Type R:



Type R:

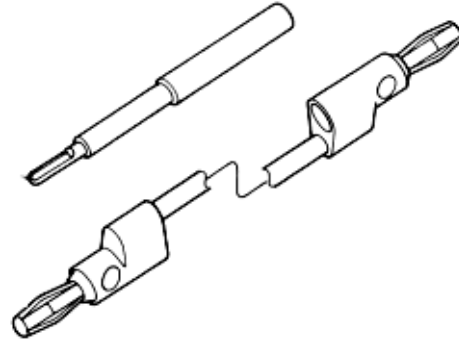


- ♦ If there is no continuity, check the cruise control Set/Resume/Cancel switch (with cruise control). If the switch is OK, replace the cable reel (see section 24) and confirm the proper operation.
- ♦ If there is continuity:
 - Except Type R:**
 - Replace the horn switch (SRS airbag assembly) (see section 24).
 - Type R:**
 - Repair or replace the horn switch.

Special Tool

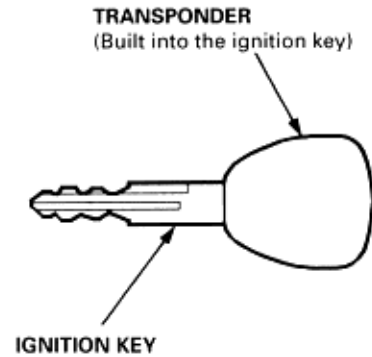
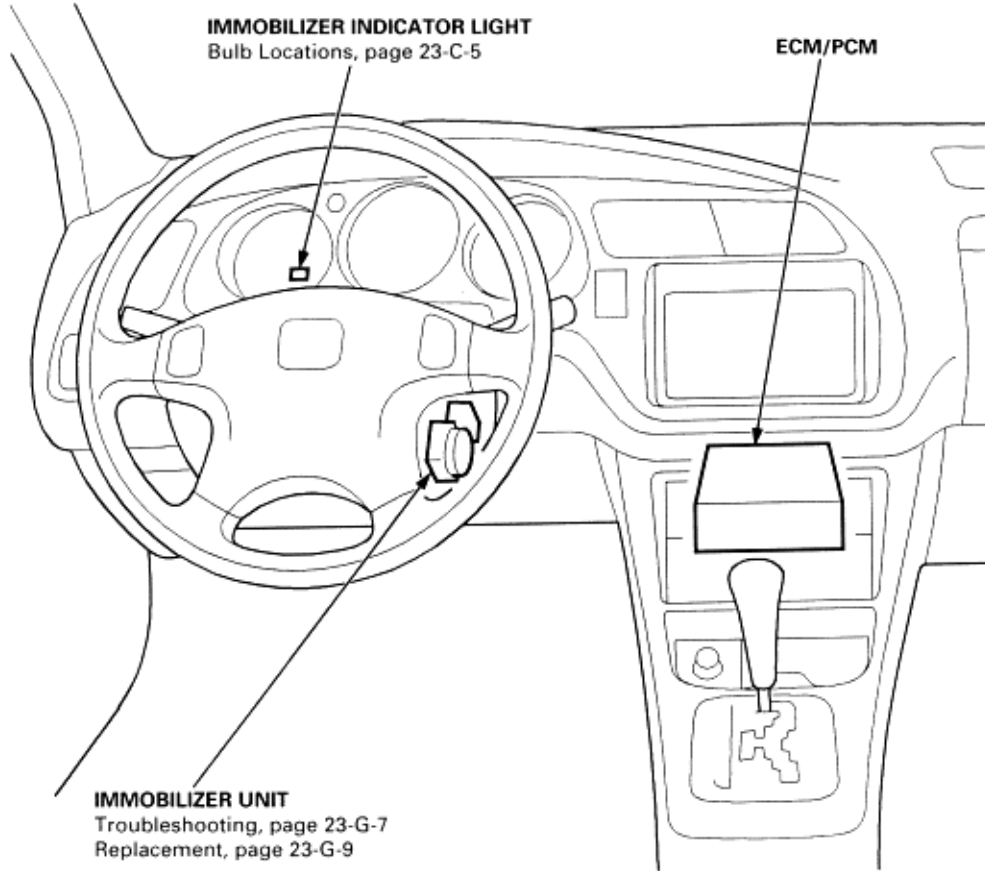
23-G-2

Ref No.	Tool Number	Description	Qty	Remark
1	07SAZ - 001000A	Backprobe Set	1	



①

NOTE: LHD type is shown, RHD type is similar



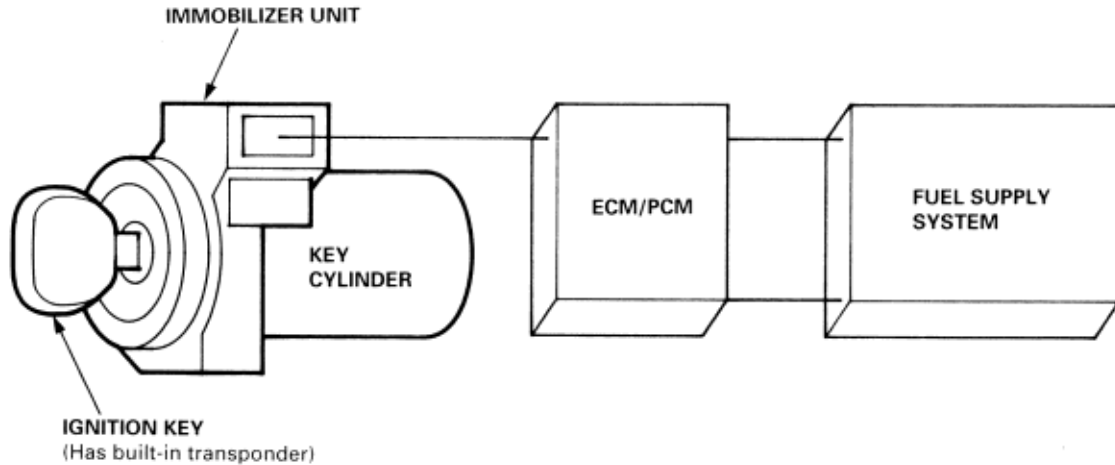
To go to the pages referenced on the diagram above,
click on the following:
[\(See Page 23-C-5\)](#)
[\(See Page 23-G-7\)](#)
[\(See Page 23-G-9\)](#)

Immobilizer System

Description

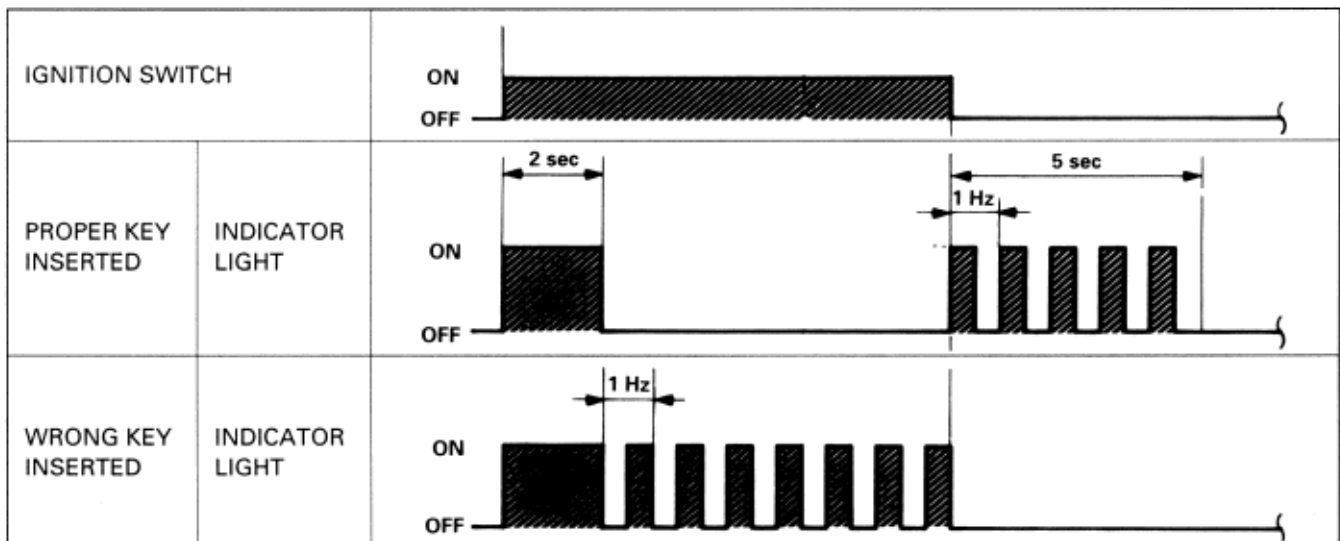
23-G-4

- The vehicle is equipped with an immobilizer system that will disable the vehicle unless the proper ignition key is used. This system consists of a transponder, an immobilizer unit, an indicator light and ECM/PCM.
- When the key is inserted in the ignition switch and turned to the (II) position, the immobilizer unit sends power to the transponder. The transponder then sends a coded signal back to the immobilizer unit. The immobilizer unit in turn signals the ECM/PCM.

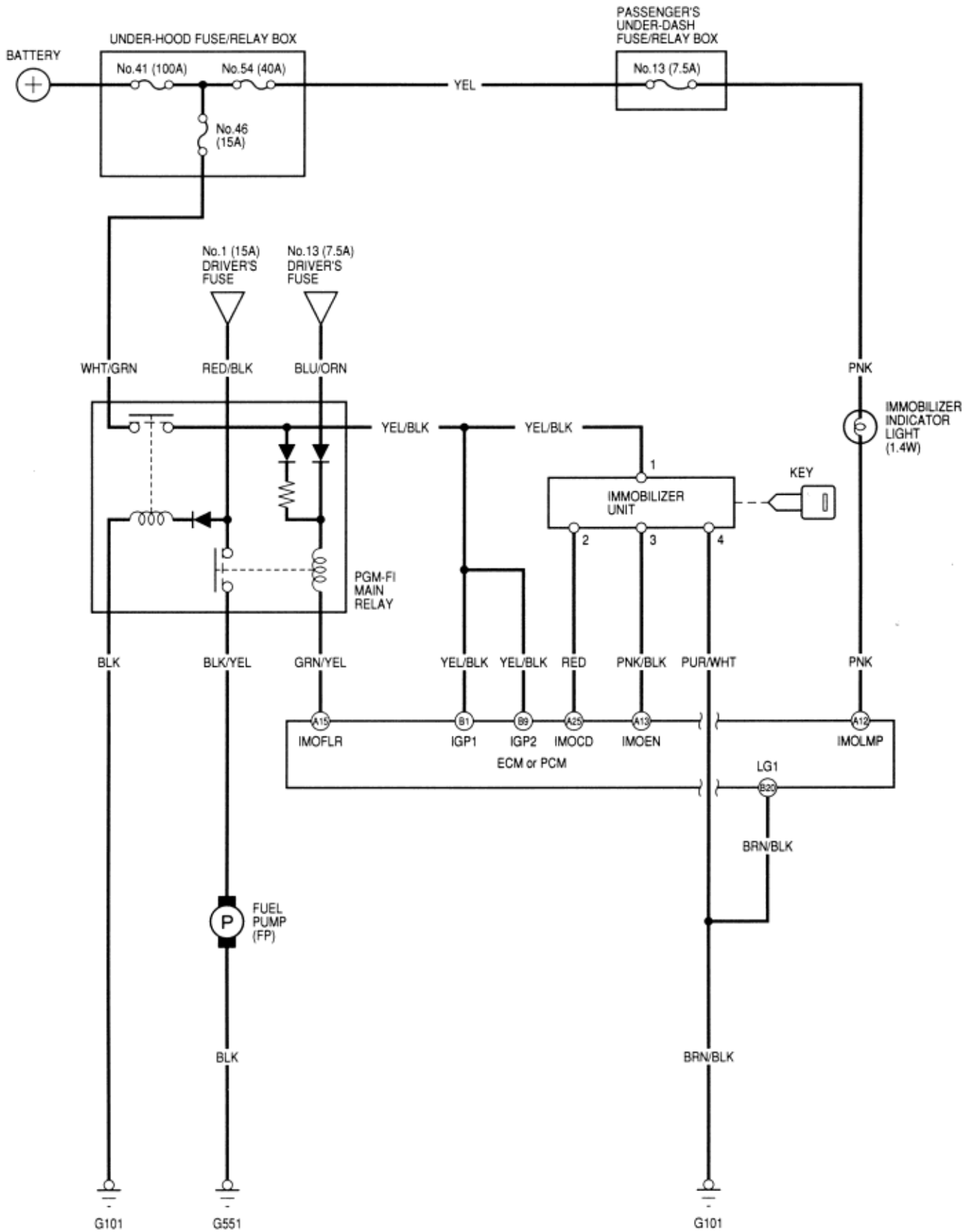


- If the proper key has been used, the immobilizer indicator light will come on for about two seconds, then go off.
- If the wrong key has been used whose code was not received or recognised by the unit, or which was not approved by Honda, the indicator light will come on for about two seconds, then it will go on blinking until the ignition switch is turned OFF.
- If the ignition switch is turned OFF, the indicator will blink for about five seconds to signal that the unit has been set correctly then the indicator will go off.

IMMOBILIZER INDICATOR LIGHT BLINKING PATTERN:



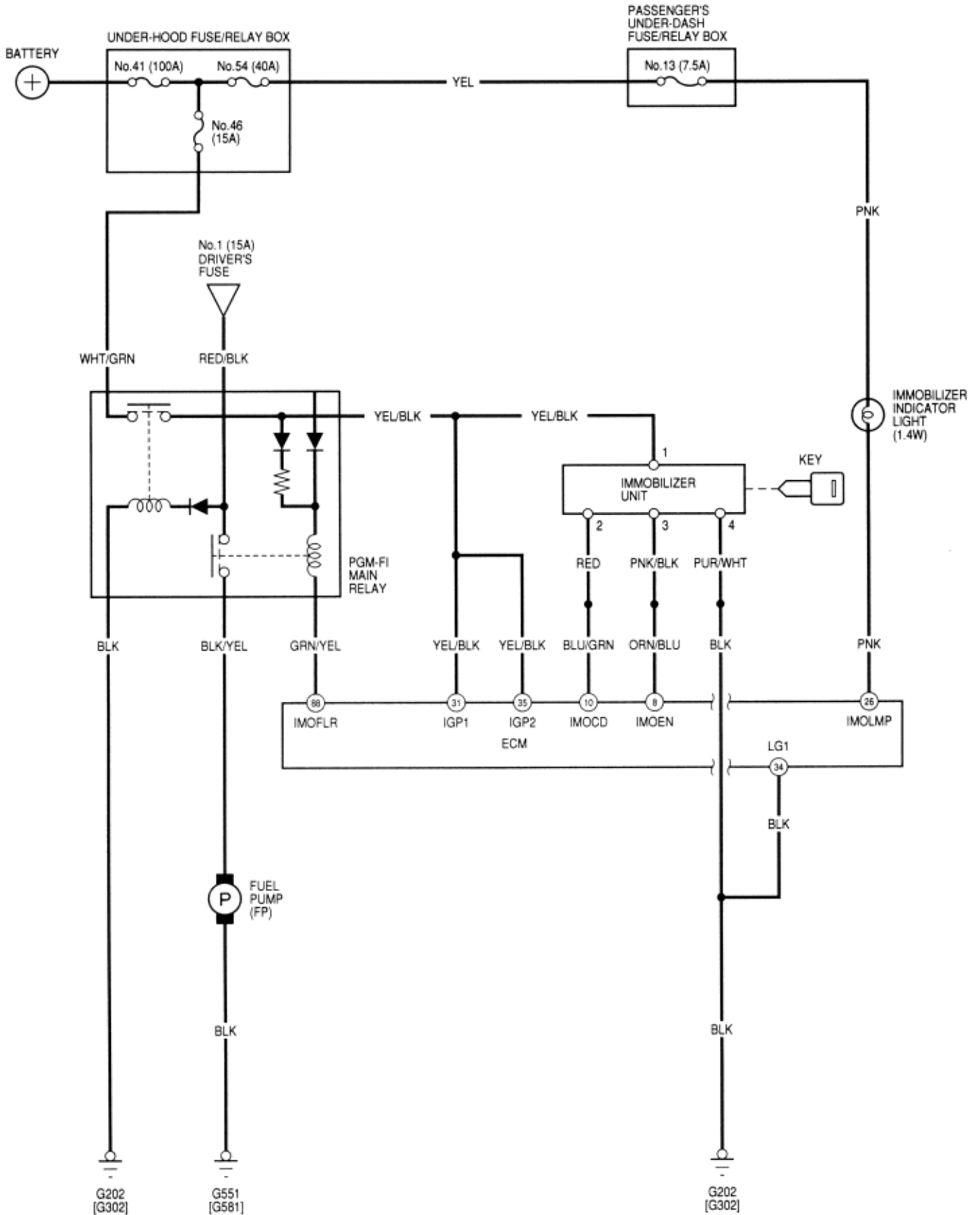
- If the customer has lost his key, and cannot start the engine, contact Honda Customer Relations.



Immobilizer System
Circuit Diagram (D16B6 engine)

23-G-6

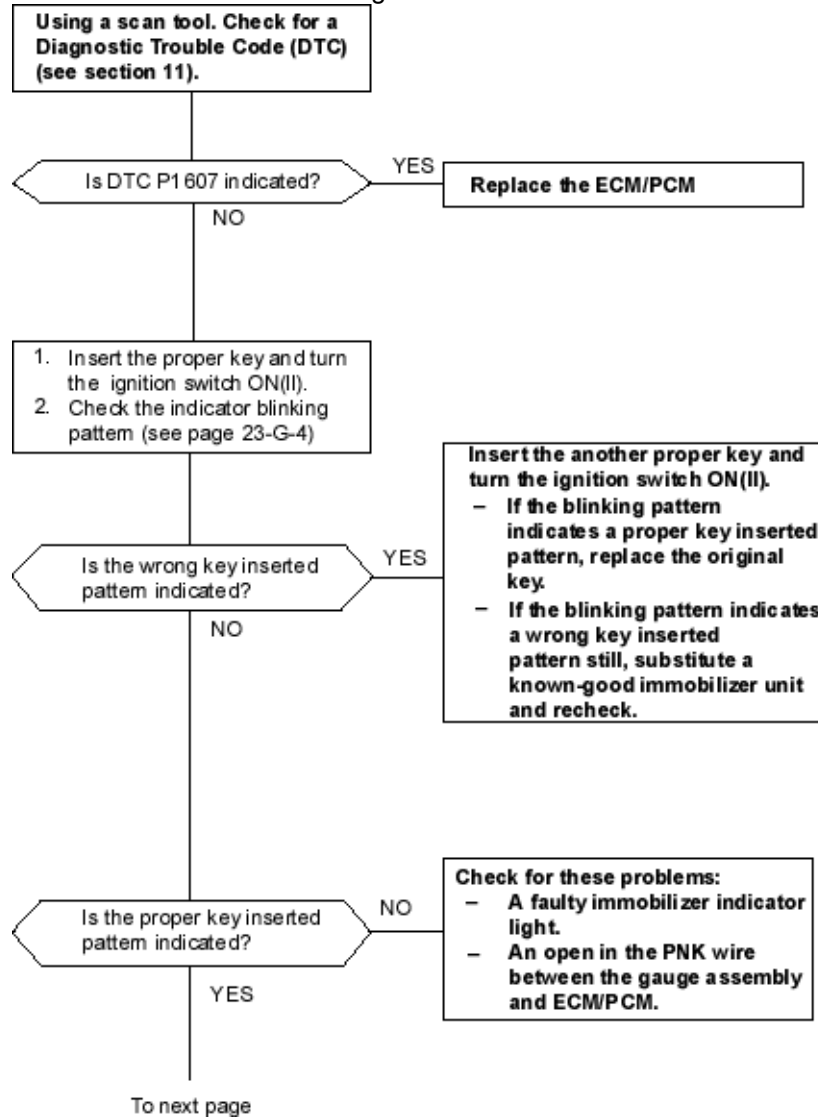
[] : RHD type

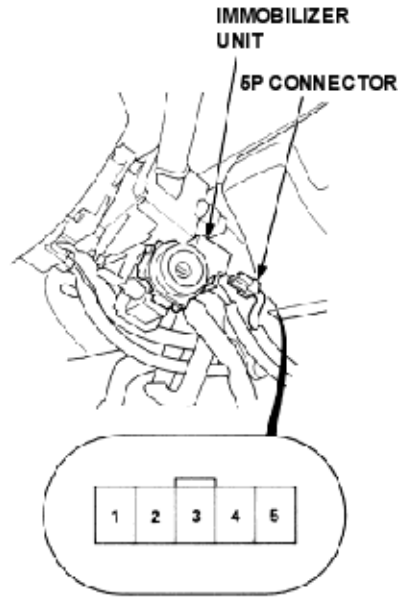
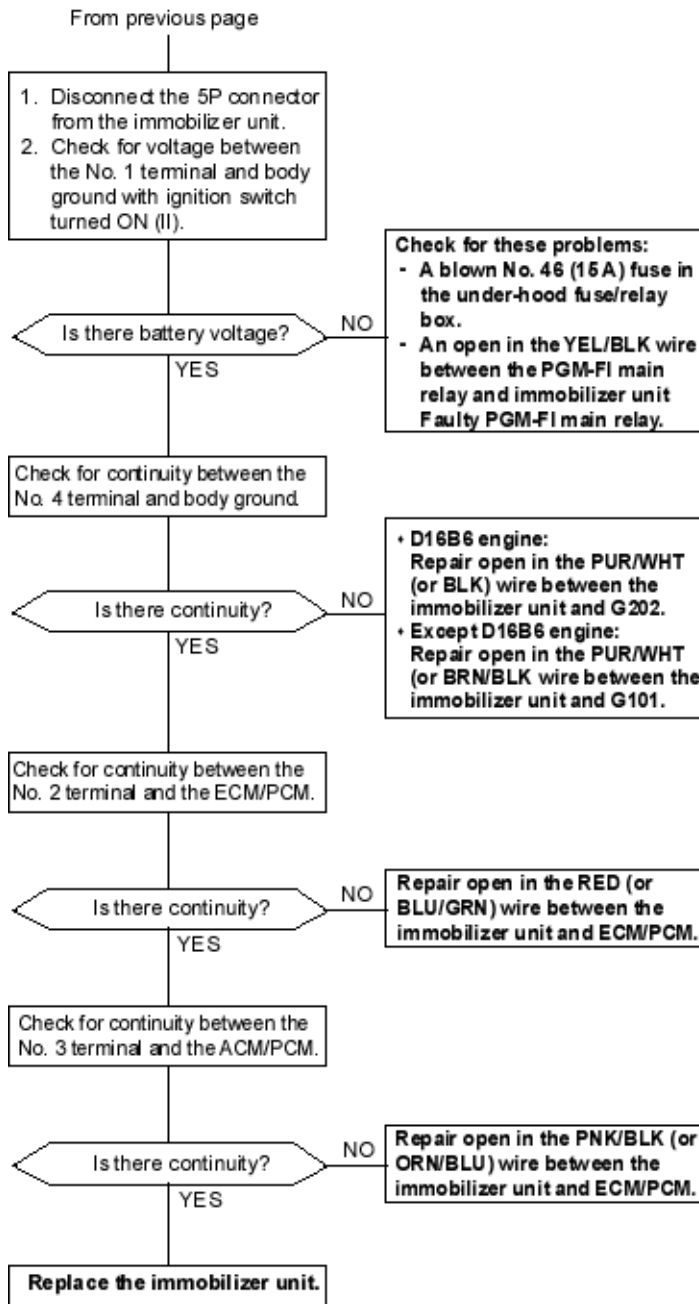


Before testing:

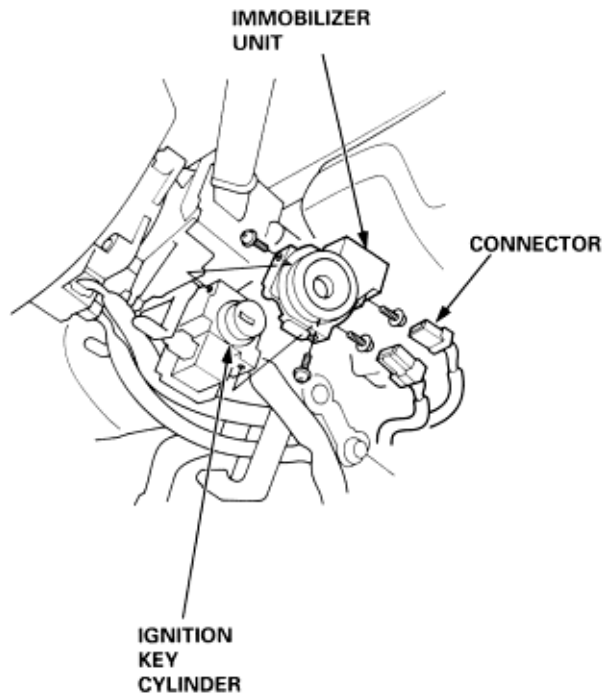
- Due to the action of the immobilizer system, the engine takes slightly more time to start than engines of vehicle without an immobilizer system.
- If the ECM/PCM is faulty, substitute a known-good ECM/PCM, and recheck. However, since the known-good ECM/PCM has a different code stored into it, it must be rewritten with the Honda PGM Tester, otherwise the engine will not start.

Follow the flowcharts if the vehicle does not start after rewriting the ECM/PCM with the Honda PGM Tester.



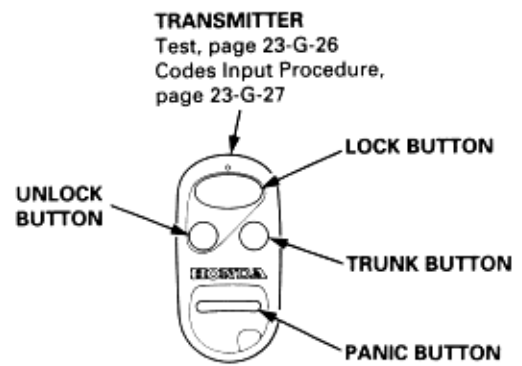
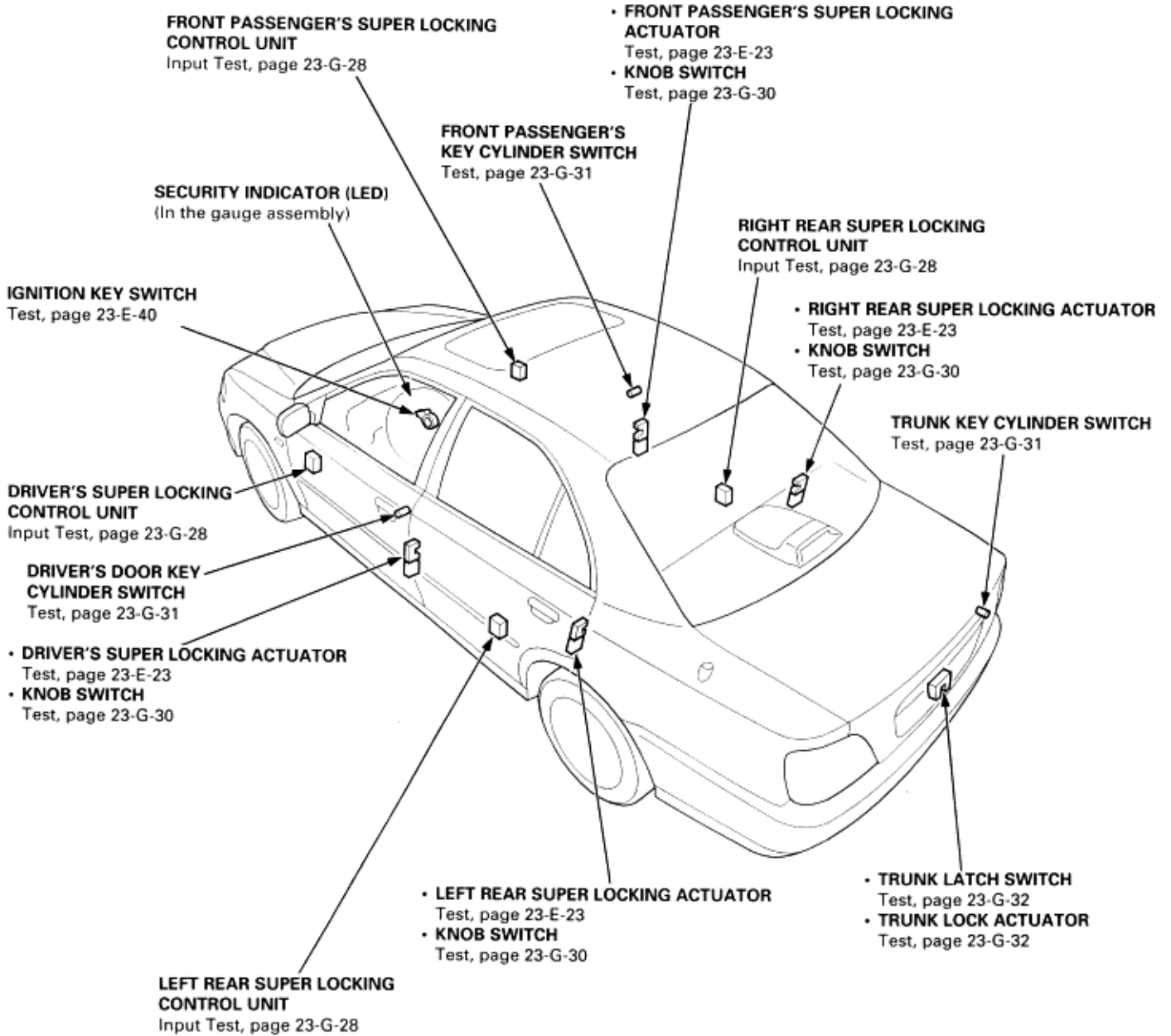


1. Remove the driver's dashboard lower cover and steering column covers (see section 20).
2. Disconnect the 5P connector from the immobilizer unit.

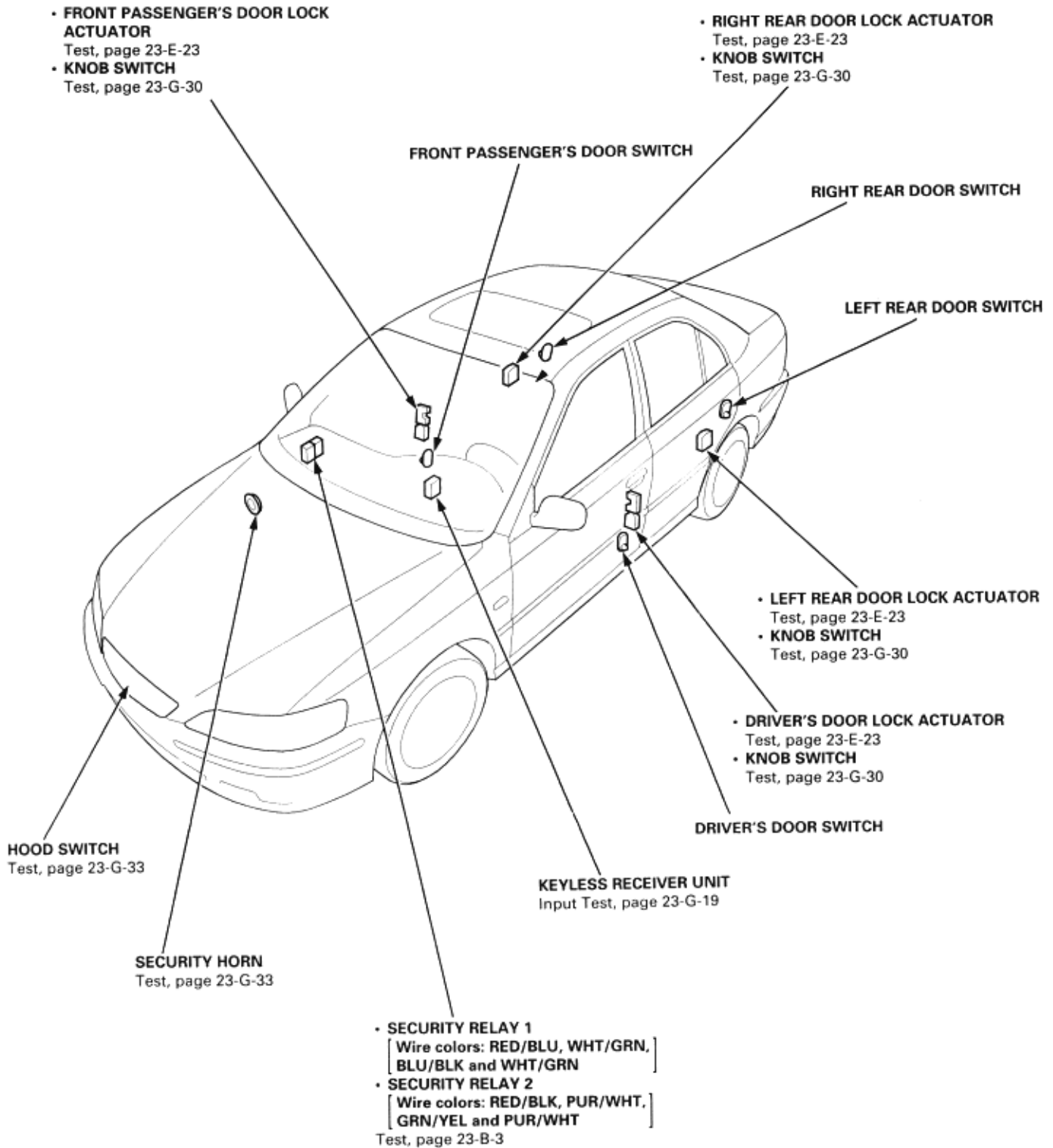


3. Remove the screws and the immobilizer unit from the ignition key cylinder.
4. Install in the reverse order of removal.
5. After replacement, make sure the immobilizer indicator light blinks correctly.

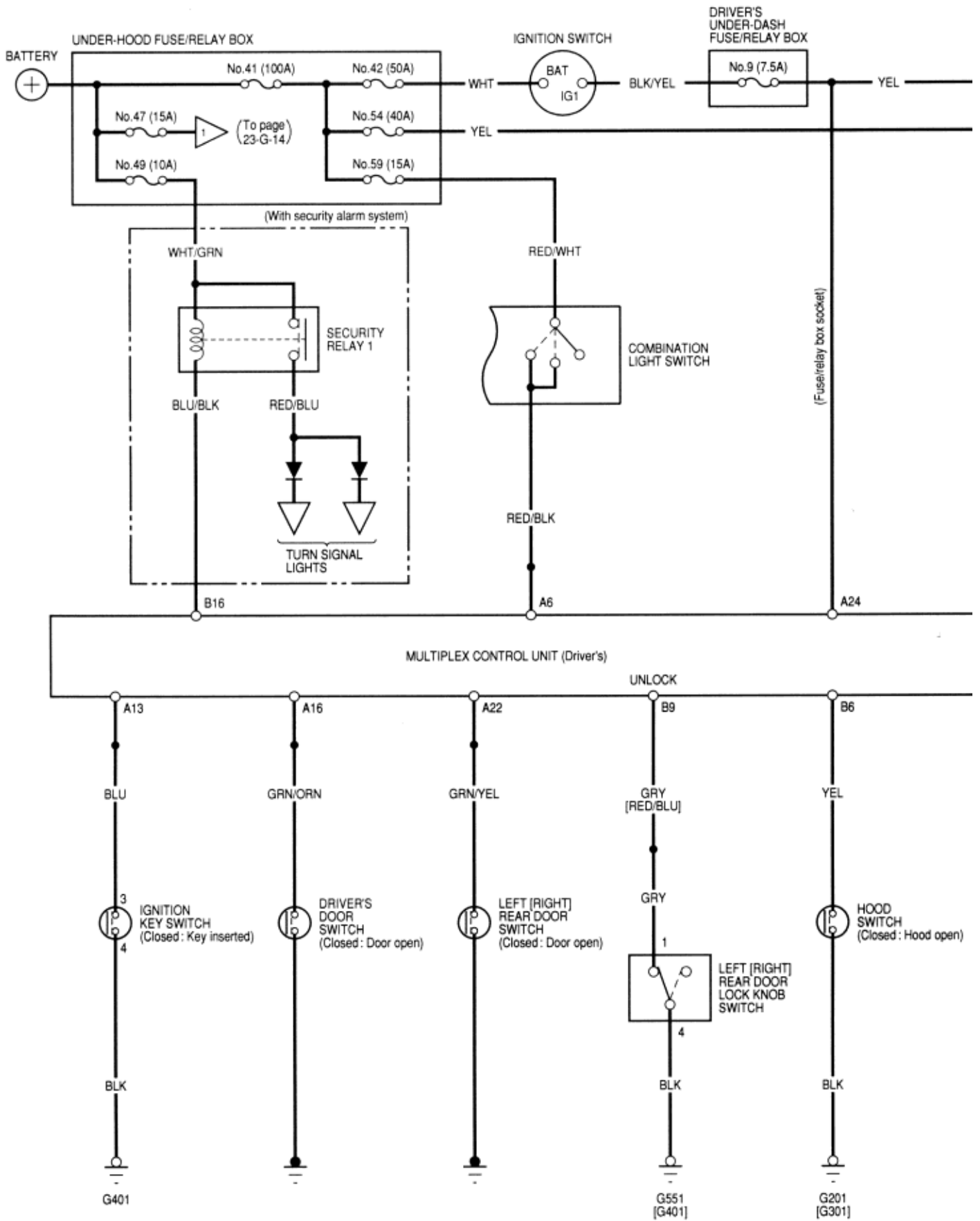
NOTE: LHD type is shown, RHD type is symmetrical.



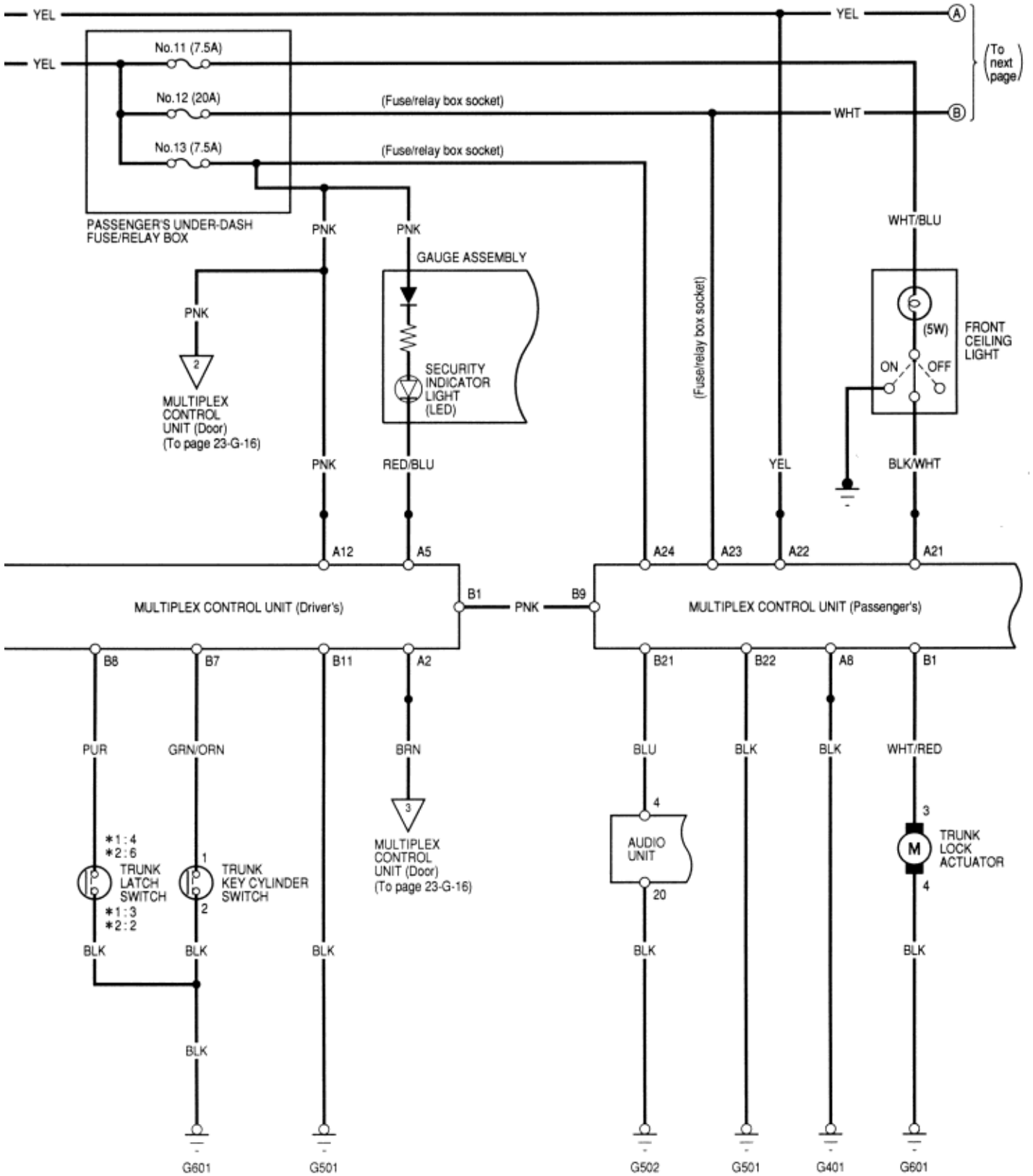
To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-G-28)
(See Page 23-G-31)
(See Page 23-E-23)
(See Page 23-G-30)
(See Page 23-E-40)
(See Page 23-G-32)
(See Page 23-G-26)
(See Page 23-G-27)

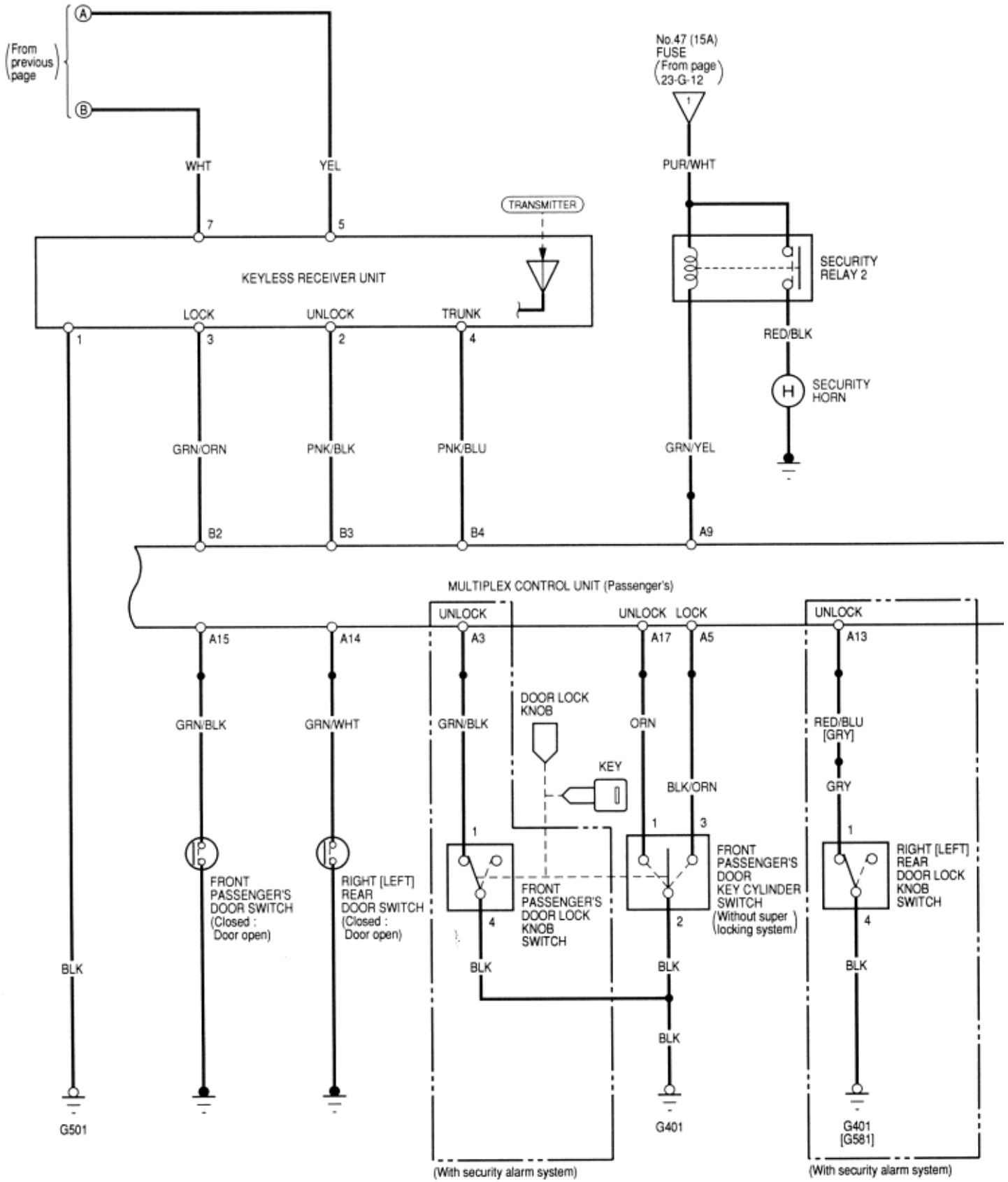


To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-E-23)
(See Page 23-G-30)
(See Page 23-G-33)
(See Page 23-G-19)
(See Page 23-B-3)

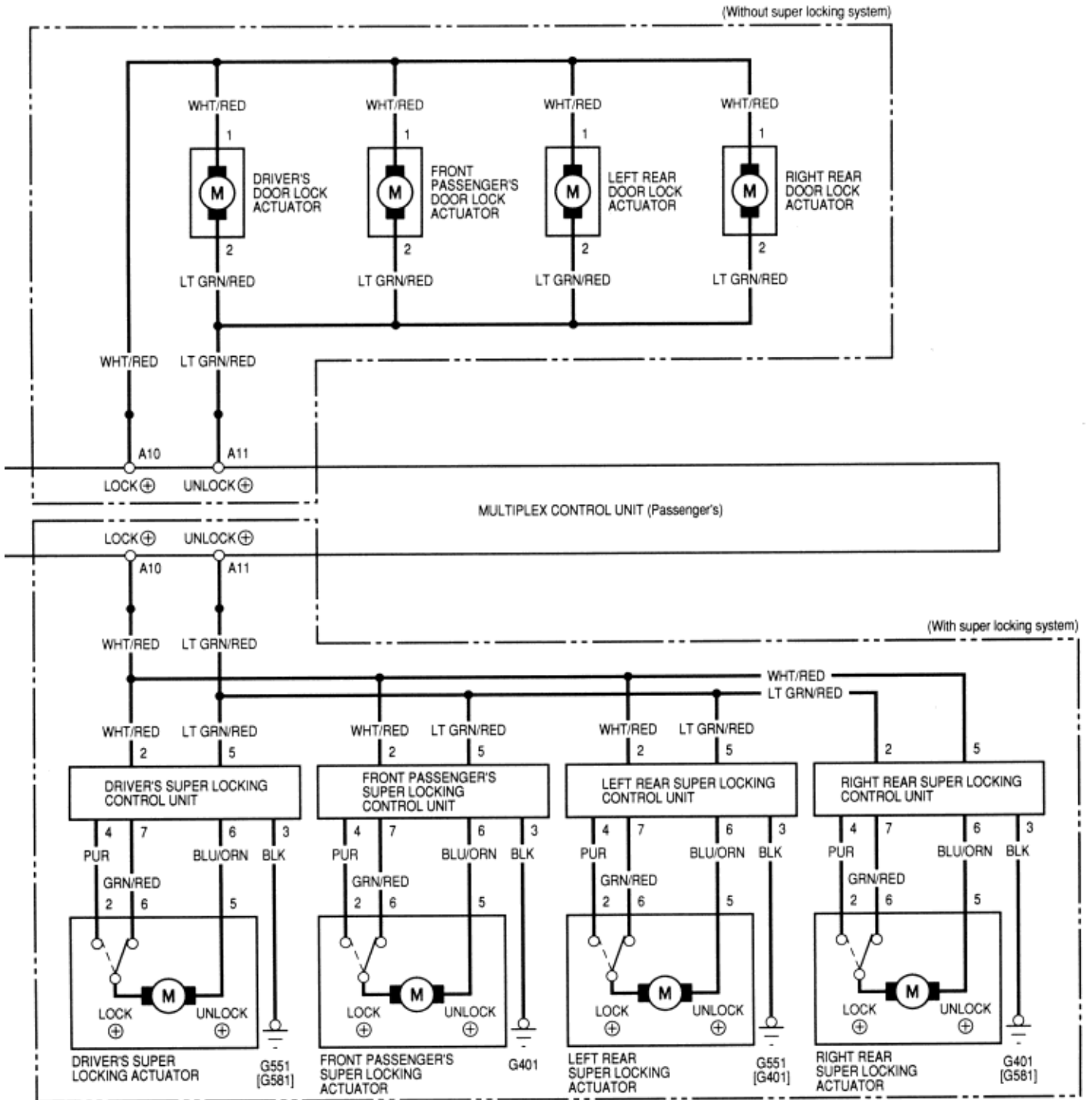


[] : RHD type
* 1 : Without security alarm system
* 2 : With security alarm system

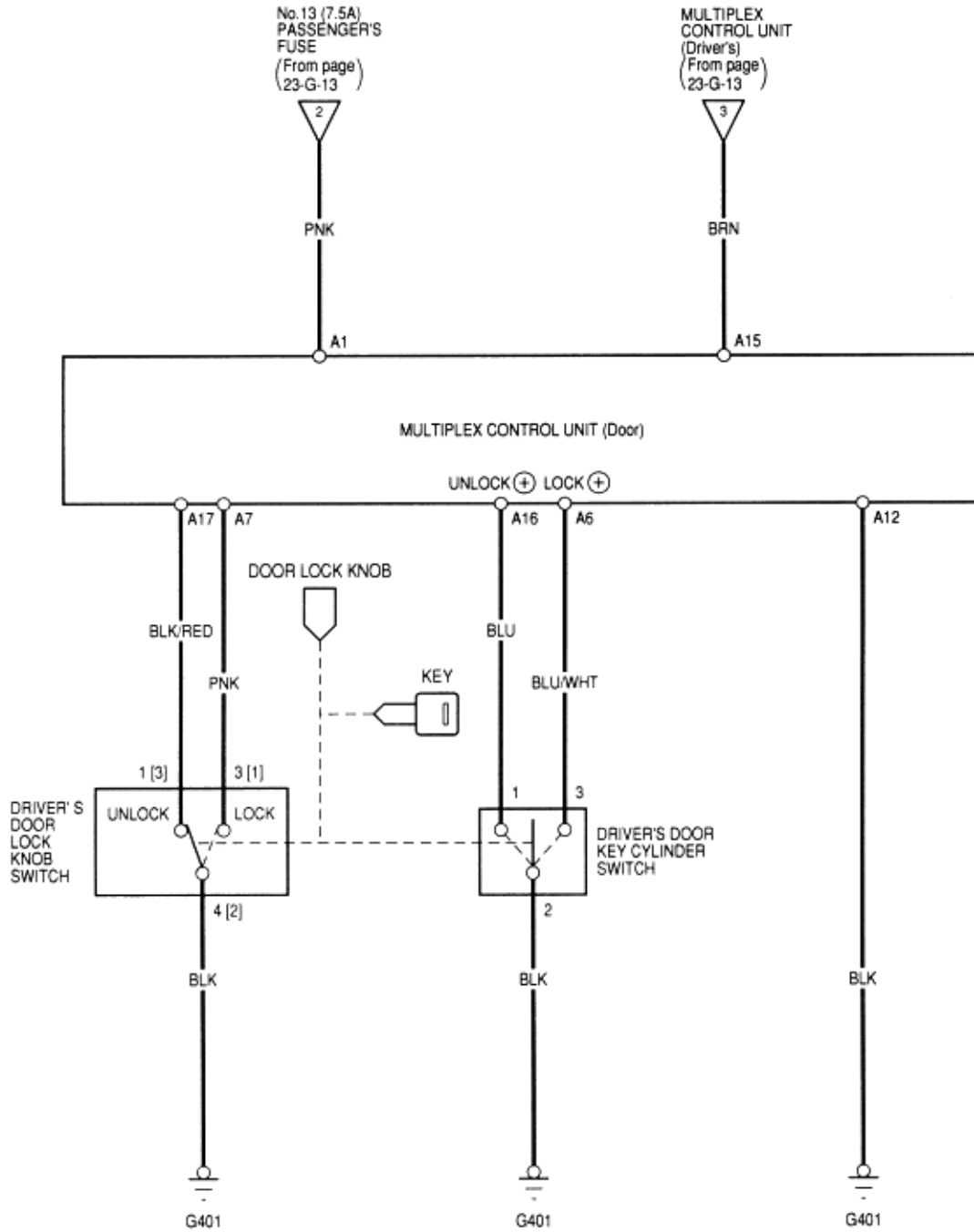




[]: RHD type



[]: Without super locking system



[]: Without super door lock system.

To go to the pages referenced on the diagram above,
 click on the following:
 (See Page 23-G-13)

Security Alarm System

The security alarm system is armed automatically after the doors, hood, and trunk are closed and locked. The security indicator on the driver's door panel flashes after the system is armed.

The system is set off when any of these things occur:

- ♦ A door is forced open.
- ♦ A door is unlocked without using the key or the transmitter.
- ♦ The trunk lid is opened without using the key or the transmitter.
- ♦ The hood is opened.
- ♦ The engine starter circuit and battery circuit are bypassed by breaking the ignition switch.

When the system is set off, the alarm (siren) sounds and the exterior lights (headlights, side marker lights, parking lights, and taillights) flash for about two minutes or until the system is disarmed by unlocking either door with the key or the transmitter.

For the system to arm, the ignition switch must be off and the key removed. Then, the keyless/security control unit must receive signals that the doors, hood, and trunk lid are closed and locked. When everything is closed and locked, none of the control unit inputs are grounded. The door switches, hood switch, trunk lid switch, door lock knob switches, and door lock cylinder switches are all open. Fifteen seconds after the doors are locked with the key or the lock knob, or immediately after locking the doors with the remote transmitter, the system arms. If anything is opened or improperly unlocked after the system is armed, the control unit gets a ground signal from that switch, and the system is set off.

If one of the switches is misadjusted or there is a short in the system, the system will not arm. As long as the control unit continues to get a ground signal, it thinks the vehicle is not closed and locked and will not arm.

An alarm that sounds for no apparent reason may have been set off by a switch that is on the threshold of misadjustment. In this case, it may only take a significant change in outside temperature, the vibration of a passing truck, or someone bumping into the vehicle to make the alarm sound.

Panic Mode

The panic mode allows the security system to be set off by the remote transmitter to attract attention. When you push and hold the PANIC button for about two seconds, the alarm will sound and the exterior lights will flash for about 30 seconds.

To immediately cancel the panic mode, press any button on the remote transmitter, or turn the ignition switch ON (II). The panic mode will not function if the key is in the ignition switch.

Keyless Entry System

The security alarm system is integrated with the keyless entry system. The keyless entry system allows you to lock and unlock the vehicle with the remote transmitter. When you push the LOCK button, all doors lock. When you push the UNLOCK button once, only the driver's door unlocks. The remaining doors unlock when you push the button a second time.

The ceiling lights, if its switch is in the center position, will come on when you press the UNLOCK button. If you do not open a door, the light will go off in about 30 seconds, the doors will automatically relock, and the security system will rearm. If you relock the doors with the remote transmitter within 30 seconds, the light will go off immediately.

You cannot lock or unlock the doors with the remote transmitter if a door or the trunk or hood is not fully closed, or if the key is in the ignition switch. If a door or the trunk or hood is not fully closed, or if the key is in the ignition switch if a door or hood is not closed the alarm chirps three times to alert you.

To open the trunk, push the Trunk Release button and hold it for about two seconds. The Trunk will not open if the key is in the ignition switch.

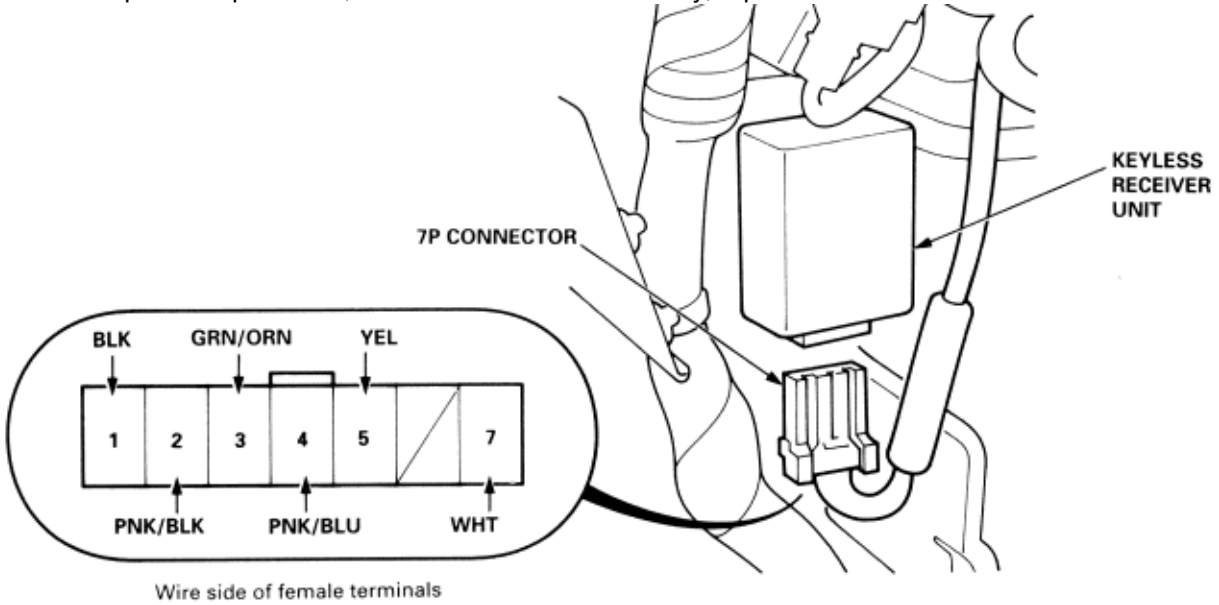
The system will signal you when the doors lock and unlock by flashing the parking lights, turn signal lights, and taillights: once when they lock, and twice when they unlock. You can program the remote transmitter so the system will also give an audible signal. The alarm will chirp once when you lock the doors and twice when you unlock them. The alarm chirps only the first time you press a transmitter button. Pressing the same button repeatedly does not chirp the alarm again.

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Item to be inspected		In the passenger's under-dash fuse/relay box		Driver's door lock knob switch	Ignition key switch	Driver's door switch	Passenger's door switch	Door lock actuator	Driver's door key cylinder switch	Passenger's door key cylinder switch	Control unit input	Super locking control unit (With super locking system)	Transmitter and receiver unit	Disconnected or obstructed door lock rod/linkage	Poor ground	Open circuit in wires, loose or disconnected terminals
		Blown No. 12 (20 A) fuse	Blown No. 13 (7.5 A) fuse													
Symptom																
Power door lock system does not work at all.		1	2								3	4				YEL, WHT/RED, LT GRN/RED
Doors don't lock or unlock with the driver's door lock knob.	All doors			1							2			G401	PNK, BLK/RED	
	One door							2			3		1			
Doors don't lock or unlock with the driver's door key.	All doors (*)								1		2			G401	BLK/ORN, ORN	
	One door							2			3		1			
Doors don't lock or unlock with the passenger's door key.	All doors									1	2					
	One door							2			3		1	G401	BLU, BLU/WHT	
The door will lock when the ignition key is inserted and one of the doors is open.					1	2	3				4			G401	BLU, GRN/BLK, GRN/WHT, GRN, GRN/ORN	
The power door lock system works properly but keyless entry system does not work.													1	G501	GRN/ORN, PNK/BLK, PNK/BLU	

(*) If the system is normal, all doors will unlock when the door key is kept in the unlock position (key cylinder switch and door lock knob switch turned ON) for one second or more.

1. Remove the glove box (see section 20).
2. Disconnect the 7P connector from the keyless receiver unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



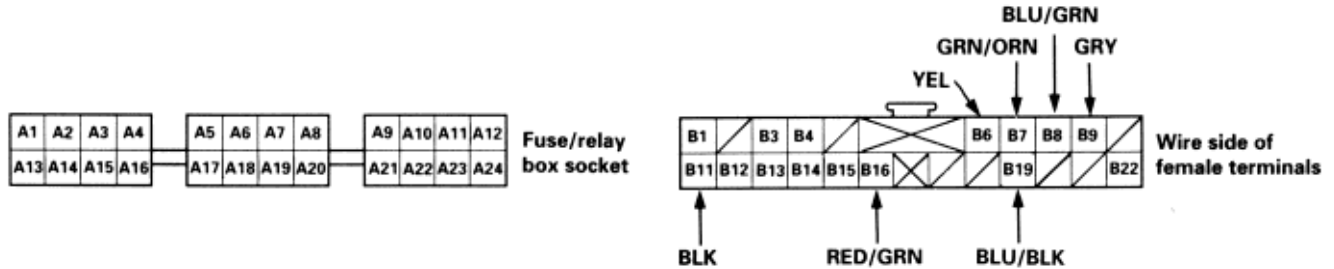
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
2	PNK/BLK	Under all conditions	Check for continuity between the terminals No. 2 and [B3], No. 3 and [B2] and No. 4 and [B4]: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
3	GRN/ORN	Under all conditions	Check for continuity between the terminals No. 2 and [B3], No. 3 and [B2] and No. 4 and [B4]: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
4	PNK/BLU	Under all conditions	Check for continuity between the terminals No. 2 and [B3], No. 3 and [B2] and No. 4 and [B4]: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
5	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
7	WHT	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire

[]: The terminal numbers of the Multiplex Control Unit (Passenger's).

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box (see page 23-B-7).
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A5	Fuse/relay box socket	Under all conditions	Connect to ground: The security indicator light should come on.	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty security indicator light (LED) ♦ An open in the wire
A6	Fuse/relay box socket	Combination light switch ON	Connect to ground: The small lights should come on.	<ul style="list-style-type: none"> ♦ Blown No 59 (15A) fuse in the under-hood fuse/relay box. ♦ Faulty combination light switch ♦ An open in the wire
B16	BLU/BLK	Under all conditions	Connect to ground: The trunk signal lights should come on.	<ul style="list-style-type: none"> ♦ Blown No 49 (10A) fuse in the under-hood fuse/relay box. ♦ Faulty security relay 1 ♦ An open in the wire

Reconnect the connectors to the unit.

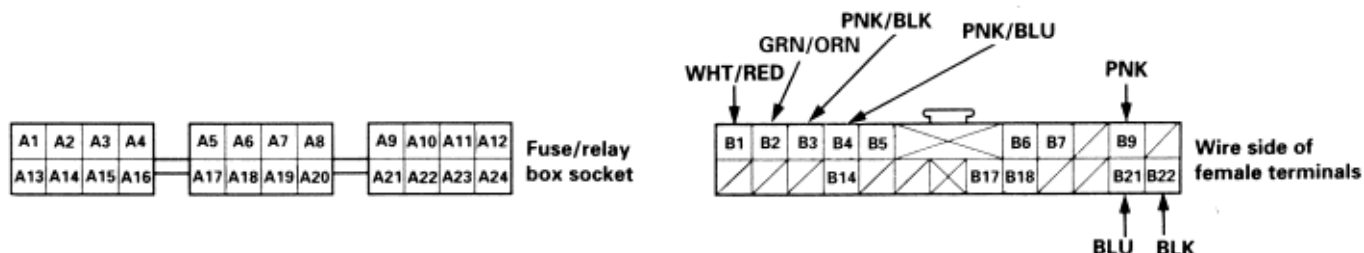
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A13	Fuse/relay box socket	Ignition key inserted in the ignition switch Ignition key out of the ignition switch	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty ignition key switch ♦ Poor ground (G401) ♦ An open in the wire
A16	Fuse/relay box socket	Driver's door opened Driver's door closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty driver's door switch ♦ An open in the wire
A17	Fuse/relay box socket	Left [Right] rear door opened Left [Right] rear door closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty left [Right] rear door switch ♦ An open in the wire
B6	YEL	Hood opened Hood closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty hood switch ♦ Poor ground (G201 [G301]) ♦ An open in the wire
B7	GRN/ORN	Trunk key cylinder switch in lock Trunk key cylinder in unlock	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty trunk key cylinder switch ♦ Poor ground (G601) ♦ An open in the wire
B8	PUR	Trunk lid opened Trunk lid closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty trunk latch switch ♦ Poor ground (G601) ♦ An open in the wire
B9	GRY [RED/BLU]	Left [Right] rear door lock knob unlocked Left [Right] rear door lock knob locked	Check for voltage to ground: There should be less than 1 V Check for voltage to ground: There should be 5 V or more	<ul style="list-style-type: none"> ♦ Faulty left [right] rear super door lock actuator ♦ Poor ground (G551). ♦ An open in the wire

[]: RHD type

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide (see page 23-E-6).

Multiplex Control Unit (Passenger's):

1. Remove the passenger's under-dash fuse/relay box (see page 23-B-7).
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A9	Fuse/relay box socket	Under all conditions	Connect to ground: The security horn should sound.	<ul style="list-style-type: none"> ♦ Blown No 47 (15A) fuse in the under-hood fuse/relay box. ♦ Faulty security horn ♦ Faulty security relay 2 ♦ An open in the wire
A21	Fuse/relay box socket	Ceiling light switch in "middle" position	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 11 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Blown ceiling light bulb. ♦ Faulty ceiling light. ♦ An open in the wire
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A23	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 12 (20A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
A24	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
B21	BLU	Under all conditions	Check for continuity between B21 terminal and audio unit No. 4 terminal: There should be continuity.	<ul style="list-style-type: none"> ♦ Faulty audio unit ♦ Poor ground (G502) ♦ An open in the wire
B22	BLK	Under all conditions	Check for continuity: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor ground (G501). ♦ An open in the wire

Reconnect the connectors to the unit.

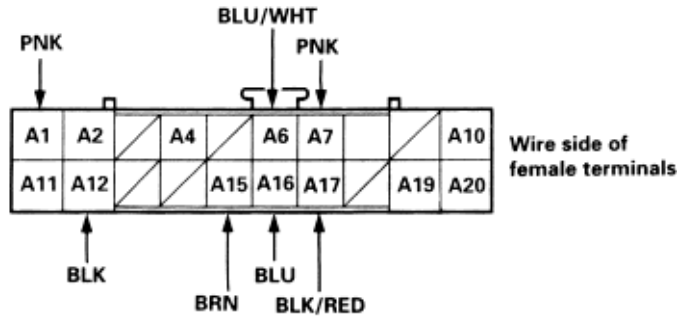
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A3	Fuse/relay box socket	Front passenger's door lock knob unlocked Front passenger's door lock knob locked	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty front passenger's supper locking or door lock actuator (knob switch) ♦ Poor ground (G401) ♦ An open in the wire
A5	Fuse/relay box socket	Front passenger's door lock key cylinder locked Front passenger's door lock key cylinder in neutral	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch. ♦ Poor ground (G401). ♦ An open in the wire
A17	Fuse/relay box socket	Front passenger's door lock key cylinder unlocked Front passenger's door lock key cylinder in neutral	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty front passenger's door lock key cylinder switch. ♦ Poor ground (G401). ♦ An open in the wire
A14	Fuse/relay box socket	Right [Left] rear door opened Right [Left] rear door closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty right [left] rear door switch ♦ An open in the wire
A15	Fuse/relay box socket	Front passenger's door opened Front passenger's door closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty front passenger's door switch ♦ An open in the wire
A13	Fuse/relay box socket	Right [Left] rear door lock knob opened Right [Left] rear door lock knob closed	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty right [left] rear super locking actuator (knob switch) ♦ Poor ground (G401 [G581]) ♦ An open in the wire
A10	Fuse/relay box socket	Connect the A10 terminal to the A23 terminal, and the A11 terminal to the B2 terminal momentarily.	Check door lock operation: All doors should lock	<ul style="list-style-type: none"> ♦ Blown No 12 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty actuator ♦ Faulty super locking control unit (with super locking system) ♦ An open in the wire
A11	Fuse/relay box socket	Connect the A10 terminal to the A23 terminal, and the A11 terminal to the B2 terminal momentarily.	Check door lock operation: All doors should lock	<ul style="list-style-type: none"> ♦ Blown No 12 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty actuator ♦ Faulty super locking control unit (with super locking system) ♦ An open in the wire
B1	WHT/RED	Connect the B1 terminal to the A24 terminal momentarily.	Check trunk lock actuator operation: Trunk lid should open	<ul style="list-style-type: none"> ♦ Faulty trunk lock actuator solenoid ♦ Poor ground (G601). ♦ An open in the wire

[]: RHD type

NOTE: Before testing, go to the Multiplex Control System trouble shooting Guide (see page 23-E-6).

Multiplex Control Unit (Door):

1. Remove the driver's door panel, and disconnect the 20P connector from the door unit Guide (see page 23-B-7).
2. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the power window master switch must be faulty: replace it.



Disconnect the connectors from the unit.

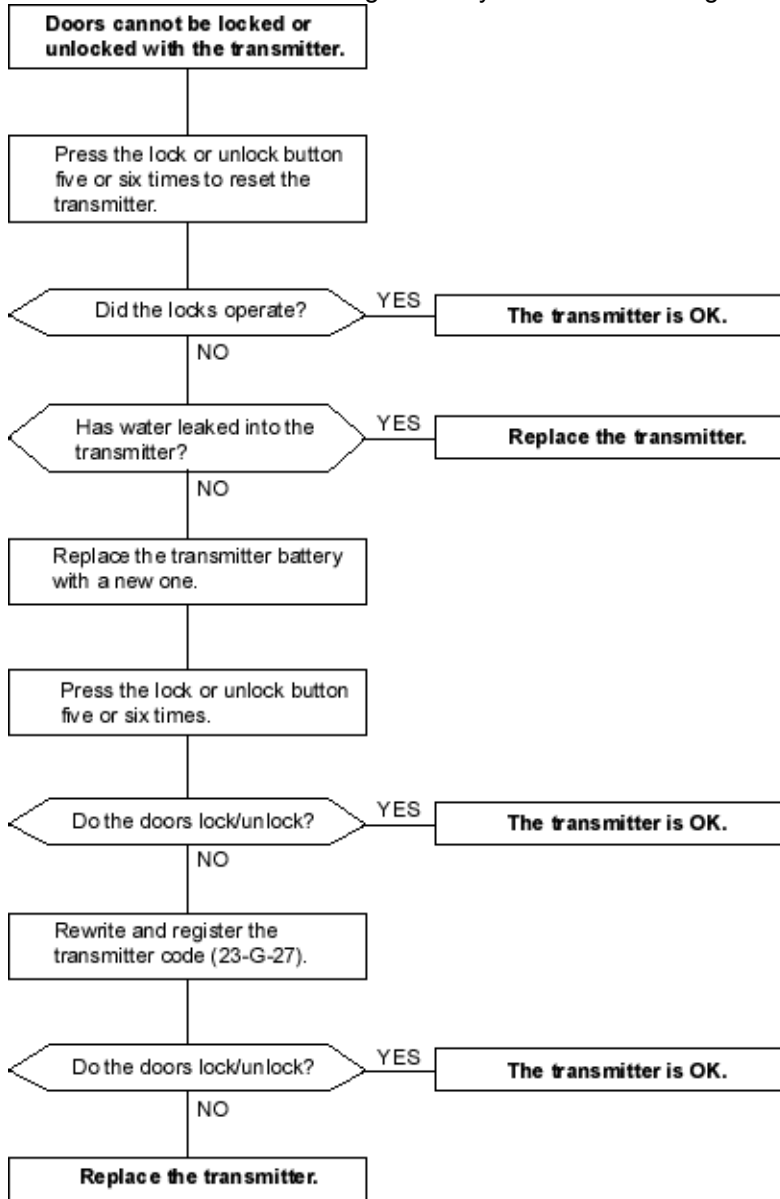
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A12	BLK	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A1	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire

Reconnect the connectors to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A6	BLU/WHT	Driver's door key cylinder switch in LOCK Driver's door key cylinder switch in neutral	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty driver's door key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A16	BLU	Driver's door key cylinder switch in UNLOCK Driver's door key cylinder switch in neutral	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5V or more	<ul style="list-style-type: none"> ♦ Faulty driver's door key cylinder switch ♦ Poor ground (G401) ♦ An open in the wire
A7	PNK	Driver's door lock knob locked Driver's door lock knob unlocked	Check for voltage to ground: There should be less than 1V Check for voltage to ground: There should be 5 V or more	<ul style="list-style-type: none"> ♦ Faulty driver's super locking or door lock actuator (knob switch) ♦ Poor ground (G401) ♦ An open in the wire
A17	BLK/RED	Driver's door lock knob unlocked Driver's door lock knob locked	Check for voltage to ground: There should be less than 1 V Check for voltage to ground: There should be 5 V or more	<ul style="list-style-type: none"> ♦ Faulty driver's super locking or door lock actuator (knob switch) ♦ Poor ground (G401) ♦ An open in the wire

NOTE:

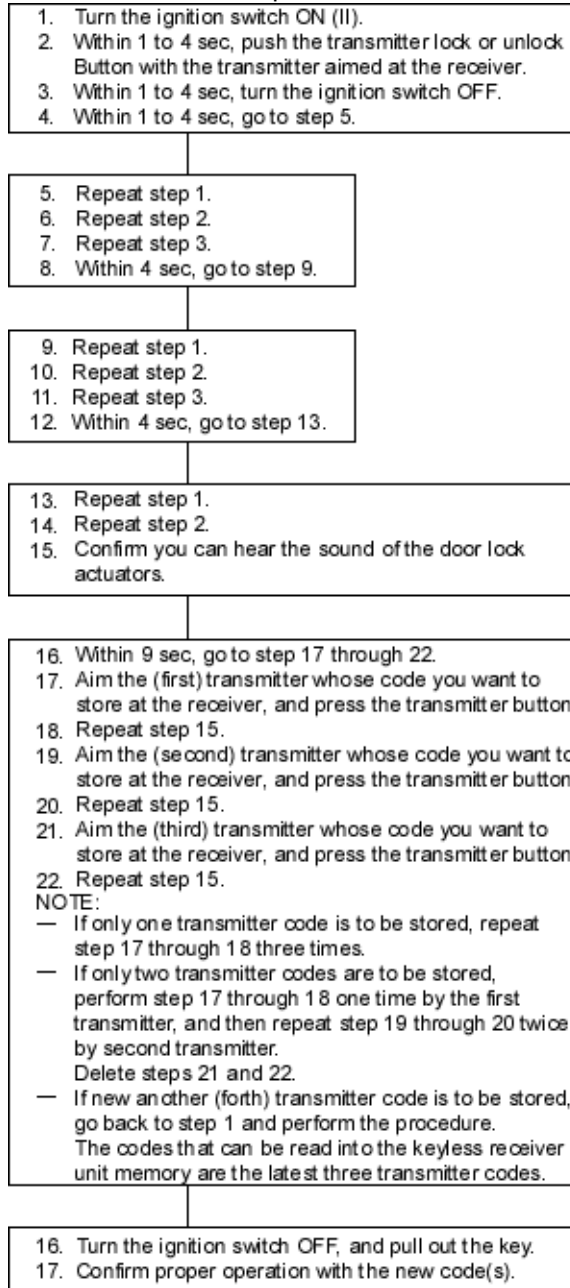
- ♦ If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- ♦ If any door is open, you cannot lock or unlock the door with the transmitter.
- ♦ If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- ♦ The doors do not lock or unlock with the transmitter if the ignition key is inserted in the ignition switch.



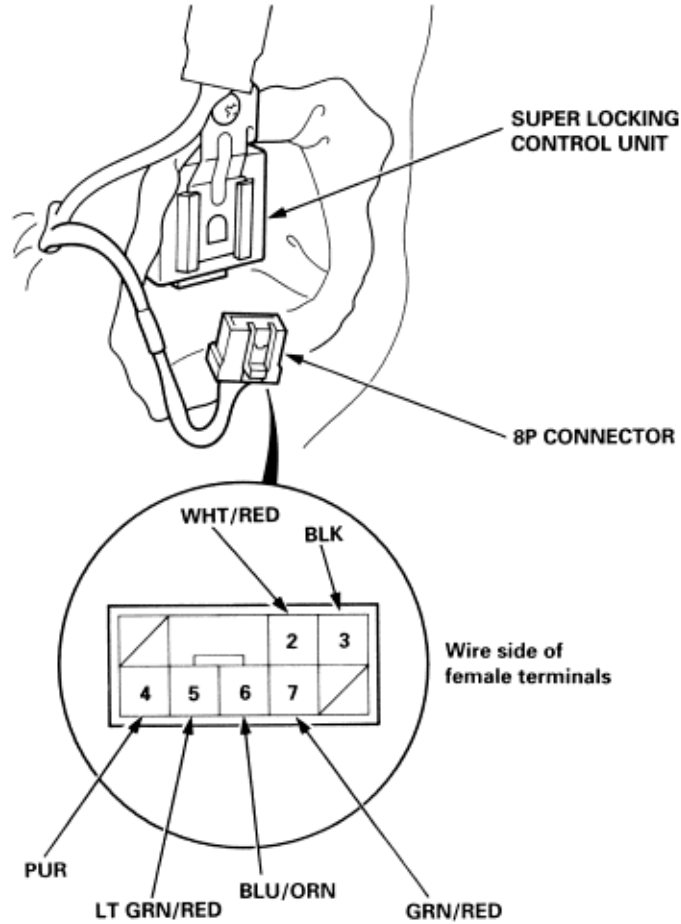
Storing transmitter codes:

The codes of up to three transmitters can be read into the keyless receiver unit memory. (If a fourth code is stored, the code which was input first will be erased.)

NOTE: It is important to maintain the time limits between the steps.



1. Remove each door panel (see section 20).
2. Disconnect the 8P connector from the super locking control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty, replace it.

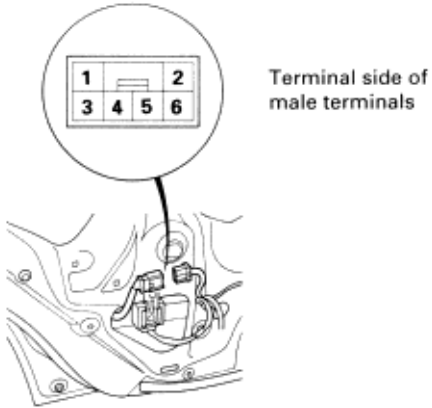


Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401, G551 [G401, G581]) ♦ An open in the wire
2 & 7	WHT/RED & GRN/RED	Connect the No. 2 terminal to the No. 7 terminal and the No. 6 terminal to the No. 3 terminal momentarily with ignition switch ON (II).	Check door lock operation: The actuator should run (lock).	<ul style="list-style-type: none"> ♦ Faulty door lock actuator ♦ An open in the wire
5 & 6	LT GRN/RED & BLU/ORN	Connect the No. 5 terminal to the No. 6 terminal and the No 7 terminal to the No. 3 terminal momentarily with ignition switch ON (II).	Check door lock operation: The actuator should run (unlock).	<ul style="list-style-type: none"> ♦ Faulty door lock actuator ♦ An open in the wire
4	PUR	Under all conditions	Check for continuity between the No 4 terminal and No 7 terminal of the actuator: There should be continuity.	<ul style="list-style-type: none"> ♦ An open in the wire

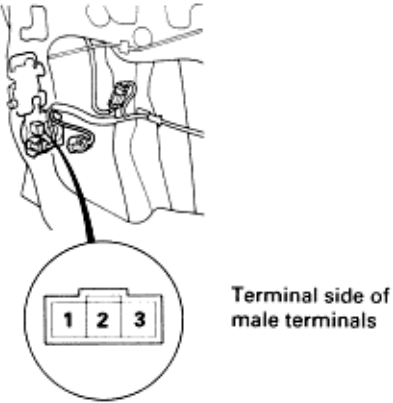
[] : RHD Type

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6P [3P] connector from the actuator.

With super locking system:



Without super locking system:

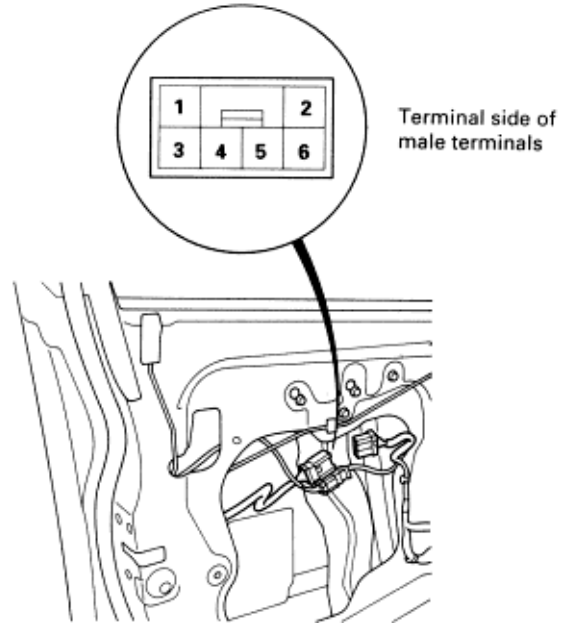


3. Check for continuity between the terminals in each knob switch position according to the table.

Terminal	1 [3]	3 [1]	4 [2]
Position			
LOCK		○	○
UNLOCK	○		○

[] : Without super locking system.

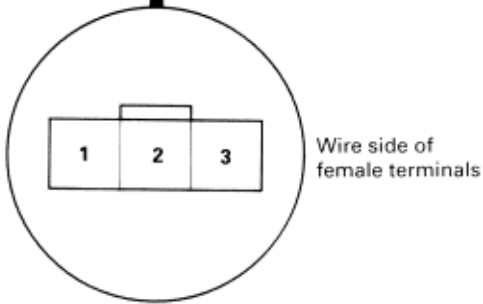
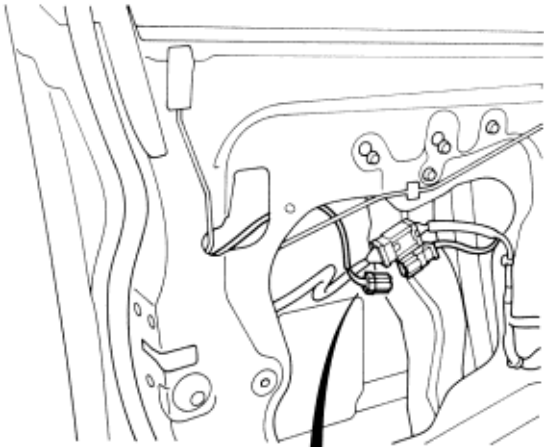
1. Remove the passenger's door panel (see section 20).
2. Disconnect the 6P connector from the actuator.



3. Check for continuity between the terminals in each knob switch position according to the table.

Terminal	1	4
Position		
LOCK		
UNLOCK	○	○

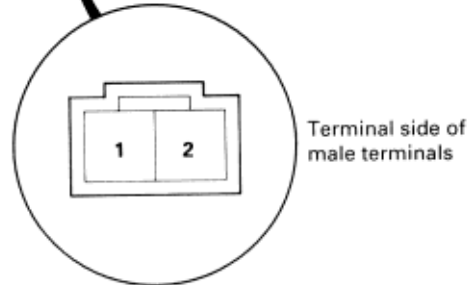
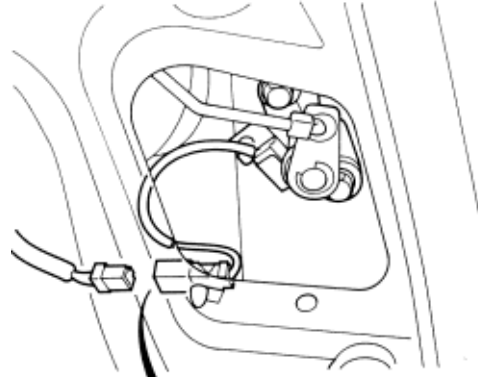
1. Remove the door panel (see section 20).
2. Disconnect the 3P connector from the key cylinder switch.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1	2	3
LOCK		○ — ○	
OFF			
UNLOCK	○ — ○		

1. Open the trunk lid.
2. Disconnect the 2P connector from the trunk key cylinder switch.

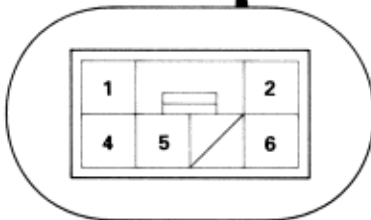
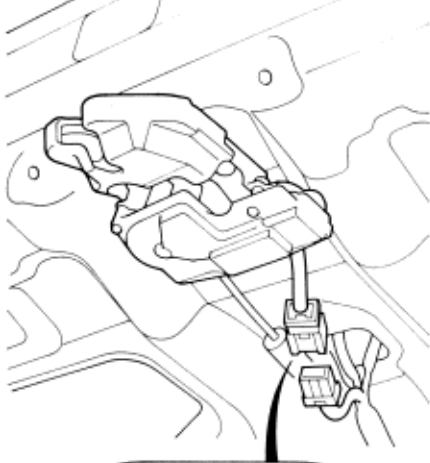


3. Check for continuity between terminals in each switch position according to the table.

Terminal Position	1	2
LOCK		
UNLOCK	○ — ○	○ — ○

1. Open the trunk lid.
2. Disconnect the 6P [4P] connector from the trunk latch.

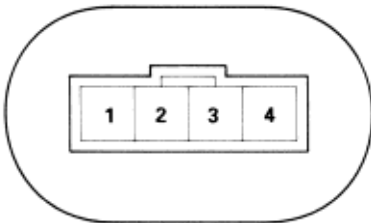
With Trunk Keyless:



Terminal side of male terminals



Without Trunk Keyless:



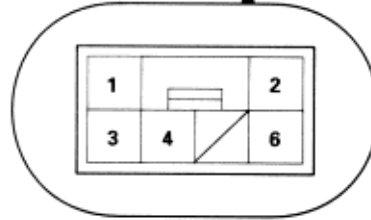
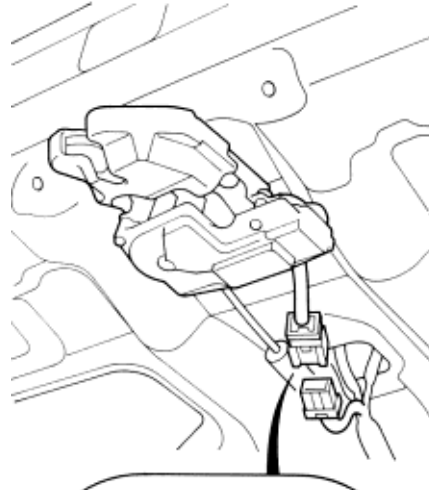
Terminal side of male terminals

3. Check for continuity between the terminals in each trunk lid position according to the table.

Terminal	2 [3]	6 [4]
Position		
Opened	○	○
Closed		

[] : Without trunk keyless

1. Open the trunk lid
2. Disconnect the 6P connector from the trunk latch.

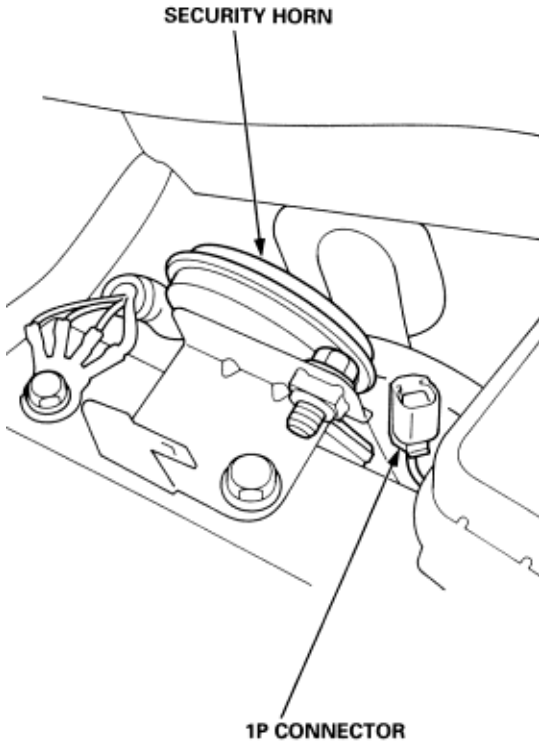


Terminal side of male terminals

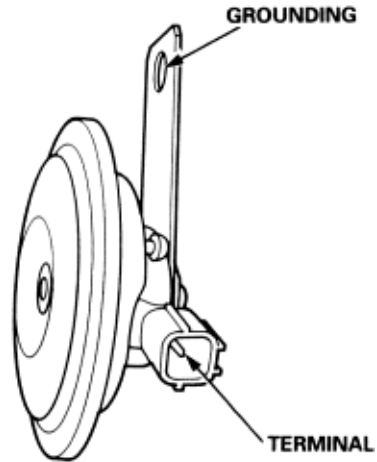
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal	3	4
Position		
UNLOCK	⊕	⊖

1. Open the hood.
2. Disconnect the 1P connector, and remove the horn.

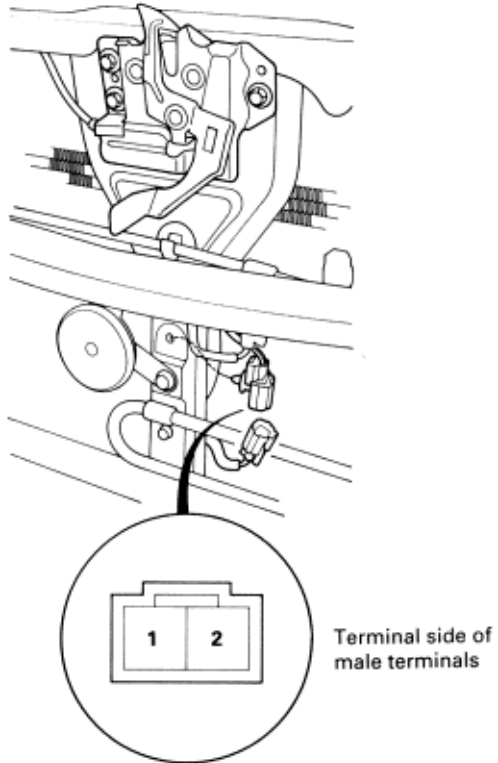


3. Disconnect the 1P connector, and remove the horn.
4. Test the horn by connecting battery power to the terminal and grounding the bracket. The horn should sound.



5. If it fails to sound, replace it.

1. Open the hood.
2. Disconnect the 2P connector from the hood switch.



3. Check for continuity between the terminals in each switch position according to the table.

Terminal	1	2
Position		
Hood open (Lever released)	○	○
Hood closed (Lever pushed down)		

Navigation System Description

23-H-2

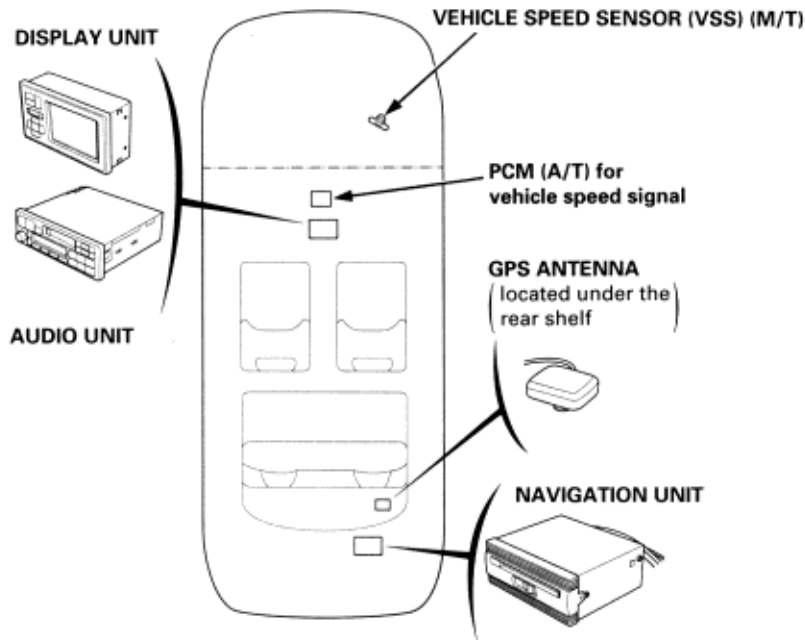
The Honda Navigation System is a highly-sophisticated, hybrid locating system that uses satellites and a map database to show you where you are and to help guide you to a desired destination.

The Navigation System receives signals from the Global Positioning System (GPS), a network of 24 satellites in orbit around the earth. By receiving signals from several of these satellites, the Navigation System can determine the latitude and longitude of the vehicle. In addition, signals from the system's yaw rate sensor and the vehicle speed sensor (VSS) enable the system to keep track of the vehicle's direction and speed of travel.

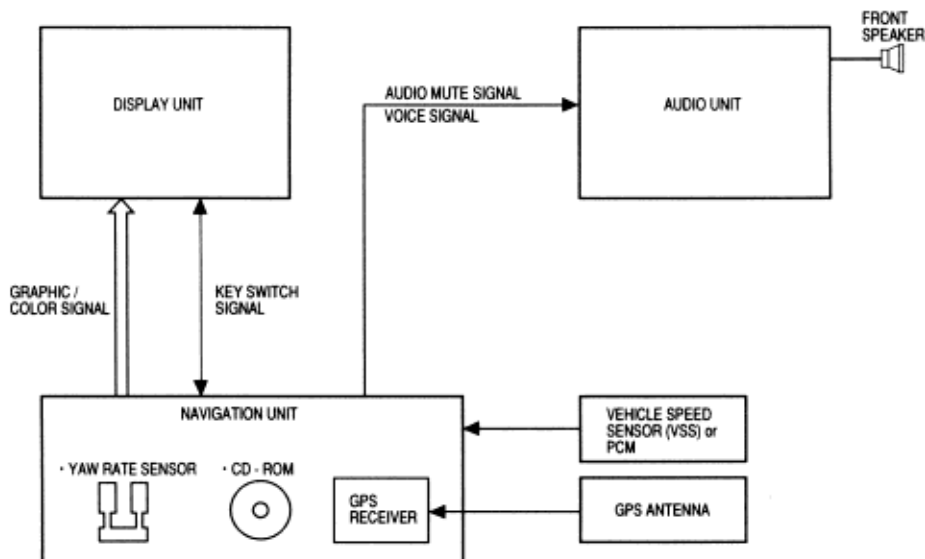
This hybrid system has advantages over a system that is either entirely self-contained or one that relies totally on the GPS. For example, the self-contained portion of the system can keep track of vehicle position even when satellite signals cannot be received, and the GPS can keep track of the vehicle position even when the vehicle is transported by ferry.

The Navigation System applies to all location, direction, and speed information to the maps and calculates a route to the destination entered. As you drive to that destination, the system provides both visual and voice guidance.

Component Locations

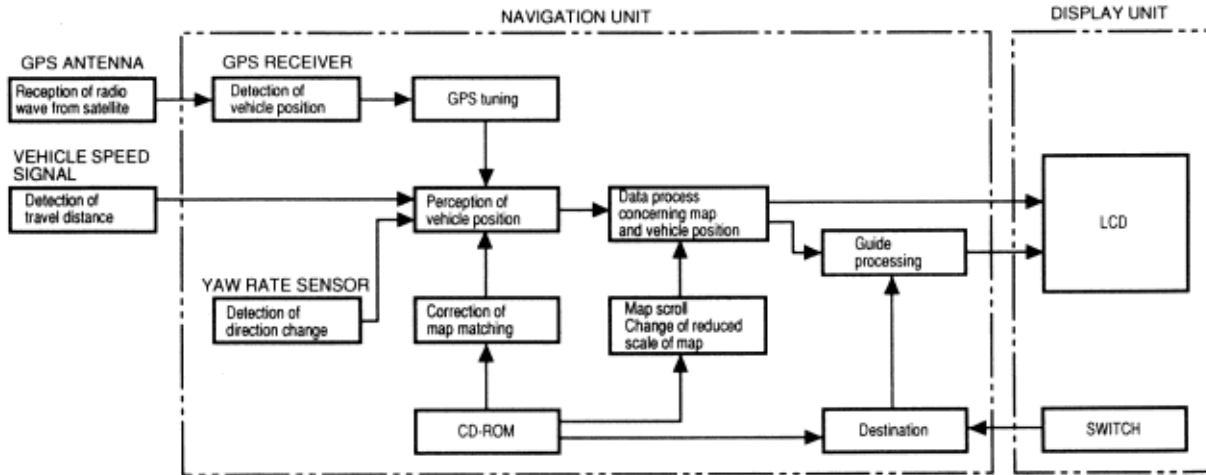


System Diagram:



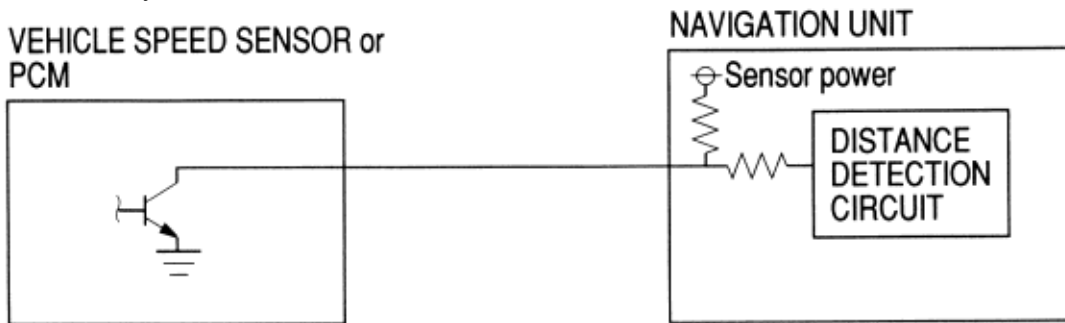
The navigation system is composed of the navigation unit, the vehicle speed sensor (M/T), PCM (A/T), the GPS antenna, and the display unit.

Function Diagram



Vehicle Speed Signal:

The vehicle speed signal is shared with the speedometer and other systems. The vehicle speed signal is outputted by the vehicle speed sensor (M/T) or PCM (A/T). For every revolution of the sensor, a four-pulse signal is sent to the navigation unit. The PCM receives the signal which is output by the counter shaft speed sensor, then the PCM processes the signal and transmits the signal to the speedometer and other systems.



Yaw Rate Sensor

The yaw rate sensor detects the direction change (angular speed) of the vehicle. The sensor is an oscillation gyro built into the navigation unit.

Sensor Element Structure

The sensor element is shaped like a tuning fork, and it consists of the piezoelectric parts, the oscillators, the metal block, and the support pin. There are four piezoelectric parts: one to drive the oscillators, one for monitoring that maintains the oscillation at a regular frequency, and two to detect angular velocity. The two oscillators have a 90 degree twist in the center, are connected at the bottom by the metal block, and supported by the support pin. A detecting piezoelectric part is attached to the top of each oscillator. The driving piezoelectric part is attached to the bottom of one oscillator, and the monitoring piezoelectric part is attached to the bottom of the other oscillator.

Oscillation Gyro Principles

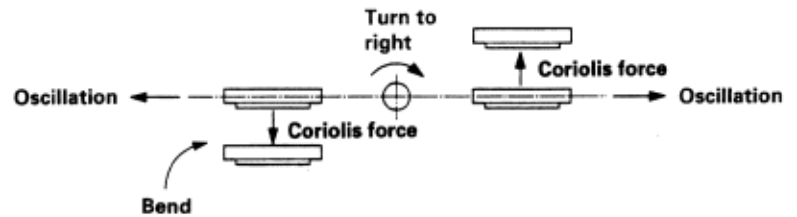
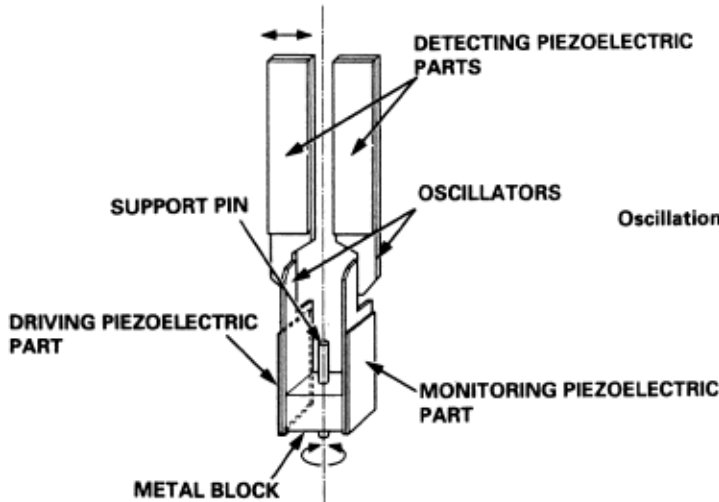
The piezoelectric parts have "electric/mechanical transfer characteristics". The piezoelectric parts bend vertically when voltage is applied to both sides of the parts, and voltage is generated between both sides of the piezoelectric parts when they are bent an external force. The oscillation gyro functions by utilising this characteristic of the piezoelectric parts and "Coriolis force." (Coriolis force deflects moving objects as a result of the earth's rotation.) In the oscillation gyro, this force moves the sensor element when the angular velocity is applied.

Operation

1. The driving piezoelectric part oscillates the oscillator by repeatedly bending and returning when an AC voltage at 6 kHz is applied to the part. The monitoring-side oscillator resonates because it is connected to the driving-side oscillator by the metal block.
2. The monitoring piezoelectric parts bends in proportion to the oscillation and outputs voltage (the monitor signal). The navigation unit control circuit, controls the drive signal to stabilise the monitor signal.
3. When the vehicle is stopped, the detecting piezoelectric parts oscillate right and left with the oscillators, but no signal is output because the parts are not bent (no angular force).
4. When the vehicle turns to the right, the sensor element moves in a circular motion with the right oscillator bending forward and the left oscillator bending rearward. The amount of forward/rearward bend varies according to the angular velocity of the vehicle.
5. The detecting piezoelectric parts output voltage (the yaw rate signal) according to the amount of bend. The amount of vehicle direction change is determined by measuring this voltage.

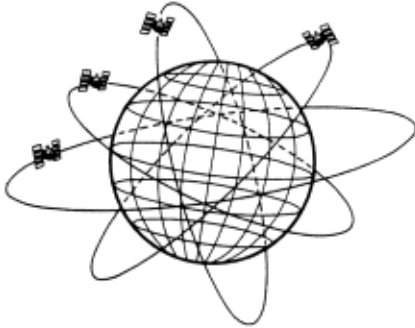
Enlarged view of sensor element

Sensor element top view

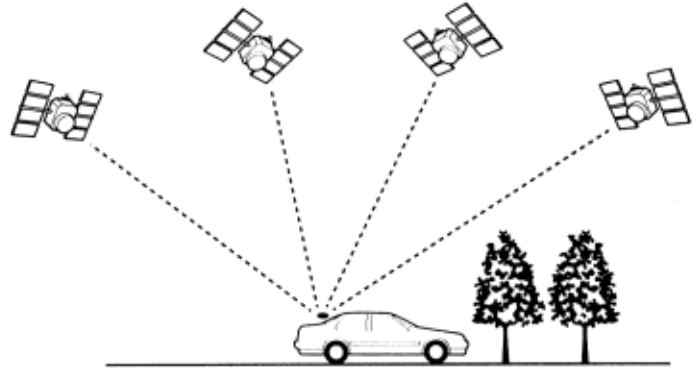


Global Position System (GPS)

The Global Positioning System (GPS) enables the navigation system to determine the current position of the vehicle by utilising the electric waves transmitted from the satellites in orbit around the earth. The satellites transmit the satellite identification signal, orbit information, transmission time signal, and other information. When the GPS receiver receives the electric waves from three or more satellites simultaneously, it calculates the current position of the vehicle based on the distance to each satellite and the satellite positions on their respective orbits.



NOTE: Four satellites on each of six orbits.



NOTE: Four satellites on each six orbits.

The precision of the GPS varies according to the number of satellites from which electric waves are received and the control condition. The receiving condition is indicated on the DSC menu.

GPS Antenna

Receiving the electric waves from the satellites, the GPS antenna amplifies and transmits them to the GPS receiver.

GPS Receiver

The GPS receiver is built in the navigation unit. It calculates the vehicle position by receiving the signal from the GPS antenna. The vehicle position and signal reception condition is transmitted from the GPS receiver to the navigation control part for tuning of the vehicle position.

Navigation Unit

The navigation unit calculates the vehicle position and guides you to the destination. The unit performs map matching correction, GPS correction, and distance tuning. It also controls the menu functions and the CD-ROM drive. With control of all these items, the navigation unit makes the navigation graphic signal, then it transmits the signal to the display unit and audio driving instructions to the audio unit.

Calculation of Vehicle Position

The navigation unit calculates the vehicle position (the driving direction and the current position) by receiving the directional change signals from the yaw rate sensor and the travel distance signals from the vehicle speed sensor or PCM.

Map Matching Tuning

The map matching tuning is accomplished by indicating the vehicle position on the roads on the map. The map data transmitted from the CD-ROM is checked against the vehicle position data, and the vehicle position is indicated on the nearest road. Map matching tuning does not occur when the vehicle travels on a road not shown on the map or when the vehicle position is far away from a road on the map.

GPS Tuning

The GPS tuning is accomplished by indicating the vehicle position as the GPS's vehicle position. The navigation unit compares its calculated vehicle position data with the GPS vehicle position data. If there is a large difference between the two, the indicated vehicle position is adjusted to the GPS vehicle position.

Distance Tuning

The distance tuning reduces the difference between the travel distance signal from the vehicle speed signal and the distance data on the map. The distance tuning, is performed by setting the vehicle type and the tyre size on the picture diagnosis.

Route Guidance

The navigation unit can calculate different routes to a selected destination.

Voice Guidance

The navigation unit transmits voice driving instructions before entering an intersection or passing a junction. The audio instructions come through audio unit and front speakers.

CD-ROM

The map data (including all scale rates) is stored in CD-ROM. The map data includes:

- ♦ Road data and guidance voice data for route guidance.
- ♦ System program.
- ♦ Latitude and longitude for GPS.

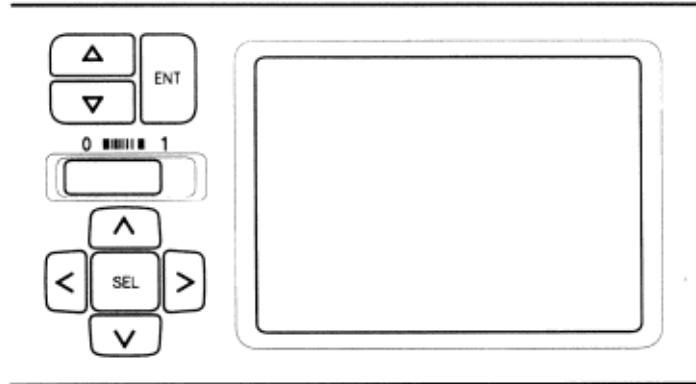
Audio Unit

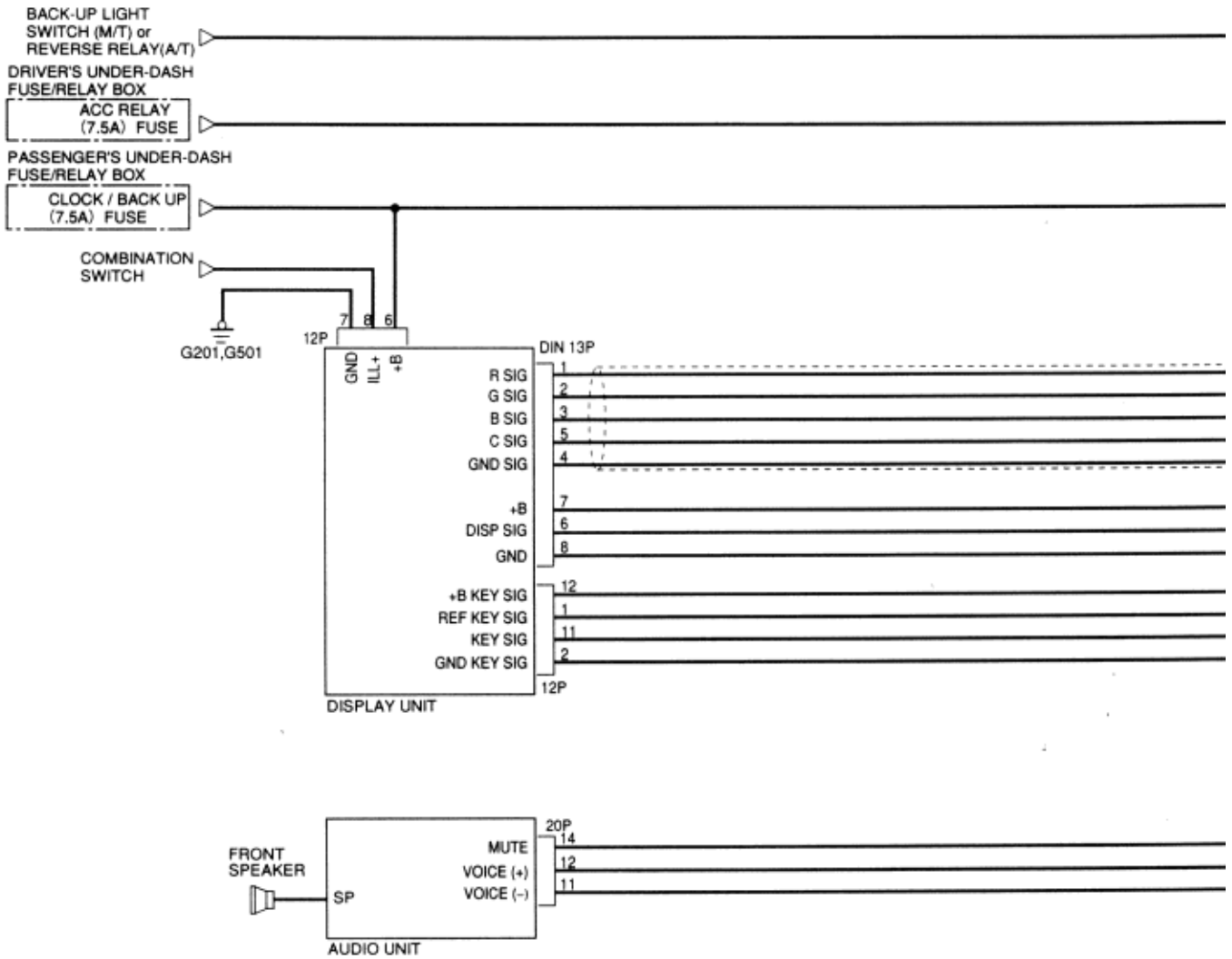
The audio unit receives the voice driving instructions from the navigation unit and transmits the instructions through the front speakers even when the audio system is in use.

Display Unit

The display unit uses a liquid crystal display (LCD). The LCD is a five inch size Thin Film Transistor (TFT), stripe type. The colour film and fluorescent light are laid out on the back of the liquid crystal film. The display unit transmits the signal from each operation key to the navigation unit.

Display unit and operation keys





DISPLAY UNIT CONNECTORS

12P CONNECTOR



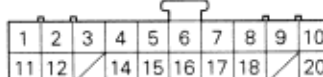
Wire side of female terminals

DIN 13P CONNECTOR

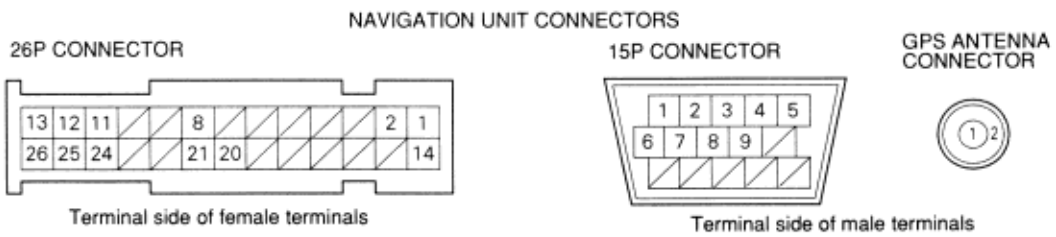
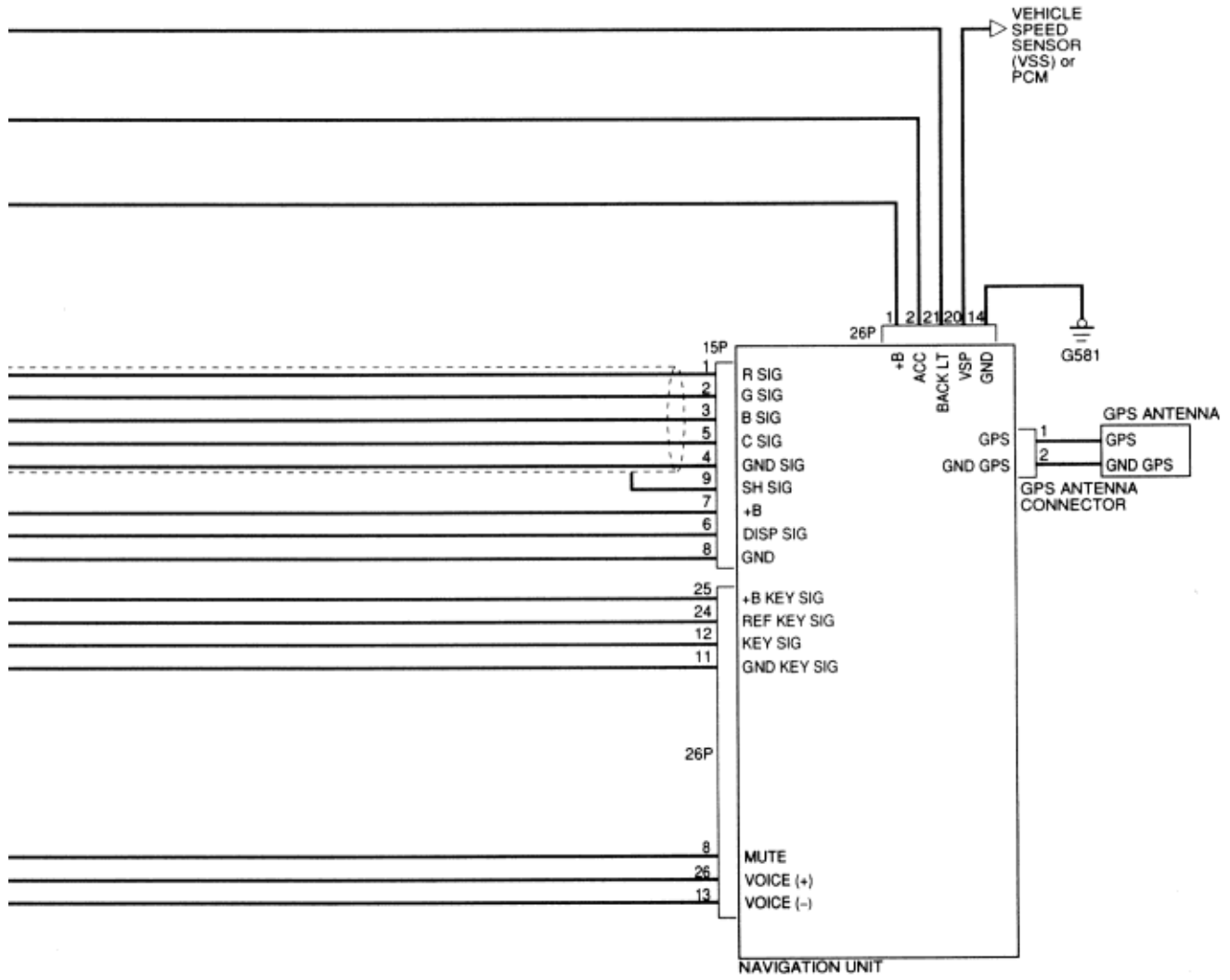


Terminal side of male terminals

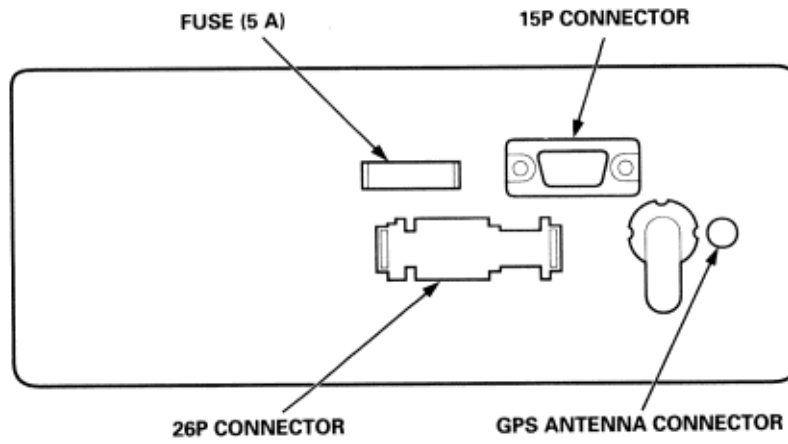
AUDIO UNIT 20P CONNECTOR



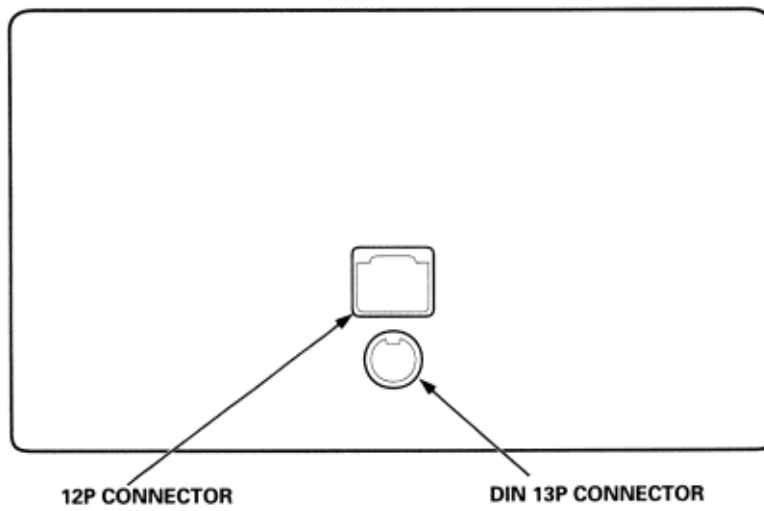
Wire side of female terminals



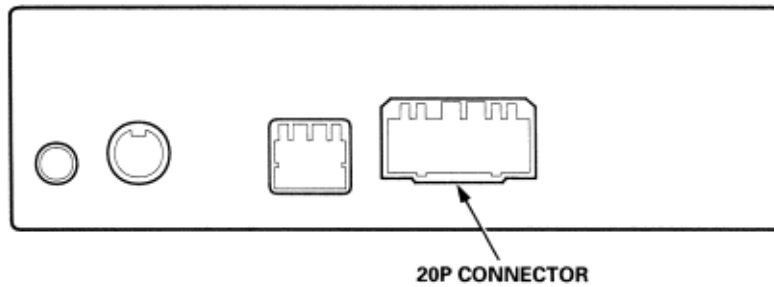
Navigation unit:



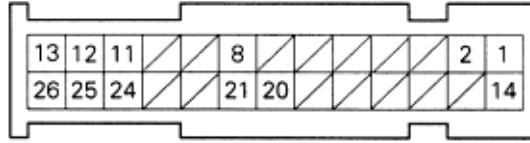
Display unit:



Audio unit:



Navigation unit 26P connector



Terminal side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	PNK	+B	+B power source	Power source for navigation unit
2	YEL/BLK	ACC	Accessory	Power source for accessory
8	BRN	MUTE	Mute	Signal to mute the audio
11	ORN	GND KEY SIG	Ground key signal	Ground for operation key signal
12	BLK	KEY SIG	key signal	Operation key signal
13	PNK	VOICE (-)	Voice negative	Voice signal negative
14	BLK	GND	Ground	Ground for navigation unit
20	BLU/WHT	VSP	Vehicle speed pulse	Vehicle speed signal
21	GRN/BLK	BACK LT	Back light	Reverse signal of shift lever
24	RED/BLK	REF KEY SIG	Reference key signal	Operation key reference signal
25	WHT	+B KEY SIG	+B key signal	Power source for operation key
26	BLU	VOICE (+)	Voice positive	Voice signal positive

GPS antenna connector



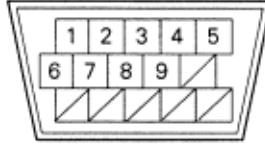
Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	GPS	GPS	GPS signal
2	-	GND GPS	GPS ground	Ground for GSP signal

Terminal Arrangement
(cont'd)

23-H-12

Navigation unit 15P connector



Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	R SIG	Red signal	Red colour signal
2	-	G SIG	Green signal	Green colour signal
3	-	B SIG	Blue signal	Blue colour signal
4	-	GND SIG	Ground signal	Ground for colour signal
5	-	C SIG	Composite signal	Composite video (vertical/horizontal) synchronising signal.
6	-	DISP SIG	Display signal	Display ON/OFF signal
7	-	+B	+B power source	Power source for display signal
8	-	GND	Ground	Ground for display signal
9	-	SH SIG	Shield signal	Shield for terminal Nos, 1, 2, 3, 4 & 5

Display unit DIN 13P connector



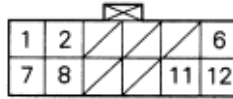
Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	R SIG	Red signal	Red colour signal
2	-	G SIG	Green signal	Green colour signal
3	-	B SIG	Blue signal	Blue colour signal
4	-	GND SIG	Ground signal	Ground for colour signal
5	-	C SIG	Composite signal	Composite video (vertical/horizontal) synchronising signal.
6	-	DISP SIG	Display signal	Display ON/OFF signal
7	-	+B	+B power source	Power source for display signal
8	-	GND	Ground	Ground for display signal

Terminal Arrangement
(cont'd)

23-H-13

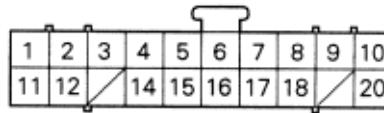
Display unit 12P connector



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	RED/BLK	REF KEY SIG	Reference key signal	Operation key reference signal
2	ORN	GND KEY SIG	Ground key signal	Ground for operation key signal
6	PNK	+B	+B power source	Power source for display unit
7	BLK	GND	Ground	Ground for display unit
8	RED/BLK	ILL+	Illumination	Illumination ON signal
11	BLK	KEY SIG	Key signal	Operation key signal
12	WHT	+B KEY SIG	+B key signal	Power source for operation key

Audio unit 20P connector



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
11	PNK	VOICE (-)	Voice negative	Voice signal negative
12	BLU	VOICE (+)	Voice positive	Voice signal positive
14	BRN	MUTE	Mute	Signal to mute the audio

General Operation

Refer to Accord Navigation System Owner's Manual, P/N 32S1T800 for the navigation system operating procedures.

System Diagnosis

Certain circumstances and system limitations will produce occasional vehicle positioning errors. Some customers may think this indicates a problem with the navigation system when, in fact, the system is normal. Keep the following items in mind when interviewing customers about navigation system symptoms.

Self-Inertial Navigation Limitations

The limitations of the self-inertial portion of the navigation system (the yaw rate sensor and the vehicle speed sensor) can cause some discrepancies between the actual vehicle position and the indicated vehicle position. If there is a large discrepancy, and the system is receiving GPS signals, the system will adjust the indicated vehicle position to the GPS vehicle position. However, if GPS signals cannot be received, you must tune the vehicle position manually.

The following circumstances may cause vehicle positioning errors until the system can adjust to the GPS.

- ♦ Moving the vehicle with the engine stopped, such as by ferry or tow truck, or if the vehicle is spun on a turn table.
- ♦ Tyre slippage, changes in tyre rolling diameters, and some driving situations may cause discrepancies in travel distances. Examples of this include:
 - Continuous tyre slippage on a slippery surface.
 - Driving with snow chains mounted.
 - Abnormal tyre pressures.
 - Different diameter tyres.
 - Frequent lanes changes across a wide highway.
 - Continuous driving on a straight or gently curving highway.
- ♦ Tolerances in the system and map accuracy sometimes limit how precisely the vehicle position is indicated. Examples of this include:
 - Driving on roads not shown on the map (map matching is not possible).
 - Driving on a road that winds in one direction, such as a loop bridge, an interchange, or a spiral parking garage.
 - Driving on a road with a series of sharp hair-pin turns.
 - Driving on one of two close parallel roads.
 - After making many 90 degree turns.

Global Positioning System (GPS) Limitations

The GPS cannot detect the vehicle position in these instances:

- ♦ For the first five to ten minutes after reconnecting the battery.
- ♦ When the satellite signals are blocked by tall building, mountains, tunnels, large trees, or large trucks.
- ♦ When the GPS antenna is blocked by something on the package shelf.
- ♦ When there is no satellite signal output. (Signal output is sometimes stopped for satellite servicing.)

The precision of the GPS is reduced when the satellite control center purposely lowers the signal precision.

LCD Display Unit Limitations

- ♦ In cold temperatures, the display may stay dark for the first two or three minutes until it warms up.
- ♦ When the display is too hot because of direct summer sunlight, it will remain dark until the temperature drops.
- ♦ When the humidity is high and the interior temperature is low, the display may appear cloudy. The display will clear after some use.

Symptom Duplication

- ♦ When the symptom can be duplicated, follow the self-diagnostic procedures (picture diagnosis mode) and the appropriate troubleshooting procedures.
- ♦ When the symptom does not reappear or only reappears intermittently, ask the customer about the conditions when the symptom occurred.
 - Try to establish if outside interference may have been the cause.
 - Try to duplicate the symptom under the same conditions the customer was experiencing.
 - Vibration, temperature extremes, and moisture (dew, humidity) may be factors that are difficult to duplicate.

Service Precautions

- ♦ Before disconnecting the battery, write down the frequencies for the radio's preset buttons.
- ♦ After servicing, park the vehicle in an area where the GPS satellite signals will be unobstructed, and check the satellite mark on the display.

NOTE: Circles (O) in the table indicate which parts to inspect.

PROBLEM SYMPTOM	RELATED UNIT, OTHER PROBLEM ITEMS						DIAGNOSIS METHOD							Refer to troubleshooting page		
	NAVIGATION UNIT	DISPLAY UNIT	GPS ANTENNA	CD-ROM	AUDIO UNIT	HARNESS	STATIC TEST	DYNAMIC TEST	CALIBRATION	GPS STATUS	HARD WARE TEST	SENSOR TEST	KEY BOARD TEST		LCD TEST	ELECTRIC CONTINUITY IN HARNESS
No picture is shown on the display	○	○				○									○	23-H-28
Display indication is not correct														○		23-H-30
Map is not shown on the display	○	○		○	○					○						23-H-30
Display unit operation key does not work		○				○						○				23-H-30
Distance of vehicle position mark is not correct	○						○	○			○					23-H-30
Vehicle position mark does not turn or does not move straight forward (or rotate)	○									○	○					23-H-30
GPS mark is not indicated	○		○			○			○	○						23-H-30
Guidance voice cannot be heard	○				○	○										23-H-31

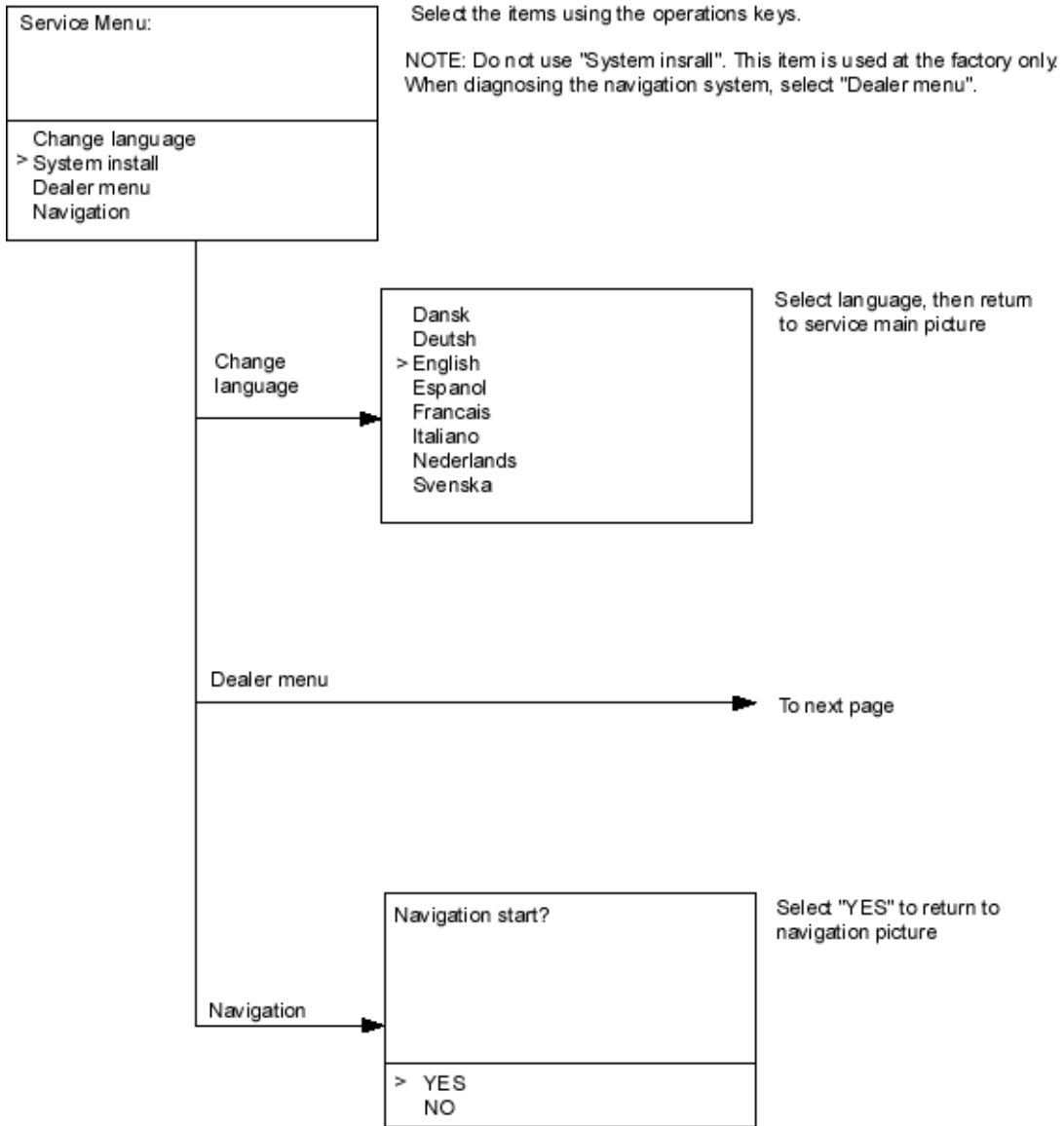
To go to the pages referenced on the table above, click on the following:
(See Page 23-H-28)
(See Page 23-H-30)
(See Page 23-H-31)

Turn the ignition switch to ACC (I) while pushing the 'V' key, then the display indicates the service menu picture.

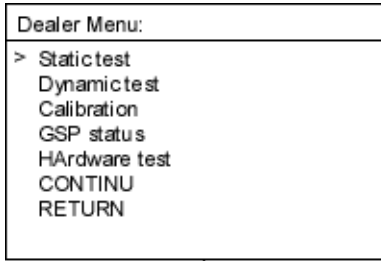
NOTE:

- ♦ If the display unit indicates the navigation picture, set the 'Standby time' to '0' on the DSC menu then retry operation.
- ♦ The picture illustrations are indicated in English.

Service menu

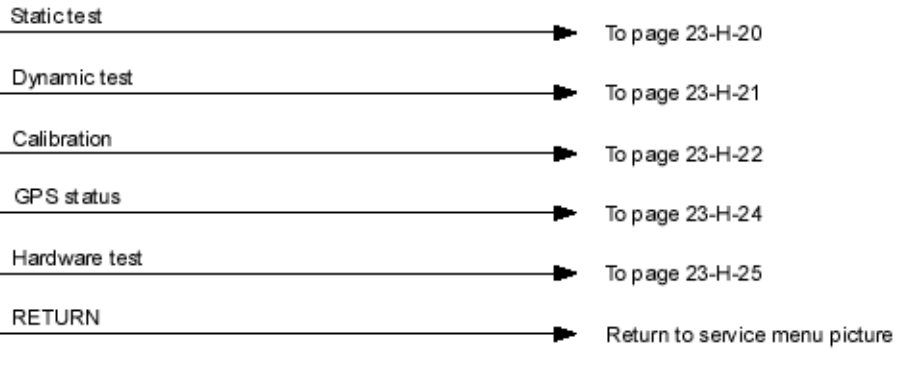


Dealer menu

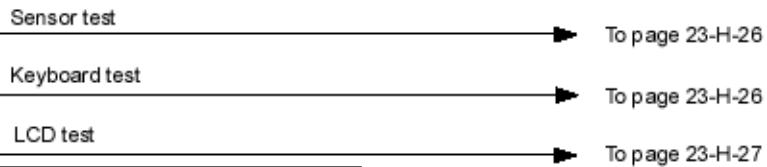
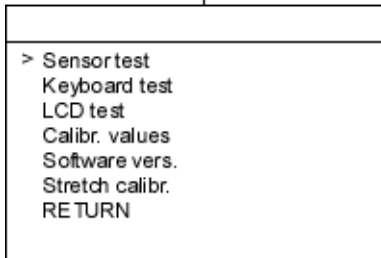


Select the items using the operation keys.

NOTE: Do not use "Calibr. values", "Software vers." and "Stretch calibr.", these items are used by the factory only.



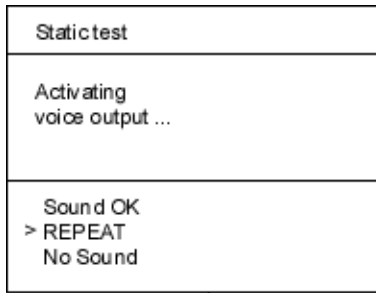
RETURN



To go to the pages referenced on the diagram above, click on the following:

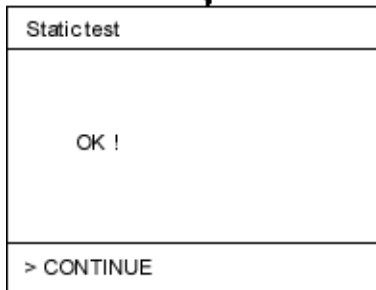
- (See Page 23-H-20)
- (See Page 23-H-21)
- (See Page 23-H-22)
- (See Page 23-H-24)
- (See Page 23-H-25)
- (See Page 23-H-26)
- (See Page 23-H-27)

Static test



- On the "Static test", diagnose for the GPS antenna, GPS receiver (inside of the navigation unit) and guidance voice output.
- When change to this picture, guidance voice is output from front speakers for first three seconds.
- If you select "Sound OK", guidance voice output becomes OK. If you select "No sound", guidance voice output becomes NG.

NOTE: If guidance voice data in the memory of the navigation unit by disconnected the battery, guidance voice is not outputted (noise will be heard). In this case, turn the ignition switch OFF to ON (II) and wait until the navigation menu is indicated (guidance voice data is loading during this time). Then perform the "Static test" again.

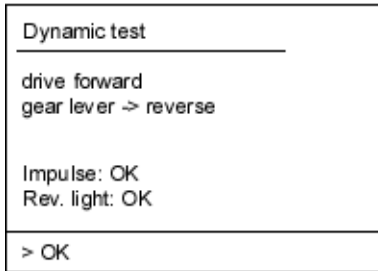


- If "Static test" is OK, this picture is indicated.
- If there is a problem, item in problem is indicated. Those items are:
 - GPS antenna: Disconnected GPS antenna or faulty GPS antenna.
 - Internal (GPS rec): Faulty GPS receiver (inside of the navigation unit).
 - Radio: Guidance voice signal line is disconnected.

CONTINUE

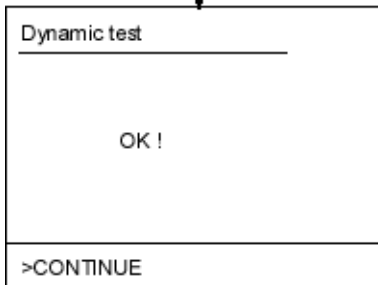
Return to dealer main picture

Dynamic test



- On the "Dynamic test", diagnose for the vehicle speed signal and back-up light signal.
- When driving the vehicle forward and vehicle speed signal input to navigation unit, the display indicates "Impulses OK".
- When driving the vehicle backward and back-up light signal input to navigation unit, the display indicates "Rev. light OK".

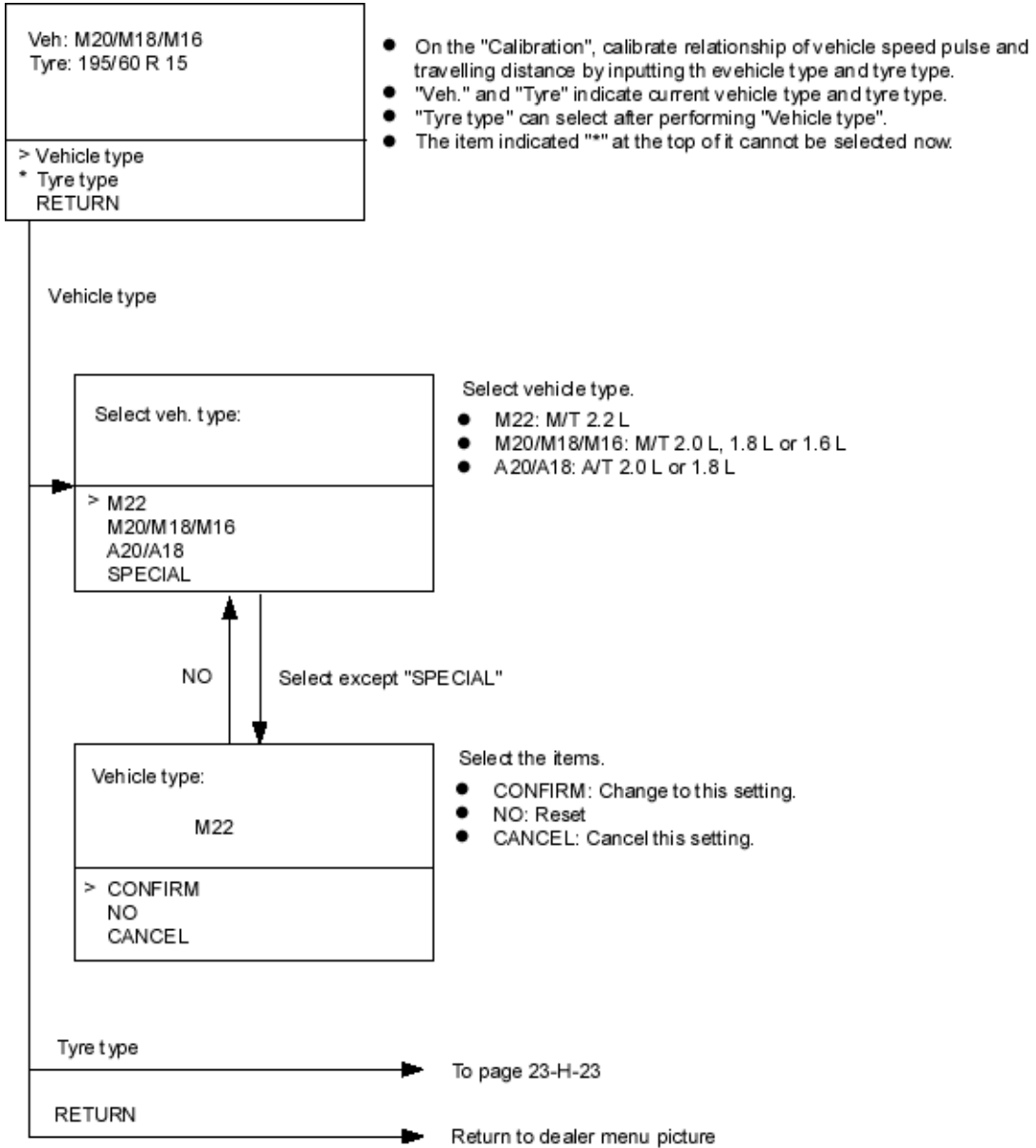
Both "Impulses" and "Rev.light" are OK or select "OK".



- If both "Impulses" and "Rev. light" are OK, this picture is indicated.
- If there is a problem, item in problem is indicated. Those items are:
 - Speed sensor: Open in the vehicle speed signal wire.
 - Reverse light: Open in the back-up light signal wire.

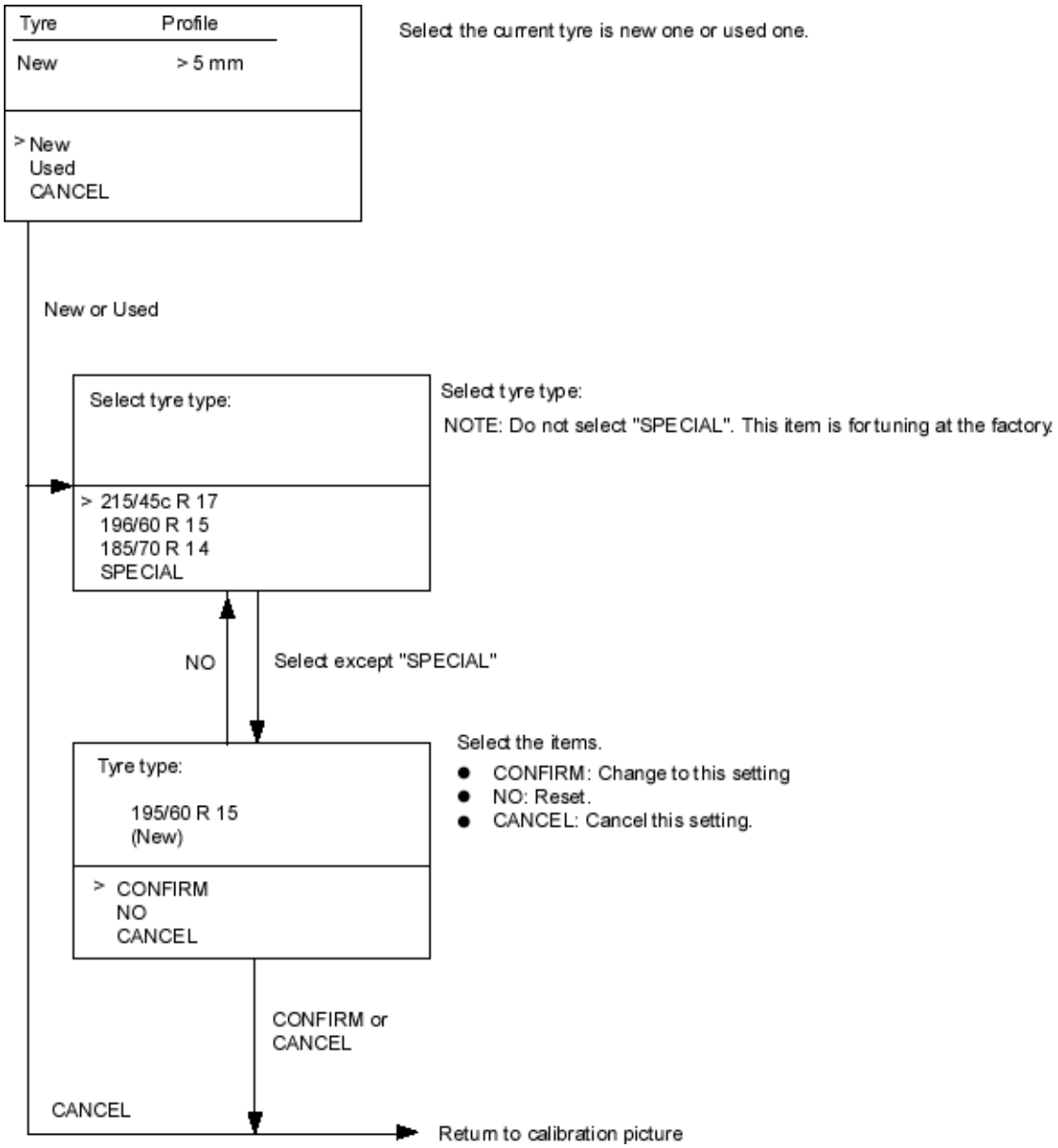
Return to dealer menu picture

Calibration



To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-H-23)

Tyre type



GPS status

On the "GPS status" one of the following pictures is indicated.

Visible sat. : xx Receiv. sat : xx Latit. : xx, xx N Longit. : xxx, xx E
>RETURN

The vehicle position is identified by received GPS signal.

Visible sat. : xx Receiv. sat : xx No GPS position available.
>RETURN

The vehicle position cannot be identified (the vehicle is behind the buildings etc).

Visible sat. : xx Receiv. sat : xx GPS initialis. active.
>RETURN

During initialising GPS receiver (after replacing the battery etc).

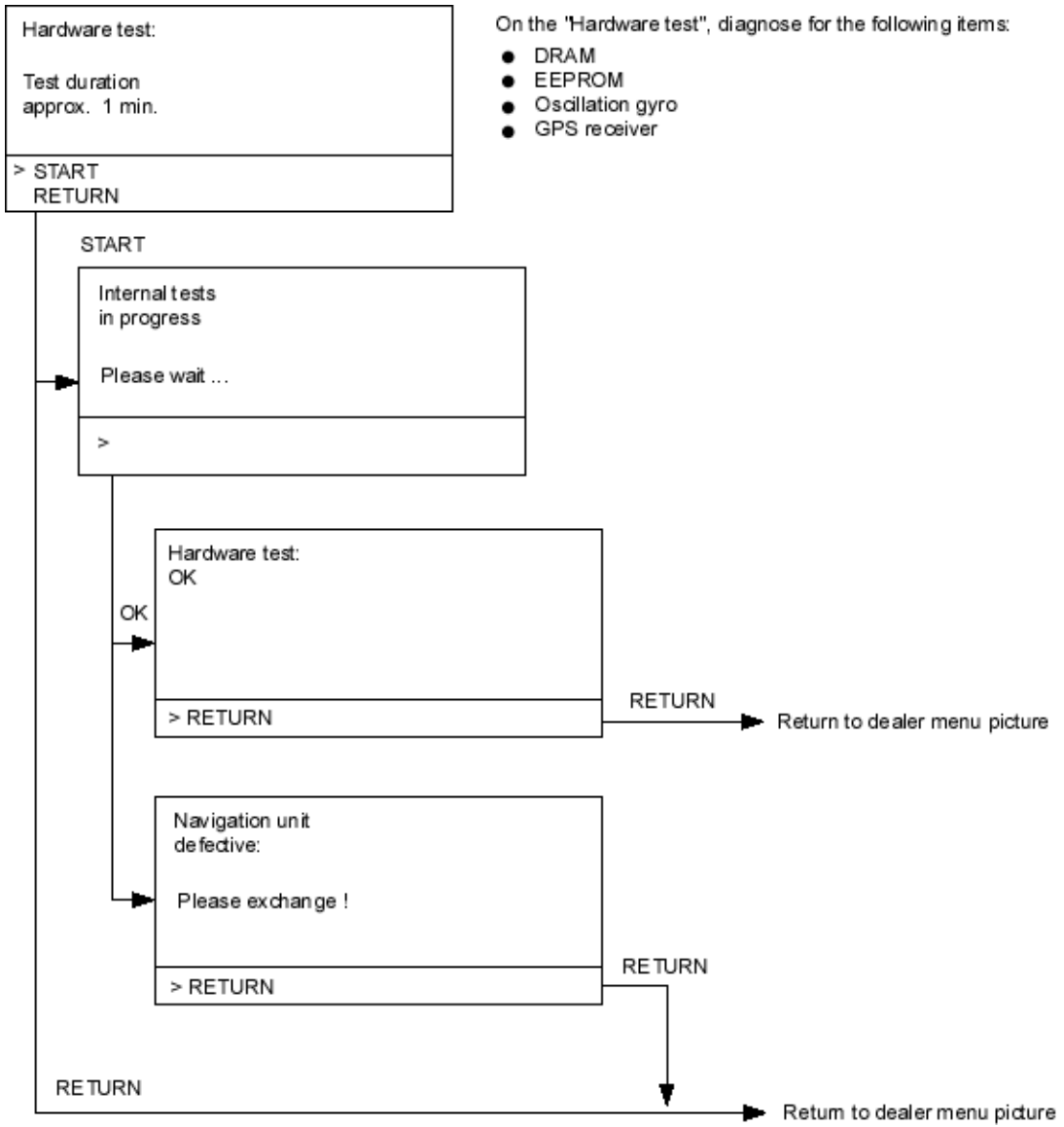
Error: GPS antenna or antenna cable defective
>RETURN

Open in the GPS antenna wire or faulty GPS antenna.

Error: No data available from GPS receiver.
>RETURN

Faulty GPS receiver (inside of the navigation unit) or connection error.

Hardware test



Sensor test

Gyro	:	XXXX
Whl. sensor:	:	XXXXX
Speedomet. :		
km/h	»	xxx
Direction:		FORW.
>RETURN		

On the "Sensor test", diagnose for following items;

- Oscillation gyro
- Speedometer
- Vehicle speed signal
- Vehicle direction (forward or backward)

Display item and diagnosis method

Display	Test	Display OK	Corrective measure in event of error
Gyro	Move vehicle and change direction.	Values change during steering motions within the valid range 30 - 994.	Replace the oscillation gyro and/or navigation unit.
Whl.sensor	Not used		
Speedomet.	Move vehicle forward.	Value increases during motion. (return to 0 after 65535)	Check the wiring for connection and signal.
km/h	Move vehicle forward.	Display roughly matches the speedometer display (±15 %).	Conduct calibration.
Direction	Move gear lever into and out of reverse.	Display "BACKW." when gear lever is in reverse. Display "FORW." when otherwise.	Check back-up light wiring.

Keyboard test

Pressed button:
ENT
>RETURN

Check the operation keys by pushing the key.

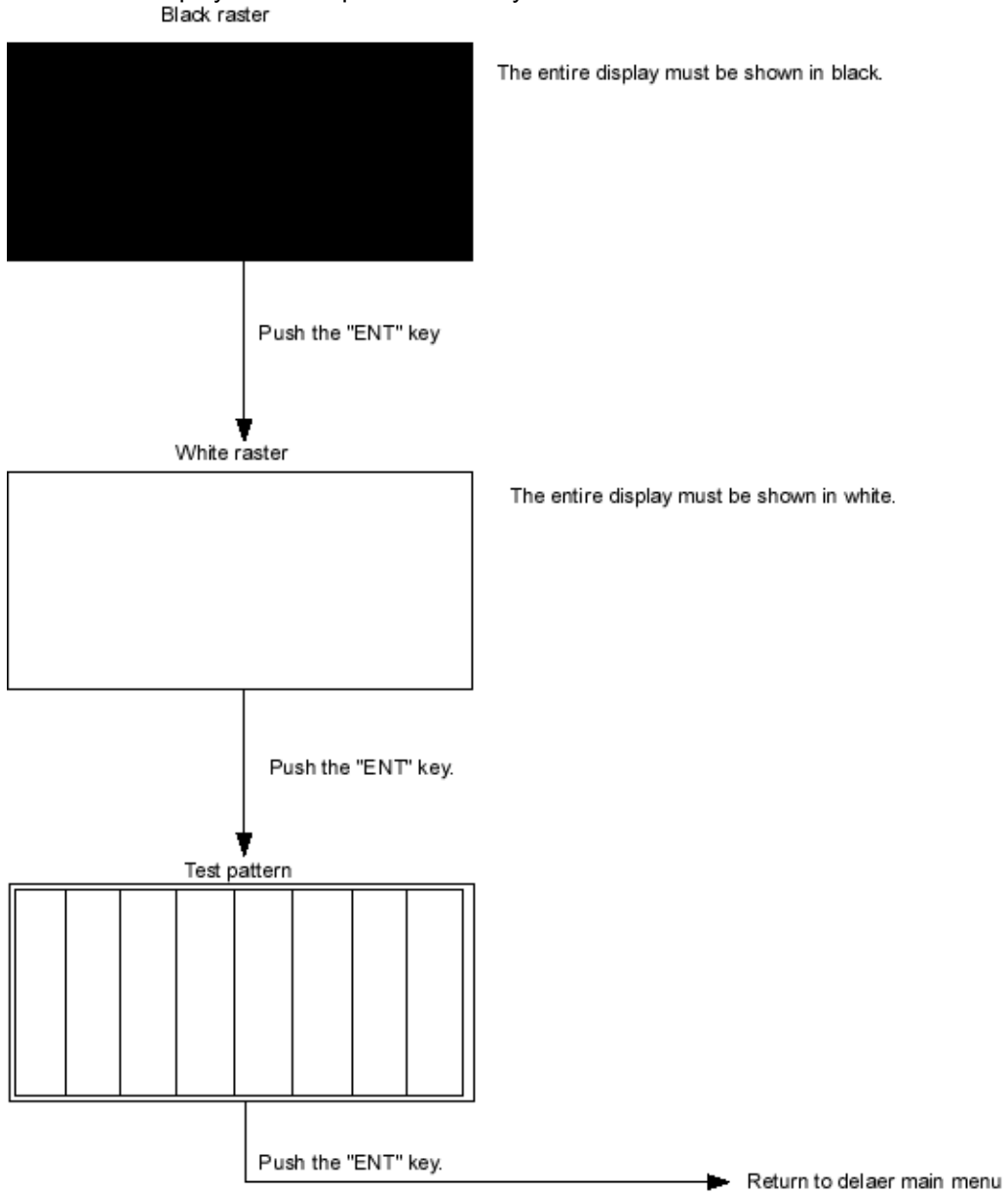
- When push the enter key, indicate ">>RETURN" on the display. When push the enter key again, return to dealer menu picture.

Operation key and display indication

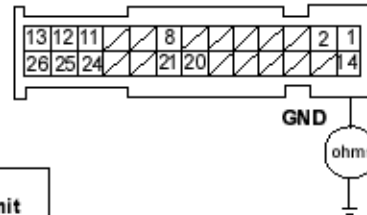
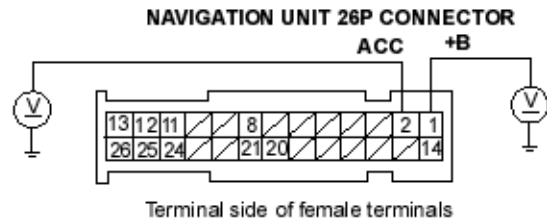
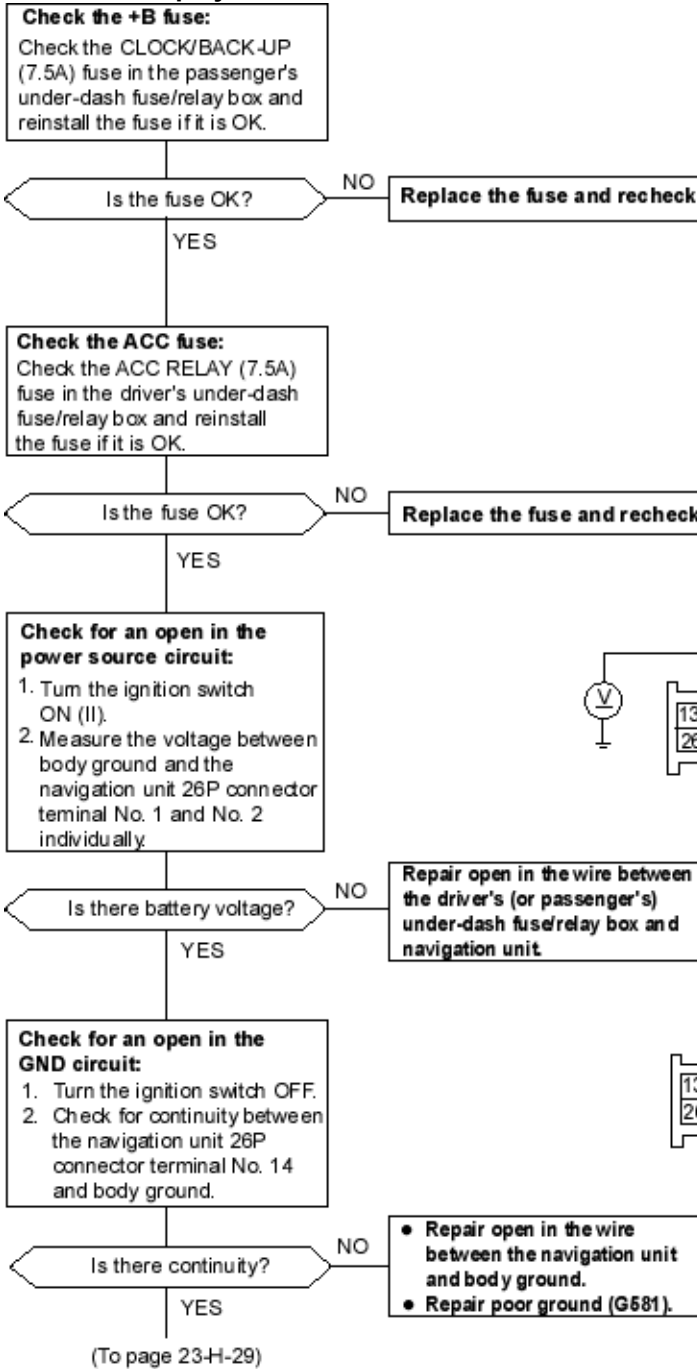
Key	△	▽	ENTER	∧	∨	←	→	SET
Display	ENT△	ENT▽	ENT	SET↑	SET↓	SET←	SET→	SET

LCD test

LCD test is used to check that the display indicates picture correctly.



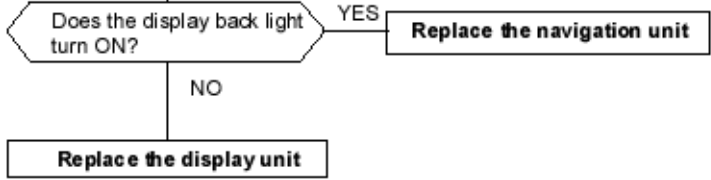
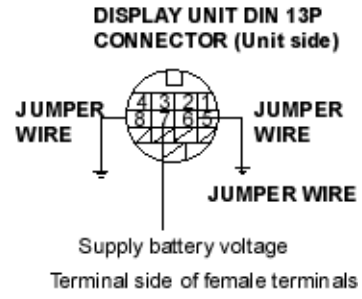
No picture is shown on the display



(From page 23-H-28)

- Check the display unit:**
1. Disconnect the display unit DIN 13P connector.
 2. Turn the ignition switch ON (II).
 3. Connect body ground and the display unit DIN 13P connector terminals No. 6 and No. 8 on the display unit individually with a jumper wire.
 4. Supply battery voltage to terminal No. 7.

NOTE: To check, shield the display unit from the sun with your hand.



Display indication is not correct

Picture diagnosis:
Perform picture diagnosis LCD test (see page 23-H-27).

Map is not shown on the display

Picture diagnosis:
Perform picture diagnosis hardware test (see page 23-H-25).

Display unit operation key does not work

Picture diagnosis:
Perform picture diagnosis keyboard test (see page 23-H-26).

Distance of vehicle position mark is not correct

Picture diagnosis:
Perform picture diagnosis dynamic test, calibration and sensor test (see page 23-H-19).

Vehicle position mark does not turn

Picture diagnosis:
Perform picture diagnosis sensor test (see page 23-H-26).

GPS mark is not indicated

Picture diagnosis:
Perform picture diagnosis static test, GPS status and hardware test (see page 23-H-19).

To go to the pages referenced on the diagram above, click on the following:

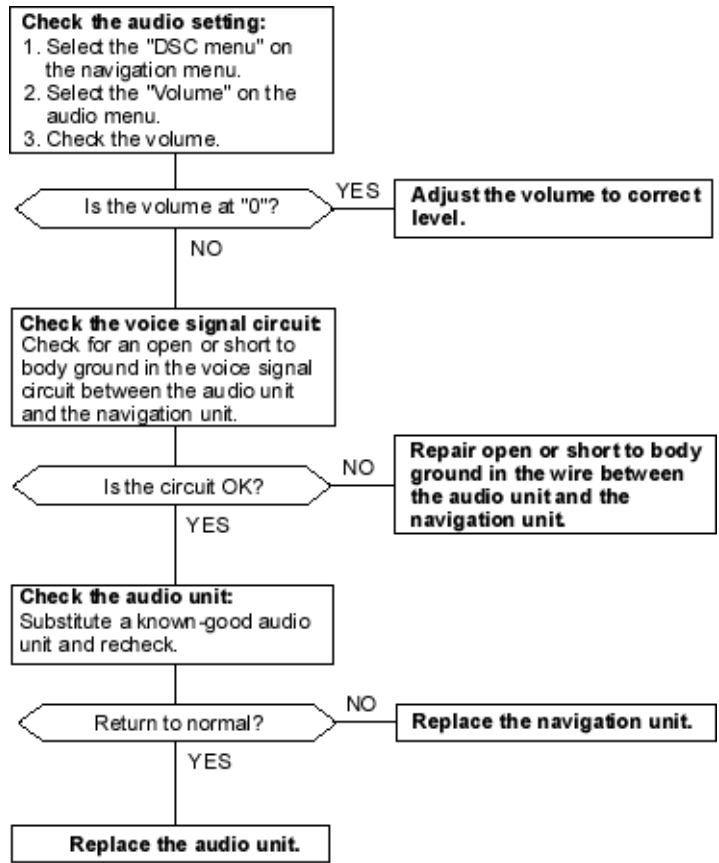
(See Page 23-H-27)

(See Page 23-H-25)

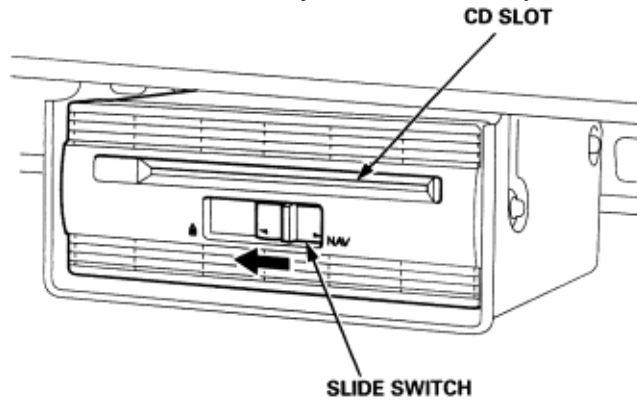
(See Page 23-H-26)

(See Page 23-H-19)

Guidance voice can't be heard

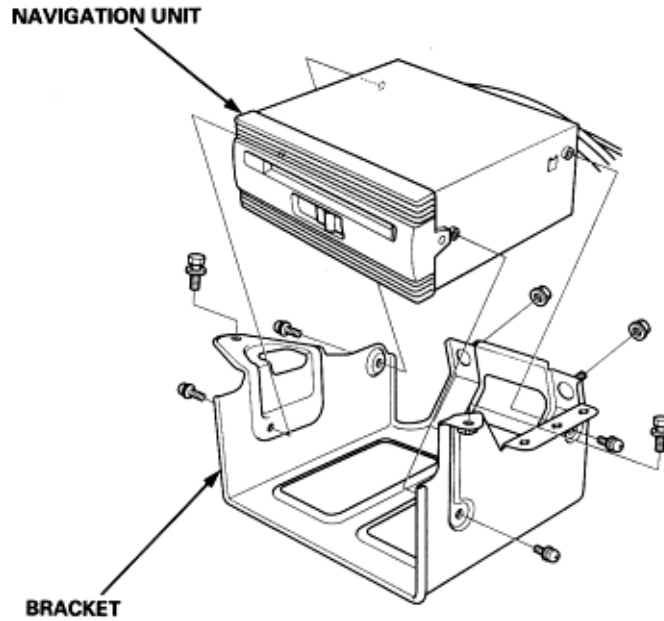


1. Turn the ignition switch ON (II).
2. Move the slide switch to the left side, and the CD-ROM is ejected automatically.

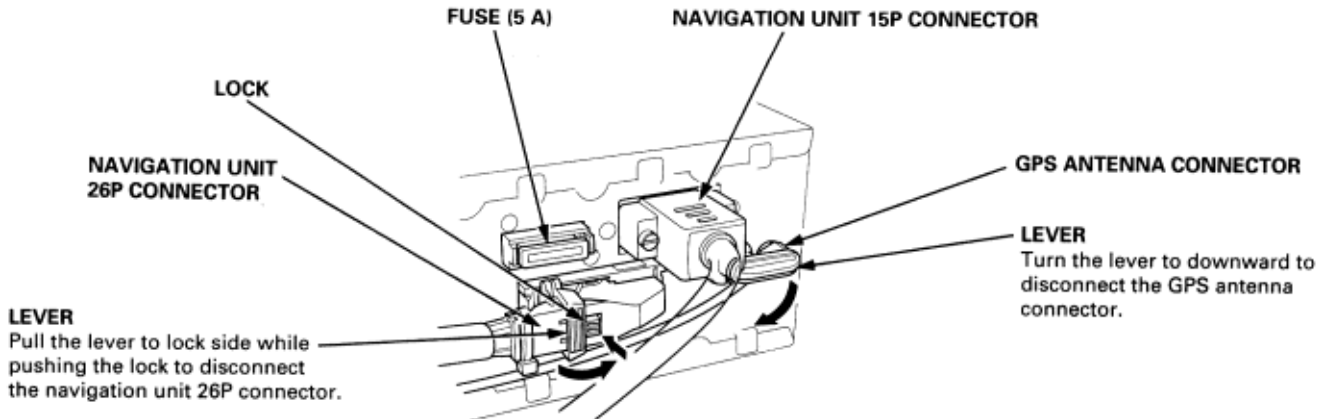


3. Remove the CD-ROM.
4. Insert the CD-ROM with the label facing up, carefully into the CD slot until it is automatically pulled into the CD-ROM drive.
5. After the CD-ROM is securely in the drive, move the slide switch to the right side.

1. Remove the rear seat back and rear shelf (see page 20-67).
2. Remove the navigation unit bracket from the frame.



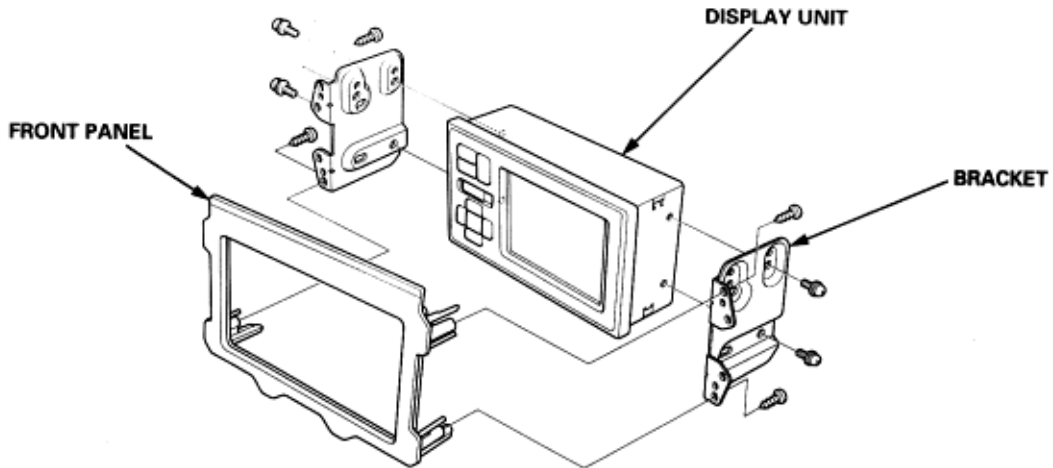
3. Remove the navigation unit from the bracket.
4. Disconnect the connectors from the navigation unit.



5. Install the parts in the reverse order of removal.

Display Unit

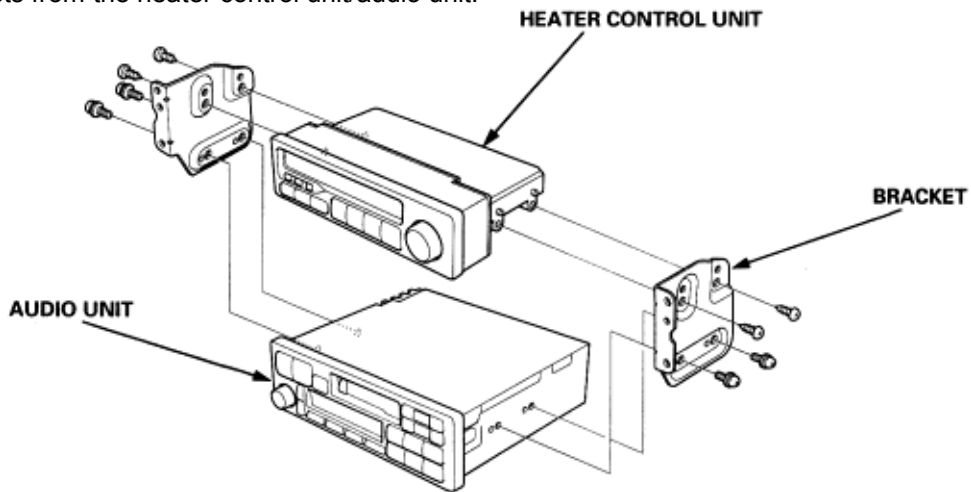
1. Remove the front panel/display unit/brackets as an assembly from the center console (**see page 20-78**).
2. Remove the front panel and the brackets from the display



3. Install the parts in the reverse order of removal.

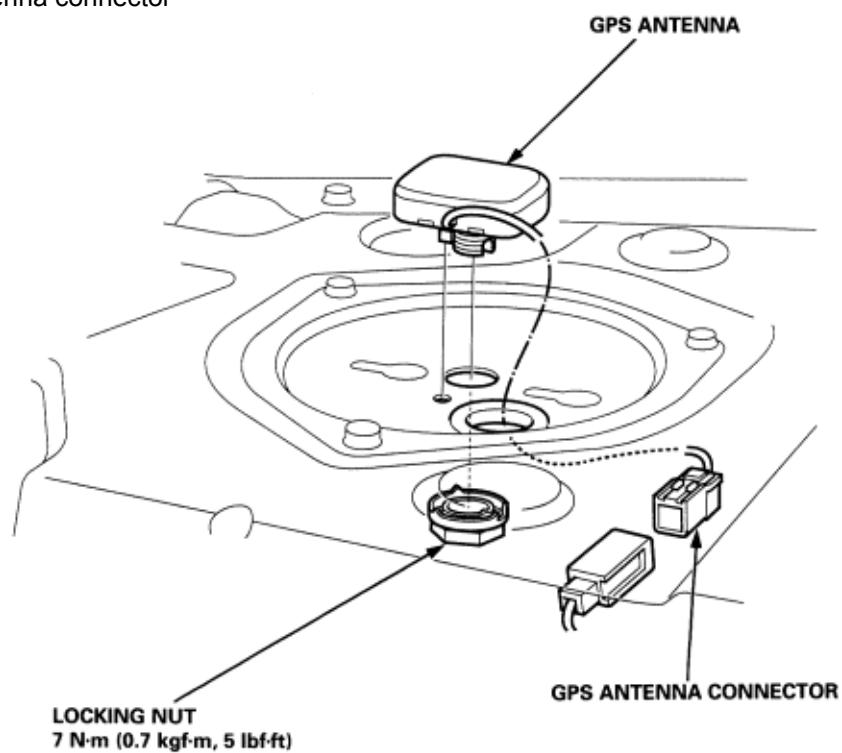
Audio Unit

1. Remove the heater control unit/audio unit/brackets as an assembly from the center console (**see page 20-75**).
2. Remove the brackets from the heater control unit/audio unit.

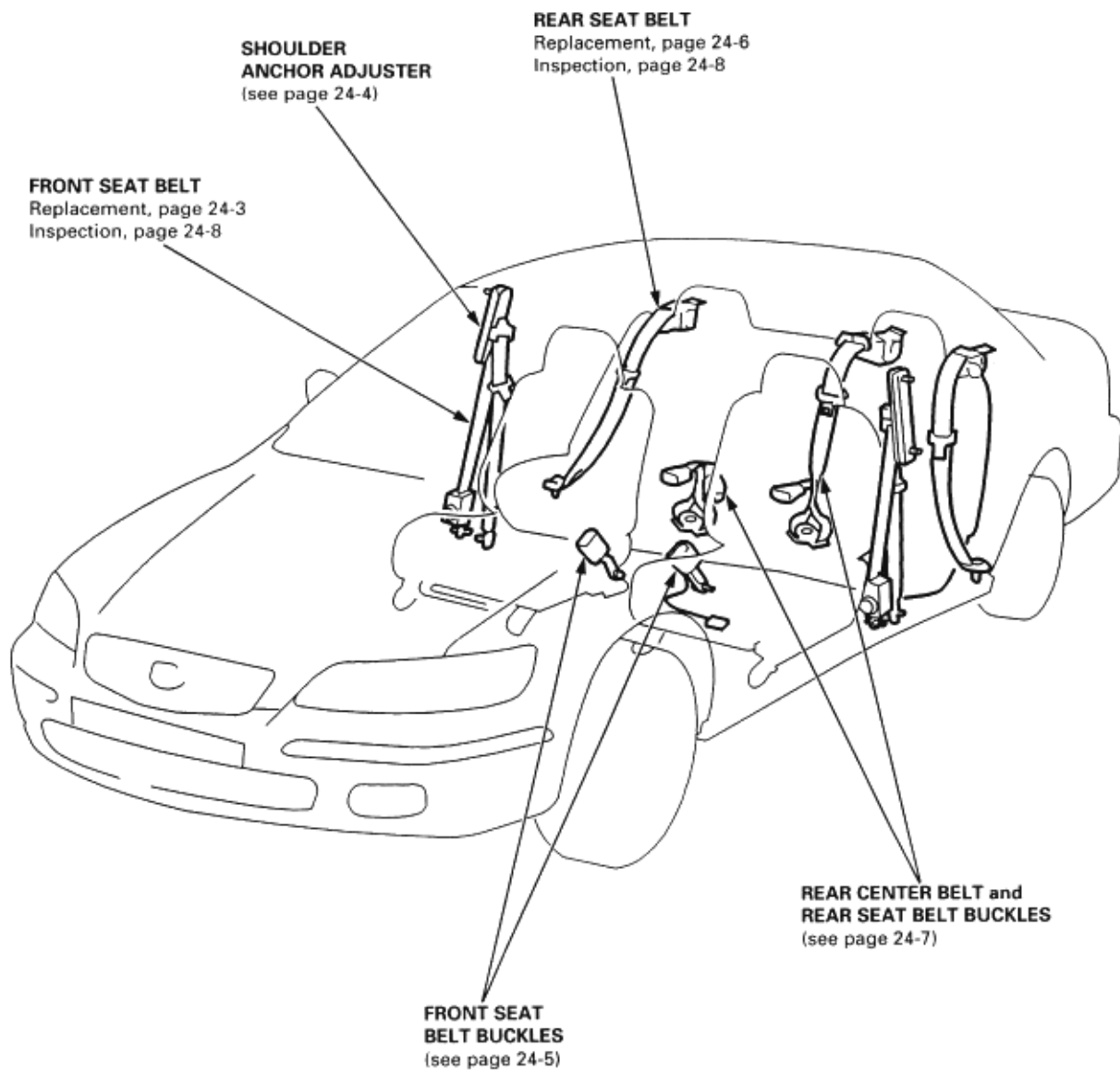


3. Install the parts in the reverse order of removal.

1. Remove the rear shelf (**see page 20-67**).
2. Disconnect the GPS antenna connector



3. Remove the locking nut located under the frame, then remove the GPS antenna.
4. Install the parts in the reverse order of removal.



To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-6)
- (See Page 24-8)
- (See Page 24-4)
- (See Page 24-3)
- (See Page 24-5)
- (See Page 24-7)

Seat Belts

Front Seat Belt Replacement

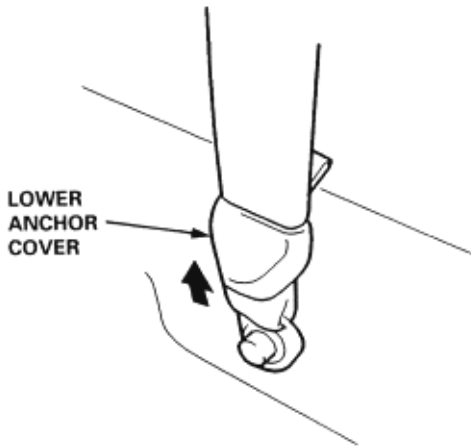
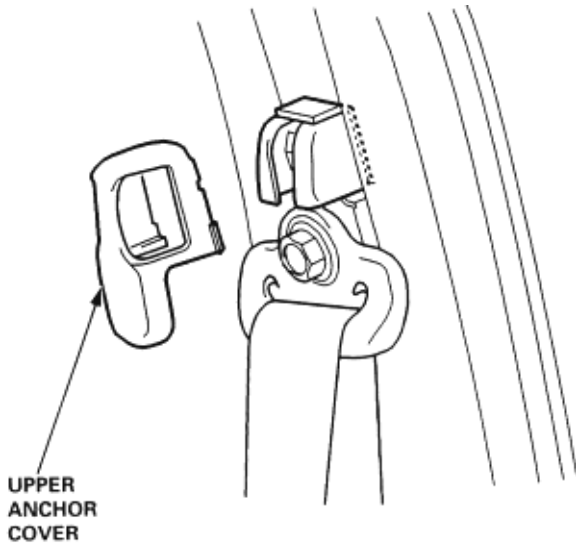
24-3

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in this section (24) before performing repairs or service.

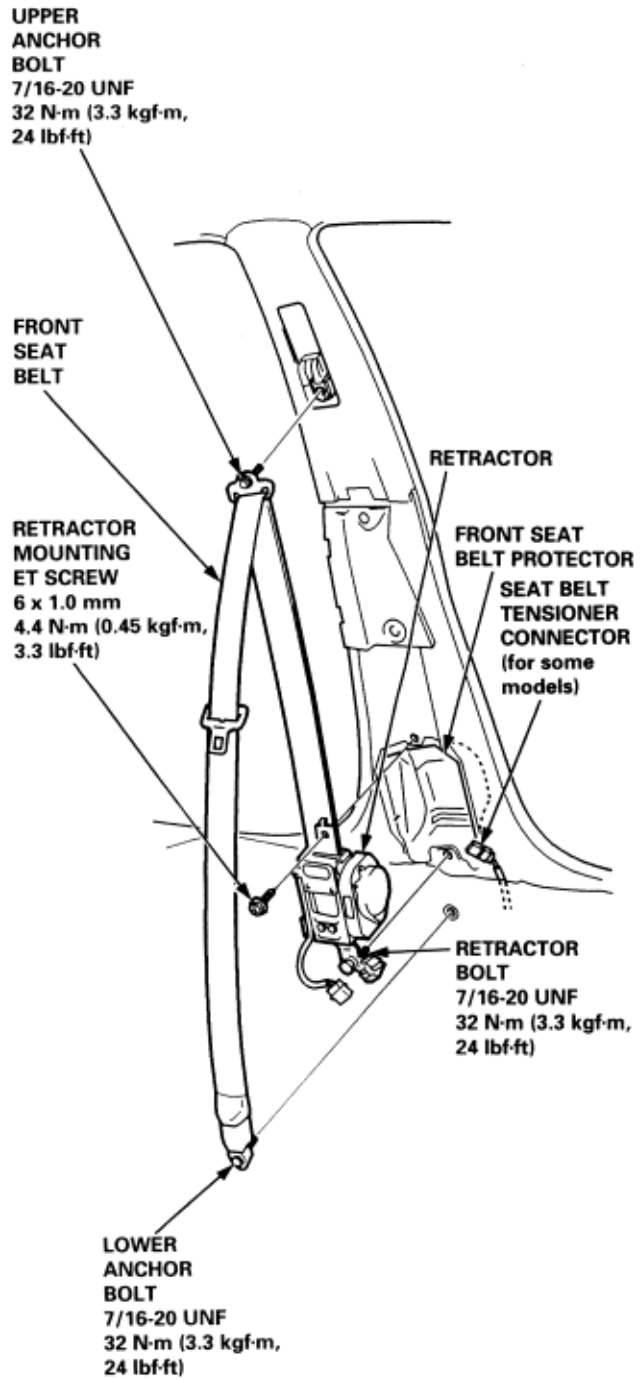
NOTE: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Front seat belt:

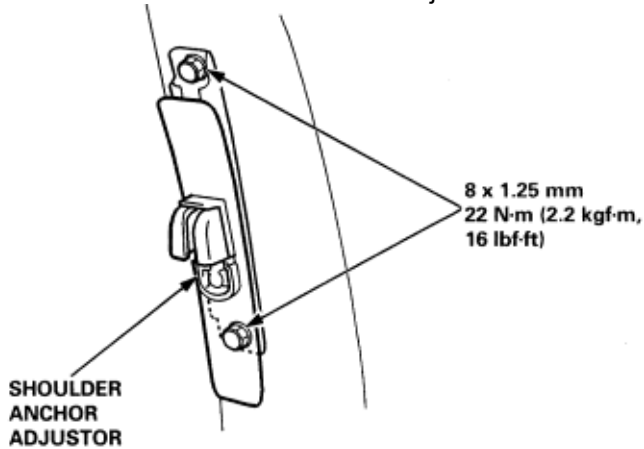
1. Slide the front seat forward fully.
2. Remove (see section 20):
 - ♦ Rear seat cushion
 - ♦ Front side trim
 - ♦ Rear side trim
 - ♦ Center pillar lower trim panel.
3. Remove the upper anchor cover, and pull the lower anchor cover back.



4. Remove the upper anchor bolt and lower anchor bolt, the retractor mounting ET screw, the retractor bolt, if equipped, disconnect the seat belt tensioner connector, remove the front seat belt and retractor.

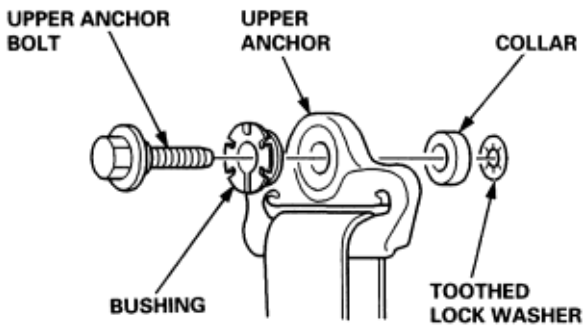


5. Remove the front and rear door trim as necessary (see section 20).
6. Remove the center pillar upper trim (see section 20).
7. Remove the shoulder anchor adjuster.

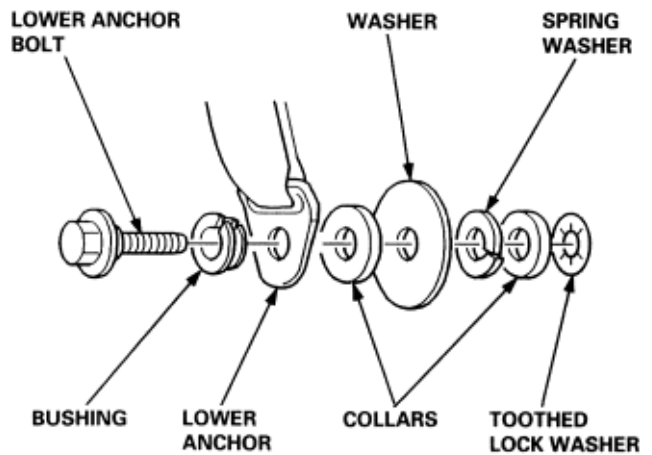


8. Install in the reverse order of removal, and note these items:
 - ♦ Apply liquid thread lock to the upper anchor bolt before reinstallation.
 - ♦ If the threads on the retractor mounting ET screw are worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that the retractor locking mechanism functions (See Page 24-8).
 - ♦ Assemble the washers, collar and bushing on the upper and lower anchor bolts as shown.
 - ♦ Before installing the anchor bolts, make sure there are no twists or kinks in the front seat belt.
 - ♦ If so equipped, make sure the seat belt tensioner connector is connected securely.

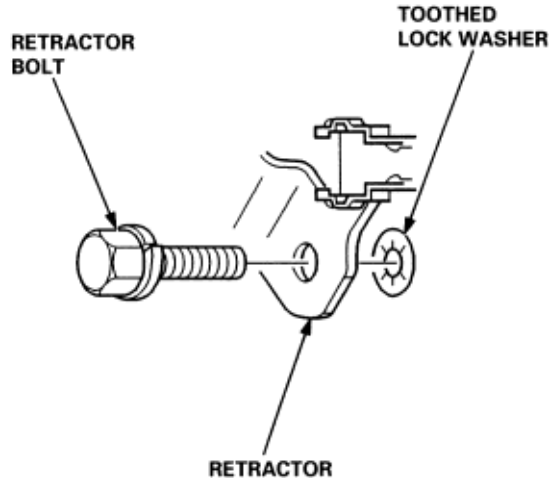
Upper anchor bolt construction:



Lower anchor bolt construction:



Retractor bolt construction:



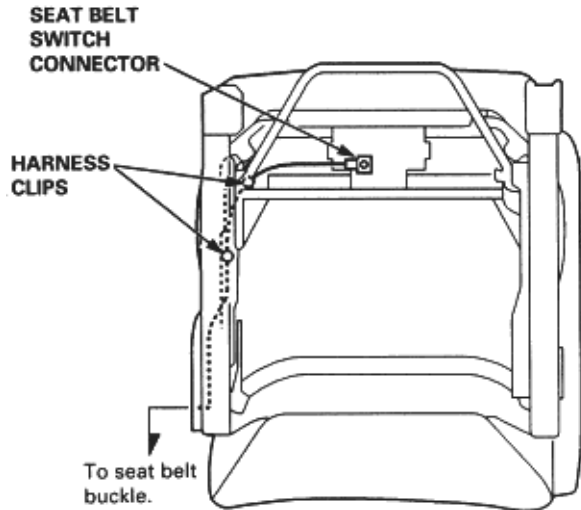
Seat Belts

Front Seat Belt Replacement (cont'd)

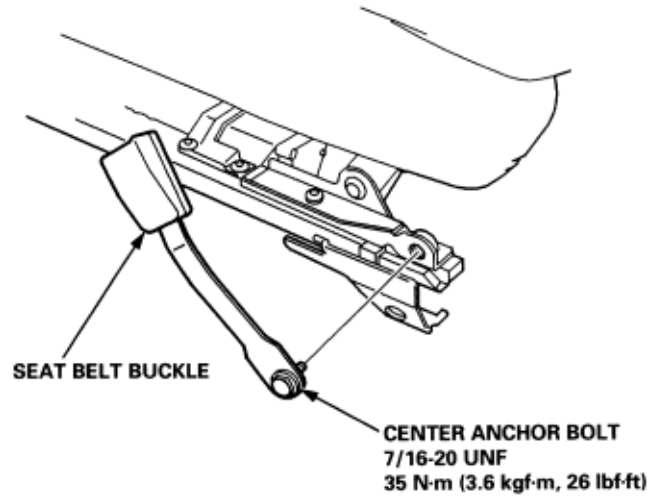
24-5

Seat belt buckle:

1. Remove the front seat (see section 20).
2. With seat belt switch, detach the seat belt switch connector and harness clips.

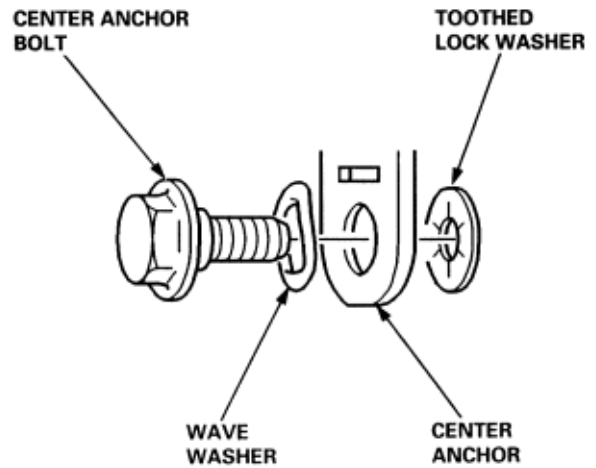


3. Remove the center anchor bolt, and remove the seat belt buckle.
NOTE: The 8-way power seat is shown, the manual seat, and the manual height adjustable seat are similar.



4. With seat belt switch: raise the seat cushion to its maximum height, then remove the seat belt switch harness.

Center anchor bolt construction:



5. Install in the reverse order of removal; assemble the washers on the center anchor bolt as shown.

Seat Belts

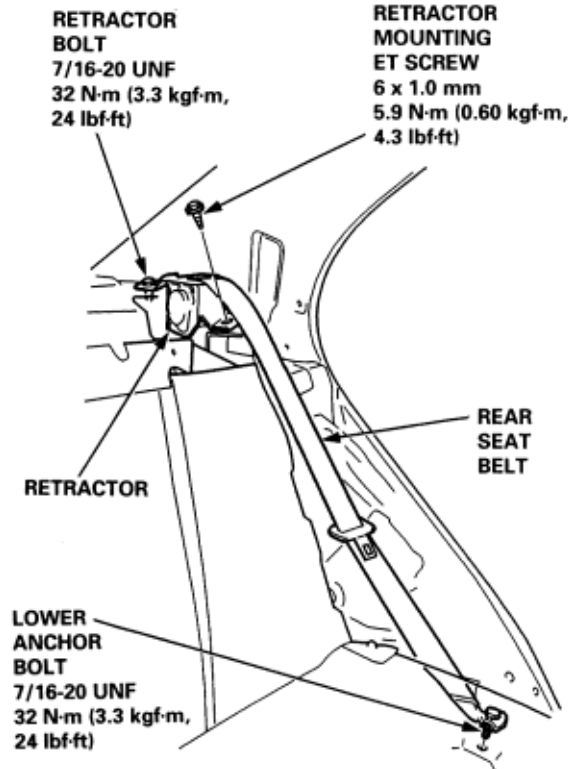
Rear Seat Belt Replacement

24-6

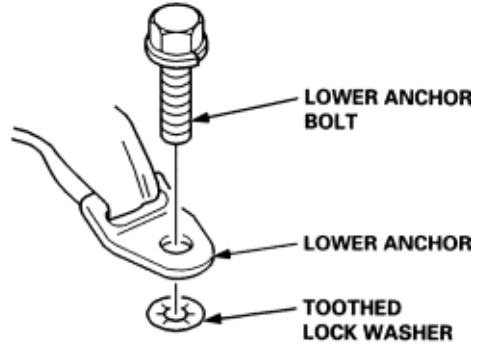
NOTE: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Rear seat belt:

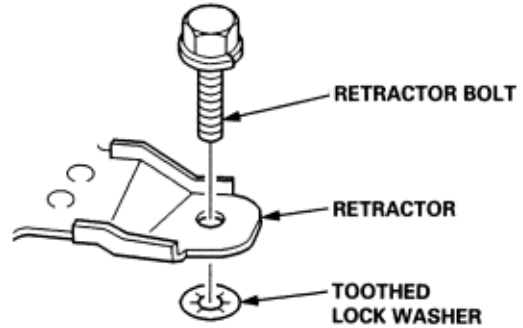
1. Remove:
 - ♦ Rear seat-back, for fixed rear seat (see section 20)
 - ♦ Rear bulkhead cover, for fold down rear seat (see section 20)
 - ♦ Rear shelf (see section 20).
2. Remove the lower anchor bolt, the retractor mounting ET screw, the retractor bolt and then remove the rear seat belt and retractor.



Lower anchor bolt construction:



Retractor bolt construction:



3. Install in the reverse order of removal, and note these items:
 - ♦ If the threads on the retractor mounting ET screw are worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that the retractor locking mechanism functions (**See Page 24-8**).
 - ♦ Before installing the anchor bolt, make sure there are no twists or kinks in the rear seat belt .

Seat Belts

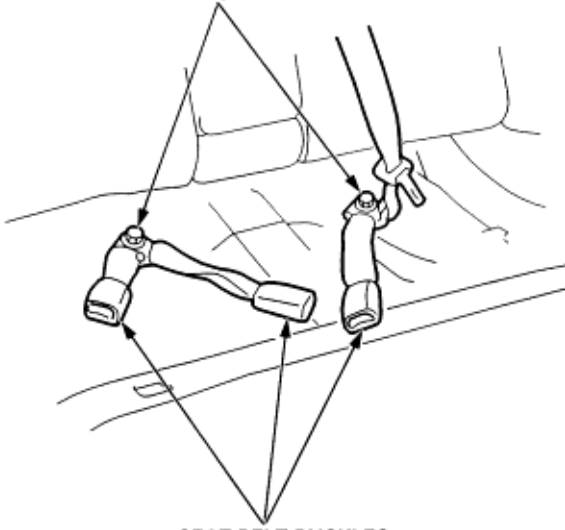
Rear Seat Belt Replacement (cont'd)

24-7

Center belt and seat belt buckles:

1. Remove the rear seat cushion (see section 20).
2. Remove the center anchor bolts, and remove the seat belt buckles.

CENTER ANCHOR BOLT
7/16-20 UNF
32 N-m (3.3 kgf-m,
24 lbf-ft)



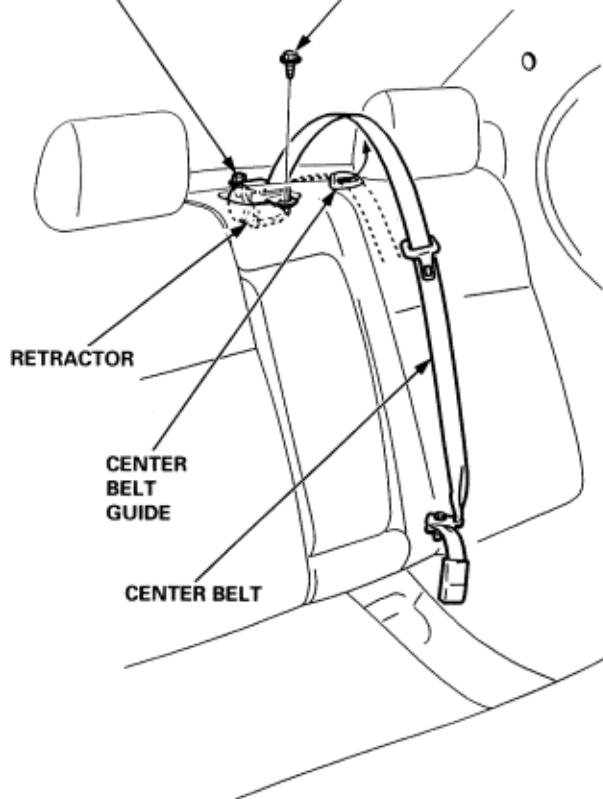
SEAT BELT BUCKLES

3. Remove (see section 20):
 - ♦ Rear seat-back, for fixed rear seat
 - ♦ Rear bulkhead cover, for fold down rear seat
 - ♦ Rear shelf

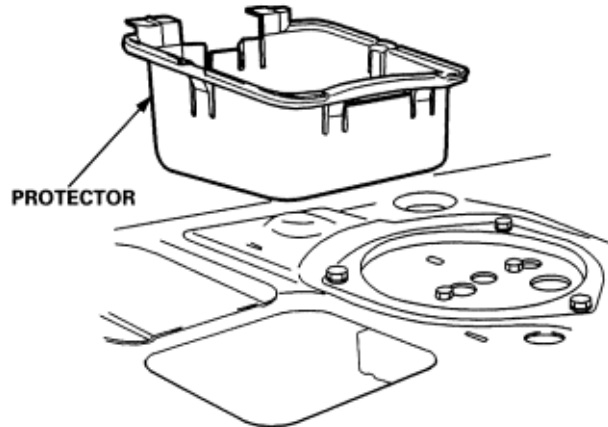
4. Remove the center belt from the center belt guide through it's slit (with fold down rear seat). Remove the retractor mounting ET screw, and the retractor bolt, then remove the center belt and retractor.

RETRACTOR BOLT
7/16-20 UNF
32 N-m (3.3 kgf-m,
24 lbf-ft)

RETRACTOR MOUNTING ET SCREW
6 x 1.0 mm
3.4 N-m (0.35 kgf-m,
2.5 lbf-ft)



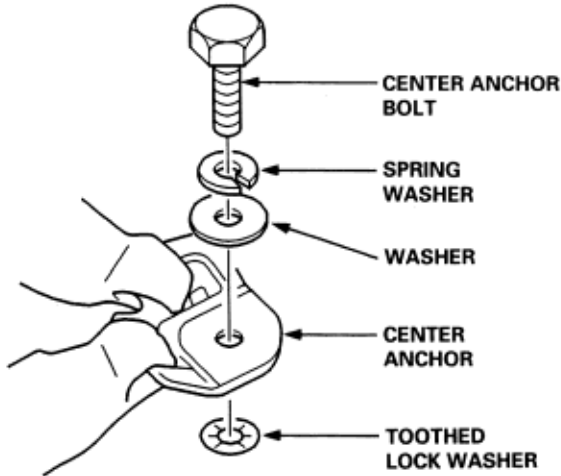
5. Remove the protector.



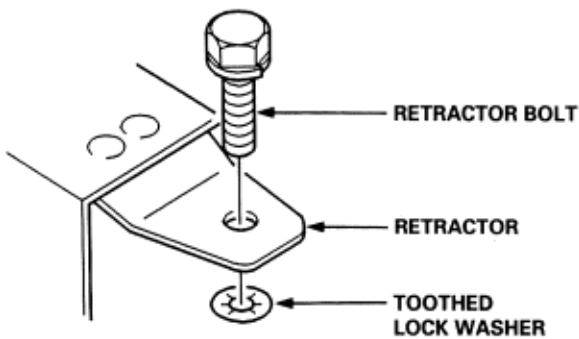
Rear Seat Belt Replacement (cont'd)

6. Install in the reverse order of removal, and note the following items:
 - ♦ If the threads on the retractor mounting ET screw are worn out, use an oversized ET screw made specifically for this application.
 - ♦ Check that the retractor locking mechanism functions as described (**See Page 24-8**).
 - ♦ Assemble the washers on the center anchor bolt as shown.
 - ♦ Before installing the center anchor bolt, make sure there are no twists or kinks in the center belt.

Center anchor bolt construction:



Retractor bolt construction:



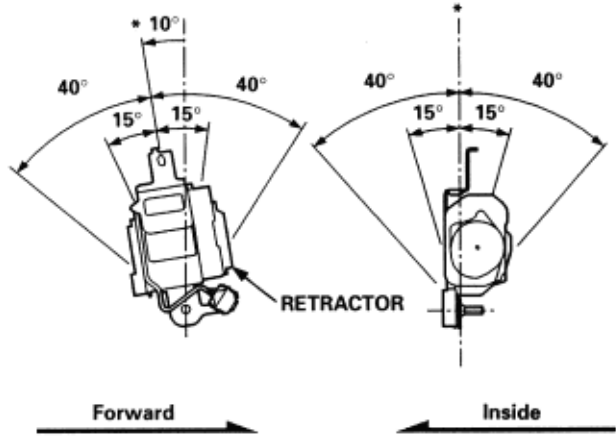
Retractor:

SRS components are located in this area. Review the SRS component locations, precautions, and procedures (see page 24) before performing repairs or service.

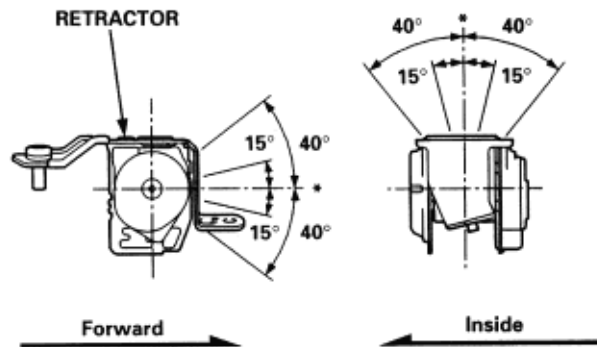
1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retraction is leaned over 40°. Do not attempt to disassemble the retractor.

Front:

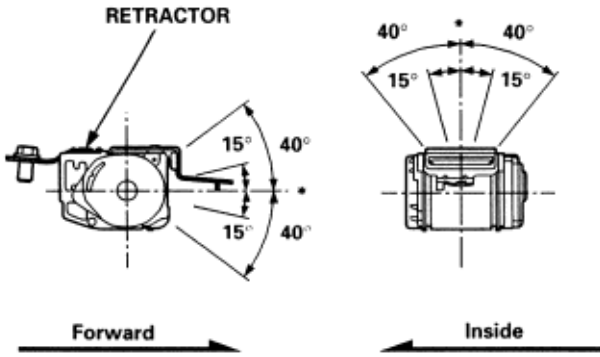
***: Mounted Position**



Rear side:



Rear center:



3. Replace the seat belt with a new one if there is any abnormality.

In-vehicle:

1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.
NOTE: Dirt build-up in the metal loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Make sure that the seat belt will retract automatically when released.
6. Replace the seat belt with a new one if there is any abnormality.

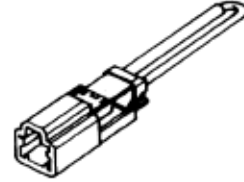
Ref No.	Tool Number	Description	Qty	Remark
1 *1	07HAZ - SG00500	Deployment Tool	1	
2 *1	07PAZ - 0010100	SCS Short Connector	1	
3	07SAZ - TB4011A	SRS Inflator Simulator	1	
4	07TAZ - SZ5011A	SRS Simulator Lead C	1	
5 *2	07TAZ - 001020A	Backprobe Adapter, 17 mm	2	
6	07XAZ - SIA0100	SRS Test Box 4P	1	
7	07XAZ - SIA0200	SRS Simulator Lead D	1	

*1: Included in SRS Tool Set 07MAZ - SM5000B.

*2: Use with the stacking patch cords from T/N 07SAZ - 001000A, Backprobe Set.



①



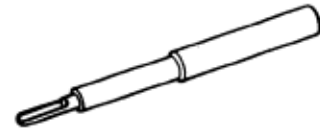
②



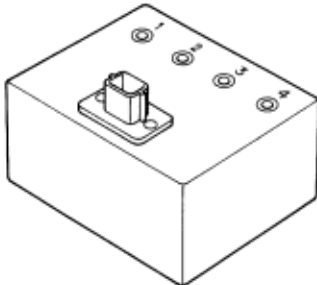
③



④



⑤

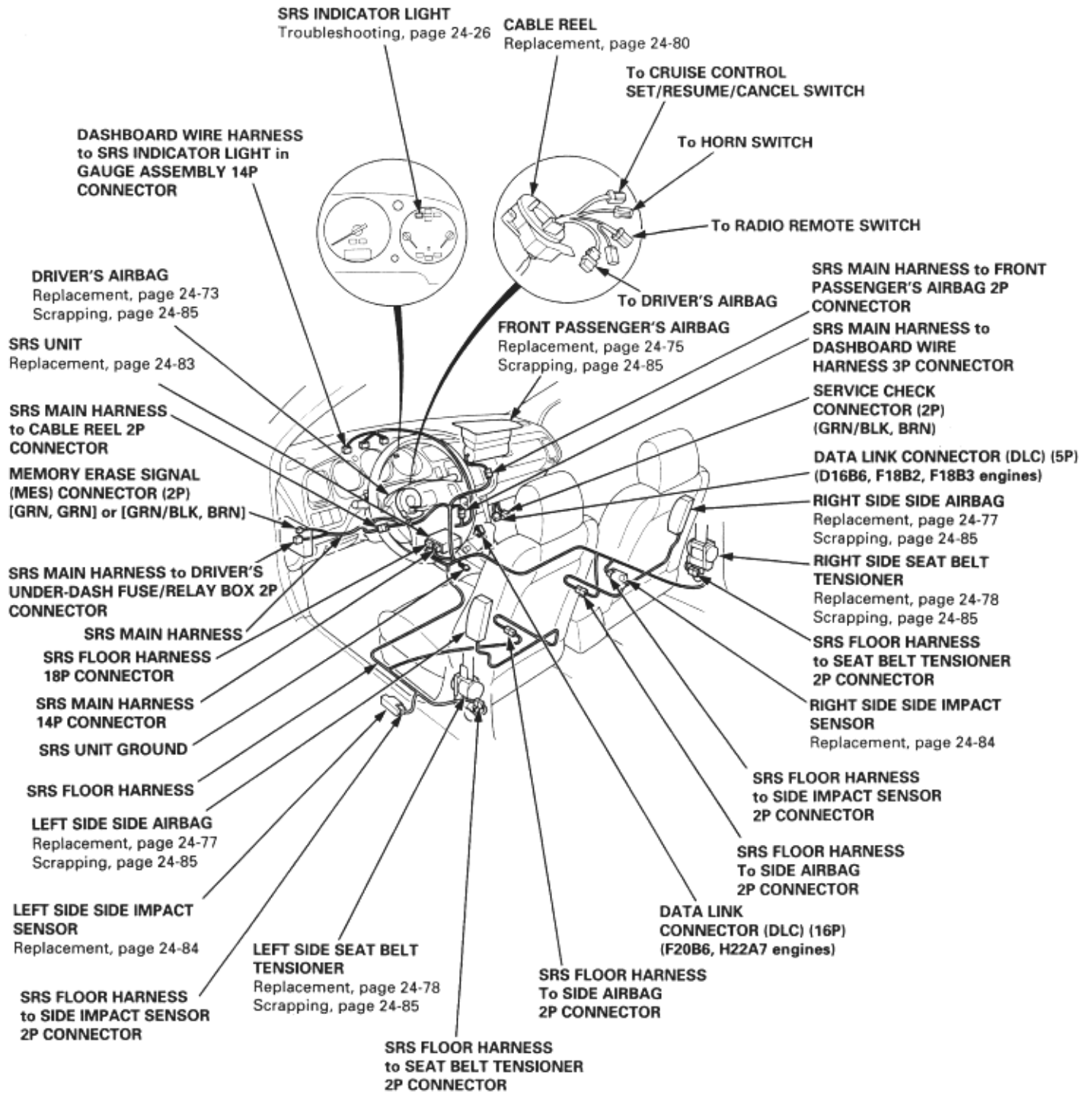


⑥



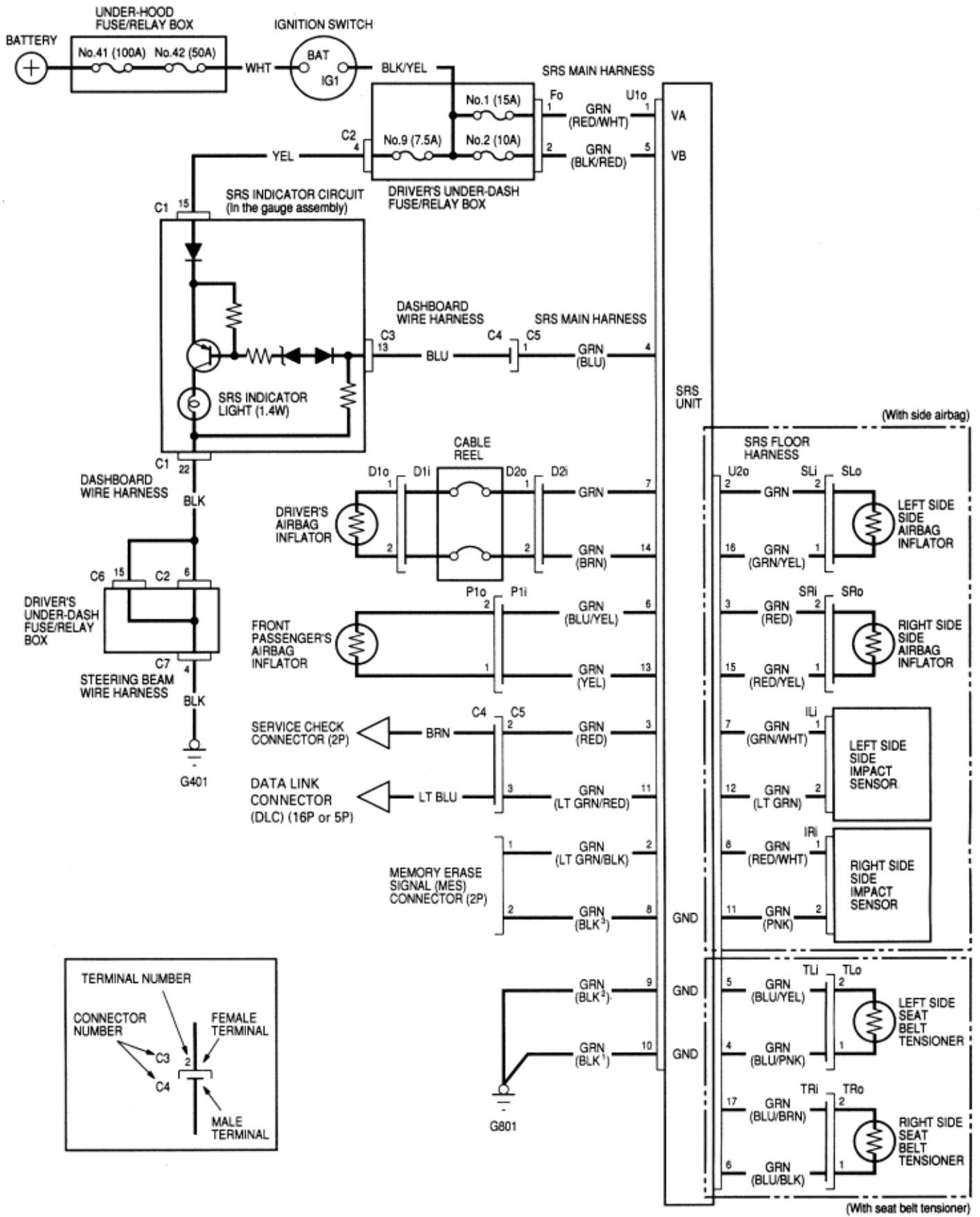
⑦

NOTE: LHD type is shown, RHD type is symmetrical.



To go to the pages referenced on the diagram above,
click on the following:

- (See Page 24-26)
- (See Page 24-73)
- (See Page 24-85)
- (See Page 24-83)
- (See Page 24-75)
- (See Page 24-77)
- (See Page 24-84)
- (See Page 24-78)



Connector No.	Wire harness and connector	Terminal		Remark	Ref. No. (next page)	
		Male	Female			
U1o	SRS main harness 14P connector		O	(1)	1	
U2o	SRS floor harness 18P connector		O	(1)	2	
Fo	SRS main harness 2P connector		O	(1)	3	
D1	D1o	Driver's airbag 2P connector		O	(2)	5
D1	D1i	Cable reel 2P connector	O		(2)	4
D2	D2o	Cable reel 2P connector		O	(1)	5
D2	D2i	SRS main harness 2P connector	O		(1)	4
P1	P1o	Front passenger's airbag connector		O	(2)	5
P1	P1i	SRS main harness 2P connector	O		(2)	4
TL	TLo	Left side seat belt tensioner 2P connector		O	(2)	5
TL	TLi	SRS floor harness 2P connector	O		(2)	4
TR	TRo	Right side seat belt tensioner 2P connector		O	(2)	5
TR	TRi	SRS floor harness 2P connector	O		(2)	4
SL	SLo	Left side airbag 2P connector		O	(2) (3)	6
SL	SLi	SRS floor harness 2P connector	O		(2) (3)	7
SR	SRo	Right side airbag 2P connector		O	(2) (3)	6
SR	SRi	SRS floor harness 2P connector	O		(2) (3)	7
	ILi	SRS floor harness 2P connector		O	(1) (3)	8
	IRi	SRS floor harness 2P connector		O	(1) (3)	8
	C1	Dashboard wire harness 22P connector		O		9
	C2	Dashboard wire harness 18P connector		O		10
	C3	Dashboard wire harness 14P connector		O		11
	C4	Dashboard wire harness 3P connector	O			12
	C5	SRS main harness 3P connector		O		13
	C6	Dashboard wire harness 18P connector		O		14
	C7	Steering beam wire harness 22P connector		O		15

*1 : The connector numbers are different from other sections.

*2 : Remark

(1) : Spring loaded lock connector

(2) : Spring loaded lock connector with built-in short contact

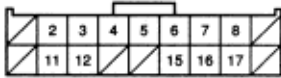
(3) : Waterproof connector

1. U1o



Wire side of female terminals

2. U2o
With side airbags



Wire side of female terminals

Without side airbags, with seat belt tensioner



Wire side of female terminals

3. Fo



Wire side of female terminals

4. D1i, D2i, P1i, TLi, TRi



Terminal side of male terminals

5. D1o, D2o, P1o, TLo, TRo



Wire side of female terminals

6. SLo, SRo



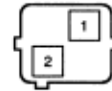
Terminal side of male terminals

7. SLi, SRi



Wire side of female terminals

8. ILi, IRi



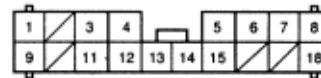
Wire side of female terminals

9. C1



Wire side of female terminals

10. C2



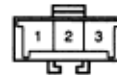
Wire side of female terminals

11. C3



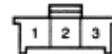
Wire side of female terminals

12. C4



Terminal side of male terminals

13. C5



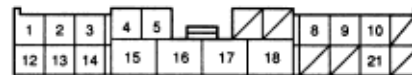
Wire side of female terminals

14. C6



Wire side of female terminals

15. C7



Wire side of female terminals

Airbag

The SRS is a safety device which, when used in conjunction with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit (including safety sensor and frontal impact sensor), the cable reel, the driver's airbag and front passenger's airbag.

Side airbag

The side airbag is designed to help protect the driver's and front passenger's chests in a side impact exceeding a certain set limit. A side airbag only operates on the side which has the impact, and protects the side of the driver's or passenger's chest.

Seat Belt Tensioner

The seat belt tensioner is linked with the SRS airbags to further increase the effectiveness of the seat belt. In a front-end collision, the tensioner instantly retracts the belt firmly to secure the occupants in their seats.

Operation

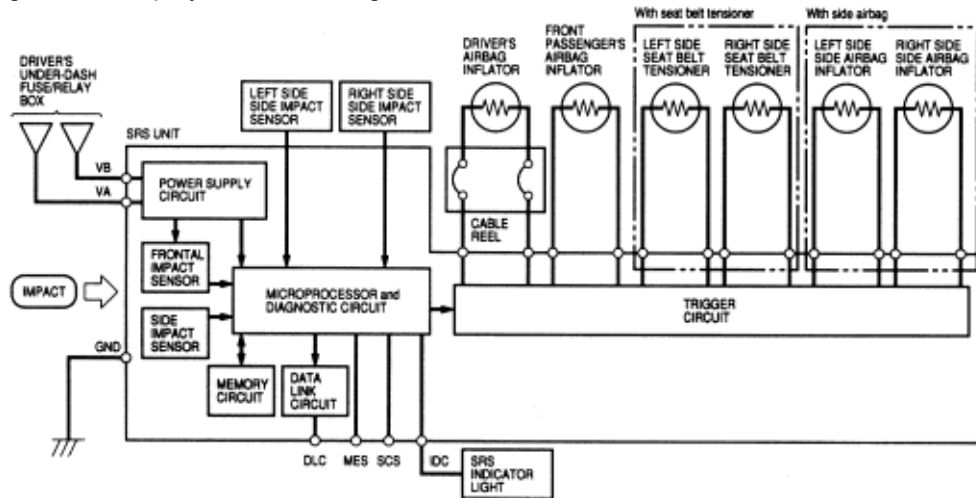
The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit respectively will keep voltage at a constant level.

For the SRS to operate:**Airbag and Seat Belt Tensioner**

- (1) The frontal impact sensor must activate, and send electric signals to the microprocessor.
- (2) The microprocessor must compute the signals, and must send signals to the airbag inflators and seat belt tensioners.
- (3) The inflators must ignite and deploy the airbags and activate the tensioners.

Side Airbag

- (1) The side impact sensor's must activate, and send electric signals to the microprocessor.
- (2) The microprocessor must compute the signals, and must send signals to the side airbag inflators
- (3) The inflators must ignite and deploy the side airbags.

**Self-diagnosis System**

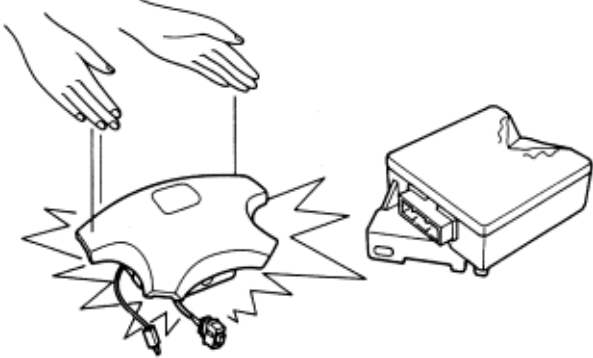
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about six seconds if the system is operating normally.

If the light does not come on, or does not go off after six seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For battery serviceability, the memory will store the cause of the malfunction, and the data link circuit passes on the information from the memory to the data link connector (DLC). This information can be read with the Honda PGM Tester connected to the DLC (16P or 5P).

Please read the following precautions carefully before performing the SRS service. Observe the instructions described in this manual, or the airbags and side airbags could accidentally deploy and cause damage or injuries.

- ◆ Except when performing electrical inspections, always turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least three minutes before beginning work.
NOTE: The contents within the memory, is not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.
- ◆ Use the replacement parts which, are manufactured to the same standards as the original parts and quality. Do not install used SRS parts from another vehicle. Use only new parts when making SRS repairs.
- ◆ Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



- ◆ Before removing any of the SRS parts (including the disconnection of the connectors), always disconnect the SRS connectors. For disconnection of the SRS connectors (**See Page 24-24**).

- ◆ Use only a digital multimeter to check the system. If it is not a Honda multimeter, make sure its output is 10 mA (0.01A) or less when switched to the lowest value in the ohmmeter range. A tester with a higher output could cause accidental deployment and possible injury.
- ◆ Do not put objects on the front passenger's airbag assembly.
- ◆ Except KY model; the radio has a coded theft protection circuit. Be sure to get the customer's radio code before disconnecting the battery cable.

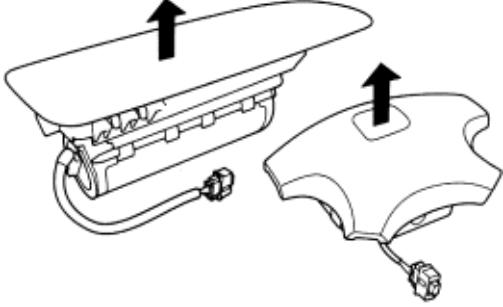
Precautions/Procedures

Airbag/Seat Belt Tensioner/Side Airbag/Handling Storage

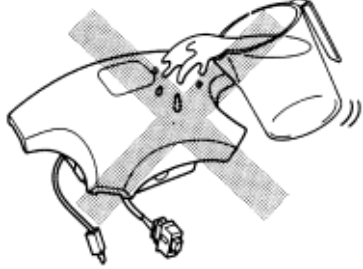
24-19

Do not disassemble the airbag, seat belt tensioner and side airbag. It has no serviceable parts. Once an airbag and a side airbag have been deployed, and once a seat belt tensioner has been activated it cannot be repaired or reused. For temporary storage of the airbag, seat belt tensioner and side airbag during service, please observe the following precautions:

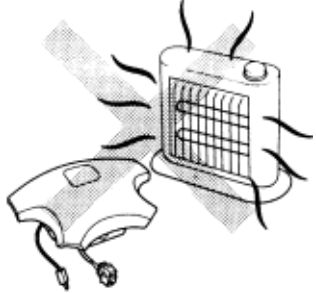
- ◆ Store the removed airbag and a side airbag with pad surface (deployment surface) up. Never put any things on the removed airbag and side airbag assembly.



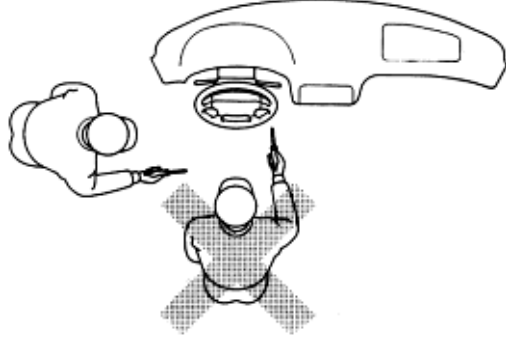
- ◆ Keep free from any oil, grease, detergent, or water to prevent damage to the airbag, seat belt tensioner and side airbag assembly.



- ◆ Store the removed airbag and side airbag on a secure flat surface away from any high heat source (exceeding 93°C/200°F).



- ◆ Never perform electrical inspections to the airbag, seat belt tensioner and side airbag such as measuring resistance.
- ◆ Do not position yourself in front of the airbag assembly during removal, inspection, or replacement.



- ◆ Refer to the scrapping procedures for disposal of the damaged airbag (**See Page 24-91**).

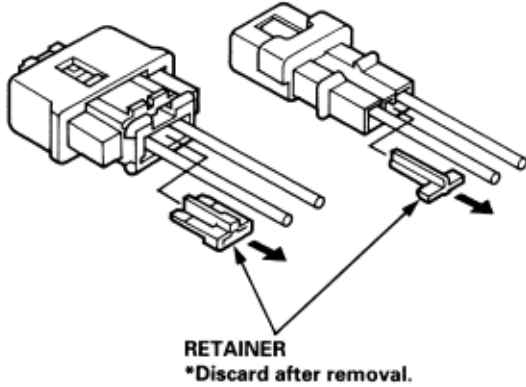
Precautions/Procedures

Backprobing Spring-loaded Lock Connectors (Without Waterproof Type)

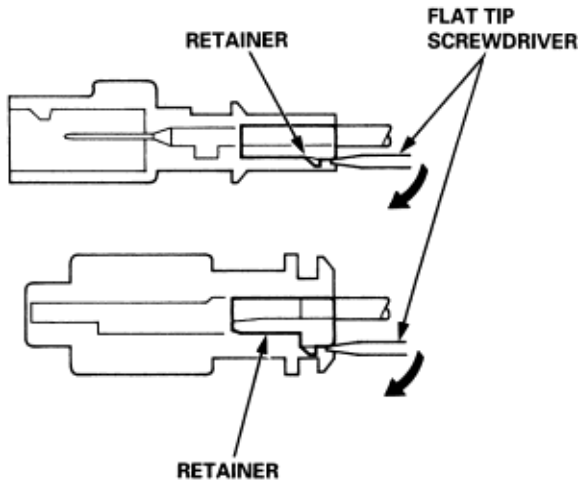
24-20

Seat with Side Airbag

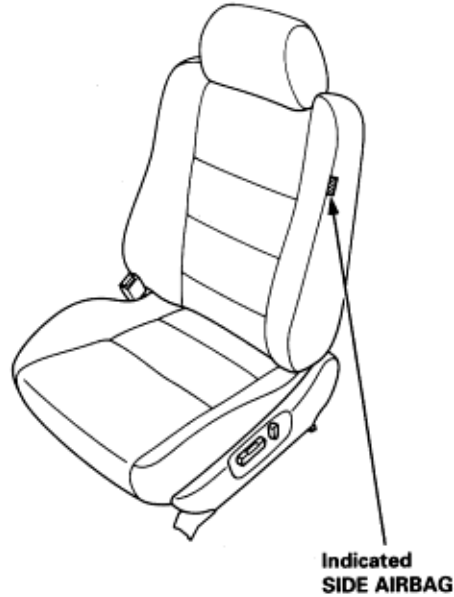
- When checking voltage or resistance on this type of connector the first time, it is necessary to remove the retainer to insert the tester probe from the wire side. It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.



- To remove the retainer, insert a flat-tip screwdriver between the connector body and the retainer, then carefully pry out the retainer. Take care not to break the connector.

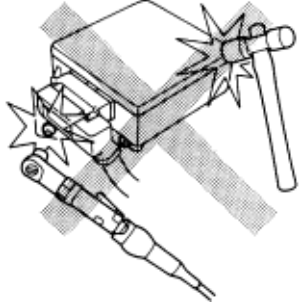


- To distinguish two types of the seats, the seat with an airbag is marked with side airbag on the surface of the seat-back. As the component parts (seat-back cover, etc) are different from the types with side airbags and types without side airbags, if service is necessary, be careful not to assemble the wrong parts.

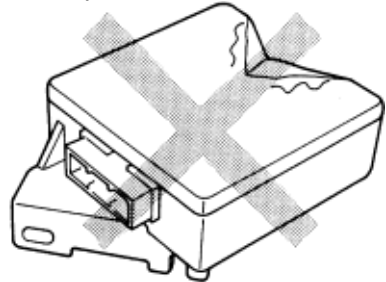


- Do not wash the seat and do not spray the steam on the seat.
- Do not repair the tear or frayed spot of the seat-back cover. If necessary, replace the seat-back cover.
- After a collision in which the side airbag was deployed, replace the seat-back cover and side airbag of the deployed side seat with new parts.

- ♦ Be careful not to bump or impact the SRS unit and side impact sensor whenever the ignition switch is ON (II), or wait for at least three minutes after the ignition switch is turned OFF.
- ♦ During installation or replacement, be careful not to bump (by impact wrench, hammer, etc.) the area around the SRS unit and side impact sensor. The airbags and side airbags could accidentally deploy and cause damage or injury.



- ♦ After a collision in which the airbags were deployed, replace the SRS unit. After a collision in which the side airbag was deployed, replace the side impact sensor of the deployed side and SRS unit. After a collision in which the airbags or the side airbags were not deployed, inspect for any damage or any deformation on the SRS unit and the side impact sensor. If there is any damage, replace the SRS unit and/or the side impact sensor.

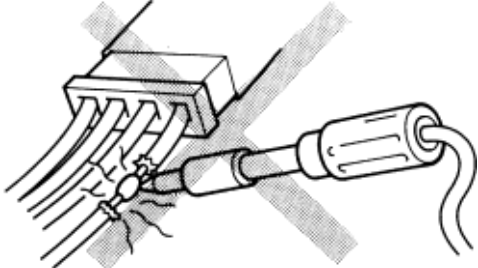


- ♦ Do not disassemble the SRS unit and side impact sensor.
- ♦ Turn the ignition switch OFF, disconnect the battery negative cable and wait at least three minutes before beginning installation or replacement of the SRS units and disconnect the connectors from the SRS unit.
- ♦ Be sure the SRS unit and side impact sensors are installed securely to the specified torque.
TORQUE: 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
- ♦ Do not spill water or oil on the SRS unit and side impact sensor and keep them away from dust.
- ♦ Store the SRS unit and side impact sensor in a cool (less than 40°/104°F) and dry (less than 80% relative humidity, no moisture) area.

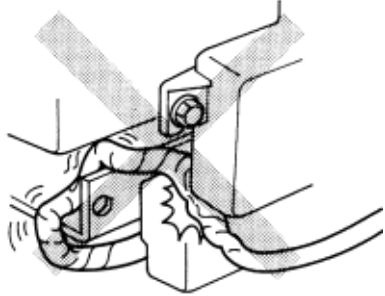
Cable Reel Alignment

- ♦ Center the cable reel whenever the following is performed. For centering the cable reel (**See Page 24-82**). Misalignment of the cable reel (the cable reel is not centered) could cause an open in the cable reel, making the SRS system and the horns inoperative.
 - Installation of the steering wheel.
 - Installation of the cable reel.
 - Installation of the steering column.
 - Other steering-related adjustment or installation.
- ♦ Do not disassemble the cable reel.
- ♦ Do not apply grease on the cable reel.
- ♦ If the cable reel shows any signs of damage for example, it does not rotate smoothly, replace the cable reel with a new one.

- ◆ SRS wiring can be identified by special yellow outer covering (except the SRS indicator light circuit). Observe the instructions described in this chapter.
- ◆ Confirm that the article number label with the SRS floor harness is located in the right side of the body, when you replace the SRS floor harness.
- ◆ Never attempt to modify, splice, or repair SRS wiring. If there is an open or damage in SRS wiring, replace the harness.

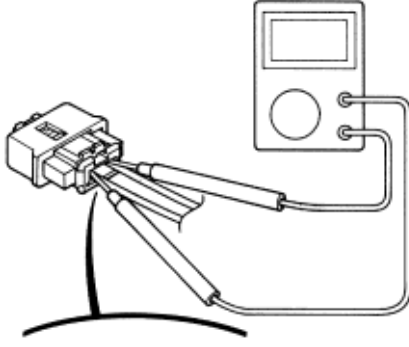


- ◆ Be sure to install the harness wires so that they are not pinched, or interfere with other parts.

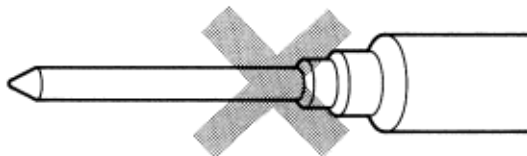
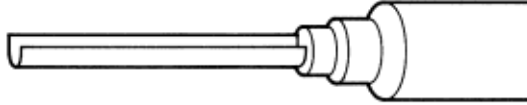


- ◆ Make sure all SRS ground locations are clean, and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

- ◆ Use the special tools for the waterproof connector.
- ◆ When using electrical test equipment, insert the probe of the tester into the wire side of the connector. Do not insert the probe of the tester into the terminal side of the connector, and do not tamper with the connector. Inserting the probe into the terminal side of the connector and tampering of the connector could cause malfunction of the SRS system or an error in inspection.



- ◆ Use a U-Type probe with a Honda PGM Tester as shown below. Do not insert the probe forcibly.



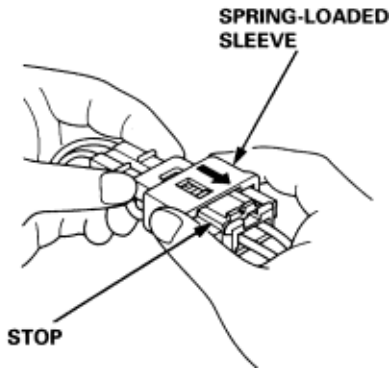
- ◆ Use specified service connectors in troubleshooting. Using tools which are not to specified standard design could cause poor metal-to-metal contact.

Some SRS system connectors have a spring-loaded lock.

Except Side Airbag Connector:

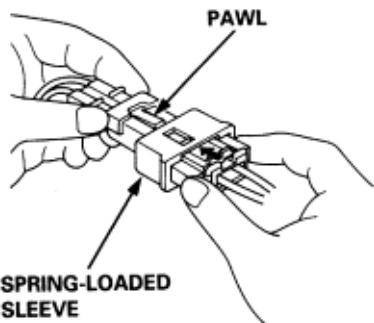
Disconnecting

To release the lock, pull the spring-loaded sleeve toward the stop while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.

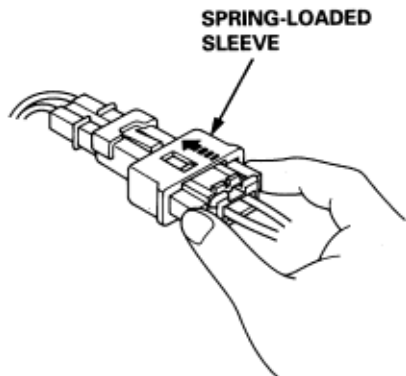


Connecting

1. Hold the pawl-side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve is pushed back by the pawl. Do not touch the sleeve.



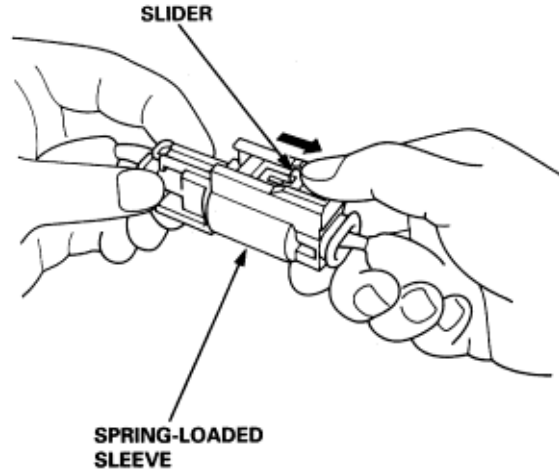
2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.



Side Airbag Connector:

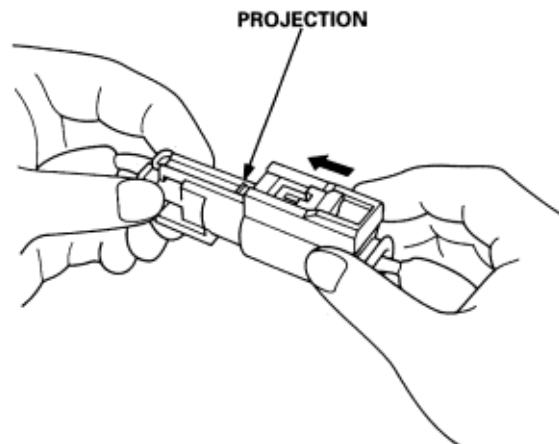
Disconnecting

To release the lock, pull the spring-loaded sleeve with pulling the slider while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.



Connecting

Hold the both connector halves, and press then forcibly until the projection of the sleeve-side connector clicks to lock.



Precautions/Procedures

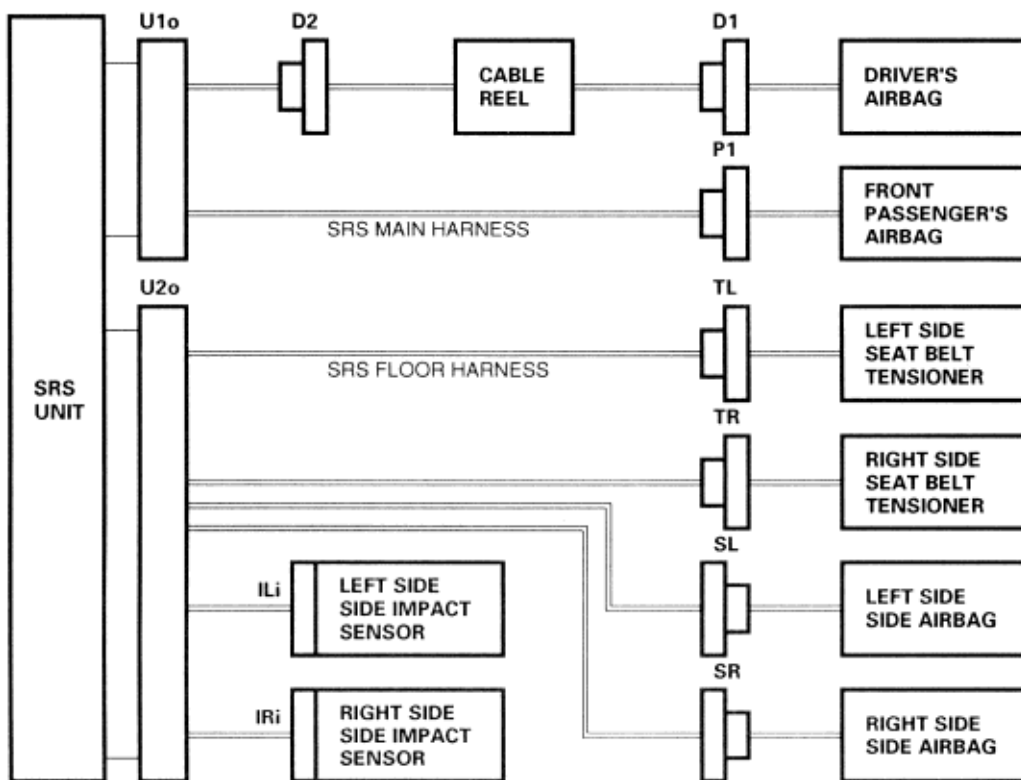
Disconnecting the Airbag Connectors, Side Airbag Connectors and Seat Belt Tensioning Connectors

Before removing the airbag or the side airbag, or SRS related devices (the SRS unit, the cable reel, the side impact sensor and the seat belt tensioner connector), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors from the airbags or the side airbag connectors from the side airbags to prevent accidental deployment.

⚠ WARNING

Turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least three minutes before beginning the following procedures A and B. (procedure B follows the procedure A.)

A. Airbag connectors to be disconnected	B. SRS devices to be removed/SRS-related connectors to be disconnected
Disconnect the D1, P1, TL, TR, SL and SR connectors.	Removal of the SRS unit
Disconnect the D1 connector.	Removal of the cable reel
Disconnect the SL connector.	Removal of the left side side impact sensor
Disconnect the SR connector.	Removal of the right side side impact sensor
Disconnect the D1 connector.	Disconnection of the D2 connector
Disconnect the D1 and P1 connectors.	Disconnection of the U1o connector
Disconnect the TL, TR, SL and SR connectors.	Disconnection of the U2o connector
Disconnect the SL connector.	Disconnection of the ILi connector
Disconnect the SR connector.	Disconnection of the IRi connector



Precautions/Procedures

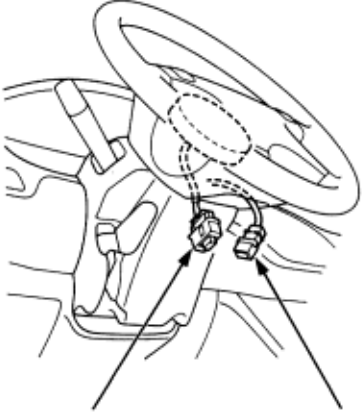
Disconnecting the Airbag Connectors, Side Airbag Connectors and Seat Belt Tensioning Connectors (cont'd)

24-25

1. Disconnect the battery negative cable, and wait at least three minutes.
2. Disconnect the airbag connector(s), the side airbag connector(s) and (or) seat belt tensioner(s) connector(s).

Driver's Side:

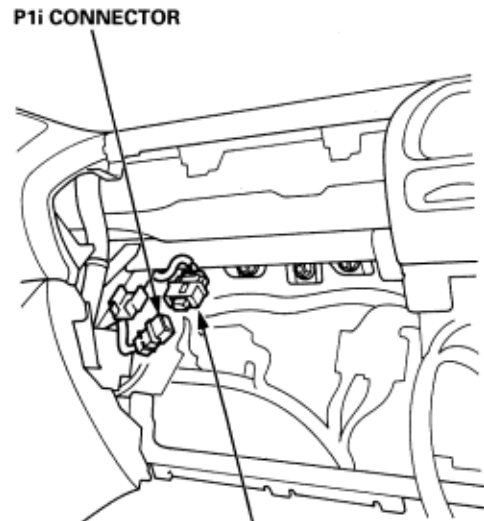
- ♦ Remove the access panel from the steering wheel, then disconnect the D1i connector and D1o connector.



D1o CONNECTOR D1i CONNECTOR

Front Passenger's Side:

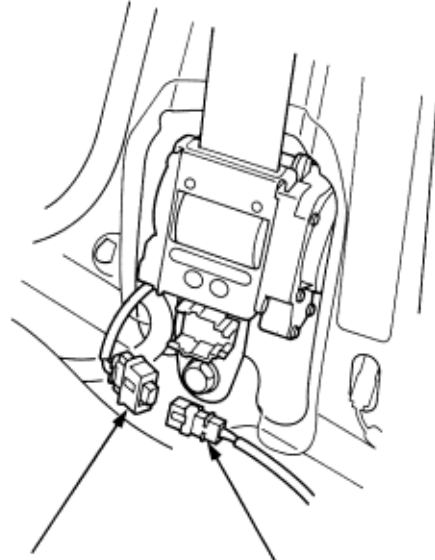
- ♦ Remove the glove box (see section 20), then disconnect the P1i connector and P1o connector.



P1o CONNECTOR

Seat Belt Tensioner:

- ♦ Remove the left and (or) right center pillar lower trim panel (see section 20).
- ♦ Disconnect the TLo connector from the TLi connector and (or) TRo connector from the TRi connector.

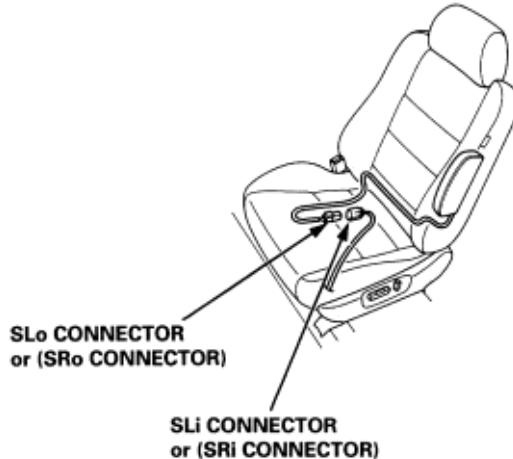


TLo CONNECTOR
or (TRo CONNECTOR)

TLi CONNECTOR
or (TRi CONNECTOR)

Side Airbag:

- ♦ Disconnect the SLo connector from the SLi connector and (or) SRo connector from the SRI connector.



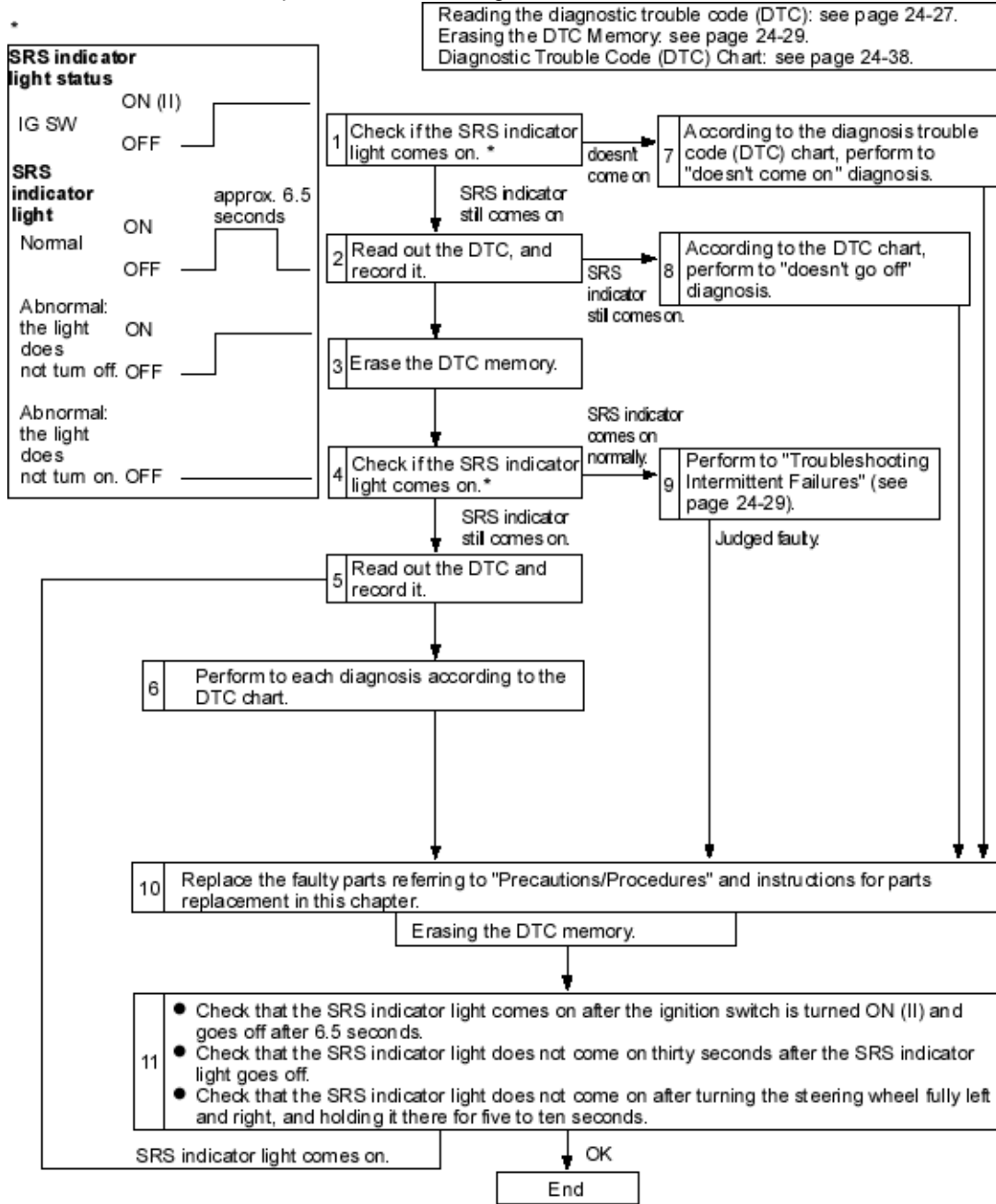
SLo CONNECTOR
or (SRo CONNECTOR)

SLi CONNECTOR
or (SRI CONNECTOR)

For correct and effective troubleshooting, follow the flowchart below.

NOTE:

- Observe the precautions and the procedure described in this chapter in performing troubleshooting.
- Make sure the battery is sufficiently charged. If the battery is dead or low, measuring value will not be correct.
- When performing diagnosis for an open or damage in the wire harness, check the condition of the connectors and visually inspect the terminals for corrosion, bent pins, or other damage.



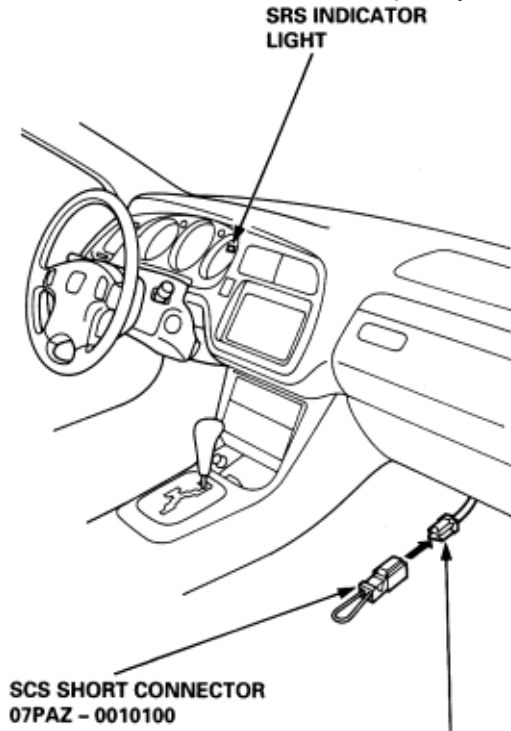
To go to the pages referenced on the diagram above, click on the following:
[\(See Page 24-27\)](#)
[\(See Page 24-29\)](#)
[\(See Page 24-38\)](#)

There are two ways of reading the DTC that depends on the SRS indicator light (A) and using a Honda PGM Tester (B).

A. Reading the DTC by the SRS indicator light:

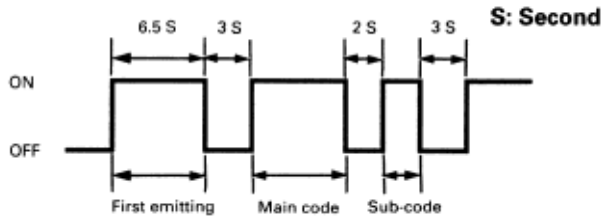
The SRS indicator light indicates the DTC by the number of blinks when the SCS short connector is connected to the service check connector (2P).

1. Turn the ignition switch OFF, and wait for ten seconds. Then connect the SCS short connector to the service check connector (2P). If you do not wait ten seconds, the SRS unit will not be completely reset or output DTCs.



2. Turn the ignition switch ON (II). The SRS indicator light comes on for about 6.5 seconds, and then goes off. Then it will indicate the DTC.
3. Read the DTC.
4. Turn the ignition switch OFF, and wait for ten seconds. Then disconnect the SCS short connector from the service check connector (2P).
5. End.

The DTC consists of a main code and sub-code.

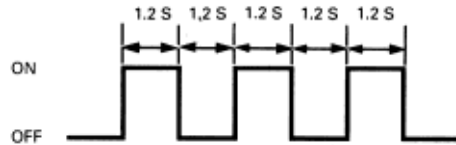


Reading the main code:

In case of 1 ~ 10

Count the number of the blinks.

Example:

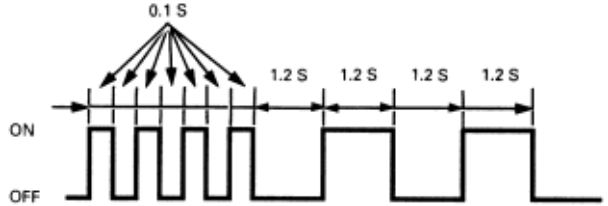


Main code = 1 + 1 + 1 = 3

In case of 11 ~ 14

The indicator's blink is regarded first four continuous blinks as count of ten, then after blink is added to them.

Example:

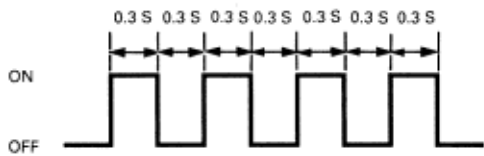


Main code = 10 + 1 + 1 = 12

Reading the sub code:

Count the number of the blinks.

Example:



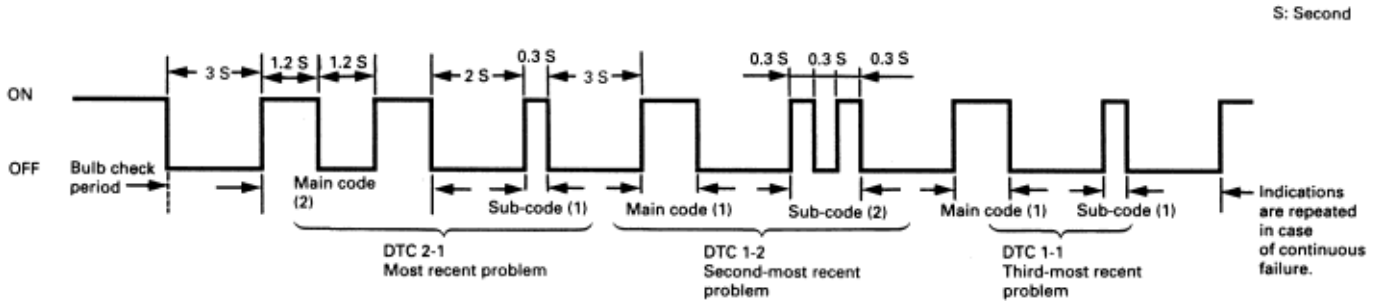
Sub code = 1 + 1 + 1 + 1 = 4

In case of main code is '3', sub code is '4', record a DTC 3-4.

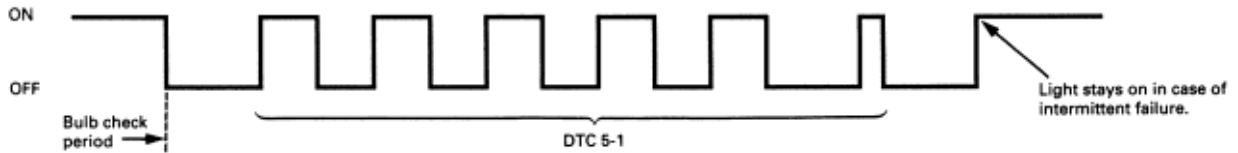
- Including the most recent problem, up to three different malfunctions can be indicated (see example 1 below).
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
- In case of an intermittent failure, the SRS indicator light will indicate the DTC one time, then it will stay on (see example 2 below).
- If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- When the system is normal (no DTC), the SRS indicator light will stay on (see example 3).
- If the SRS indicator light comes on continually without DTC, it will faulty.

Examples of the DTC Indications:

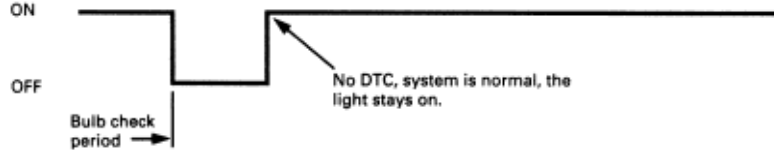
1. Continuous failure, SRS Indicator Light is:



2. Intermittent failure, SRS Indicator Light is:

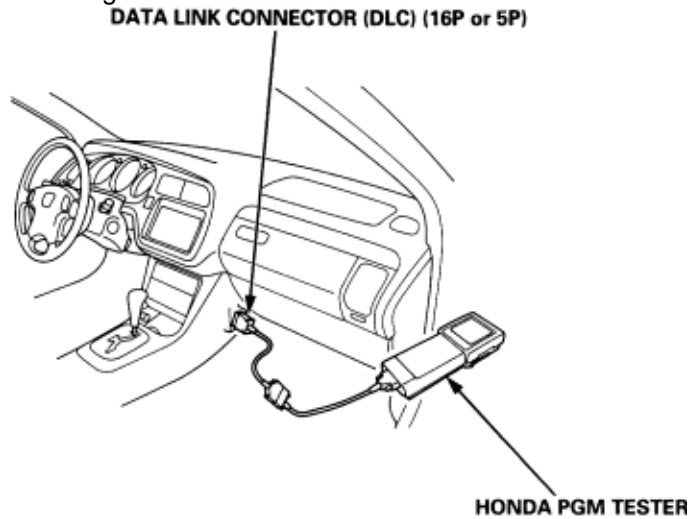


3. Normal (no failure), SRS Indicator Light is:



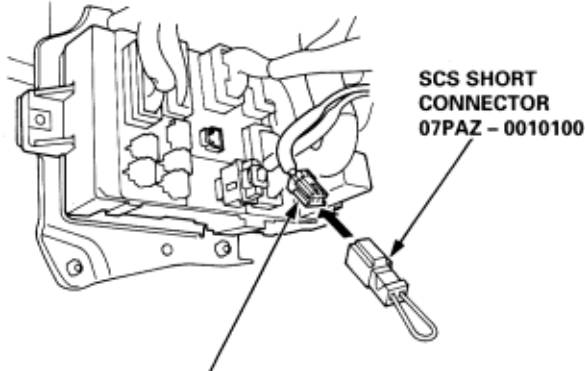
B. Reading the DTC by the Honda PGM Tester:

DTC can be read with the Honda PGM Tester connected to the DLC (16P or 5P) shown below. If the tester indicates the no DTC or DTC 9-1 or DTC 9-2, read by SRS indicator light.



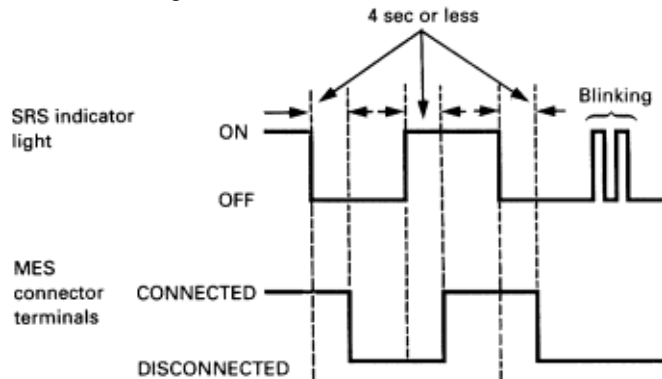
To erase the DTC(s) from the SRS unit, use a Honda PGM Tester SRS vehicle System Supplement or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS short connector to the MES connector (2P). Do not use a jumper wire.



MEMORY ERASE SIGNAL (MES) CONNECTOR (2P) [GRN, GRN], or [GRN/BLK, BRN]

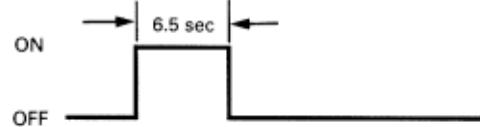
3. Turn the ignition switch ON (II).
4. The SRS indicator light comes on for about 6.5 seconds and goes off. Remove the SCS short connector from the MES connector (2P) within four seconds after the SRS indicator light goes off.
5. The SRS indicator light comes on again. Reconnect the SRS short connector to the MES connector (2P) within four seconds after the SRS indicator light comes on.
6. The SRS indicator light goes off. Remove the SCS short connector from the MES connector (2P) within four seconds.
7. The SRS indicator light indicates that the memory is erased by blinking two times.
8. Turn the ignition switch OFF, and wait for ten seconds.



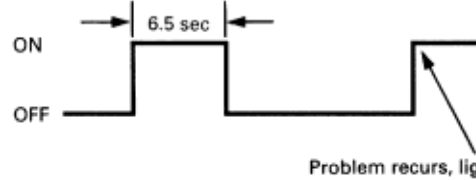
If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator light comes on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see Reading the DTC).
2. Erase the DTC memory (see "Erasing the DTC Memory").
3. With the shift lever in neutral, start the engine, and let the engine idle.
4. The SRS indicator light comes on for about 6.5 seconds and then goes off.



5. Shake the wire harness and connector, take a test drive (quick acceleration, quick braking, cornering), and turn the steering wheel fully left and right, and hold it there for five to ten seconds. If the problem recurs, the SRS indicator light will come on.



6. If you cannot duplicate the intermittent failure, the system is OK at this time.

Troubleshooting**24-30****Diagnostic Trouble Code (DTC) Chart**

SRS indicator light	DTC	Possible cause	Corrective action	See page
doesn't come on	none (doesn't come on)	Faulty SRS indicator light circuit	Troubleshooting	(See Page 24-38)
comes on	none (doesn't go off)	Faulty SRS indicator light circuit, internal failure of SRS unit, faulty SRS power supply (VB line)	Troubleshooting	(See Page 24-40)
comes on	1-1	Open or increased resistance in the driver's airbag	Troubleshooting	(See Page 24-43)
comes on	1-3	Short to another wire or decreased resistance in the driver's airbag inflator	Troubleshooting	(See Page 24-44)
comes on	1-4	Short to power in the driver's airbag inflator	Troubleshooting	(See Page 24-45)
comes on	1-5	Short to ground in the driver's airbag inflator	Troubleshooting	(See Page 24-46)
comes on	2-1	Open or increased resistance in the passenger's airbag inflator	Troubleshooting	(See Page 24-47)
comes on	2-3	Short to another wire or decreased resistance in the passenger's airbag inflator	Troubleshooting	(See Page 24-48)
comes on	2-4	Short to power in the passenger's airbag inflator	Troubleshooting	(See Page 24-49)
comes on	2-5	Short to ground in the passenger's airbag inflator	Troubleshooting	(See Page 24-50)
comes on	3-1	Open or increased resistance in the left side seat belt tensioner	Troubleshooting	(See Page 24-51)
comes on	3-3	Short to another wire or decreased resistance in the left side seat belt tensioner	Troubleshooting	(See Page 24-52)
comes on	3-4	Short to power in the left side seat belt tensioner	Troubleshooting	(See Page 24-53)
comes on	3-5	Short to ground in the left side seat belt tensioner	Troubleshooting	(See Page 24-54)
comes on	4-1	Open or increased resistance in the right side seat belt tensioner	Troubleshooting	(See Page 24-55)
comes on	4-3	Short to another wire or decreased resistance in the right side seat belt tensioner	Troubleshooting	(See Page 24-56)
comes on	4-4	Short to power in the right side seat belt tensioner	Troubleshooting	(See Page 24-57)
comes on	4-5	Short to ground in the right side seat belt tensioner	Troubleshooting	(See Page 24-58)

SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	5-1	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	5-2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	5-3	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	5-4	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	5-5	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	5-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-1	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-3	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-4	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-5	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-6	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-7	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	7-1	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	7-2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	7-3	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-1	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-3	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-4	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-5	Internal failure of the SRS unit	SRS unit replacement	(See Page 4-83)
comes on	8-6	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-7	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	9-1 *1	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	9-2 *2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)

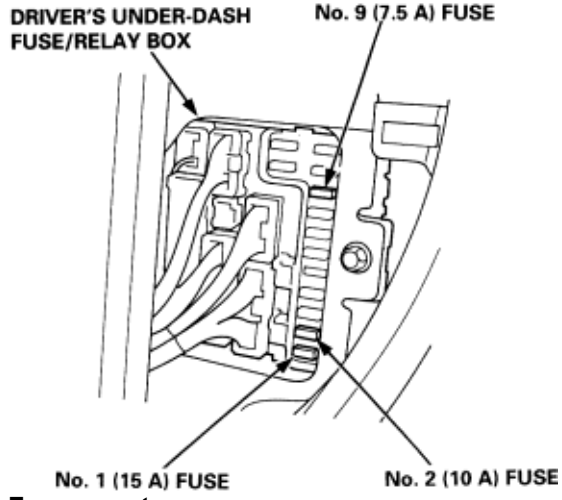
NOTE:

*1: In case of an intermittent failure DTC 9-1, it means there was an internal failure of the SRS unit or faulty SRS indicator light circuit. Do the troubleshooting for intermittent failures (See Page 24-29).

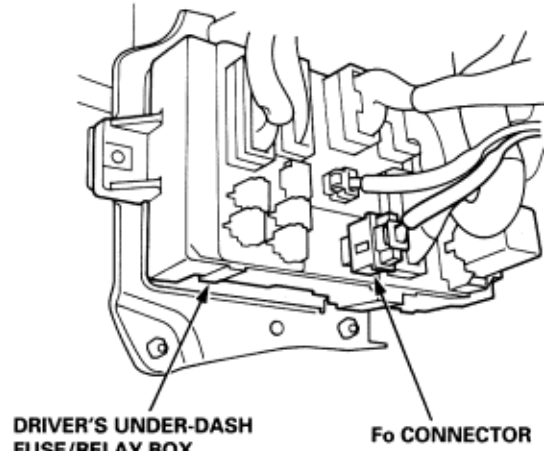
*2: In case of an intermittent failure DTC 9-2, it means there was an internal failure or the power supply (VB line). Do the troubleshooting for intermittent failures (See Page 24-29).

SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	10-1	Airbags and seat belt tensioners deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-2	Left side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-3	Right side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-4	Airbags and seat belt tensioners and left side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-5	Airbags and seat belt tensioners and right side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-6	Side airbags deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-7	Airbags and seat belt tensioners and side airbags deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	11-1	Open or increased resistance in the left side airbag inflator	Troubleshooting	(See Page 24-59)
comes on	11-3	Short to another wire or decreased resistance in the left side side airbag inflator	Troubleshooting	(See Page 24-60)
comes on	11-4	Short to power in the left side side airbag inflator	Troubleshooting	(See Page 24-61)
comes on	11-5	Short to power in the right side side airbag inflator	Troubleshooting	(See Page 24-62)
comes on	12-1	Open or increased resistance in the right side side airbag inflator	Troubleshooting	(See Page 24-63)
comes on	12-3	Short to another wire or decreased resistance in the right side side airbag inflator	Troubleshooting	(See Page 24-64)
comes on	12-4	Short to power in the right side side airbag inflator	Troubleshooting	(See Page 24-65)
comes on	12-5	Short to ground in the right side side airbag inflator	Troubleshooting	(See Page 24-66)
comes on	13-1	Internal failure of the left side side impact sensor	Left side side impact sensor replacement	(See Page 24-84)
comes on	13-2	Internal failure of the left side side impact sensor	Left side side impact sensor replacement	(See Page 24-84)
comes on	13-3	Faulty signal line of the left side side impact sensor	Troubleshooting	(See Page 24-67)
comes on	13-4	Faulty power line of the left side side impact sensor	Troubleshooting	(See Page 24-68)
comes on	14-1	Internal failure of the right side side impact sensor	Right side side impact sensor replacement	(See Page 24-83)
comes on	14-2	Internal failure of the right side side impact sensor	Right side side impact sensor replacement	(See Page 24-83)
comes on	14-3	Faulty signal line of the right side side impact sensor	Troubleshooting	(See Page 24-70)
comes on	14-4	Faulty power line of the right side side impact sensor	Troubleshooting	(See Page 24-71)

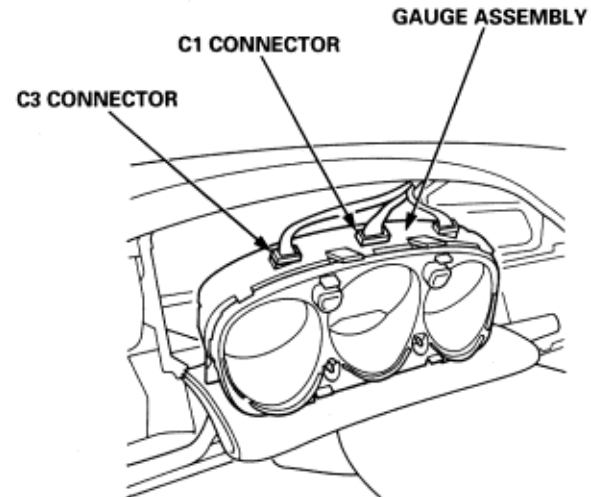
Driver's under-dash fuse/relay box:



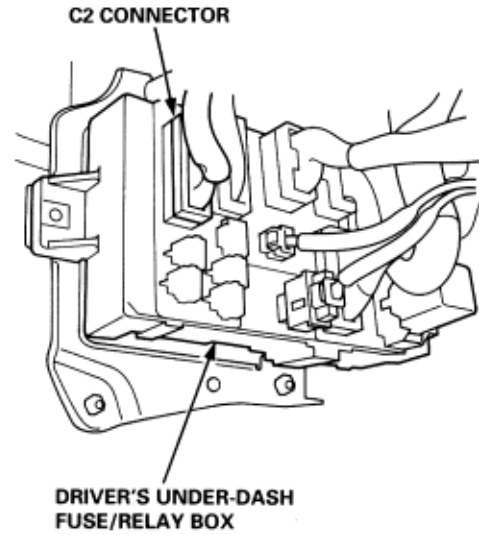
Fo connector:



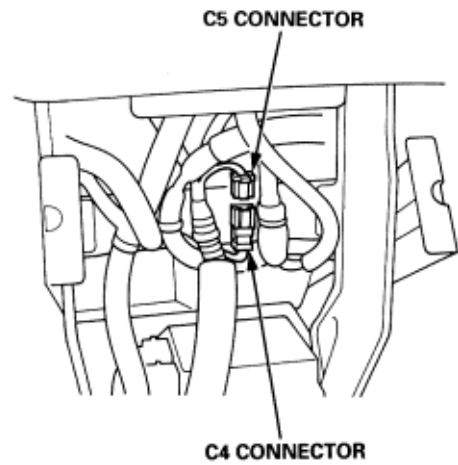
C1, C3 connector:



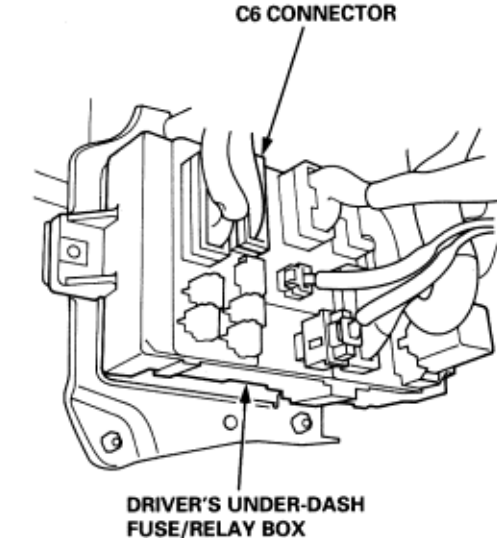
C2 connector:



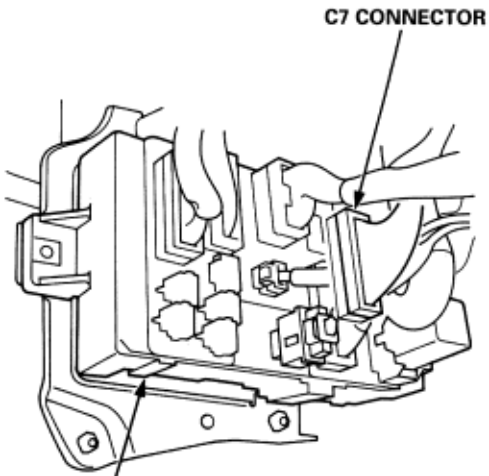
C4, C5 connector:



C6 connector:

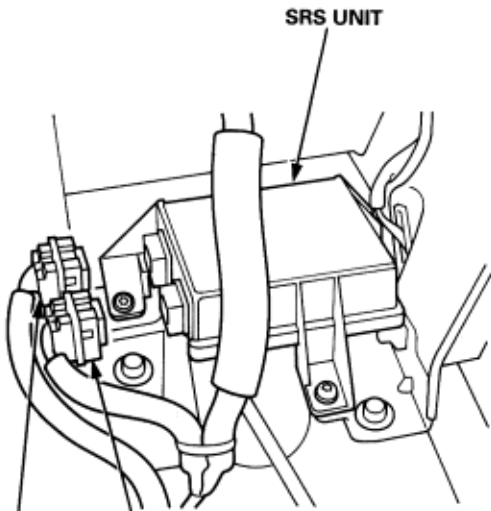


C7 connector:



**DRIVER'S UNDER-DASH
FUSE/RELAY BOX**

U1o, U2o connector:

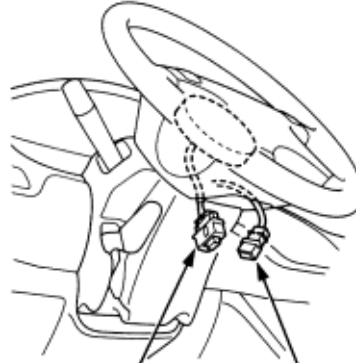


SRS UNIT

U2o CONNECTOR

U1o CONNECTOR

D1o and D1i connector:

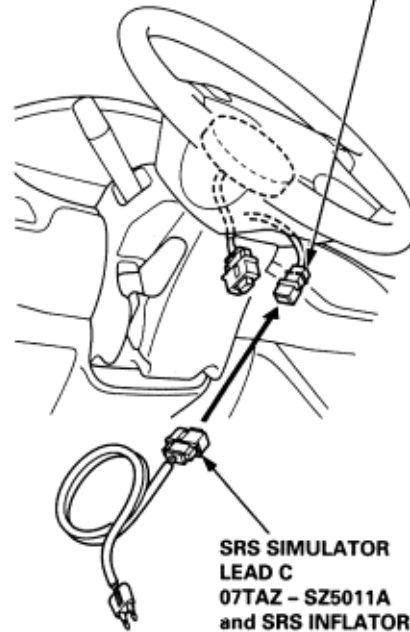


D1o CONNECTOR

D1i CONNECTOR

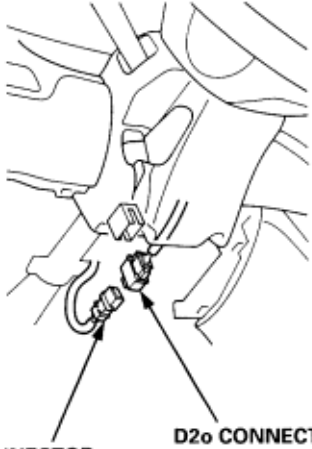
Connecting the special tool to the D1i connector:

D1i CONNECTOR

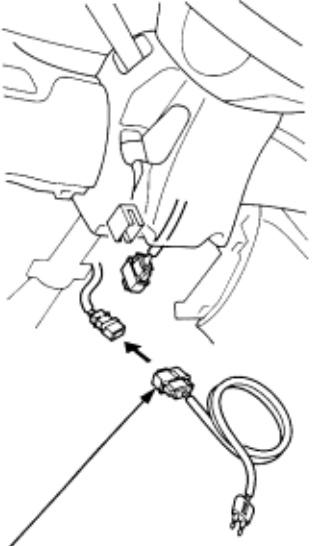


**SRS SIMULATOR
LEAD C
07TAZ - SZ5011A
and SRS INFLATOR
SIMULATOR
(2 Ω JACK)
07SAZ - TB4011A**

D2o and D2i connector:

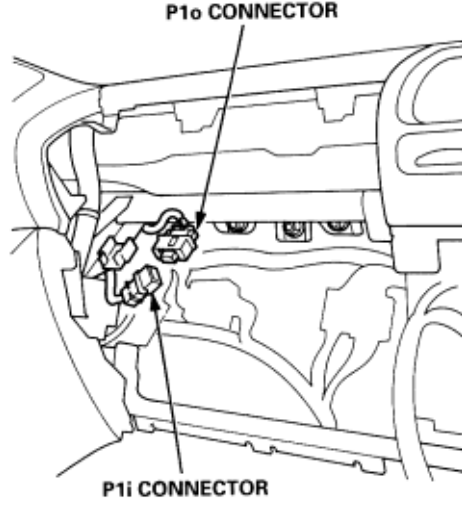


Connecting the special tool to the D2i connector:

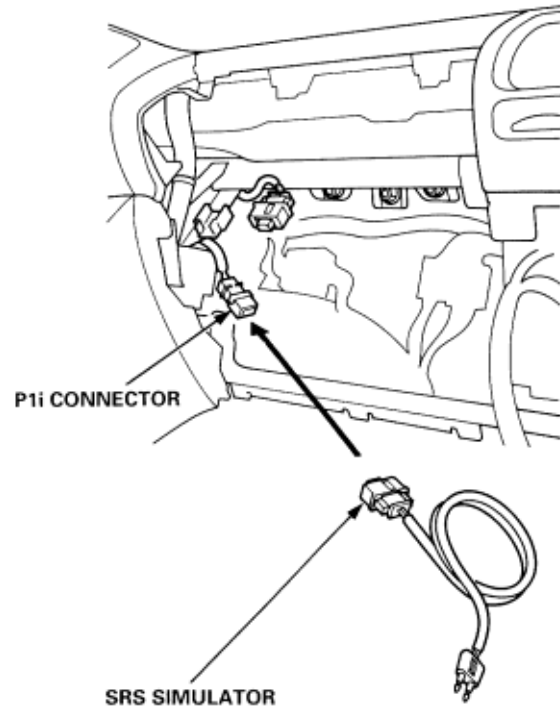


**SRS SIMULATOR
LEAD C
07TAZ - SZ5011A
and SRS INFLATOR
SIMULATOR
(2 Ω JACK)
07SAZ - TB4011A**

P1o and P1i connector:

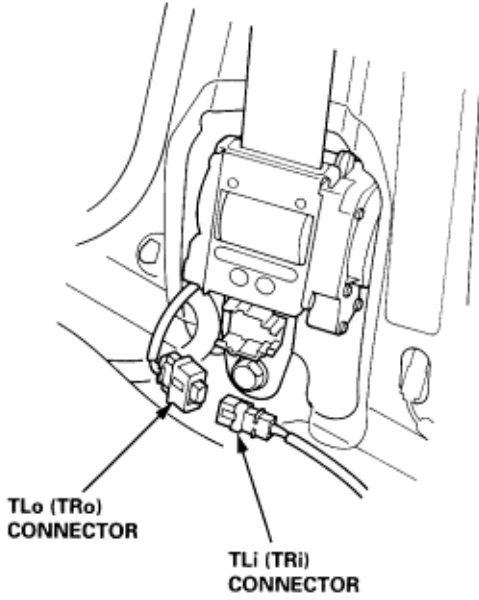


Connecting the special tool to the P1i connector:

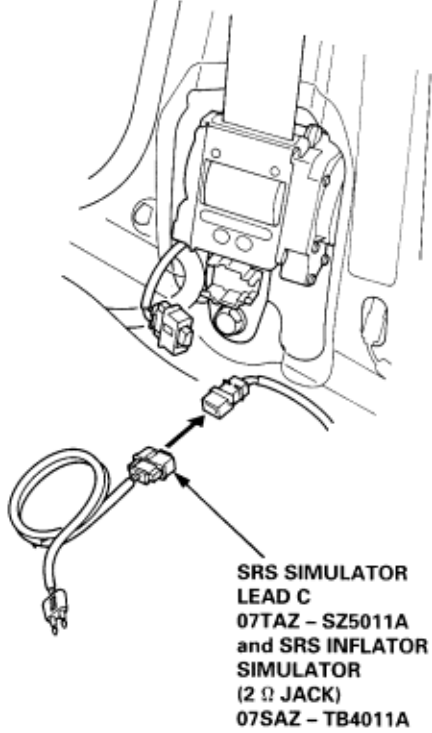


**SRS SIMULATOR
LEAD C
07TAZ - SZ5011A
and SRS INFLATOR
SIMULATOR
(2 Ω JACK)
07SAZ - TB4011A**

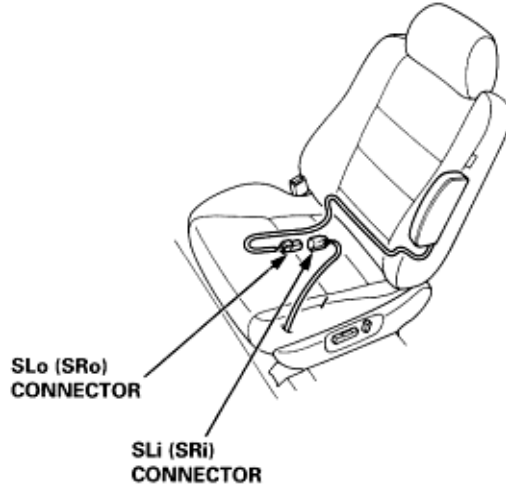
TLo connector and TLi connector (left side) or TRo connector and TRi connector (right side):



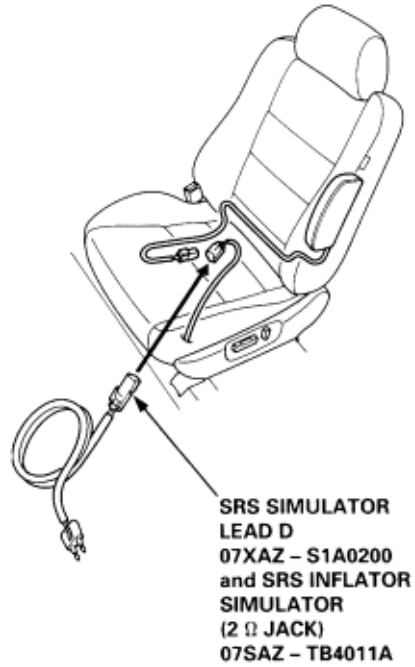
Connecting the special tool to the TLi (or TRi) connector:



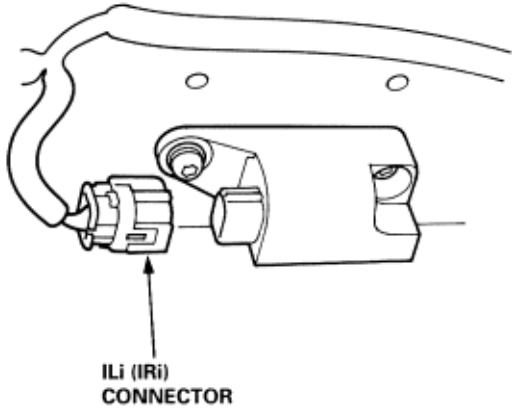
SLo connector and SLi connector (left side) or SRO connector and SRi connector (right side):



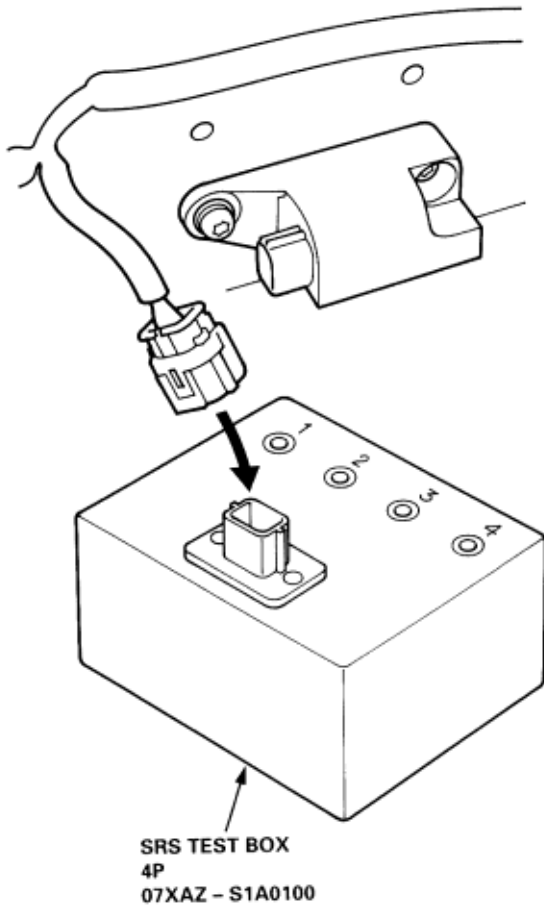
Connecting the special tool to the SLi (or SRi) connector:



ILi connector (left side) or IRi connector (right side):

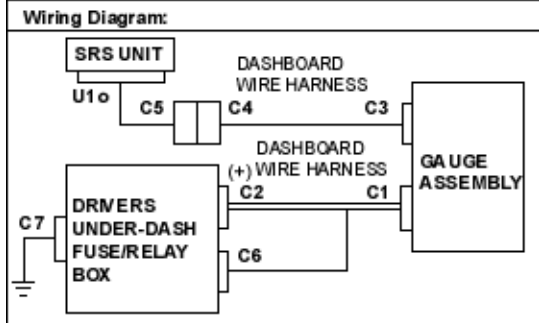


Connecting the special tool to the ILi (or IRi) connector:



CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.



- Possible Causes of Failures:**
- Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box. There is a possibility of a short to ground between the C1 and C2 connectors in the dashboard wire harness or short to ground in other circuits in relation to the No. 9 fuse.
 - Open between the C1 and C2 connectors in the dashboard wire harness.
 - Short to power between the U1o and C3 connectors.
 - Open in the wire between the C1 connector and body ground.
 - Faulty SRS unit.
 - Failure or blown bulbs in the gauge assembly.
- Refer to pages 24-33 for the fuse box and connector locations.

Check the power supply (fuse):
Turn the ignition switch ON (II), and check whether the other indicator lights come on or not (brake system, ect).

Do the other indicator lights come on?

YES NO

Check the fuse:
Check the No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box (see page 24-33).

Is the fuse OK?

YES NO

(B) (C)

(A)

(A)

(B) (C)

Check the bulb:
Replace the No. 9 (7.5 A) fuse, and check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES NO

END

Check the wire harness between fuse and gauge assembly:
Check for an open in the wire between fuse No. 9 (7.5A) and the gauge assembly, and repair. Check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES NO

END

Check the SRS indicator light bulb:
1. Turn the ignition switch OFF.
2. Remove the gauge assembly.
3. Check for blown SRS indicator light bulb.

Is the SRS indicator light bulb OK?

YES NO

Check the SRS indicator light circuit:
Replace the bulb, and reconnect the gauge assembly connectors. Then turn the ignition switch ON (II).

Does the SRS indicator light come on?

YES NO

END

To page 24-39 (E)

(D) To page 24-39

To go to the page referenced on the diagram above, click on the following:
(See Page 24-33)

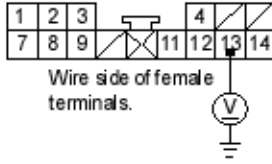
(D) From page 24-38

From page 24-38 (E)

(F)

Check the SRS indicator light circuit:

Disconnect the C3 connector from the gauge assembly (see page 24-33).
Connect a voltmeter between the No. 13 terminal (+) of the C3 connector and ground.
Turn the ignition switch ON (II), and measure voltage.



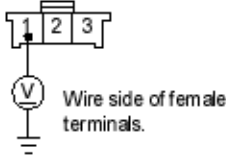
Is there 8.5V or less for 6.6 seconds after the ignition switch has been turned ON (II)?

YES **NO**

Faulty SRS indicator light circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly.

Check the wire harness of the SRS indicator light circuit (1):

1. Turn the ignition switch OFF.
2. Disconnect the C5 connector from the dashboard wire harness (see page 24-33).
3. Connect a voltmeter between the No. 1 terminal (+) of the C5 connector and ground.
4. Turn the ignition switch ON (II), and measure voltage.



Is there 8.5V or less for six seconds after the ignition switch has been turned ON (II)?

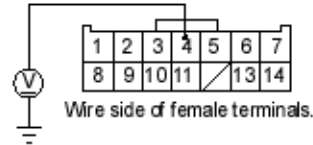
YES **NO**

Short to power in the BLU wire of the dashboard wire harness; repair the dashboard wire harness.

(F)

Check the wire harness of the SRS indicator circuit (2):

1. Turn the ignition switch OFF.
2. Disconnect the negative battery cable and wait for three minutes.
3. Disconnect the D1 and P1 connectors (see page 24-25).
4. Disconnect the U1o connector from the SRS unit (see page 24-34).
5. Reconnect the negative battery cable.
6. Connect a voltmeter between the No. 4 terminal (+) of the U1o connector and ground.
7. Turn the ignition switch ON (II), and measure voltage. There should be 0.5V or less.



Is voltage as specified?

YES **NO**

Faulty SRS unit; replace the unit (see page 24-83).

Short to power in the BLU wire of the SRS main harness; replace the SRS main harness.

To go to the pages referenced on the diagram above, click on the following:

(See Page 24-33)

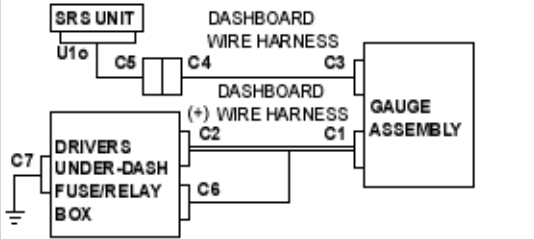
(See Page 24-25)

(See Page 24-34)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failure:

- Blown No. 2 (10A) fuse in the driver's under-dash fuse/relay box.
- Open or short to ground between the U1o and C3 connectors.
- Faulty SRS indicator light circuit in the gauge assembly.
- Faulty SRS unit.
- Faulty power supply circuit in the SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II) and check that the SRS indicator light comes on for about 6.5 seconds and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on Page 24-29.

Check the No. 2 (10A) fuse:

1. Turn the ignition switch OFF.
2. Check for blown No. 2 (10A) fuse in the driver's underdash fuse/relay box (see page 24-33).

Is the fuse OK?

YES NO

(A)

(B)

(B)

Replace the fuse, and erase the memory:

1. Replace the No. 2 (10A) fuse.
2. Erase the DTC memory (see page 24-29).
3. Turn the ignition switch ON (II).

Does the SRS indicator light go off after 6.5 seconds?

YES NO

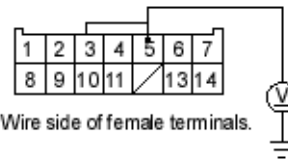
END

Confirm the DTC, and continue troubleshooting.

(A)

Check for an open in the SRS main harness (VB line):

1. Disconnect the negative battery cable and wait for three minutes.
2. Disconnect the D1 and P1 connectors (see page 24-25).
3. Disconnect the U1o connector from the SRS unit (see page 24-34).
4. Reconnect the negative battery cable.
5. Connect a voltmeter between the No. 5 terminal (+) of the U1o connector and ground.
6. Turn the ignition switch ON (II).



Is there battery voltage?

YES NO

Open in the SRS main harness (VB line); replace the SRS main harness.

(C) To page 24-41

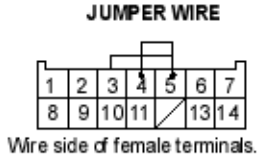
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-25)
- (See Page 24-34)

(C) From page 24-40

Check the SRS unit

Connect the U10 connector terminals No. 4 and No. 5 with a jumper wire and backprobe adapters.



Does the SRS indicator light go off?

YES NO

Faulty SRS unit or poor contact at the U10 connector; check the connector. If the connector is OK, replace the SRS unit (see page 24-83).

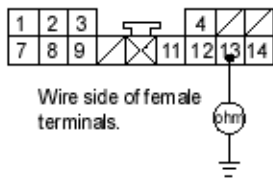
Did fuse No. 2 (10 A) blow?

YES NO

(D)

Check for a short to ground in the SRS indicator light circuit

1. Turn the ignition switch OFF.
2. Disconnect the C3 connector from the gauge assembly (see page 24-33).
3. Check resistance between the No. 13 terminal of the C3 connector and ground. There should be 1 M ohm or more.



Is resistance as specified?

YES NO

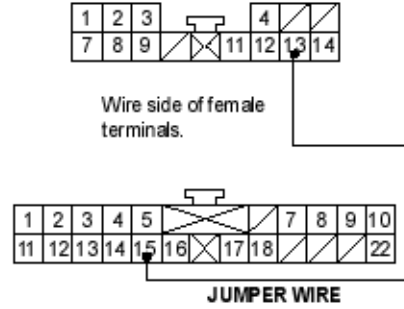
Short to ground in the gauge assembly; replace the gauge assembly.

To page 24-42 (E)

(D)

Check the SRS indicator light circuit

1. Turn the ignition switch OFF.
2. Remove the gauge assembly. Do not disconnect the connector from the gauge assembly.
3. Turn the ignition switch ON (II).
4. Connect the No. 13 terminal of the C3 connector and No. 15 terminal of the C1 connector with a jumper wire (see page 24-33).



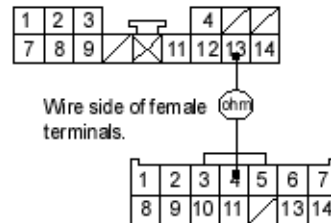
Does the SRS indicator light go off?

YES NO

Faulty SRS indicator light circuit in the gauge assembly; replace the SRS indicator circuit board in the gauge assembly.

Check for an open in the SRS indicator light circuit:

1. Turn the ignition switch OFF.
2. Disconnect the C3 connector from the gauge assembly (see page 24-33).
3. Check resistance between the No. 4 terminal of the U10 connector and No. 13 terminal of the C3 connector; there should be 0 - 1.0 ohm.



Is the resistance as specified?

YES NO

(F) To page 24-42

To page 24-42 (G)

To go to the pages referenced on the diagram above,

click on the following:

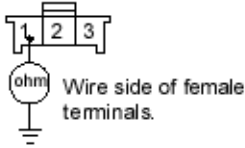
(See Page 24-83)

(See Page 24-33)

From page 24-41 (E)

Check for a short to ground in the SRS main harness:

1. Disconnect the C5 connector from the dashboard wire harness (see page 23-33).
2. Check resistance between the No. 1 terminal of the C5 connector and ground. There should be 1 M ohm or more.



Is the resistance as specified?

YES

NO

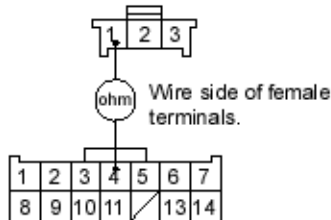
Short to ground in the dashboard wire harness; repair the dashboard wire harness.

Short to ground in the SRS main harness; replace the SRS main harness.

From page 24-41 (G)

Check for an open in the dashboard wire harness:

1. Disconnect the C5 connector from the dashboard wire harness (see page 24-33).
2. Check resistance between the No. 4 terminal of the U1o connector and No. 1 terminal of the C5 connector; there should be 0 - 1.0 ohm.



Is the resistance as specified?

YES

NO

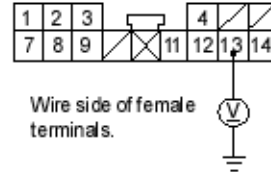
Open in the BLU wire of the dashboard wire harness; repair the dashboard wire harness.

Open in the SRS main harness; replace the SRS main harness.

(F) From page 24-41

Check the SRS indicator circuit input voltage:

1. Reconnect the U1o connector to the SRS unit.
2. Connect a voltmeter between the No. 13 terminal (+) of the C3 connector and ground.
3. Turn the ignition switch ON (II), wait for 6.5 seconds, then measure voltage.



Is there 8.5 V or more?

YES

NO

The problem has disappeared due to disconnecting and connecting the connectors. Be sure all terminals make good contact, and recheck the system (see Troubleshooting Intermittent Failures on page 24-29).

Poor contact at the U1o connector; check the connector.

- If the connector is OK, substitute a known-good SRS unit, and recheck.
- If the problem is still present, replace the SRS main harness.

To go to the pages referenced on the diagram above, click on the following:

(See Page 24-33)

(See Page 24-29)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Open or increased resistance between the U1o connector and the D1i connectors.
- Open or increased resistance in the driver's air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for an open or increased resistance in the driver's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1i connector from the D1o connector (see page 24-34).
3. Connect the special tool (2 ohm) to the D1i connector (see page 24-34).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 1-1 indicated?

YES NO

Open or increased resistance in the driver's air bag inflator; replace the driver's air bag (see page 24-73).

(A)

Check for an open or increased resistance in the cable reel:

1. Disconnect the D2i connector from the D2o connector (see page 24-35).
2. Connect the special tool (2 ohm) to the D2i connector (see page 24-35).
3. Erase the DTC memory (see page 24-29).
4. Read the DTC (see page 24-27).

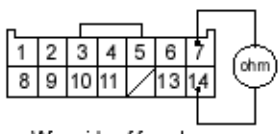
Is DTC 1-1 indicated?

YES NO

Open or increased resistance in the cable reel; replace the cable reel (see page 24-80).

Check for an open or increased resistance in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1 connector (see page 24-35).
3. Disconnect the U1o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the D2i connector.
4. Check resistance between the No. 7 terminal and the No. 14 terminal of the U1o connector. There should be 2.0 - 3.0 ohm.



Is the resistance as specified?

YES NO

Faulty SRS unit or poor contact at the U1o connector and the SRS unit, check the connection between the U1o connector and the SRS unit.
● If the connection is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS main harness; replace the SRS main harness.

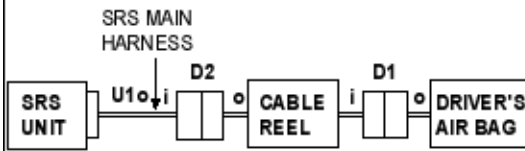
(A)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 24-33\)](#)
[\(See Page 24-29\)](#)
[\(See Page 24-34\)](#)
[\(See Page 24-27\)](#)
[\(See Page 24-73\)](#)
[\(See Page 24-35\)](#)
[\(See Page 24-83\)](#)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failure:

- Short to another wire between the U1o connector and the D1i connectors.
- Short to another wire in the driver's air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II) and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to another wire in the driver's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1i connector from the D1o connector (see page 24-34).
3. Connect the special tool (2 ohm) to the D1i connector (see page 24-34).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 1-3 indicated?

YES NO

Short to another wire in the driver's air bag inflator; replace the driver's air bag (see page 24-73).

(A)

Check for a short to another wire in the cable reel:

1. Disconnect the D2o connector from the D2i connector (see page 24-35).
2. Connect the special tool (2 ohm) to the D2i connector (see page 24-35).
3. Erase the DTC memory (see page 24-29).
4. Read the DTC (see page 24-27).

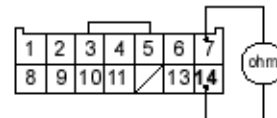
Is DTC 1-3 indicated?

YES NO

Short to another wire in the cable reel; replace the cable reel (see page 24-80).

Check for a short to another wire in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1 connector (see page 24-35).
3. Disconnect the U1o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the D2i connector (see page 24-35).
5. Check resistance between the No. 7 terminal and the No. 14 terminal of the U1o connector. There should be 1 M ohm or more.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS main harness; replace the SRS main harness.

(A)

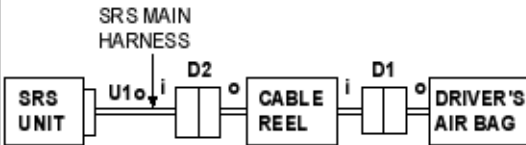
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-73)
- (See Page 24-35)
- (See Page 24-80)
- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failure:

- Short to power between the U1o connector and the D1i connectors.
- Short to power in the driver's air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to power in the driver's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1i connector from the D1o connector (see page 24-34).
3. Connect the special tool (2 ohm) to the D1i connector (see page 24-34).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 1-4 indicated?

YES NO

Short to power in the driver's air bag inflator; replace the driver's air bag (see page 24-73).

(A)

Check for a short to power in the cable reel:

1. Disconnect the D2o connector from the D2i connector (see page 24-35).
2. Connect the special tool (2 ohm) to the D2i connector (see page 24-35).
3. Erase the DTC memory (see page 24-29).
4. Read the DTC (see page 24-27).

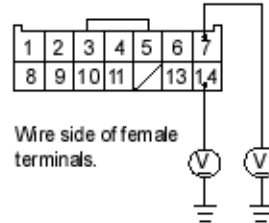
Is DTC 1-4 indicated?

YES NO

Short to power in the cable reel; replace the cable reel (see page 24-80).

Check for a short to power in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1 connector (see page 24-35).
3. Disconnect the U1o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the D2i connector (see page 24-35).
5. Reconnect the negative battery cable.
6. Turn the ignition switch ON (II).
7. Check for voltage between the No. 7 terminal of the U1o connector and the body ground, and between the No. 14 terminal of the U1o connector and body ground. There should be 0.5 V or less.



Is the voltage as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to power in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-73)
- (See Page 24-35)
- (See Page 24-80)
- (See Page 24-83)



CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to ground between the U1o connector and the D1i connectors.
- Short to ground in the driver's air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to ground in the driver's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1i connector from the D1o connector (see page 24-34).
3. Connect the special tool (2 ohm) to the D1i connector (see page 24-34).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 1-5 indicated?

YES NO

Short to ground in the driver's air bag inflator, replace the driver's air bag (see page 24-73).

(A)

Check for a short to ground in the cable reel:

1. Disconnect the D2o connector from the D2i connector (see page 24-35).
2. Connect the special tool (2 ohm) to the D2i connector (see page 24-35).
3. Erase the DTC memory (see page 24-29).
4. Read the DTC (see page 24-27).

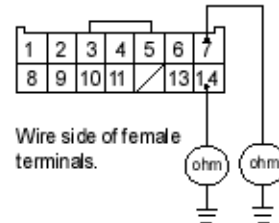
Is DTC 1-5 indicated?

YES NO

Short to ground in the cable reel; replace the cable reel (see page 24-80).

Check for a short to ground in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1 connector (see page 24-35).
3. Disconnect the U1o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the D2i connector (see page 24-35).
5. Check resistance between the No. 7 terminal of the U1o connector and body ground, and between the No. 14 terminal of the U1o connector and body ground. There should be 1 M ohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Open or increased resistance between the U1o connector and the P1i connectors.
- Open or increased resistance in the front passenger's air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for an open or increased resistance in the front passenger's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1i connector from the P1o connector (see page 24-35).
3. Connect the special tool (2 ohm) to the P1i connector (see page 24-35).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 2-1 indicated?

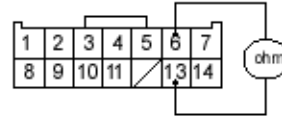
YES NO

Open or increased resistance in the front passenger's air bag inflator; replace the front passenger's air bag (see page 24-75).

(A)

Check for an open or increased resistance in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1 connector (see page 24-34).
3. Disconnect the U1o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the P1i connector.
4. Check resistance between the No. 6 and No. 13 terminals of the U1o connector. There should be 2.0 - 3.0 ohm.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit or poor contact at the U1o connector and the SRS unit; check the connection between the U1o connector and the SRS unit.

- If the connector is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-75)
- (See Page 24-35)
- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to another wire between the U1o connector and the P1i connectors.
- Short to another wire in the front passenger's air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to another wire in the front passenger's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1i connector from the P1o connector (see page 24-35).
3. Connect the special tool (2 ohm) to the P1i connector (see page 24-35).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 2-3 indicated?

YES NO

Short to another wire in the front passenger's air bag inflator; replace the front passenger's air bag (see page 24-75).

(A)

Check for a short to another wire in the SRS main harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the D1 connector (see page 24-34).
3. Disconnect the special tool (2 ohm) from the P1i connector (see page 24-35).
4. Disconnect the U1o connector from the SRS unit (see page 24-34).
5. Check resistance between the No. 6 and No. 13 terminals of the U1o connector. There should be 1 Mohm or more.

Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to power between the U1o connector and the P1i connectors.
- Short to power in the front passenger's air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to power in the front passenger's air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1i connector from the P1o connector (see page 24-35).
3. Connect the special tool (2 ohm) to the P1i connector (see page 24-35).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

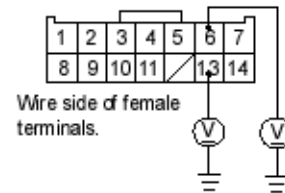
Is DTC 2-4 indicated?

YES NO

Short to power in the front passenger's air bag inflator; replace the front passenger's air bag (see page 24-75).

(A)

- Check for a short to power in the SRS main harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the D1 connector (see page 24-34).
 3. Disconnect the U1o connector from the SRS unit (see page 24-34).
 4. Disconnect the special tool (2 ohm) from the P1i connector (see page 24-35).
 5. Reconnect the negative battery cable.
 6. Turn the ignition switch ON (II).
 7. Check for voltage between the No. 6 terminal of the U1o connector and body ground, and between the No. 13 terminals of the U1o connector and body ground. There should be 0.5 V or less.



Is the voltage as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to power in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

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- (See Page 24-29)
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to ground between the U1o connector and the P1i connectors.
- Short to ground in the front passenger's air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES	NO
-----	----

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29

Check for a short to ground in the front passenger's air bag inflator

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the P1i connector from the P1o connector (see page 24-35).
3. Connect the special tool (2 ohm) to the P1i connector (see page 24-35).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

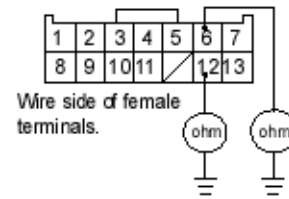
Is DTC 2-5 indicated?

YES	NO
-----	----

Short to ground in the front passenger's air bag inflator; replace the front passenger's air bag (see page 24-76).

(A)

- Check for a short to ground in the SRS main harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the D1 connector (see page 24-34).
 3. Disconnect the U1o connector from the SRS unit (see page 24-34).
 4. Disconnect the special tool (2 ohm) from the P1i connector (see page 24-35).
 5. Check resistance between the No. 6 terminal of the U1o connector and body ground, and between the No. 13 terminal of the U1o connector and body ground. There should be 1 M ohm or more.



Is the resistance as specified?

YES	NO
-----	----

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS main harness; replace the SRS main harness.

(A)

To go to the pages referenced on the diagram above, click on the following:
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Open or increased resistance between the U2o connector and the TLi connectors.
- Open or increased resistance in the left side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for an open or increased resistance in the left side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TLi connector from the TLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 3-1 indicated?

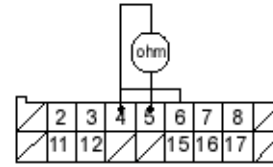
YES NO

Open or increased resistance in the left side seat belt tensioner; replace the left side seat belt (see page 24-78).

(A)

Check for an open or increased resistance in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TR, (SL and SR) connector(s) (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the TLi connector.
4. Check resistance between the No. 4 and No. 5 terminals of the U2o connector. There should be 2.0 - 3.0 ohm.



Wire side of female terminals.

Is the resistance as specified?

YES

NO

Faulty SRS unit or poor contact at the U2o connector and the SRS unit, check the connection between the U2o connector and the SRS unit

- If the connector is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS floor harness; replace the SRS floor harness.

(A)

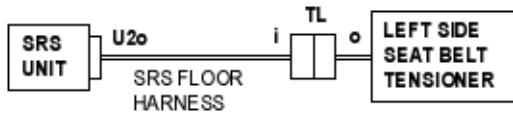
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to another wire between the U2o connector and the TLi connectors.
- Short to another wire in the left side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to another wire in the left side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TLi connector from the TLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 3-3 indicated?

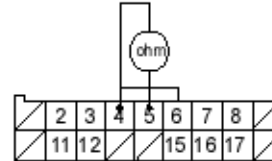
YES NO

Short to another wire in the left side seat belt tensioner; replace the left side seat belt (see page 24-78).

(A)

Check for a short to another wire in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TR, (SL and SR) connector(s) (see page 24 - 36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the TLi connector (see page 24-36).
5. Check resistance between the No. 4 and No. 5 terminals of the U2o connector. There should be 1 Mohm or more.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS floor harness; replace the SRS floor harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to power between the U2o connector and the TLi connectors.
- Short to power in the left side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to power in the left side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TLi connector from the TL0 connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 3-4 indicated?

YES NO

Short to power in the left side seat belt tensioner; replace the left side seat belt (see page 24-78).

(A)

Check for a short to power in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TRo, (SLi and SRi) connector(s) (see page 24 - 36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Check resistance between the No. 4 and No. 7 terminals of the U2o connector, and between the No. 4 and No. 8 terminals of the U2o connector. There should be 1 Mohm or more.

Is the resistance as specified?

YES NO

Short to power in the SRS floor harness; replace the SRS floor harness.

Faulty SRS unit; replace the SRS unit (see page 24-83).

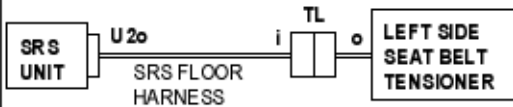
(A)

To go to the pages referenced on the diagram above, click on the following:
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to ground between the U2o connector and the TLi connectors.
- Short to ground in the left side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to ground in the left side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TLi connector from the TL0 connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 3-5 indicated?

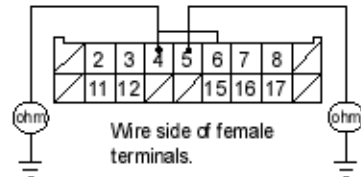
YES NO

Short to ground in the left side seat belt tensioner; replace the left side seat belt (see page 24-78).

(A)

Check for a short to ground in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TR, (SL and SR) connector(s) (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the TLi connector (see page 24-36).
5. Check resistance between the No. 4 terminal of the U2o connector and body ground, and between the No. 5 terminals of the U2o connector and body ground. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS floor harness; replace the SRS floor harness.

(A)

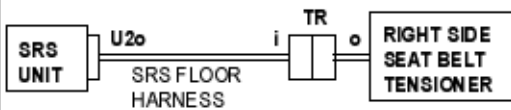
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-78)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Open or increased resistance between the U2o connector and the TRi connectors.
- Open or increased resistance in the right side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for an open or increased resistance in the right side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TRi connector from the TRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 4-1 indicated?

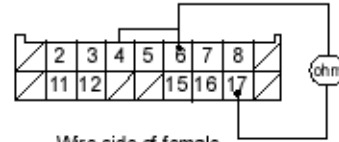
YES NO

Open or increased resistance in the right side seat belt tensioner; replace the right side seat belt (see page 24-78).

(A)

Check for an open or increased resistance in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TL, (SL and SR) connector(s) (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the TRi connector.
4. Check resistance between the No. 6 and No. 17 terminals of the U2o connector. There should be 2.0 - 3.0 ohm.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit or poor contact at the U2o connector and the SRS unit, check the connection between the U2o connector and the SRS unit.

- If the connector is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS floor harness; replace the SRS floor harness.

(A)

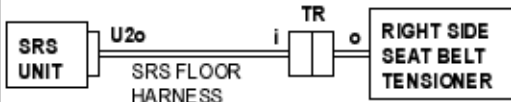
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
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- (See Page 24-27)
- (See Page 24-78)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to another wire between the U2o connector and the TRi connectors.
- Short to another wire in the right side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to another wire in the right side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TRi connector from the TRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 4-3 indicated?

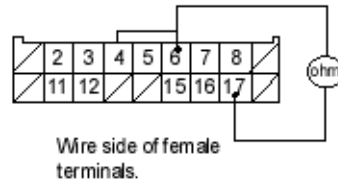
YES NO

Short to another wire in the right side seat belt tensioner; replace the right side seat belt (see page 24-78).

(A)

Check for a short to another wire in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TL, (SL and SR) connector(s) (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Disconnect the special tool (2 ohm) from the TRi connector (see page 24-36).
5. Check resistance between the No. 6 and No. 17 terminals of the U2o connector. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS floor harness; replace the SRS floor harness.

(A)

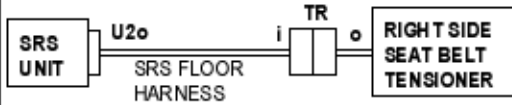
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-78)
- (See Page 24-36)
- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to power between the U2o connector and the TRi connectors.
- Short to power in the right side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to power in the right side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TRi connector from the TRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 4-4 indicated?

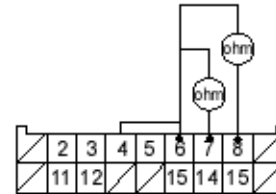
YES NO

Short to power in the right side seat belt tensioner; replace the right side seat belt (see page 24-78).

(A)

Check for a short to power in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TLo, (SLi and SRi) connector(s) (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Check resistance between the No. 6 and No. 7 terminals of the U2o connector, and between the No. 6 and No. 8 terminals of the U2o connector. There should be 1 Mohm or more.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Short to power in the SRS floor harness; replace the SRS floor harness.

Faulty SRS unit; replace the SRS unit (see page 24-83).

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-78)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to ground between the U2o connector and the TRi connectors.
- Short to ground in the right side seat belt tensioner.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to ground in the right side seat belt tensioner:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TRi connector from the TRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the TRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 4-5 indicated?

YES NO

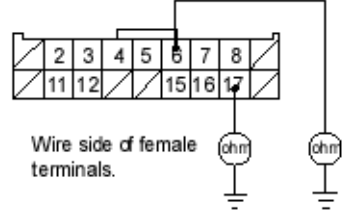
Short to ground in the right side seat belt tensioner; replace the right side seat belt (see page 24-78).

(A)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 24-33\)](#)
[\(See Page 24-29\)](#)
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[\(See Page 24-27\)](#)
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[\(See Page 24-83\)](#)

(A)

- Check for a short to ground in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the TL, (SL and SR) connector(s) (see page 24-36).
 3. Disconnect the U2o connector from the SRS unit (see page 24-34).
 4. Disconnect the special tool (2 ohm) from the TRi connector (see page 24-36).
 5. Check resistance between the No. 6 terminal of the U2o connector and body ground, and between the No. 17 terminal of the U2o connector and body ground. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS floor harness; replace the SRS floor harness.

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Open or increased resistance between the U2o connector and the SLi connectors.
- Open or increased resistance in the left side side air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for an open or increased resistance in the left side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

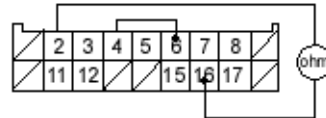
Is DTC 11-1 indicated?

YES NO

Open or increased resistance in the left side side air bag inflator; replace the left side side air bag (see page 24-77).

(A)

- Check for an open or increased resistance in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the SR, TL and TR connectors (see page 24-36).
 3. Disconnect the U2o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the SLi connector.
 4. Check resistance between the No. 2 and No. 16 terminals of the U2o connector. There should be 2.0 - 3.0 ohm.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit or poor contact at the U2o connector and the SRS unit; check the connection between the U2o connector and the SRS unit.

- If the connector is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS floor harness; replace the SRS floor harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

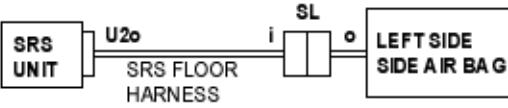
- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-77)
- (See Page 24-36)
- (See Page 24-83)



CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to another wire between the U2o connector and the SLi connectors.
- Short to another wire in the left side side air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to another wire in the left side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 11-3 indicated?

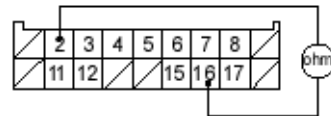
YES NO

Short to another wire in the left side side air bag inflator; replace the left side side air bag see page 24-77).

(A)

Check for a short to another wire in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SR, TL and TR connectors (see page 24-36).
3. Disconnect the special tool (2 ohm) from the SLi connector (see page 24-36).
4. Disconnect the U2o connector from the SRS unit (see page 24-34).
5. Check resistance between the No. 2 and No. 16 terminals of the U2o connector. There should be 1 Mohm or more.



Wire side of female terminals.

Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS floor harness; replace the SRS floor harness

(A)

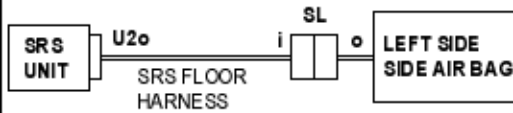
To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
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- (See Page 24-27)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Short to power between the U2o connector and the SLi connectors.
- Short to power in the left side side air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failures, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to power in the left side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 11-4 indicated?

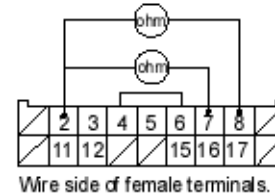
YES NO

Short to power in the left side side air bag inflator; replace the left side side air bag (see page 24-77).

(A)

Check for a short to power in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SR, TL and TR connectors (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34).
4. Check resistance between the No. 2 and No. 7 terminals of the U2o connector, and between the No. 2 and No. 8 terminals of the U2o connector. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Short to power in the SRS floor harness; replace the SRS floor harness.

Faulty SRS unit; replace the SRS unit (see page 24-83).

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to ground between the U2o connector and the SLi connectors.
- Short to ground in the left side side air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES	NO
-----	----

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to ground in the left side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SLi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

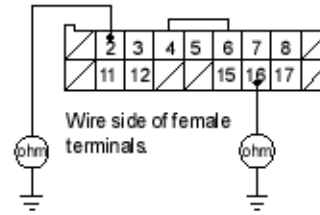
Is DTC 11-5 indicated?

YES	NO
-----	----

Short to ground in the left side side air bag inflator; replace the left side side air bag (see page 24-77).

(A)

- Check for a short to ground in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the SR, TL and TR connectors (see page 24-36).
 3. Disconnect the U2o connector from the SRS unit (see page 24-34).
 4. Disconnect the special tool (2 ohm) from the SLi connector (see page 24-36).
 5. Check resistance between the No. 2 terminal of the U2o connector and body ground. There should be 1 Mohm or more. Then check resistance between the No. 16 terminal of the U2o connector and body ground. There should be 1 Mohm or more.



Is the resistance as specified?

YES	NO
-----	----

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS floor harness; replace the SRS floor harness.

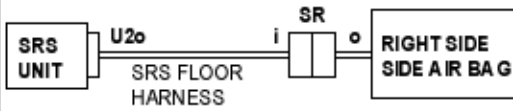
(A)

To go to the pages referenced on the diagram above, click on the following:
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 (See Page 24-77)
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CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Open or increased resistance between the U2o connector and the SRi connectors.
- Open or increased resistance in the right side side air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on pages 24-29.

Check for an open or increased resistance in the right side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

Is DTC 12-1 indicated?

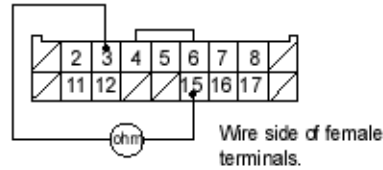
YES NO

Open or increased resistance in the right side side air bag inflator; replace the right side side air bag (see page 24-77).

(A)

Check for an open or increased resistance in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SL, TL and TR connectors (see page 24-36).
3. Disconnect the U2o connector from the SRS unit (see page 24-34). Do not disconnect the special tool (2 ohm) from the SRi connector.
4. Check resistance between the No. 3 and No. 15 terminals of the U2o connector. There should be 2.0 - 3.0 ohm.



Is the resistance as specified?

YES NO

Faulty SRS unit or poor contact at the U2o connector and the SRS unit; check the connection between the U2o connector and the SRS unit.

- If the connector is OK, replace the SRS unit (see page 24-83).

Open or increased resistance in the SRS floor harness; replace the SRS floor harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
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- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to another wire between the U2o connector and the SRi connectors.
- Short to another wire in the right side side air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on pages 24-29.

Check for a short to another wire in the right side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

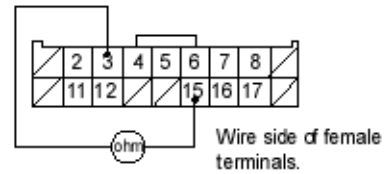
Is DTC 12-3 indicated?

YES NO

Short to another wire in the right side side air bag inflator; replace the right side side air bag (see page 24-77).

(A)

- Check for a short to another wire in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the SL, TL and TR connectors (see page 24-36).
 3. Disconnect the special tool (2 ohm) from the SRi connector (see page 24-36).
 4. Disconnect the U2o connector from the SRS unit (see page 24-34).
 5. Check resistance between the No. 3 and No. 15 terminals of the U2o connector. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to another wire in the SRS floor harness; replace the SRS floor harness.

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-27)
- (See Page 24-77)
- (See Page 24-36)
- (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to power between the U2o connector and the SRo connectors.
- Short to power in the right side side air bag inflator.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on pages 24-29.

Check for a short to power in the right side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRo connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

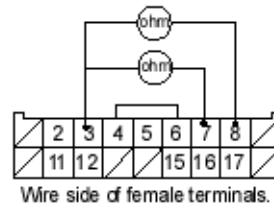
Is DTC 12-4 indicated?

YES NO

Short to power in the right side side air bag inflator; replace the right side side air bag (see page 24-77).

(A)

- Check for a short to power in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the SR, TL and TR connectors (see page 24-36).
 3. Disconnect the U2o connector from the SRS unit (see page 24-34).
 4. Check resistance between the No. 3 and No. 7 terminals of the U2o connector, and between the No. 3 and No. 8 terminals of the U2o connectors. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Short to power in the SRS floor harness; replace the SRS floor harness.

Faulty SRS unit; replace the SRS unit (see page 24-83).

(A)

To go to the pages referenced on the diagram above, click on the following:
 (See Page 24-33)
 (See Page 24-29)
 (See Page 24-34)
 (See Page 24-27)
 (See Page 24-77)
 (See Page 24-36)
 (See Page 24-83)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Short to ground between the U2o connector and the SRi connectors.
- Short to ground in the right side side air bag inflator.
- Faulty SRS unit.

Refer to page 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for a short to ground in the right side side air bag inflator:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRO connector (see page 24-36).
3. Connect the special tool (2 ohm) to the SRi connector (see page 24-36).
4. Reconnect the negative battery cable.
5. Erase the DTC memory (see page 24-29).
6. Read the DTC (see page 24-27).

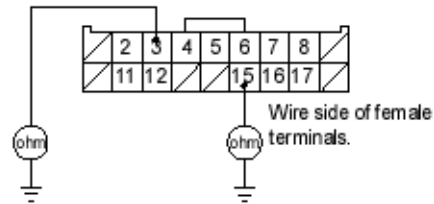
Is DTC 12-5 indicated?

YES NO

Short to ground in the right side side air bag inflator; replace the right side side air bag (see page 24-77).

(A)

- Check for a short to ground in the SRS floor harness:**
1. Disconnect the negative battery cable, and wait for three minutes.
 2. Disconnect the SL, TL and TR connectors (see page 24-36).
 3. Disconnect the U2o connector from the SRS unit (see page 24-34).
 4. Disconnect the special tool (2 ohm) from the SRi connector (see page 24-36).
 5. Check resistance between the No. 3 terminal of the U2o connector and body ground. There should be 1 Mohm or more. Then check resistance between the No. 15 terminals of the U2o connector and body ground. There should be 1 Mohm or more.



Is the resistance as specified?

YES NO

Faulty SRS unit; replace the SRS unit (see page 24-83).

Short to ground in the SRS floor harness; replace the SRS floor harness.

(A)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 24-33\)](#)
[\(See Page 24-29\)](#)
[\(See Page 24-34\)](#)
[\(See Page 24-27\)](#)
[\(See Page 24-77\)](#)
[\(See Page 24-36\)](#)
[\(See Page 24-83\)](#)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Faulty signal line between the U2o and ILi connectors.
- Faulty left side side impact sensor.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for poor contact at the ILi connector:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector (see page 24-36).
3. Check for connections between the ILi connector and the left side side impact sensor.

Is the connections OK?

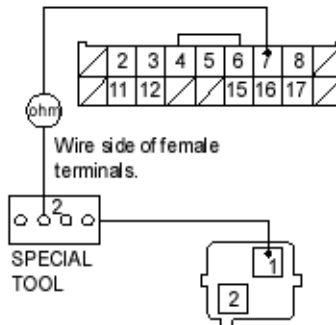
YES NO

Poor contact at the ILi connector; connect the ILi connector securely.

(A)

Check for an open in the SRS floor harness:

1. Disconnect the TL, TR and SR connectors (see page 24-36).
2. Disconnect the ILi connector from the left side side impact sensor (see page 24-37).
3. Connect the special tool to the ILi connector (see page 24-37).
4. Disconnect the U2o connector from the SRS unit (see page 24-34).
5. Check resistance between the No. 7 terminal of the U2o connector and the No. 2 terminal of the special tool. There should be 0 - 1.0 ohm.



Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

(B) To page 24-68

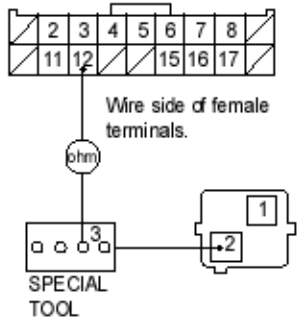
(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-37)
- (See Page 24-36)

(B) From page 24-67

Check for an open in the SRS floor harness:
 Check resistance between the No. 12 terminal of the U2o connector and the No. 3 terminal of the special tool.
 There should be 0 - 1.0 ohm.



Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

Faulty left side side impact sensor or SRS unit; replace the left side side impact sensor.
 ● If the problem is still present, replace the SRS unit.

To go to the pages referenced on the diagram above, click on the following:
 (See Page 24-33)
 (See Page 24-29)

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Faulty power line between the U2o and ILi connectors.
- Faulty left side side impact sensor.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

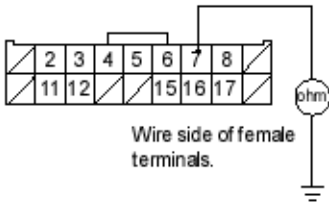
Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

(A) To page 24-69

(A) From page 24-68

Check for a short to ground in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TL, TR, SL and SR connectors (see page 24-36).
3. Disconnect the ILi connector from the left side side impact sensor (see page 24-37).
4. Disconnect the U2o connector from the SRS unit (see page 24-34).
5. Check resistance between the No. 7 terminal of the U2o connector and body ground. There should be 1 M ohm or more.



Is the resistance as specified?

YES

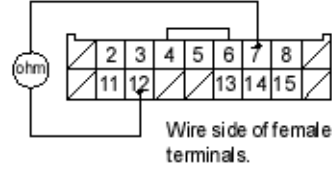
NO

Short to ground in the SRS floor harness; replace the SRS floor harness.

(B)

Check for a short to another wire in the SRS floor harness:

Check resistance between the No. 7 and No. 12 terminals of the U2o connector. There should be 1 M ohm or more.



Is the resistance as specified?

YES

NO

Short to another wire in the SRS floor harness; replace the SRS floor harness.

Faulty left side side impact sensor or SRS unit; replace the left side side impact sensor.

- If the problem is still present, replace the SRS unit. (see page 24-83).

(B)

To go to the pages referenced on the diagram above, click on the following:

(See Page 24-36)

(See Page 24-37)

(See Page 24-34)

(See Page 24-83)



CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Faulty signal line between the U2o and IRi connectors.
- Faulty right side side impact sensor.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light:

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

Check for poor contact at the IRi connector:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRo connector (see page 24-36).
3. Check for connections between the IRi connector and the right side side impact sensor.

Is the connections OK?

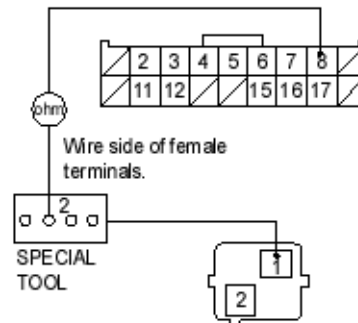
YES NO

Poor contact at the IRi connector; connect the IRi connector securely.

(A)

Check for an open in the SRS floor harness:

1. Disconnect the TL, TR and SL connectors (see page 24-36).
2. Disconnect the IRi connector from the right side side impact sensor (see page 24-37).
3. Connect the special tool to the IRi connector (see page 24-37).
4. Disconnect the U2o connector from the SRS unit (see page 24-34).
5. Check the resistance between the No. 8 terminals of the U2o connector and the No. 2 terminal of the special tool. There should be 0 - 1.0 ohm.



Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

(B) To page 24-71

(A)

To go to the pages referenced on the diagram above, click on the following:

- (See Page 24-33)
- (See Page 24-29)
- (See Page 24-34)
- (See Page 24-37)
- (See Page 24-36)

(B) From page 24-70

Check for an open in the SRS floor harness:
Check resistance between the No. 11 terminal of the U2o connector and the No. 3 terminal of the special tool. There should be 0 - 1.0 ohm.

Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

Faulty right side side impact sensor or SRS unit; replace the right side side impact sensor.
● If the problem is still present, replace the SRS unit.

! CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:

Possible Causes of Failures:

- Faulty power line between the U2o and IRI connectors.
- Faulty right side side impact sensor.
- Faulty SRS unit.

Refer to pages 24-33 for the fuse box and connector locations.

Try to reproduce the SRS indicator light

1. Erase the DTC memory (see page 24-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures on page 24-29.

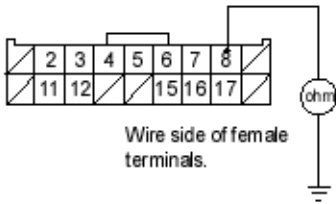
(A) To page 24-72

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 24-33\)](#)
[\(See Page 24-29\)](#)

(A) From page 24-71

Check for a short to ground in the SRS floor harness:

1. Disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the TL, TR, SL and SR connectors (see page 24-36).
3. Disconnect the IRi connector from the right side side impact sensor (see page 24-37).
4. Disconnect the U2o connector from the SRS unit (see page 24-34).
5. Check resistance between the No. 8 terminal of the U2o connector and body ground. There should be 1 M Ω or more.



Is the resistance as specified?

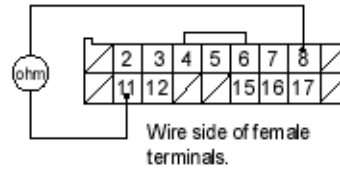
YES NO

Short to ground in the SRS floor harness; replace the SRS floor harness.

(B)

Check for a short to another wire in the SRS floor harness:

Check resistance between the No. 8 and No. 11 terminals of the U2o connector. There should be 1 M Ω or more.



Is the resistance as specified?

YES NO

Short to another wire in the SRS floor harness; replace the SRS floor harness.

Faulty right side side impact sensor or SRS unit; replace the right side side impact sensor.

- If the problem is still present, replace the SRS unit (see page 24-83).

(B)

To go to the pages referenced on the diagram above, click on the following:

(See Page 24-36)

(See Page 24-37)

(See Page 24-34)

(See Page 24-83)



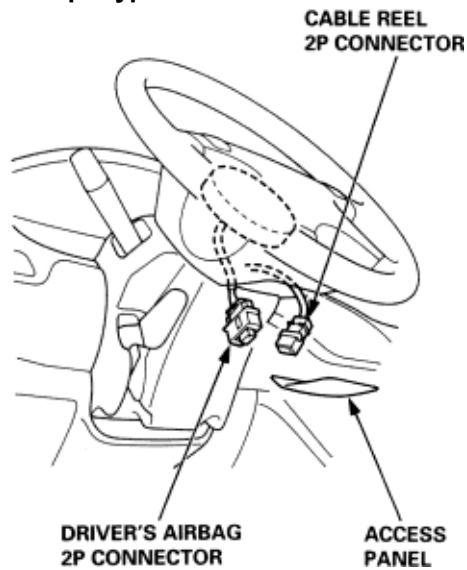
CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

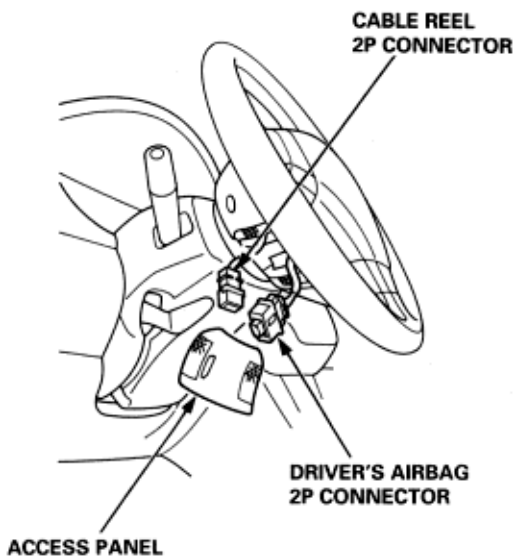
Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Remove the access panel from the steering wheel, then disconnect the connector between the cable reel 2P connector and driver's airbag 2P connector.

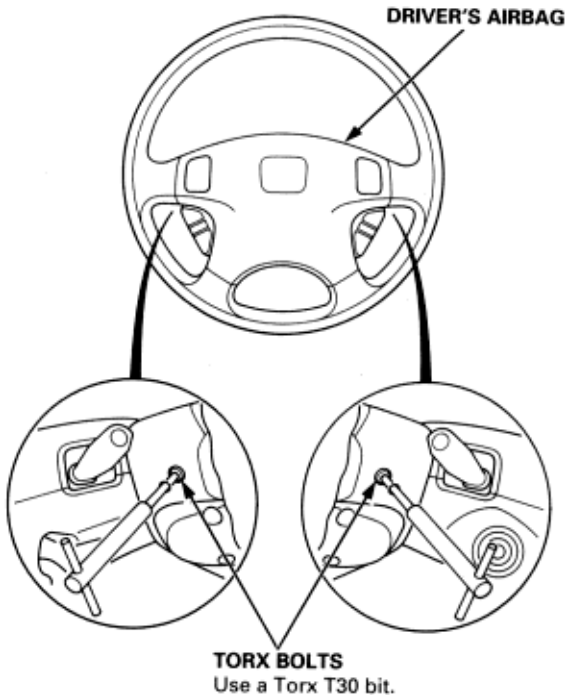
Except Type R:



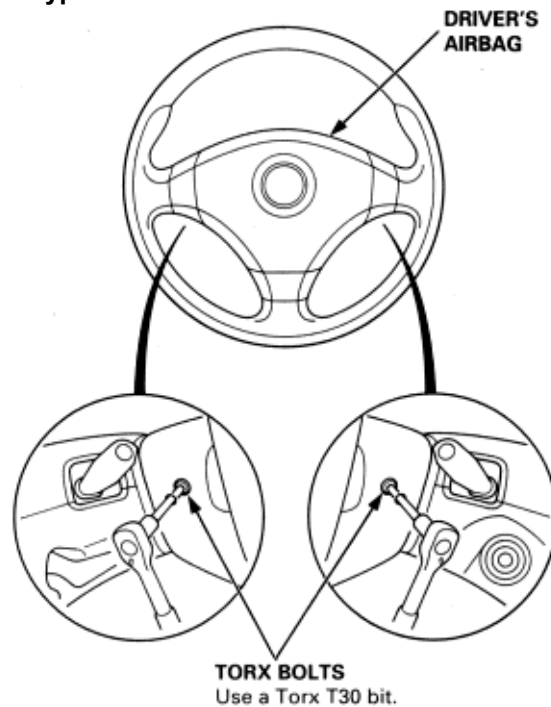
Type R:



3. Remove the two Torx bolts using a Torx T30 bit (long Torx FTXL30 made of the Snap-on is recommended to be used except in Type R), then remove the driver's airbag.



Type R:



Driver's Airbag Replacement (cont'd)

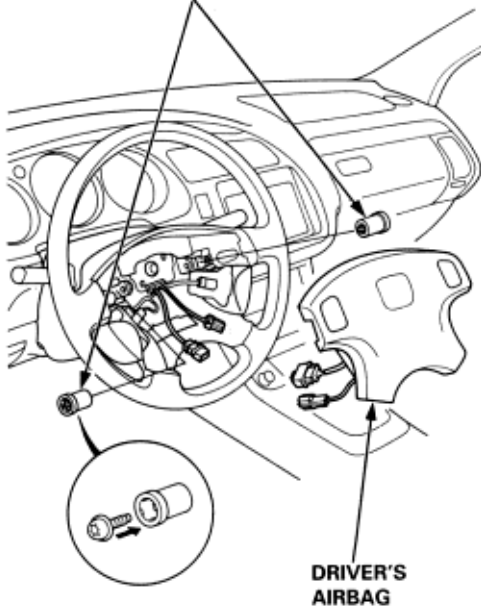
24-74

Installation

1. Place the new driver's airbag in the steering wheel, and secure it with new Torx bolts (Torx bolts are exchanged with the resin color except in Type R).

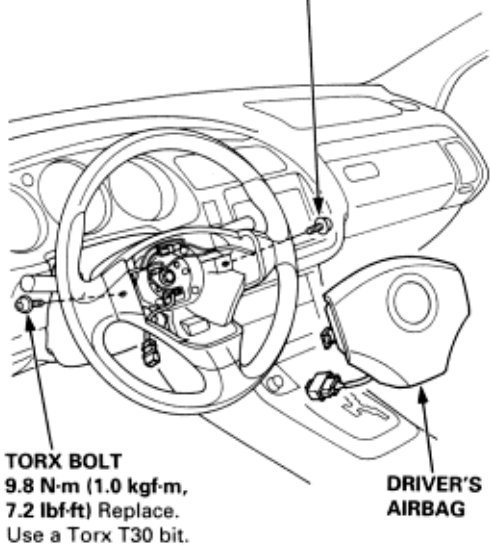
Except Type R:

TORX BOLTS with RESIN COLLARS
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
Replace.



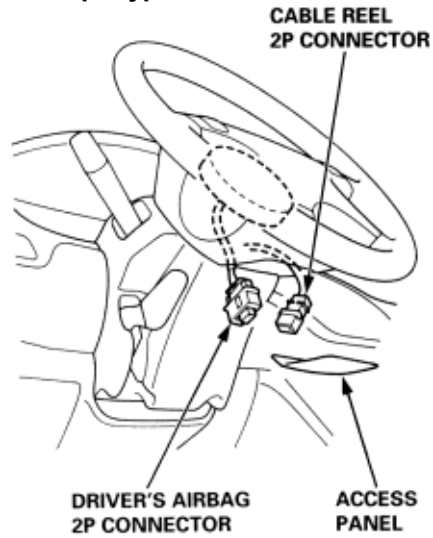
Type R:

TORX BOLT
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
Replace.
Use a Torx T30 bit.



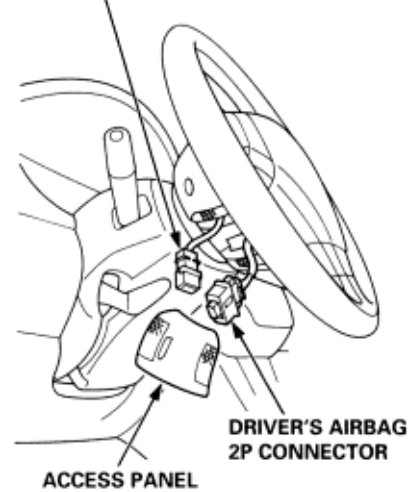
2. Connect the cable reel 2P to the driver's airbag 2P connector, then install the access panel on the steering wheel.

Except Type R:



Type R:

CABLE REEL 2P CONNECTOR



3. Connect the negative battery cable.
4. After installing the airbag, confirm proper system operation:
 - Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.
 - Make sure horn button works.



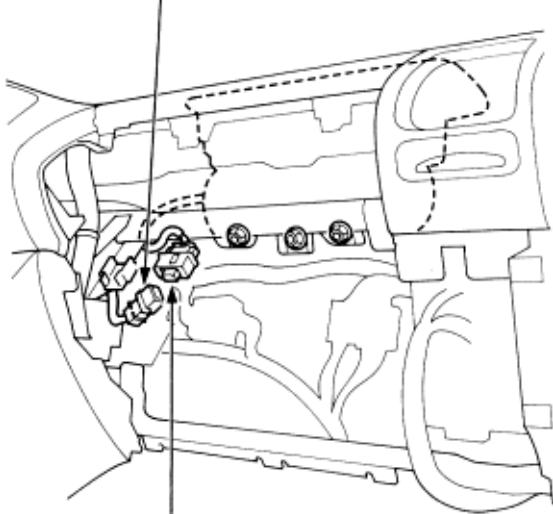
CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Remove the glove box (see section 20), then disconnect the connector between the SRS main harness 2P connector and front passenger's airbag 2P connector.

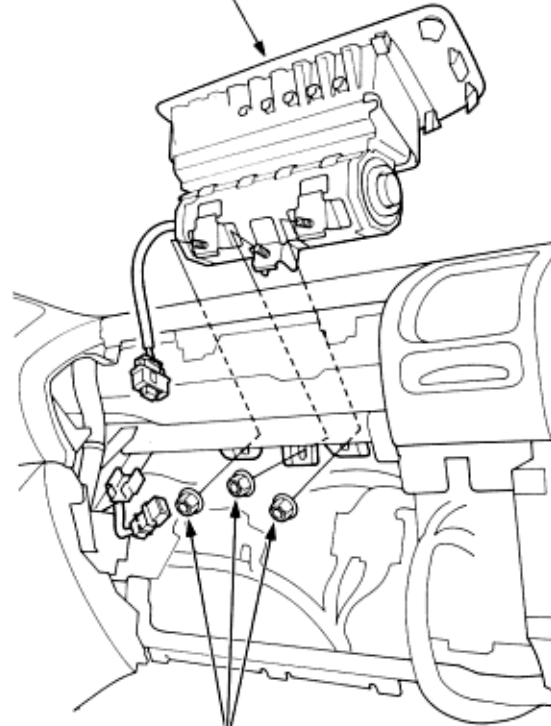
**SRS MAIN HARNESS
2P CONNECTOR**



**FRONT PASSENGER'S
AIRBAG
2P CONNECTOR**

3. Remove the three mounting nuts from the bracket. Cover the lid and dashboard with a cloth, and pry carefully with a screwdriver to lift the front passenger's airbag out of the dashboard. NOTE: The airbag lid has pawls on the side which is attached to the dashboard.

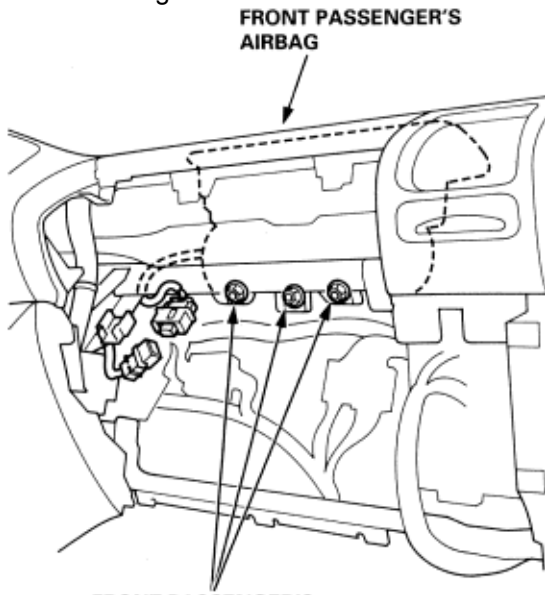
**FRONT PASSENGER'S
AIRBAG**



**FRONT PASSENGER'S
AIRBAG
MOUNTING NUTS**

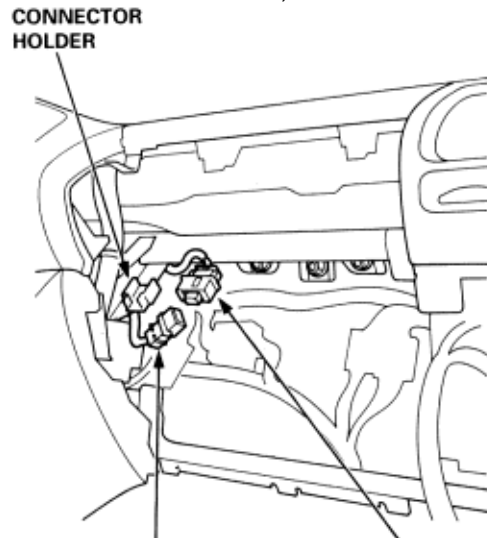
Installation

1. Place the new front passenger's airbag into the dashboard. Tighten the front passenger's airbag mounting nuts.



FRONT PASSENGER'S AIRBAG MOUNTING NUTS
9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)

2. Connect the front passenger's airbag 2P connector to the SRS main harness 2P connector. Attach the front passenger's airbag connector to the connector holder, then reinstall the glove box.



SRS MAIN HARNESS 2P CONNECTOR **FRONT PASSENGER'S AIRBAG 2P CONNECTOR**

3. Reconnect the negative battery cable.
4. After installing the airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.



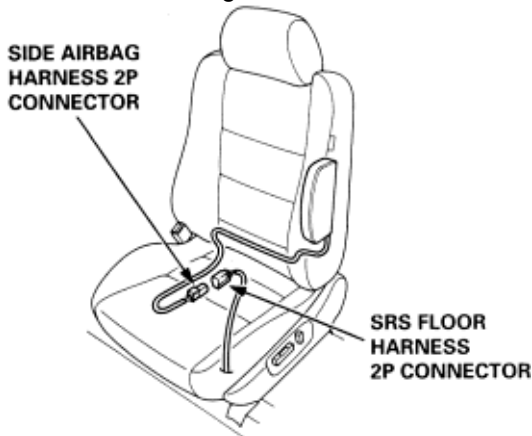
CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

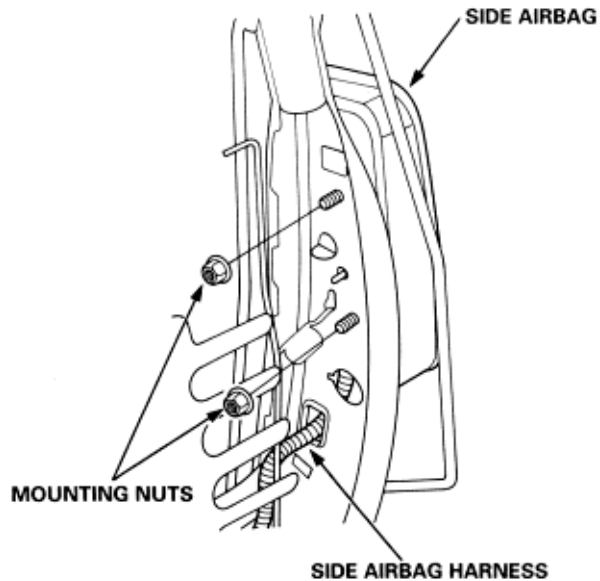
Review the Seats in the Body section (20) before performing repair or service.

Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Disconnect the SRS floor harness 2P connector from the side airbag harness 2P connector.



3. Remove the seat assembly and seat-back cover (see section 20).
4. Remove the two mounting nuts and the side airbag.

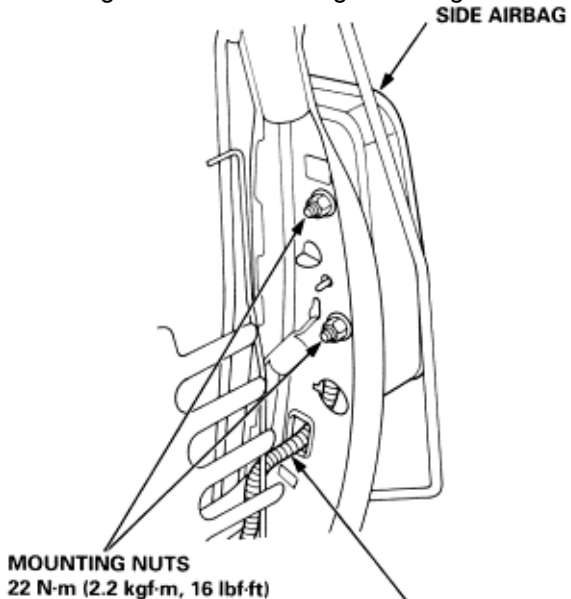


CAUTION

Be sure to install the harness wires so that they are not pinched or interfering with other parts.

NOTE:

- ♦ If the side airbag lid is fixed by a tape, remove it.
 - ♦ Do not open the lid of the side airbag cover.
 - ♦ Use new mounting nuts according to the specified torque when you replace a side airbag.
 - ♦ Make sure that the seat-back cover is installed properly. Improper installation disturbs the proper deployment.
1. Place the new side airbag on the seat back-frame. Tighten the side airbag mounting nuts.



2. Install the new seat-back cover (see section 20).
3. Install the seat assembly on the body (see section 20), then connect the side airbag harness 2P connector to the SRS floor harness 2P connector.
4. Reconnect the negative battery cable.
5. After installing the side airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.

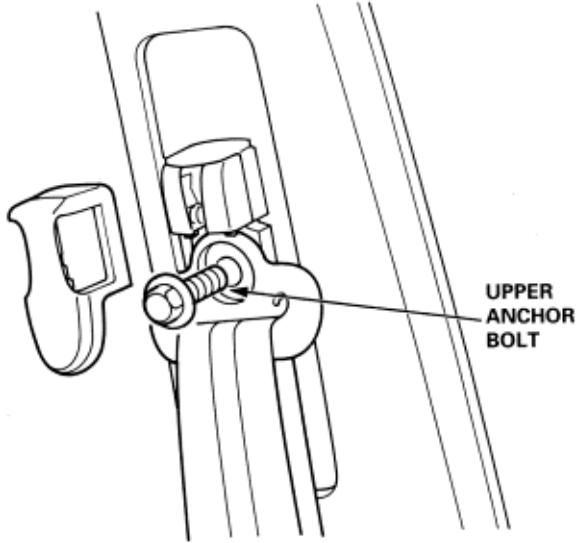


CAUTION

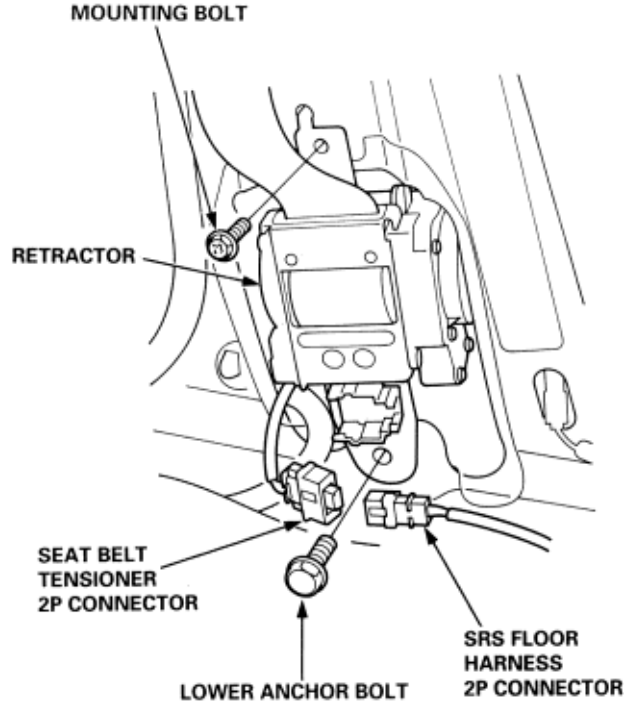
Removal of the airbag must be performed according to the precautions/procedures described before.

Review the front seat belt replacement in the Seat Belts section (24) before performing repair or service.

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Remove the center pillar lower trim panel (see section 20).
3. Disconnect the seat belt tensioner 2P connector from the SRS floor harness 2P connector.
4. Remove the upper anchor cover and upper anchor bolt.



5. Remove the two retractor mounting bolts, then remove the retractor.



Installation

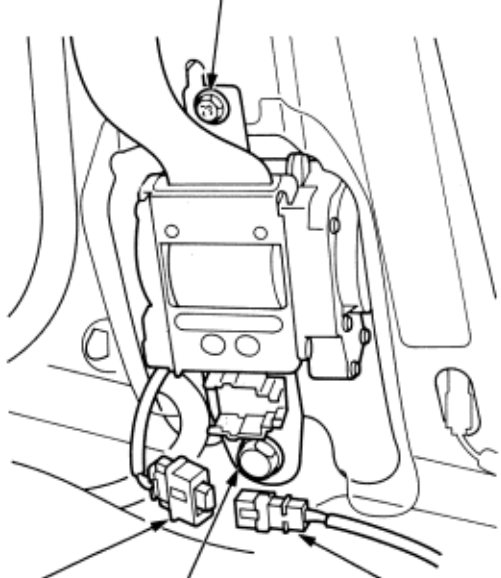


CAUTION

Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Install the new seat belt.

MOUNTING BOLT
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

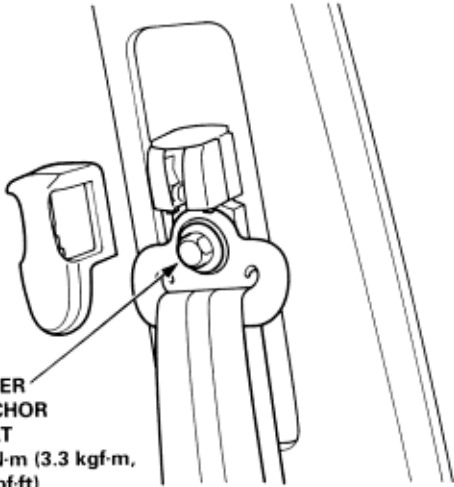


**SEAT BELT
TENSIONER
2P CONNECTOR**

LOWER ANCHOR BOLT
32 N·m (3.3 kgf·m, 24 lbf·ft)

**SRS FLOOR
HARNESS
2P CONNECTOR**

2. Reinstall the upper anchor bolt and upper anchor cover.



**UPPER
ANCHOR
BOLT**
32 N·m (3.3 kgf·m,
24 lbf·ft)

3. Reconnect the seat belt tensioner 2P connector to SRS floor harness 2P connector.
4. Reinstall the center pillar lower trim panel (see section 20).
5. Reconnect the negative battery cable.
6. After installing the seat belt, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.



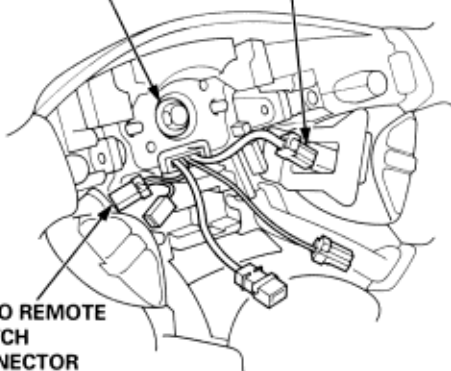
CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

Removal

1. Make sure the wheels are aligned straight ahead.
2. Disconnect the negative battery cable and wait at least three minutes.
3. Remove the driver's airbag (**See Page 24-73**).
4. Disconnect the connectors from the horn, radio remote switch, and cruise control set/resume/cancel switches, then remove the steering wheel bolt.

STEERING WHEEL BOLT
CRUISE CONTROL SET/RESUME/CANCEL SWITCH CONNECTOR



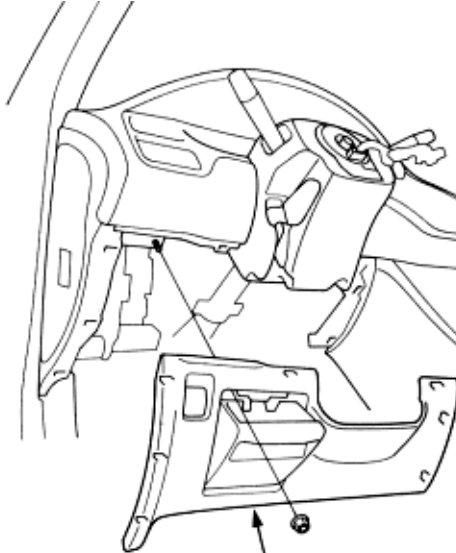
RADIO REMOTE SWITCH CONNECTOR

5. Align the front wheels straight ahead, then remove the steering wheel with a steering wheel puller. Do not tap on the steering wheel or steering column shaft when removing the steering wheel.



STEERING WHEEL PULLER

6. Remove the dashboard lower cover.



DASHBOARD LOWER COVER

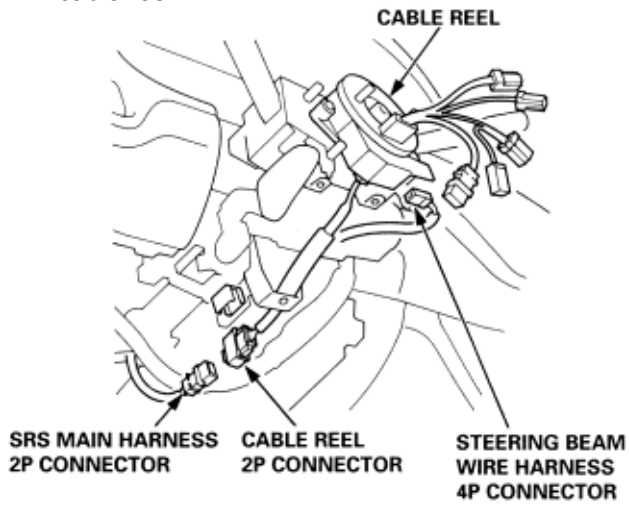
7. Remove the column covers.

UPPER COLUMN COVER

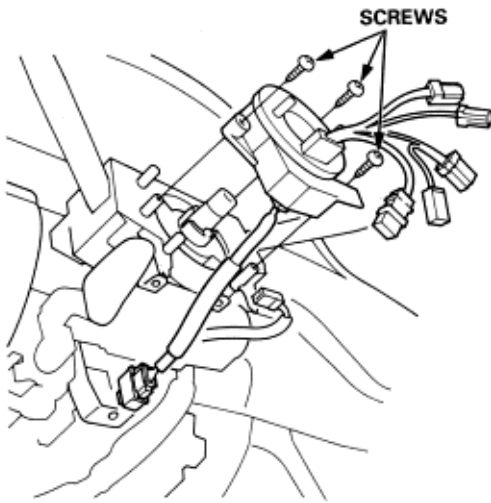


LOWER COLUMN COVER

8. Disconnect the SRS main harness 2P connector from the cable reel 2P connector, then disconnect the steering beam wire harness 4P connector from the cable reel.

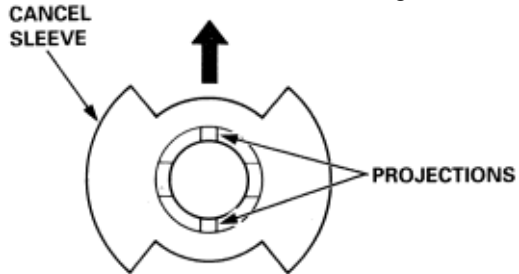


9. Remove the screw from the cable reel, then remove the cable reel from the column.

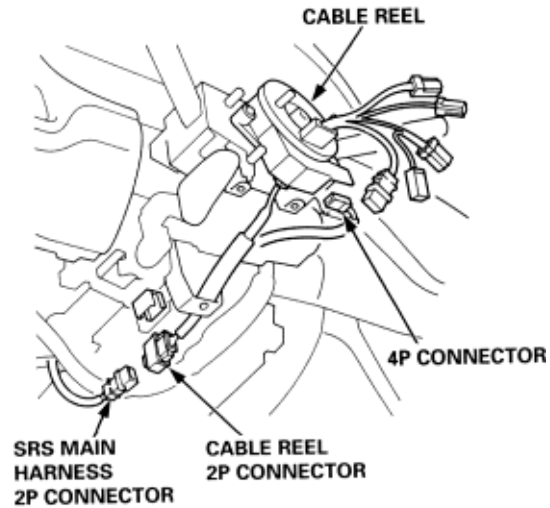


Installation

1. Before installing the steering wheel, the front wheels should be aligned straight ahead.
2. Be sure to check the negative cable from the battery is disconnected.
3. Set the cancel sleeve to align vertically.

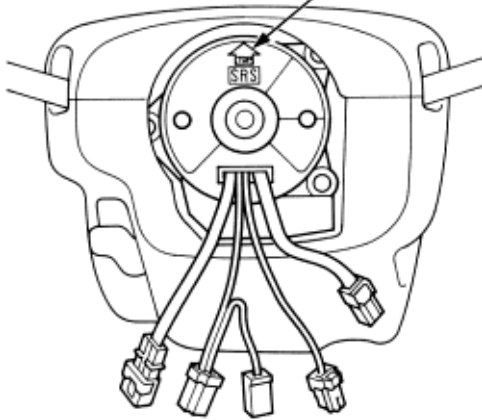


4. Carefully install the cable reel on the steering column shaft. Then connect the 4P connector to the cable reel, and connect the 2P connector to the SRS main harness.



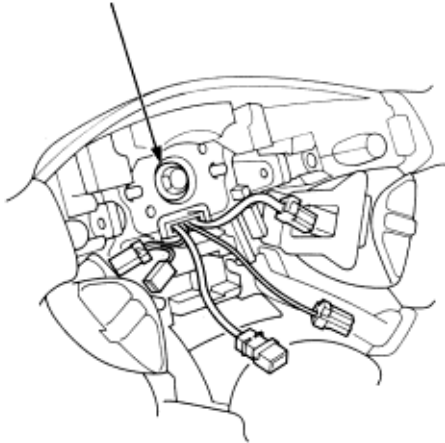
5. Install the steering column covers.
6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise (approximately two and a half turns) until the arrow mark on the cable reel label points straight up.

ARROW MARK



7. Align the slots on the steering wheel shaft and projections on the cancel sleeve, then install the steering wheel.

STEERING WHEEL BOLT
38 N·m (3.9 kgf·m, 28 lbf·ft)



8. Install the driver's airbag (**See Page 24-74**).
9. Reconnect the negative battery cable.
10. After installing the cable reel, confirm proper system operation:
 - ♦ Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.
 - ♦ After the SRS indicator light has come off, turn the steering wheel fully left and right to confirm the SRS indicator light does not come on.
 - ♦ Make sure horn button works.



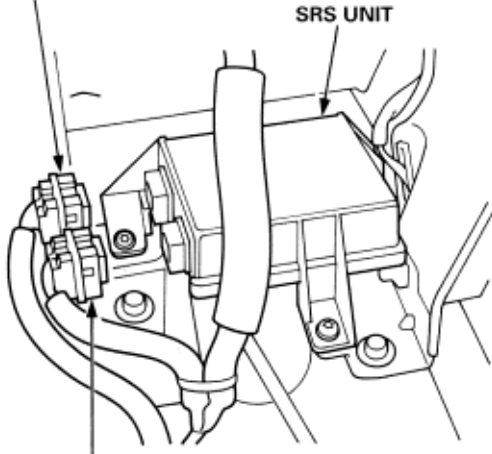
CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Disconnect the airbag, side airbag and seat belt tensioner connectors (See Page 24-34).
3. Remove the console assembly (see section 20).
4. Disconnect the SRS main harness 14P connector and SRS floor harness 18P connector from the SRS unit.

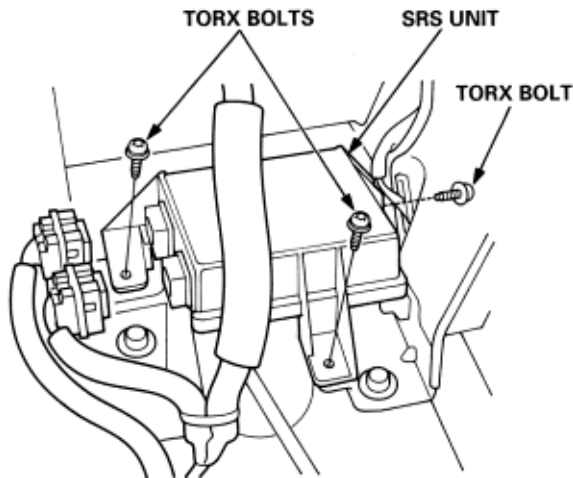
**SRS FLOOR HARNESS
18P CONNECTOR**



SRS UNIT

**SRS MAIN HARNESS
14P CONNECTOR**

5. Remove the three Torx bolts from the SRS unit, then pull out the SRS unit from the bracket.



TORX BOLTS

SRS UNIT

TORX BOLT

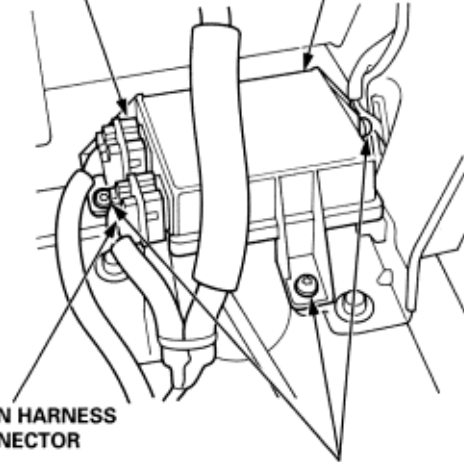
Installation

1. Install the new SRS unit with Torx bolts, then connect the SRS main harness 14P connector and SRS floor harness 18P connector to the SRS unit; push it into position until it clicks.

NOTE: When tightening the Torx bolts to the specified torque after replacement, be careful to turn them in so that their heads rest squarely on the brackets.

**SRS FLOOR HARNESS
18P CONNECTOR**

SRS UNIT



**SRS MAIN HARNESS
14P CONNECTOR**

**TORX BOLTS
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
Use a Torx T30 bit.**

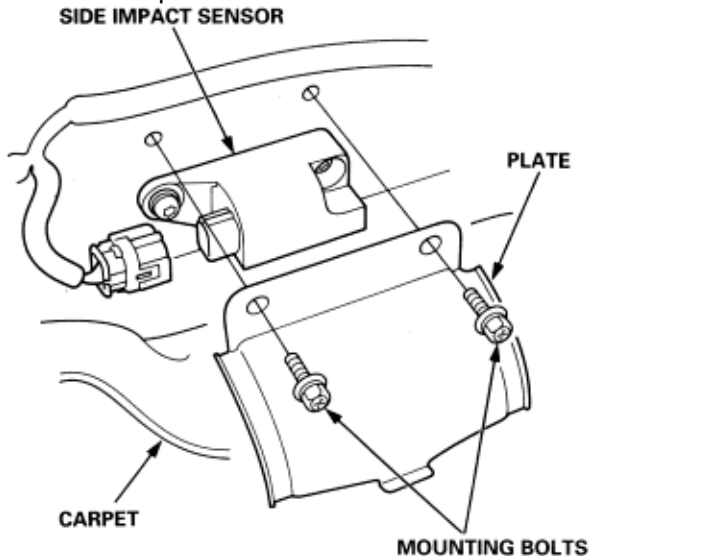
2. Install the console assembly (see section 20).
3. Reconnect the airbag, side airbag and seat belt tensioner connectors (See Page 24-34).
4. Reconnect the negative battery cable.
5. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.

CAUTION

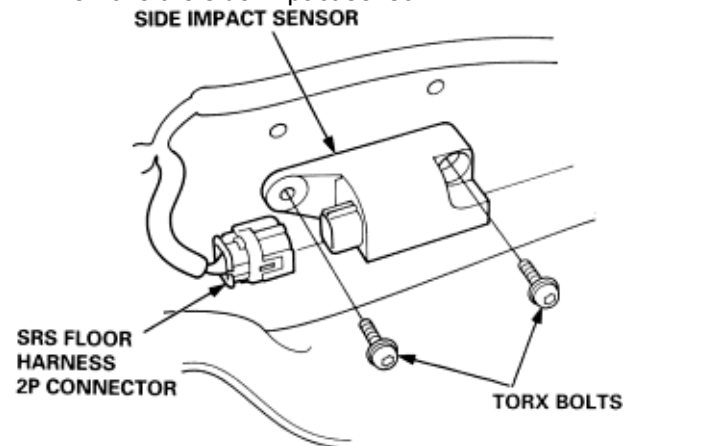
Removal of the airbag must be performed according to the precautions/procedures described before.

Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Remove (see section 20):
 - ♦ Seat assembly
 - ♦ Front side trim
 - ♦ Center pillar lower trim panel
 - ♦ Lower anchor bolt
3. Turn up the carpet, then remove the two mounting bolts and the plate.



4. Disconnect the SRS floor harness 2P connector from the side impact sensor.
5. Remove the two Torx bolts using a Torx T30 bit, then remove the side impact sensor.



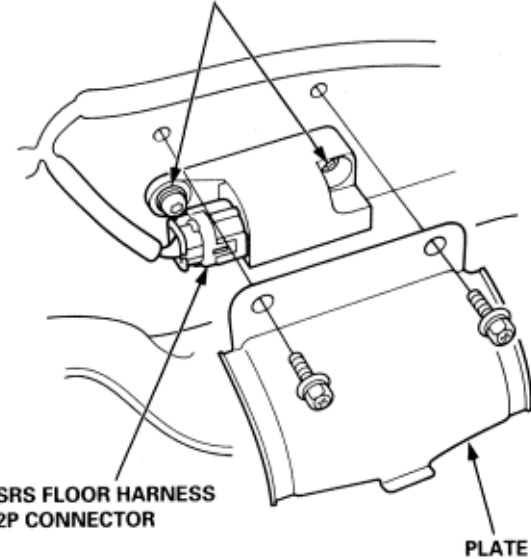
Installation

CAUTION

Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Install the new side impact sensor, then connect the SRS floor harness connector to the side impact sensor.
2. Reinstall the plate.

TORX BOLTS
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
Use a Torx T30 bit.



3. Reconnect the negative battery cable.
4. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.

Before scrapping any deployment units (airbag or side airbags or seat belt tensioners) (including those in a whole vehicle to be scrapped), the deployment units must be deployed. If the vehicle is still within the warranty period, before you deploying the deployment units, the local Honda Service Manager must give approval and/or special instructions. Only after the deployment units (as the result of vehicle collision, for example), can they be scrapped. If the deployment units appear intact (not deployed or triggered) treat them with extreme caution.

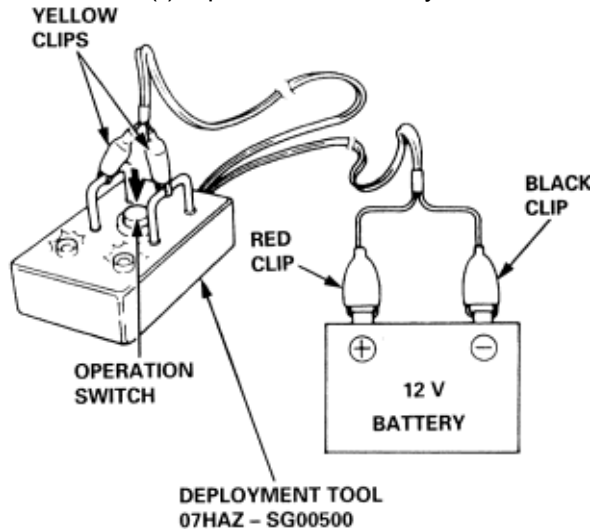
Follow this procedure:

1. Deployment Preparations (See Page 24-86) to (See Page 24-90).
2. Deployment (See Page 24-90).and (See Page 24-91).
3. Disposal (See Page 24-91).

⚠ WARNING

If you scrap more than one deployment unit, first complete the deployment procedure for one deployment unit, and only then start with step 1 of Deployment Preparations. Otherwise, severe personal injury could result from deployment.

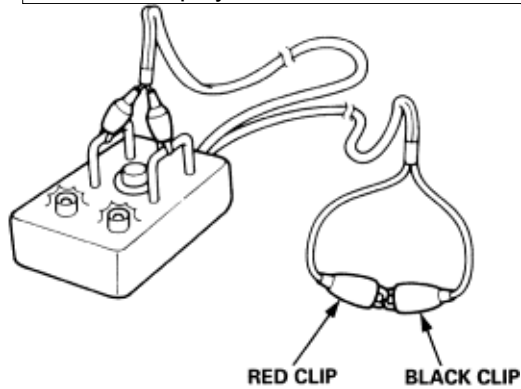
1. Connect the yellow clips to both switch protector handles on the tool, and connect the red (+) and black (-) clips to a 12 V battery.



2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. After the check, disconnect the red and black clips from the battery, and connect them to each other.

⚠ WARNING

Do not reconnect the red and black clips to the battery until all preparations for deployment are finished. Otherwise, severe personal injury could result from accidental deployment.



NOTE: If an SRS vehicle is to be entirely scrapped, its deployment units should be deployed while still in the vehicle. The deployment units should not be considered as salvageable parts and should never be installed in another vehicle.

⚠ WARNING

Confirm that the deployment units are securely mounted; otherwise, severe personal injury could result from deployment.

Necessary equipment:

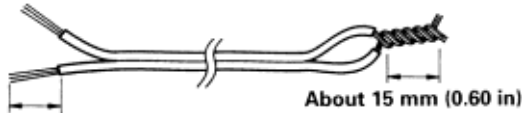
With deployment tool

- Deployment tool
- Fully charged 12 volt battery

Without deployment tool

- Fully charged 12 volt battery
- 12 to 15m(40 to 50ft) of vinyl double cable
- Insulation tape

1. Disconnect the negative battery cable, and wait at least three minutes.
2. With Deployment Tool: confirm that the deployment tool is functioning properly by following the check procedure on the tool box label, or (See Page 24-85).
3. Without Deployment Tool: strip both ends of the vinyl double cable about 15mm (0.60 in), and intertwine the wires on one end.



About 15 mm (0.60 in)

About 15 mm (0.60 in)

Driver's Airbag:

4. Disconnect the driver's airbag 2P connector from the cable reel (See Page 24-34).

Front Passenger's Airbag:

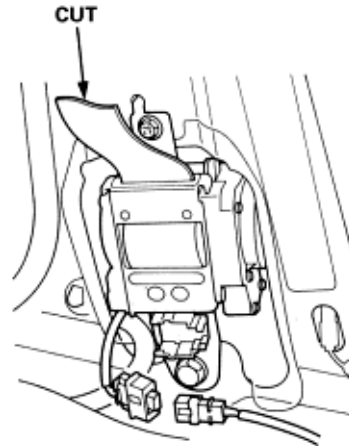
5. Disconnect the front passenger's airbag 2P connector from the SRS main harness (See Page 24-35).

Side Airbag:

6. Disconnect the side airbag 2P connector from the SRS floor harness (See Page 24-36).

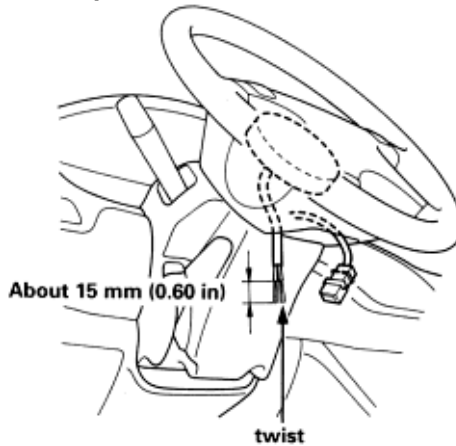
Seat Belt Tensioner:

7. Disconnect the seat belt tensioner 2P connector from the harness (See Page 24-36).
8. Pull the seat belt out all the way and cut it.

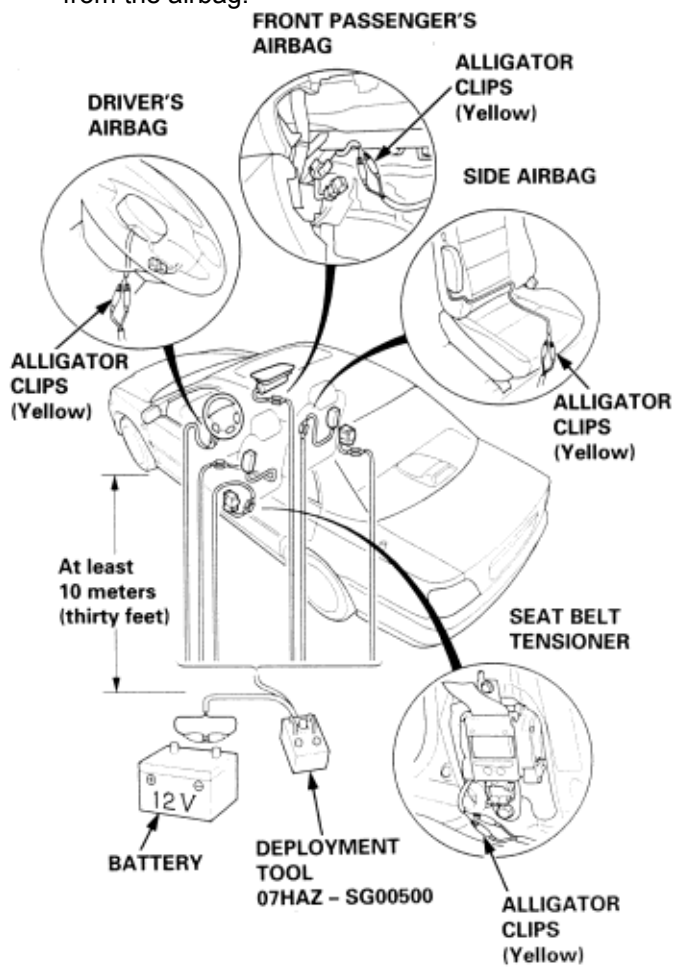


9. Cut off the airbag or side airbag seat belt tensioner connector, and strip the ends of the airbag wires about 15 mm (0.60 in), and twist then together.

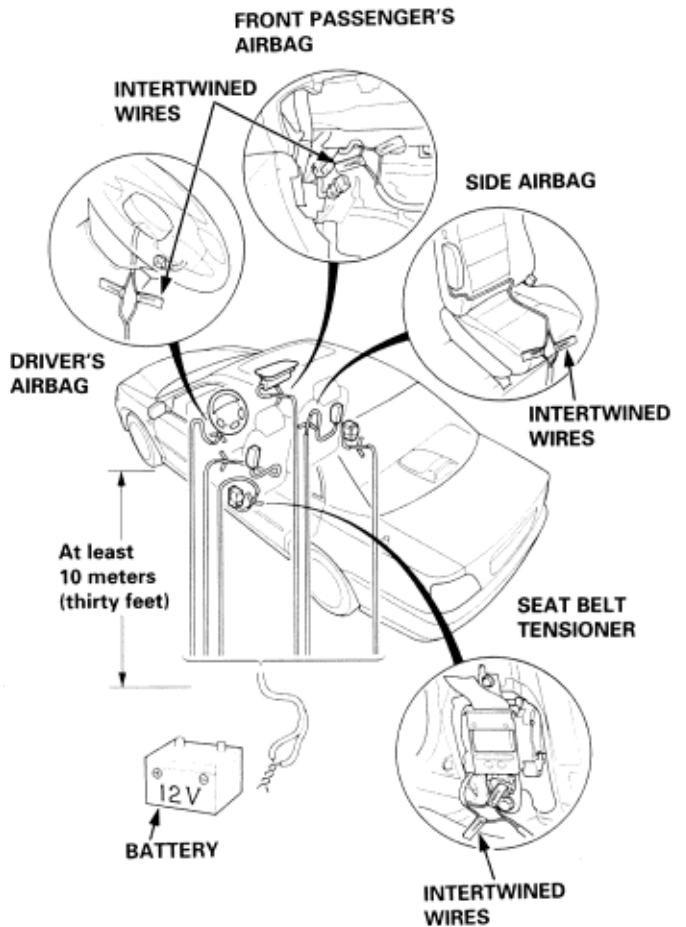
Example:



10. With Deployment Tool: Connect the deployment tool alligator clips to the deployment wires as shown. Place the deployment tool at least 10 meters (thirty feet) away from the airbag.



11. Without Deployment Tool: Connect the wires of the vinyl double cable which were not intertwined in step 10 to the deployment unit wires as shown, and put insulation tape over the connections. Place the battery at least 10 meters (thirty feet) away from the vehicle.



12. With Deployment Tool: Go to Deployment ([See Page 24-90](#)).
13. Without Deployment Tool: Go to Deployment ([See Page 24-91](#)).

NOTE: If an intact airbag or side airbag or seat belt tensioner has been removed from a scrapped vehicle or has been found defective or damaged during transit, storage or service, it should be deployed as follows.

Necessary Equipment:

With deployment tool:

- Deployment tool

Without deployment tool:

- 12 to 15 m (40 to 50 ft) of vinyl double cable
- Insulation tape

Other

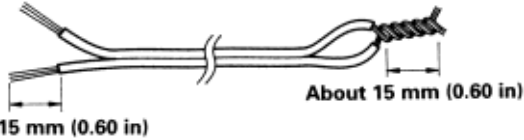
- Fully charged 12 volt battery
- Four tyres for 15 inch wheels or bigger without wheel, and one tyre of the same size with wheel

NOTE:

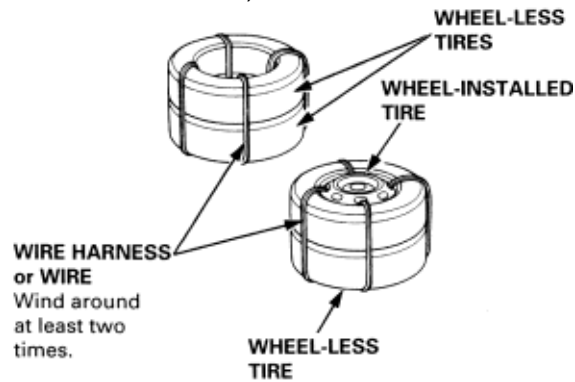
- ♦ Preferably take used tyres.
- ♦ Tyres have been used for airbag deployment can be reused on vehicles after carefully cleaning their inner side with water.

- Vehicle wire harness with a core wire cross sectional area of at least 1.25 mm² (0.002 in²) or iron wire with a diameter of more than 1.2 mm (0.05 in).

1. Turn the ignition switch OFF. Disconnect the negative battery cable and wait at least three minutes.
2. With Deployment Tool: Confirm that the deployment tool is functioning properly by following the check procedure on the tool box label, or (See Page 24-85).
3. Without Deployment Tool: Strip both ends of the vinyl double cable about 15 mm (0.60 in), and intertwine the wires on one end.



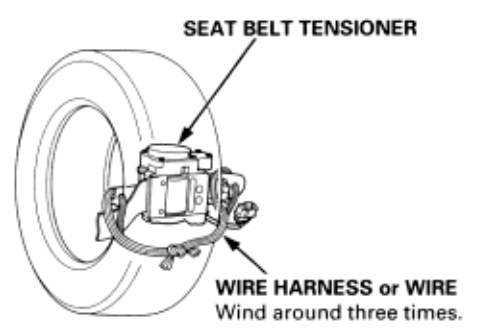
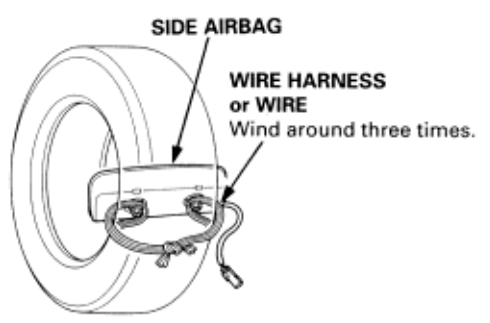
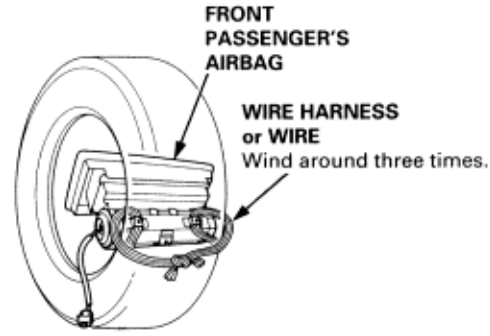
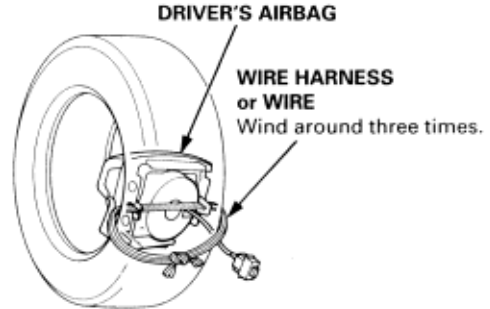
4. Remove the driver's airbag ((See Page 24-73).
5. Remove the front passenger's airbag (See Page 24-75).
6. Remove the side airbag (See Page 24-77).
7. Remove the seat belt tensioner (See Page 24-78).
8. With vehicle wire harness or wire, tie two of the wheel-less tyres together, then tie one wheel-less tyre and the wheel-installed tyre together. (Wind around at least two times.)



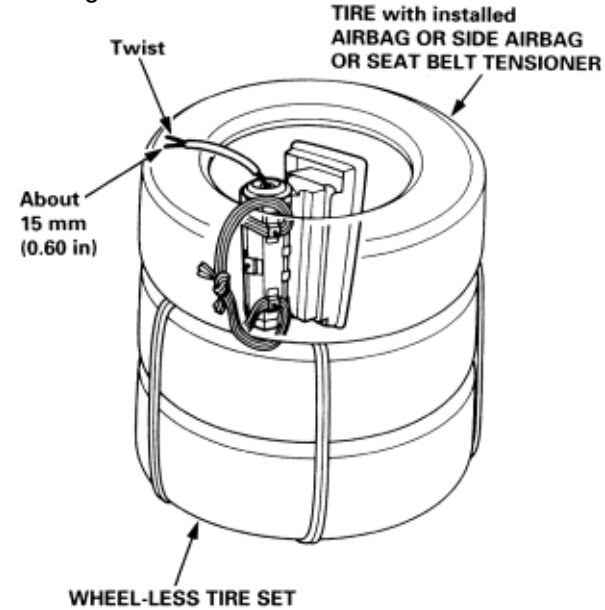
9. Tie the airbag or the side airbag or the seatbelt tensioner with vehicle wire harness or wire to the remaining wheel-less tyre as shown. (Wind around three times.)

CAUTION

Make sure the pad surface is turned to the center of the tyre.

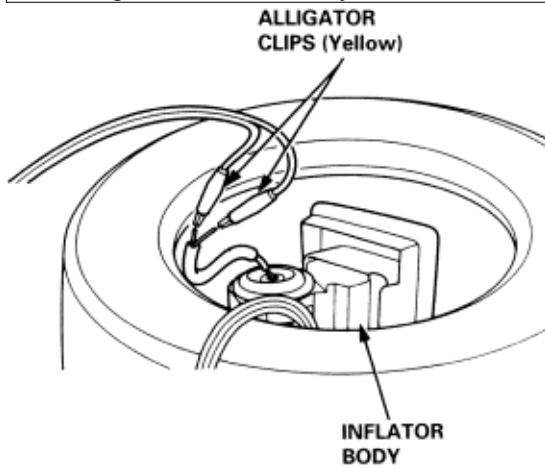


10. Place the set of two wheel-less tyres on flat ground, and place the tyre with the airbag or side airbag or seat belt tensioner on them.
11. Cut off the airbag or side airbag or seat belt tensioner connector, strip the ends of the air bag or seat belt tensioner wires about 15 mm (0.60 in), and twist them together.



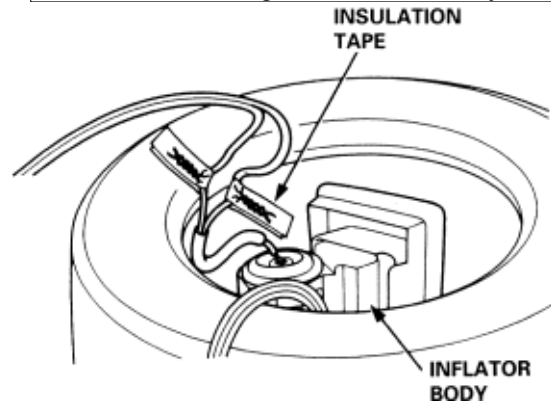
12. Connect the deployment tool alligator clips to the airbag or side airbag or seat belt tensioner wires.

CAUTION
Do not route the vinyl double cable near the pad surface of the airbag or the inflator body.

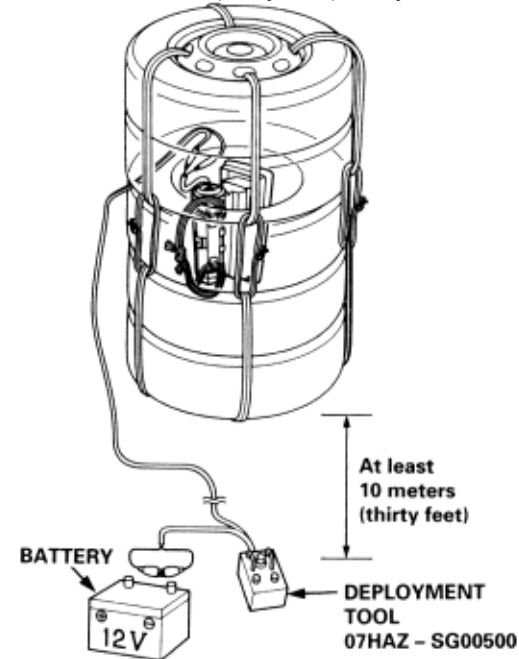


13. Without Deployment Tool: Connect the wires of the vinyl double cable which were not intertwined in step 3 to the airbag or side airbag or seat belt tensioner wires as shown, and put insulation tape over the connections.

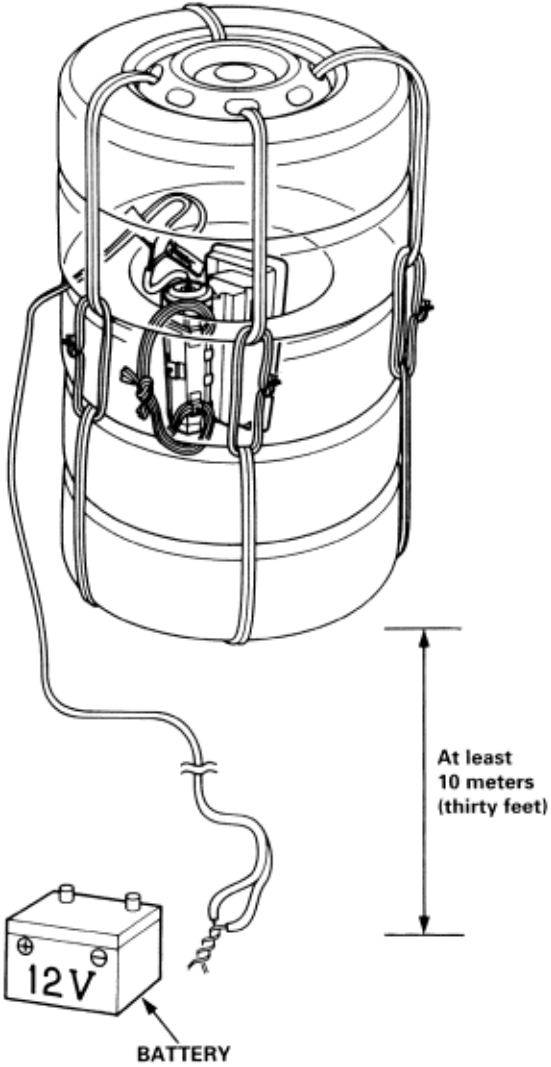
CAUTION
Do not route the vinyl double cable near the pad surface of the airbag or the inflator body.



14. With Deployment Tool: With the wheel-installed tyre up, put the second pair of tyres on top of the other three tyres, and tie the upper and lower tyre sets together. Place the deployment tool at least 10 meters (thirty feet) away from the tyres.

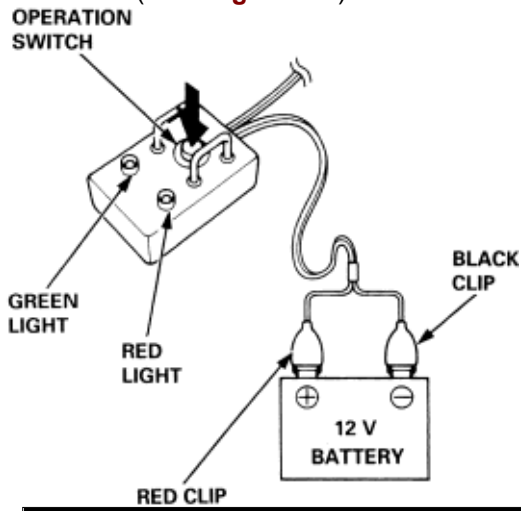


15. Without Deployment Tool: With the wheel-installed tyre up, put the second pair of tyres on top of the other three tyres, and tie the upper and lower tyre sets together. Place the battery at least 10 meters (thirty feet) away from the tyres.



16. With Deployment Tool: Go to Deployment ([See Page 24-90](#)).
17. Without Deployment Tool: Go to Deployment ([See Page 24-91](#)).

1. Connect the red (+) and black (-) clips of the deployment tool to the 12 volt battery:
 - ♦ If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. In this case, refer to Damaged Airbag, Side Airbag, Seat Belt Tensioner Special Procedure under Disposal ([See Page 24-91](#)).
 - ♦ If the red light on the tool comes on, the airbag is ready to be deployed.
2. Push the tool's operation switch. The airbag should deploy (deployment is both highly audible and visible; a loud noise and rapid inflation of the bag, followed by slow deflation).
 - ♦ If audible/visible deployment happens and the green light on the tool comes on, go to Disposal ([See Page 24-91](#)).
 - ♦ If the airbag does not deploy, yet the green light comes on, the igniter is defective. Go to Damaged Airbag, Side Airbag, Seat Belt Tensioner Special Procedure under Disposal ([See Page 24-91](#)).



CAUTION

During deployment, the deployment unit can become hot enough to burn you. Wait thirty minutes after deployment before touching the unit.

Airbag Scrapping

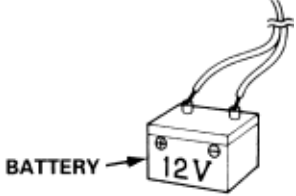
Deployment (Without Deployment Tool)

24-91

Disposal

Untwist the stripped ends of the vinyl double cable and connect them to the 12 volt battery. The deployment unit should deploy (deployment is both highly audible and visible; a loud noise and rapid inflation of the bag, followed by slow deflation).

- ♦ If audible/visible deployment happens, go to Disposal.
- ♦ If the airbag or side airbag or seat belt tensioner does not deploy, go to Damaged Airbag or Side Airbag or Seat Belt Tensioner Special Procedure.



CAUTION

During deployment, the deployment unit can become hot enough to burn you. Wait thirty minutes after deployment before touching the unit.

In accordance with local regulations, dispose of the complete deployment unit. No part of it can be reused. Place it in a sturdy plastic bag, and seal it securely.



CAUTION

- ♦ Wear a face shield and gloves when handling a deployed unit.
- ♦ Wash your hands and rinse them well with water after handling a deployed unit.



Damaged Airbag, Side Airbag, Seat Belt Tensioner Special Procedure

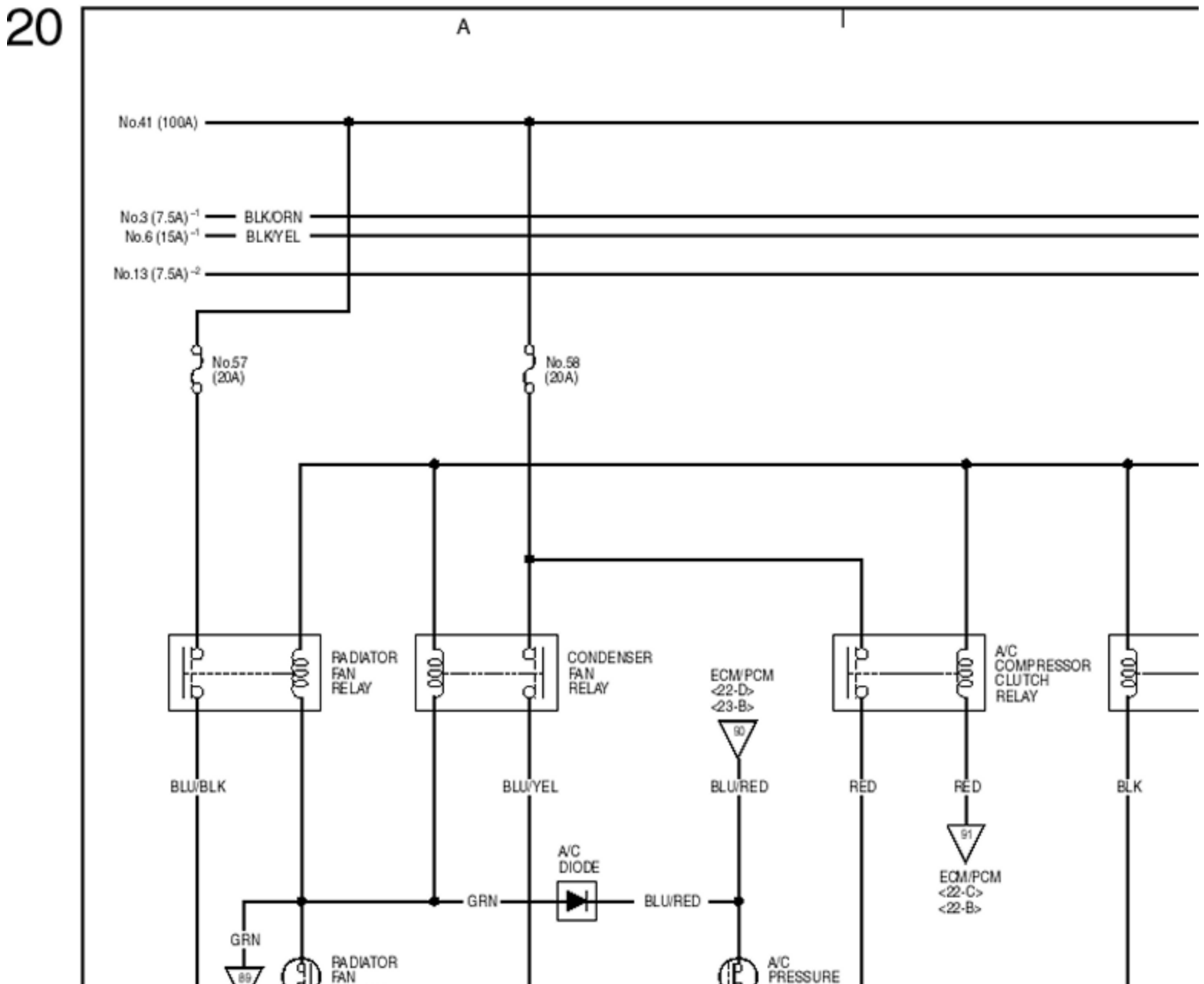
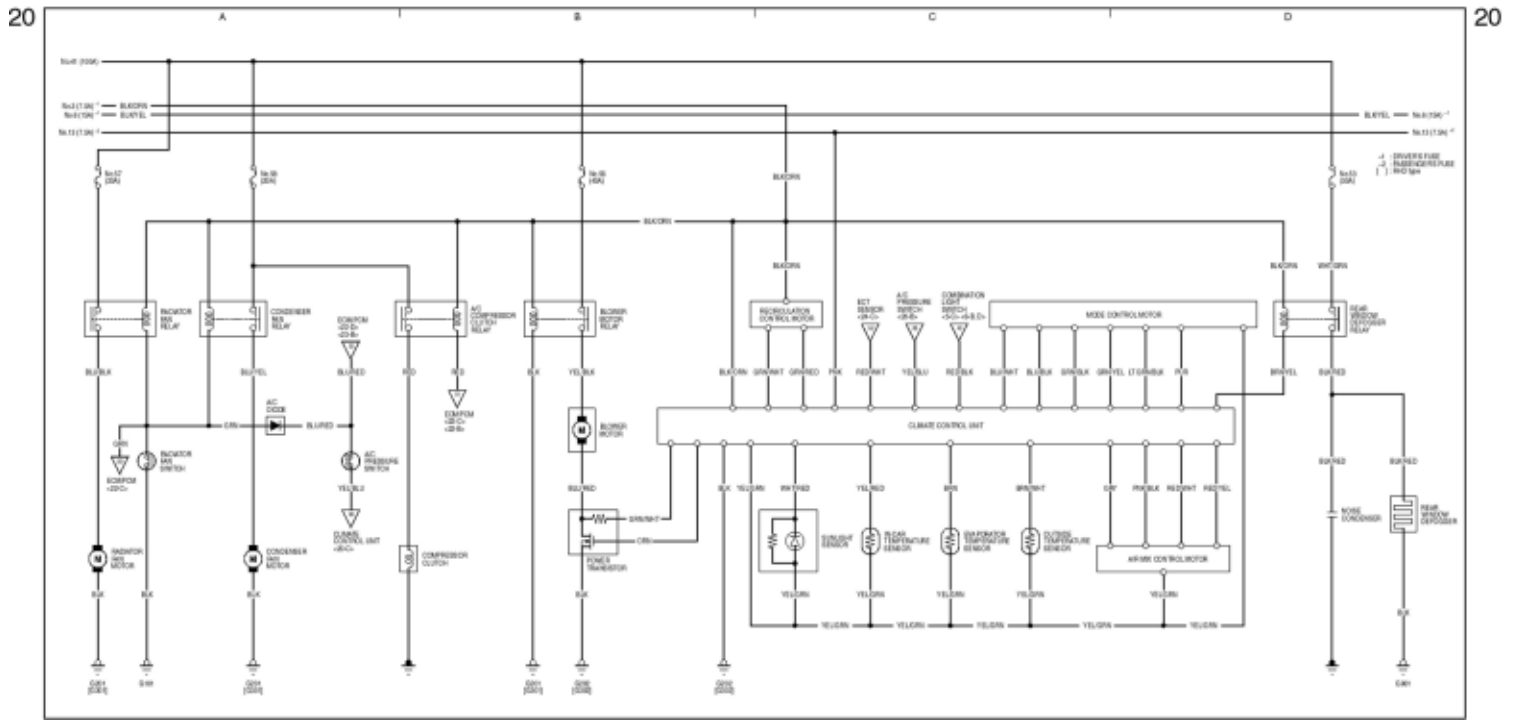


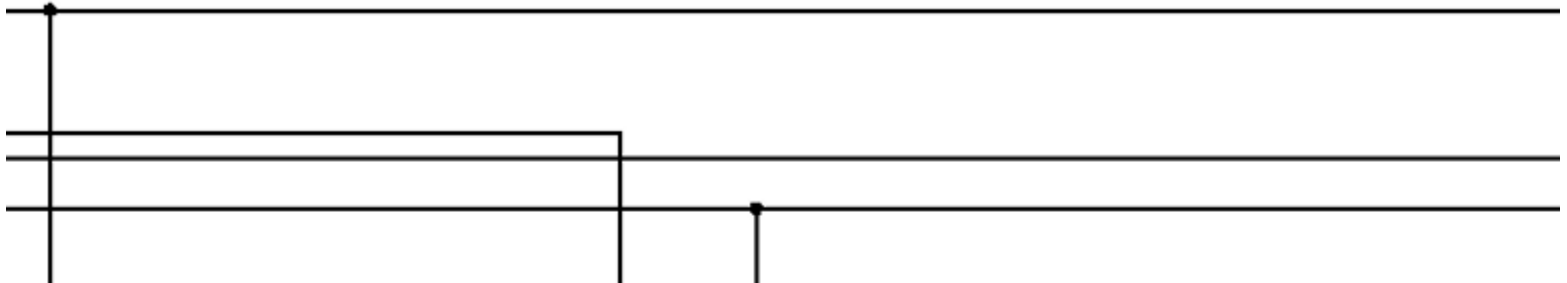
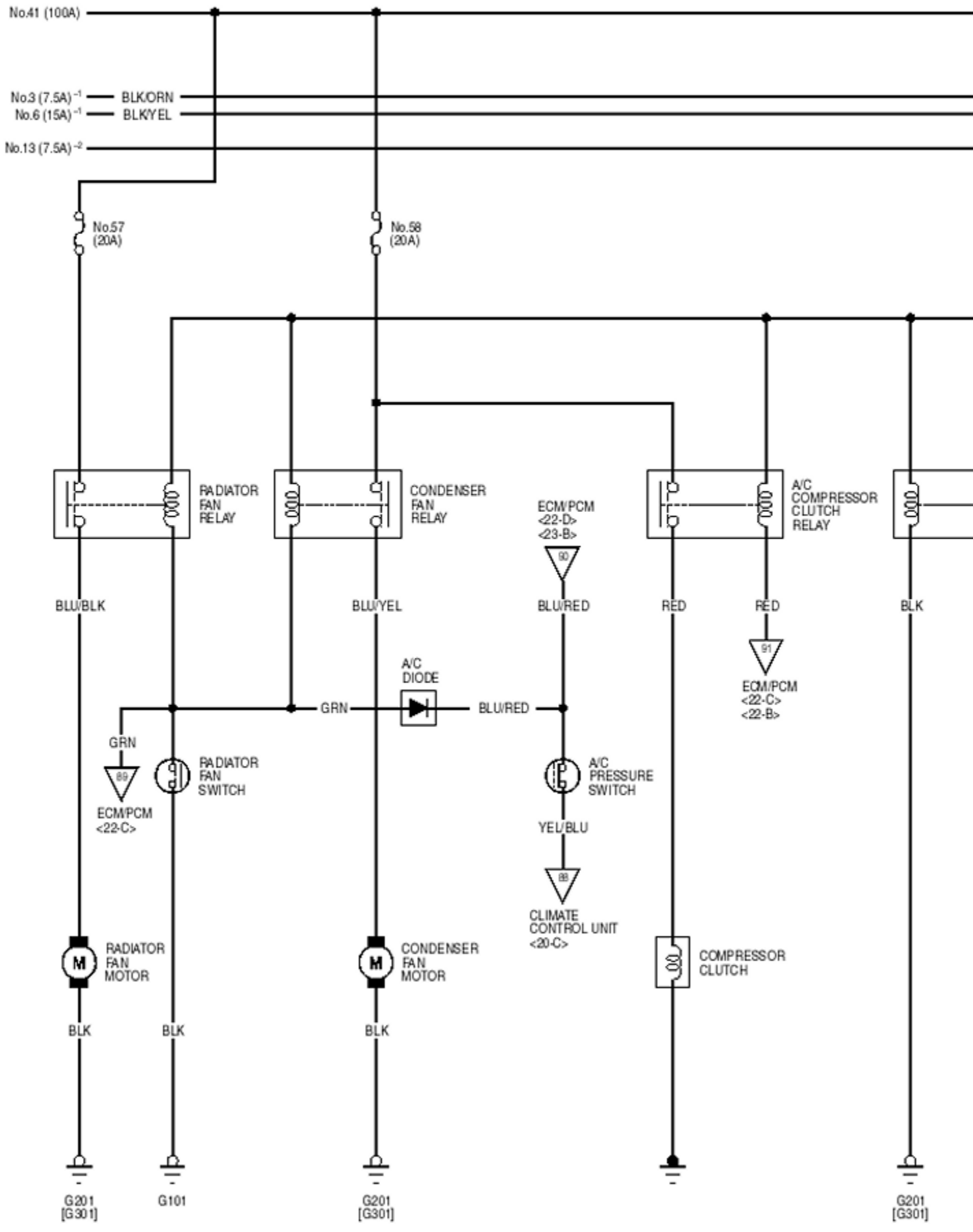
WARNING

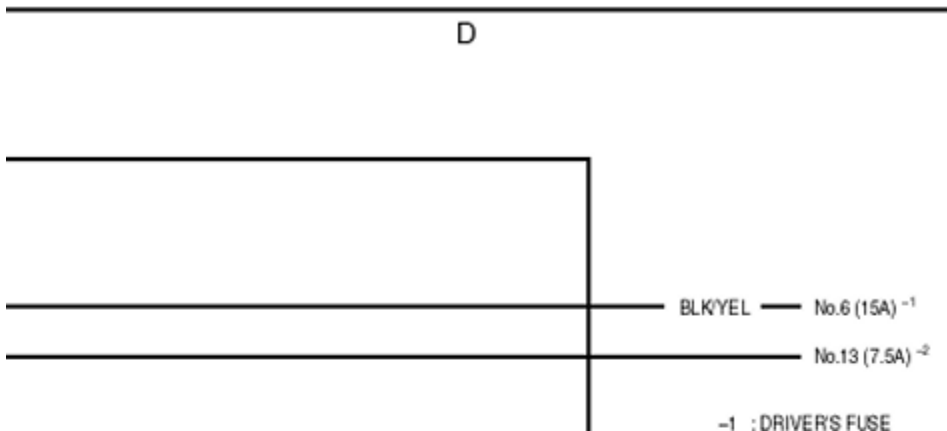
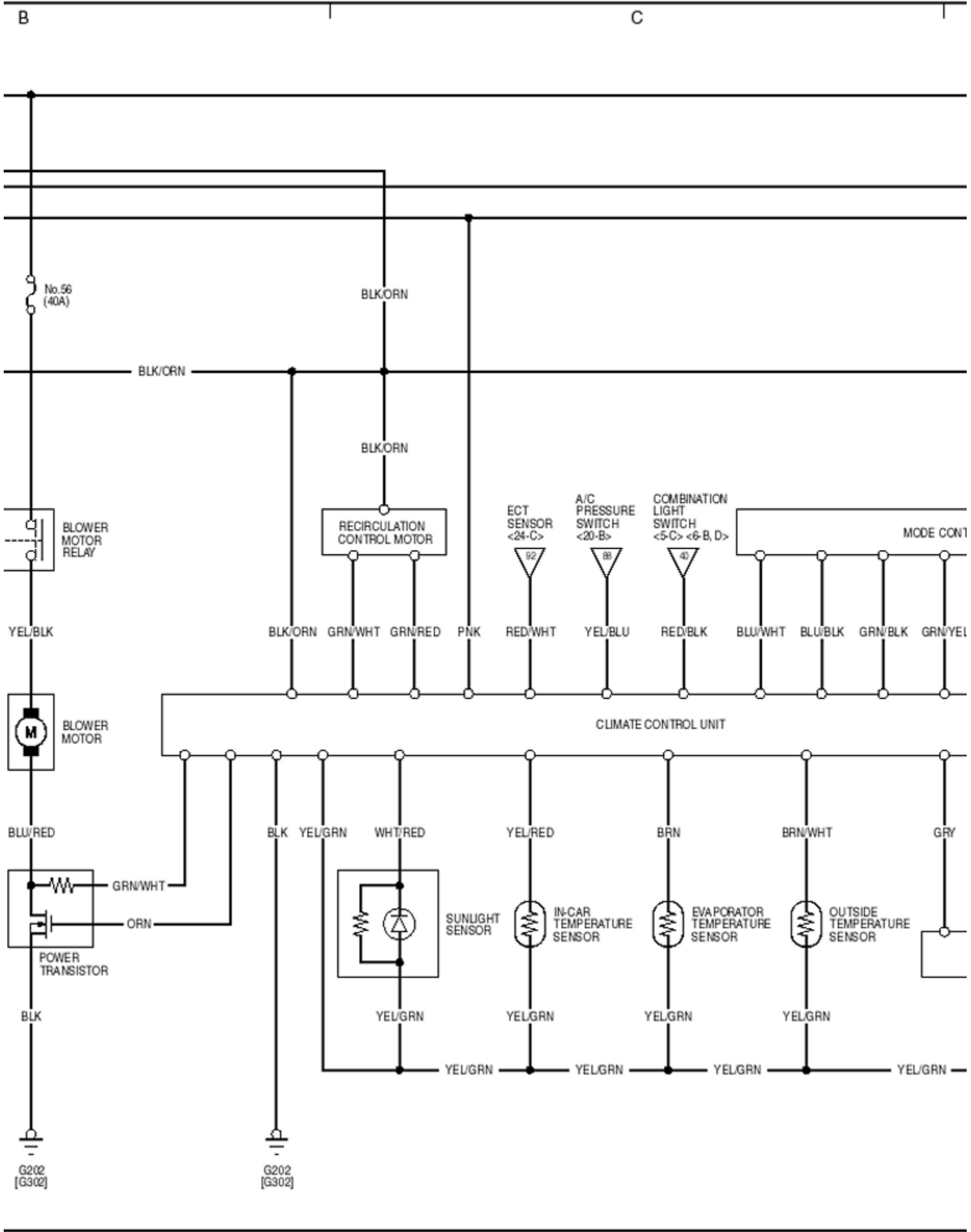
If a deployment unit cannot be deployed, it should not be treated as normal scrap, it should still be considered a potentially explosive device that can cause serious injury.

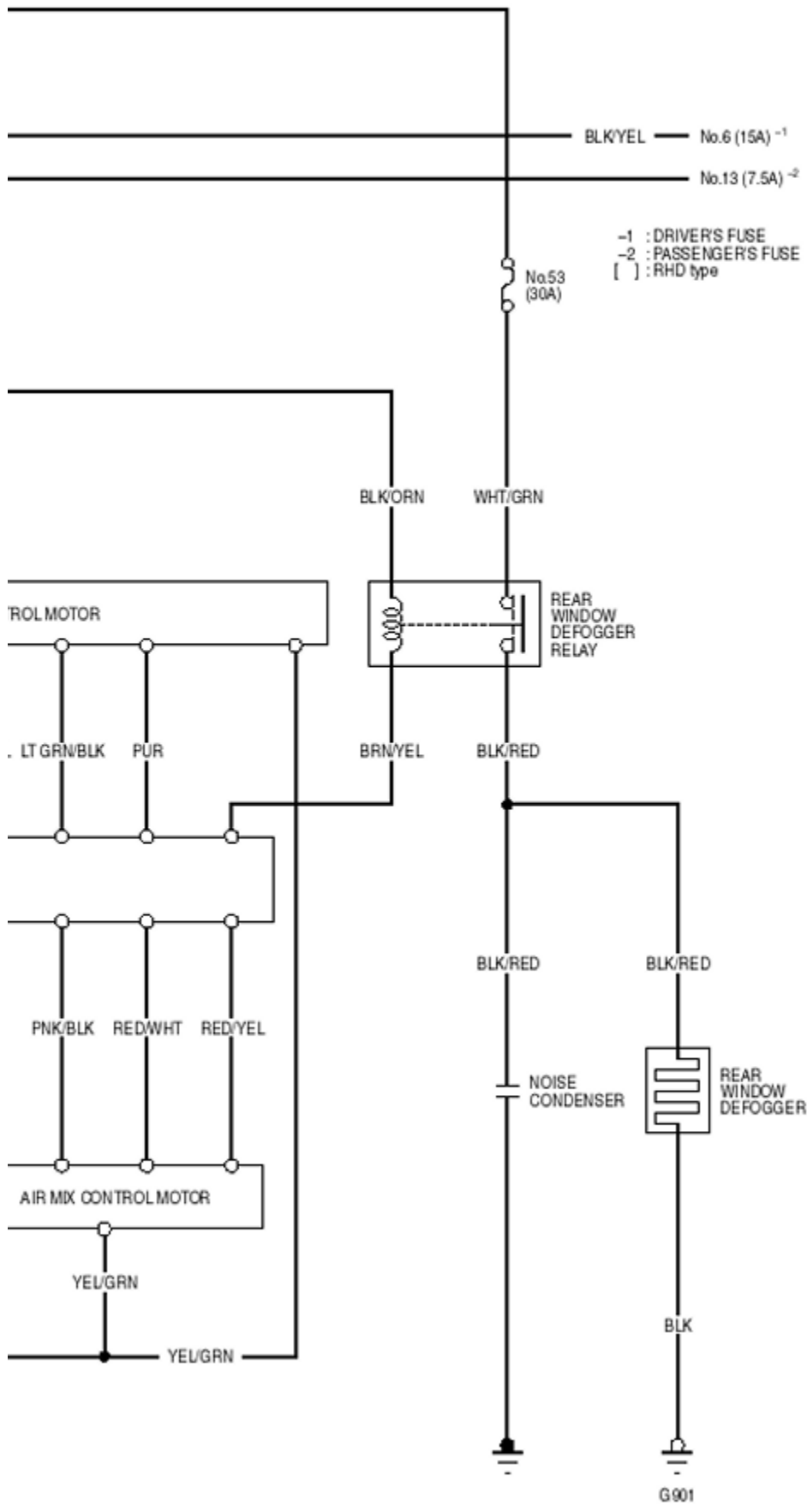
1. If installed in a vehicle, follow the removal procedure (**See Page 24-73**).
2. Intertwine the stripped ends of the two deployment unit wires to make a short circuit.
3. Package the deployment unit in exactly the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your local Honda Service Manager for how and where to return it for disposal.

Wiring Diagrams
Air Conditioning



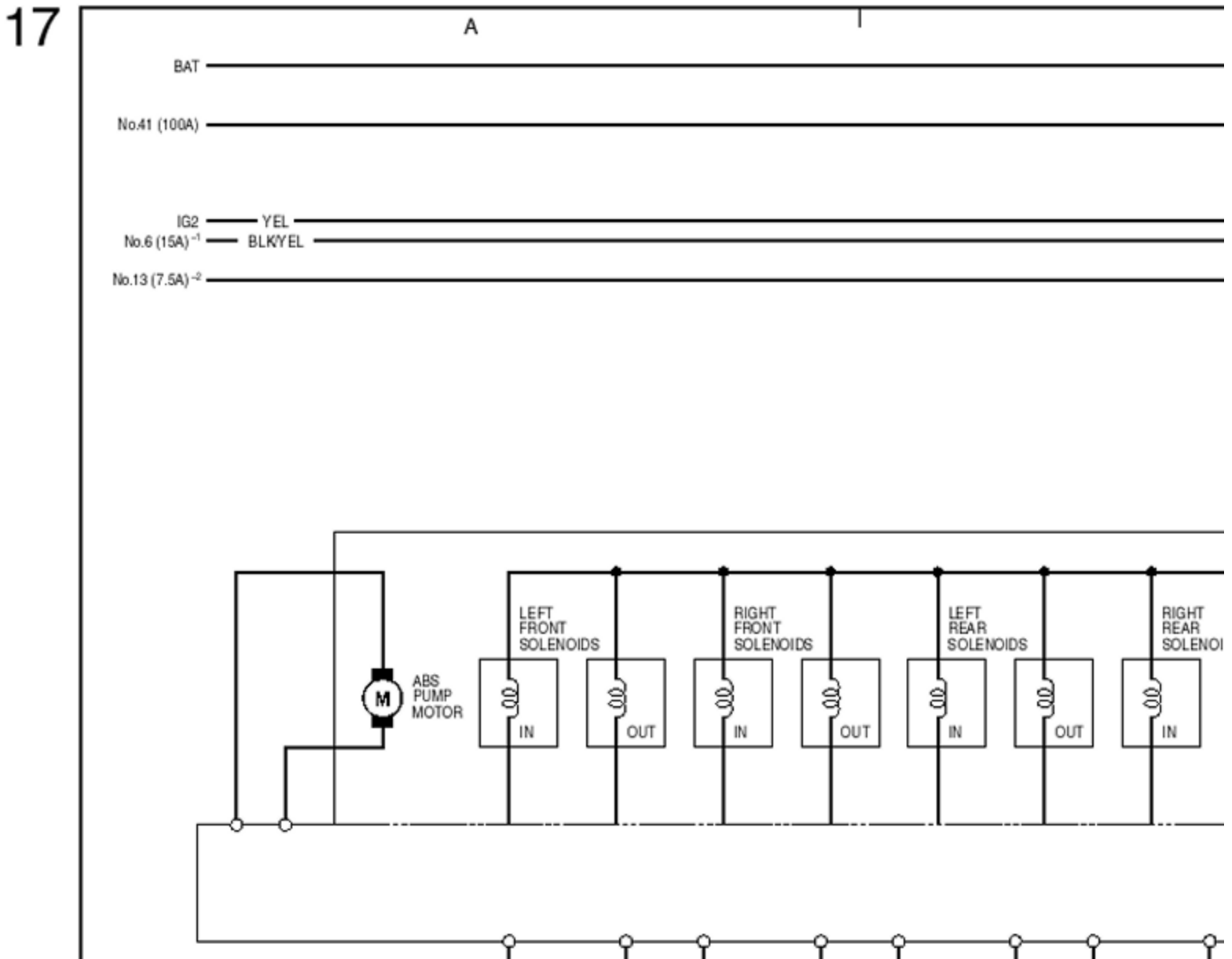
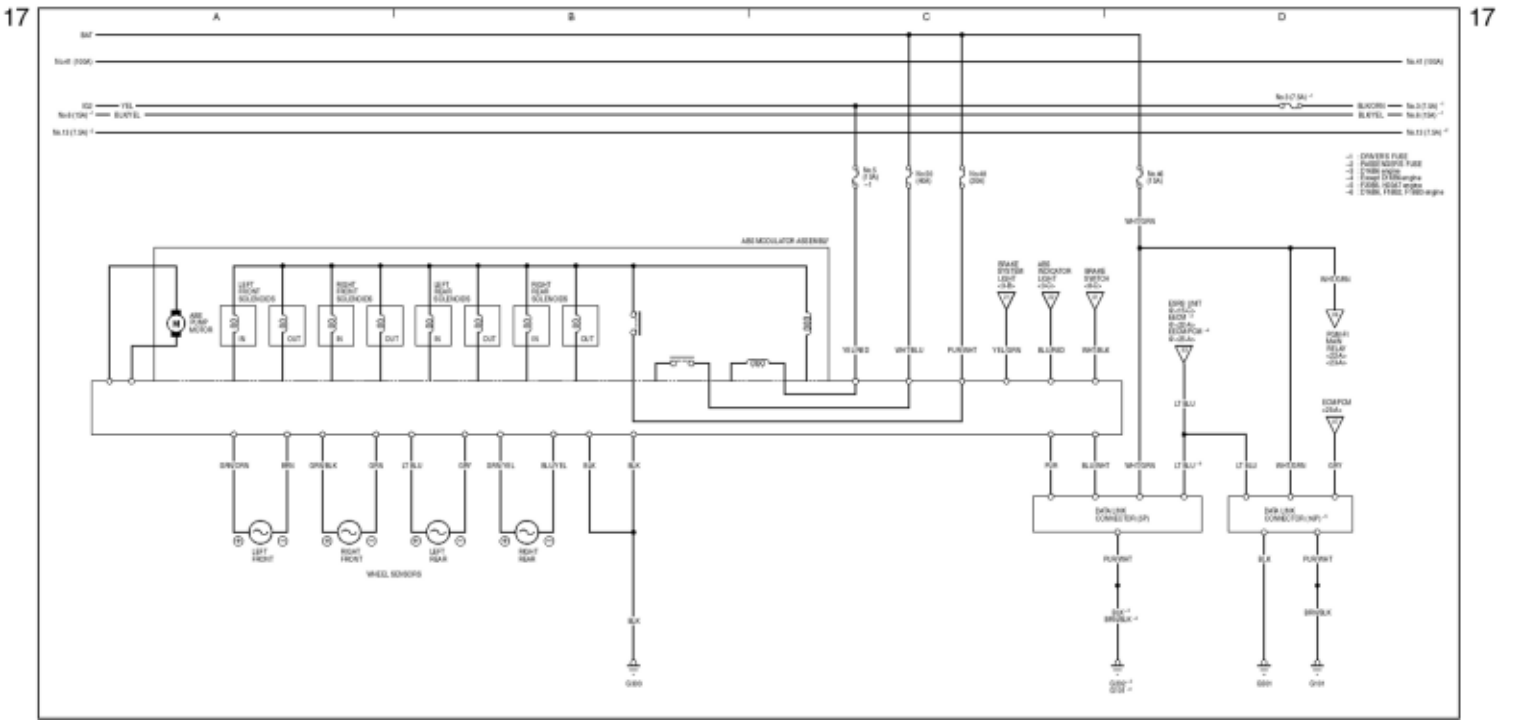




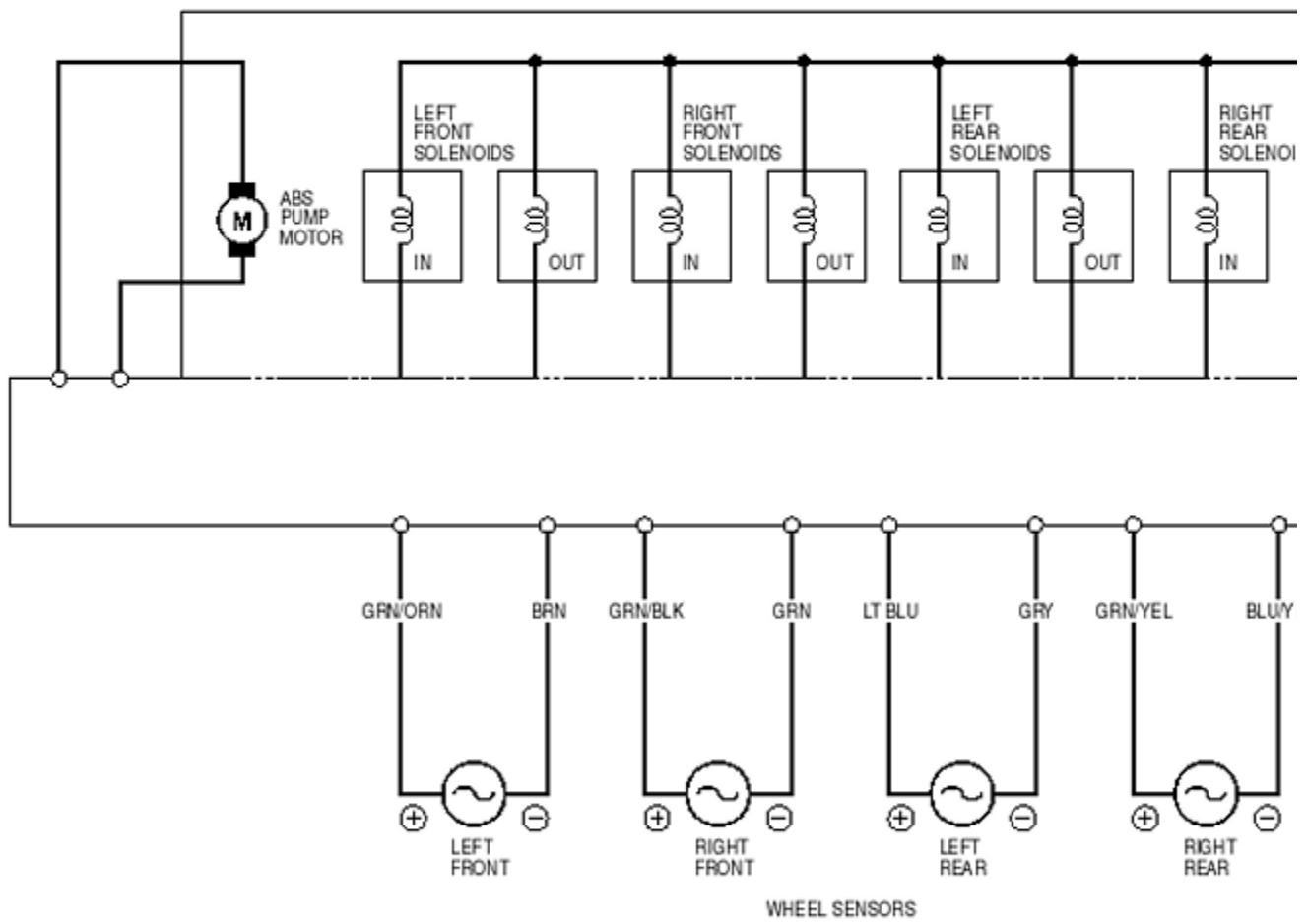
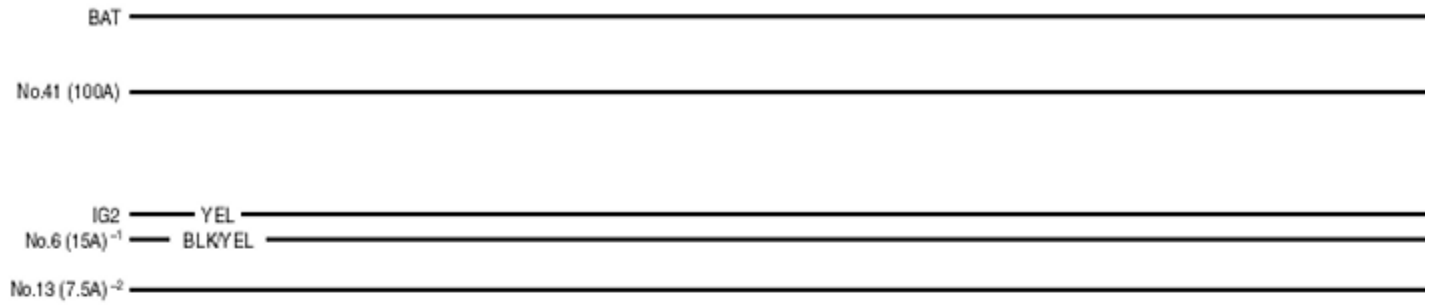


Wiring Diagrams

Anti-lock Brake system

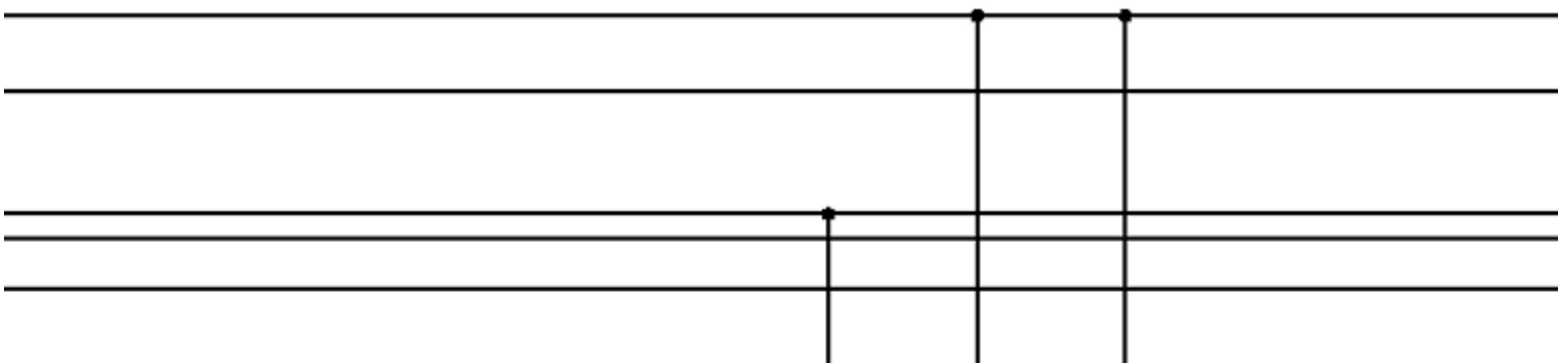


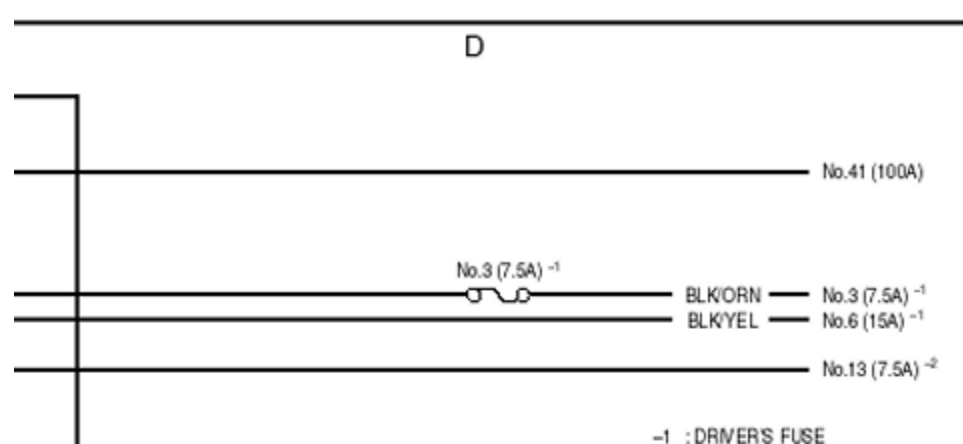
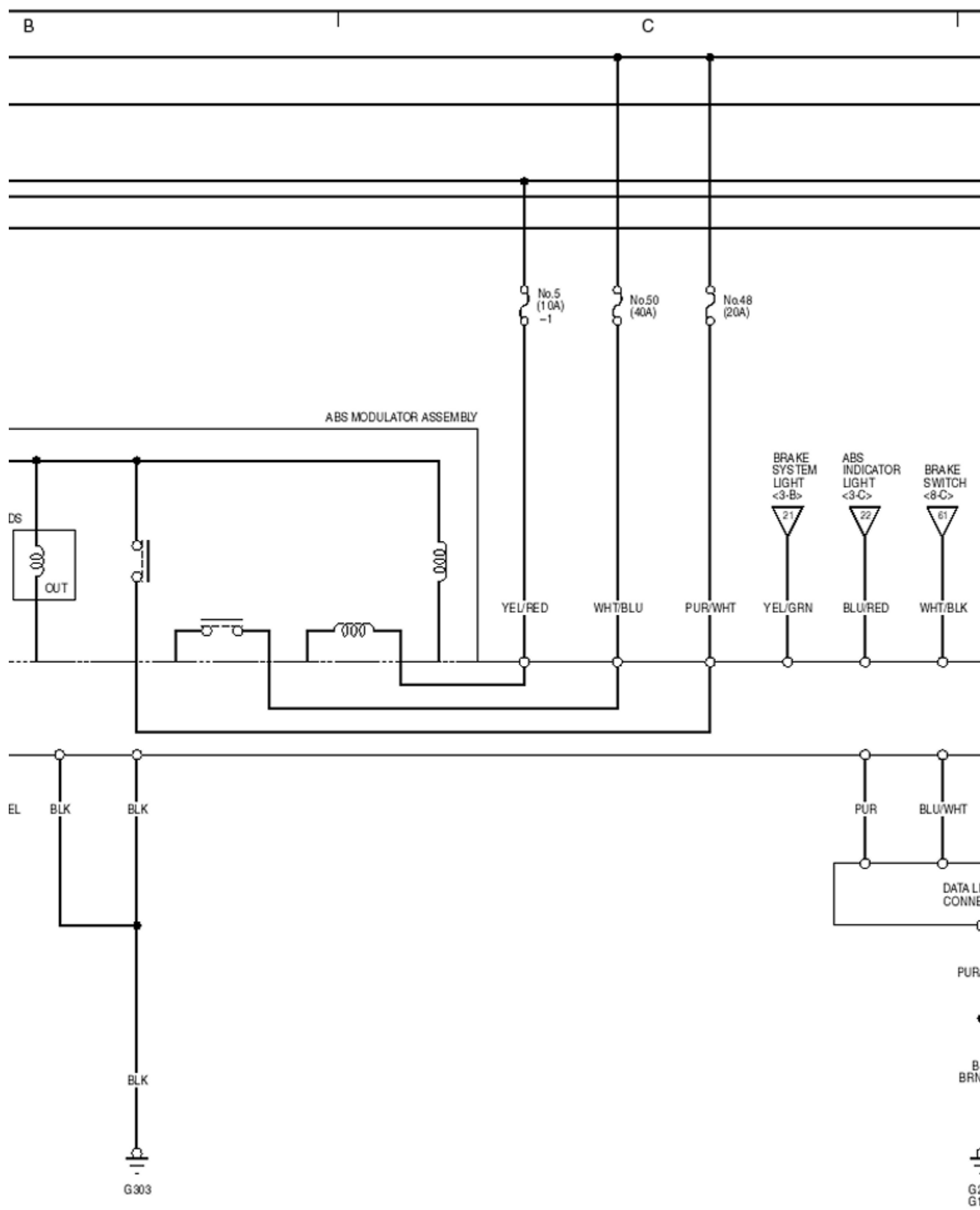
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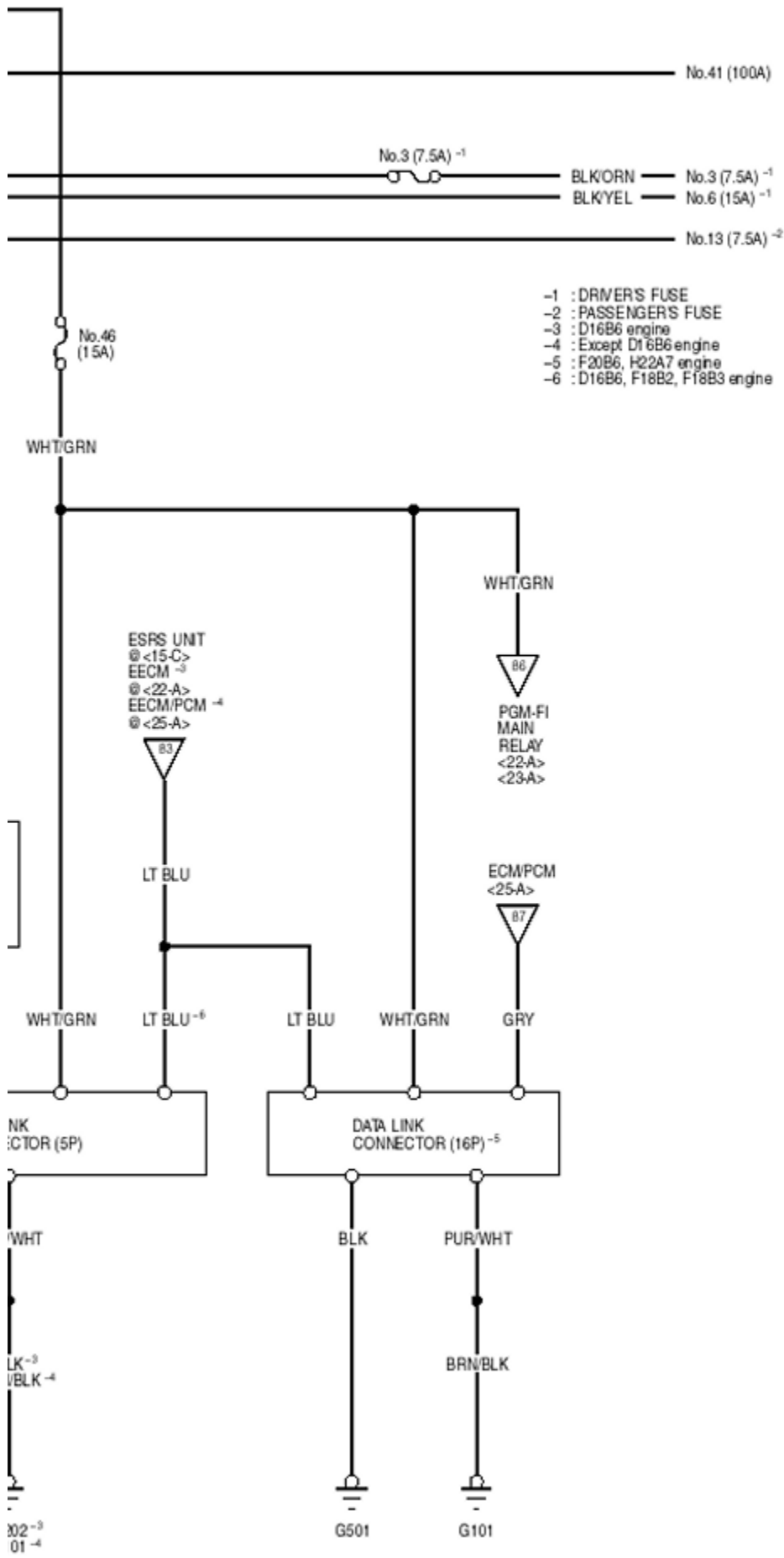
B

C



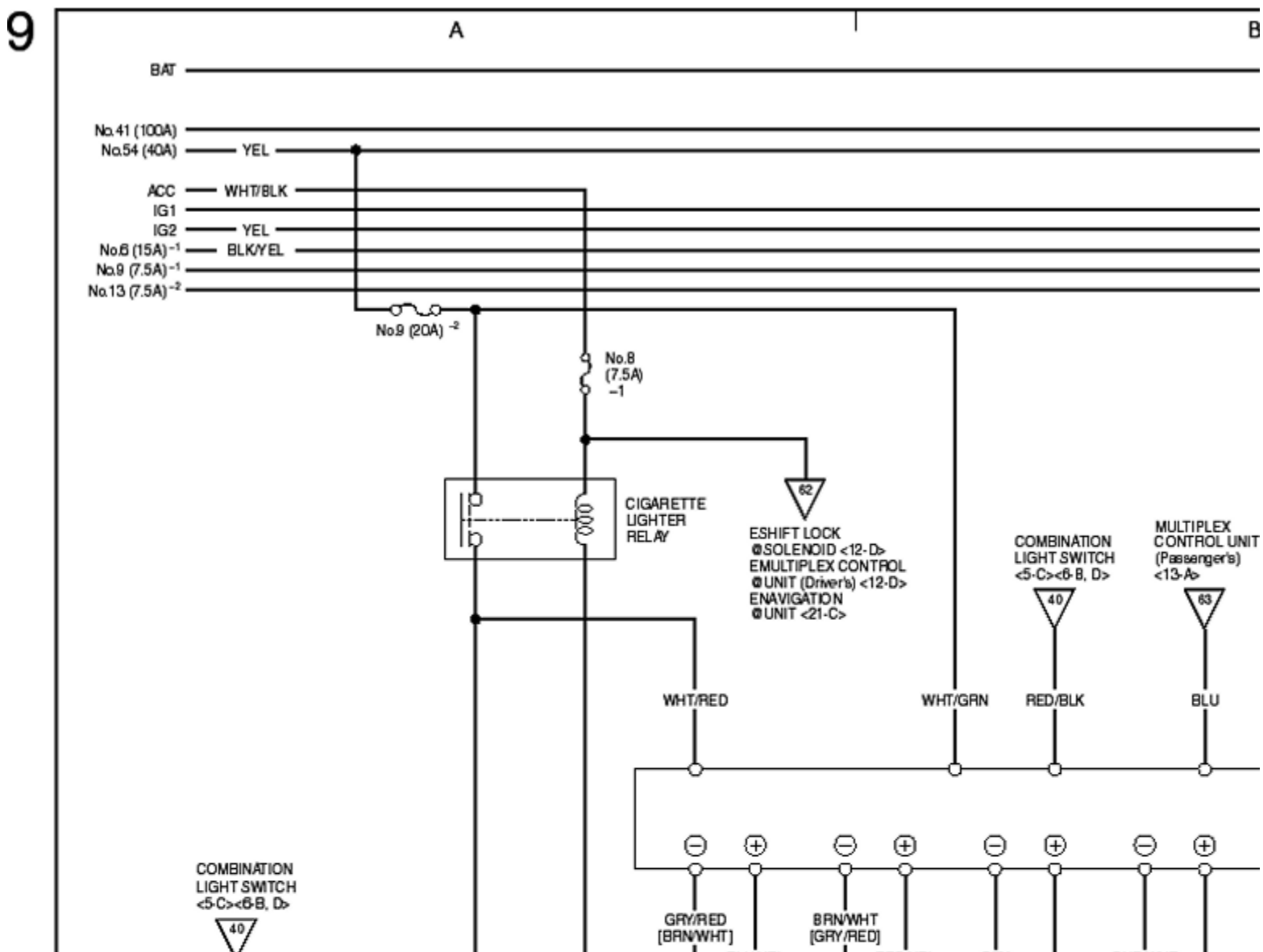
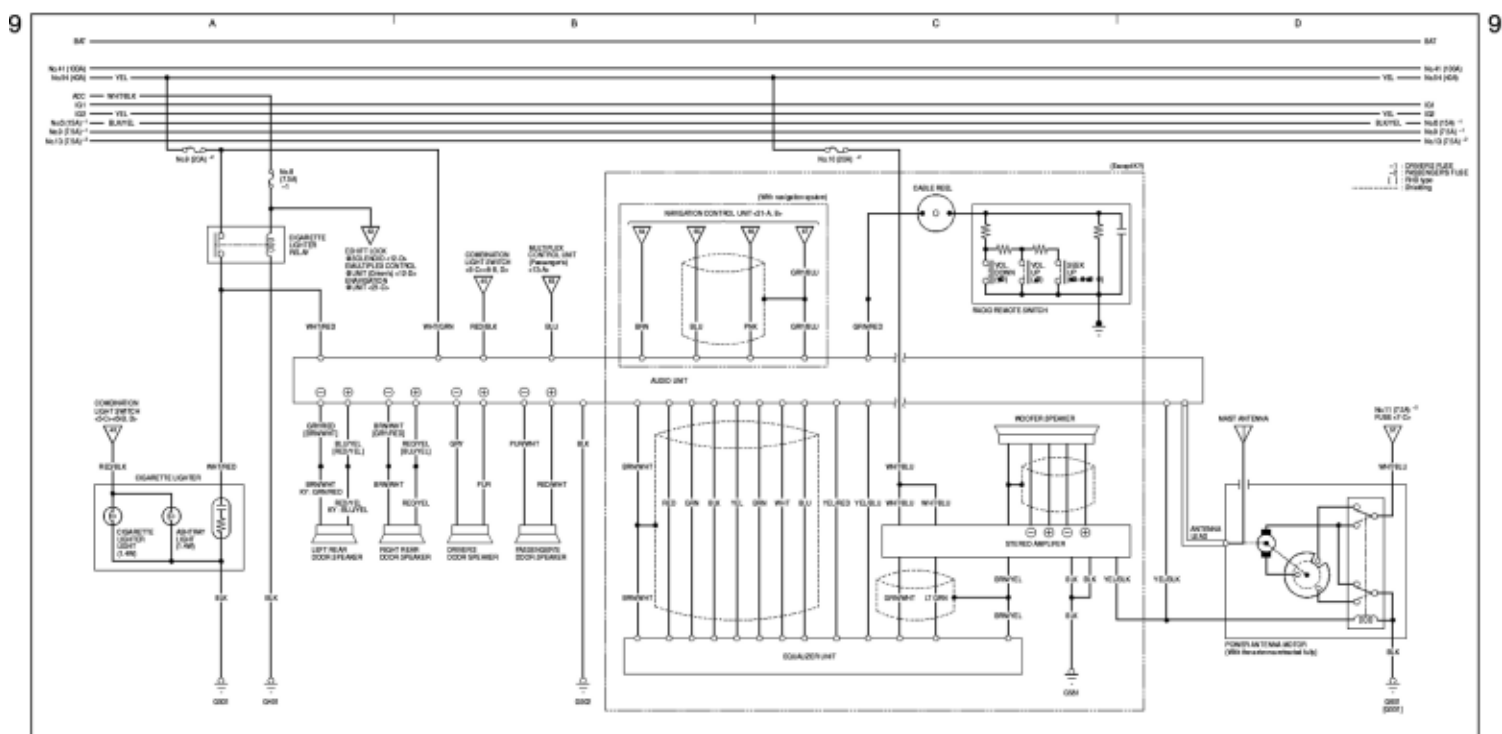


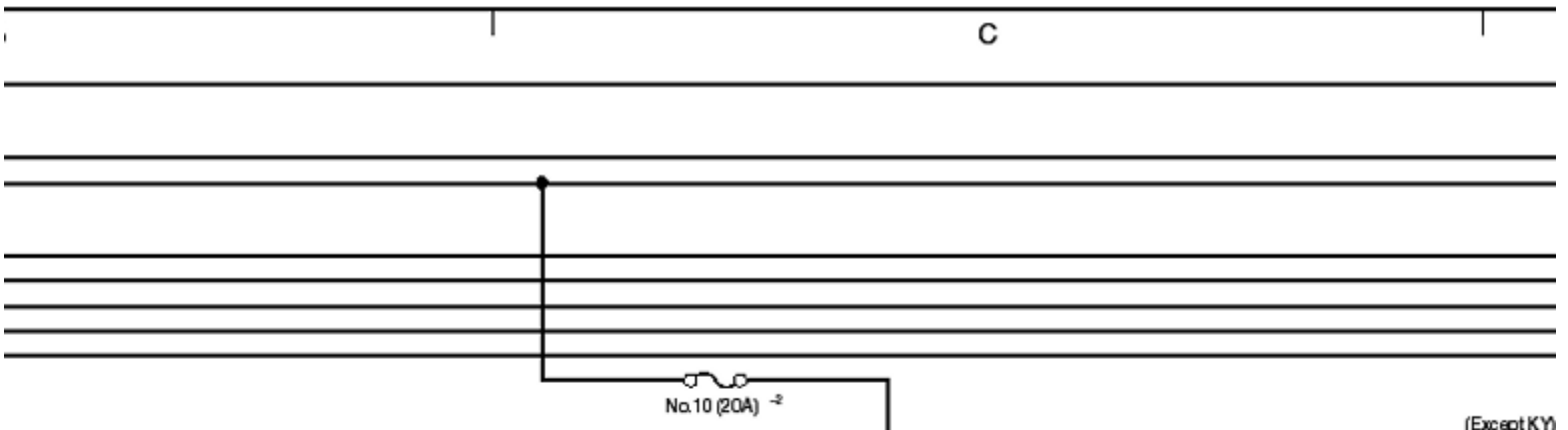
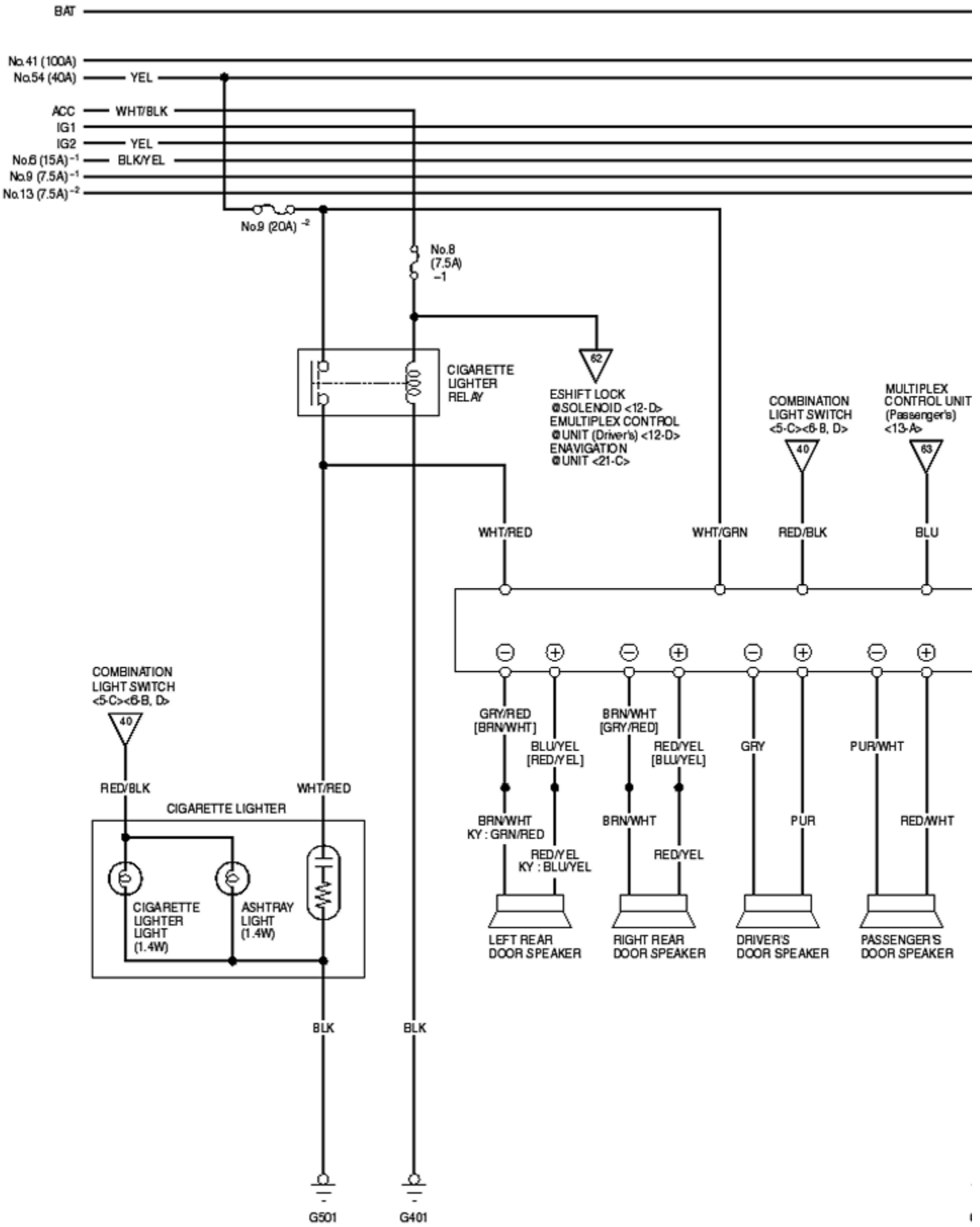
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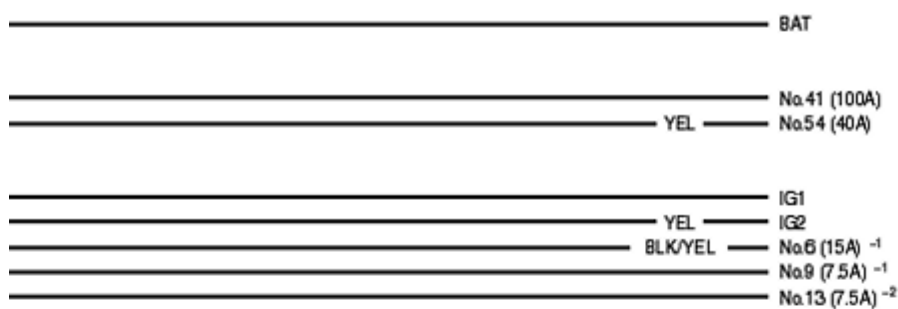
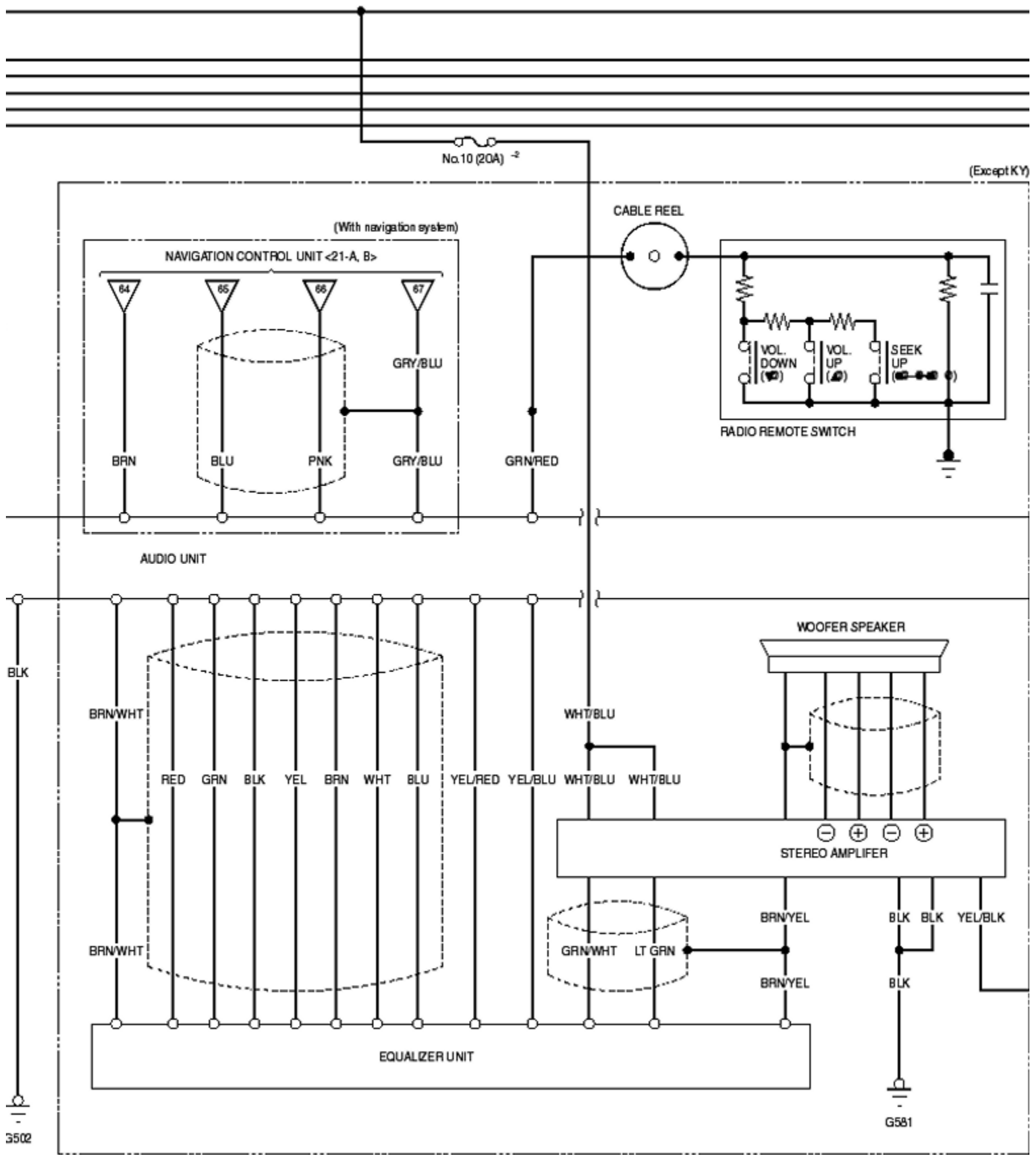


Wiring Diagrams

Audio Unit

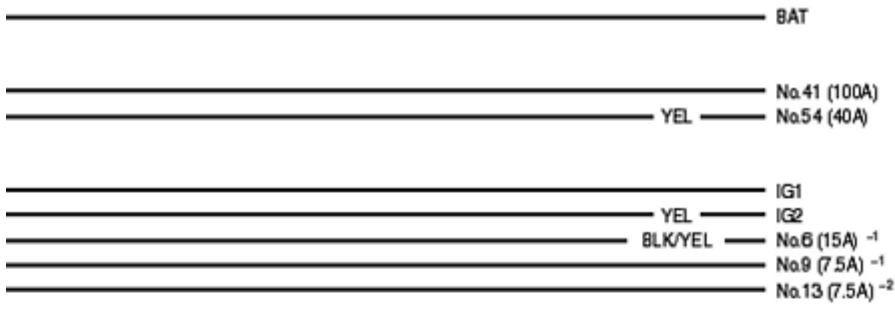




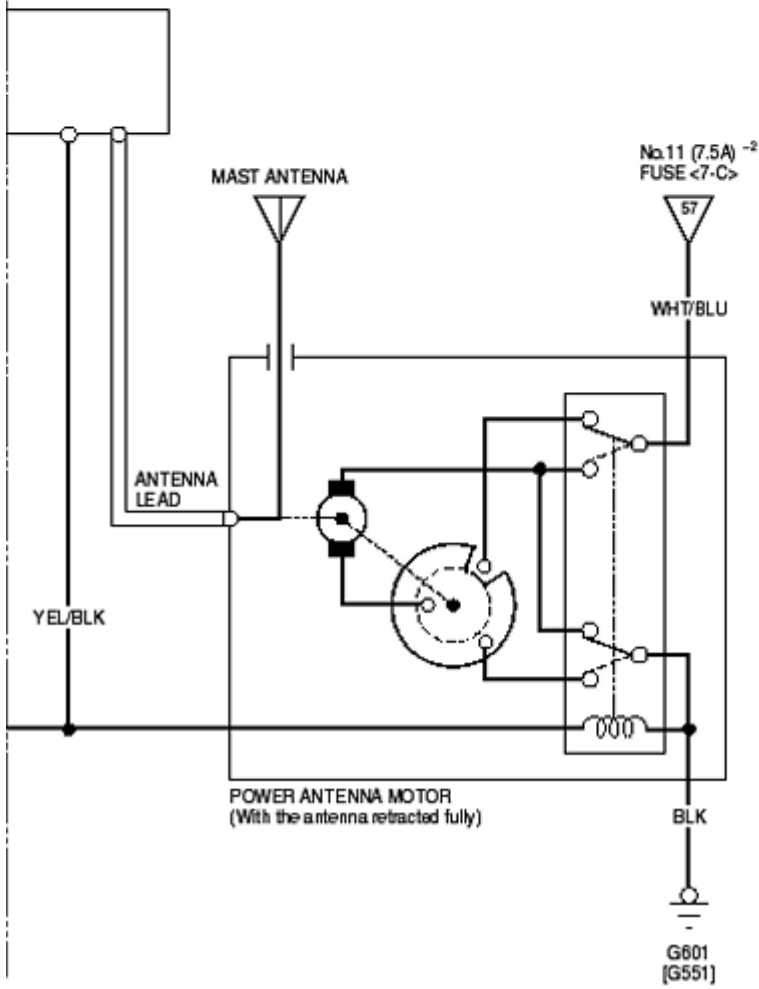


D

9

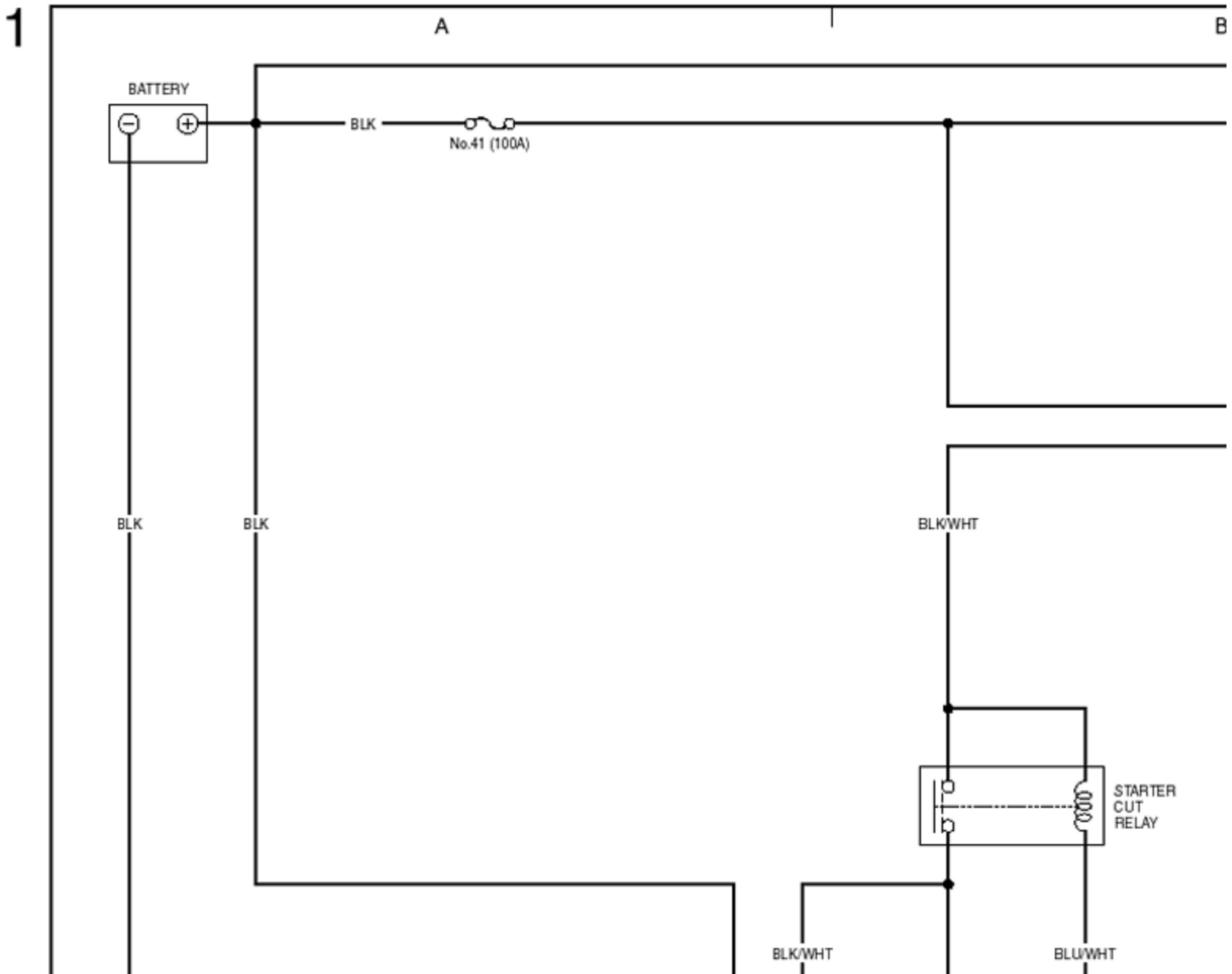
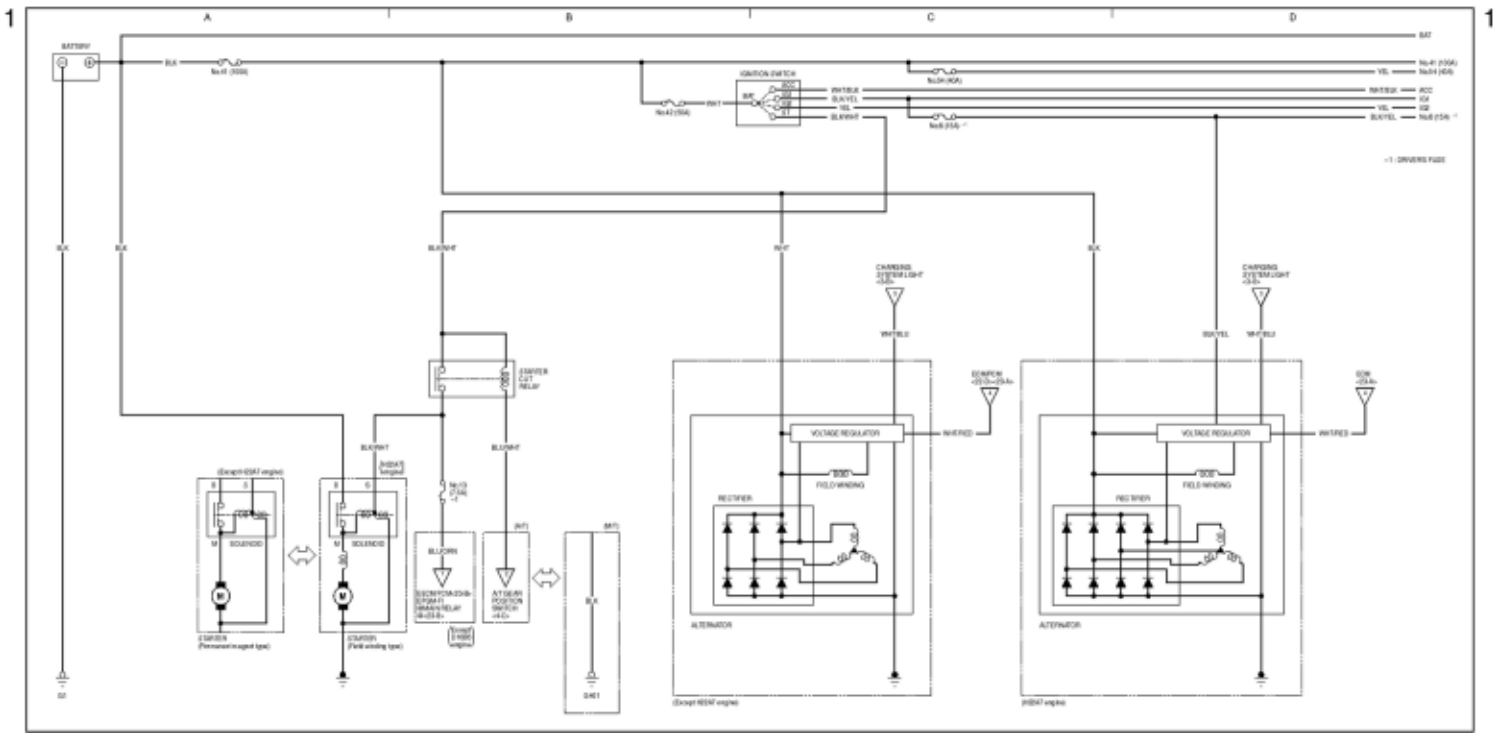


- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- [] : RHD type
- : Shielding

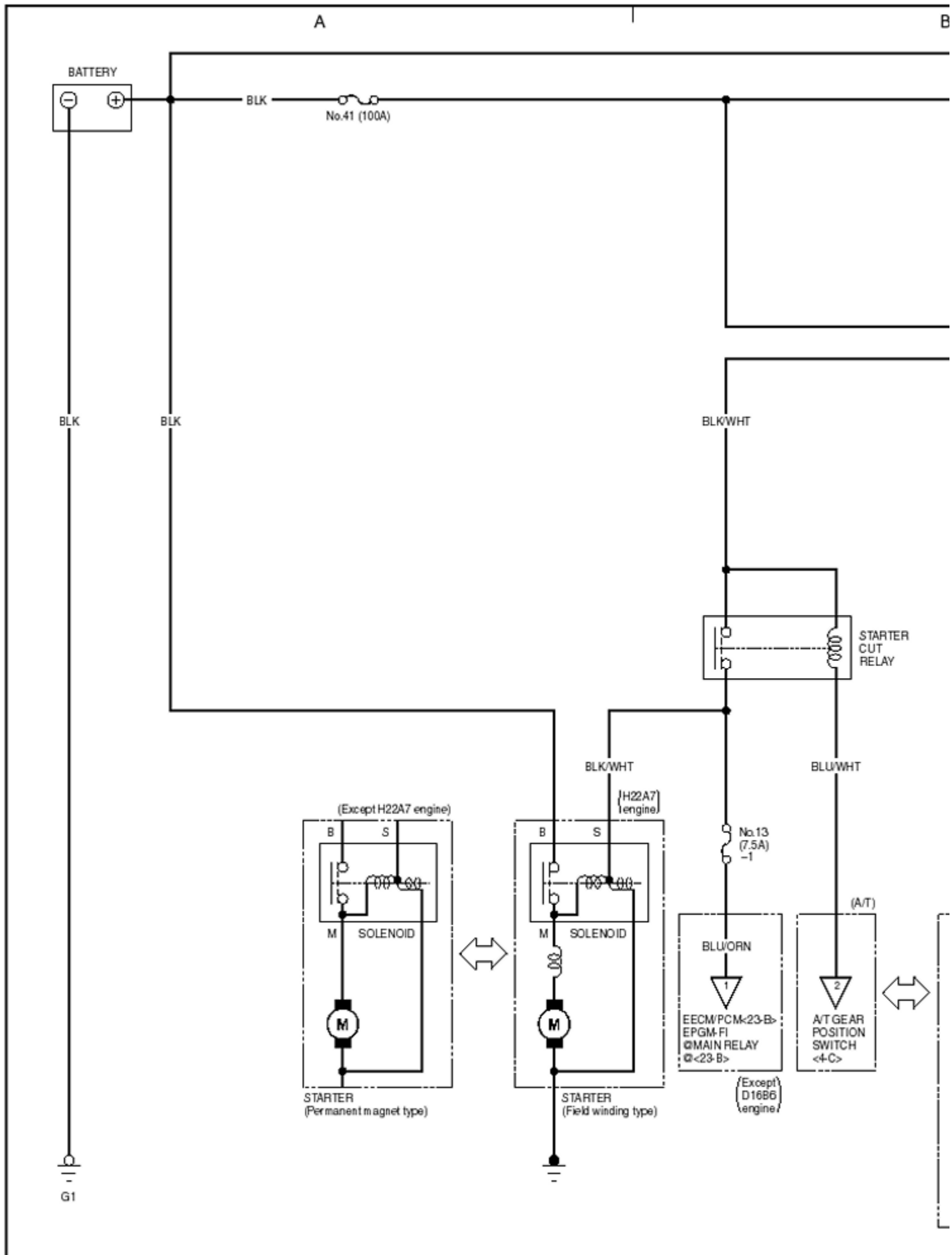


Wiring Diagrams

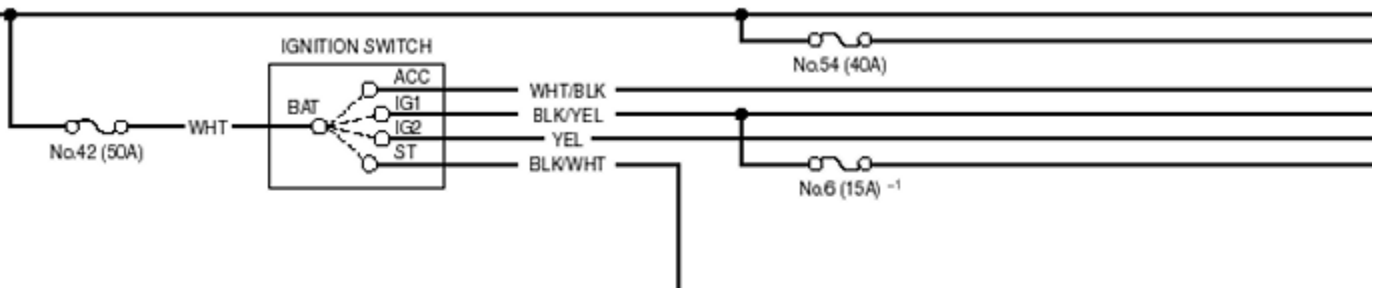
Battery



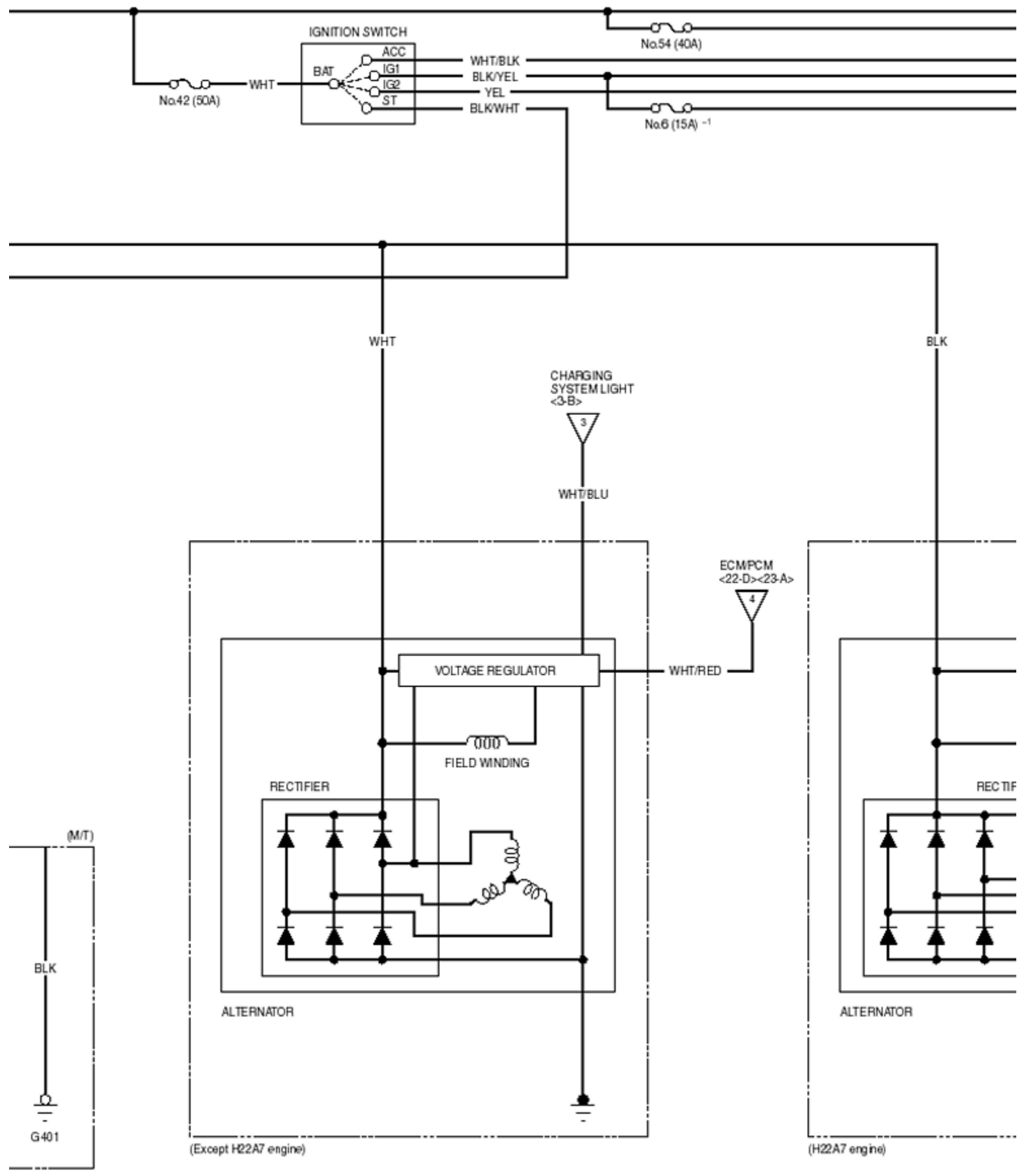
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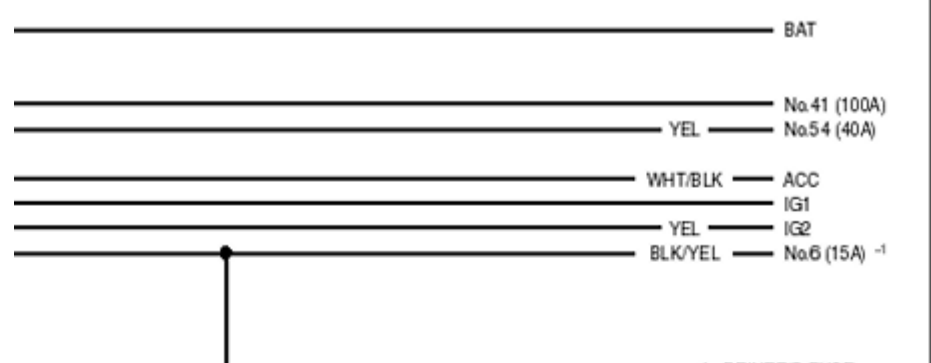
C



C



D

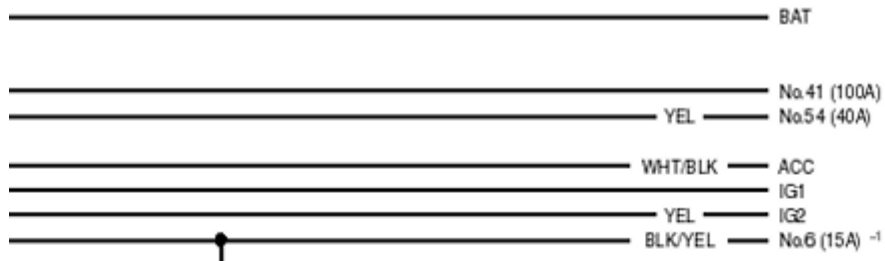


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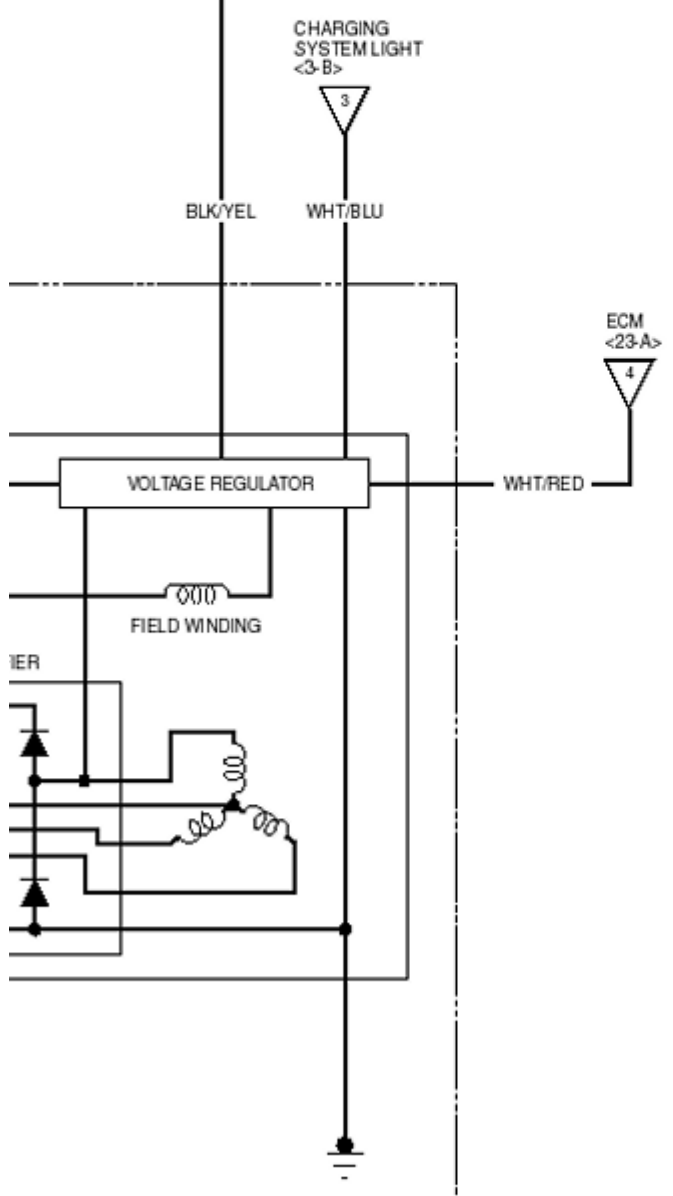
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D

1

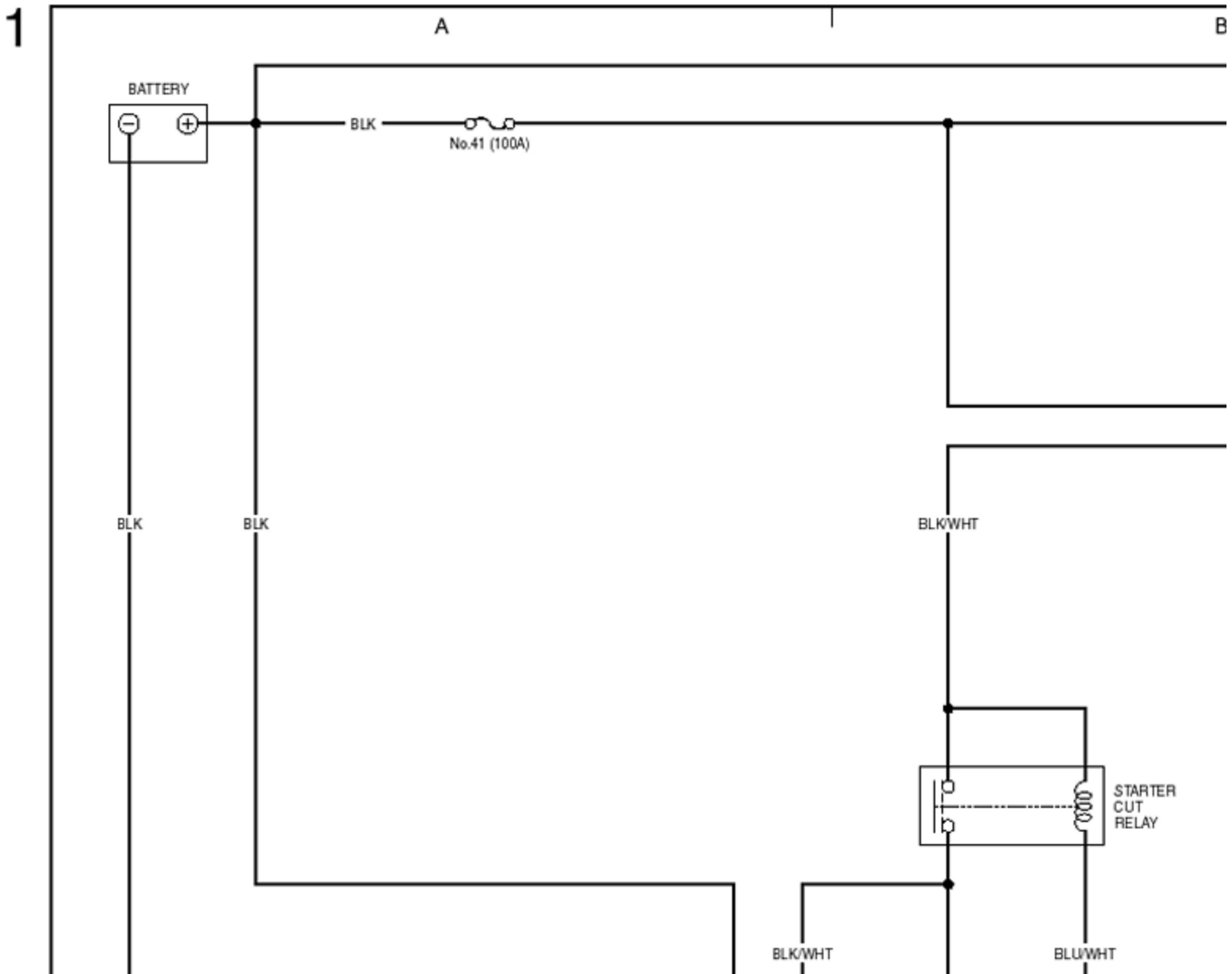
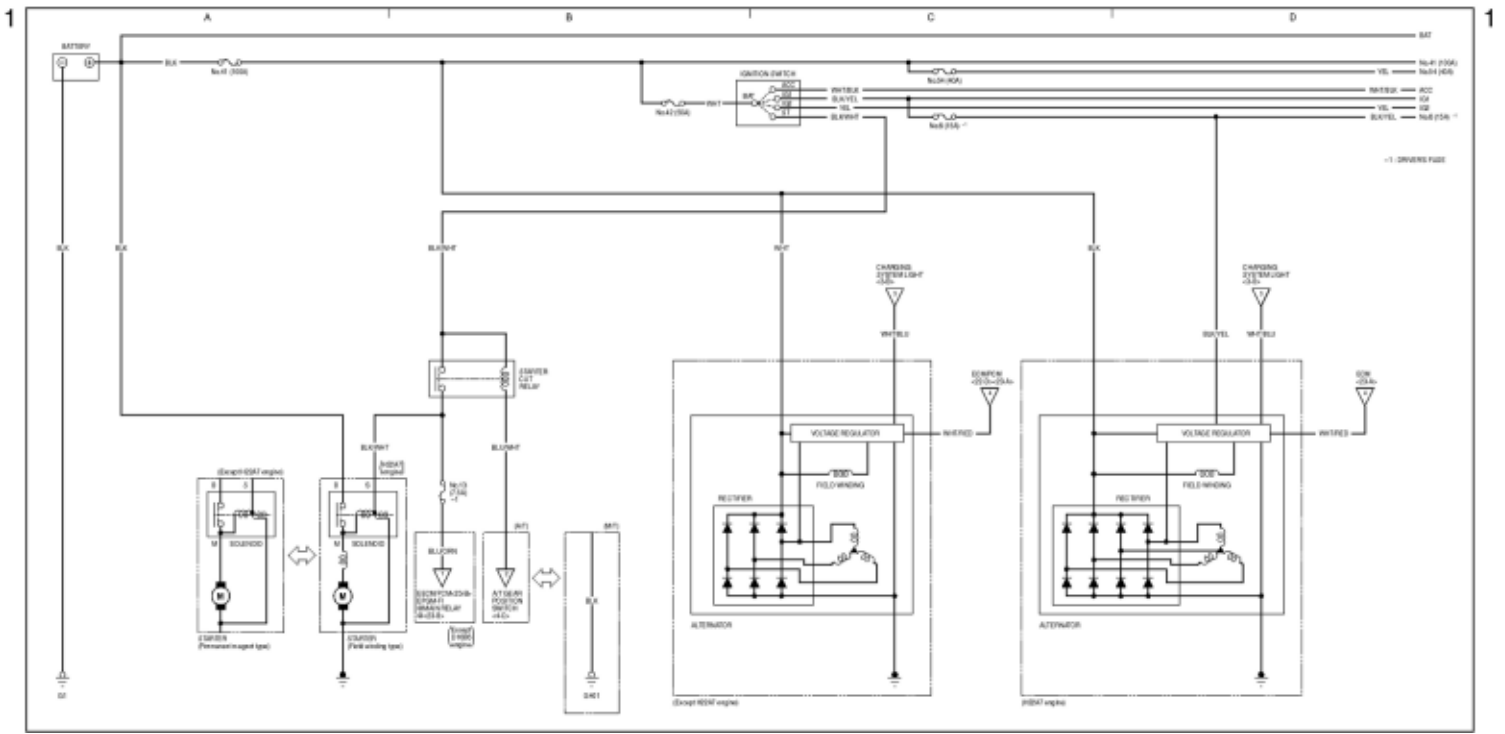


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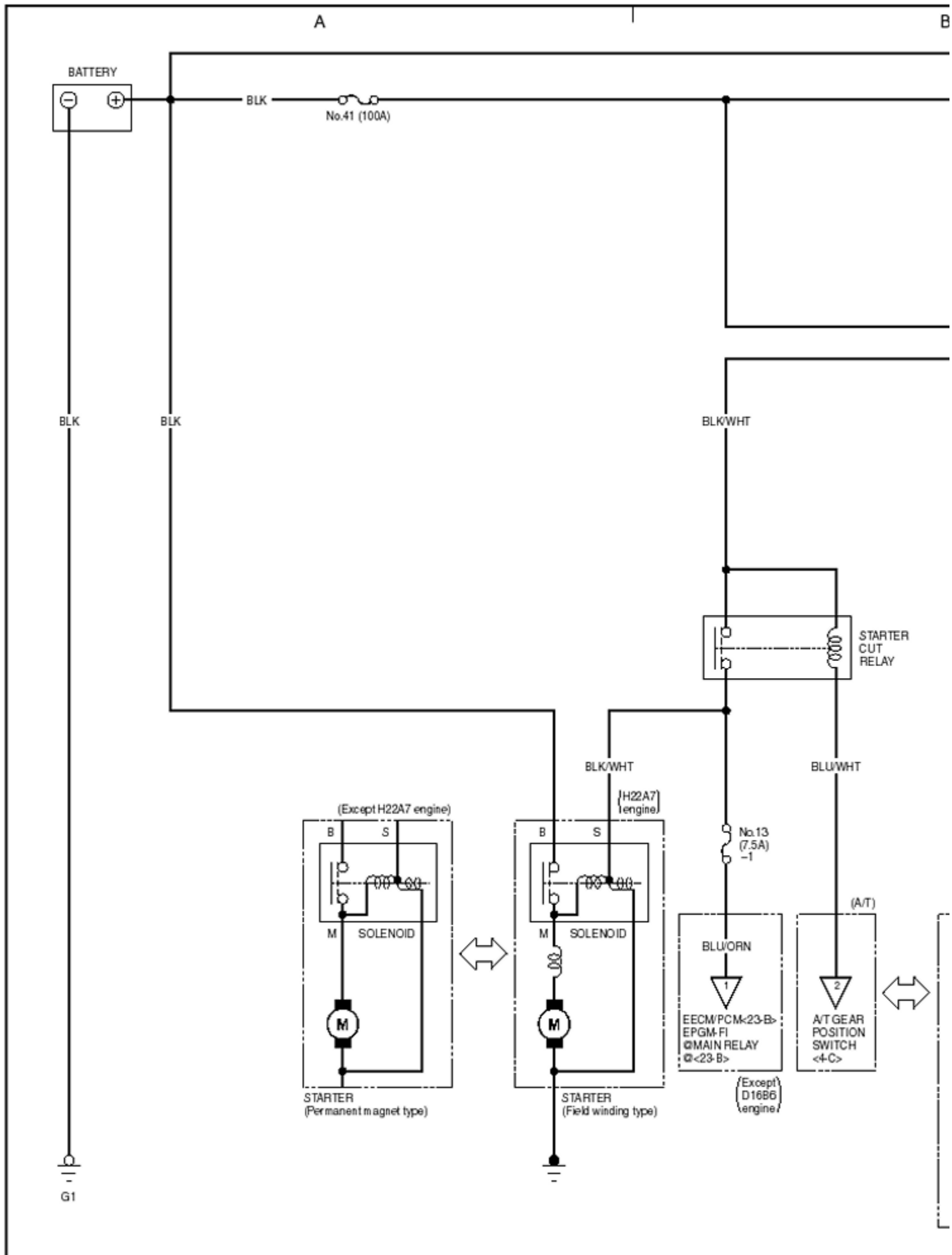


Wiring Diagrams

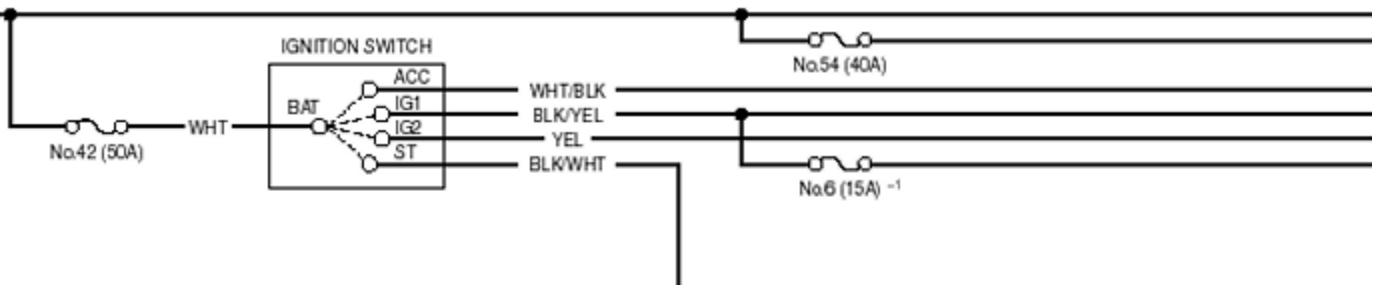
Charging System



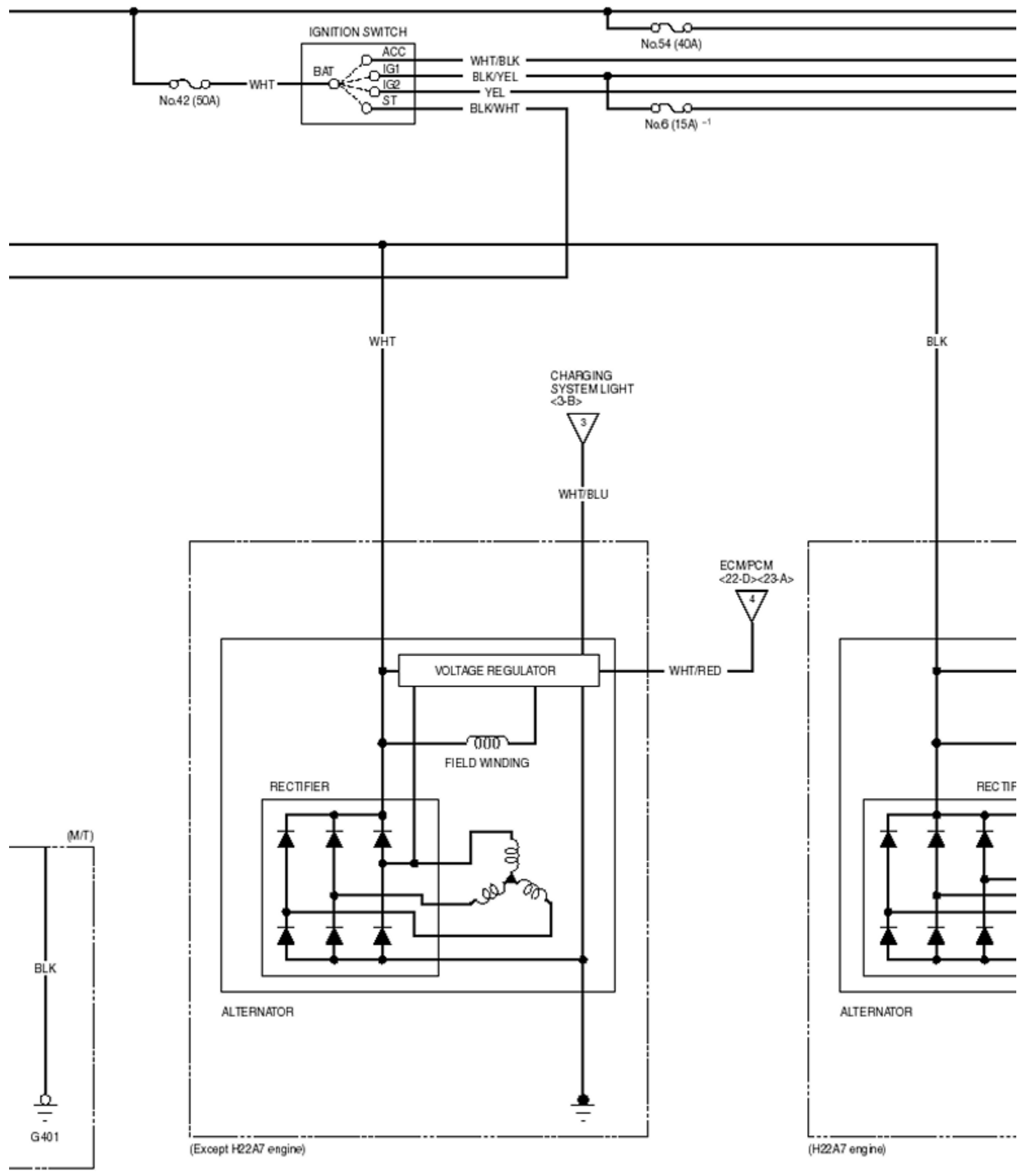
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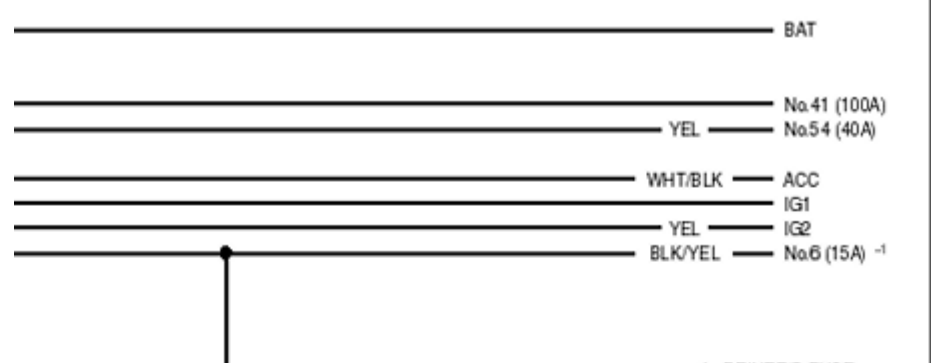
C



C



D

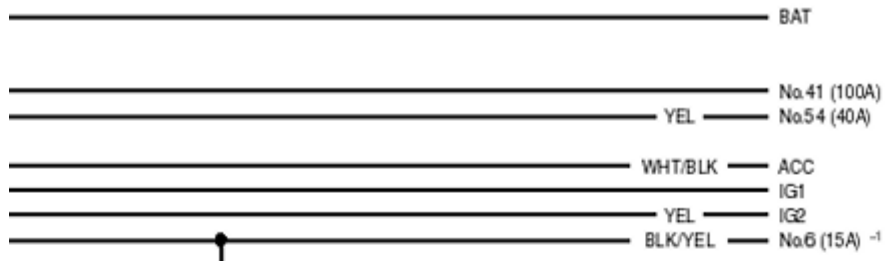


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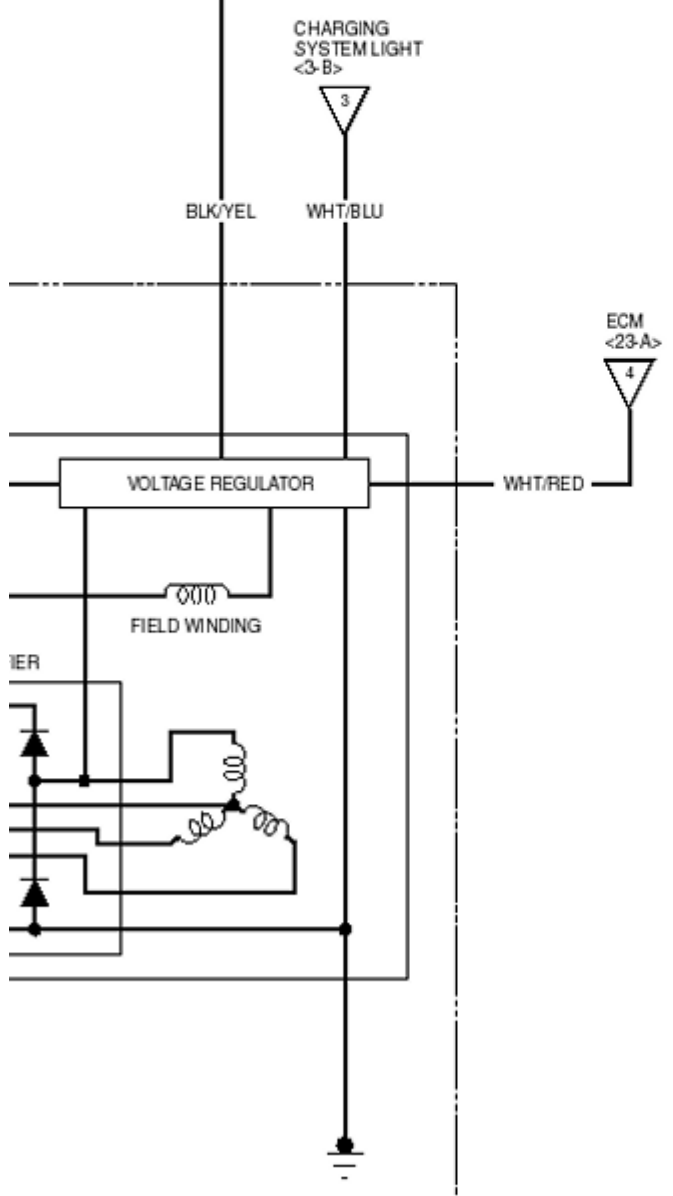
-1: DRIVERS FUSE

D

1

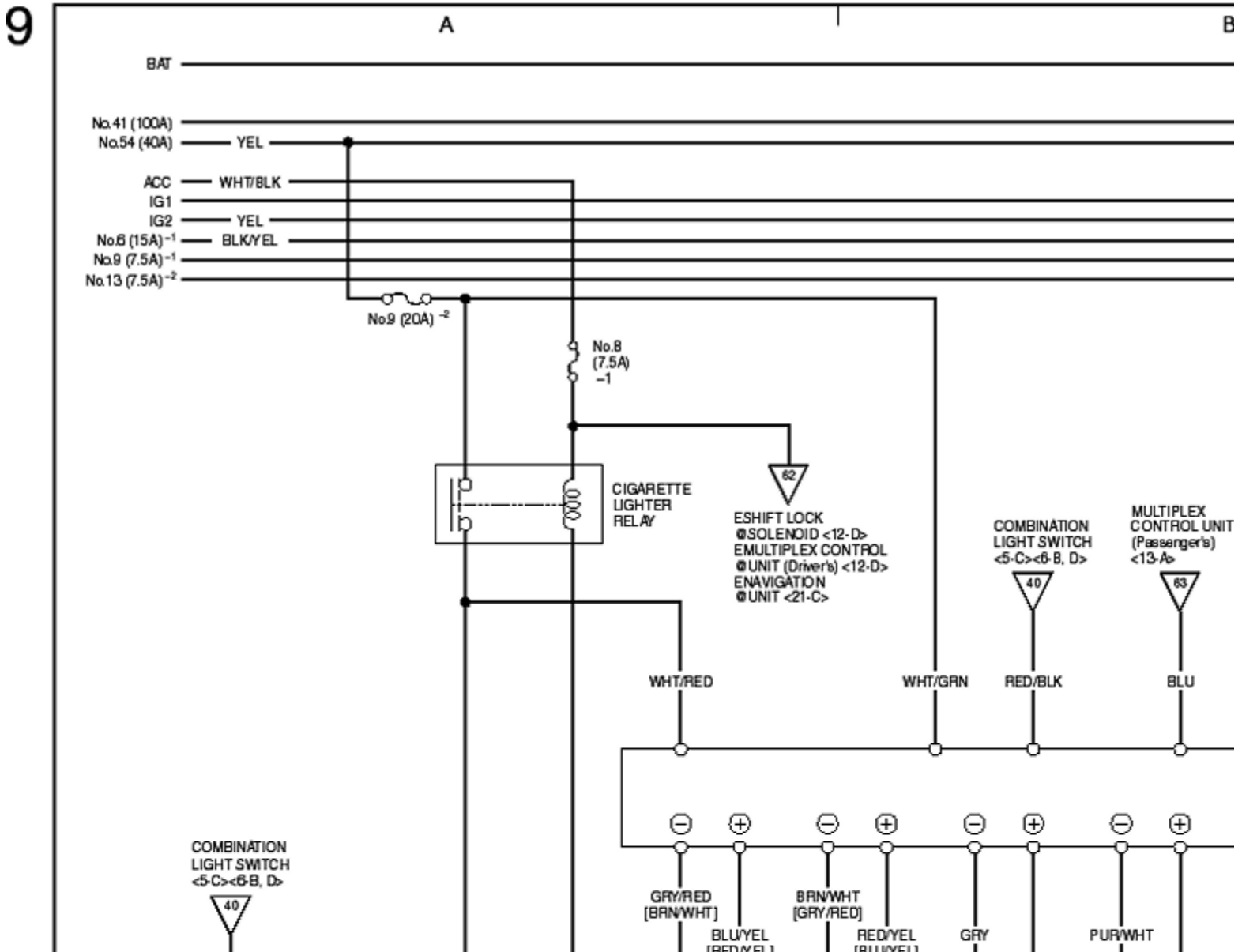
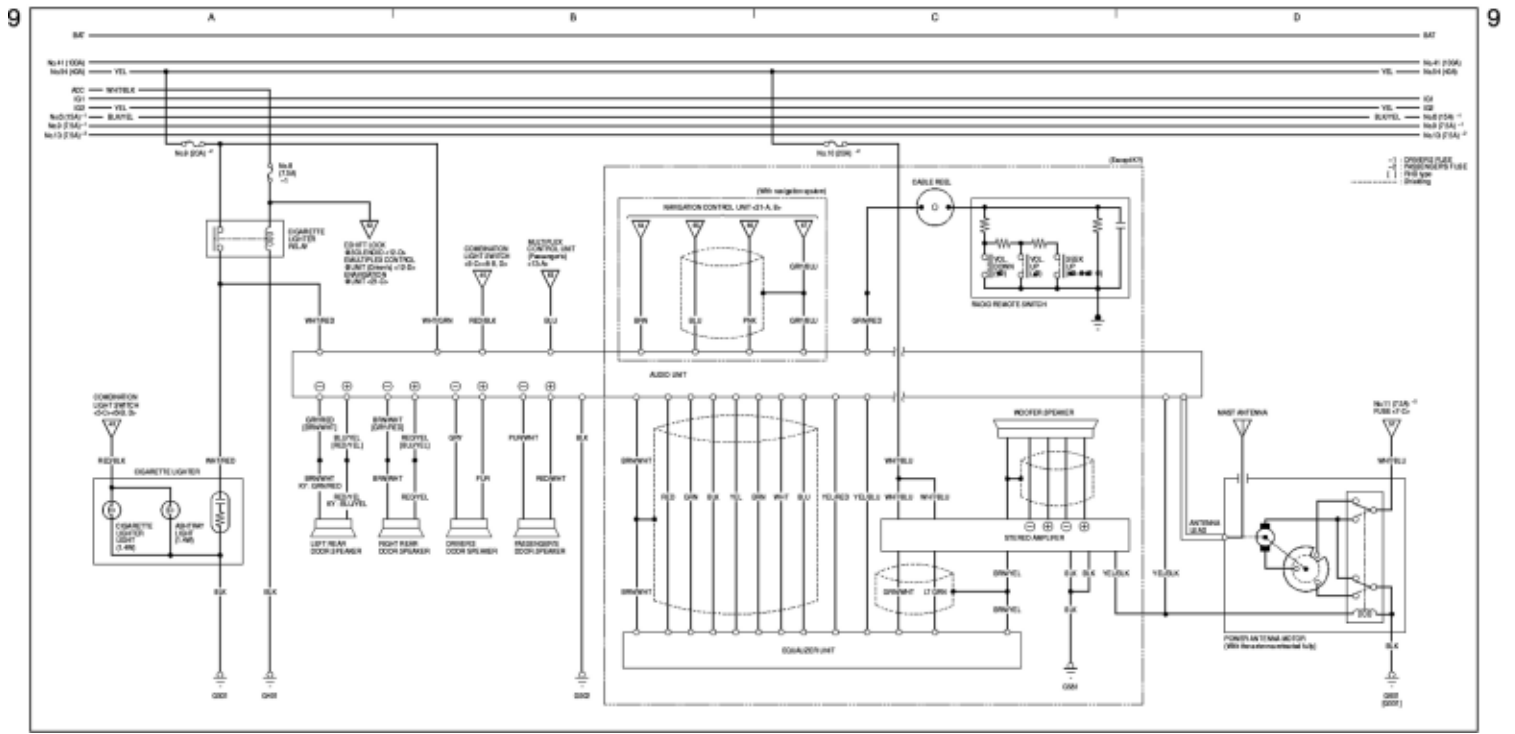


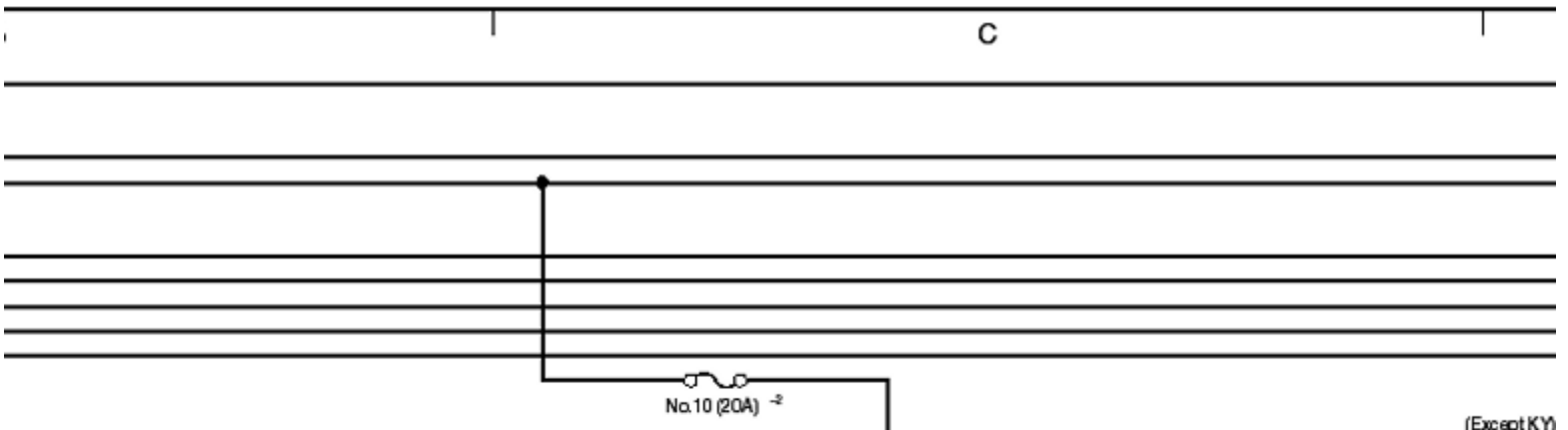
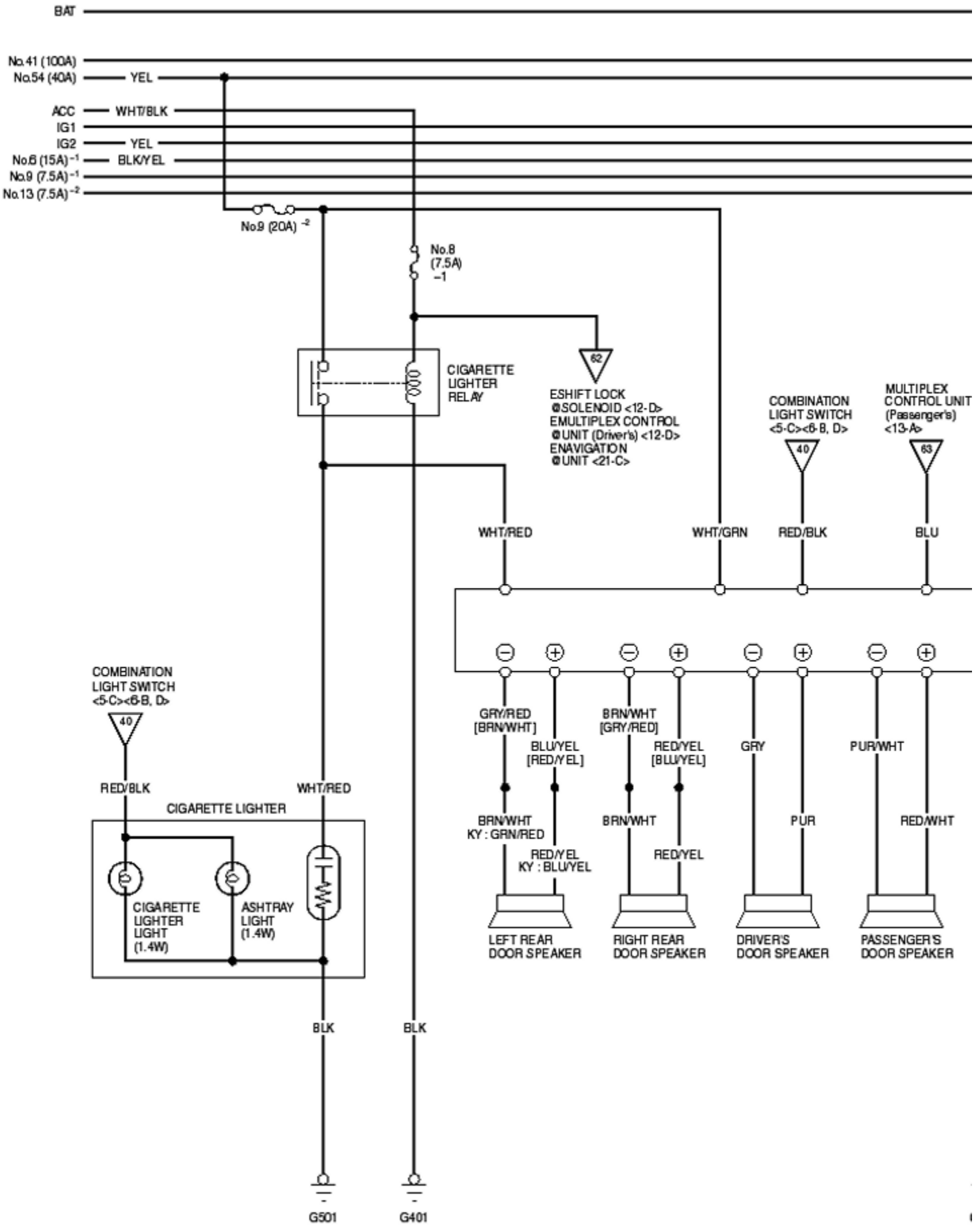
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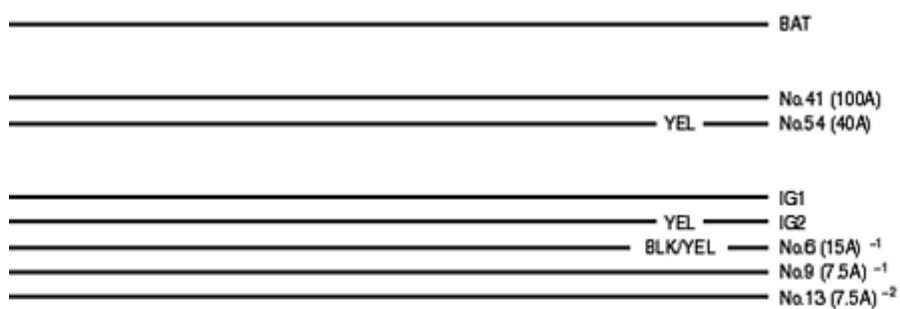
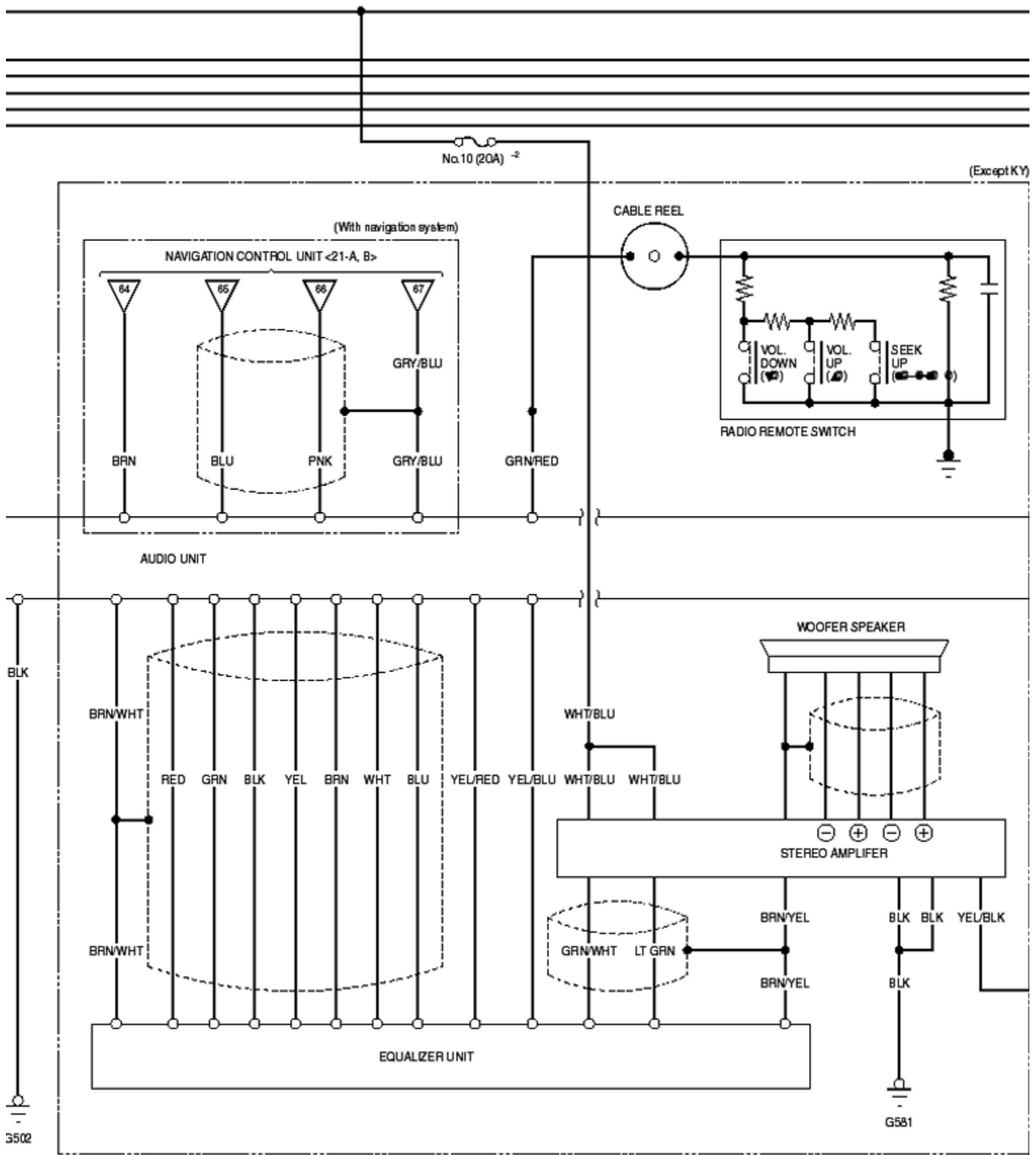


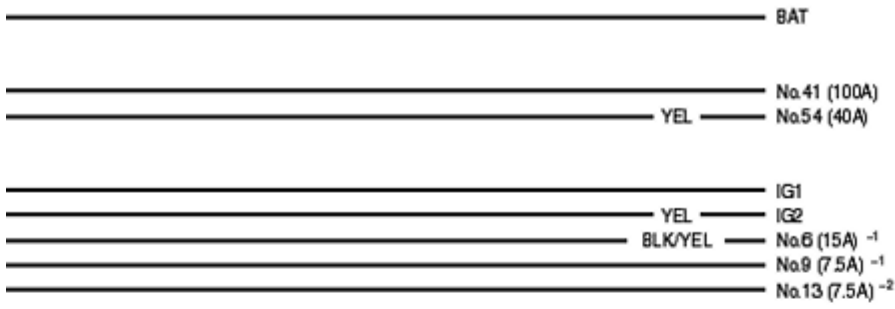
Wiring Diagrams

Cigarette Lighter

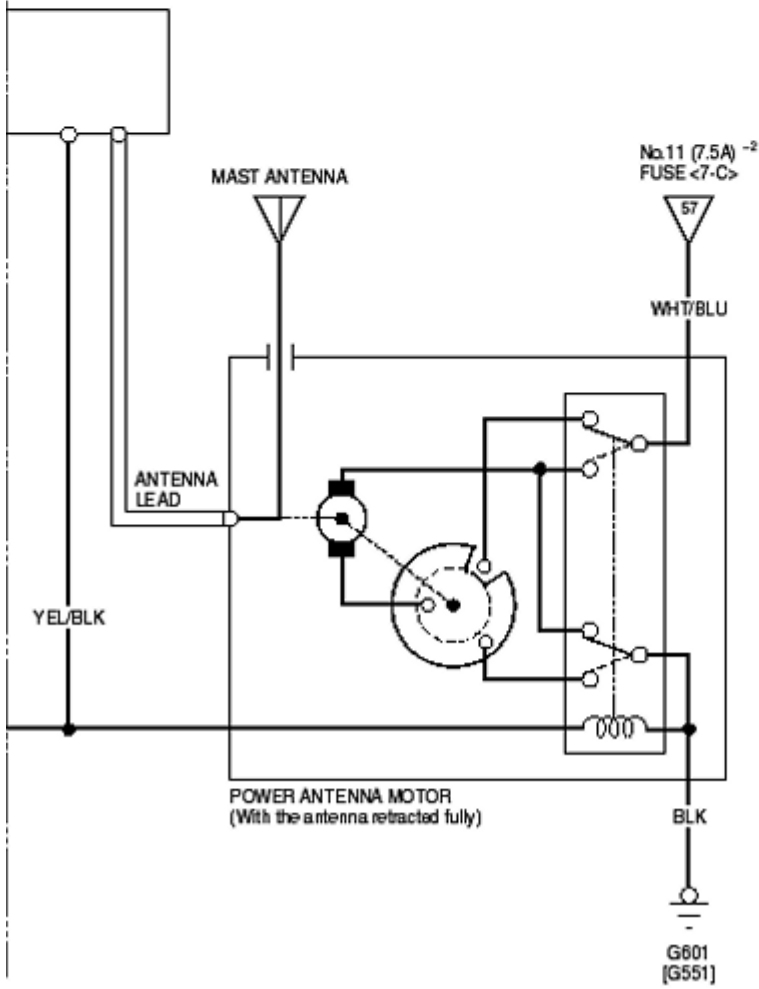








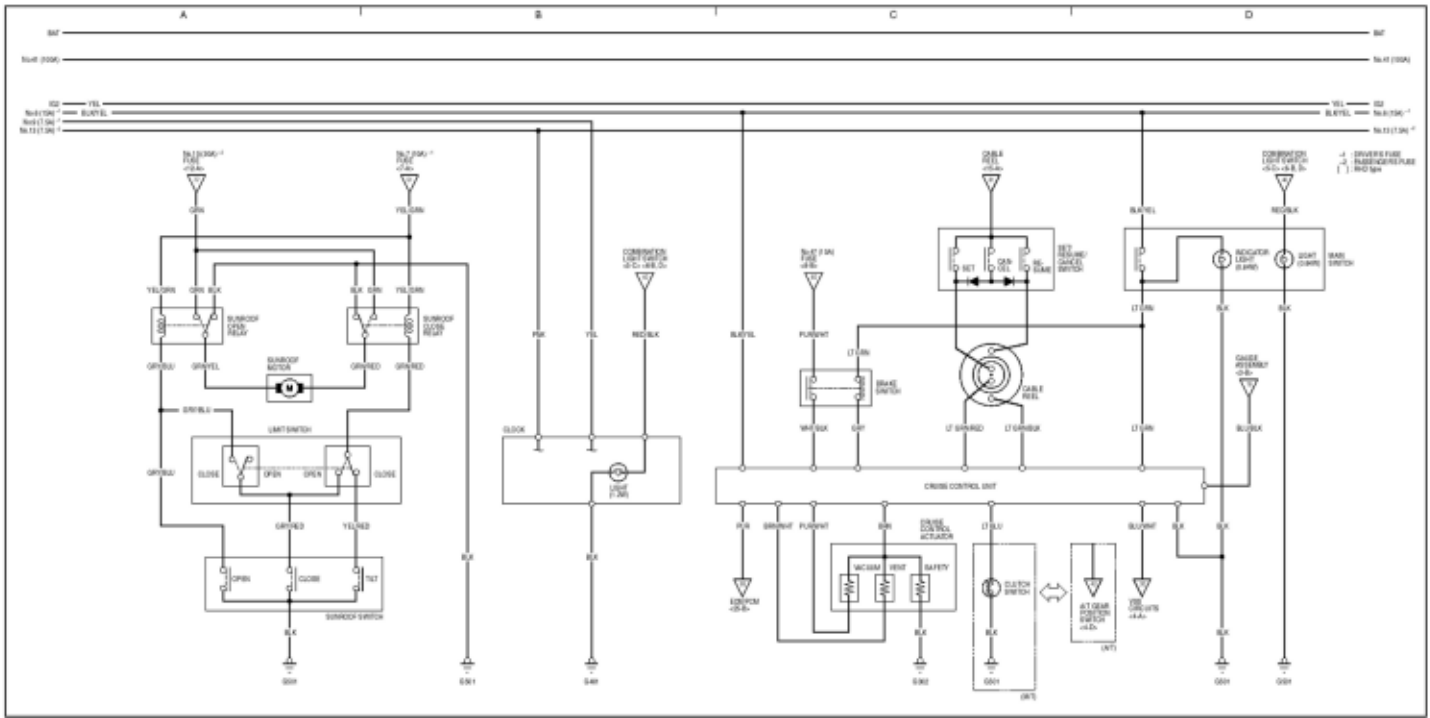
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- [] : RHD type
- : Shielding



Wiring Diagrams

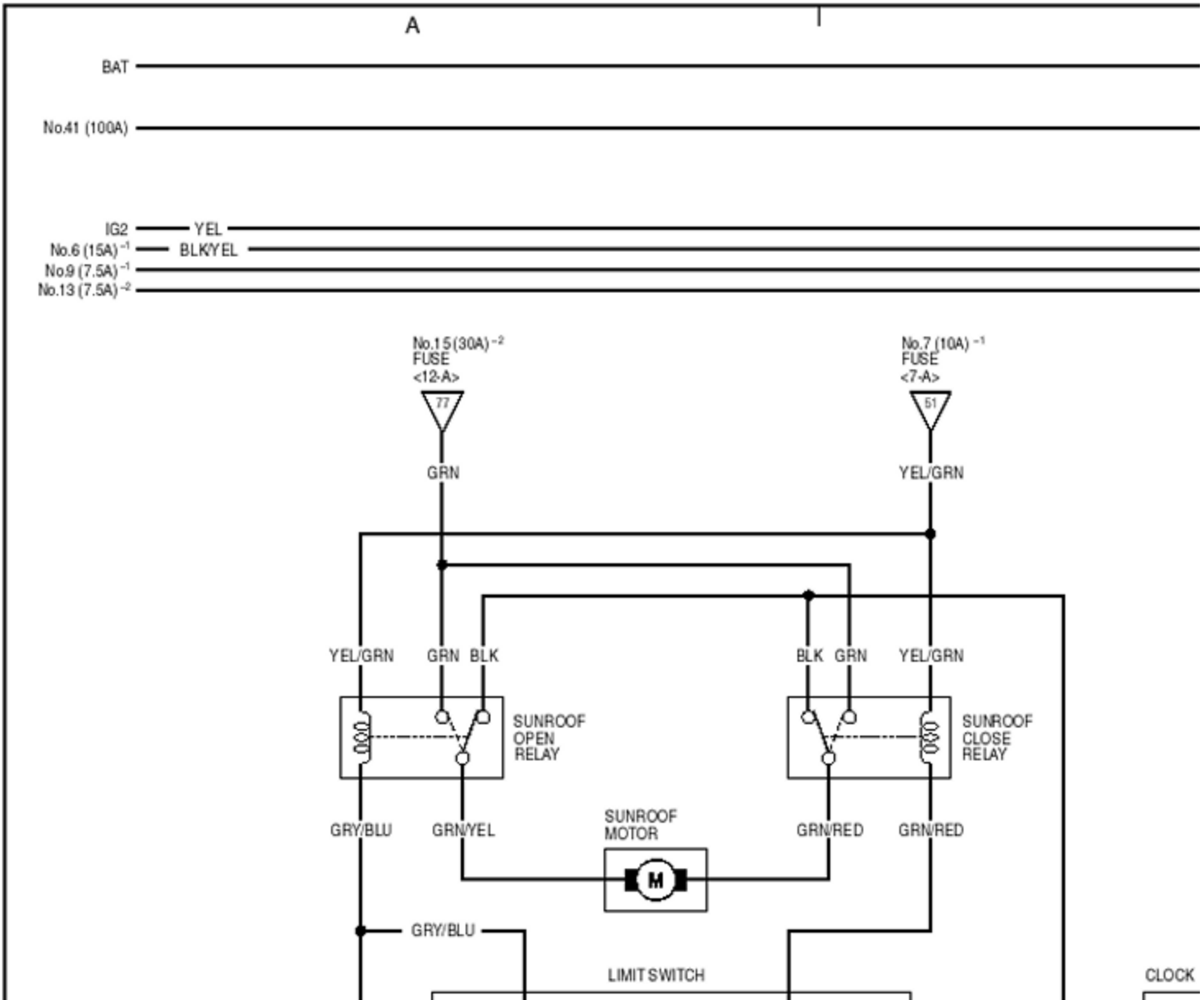
Clock

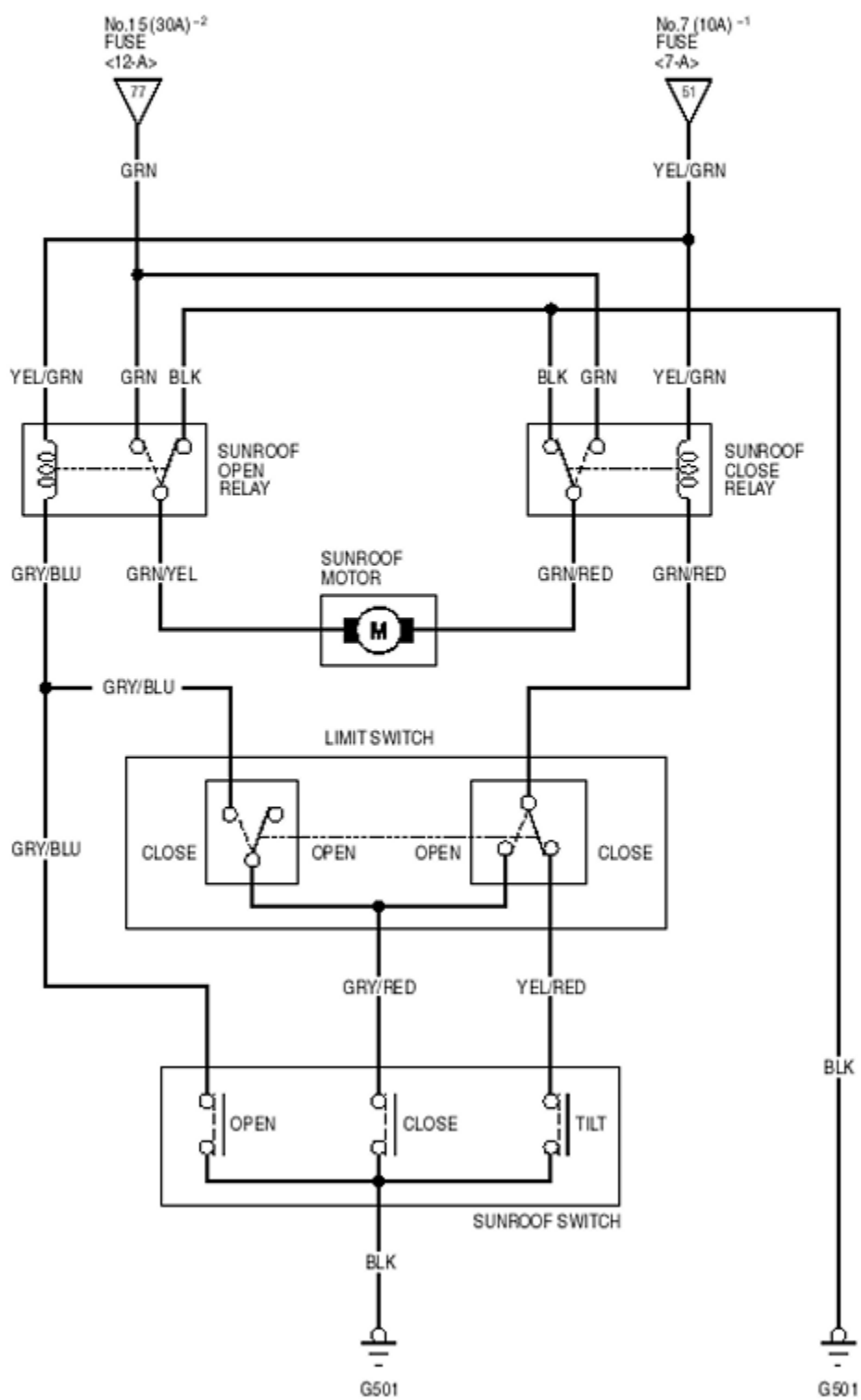
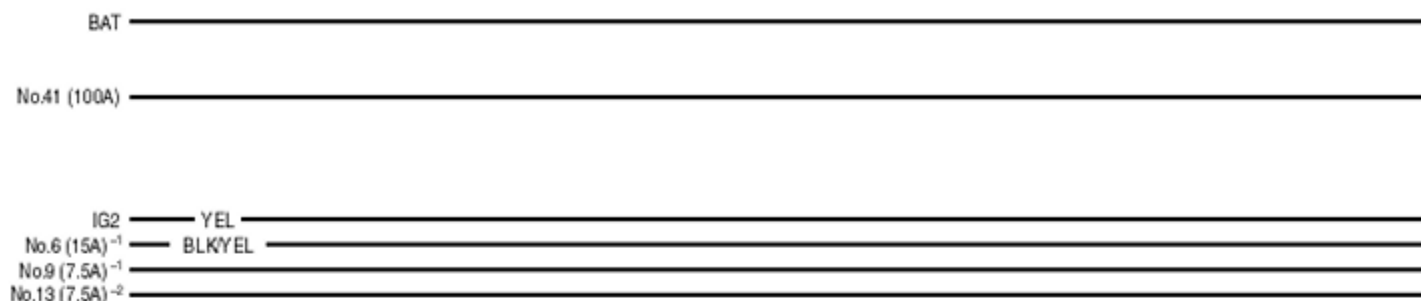
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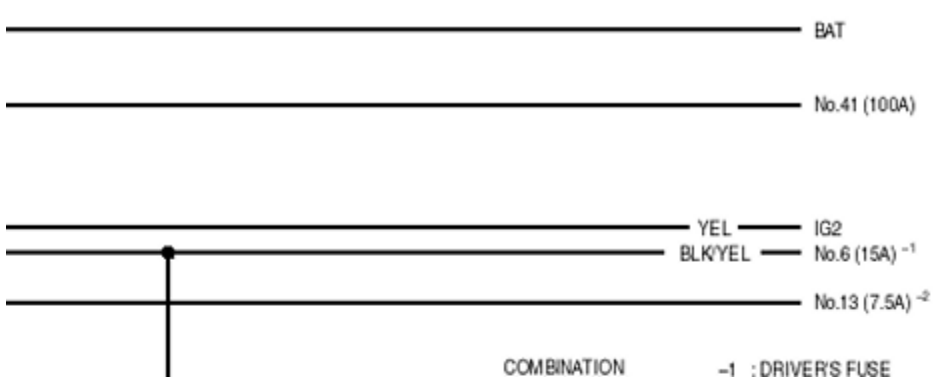
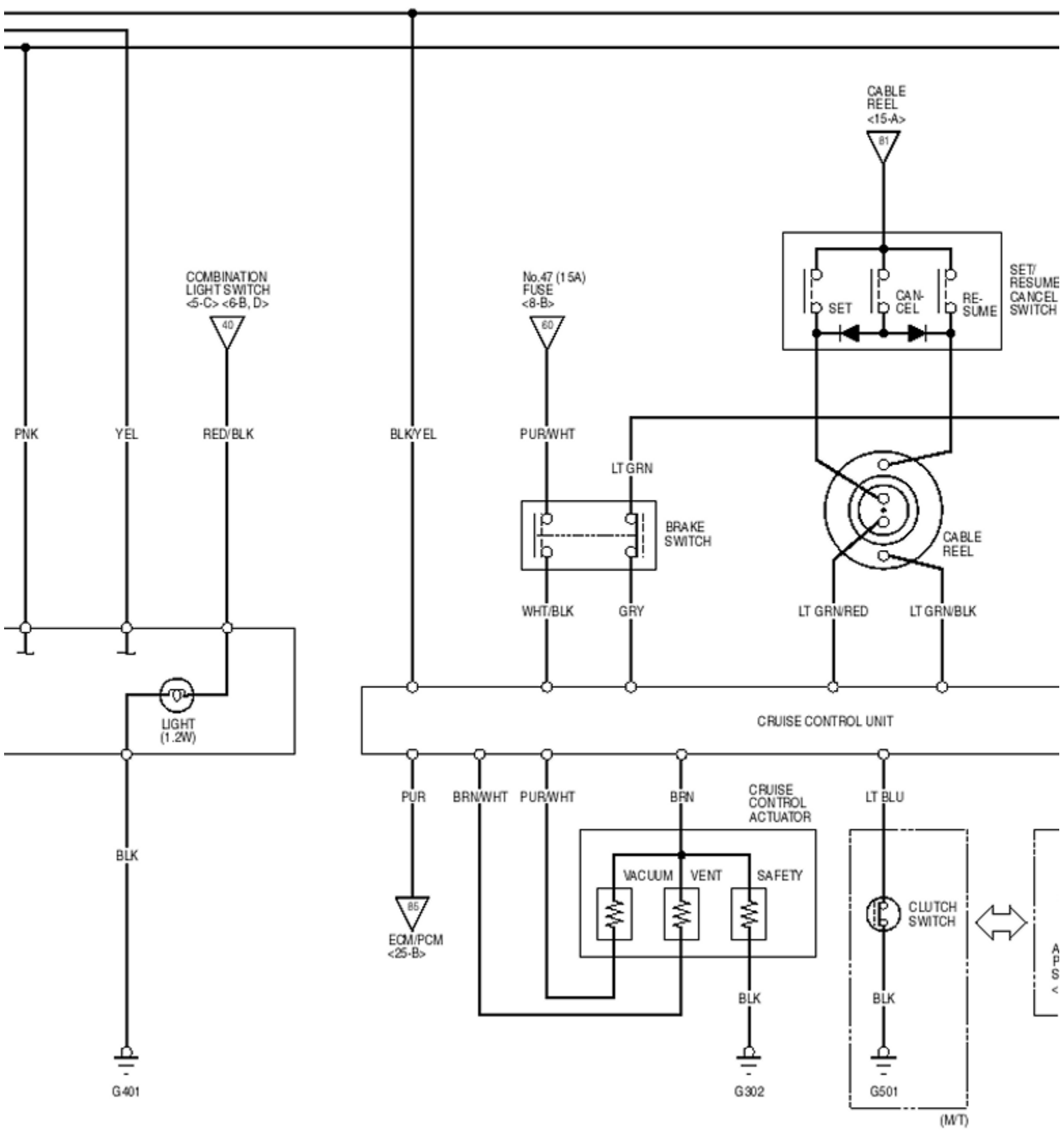


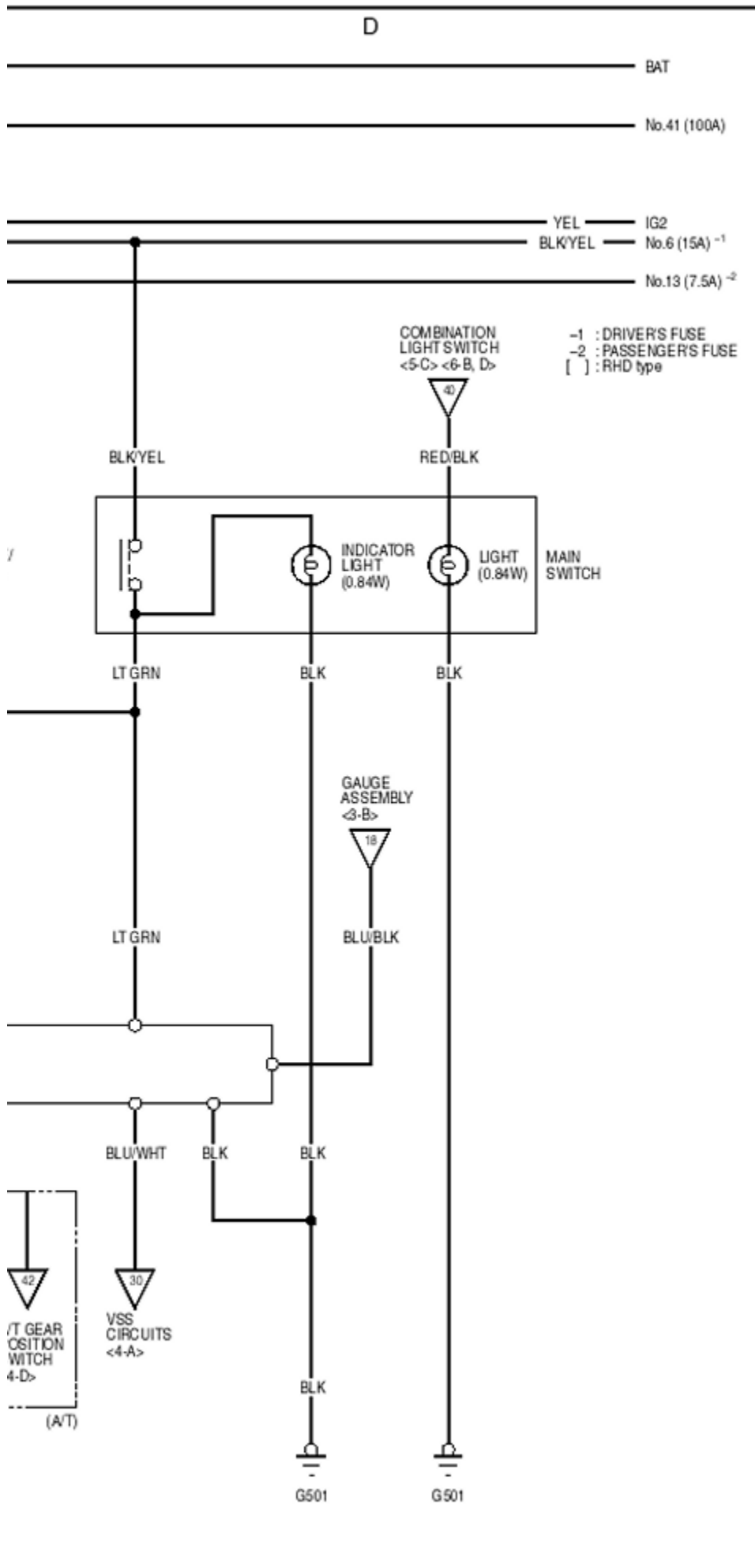
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16



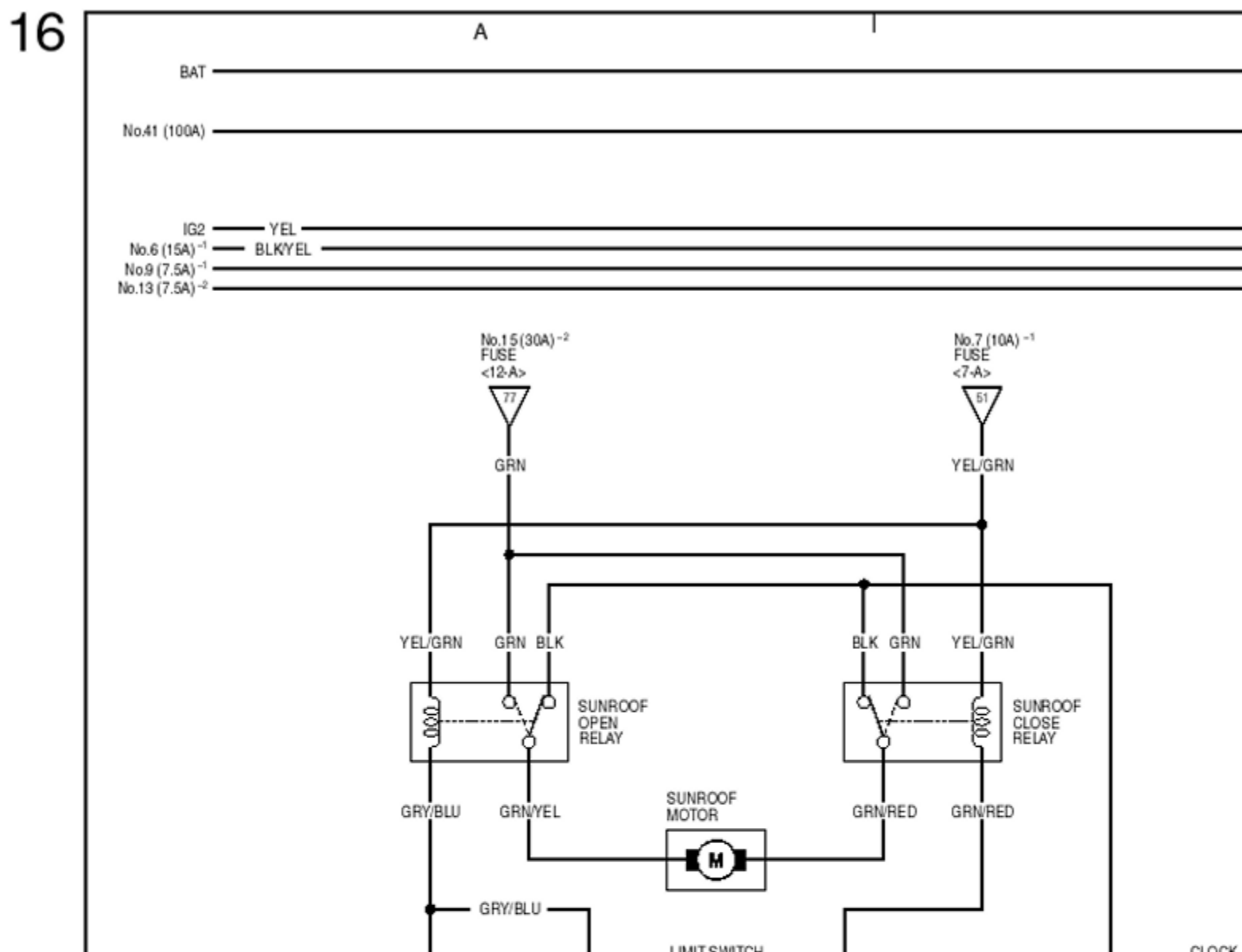
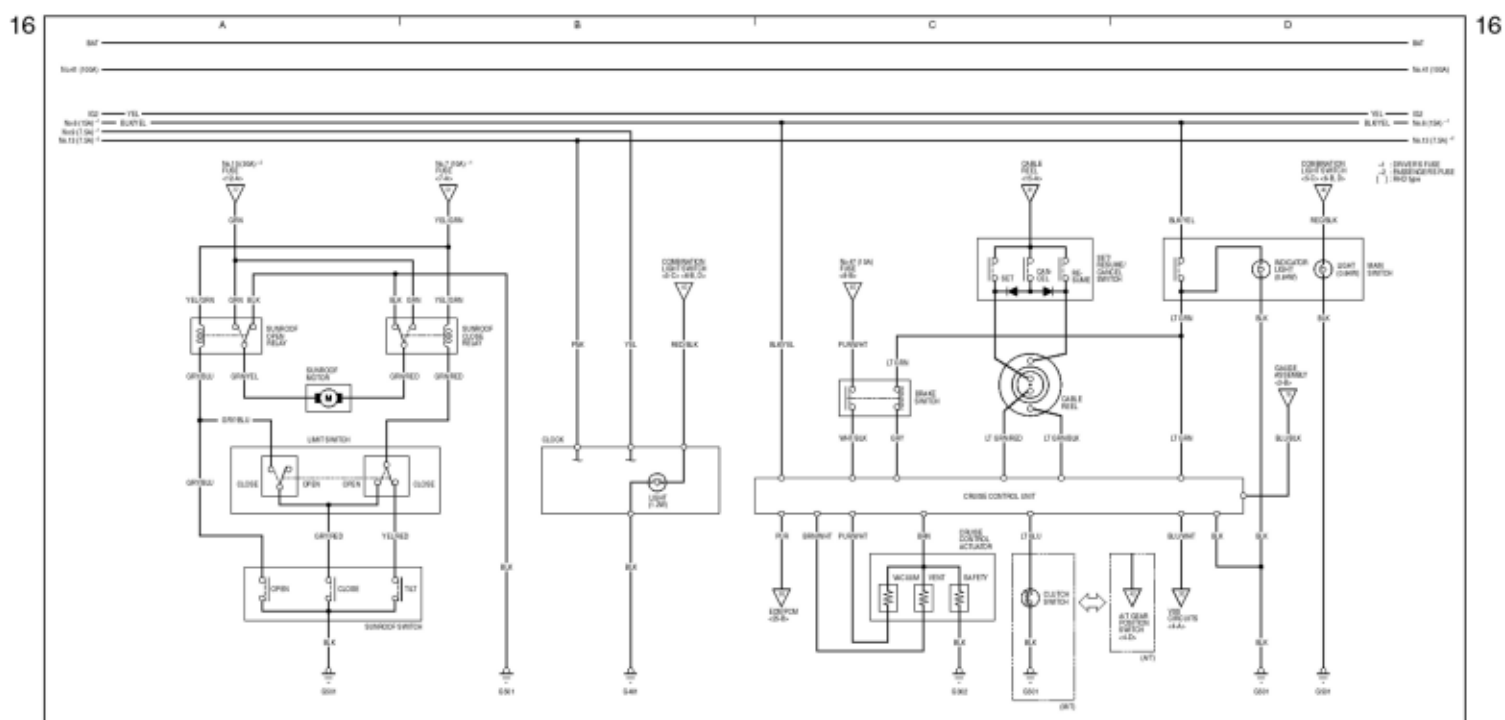


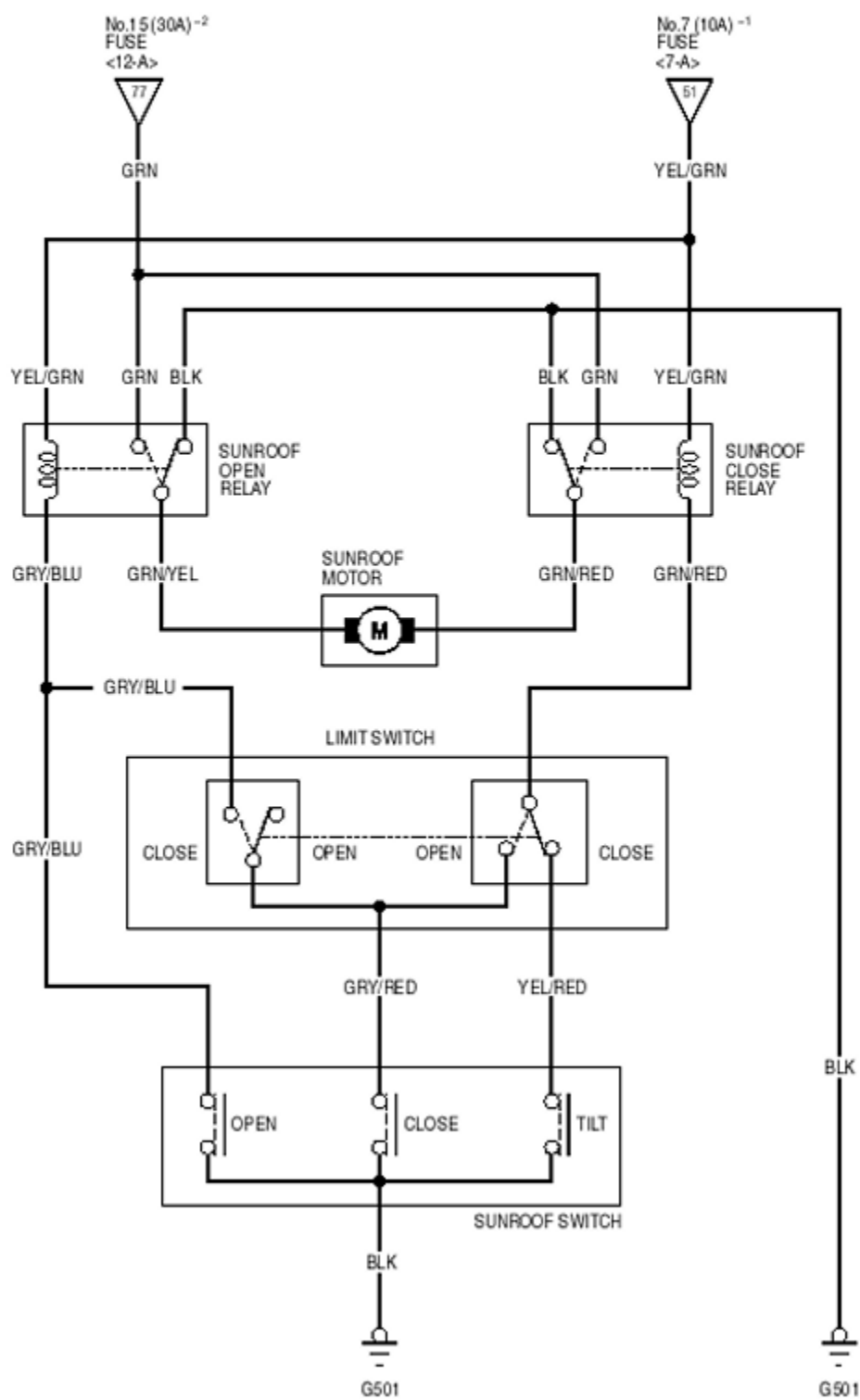
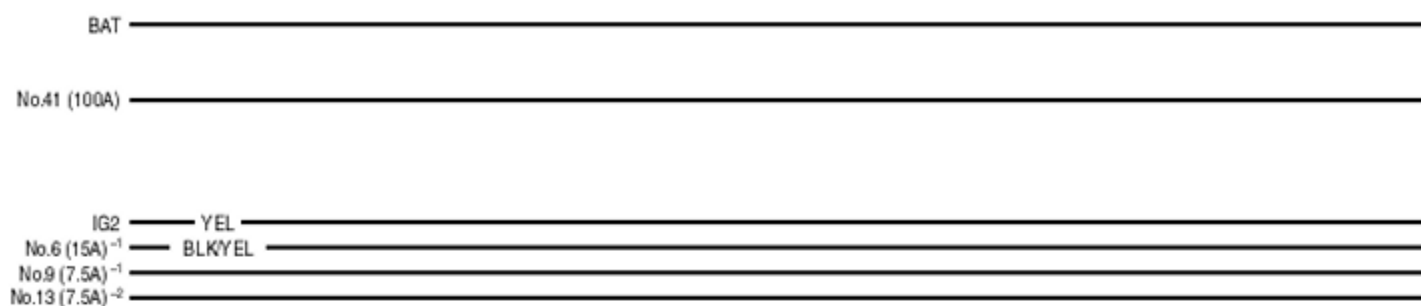




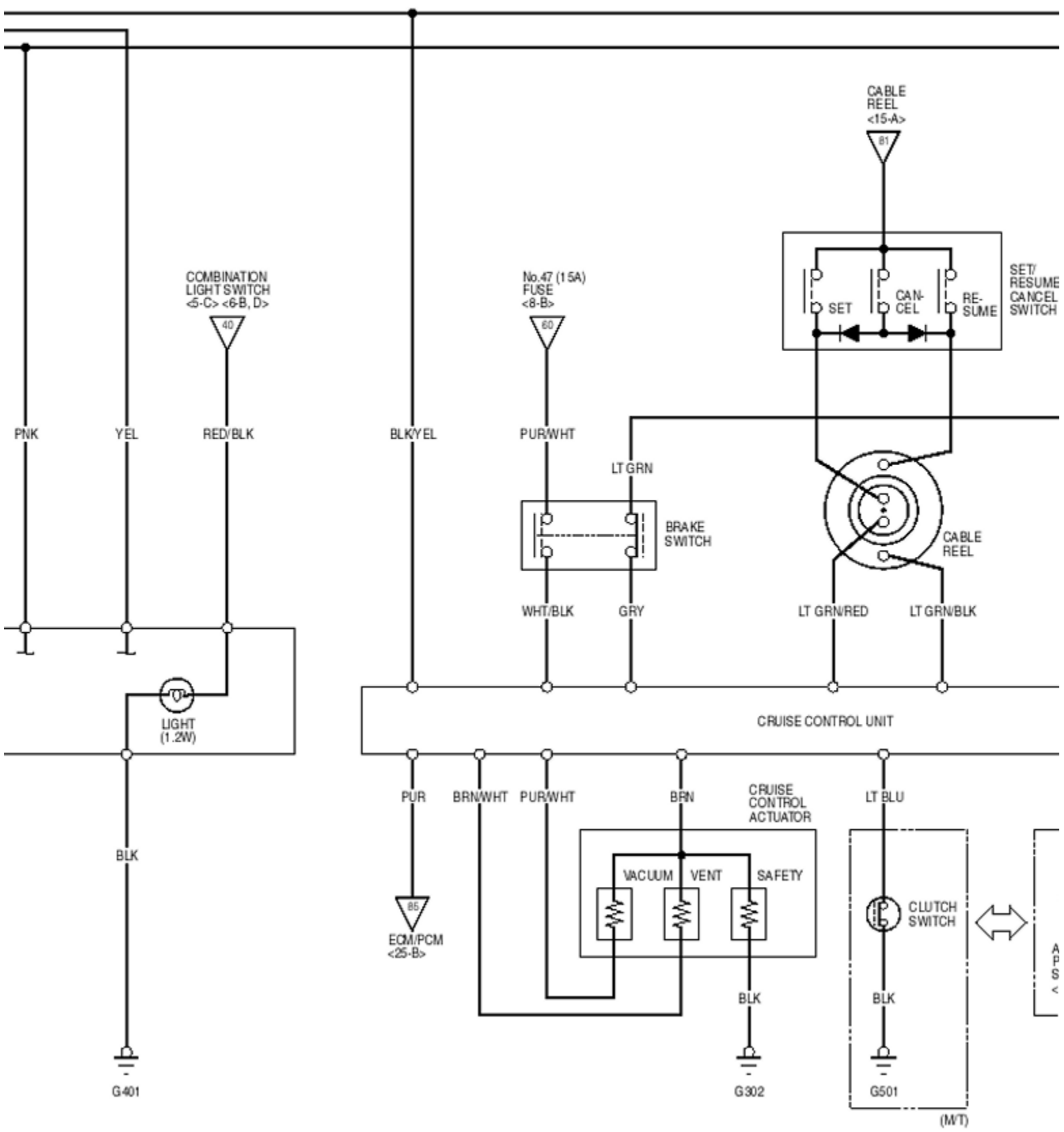
Wiring Diagrams

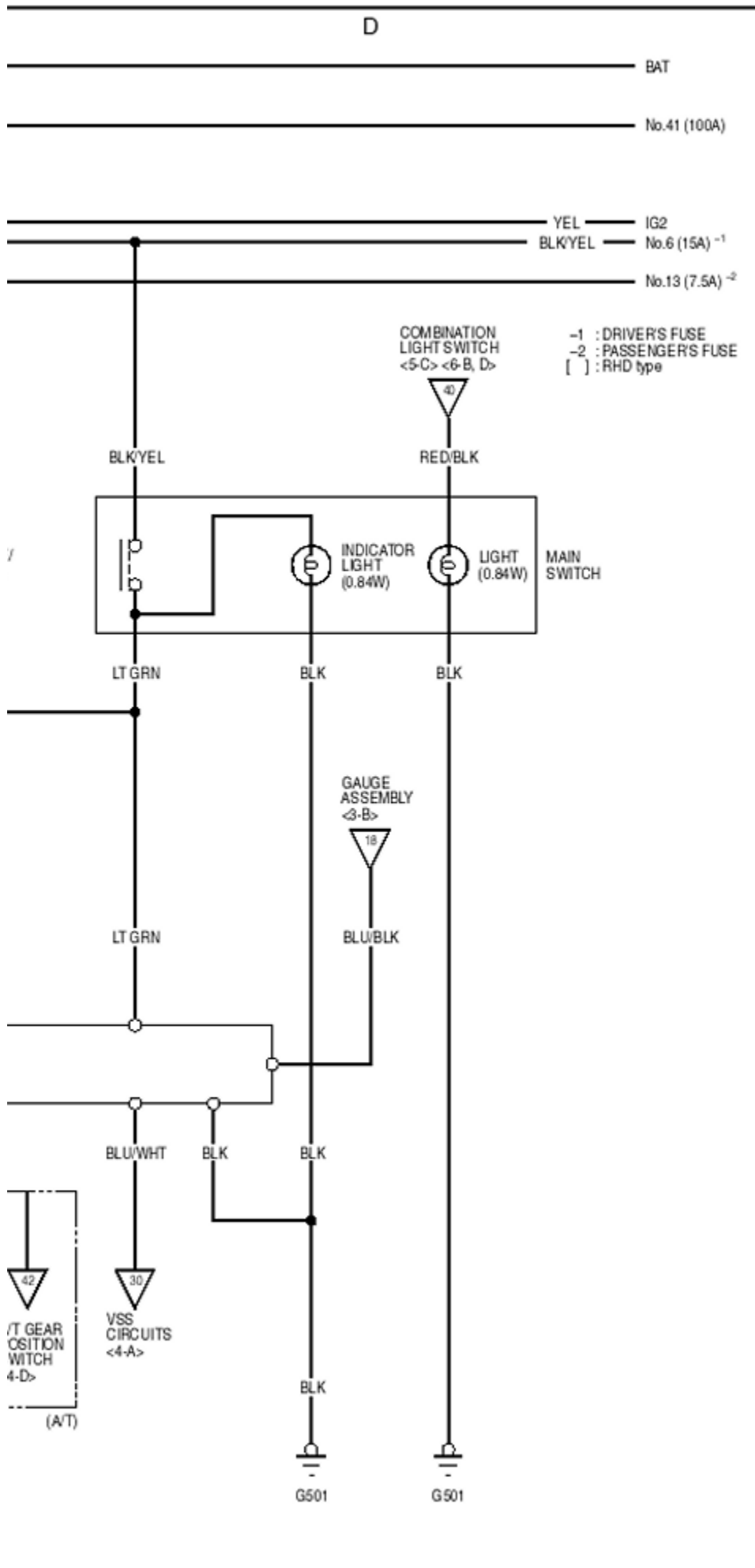
Cruise Control





CLOCK

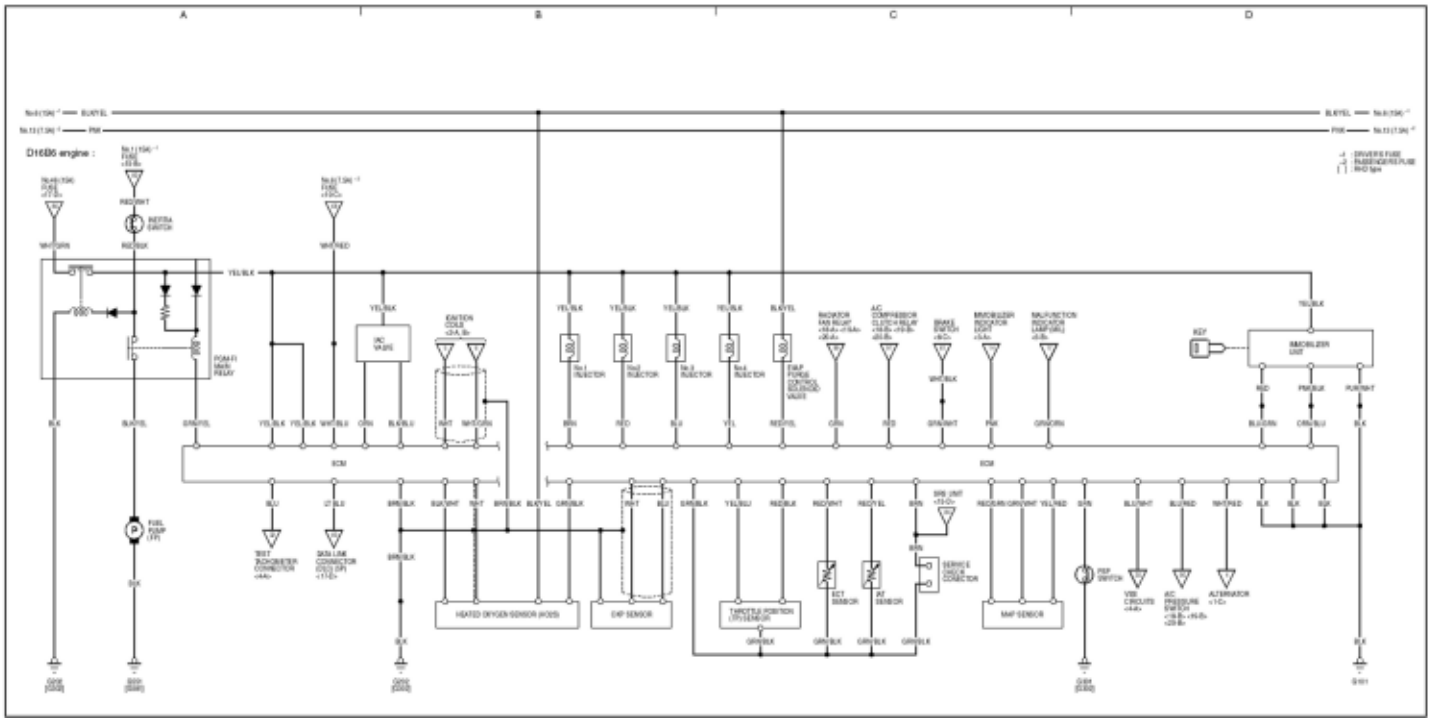




Wiring Diagrams

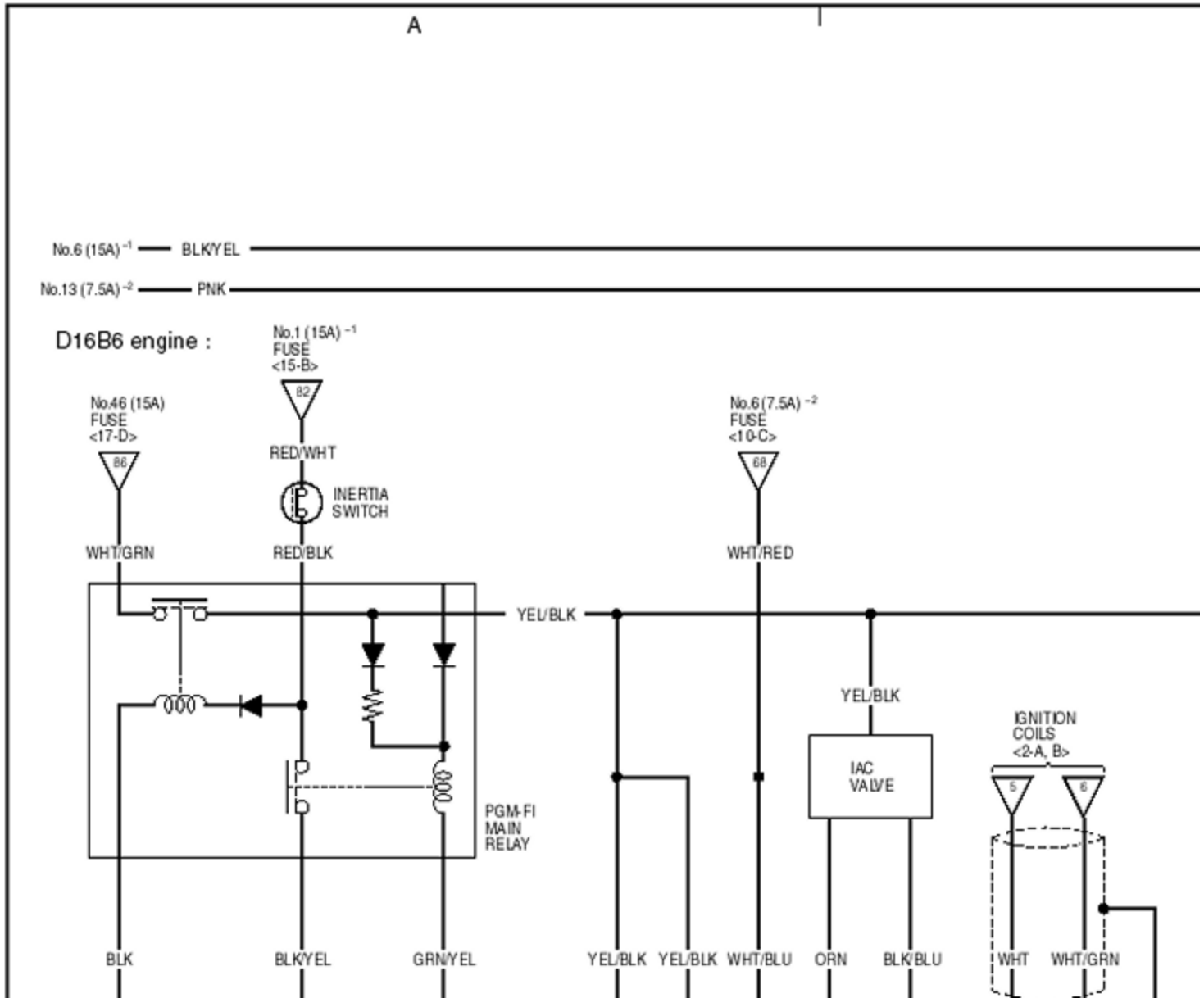
ECM/PCM

22



22

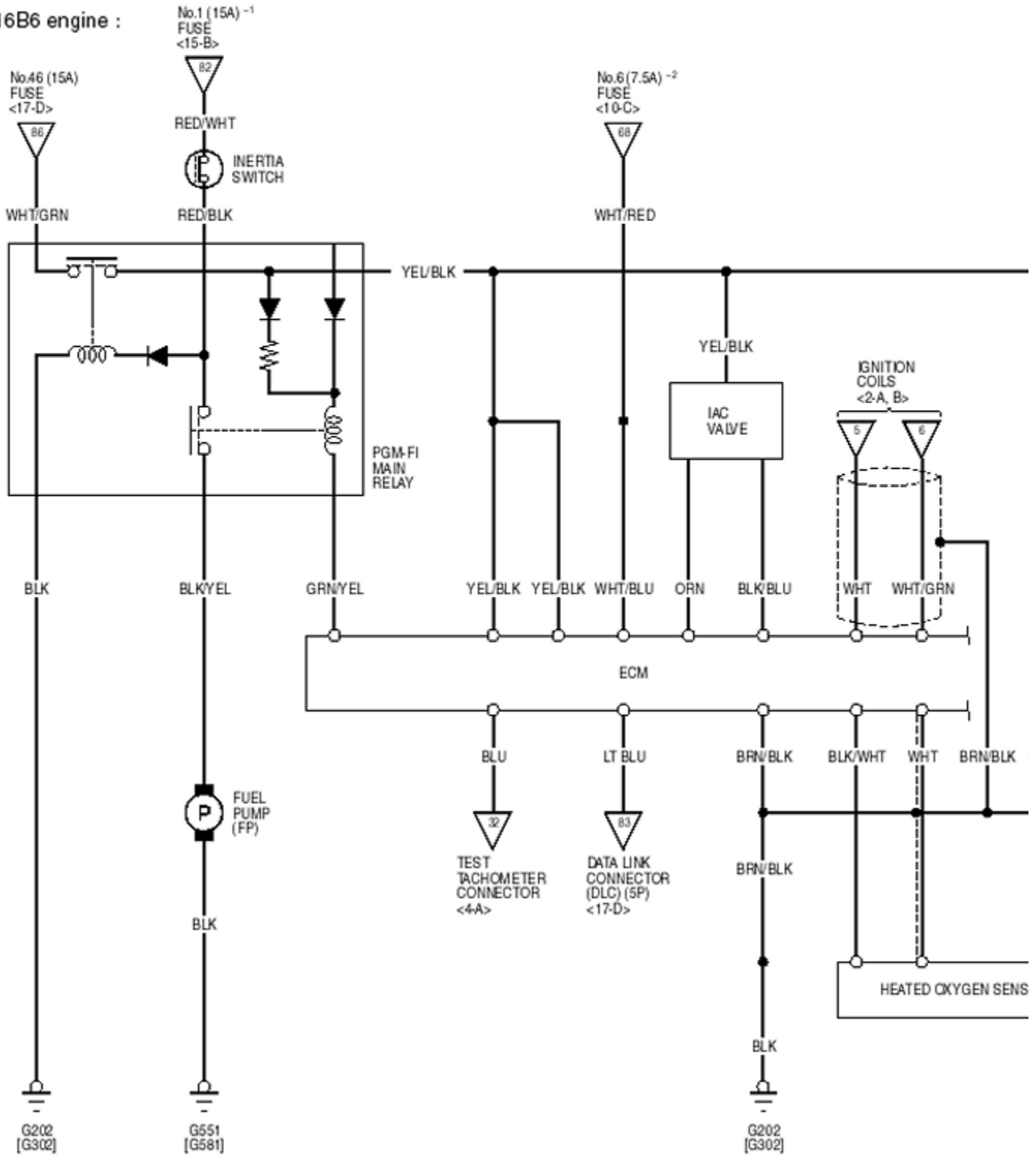
22



No.6 (15A)⁻¹ — BLKYEL

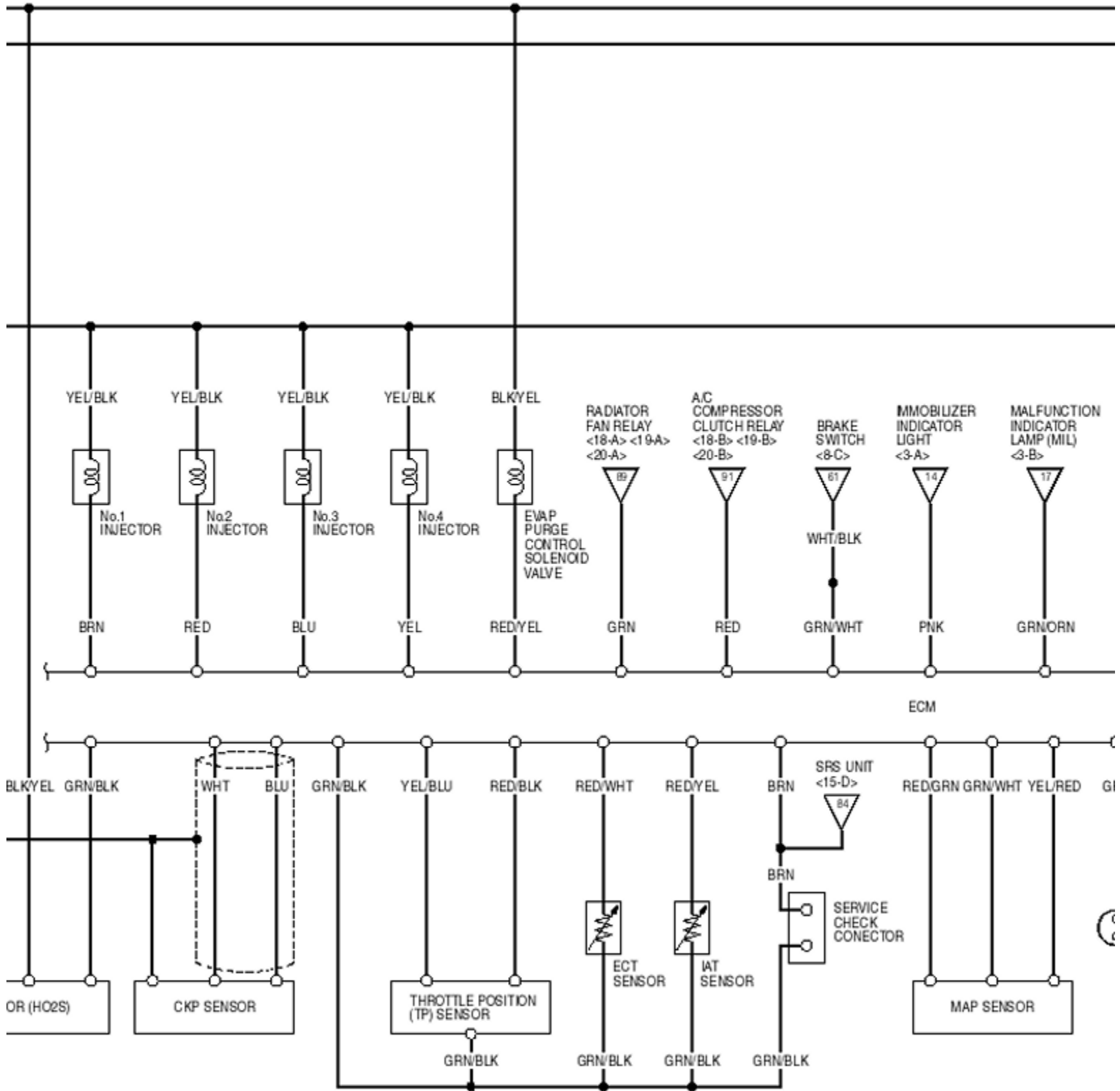
No.13 (7.5A)⁻² — PNK

D16B6 engine :



B

C



D

22

BLK/YEL — No.6 (15A)⁻¹

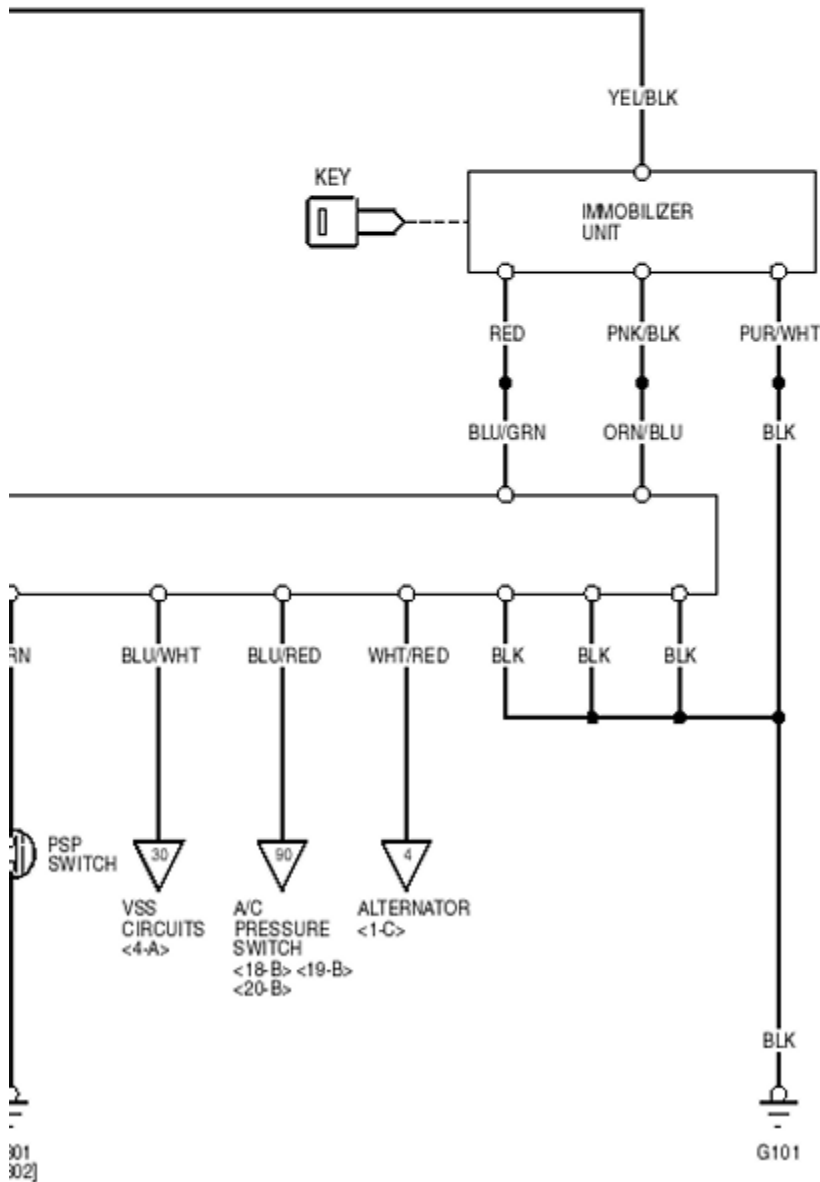
PNK — No.13 (7.5A)⁻²

-1 : DRIVERS FUSE

BLK/YEL — No.6 (15A) ⁻¹

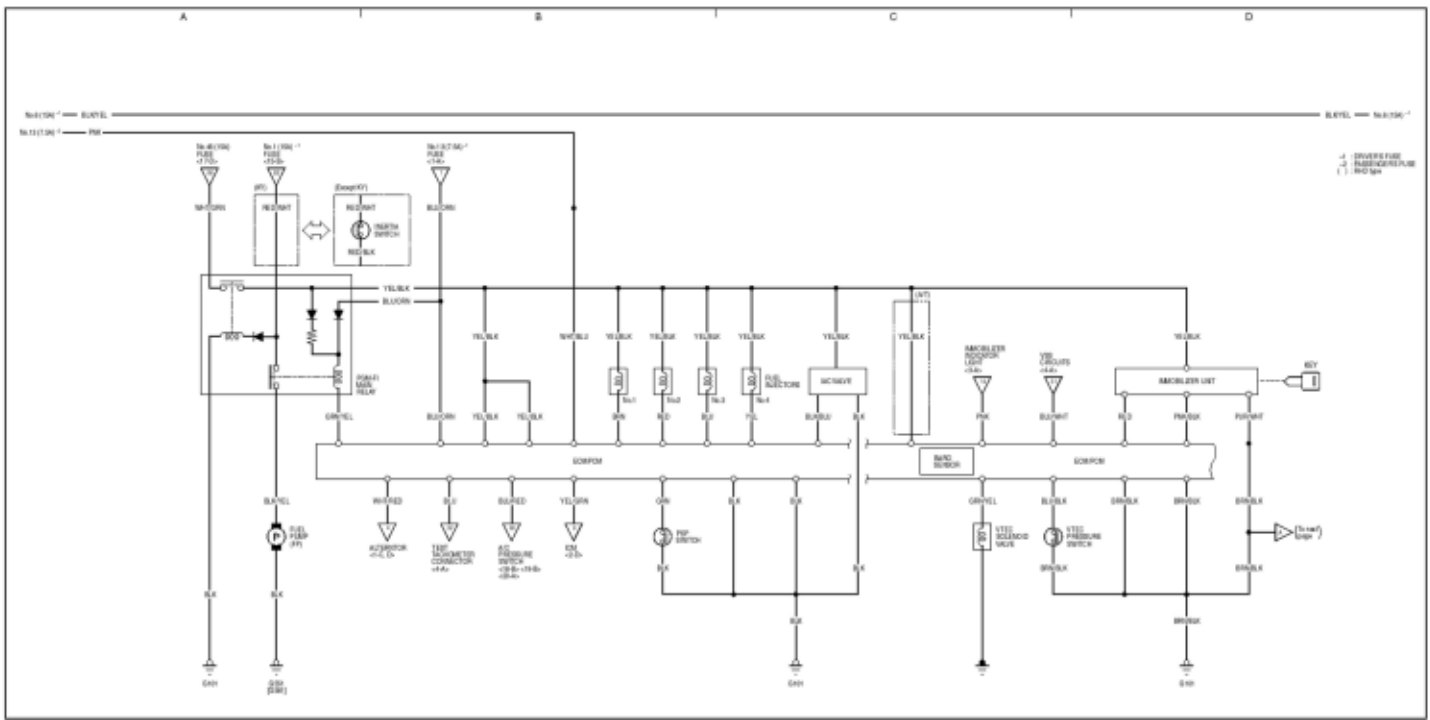
PNK — No.13 (7.5A) ⁻²

-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



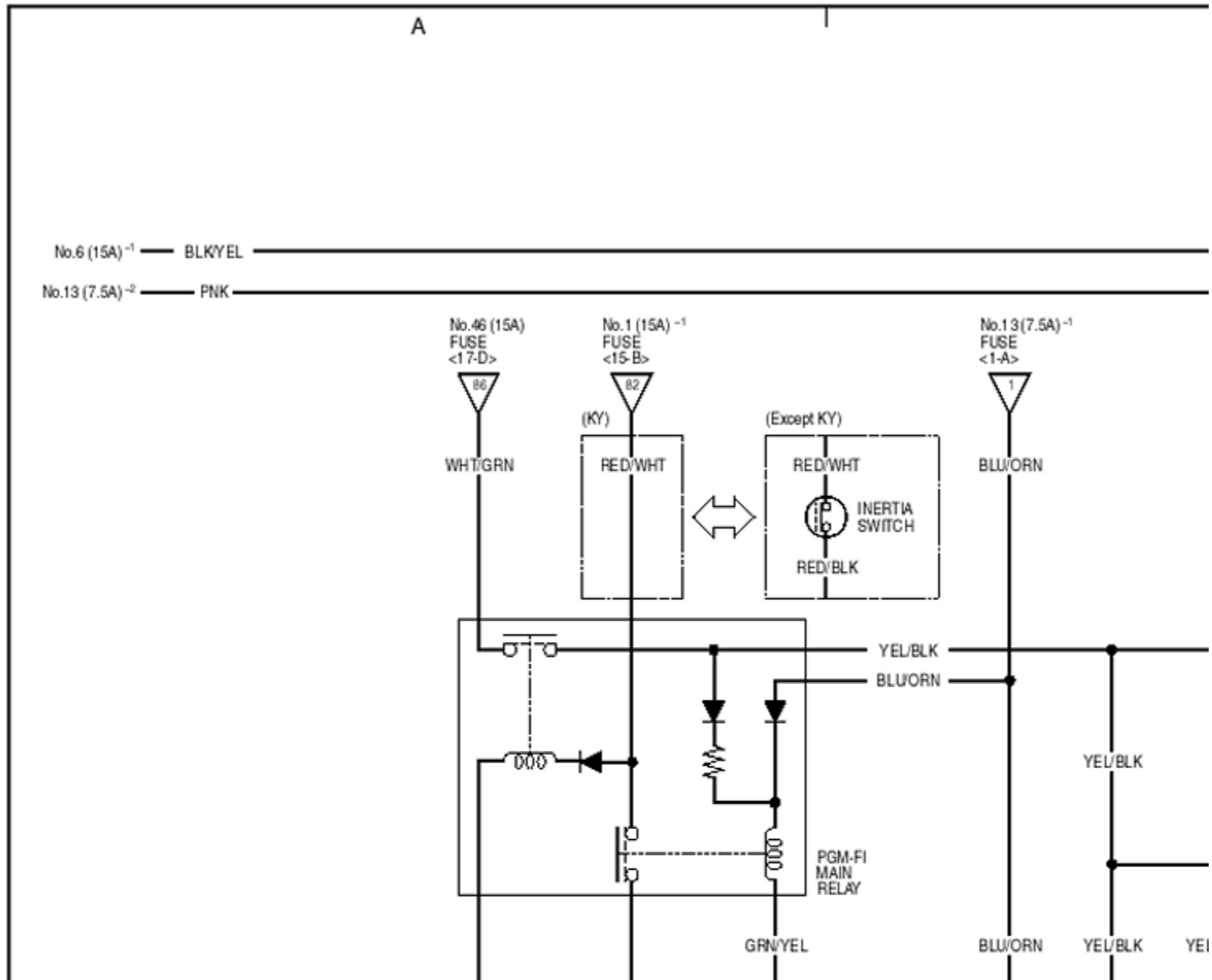
Wiring Diagrams
ECM/PCM

23



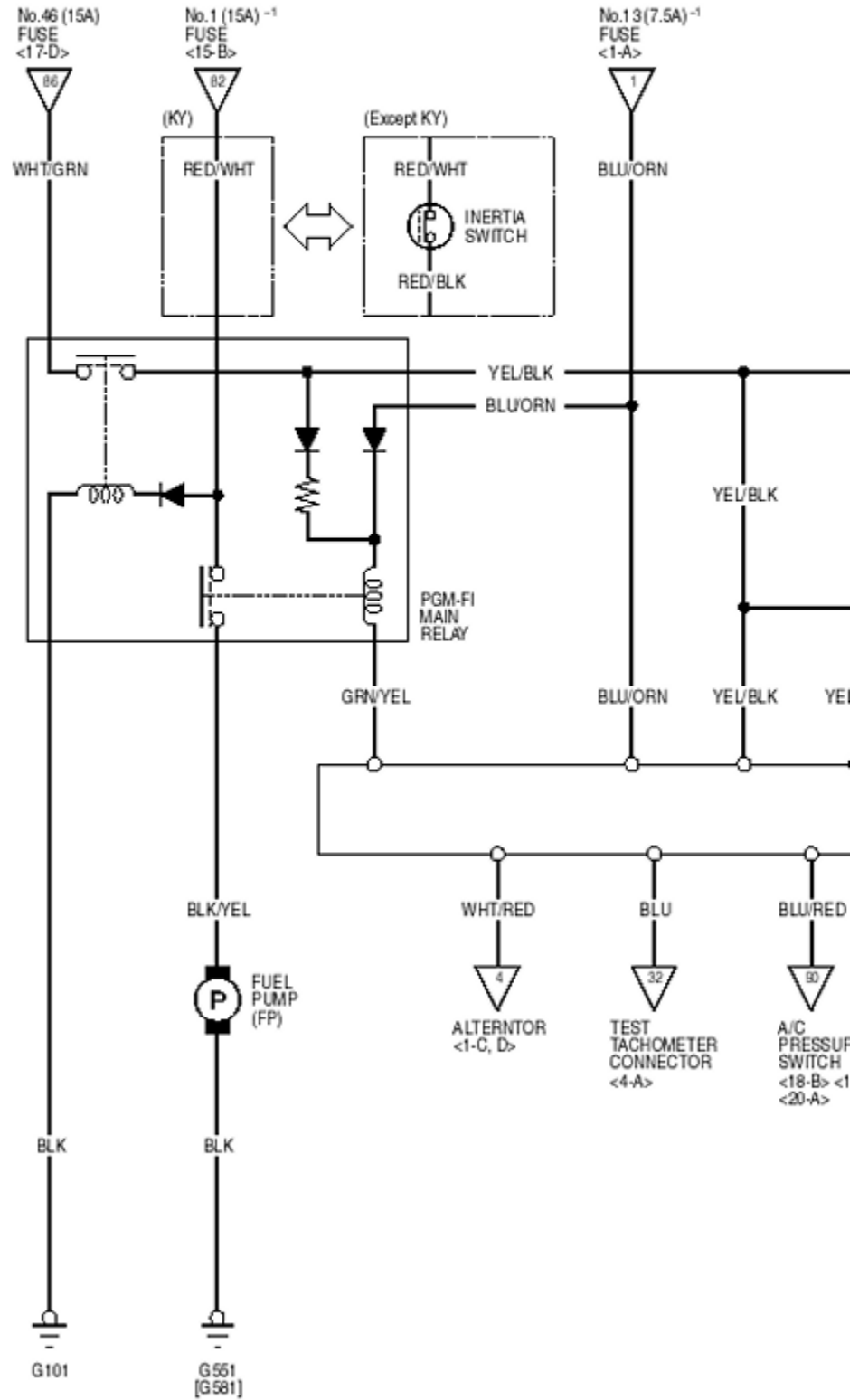
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23



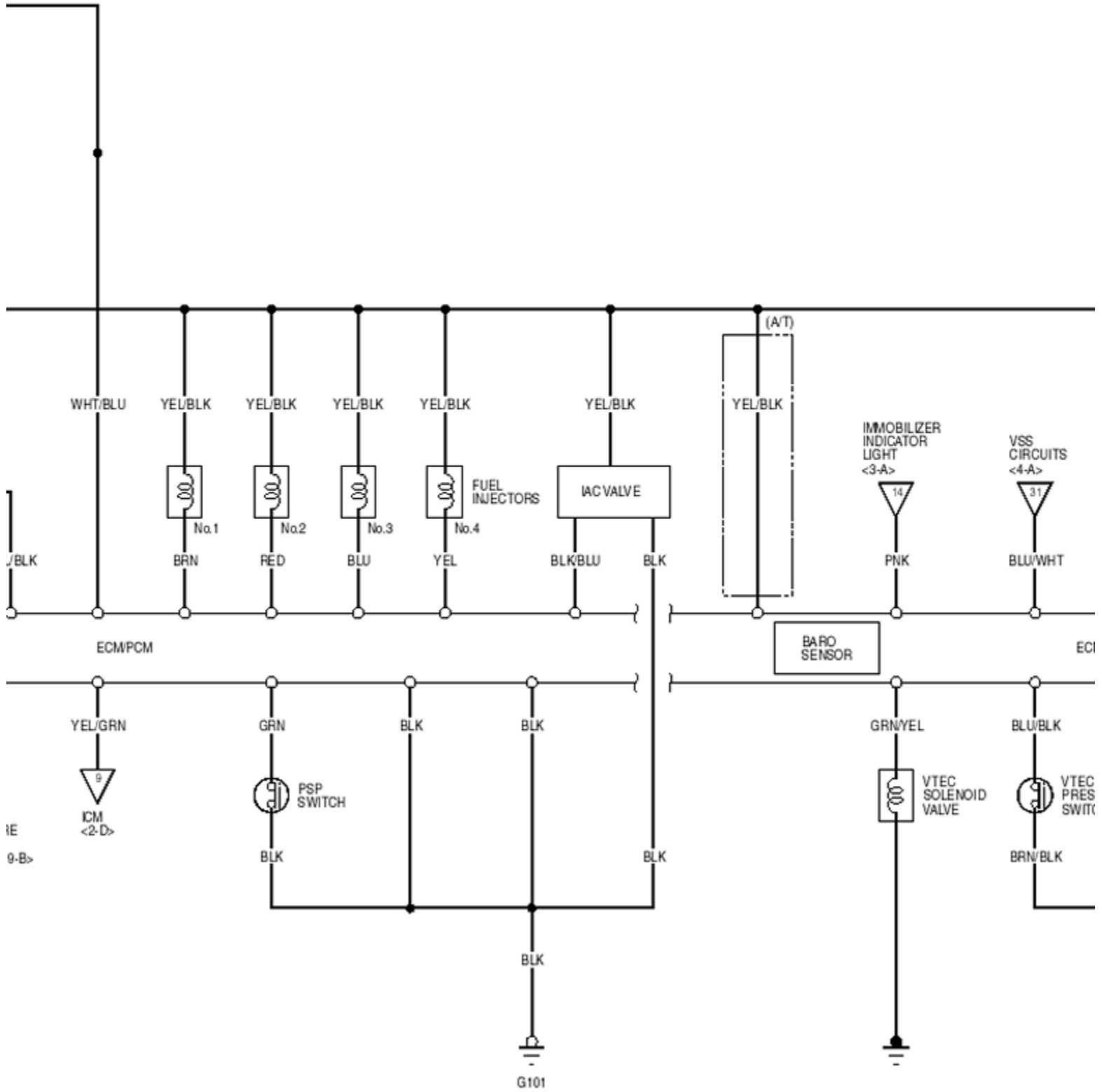
No.6 (15A)⁻¹ — BLKYEL

No.13 (7.5A)⁻² — PNK



B

C



D

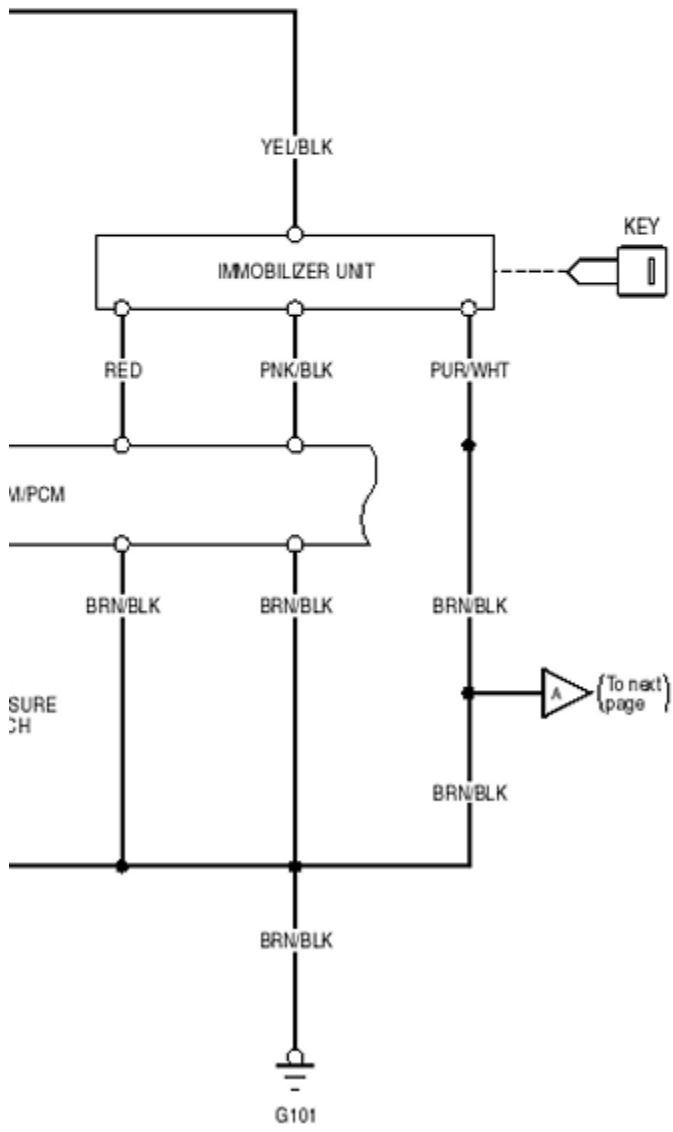
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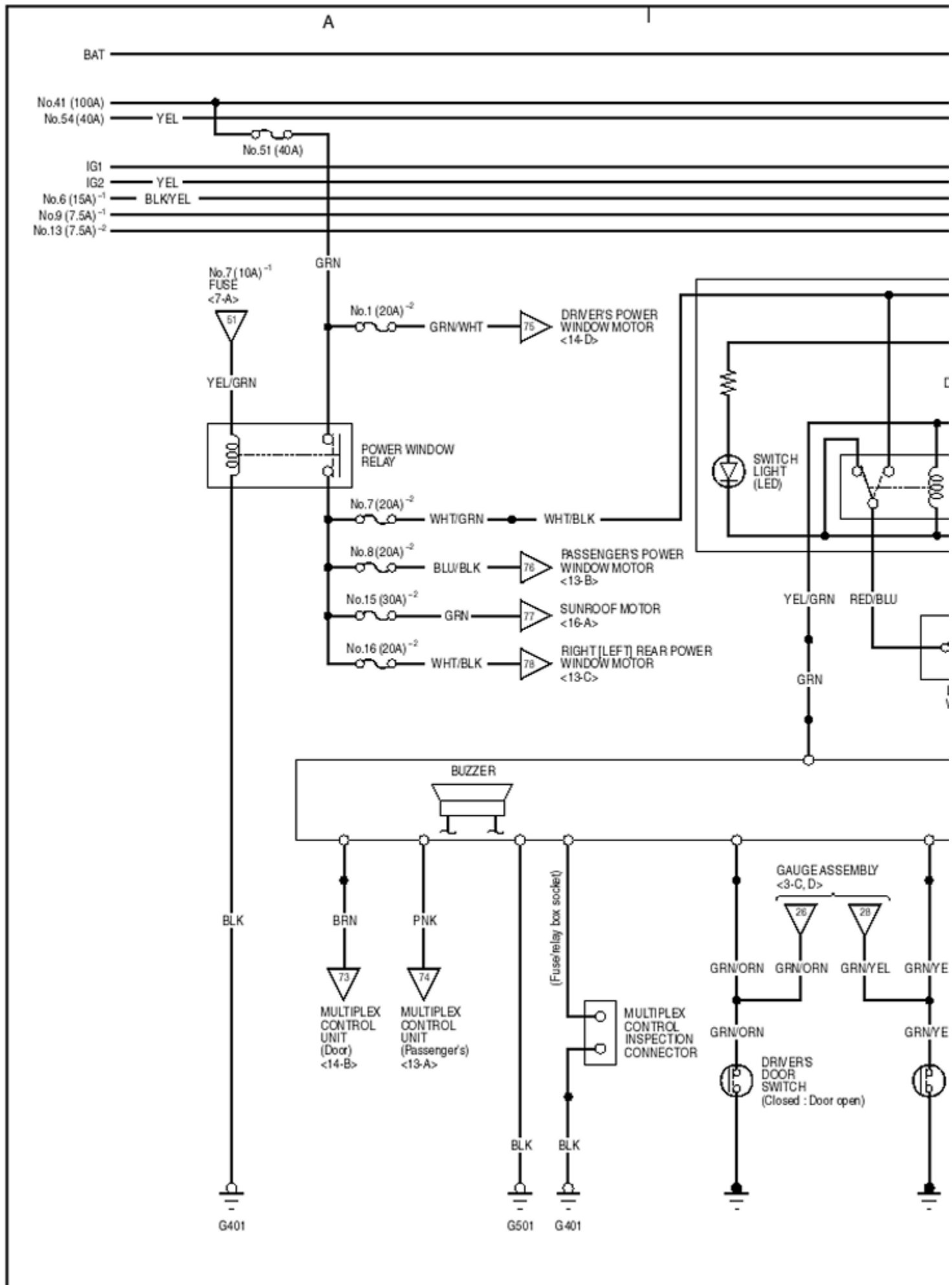
BLK/YEL — No.6 (15A)⁻¹

-1 : DRIVERS FUSE

BLK/YEL — No.6 (15A) -1

-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
() : RHD type



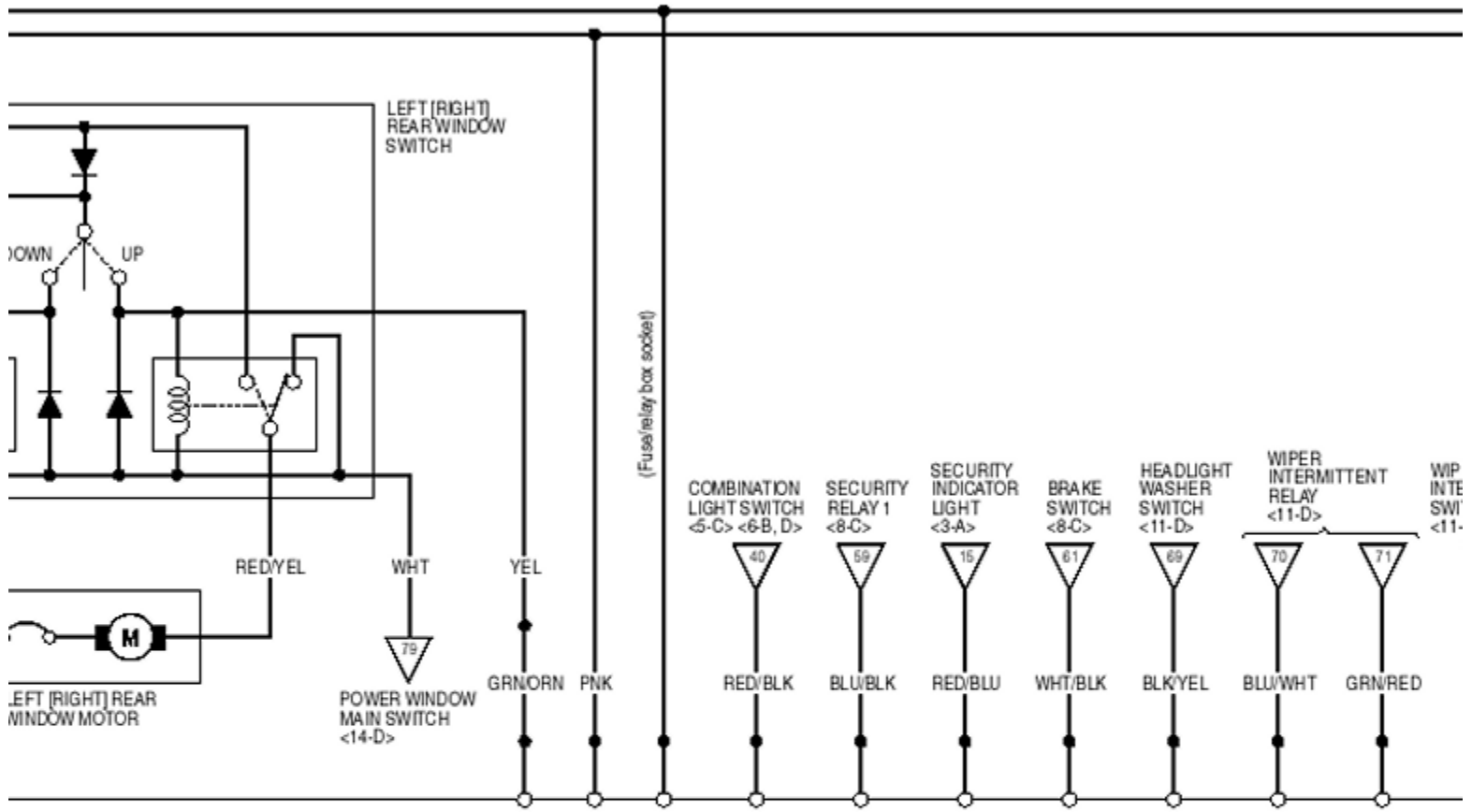


B

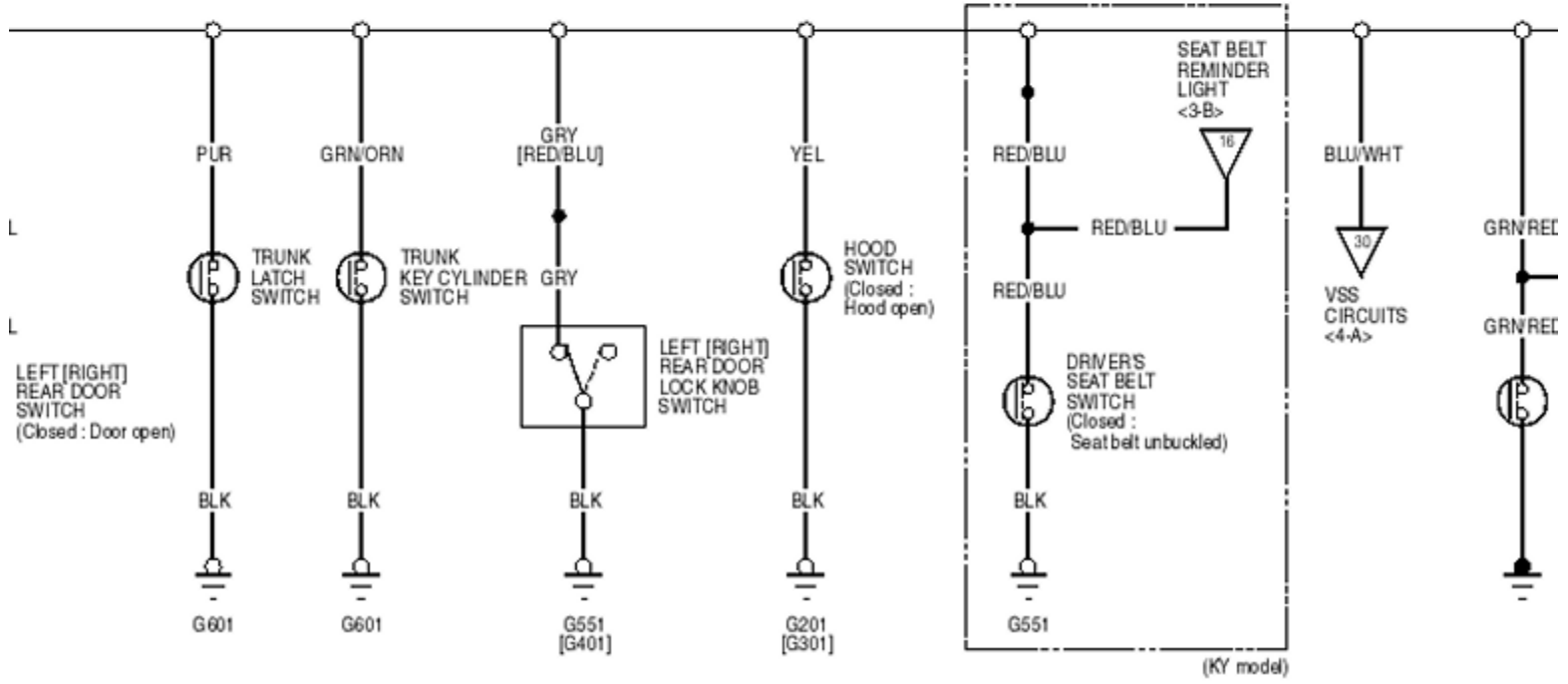
C

B

C

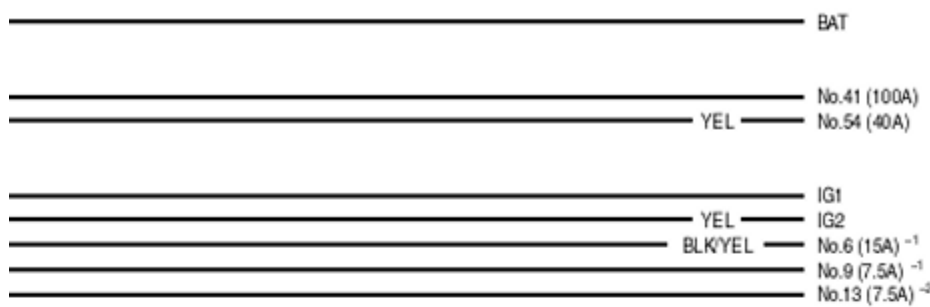


MULTIPLEX CONTROL UNIT (Driver's)



D

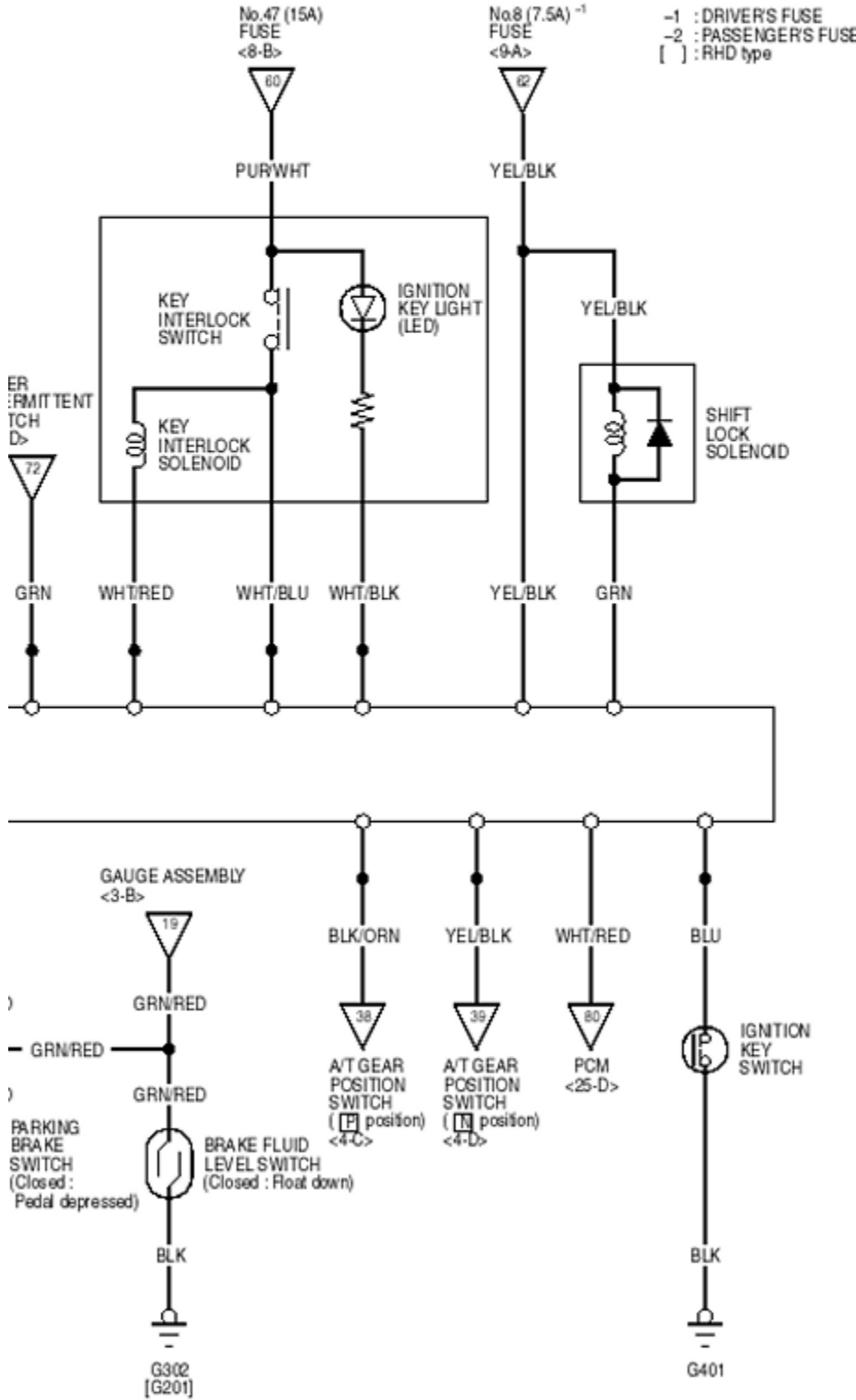
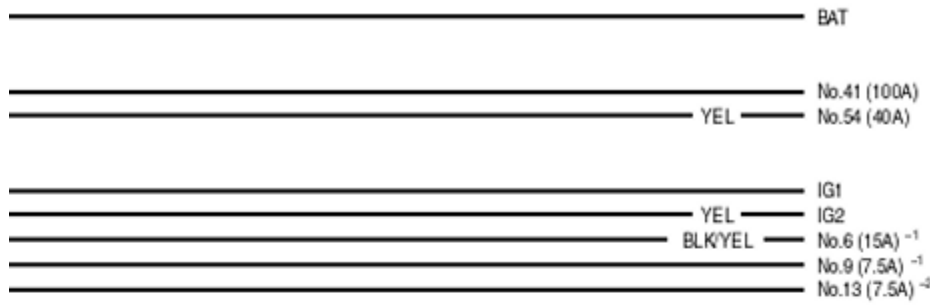
12



No.47 (15A)

No.8 (7.5A)⁻¹

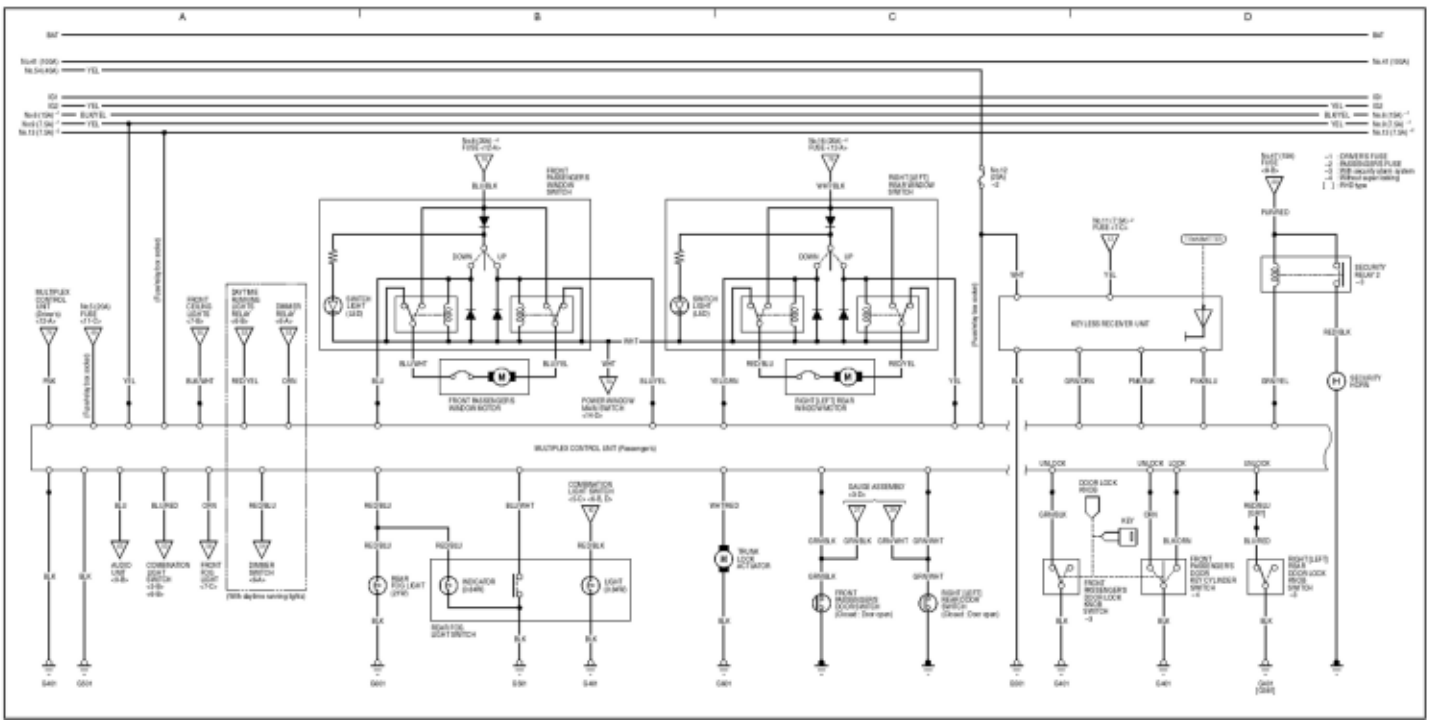
-1 : DRIVER'S FUSE



Wiring Diagrams

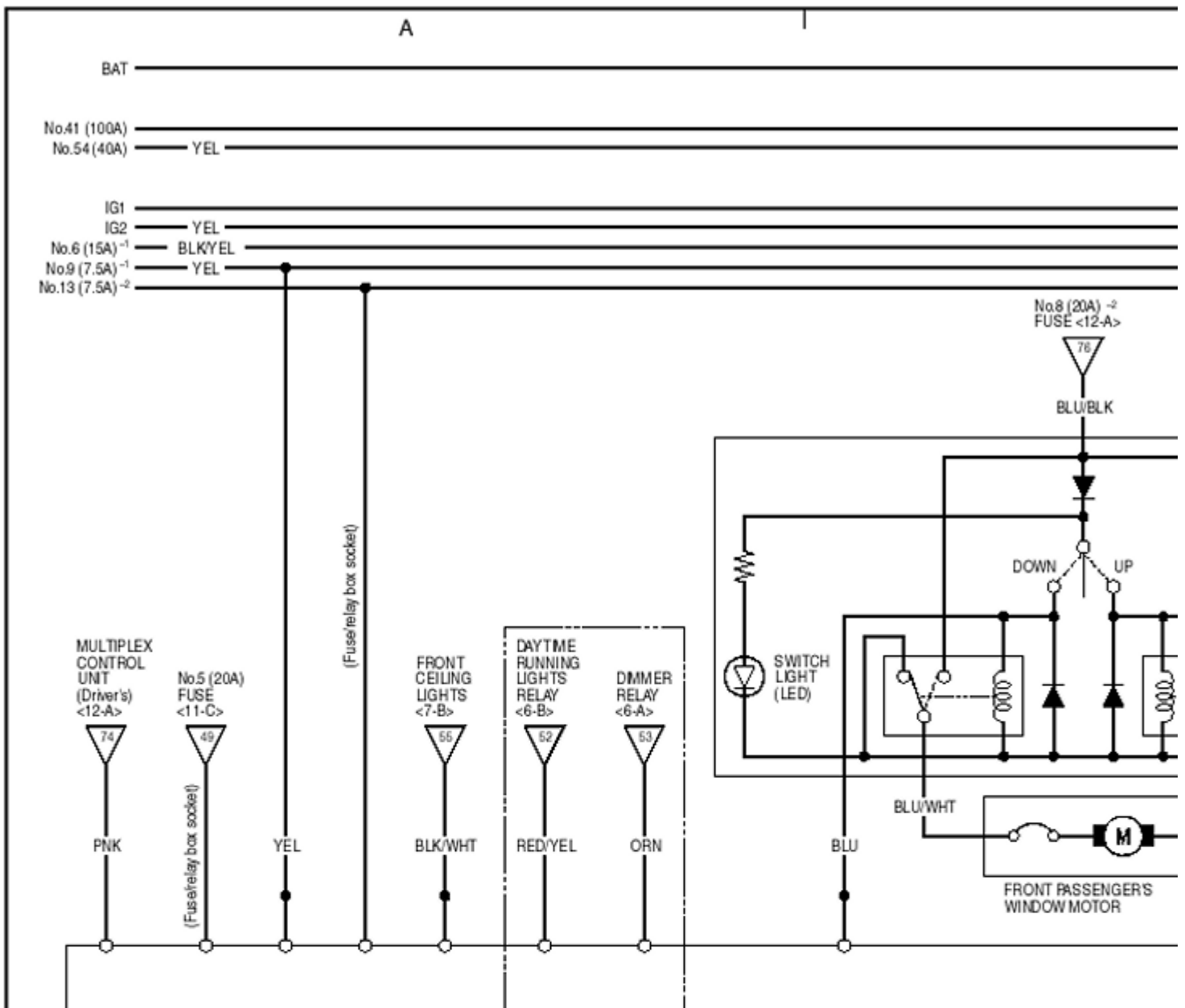
Entry Light Control System

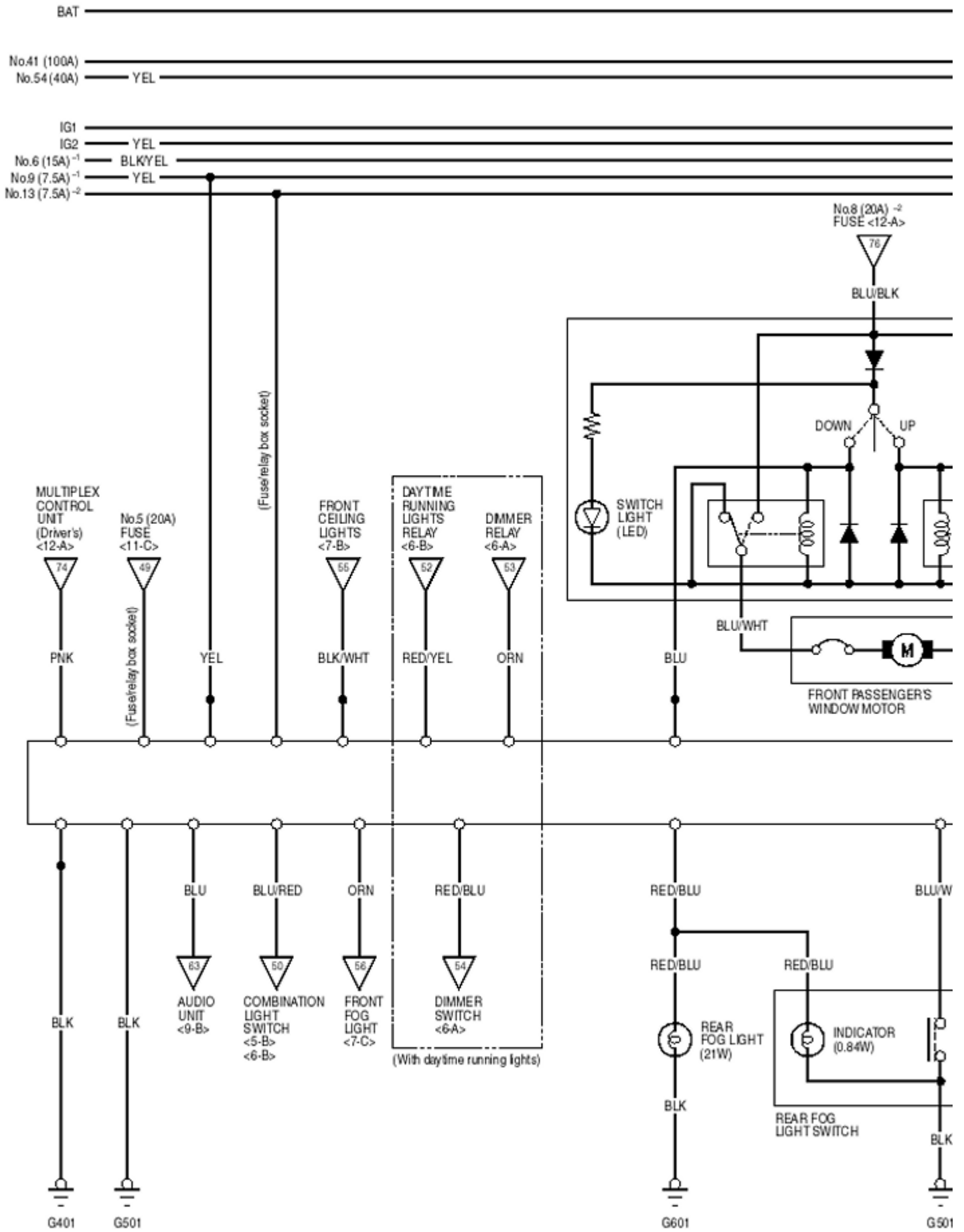
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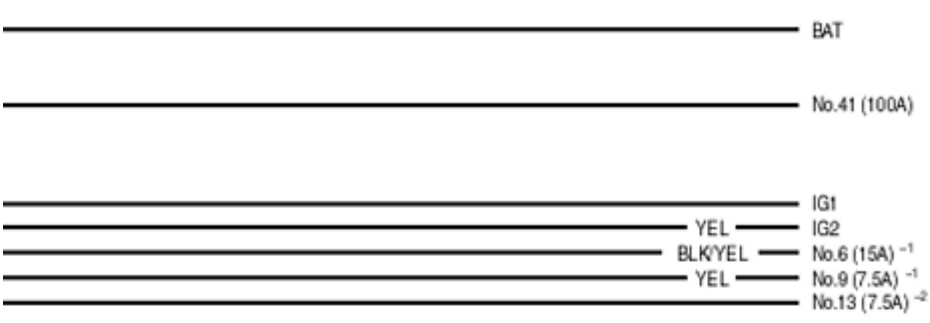
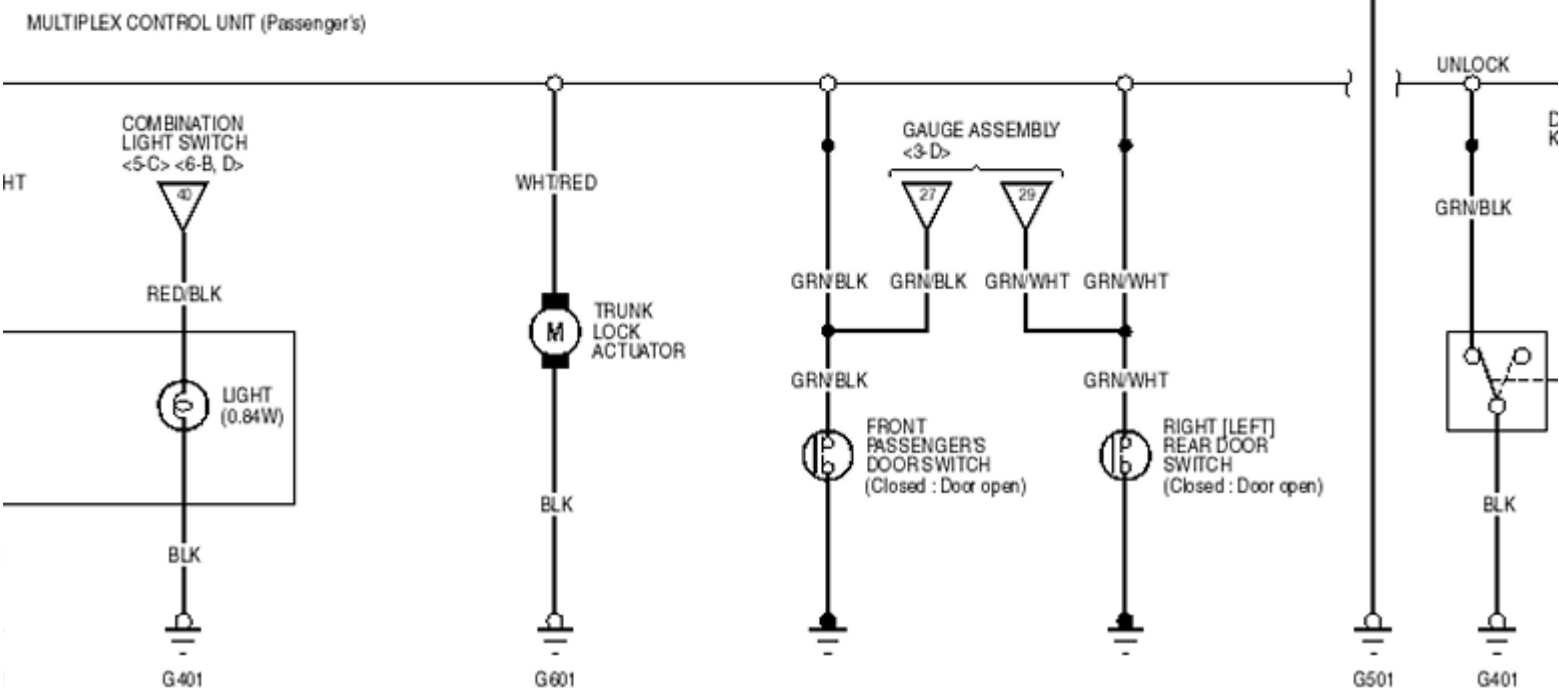
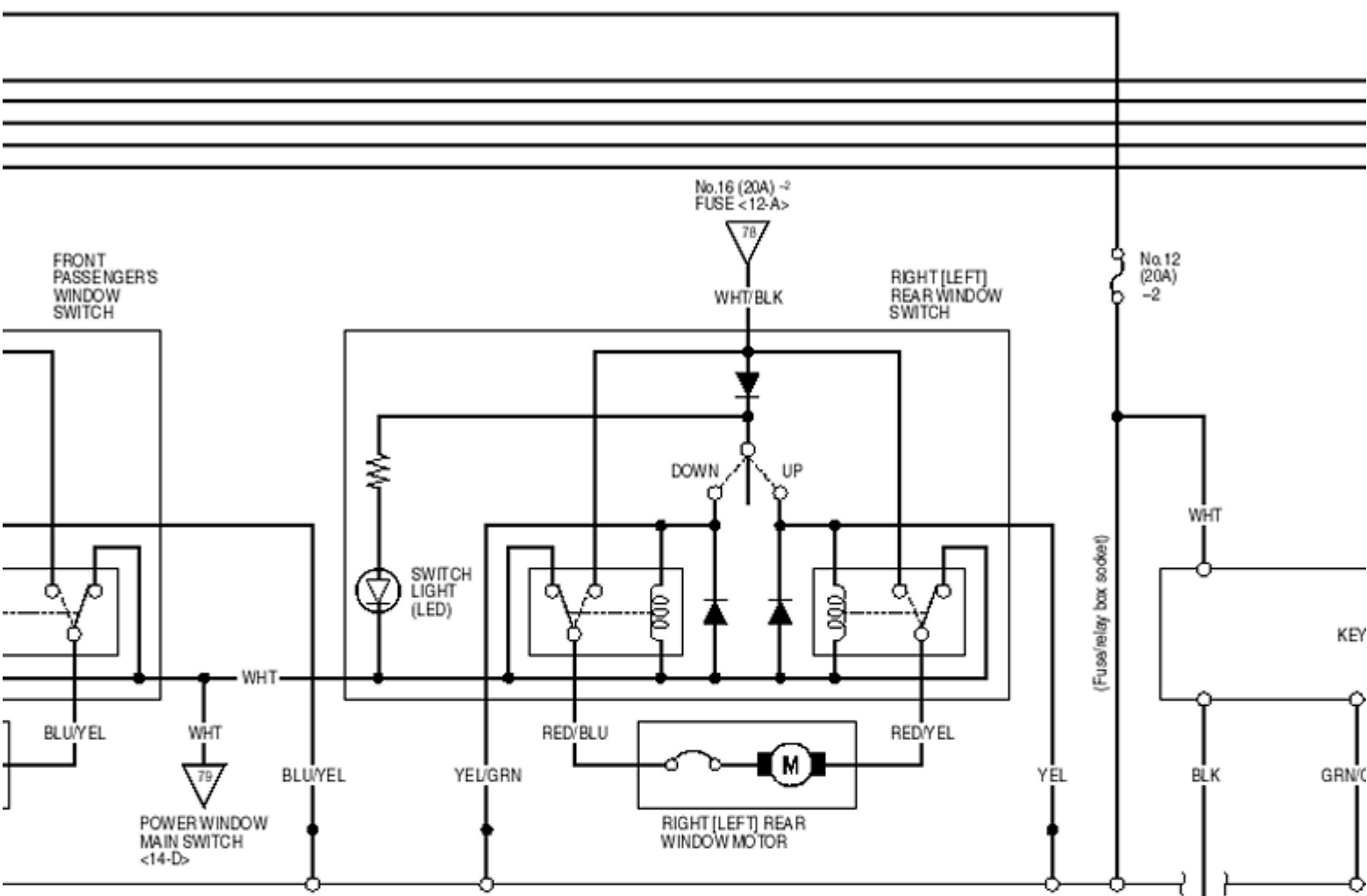


13

13



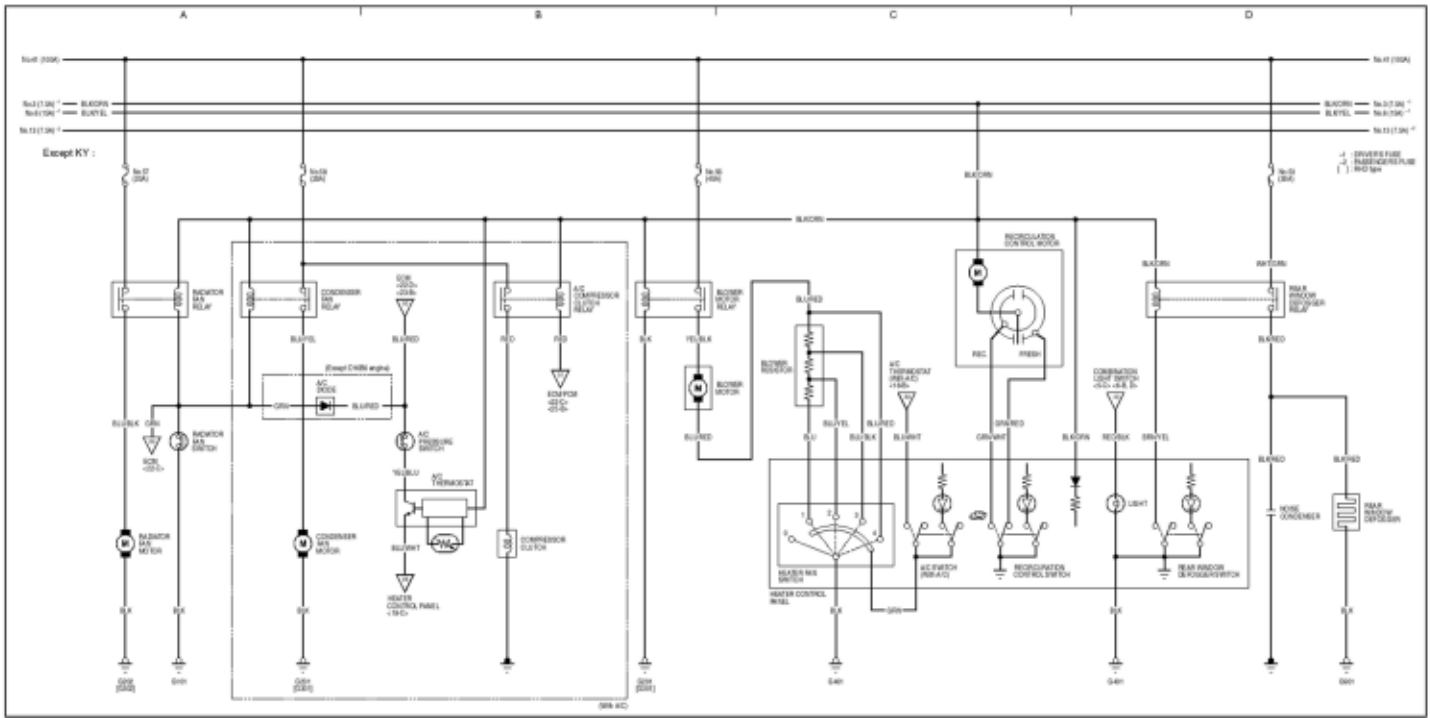




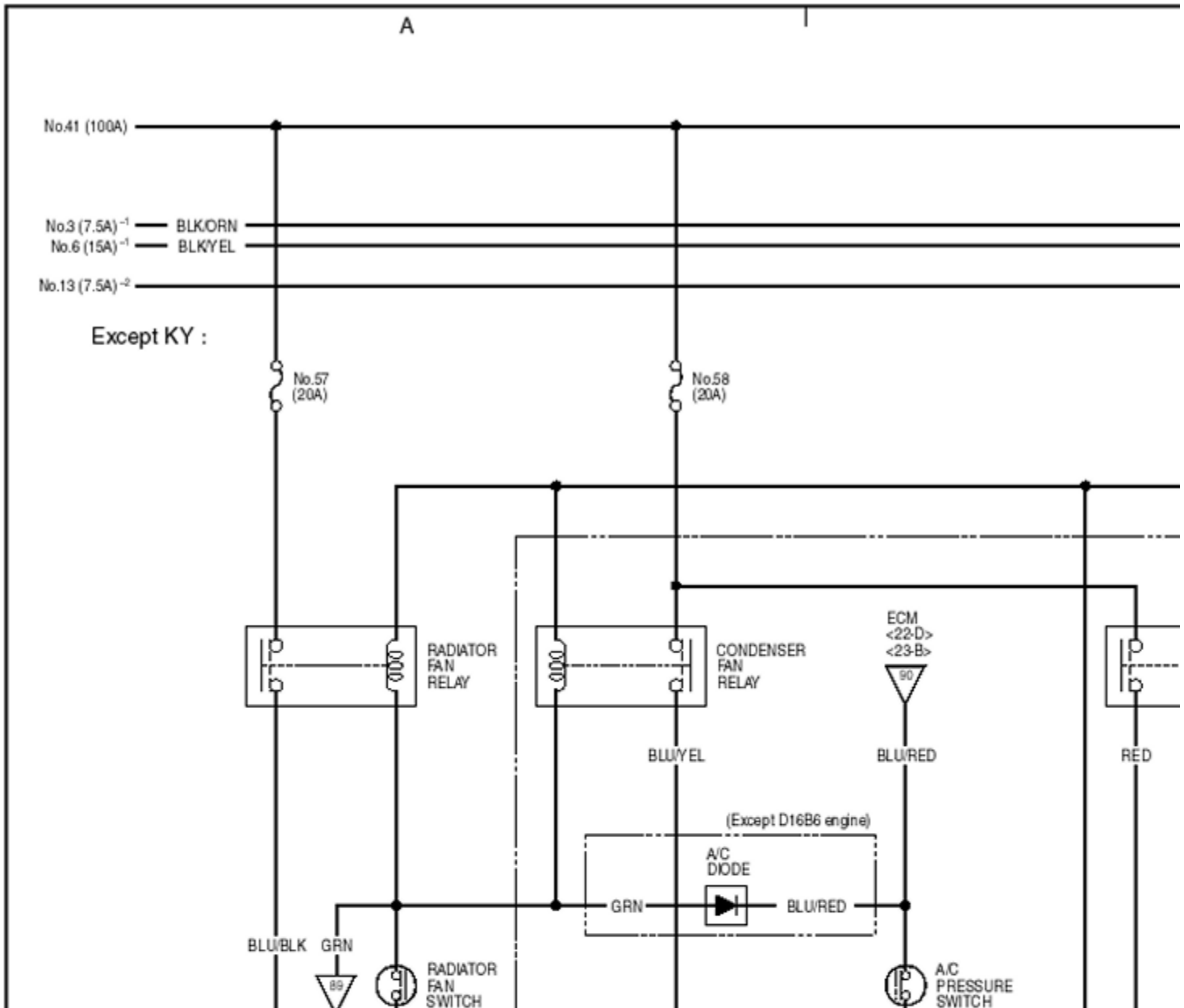
Wiring Diagrams

Fan Controls

18



18

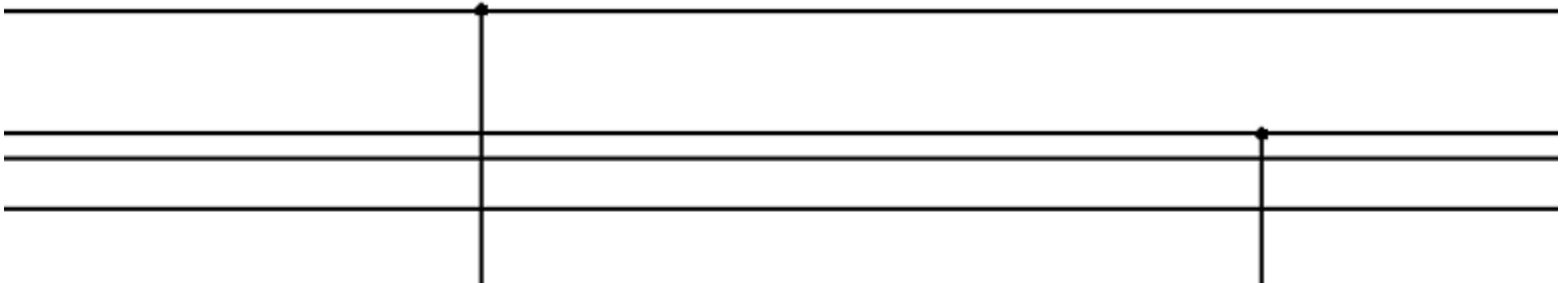
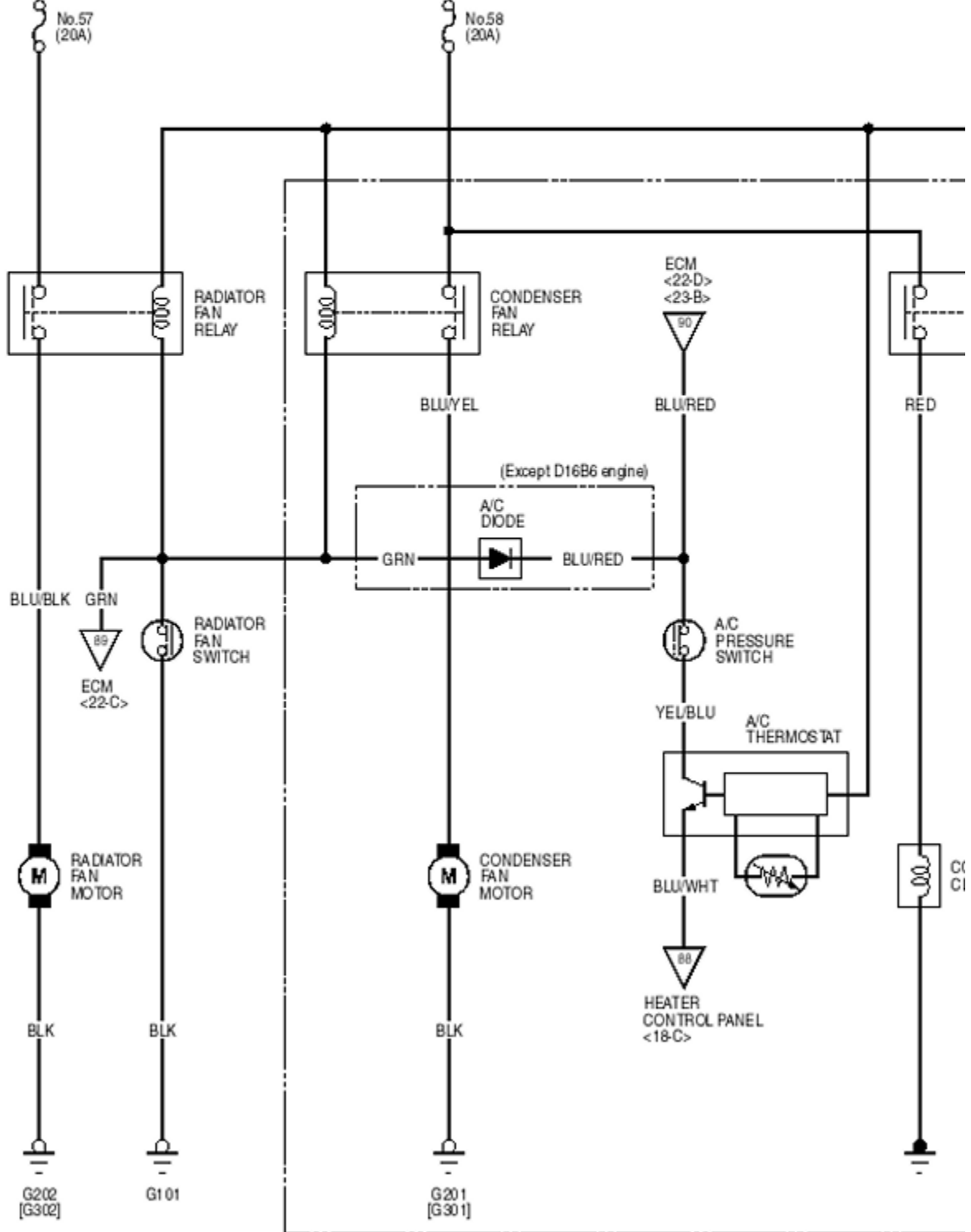


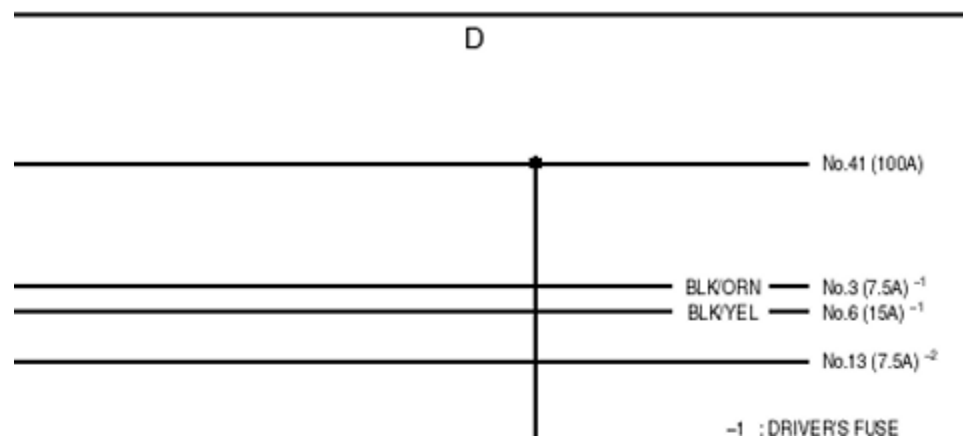
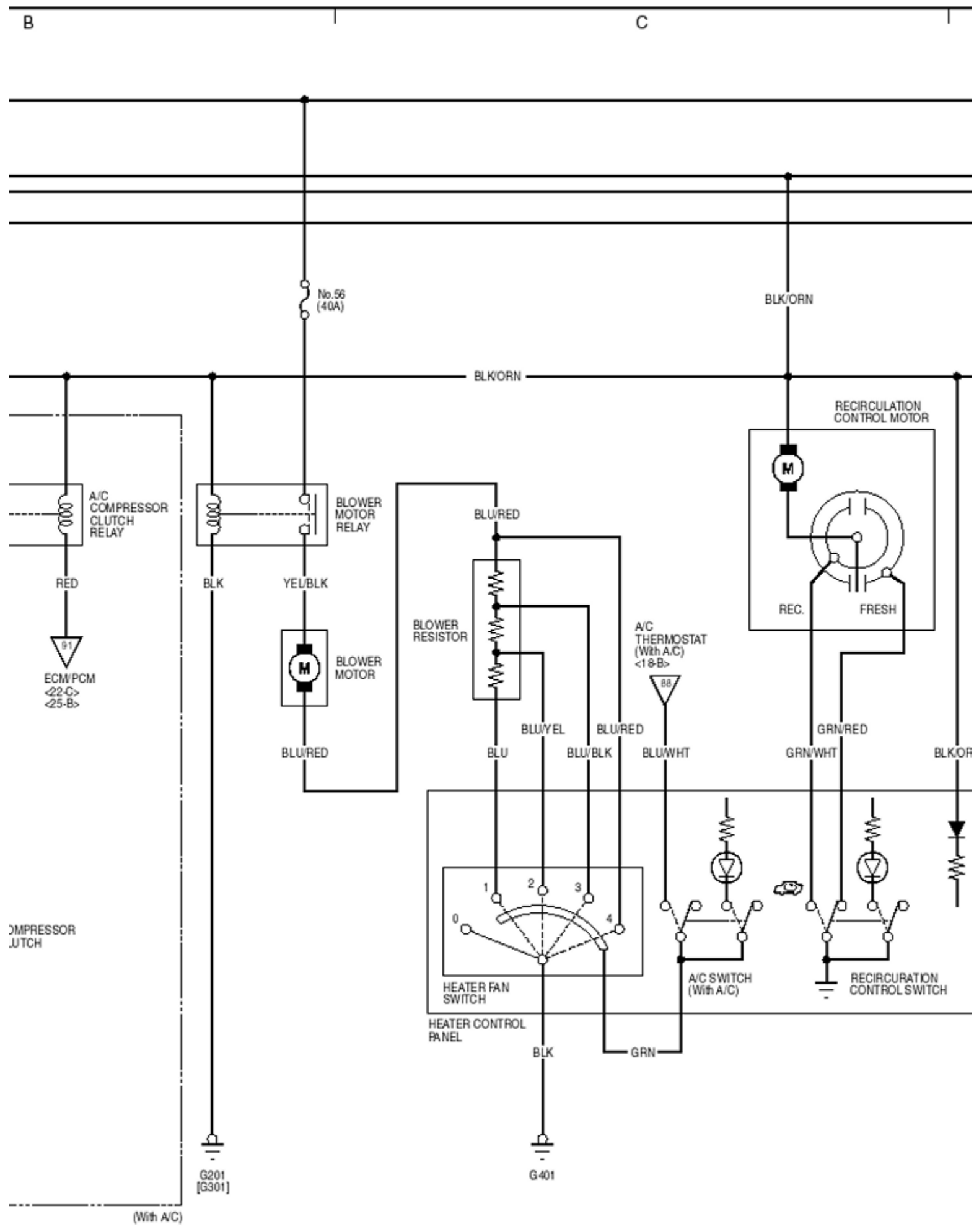
No.41 (100A)

No.3 (7.5A)⁻¹ — BLKORN
 No.6 (15A)⁻¹ — BLKYEL

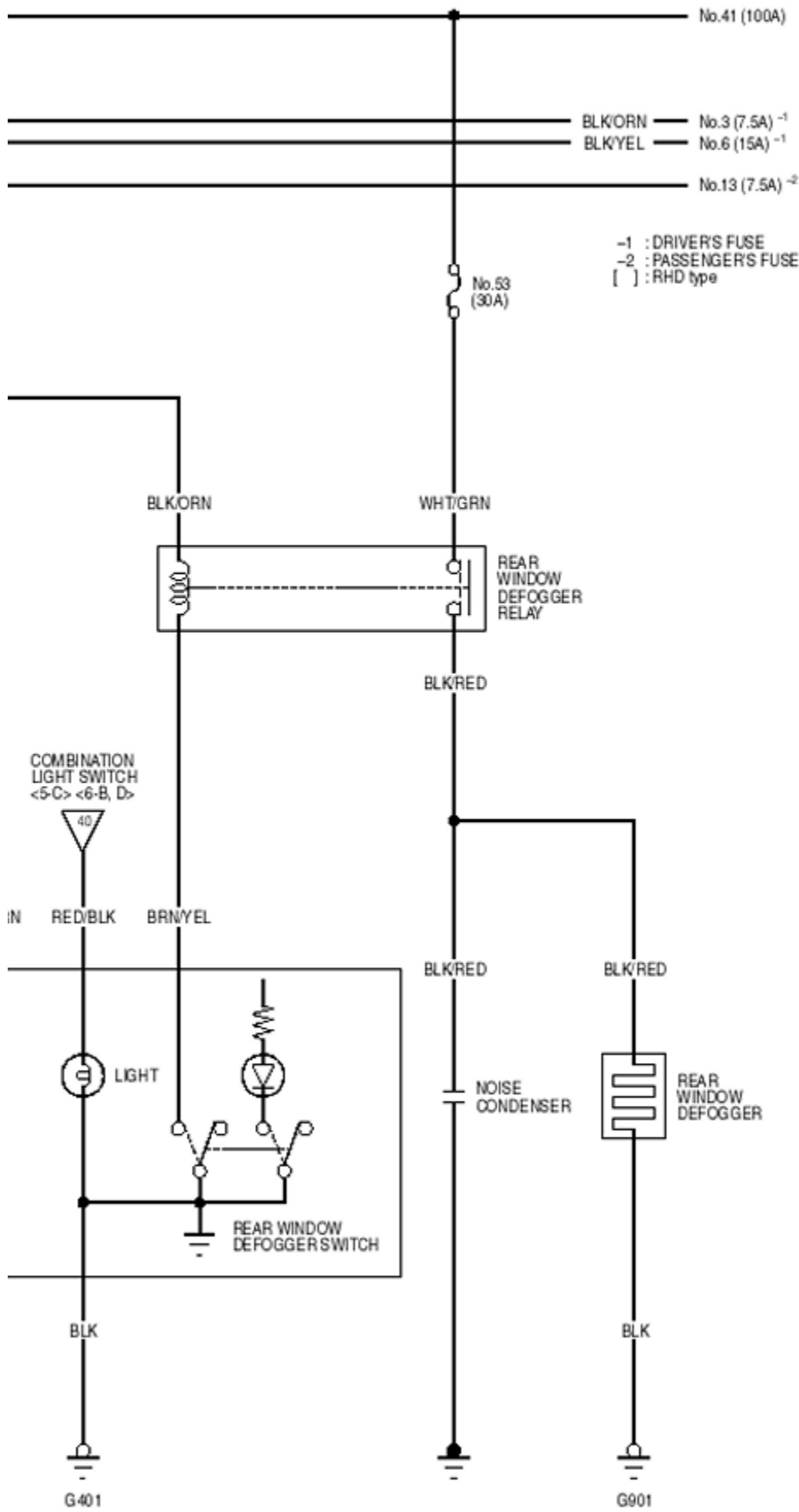
No.13 (7.5A)⁻²

Except KY :



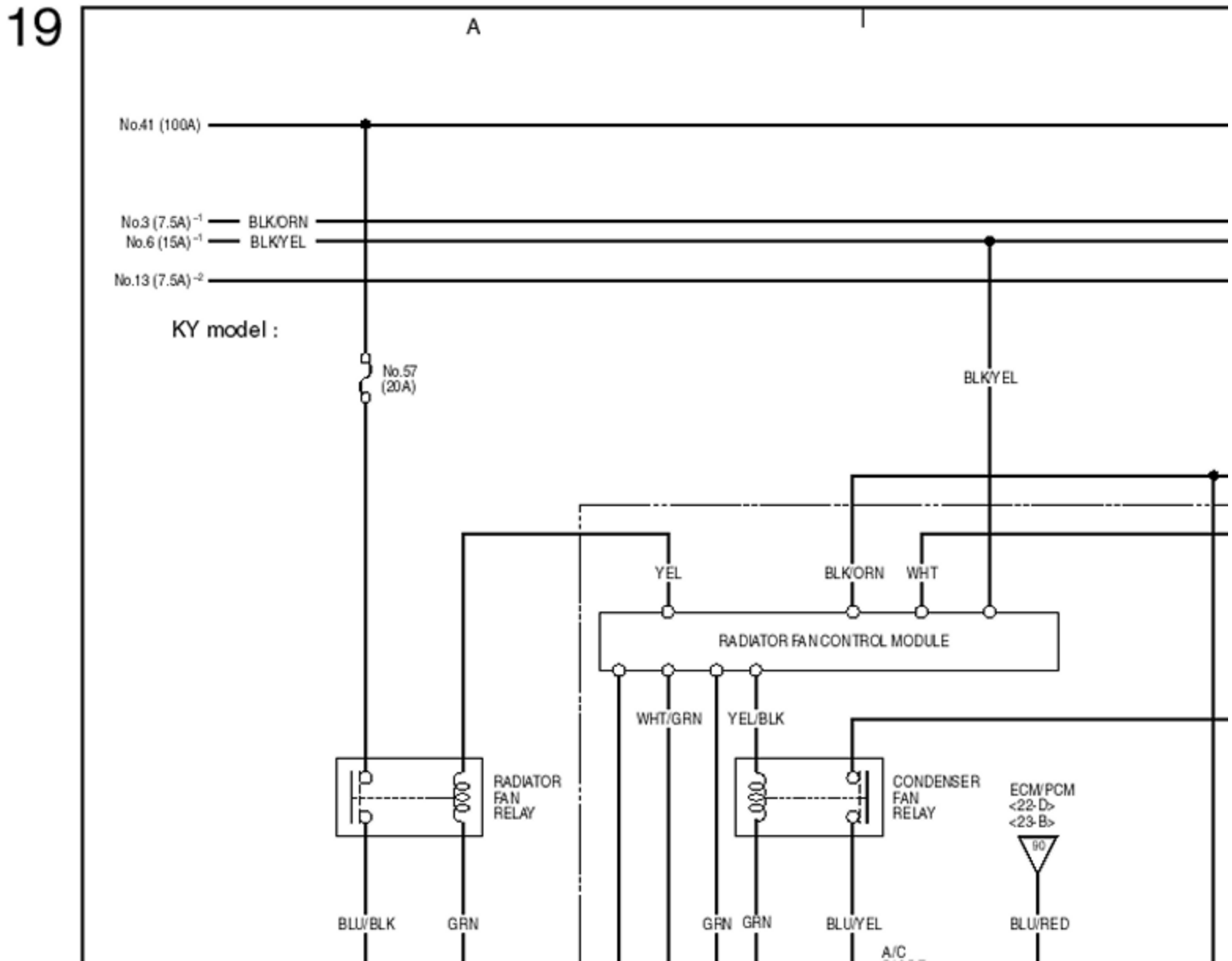
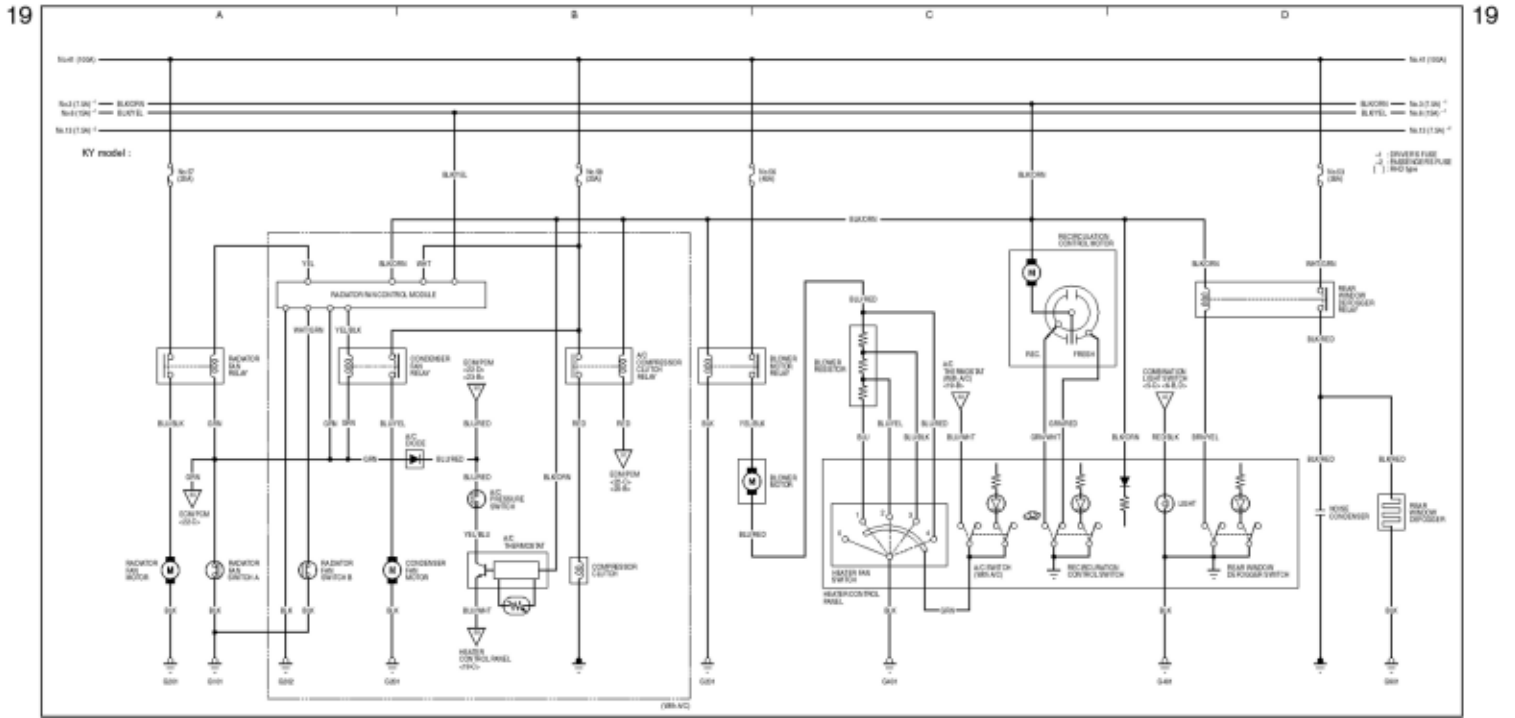


D



Wiring Diagrams

Fan Controls

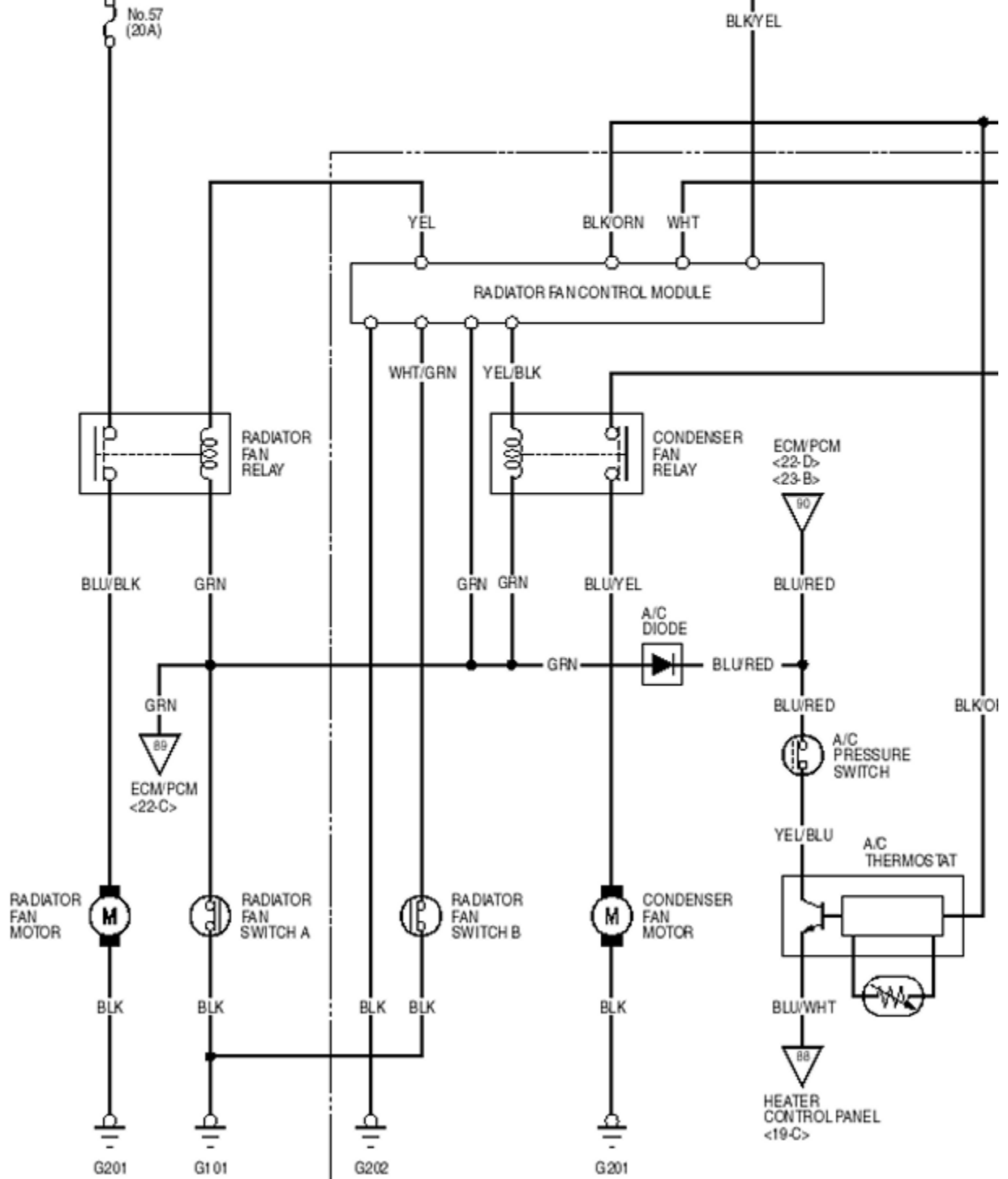


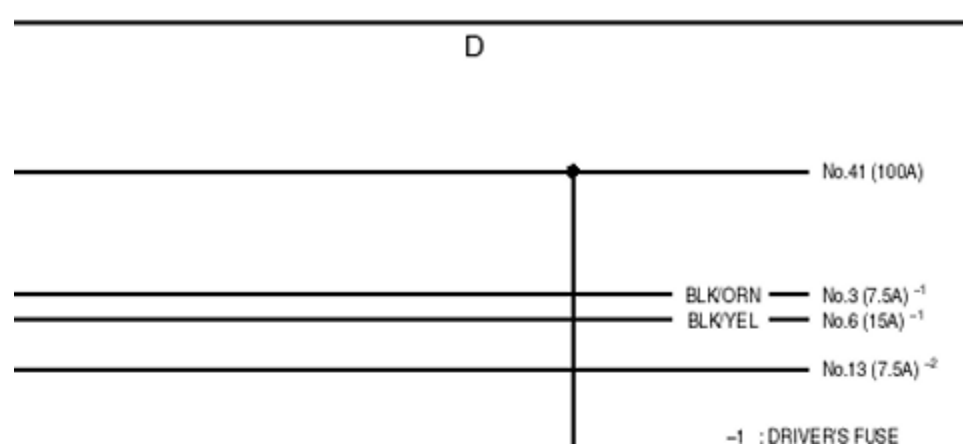
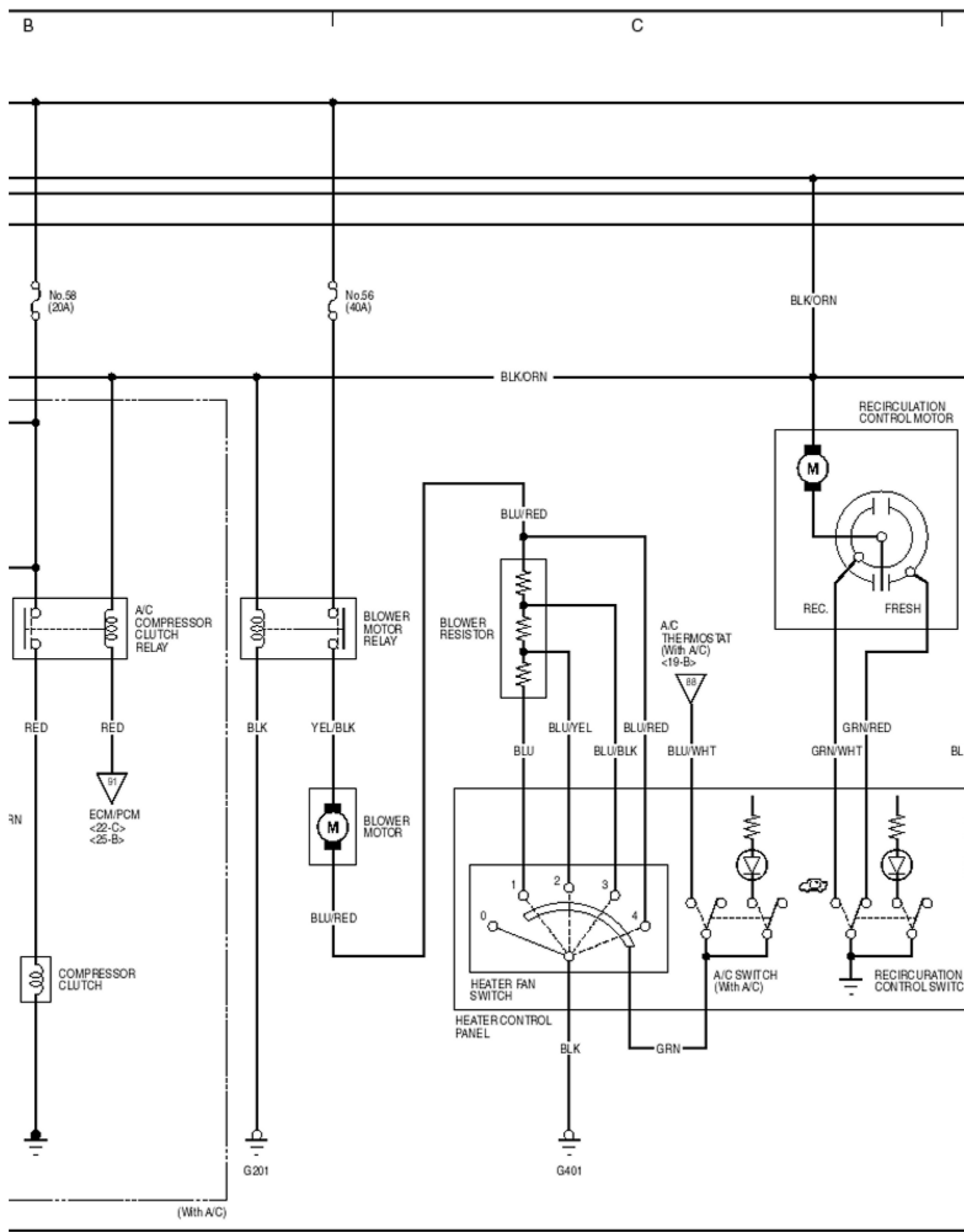
No.41 (100A)

No.3 (7.5A)⁻¹ — BLKORN
 No.6 (15A)⁻¹ — BLKYEL

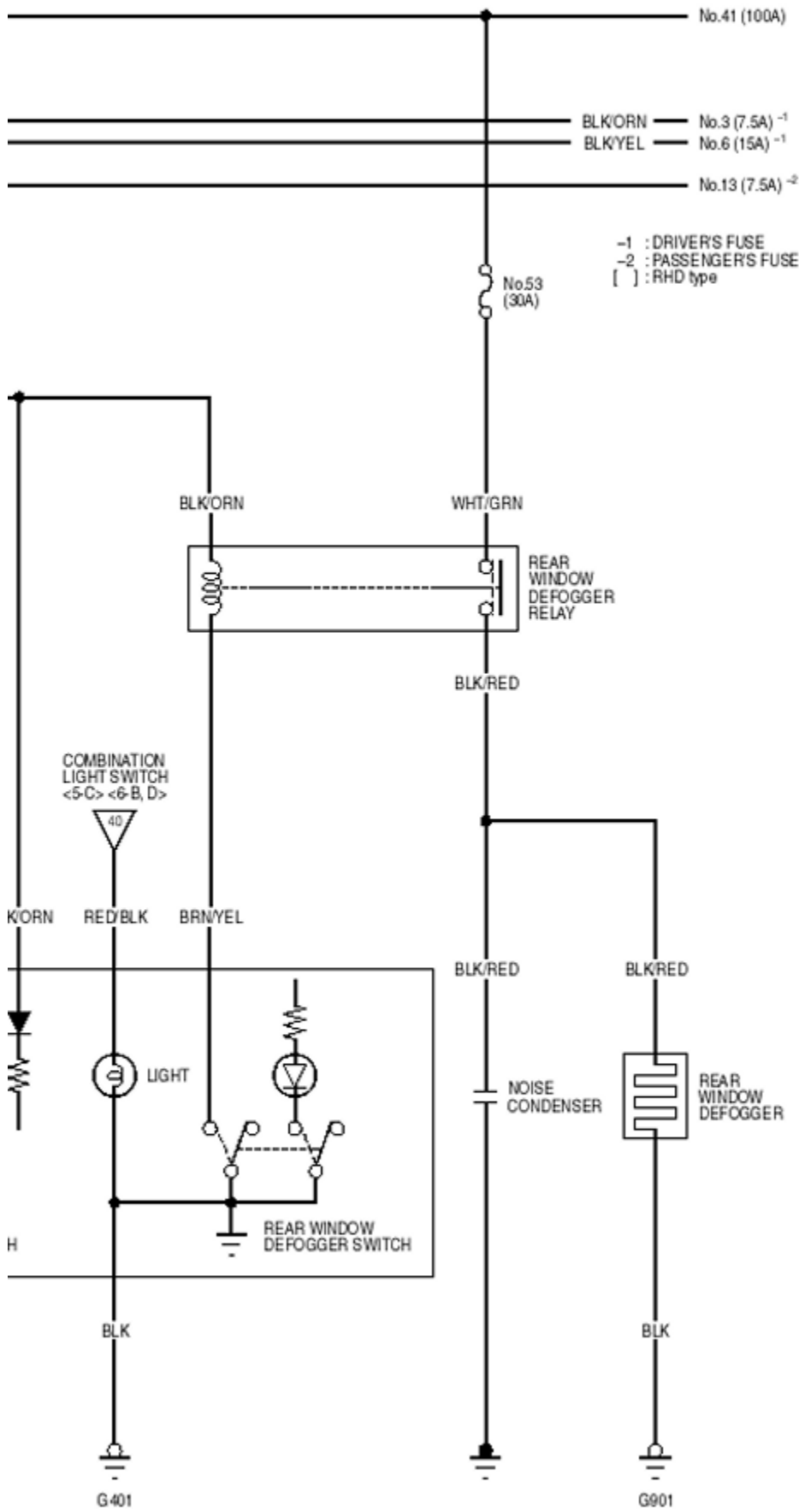
No.13 (7.5A)⁻²

KY model :



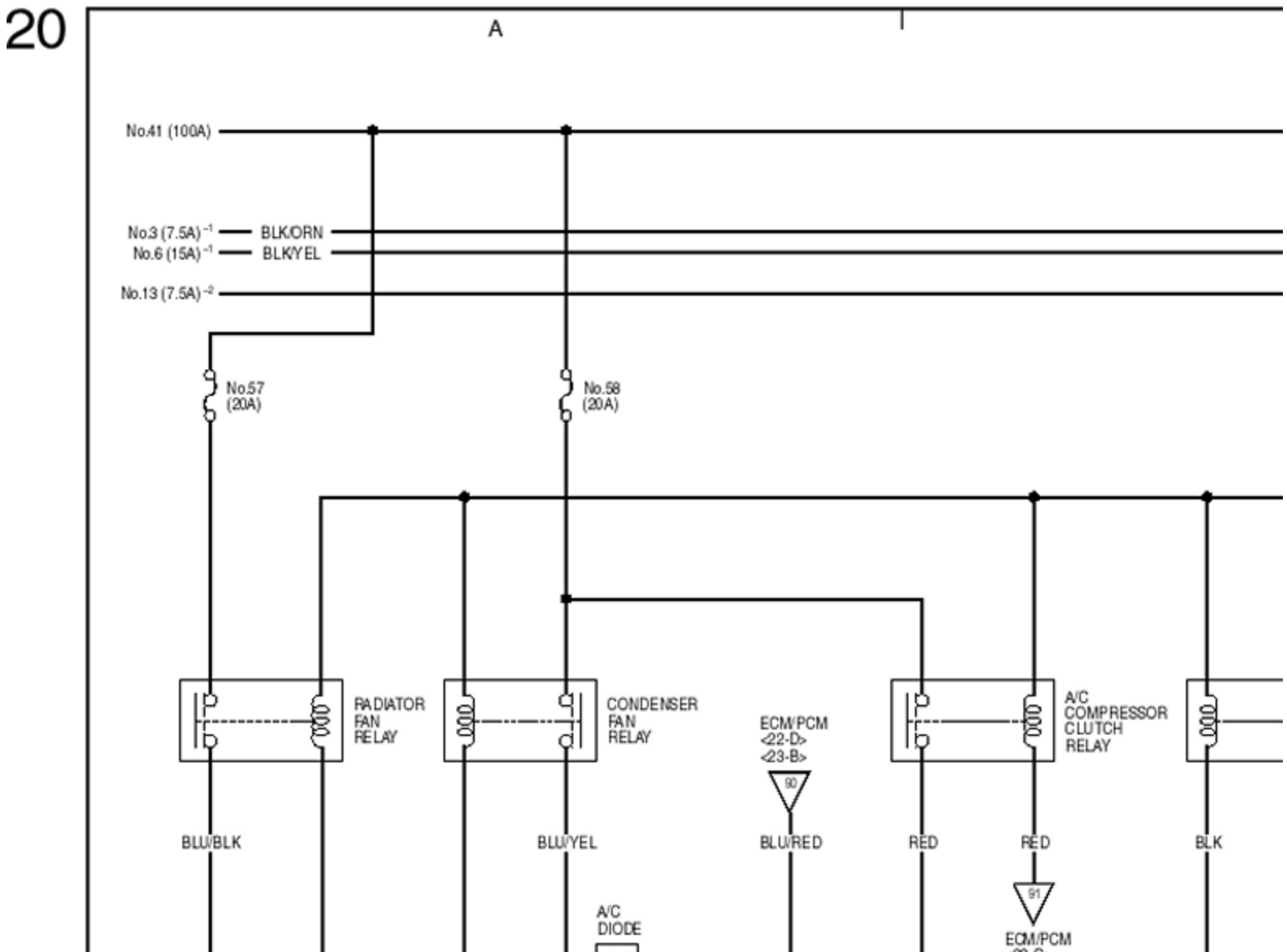
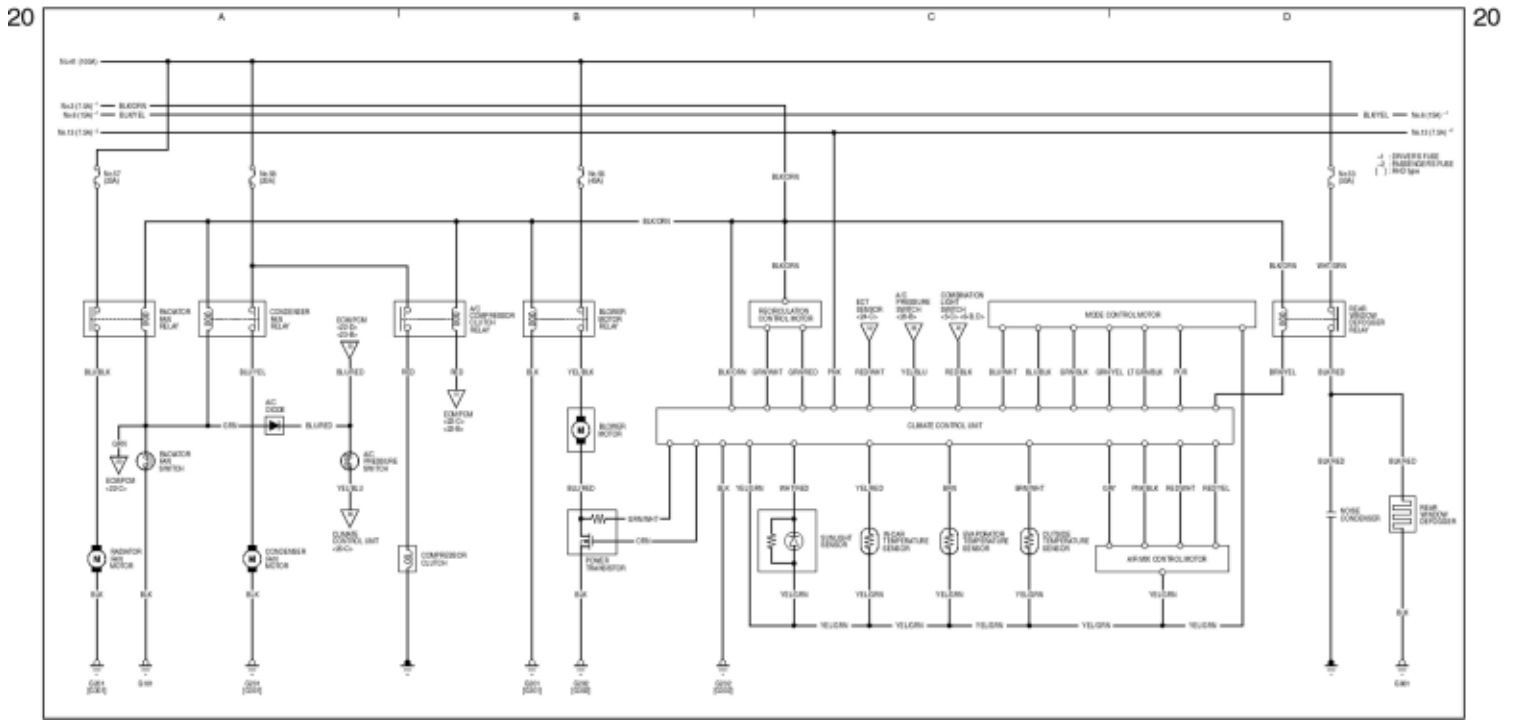


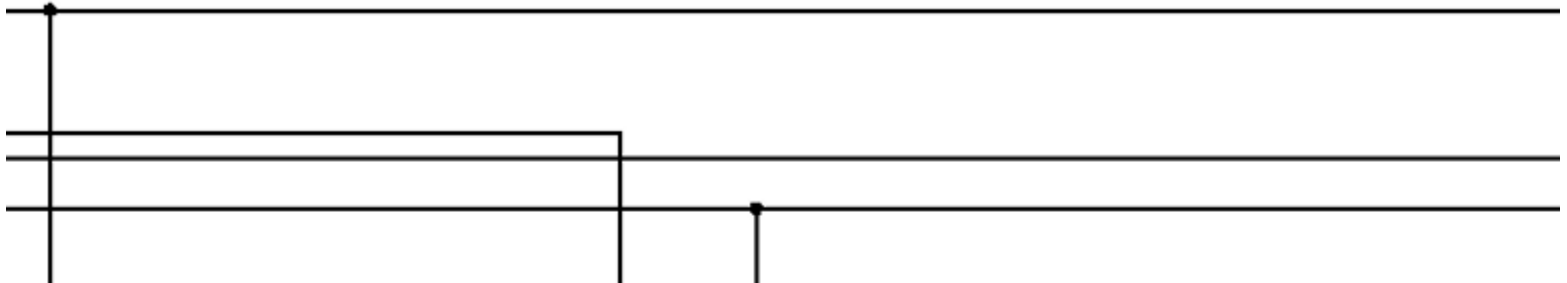
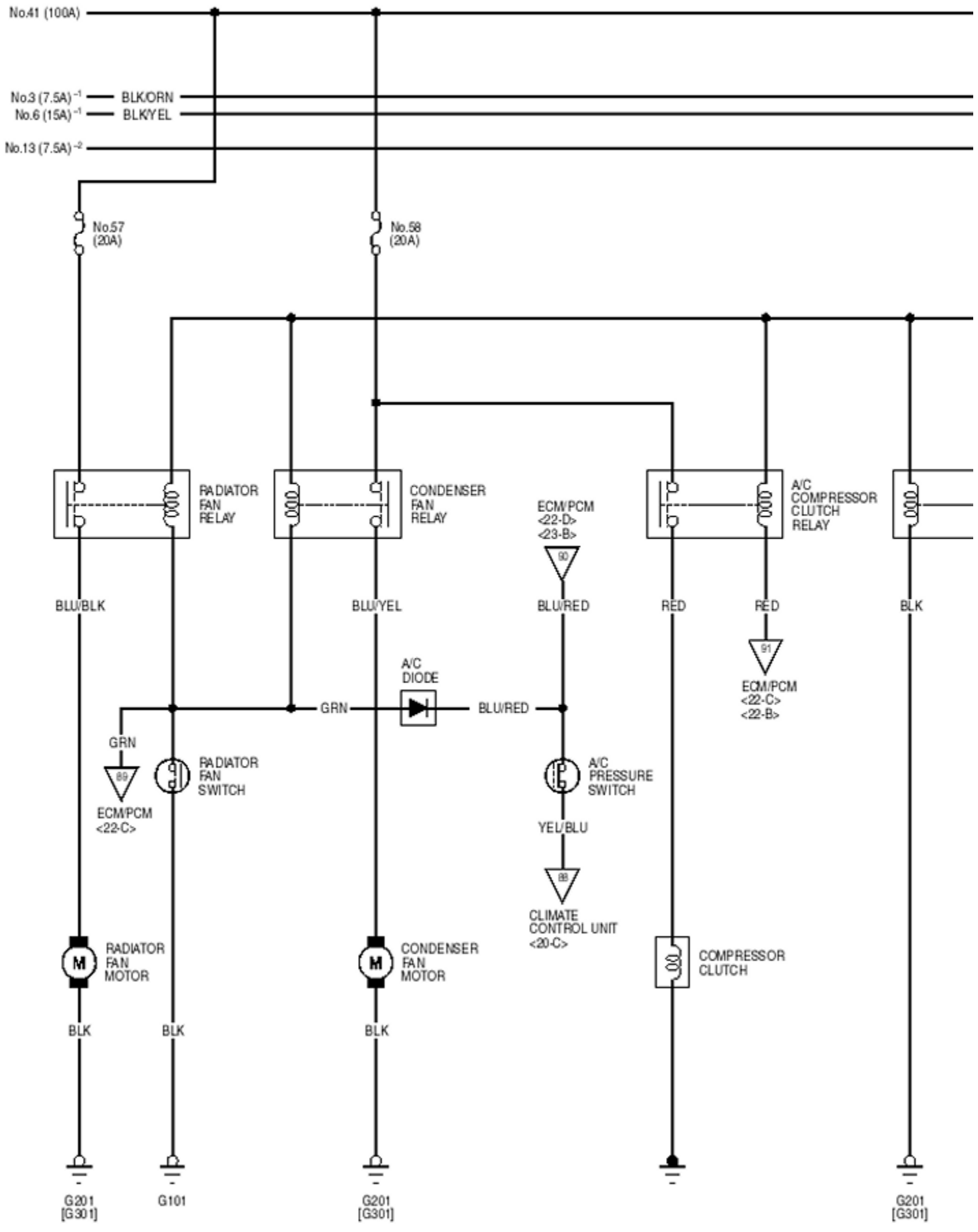
D

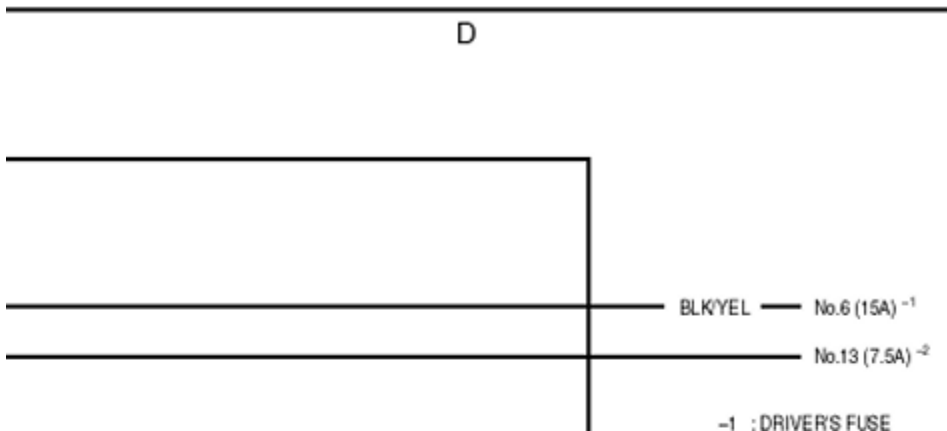
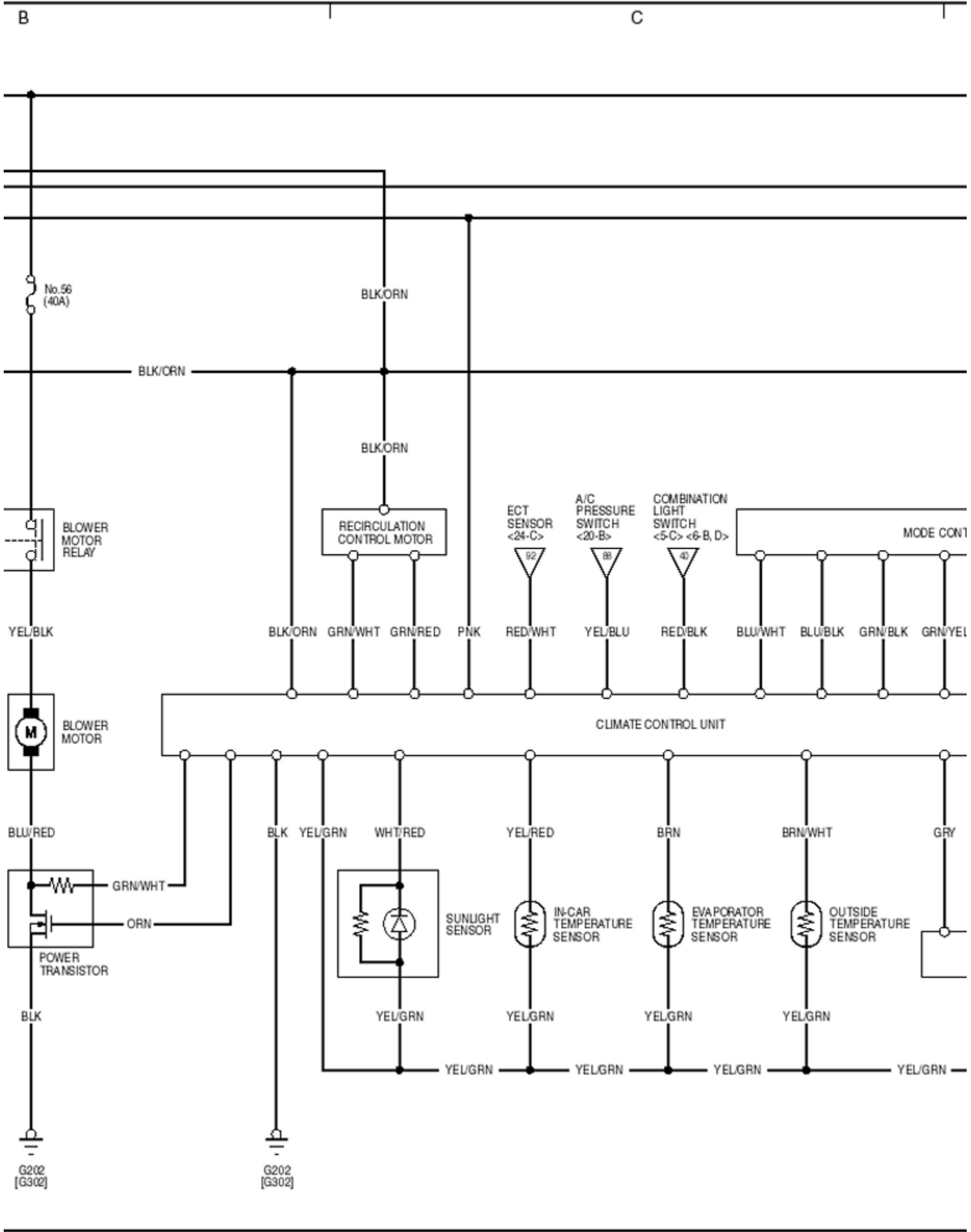


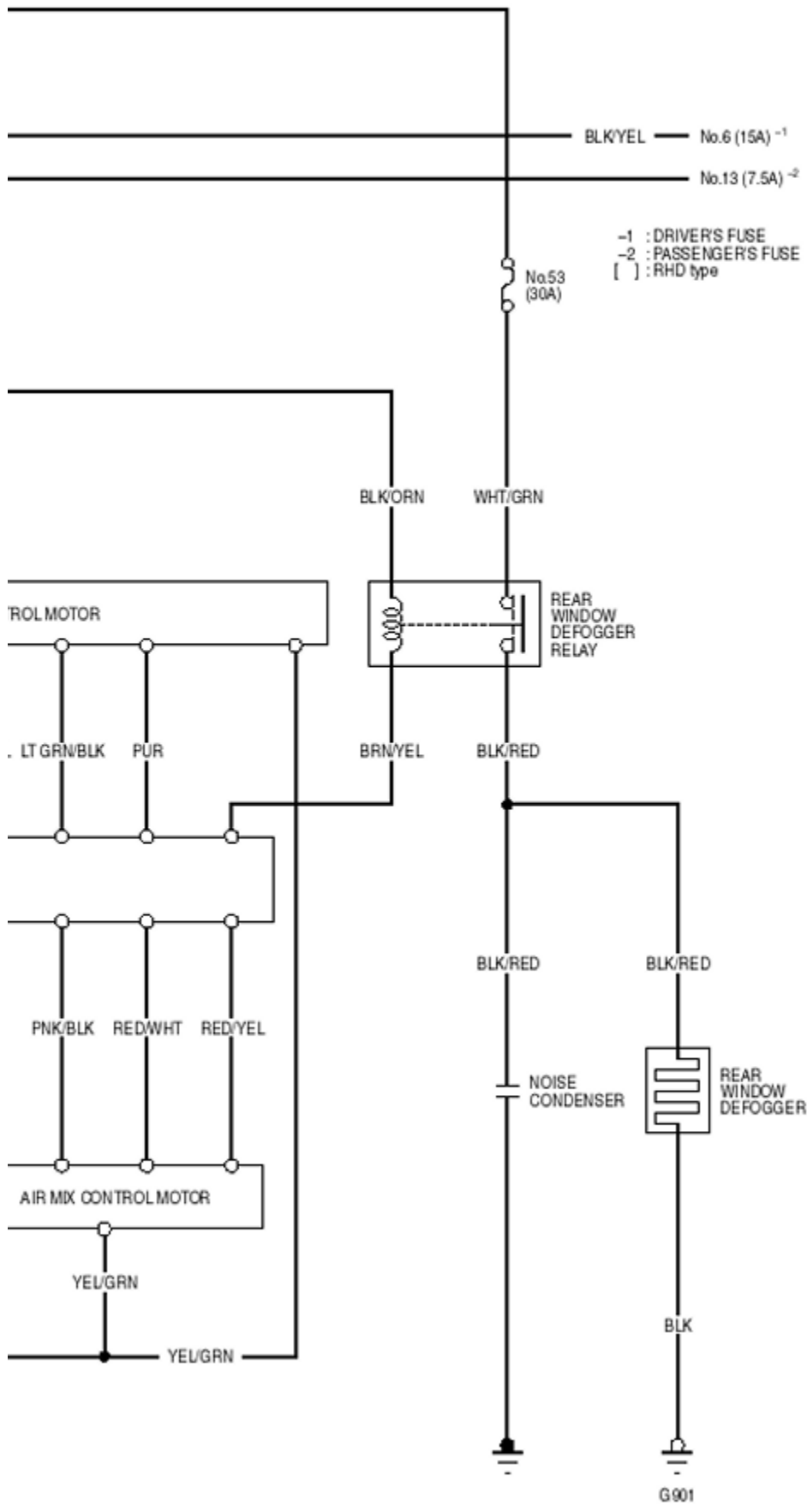
Wiring Diagrams

Fan Controls



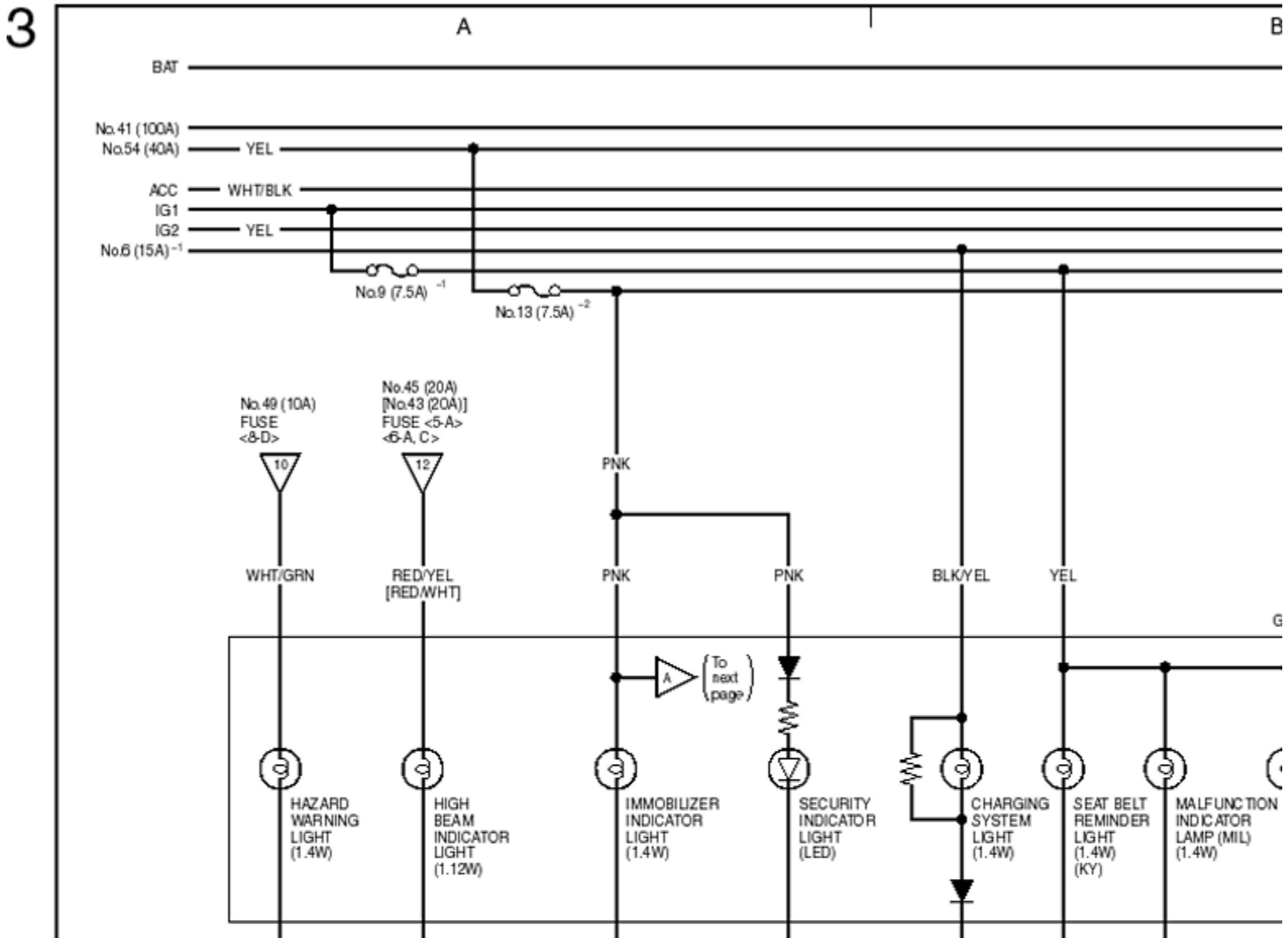
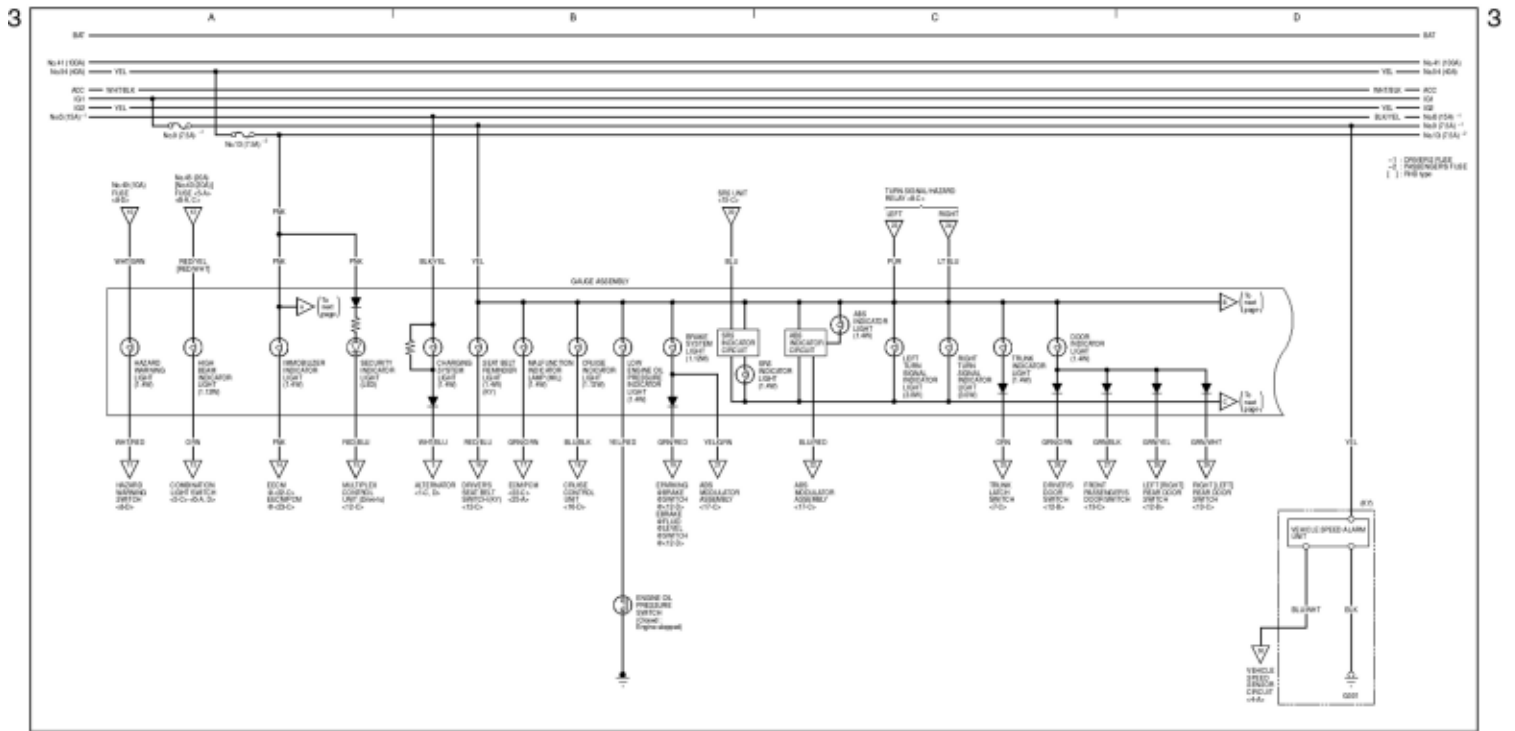


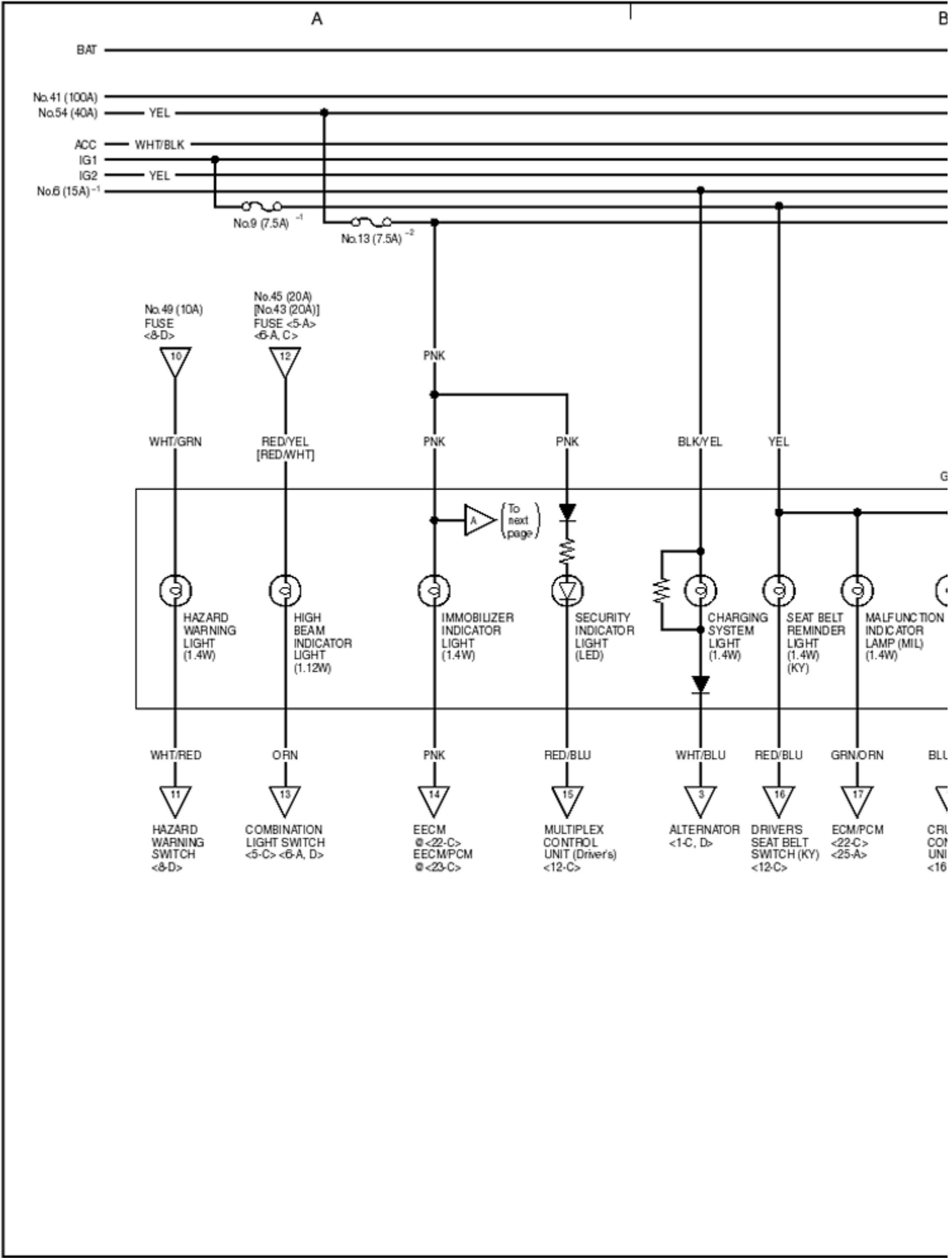


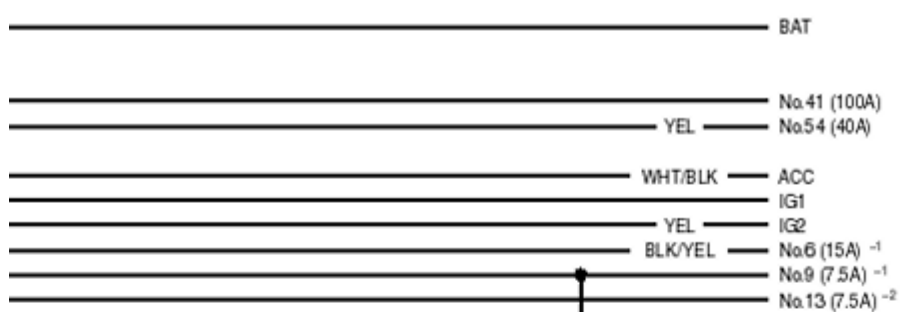
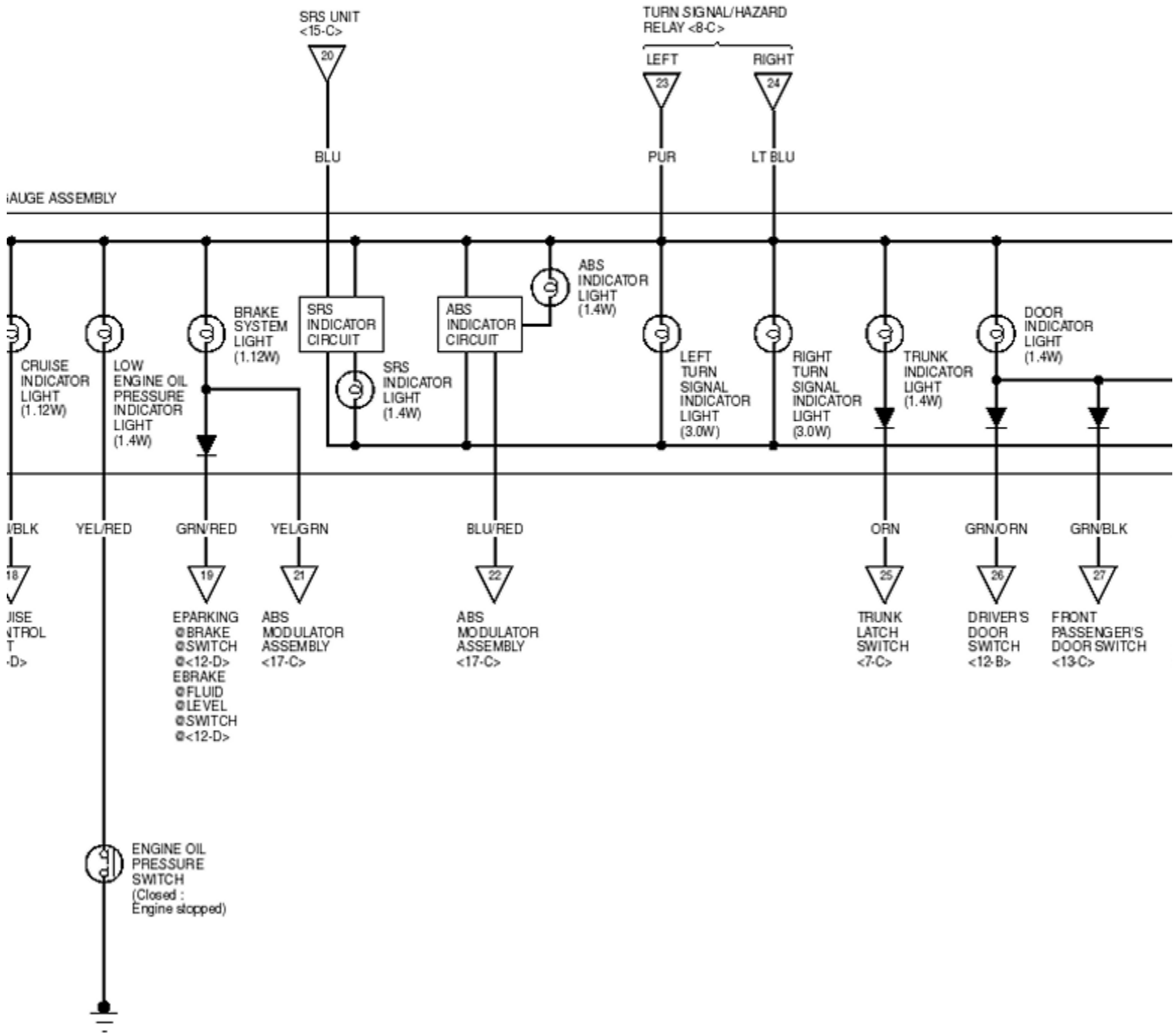


Wiring Diagrams

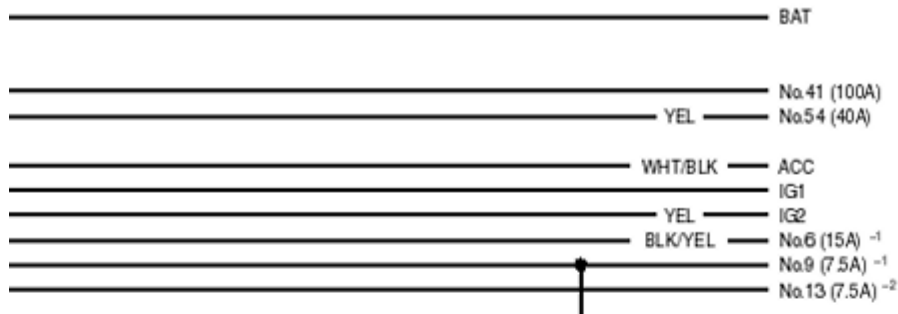
Gauges



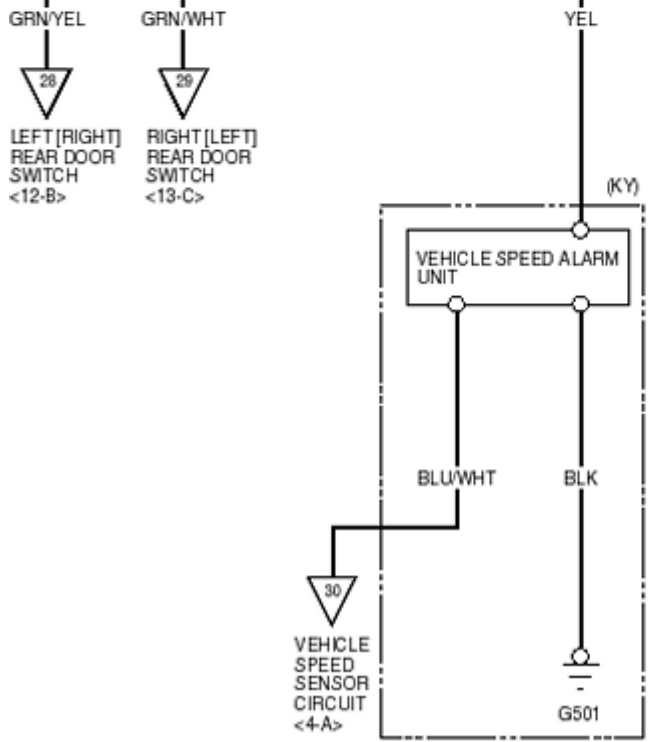
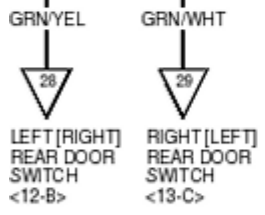
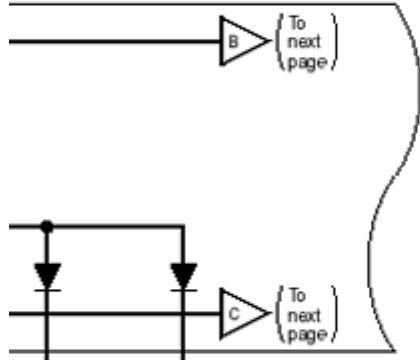




D

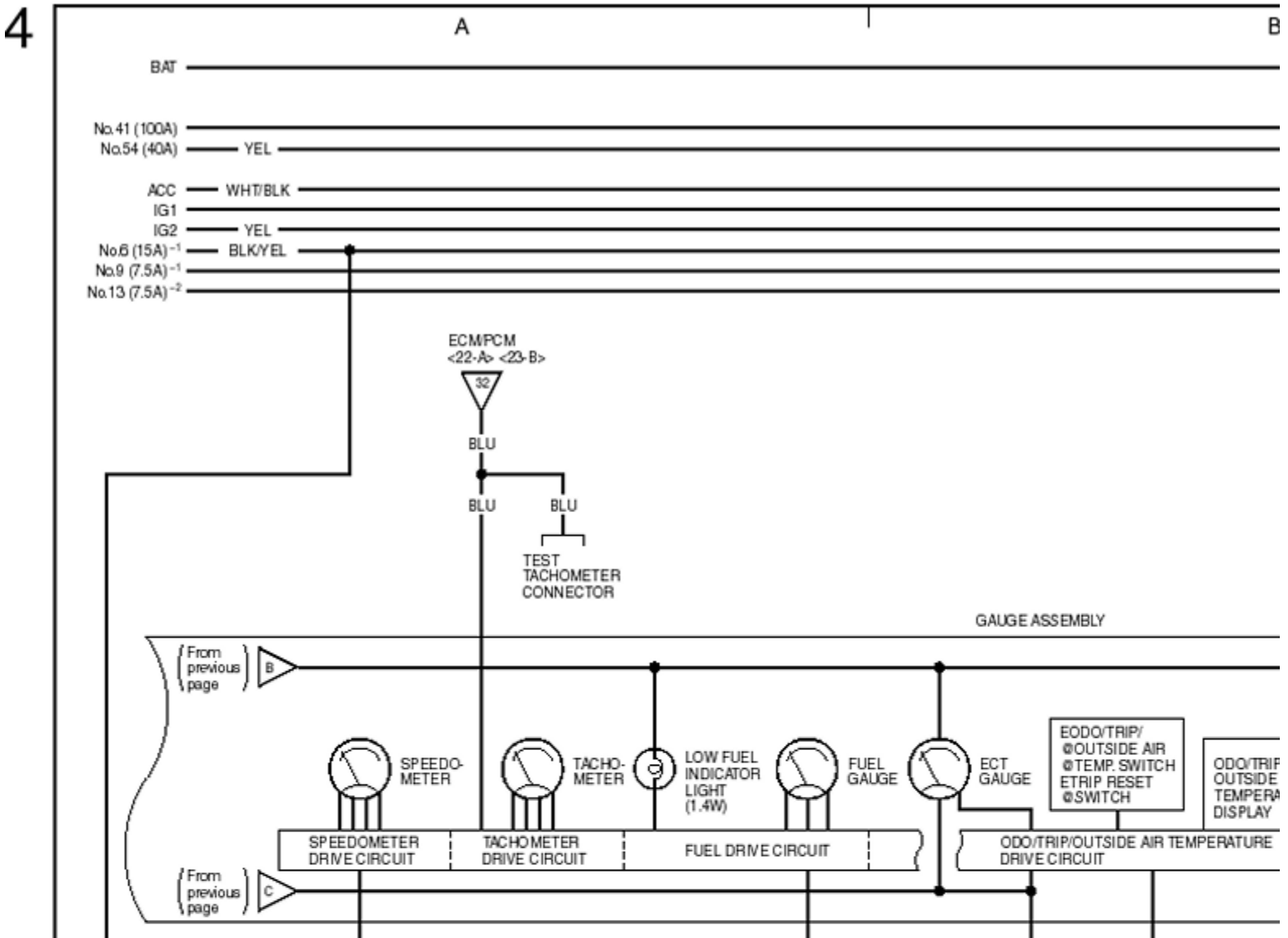
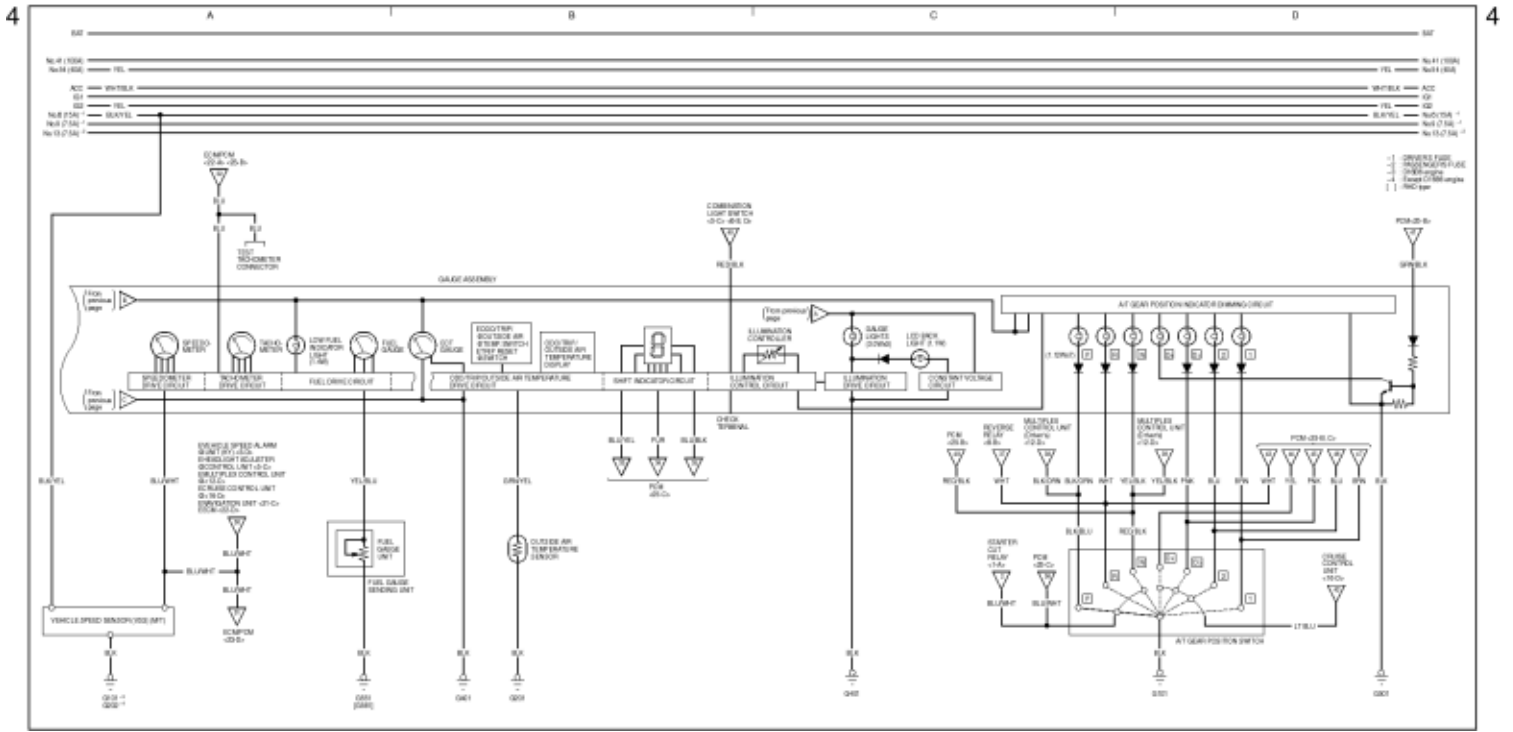


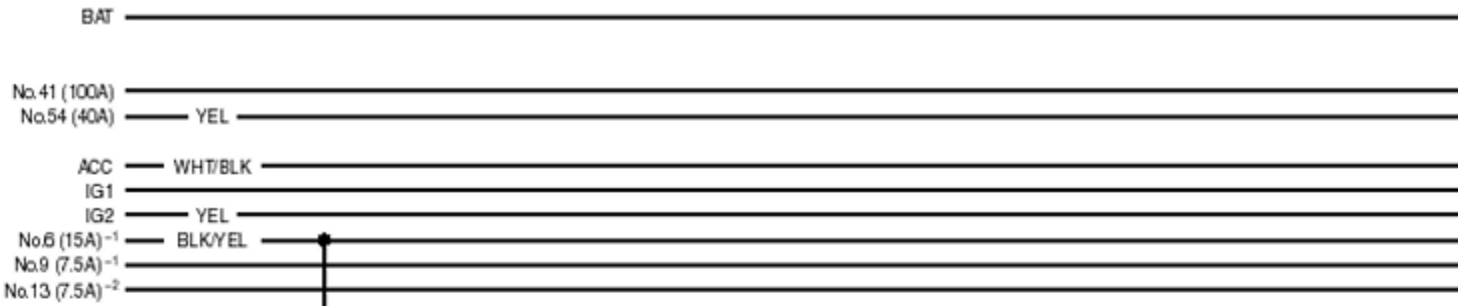
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



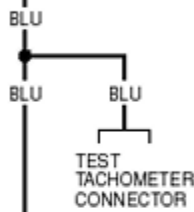
Wiring Diagrams

Gauges

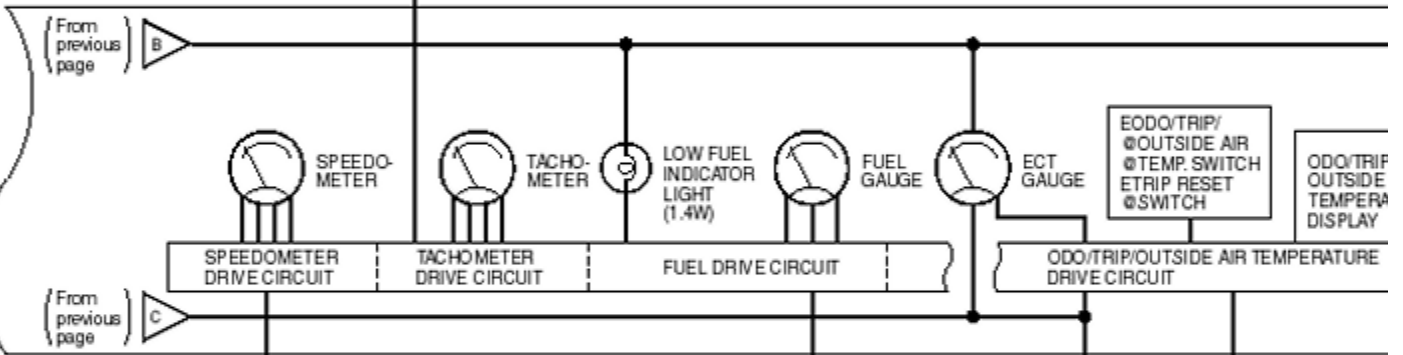




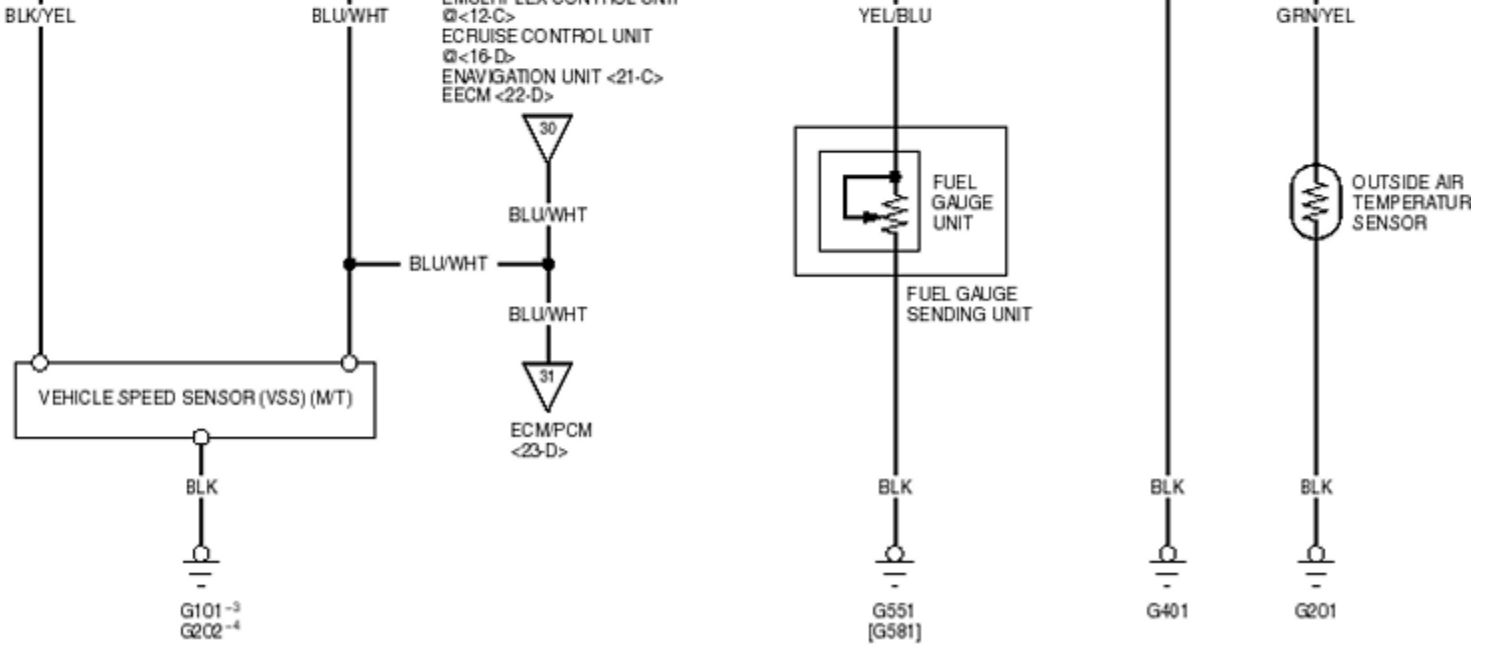
ECM/PCM <22-A> <23-B>

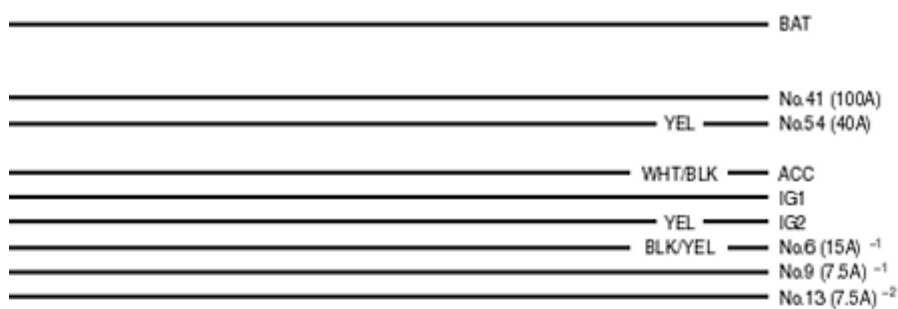
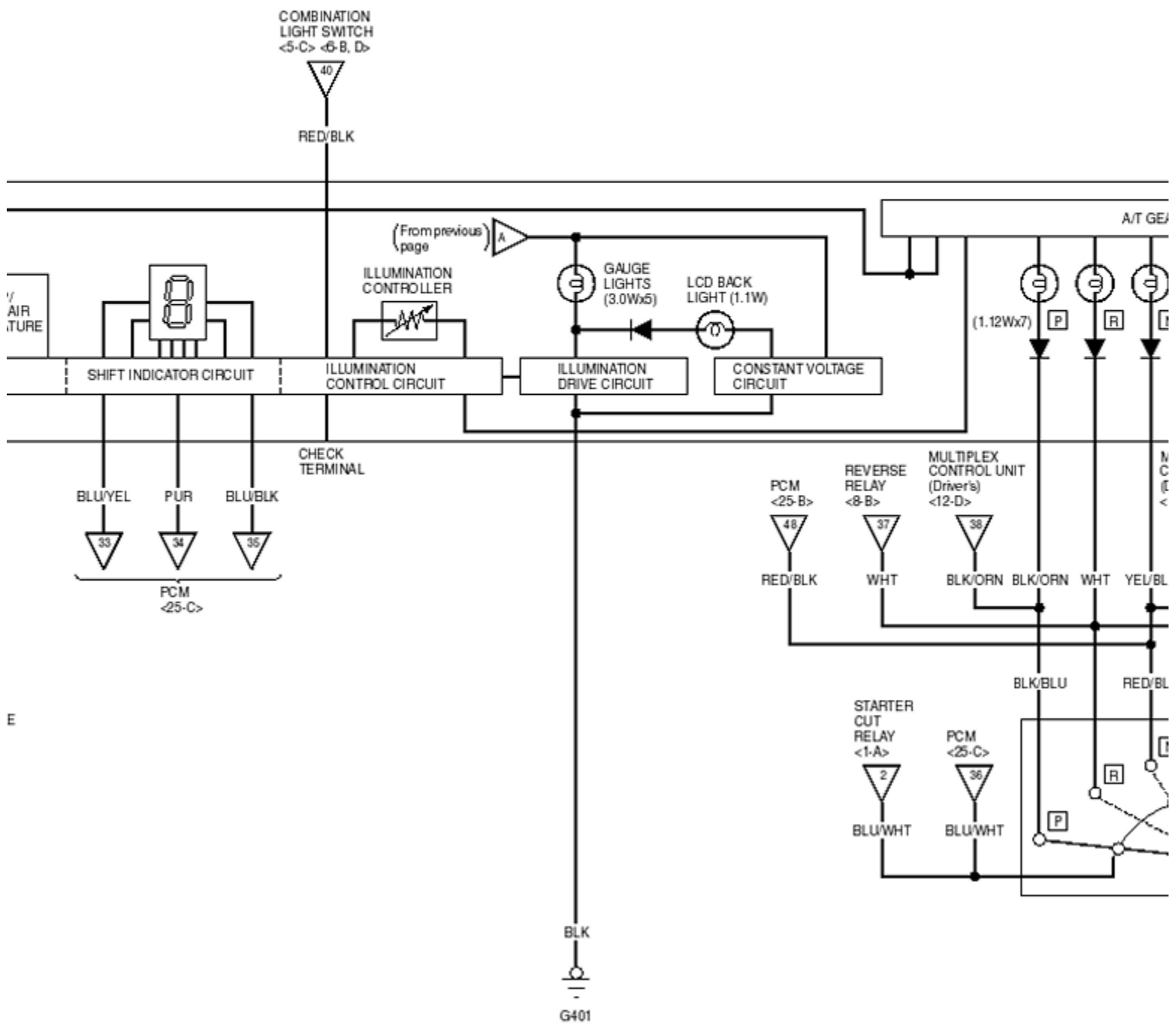


GAUGE ASSEMBLY

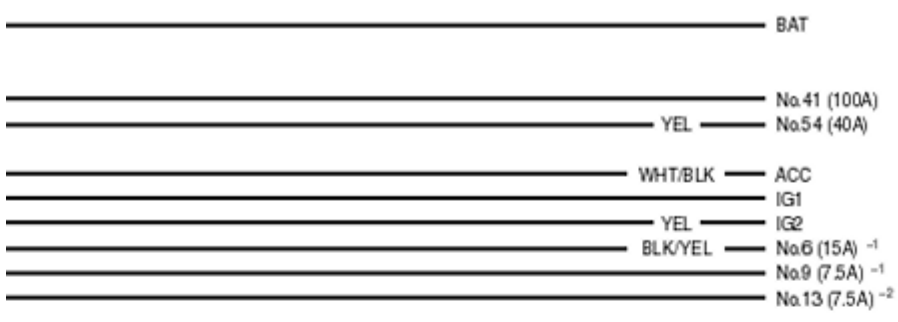


- VEHICLE SPEED ALARM UNIT (KY) <3-D>
- HEADLIGHT ADJUSTER CONTROL UNIT <5-C>
- MULTIPLY CONTROL UNIT <12-C>
- CRUISE CONTROL UNIT <16-D>
- NAVIGATION UNIT <21-C>
- ECM <22-D>

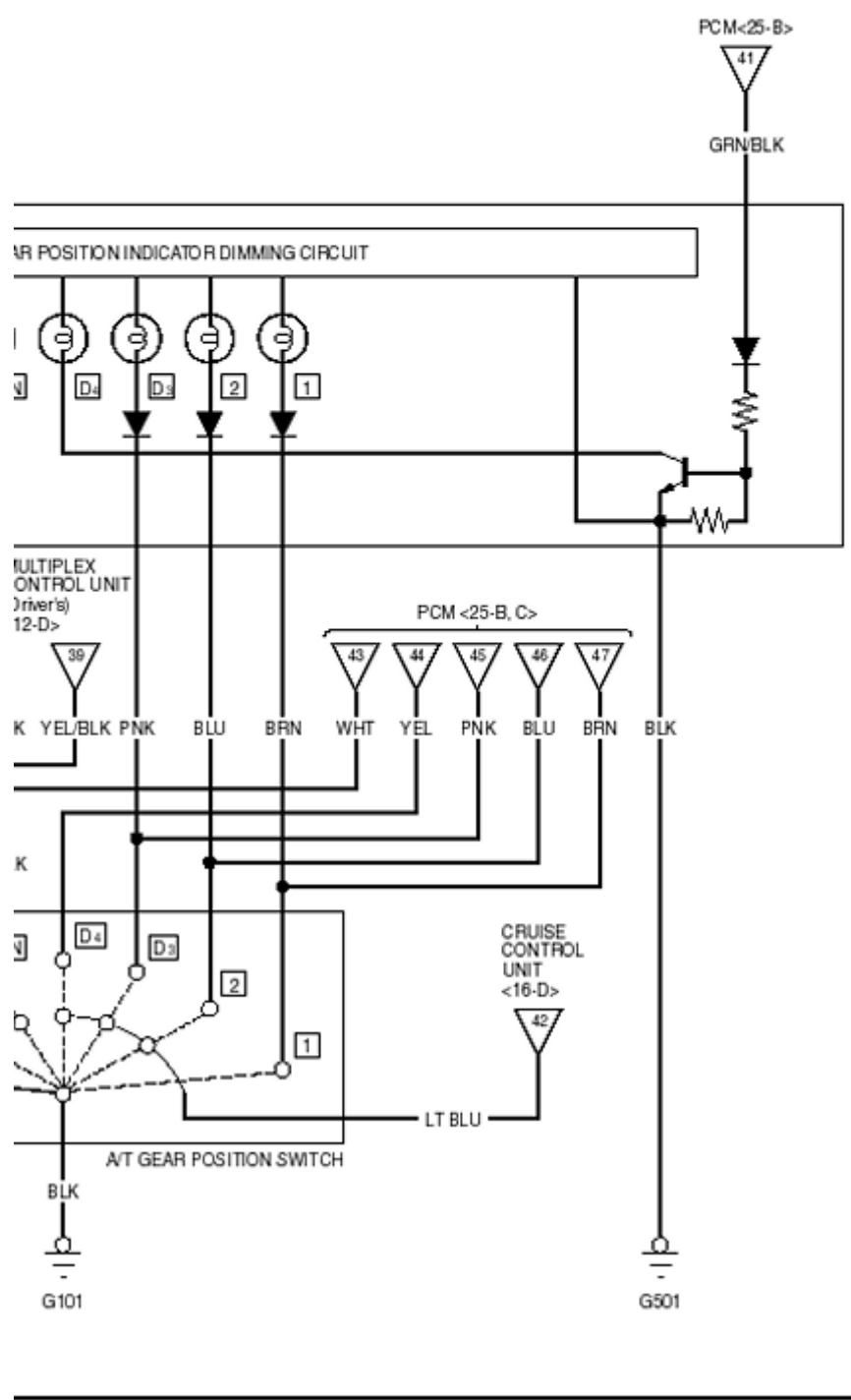




D

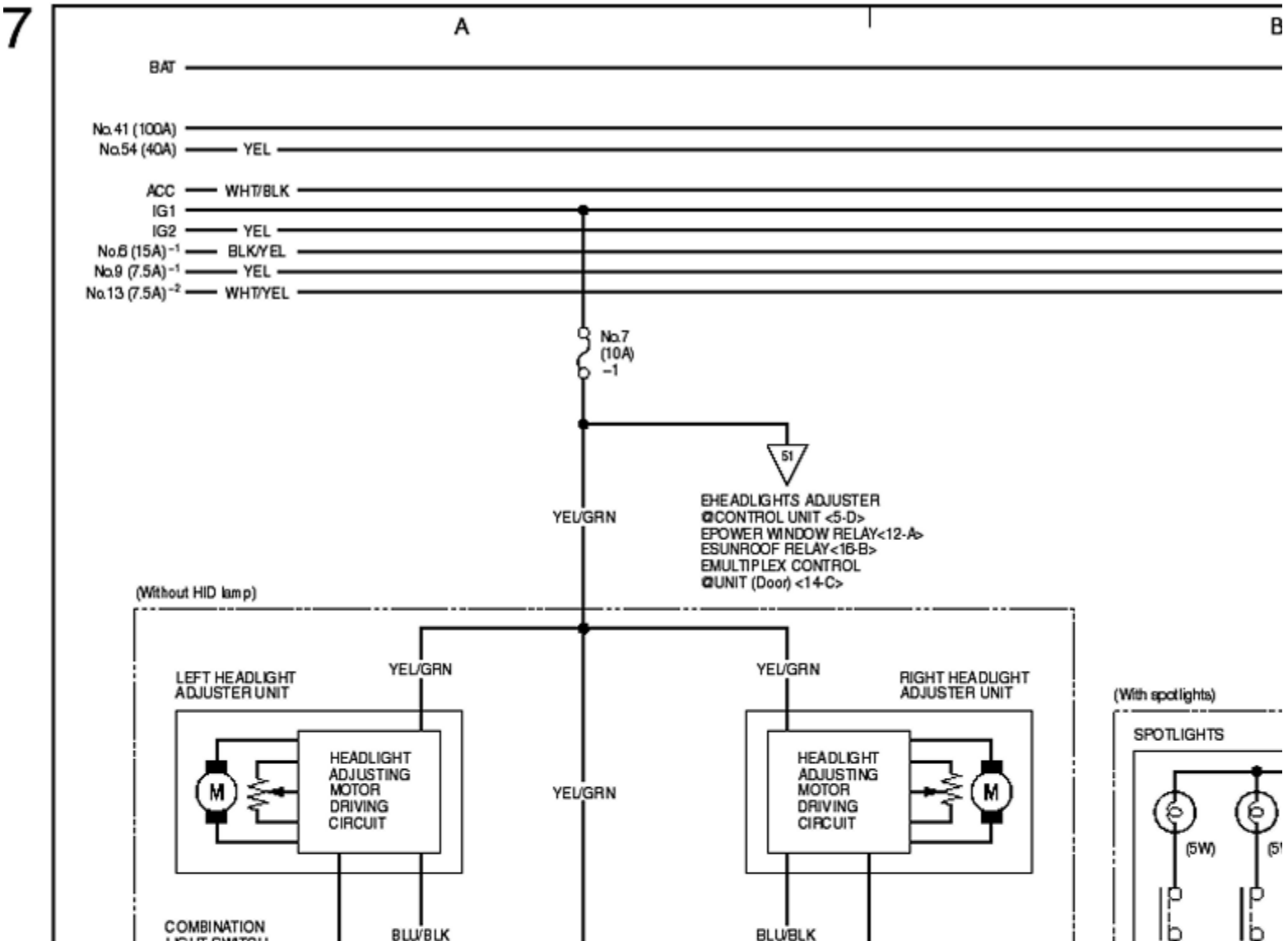
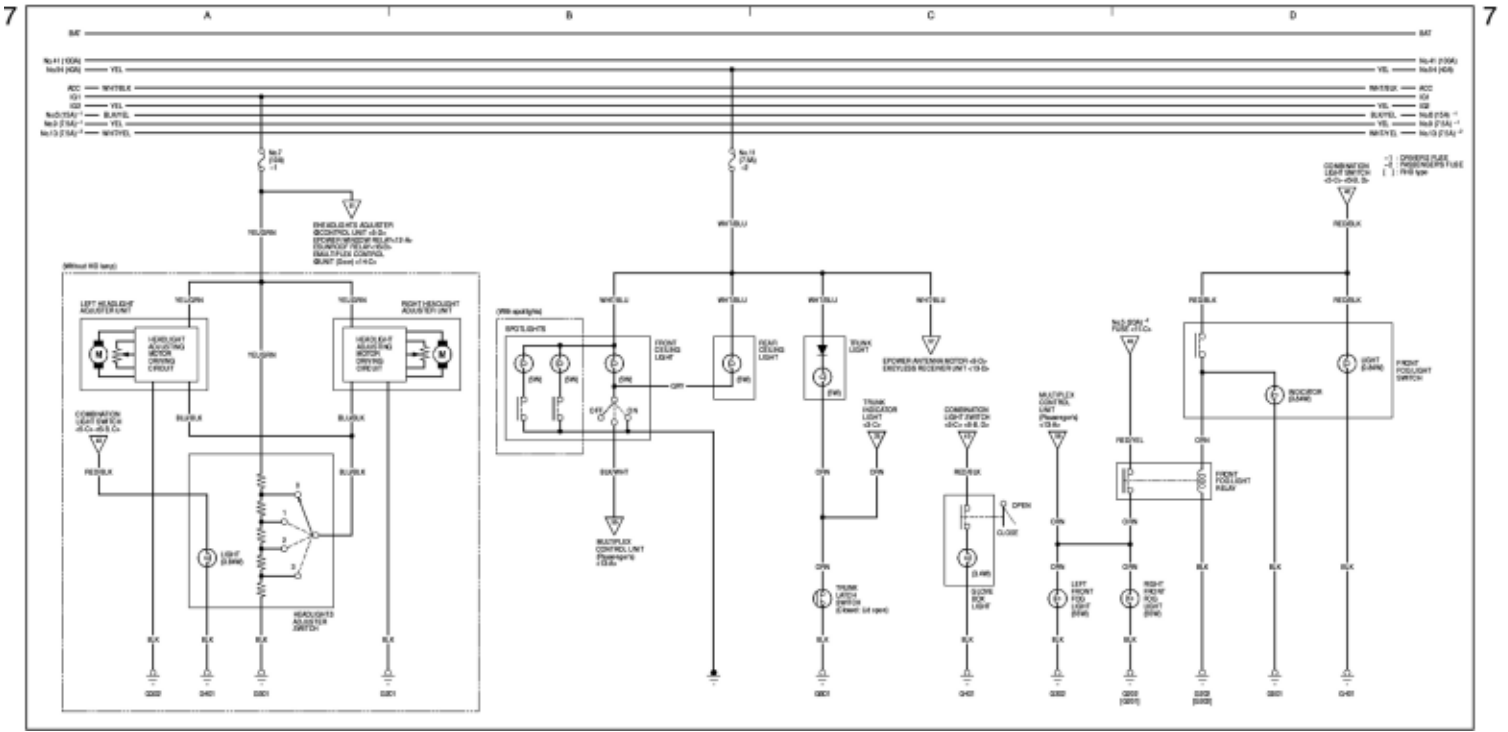


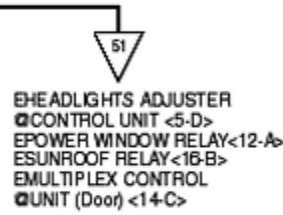
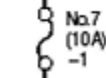
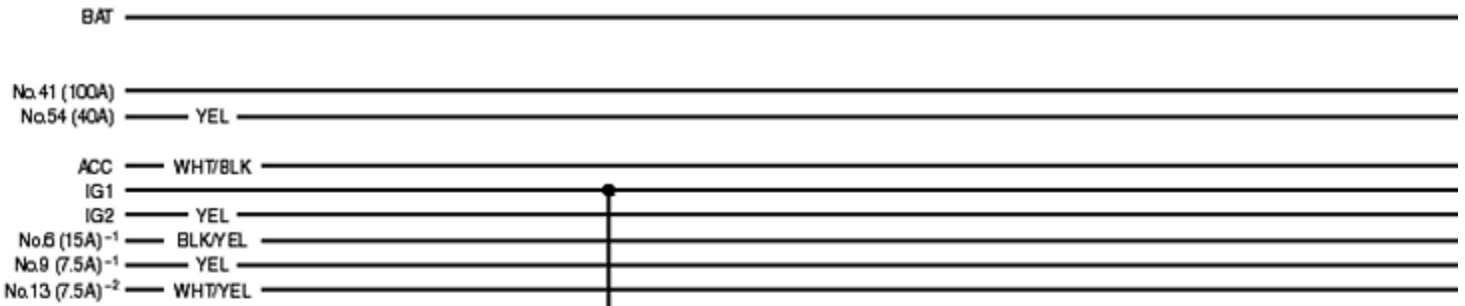
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : D16B6 engine
- 4 : Except D16B6 engine
- [] : RHD type



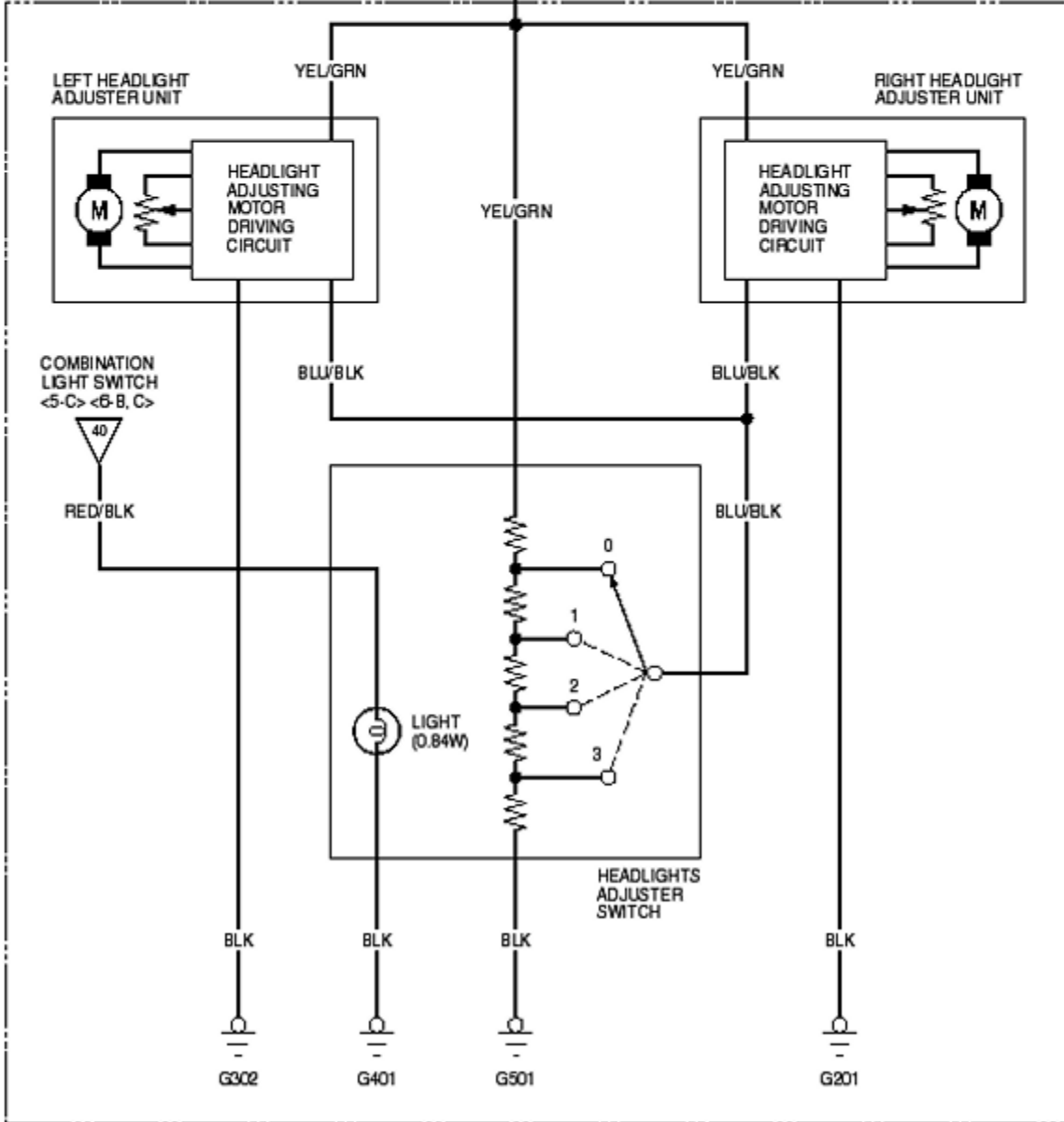
Wiring Diagrams

Headlights Adjuster

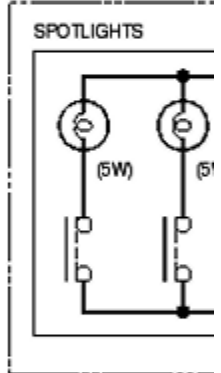


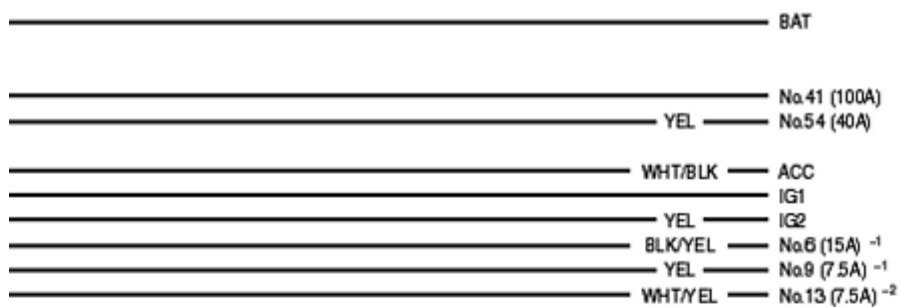
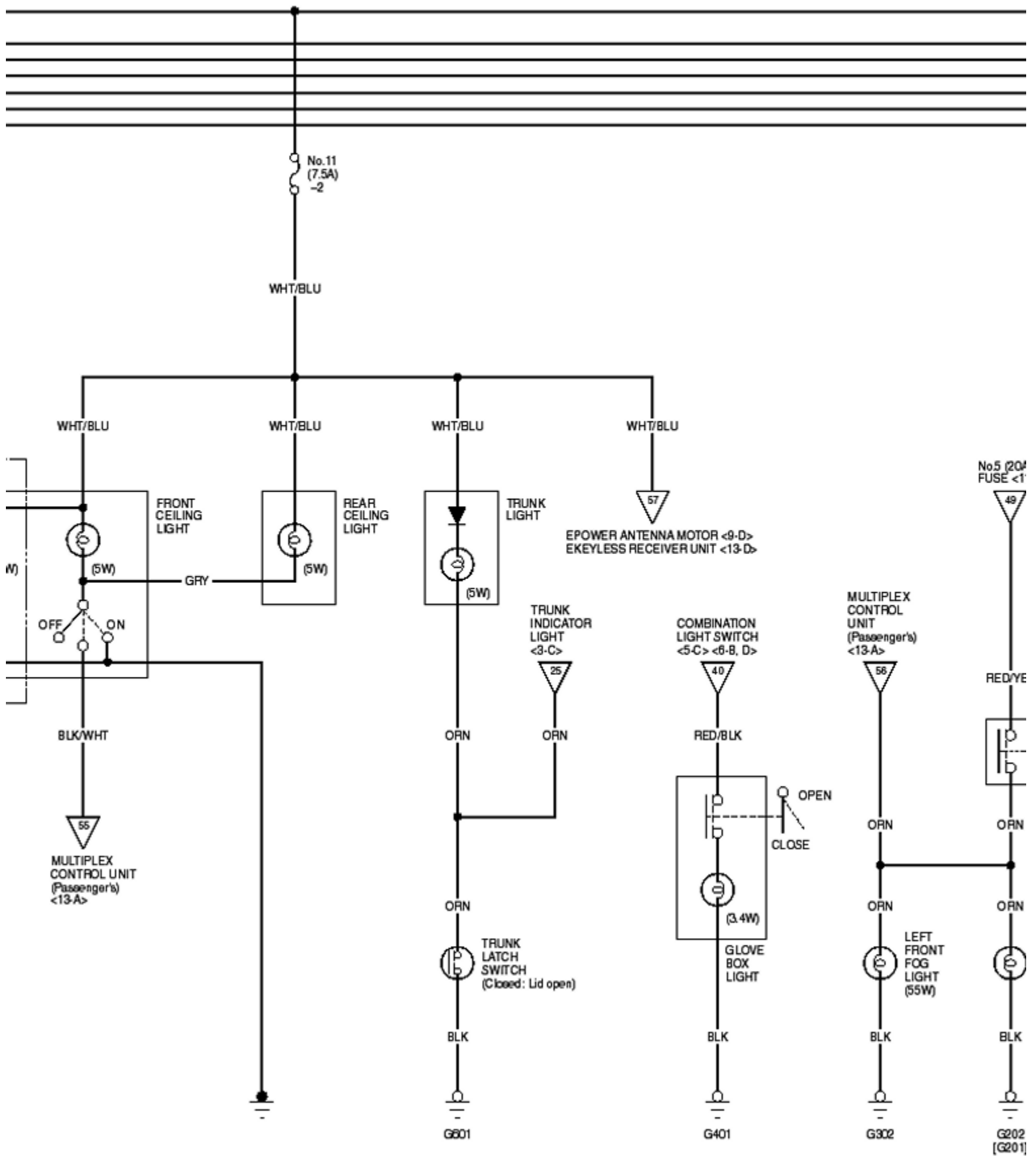


(Without HID lamp)



(With spotlights)

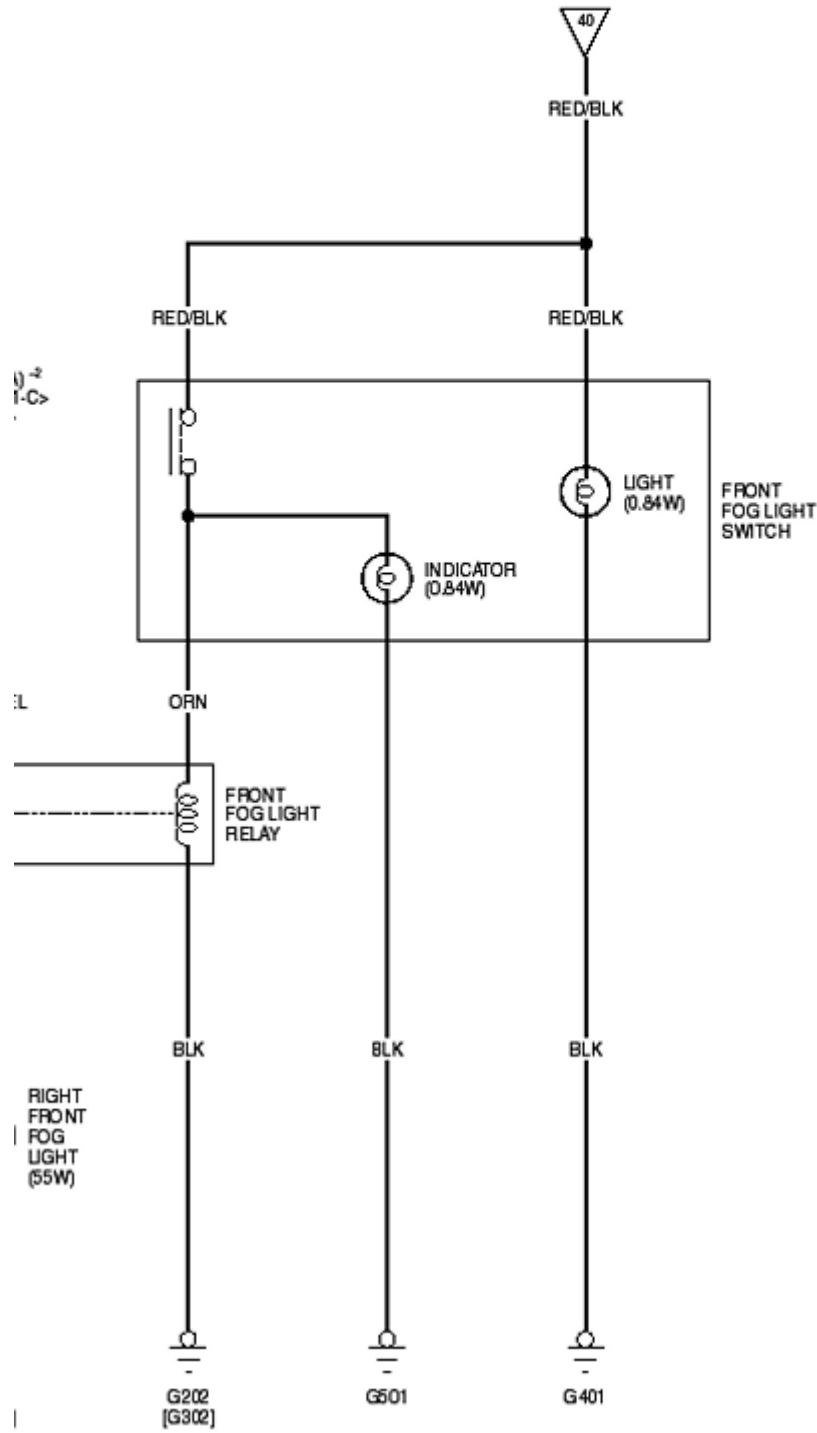




- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

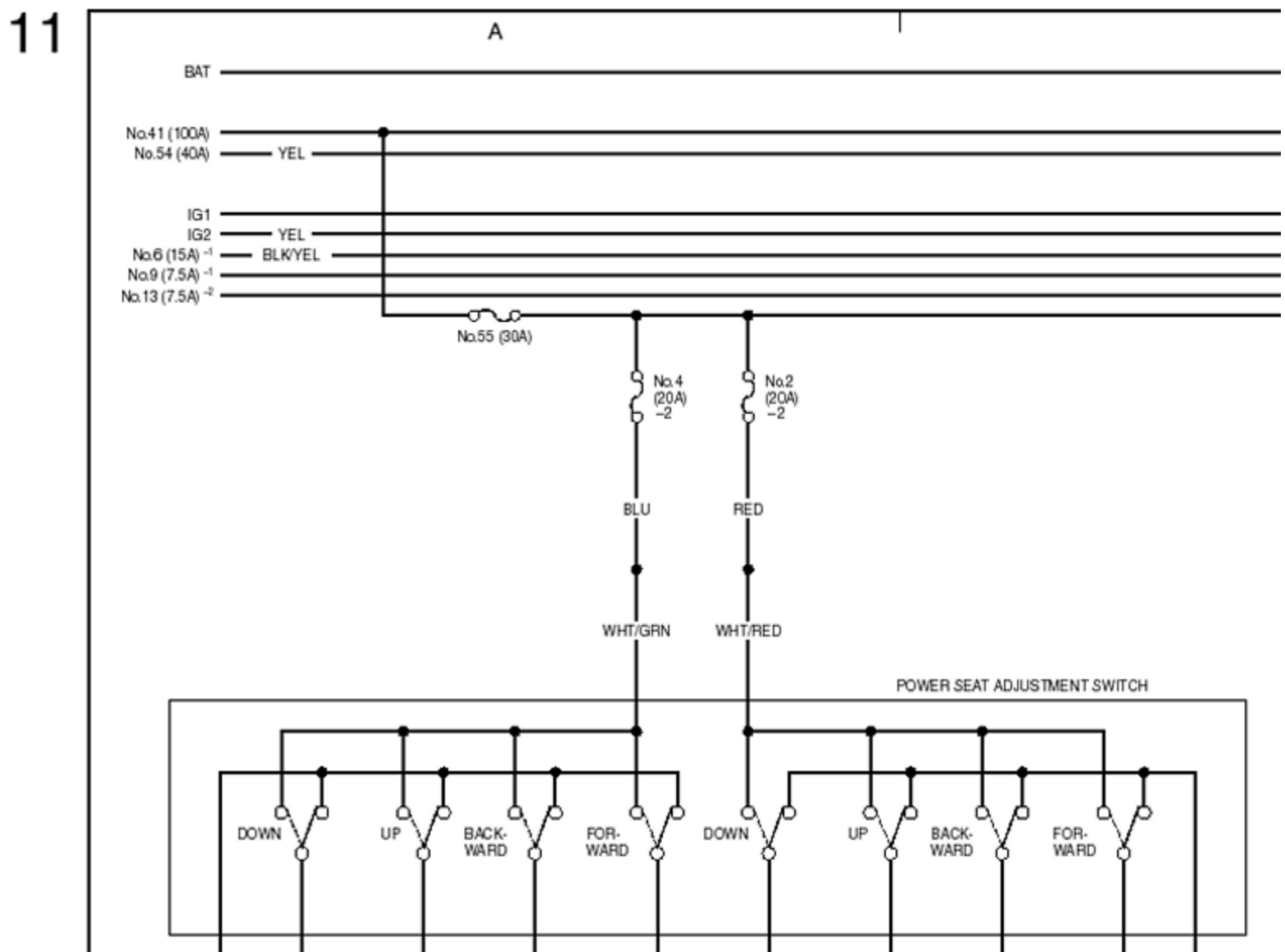
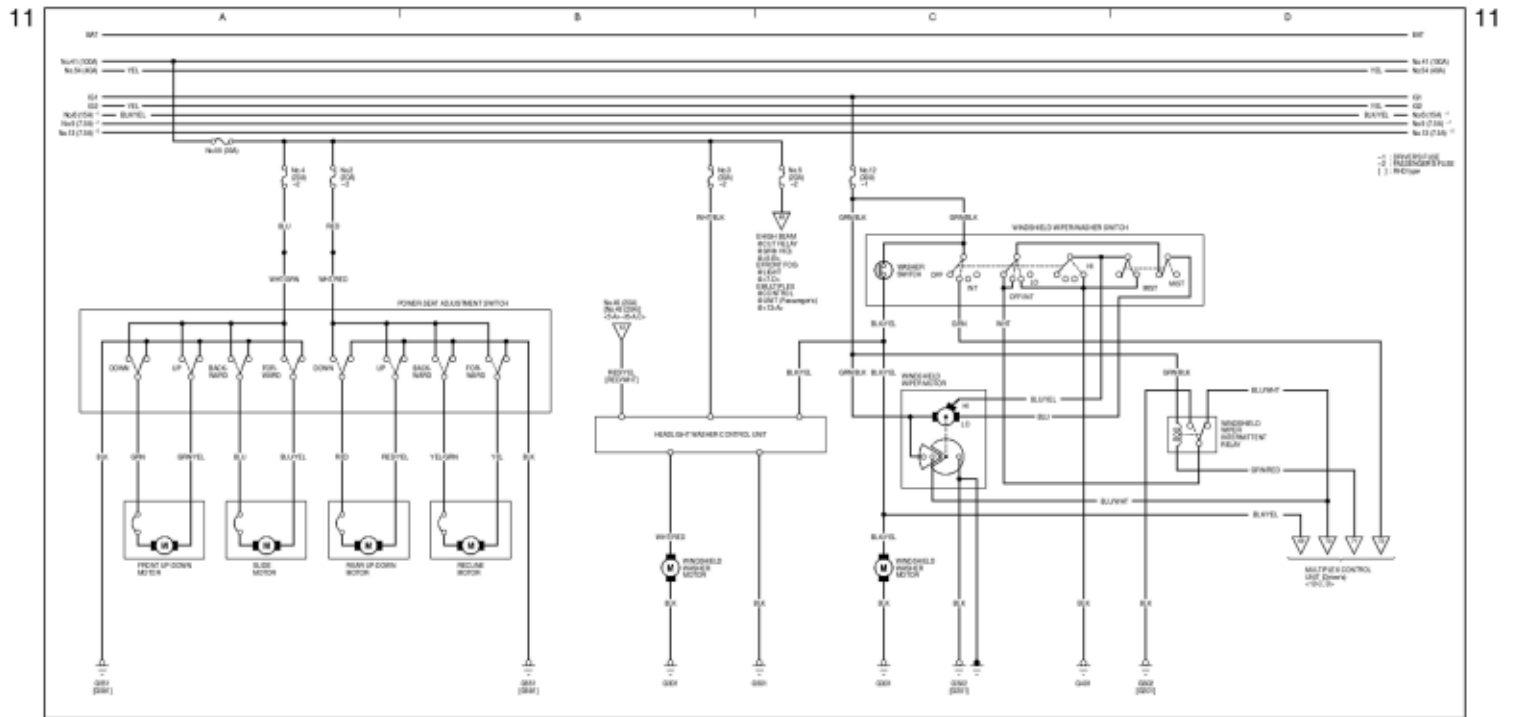
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

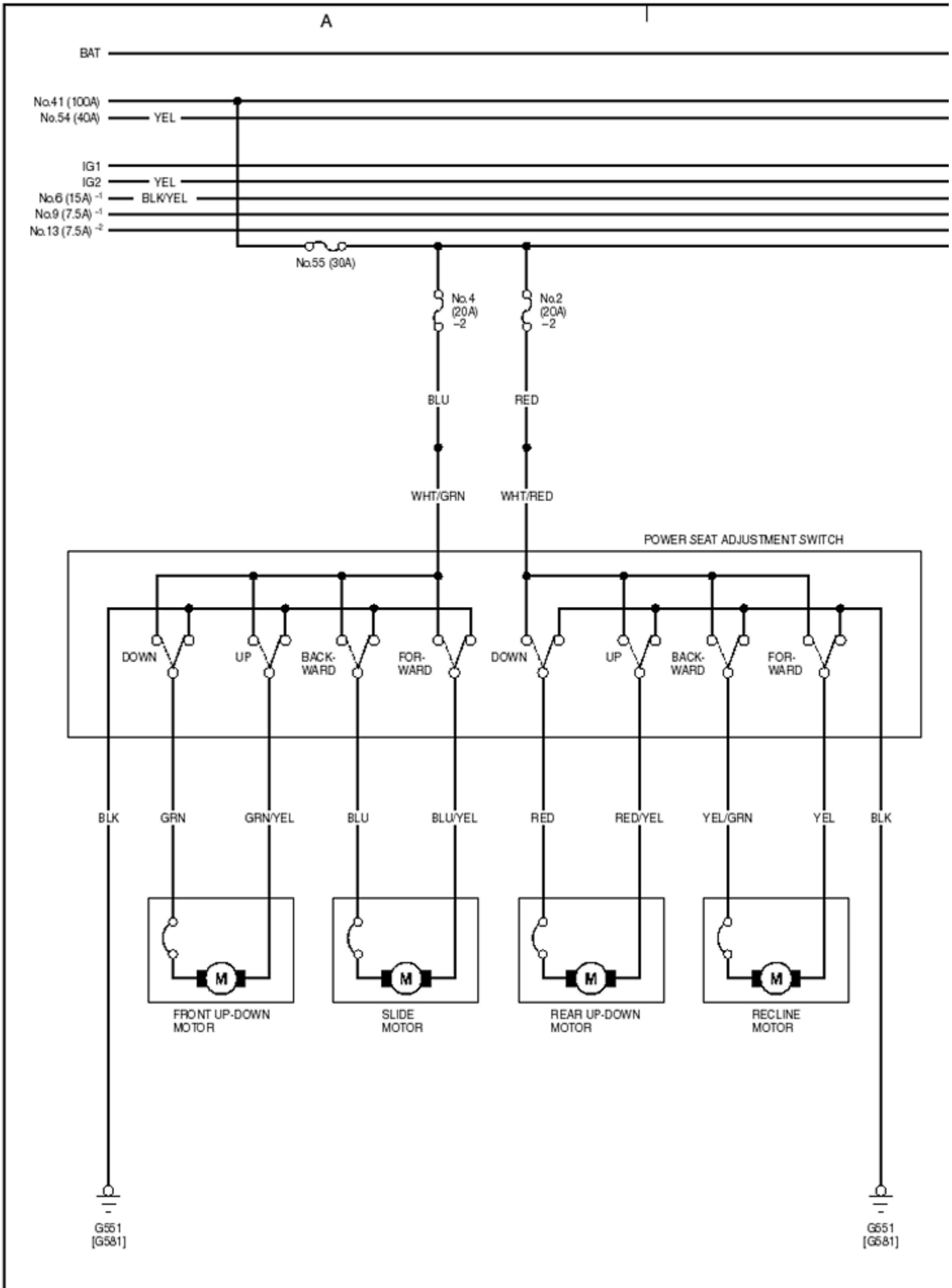
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



Wiring Diagrams

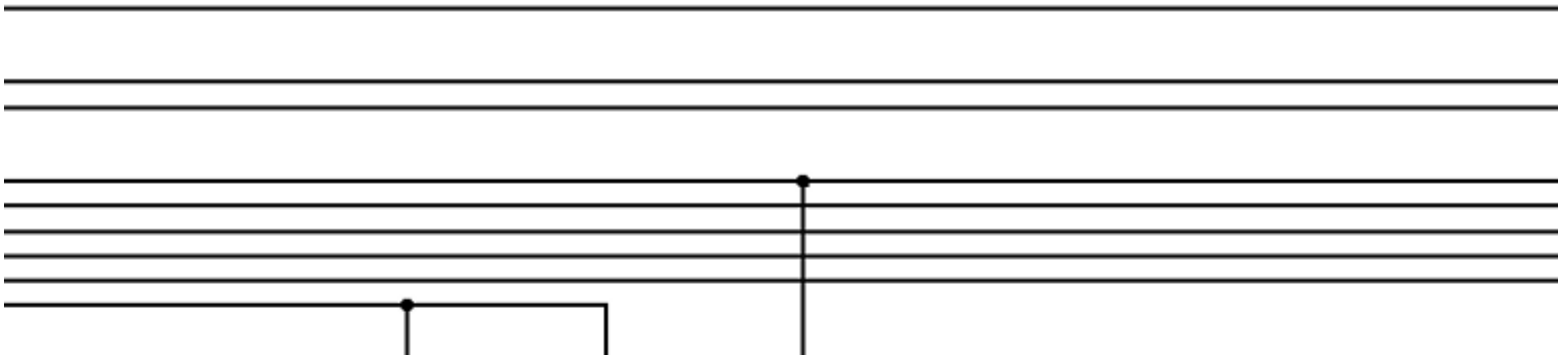
Headlights Washer

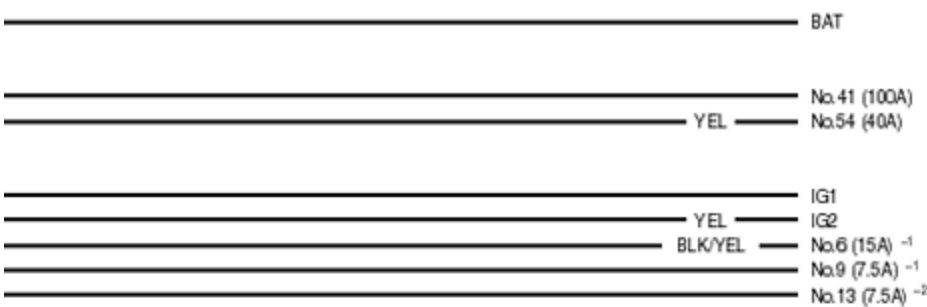
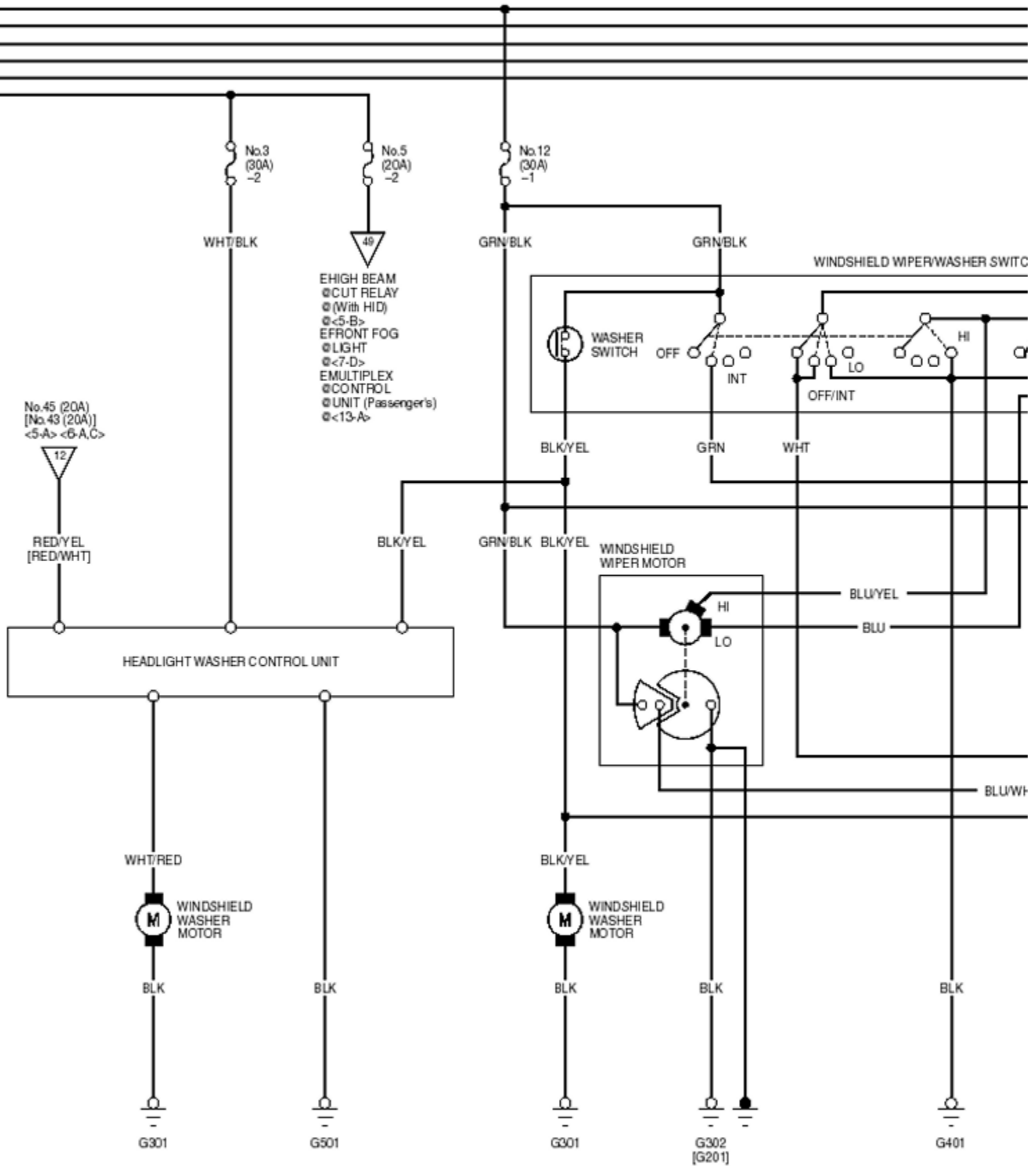




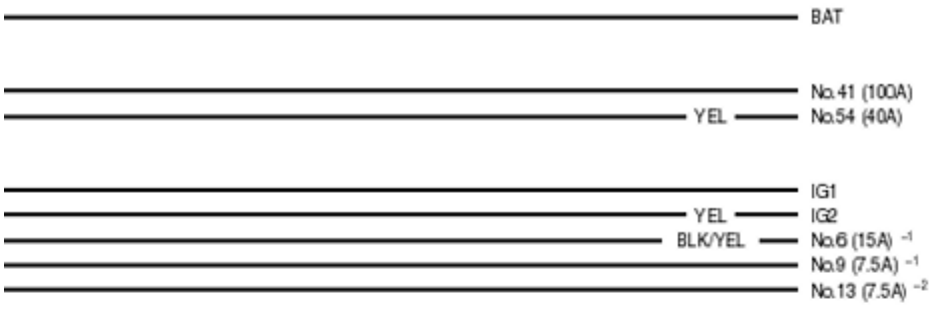
B

C



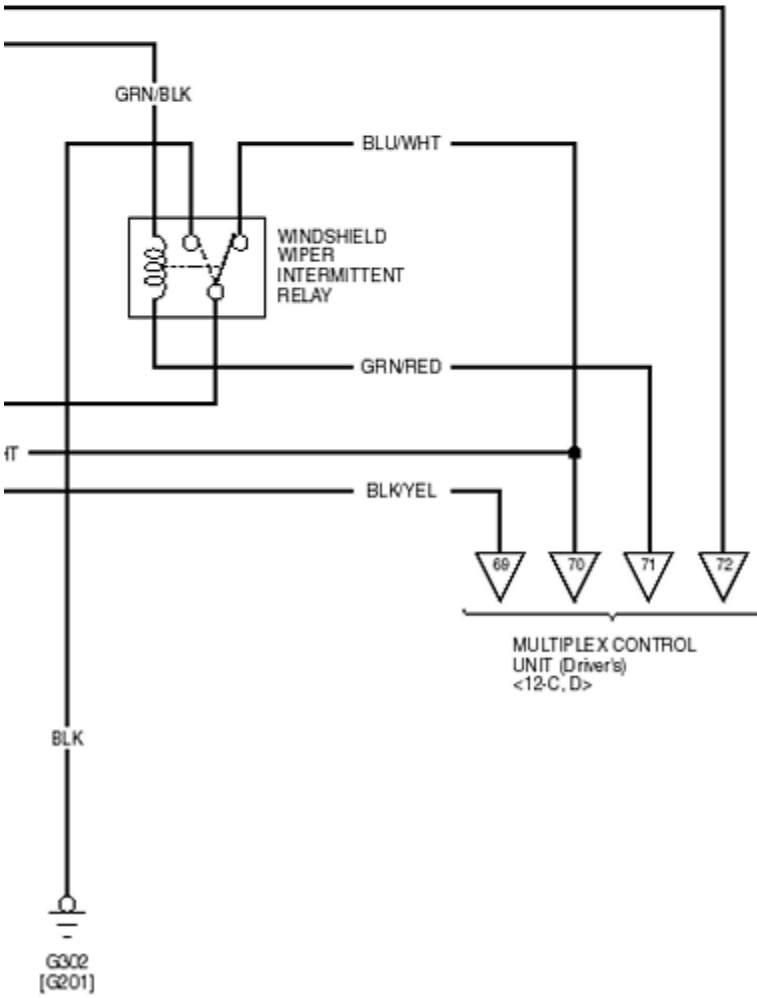
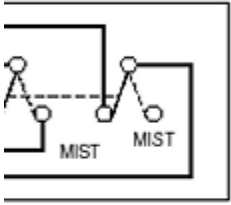


D



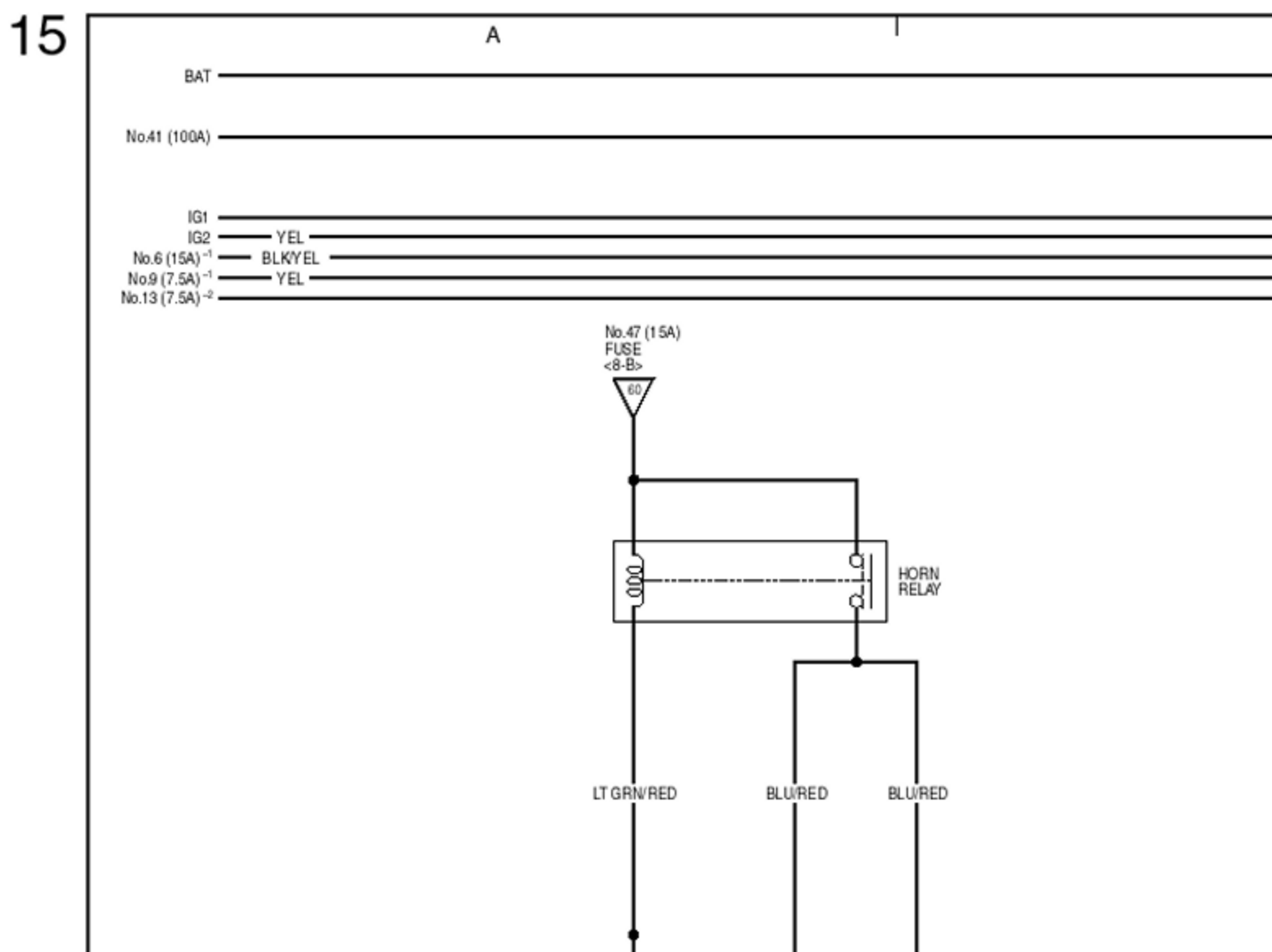
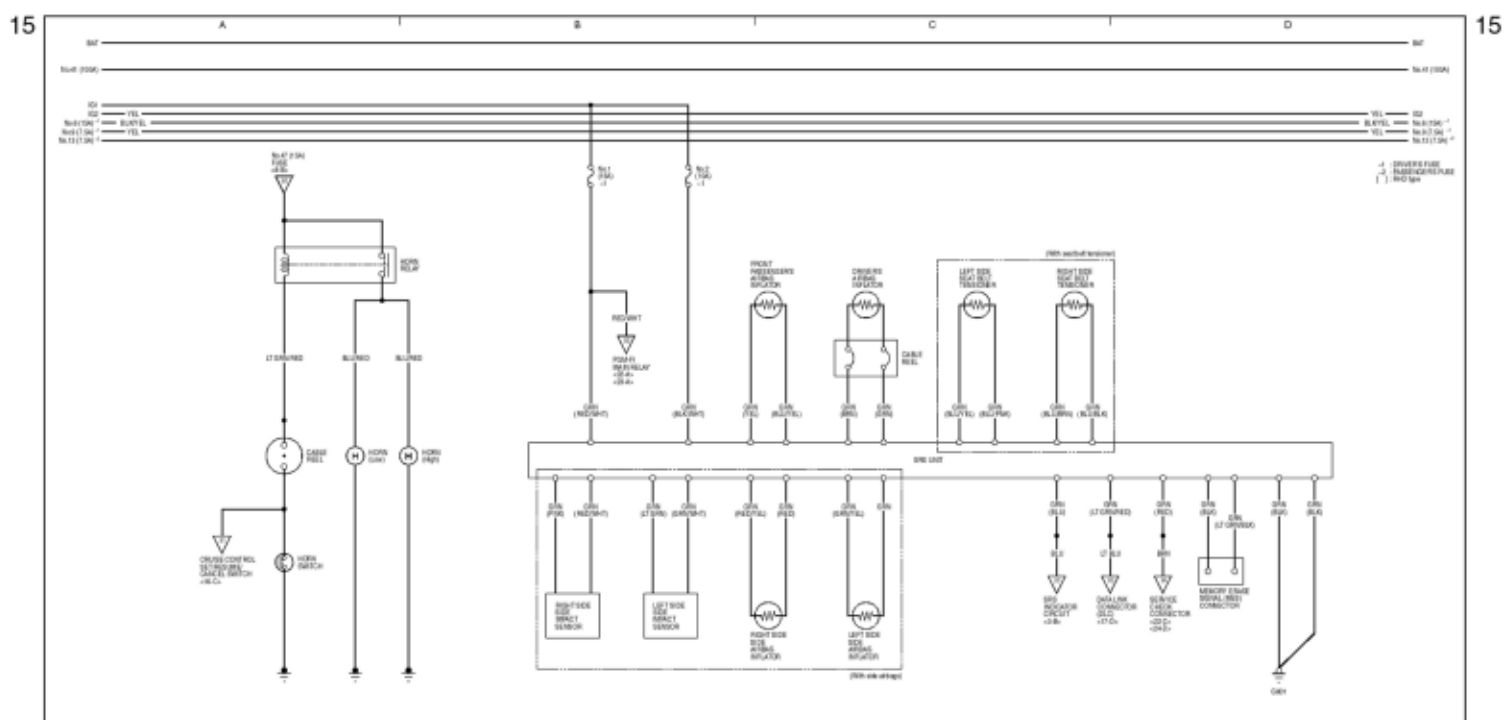
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

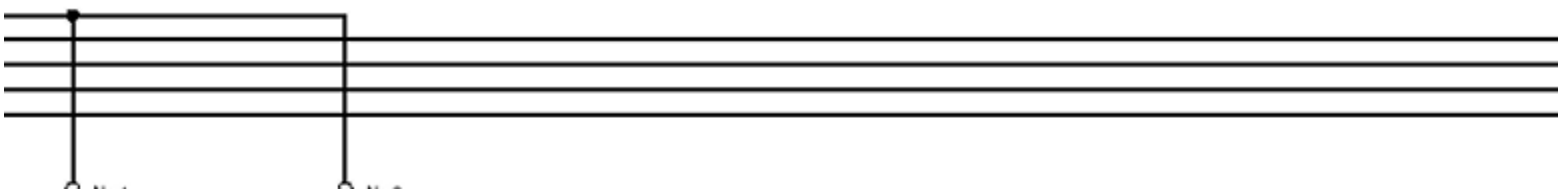
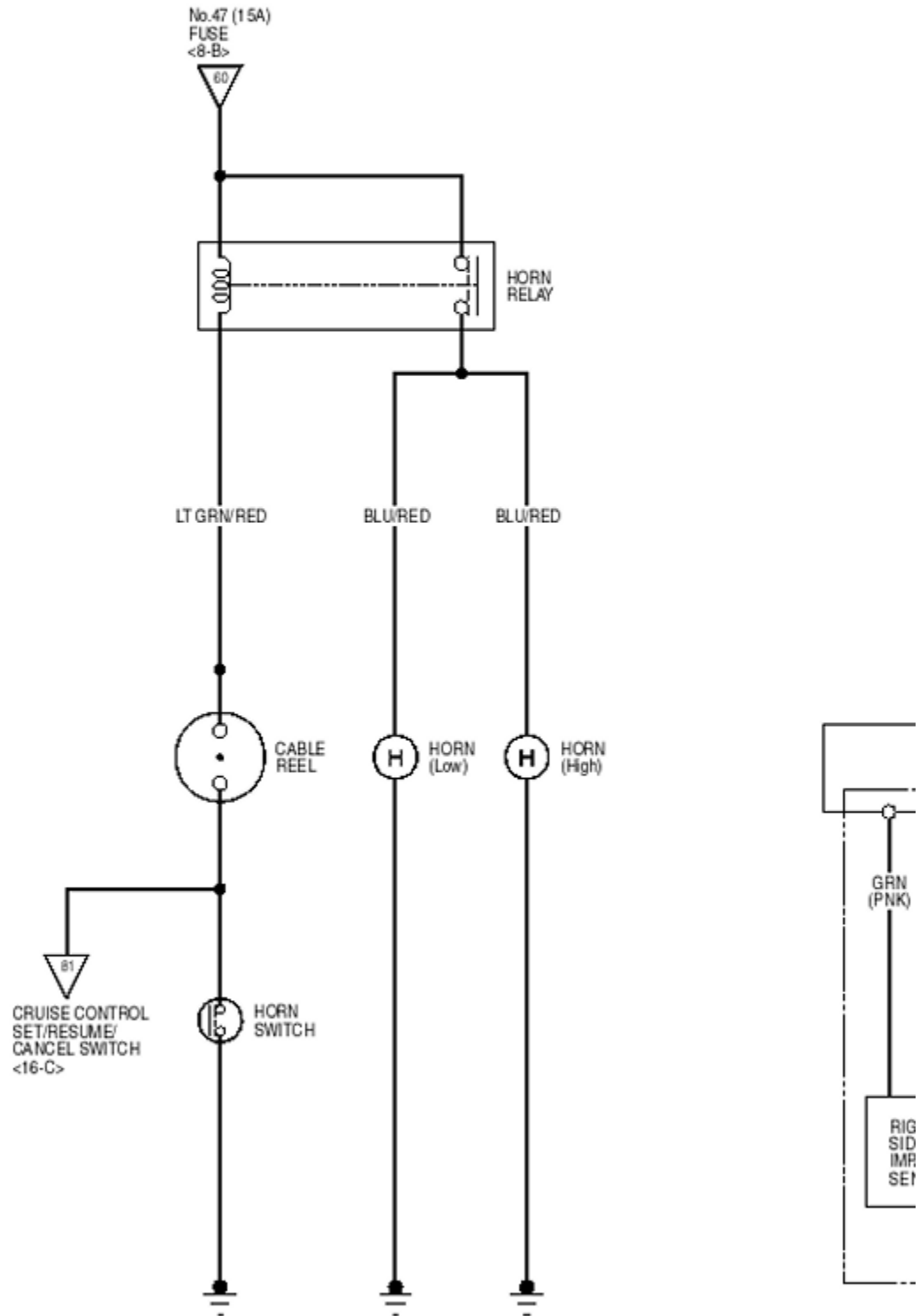
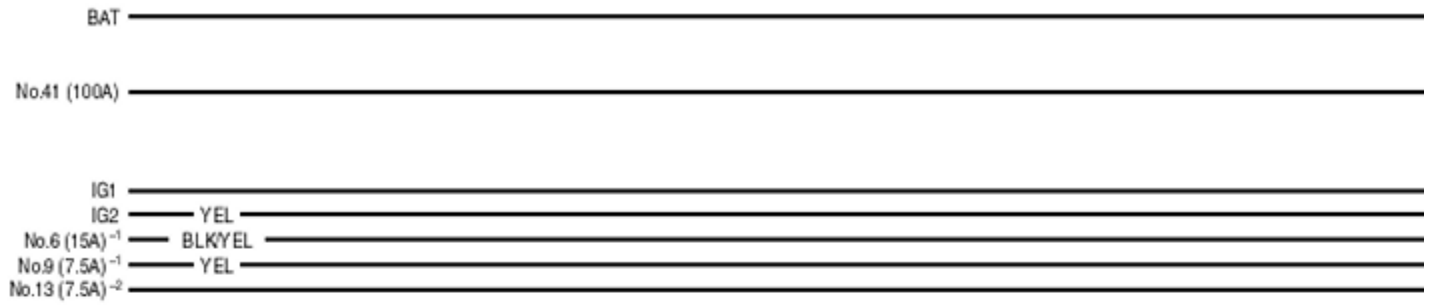
H



Wiring Diagrams

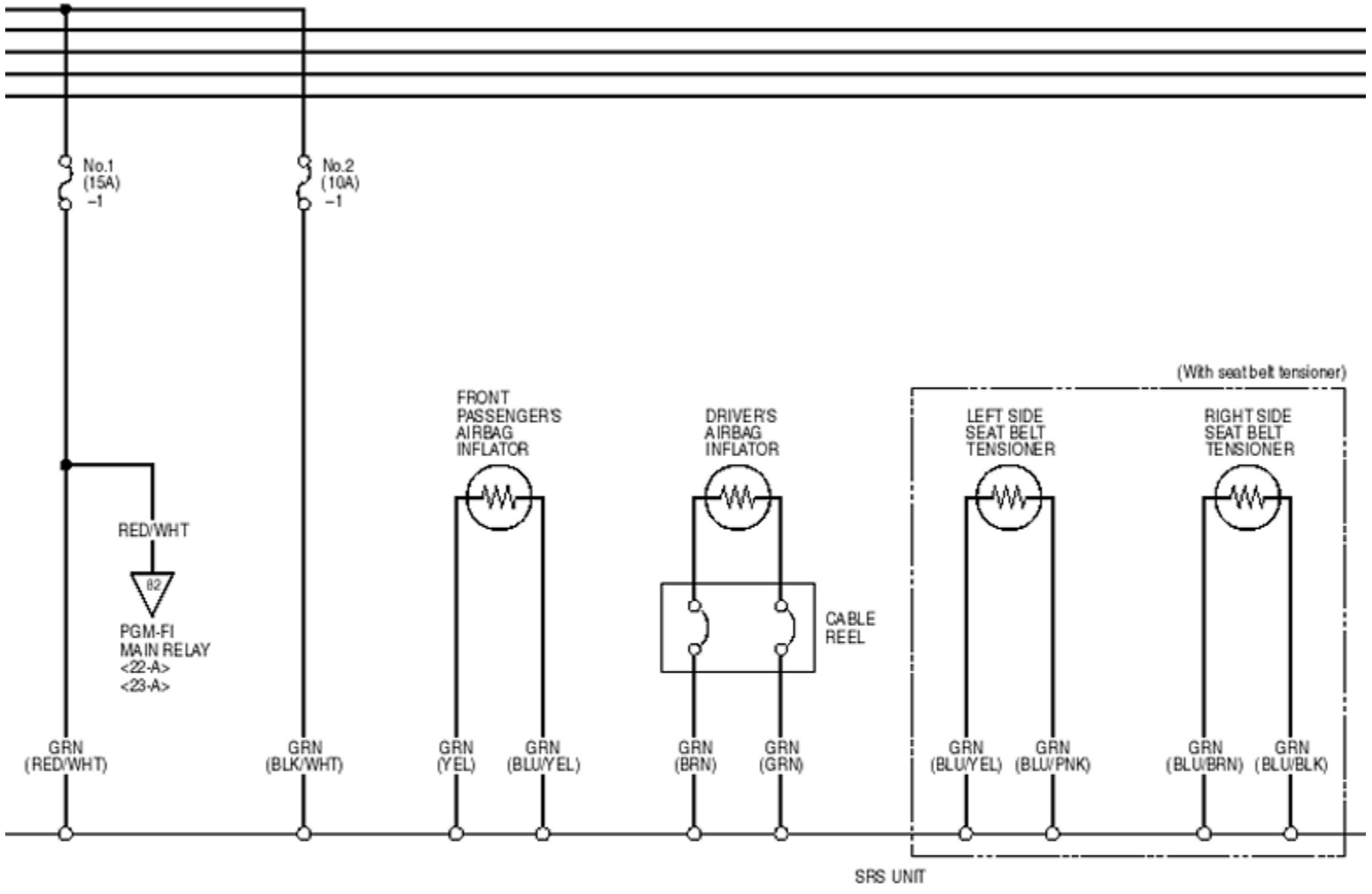
Horn



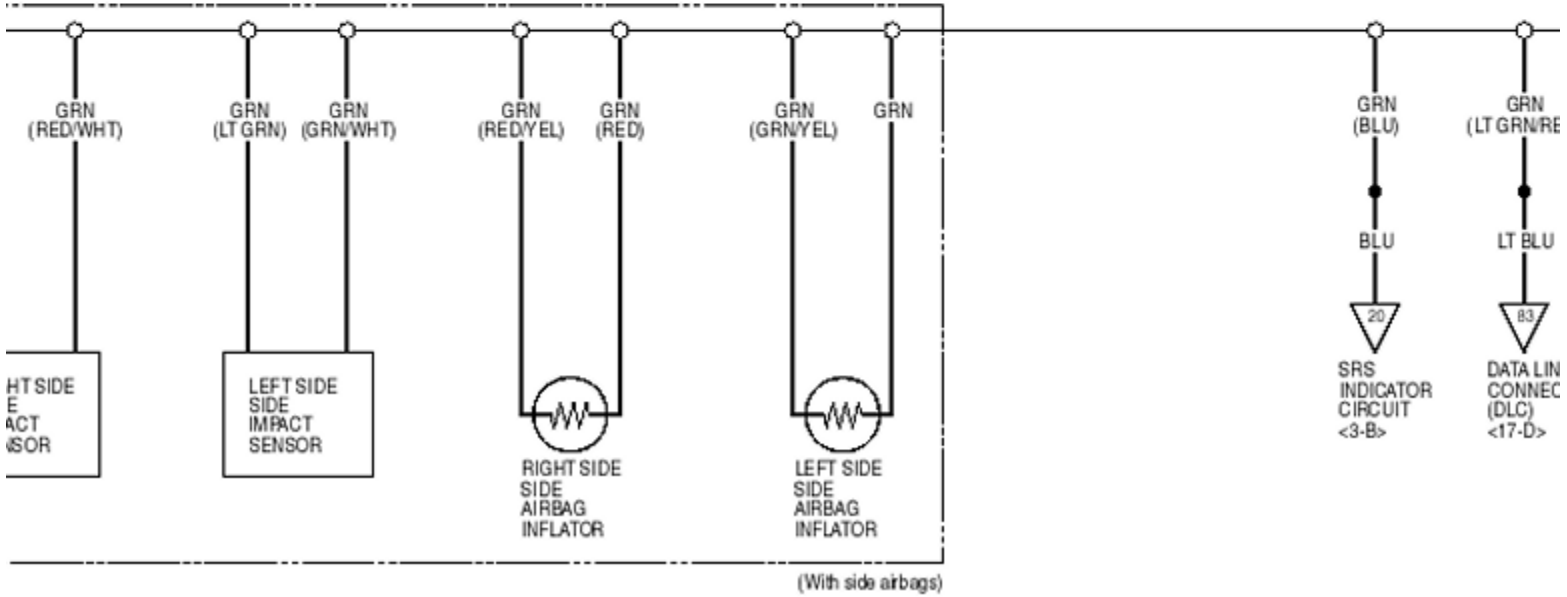


B

C

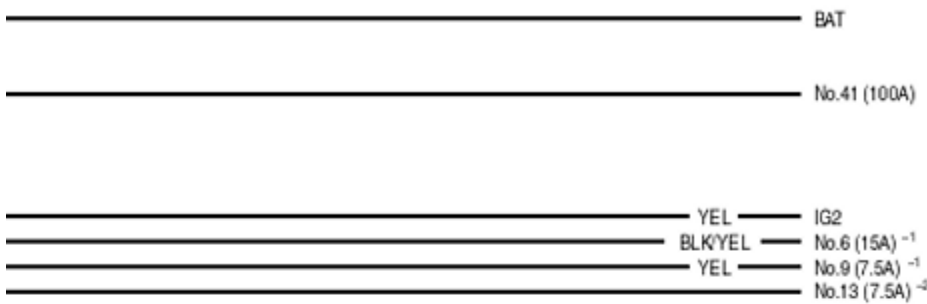


SRS UNIT



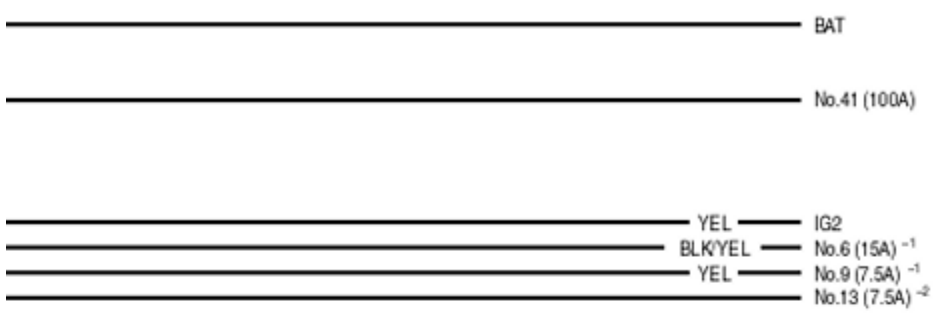
D

15

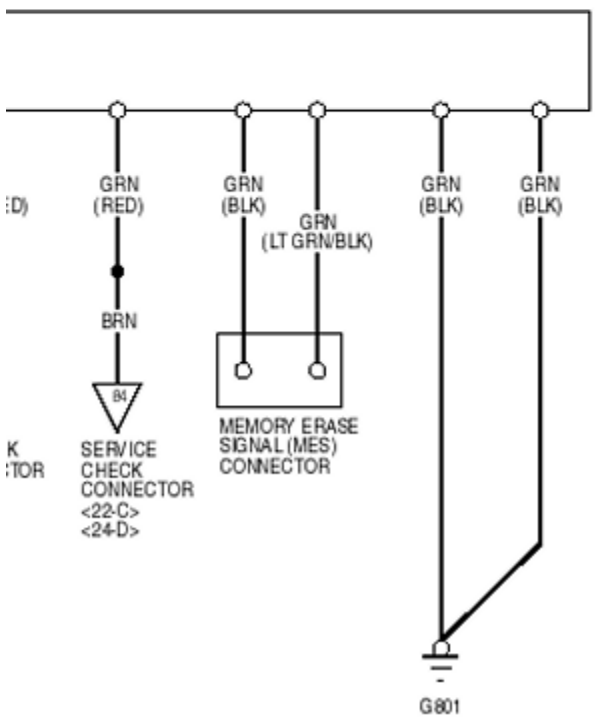


-1 : DRIVER'S FUSE

D

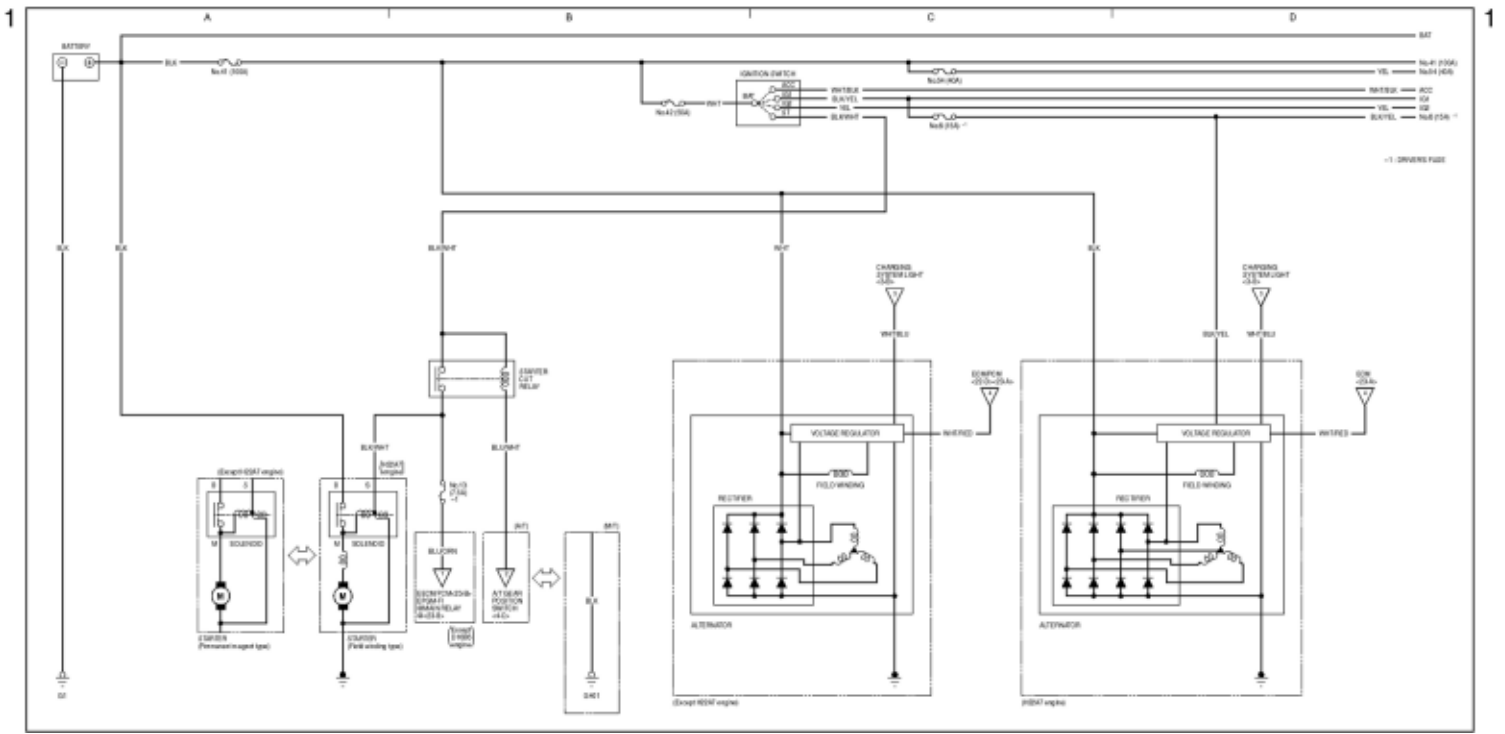


-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

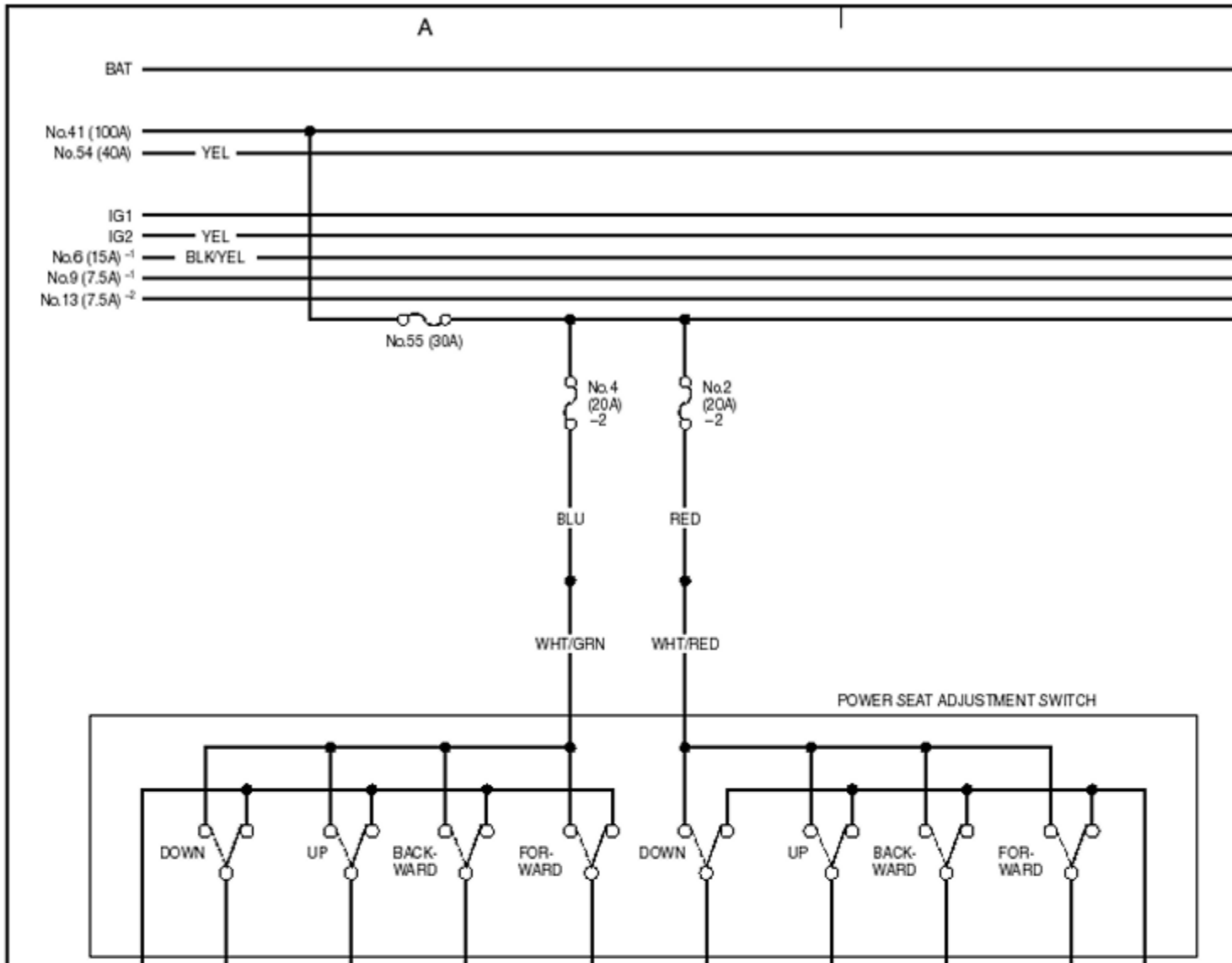


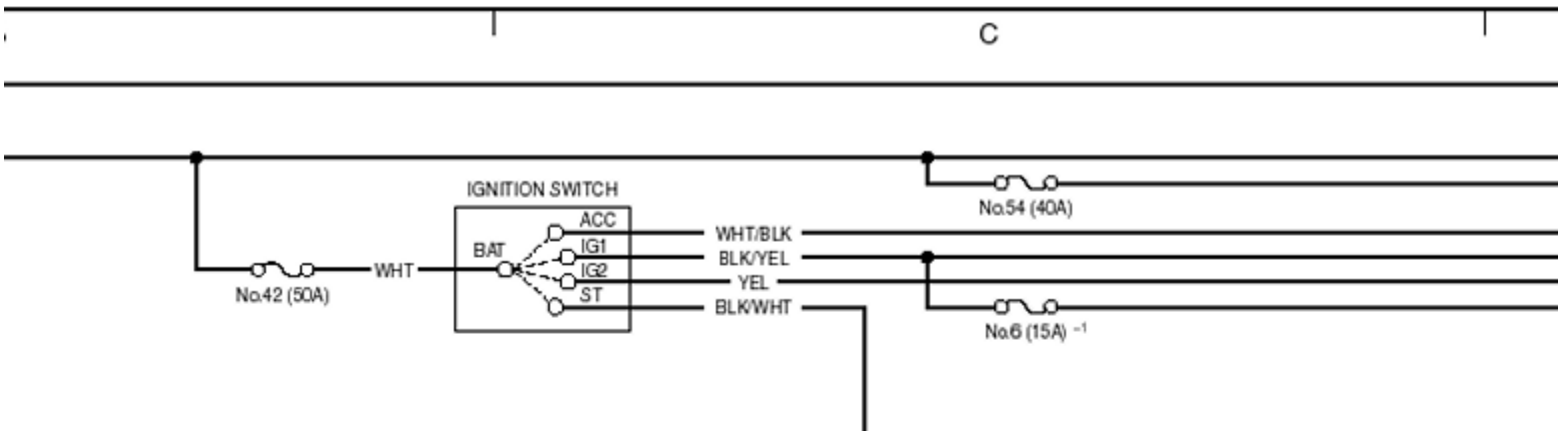
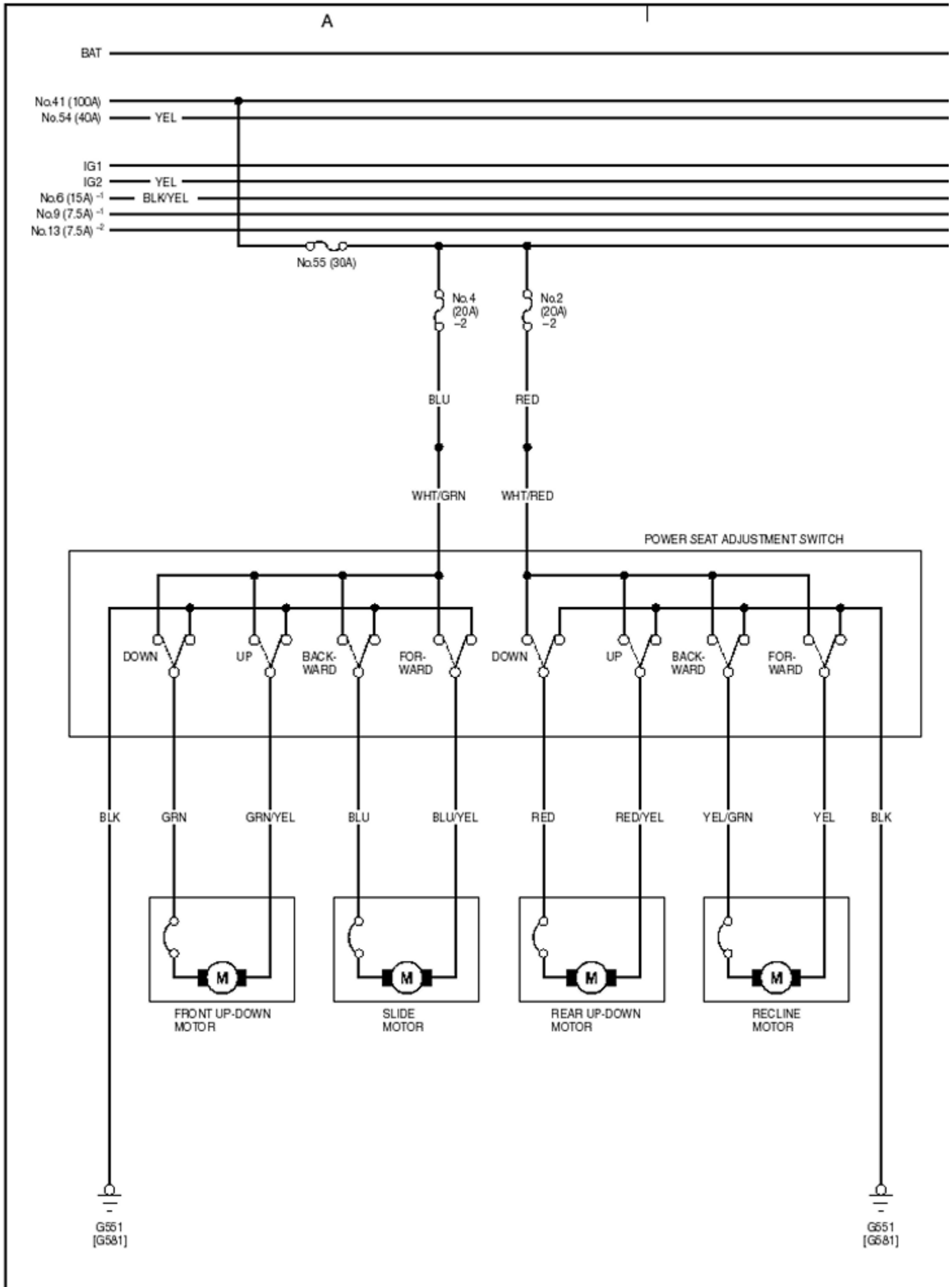
Wiring Diagrams

Ignition Switch

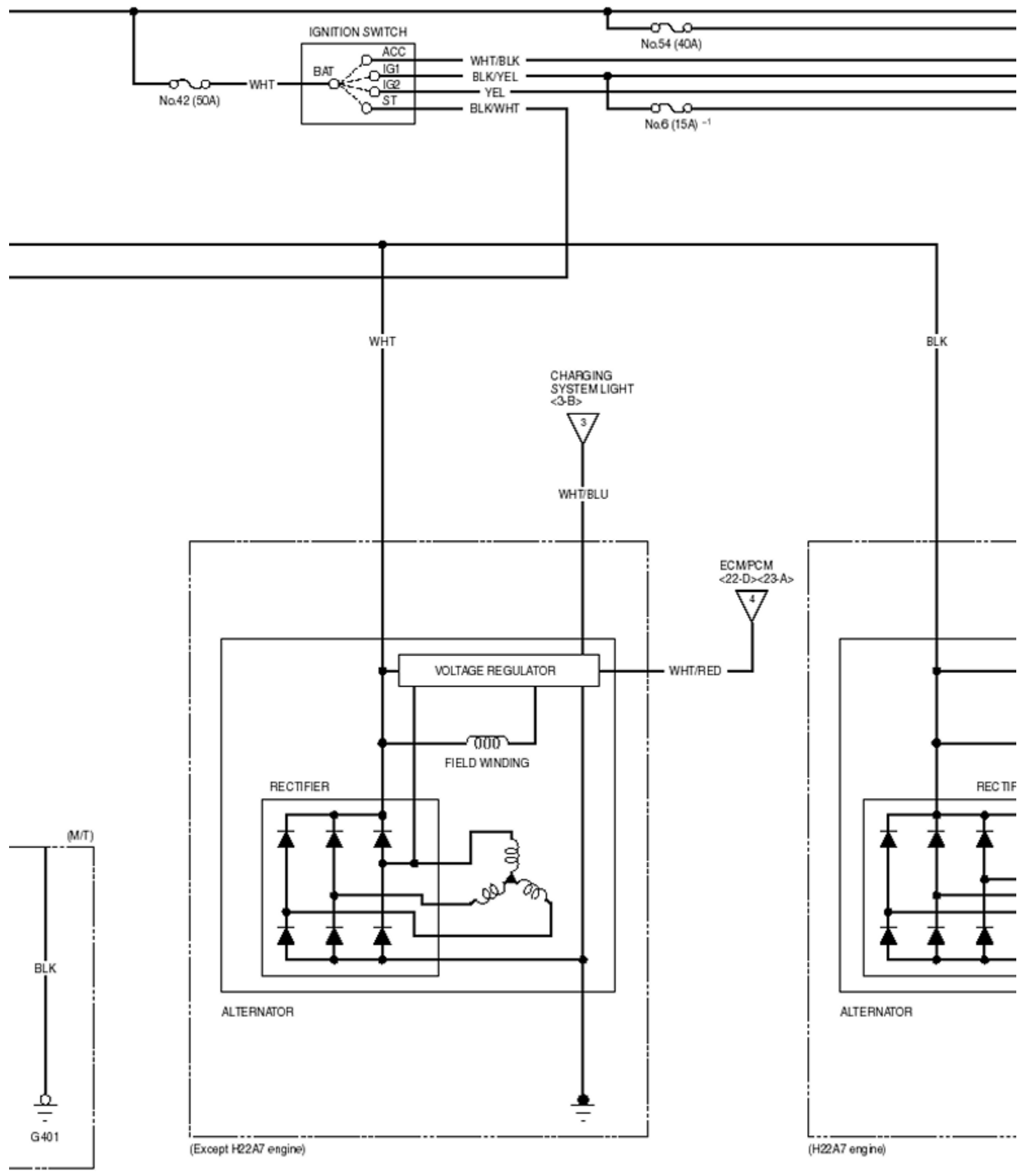


11

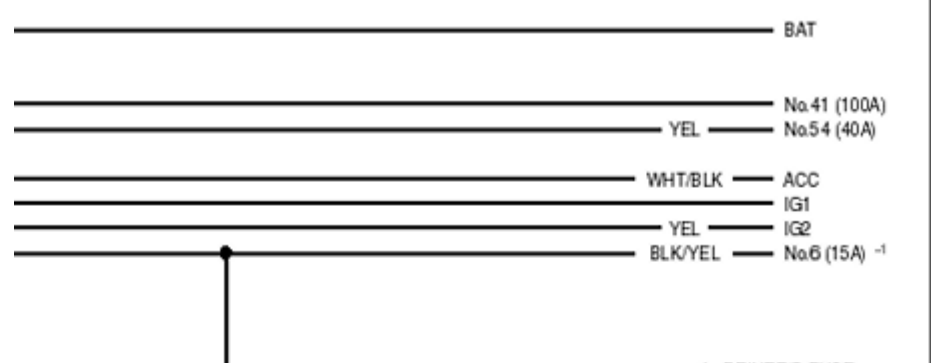




C

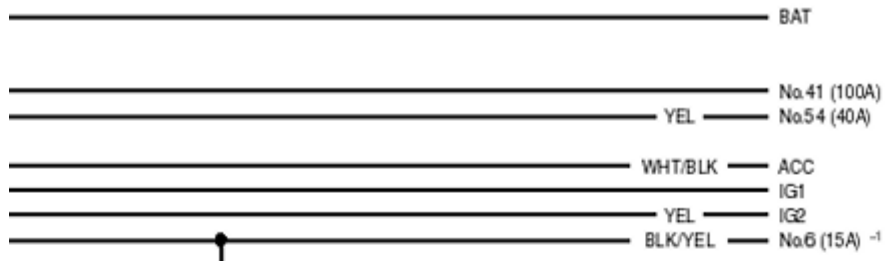


D

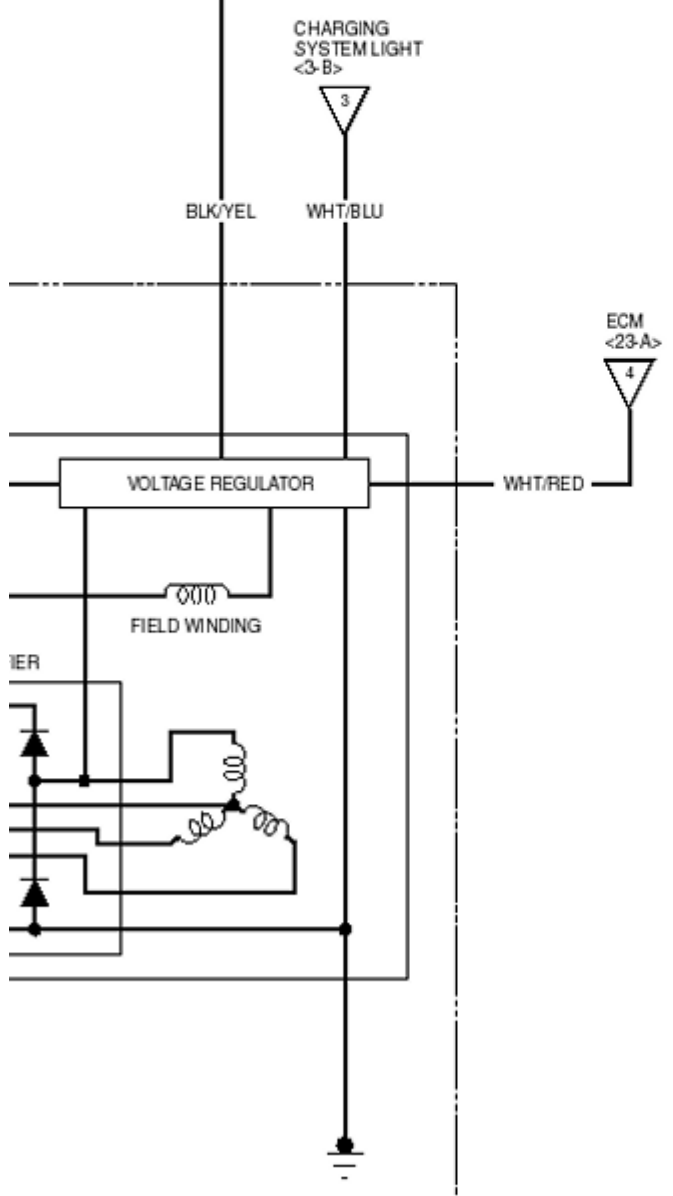


D

1

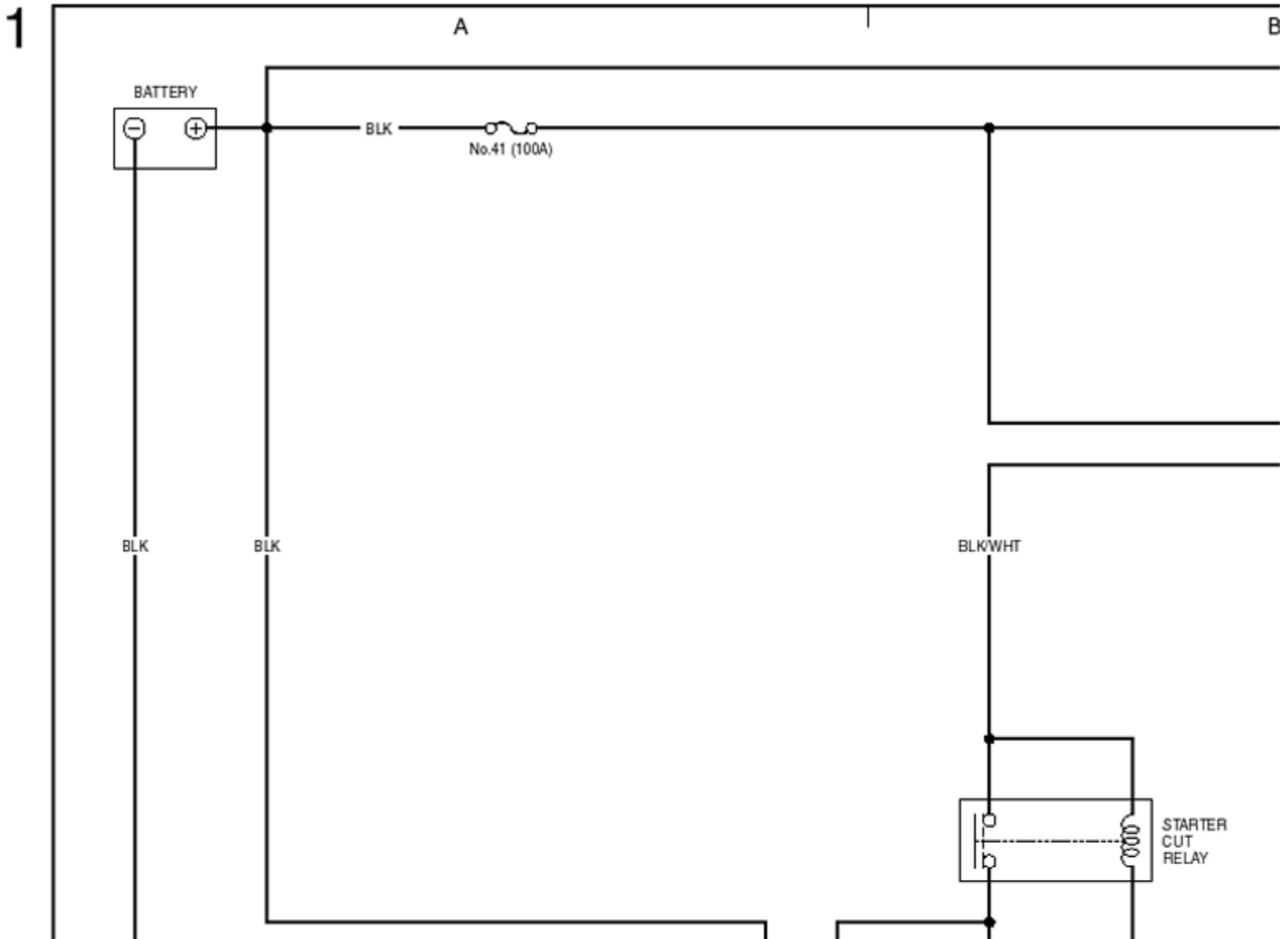
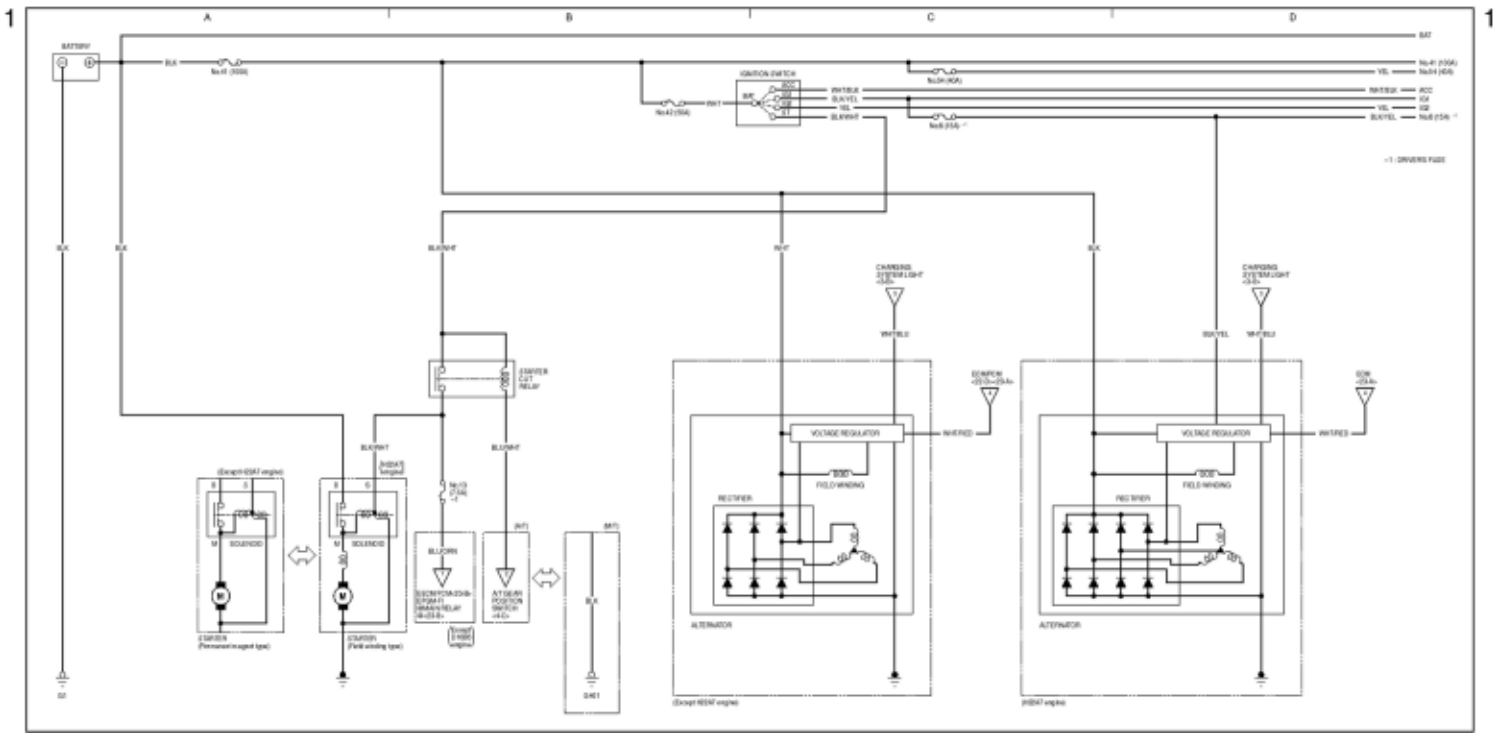


-1: DRIVERS FUSE

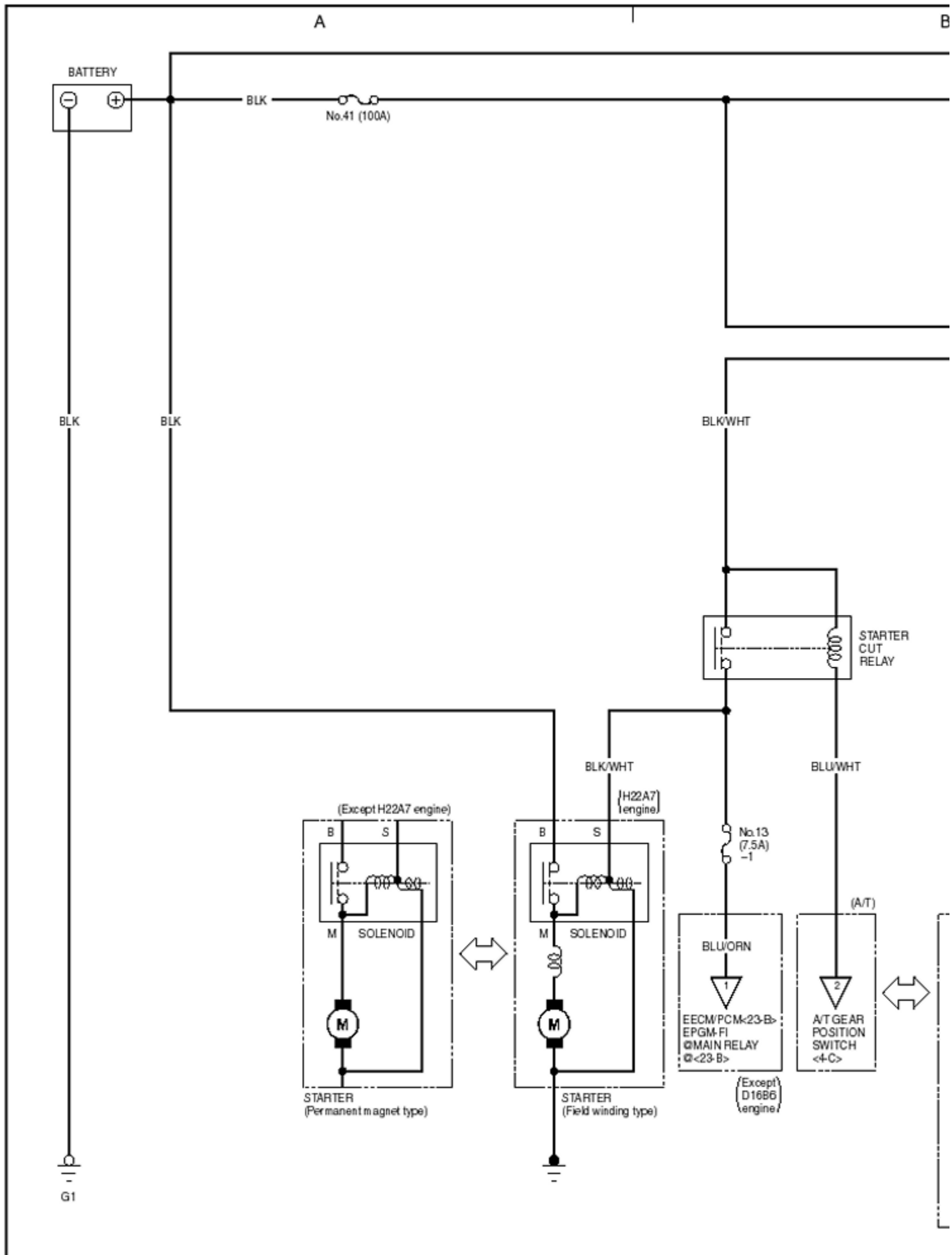


Wiring Diagrams

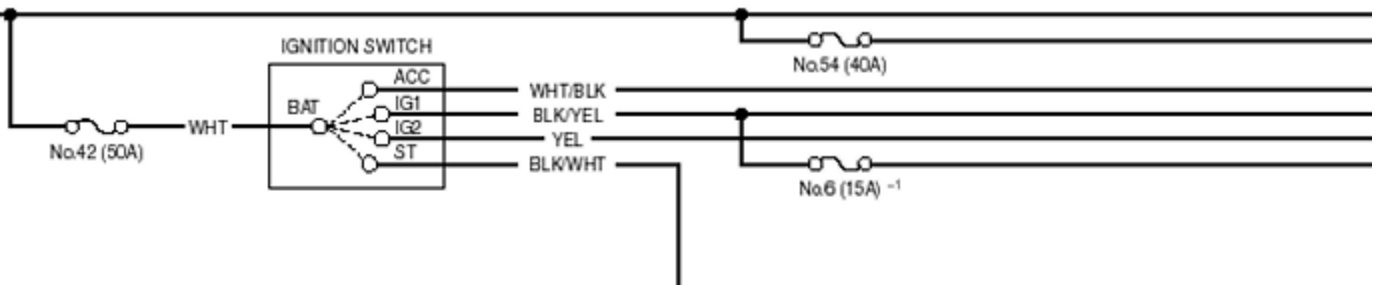
Ignition System



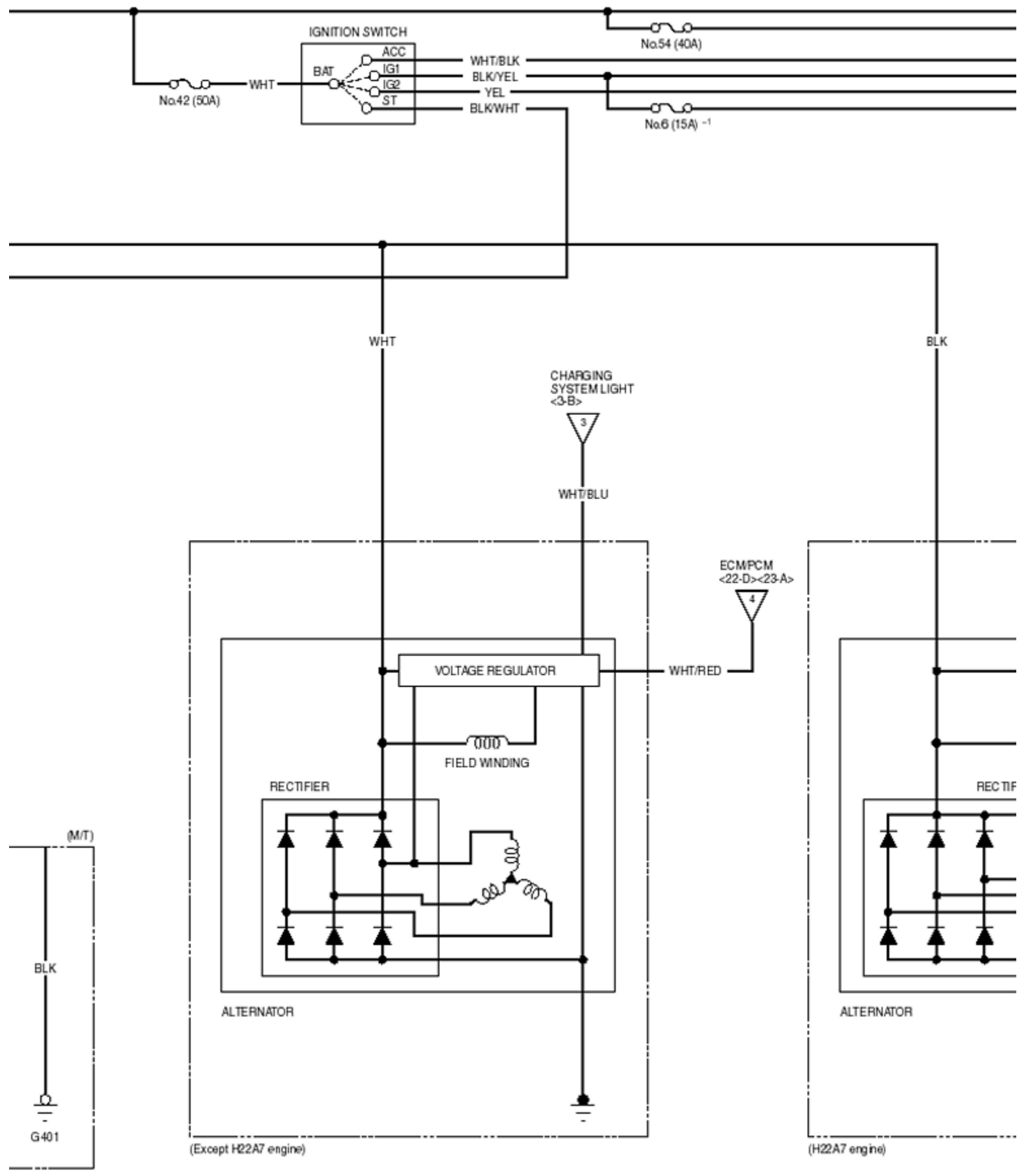
1



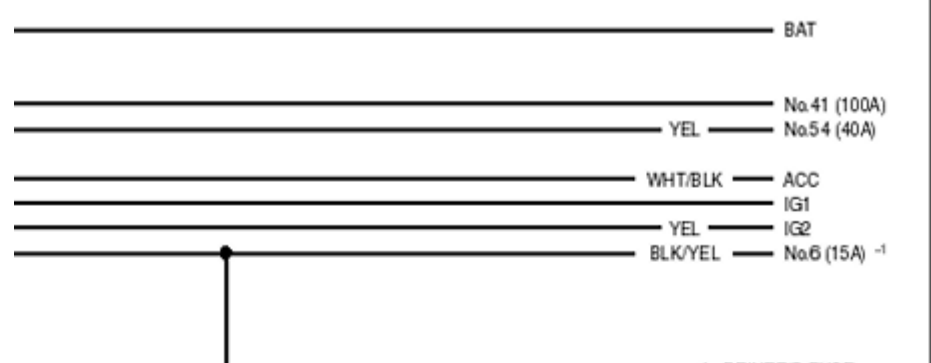
C



C

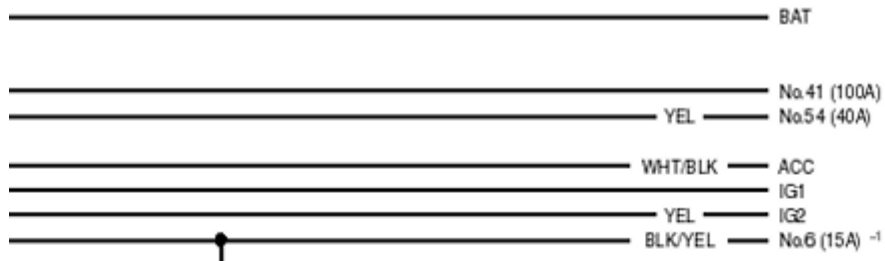


D

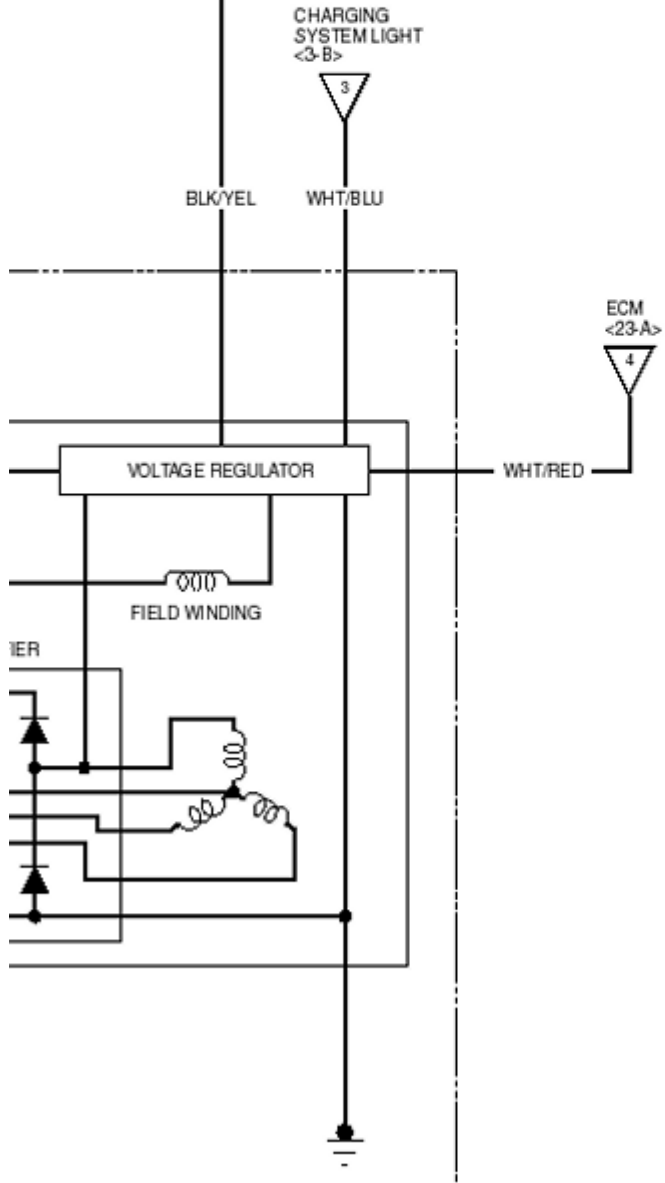


D

1



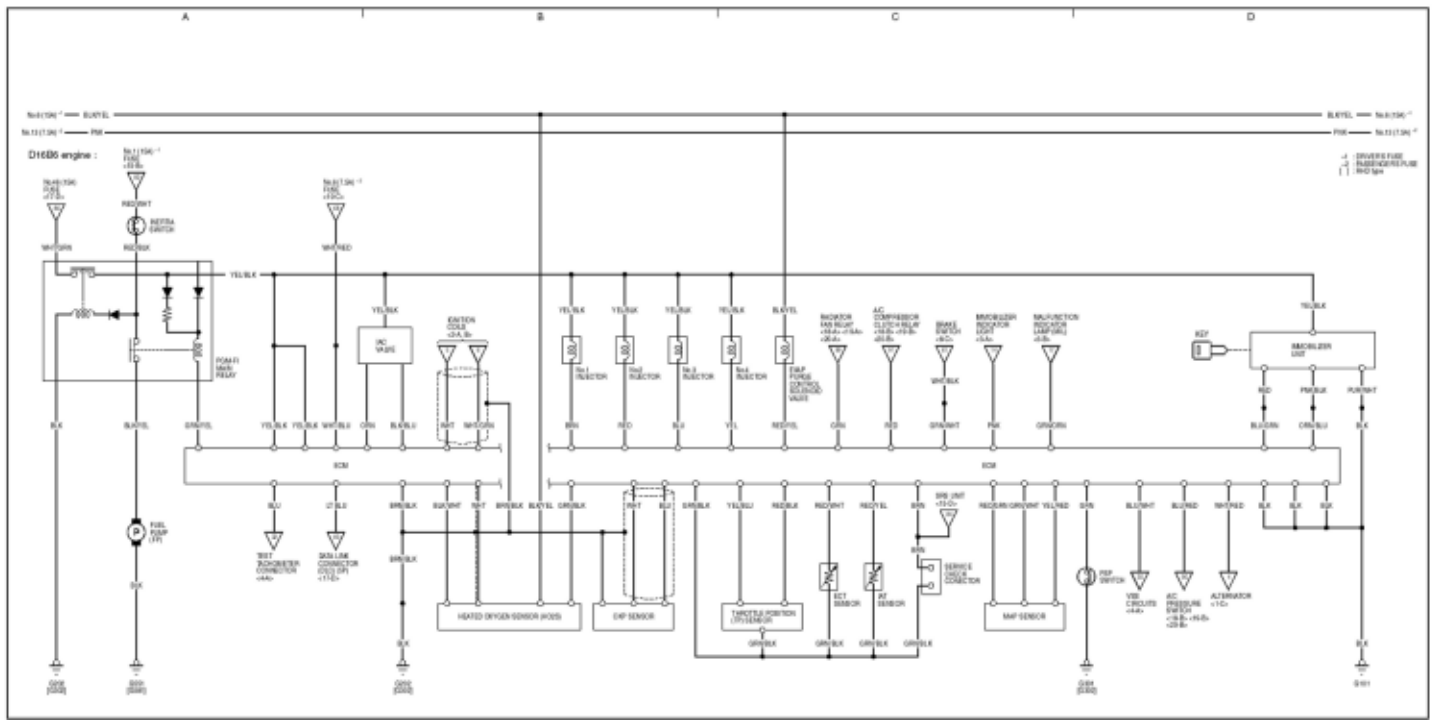
-1: DRIVERS FUSE



Wiring Diagrams

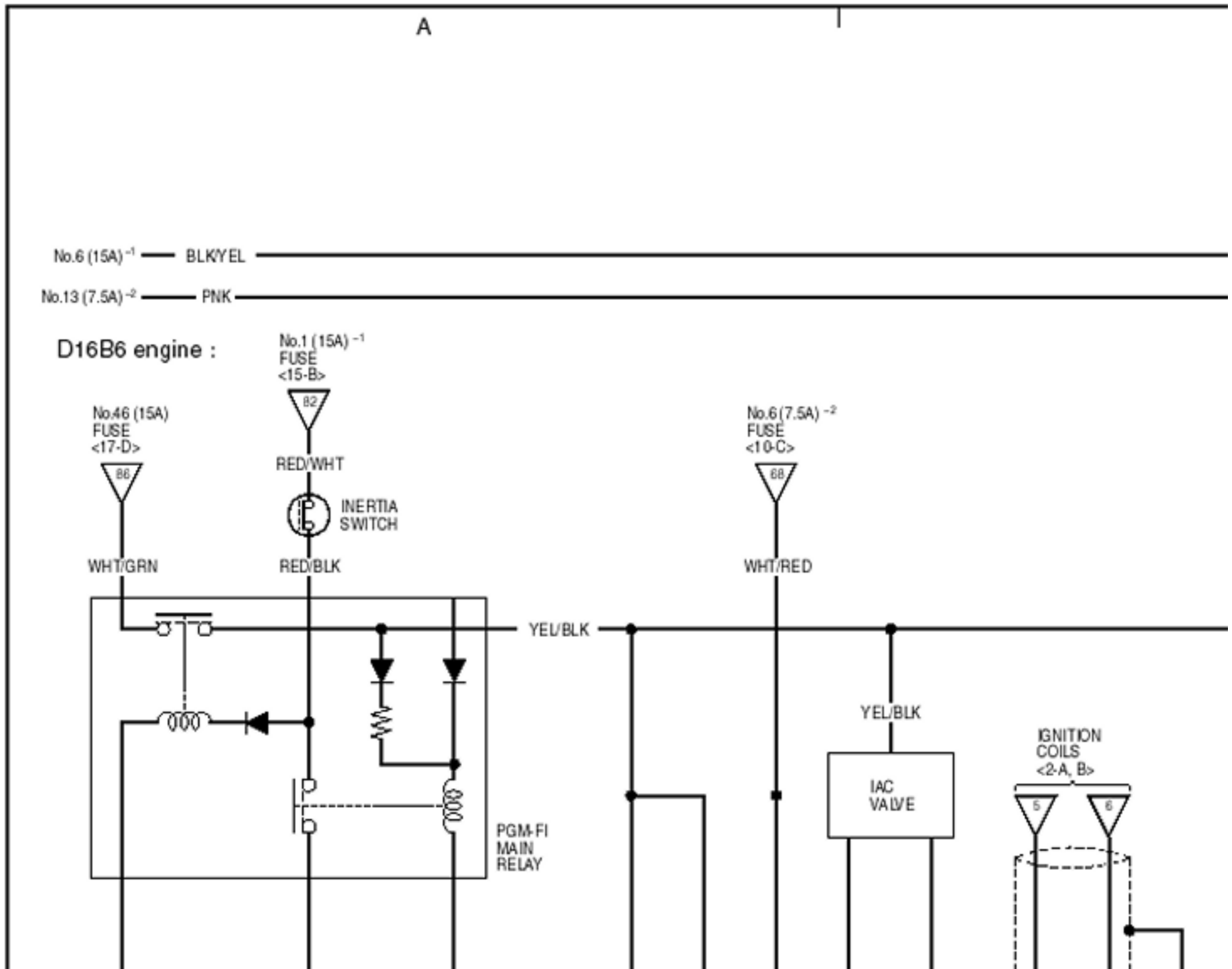
Immobilizer System

22



22

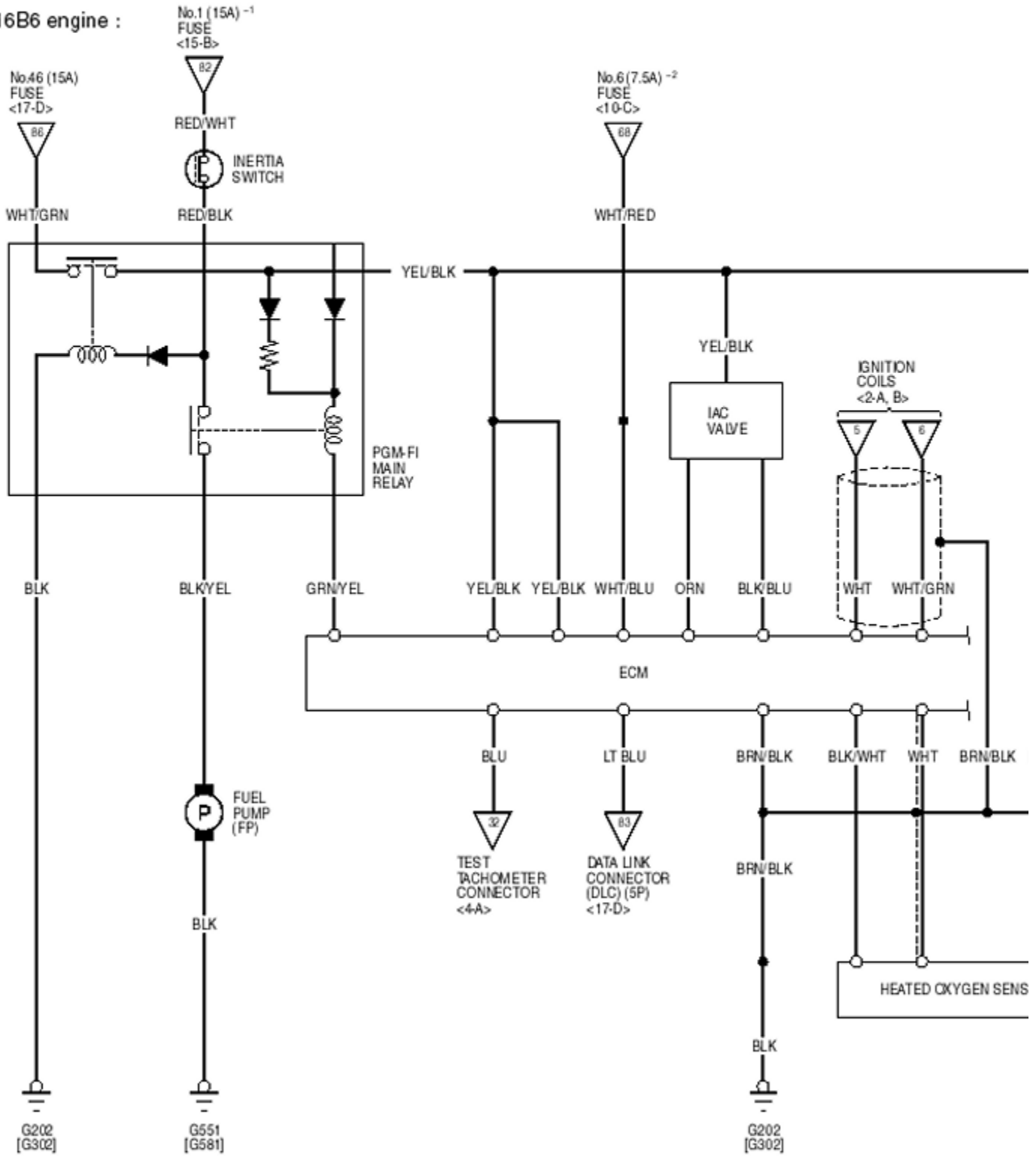
22



No.6 (15A)⁻¹ — BLKYEL

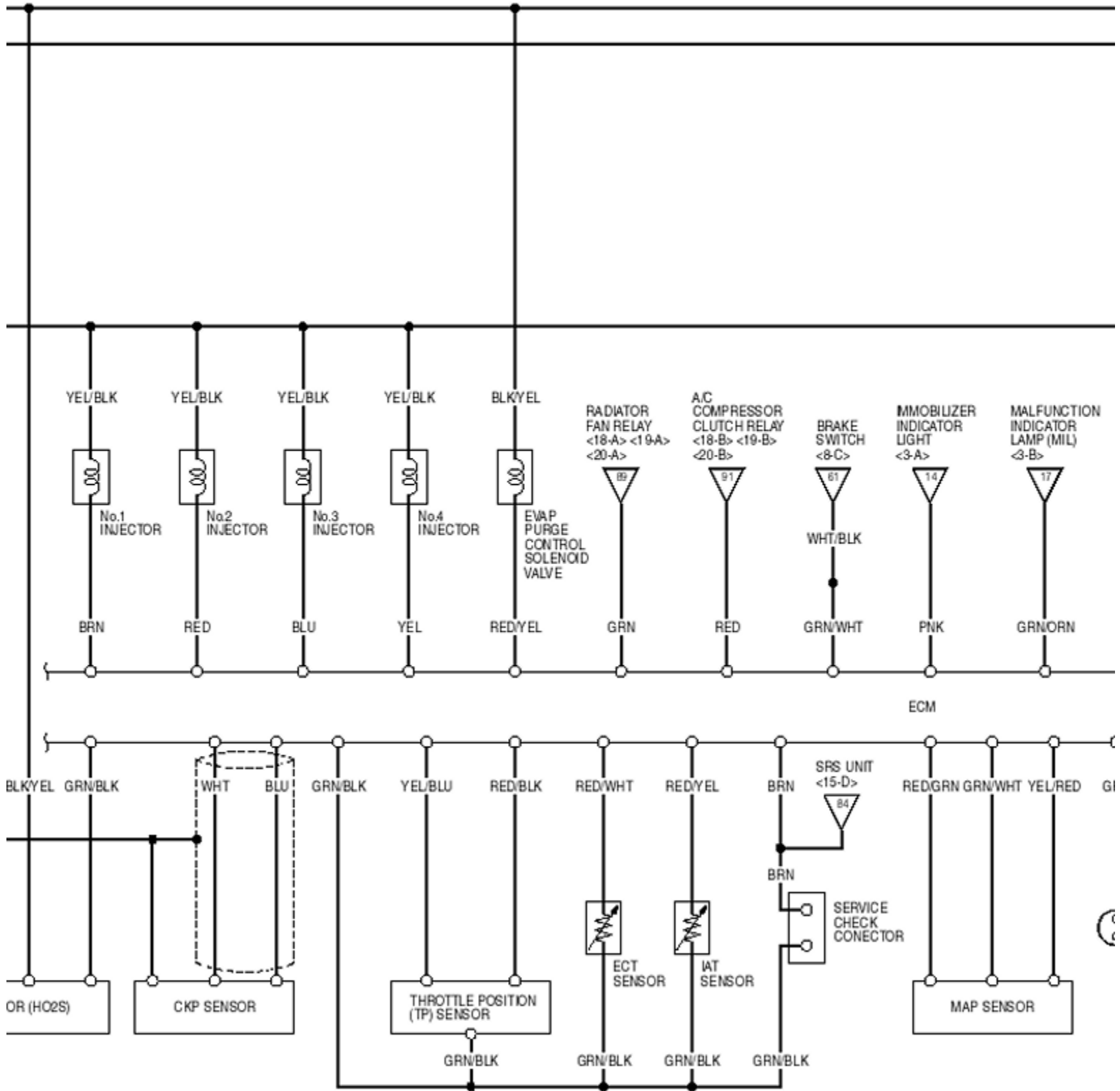
No.13 (7.5A)⁻² — PNK

D16B6 engine :



B

C



ECM

1
G
G

D

22

BLKYEL — No.6 (15A)⁻¹

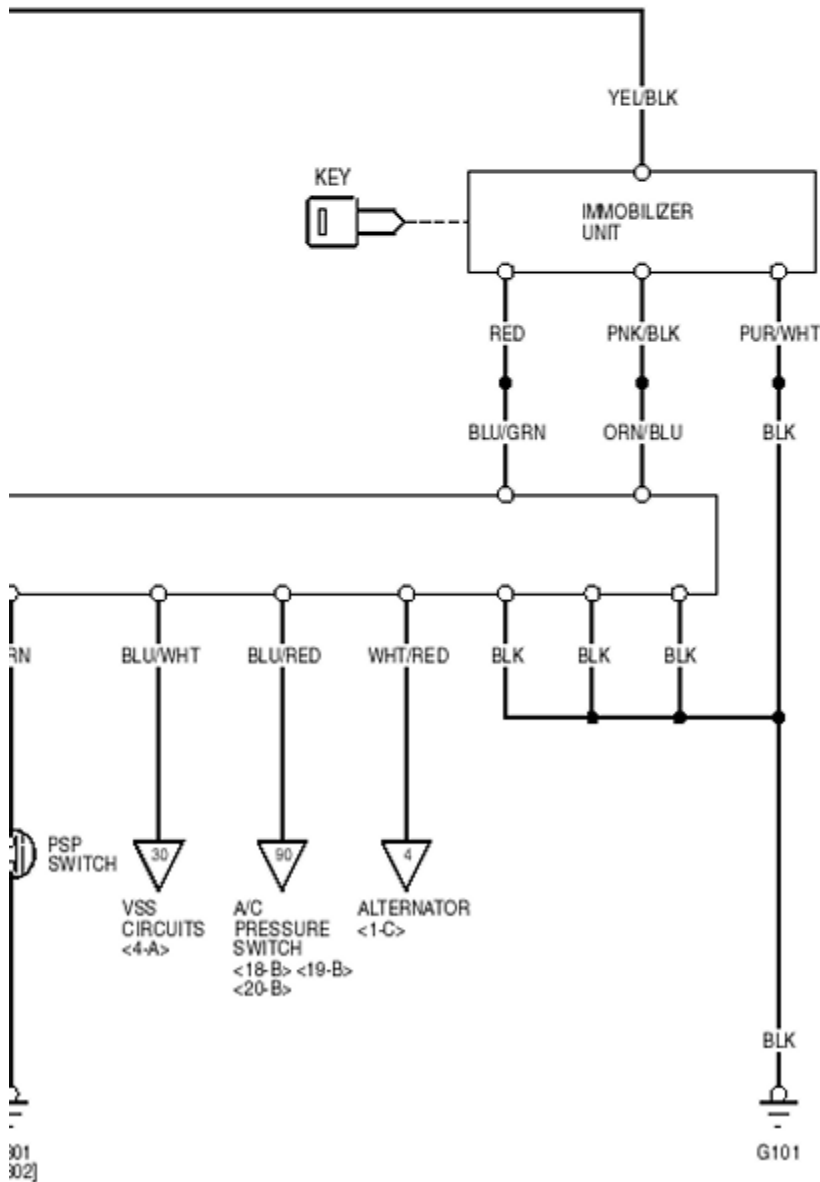
PNK — No.13 (7.5A)⁻²

-1 : DRIVERS FUSE

BLK/YEL — No.6 (15A) ⁻¹

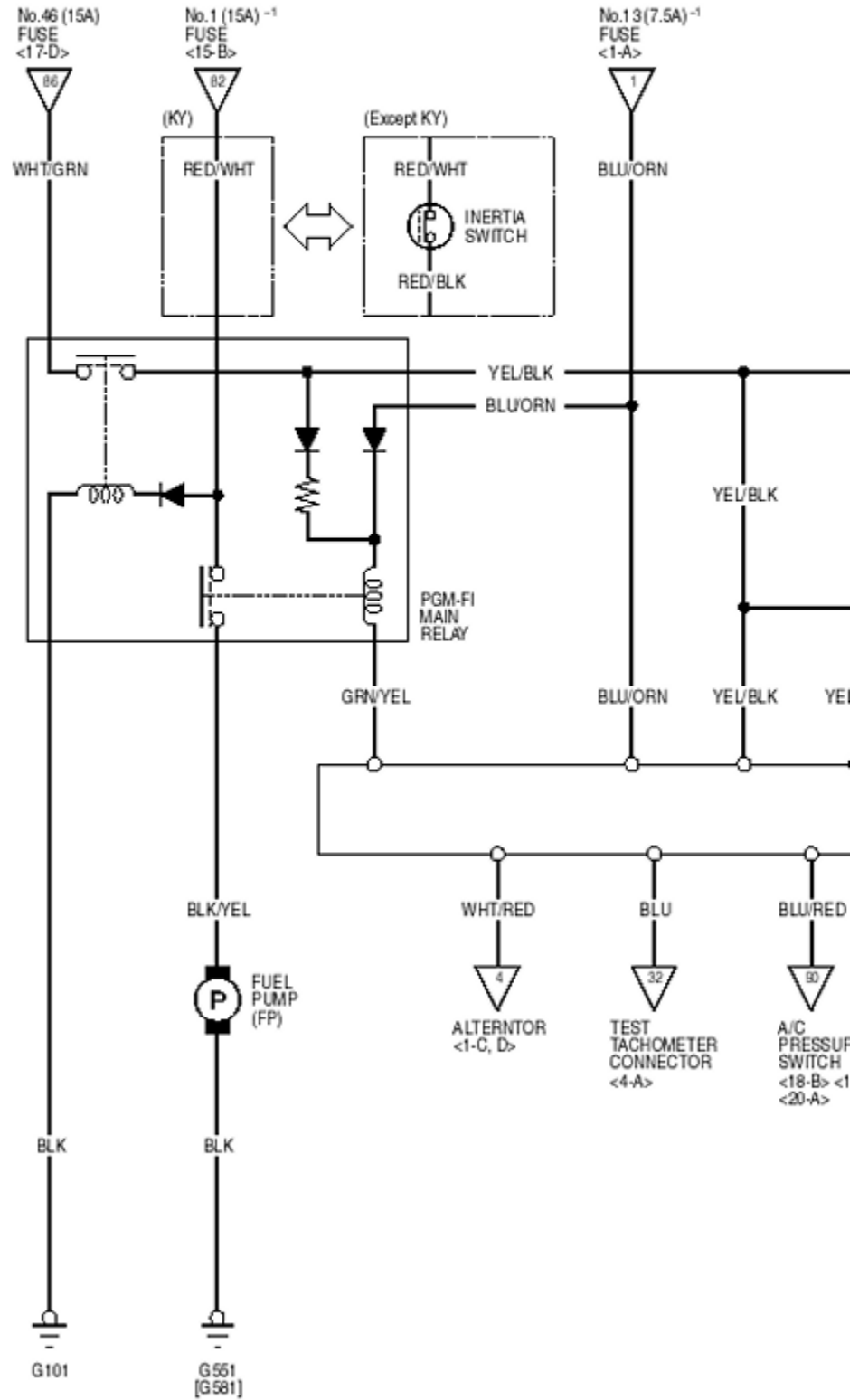
PNK — No.13 (7.5A) ⁻²

-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



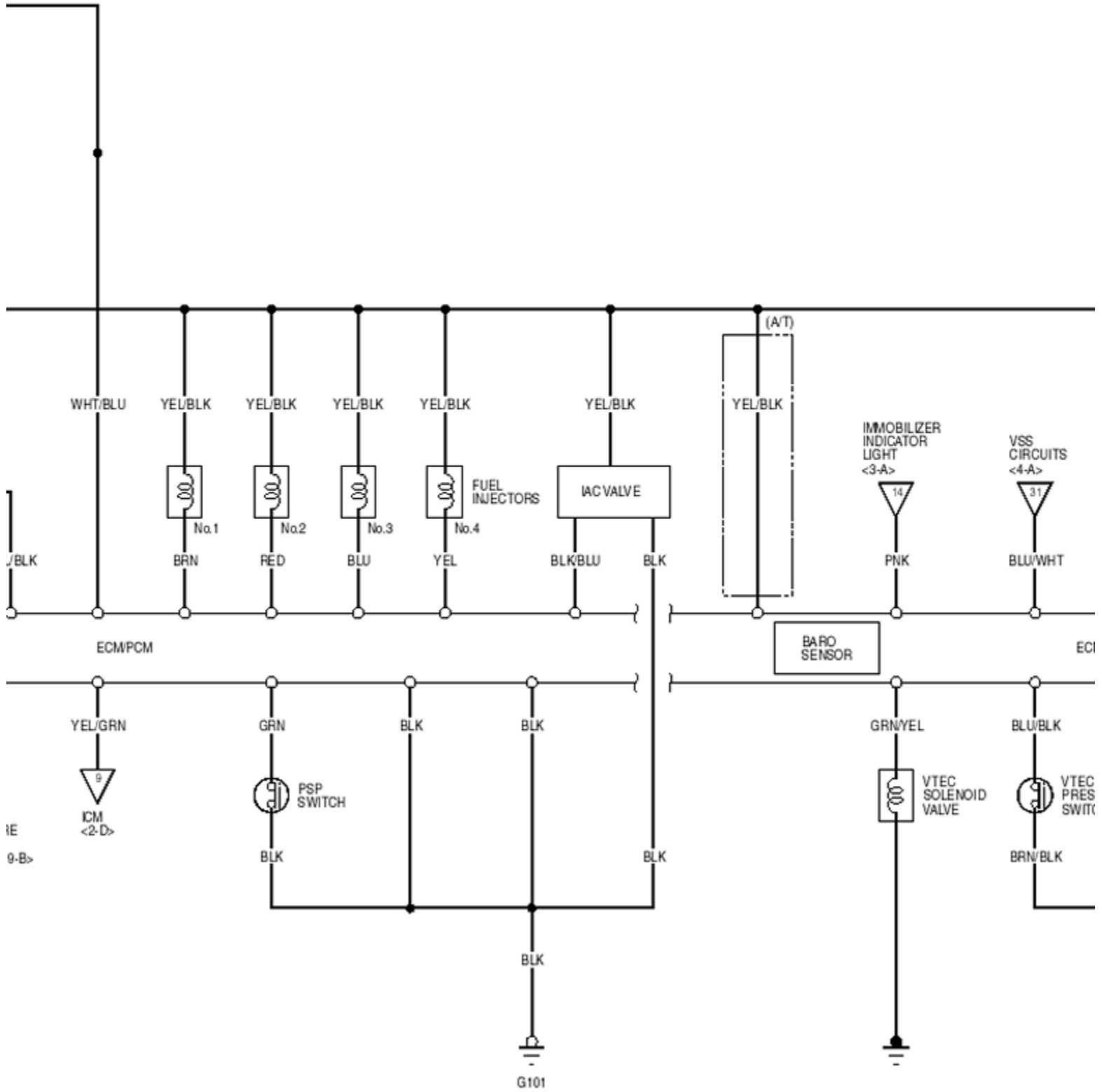
No.6 (15A)⁻¹ — BLKYEL

No.13 (7.5A)⁻² — PNK



B

C



D

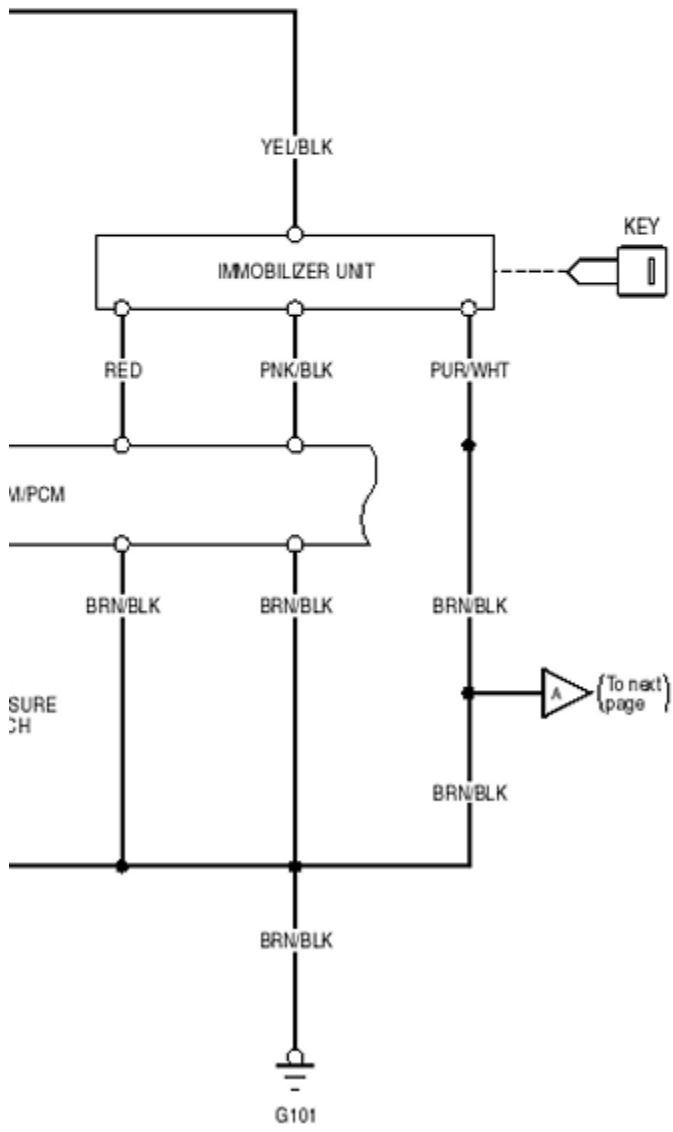
23

BLK/YEL — No.6 (15A) -1

-1 : DRIVER'S FUSE

BLK/YEL — No.6 (15A) -1

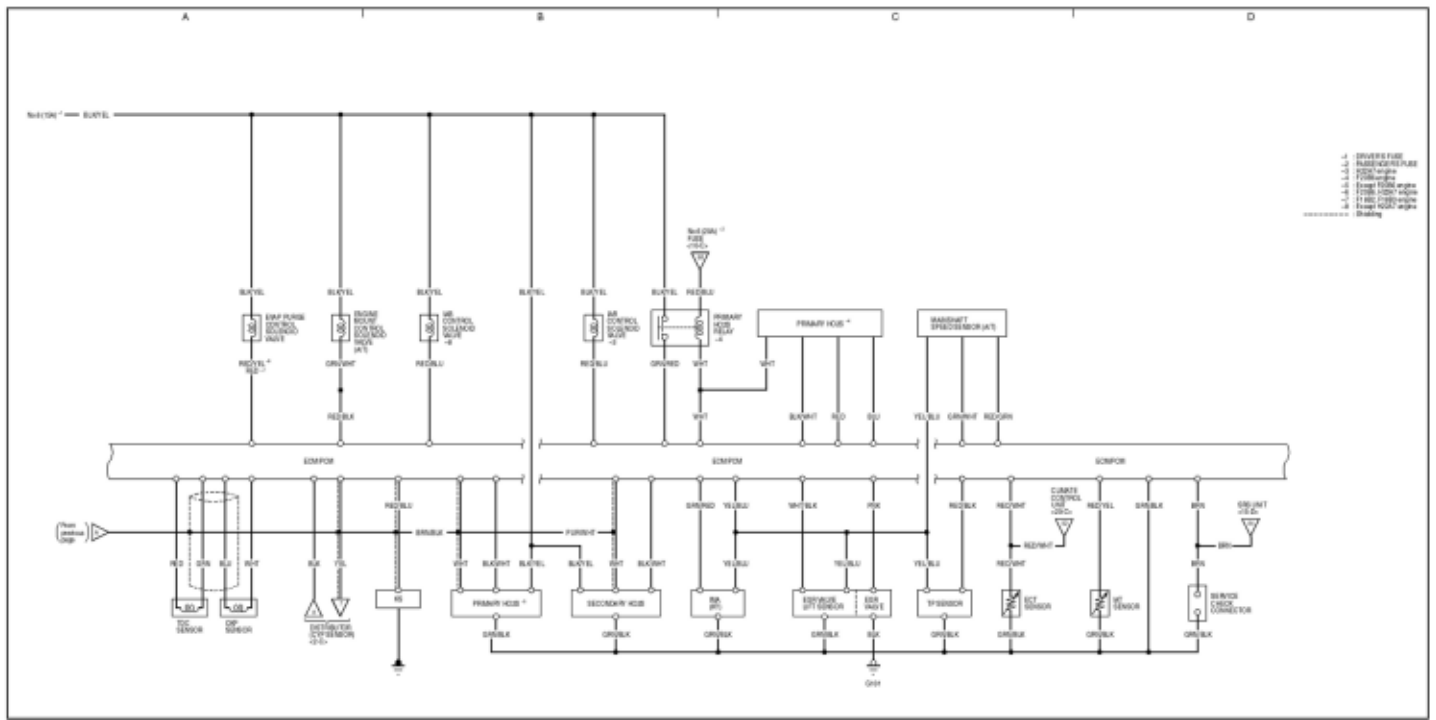
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
() : RHD type



Wiring Diagrams

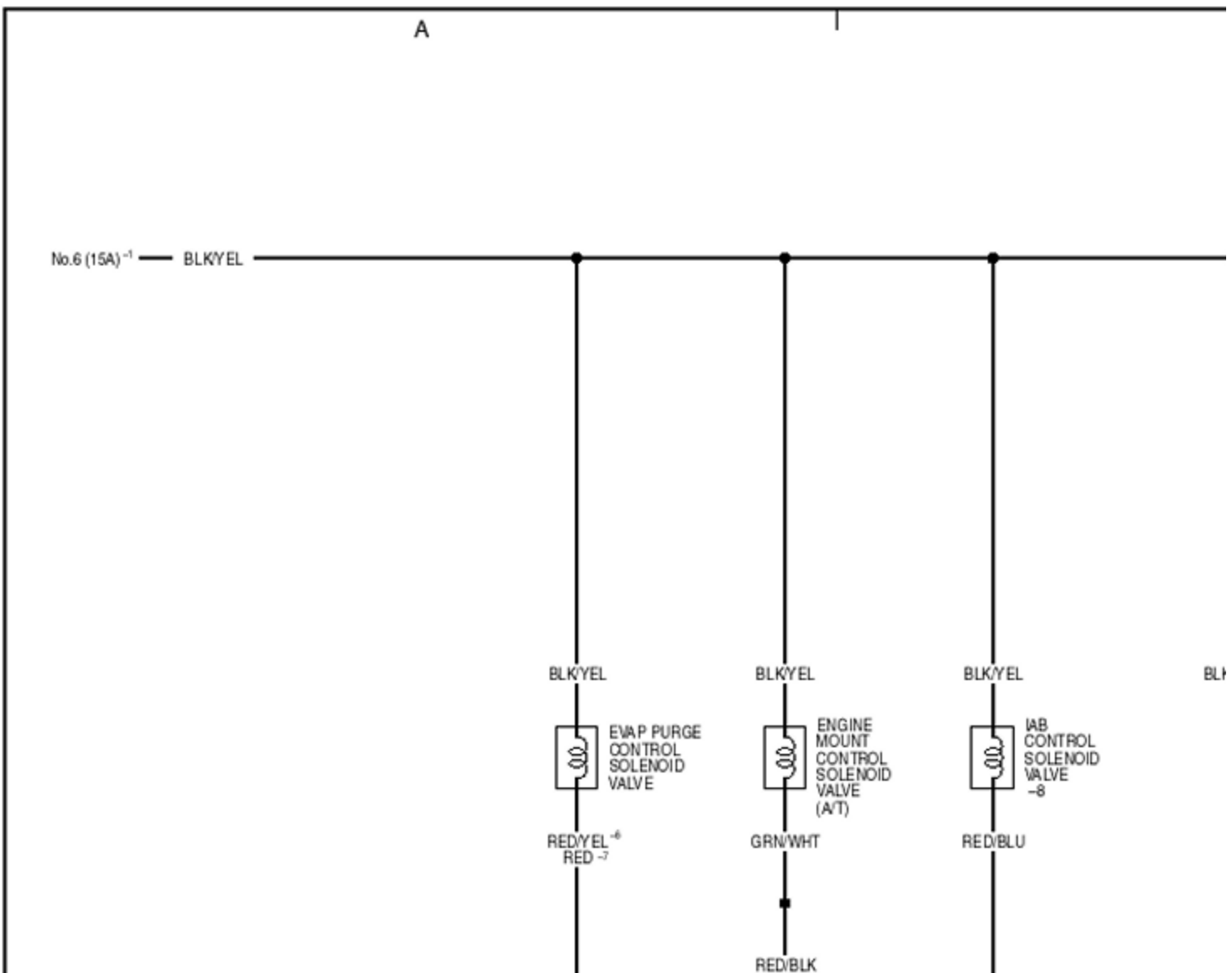
Immobilizer System

24



24

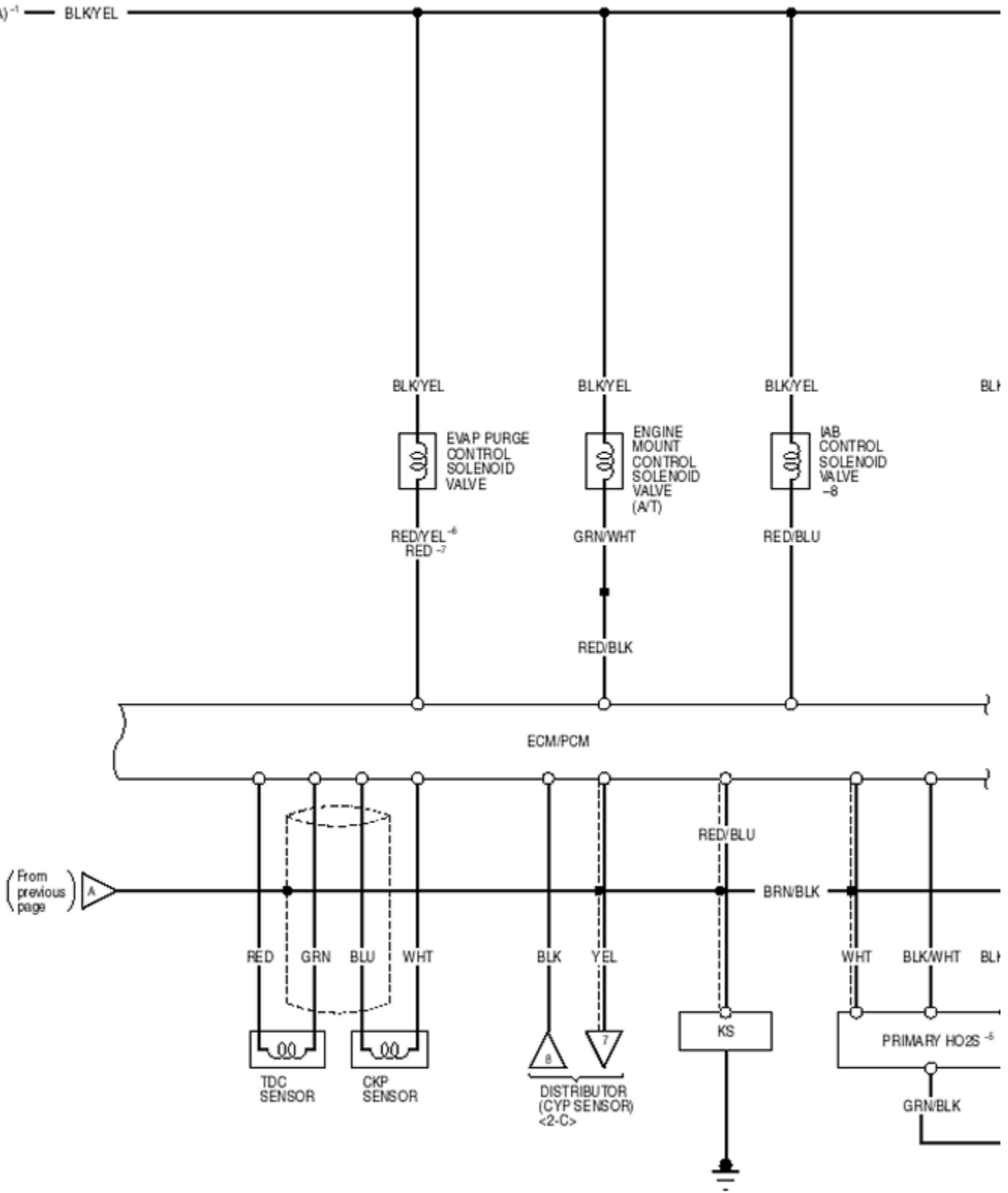
24



BL

A

No.6 (15A)⁻¹ — BLK/YEL



(From previous page) A

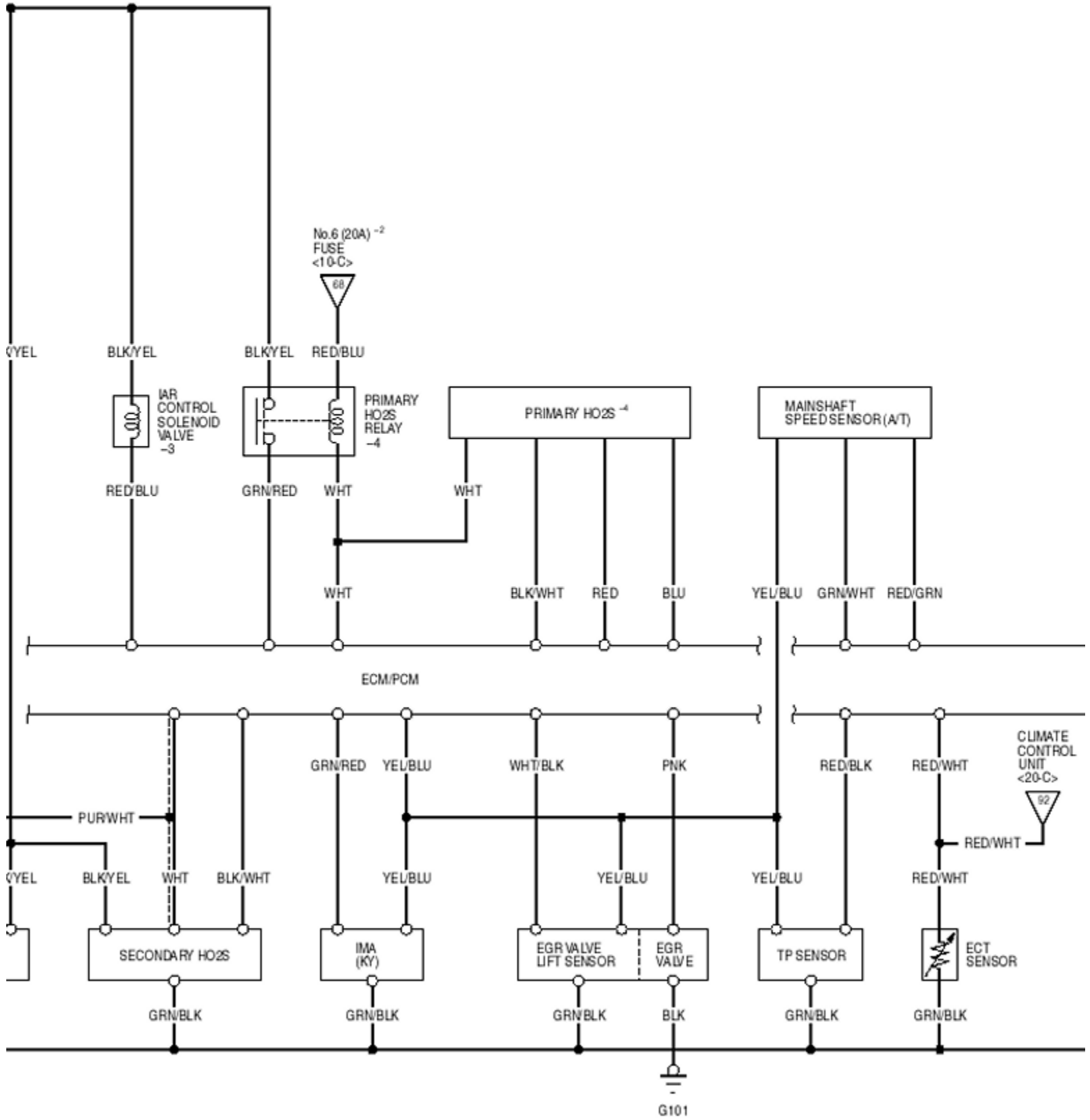
B

C



B

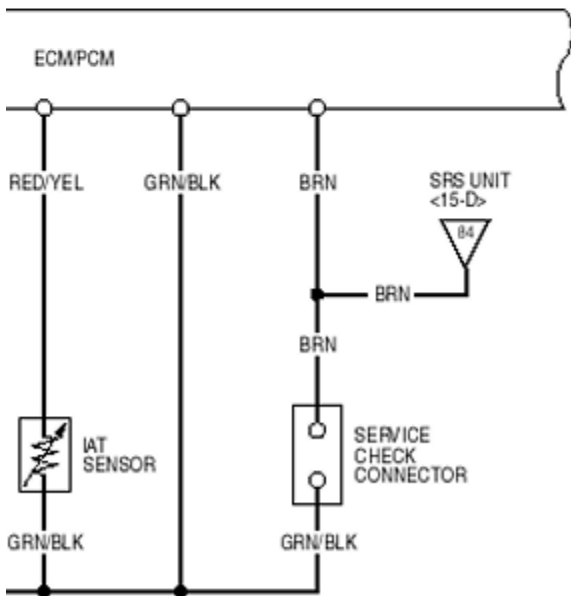
C



D

24

- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : H22A7 engine
- 4 : F20B6 engine
- 5 : Except F20B6 engine
- 6 : F20B6, H22A7 engine
- 7 : F18B2, F18B3 engine
- 8 : Except H22A7 engine
- : Shielding

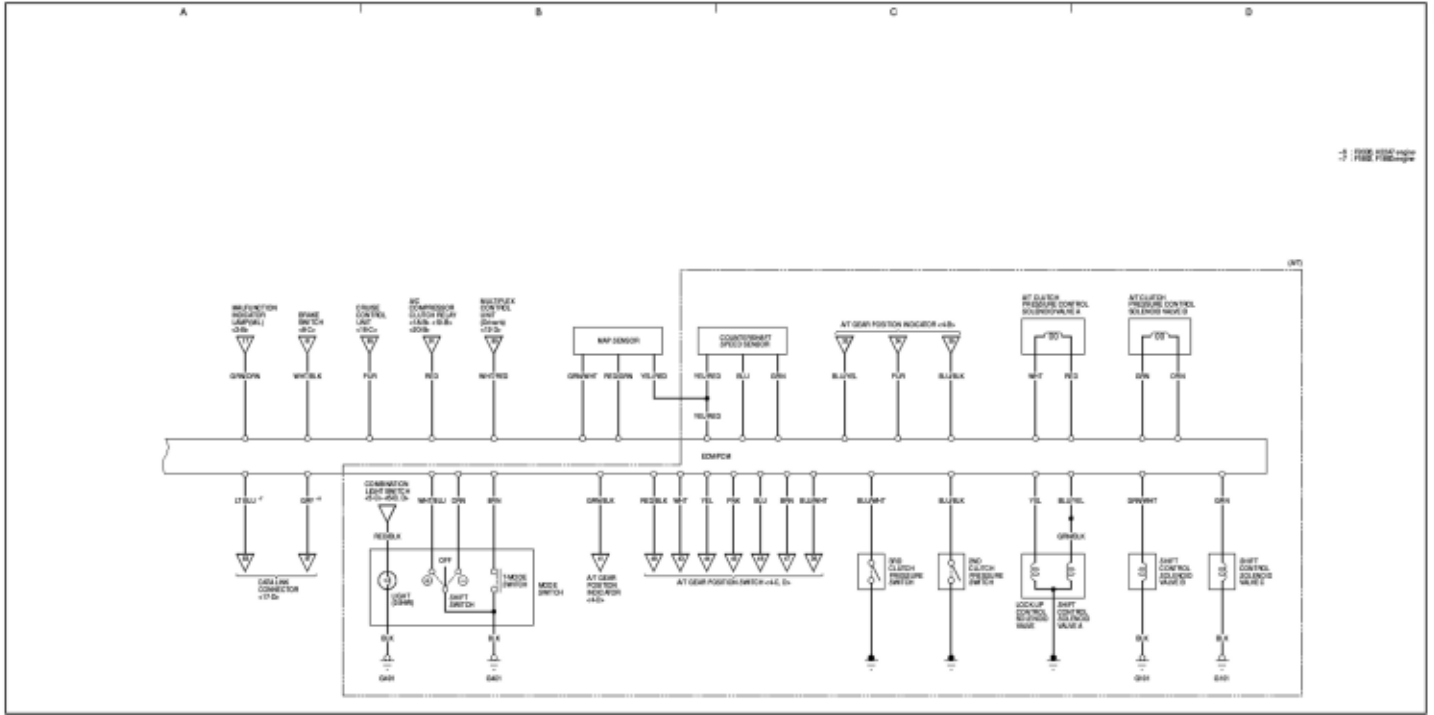


Wiring Diagrams

Immobilizer System

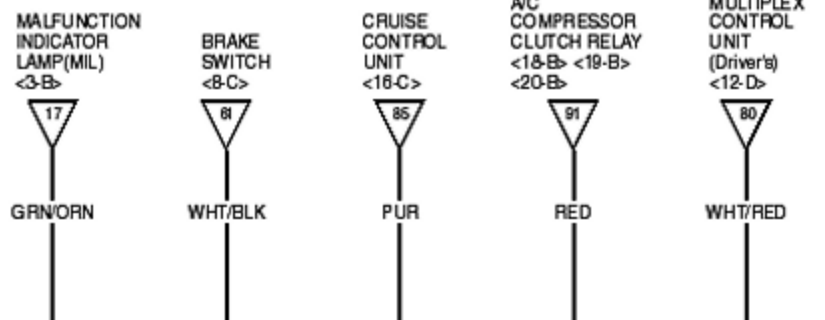
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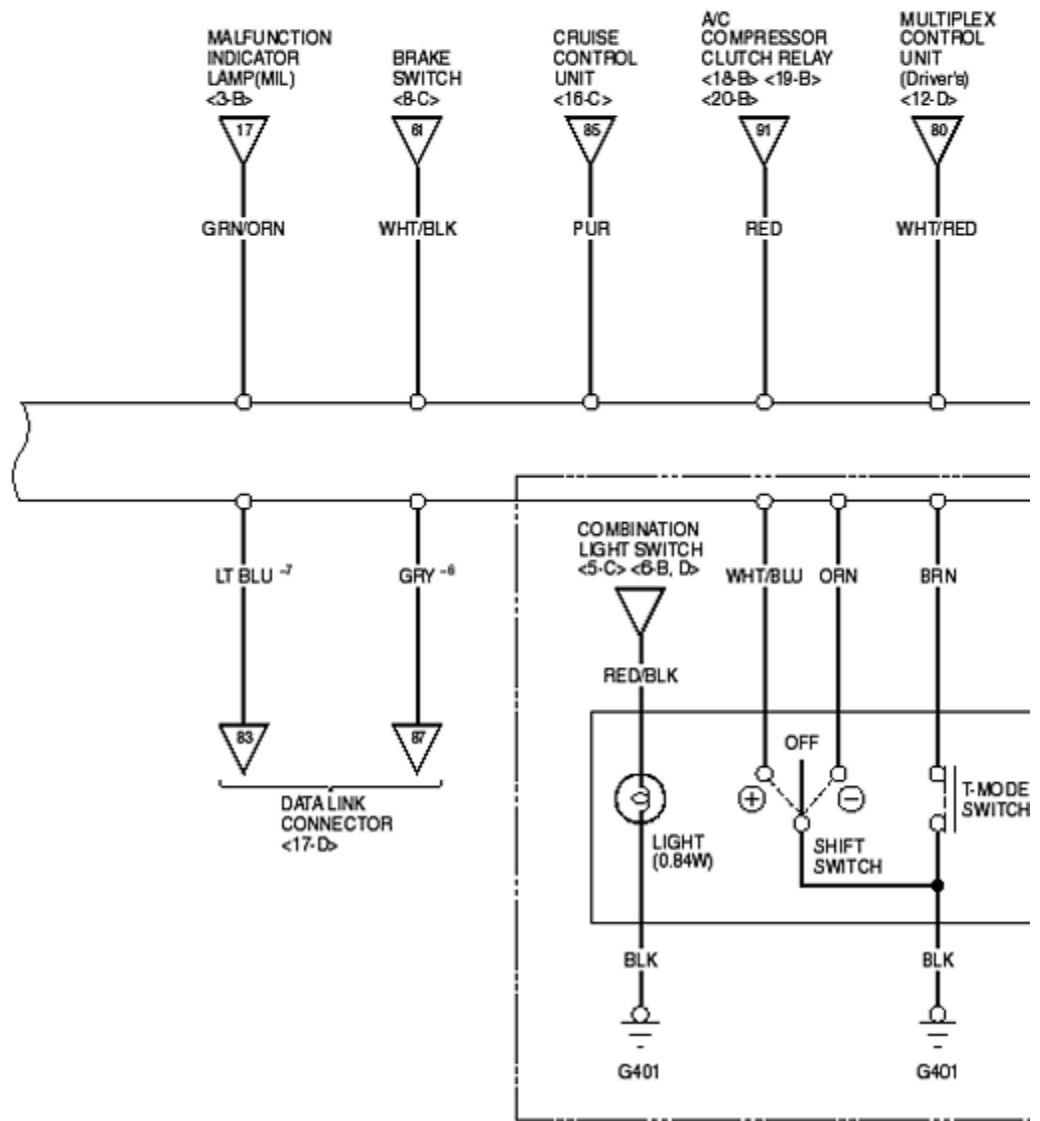
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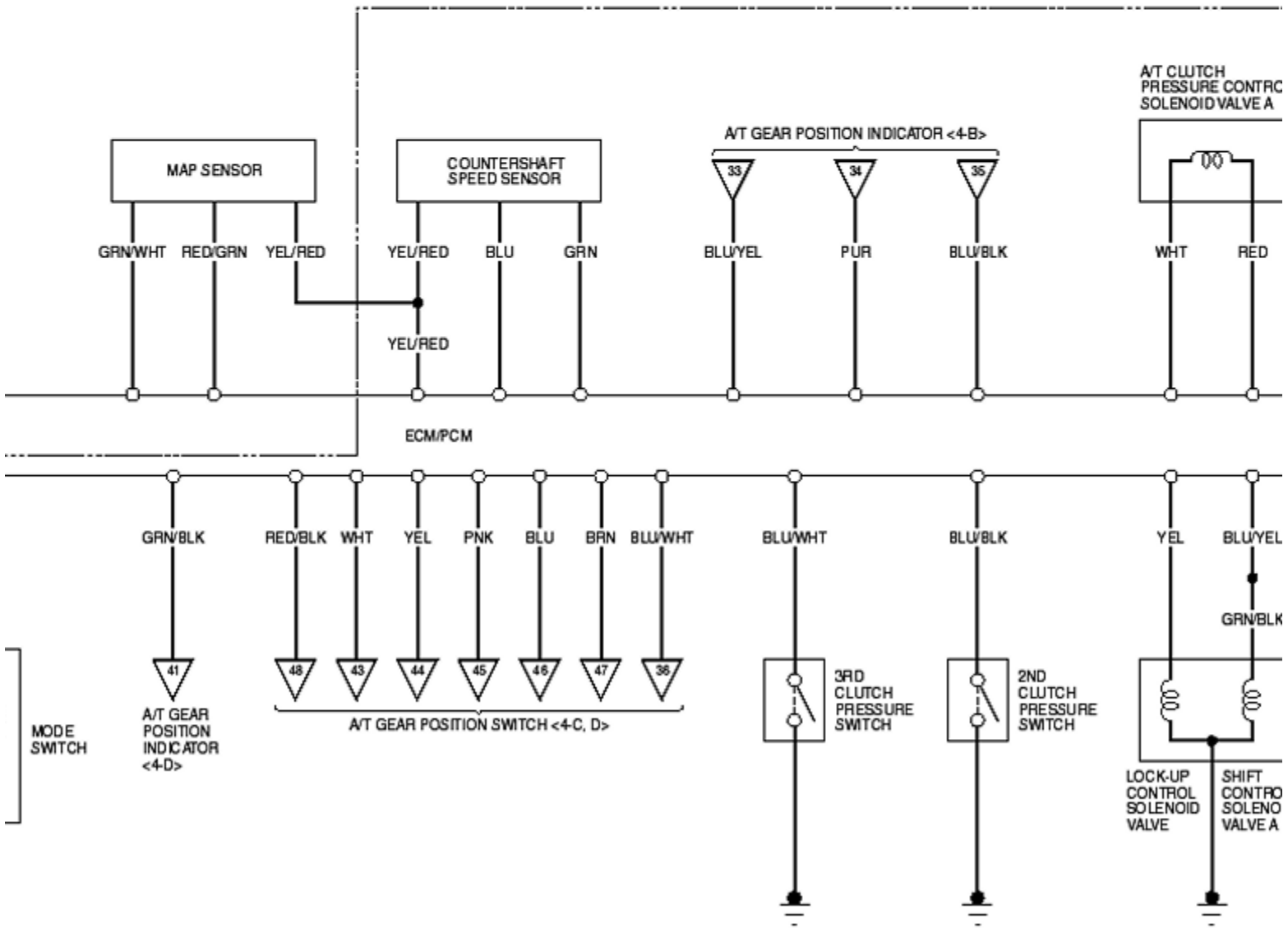


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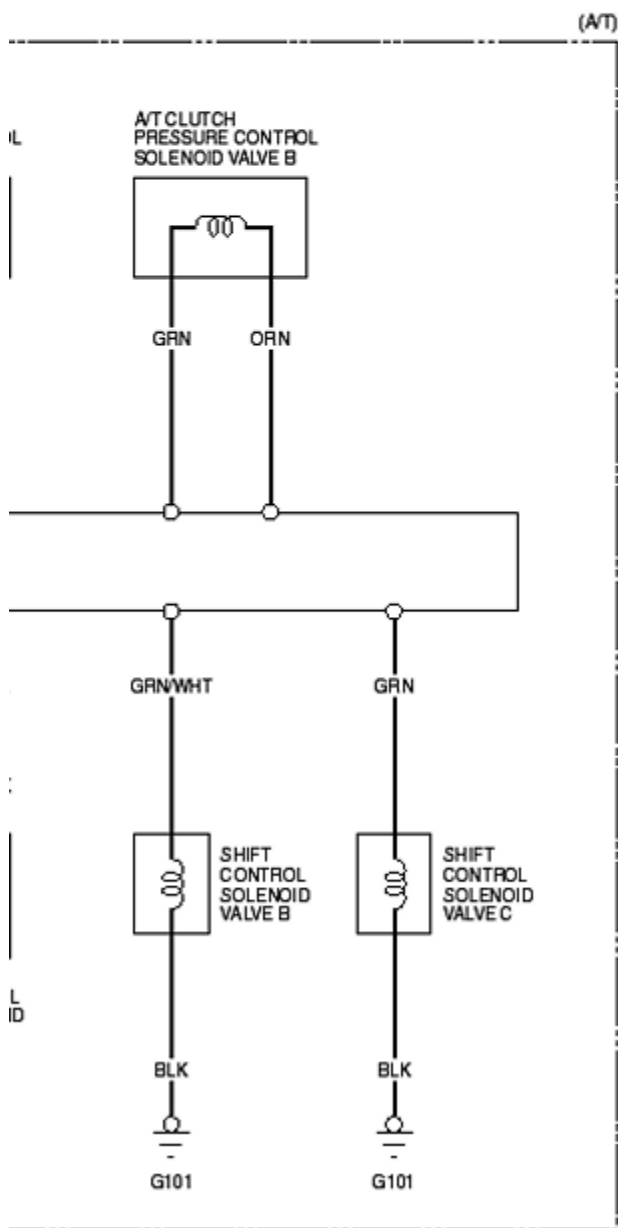
A







-6 : F20B6, H22A7 engine
-7 : F18B2, F18B3 engine

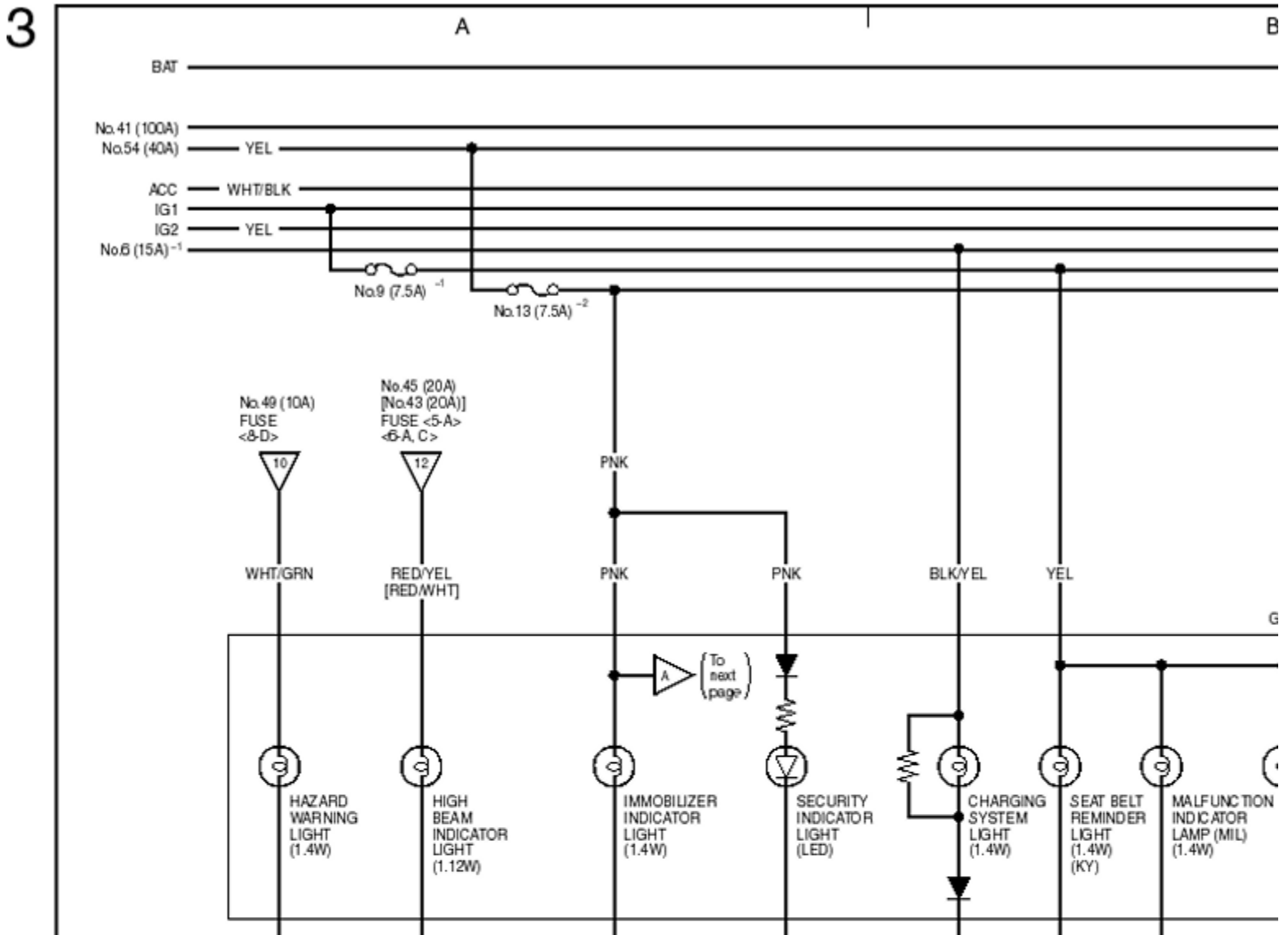
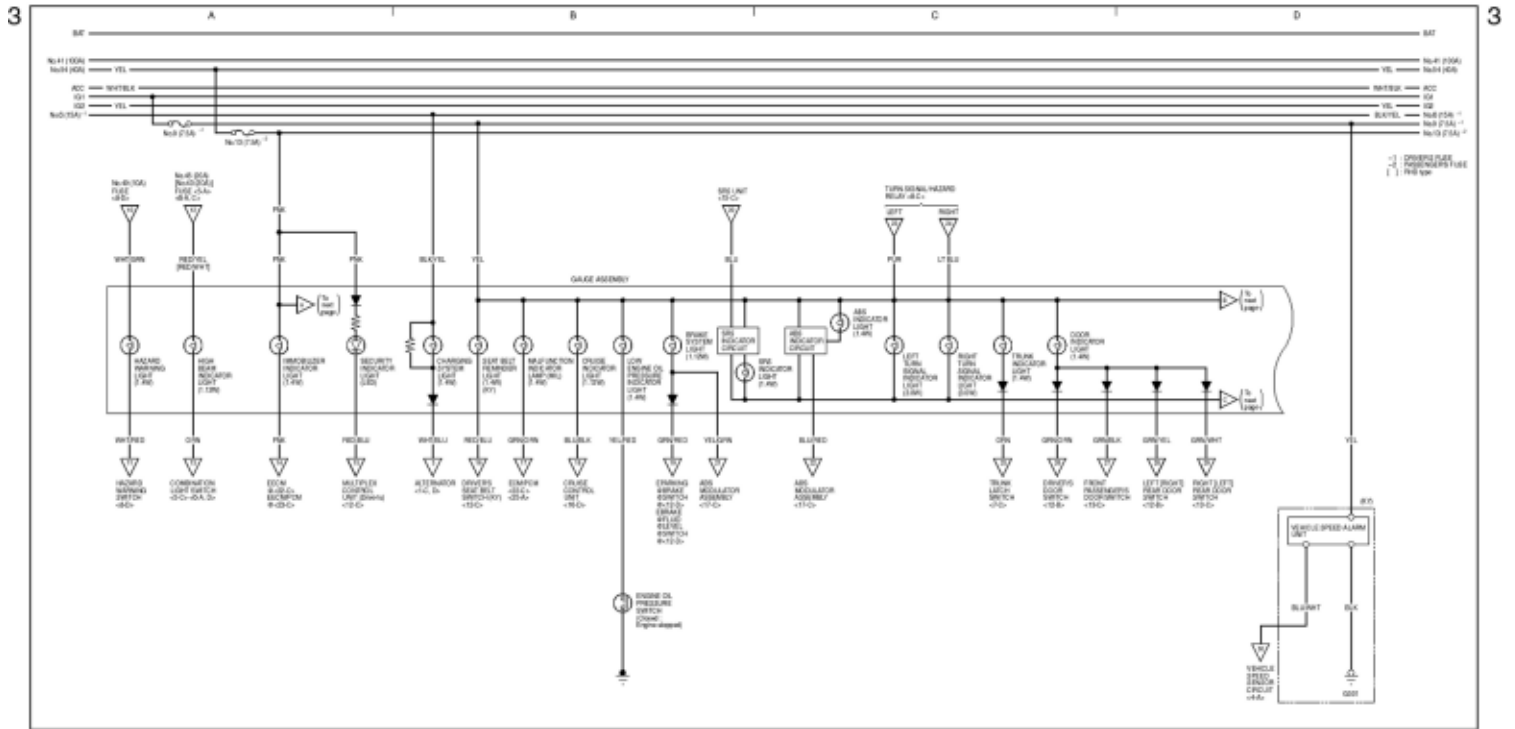


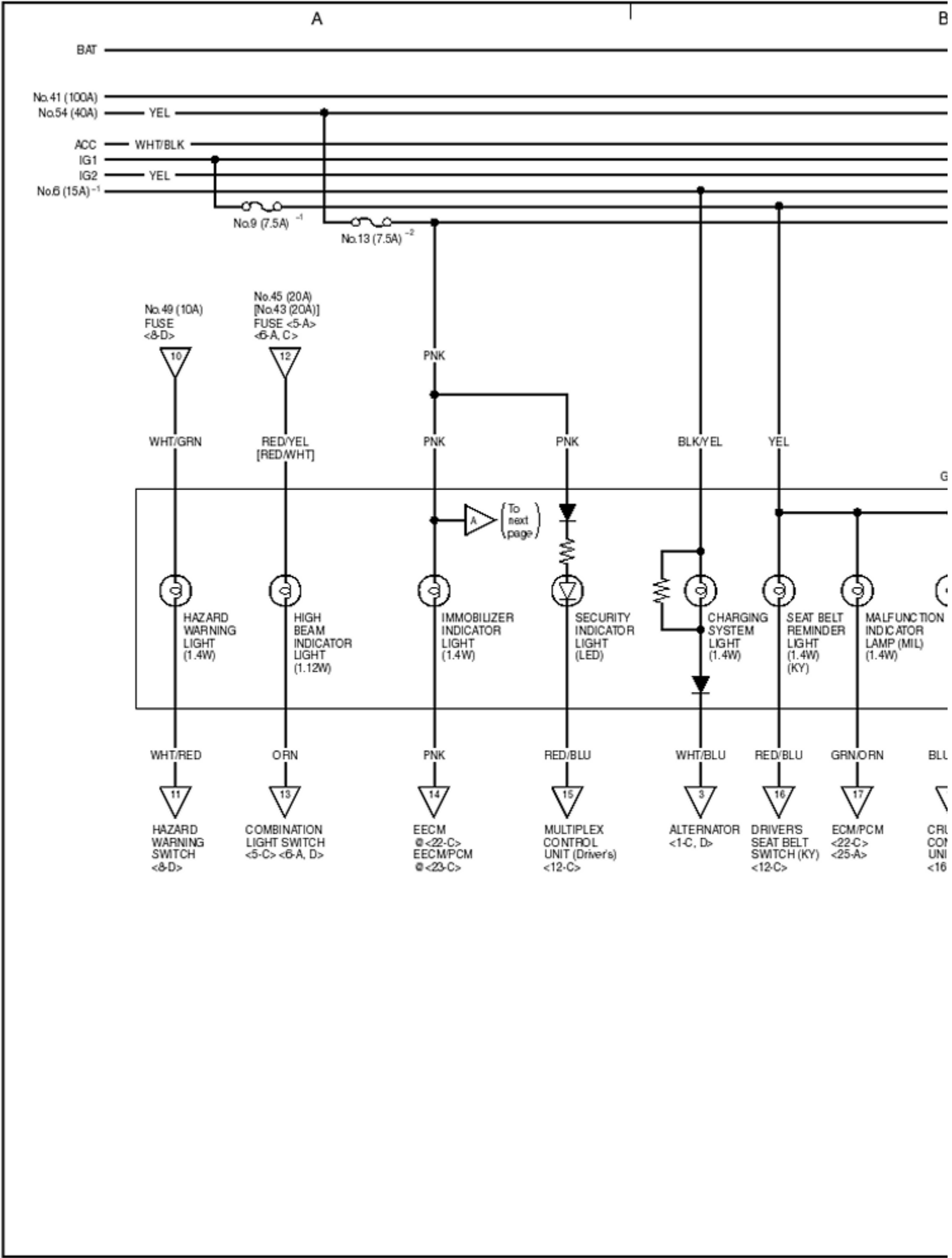
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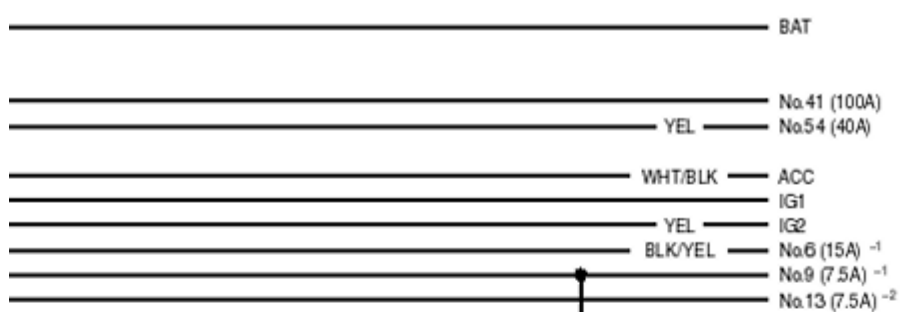
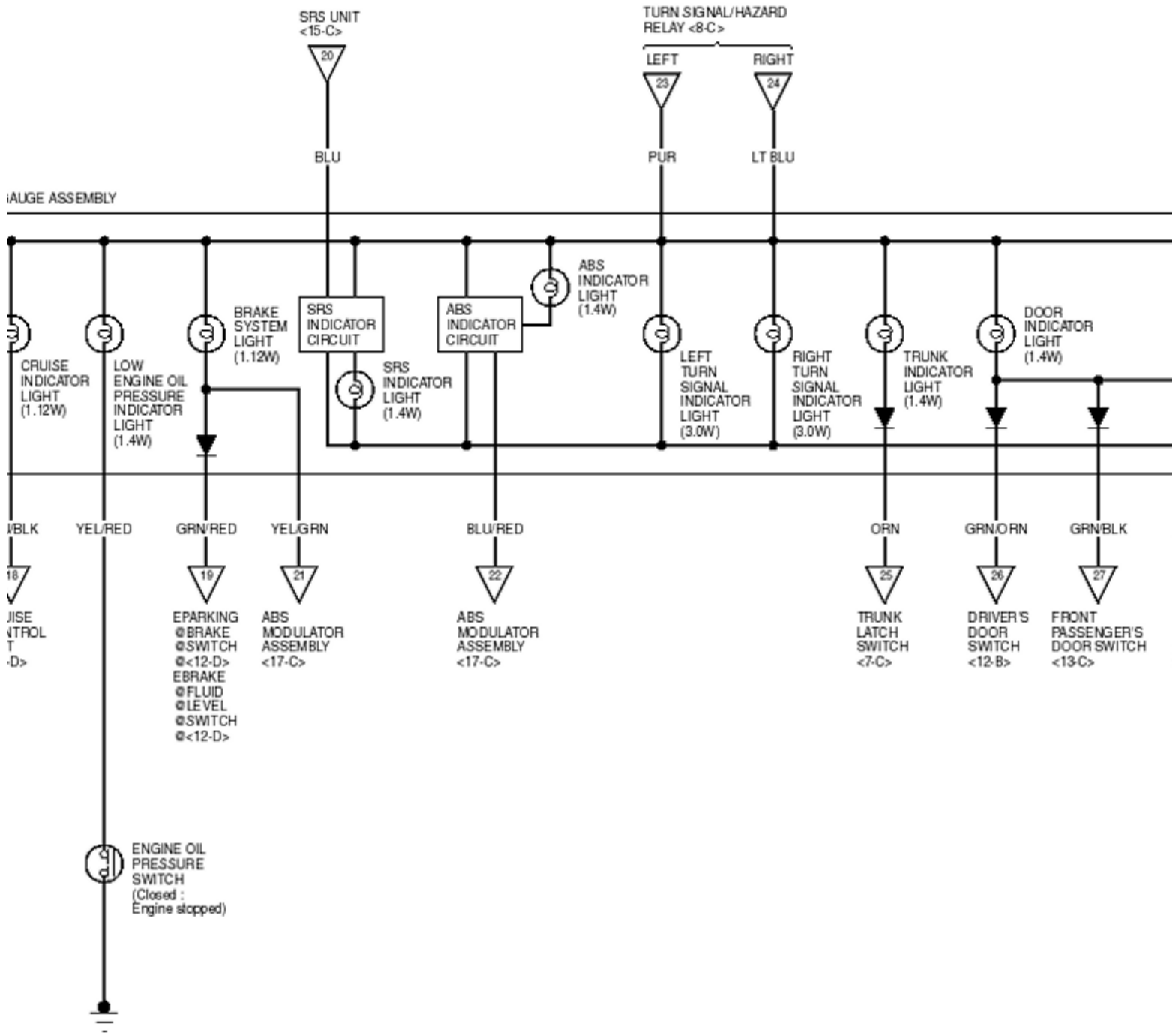
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ID

Wiring Diagrams

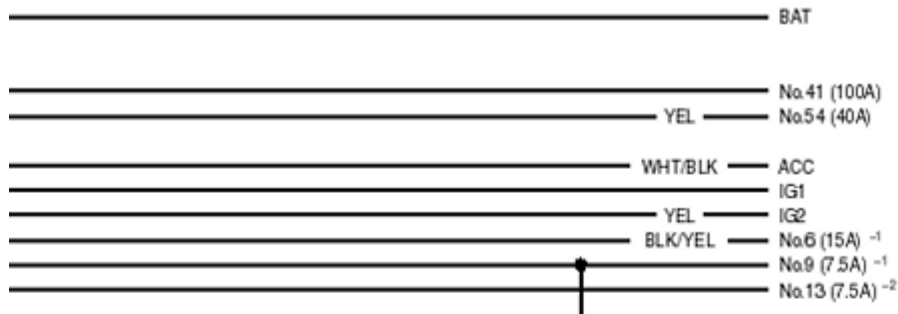
Indicators - ABS Indicator



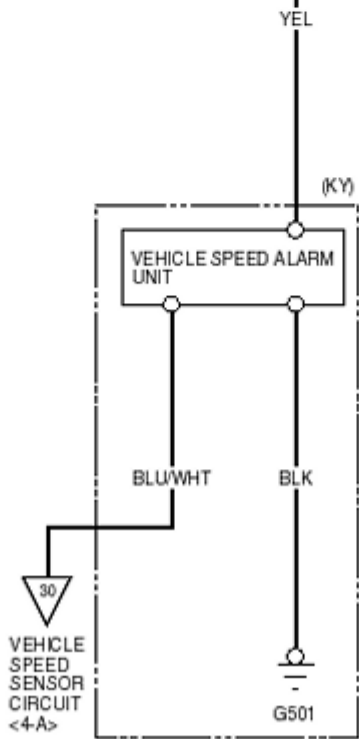
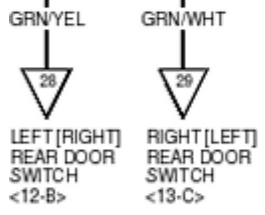
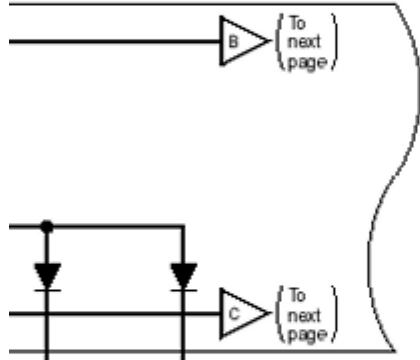




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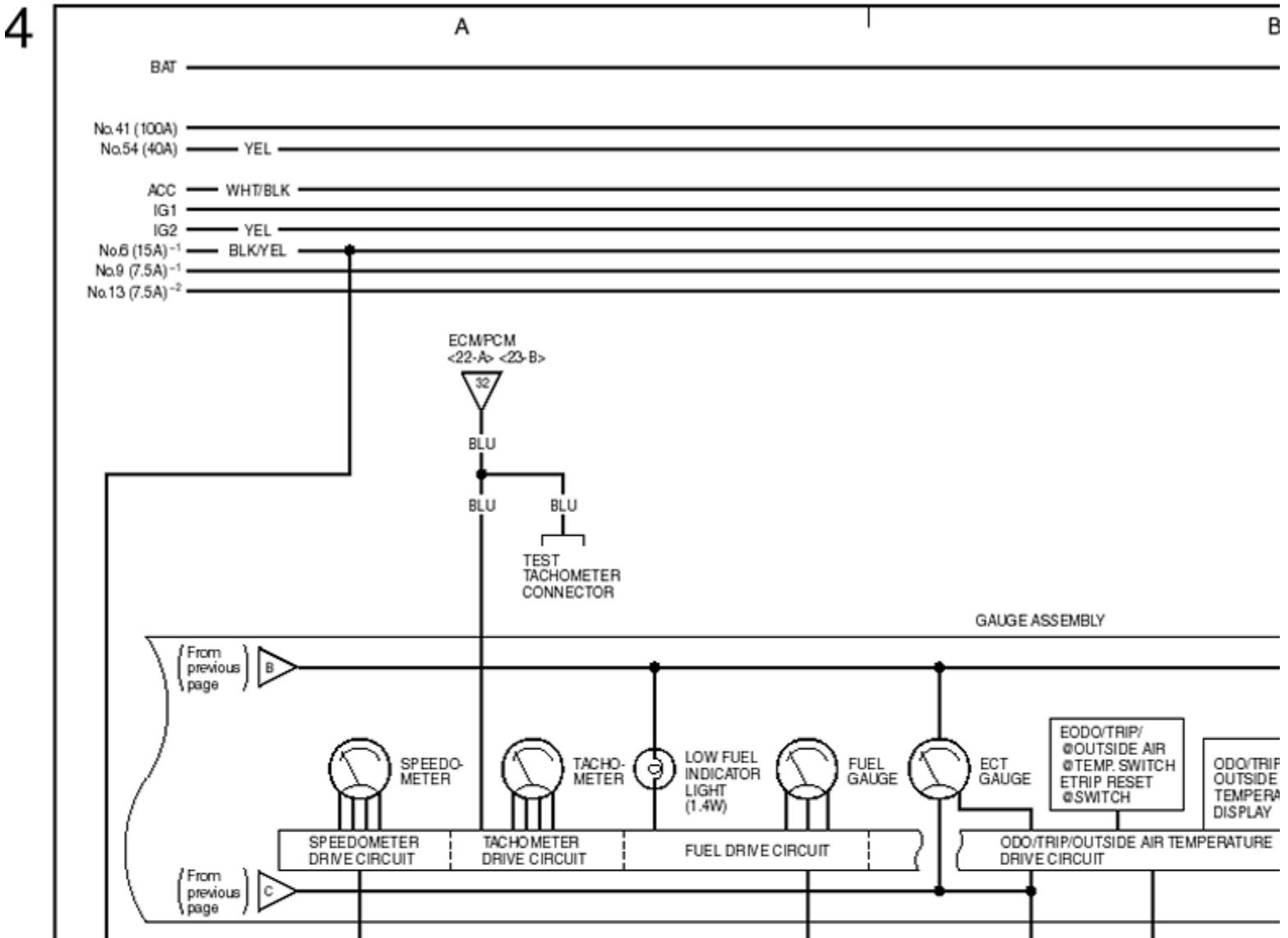
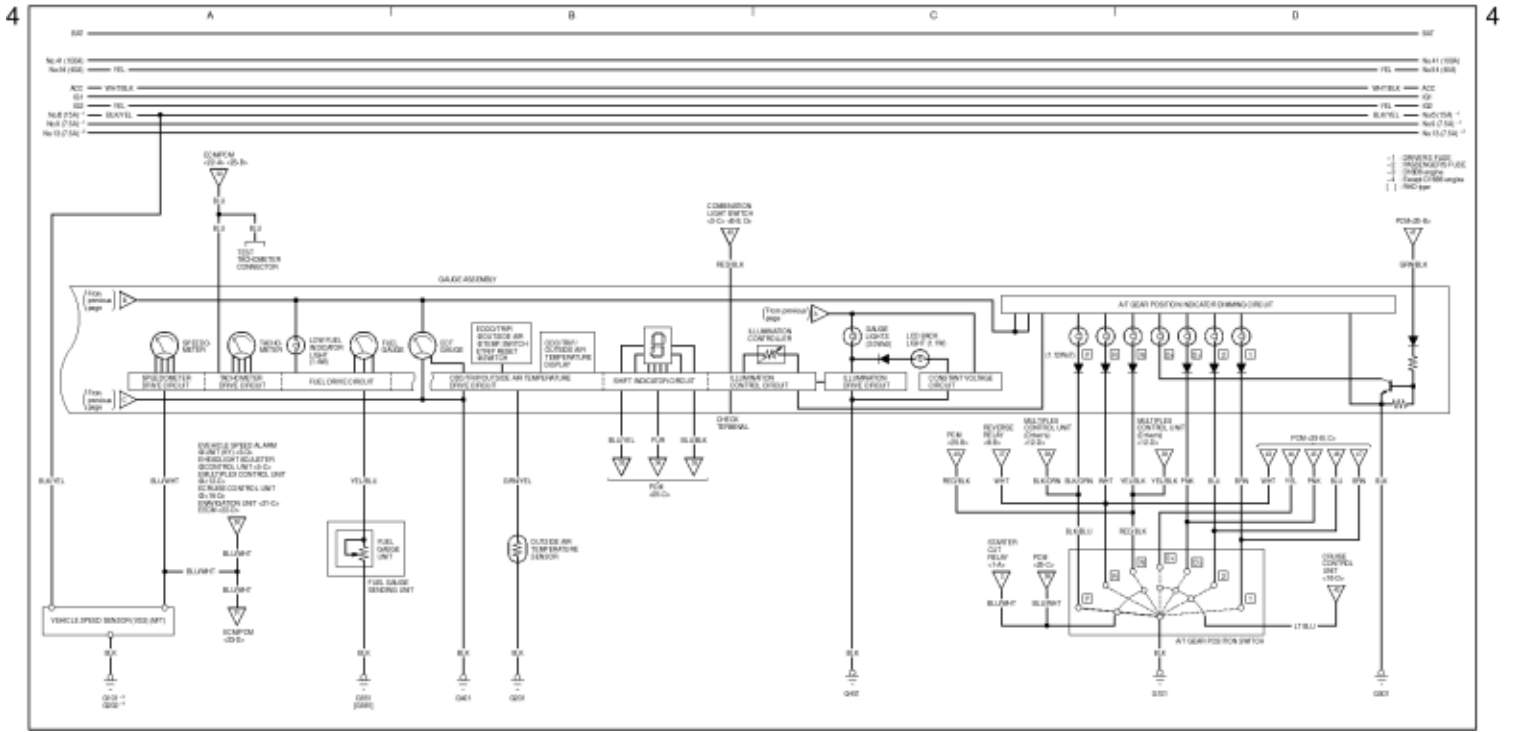


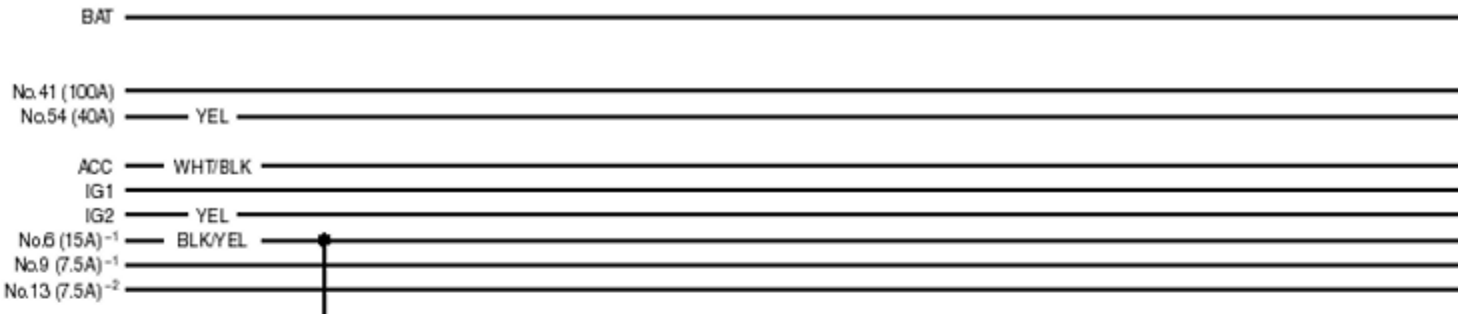
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



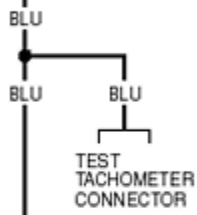
Wiring Diagrams

Indicators - A/T Gear Position Indicator

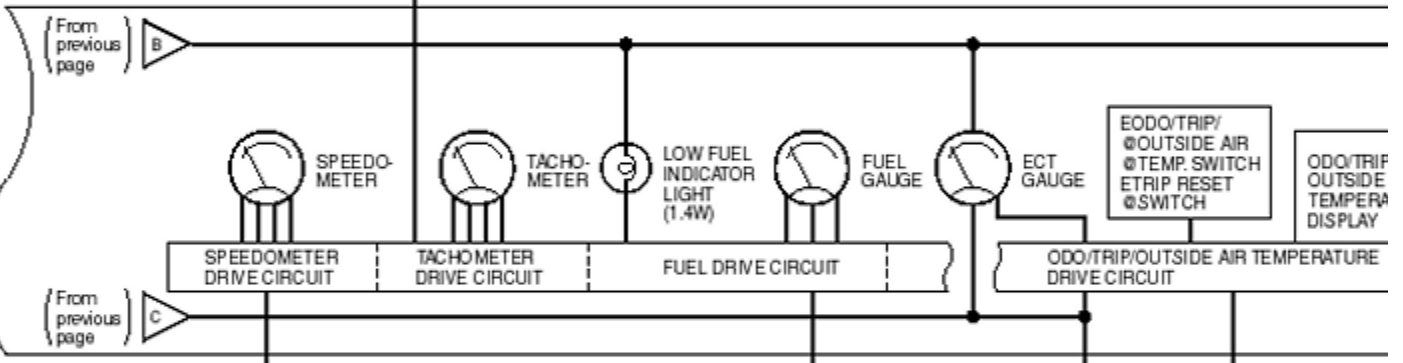




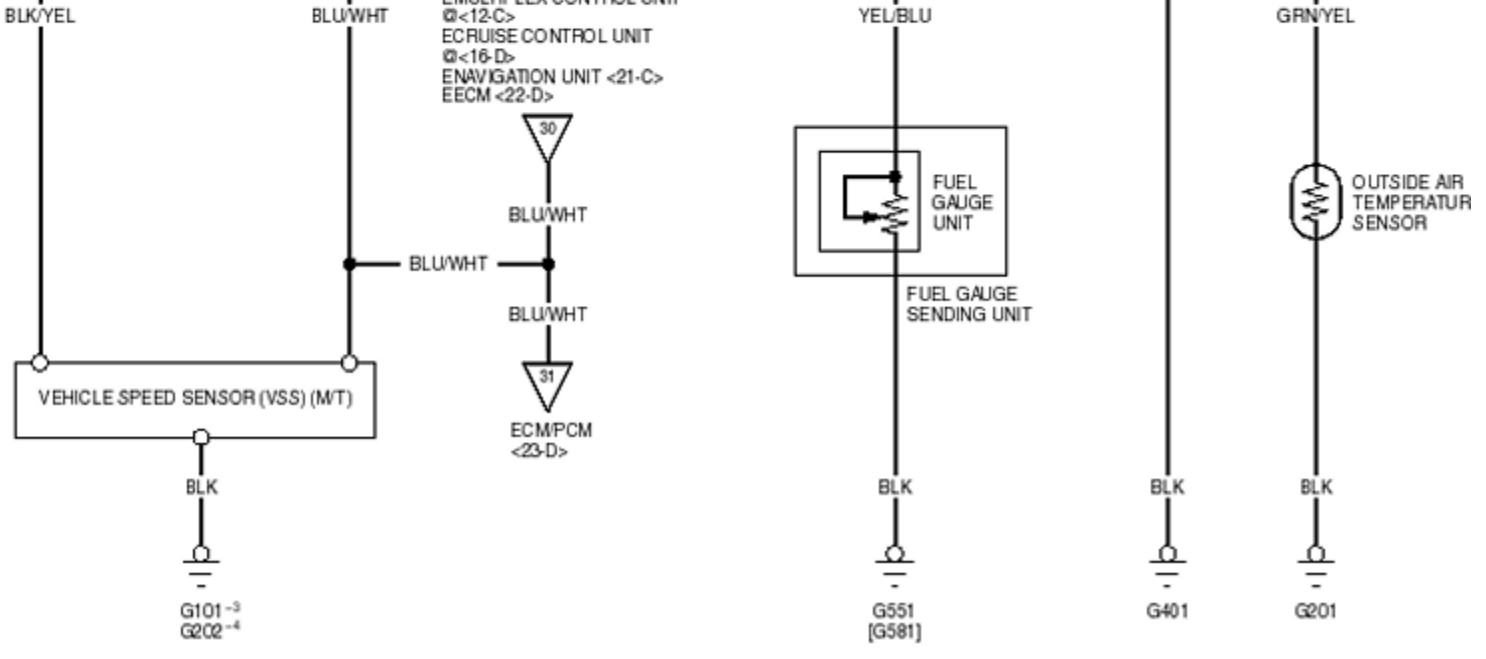
ECM/PCM <22-A> <23-B>

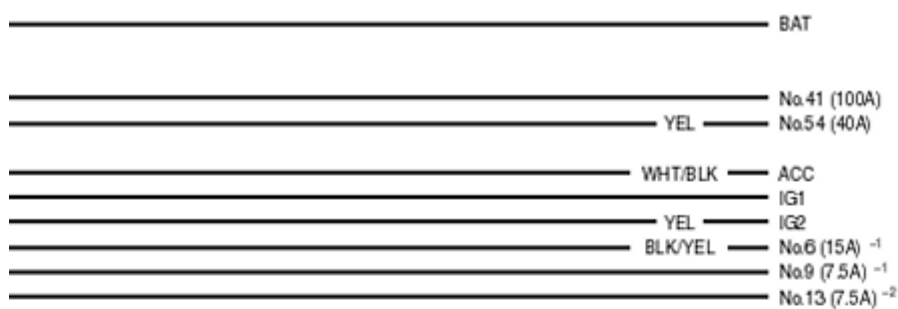
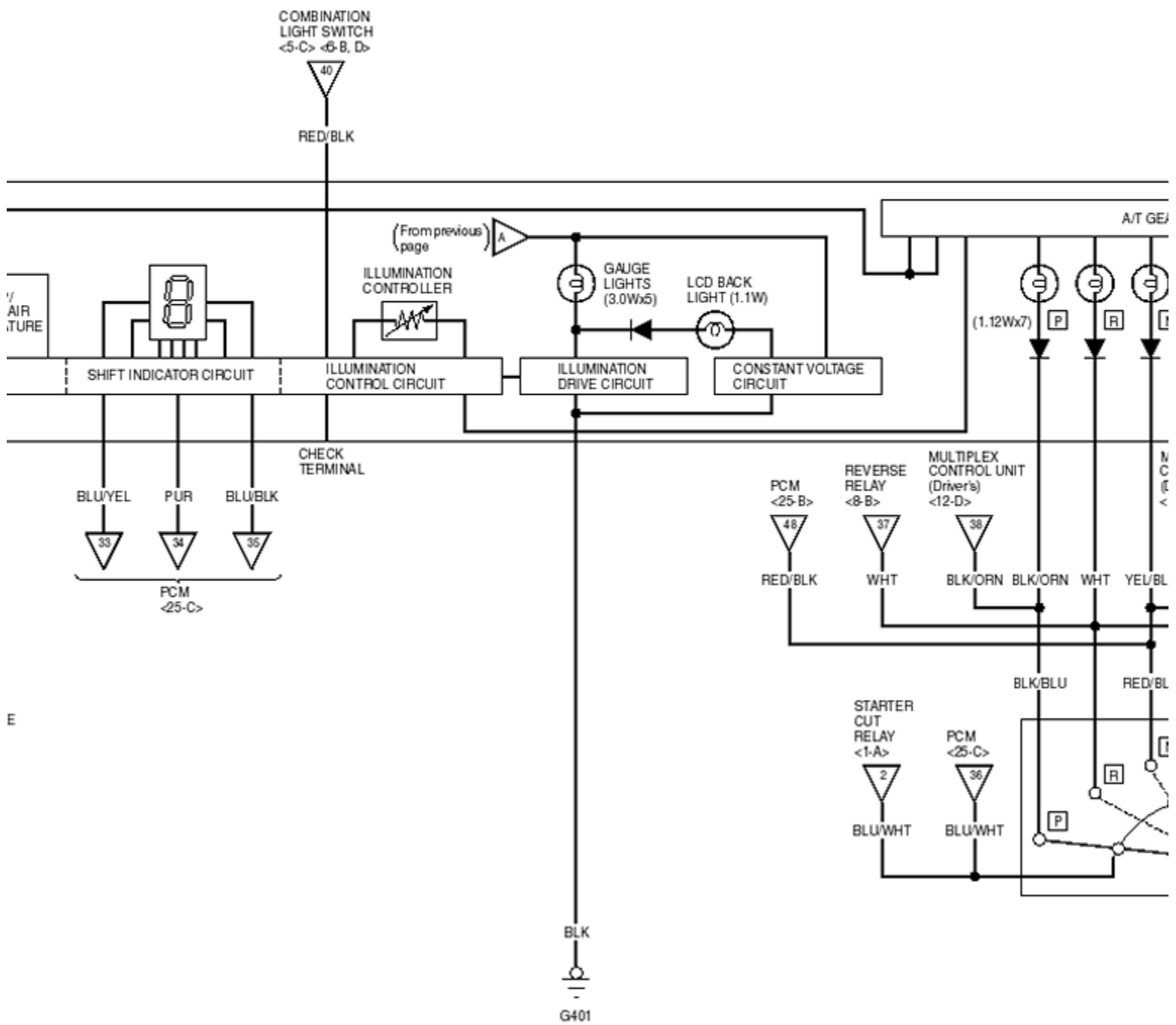


GAUGE ASSEMBLY

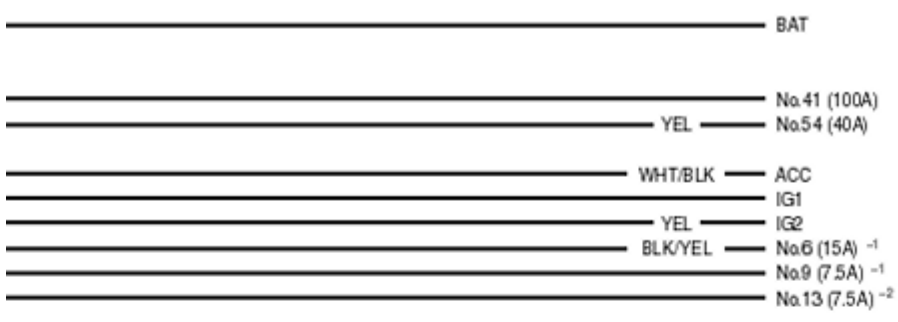


- VEHICLE SPEED ALARM UNIT (KY) <3-D>
- EHEADLIGHT ADJUSTER CONTROL UNIT <5-C>
- EMULTIPLEX CONTROL UNIT <12-C>
- ECRUISE CONTROL UNIT <16-D>
- ENAVIGATION UNIT <21-C>
- EECM <22-D>

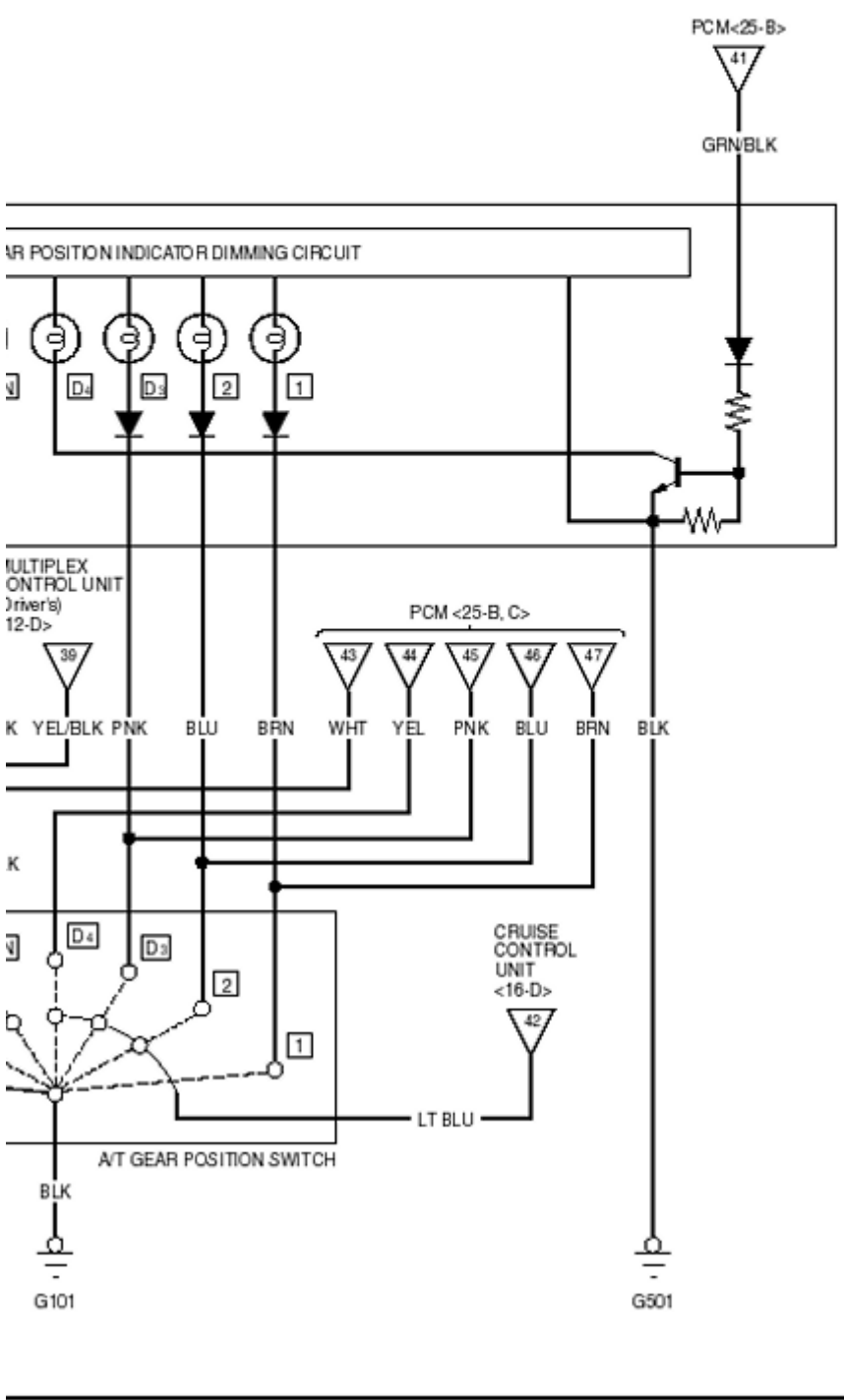


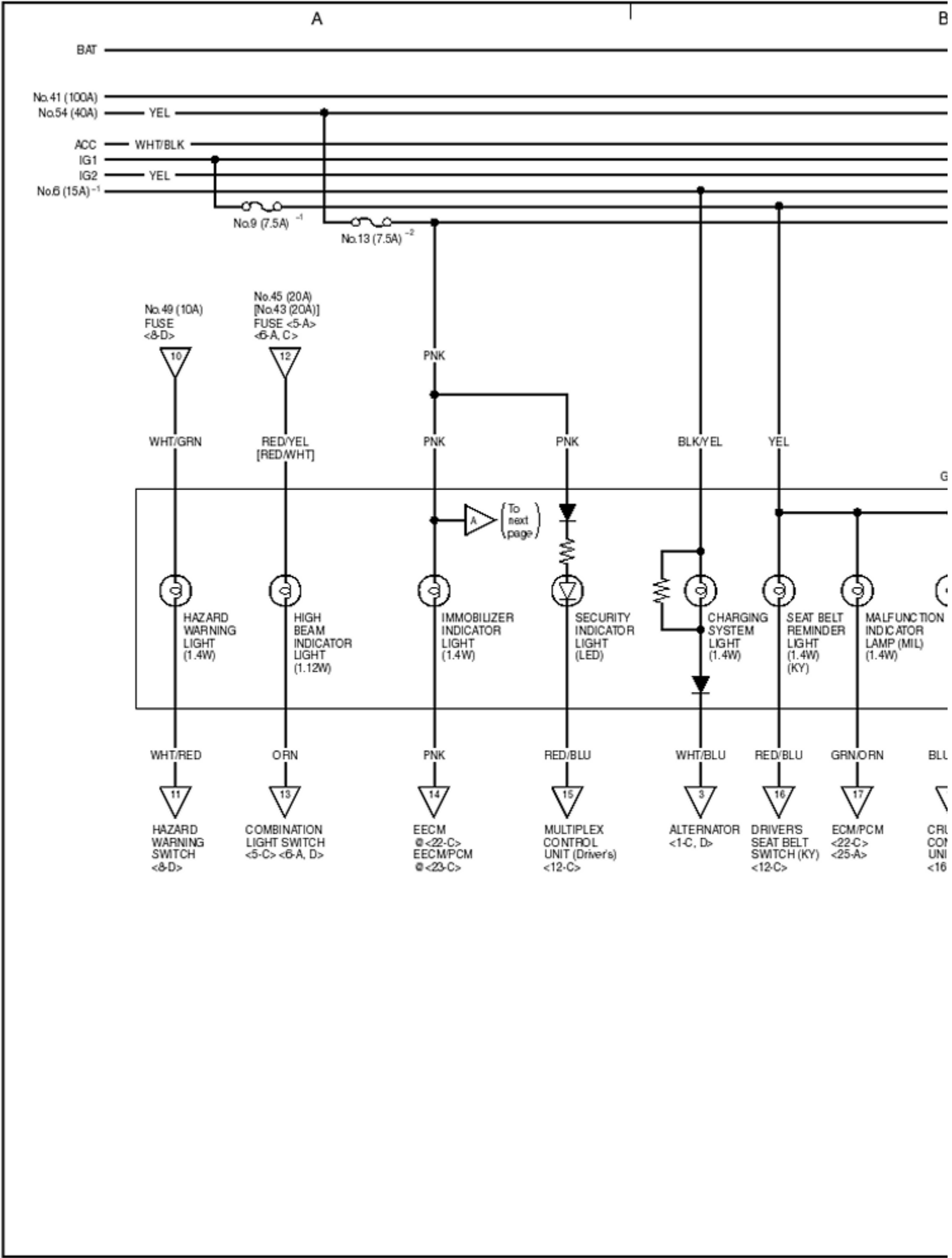


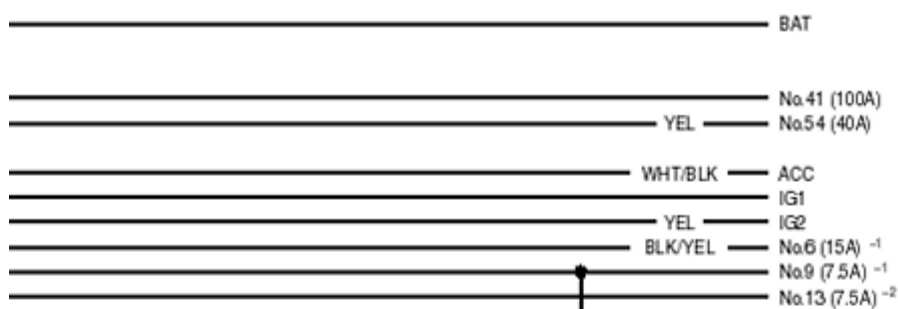
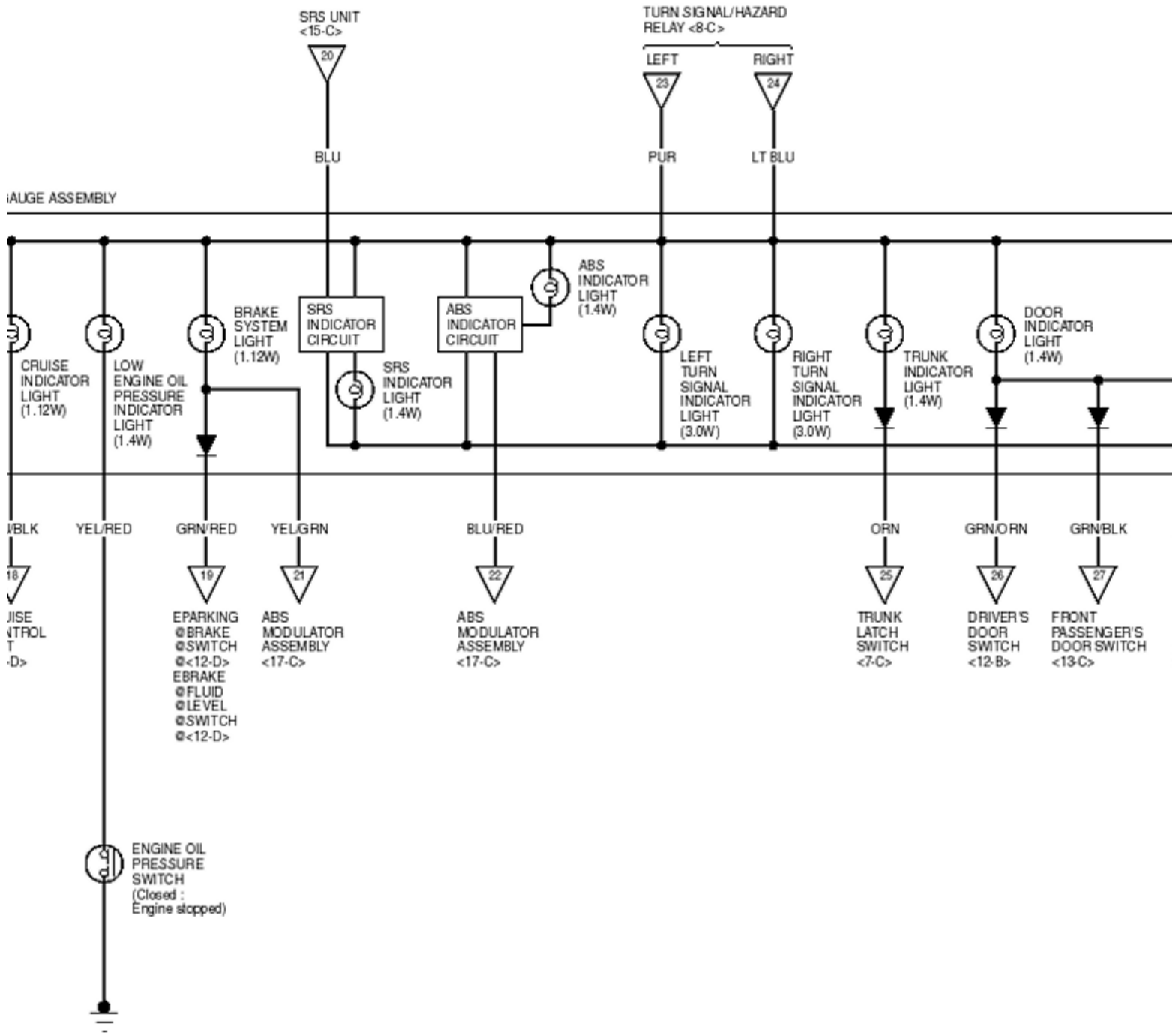
D



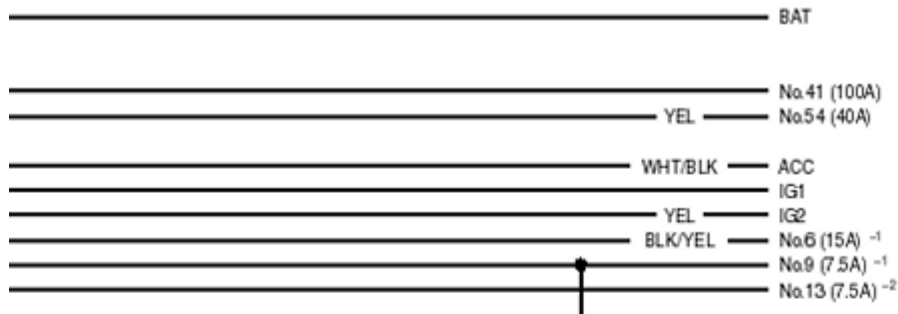
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : D16B6 engine
- 4 : Except D16B6 engine
- [] : RHD type



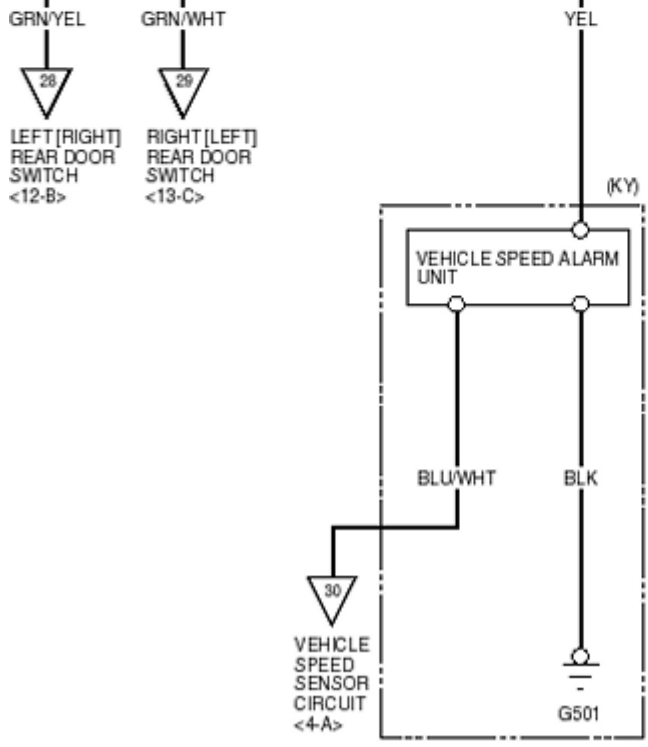
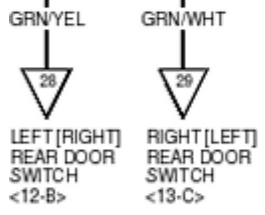
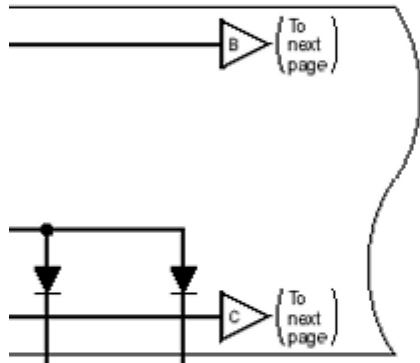




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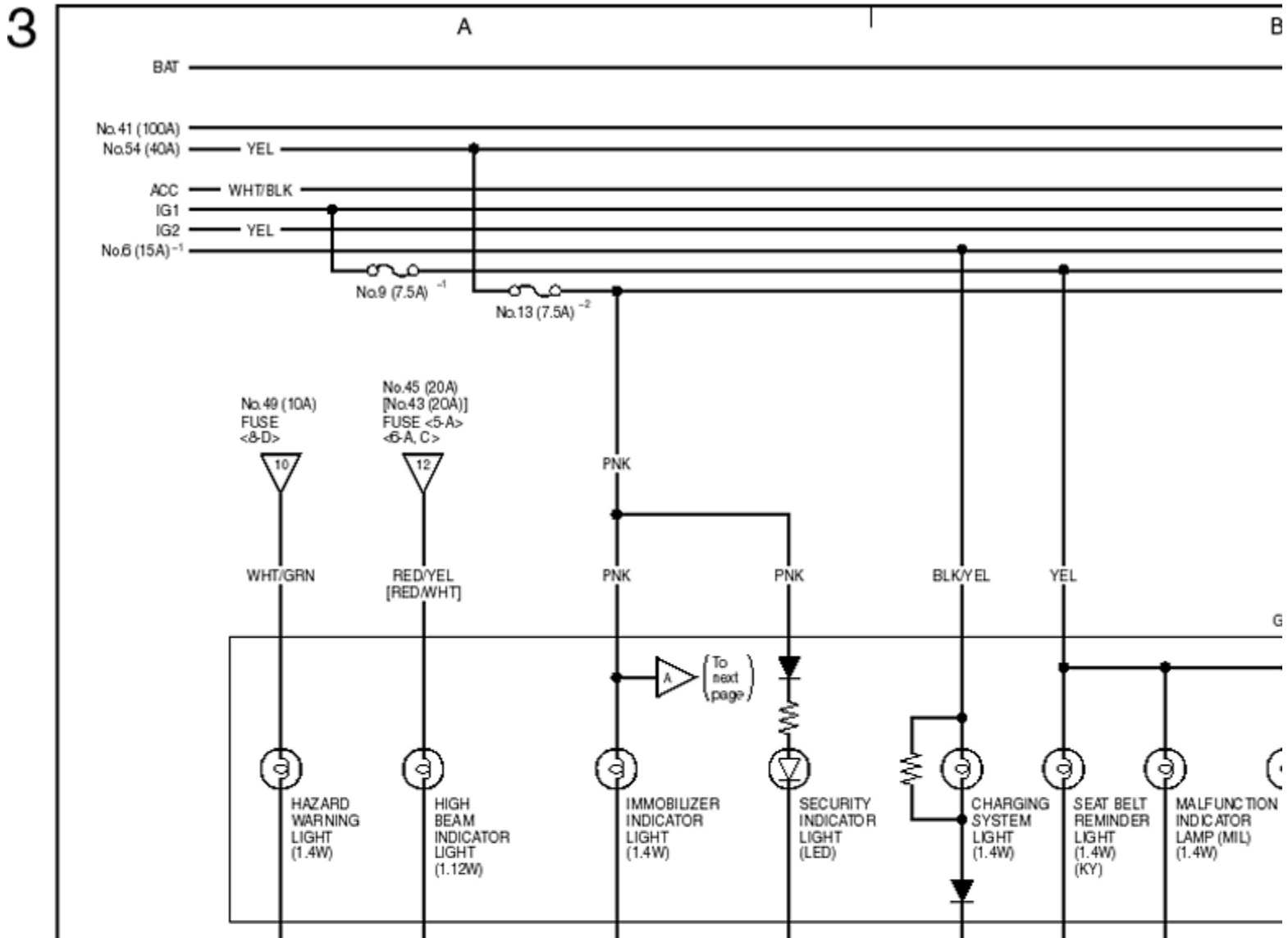
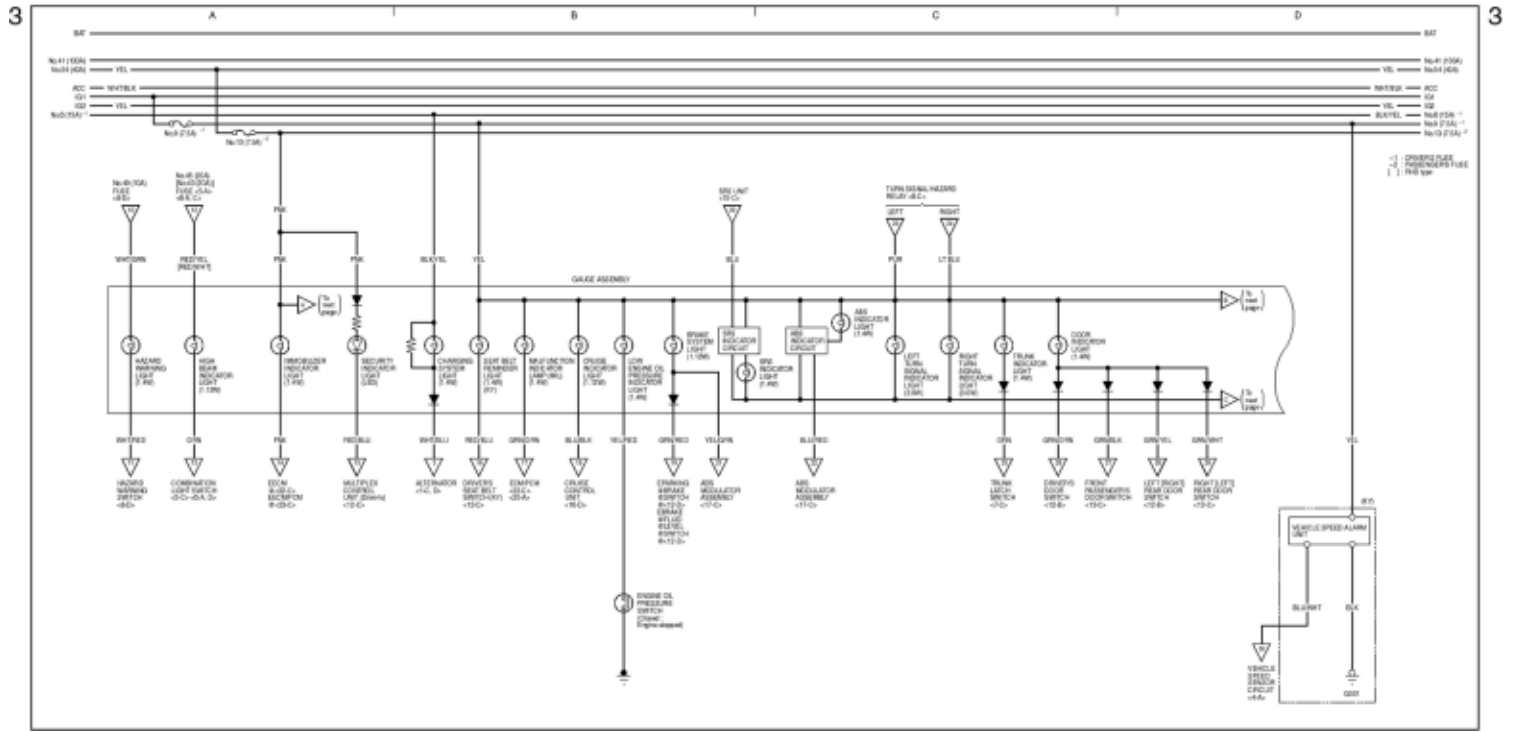


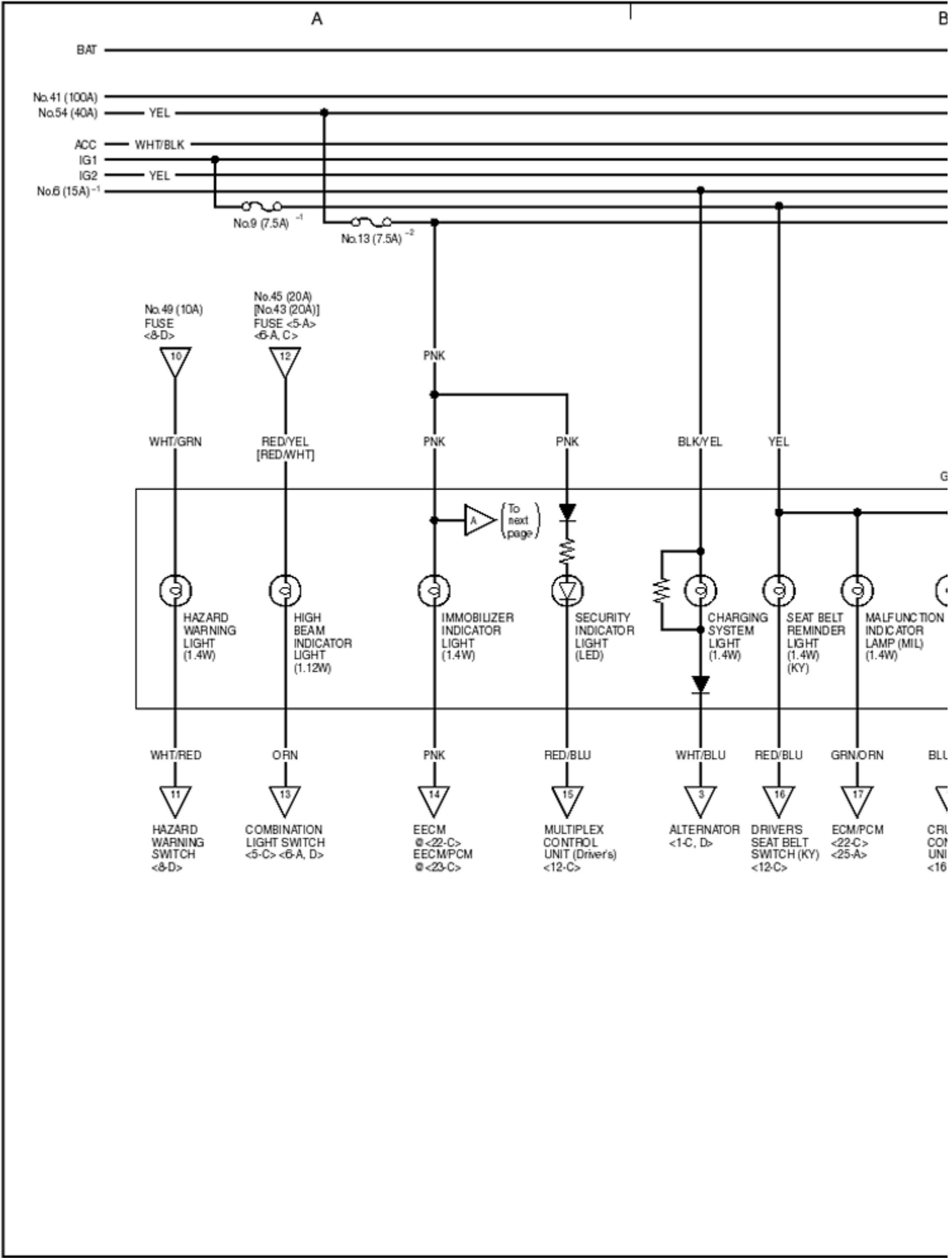
-1 : DRIVER'S FUSE
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[] : RHD type

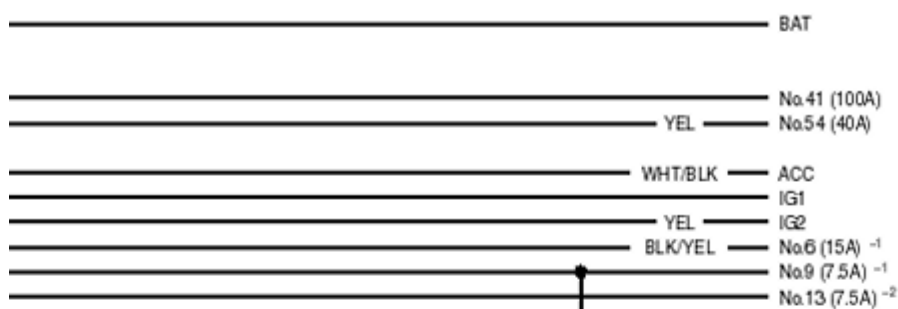
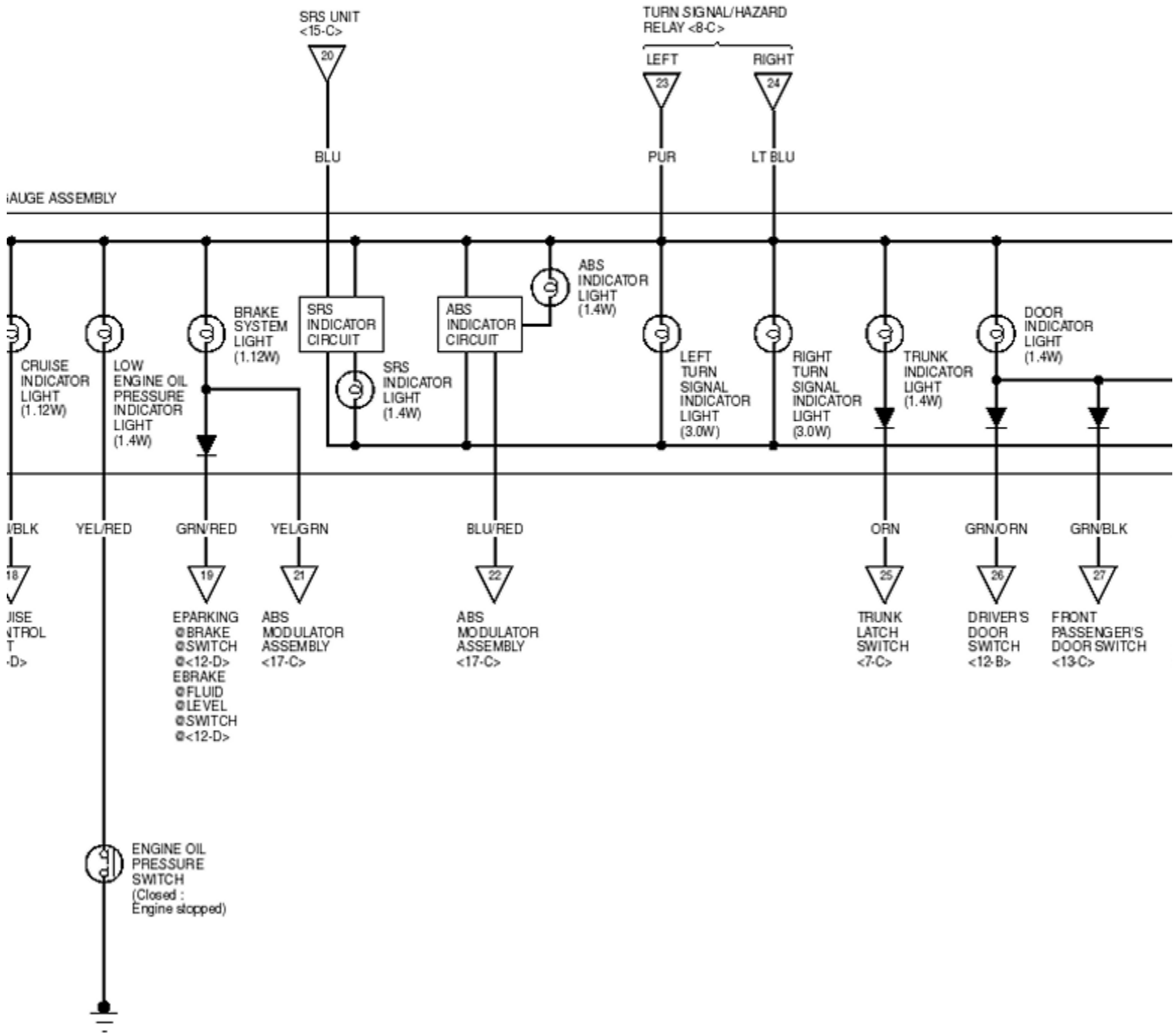


Wiring Diagrams

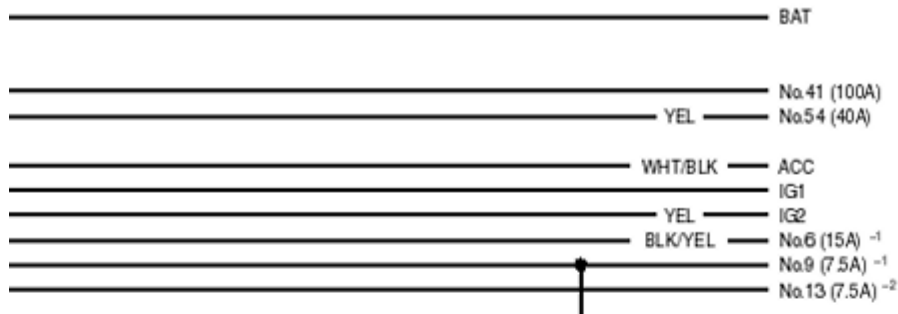
Indicators - Door Indicator



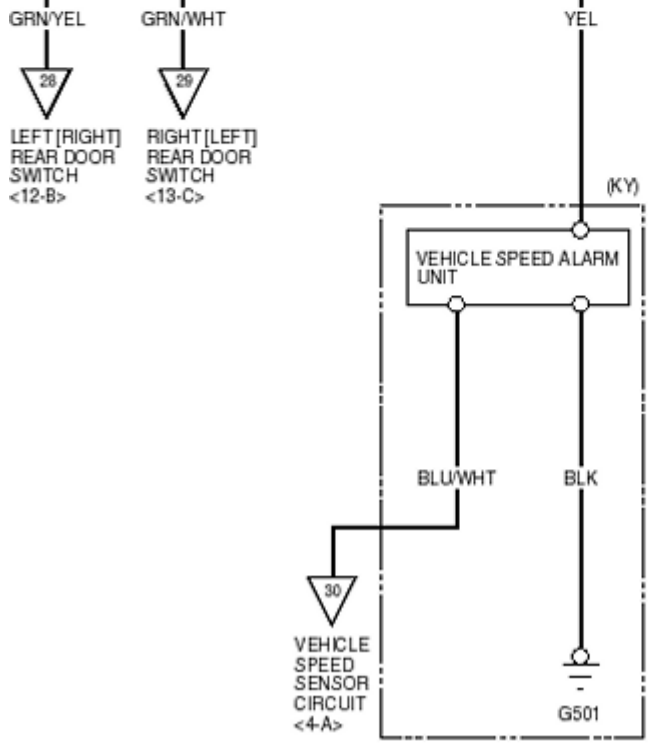
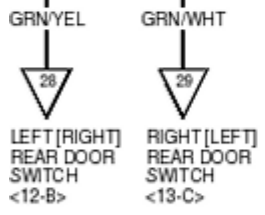
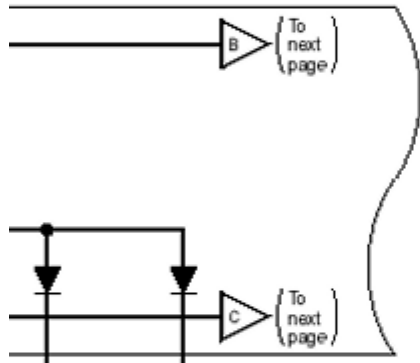




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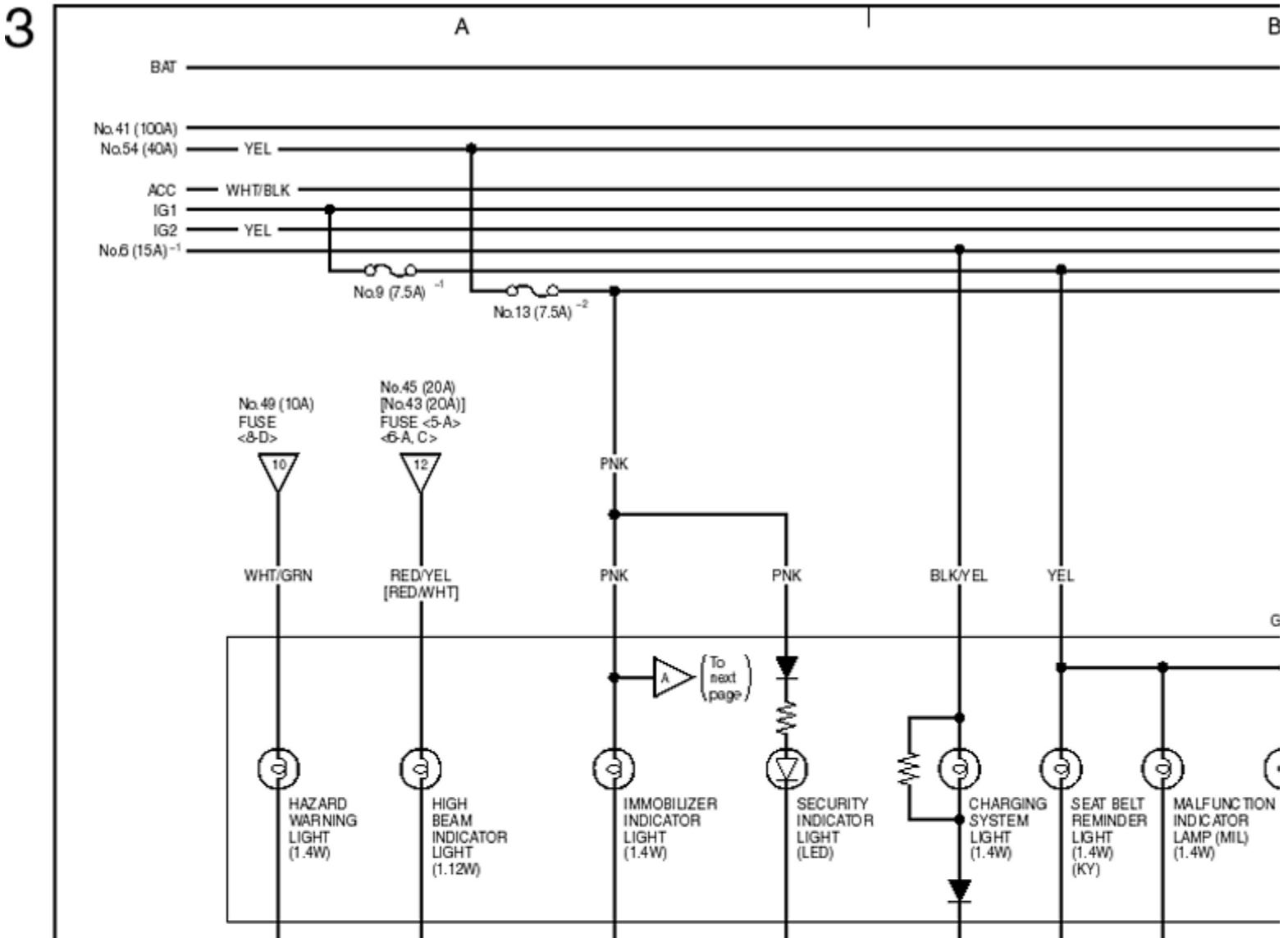
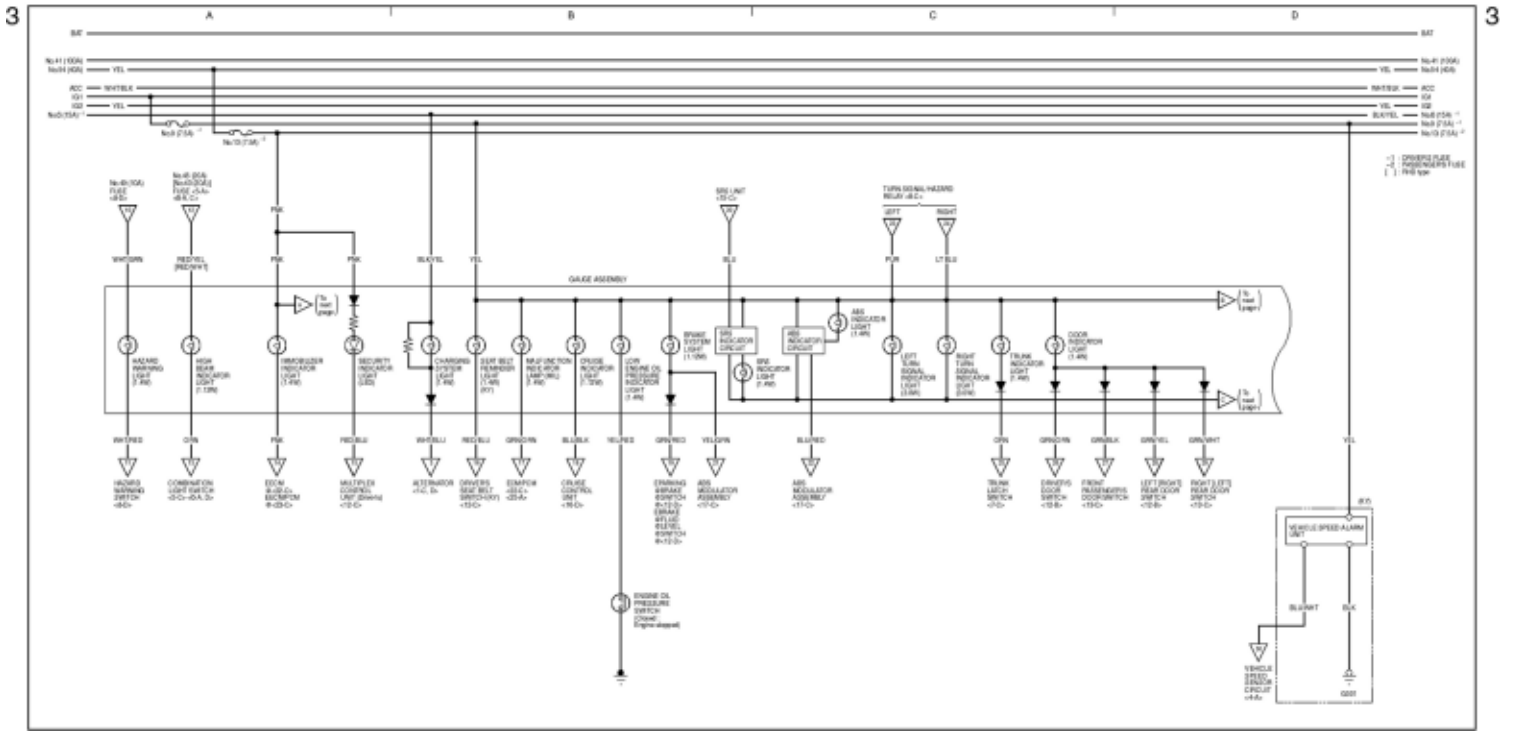


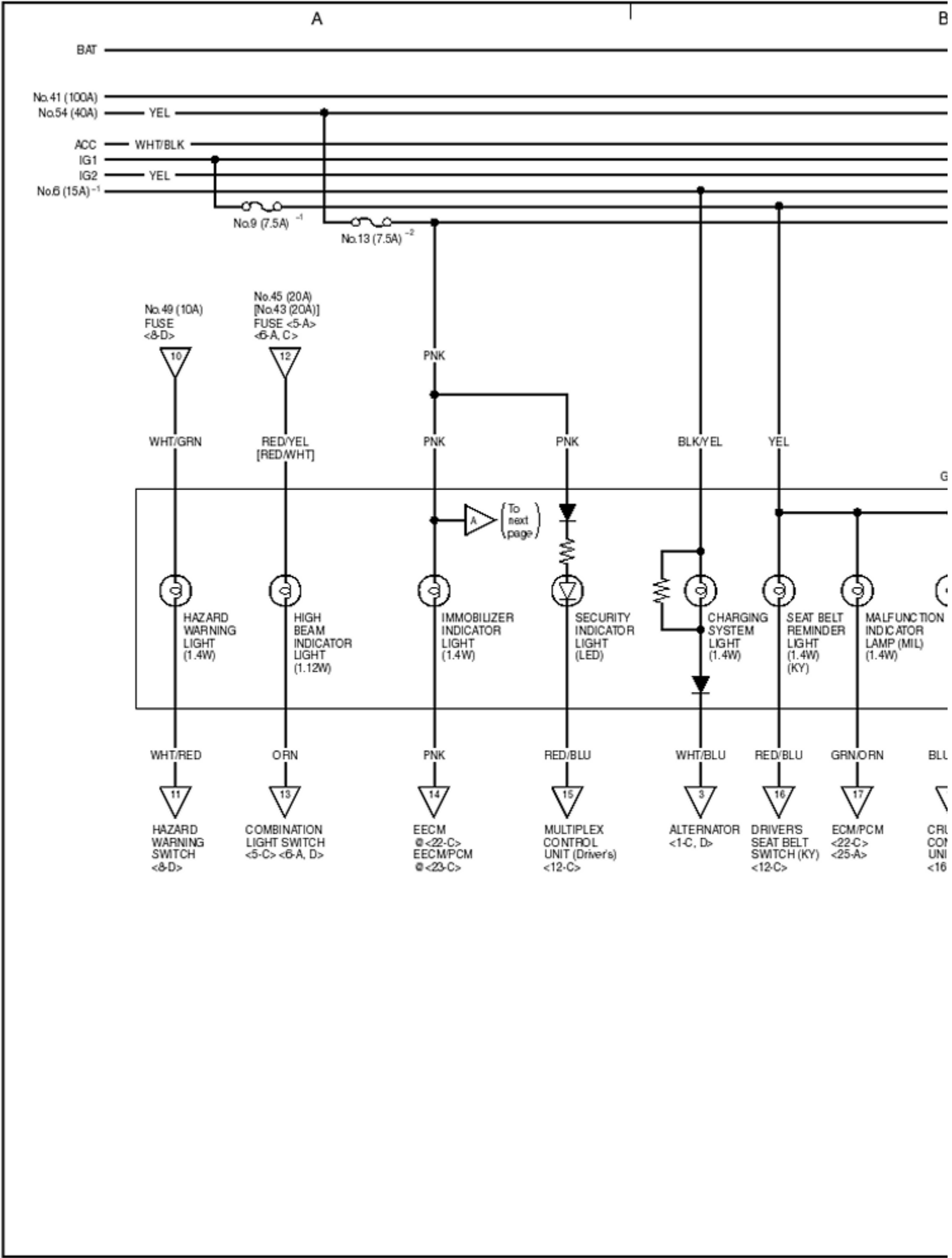
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type

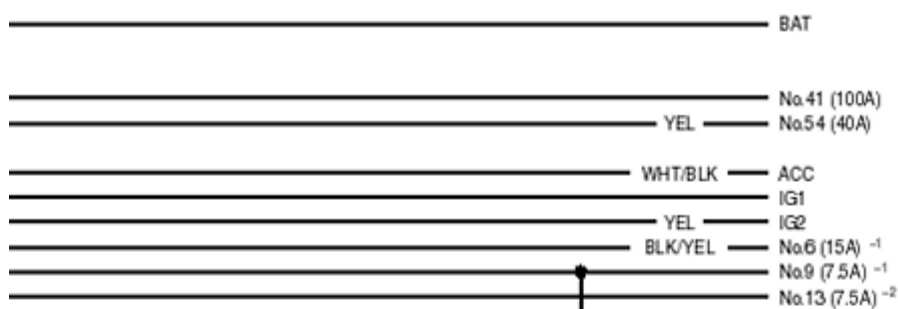
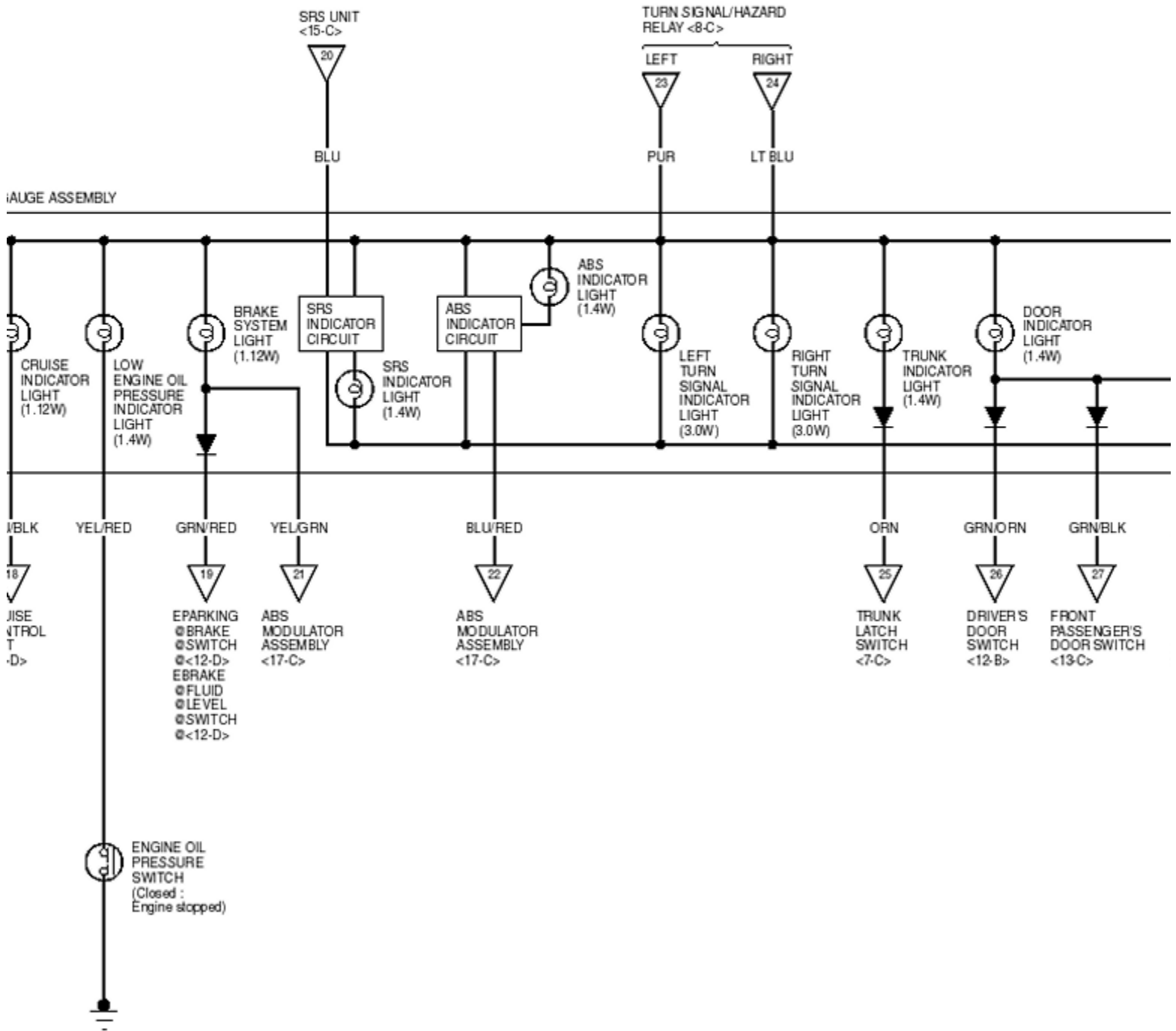


Wiring Diagrams

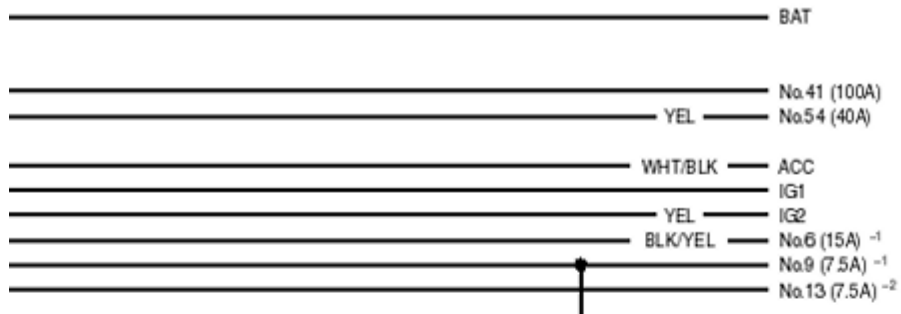
Indicators - High Beam Indicator



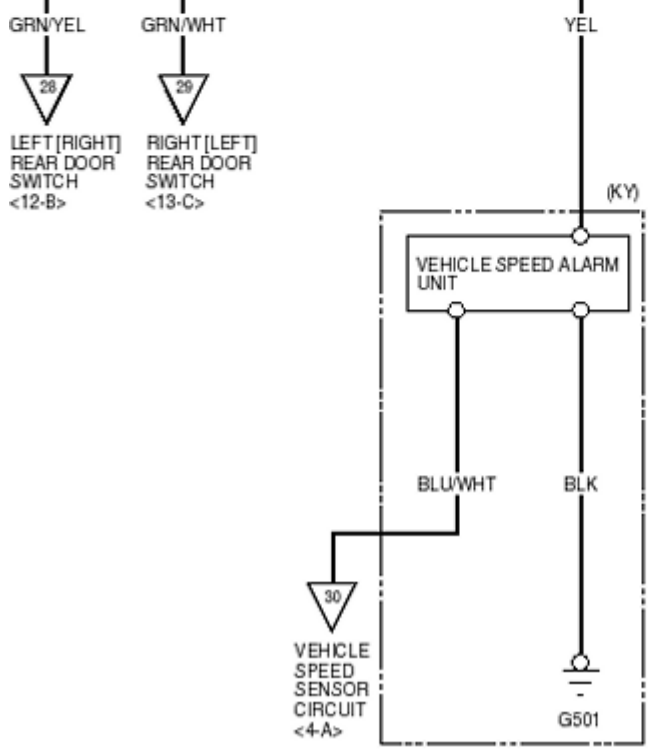
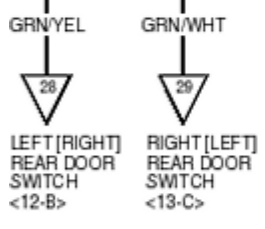
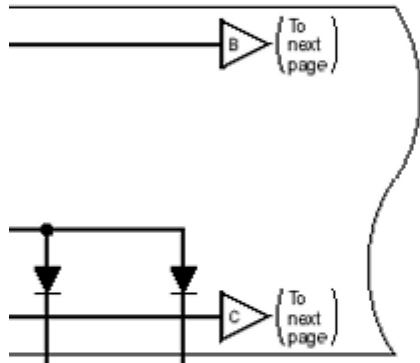


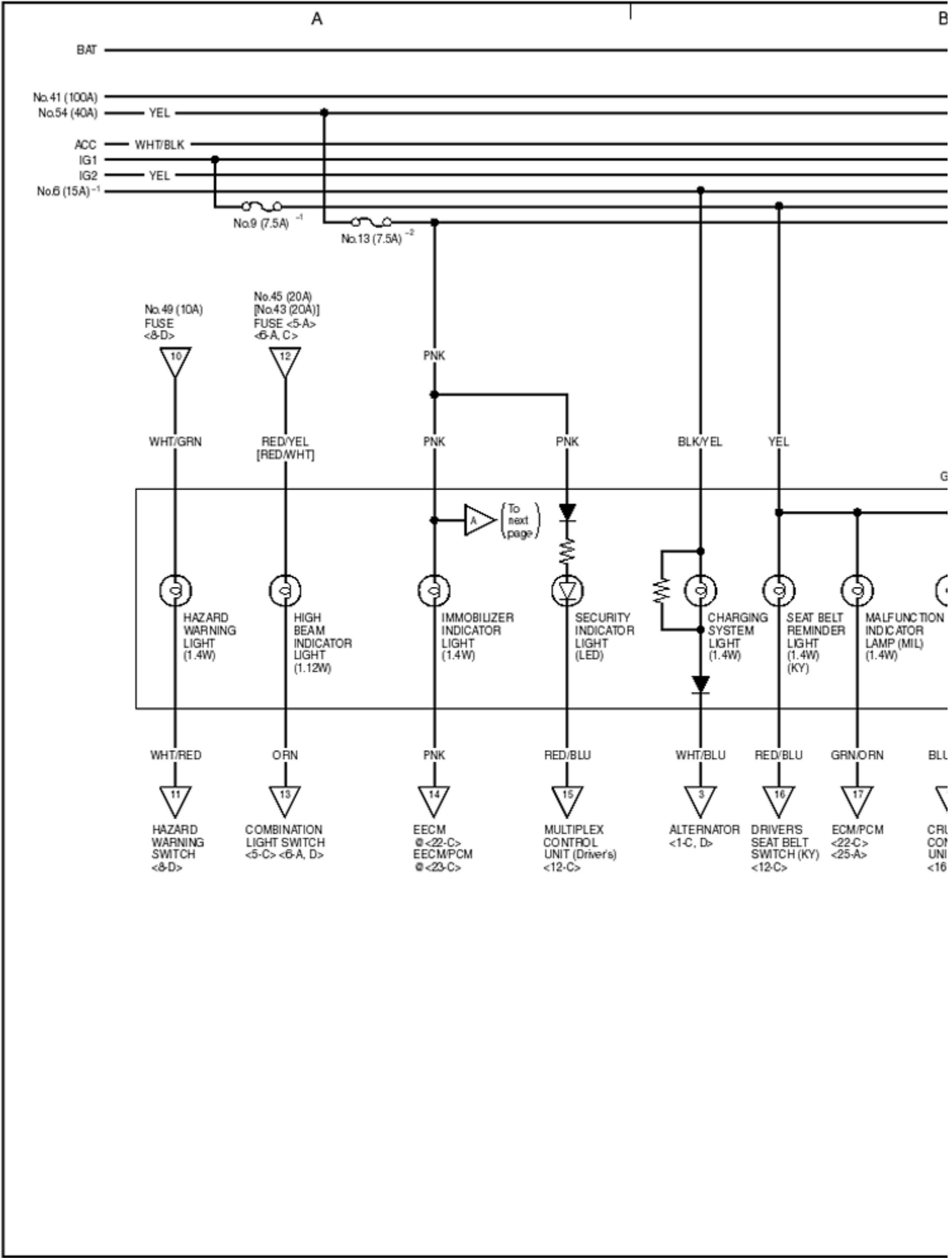


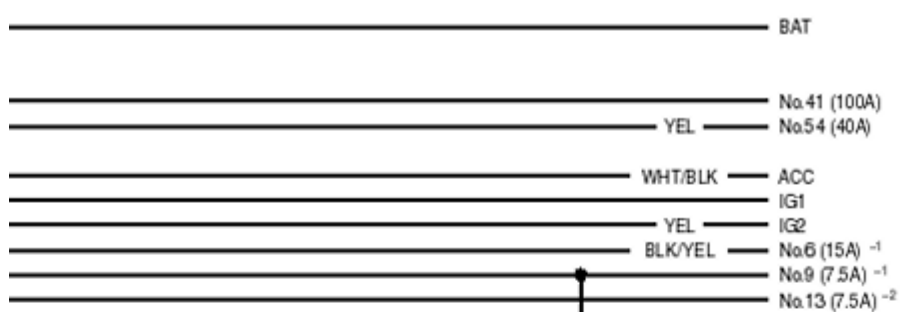
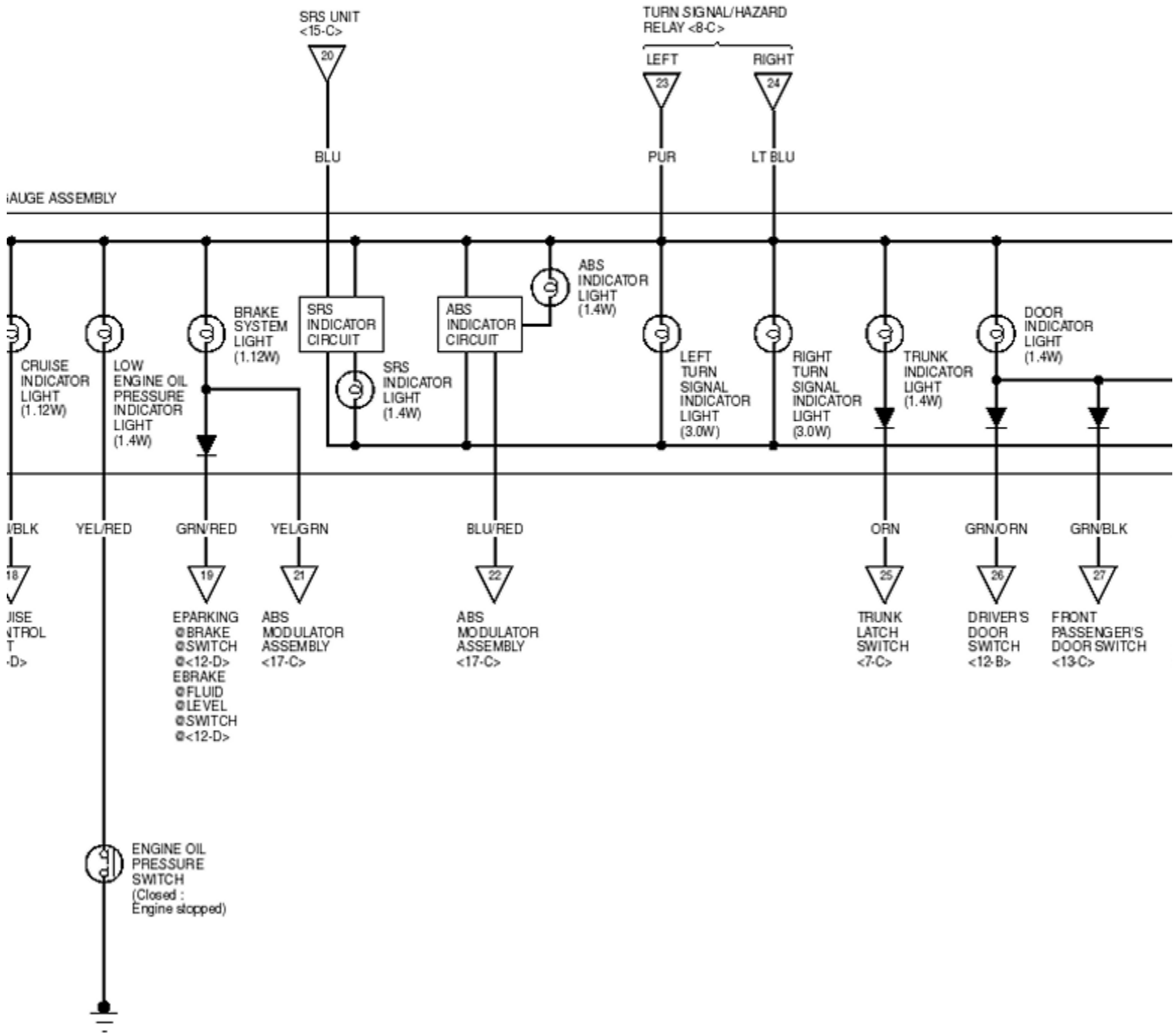
D



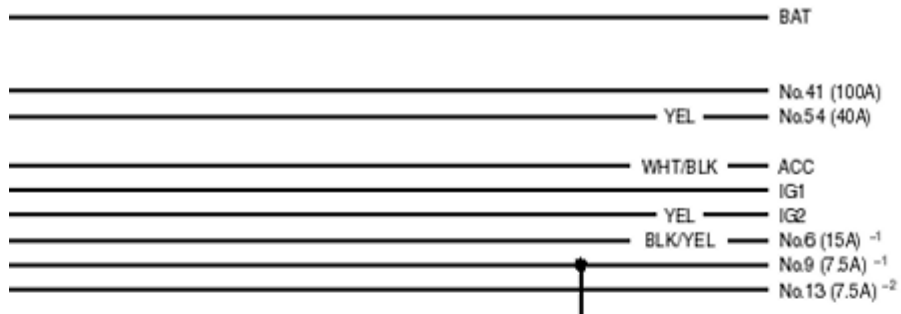
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-2 : PASSENGER'S FUSE
[] : RHD type



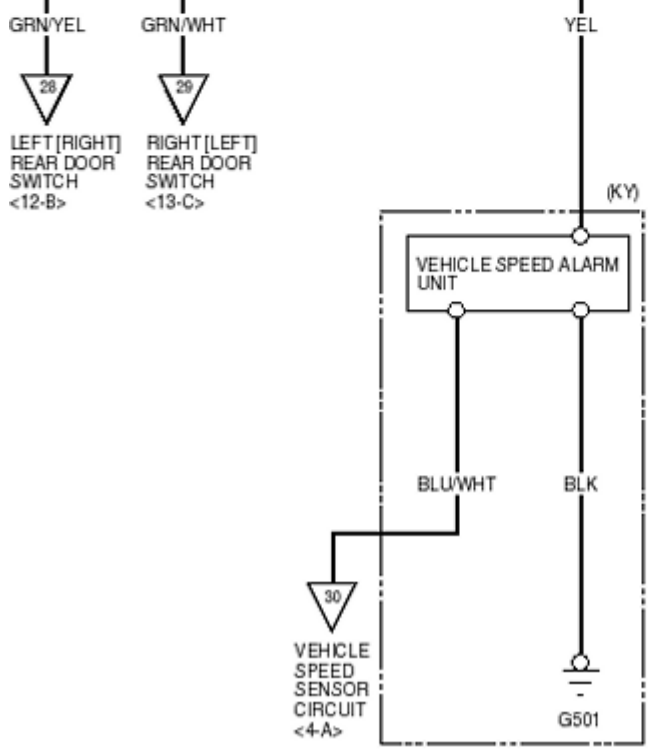
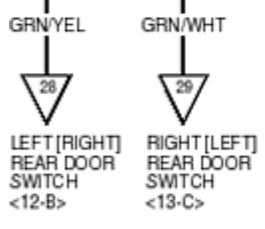
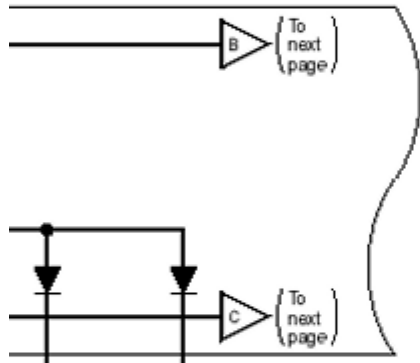


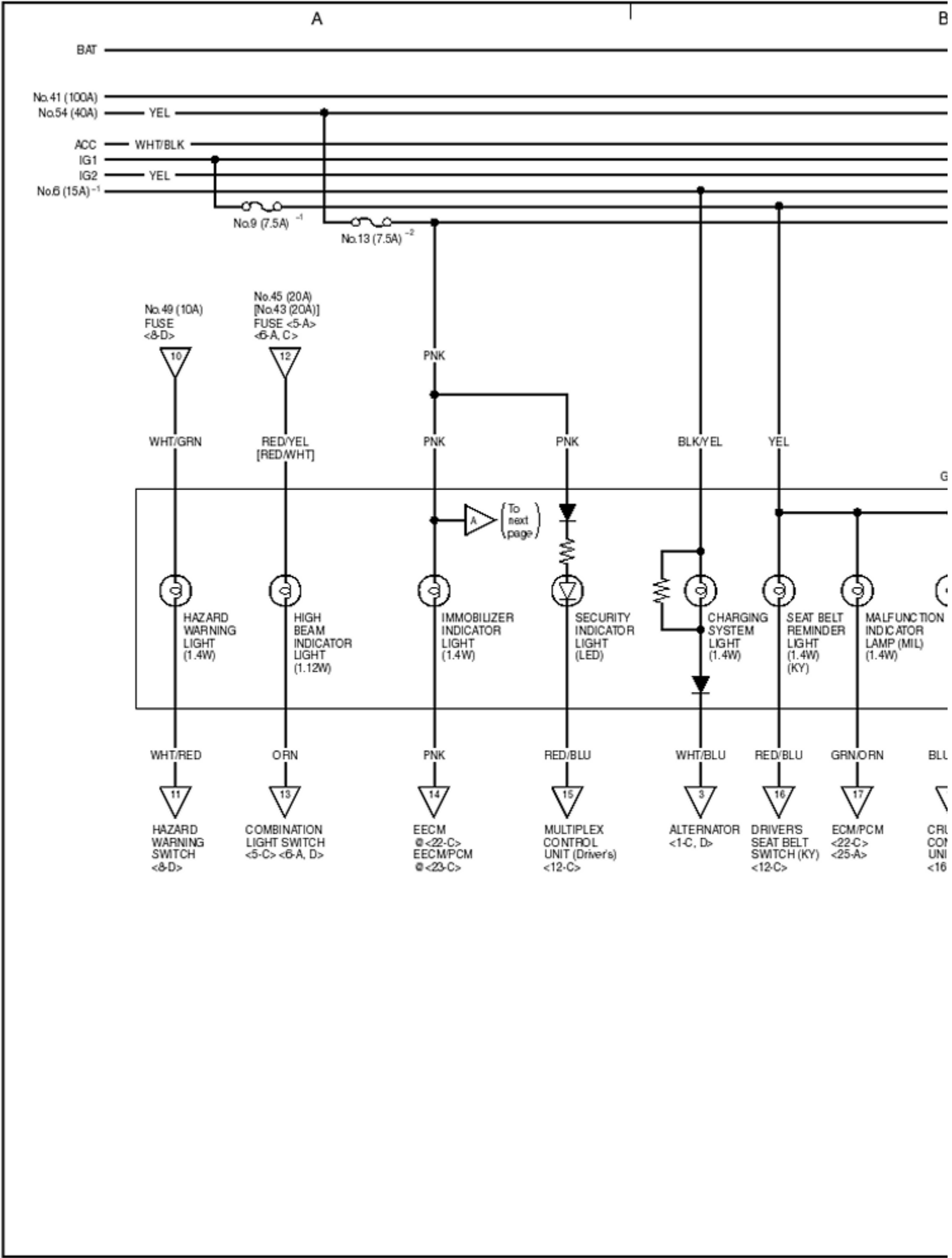


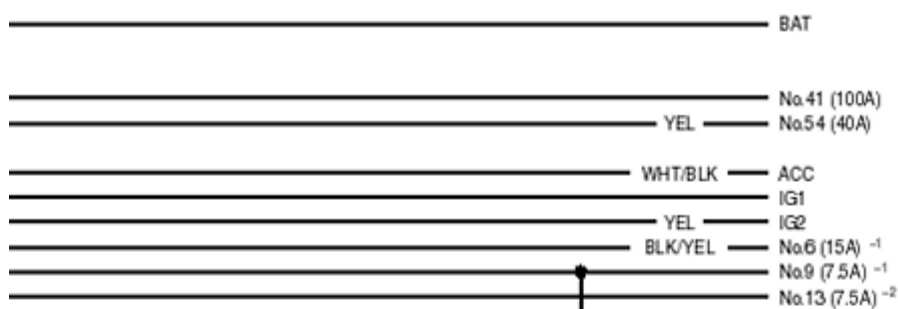
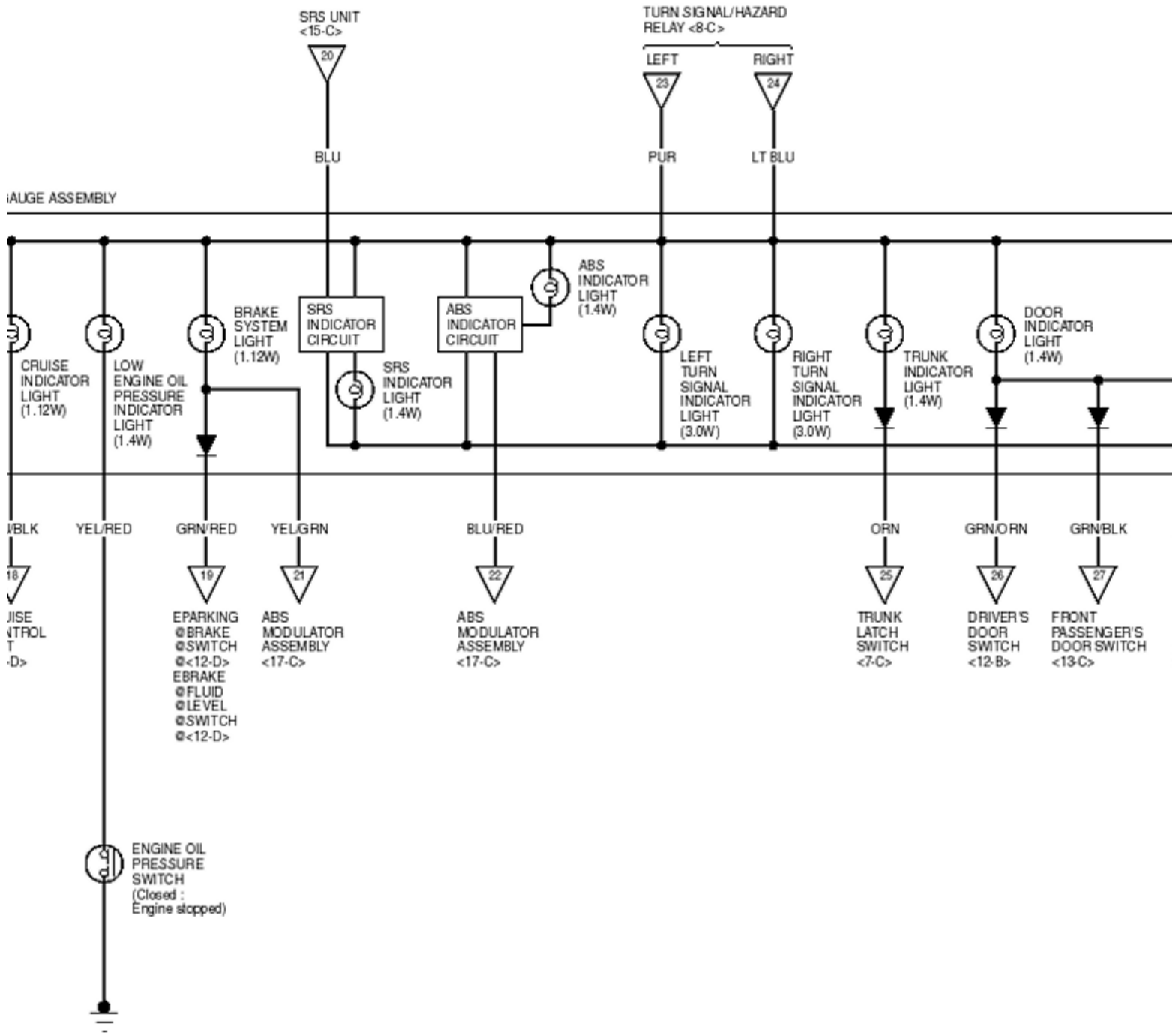
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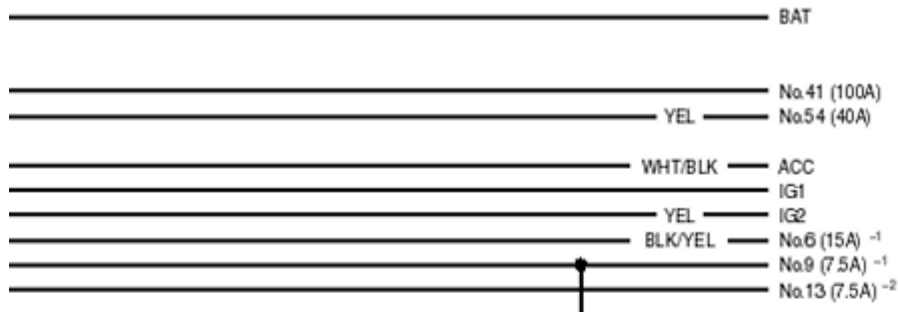
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



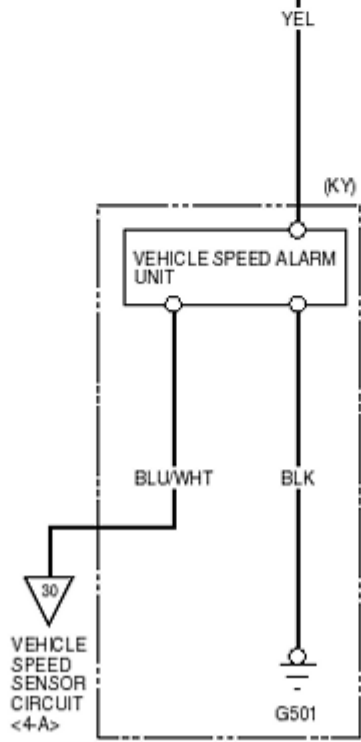
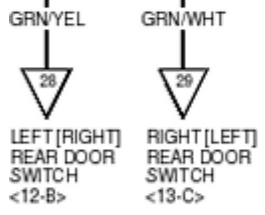
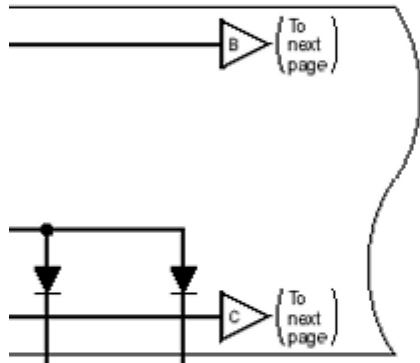




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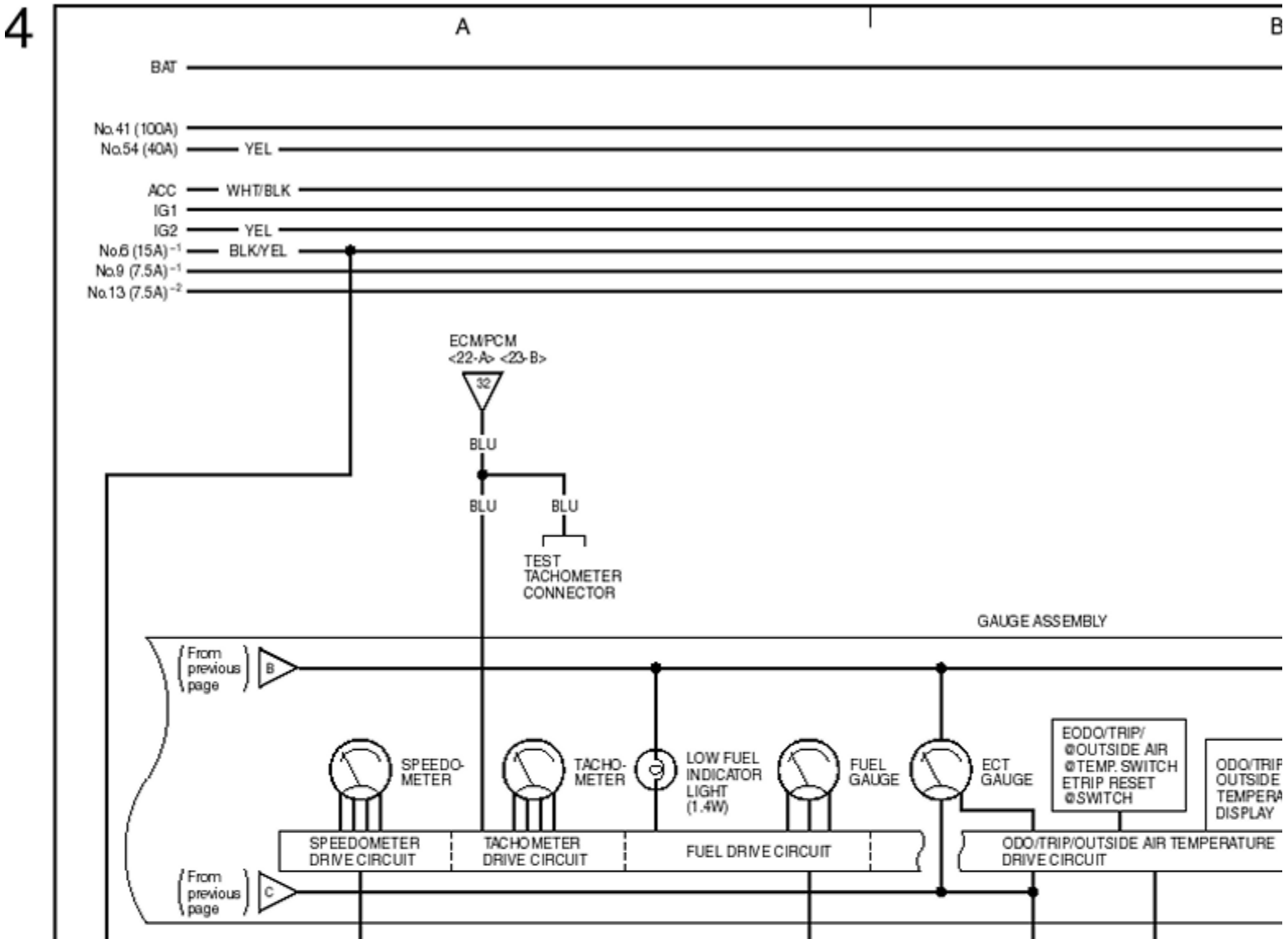
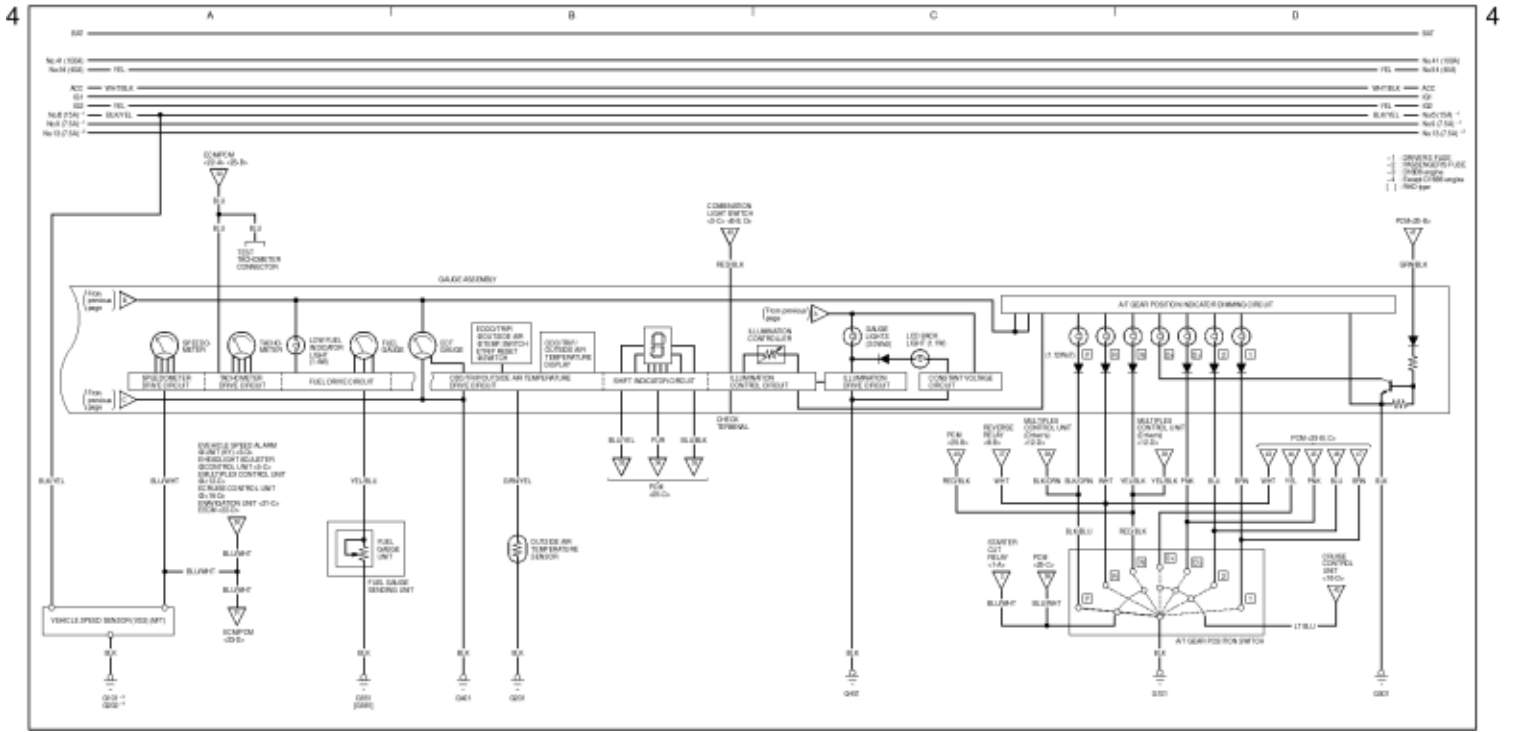


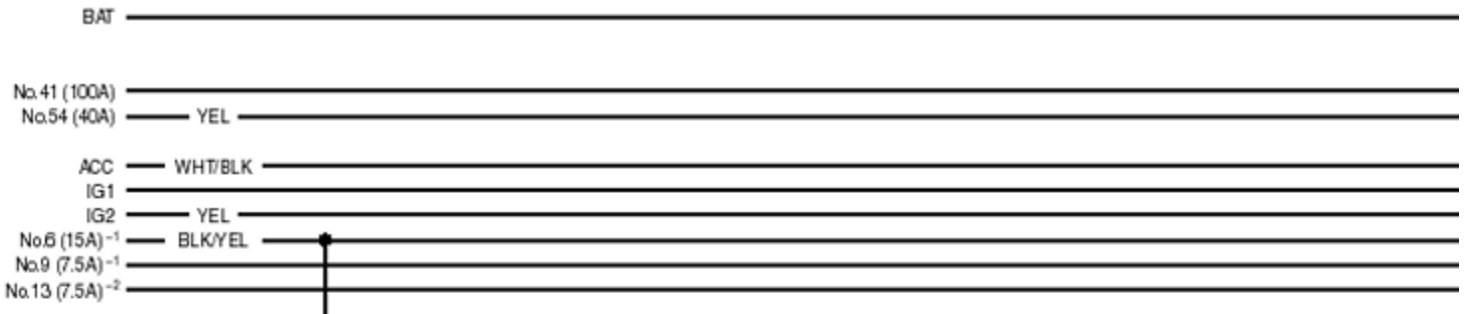
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



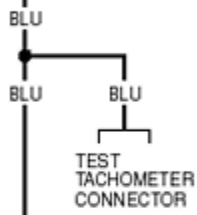
Wiring Diagrams

Indicators - Low Fuel Indicator

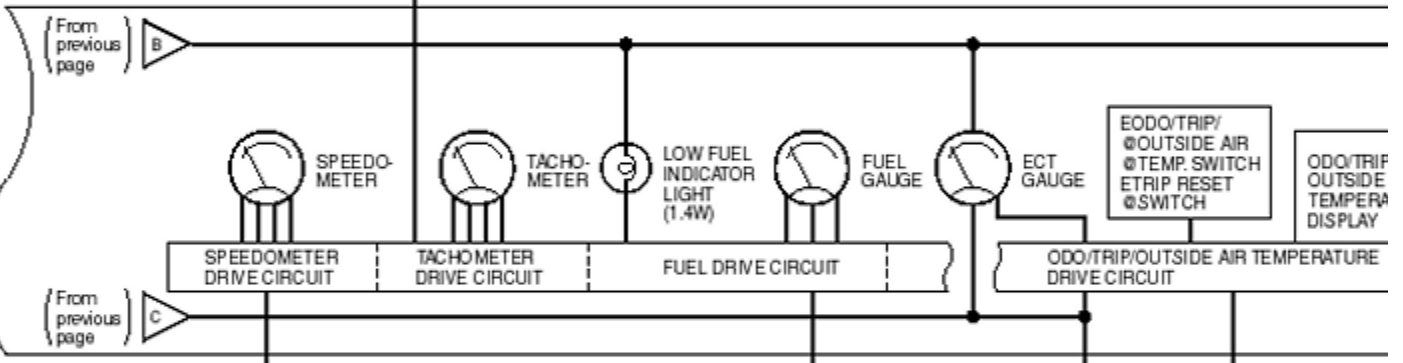




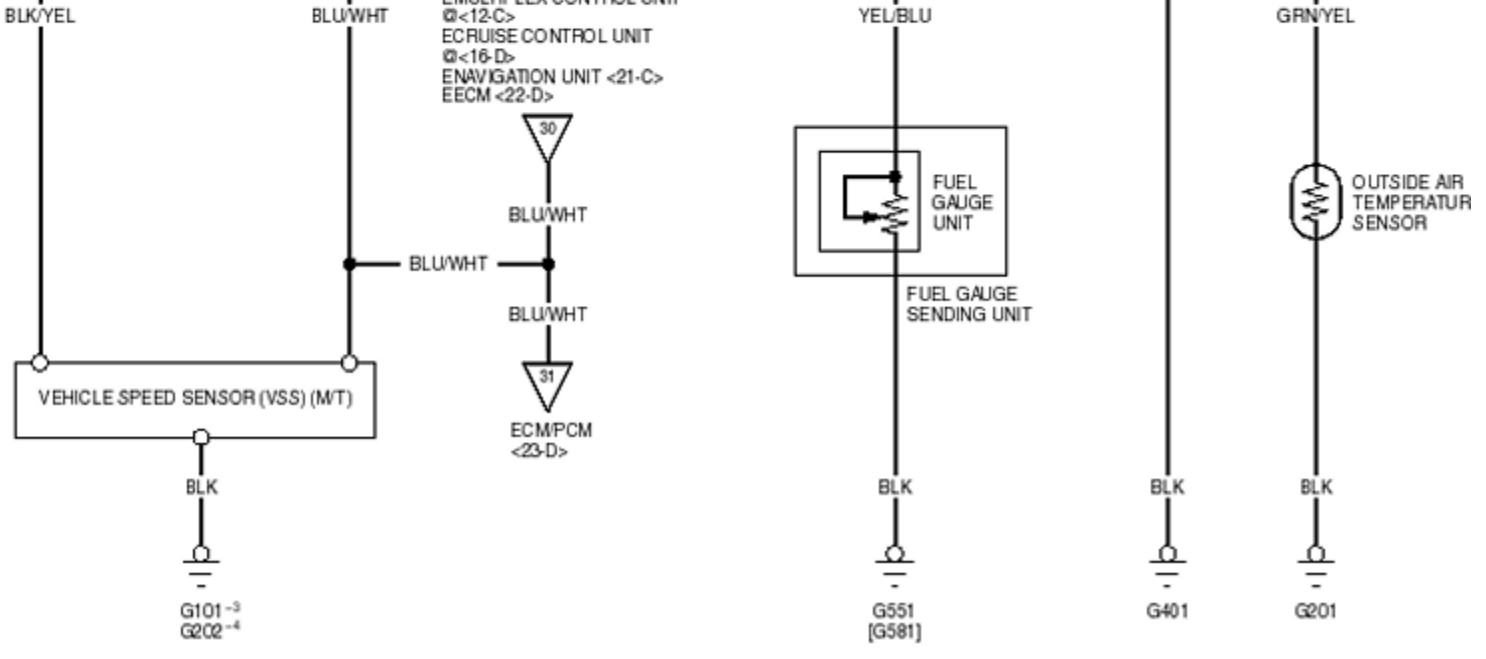
ECM/PCM <22-A> <23-B>

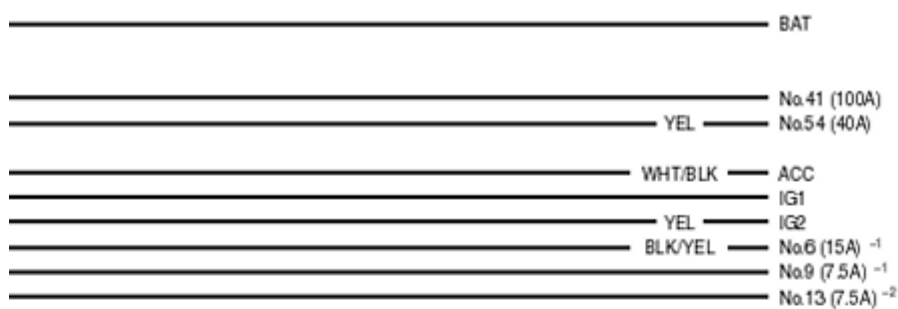
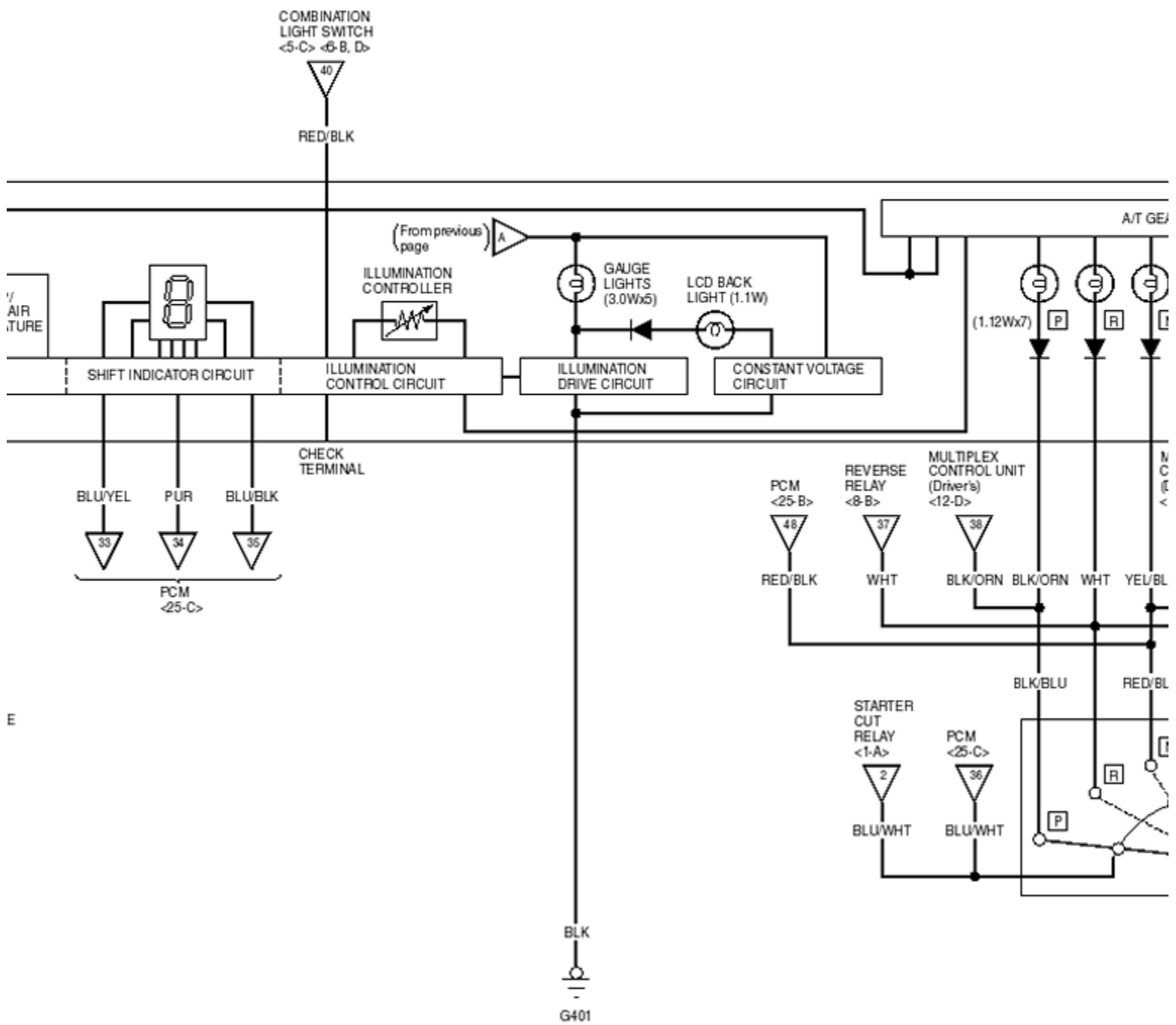


GAUGE ASSEMBLY

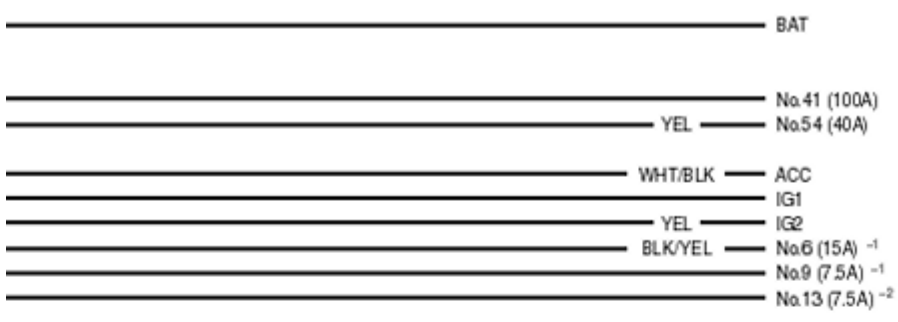


- VEHICLE SPEED ALARM UNIT (KY) <3-D>
- EHEADLIGHT ADJUSTER CONTROL UNIT <5-C>
- EMULTIPLEX CONTROL UNIT <12-C>
- ECRUISE CONTROL UNIT <16-D>
- ENAVIGATION UNIT <21-C>
- EECM <22-D>

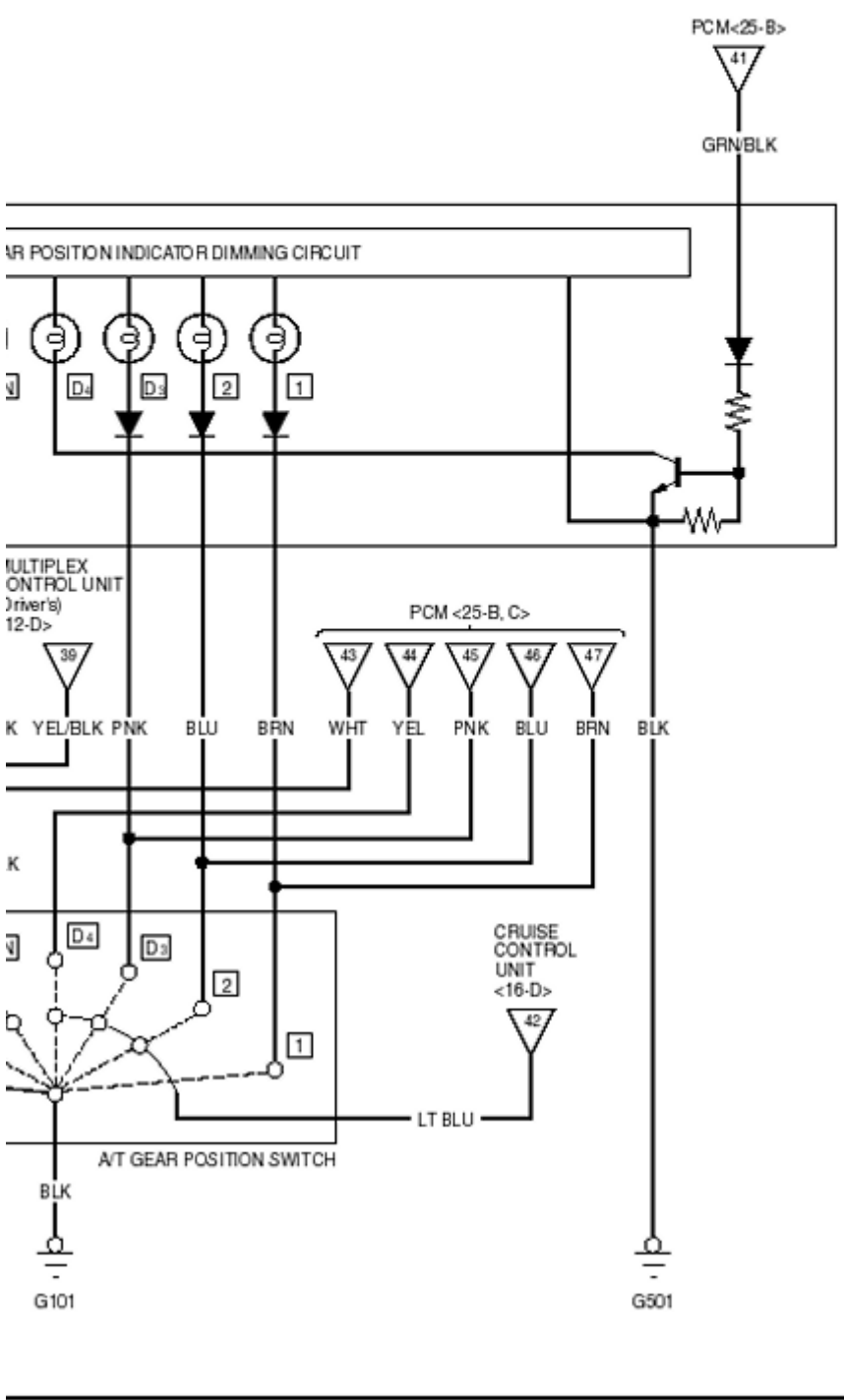




D

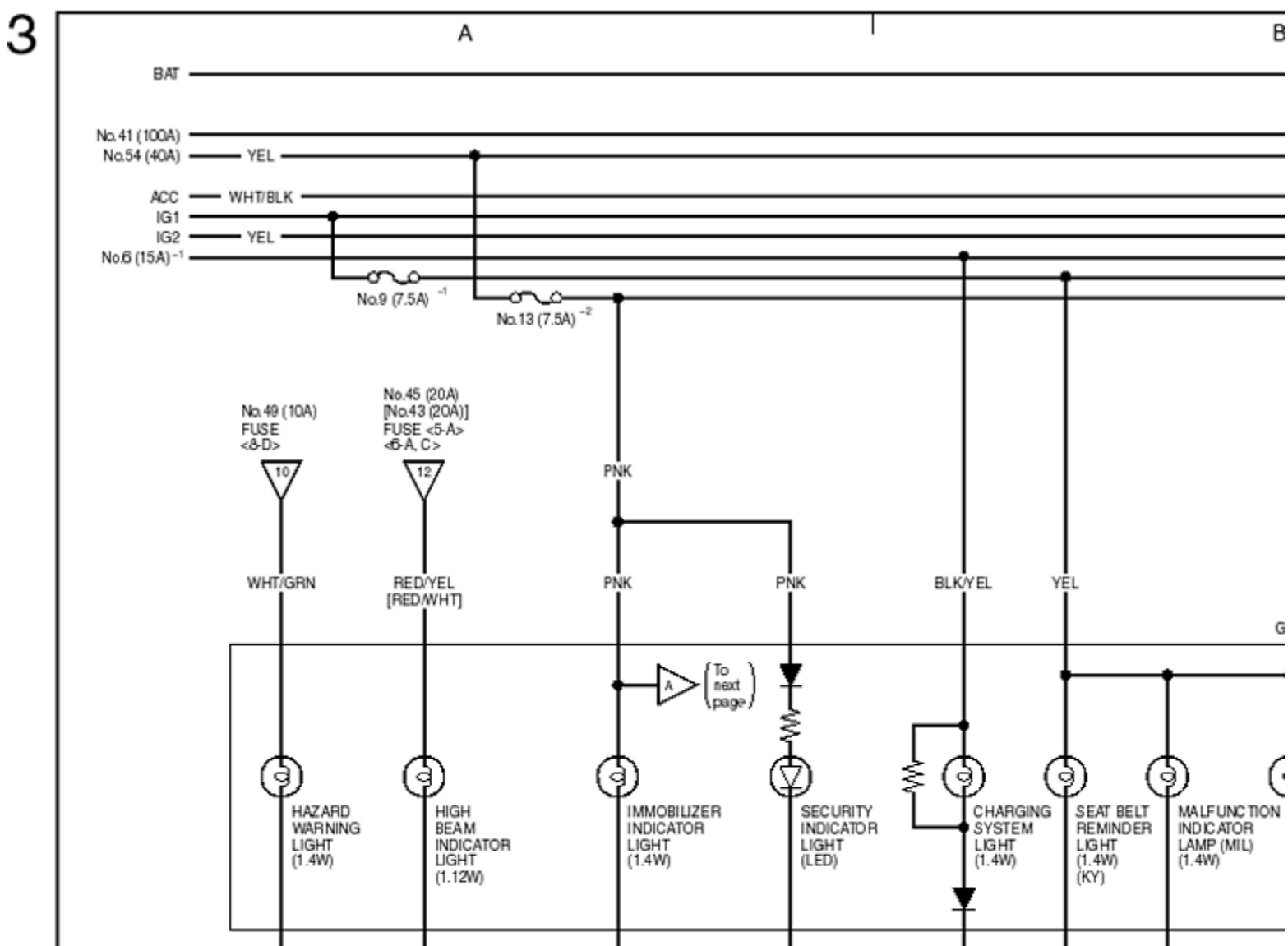
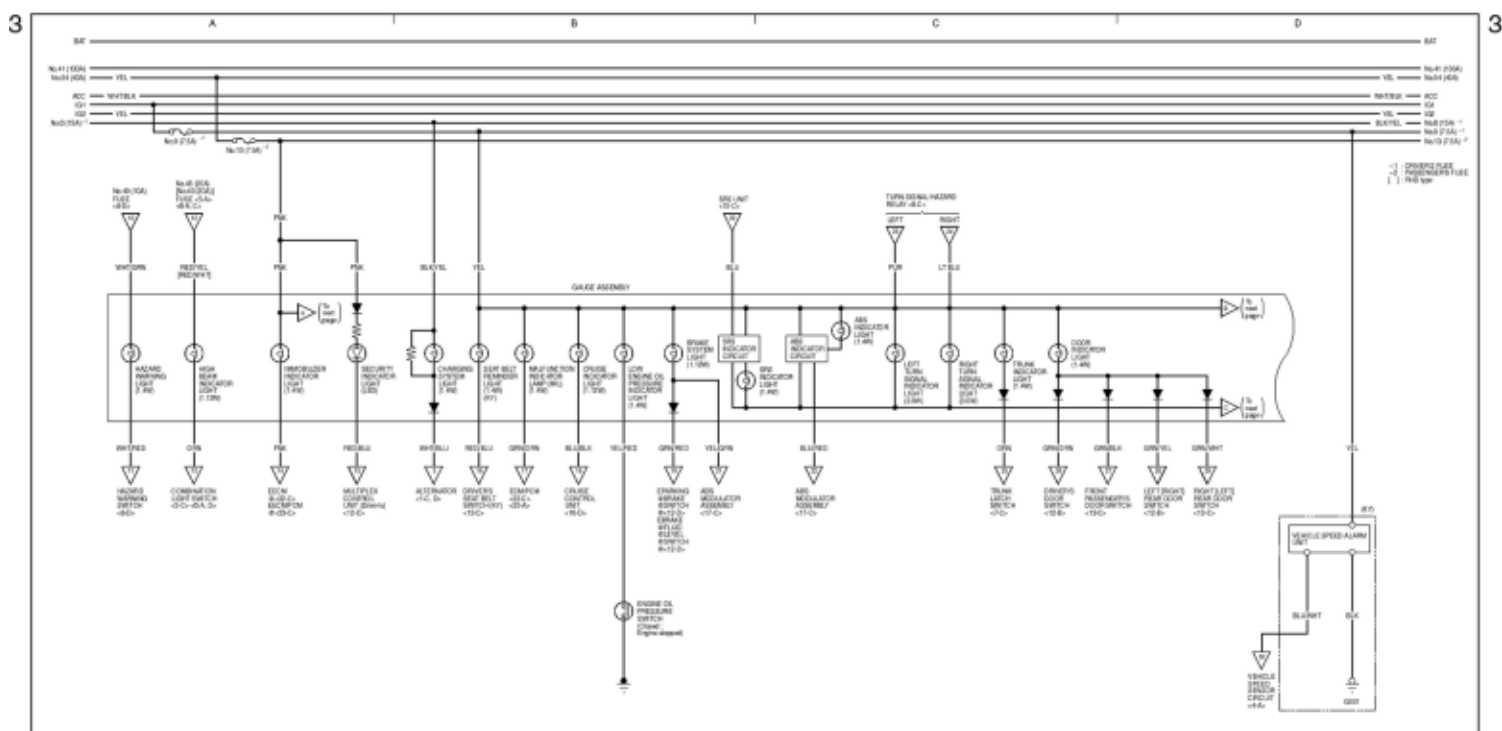


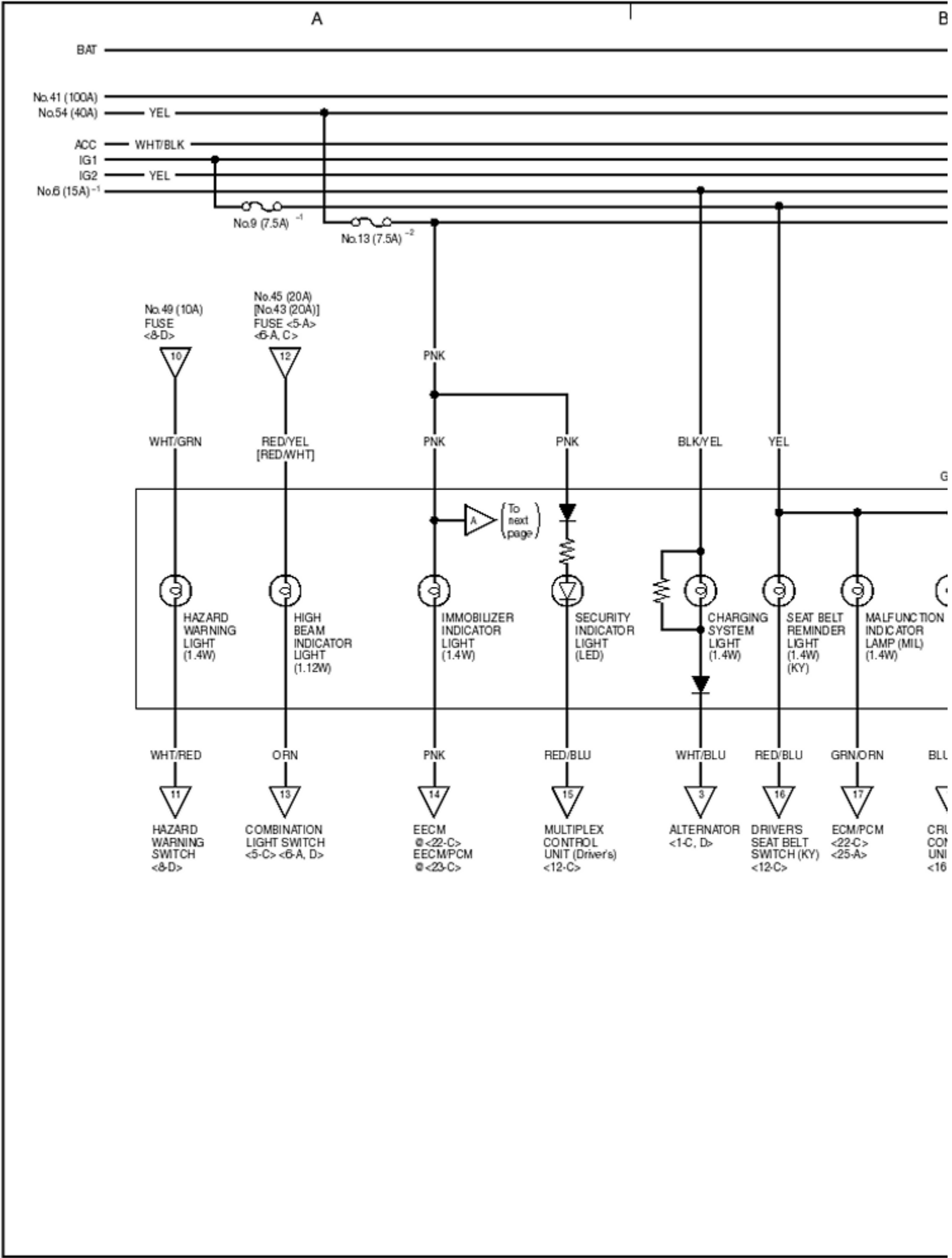
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : D16B6 engine
- 4 : Except D16B6 engine
- [] : RHD type

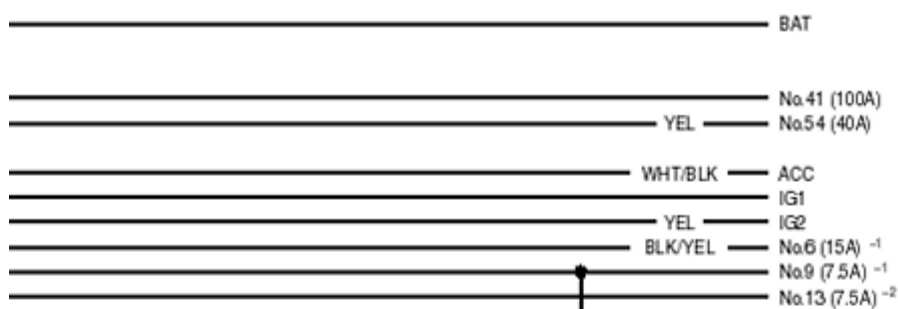
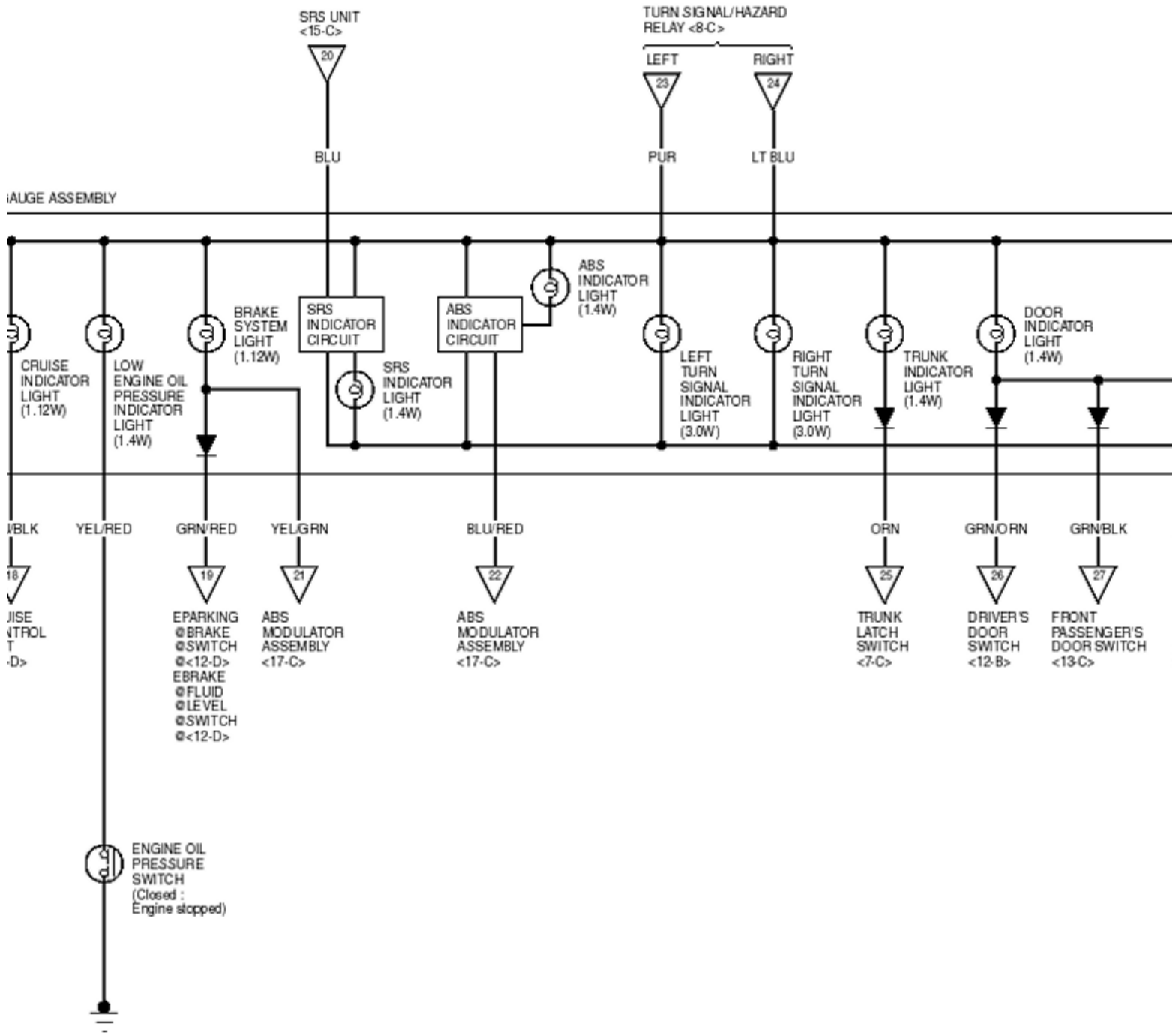


Wiring Diagrams

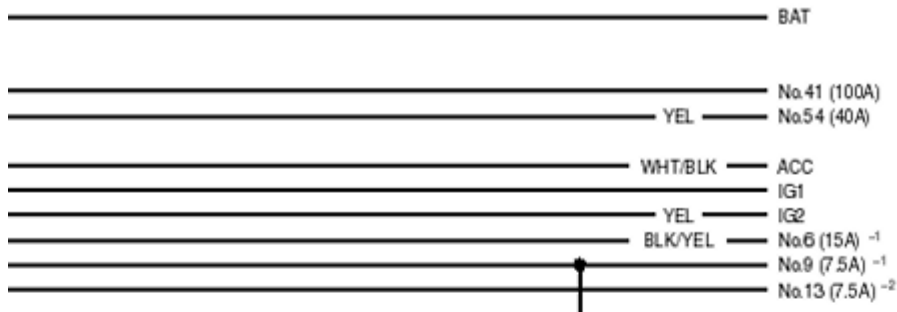
Indicators - Malfunction Indicator Lamp (MIL)



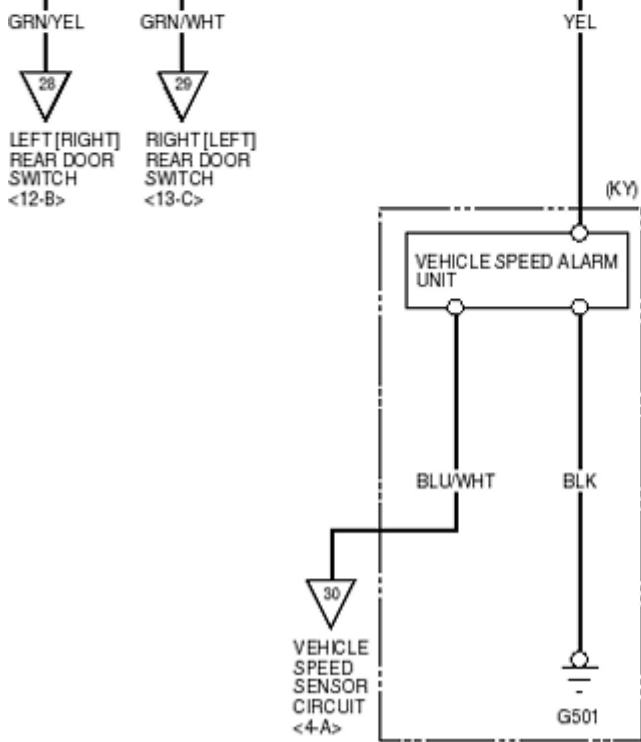
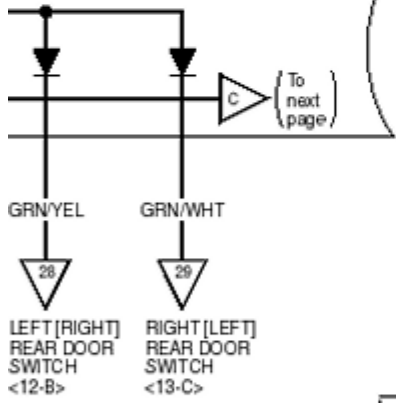
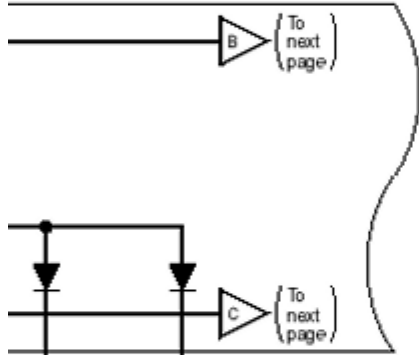




D

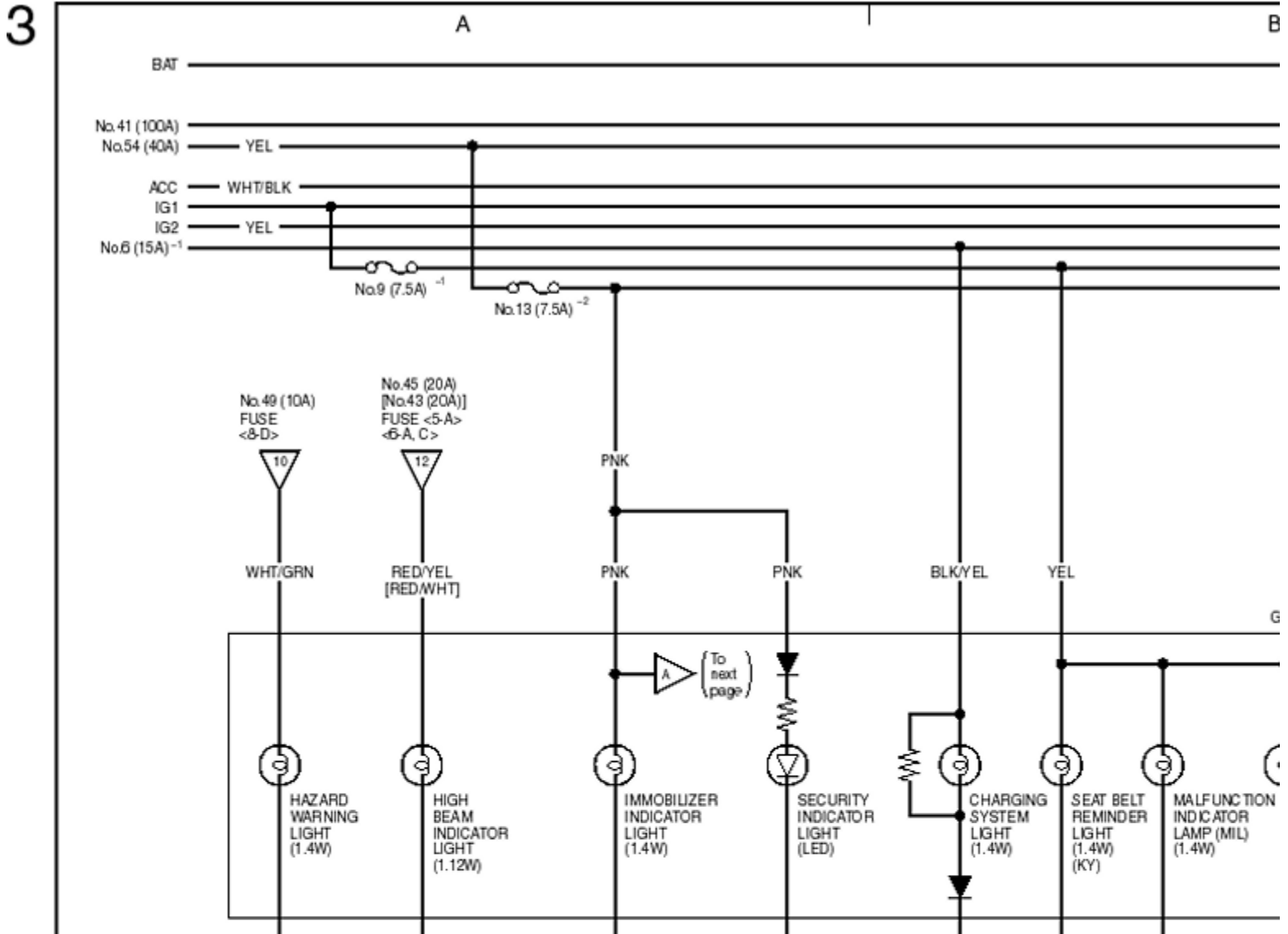
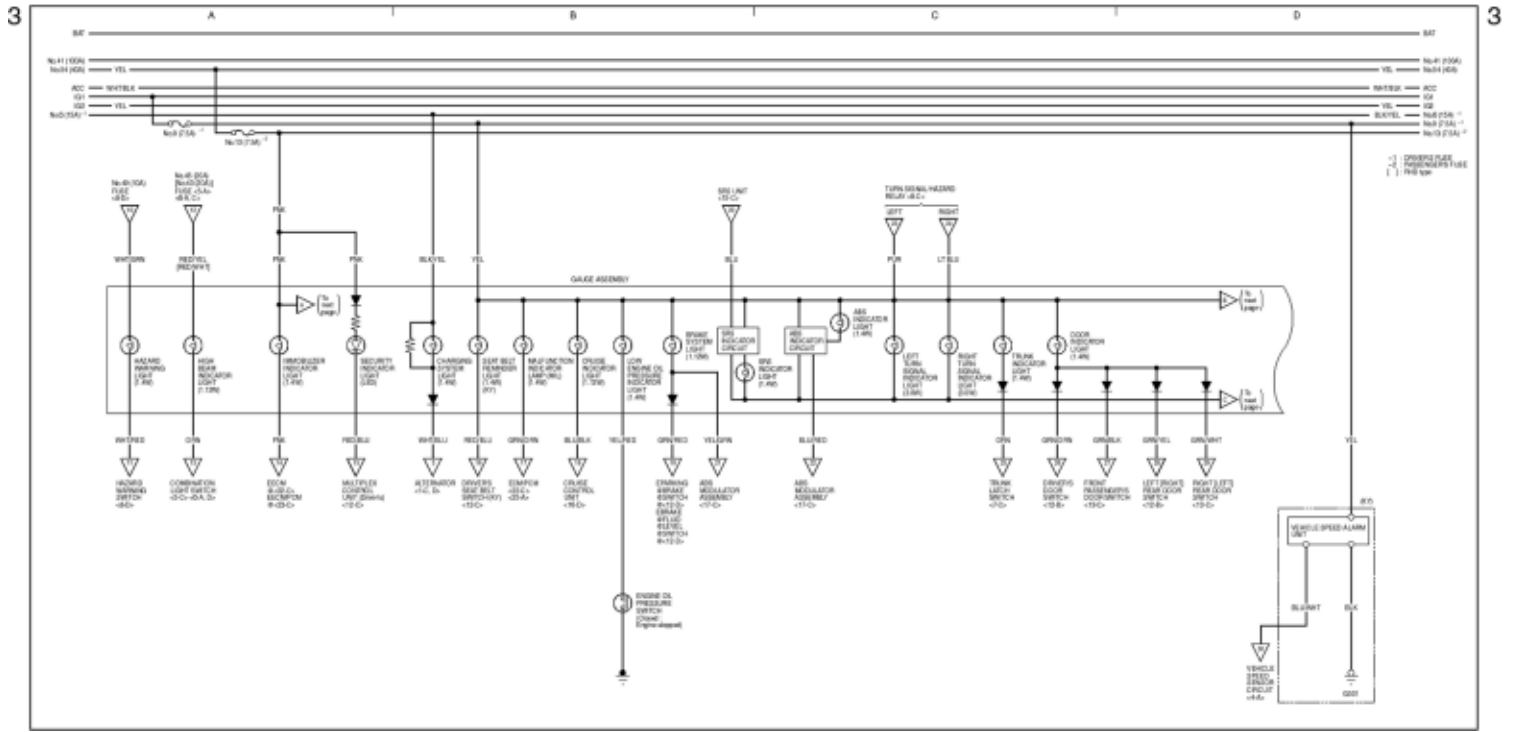


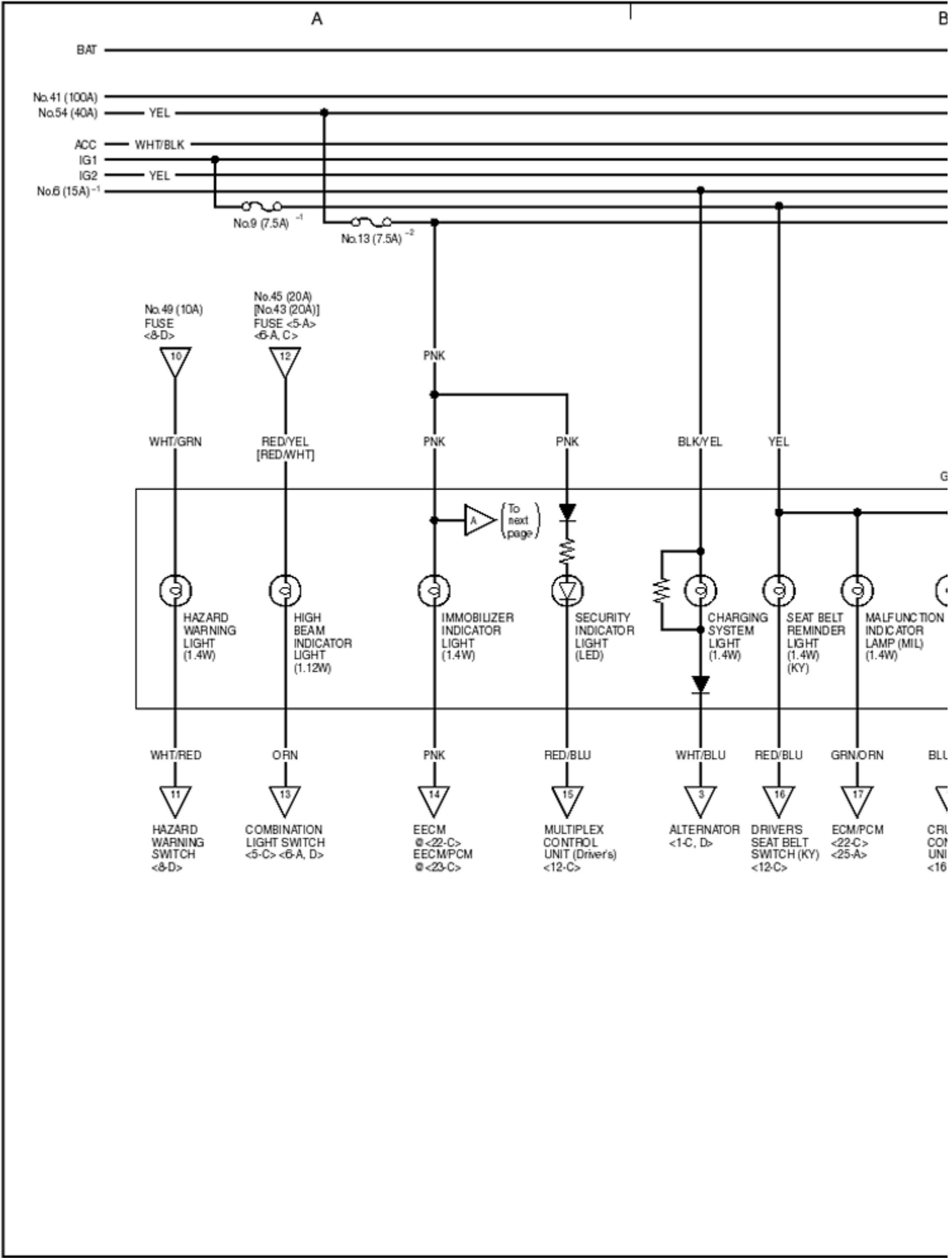
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type

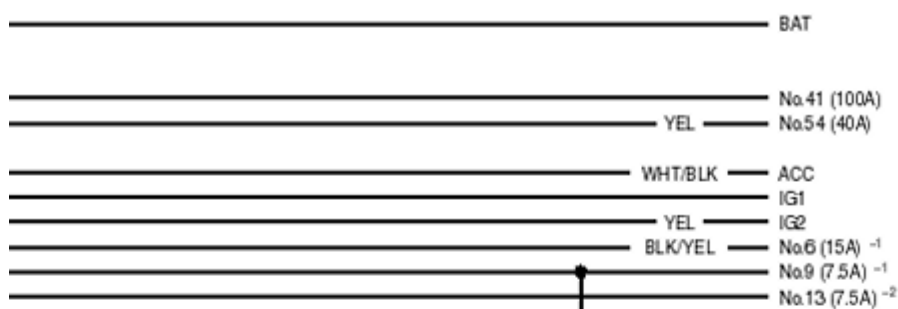
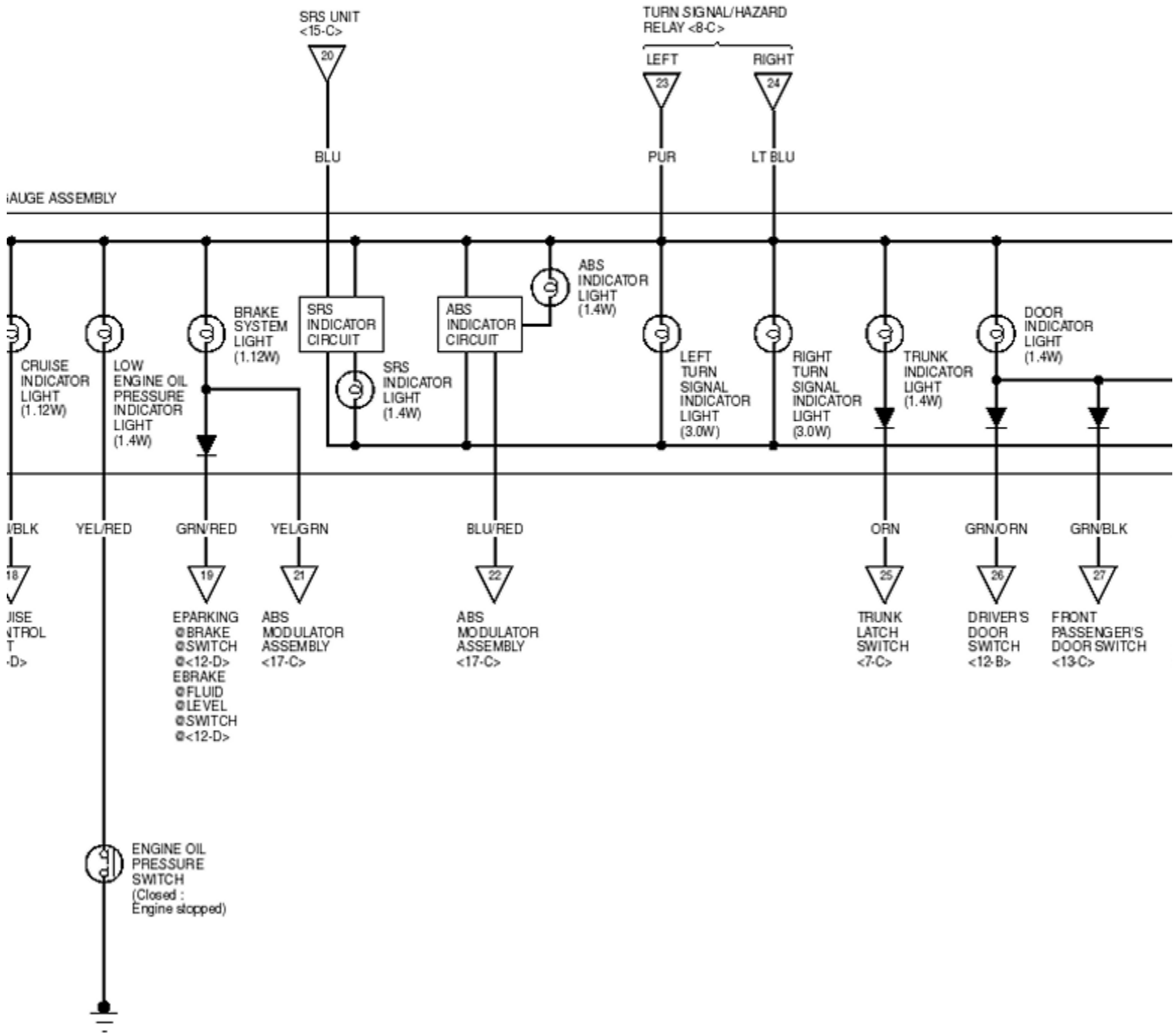


Wiring Diagrams

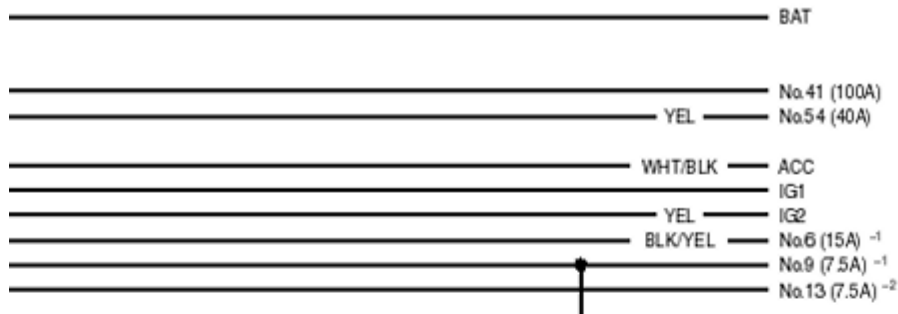
Indicators - Seat Belt Reminder Indicator



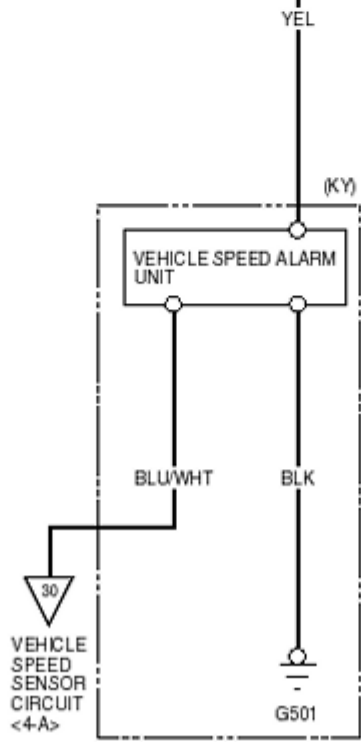
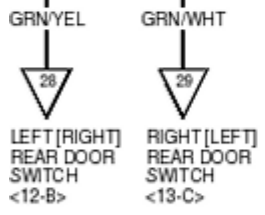
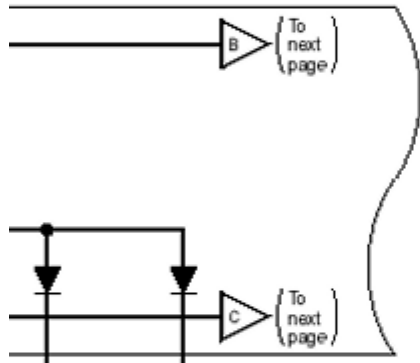


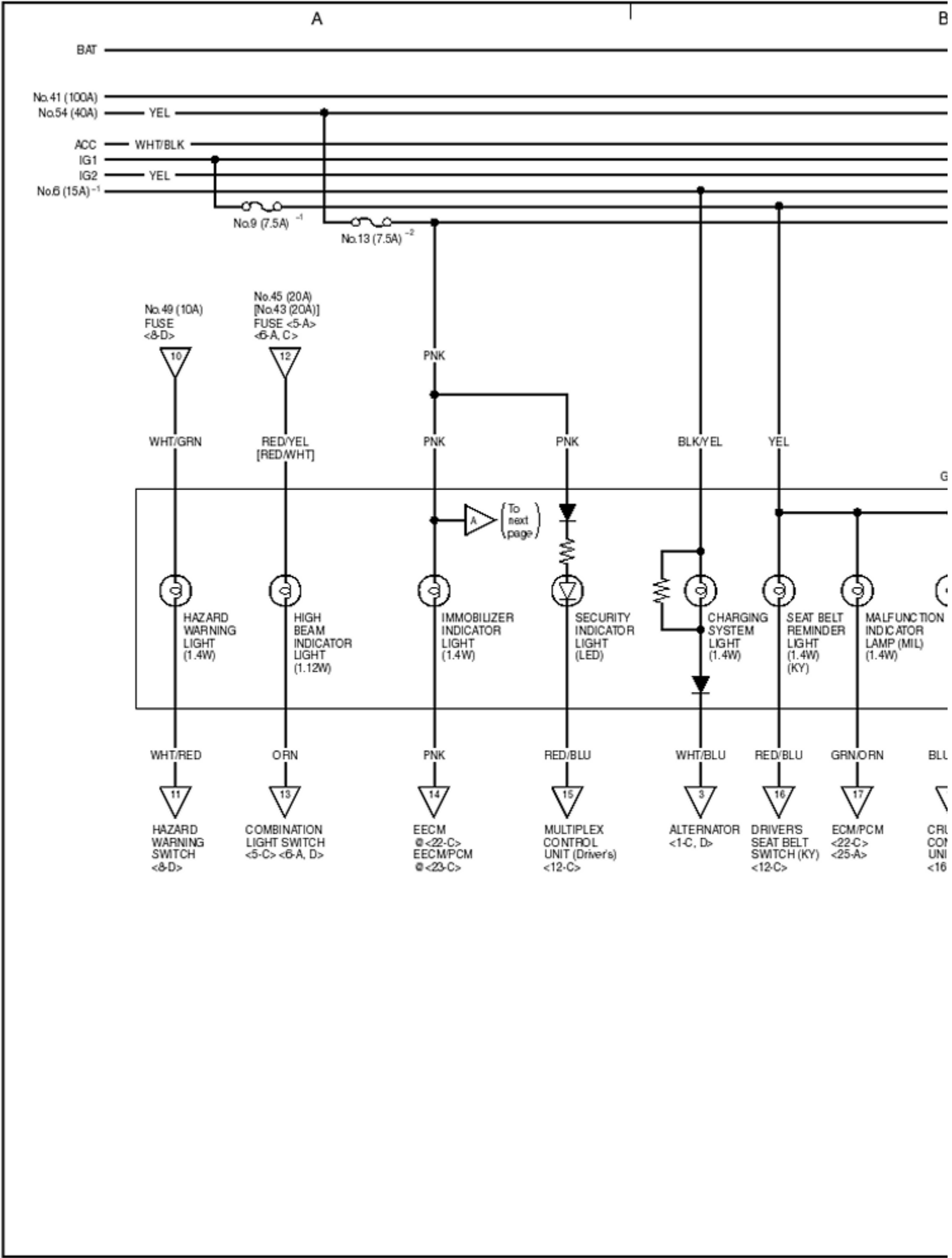


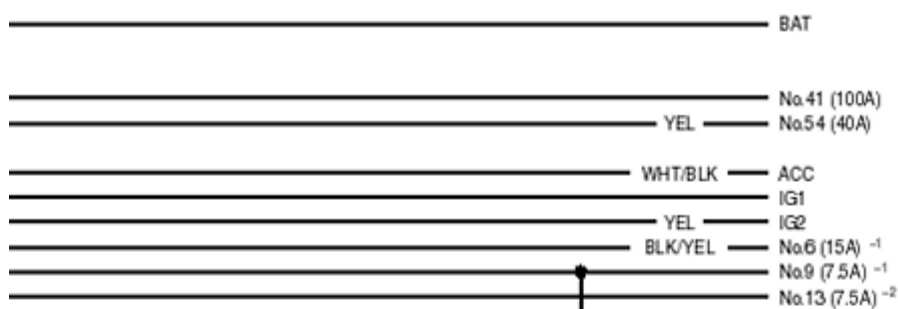
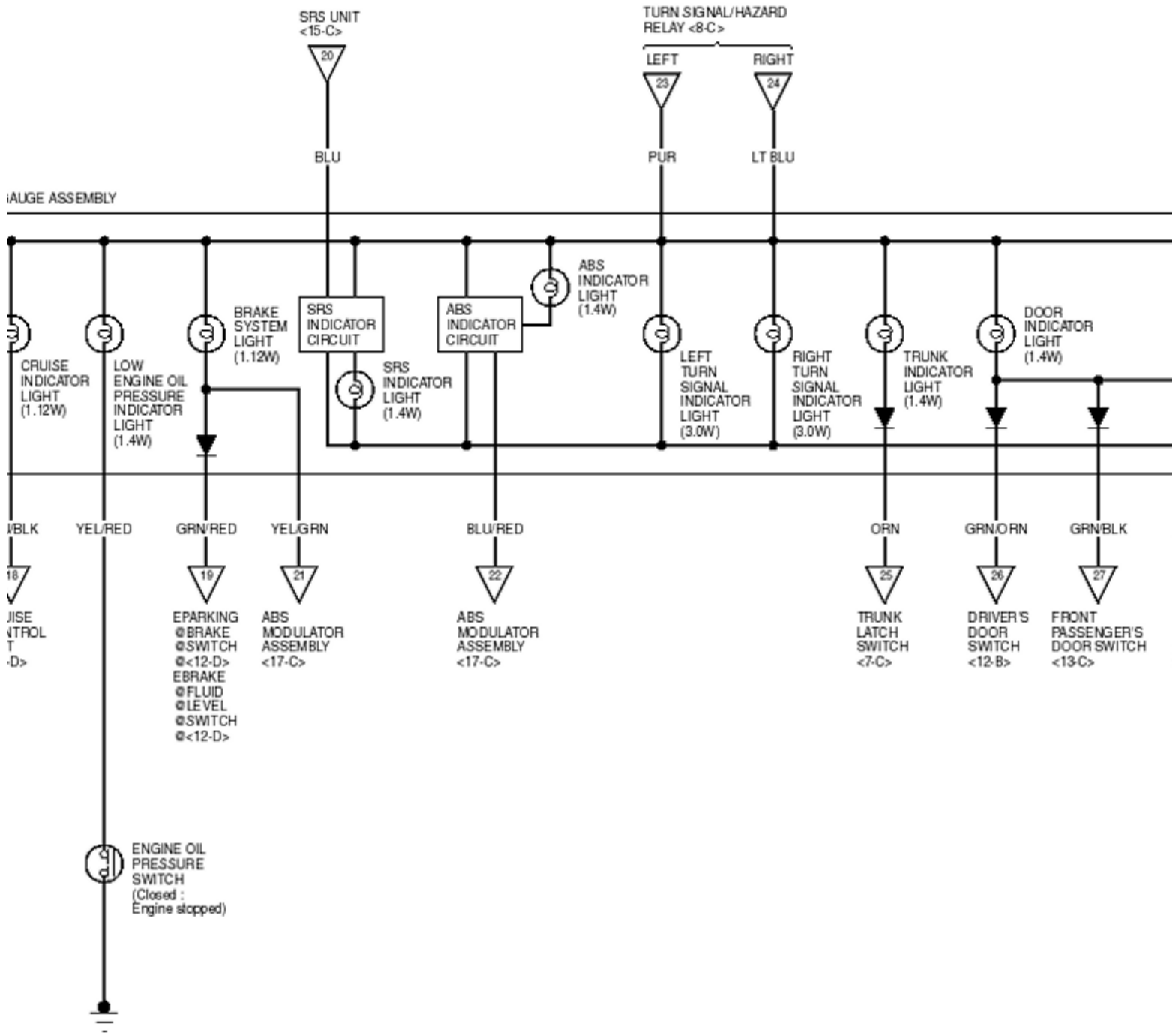
D



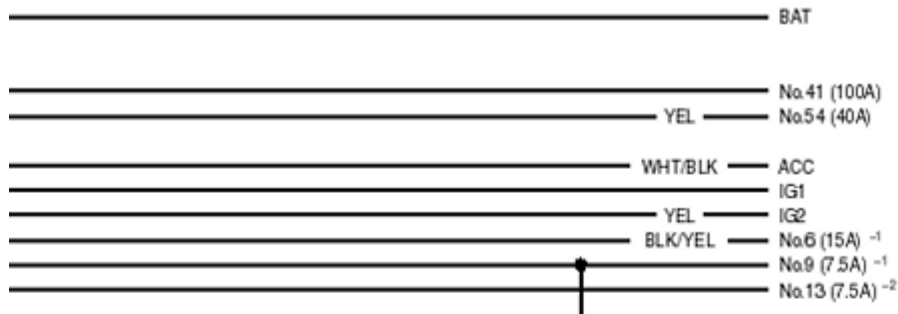
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



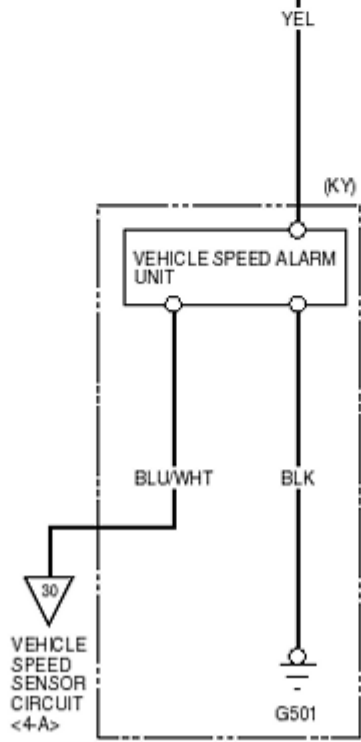
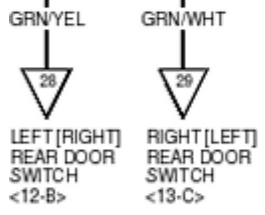
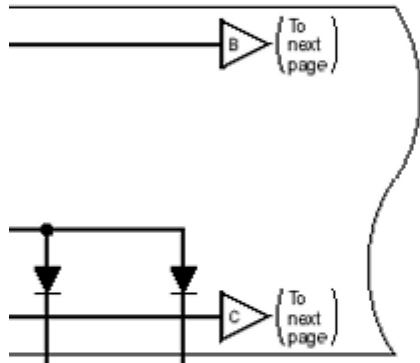


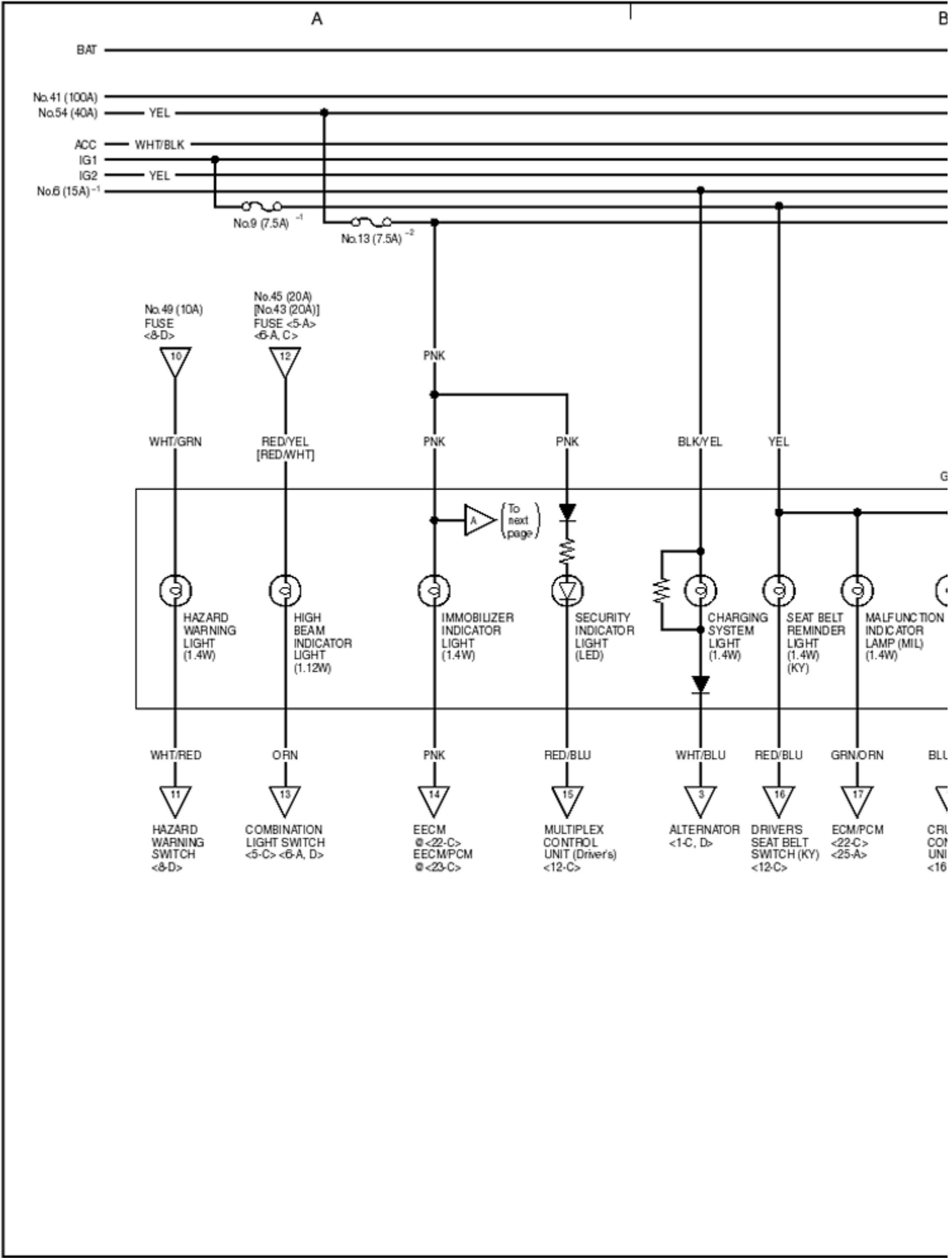


D

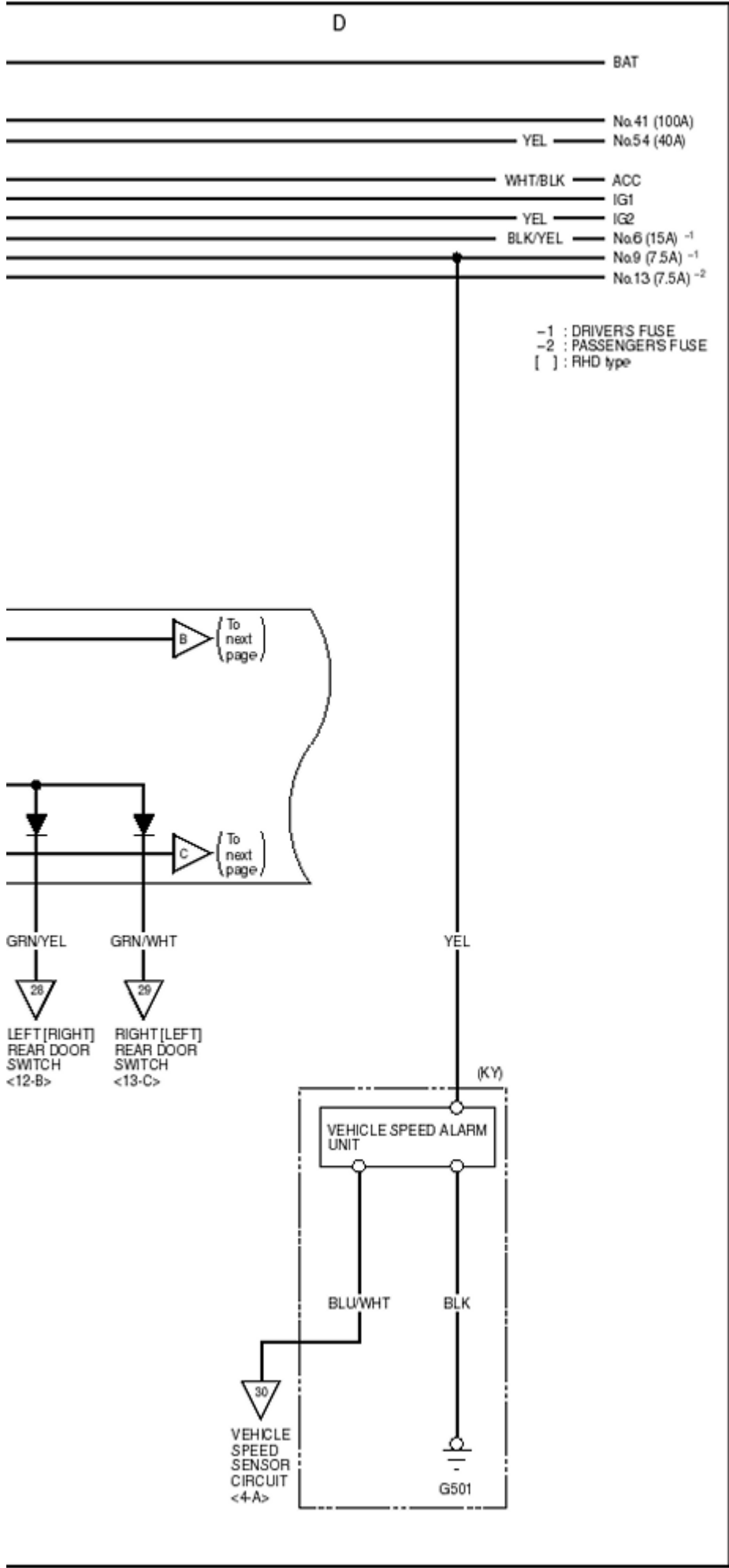


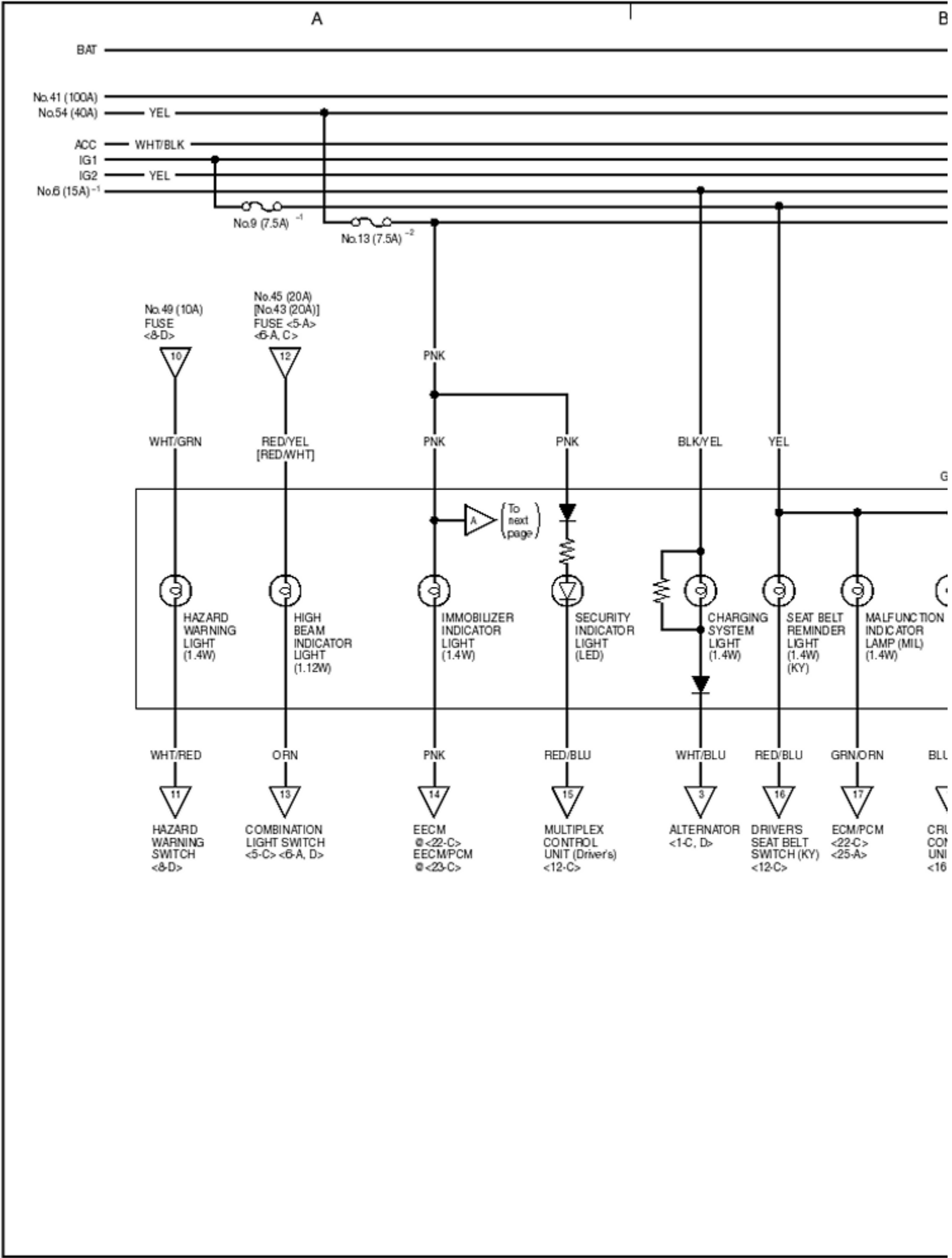
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type

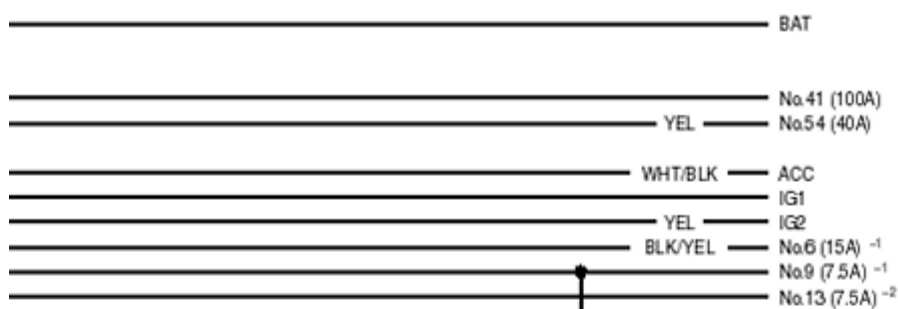
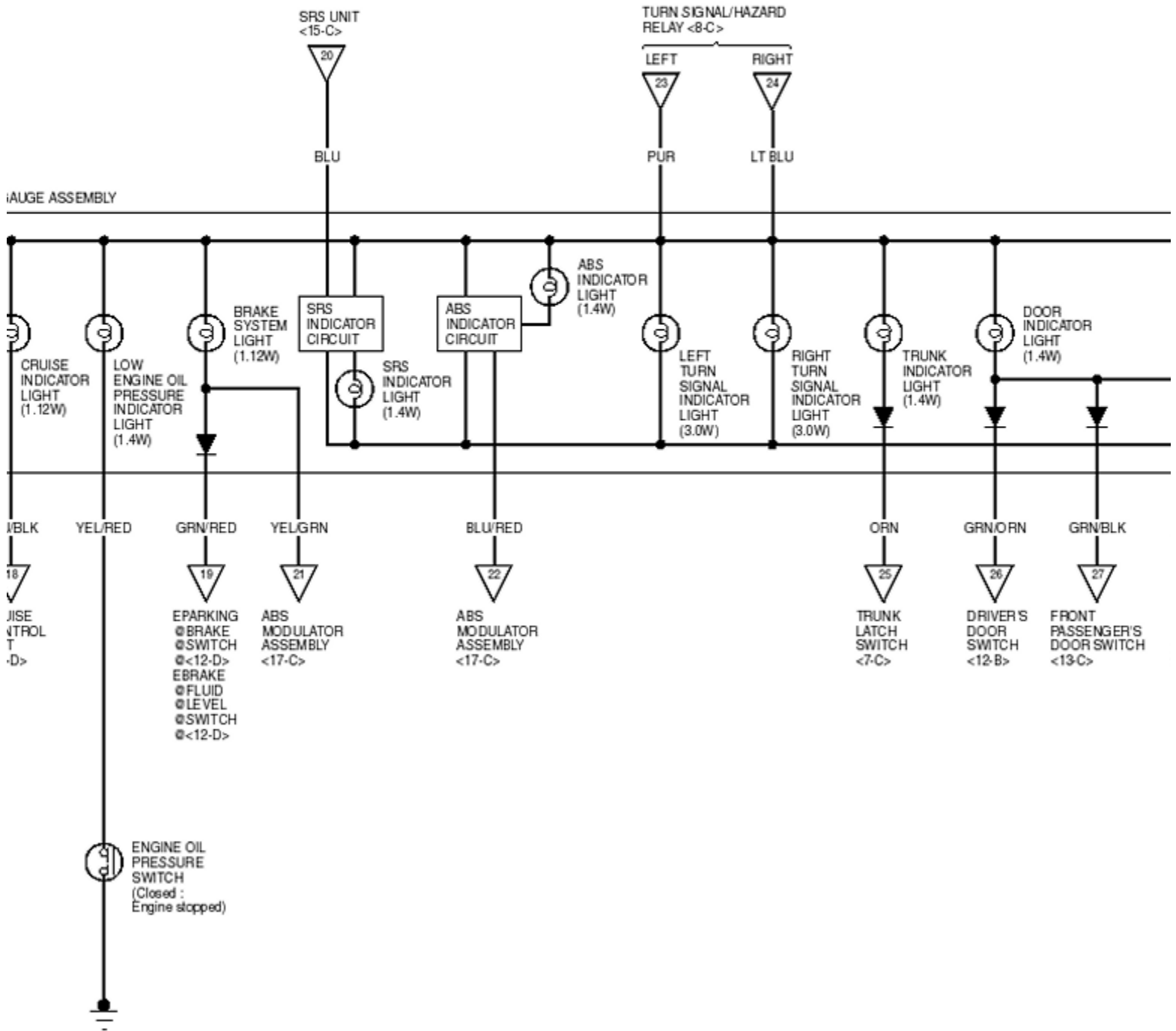




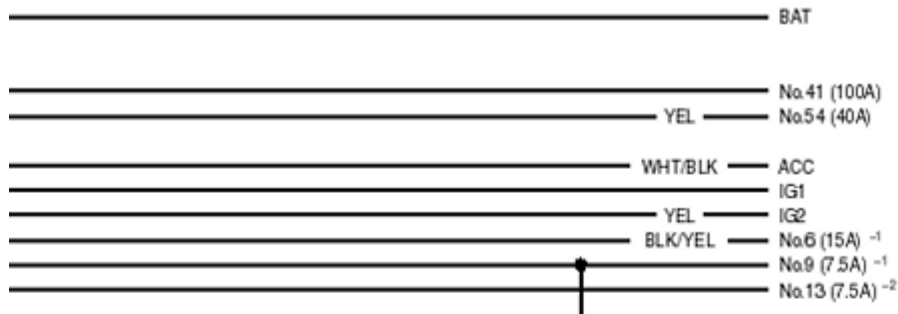
D



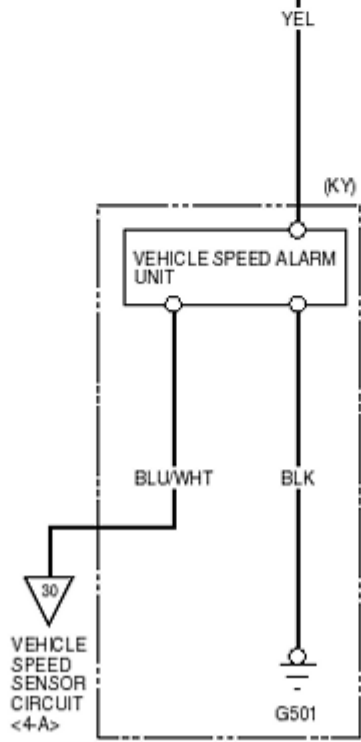
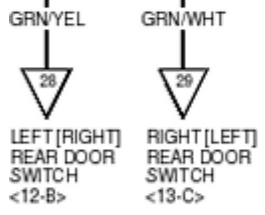
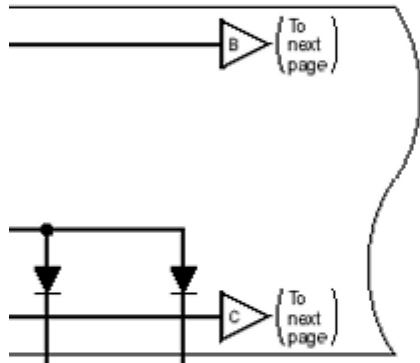




D



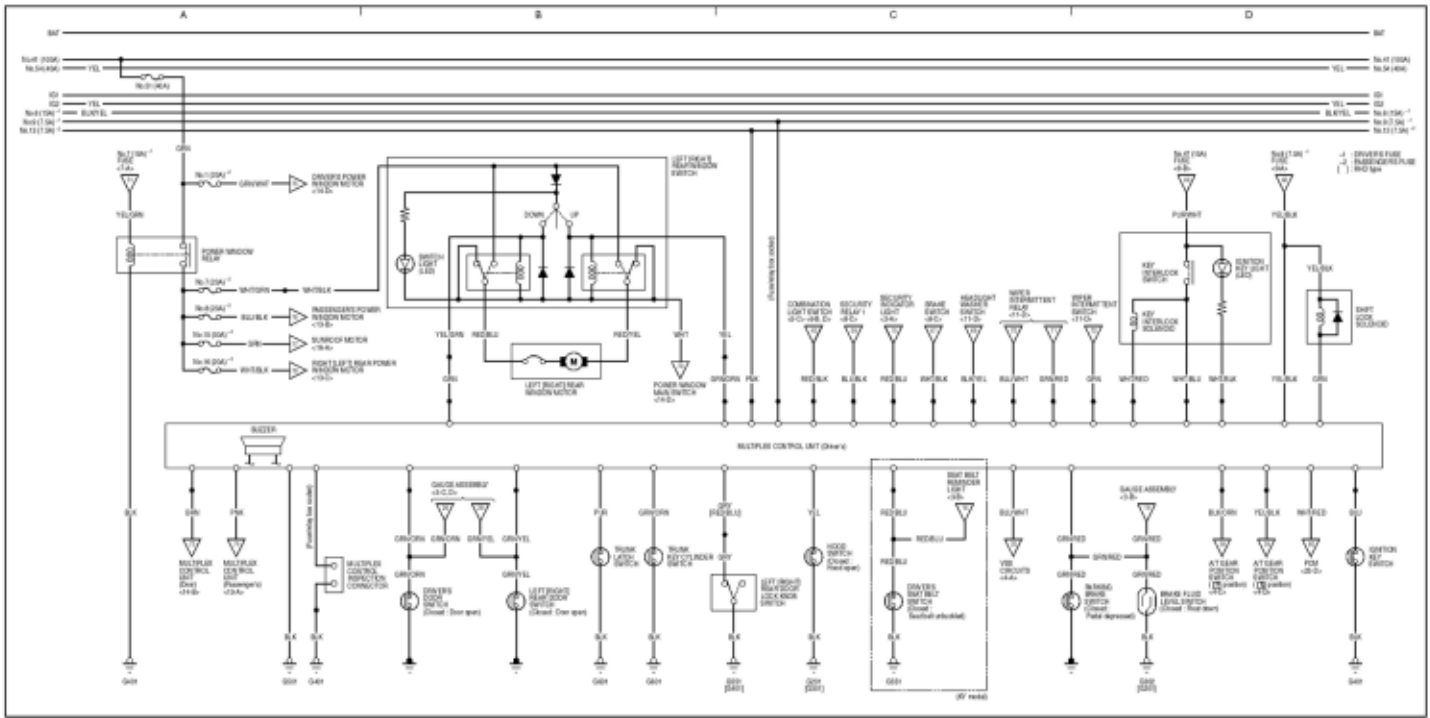
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



Wiring Diagrams

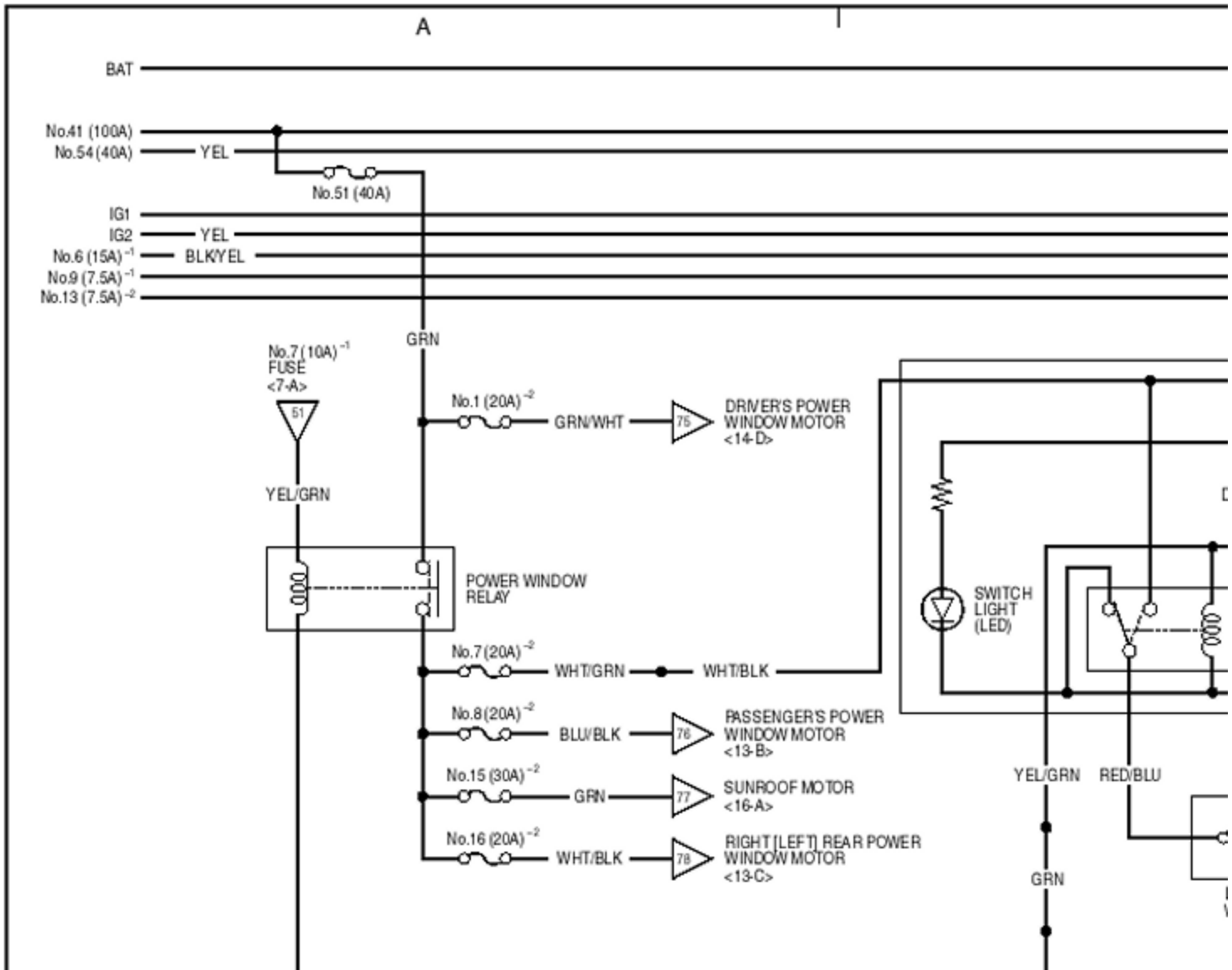
Interlock System

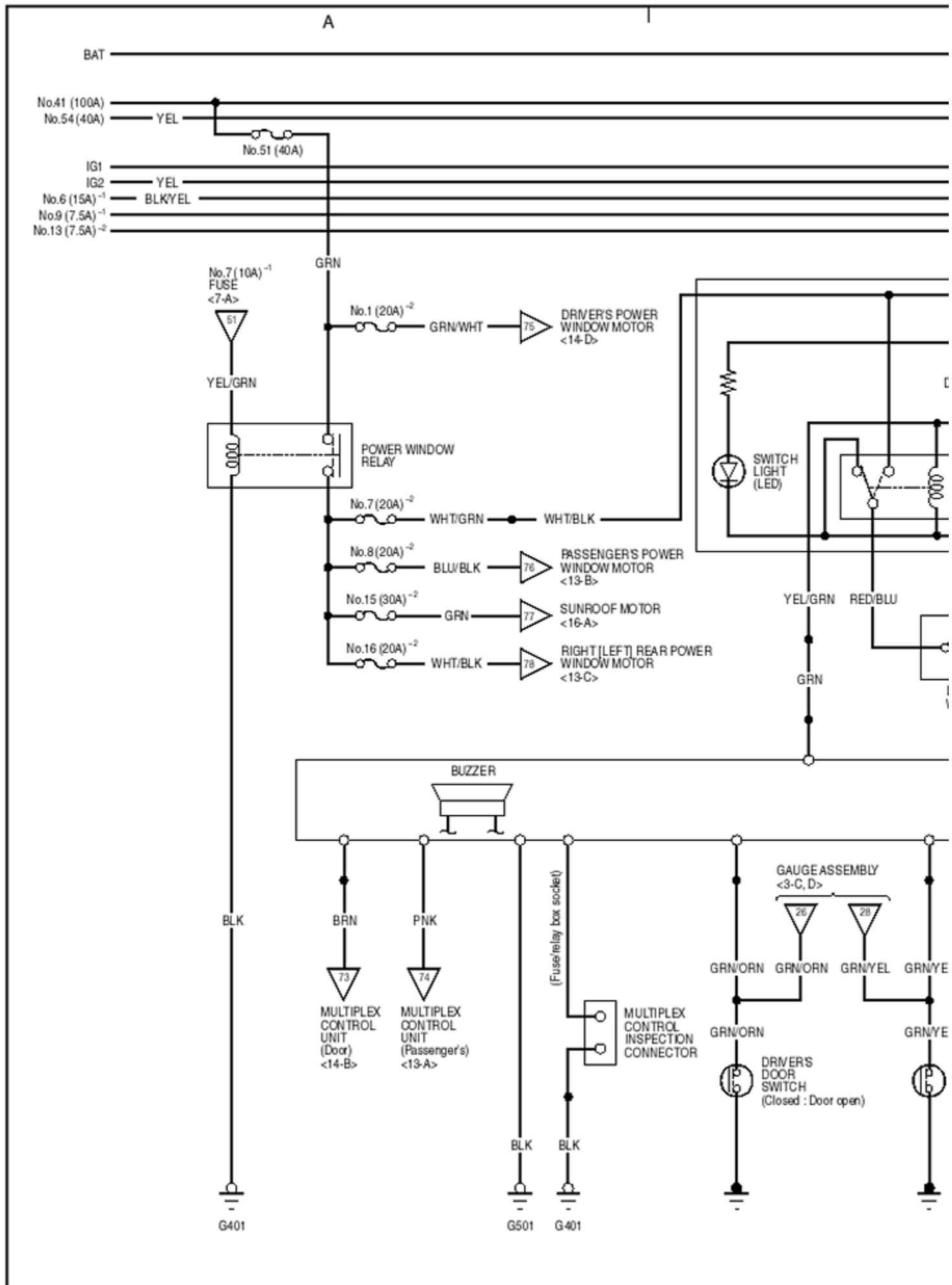
12



12

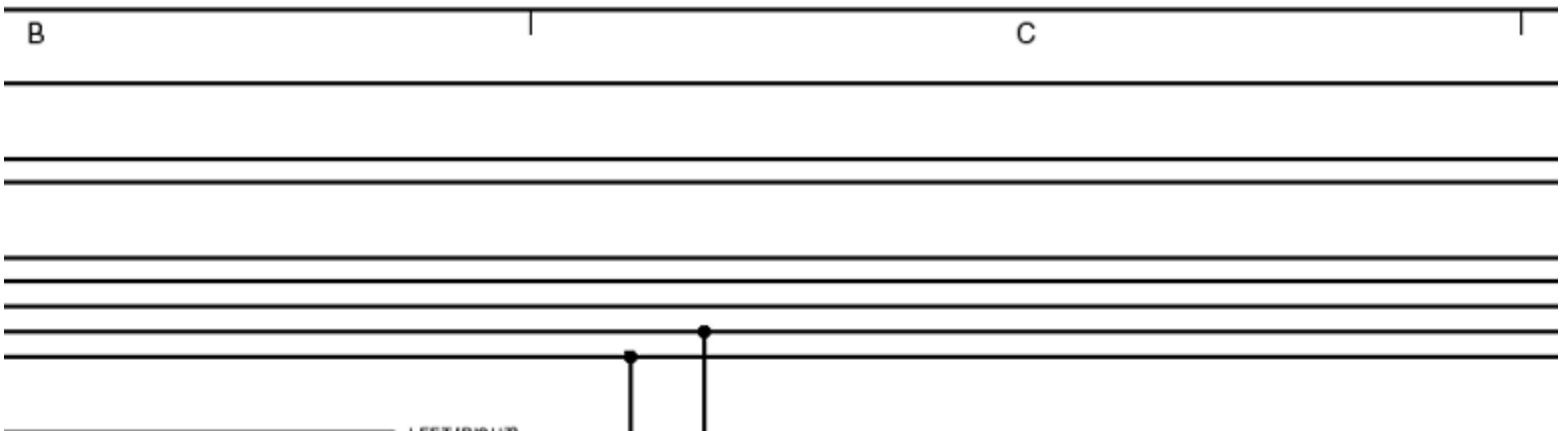
12





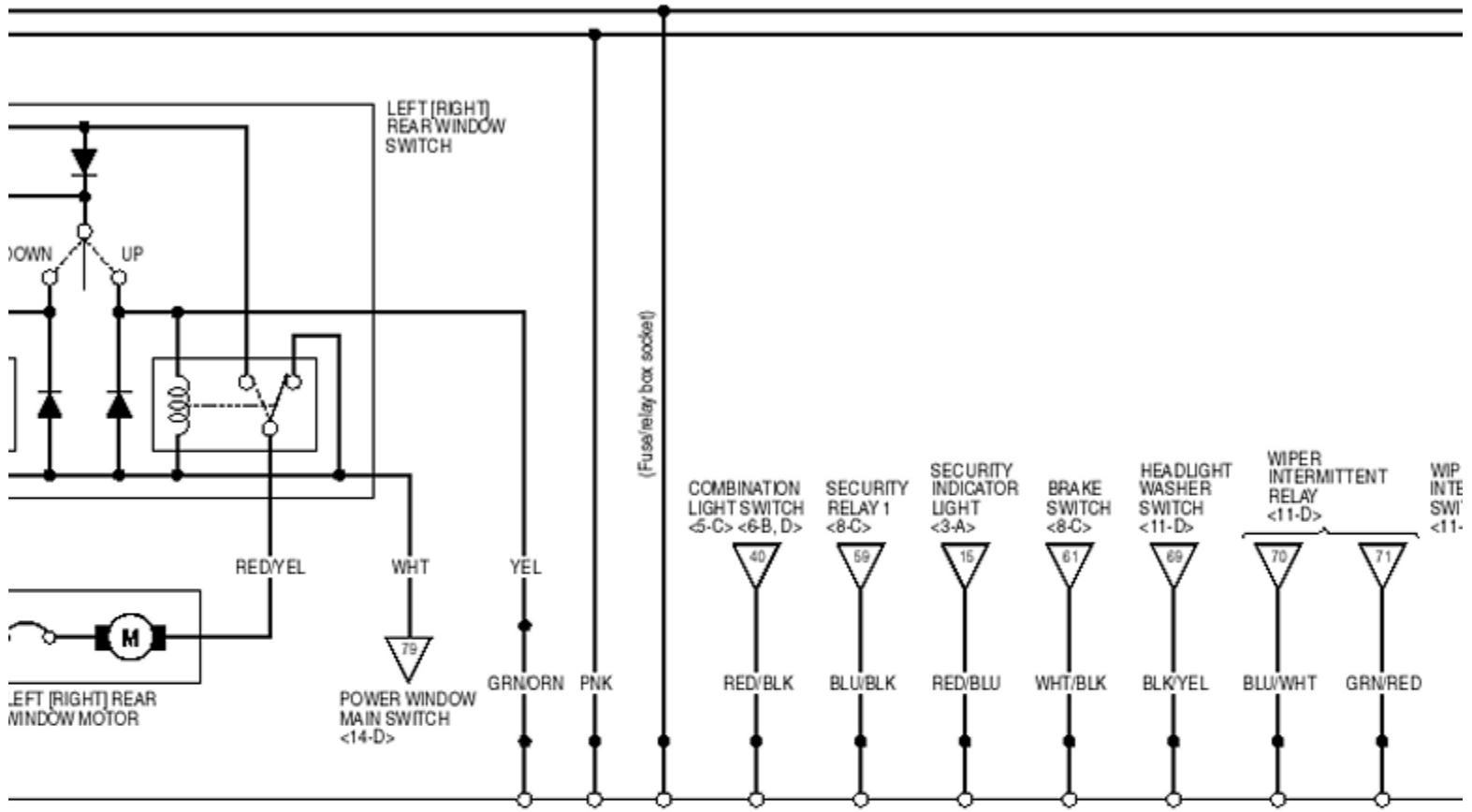
B

C

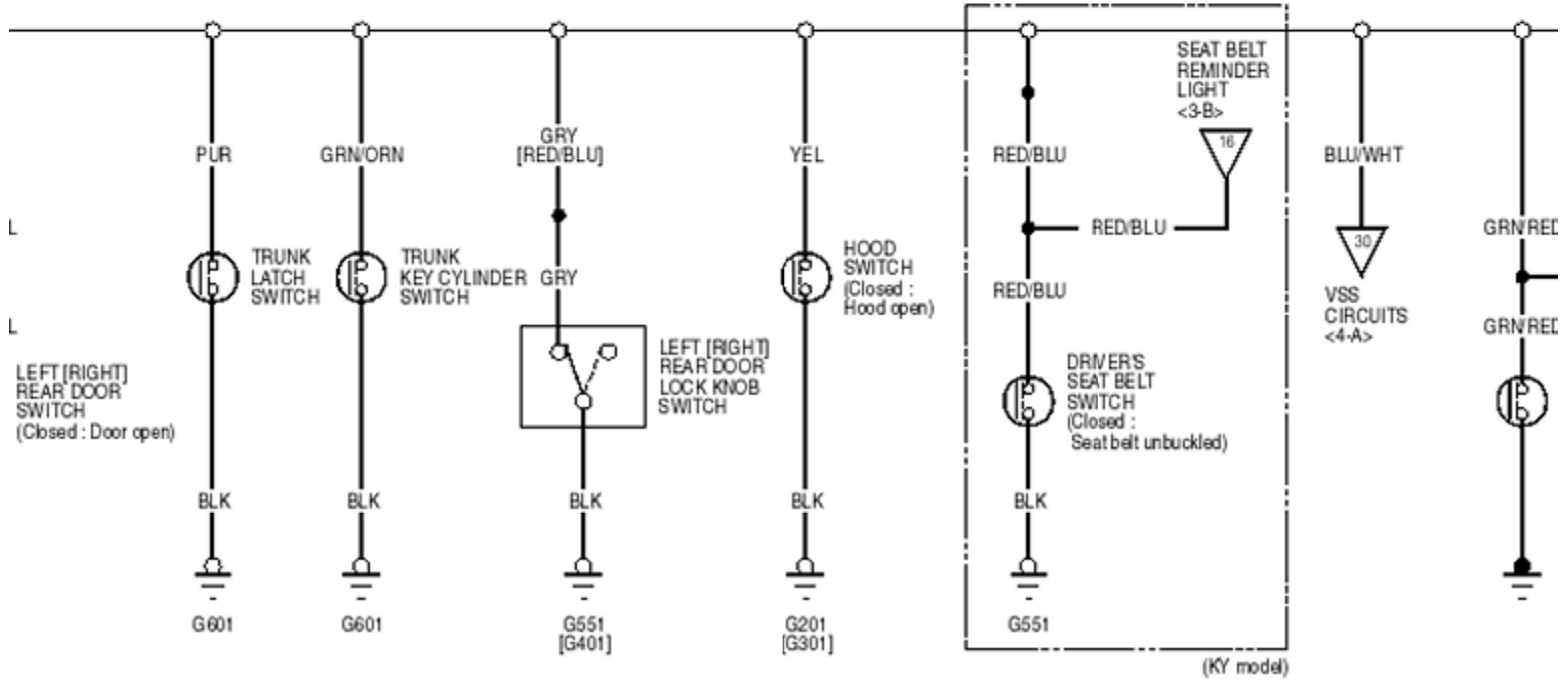


B

C



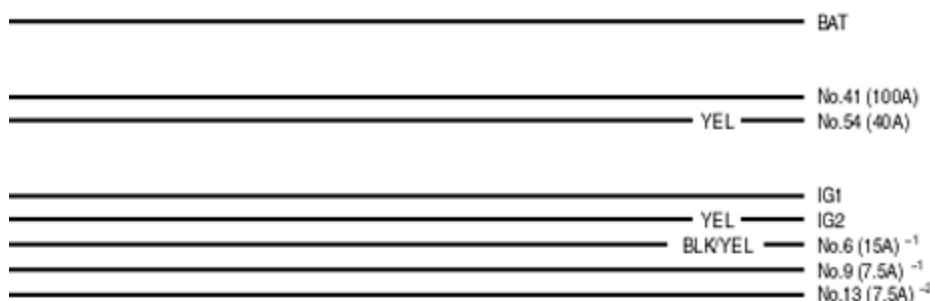
MULTIPLEX CONTROL UNIT (Driver's)



(KY model)

D

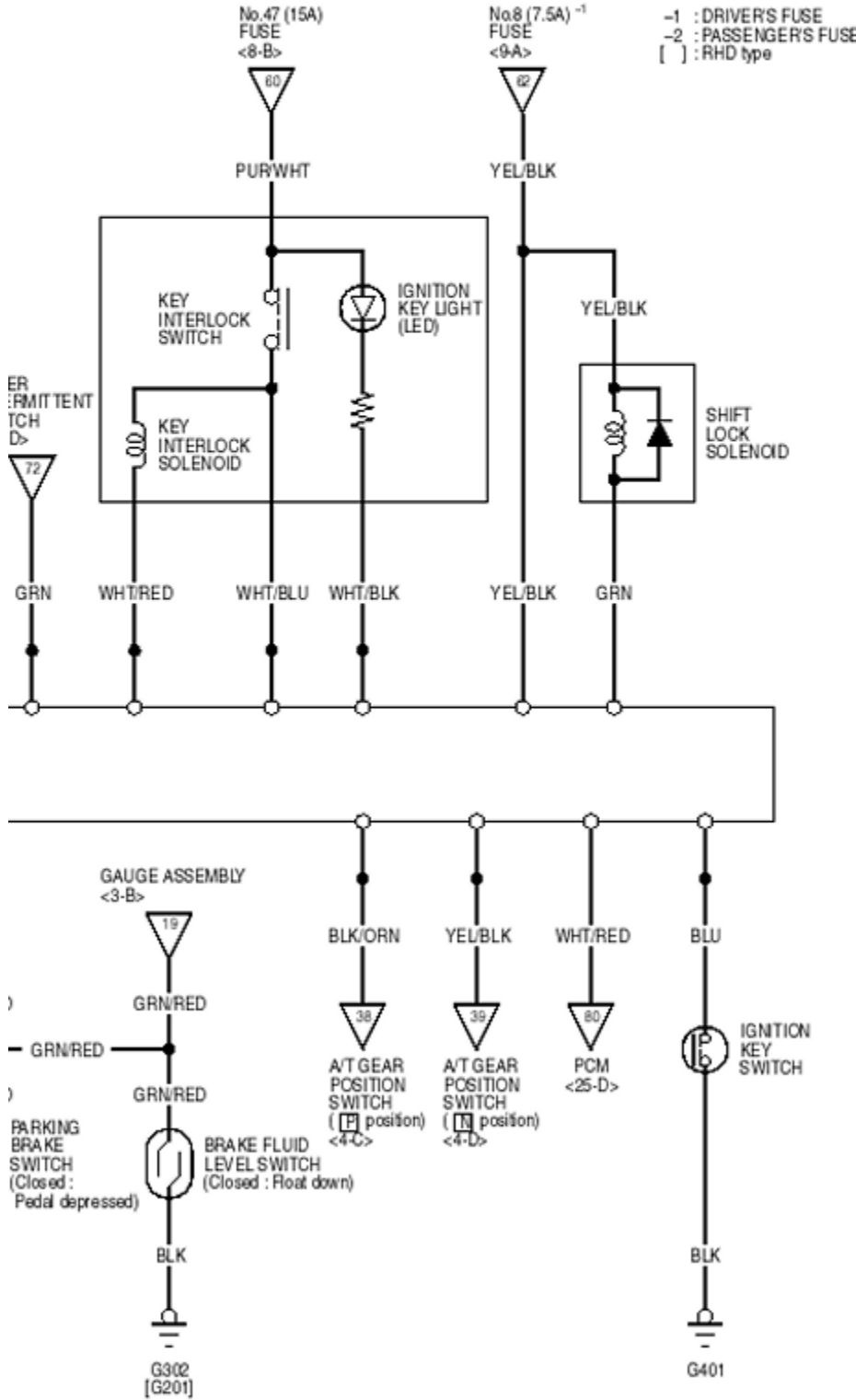
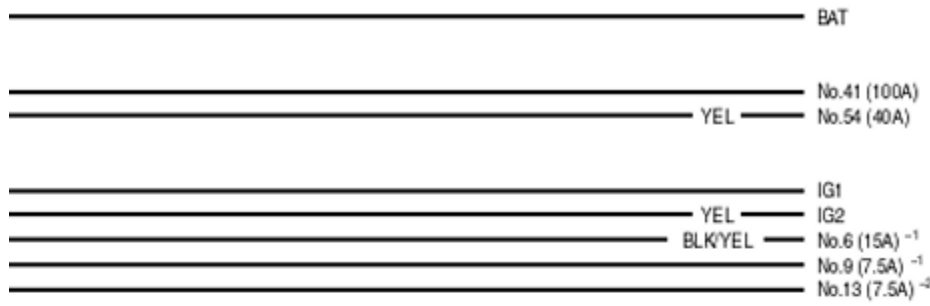
12



No.47 (15A)

No.8 (7.5A)⁻¹

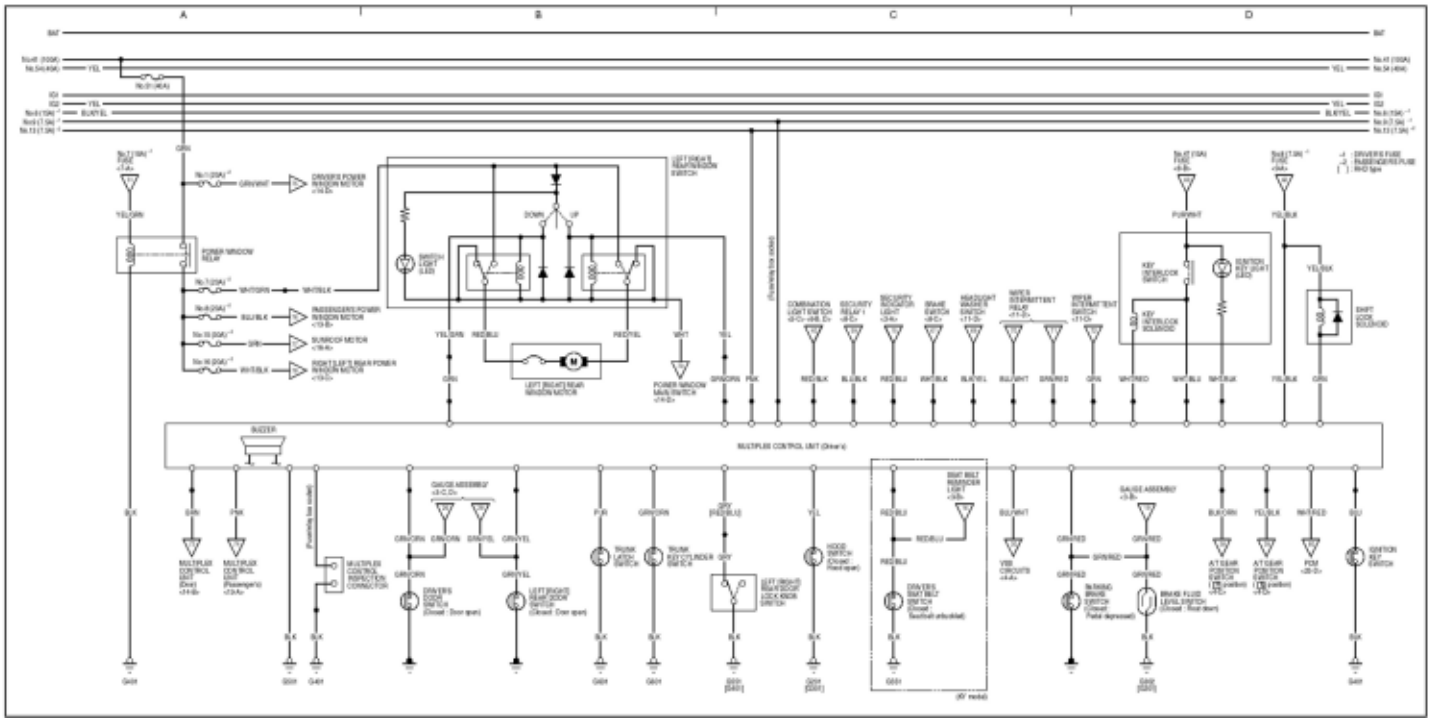
-1 : DRIVER'S FUSE



Wiring Diagrams

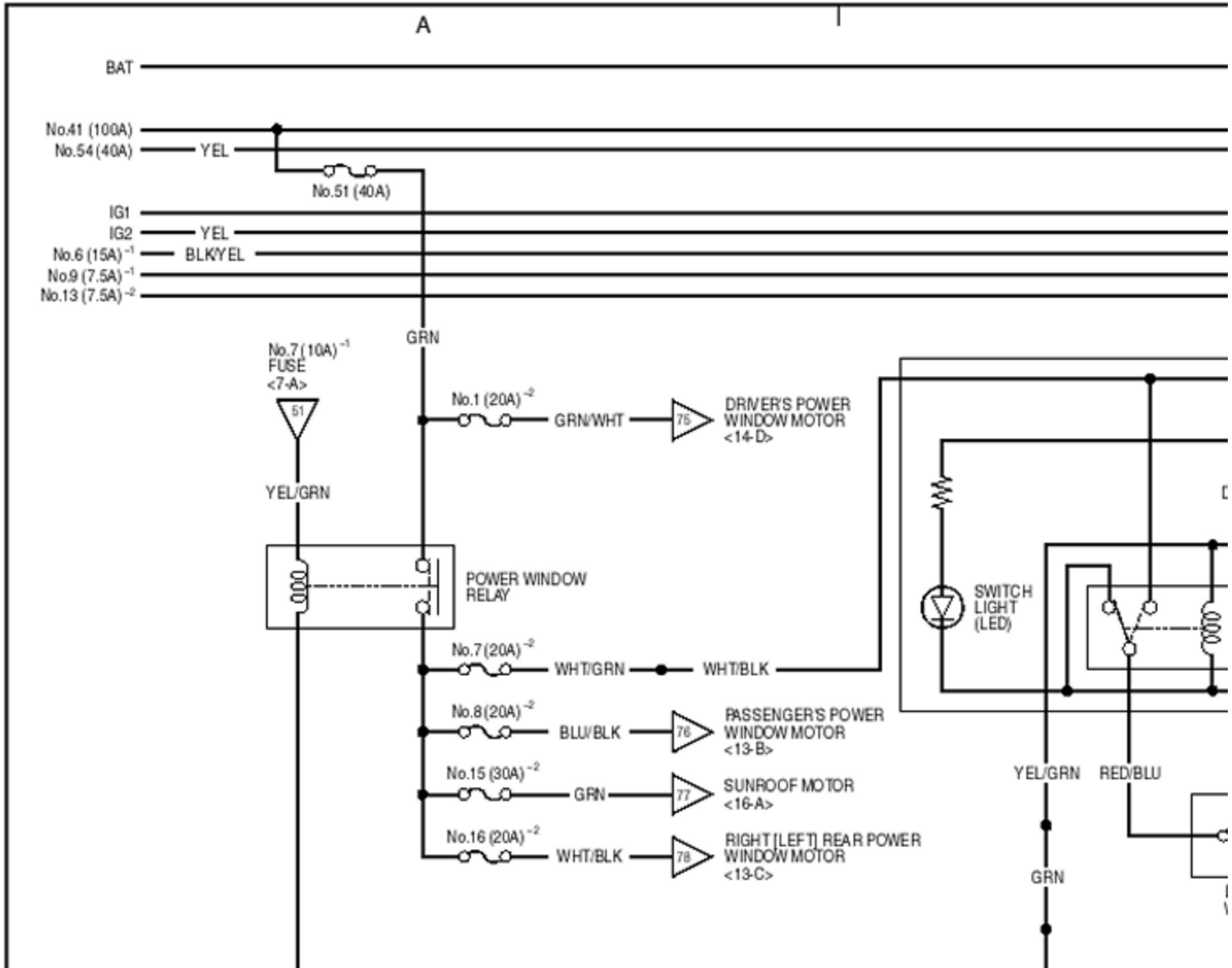
Keyless Entry/Security Alarm System

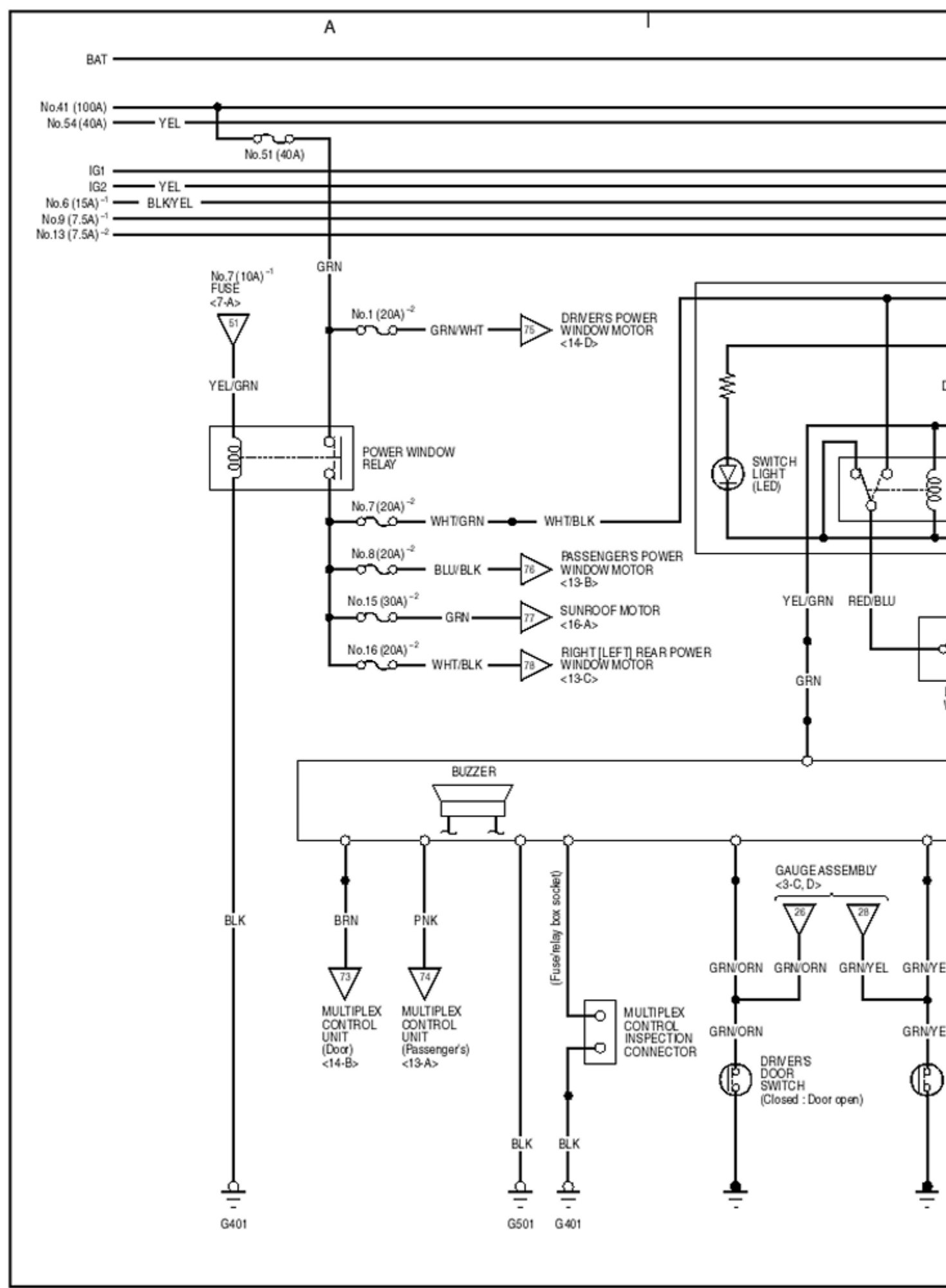
12



12

12



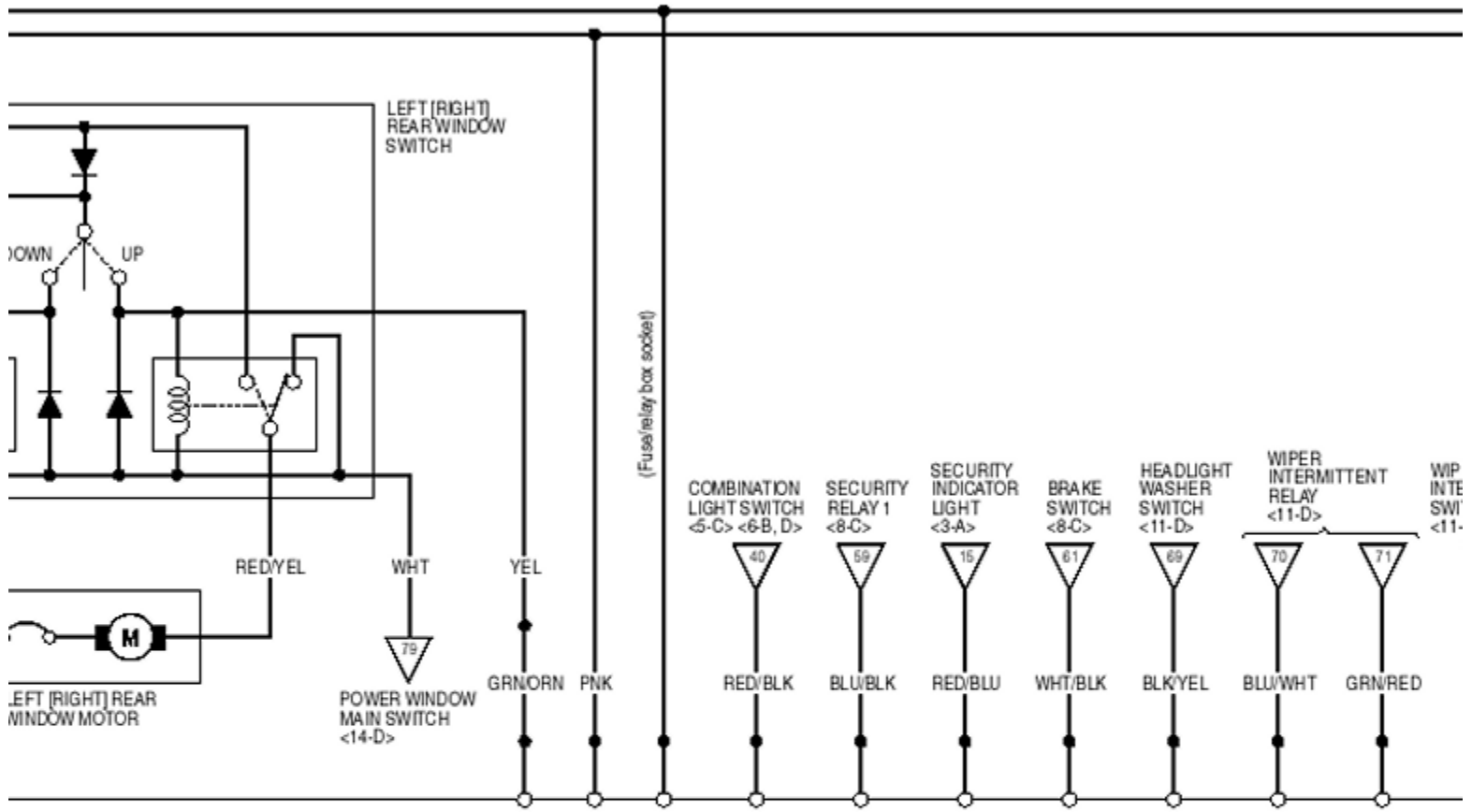


B

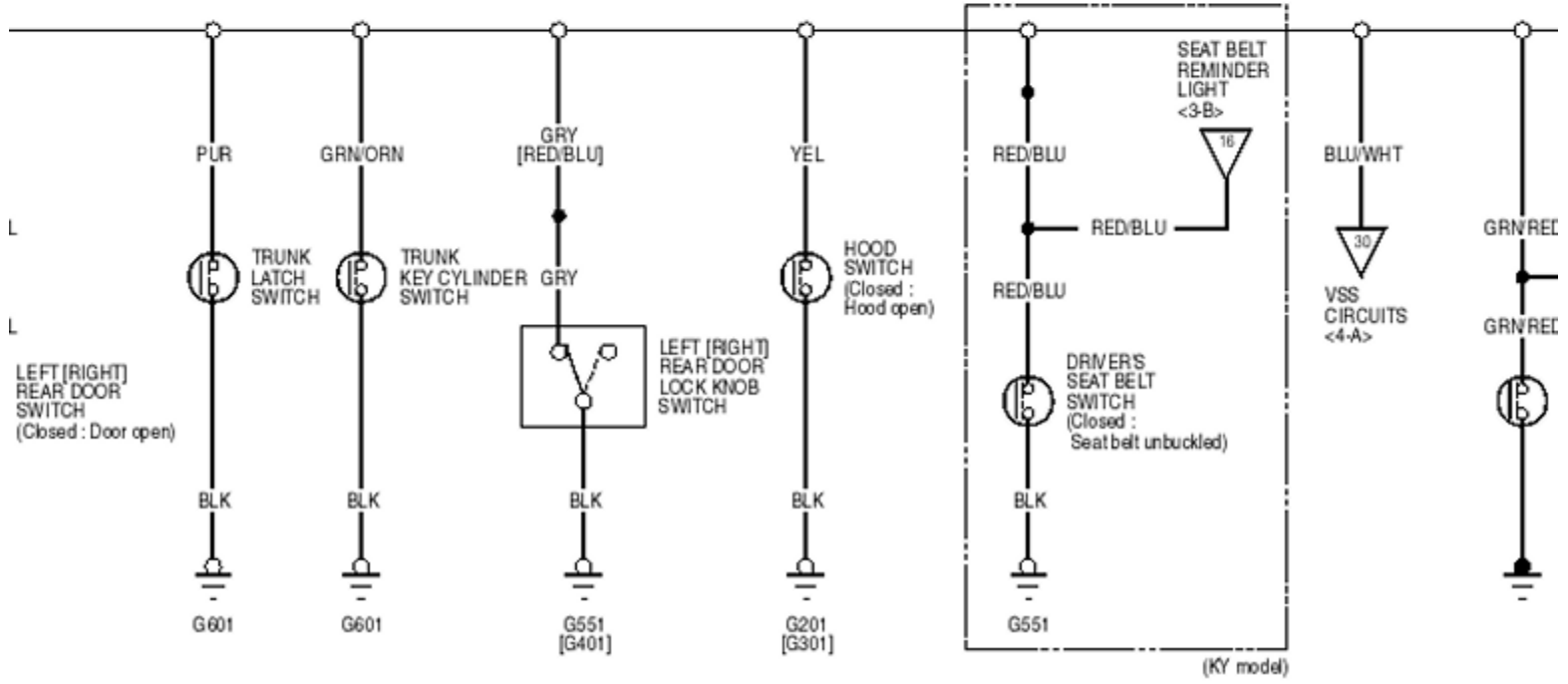
C

B

C

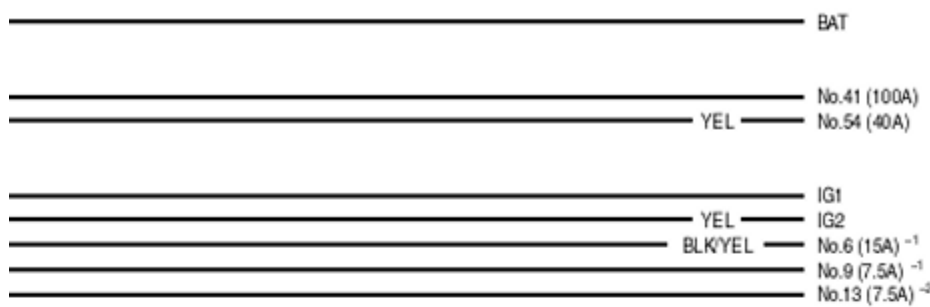


MULTIPLEX CONTROL UNIT (Driver's)



D

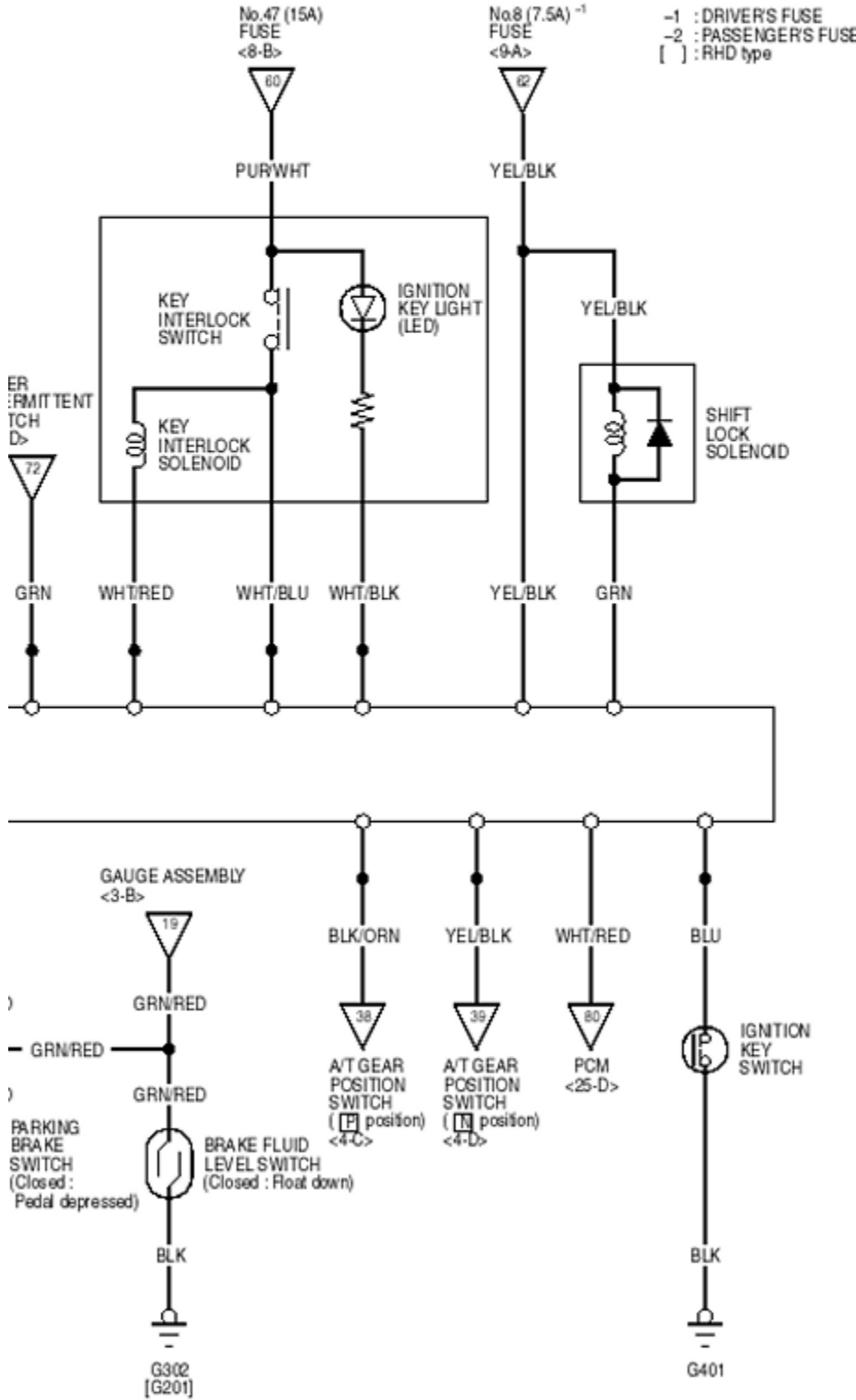
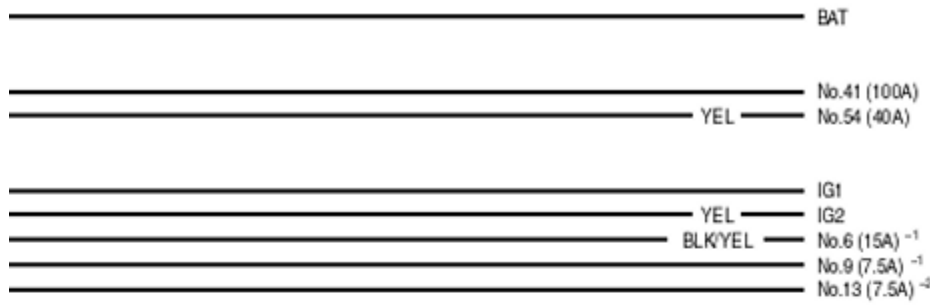
12



No.47 (15A)

No.8 (7.5A)⁻¹

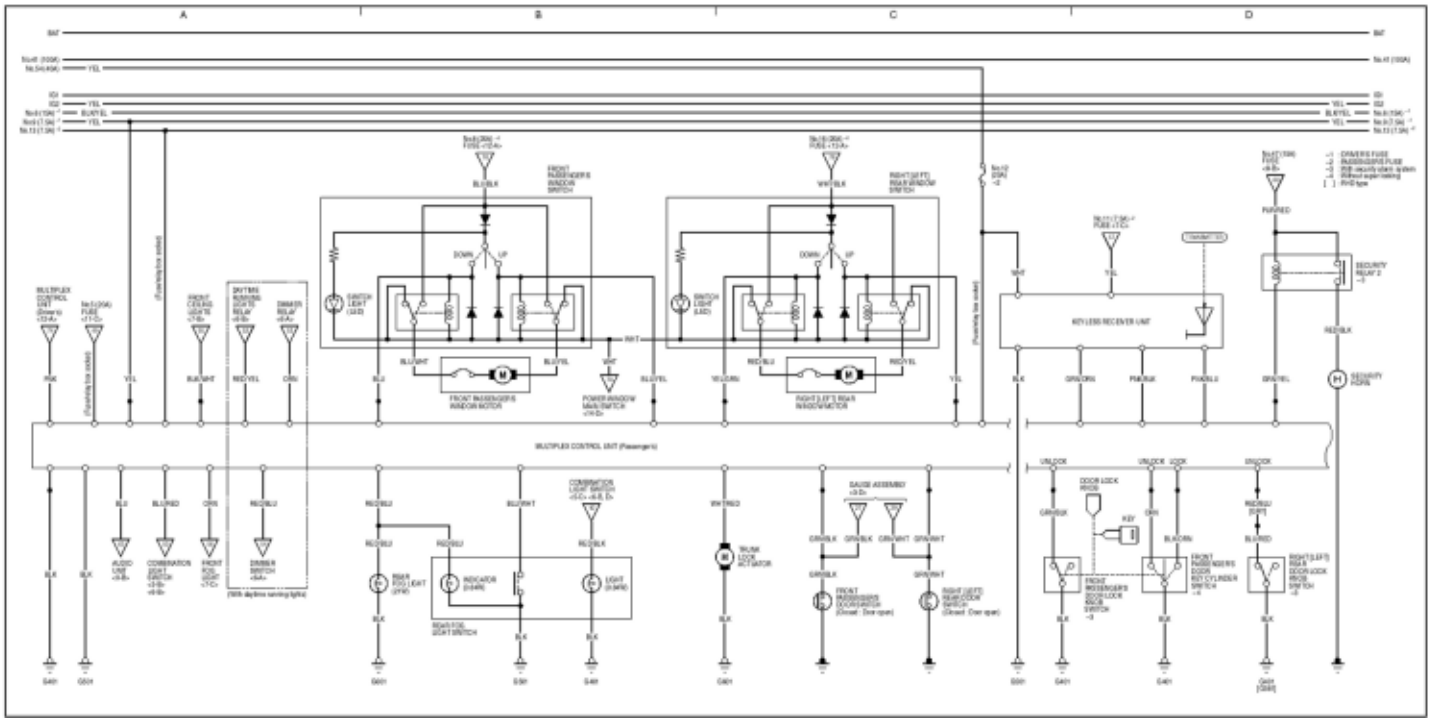
-1 : DRIVER'S FUSE



Wiring Diagrams

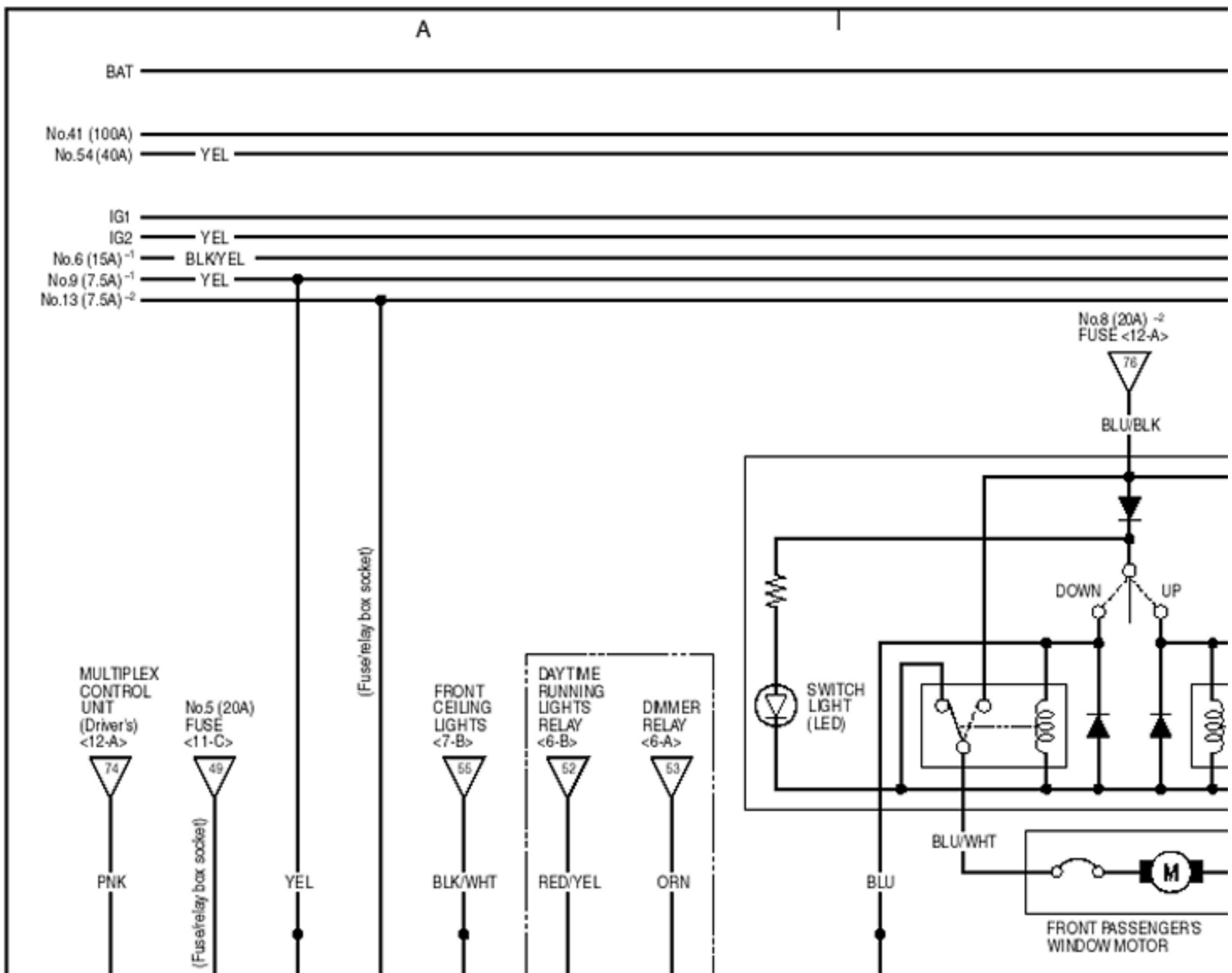
Keyless Entry/Security Alarm System

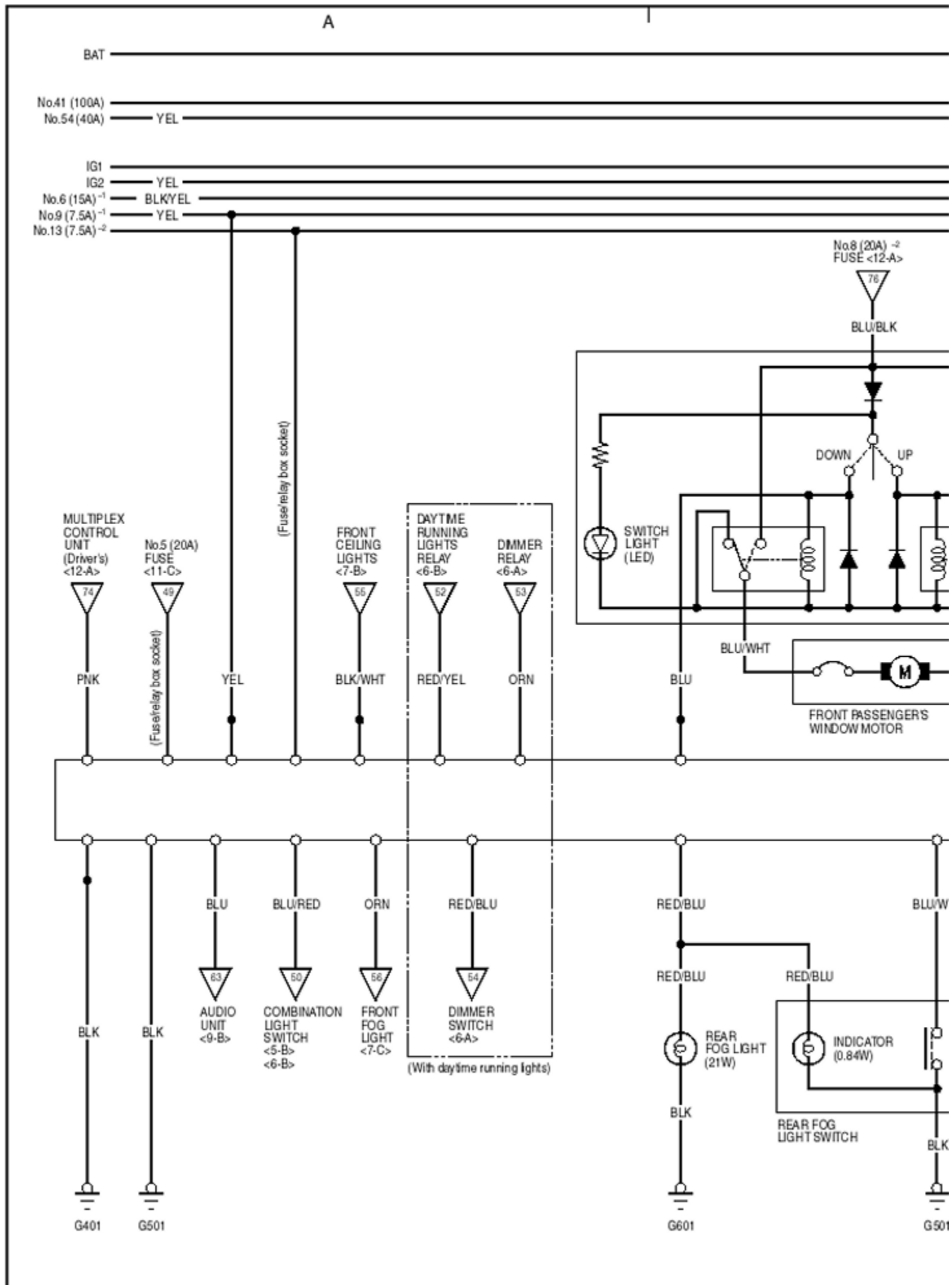
13



13

13



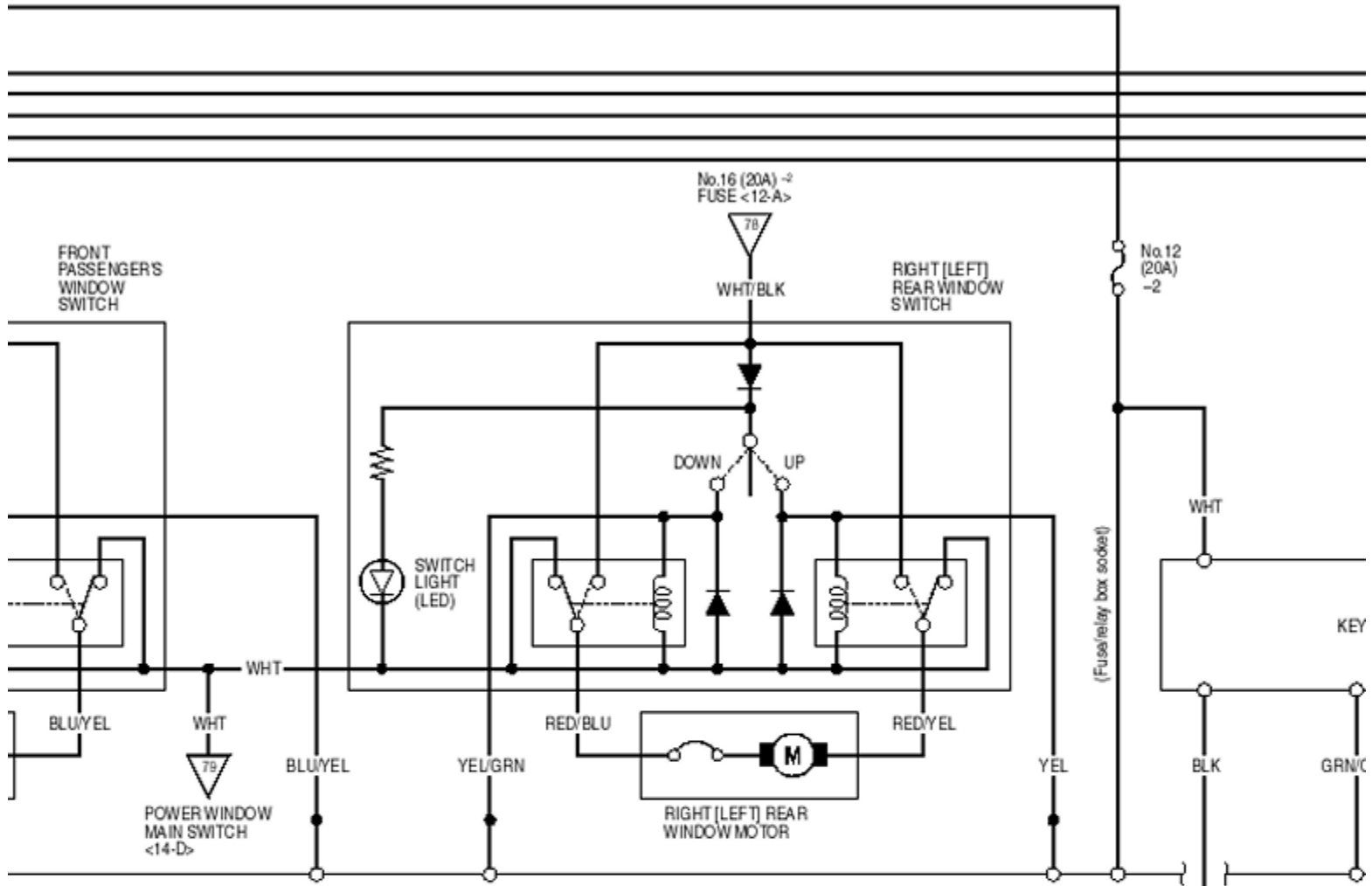


B

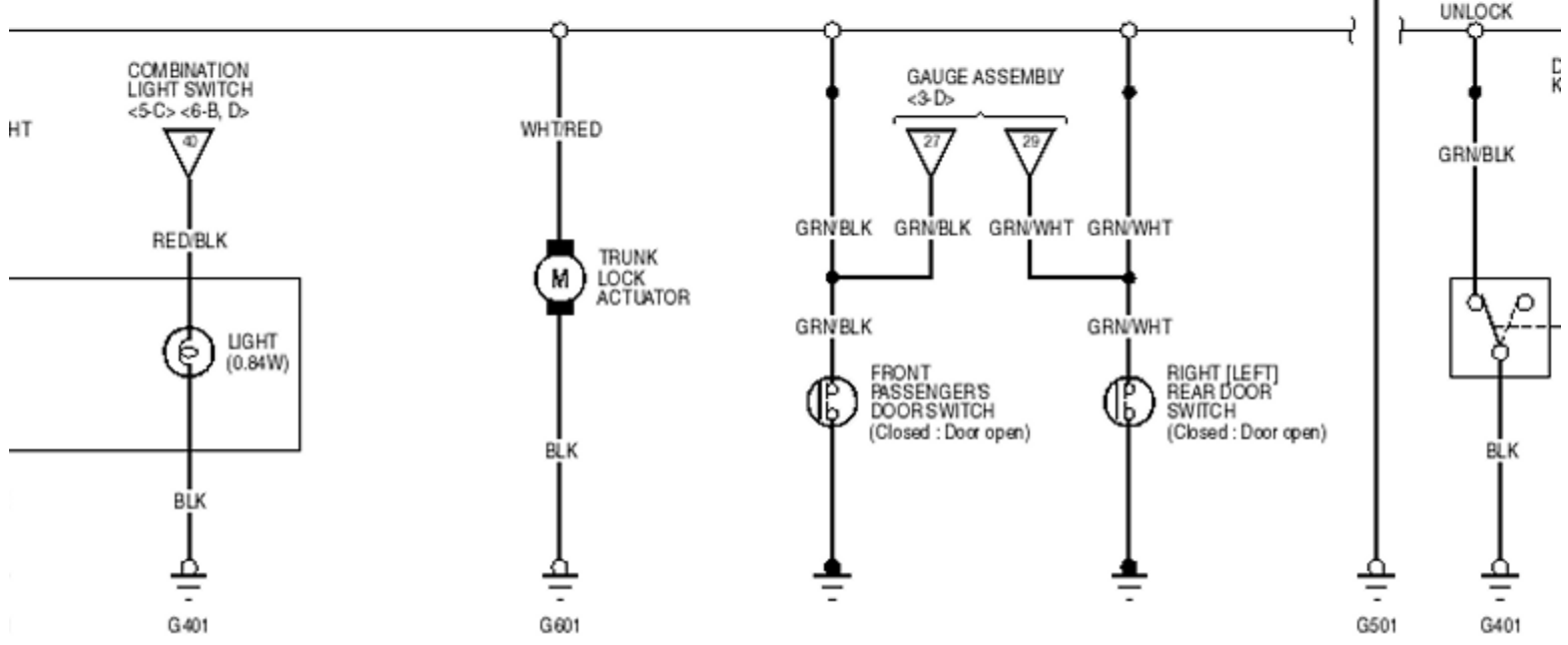
C

B

C

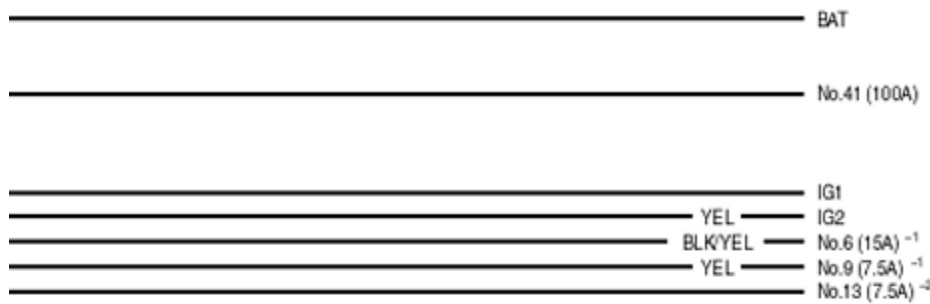


MULTIPLEX CONTROL UNIT (Passenger's)

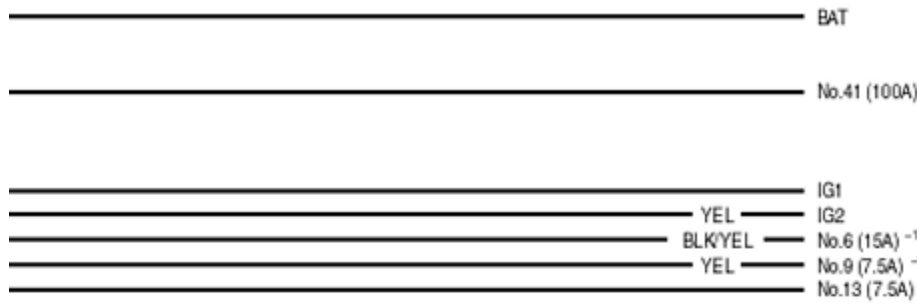


D

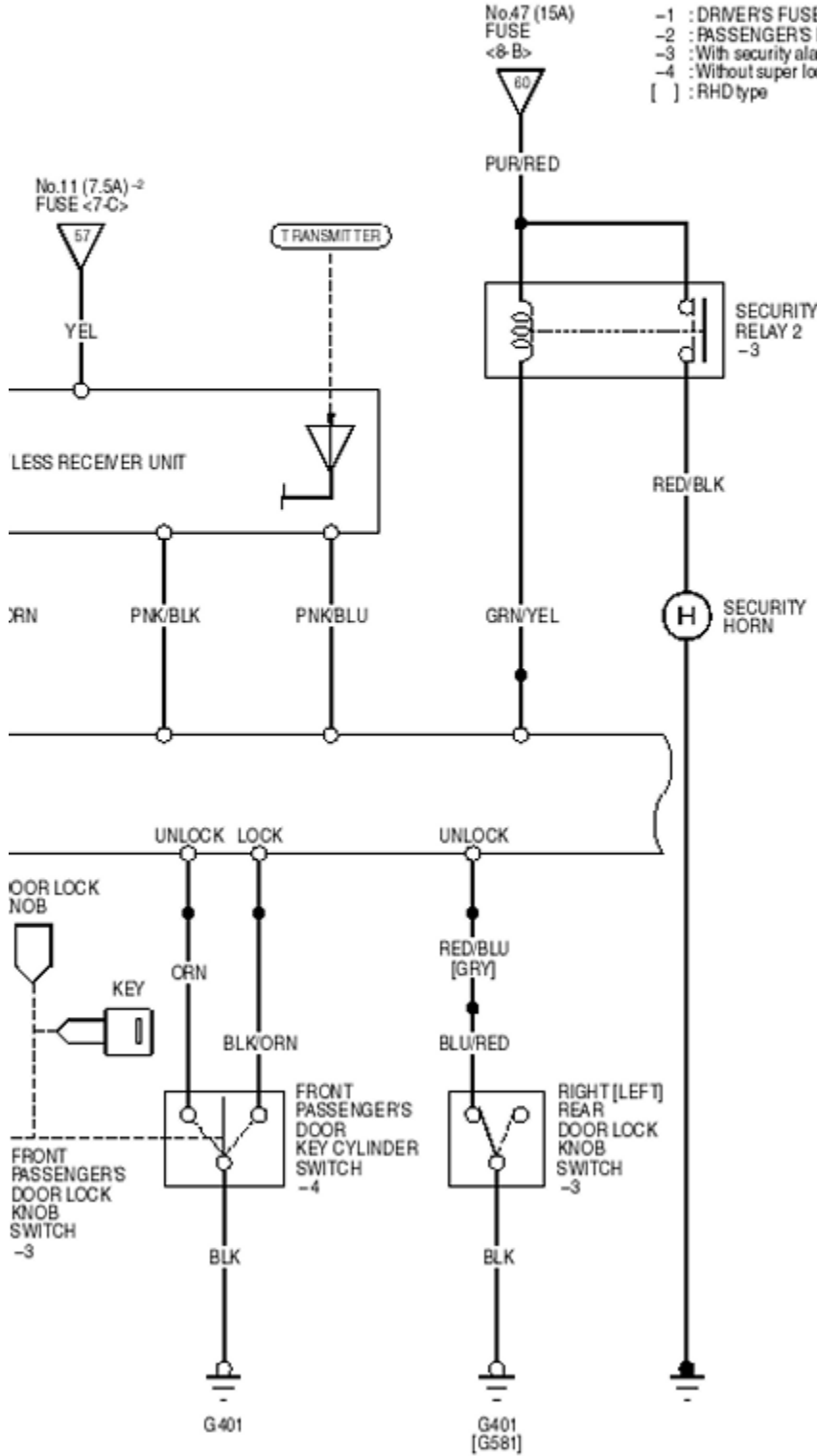
13



No. 47 (15A) -1 : DRIVER'S FUSE

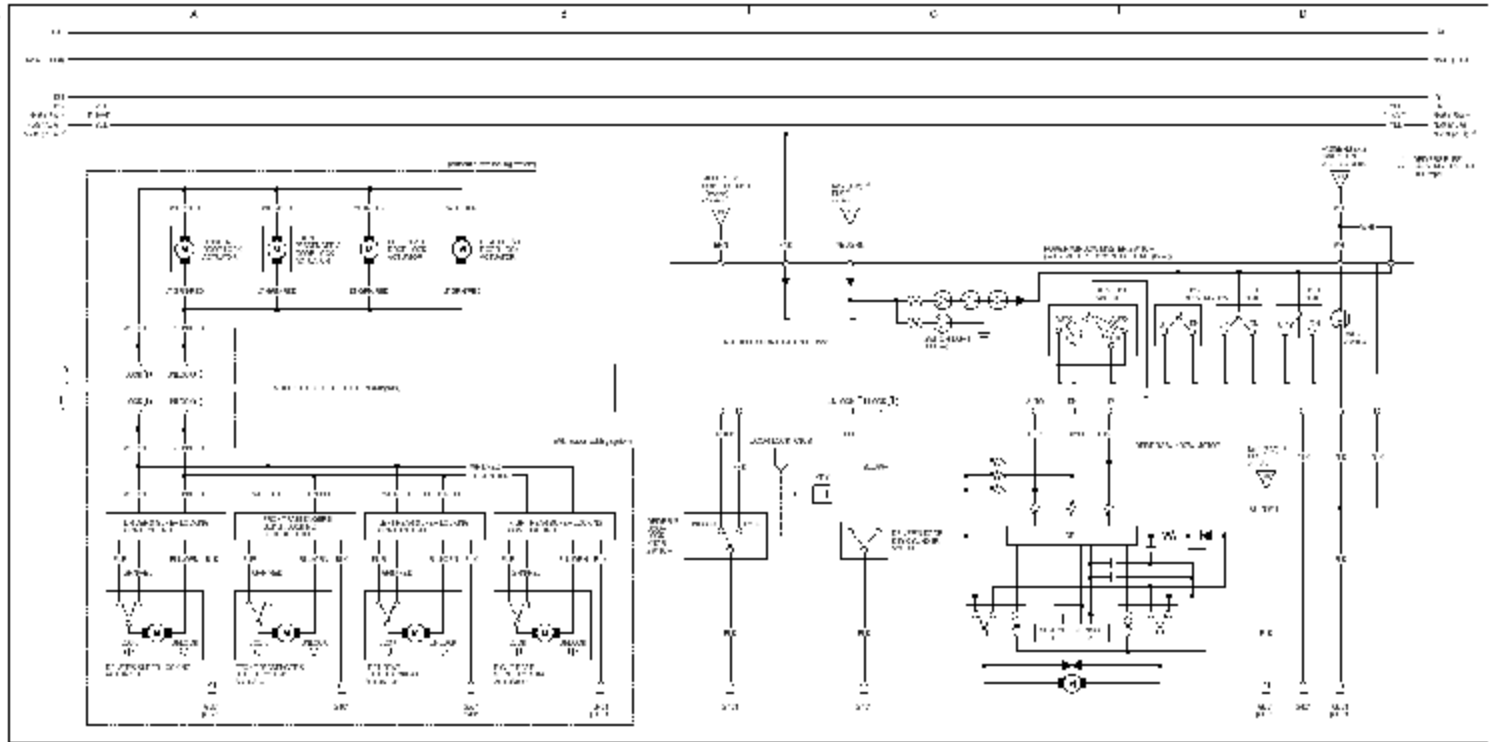


No.47 (15A) FUSE <8-B>
 -1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type



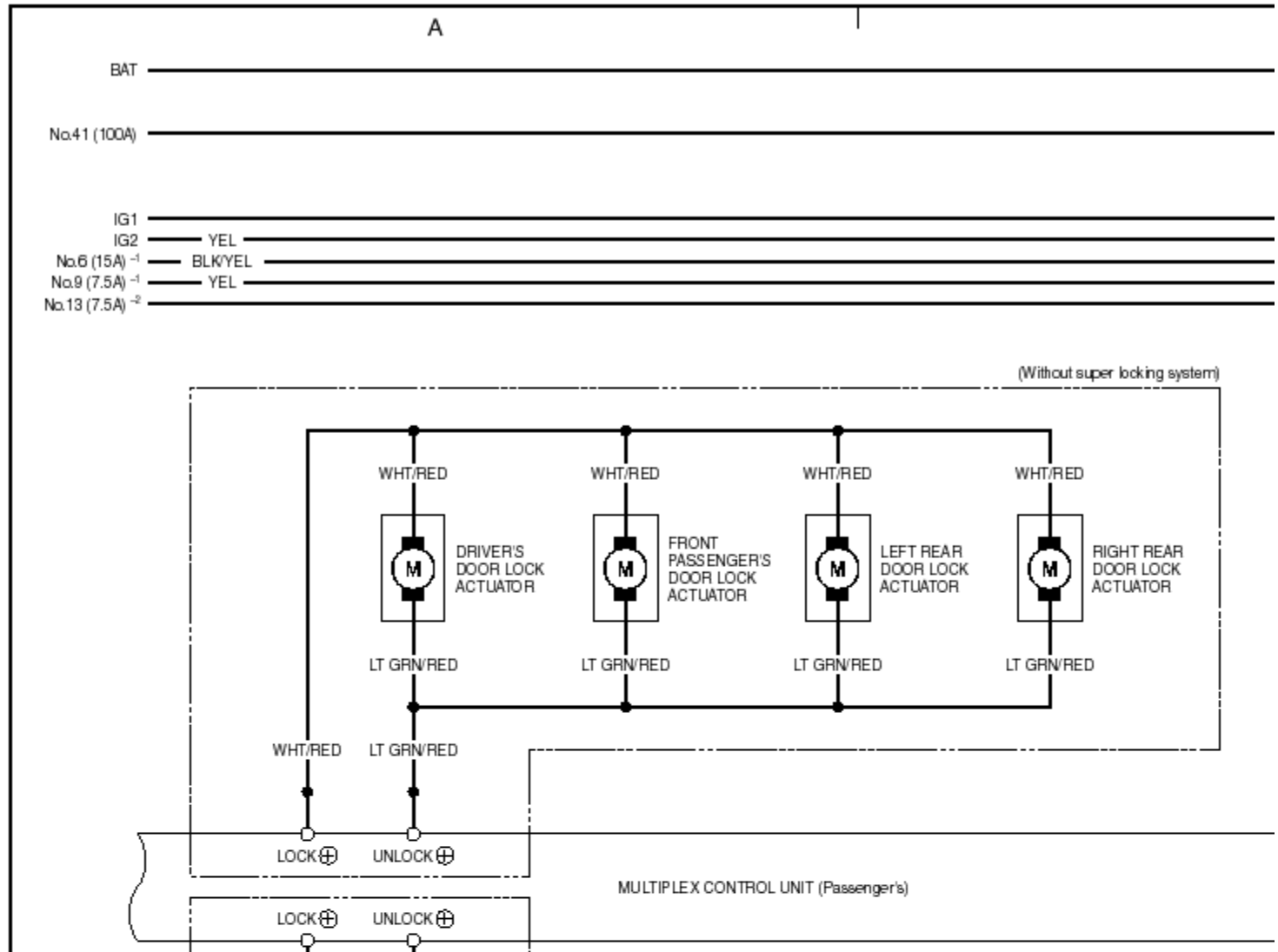
Wiring Diagrams
Keyless Entry/Security Alarm System/Multiplex
Control System/Power Door Locks/Power Windows

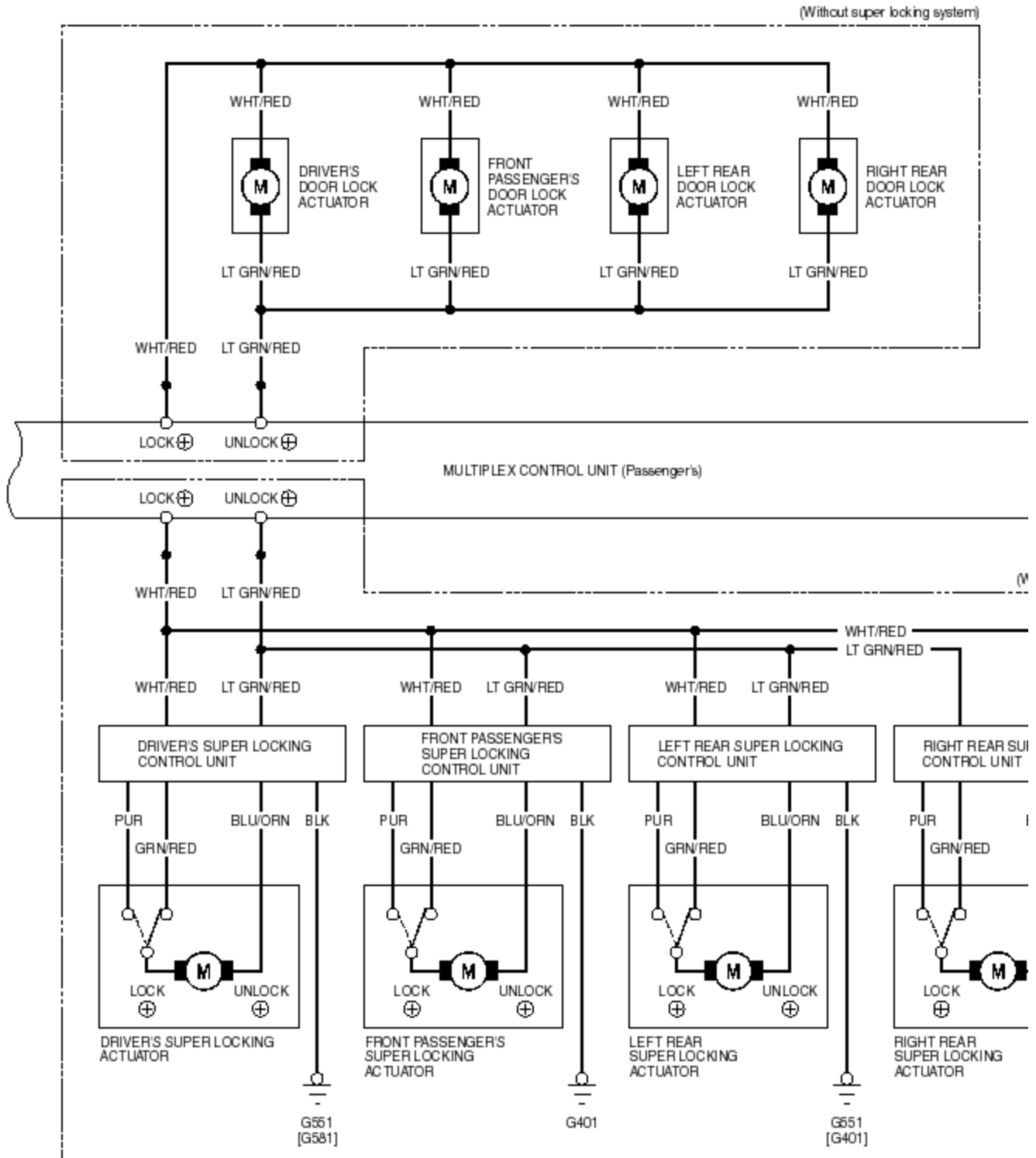
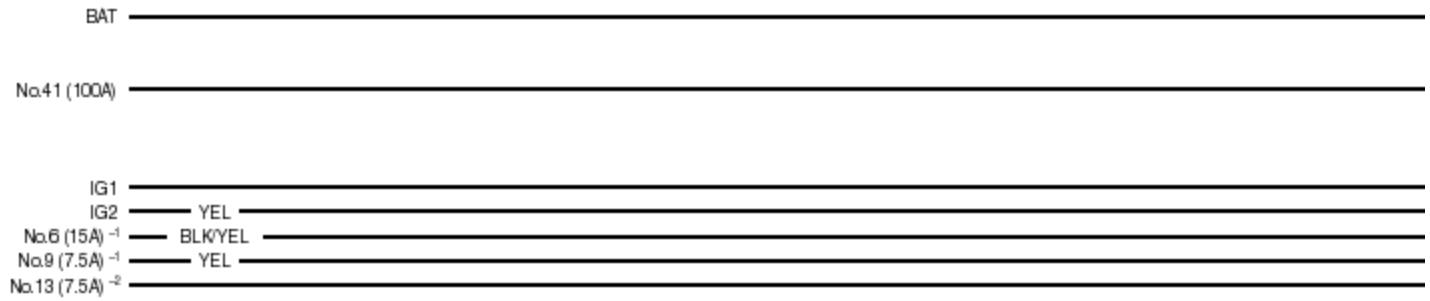
14

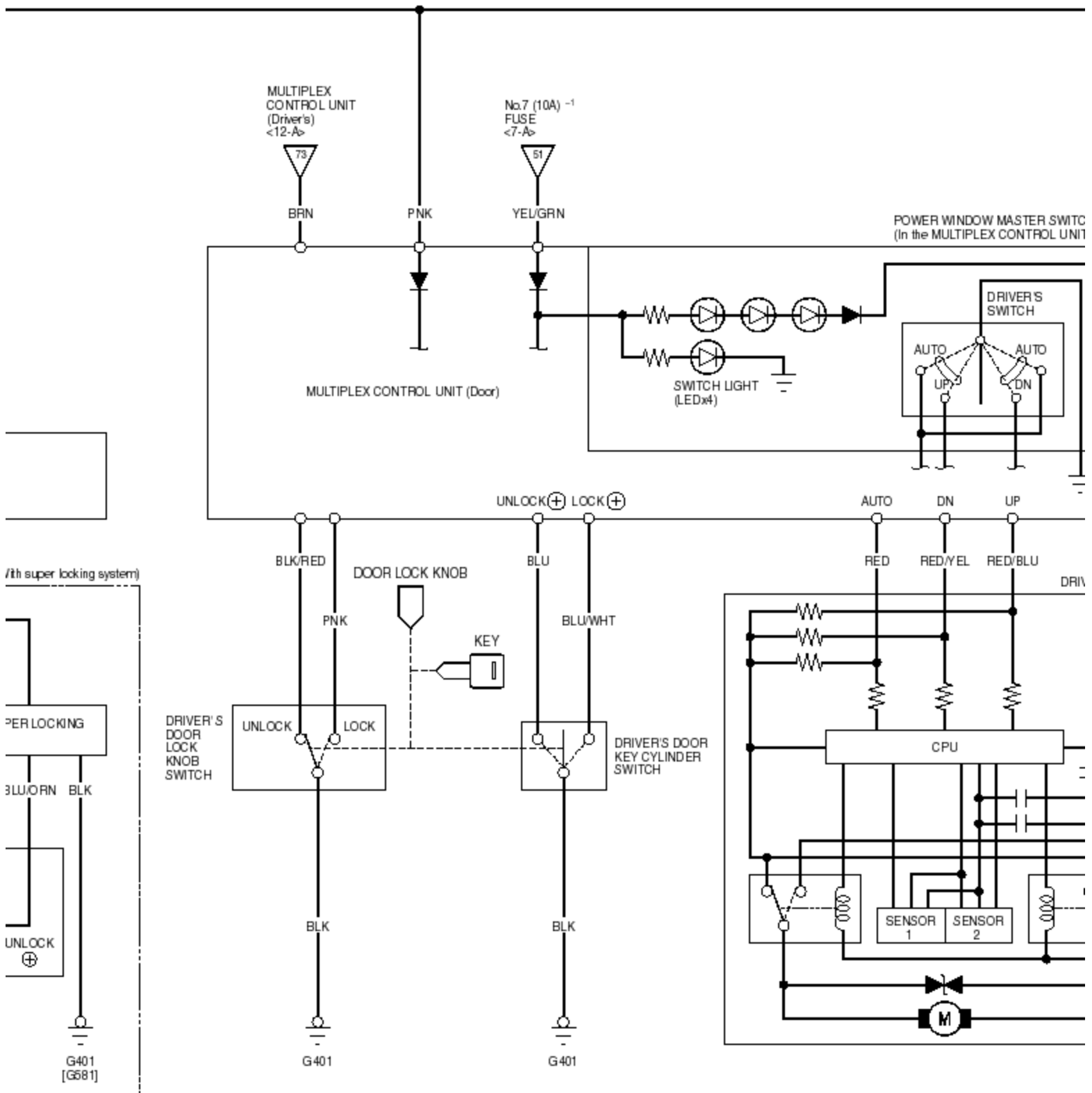


14

14







(with super locking system)

PER LOCKING

3LU/ORN BLK

UNLOCK ⊕

G401 (G581)

D

BAT

No.41 (100A)

IG1

YEL IG2

BLK/YEL No.6 (15A) -1

YEL No.9 (7.5A) -1

No.13 (7.5A) -2

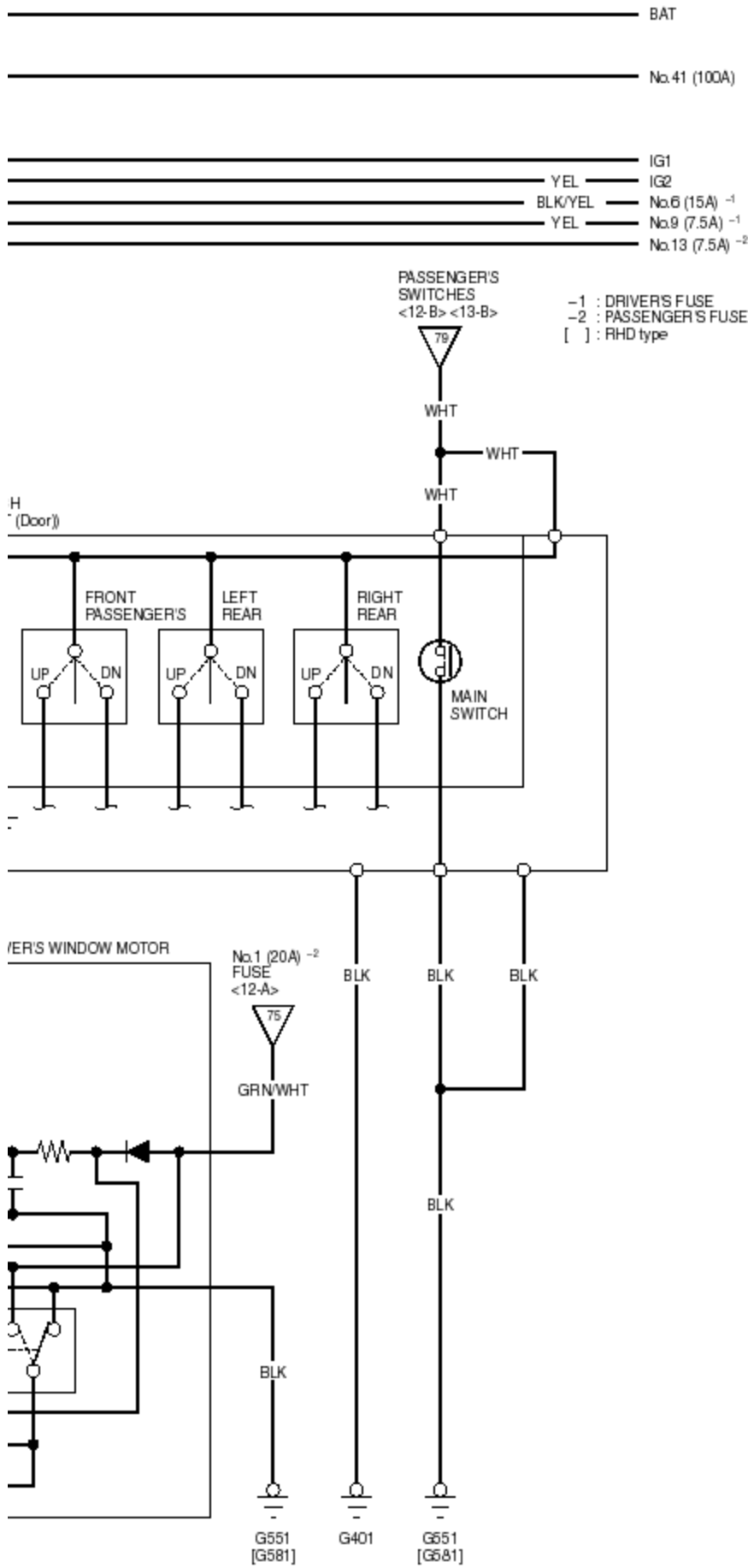
PASSENGER'S SWITCHES <12-B> <13-B>

-1 : DRIVER'S FUSE

-2 : PASSENGER'S FUSE

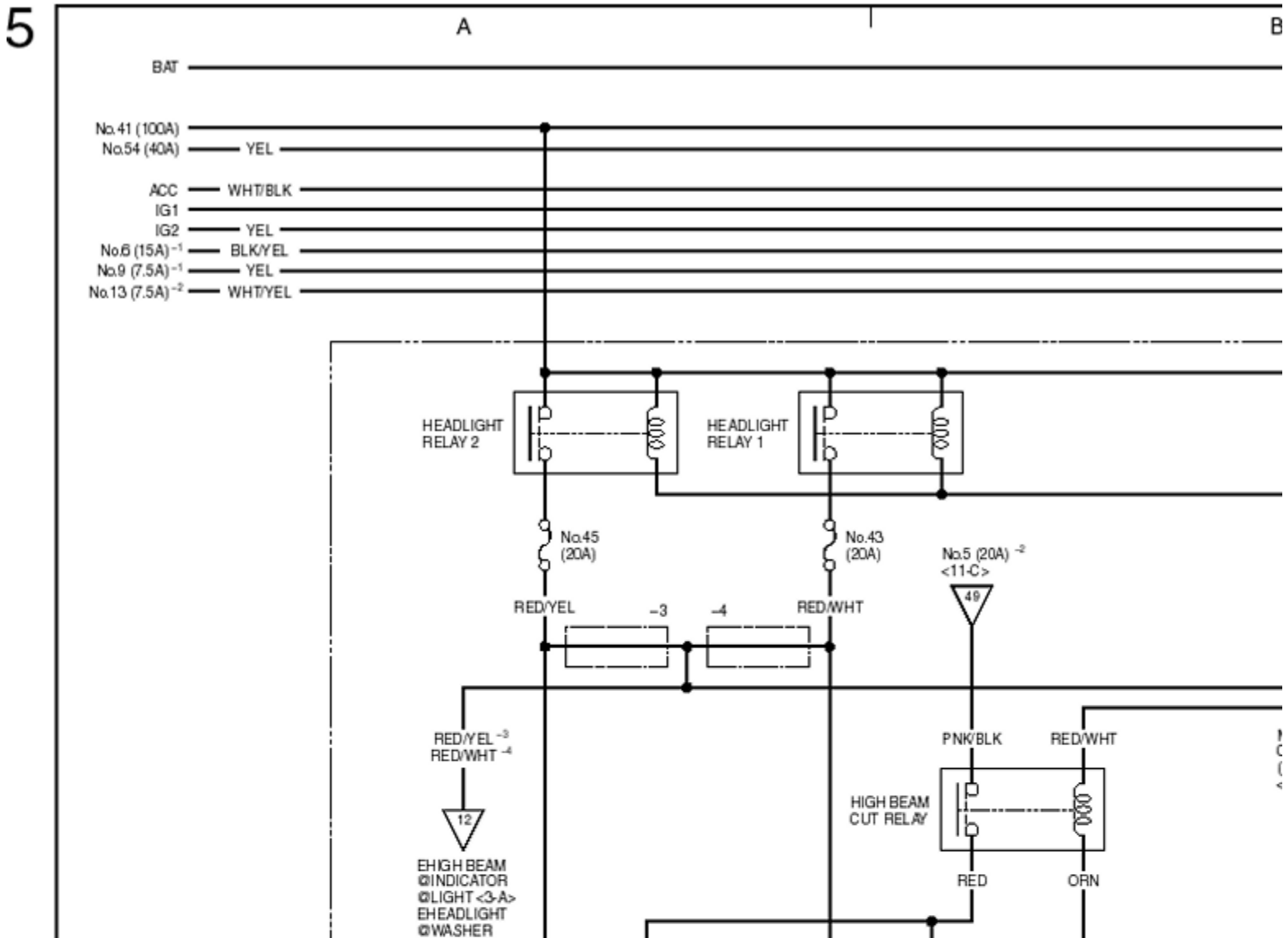
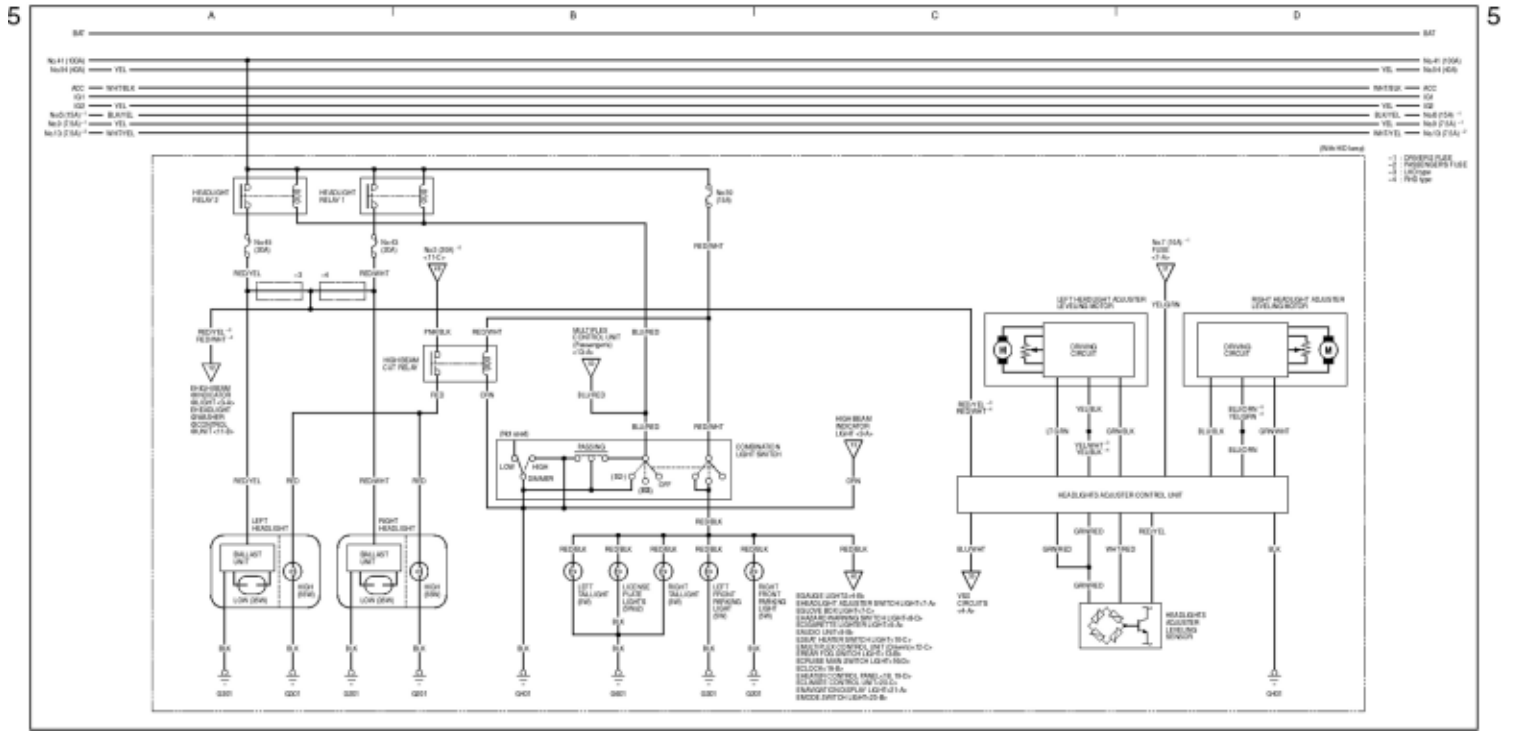
[] : RHD type

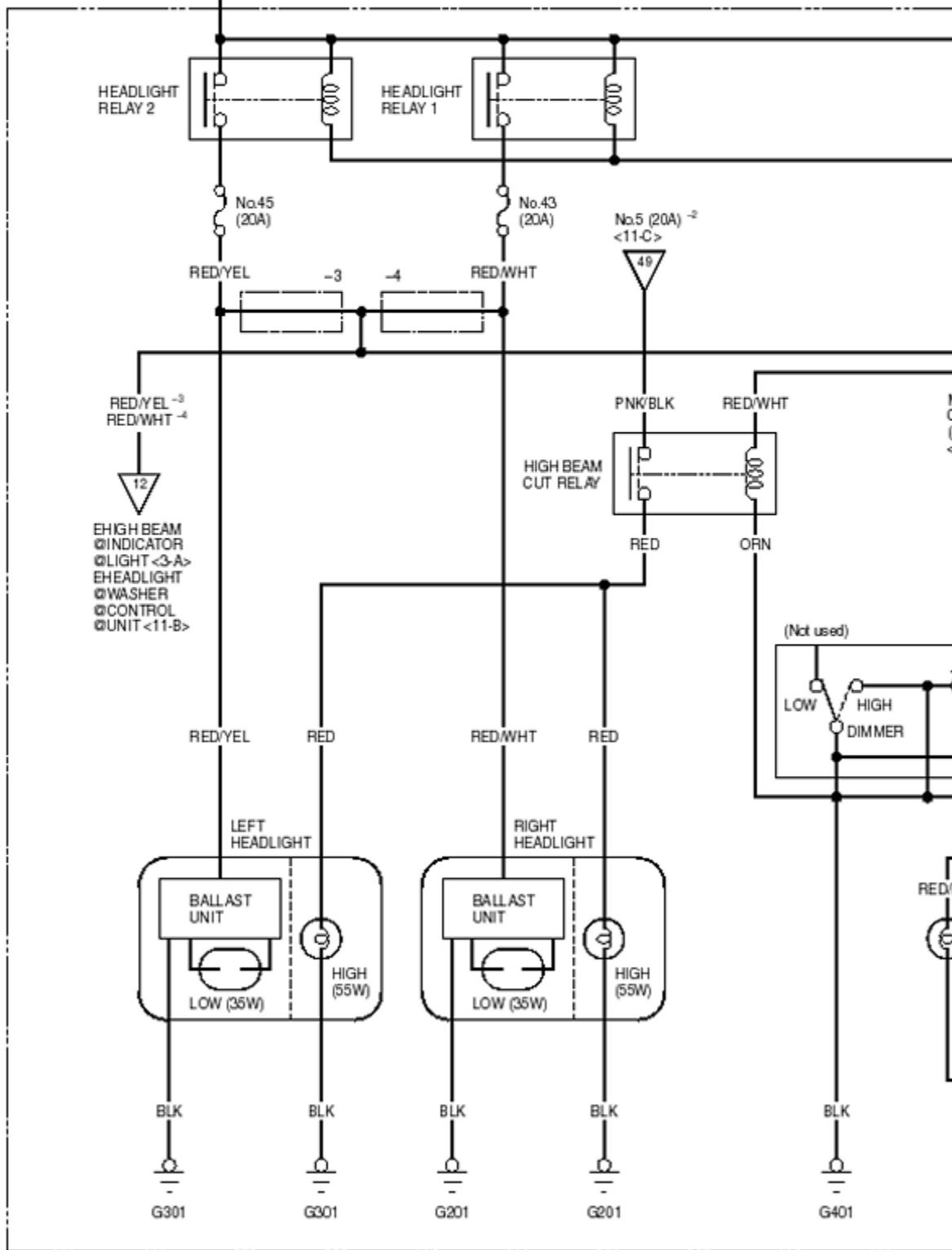
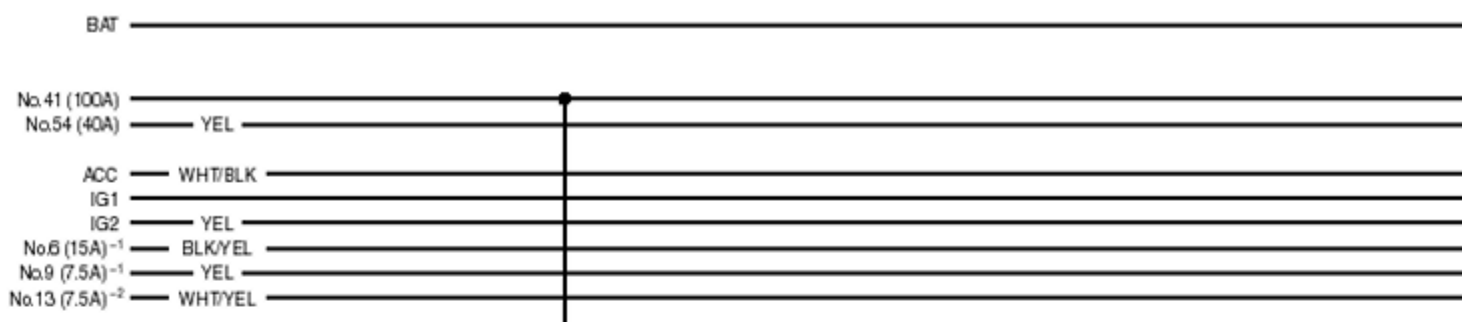
D

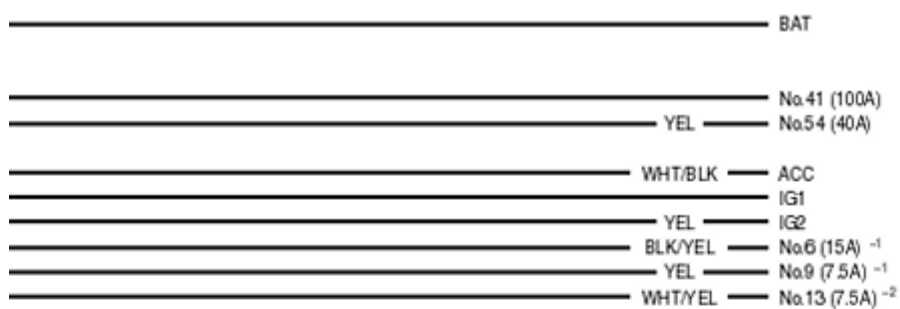
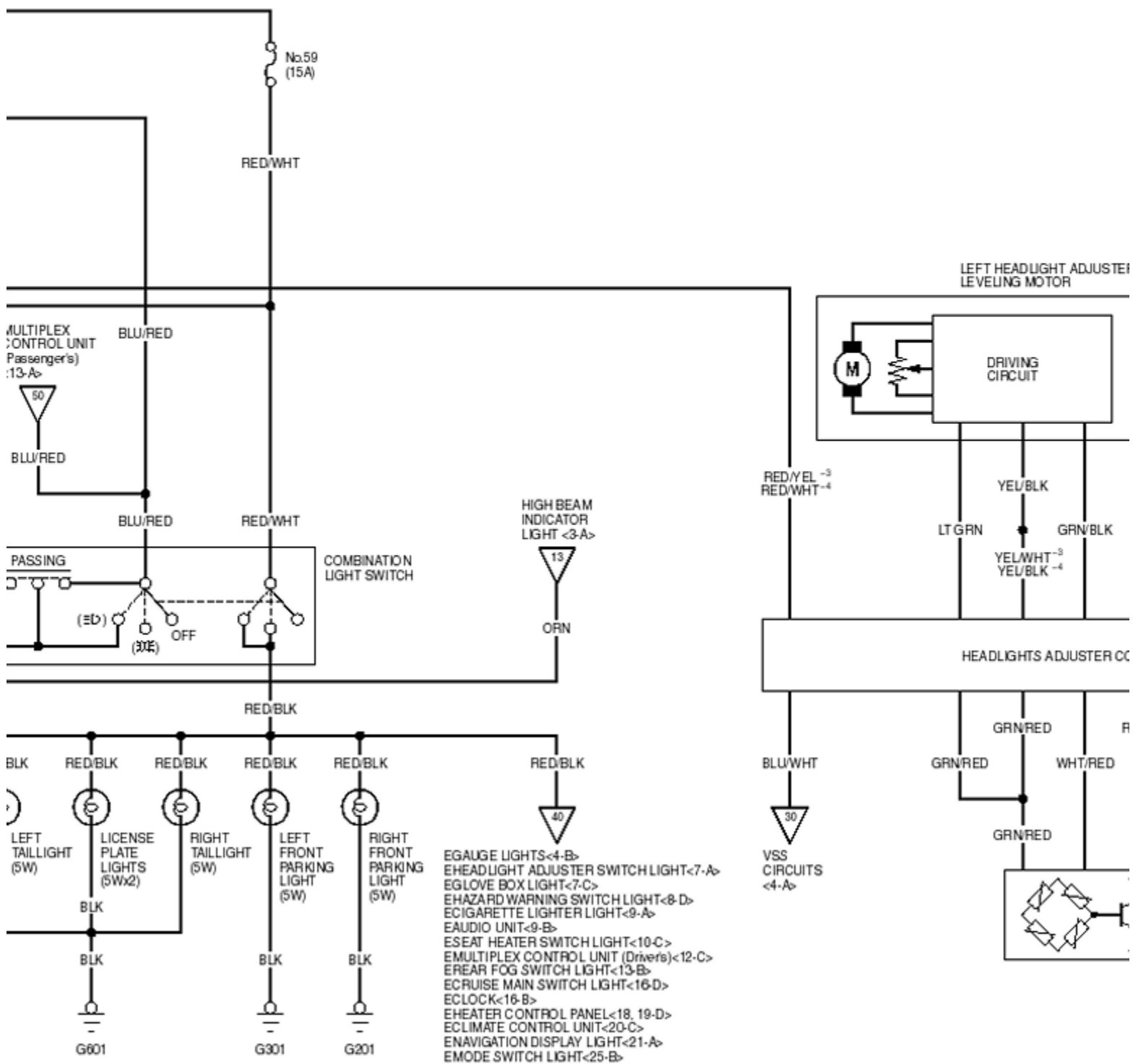


Wiring Diagrams

Lighting System







(With HID lamp)

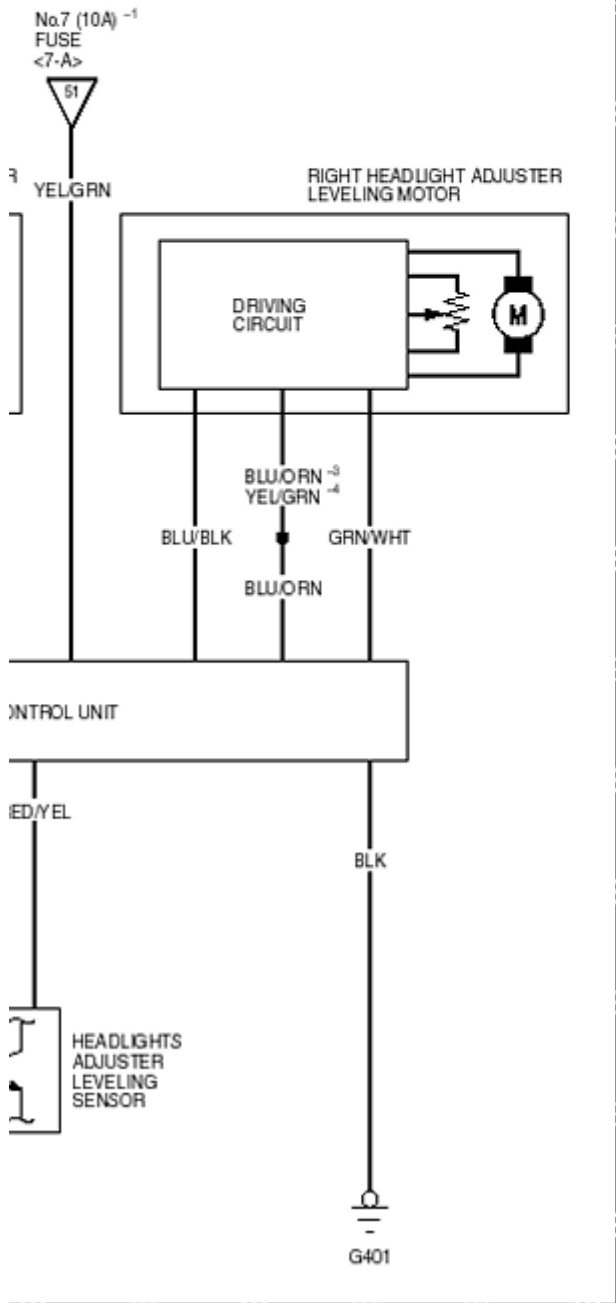
- 1 : DRIVER'S FUSE

D

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

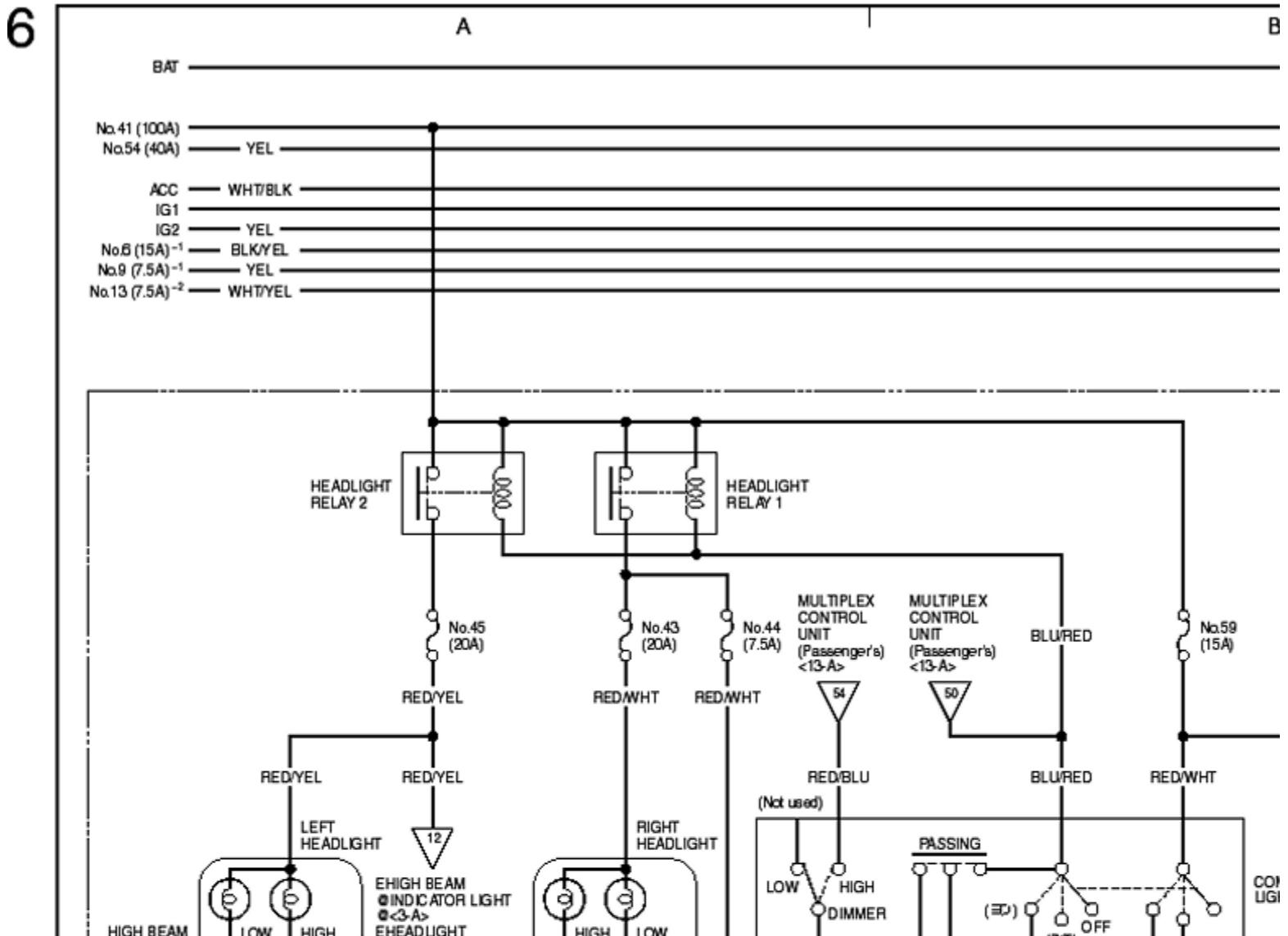
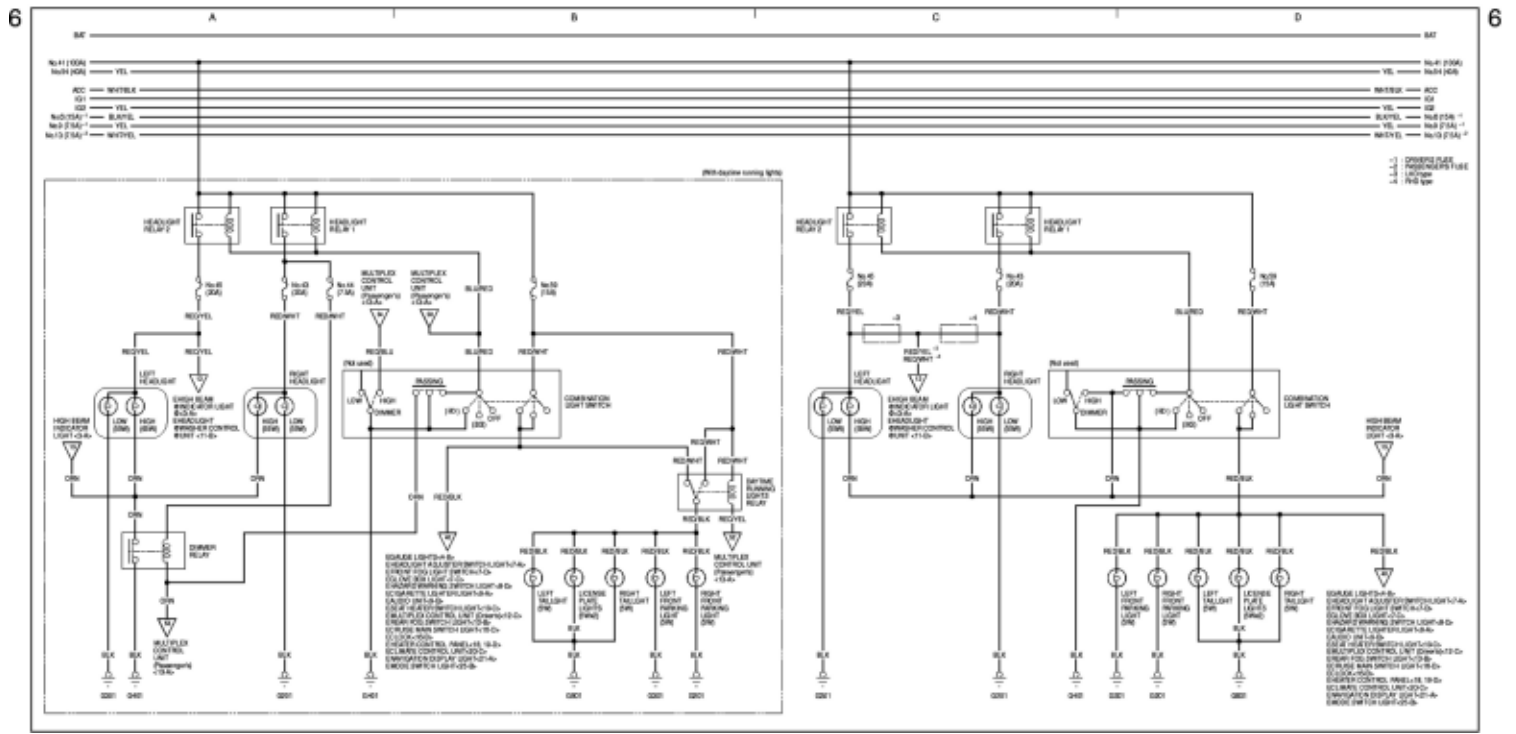
(With HID lamp)

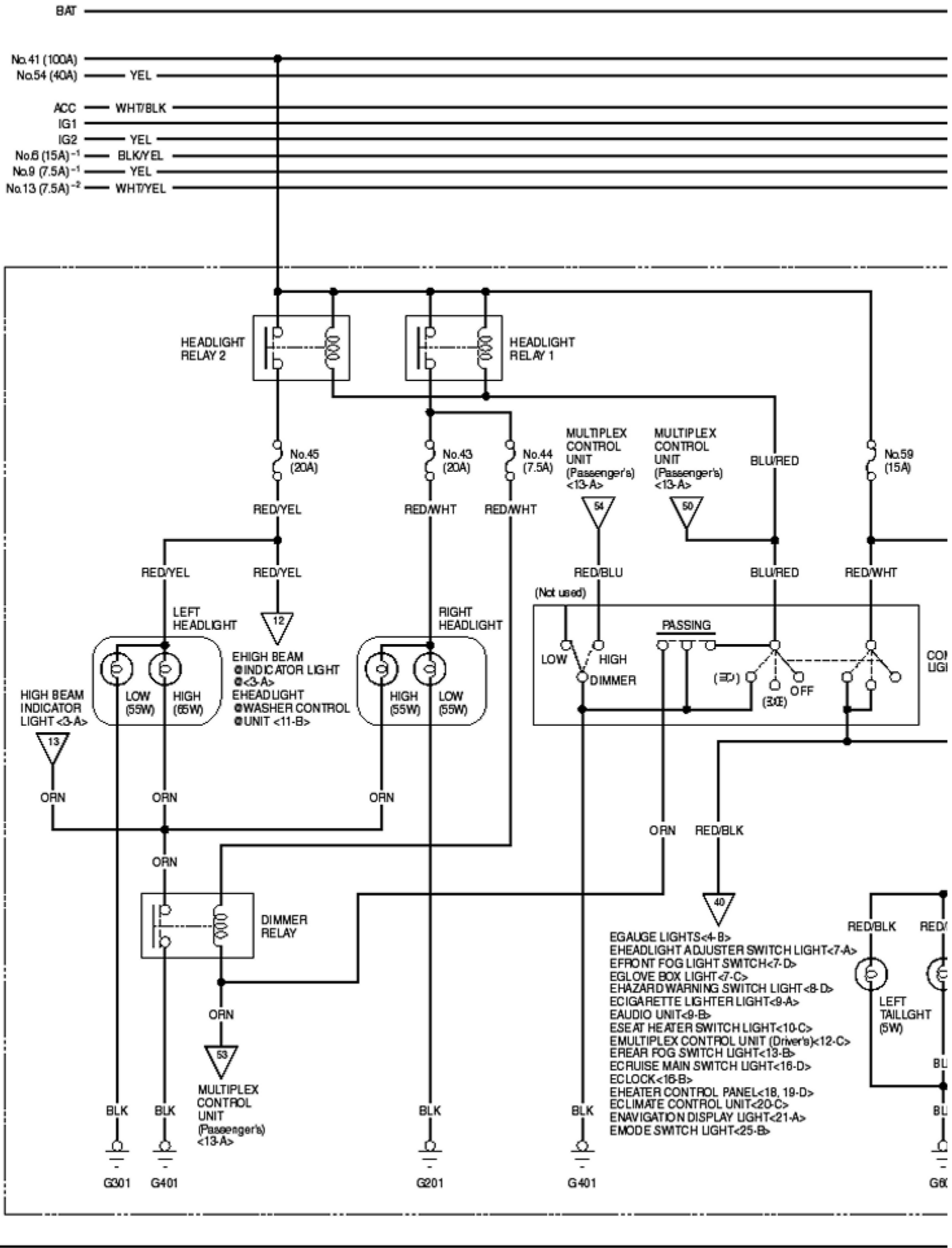
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type



Wiring Diagrams

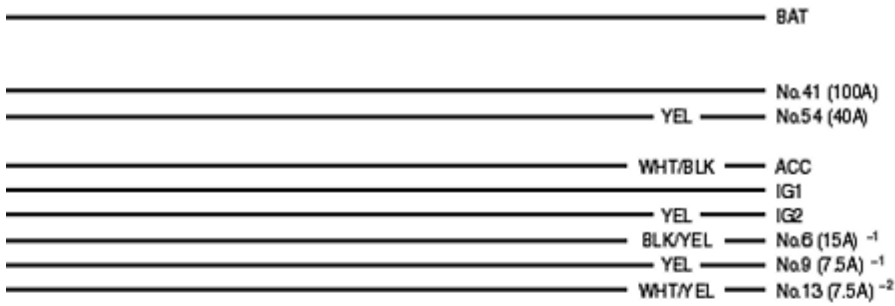
Lighting System



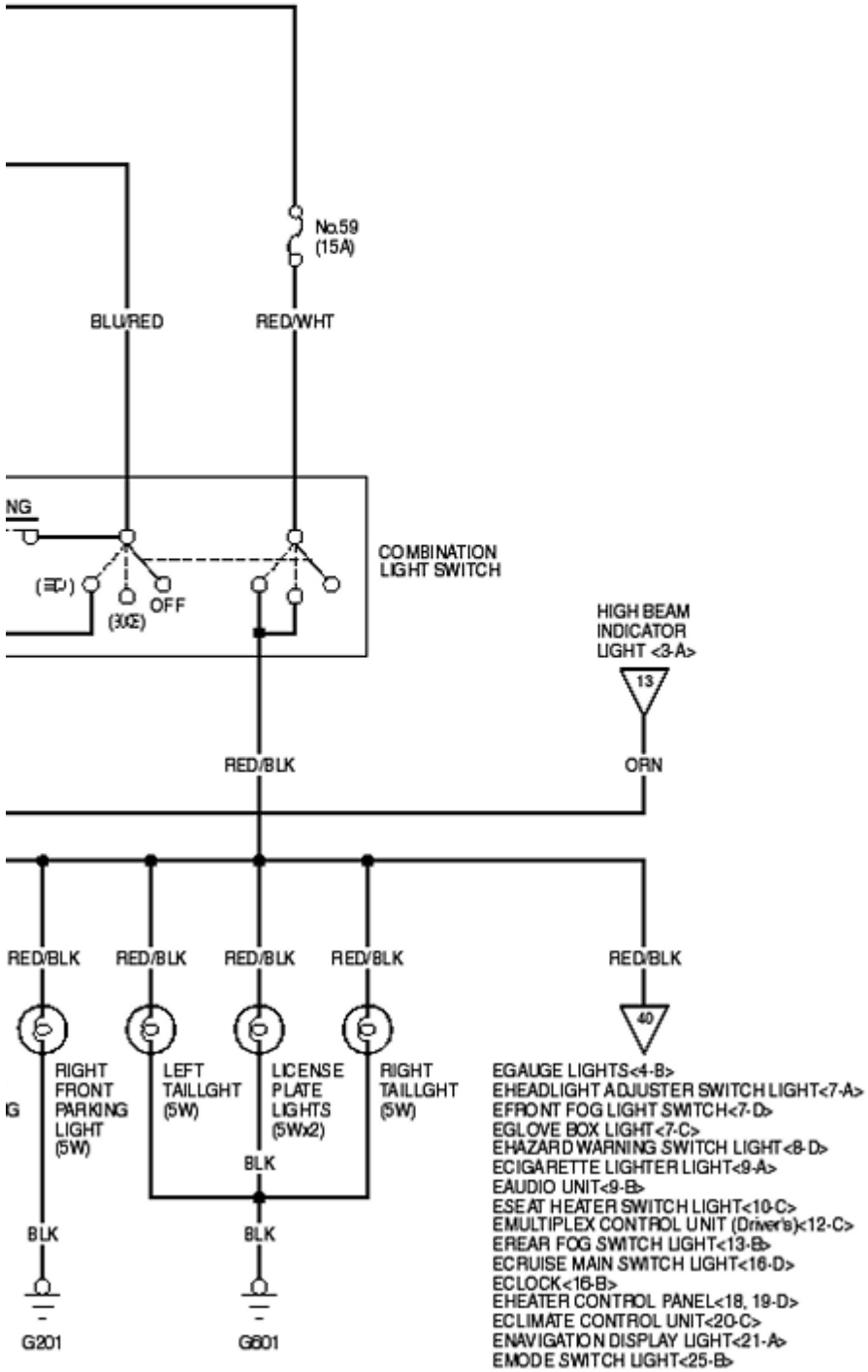


D

6

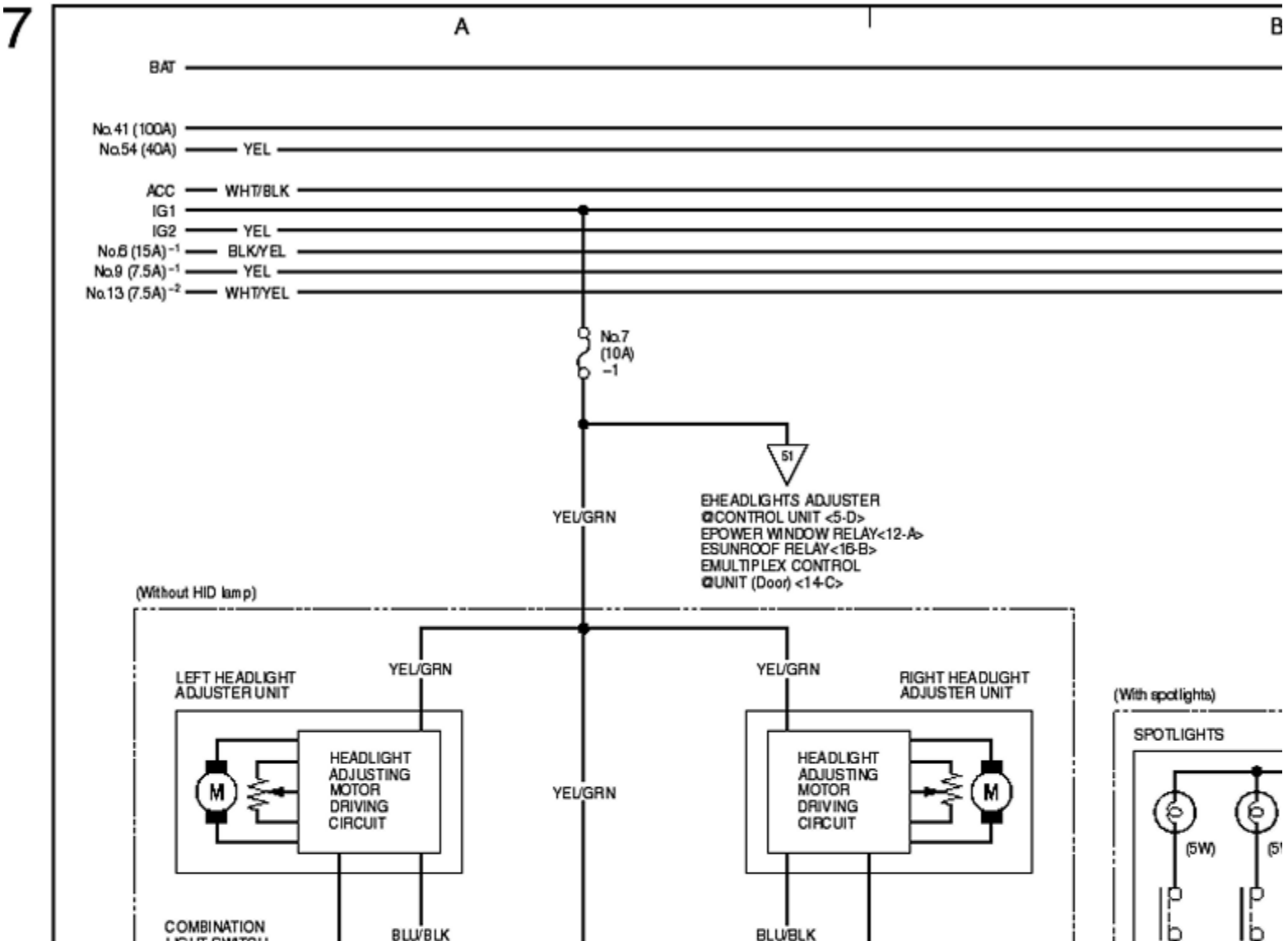
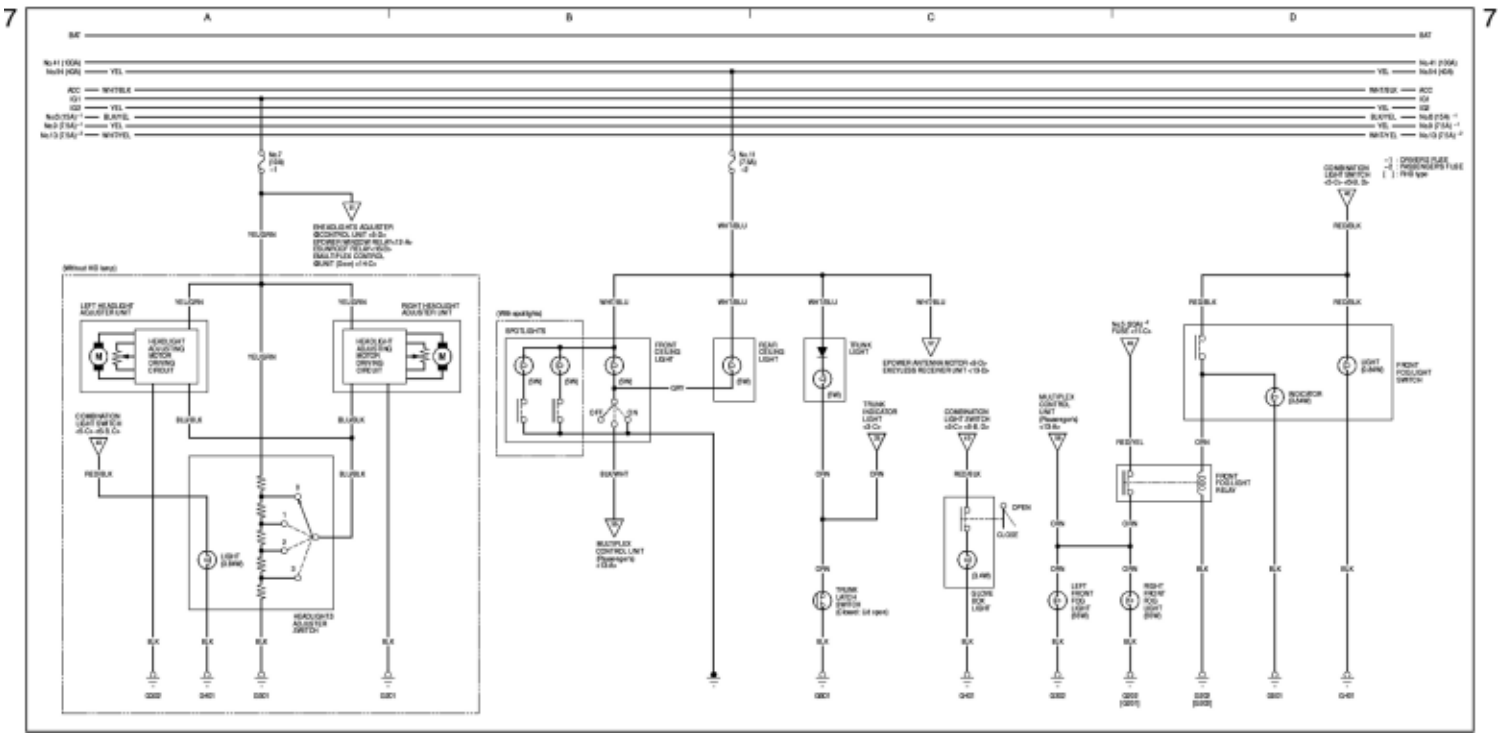


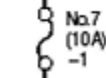
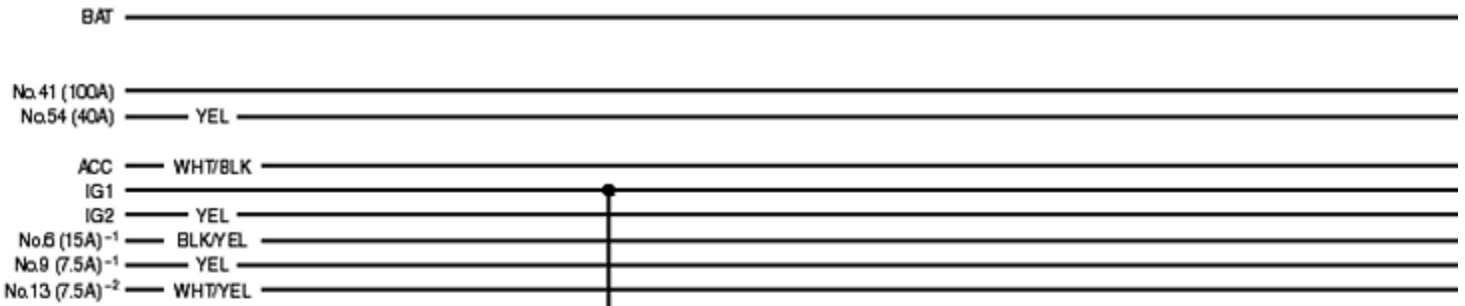
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : LHD type
 -4 : RHD type



Wiring Diagrams

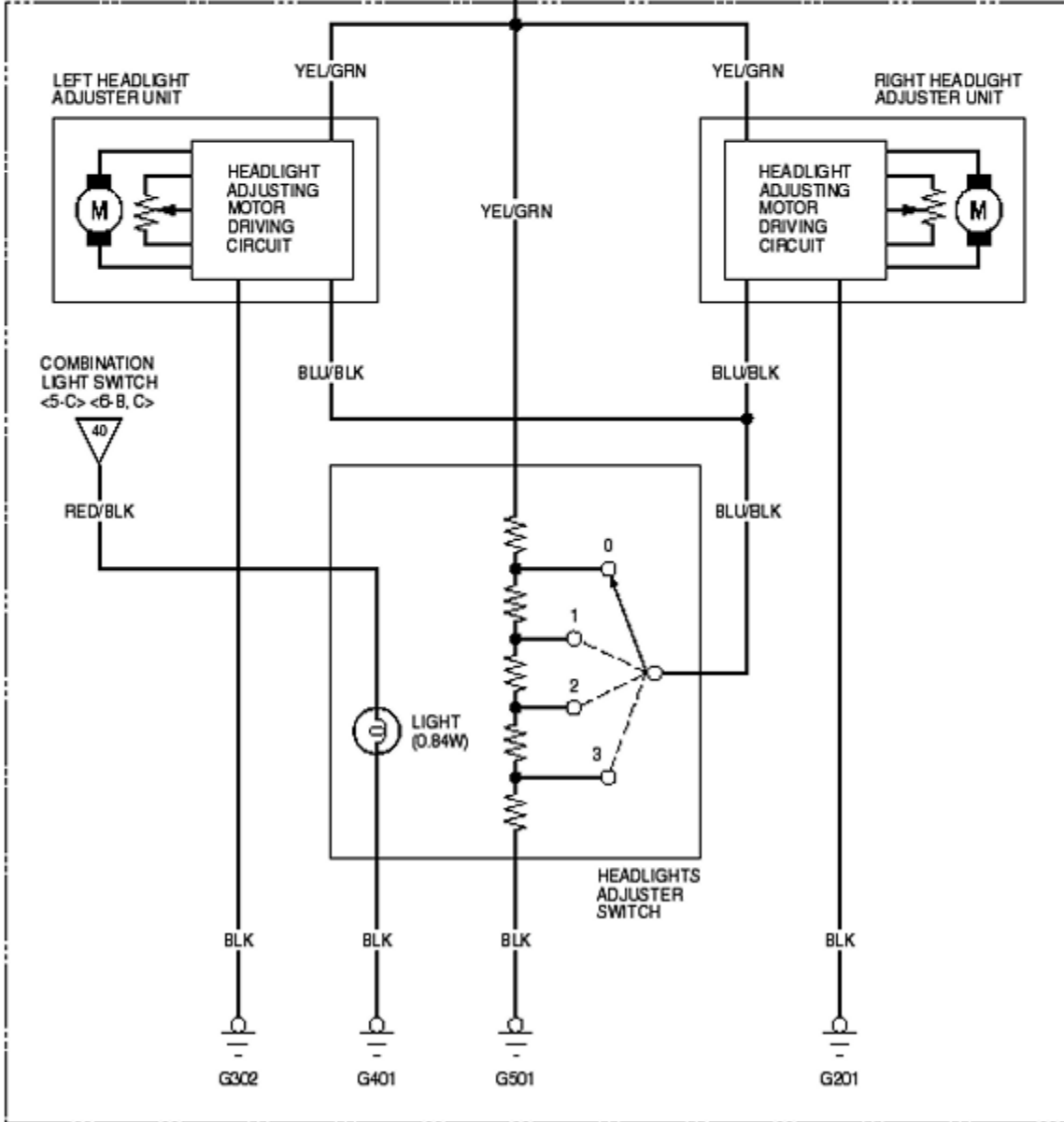
Lighting System



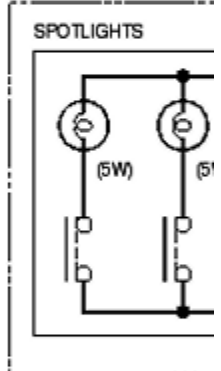


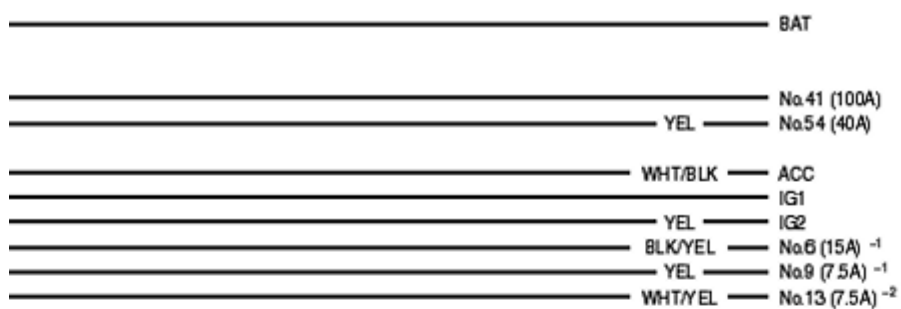
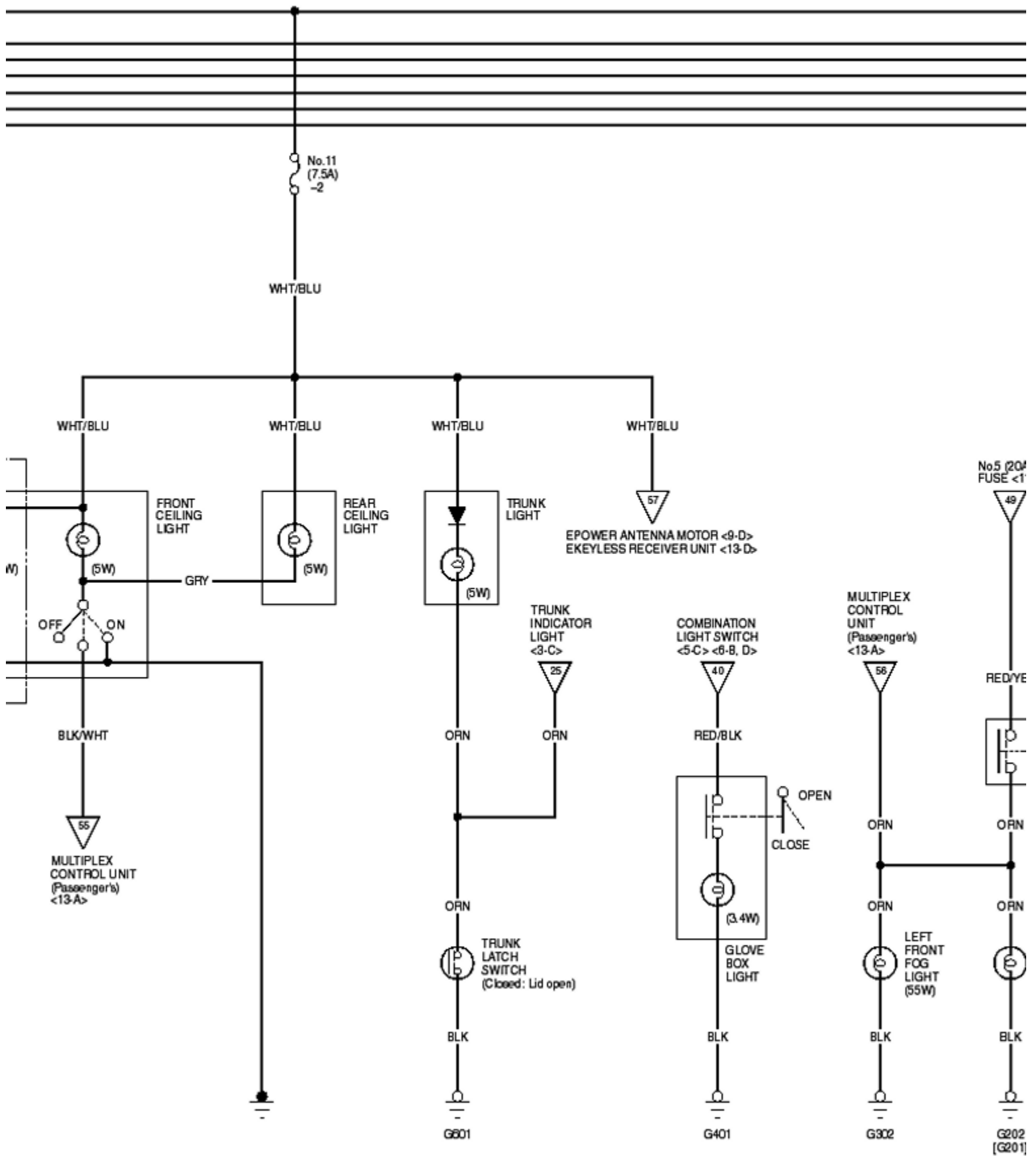
EHEADLIGHTS ADJUSTER
 CONTROL UNIT <5-D>
 EPOWER WINDOW RELAY<12-A>
 ESUNROOF RELAY<16-B>
 EMULTIPLEX CONTROL
 UNIT (Door) <14-C>

(Without HID lamp)



(With spotlights)





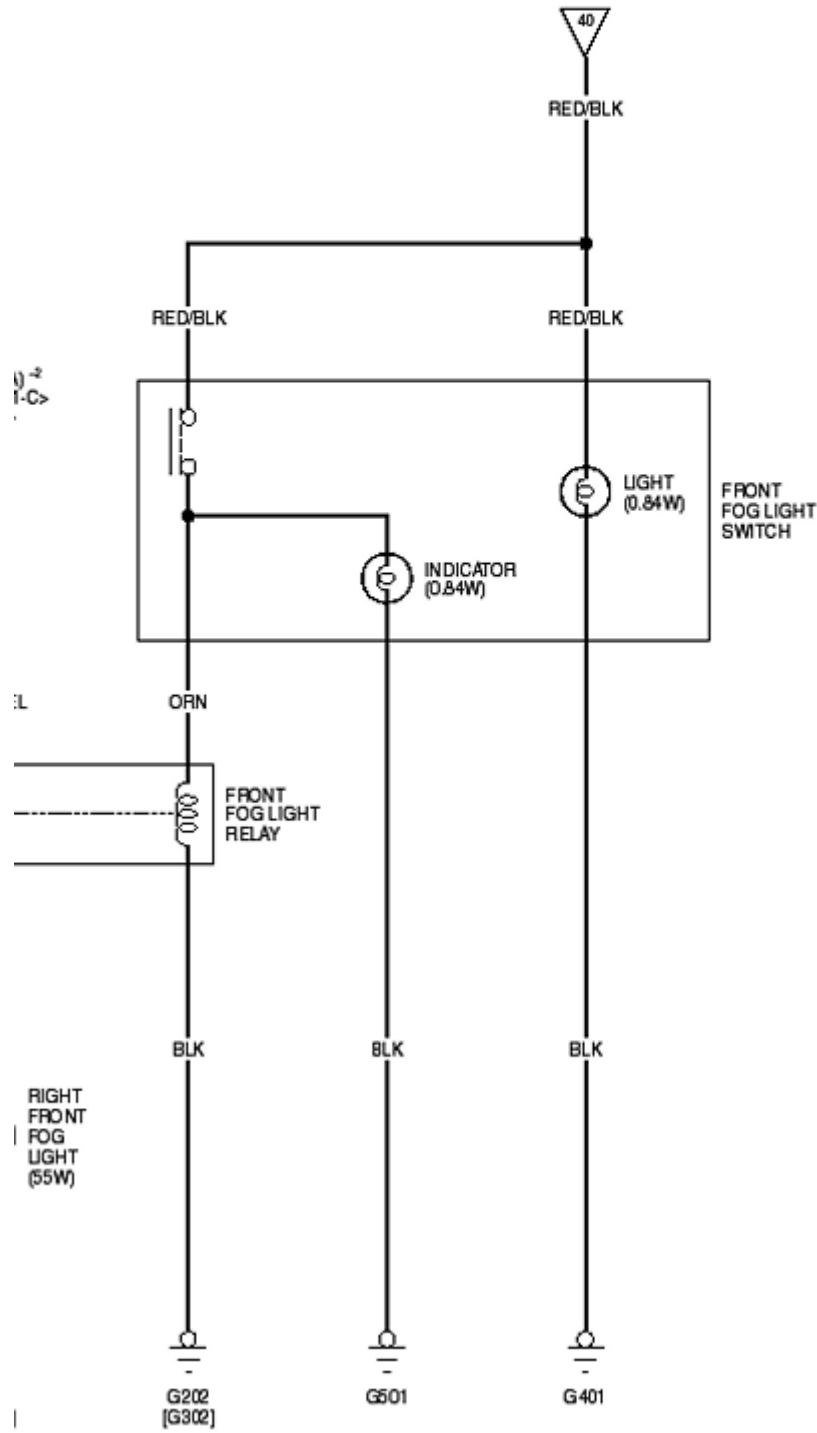
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

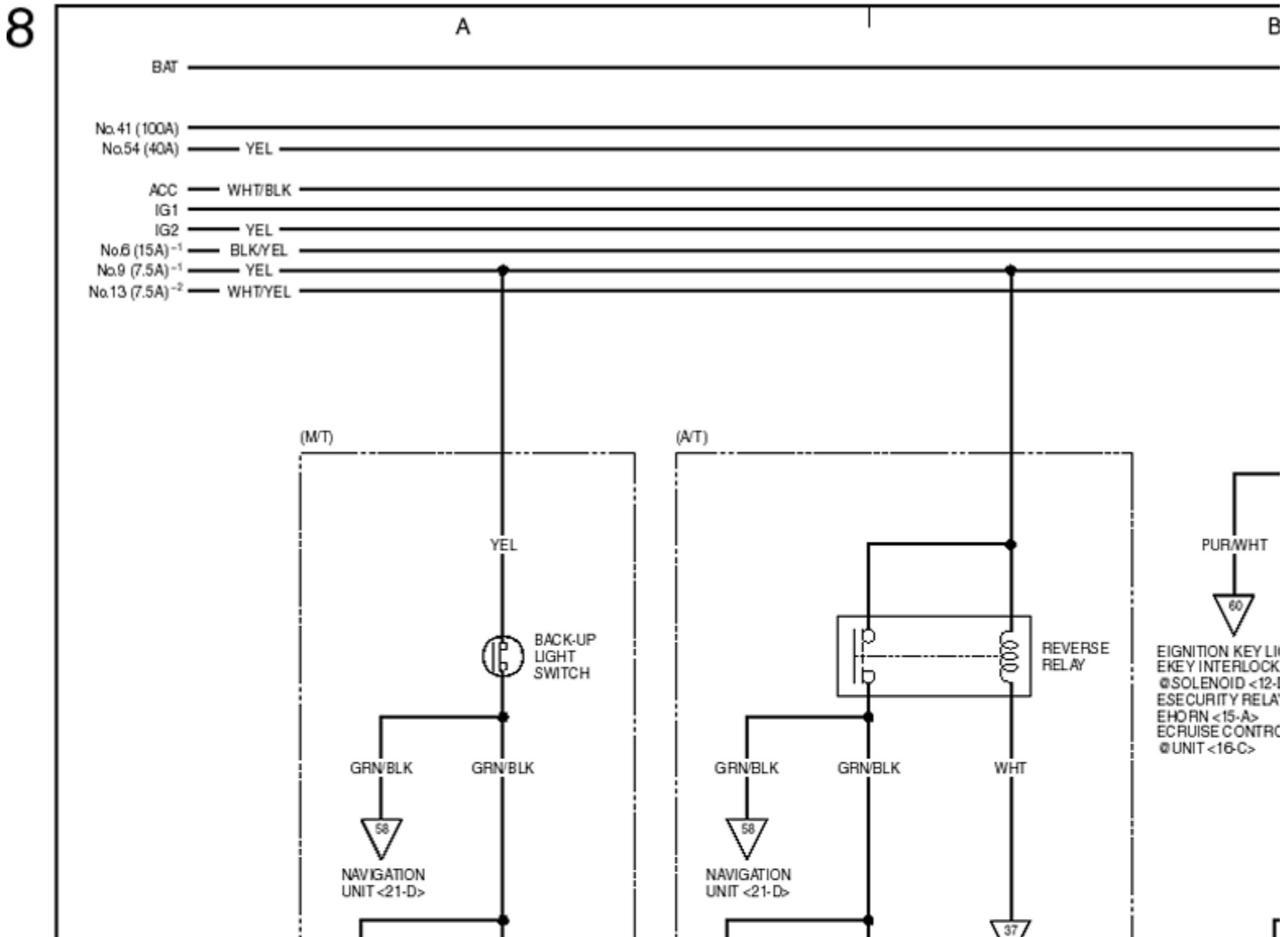
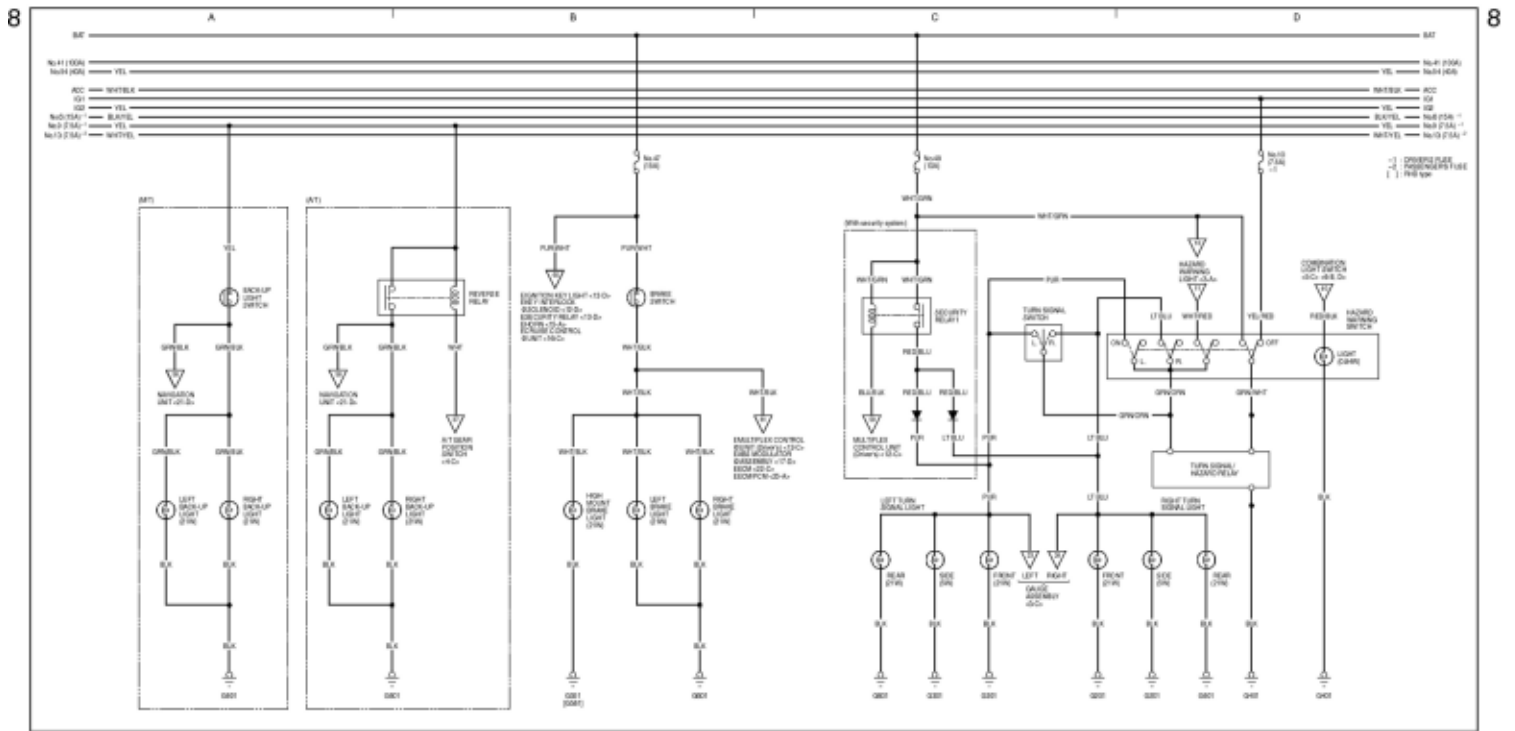
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

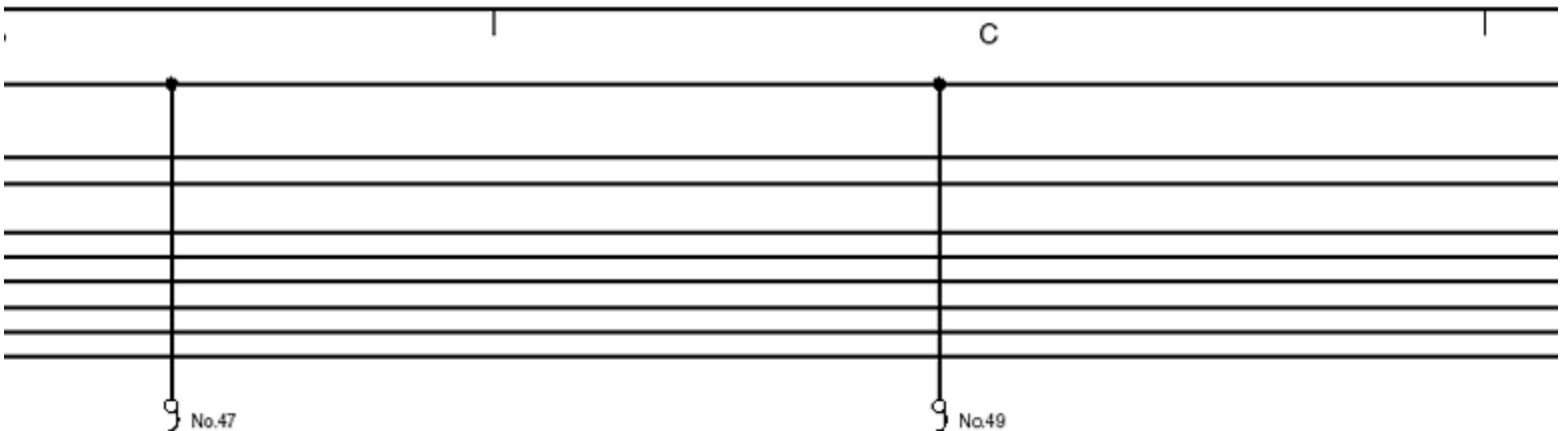
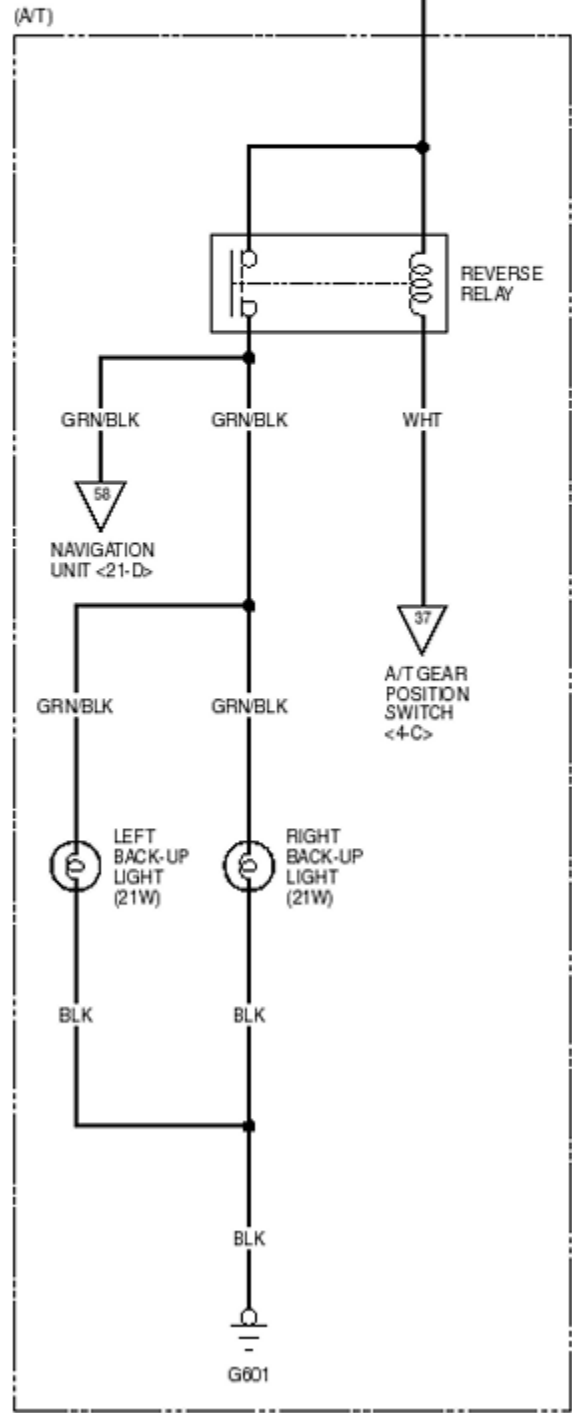
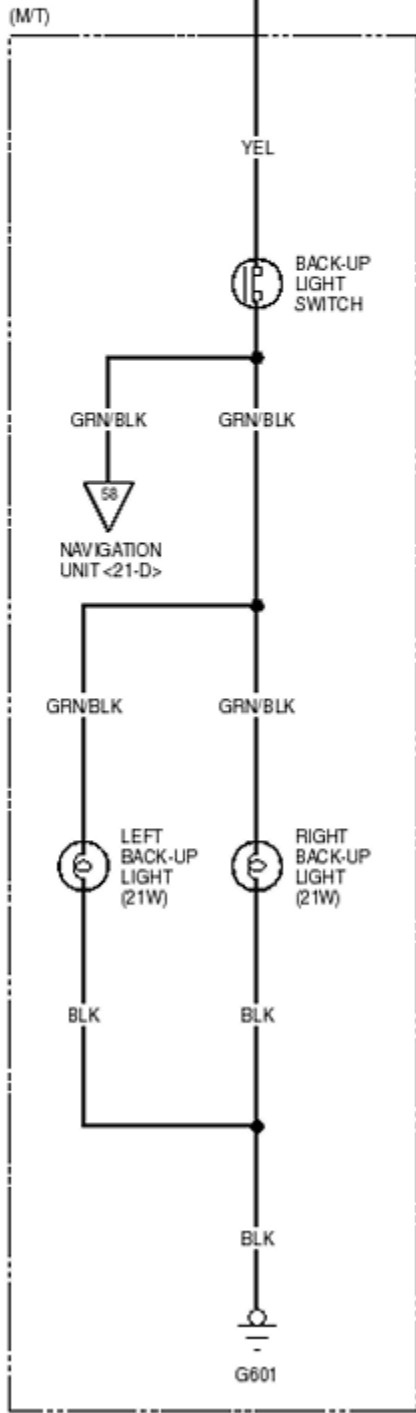
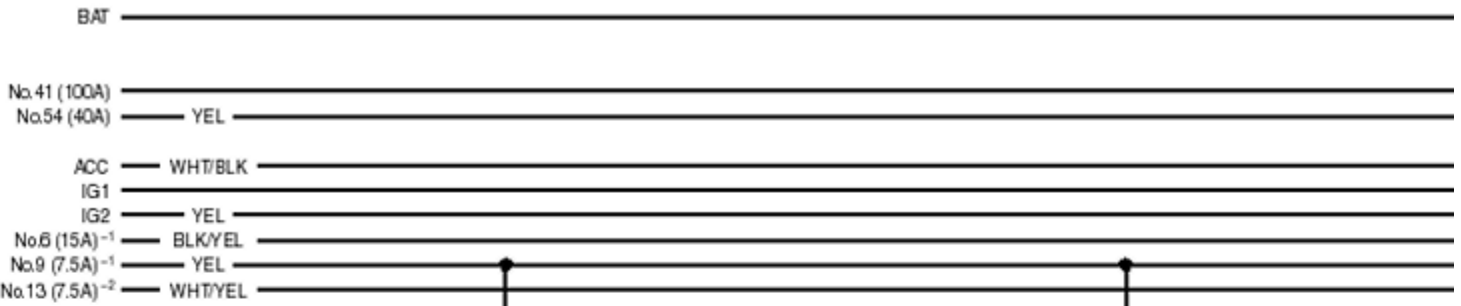
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

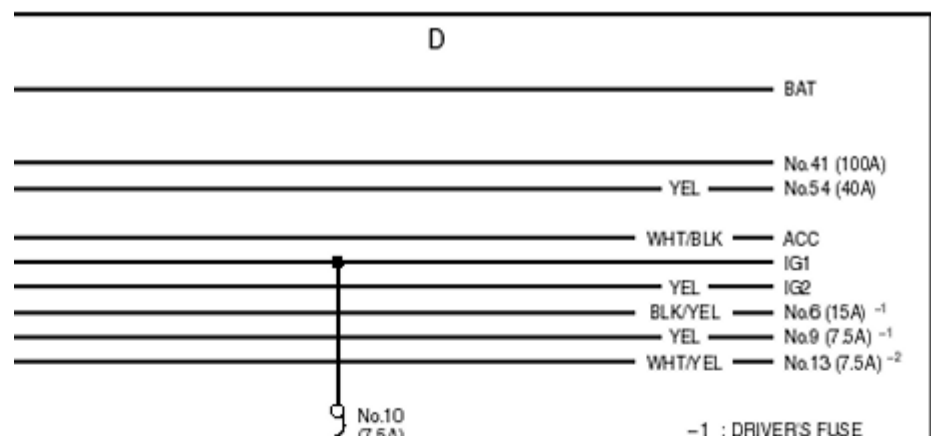
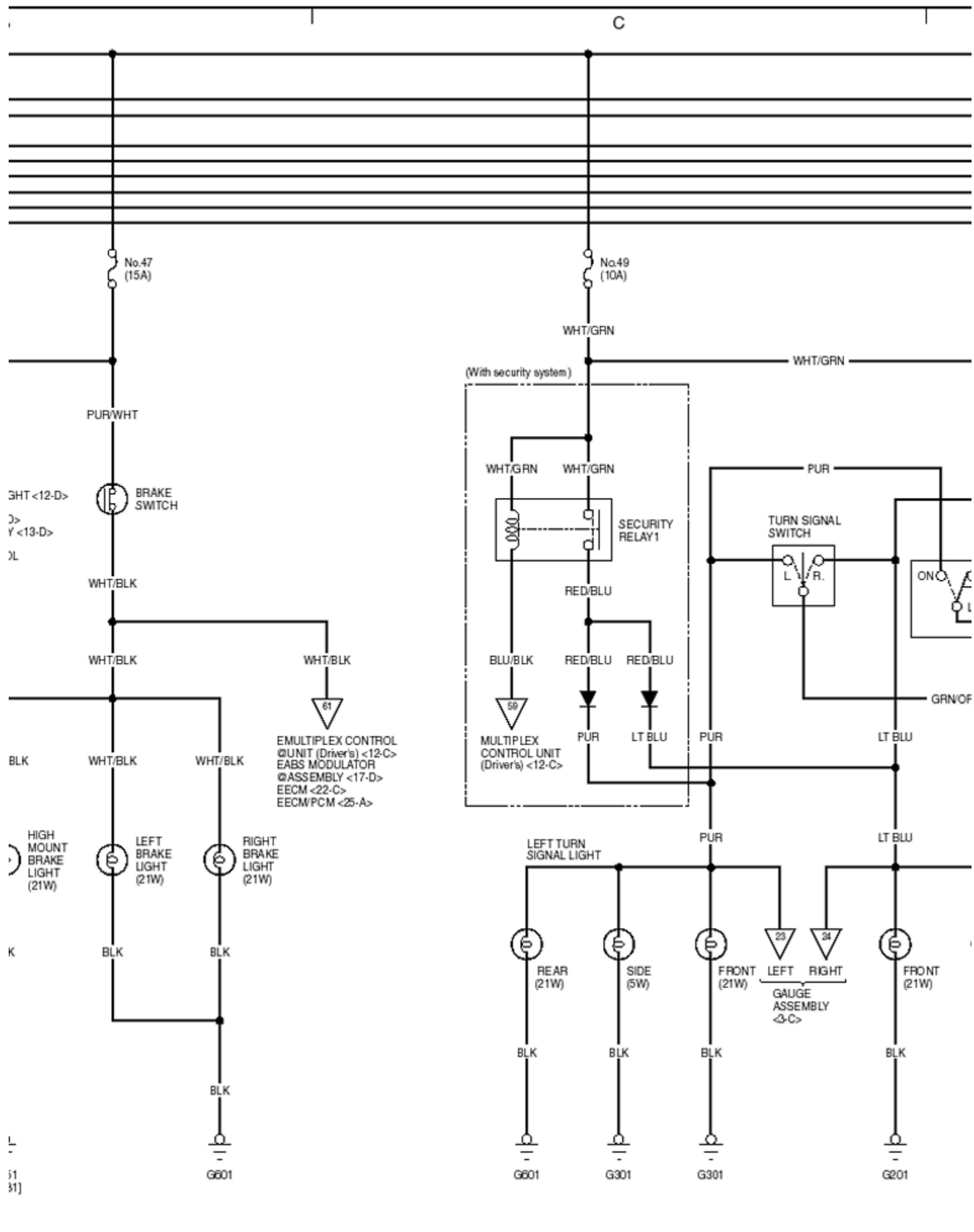


Wiring Diagrams

Lights, Exterior - Back-up Lights



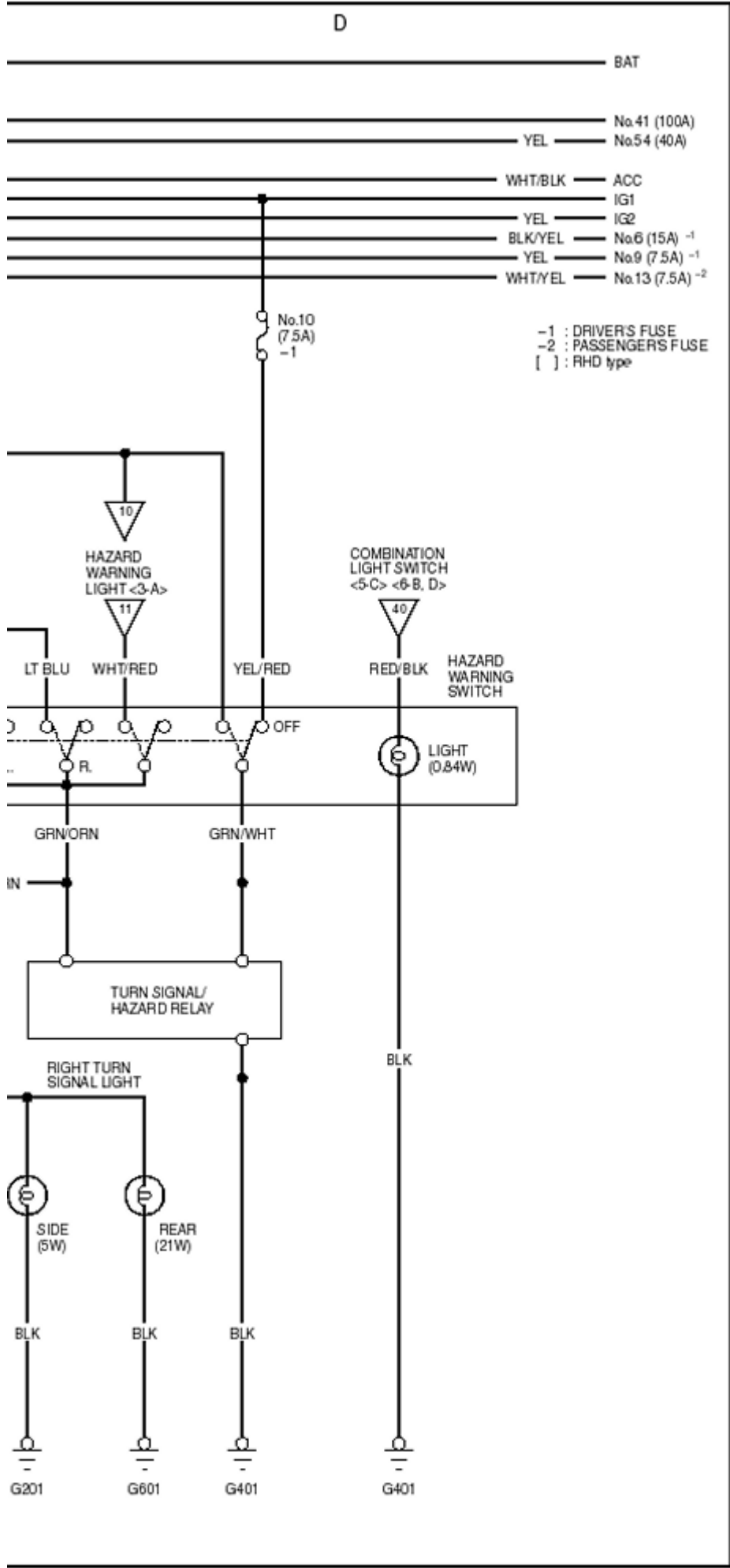




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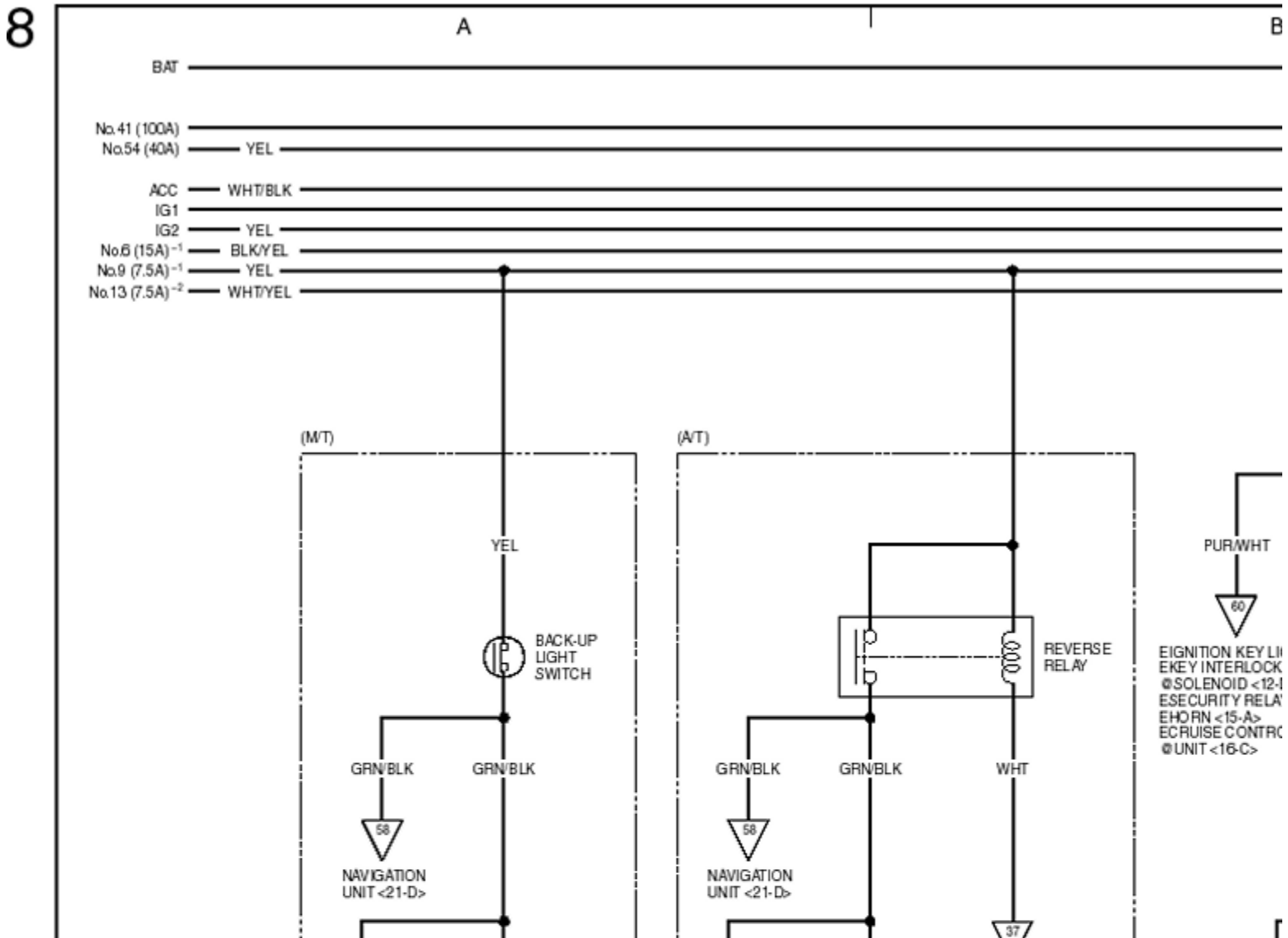
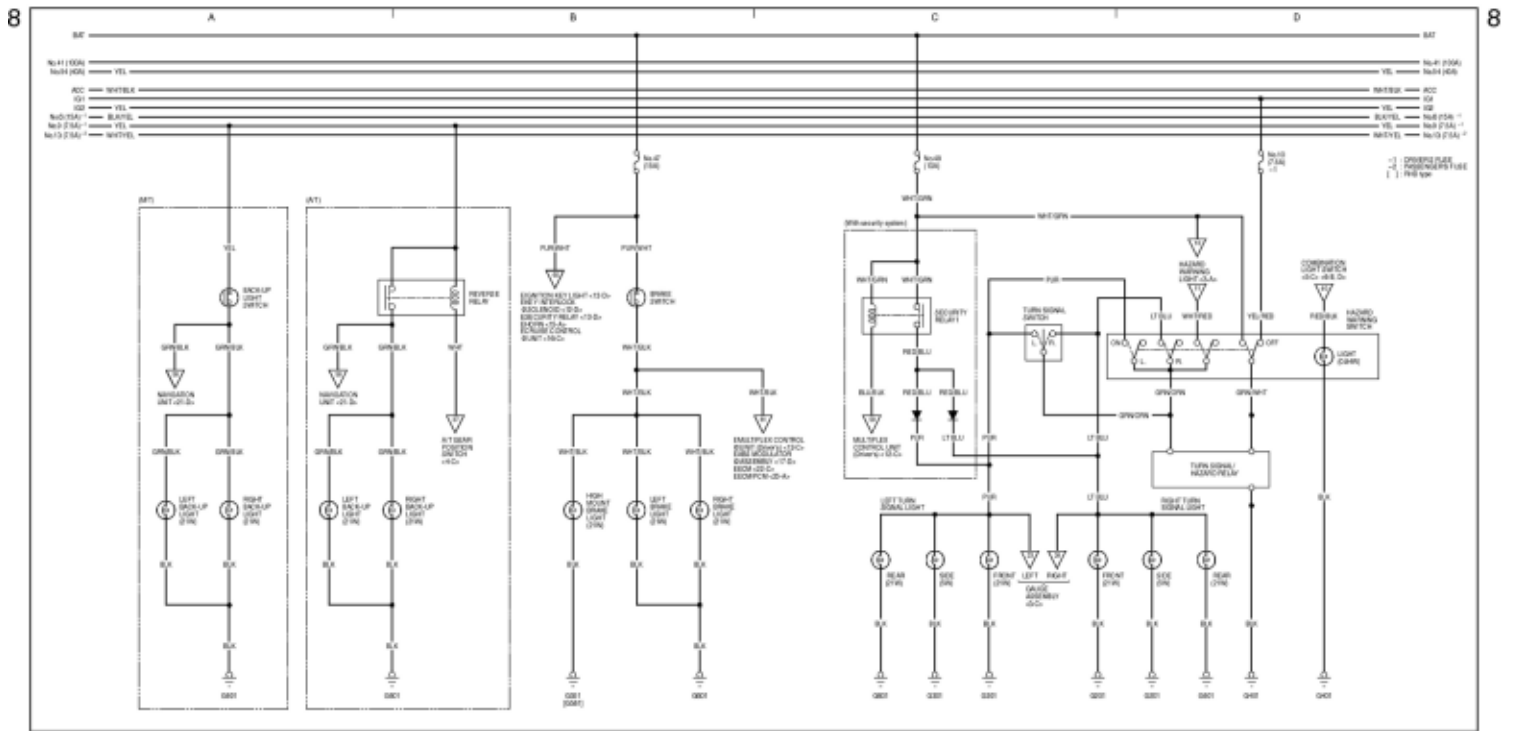
D

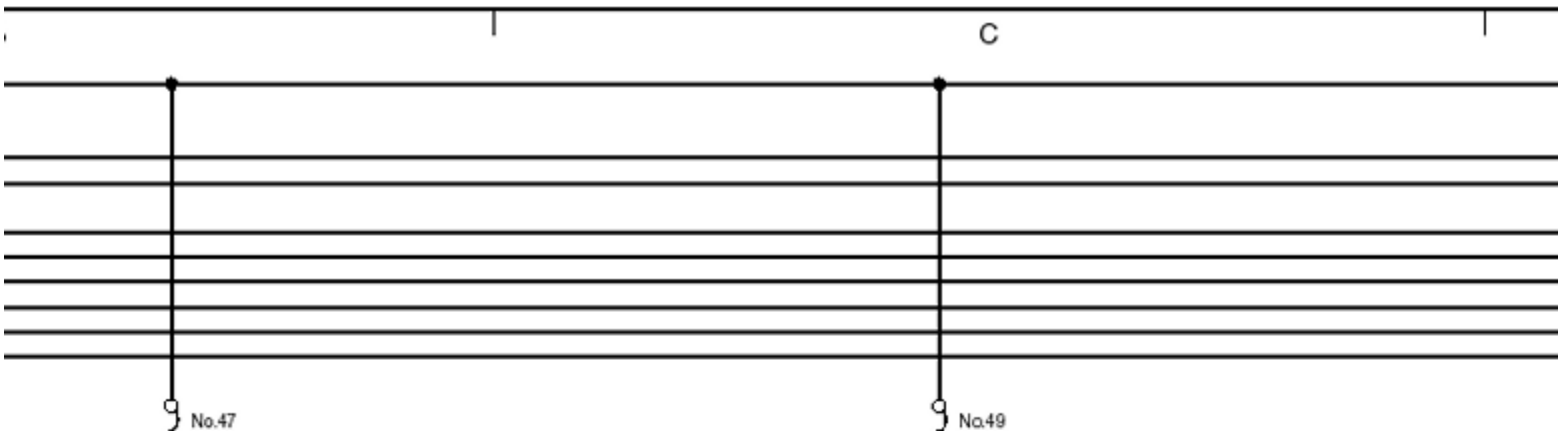
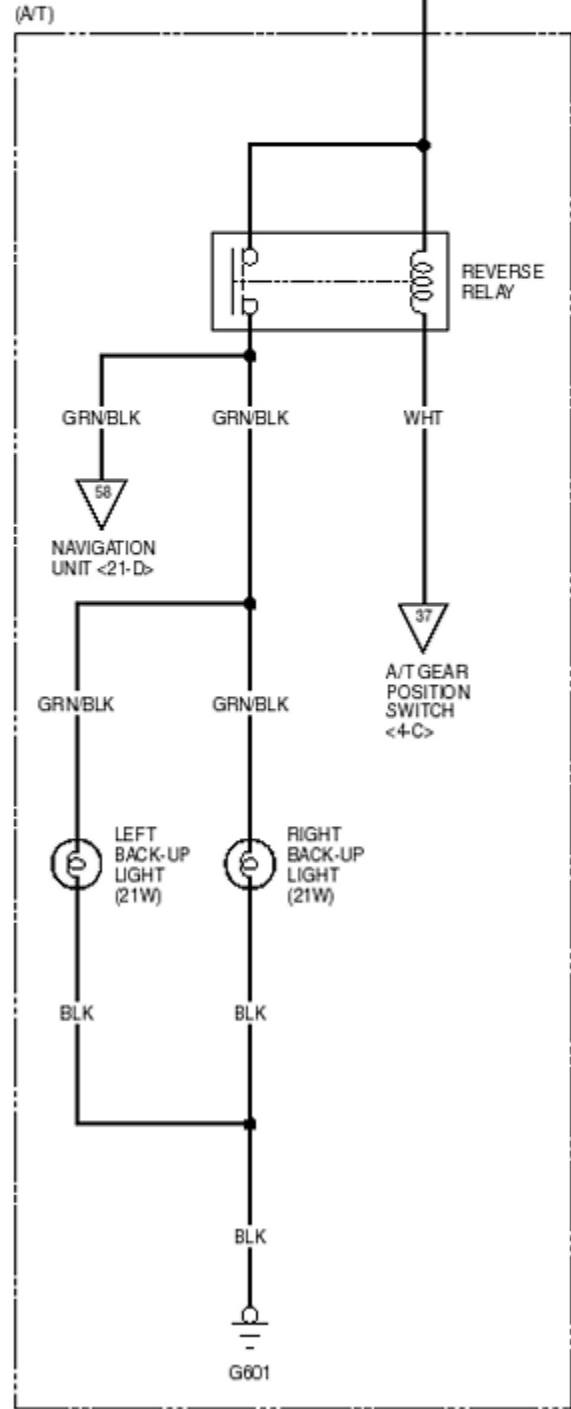
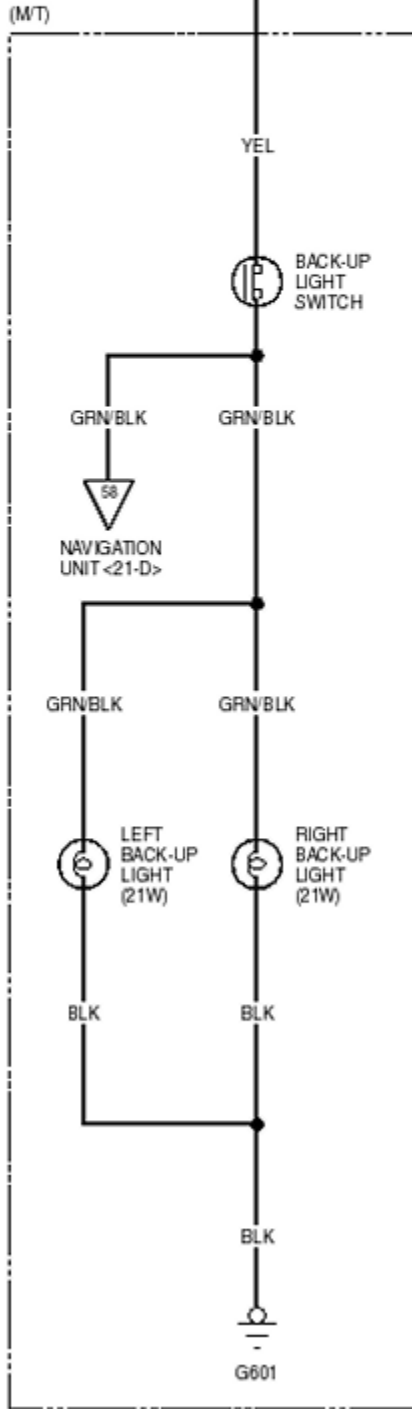
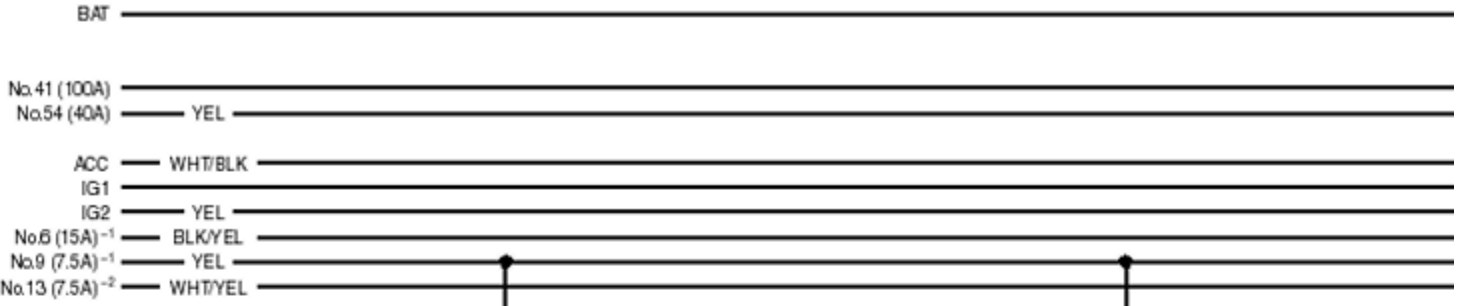
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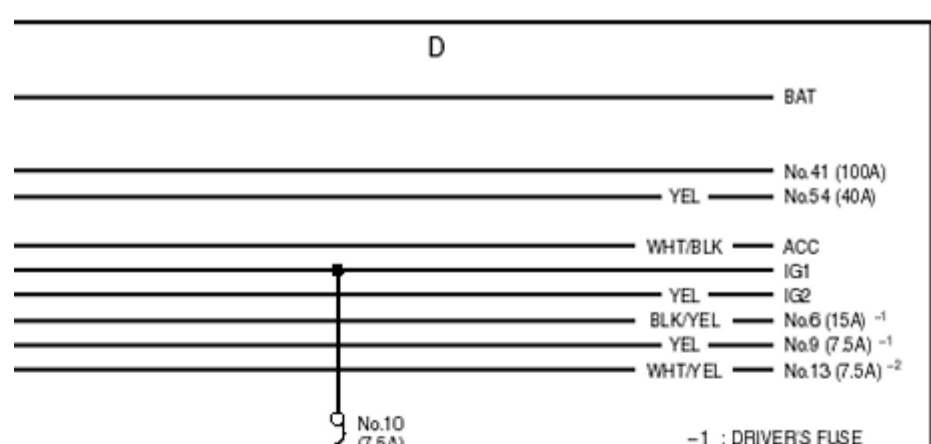
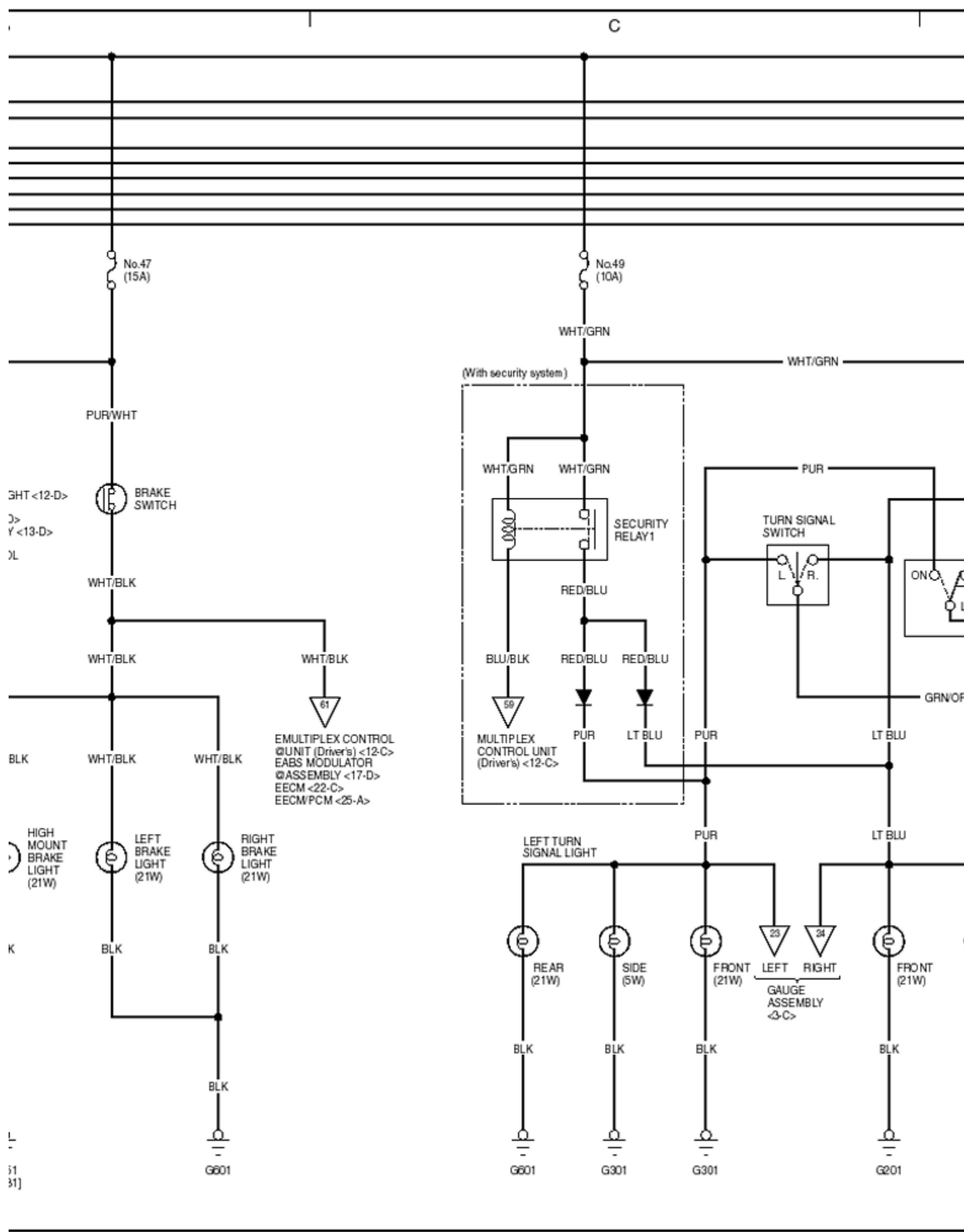


Wiring Diagrams

Lights, Exterior - Brake Lights



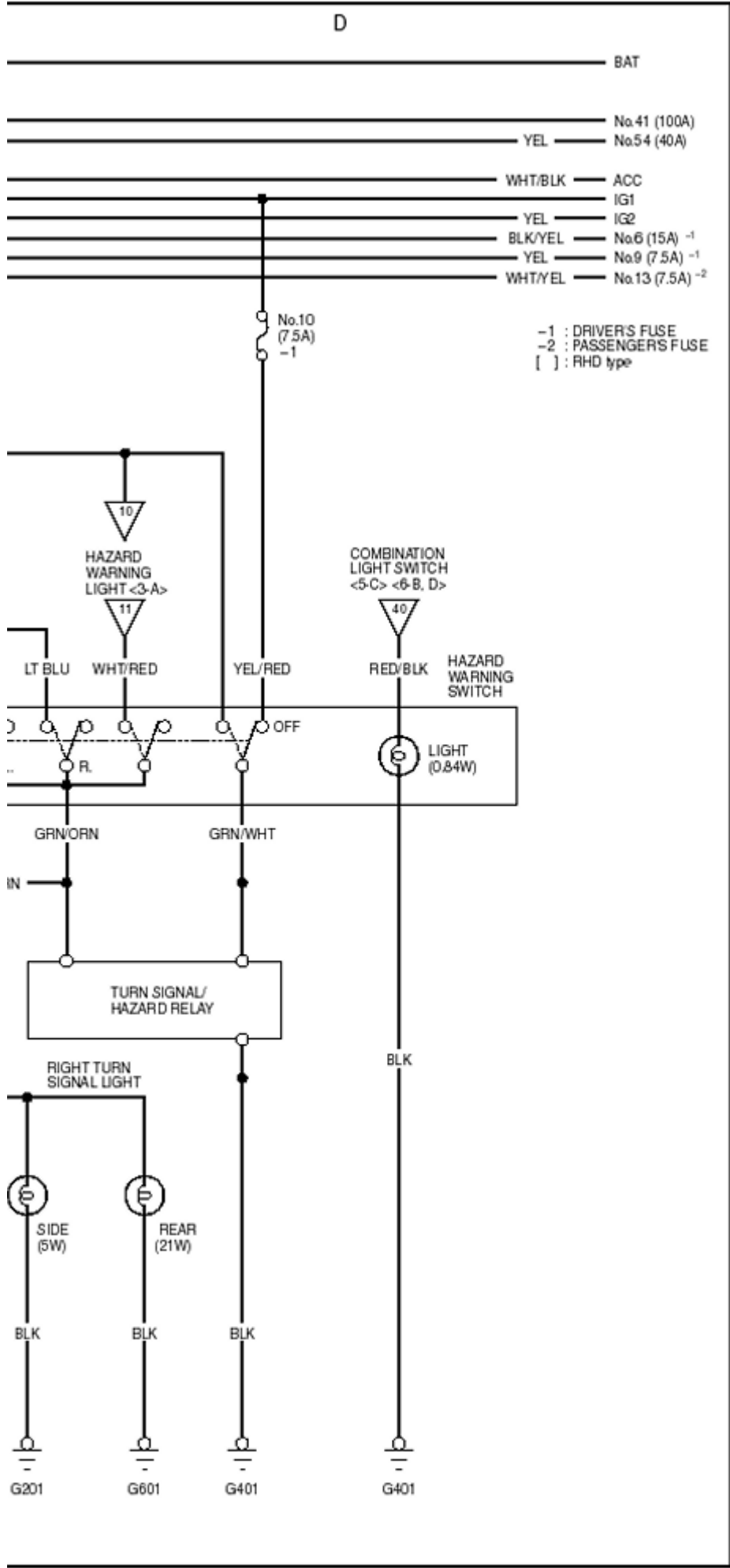


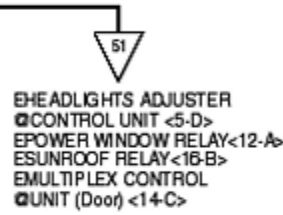
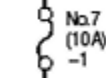
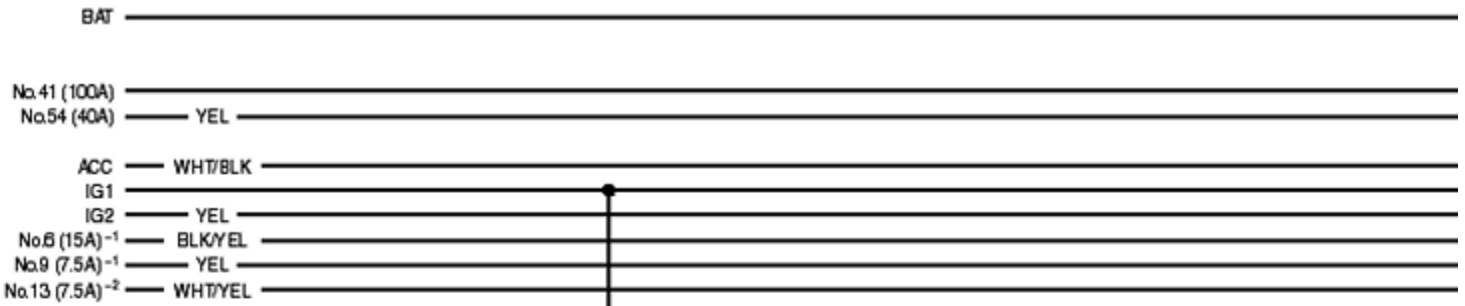


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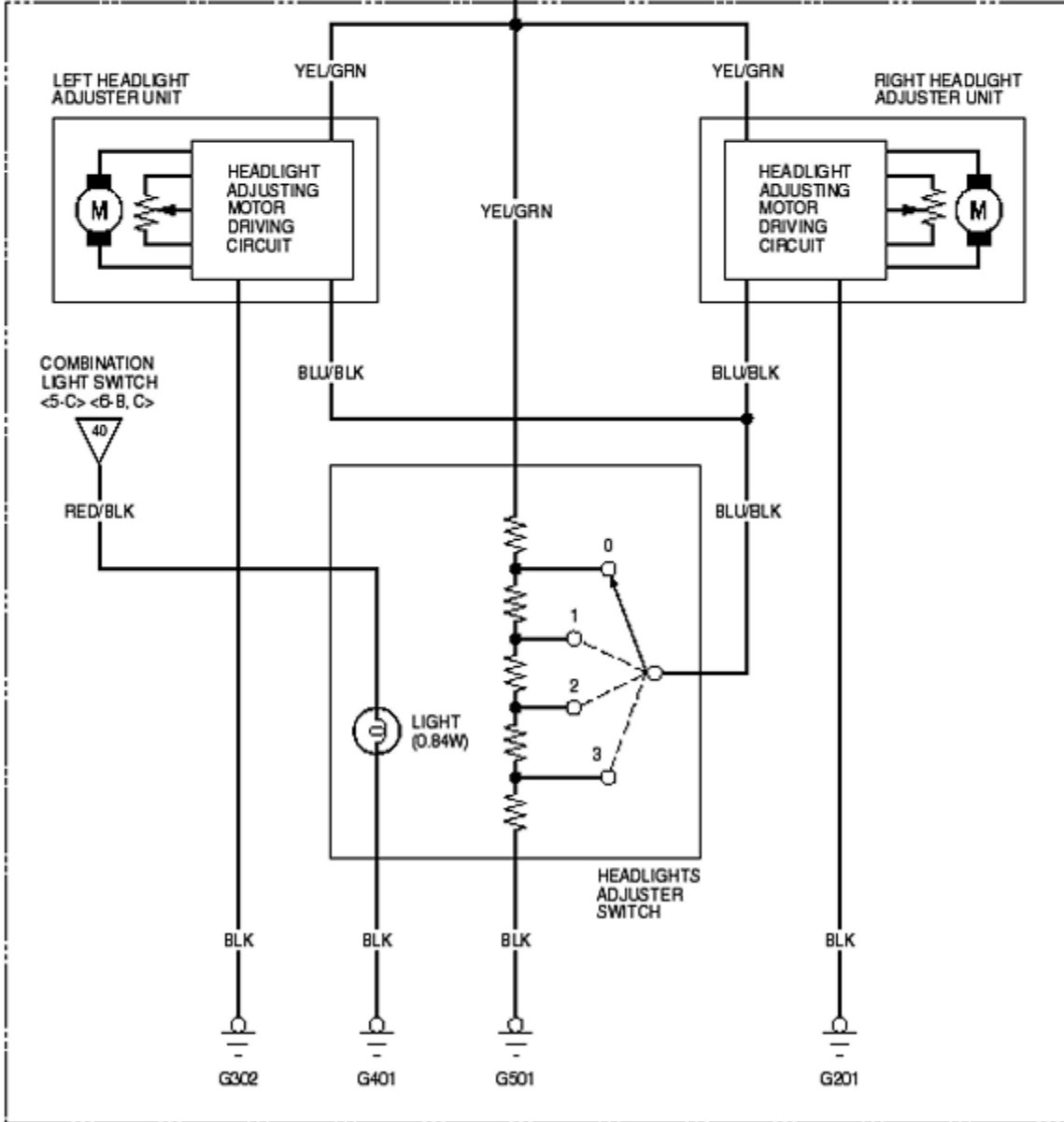
D

8

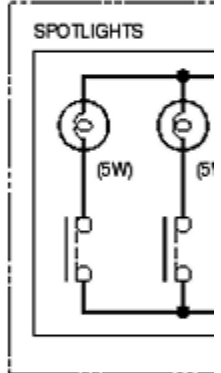


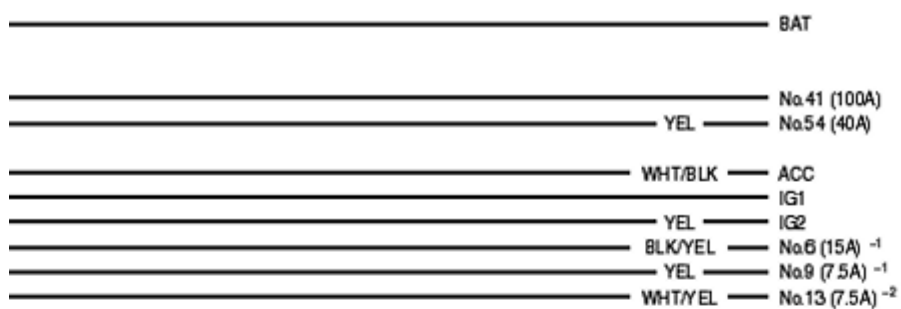
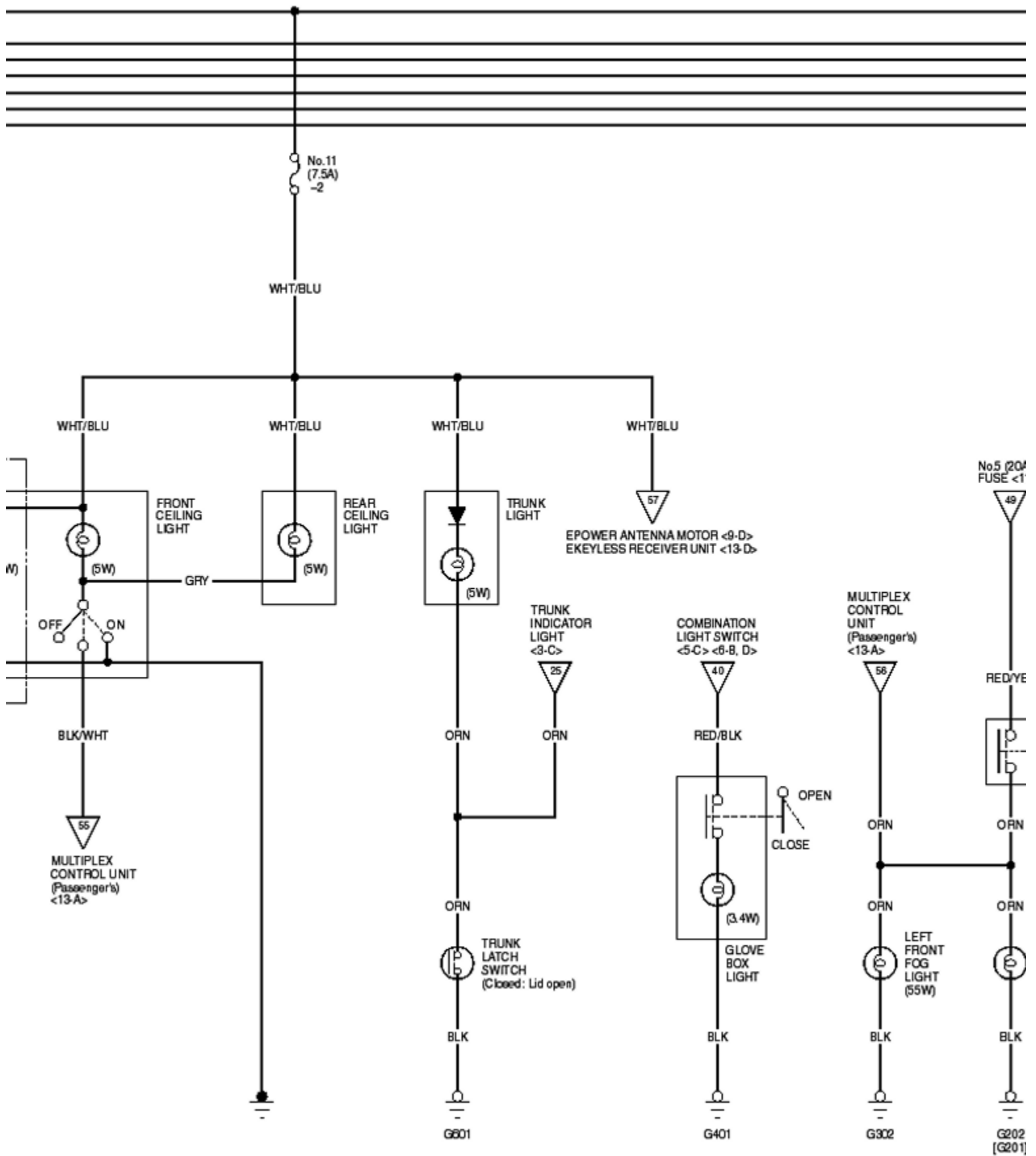


(Without HID lamp)



(With spotlights)





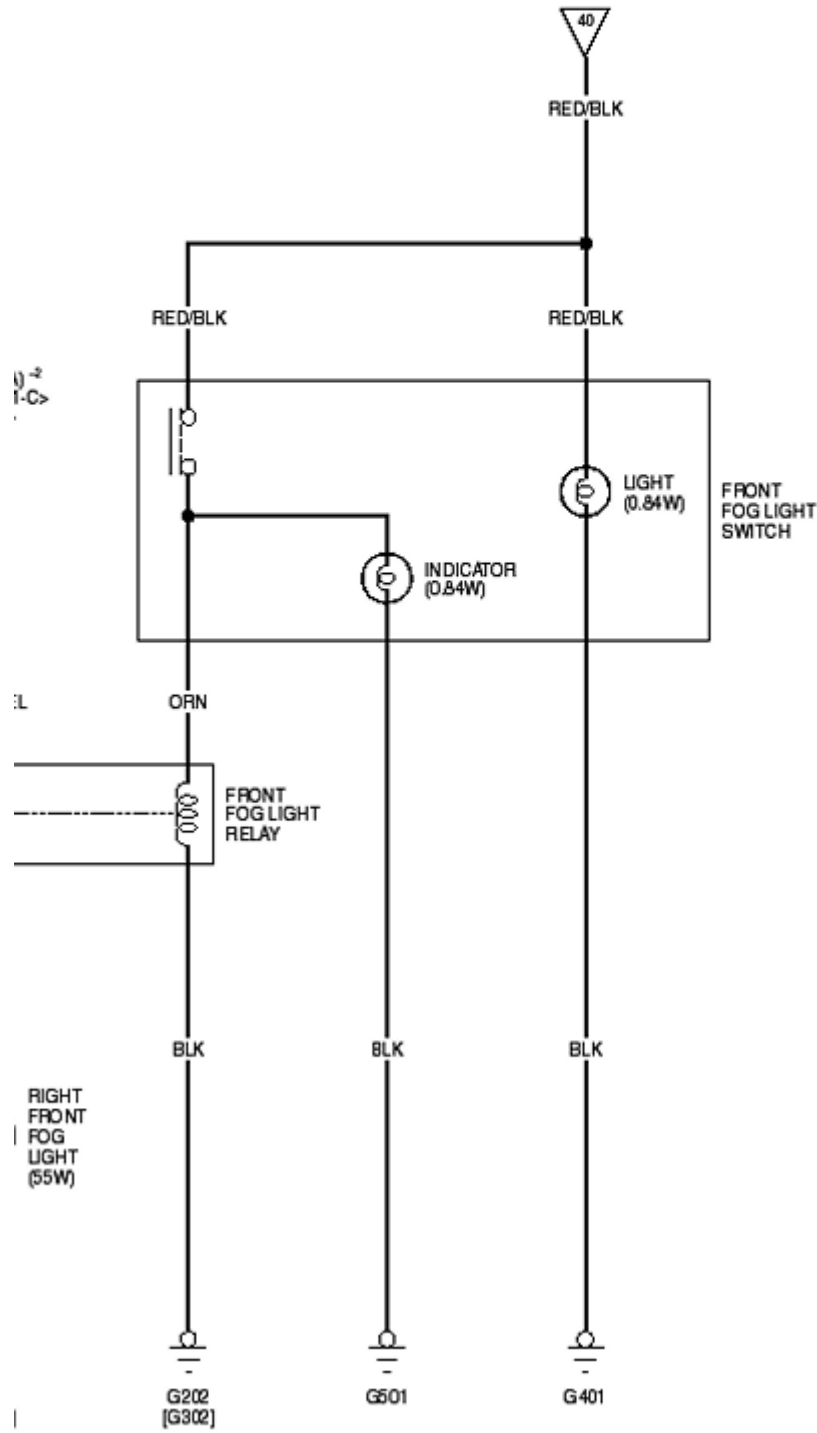
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

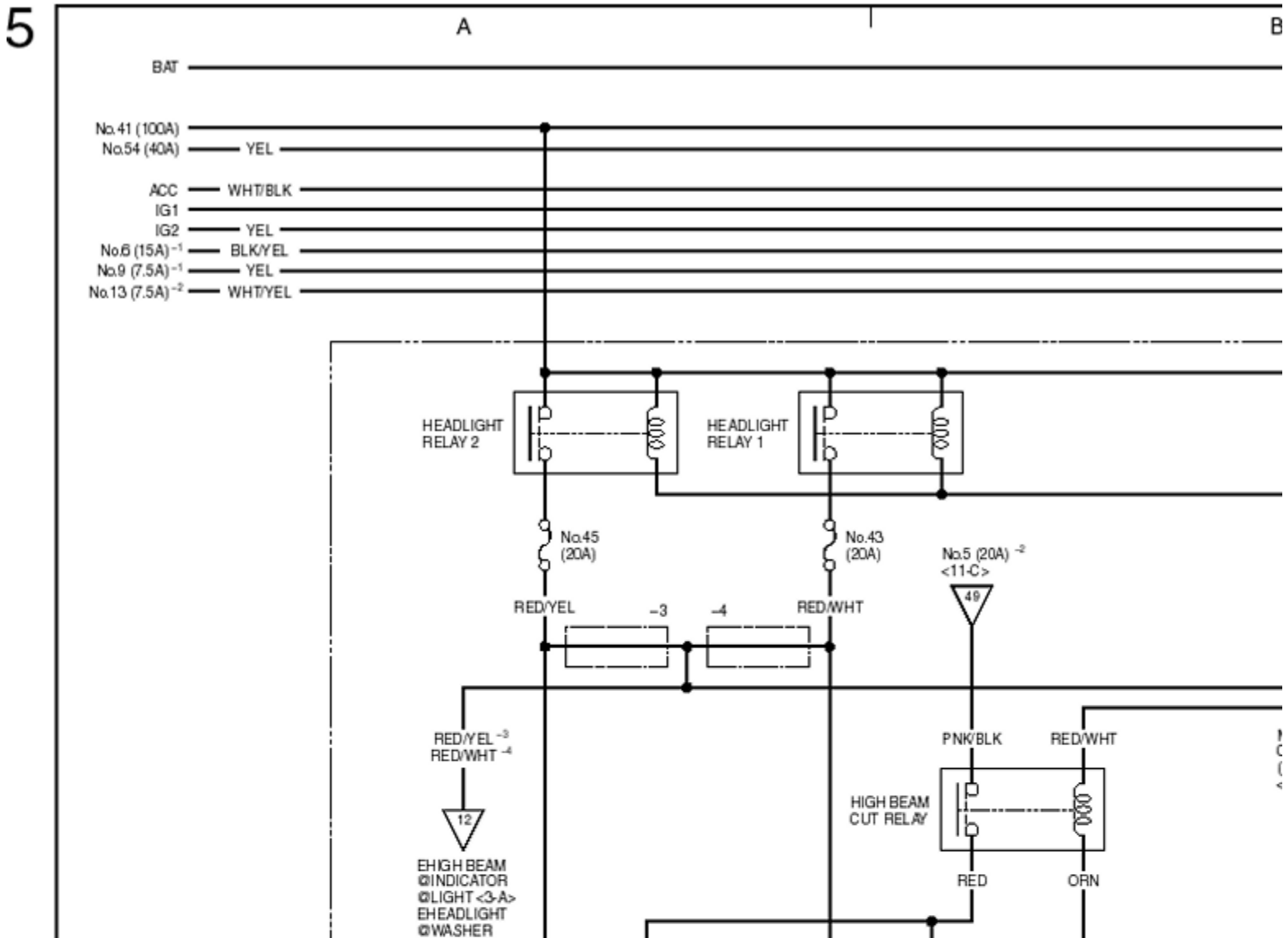
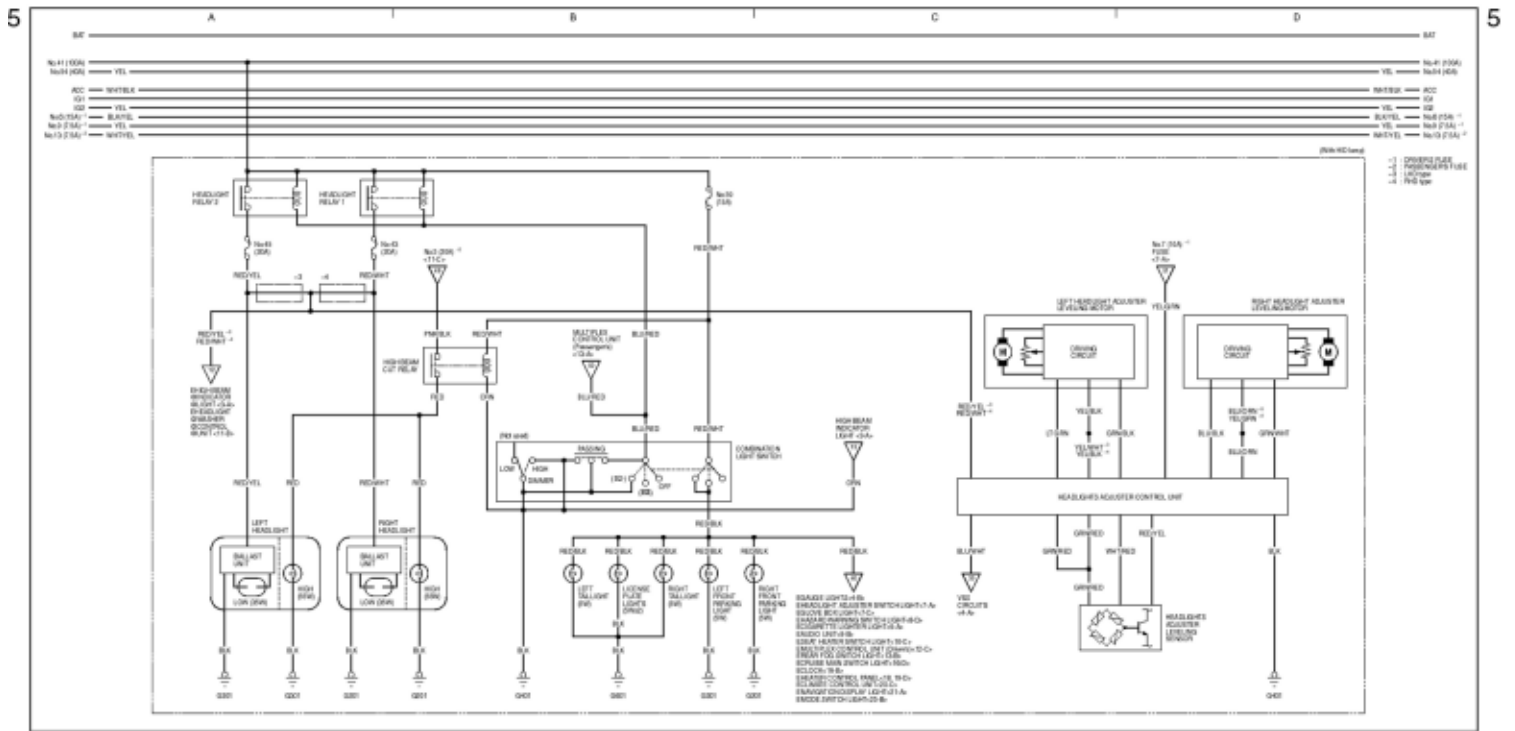
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

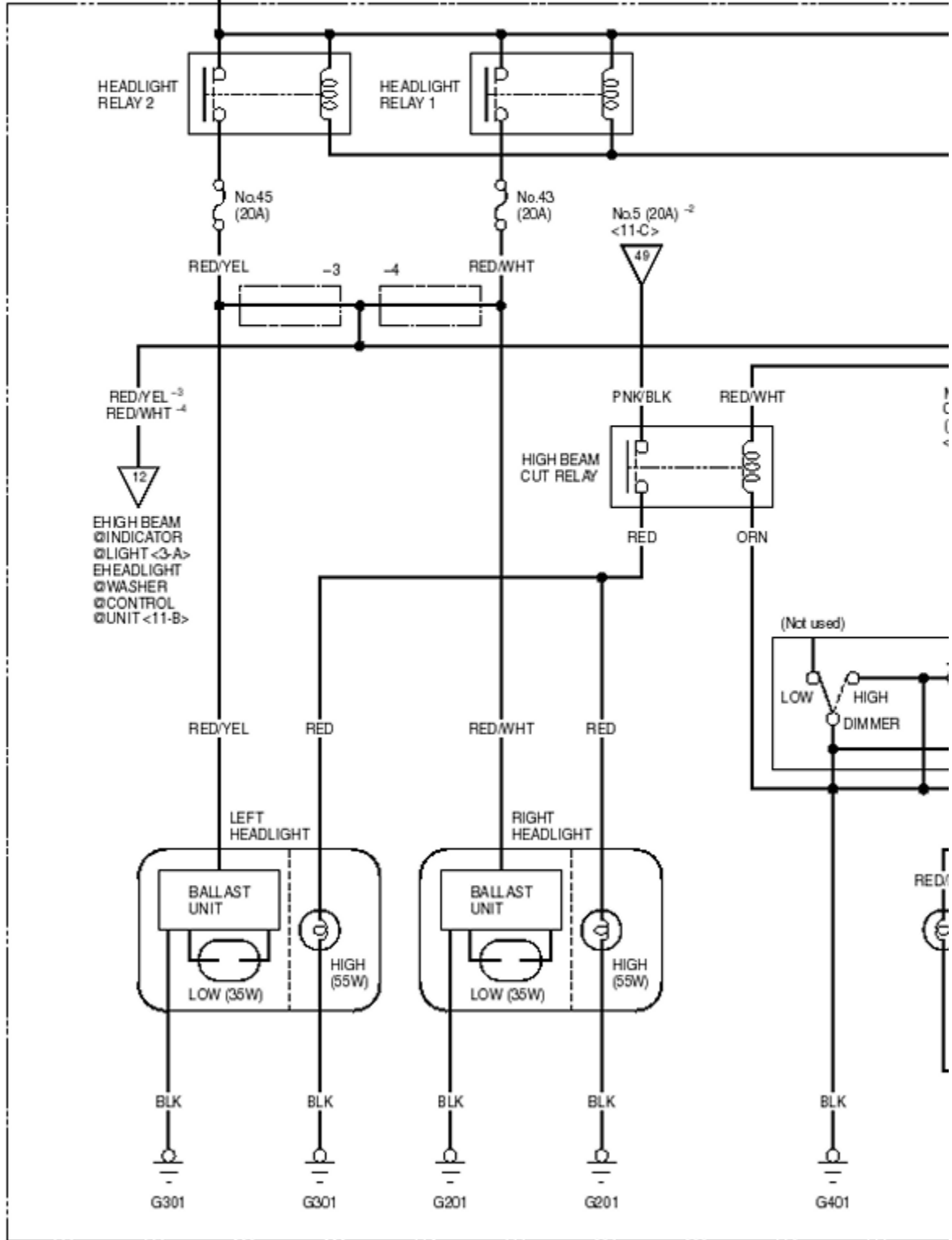


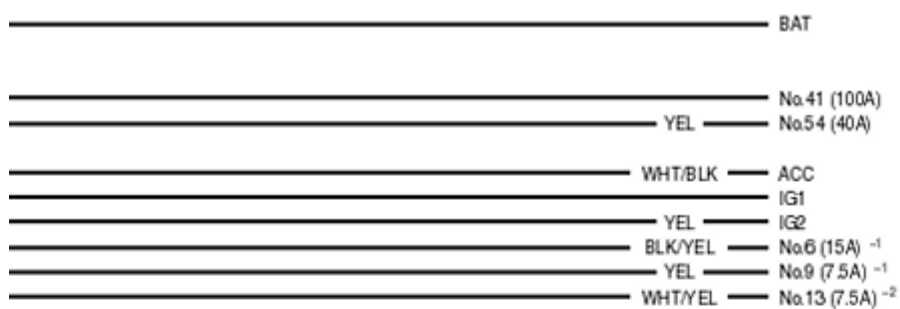
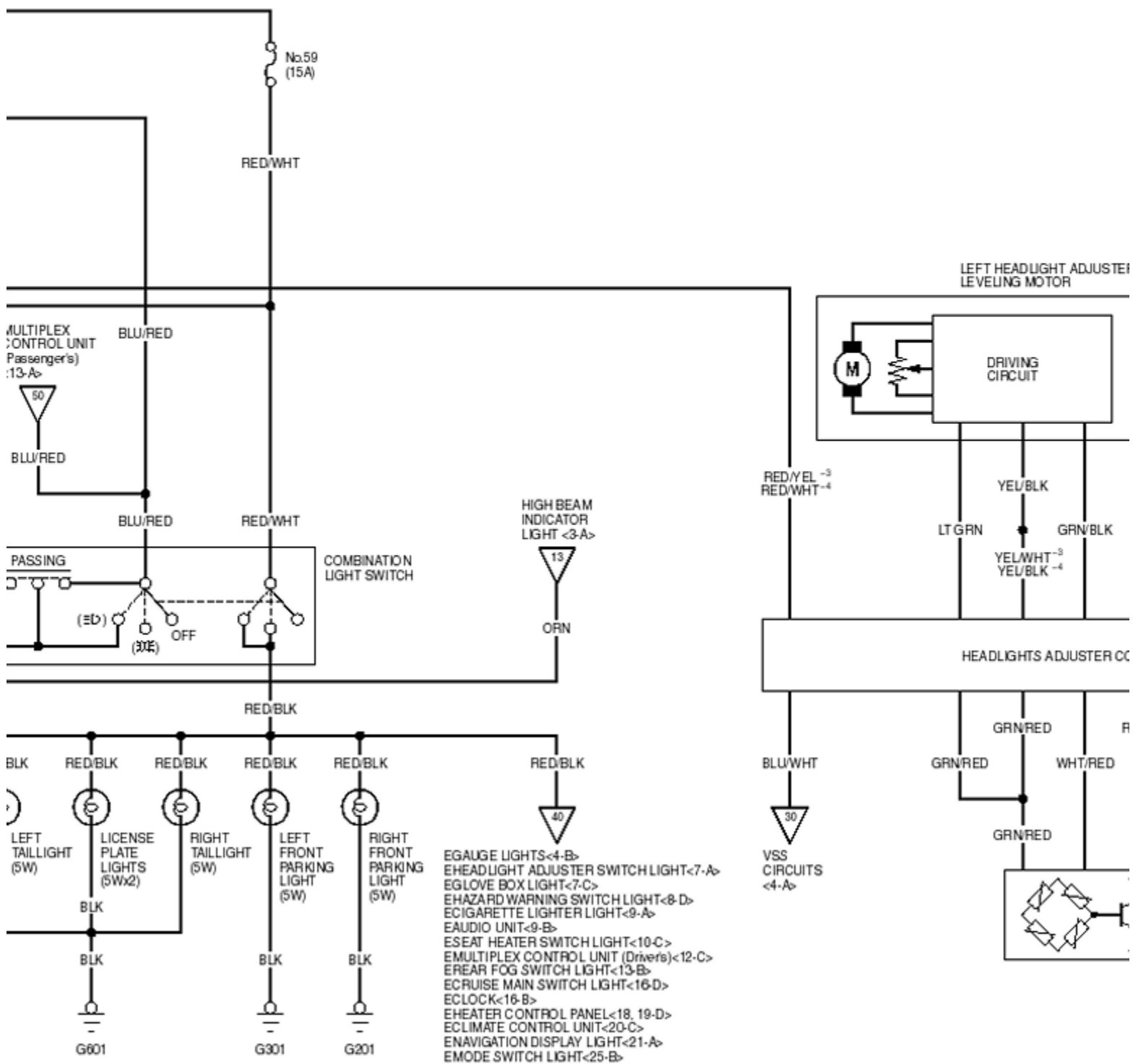
Wiring Diagrams

Lights, Exterior - Headlights



- BAT _____
- No.41 (100A) _____
- No.54 (40A) _____ YEL _____
- ACC _____ WHT/BLK _____
- IG1 _____
- IG2 _____ YEL _____
- No.6 (15A)⁻¹ _____ BLK/YEL _____
- No.9 (7.5A)⁻¹ _____ YEL _____
- No.13 (7.5A)⁻² _____ WHT/YEL _____





(With HID lamp)

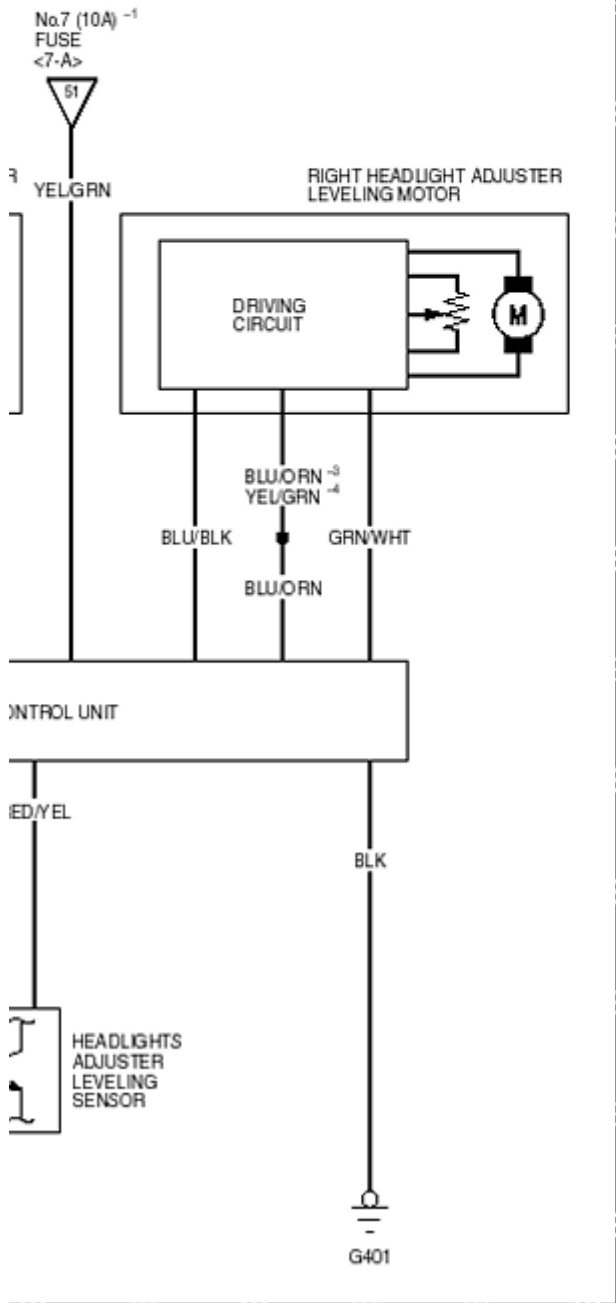
- 1 : DRIVER'S FUSE

D

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

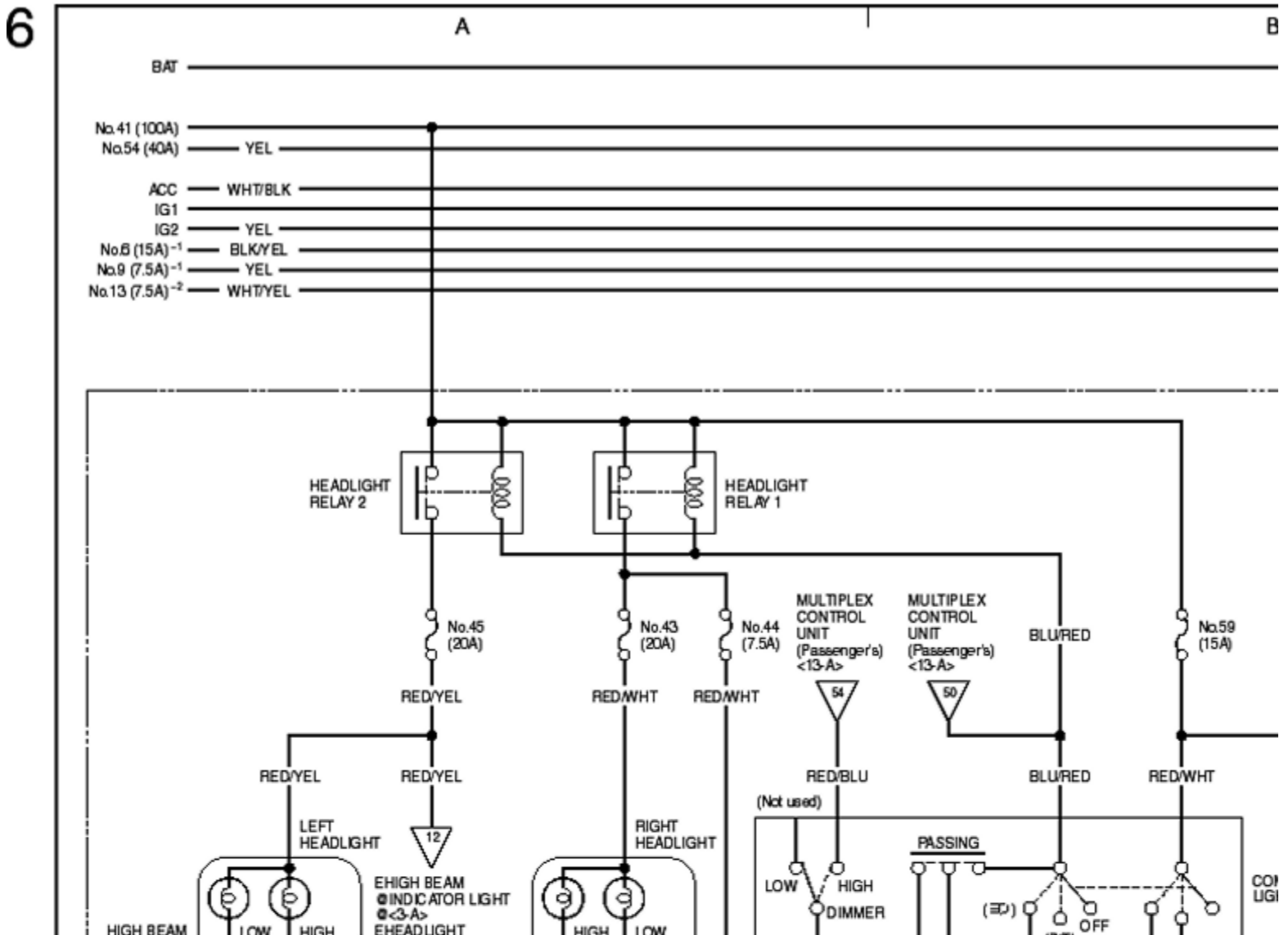
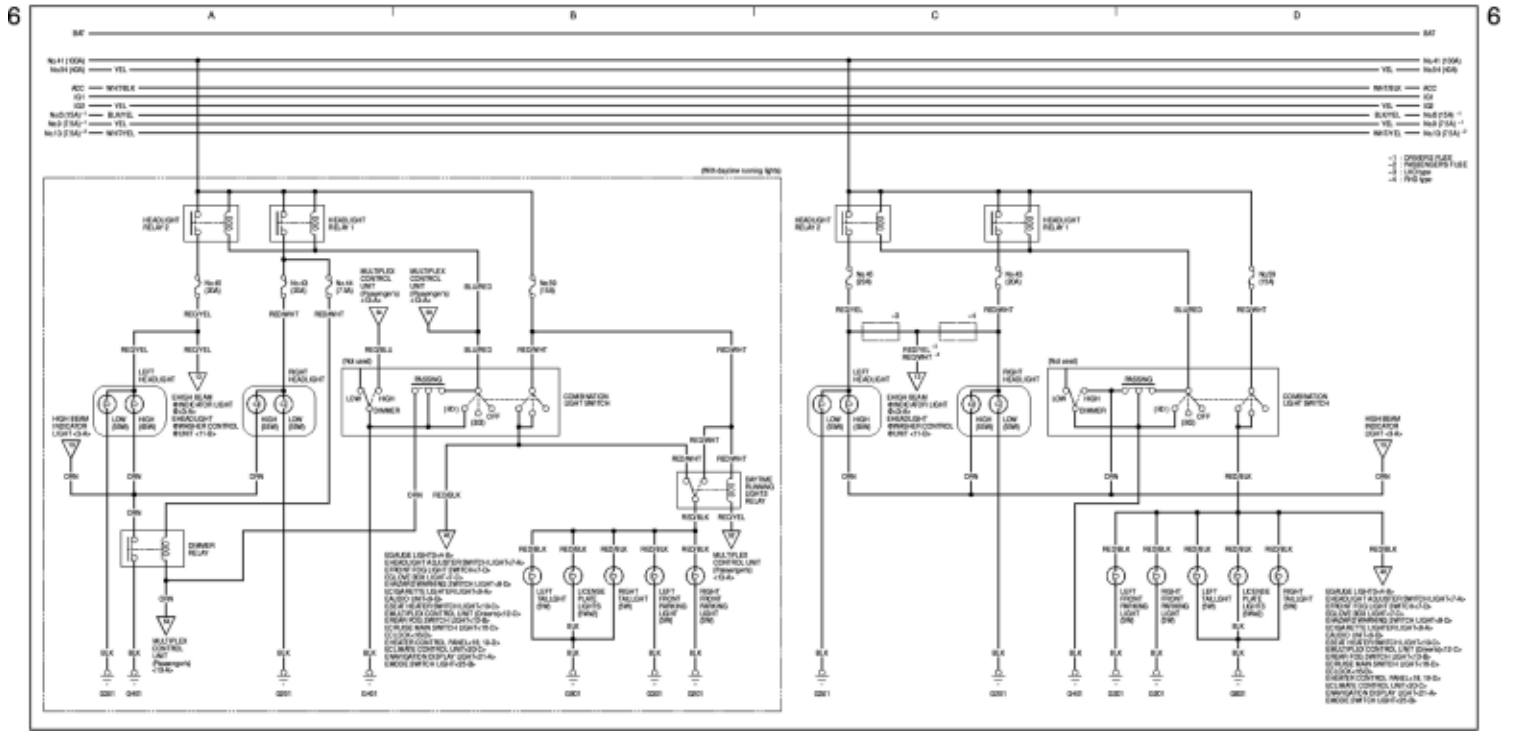
(With HID lamp)

- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type



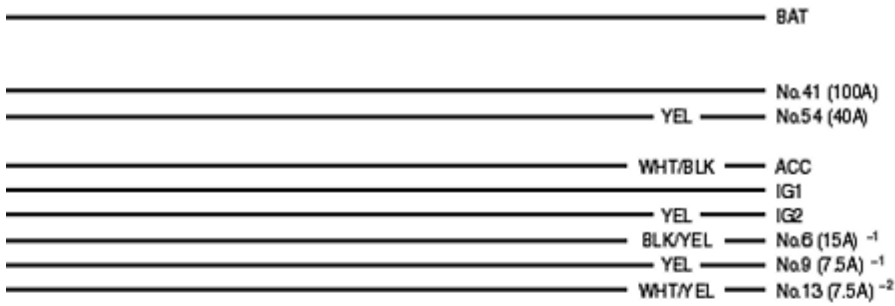
Wiring Diagrams

Lights, Exterior - Headlights

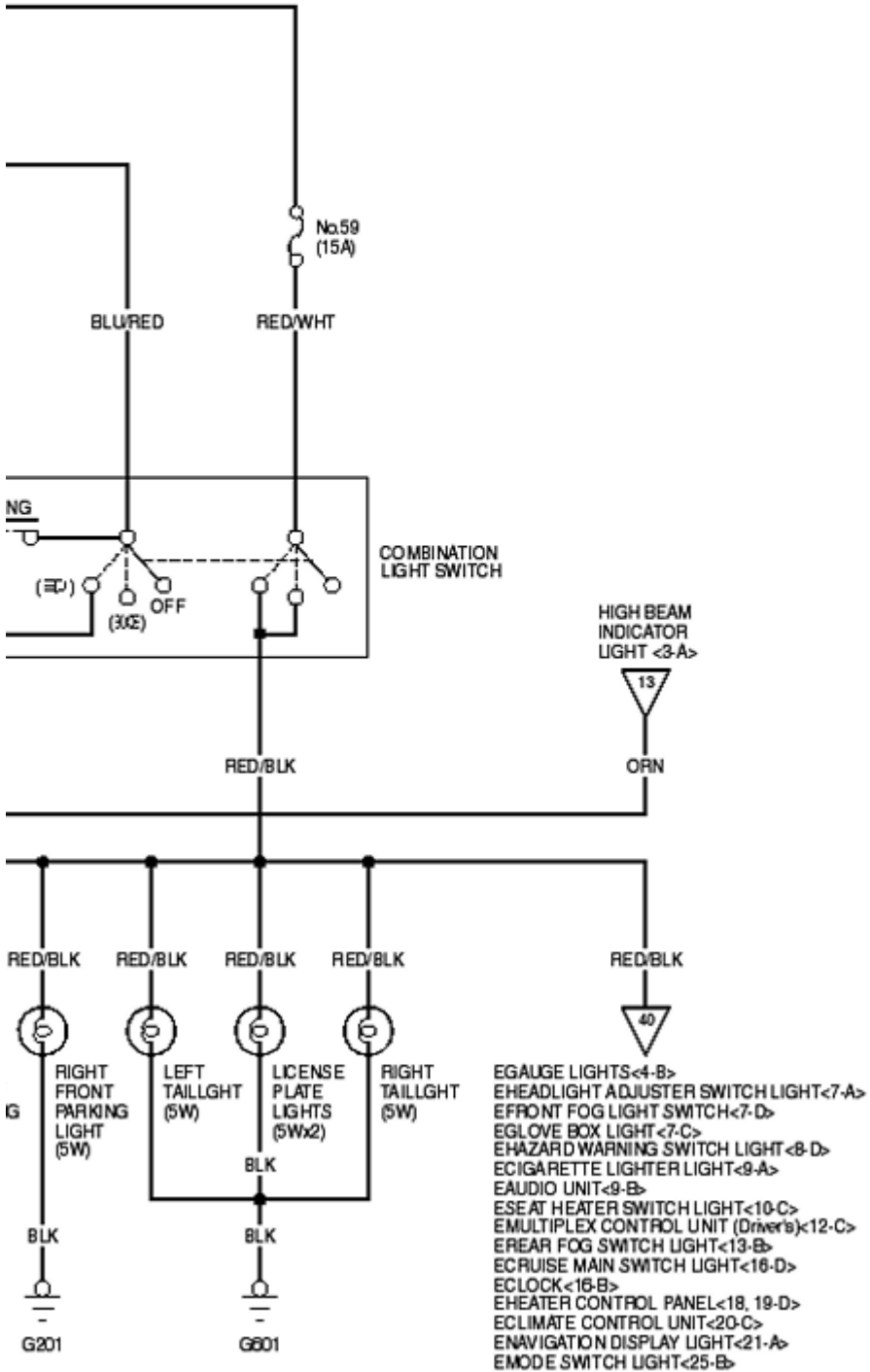


D

6

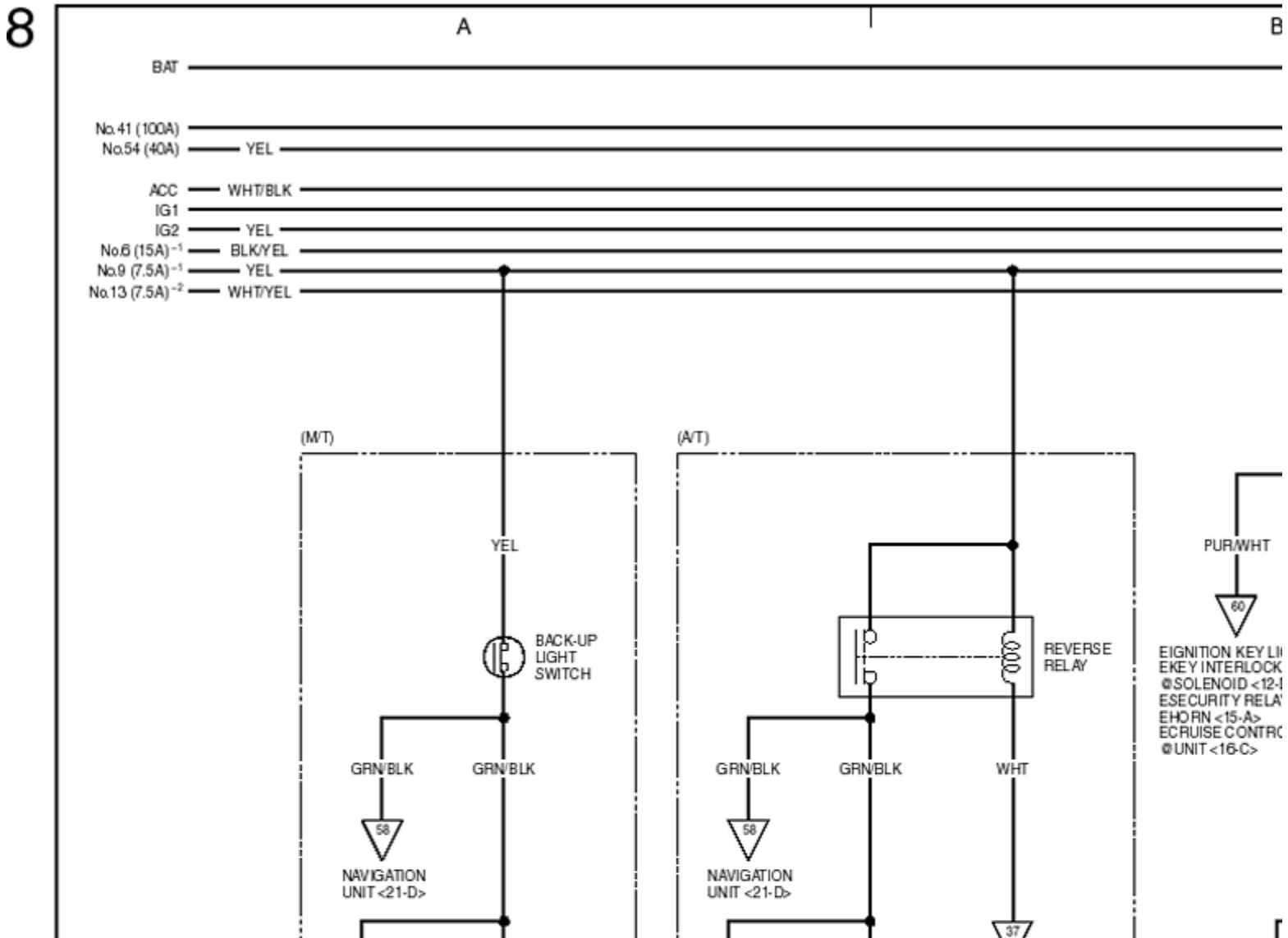
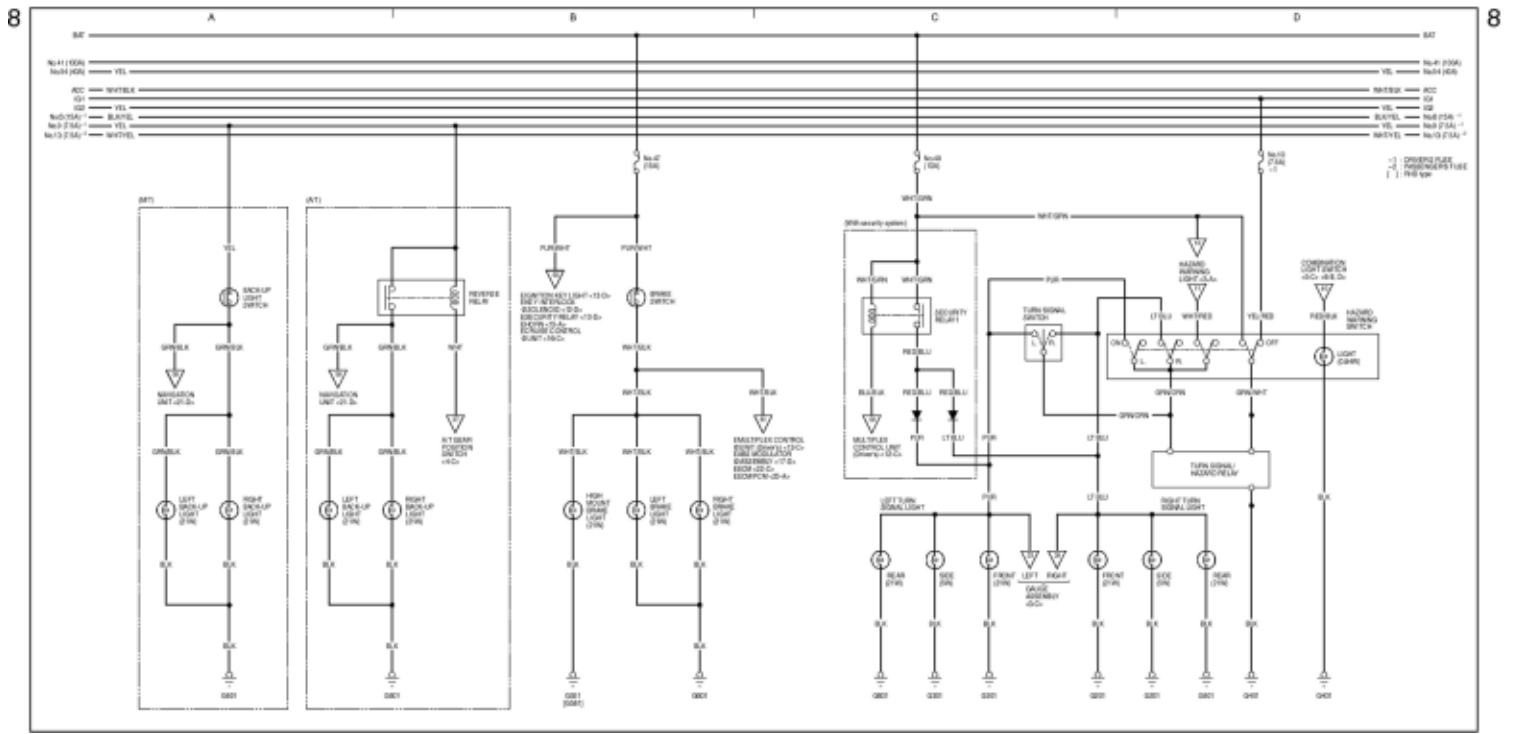


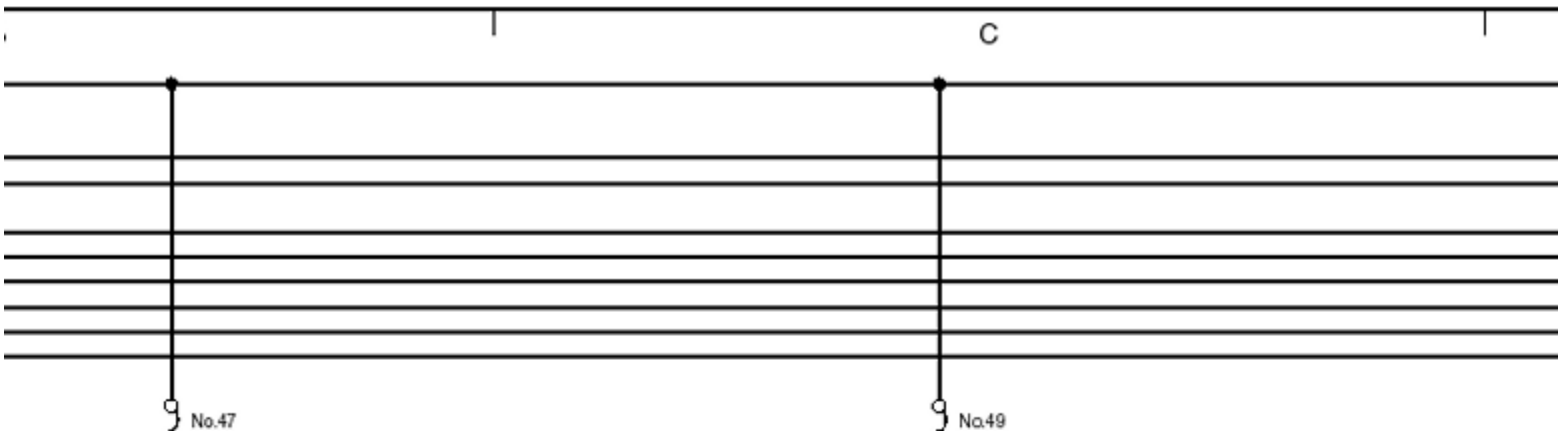
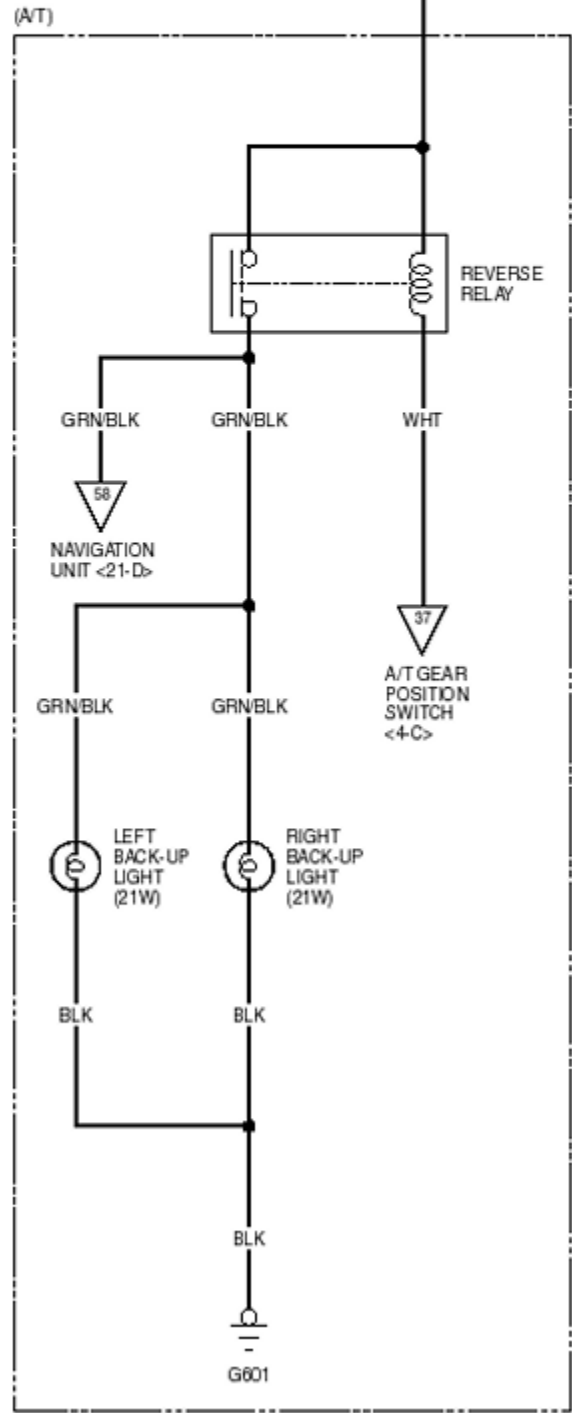
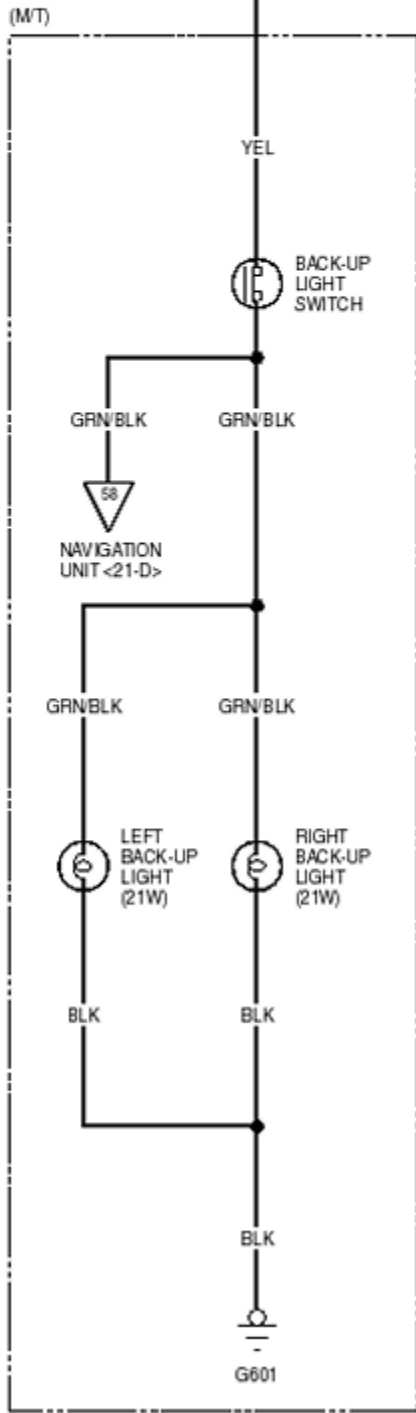
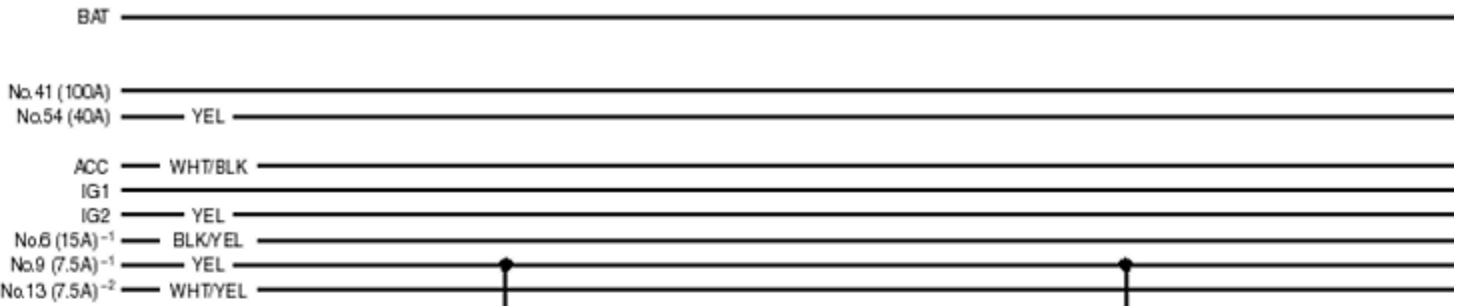
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type

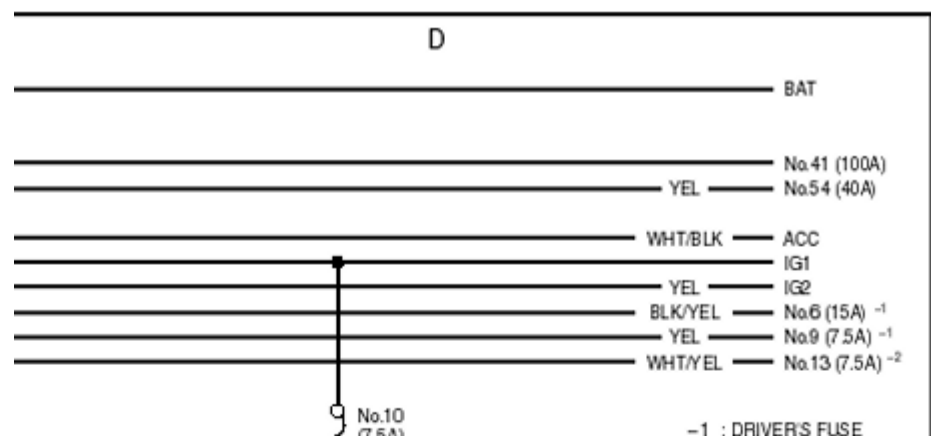
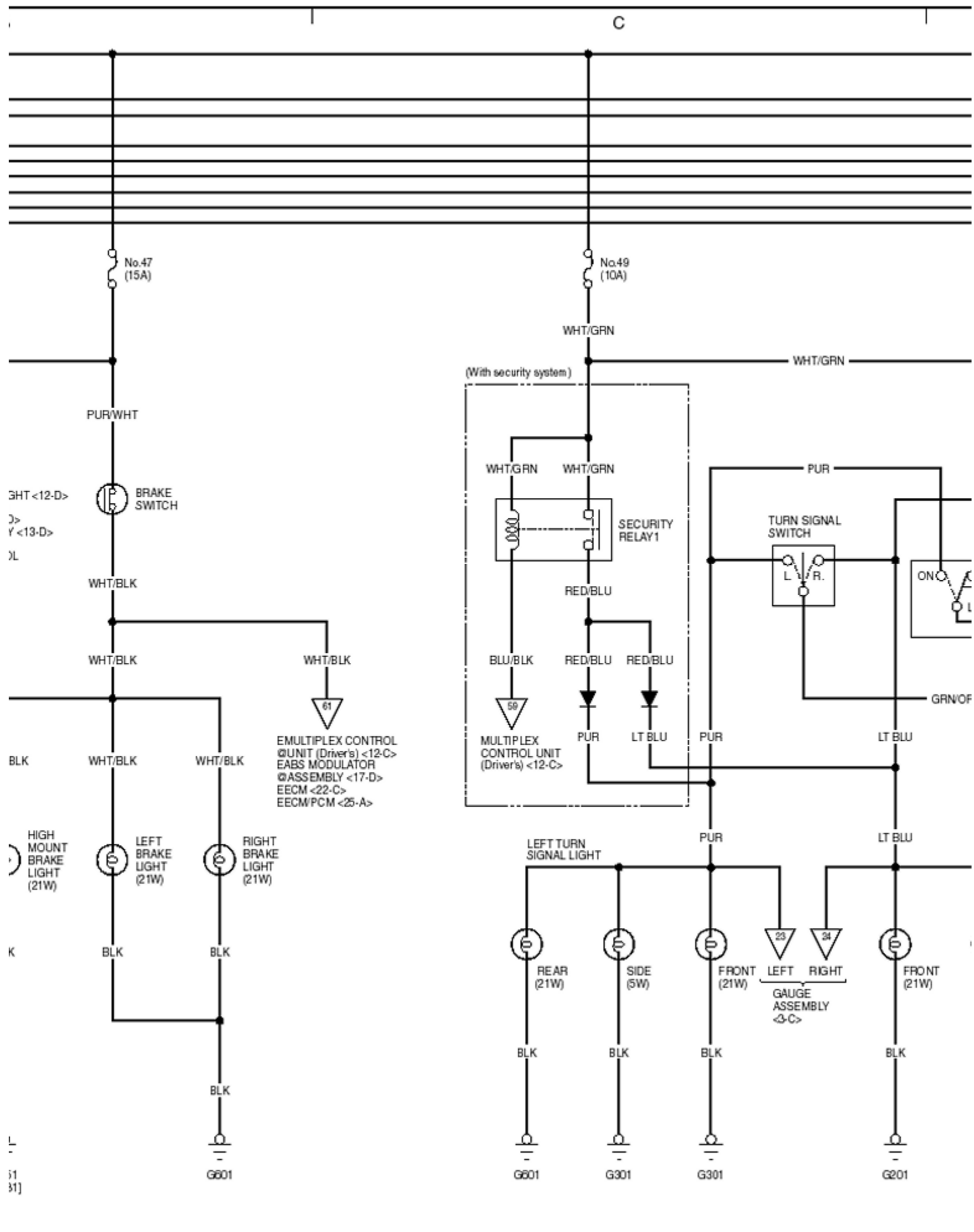


Wiring Diagrams

Lights, Exterior - High Mount Brake Light

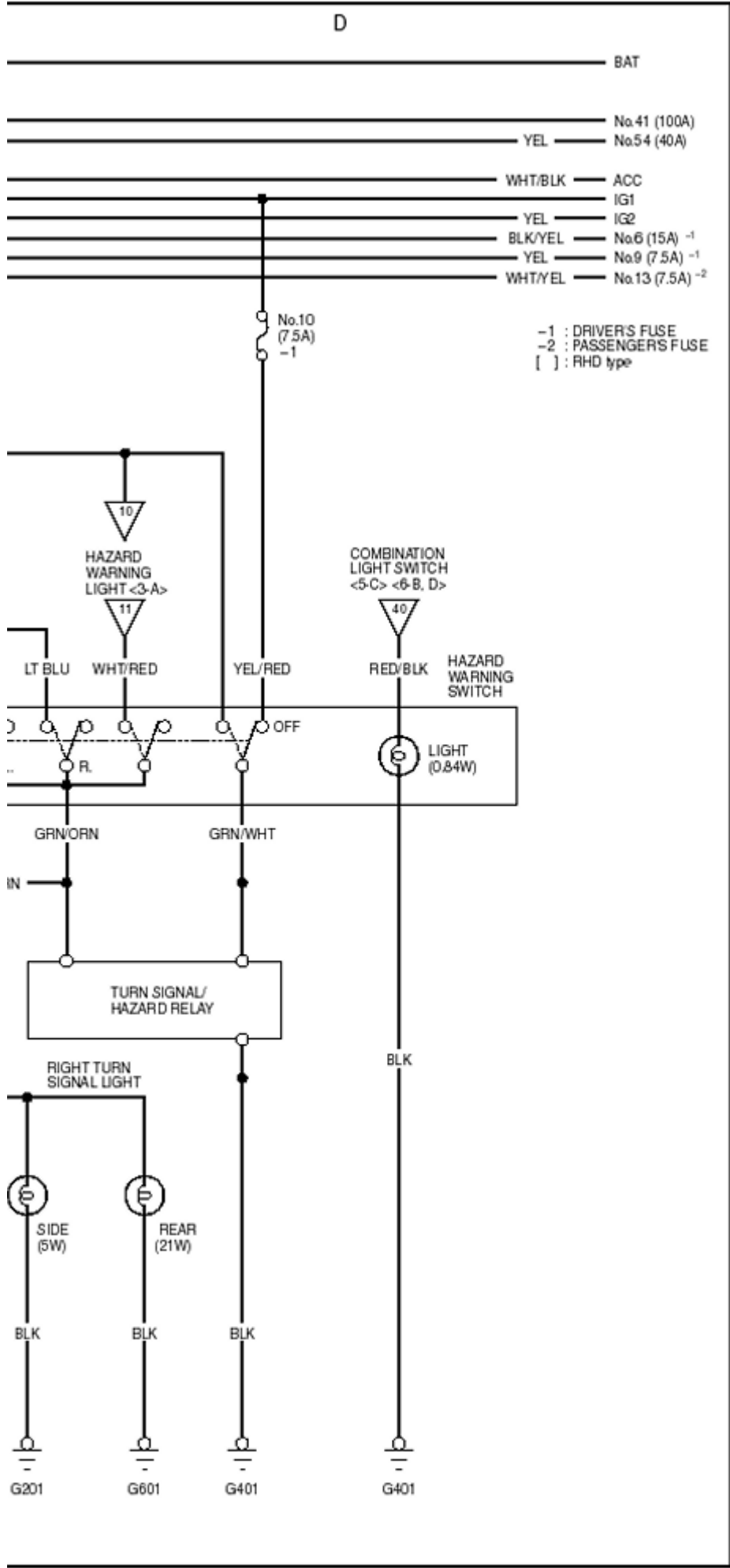






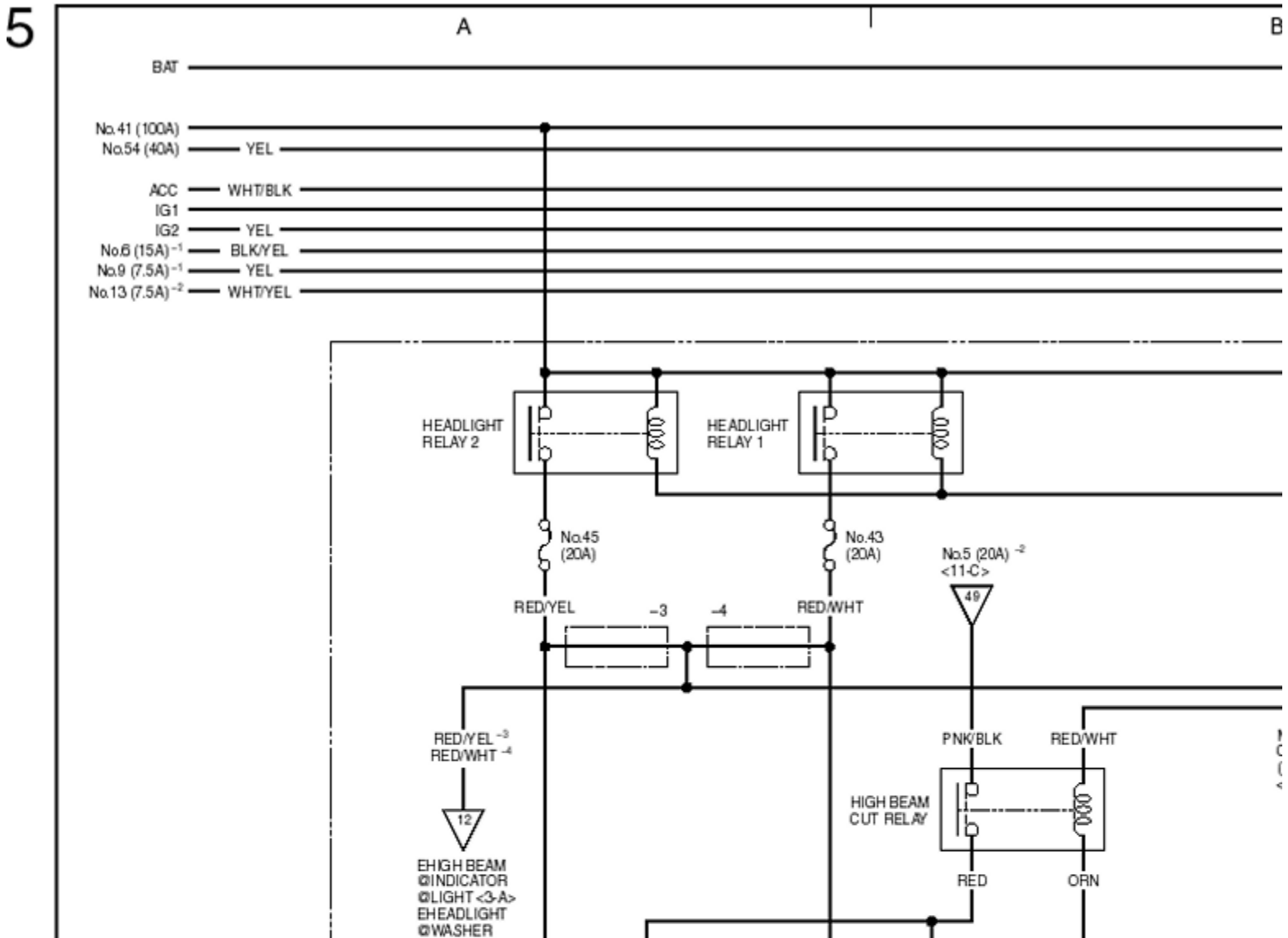
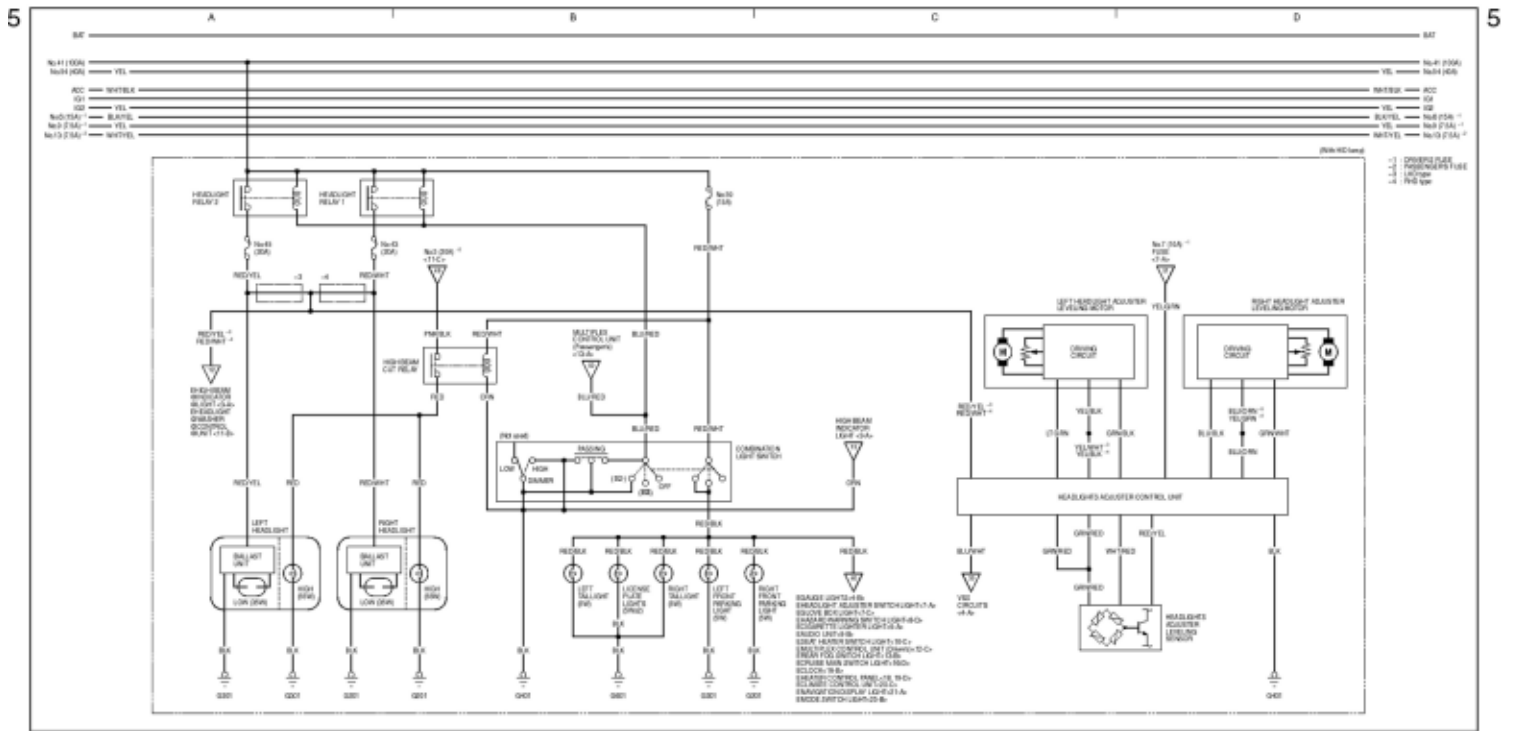
D

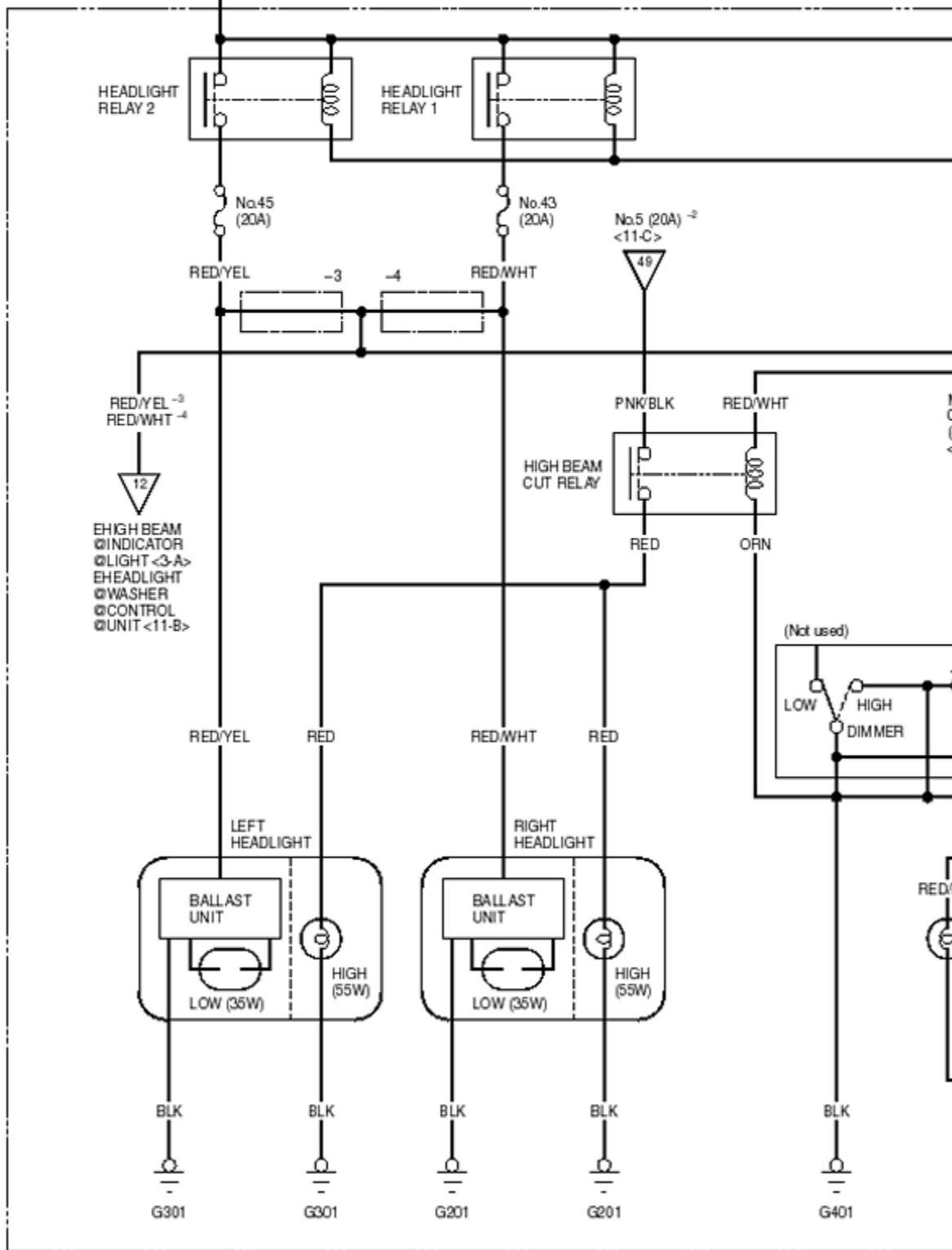
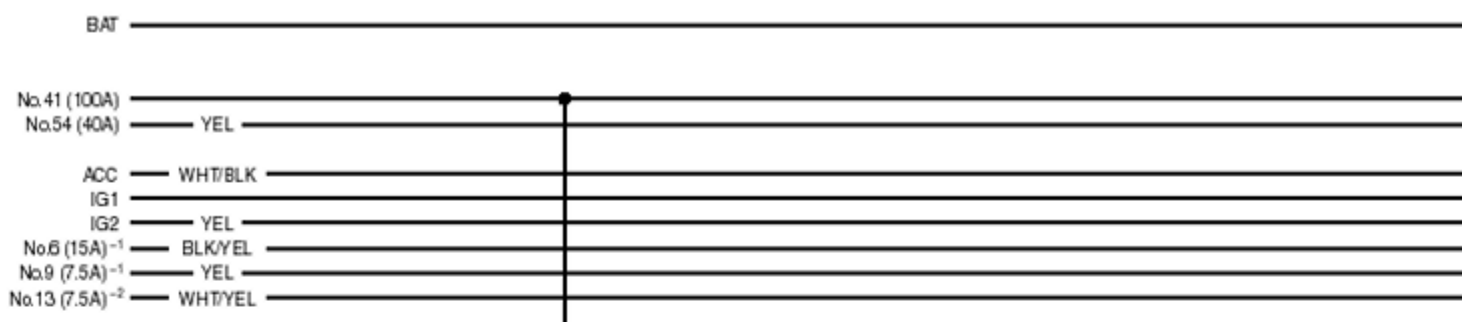
8

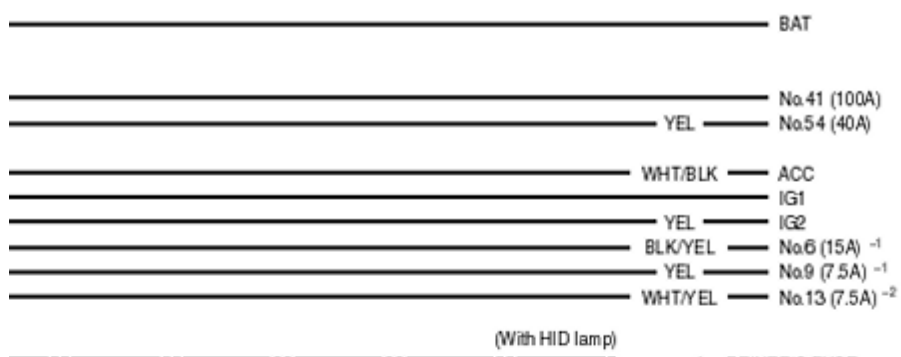
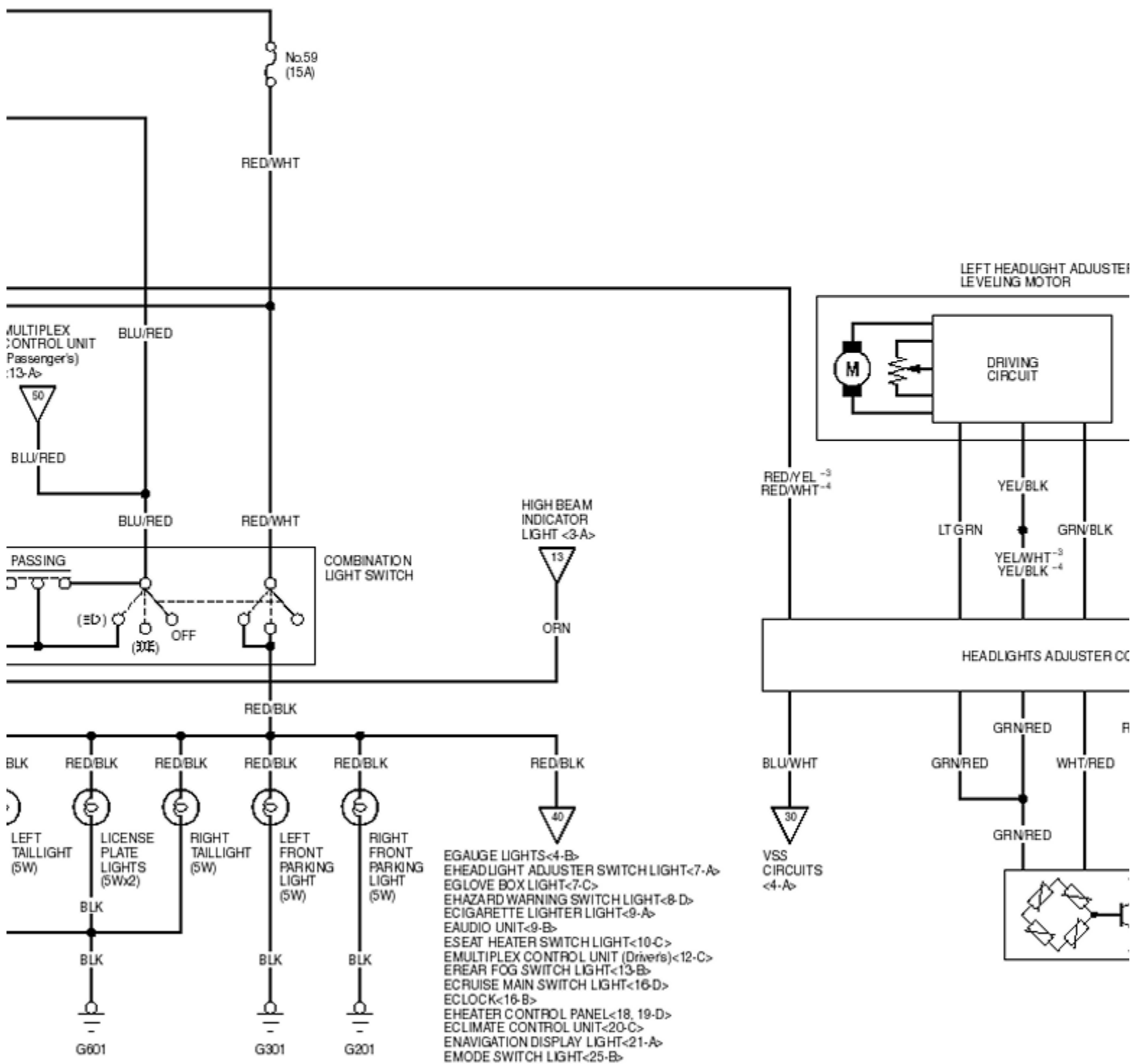


Wiring Diagrams

Lights, Exterior - License Plate Lights





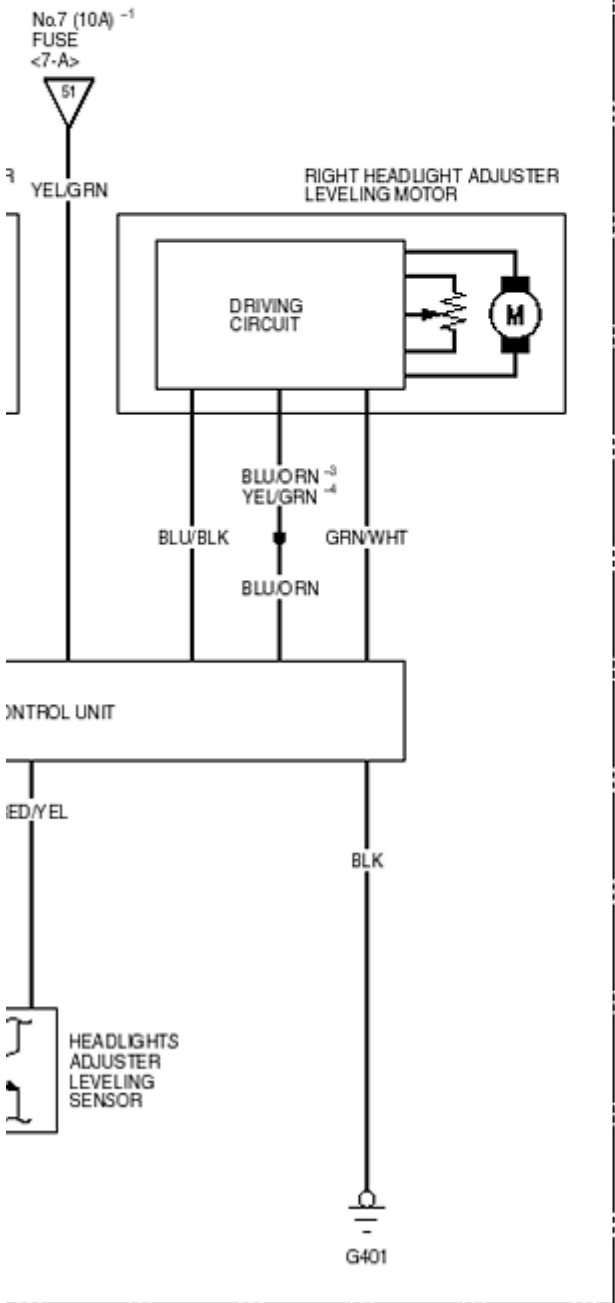


D

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

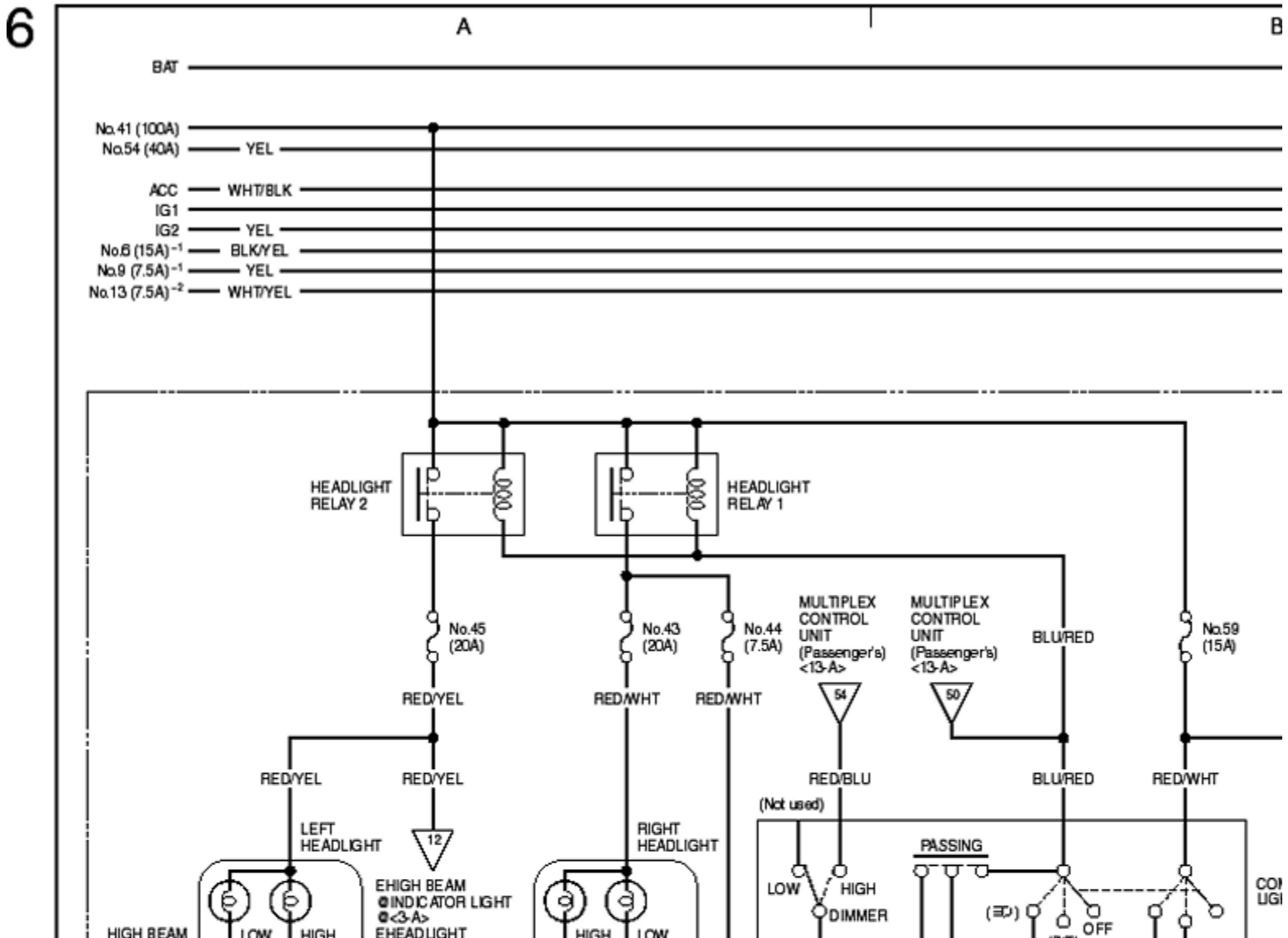
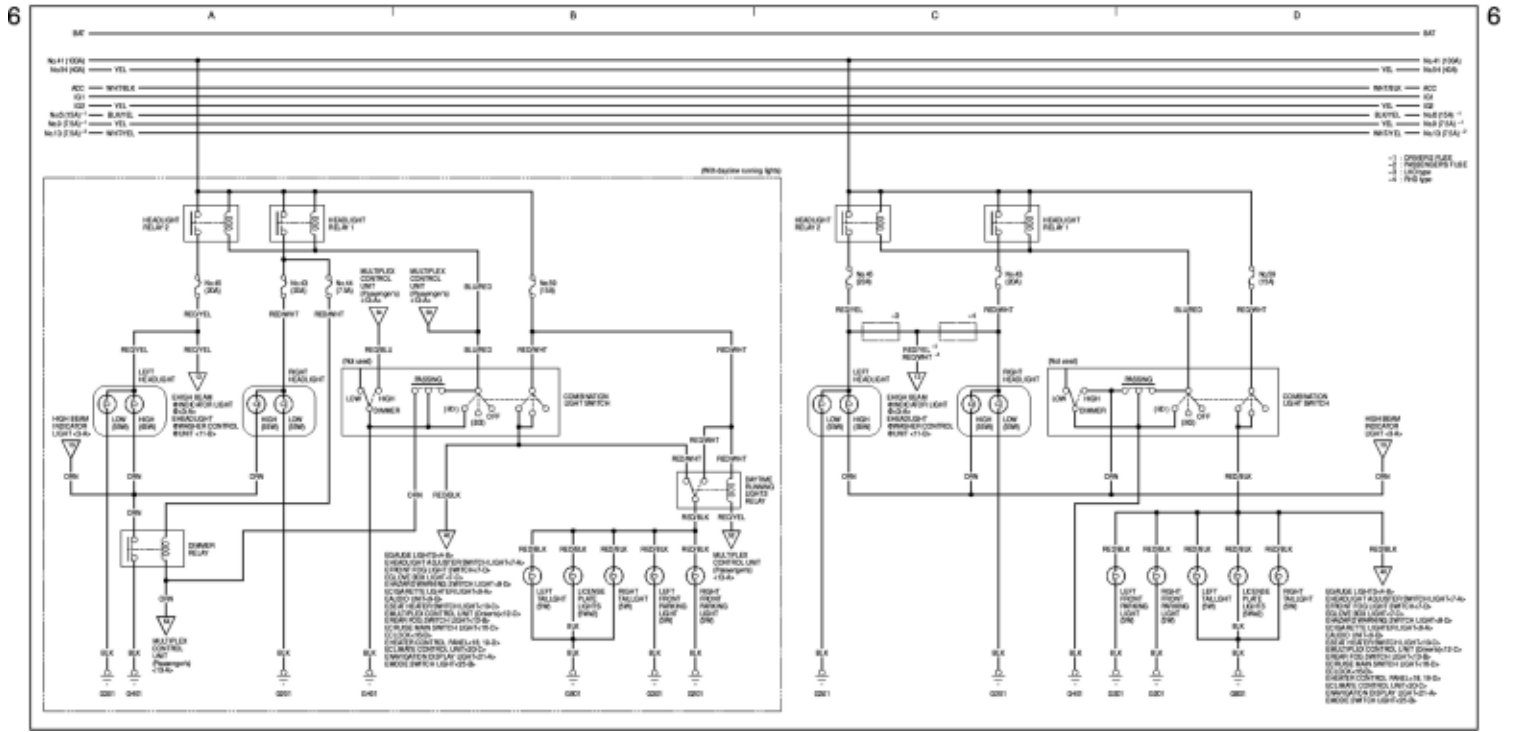
(With HID lamp)

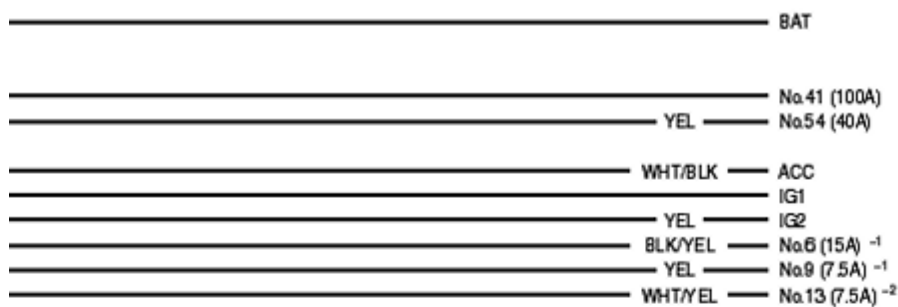
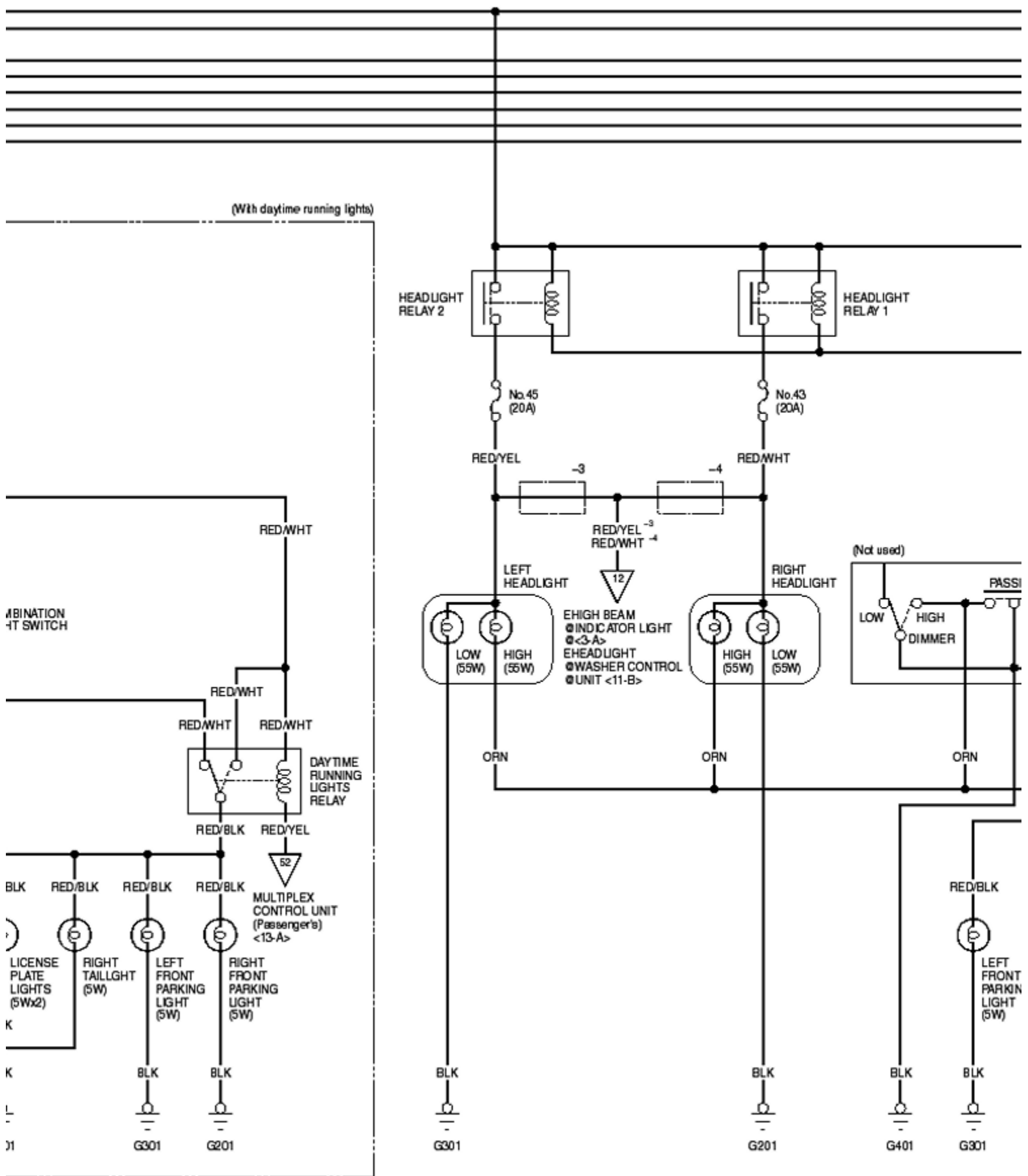
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type



Wiring Diagrams

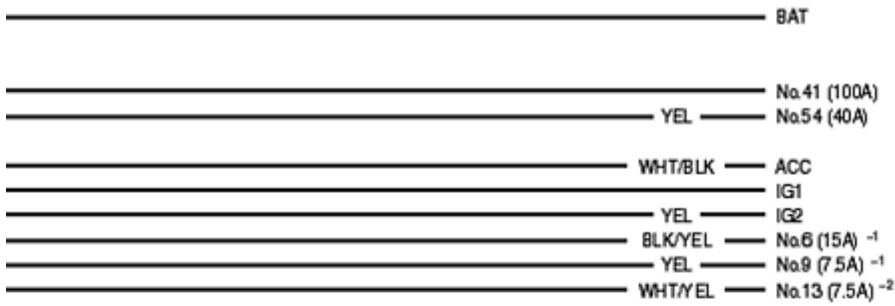
Lights, Exterior - License Plate Lights



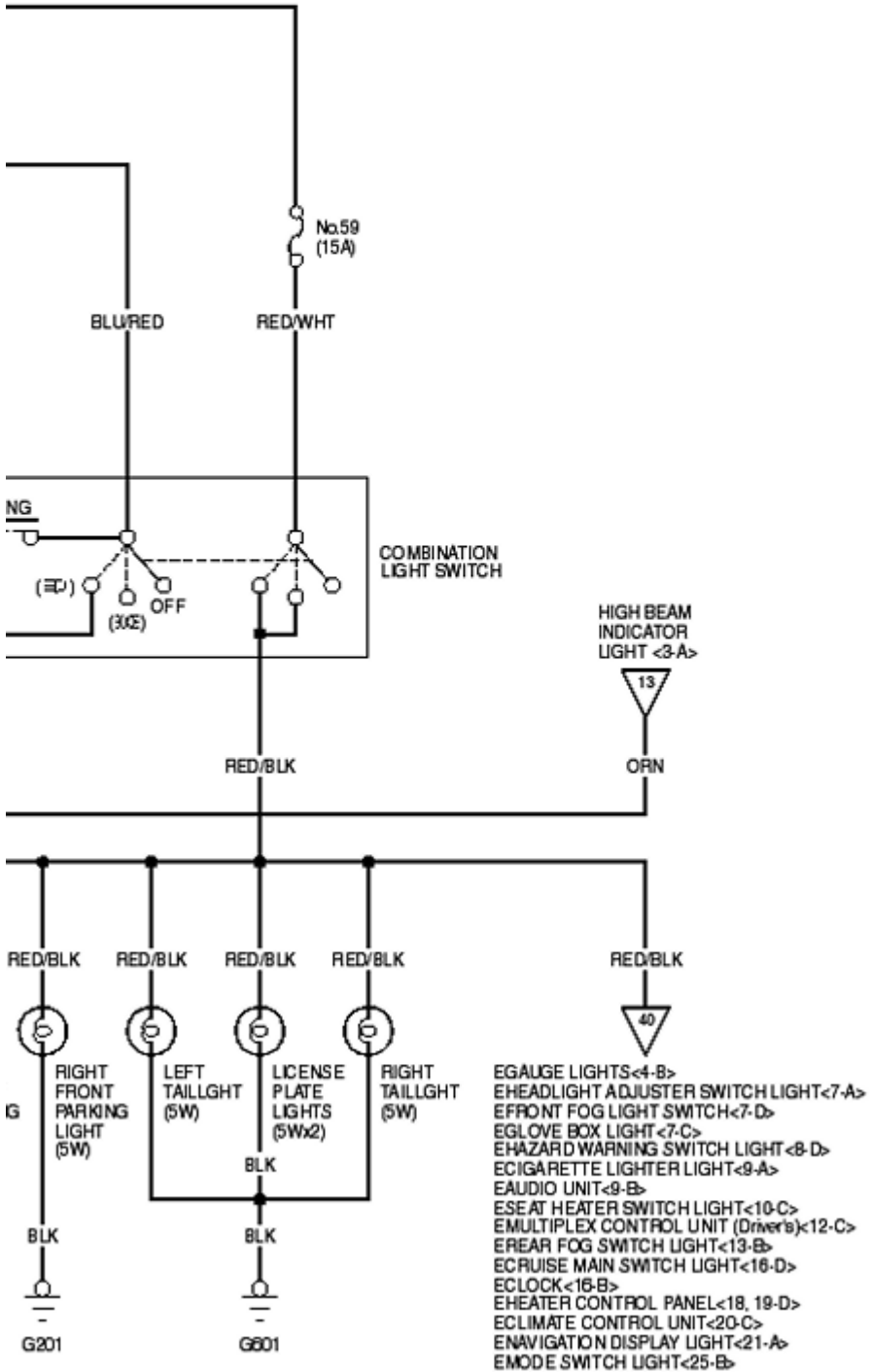


D

6

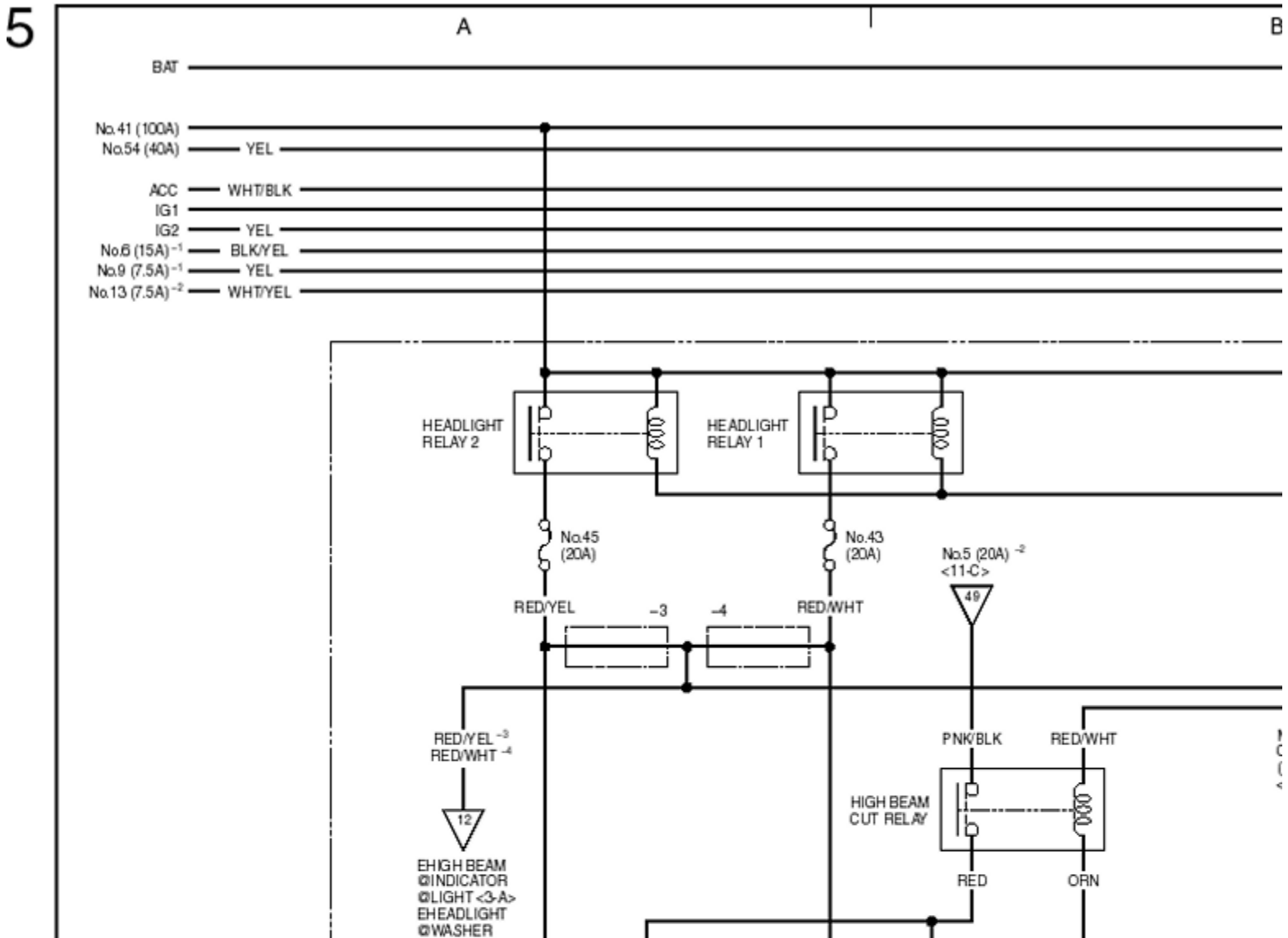
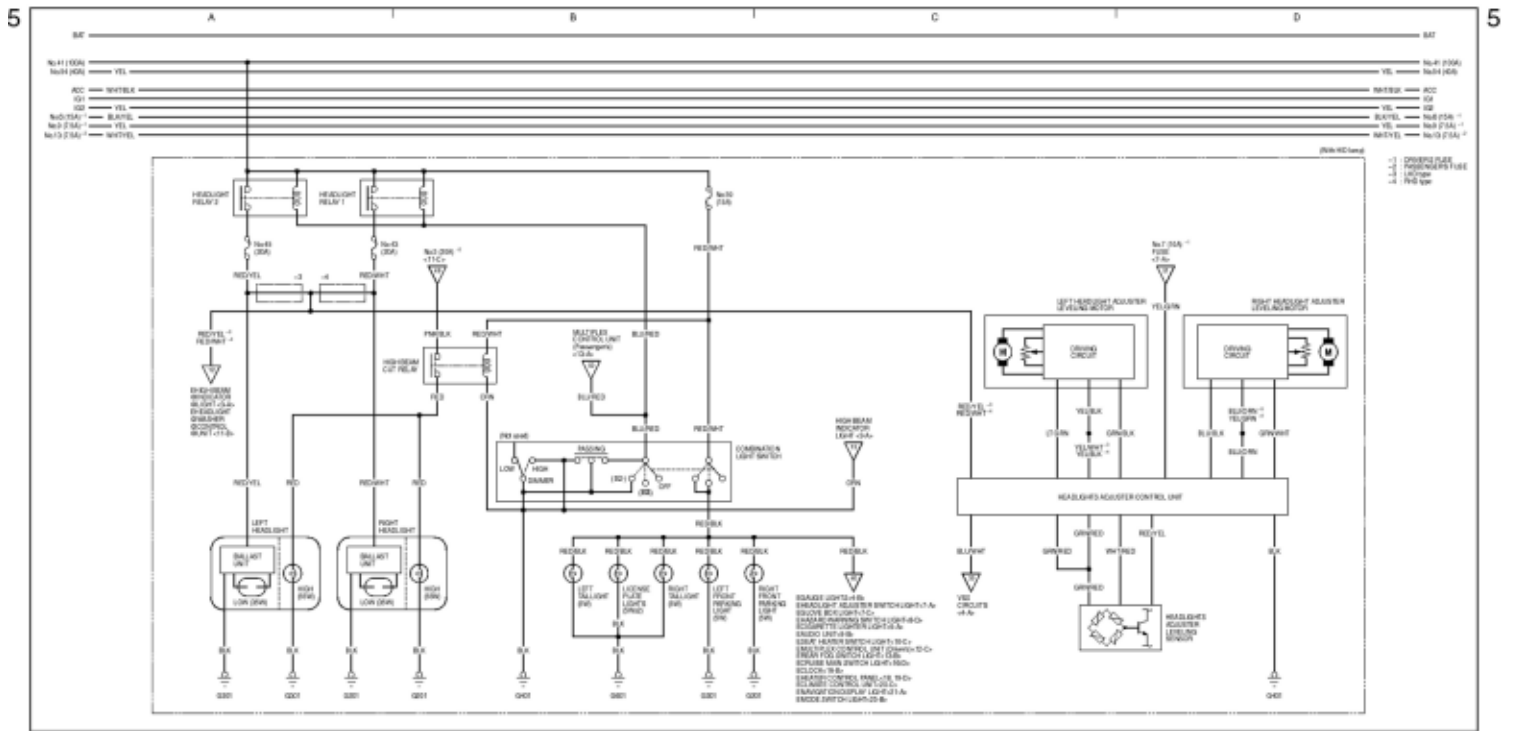


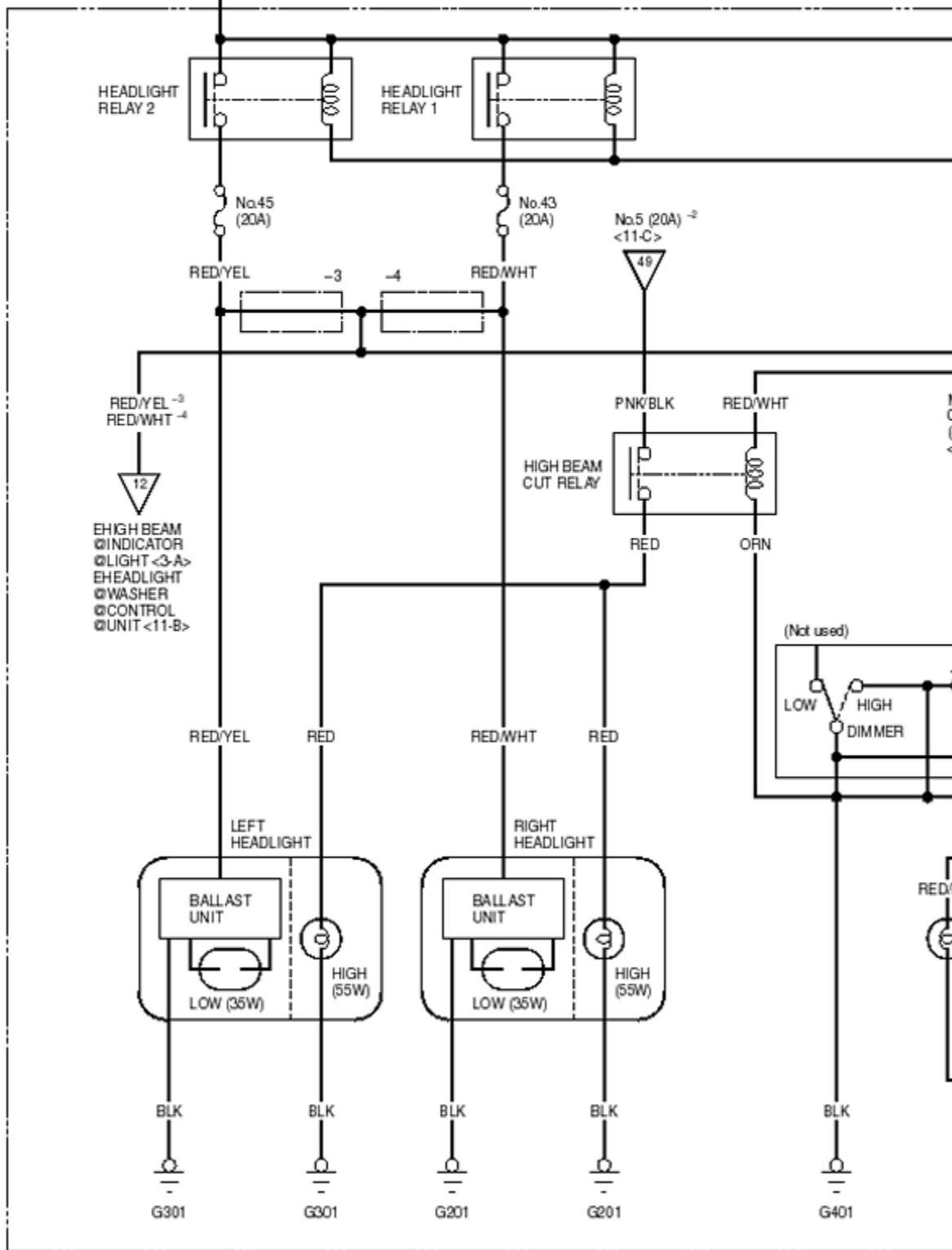
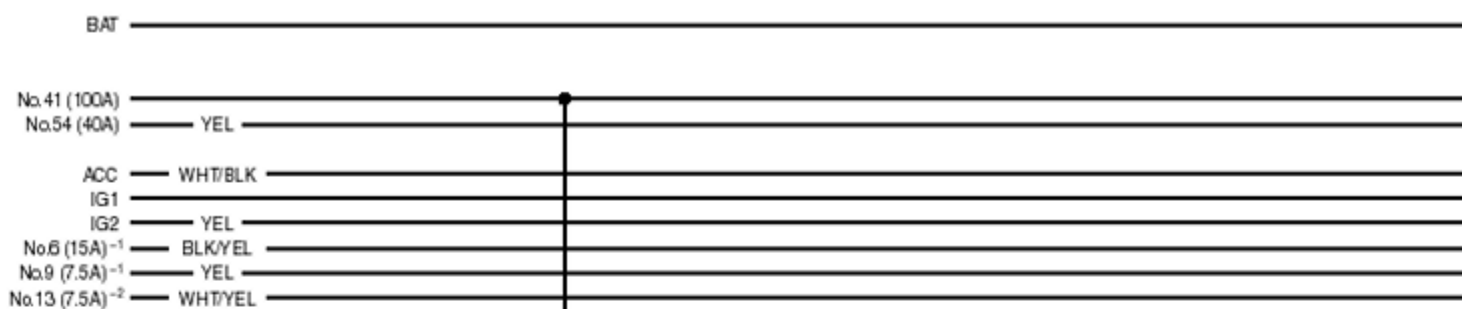
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type

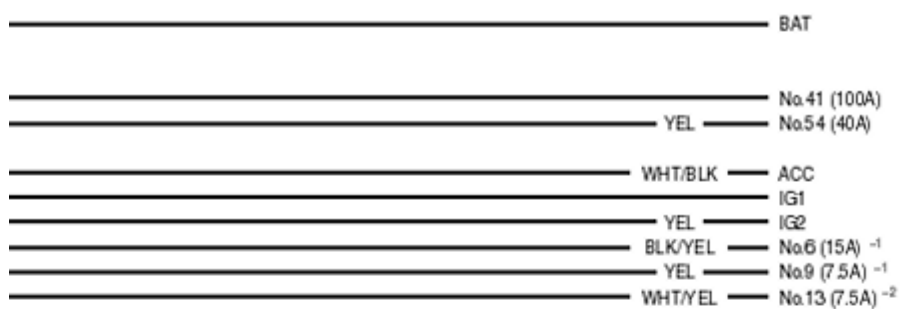
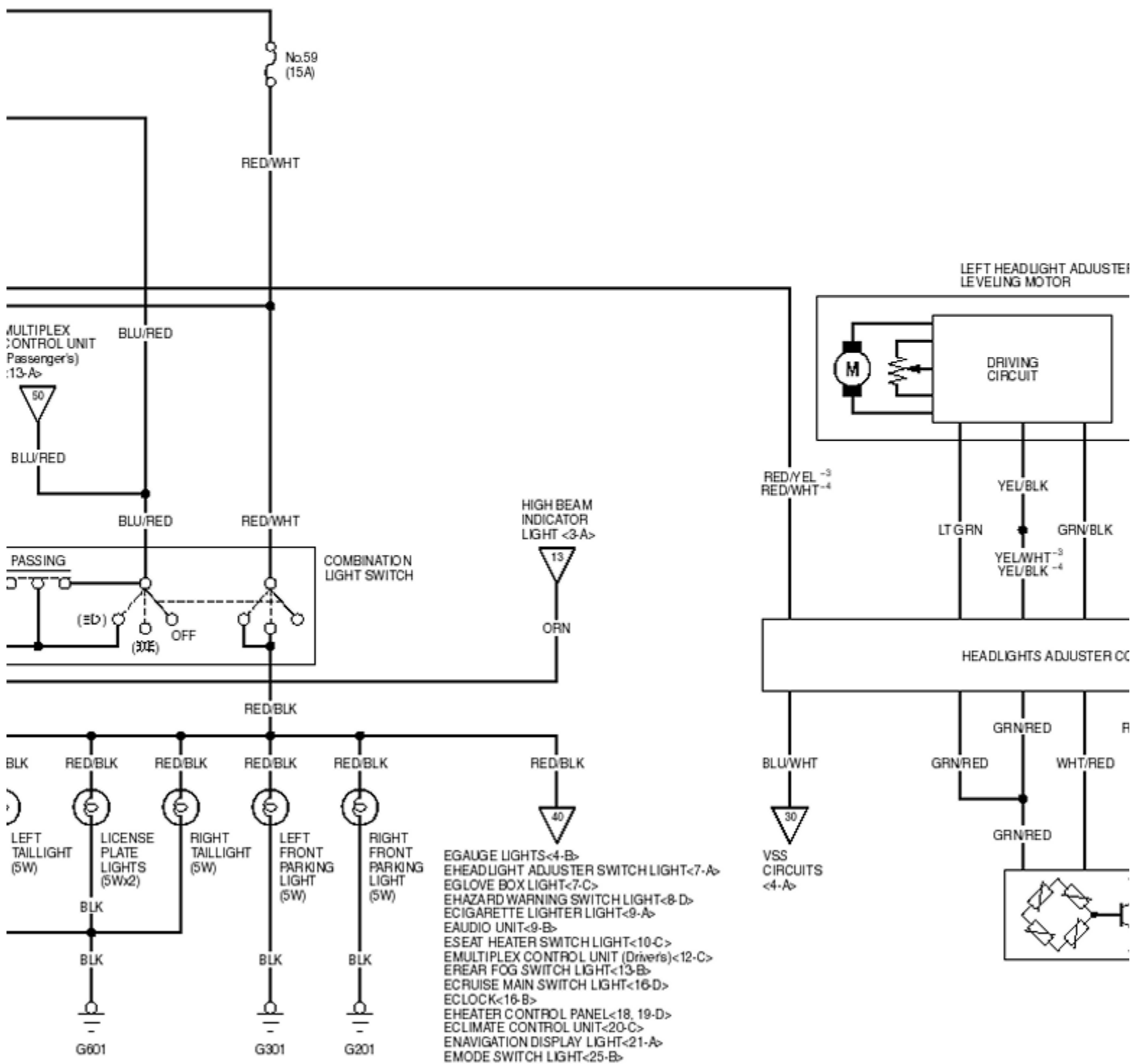


Wiring Diagrams

Lights, Exterior - License Plate Lights







(With HID lamp)

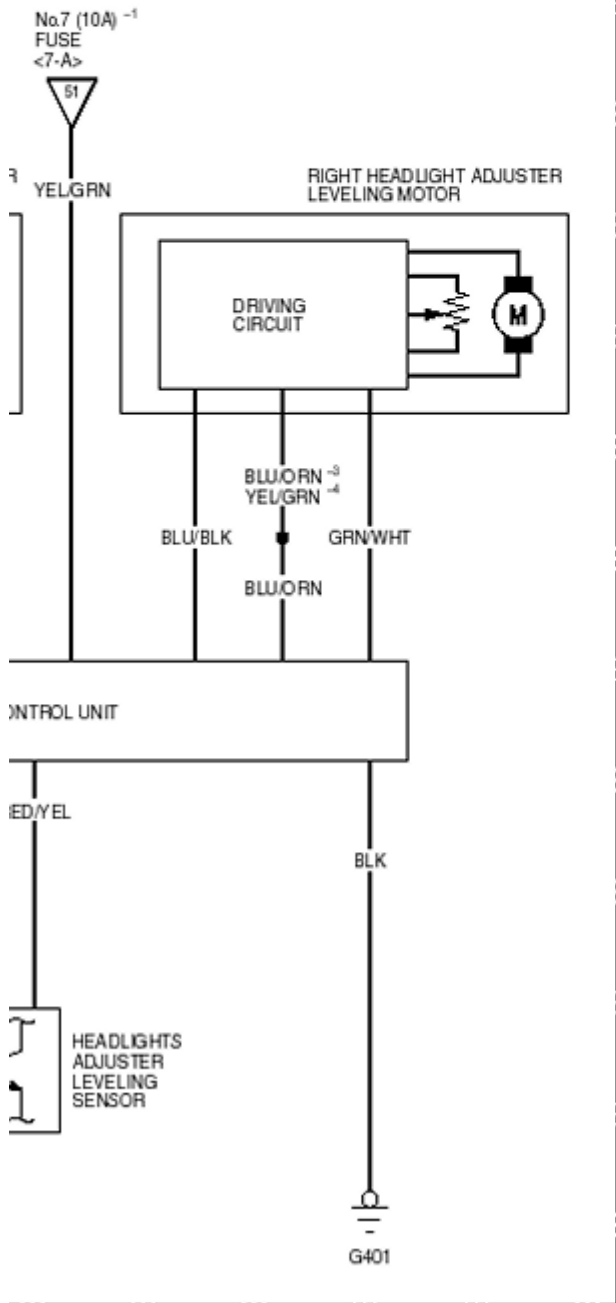
-1 : DRIVER'S FUSE

D

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

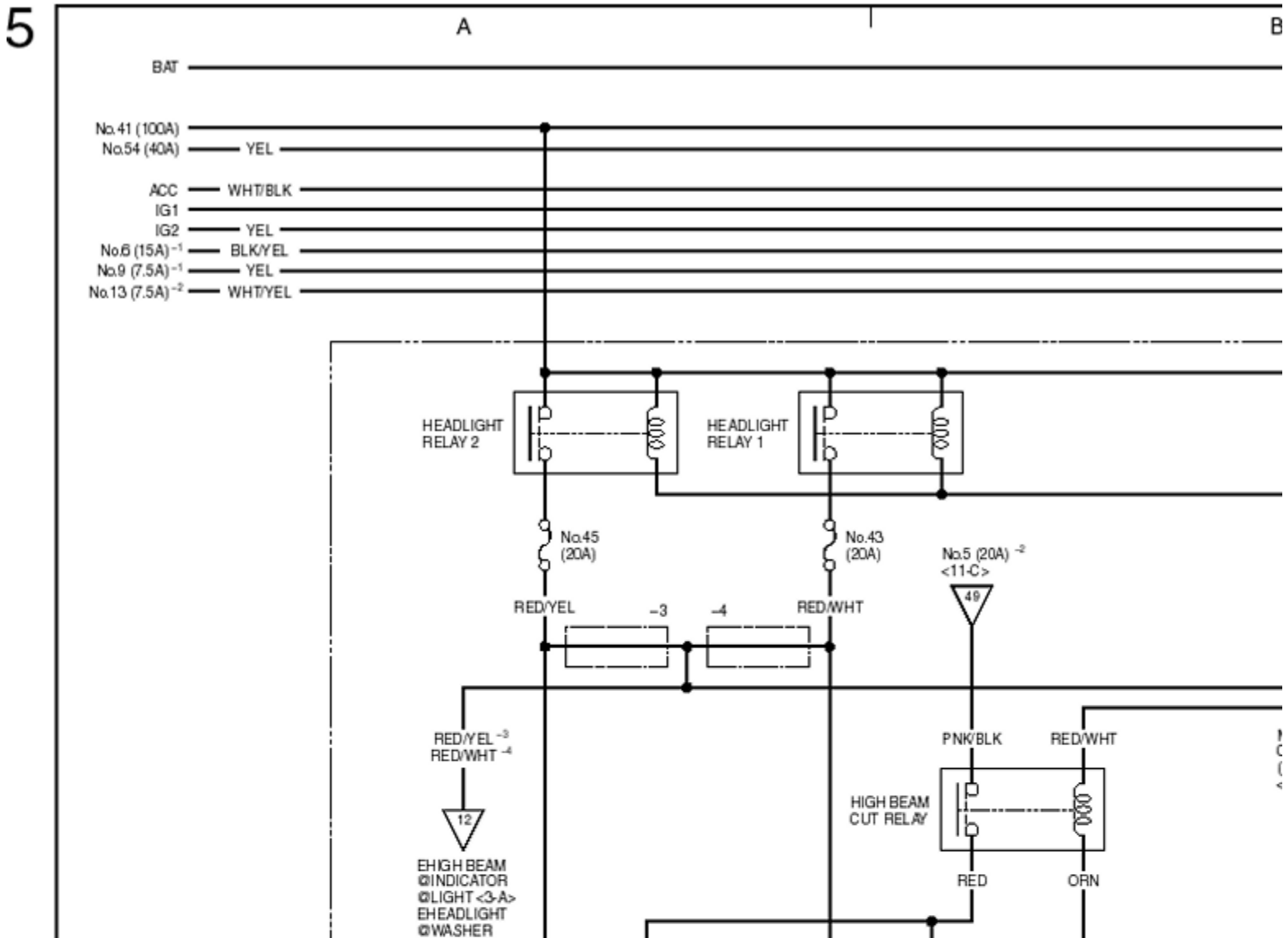
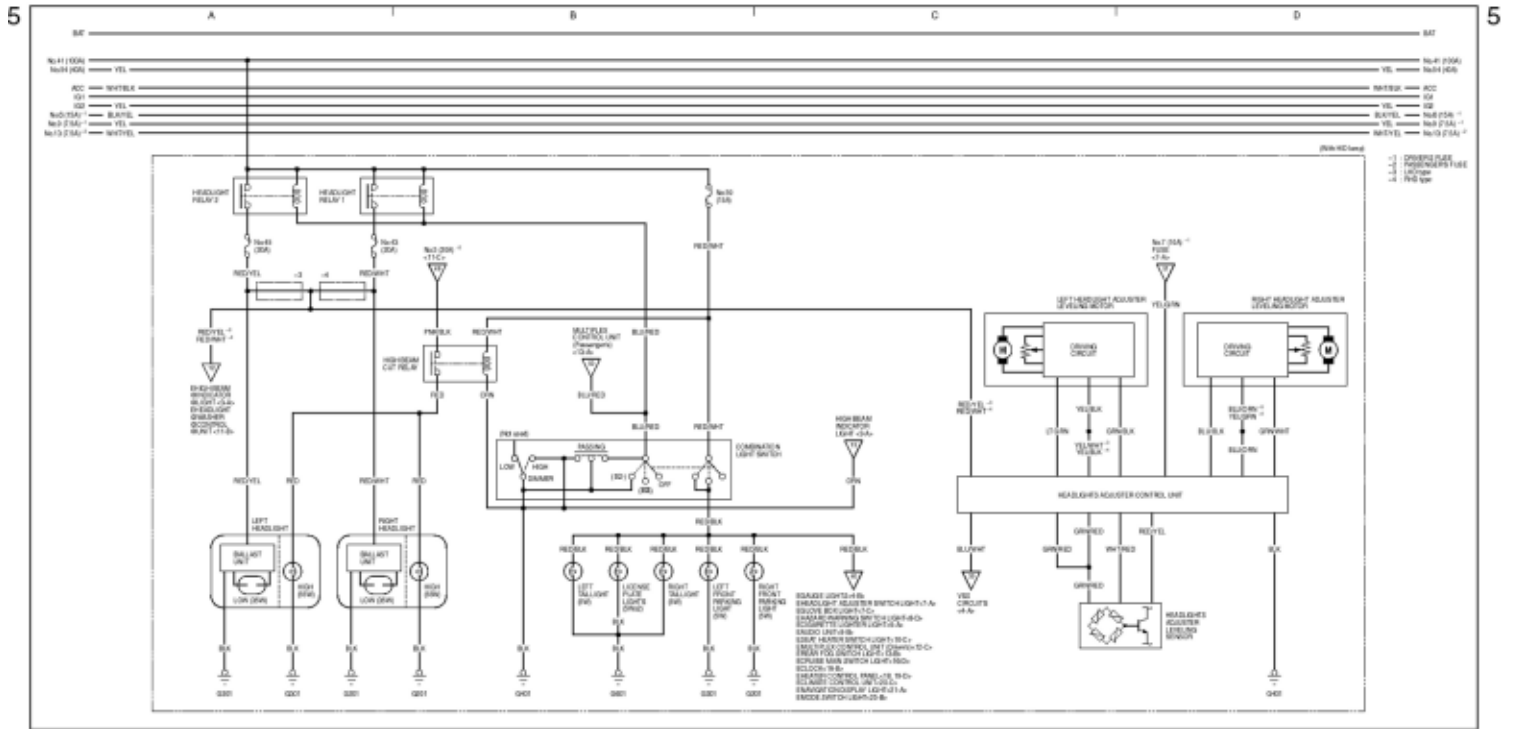
(With HID lamp)

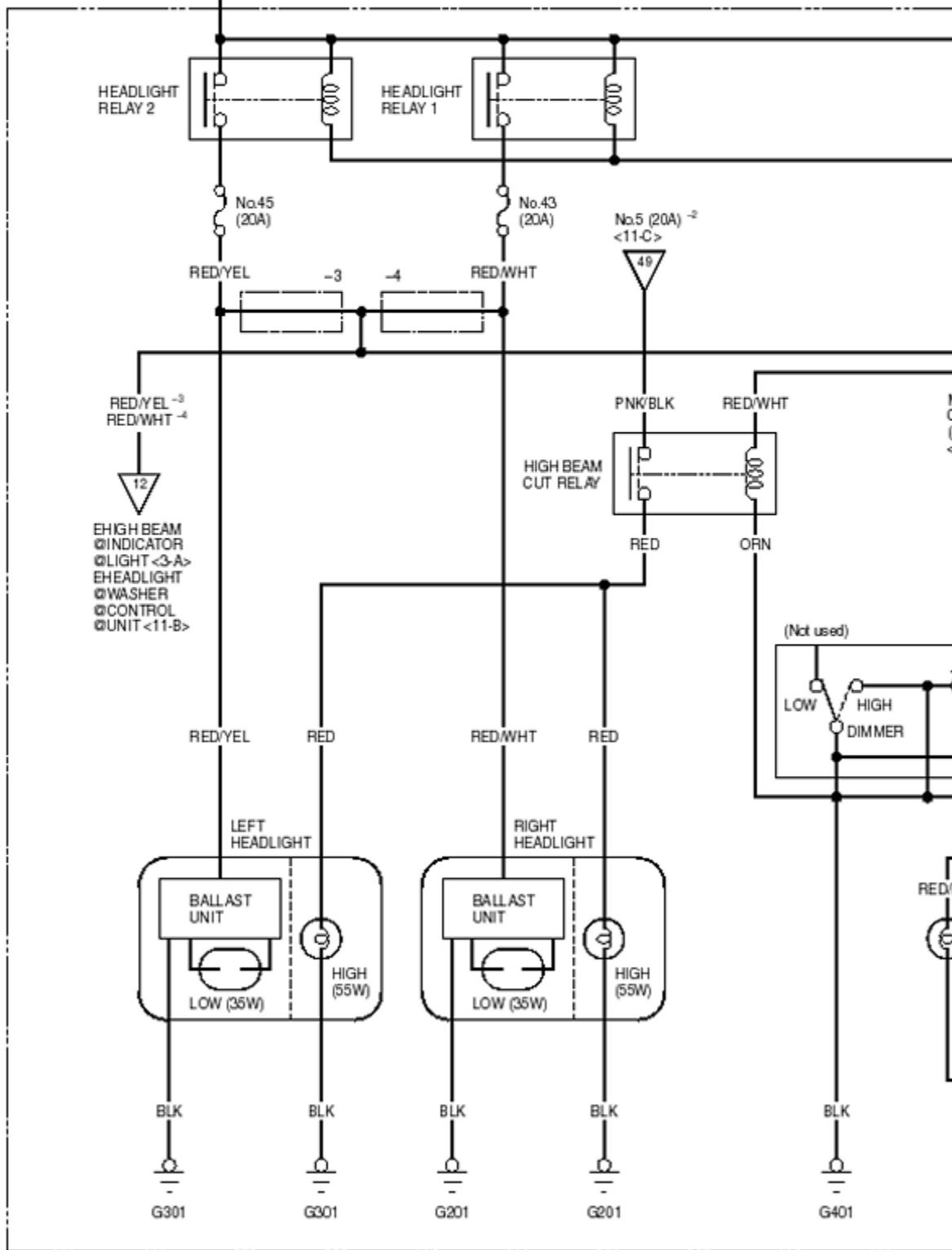
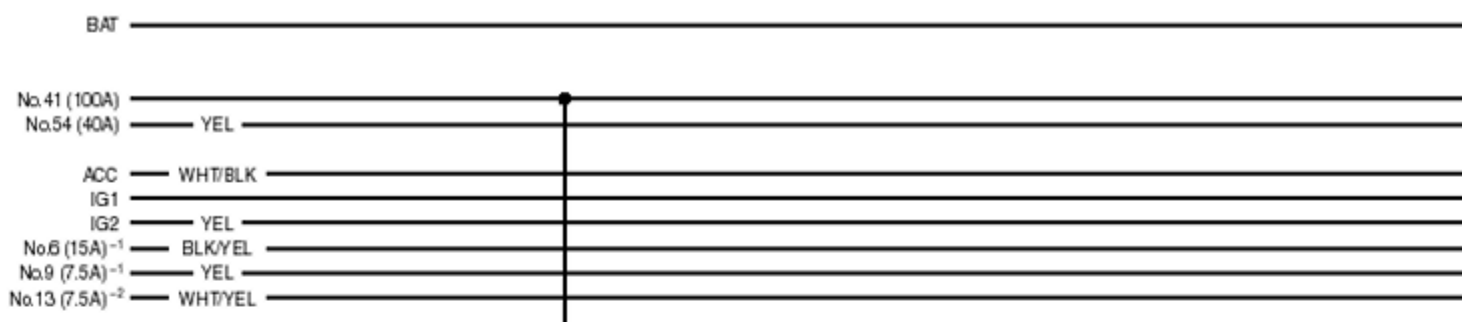
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type

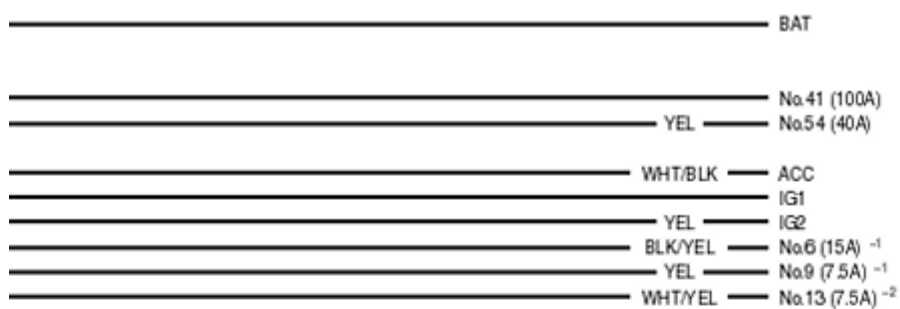
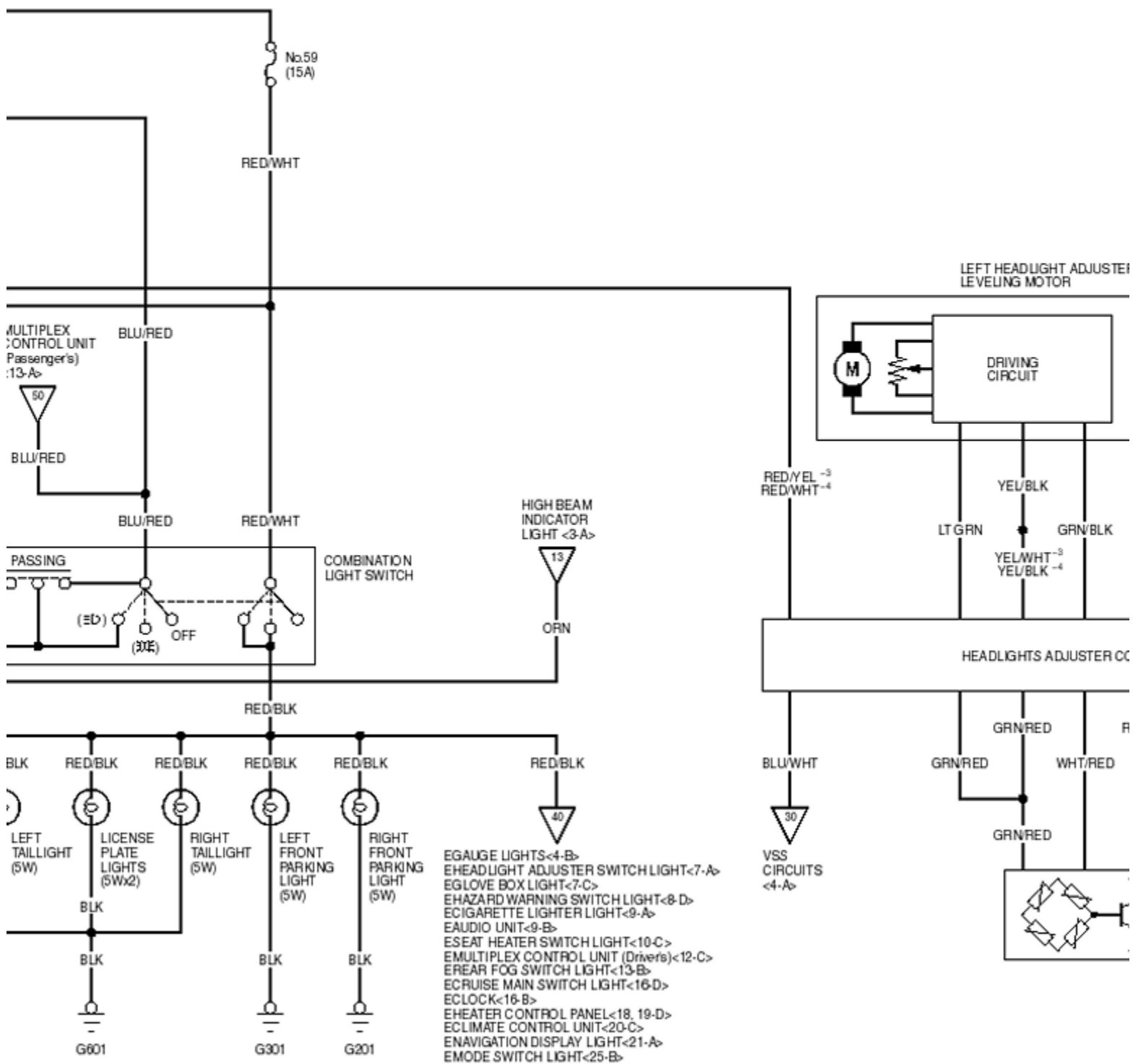


Wiring Diagrams

Lights, Exterior - Parking Lights







(With HID lamp)

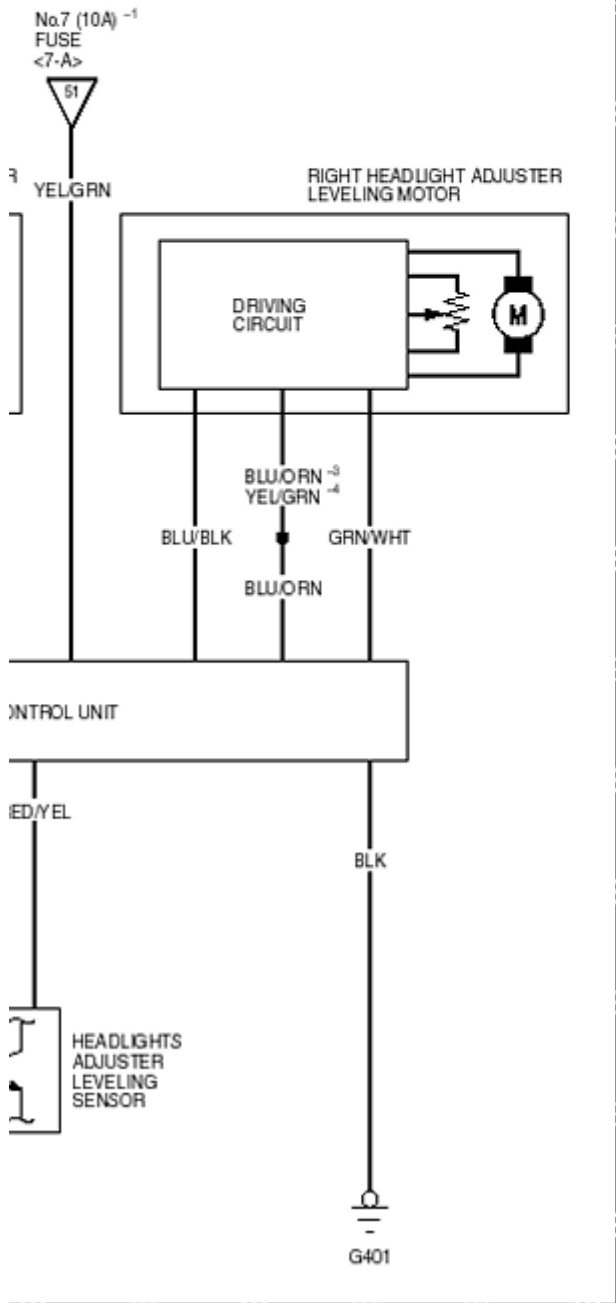
- 1 : DRIVER'S FUSE

D

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

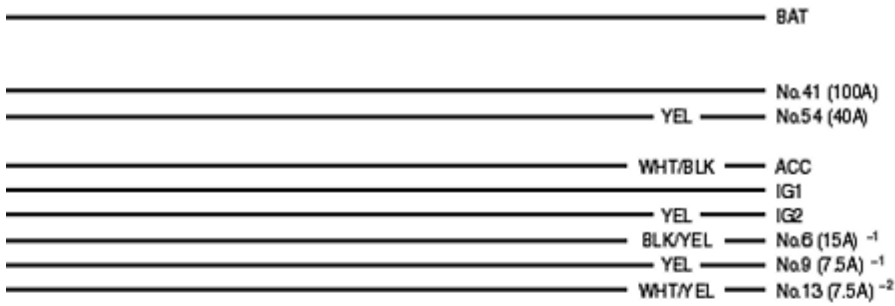
(With HID lamp)

- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : LHD type
- 4 : RHD type

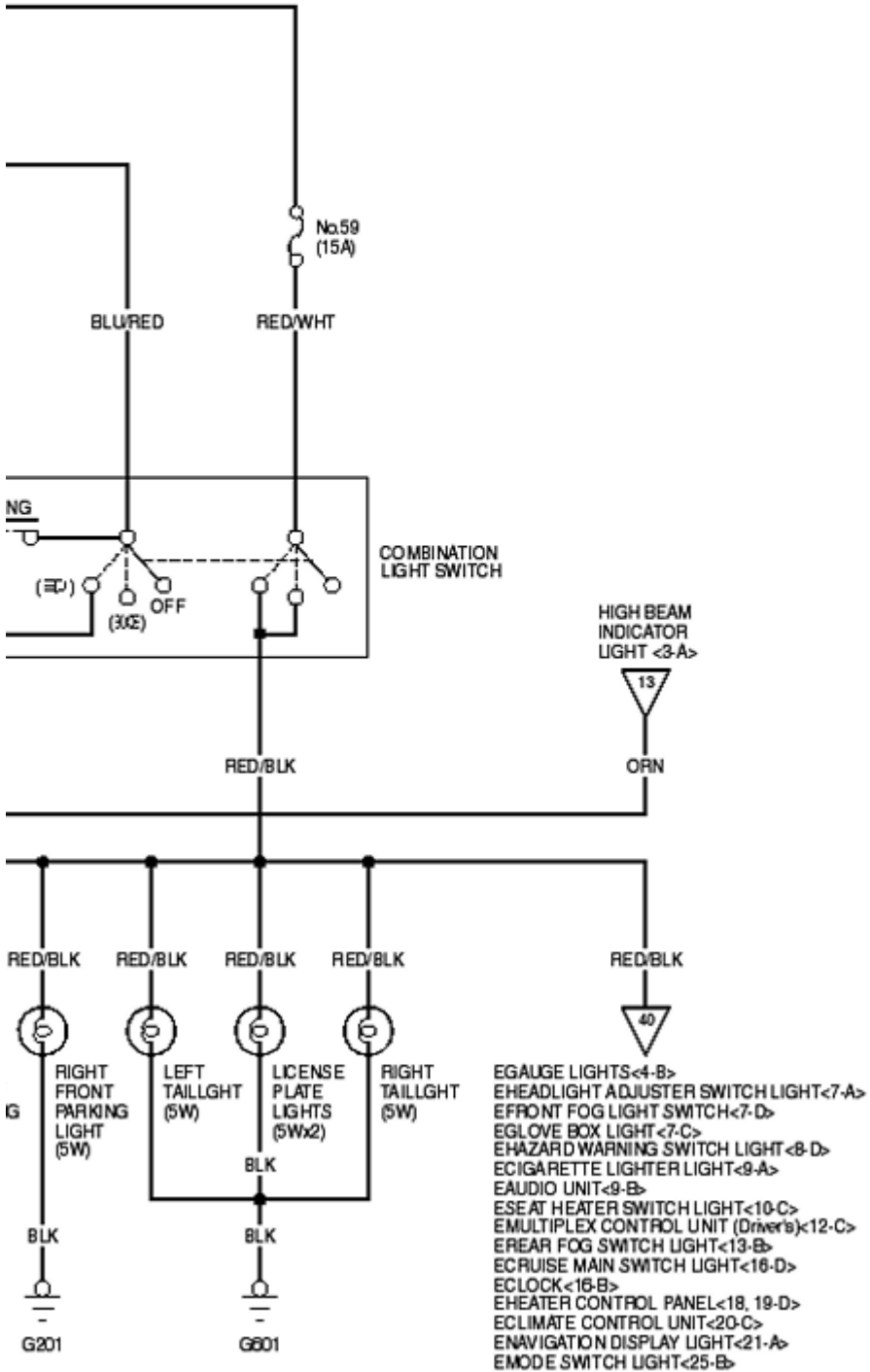


D

6



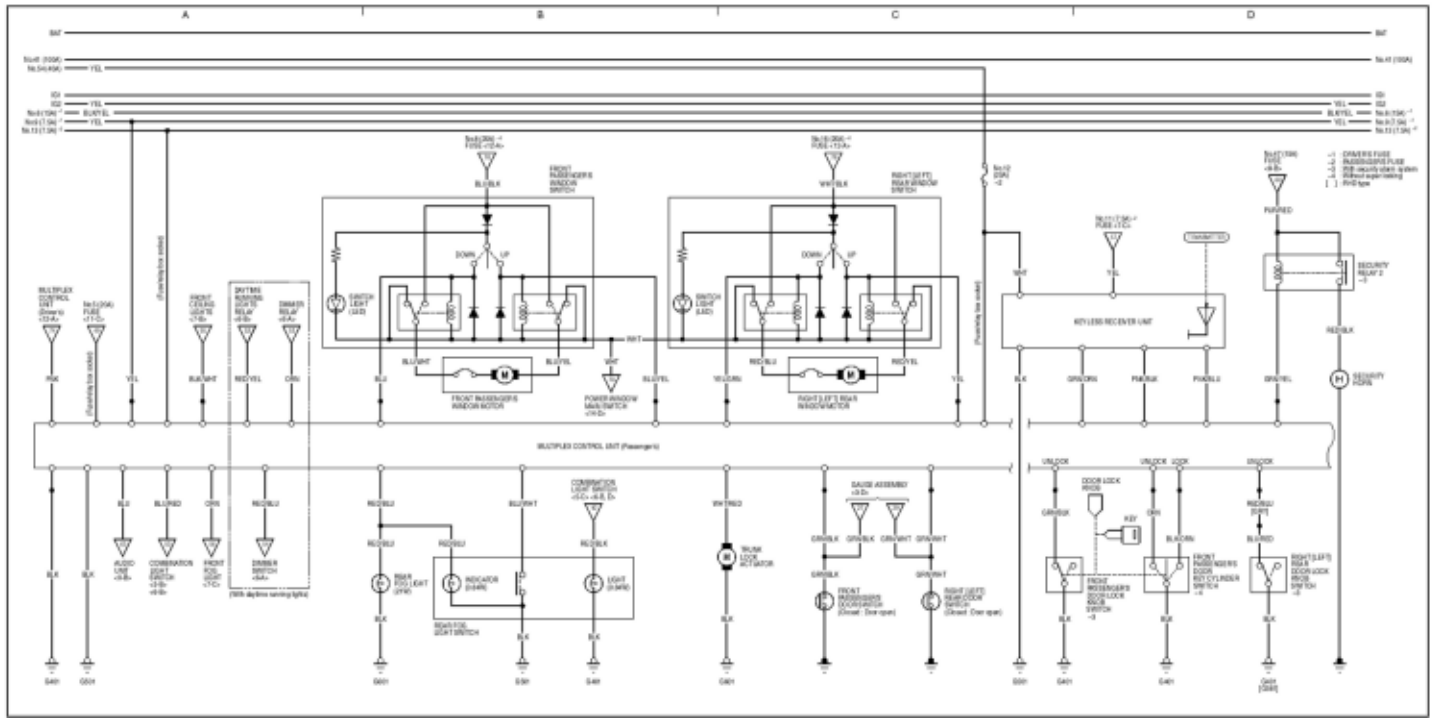
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : LHD type
 -4 : RHD type



Wiring Diagrams

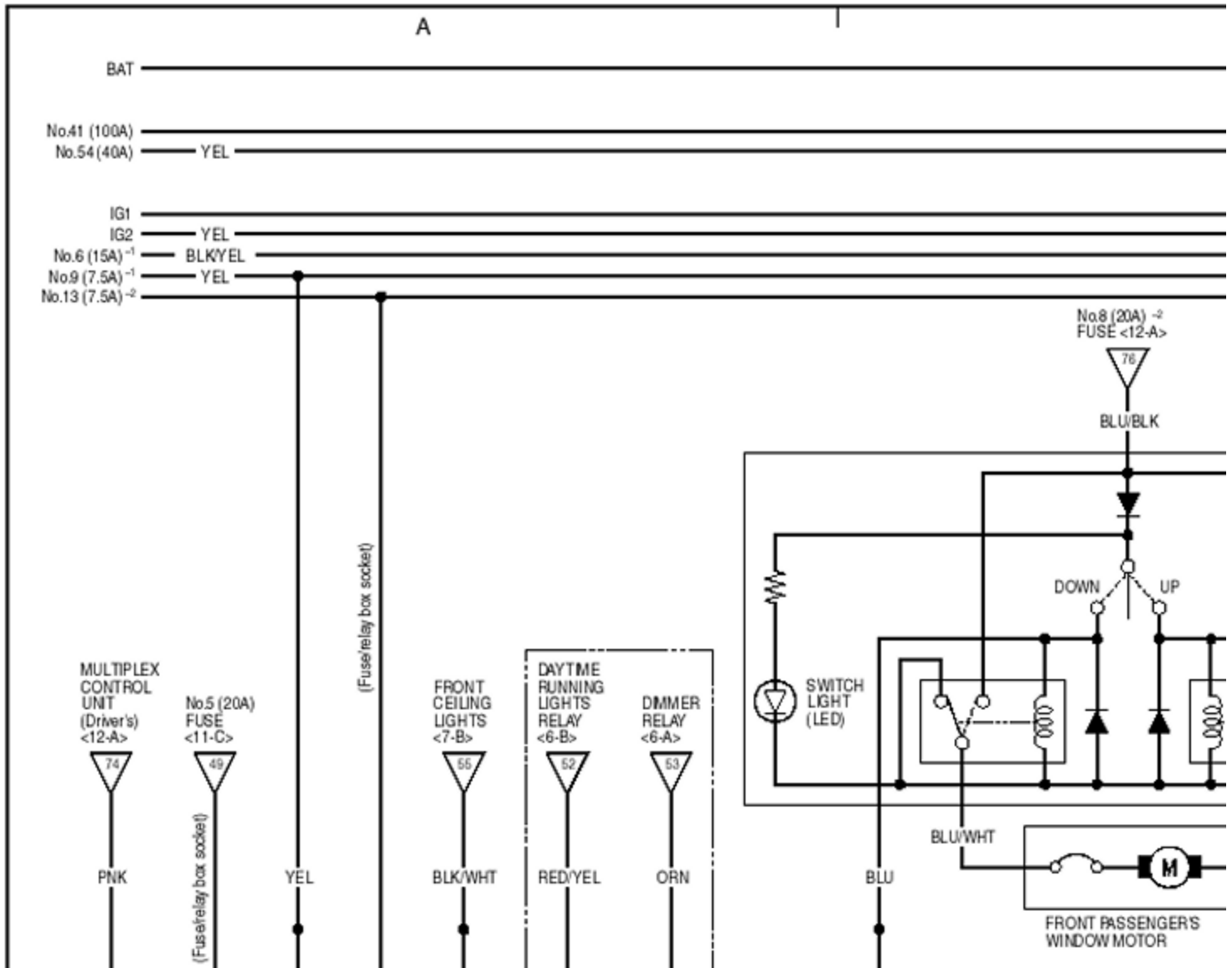
Lights, Exterior - Rear Fog Light

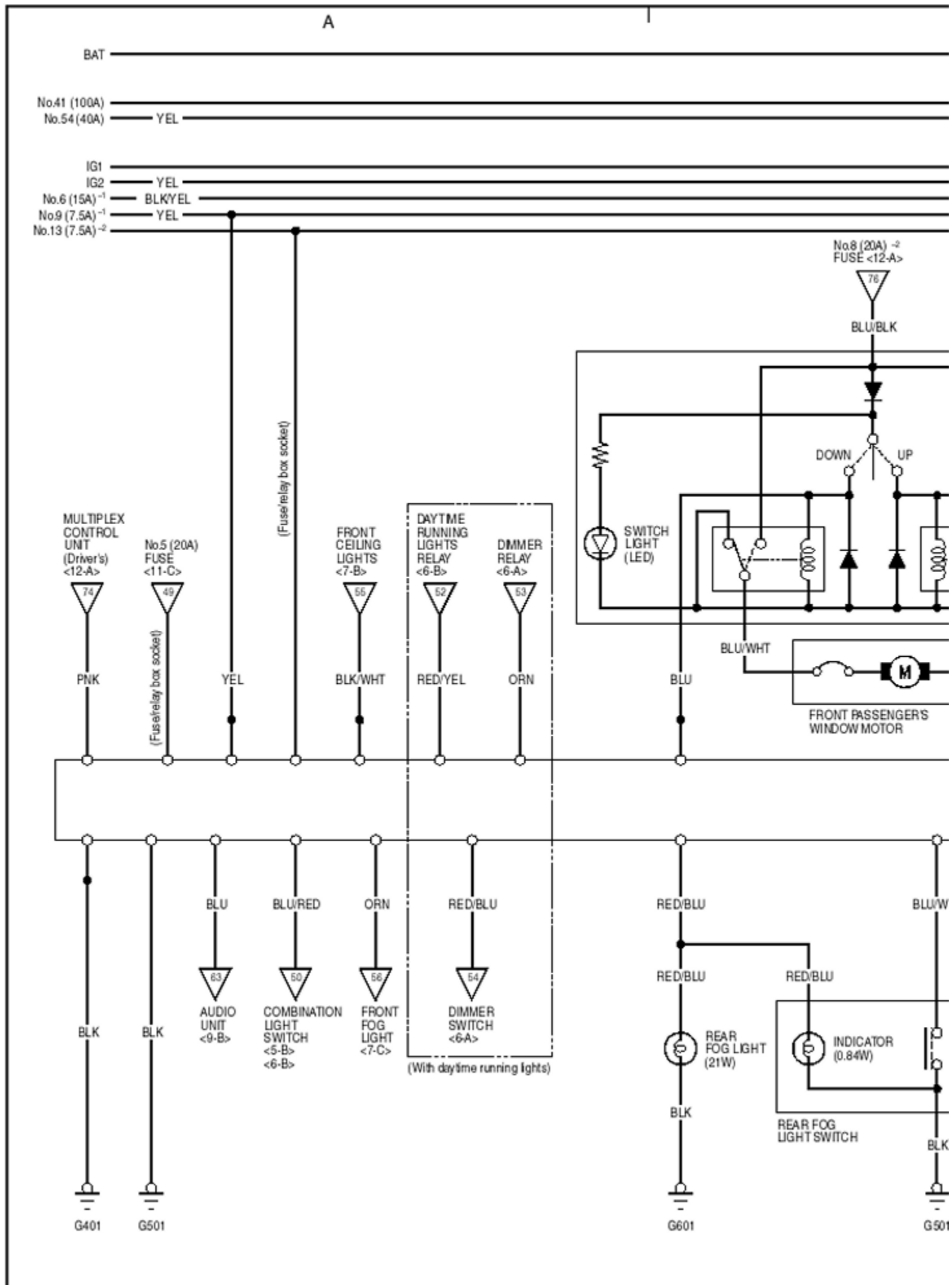
13



13

13



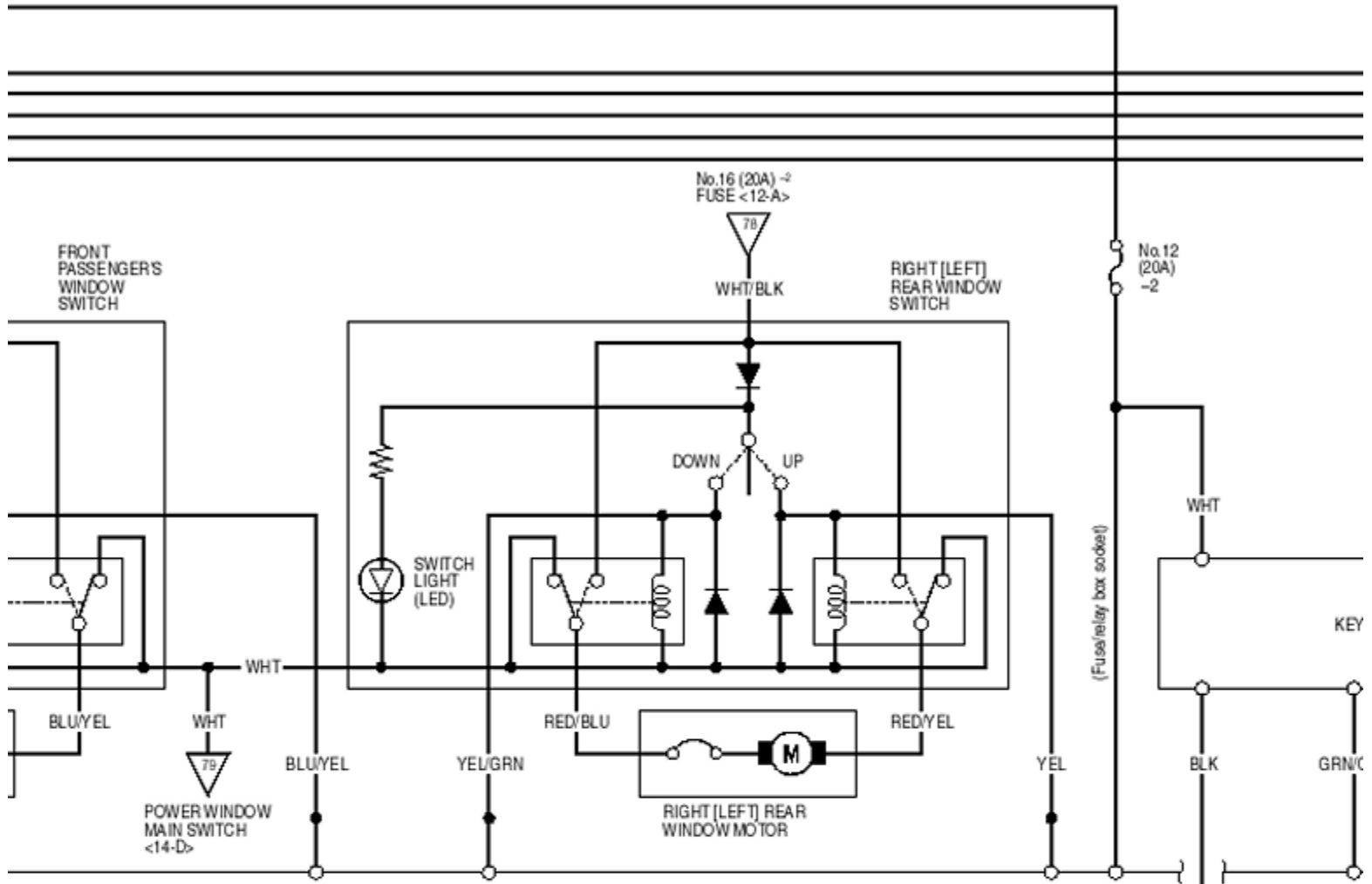


B

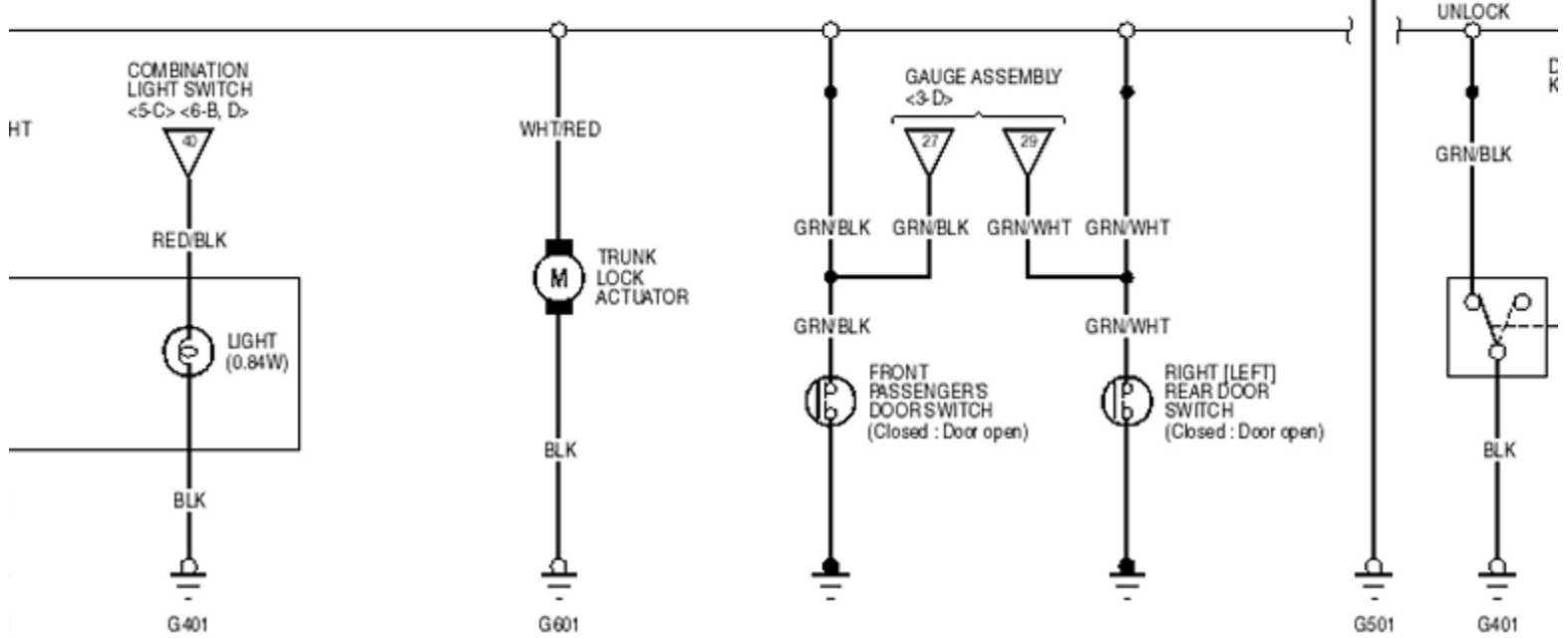
C

B

C

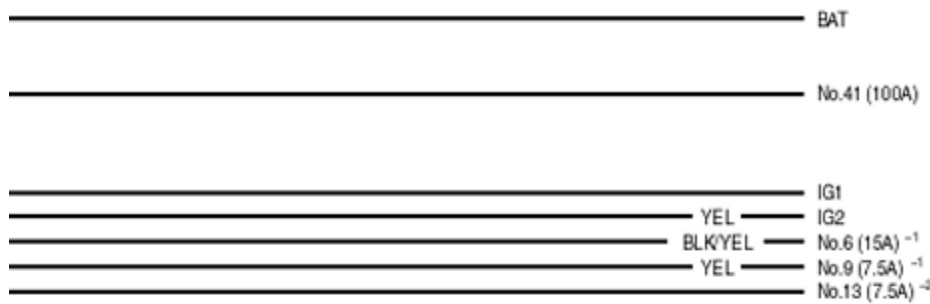


MULTIPLEX CONTROL UNIT (Passenger's)

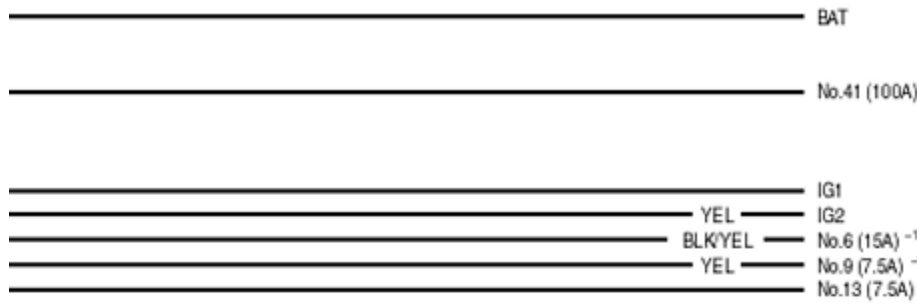


D

13

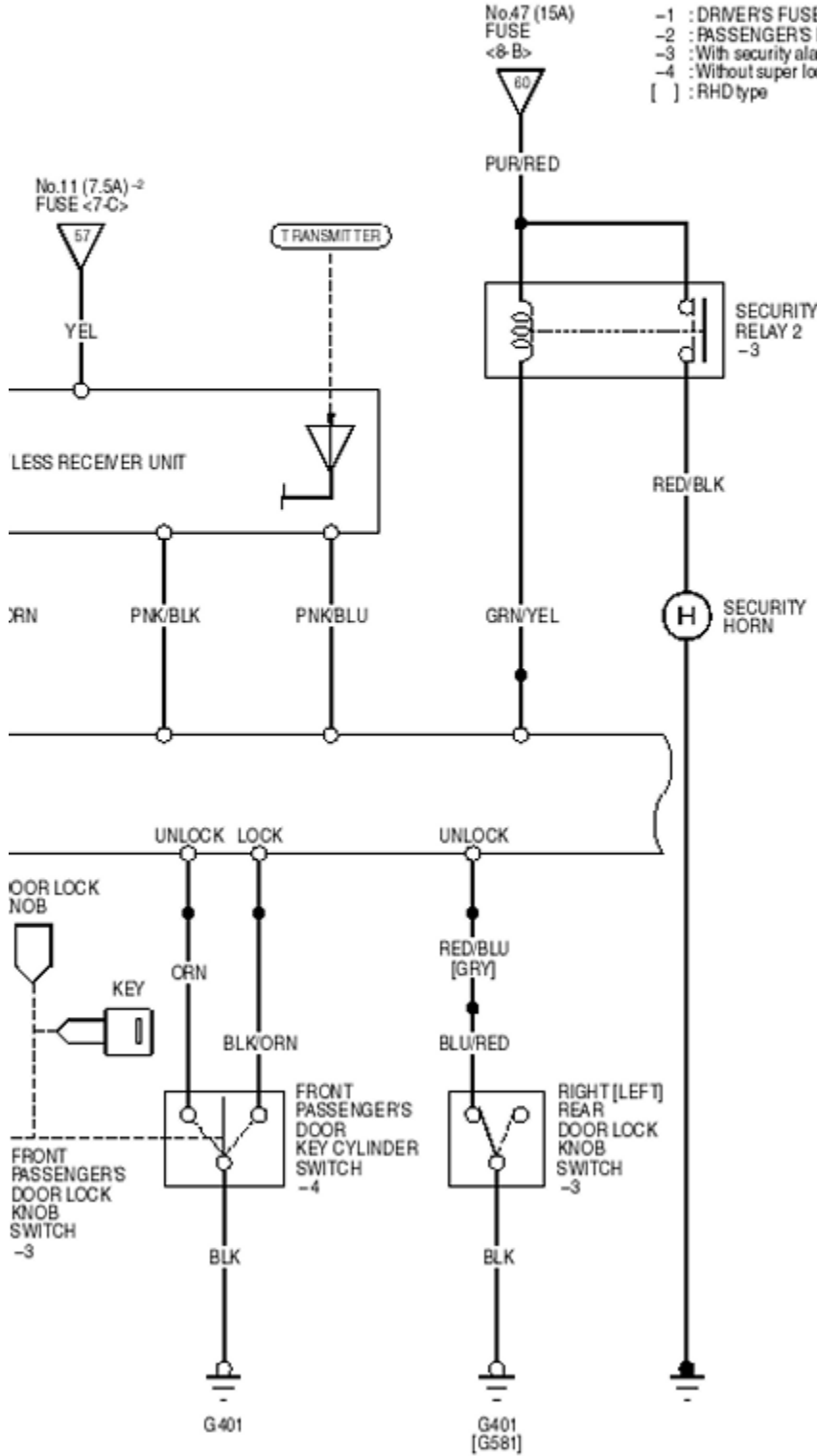


No. 47 (15A) -1 : DRIVER'S FUSE



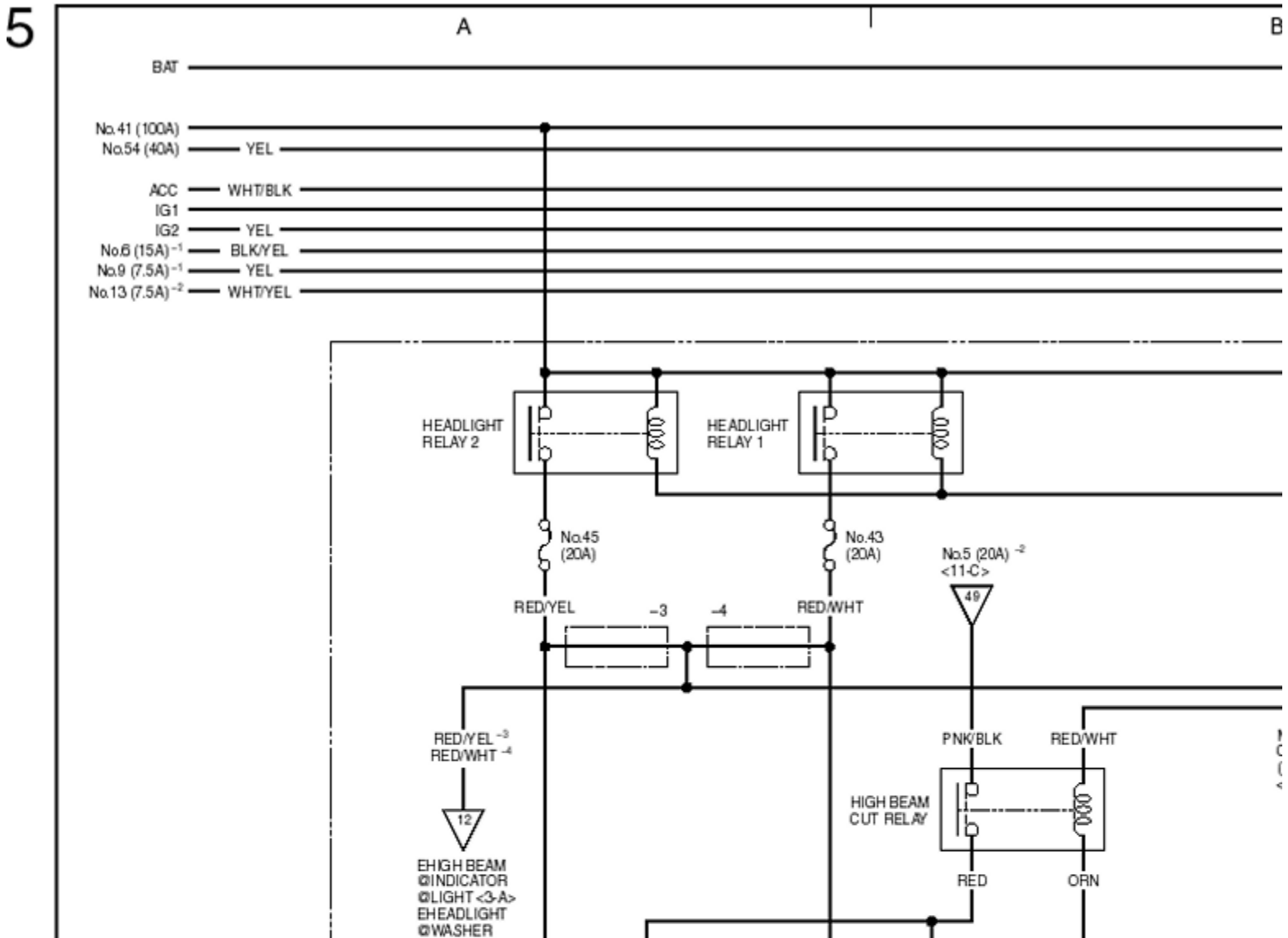
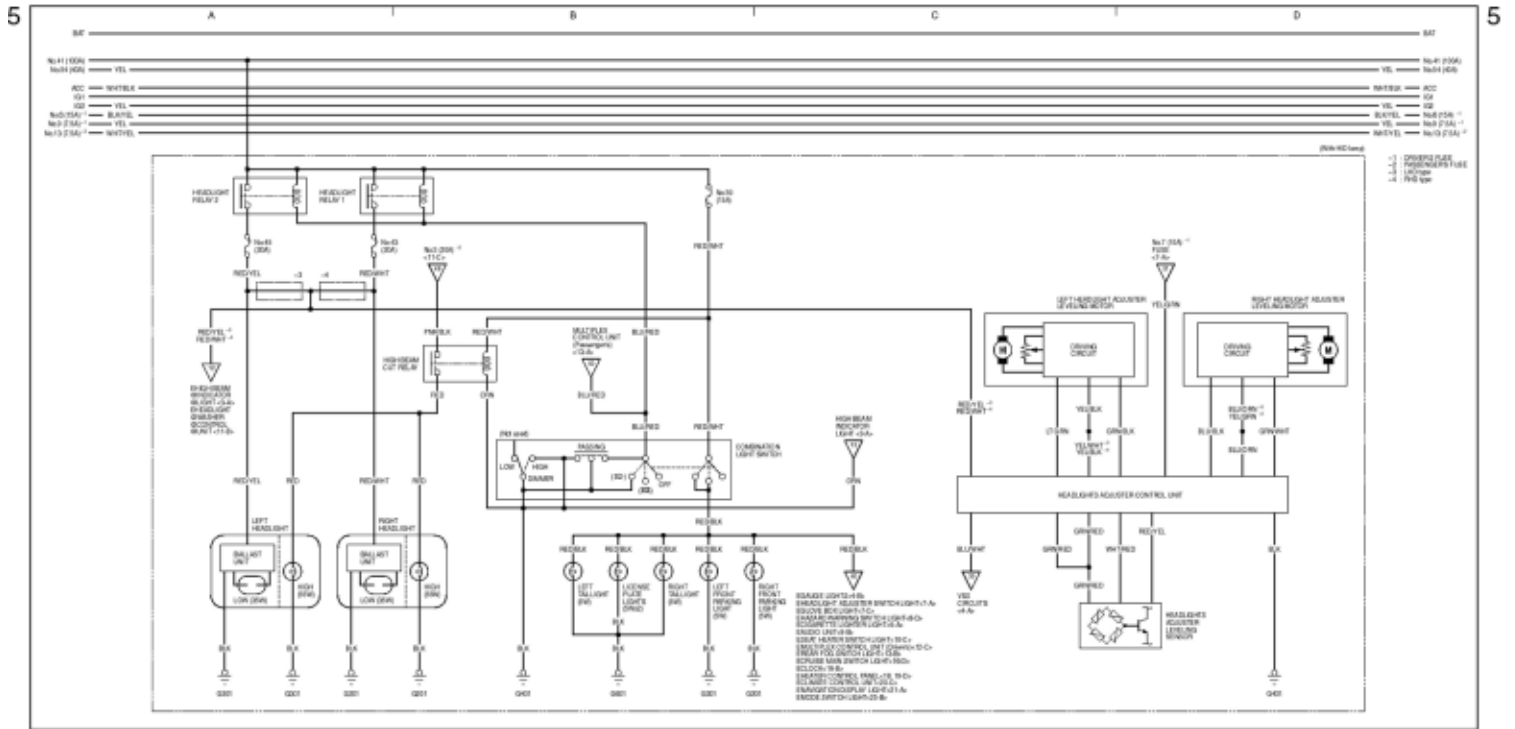
No.47 (15A) FUSE <8-B>

-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type

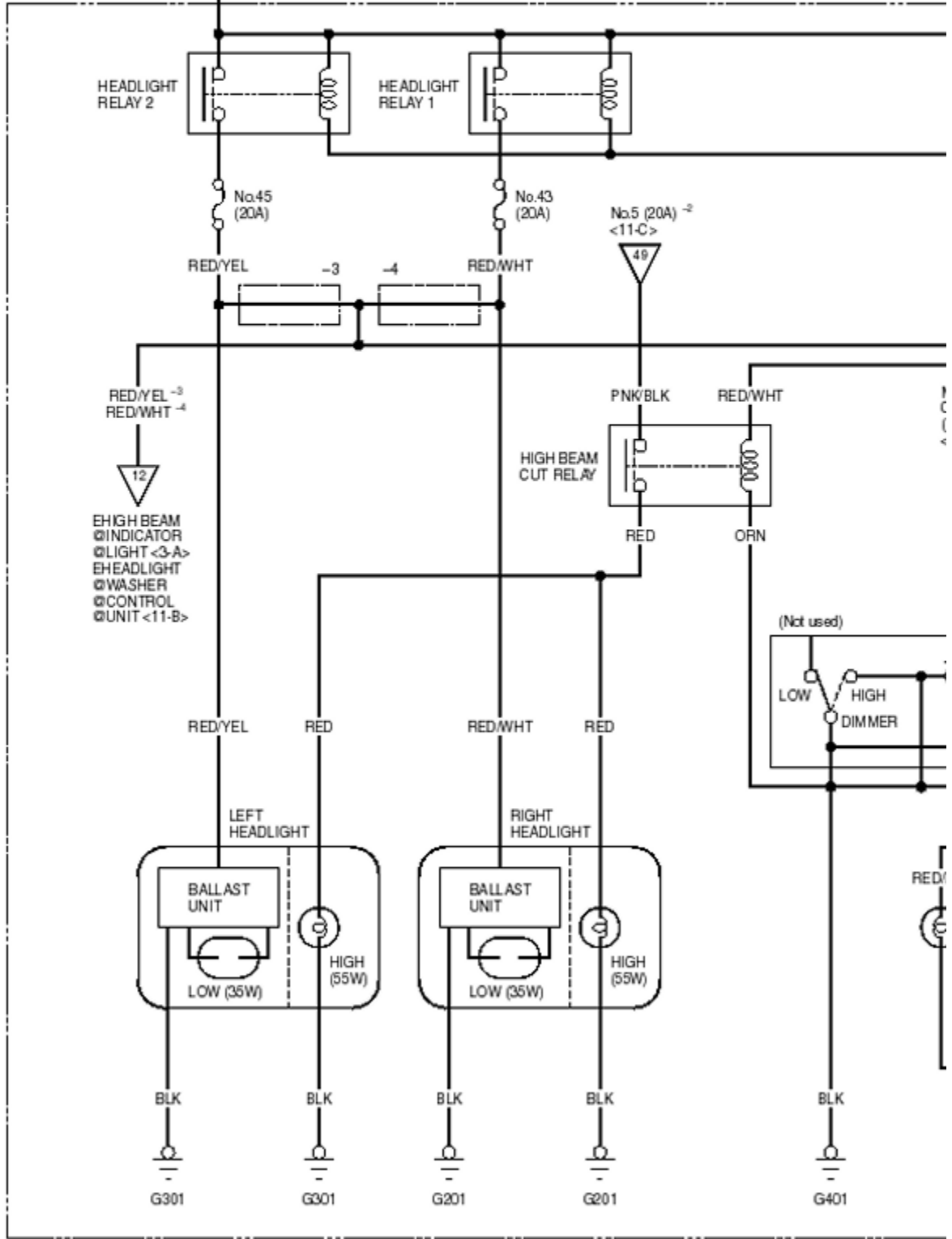


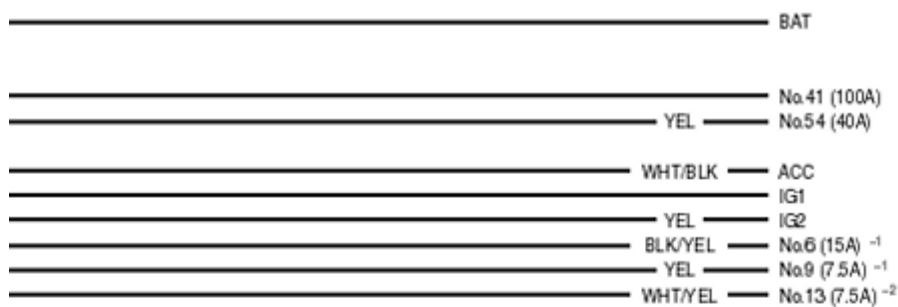
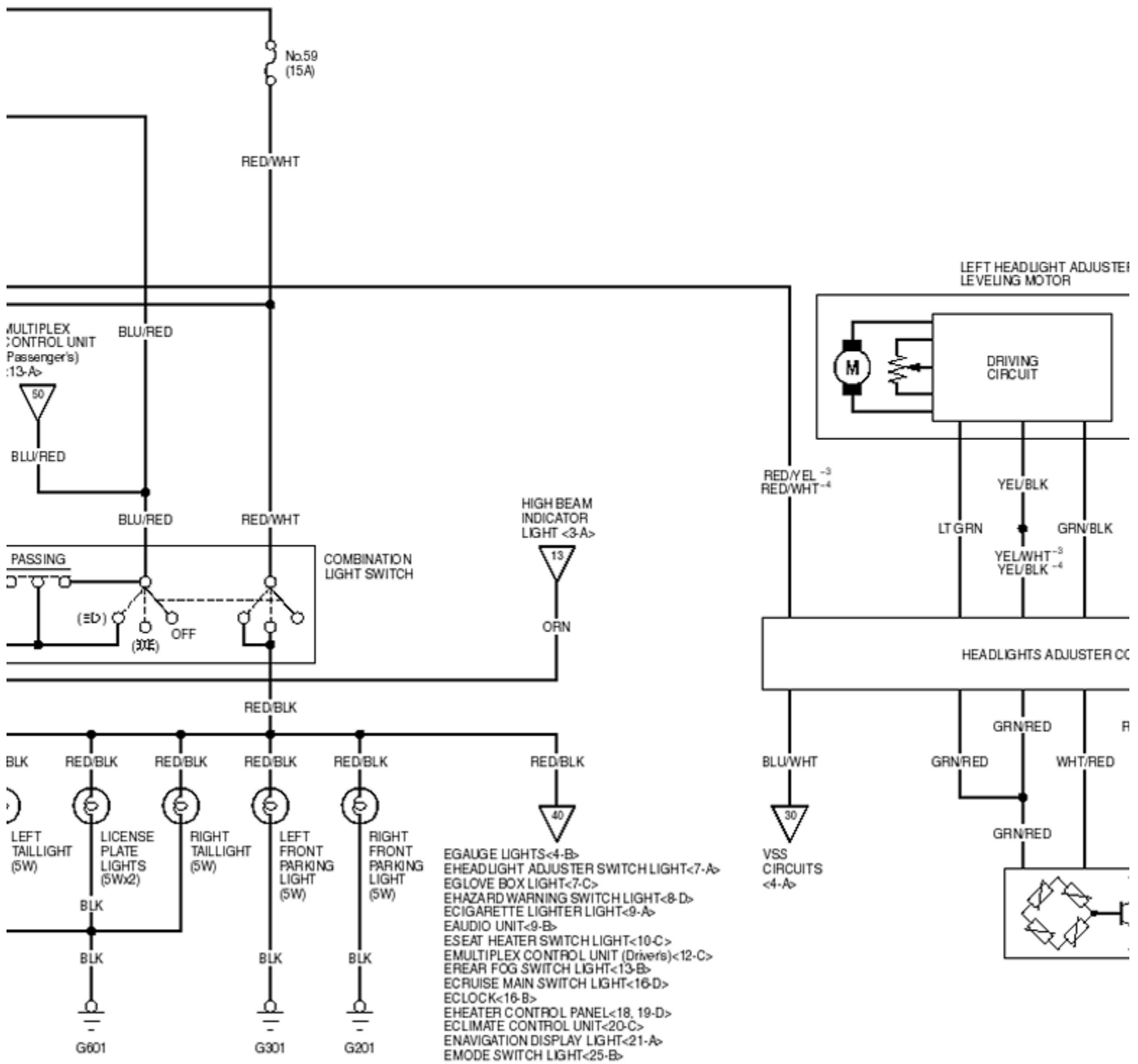
Wiring Diagrams

Lights, Exterior - Taillights



- BAT
- No.41 (100A)
- No.54 (40A) — YEL
- ACC — WHT/BLK
- IG1
- IG2 — YEL
- No.6 (15A)⁻¹ — BLK/YEL
- No.9 (7.5A)⁻¹ — YEL
- No.13 (7.5A)⁻² — WHT/YEL



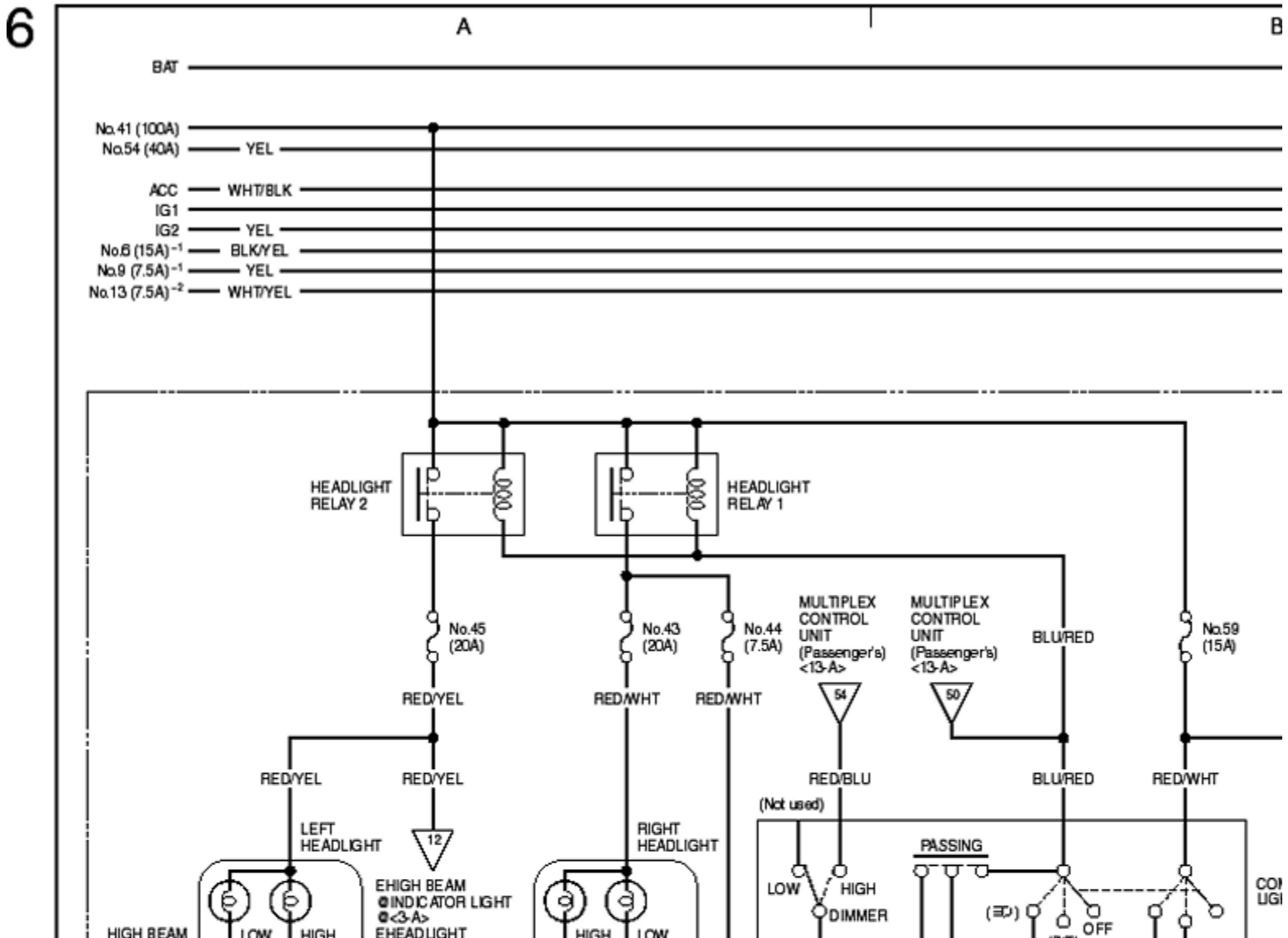
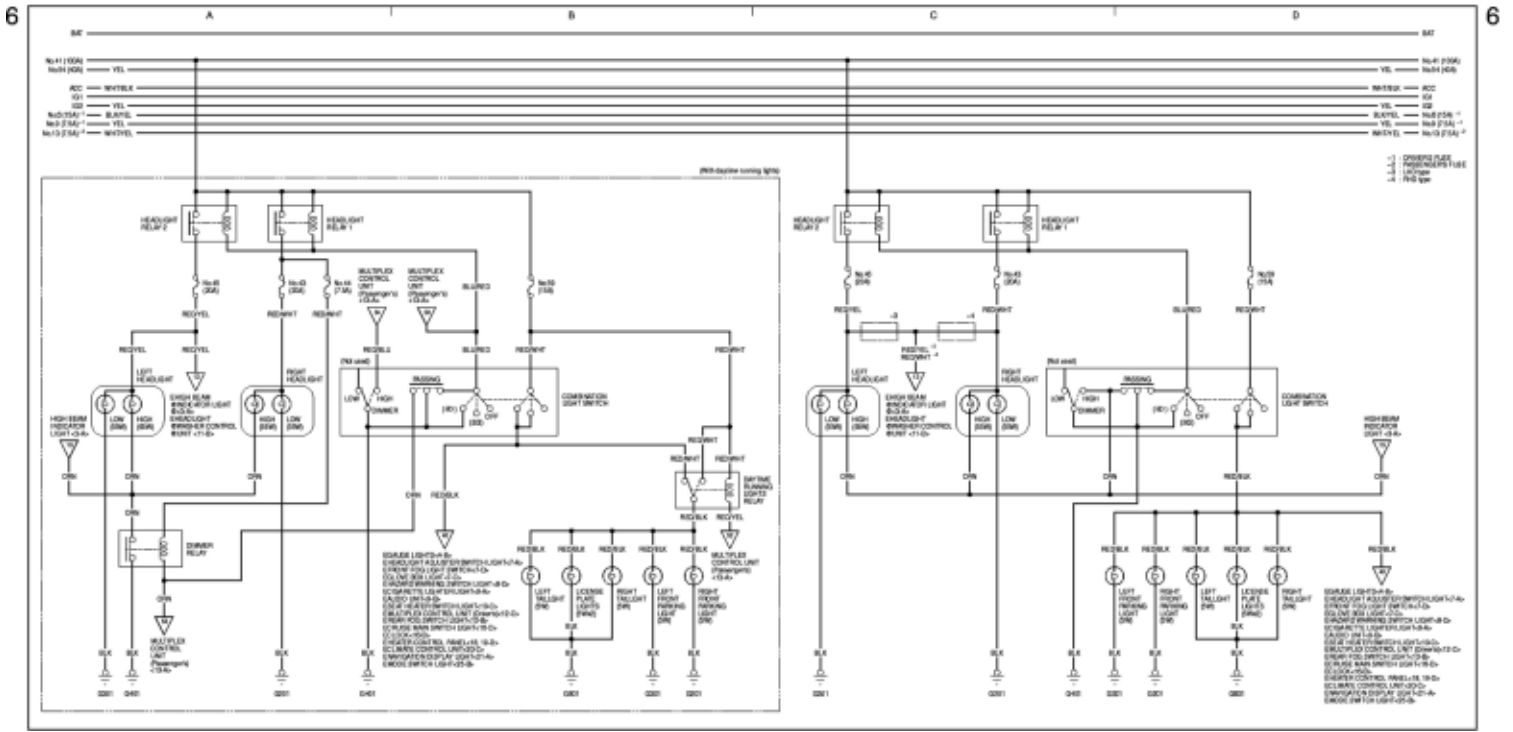


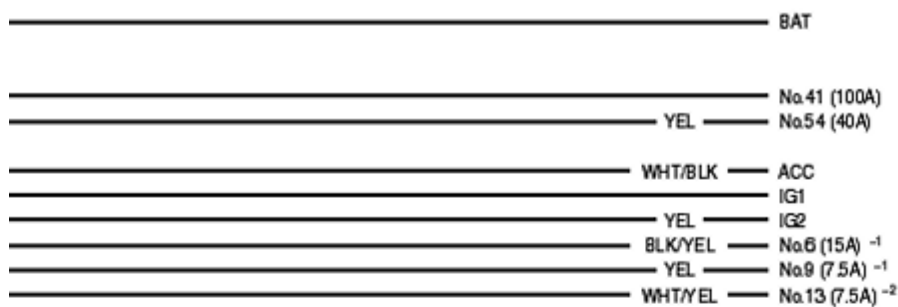
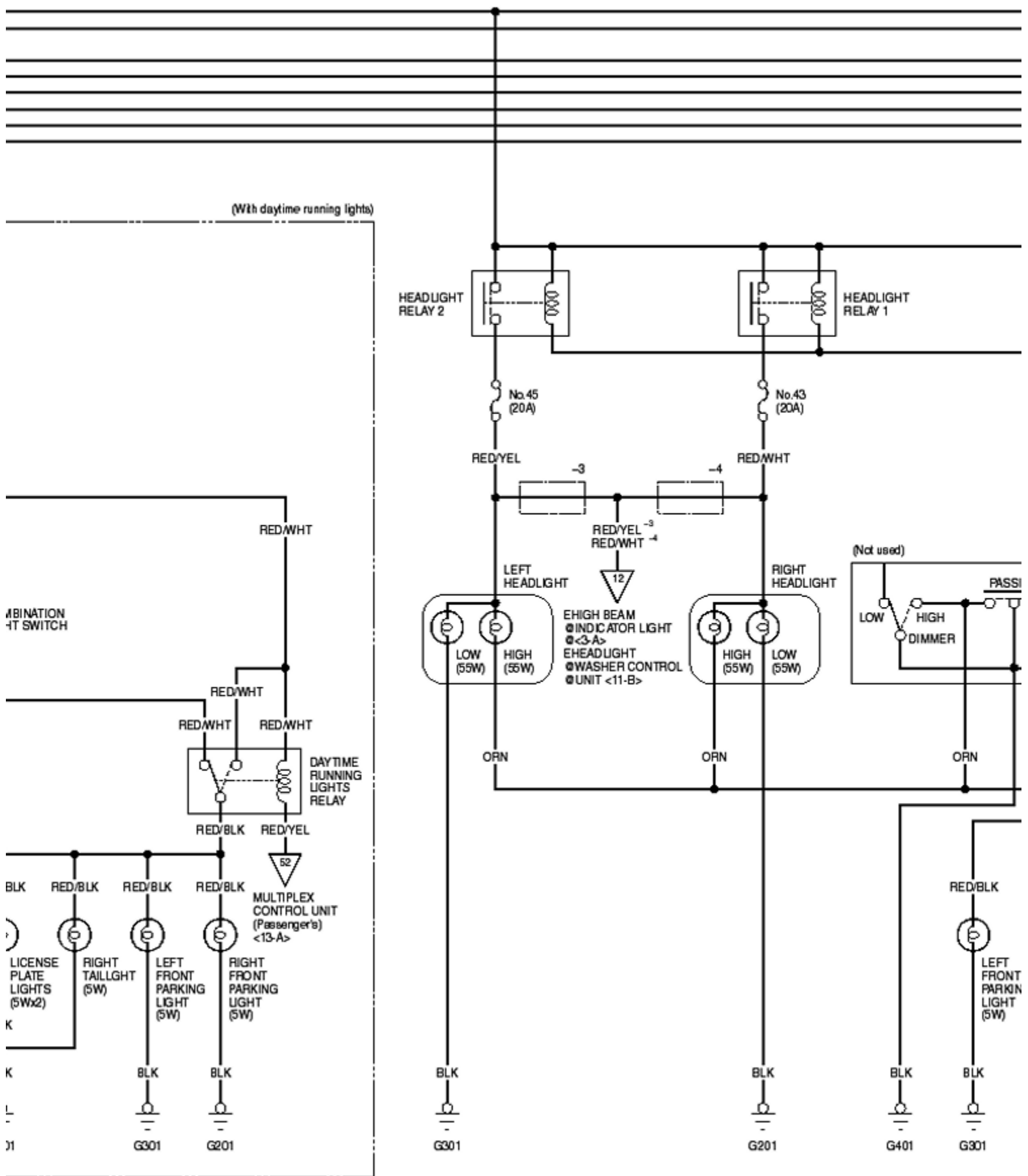
(With HID lamp)

- 1 : DRIVER'S FUSE

Wiring Diagrams

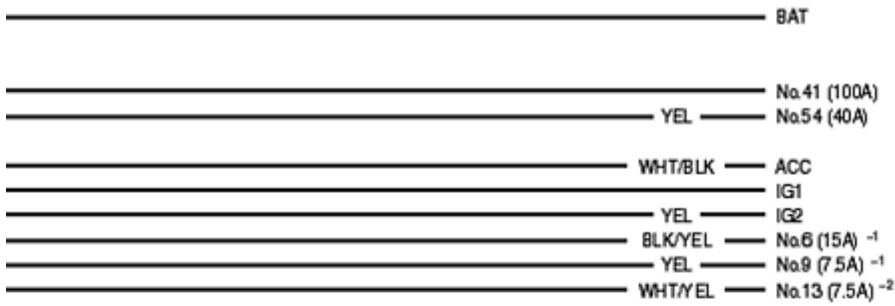
Lights, Exterior - Taillights



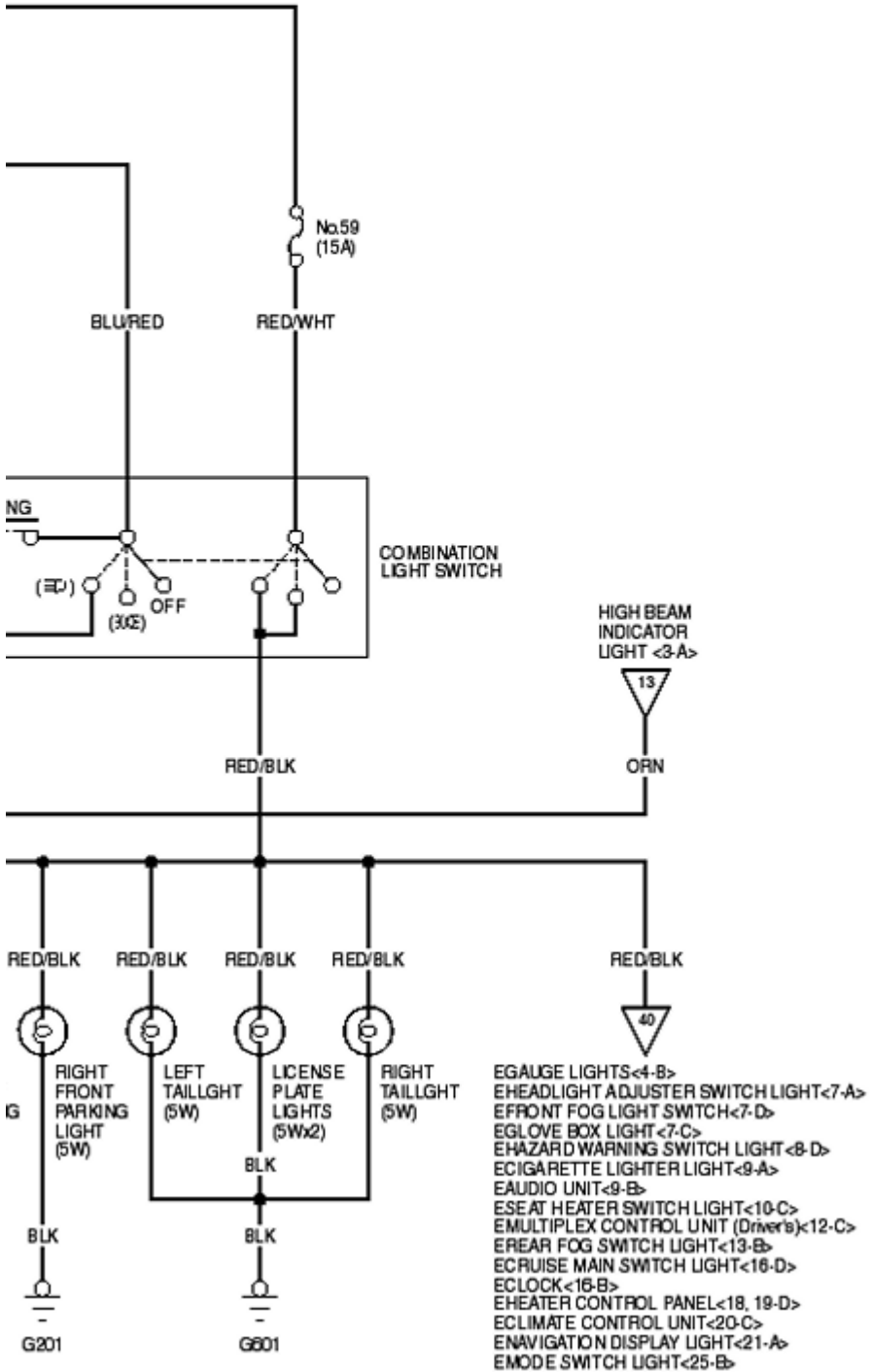


D

6

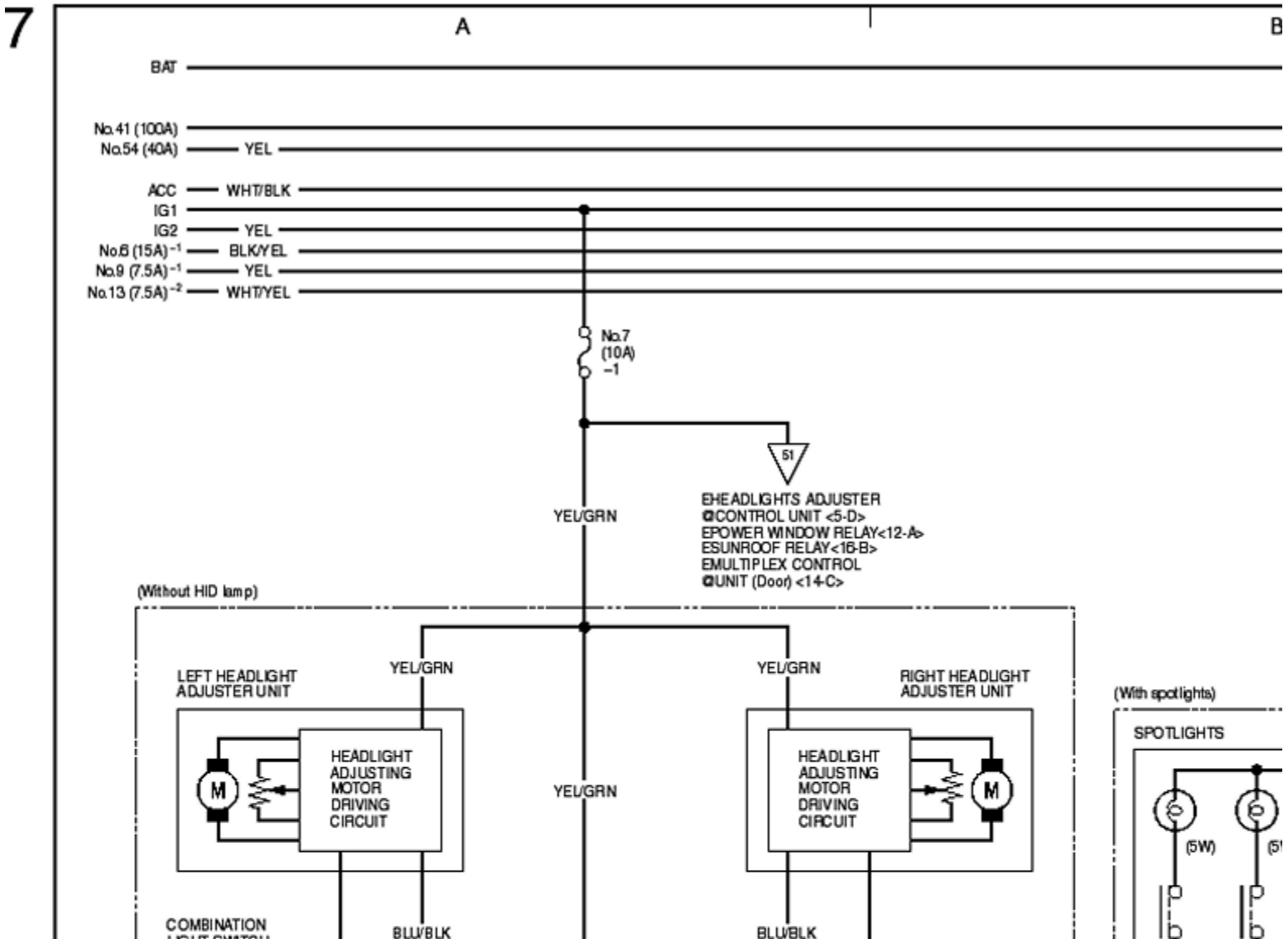
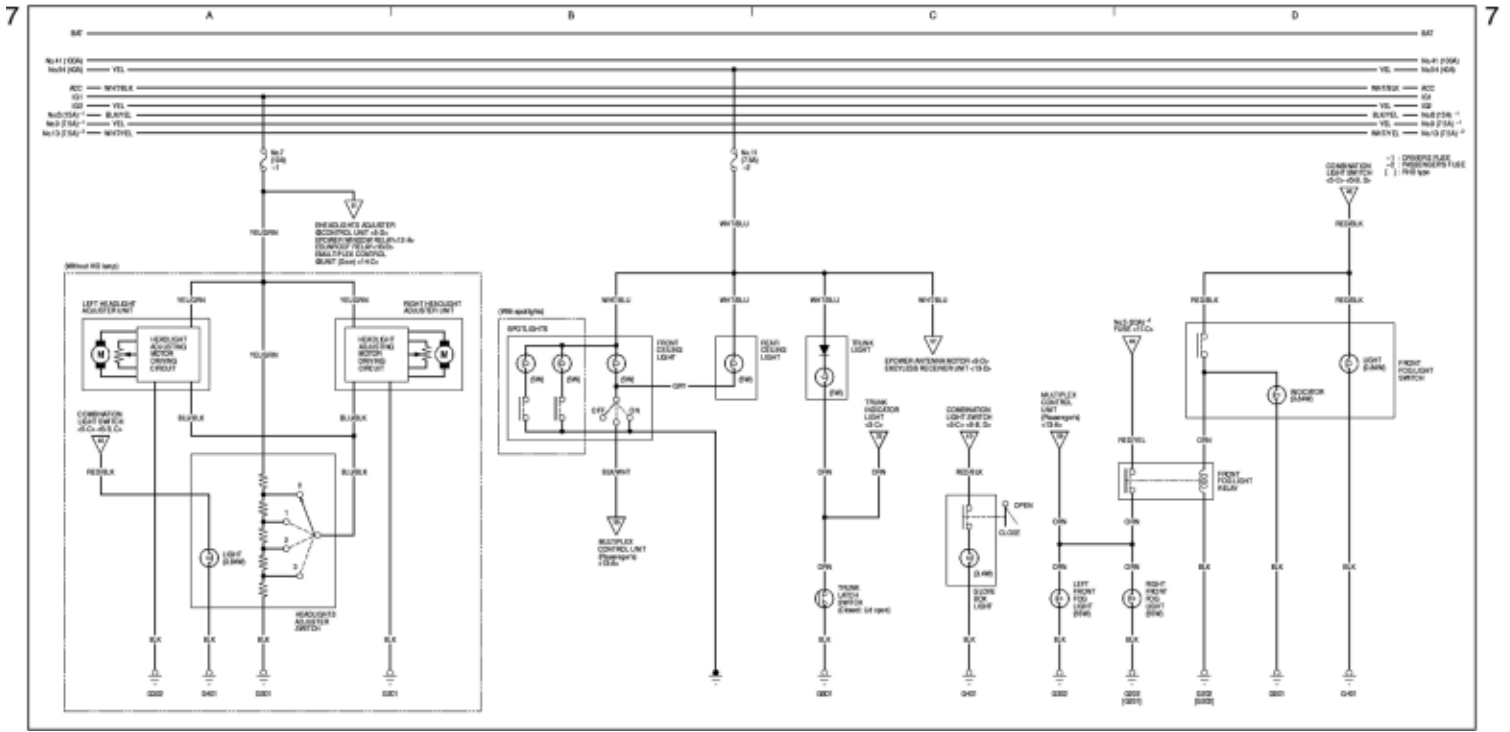


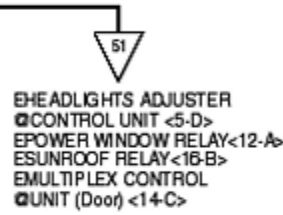
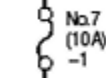
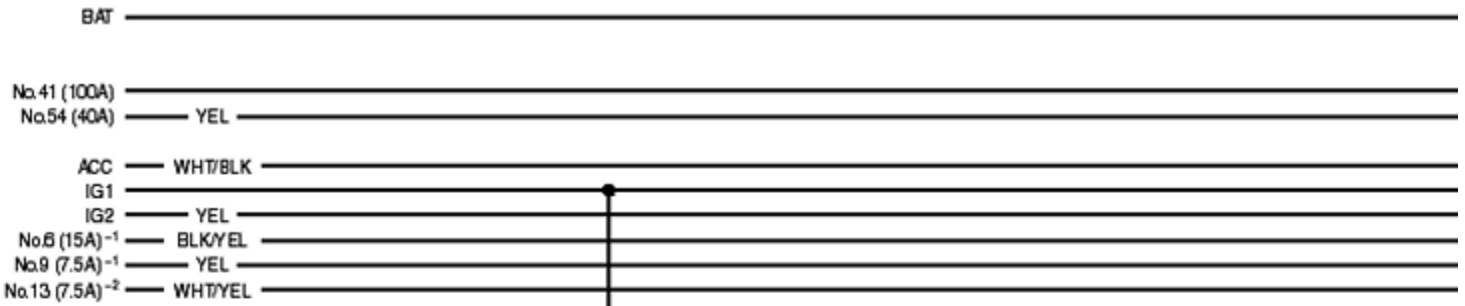
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : LHD type
 -4 : RHD type



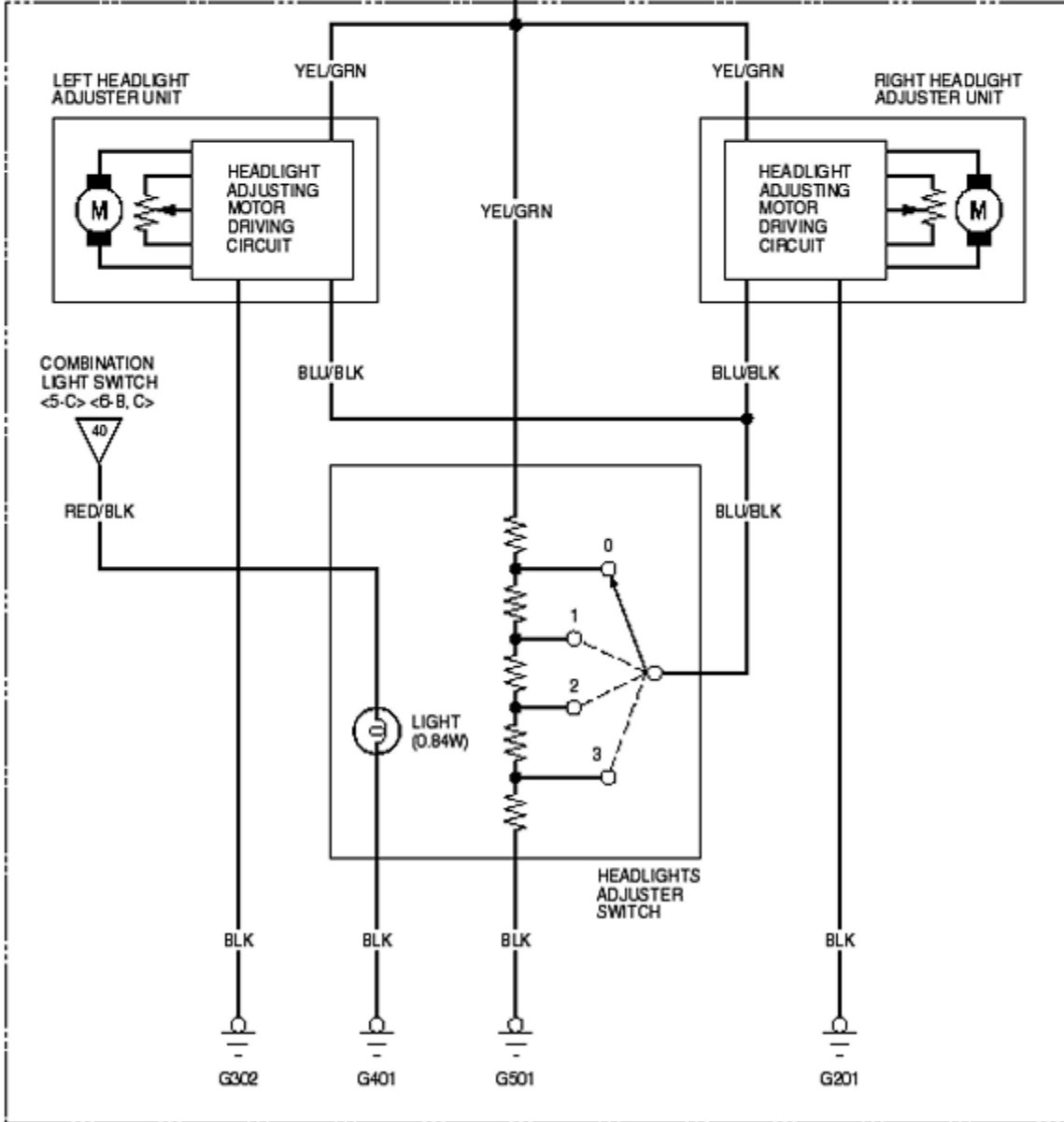
Wiring Diagrams

Lights, Exterior - Taillights

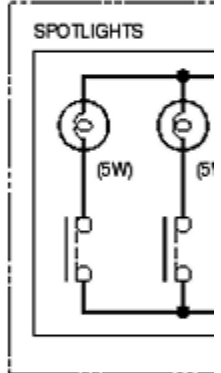


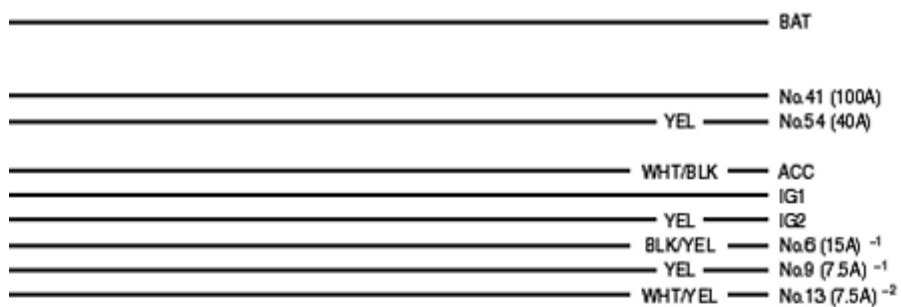
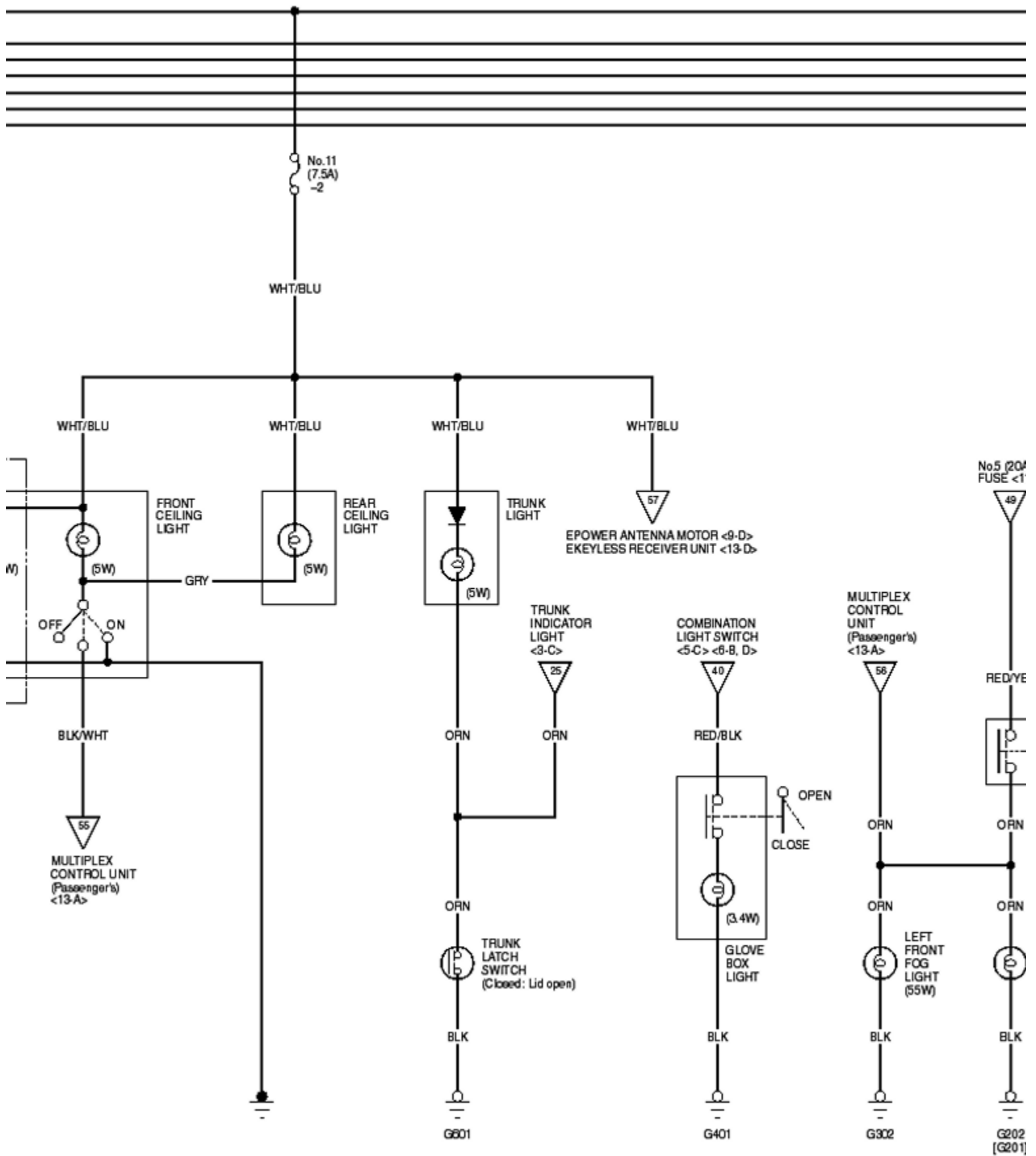


(Without HID lamp)



(With spotlights)





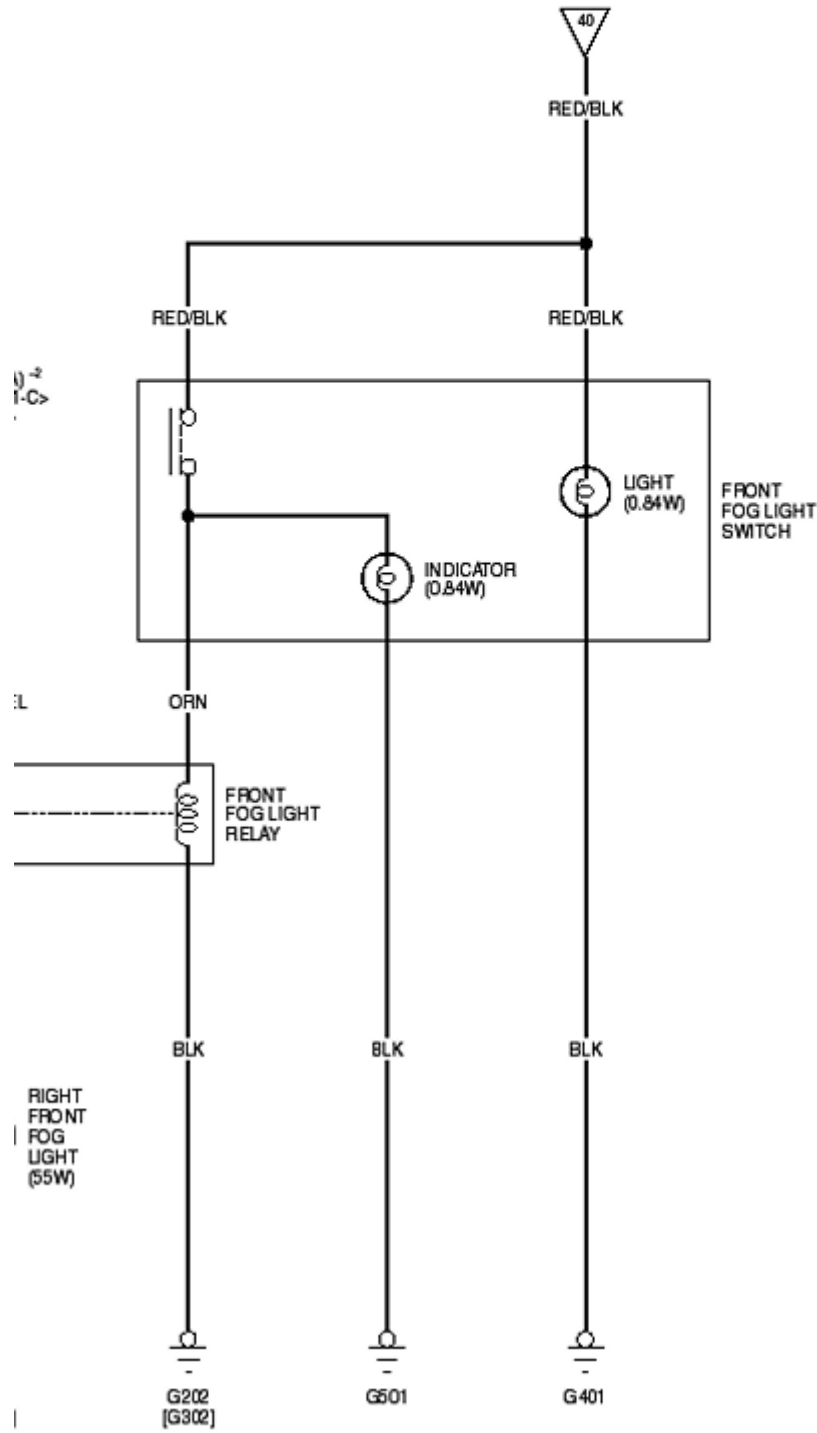
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

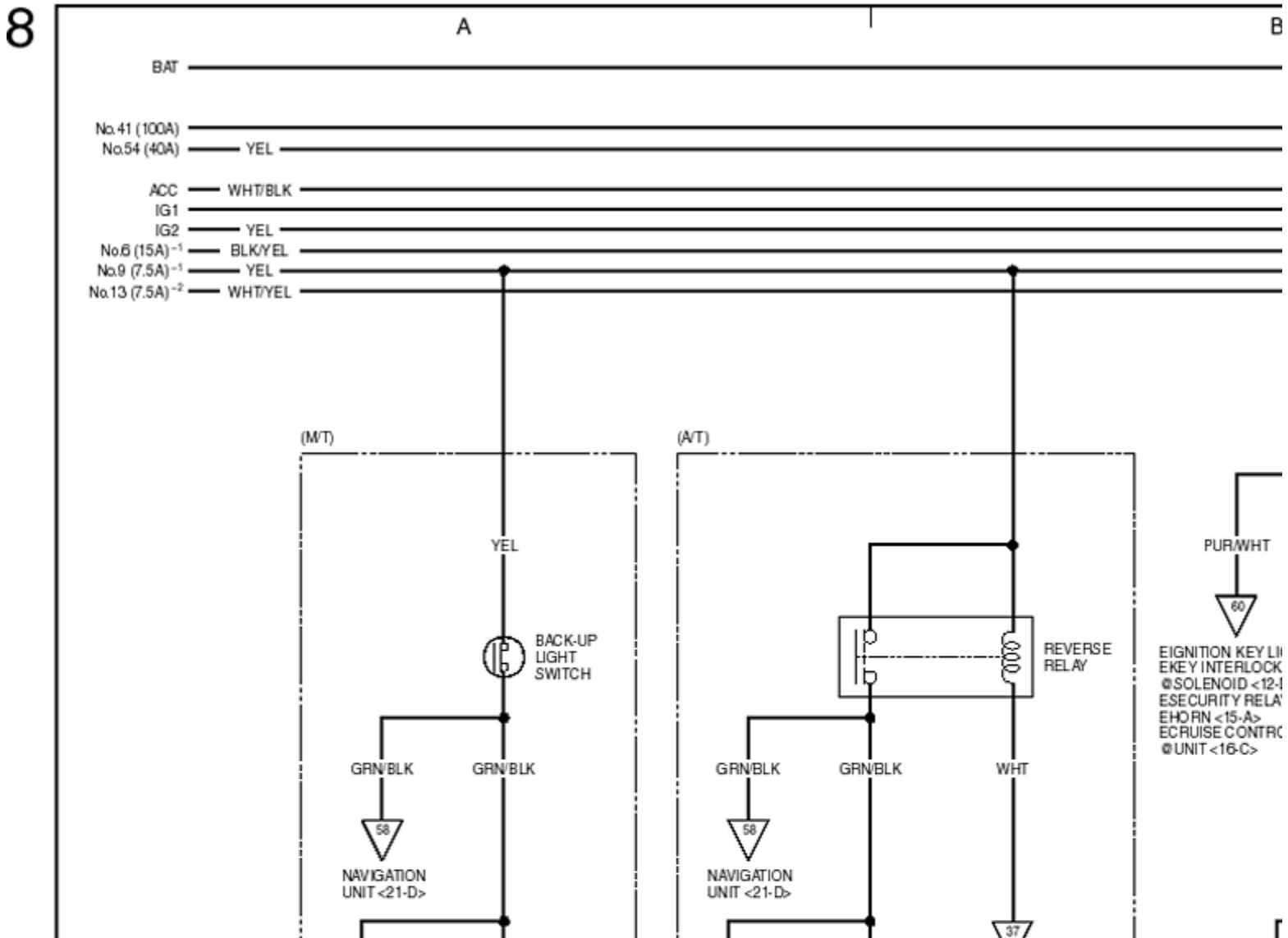
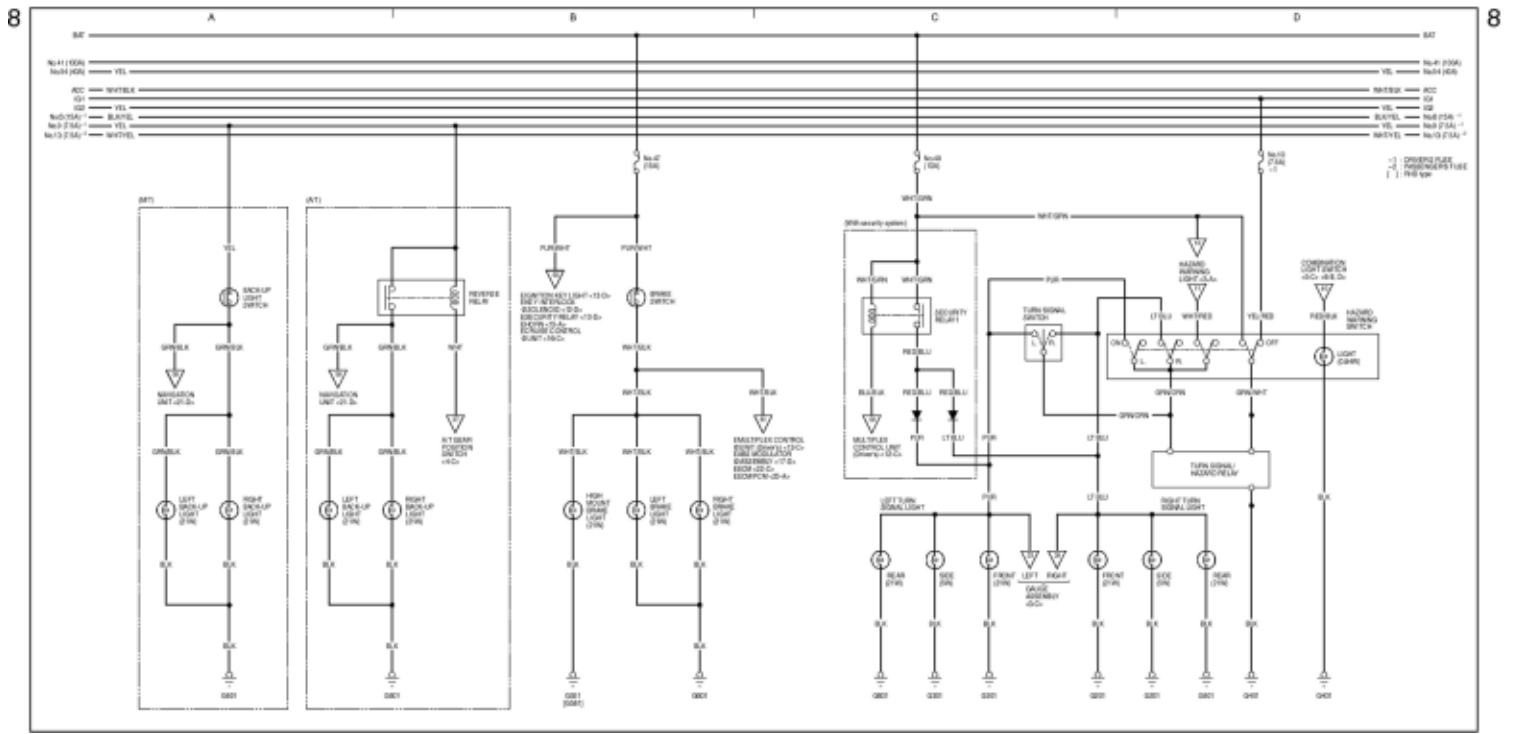
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

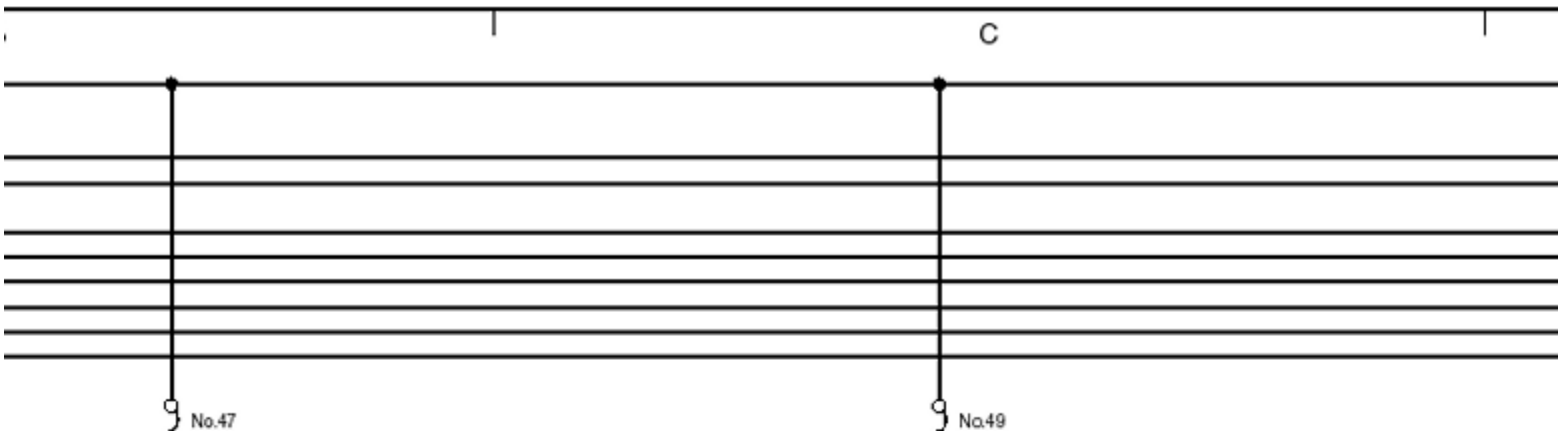
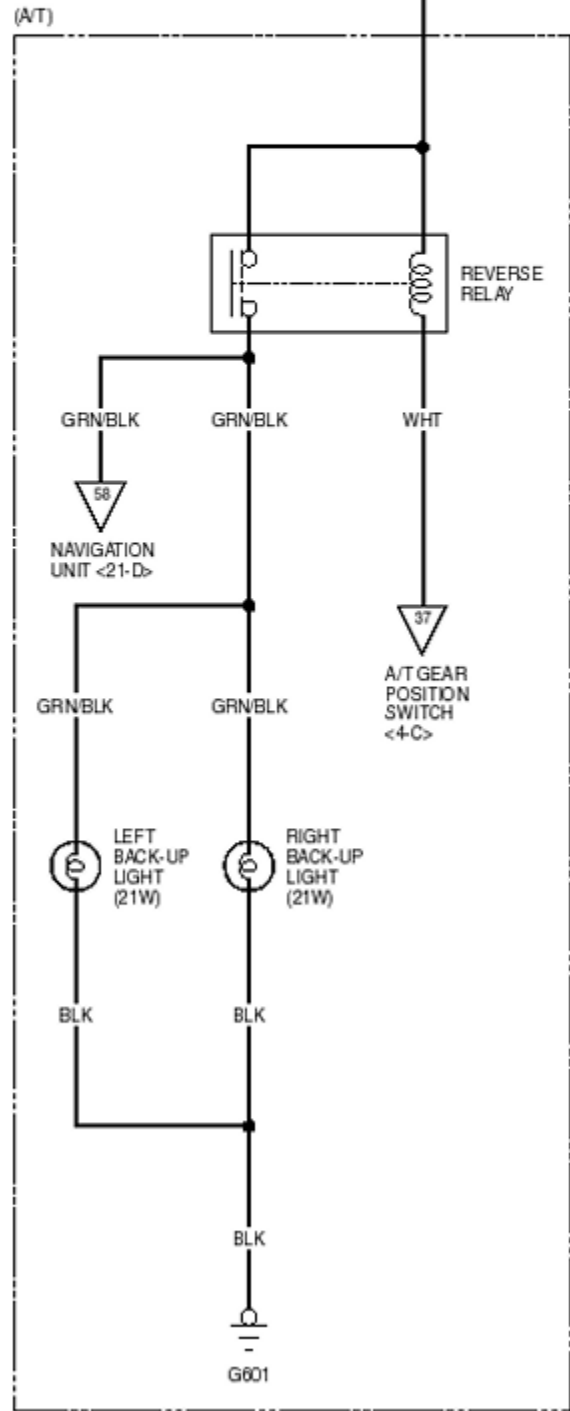
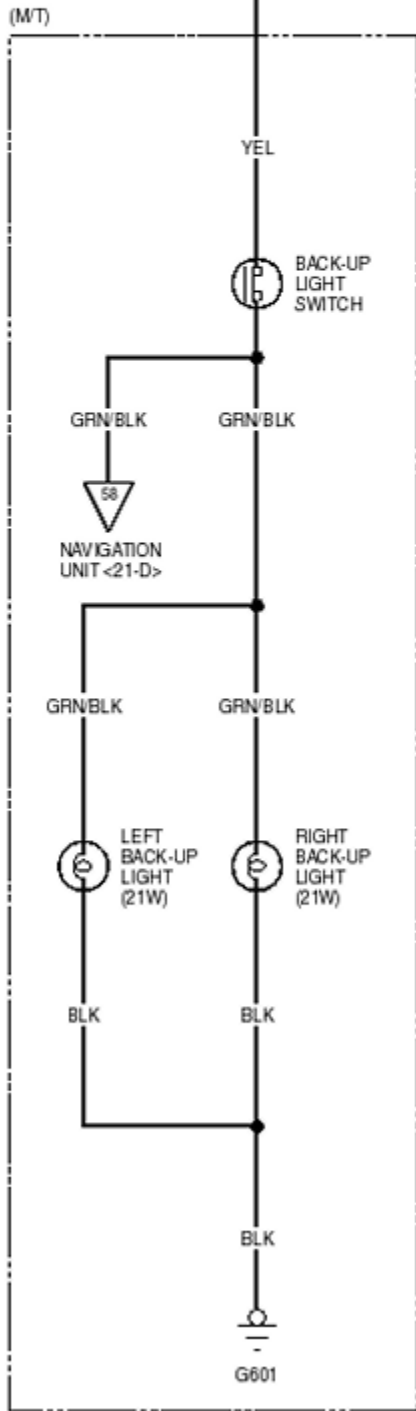
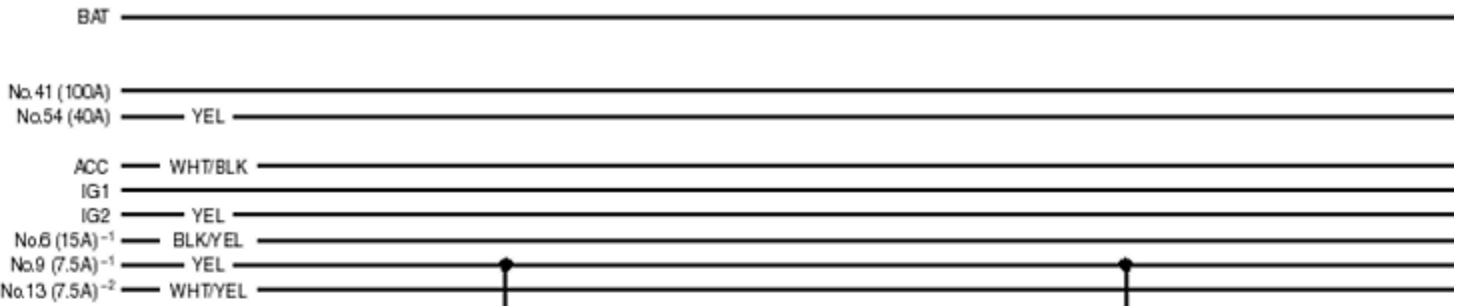
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

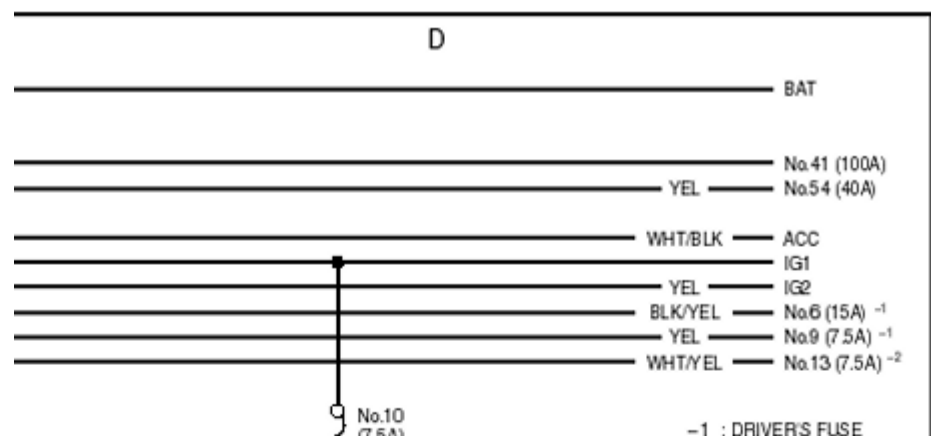
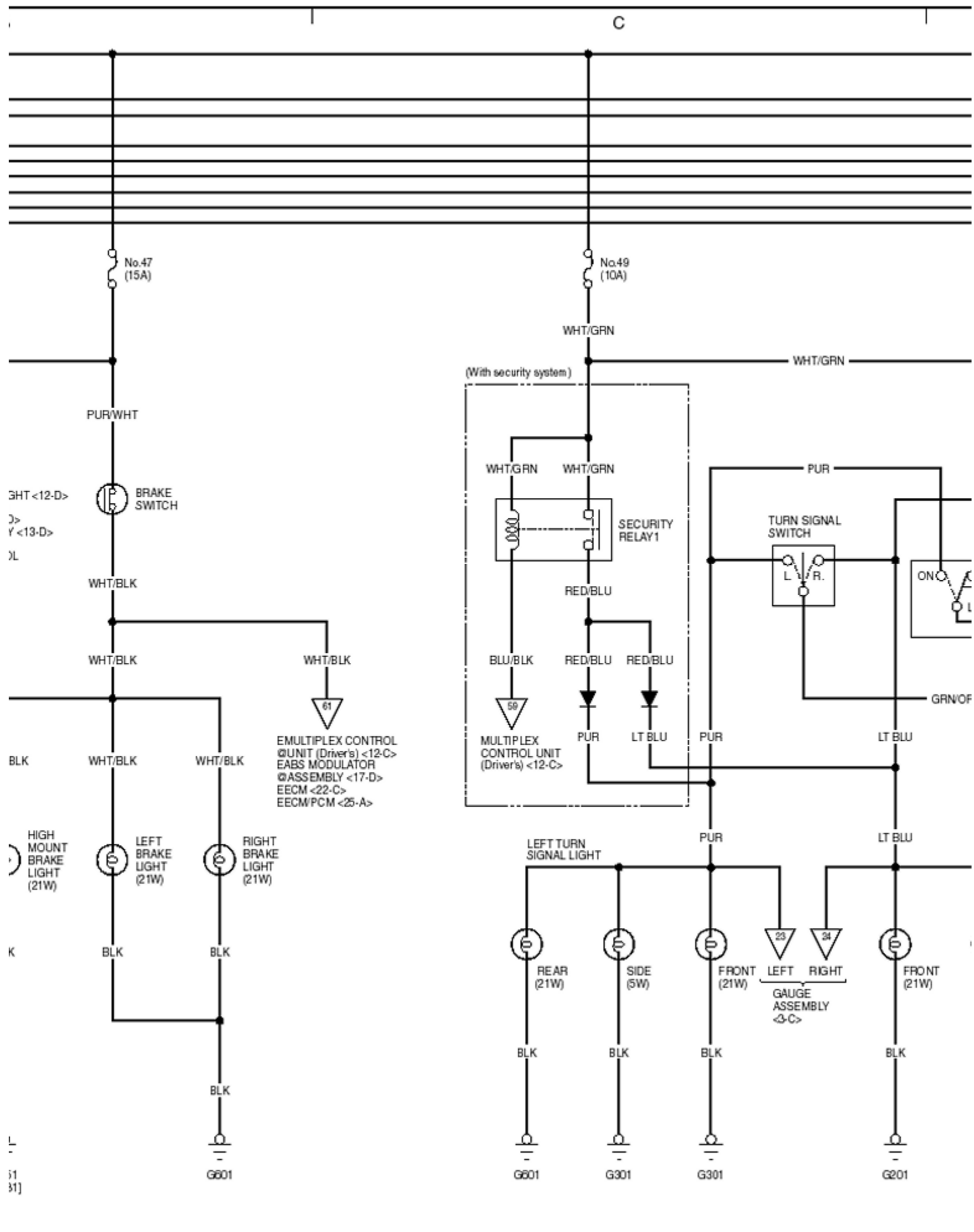


Wiring Diagrams

Lights, Exterior - Turn Signal Lights



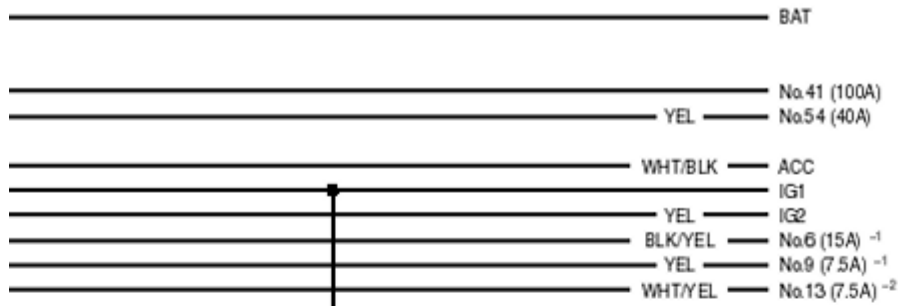




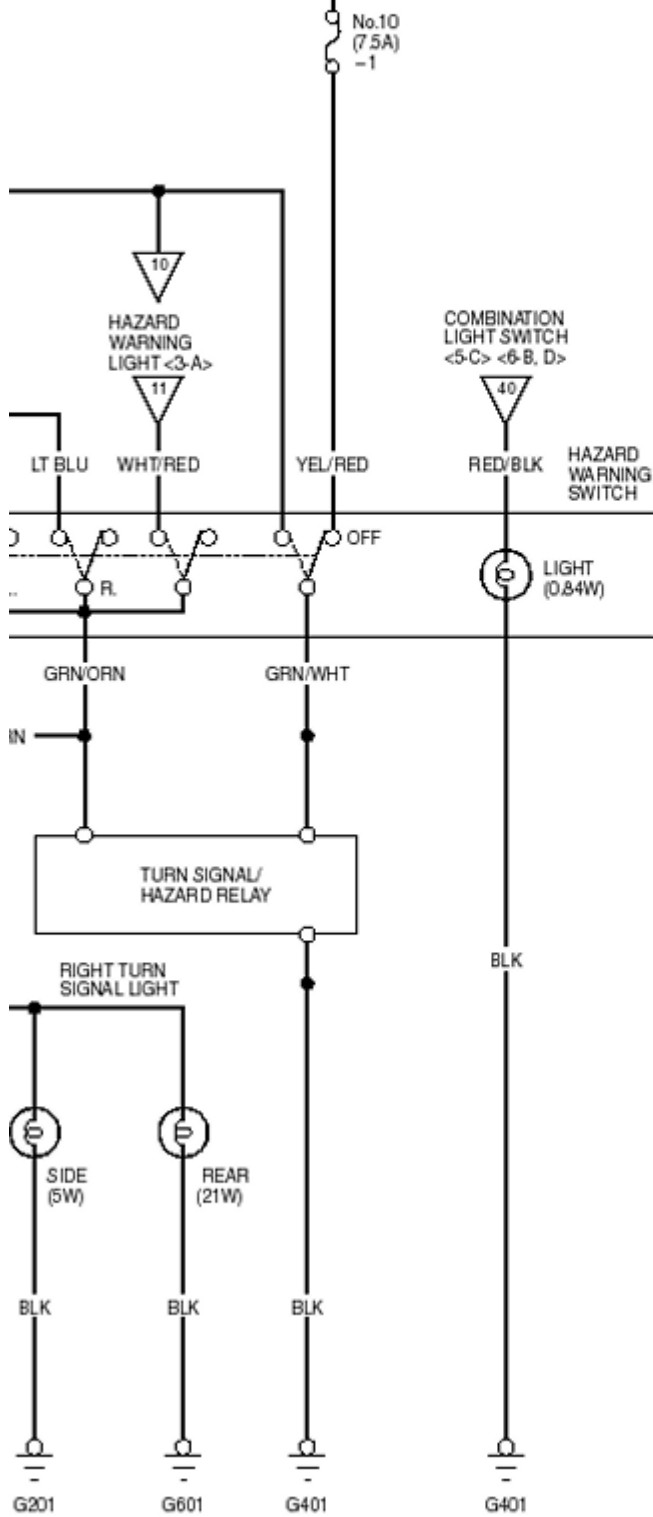
8

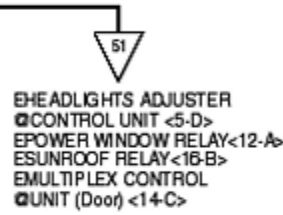
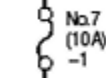
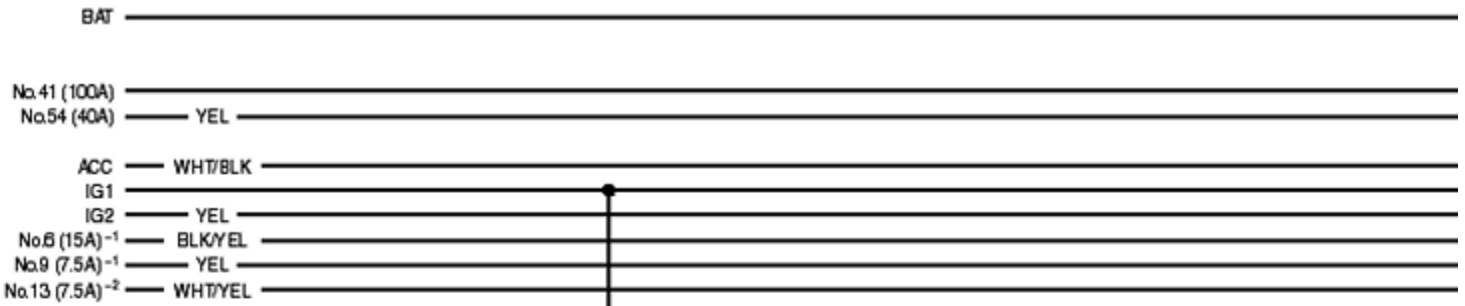
D

8

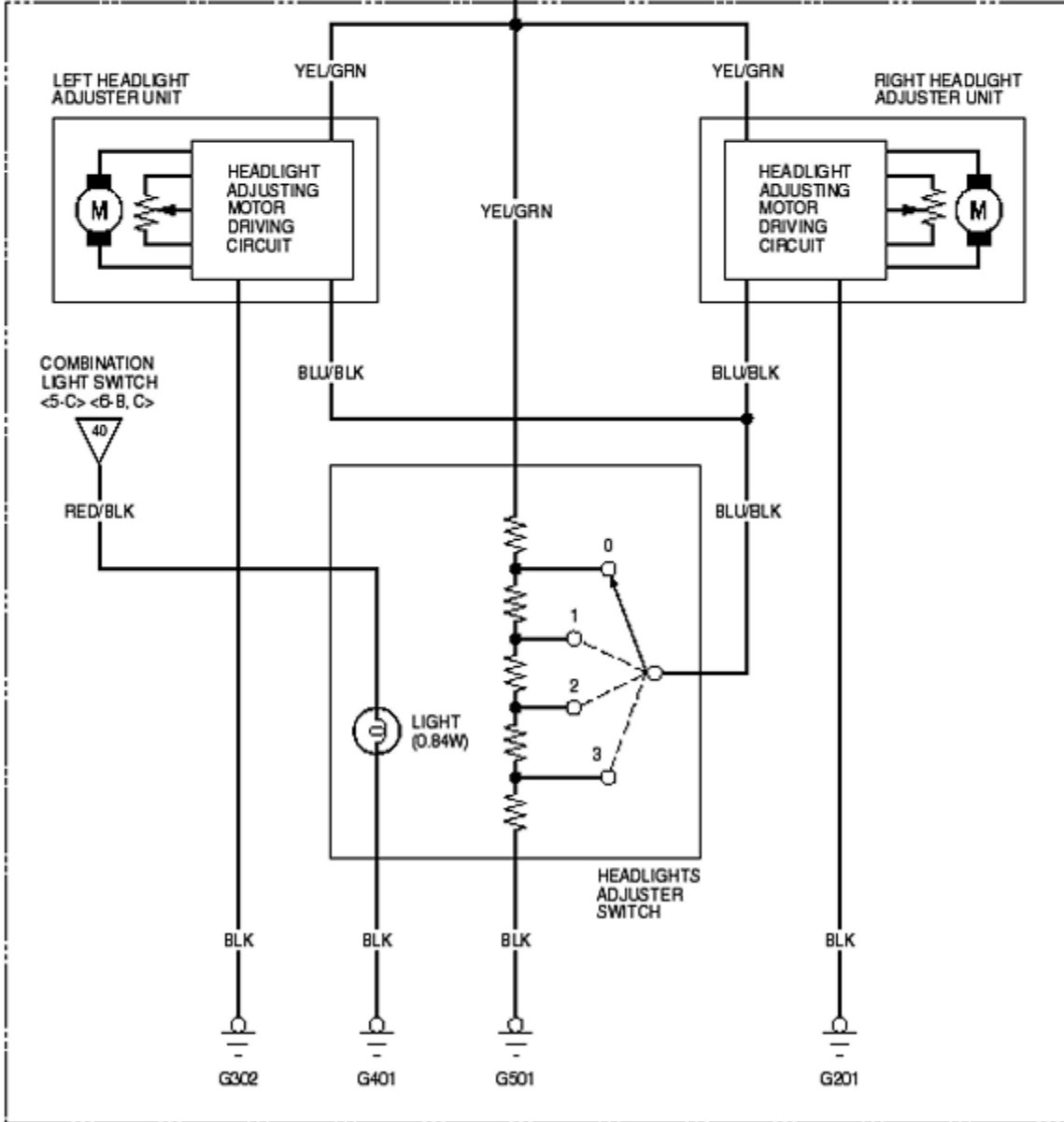


-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

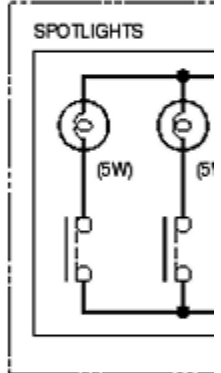


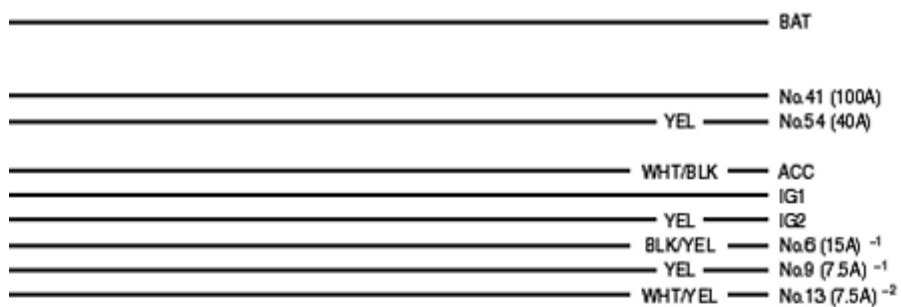
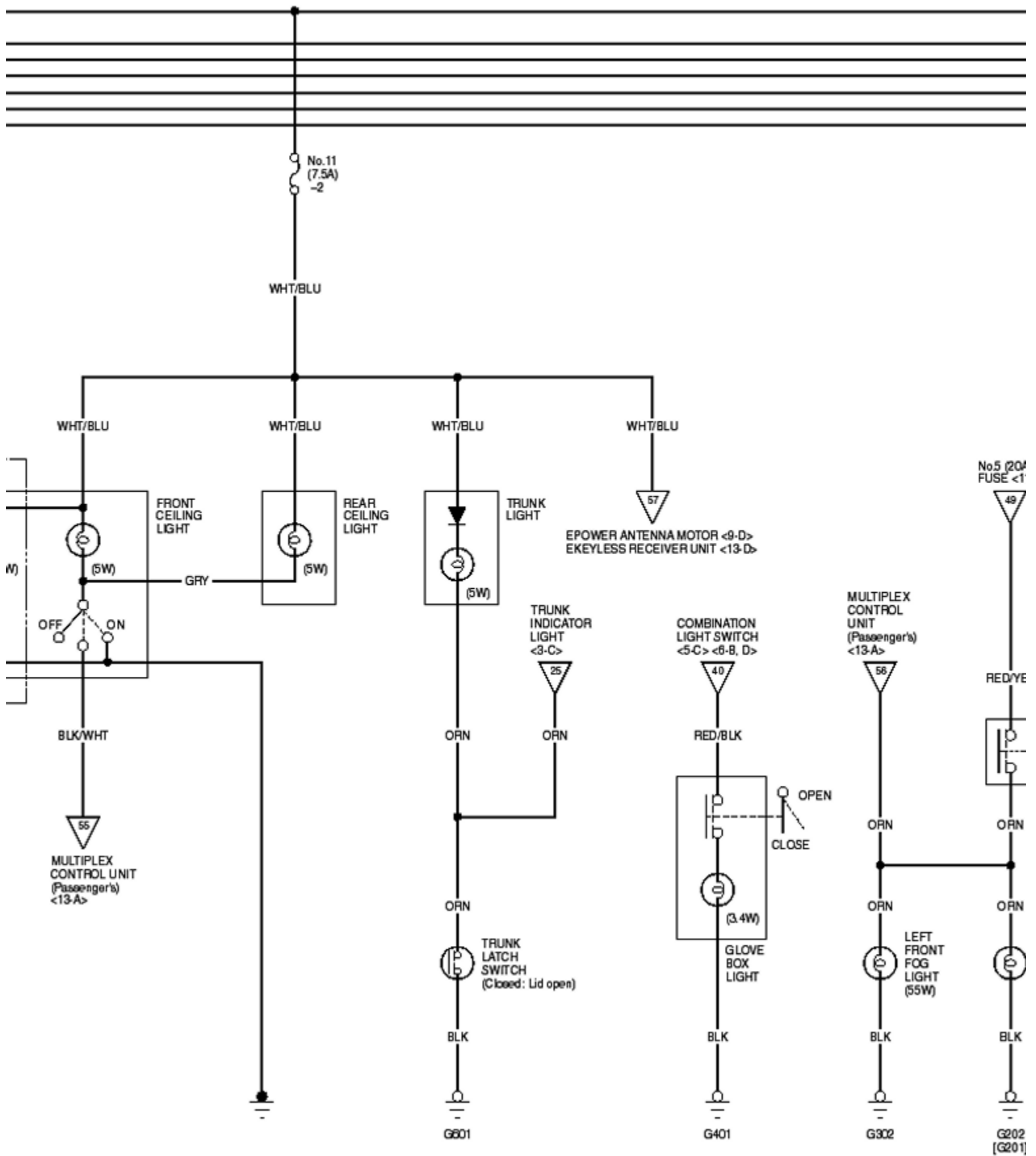


(Without HID lamp)



(With spotlights)





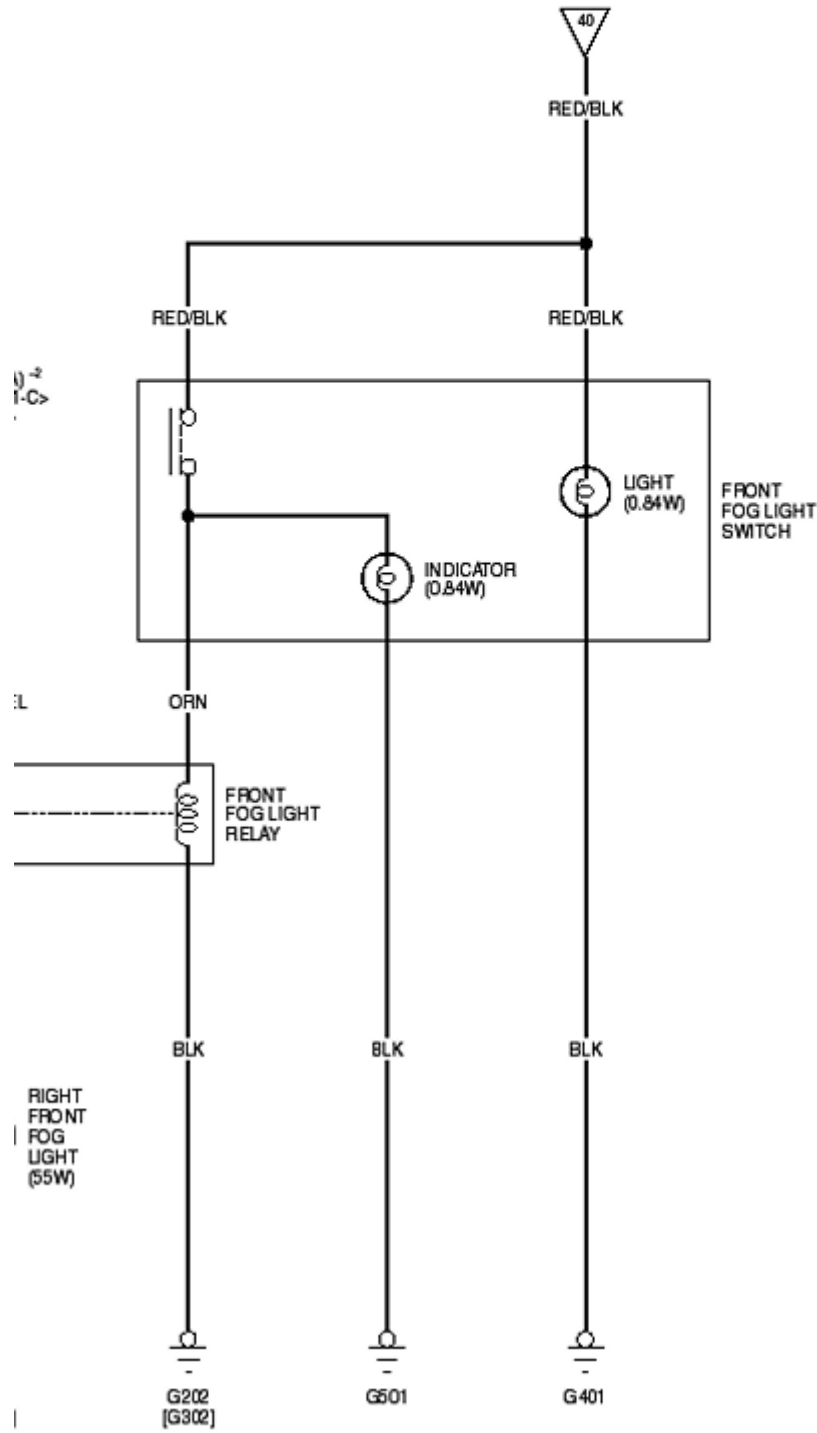
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

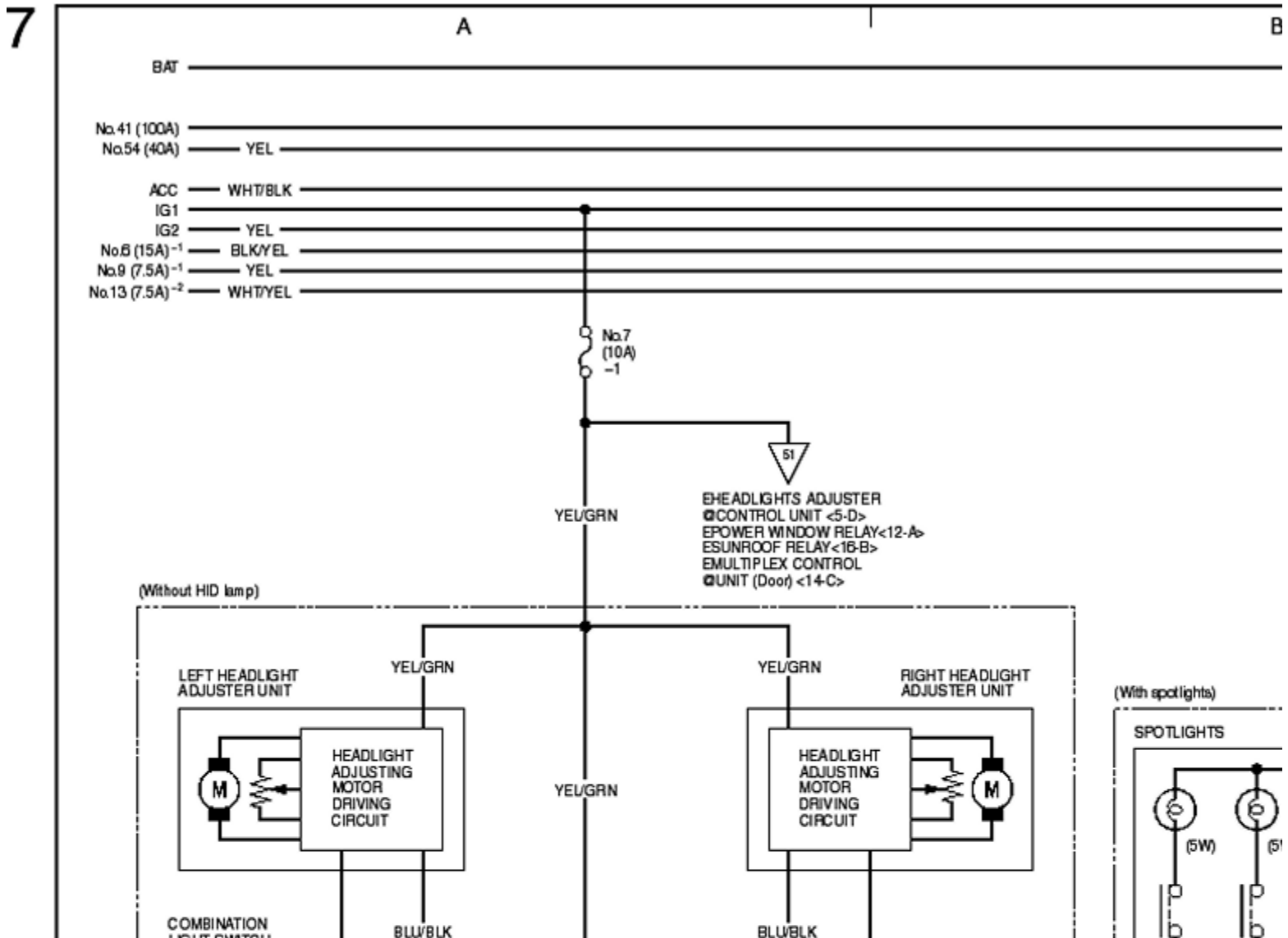
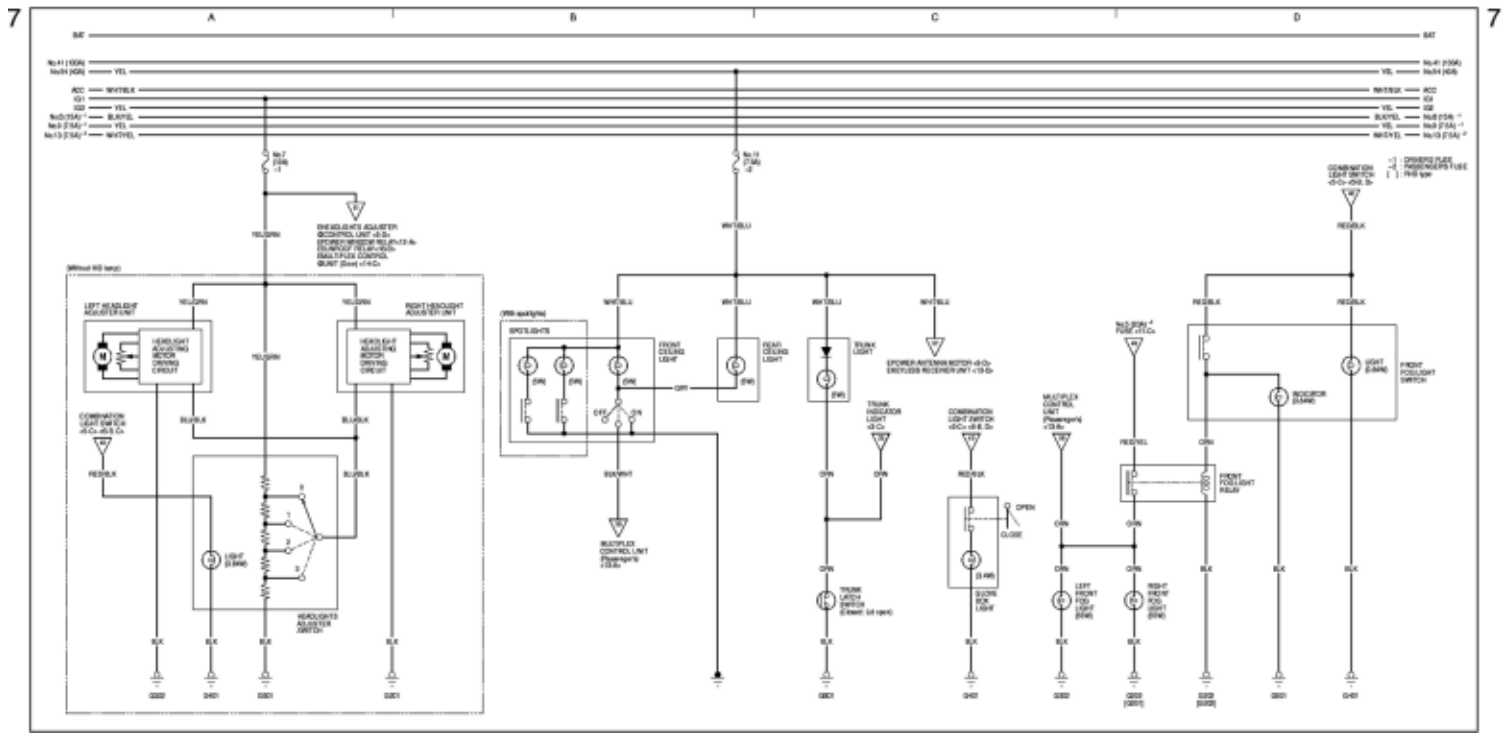
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

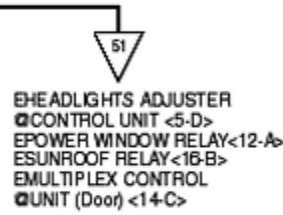
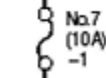
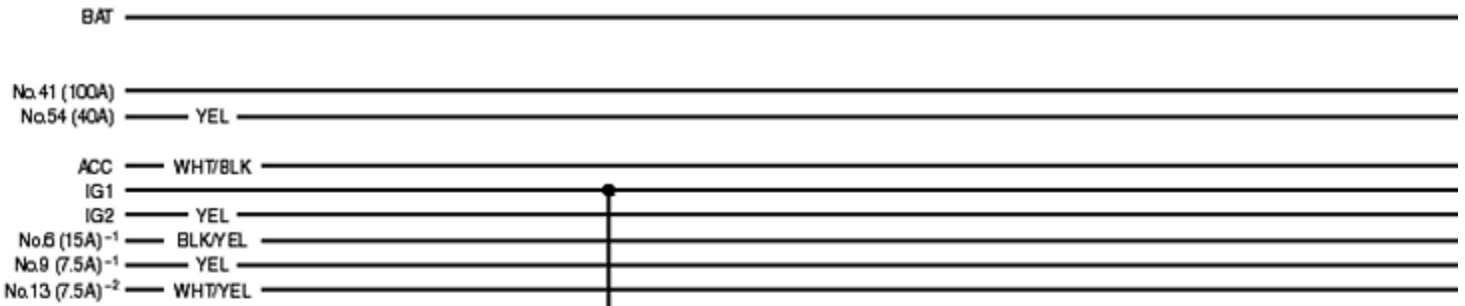
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



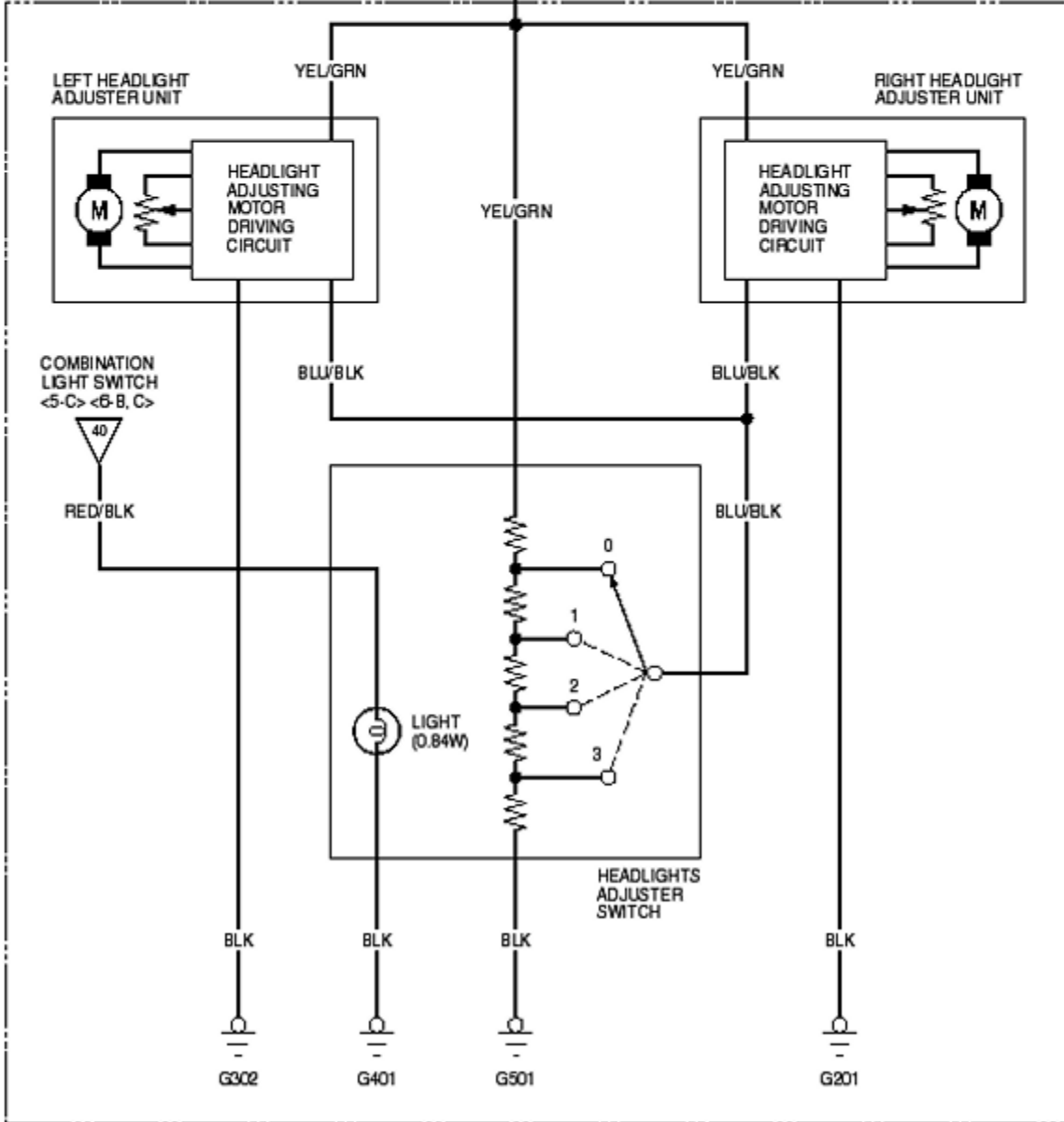
Wiring Diagrams

Lights, Interior - Ceiling Light (Rear)

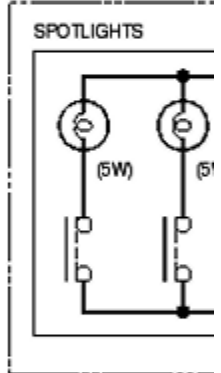


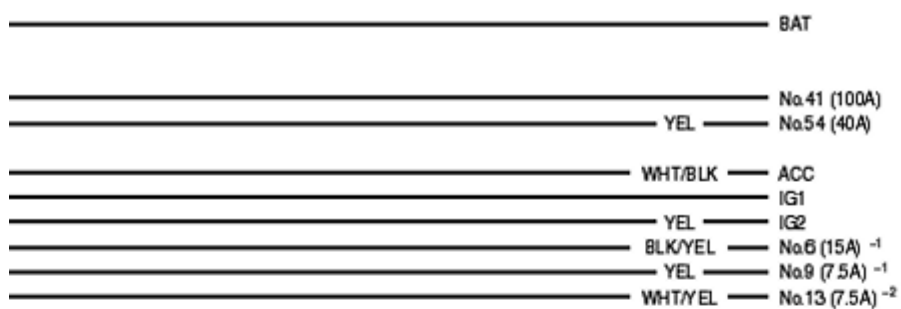
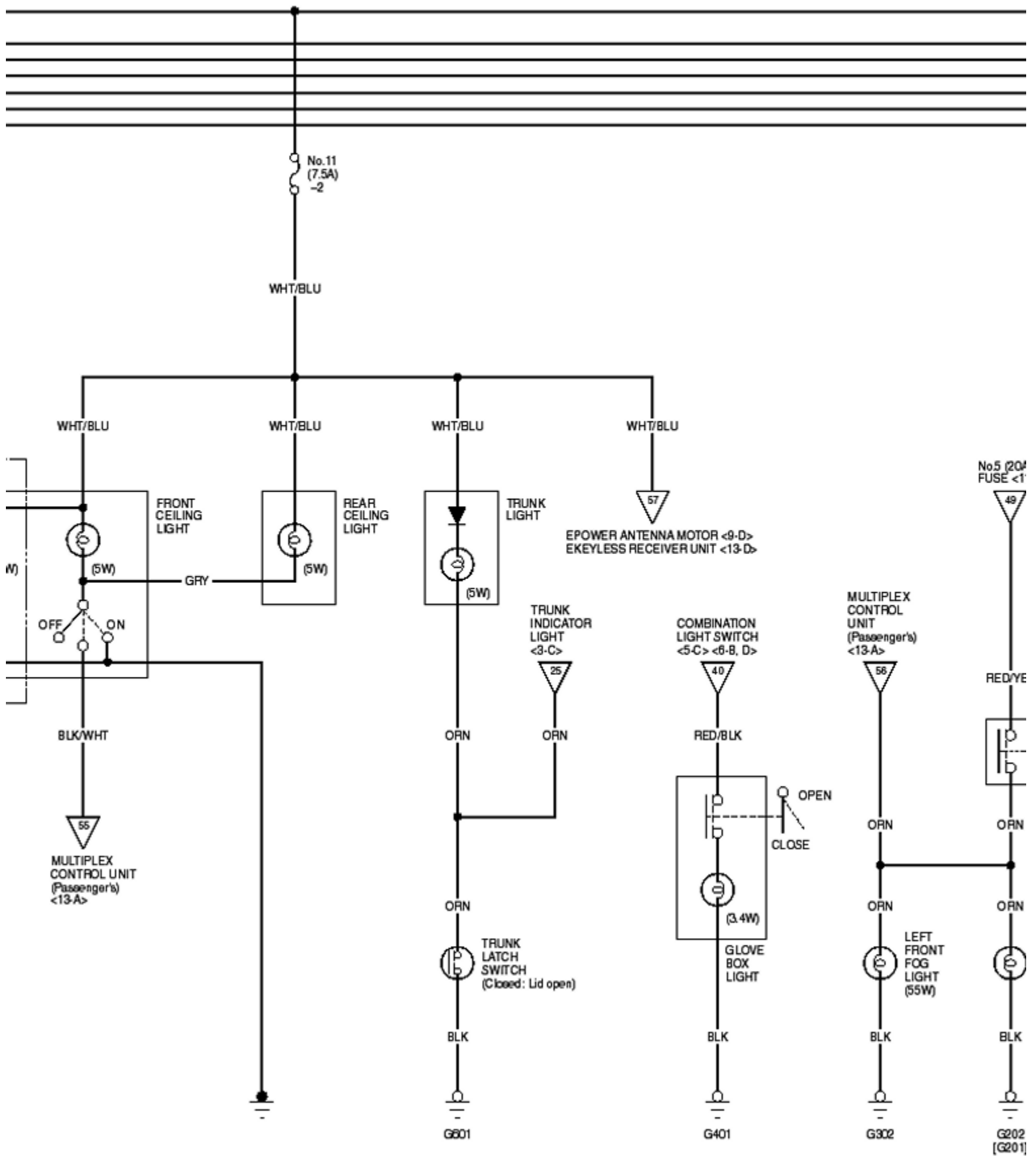


(Without HID lamp)



(With spotlights)





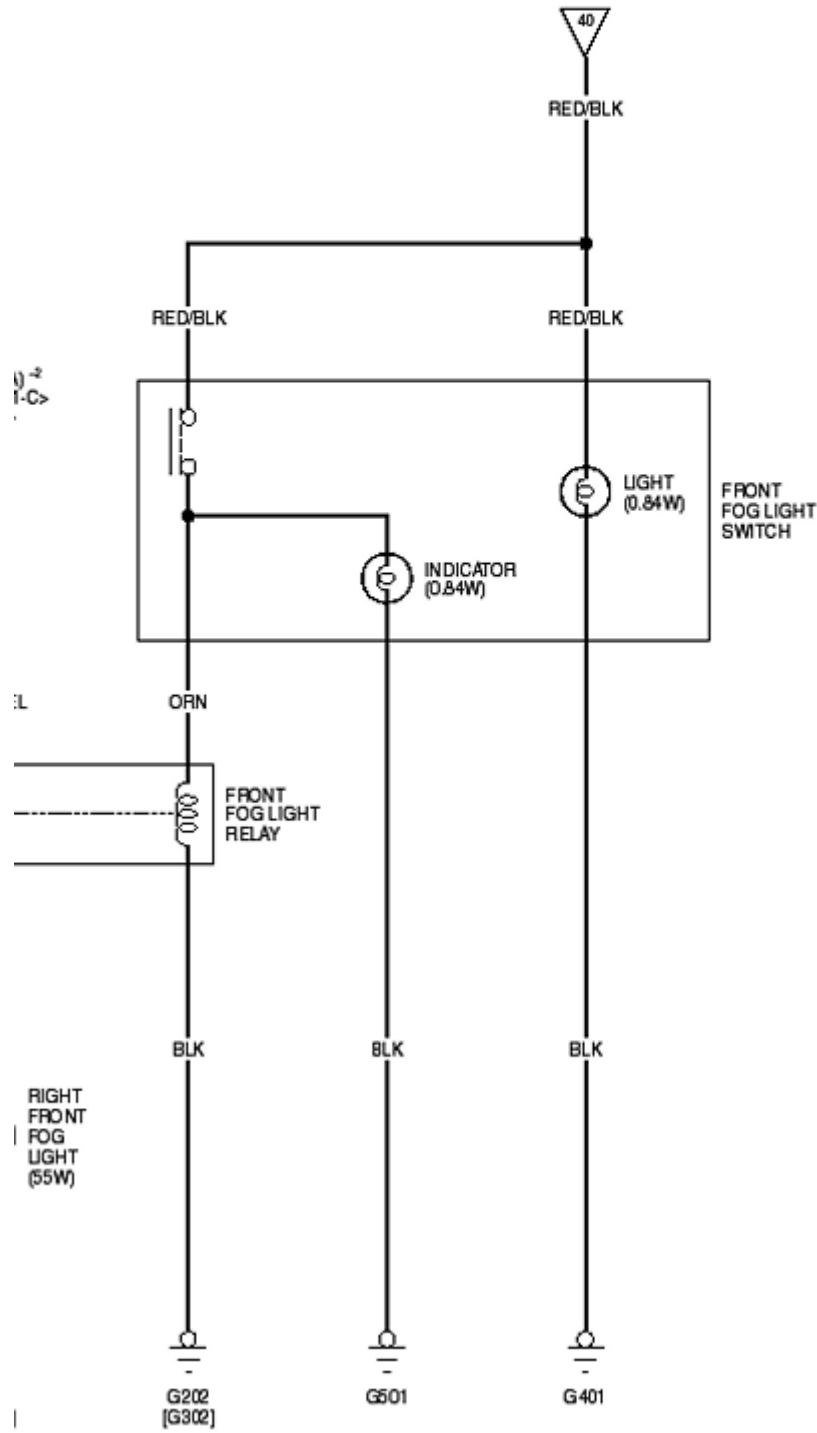
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

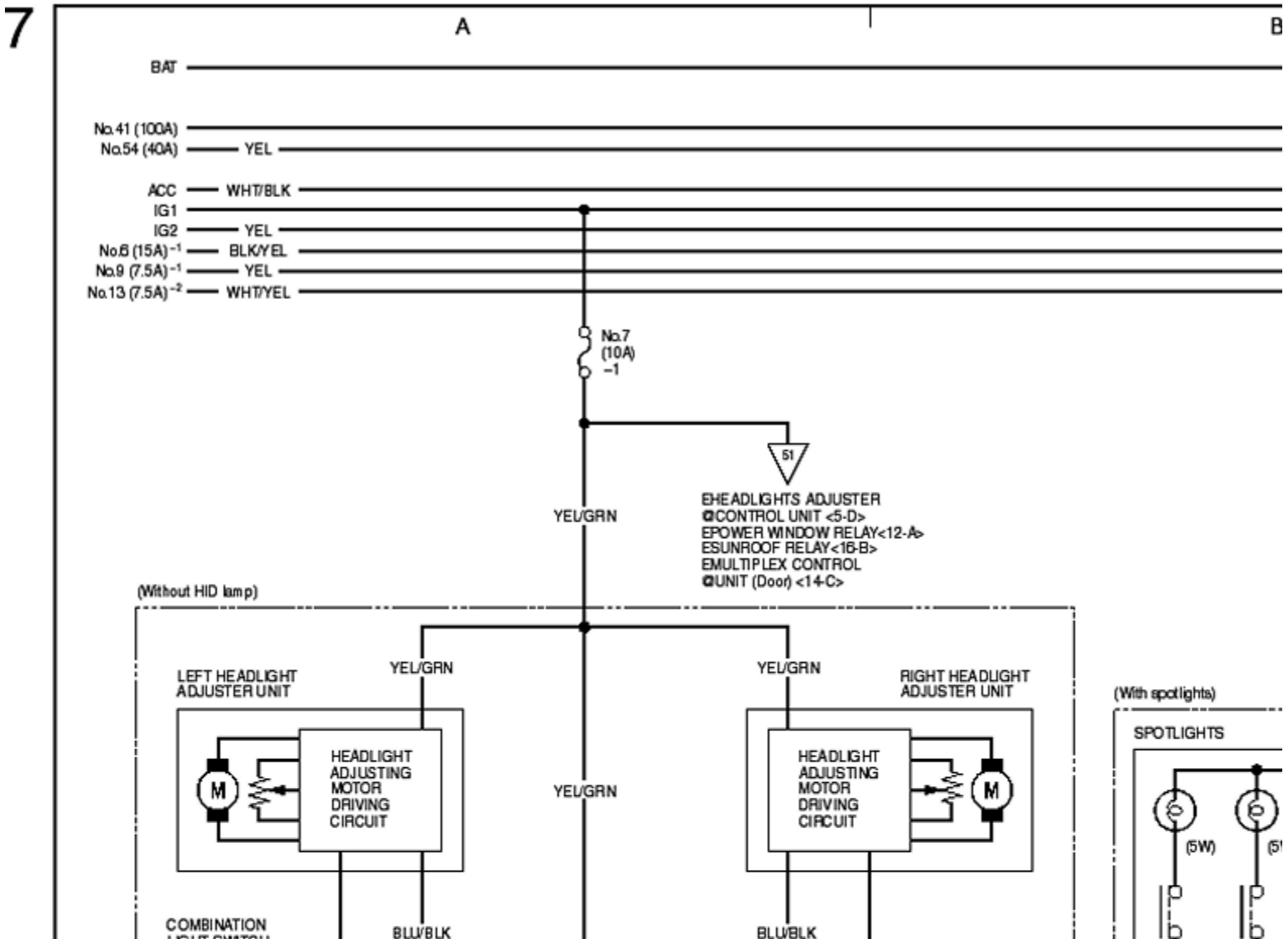
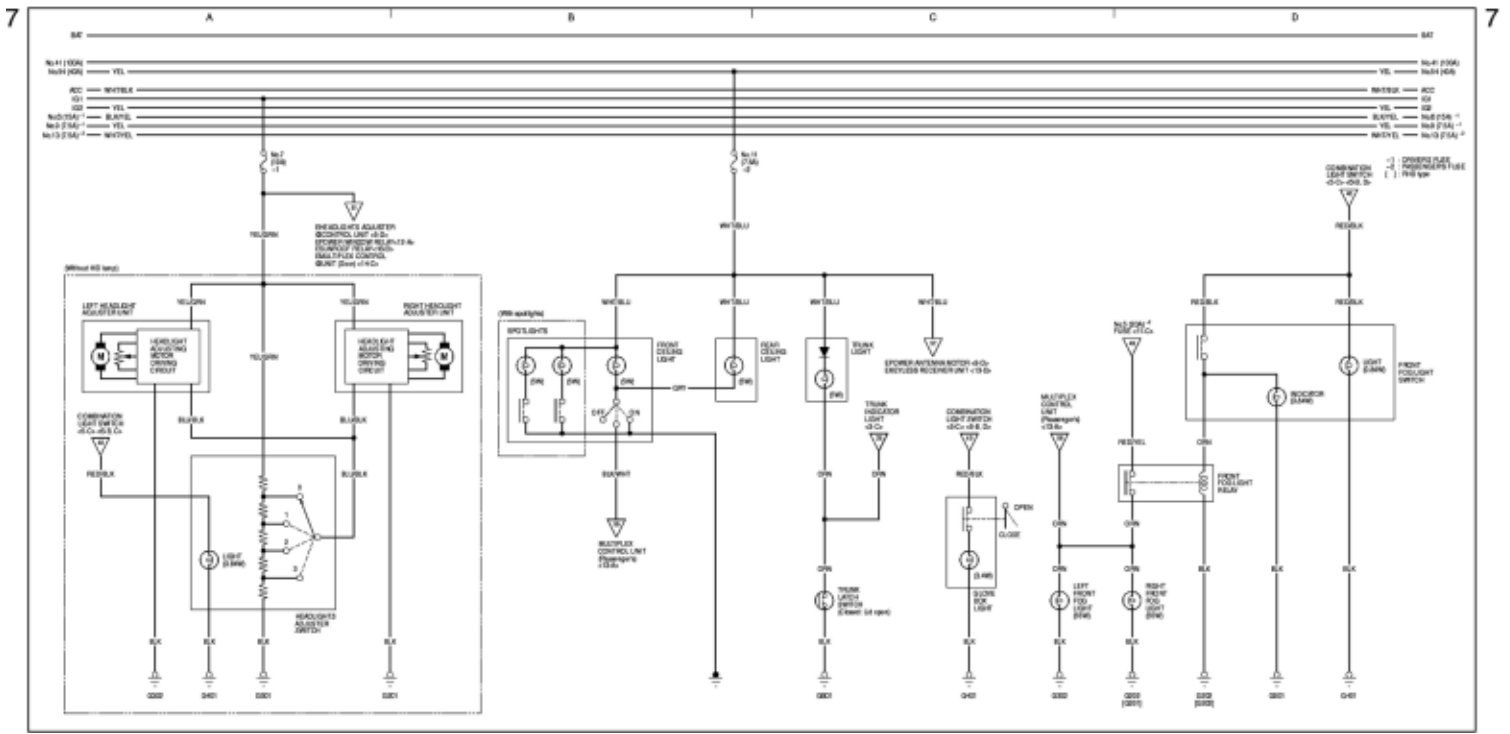
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

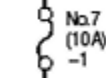
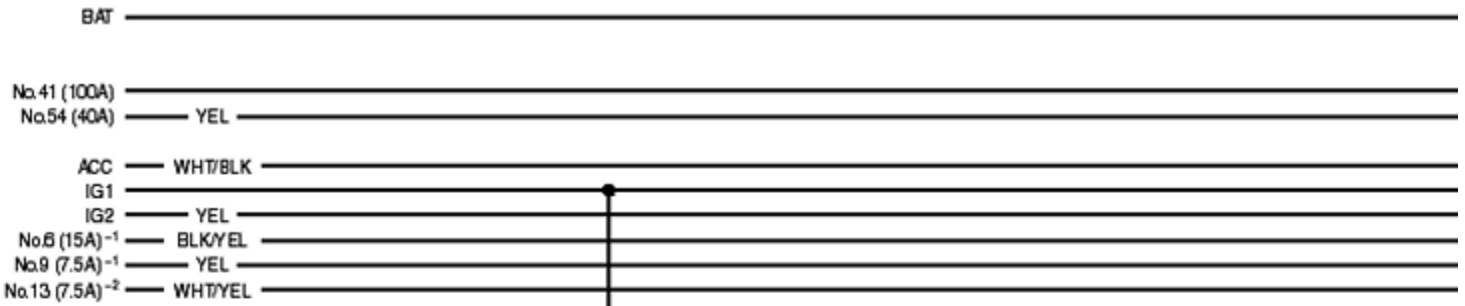
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



Wiring Diagrams

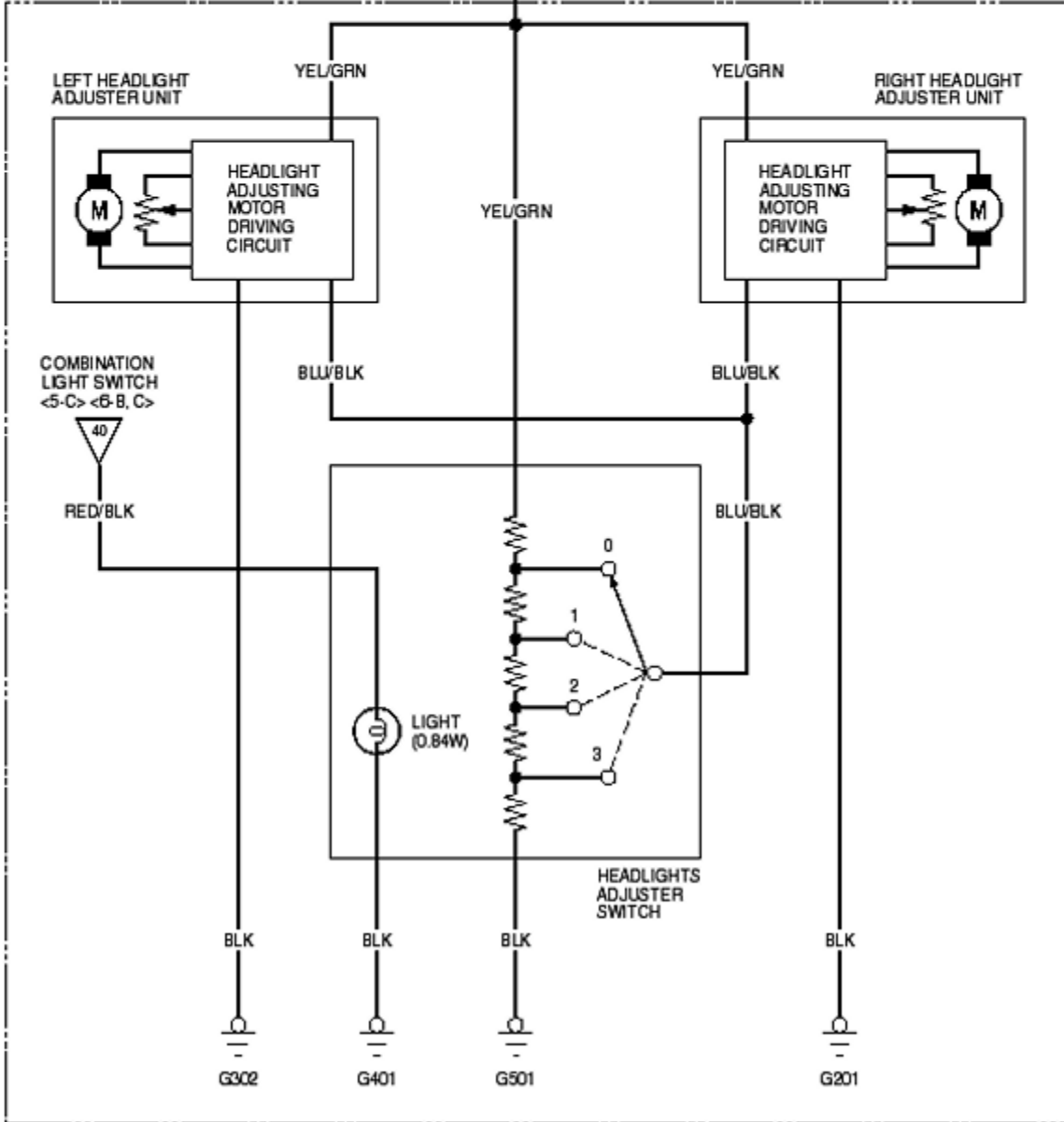
Lights, Interior - Glove Box Light



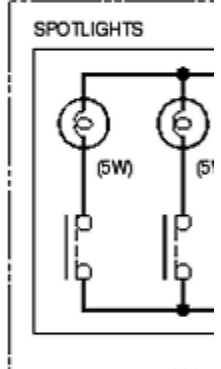


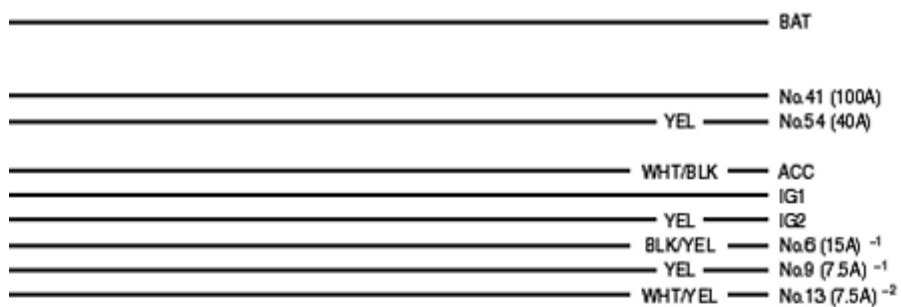
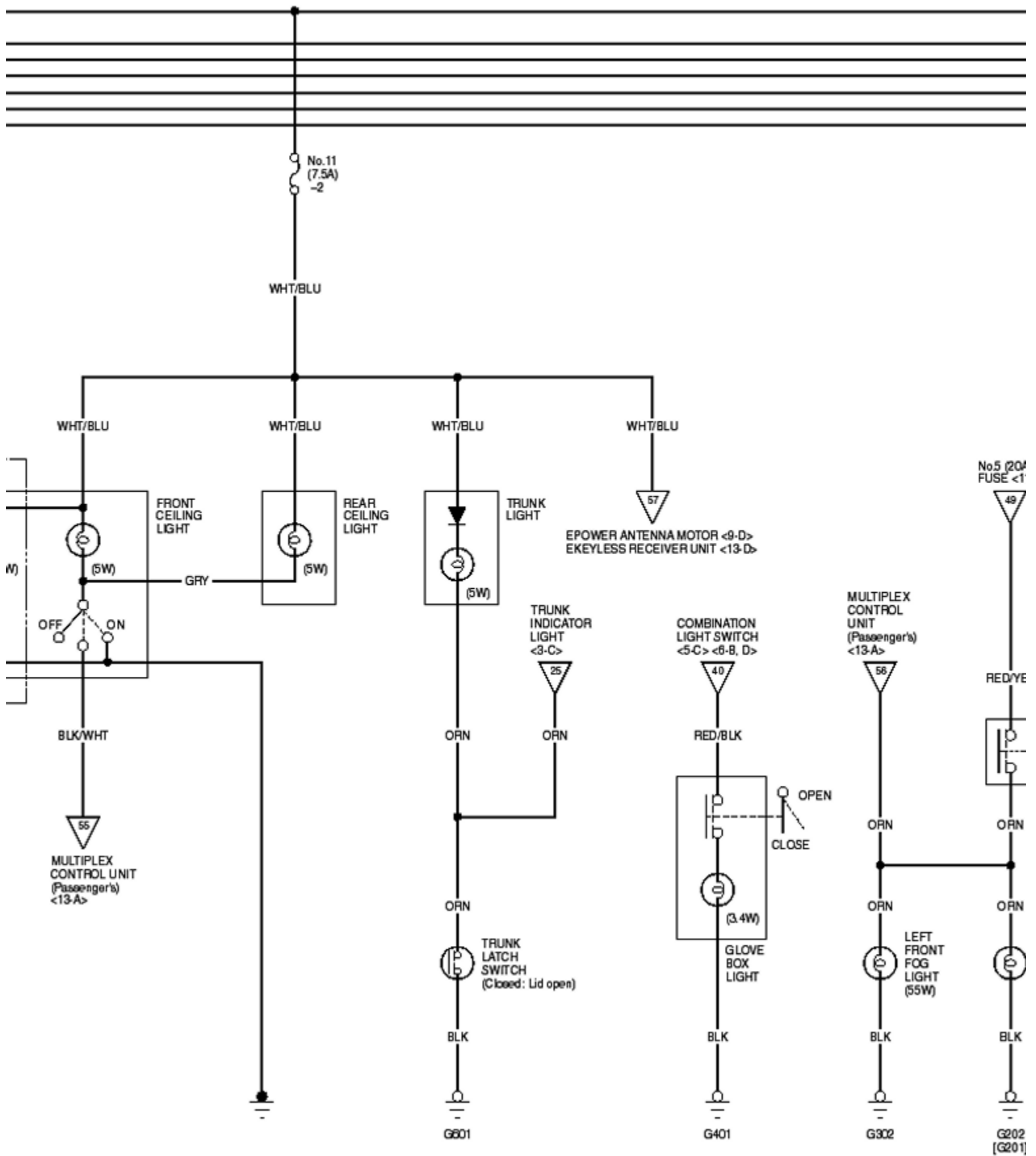
EHEADLIGHTS ADJUSTER
 CONTROL UNIT <5-D>
 EPOWER WINDOW RELAY<12-A>
 ESUNROOF RELAY<16-B>
 EMULTIPLEX CONTROL
 UNIT (Door) <14-C>

(Without HID lamp)



(With spotlights)





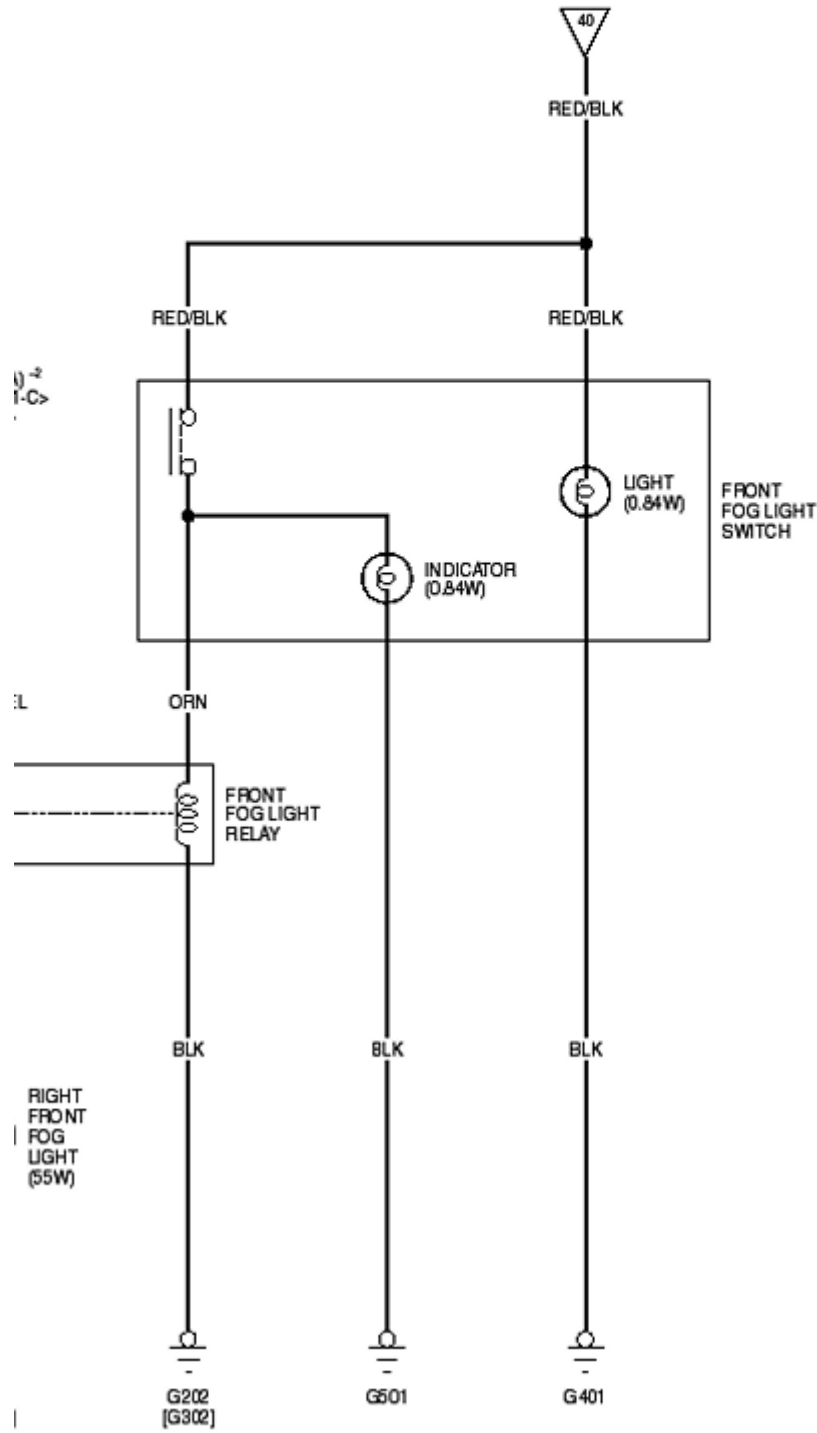
D

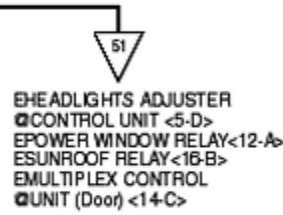
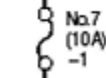
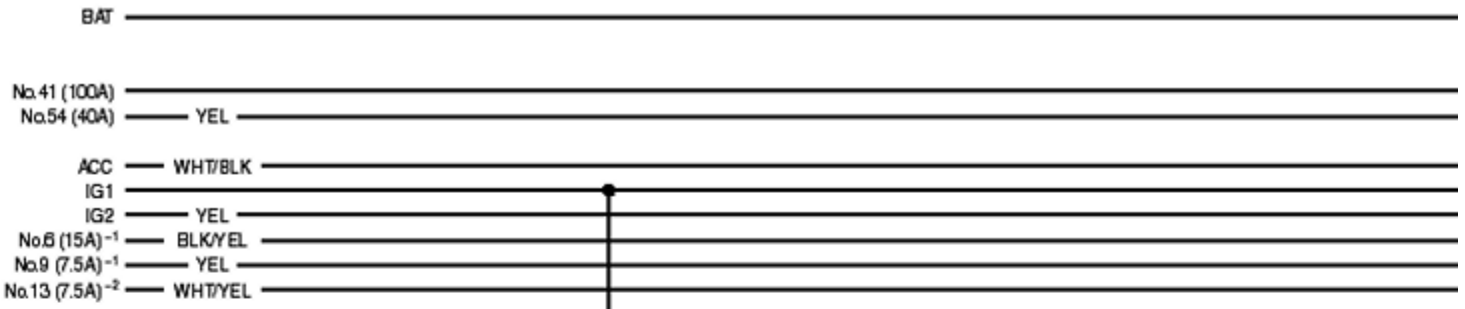
7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

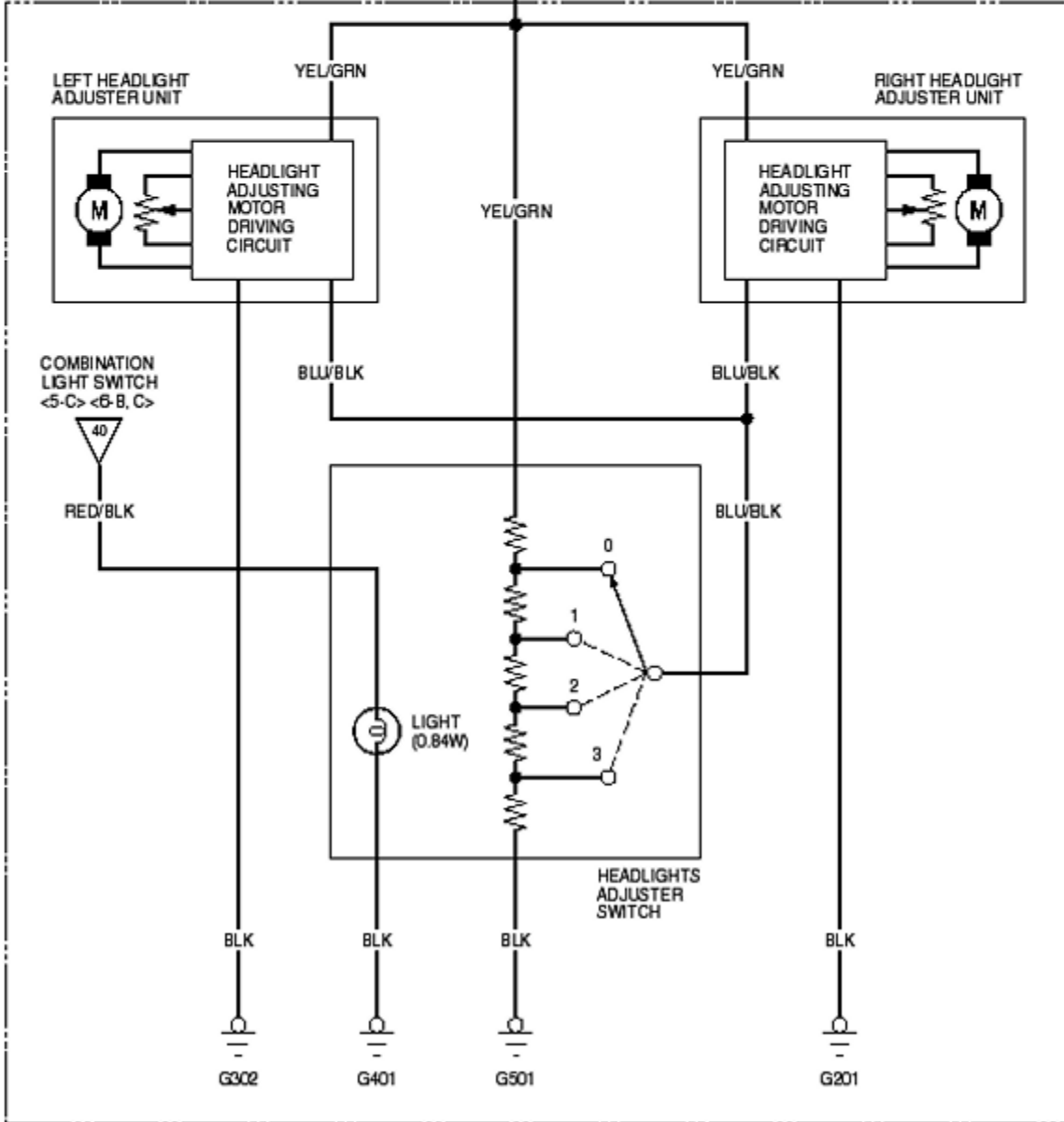
COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

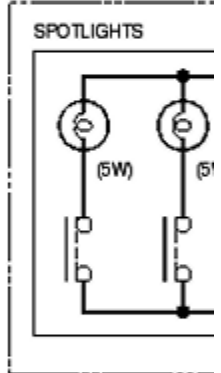


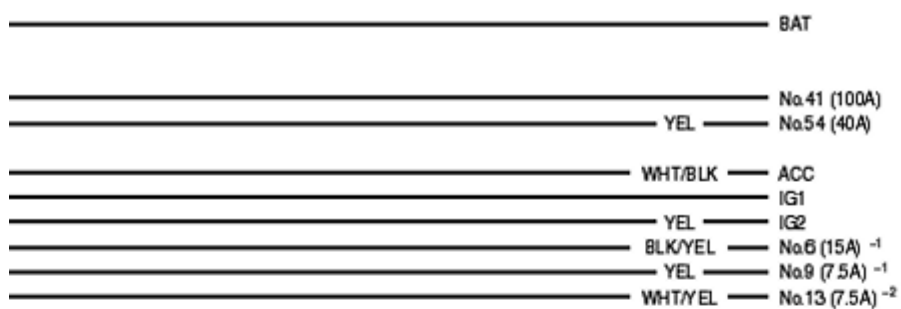
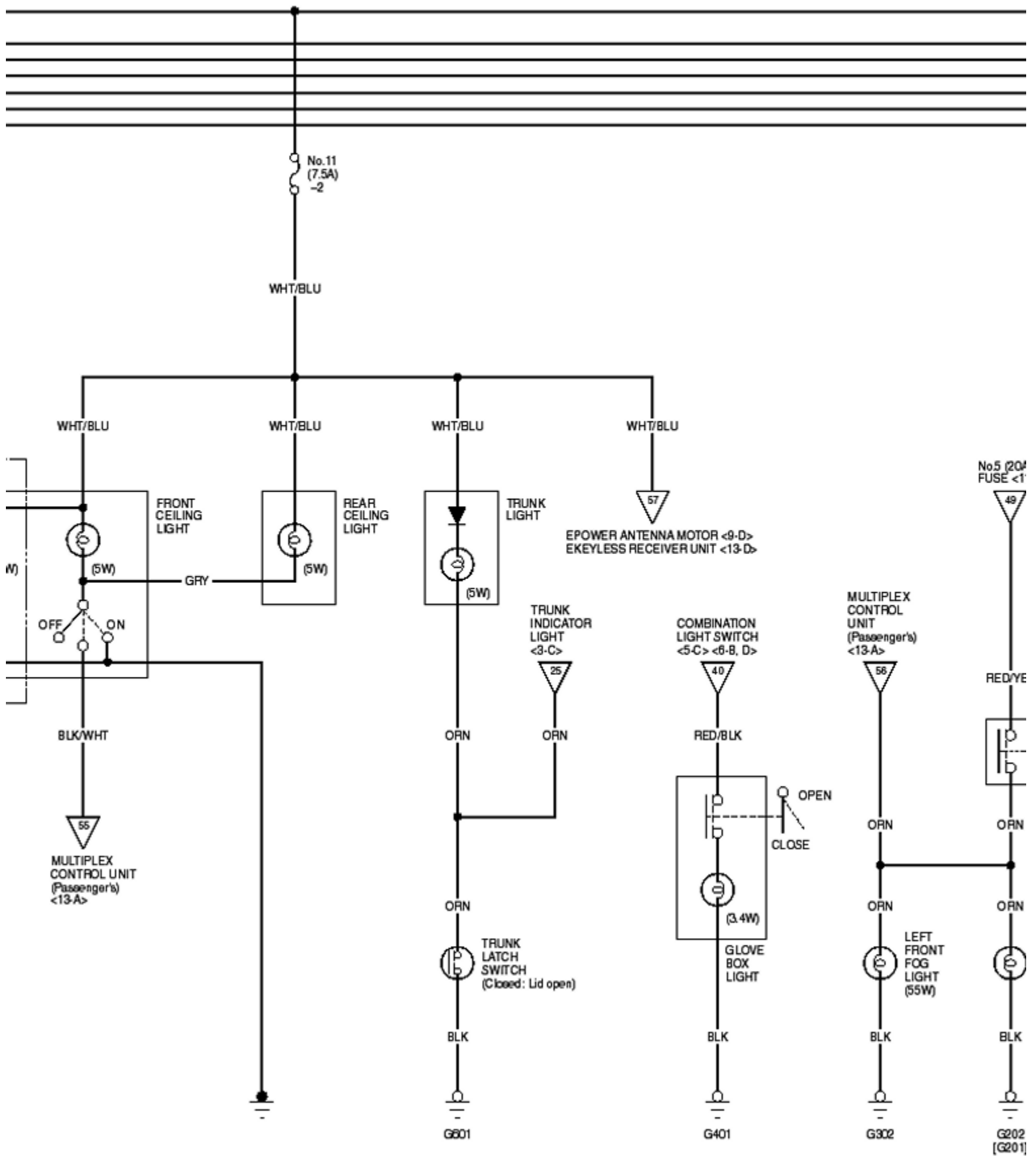


(Without HID lamp)



(With spotlights)





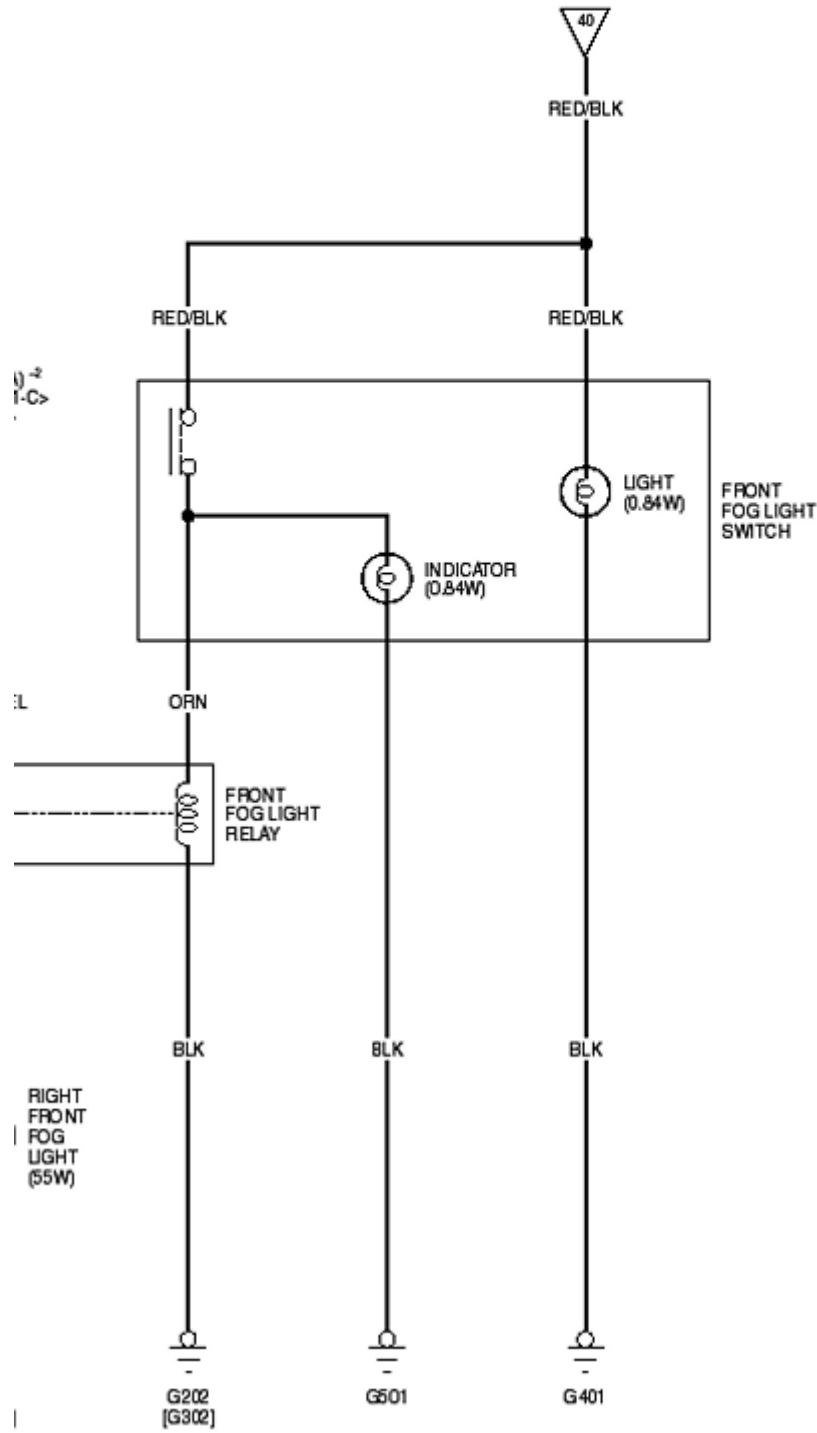
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



4.4

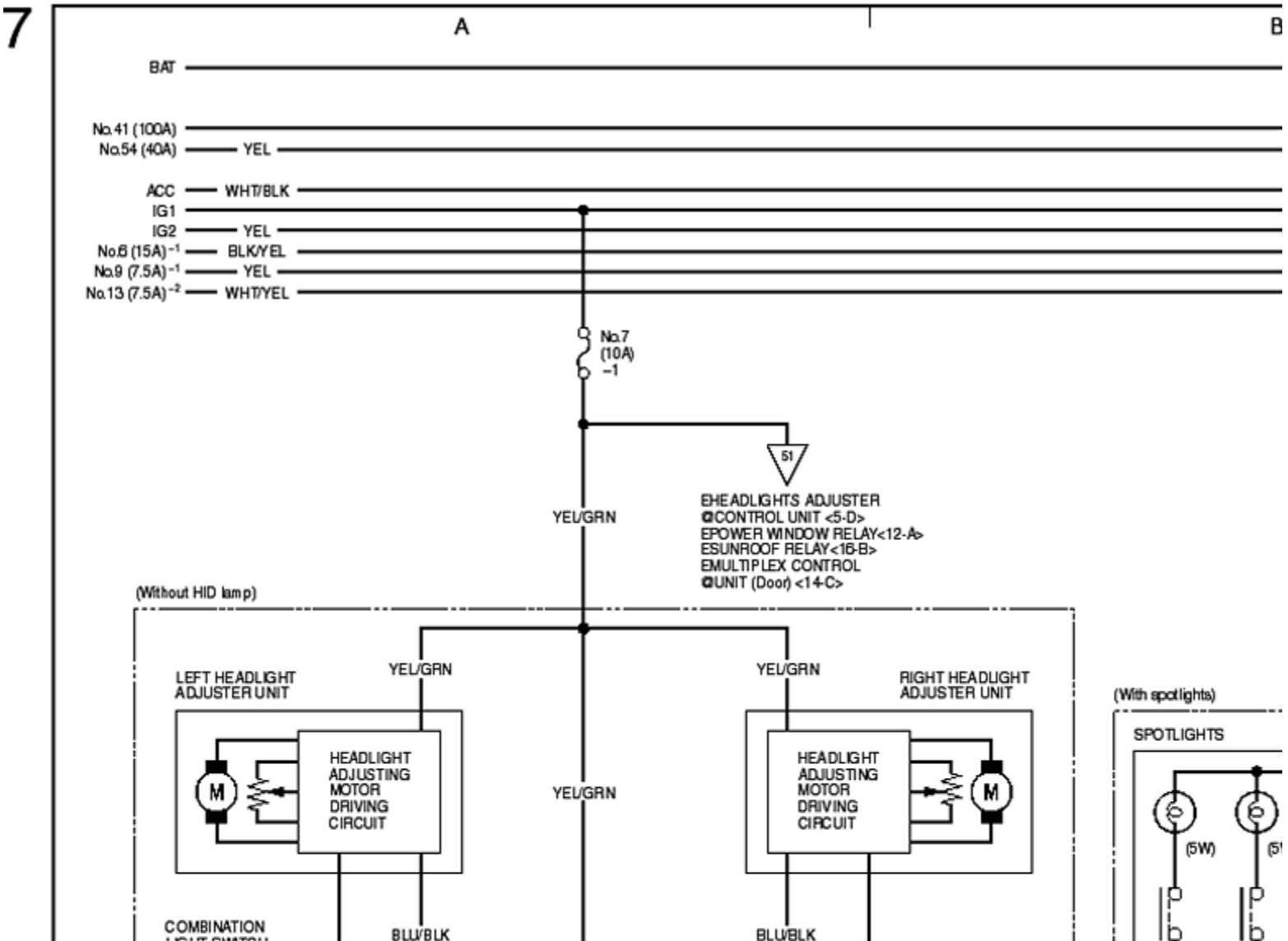
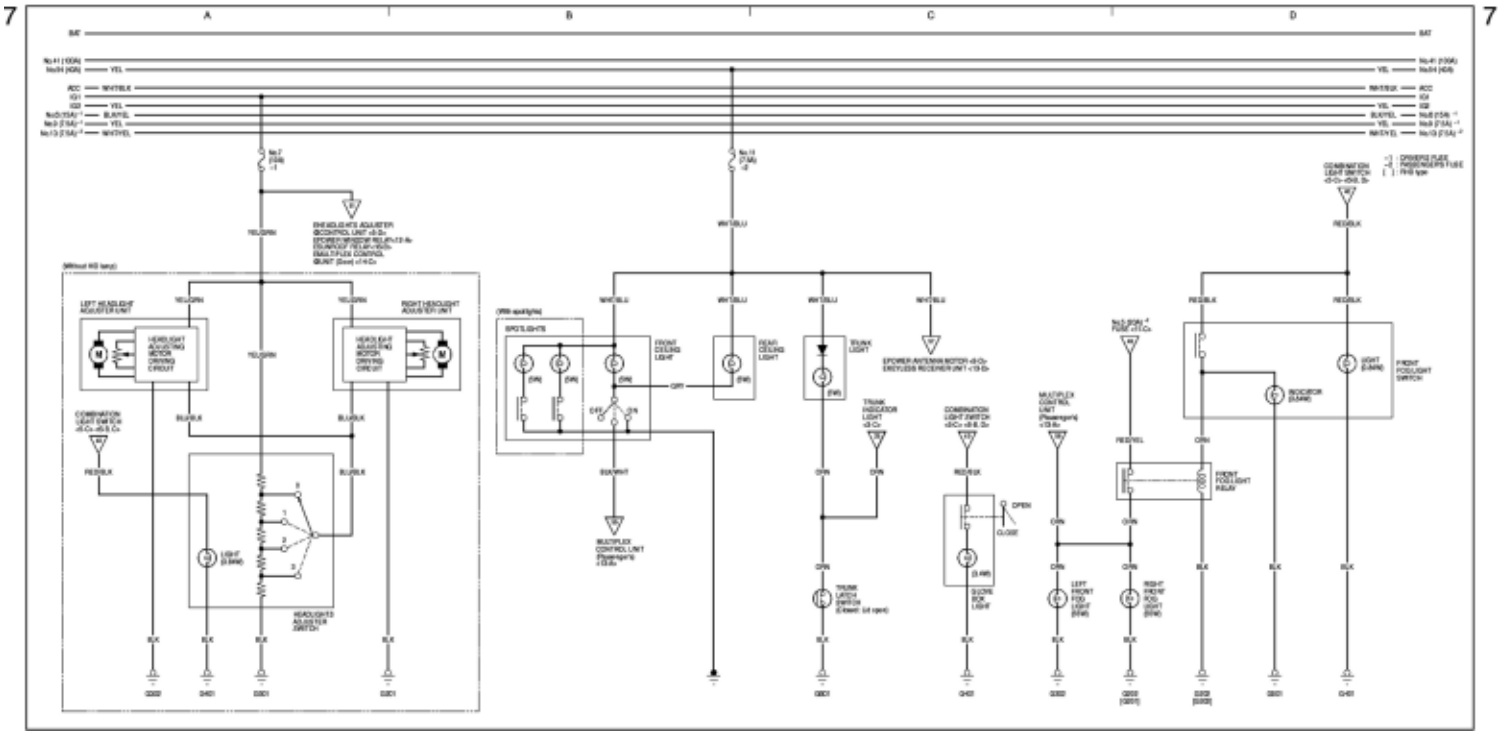
3.L

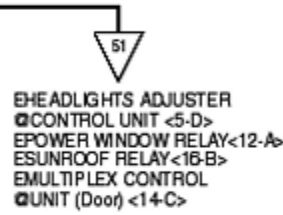
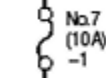
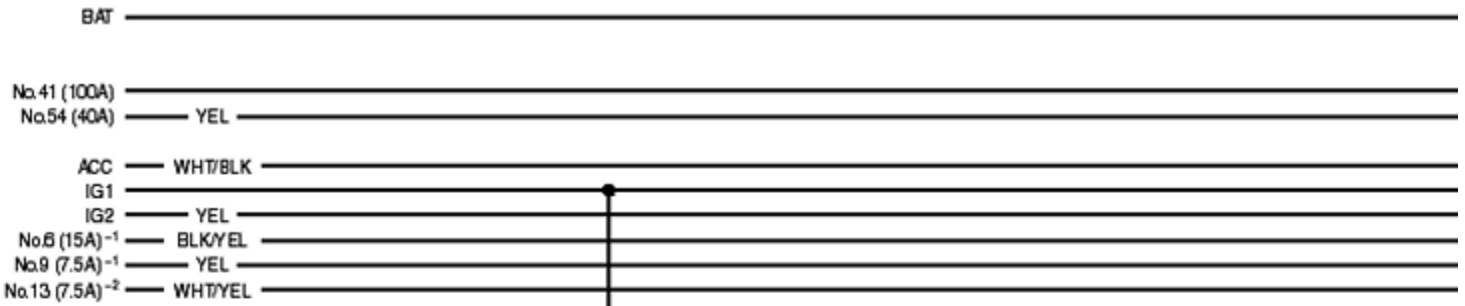
RIGHT FRONT FOG LIGHT (55W)

1

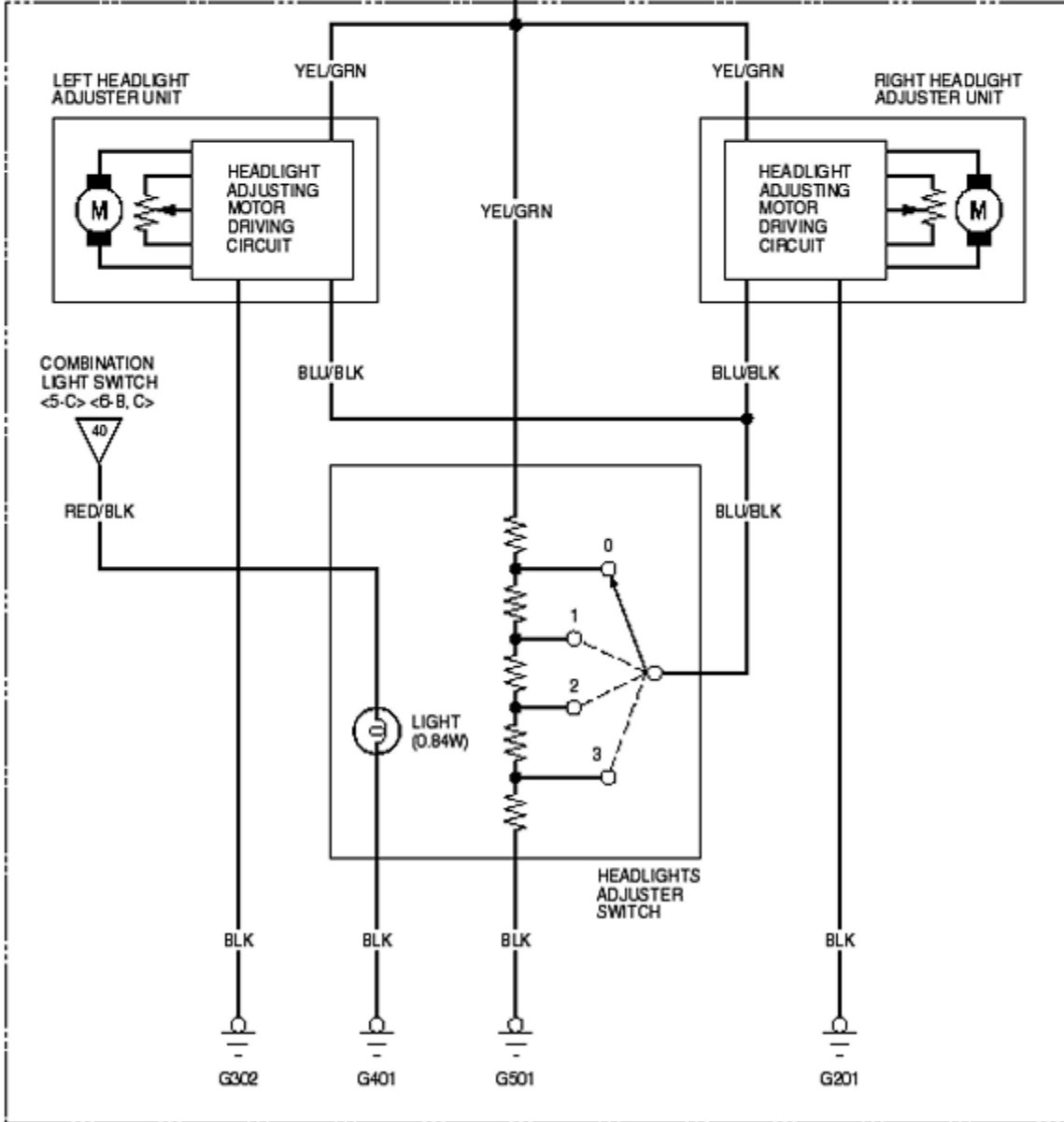
Wiring Diagrams

Lights, Interior - Trunk Light

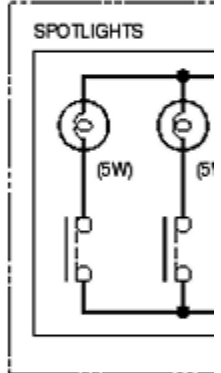


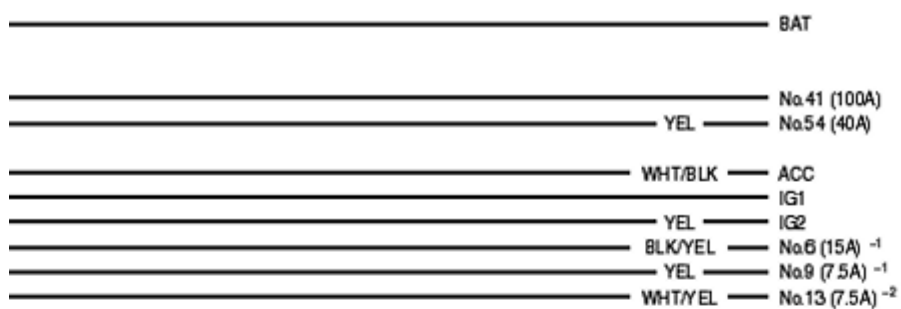
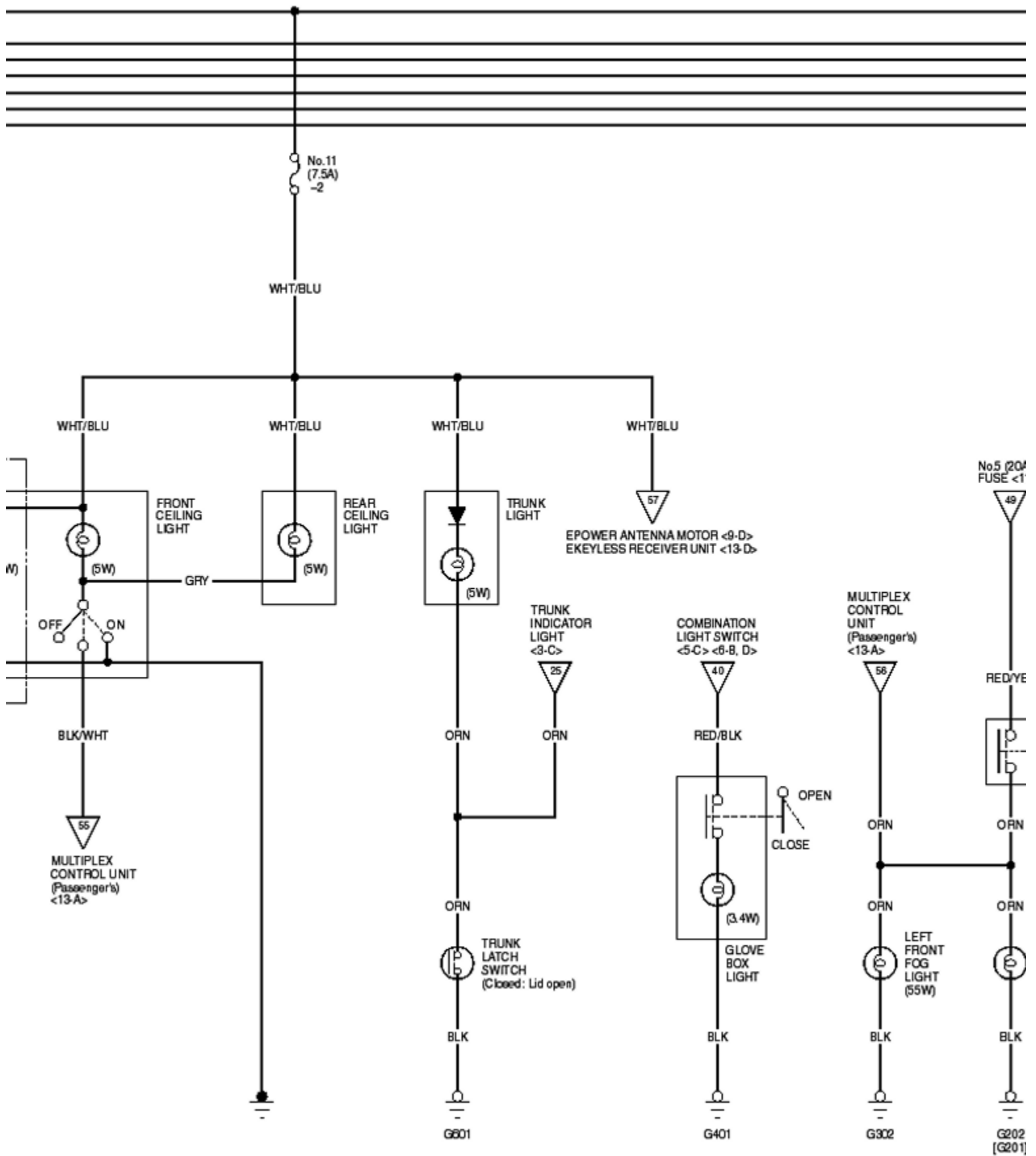


(Without HID lamp)



(With spotlights)





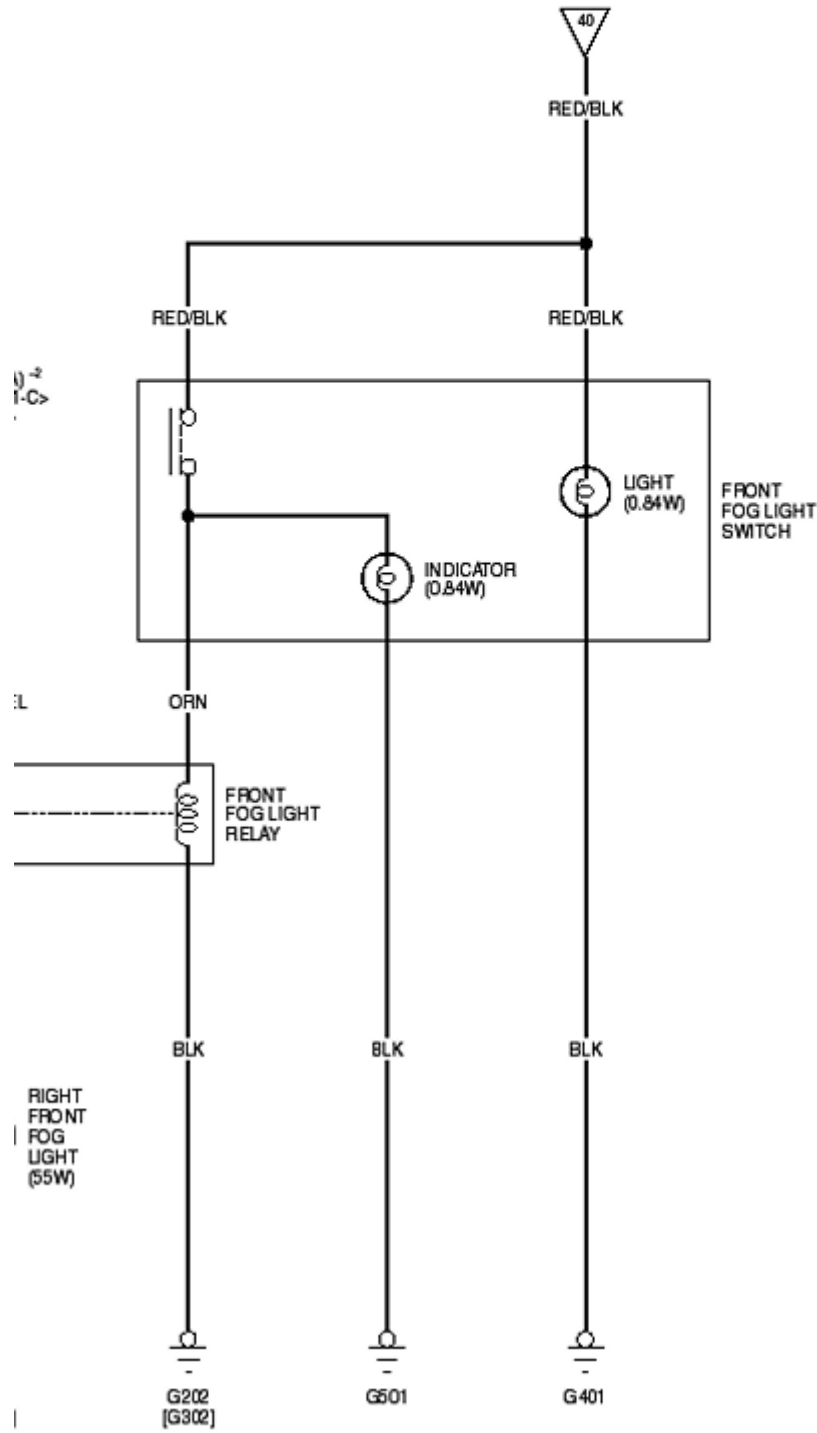
D

7

- BAT
- No.41 (100A)
- YEL No.54 (40A)
- WHT/BLK ACC
- IG1
- YEL IG2
- BLK/YEL No.6 (15A) ⁻¹
- YEL No.9 (7.5A) ⁻¹
- WHT/YEL No.13 (7.5A) ⁻²

COMBINATION LIGHT SWITCH
 <5-C> <6-B, D>

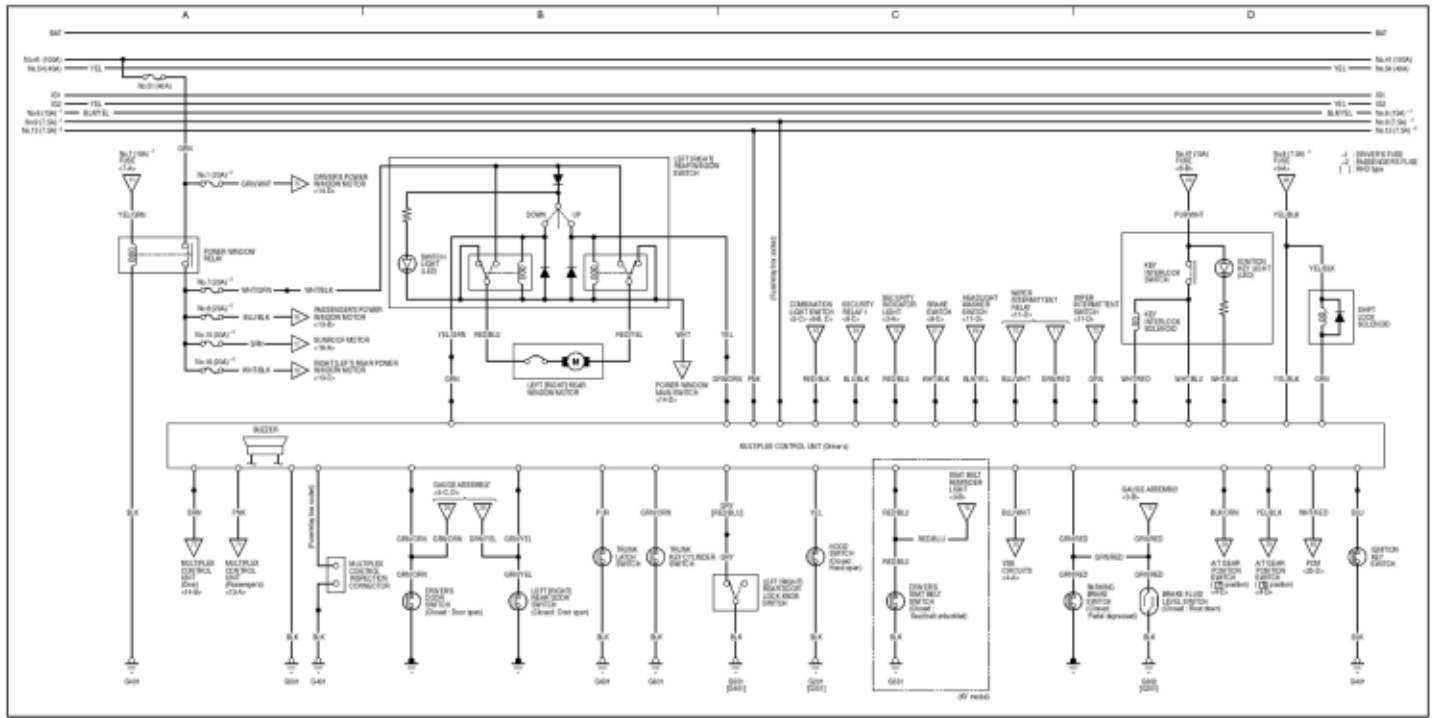
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



Wiring Diagrams

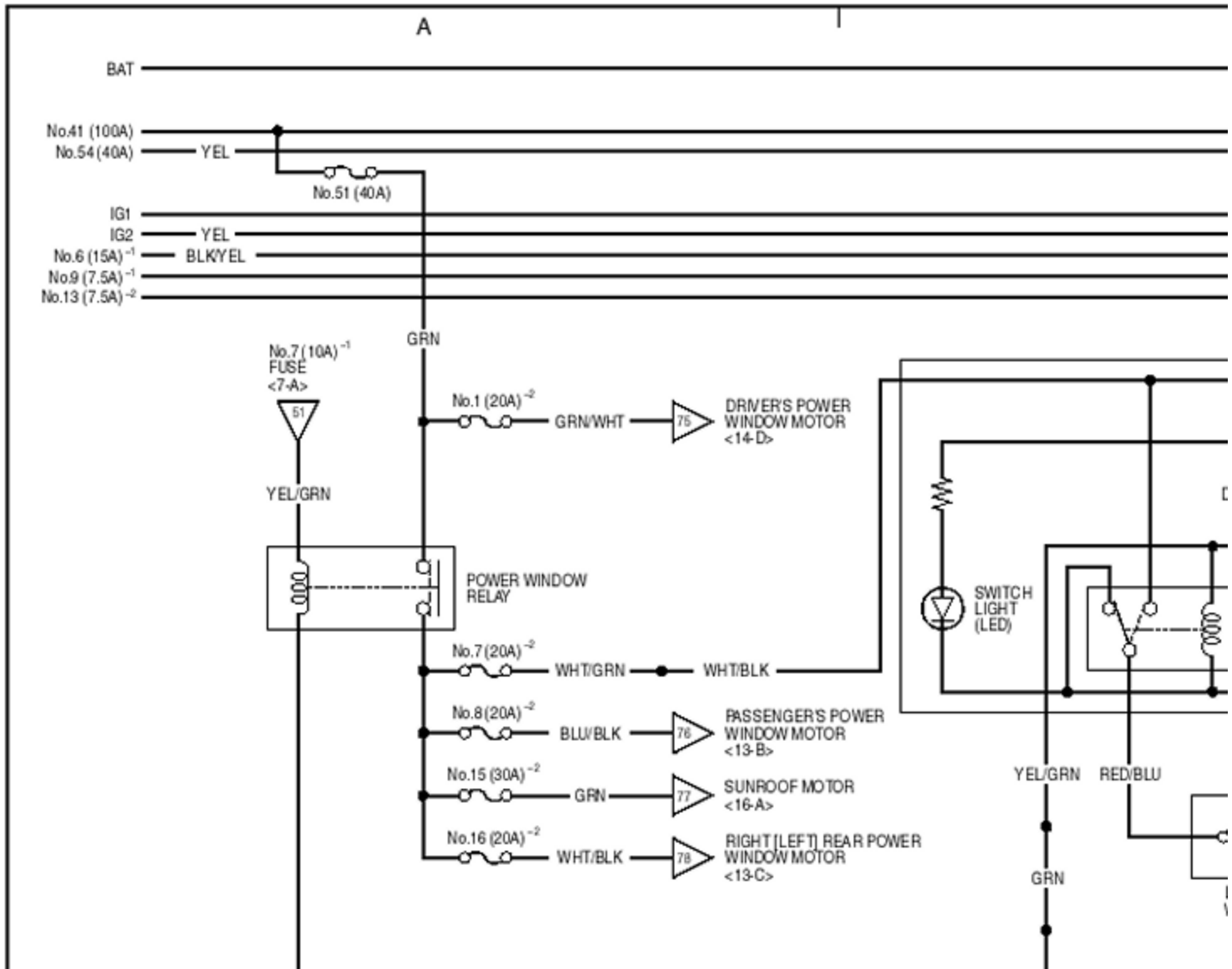
Multiplex Control System

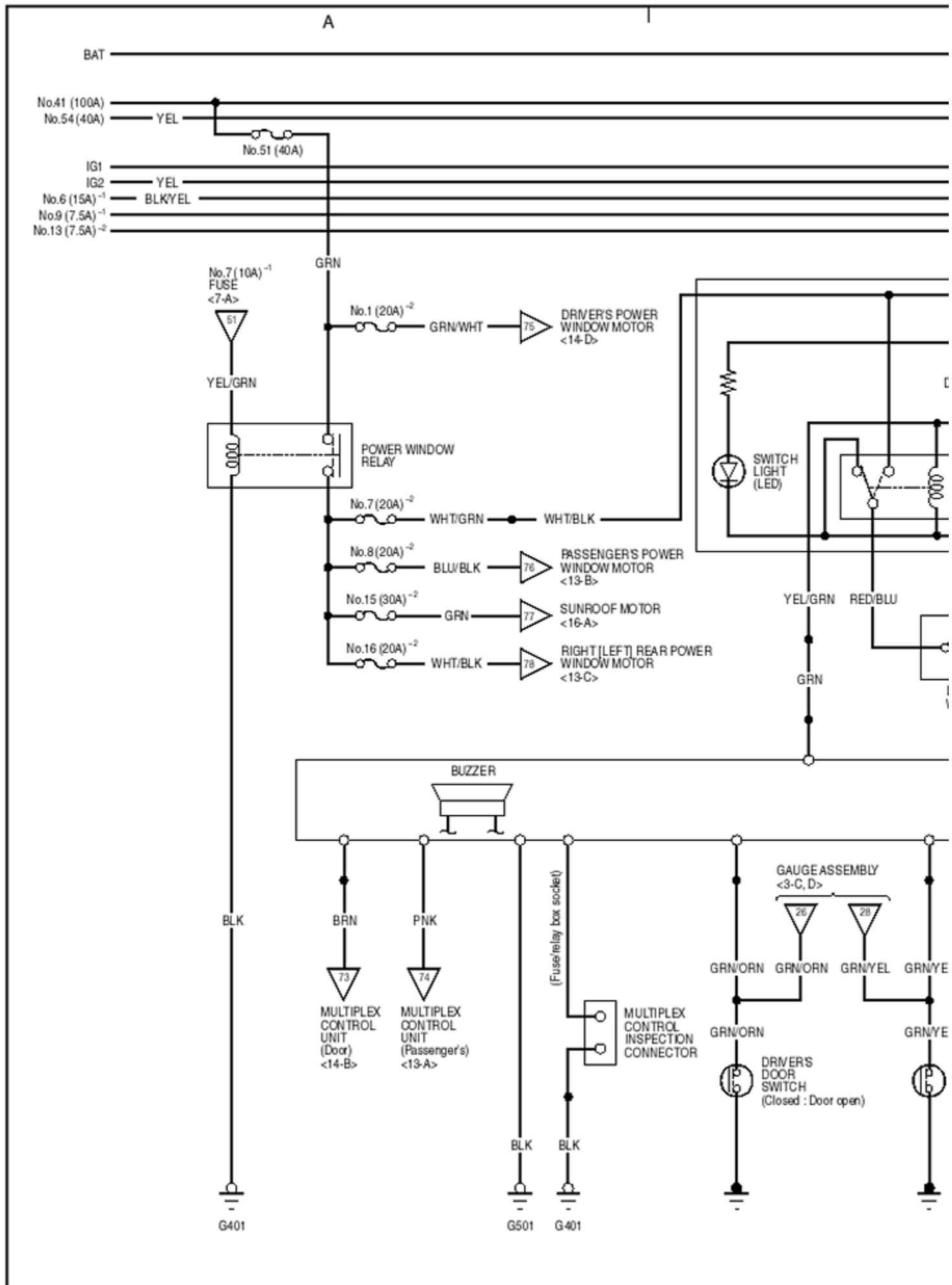
12



12

12



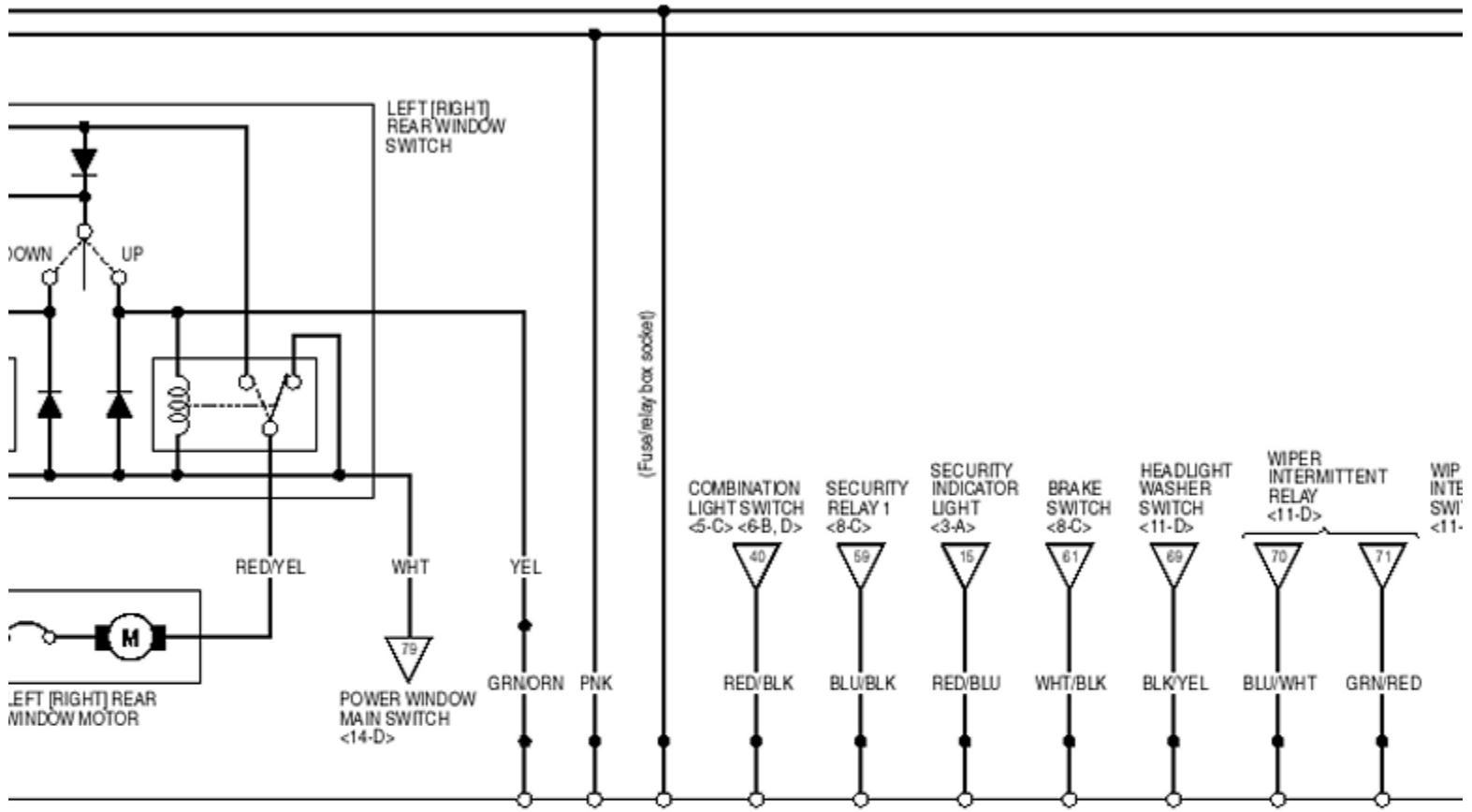


B

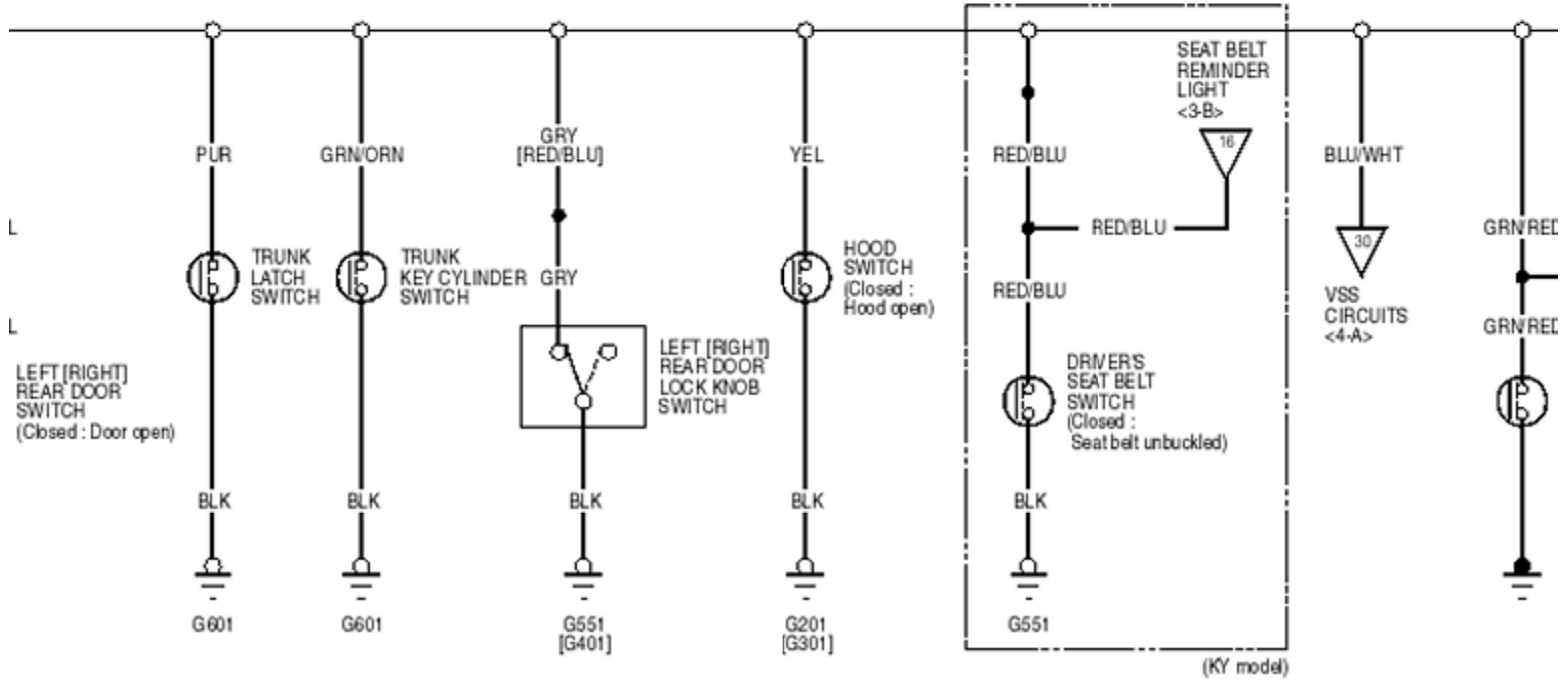
C

B

C

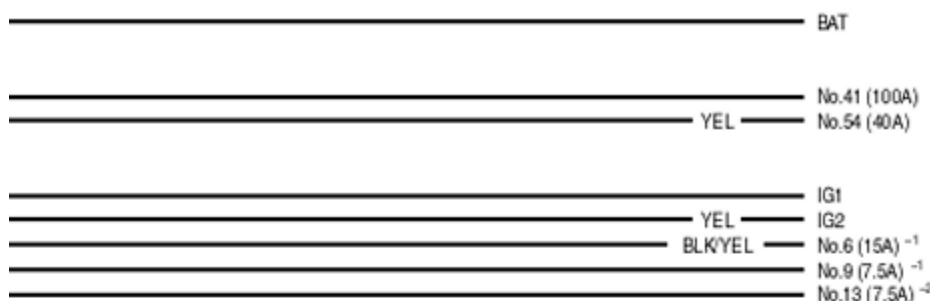


MULTIPLEX CONTROL UNIT (Driver's)



D

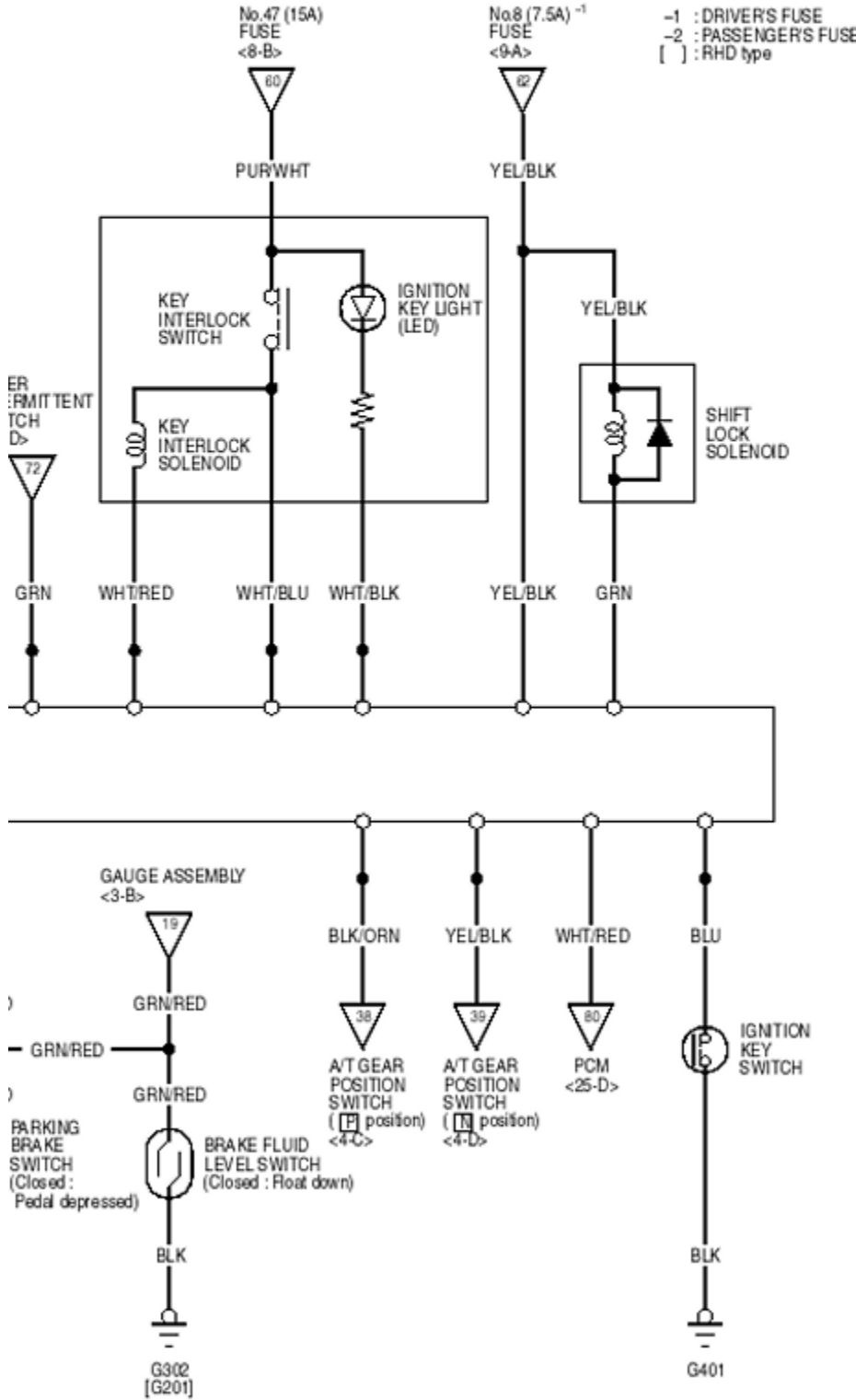
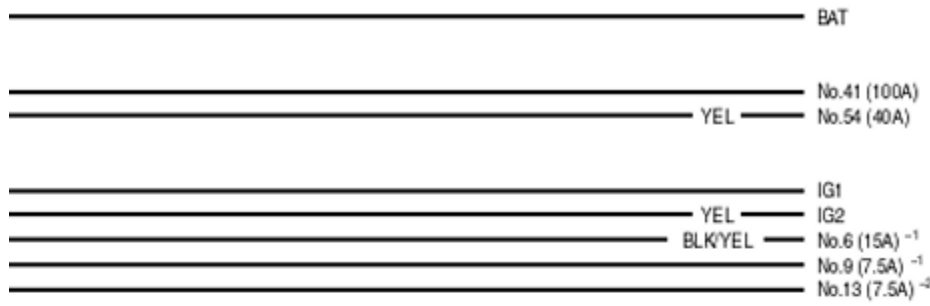
12

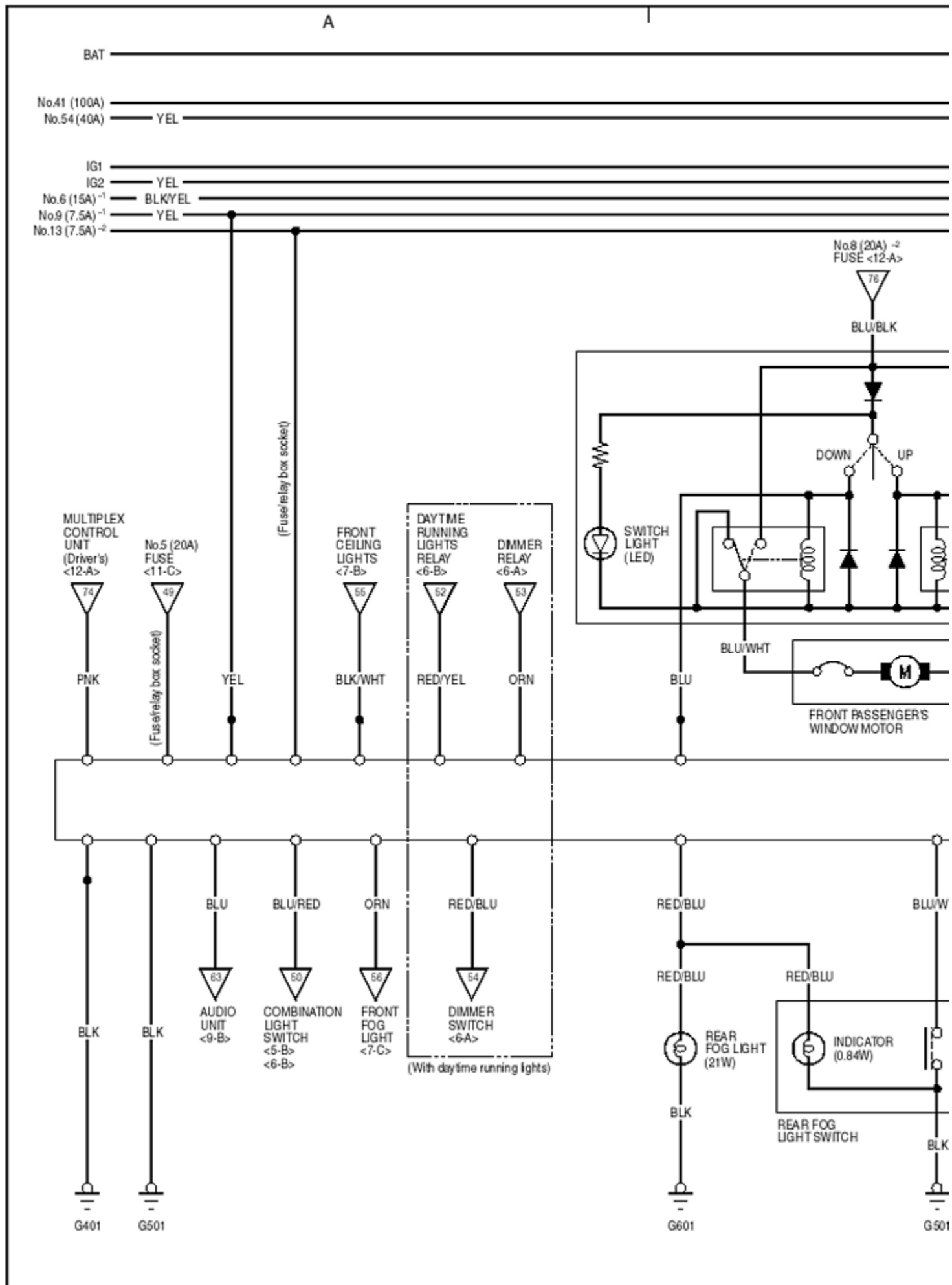


No.47 (15A)

No.8 (7.5A)⁻¹

-1 : DRIVER'S FUSE



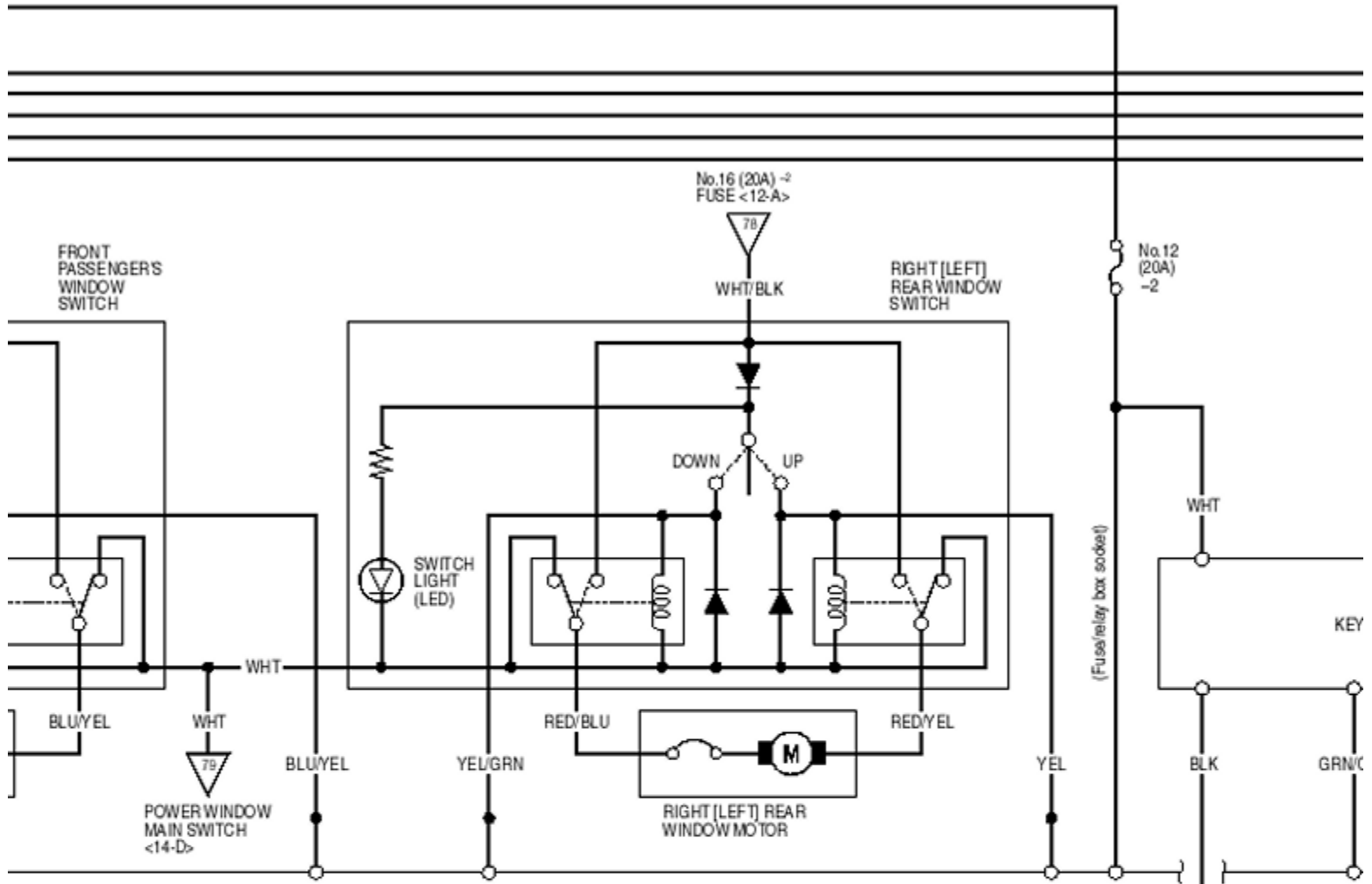


B

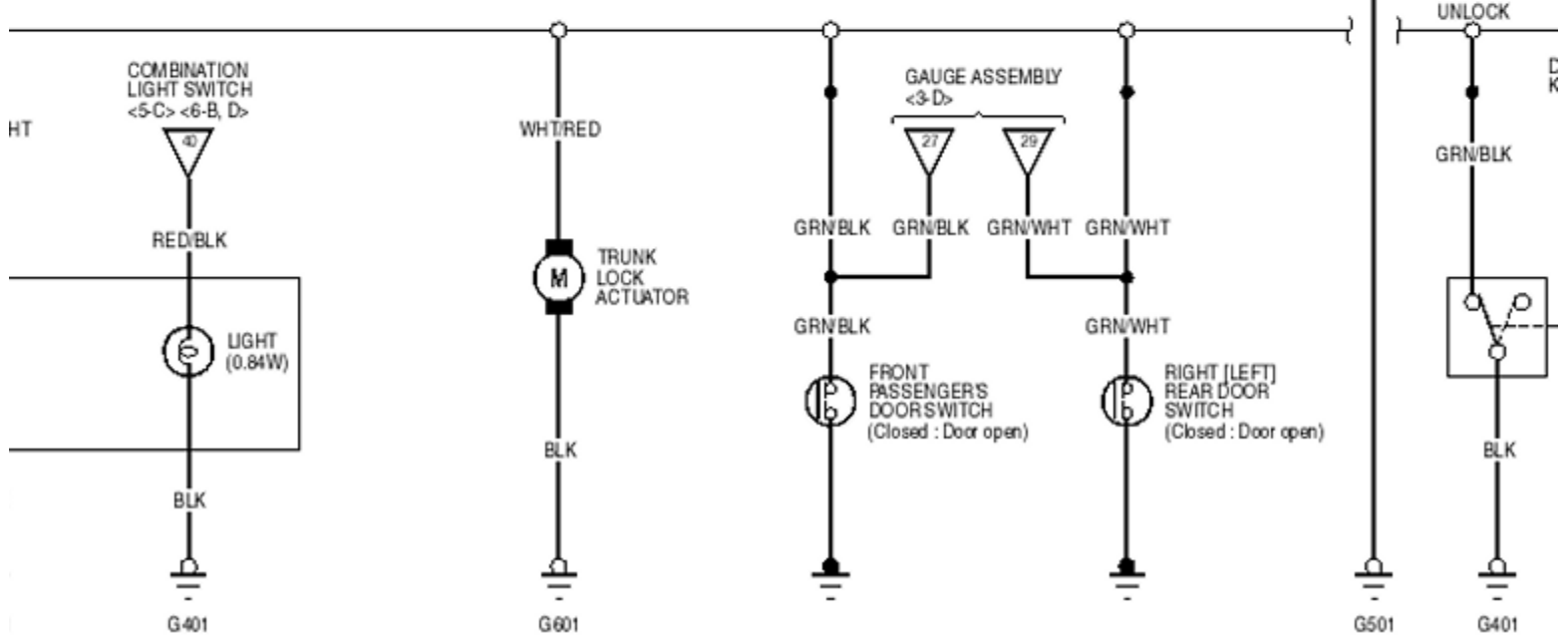
C

B

C

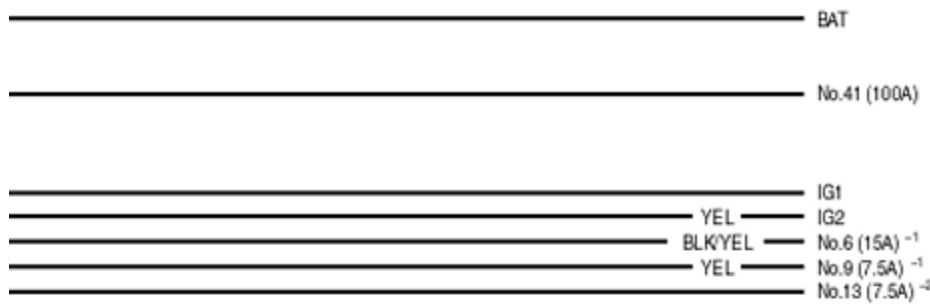


MULTIPLEX CONTROL UNIT (Passenger's)

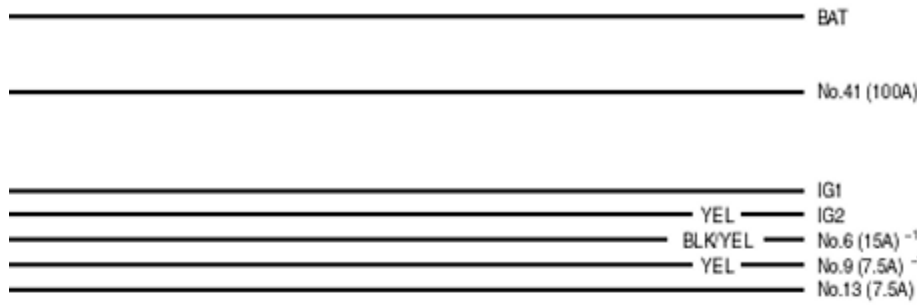


D

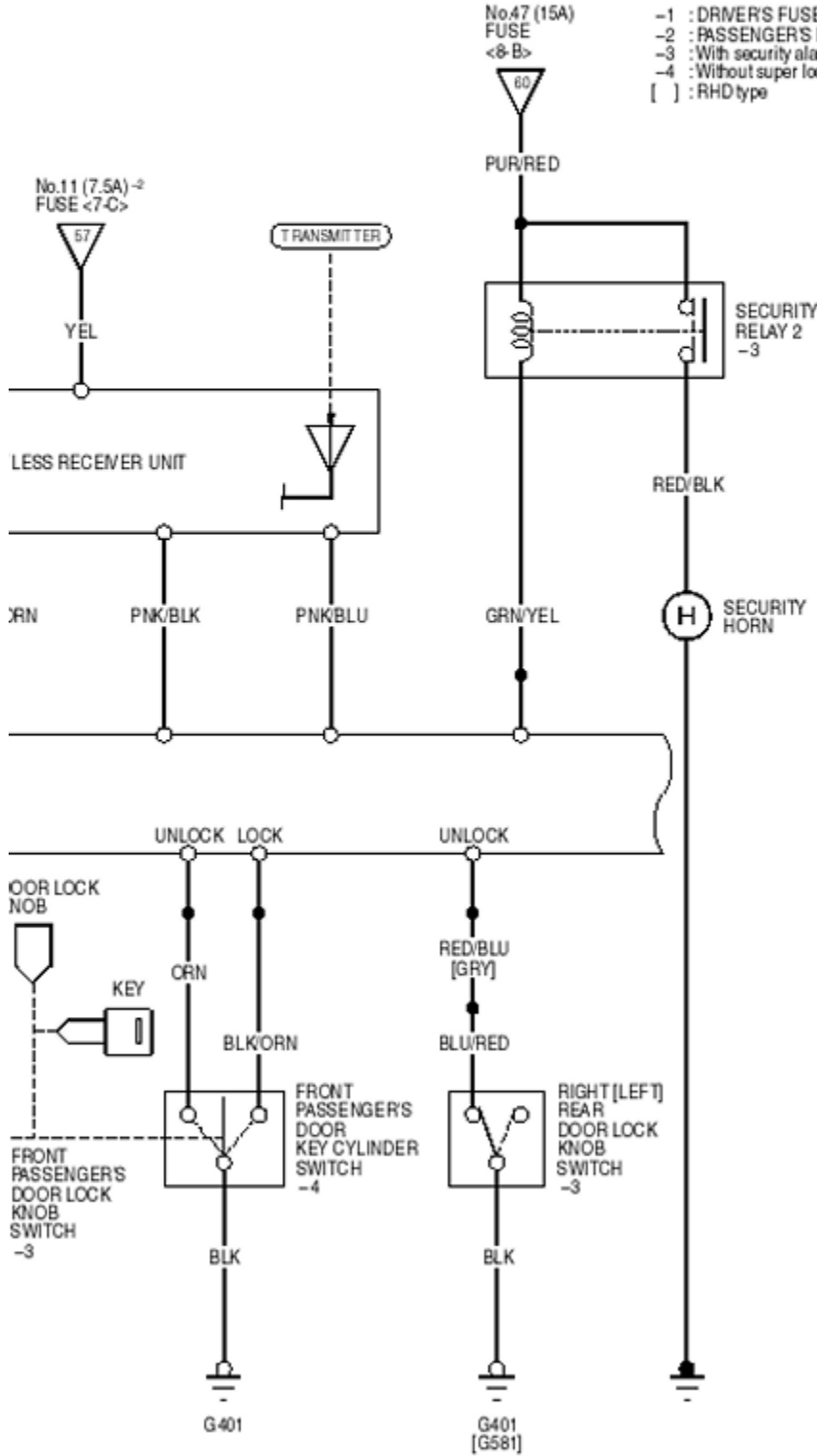
13



No. 47 (15A) -1 : DRIVER'S FUSE

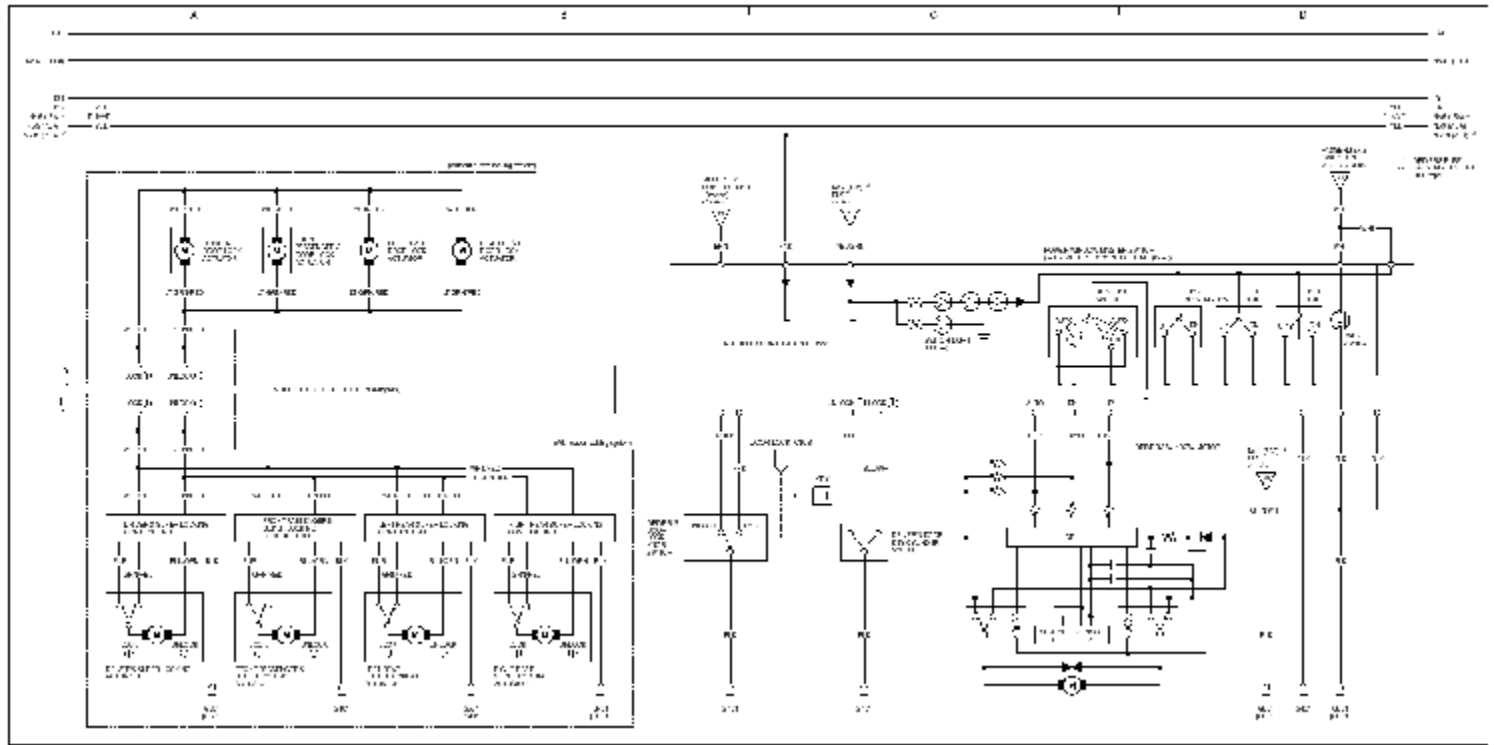


No.47 (15A) FUSE <8-B>
 -1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type



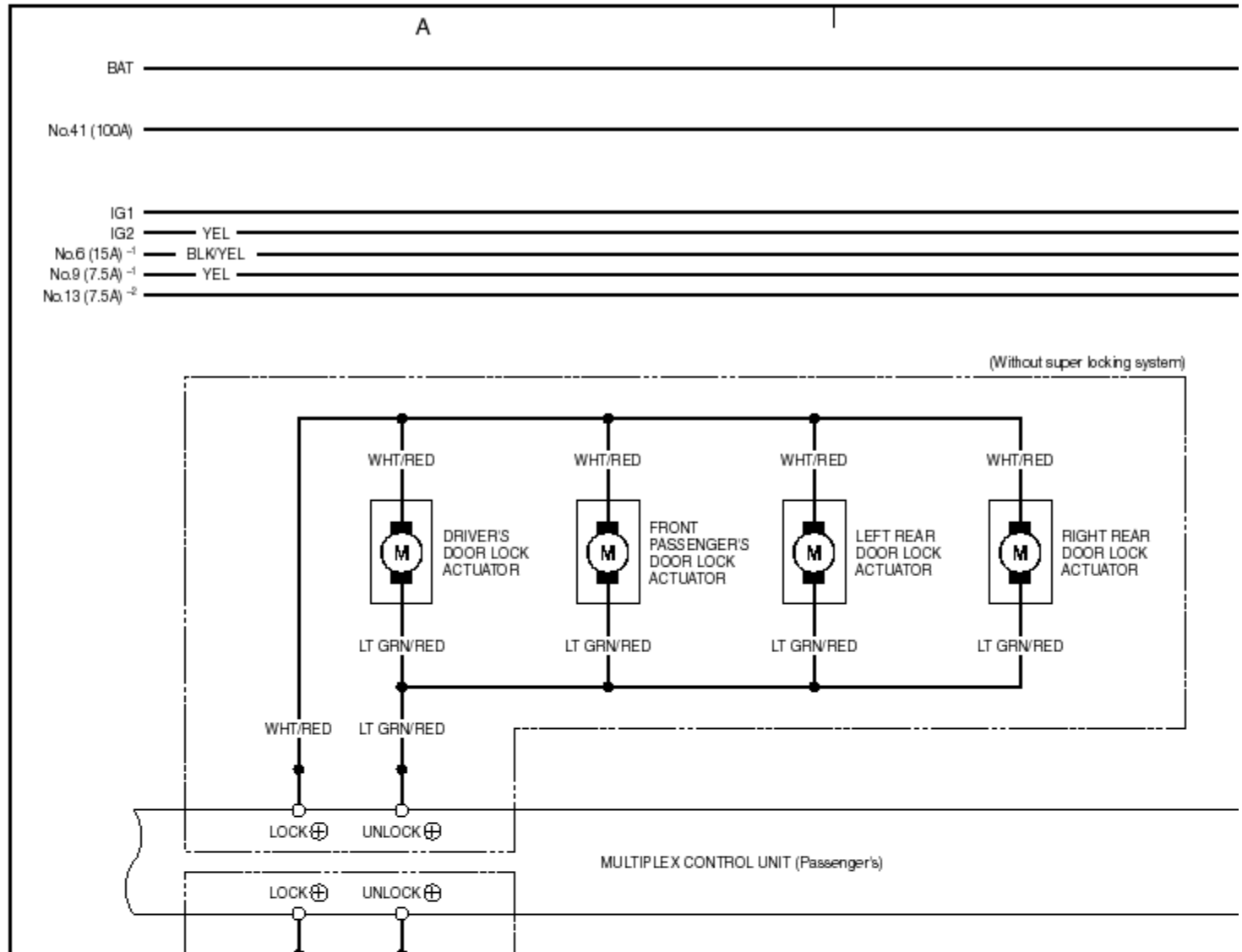
Wiring Diagrams
Multiplex Control System

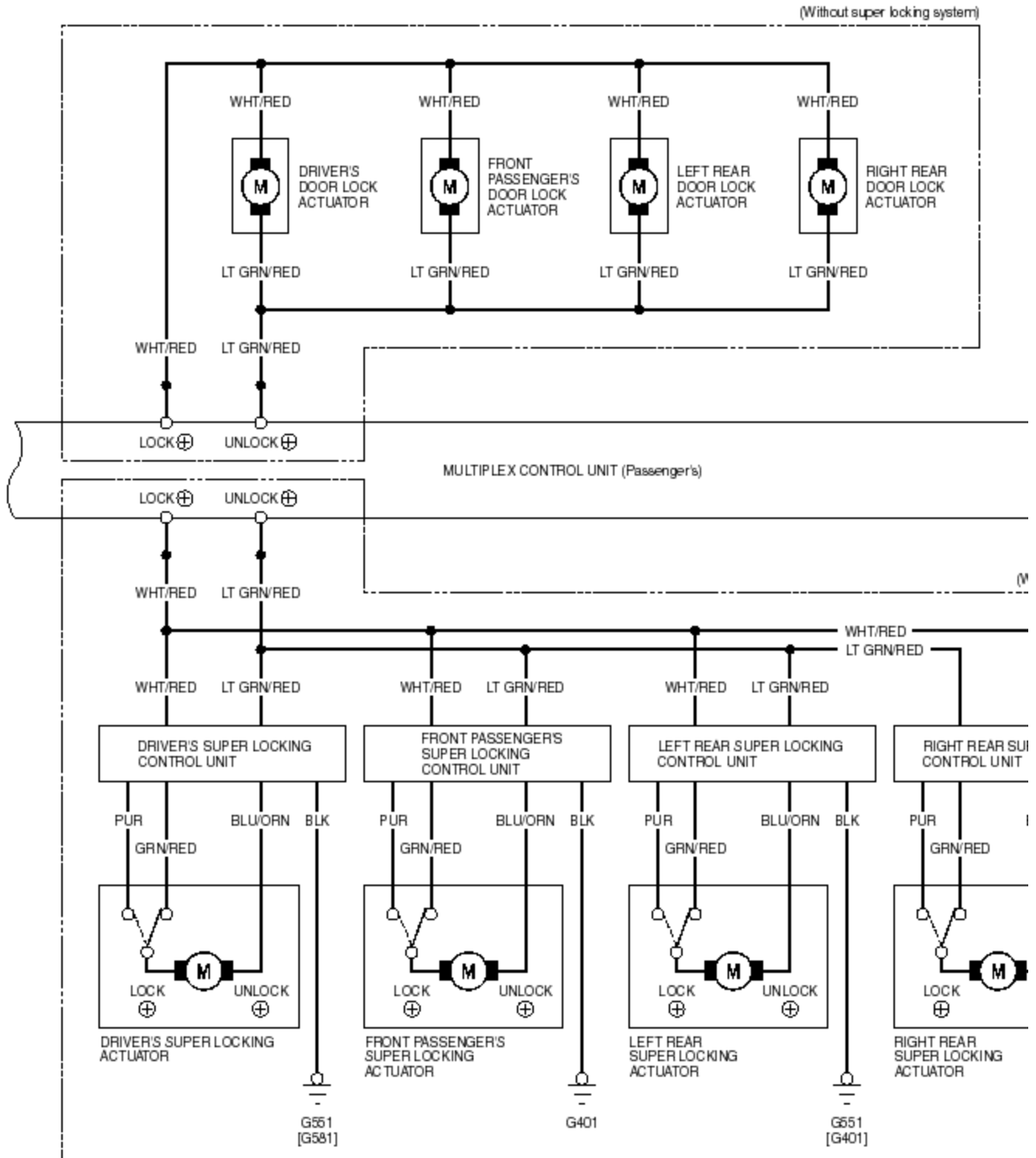
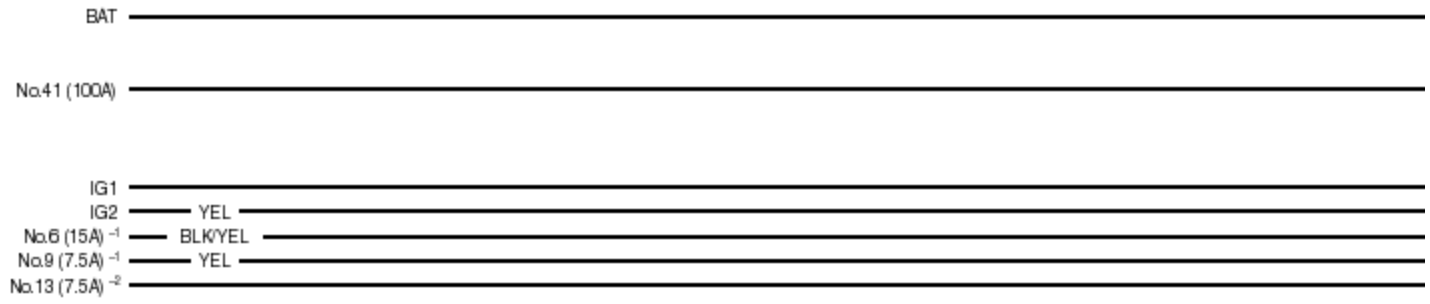
14

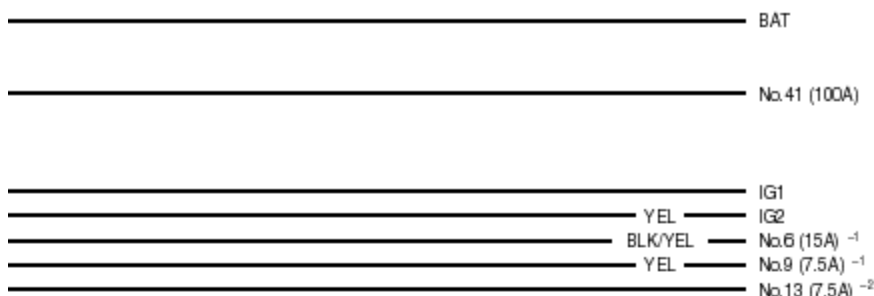
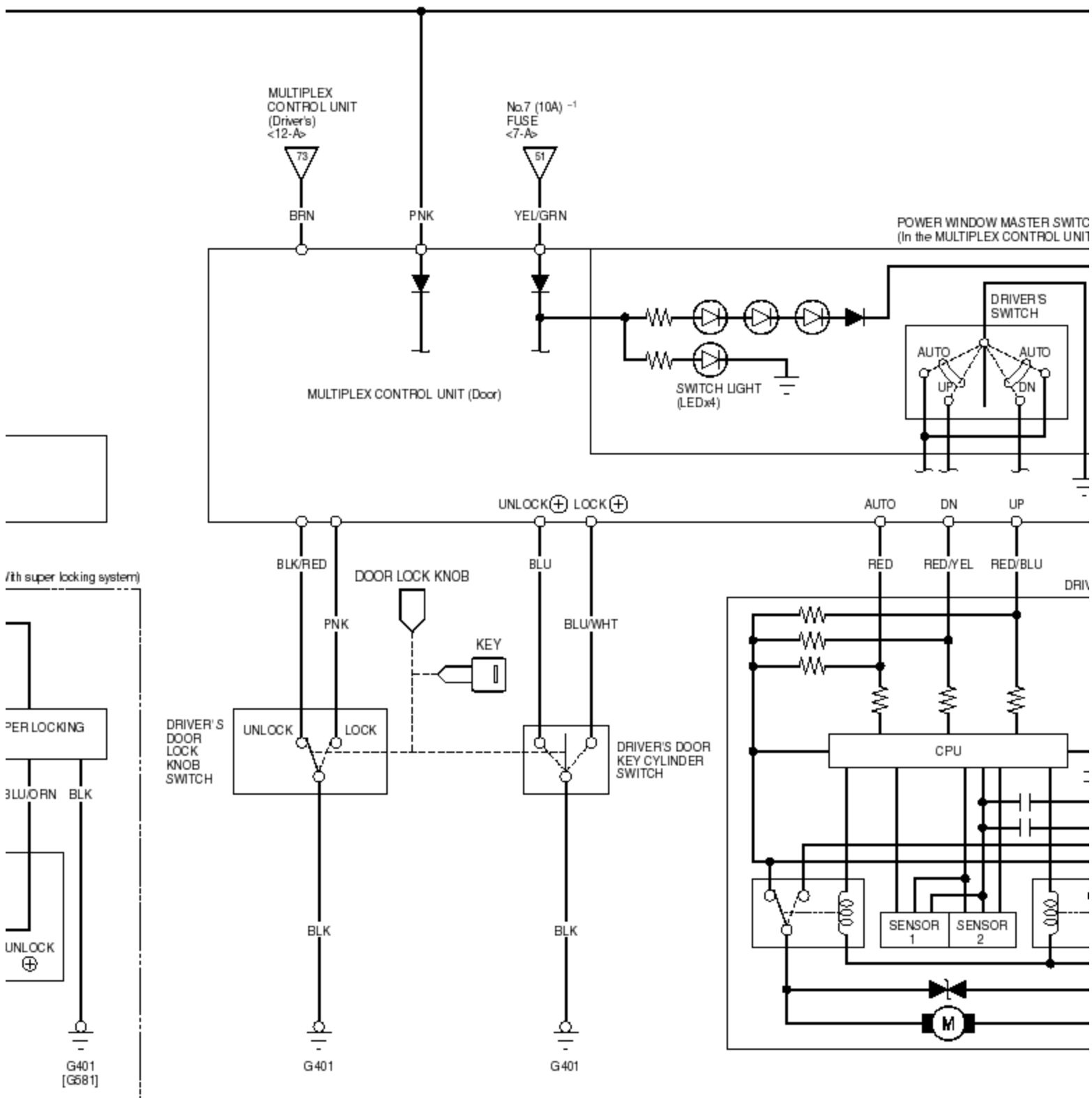


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14







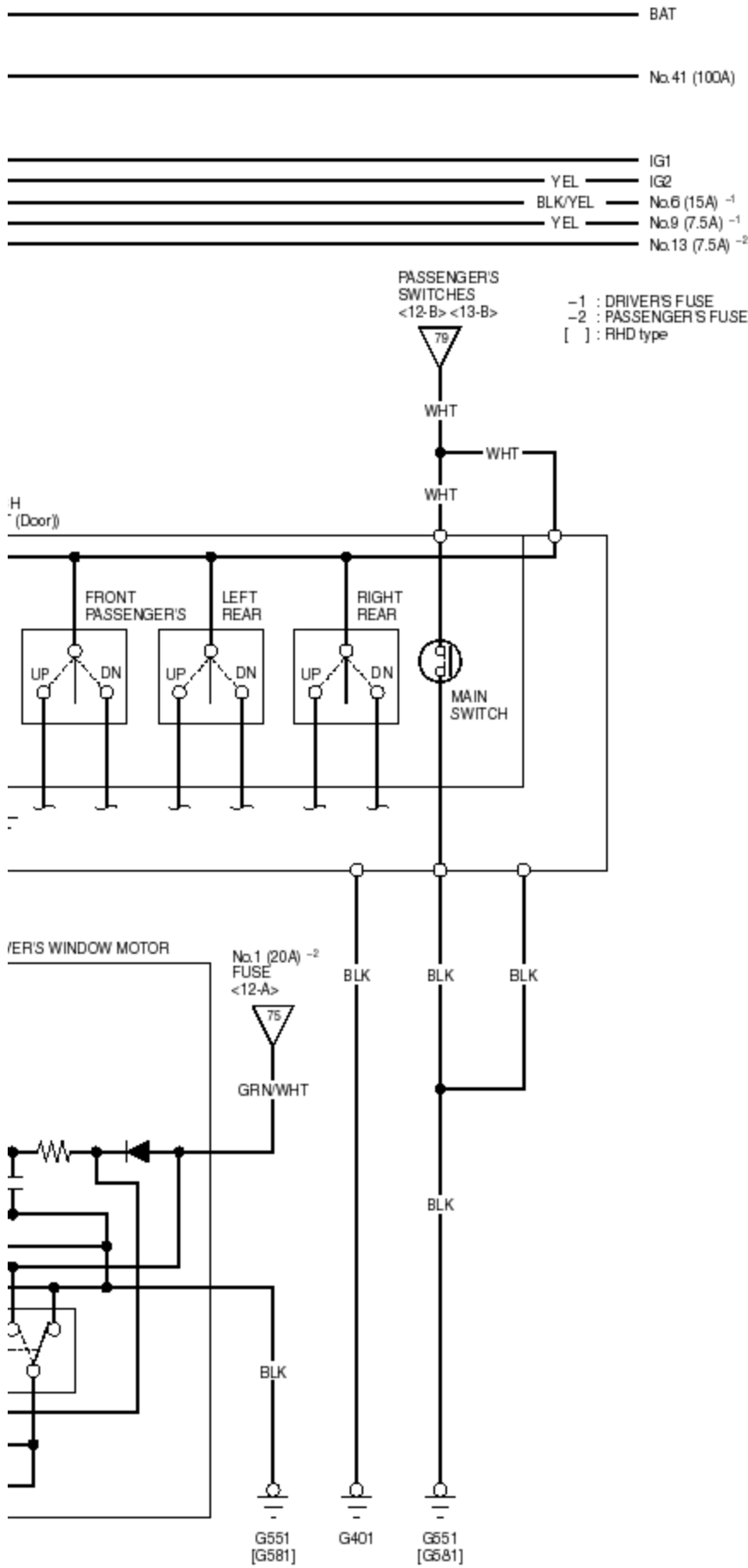
PASSENGER'S SWITCHES <12-B> <13-B>

-1 : DRIVER'S FUSE

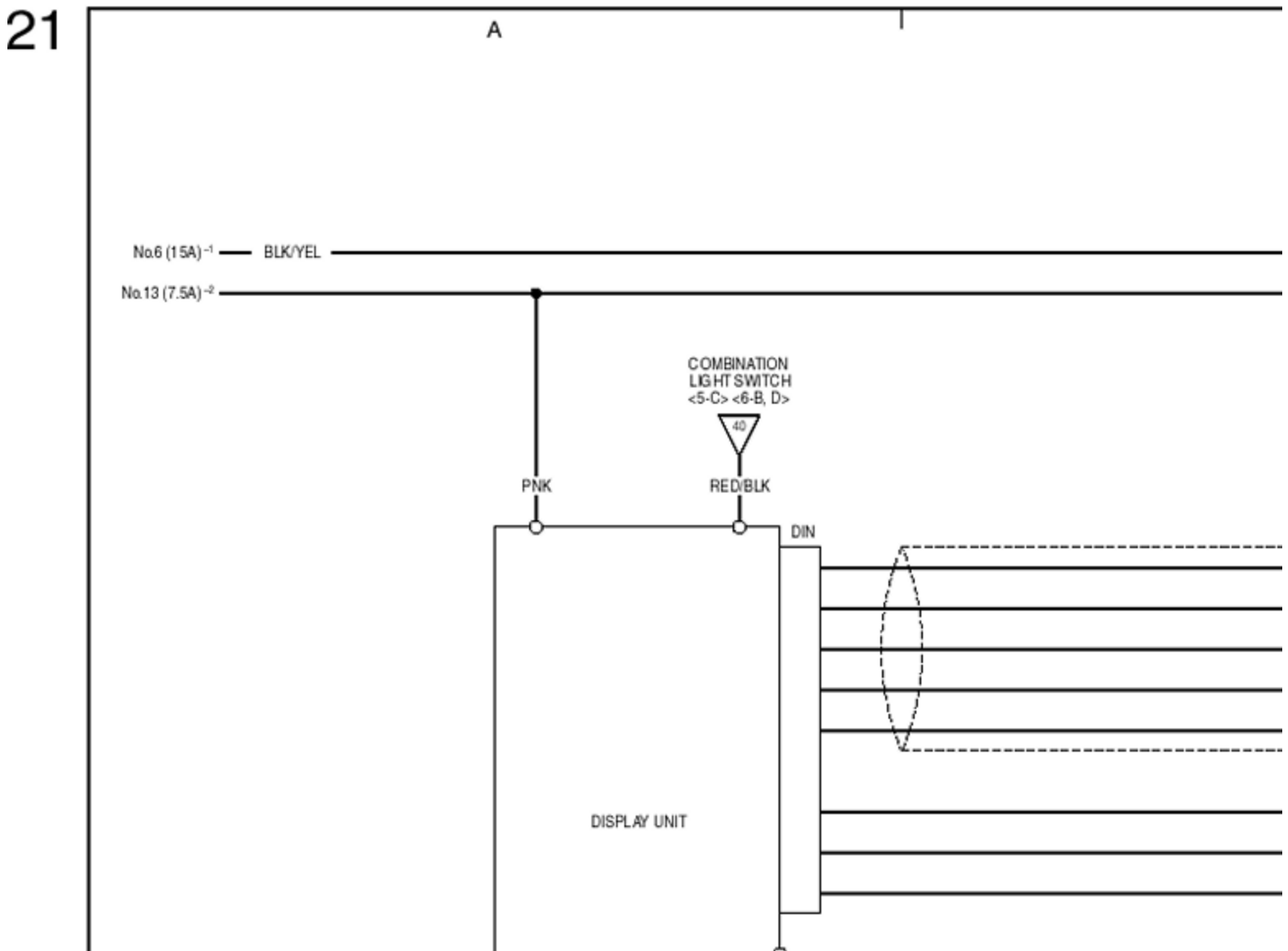
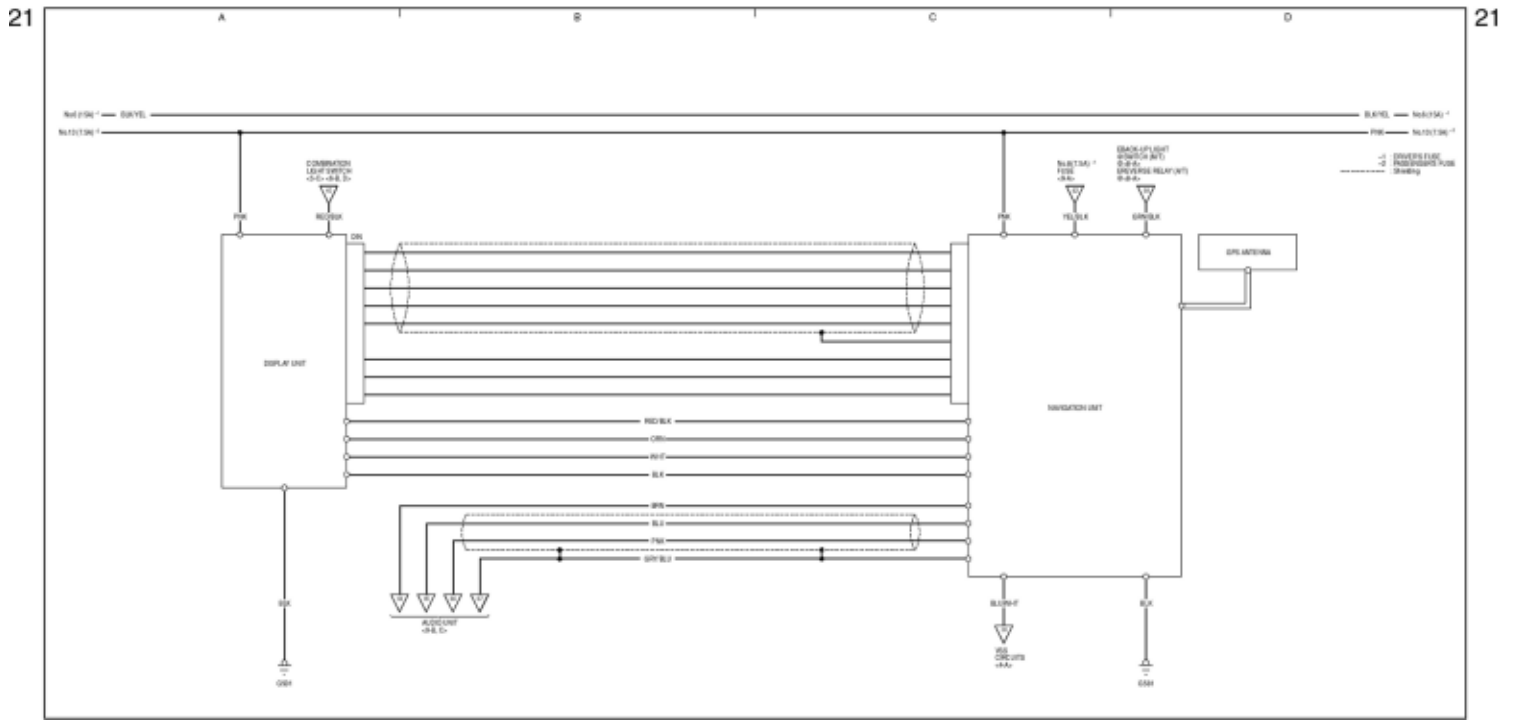
-2 : PASSENGER'S FUSE

[] : RHD type

D



Wiring Diagrams
Navigation System



A

No.6 (15A)⁻¹ — BLK/YEL

No.13 (7.5A)⁻²

COMBINATION
LIGHT SWITCH
<5-C> <6-B, D>

40

PNK

RED/BLK

DIN

DISPLAY UNIT

BLK

G901

64

65

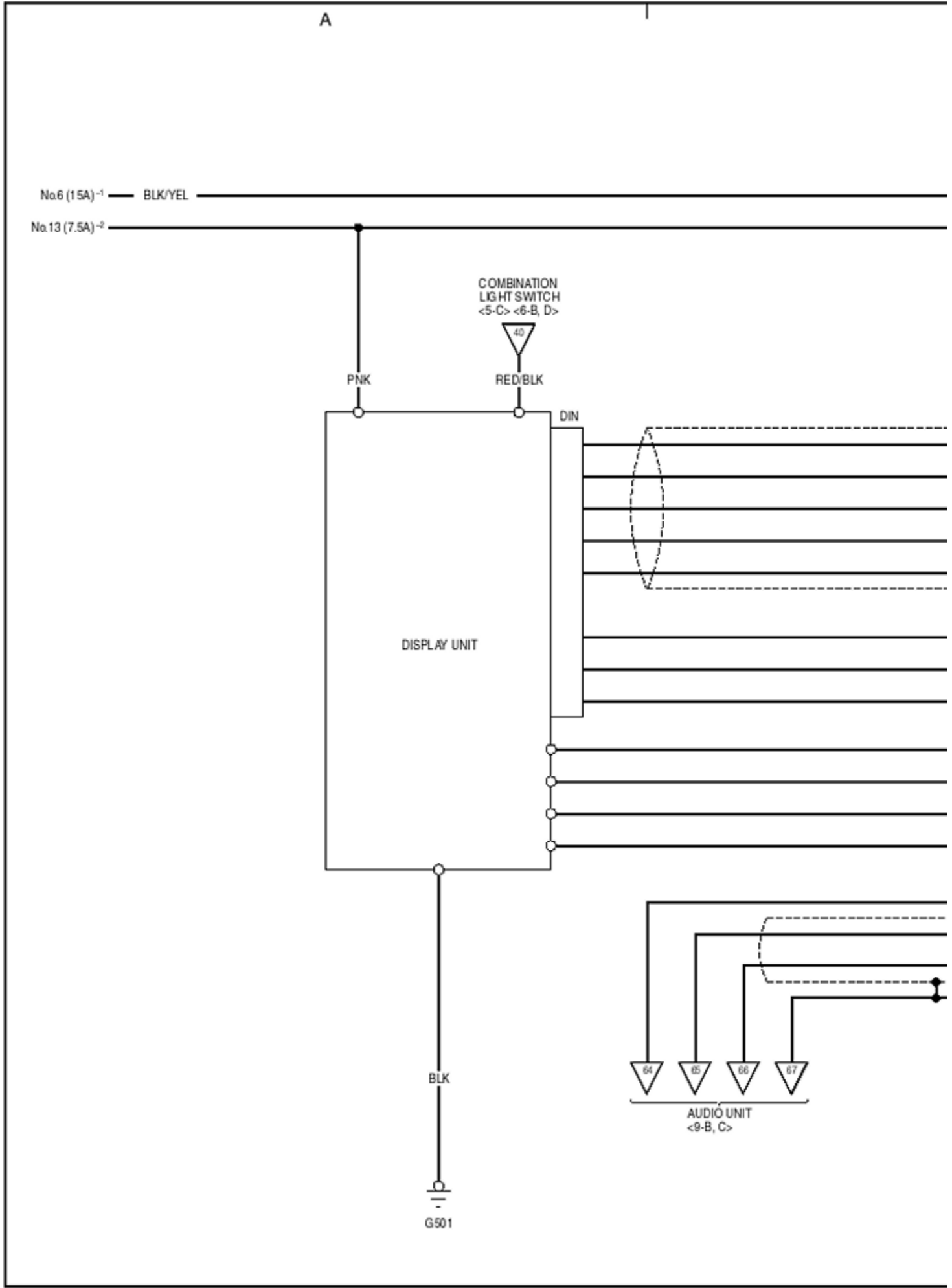
66

67

AUDIO UNIT
<9-B, C>

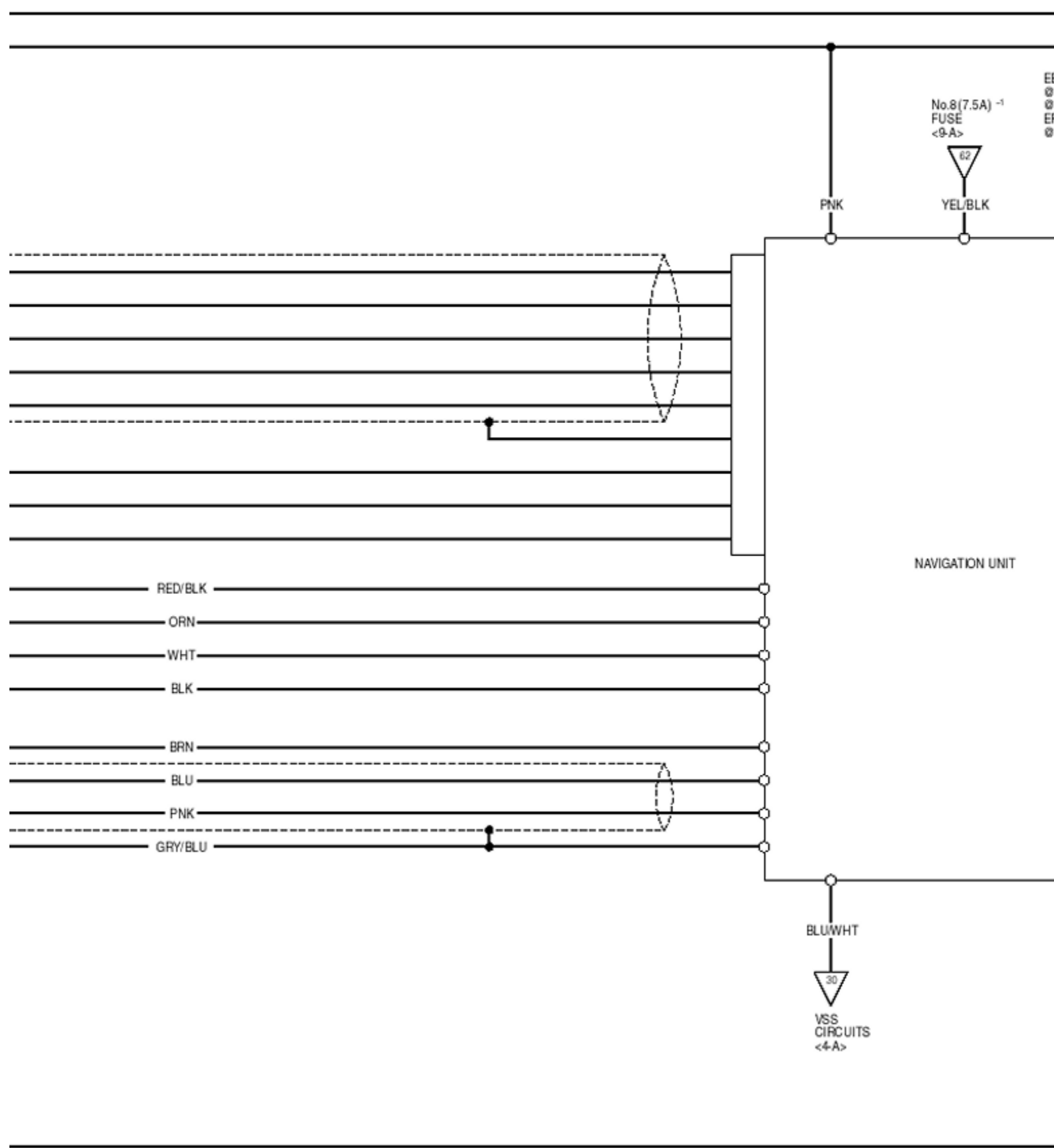
B

C



B

C



EE
EF
EF

D

21

BLK/YEL — No.6 (15A) ⁻¹

PNK — No.13 (7.5A) ⁻²

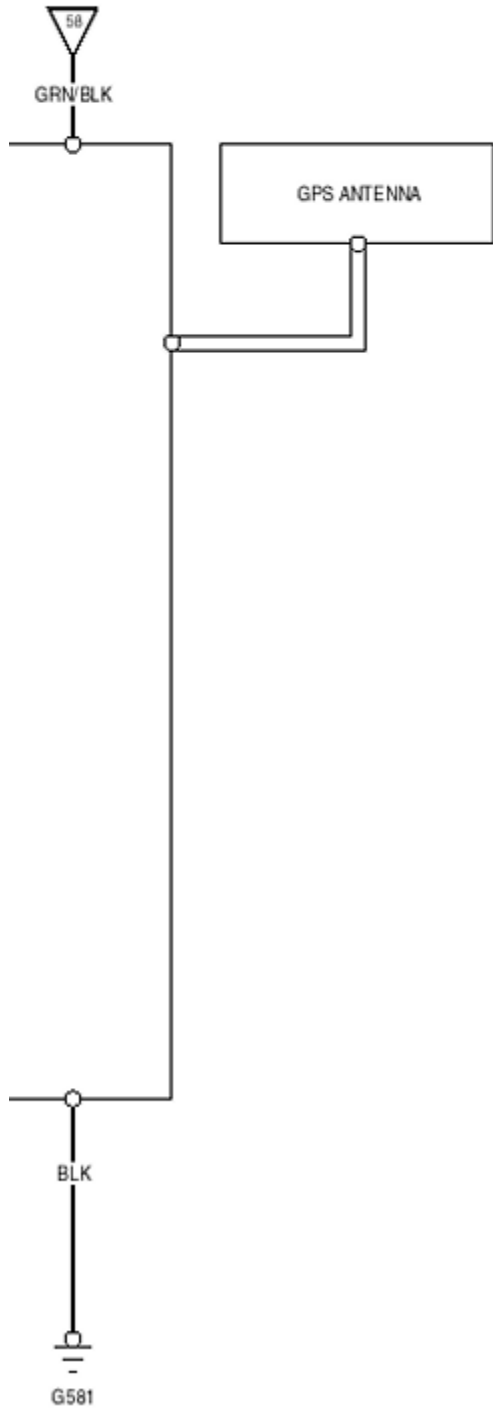
JACK-UP LIGHT SWITCH (M/T)

-1 : DRIVERS FUSE

BLK/YEL — No.6 (15A) ⁻¹
PNK — No.13 (7.5A) ⁻²

JACK-UP LIGHT
SWITCH (M/T)
<8-A>
REVERSE RELAY (A/T)
<8-A>

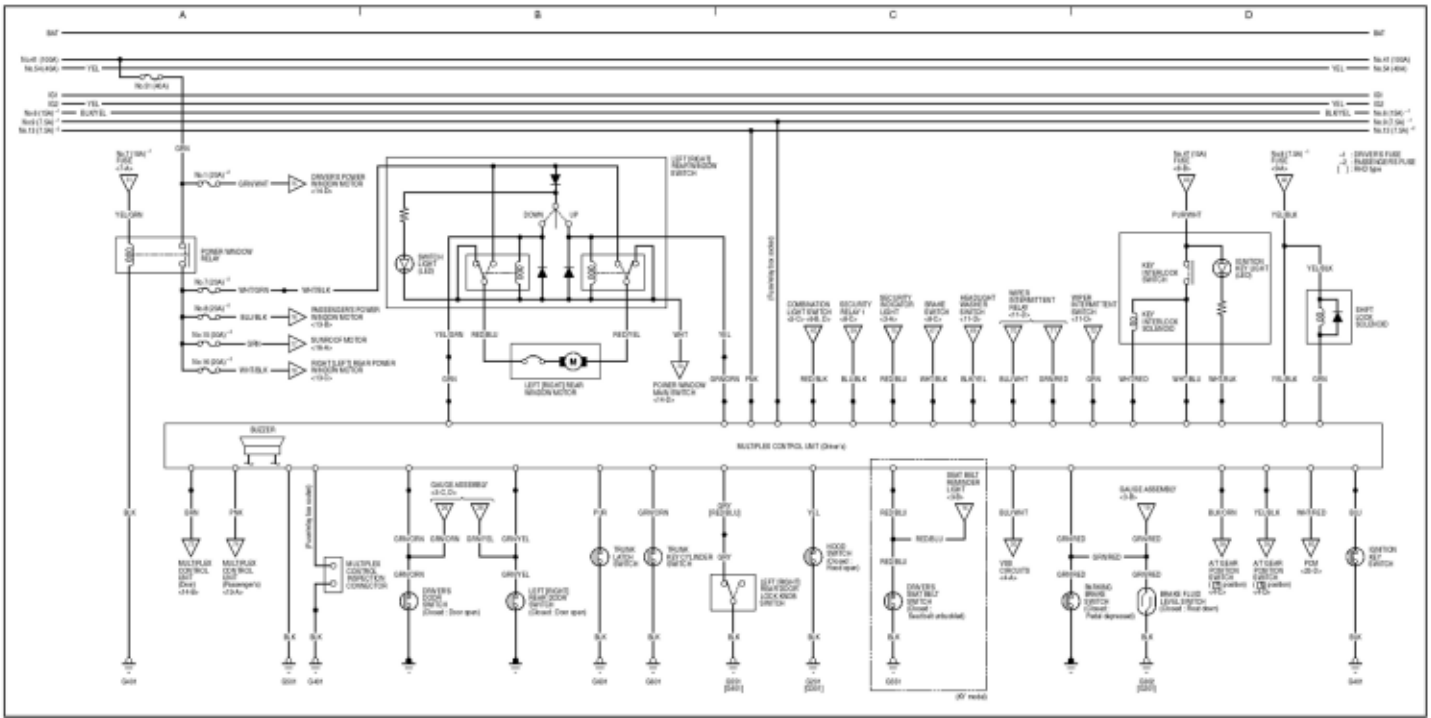
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
----- : Shielding



Wiring Diagrams

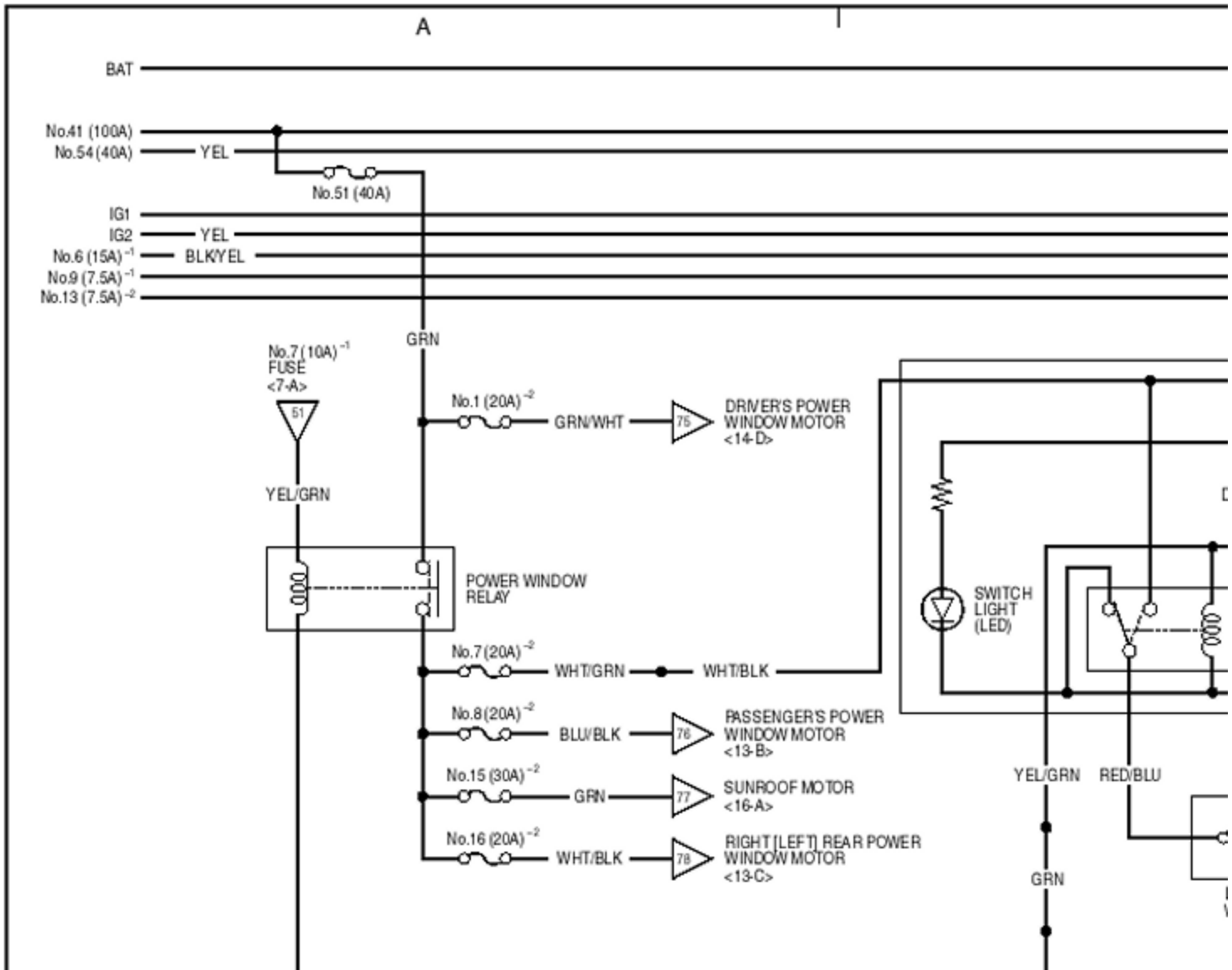
Power Door Locks

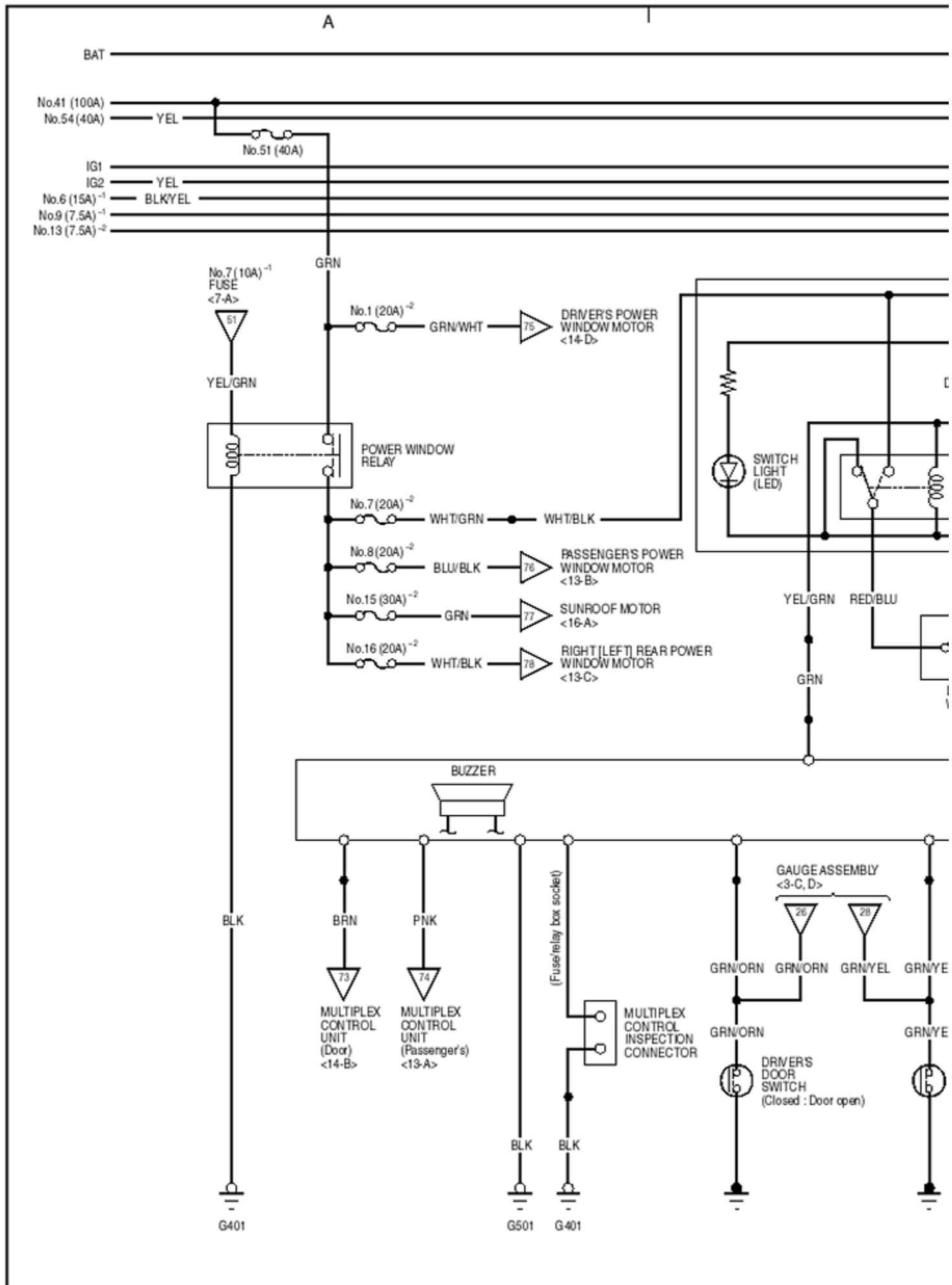
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12

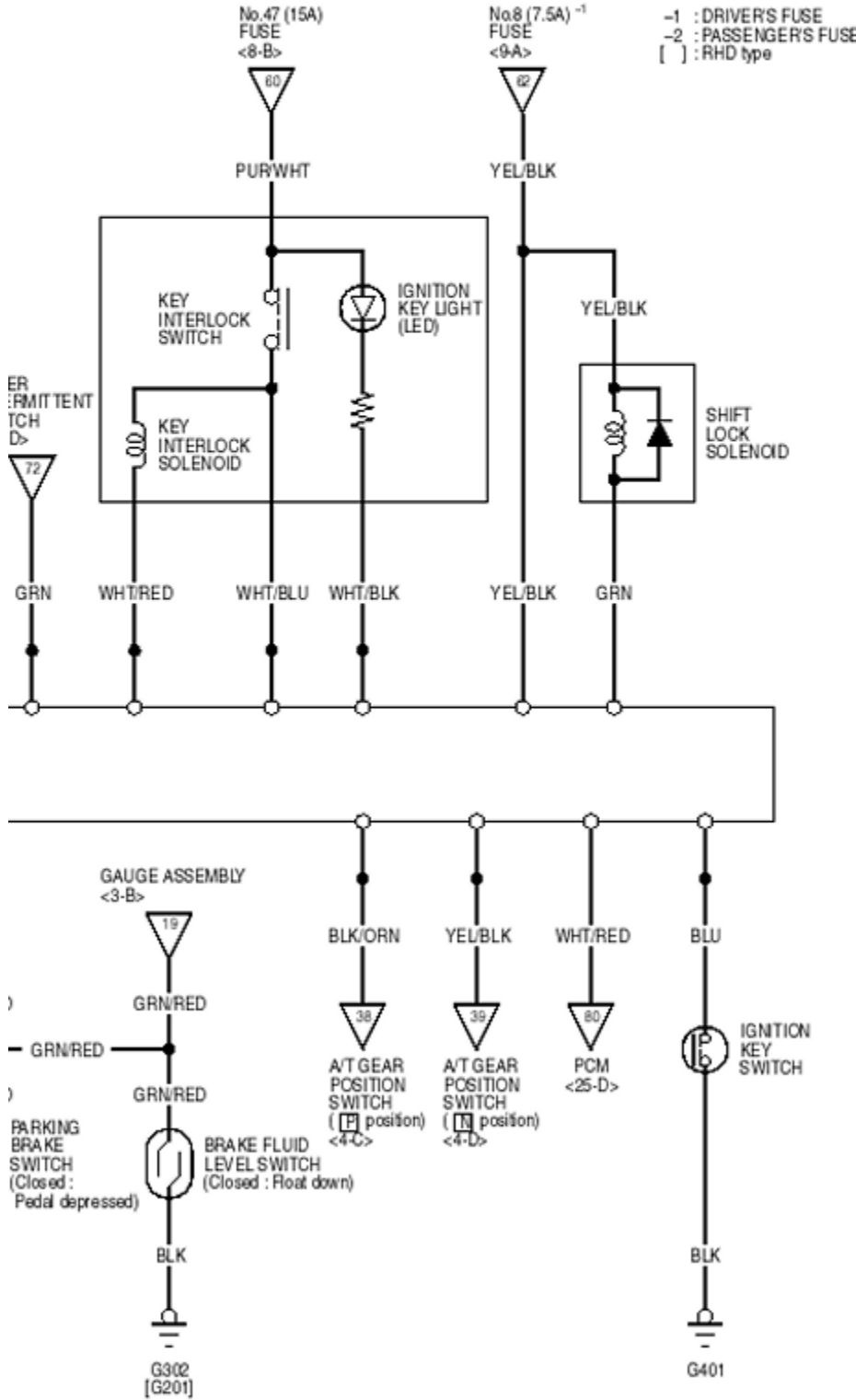
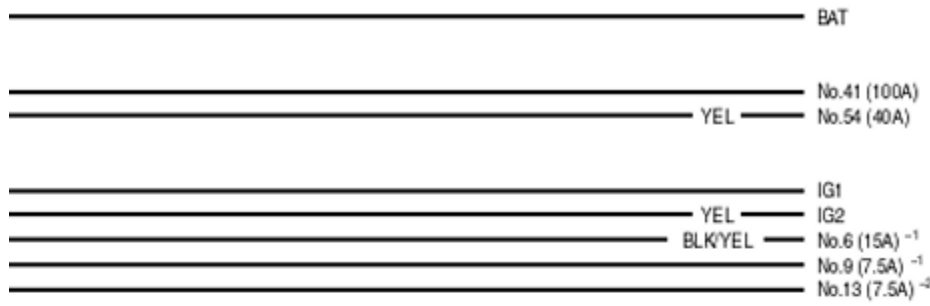
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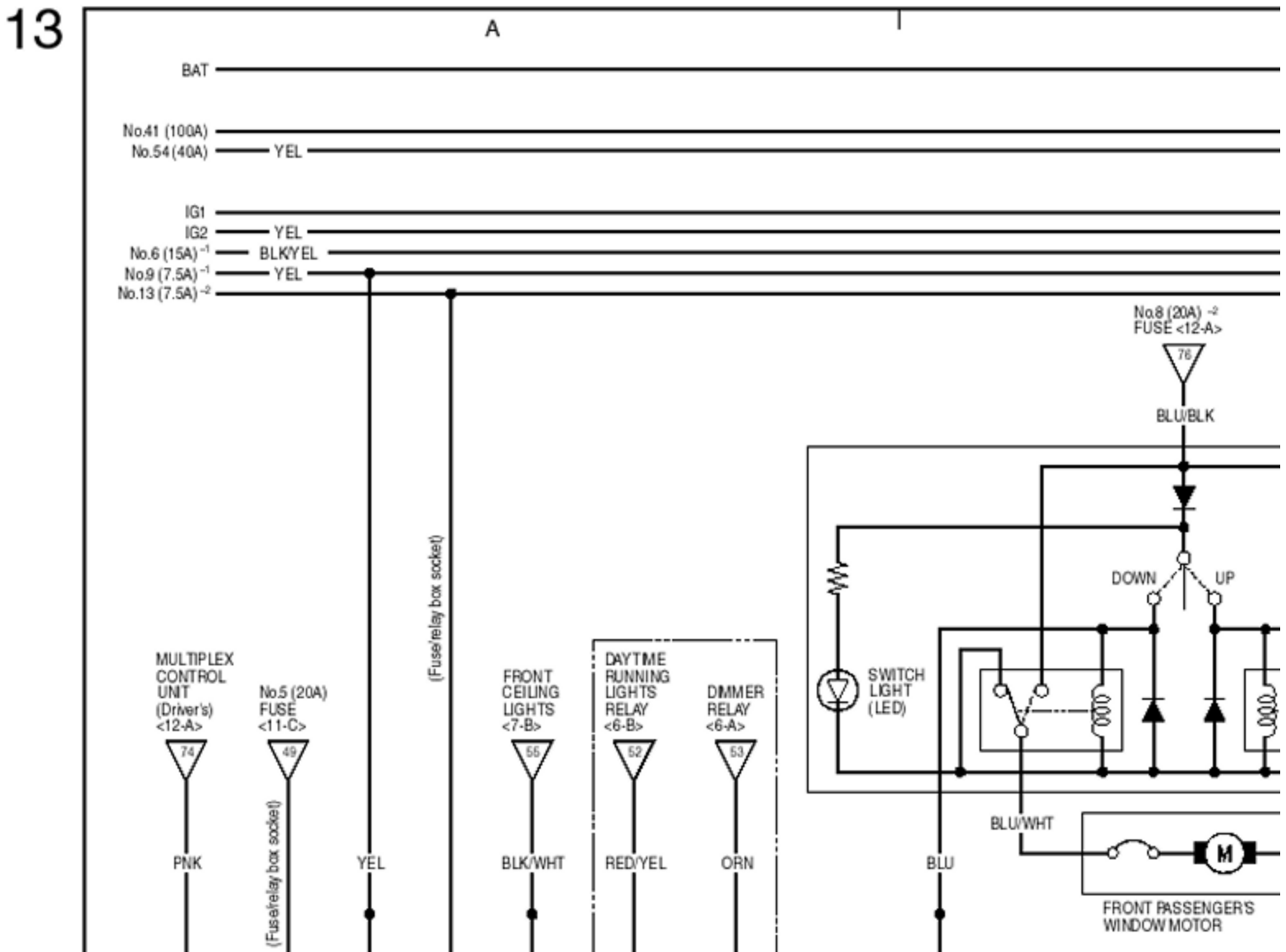
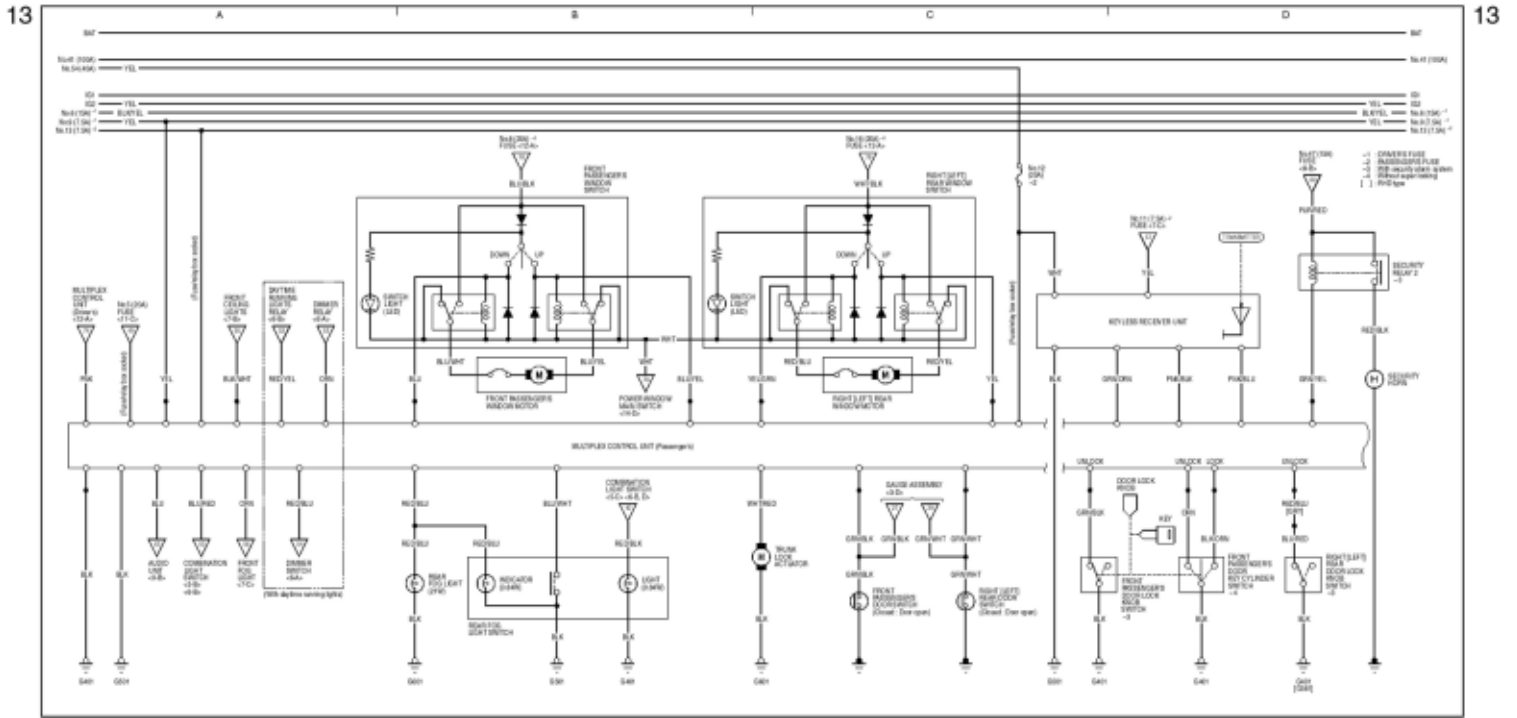
B

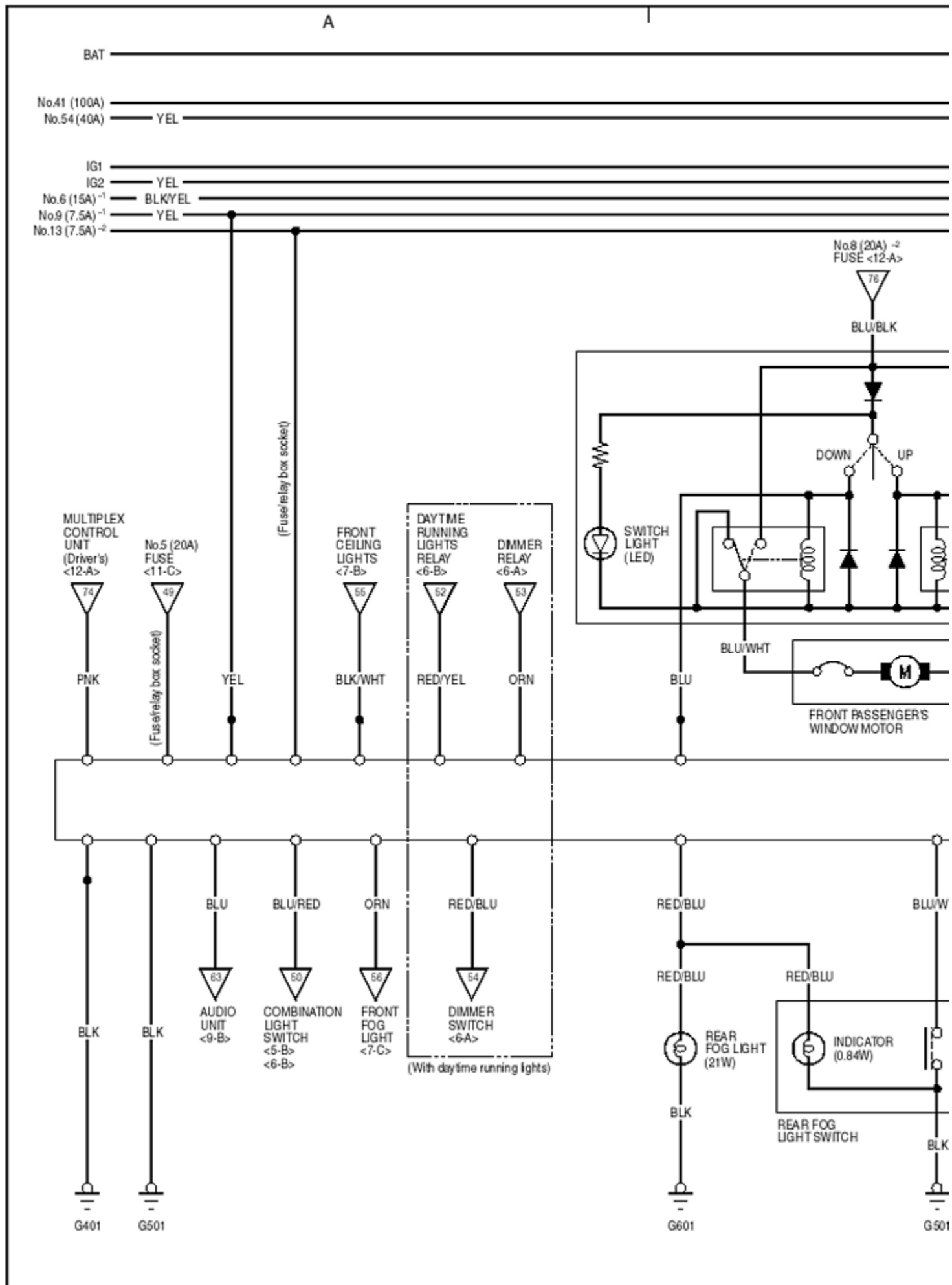
C



Wiring Diagrams

Power Door Locks



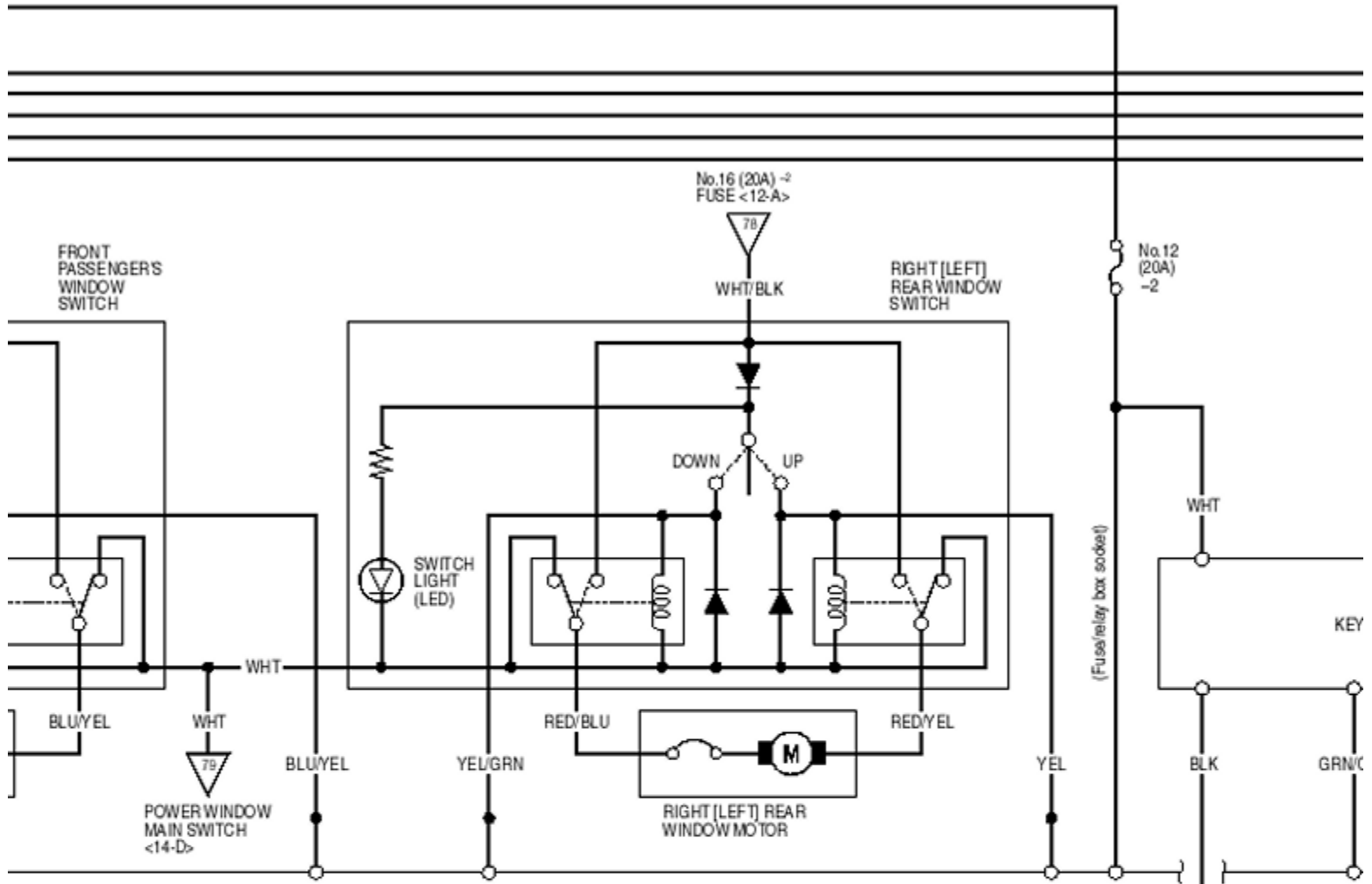


B

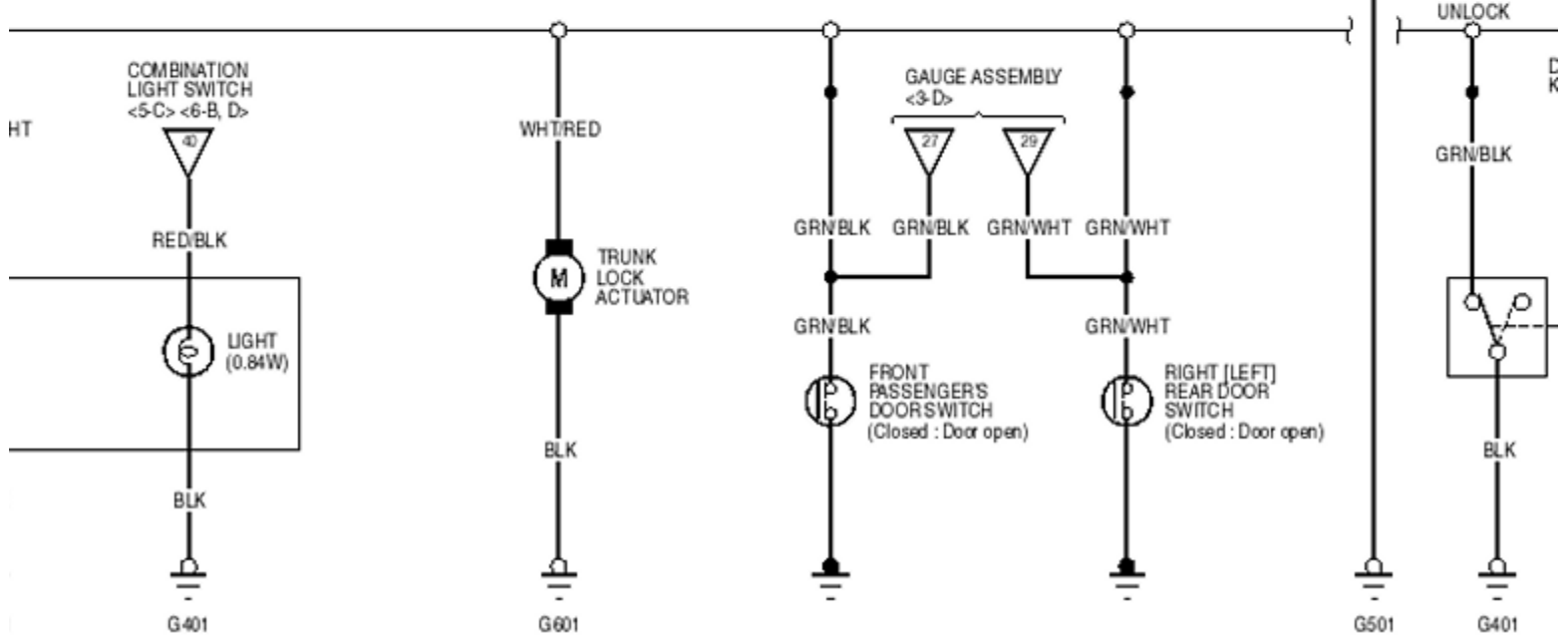
C

B

C

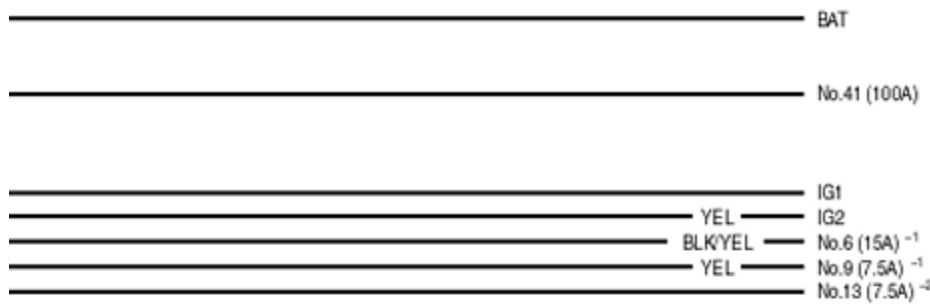


MULTIPLEX CONTROL UNIT (Passenger's)

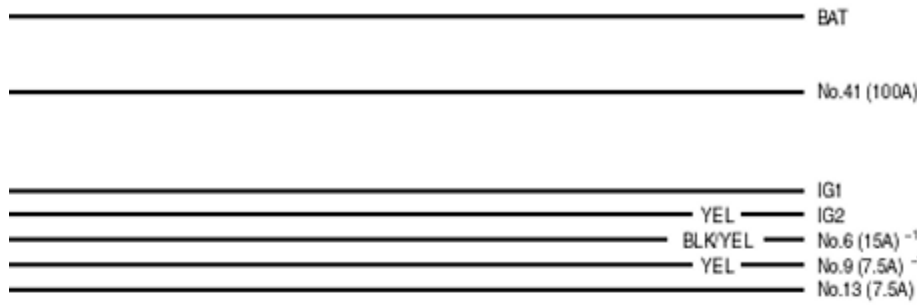


D

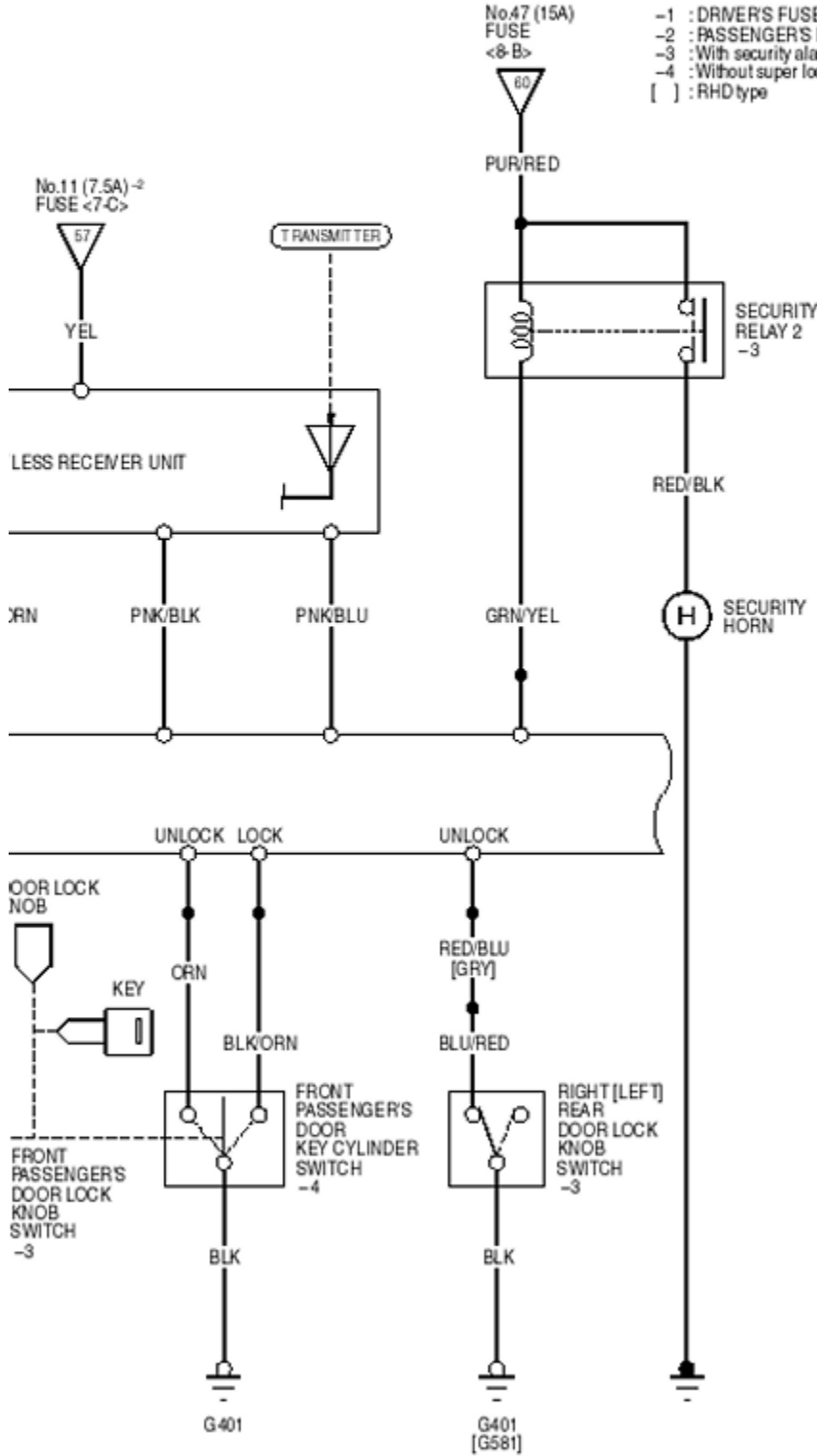
13



No. 47 (15A) -1 : DRIVER'S FUSE



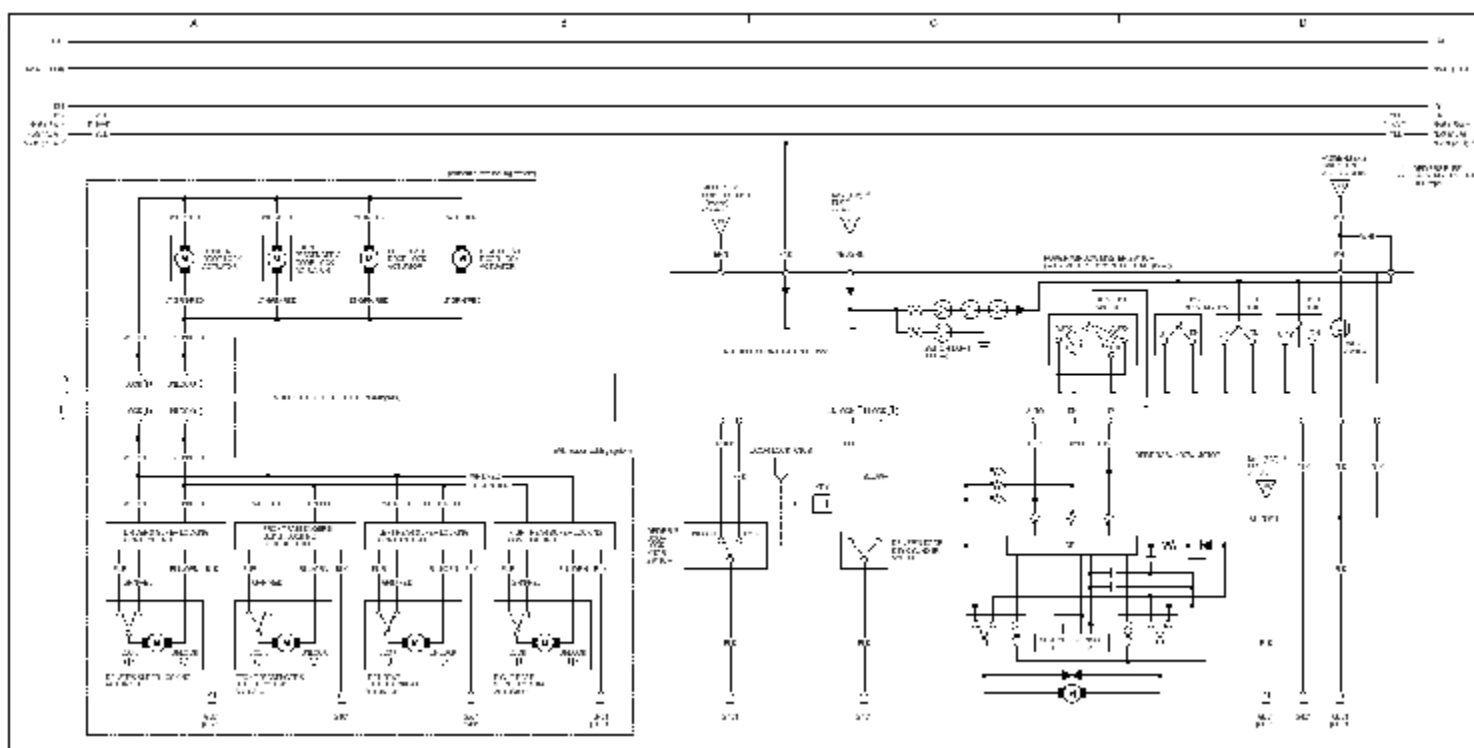
No.47 (15A) FUSE <8-B>
 -1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type



Wiring Diagrams

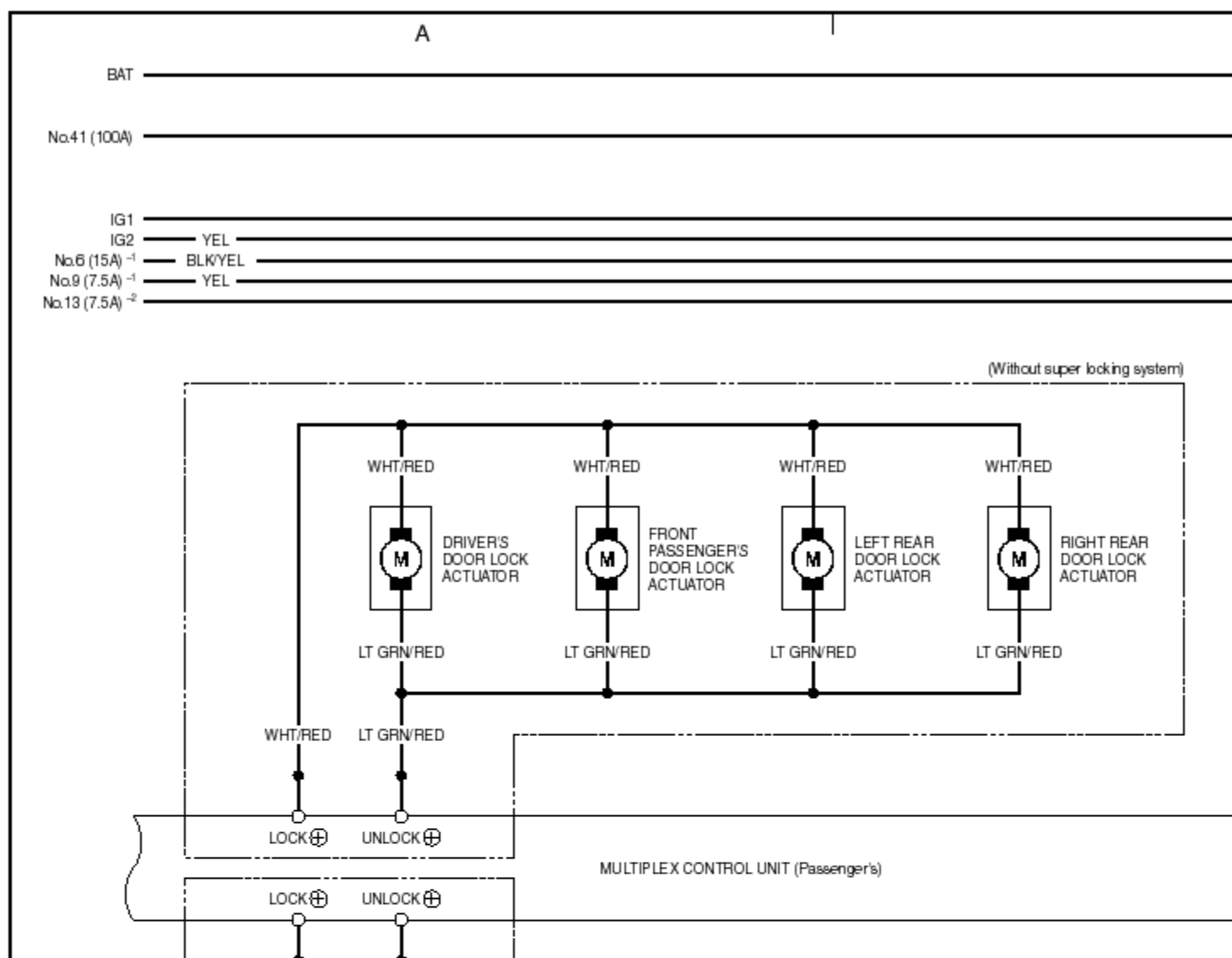
Power Door Locks

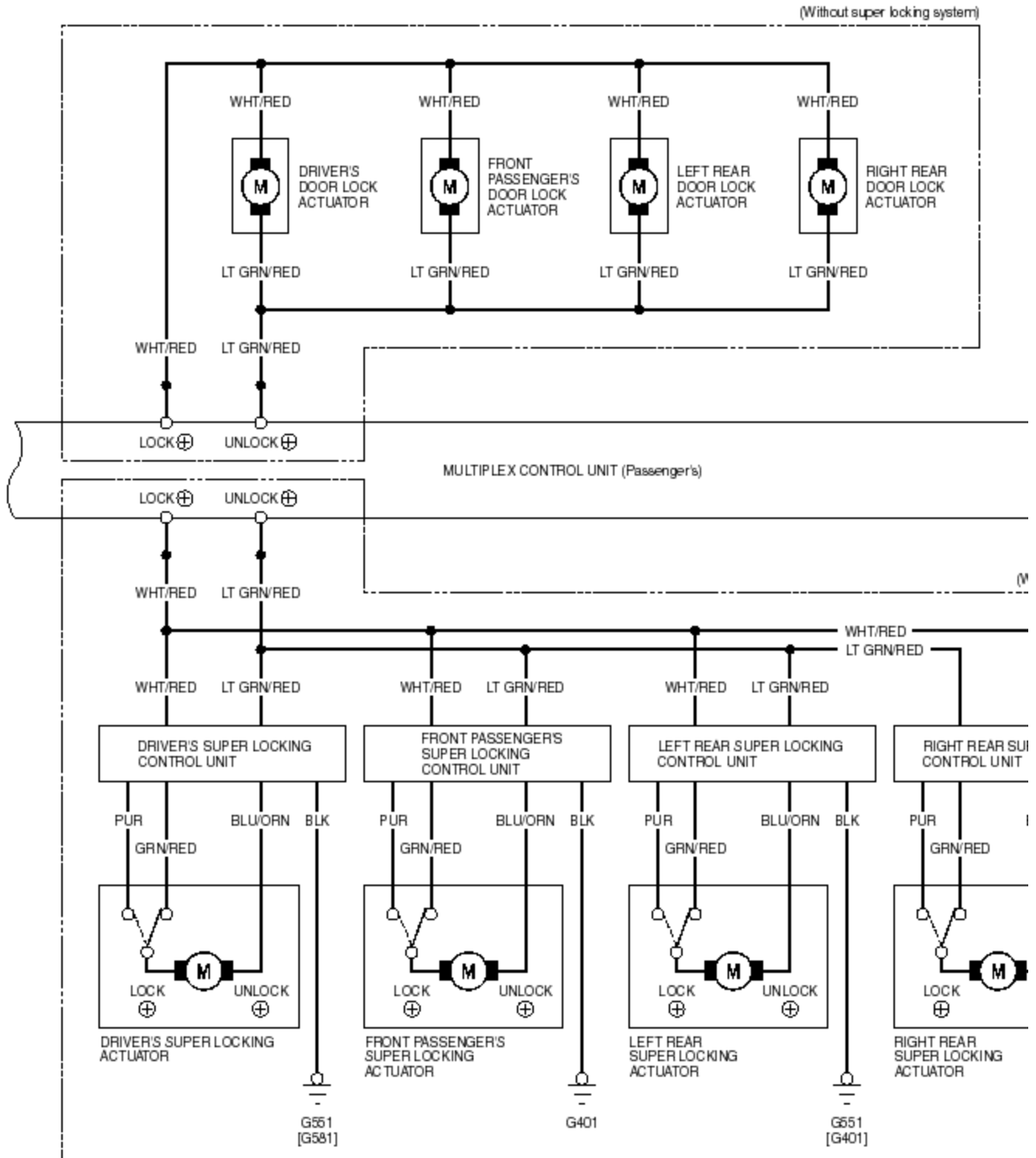
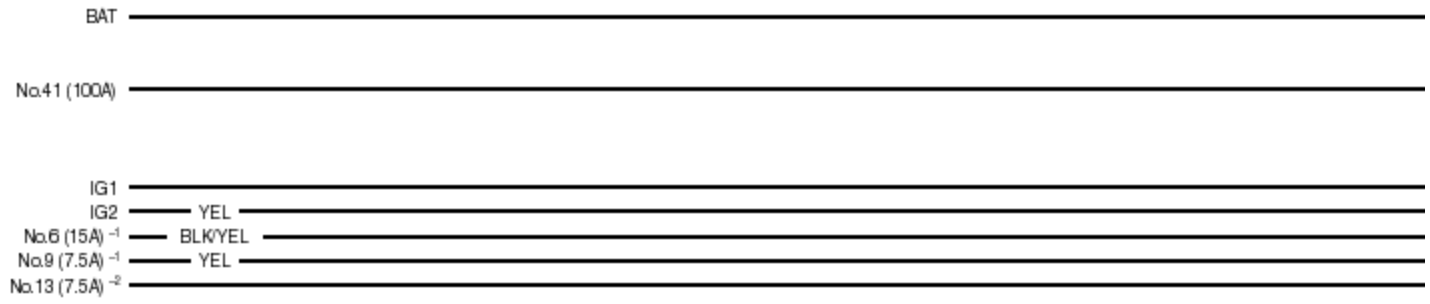
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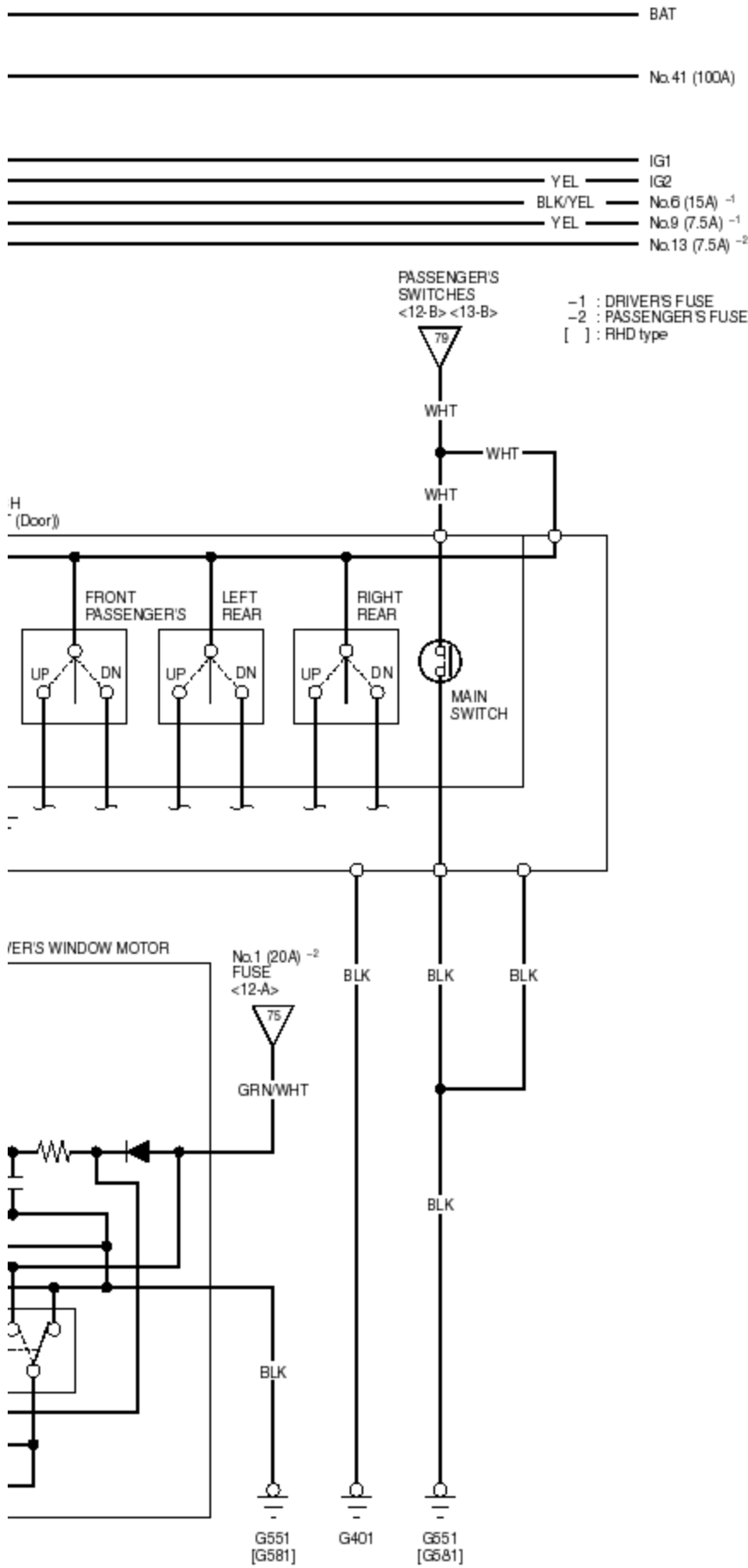
14

14





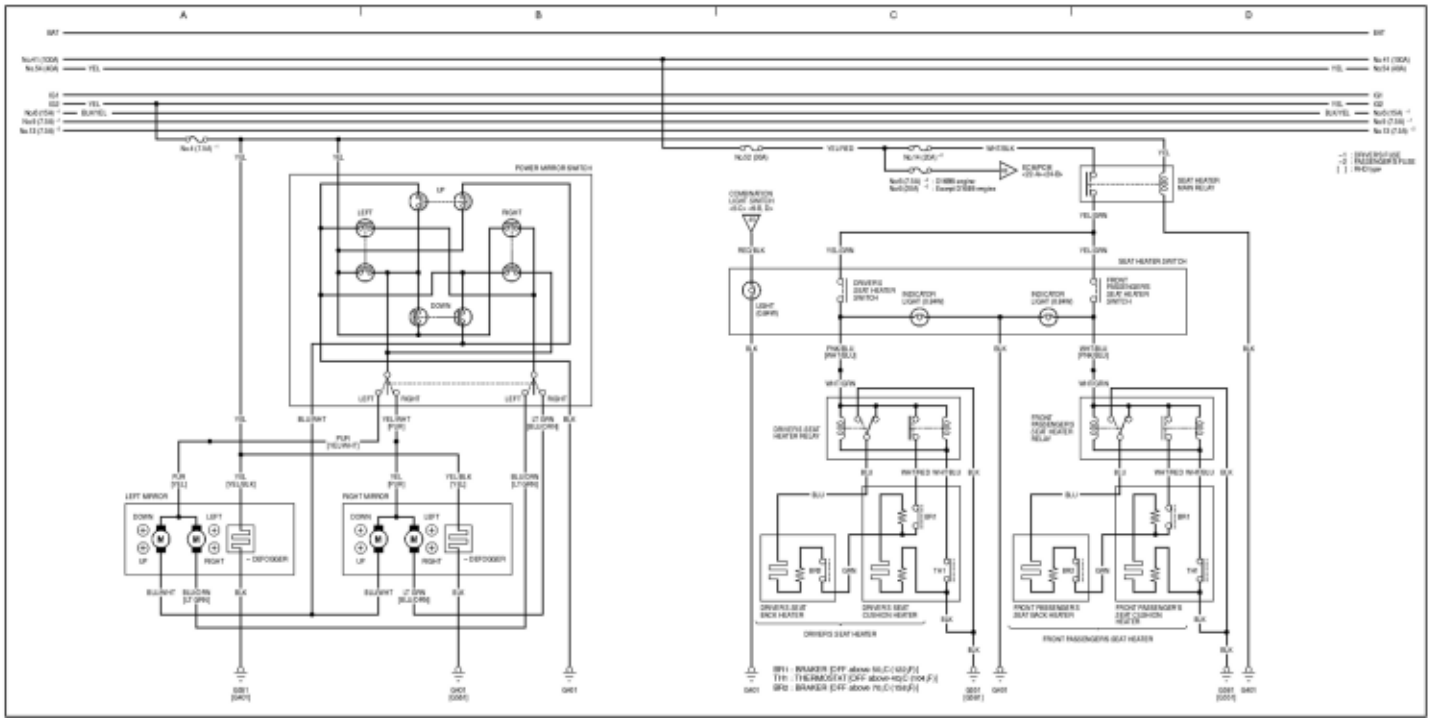
D



Wiring Diagrams

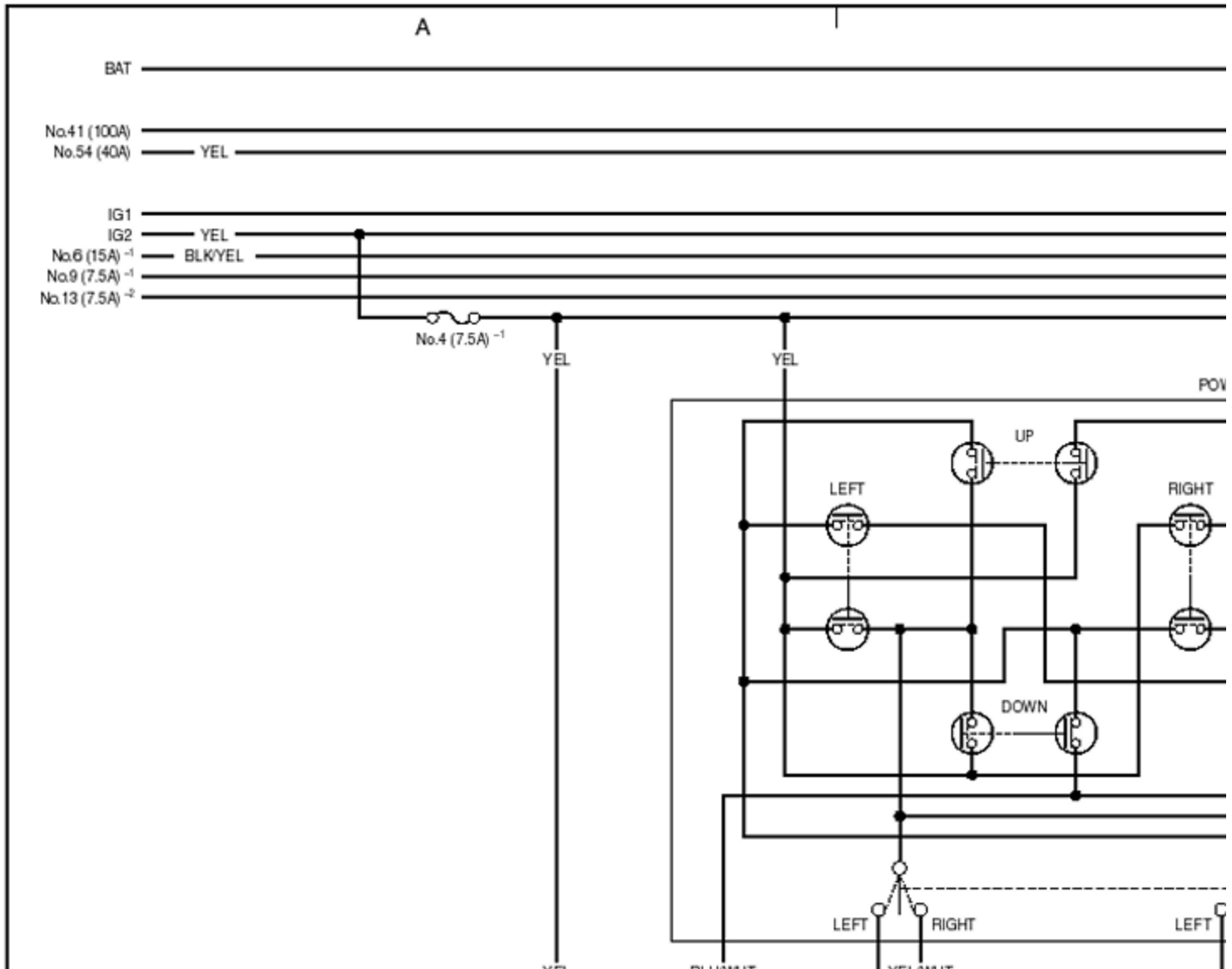
Power Mirrors

10

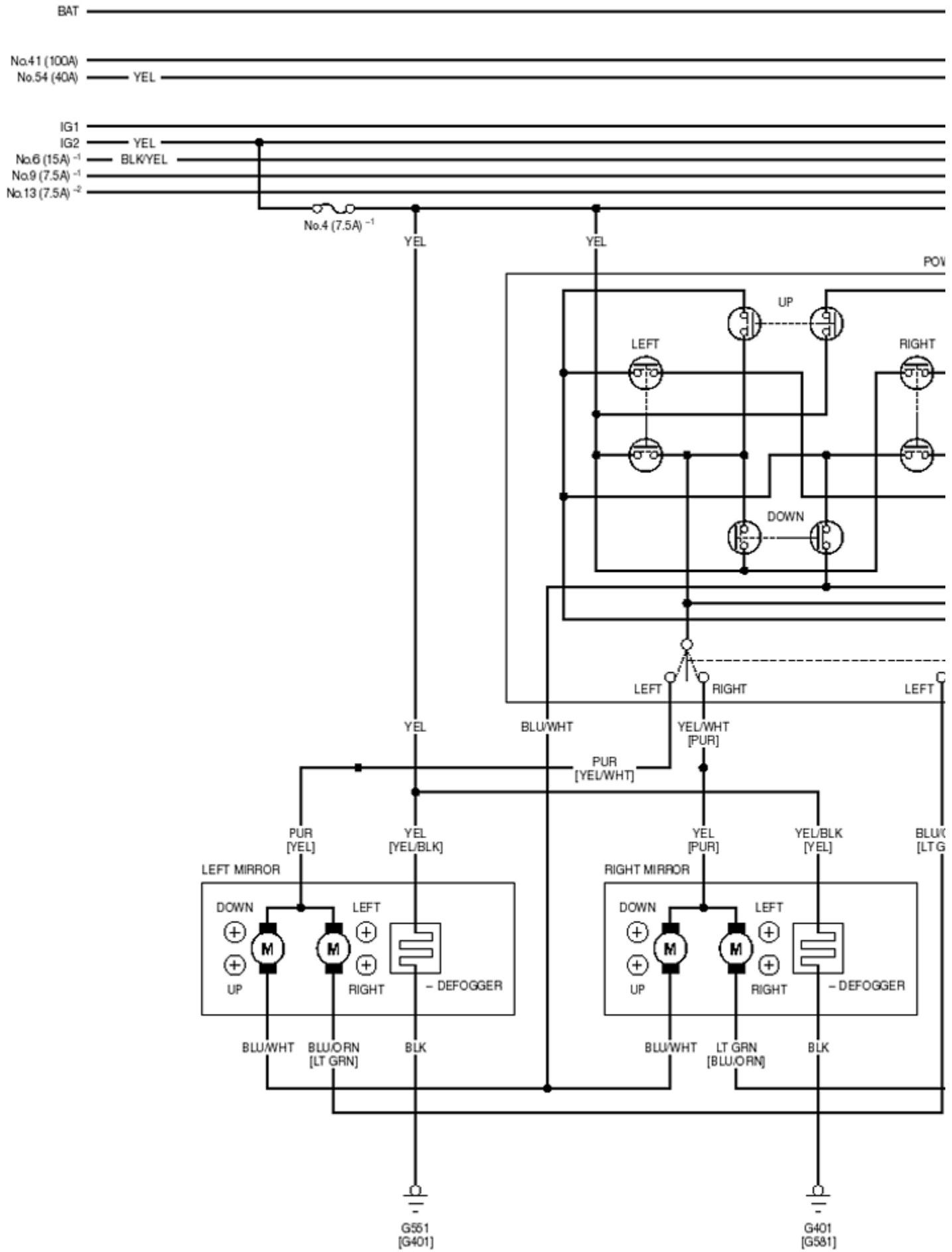


10

10

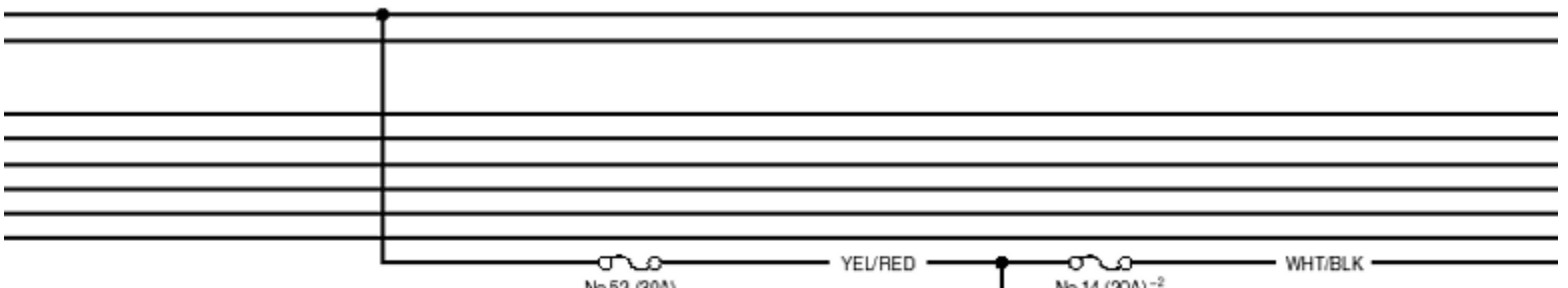


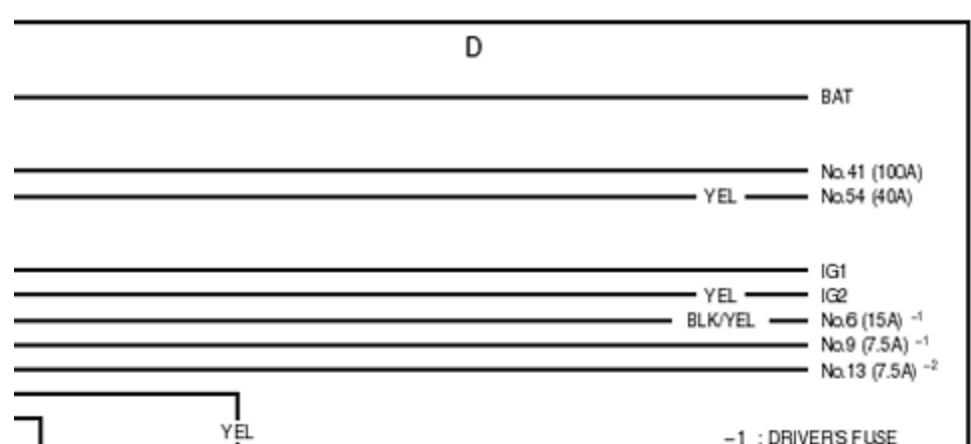
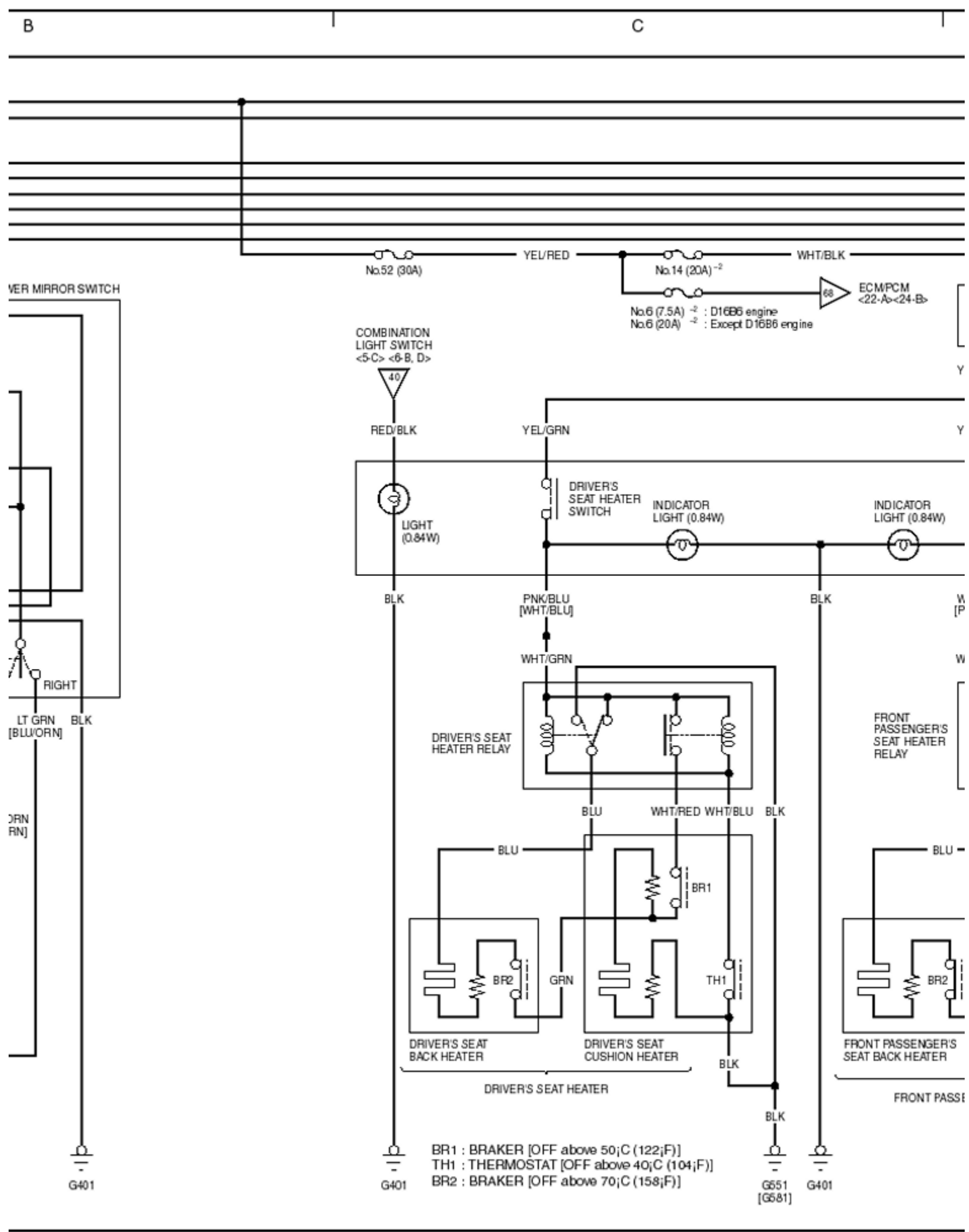
A



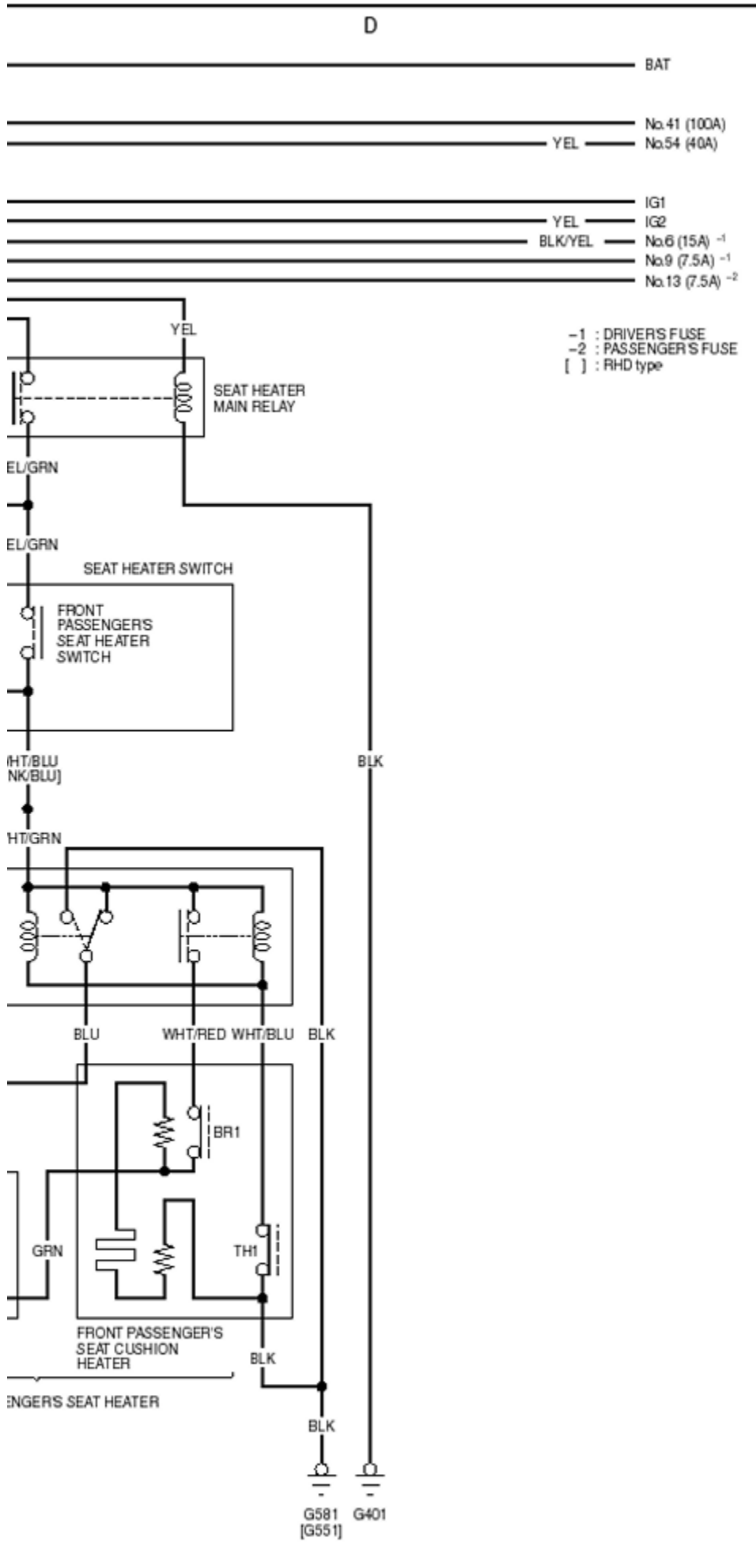
B

C





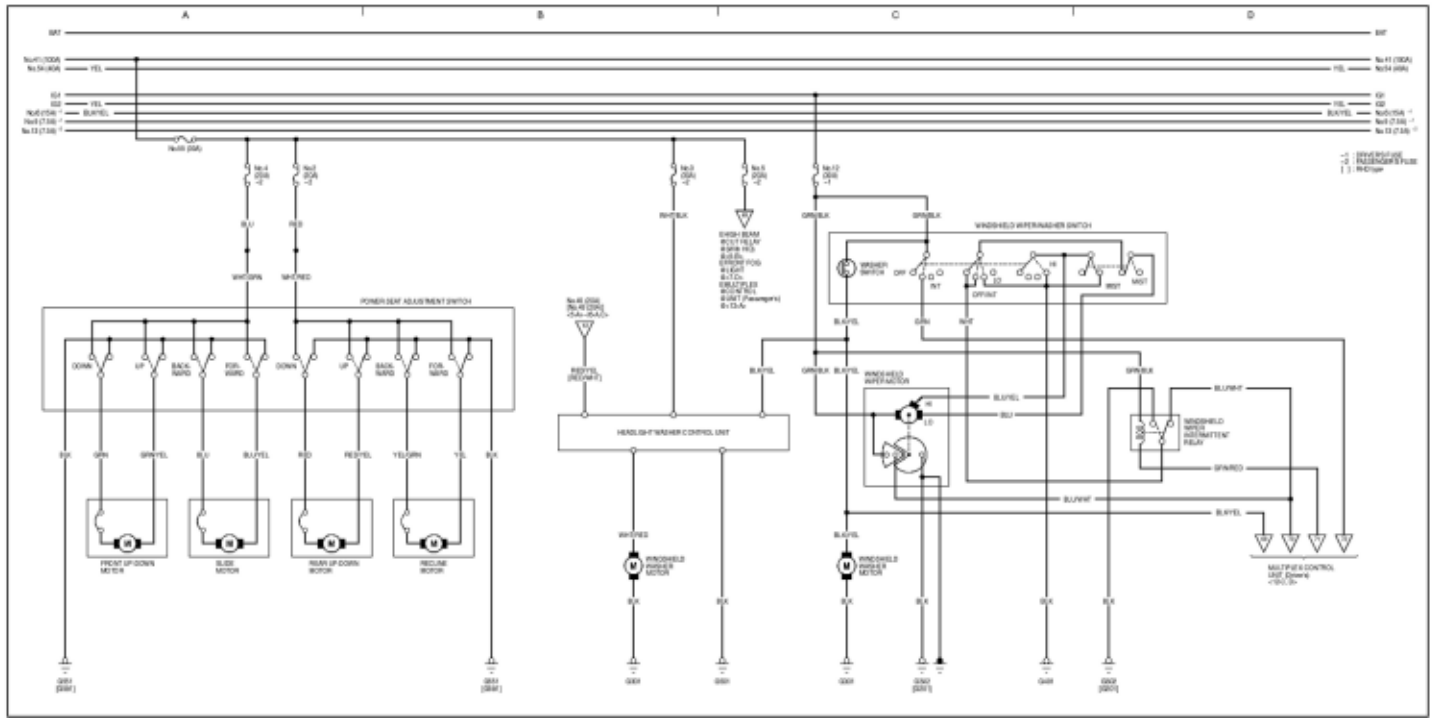
D



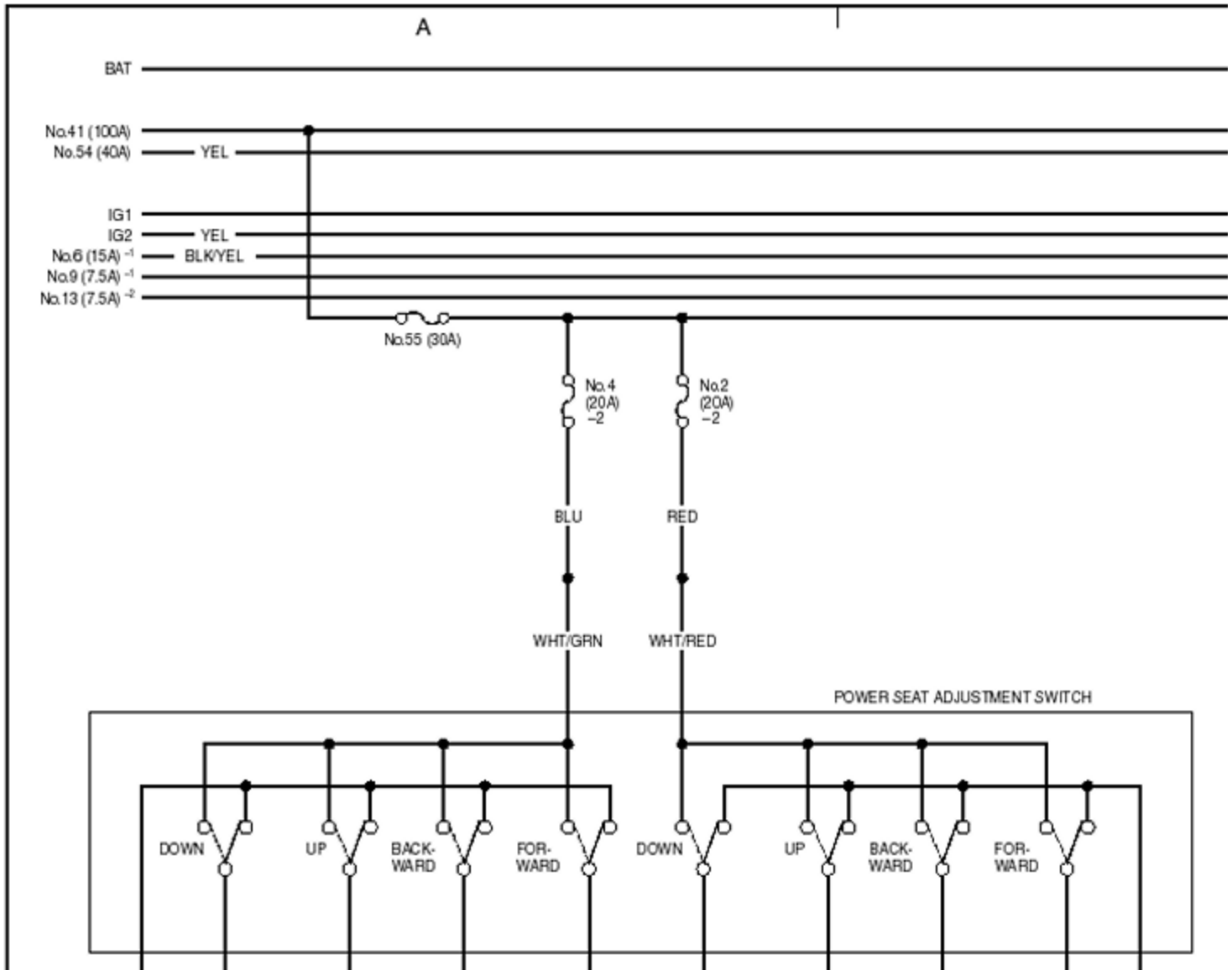
Wiring Diagrams

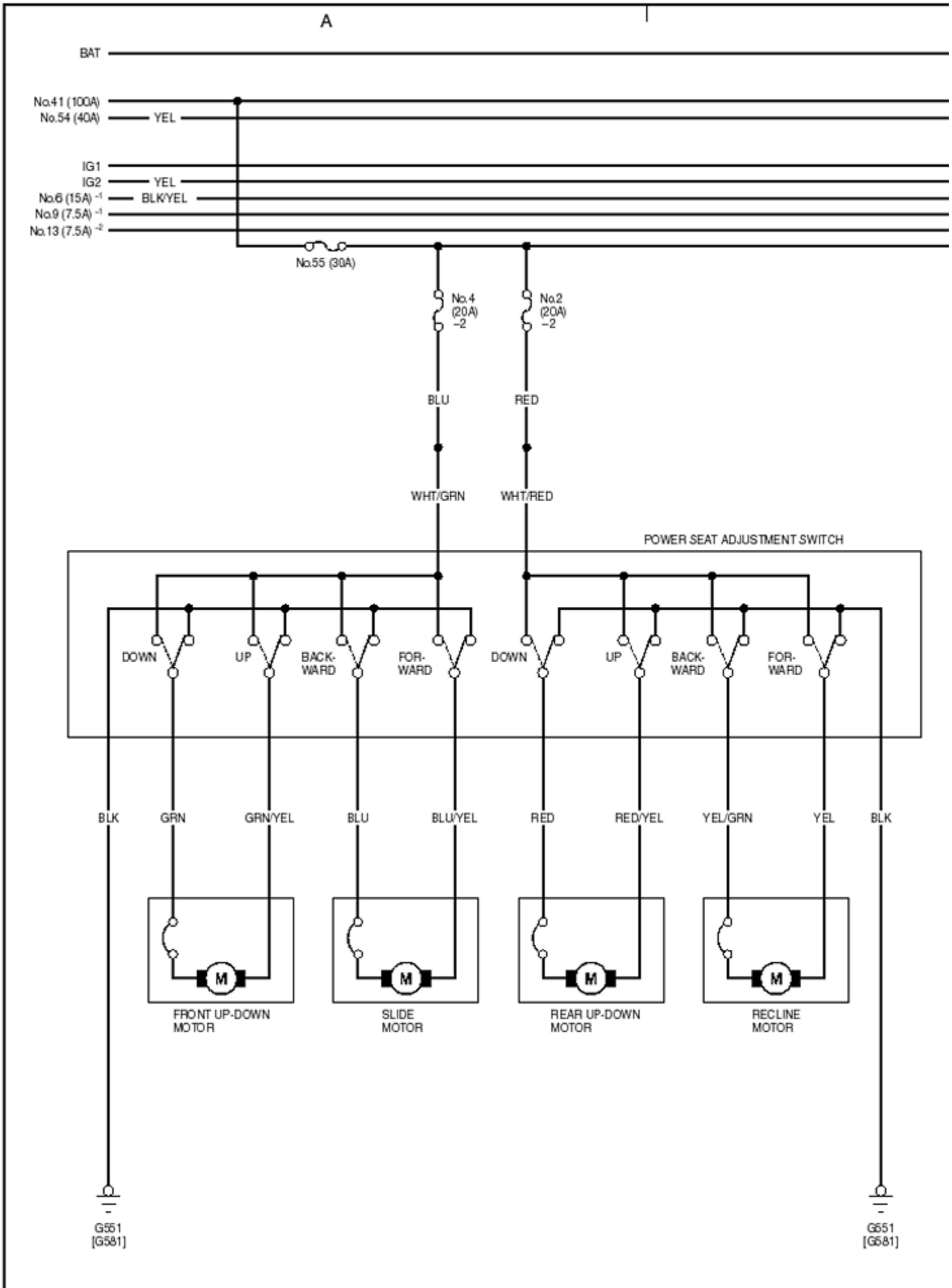
Power Seats

11



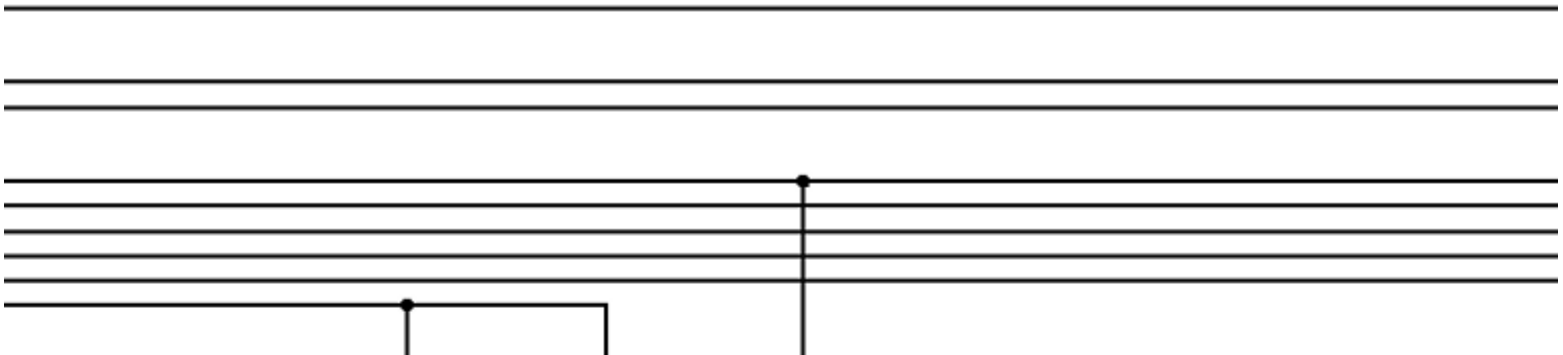
11

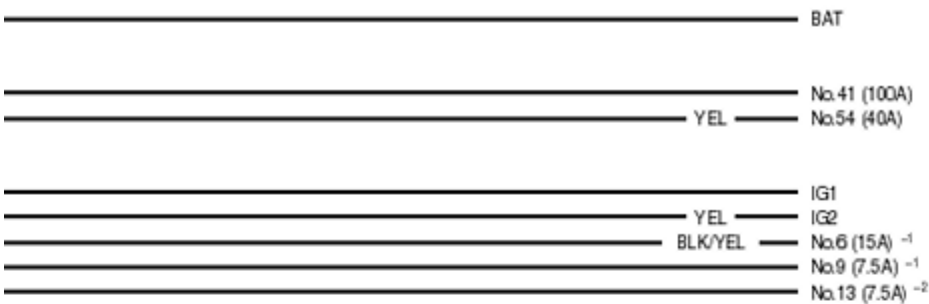
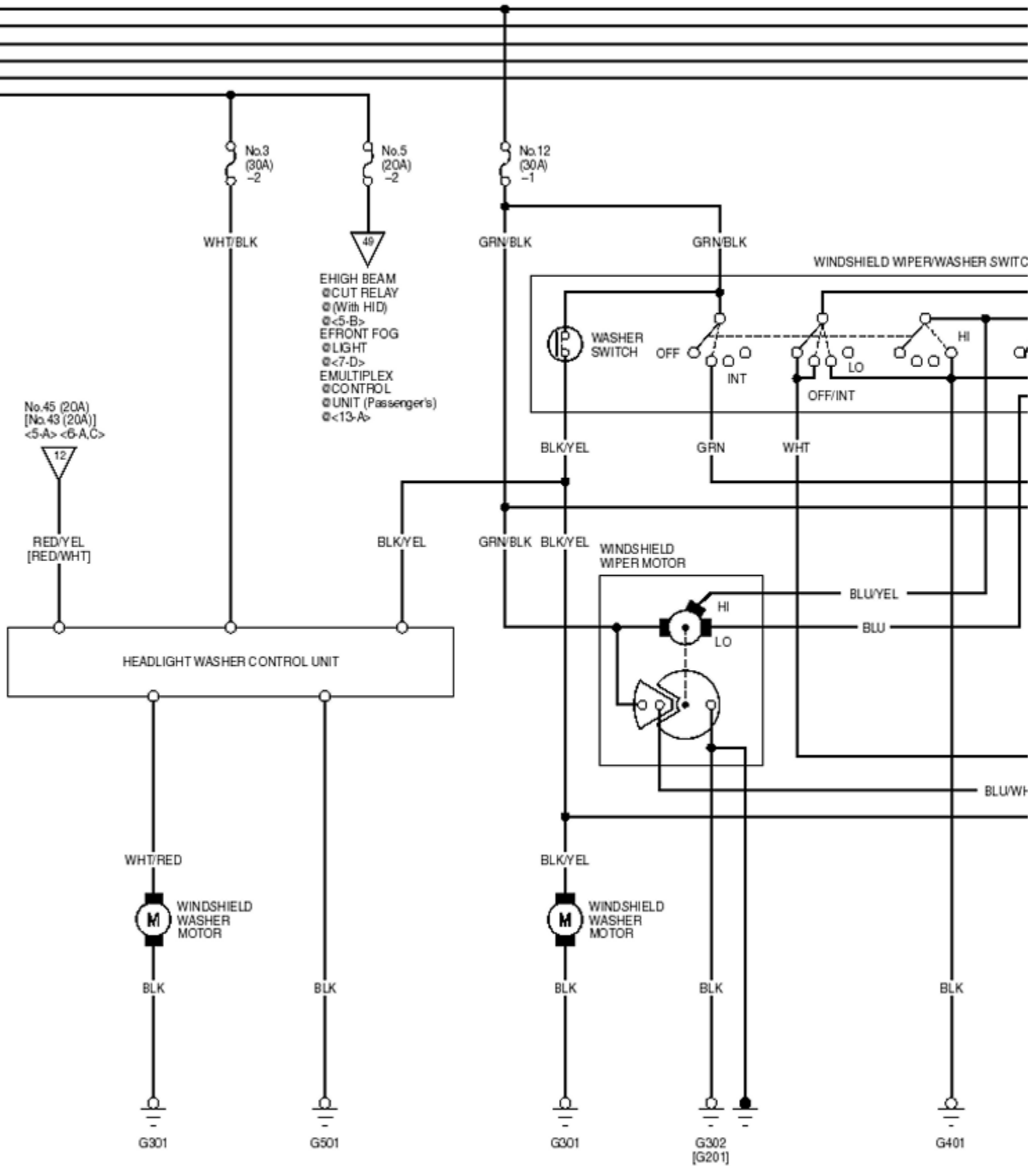




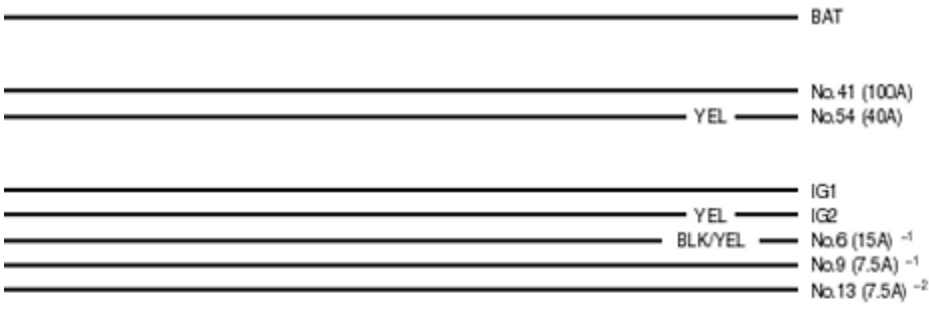
B

C



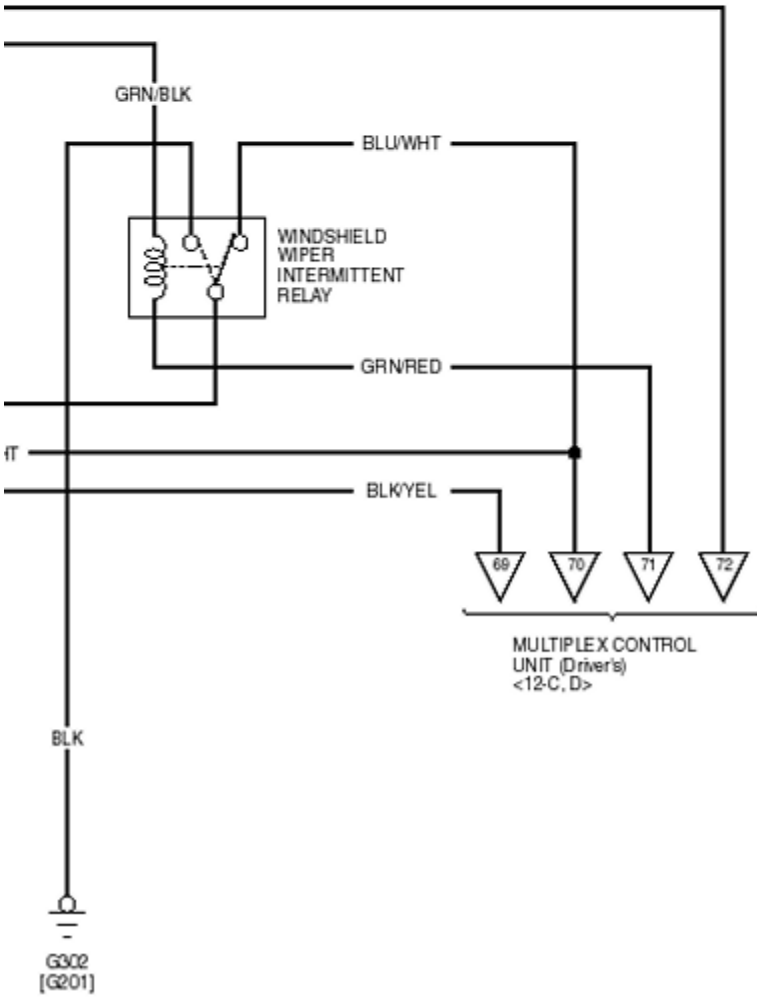
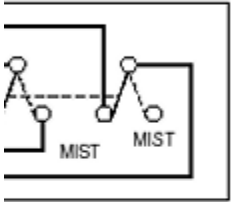


D



-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

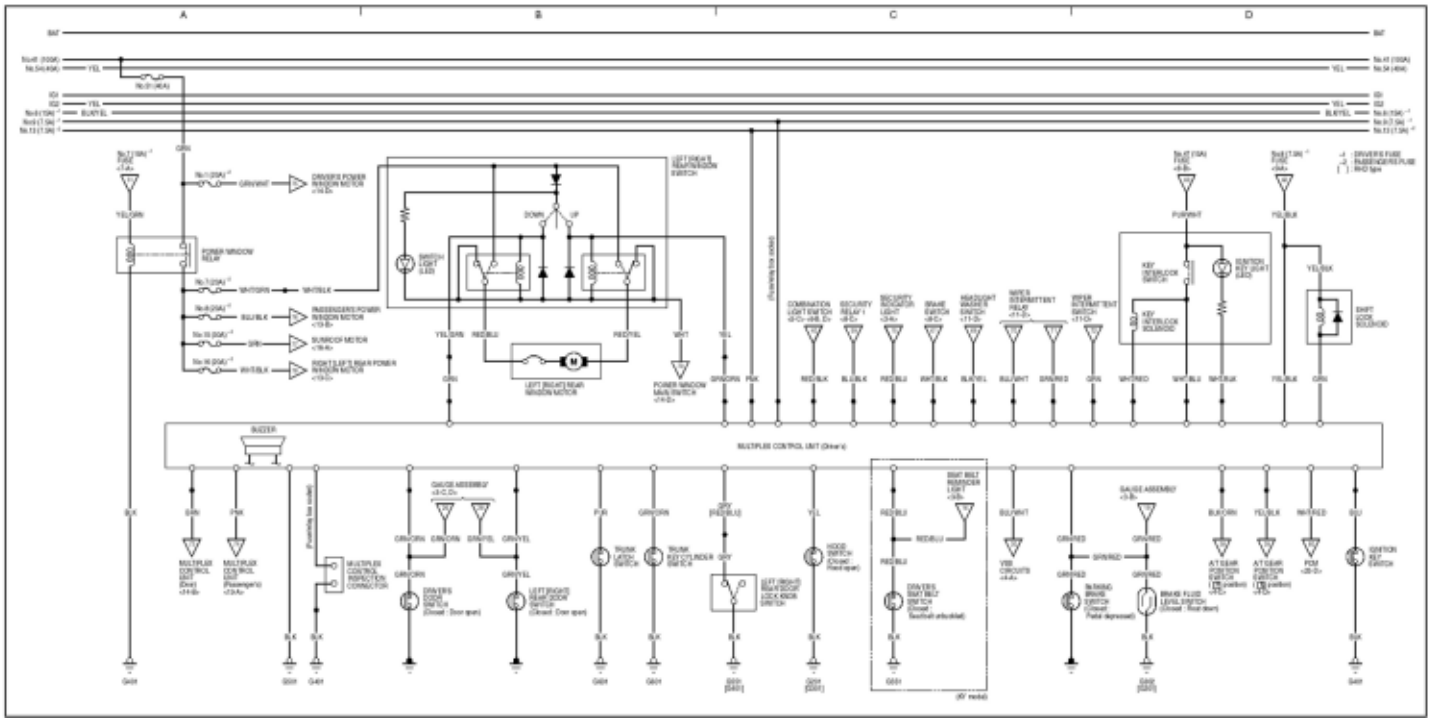
H



Wiring Diagrams

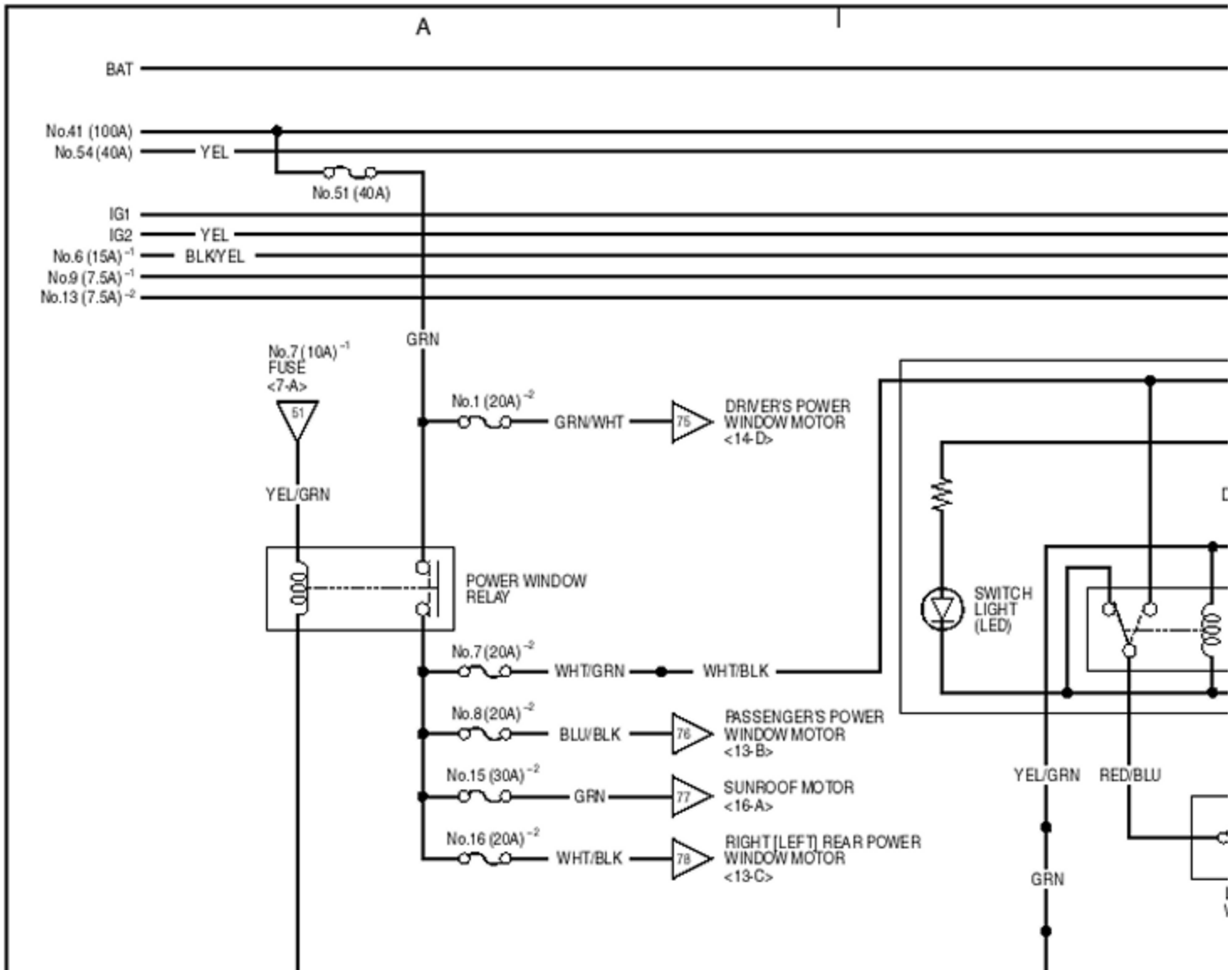
Power Windows

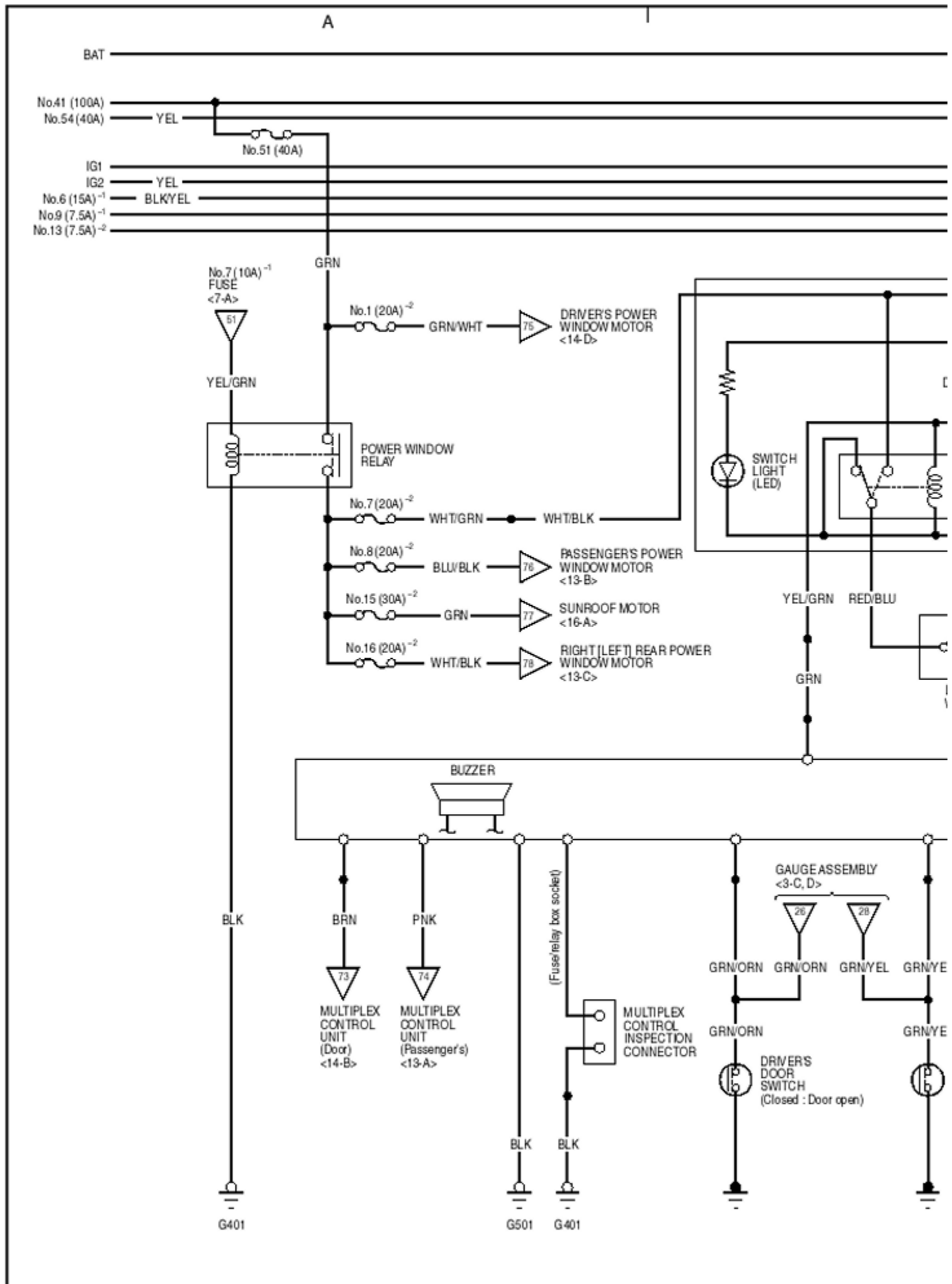
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12

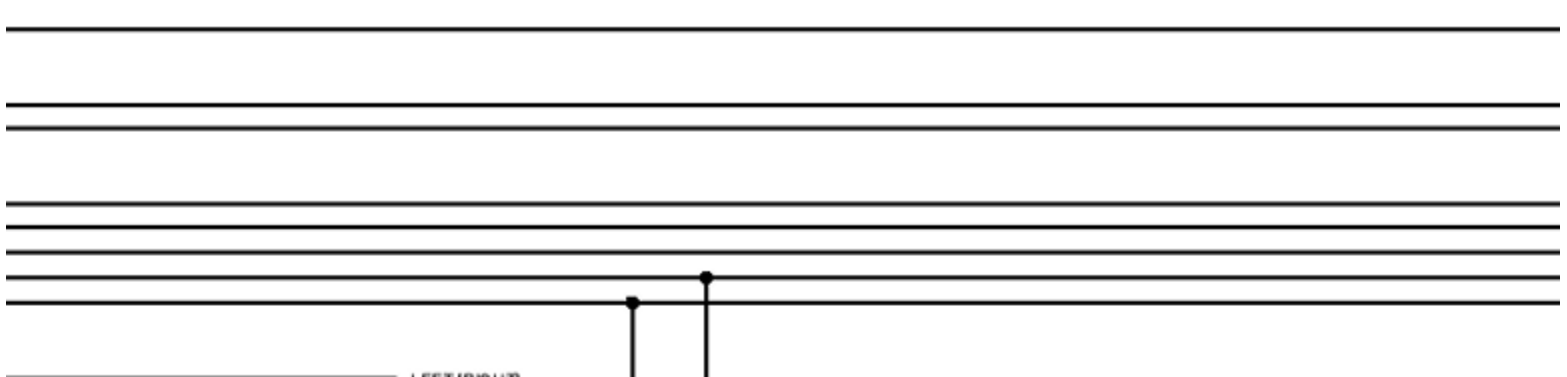
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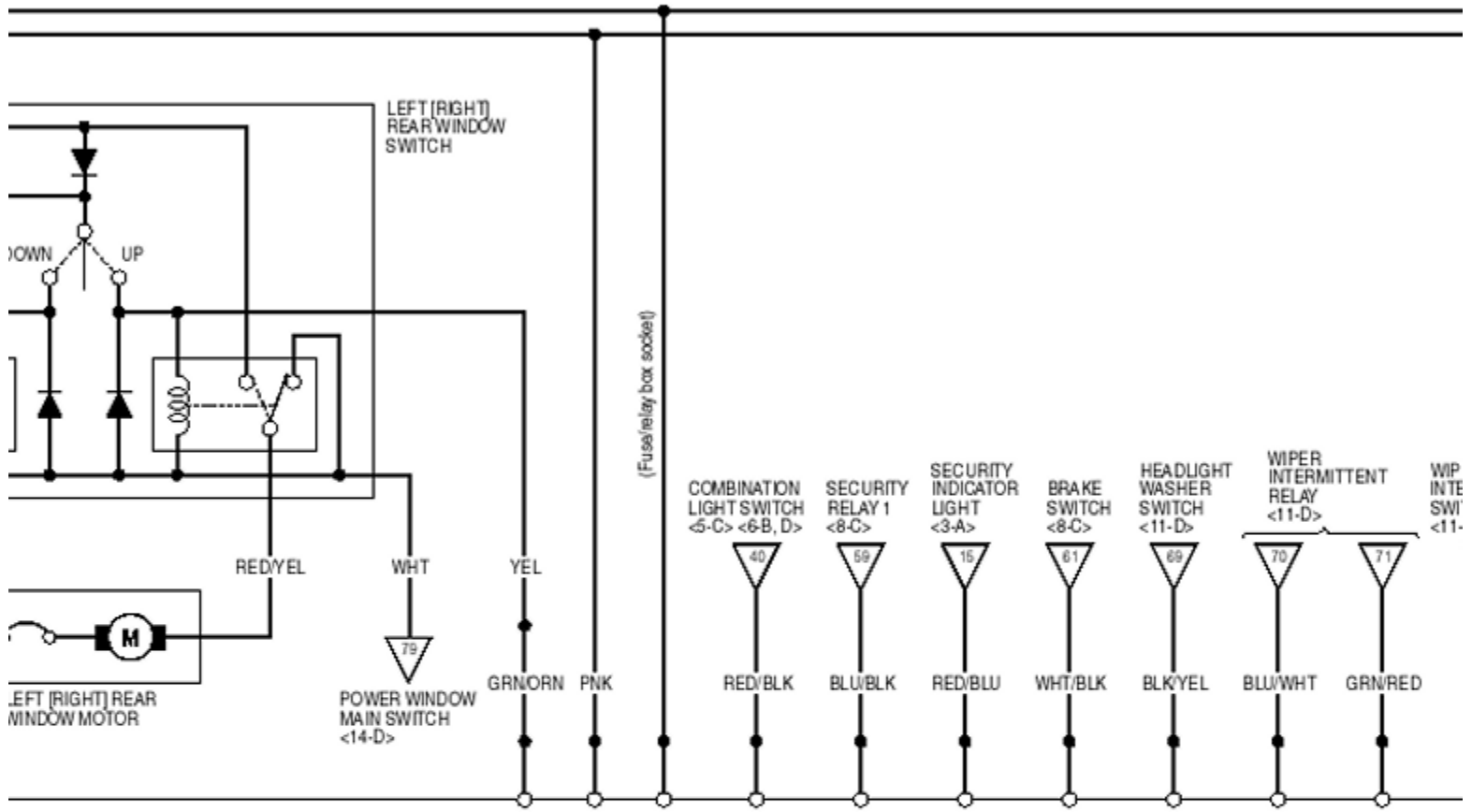
B

C

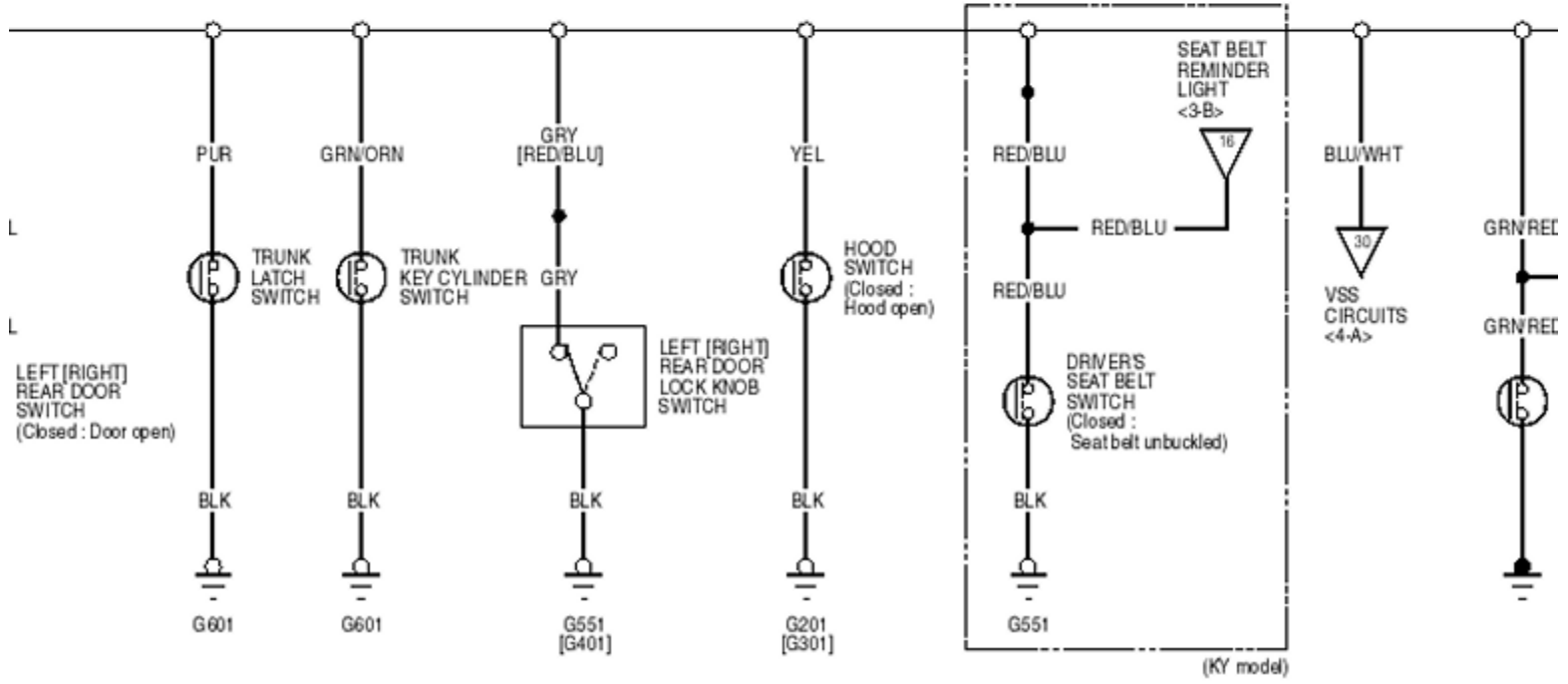


B

C

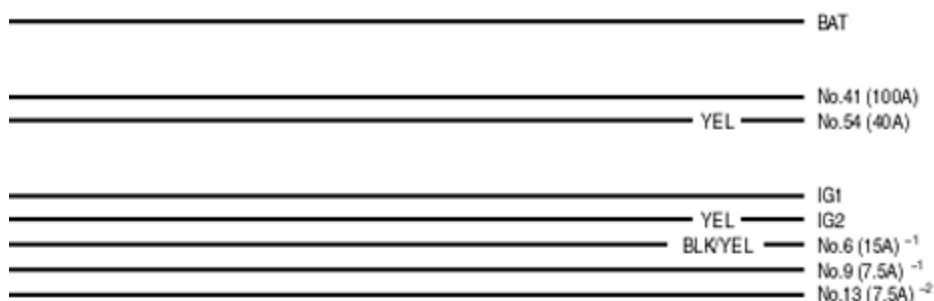


MULTIPLEX CONTROL UNIT (Driver's)



D

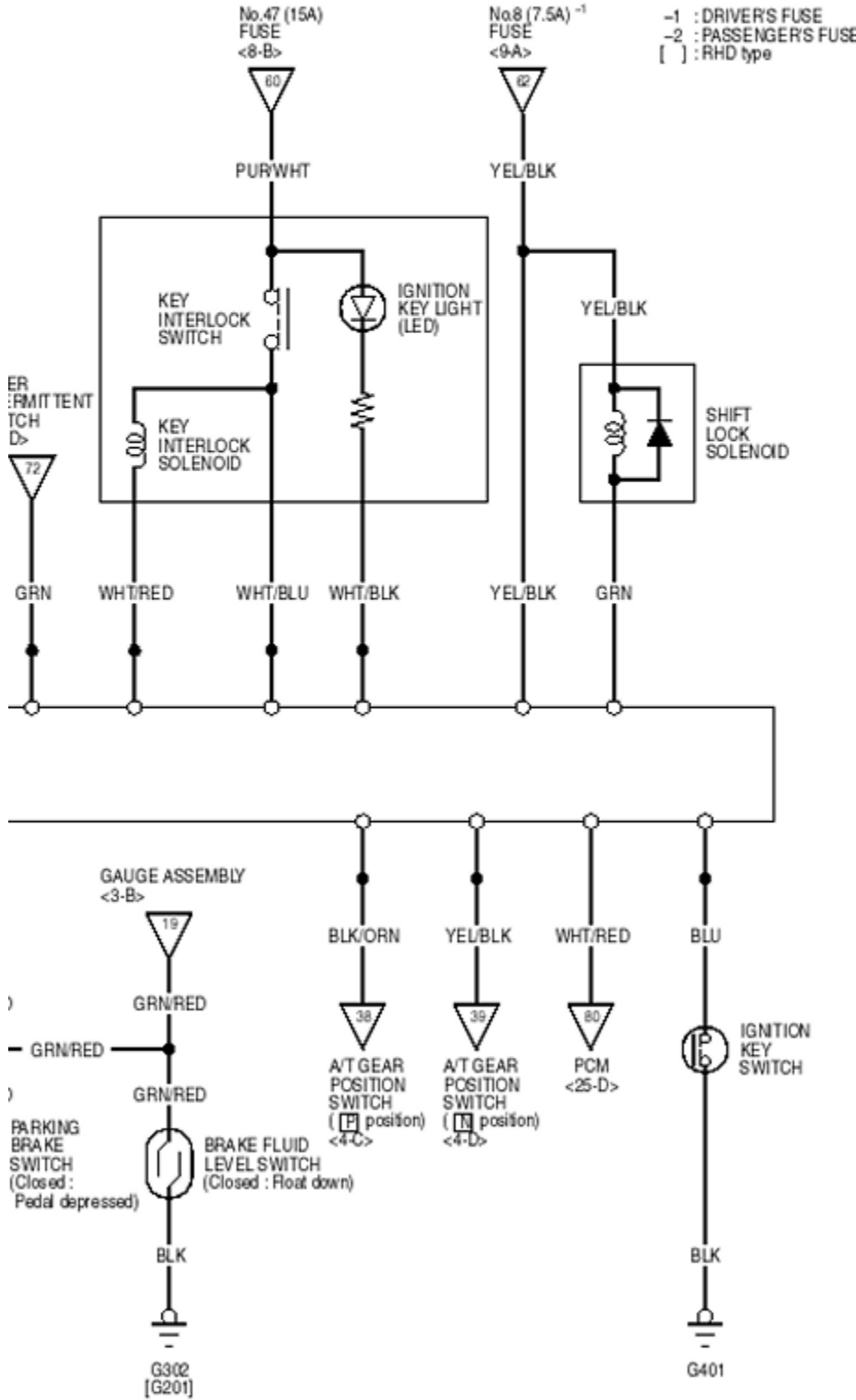
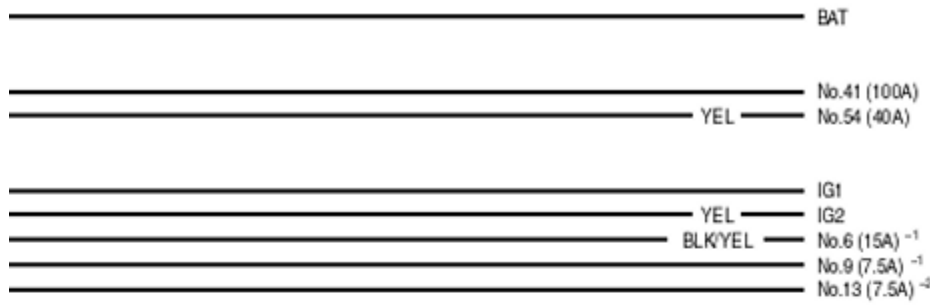
12



No.47 (15A)

No.8 (7.5A)⁻¹

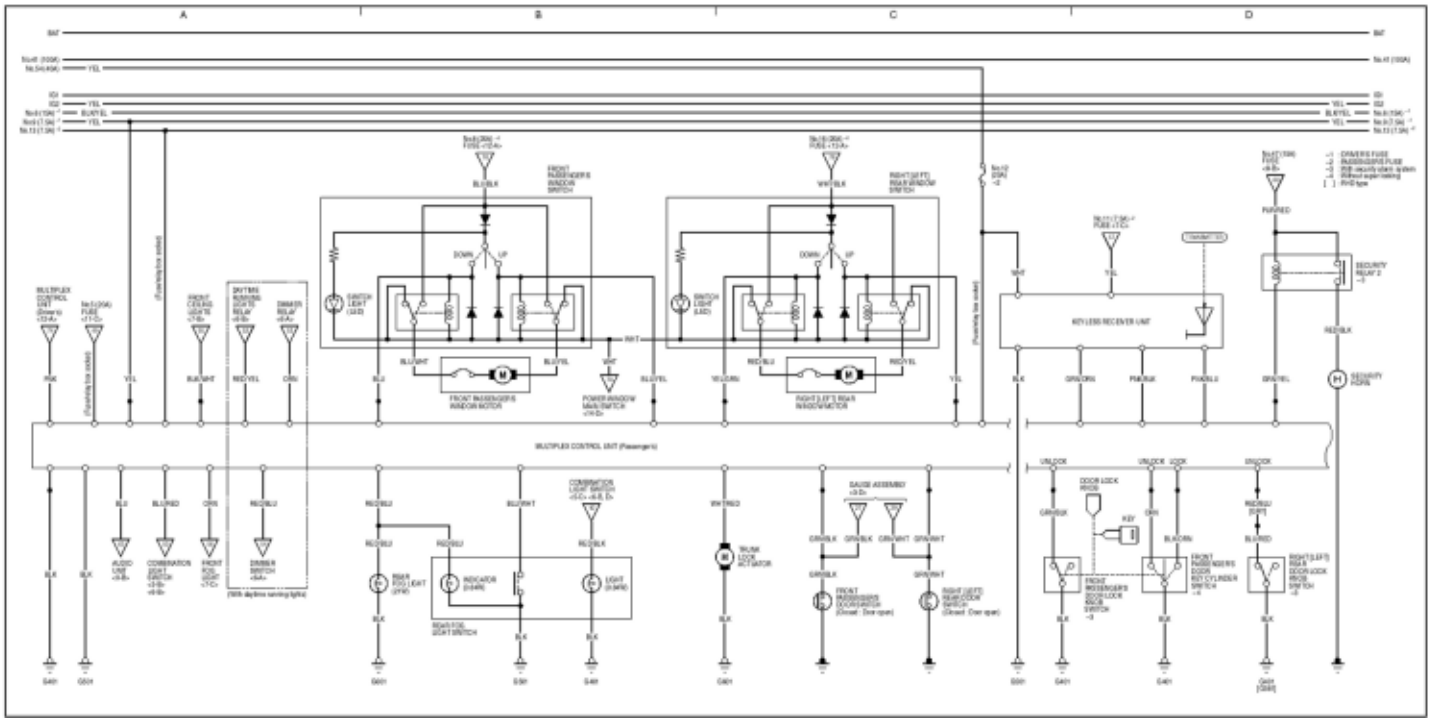
-1 : DRIVER'S FUSE



Wiring Diagrams

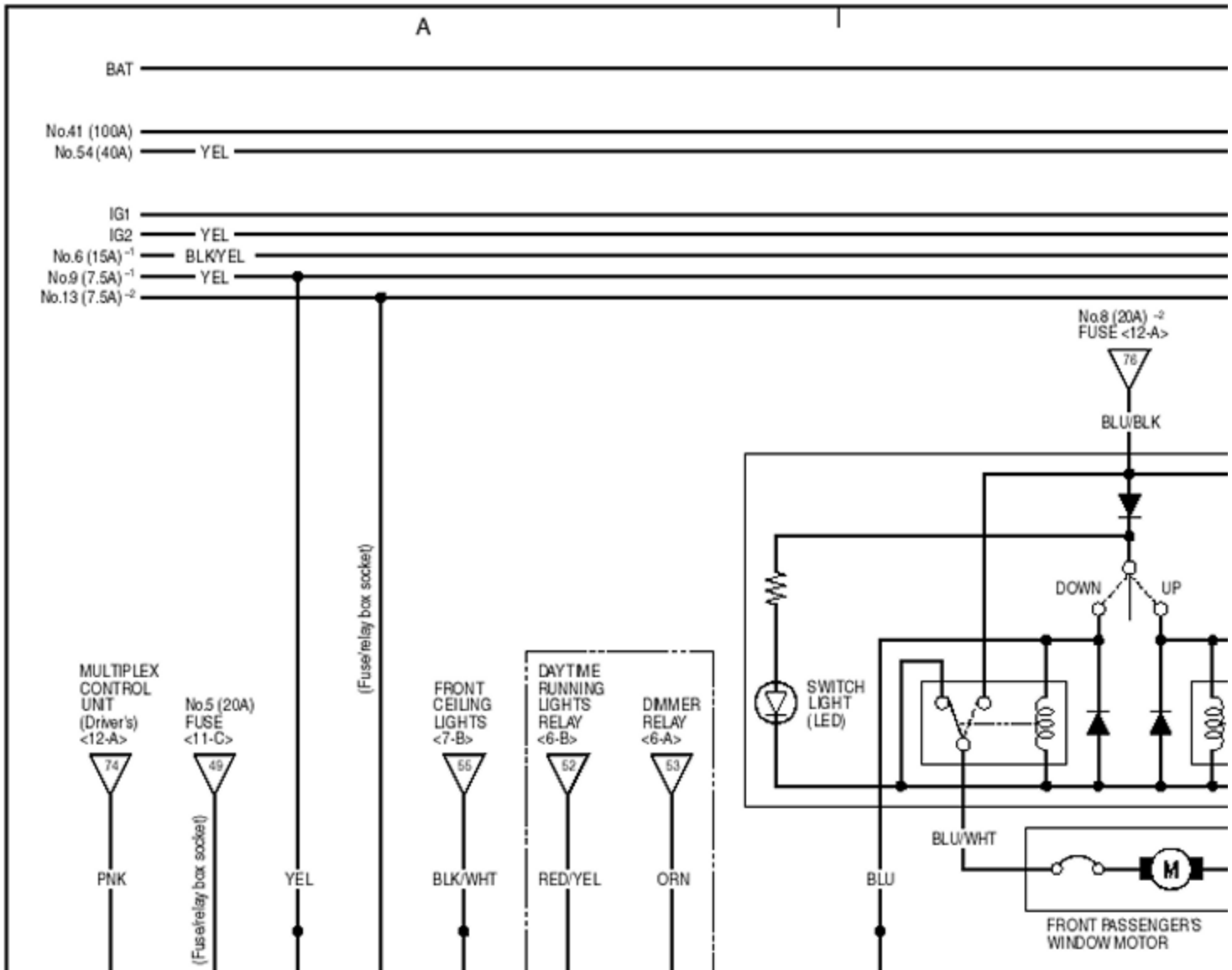
Power Windows

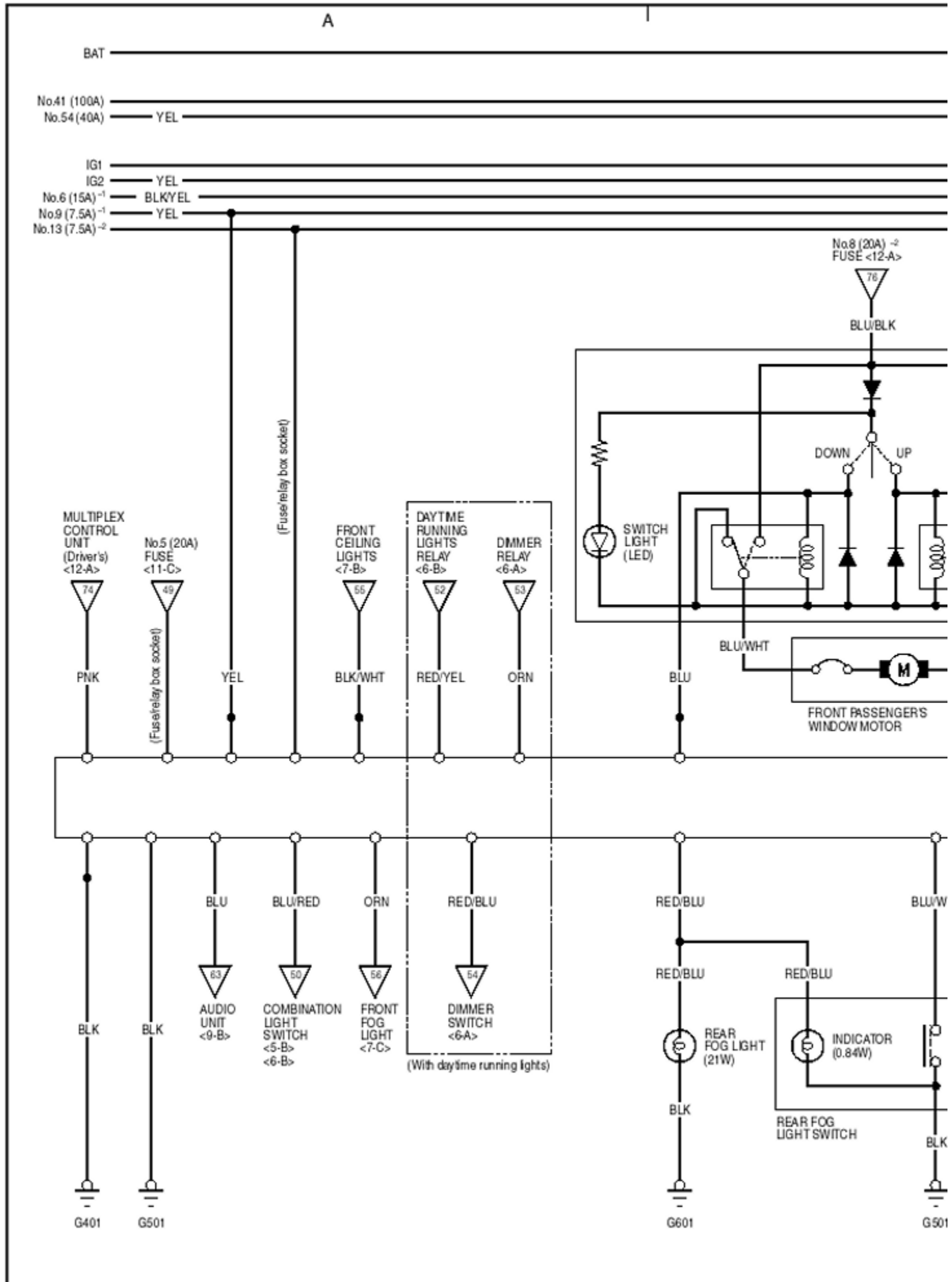
13



13

13



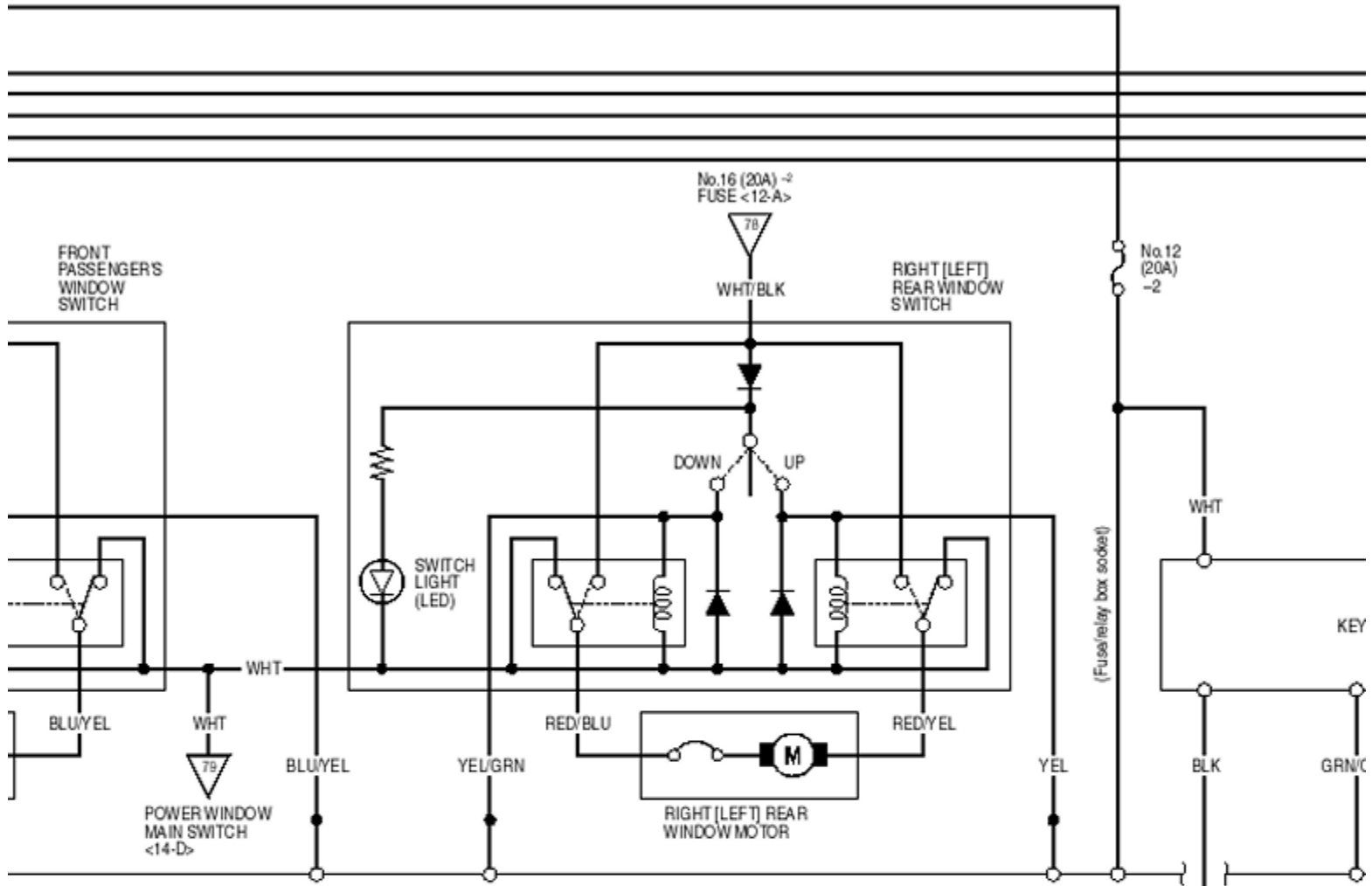


B

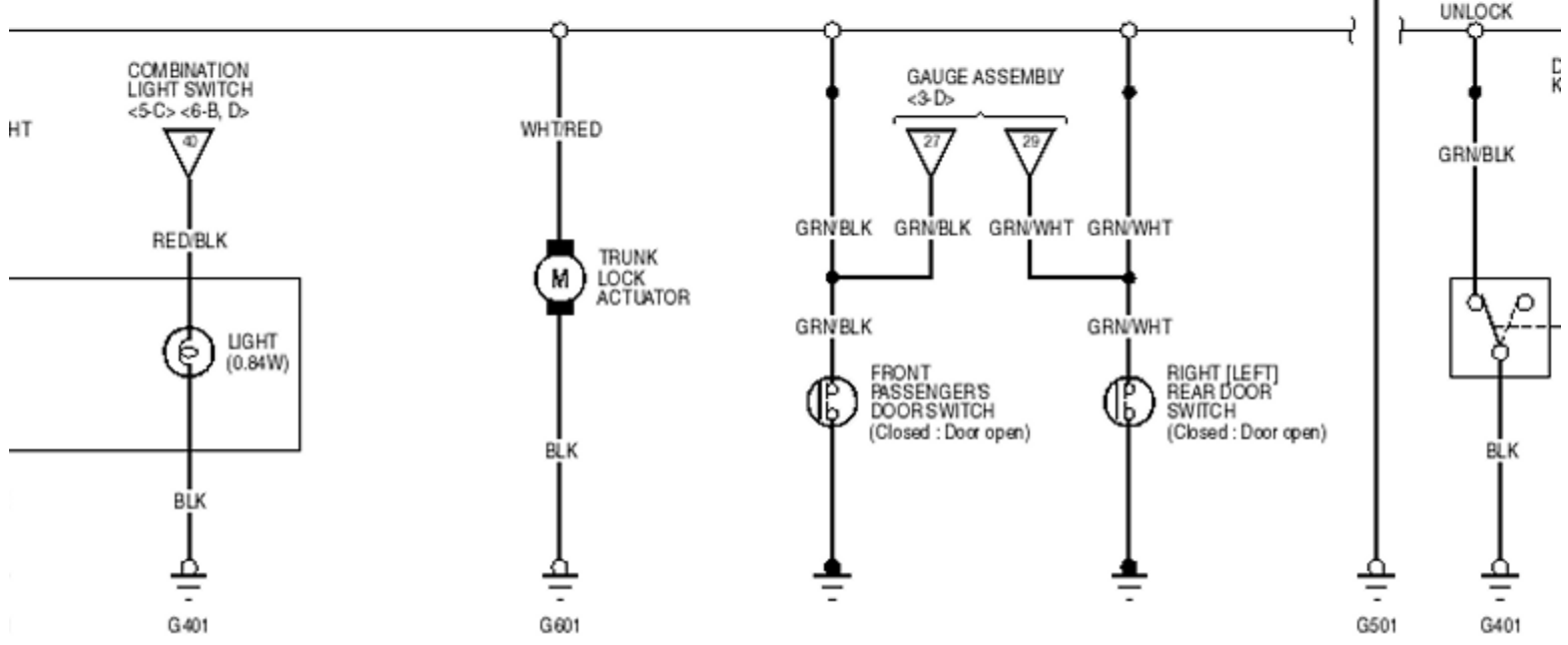
C

B

C

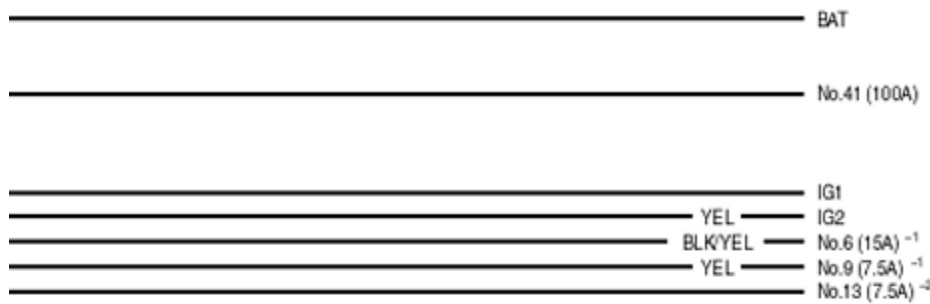


MULTIPLEX CONTROL UNIT (Passenger's)

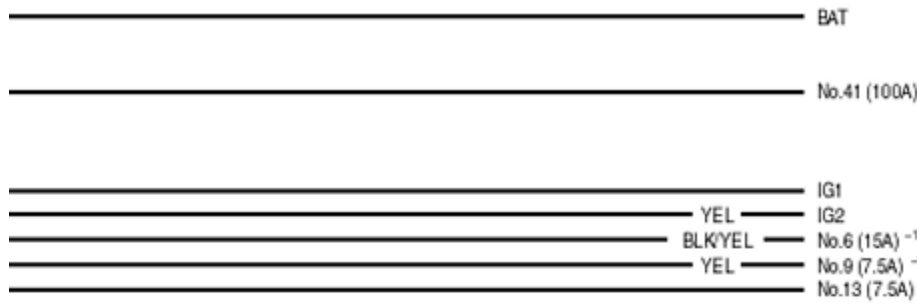


D

13

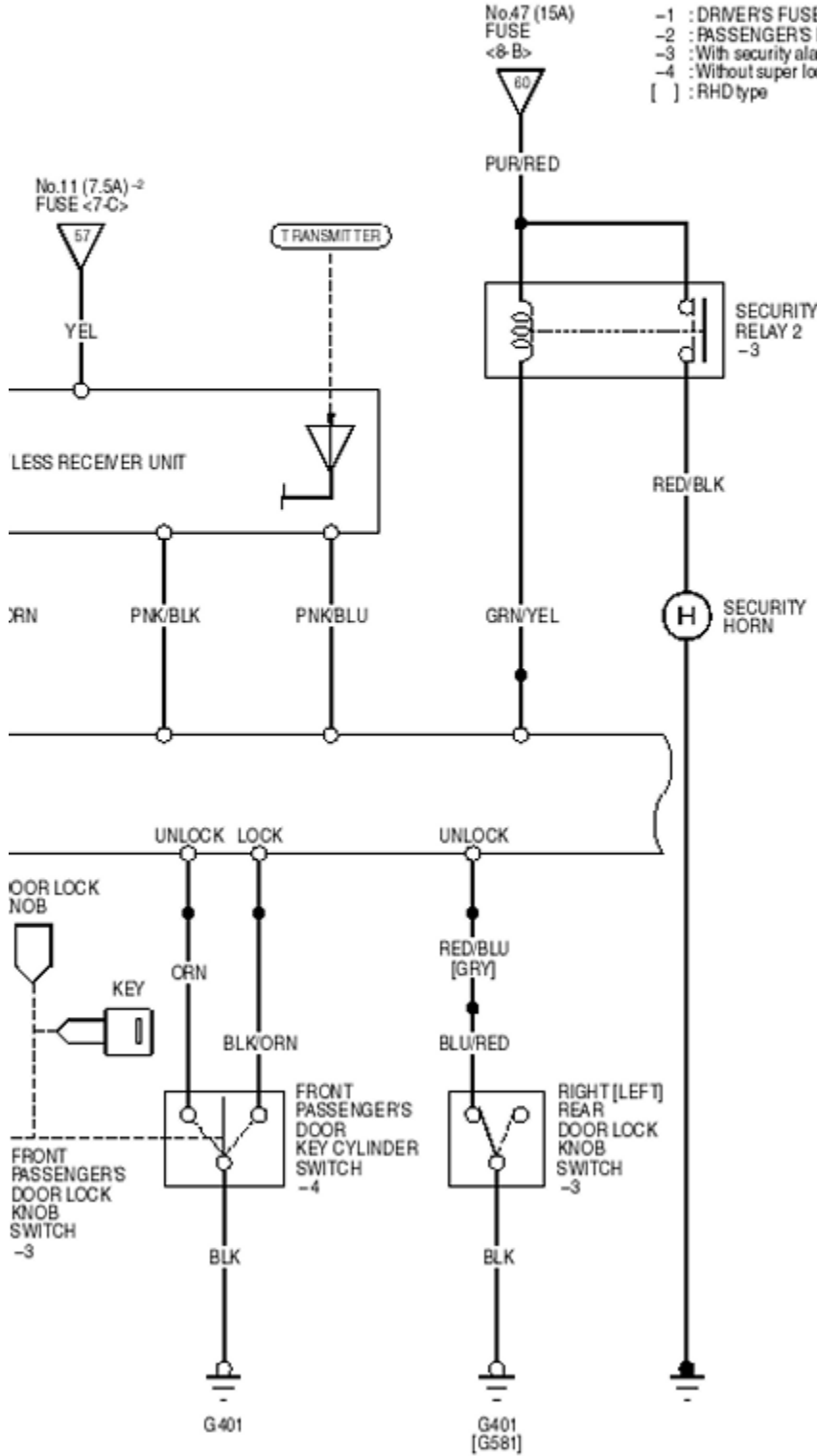


No.47 (15A) -1 : DRIVER'S FUSE



No.47 (15A) FUSE <8-B>

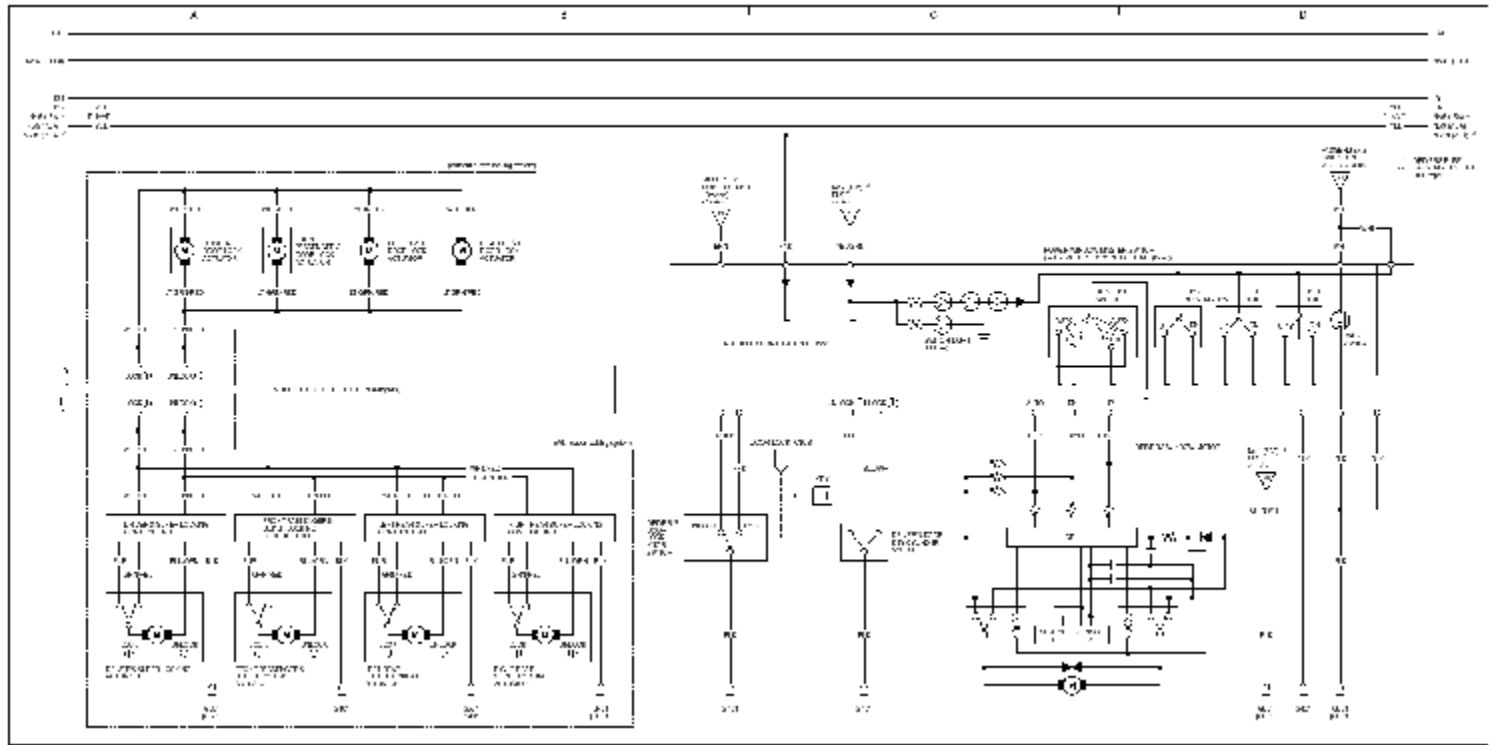
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type



Wiring Diagrams
Power Windows

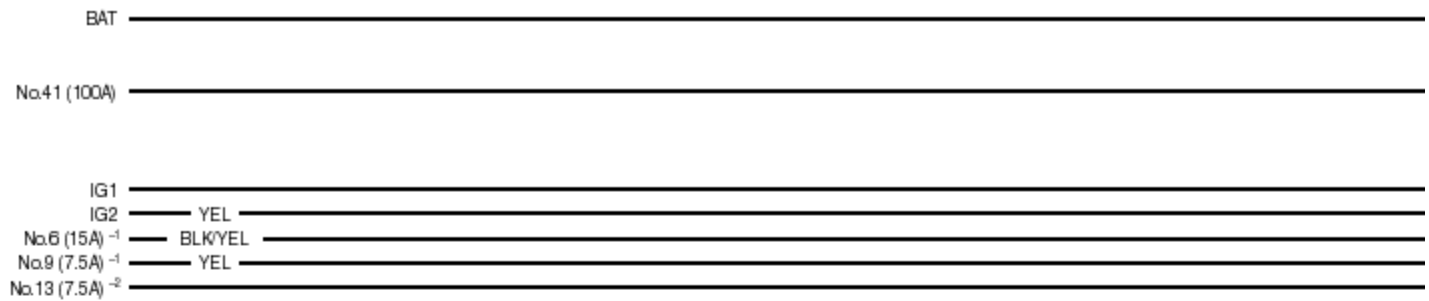
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14

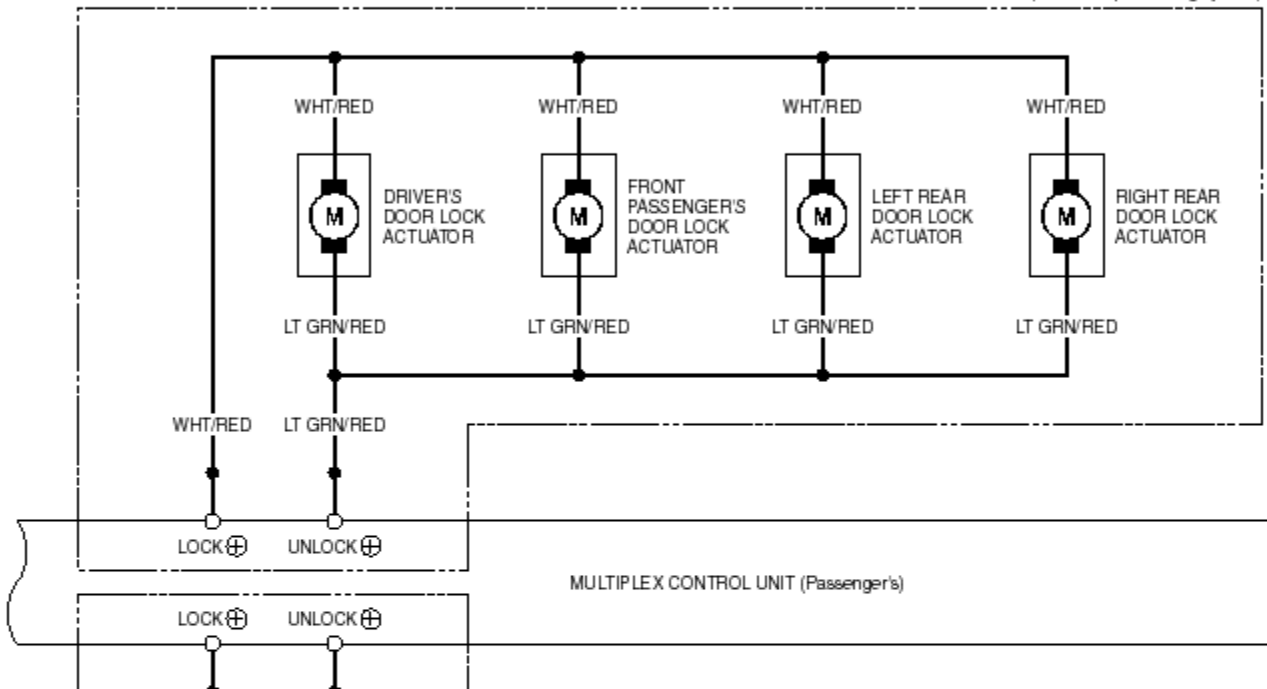


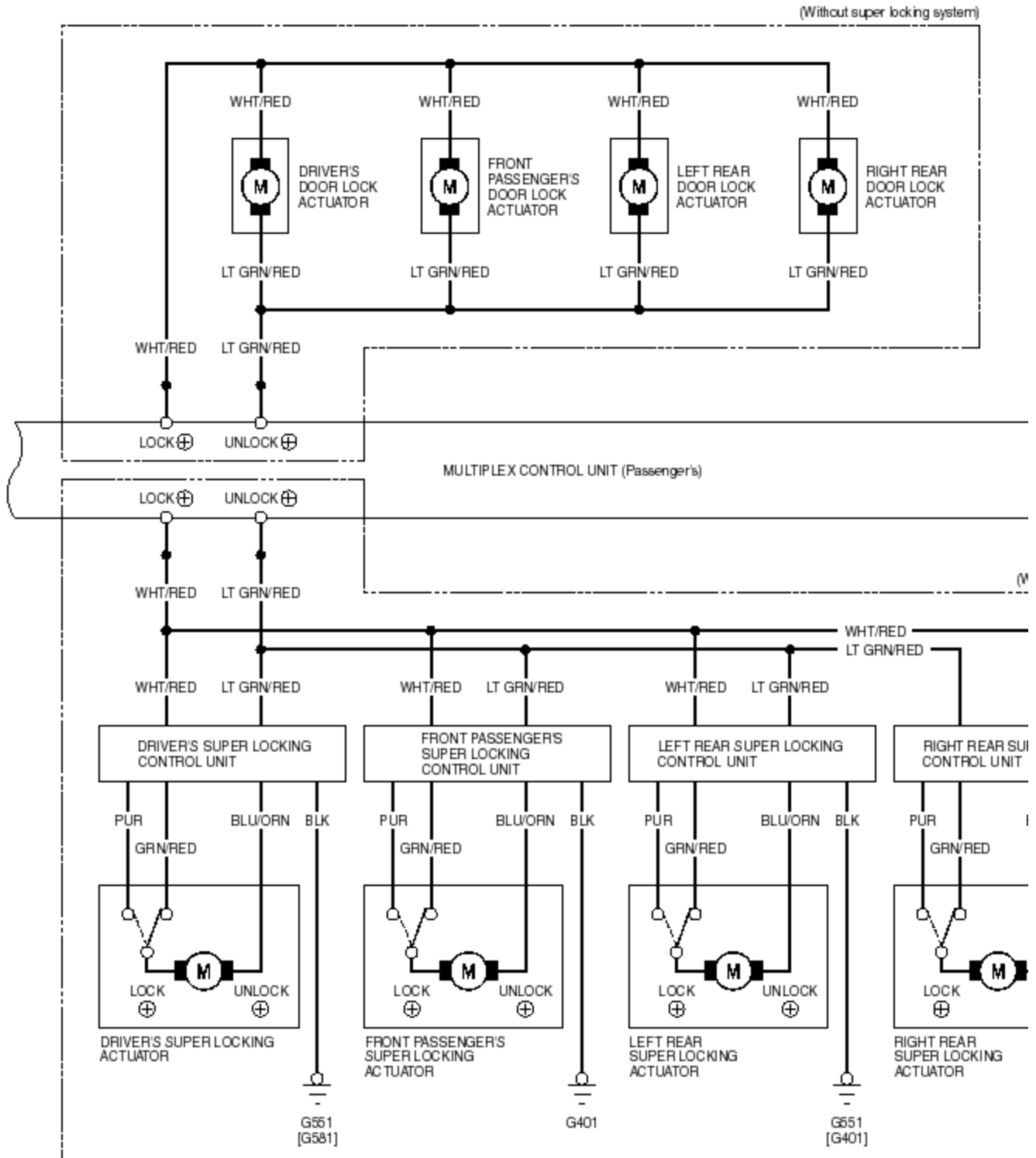
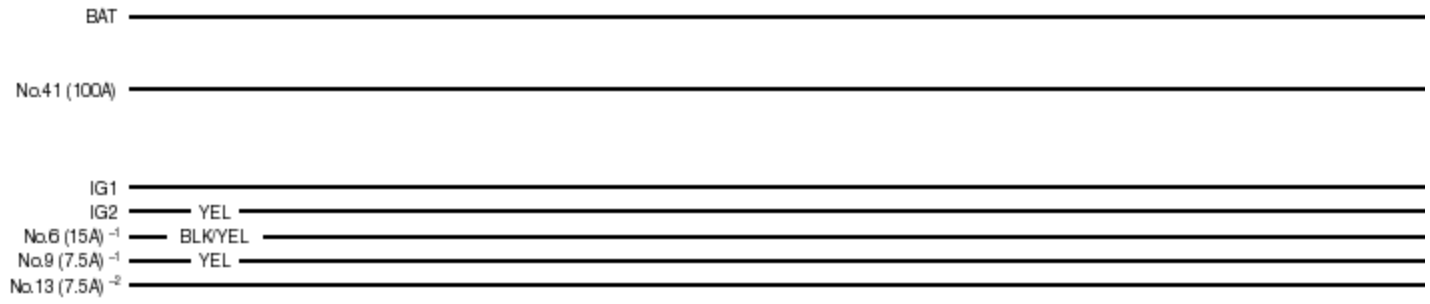
14

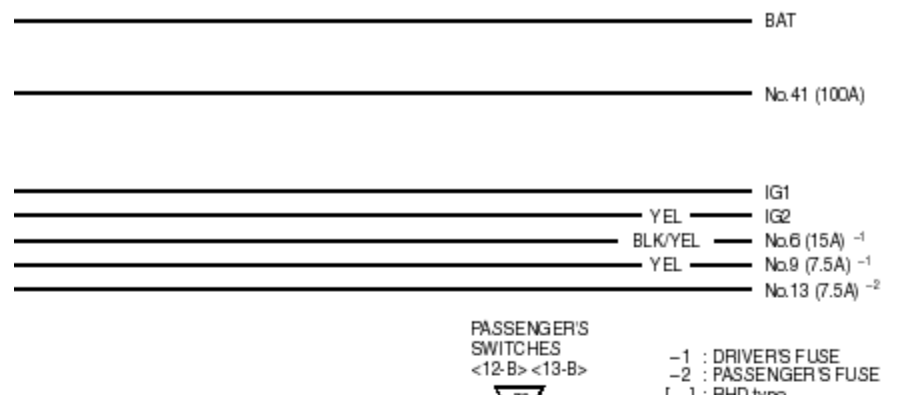
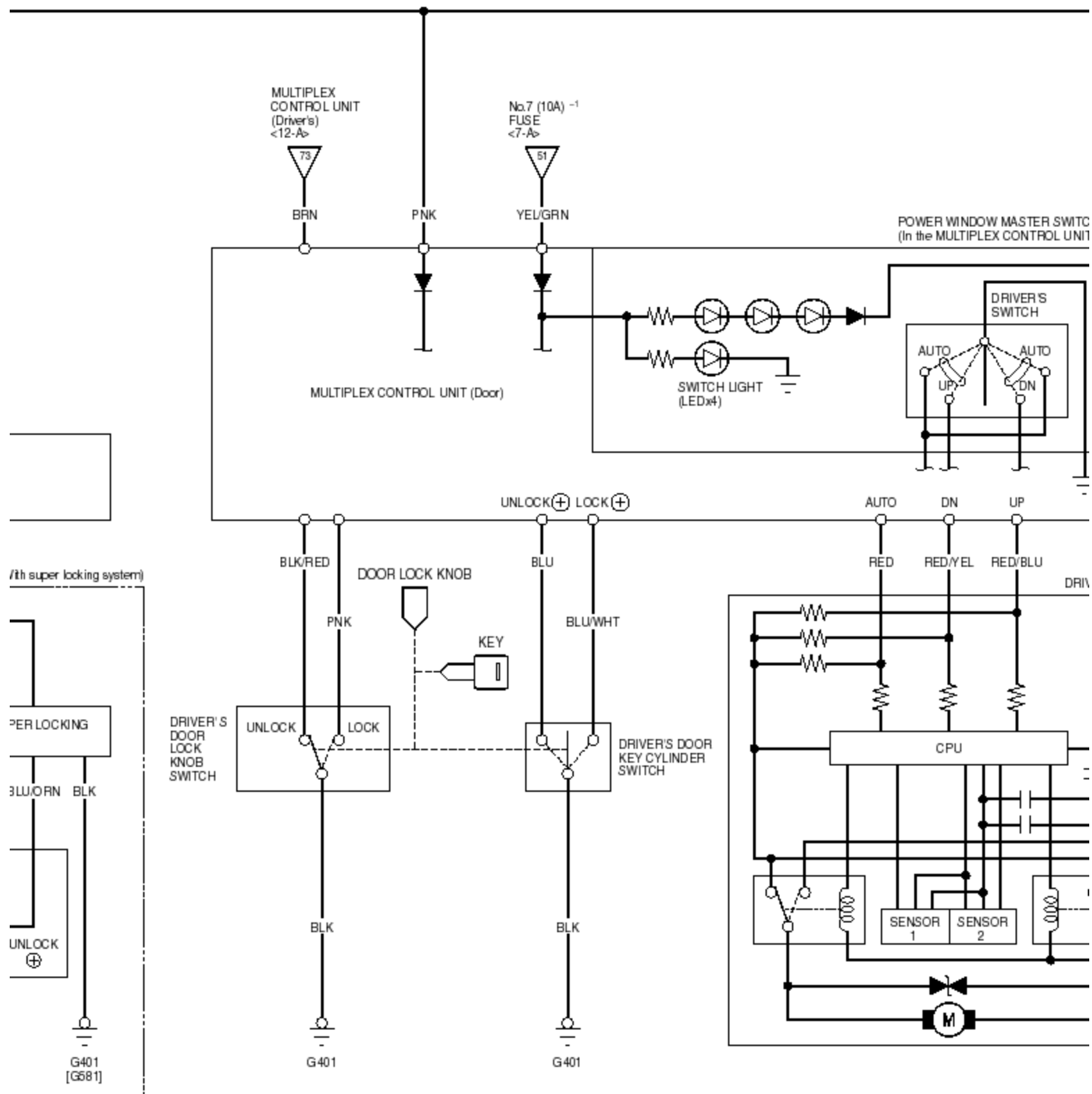
A



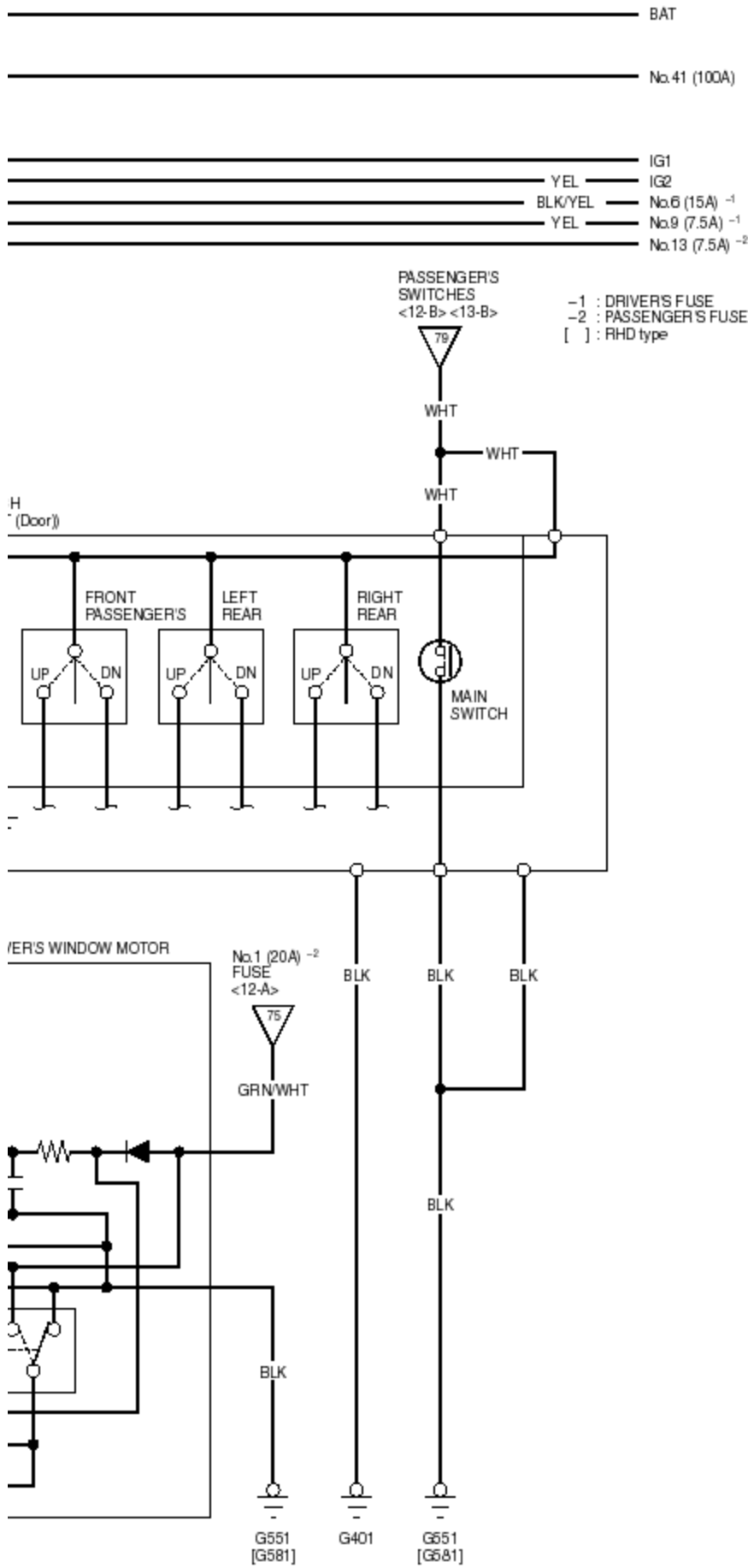
(Without super locking system)







D

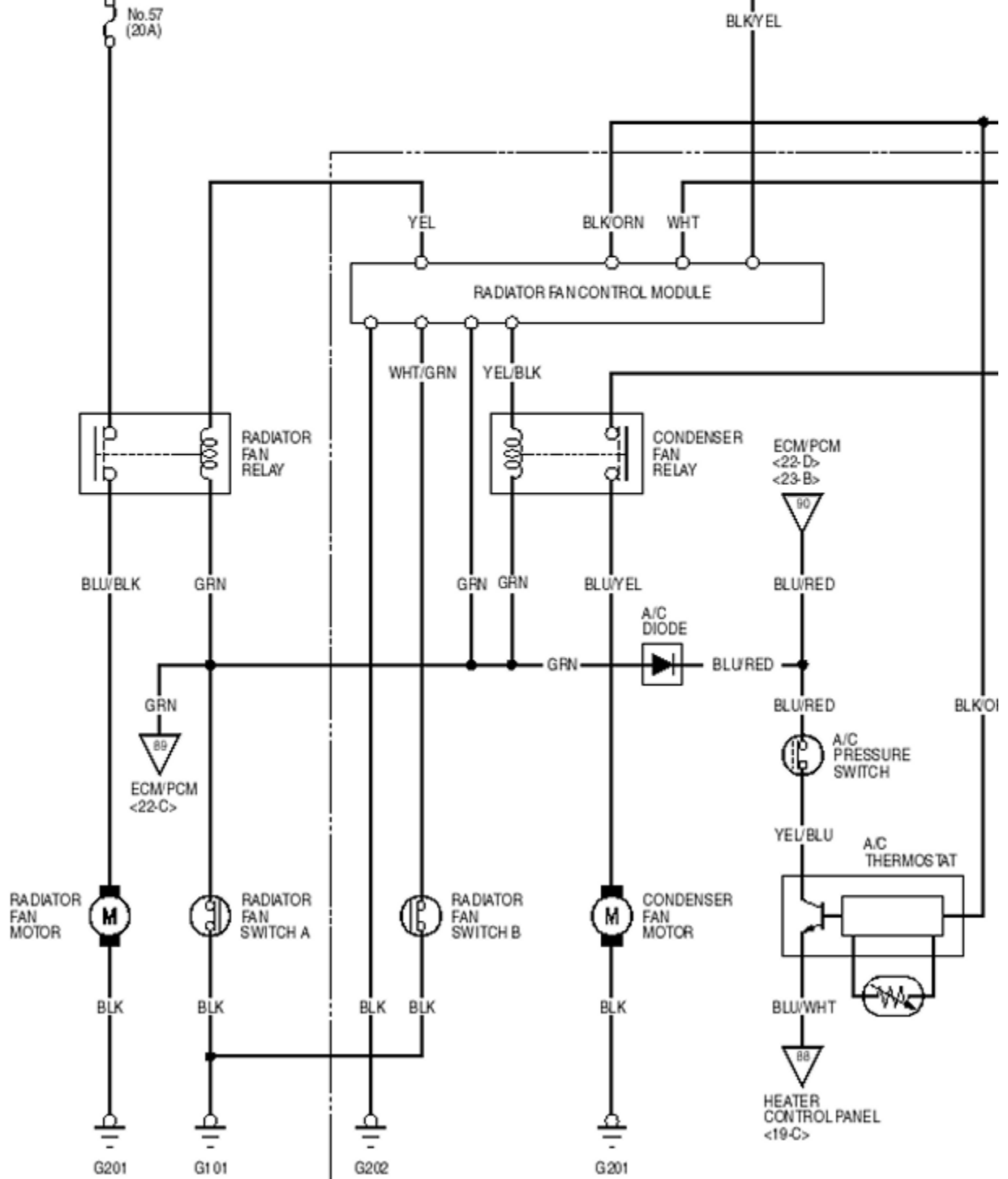


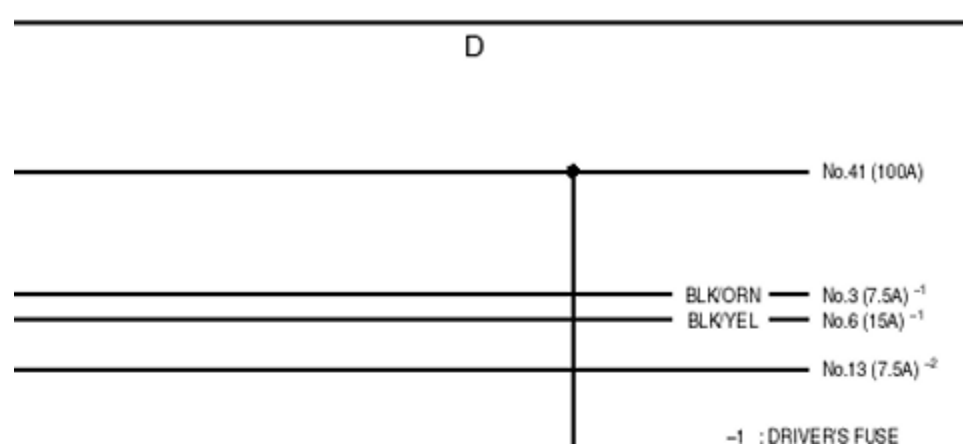
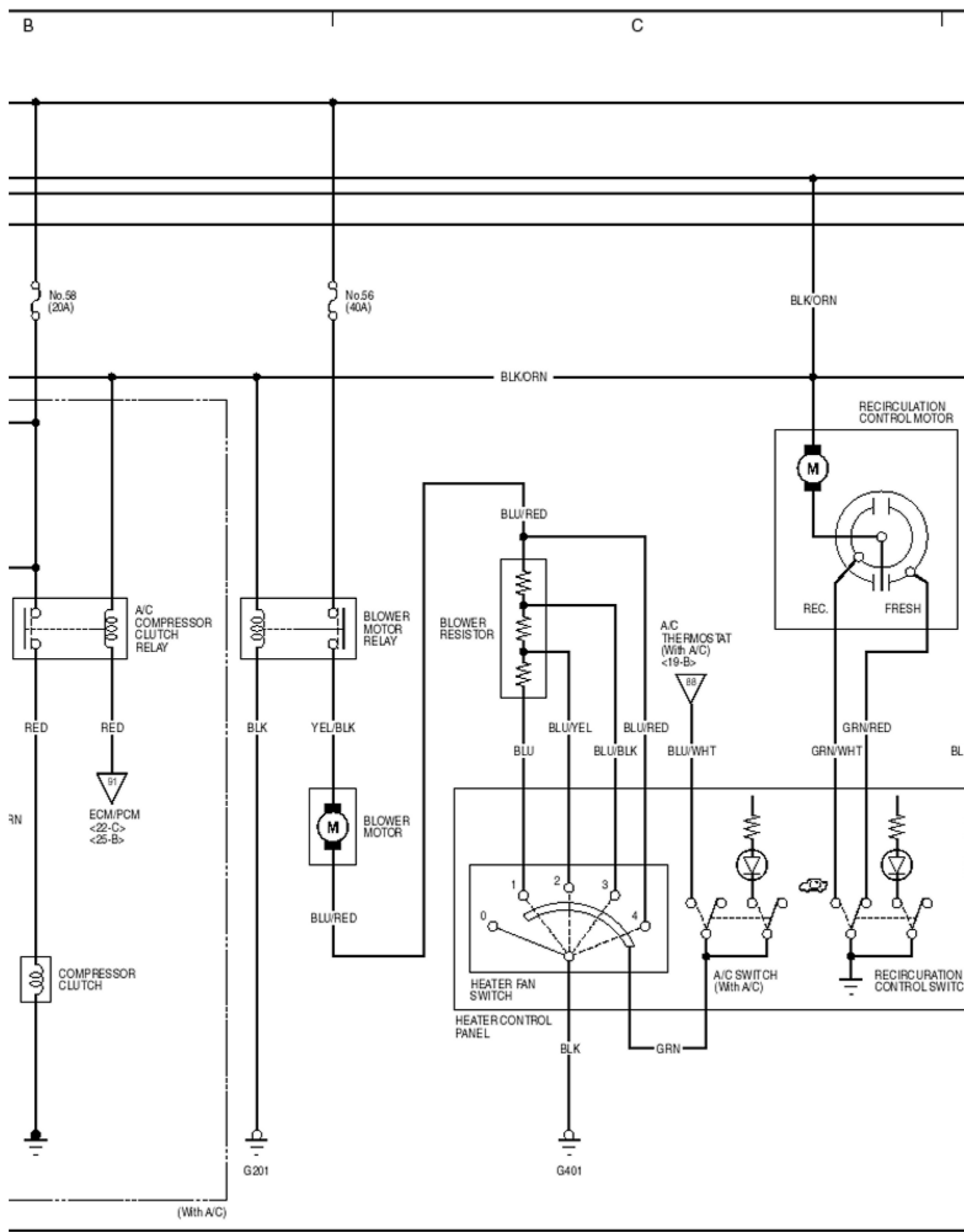
No.41 (100A)

No.3 (7.5A)⁻¹ — BLKORN
 No.6 (15A)⁻¹ — BLKYEL

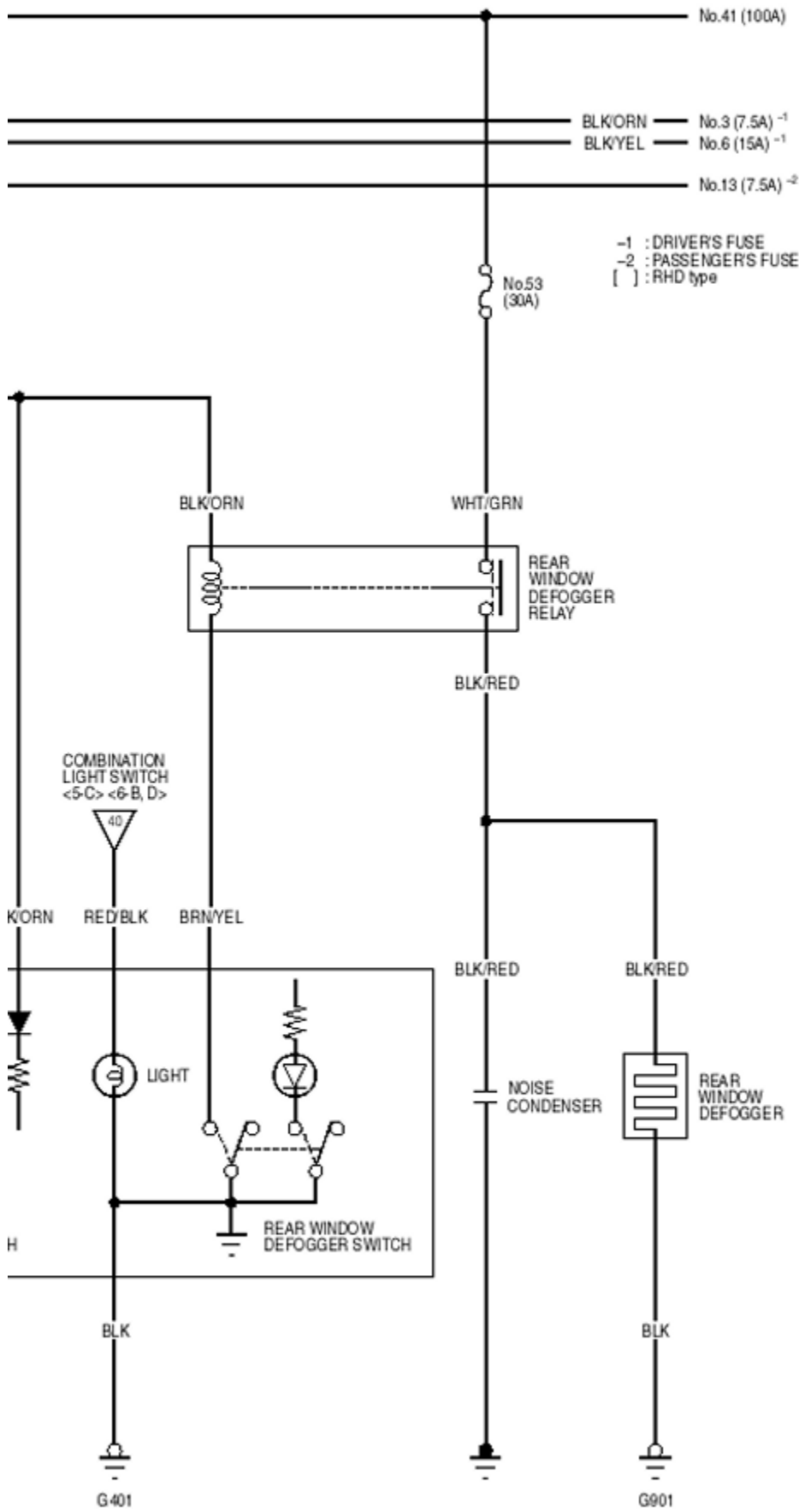
No.13 (7.5A)⁻²

KY model :



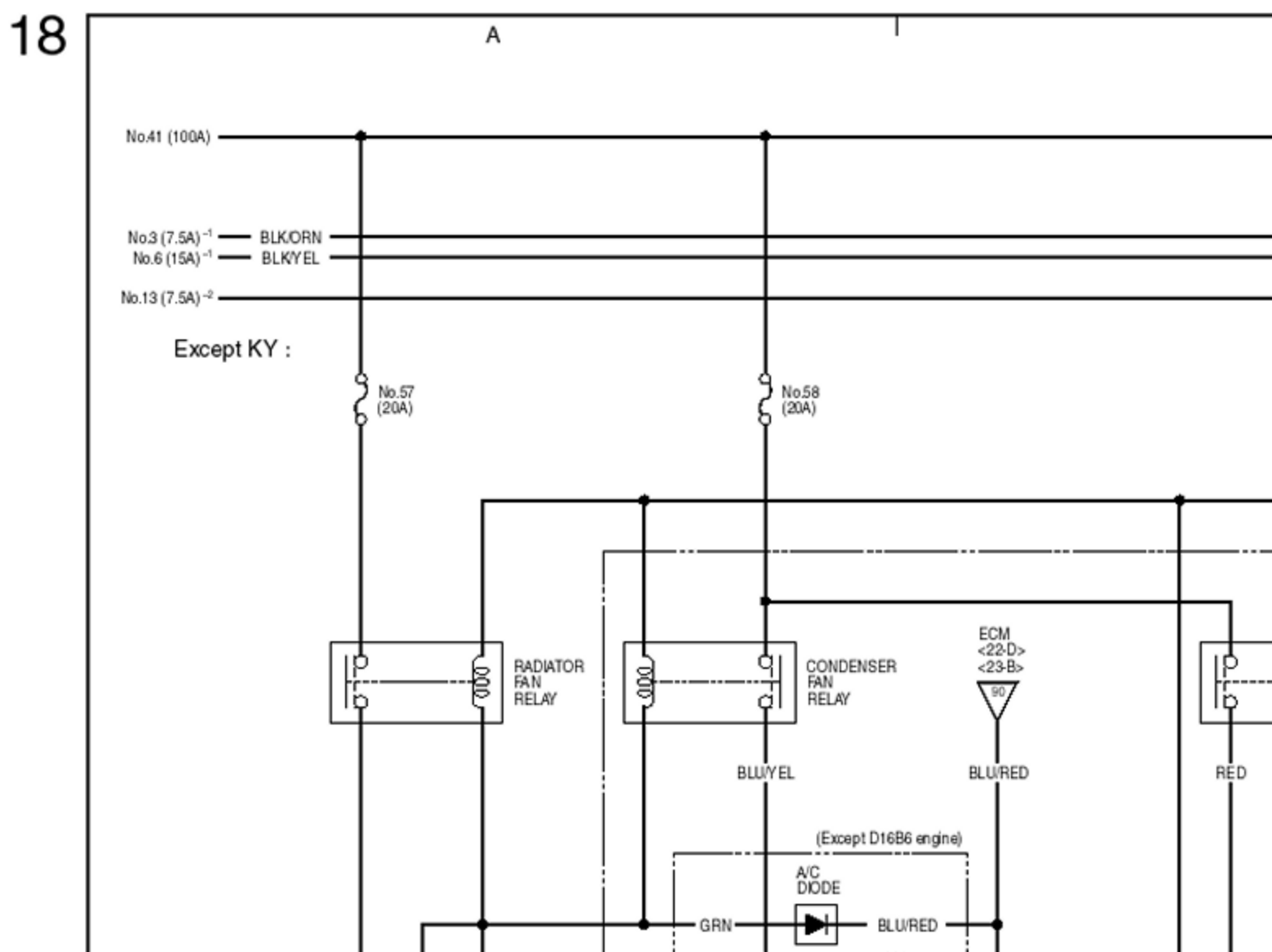
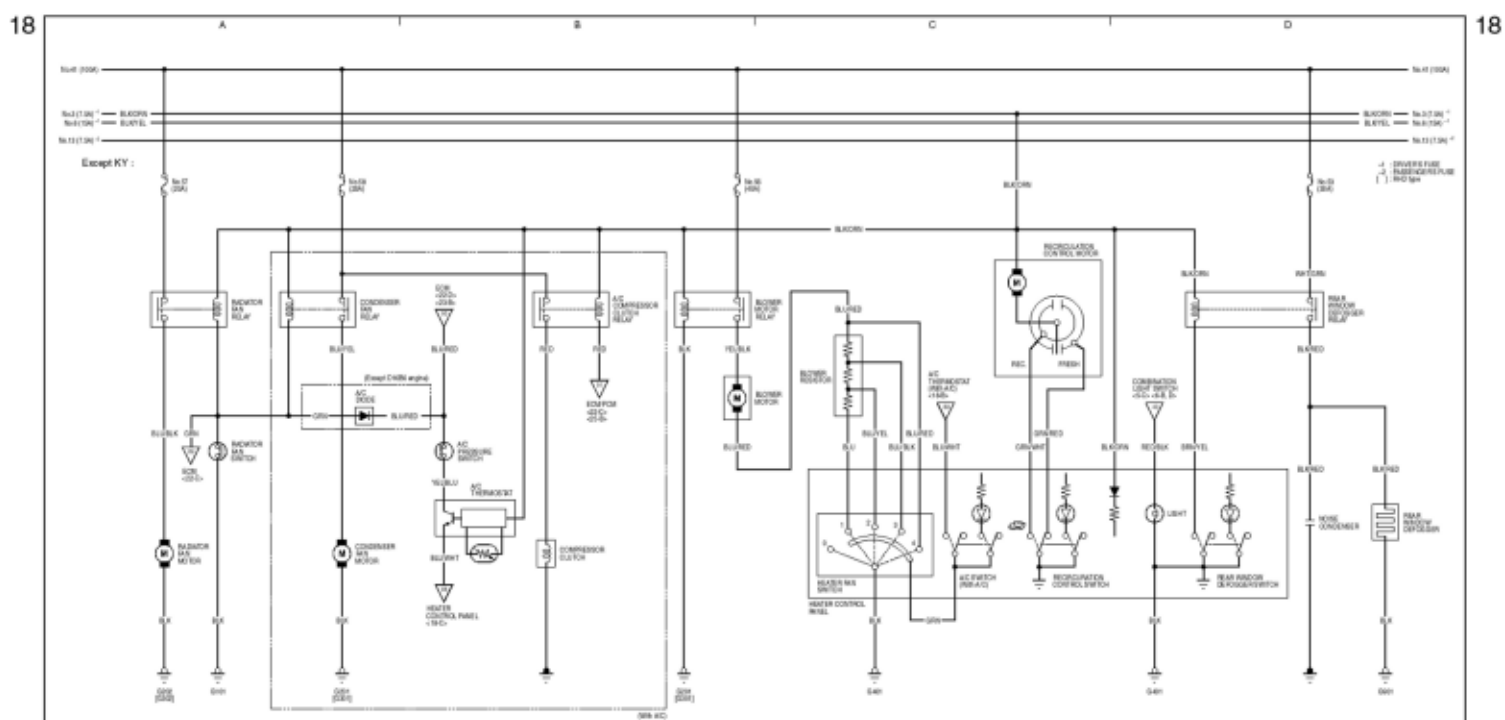


D



Wiring Diagrams

Rear Window Defogger



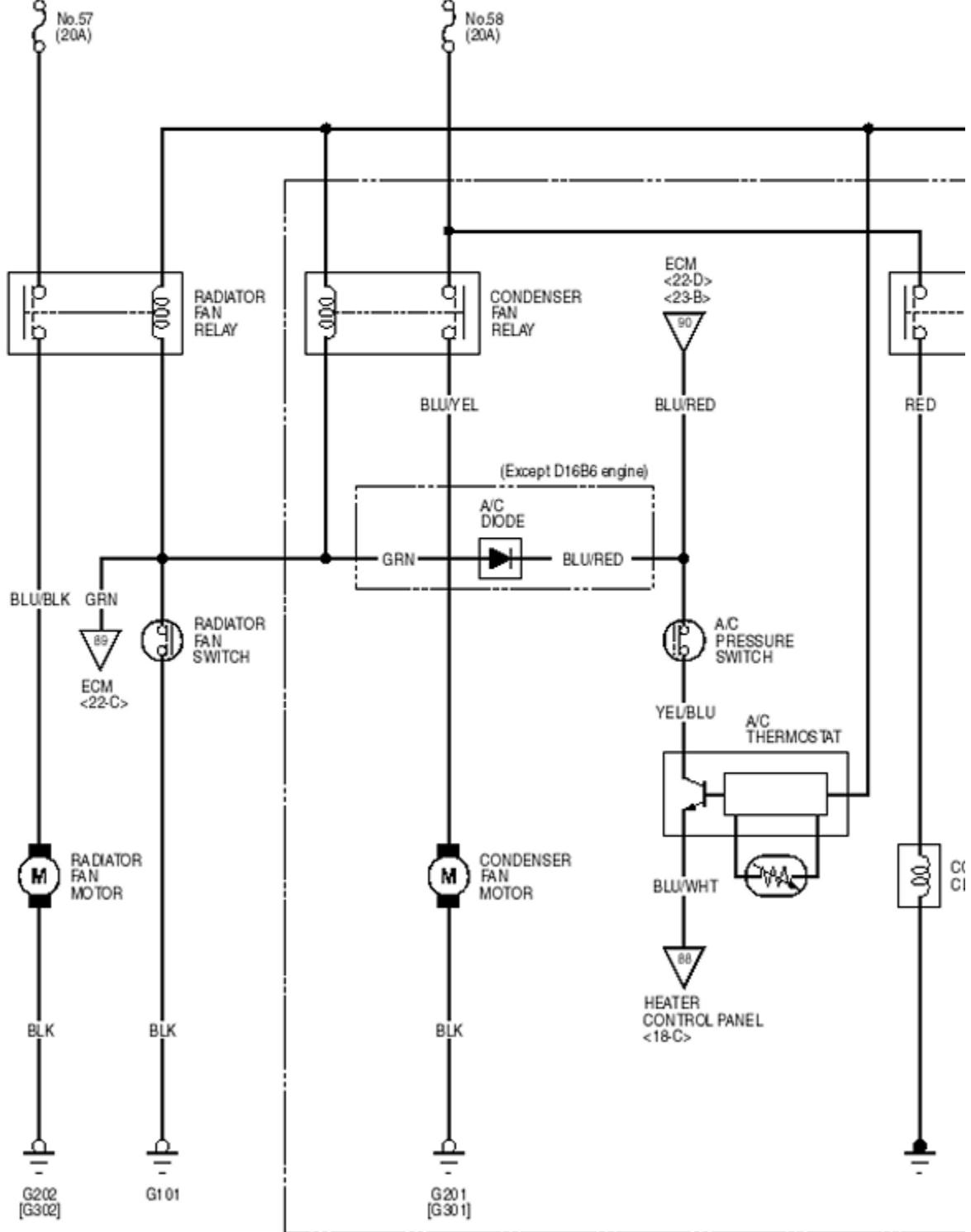
No.41 (100A)

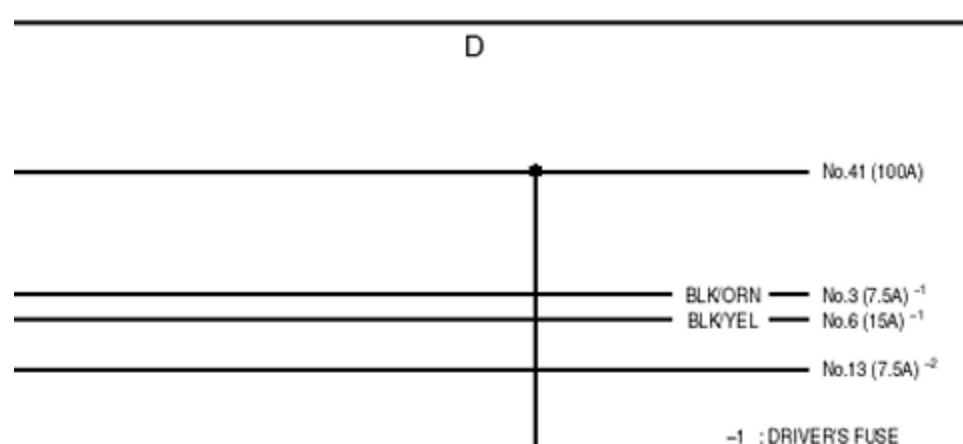
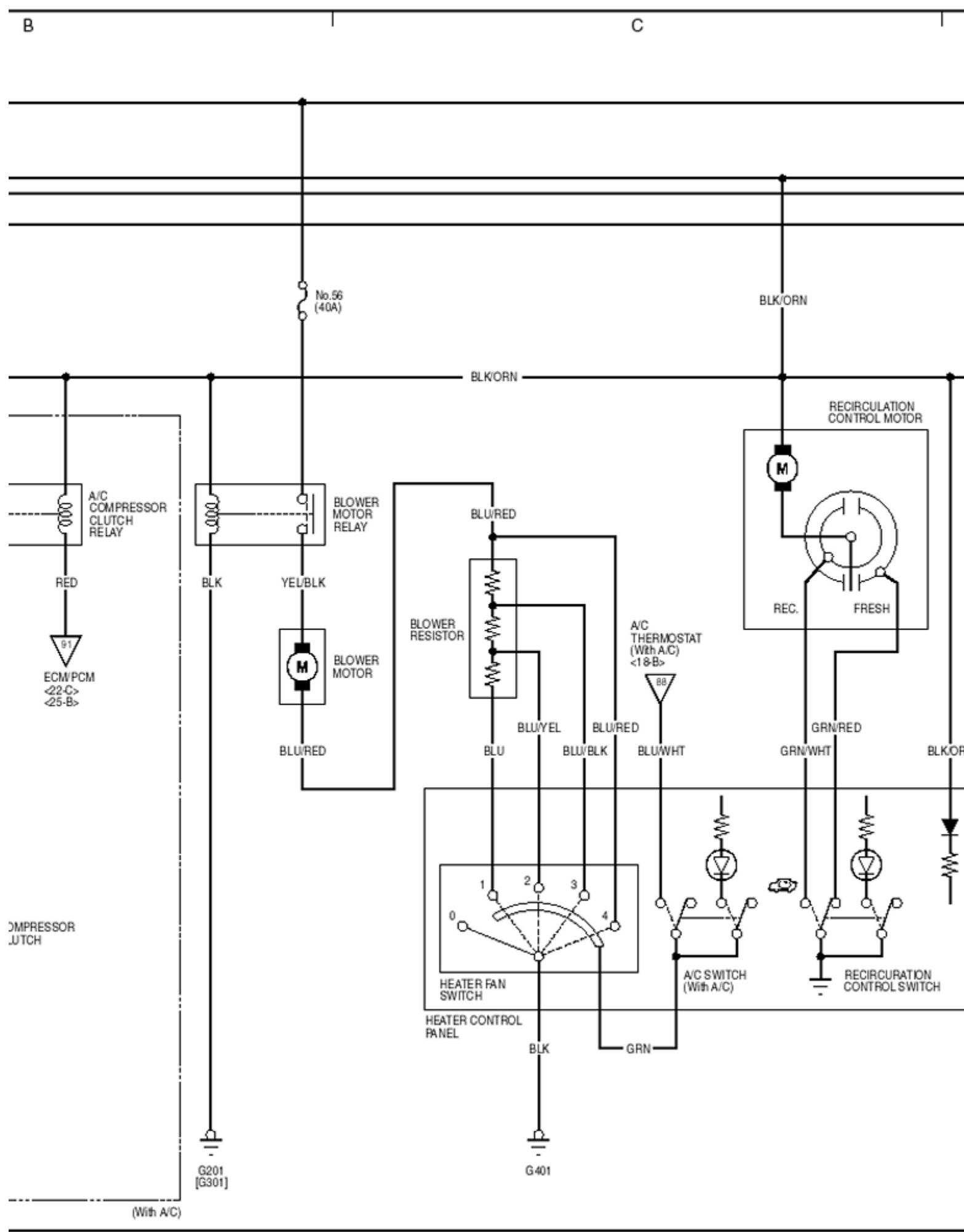
No.3 (7.5A)⁻¹ — BLKORN

No.6 (15A)⁻¹ — BLKYEL

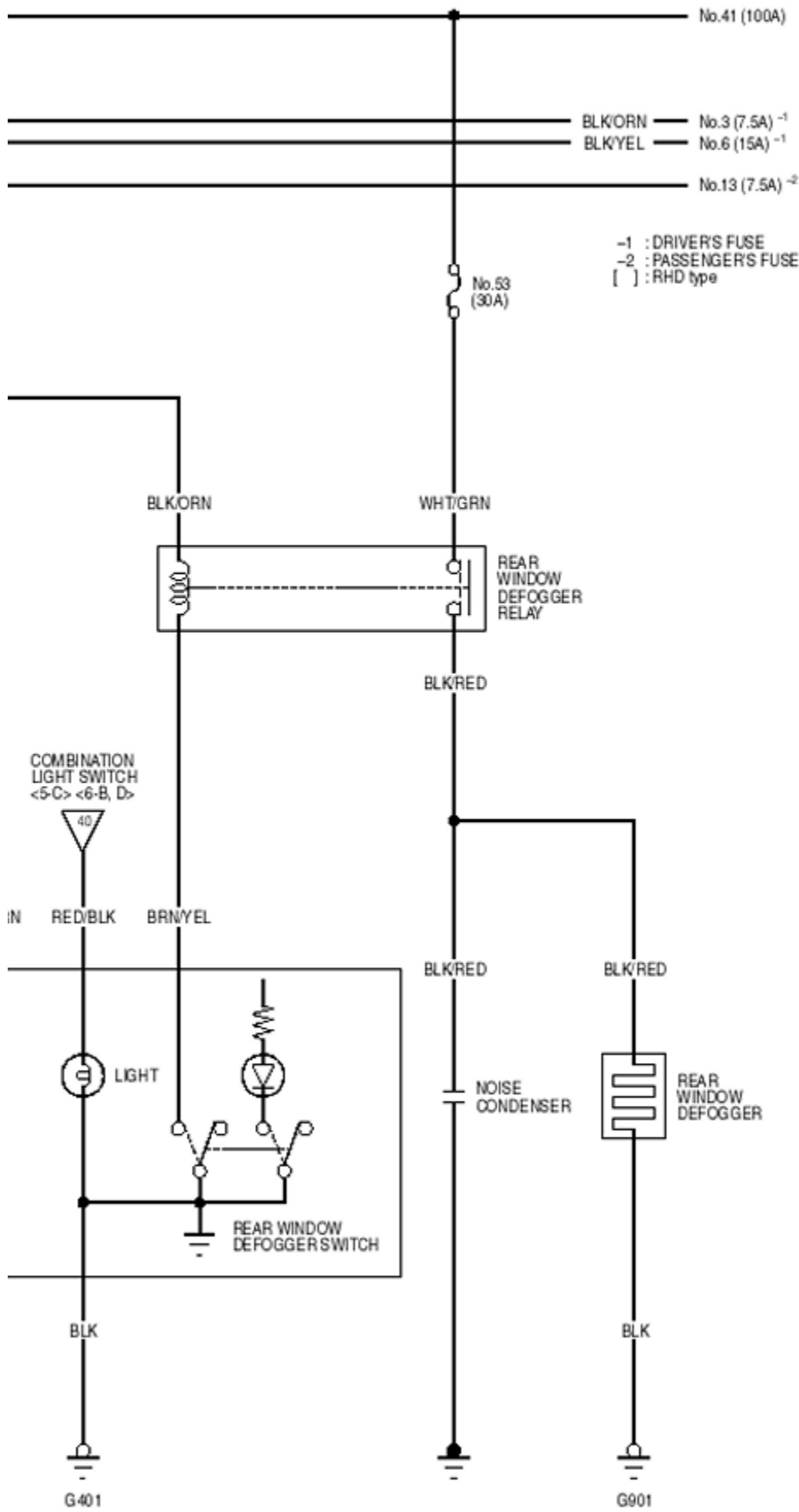
No.13 (7.5A)⁻²

Except KY :



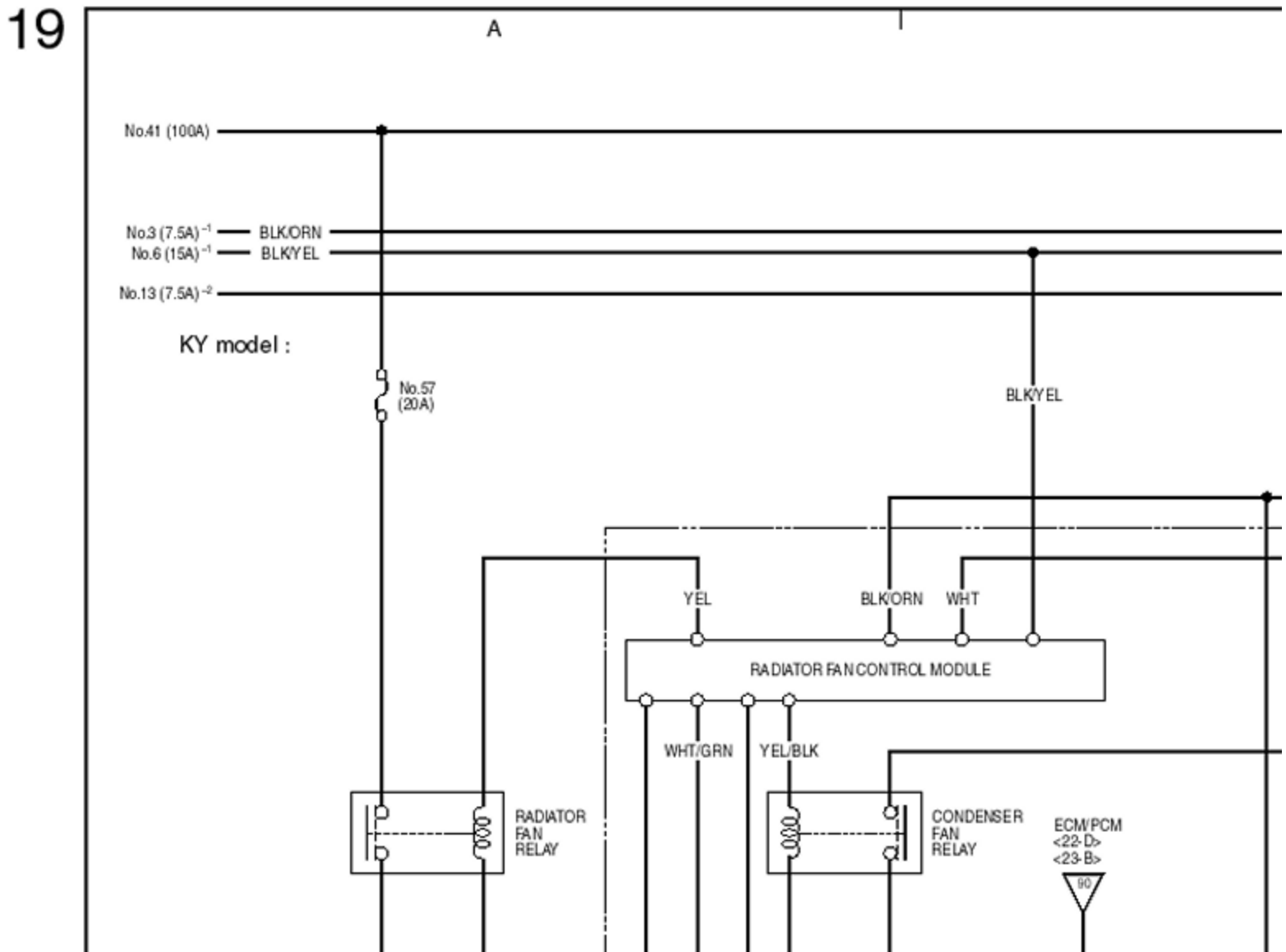
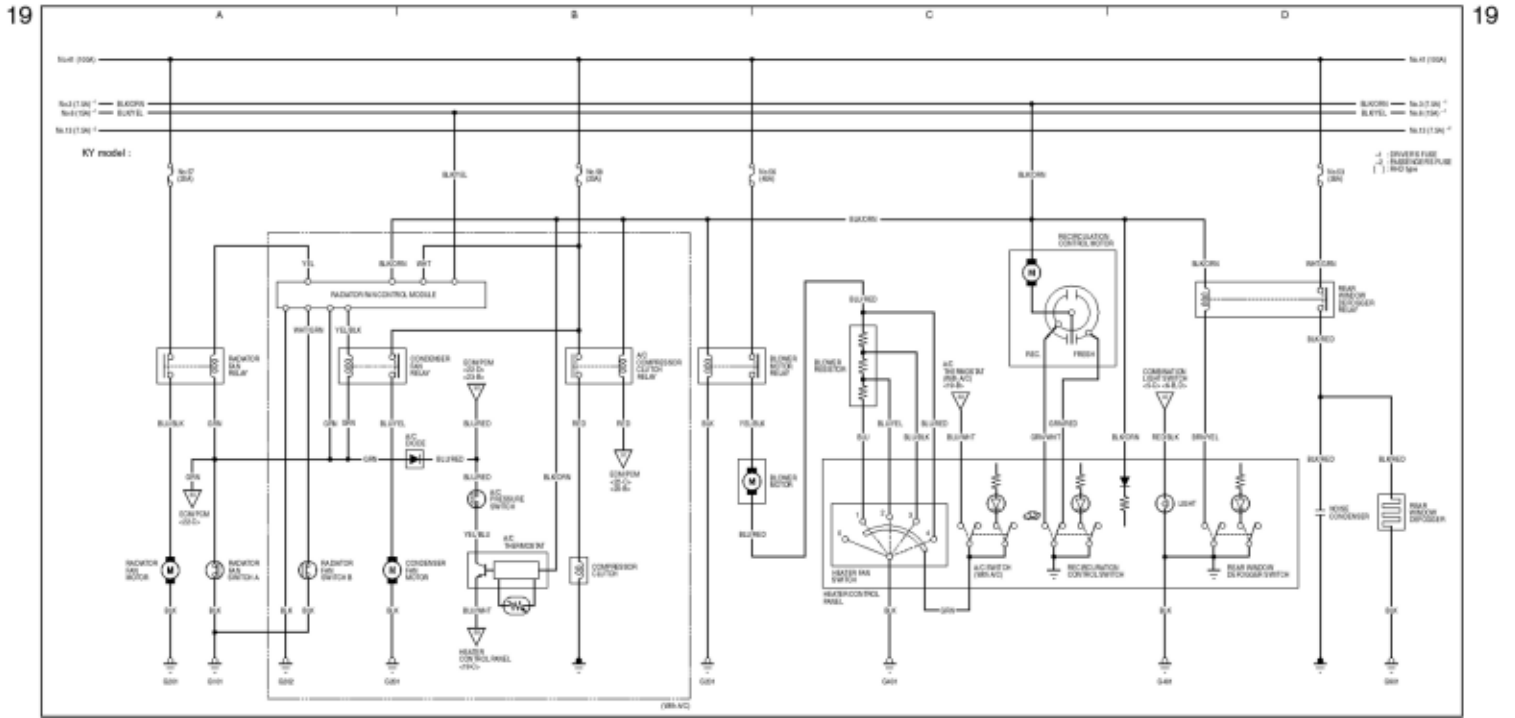


D



Wiring Diagrams

Rear Window Defogger

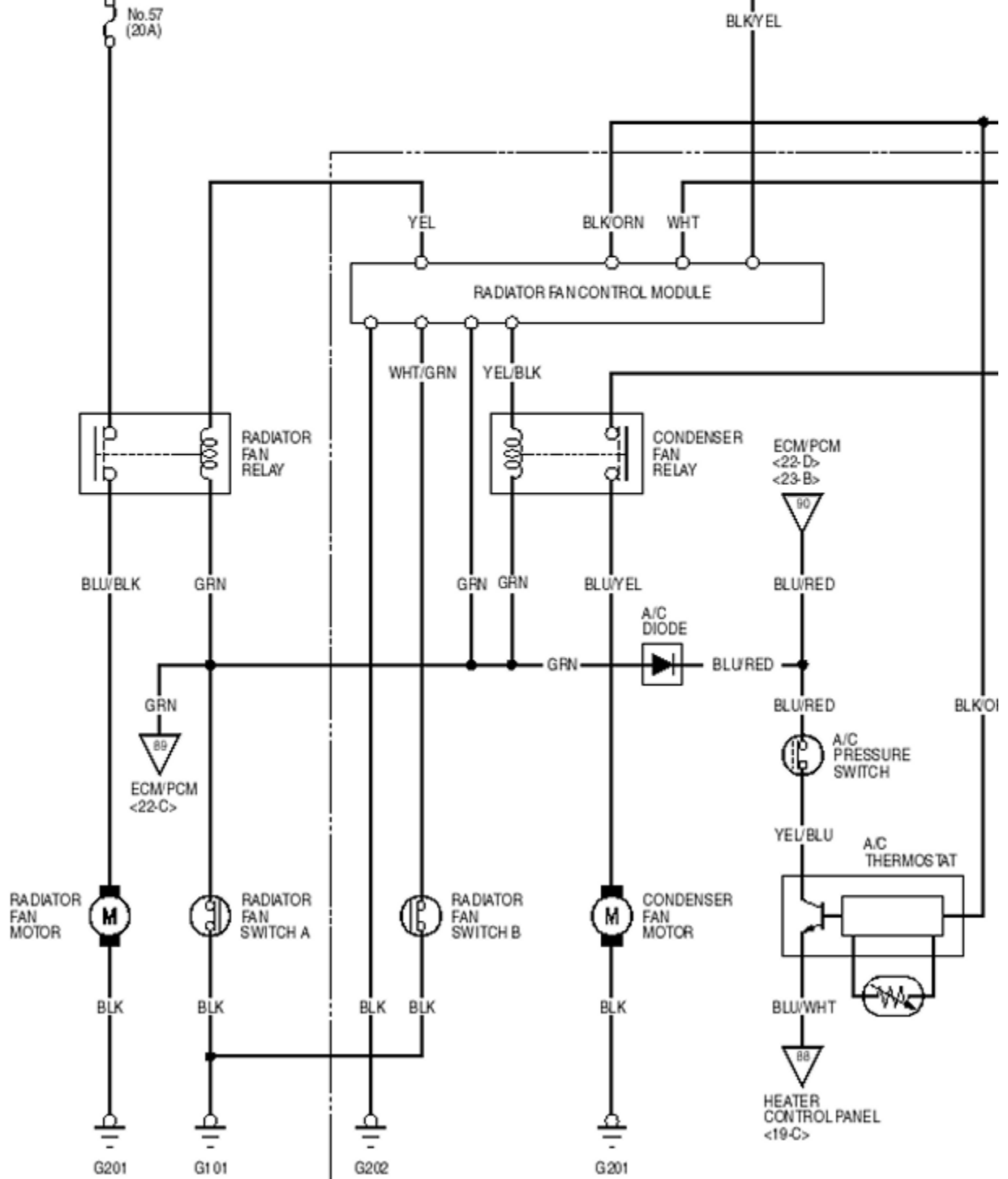


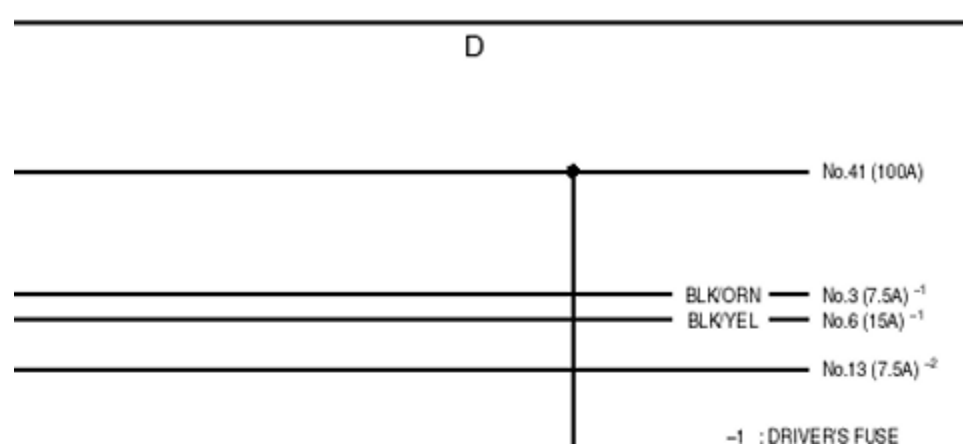
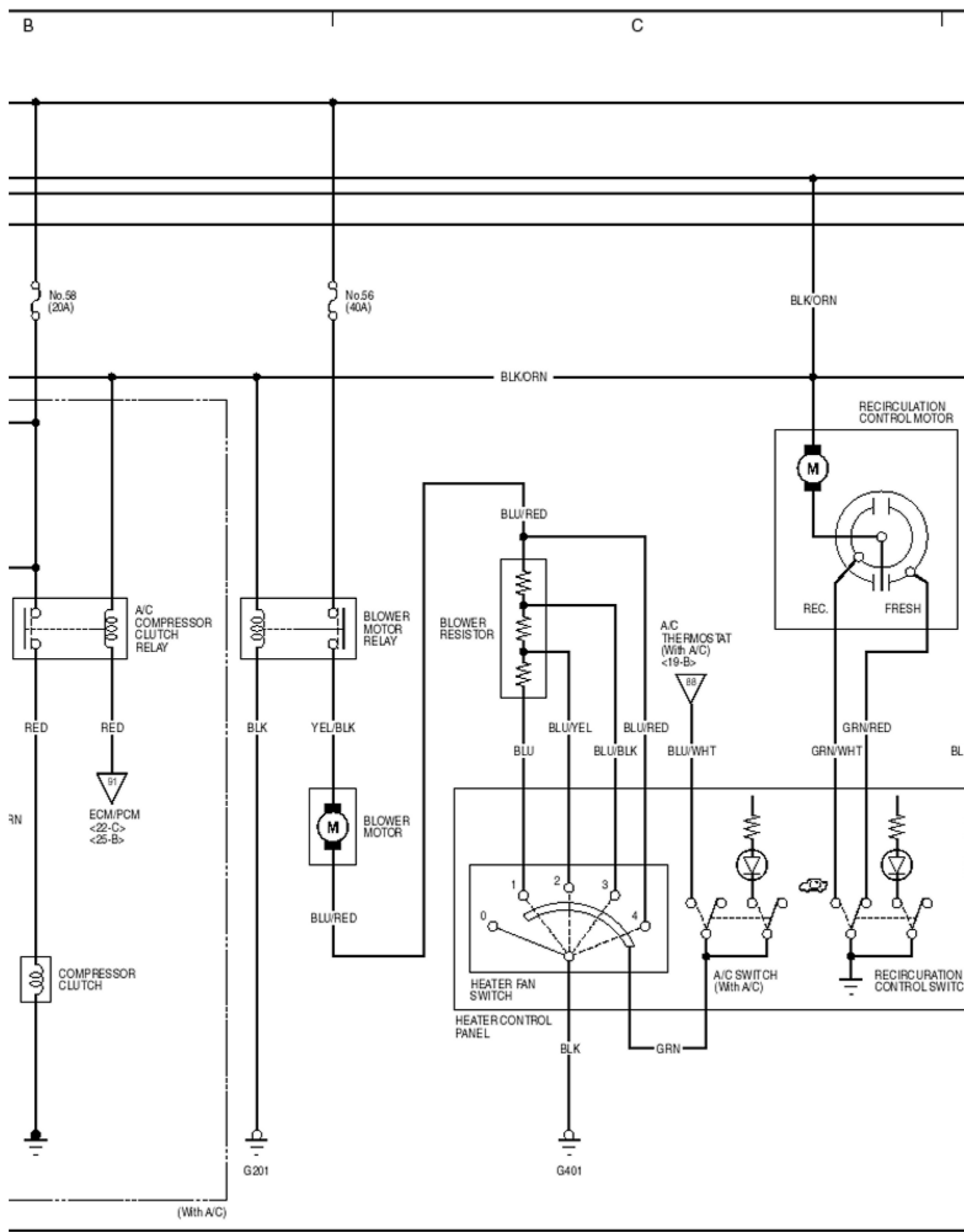
No.41 (100A)

No.3 (7.5A)⁻¹ — BLKORN
 No.6 (15A)⁻¹ — BLKYEL

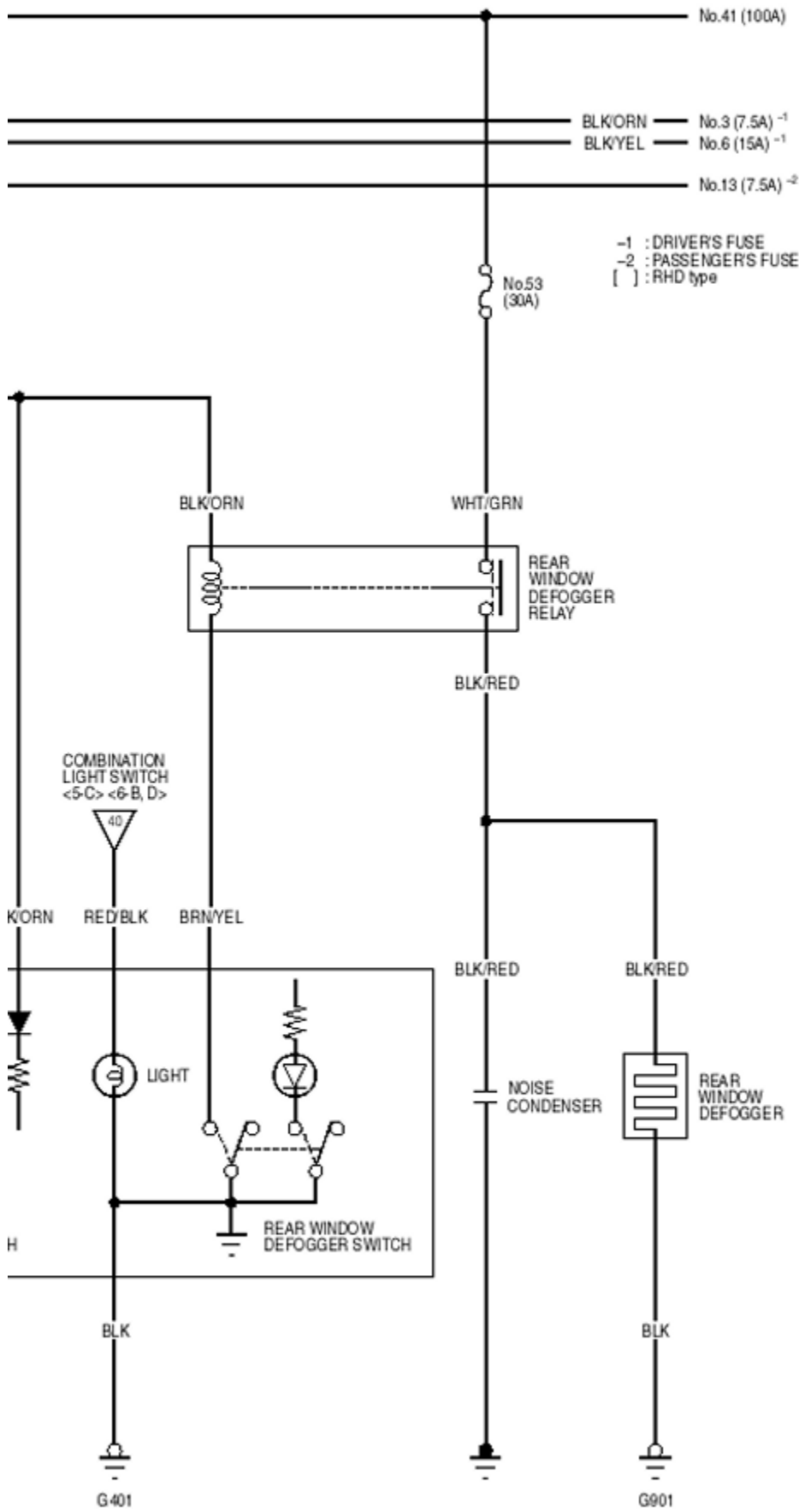
No.13 (7.5A)⁻²

KY model :



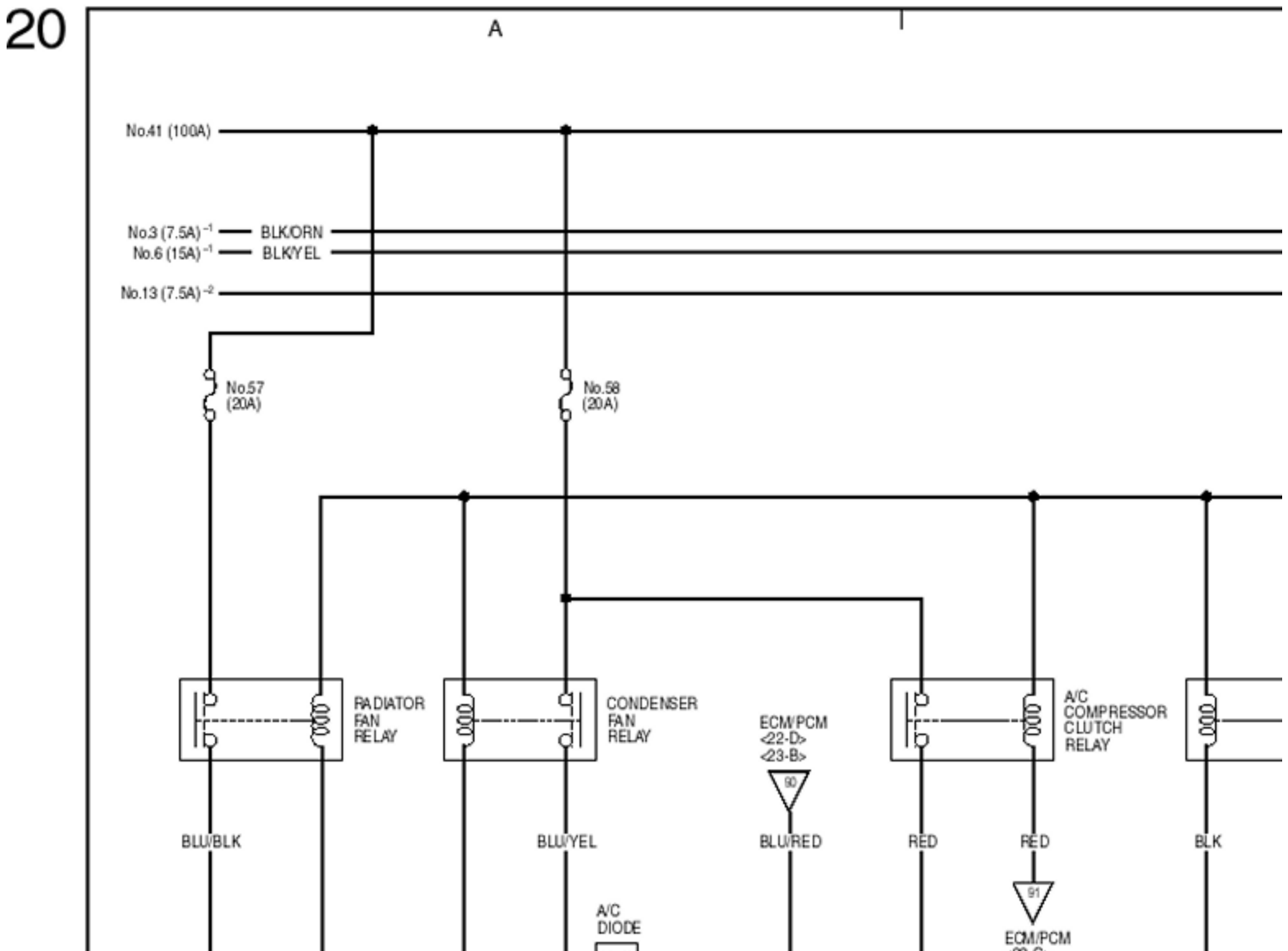
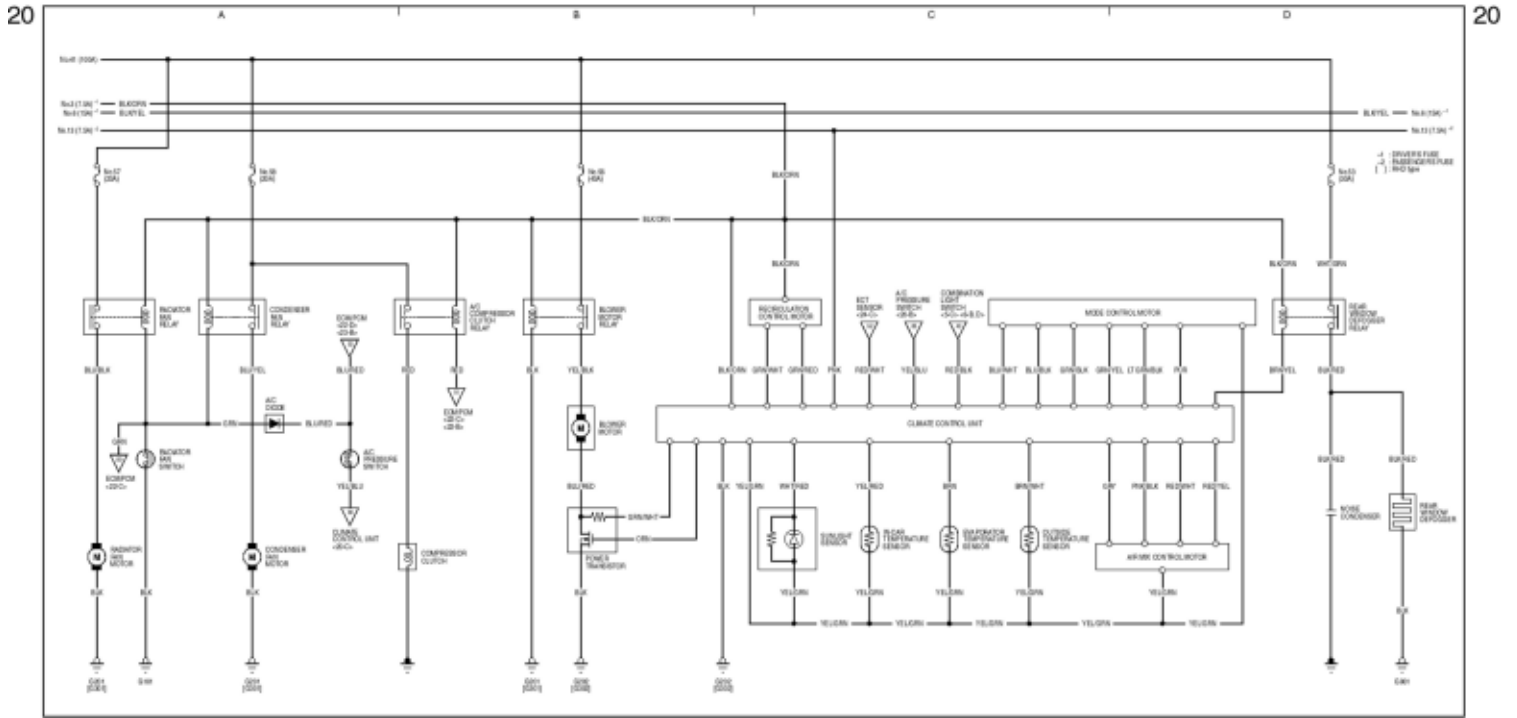


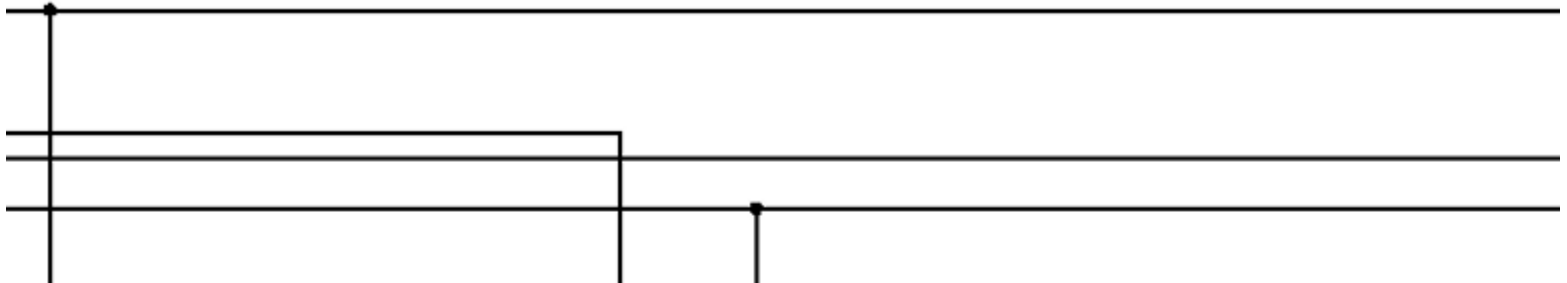
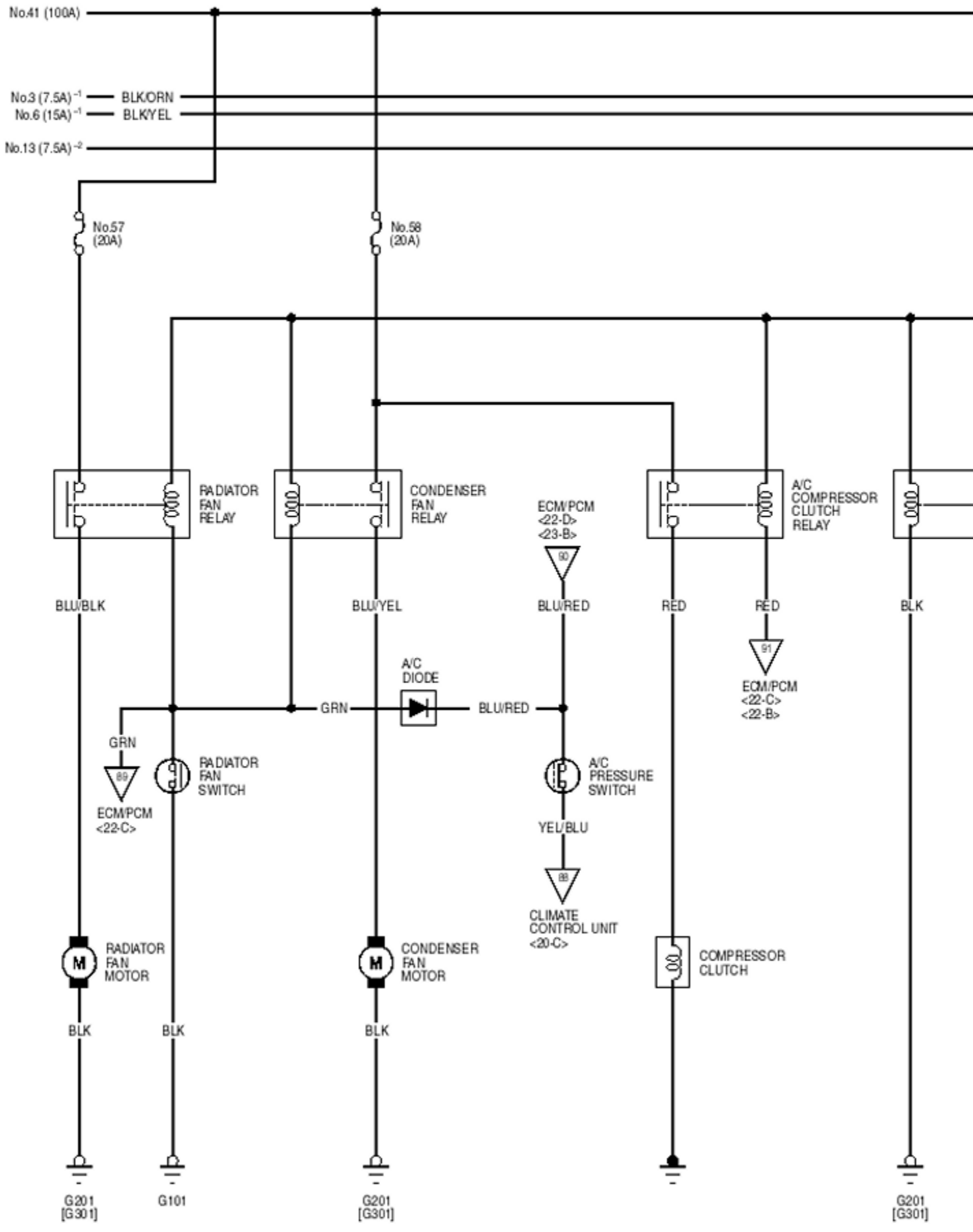
D

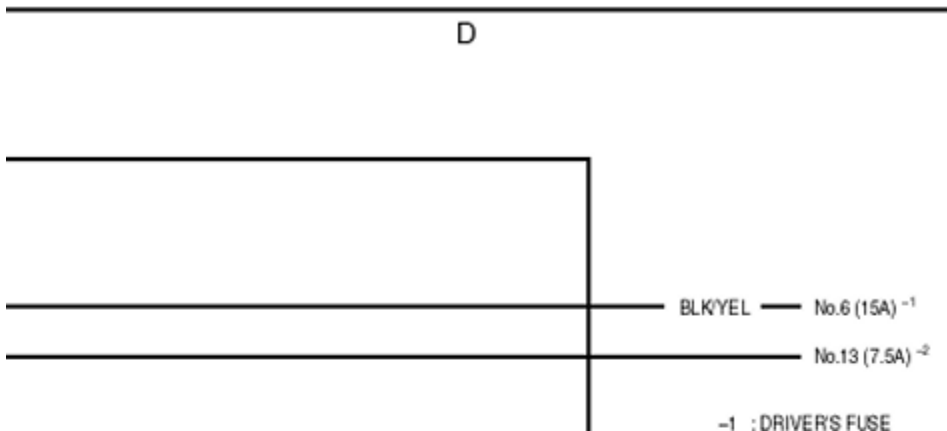
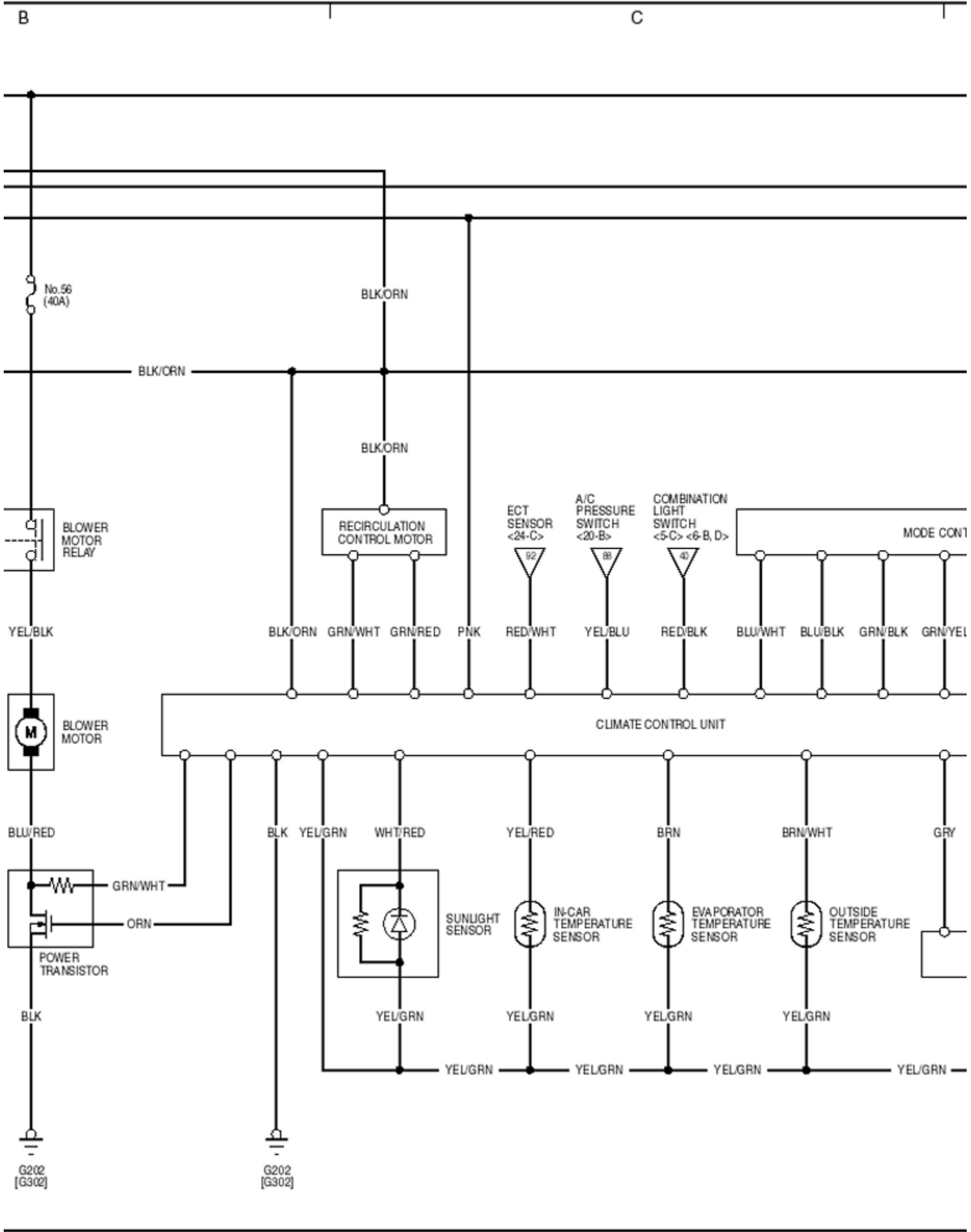


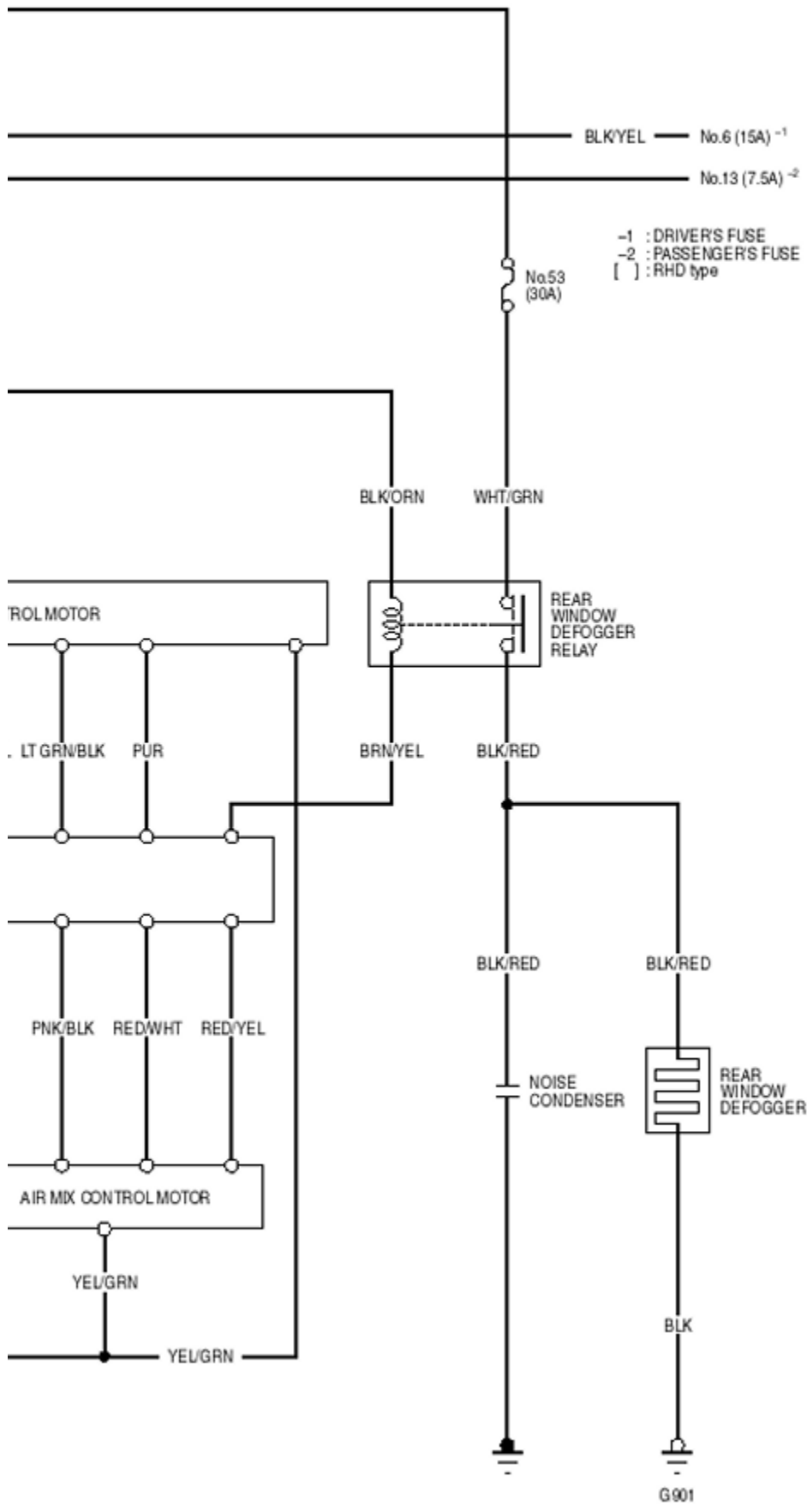
Wiring Diagrams

Rear Window Defogger





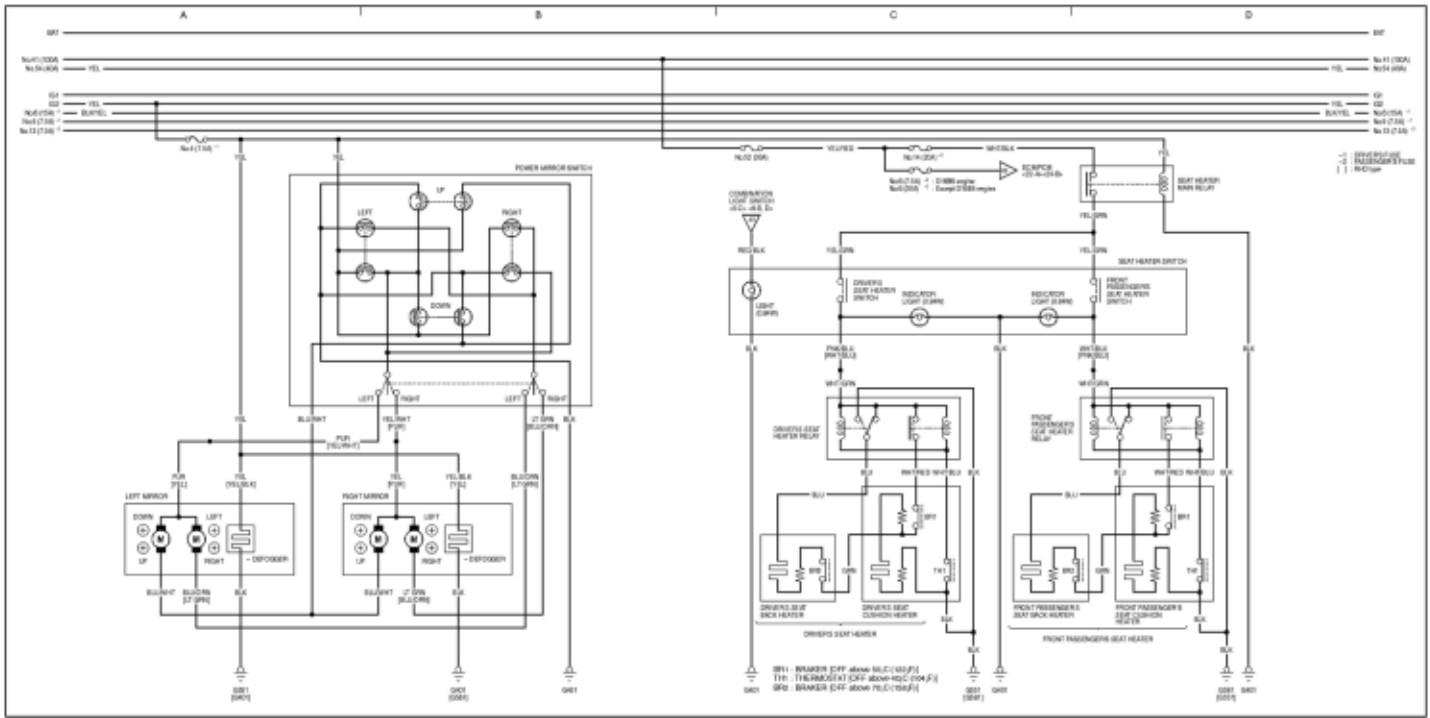




Wiring Diagrams

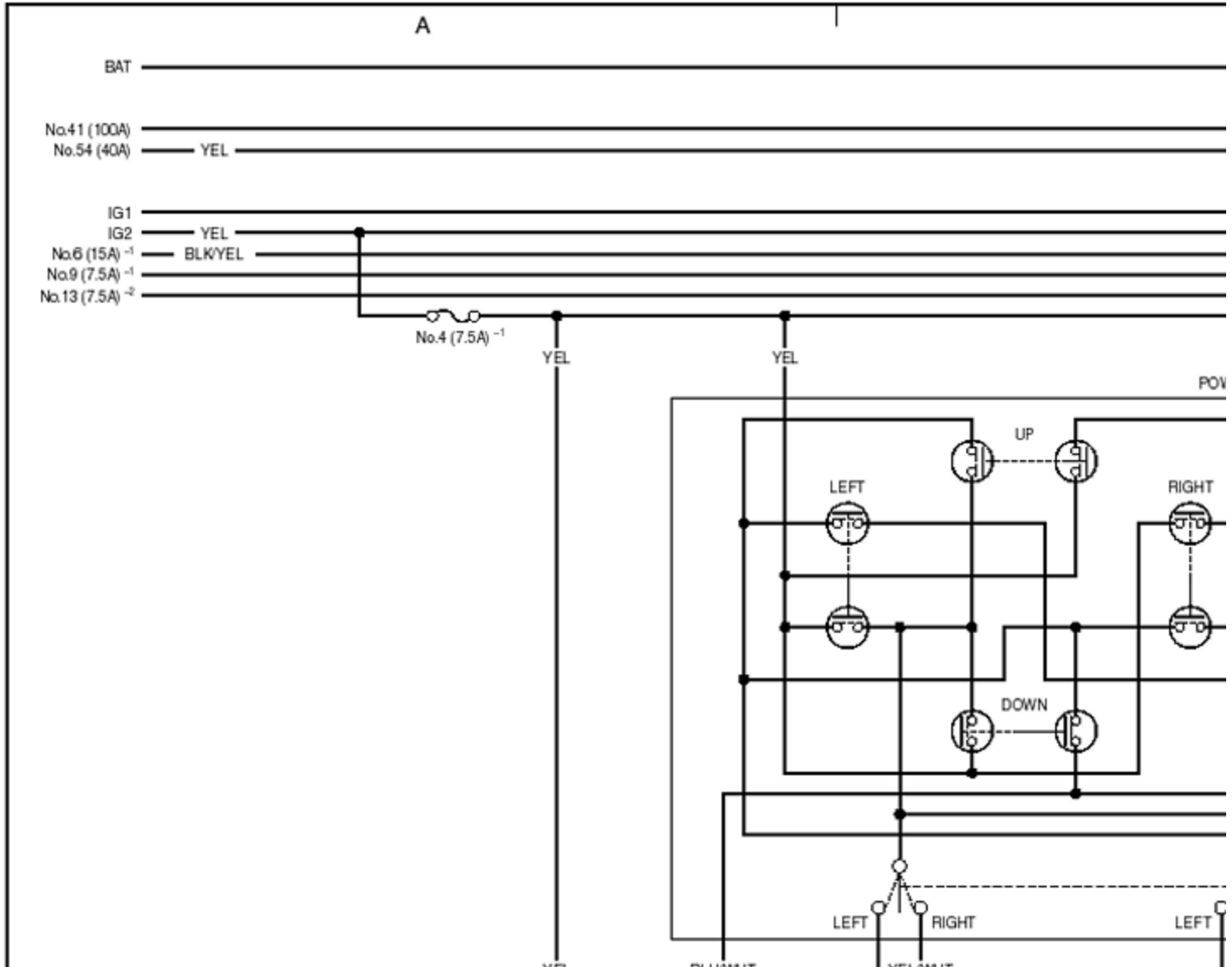
Seat Heaters

10

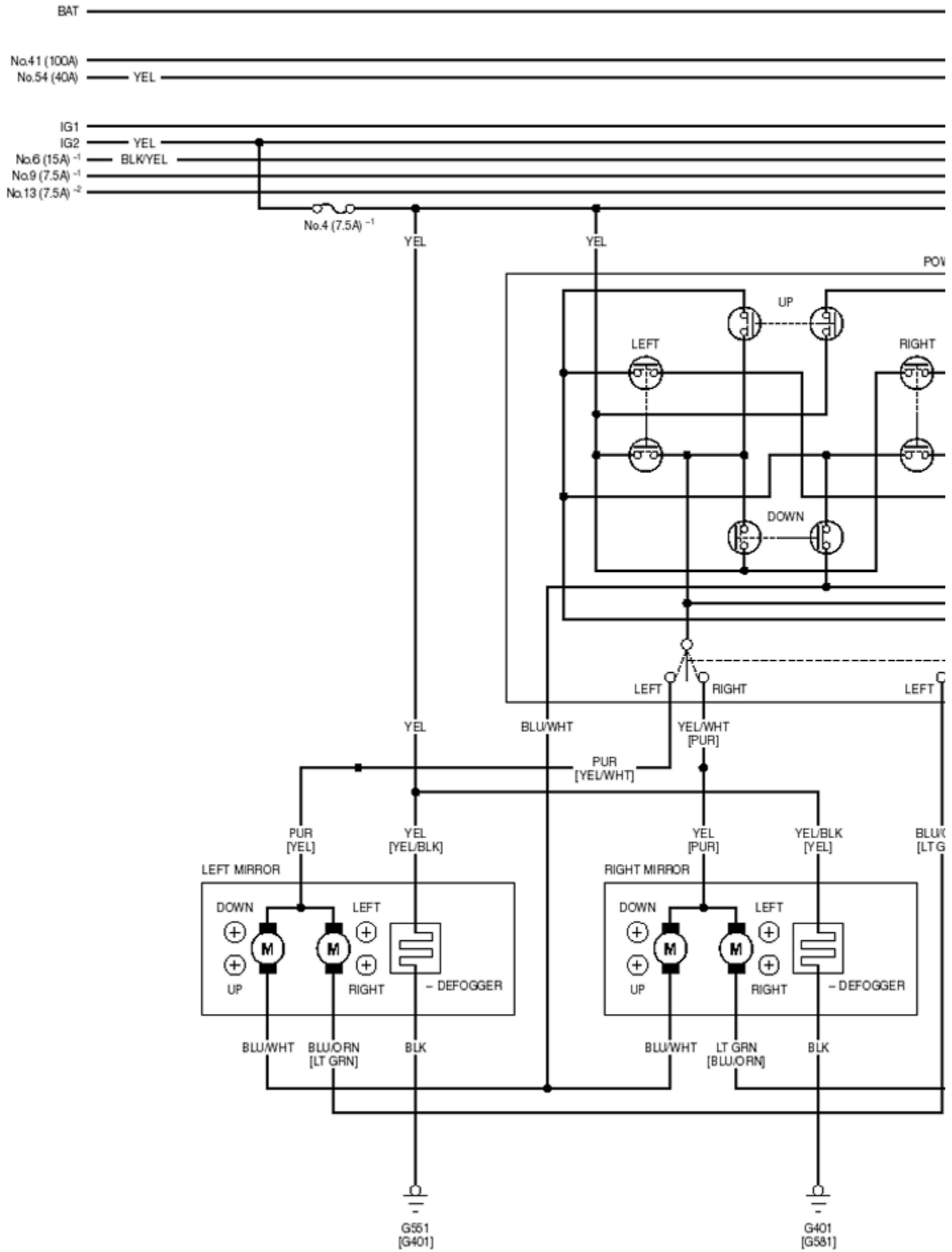


10

10

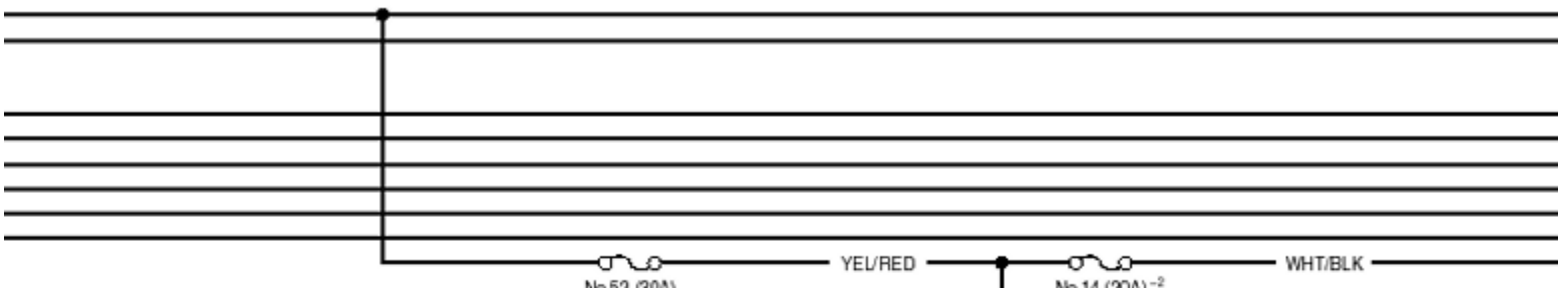


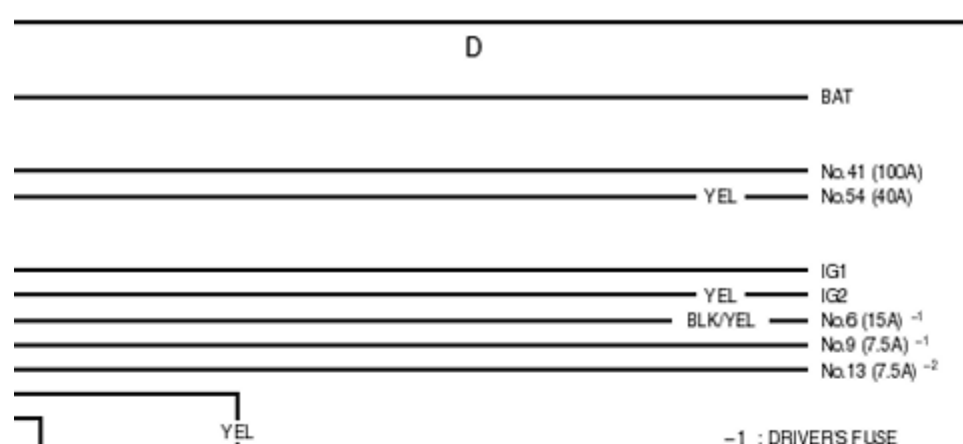
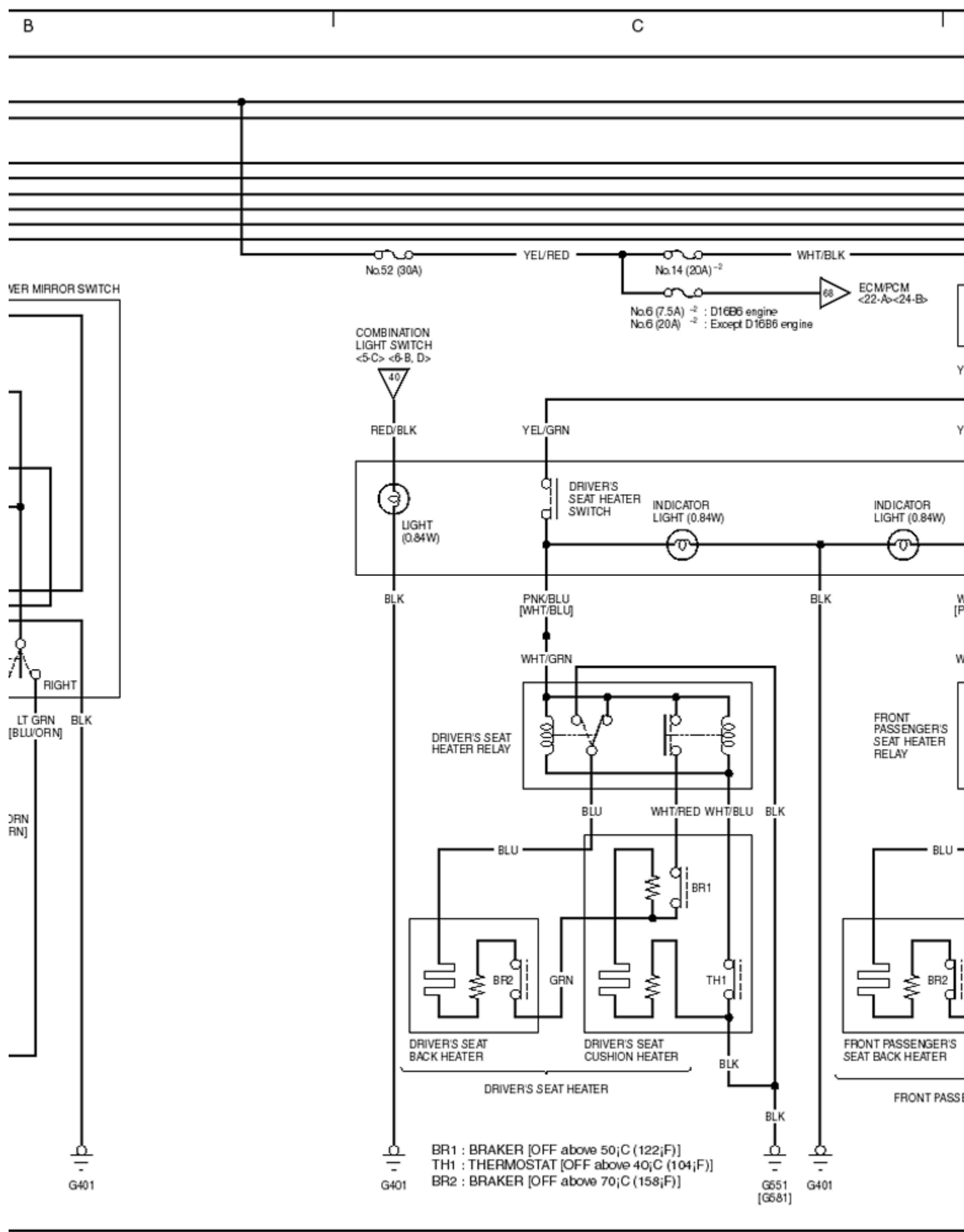
A



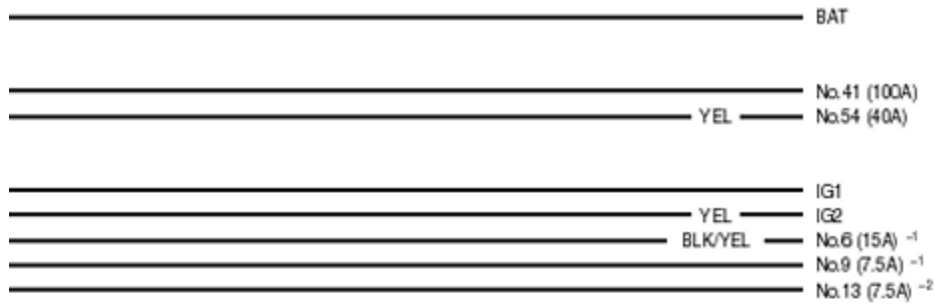
B

C

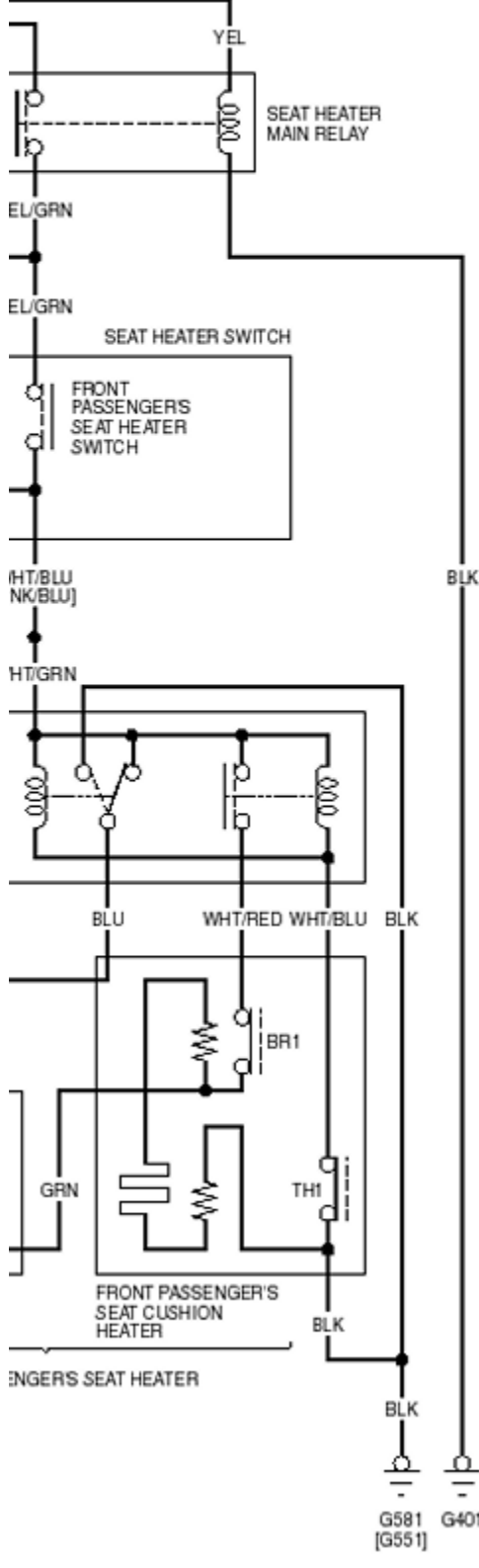




10



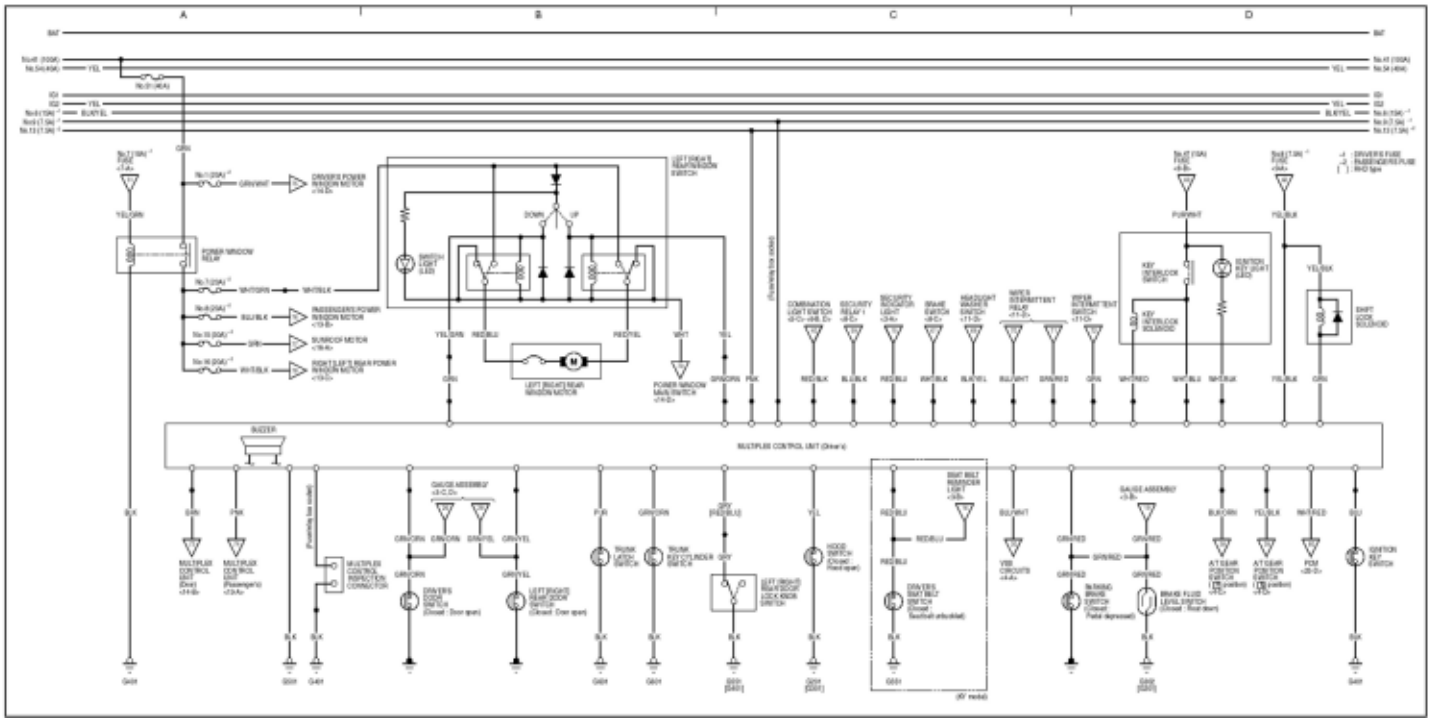
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type



Wiring Diagrams

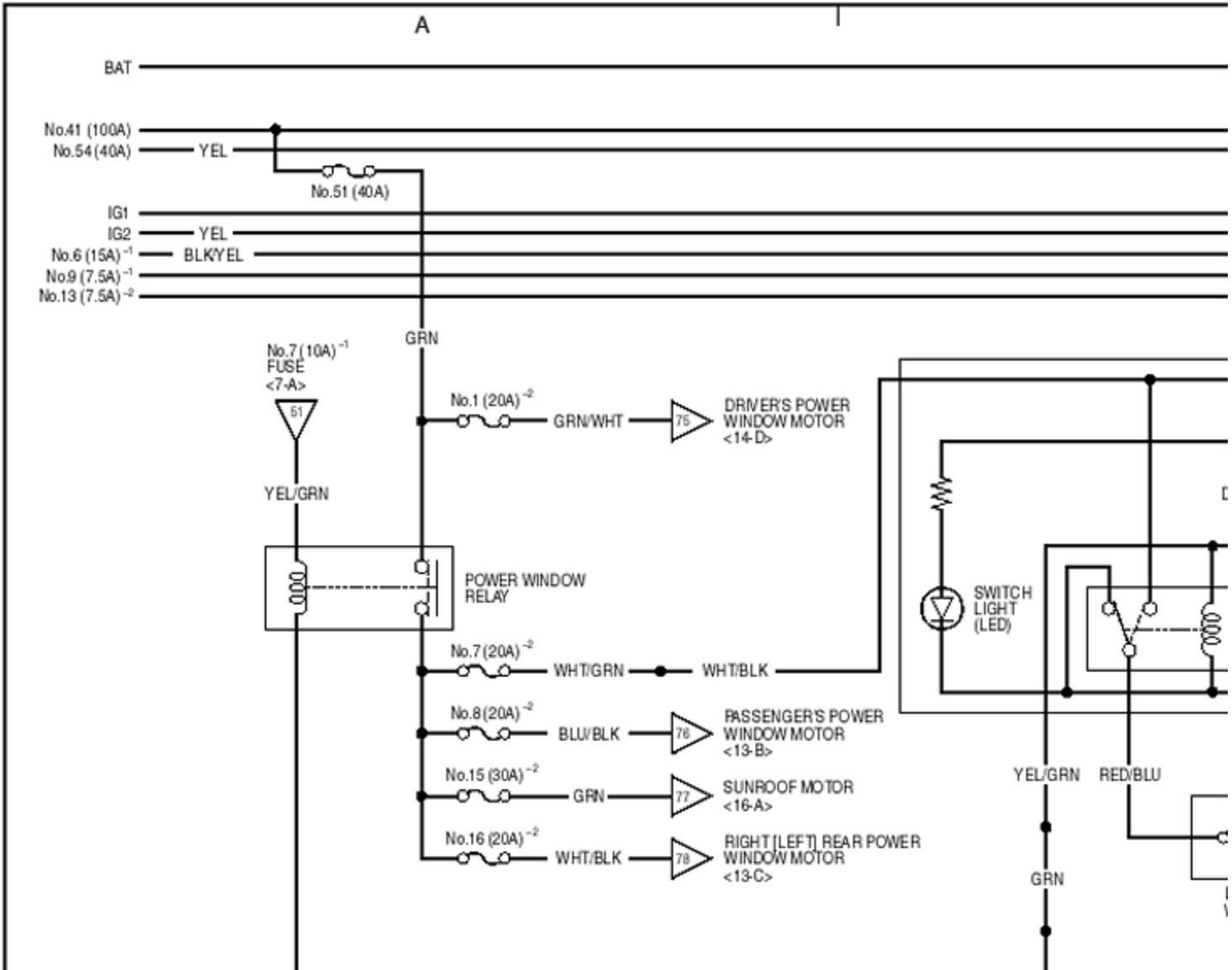
Security Alarm System

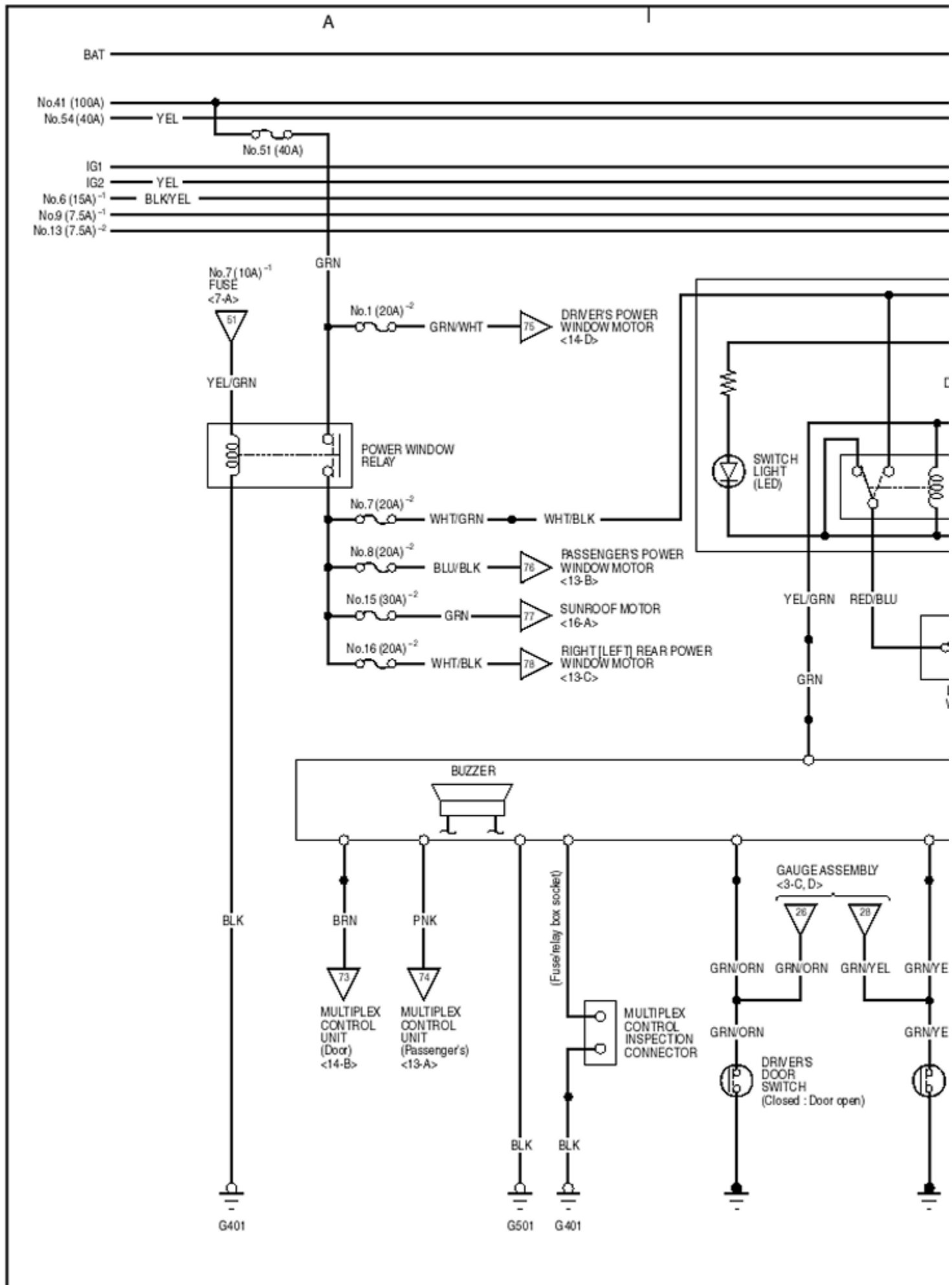
12



12

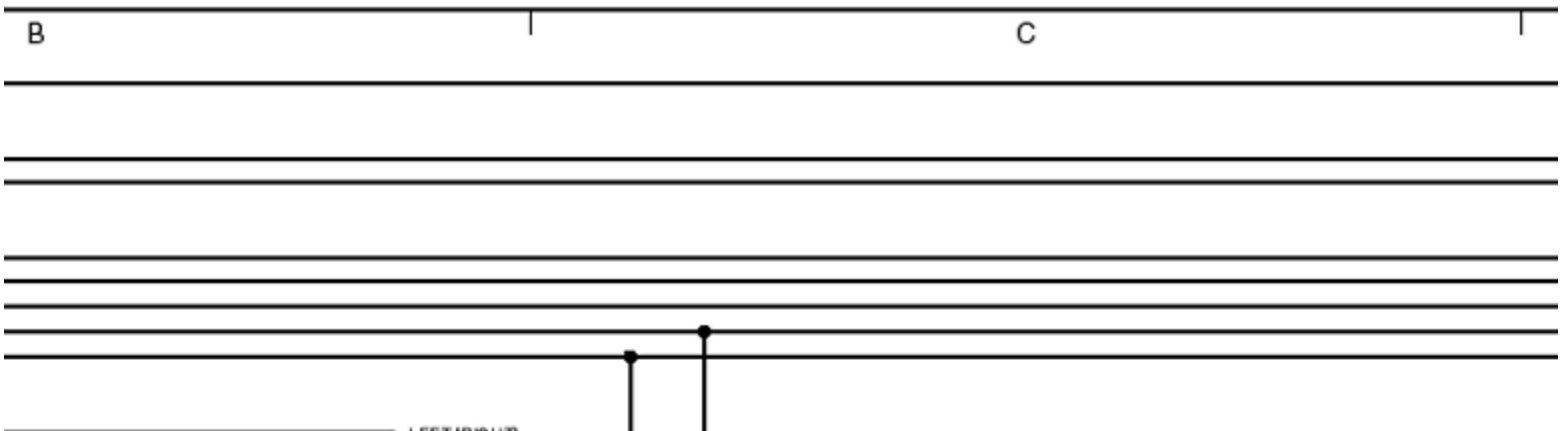
12

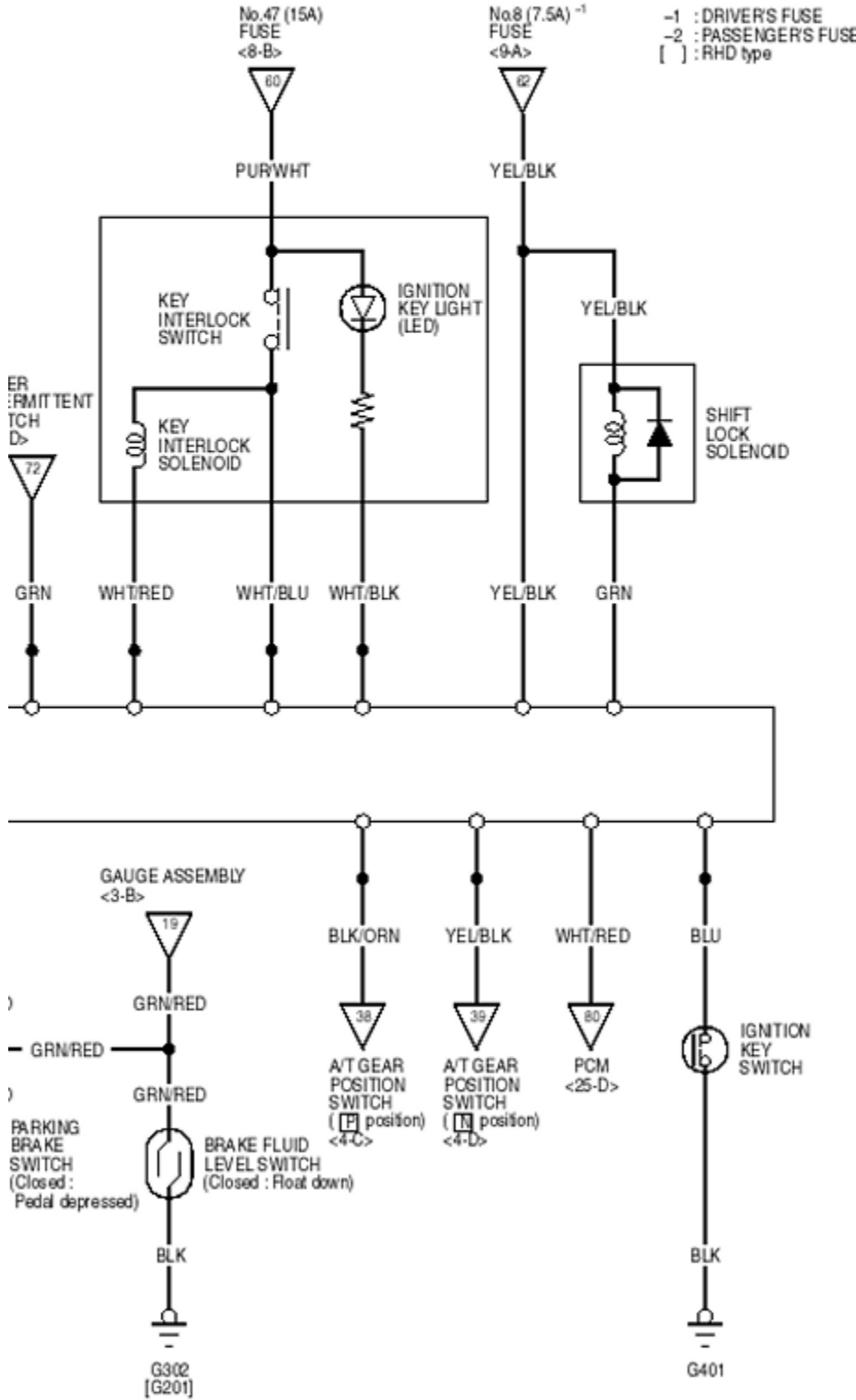
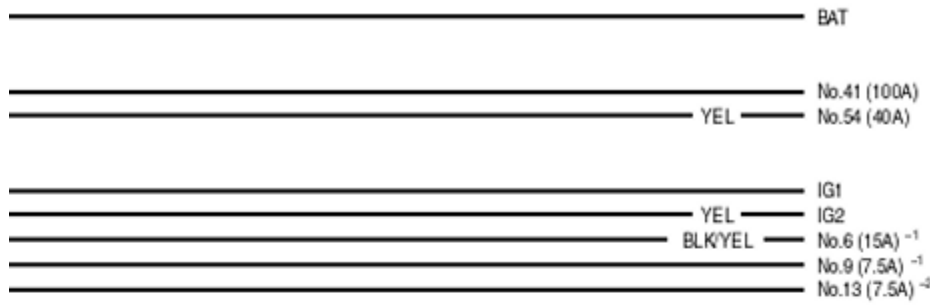


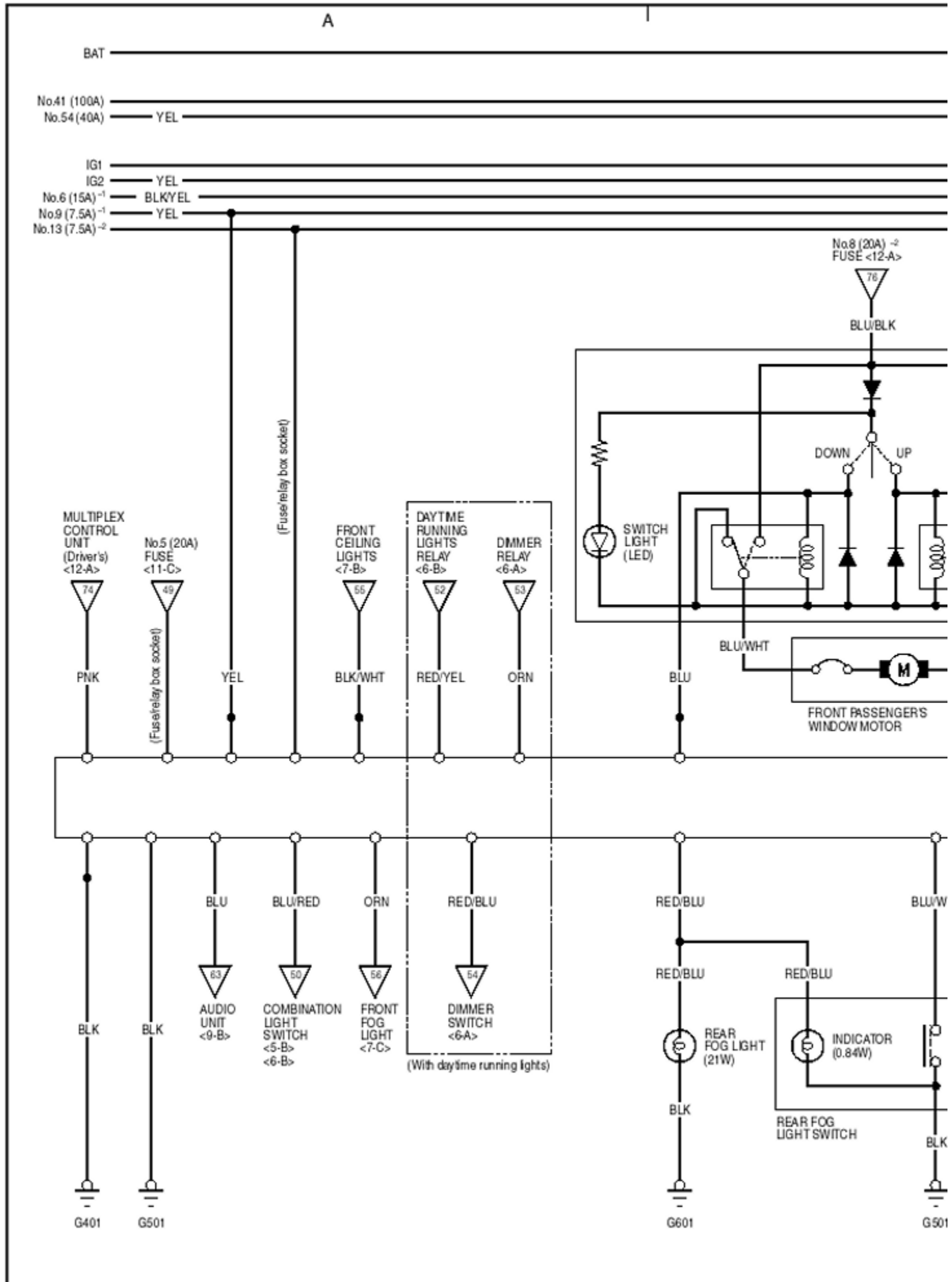


B

C





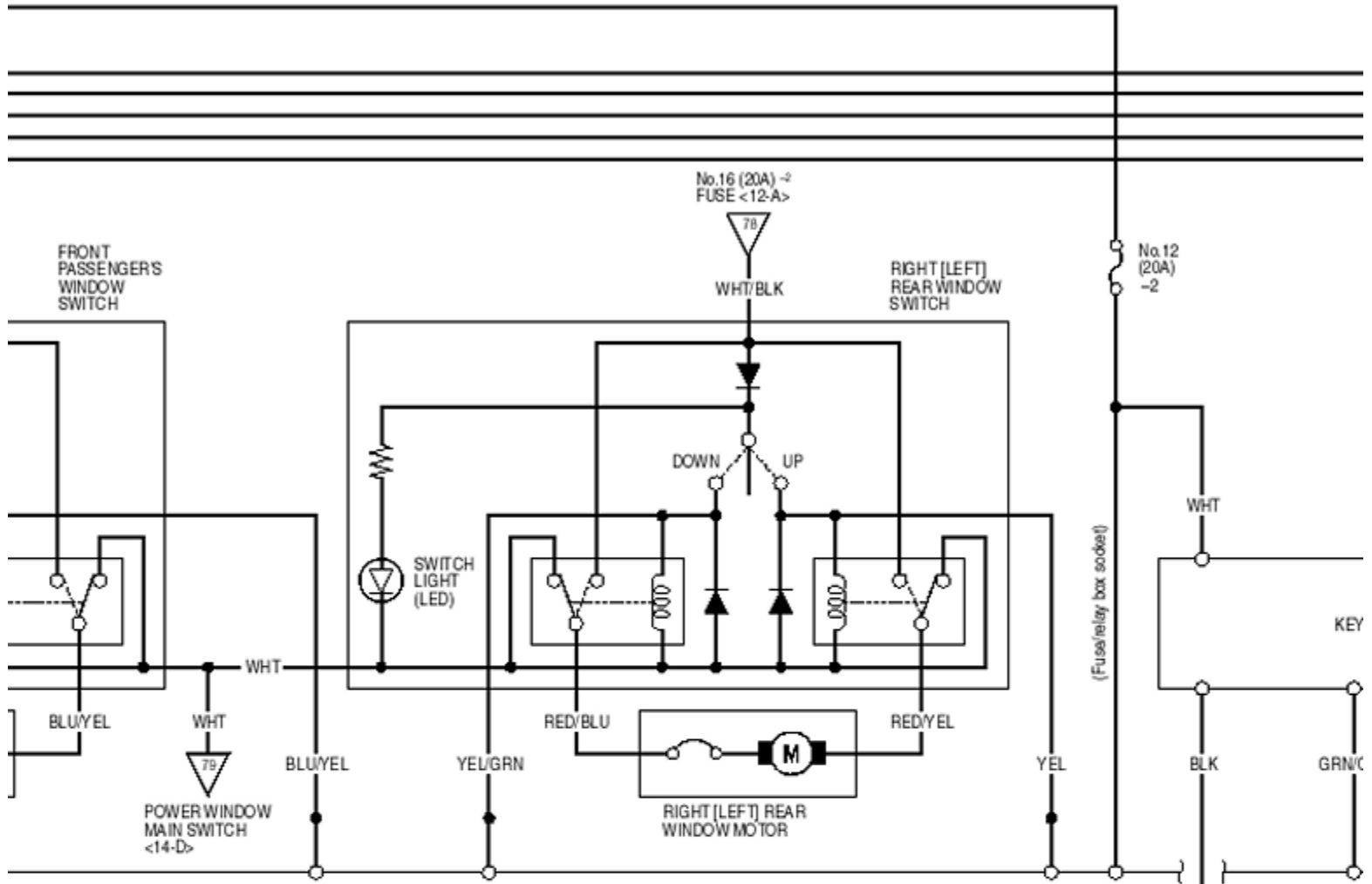


B

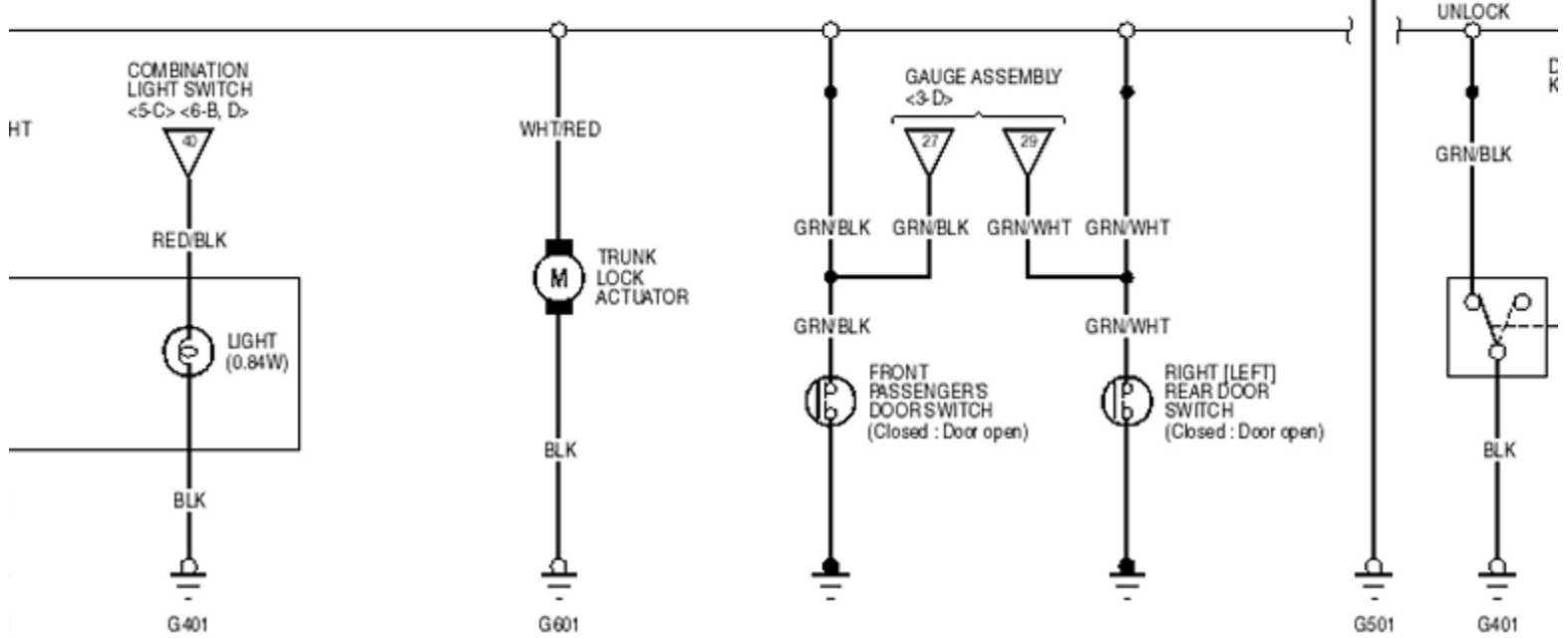
C

B

C

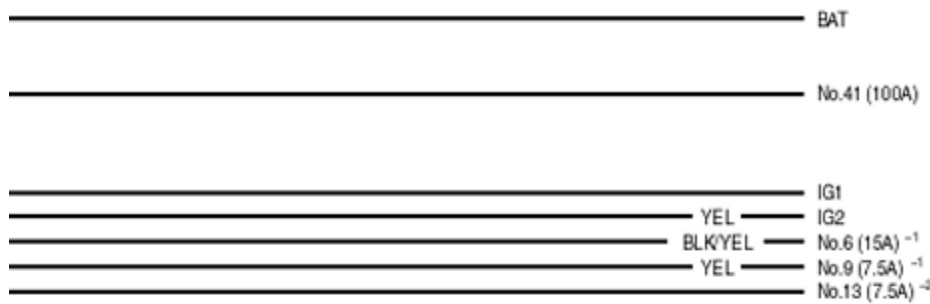


MULTIPLEX CONTROL UNIT (Passenger's)

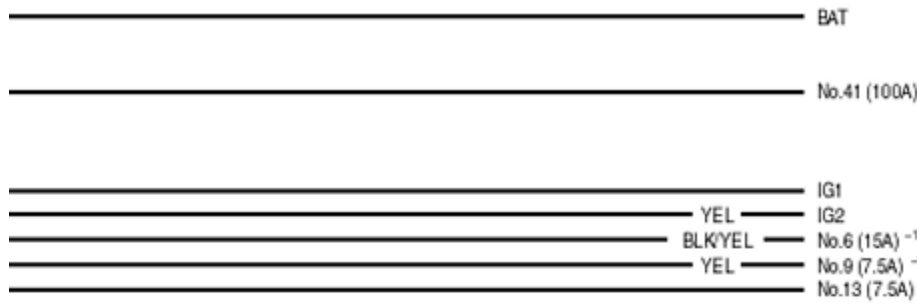


D

13

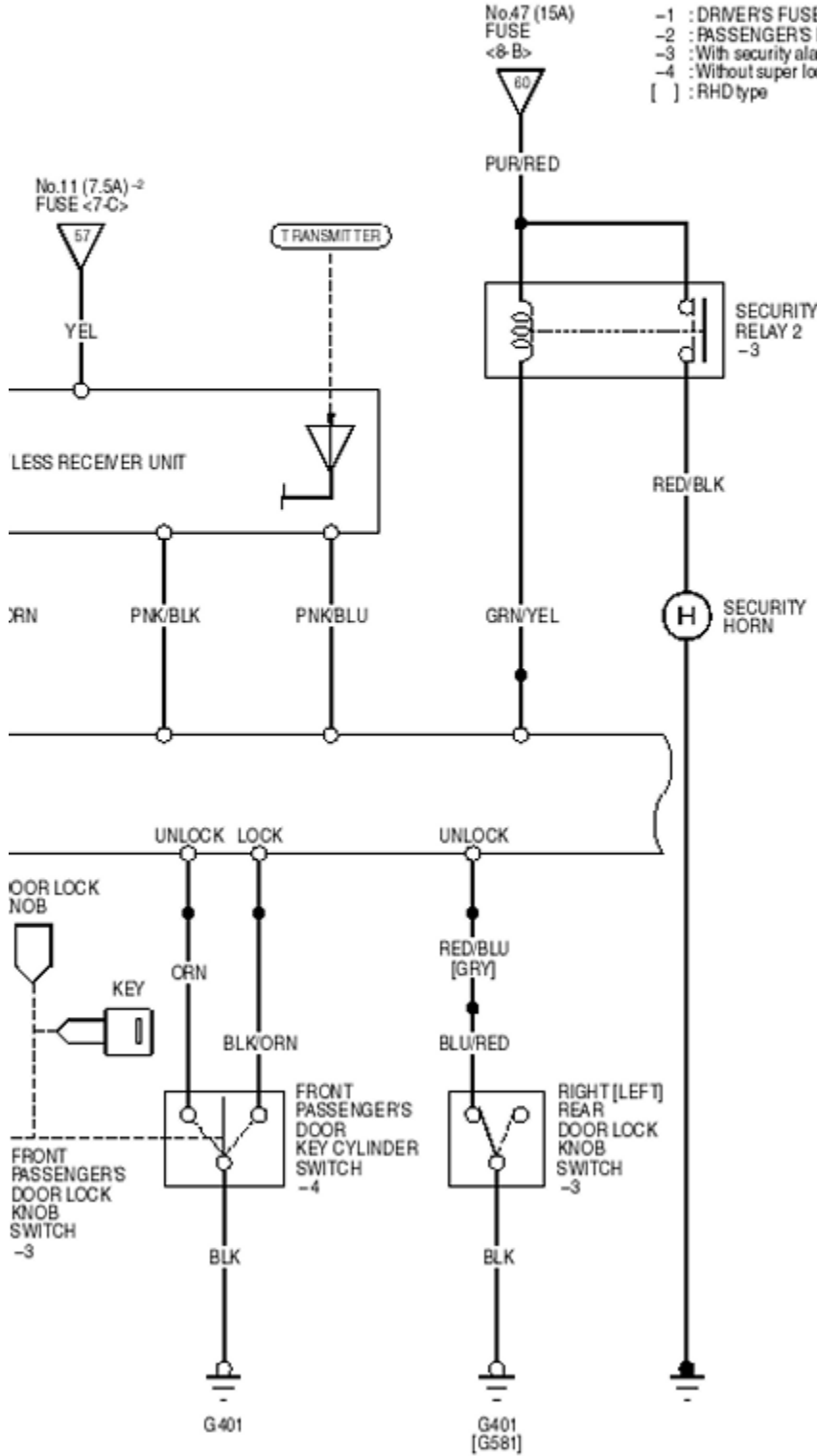


No. 47 (15A) -1 : DRIVER'S FUSE



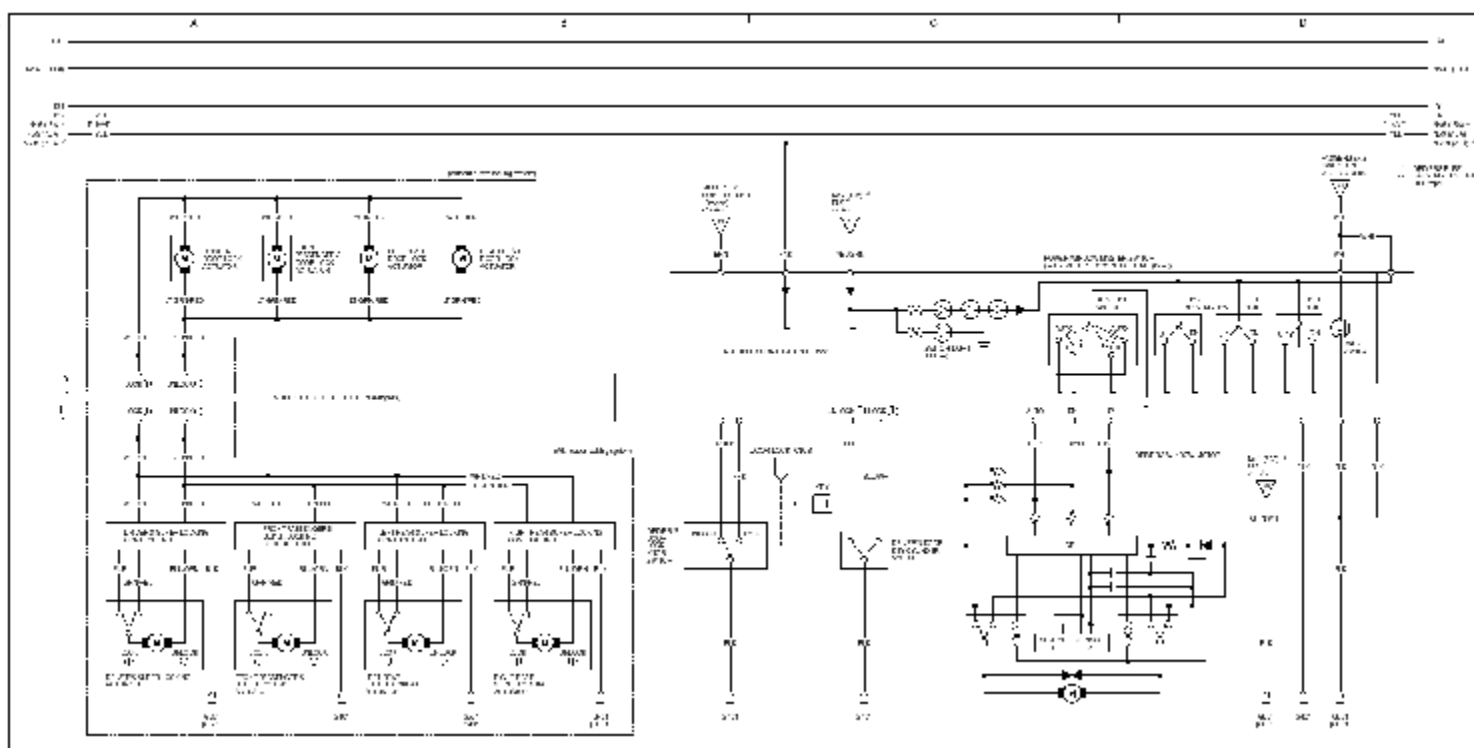
No.47 (15A) FUSE <8-B>

-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 -3 : With security alarm system
 -4 : Without super locking
 [] : RHD type



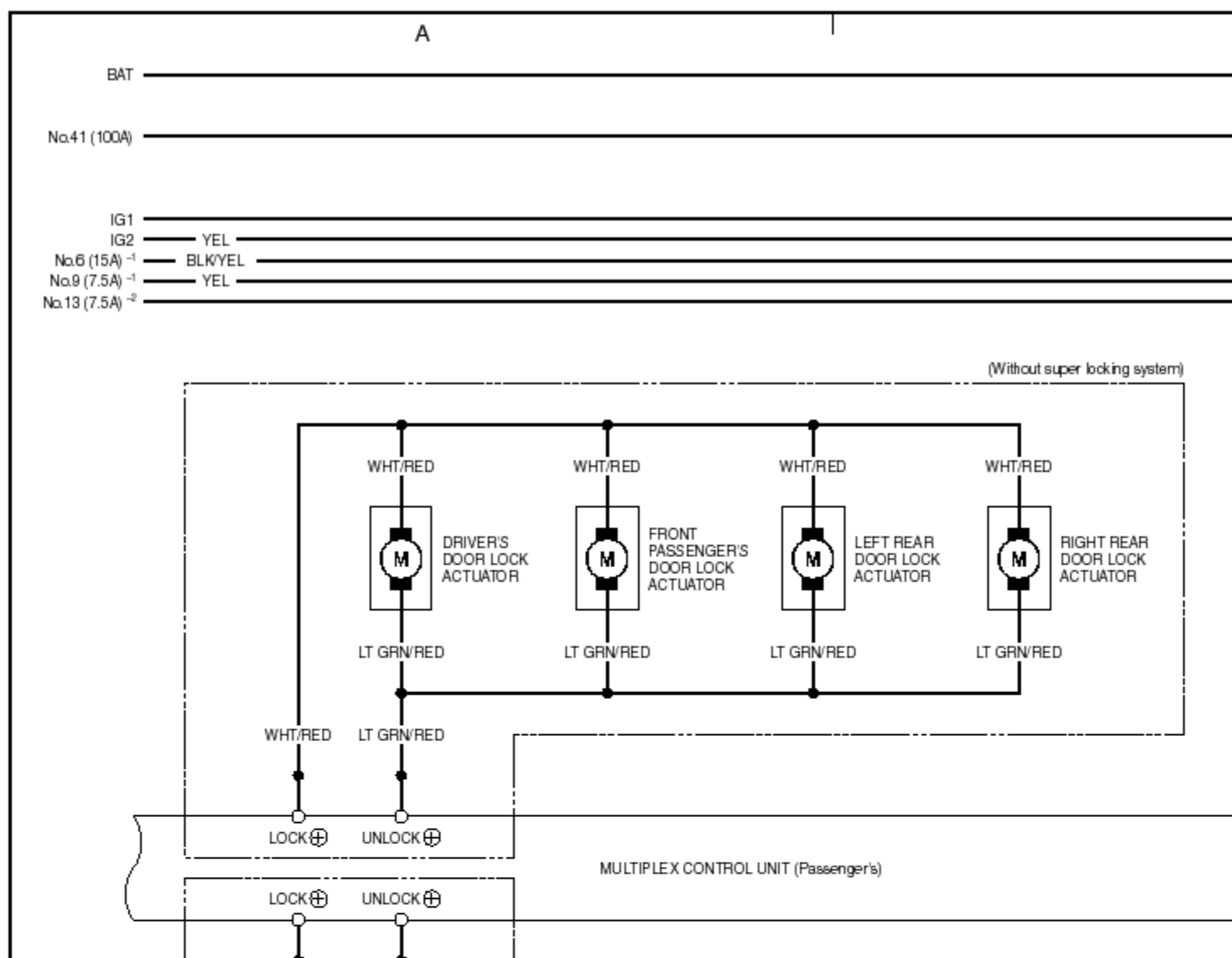
Wiring Diagrams
Security Alarm System

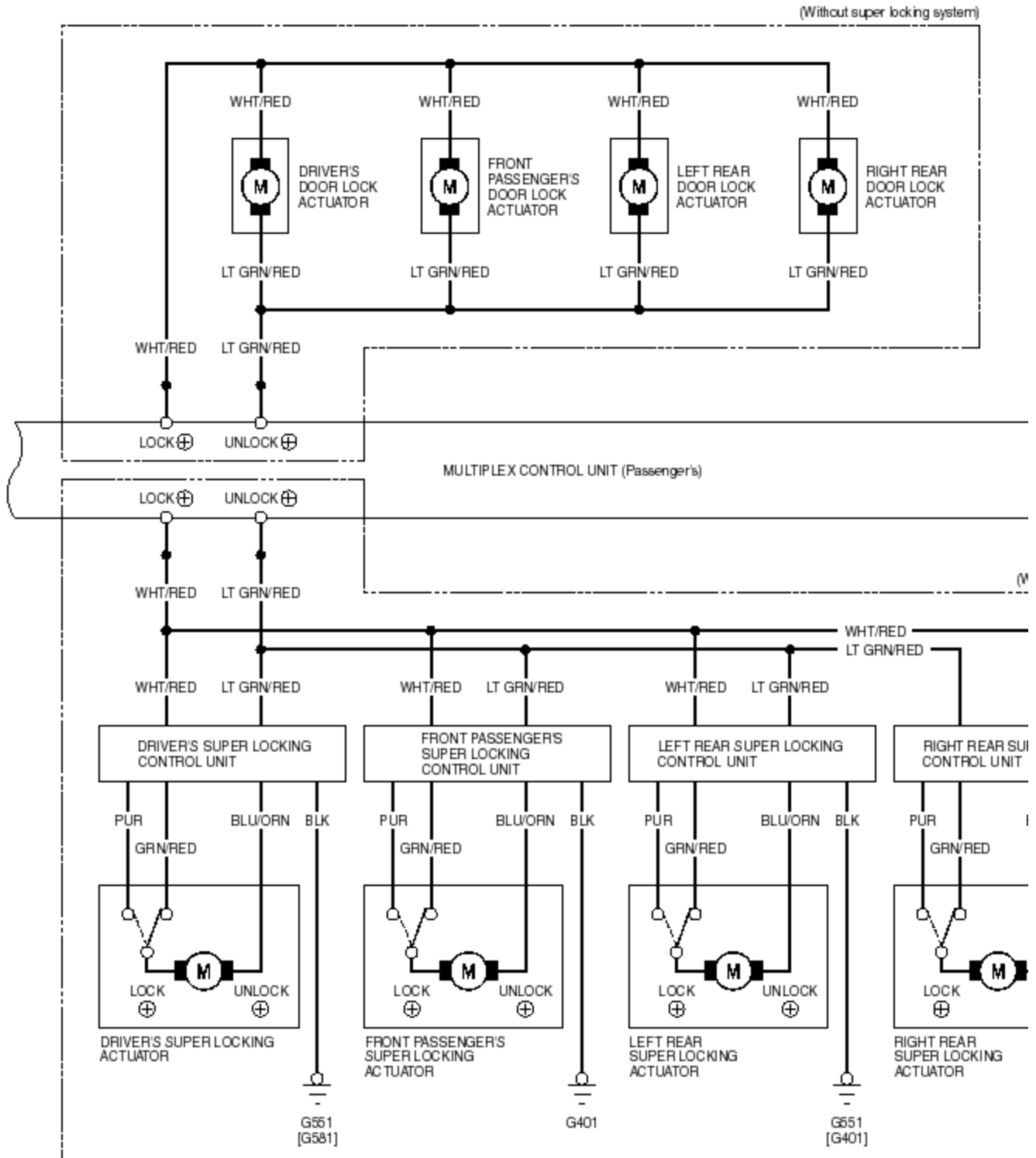
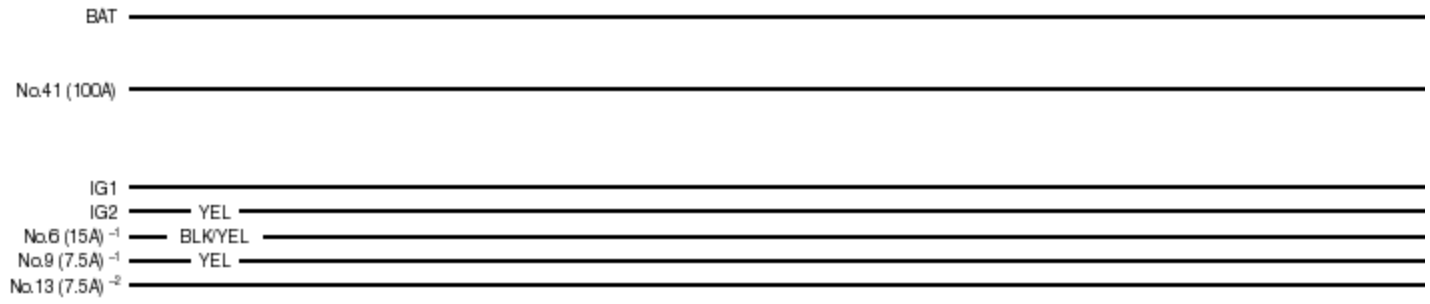
14



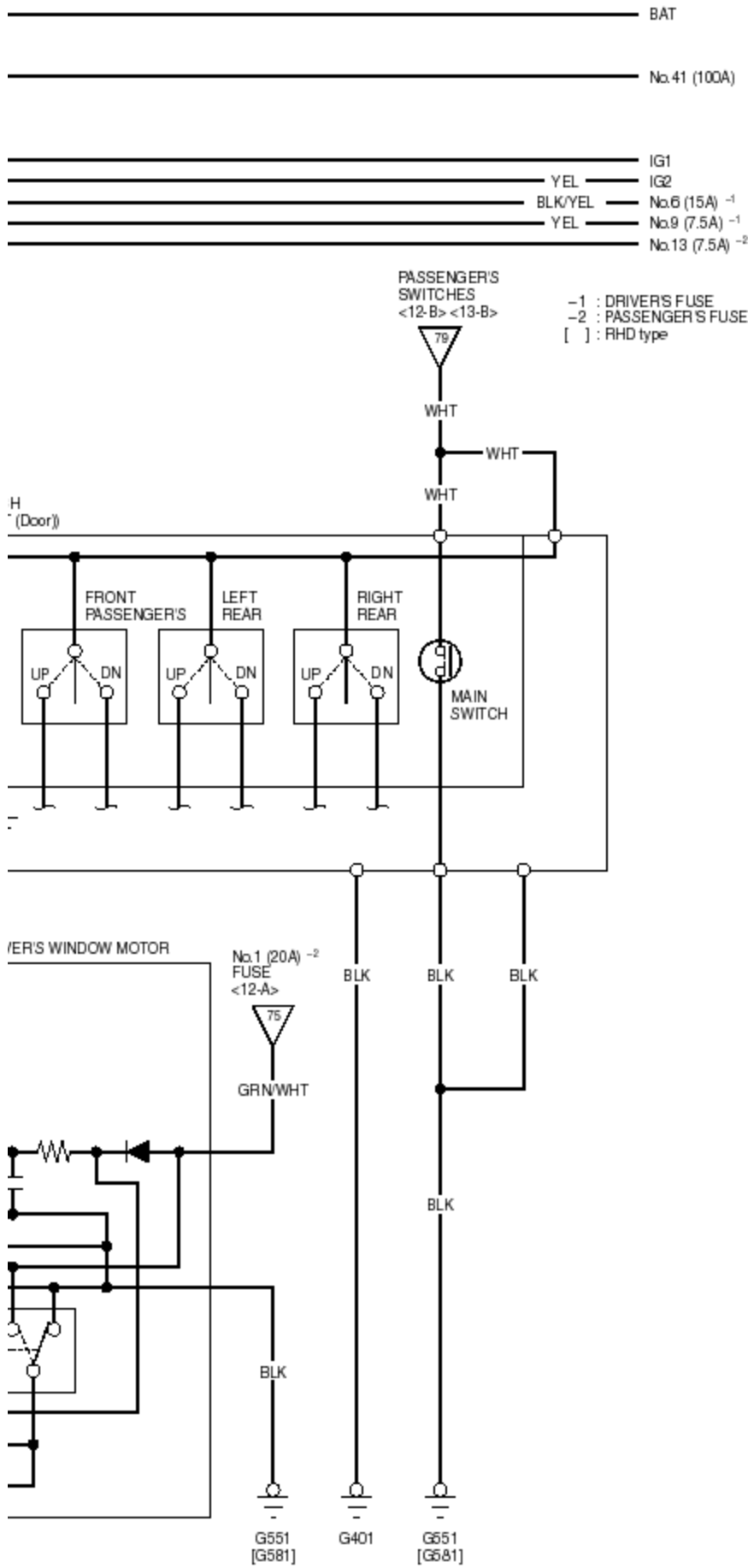
14

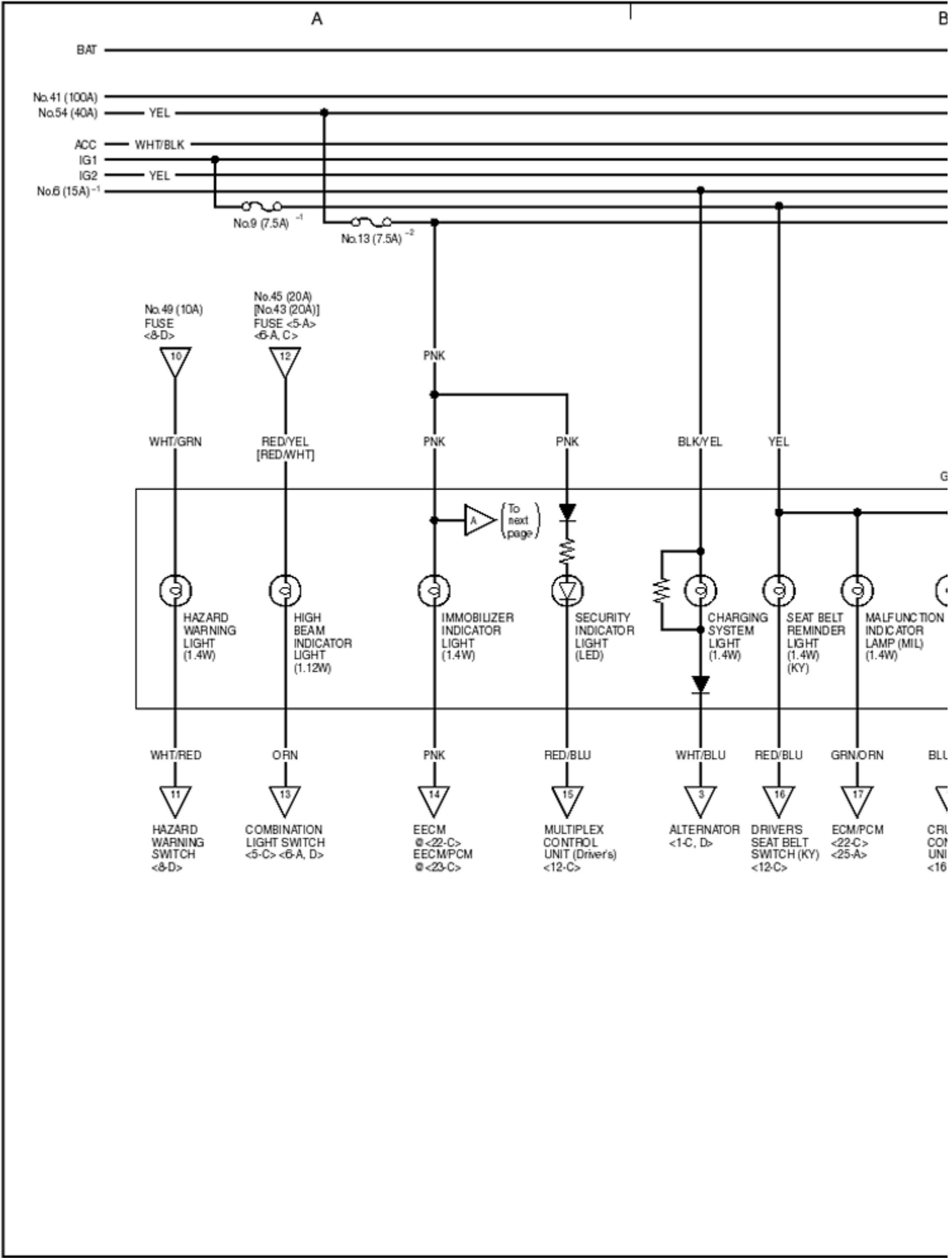
14

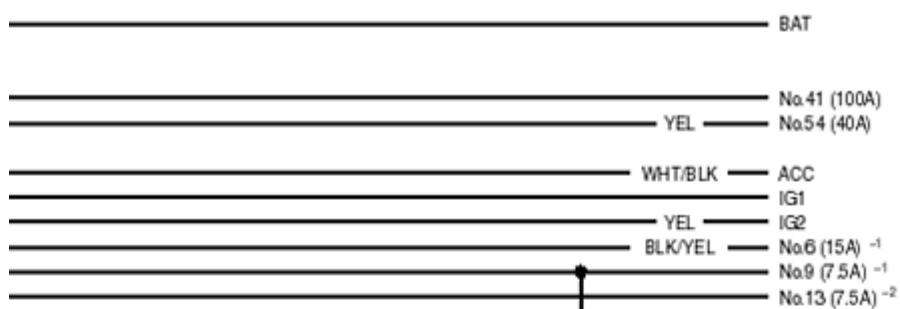
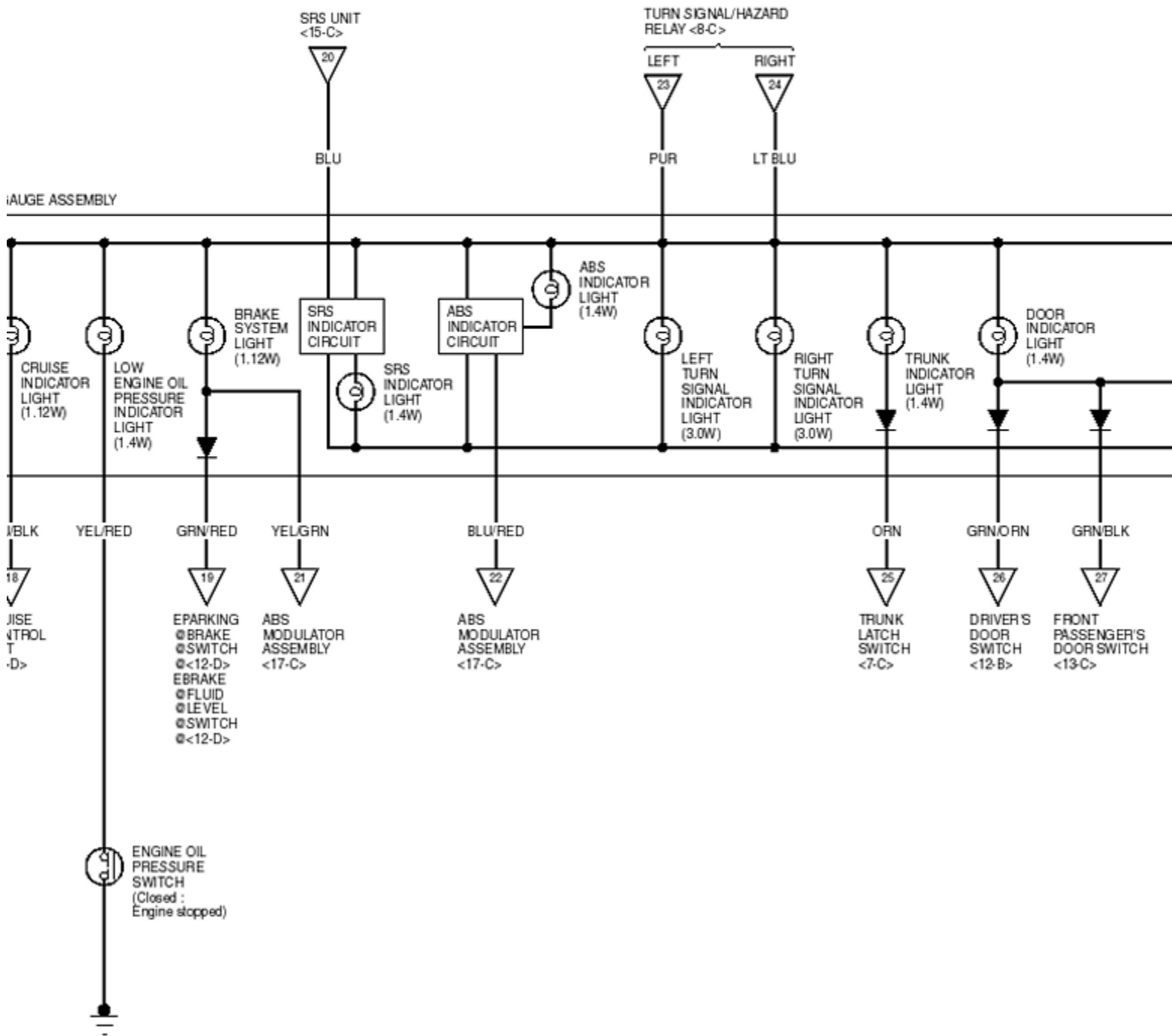




D

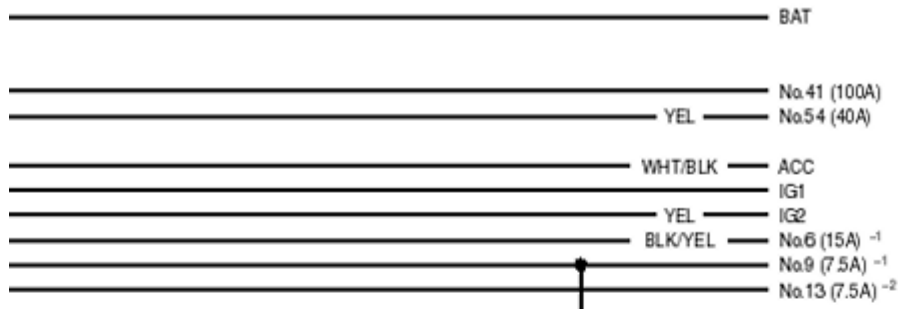




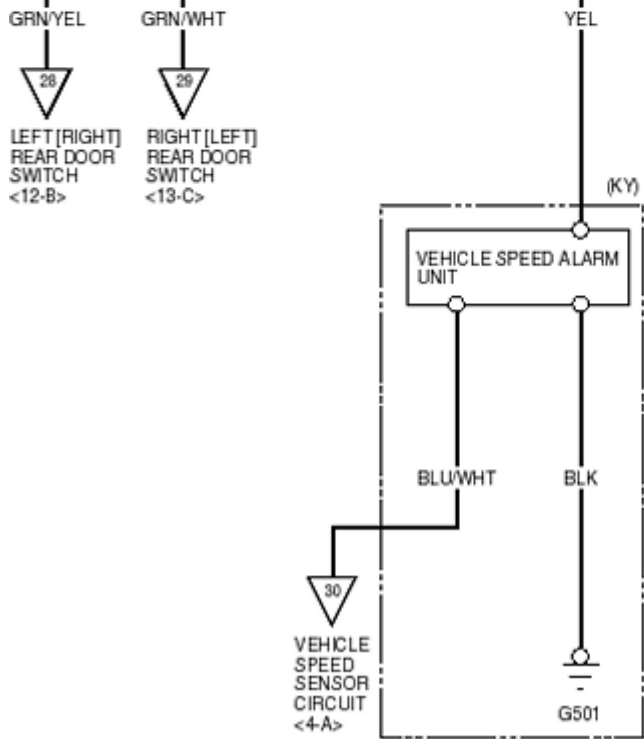
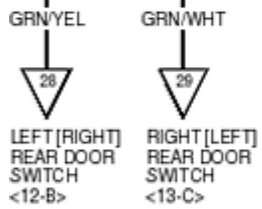
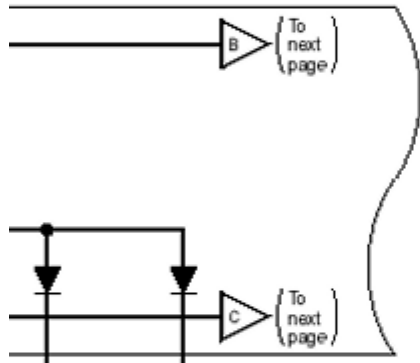


D

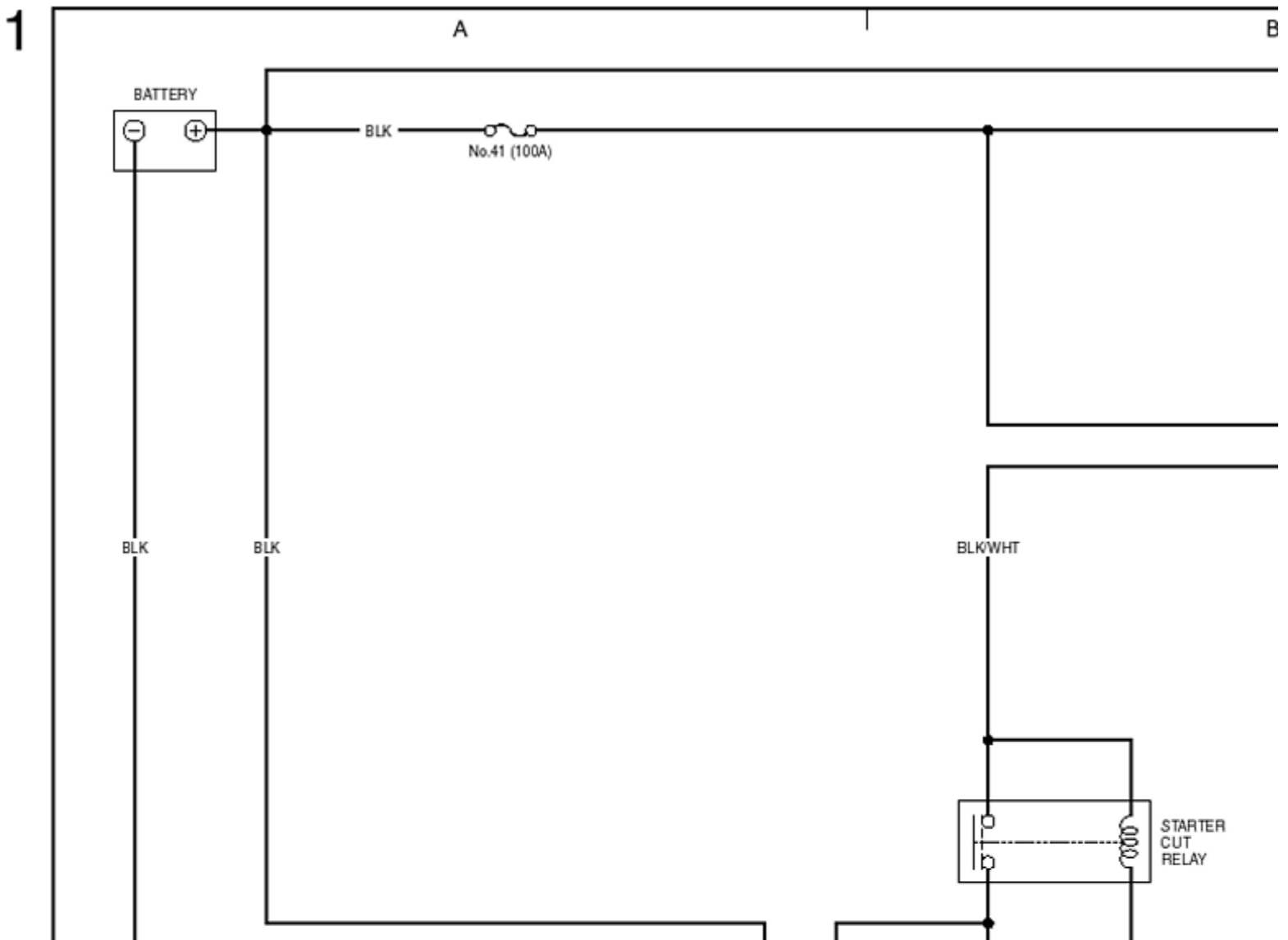
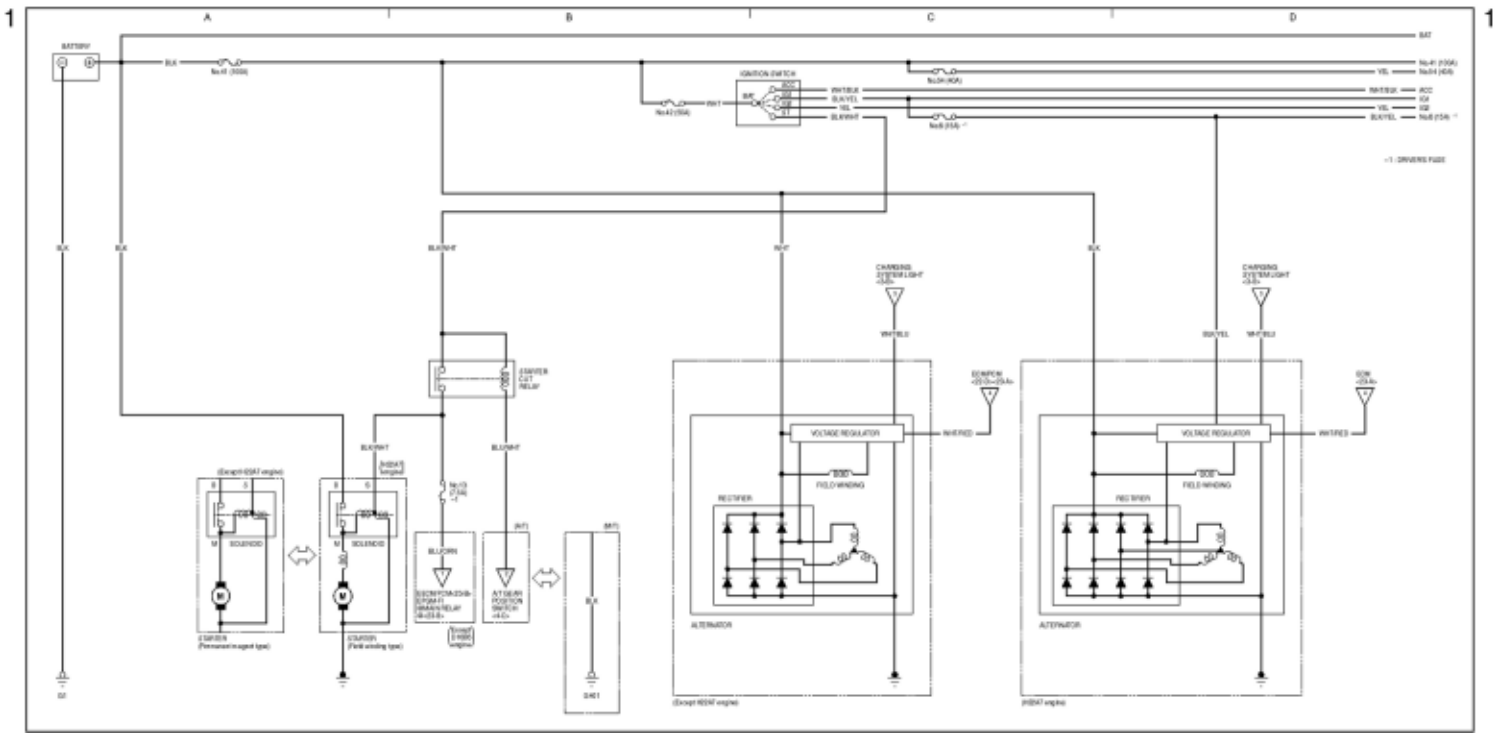
3



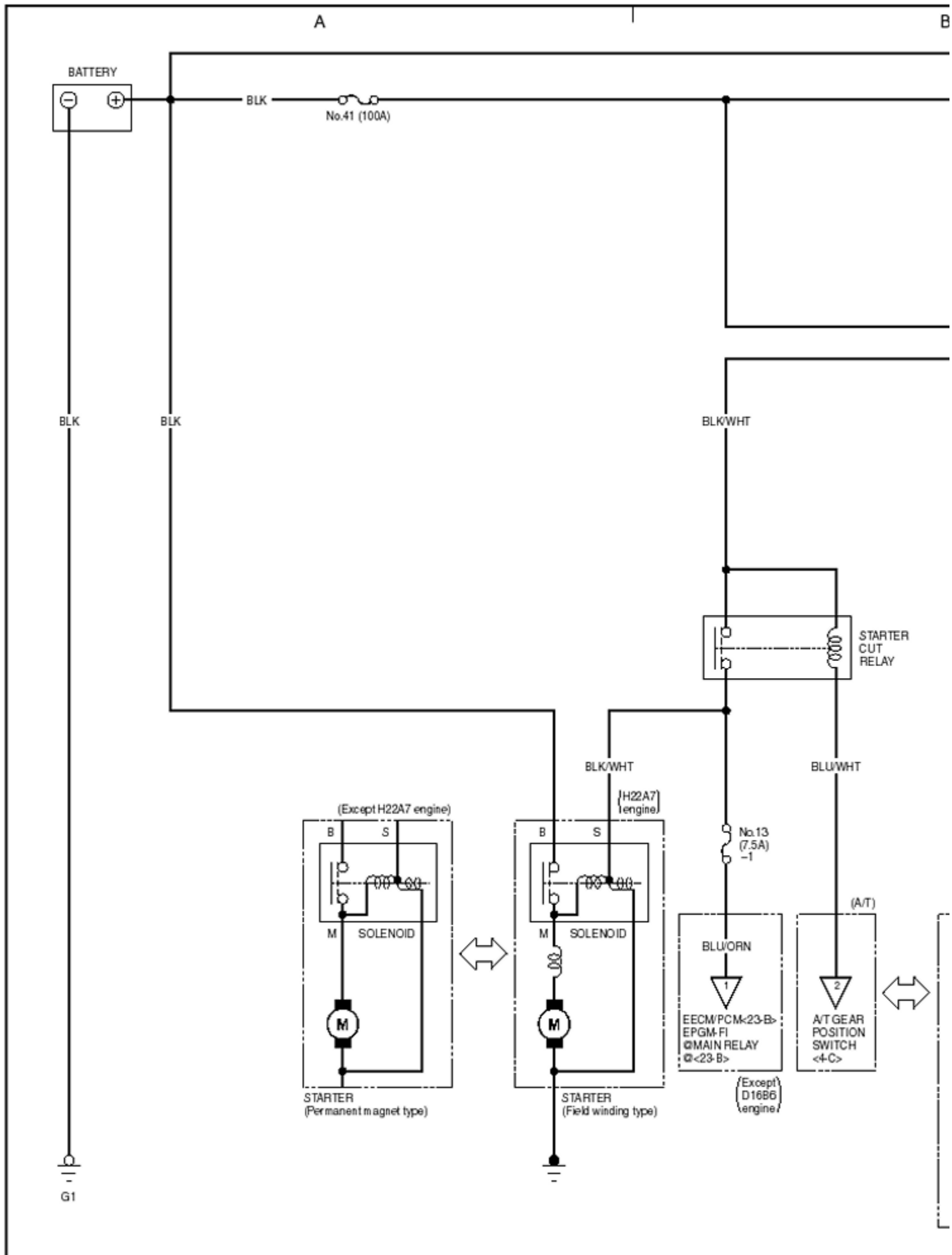
-1 : DRIVER'S FUSE
-2 : PASSENGER'S FUSE
[] : RHD type



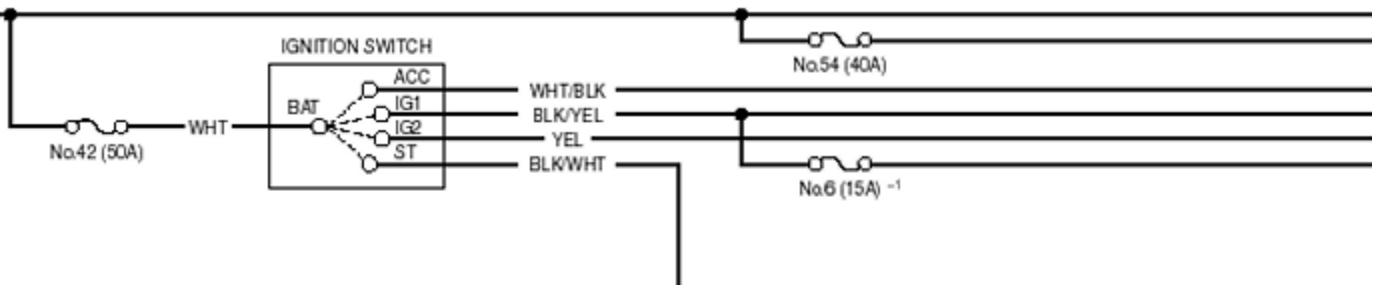
Wiring Diagrams
Starting System



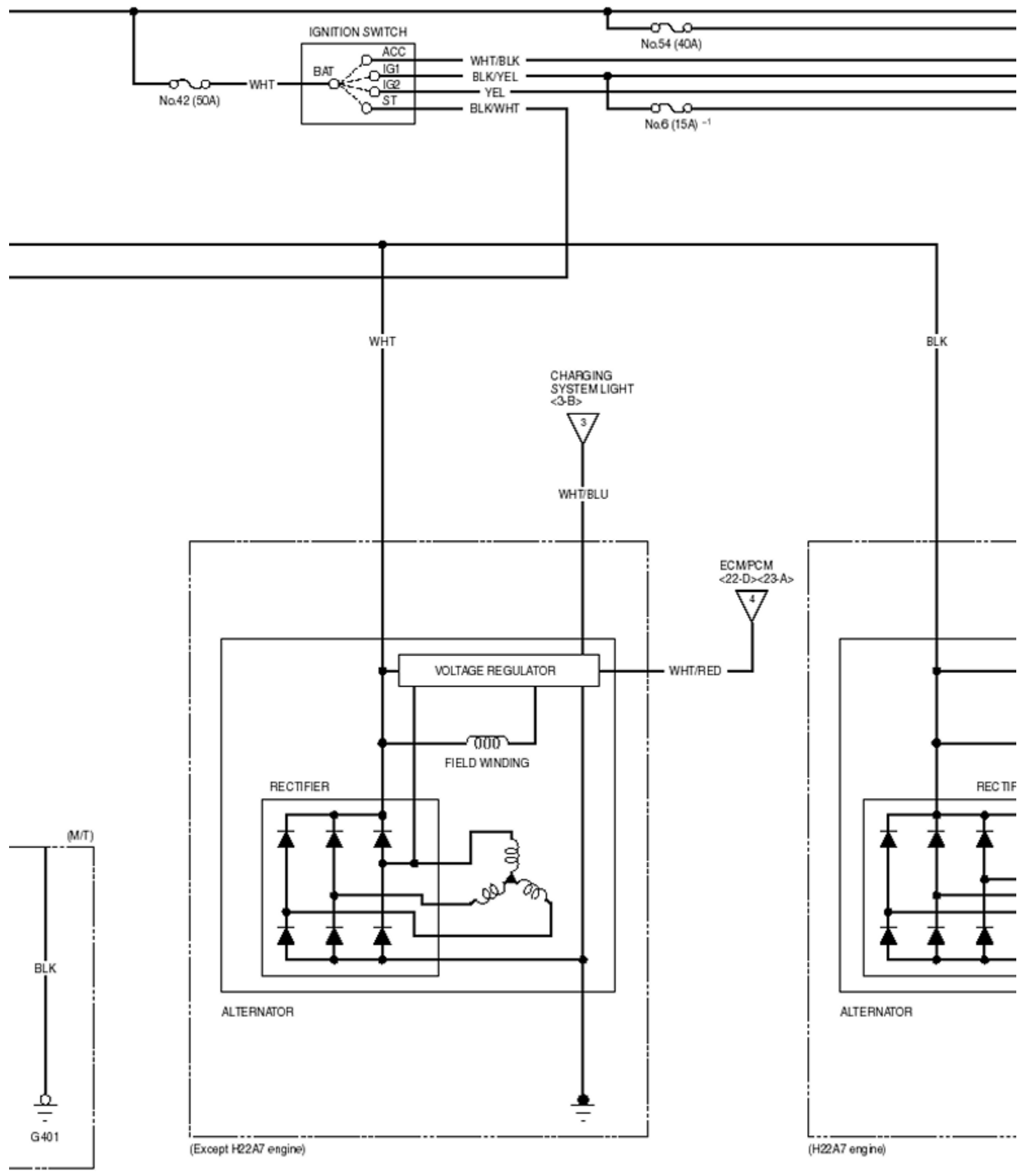
1



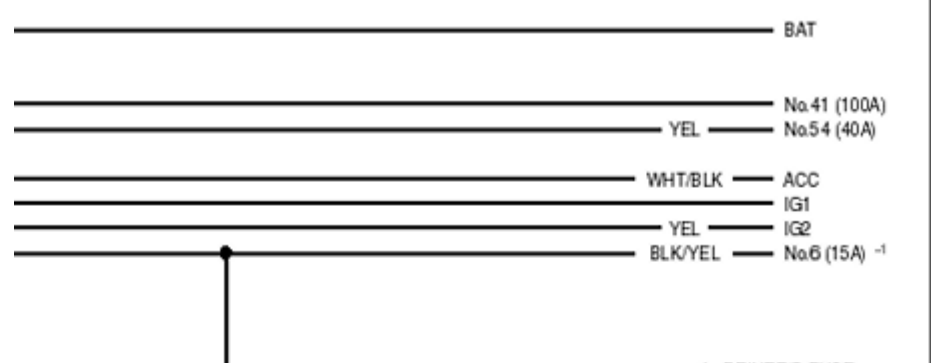
C



C



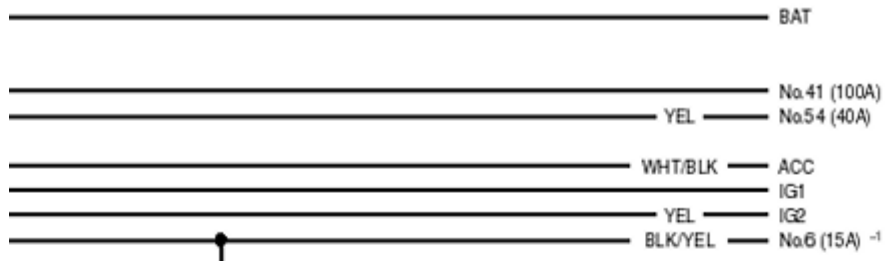
D



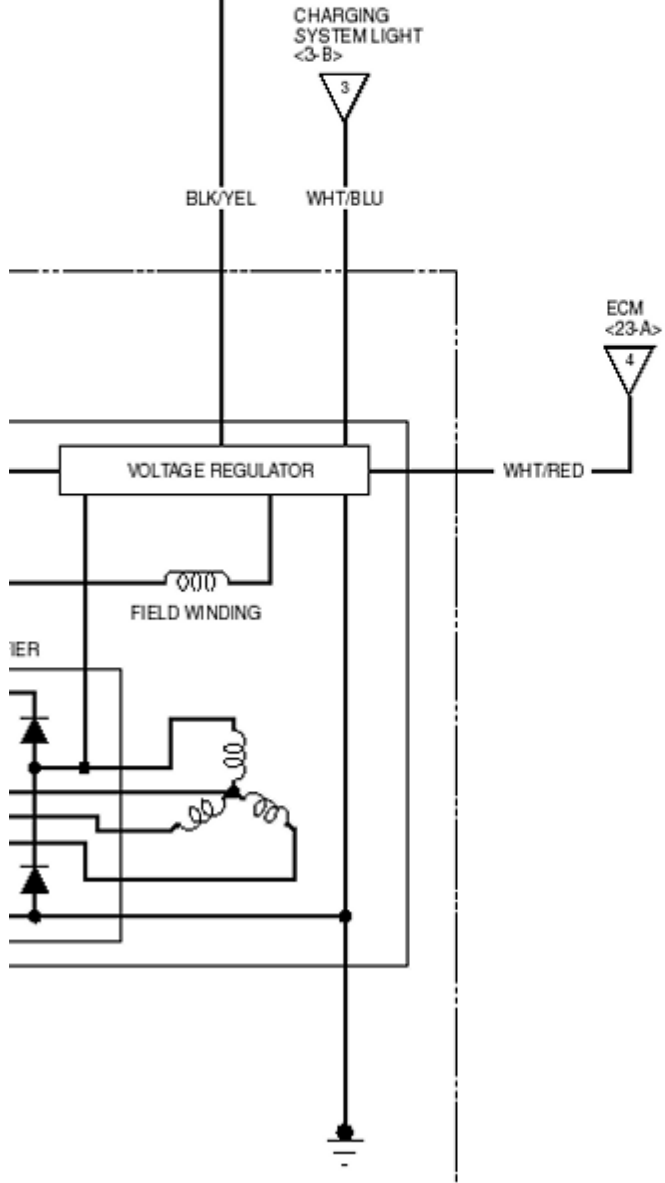
1

D

1



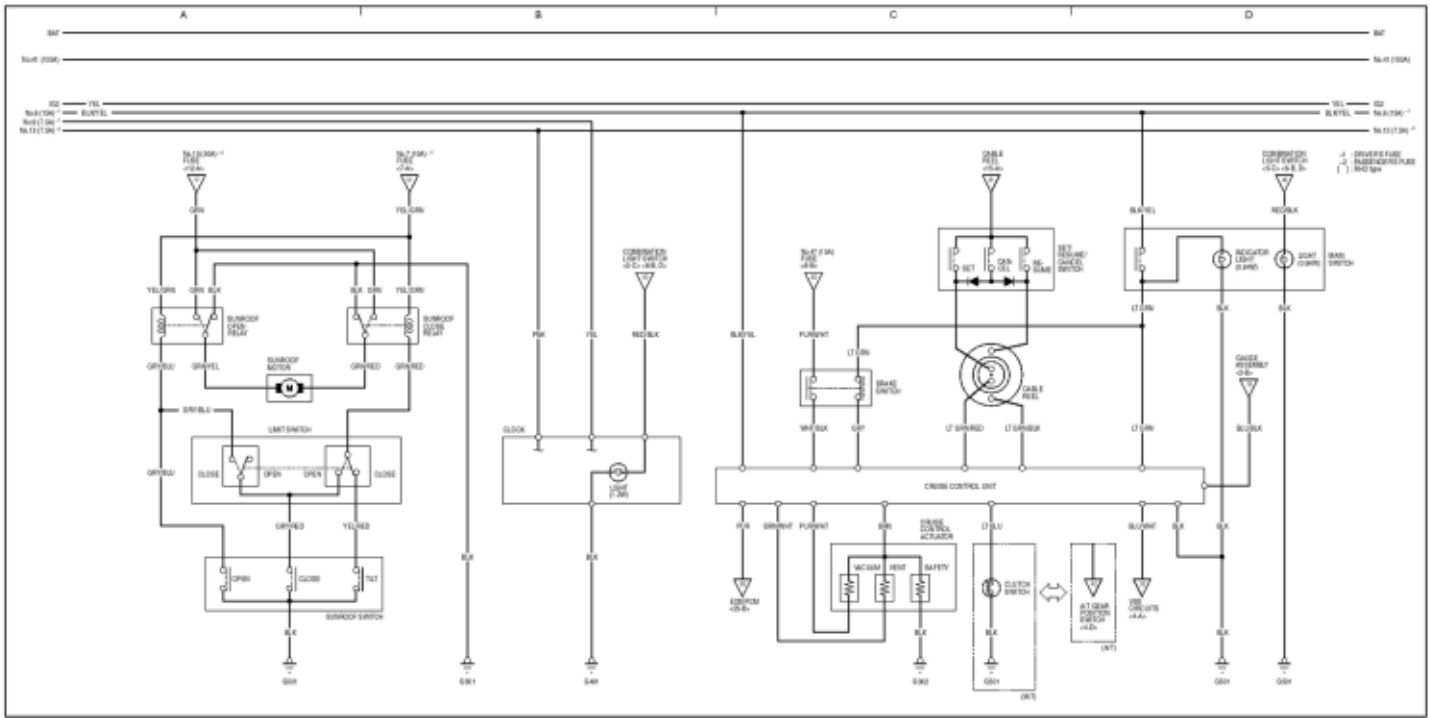
-1: DRIVERS FUSE



Wiring Diagrams

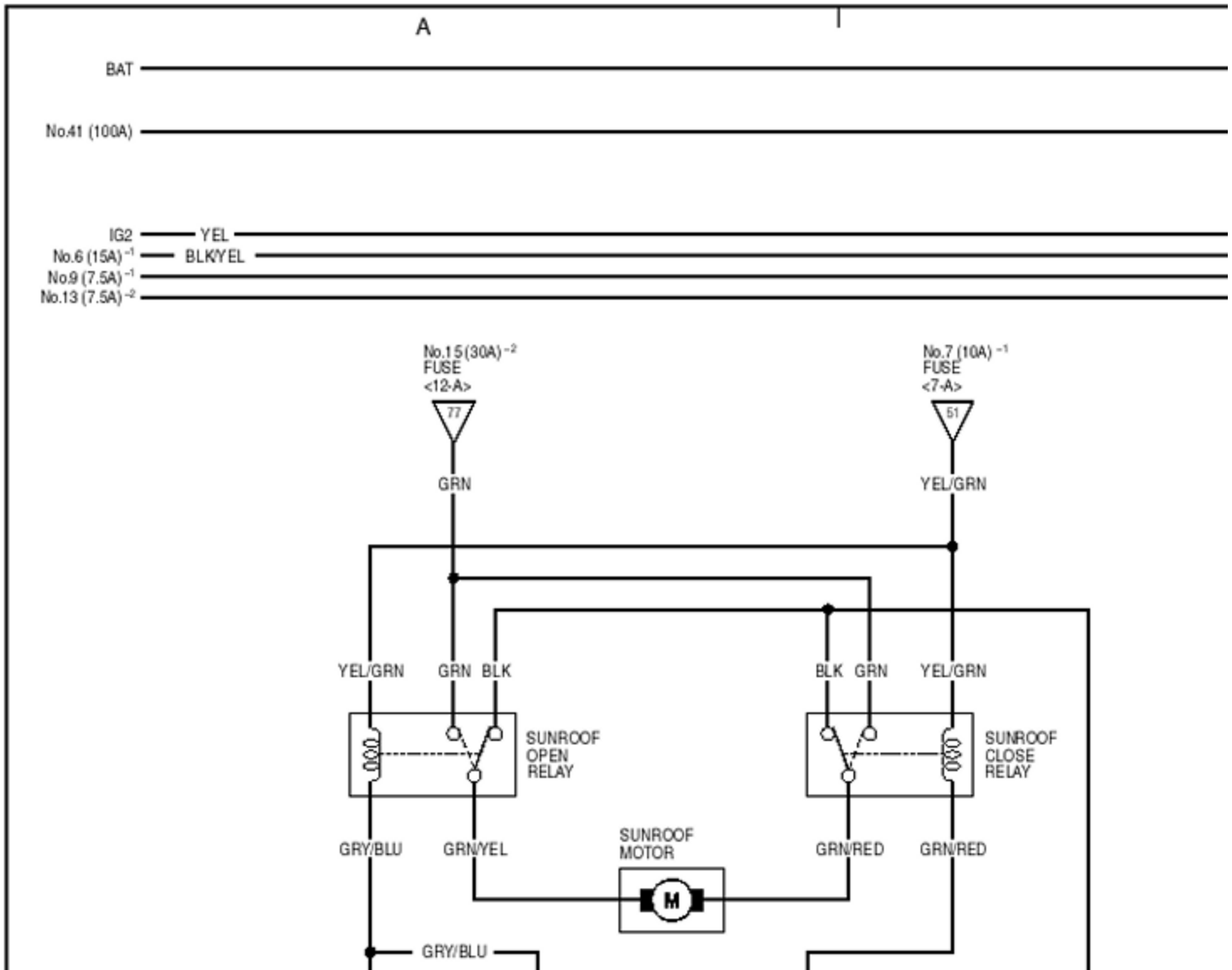
Sunroof

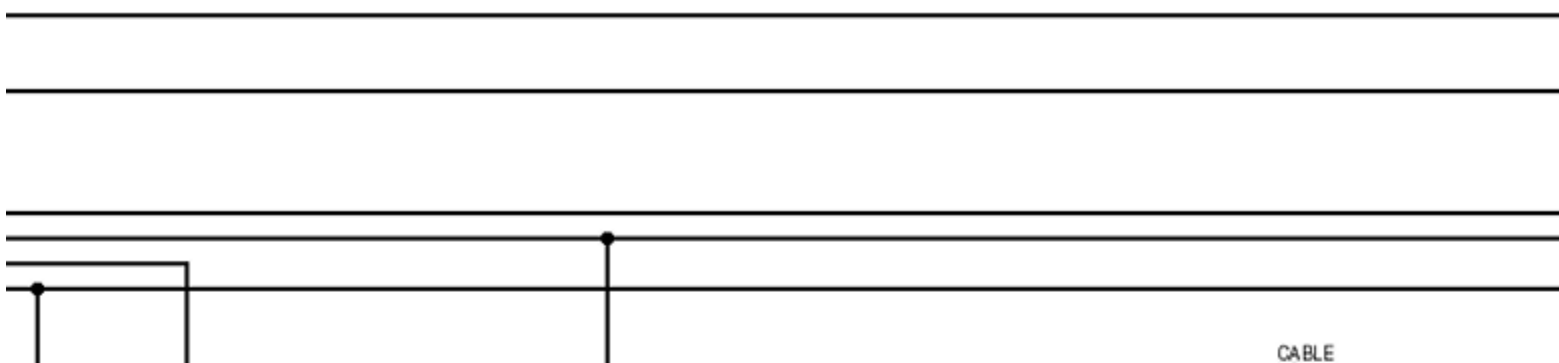
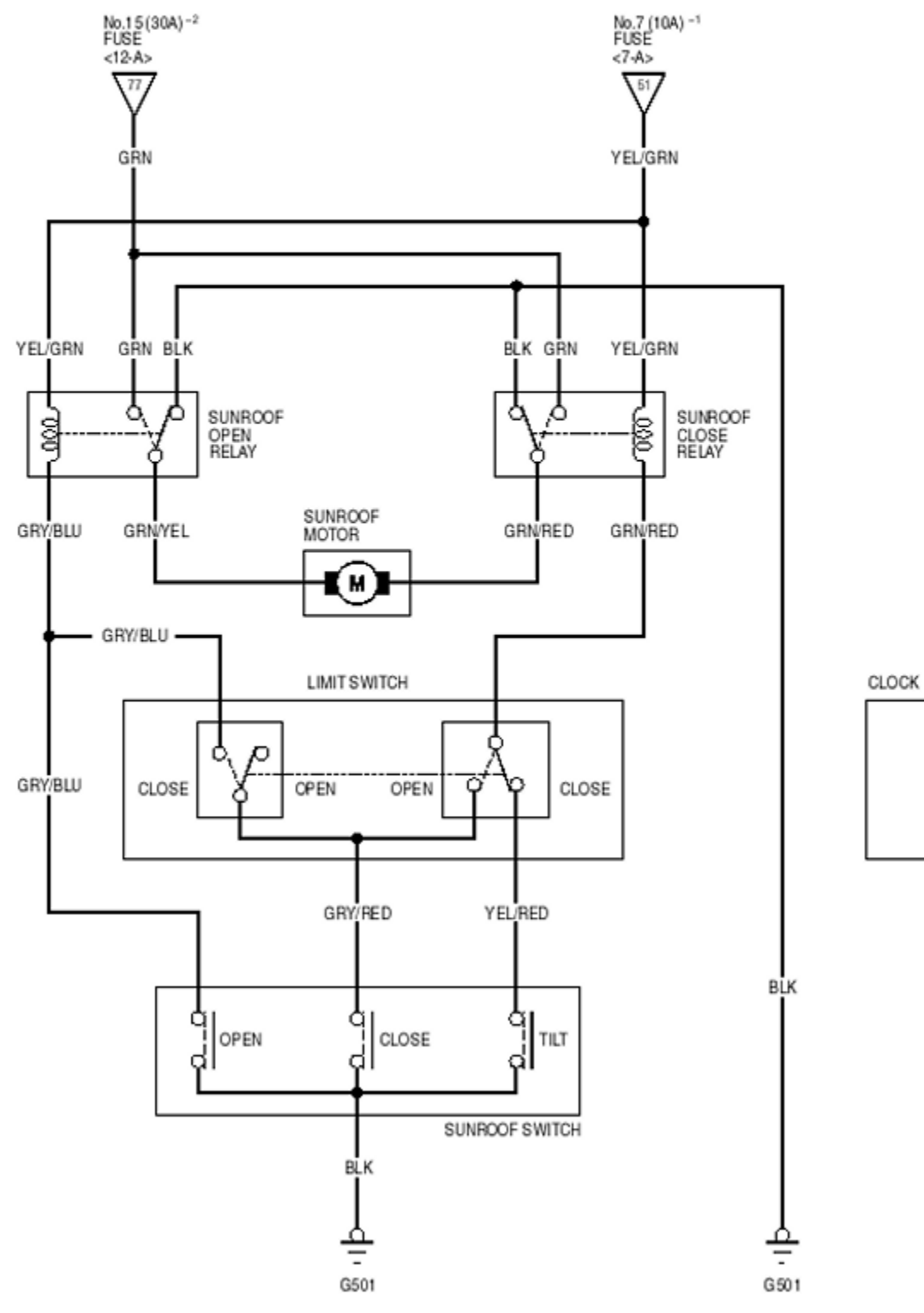
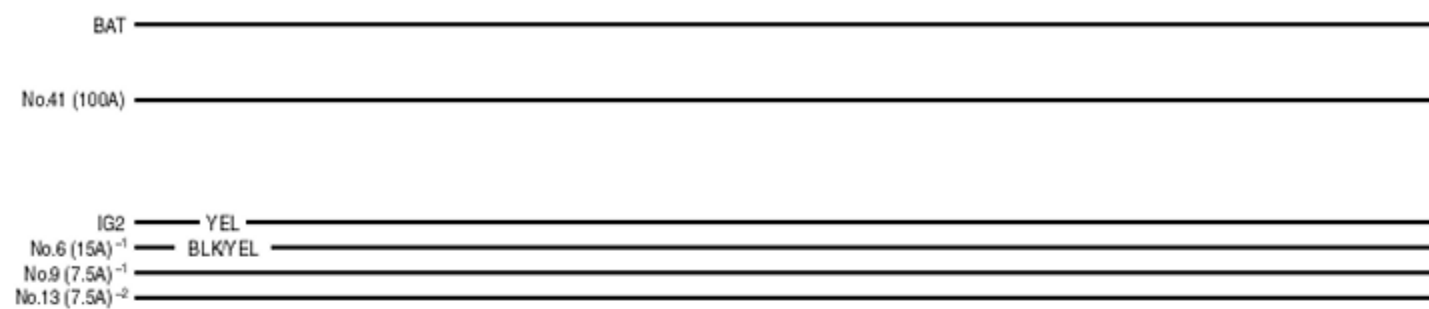
16

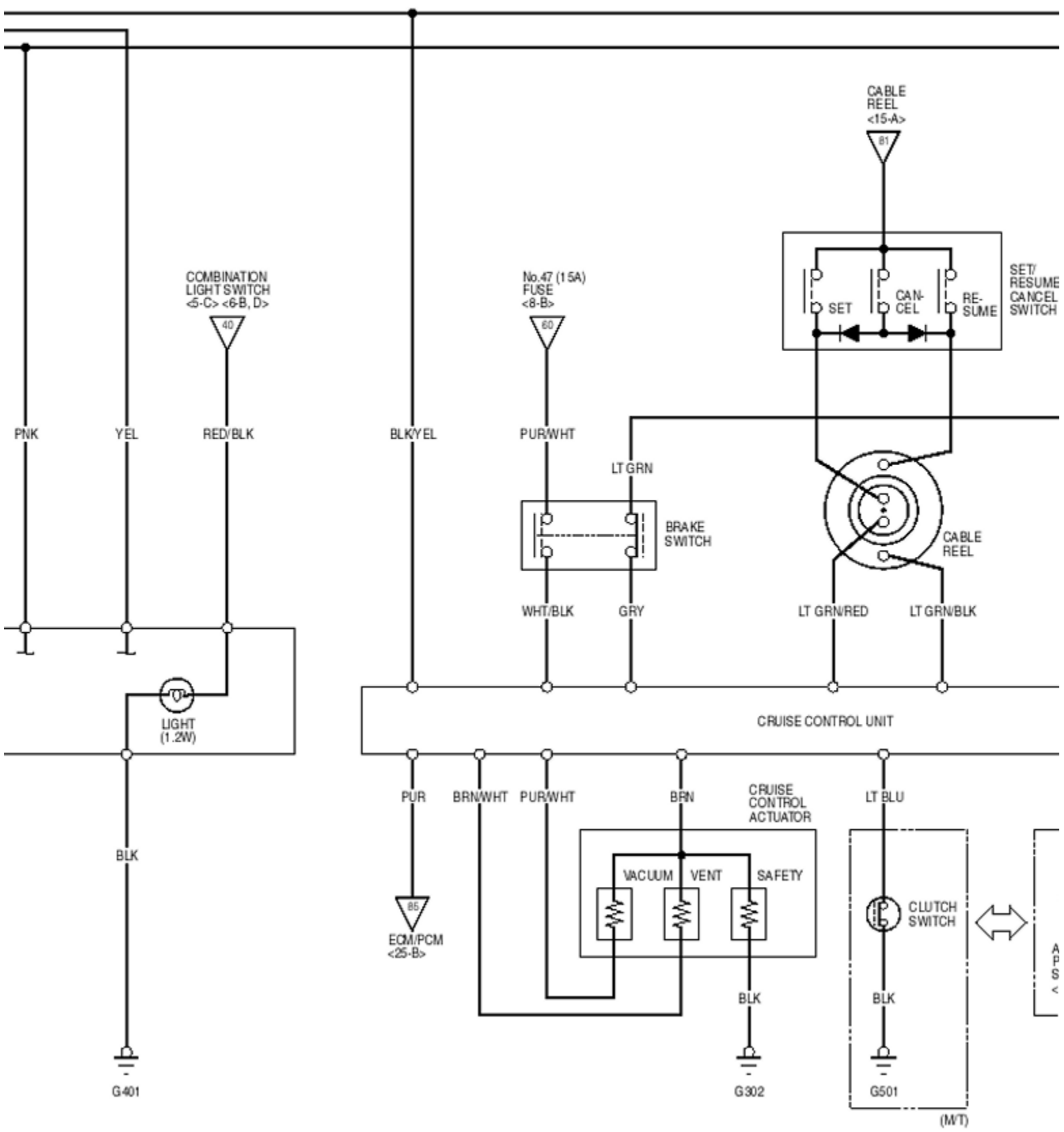


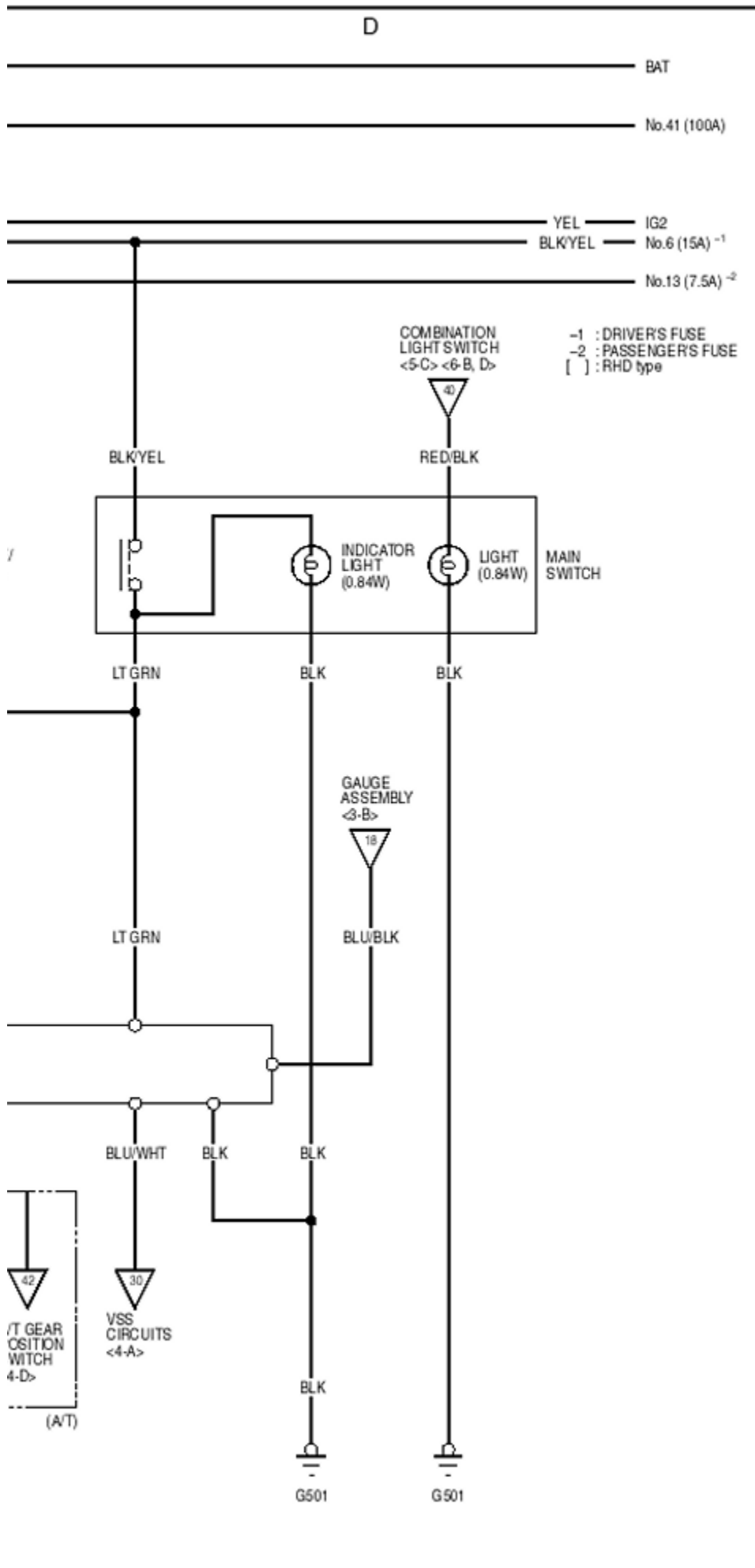
16

16





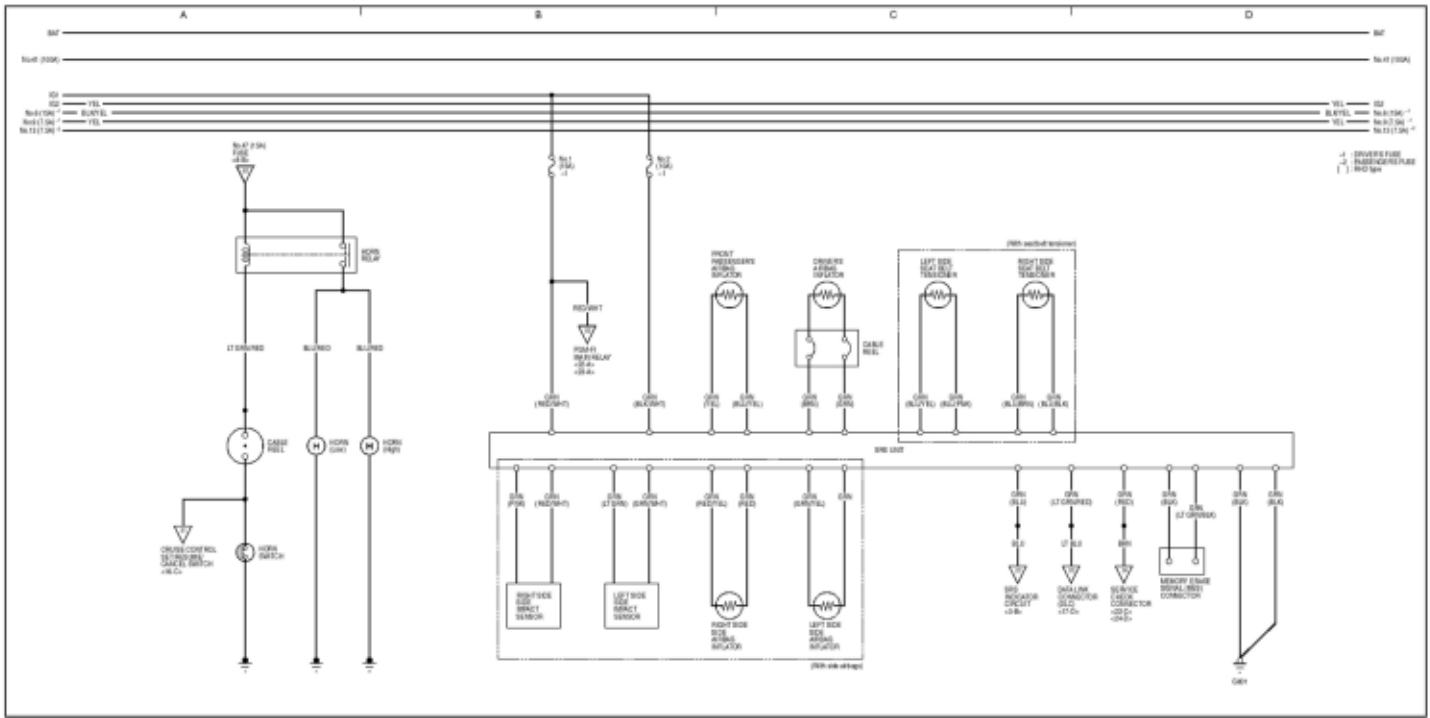




Wiring Diagrams

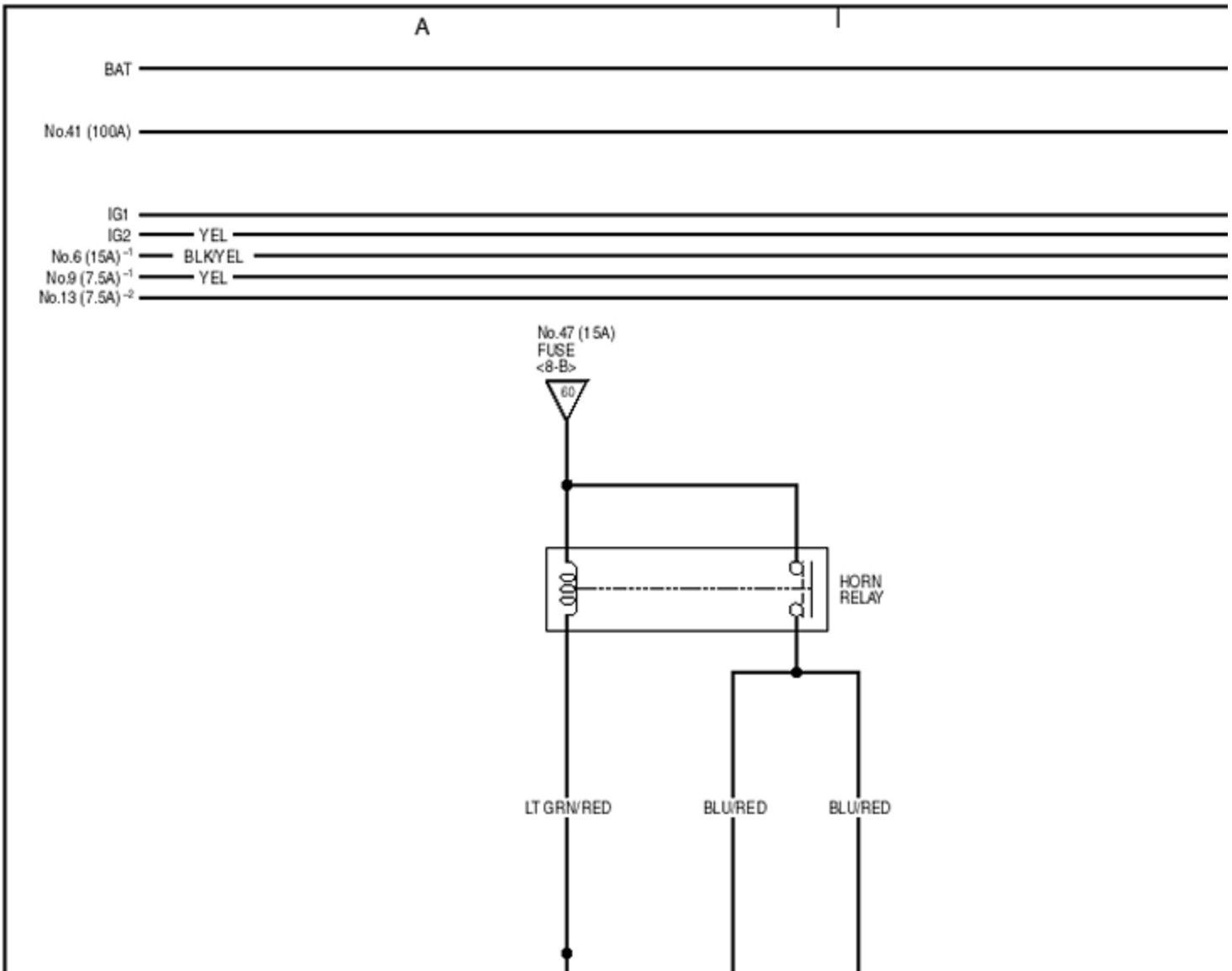
Supplementary Restraint System

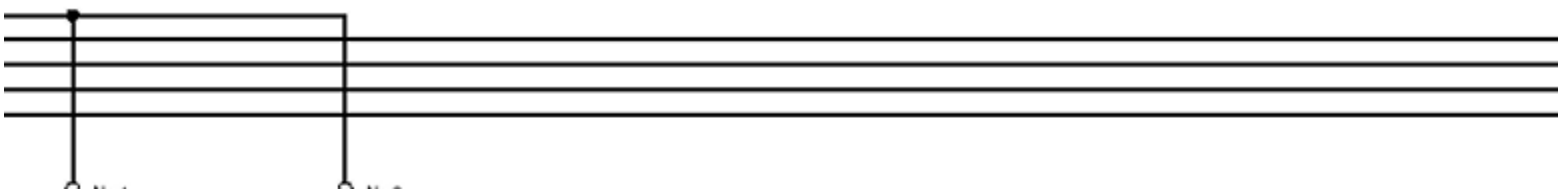
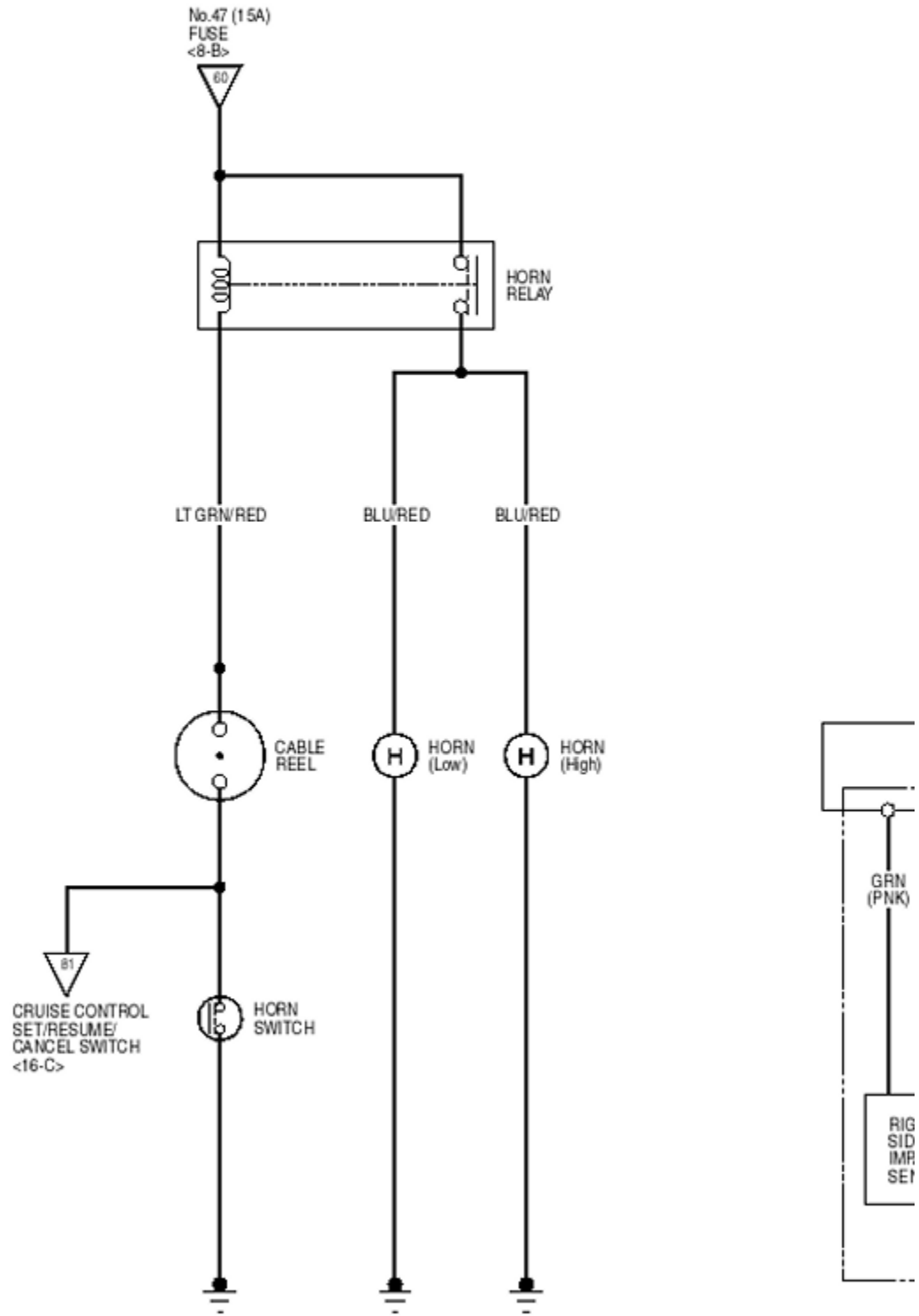
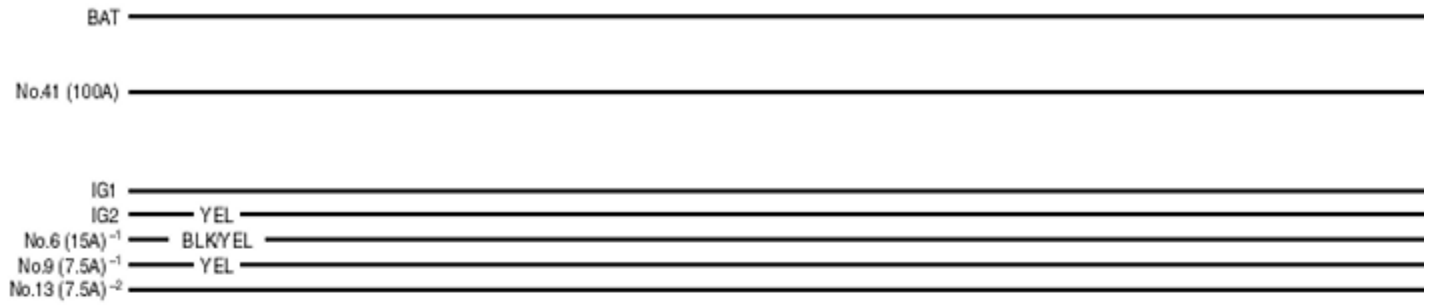
15

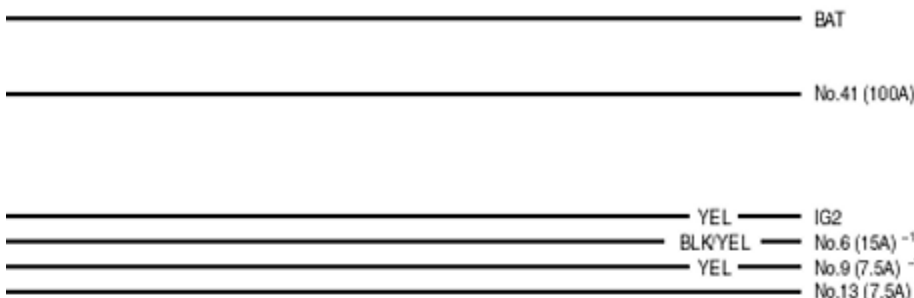
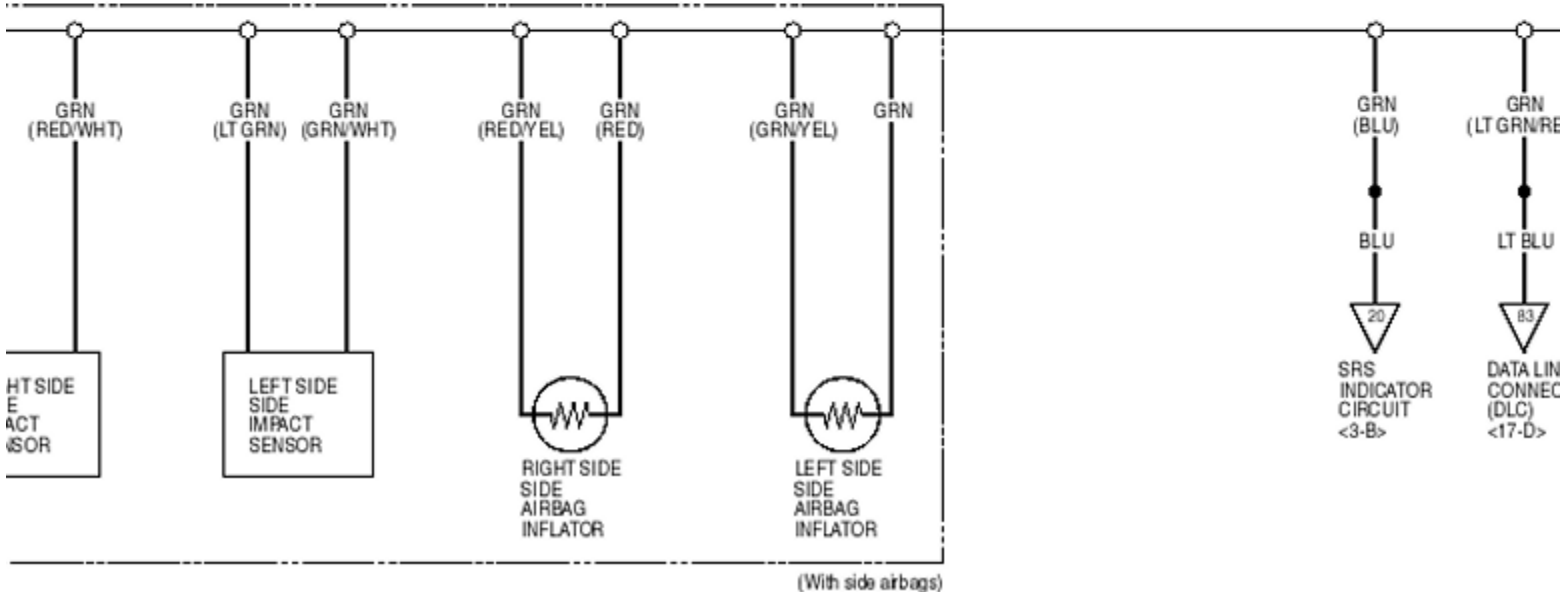
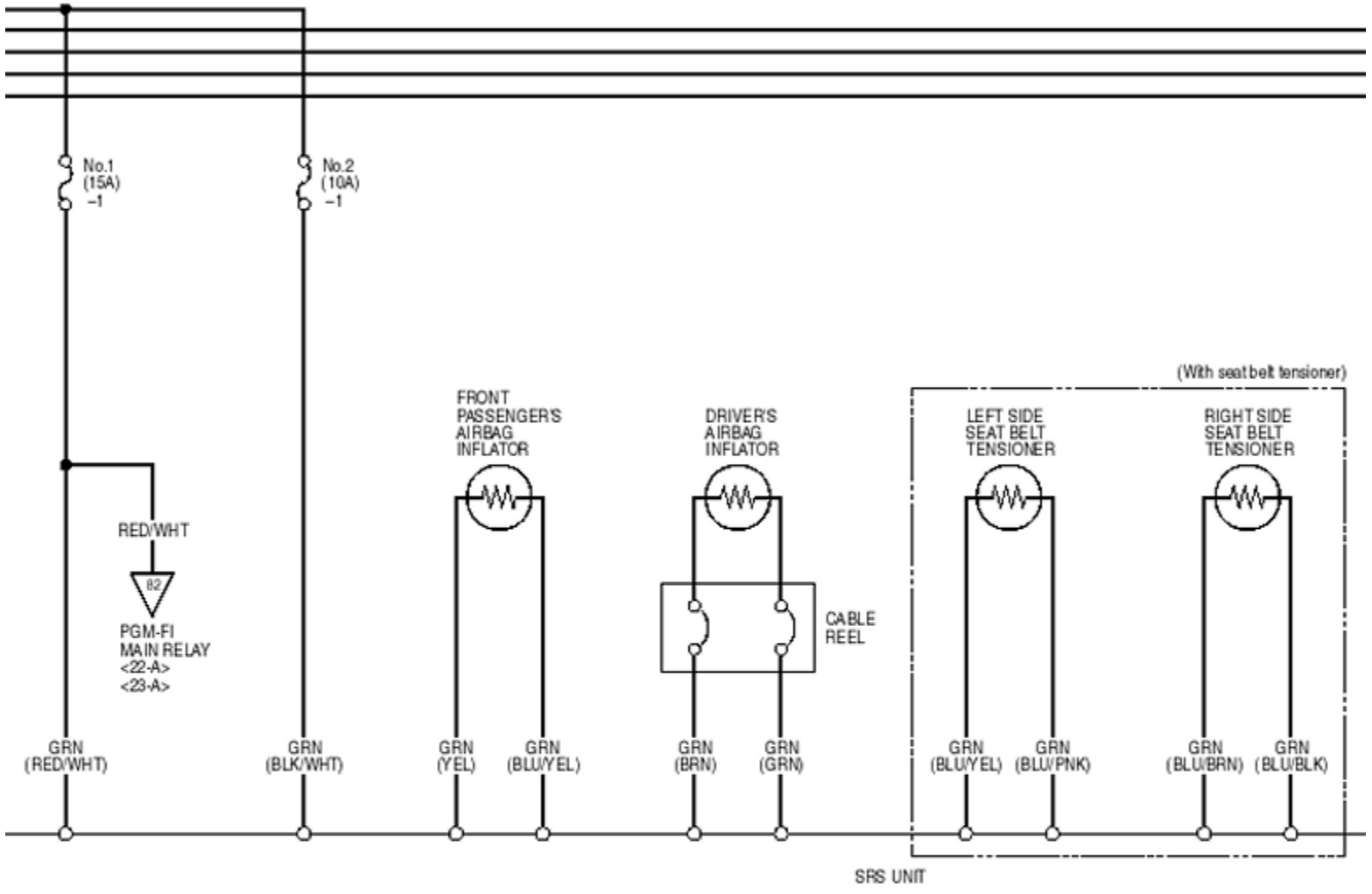


15

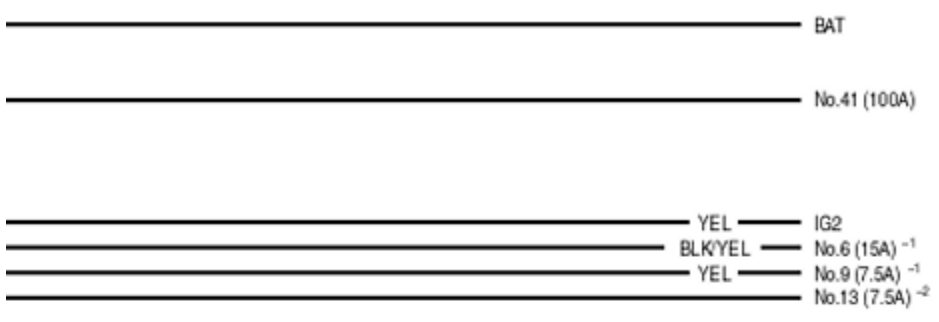
15



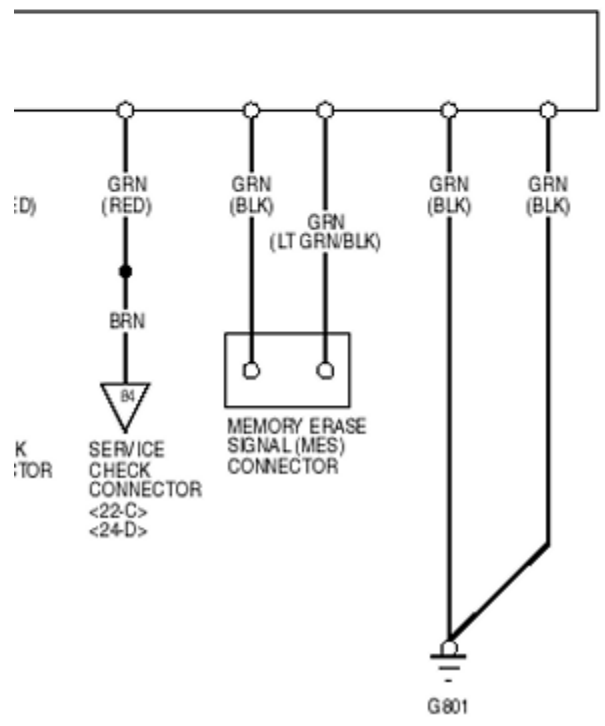




D



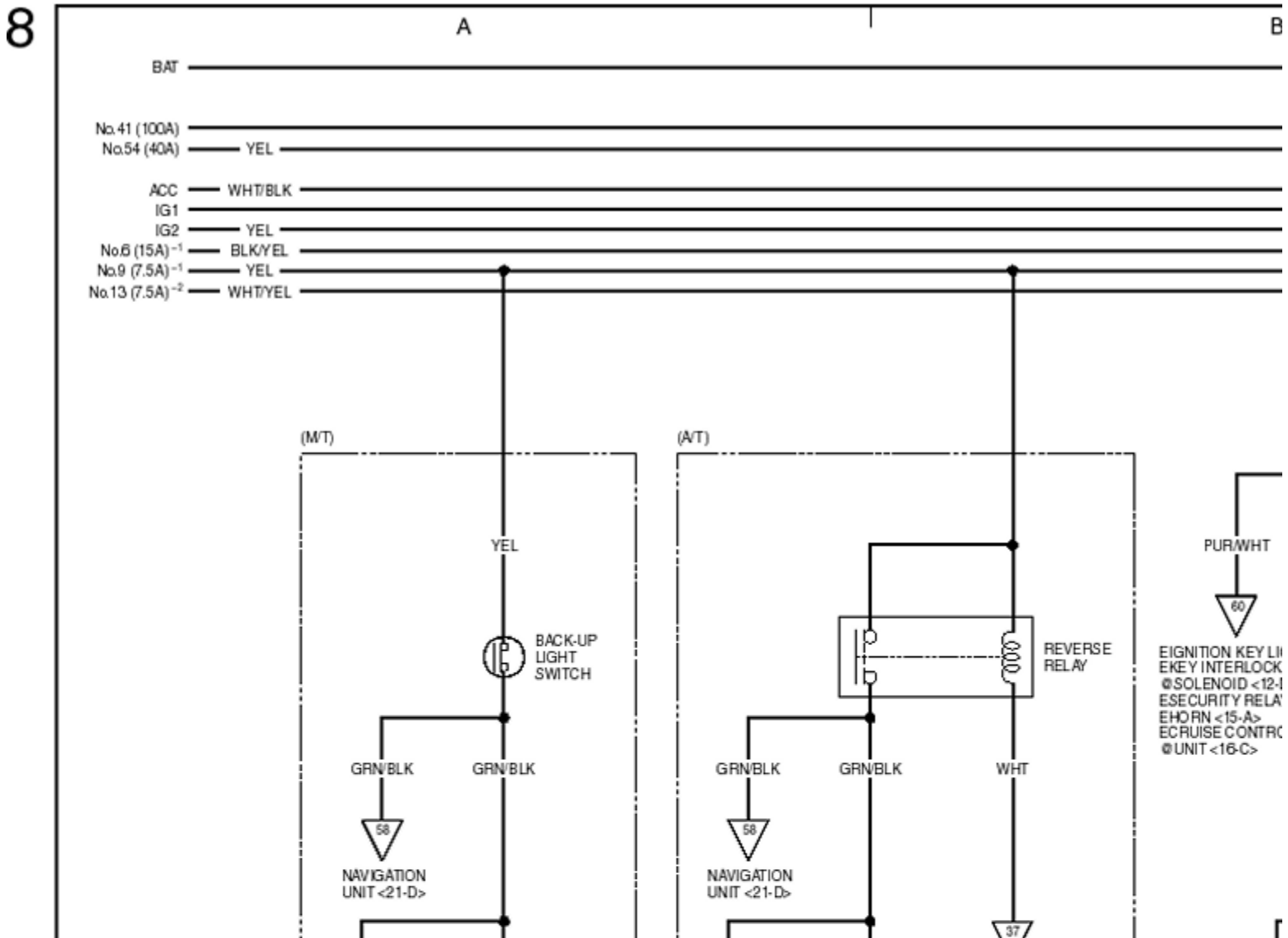
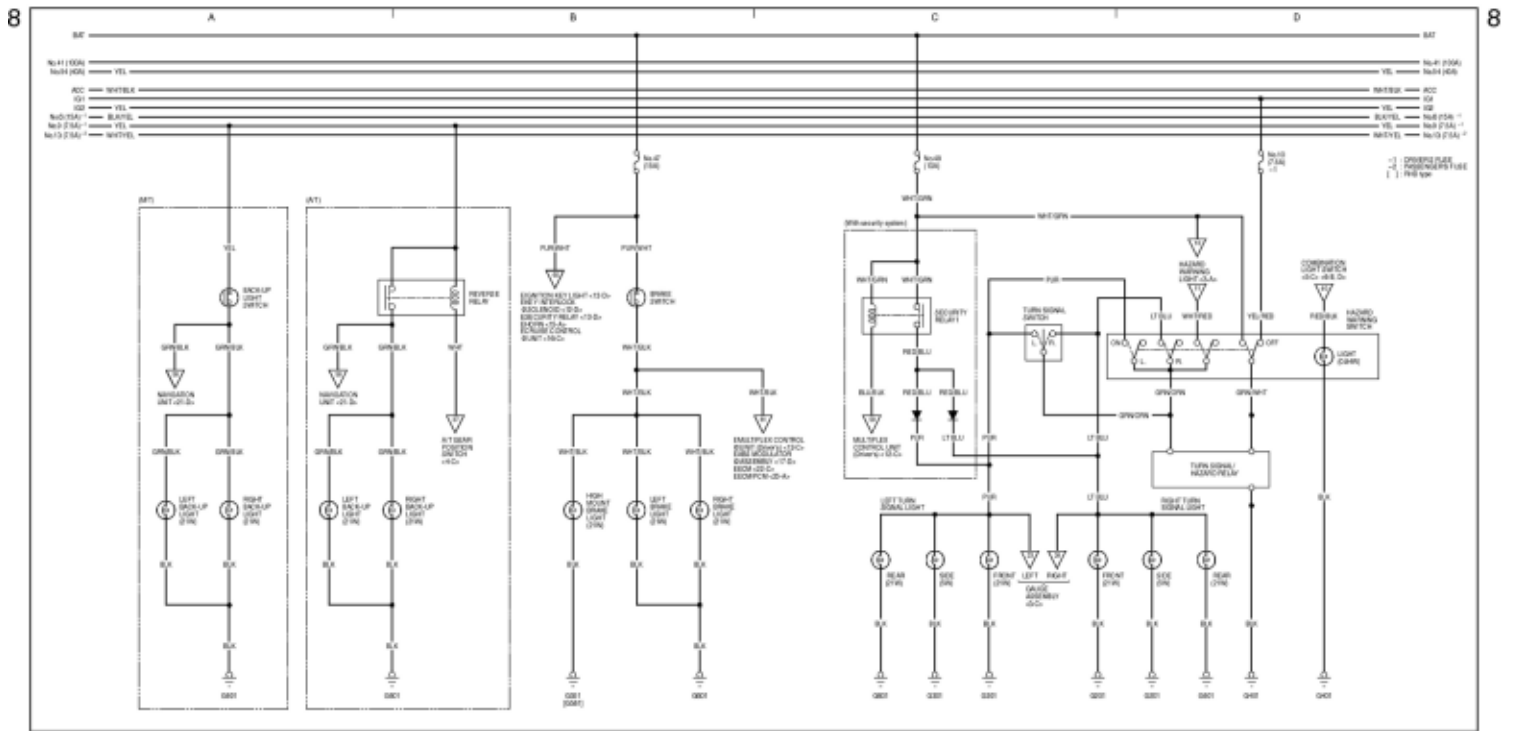
-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

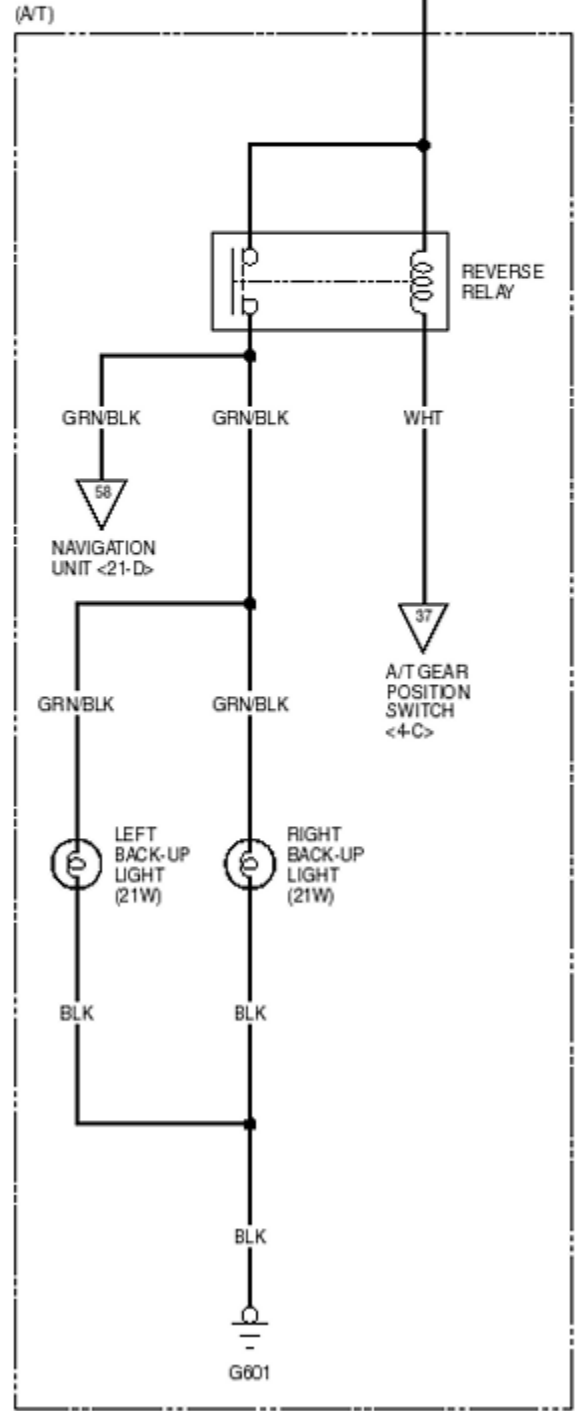
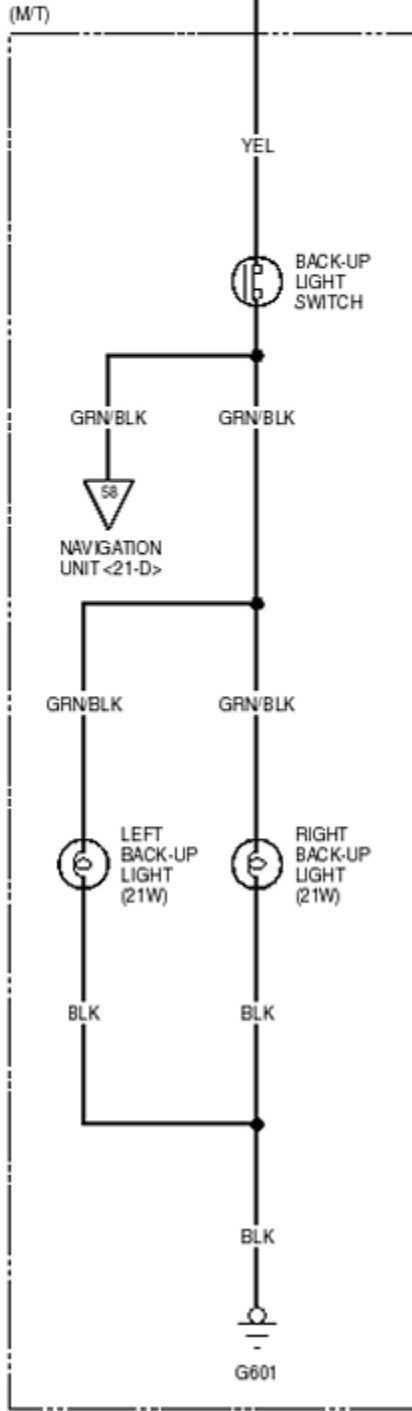
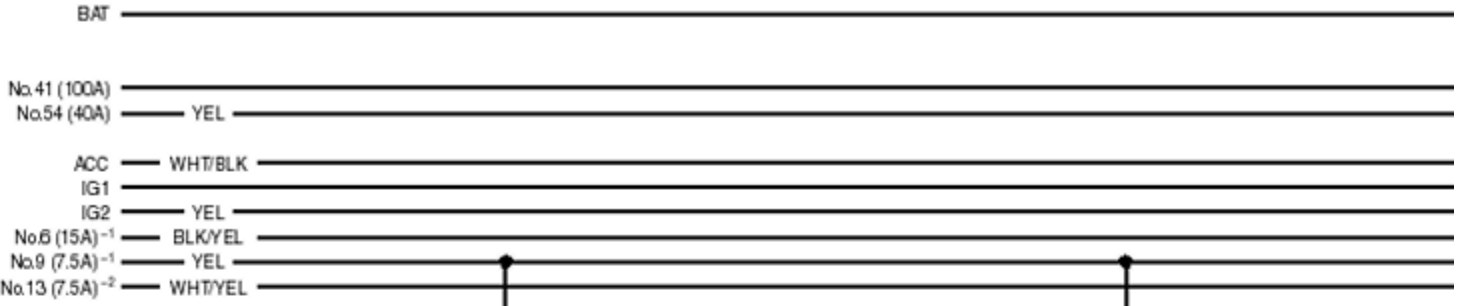


K :TOR

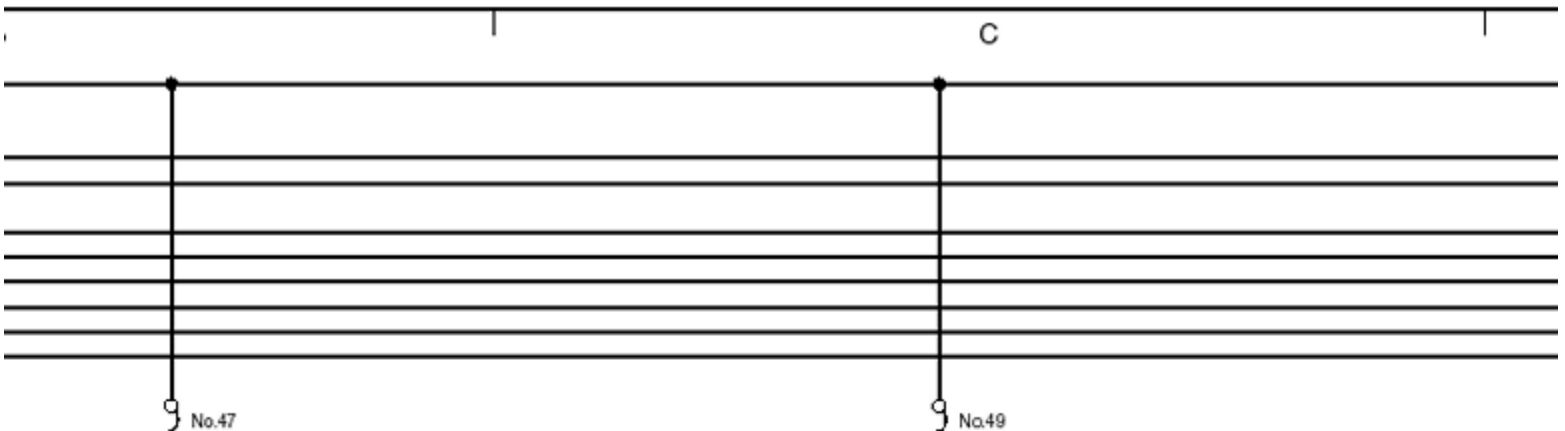
Wiring Diagrams

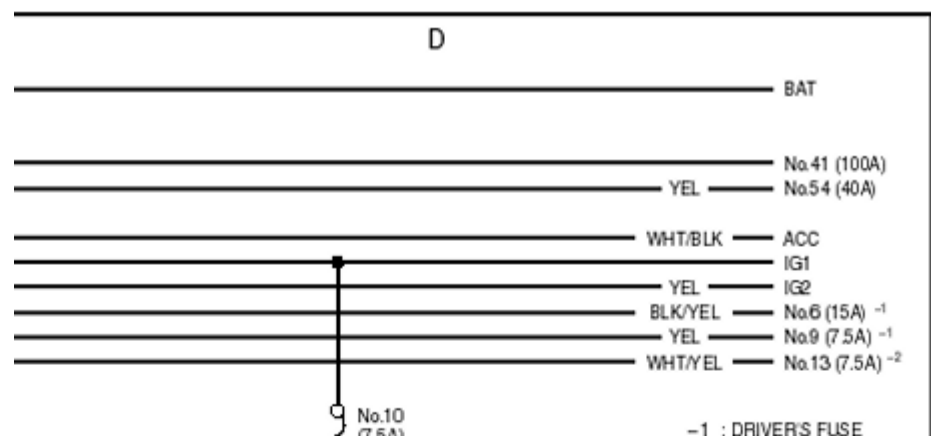
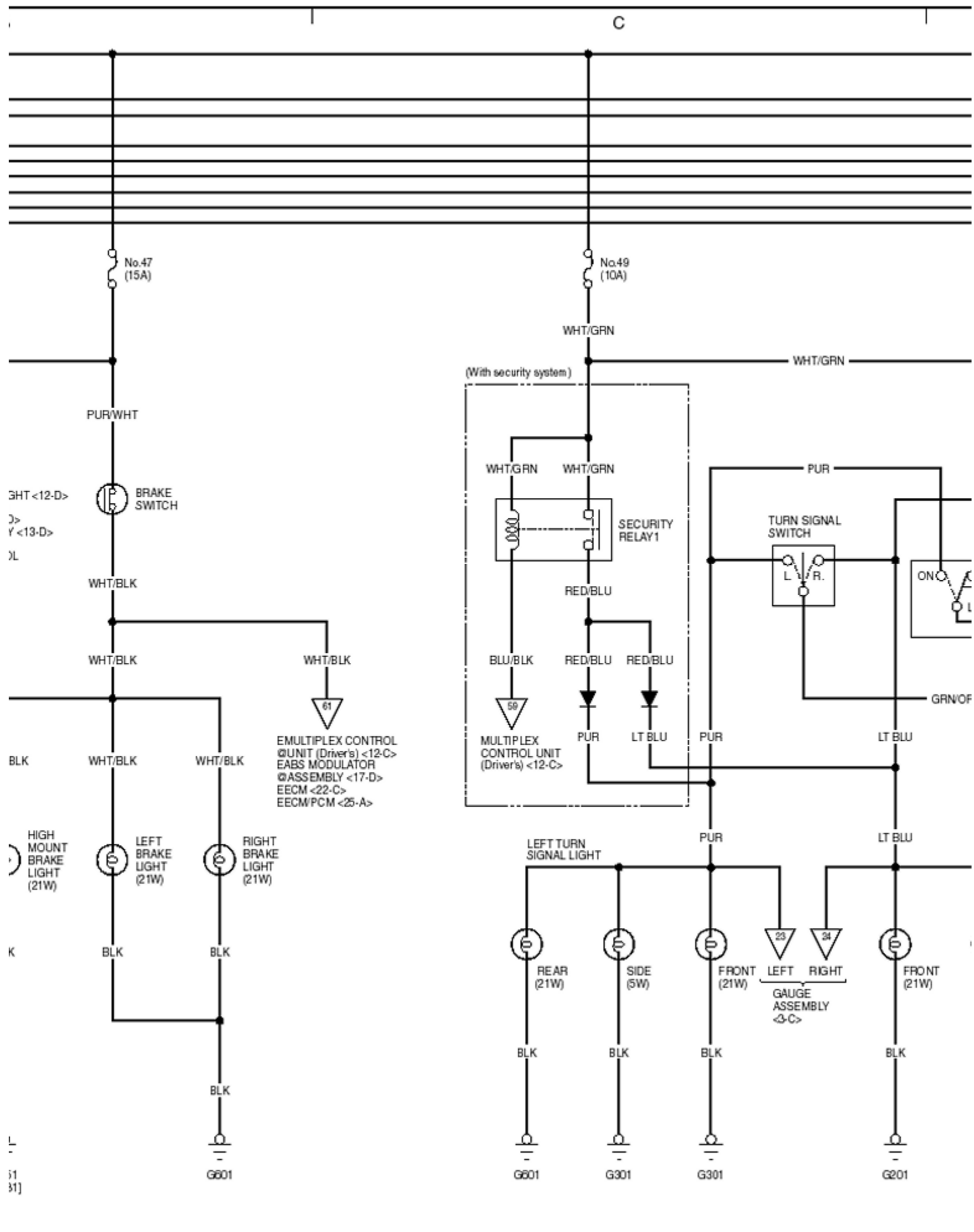
Turn Signal/Hazard Flasher System





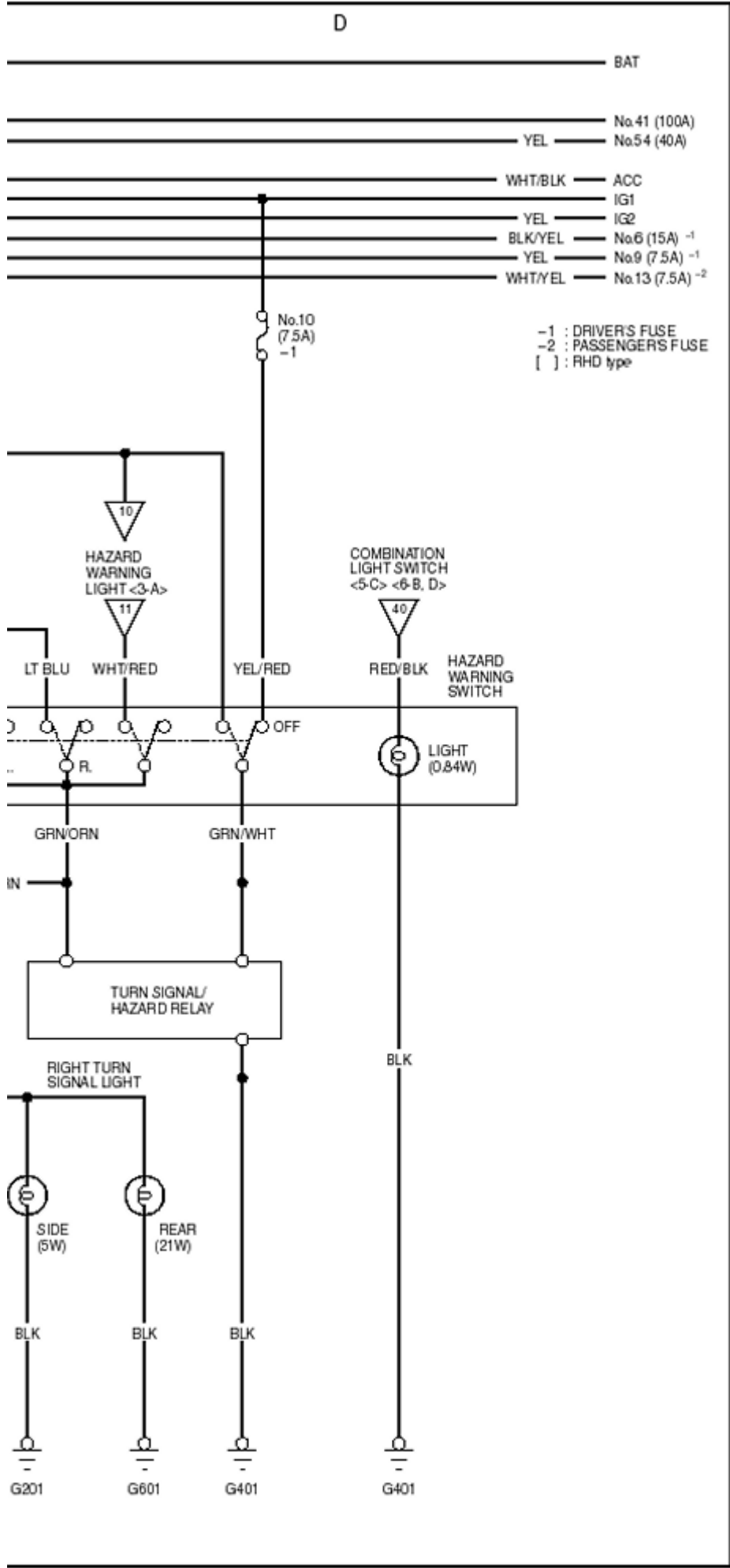
EIGNITION KEY LI
 EKEY INTERLOCK
 SOLENOID <12-I>
 SECURITY RELAY
 HORN <15-A>
 CRUISE CONTR
 UNIT <16-C>





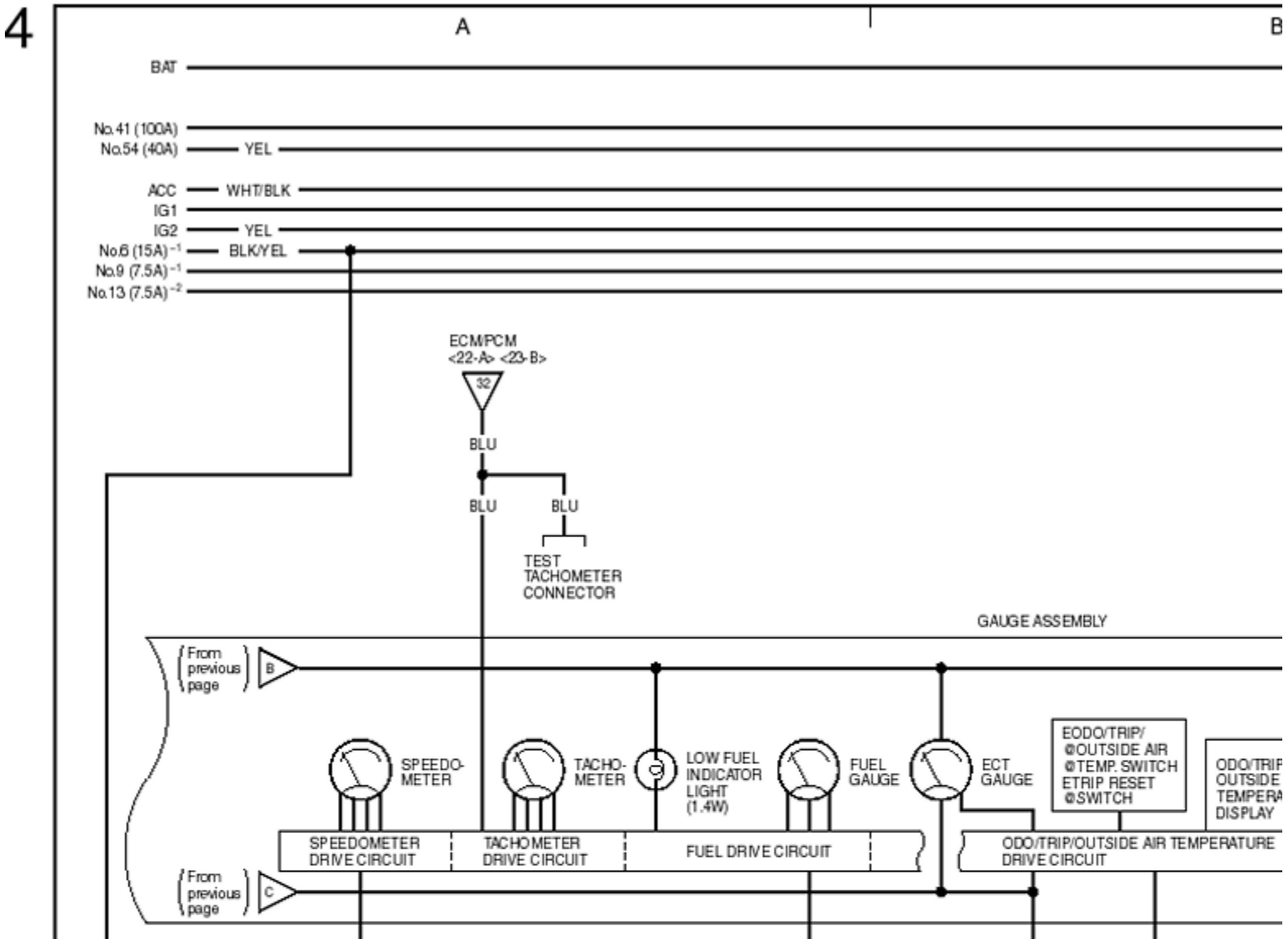
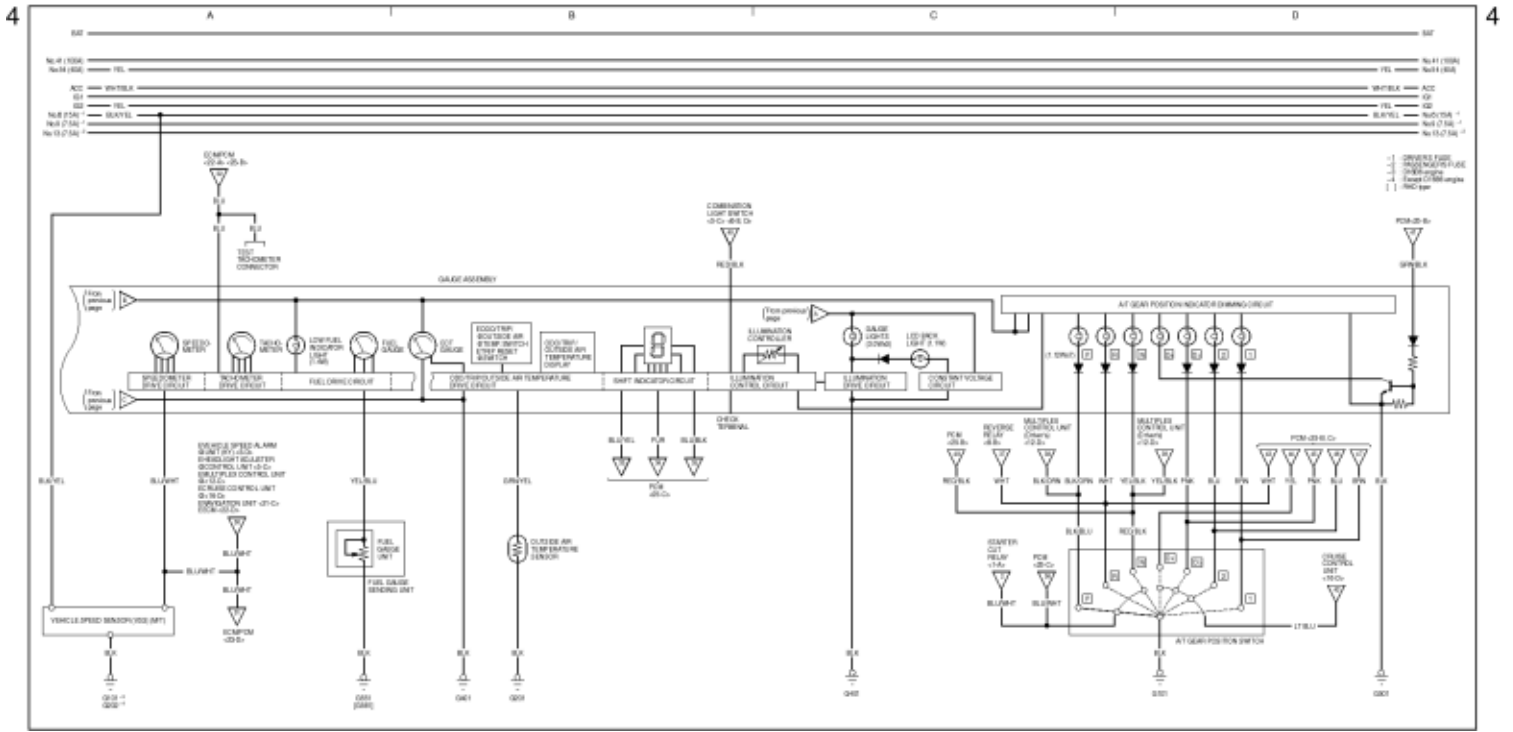
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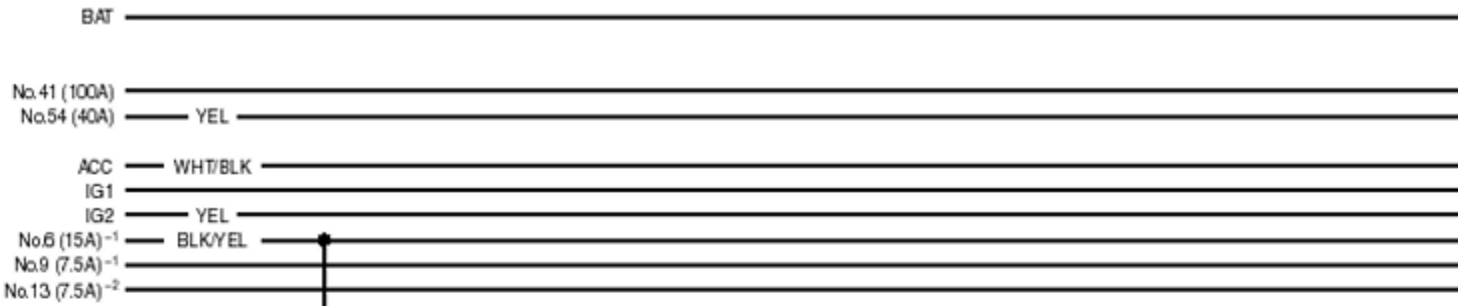
8



Wiring Diagrams

Vehicle Speed Sensor (VSS) (M/T)





ECM/PCM <22-A> <23-B>

BLU

BLU

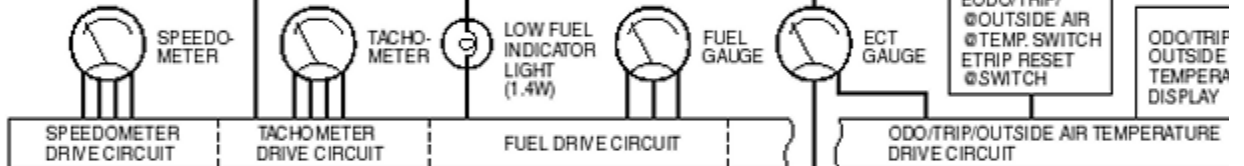
BLU

TEST TACHOMETER CONNECTOR

GAUGE ASSEMBLY

(From previous page) B

(From previous page) C



SPEEDOMETER DRIVE CIRCUIT

TACHOMETER DRIVE CIRCUIT

FUEL DRIVE CIRCUIT

ODO/TRIP/OUTSIDE AIR TEMPERATURE DRIVE CIRCUIT

BLK/YEL

BLU/WHT

- VEHICLE SPEED ALARM UNIT (KY) <3-D>
- EHEADLIGHT ADJUSTER CONTROL UNIT <5-C>
- EMULTIPLEX CONTROL UNIT <12-C>
- ECRUISE CONTROL UNIT <16-D>
- ENAVIGATION UNIT <21-C>
- EECM <22-D>

30

BLU/WHT

BLU/WHT

BLU/WHT

31

ECM/PCM <23-D>

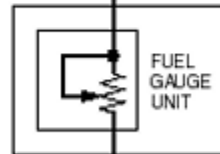
VEHICLE SPEED SENSOR (VSS) (MT)

BLK

G101⁻³
G202⁻⁴

YEL/BLU

GRN/YEL



BLK

G551 [G581]

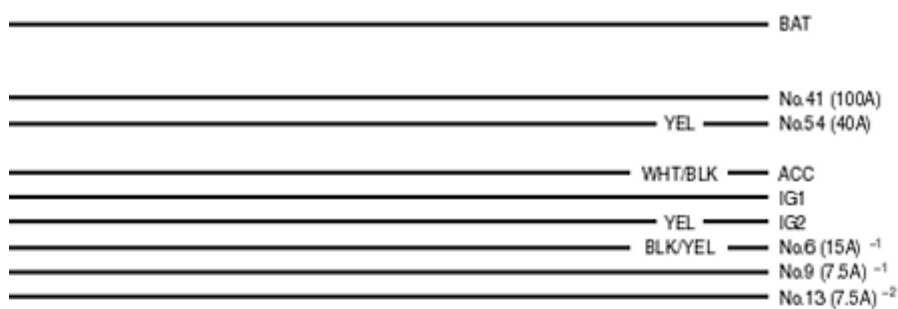
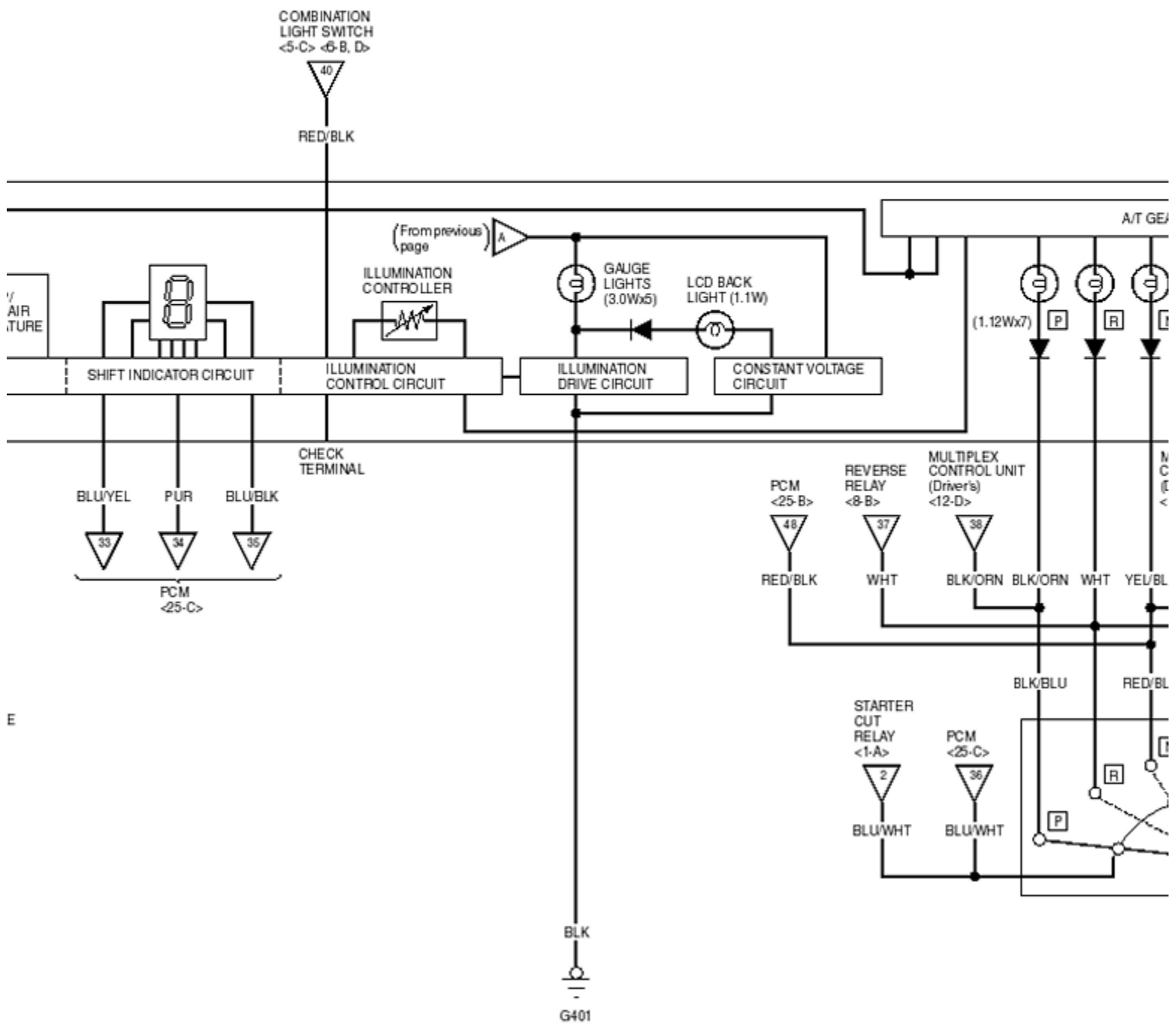
BLK

G401

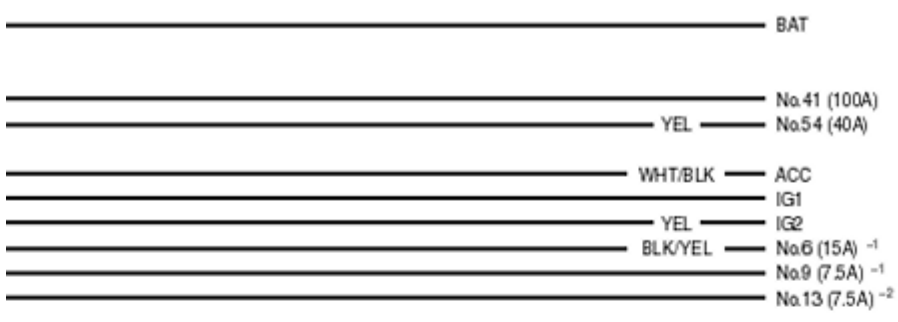
BLK

G201

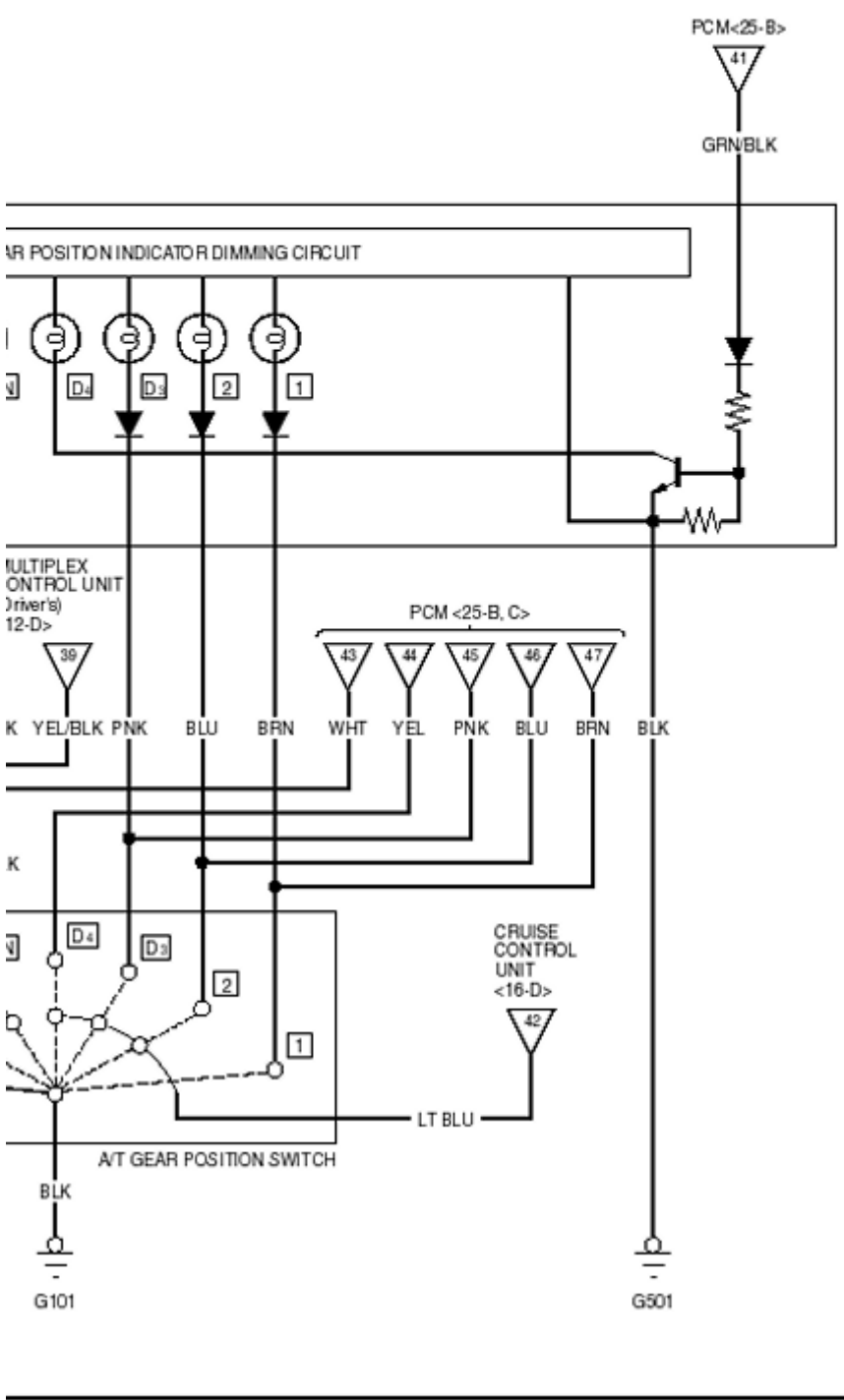
OUTSIDE AIR TEMPERATURE SENSOR



D



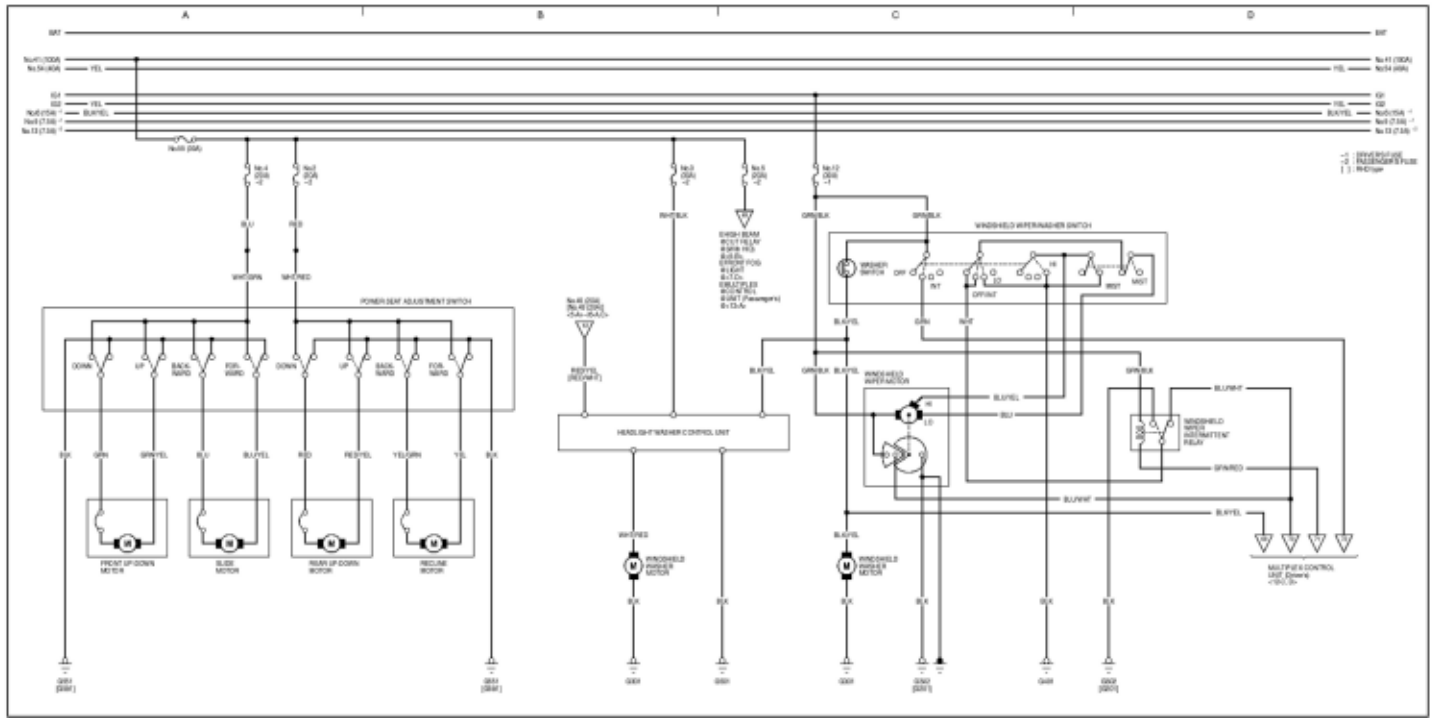
- 1 : DRIVER'S FUSE
- 2 : PASSENGER'S FUSE
- 3 : D16B6 engine
- 4 : Except D16B6 engine
- [] : RHD type



Wiring Diagrams

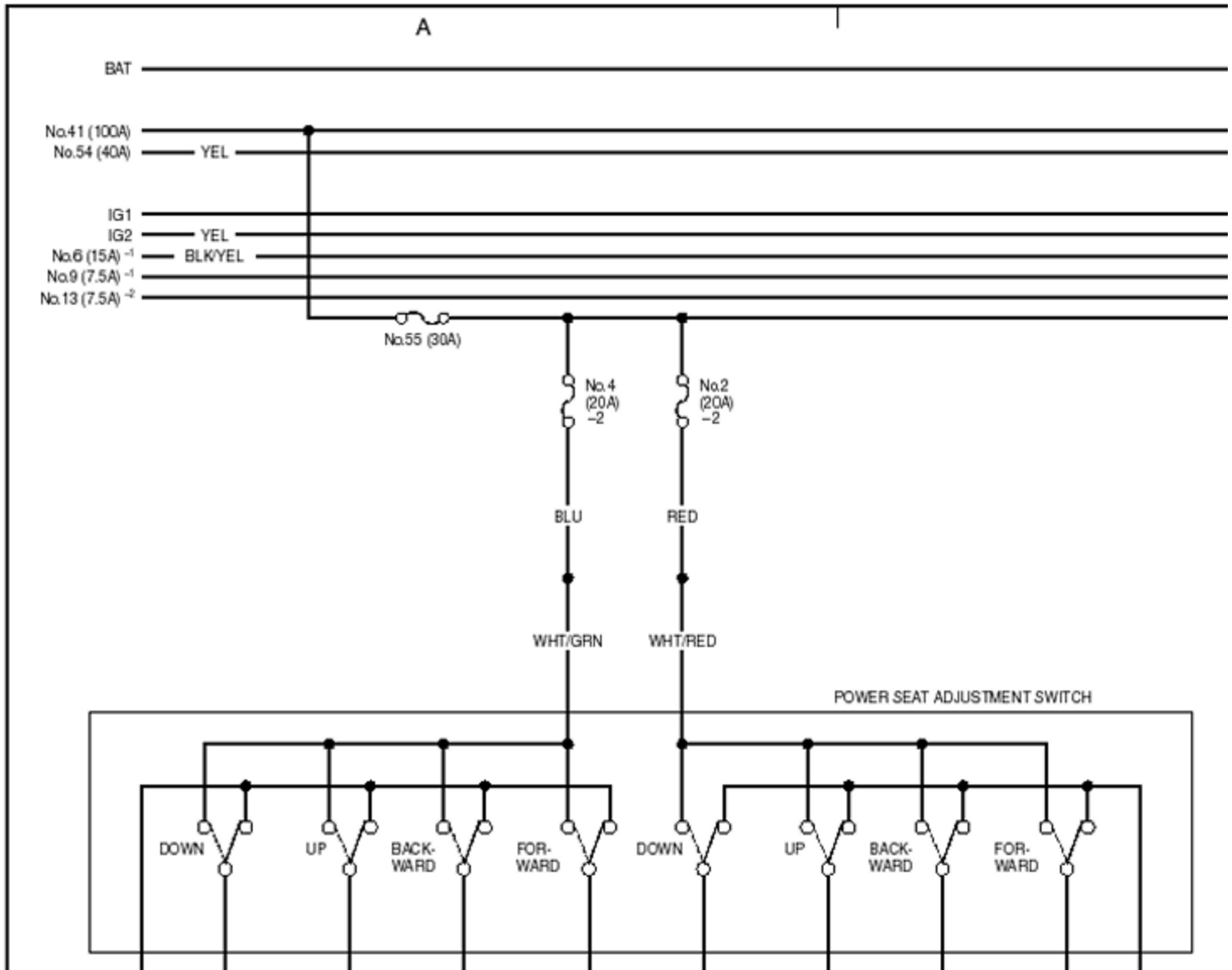
Wiper/Washer

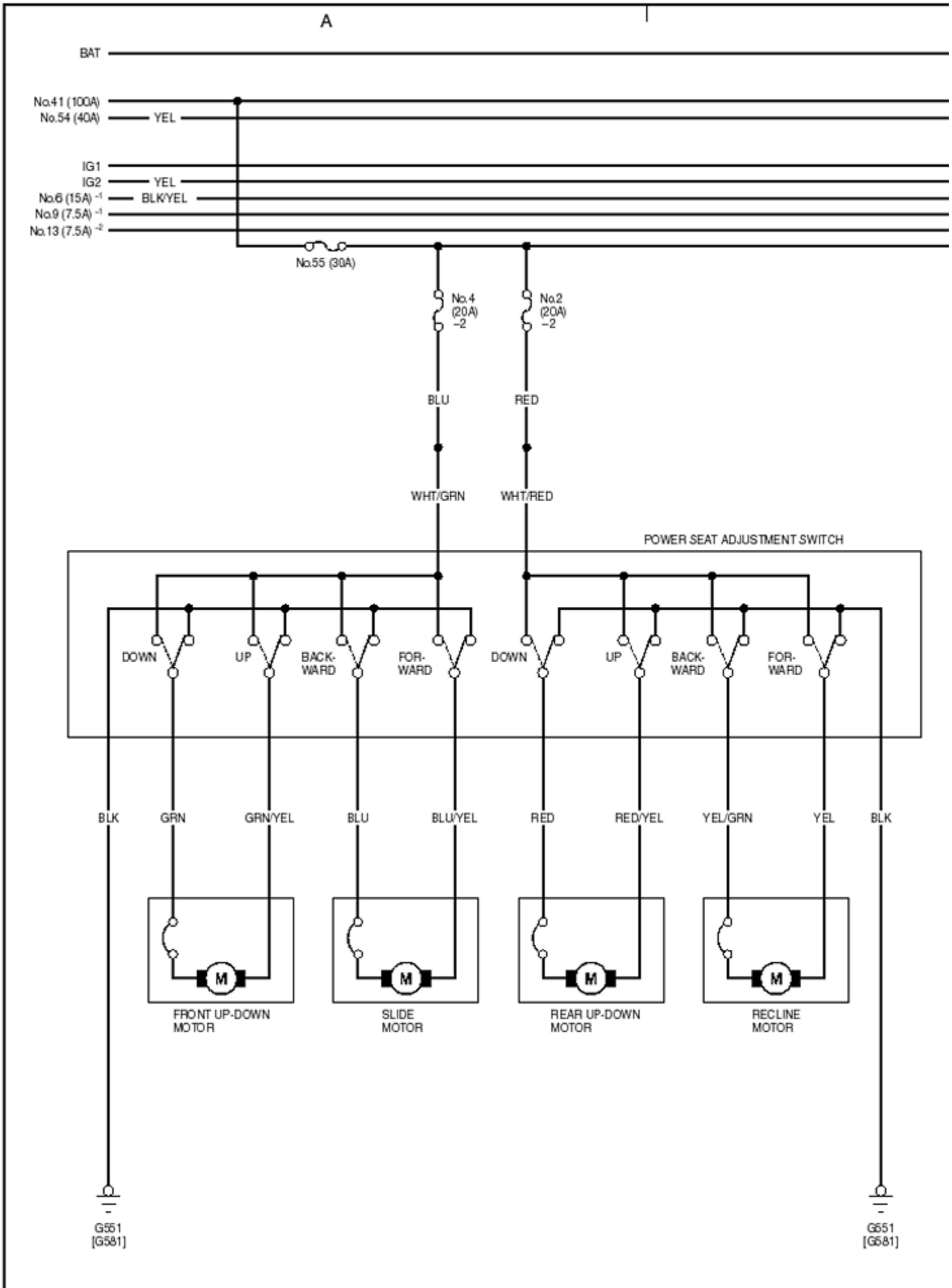
11



11

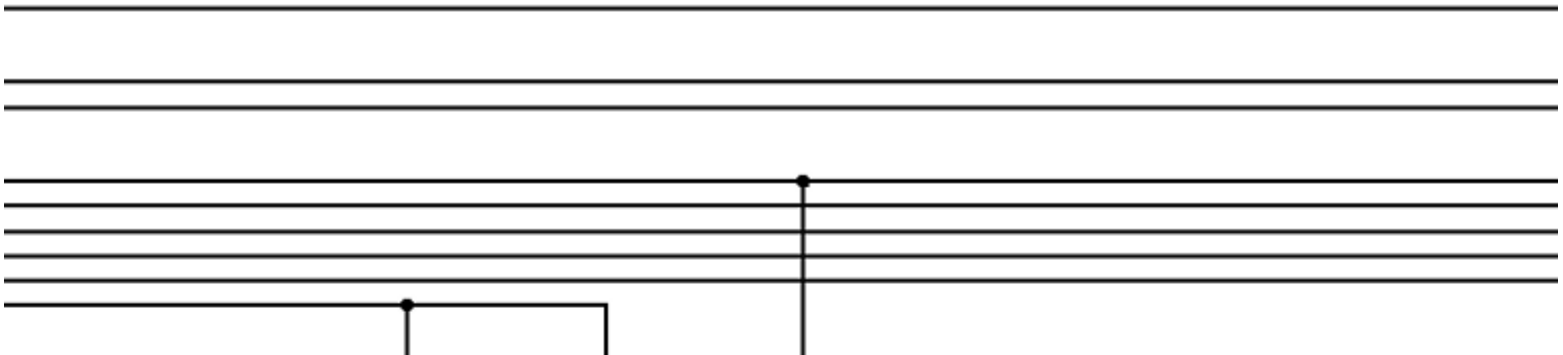
11

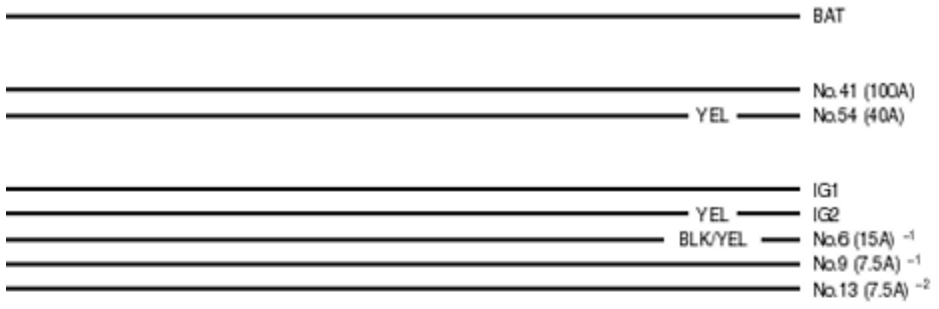
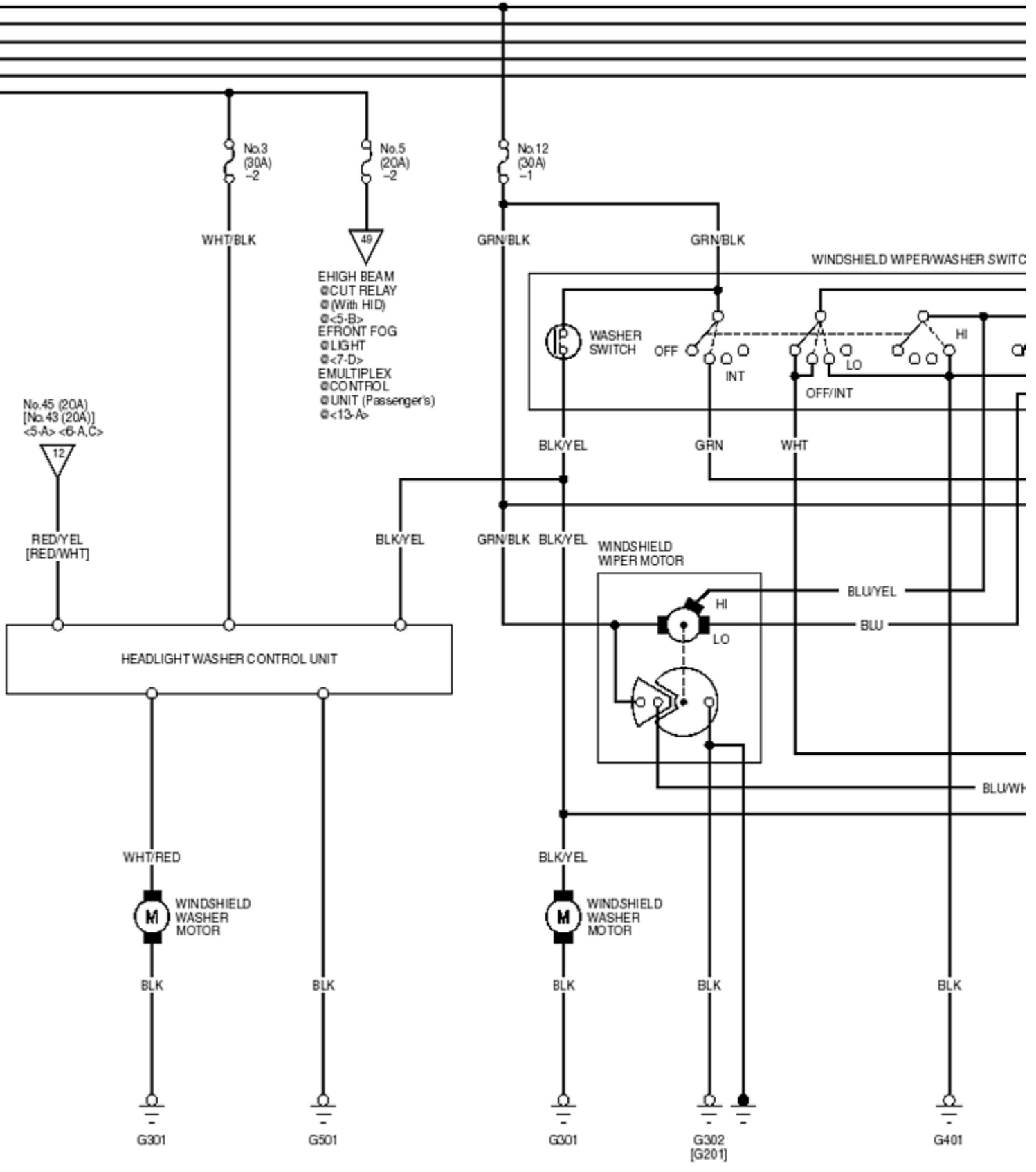




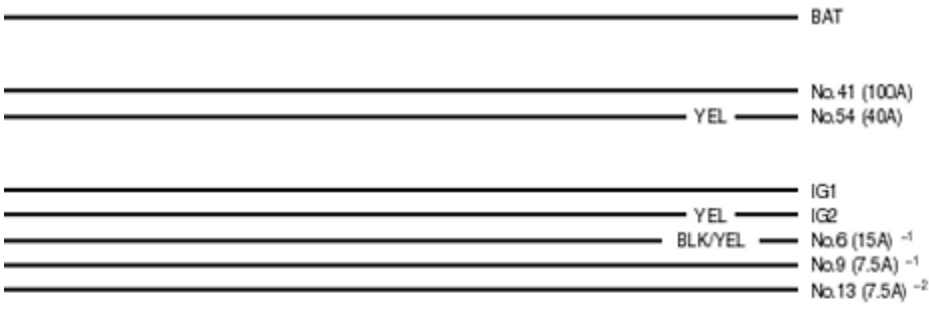
B

C



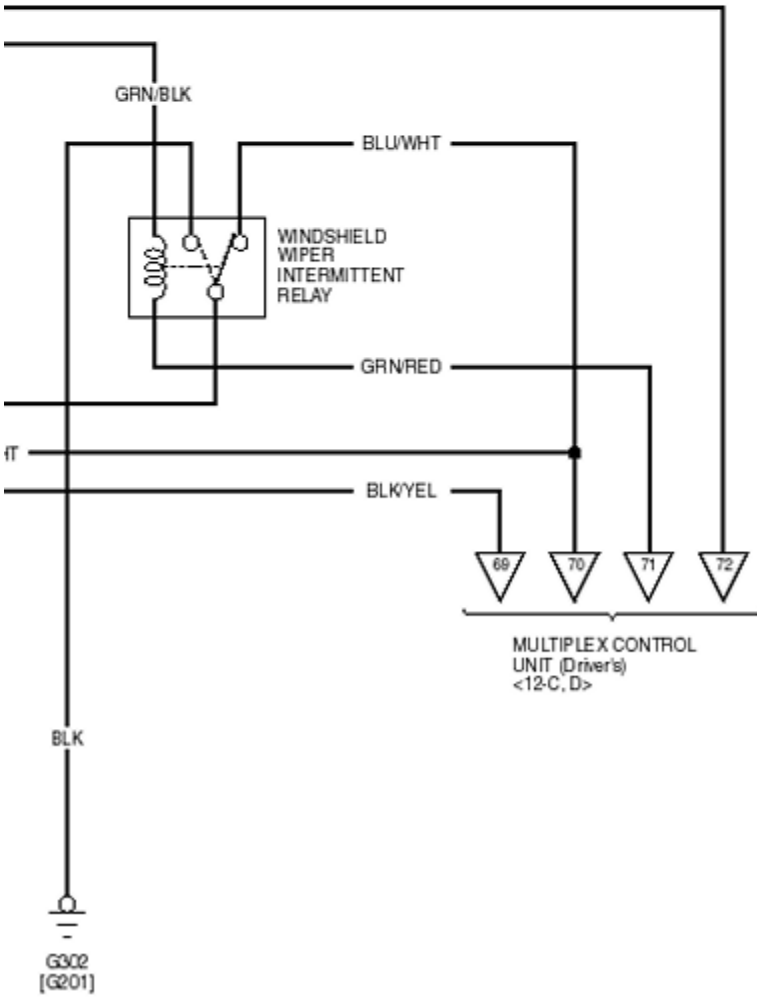
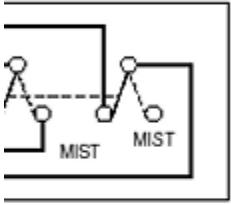


D



-1 : DRIVER'S FUSE
 -2 : PASSENGER'S FUSE
 [] : RHD type

H



Chassis and Engine Numbers

1-2

4 door:

Vehicle Identification Number (VIN)

SHH CG7520YU000101

Manufacturer Make and Type of Vehicle
 SHH: HONDA OF THE U.K. MFG., LTD. U.K.
 HONDA Passenger car

Line, Body and Engine Type
 CG7: ACCORD SEDAN/D16B6, D16B7
 CG8: ACCORD SEDAN/F18B2, F18B3, F18B4
 CG9: ACCORD SEDAN/F20B6
 CH1: ACCORD SEDAN/H22A7
 CH2: ACCORD SEDAN/20T2N

Body and Transmission Type
 5: 4-door SEDAN/5-speed Manual
 6: 4-door SEDAN/4-speed Automatic

Vehicle Grade (Series)
 1: 2.0i ES
 2: 1.6i S, 1.8i S, 2.0 TDi
 3: 1.6i LS, 1.8i LS
 4: 1.6i LS, 1.8i LS, 2.0i LS, 2.0 SDi
 5: 1.6i LS, 1.8i LS, 2.0i LS, 1.8i S
 6: 1.8i ES, 1.8i S
 7: 1.8i ES, 2.0i ES, 2.0 TDi
 8: 1.8i ES, 2.0i ES, 2.2 R, 2.0 SDi
 9: 2.2 R, 2.0i ES

Fixed Code

Supplemental Number

Factory Code
 U: Honda of the U.K. Manufacturing in U.K.

Model Year
 1, 2: 2000

Serial Number

Engine Number

D16B6-E100001

Engine Type

D16B6, D16B7 : 1.6l SOHC 16-valve Sequential Multiport Fuel-injected Unleaded gasoline with CATA

F18B2, F18B4 : 1.8l SOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA

F18B3: 1.8l SOHC 16-valves VTEC Sequential Multiport Fuel-injected Leaded gasoline without CATA

F20B6 : 2.0l SOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA

H22A7 : 2.2l DOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA

20T2N : 2.0l SOHC 8-valves Fuel-injected diesel engine with turbo charger, intercooler and CATA

Serial Number
 H22A7 : 1000001~
 20T2N : 0000001~
 Except H22A7, 20T2N : E100001~

Transmission Number

U2J4 - 1000001

Transmission Type

DH: Manual for D16B6, D16B7 engines
 U2J4: Manual for F18B2, F18B3, F20B6 engines
 U2G5: Manual for F18B4 engine
 U2Q7: Manual for H22A7 engine
 9A: Manual for 20T2N engine
 MDJA: Automatic

Serial Number

Chassis and Engine Numbers

1-3

4 door: (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD Sedan	KE	1.6i S	5MT	SHHCG7520YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU100001~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i S	4AT	SHHCG8620YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i LS	5MT	SHHCG8540YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	5MT*1	SHHCG8580YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	4AT	SHHCG8670YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	4AT*1	SHHCG8680YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0i LS	5MT	SHHCG9540YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	4AT	SHHCG9640YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	5MT	SHHCG9570YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU100001~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU100001~	H22A7-1000001~	U2Q7-1000001~
		2.2 R	5MT*5	SHHCH1580YU100001~	H22A7-1000001~	U2Q7-1000001~
		2.0 TDi	5MT	SHHCH2520YU200001~	20T2N-0000001~	9A-1000001~
2.0 TDi	5MT	SHHCH2570YU200001~	20T2N-0000001~	9A-1000001~		
2.0 SDi	5MT	SHHCH2580YU200001~	20T2N-0000001~	9A-1000001~		
ACCORD Sedan	KG	1.6i S	5MT	SHHCG7520YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7530YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT*2	SHHCG7540YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT*4	SHHCG7550YU100001~	D16B7-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i S	4AT	SHHCG8620YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i LS	5MT	SHHCG8530YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT*3	SHHCG8540YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT*4	SHHCG8550YU100001~	F18B4-E100001~	U2G5-1000001~
		1.8i LS	4AT	SHHCG8640YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i ES	5MT*1	SHHCG8580YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT*4	SHHCG8560YU100001~	F18B4-E100001~	U2G5-1000001~
		1.8i ES	4AT	SHHCG8670YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	4AT*1	SHHCG8680YU100001~	F18B2-E100001~	MDJA-1000001~

*1: with NAVI.

*2: with Auto Aircon

*3: with NAVI and Leather seat

*4: 7PA

*5: with Trunk Spoiler

Chassis and Engine Numbers

1-4

4 door: (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number

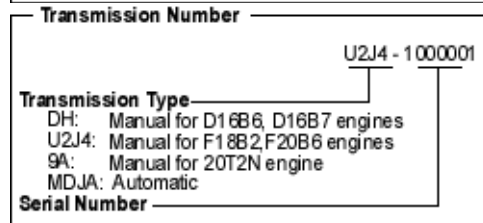
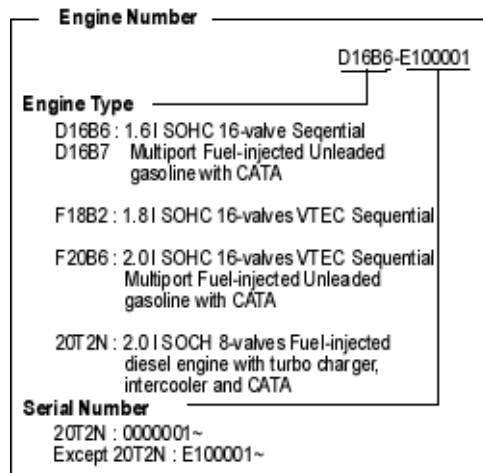
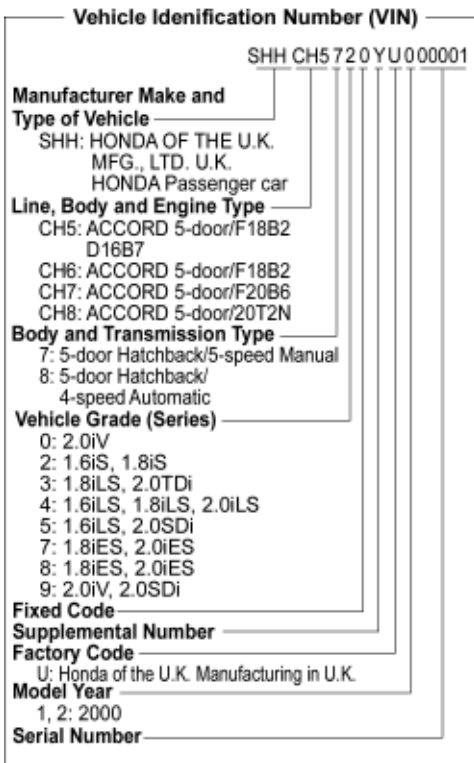
MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
Accord SEDAN	KG	2.0i LS	5MT	SHHCG9540YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	5MT	SHHCG9550YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i LS	4AT	SHHCG9640YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i LS	4AT	SHHCG9650YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	5MT	SHHCG9570TU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9590YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9510YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT	SHHCG9690YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT	SHHCG9610YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU100001~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU100001~	H22A7-1000001~	U2Q7-1000001~
		2.0 TDi	5MT	SHHCH2520YU200001~	20T2N-0000001~	9A-1000001~
		2.0 TDi	5MT	SHHCH2570YU200001~	20T2N-0000001~	9A-1000001~
2.0 SDi	5MT	SHHCH2540YU200001~	20T2N-0000001~	9A-1000001~		
2.0 SDi	5MT	SHHCH2580YU200001~	20T2N-0000001~	9A-1000001~		
Accord SEDAN	KS	1.6i S	5MT	SHHCG7520YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU100001~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT	SHHCG8540YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0i LS	5MT	SHHCG9540YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9570YU100001~	F20B6-E100001~	U2J4-1000001~
Accord SEDAN	KR	1.6i S	5MT	SHHCG7520YU100001~	D16B6-E100001~	DH-1000001~
		1.6i LS	5MT	SHHCG7540YU100001~	D16B6-E100001~	DH-1000001~
		1.8i S	5MT	SHHCG8520YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	5MT	SHHCG8540YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8i LS	4AT	SHHCG8640YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8i ES	5MT	SHHCG8570YU100001~	F18B2-E100001~	U2J4-1000001~
		2.0i LS	5MT	SHHCG9540YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT	SHHCG9570YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	5MT*1	SHHCG9580YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0i ES	4AT	SHHCG9670YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0i ES	4AT*1	SHHCG9680YU100001~	F20B6-E100001~	MDJA-1000001~
		2.2 R	5MT	SHHCH1590YU100001~	H22A7-1000001~	U2Q7-1000001~
		2.0 TDi	5MT	SHHCH2520YU200001~	20T2N-0000001~	9A-1000001~
2.0 SDi	5MT	SHHCH2540YU200001~	20T2N-0000001~	9A-1000001~		
Accord SEDAN	KY	1.8i S	5MT	SHHCG8527YU100001~	F18B3-E100001~	U2J4-1000001~
		1.8i S	4AT	SHHCG8627YU100001~	F18B3-E100001~	MDJA-1000001~

*1: with NAVI.

Chassis and Engine Numbers

1-5

5 door:



Chassis and Engine Numbers

1-6

5 door:

Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD 5-door	KE	1.6iS	5MT	SHHCH5720YU100001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU100001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iS	4AT	SHHCH6820YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iLS	5MT	SHHCH6740YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	5MT	SHHCH6770YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	5MT	SHHCH6780YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	4AT	SHHCH6870YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	4AT	SHHCH6880YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iLS	4AT	SHHCH7840YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	4AT	SHHCH7870YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	4AT	SHHCH7880YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iV	5MT	SHHCH7790YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iV	5MT	SHHCH7700YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iV	4AT	SHHCH7890YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iV	4AT	SHHCH7800YU100001~	F20B6-E100001~	MDJA-1000001~
2.0TDi	5MT	SHHCH8730YU200001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8790YU20000X~	20T2N-0000001~	9A-1000001~		
ACCORD 5-door	KG	1.6iS	5MT	SHHCH5720YU100001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU100001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5750YU100001~	D16B7-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iS	4AT	SHHCH6820YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iLS	5MT	SHHCH6730YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6750YU100001~	F18B4-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	5MT	SHHCH6770YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	5MT	SHHCH6780YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iES	4AT	SHHCH6870YU100001~	F18B2-E100001~	MDJA-1000001~
		1.8iES	4AT	SHHCH6880YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iLS	4AT	SHHCH7840YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	4AT	SHHCH7870YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	4AT	SHHCH7880YU100001~	F20B6-E100001~	MDJA-1000001~
2.0iV	5MT	SHHCH7790YU100001~	F20B6-E100001~	U2J4-1000001~		
2.0iV	5MT	SHHCH7700YU100001~	F20B6-E100001~	U2J4-1000001~		
2.0iV	4AT	SHHCH7890YU100001~	F20B6-E100001~	MDJA-1000001~		
2.0iV	4AT	SHHCH7800YU100001~	F20B6-E100001~	MDJA-1000001~		
2.0TDi	5MT	SHHCH8730YU200001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8750YU200001~	20T2N-0000001~	9A-1000001~		
2.0SDi	5MT	SHHCH8790YU200001~	20T2N-0000001~	9A-1000001~		

Chassis and Engine Numbers**1-7**

5 door: (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD 5-door	KS	1.6iS	5MT	SHHCH5720YU100001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU100001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0iLS	5MT	SHHCH7740YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7770YU100001~	F20B6-E100001~	U2J4-1000001~
ACCORD 5-door	KR	1.6iS	5MT	SHHCH5720YU100001~	D16B6-E100001~	DH-1000001~
		1.6iLS	5MT	SHHCH5740YU100001~	D16B6-E100001~	DH-1000001~
		1.8iS	5MT	SHHCH6720YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	5MT	SHHCH6740YU100001~	F18B2-E100001~	U2J4-1000001~
		1.8iLS	4AT	SHHCH6840YU100001~	F18B2-E100001~	MDJA-1000001~
		2.0iES	5MT	SHHCH7770YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	5MT	SHHCH7780YU100001~	F20B6-E100001~	U2J4-1000001~
		2.0iES	4AT	SHHCH7870YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0iES	4AT	SHHCH7880YU100001~	F20B6-E100001~	MDJA-1000001~
		2.0TDi	5MT	SHHCH8730YU200001~	20T2N-0000001~	9A-1000001~
		2.0SDi	5MT	SHHCH8750YU200001~	20T2N-0000001~	9A-1000001~

Abbreviations

1-8

List of automotive abbreviations which may be used in shop manual.

ABS	Anti-lock Brake System	EGR	Exhaust Gas Recirculation
A/C	Air Conditioning, Air Conditioner	ELD	Electrical Load Detector
ACL	Air Cleaner	EPR	Evaporator Pressure Regulator
A/F	Air Fuel Ratio	EPS	Electrical Power Steering
ALR	Automatic Locking Retractor	EVAP	Evaporative
ALT	Alternator	EX	Exhaust
AMP	Ampere (s)	F	Front
ANT	Antenna	FIA	Fuel Injection Air
API	American Petroleum Institute	FL	Front Left
APPROX.	Approximately	FP	Fuel Pump
ASSY	Assembly	FR	Front Right
A/T	Automatic Transmission	FSR	Fail Safe Relay
ATDC	After Top Dead Centre	FWD	Front Wheel Drive
ATF	Automatic Transmission Fluid	GAL	Gallon
ATT	Attachment	GND	Ground
ATTS	Active Torque Transfer System	GPS	Global Positioning System
AUTO	Automatic	H/B	Hatchback
AUX	Auxiliary	HC	Hydrocarbons
BARO	Barometric	HID	High Intensity Discharge
BAT	Battery	H02S	Heated Oxygen Sensor
BDC	Bottom Dead Centre	IAB	Intake Air Bypass
BTDC	Before Top Dead Centre	IAC	Idle Air Control
CARB	Carburettor	IACV	Idle Air Control Valve
CAT	Catalytic Converter	IAR	Intake Air Resonator
or CATA		IAT	Intake Air Temperature
CHG	Charge	ICM	Ignition Control Module
CKF	Crankshaft Speed Fluctuation	ID	Identification
CKP	Crankshaft Position	ID or I.D.	Inside Diameter
CO	Carbon Monoxide	IG or IGN	Ignition
COMP	Complete	IMA	Idle Mixture Adjustment
CPB	Clutch Pressure Back up	IMMOBI.	Immobiliser
CPC	Clutch Pressure Control	IN	Intake
CPU	Central Processing Unit	INJ	Injection
CVT	Continuously Variable Transmission	INT	Intermittent
CYL	Cylinder	KS	Knock Sensor
CYP	Cylinder Position	L	Left
DI	Distributor Ignition	L/C	Lock-up Clutch
DIFF	Differential	LCD	Liquid Crystal Display
DLC	Data Link Connector	LED	Light Emitting Diode
DOHC	Double Overhead Camshaft	LF	Left Front
DPI	Dual Point Injection	LH	Left Handle
DTC	Diagnostic Trouble Code	LHD	Left Handle Drive
EBD	Electronic Brake Distribution	LR	Left Rear
ECM	Engine Control Module	LSD	Limited Slip Differential
ECT	Engine Coolant Temperature	L-4	In-line Four Cylinder (engine)

Abbreviations
(cont'd)

MAP	Manifold Absolute Pressure
MAX.	Maximum
MBS	Mainshaft Brake System
MCK	Motor Check
MCU	Moment Control Unit
MIL	Malfunction Indicator Light
MIN.	Minimum
MPI	Multi Point Injection
M/S	Manual Steering
M/T	Manual Transmission
N	Neutral
NOx	Oxides of Nitrogen
OBD	On-board Diagnostic
O2S	Oxygen Sensor
OD or O.D.	Outside Diameter
P	Park
PAIR	Pulsed Secondary Air Injection
PCM	Powertrain Control Module
PCV	Positive Crankcase Ventilation
	Proportioning Control Valve
PGM-FI	Programmed-fuel Injection
PGM-IG	Programmed Ignition
PH	Pressure High
PL	Pilot Light or Pressure Low
PMR	Pump Motor Relay
P/N	Part Number
PRI	Primary
P/S	Power Steering
PSF	Power Steering Fluid
PSP	Power Steering Pressure
PSW	Pressure Switch
Qty	Quantity
R	Right
REF	Reference
RGB	Red, Green, Black
RHD	Right Handle Drive
RL	Rear Left
RON	Research Octane Number
RR	Rear Right
SAE	Society of Automotive Engineers
SCS	Service Check Signal
SEC	Second
	Secondary
SOHC	Single Overhead Camshaft
SOL	Solenoid
SPEC	Specification
S/R	Sun Roof
SRS	Supplemental Restraint System

STD	Standard
SW	Switch
T	Torque
TB	Throttle Body
T/B	Timing Belt
TC	Torque Converter
TCM	Transmission Control Module
TCS	Traction Control System
TDC	Top Dead Centre
TFT	Thin Film Transistor
T/N	Tool Number
TP	Throttle Position
TWC	Three Way Catalytic Converter
VC	Viscous Coupling
VDP	Variable Displacement Pump
VFV	Variable Force Control Valve
VGR	Variable Gear Ratio
VIN	Vehicle Identification Number
VSC	Valuable Space Column
VSS	Vehicle Speed Sensor
VTEC	Variable Valve Timing & Valve Lift Electronic Control
VVIS	Variable Volume Intake System
W	With
W/O	Without
WOT	Wide Open Throttle
2WD	Two Wheel Drive
4WD	Four Wheel Drive
2WS	Two Wheel Steering
4WS	Four Wheel Steering
4AT	4-speed Automatic Transmission
5MT	5-speed Manual Transmission
P	Park
R	Reverse
N	Neutral
D4	Drive (1st through 4th gear)
D3	Drive (1st through 3rd gear)
2	Second
1	First
D	Drive
S	Second
L	Low
O/D	Over Drive
1ST	Low (gear)
2ND	Second (gear)
3RD	Third (gear)
4TH	Fourth (gear)
5TH	Fifth (gear)

		MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V		12	
	Primary winding resistance at 20°C (68°F) ohms		0.45-0.55	
	Except H22A7 engine		0.63-0.77	
	H22A7 engine			
Secondary winding resistance at 20°C (68°F) k ohms	D16B6, D16B7 engines		12.0-14.6	
	F18B2, F18B3, F10B4, F10B7 engines		22.4-33.6	
	H22A7 engine		12.8-19.2	
Ignition wire	Resistance at 20°C (68°F) k ohms		25 max.	
	Firing order		1 - 4 - 2 - 3	
	D16B6, D16B7 engines		1 - 3 - 4 - 2	
	Except D16B6, D16B7 engines			
Spark plug	Type		STANDARD (NEW)	SERVICE LIMIT
	Gap	Except H22A7 engine	See section 4	
		H22A7 engine	1.0-1.1 (0.039-0.043)	-
Ignition timing	At idle	Except H22A7 engine	12 ± 2 (Neutral)	
	BTDC (Red)	M/T	12 ± 2 (N or P position)	
		A/T		
		H22A7 engine	15 ± 2 (Neutral)	
Alternator Belt*1 (D16B6 engine)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.0-10.5 (0.28-0.41) with used belt 5.0-7.0 (0.20-0.28) with new belt	
Alternator Belt*1 (D16B6 engine)	Belt tension N (kgf, lbf)		340-490 (35-50, 77-110) with used belt	
	Measured with belt tension gauge		640-780 (65-80, 140-180) with new belt	
Alternator Belt*1 (D16B6 engine with A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-12.0 (0.39-0.47) with used belt 5.5-7.5 (0.22-0.30) with new belt	
Alternator Belt*1 (D16B6 engine with A/C)	Belt tension N (kgf, lbf)		390-540 940-55, 88-120) with used belt	
	Measured with belt tension gauge		880-1,030 (90-105, 200-230 with new belt	
Alternator Belt*1 (Except D16B6 engine without A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-13.0 (0.39-0.51) with used belt 7.5-10.0 (0.30-0.39) with new belt	
Alternator Belt*1 (Except D16B6 engine without A/C)	Belt tension N (kgf, lbf)		290-440 (30-45, 66-99) with used belt	
	Measured with belt tension gauge		540-740 (55-75, 120-170) with new belt	
Alternator (Except H22A7 engine)	Output 13.5 V at hot		STANDARD (NEW)	SERVICE LIMIT
	D16B6, D16B7 engines		85 A	
	Except D16B6, D16B7 engines		90 A	
	Coil resistance (rotor) at 20°C (68°F) ohm			
	D16B6, D16B7 engines		2.6	-
	Except D16B6, D16B7 engines		2.4	-
	Slip ring O.D.		15.4 (0.61)	14.15 (0.557)
Brush length		13.2 (0.52)	3.2 (0.13)	
Brush spring tension N (kgf, lbf)		1.9 (0.19, 0.42)	-	
Alternator (H22A7 engine)	Output 13.5 V at hot		95 A	
	Coil resistance (rotor) at 20°C (68°F) ohm		2.2-3.0	-
	Slip ring O.D.		14.4 (0.57)	14.0 (0.55)
	Brush length		10.5 (0.41)	1.5 (0.06)
	Brush spring tension N (kgf, lbf)		2.9-3.5 (0.30-0.36, 0.66-0.79)	-
Starter (Except H22A7 engine)	Manufacturer		VALEO	
	Output		1.0 kW	
	Commutator mica depth		0.5-0.9 (0.020-0.035)	0.2 (0.08)
	Commutator runout		0-01 (0-0004) max.	0.015 (0.0006)
	Brush length		18 (0.7)	5 (0.2)
	Brush spring tension N (kgf, lbf)		15.3-19.2 (1.56-1.96, 3.44-4.32)	-
Starter (H22A7 engine)	Manufacturer		DENSO	
	Output		1.0 kW	
	Commutator mica depth		0.5-0.8 (0.020-0.031)	0.2 (0.08)
	Commutator runout		0.02 (0-0008) max.	0.05 (0.002)
	Commutator O.D.		27.9-28.0 (1.098, 1.102)	27.0 (1.06)
	Brush length		14.0-14.5 (0.55-0.57)	9.0 (0.35)
	Brush spring tension N (kgf, lbf)		13.7-17.7 (1.4-1.8, 3.09-3.97)	-

*1: When using a new belt, adjust deflection or tension to new belt values. Run the engine for 5 minutes then turn it off. Readjust

deflection or tension to used belt values.

Standards and Service Limits**2-3****Cylinder Head/Valve Train (D16B6, D16B7 engines) -
Section 6**

Unit of length: mm (in)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm (min*1) and wide open throttle kPa (kgf/cm ² , psi)	Minimum	930 (9.5, 135)	
		Maximum variation	200 (2.0, 28)	
Cylinder head	Warpage		-	0.05 (0.002)
	Height		92.95-93.05 (3.659-3.663)	-
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)
	Total runout		0.03 (0.001) max.	0.04 (0.002)
	Cam lobe height	IN	35.019 (1.3787)*1, 34.734(1.3675)*2	-
		EX	37.904 (1.4923)	-
Valve	Valve clearance (Cold)	IN	0.18-0.22 (0.007-0.009)	-
		EX	0.23-0.27 (0.009-0.011)	-
	Valve stem O.D.	IN	5.48-5.49 (0.2157-0.2161)	5.45 (0.2146)
		EX	5.45-5.46 (0.2146-0.2150)	5.42 (0.2134)
	Stem-to-guide clearance	IN	0.02-0.05 (0.001-0.002)	0.08 (0.003)
		EX	0.05-0.08 (0.002-0.003)	0.11 (0.004)
Valve seat	Width	IN	0.85-1.15 (0.033-0.045)	1.6 (0.063)
		EX	1.25-1.55 (0.049-0.061)	2.0 (0.079)
	Stem installed height	IN	53.17-53.64 (2.093-2.112)	53.89 (2.122)
		EX	53.17-53.64 (2.093-2.112)	53.89 (2.122)
Valve spring	Free length	IN and EX	58.7 (2.31)	-
Valve guide	I.D.	IN	5.51-5.53 (0.217-0.218)	5.55 (0.219)
		EX	5.51-5.53 (0.217-0.218)	5.55 (0.219)
	Installed height	IN	17.85-18.35 (0.703-0.722)	-
		EX	18.65-19.15 (0.734-0.754)	-
Rocker arm	Arm-to-shaft clearance	IN	0.017-0.050 (0.0007-0.0020)	0.08 (0.003)
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)

*1: Timing belt side, *2: Distributor side

Standards and Service Limits
Cylinder Head/Valve Train (F18B2, F18B3, F18B4,
F20B6 engines) - Section 6

2-4

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm (min*1) and wide open throttle kPa (kgf/cm ² , psi)			
		Minimum Maximum variation	930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage		-	0.05 (0.002)
	Height		99.95-100.05 (3.935-3.939)	-
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)
	Total runout		0.03 (0.001) max.	0.04 (0.002)
	Cam lobe height F18B2, F18B4 engines			
		IN Primary	38.539 (1.5173)	-
		Mid	39.223 (1.5442)	-
		Secondary	33.913 (1.3352)	-
		EX	38.645 (1.5215)	-
		F20B6 engine		
		IN Primary	38.539 (1.5173)	-
		Mid	39.725 (1.5640)	-
	Secondary	33.913 (1.3352)	-	
	EX	38.645 (1.5215)	-	
Valve	Valve clearance (Cold)	IN	0.24-0.28 (0.009-0.011)	-
		EX	0.28-0.32 (0.011-0.013)	-
	Valve stem O.D.	IN	5.485-5.495 (0.2159-0.2163)	5.455 (0.2148)
		EX	5.450-5.460 (0.2146-0.2150)	5.420(0.2134)
	Stem-to-guide clearance	IN	0.020-0.045 (0.0008-0.0018)	0.08 (0.003)
		EX	0.055-0.080 (0.0022-0.0031)	0.12 (0.005)
Valve seat	Width	IN	1.25-1.55 (0.049-0.061)	2.00 (0.079)
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)
	Stem installed height	IN	46.75-47.55 (1.841-1.872)	47.80 (1.882)
		EX	46.68-47.48 (1.838-1.869)	47.73 (1.879)
Valve spring	Free length	IN	51.08 (2.011)	-
		EX	55.58 (2.188)	-
Valve guide	I.D.	IN	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)
		EX	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)
	Installed height	IN	21.20-22.20 (0.835-0.874)	-
		EX	20.63-21.63 (0.812-0.852)	-
Rocker arm	Arm-to-shaft clearance	IN	0.026-0.067 (0.0010-0.0026)	0.08 (0.003)
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)

Standards and Service Limits

2-5

Cylinder Head/Valve Train (H22A7 engine) - Section 6

Unit of length: mm (in)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Compression	250 rpm (min ⁻¹)	Nominal	1,270 (13.0, 185)		
	wide open throttle	Minimum	930 (9.5, 135)		
	kPa (kgf/cm ² , psi)	Maximum variation	200 (2.0, 28)		
Cylinder head	Warpage		-	0.05 (0.002)	
	Height		146.95-147.05 (5.785-5.789)	-	
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)	
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)	
	Total runout		0.03 (0.001) max.	0.04 (0.002)	
	Cam lobe height	IN	Primary	34.041 (1.3402)	-
			Mid	37.229 (1.4657)	-
			Secondary	34.071 (1.3414)	-
		EX	Primary	33.745 (1.3285)	-
			Mid	36.704 (1.4450)	-
			Secondary	34.683 (1.3655)	-
Valve	Valve clearance (Cold)	IN	0.15-0.19 (0.006-0.007)*1	-	
		EX	0.17-0.21 (0.007-0.008)*1	-	
	Valve stem O.D.	IN	5.475-5.485 (0.2156-0.2159)	5.445 (0.2144)	
		EX	5.475-5.485 (0.2156-0.2156)	5.445 (0.2144)	
	Stem-to-guide clearance	IN	0.025-0.055 (0.0010-0.0022)	0.08 (0.003)	
		EX	0.050-0.080 (0.0020-0.0031)	0.11 (0.004)	
Valve seat	Width	IN	1.30-1.50 (0.051-0.059)	2.00 (0.079)	
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
	Stem installed height	IN	42.5-42.7 (1.673-1.681)	42.95 (1.691)	
		EX	43.9-44.1 (1.728-1.736)	44.35 (1.746)	
Valve spring	Free length	IN	Outer	44.10 (1.736)	
			Inner	41.32 (1.627)	
		EX	Outer	44.92 (1.769)	
			Inner	40.01 (1.575)	
Valve guide	I.D.	IN	5.510-5.530 (0.2169-0.2177)	5.55 (0.219)	
		EX	5.535-5.555 (0.2179-0.2187)	5.60 (0.220)	
	Installed height	IN	14.55-15.05 (0.573-0.593)	-	
		EX	14.95-15.45 (0.589-0.608)	-	
Rocker arm	Arm-to-shaft clearance	IN	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)	
		EX	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)	

*1: Measuring point between camshaft and rocker arm.

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	75.00-75.02 (2.953-2.954)	75.07 (2.956)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.5 (0.02)	
Piston	Skirt O.D. at 5 mm (0.2 in) from bottom of skirt	74.980-74.990 (2.9520-2.9524)	74.970 (2.9516)	
	Clearance in cylinder	0.010-0.040 (0.0004-0.0016)	0.05 (0.002)	
	Groove width (for ring)	Top	1.020-1.030 (0.0402-0.0406)	1.05 (0.041)
		Second	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
Piston ring	Ring-to-groove clearance	Top	0.030-0.060 (0.0012-0.0024)	0.13 (0.005)
		Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap	Top	0.15-0.30 (0.006-0.012)	0.70 (0.028)
		Second	0.20-0.70 (0.008-0.028)	0.80 (0.031)
Piston pin	O.D.	Oil	0.20-0.80 (0.008-0.031)	0.90 (0.035)
	Pin-to-piston clearance		18.994-19.000 (0.7478-0.7480)	-
			0.010 - 0.022 (0.0004-0.0009)	-
Connecting rod	Pin-to-rod clearance	0.014-0.040 (0.0006-0.0016)	-	
	Small end bore diameter	18.96-18.98 (0.746-0.747)	-	
	Large end bore diameter	Nominal 48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter	54.976-55.000 (2.1644-2.1654)	-	
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-	
	Taper	0.0025 (0.0001) max.	0.005 (0.0002)	
	Out of round	0.0025 (0.0001) max.	0.005 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Total runout	0.03 (0.001) max.	0.04 (0.002)	
Bearing	Main bearing-to-journal oil clearance	No. 1 and 5 journals	0.018-0.036 (0.0007-0.0014)	0.05 (0.002)
		No. 2, 3 and 4 journals	0.024-0.042 (0.0009-0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance	0.020-0.038 (0.0008-0.0015)	0.05 (0.002)	

Standards and Service Limits

Engine Block (F18B2, F18B3, F18B4, F20B6 engines)

- Section 7

2-7

Unit of length: mm (in)

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A or I 85.010-85.020 (3.3468-3.3472) B or II 85.000-85.010 (3.3465-3.3468)	85.070 (3.3492) 85.070 (3.3492)
	Bore taper	-	0.05 (0.002)
	Reboring limit	-	0.25 (0.01)
Piston	Skirt O.D. [at 16mm (0.6in) from bottom of skirt]	No letter 84.980-84.990 (3.3457-3.3461) Letter B 84.970-84.980 (3.3453-3.3457)	84.970 (3.3453) 84.960 (3.3449)
	Clearance in cylinder	0.020-0.040 (0.0008-0.0016)	0.05 (0.002)
	Groove width (For ring)	Top 1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
		Second 1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
	Oil 2.805-2.825 (0.1104-0.1112)	2.85 (0.112)	
Piston ring	Ring-to-groove clearance	Top 0.035-0.060 (0.0014-0.0024)	0.13 (0.005)
		Second 0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap	Top 0.20-0.35 (0.008-0.014)	0.60 (0.024)
		Second 0.40-0.55 (0.016-0.022)	0.70 (0.028)
	Oil 0.20-0.70 (0.008-0.028)	0.80 (0.031)	
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)
	Pin-to-piston clearance	-0.0050-+0.0020 (-0.00020-+0.00008)	0.004 (0.0002)
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.0006)	0.020 (0.0008)
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-
	Large end bore diameter	Nominal 48.0 (1.89)	-
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		
		No. 1, 2 and 4 journals 54.980-55.004 (2.1646-2.1655)	-
		No. 3 journal 54.976-55.000 (2.1644-2.1654)	-
		No. 5 journal 54.992-55.016 (2.1650-2.1660)	-
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-
	Taper	0.005 (0.0002) max.	0.010 (0.0004)
	Out-of-round	0.005 (0.0002) max.	0.010 (0.0004)
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)
	Runout	0.02 (0.001) max.	0.04 (0.002)
Bearings	Main bearing-to-journal oil clearance		
		No. 1 and No. 4 journals 0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)
		No. 2 journal 0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)
		No. 3 journal 0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)
		No. 5 journal 0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)
		Rod bearing-to-journal clearance 0.015-0.043 (0.0006-0.0017)	0.050 (0.0020)
Balancer shaft	Journal diameter		
		No. 1 front journal 42.722-42.734 (1.6820-1.6824)	42.71 (1.681)
		No. 1 rear journal 20.938-20.950 (0.8243-0.8248)	20.92 (0.824)
		No. 2 front and rear journals 38.712-38.724 (1.5241-1.5246)	38.70 (1.524)
		No. 3 front and rear journals 34.722-34.734 (1.3670-1.3675)	34.71 (1.367)
	Journal taper	0.005 (0.0002) max.	-
	End play	Front 0.10-0.40 (0.004-0.016)	-
		Rear 0.04-0.15 (0.002-0.006)	-
	Total runout	0.02 (0.001) max.	0.03 (0.001)
	Shaft-to-bearing oil clearance		
	No. 1 front, No. 3 front and rear journals 0.066-0.098 (0.0026-0.0039)	0.12 (0.005)	
	No. 1 rear journal 0.050-0.075 (0.0020-0.0030)	0.09 (0.004)	
	No. 2 front and rear journals 0.076-0.108 (0.0030-0.0043)	0.13 (0.005)	
Balancer shaft bearing	I.D.		
		No. 1 front journal 42.800-42.820 (1.6850-1.6858)	42.83 (1.686)
		No. 1 rear journal 21.000-21.013 (0.8268-0.8273)	21.02 (0.828)
		No. 2 front and rear journals 38.800-38.820 (1.5276-1.5283)	38.83 (1.529)
	No. 3 front and rear journals 34.800-34.820 (1.3701-1.3709)	34.83 (1.371)	

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	A or I 87.010-27.020 (3.4256-3.4260) B or II 87.000-87.010 (3.4252-3.4256)	87.070 (3.4279) 87.070 (3.4279)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.25 (0.010)	
Piston	Skirt O.D. [at 15 mm (0.6 in) from bottom skirt]	No letter Letter B	86.993-87.006 (3.4249-3.4254) 86.983-86.996 (3.4245-3.4250)	
			86.980 (3.4244) 86.970 (3.4240)	
	Clearance in cylinder		0.004-0.027 (0.0002-0.0011) 0.04 (0.002)	
	Groove width (For ring)	Top	1.240-1.255 (0.0488-0.0494)	1.275 (0.0502)
		Second	1.230-1.245 (0.0484-0.0490)	1.265 (0.0498)
	Oil	2.805-2.825 (0.1104-0.1112)	2.85 (0.112)	
Piston ring	Ring-to-groove clearance	Top	0.055-0.085 (0.0022-0.0033)	0.13 (0.005)
		Second	0.040-0.070 (0.0016-0.0028)	0.13 (0.005)
	Ring end gap	Top	0.25-0.35 (0.010-0.014)	0.60 (0.024)
		Second	0.60-0.70 (0.024-0.028)	0.90 (0.035)
		Oil	0.20-0.70 (0.008-0.028)*1 0.20-0.50 (0.008-0.020)*2	0.80 (0.031)*1 0.60 (0.024)*2
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)	
	Pin-to-piston clearance	-0.0030-+0.0060 (-0.00012-+0.00024)	0.009 (0.0004)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.006)	0.002 (0.0001)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-	
	Large end bore diameter	Nominal 51.0 (2.01)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter	No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655)	-
		No. 3 journal	54.976-55.000 (2.1644-2.1654)	-
		No. 5 journal	54.992-55.016 (2.1650-2.1660)	-
		Rod journal diameter	47.976-48.000 (1.8888-1.8898)	-
	Taper	0.005 (0.0002) max.	0.006 (0.0002)	
	Out-of-round	0.004 (0.0002) max.	0.006 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Runout	0.03 (0.001) max.	0.04 (0.002)	
Bearings	Main bearing-to-journal oil clearance	No. 1 and No. 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)
		No. 2 journal	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)
		No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)
		No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)
		Rod bearing-to-journal oil clearance	0.027-0.055 (0.0011-0.0022)	0.060 (0.0024)
Balancer shaft	Journal diameter	No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)
		No. 1 rear journal	20.938-20.950 (0.8243-0.8248)	20.92 (0.824)
		No. 2 front and rear journals	38.712-38.724 (1.5241-1.5246)	38.70 (1.524)
		No. 3 front and rear journals	34.722-34.734 (1.3670-1.3675)	34.71 (1.367)
		Journal taper	0.005 (0.0002) max.	-
	End play	Front	0.10-0.40 (0.004-0.016)	-
		Rear	0.04-0.15 (0.002-0.006)	-
	Total runout	0.02 (0.001) max.	0.03 (0.001)	
	Shaft-to-bearing oil clearance	No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)	0.12 (0.005)
		No. 1 rear journal	0.050-0.075 (0.0020-0.0030)	0.09 (0.004)
No. 2 front and rear journals		0.076-0.108 (0.0030-0.0043)	0.13 (0.005)	
Balancer shaft bearing	I.D.	No. 1 front journal	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)
		No. 1 rear journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)
		No. 2 front and rear journals	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)
		No. 3 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)

*1: RIKEN manufactured piston ring.

*2: TEIKOKU PISTON RING manufactured piston ring.

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity / (US qt, Imp qt)	D16B6, D16B7 engines: 4.0 (4.2, 3.5) for engine overhaul 3.6 (3.8, 3.2) for oil change, including filter 3.3 (3.5, 2.9) for oil change, without filter F18B2, F18B3, F10B4, F20B6 engines: 5.7 (6.0, 5.0) for engine overhaul 4.4 (4.6, 3.9) for oil change, including filter 4.1 (4.3, 3.6) for oil change, without filter H22A7 engine: 5.9 (6.2, 5.2) for engine overhaul 4.8 (5.1, 4.2) for oil change, including filter 4.5 (4.8, 4.0) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing-to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing-to-rotor axial clearance D16B6, D16B7 engines Except D16B6, D16B7 engines	0.02-0.14 (0.001-0.006) 0.02-0.16 (0.001-0.006) 0.10-0.18 (0.004-0.007) 0.10-0.19 (0.004-0.007) 0.03-0.08 (0.001-0.003) 0.02-0.07 (0.001-0.003)	0.20 (0.008) 0.20 (0.008) 0.20 (0.008) 0.21 (0.008) 0.15 (0.006) 0.12 (0.005)
Relief valve	Pressure setting at engine oil temp. 80°C (176°F) kPa (kgf/cm ² , psi) at idle at 3,000 rpm (min ⁻¹)	70 (0.7, 10) min. 340 (3.5, 50) min.	

Cooling - Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity / (US qt, Imp qt) [including engine, heater, cooling line and reservoir] Reservoir capacity: 0.55 / (0.58 US qt, 0.48 Imp qt)	D16B6, D16B7 engines: 4.6 (4.9, 4.1) for overhaul 3.9 (4.1, 3.4) for coolant change F18B2, F18B3, F10B4, F20B6 engines: M/T: 5.8 (6.1, 5.1) for overhaul 4.2 (4.4, 3.7) for coolant change A/T: 5.7 (6.0, 5.0) for overhaul 4.1 (4.3, 3.6) for coolant change H22A7 engine: 6.9 (7.3, 6.1) for overhaul 3.3 (3.5, 2.9) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm ² , psi)	93-123 (0.95-1.25, 14-18)
Thermostat	Start to open °C (°F) Fully open °C (°F) Valve lift at fully open Except H22A7 engine H22A7 engine	76-80 (169-176) 90 (194) 8.0 (0.31) min. 10.0 (0.39) min.
Cooling fan	Thermoswitch "ON" temperature °C (°F) Except H22A7 engine H22A7 engine Thermoswitch "OFF" temperature °C (°F) Except H22A7 engine H22A7 engine Fan timer "ON" temperature °C (°F) Fan timer "OFF" temperature °C (°F)	91-95 (196-203) 92-98 (198-208) Subtract 3-8 (5-15) from actual "ON" temperature Subtract 2-7 (4-12) from actual "ON" temperature 103-109 (217-228) Subtract 4-9 (7-16) from actual "ON" temperature

	MEASUREMENT	STANDARD (NEW)
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm ² , psi)	D16B6, D16B7 engines 290-300 (3.0-3.1, 43-44) F18B2, F18B3, F18B4, F20B6 engines 270-320 (2.8-3.3, 40-47) H22A7 engine 270-370 (2.8-3.8, 40-54)
Fuel tank	Capacity / (US gal, Imp gal)	65.0 (17.2, 14.3)
Engine	Idle speed with headlight and cooling fan off rpm (min ⁻¹)	D16B6, D16B7, F18B4 engines 750 ± 50 (M/T: neutral) F18B2, F10B3, F20B6 engines 750 ± 50 (M/T: neutral) 730 ± 50 (A/T: N or P position) H22A7 engine 790 ± 50 (M/T: neutral)
Engine	Idle CO %	With TWC model: 0.1 max. Without TWC model: 1.0 ± 1.0

Clutch - Section 12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Clutch pedal	Pedal height	to floor		
		LHD	177-187 (7.0-7.4)	-
		RHD	201-211 (7.9-8.3)	-
	Stroke		141-151 (5.55-5.94)	-
		Free play	9-15 (0.4-0.6)	-
	Pedal play		1.0-7.0 (0.04-0.28)	-
	Disengagement height	to floor		
LHD		81 (3.2) min.	-	
RHD		107 (4.21) min.	-	
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)	
Clutch disc	Rivet head depth	U2J4, U2G5	1.4 (0.06) min	0.2 (0.008)
		DH	1.3 (0.05) min	0.2 (0.008)
		U2Q7	1.2-1.7 (0.05-0.07)	0.2 (0.008)
	Surface runout		0.6 (0.02) max.	1.0 (0.04)
	Thickness	U2J4, U2G5	7.9-8.4 (0.31-0.33)	6.0 (0.24)
		DH	7.7-8.2 (0.30-0.32)	6.0 (0.24)
U2Q7		8.3-9.0 (0.33-0.35)	6.0 (0.24)	
Pressure plate	Warpage	0.03 (0.001) max.	0.15 (0.006)	
	Diaphragm spring finger alignment	0.6 (0.02) max.	0.8 (0.03)	

Manual Transmission (DH) - Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission fluid	Capacity / (US qt, Imp qt)	1.8 (1.9, 1.6) at fluid change		
		1.9 (2.0, 1.7) at overhaul		
Mainshaft	End play	0.11-0.18 (0.004-0.007)	Adjust	
	Diameter of ball bearing contact area A (Transmission housing side)	21.987-22.000 (0.8656-0.8661)	21.930 (0.8634)	
	Diameter of 4th, 5th gear contact area B	26.980-26.993 (1.0622-1.0627)	26.930 (1.0602)	
	Diameter of 3rd gear contact area C	33.984-34.000 (1.3380-1.3386)	33.930 (1.3358)	
	Diameter of ball bearing contact area D (Clutch housing side)	25.977-25.990 (1.0227-1.0232)	25.920 (1.0205)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	
Mainshaft 3rd and 4th gears	I.D.	39.009-39.025 (1.5358-1.5364)	39.07 (1.5382)	
	End play	3rd	0.06-0.21 (0.002-0.008)	0.33 (0.013)
		4th	0.06-0.19 (0.002-0.007)	0.31 (0.012)
		Thickness	3rd	30.22-30.27 (1.190-1.192)
	4th	30.12-30.17 (1.186-1.188)	30.05 (1.183)	
Mainshaft 5th gear	I.D.	37.009-37.025 (1.4570-1.4577)	37.07 (1.459)	
	End play	0.06-0.19 (0.002-0.007)	0.31 (0.012)	
	Thickness	28.42-28.47 (1.119-1.121)	28.35 (1.116)	
Countershaft	Diameter of needle bearing contact area A	30.000-30.015 (1.1811-1.1817)	29.95 (1.179)	
	Diameter of 1st gear contact area B	35.984-36.000 (1.4167-1.4173)	35.93 (1.415)	
	Diameter of ball bearing contact area C	24.980-24.993 (0.9835-0.9840)	24.93 (0.982)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Countershaft 1st gear	I.D.	41.009-41.025 (1.6145-1.6152)	41.07 (1.617)
	End play (When tightened by the specified torque)	0.03-0.10 (0.001-0.004)	0.22 (0.009)
	Thickness	30.41-30.44 (1.197-1.198)	30.36 (1.195)
Countershaft 2nd gear	I.D.	44.009-44.025 (1.7326-1.7333)	44.07 (1.735)
	End play (When tightened by the specified torque)	0.04-0.12 (0.002-0.005)	0.24 (0.009)
	Thickness	31.91-31.96 (1.256-1.258)	31.85 (1.254)
Spacer collar (Countershaft 2nd gear)	I.D.	33.000-33.010 (1.2992-1.2996)	33.04 (1.301)
	O.D.	38-989-39.000 (1.5350-1.5354)	38.93 (1.533)
	Length	32.03-32.06 (1.261-1.262)	32.01 (1.260)
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	27.002-27.012 (1.0631-1.0635)	27.06 (1.065)
	O.D.	33.989-34.000 (1.3381-1.3386)	33.93 (1.336)
		31.989-32.000 (1.2594-1.2598)	31.93 (1.257)
	Length	22.83-22.86 (0.899-0.900)	22.81 (0.898)
		23.53-23.56 (0.926-0.928)	23.51 (0.926)
Reverse idler gear	I.D.	15.016-15.043 (0.5912-0.5922)	15.08 (0.594)
	Gear-to-reverse gear shaft clearance	0.032-0.077 (0.0013-0.0030)	0.14 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.73-1.18 (0.029-0.046)	0.4 (0.016)
Shift fork	Finger thickness	1st/2nd/5th 7.4-7.6 (0.29-0.30)	-
		3rd/4th	-
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	-
Reverse shift fork	Fork pawl groove width	12.7-13.0 (0.50-0.51)	-
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)
	L-groove width	7.05-7.25 (0.278-0.285)	-
	Fork-to-6th/reverse shift shaft piece pin clearance	0.05-0.35 (0.002-0.014)	0.5 (0.02)
Shift arm A	Inner diameter of shift arm A contact point	13.05-13.13 (0.514-0.517)	-
	Shift arm A-to-shift arm C clearance	0.05-0.23 (0.002-0.009)	0.35 (0.014)
Shift arm B	Inner diameter of shift arm B shaft contact point	13.973-14.000 (0.5501-0.5512)	-
	Shift arm B-to-shaft clearance	0.013-0.070 (0.0005-0.0028)	0.16 (0.006)
	Shift arm B-to-shift piece clearance	0.2-0.05 (0.01-0.02)	0.06 (0.02)
	Diameter of shift fork contact point	12.900-13.0 -0.5118)	12.78 (0.503)
	Shift fork 1st-2nd/shift piece groove width	13.2-13.4 (0.52-0.53)	-
MBS shift piece	Diameter of pin	6.9-7.1 (0.27-0.28)	6.8 (0.27)
Differential carrier	Pinion shaft bore diameter	18.010-18.028 (0.7091-0.7098)	-
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.0009-0.0022)	0.095 (0.004)
	Driveshaft bore diameter	26.025-26.045 (1.0246-1.0254)	-
	Carrier-to-driveshaft clearance	0.045-0.086 (0.0018-0.0034)	0.14 (0.006)
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	-
	Pinion gear bore diameter	18.042-18.066 (0.7103-0.7113)	-
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)
Set ring-to-bearing outer race		0-0.1 (0-0.004)	Adjust

Standards and Service Limits

2-13

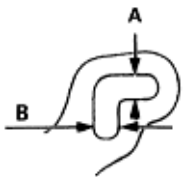
Manual Transmission (U2J4, U2G5, U2Q7) - Section

13

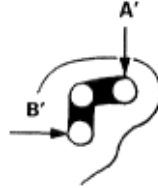
Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Shift fork	Finger thickness 1st/2nd/5th	6.2-6.4 (0.24-0.25)	-	
	3rd/4th	7.4-7.6 (0.29-0.30)	-	
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	1.0 (0.04)	
Reverse shift fork	Pawl groove width	13.0-13.3 (0.51-0.52)	-	
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)	
	Groove width*1	at A	7.05-7.25 (0.278-0.285)	-
		at B	7.4-7.7 (0.29-0.30)	-
	Fork-to-5th/reverse shift shaft Clearance*2	at A'	0.05-0.35 (0.002-0.014)	0.5 (0.02)
at B'		0.4-0.8 (0.02-0.03)	1.0 (0.04)	
Shift arm	I.D.	15.973-16.000 (0.6289-0.6299)	-	
	Shift arm-to-shaft clearance	0.005-0.059 (0.0002-0.0023)	-	
	Shift fork diameter contact area	12.9-13.0 (0.508-0.512)	-	
	Shift arm-to-shift fork shaft clearance	0.2-0.5 (0.01-0.02)	0.6 (0.02)	
Select lever	Shaft outer diameter	15.941-15.968 (0.6276-0.6287)	-	
	Shift arm cover clearance	0.032-0.102 (0.0013-0.0040)	-	
Shift lever	O.D.	15.941-15.968 (0.6276-0.6287)	-	
	Transmission housing clearance	0.021-0.141 (0.0008-0.0056)	-	
Interlock	Bore diameter	16.00-16.05 (0.630-0.632)	-	
	Shift arm clearance	0.032-0.109 (0.0013-0.0043)	-	
Differential carrier	Pinion shaft contact area I.D.			
	Except U2Q7	18.000-18.018 (0.7087-0.7094)	-	
	Carrier-to-pinion shaft clearance			
	Except U2Q7	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)	
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	-	
Carrier-to-driveshaft clearance	R	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)	
	L	0.055-0.091 (0.0022-0.0036)	0.15 (0.006)	
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	-	
	I.D.	18.042-18.066 (0.7103-0.7113)	-	
	Except U2Q7	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)
Tapered roller bearing preload	Starting torque Nm (kgf/cm, lbf/in)	1.4-2.5 (14-26, 12-23)	Adjust	

*1: Measuring points



*2: Measuring points



	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity	/ (US qt, Imp qt)	6.1 (6.4, 5.4) at overhaul 2.5 (2.6, 2.2) at fluid change	
Hydraulic pressure kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm (min ⁻¹) in N or P position		850-910 (8.7-9.3, 120-130)	800 (8.2, 120)
Hydraulic pressure kPa (kgf/cm ² , psi)	4th clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 3rd clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 2nd clutch pressure at 2,000 rpm (min ⁻¹) in 2 position 1st clutch pressure at 2,000 rpm (min ⁻¹) in 1 position		840-920 (8.6-9.4, 120-130)	790 (8.1, 120)
Stall speed rpm (min ⁻¹) (Check with vehicle on level ground)	F20B6 engine F18B2, F18B4 engines		2,250 2,450	1,950-2,550 2,150-2,750
Clutch	Clutch initial clearance	1st 2nd 3rd 4th	1.15-1.35 (0.045-0.053) 0.7-0.9 (0.028-0.035) 0.6-0.8 (0.024-0.031) 0.4-0.6 (0.016-0.024)	- - - -
	Clutch return spring free length	1st, 2nd 3rd, 4th	45.7 (1.80) 33.5 (1.32)	43.7 (1.72) 31.5 (1.24)
	Clutch disc thickness		1.88-2.00 (0.074-0.079)	Until grooves worn out
	Clutch plate thickness	1st 2nd 3rd 4th	1.95-2.05 (0.077-0.081) 2.25-2.35 (0.089-0.093) 2.55-2.65 (0.100-0.104) 2.25-2.35 (0.089-0.093)	Discoloration Discoloration Discoloration Discoloration
Clutch	Clutch end plate thickness	Mark 6 1st, 2nd clutches Mark 7 Mark 8 Mark 9 Mark 0 Mark 1 Mark 2 Mark 3 Mark 4	2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114) 2.95-3.00 (0.116-0.118) 3.05-3.10 (0.120-0.122) 3.15-3.20 (0.124-0.126) 3.25-3.30 (0.128-0.130) 3.35-3.40 (0.132-0.134)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
Clutch	Clutch end plate thickness	Mark 1 3rd, 4th clutches Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9	2.05-2.10 (0.081-0.083) 2.15-2.20 (0.085-0.087) 2.25-2.30 (0.089-0.091) 2.35-2.40 (0.093-0.094) 2.45-2.50 (0.096-0.098) 2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
Valve body	Stator shaft needle bearing contact I.D.	Torque converter side	27.000-27.021 (1.0630-1.0638)	Wear or damage
		ATF pump side	29.000-29.021 (1.1417-1.1426)	-
	ATF pump gear thrust clearance		0.03-0.05 (0.001-0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance	Drive	0.210-0.265 (0.0083-0.0104)	-
		Driven	0.070-0.125 (0.0028-0.0049)	-
	ATF pump driven gear I.D.		14.016-14.034 (0.5518-0.5525)	Wear or damage
	ATF pump driven gear shaft O.D.		13.980-13.990 (0.5504-0.5508)	Wear or damage
Shifting device and parking brake	Reverse shift fork finger thickness		5.90-6.00 (0.232-0.236)	5.40 (0.213)
	Parking brake pawl		-	Wear or other defect
	Parking gear		-	Wear or other defect
Servo body	Shift fork shaft bore I.D.		14.000-14.010 (0.5512-0.5516)	-
	Shift fork shaft valve bore I.D.		37.000-37.039 (1.4567-1.4582)	37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.		32.000-32.025 (1.2598-1.2608)	32.050 (1.2618)

Accumulator body	Sealing ring contact I.D.	35.000-35.025 (1.3780-1.3789)	35.05 (1.3799)
Stator shaft	Sealing ring contact I.D.	29.000-29.021 (1.1417-1.1426)	29.050 (1.1437)

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 3rd gear thrust shim, 41 x 72 mm thickness	6.32-6.35 (0.2488-0.2500)	Wear or damage
		6.37-6.40 (0.2508-0.2520)	Wear or damage
		6.42-6.45 (0.2528-0.2539)	Wear or damage
		6.47-6.50 (0.2547-0.2559)	Wear or damage
		6.52-6.55 (0.2567-0.2579)	Wear or damage
		6.57-6.60 (0.2587-0.2598)	Wear or damage
Transmission	Mainshaft 4th gear thrust washer, 27 x 47 mm thickness	4.95-5.00 (0.1949-0.1969)	Wear or damage
Transmission	Secondary shaft splined washer, 38 x 56.5 mm thickness	6.82-6.85 (0.269-0.270)	Wear or damage
		6.87-6.90 (0.270-0.272)	Wear or damage
		6.92-6.95 (0.272-0.274)	Wear or damage
		6.97-7.00 (0.274-0.276)	Wear or damage
		7.02-7.05 (0.276-0.278)	Wear or damage
		7.07-7.10 (0.278-0.280)	Wear or damage
Transmission	Secondary shaft thrust shim, 37 x 55 mm thickness	4.87-4.90 (0.192-0.193)	Wear or damage
		4.92-4.95 (0.194-0.195)	Wear or damage
		4.97-5.00 (0.196-0.197)	Wear or damage
		5.02-5.05 (0.198-0.199)	Wear or damage
		5.07-5.10 (0.200-0.201)	Wear or damage
		5.12-5.15 (0.202-0.203)	Wear or damage
		5.17-5.20 (0.204-0.205)	Wear or damage
Transmission	Mainshaft 4th gear collar length	49.40-49.50 (1.945-1.949)	-
	Mainshaft 4th gear collar flange thickness	4.35-4.50 (0.171-0.177)	Wear or damage
	Countershaft distance collar length	50.42-50.46 (1.985-1.987)	-
	Cotter thickness	1.99-2.02 (0.078-0.080)	-
	Secondary shaft sealing ring, 35 mm thickness	1.890-1.950 (0.074-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 32 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 29 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Secondary shaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Mainshaft 4th clutch feed pipe O.D.	11.47-11.48 (0.4516-0.4520)	11.45 (0.4508)
	Mainshaft 3rd clutch feed pipe O.D.	5.97-5.98 (0.2350-0.2354)	5.95 (0.2343)
	Secondary shaft feed pipe O.D.	7.97-7.98 (0.3138-0.3142)	7.95 (0.3130)
	Mainshaft 4th clutch feed pipe bushing I.D.	11.500-11.518 (0.4528-0.4535)	11.530 (0.4539)
	Mainshaft 3rd clutch feed pipe bushing I.D.	6.018-6.030 (0.2369-0.2374)	6.045 (0.2380)
	Secondary shaft bushing I.D.	8.000-8.015 (0.3150-0.3156)	8.030 (0.3161)
	Diameter of needle bearing contact area		
	On mainshaft of stator shaft	22.984-23.000 (0.9049-0.9055)	Wear or damage
	On mainshaft of 3rd gear	55.975-55.991 (2.2037-2.2044)	Wear or damage
	On mainshaft of 4th gear collar	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 4th gear	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 2nd gear	39.979-40.000 (1.5740-1.5748)	Wear or damage
	On countershaft of L. side	36.005-36.015 (1.4175-1.4179)	Wear or damage
	On parking gear	41.964-41.980 (1.6521-1.6528)	Wear or damage
	On secondary shaft of 1st gear	37.978-37.993 (1.4952-1.4958)	Wear or damage
	On secondary shaft of 2nd gear	33.986-33.999 (1.3380-1.3385)	Wear or damage
	On secondary shaft of L. side	34.000-34.013 (1.3386-1.3391)	Wear or damage
	On reverse idler gear shaft	14.985-15.000 (0.5900-0.5906)	Wear or damage
	Transmission housing of reverse idler gear shaft contact area I.D.	14.800-14.818 (0.5827-0.5834)	-
	Reverse idler gear shaft holder I.D.	14.800-14.824 (0.5827-0.5836)	Wear or damage
	Reverse selector hub O.D.	55.87-55.90 (2.1996-2.2008)	Wear or damage
	Inside Diameter		
	Mainshaft 3rd gear	61.000-61.019 (2.4016-2.4033)	Wear or damage
	Mainshaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft idler gear	50.000-50.016 (1.9685-1.9691)	Wear or damage
	Countershaft reverse gear	46.000-46.016 (1.8110-1.8116)	Wear or damage
Reverse idler gear	20.007-20.020 (0.7877-0.7882)	Wear or damage	
Secondary shaft 1st gear	44.000-44.016 (1.7323-1.7329)	Wear or damage	
Secondary shaft 2nd gear	40.000-40.016 (1.5748-1.5754)	Wear or damage	

	MEASUREMENT	STANDARD (NEW)			SERVICE LIMIT
Transmission (cont'd)	End play				
	Mainshaft 3rd gear	0.03-0.11 (0.001-0.004)			-
	Mainshaft 4th gear	0.10-0.22 (0.004-0.009)			-
	Countershaft 1st gear	0.00-0.33 (0.000-0.013)			-
	Countershaft 4th gear	0.04-0.28 (0.002-0.011)			-
	Countershaft idler gear	0.015-0.045 (0.0006-0.0018)			-
	Countershaft reverse gear	0.10-0.25 (0.004-0.010)			-
	Reverse idler gear	0.20-0.55 (0.008-0.022)			-
	Secondary shaft 1st gear	0.07-0.15 (0.003-0.006)			-
	Secondary shaft 2nd gear	0.04-0.12 (0.002-0.005)			-
Differential carrier	Pinion shaft contact area I.D.	18.010-18.028 (0.709-0.710)			-
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.001-0.002)			0.1 (0.004)
	Driveshaft contact area I.D.	28.025-28.045 (1.103-1.104)			-
	Carrier-to-driveshaft clearance	0.045-0.086 (0.002-0.003)			0.12 (0.005)
Differential pinion gear	Backlash	0.050-0.150 (0.002-0.006)			-
	I.D.	18.042-18.066 (0.710-0.711)			-
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.002-0.004)			0.12 (0.005)
Differential tapered roller bearing preload	For new bearing	2.7-3.9 (28-40, 24-35)			Adjust
	For used bearing	2.5-3.6 (25-37, 22-32)			Adjust
Starting torque Nm (kgf/cm, lbf/in)					
	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0
	Relief valve spring	0.9 (0.035)	6.6 (0.260)	39.8 (1.567)	20.4
	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
	Shift valve E spring	0.7 (0.028)	6.6 (0.260)	32.2 (1.268)	13.4
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	1st accumulator spring A	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5	
3rd accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
4th accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
2nd accumulator spring A	2.6 (0.102)	21.6 (0.850)	73.2 (2.882)	10.0	
2nd accumulator spring B	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6	

Unit of length: mm (in)

		MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotation play at steering wheel circumference		0-10 (0-0.39)
	Starting load at steering wheel circumference N (kgf, lbf) Engine running		30 (3.1, 6.8)
Gearbox	Angle of rack-guide-screw loosened from locked position		5° - 10°
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm ² , psi).		
	D16B6 engine model		5,700-6,400 (58-65, 820-920)
	F18B2, F18B3, F20B6 engines model H22A7 engine model		6,700-7,400 (68-75, 970-1,070) 6,900-7,600 (70-77, 1,000-1,090)
Power steering fluid	Recommended fluid		Honda power steering fluid S
	Fluid capacity / (US qt. Imp qt) For overhaul		
	D16B6 engine model		1.0 (1.1, 0.9)
	RHD (Except D16B6 engine) LHD (Except D16B6 engine) For fluid change		1.1 (1.2, 1.0) 1.0 (1.1, 0.9) 0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	D16B6 engine model	10.5-14.0 (0.41-0.55) with used belt 7.5-10.0 (0.30-0.39) with new belt
		Except D16B6 engine model	13.0-16.5 (0.51-0.65) with used belt 8.5-11.0 (0.33-0.43) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge		
Power steering belt*	D16B6 engine model		340-490 (35-50, 77-110) with used belt 640-780 (65-80, 143-176) with new belt
	Except D16B6 engine model		390-540 (40-55, 88-121) with used belt 740-880 (75-90, 165-198) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension - Section 18

		MEASUREMENT	STANDARD (NEW)	
Wheel alignment	Camber	Front H22A7 engine model	-0° 15' ± 1°	
		Except H22A7 engine model	0° ± 1°, 0°10' ± 1°*1	
	Rear	H22A7 engine model	-1°15' ± 30'	
		Except H22A7 engine model	-1°00' ± 30', -0°50' ± 30°*1	
	Caster	Front H22A7 engine model	3°00' ± 1°	
		Except H22A7 engine model	2°50' ± 1°, 2°45' ± 1°*1	
	Total toe	Front	0 ± 2 (0 ± 0.08)	
		Rear	IN 2 + 2 -1 (0.08 + 0.08 -0.04)	
	Front wheel turning angle	Inward wheel	H22A7 engine model	36°06' ± 2°
			Except H22A7 engine model	39°10' ± 2°, 39°27' ± 2°
Outward wheel		H22A7 engine model	29°12' (Reference)	
		Except H22A7 engine model	30°58' (Reference), 31°14' (Reference) *1	
Wheel bearing	End play	Front	0-0.05 (0-0.002)	
		Rear	0-0.05 (0-0.002)	
Wheel	Rim runout Aluminium wheel	Axial	STANDARD (NEW)	
		Radial	0-0.7 (0-0.03)	
	Steel Wheel	Axial	0-0.7 (0-0.03)	
		Radial	0-1.0 (0-0.04)	
			SERVICE LIMIT	
			2.0 (0.08)	
			1.5 (0.06)	
			2.0 (0.08)	
			1.5 (0.06)	

*1: KY model

		MEASUREMENT		STANDARD (NEW)	
Parking brake lever	Play in stroke at 196 N (20 kgf, 44 lbf) lever force		To be locked when pulled 6-9 notches		
Foot brake pedal	Pedal height (With floor mat removed)		M/T	168.5 (6.63)	
			A/T	173.5 (6.83)	
	Free play		1-5 (0.04-0.20)		
Master cylinder	Piston-to-pushrod clearance		0-0.4 (0.-0.02)		
Disc brakes	Disc thickness		STANDARD (NEW)		SERVICE LIMIT
	H22A7 engine mode		27.9-28.1 (1.10-1.11)		26.0 (1.02)
	Except D16B6, D16B7 H22A7 engines model		24.9-25.1 (0.98-0.99)		23.0 (0.91)
	D16B6, D16B7 engines model		22.9-23.1 (0.90-0.91)		21.0 (0.83)
	Rear		9.9-10.1 (0.390-0.398)		8.0 (0.31)
	Disc runout	Front	-		0.10 (0.004)
		Rear	-		0.10 (0.004)
	Disc parallelism	Front and rear		-	
Pad thickness	Front	10.5-11.5 (0.41-0.45)		1.6 (0.06)	
	Rear	8.5-9.5 (0.33-0.37)		1.6 (0.06)	
Drum brake	Drum I.D.		228.6-228.7 (9.000-9.004)		229.6 (9.039)
	Lining thickness		5.0 (0.20)		2.0 (0.08)
Brake booster	Characteristics at 98 N (10 kgf, 22 lbf) and 294 (30 kgf, 68 lbf) pedal force				
			Minimum line pressure D16B6 engine model		
		Vacuum	N (kgf, lbf)		kPa kgf/cm ² , psi
		kPa (mm Hg, in Hg)	98 (10, 22)		0 (0, 0)
		0 (0, 0)	294 (30, 66)		1,470 (15, 213)
	66.7 (500, 19.7)	98 (10, 22)		3,040 (31, 441)	
		294 (30, 66)		6,860 (70, 995)	
Brake booster	Characteristics at 98 N (10 kgf, 22 lbf) and 294 (30 kgf, 68 lbf) pedal force				
			Minimum line pressure Except D16B6 engine model		
		Vacuum	N (kgf, lbf)		kPa kgf/cm ² , psi
		kPa (mm Hg, in Hg)	98 (10, 22)		0 (0, 0)
		0 (0, 0)	294 (30, 66)		1,275 (13, 185)
	66.7 (500, 19.7)	98 (10, 22)		3,825 (39, 555)	
		294 (30, 66)		8,238 (84, 1, 194)	

Air Conditioning - Section 22

		MEASUREMENT		STANDARD (NEW)	
Air conditioning system SANDEN	Lubricant type: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 38899-P13-A01) (For Refrigerant: HFC-134a (R-134a))				
	Lubricant capacity m/ (fl oz, Imp oz)	Condenser	25 (5/6, 0.9)		
		Evaporator	40 (1 1/3, 1.4)		
		Line or hose	10 (1/3, 0.4)		
		Receiver	10 (1/3, 0.4)		
Air conditioning system DENSO	Lubricant type: ND-OIL8 (P/N 38897-PR7-003, 38898-PR7-003 or 38899-PR7-A01) (For Refrigerant: HFC-134a (R-134a))				
	Lubricant capacity m/ (fl oz, Imp oz)	Condenser	25 (5/6, 0.9)		
		Evaporator	40 (1 1/3, 1.4)		
		Line or hose	10 (1/3, 0.4)		
		Receiver	10 (1/3, 0.4)		
Compressor SANDEN	Lubricant type: SP-10				
	Lubricant capacity	m/ (fl oz, Imp oz)	130 (4 1/3, 4.6)		
	Field coil resistance at 20°C (68°F)	ohms		3.05-3.35	
	Pulley-to-pressure plate clearance	0.5 ± 0.15 (0.02 ± 0.006)			
Compressor DENSO	Lubricant type: ND-OIL8				
	Lubricant capacity	m/ (fl oz, Imp oz)	160 (5 1/3, 5.6)		
	Stator coil resistance at 20°C (68°F)	ohms		3.9-4.3	
	Pulley-to-pressure plate clearance	0.5 ± 0.15 (0.02 ± 0.006)			
Compressor belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys				
	D16B6, D16B7 engines		7.5-9.5 (0.30-0.37) with used belt		
			5.0-6.5 (0.20-0.26) with new belt		
	All except D16B6, D16B7 engines		10.0-12.0 (0.39-0.47) with used belt		
		5.5-7.5 (0.22-0.30) with new belt			
Compressor belt*	Belt Tension N (kgf, lbf)				

Measured with belt tension gauge	
D16B6, D16B7 engines	340-490 (35-50, 77-110) with used belt 690-830 (70-85, 150-190) with new belt
All except D16B6, D16B7 engines	390-540 (40-55, 88-120) with used belt 880-1,030 (90-105, 200-231) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

	ITEM		METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length		4,595 mm	180.9 in	
	Overall Width		1,750 mm	68.9 in	
	Overall Height	Except KY model	1,430 mm	56.3 in	
		KY model	1,445 mm	56.9 in	
	Wheelbase	Except TYPE R	2,668 mm	105.0 in	
		TYPE R	2,670 mm	105.1 in	
	Track Front/Rear	Except TYPE R	1,495/1,504 mm	58.9/59.2 in	
TYPE R		1,507/1,515 mm	59.3/59.6 in		
Wheel Arch Front/Rear		666/669 mm	26.2/26.3 in	EU	
	Seating Capacity		Five		
WEIGHT 4-door	Curb Weight	KE	1.6iS M/T	1,270 kg	2,800 lbs
			M/T with A/C, S/R	1,301 kg	2,868 lbs
	1.6iLS	M/T with A/C, S/R	1,301 kg	2,868 lbs	
		1.8iS	M/T	1,345 kg	2,965 lbs
	1.8iLS	A/T	1,370 kg	3,020 lbs	
		M/T with A/C	1,360 kg	2,998 lbs	
		A/T with A/C	1,385 kg	3,053 lbs	
		M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
		M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
		1.8iES	M/T	1,406 kg	3,100 lbs
	A/T		1,431 kg	3,155 lbs	
	2.0iLS	M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
	2.0iES	M/T	1,406 kg	3,100 lbs	
		A/T	1,431 kg	3,155 lbs	
	TYPE R	M/T	1,345 kg	2,965 lbs	
		KG	1.6iS	M/T with A/C	1,285 kg
	M/T with S/R		1,286 kg	2,835 lbs	
	1.6iLS	M/T with A/C	1,285 kg	2,833 lbs	
		M/T with S/R	1,286 kg	2,835 lbs	
	1.8iS	M/T with A/C, S/R	1,301 kg	2,868 lbs	
		M/T with A/C	1,360 kg	2,998 lbs	
		A/T with A/C	1,385 kg	3,053 lbs	
	1.8iLS	M/T with S/R	1,361 kg	3,000 lbs	
		M/T	1,345 kg	2,965 lbs	
		A/T	1,370 kg	3,020 lbs	
		M/T with A/C	1,360 kg	2,998 lbs	
		A/T with A/C	1,385 kg	3,053 lbs	
		M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs	
	1.8iES	A/T with A/C, S/R	1,401 kg	3,089 lbs	
		M/T	1,406 kg	3,100 lbs	
	2.0iLS	A/T	1,431 kg	3,155 lbs	
		M/T	1,345 kg	2,965 lbs	
		A/T	1,370 kg	3,020 lbs	
		M/T with A/C	1,360 kg	2,998 lbs	
		A/T with A/C	1,365 kg	3,053 lbs	
		M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
		2.0iES	M/T	1,406 kg	3,100 lbs
			A/T	1,431 kg	3,155 lbs
TYPE R		M/T	1,345 kg	2,965 lbs	
	KS	1.6iS	M/T	1,270 kg	2,800 lbs
M/T with A/C		1,285 kg	2,833 lbs		
1.6iLS	M/T with A/C	1,285 kg	2,833 lbs		
1.8iS	M/T with A/C	1,360 kg	2,998 lbs		
1.8iLS	A/T	1,375 kg	3,031 lbs		
	M/T with A/C	1,360 kg	2,998 lbs		

	ITEM			METRIC	ENGLISH	NOTES
WEIGHT 4-door	KS	2.0iLS	M/T	1,345 kg	2,965 lbs	
		2.0iES	M/T with A/C	1,390 kg	3,064 lbs	
	KR	1.6iS	M/T	1,265 kg	2,789 lbs	
			M/T with ABS	1,270 kg	2,800 lbs	
			M/T with ABS, A/C	1,285 kg	2,833 lbs	
		1.6iLS	M/T with A/C	1,285 kg	2,833 lbs	
			M/T with A/C, S/R	1,301 kg	2,868 lbs	
		1.8iS	M/T with A/C	1,360 kg	3,998 lbs	
		1.8iLS	M/T	1,345 kg	2,965 lbs	
			A/T	1,370 kg	3,020 lbs	
			M/T with A/C	1,360 kg	2,998 lbs	
			A/T with A/C	1,385 kg	3,053 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs		
		1.8iES	M/T	1,375 kg	3,031 lbs	
		2.0LS	M/T	1,360 kg	2,998 lbs	
		2.0ES	M/T	1,406 kg	3,100 lbs	
			A/T	1,431 kg	3,155 lbs	
		TYPE R	M/T	1,345 kg	2,965 lbs	
	KY	1.8iS	M/T	1,340 kg	2,954 lbs	
			A/T	1,365 kg	3,009 lbs	
WEIGHT 4-door	Weight Distributions (Front/Rear)					
KE	1.6iS	M/T	730/540 kg	1,610/1,190 lbs		
		M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs		
	1.6iLS	M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs		
		1.8iS	M/T	805/540 kg	1,775/1,190 lbs	
		A/T	830/540 kg	1,830/1,190 lbs		
		M/T with A/C	820/540 kg	1,808/1,190 lbs		
		A/T with A/C	845/540 kg	1,863/1,190 lbs		
		M/T with S/R	813/548 kg	1,792/1,208 lbs		
		A/T with S/R	838/548 kg	1,848/1,208 lbs		
	1.8iLS	M/T with S/R	813/548 kg	1,792/1,208 lbs		
		A/T with S/R	838/548 kg	1,848/1,208 lbs		
		M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs		
	A/T with A/C, S/R	853/548 kg	1,881/1,208 lbs			
1.8iES	M/T	838/568 kg	1,848/1,252 lbs			
	A/T	863/568 kg	1,903/1,252 lbs			
2.0iLS	M/T with S/R	823/538 kg	1,814/1,186 lbs			
		A/T with S/R	848/538 kg	1,870/1,186 lbs		
	M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs			
		A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs		
2.0iES	M/T	848/558 kg	1,870/1,230 lbs			
	A/T	873/558 kg	1,925/1,230 lbs			
TYPE R	M/T	820/525 kg	1,808/1,157 lbs			
		KG	1.6iS	M/T with A/C	745/540 kg	1,643/1,190 lbs
	1.6iS	M/T with S/R	738/548 kg	1,627/1,208 lbs		
		1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
		M/T with S/R	738/548 kg	1,627/1,208 lbs		
		M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs		
	1.8iS	M/T with A/C	820/540 kg	1,808/1,190 lbs		
		A/T with A/C	845/540 kg	1,863/1,190 lbs		
		M/T with S/R	813/548 kg	1,792/1,208 lbs		
	1.8iLS	M/T	805/540 kg	1,775/1,190 lbs		
		A/T	803/540 kg	1,830/1,190 lbs		
		M/T with A/C	820/540 kg	1,808/1,190 lbs		
	A/T with A/C	845/540 kg	1,863/1,190 lbs			
	M/T with S/R	813/548 kg	1,792/1,208 lbs			
	A/T with S/R	838/548 kg	1,848/1,208 lbs			
	M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs			
	A/T with A/C, S/R	853/548 kg	1,881/1,208 lbs			
1.8iES	M/T	838/568 kg	1,848/1,252 lbs			
	A/T	863/568 kg	1,903/1,252 lbs			
2.0iLS	M/T	815/530 kg	1,797/1,168 lbs			
		A/T	840/530 kg	1,852/1,168 lbs		
	M/T with A/C	830/530 kg	1,830/1,168 lbs			
		A/T with A/C	855/530 kg	1,885/1,168 lbs		
	M/T with S/R	823/538 kg	1,814/1,186 lbs			
		A/T with S/R	848/538 kg	1,870/1,186 lbs		
	M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs			
		A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs		

	ITEM			METRIC	ENGLISH	NOTES		
WEIGHT	KG	2.0iES	M/T	848/558 kg	1,870/1,230 lbs			
			A/T	873/558 kg	1,925/1,230 lbs			
	KS	TYPE R	M/T	820/525 kg	1,808/1,157 lbs			
			1.6iS	M/T	730/540 kg	1,610/1,190 lbs		
				M/T with A/C	745/540 kg	1,643/1,190 lbs		
			1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs		
			1.8iS	M/T with A/C	830/530 kg	1,830/1,168 lbs		
			1.8iLS	A/T	815/560 kg	1,797/1,234 lbs		
				M/T with A/C	820/540 kg	1,808/1,190 lbs		
			2.0iLS	M/T	815/530 kg	1,797/1,168 lbs		
			2.0iES	M/T with A/C	840/550 kg	1,852/1,212 lbs		
		KR	1.6iS	M/T	725/540 kg	1,598/1,191 lbs		
				M/T with ABS	730/540 kg	1,610/1,190 lbs		
					M/T with ABS, A/C	745/540 kg	1,643/1,190 lbs	
				1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
					M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
			1.8iS	M/T with A/C	820/540 kg	1,808/1,190 lbs		
			1.8iLS	M/T	805/540 kg	1,775/1,190 lbs		
				A/T	830/540 kg	1,830/1,190 lbs		
				M/T with A/C	820/540 kg	1,808/1,190 lbs		
				A/T with A/C	845/540 kg	1,863/1,190 lbs		
				M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs		
			1.8iES	M/T	815/560 kg	1,797/1,234 lbs		
			2.0LS	M/T	830/530 kg	1,830/1,168 lbs		
		2.0ES	M/T	848/558 kg	1,870/1,230 lbs			
	KY	TYPE R	A/T	873/558 kg	1,925/1,230 lbs			
			M/T	820/525 kg	1,808/1,157 lbs			
1.8iS		M/T	805/535 kg	1,775/1,179 lbs				
		A/T	830/535 kg	1,830/1,179 lbs				
WEIGHT	Max. Permissible Weight (EU)							
	D16B6 engine models			1,740 kg	3,836 lbs			
	F18B2, F18B3, F20B6 engine models			1,890 kg	4,167 lbs			
	H22A7 engine model			1,820 kg	4,012 lbs			
WEIGHT 5-door	Curb Weight							
	KE	1.6Is	M/T with SRS	1,314 kg	2,897 lbs			
			M/T with SRS	1,314 kg	2,897 lbs			
	1.8iS	1.8iS	M/T with SRS, A/C	1,389 kg	3,062 lbs			
			M/T with SRS, S/R	1,404 kg	3,095 lbs			
				A/T with SRS, A/C	1,414 kg	3,117 lbs		
				A/T with SRS S/R	1,429 kg	3,150 lbs		
		1.8iLS	1.8iLS	M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs		
				A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs		
		1.8iES	1.8iES	M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs		
				M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs		
					M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs	
					M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs	
					A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs	
					A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
					A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
					A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
			2.0iLS	2.0iLS	M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs	
					A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs	
		2.0iES		2.0iES	M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
					M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs	
				M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs		
				A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs		
				A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs		
				A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs		
	2.0iV	2.0iV		M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs		
				M/T with SRS, A/C, S/R, Power seat, NAVI.	1,439 kg	3,172 lbs		
				A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs		
				A/T with SRS, A/C, S/R, Power seat, NAVI.	1,464 kg	3,228 lbs		
2.0Tdi		2.0Tdi	M/T with SRS, A/C	1,464 kg	3,228 lbs			
			M/T with SRS, A/C, S/R	1,479 kg	3,261 lbs			

	ITEM	METRIC	ENGLISH	NOTES
WEIGHT 5-door	KG 1.6iS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
	1.6iLS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
		M/T with SRS, side SRS	1,309 kg	2,885 lbs
	1.8iS	M/T	1,390 kg	3,064 lbs
		M/T with SRS	1,419 kg	3,128 lbs
		M/T with SRS, side SRS	1,386 kg	3,056 lbs
		A/T with SRS	1,417 kg	3,124 lbs
	1.8iLS	M/T	1,390 kg	3,064 lbs
		M/T with side SRS	1,390 kg	3,064 lbs
		M/T with SRS, A/C	1,392 kg	3,068 lbs
		M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs
		M/T with SRS	1,376 kg	3,034 lbs
		A/T with SRS, A/C	1,417 kg	3,123 lbs
		A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs
	1.8iES	M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs
		M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs
		M/T with SRS, S/R	1,389 kg	3,062 lbs
		A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs
		A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs
		A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs
		A/T with SRS, A/C, S/R, power seat, NAVI.	1,456 kg	3,210 lbs
	KG 2.0iLS	M/T with SRS, A/C	1,396 kg	3,077 lbs
		M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs
		A/T with SRS, A/C	1,419 kg	3,128 lbs
		A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs
	2.0iES	M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs
		M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs
		A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs
		A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs
		A/T with SRS, A/C, S/R, Power seat	1,450 kg	3,197 lbs
		A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs
	2.0iV	M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,439 kg	3,172 lbs
		A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs
		A/T with SRS, A/C, S/R, NAVI.	1,464 kg	3,228 lbs
	2.0TDi	M/T with SRS, A/C	1,464 kg	3,228 lbs
	2.0SDi	M/T with SRS, A/C	1,464 kg	3,228 lbs
		M/T with SRS, A/C, S/R	1,479 kg	3,260 lbs
	KS 1.6iS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
	1.6iLS	M/T with SRS	1,314 kg	2,897 lbs
	1.8iS	M/T with SRS	1,419 kg	3,128 lbs
	1.8iLS	M/T with SRS, A/C	1,392 kg	3,068 lbs
		A/T with SRS, A/C	1,417 kg	3,123 lbs
	2.0iLS	M/T with SRS, A/C	1,396 kg	3,077 lbs
	2.0iES	M/T with SRS, A/C	1,409 kg	3,106 lbs
	KR 1.6iS	M/T	1,307 kg	2,881 lbs
		M/T with SRS	1,314 kg	2,897 lbs
1.6iLS	M/T with SRS	1,314 kg	2,897 lbs	
1.8iLS	M/T with SRS	1,419 kg	3,128 lbs	
1.8iLS	M/T with SRS, A/C	1,408 kg	3,104 lbs	
	M/T with SRS, A/C (AUTO)	1,408 kg	3,104 lbs	
	M/T with SRS, A/C, S/R	1,423 kg	3,137 lbs	
	A/T with SRS, A/C	1,433 kg	3,159 lbs	
	A/T with SRS, A/C (AUTO)	1,433 kg	3,159 lbs	
2.0iES	M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs	
	A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
2.0TDi	M/T with SRS, A/C	1,464 kg	3,228 lbs	
2.0SDi	M/T with SRS, A/C	1,464 kg	3,228 lbs	

	ITEM	METRIC	ENGLISH	NOTES	
WEIGHT	Weight Distribution (Front/Rear)				
	KE 1.6iS	M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.6iLS	M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.8iS	M/T with SRS, A/C	802/587 kg	1,768/1,294 lbs	
		M/T with SRS, S/R	810/594 kg	1,786/1,309 lbs	
		A/T with SRS, A/C	827/587 kg	1,823/1,294 lbs	
		A/T with SRS, S/R	835/594 kg	1,840/1,310 lbs	
	1.8iLS	M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs	
		A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs	
	1.8iES	M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs	
		M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs	
		M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,835/1,307 lbs	
		M/T with SRS, A/C, S/R, Power seat, NAVI.	835/596 kg	1,841/1,314 lbs	
		A/T with SRS, A/C, S/R	851/594 kg	1,876/1,310 lbs	
		A/T with SRS, A/C, S/R, Power seat	854/597 kg	1,883/1,316 lbs	
		A/T with SRS, A/C, S/R, NAVI.	856/594 kg	1,887/1,310 lbs	
		A/T with SRS, A/C, S/R, Power seat, NAVI.	859/597 kg	1,894/1,316 lbs	
		2.0iLS	M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs
			A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs
	2.0iES	M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs	
		M/T with SRS, A/C, S/R, NAVI.	827/600 kg	1,823/1,323 lbs	
		M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs	
		A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs	
		A/T with SRS, A/C, S/R, NAVI	858/592 kg	1,892/1,305 lbs	
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs	
	2.0iV	M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs	
		M/T with SRS, A/C, S/R, Power seat, NAVI.	836/603 kg	1,843/1,329 lbs	
		A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs	
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/603 kg	1,899/1,329 lbs	
	2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs	
	2.0SDi	M/T with SRS, A/C, S/R	881/598 kg	1,942/1,319 lbs	
	KG	1.6iS	M/T	738/574 kg	1,627/1,265 lbs
			M/T with SRS	738/576 kg	1,627/1,270 lbs
		1.6iLS	M/T	738/574 kg	1,627/1,265 lbs
			M/T with SRS	739/575 kg	1,629/1,268 lbs
		1.8iS	M/T with SRS, side SRS	730/578 kg	1,610/1,275 lbs
			M/T	806/584 kg	1,777/1,287 lbs
			M/T with SRS	809/610 kg	1,783/1,345 lbs
			M/T with SRS, side SRS	813/573 kg	1,793/1,263 lbs
			A/T with SRS	832/585 kg	1,834/1,290 lbs
			1.8iLS	M/T	806/584 kg
		M/T with side SRS		806/584 kg	1,777/1,287 lbs
		1.8iES	M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs
			M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs
			M/T with SRS	805/570 kg	1,775/1,259 lbs
			A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs
			A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs
			M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs
			M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs
			M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,834/1,308 lbs
			M/T with SRS, A/C, S/R, Power seat, NAVI.	835/596 kg	1,841/1,314 lbs
			M/T with SRS, S/R	803/586 kg	1,770/1,292 lbs
A/T with SRS, A/C, S/R			851/594 kg	1,876/1,310 lbs	
A/T with SRS, A/C, S/R, Power seat			854/597 kg	1,883/1,316 lbs	
A/T with SRS, A/C, S/R, NAVI.			856/594 kg	1,887/1,310 lbs	
A/T with SRS, A/C, S/R, Power seat, NAVI.			859/597 kg	1,894/1,316 lbs	
2.0iLS			M/T with SRS, A/C	801/595 kg	1,765/1,312 lbs
			M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs
		A/T with SRS, A/C	824/595 kg	1,816/1,312 lbs	
		A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs	

	ITEM	METRIC	ENGLISH	NOTES			
WEIGHT 5-door	KG 2.0iES	M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs			
		M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs			
		M/T with SRS, A/C, S/R NAVI.	827/600 kg	1,823/1,323 lbs			
		M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs			
		A/T with SRS, A/C, S/R	848/594 kg	1,870/1,309 lbs			
		A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs			
		A/T with SRS, A/C, S/R, NAVI.	858/592 kg	1,892/1,305 lbs			
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs			
		2.0iV	M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs		
			M/T with SRS, A/C, S/R, NAVI.	836/603 kg	1,843/1,329 lbs		
			A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs		
			A/T with SRS, A/C, S/R NAVI.	861/603 kg	1,899/1,329 lbs		
		2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
		2.0SDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs		
		M/T with SRS, A/C, S/R	881/598 kg	1,942/1,318 lbs			
	KS	1.6iS	M/T	738/574 kg	1,627/1,265 lbs		
			M/T with SRS	739/575 kg	1,629/1,268 lbs		
		1.6iLS	M/T with SRS	739/575 kg	1,629/1,268 lbs		
		1.8iS	M/T with SRS	809/610 kg	1,783/1,345 lbs		
		1.8iLS	M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs		
			A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs		
		2.0iIs	M/T with SRS, A/C	801/595 kg	1,766/1,311 lbs		
		2.0iES	M/T with SRS, A/C	816/592 kg	1,799/1,305 lbs		
		KR	1.6iS	M/T	733/574 kg	1,616/1,265 lbs	
				M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.6iLS		M/T with SRS	739/575 kg	1,629/1,268 lbs		
	1.8iS		M/T with SRS	809/610 kg	1,784/1,344 lbs		
	1.8iLS		M/T with SRS, A/C	823/585 kg	1,814/1,290 lbs		
			M/T with SRS, A/C (AUTO)	823/585 kg	1,814/1,290 lbs		
			M/T with SRS, A/C, S/R	830/593 kg	1,830/1,307 lbs		
			A/T with SRS, A/C	847/586 kg	1,867/1,292 lbs		
			A/T with A/C (AUTO)	847/586 kg	1,867/1,292 lbs		
	2.0iES		M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs		
M/T with SRS, A/C, S/R, Power seat			825/603 kg	1,819/1,329 lbs			
M/T with SRS, A/C, S/R, NAVI			827/600 kg	1,823/1,323 lbs			
A/T with SRS, A/C, S/R			848/594 kg	1,869/1,310 lbs			
A/T with SRS, A/C S/R, Power seat			856/595 kg	1,887/1,312 lbs			
A/T with SRS, A/C, S/R, NAVI			858/592 kg	1,892/1,305 lbs			
2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs				
2.0SDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs				
WEIGHT 5-door	Max. Permissible Weight (EU)						
		D16B6, D16B7 engine models	1,740 kg	3,241 lbs			
		F18B2, F18B4, F20B6 engine models	1,930 kg	4,255 lbs			
		20T2N engine model	1,940 kg	4,277 lbs			

	ITEM	METRIC	ENGLISH	NOTES	
ENGINE	Type	D16B6, D16B7 engines			
		F18B2, F18B3, F18B4, F20B6 engines			
		H22A7 engine			
	Cylinder Arrangement	Water-cooled, 4-stroke SOHC gasoline engine			
	Bore and Stroke	Water cooled, 4-stroke SOHC VTEC gasoline engine			
		Water-cooled, 4 stroke DOHC VTEC gasoline engine			
		Inline-4-cylinder, transverse			
		D16B6, D16B7 engine	75.0 x 90.0 mm		2.95 x 3.54 in
		F18B2, F18B3, F18B4 engines	85.0 x 81.5 mm		3.35 x 3.21 in
		F20B6 engine	85.0 x 88.0 mm		3.35 x 3.46 in
		H22A7 engine	87.0 x 90.7 mm		3.43 x 3.57 in
	Displacement	D16B6, D16B7 engine	1,590 cm ³ (m/)		97.0 cu-in
		F18B2, F18B3, F18B4 engines	1,850 cm ³ (m/)		112.9 cu-in
		F20B6 engine	1,997 cm ³ (m/)		121.9 cu-in
		H22A7 engine	2,157 cm ³ (m/)		131.6 cu-in
	Compression Ratio	D16B6, D16B7 engine	9.6		
		F18B2, F18B3, F18B4, F20B6 engines	10.0		
		H22A7 engine	11.0		
	Valve Train	D16B6, D16B7 engine	Belt Driven, SOHC 4 valve per cylinder		
		F18B2, F18B3, F18B4, F20B6 engines	Belt Driven, SOHC VTEC 4 valve per cylinder		
	H22A7 engine	Belt Driven, DOHC VTEC 4 valve per cylinder			
Lubrication System	Forced and wet sump, trochoid pump				
Oil Pump Displacement	D16B6, D16B7 engines	35.4 l (37.4 US qt, 31.1 Imp qt)			
	Except D16B6, D16B7 engines	73.5 l (77.7 US qt, 64.7 Imp qt)			
Water Pump Displacement	D16B6, D16B7 engines	125 l (132 US qt, 110 Imp qt)			
	Except D16B6, D16B7 engines	160 l (169 US qt, 141 Imp qt)			
Fuel Required	D16B6, D16B7, F18B2, F18B4 F20B6 engines	Premium UNLEADED gasoline with a Research Octane Number (RON) of 95 or higher			
	F18B3 engine	LEADED gasoline with a Research Octane Number (RON) of 91 or higher* ¹			
	H22A7 engine	Super plus UNLEADED gasoline with a Research Octane Number (RON) of 98 or higher			
STARTER	Type	Gear reduction			
	Normal Output	1.0 kW			
	Normal Voltage	12 V			
	Hour Rating	30 seconds			
	Direction of Rotation	Clockwise as viewed from gear end			

	ITEM		METRIC	ENGLISH			NOTES
CLUTCH	Type	M/T	Single plate dry, diaphragm spring				
	Facing Area	A/T	Torque converter				
TRANSMISSION	Type	M/T	176 cm ²	27.3 sq-in			
	Primary Reduction	A/T	Synchronised 5-speed forward, 1 reverse				
TRANSMISSION	Type/Ratio		Electronically controlled				
			4-speed automatic, 1 reverse				
TRANSMISSION	Manual Transmission Gear Ratio	DH	U2J4	U2G5	U2Q7	9A	
		D16B6	F18B2	F18B4	H22A7	20T2N	
		D16B7	F18B3	engine	engine	engine	
		engines	F20B6				
		engines					
	1st	3.250	3.285	3.285	3.285	3.285	
	2nd	1.782	1.807	1.807	2.090	1.894	
	3rd	1.250	1.266	1.193	1.481	1.222	
	4th	0.937	0.966	0.843	1.071	0.848	
	5th	0.750	0.787	0.685	0.870	0.649	
Reverse	3.153	3.000	3.000	3.000	3.000		
Final Reduction Gear	Ratio	4.437	4.266	4.062	4.266	3.938	
	Type	Single helical gear					
TRANSMISSION	Automatic transmission Gear Ratio	1st	2.528				
		2nd	1.427				
	3rd	0.976					
	4th	0.653					
	Reverse	1.863					
	Final Reduction Gear	Ratio	4.466				
	Type	Single helical gear					
AIR CONDITIONING	Cooling Capacity		4,780 Kcal/h	19,000 BTU/h		KY model	
			3,910 Kcal/h	15,500 BTU/h		KR model	
			3,740 Kcal/h	14,800 BTU/h		KG, KE, KS models	
AIR CONDITIONING	Compressor: SANDEN	Type	Scroll				
		Capacity	85.7 cm ³ /rev	5.23 cu-in/rev			
	Max. Speed	10,000 rpm (min ⁻¹)					
	Lubricant Type	SP-10					
	Lubricant Capacity	130 cm ³	4.1/3 fl oz, 4.6 Imp oz				
	Compressor: DENSO	Type	Swash-plate				
	No. of Cylinder	10					
	Capacity	188.0 cm ³ /rev	11.47 cu-in/rev				
Max. speed	7,600 rpm (min ⁻¹)						
Lubricant Type	ND-OIL8						
Lubricant Capacity	160 cm ³	5 1/3 fl oz, 5.6 Imp oz					
AIR CONDITIONING	Condenser	Type	Corrugated fin				
AIR CONDITIONING	Evaporator	Type	Corrugated fin				
AIR CONDITIONING	Blower	Type	Sirocco fan				
		Motor Input	220 W/12 V max.				
		Speed Control	4-speed*1/Infinite variable*2				*1: Manual A/C
	Max. Capacity	470 m ³ /h	16,600 cu-ft/h			*2: AUTO A/C	
AIR CONDITIONING	Temp. Control	Type	Air-Mix				
AIR CONDITIONING	Compressor Clutch	Type	Dry, single plate, poly-V belt drive				
		Power Consumption SANDEN	40 W max/12 V				
		DENSO	40 W max/12 V				
AIR CONDITIONING	Refrigerant	Type	HFC-134a (R-134a)				
		Quantity	500-550 g	18-19 oz			
STEERING SYSTEM	Type	Power assisted, rack and pinion					
	Overall Ratio	Except H22A7 engine model					15.50
		H22A7 engine model					15.74
	Turns, Lock-to-Lock						

	Except H22A7 engine model		3.02		
	H22A7 engine model		2.88		
	Steering Wheel Dia.	380 mm		15.0 in	

	ITEM		METRIC	ENGLISH	NOTES
SUSPENSION	Type	Front	Independent double wishbone, coil spring with stabiliser		
		Rear	Independent double wishbone, coil spring with stabiliser		
	Shock Absorber	Front and Rear	Telescopic, hydraulic nitrogen gas-filled		
WHEEL ALIGNMENT 4-door	Camber	Front	H22A7 engine model -0°15'		
		Except H22A7 engine model	0°00', 0°10'*1		
	Rear	H22A7 engine model	-1° 15'		
		Except H22A7 engine model	-1°00', -0°50'*1		
	Caster	Front	H22A7 engine model 3°00'		
		Except H22A7 engine model	2°50', 2°45'*1		
Total Toe	Front	0 mm	0 in		
	Rear	In 2 mm	In 0.08 in		
WHEEL ALIGNMENT 5-door	Camber	Front	0°00'		
		Rear	-1°00'		
	Caster	Front	2°50'		
		Total Toe	Front	0 mm	0 in
	Rear	In 2 mm	In 0.08 in		
BRAKE SYSTEM	Type	Front	Power-assisted self-adjusting ventilated disc		
		Rear	Power-assisted self-adjusting solid disc*2		
			Power-assisted self-adjusting drum*3		
	Pad Surface Area	Front	53.2 cm ² x 2	8.25 sq-in x 2	H22A7 engine model
			47.6 cm ² x 2	7.38 sq-in x 2	Except H22A7, D16B6 engine model
			40.0 cm ² x 2	6.20 sq-in x 2	D16B6 engine model
	Lining Surface Area	Rear	25.4 cm ² x 2	3.94 sq-in x 2	Disc brake
Rear		86.8 cm ² x 2	13.45 sq-in x 2	Drum brake	
Parking brake	Type	Mechanical actuating, rear two wheel brakes			
TYRE	Size and Pressure	See tyre label			
WASHER RESERVOIR	Capacity / (US qt, Imp qt)	4.5*8 (4.8, 4.0) 6.9*9 (7.3, 6.1)			
ELECTRICAL	Battery	*412 V-47 AH-20 HR *512 V-57 AH-20 HR			
	Under-hood fuse/relay box	100 A, 50 A, 40 A, 30 A, 20 A, 15 A, 10 A, 7.5 A			
	Driver's under-dash fuse/relay box	30 A, 15 A, 10 A, 7.5 A			
	Passenger's under-dash fuse/relay box	30 A, 20 A, 7.5 A			
	Headlight high beam	12 V - 55 W			
	Headlight low beam	*612 V-35 W, *712V-55 W			
	Front turn signal lights	12 V - 21 W			
	Front parking lights	12 V - 5 W			
	Front fog lights	12 V - 55 W			
	Side turn signal lights	12 V - 5 W			
	Rear turn signal lights	12 V - 21 W			
	Brake lights	12 V - 21 W			
	Tail lights	12 V - 5 W			
	High mount brake light	12 V - 5 W			
	Back-up lights	12 V - 21 W			
	Rear fog light	12 V - 21 W			
	License plate lights	12 V - 5 W			
	Front ceiling light	12 V - 5 W			
	Rear ceiling light	12 V - 5 W			
	Trunk Light	12 V - 5 W			
	Glove box light	12 V - 3.4 W			
Spotlights	12 V - 5 W				
Gauge lights	14 V - 1.12 W, 1.4 W, 3.0 W, 9.5				

		V - 1.1 W	
	Indicator lights	12 V - LED, 14 V - 0.84 W, 1.4 W	
	Panel and pilot lights	14 V - 0.84 W, 1.2 W	

- *1: KY model
- *2: Except B16B6 engine model
- *3: B16B6 engine model
- *4: CG7 (Vehicle type)
- *5: Except CG7 (Vehicle type)
- *6: With HID lamp
- *7: Without HID lamp
- *8: Without Headlight Washer
- *9: With Headlight Washer

Maintenance Schedule
European Model - Normal Conditions

3-2

Follow the Normal Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
	miles x 1,000	9	18	27	36	45	54	63	72	81	90	99		
	months	12	24	36	48	60	72	84	96	108	120	132		
Replace engine oil and oil filter		*	*	*	*	*	*	*	*	*	*	*		*1 8-7 to 8-10
Replace air cleaner element				*			*			*				*1 11-A-119
Inspect valve clearance				*			*			*			Check the valve clearance.	*1 6-A-3, 6-B-12, 6-C-9
Replace fuel filter								*						*1 11-A-105
Replace spark plugs				*			*			*				*1 4-31
Replace timing belt, timing balancer belt and inspect water pump									*				Check water pump for signs of seal leakage.	*1 6-A-8, 6-B-18, 6-C-14, 10-17
Inspect and adjust drive belts				*			*			*			<ul style="list-style-type: none"> Check for cracks and damage. Check deflection and tension 	*1 4-46, 4-47, 4-48, *2 17-14, 22-53, 22-54
Inspect idle speed								*						*1 11-A-94, 11-B-65, 11-C-57
Replace engine coolant						*			*			*	Check specific gravity for freezing point.	*1 10-7 to 10-10
Replace transmission fluid (O: Inspect)	MT				O				*				Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF.	*1 13-3, 13-57
Replace transmission fluid (O: Inspect)	AT			O*3		*			O		*		Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF.	*1 14-132
Inspect front and rear brakes		*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> Check the brake pad and disc thickness. Check for damage or cracks. Check the callipers for damage, leaks and tightness. 	*2 19-A-4, 19-A-10, 19-A-12, 19-A-14, 19-A-15, 19-A-17, 19-A-26, 19-A-28, 19-A-30, 19-A-31
Replace brake fluid		Every 3 years											Use only DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*2 19-A-7
Check parking brake adjustment		*	*		*		*		*		*		Check the parking brake operation	*2 19-A-6
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months												*2 22-39
Check lights alignment		*	*	*	*	*	*	*	*	*	*	*	Check the position of the headlights.	*2 23-D-9
Test drive (noise, stability, dashboard operations)		*	*	*	*	*	*	*	*	*	*	*	Check for road stability, noise, vibrations and dashboard operation.	-

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

*3: Inspect at 45,000 km (27,000 miles/36 months and every 45,000 km (27,000 miles/36 months after replacement.

*4: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule

3-3

European Model - Normal Conditions (cont'd)

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
miles x 1,000	months	9	18	27	36	45	54	63	72	81	90	99		
		12	24	36	48	60	72	84	96	108	120	132		
Visually inspect the following items													<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten 	-
Tie rod ends, steering gearbox, and boots		*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-13, 17-26
Suspension components		*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22
Driveshaft boots		*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3
Brake hoses and lines (including ABS)		*	*	*	*	*	*	*	*	*	*	*	Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.	*2 19-A-3, 19-A-36
Exhaust system		*	*	*	*	*	*	*	*	*	*	*	Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	*1 9-9 to 9-12
Fuel lines and connections		*	*	*	*	*	*	*	*	*	*	*	Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	*1 11-A-95, 11-C-59
Tyre condition		*	*	*	*	*	*	*	*	*	*	*	Check for pressure, puncture or cuts and irregular tread wear.	-

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

Maintenance Schedule
European Model - Severe Conditions

3-4

Service at the indicated distance or time whichever comes first	km x 1,000	miles x 1,000	months	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	SECTION and PAGE	
				4.5 6	9 12	13.5 18	18 24	22.5 30	27 36	31.5 42	36 48	40.5 54	45 60	49.5 66	54 72	58.5 78	63 84	67.5 90	72 96			
Replace engine oil and oil filter				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*1 8-7 to 8-10	
Clean (O) or replace (*) air cleaner element	Except 1.6 /					O			*							*			O		*1 11-A-119	
- Use normal schedule except in dusty conditions	1.6 /				*			*			*			*				*			*1 11-A-119	
Inspect valve clearance								*						*							Check the valve clearance *1 6-A-3 , 6-B-12 , 6-C-9	
Replace fuel filter								*						*							*1 11-A-105	
Replace spark plugs								*						*							*1 4-31	
Replace timing belt, timing balancer belt and inspect water pump																			*	*	Check water pump for signs of seal leakage *1 6-A-8 , 6-B-18 , 6-C-14 , 10-17	
Inspect and adjust drive belts								*						*							* Check for cracks and damage. * Check for deflection and tension. *1 4-46 , 4-47 , 4-48 , 22-53 , 22-54	
Inspect idle speed																		*			*1 11-A-94 , 11-B-65 , 11-C-57	
Replace engine coolant												*							*		Check specific gravity for freezing point *1 10-7 , to 10-10	
Replace transmission fluid	MT										*		*						*		Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF. *1 13-3 , 13-57	
	AT							*				*							*		Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or DEXRON II or III ATF. *1 14-132	
Inspect front and rear brakes				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		* Check the brake pad and disc thickness. * Check for damage or cracks. * Check the callipers for damage, leaks and tightness. *2 19-A-4 , 19-A-10 , 19-A-12 , 19-A-14 , 19-A-15 , 19-A-17 , 19-A-26 , 19-A-28 , 19-A-30 , 19-A-31
Replace brake fluid			Every three years																		Use DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir. *2 19-A-7	
Check parking brake adjustment				*		*					*								*		Check the parking brake operation *2 19-A-6	
Replace pollen filter			Every 30,000 km (18,000 miles) or 12 months																		*2 22-39	
Check lights alignment				*		*		*		*		*		*		*		*		*	Check the position of the headlights *2 23-D-9	
Test drive (noise, stability, dashboard operations)				*		*		*		*		*		*		*		*		*	Check for road stability, noise, vibrations, and dashboard operation. -	

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A
 *2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B
 *3: These belts should normally be replaced at the intervals shown in the maintenance schedule. (Normal Conditions)
 Replace these belts at 75,000 km or 45,000 miles if you regularly drive your vehicle in one or more of these conditions.
 * In very high temperatures [43°C (110°F) above]
 * In very low temperatures [-29°C (-20°F) under]
 *4: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule
European Model - Severe Conditions (cont'd)

3-5

Service at the indicated distance or time whichever comes first	km x 1,000		7.5		15		22.5		30		37.5		45		52.5		60		67.5		75		82.5		90		97.5		105		112.5		120		NOTES	SECTION and PAGE	
	miles x 1,000	months	4.5	6	9	12	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72	76	80	84	88	92	96	100	104	108	112	116	120					
Visually inspect the following items:																												<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints. If necessary, retighten. 	-								
Tie rod ends, steering gearbox and boots	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-13, 17-26	
Suspension components	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22	
Driveshaft boots	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3	
Brake hoses and lines (including ABS)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.	*2 19-A-3, 19-A-36	
Exhaust system	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	*1 9-9 to 9-12	
Fuel lines and connections	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	*1 11-A-95, 11-C-59
Tyre condition	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	Check for pressure, puncture or cuts and irregular tread wear.	-

*1: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 1 Code No. 62S1A00A

*2: Refer to shop manual: 99 Accord MAINTENANCE, REPAIR and CONSTRUCTION VOL. 2 Code No. 62S1A00B

Follow the Severe Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

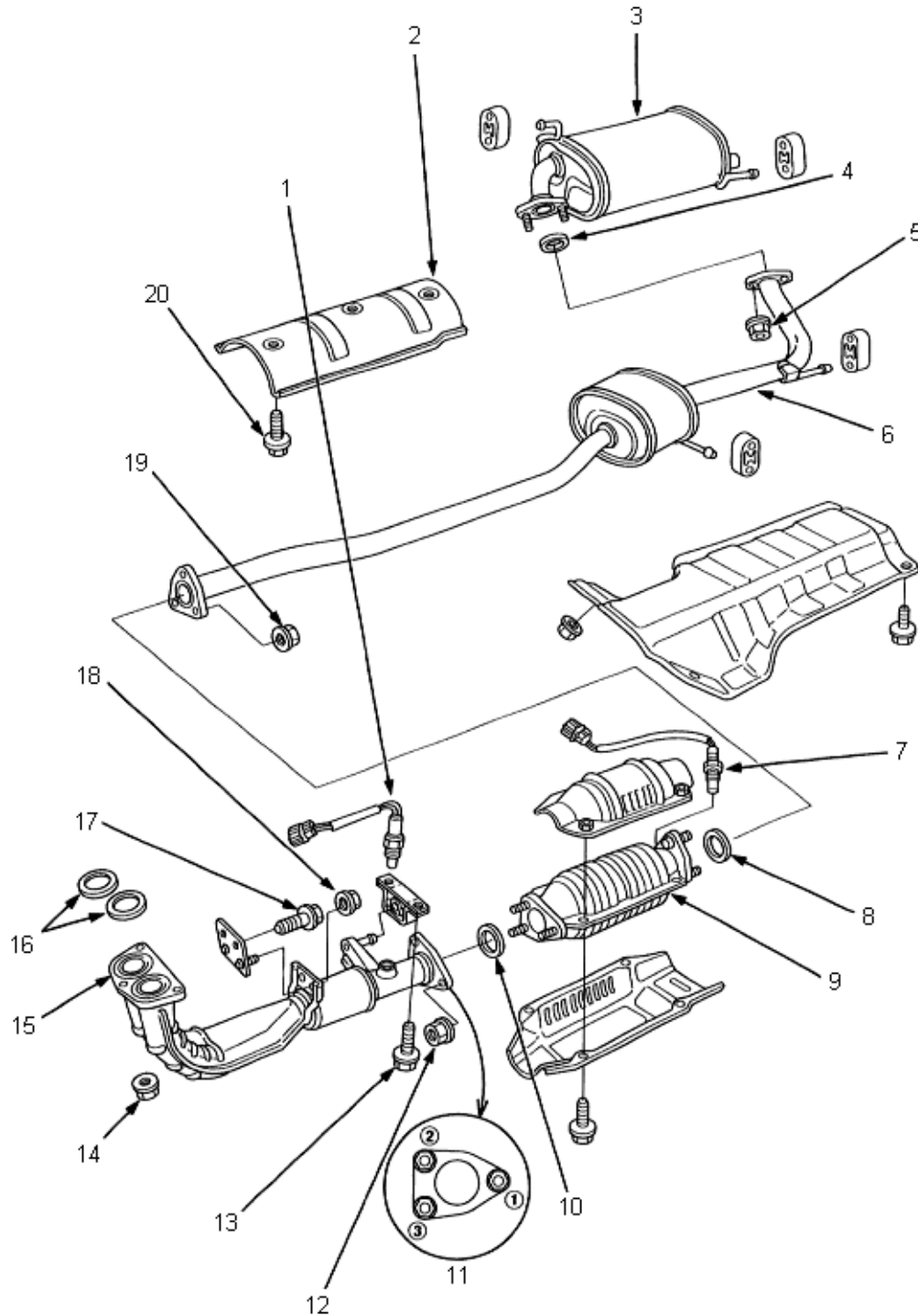
- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot [over 32°C, (90°F)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty or de-iced roads.

NOTE: If the customer's vehicle is driven OCCASIONALLY under severe conditions, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

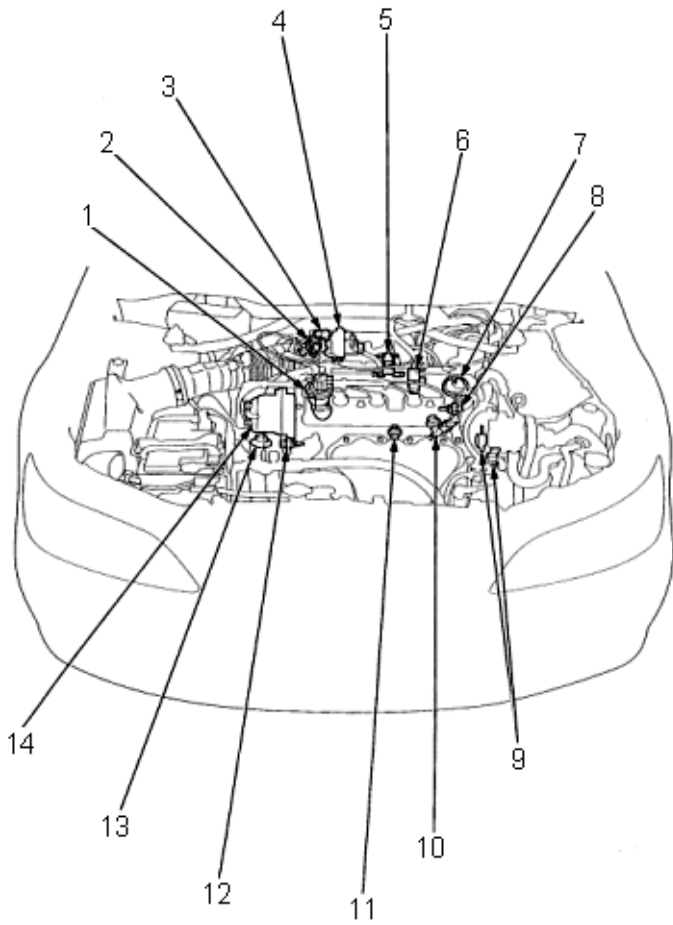
Exhaust Pipe and Muffler Replacement

9-2

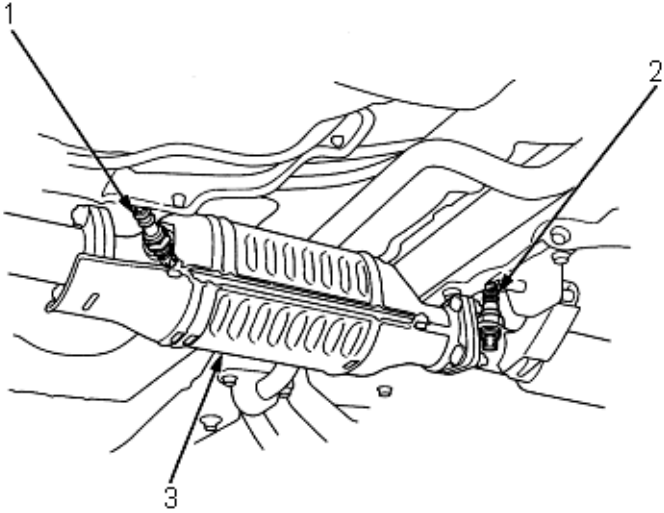
NOTE: Use new gaskets and self-locking nuts when reassembling.



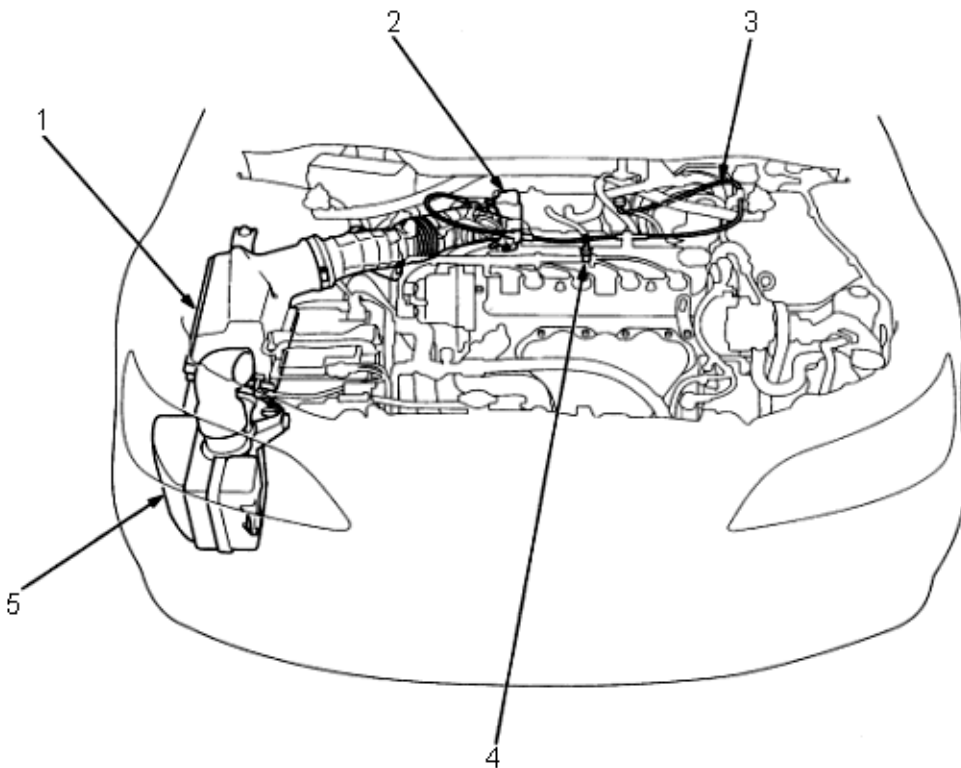
1. PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S)
44 Nm (4.5 kgf/m, 33 lbf/ft)
2. HEAT SHIELD
3. MUFFLER
4. GASKET
Replace.
5. SELF-LOCKING NUT
10 x 1.25 mm
54 Nm (5.5 kgf/m, 40 lbf/ft)
Replace.
6. EXHAUST PIPE B
7. SECONDARY HO2S
44 Nm (4.5 kgf/m, 33 lbf/ft)
8. GASKET
Replace.
9. THREE WAY CATALYTIC CONVERTER
10. GASKET
Replace.
11. THREE WAY CATALYTIC CONVERTER
TIGHTENING SEQUENCE
12. SELF-LOCKING NUT
10 x 1.25 mm
22 Nm (3.4 kgf/m, 25 lbf/ft)
Replace.
13. 10 x 1.25 mm
28 Nm (3.9 kgf/m, 28 lbf/ft)
14. SELF-LOCKING NUT
10 x 1.25 mm
54 Nm (5.5 kgf/m, 40 lbf/ft)
Replace.
15. EXHAUST PIPE A
16. GASKET
Replace.
17. 8 x 1.25 mm
22 Nm (2.2 kgf/m, 16 lbf./ft)
18. SELF-LOCKING NUT
8 x 1.25 mm
18 Nm (kgf/m, 13 lbf/ft)
19. SELF-LOCKING NUT
10 x 1.25 mm
33 Nm (3.4 kgf/m, 25 lbf/ft)
Replace.
20. 6 x 1.0 mm
33 Nm (3.4 kgf/m, 8.0 lbf/ft)



1. **EXHAUST GAS RECALCULATION (EGR) VALVE and LIFT SENSOR**
Troubleshooting, (See Page 11-B-97)
2. **THROTTLE POSITION (TO) SENSOR**
Troubleshooting, (See Page 11-B-59)
3. **MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR**
Troubleshooting, (See Page 11-B-52)
4. **IDLE AIR CONTROL (IAC) VALVE**
Troubleshooting, (See Page 11-B-91)
5. **EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE**
Troubleshooting, (See Page 11-B-102)
6. **INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE**
7. **INTAKE AIR BYPASS (IAB) CONTROL DIAPHRAGM**
8. **INTAKE AIR TEMPERATURE (IAT) SENSOR**
Troubleshooting, (See Page 11-B-54)
9. **CRANKSHAFT POSITION/TOP DEAD CENTRE (CKP/TDC) SENSOR**
Troubleshooting, (See Page 11-B-76)
10. **POWER STEERING PRESSURE (PSP) SWITCH**
11. **KNOCK SENSOR (KS)**
Troubleshooting, (See Page 11-B-75)
12. **ENGINE COOLANT TEMPERATURE (ECT) SENSOR**
Troubleshooting, (See Page 11-B-56)
13. **VEHICLE SPEED SENSOR (VSS) (M/T)**
Troubleshooting, (See Page 11-B-79)
14. **CYLINDER POSITION (CYP) SENSOR**
(Build into the distributor)
Troubleshooting, (See Page 11-B-81)

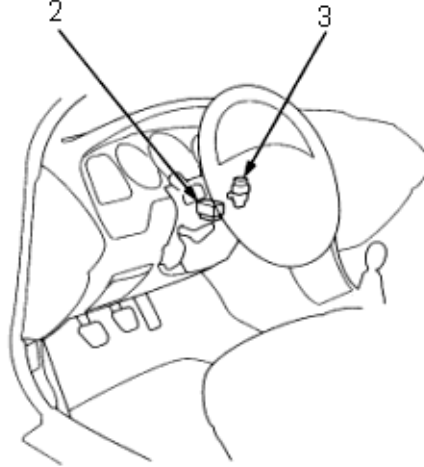
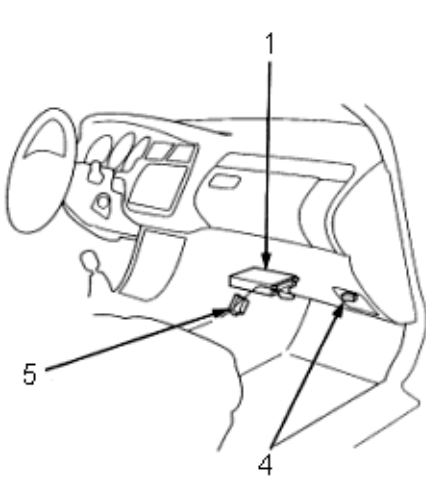


1. **SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S)**
Troubleshooting, (See Page 11-B-65)
2. **PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S)**
Troubleshooting, (See Page 11-B-62)
3. **THREE WAY CATALYTIC CONVERTER (TWC)**
Troubleshooting, (See Page 11-B-96)



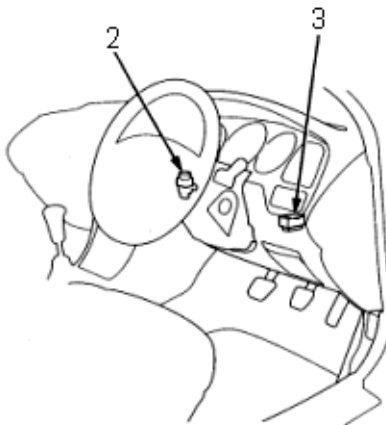
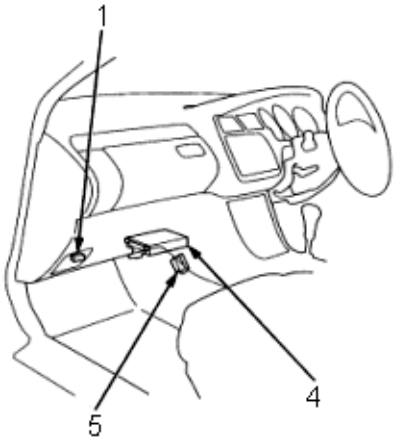
1. **AIR CLEANER**
2. **THROTTLE BODY**
3. **THROTTLE CABLE**
4. **POSITIVE CRANKCASE VENTILATION (PCV) VALVE**
5. **RESONATOR**

LHD:



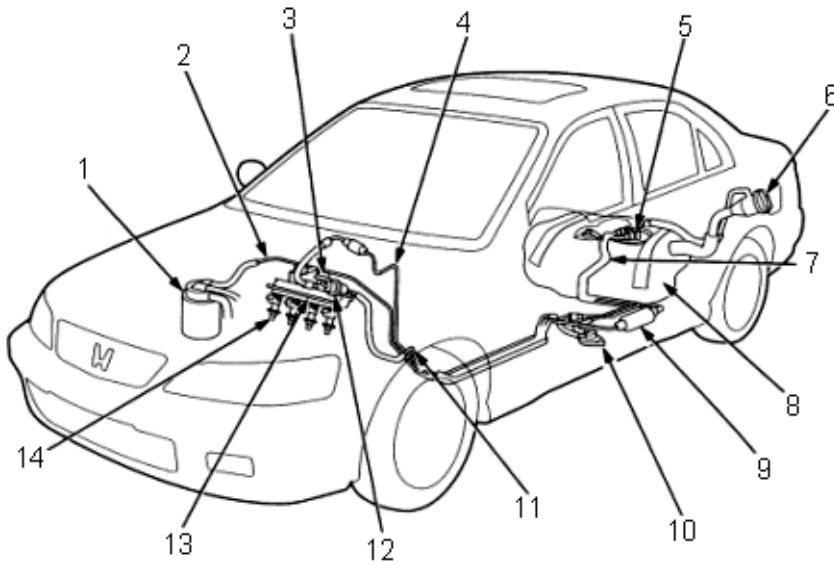
1. **ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM)**
Troubleshooting, (See Page 11-B-83)
2. **PGM-FI MAIN RELAY**
3. **INERTIA SWITCH**
4. **SERVICE CHECK CONNECTOR**
5. **DATA LINK CONNECTOR (DLC)**

RHD:



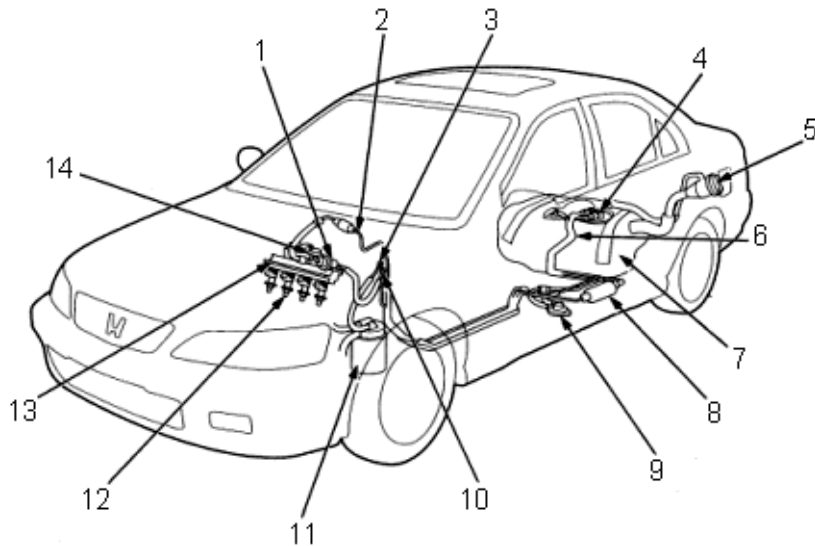
1. **SERVICE CHECK CONNECTOR**
2. **INERTIA SWITCH**
3. **PGM-FI MAIN RELAY**
4. **ENGINE CONTROL MODULE (ECM)/POWERTRAIN CONTROL MODULE (PCM)**
Troubleshooting, (See Page 11-B-83)
5. **DATA LINK CONNECTOR (DLC)**

LHD:

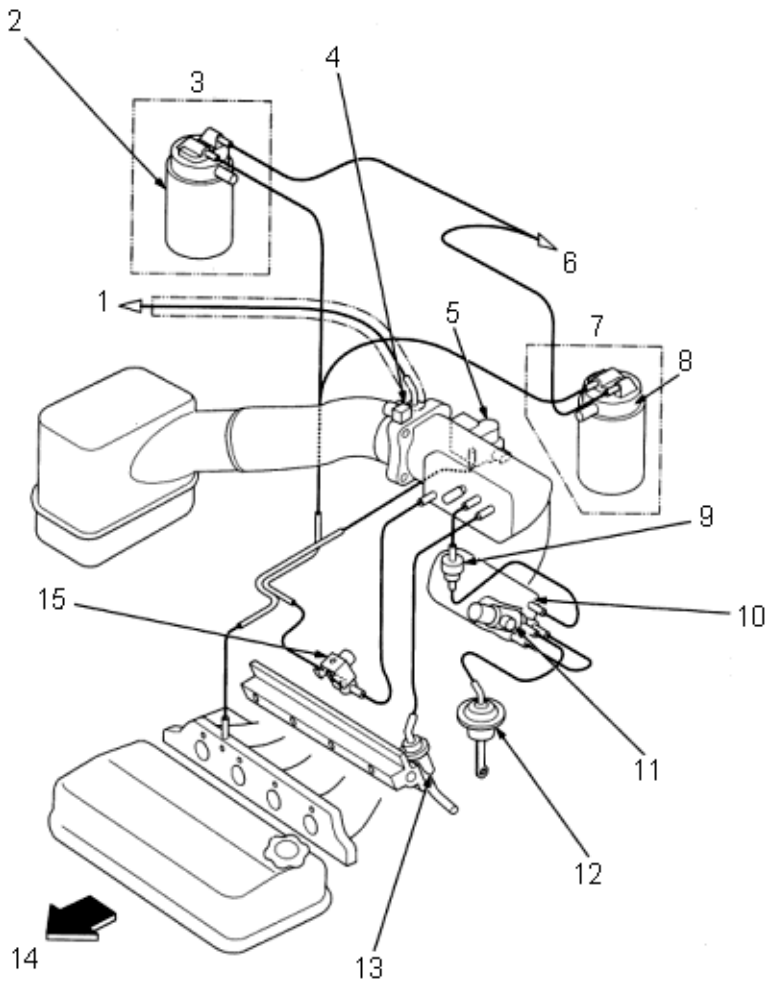


1. **EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER**
Inspection, (See Page 11-B-104)
2. **FUEL VAPOUR PIPE**
3. **FUEL PULSATION DAMPER**
4. **FUEL FEED PIPE**
5. **FUEL PUMP**
6. **FUEL GAUGE SENDING UNIT**
7. **FUEL FILL CAP**
8. **FUEL TANK**
9. **FUEL FILTER**
10. **EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE**
11. **FUEL RETURN PIPE**
12. **FUEL PRESSURE REGULATOR**
13. **FUEL RAIL**
14. **FUEL INJECTORS**

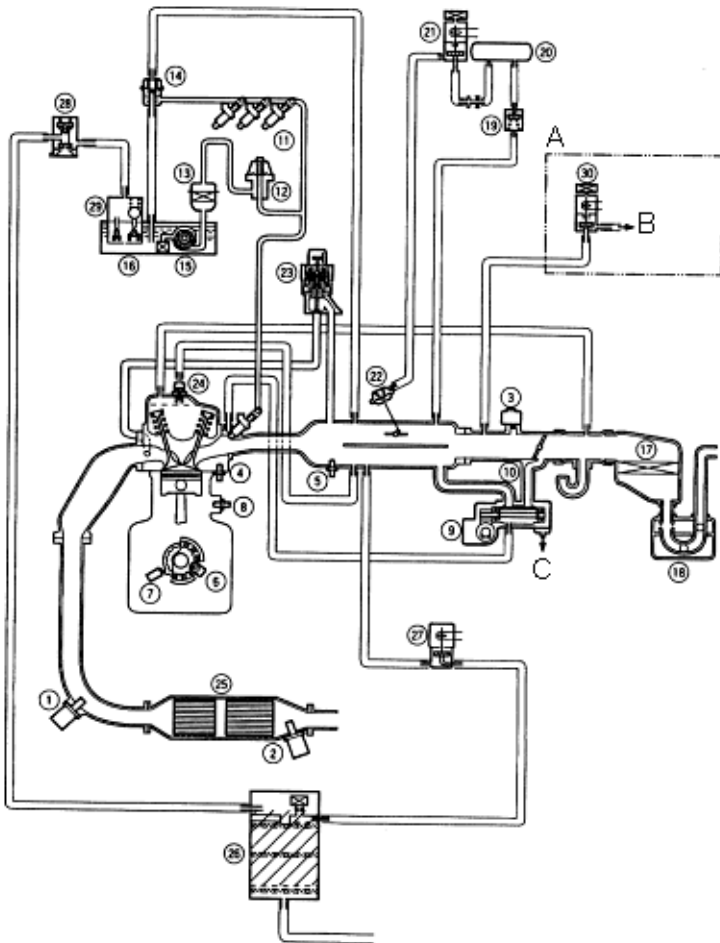
RHD:



1. **FUEL PRESSURE REGULATOR**
2. **FUEL FEED PIPE**
3. **FUEL VAPOUR PIPE**
4. **FUEL PUMP**
5. **FUEL GAUGE SENDING UNIT**
6. **FUEL FILL CAP**
7. **FUEL TANK**
8. **FUEL FILTER**
9. **EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE**
10. **FUEL RETURN PIPE**
11. **EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER**
Inspection, (See Page 11-B-104)
12. **FUEL INJECTORS**
13. **FUEL RAIL**
14. **FUEL PULSATION DAMPER**

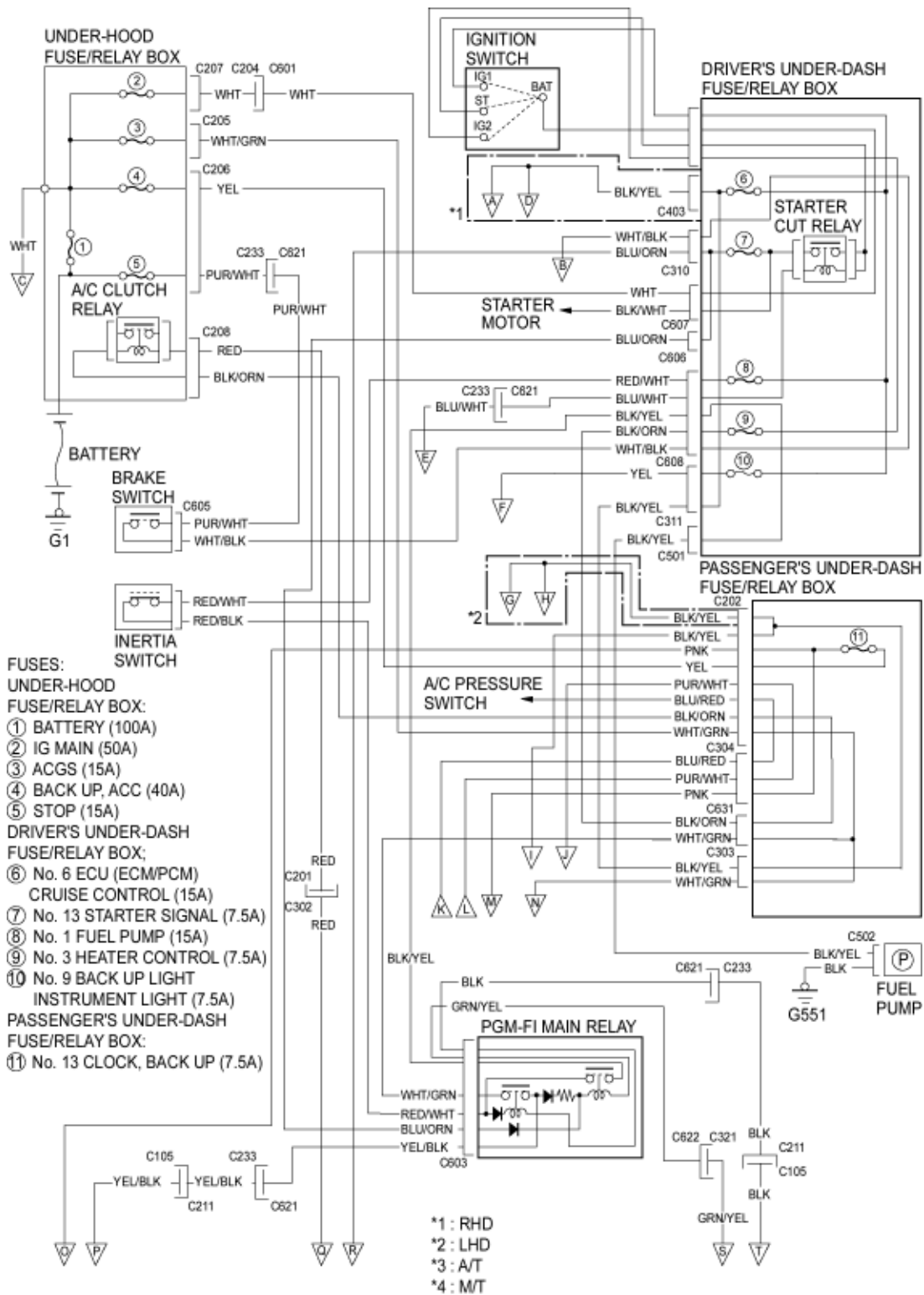


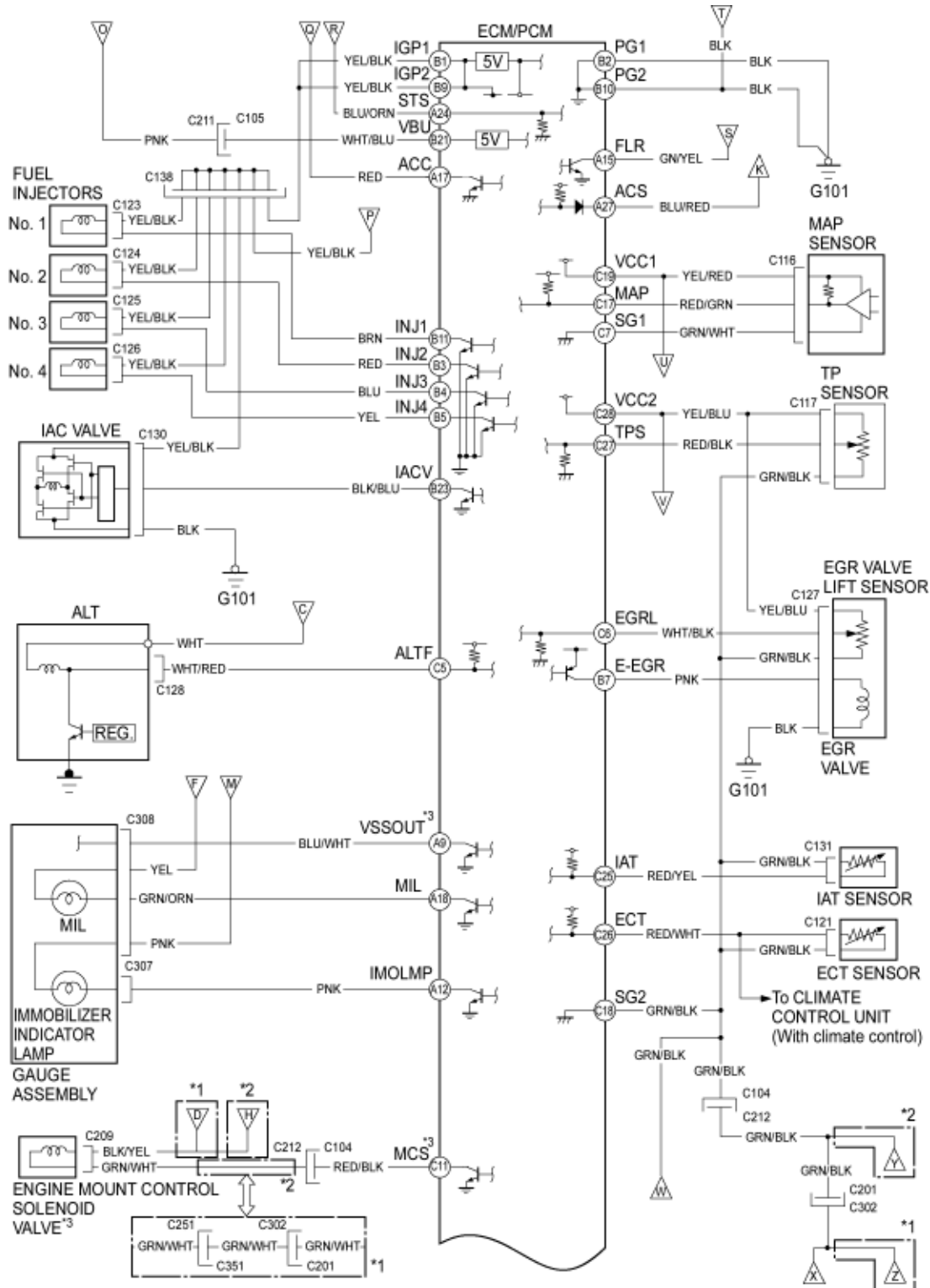
1. To ENGINE MOUNT CONTROL SOLENOID VALVE (AT)
2. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
3. (LHD)
4. MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
5. IDLE AIR CONTROL (IAC) VALVE
6. To EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
7. (RHD)
8. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
9. INTAKE AIR BYPASS (IAB) CHECK VALVE
10. INTAKE AIR BYPASS VACUUM TANK
11. INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE
12. INTAKE AIR BYPASS (IAB) CONTROL DIAPHRAGM VALVE
13. FUEL PRESSURE REGULATOR
14. FRONT OF VEHICLE
15. EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE

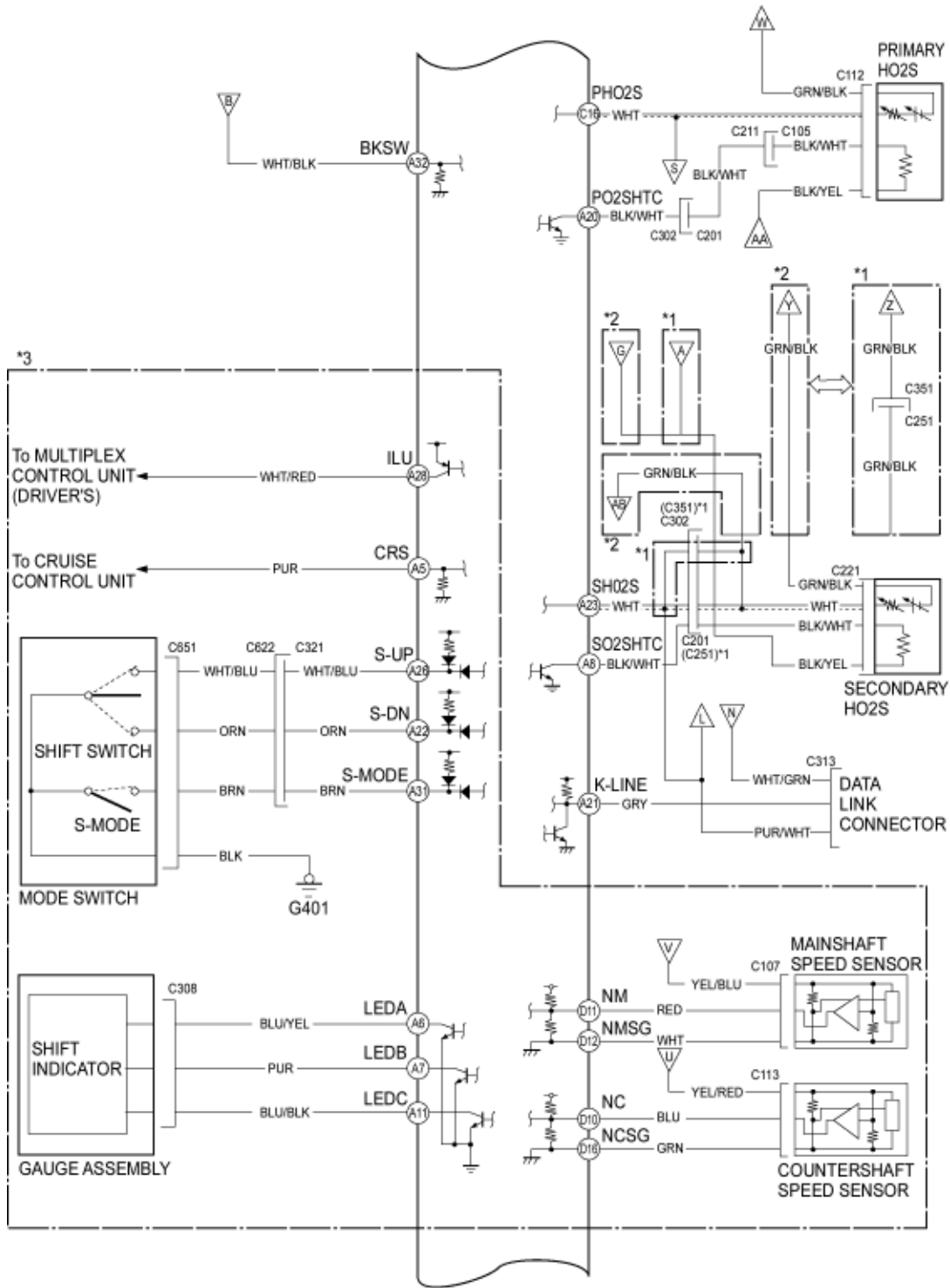


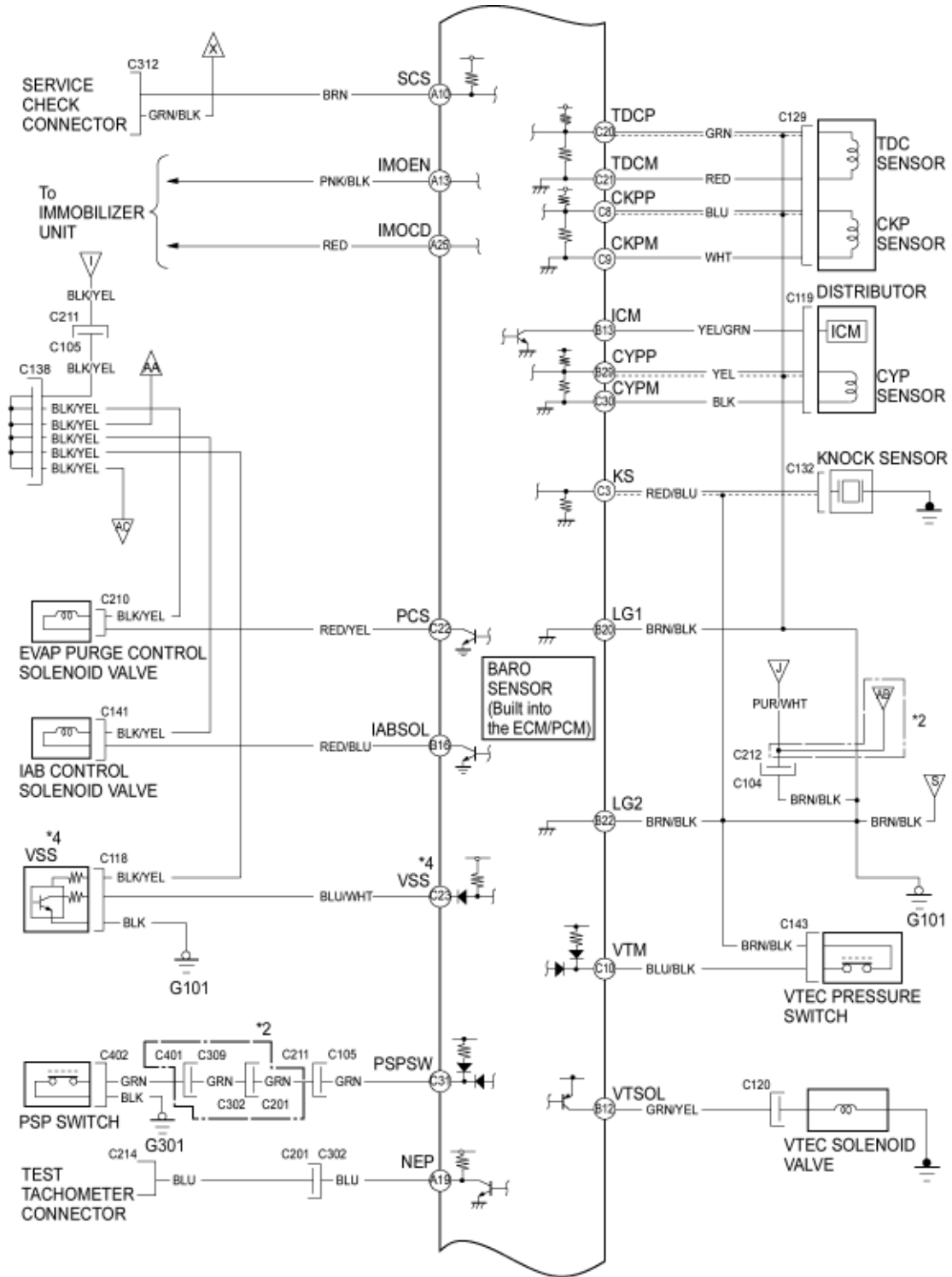
A. (AT)
 B. To ENGINE MOUNT
 C. ENGINE COOLANT

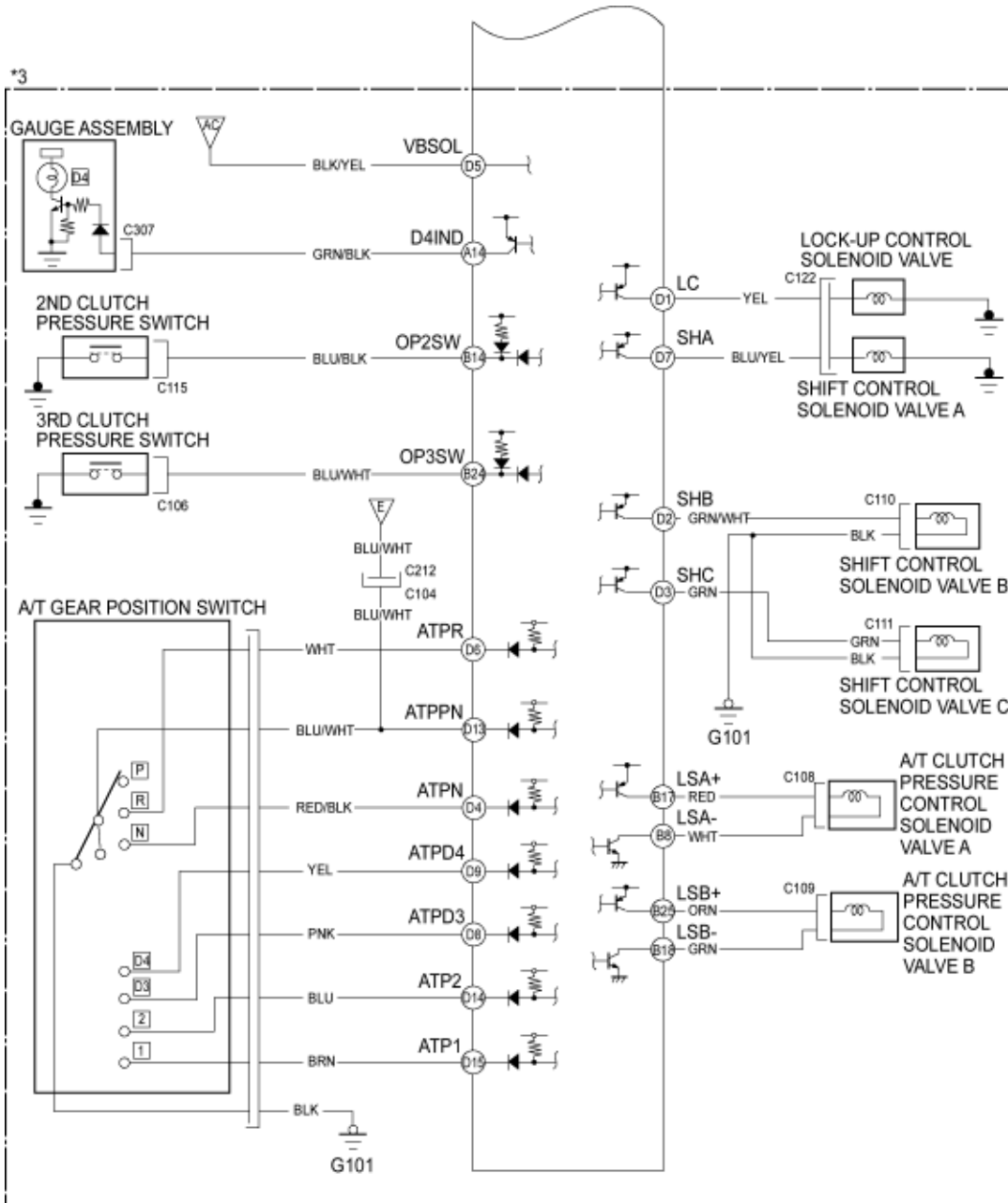
- | | |
|---|--|
| 1. PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1) | 16. FUEL TANK |
| 2. SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2) | 17. AIR CLEANER |
| 3. MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR | 18. RESONATOR |
| 4. ENGINE COOLANT TEMPERATURE (ECT) SENSOR | 19. INTAKE AIR BYPASS (IAB) CHECK VALVE |
| 5. INTAKE AIR TEMPERATURE (IAT) SENSOR | 20. INTAKE AIR BYPASS (IAB) VACUUM TANK |
| 6. CRANKSHAFT POSITION (CKP) SENSOR | 21. INTAKE AIR BYPASS (IAB) CONTROL SOLENOID VALVE |
| 7. TOP DEAD CENTRE (TDC) SENSOR | 22. INTAKE AIR BYPASS (IAB) CONTROL DIAPHRAGM VALVE |
| 8. KNOCK SENSOR (KS) | 23. EXHAUST GAS RECALCULATION (EGR) VALVE and LIFT SENSOR |
| 9. IDLE AIR CONTROL (IAC) VALVE | 24. POSITIVE CRANKCASE VENTILATION (PCV) VALVE |
| 10. THROTTLE BODY (TB) | 25. THREE WAY CATALYTIC CONVERTER |
| 11. FUEL INJECTOR | 26. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER |
| 12. FUEL PULSATION DAMPER | 27. EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE |
| 13. FUEL FILTER | 28. EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE |
| 14. FUEL PRESSURE REGULATOR | 29. FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE |
| 15. FUEL PUMP (FP) | 30. ENGINE MOUNT CONTROL SOLENOID VALVE |



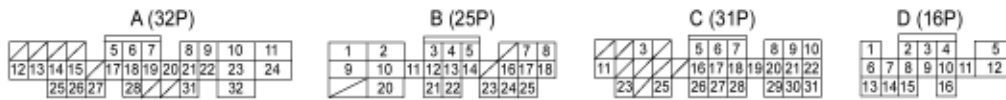




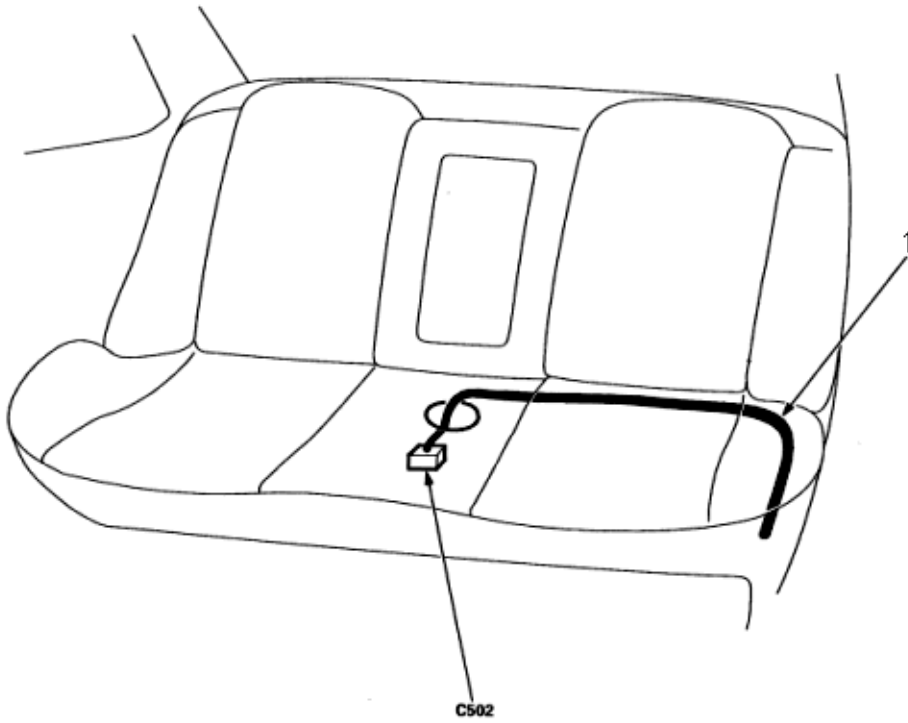




ECM/PCM TERMINAL LOCATIONS



1. LEFT SIDE WIRE HARNESS



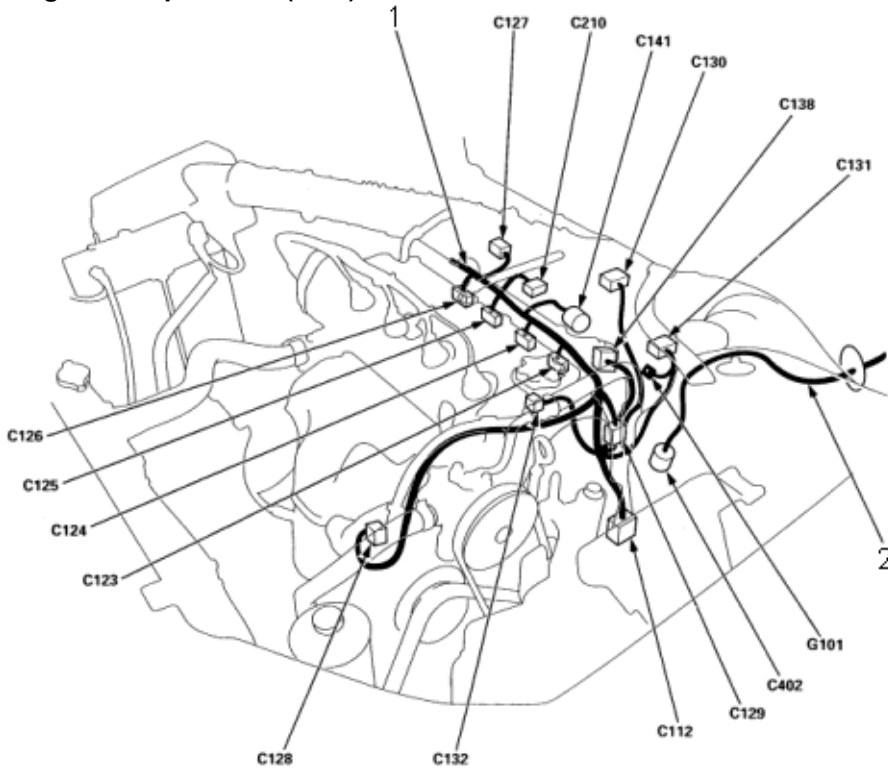
C502



①	BLK/YEL
②	BLK
3	BLK
4	YEL/BLU

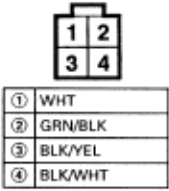
- NOTE:
- ♦ O: Related to Fuel and Emissions System.
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (LHD)



1. ENGINE WIRE HARNESS
2. LEFT ENGINE COMPARTMENT WIRE HARNESS

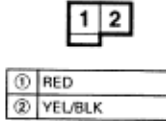
C112



C123



C124



C125



C126



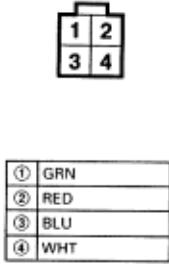
C127



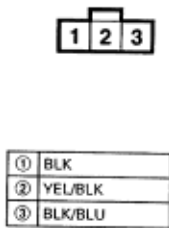
C128



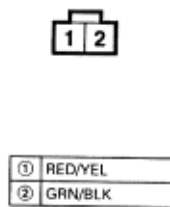
C129



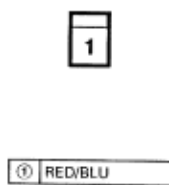
C130



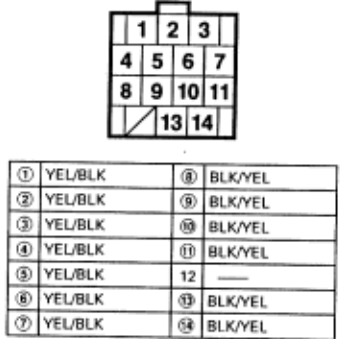
C131



C132



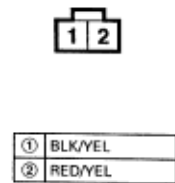
C138



C141



C210

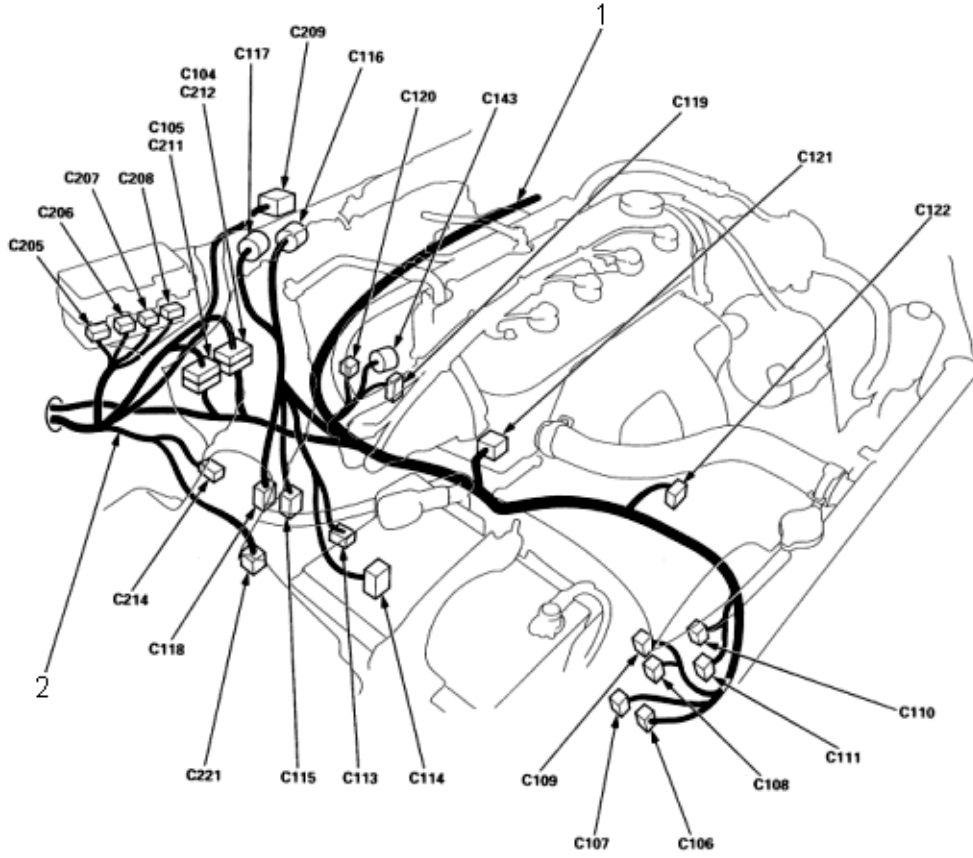


C402

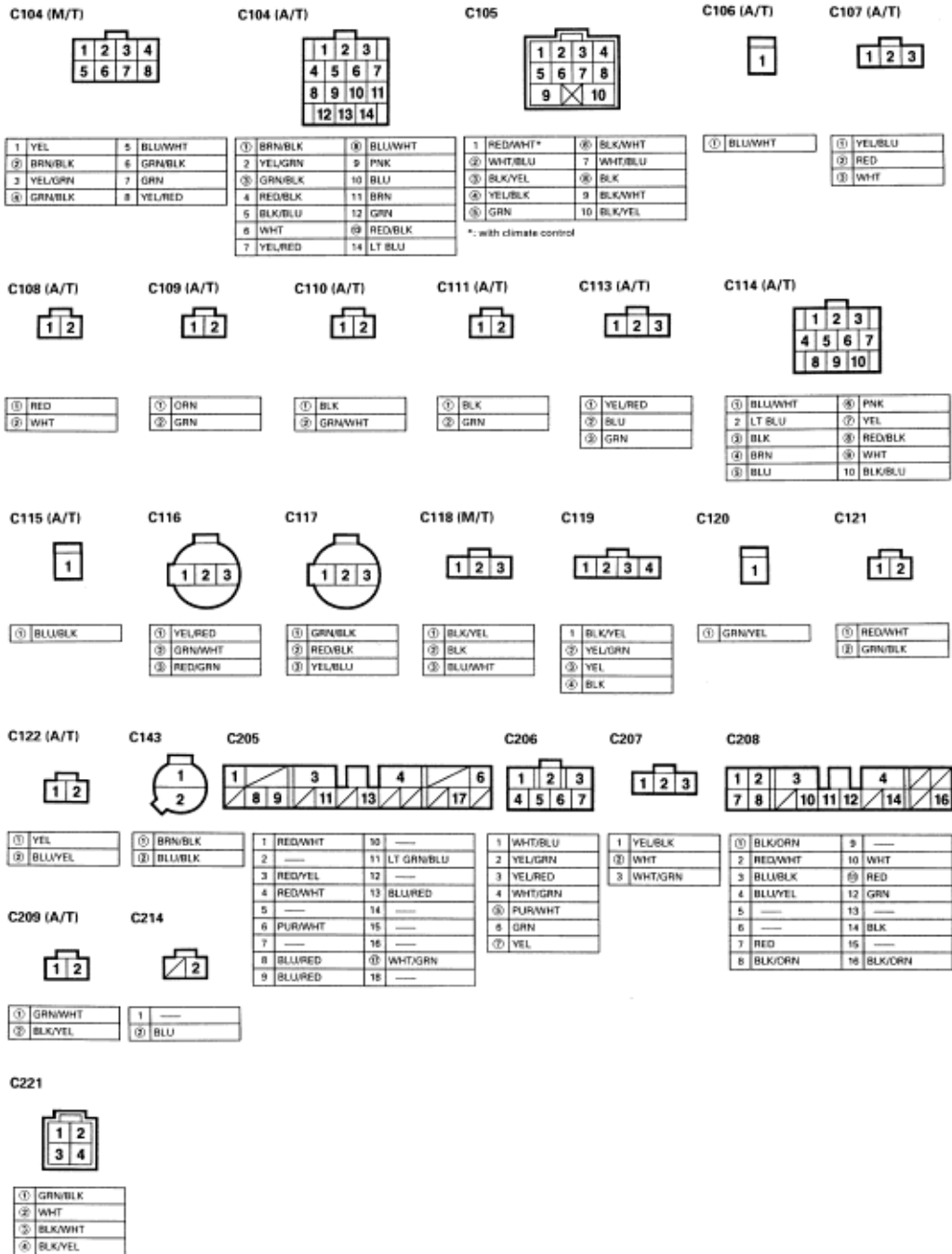


NOTE: ♦ O: Related to Fuel and Emissions System.
 ♦ Connector with male terminals (double outline): View from terminal side
 ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (LHD)

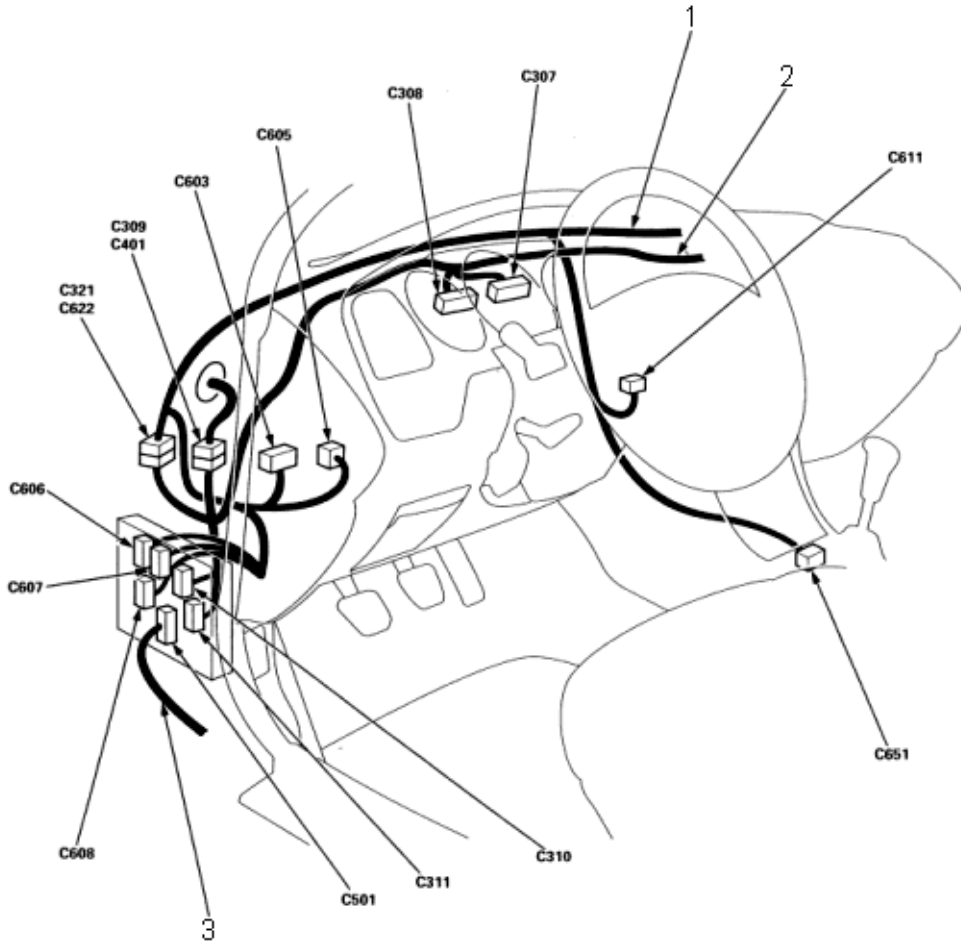


1. ENGINE WIRE HARNESS
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS

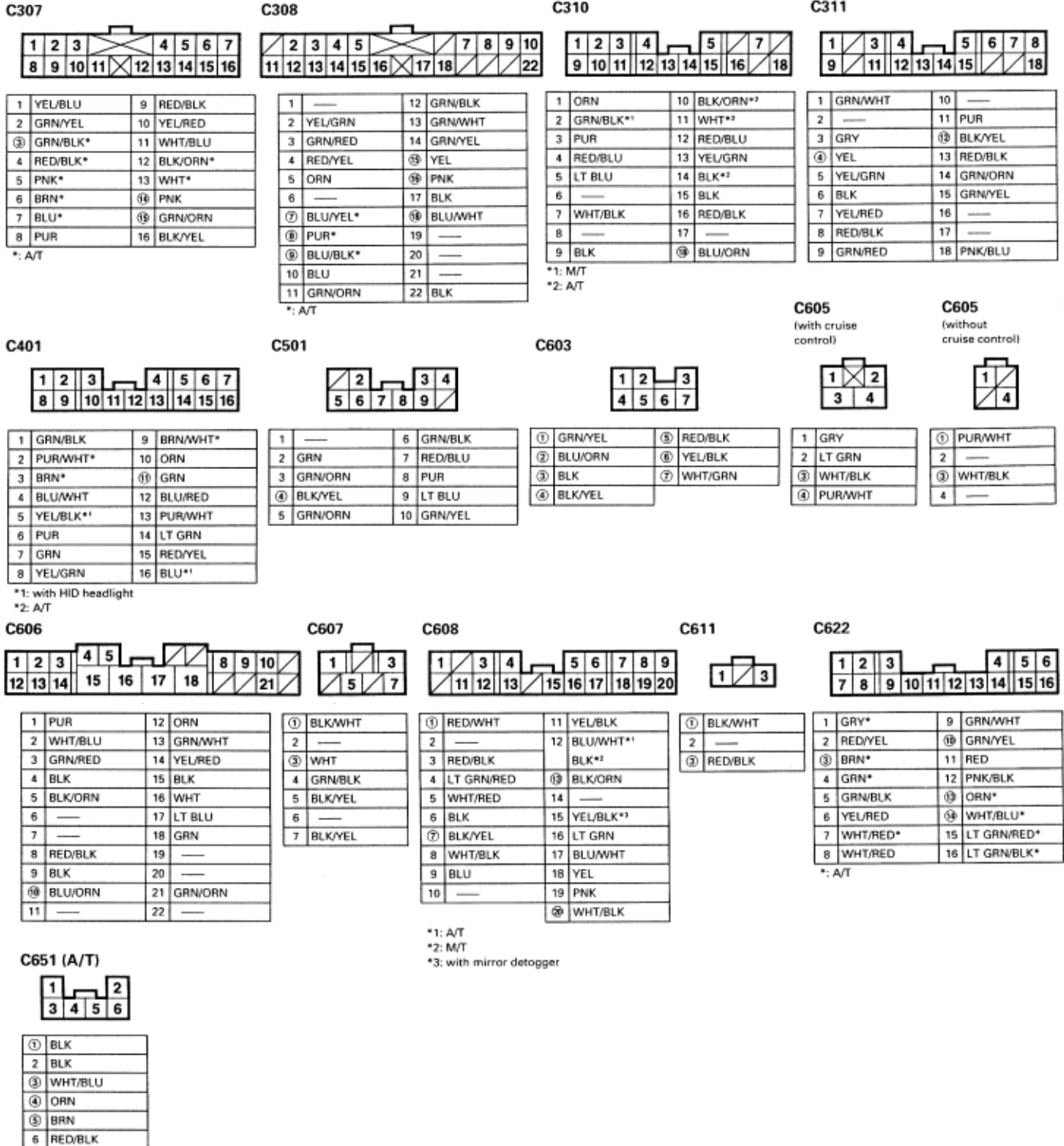


NOTE: ♦ O: Related to Fuel and Emissions System.
♦ Connector with male terminals (double outline): View from terminal side
♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (LHD)

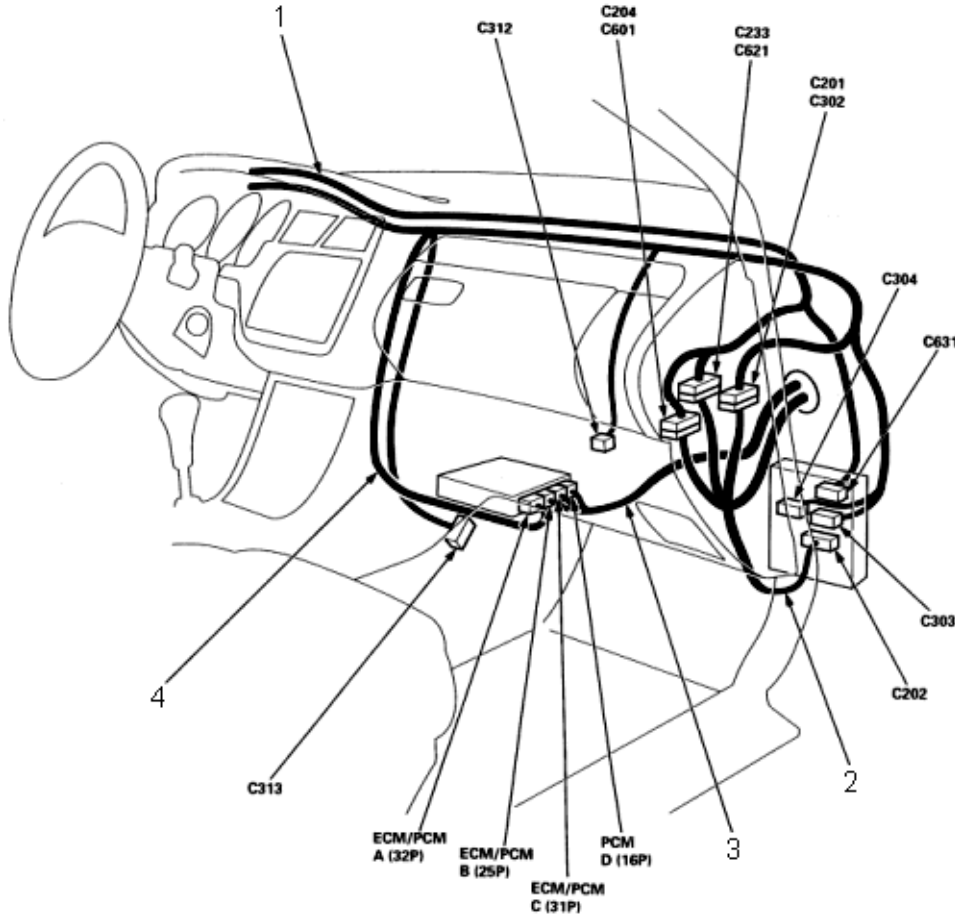


1. DASHBOARD WIRE HARNESS B
2. DASHBOARD WIRE HARNESS A
3. LEFT SIDE WIRE HARNESS



NOTE: ♦ O: Related to Fuel and Emissions System.
♦ Connector with male terminals (double outline): View from terminal side
♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (LHD)



1. DASHBOARD WIRE HARNESS B
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS
3. ENGINE WIRE HARNESS
4. DASHBOARD WIRE HARNESS A

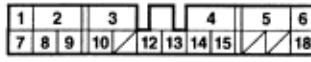
C201



1	LT BLU**	12	BLU/BLK
2	GRN/RED	13	GRN/BLK
3	BLK/WHT	14	RED
4	YEL	15	YEL/RED
5	BLK/ORN**	16	GRN
	GRN/BLK**	17	BLU
6	WHT	18	YEL/GRN
7	RED/BLK	19	WHT/BLU
8	PNK	20	YEL/GRN
9	BLU	21	BLK/WHT
10	BRN	22	WHT
11	---		

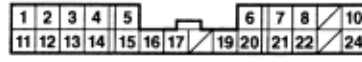
*1: A/T
*2: M/T

C202



1	GRN	10	BLK/YEL
2	RED/YEL	11	---
3	BLK/YEL	12	BLU/WHT
4	YEL/RED	13	BLU/RED
5	YEL	14	GRN/YEL
6	BLU/RED	15	PNK
7	RED/BLK	16	---
8	BLK/ORN	17	---
9	WHT/GRN	18	PUR/WHT

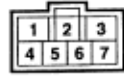
C233



1	RED/BLU	13	LT GRN/RED
2	BLK	14	LT BLU
3	RED/WHT*	15	YEL/BLK
4	BLK	16	ORN
5	RED/WHT	17	PUR/WHT
6	YEL	18	---
7	GRN/WHT*	19	GRN
8	BLK/YEL	20	GRN/BLK
9	---	21	RED/WHT
10	BLU/WHT	22	WHT/GRN
11	YEL/BLU	23	---
12	BRN/WHT*	24	YEL/GRN*

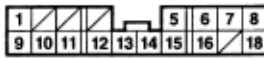
*: with climate control

C204



1	BLK/WHT
2	WHT/BLU
3	WHT
4	BLU
5	BLU/YEL
6	BLU/RED
7	BLU/BLK

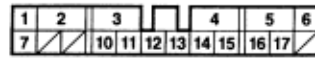
C303



1	BLU/WHT	10	RED/WHT
2	---	11	PUR/WHT
3	---	12	BLK/YEL
4	---	13	RED/YEL
5	RED/YEL	14	RED/BLU
6	BRN/WHT	15	WHT/GRN
7	RED/BLK	16	GRN/WHT
8	BLK/WHT	17	---
9	GRN/BLK	18	RED/YEL

*: with HID headlights
2: PNK/BLK

C304



1	BLU**	10	WHT/GRN
2	RED*	11	WHT/GRN
3	GRN/WHT	12	YEL/BLK**
4	WHT/BLK**	13	WHT/RED
5	WHT	14	PUR/WHT
6	YEL/GRN	15	---
7	YEL	16	PNK
8	---	17	BLU/RED
9	---	18	---

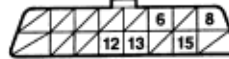
*1: with power seat
*2: with headlight washer
*3: with mirror defogger

C312



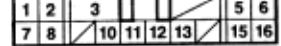
1	GRN/BLK
2	BRN

C313



1	---	9	---
2	---	10	---
3	---	11	---
4	---	12	BLK
5	---	13	PUR/WHT
6	LT BLU	14	---
7	---	15	GRY
8	WHT/GRN	16	---

C631



1	WHT/BLU	9	---
2	GRN/YEL	10	BLU/YEL
3	WHT	11	WHT/GRN
4	---	12	YEL
5	RED/BLK	13	LT GRN
6	BLK	14	---
7	YEL/BLK	15	BLK/ORN
8	BLU/WHT	16	WHT/BLU

ECM/PCM A (32P)



1	---	17	PNK	33	WHT
2	---	18	PNK/BLK	34	BLU/ORN
3	---	19	GRN/BLK	35	RED
4	---	20	GRN/YEL	36	WHT/BLU
5	PUR	21	---	37	BLU/RED
6	BLU/YEL*	22	RED	38	WHT/RED
7	PUR*	23	GRN/ORN	39	---
8	BLK/WHT	24	BLU	40	---
9	BLU/WHT*	25	BLK/WHT	41	BRN
10	BRN	26	GRY	42	WHT/BLK
11	BLU/BLK*	27	ORN		

*: A/T

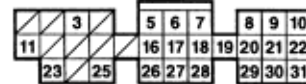
ECM/PCM B (25P)



1	YEL/BLK	13	YEL/GRN
2	BLK	14	BLU/BLK*
3	RED	15	---
4	BLU	16	RED/BLU
5	YEL	17	RED
6	---	18	GRN*
7	PNK	19	---
8	WHT*	20	BRN/BLK
9	YEL/BLK	21	WHT/BLU
10	BLK	22	BRN/BLK
11	BRN	23	BLK/BLU
12	GRN/YEL	24	BLU/WHT*
		25	ORN*

*: A/T

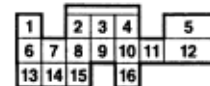
ECM/PCM C (31P)



1	---	17	---	33	BLU/WHT**
2	---	18	---	34	---
3	RED/BLU	19	---	35	RED/YEL
4	---	20	---	36	RED/WHT
5	WHT/RED	21	WHT	37	RED/BLK
6	WHT/BLK	22	RED/GRN	38	YEL/BLU
7	GRN/WHT	23	GRN/BLK	39	YEL
8	BLU	24	YEL/RED	40	BLK
9	WHT	25	GRN	41	GRN
10	BLU/BLK	26	RED		
11	RED/BLK**	27	RED/YEL		

*1: A/T
*2: M/T

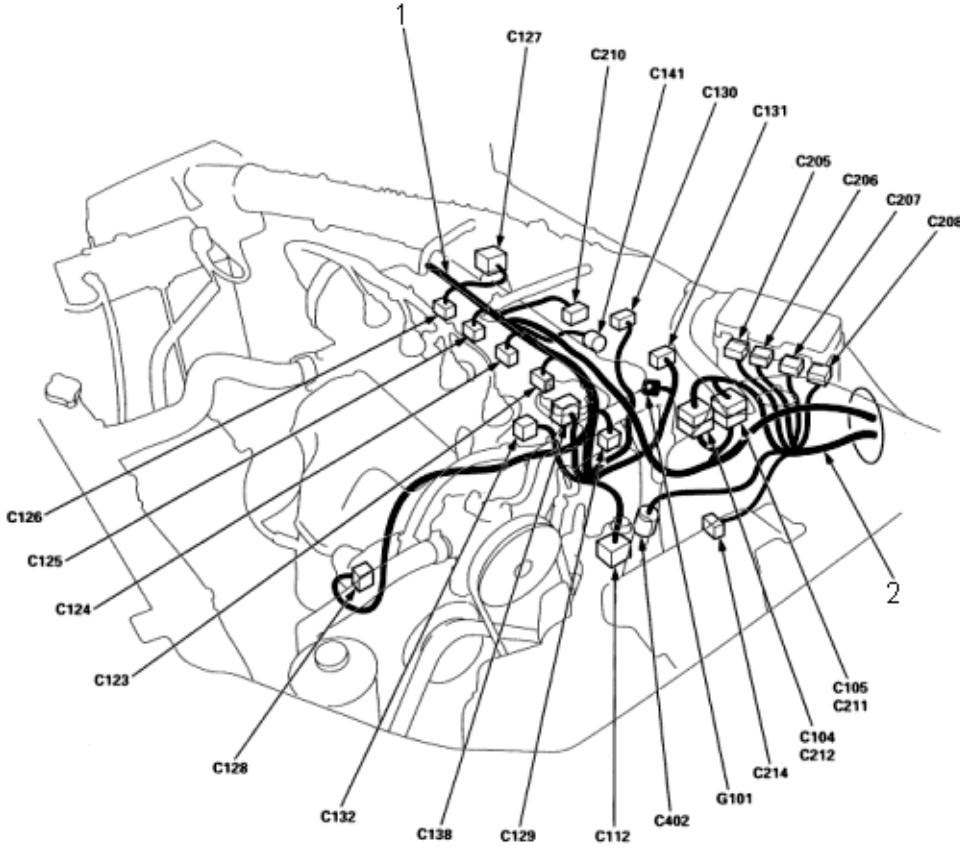
PCM D (16P) (A/T)



1	YEL	9	YEL
2	GRN/WHT	10	BLU
3	GRN	11	RED
4	RED/BLK	12	WHT
5	YEL/BLK	13	BLU/WHT
6	WHT	14	BLU
7	BLU/YEL	15	BRN
8	PNK	16	GRN

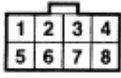
- NOTE:
- O: Related to Fuel and Emissions System.
 - Connector with male terminals (double outline): View from terminal side
 - Connector with female terminals (single outline): View from wire side

Engine Compartment (RHD)



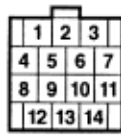
1. ENGINE WIRE HARNESS
2. LEFT ENGINE COMPARTMENT WIRE HARNESS

C104 (M/T)



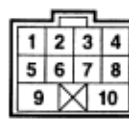
1	YEL	5	BLU/WHT
②	BRN/BLK	6	GRN/BLK
3	YEL/GRN	7	GRN
④	GRN/BLK	8	YEL/RED

C104 (A/T)



①	BRN/BLK	⑧	BLU/WHT
2	YEL/GRN	9	PNK
③	GRN/BLK	10	BLU
4	RED/BLK	11	BRN
5	BLK/BLU	12	GRN
6	WHT	⑬	RED/BLK
7	YEL/RED	14	LT BLU

C105



1	RED/WHT*	⑥	BLK/WHT
②	WHT/BLU	7	WHT/BLU
③	BLK/YEL	⑧	BLK
④	YEL/BLK	9	BLK/WHT
⑤	GRN	10	BLK/YEL

*: with climate control

C112



①	WHT
②	GRN/BLK
③	BLK/YEL
④	BLK/WHT

C123



①	BRN
②	YEL/BLK

C124



①	RED
②	YEL/BLK

C125



①	BLU
②	YEL/BLK

C126



①	YEL
②	YEL/BLK

C127



①	WHT/BLK
②	GRN/BLK
③	YEL/BLU
④	PNK
5	---
⑥	BLK

C128



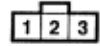
1	WHT/BLU
②	WHT/RED

C129



①	GRN
②	RED
③	BLU
④	WHT

C130



①	BLK
②	YEL/BLK
③	BLK/BLU

C131



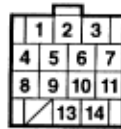
①	RED/YEL
②	GRN/BLK

C132



①	RED/BLU
---	---------

C138



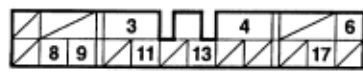
①	YEL/BLK	⑧	BLK/YEL
②	YEL/BLK	⑨	BLK/YEL
③	YEL/BLK	⑩	BLK/YEL
④	YEL/BLK	⑪	BLK/YEL
⑤	YEL/BLK	12	---
⑥	YEL/BLK	⑬	BLK/YEL
⑦	YEL/BLK	⑭	BLK/YEL

C141



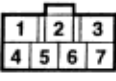
①	BLK/YEL
②	RED/BLU

C205



1	---	10	---
2	---	11	LT GRN/BLU
3	RED/YEL	12	---
4	RED/WHT	13	BLU/RED
5	---	14	---
6	PUR/WHT	15	---
7	---	16	---
8	BLU/RED	⑱	WHT/GRN
9	BLU/RED	18	---

C206



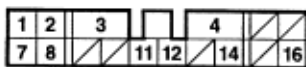
1	WHT/BLU
2	YEL/GRN
3	YEL/RED
4	WHT/GRN
⑤	PUR/WHT
6	GRN
⑦	YEL

C207



1	YEL/BLK
②	WHT
3	WHT/GRN

C208



①	BLK/ORN	9	---
2	RED/WHT	10	---
3	BLU/BLK	⑱	RED
4	BLU/YEL	12	GRN
5	---	13	---
6	---	14	BLK
7	RED	15	---
8	BLK/ORN	16	BLK/ORN

C210



①	BLK/YEL
②	RED/YEL

C214



1	---
②	BLU

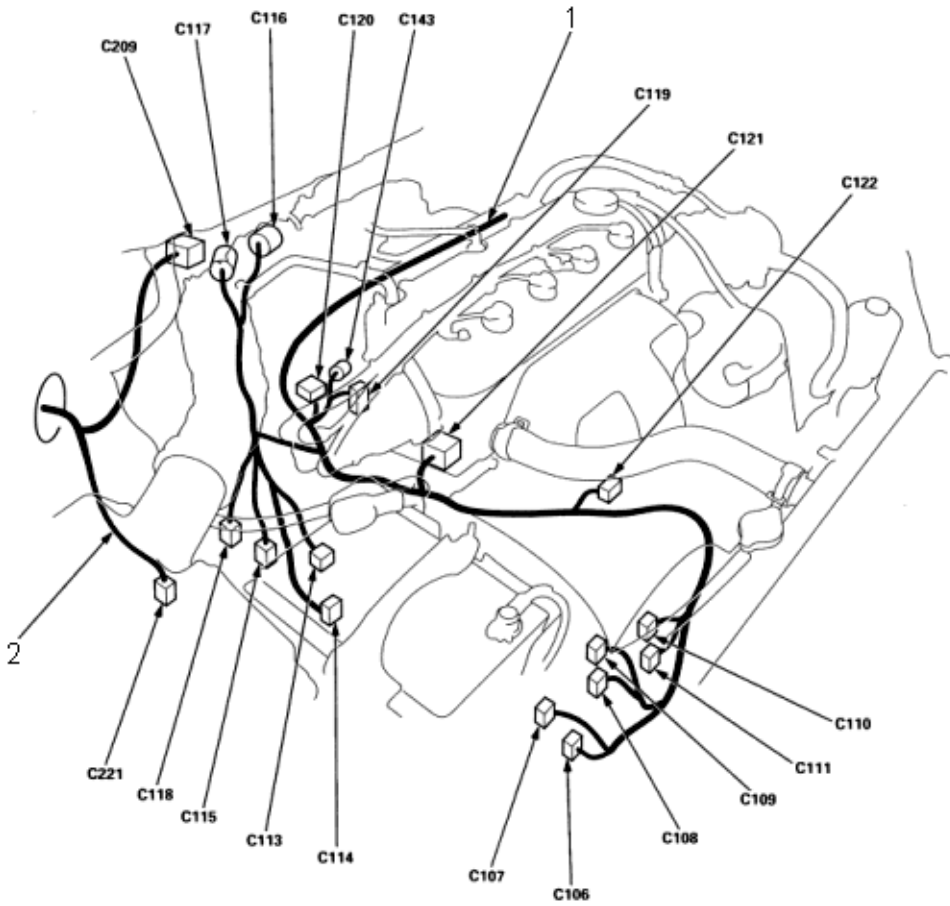
C402



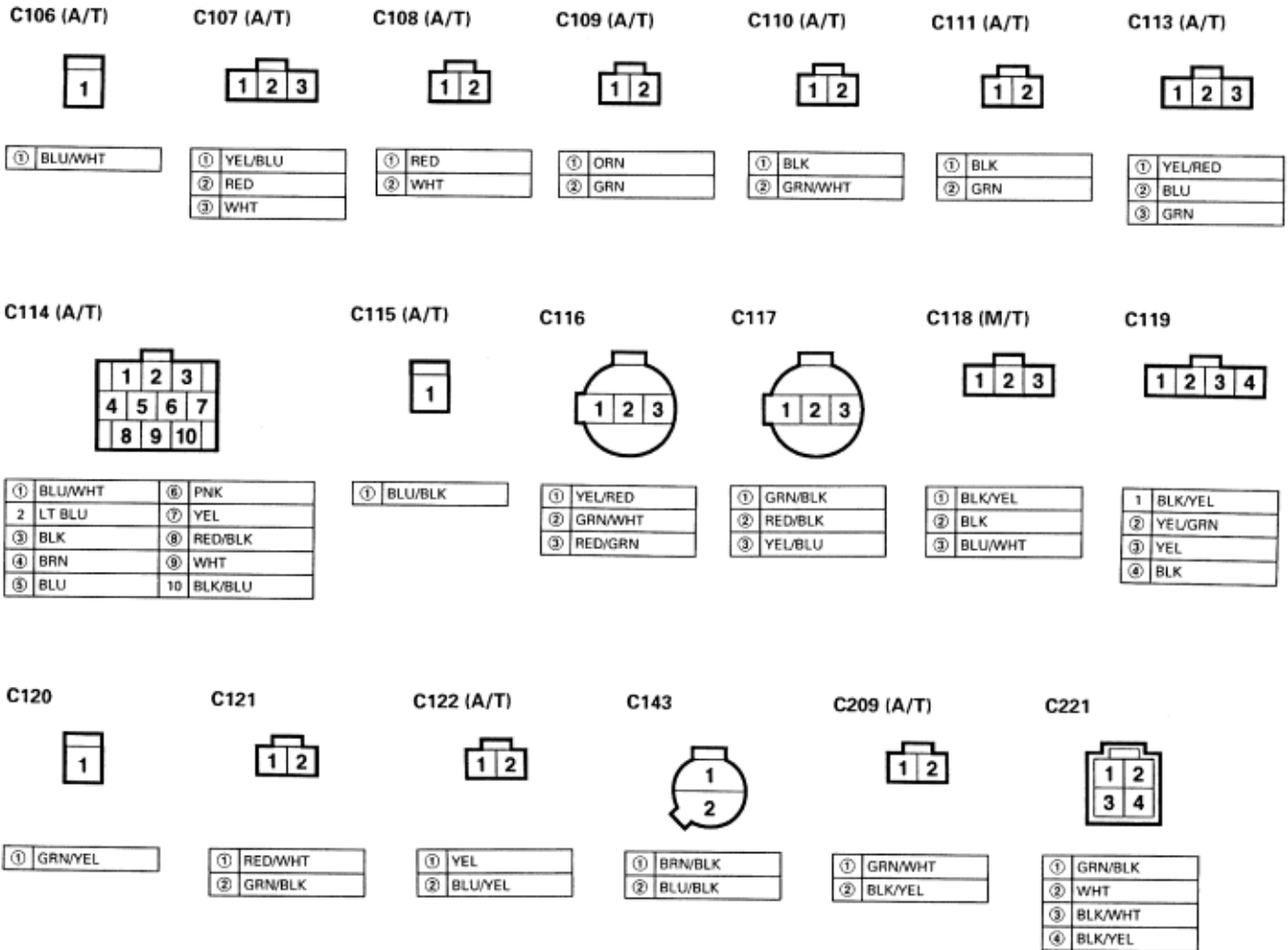
①	GRN
②	BLK

NOTE: ♦ O: Related to Fuel and Emissions System.
 ♦ Connector with male terminals (double outline): View from terminal side
 ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (RHD)

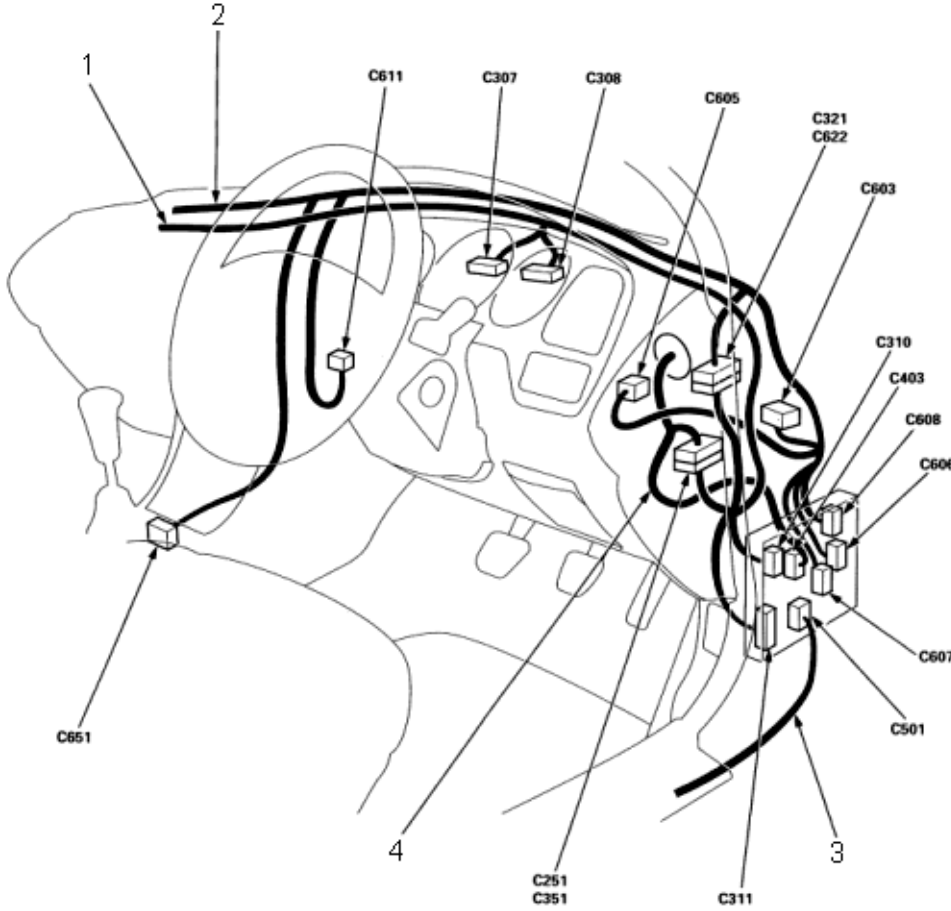


1. ENGINE WIRE HARNESS
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS



NOTE: ♦ O: Related to Fuel and Emissions System.
 ♦ Connector with male terminals (double outline): View from terminal side
 ♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (RHD)



1. DASHBOARD WIRE HARNESS A
2. DASHBOARD WIRE HARNESS B
3. RIGHT SIDE WIRE HARNESS
4. RIGHT ENGINE COMPARTMENT WIRE HARNESS

C307



1	YEL/BLU	9	RED/BLK
2	GRN/YEL	10	YEL/RED
③	GRN/BLK*	11	WHT/BLU
4	RED/BLK*	12	BLK/ORN*
5	PNK*	13	WHT*
6	BRN*	④	PNK
7	BLU*	⑤	GRN/ORN
8	PUR	16	BLK/YEL

*1: A/T

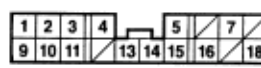
C308



1	---	12	GRN/ORN
2	YEL/GRN	13	GRN/YEL
3	GRN/RED	14	GRN/WHT
4	RED/WHT	⑥	YEL
5	ORN	⑦	PNK
6	---	17	BLK
7	BLU/YEL*	⑧	BLU/WHT
8	PUR*	19	---
9	BLU/BLK*	20	---
10	BLU	21	---
11	GRN/BLK	22	BLK

*1: A/T

C310

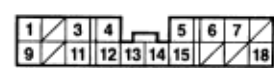


1	ORN	10	BLK/ORN**
2	GRN/BLK**	11	WHT**
3	LT BLU	12	---
4	RED/BLU	13	YEL/GRN
5	PUR	14	BLK
6	---	15	BLK
⑦	WHT/BLK	16	RED/BLK
8	---	17	---
9	BLK	⑧	BLU/ORN

*1: M/T

*2: A/T

C311



1	GRN/WHT	10	---
2	---	11	PUR
3	GRY	⑨	BLK/YEL
④	YEL	13	RED/BLK
5	YEL/GRN	14	GRN/ORN
6	BLK	15	GRN/YEL
7	YEL/RED	16	---
8	---	17	---
9	GRN/RED	18	PNK/BLU

C251



1	GRN/YEL	8	---
2	---	⑩	WHT
③	PUR/WHT	⑪	BLK/WHT
4	ORN**	⑫	GRN/BLK
5	---	12	---
6	BLU/BLK	13	RED/WHT
7	---	⑬	GRN/WHT**

*1: with fog light

*2: A/T

C403



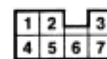
1	ORN	11	---
2	BLK	12	---
3	GRN/RED	⑭	BLK/YEL
4	---	14	---
5	---	15	---
6	YEL/GRN	16	---
7	LT BLU	17	---
8	---	18	RED/BLK
9	---	19	---
10	---	20	GRN/RED

C501



1	RED/BLK	6	GRN/BLK
2	GRN	7	---
3	GRN/ORN	8	LT BLU
④	BLK/YEL	9	PUR
5	GRN/ORN	10	GRN/YEL

C603



①	GRN/YEL
②	BLU/ORN
③	BLK
④	BLK/YEL
⑤	RED/BLK
⑥	YEL/BLK
⑦	WHT/GRN

C622



1	GRY*	9	GRN/WHT
2	WHT/RED*	⑩	GRN/YEL
③	BRN*	11	RED
4	GRN*	12	PNK/BLK
5	GRN/RED	⑪	ORN*
6	YEL/RED	⑫	WHT/BLU*
7	WHT/BLU*	15	LT GRN/RED*
8	YEL/BLK	16	LT GRN/BLK*

*1: A/T

C605
(With
cruise
control)

C605
(Without
cruise
control)

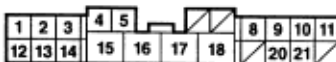


1	GRY
2	LT GRN
③	WHT/BLK
④	PUR/WHT



①	PUR/WHT
2	---
③	WHT/BLK
4	---

C606



1	LT BLU	12	ORN
2	WHT/BLU	13	GRN/WHT
3	GRN/RED	14	YEL/RED
4	BLK	15	BLK
5	BLK/ORN	16	WHT
6	---	17	PUR
7	---	18	GRN
8	RED/BLK	19	---
9	BLK	20	WHT/BLU
⑩	BLU/ORN	21	GRN/ORN
11	---	22	---

C607



1	BLK/WHT
2	---
③	WHT
4	GRN/BLK
5	BLK/YEL
6	---
7	BLK/YEL

C608



①	RED/WHT	11	YEL/BLK
2	GRN/YEL	12	BLU/WHT**
3	RED/BLK	13	BLK**
4	LT GRN/RED	⑩	BLK/ORN
5	WHT/RED	14	---
6	BLK	15	YEL/BLK**
⑦	BLK/YEL	16	LT GRN
8	WHT/BLK	17	BLU/WHT
9	BLU	18	YEL
10	BLU/YEL	19	PNK
		⑪	WHT/BLK

*1: A/T

*2: M/T

*3: with mirror defogger

C611



①	RED/WHT
2	---
③	RED/BLK

C651 (A/T)

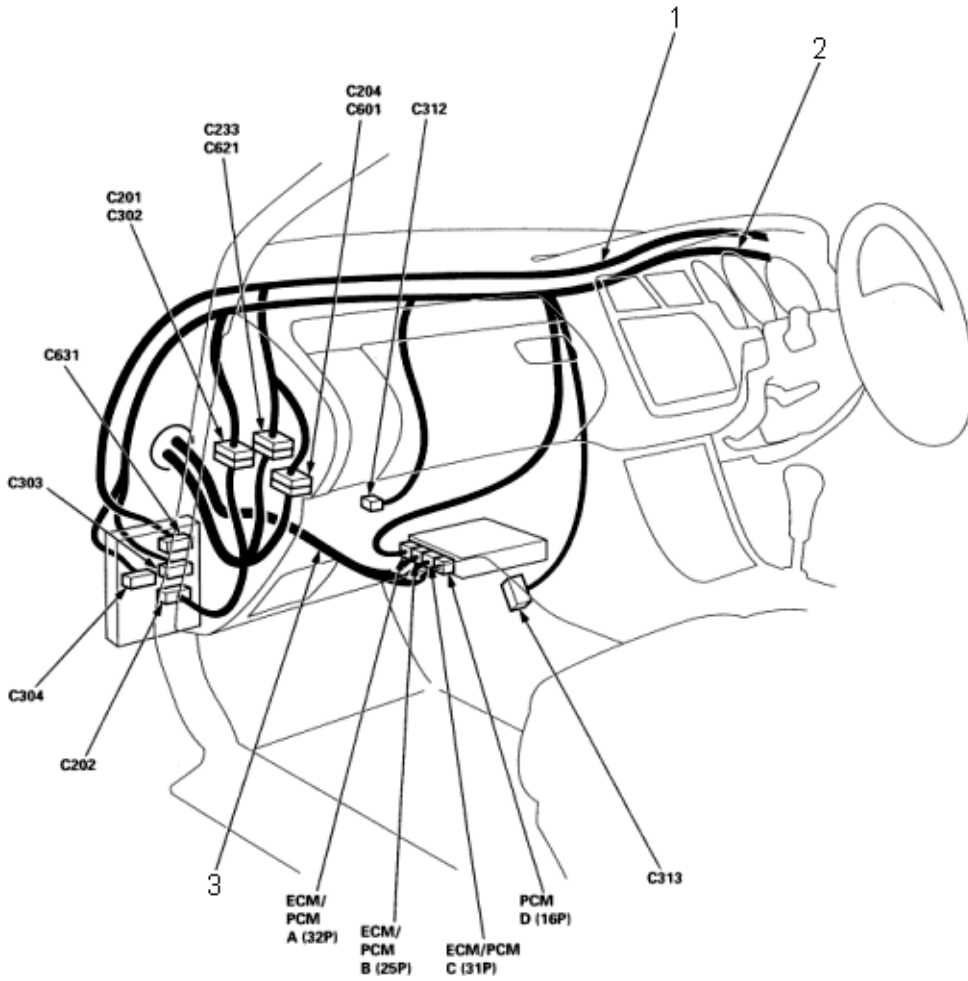


①	BLK
2	BLK
③	WHT/BLU
④	ORN
⑤	BRN
6	RED/BLK

- NOTE: ♦ O: Related to Fuel and Emissions System.
♦ Connector with male terminals (double outline): View from terminal side
♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (RHD)

1. DASHBOARD WIRE HARNESS B
2. DASHBOARD WIRE HARNESS A
3. ENGINE WIRE HARNESS



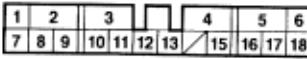
C201



1	YEL/GRN	12	YEL**
2	BLU/RED	13	BRN
③	GRN/WHT**	14	PUR/WHT
4	WHT**	⑤	BLU
5	BLK/ORN**	16	YEL/GRN
6	RED/BLK**	17	YEL/GRN
7	BLU**	18	BLU/BLK
8	BRN**	19	YEL/RED
9	PNK**	20	BRN/WHT**
⑩	GRN/BLK	21	---
⑪	RED	⑫	BLK/WHT

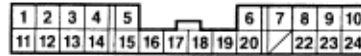
*1: A/T
*2: M/T

C202



1	GRN	10	BLK/YEL
2	RED/WHT	11	GRY
③	BLK/YEL	④	BLU/WHT
4	YEL/RED	13	BLU/RED
⑤	YEL	14	---
⑥	BLU/RED	⑦	PNK
7	BLK/YEL	16	LT BLU
⑧	BLK/ORN	17	RED/BLK
⑨	WHT/GRN	⑩	PUR/WHT

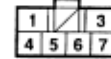
C233



1	BLU/YEL	13	WHT/BLK
2	GRN/YEL	14	WHT/GRN
3	GRN	15	RED/WHT
4	GRN/BLK	16	ORN**
5	GRN/WHT**	17	BRN/WHT**
6	RED/WHT**	18	BLK/YEL
7	YEL/BLU	⑧	BLK
8	PUR	⑨	YEL/BLK
⑩	BLU/WHT**	21	---
10	YEL/GRN**	22	BLK**
11	YEL/RED	⑫	PUR/WHT
12	LT GRN/RED	24	YEL

*1: with climate control
*2: A/T

C204



1	BLK/WHT
2	---
③	WHT
4	BLU*
5	BLU/YEL*
6	BLU/RED*
7	BLU/BLK*

*: without climate control

C312



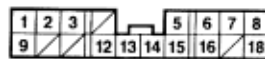
①	GRN/BLK
②	ORN

C313



1	---	9	---
2	---	10	---
3	---	11	---
4	---	12	BLK
5	---	⑬	PUR/WHT
6	LT BLU	14	---
7	---	⑭	GRY
⑮	WHT/GRN	16	---

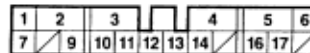
C303



1	BLU/WHT**	10	---
2	RED/WHT	11	---
3	PUR/WHT	⑫	BLK/YEL
4	---	13	RED/WHT
5	RED/YEL	14	RED/BLU
6	BRN/WHT	⑮	WHT/GRN
7	BLK/YEL**	16	GRN/WHT
8	BLK/WHT	17	---
9	GRN/BLK	18	RED/YEL**

*1: M/T
*2: with headlight washer
*3: with fog light

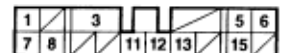
C304



1	BLU**	10	WHT/GRN
2	RED**	11	WHT/GRN
3	GRN/WHT	12	YEL/BLK**
4	WHT/BLK**	13	WHT/RED
5	WHT	⑫	PUR/WHT
6	YEL/GRN	15	---
7	YEL	⑮	PNK
8	---	⑯	BLU/RED
9	RED/BLK	18	---

*1: with power seat
*2: with headlight washer
*3: with mirror defogger

C631



1	WHT/BLU	9	---
2	---	10	---
3	WHT	⑩	WHT/GRN
4	---	12	YEL
5	BLK/YEL	13	LT GRN
6	BLK	14	---
7	YEL/BLK	15	BLK/ORN
8	BLU/WHT	16	---

ECM/PCM A (32P)



1	---	⑬	PNK	⑳	WHT
2	---	⑭	PNK/BLK	㉑	BLU/ORN
3	---	⑮	GRN/BLK	㉒	RED
4	---	⑯	GRN/YEL	㉓	WHT/BLU
⑤	PUR	16	---	⑳	BLU/RED
⑥	BLU/YEL*	⑰	RED	㉑	WHT/RED
⑦	PUR*	⑱	GRN/ORN	29	---
⑧	BLK/WHT	⑲	BLU	30	---
⑨	BLU/WHT*	㉒	BLK/WHT	31	BRN
⑩	BRN	㉓	GRY	⑳	WHT/BLK
⑪	BLU/BLK*	㉔	ORN		

*: A/T

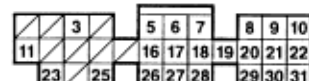
ECM/PCM B (25P)



①	YEL/BLK	⑮	YEL/GRN
②	BLK	⑯	BLU/BLK*
③	RED	15	---
④	BLU	⑰	RED/BLU
⑤	YEL	⑱	RED
6	---	⑳	GRN*
⑦	PNK	19	---
⑧	WHT*	㉑	BRN/BLK
⑨	YEL/BLK	㉒	WHT/BLU
⑩	BLK	㉓	BRN/BLK
⑪	BRN	㉔	BLK/BLU
⑫	GRN/YEL	㉕	BLU/WHT*
		㉖	ORN*

*: A/T

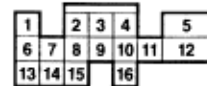
ECM/PCM C (31P)



1	---	13	---	⑳	RED/YEL
2	---	14	---	㉑	RED/WHT
③	RED/BLU	15	---	㉒	RED/BLK
4	---	⑮	WHT	㉓	YEL/BLU
⑤	WHT/RED	⑰	RED/GRN	㉔	YEL
⑥	WHT/BLK	⑱	GRN/BLK	㉕	BLK
⑦	GRN/WHT	⑲	YEL/RED	㉖	GRN
⑧	BLU	㉑	GRN		
⑨	WHT	㉒	RED		
⑩	BLU/BLK	㉓	RED/YEL		
⑪	RED/BLK**	㉔	BLU/WHT**		
12	---	24	---		

*1: A/T
*2: M/T

PCM D (16P) (A/T)

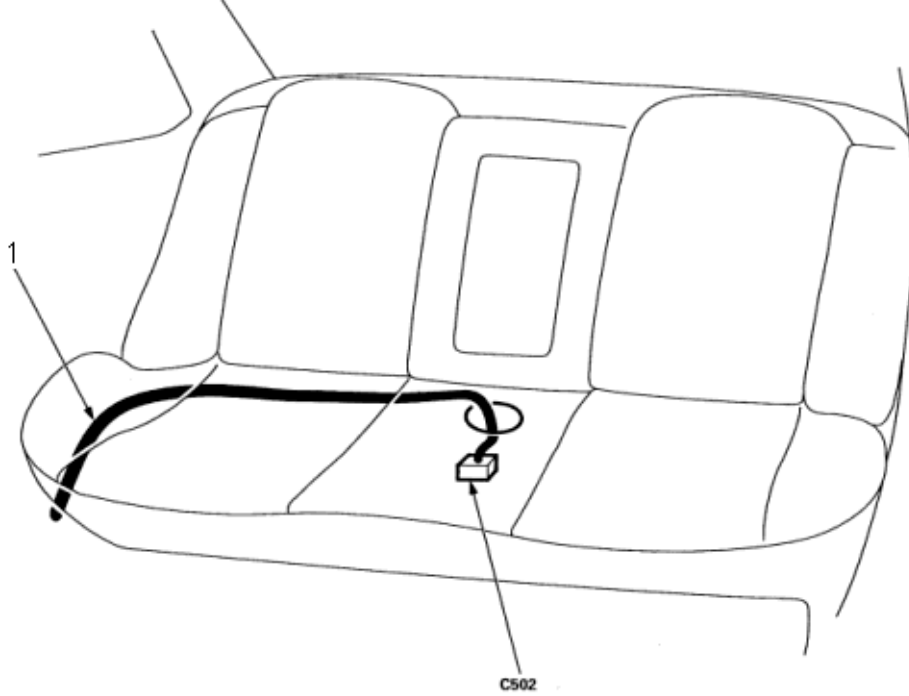


①	YEL	⑮	YEL
②	GRN/WHT	⑯	BLU
③	GRN	⑰	RED
④	RED/BLK	⑱	WHT
⑤	YEL/BLK	⑲	BLU/WHT
⑥	WHT	⑳	BLU
⑦	BLU/YEL	㉑	BRN
⑧	PNK	㉒	GRN

- NOTE: ♦ O: Related to Fuel and Emissions System.
♦ Connector with male terminals (double outline): View from terminal side
♦ Connector with female terminals (single outline): View from wire side

Fuel Pump (RHD)

1. RIGHT SIDE WIRE HARNESS



C502



- NOTE: ♦ O: Related to Fuel and Emissions System.
- ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Intermittent Failures

The term “intermittent failure” means a system may have had a failure, but it checks OK now. If the Malfunction indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting.

Opens and Shorts

“Open” and “Short” are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. In complex electronics (like ECM's/PCM's) this can sometimes mean something works, but not the way it is supposed to.

A flowchart is designed to be used from the start to final repair.

It is like a map showing you the shortest distance. But beware: if you go off the “map” anywhere but a “stop” symbol, you can easily get lost.

START

(bold type) Describes the conditions or situation to start a troubleshooting flowchart.

ACTION

Asks you to do something; perform a test, set up a condition etc.

DECISION

Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.

STOP

(bold type) The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

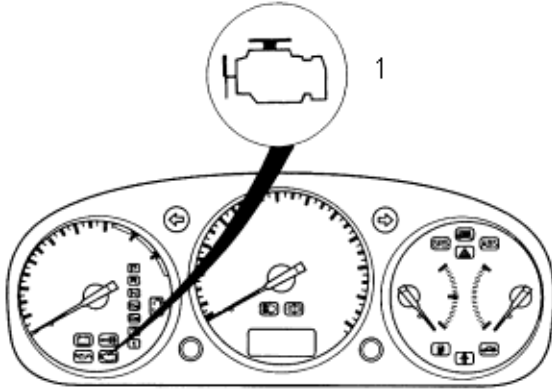
General Troubleshooting Information

How to Use the PGM Tester or a Scan Tool (F18B2, F18B4 engine)

11-B-32

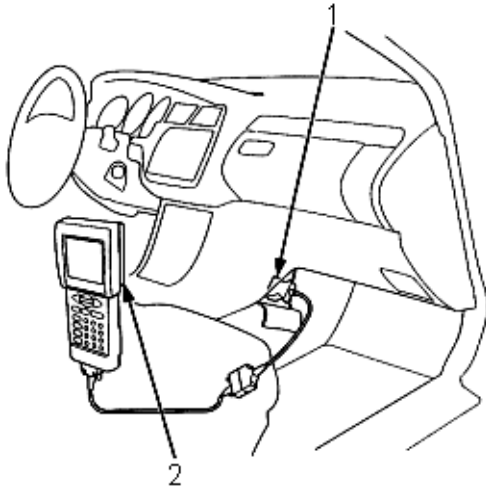
If the MIL (Malfunction Indicator Lamp) has come on

1. Start the engine and check the MIL.



1. MALFUNCTION INDICATOR LAMP (MIL)

2. If the MIL stays on, turn the ignition switch OFF and connect the Honda PGM Tester or a scan tool to the Data Link Connector (DLC) located on the passenger's side of the centre console.



1. DATA LINK CONNECTOR (DLC)
2. SCAN TOOL or HONDA PGM TESTER

The illustration shows LHD type.

RHD type is symmetrical.

3. Turn the ignition switch ON (II).
4. Check the diagnostic Trouble Codes (DTC) and note it. Also check the freeze frame data. Refer to the DTC Troubleshooting index and begin the appropriate troubleshooting procedure.

NOTE:

- ♦ Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected.
- ♦ The scan tool and the Honda PGM Tester can read the DTC, freeze frame data, current data and other ECM/PCM data.
- ♦ For specific operations, refer to the user's manual that came with the scan tool or Honda PGM Tester.

If the MIL did not come on

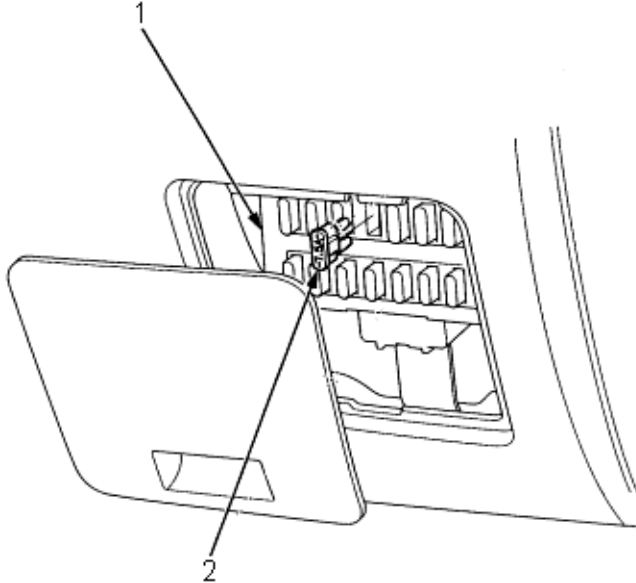
If the MIL did not come on but there is a drivability problem, refer to the Symptom Troubleshooting Index (See Page 11-B-38).

If you can not duplicate the DTC

Some of the troubleshooting in this section requires you to reset the Engine Control Module (ECM)/Powertrain Control Module (PCM) and try to duplicate the DTC. IF the problem is intermittent and you cannot duplicate the code, do not continue through the procedure. To do so will only result in confusion and possibly, a needlessly replaced ECM/PCM.

You can reset the ECM/PCM in either of two ways:

- ♦ Use the scan tool or Honda PGM Tester to clear the ECM's/PCM's memory. See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- ♦ Turn the ignition switch OFF, and remove the No 13 CLOCK BACK UP (7.5 A) fuse from the passenger's under-dash fuse/relay box for 10 seconds.



1. PASSENGER'S UNDER-DASH FUSE/RELAY BOX
2. No. 13 CLOCK BACK UP (7.5 A) FUSE

How to End a Troubleshooting Session (F18B2, F18B4 engine)

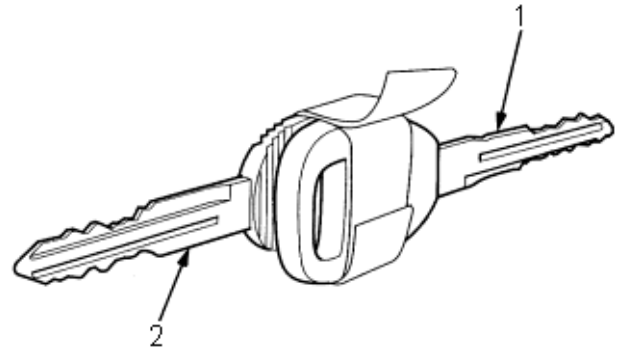
This procedure must be done after any troubleshooting.

1. Do the ECM/PCM Reset Procedure
2. Turn the ignition switch OFF.
3. Disconnect the scan tool or Honda PGM Tester from the Data Link Connector (DLC).

NOTE: The ECM/PCM is part of the immobiliser system. If you replace ECM/PCM, the ECM/PCM will have different immobiliser code. In order for the engine to start, you must rewrite the immobiliser code with the Honda PGM Tester.

Use this procedure if you need a know-good ECM/PCM to test a vehicle. It allows you to swap a ECM/PCM from the test vehicle's ignition key.

1. Cut a temporary ignition key for the test vehicle with a non-immobiliser key blank.
2. Remove the ECM/PCM from the test vehicle.
3. Write the test vehicle's VIN on the ECM/PCM you just remove to avoid confusing it with the donor vehicle's ECM/PCM.
4. Remove the know-good ECM/PCM from the donor vehicle, and install it in the test vehicle.
5. Tape the donor vehicle's temporary key. The ECM/PCM will recognise the code from the donor vehicle's key and allow you to start the engine with the temporary key.



1. VEHICLES KEY (DONOR)
2. TEMPORARY KEY

6. After completing you test, reinstall both ECM's/PCM's, and destroy the temporary key.

Scan tool DTC		Honda DTC		Detection Item	Page
DTC	Temporary DTC	DTC (MIL indication*)	Temporary DTC		
P0107	-	3-1 (3)	-	Manifold Absolute Pressure (MAP) Sensor Circuit Low Input	(See Page 11-B-52)
P0108	-	3-2 (3)	-	Manifold Absolute Pressure (MAP) Sensor Circuit High Input	(See Page 11-B-53)
P0112	-	10-1 (10)	-	Intake Air Temperature (IAT) Sensor Circuit Low Input	(See Page 11-B-54)
P0113	-	10-2 (10)	-	Intake Air Temperature (IAT) Sensor Circuit High Input	(See Page 11-B-55)
P0117	-	6-1 (6)	-	Engine Coolant Temperature (ECT) Sensor Circuit Low Input	(See Page 11-B-56)
P0118	-	6-2 (6)	-	Engine Coolant Temperature (ECT) Sensor Circuit High Input	(See Page 11-B-58)
P0122	-	7.4-(7)	-	Throttle Position (TP) Sensor Circuit Low Input	(See Page 11-B-59)
P0123	-	7-2 (7)	-	Throttle Position (TP) Sensor Circuit High Input	(See Page 11-B-61)
P0131	-	1-1 (1)	-	Primary Heated Oxygen Sensor (HO2S) Circuit Low Voltage	(See Page 11-B-62)
P0132	-	1-2 (1)	-	Primary Heated Oxygen Sensor (HO2S) Circuit High Voltage	(See Page 11-B-63)
P0133	P0133	61-1 (61)	61-1	Primary Heated Oxygen Sensor (HO2S) Slow Response	(See Page 11-B-64)
P0135	-	41-1 (41)	-	Primary Heated Oxygen Sensor (HO2S) Heater Circuit Malfunction	(See Page 11-B-68)
P0137	P0136	63-1 (63)	-	Secondary Heated Oxygen Sensor (HO2S) Circuit Low Voltage	(See Page 11-B-65)
P0138	P0136	63-2 (63)	-	Secondary Heated Oxygen Sensor (HO2S) Circuit High Voltage	(See Page 11-B-66)
P0139	P1036	63-3 (63)	-	Secondary Heated Oxygen Sensor (HO2S) Slow Response	(See Page 11-B-67)
P0141	-	65-2 (65)	-	Secondary Heated Oxygen Sensor (HO2S) Heater Circuit Malfunction	(See Page 11-B-68)
P0171	P0170	45-1 (45)	-	Fuel System Too Lean	(See Page 11-B-70)
P0172	P0170	45-2 (45)	-	Fuel System Too Rich	(See Page 11-B-70)

*: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

Scan tool DTC		Honda DTC		Detection Item	Page
DTC	Temporary DTC	DTC (MIL indication*)	Temporary DTC		
P0300 and some of P0301 P0302 P0303 P0304	P1399	(71) (72) (73) (74)	-	Random Misfire	(See Page 11-B-72)
P0301 P0302 P0303 P0304	P1399	(71) (72) (73) (74)	-	Cylinder 1 Cylinder 2 Cylinder 3 Cylinder 4 Misfire Detected	(See Page 11-B-73)
P0325	-	23-1 (23)	-	Knock Sensor (KS) Circuit Malfunction	(See Page 11-B-75)
P0335	-	4-1 (4)	-	Crankshaft Position (CKP) Sensor Circuit Malfunction	(See Page 11-B-75)
P036	-	4-2 (4)	-	Crankshaft Position (CKP) Sensor Range/Performance	(See Page 11-B-76)
P0401	P0401	80-1 (80)	80-1 (80)	Exhaust Gas Recalculation Insufficient Flow Detected	(See Page 11-B-97)
P0402	-	67-1	67-1 (67)	Catalyst System Efficiency Below Threshold	(See Page 11-B-96)
P0443	-	92-4 (92)	-	Evaporative Emission (EVAP) Purge Control Solenoid Valve Circuit Malfunction	(See Page 11-B-102)
P0500	-	17-1 (17)	-	Vehicle Speed Sensor (VSS) Malfunction (M/T)	(See Page 11-B-79)
P0715 P0720 P0730 P0753 P0758 P0763	-	70-3 (70)*	-	Automatic Transaxle	Section 14
P1107	-	13-1 (13)	-	Barometric Pressure Circuit Low Input	(See Page 11-B-80)
P1108	-	13-2 (13)	-	Barometric Pressure Circuit High Input	(See Page 11-B-80)
P1259	-	22-4 (22)	-	VTEC System Malfunction	Section 6
P1359	-	8-3 (8)	-	Crankshaft Position/Top Dead Centre/Cylinder Position Sensor Connector Disconnection	(See Page 11-B-78)

*: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

*1: The  indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

General Troubleshooting Information
DTC Troubleshooting Index (F18B2, F18B4 engine)
 (cont'd)

11-B-36

Scan tool DTC		Honda DTC		Detection Item	Page
DTC	Temporary DTC	DTC (MIL indication*)	Temporary DTC		
P1361	-	8-2 (8)	-	Top Dead Centre (TDC) Sensor Intermittent Interruption	(See Page 11-B-76)
P1362	-	8-1 (8)	-	Top Dead Centre (TDC) Sensor No Signal	(See Page 11-B-76)
P1381	-	9-2 (9)	-	Cylinder Position (CYP) Sensor Intermittent Interruption	(See Page 11-B-81)
P1382	-	9-1 (9)	-	Cylinder Position (CYP) Sensor No Signal	(See Page 11-B-81)
P1491	P1491	12-3 (12)	12-3 (12)	EGR Valve Lift Insufficient Detected	(See Page 11-B-98)
P1498	-	12-2 (12)	-	EGR Valve Lift Sensor High Voltage	(See Page 11-B-101)
P1519	-	14-1 (14)	-	Idle Air Control Valve Circuit Failure	(See Page 11-B-91)
P1607	-	0-2	-	Engine Control Module (ECM)/Powertrain Control Module (PCM) Internal Circuit Failure	(See Page 11-B-83)
P1705 P1706 P1738 P1739 P1753 P1768 P1773 P1791	-	70-2 (70)*1	-	Automatic Transaxle	Section 14

*: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

*1: The  indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.

General Troubleshooting Information
Symptom Troubleshooting Index (F18B2, F18B4
engine) (cont'd)

11-B-39

FUEL SUPPLY						INTAKE AIR				EMISSIONS CONTROL			
FUEL LINES, FUEL PRESSURE	FUEL INJECTOR	FUEL FILTER	FUEL PUMP	PGM-FI MAIN RELAY	FUEL	AIR CLEANER	THROTTLE CABLE	THROTTLE BODY	IAB CONTROL SYSTEM	TWC	EGR SYSTEM	PCV SYSTEM	EVAP EMISSION CONTROL SYSTEM
-	-	-	-	-	-	-	-	-	-	11-B-96	11-B-97	-	11-B-102
1	3		2	2	1			3					
1	3	2	2		1			3			3		
							2	2					
							2	2					
								2					
								2					
2	2				3						3	3	
1	2		2		2								
2	2				3					1			
1	3	2	2		3	2	2	2	3	2	3		

Troubleshooting**ECM/PCM Data (F18B2, F18B4 engine)****11-B-40**

You can retrieve data from the ECM/PCM by connecting the scan tool or the Honda PGM Tester to the 16P data link connector (DLC). The items listed in the table below can be indicated by both scan tool and Honda PGM tester. The Honda PGM Tester also reads data beyond these items. Understanding this data may help you find the causes of intermittent problems.

NOTE:

- The “operating values” listed are approximate and may vary depending on the environment and the individual vehicle.
- Unless noted otherwise, “at idle speed” means idling with the engine completely warmed up, A/T in Park or neutral, M/T in neutral and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM/PCM detects a problem, it will store it as a code consisting of one letter and four numbers.	If no problem is detected, there is no output.	YES
Engine Speed	The ECM/PCM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication At idle speed: M/T: 750 ± 50 rpm (min ⁻¹) A/T: 730 ± 50 rpm (min ⁻¹)	YES
Vehicle Speed	The ECM/PCM converts pulse signals from the Vehicle Speed Sensor (VSS) (M/T) or countershaft speed sensor (A/T) into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure At idle speed: 21-41 kPa (160-310 mmHg, 6.3-12.2 inHg)	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM/PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM/PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT With engine warmed up: approx. 70-100°C (158-212°F)	YES
Heated Oxygen Sensor (HO2S) (Primary Sensor 1) (Secondary Sensor 2)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM/PCM. Based on these signals, the ECM/PCM controls the air/fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the ratio is richer than the stoichiometric ratio), the voltage signal is higher.	0.0-1.25 V At idle speed: about 0.1-0.9 V	YES (Primary Sensor 1 only)
HO2S Feedback Loop Status	Loop status is indicated as “open” or “closed”. Closed: Based on the HO2S output, the ECM/PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: ignoring HO2S output, the ECM/PCM refers to signals from the TP, MAP and ECT sensors to control the amount of injected fuel.	At idle speed: closed	YES

Troubleshooting**11-B-41****ECM/PCM Data (F18B2, F18B4 engine) (cont'd)**

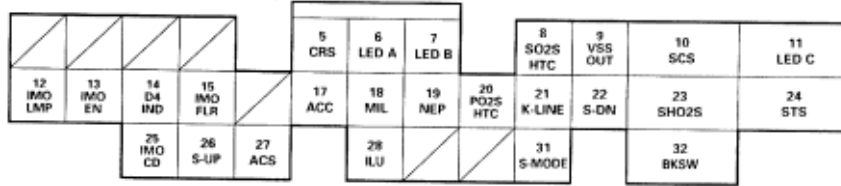
Data	Description	Operating Value	Freeze Data
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO ₂ S feedback is in the closed loop status. When the signal from the HO ₂ S is weak, short term fuel trim gets higher, and the ECM/PCM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO ₂ S output. Consequently, the short term fuel trim is lowered, and the ECM/PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	± 20%	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	± 20%	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM/PCM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: approx. 10%	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the ECM/PCM. The ECM/PCM matches ignition timing to the driving conditions.	At idle speed: 12° ± 2° BTDC with the SCS service signal line is jumped with the Honda PGM tester	NO
Calculated Load Valve (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 12 - 34 %	YES

Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (F18B2, F18B4 engine)

11-B-42

ECM/PCM CONNECTOR A (32P)

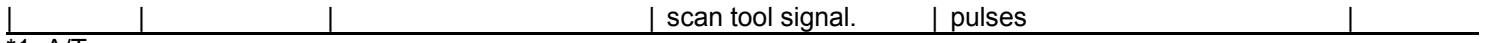


Wire side of female terminals

ECM/PCM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire Colour	Terminal Name	Description	Signal
5*1	PUR	CRS (CRUISE CONTROL SIGNAL)	Down shift signal input from cruises control unit.	When cruise control is used: pulses
6*1	BLU/YEL	LED A	Shift indicator light control	In manual mode: <ul style="list-style-type: none"> In 4th gear position: battery voltage In 1st, 2nd and 3rd gear positions: 0 V
7*1	PUR	LED B	Shift indicator light control	In manual mode: <ul style="list-style-type: none"> In 2nd and 3rd gear position: battery voltage In 1st and 4th gear positions: 0 V
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATED CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
9*1	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Vehicle speed signal detected from countershaft speed sensor.	Depending on vehicle speed: pulses
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0 V With the terminal disconnected: about 5 V or battery voltage
11	BLU/BLK	LED C	Shift indicator light control	In manual mode: <ul style="list-style-type: none"> In 1st and 3rd gear positions: battery voltage In 2nd and 4th gear positions: 0 V
12	PNK	IMOLMP (IMMOBILISER INDICATOR LIGHT)	Drives immobiliser indicator light.	With immobiliser indicator light turned ON: 0 V With immobiliser indicator light turned OFF: battery voltage
13	PNK/BLK	IMOEN (IMMOBILISER ENABLE SIGNAL)	Sends immobiliser enable signal.	
14*1	GRN/BLK	D4IND (D4 INDICATOR)	Drives D4 indicator light.	With D4 indicator light turned ON: 0 V With D4 indicator light turned OFF: battery voltage
15	GRN/BLK	IMO FLR (IMMOBILISER FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
20	BLK/WHT	PO2SHTC (PRIMARY HEATED CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
21	GRY	K-LINE	Sends and receives	With ignition switch ON (II):



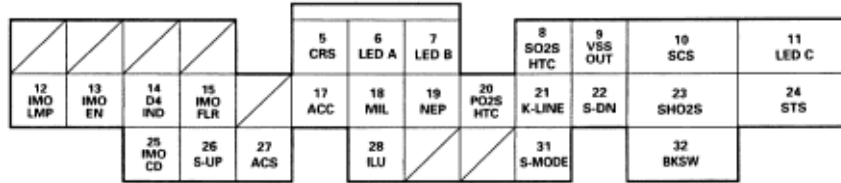
*1: A/T
*2: M/T

Troubleshooting

11-B-43

Engine/Powertrain Control Module Terminal Arrangement (F18B2, F18B4 engine)(cont'd)

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

ECM/PCM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire Colour	Terminal Name	Description	Signal
22*1	ORN	S-DN (SHIFT DOWN)	Detects downshift switch signal.	In manual and shift lever pushed toward downshift position (marked with "-"): 0 V In manual mode and shift lever in neutral position: battery voltage
23	WHT	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
24	BLU/ORN	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: 0 V
25	RED	IMOC D (IMMOBILISER CODE)	Detects immobiliser signal.	
26*1	WHT/BLU	S-UP (SHIFT UP)	Detects upshift switch signal.	In manual mode and shift lever pushed toward upshift position (marked with "+"): 0 V In manual mode and shift lever in neutral position: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: about 5 V
28*1	WHT/RED	ILU (INTERLOCK CONTROL UNIT)	Drives interlock control unit.	With ignition switch ON (II) and brake pedal depressed: battery voltage
31*1	BRN	S-MODE (SHIFT MODE)	Detects manual mode switch signal.	In manual mode (shift lever is positioned in manual mode): 0 V In other than manual mode: battery voltage
32	WHT/BLK	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage

*1: A/T

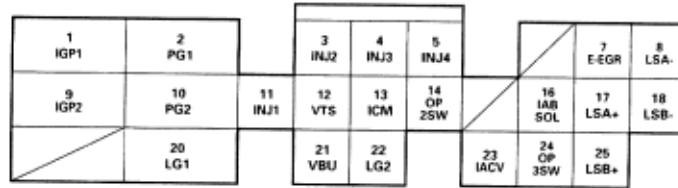
*2: M/T

Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (F18B2, F18B4 engine) (cont'd)

11-B-44

ECM/PCM CONNECTOR B (25P)



Wire side of female terminals

PCM CONNECTOR B (25P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire Colour	Terminal Name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
3	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	With engine running: pulses
4	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel filter	With engine running: pulses
5	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	With engine running: pulses
7	PNK	E-EGR	Drives EGR valve.	With EGR operation during driving with fully warmed up engine: duty controlled With EGR not operating: 0 V
8*1	WHT	LSA- (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A - SIDE)	A/T clutch pressure control solenoid valve A power supply negative electrode.	With ignition switch ON (II): pulses
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
11	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	With engine running: pulses
12	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: 0 V With engine at high rpm: battery voltage
13	YEL/GRN	ICM (IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): battery voltage With ignition running: about 10 V (depending on engine speed)
14*1	BLU/BLK	OP2SW (2ND OIL PRESSURE SWITCH)	Detects 2nd oil pressure switch.	With ignition switch ON (II): battery voltage
16	RED/BLU	IABSOL (INTAKE AIR BYPASS CONTROL SOLENOID VALVE)	Drives IAB control solenoid valve.	With engine running, engine speed below: 3,900 rpm (min ⁻¹) battery voltage With engine running, engine speed above: 3,900 rpm (min ⁻¹) 0 V
17*1	RED	LSA+ (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A + SIDE)	A/T clutch pressure control solenoid valve A power supply positive electrode.	With ignition switch ON (II): pulses
18*1	GRN	LSB- (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B - SIDE)	A/T clutch pressure control solenoid valve B power supply negative electrode.	With ignition switch ON (II): pulses
20	BRN/BLK	LG11 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
21	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM/PCM control	Battery voltage at all times

			circuit. Power source for the DTC memory.	
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
23	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: pulses
24*1	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch.	With ignition switch ON (II): battery voltage
25*1	ORN	LSB+ (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B + SIDE)	A/T clutch pressure control solenoid valve B power supply positive electrode.	With ignition switch ON (II): pulses

*1: A/T

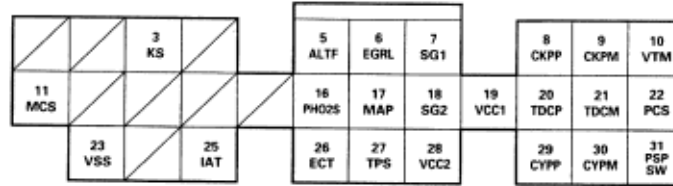
*2: M/T

Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (F18B2, F18B4 engine) (cont'd)

11-B-45

ECM/PCM CONNECTOR C (13P)



Wire side of female terminals

ECM/PCM CONNECTOR C (13P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire Colour	Terminal Name	Description	Signal
3	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine knocking: pulses
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V - battery voltage (depending on electrical load)
6	WHT/BLK	EGRL (EGR VALVE LIFT SENSOR)	Detects EGR valve lift sensor signal.	At idle: about 1.2 V
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
9	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor.	
10	BLU/BLK	VTM (VTEC PRESSURE SWITCH SIGNAL)	Detects VTEC pressure switch signal.	With engine at low engine speed: 0 V With engine at high engine speed: battery voltage
11*1	RED/BLK	MCS (ENGINE MOUNT CONTROL SOLENOID VALVE)	Drives engine mount control solenoid valve.	At idle: 0 V Above idle: battery voltage
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) signal.	With throttle fully opened from idle with fully, warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	RED/GRN	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/BLK	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
20	GRN	TDCP (TDC SENSOR P SIDE)	Detects TDC sensor.	With engine running: pulses
21	RED	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor.	
22	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant below 55°C (131°F): battery voltage With engine running, engine coolant above 55°C (131°F): duty controlled
23*2	BLU/WHT	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheel rotating: cycles 0 V - about 5 V or battery voltage
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 - 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 - 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V

28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON: about 5 V With ignition switch OFF: 0 V
29	YEL/BLU	CYPP (CYP SENSOR P SIDE)	Detects CYP sensor.	With engine running: pulses
30	BLK	CYPM (CYP SENSOR M SIDE)	Ground for CYP sensor.	
31	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage

*1: A/T

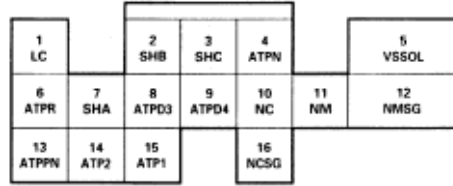
*2: M/T

Troubleshooting

Engine/Powertrain Control Module Terminal Arrangement (F18B2, F18B4 engine) (cont'd)

11-B-46

PCM CONNECTOR D (16P)



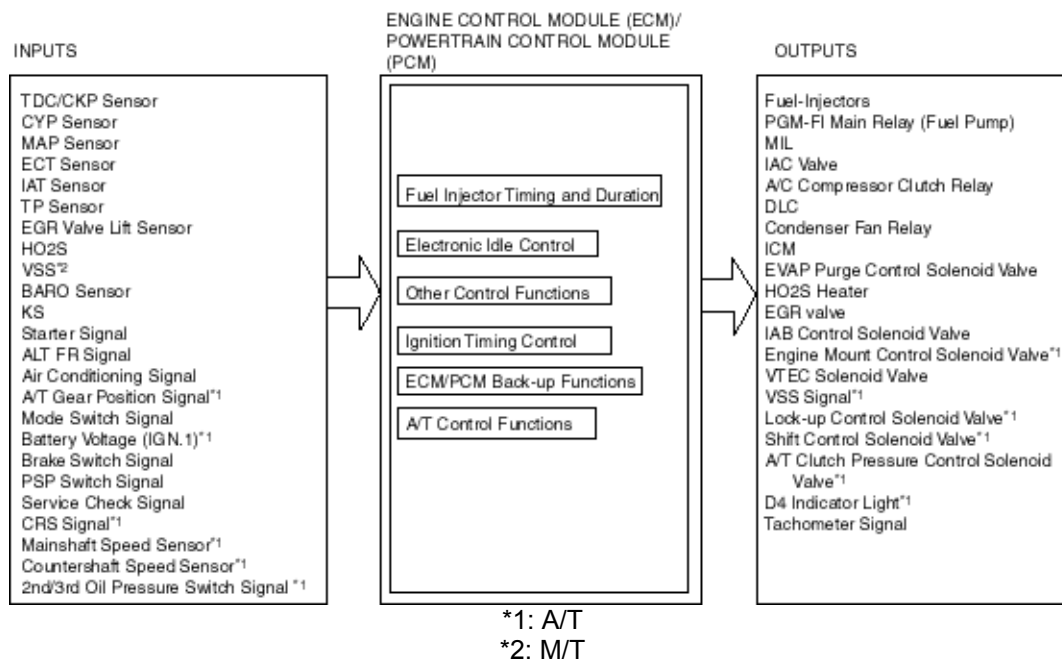
Wire side of female terminals

PCM CONNECTOR D (16P) (A/T only)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire Colour	Terminal Name	Description	Signal
1	YEL	LC (LOCK-UP CONTROL SOLENOID VALVE)	Drives lock-up control solenoid valve.	During half and full lock-up conditions and during deceleration condition: battery voltage during no lock-up condition: 0 V
2	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B.	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 1, 2 and positions ♦ D4 and D4 positions in 1st and 2nd gear. ♦ P, R and N positions 0 V in following positions: <ul style="list-style-type: none"> ♦ D4 and D3 positions in 3rd gear ♦ D4 position in 4th gear
3	GRN	SHC (SHIFT CONTROL SOLENOID VALVE C)	Drives shift control solenoid valve C.	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4, D3 positions in 1st and 3rd gear 0 V in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4, D3 positions in 2nd gear ♦ D4 position in 4th gear ♦ P, R and N positions
4	RED/BLK	ATPN (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In N position: 0 V In any other position: about 5 V
5	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve.	With ignition switch ON (II): battery voltage With ignition switch off: 0 V
6	WHT	ATPR (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In R position: 0 V In any other position: about 5 V
7	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A.	Battery voltage in following positions: <ul style="list-style-type: none"> ♦ 2 position ♦ D4 and D3 positions in 2nd and 3rd gear 0 V in following positions: <ul style="list-style-type: none"> ♦ 1 position ♦ D4 and D3 position in 1st gear ♦ D4 position in 4th gear ♦ P, R and N positions
8	PNK	ATPD3 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D3 position: 0 V In any other position: about 5 V
9	YEL	ATPD4 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D4 position: 0 V In any other position: about 5 V
10	BLU	NC (COUNTERSHAFT)	Detects countershaft	Depending on vehicle speed:

		SPEED SENSOR)	speed sensor signals.	pulsing signal When engine is stopped: approx. 0 V
11	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals.	Depending on vehicle speed: pulsing signal When vehicle is stopped: approx. 0 V
12	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
13	BLU/WHT	ATPPN (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In P or N position: 0 V In any other position: about 5 V
14	BLU	ATP2 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 2 position: 0 V In any other position: about 5 V
15	BRN	ATP1 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 1 position: 0 V In any other position: about 5 V
16	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM/PCM contains memories for the basic discharge durations at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

When the engine is cold, the A/C compressor is on, the transmission is in gear^{*1} the brake pedal is depressed, the P/S load is high, or the alternator is charging, the ECM/PCM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- ♦ The ECM/PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- ♦ A knock control system is also used. When detonation is detected by a knock sensor (KS), the ignition timing is retarded.

Other Control Functions

1. Starting Control
When the engine is started, the ECM/PCM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
 - ♦ When the ignition switch is initially turned ON (II), the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurise the fuel system.
 - ♦ When the engine is running, the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
 - ♦ When the engine is not running and the ignition is ON (II), the ECM/PCM cuts ground to the PGM-FI main relay that cuts current to the fuel pump.
3. Fuel Cut-off Control
 - ♦ During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,000 rpm (min⁻¹).
 - ♦ Fuel cut-off action also takes place when engine speed exceeds 6,500 rpm (min⁻¹), regardless of the position of the throttle valve, to protect the engine from over-revving.
4. A/C Compressor Clutch Relay
When the ECM/PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energised, and enriches the mixture to assure smooth transition to the A/C mode.
5. Intake Air Bypass (IAB) Control Solenoid Valve
When the engine rpm is below 4,200 rpm (min⁻¹), the IAB control solenoid valve is activated by a signal from the ECM/PCM, intake air flows through the long intake path, then high torque is delivered. At speeds higher than 4,200 rpm (min⁻¹), the solenoid valve is deactivated by the ECM/PCM, and intake air flows through the short intake path in order to reduce the resistance in airflow.
6. Evaporative Emission (EVAP) Purge Control Solenoid Valve
When the engine coolant temperature is above 55°C (131°F), the ECM/PCM controls the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.
7. Exhaust Gas Recirculation (EGR) Control Solenoid Valve
When the EGR is required for control of oxides of nitrogen (NO_x) emissions, the ECM/PCM controls the EGR valve.

ECM/PCM Fail-safe/Back-up Functions

1. **Fail-safe Function**
When an abnormality occurs in a signal from a sensor, the ECM/PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. **Back-up Function**
When an abnormality occurs in the ECM/PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.
3. **Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]**
When an abnormality occurs in a signal from a sensor, the ECM/PCM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned ON (II), the ECM/PCM supplies ground for the MIL for two seconds to check the MIL bulb condition.
4. **Two Driving Cycle Detection Method**
To prevent false indications, the "two driving cycle detection method" is used for the EGR system and other self-diagnostic functions. When an abnormality occurs, the ECM/PCM stores it in its memory. When the same abnormality recurs after the switch is turned OFF and ON (II) again, the ECM/PCM informs the driver by turning on the MIL.

PGM-FI System

System Descriptions (F18B2, F18B4 engine)

(cont'd)

11-B-50

The Programmed Fuel Injection (PGM-FI) system is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM/PCM contains the memory for basic discharge duration at various engine speeds and manifold pressures.

The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

By monitoring Long Term Fuel Trim, the ECM/PCM detects long term malfunctions in the fuel system, and will set a DTC if the malfunction occurs during two consecutive trips.

Ignition Timing Control

The ECM/PCM contains the memory for basic ignition timing at various engine speeds and manifold air flow rates. It also adjusts the timing according to engine coolant temperature.

The ECM/PCM detects misfiring by using the CKP sensor to monitor fluctuations in crankshaft speed.

It will then set DTCs depending on how much misfiring occurs.

Starting Control

When the engine is started, the ECM/PCM provides a rich mixture by increasing fuel injector duration.

Alternator Control

The alternator signals the ECM/PCM during charging. The ECM/PCM then controls the voltage generated at the alternator according to the electrical load determined by the ELD (Electrical Load Detector) and driving mode. This reduces engine load to improve fuel economy.

A/C Switch

The A/C (air conditioning) switch signals the ECM/PCM whenever there is a demand for cooling.

A/C Compressor Clutch Relay

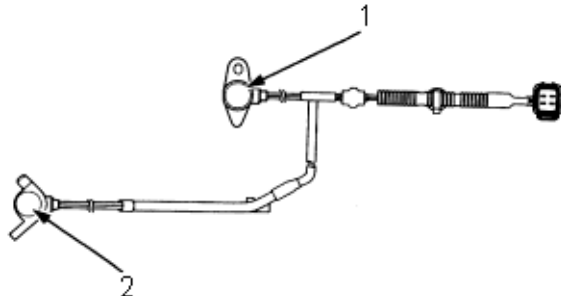
When the ECM/PCM receives a demand for cooling from the A/C system, it delays the compressor from being energised, and enriches the mixture to assure smooth transition to the A/C mode.

Vehicle Speed Sensor (VSS)

The speed sensor generates a pulsed signal from an input of 5 volts. The number of pulses per minutes increases/decreases with the speed of the vehicle.

CKP (Crankshaft Position) and TDC (Top Dead Centre) Sensors

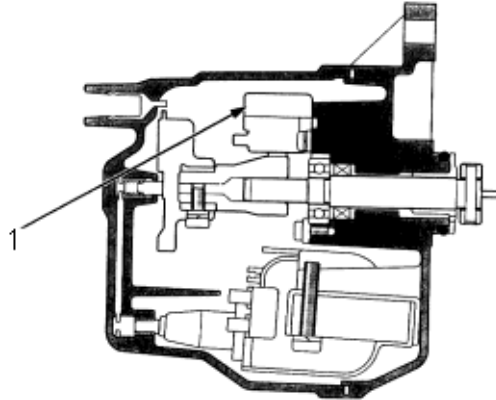
The CKP Sensor determines fuel injection timing and ignition timing for each cylinder and also detects engine speed. The TDC sensor determines ignition timing at start-up and when crankshaft position signal is abnormal.



1. CKP SENSOR ROTOR
2. TDC SENSOR ROTOR

CYP (Cylinder Position) Sensor

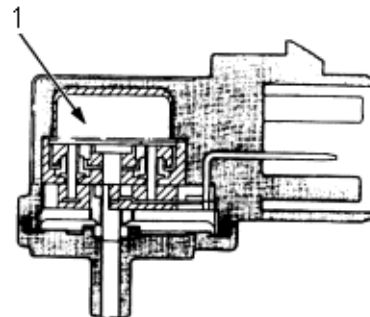
The CYP sensor inside the distributor detects the position of the No. 1 cylinder as a reference for sequential fuel injection to each cylinder.



1. PICK UP ASSEMBLY

MAP (Manifold Absolute Pressure) Sensor

The MAP sensor converts manifold absolute pressure into electrical signals to the ECM/PCM.



1. SENSOR UNIT

PGM-FI System

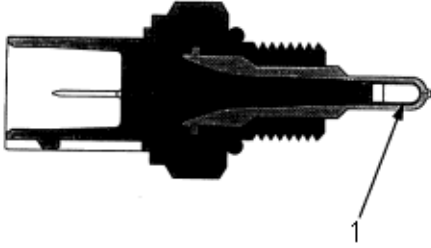
System Descriptions (F18B2, F18B4 engine)

(cont'd)

11-B-51

Intake Air Temperature (IAT) Sensor

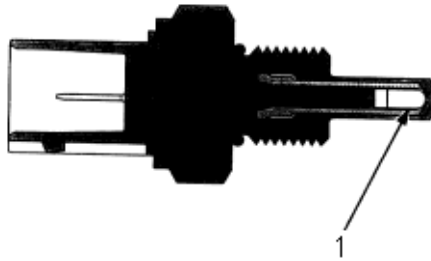
The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.



1. THERMISTOR

Engine Coolant Temperature (ECT) Sensor

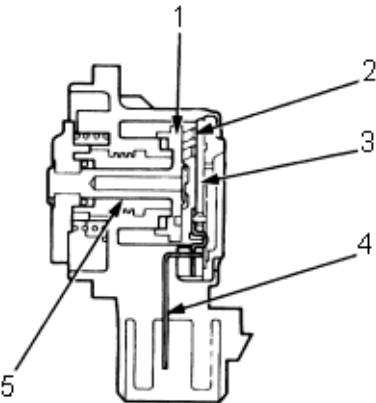
The ECT sensor is a temperature dependant resistor (thermistor). The resistor of the thermistor decreases as the engine coolant temperature increases.



1. THERMISTOR

Throttle Position (TP) Sensor

The TP sensor is a potentiometer connected to the throttle valve shaft. As the throttle position changes, the sensor varies the signal voltage to the ECM/PCM. The TP sensor is not replaceable apart from the throttle body.



1. BRUSH HOLDER
2. BRUSH
3. RESISTOR
4. TERMINAL
5. INNER BUSHING

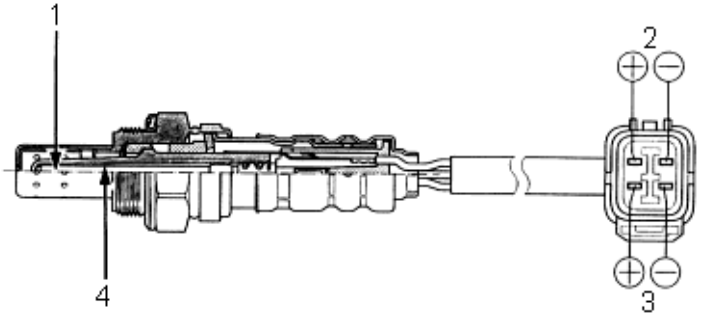
Barometric Pressure (BARO) Sensor

The barometric pressure sensor is inside the ECM/PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

Primary Heated Oxygen Sensor (PHO2S) and Secondary Heated Oxygen Sensor (SHO2S)

The heated oxygen sensors detect the oxygen content in the exhaust gas, then send signals to the ECM/PCM which varies the duration of fuel injection accordingly. To stabilise its output, the sensors have an internal heater.

The primary sensor is installed in the exhaust pipe. The secondary sensor is installed in the TWC.

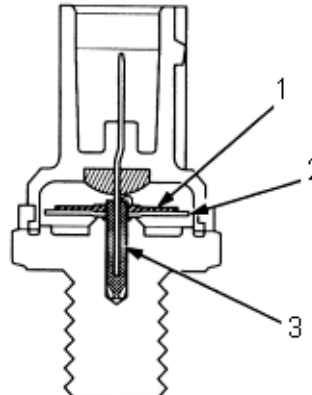


1. ZIRCONIA ELEMENT
2. SENSOR TERMINALS
3. HEATER TERMINALS
4. HEATER

By controlling the air/fuel ratio with sensors, the deterioration of the primary sensor can be evaluated by its feedback period. When the feedback period exceeds a certain value during stable conditions, the sensor is considered deteriorated and the ECM/PCM sets a DTC.

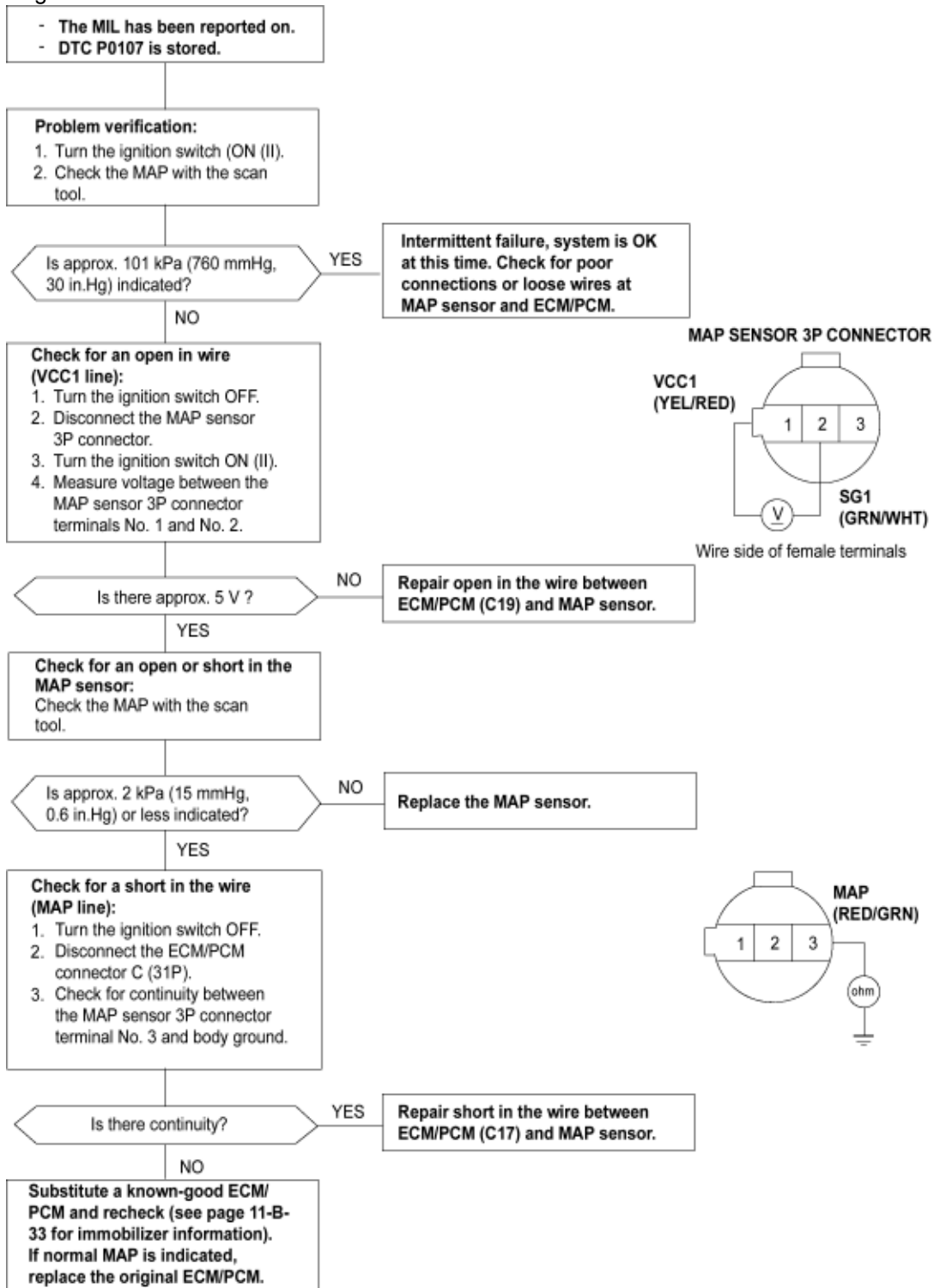
Knock Sensor (KS)

The knock control system adjusts the ignition timing for the octane rating of the gasoline used.



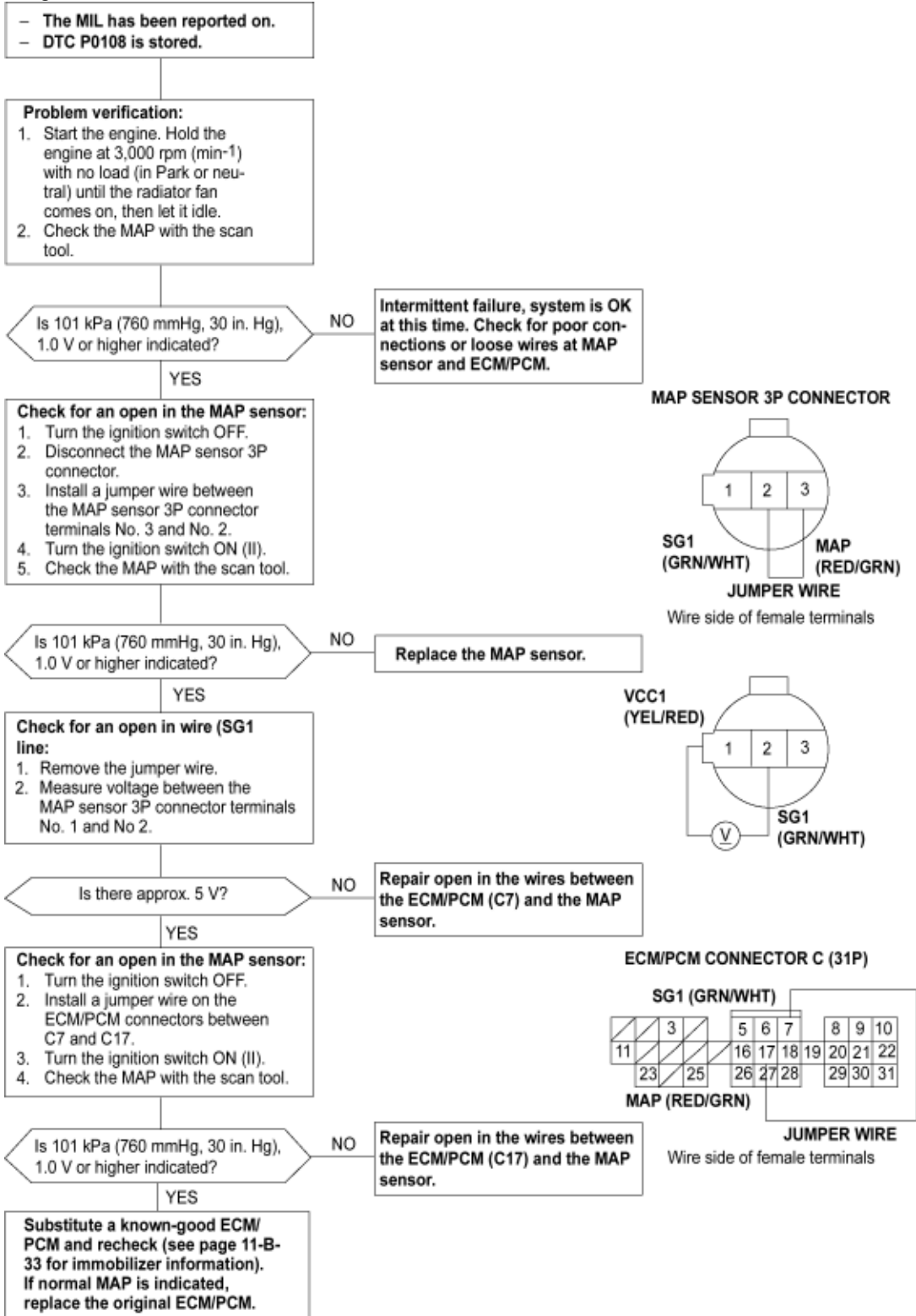
1. PIEZO CERAMIC
2. DIAPHRAGM
3. TERMINAL

DTC P0107: Low Voltage in MAP Sensor Circuit



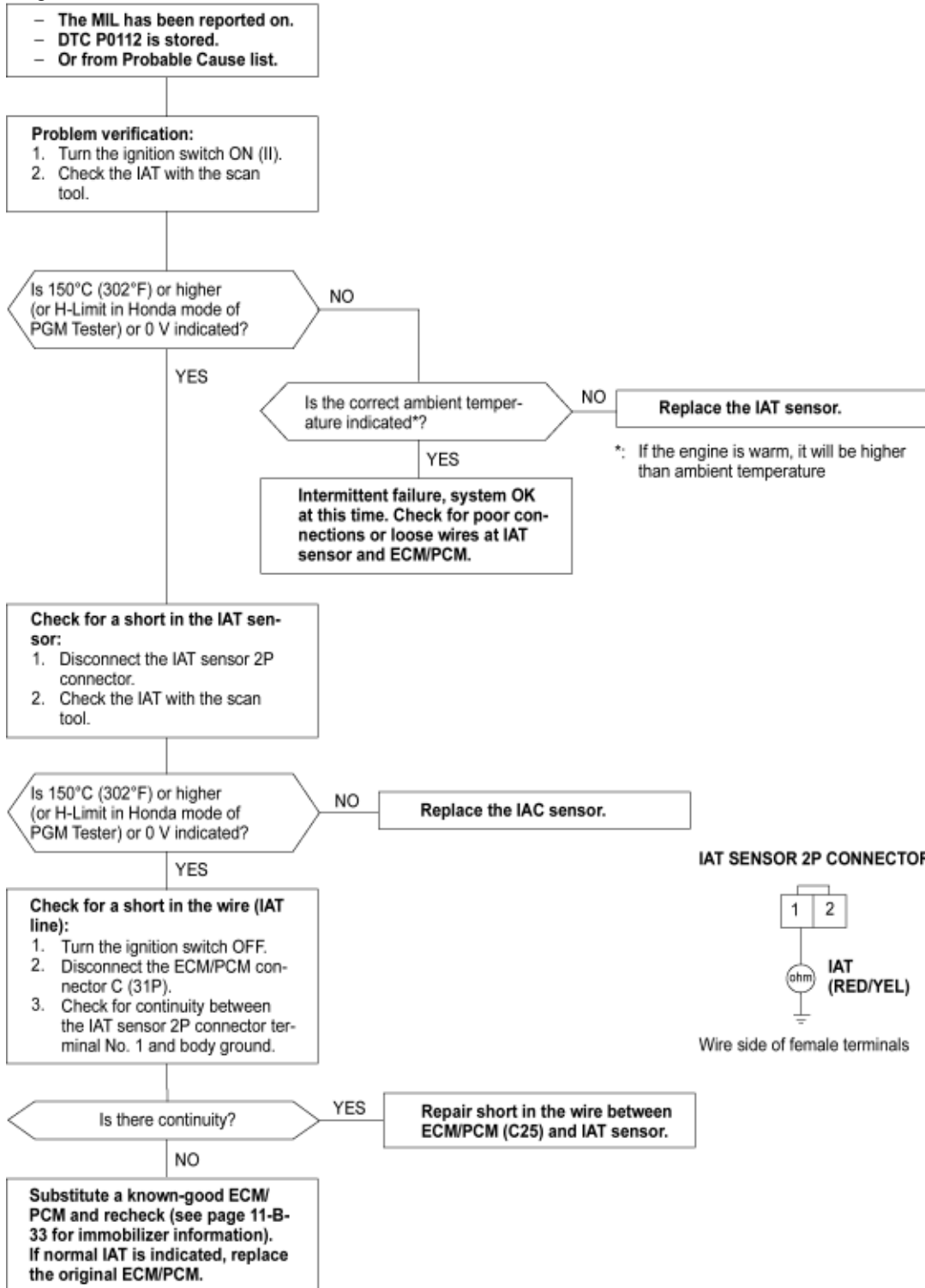
To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-B-33)

DTC P0108: High Voltage in MAP Sensor Circuit



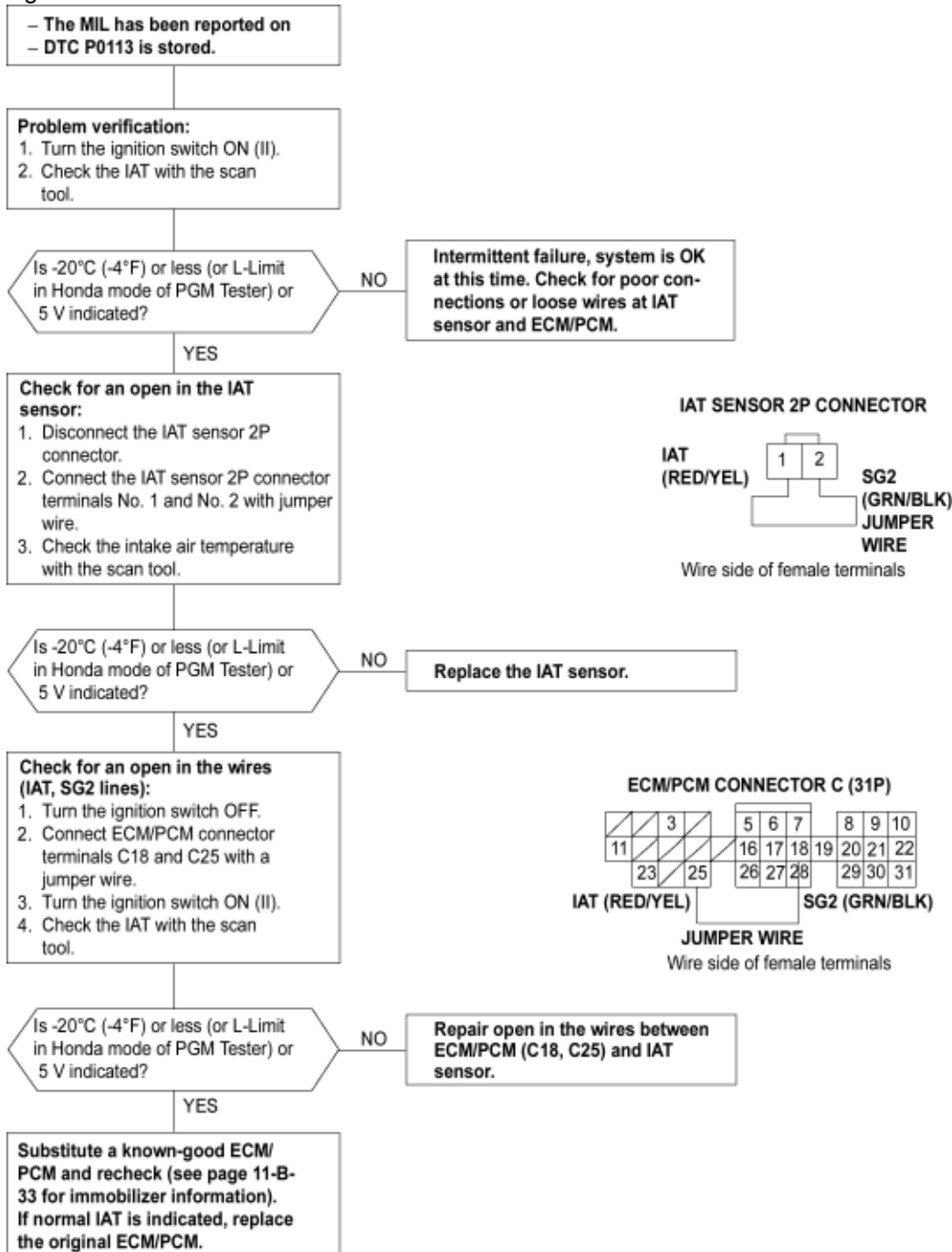
To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0112: Low Voltage in IAT Sensor Circuit



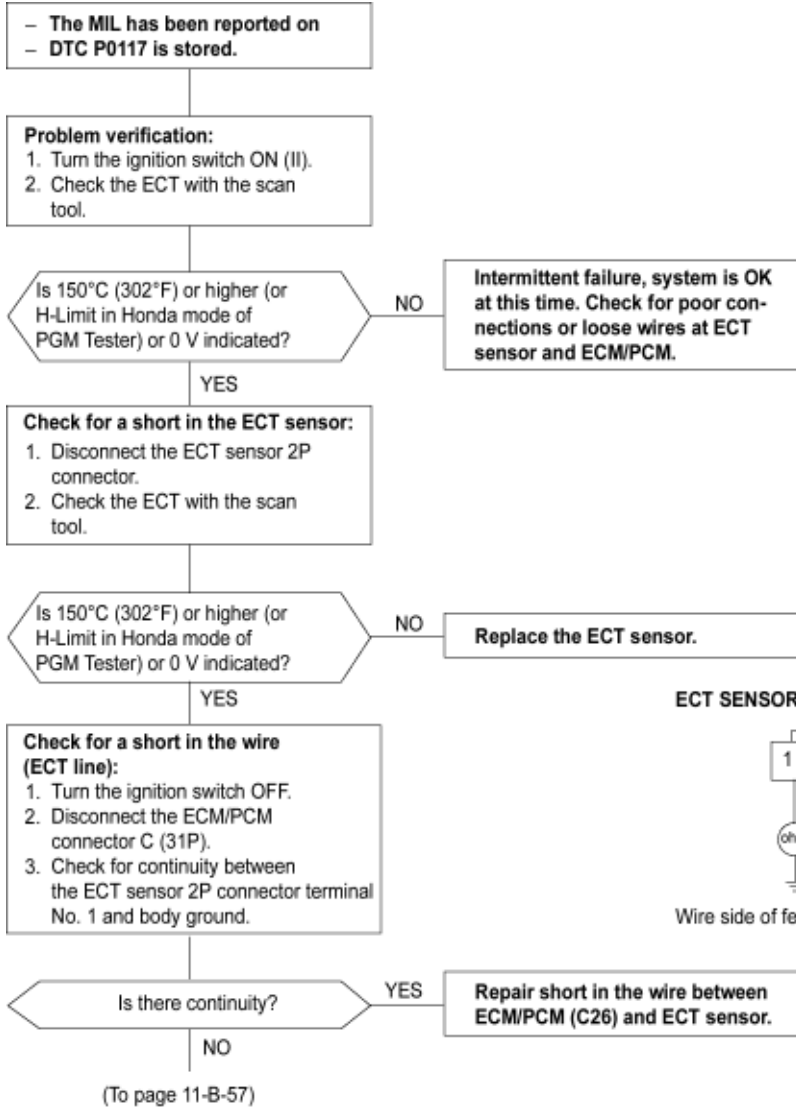
To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0113: High Voltage in IAT Sensor Circuit

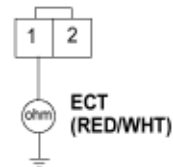


To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

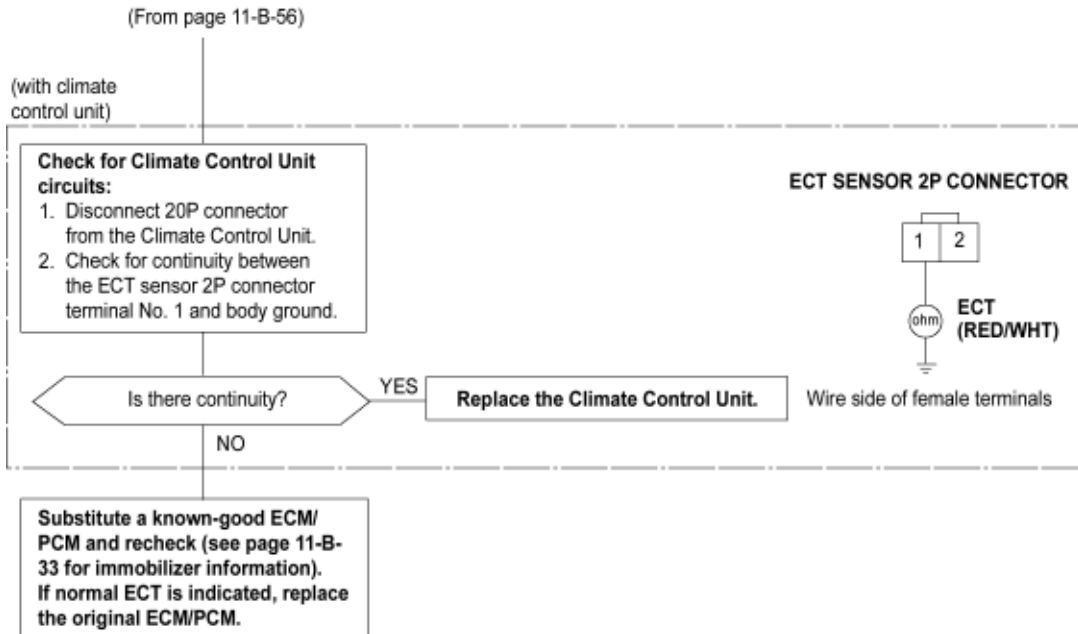
DTC P0117: Low Voltage in ECT Sensor Circuit



ECT SENSOR 2P CONNECTOR

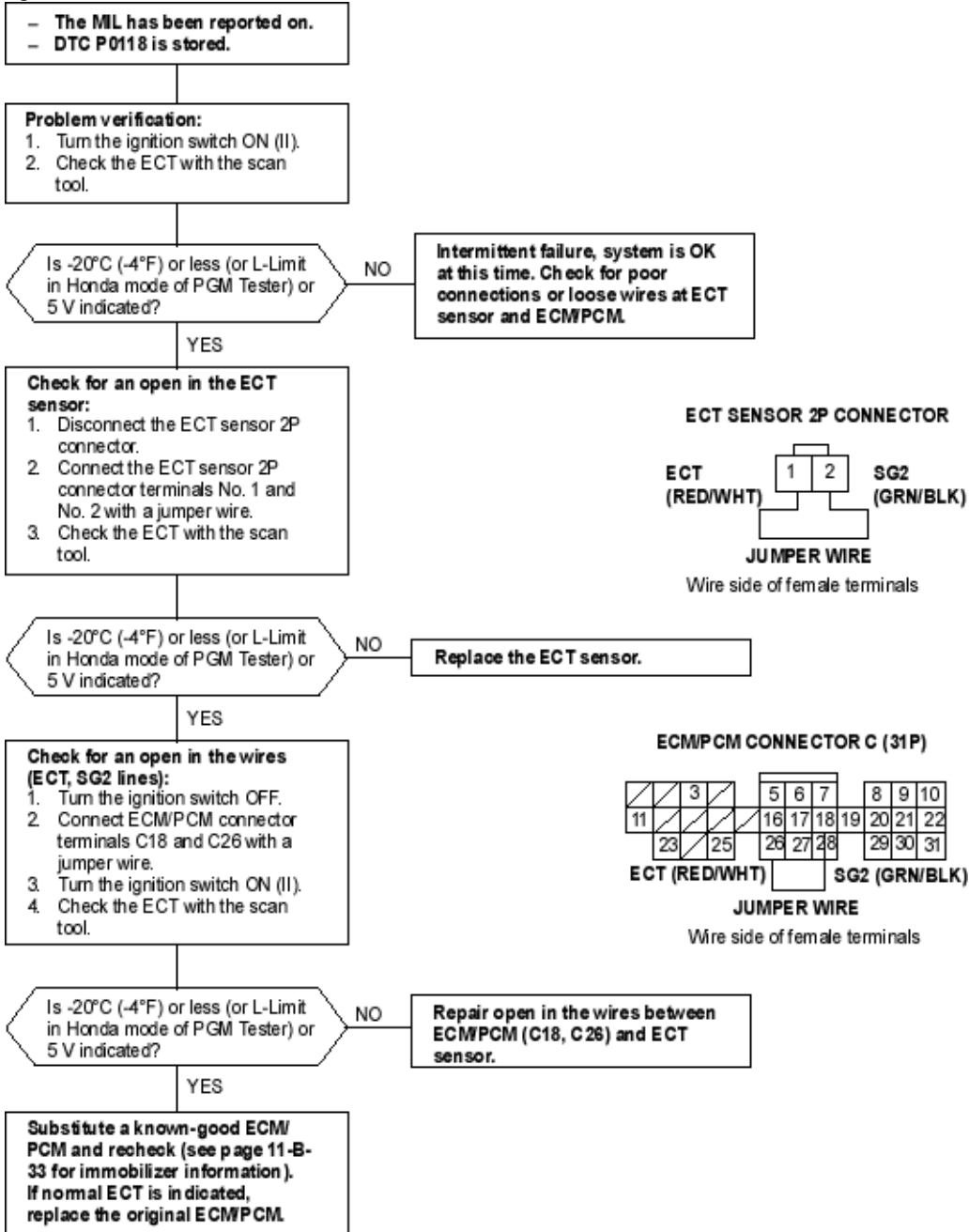


Wire side of female terminals



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0118: High Voltage in ECT Sensor Circuit



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0122: Low voltage in TP Sensor Circuit

- The MIL has been reported on.
- DTC P0122 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm (min-1) with no load (in Park or neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES
Intermittent failure, system is OK at this time. Check for poor connections or loose wires at TP sensor and ECM/PCM.

NO
Check for an open or short in the wire (VCC2 line):
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between the TP sensor 3P connector terminals No. 1 and No. 3.

Is there approx. 5 V?

NO
Check for an open in wire (VCC2 line):
Measure voltage between ECM/PCM connector terminals C-18 and C-28.

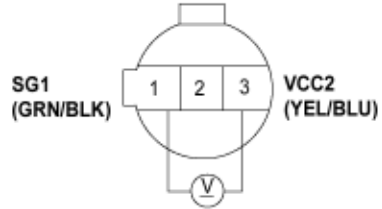
YES
Repair open in the wire between ECM/PCM (C28) and TP sensor.

NO
Substitute a known-good ECM/PCM and recheck (see page 11-B-33 for immobilizer information). If prescribed voltage is now available, replace the original ECM/PCM.

Check for an open or short in TP sensor:
1. Turn the ignition switch OFF.
2. At the sensor side, measure resistance between the TP sensor 3P connector terminals No. 1 and No. 2 with the throttle fully closed.

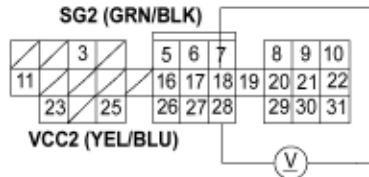
(To page 11-B-60)

TP SENSOR 3P CONNECTOR

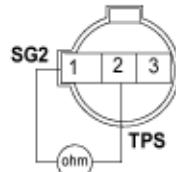


Wire side of female terminals

ECM/PCM CONNECTOR C (31P)

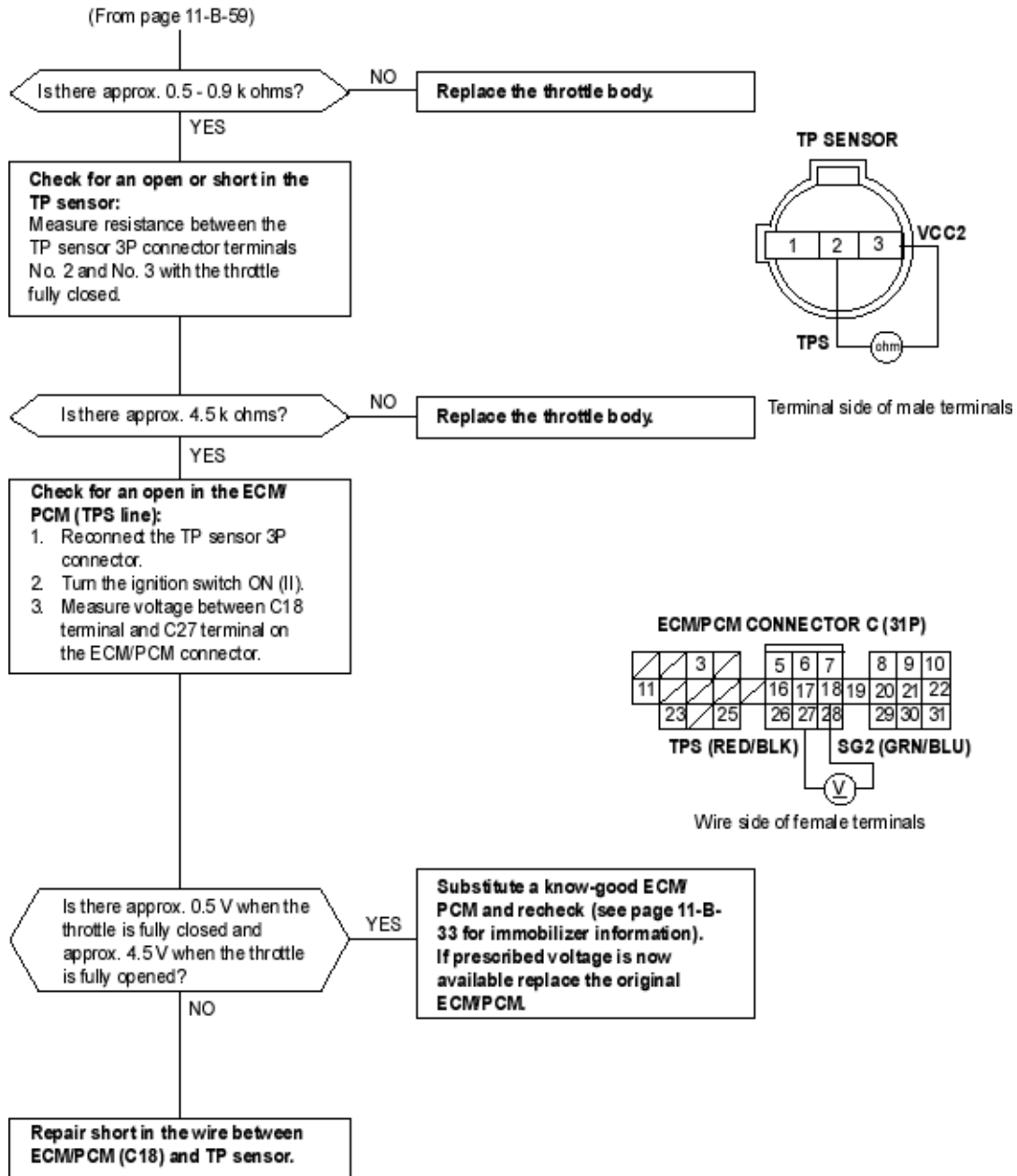


Wire side of female terminals



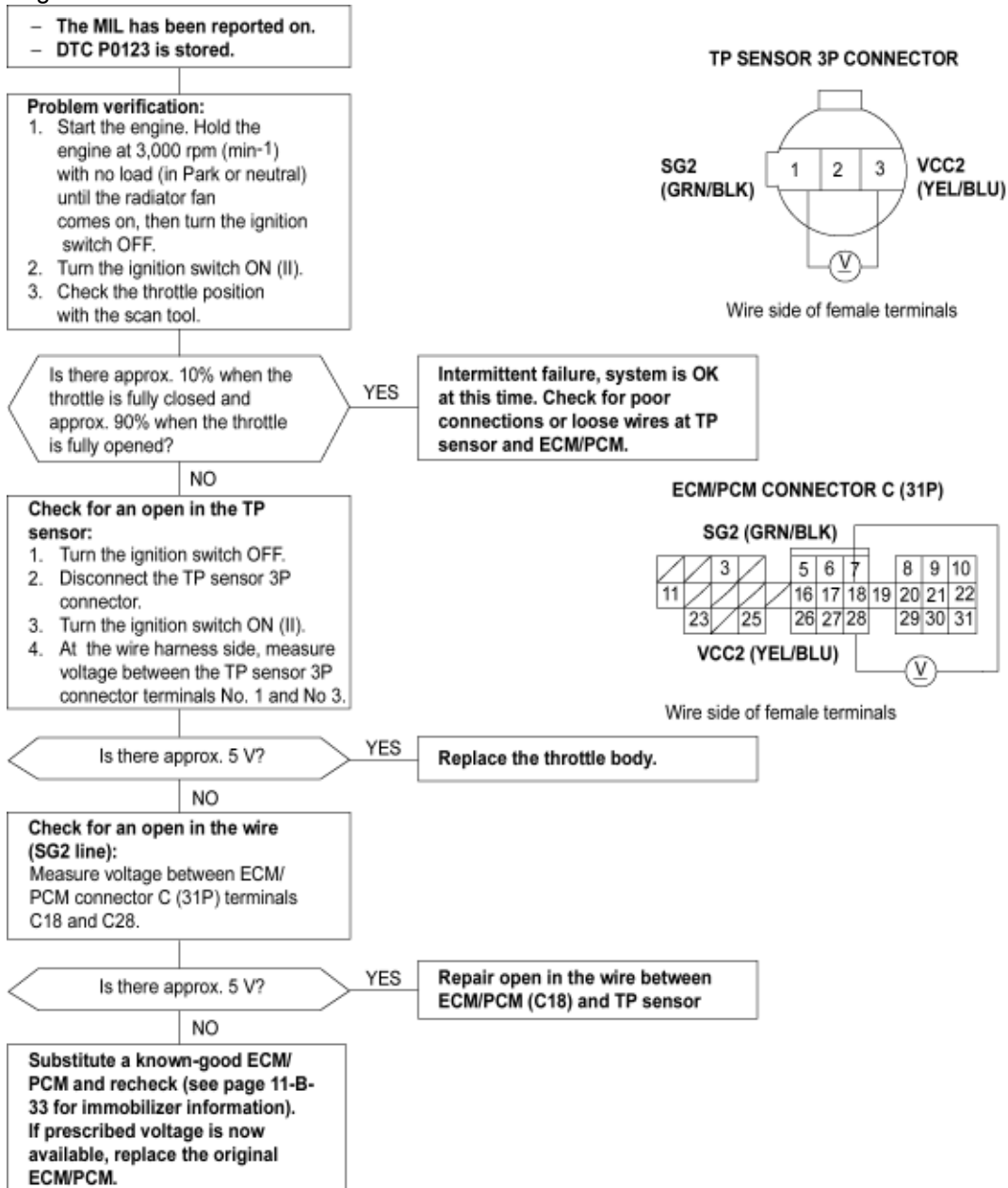
Terminal side of male terminals

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)



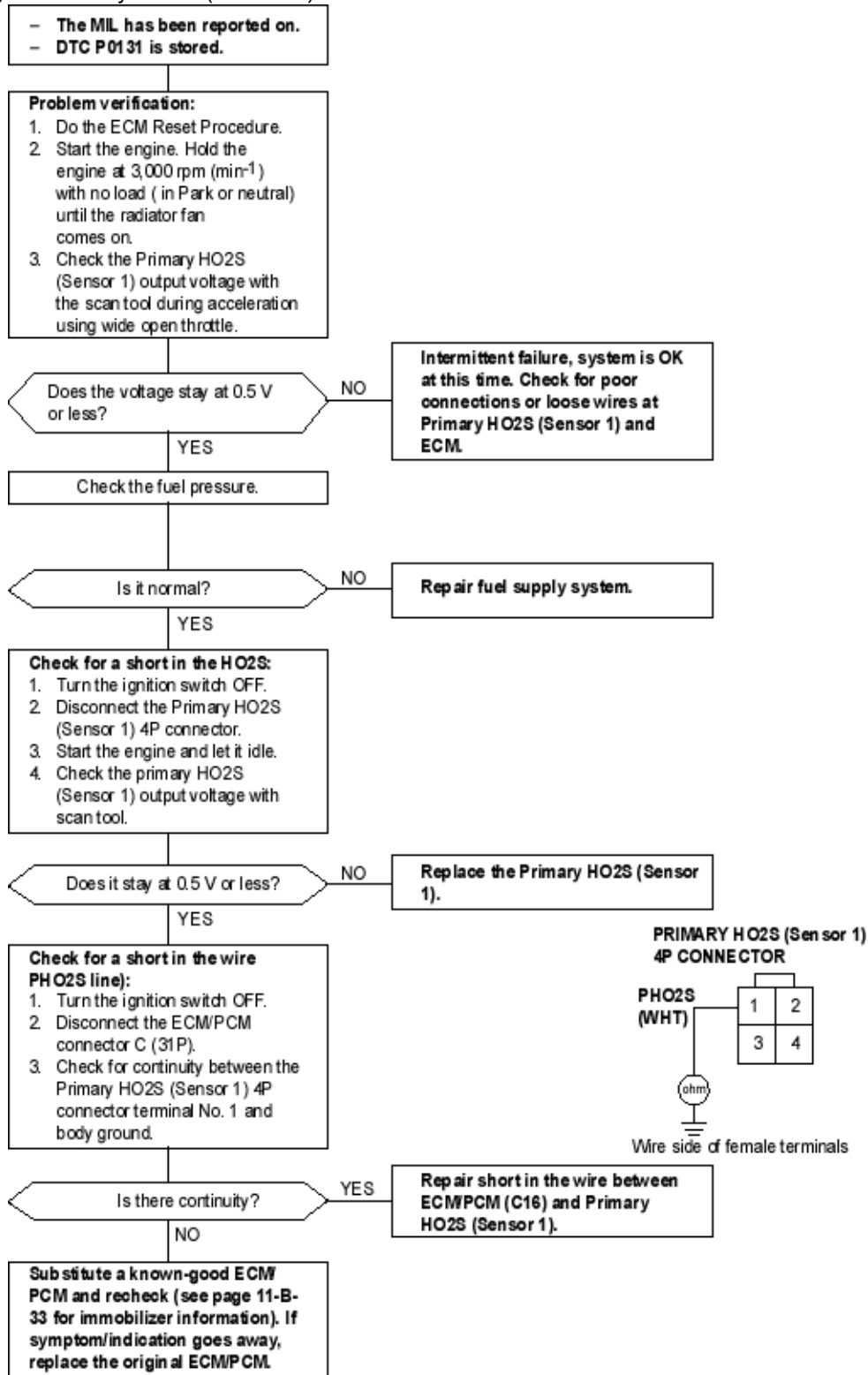
To go to the pages referenced on the diagram above, click on the following:
 (See Page 11-B-33)

DTC P0123: High Voltage in TP Sensor Circuit



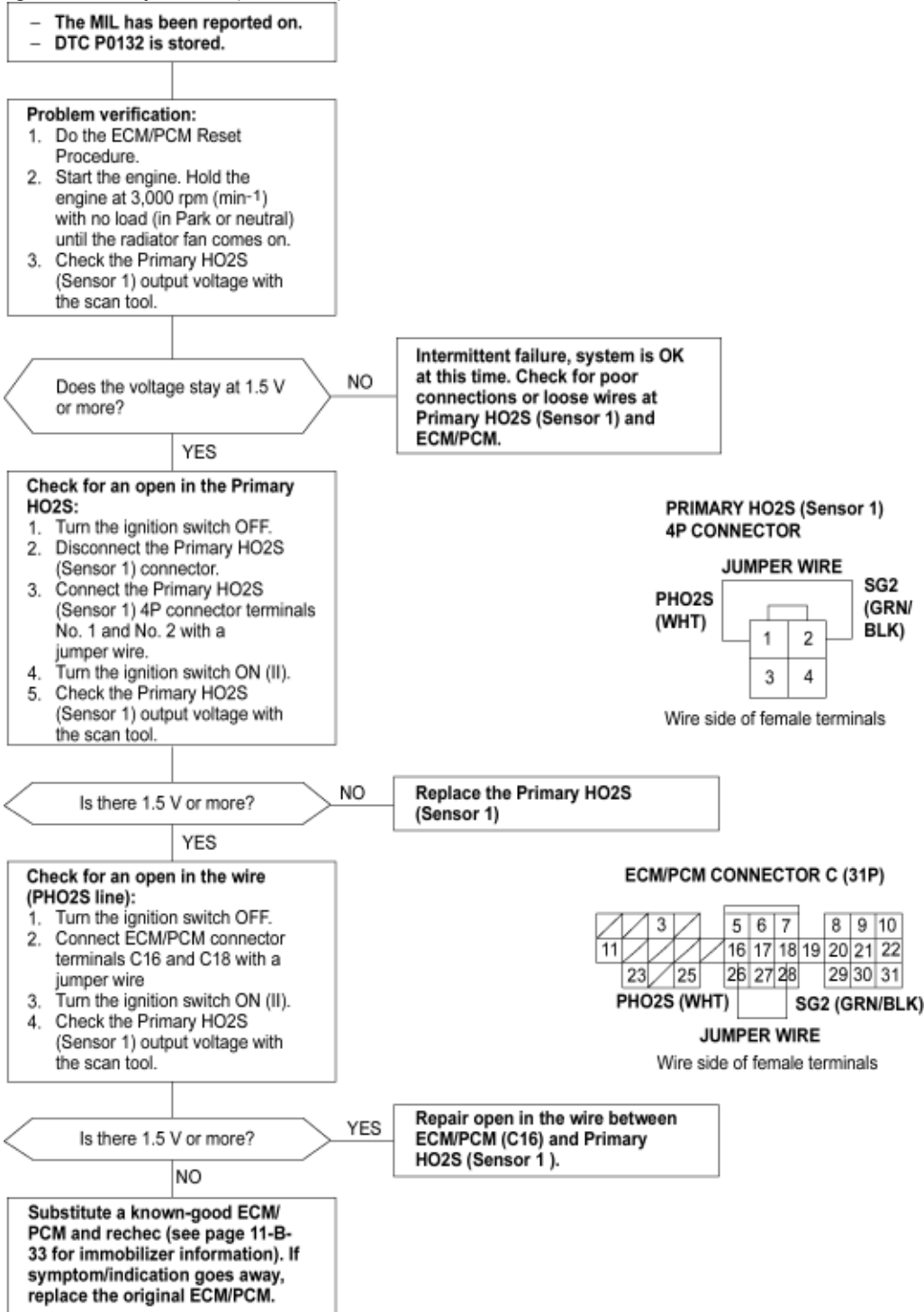
To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0131: Low Voltage in Primary HO2S (Sensor 1)



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0132: High Voltage in Primary HO2S (Sensor 1) Circuit



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0133: Slow Response in Primary HO2S (Sensor 1) Circuit

Description

By controlling the air/fuel ratio with a Primary HO2S (Sensor 1) and a Secondary HO2S (Sensor 2), the deterioration of the Primary HO2S (Sensor 1) can be evaluated by its feedback period. When the feedback period of the HO2S exceeds a certain value during stable driving conditions, the sensor will be judged as deteriorated.

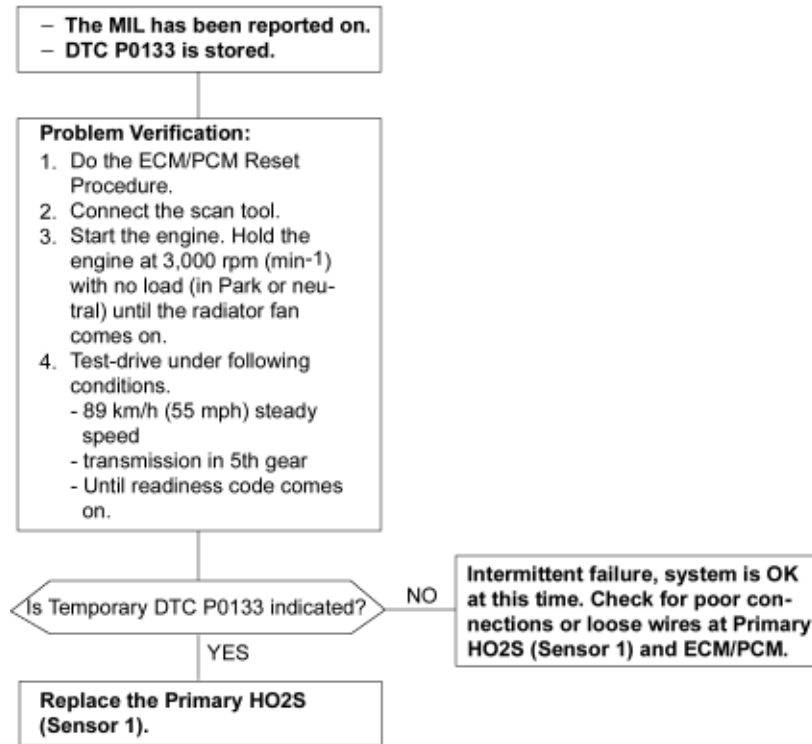
When deterioration has been detected during two consecutive trips, the MIL comes on and DTC P0133 will be stored.

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then troubleshoot DTC P0133.

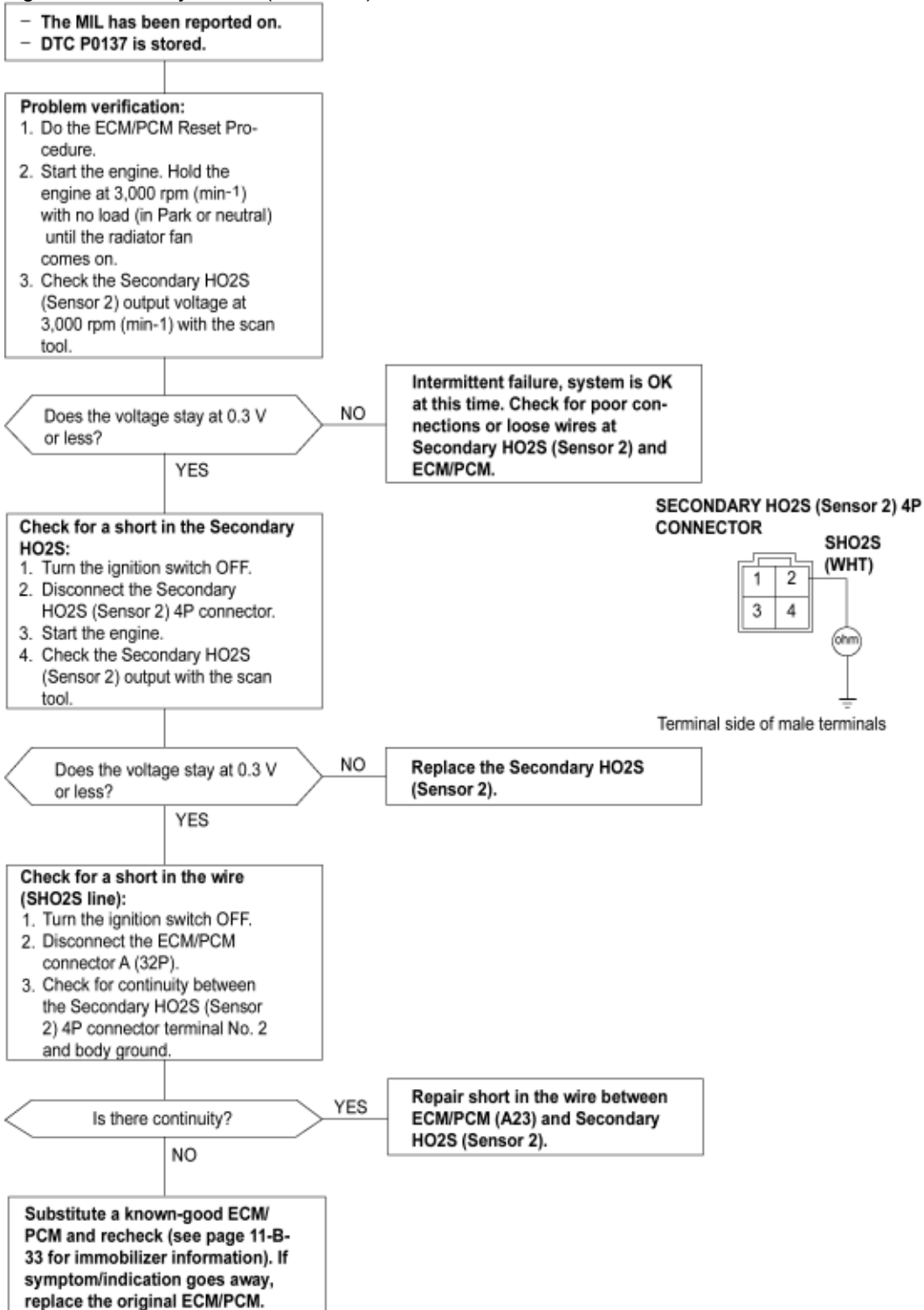
Possible cause

- ♦ Primary HO2S (Sensor 1) Deterioration
- ♦ Primary HO2S Heater (Sensor 1) Deterioration
- ♦ Exhaust System Leakage

Troubleshooting Flowchart

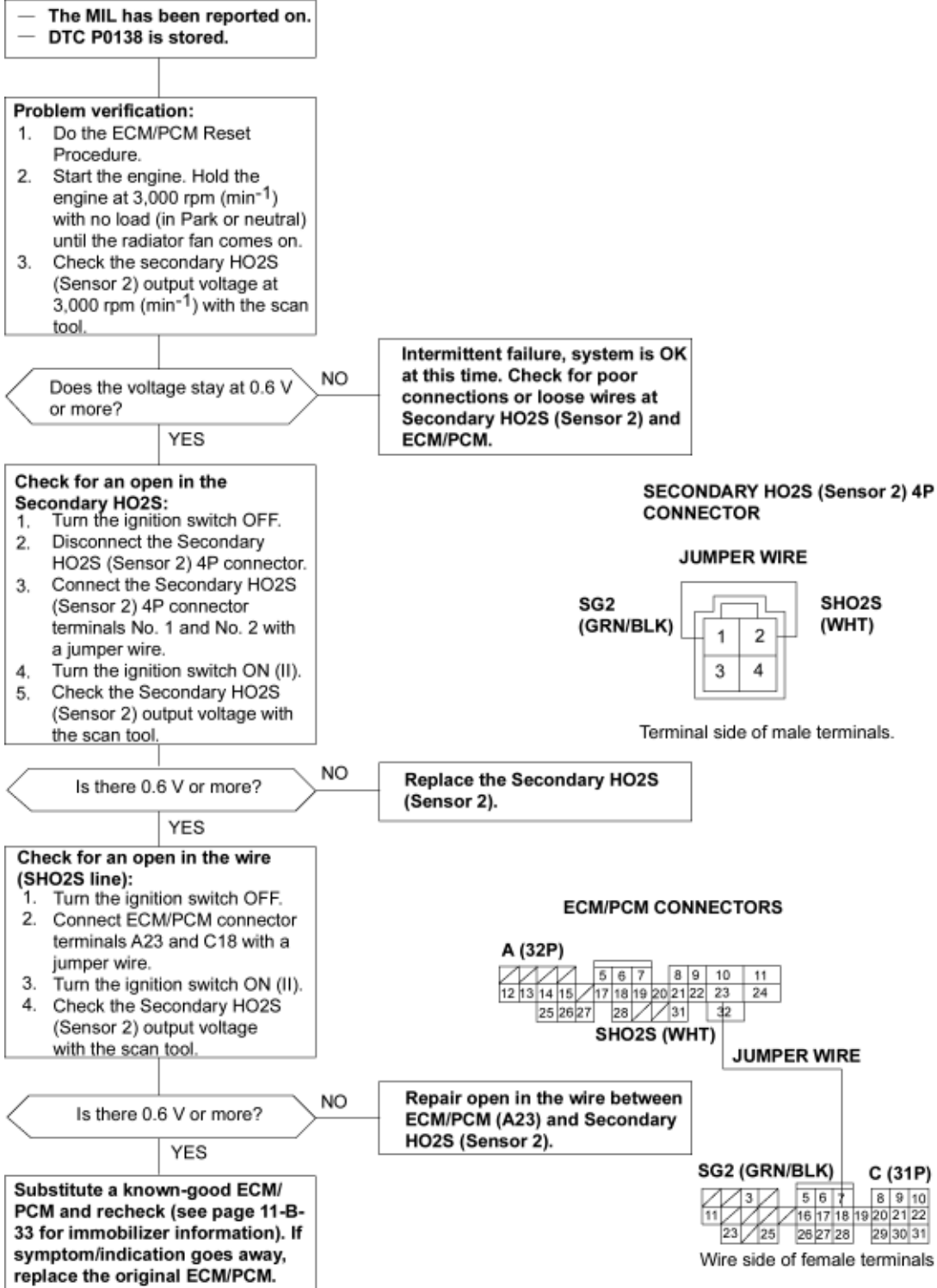


DTC P0137: Low Voltage in Secondary HO2S (Sensor 2) Circuit



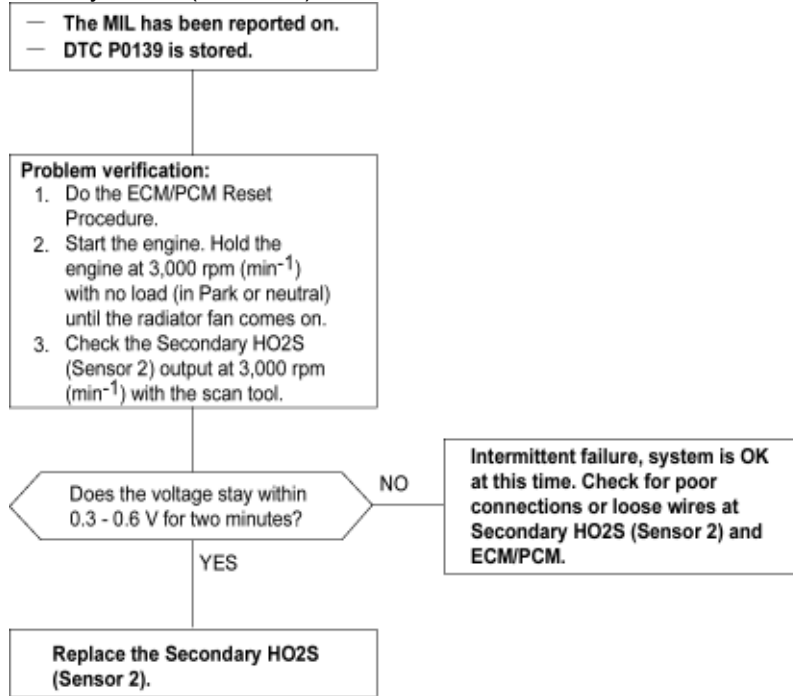
To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0138: High Voltage in Secondary HO2S (Sensor 2) Circuit



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

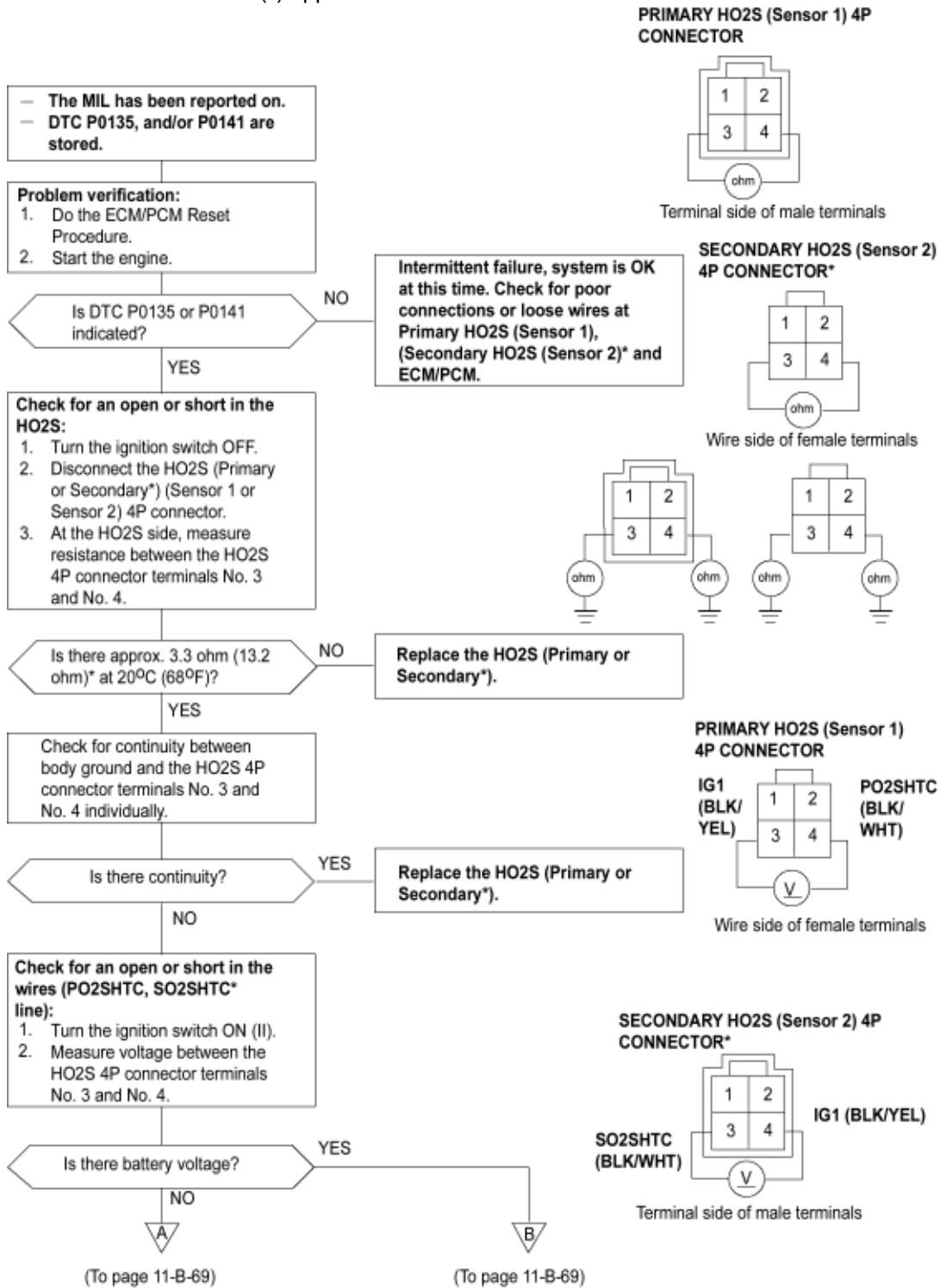
DTC P0139: Slow Voltage in Secondary HO2S (Sensor 2) Circuit



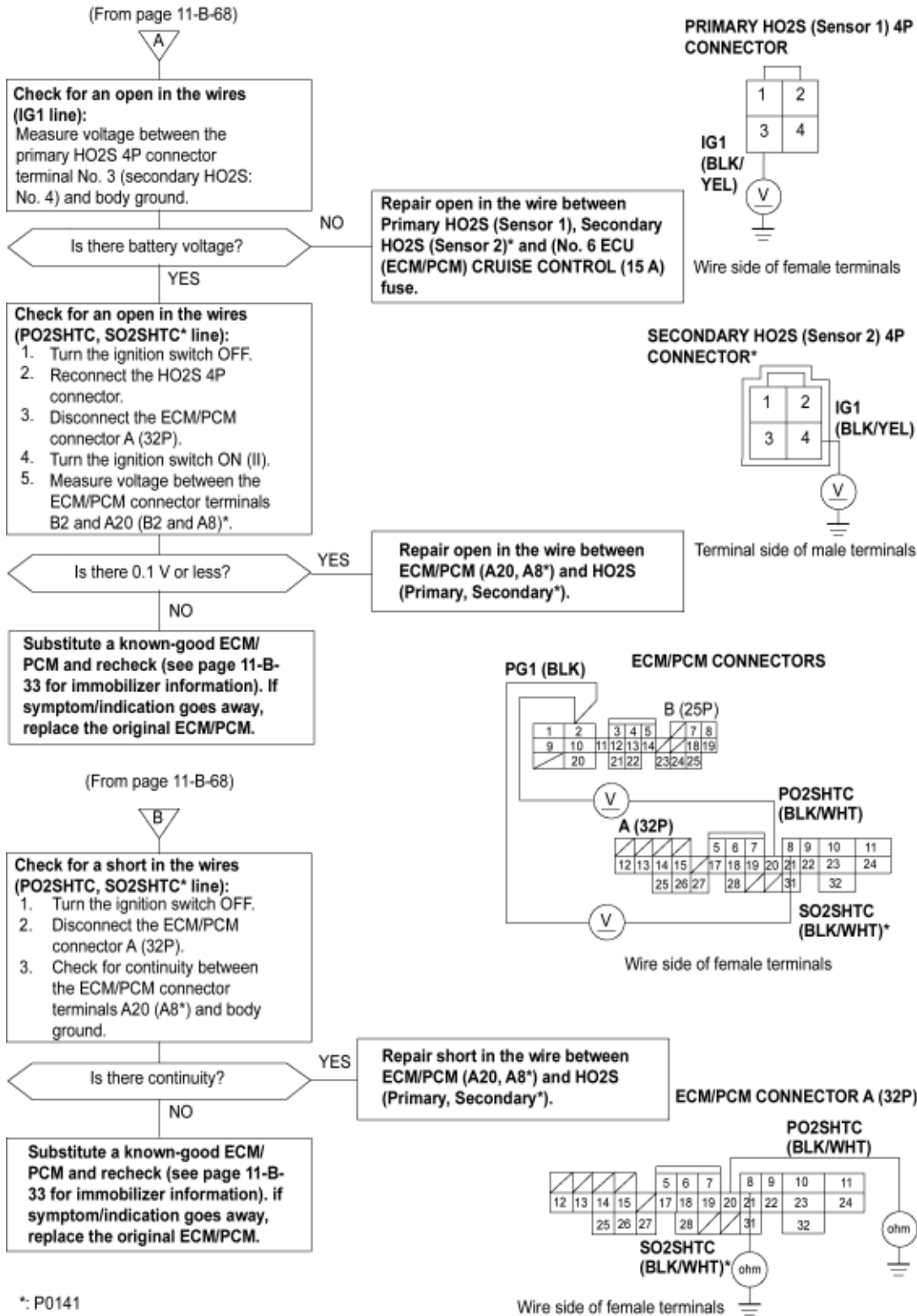
DTC P0135: Malfunction in Primary HO2S (Sensor 1) Heater Circuit

DTC P0141: Malfunction in Secondary HO2S (Sensor 2) Heater Circuit

NOTE: Information marked with an asterisk (*) applies to DTC P0141



*: P0141



*: P0141

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0171: Fuel System Too Lean**DTC P0172:** Fuel System Too Rich**Description**

By monitoring the Long Term Fuel Trim, long term malfunction in the fuel system will be detected. If a malfunction has been detected during two consecutive trips, the MIL will come on and DTC P0171 and/or P0172 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then troubleshoot DTC P0171 and/or P0172.

- ♦ P0107, P0108: MAP sensor
- ♦ P0135: Primary HO2S (Sensor 1) Heater
- ♦ P0137, P0138: Secondary HO2S (Sensor 2)
- ♦ P0141: Secondary HO2S (Sensor 2) Heater
- ♦ P0401: EGR Flow Insufficient
- ♦ P0443: EVAP Purge Control Solenoid Valve Circuit
- ♦ P1259: VTEC System
- ♦ P1491: EGR Valve Lift Insufficient
- ♦ P1498: EGR Valve Lift Sensor High Voltage

Possible Cause**DTC P0171**

System too lean

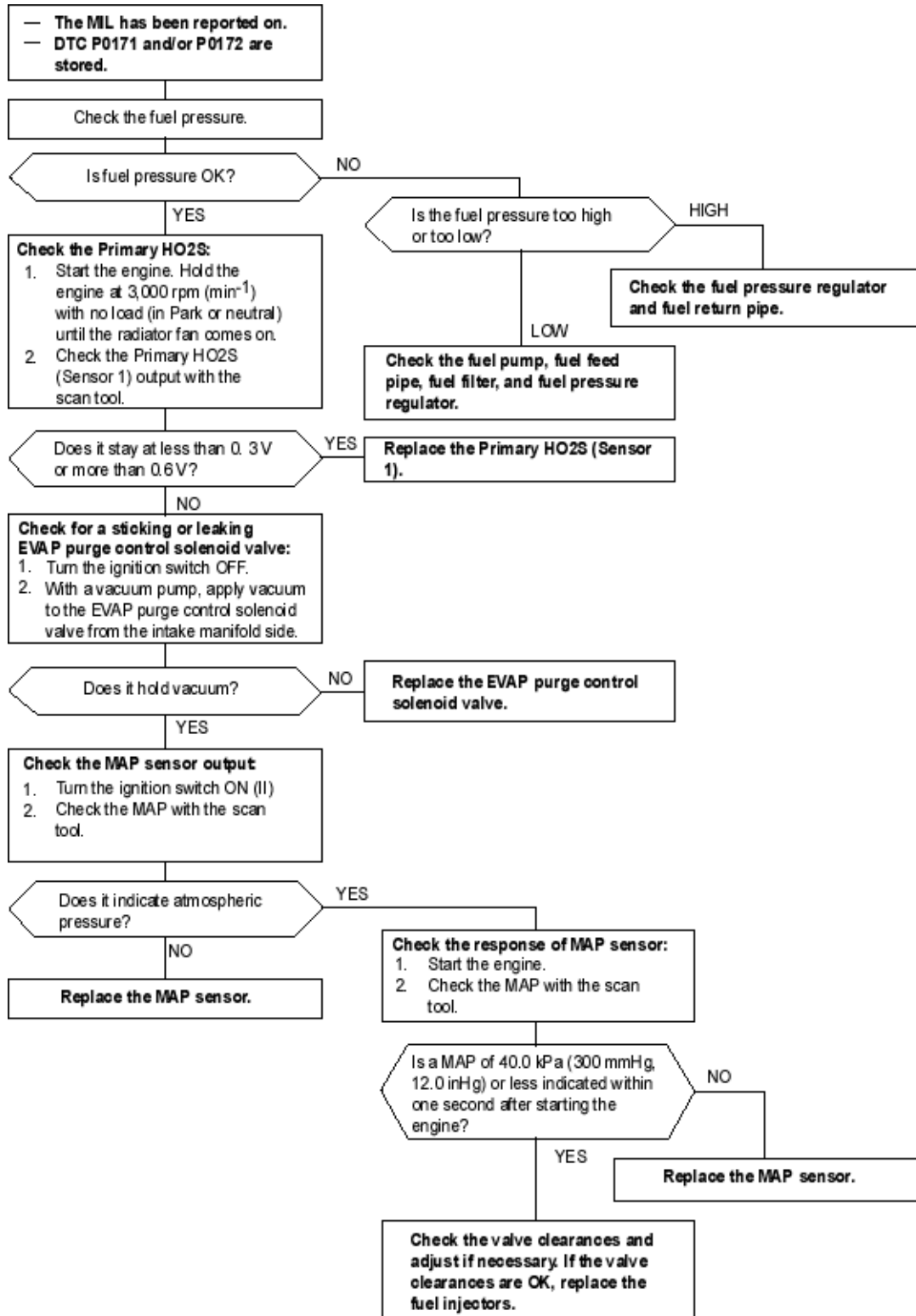
- ♦ Fuel Pump insufficient flow/pressure
- ♦ Fuel Feed Line clogged, leaking
- ♦ Fuel Pressure Regulator stuck open
- ♦ Fuel Filter clogged
- ♦ Fuel Injector clogged, air inclusion
- ♦ Gasoline does not meet Owner's Manual spec.
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ EGR System malfunction (too much flow)
- ♦ Valve Clearance
- ♦ Exhaust leak

DTC P0172

System too rich

- ♦ Fuel Pressure Regulator clogged, stuck closed
- ♦ Fuel Return Pipe clogged
- ♦ Fuel injector leaking
- ♦ Gasoline does not meet Owner's Manual spec.
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ EGR System insufficient flow
- ♦ EVAP Purge Control Solenoid Valve leaking, stuck open
- ♦ Valve Clearance

Troubleshooting Flowchart



PGM-FI System**DTC Troubleshooting (F18B2, F18B4 engine)**

(cont'd)

11-B-72**DTC P0300:** Random misfire and any combination of the following:**DTC P0301:** Cylinder 1 misfire**DTC P0302:** Cylinder 2 misfire**DTC P0303:** Cylinder 3 misfire**DTC P0304:** Cylinder 4 misfire

NOTE:

- ♦ If the misfiring is frequent enough to trigger detection of increased emissions during two consecutive driving cycles, the MIL will come on, and DTC P0300 (and some combination of P0301 through P0304) will be stored.
 - ♦ If the misfiring is frequent enough to damage the catalyst, the MIL will blink whenever the misfiring occurs, and DTC P0300 (and some combination of P0301 through P0304) will be stored. When the misfiring stops, the MIL will remain on.
1. Troubleshoot the following DTCs first if any of them were stored along with the random misfire DTC (s):
 - ♦ P0107, P0108: MAP Sensor
 - ♦ P0171, P0172: Fuel metering
 - ♦ P0401, P1491, P1498: EGR system
 - ♦ P1259: VTEC System
 - ♦ P1361, P1362: TDC Sensor
 - ♦ P1381, P1382: CYP Sensor
 - ♦ P1519: IAC Valve
 2. Test-drive the vehicle to verify the symptom.
 3. Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure (s)	Also check for:
Random misfire only at low engine and load	Check fuel pressure.	<ul style="list-style-type: none"> ♦ Low compression ♦ Low quality fuel
Random misfire only during acceleration	<ol style="list-style-type: none"> 1. Check fuel pressure. 2. Test the ignition coils (see section 4). 	Malfunction in the VTEC system (see section 6)
Random misfire only at high engine speed and load, or under random conditions	<ol style="list-style-type: none"> 1. Check fuel pressure. 2. Test the ignition coils (see section 4). 	Correct valve clearance (see section 6)

NOTE: If misfire does not recur, some possible causes are fuel that does not meet owner's manual spec, lack of fuel, carbon deposits on spark plug, etc.

DTC P0301: Cylinder 1 misfire detected

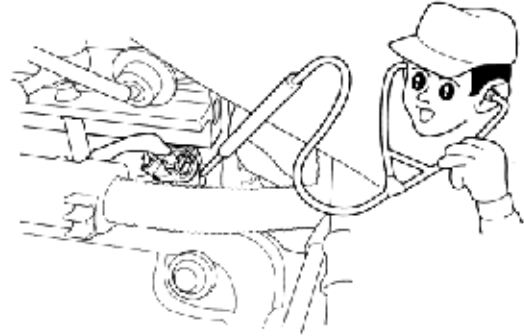
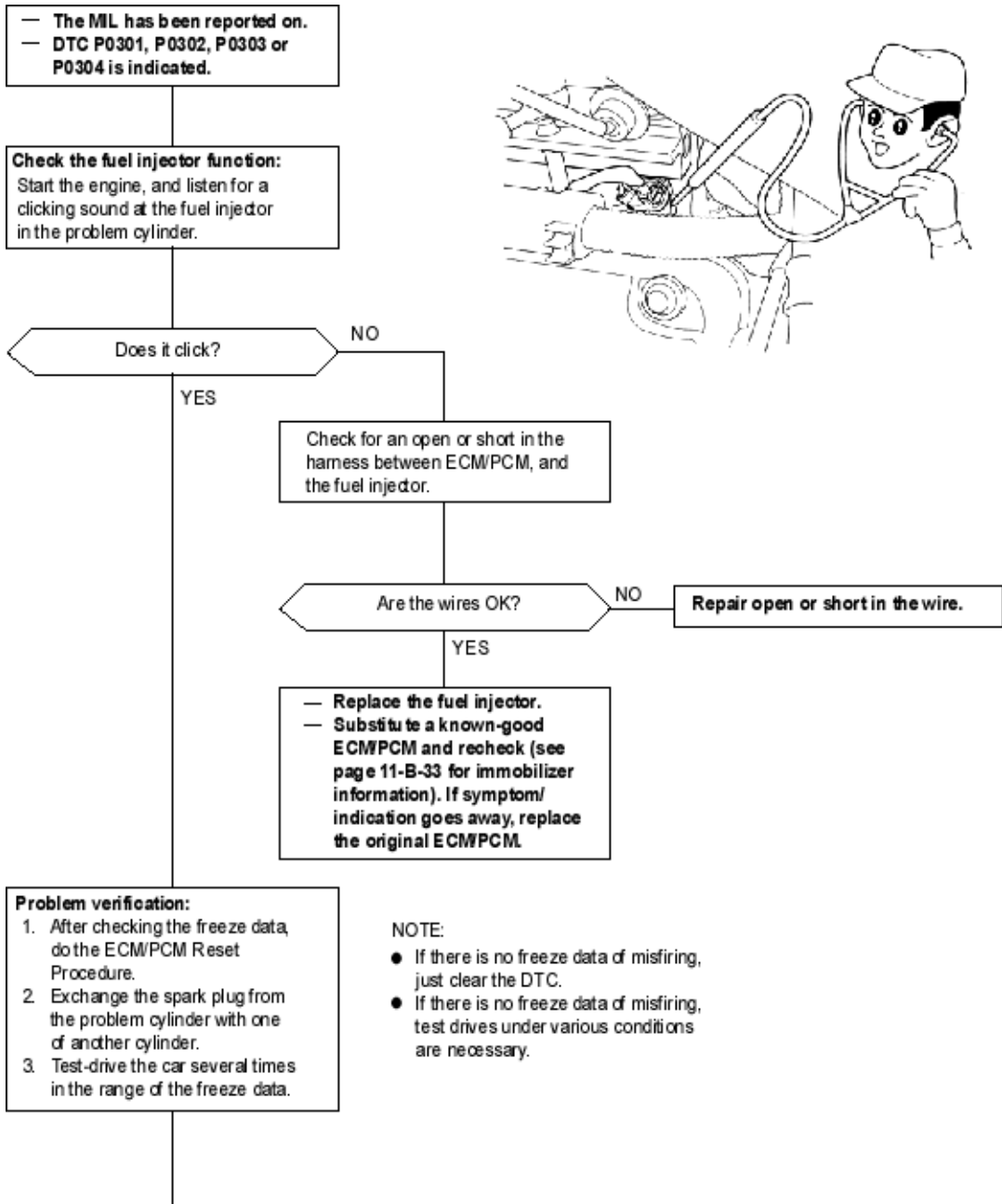
DTC P0302: Cylinder 2 misfire detected

DTC P0303: Cylinder 3 misfire detected

DTC P0304: Cylinder 4 misfire detected

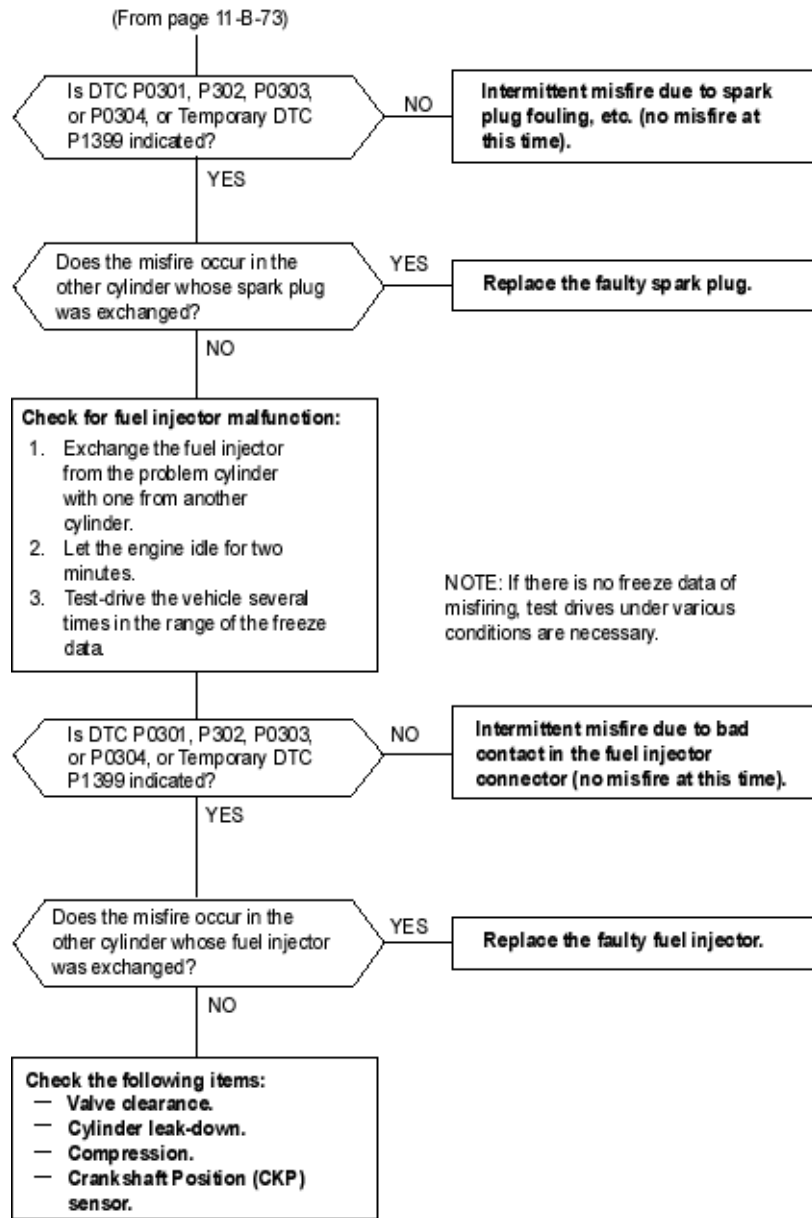
NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then recheck for the misfire DTC.

- ♦ P0107, P0108: MAP Sensor
- ♦ P0171, P0172: Fuel metering
- ♦ P0401, P1491, P1498: EGR system
- ♦ P1259: VTEC System
- ♦ P1361, P1362: TDC Sensor
- ♦ P1381, P1382: CYP Sensor
- ♦ P1519: IAC valve

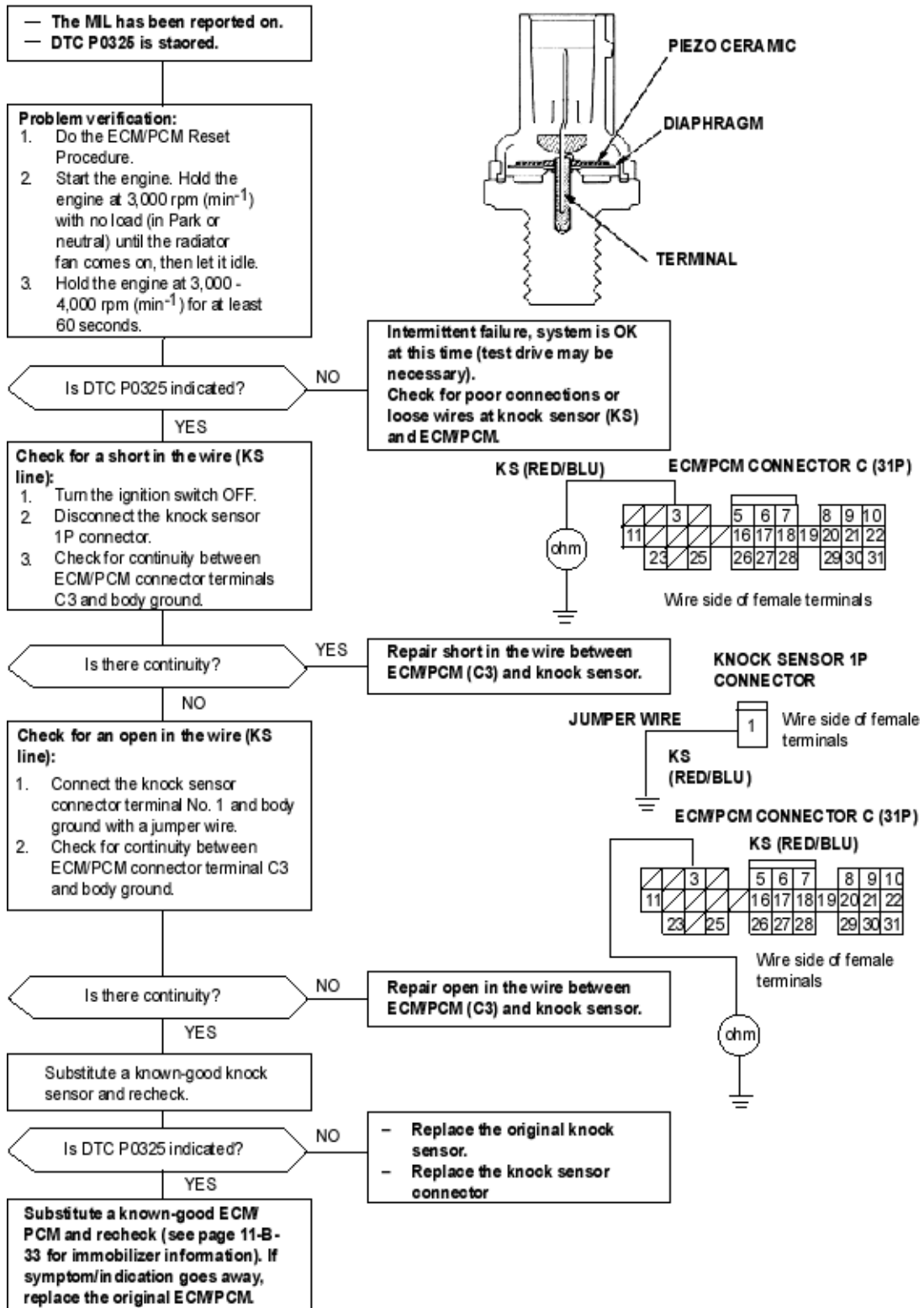


(To page 11-B-74)

To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

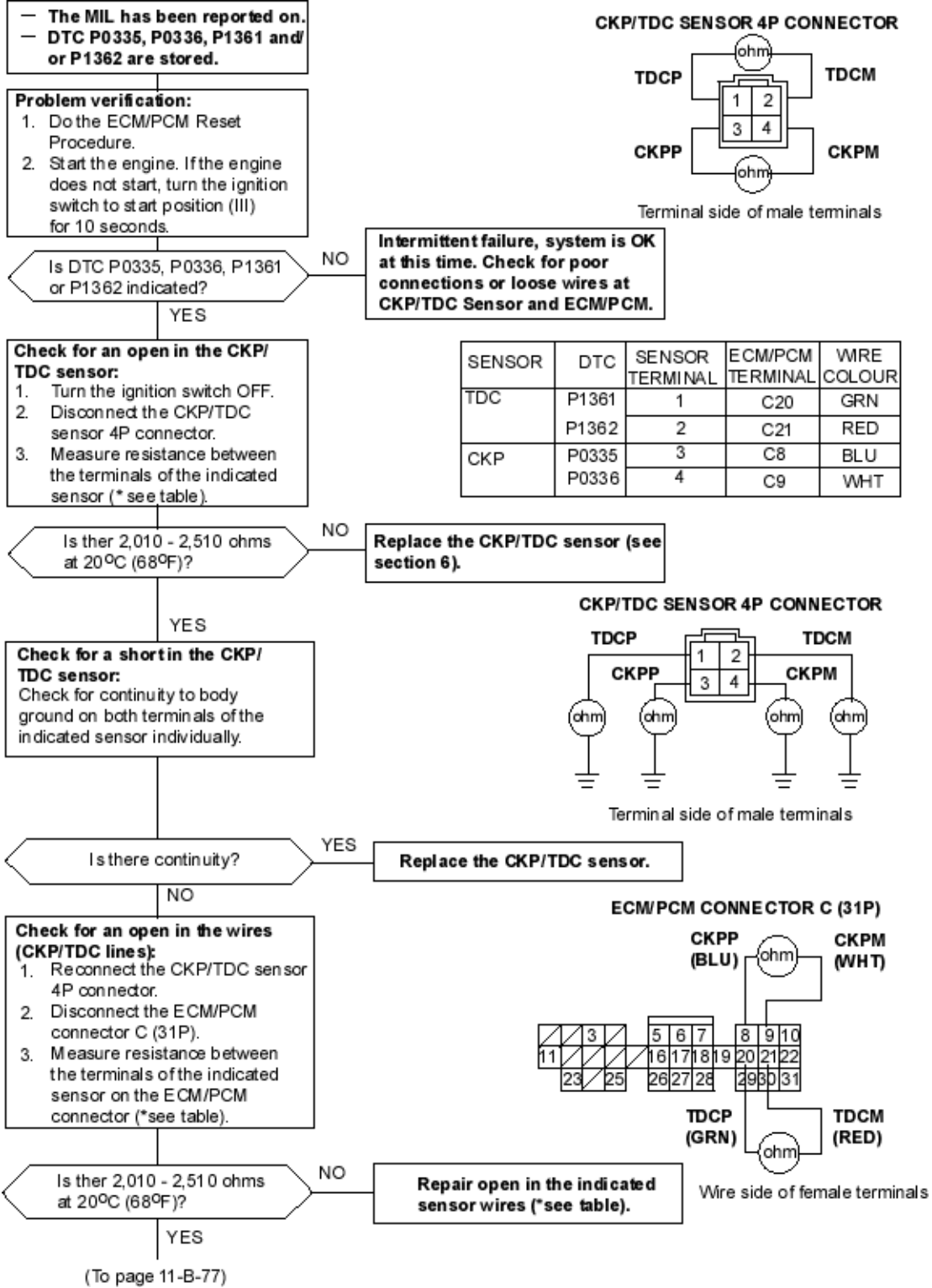


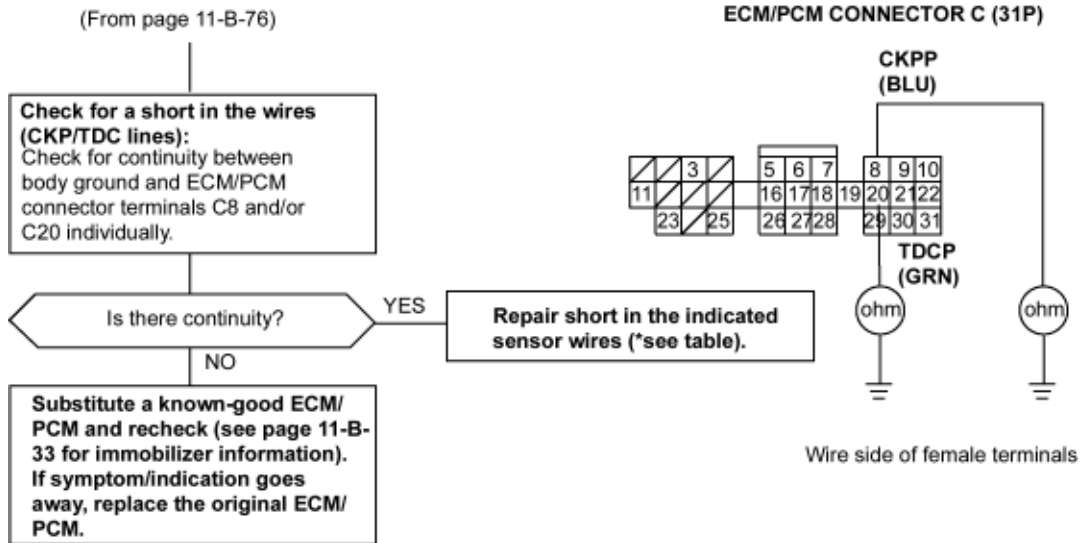
DTC P0325: Malfunction in Knock Sensor Circuit



To go to the pages referenced on the diagram above, click on the following:
(See Page 11-B-33)

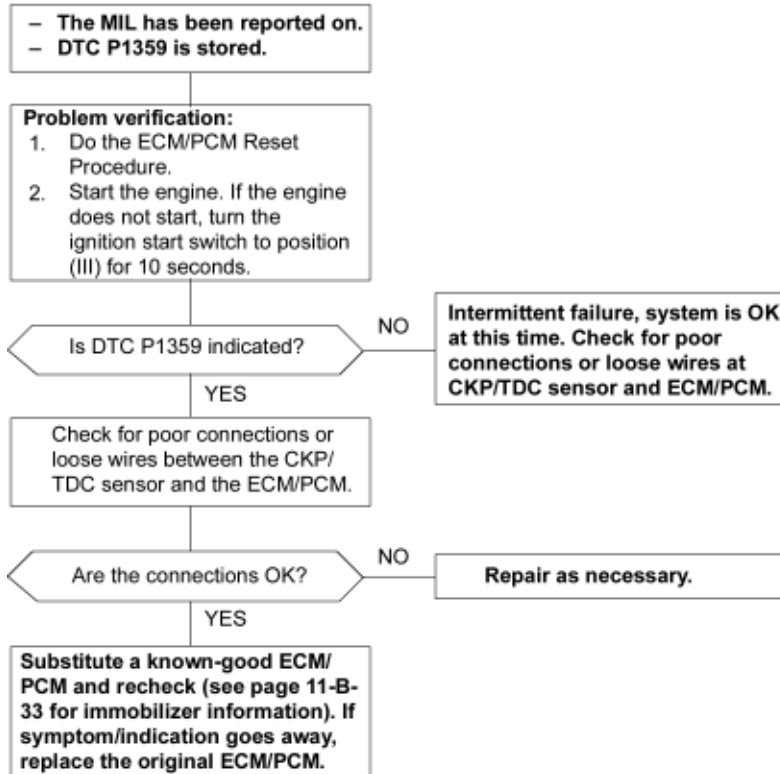
- DTC P0335: Malfunction in CKP Sensor Circuit
- DTC P0336: Range/Performance Problem in CKP Sensor Circuit
- DTC P1361: Intermittent interruption in TDC Sensor Circuit
- DTC P1362: No signal in TDC Sensor Circuit





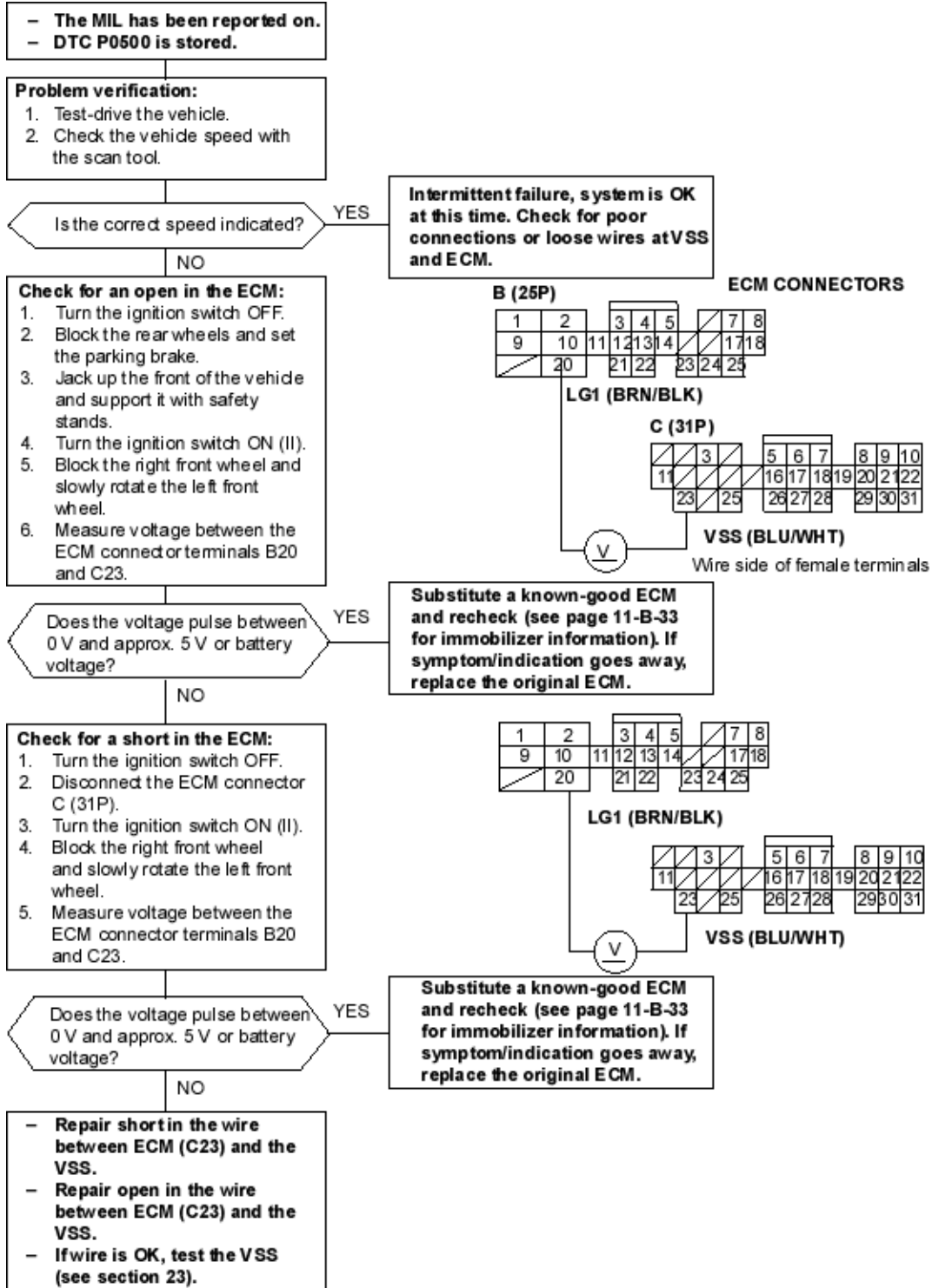
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P1359: Problem in CKP/TDC Sensor Circuit



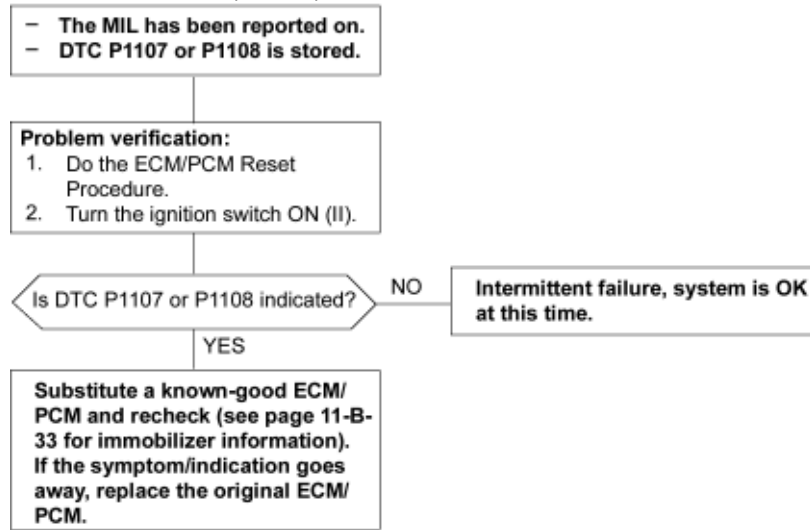
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0500: Malfunction in VSS Circuit



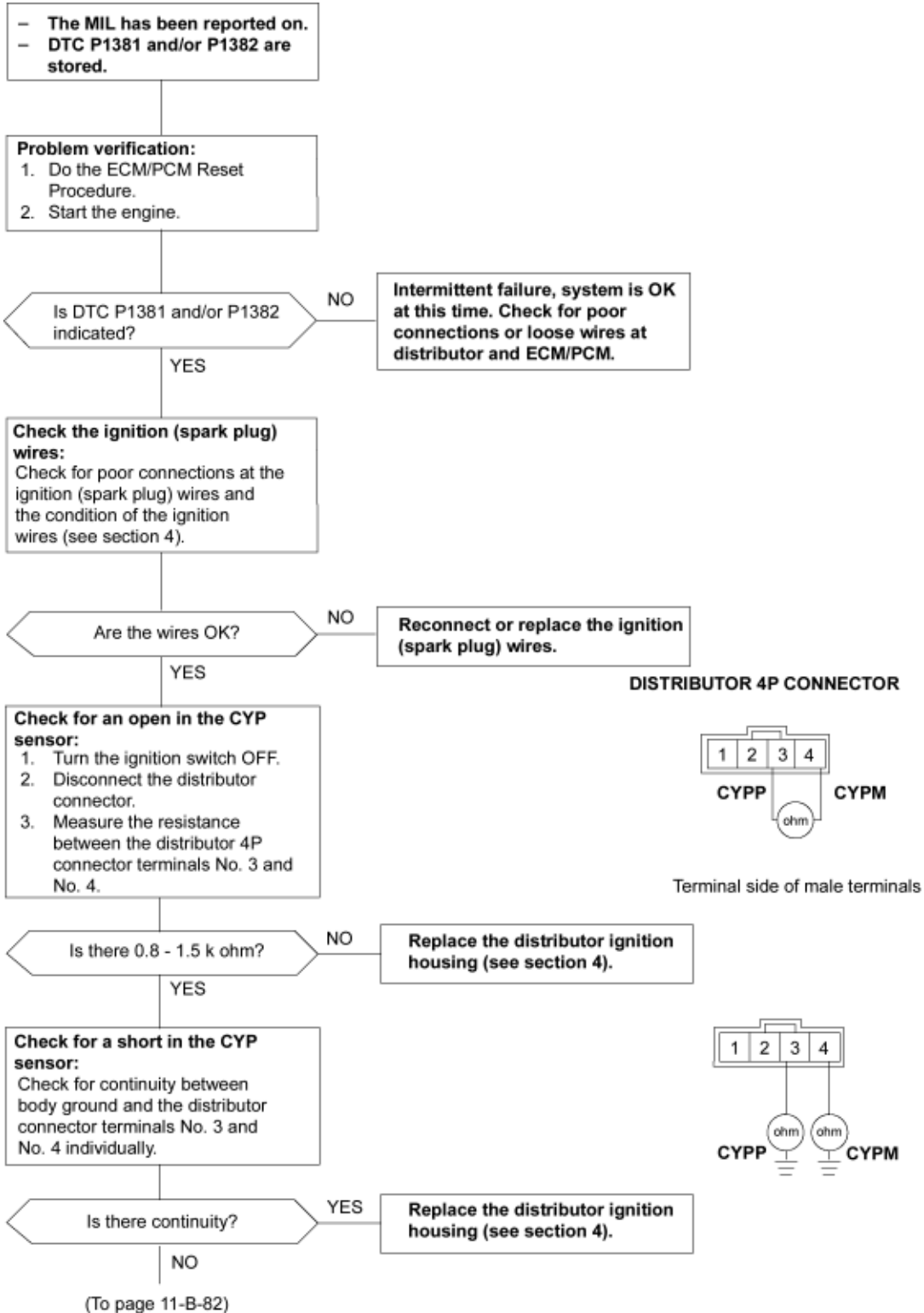
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

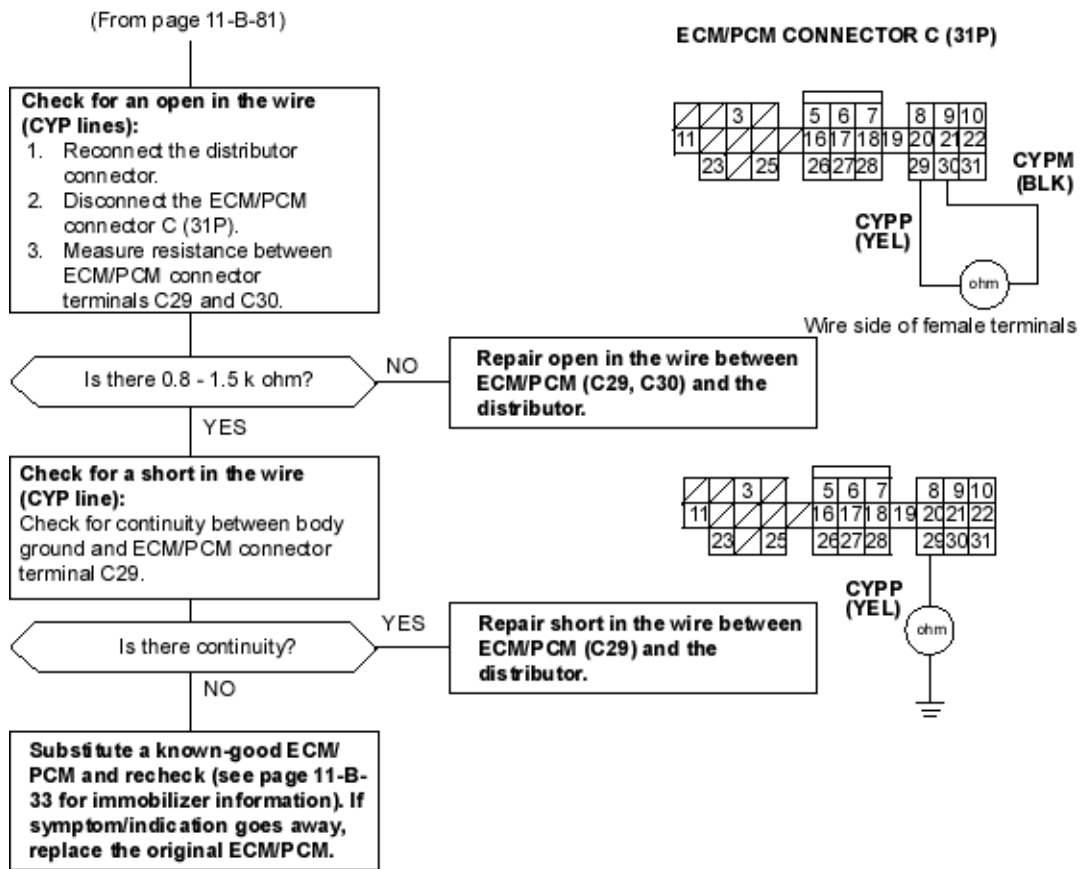
DTC P1107: Low Voltage in Barometric Pressure (BARO) Sensor Circuit
DTC P1108: High Voltage in Barometric Pressure (BARO) Sensor Circuit



To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

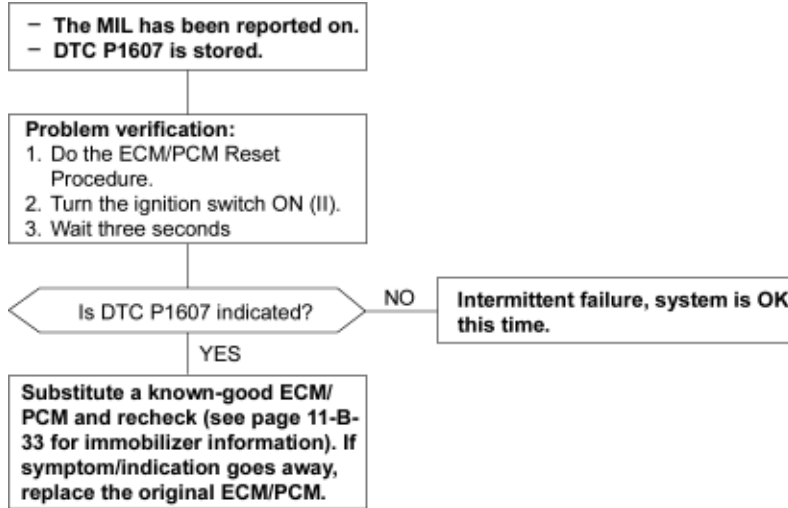
DTC P1381: Intermittent interruption in CYP Sensor Circuit
DTC P1382: No signal in CYP Sensor Circuit





To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P1607: Malfunction in ECM/PCM Internal Circuit



To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

NOTE:

If this symptom is intermittent, check the following problems.

- The MIL never comes on after the ignition switch is turned ON (II).
 - A loose ACGS (15 A) fuse in the under hood fuse/relay box.
 - A loose No. 1 FUEL PUMP (15 A) fuse in the under-dash fuse/relay box.
 - A loose No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the underdash fuse/relay box.
 - An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly.
 - An intermittent short in the wire between the ECM/PCM (C19) the MAP sensor and the countershaft speed sensor (A/T).
 - An intermittent short in the wire between the ECM/PCM (C28) and the TP sensor, the EGR valve lift sensor and the mainshaft speed sensor (A/T).
 - PGM-FI main relay.
- The MIL stays on or comes on after two seconds with the ignition switch turned ON (II).
 - An intermittent short in the wire between the ECM/PCM (A10) and the service check connector.
 - An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly.
- See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.

Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

Does the MIL come on and stay on?

YES

NO

Check the inertia switch:
 1. Turn the ignition switch OFF.
 2. Press the inertia switch button.
 3. Turn the ignition switch ON (II).

Does the MIL come on for two seconds after ignition switch is turned ON (II)?

YES

Intermittent failure, system is OK at this time.

NO

Check the fuse:
 1. Turn the ignition switch OFF.
 2. Turn the ignition switch ON (II).

Does the low oil pressure indicator light come on?

NO

- Repair short or open in the wire between No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse and gauge assembly.
 - Replace the No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse.

YES

Check the engine starting:
 Try to start the engine.

Does the engine start?

YES

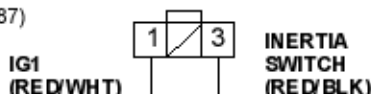
Check for an open in the wire or bulb (MIL line):
 1. Turn the ignition switch OFF.
 2. Connect the ECM/PCM connector terminal A18 and body ground with a jumper wire.
 3. Turn the ignition switch ON (II).

NO

(To page 11-B-85)

(To page 11-B-85)

INERTIA SWITCH CONNECTOR



JUMPER WIRE

Wire side of female terminals

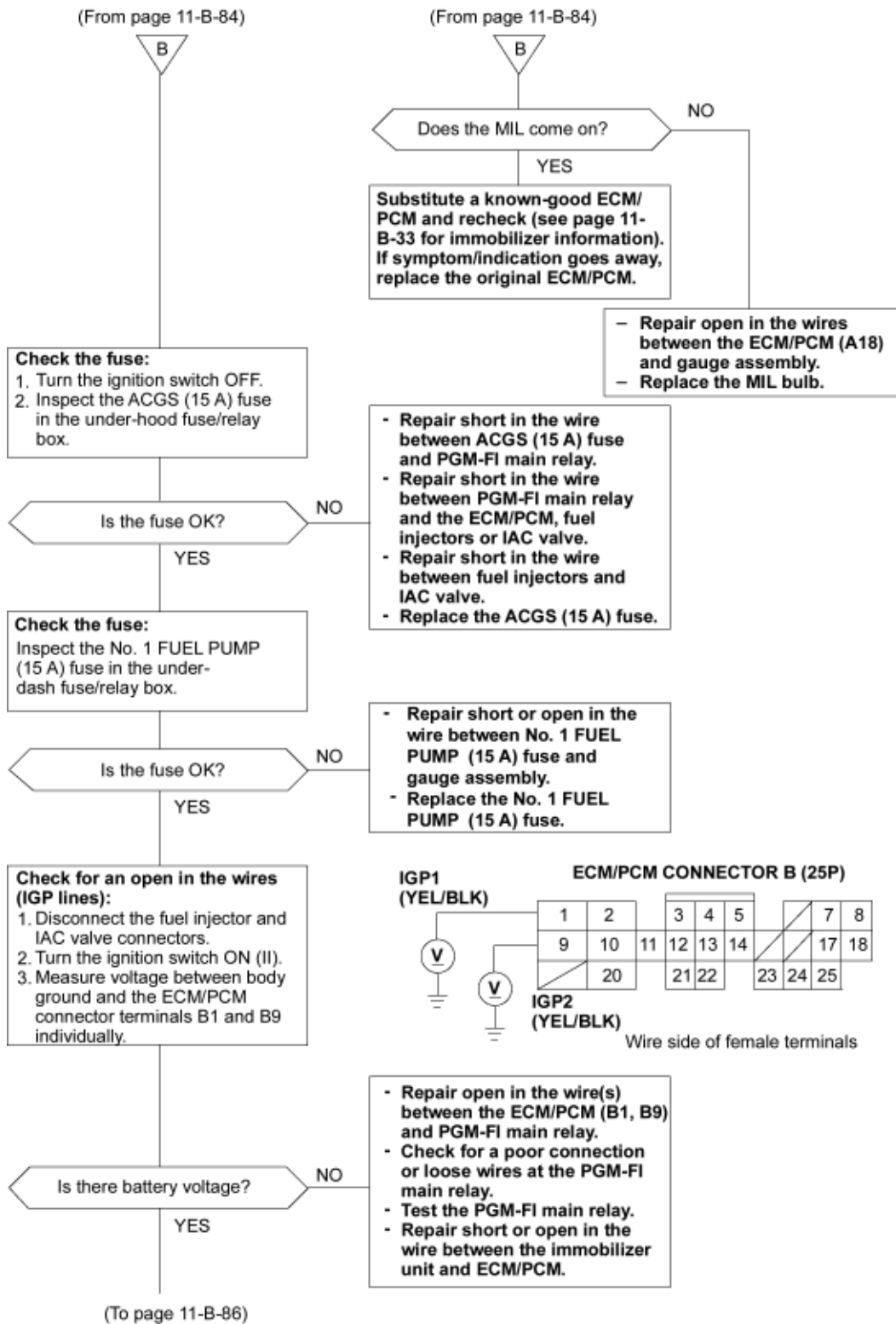
ECM/PCM CONNECTOR A (32P)



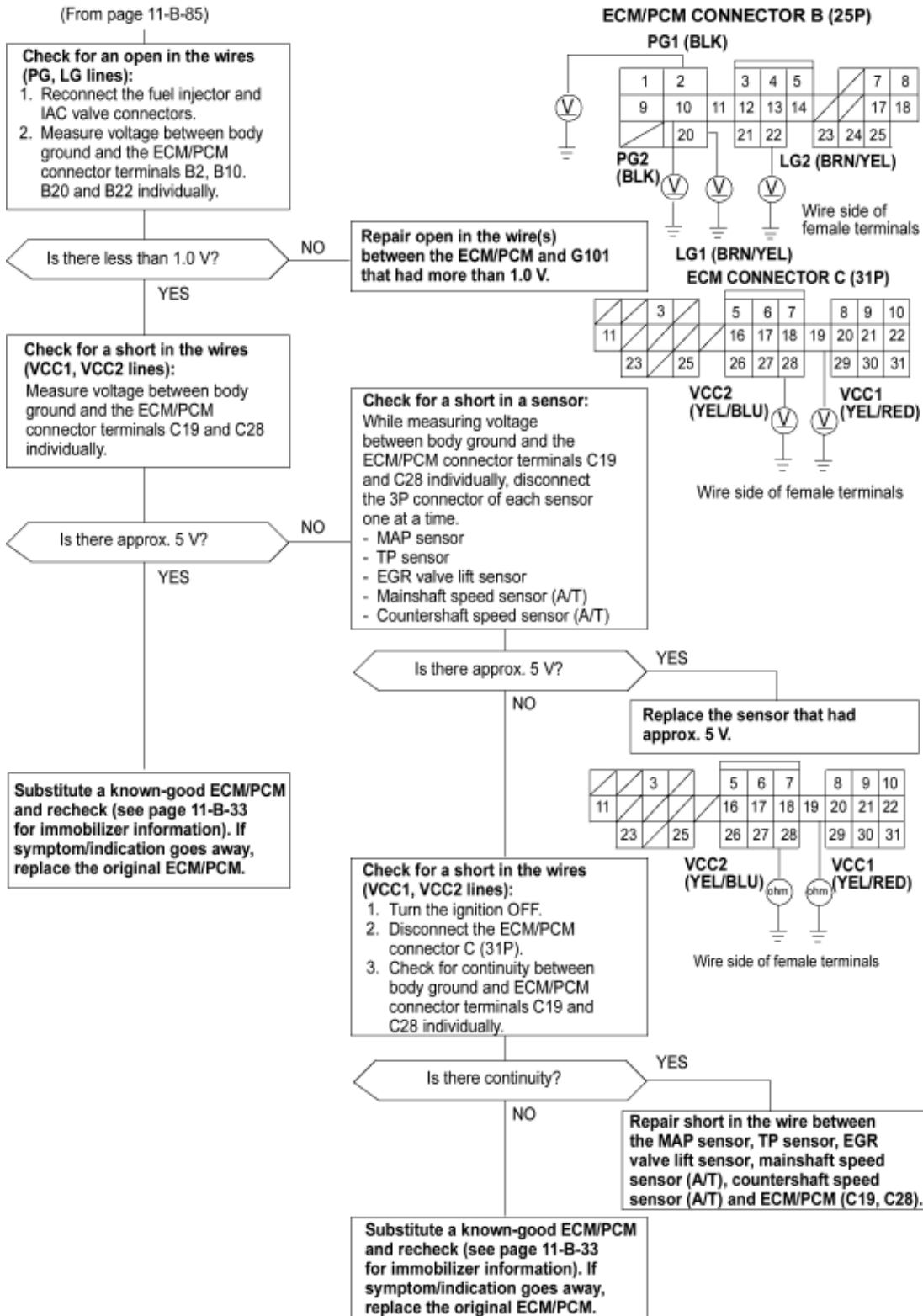
JUMPER WIRE

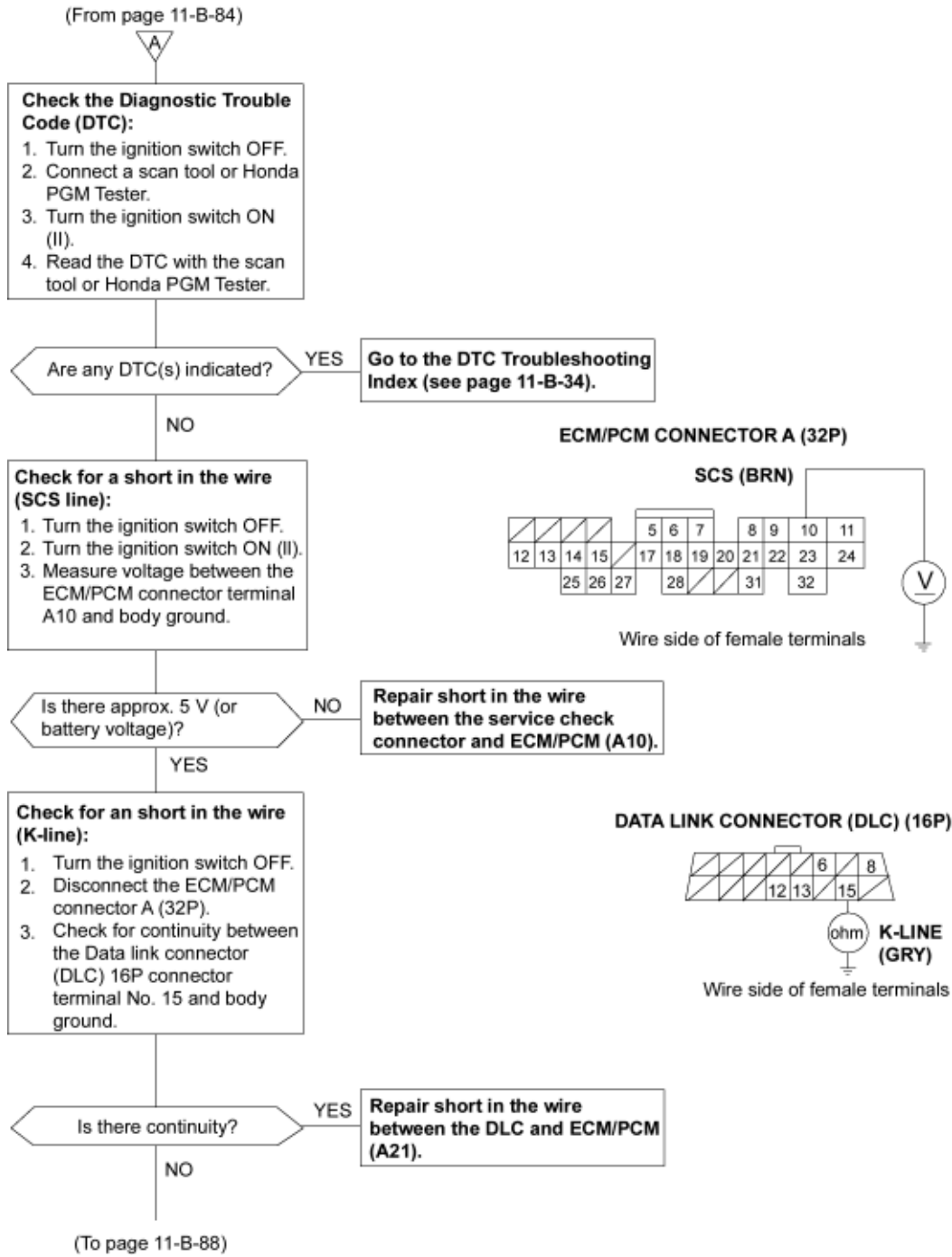
Wire side of female terminals

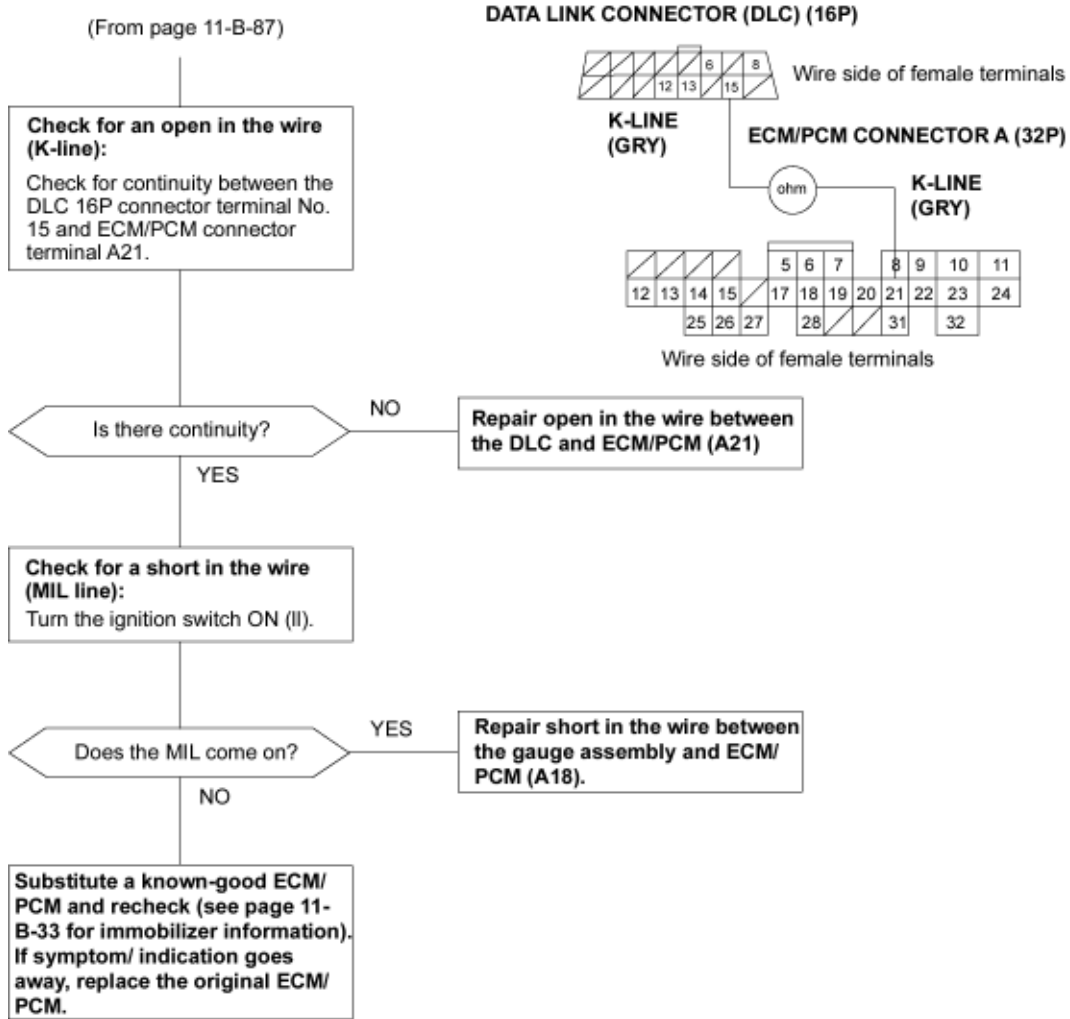




To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)







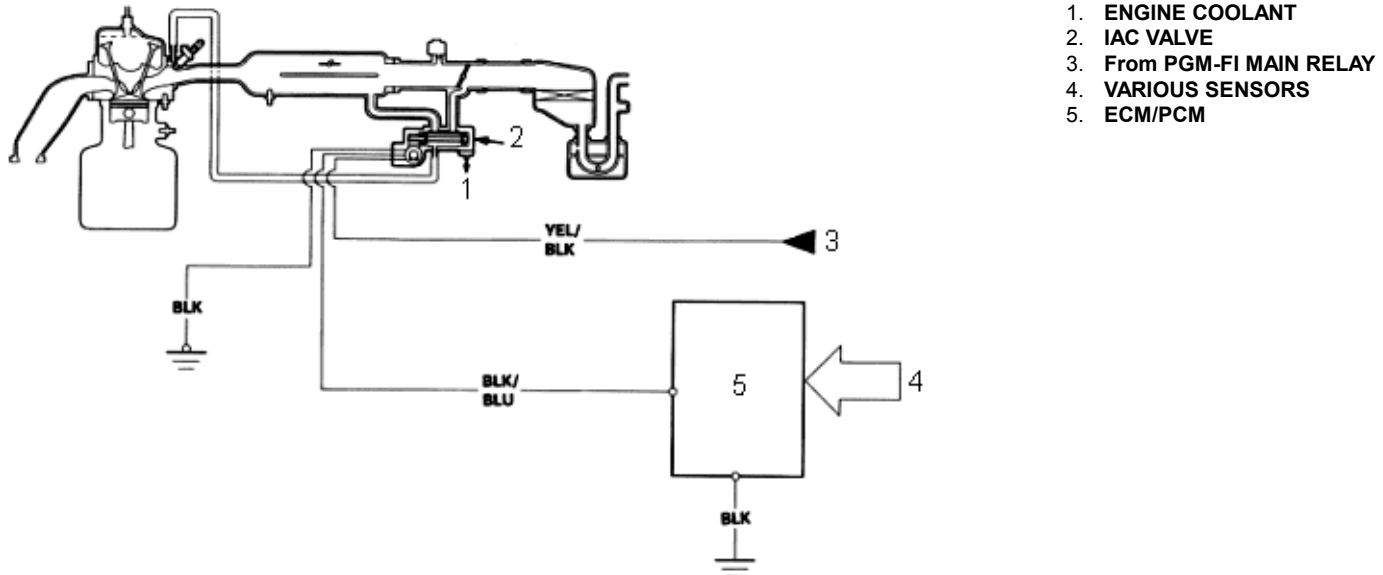
To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-B-33\)](#)

Idle Control System

System Description (F18B2, F18B4 engine)

11-B-89

The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve. The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM/PCM. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.



1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about 150 - 300 rmp (min⁻¹).
2. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air thus controlled in relation to the engine coolant temperature.
3. When the idle speed is out of specification and the scan tool does not indicate Diagnostic Trouble Code (DTC) P1519, check the following items:
 - ♦ Air conditioning signal
 - ♦ ALT FR signal
 - ♦ Brake switch signal
 - ♦ Starter switch signal
 - ♦ A/T gear position signal (A/T)
 - ♦ PSP switch signal
 - ♦ Hoses and connections
 - ♦ IAC valve and its mounting O-rings
4. If the above items are normal (and the scan tool does not indicated DTC P1519), after IAC valve replacement, substitute a know-good ECM/PCM and recheck (**See Page 11-B-33** for immobiliser information). If symptom goes away, replace the original ECM/PCM.

Idle Control System

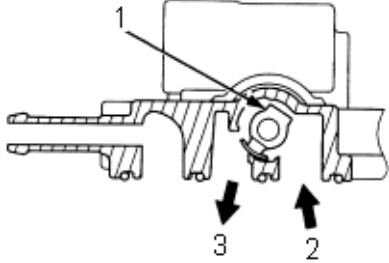
System Description (F18B2, F18B4 engine) (cont'd)

11-B-90

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is depressed, the power steering load is high, or the alternator is charging, the ECM/PCM controls current to the IAC valve to maintain the correct idle speed. Refer to the System Diagram to see the functional of the system.

IAC (Idle Air Control) Valve

To maintain the proper idle speed, the IAC valve changes the amount of air bypassing the throttle body in response to an electrical signal from the ECM/PCM.



1. VALVE
2. From AIR CLEANER
3. To INTAKE MANIFOLD

PSP (Power Steering Pressure) Switch

The PSP switch signals the ECM/PCM when the power steering load is high.

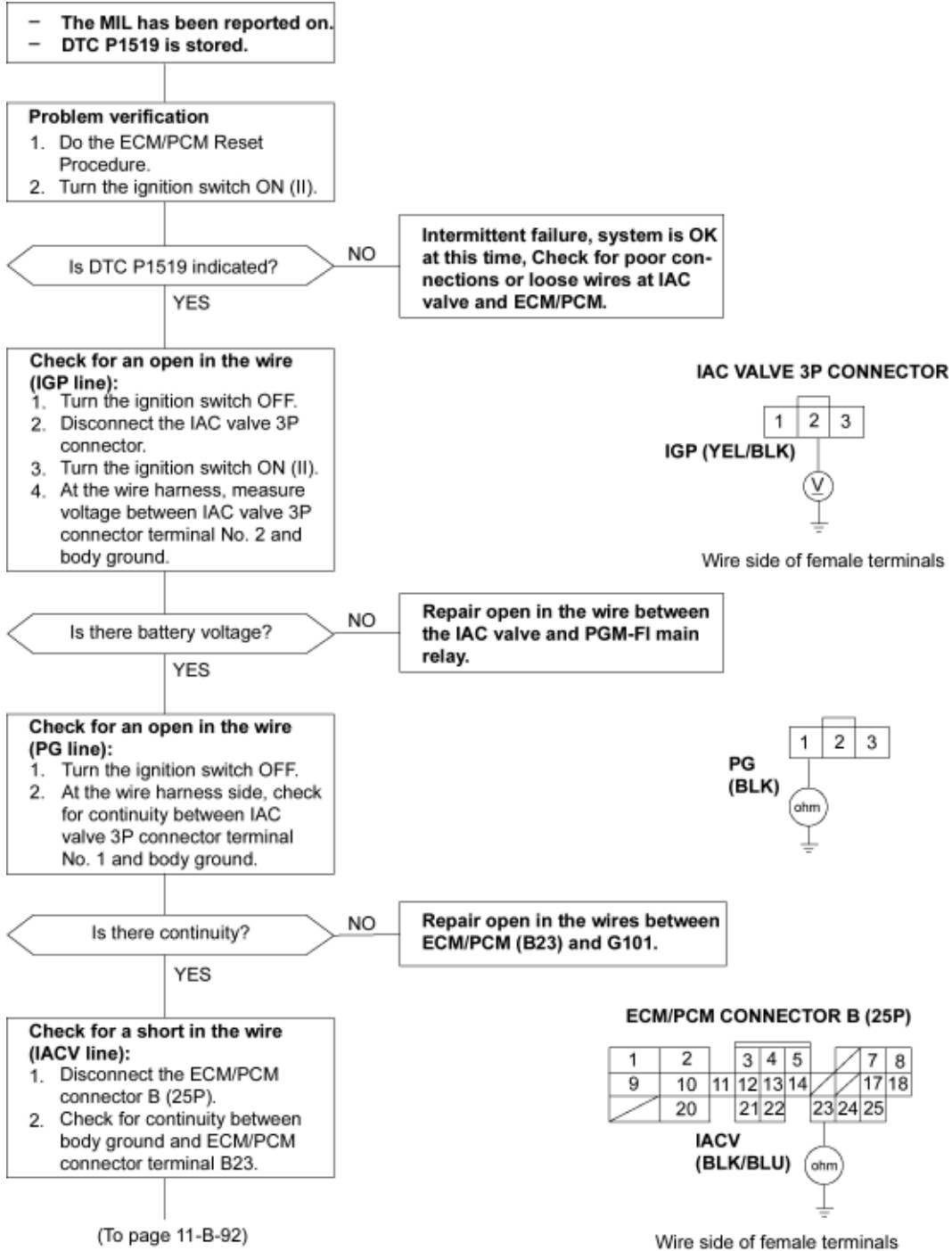
Starter (Ignition) Switch

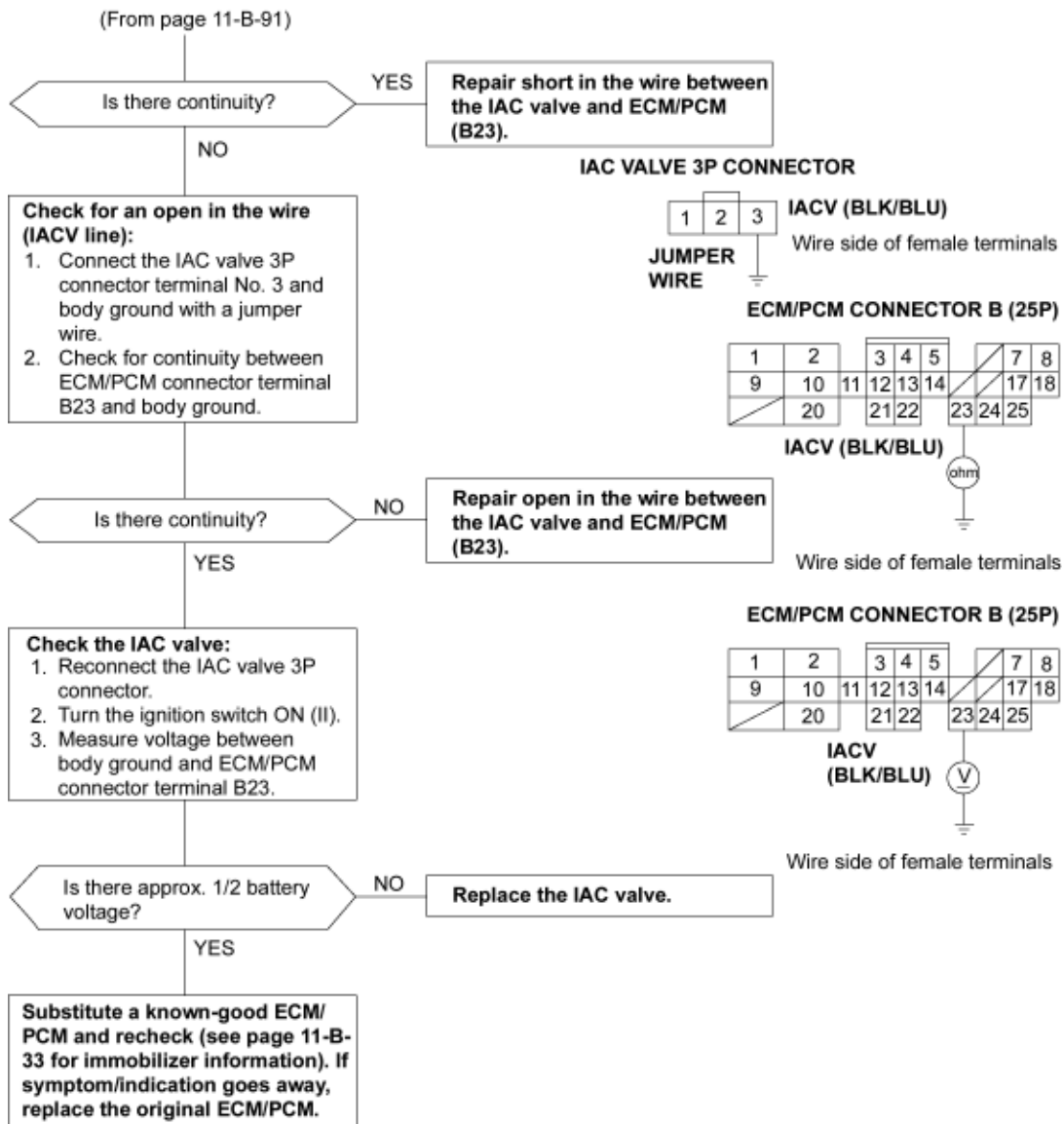
The ignition switch signals the ECM/PCM when the engine is cranking.

Brake Switch

The brake switch signals the ECM/PCM when the brake pedal is pressed.

DTC P1519: Malfunction in IAC Valve Circuit





To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-33)

Emission Control System

System Description (F18B2, F18B4 engine)

11-B-93

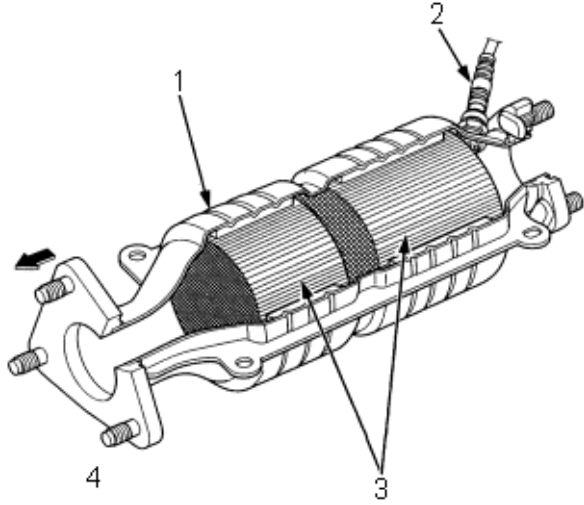
Catalytic Converter System

Three-way Catalytic Converter (TWC)

The TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO₂), dinitrogen (N₂) and water vapour.

Removal/Installation

(see section 9)



1. HOUSING
2. SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO₂S)
3. THREE WAY CATALYSTS
4. FRONT OF VEHICLE

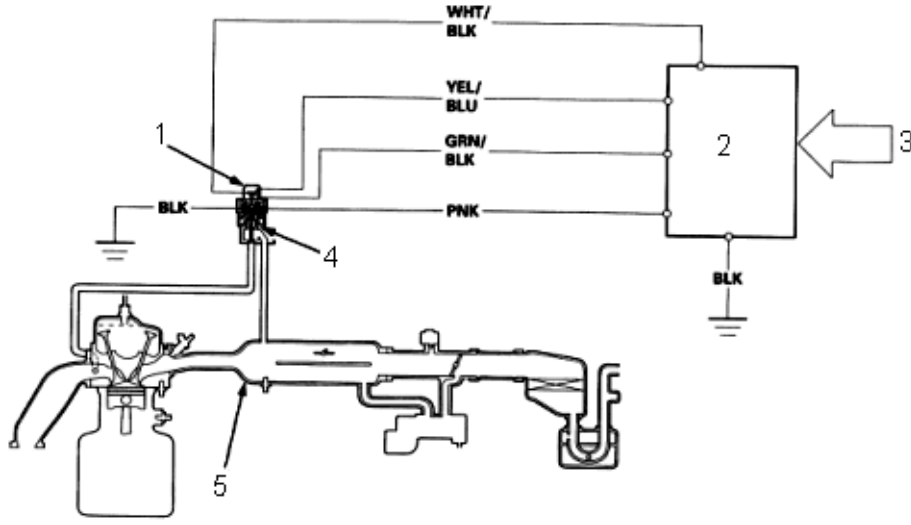
Emission Control System

System Description (F18B2, F18B4 engine) (cont'd)

11-B-94

Exhaust Gas Recirculation (EGR) System

The EGR system reduces oxides of nitrogen (NOx) emissions by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. The ECM/PCM memory includes the ideal EGR valve lift for varying operating conditions. The EGR valve lift sensor detects the amount of EGR valve lift and sends it to the ECM/PCM. The ECM/PCM then compares it with the ideal lift in its memory (based on signals sent from other sensors). If there is any difference between the two, the ECM/PCM cuts current to the EGR valve.



Evaporative Emission (EVAP) Controls

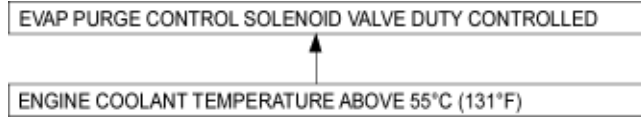
The evaporative emission controls are designed to minimise the amount of fuel vapour escaping to the atmosphere. The system consist of the following components:

A. Evaporative Emission (EVAP) Control Canister

An EVAP control canister is used for the temporary storage of fuel vapour until the fuel vapour can be purged from the EVAP control canister into the engine and burned.

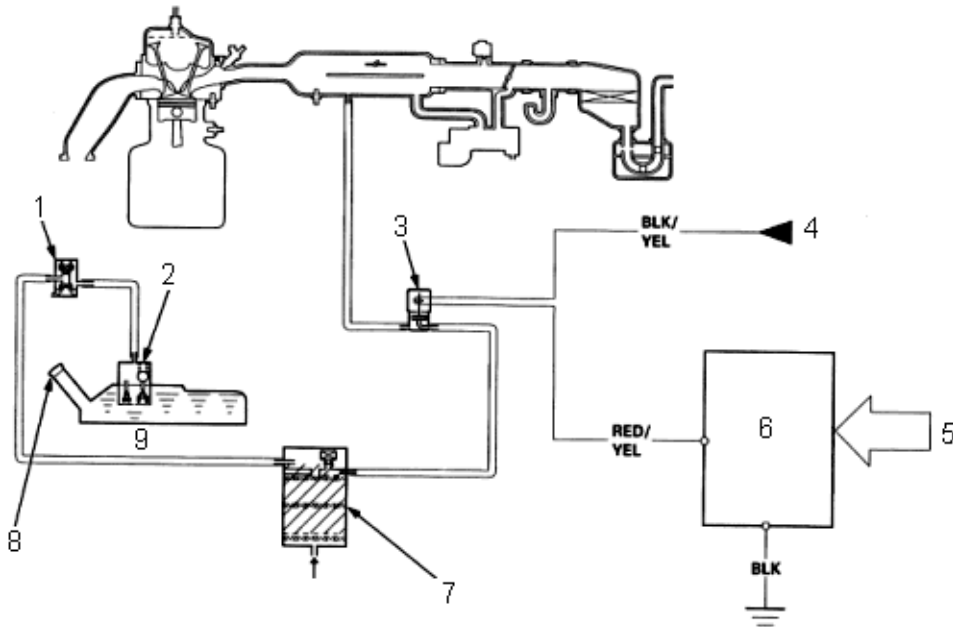
B. Vapour Purge Control System

EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the throttle body. The purging vacuum is controlled by the EVAP purge control canister and the EVAP purge control solenoid valve.



C. Fuel Tank Vapour Control System

When fuel vapour pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapour to the EVAP control canister.



- 1. EVAP TWO WAY VALVE
- 2. FUEL TANK EVAP VALVE
- 3. EVAP PURGE CONTROL SOLENOID VALVE
- 4. From No. 6 ECU (ECM/PCM) CRUISE CONTROL (15 A) FUSE
- 5. VARIOUS SENSORS
- 6. ECM/PCM
- 7. EVAP CONTROL CANISTER
- 8. FUEL FILL CAP
- 9. FUEL TANK

DTC P0420: Catalyst system efficiency below threshold

NOTE: If some of the DTCs listed below are stored at the same time as DTC P02420, troubleshoot those DTCs first, then troubleshoot DTC P0420.

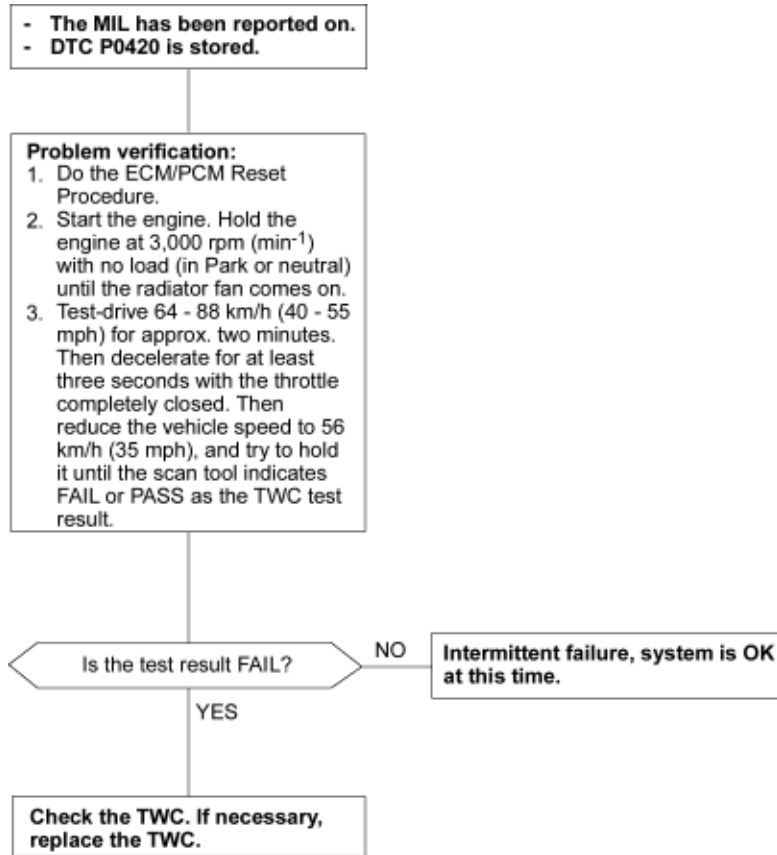
P0137, P0138: Secondary JO2S (sensor 2)

P0141: Secondary HO2S (Sensor 2) Heater

Possible Cause

- ♦ Three Way Catalytic Converter (TWC) Deterioration
- ♦ Exhaust system leakage

Troubleshooting Flowchart



Emission Control System

DTC Troubleshooting (F18B2, F18B4 engine)
(cont'd)

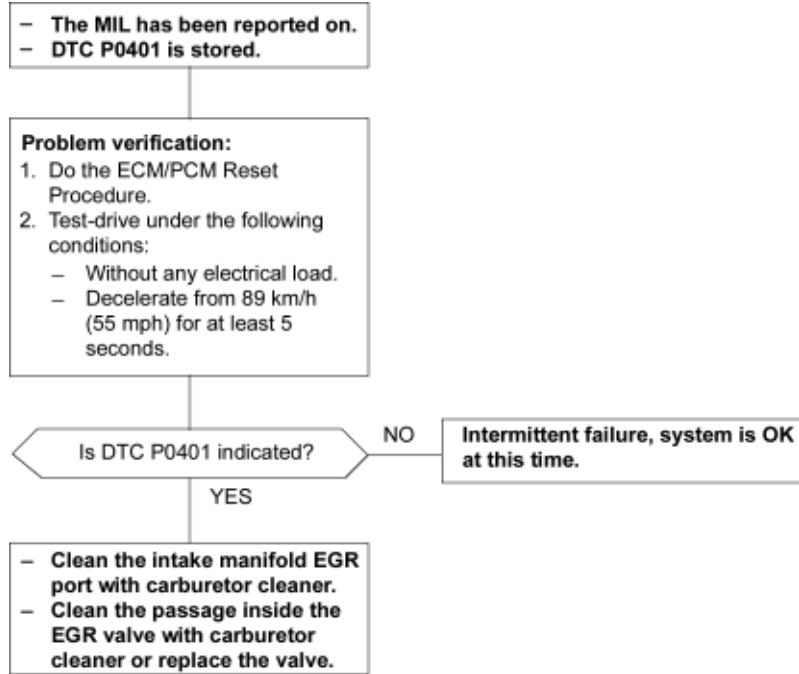
11-B-97

DTC P0401: Insufficient flow in EGR system.

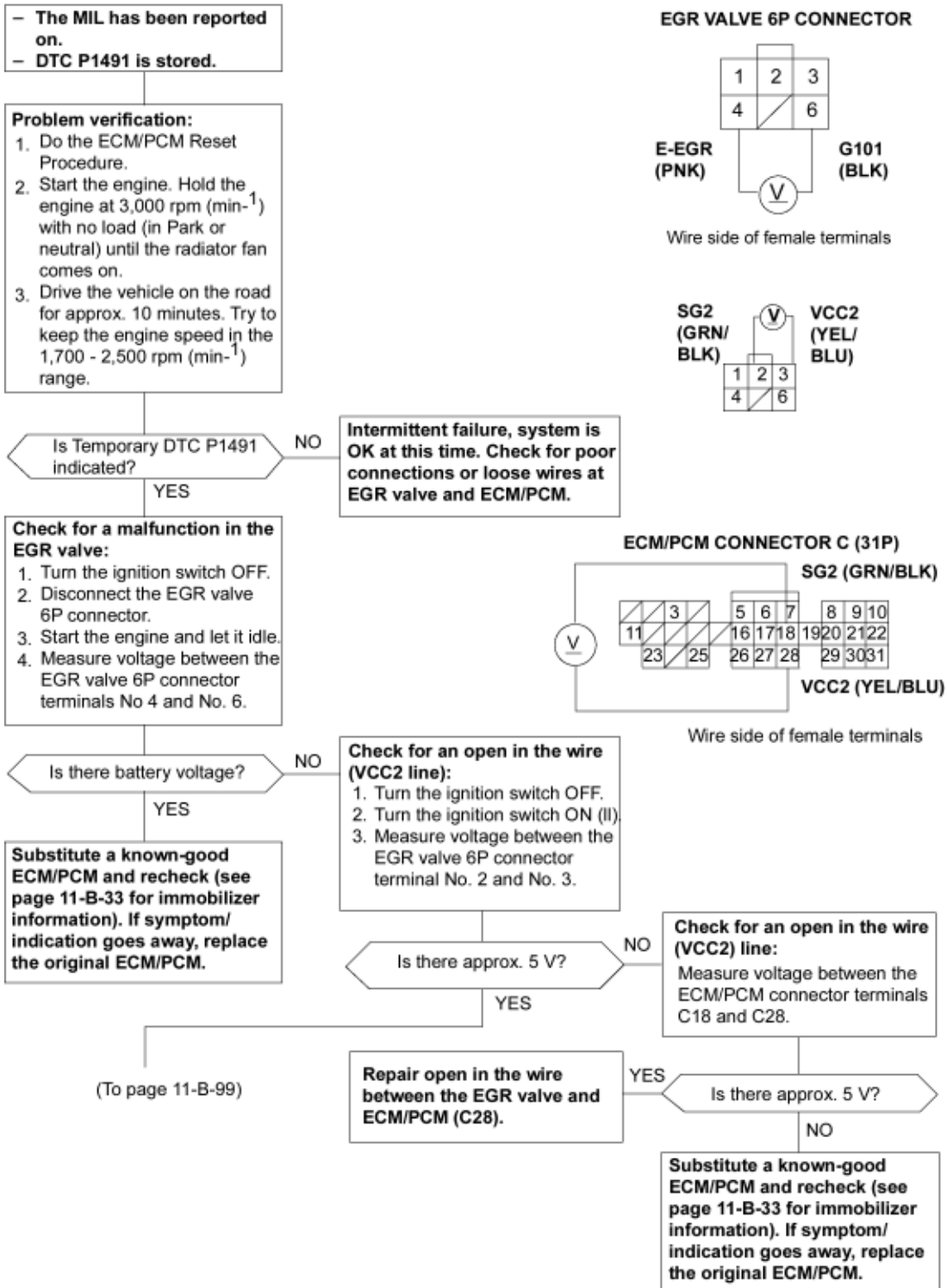
Possible Cause

- ♦ Clogging, leakage in the EGR line
- ♦ Faulty EGR valve

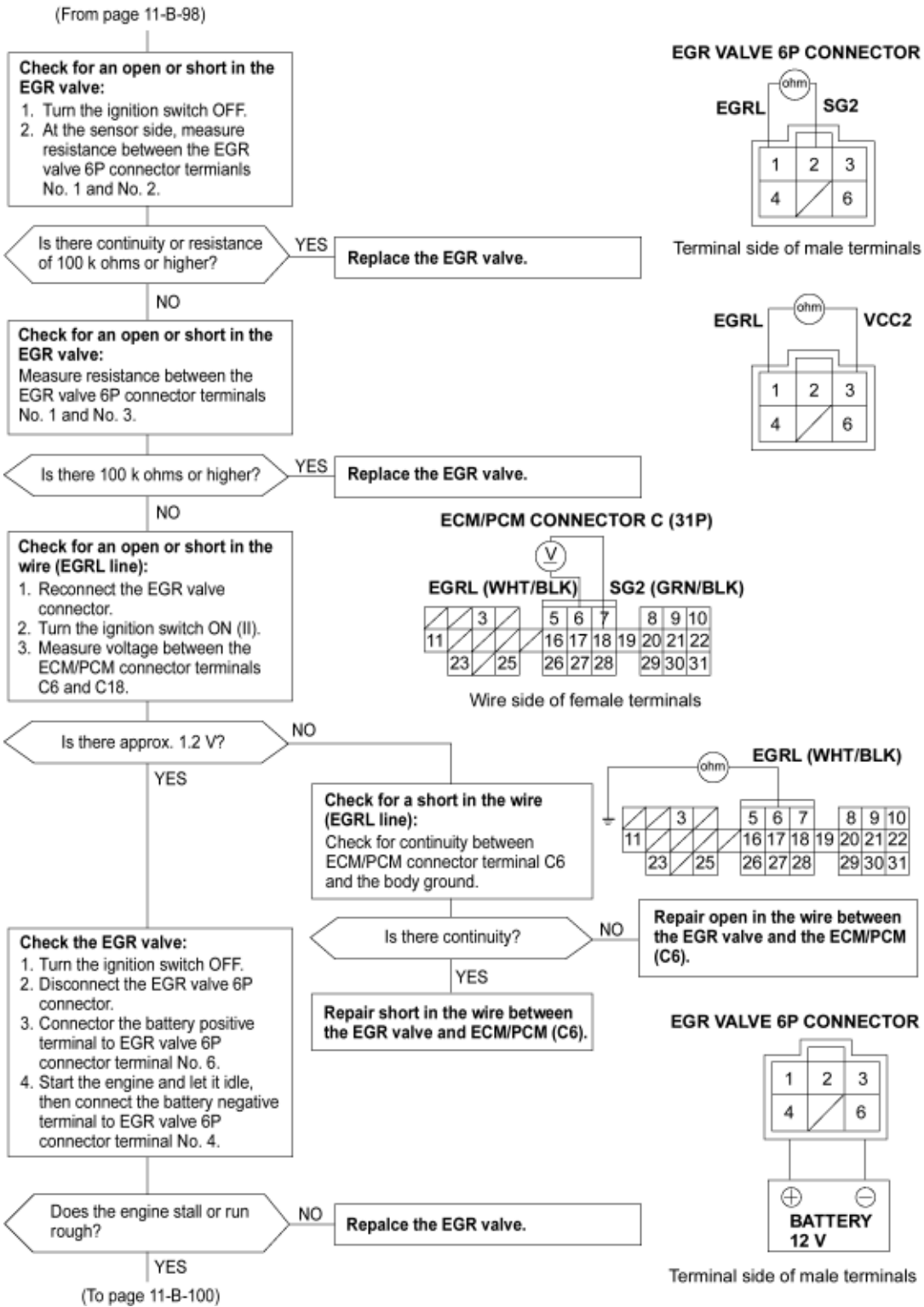
Troubleshooting Flowchart



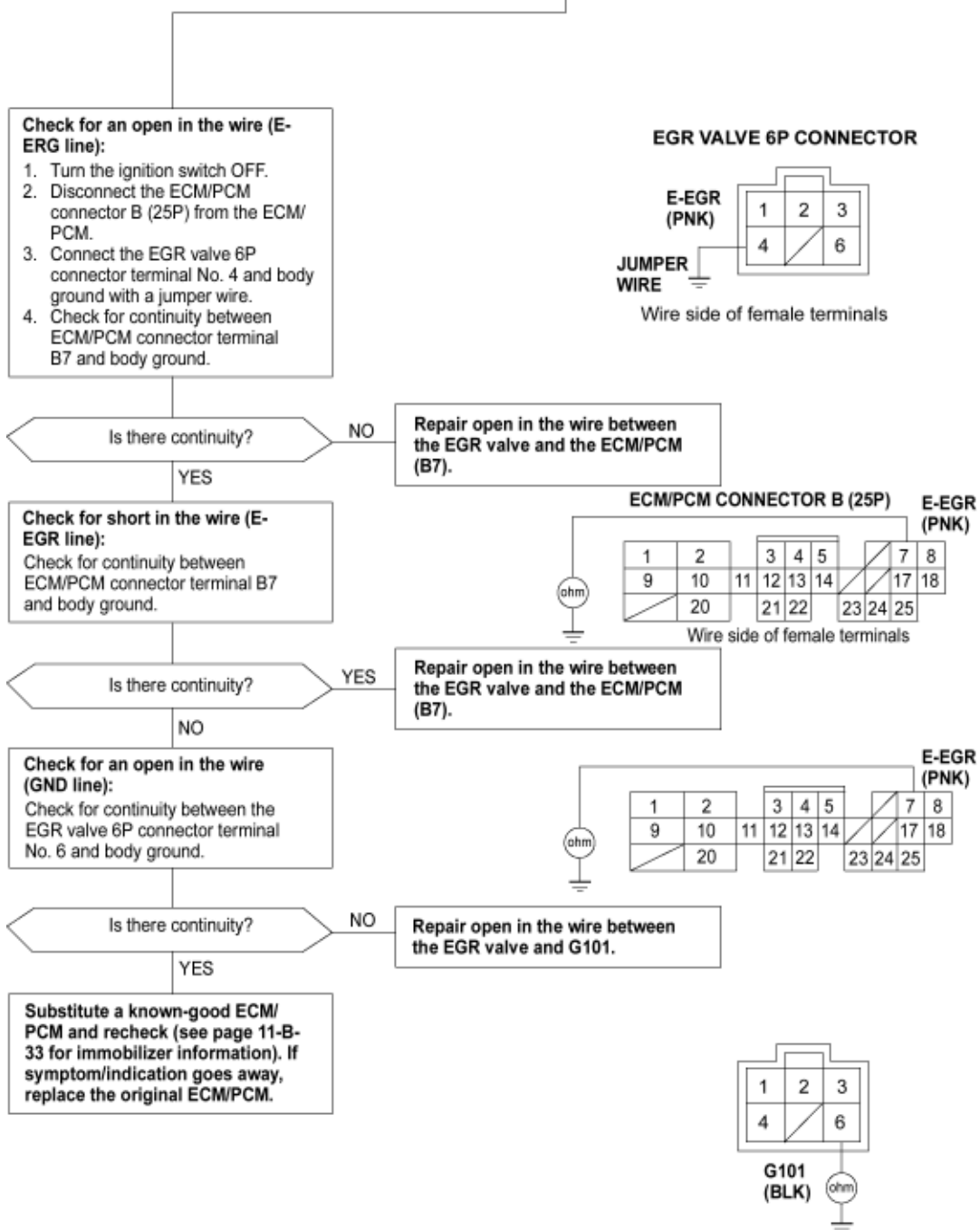
DTC P1491: Malfunction in EGR system



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-33)

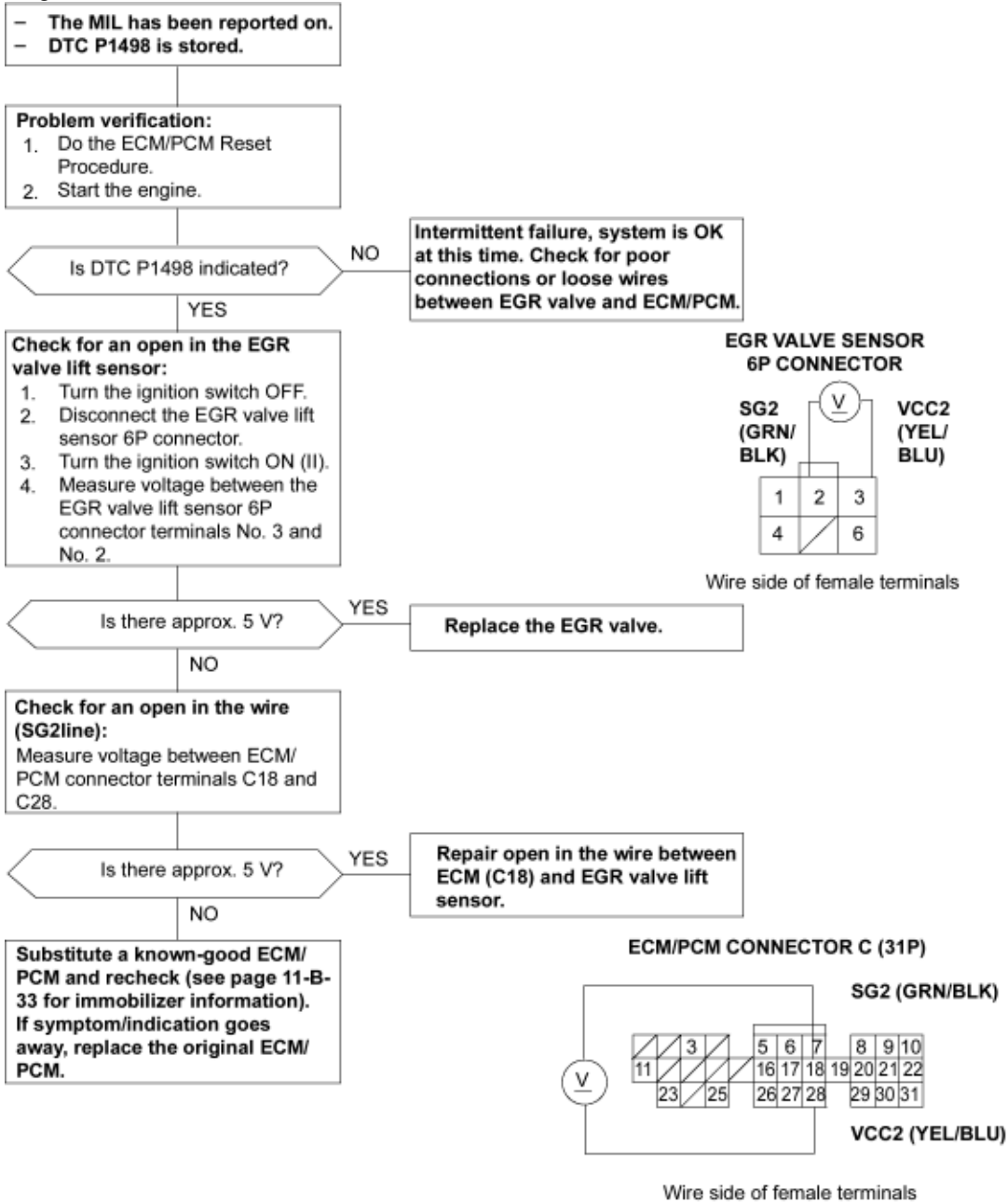


(From page 11-B-99)



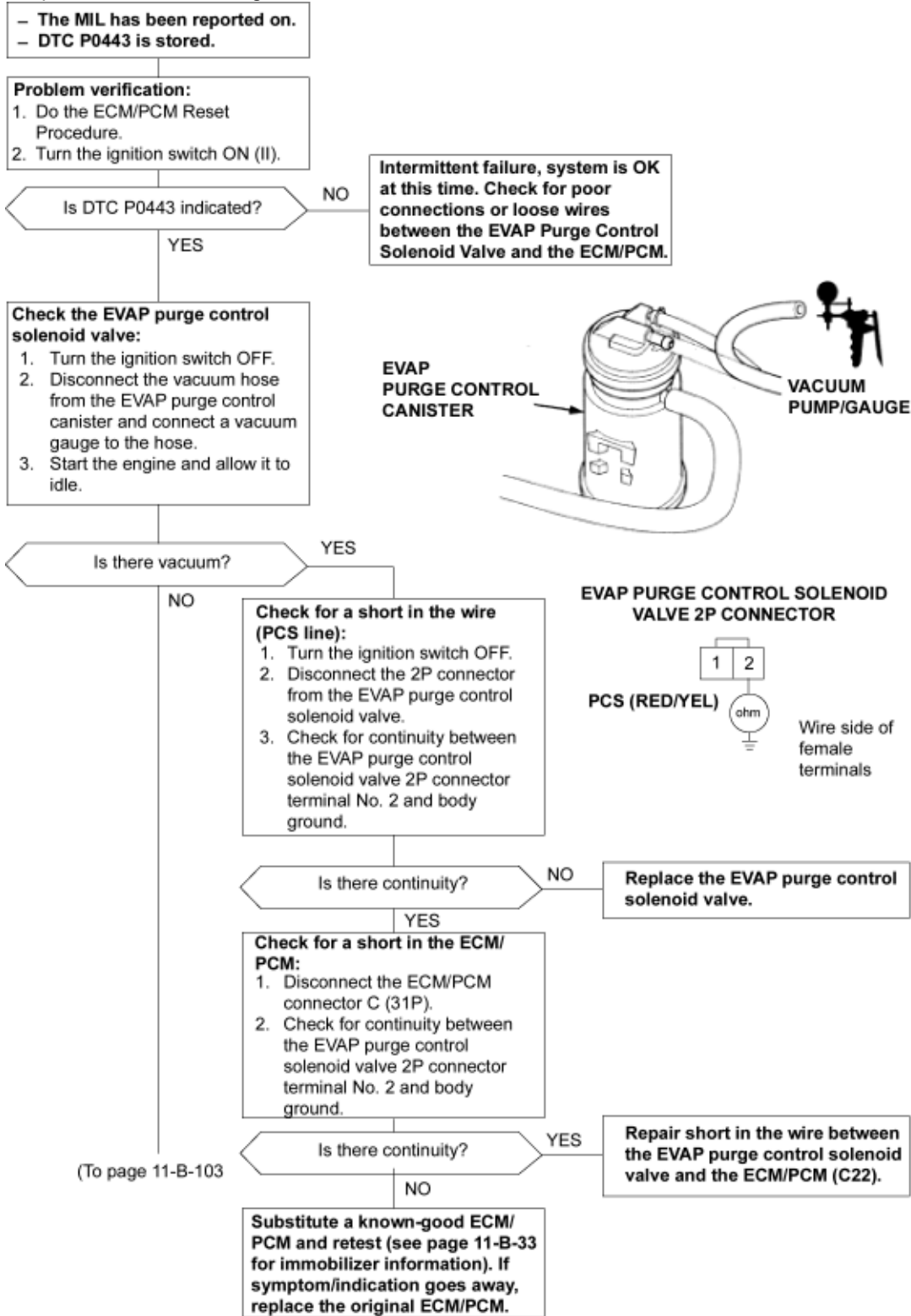
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-33)

DTC P1498: High voltage in EGR valve lift sensor circuit



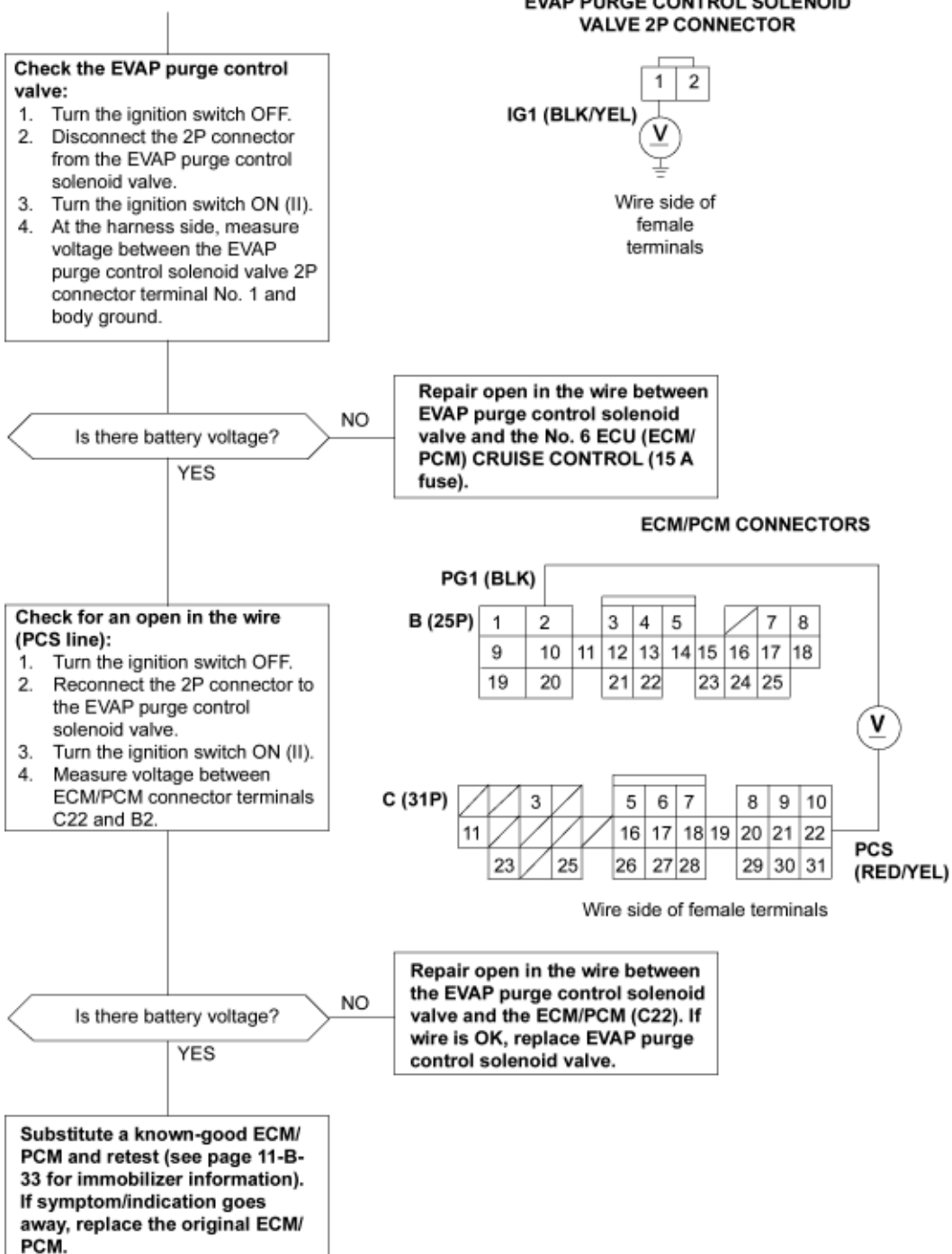
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

DTC P0443: Electrical problem in EVAP Purge Control Solenoid Valve circuit



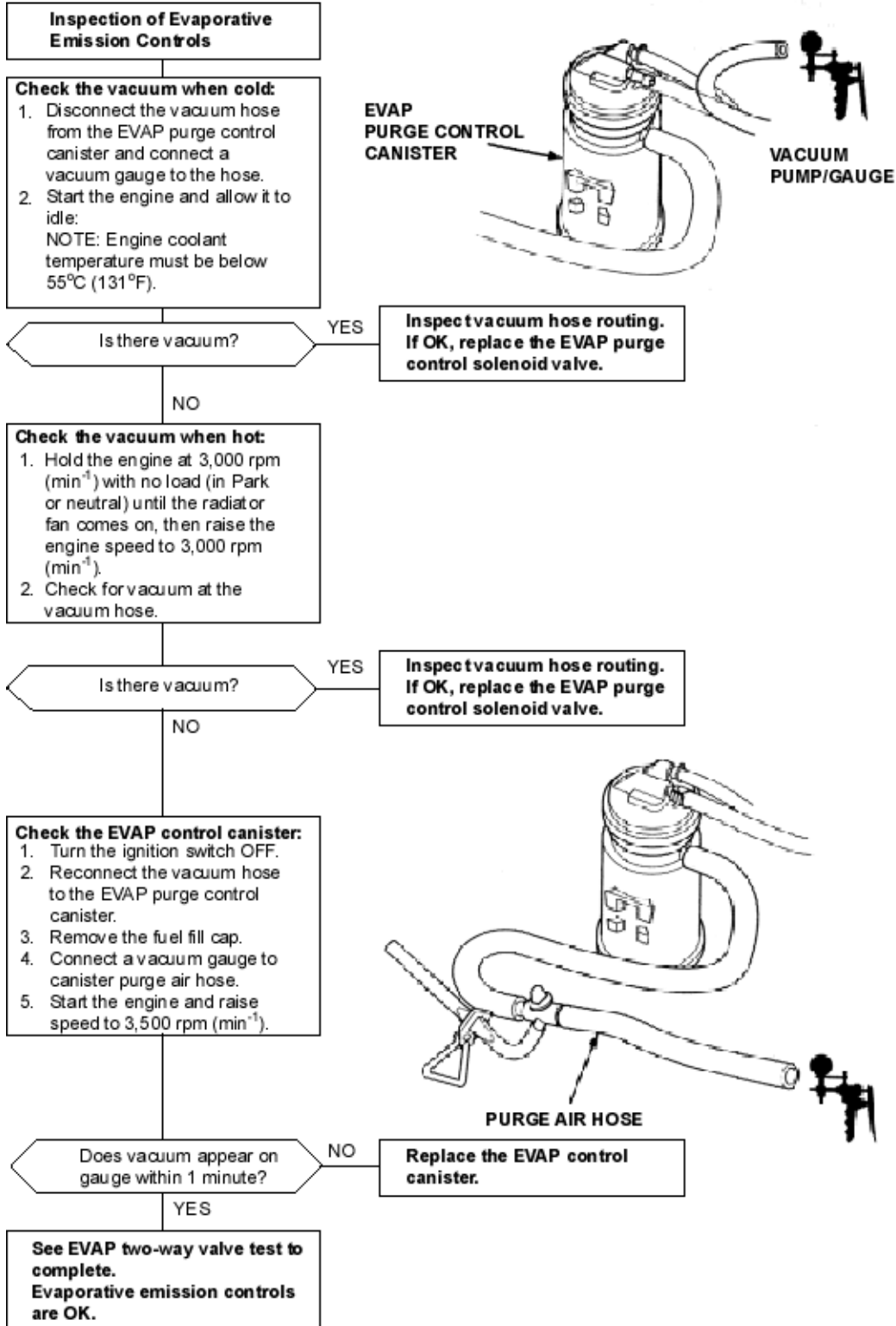
To go to the page referenced on the diagram above, click on the following:
(See Page 11-B-33)

(From page 11-B-102)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-B-33)

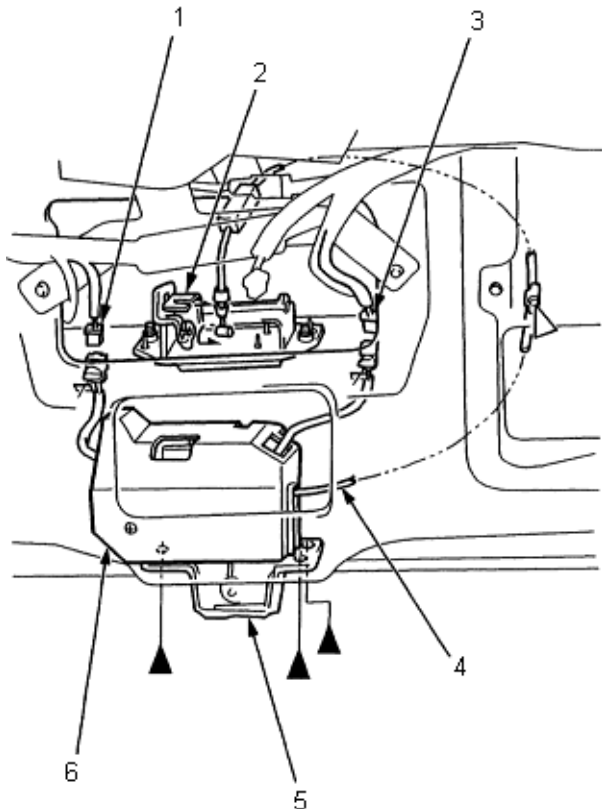
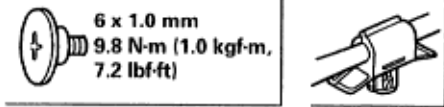
Inspection



NOTE:

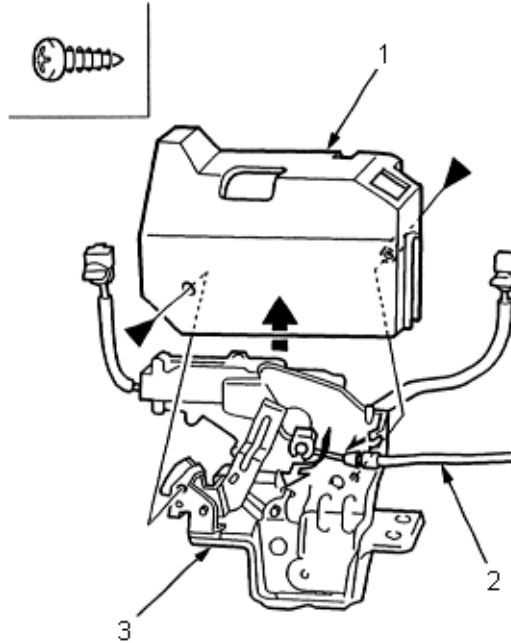
- ♦ Take care not to bend the handle cable.
 - ♦ Put on gloves to protect your hands.
1. Remove the tailgate lining (See Page 20-13).
 2. Disconnect the handle cable from the tailgate handle and detach the cable clip. Disconnect the tailgate latch switch connector and tailgate latch actuator connector and detach the connectors.
 3. Remove the bolts, then remove the tailgate latch/latch cover.

▶: Bolt locations, 3 ▷: Clip location, 1



1. TAILGATE LATCH ACTUATOR CONNECTOR
2. TAILGATE HANDLE
3. TAILGATE LATCH SWITCH CONNECTOR
4. HANDLE CABLE
5. TAILGATE LATCH
6. LATCH COVER

4. Remove the screws, then remove the latch cover.
- ▶: Screw locations, 2



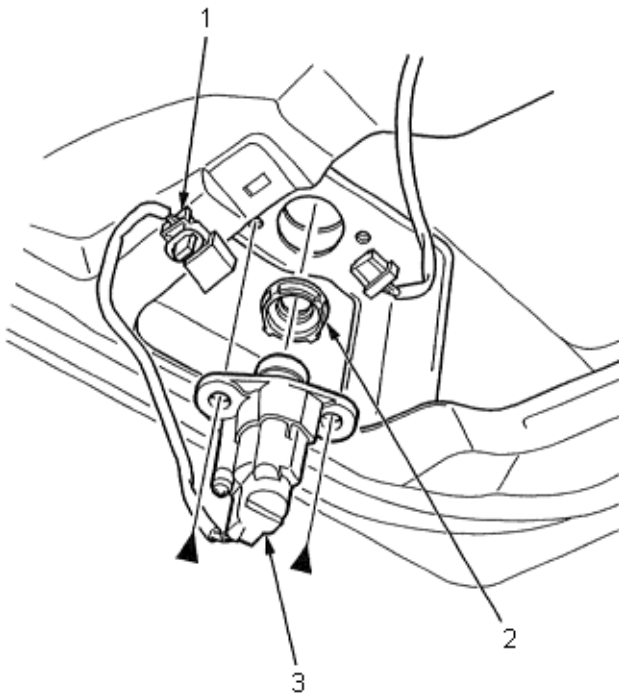
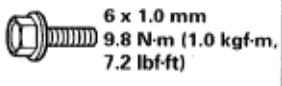
1. LATCH COVER
2. HANDLE CABLE
3. TAILGATE LATCH

5. Disconnect the handle cable.
6. Install in the reverse order of removal and note these items:
 - ♦ Make sure the connectors are plugged in properly and the handle cable is connected properly.
 - ♦ Make sure the tailgate opens properly and locks securely.

Tailgate Lock Cylinder Replacement

1. Disconnect the cylinder switch connector, then detach the cylinder switch connector from the tailgate.
2. Remove the bolt securing the lock cylinder and remove the lock cylinder. If necessary, remove the tailgate lock cylinder trim.

▶: Bolt locations, 2



1. CYLINDER SWITCH CONNECTOR
2. TAILGATE LOCK CYLINDER TRIM
3. TAILGATE LOCK CYLINDER

3. Install in the reverse order of removal and note these items:
 - ♦ Make sure the connector is plugged in properly.
 - ♦ Make sure the tailgate opens properly and locks securely.

Preparation of Work
Description

1-2

Most monocoque bodies are composed as a single unit by welding together pressed parts made of steel plates which come in a variety of different shapes and sizes. Each part is responsible for displaying a certain strength and durability in order that it may play its role in meeting the functions of the body as a whole.

Damage to the exterior of the body can be inspected visually, but where there has been an external impact, it is necessary to inspect the extent of the damage. In some cases, the deformation may have spread beyond the actual areas that were in the collision so the deformation must be inspected closely.

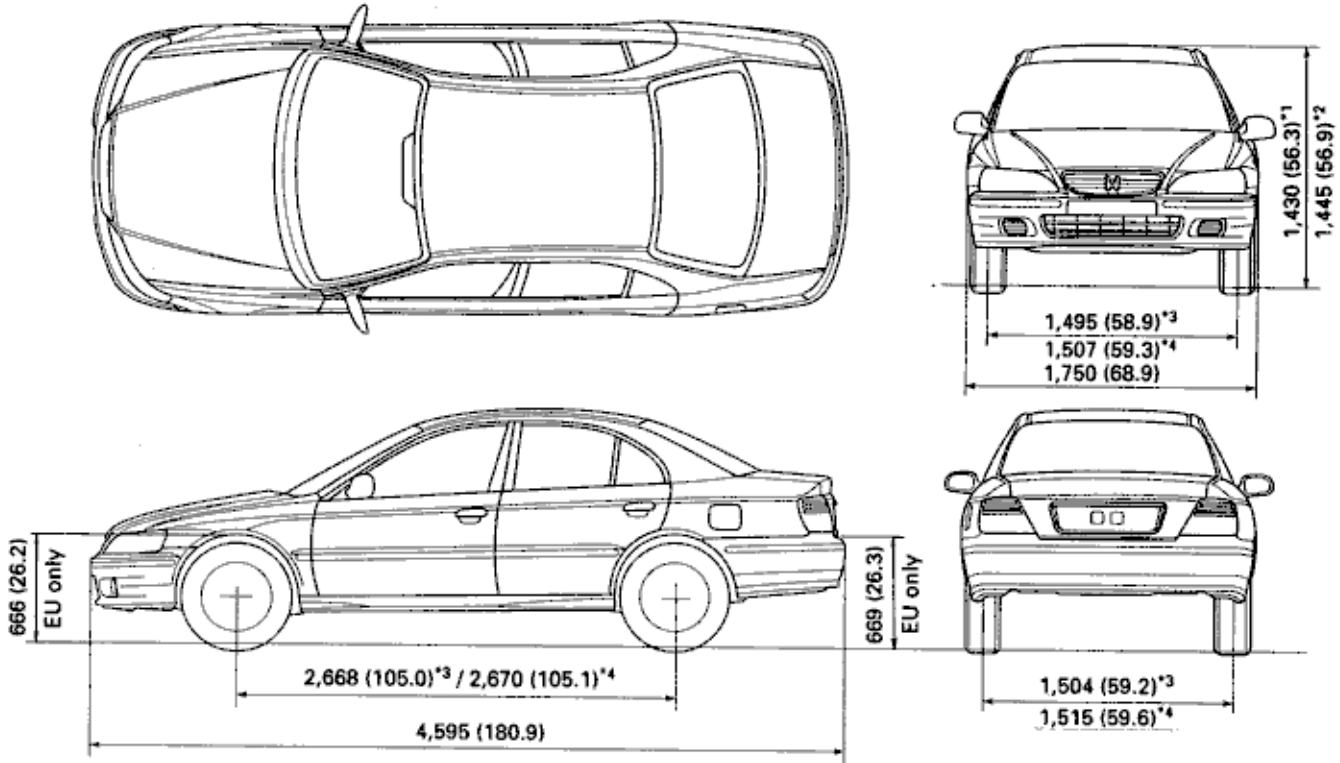
*1: Except KY model

*2: KY model

*3: Except Type R

*4: Type R

Unit: mm (in)



Front wheel alignment:

	Other engine types	H22A7 engine types only
Camber	0°00'±1' (*0°10'±1')	-0°15'±1'
Caster	2°50'±1' (*2°45'±1')	3°00'±1'
Total toe	0±2 (0±0.08)	←
Wheel turning angle	in	39°10'±2' (*39°27'±2')
	out (Reference)	30°58' (*31°14')

*: KY model

Rear wheel alignment:

	Other engine types	H22A7 engine types only
Camber	-1°00'±30' (*-0°50'±30')	-1°15'±30'
Total toe	IN2±2 (0.08±0.08)	←

*: KY model

Accurate Inspection of Damaged Parts (Visual)

Seat Belts

Replace the seat belts if:

- ♦ The airbags were deployed.
- ♦ The belt material is cut, punctured, burned, or in any way damaged.
- ♦ The buckle or retractor does not work properly.
- ♦ They were worn at the time of a collision (check for damage at the seat belt anchor points).
- ♦ Their condition is questionable.

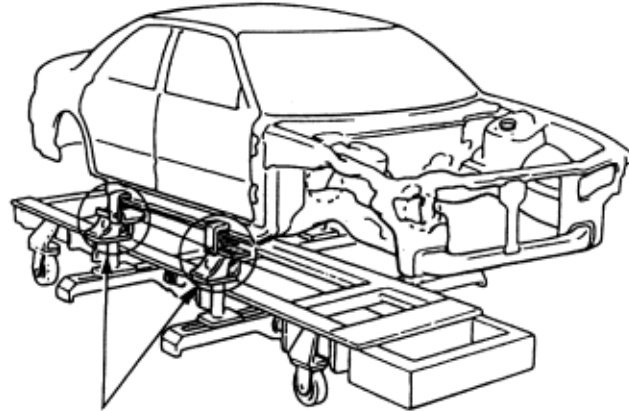
Front Section:

- ♦ Is there any bending, splitting, denting or other damage to the suspension and its related parts?
- ♦ Is there any deformation of the front bulkhead or radiator core? Have any of the connected sections come apart?
- ♦ Are there any creases or distortion in the front wheelhouse or side frame? Have any of the connected sections come apart?
- ♦ Is there any bending or twisting of the whole front area?
- ♦ Is there any deformation like creases, bulges, or dents in the front pillar, dashboard, floor, or other areas?
- ♦ Is there any vertical twisting or misaligned clearance in the door?
- ♦ Is the windshield seal broken?
- ♦ Is there any deformation in the vicinity of the top part of the roof panel's center pillar?
- ♦ Is there any damage inside the vehicle (is there any twisting of the dashboard, or anything irregular with the clearances or mounting parts)?
- ♦ Is there any damage to the steering wheel? Is there any deformation in the column and the column-mounted parts?
- ♦ Is there any oil or water leakage and damage to the engine, transmission, or brakes?
- ♦ Is there any irregular noise in the gear changing operation, engine or transmission rotation?
- ♦ Are there any traces of contact between the engine block and the dashboard lower panel?
- ♦ Is there any damage to brake or fuel lines, or wire harnesses?

Rear Section:

- ♦ Is there any twisting, bulging or denting of the rear floor and rear bulkhead? Have any of the connected sections come apart?
- ♦ Is there any irregular bulging or denting in the rear fender?
- ♦ Is there any distortion in the rear inner panel? Is there any bending and denting in the vicinity of the rear pillar?
- ♦ Is there any distortion or creasing in the rear wheelhouse and arch sections? Have any of the connected sections come apart?
- ♦ Is there anything irregular in the quarter glass seal clearance?
- ♦ Is there any twisting or misalignment of the clearances of the tailgate opening section?
- ♦ Is there any bending, splitting, denting or other damage to the suspension and its related parts?
- ♦ Is there any deformation of the rear floor, rear floor cross member and damper base? Have any of the connected sections come apart?

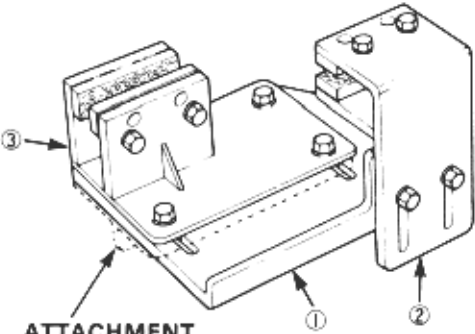
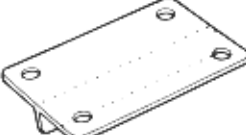
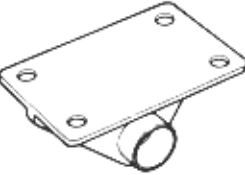
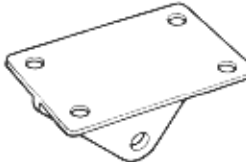
Connect the frame corrector to the vehicle body. The side sill is flangeless to allow reshaping by pulling it out. Use the horizontal pinch welds for anchoring the vehicle.



UNDERBODY CLAMPS

Underbody Clamp:
 V.L CHURCHILL Ltd.
 PO Box 3, London Road,
 Daventry, Northants,
 NN114NF
 TEL + 44 (01327) 704461
 FAX + 44 (01327) 71625

Underbody Clamp Specifications:

UNDERBODY CLAMP (Special tool)	Clamp Number		
 <p>ATTACHMENT</p>	<p>AT-63</p> <p>① Clamp body ② Side clamp ③ Under clamp</p>		
<p>Standard type:</p> 	<p>AT-63-AL</p>	<p>Frame correctors</p> <ul style="list-style-type: none"> ● Dataliner ● Car-o-liner ● Celette ● Flex-o-liner ● etc. 	
<p>C - type:</p> 	<p>AT-63-C</p> <p>Inner diameter 65 mm (2.6 in.)</p>	<ul style="list-style-type: none"> ● Korek ● Auto pole ● etc. 	
<p>U - type:</p> 	<p>AT-63-U</p> <p>Inner diameter 20 mm (0.8 in.)</p>	<ul style="list-style-type: none"> ● U-Base ● Pro-Tec ● etc. 	

1. Apply load to the damaged section and pull on it until the section is almost restored to its original shape.
2. Check that the parts of the body are more or less restored to their original shapes.
NOTE: Check the original position using the body dimensional drawings (see section 6) and the positioning jigs (see page 1-7).
3. Remove the parts that require replacement.
4. Decide whether to replace all the affected parts or to cut the weld joint parts and replace them.
5. Cut off and separate the damaged parts.
NOTE: When cutting the parts off, take special care that you do not damage adjacent parts on the vehicle.
Setting Conditions for Replacement Parts Joint Sections:
 - ♦ Make sure that you can perform straightening work after welding.
 - ♦ Make sure that the locations will not be susceptible to distortion caused by other parts.
 - ♦ Make sure that there are few removable parts and that the location allows for safe welding.
 - ♦ Make sure that the joints are short and that the paint repair can be performed easily.
 - ♦ Make sure the locations are such that the joints can be finished in a way that will not affect the outward appearance.
 - ♦ Make sure that the locations do not hinder the removing and attaching of parts.
NOTE: Keep all of these conditions in mind, and after determining the joint locations, cut the joints for an overlap of 20~30 mm (0.8~1.2 in).
6. Mold the related parts.
7. Set and tack weld the replacement parts.
NOTE: Temporarily mount the related parts and check for clearance and level differences.

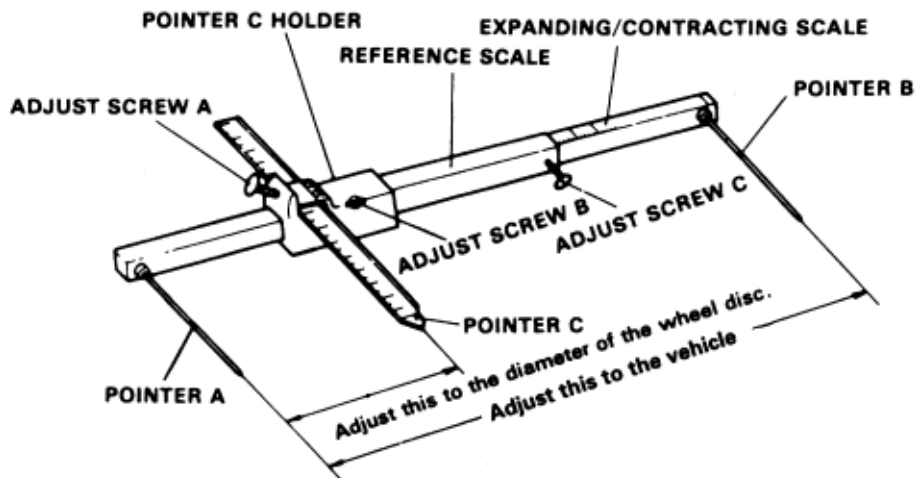
8. Weld the replacement parts.
Use proper welding methods (see section 2).
NOTE: Use of the positioning jig is recommended.



Protect body parts with the heat resistant protective cover to prevent damage when welding.

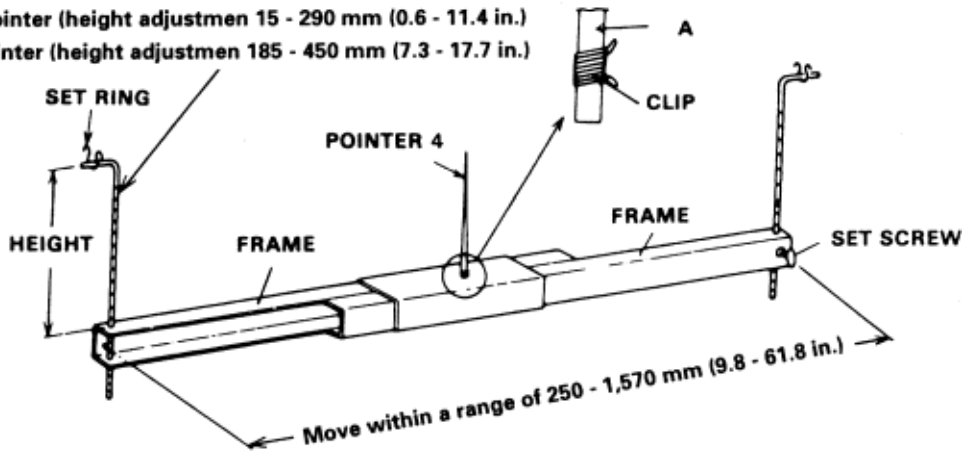
The paint film designed to prevent corrosion will be destroyed around the edges of areas that were welded. Therefore these areas and other areas not clearly visible must be repainted. Refer to rust prevention in section 7 of this manual.

Whenever possible, make judgements and conclusions based on measurement. Measure the wheel alignment (see page 1-2) to prevent uneven tyre wear or incorrect steering wheel alignment. If there are any deviations, use a tram tracking gauge and measure parts of the body.

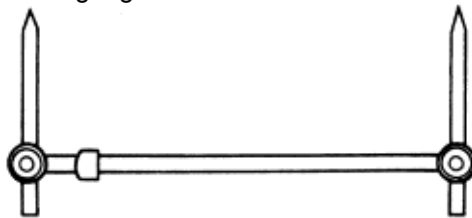


If there is any twisting to the body, measure by using a frame centering gauge.

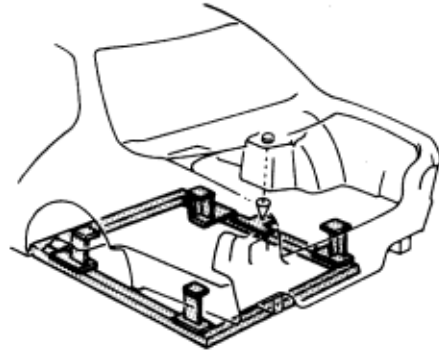
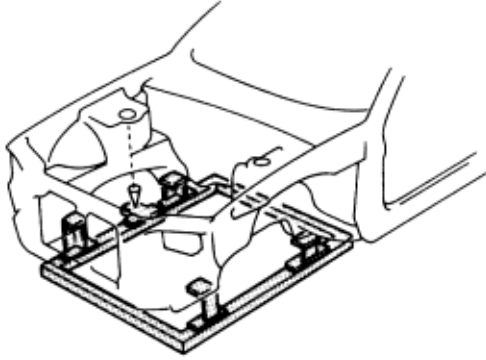
Pointer B - short pointer (height adjustment 15 - 290 mm (0.6 - 11.4 in.)
- long pointer (height adjustment 185 - 450 mm (7.3 - 17.7 in.)



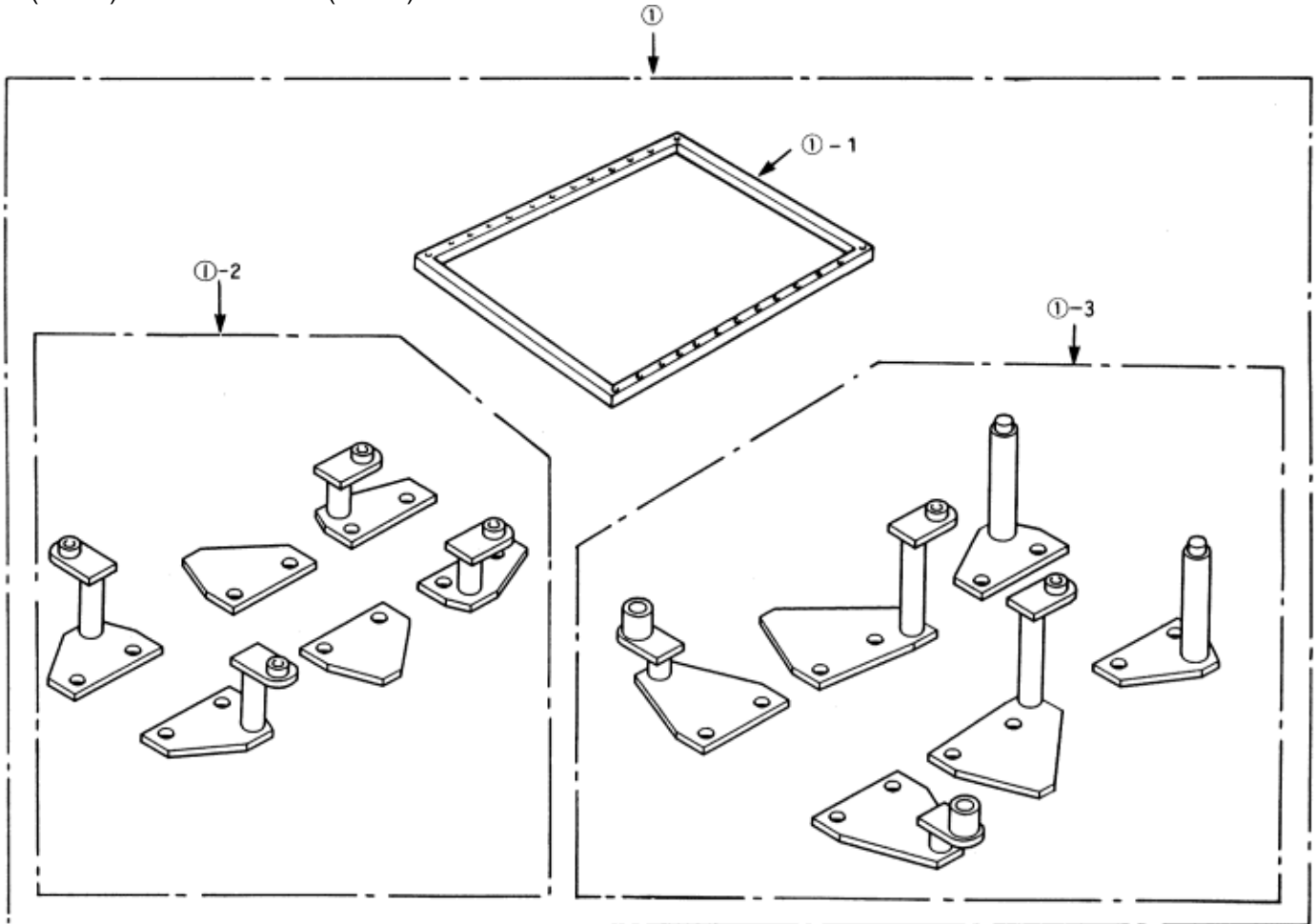
To measure body dimensions, use a universal tram gauge.



No.	Jig Number	Description	Page Reference
1	HJ-44	Under frame positioning jig set	
1-1	HJF-01	Frame	see page 4-11, see page 4-17, see page 4-40
1-2	HJ-44-F	Front jig brackets	see page 4-11, see page 4-17
1-3	HJ-44-R	Rear jig brackets	see page 4-40

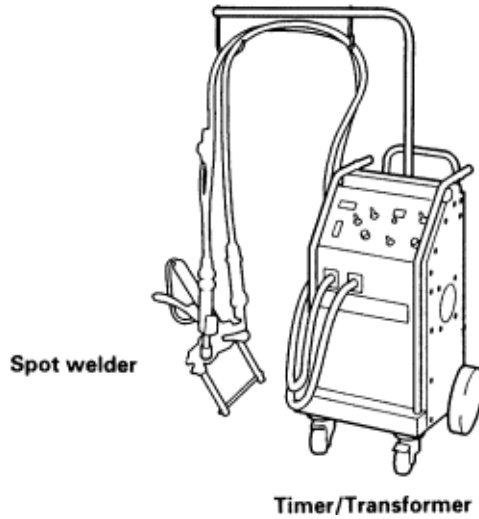


Positioning Jig:
 V.L. CHURCHILL Ltd.
 PO BOX 3, London Road, Daventry, Northants, NN114NF
 TEL + 44 (01327) 704461 FAX + 44 (01327) 71625



Spot welding is also known as resistance spot welding, and it is the most suitable method of welding for vehicles. It has three main features: the welding can be performed instantaneously, it has a minimal effect on the source material, and it has a minimum effect on distortion to the absolute minimum. However for reliable results, please remember to remove all paint and other impurities from the surface of the material you intend to weld.

Welders:

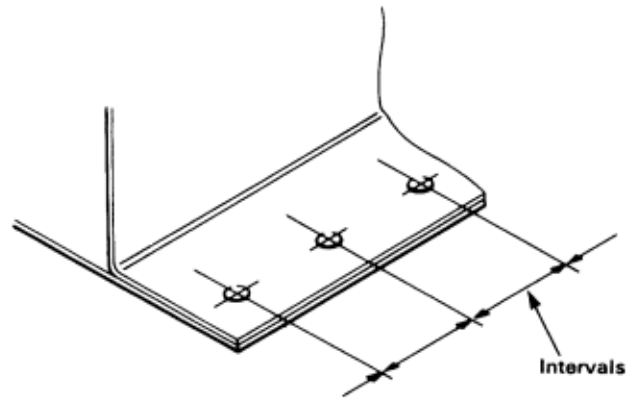
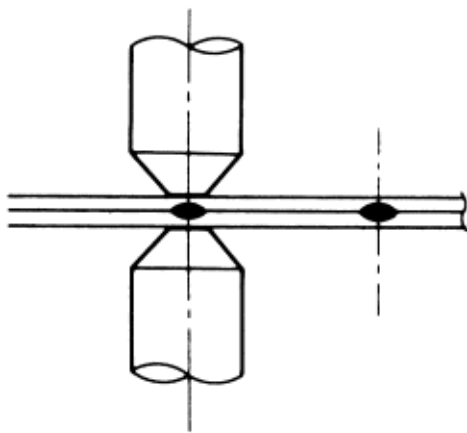


Welding Conditions:

When performing spot welding, make sure that you conform to the following conditions: use the correct current, conductivity time, welding pressure, holding time, and shutdown time recommended for the spot welder.

Please bear in mind the following points when welding:

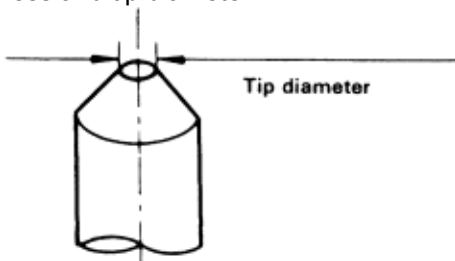
- Plate thickness and minimum welding pitch



Unit: mm (in.)

Plate thickness	0.6 (0.02)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Minimum intervals	11 (0.43)	16 (0.63)	20 (0.79)	24 (0.94)

NOTE: If the welding intervals are too short, branching may occur, making it impossible to maintain the desired soldering state. Plate thickness and tip diameter



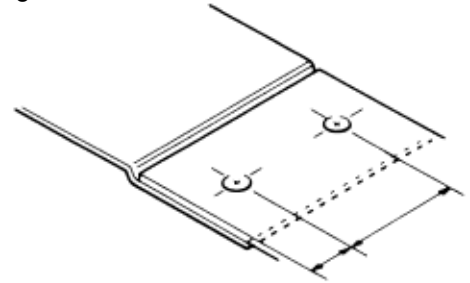
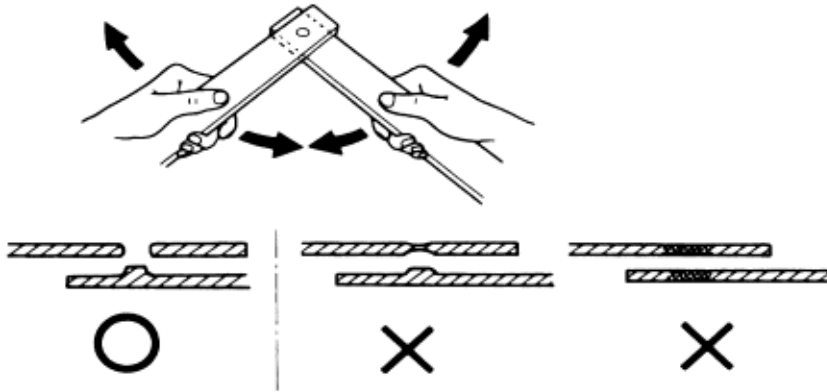
Unit: mm (in.)

Plate thickness	0.8 (0.03)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Tip diameter	4.5 (0.12)	5.0 (0.2)	5.5 (0.22)	6.0 (0.24)

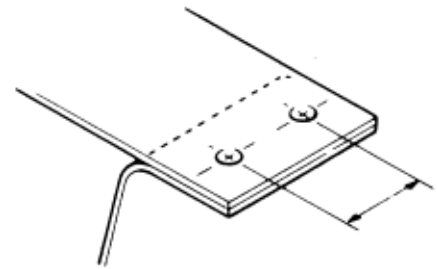
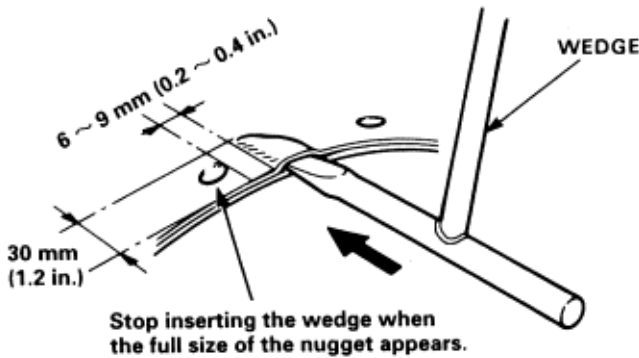
Welding Strength Test

Even if you perform the welding according to the proper conditions, the strength of the welded sections may fluctuate due to drops in the voltage and other factors. The quality of the welding cannot be evaluated unless the welded sections are destroyed. Provide yourself with a steel plate of the same thickness and conduct a destruction test.

- ♦ If holes appear in the steel plates, it means that the welding is of standard strength.



- ♦ Drive a wedge between two panels near the nugget. If the welded parts do not come apart and the diameter of the nugget is more than 3mm (0.1 in), the welding should be satisfactory.



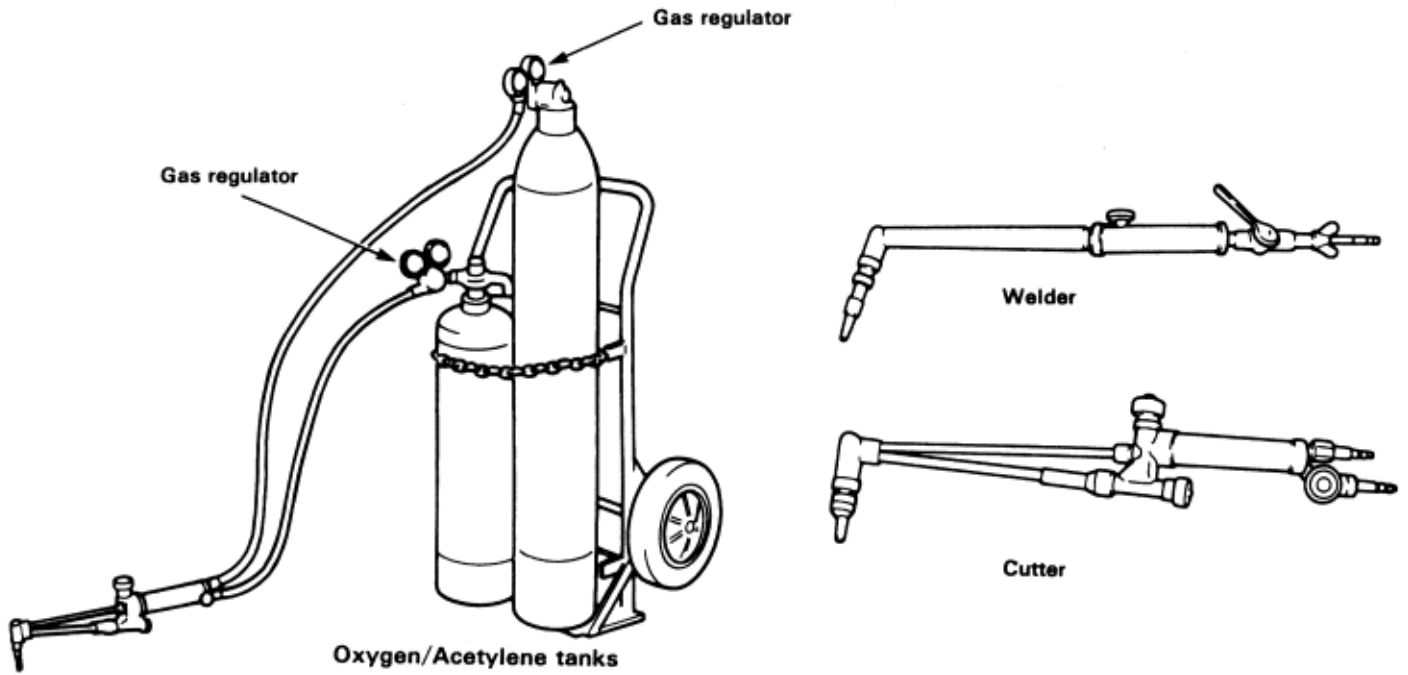
NOTE: It is difficult to perform spot welding in the following circumstances:

- ♦ When it is not possible to remove any rust or paint attached to the welding surfaces.
- ♦ When the tip of the spot welder cannot be inserted into the welding section.
- ♦ When the welding surfaces can be seen from the outside and welding will impair the exterior appearance.

In all these cases, the gas welding method should be employed. Moreover, if it is not possible to perform spot welding because of space restrictions, plug welding using the arc welding method may be performed instead. For plug welding, the sections to be welded must be closer together.

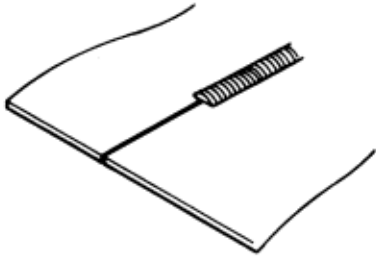
Gas welding is indispensable for body repair because of the broad range of its applications to join the body panels, cut the materials that construct the body and apply heat to reform panels. However, this method requires experience.

Welders:

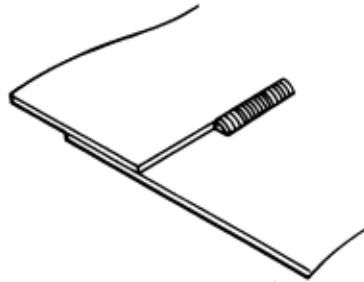


Welding Methods:

Butt welding



Fillet welding or soldering

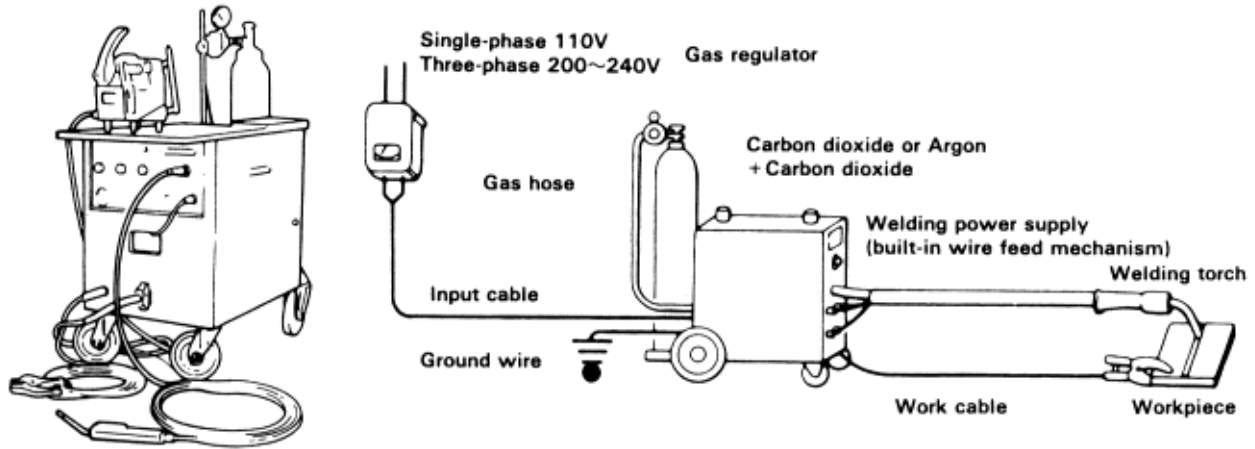


Welding Methods/Repair Tools
Carbon Dioxide Arc Welding (MIG Arc Weld)

2-5

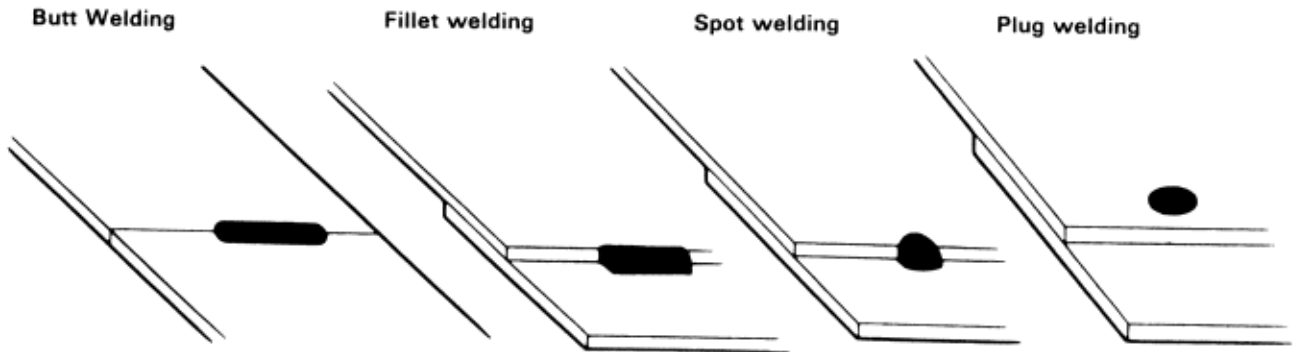
This welding process uses inexpensive carbon dioxide instead of expensive inert gases as a shielding means. Consumable metal electrodes are employed. It has a wide range of applications, including butt welding of a thin plate, fillet welding, plug welding and MIG spot welding. In terms of the weld strength, it is also highly stable.


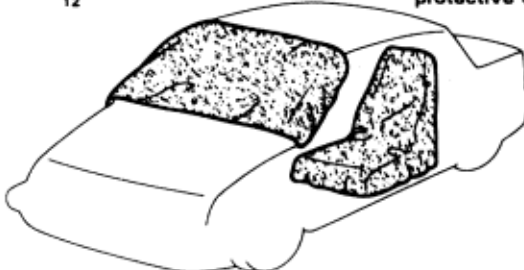
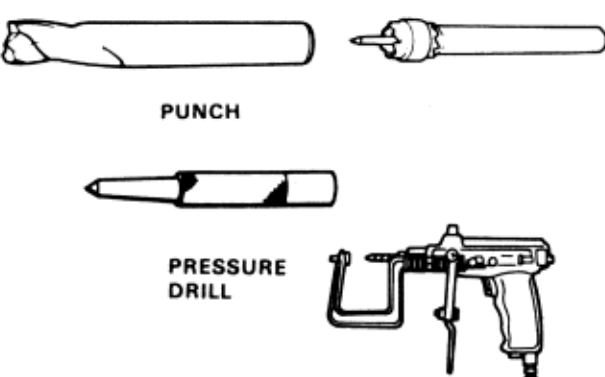
Welders:




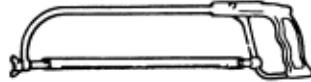
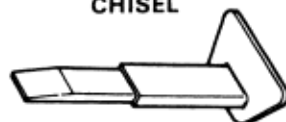
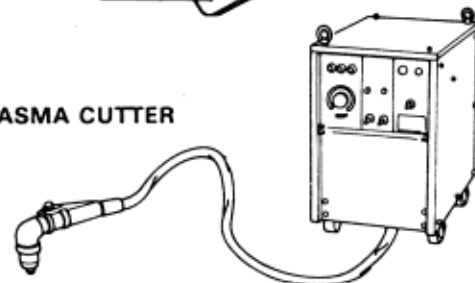
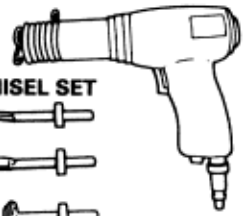



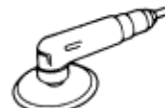




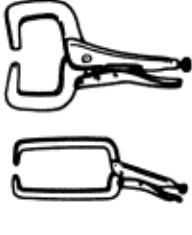


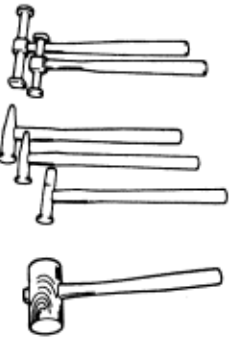


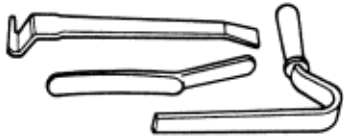

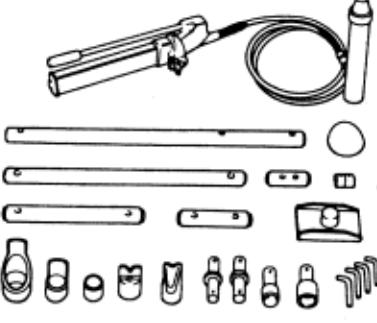

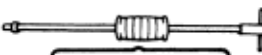
⚠ CAUTION
Disconnect the negative battery cable before arc welding.

Welding Methods:

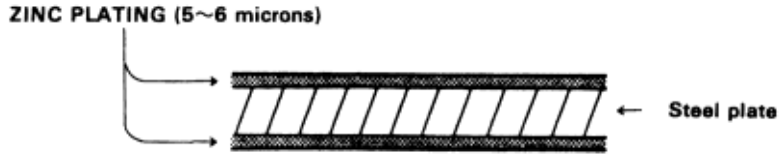


Item	Work	Tools, equipment used
Protective tools	Operator	<p>1. Protective goggles 7. Protective apron 2. Cap 8. Welding gloves 3. Ear plug 9. Foot protectors 4. Shield for eyes 10. Safety shoes 5. Overalls with long sleeves 11. Work gloves 6. Dust-proof mask 12. Splatter guard</p> 
	Vehicle body	<p>12.  Heat-resistant protective cover.</p>
Processing tools	Plug hole drilling	<p>DRILLING BLADE, DRILL, SPOT CUTTER</p>  <p>PUNCH</p> <p>PRESSURE DRILL</p>

Item	Work	Tools, equipment used
Flange tools	Edge preparation	
Cutting tools	Cutting	<p>AIRSAW</p>  <p>AIR JIGSAW</p>  <p>HANDBSAW</p>  <p>CHISEL</p>  <p>PLASMA CUTTER</p>  <p>AIR IMPACT CUTTER</p>  <p>CHISEL SET</p>  <p>HAND NIBBLER</p>  
Sanding tools	Cleaning	<p>DISC SANDER</p> <p>Air type:  Electric type: </p> <p>BELT SANDER</p> 

Item	Work	Tools, equipment used
Fixing tools	Base metal fixing	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>WISE-GRIPS</p>  </div> <div style="width: 30%;"> <p>SCREW CLAMP</p>  </div> <div style="width: 30%;"> <p>SQUILL VISES</p>  </div> </div>
Shaping tools	Skin panel shaping	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>HAMMERS</p>  </div> <div style="width: 30%;"> <p>DOLLIES</p>  </div> <div style="width: 30%;"> <p>CHISEL</p>  </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;"> <p>SPOONS</p>  </div> <div style="width: 30%;"> <p>SNIPS/SHEARS</p>  </div> </div>
	Body and frame shaping	<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>BODY JACK</p>  </div> <div style="width: 35%;"> <p>WELDER</p>  </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 60%;"> <p>SLIDE HAMMER</p>  </div> </div>

The zinc-plated steel plate used in some panels of the Accord requires different repair techniques than ordinary steel plate. Refer to "Body Construction" (see page 4-2) for the location of the zinc-plated panels.



1. Before spot welding the zinc-plated steel plate, remove the paint from both sides of the flange to be welded. Apply sealer to the flange after welding.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

NOTE: Seal the sanded surfaces thoroughly to prevent rust.

2. The electric continuity properties of zinc-plated steel plate are different from ordinary steel plate. When spot welding, increase the current by 10-20%, or increase the resistance welding time. Increase the weld spots by 10-20%.

NOTE: The MIG welding procedures for zinc-plated steel plate are the same as for ordinary steel plate.

⚠ WARNING

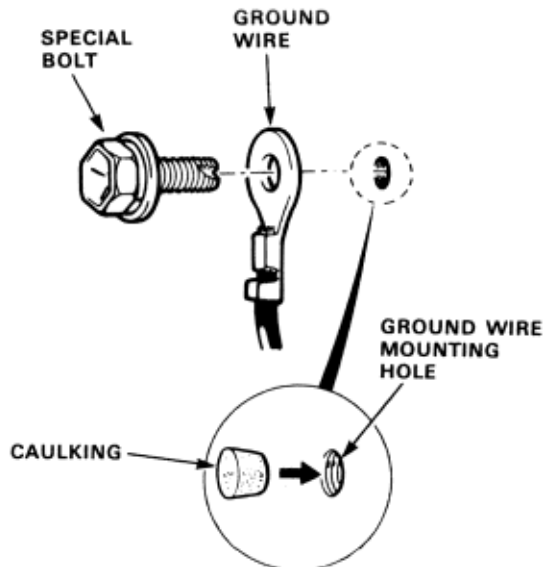
To prevent eye injury and burns when welding, wear approved welding helmet, gloves and safety shoes.

3. Before applying putty or body filler to the zinc-plated steel plate, sand the zinc plating thoroughly to promote adhesion and to prevent blistering.

NOTE:

- Use only epoxy-based putties and fillers on zinc-plated steel plate.
- Follow the manufacturer's specification.

4. When performing paintwork, apply caulking to the ground wire mounting hole to keep the paint out.



Avoid using putty as much as possible when repairing a new vehicle. Use alternative methods if possible.

⚠ WARNING

- ♦ Most paints contain substances that are harmful if inhaled or swallowed. Read the paint label before opening the container. Spray paint only in a well ventilated area.
- ♦ Cover spilled paint with sand, or wipe it up at once.
- ♦ Wear an approved respirator, gloves, eye protection and appropriate clothing when painting. Avoid eye contact with skin.
- ♦ If paint gets in your mouth or on your skin, rinse and wash thoroughly with water. If paint gets in your eyes, flush with water and get prompt medical attention.
- ♦ Paint is flammable. Store it in a safe place, and keep away from sparks, flames or cigarettes.

Operation	Tools/Materials	Procedure	Remarks
1. Prep the repair area.	Double-action sander, #80 sandpaper	Sand the area with a double-action sander and #80 sandpaper. Clean with wax and grease remove	
2. Apply putty. NOTE: Putty can be applied after priming as described in step 4.	Epoxy-based putty. Mix the putty and hardener according to the manufacturer's directions. Polyester resin putty. Body filler.	Apply in several thin coats if necessary. Try to avoid leaving pinholes in the putty. Follow the manufacturer's recommendations for preparation	
3. Sand and clean the puttied area.	Double-action sander, orbital sander, hand sanding file, #80, #120, #240 sandpaper, wax and grease remover, shop towels.	Rough-sand the area with a double-action sander and #80 sandpaper, then sand with #120 sandpaper. Featheredge with #240 sandpaper. Clean with wax and grease remover.	
4. Coat with primer. NOTE: Apply to bare sheet metal and puttied area.	Epoxy-based primer and hardener, epoxy thinner: Mix and thin the primer according to the manufacturer's directions.	Apply 2 - 4 coats, allowing sufficient flash time between coats. Force dry at 140 - 158°F (60 - 70°C) for at least 30 minutes.	Spray to a thickness of 30 - 35 microns.
5. Sand and clean the whole area.	Double-action sander, #300, #400 sandpaper, wax and grease remover, shop towels.	Sand the repair area by hand with #300, #400 sandpaper. Blow off with compressed air. Clean with wax and grease remover.	
6. Apply intermediate coat to the whole area to be repainted.	Polyester/urethane resin primer/surfacer or top-coat enamel: Mix and thin the primer according to the manufacturer's directions.	Apply 2 - 4 coats, allow sufficient flash time between coats. Force dry at 140 - 158°F (60 - 70°C) for at least 30 minutes.	Spray to a thickness of 30 - 35 microns.
7. Sand and clean the whole area to be repainted	Hand sanding file, double-action sander, #400, #600 sandpaper, wax and grease remover, shop towels.	Sand the repair area by hand with #400 sandpaper until it is level. Sand the whole area to be repainted with #400 - 600 sandpaper. Clean with wax and grease remover.	
8. Top-coat the whole area to be repainted.	Acrylic urethane resin top coat paint, hardener and thinner: Mix and thin the paint according to the manufacturer's directions.	Apply 2 - 4 coats allowing sufficient flash time between coats. Force dry at 140 - 158°F (60 - 70°C) for at least 30 minutes.	Spray to a thickness of 40 - 50 microns.

General Information

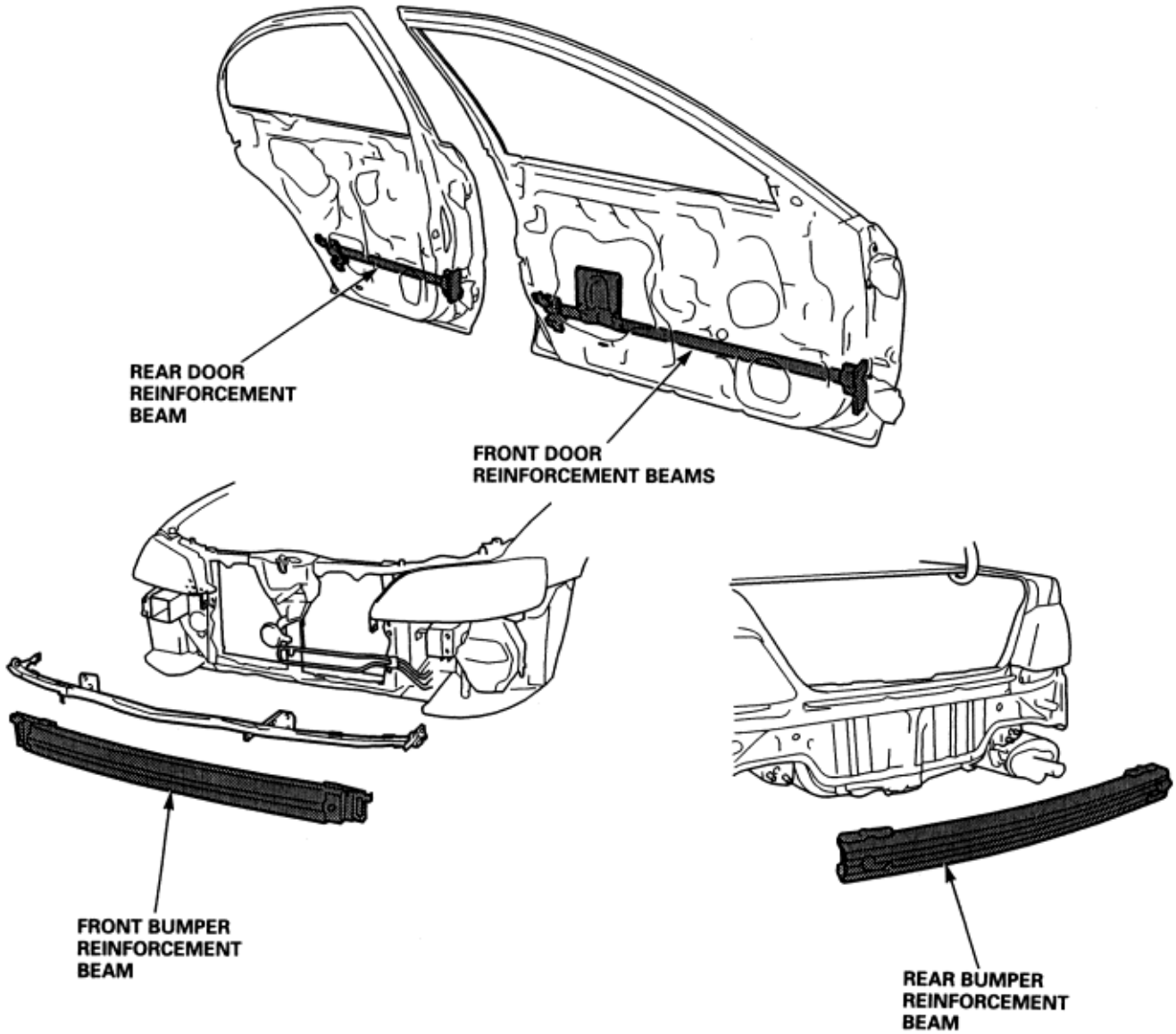
Door and Bumper Reinforcement Beams

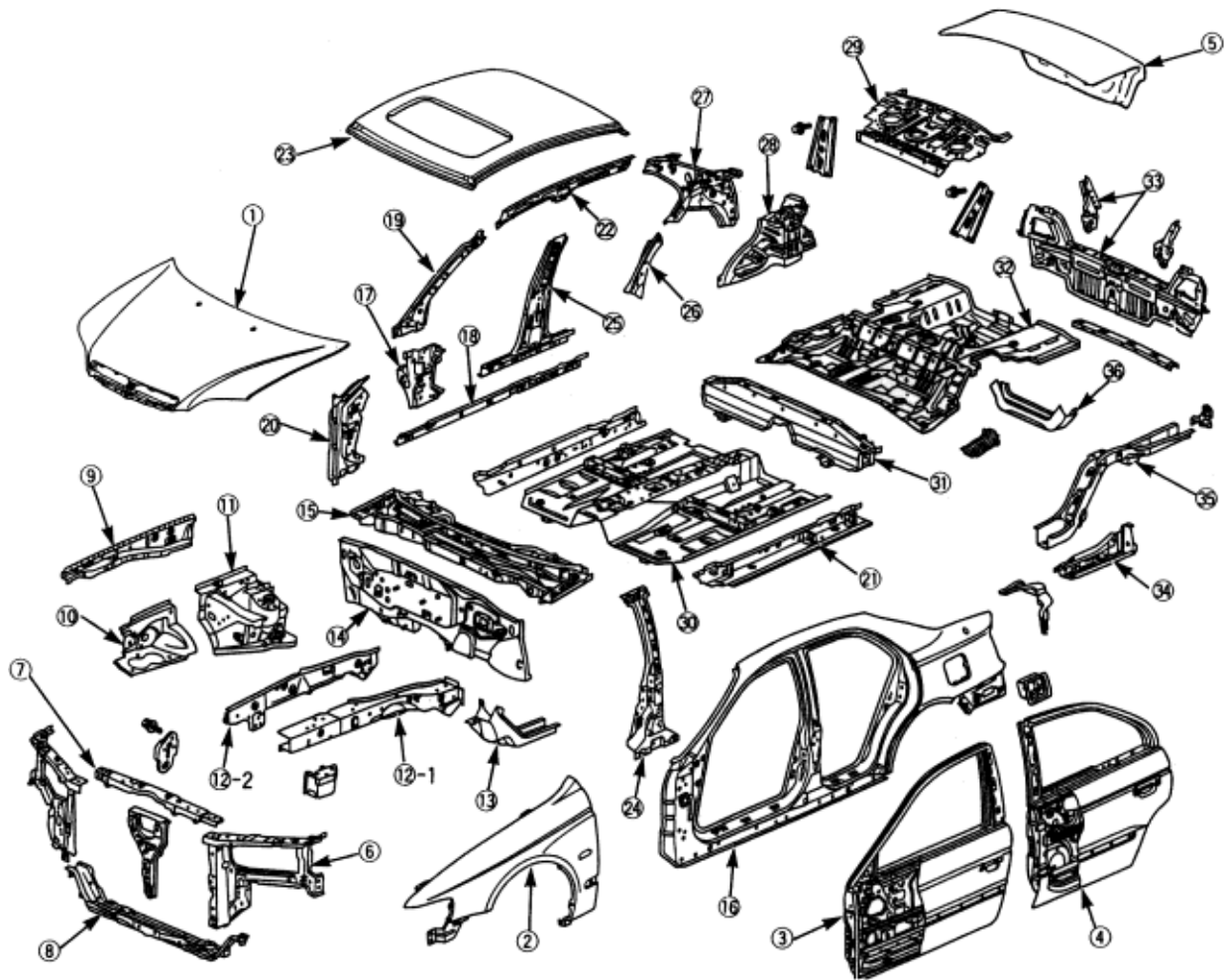
3-4

Door and Bumper reinforcement beams used on Honda vehicles are made from a metal equivalent to High Strength Steel. If High Strength Steel is heated, the strength of the steel will be reduced. If High Strength Steel is damaged, as in a vehicle accident, where the door and bumper reinforcement beams are bent, the beams may crack if an attempt is made to straighten them.

For this reason, door and bumper reinforcement beams should never be repaired, they should be replaced if they are damaged.

NOTE: If a door reinforcement beam is damaged, the whole door panel assembly should be replaced.





NOTE: Be sure to use epoxy-based putty and primer surfacer to make any repairs on paint coats or zinc-plated sheet metal (see page 3-3).

No.	Part Name	Zinc-plated	No.	Part Name	Zinc-plated
1	Hood	O	19	Front Pillar Inner Upper	
2	Front Fender	O	20	Front Pillar Lower Stiffener	O
3	Front Door Panel/Door Skin	O	21	Inside Sill	O
4	Rear Door Panel/Door Skin	O	22	Roof Side Rail	
5	Trunk Lid	O	23	Roof Panel	
6	Front Side Bulkhead	O	24	Center Pillar Stiffener	
7	Bulkhead Upper Center Frame	O	25	Center Pillar Inner	
8	Bulkhead Lower Cross-member	O	26	Wheel Arch Extension	O
9	Wheelhouse Upper Member	O	27	Rear Inner Panel	O
10	Front Wheelhouse	O	28	Rear Wheelhouse	O
11	Damper Housing	O	29	Rear Shelf	
12-1	Front Side Frame	O	30	Front Floor	O
12-2	Front Side Extension	O	31	Middle Floor Cross-member	O
13	Side Frame Rear End/Outrigger	O	32	Rear Floor	O
14	Dashboard Lower	O	33	Rear Panel	O
15	Dashboard Upper	O	34	Side Sill Extension	O
16	Outer Panel	O	35	Rear Frame	O
17	Front Pillar Inner Lower	O	36	Rear Floor Cross-member	O
18	Side Sill Reinforcement	O			

Exterior Body Parts Removal/Installation

4-3

NOTE: To adjust the clearance with the hood door, and trunk lid alignment, refer to the Accord Shop Manual.

Mounting bolts/nuts Torque:

6 x 1.0 mm: 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)

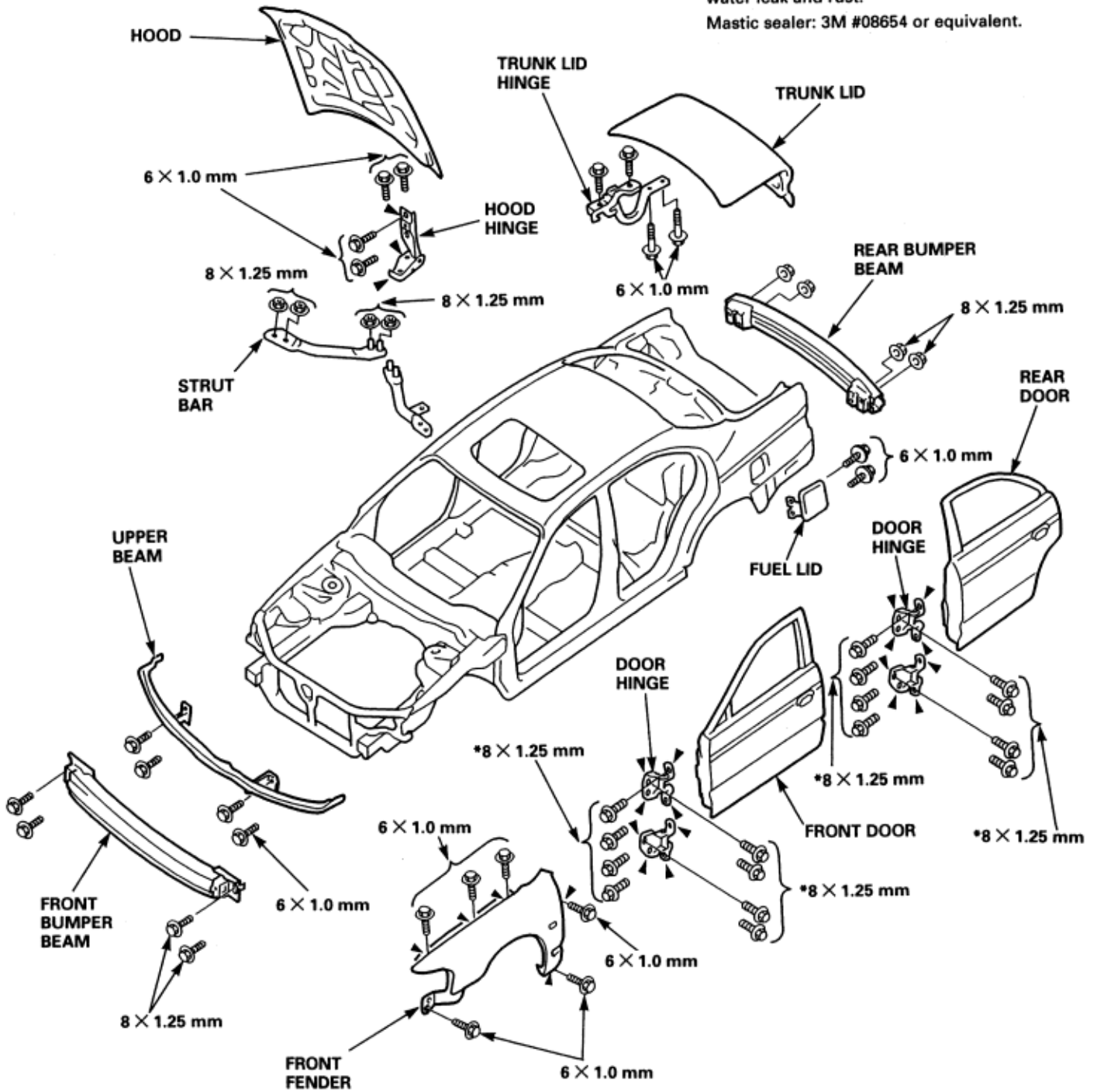
8 x 1.25 mm: 22 Nm (2.2 kgf/m, 16 lbf/ft)

*8 x 1.25 mm: 28 Nm (2.9 kgf/m, 21 lbf/ft)

▶: Sealing locations

NOTE: Seal the following areas to prevent water leak and rust.

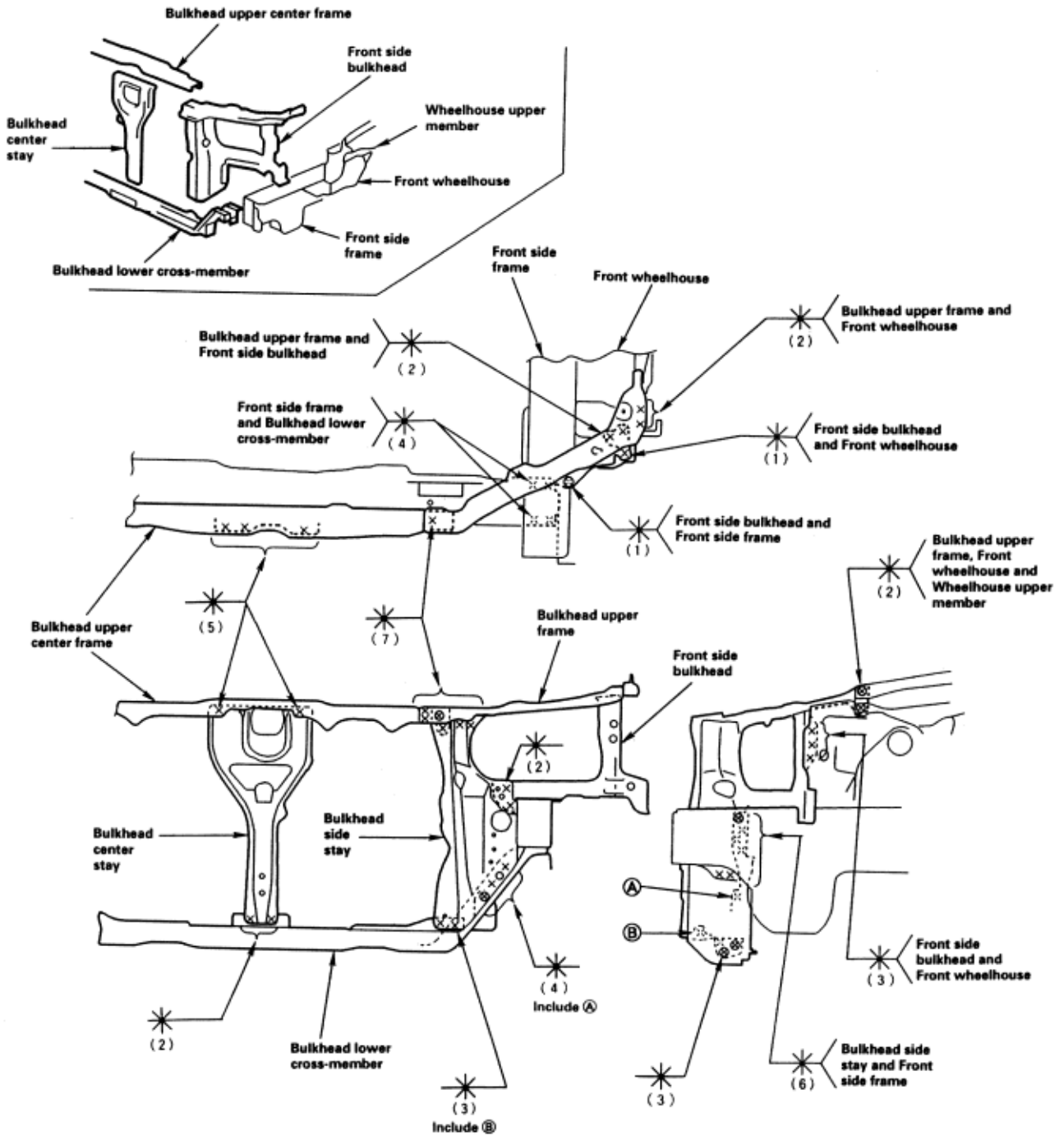
Mastic sealer: 3M #08654 or equivalent.



Front Bulkhead

Mass Production Body Welding Diagram

The front bulkhead is joined to the front wheelhouse and front side frame. It forms the base for the headlights and other parts and maintains the rigidity of the front section of the body. Pay particular attention to twists and parallelism and check mountings of related parts when welding.



1. Remove the related parts.
 - ♦ Front bumper.
 - ♦ Right and left headlights.
 - ♦ Right and left front fenders.
 - ♦ Radiator, condenser.
 - ♦ Hood latch.
2. Roughly pull out and straighten the damaged area.
 - ♦ Check the damage to the front wheelhouse and front side frame before removing the front bulkhead. Use the frame straightener to roughly pull out and repair the damaged bulkhead before removing the bulkhead.

NOTE: Check the fit of the door, taking care not to pull the damaged area out more than necessary.

- ♦ Use the horizontal pinch weld clamps and attach the car to the frame straightener at the clamping points securely.

3. Keep the body level.
Jack up the body, and place safety stands at the four designated places of the side sills.

NOTE: Refer to the Accord Shop Manual for safety stand location points.

4. Cut and pry off the front bulkhead.
 - ♦ Center punch around the spot weld imprints.
 - ♦ Use the special spot cutter to drill holes at the spot weld nuggets on the front wheelhouse and front side frame.

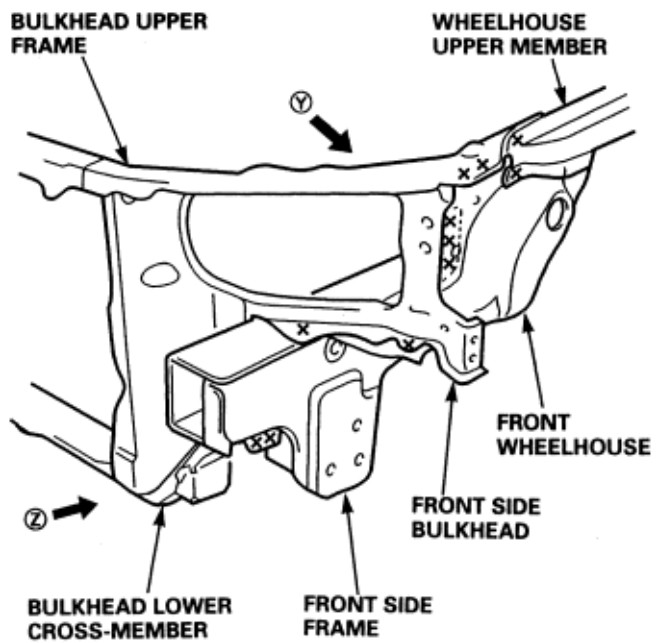
NOTE: Refer to the Accord Shop Manual for safety stand location points.

- ♦ Cut off the bulkhead with an air chisel, leaving the welding flanges intact.
- ♦ Level and finish the burrs from the pried off spot welds with a disc sander.



WARNING

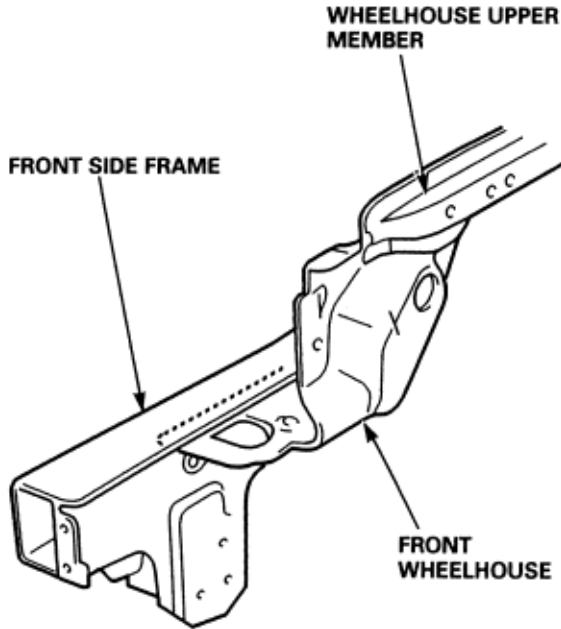
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.



VIEW Z

VIEW Y

5. Check the front side frame, front wheelhouse, and wheelhouse upper member for position and damage. If necessary, replace the front wheelhouse (see page 4-9).



6. Straighten the damaged related parts.
- ♦ Use a hammer and dolly to mold the damaged areas of the front wheelhouse and side frame.
 - ♦ Even out the welding flanges with a hammer and dolly.
 - ♦ Fill all drilled holes by MIG or gas welding.

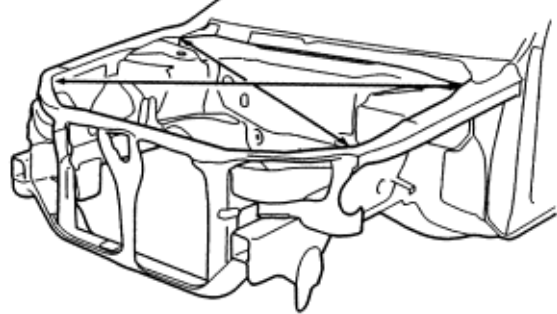
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

7. Set the new front bulkhead.
- ♦ Grind both sides of the welding section of the bulkhead with a sander to remove the undercoat and to expose the steel plate.

- ♦ Clamp both the right and left sides with the vice-grips
- NOTE: Apply the spot sealer to the welding surface when spot welding.

- ♦ Check the front bulkhead position using the body dimensional drawings (see section 6).
8. Measure the front compartment diagonally with a tracking gauge or convex tools as shown to check it for twisting or bending.



9. Tack weld the new front bulkhead.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- Spot weld the clamped sections.
- NOTE: Make sure that the right and left bulkheads are in line with each other.

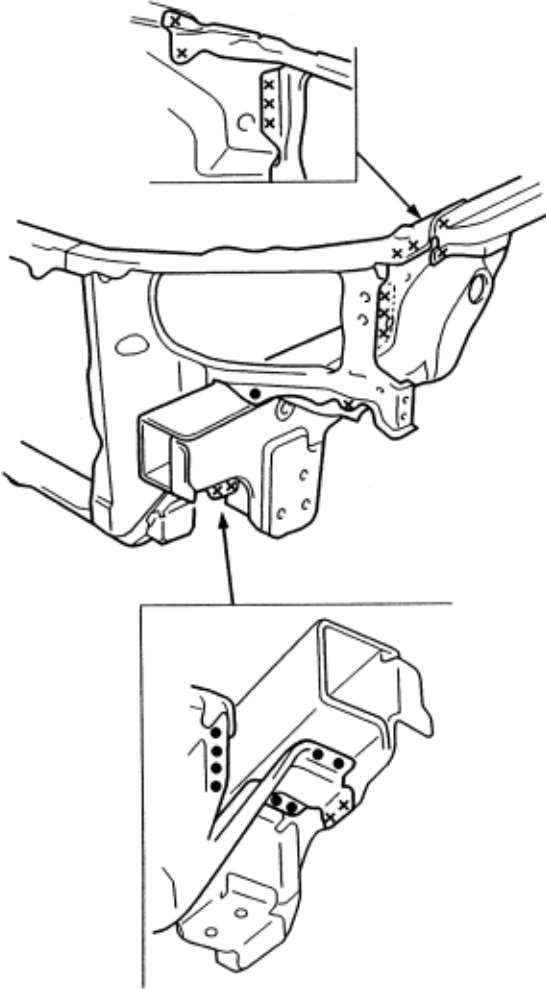
10. Temporarily assemble the hood, headlight, front fender and front bumper, then check the clearances and level differences.

11. Perform the main welding.
 - ♦ Spot weld the bulkhead as shown.
 - ♦ Make 20% to 30% more spot welds than there were holes drilled.

NOTE: If there is no room for spot welds, compensate by using MIG welds.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.



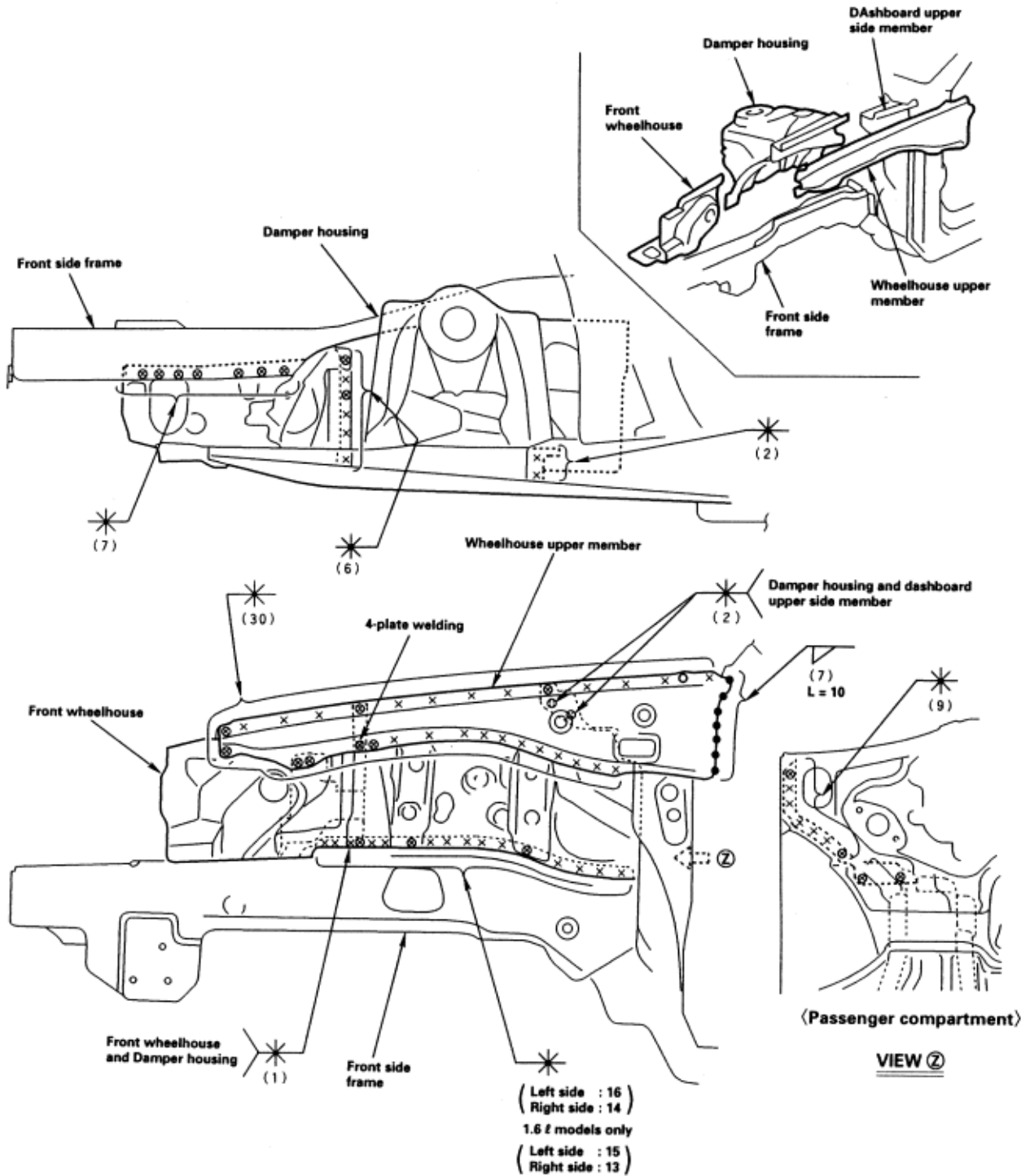
12. Finish the welds. Use a hammer and dolly to even out the front wheelhouse gusset, front wheelhouse and front side frame flanges for a close fit with the surface of the front bulkhead.
13. Apply the undercoat (see section 7).
14. Attach the front fender.
15. Lower the body.
16. Apply the paint. See Paint Repair Section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

17. Install the related parts.
18. Inspect, check and make adjustments.
 - ♦ Adjust the headlight aim.
 - ♦ Check that the electrical components light up and operate properly.
 - ♦ Replenish radiator coolant and inspect for leaks.

The front wheelhouse component is constructed as a unit with the front damper housing. Therefore, replacement of the component affects the front wheel alignment. When assembling it, either use a positioning jig or follow the dimensions on the frame repair chart for positioning. Weld Carefully.



1. Remove the related parts.
 - ♦ Parts that must be removed when removing the front bulkhead.
 - ♦ Parts on passenger side of lower dashboard which are especially flammable.
 - ♦ Electrical accessories in engine the compartment and the wire harnesses.

NOTE: See the Accord Shop Manual, for removal and installation of the engine, front suspension and brakes.

2. Pull out and straighten the damaged area to approximately the original shape.
 - ♦ Attach the vehicle to the frame straightener by tightening the underbody clamps at the horizontal pinch weld points.

NOTE: Refer to the Accord Shop Manual for safety stand location points.

- ♦ Before cutting off the damaged sections, pull them out so that they are restored to the original shape.
- ♦ Do not pull out more than necessary.
- ♦ Pull out and straighten the damaged area of the lower dashboard, front pillar and other parts.
- ♦ After pulling, check the damper housing position using the body dimensional drawings (see section 6) and positioning jig (see page 1-7).

NOTE: Check the condition of the door and hinges.

3. Peel off the undercoat.

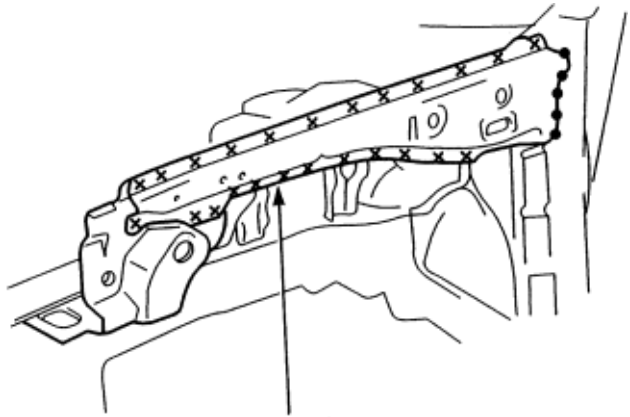
Heat the undercoat at the weld areas of the wheelhouse and front side frame with a gas torch and peel off the undercoat with a metal spatula.
4. Remove the wheelhouse upper member carefully so it can be reused.
 - ♦ Center punch around the spot weld imprints.
 - ♦ Use the special spot cutter to drill holes at the spot weld nuggets.
 - ♦ Remove the MIG weld flange with a disc sander.



WARNING

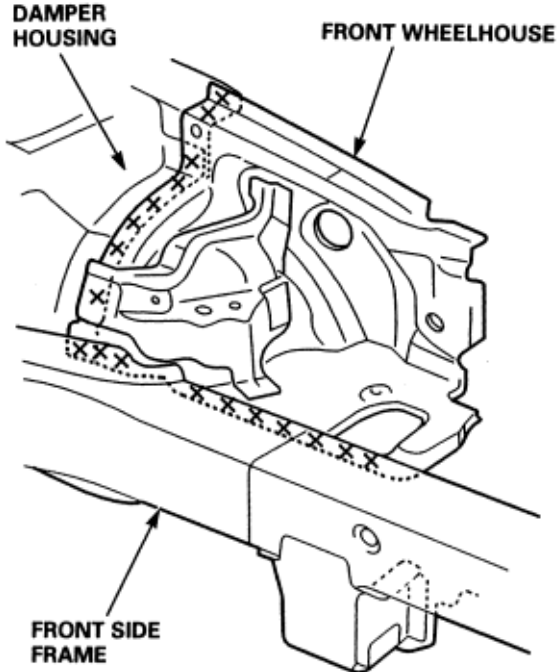
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Using a chisel, pry off the welded flange from the front pillar and damper housing.

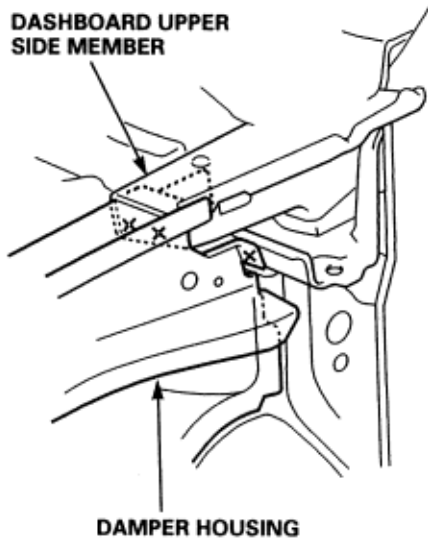
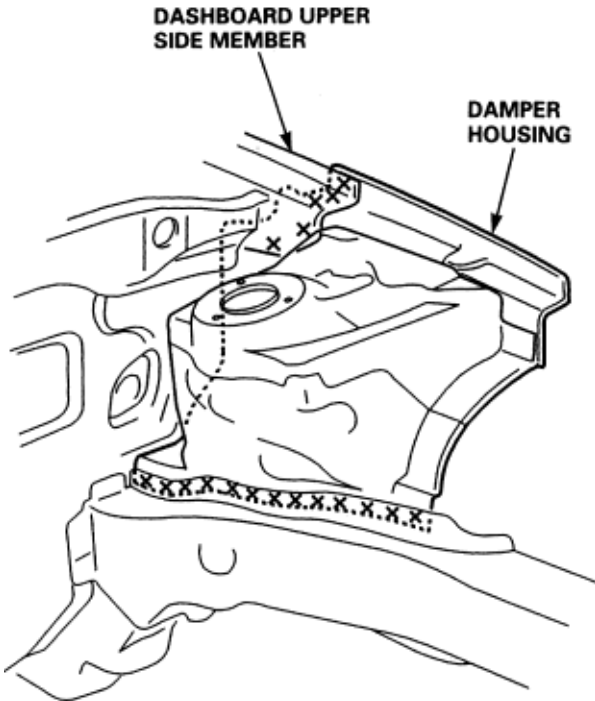


**WHEELHOUSE
UPPER MEMBER**

5. Replace the front wheelhouse.
 - ♦ Center punch around the spot weld imprints on the front side frame and damper housing.
 - ♦ Drill holes in the center punched areas using a spot cutter.
 - ♦ Using a chisel, pry off the welded flange.
 - ♦ Level and finish the burrs left on the welding faces with a sander.

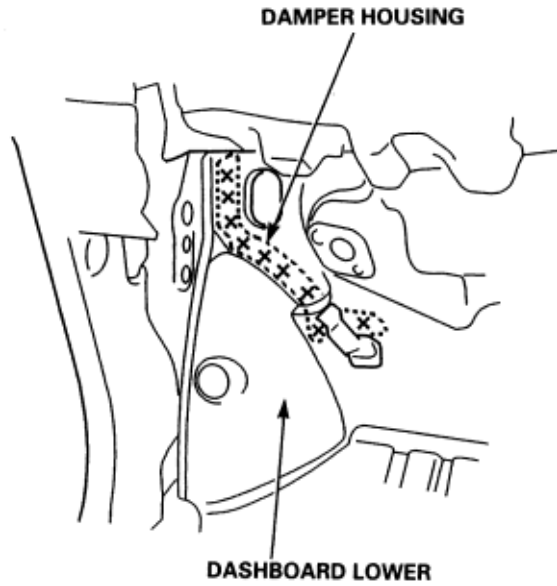


6. Check the damper housing for position and damage. If necessary, replace the damper housing.
- ♦ Center punch around the spot weld imprints on the front side frame, lower dashboard and dashboard upper side member.
 - ♦ Drill holes using a spot cutter.
 - ♦ Using a chisel, pry off the weld flange.

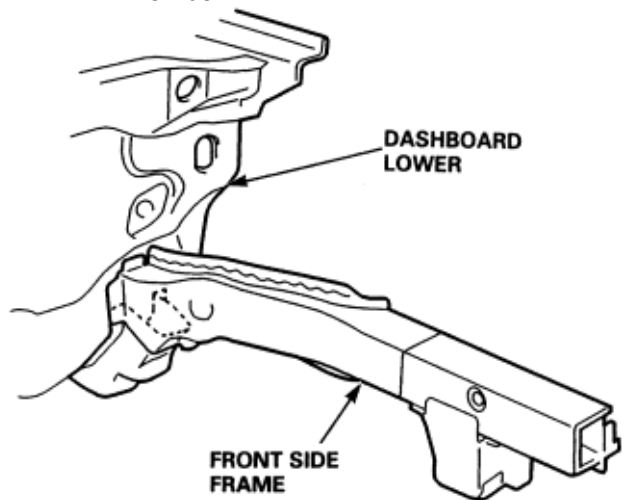


- ♦ From the passenger compartment side, drill holes in the spot welded area with a 5 mm (0.2 in.) spot weld cutter.

NOTE: Drill holes completely through the parts since the replacement damper housing will be welded by MIG welding



7. Straighten the related parts.
- ♦ Level and finish the burrs left on the welding surfaces with a sander.
 - ♦ Fill all drilled holes by MIG or gas welding.
 - ♦ Use a hammer and dolly to even out the welded areas of the lower dashboard, front side frame and dashboard upper side member.



8. Set the new front wheelhouse and damper housing.
 - ♦ Apply body paint to both sides of the new front wheelhouse and damper housing.
 - ♦ See Paint Repair section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.
 - ♦ Remove the undercoat from both sides of the welding section and expose the steel plate using a disc sander.

⚠ WARNING

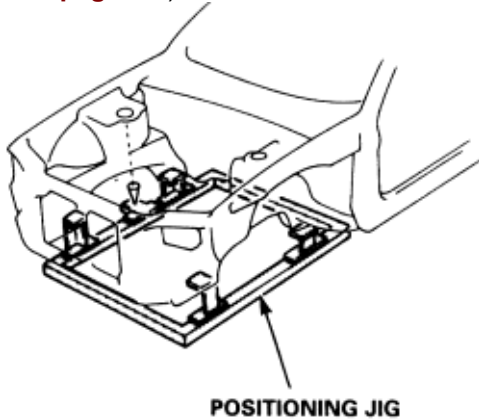
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Clamp the front side frame with vice-grips and squill vices.

NOTE: Apply the spot sealer to the welding surface when spot welding.

- ♦ Clamp the front bulkhead with vice-grips.
- ♦ Measure the front compartment diagonally.

NOTE: Use of a positioning jig is recommended (see page 1-7).

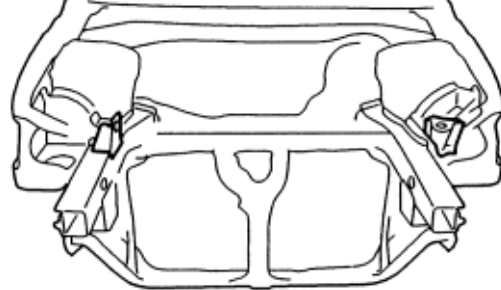


- ♦ Spot weld several points in the clamped sections and temporarily attach the front wheelhouse and damper housing.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

9. Check the dimensions (see section 6)., temporarily install the hood, front fender and headlight and check for differences in level and clearance.



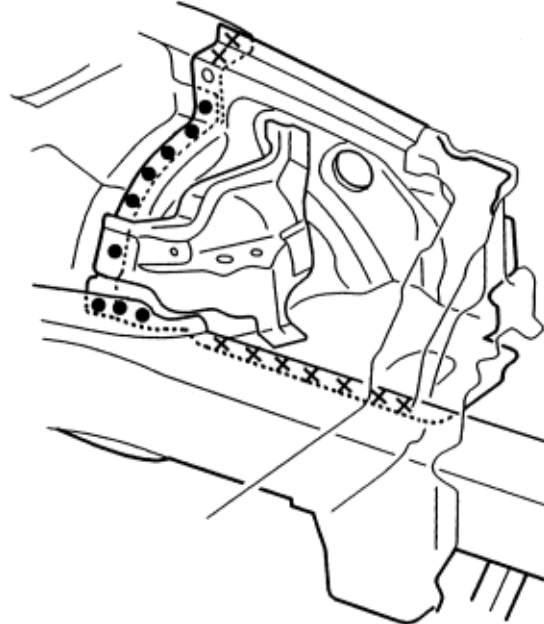
10. Perform the main welding.
 - ♦ Weld as much as possible with the jig still mounted.

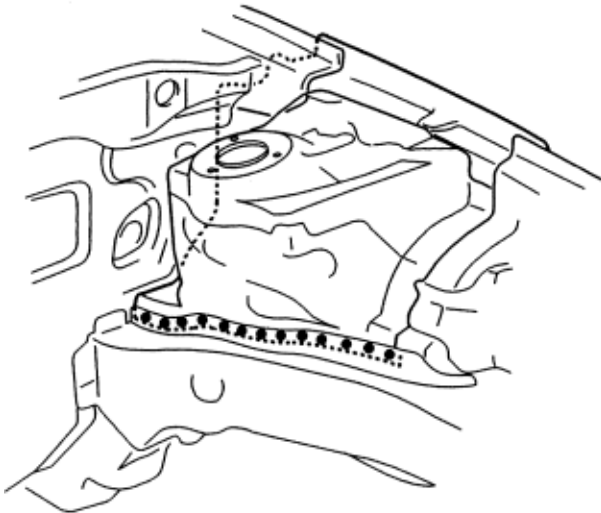
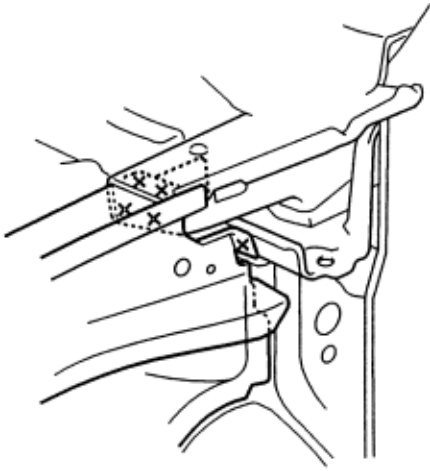
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

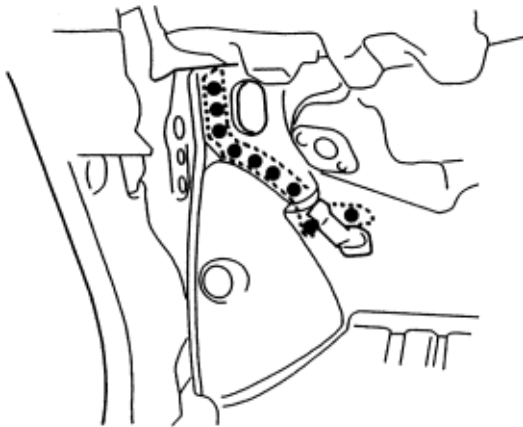
- ♦ Make 20% to 30% more spot welds than there were holes drilled.

NOTE: If there is no room for spot welds, compensate by using MIG welds.

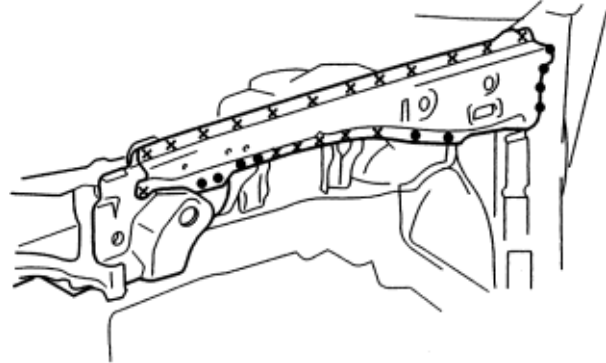




- ♦ Plug weld the holes in the lower dashboard and damper housing with a MIG welder.



11. After the front bulkhead has been welded, weld the wheelhouse upper member.
If the upper member is to be reused, make MIG plug welds at the drilled holes.



12. Finish the welded area. Use a hammer and a dolly to even the side bulkhead and front side frame flanges for a close fit with the surface of the front wheelhouse and damper housing.
13. Apply sealer (see section 5) to the mating surface of the lower dashboard and front side frame, etc.
14. Apply the paint. See Paint Repair section.

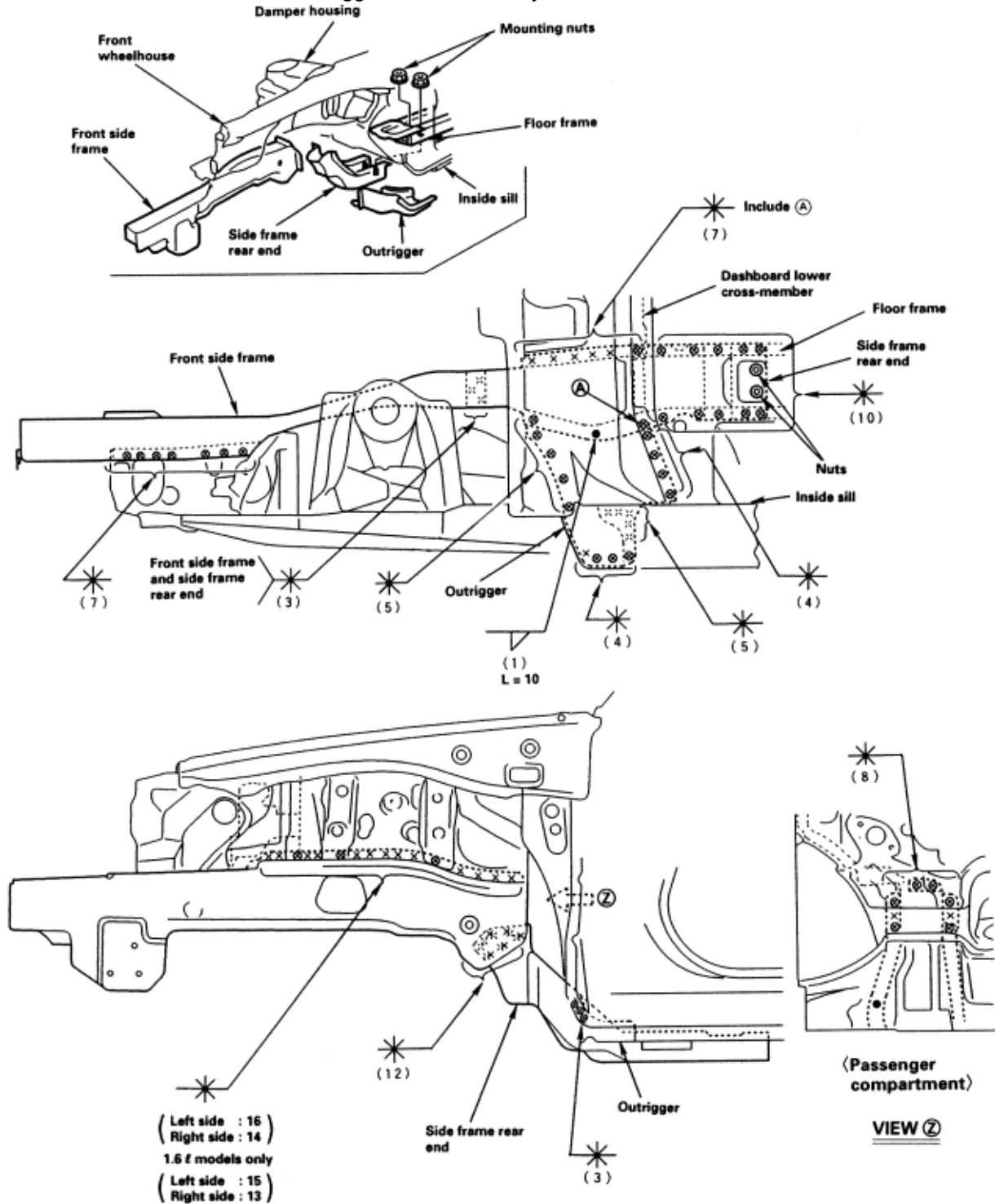
⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
 - ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.
15. Apply the undercoat. Undercoat the front floor, etc., and apply anti-rust agent to the inside of the welding section of the front side frame, lower dashboard, and upper member, etc., (see section 7).
 16. Install in the parts in the reverse order in which they were removed.
 17. Inspect, check, and make adjustments.
 - ♦ Measure the front wheel alignment.
 - ♦ Inspect the brake system.
 - ♦ Adjust the headlight aim.

Front Side Frame/Side Frame Rear End
Mass Production Body Welding Diagram

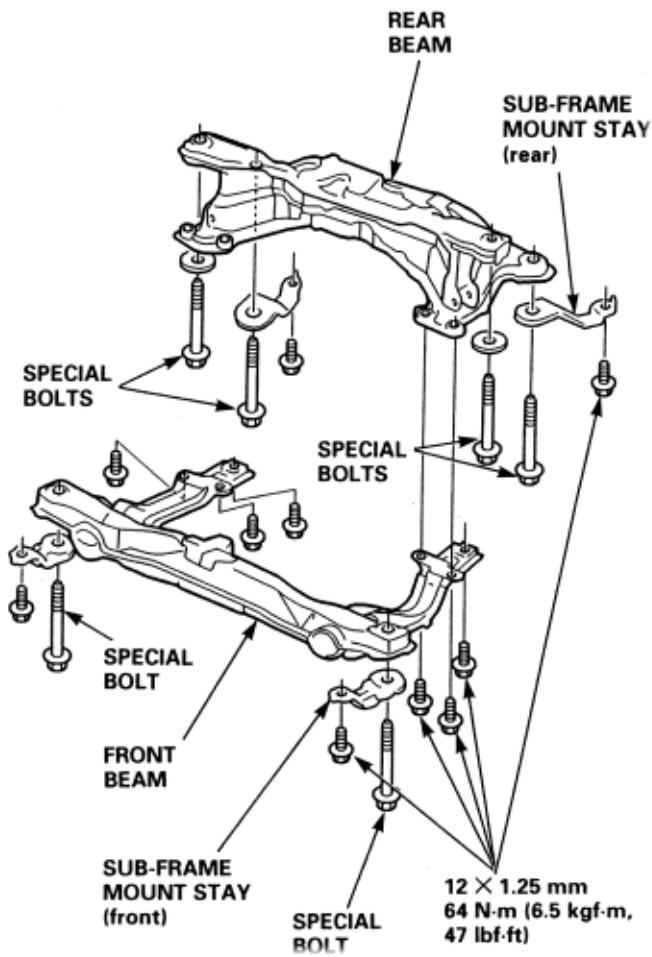
4-13

The front side frame acts as a base for the front suspension and is highly important in maintaining the rigidity of the front section. Pay careful attention to the position and dimensions of the weld joints and weld carefully.
 NOTE: Replace the side frame rear end and outrigger as an assembly.



1. Remove the related parts.
 - ♦ Front suspension parts.
 - ♦ Brake hose and lines.
 - ♦ Engine compartment electrical components.
 - ♦ Fittings in passenger compartment, etc.
 - ♦ Steering gearbox.
2. Remove the front sub-frame.

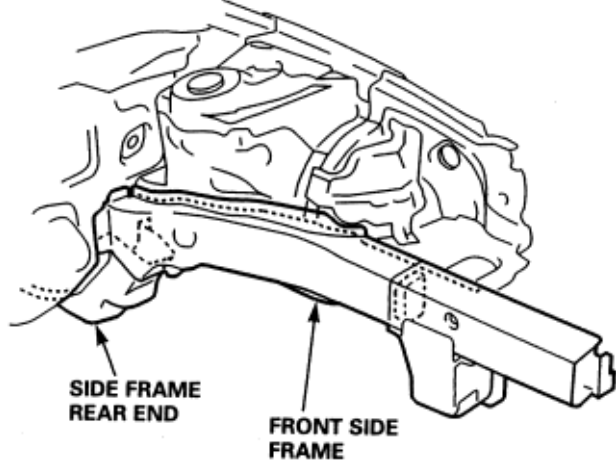
SPECIAL BOLT:
 14 × 1.5 mm
 103 N·m (10.5 kgf·m, 76 lbf·ft)
 Replace.



3. Roughly pull out and straighten the damaged area.
 - ♦ Attach the vehicle to the frame straightener by tightening the underbody clamps located at the horizontal pinch welds.

NOTE: Refer to the Accord Shop Manual for safety stand location points.

- ♦ Before cutting off the damaged sections, pull them out so that they are restored to the original shape.
- ♦ Cutting off the front side frame before pulling out the damage makes repair of the side frame rear end, lower dashboard, and other related parts difficult.



4. Peel off the undercoat. Heat the undercoat at the weld areas of the lower dashboard, front floor and side sill with a gas torch and peel off the undercoat with a metal spatula.

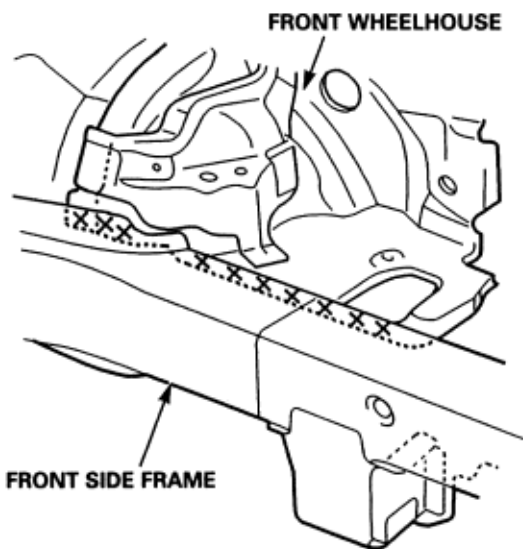
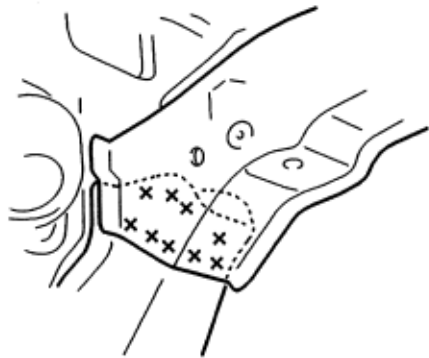
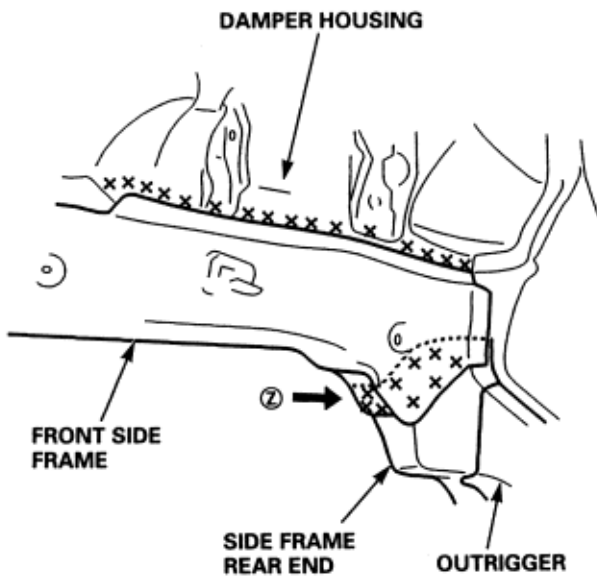
⚠ CAUTION

Be careful not to burn the fittings inside the passenger compartment and dashboard insulator when heating.

5. Remove the front side frame.

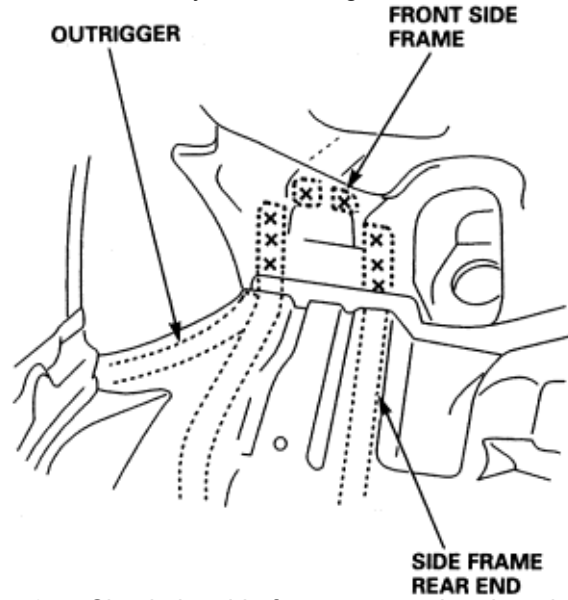
NOTE: It is not necessary to separate the front wheelhouse from the front side frame if the wheelhouse/damper housing also needs replacing.

 - ♦ Center punch around the spot weld imprints on the wheelhouse, damper housing, lower dashboard and side frame rear end.
 - ♦ Using a spot cutter, drill holes in the spot welded areas.
 - ♦ Peel off the welding flange using a chisel.

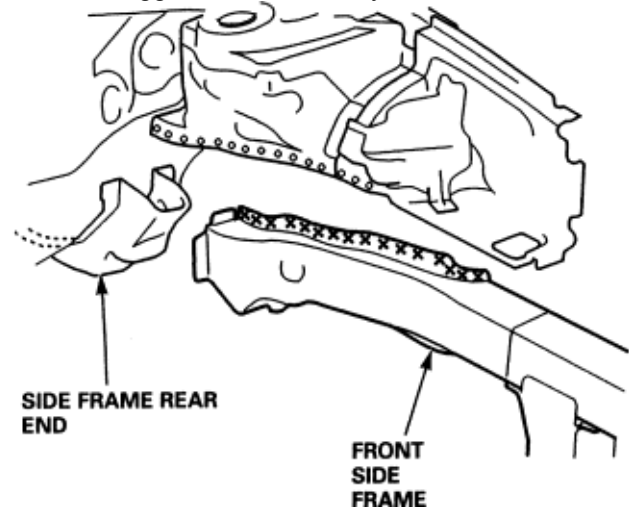


- ♦ Center punch around the spot weld imprints on the front side frame from inside the passenger compartment.
- ♦ Drill holes in the spot welded area with a 5 mm (0.2 in.) drill.

NOTE: Drill holes completely through the parts since the replacement front side frame will be welded by MIG welding.

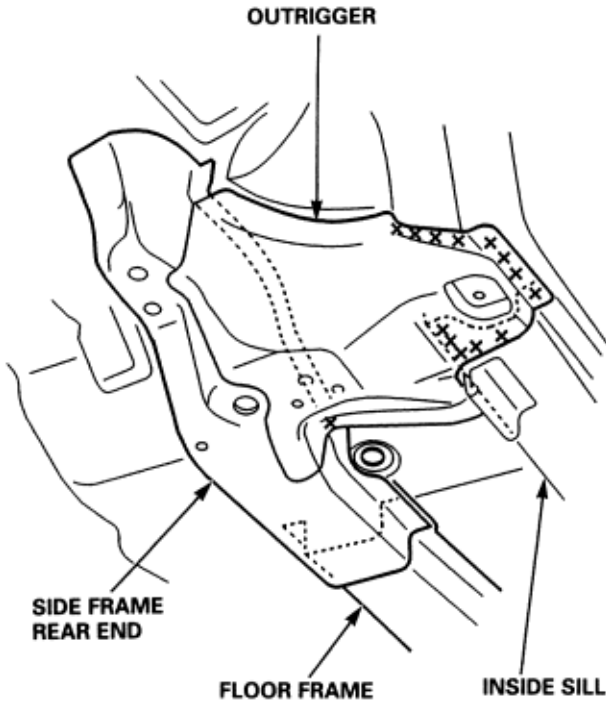


6. Check the side frame rear end and outrigger for position and damage. If necessary, replace the side frame rear end and outrigger as an assembly.



- ♦ Center punch around the spot weld imprints on the outer panel, floor frame and inside sill.
- ♦ Drill holes in the center punched areas using a spot weld cutter.

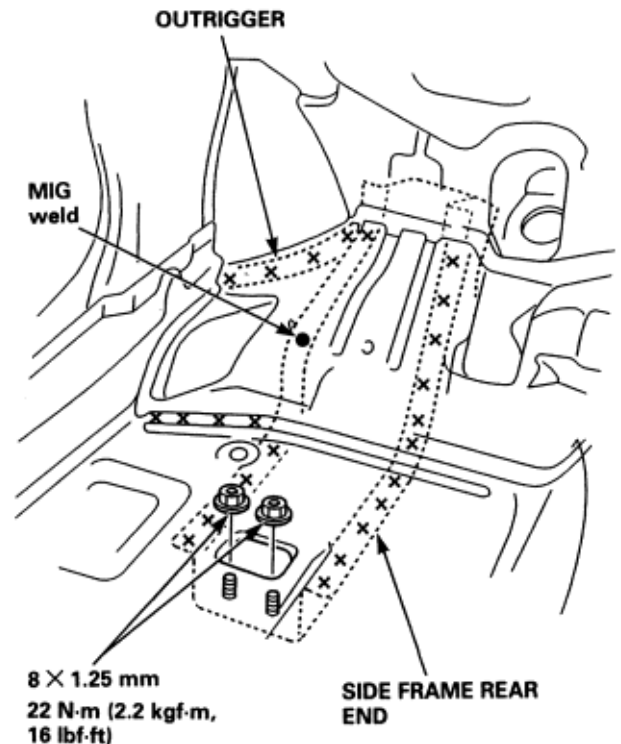
NOTE: When drilling holes be careful not to drill down to the floor frame and the inside sill.



- ♦ Center punch around the spot weld imprints on the side frame rear end and outrigger from inside the passenger compartment.
- ♦ Drill holes in the spot welded areas with a 5 mm (0.2 in.) spot weld cutter.

NOTE: Drill holes through the parts completely since the replacement side frame rear end and outrigger will be welded by MIG welding.

- ♦ Remove the MIG weld of the side frame rear end and lower dashboard with a disc sander.
- ♦ Remove the mounting nuts from the hole of the front floor.



8 × 1.25 mm
22 N·m (2.2 kgf·m,
16 lbf·ft)

- ♦ Level off and finish the burrs of the pried off spot welds with a disc sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

7. Straighten the related parts.
Reshape the lower dashboard, floor frame, front floor, inside sill and side sill inner joint using a hammer and dolly. Check the floor frame and inside sill for position and damage.
8. Set the new front side frame.
 - ♦ Remove the undercoat from both sides of the welding section and expose the steel plate using a disc sander.

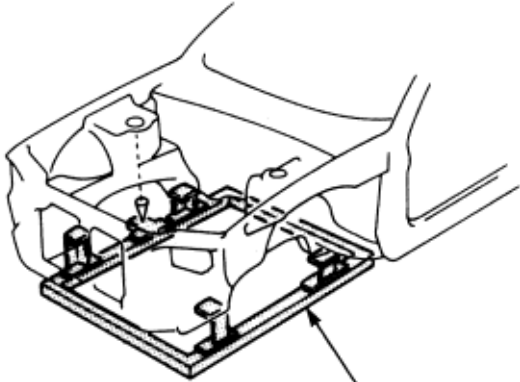
⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

NOTE: Apply the spot sealer to the welding surface when spot welding.

- ♦ Tighten the front side frame against the front floor and side sill using vice-grips or pliers.
- ♦ Drill 3 mm (0.12 in.) holes and screw 5 mm self-tapping screws into the drilled holes at the areas where the side frame rear end and outrigger does not fit closely.
- ♦ Even out the welded flange and damaged area with a hammer and dolly.
- ♦ Place a jack under the side frame rear end and support it, then measure the positions for temporary attachment.

NOTE: Use of a positioning jig is recommended (see page 1-7).



POSITIONING JIG

- ♦ Clamp the front bulkhead and front wheelhouse/damper housing with squill vices and vice-grips.
- ♦ Measure the front compartment diagonally.
- ♦ Spot weld several points in the clamped sections and temporarily attach the front side frame and side frame rear end.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Check the body dimensions (see section 6).
- ♦ Install the new sub-frame and check the front side frame position.

- 9. Perform the main welding.
 - ♦ Make 20% to 30% more spot welds than there were holes drilled.

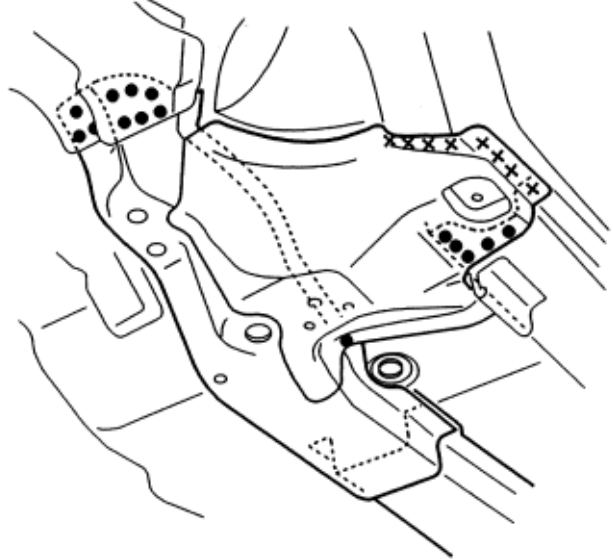
NOTE: If there is no room for spot welds, compensate by using MIG welds.

- ♦ Weld as much as possible with the jig still mounted.

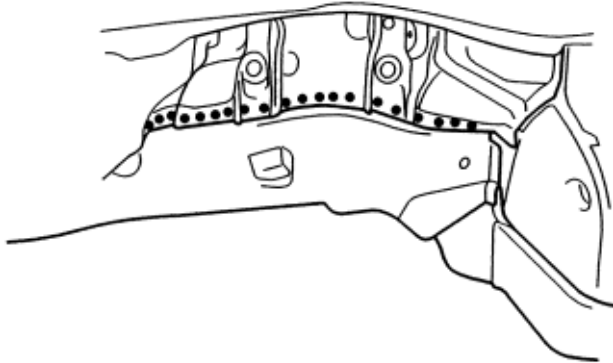
⚠ WARNING

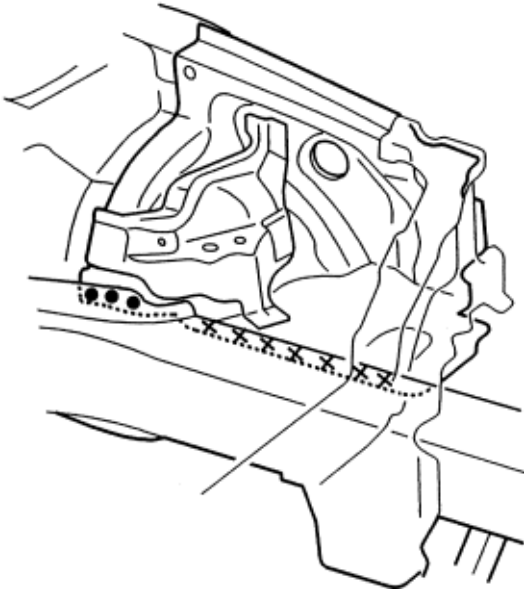
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ MIG weld the side frame rear end and outrigger.

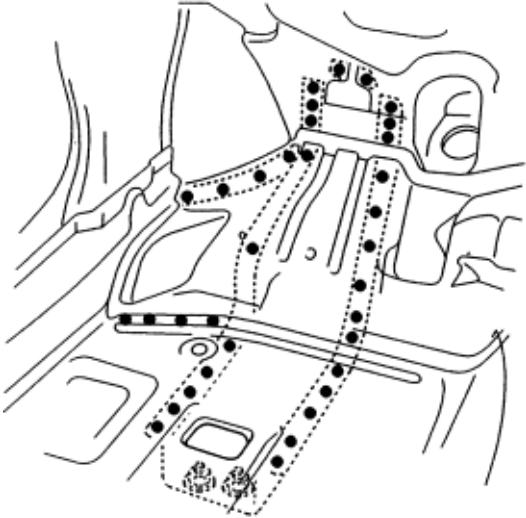


- ♦ Weld the front side frame, wheelhouse, damper housing and bulkhead.





- ♦ From the passenger compartment side, plug weld the holed areas of the lower dashboard, front floor and floor frame with a MIG welder.



10. Finish the welds. Use a hammer and dolly to even out the damper housing, wheelhouse, lower dashboard, front bulkhead and side sill flanges for a close fit with the surface of the front side frame.

11. Apply sealer (see section 5) to the mating surfaces of the lower dashboard, etc.
12. Apply the paint. See Paint Repair section.



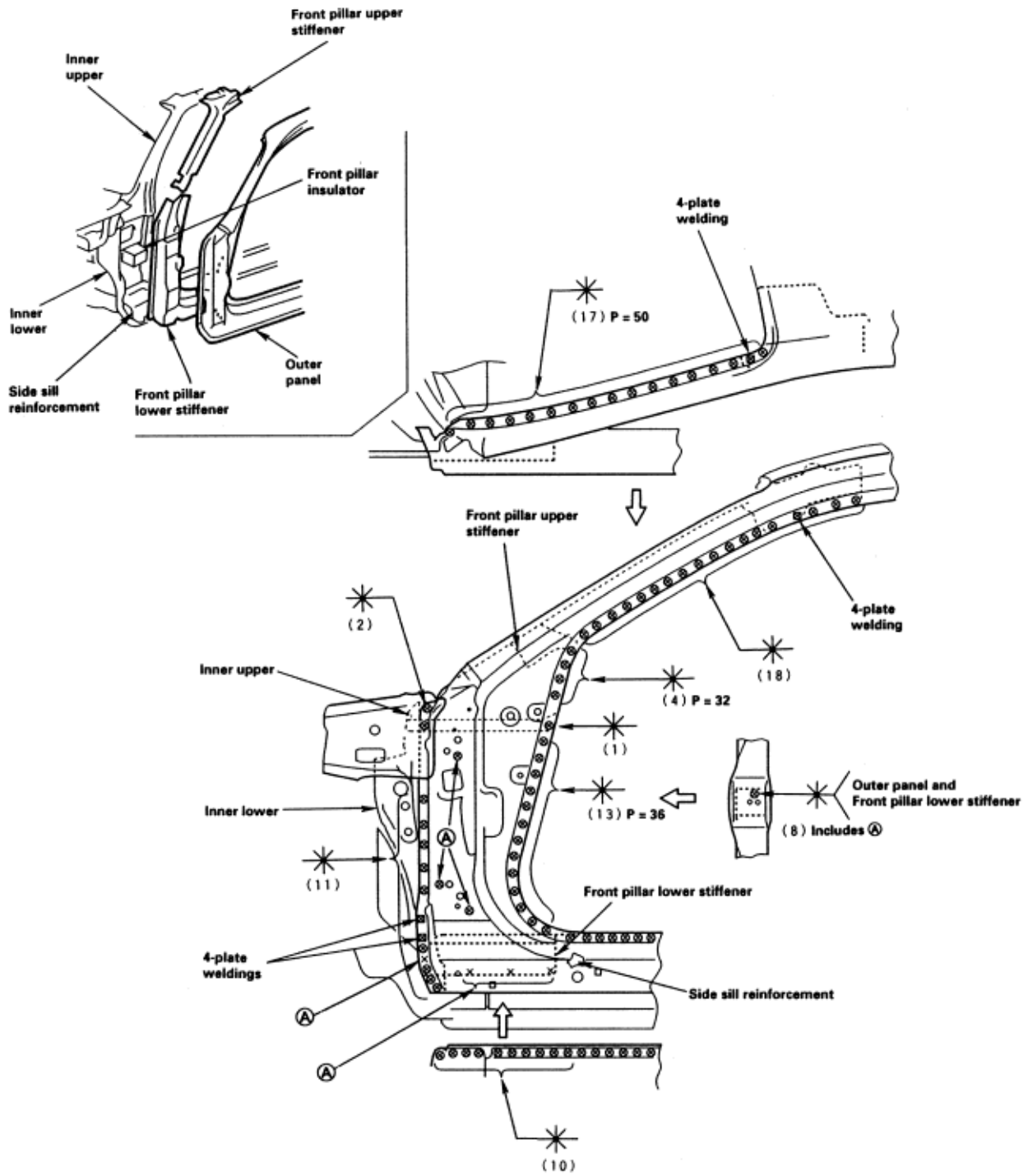
WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
 - ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.
13. Apply the undercoat.
Undercoat the front floor, and apply anti-rust agent to the inside of the welding section of the side sill, front side frame, side frame rear end and outrigger (see section 7).
 14. Install the related parts in the reverse order in which they were removed.
 15. Inspect, check and adjust.
 - ♦ Measure the front wheel alignment.
 - ♦ Inspect the brake system.
 - ♦ Adjust the headlight aim.

Front Pillar (Outer Panel)

Mass Production Body Welding Diagram

The front pillar is connected to the roof, windshield door hinges and side sills and the front pillar is a very important support. Proper connection of the front pillar determines the position of the windshield and front door. Align the front fender, door and windshield while the front pillar is loosely mounted, then check the clearances and level differences.



1. Remove the related parts:

- ♦ Hood.
- ♦ Front fender.
- ♦ Front door.
- ♦ Windshield.
- ♦ Front side trim.
- ♦ Door opening trim.
- ♦ Side cowl lining.
- ♦ Dashboard.
- ♦ Front pillar trim.
- ♦ Wire harness, etc.
- ♦ Steering column.
- ♦ Steering hanger brace.

NOTE: Make sure that the right and left pillars are parallel with the windshield surface. Check the door for proper opening and closing.

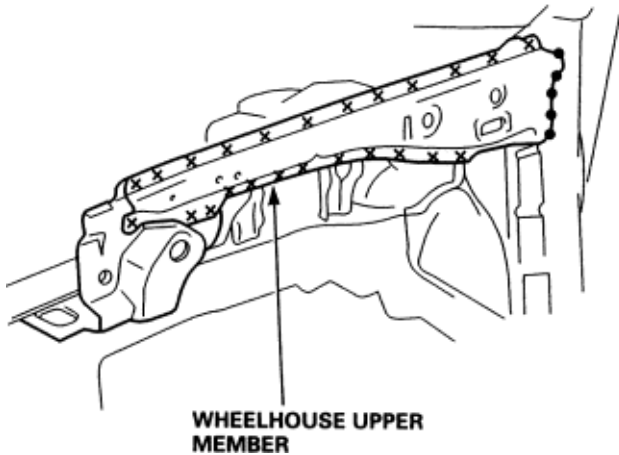
2. Pull out and straighten the damaged area.

- ♦ Pull out the damaged area with the frame straightener before cutting off the wheelhouse upper member and front pillar.

NOTE: Pull out until the pillar is lined up with the surface of the windshield.

- ♦ With the pillar pulled out, pull out and straighten the related lower dashboard and floor section
- ♦ After pulling, check the inner pillar position using the body dimensional drawings (see section 6).

3. Remove the wheelhouse upper member carefully so it can be reused.



4. Cut off the front pillar.

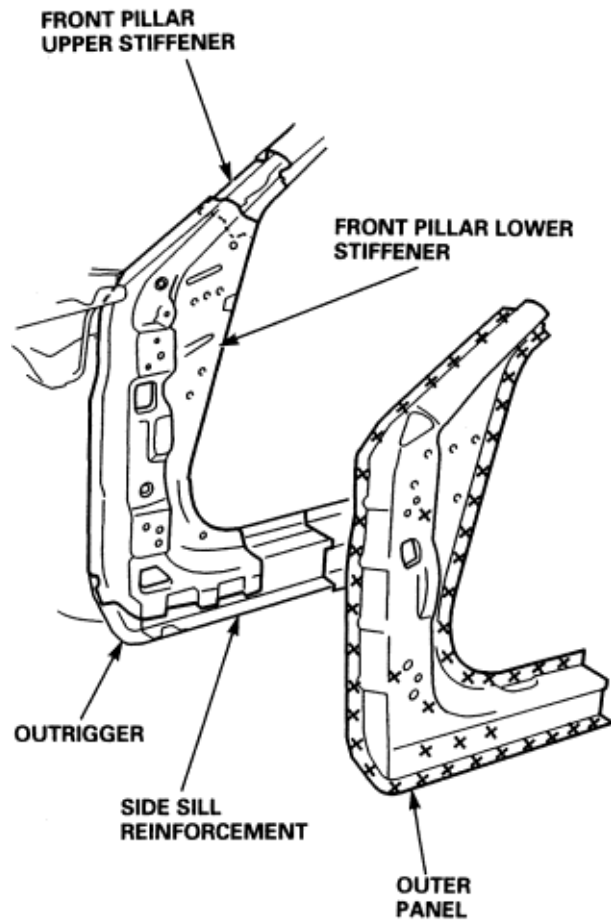
- ♦ Use a die grinder to cut the windshield and side sill areas.

NOTE: Be careful not to cut the front pillar upper stiffener and side sill reinforcement.

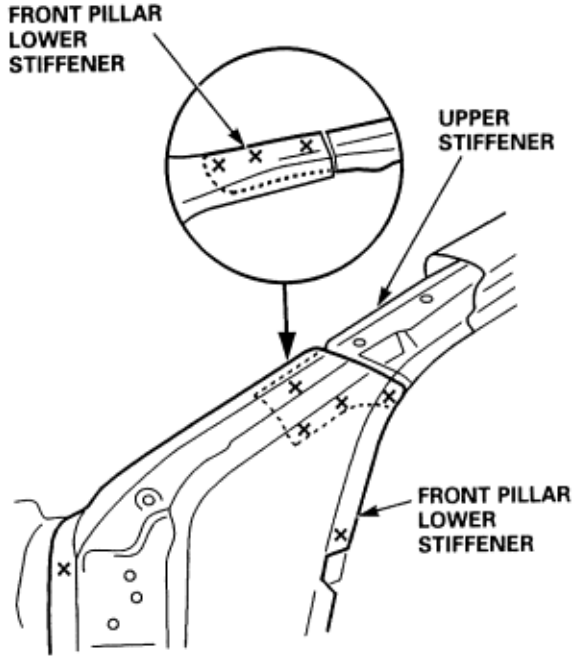
- ♦ Center punch around the spot weld imprints.
- ♦ Drill holes using a spot cutter.
- ♦ Chisel off the weld flanges.
- ♦ Finish the burs at the drilled areas with a disc sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.



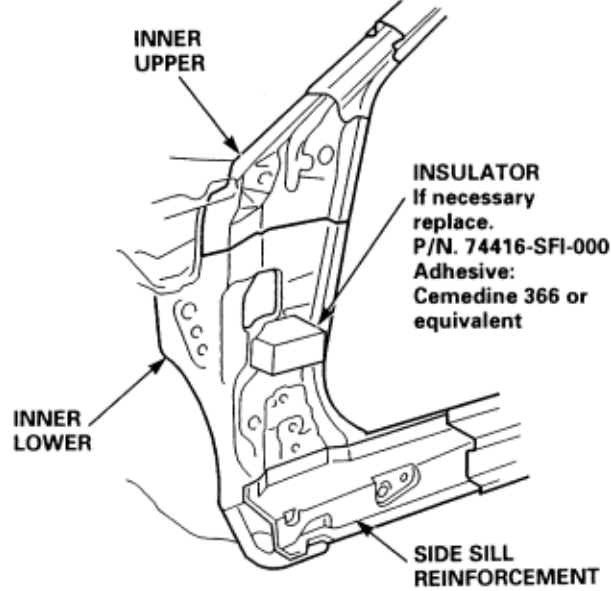
- ♦ Check the front pillar lower stiffener for position and damage, if necessary replace it.



5. Straighten the related parts. Fill any holes by MIG or gas welding and even out with a hammer and dolly.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.



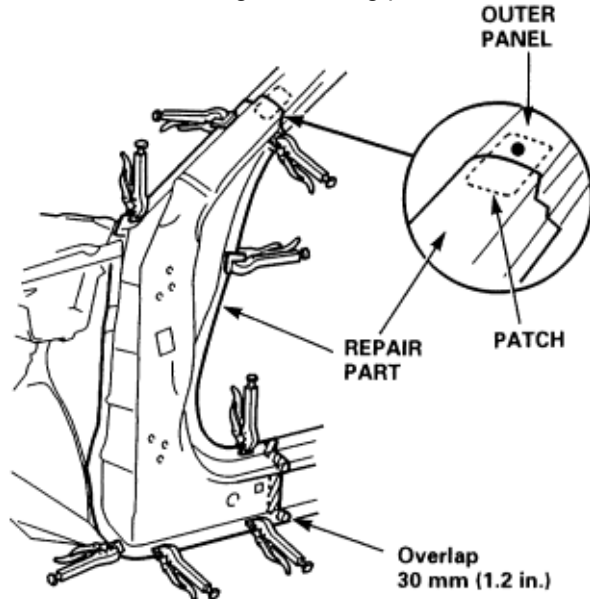
6. Set the new front pillar lower stiffener and repair part.
 - ♦ Align the repair part with the top cut section, then cut it with a handsaw.

NOTE: Cut the side sill joint with a handsaw leaving an overlap of 30 mm (1.2 in.)

- ♦ Attach the patch to the cut section of the front pillar (body side) and plug weld it.
- ♦ Remove the undercoat from both sides of the areas to be spot welded with a sander to expose the steel plate.

NOTE: Apply the spot sealer to the welding surface of the new front pillar lower stiffener.

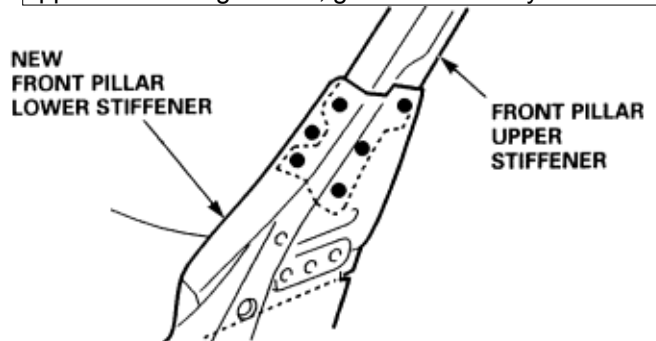
- ♦ Clamp the new front pillar lower stiffener and the repair part.
- ♦ Check the body dimensions (see section 6).
- ♦ Temporarily install the door, and check the door hinge mounting position.



7. Remove the repair part and weld the new front pillar lower stiffener and upper stiffener.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

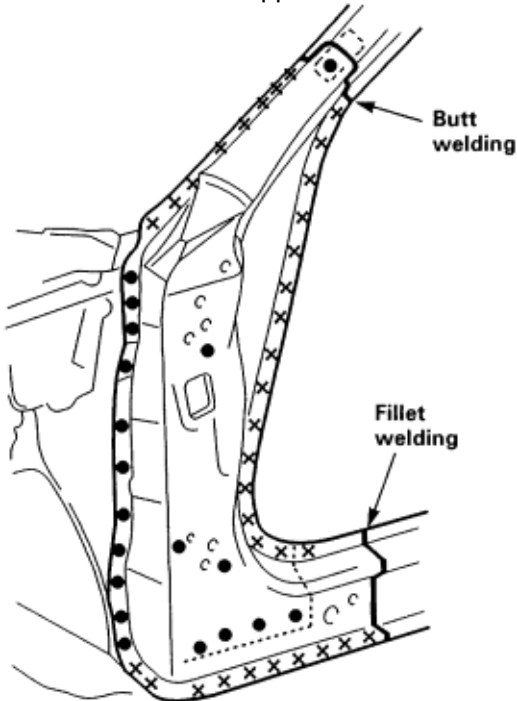


8. Apply spot sealer to the welding surface of the repair part.
9. Clamp the repair part and recheck the clearance and alignment of the door, front fender and windshield.
10. Perform the main welding.
NOTE: Be careful not to burn the insulator of the fitting inside the front pillar lower stiffener while welding.
 - ♦ Weld the front pillar and side sill outer joints with a MIG welder.
 - ♦ Make 20% to 30% more spot welds than there were holes drilled.NOTE: If there is no room for spot welds, compensate by using MIG welds.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Make 5 mm (0.2 in.) holes in the MIG weld holes with the repair part, and weld the lower stiffener and dashboard upper side member with a MIG welder.



- ♦ Weld the wheelhouse upper member (see page 4-12).

11. Finish the welding areas.
 - ♦ Grind the finishing allowance with a disc sander until it is smooth.

⚠ WARNING

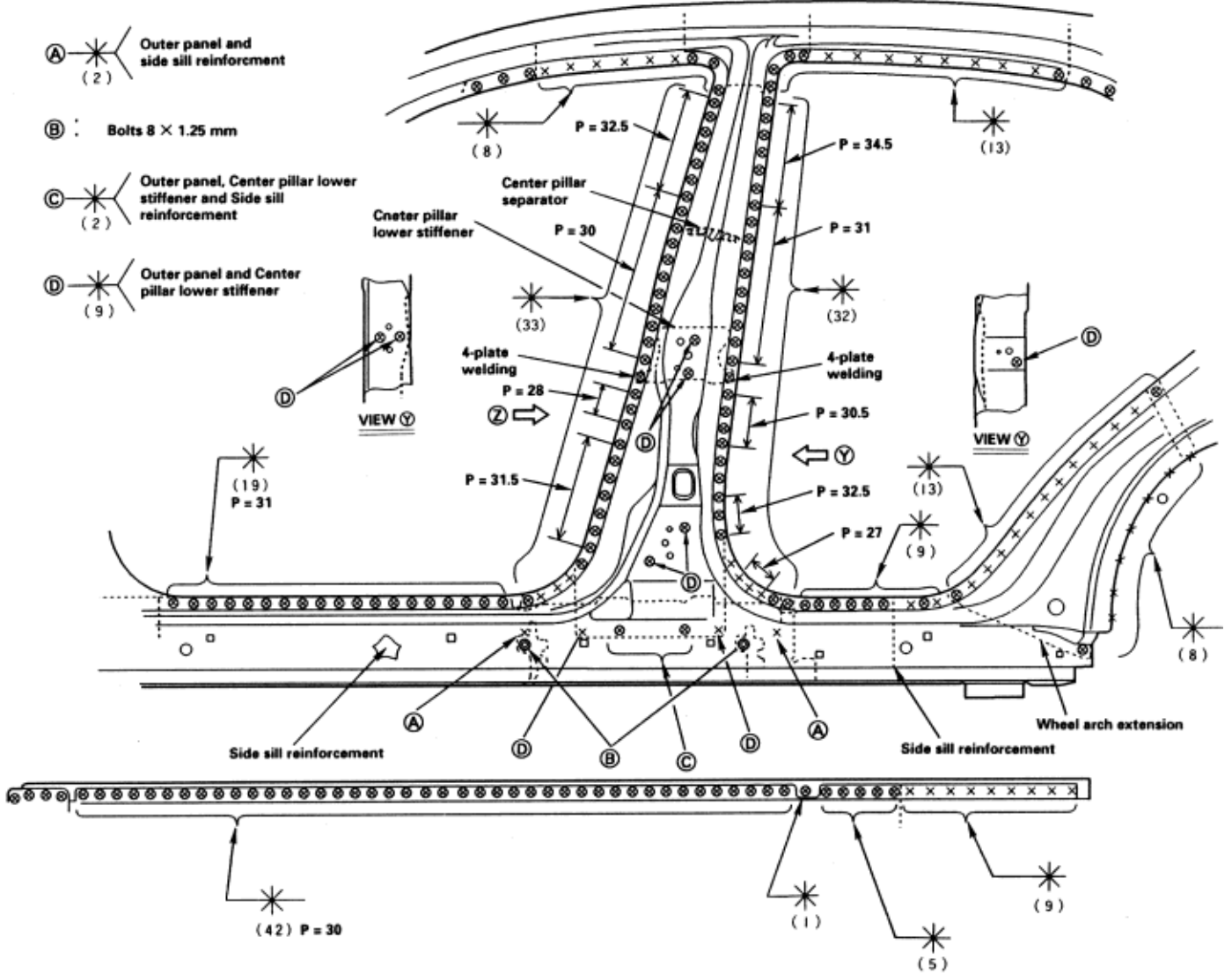
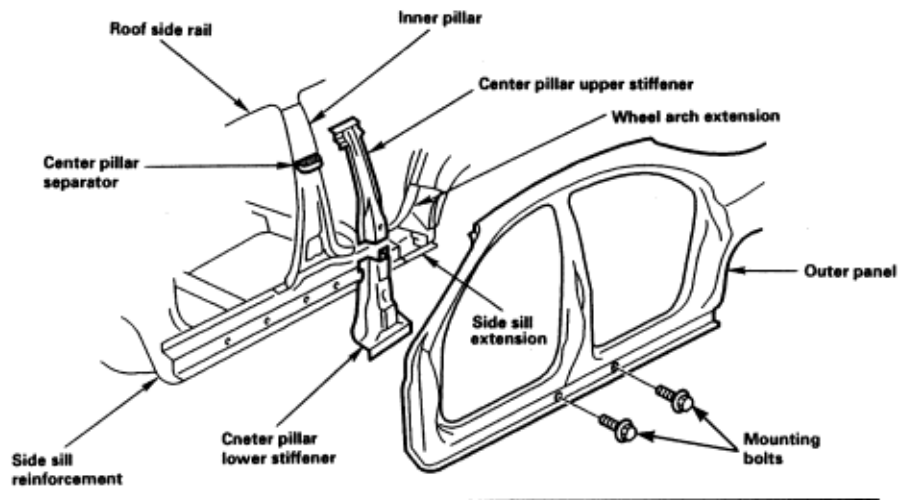
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Smooth the flanged section of the door opening with a hammer and dolly.
12. Apply the sealer (see section 5).
 13. Apply the paint.
See Paint Repair section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

14. Apply anti-rust agent to the inside of the front pillar, wheelhouse upper member and side sill (see section 7).
15. Install the related parts.
 - ♦ Install in the reverse order of removal.
 - ♦ Check the door for proper installation and alignment with the fenders.
16. Clean and check.
 - ♦ After installing the dash board, check the lights and gauges for proper operation.
 - ♦ Clean the passenger compartment and check for water leaks.

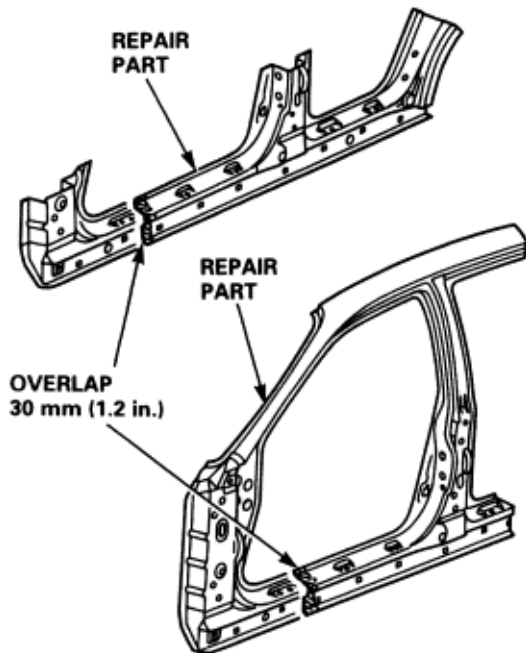


Side Sill (Outer Panel) Replacement

4-24

1. Remove the related parts.
 - ♦ Doors (remove according to part damaged).
 - ♦ Side trim panel.
 - ♦ Door opening trim and door sill moldings.
 - ♦ Carpet.
 - ♦ Door switch.
 - ♦ Seat belt.
2. Pull out and straighten the damage area.
Damage may extend to the inside sill and floor.
Determine the extent of the damage first, so that the frame can be pulled out properly.
3. Cut and pry off the side sill.
 - ♦ Check the damage on the outer side sill, then cut the repair outer side sill so it will overlap by 30 mm (0.2 in.) in the front and back.
 - ♦ Cut the side sill with a handsaw.

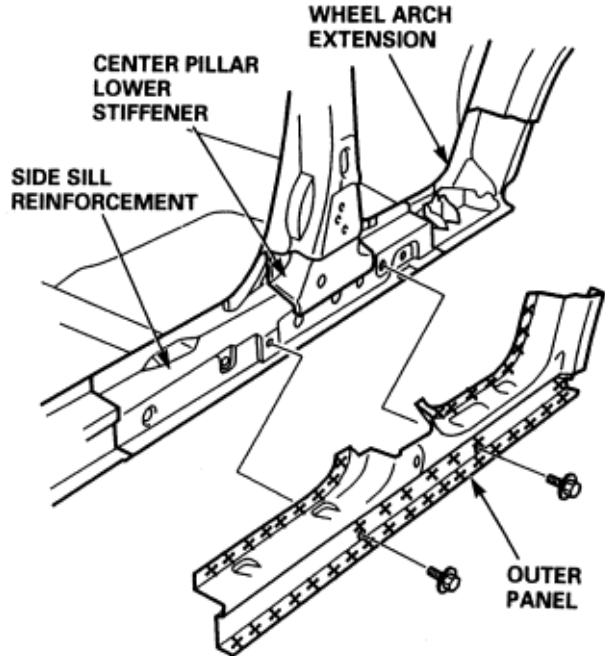
NOTE: Be careful not to cut the inside sill and center pillar stiffener and side sill reinforcement. This could result in extensive repair.



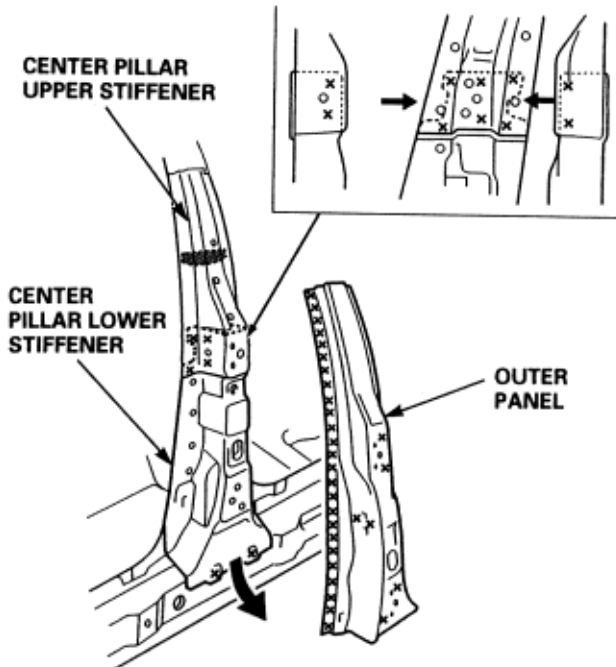
- ♦ Center punch around the spot weld imprints on the welded flange.
- ♦ Drill holes using the spot cutter.
- ♦ Pry of the welded flange with a chisel.

NOTE: Be careful not to let the holes penetrate down to the inner section.

- ♦ If the damage involves part of the center pillar and rear wheel arch, cut them as shown with a handsaw.



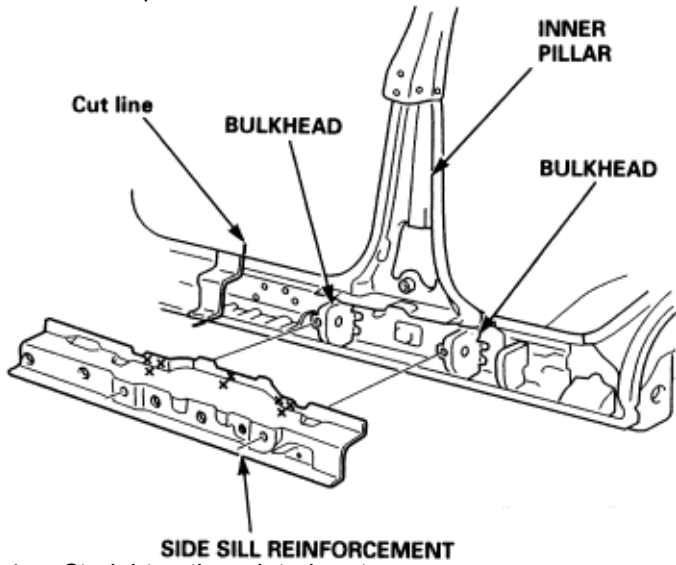
- ♦ Check the inside sill, center pillar lower stiffener, side sill reinforcement and inner pillar for position and damage.
- ♦ Cut the outer panel and replacing the centre pillar lower stiffener, if necessary.



Side Sill (Outer Panel) Replacement (cont'd)

4-25

- ♦ If necessary, cut the side sill reinforcement and replace it.

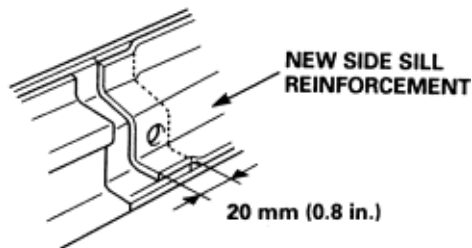


4. Straighten the related parts.
 - ♦ Fill any holed areas by MIG or gas welding.

WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Level and finish burrs at welded areas with a disc sander, then even them out with a hammer and dolly.
 - ♦ Sand off the undercoat from both sides of the flange to be welded.
5. Cut the new side sill reinforcement so it will overlap the body side by approximately 20 mm (0.8 in.).



6. Set the side sill reinforcement and new center pillar lower stiffener.

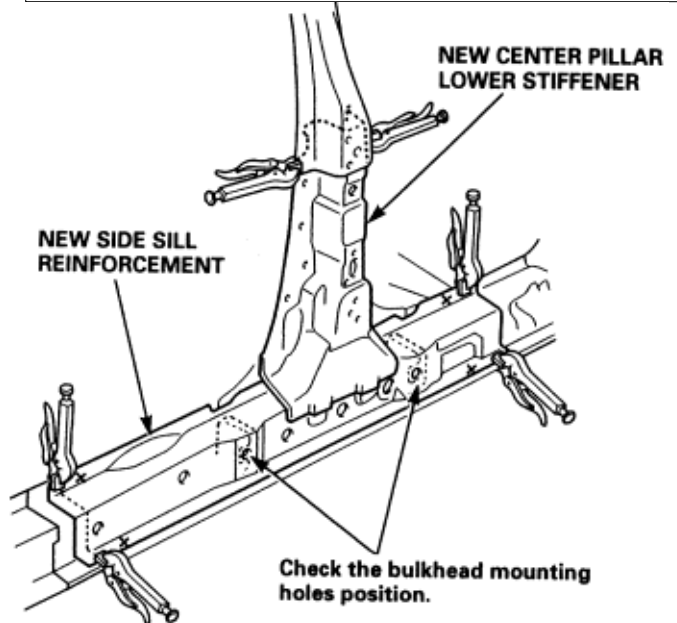
- ♦ Sand off the undercoat from both sides of the welded flange with a sander to expose the steel plate.

NOTE: Apply the spot sealer to the side sill reinforcement welding, surface when spot welding.

- ♦ Clamp the side sill reinforcement and front pillar lower stiffener and check the position of them using the body dimensional drawings (see section 6).
- ♦ Tack weld the side sill lower reinforcement.

WARNING

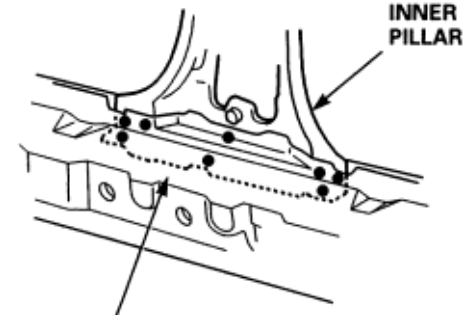
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.



7. Clamp the new out panel and temporarily install the doors and check the door hinge mounting positions.
8. Remove the new outer panel and new center pillar lower stiffener.

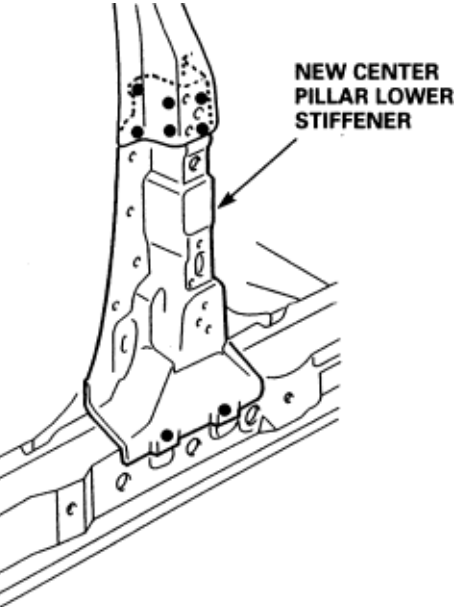
9. Weld the new side sill reinforcement and inner pillar with a MIG welder.

⚠ WARNING
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

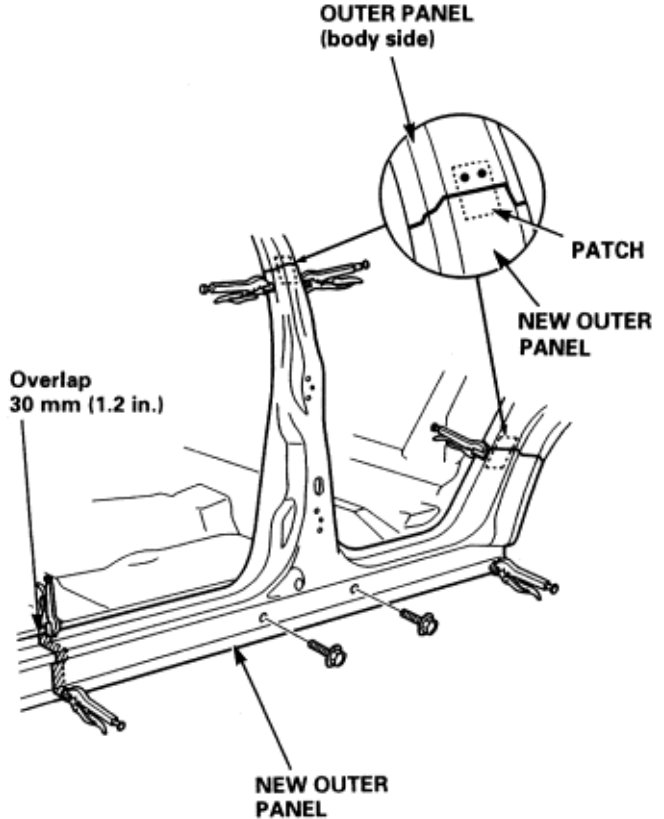


NEW SIDE SILL REINFORCEMENT

10. Apply the spot sealer to the welding surface of the new center pillar lower stiffener.
11. Clamp the new center pillar lower stiffener and recheck the door hinge mounting position.
12. Main weld the center pillar lower stiffener with a MIG welder.



13. Clamp the new out panel.
- ♦ Attach the patches to the cut sections of the center pillar and wheel arch (body side) and plug weld them.
 - ♦ Sand off the undercoat from both sides of the welded flange on the outer panel.
 - ♦ Clamp the outer panel in place with vice-grips.
- NOTE: Apply the spot sealer to the welding surface when spot welding.
- ♦ Check the body dimensions (see section 6).



14. Tack weld the new out panel.

⚠ WARNING
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

Remove the vice-grips and install the fender and doors. Check for differences in level and clearance.

15. Perform main welding.

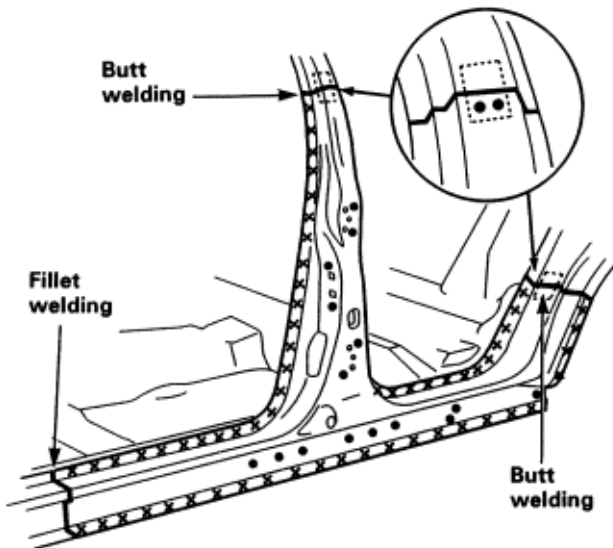
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Weld the side sill and rear side outer joints with a MIG welder.
- ♦ Spot weld the side sill flanges.
- ♦ Make 20% to 30% more spot welds than there were holes drilled.

NOTE: If there is no room for spot welds, compensate by using MIG welds.

- ♦ Make 5 mm (0.2 in.) holes in the MIG weld holes with the new outer panel, and weld the center pillar lower stiffener and side sill reinforcement with a MIG welder.



- ♦ Level the weld beads at the front and rear with a disc sander. Hammer down the projections, then fill with solder or putty to finish it.

16. Apply sealer to the mating surfaces of the floor and inside sill (see section 5).

17. Apply the paint. See Paint Repair section.

⚠ WARNING

♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.

♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.

♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

18. Apply the undercoat.

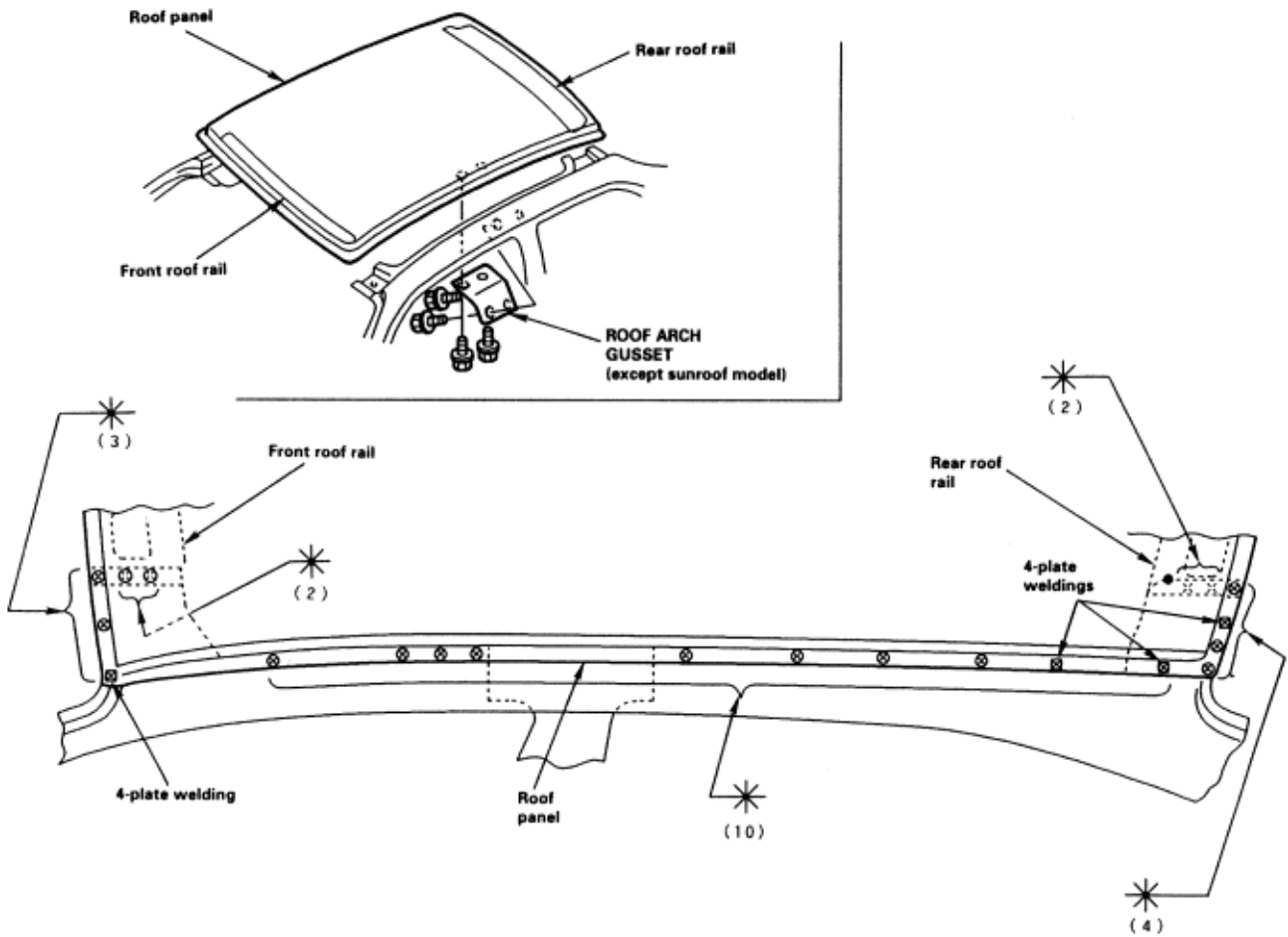
Undercoat the front floor, and apply an anti-rust agent to the inside of the side sill and center pillar (see section 7).

19. Install the related parts.

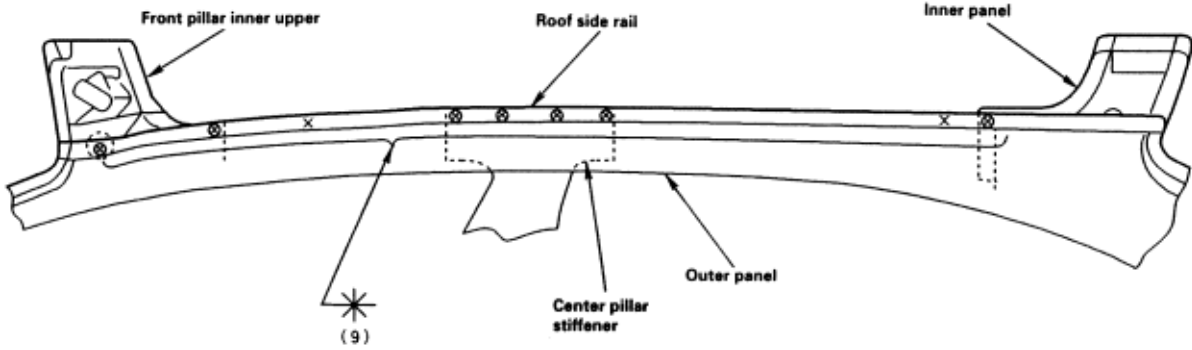
- ♦ Install in the reverse order of removal.
- ♦ Check the doors for proper installation and level differences from the fender.

20. Clean the passenger compartment and check for water leaks.

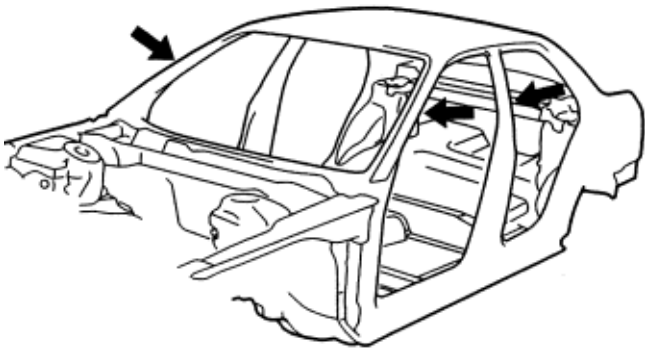
Deformation of the roof panel is highly noticeable in terms of the vehicle's outer appearance. Before replacing the roof rail, make sure that the body is horizontal. Before welding the roof panel, adjust the roof rail flanges so that they contact the roof panel.



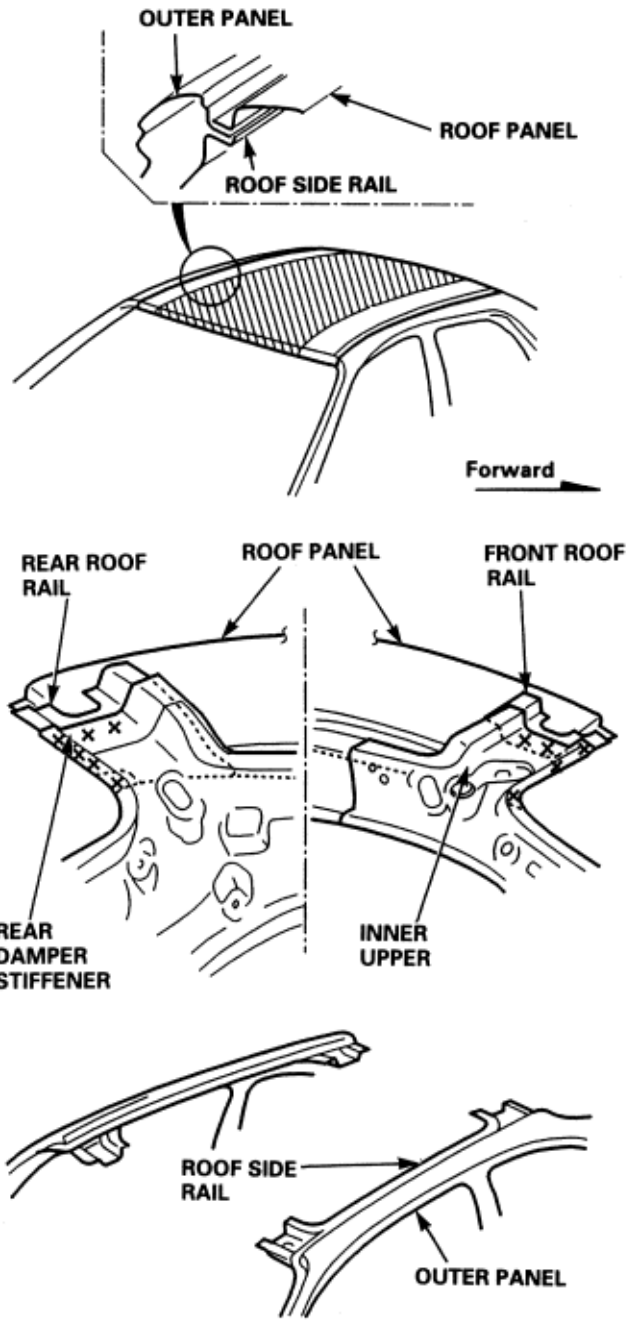
NOTE: When replacing the outer panel, drill holes at the areas where it joins to the roof side rail and rear inner panel as shown.



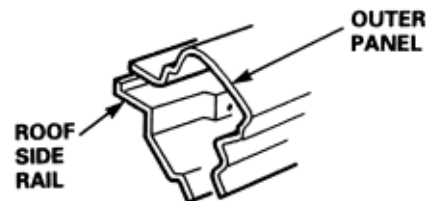
1. Remove the related parts.
 - ♦ Windshield.
 - ♦ Rear window.
 - ♦ Sunvisor.
 - ♦ Ceiling lights.
 - ♦ Headliner.
 - ♦ Sunroof frame (for some models).
2. Pull out and straighten the damaged area to approximately the original shape.
NOTE: Check the inner front pillar and the inner center pillar for position and damage.
Cut the roof panel and pull out the pillars if necessary.
 - ♦ Pull out the damaged area with the frame straightener before removing the roof panel.
 - ♦ Attach the vehicle to the frame straightener by tightening the underbody clamps located at the horizontal pinch welds.
3. Keep the body level.
NOTE: Refer to the Accord Shop Manual for safety stand location points.
Jack-up the body at the front and back. Place safety stands to support engine weight, at the four designated place of the side sills.
NOTE: Make sure that the right and left pillars are parallel with the windshield surface. Check the door for proper opening and closing.



4. Cut off the shaded areas of the roof panel.
 - ♦ Cut the roof rail weld flange with a handsaw at the four corners.
 - ♦ Using a chisel, pry off the roof panel along the bold lines as shown.
 - ♦ Center punch around the spot weld imprints of the roof gutter welded flange.
 - ♦ Drill holes using the spot cutter.
 - ♦ Using a chisel, pry off the welded flange.



NOTE: If necessary, replace the outer panel (see page 4-28).



5. Plug weld the holes with a MIG welder.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Level and finish the burrs on the welded flanges with a disc sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Even out the roof side rail welded flange with a hammer and dolly for a close fit with the roof panel welded flange.

6. Apply paint to the underside of the new roof panel. See Paint Repair section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

7. Set the new roof panel.

- ♦ Sand off the undercoat from both sides of the flange sections to be spot welded to expose the steel plate.

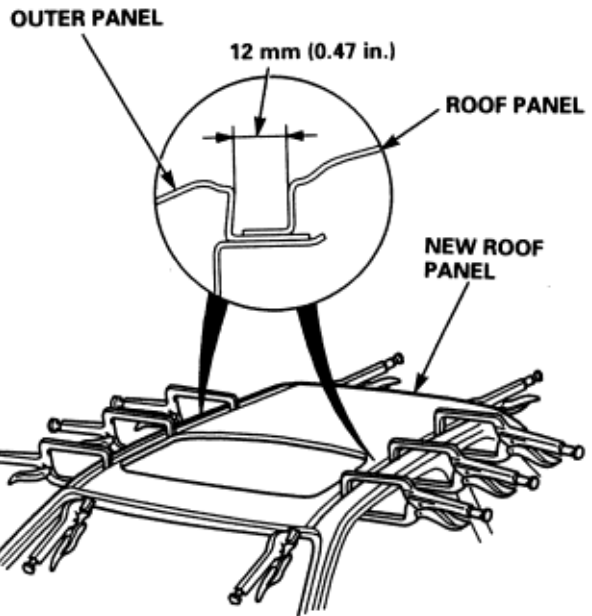
⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Clamp the roof panel with vice-grips.

NOTE:

- ♦ Check that the flange surfaces fit closely. Be careful not to twist or deform the roof panel.
- ♦ Check the width of the groove of the roof moldings on both sides.
- ♦ Apply the spot sealer to the welding surface when spot welding.



- ♦ Check the body dimension (see section 6).

8. Tack weld the new roof panel.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Spot weld the clamped sections to temporarily install the roof panel.
- ♦ Set the windshield and rear window and check the roof panel for proper installation.
- ♦ Install the roof molding and check the width of the groove.

9. Perform the main welding.

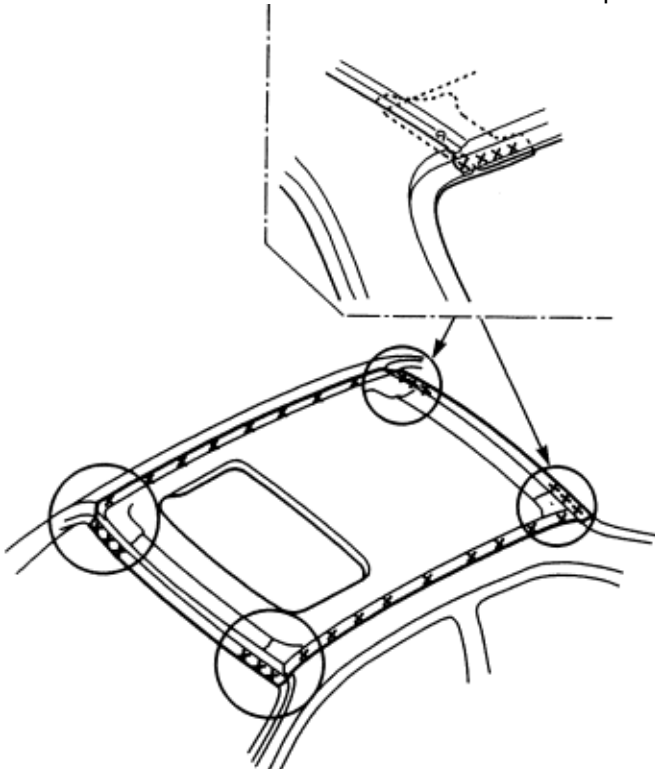
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Spot weld the roof rails at the front and rear.
- ♦ Spot weld the roof arch.
- ♦ Make 20% to 30% more spot welds than there were holes drilled.

NOTE: If there is no room for spot welds, compensate by MIG welds.

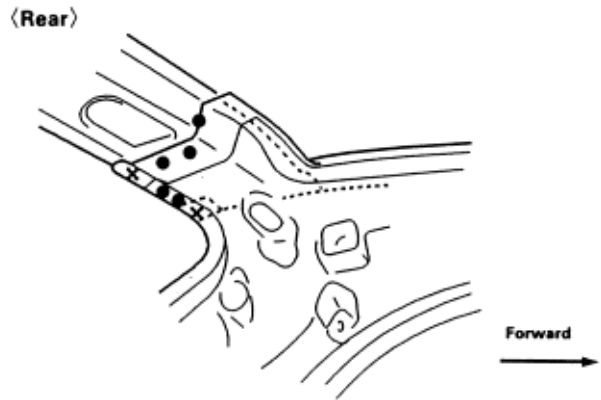
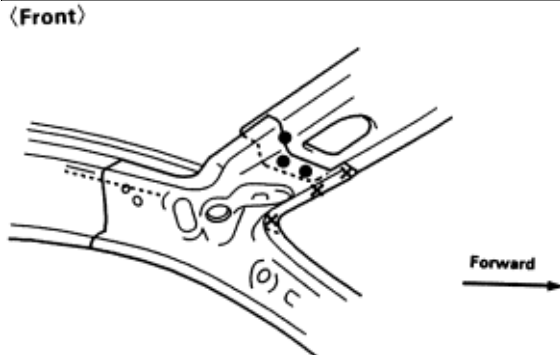
- ◆ Smooth the spot weld areas under the windshield and rear window with a hammer and dolly.
NOTE: After welding the pillars, grind and finish the welded areas flat and blend them into the roof panel.



- ◆ Weld the roof rail from the inside by MIG welding as shown.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.



10. Apply and level the sealer to the welded areas.

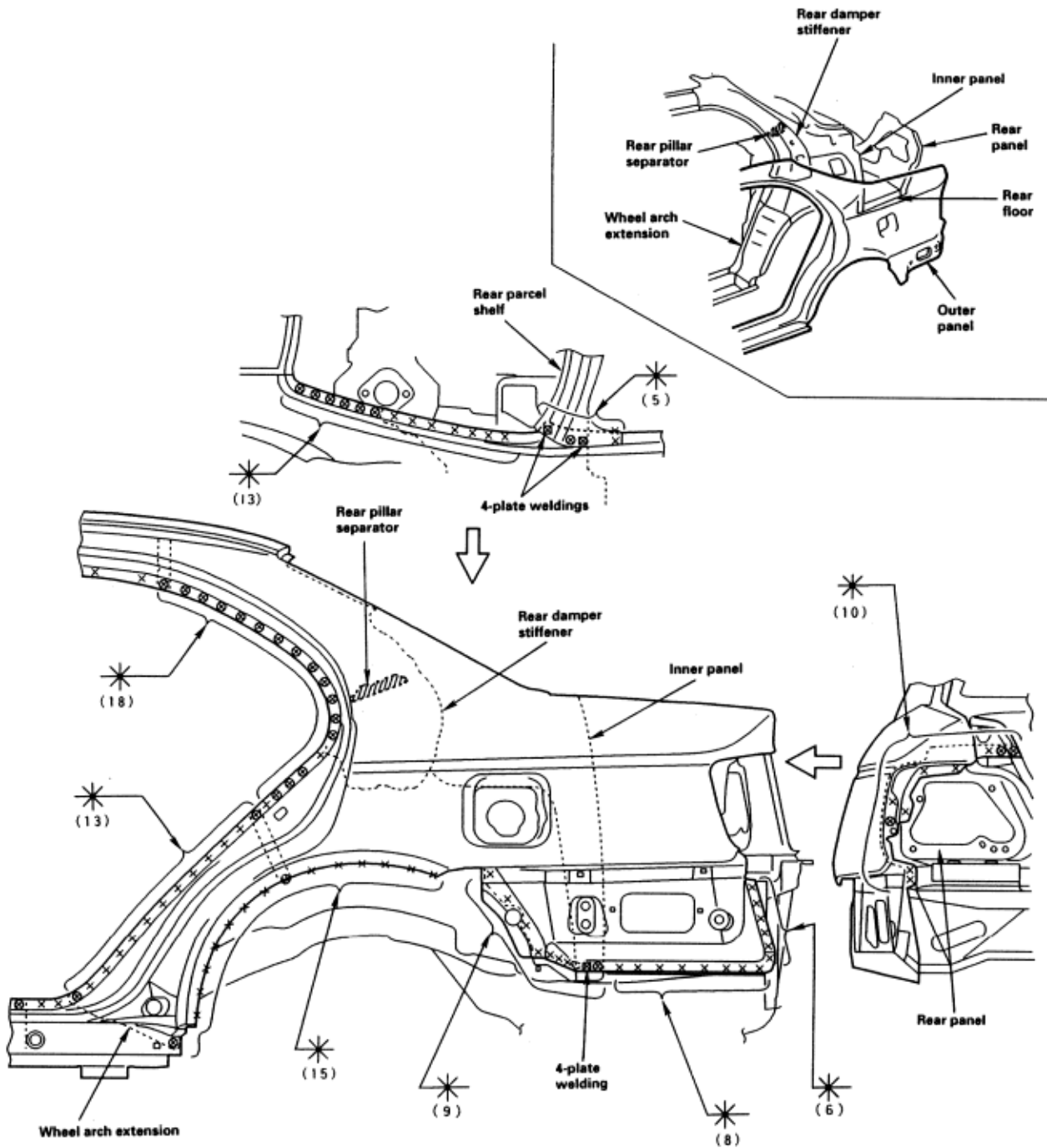


11. Apply the paint. See Paint Repair section.

⚠ WARNING

- ◆ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
 - ◆ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - ◆ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.
12. Apply an anti-rust agent to the inside of the roof side rail.
13. Install the related parts in the reverse order of removal.
14. Check and clean.
- ◆ Check the windshield and rear window for water leaks.
 - ◆ Make sure the sunroof operates smoothly.
 - ◆ Clean the passenger compartment thoroughly.

The rear side outer panel is a conspicuous part of the vehicle. It is especially important for the body line continuing from the door. Therefore, pay particular attention to it when conducting work. This part is also next to the trunk lid, door and rear window, and other parts and must be aligned with them.



1. Remove the related parts.
 - ♦ Rear bumper.
 - ♦ Rear window.
 - ♦ Trunk lid.
 - ♦ Taillight.
 - ♦ Rear pillar trim panel.
 - ♦ Trunk side panel.
 - ♦ Rear seat.
 - ♦ Rear seat belt.
 - ♦ Fuel fill pipe (left side only).

⚠ WARNING

Do not smoke while working near the fuel system. Keep open flame away from the fuel system. If necessary, remove the fuel tank and/or lines before welding nearby. Drain fuel into an approved container.

2. Pull out and straighten the damaged area.

NOTE: Carefully check the inner pillar and trunk gutter for position and damage. Pull out the inner panel by cutting the outer if necessary.

 - ♦ Jack-up the body and place safety stands at the four designated support points.
 - ♦ Pull out the damaged rear side outer panel with the frame straightener, then pull out and straighten the rear pillar inner panel and rear wheelhouse.

NOTE: Be careful not to pull out more than necessary.

 - ♦ After pulling, check the inner pillar, rear panel and trunk gutter position using the body dimensional drawings (see section 6).
3. Peel off the undercoat.

Heat the undercoat at the weld areas of the rear wheel house with a gas torch and peel off the undercoat with metal spatula.

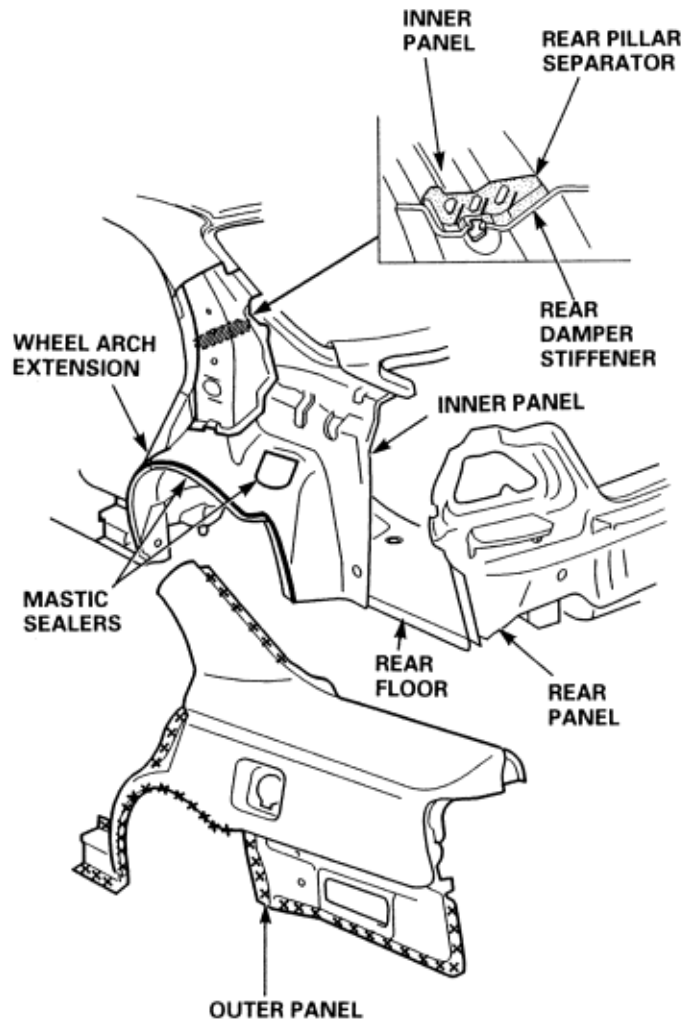
⚠ WARNING

Do not smoke while working near the fuel system. Keep open flame away from the fuel system. If necessary, remove the fuel tank and/or lines before welding nearby. Drain fuel into an approved container.

4. Cut and pry off the rear side outer panel.
 - ♦ Cut at the rear pillar and side sill with a handsaw.
 - ♦ Cut the panel from the body with a chisel, leaving the weld flange at the inner panel intact.

NOTE: Do not cut or damage the inner panel, rear damper stiffener and rear pillar separator.

 - ♦ Cut at the side sill or wheel arch according to the extent of the damage.
 - ♦ Center punch around the spot weld imprints on the remaining flange.
 - ♦ Drill out the spot welds with the spot cutter.
 - ♦ Pry off the welded flange sections using a chisel.



5. Straighten the inner panel and related parts.
 - ♦ Use a slide hammer to even out the damaged areas of the rear wheel arch.
 - ♦ Fill the holes drilled by MIG or gas welding.

⚠ WARNING

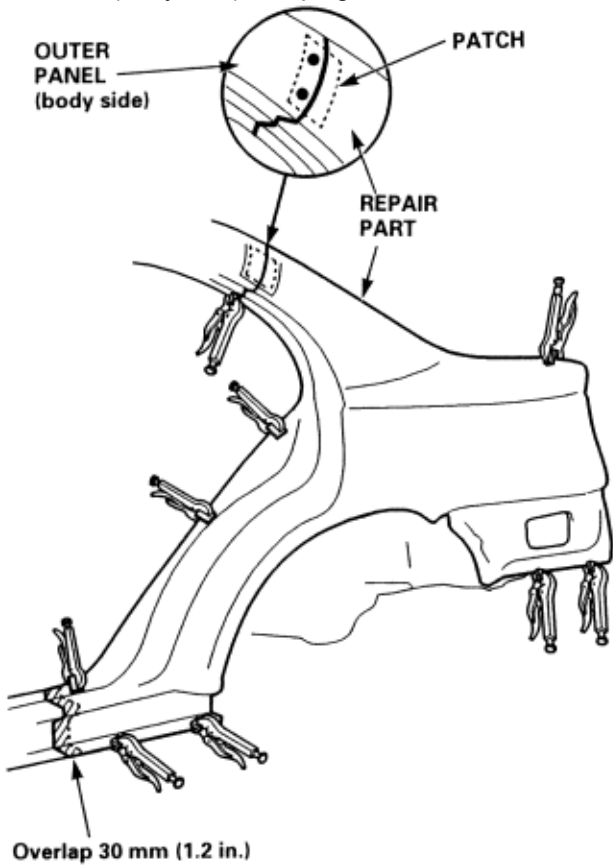
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Level and finish burrs, etc., with a disc sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

6. Cut and set the repair part.
 - ♦ Cut the repair part cut so that the repair part overlaps the side sill by 30 mm (1.2 in.).
 - ♦ Attach the patch to the cut section of the rear pillar (body side) and plug weld it.



- ♦ Apply body paint to the back of the repair part.
- ♦ See Paint Repair section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

- ♦ Remove the undercoat from both sides of the weld flange with a sander to expose the steel plate.

NOTE: Apply the spot sealer to the welding surface when spot welding.

7. Check the position of the rear panel and repair part using the body dimensional drawings (see section 6).
Temporarily spot weld the panel at the clamped positions.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

8. Remove the vice-grips and install the rear door, taillight, rear bumper and trunk lid.
NOTE:
 - ♦ Check for flushness of the front fender, doors and the rear fender, taillight, rear bumper, and make sure the body lines flow smoothly.
 - ♦ Check the alignment of the rear window and trunk lid.
9. Perform the main welding.

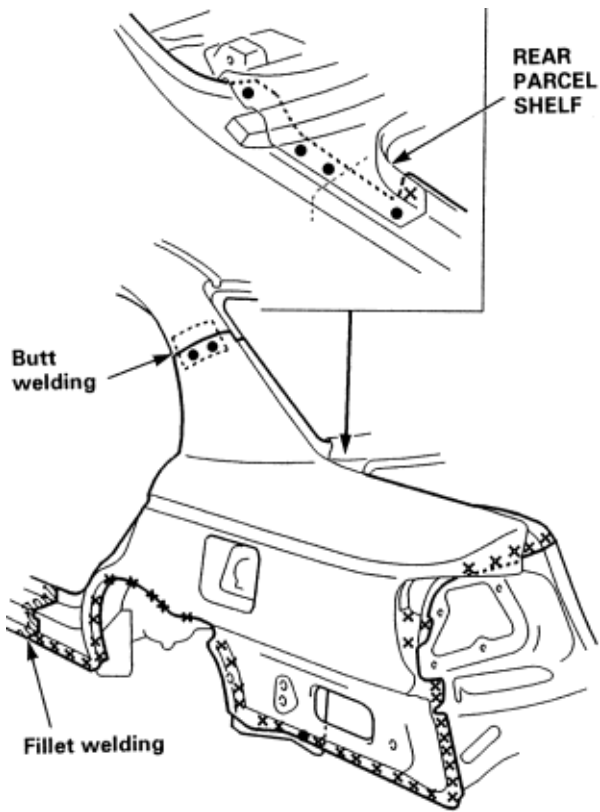
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Make 20% to 30% more spot welds than there were holes drilled.

NOTE: If there is no room for spot welds, compensate by using MIG welds.

- ♦ Make 5 mm (0.2 in.) holes in the MIG weld hole with the repair part and the inner panel and center pillar stiffener with a MIG welder.
- ♦ Weld the outer panel at the rear pillar and side sill with a MIG welder.



10. Finish the welded areas.
- ♦ Level the MIG welded areas with a disc sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Even out high areas with a hammer. Be careful not to deform them.
 - ♦ Even out the spot welded flange areas with a hammer and dolly.
 - ♦ Fill in deformations and level differences of the welded areas with solder or putty, then finish.
11. Apply the sealer (see section 5).
Apply sealer to the fuel filler sections, trunk lid opening joint and around the taillight area of the rear panel.

12. Apply paint. See Paint Repair section.

⚠ WARNING

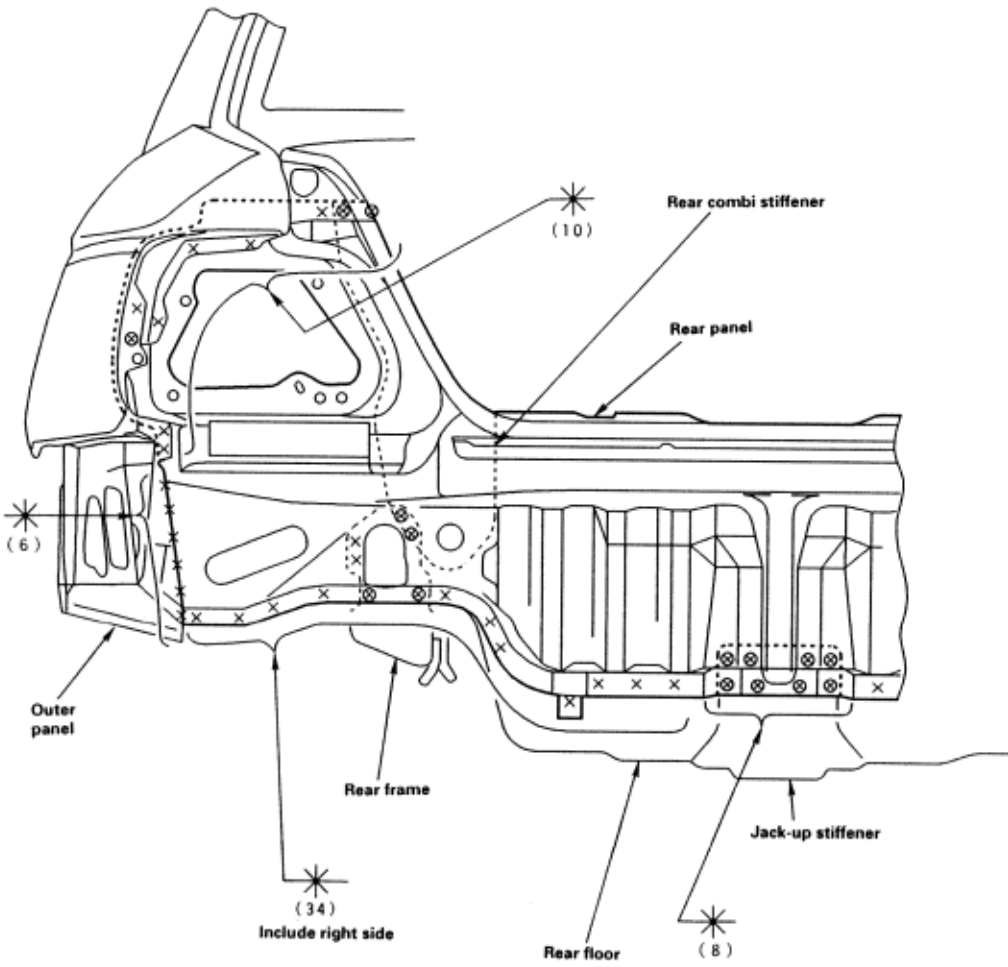
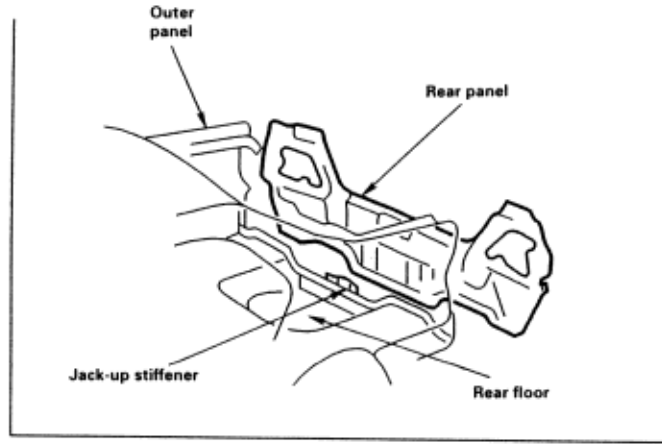
- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

13. Apply the undercoat.
Apply undercoat to the wheelhouse and apply anti-rust agent to the inside of the outer panel (see section 7).
14. Install the related parts in the reverse order in which they were removed.
15. Inspect, check and clean.
- ♦ Adjust the clearance with the door and trunk lid then adjust the level differences and fit. Check operation.
 - ♦ Test for leaks in the trunk and passenger compartments.
 - ♦ Check the quarter glass for water leaks.
 - ♦ Clean the trunk floor.

Rear Panel
Mass Production Body Welding Diagram

4-36

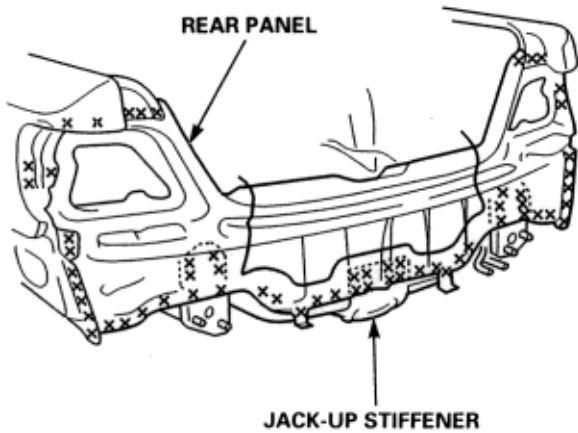
The rear panel is joined to the rear outer panel and rear floor, and maintains the rigidity of both sides of the rear body. It must be welded carefully.



1. Remove the related parts.
 - ♦ Rear bumper.
 - ♦ Rear bumper beam.
 - ♦ Trunk lid lock and attachments.
 - ♦ Other related parts.
 - ♦ Rear and side trim panels.
 - ♦ Taillights.
2. Pull out and straighten the damaged area.
 - ♦ Pull out the related rear side inner panel, rear floor, rear side frame, and other damaged parts with the frame straightener.
 - ♦ Attach the vehicle to the frame straightener by tightening the underbody clamps located at the jack-up points on the bottom of the side sill and the side sill side flanges.
3. Cut and pry off the rear panel.
 - ♦ Cut along the body line shown with a gas cutter or an air chisel and remove the rear panel.
 - ♦ Center punch around the spot weld imprints with the rear side outer panel and rear floor.
 - ♦ Drill holes using the spot cutter.

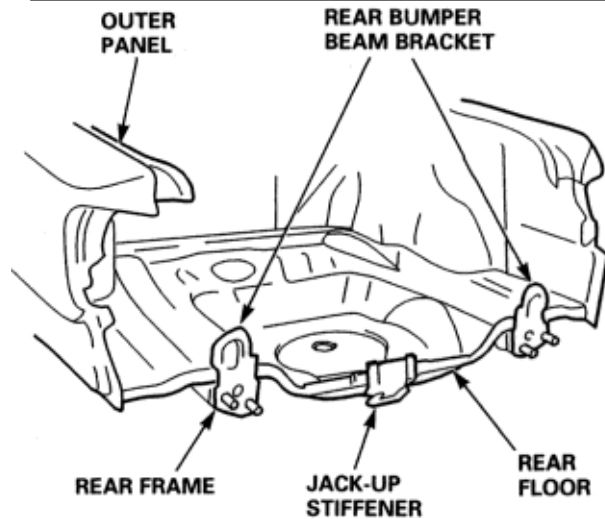
NOTE: Be careful not to let holes penetrate through to the rear floor.

 - ♦ Remove weld flange with a chisel.



4. Straighten the related parts.
 - Repair all cracks, holes or other defects by MIG or gas welding.

WARNING
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.



5. Set the new rear panel and rear.
 - ♦ Paint the inside of the rear panel with the body color.

WARNING
♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

- ♦ Remove the undercoat from the welding section of the panels and expose the steel plate using a disc sander.

WARNING
To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

NOTE: Apply the spot sealer to the welding surface when spot welding.

- ♦ Check the rear panel position using the body dimensional drawings (see section 6).

6. Tack weld the rear panel.
 - ♦ Weld the clamped sections for temporary installation.

⚠ WARNING

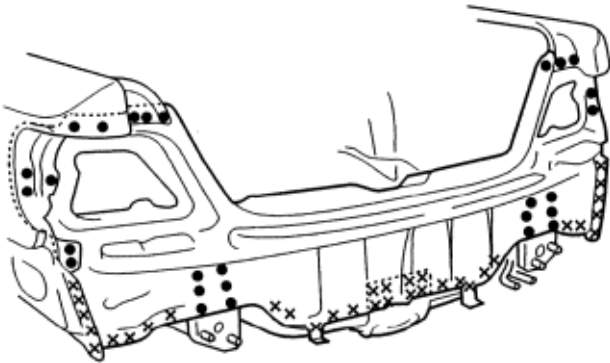
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

7. Open and close the trunk lid to check for proper installation.
NOTE: Make sure the trunk lid locks securely. Position the rear panel in its correct position with the rear bumper and taillight installed.
8. Perform the main welding.

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Make 20% to 30% more spot welds than there were holes drilled.
- NOTE: If there is no room for spot welds, compensate by using MIG welds.



9. Finish the welding area.
 - ♦ Level the welded areas with a disc sander, then even out high areas with a hammer. Be careful not to deform them.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

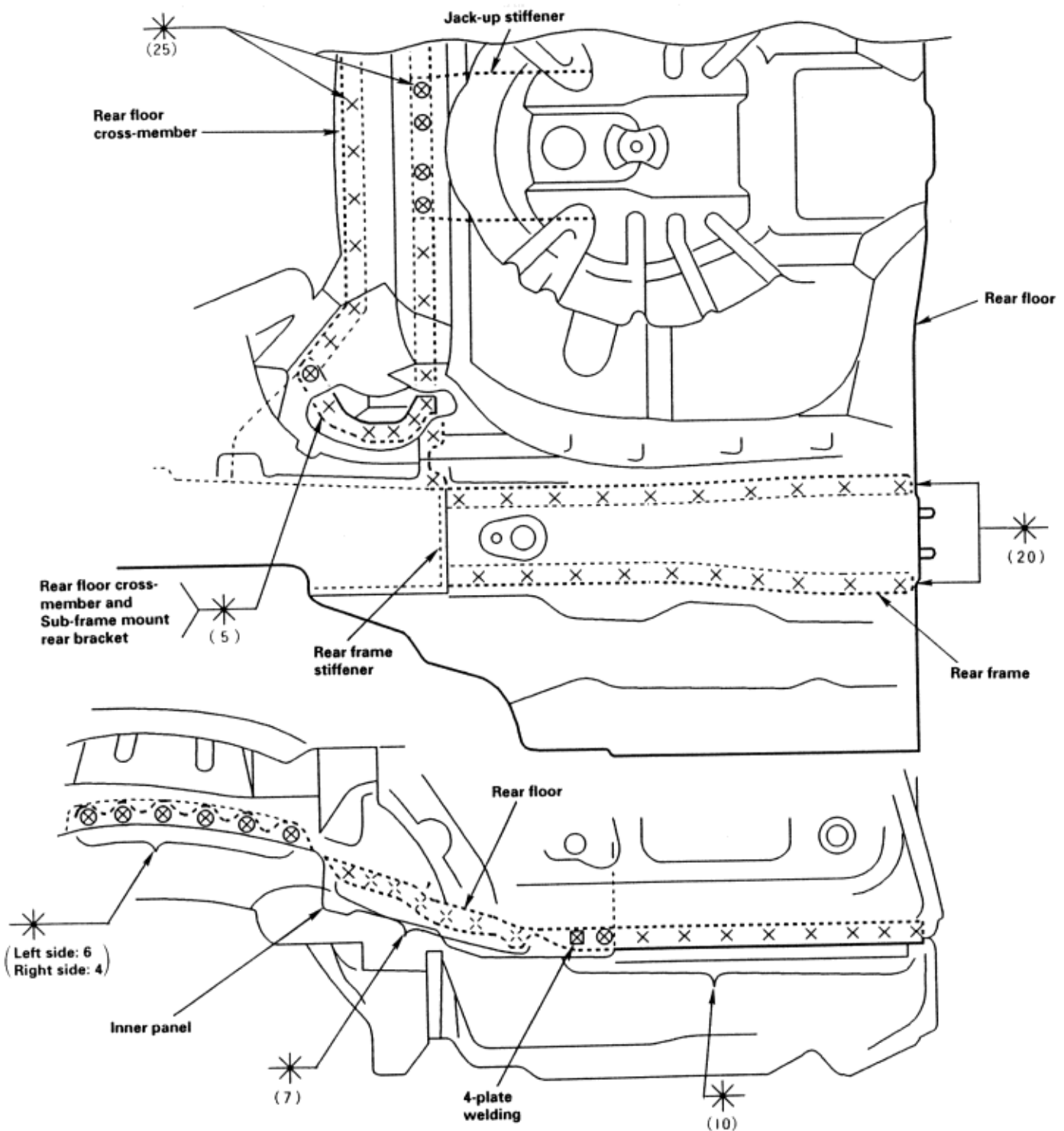
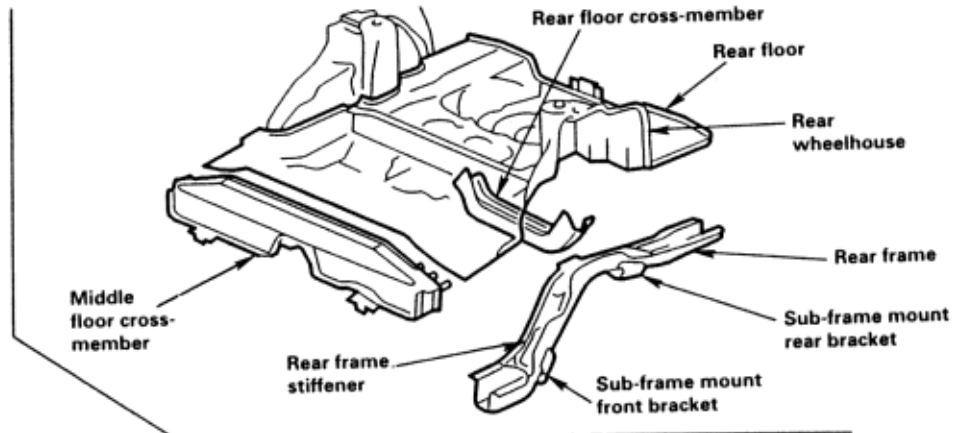
- ♦ Even out the spot welded flange area with a hammer and dolly.
10. Apply the sealer (see section 5).
 - ♦ Apply sealer to the rear side outer joint and around the taillight areas of the rear panel.
 - ♦ Apply sealer to the rear panel and rear floor joint.
 11. Apply the paint. See Paint Repair section.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.

12. Apply anti-rust agent (see section 7).
 - ♦ Apply agent to the outer panel, rear panel and rear floor joint.
 - ♦ Apply agent to the inside of the jack position stiffener.
13. Install the related parts in the reverse order in which they were removed.
14. Inspect, check and clean.
 - ♦ Adjust the clearance with the trunk lid, then adjust the level differences and fit. Check operation.
 - ♦ Test for leaks in the trunk compartment.
 - ♦ Clean the trunk floor.

The rear floor and rear floor cross-member are the base of the rear body and it is critical for the rigidity of the rear body. During replacement, refer to the body dimension chart or body correction chart and determine the position to set the rear floor, and rear floor cross-member, properly. Be sure that the rear floor is not bent or deformed. Weld securely, following the welder manufacturer's instructions to maintain the rigidity of the body.



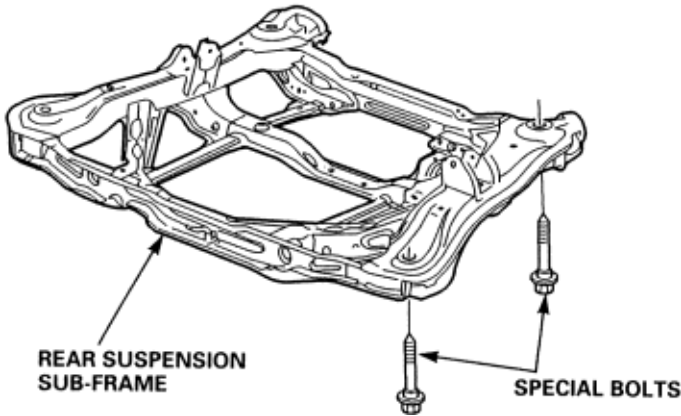
1. Remove the related parts.
 - ♦ Rear seat.
 - ♦ Trim and other luggage compartment fittings.
 - ♦ Left and right rear suspension assembly.
 - ♦ Parking brake parts.
 - ♦ Muffler.
 - ♦ Wire harness.
 - ♦ Other parts as necessary.
2. Disconnect the fuel lines and remove the rear suspension sub-frame.



WARNING

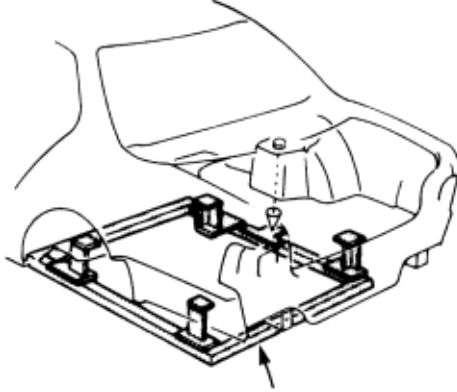
Do not smoke while working near the fuel system. Keep open flame away from the fuel system. If necessary, remove the fuel tank and/or lines before welding nearby. Drain fuel into an approved container.

SPECIAL BOLT: 14 x 1.5 mm
103 Nm (10.5 kgf/m, 76 lbf/ft)
Replace



3. Pull out and straighten the damaged area.
 - ♦ Check whether the damage extended to the rear floor cross-member, rear wheelhouse, and the passenger compartment. Pull out the damaged parts using the frame corrector.
 - ♦ Impact damage to the rear floor spreads to related parts such as the rear frame, rear floor cross-member and rear wheelhouse.
 - ♦ Therefore, pull out the damaged areas with the frame straightener and measure in reference to body dimensional drawing.

NOTE: Use of a positioning jig is recommended (see page 1-7).



POSITIONING JIG

4. Peel off the undercoat. Heat the undercoat at the weld areas of the lower rear floor with a gas torch and peel off the undercoat with a metal spatula.



CAUTION

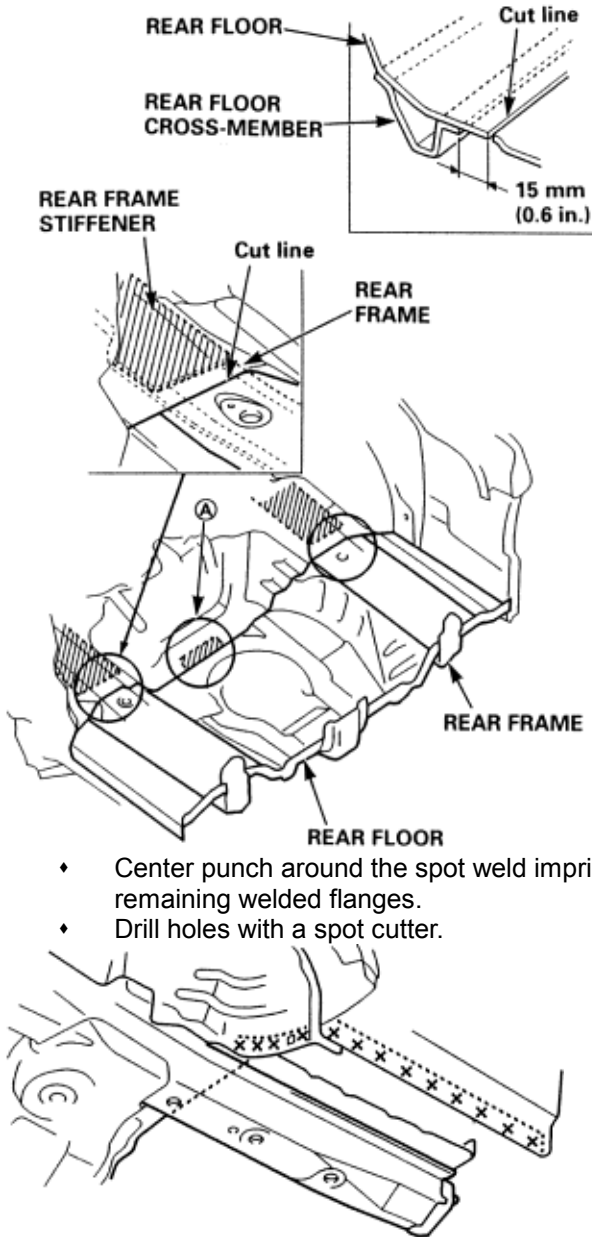
Be careful not to burn the fittings inside the trunk compartment and rear wheelhouse insulator while heating.

5. Cut and pry off the rear panel (see page 4-36).

6. Cut and pry off the rear floor.
- ♦ Cut off the rear floor with a gas cutter or air chisel.
 - ♦ Leave the spot welded flanges of the rear frame and rear floor cross-member shown by the bold line in the figure below.

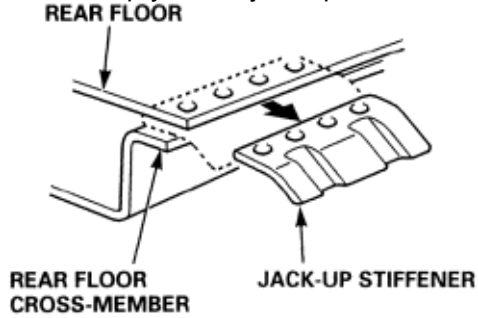
NOTE:

- ♦ Cut the rear floor 15 mm (0.6 in.) from the welded flange of the rear floor cross-member.
- ♦ Do not cut or damage the rear frame stiffener.



- ♦ Center punch around the spot weld imprints on the remaining welded flanges.
- ♦ Drill holes with a spot cutter.

- (A) section:
Drill and pry off the jack-up stiffener.

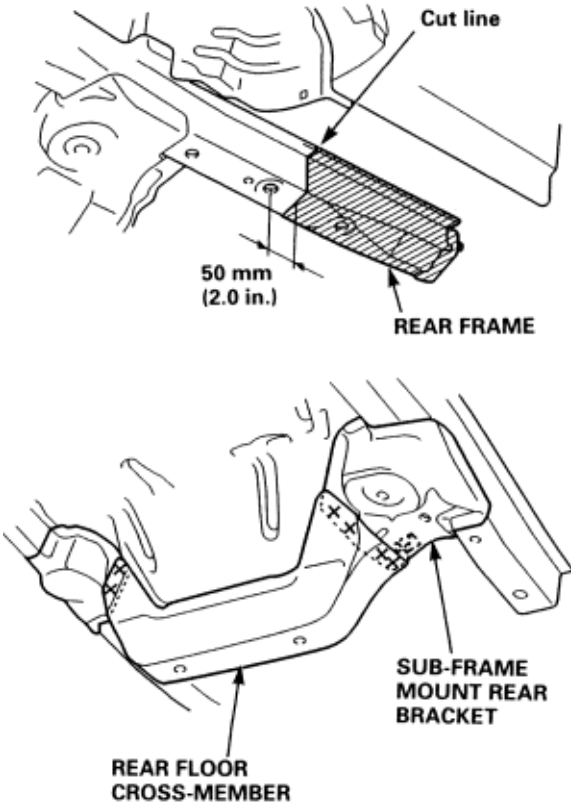


7. Check the damage and position of the rear frame and rear floor cross-member.

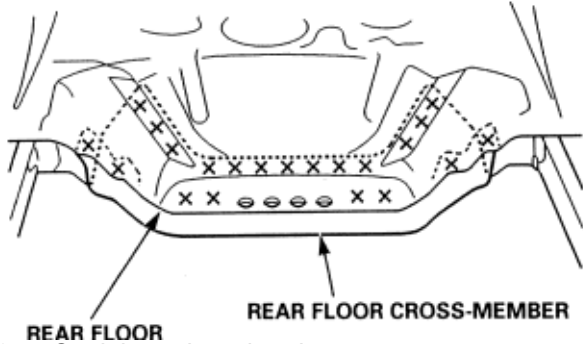
- ♦ Smooth the welding flanges of the rear frame with a hammer and dolly.

NOTE: Check that the rear frame is parallel at the right and left.

8. If necessary, cut the rear frame, and replace the rear floor cross-member.



- ♦ Strike a center punch around the spot weld imprints on the rear floor cross-member from inside the trunk compartment.
 - ♦ Drill out the spot welds with the spot cutter.
- NOTE: Keep the holes to a minimum since they will be used as weld holes MIG welding of the new part.



9. Straighten the related parts.
- ♦ Remove the burrs from the spot weld or MIG weld using a sander.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

- ♦ Fill any holes made in the spot welded areas of the flange by MIG or gas welding.

⚠ WARNING

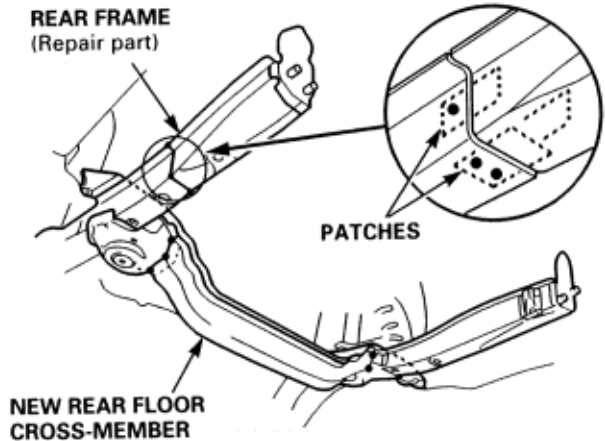
To prevent eye injury and burns when welding, wear an approved helmet, gloves and safety shoes.

10. Keep the body level.
Jack the body at the front and back. Place safety stands at the four designated places of the side sill.
11. Set the new rear floor cross-member and rear frame (repair part), and check the position of the rear frames using the body dimensional drawings (see section 6) and the positioning jig.
12. Tack weld the new rear floor cross-member and rear frame (repair part).

⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

- ♦ Attach the patches to the cut section of the frame, and weld them.

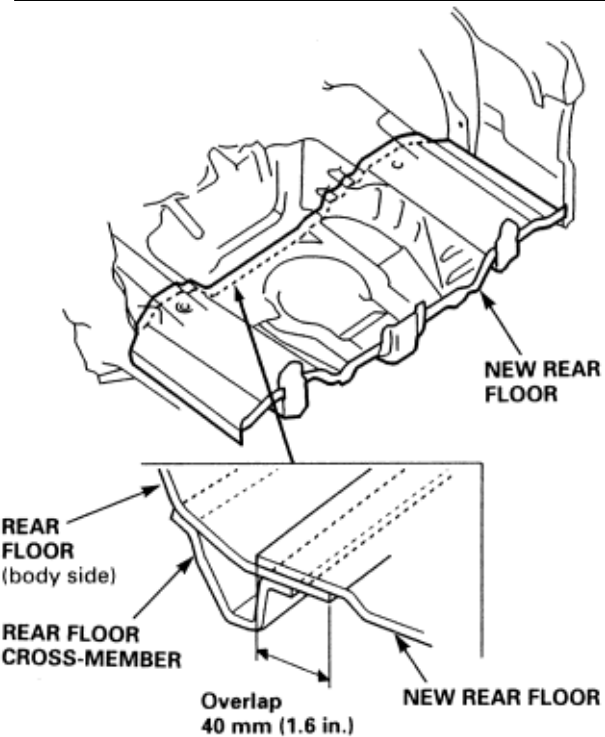


NEW REAR FLOOR CROSS-MEMBER

13. Cut the new rear floor to align it with the body.
NOTE: Cut the new part so it overlaps the body side floor by approximately 40 mm (1.6 in.)
Remove the undercoat from both sides of the areas to be welded with a sander to expose the steel plate.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

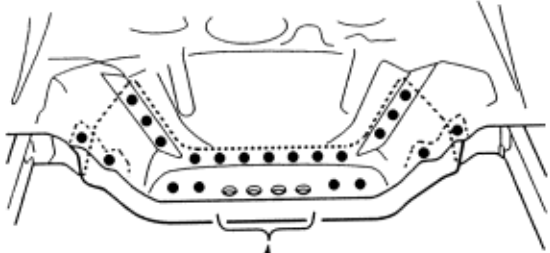


14. Clamp the new rear floor and check the position of the rear wheelhouse, inner panel and outer panel.
15. Check the rear frame in its correct position with the rear sub-frame installed.
16. Remove the new rear floor.
17. Weld the rear floor cross-member and rear floor (body side).

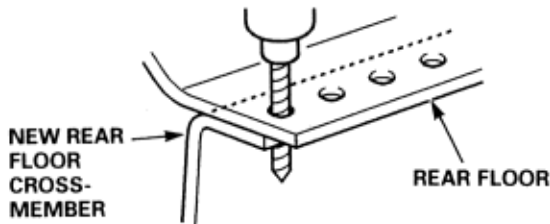
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

NOTE: Weld as much as possible with the positioning jig still mounted.

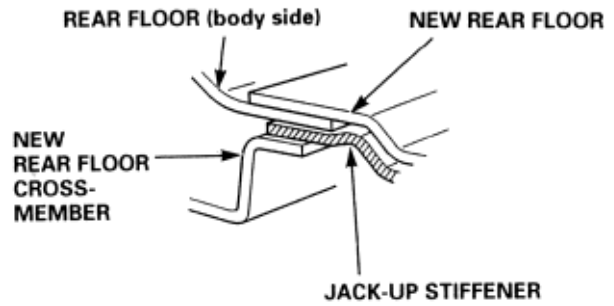


Align the rear floor holes (body side), and drill the holes in the plug weld holes with the new rear floor cross-member.



18. Finish the welding area.
Roughly grind the welds in the trunk compartment with a disc grinder. Be sure to leave the finishing allowance.
NOTE: Take care not to grind excessively.
19. Set the new rear floor.
 - ♦ Drill the holes for welding the new rear floor.
 - ♦ Check that the weld flange surfaces fit closely.

- ♦ Insert the jack-up stiffener (new part) between the rear floor (body side) and rear floor cross-member.



- ♦ Tack weld the new rear floor.

⚠ WARNING

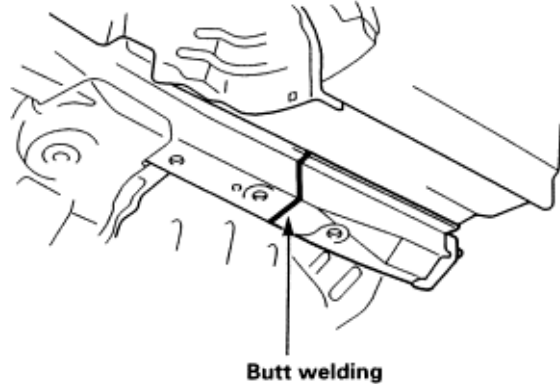
To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

20. Clamp the rear panel and check the outer panel and trunk gutter position.
21. Main weld the new rear floor, rear frame (repair part) and rear floor cross-member.

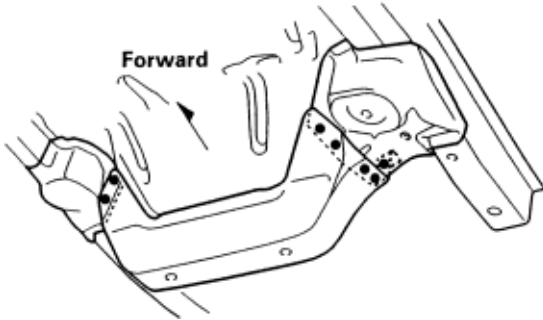
⚠ WARNING

To prevent eye injury and burns when welding, wear an approved welding helmet, gloves and safety shoes.

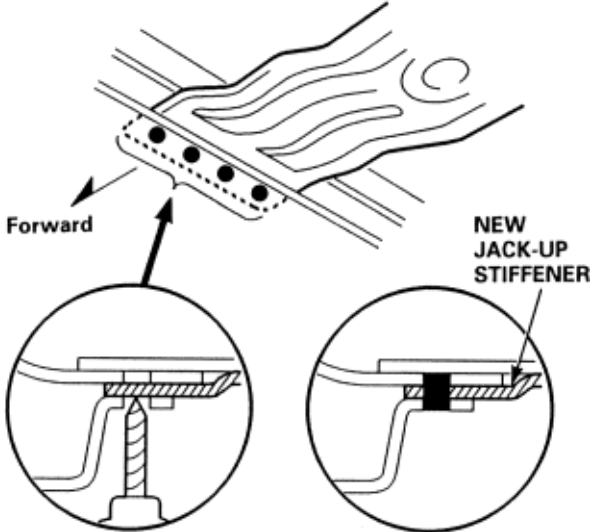
- ♦ Weld the rear frame.



- ♦ Weld the new rear floor cross-member.

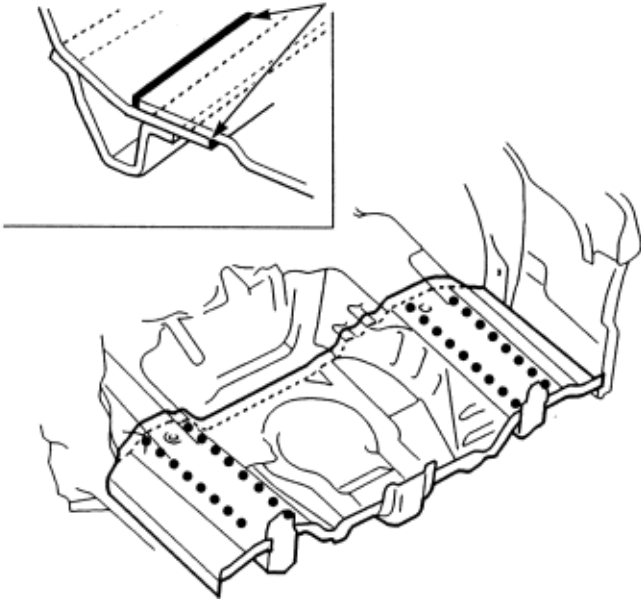


- ♦ Drill the holes for welding the new jack-up stiffener and weld the rear floor cross-member.

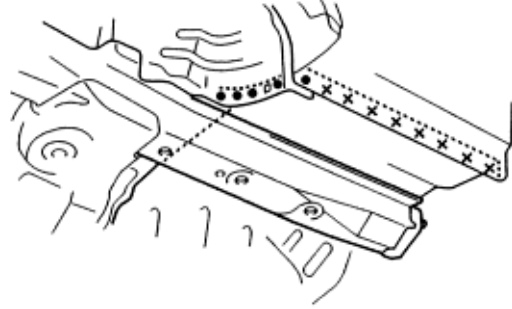


- ♦ Weld the new rear floor.

Fillet welding



- ♦ Weld the inner panel and outer panel.



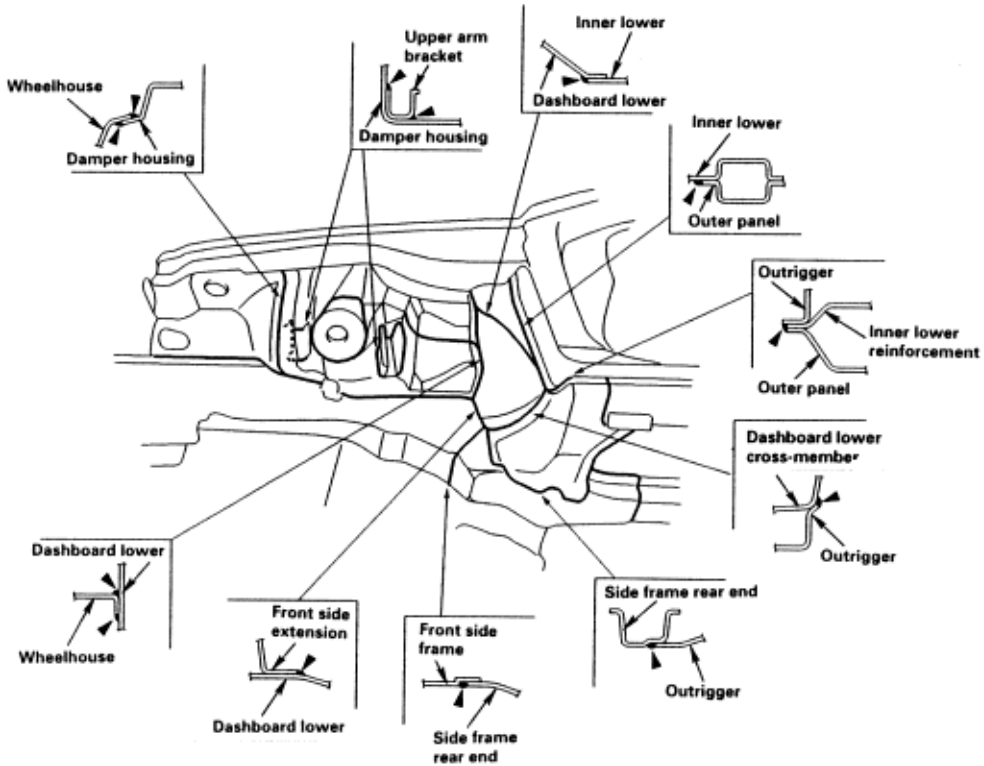
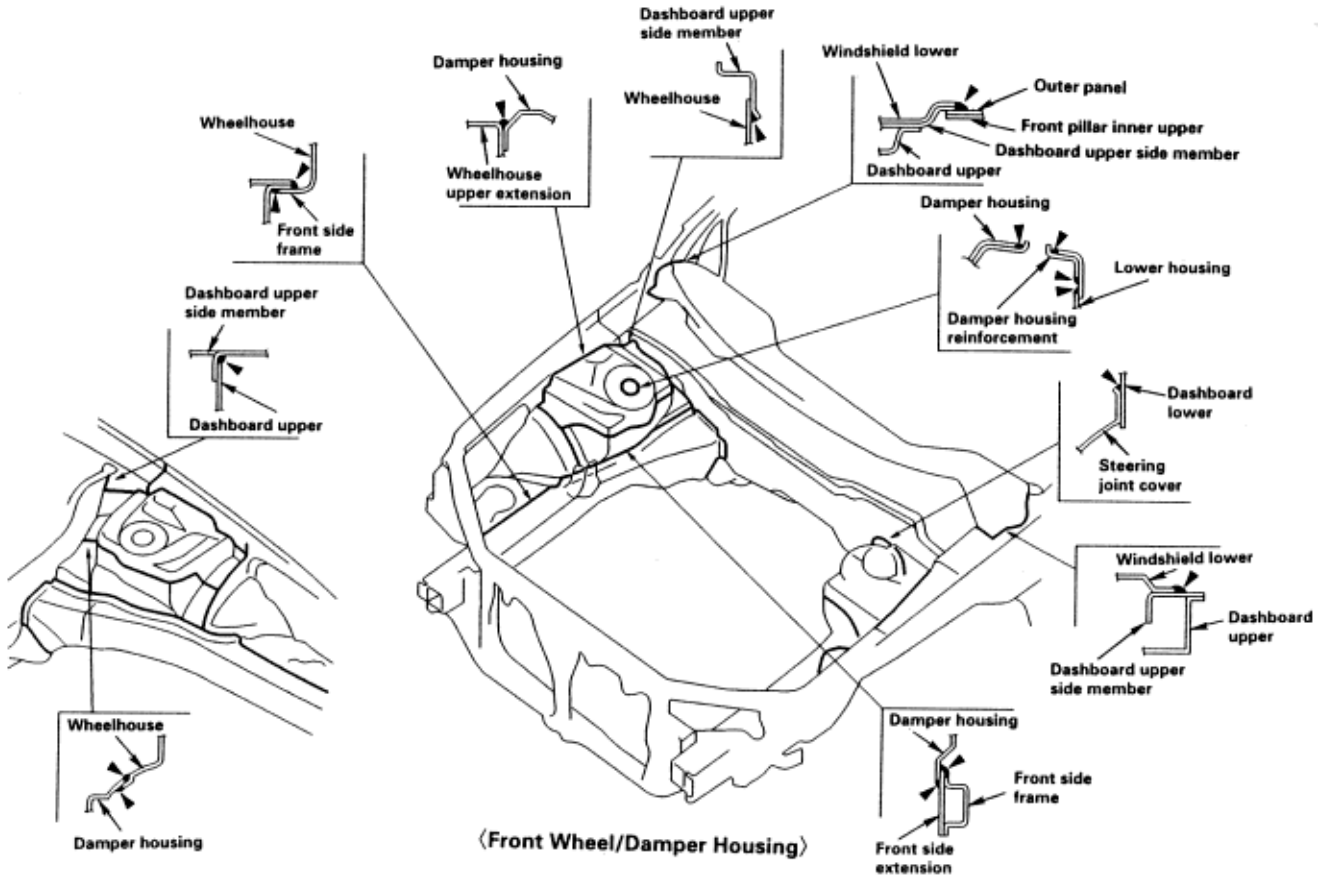
- ♦ Weld the rear panel (**see page 4-38**).
22. Finish the welded area. Even out the welded area with a hammer and dolly and fit the flange surfaces closely together.
 23. Apply sealer at the overlapped area of the rear floor, and the welded surfaces of the rear wheelhouse and rear end inner panel. Seal gaps completely (see section 5).
 24. Apply the paint. See Paint Repair section.

⚠ WARNING

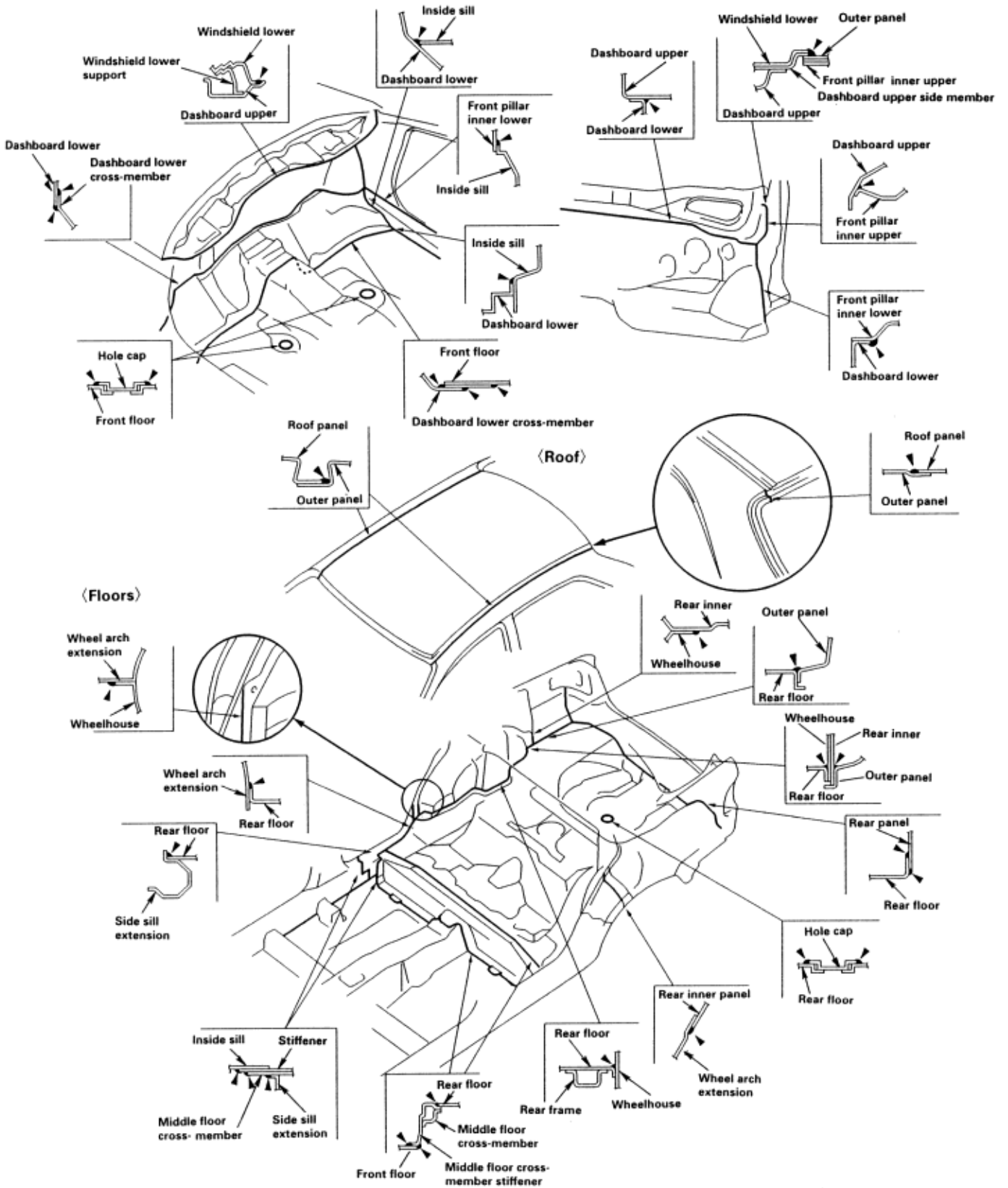
- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
 - ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
 - ♦ Paint is flammable. Store it in a safe place and keep it away from sparks, flames or cigarettes.
25. Apply the undercoat. Apply anti-rust agent to the inside of the rear floor cross-member, jack-up stiffener, and jointed areas of the rear floor (see section 7).
 26. Weld the rear panel and install the related parts. Install in the reverse order in which they were removed.
 27. Inspect and clean.
 - ♦ Measure the rear wheel alignment.
 - ♦ Clean the inside of the trunk compartment.

Cross Section of Body and Sealants
Engine Compartment/Front Wheelhouse/Damper
Housing

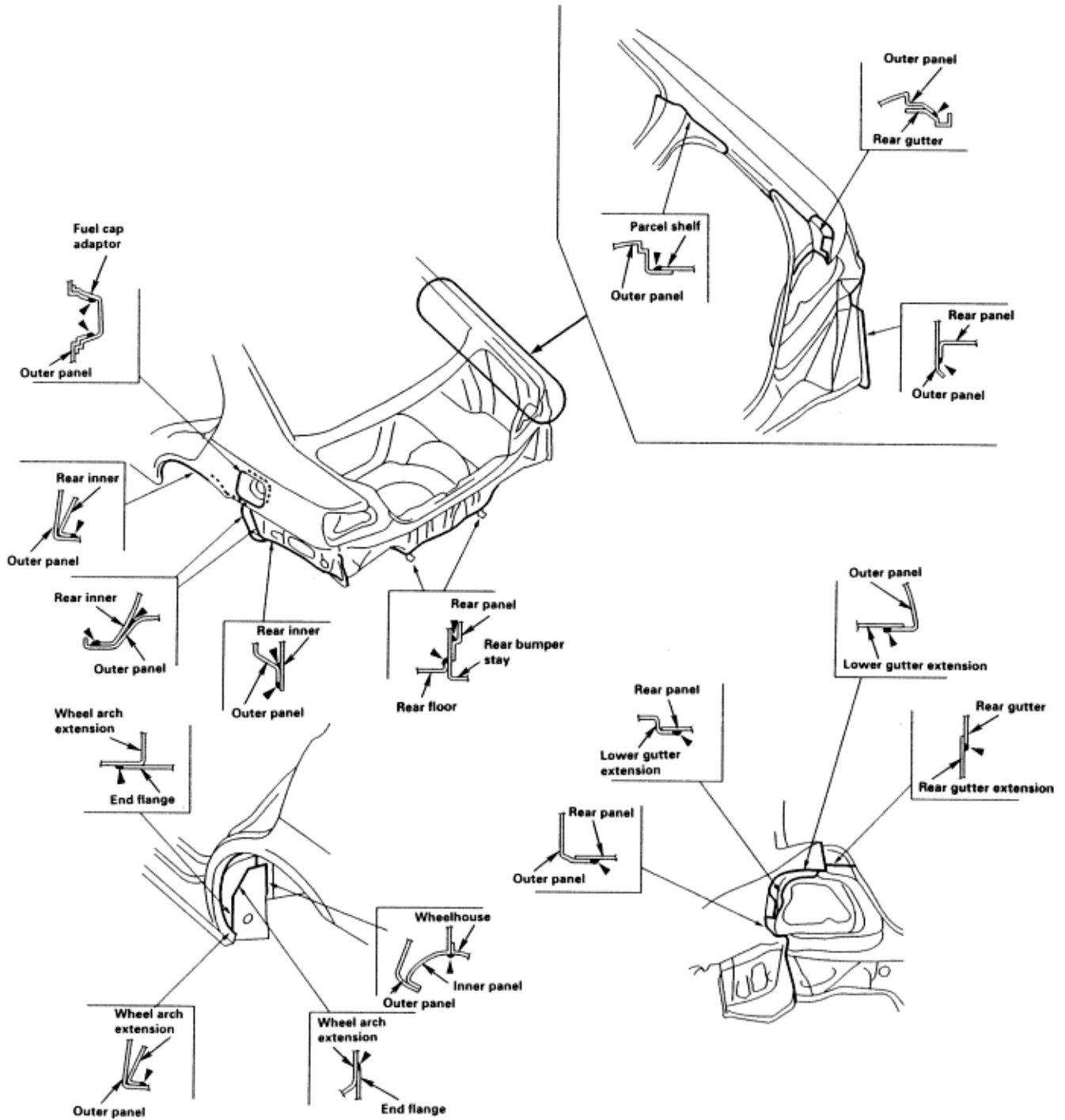
(Engine Compartment)



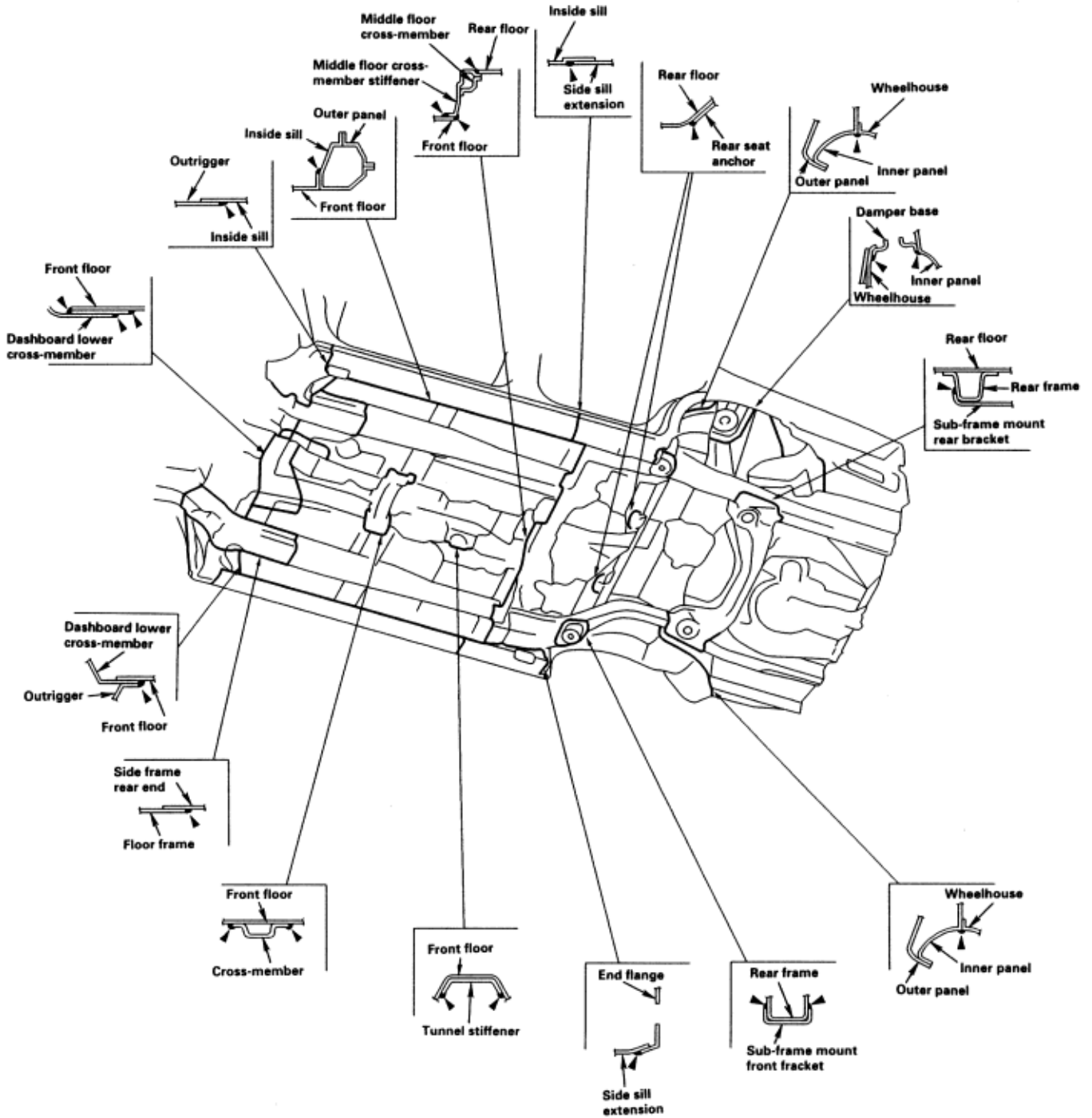
(Dashboard)



(Rear Side Outer Panel/Rear Panel)

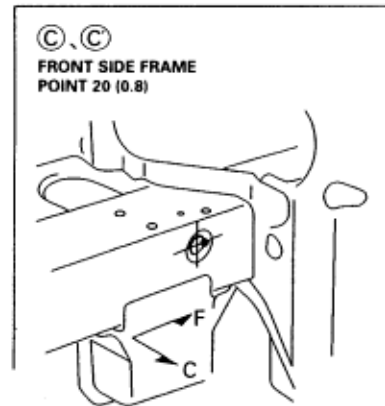
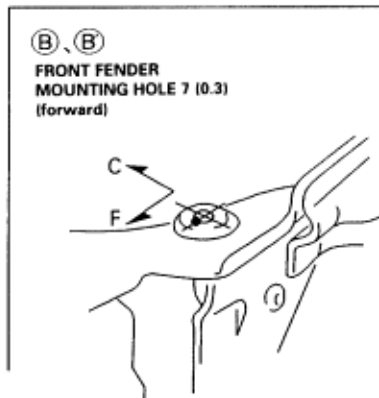
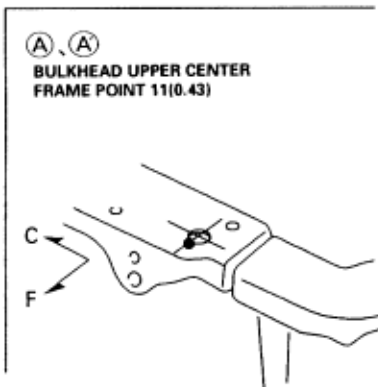
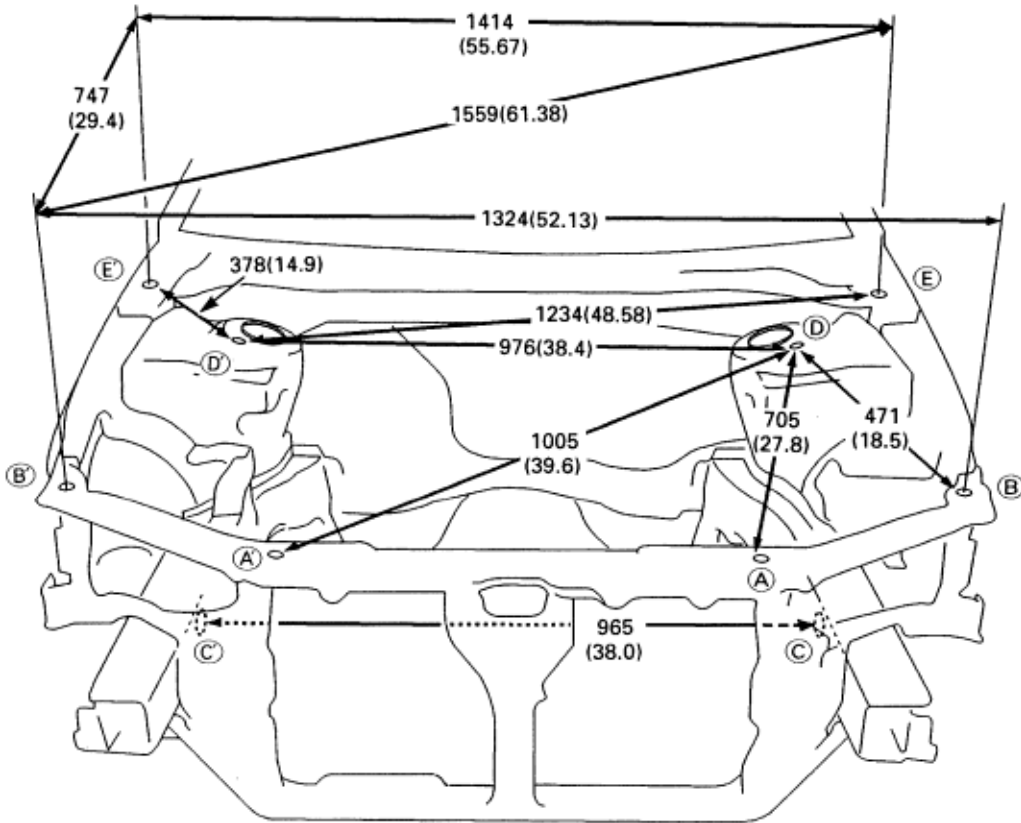
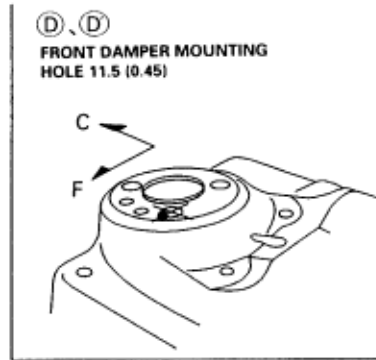


(Under Floor)

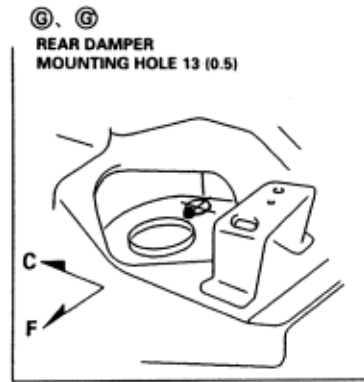
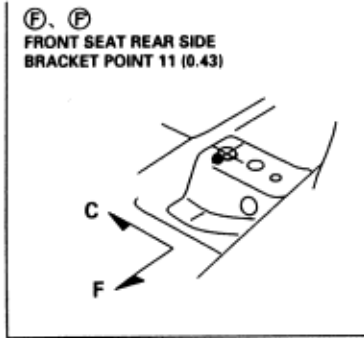


Body Dimensional Drawings
Upper Body Measuring Dimensions

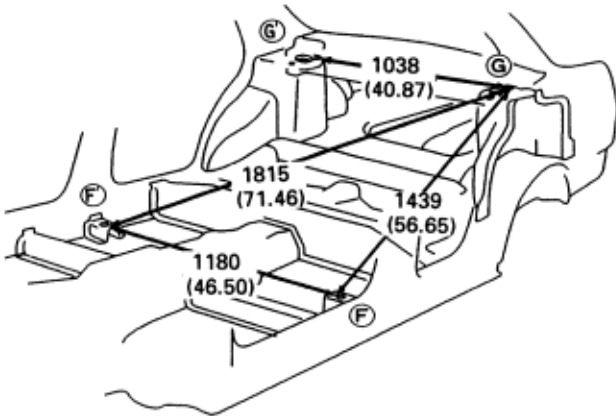
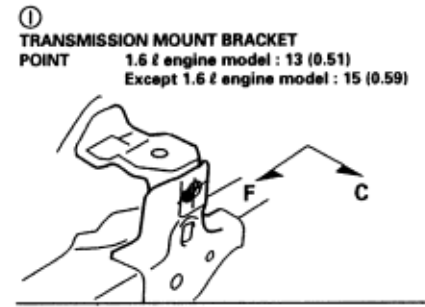
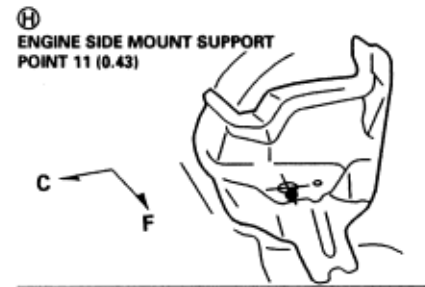
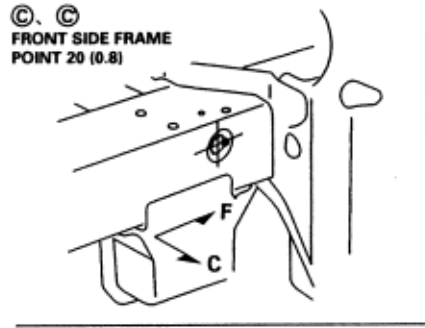
(Engine Compartment)
 Unit: mm (in.)



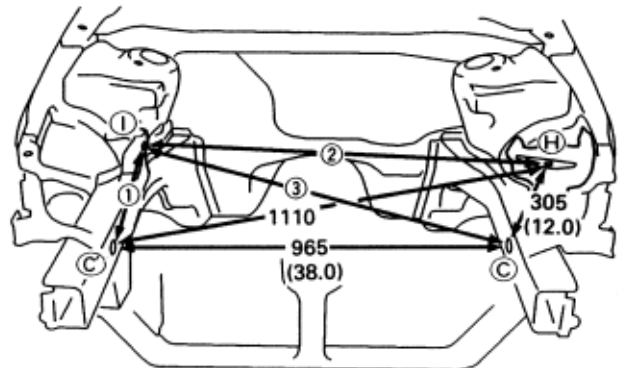
(Passenger Compartment)
Unit: mm (in.)



Unit: mm (in.)

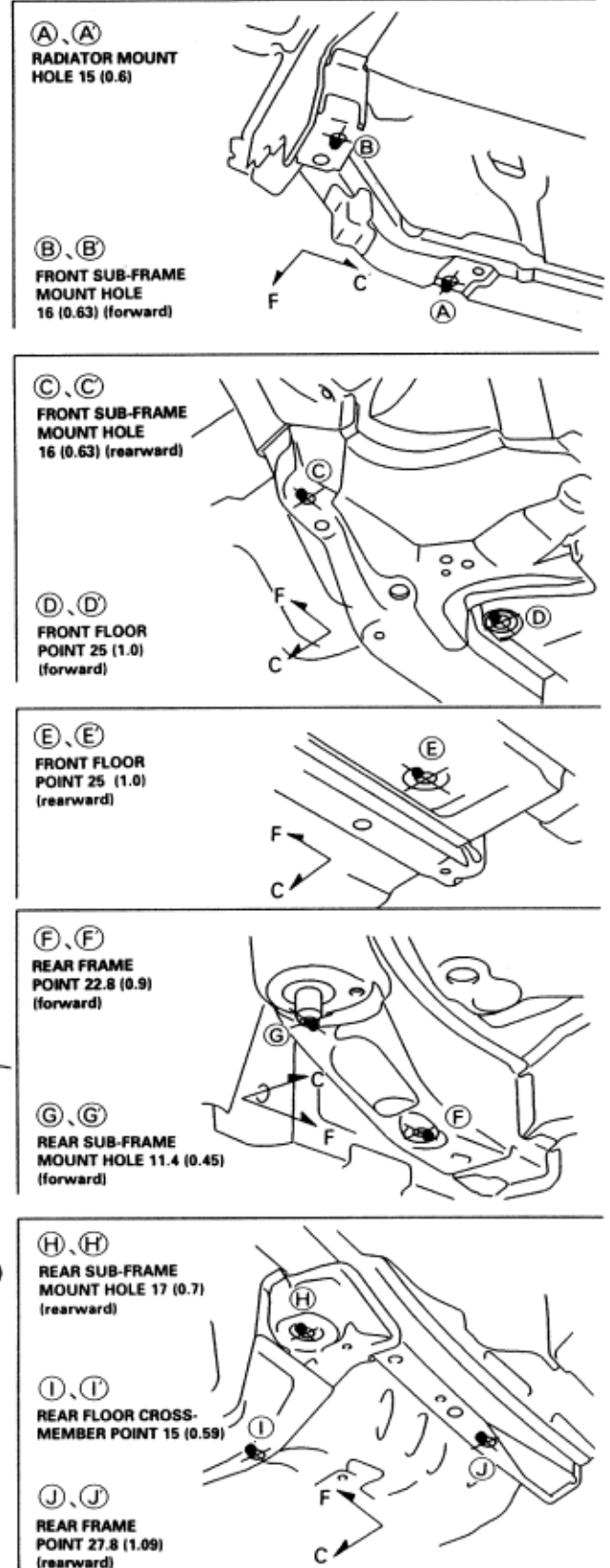
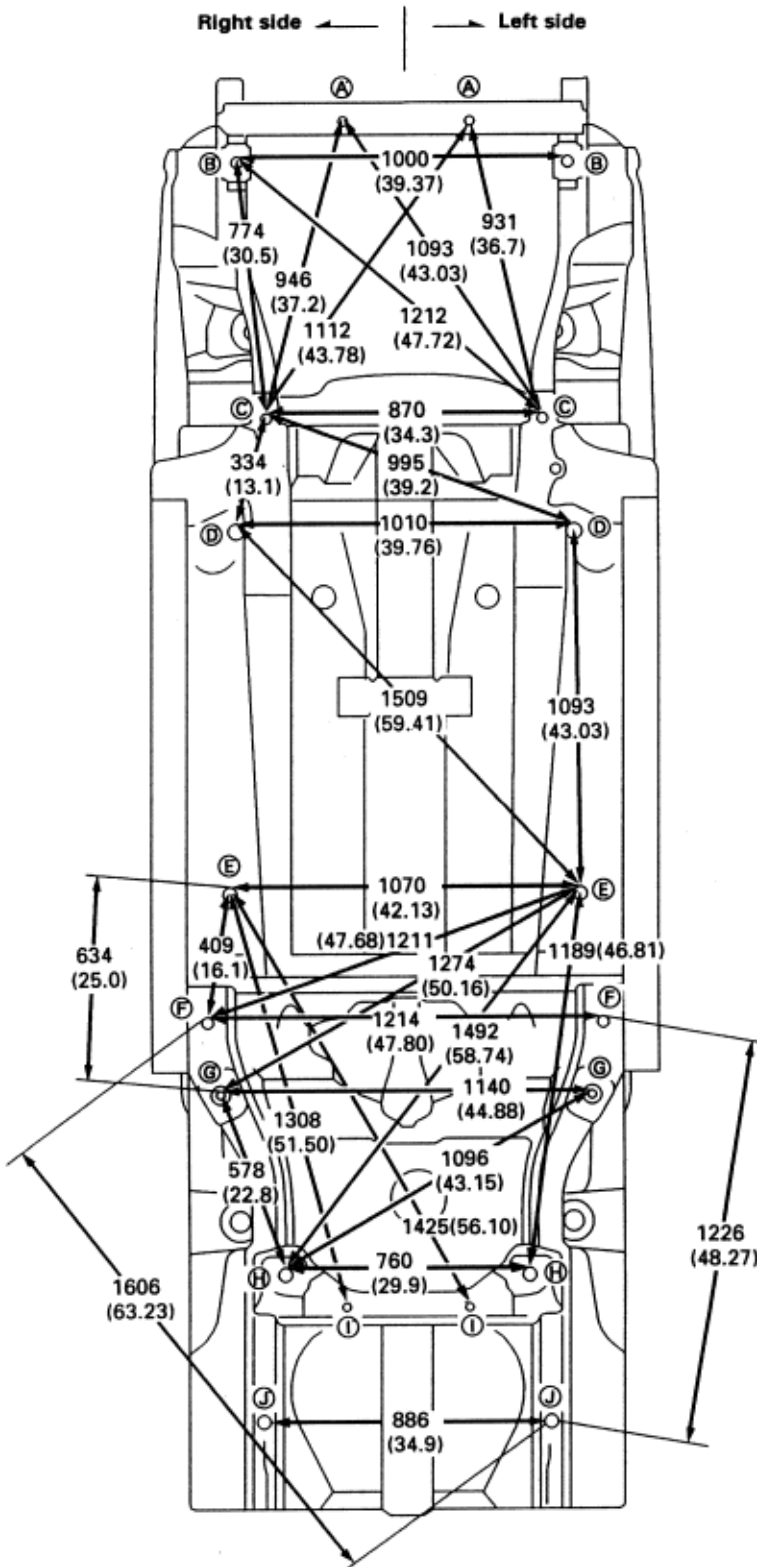


No.	①	②	③
1.6 l engine model	384 (15.1)	1041 (40.98)	1004 (39.53)
Except 1.6 l engine model	375 (14.8)	1045 (41.14)	1006 (39.61)



Body Dimensional Drawings
Under Body Measuring Dimensions

Unit: mm (in.)

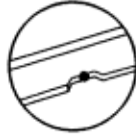


(Windshield/Door Opening)
 Unit: mm (in.)

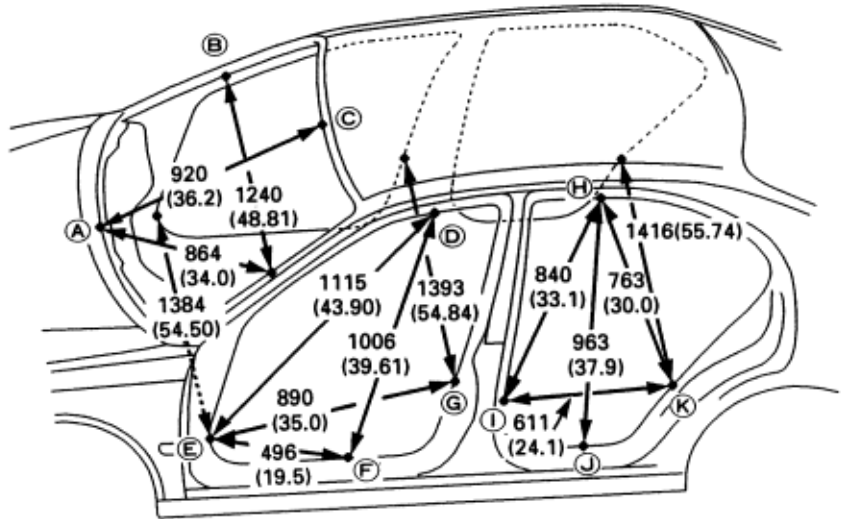
A
 Dashboard upper
 cowl cover mounting hole



B, C
 Windshield opening
 flange notch
 (3 places)



D, E, F, G,
H, I, J, K
 Door opening
 flange notch
 (4 places)



(Rear Window/Trunk Lid Opening)

L, M
 Rear window
 opening flange notch
 (3 places)



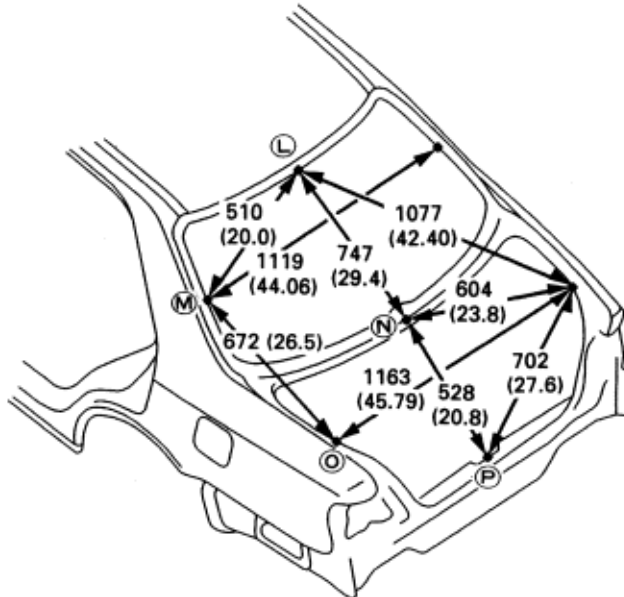
N
 Trunk gutter area
 convex bead



O
 Outer panel
 flange end
 (2 places)



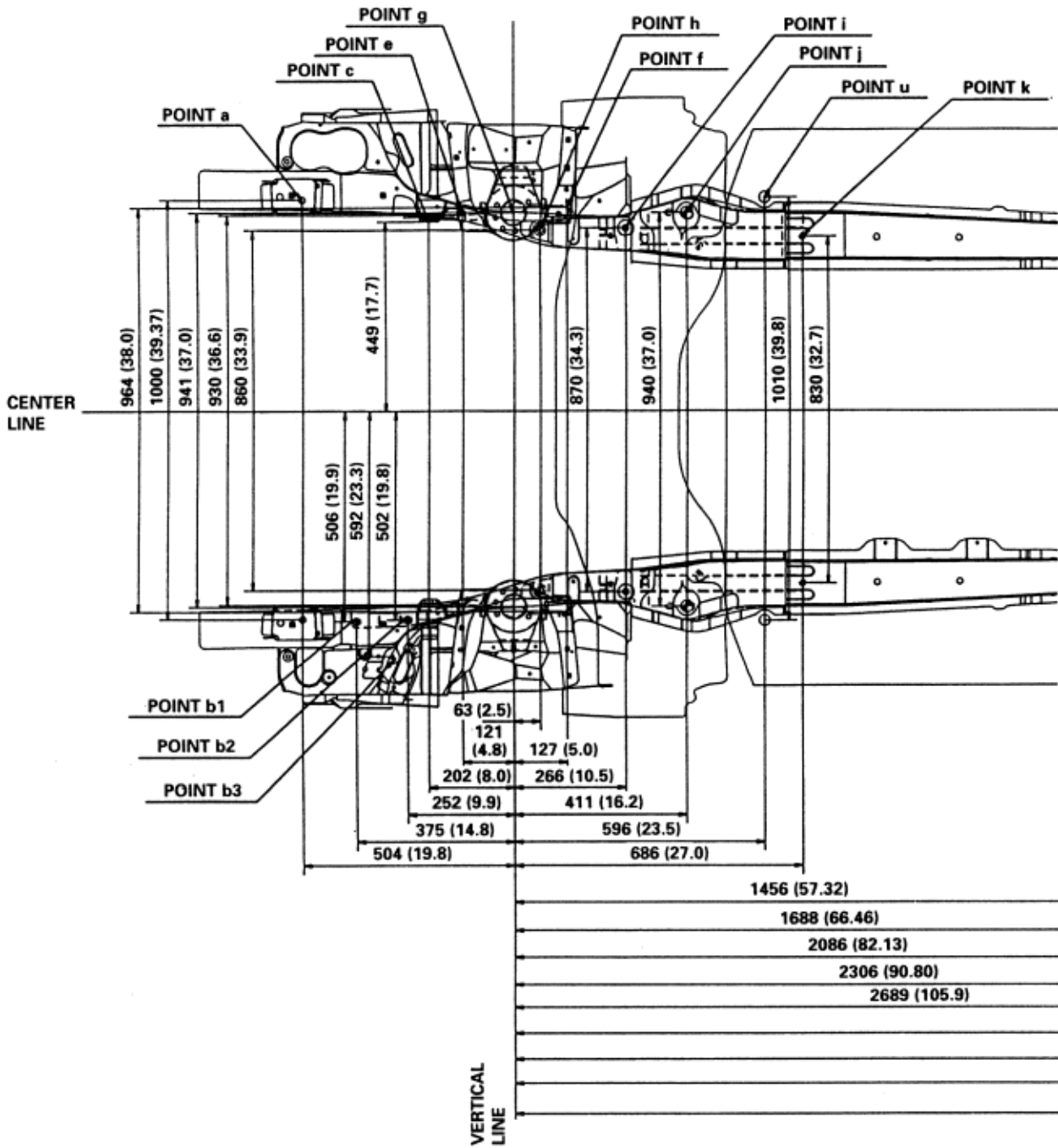
P
 Trunk seal
 flange water
 drain holes

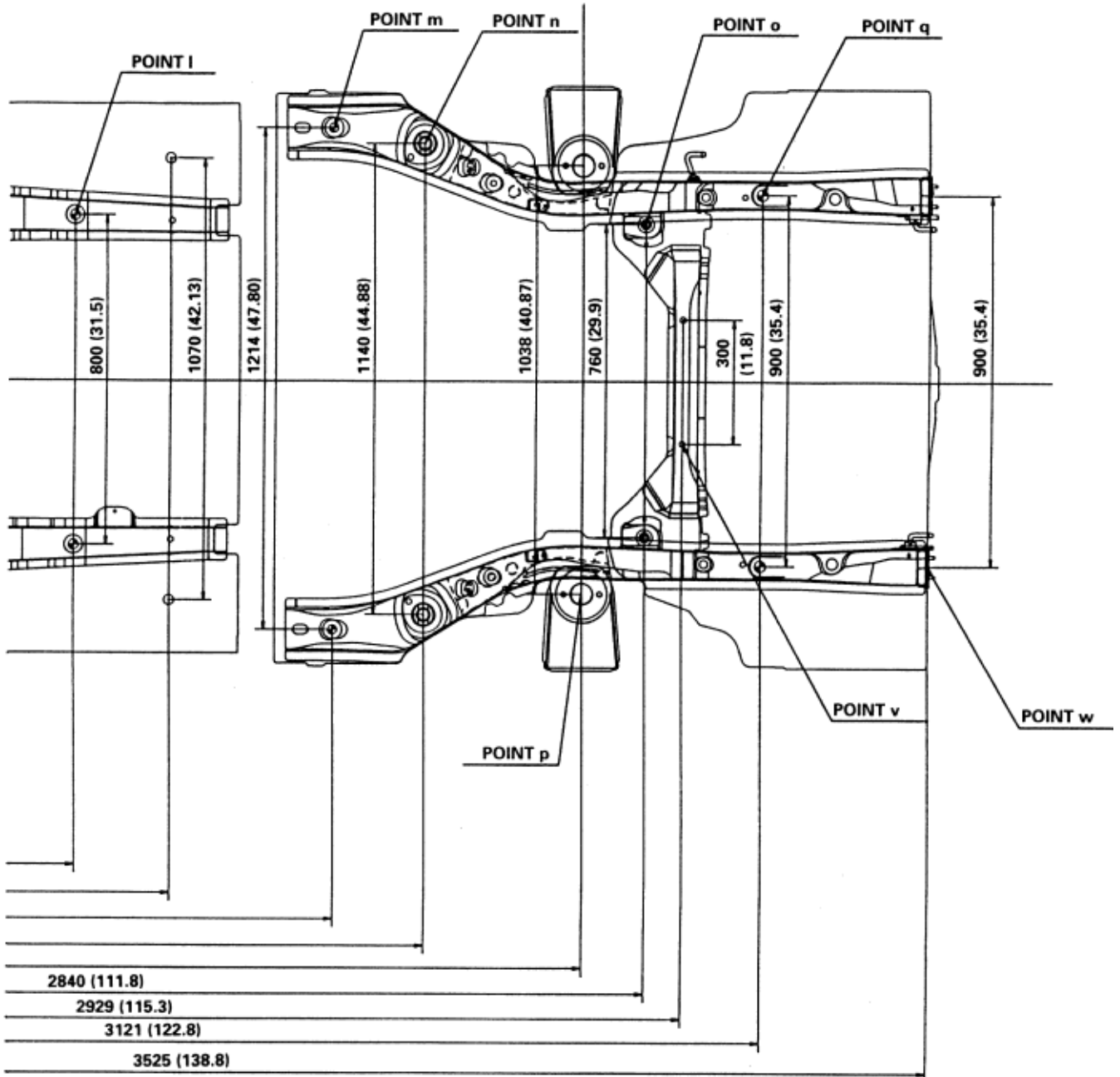


Body Dimensional Drawings
Frame Repair Chart

6-6

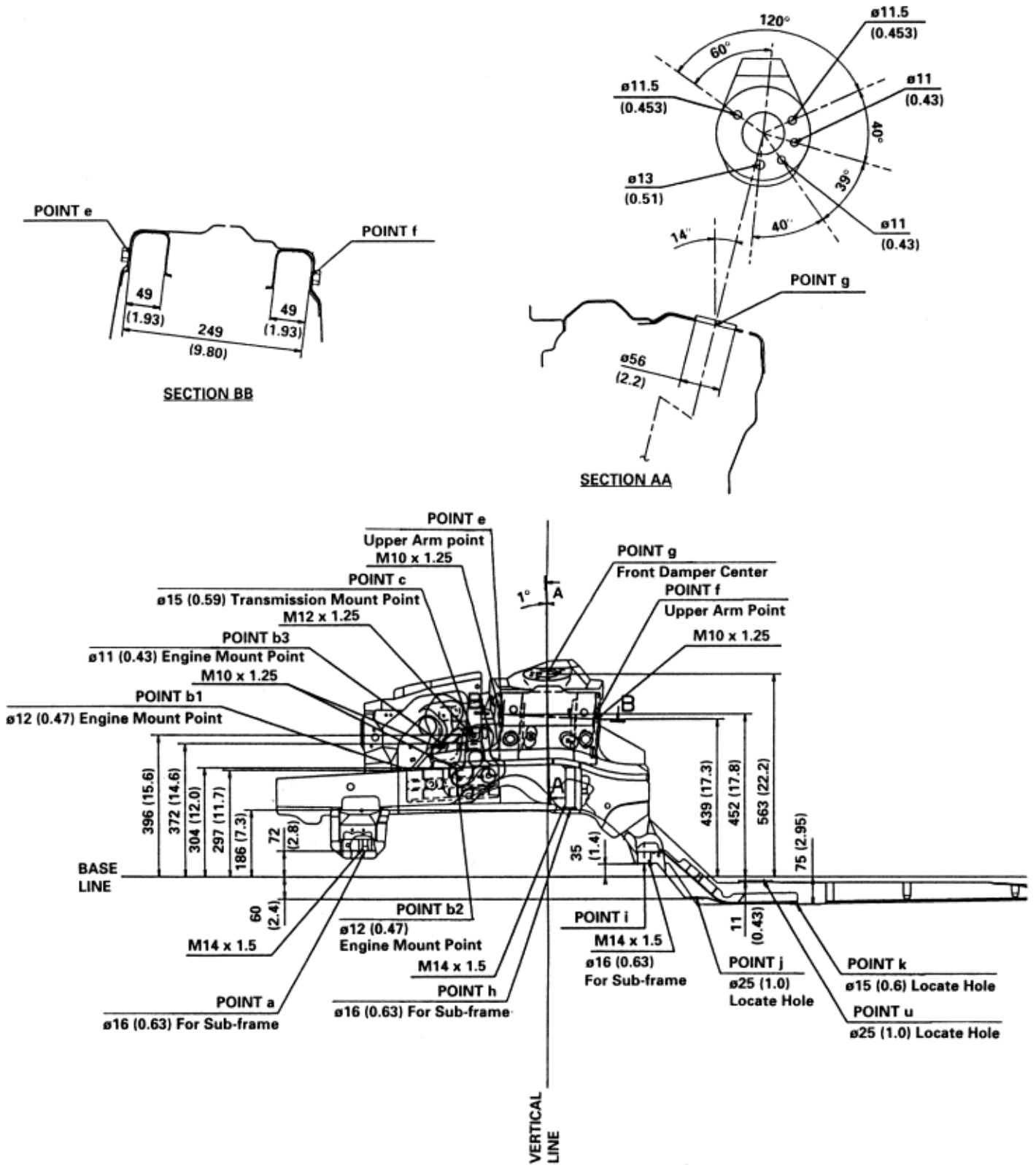
Top View:
 Unit: mm (in.)
 Ø: Inner diameter

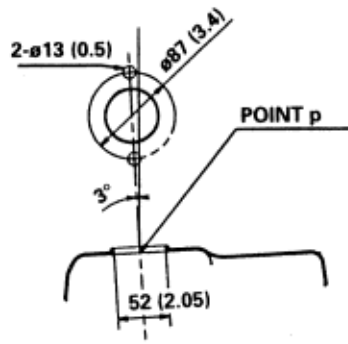




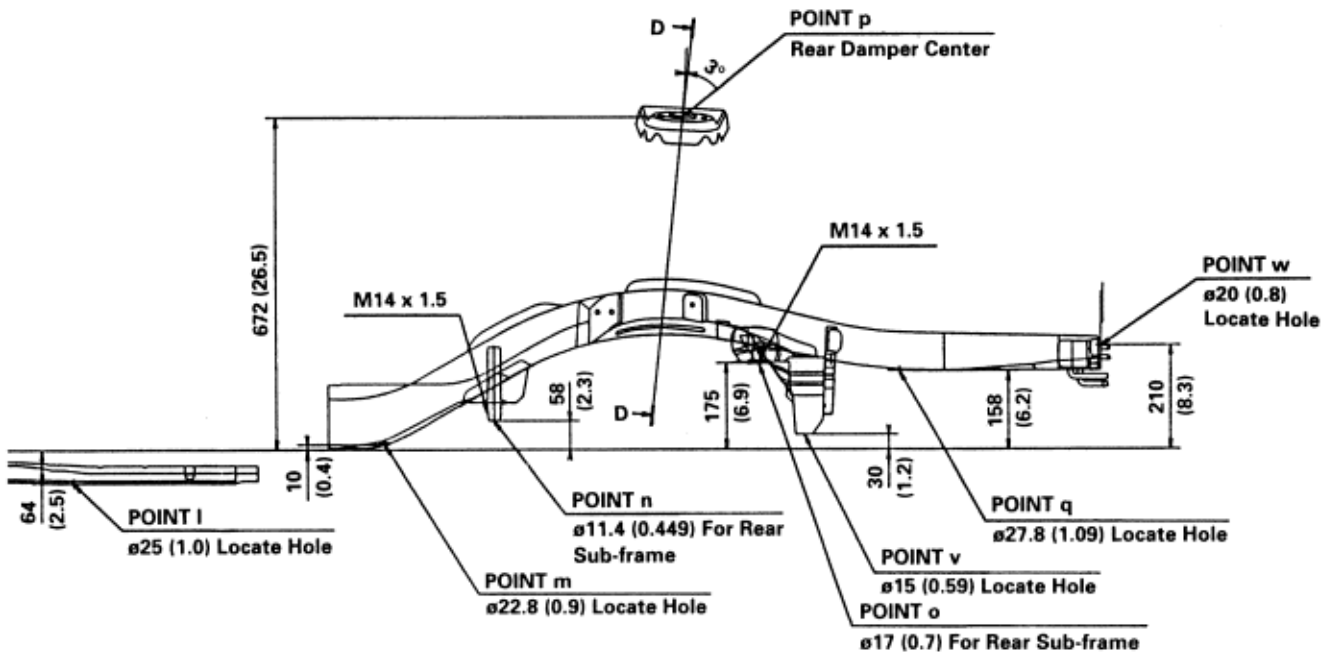
Body Dimensional Drawings
Frame Repair Chart (cont'd)

Side View:
 Unit: mm (in.)
 Ø: Inner diameter





SECTION DD



Corrosion starts immediately after the steel base contacts the atmosphere. The condition is aggravated by sea wind, road salt, rain, snow and industrial fallout. There are many ways to protect vehicles against corrosion. Primer surfaces and paints are applied by electrodeposition or spray to protect the body.

Anti-rust Agents and Spray Guns

Use the following anti-rust agents or equivalents when making a body repair.










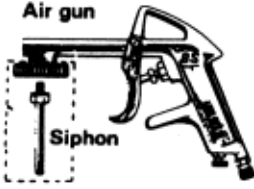



 WARNING
ANTI-RUST agents contain substances that are harmful if you breathe or swallow them, or get them on your skin. Wear overalls, gloves, eye protection and an approved respirator while using such agents.

RUSTOP DEOX #100 WAXOYL or equivalent	To be applied to welded joints inside body panel.
NOX-RUST 409-20S SOLTON 1000S or equivalent	To be applied to under-floor and wheelhouse.

Spray guns:

Use the correct gun for the agent being used.

- Use of a pressure type spray gun is recommended when work involves a considerable number of vehicles.

For RUSTOP	For DEOX#100	For WAXOYL	For NOXRUST 409-20S/ SOLTON 1000S
 Flexible nozzle  Open nozzle 	 L-type nozzle  360° nozzle 	 L-type nozzle  360° nozzle 	 Air gun  Siphon V-type nozzle  Open nozzle 
Protectors: Wear gloves, mask, and suitable eye protection. ● Use light oil and a rag to clean up spilled anti-rust agents.			

Precautions:

- Before applying an anti-rust agent, thoroughly clean the areas to be coated with a steam cleaner, etc., and let the areas dry.
NOTE: Waxoyl may be applied to a wet surface.
- Spray an anti-rust agent sufficiently until the excess amount oozes out when filling the doors, side sills etc. Wipe away the excess agent with a clean rag dampened with light oil.
- Do not spray an anti-rust agent on the brake hoses, brake wheel cylinders, brake drums, exhaust muffler and its related parts, emission control devices in the engine department, ball joint covers, plastic fuel strainer, etc. Wipe up any spilled agent at once.
- Heat an anti-rust agent to room temperature 97.7°F (36.5°C) by submerging the container in hot water when the outside temperature is below 50°F (10°C).
- Ventilate when spraying an anti-rust agent as it contains a small amount of organic solvent. Keep sparks, flames and cigarettes away.

Clean the spray gun after spraying with anti-rust agent

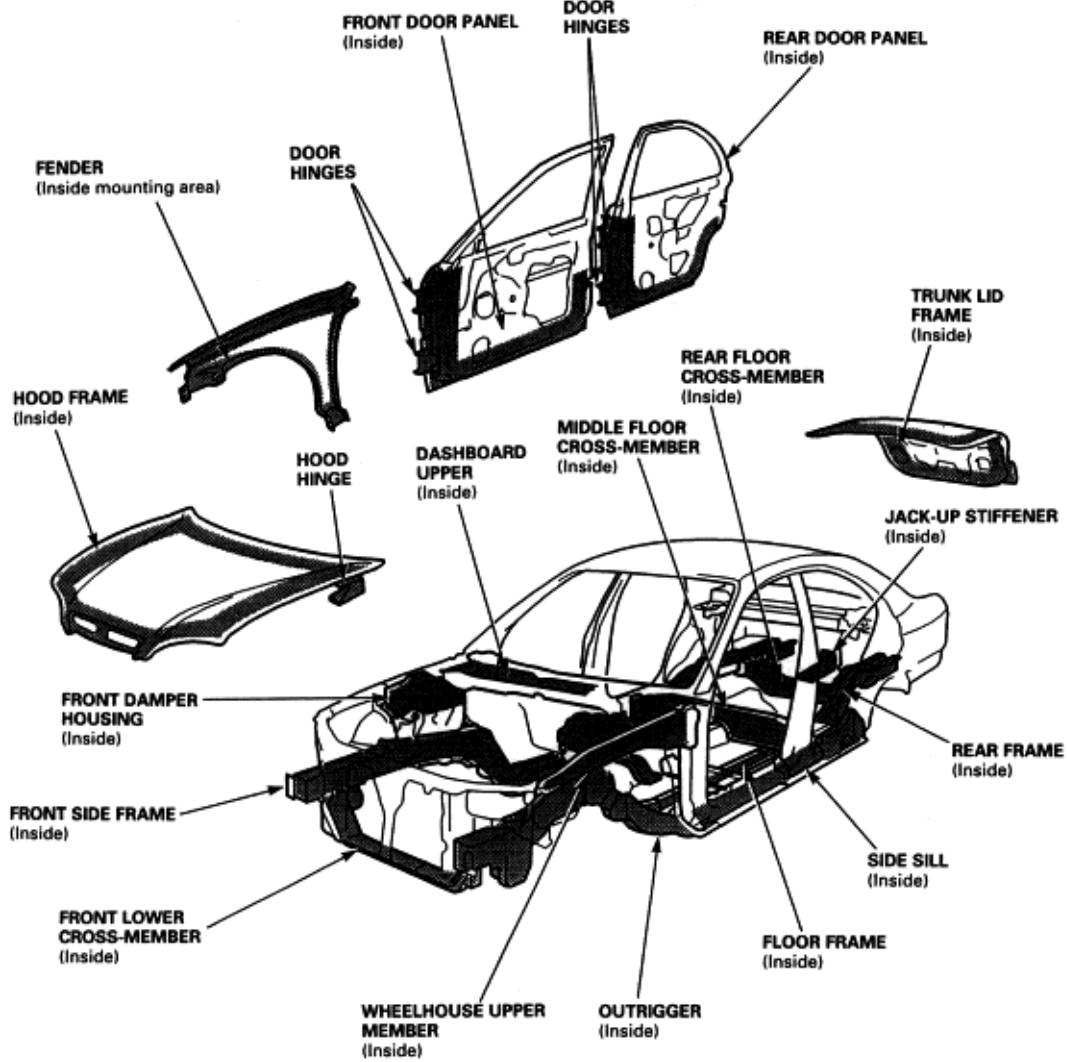
 CAUTION
Any remaining agent will harden in the passages of the spray gun, making it unserviceable.

NOTE:

- ♦ Apply the designated thickness over surfaces including gaps and edges.
- ♦ Avoid spraying agents on the following parts:
Window glass, lights, grille, exhaust parts, tyres, bumper and lower skirt.
- ♦ Wipe off spilled agents at once from rubber and plastic parts.

Anti-rust Agents:

- ♦ Use RUSTOP, DEOX # 100, WAXOYL or equivalents for protecting inner surfaces.
- ♦ Use NOX-RUST 409-20S, SOLTON 1000S or equivalents for protecting outer surfaces.



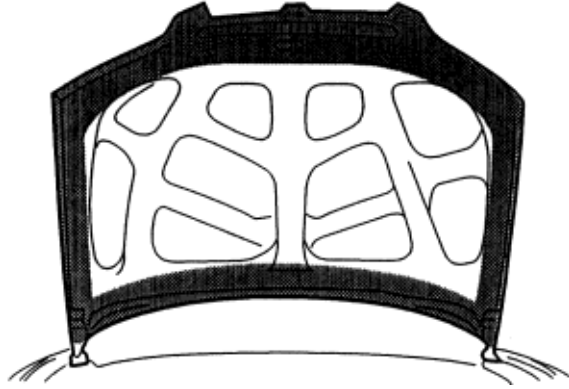
Rust-preventative Treatments:

Nozzle	Type
A	360°
B	L-type
C	Straight nozzle (Undercoat gun)

Hood, Underside:

- Coat the entire panel and seams all the way around.
- Spray sufficient anti-rust agent to the front area and each corner.
- Apply rust-preventative agent or grease to the hood hinges.
- Coat the bulkhead upper frame and hood frame with anti-rust agent.

Nozzles used: A and B

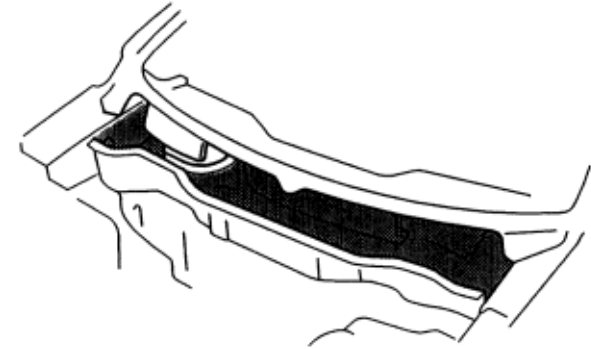


Dashboard Upper/Windshield Lower

- Coat the windshield lower and dashboard upper water drain with anti-rust agent at the front, right and left.
- Spray anti-rust agent completely over the rear of the dashboard upper (windshield side).

NOTE: To insert the nozzle in the dashboard upper, remove the air scoop grille for easier, more thorough spraying.

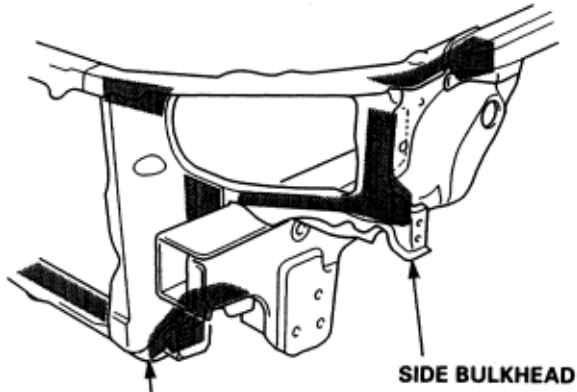
Nozzles used: A and B



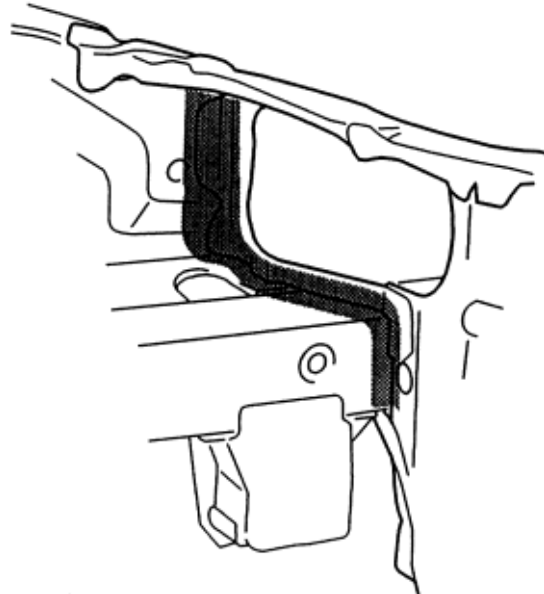
Front Bulkhead Area

- With the hood open, coat the joints of the bulkhead, wheelhouse and side frame and around the back of the headlight assembly.
- Coat the inside of the bulkhead lower cross-member.

Nozzle used: B



**BULKHEAD LOWER
CROSS-MEMBER**
Side bulkhead, Back



Rust-preventative Treatments

Areas to be Covered by Anti-rust Agents (cont'd)

7-5

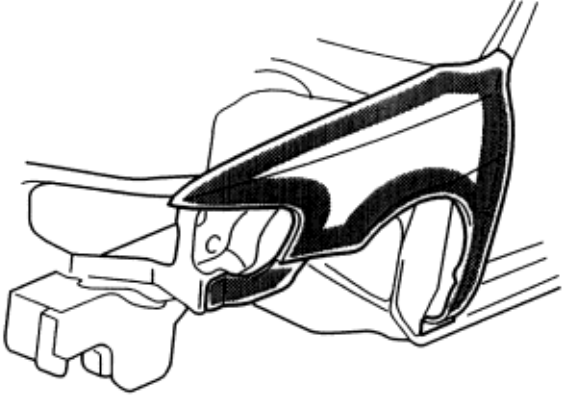
Front Fender, Underside

Apply anti-rust agent to the end of the fender, wheelhouse and side sill installation.

NOTE:

- ♦ Apply a coat of agent to the front door side, wheel arch end.
- ♦ If the fender is to be removed, take care to avoid damaging the paint finish. Apply agent to the entire surface of the back of the fender.
- ♦ Apply agent to the front fender filling pillar.

Nozzles used: B and C

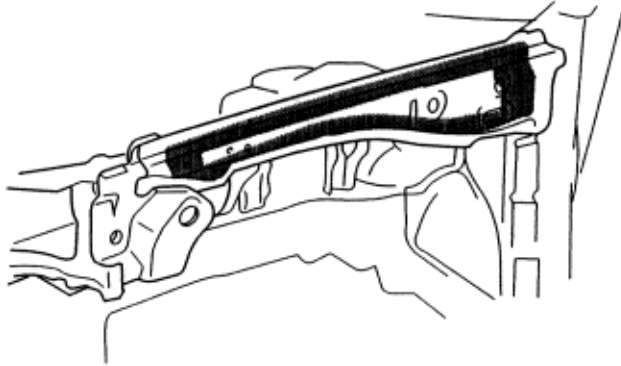


FILLING PILLAR

Wheelhouse Upper Member, Inside

- ♦ Remove the front fender.
- ♦ Remove the air scoop grille in the dashboard upper and coat the inside of the wheelhouse upper member with anti-rust agent.

Nozzles used: A and B



Doors, Front Pillar and Center Pillar, Inside

- ♦ Apply agent to the point between the door stiffener and door skin through the water drain hole at the bottom of the door.

NOTE: When a suction type spray gun is used, remove the door trim panel.

- ♦ Remove the door harness grommet and insert the nozzle facing down.

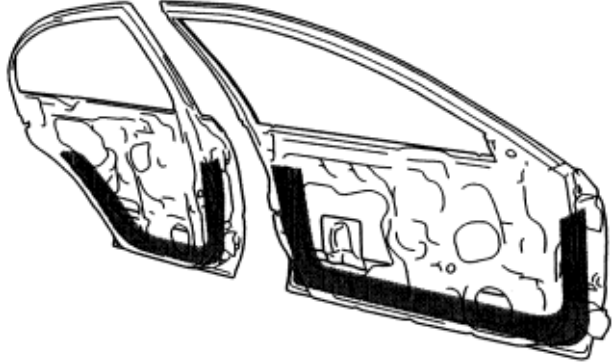
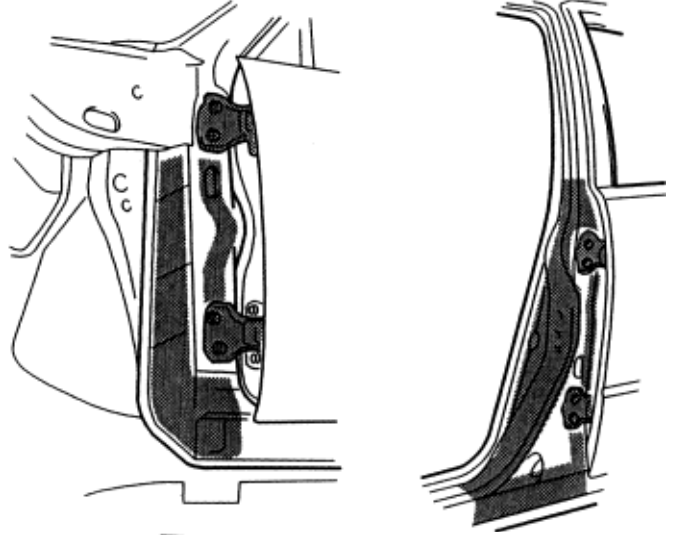
NOTE: Make sure that the nozzle is not interfering with the door hinge bracket. Spray thoroughly.

- ♦ Coat the door checker bracket.

Nozzles used: A and B

Front Pillar

Center pillar



Rust-preventative Treatments

Areas to be Covered by Anti-rust Agents (cont'd)

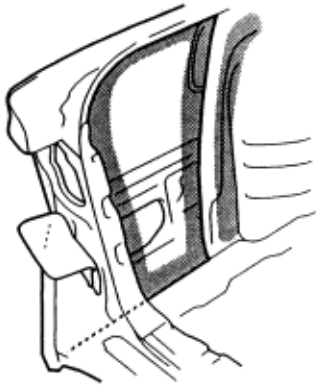
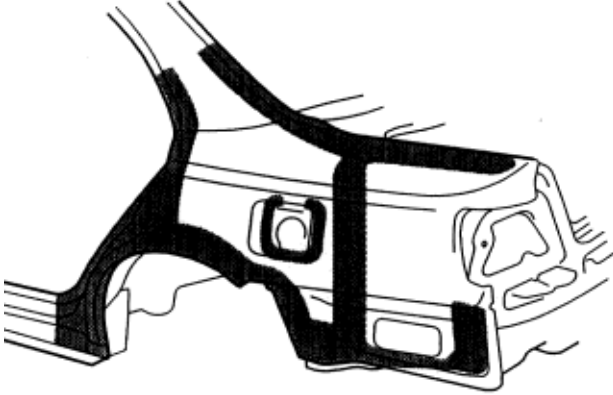
7-6

Rear Side Outer Panel and Center Pillar Stiffener, Inside

- ♦ Remove the door lock striker, taillight and grommets, then spray agent through the hole.
- ♦ To apply agent to the inside of the rear wheelhouse, remove the rear trim panel and trunk side trim panel.

NOTE: Make sure that all surfaces are coated with anti-rust agent as the area to be covered are relatively extensive.

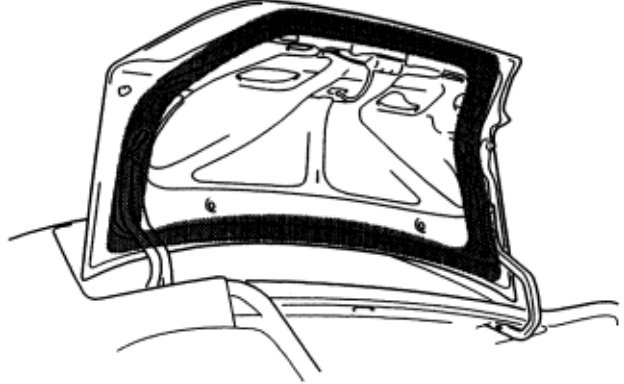
Nozzle used: A



Trunk Lid, Inside

- ♦ Coat the trunk lid skin, and frame seams all the way around.
- ♦ On the trunk lid, apply the agent to the inside of the reinforcement frame.

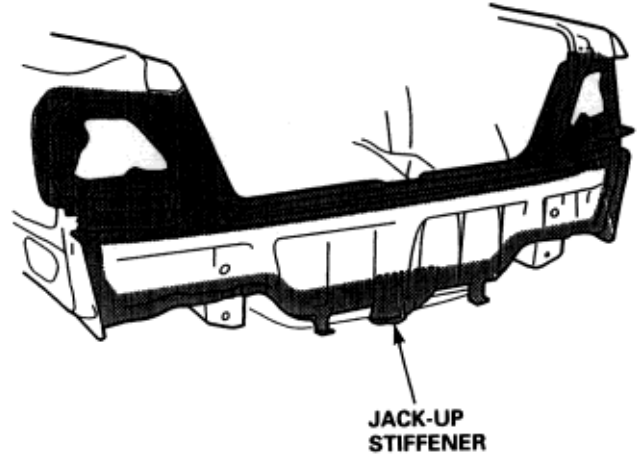
Nozzles used: A and B



Rear Panel, Inside and Outside/Rear Floor End

- ♦ Apply the agent to the gap between the rear panel and rear floor.
- ♦ Apply the agent to the inside of the rear combi stiffener and center frame.
- ♦ Undercoat may be used on those areas of the rear panel that are concealed from view when parts are installed.
- ♦ Apply the agent to the inside of the jack-up stiffener.

Nozzle used: B



Rust-preventative Treatments

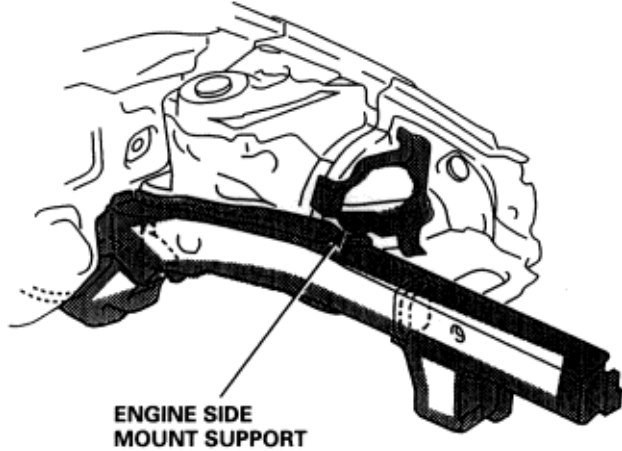
Areas to be Covered by Anti-rust Agents (cont'd)

7-7

Front Side Frame, Inside

- ♦ Remove the grommets from inside the front compartment and coat the inside of the front side frame.
- ♦ Coat the battery mount bracket base.
- ♦ Apply the agent to the inside of the engine side mount support and front side outrigger.

Nozzles used: A and B

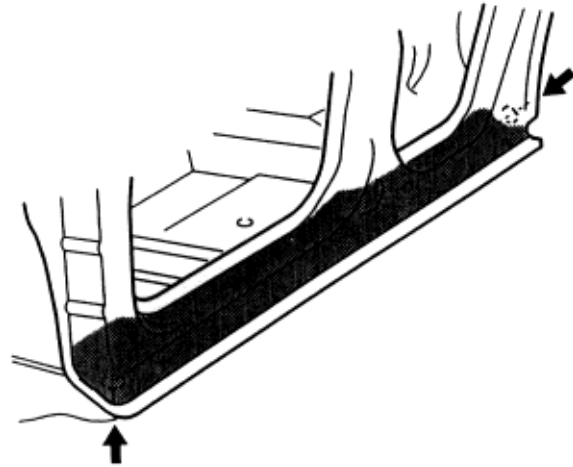


Side Sill, Inside

- ♦ Remove the rear grommets and side sill panel to be sprayed.
- ♦ Insert the nozzle all the way through the grommet holes and spray. Move the nozzle right and left, and up and down while pulling it back out of the grommet hole.

NOTE: Spray agent until it drips from the drain hole

Nozzles used: A and B



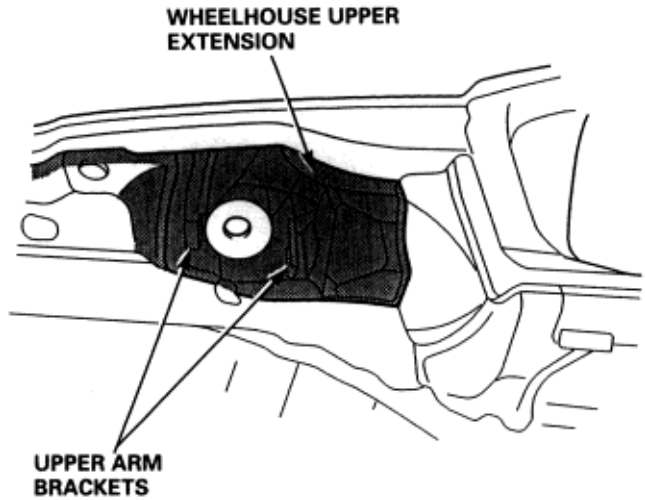
Damper Housing

- ♦ Spray agent on the wheelhouse, front fender stay, upper member and upper arm brackets as shown.
- ♦ Undercoat the wheelhouse where anti-rust agent or undercoat has not yet been applied.

NOTE:

- ♦ Coat the wheelhouse upper extension, particularly the upper face.
- ♦ Undercoat the inner fender mounting area of the wheelhouse and upper face of the inner fender.

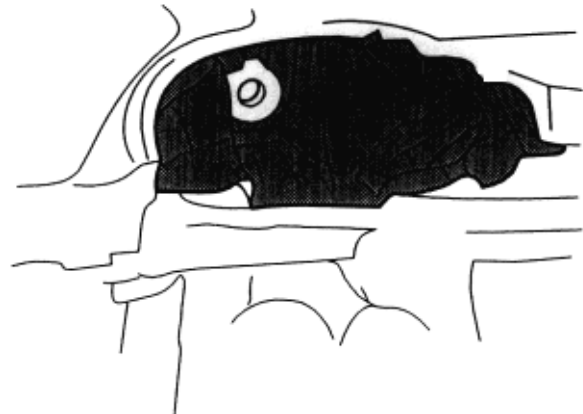
Nozzles Used: A and C



Rear Wheelhouse

- ♦ Coat the gaps between the inner and outer wheelhouses, including the damper base.
- ♦ Apply agent to the edge of the rear side frame, side sill and rear floor.
- ♦ Undercoat the wheelhouse where undercoat or anti-rust agent has not yet been applied.

Nozzles used: B and C



Rust-preventative Treatments

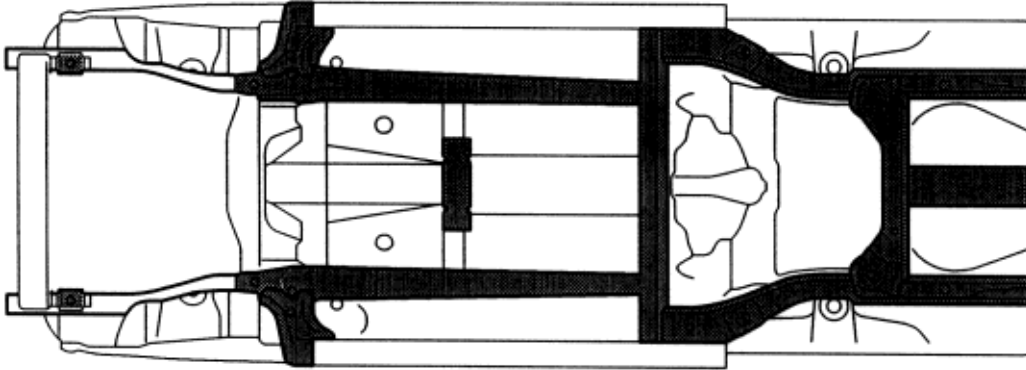
7-8

Areas to be Covered by Anti-rust Agents (cont'd)

Under-Floor Member/Floor Frame, Inside

- ♦ To spray agent to the inside of the under-floor member, insert the nozzle in the holes in the members.
- ♦ Also apply the agent to the inside of the floor frame and rear frame.

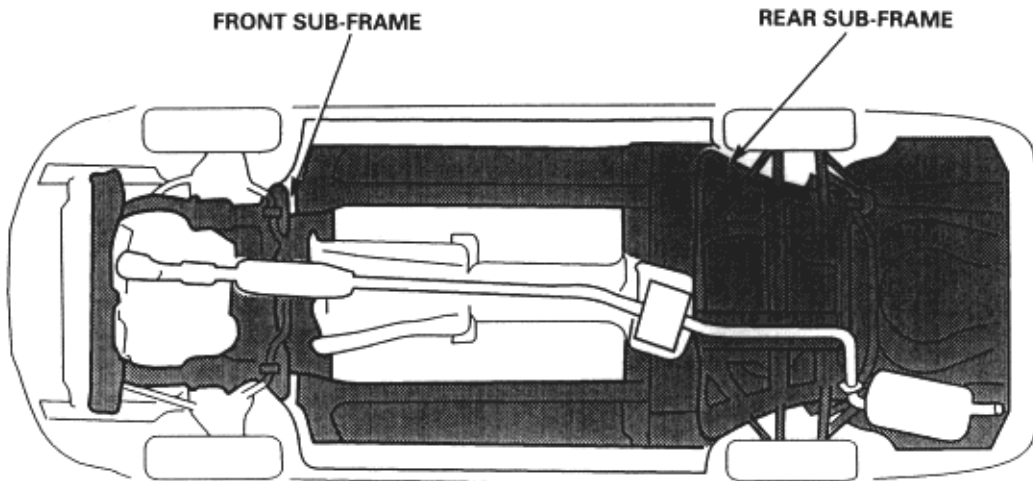
Nozzle used: A



Under-Floor

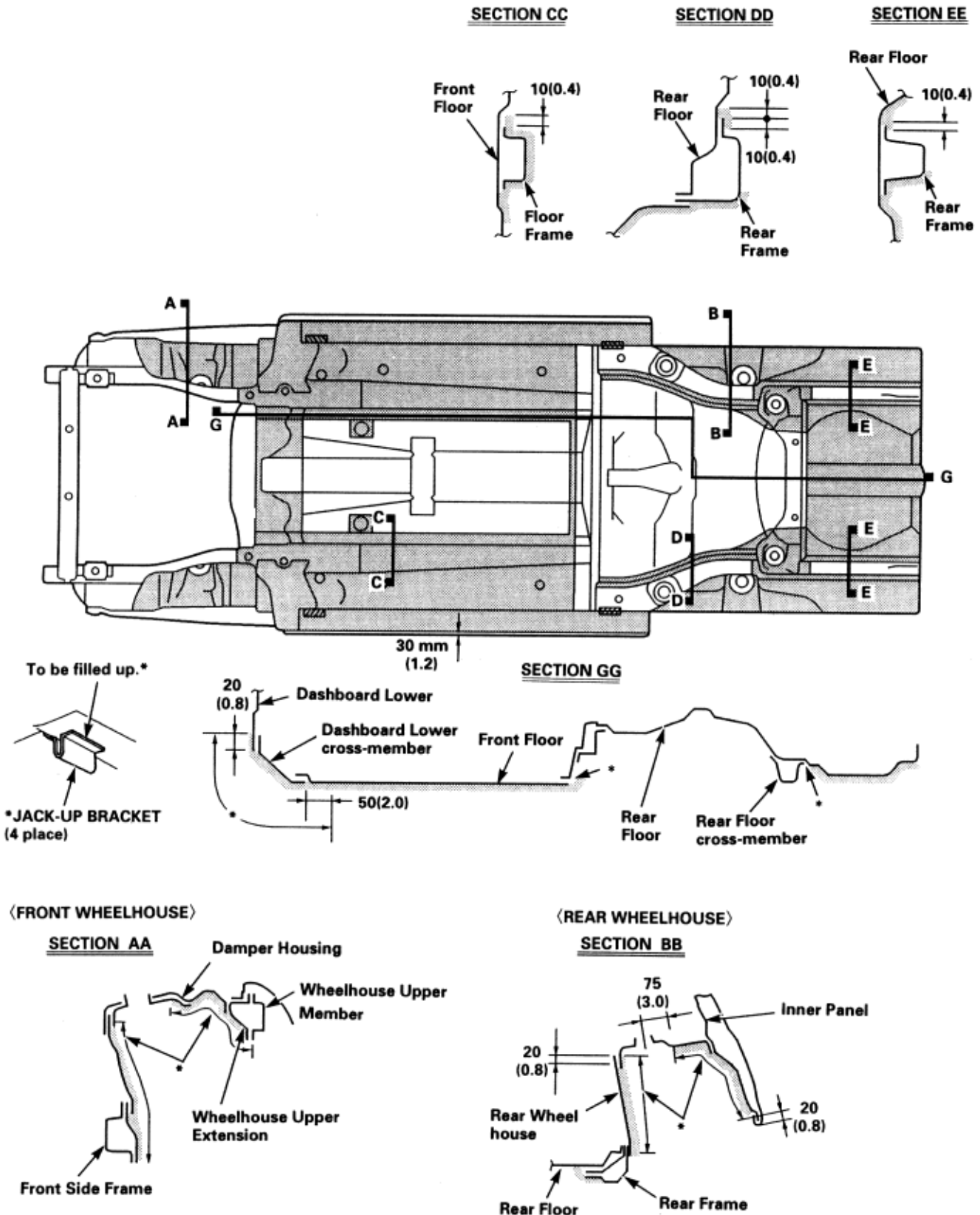
- ♦ Apply the agent to the shaded areas only. Do not apply it to the exhaust system and heated oxygen sensors.
- ♦ Coat the bottom of the fuel tank.

Nozzle used: C



- NOTE:
- ♦ Coating thickness: 0.5 mm (0.02 in.) min.
 - ♦ Follow the above instructions for paint repair or refinishing.
 - ♦ Avoid coating on the front and rear suspensions, and exhaust system mount area.
 - ♦ Items marked with an asterisk (*) on the important control areas. Coating thickness 1 mm (0.04 in.)
- Unit: mm (in.)

 indicates PVC coating areas.

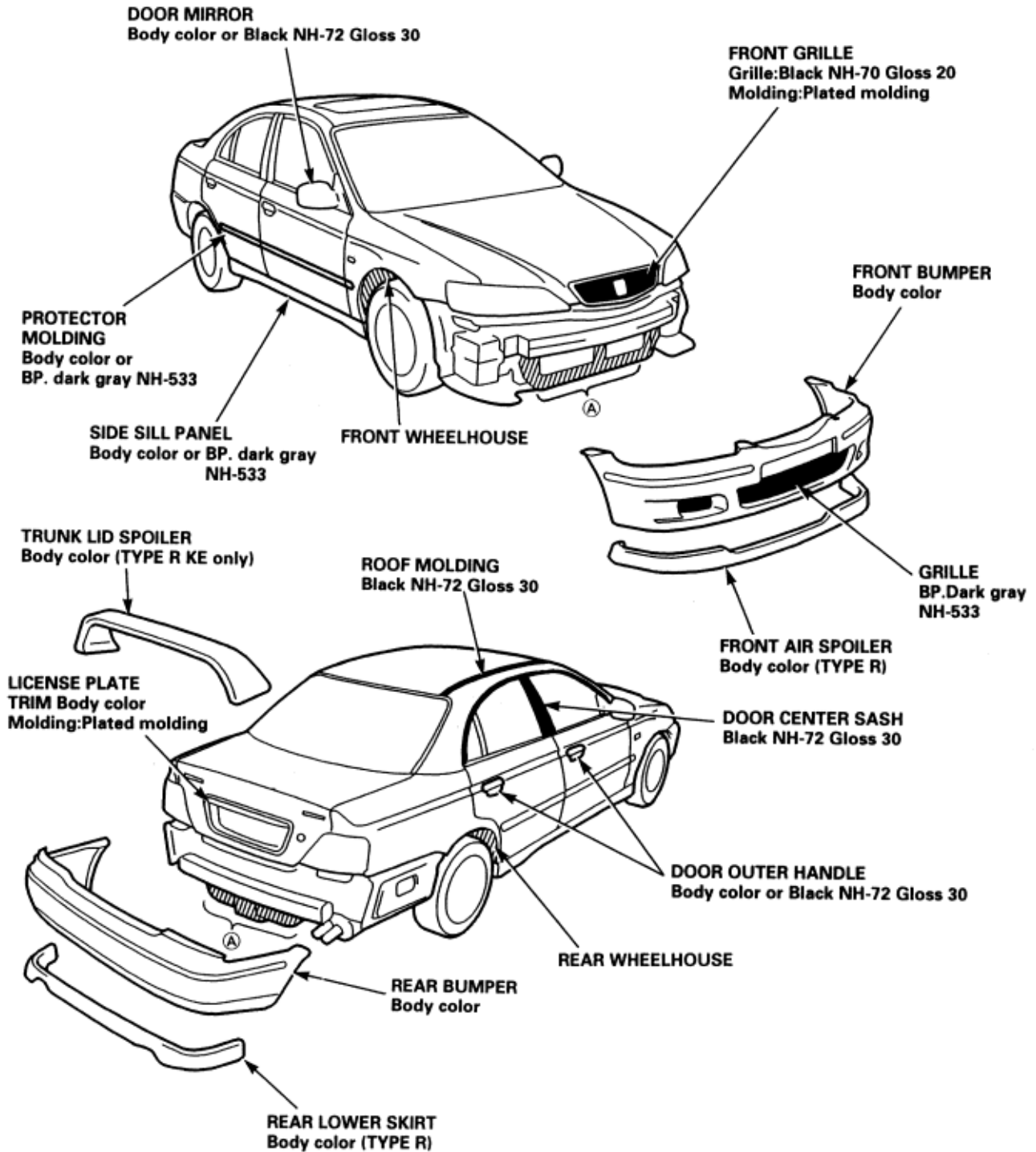


Paint Code Color Name		B-77P Orleans Blue Peal	B-94 Midnight Blue Solid	G-86P Baikal Green Peal	GY-20M Chartreuse Metallic	NH-0 Champion- ship White	NH-605P Pirates Black Peal	NH-614M Titan Silver Metallic	R-500P Sicilian Red Peal	R-502 Vesuvio Red
KR / KE / KG	1.6iS									
	1.6iLS									
	1.8iS	○	○	○	○			○		
	1.8iLS									
	1.8iES									
	2.0iLS									
	2.0iES									
	TYPE R					○	○		○	
KS	1.6iS									
	1.6iLS									
	1.8iS	○	○	○	○			○	○	
	1.8iLS									
	2.0iLS									
	2.0iES									
KY	1.8iS	○	○	○	○		○	○	○	

Side sill		
Body colour		TYPE R
BP, Dark grey NH-533		1.6iS, 1.6iLS, 1.8iS, 1.8iLS, 1.8iES, 2.0iLS, 2.0iES
Protector Molding		
Body colour		1.8iES, 2.0iES
BP, Dark grey NH-533		1.6iS, 1.6iLS, 1.8iS, 1.8iLS, 2.0iLS
Door Mirror / Outer Handle		
Body color		1.8iES, 2.0iES, TYPE R
Black NH-72 (Gloss 30)		1.6iS, 1.6iLS, 1.8iS, 1.8iLS, 2.0iLS

NOTE:

- ♦ Apply NH-86 black (Gloss 40) to the visible surfaces of (A) areas, front and rear wheelhouses after installing equipment (except vehicles painted with B-94, G-86P and NH-605P).
- ♦ For body colors B-77P, GY-20M, NH-0, NH-614M, R-500P and R-502 apply NH-86 black (Gloss 40) to the A areas, front and rear wheelhouses.



The 3-coat-3-bake (3C-3B) paint finishes give the Accord a deep gloss and stunning finish. This manual provides information on paint defect, repair and refinishing. Throughout, the objective is to explain in a simple yet comprehensive manner the basic items you should know about paint repairs. Select the correct material for the defect and repaint or refinish in the correct manner as described in this manual.

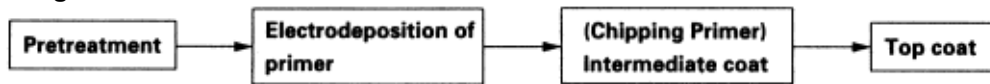
⚠ WARNING

- ♦ Most paints contain substances that are harmful if inhaled or swallowed. Read the paint label before opening the container. Spray paint only in a well ventilated area.
- ♦ Cover spilled paint with sand, or wipe it up at once.
- ♦ Wear an approved respirator, gloves, eye protection, and appropriate clothing when painting. Avoid contact with skin.
- ♦ If paint gets in your mouth or on your skin, rinse and wash thoroughly with water. If paint gets in your eyes, flush with water and get prompt medical attention.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

Basic Rules for Repairing a Paint Finish

To repair paint damage, always use the 2-part acrylic urethane paints designated; polish and bake each of the three coats, as in production to maintain the original film thickness, and so assure the same quality as the original finish.

Outline of Factory Painting Process:



Features in Each Work Process

1. Pretreatment and Electrodeposition

In the pretreatment process, the entire body is degreased, cleaned and coated with zinc phosphate by dipping. After the body has been cleaned with pure water, it is placed in an electrolytic bath of soluble primer (Cationic Electrodeposition). This produces a thorough corrosion inhibiting coating on the inner surface and corners of the body, pillars, sills and panel joints. Chipping primer is then applied to the most susceptible areas (see page 8-12).

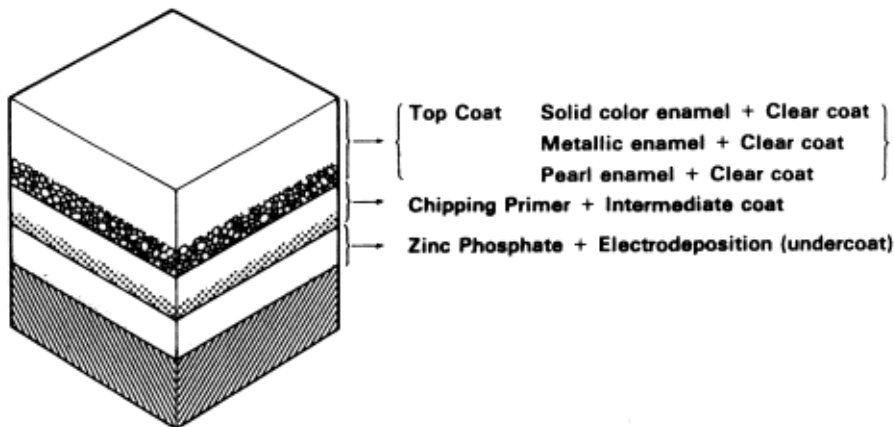
2. Intermediate coat

The intermediate coat is applied to the prepared surface for further protection against damage.

3. Top coat

Enamel paint and either polyester or acrylic resin paint are used in the top coat for higher solidity, smoothness, brightness and weather resistance.

Sectional View of Paint Coats:



Paint Refinishing

Paint damage can appear in any form. Before making a repair, check the damaged area carefully, and determine the procedure best suited to the type. The following relates to paint refinishing methods for various types of paint damage or defects.

Defects and Refinishing Processes**WARNING**

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

A. Damage or defects that have gone through to the metal surface.

Rusting or deformation:

1. Featheredge the damaged area.
2. Prepare the metal surface.
3. Apply a chemical coating to the metal surface. Metal conditioner, precoat, A.C.P treatment.
4. Apply an undercoat (primer surfacer).
5. Apply an intermediate coat (color matched to top enamel paint).
6. Apply a top coat (body color paint).
Solid color: Enamel top coat paint.
Metallic color: Metallic enamel paint + Clear top coat.
Pearl colour: Pearl enamel paint + Clear top coat.

B. Damage or defects up to undercoat or intermediate coat.

For external damage or blisters, perform steps 4 through 6 under item A.

For external damage only perform steps 5 through 6 under item A.

C. Damage or defects that have not gone through to the intermediate coats (only in top coat)

Shallow scratches or score marks:

- (1) If damage has gone through to the metallic paint, spray metallic enamel, then apply top coat wet on wet.
- (2) If damage has not reached the metallic color paint and remained in the clear top coat, polish the damaged surface or spray the top clear coat only.

NOTE: Try to repair by polishing as much as possible if the damage has not reached the metallic color paint.


D. Replacement of Parts**Welded parts**




Rear side outer panel, etc.

- (1) Perform step 1 through 6 if the damaged area is covered with filler or welded with reinforcement plate.
- (2) Perform steps 5 and 6 for undercoats except those on joints (intermediate coat for replacement parts).
- (3) On inner panels, apply paint where the undercoat is burned by welding heat. Follow this with a rust preventative treatment (see section 7).

Single parts

- ♦ Painting the outer and inner hood, door, trunk, lid etc. Perform steps 5 and 6 under item A.
- ♦ Painting the inside of the front fender. Only enamel top coat paint may be used on solid color enamel, metallic enamel or pearl enamel.
- ♦ After spraying enamel paint, perform rust preventative treatment (apply inner or outer rust preventative agent).

NOTE: (): Indicates steps which may be required depending on the degree of damage)

Refinishing Processing	Damage	To metal surface	To under/intermediate coats	To top coat	Replacement Parts	
					Welded part	Single part
1. Featheredging (polishing damaged surface)		↑			↑	
2. Preparation of metal surface		↑			↑	
3. Air blowing/Degreasing		↑			↑	
4. Treatment of metal surface		↑			↑	
5. Filling/drying/Polishing		↑ 			↑	
6. Air blowing/Degreasing		↑			↑	
7. Masking (part)		↑			↑	
8. Undercoating/Drying		↑	↓ 		↑	
9. Polishing undercoat		↑	↓		↑	
10. Air blowing/Degreasing		↑			↑	
11. Masking		↑			↑	
12. Spraying intermediate coat/Drying		↑			↑	↓ 
13. Polishing intermediate coat/Top coat		↑		↑	↑	↓
14. Air blowing/Degreasing		↑		↑	↑	↓
15. Masking		↑		↑	↑	↓
16. Spraying top coat/Drying		↑		↑	↑	↓
17. Polishing/Buffering		↓	↓	↓	↓	↓

1. Featheredging (polishing damaged areas)

Damage to metal surface

- ♦ Sand the damaged area flat and smooth with a double action sander and #60 or #80 disc paper.
- ♦ Sand the boundary between the metal surface and undercoat with a double action sander and #180 or #280 disc paper. Try to sand a larger area than the damage.

NOTE:

- ♦ Make sure there is no height difference between the metal surface and undercoat.
- ♦ If double action sander is not available, use a rubber block and wrap sandpaper around it to sand the surface.

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

Damage to: Undercoat
Intermediate coat
Top coat
Paint coat on replacement parts

Sand the damaged surface flat and smooth with a double action sander and #280 or #320 paper.

NOTE:

- ♦ If double action sander is not available, use a rubber pad and wet or dry sand the surface with #280, #320, #400 or #600 sandpaper.
- ♦ After sanding, check that the surface is flat and smooth.
- ♦ Perform the operations detailed in "damage to metal surface" above for areas where parts are welded to the body.

2. Preparation of metal surface

Remove all corrosion from the damaged area using #180 or #280 paper.

3. Air Blowing/Degreasing

- ♦ Air blow the sanded area, then degrease with a wax and grease remover.
- ♦ Use the following materials:

- 38125 Enamel Reducer (Dupont)
- Spies Hecker Silicon Remover (Hoechst)
- Standox Silicon Remover (Herberts)

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

4. Treatment of metal surface

- ♦ Brush or spray a solution of chrome phosphate or washer primer on the exposed metal surface.
- ♦ Use the following materials to treat the metal surface:
 - ♦ 2145 Kwik-Prep TM (Dupont)
 - ♦ 6155/6165 Vari Prim Self Etching Primer TM (Dupont)
 - ♦ Spies Hecker Priomat 1:1 Wash Primer 3688 (Hoechst)
 - ♦ Standox Etching Adhesion Primer (Herberts)

NOTE:

- ♦ Follow the manufacturer's instructions.
- ♦ Treat the metal surface, as much as possible, to provide a better bonding surface for the subsequent paint.

5. Application of Filler, Drying and Sanding

- ♦ Small cracks or pinholes in the sheet metal should be repaired with a filler and sanded flat and smooth.

NOTE:

- ♦ Mix the putty with the hardener in the correct ratio.
- ♦ Follow the filler manufacturer's instructions.



WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

- ♦ Allow the filler to air dry for about 5-6 minutes, then force dry with an infra-red lamp.

NOTE: Keep the lamp 40-50 cm (16-20 in) from the filler when drying.

- ♦ Stop drying the filler if a white mark appears when the surface is scratched with your nail. Wet or dry sand the surface flat and smooth with a #280 or #320 sandpaper.

6. Air Blowing/Degreasing

- ♦ Blow the surface to be repaired with compressed air, then degrease with a wax and grease remover.
- ♦ Use the following materials:
 - 38125 Enamel Reducer (Dupont).
 - Spies Hecker Silicon Remover (Hoechst).
 - Standox Silicon Remover (Herberts).

NOTE: Also clean and degrease surfaces where masking tape will be attached.

7. Masking

Mask the areas surrounding the damage to prevent overspray from the primer.

8. Application and Drying of Primer/Drying



WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Spray the primer over the filler and surface (use epoxy or urethane 2-part primer).
Spray: 2-3 coats.

- ♦ Use the following materials:
 - 615S Primer Surfacer (Dupont).
 - Primer Surfacer EP (Akzo).
 - NPS735 Urethane Primer Surfacer (R-M).
 - Spies Hecker Permacron HS Surfacer (Hoechst).
 - Standox 2K HS Filler (Herberts).

- ♦ Let the primer air dry for 5-10 minutes, then force dry with a infra-red lamp.

NOTE: Keep the lamp 40-50 cm (16-20 in) from the surfaces.

9. Application of Polishing Undercoat

- ♦ Remove the masking paper and tape.
- ♦ Check that the undercoat has dried thoroughly, then dry or wet sand the surface with #280 or #320 sandpaper.

NOTE:

- ♦ Use a rubber block and sand flat and smooth.
- ♦ Sand the entire surface to be refinished.

10. Air Blowing/Degreasing



WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

- ♦ Blow all the surfaces with compressed air then degrease with a wax and grease remover.
- ♦ Use the following materials:
 - 38125 Enamel Reducer (Dupont).
 - Spies Hecker Silicon Remover (Hoechst).
 - Standox Silicon Remover (Herberts).


NOTE: Also clean and degrease surfaces where masking tape will be attached.

11. Masking

Mask the undamaged areas surrounding the damage to prevent overspray from primer surfacer (undercoat).

NOTE: Use masking tape and paper to mask the body. A vinyl cover may also be used to effectively mask the body.

12. Application of Intermediate Coat (same color as enamel) top coat spraying/drying

 **WARNING**

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Use the same color paint as the top coat. Spray it over the surface until the undercoat (primer surfacer) is fully covered.
- ♦ Spray the paint slightly thicker than normal to allow for loss during subsequent polishing
 - Super ponacle II (R-M).
 - Super Centri (Dupont).
 - Auto cryl (Akzo).
 - Spies Hecker Permacron 2K Acrylic Top Coat (Hoechst).
 - Standox Standocryl 2K (Herberts).

13. Polishing of Intermediate Coat


- ♦ Check that the paint coat has dried thoroughly, then dry or wet sand the surface with #600 and #800 sandpaper.

NOTE: Use a rubber block to sand flat and smooth, being careful not to expose the undercoat.

Polishing the Top Coat (if damaged)

Use the same technique described above.

14. Air Blowing/Degreasing

 **WARNING**

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

- ♦ Blow the entire surface with compressed air then degrease with a wax and grease remover.
- ♦ Use the following materials:
 - 38125 Enamel Reducer (Dupont).
 - Spies Hecker Silicon Remover (Hoechst).
 - Standox Silicon Remover (Herberts).
- ♦ For shading or spot painting, polish the area with a polishing compound. Sand with a #2000 paper to give a better bonding surface for the subsequent paint.

15. Masking


- ♦ Remove all existing masking paper, then mask with new paper.
- ♦ Use a heat resistant type masking tape (SCOTCH TAPE) where tape is attached directly to the body.
- ♦ Use brown paper or masking roll paper to cover.

NOTE:

- ♦ Mask the area surrounding the damage sufficiently to prevent overspray. It is also good practice to use a vinyl cover to protect other areas.
- ♦ Protect resin parts with aluminium foil under the brown paper or masking paper to prevent damage due to heat during baking.


16. Application of Top Coat Spraying/Drying

- ♦ Prior to putting the vehicle in the painting booth, thoroughly clean the interior and spray water over the floor. Be careful about blowing dust and dirt.

 **WARNING**

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

- ♦ Blow with compressed air and degrease the surface before spraying the paint. Also clean the surface with a tack cloth.

 **WARNING**

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the paint container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Spray color matched top coat over the prepared surface. Apply 2-3 coats in two directions until the intermediate coat is fully covered.

NOTE: For application of the top coat, refer to step 12 "Application of Intermediate Coat".

Solid color: Color enamel + Color clear coat

Metallic color: Metallic enamel + Clear coat

Pearl color: Pearl enamel + Clear coat



WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

- ♦ After spraying, allow the paint to settle for about 10 minutes, then force dry with an infra-red lamp.

NOTE: Follow the paint manufacturer's instructions.

17. Polishing/Buffering

- ♦ Let the paint dry gradually, then polish the surface carefully using a polishing compound and sponge buff.
- ♦ To remove lint or dirt, wet sand the surface with #2000 sand paper or finer first, then polish with compound.

NOTE: Polish all roughness caused by sanding thoroughly. To do this, first polish with very fine compound, then with ultra fine compound.

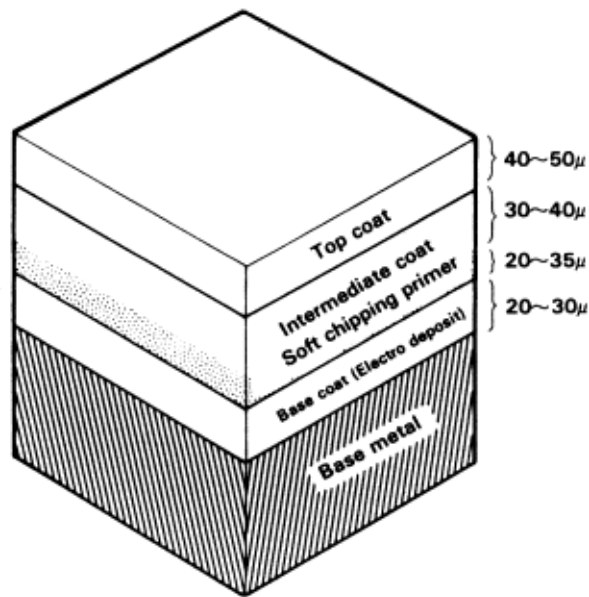
- ♦ After polishing, remove the masking paper and tape, then wash the entire vehicle thoroughly.

Body Paint Repair - Soft Chipping Guard **8-11**
Primer Coat
General

The removal of paint and undercoating by stones and gravel immediately exposes metal to the atmosphere, causing it to rust. The thickness of this rust increases if the process continues unchecked. The soft chipping guard primer protects against damage due to the impact of flying objects. The purpose of this guide is to provide information you will find useful when repairing damage to the protective coating. Refer to the Soft Chipping Primer Undercoating Diagram.

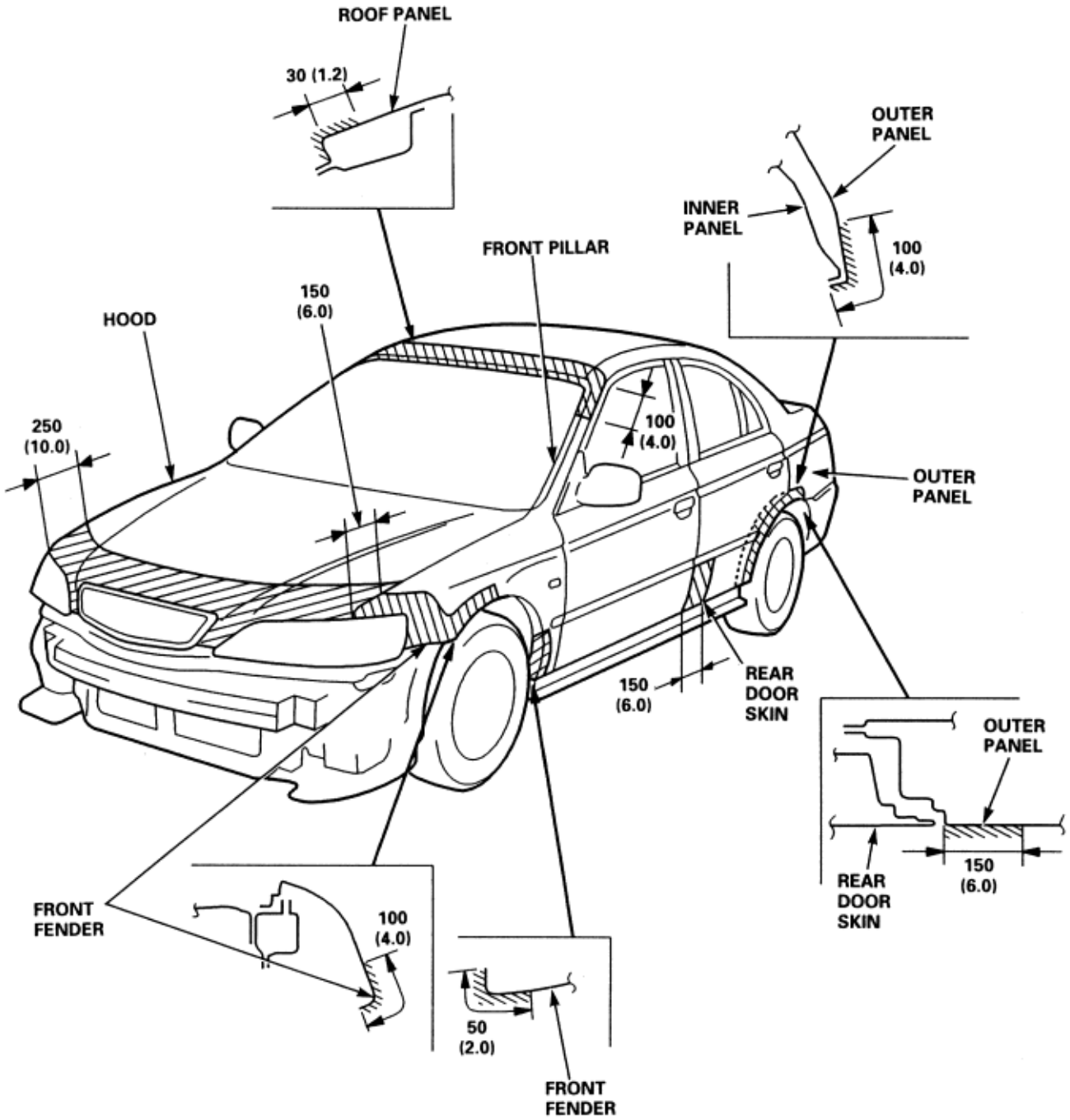
Type	Composition	Physical properties	Drying time
Polyester resin	Polyester resin Pigment Additive Solvent	Color Gray Viscosity 26sec/68°F (20°C) at painting Non volatile 40~45% at painting	302~320°F (150~160°C) × 30 minutes

The soft chipping guard primer is applied over the E.D. (Electrostatically Deposited) primer. It is followed by guide coating and top coating. The soft chipping guard primer produces a smooth surface when dry. It should be sprayed so the thickness of the protective film is 20 microns.



Body Paint Repair - Soft Chipping Guard **8-12**
Primer Coat
Coating Diagram

The diagram shows the areas to which soft chipping primer is to be applied.
NOTE: Make sure to coat the flange on front and rear wheel arches.
Unit: mm (in.)



Body Paint Repair - Soft Chipping Guard **8-13**

Primer Coat

Types of Soft Chipping Guard Primer (Reference)

/Repair Materials and Tools

Type	Application	Composition	Physical property	Drying time
Dual liquid synthetic resin	Room temperature Baked at 176°F (80°C) for 40 minutes	Pigment 12% Calcic pigment: 37% Epoxy polirole resin: 15% Additive, Solvent: 36% 100%	Color: Grey Viscosity: 68°F (20°C) Non volatile: 65% mini. Specific gravity: 68°F (20°C), 1:378	Room temperature: 68°F (20°C), 3 days Baked: 176°F (80°C), 40 minutes (to harden thoroughly)
Dual liquid Acrylic resin Urethane resin	Room temperature Baked at 176°F (80°C) for 30 minutes	Pigment: 40% Acrylic resin: 37% Additive, Solvent: 23% 100%	Color: Grey Viscosity: 68°F (20°C) 4 - 6 Poiseuille Non volatile: 65% mini. Specific gravity: 68°F (20°C), 1.35	Room temperature: 68°F (20°C), a day Baked: 176°F (80°C), 30 minutes (to harden thoroughly)

<p>Gun and brushes:</p> <ul style="list-style-type: none"> ♦ Spray gun NOTE: Any gun having a tip of more than 1.0 mm (0.04 in.) in diameter may be used for spraying the primer. ♦ Viscosity measure Iwata-type (IHS) cup, Ford cup ♦ Beaker 1-2 / (1.05-2, 10 US. qt, 0.9-2 Imp. qt) in capacity ♦ Stirring stick 	<p>Materials</p> <ul style="list-style-type: none"> ♦ Use primers equivalent to the ones shown in Types of Chipping Guard Primer (Reference). ♦ Make sure to keep the thickness of the coat at 20 microns. <p>Masking:</p> <ul style="list-style-type: none"> ♦ Masking tape, paper, vinyl sheet and plate (veneer and steel). ♦ Masking plates are not necessary when spraying in a booth.
<p>Tools:</p> <ul style="list-style-type: none"> ♦ Air or double action sander ♦ Sandpaper (#240-#400) <p>Thinner and cleaner:</p> <ul style="list-style-type: none"> ♦ Use the thinner specified for the primer. ♦ Any commercially available lacquer thinner may be used to clean the gun. 	<p>Protectors:</p> <ul style="list-style-type: none"> ♦ Wear an approved respirator or dust mask, gloves, safety goggles and other protective clothing. ♦ Rags.

WARNING

- ♦ Most paints contain substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Spray paint only in a well ventilated area.
- ♦ Cover spilled paint with sand, or wipe it up at once.
- ♦ Wear an approved respirator, gloves, eye protection and appropriate clothing when painting. Avoid contact with skin.
- ♦ If paint gets in your mouth or on your skin, rinse or wash thoroughly with water. If paint gets in your eyes, flush with water and get prompt medical attention.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames or cigarettes.

Primer Coat

Coating Procedures

NOTE: This section covers the application of the soft chipping primer to the replacement part.

1. Sanding the replacement part



Wear goggles or safety glasses to prevent eye injury.

Sand the area to be painted with #200-#400 sandpaper.

NOTE:

- ♦ Do not oversand the edges or corners of the part.
- ♦ Do not expose bare metal.

2. Air blowing/degreasing



- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

Clean the surface with compressed air and wax and grease remover.

3. Masking

- ♦ Place masking tape or paper around the surface to be painted.
- ♦ Cover as wide an area as possible with tape or paper to keep primer from spreading.

4. Spraying chipping guard primer.

- ♦ Stir the primer thoroughly.
- ♦ Put the primer in a beaker and weigh the needed amount of primer to be used.
- ♦ Mix the hardener into the primer, following the manufacturer's instructions.

NOTE: Measure the primer and hardener so they are in correct ratio.

Item	Primer	Hardener
* High Primer Surfacer 2C	10	: 1
* Auto Primer Surfacer Mighty	5	: 1

- ♦ Add the specified thinner to the mixture of hardener and primer to attain the proper viscosity for spraying
2C 68°F (20°C) 18 sec ± 1
- ♦ These substances are not available with Dupont's 123 Vinyl Coating or Sherwin-William's Vinyl Gravel Guard. Follow the manufacturer's instructions for application.
- ♦ Use the following materials:
 - ♦ Spies Hecker Permacron 4:1 Surfacer 4:1 (Hoechst)
 - ♦ Standox 2K 4:1 Special Filter (Herberts).
- ♦ Once mixed with the hardener and thinner, the primer must be used within the times shown below.

Temperature	41°F (5°C)	50°F (10°C)	68°F (20°C)
High Primer Surfacer 2C	30H	24H	8H
Auto Primer Surfacer Mighty	4H	3.5H	3H



- ♦ Most paints contain substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Spray paint only in a well ventilated area.
- ♦ Cover spilled paint with sand, or wipe it up at once.
- ♦ Wear an approved respirator, gloves, eye protection and appropriate clothing when painting. Avoid contact with skin.
- ♦ If paint gets in your mouth or on your skin, rinse or wash thoroughly with water. If paint gets in your eyes, flush with water and get prompt medical attention.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames, or cigarettes.

Body Paint Repair - Soft Chipping Guard 8-15

Primer Coat

Coating Procedures (cont'd)

- ♦ Fill the gun's paint cup with the primer. Use a strainer when pouring the primer into the cup.
- ♦ Primer should never be applied to a dirty or greasy surface. Before spraying, blow dust and dirt off the surface and clean with wax and grease remover.

(Method of spraying)

- ♦ Do not try to cover the surface with one heavy coat. Apply several thin coats.

NOTE:

- ♦ Spray coat 4 - 5 coats to get 20 microns of thickness, as one coat deposits 5 - 7 microns.
- ♦ Spray the primer at 250 - 300 kPa (2.5 - 3.0 kgf/cm², 35.6 - 42.7 psi) pressure. Spraying with improper air pressure will cause imperfections.
- ♦ Open the gun 3 - 4 turns.
- ♦ Wipe up unwanted primer immediately with thinner.

5. Cleaning spray gun

- ♦ After spraying, be sure to clean the spray gun thoroughly with thinner or solvent.
- ♦ The gun will be permanently clogged if the primer is allowed to dry.

6. Drying

- ♦ After spraying the chipping guard primer, air-dry for 7 - 10 minutes to evaporate the thinner in the primer. Then dry it with infrared lamps at 176°F (80°C) for 30 - 40 minutes.

NOTE: Insufficient baking may cause pinholes if the primer coat is too thick.

- ♦ The temperature lamps and drying time recommendations should be followed closely.

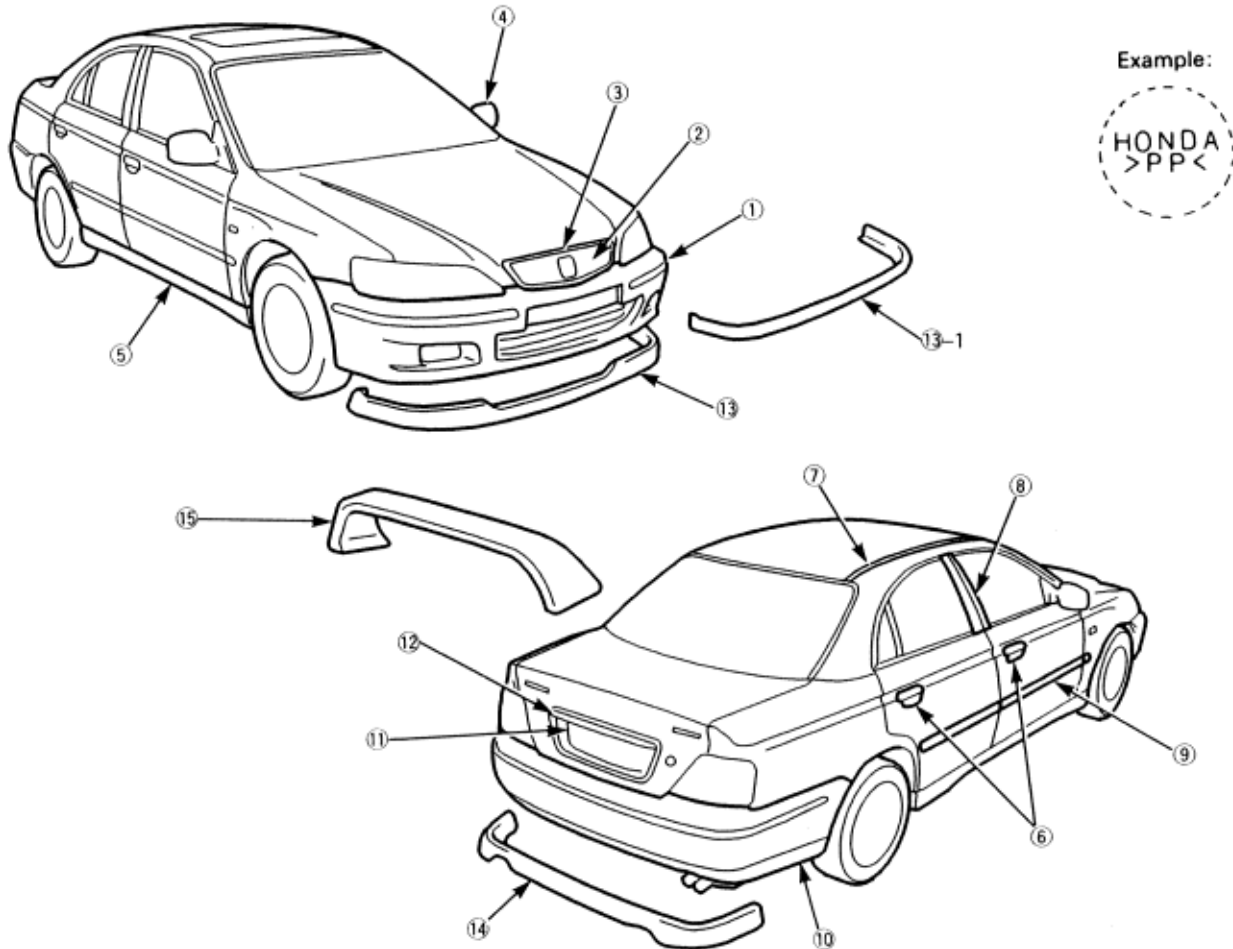
7. Intermediate and Top coating.

- ♦ Sand the chipping guard primer film with #280 - #400 sandpaper.
- ♦ Follow the intermediate/top coating Procedures ([see page 8-9](#)).

Temperature		41°F (5°C)	68°F (20°C)	86°F (30°C)	140°F (60°C)	176°F (80°C)
Time	Before	8 - 13H	3.5 - 5H	2 - 3H	30 Min.	20 Min.
	sanding	6 - 10H	4 - 5H	2 - 4H	15 - 20 Min.	10 - 15 Min.
Minimum time	Before	8H	4H	3H	30 Min	20 Min.
	Painting	10 - 18H	6 - 8H	4 - 8H	20 - 40 Min.	15 - 30 Min.

NOTE: The upper line of time shows specifications for High Primer Surfacer 2C, and the lower line Auto Primer Surfacer Mighty.

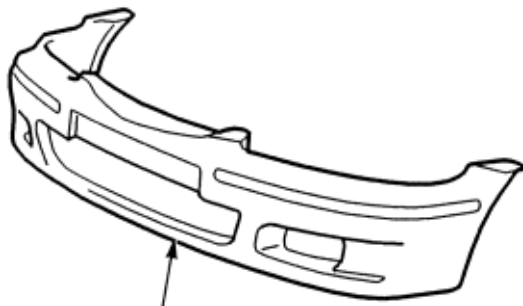
NOTE: A standard symbol is stamped on the underside of each resin part to show the type of material used.



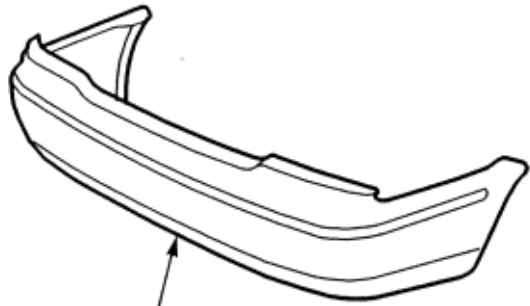
No.	Part Name	Material
①	Front Bumper	Polypropylene (PP)
②	Front Grille Base	Acrylonitrile / Butadiene / Styrene (ABS)
③	Front Grille Molding	Acrylonitrile / Butadiene / Styrene (ABS)
④	Door Mirror	Body color
		Black
⑤	Side Sill Panel	Polypropylene (PP)
⑥	Door Outer Handle	Poly carbonate plastics (PC)
⑦	Roof Molding	Poly vinyl chloride (PVC)
⑧	Door Center Sash	Acrylonitrile / Styrene / Acrylate (ASA)
⑨	Protector Molding	Polypropylene (PP)
⑩	Rear Bumper	Polypropylene (PP)
⑪	License Plate Trim	Acrylonitrile / Butadiene / Styrene (ABS)
⑫	License Plate Molding	Acrylonitrile / Butadiene / Styrene (ABS)
⑬	Front Air Spoiler (TYPE R)	Polyurethane (PUR)
⑬-1	Front Air Spoiler	Polypropylene (PP)
⑭	Rear Lower Skirt (TYPE R)	Polyurethane (PUR)
⑮	Trunk Lid Spoiler (TYPE R)	Polyurethane (PUR)

- ◆ No. 1, 5, 9, 10, 13-1 : Repair procedures (**see page 9-3**).
- ◆ No. 2, 3, 4, 6, 8, 11, 12, 13, 14, 15 : Repair procedures (**see page 9-12**).

The front bumper, rear bumper, and side sill panel are made of polypropylene (PP) resin. They can be repaired if the damage or deformation is minor in nature. This section covers PP repair. Repairing PP is different from other resins such as ABS and urethane.



**FRONT
BUMPER**



**REAR
BUMPER**

Repair Materials and Tools

The following materials and tools are required to resin bumpers

Adhesive and Filler (examples):

- ♦ Bumper primer (clear type)
- ♦ Bond quick mender
- ♦ High art mat black
- ♦ High art thinner
- ♦ High art hardener

Primer surfacer (examples):

- ♦ Dual-liquid type bumper primer surfacer (grey)
Reference (Isam Paint)
- ♦ Pigment: (1kg) (35.3 oz)
- ♦ Hardener: (100g) (3.5 oz)
- ♦ Thinner: (900 m l) (30.4 fl. oz, 31.7 Imp. oz)

NOTE: Follow the manufacturer's recommendations.

Tools:

- ♦ Putty knife
- ♦ Base (putty)
- ♦ Sandpaper
- ♦ Cutter
- ♦ Brush
- ♦ Masking tape
- ♦ Masking paper

1. Bumper Primer (Clear): Premixed type

The primer provides a good support for the filler and primer surfacer. It is applied to the surface of the bumper.

Drying time:

Natural	68°F (20°C) 20 minutes
Baked	140°F (60°C) 10 minutes

2. PUTTY BOND QUICK MENDER

After the PP primer has dried thoroughly, apply the PUTTY BOND QUICK MENDER.

- 1. Mix one part of the mender (A) and one part of the hardener (B) and stir thoroughly

NOTE: Do not mix the mender and hardener in excess of 20g (0.7 oz) at a time.

- 2. Hardening starts immediately after mixing. Practical hardness will be obtained within 60 minutes. The surface will be tacky within 5 minutes and nearly hardened after 15 minutes. It takes 12 hours for the surface to harden thoroughly 68°F (20°C).
- 3. Sanding can be done after:

3 hours	68°F (20°C) - natural drying
30 minutes	140°F (60°C) - baked

3. Primer Surfacer

NOTE: Use a dual-liquid type bumper primer surfacer (grey).

- ♦ The primer surface is used to protect the PP resin surface and to fill cavities or flaws in the intermediate and top coats.
- ♦ Mix 10 parts of primer surfacer and 1 part of hardener. Add the specific thinner (30 - 60%) to the mixture of the hardener and primer to attain the proper viscosity for spraying.

4. Intermediate and Top Paint Coats (body color)

NOTE:

- ♦ The paints are the dual liquid type based on the color chart.
- ♦ Measure the pigment and hardener as described so they are in correct ratio.
- ♦ Use the acrylic urethane paint prepared according to the mixing chart as the intermediate coat.

Mixing Ratio:

Mix 5 parts of body color pigment to 1 part of additive.

Mix 4 parts of the mixture of the pigment and additive with 1 part of the hardener.

NOTE:

- ♦ Dilute the mixture with 40 - 50% of the specified thinner (High art Thinner).
- ♦ Be sure to mix the correct amount of the additive.
- ♦ Use a spray gun to apply the paint. Do not use a brush.



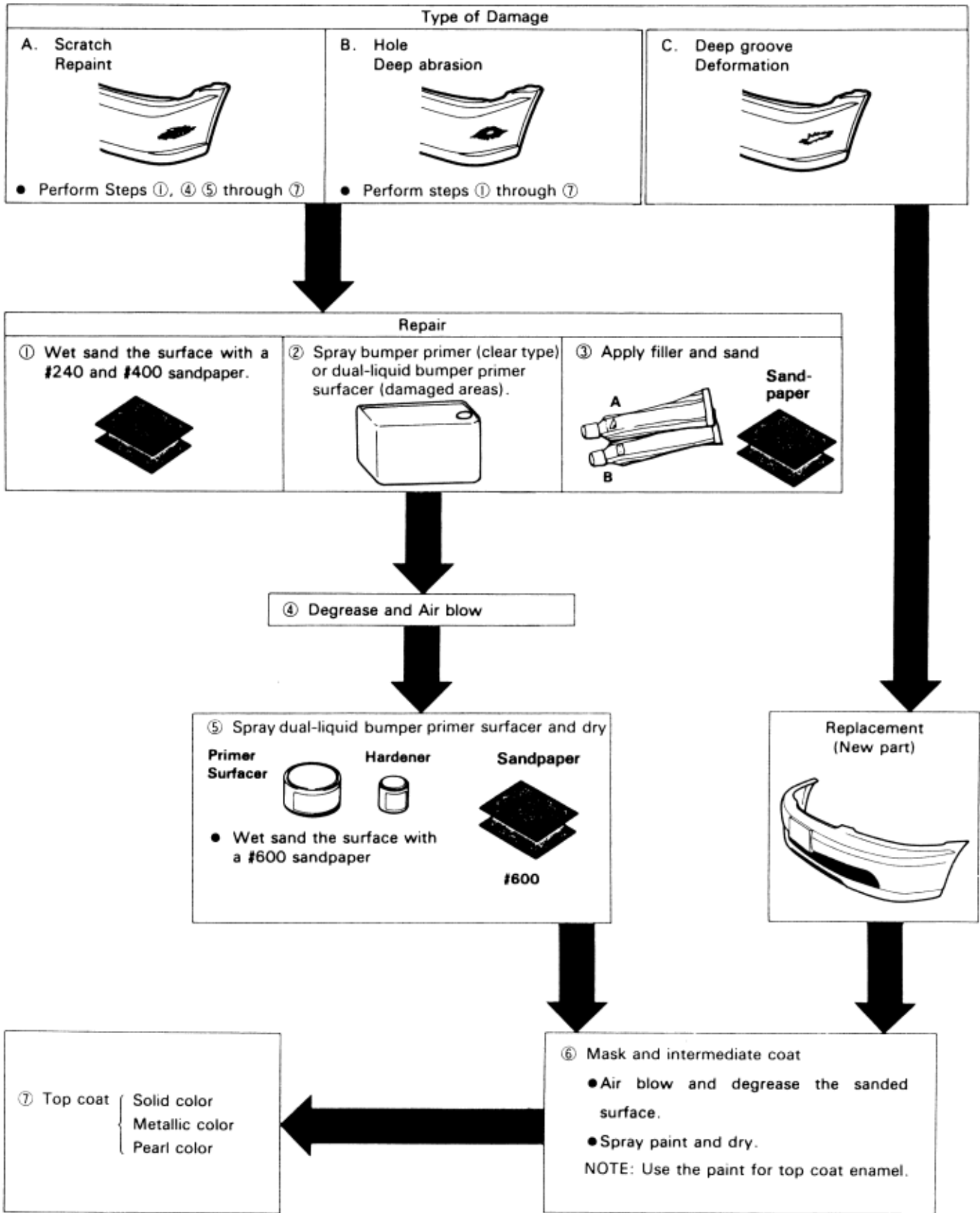
WARNING

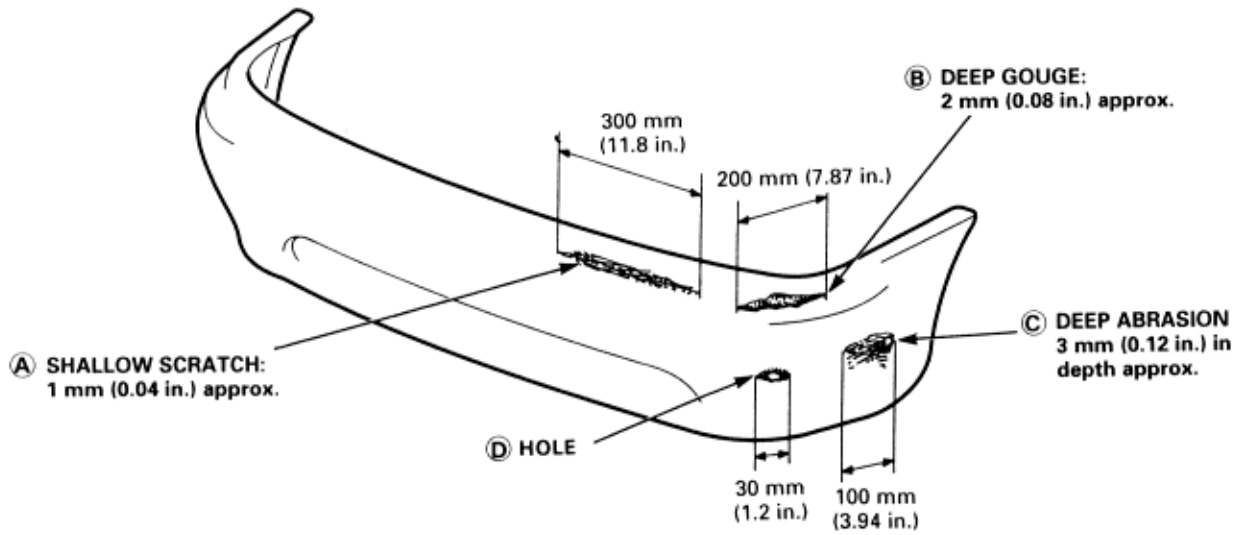
- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

Drying time:

Natural	68°F (20°C)
Surface only	20 minutes
Almost hardened	4 hours
Thoroughly hardened	96 hours

NOTE: The HIGH ART MAT BLACK SURFACER is a dual liquid type. If mixed, it will harden in a matter of hours.





NOTE: (): Indicates steps which may be required according to the degree of damage.

Work Steps	Damage A	Damage B	Damage C	Damage D	Repaint	Replacement
1. Sanding	↑	↑	↑	↑		
2. Degreasing/Cleaning (damaged areas)						
3. Spraying primer or primer						
4. Drying surfacer						
5. Applying filler	↑	↑	↑	↑		
6. Drying filler						
7. Sanding filler	↓	↓	↓	↓		
8. Degreasing/Cleaning (filled area)						
9. Spraying primer surfacer						
10. Polishing (Air blowing/degreasing)						
11. Intermediate coating						↑
12. Degreasing/Cleaning						
13. Masking						
14. Top coating					↑	↑
15. Drying top coat						
16. Polishing/Buffering					↑	↑

NOTE: Intermediate coating is recommended for bright colors.

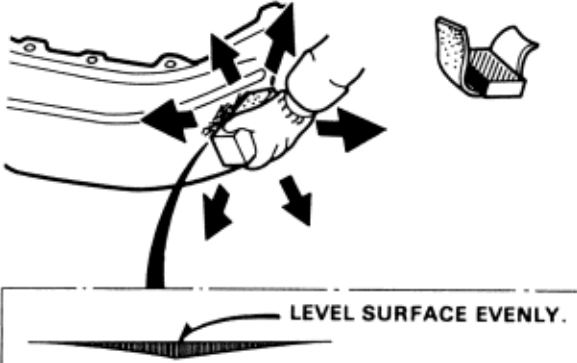
1. Sanding damaged areas

Shallow scratch:

- ♦ Level and finish damaged areas with #240 - #400 sandpaper.
- ♦ Polish the levelled area with #400 sandpaper

NOTE:

- ♦ Use a flexible block to sand the surface evenly.
- ♦ Do not remove too much material.



Deep groove/tear:

- ♦ Level and finish burrs and other irregularities with #240 sandpaper. Keep the surface as even as possible.



2. Degreasing/Cleaning

! WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.
- ♦ Clean with wax and grease remover and dry with compressed air.
- ♦ Wipe off all lint and other foreign particles from the surface with a tack cloth.

NOTE: Be sure to use a tack cloth. Dust and dirt are electrostatically drawn to the surface.

3. Applying bumper primer (clear type).

- ♦ Stir thoroughly before applying the primer. Use a spray gun or brush depending on working conditions.

! WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Cover as wide an area as possible, except for shallow grooves (2 - 3 coats).

NOTE:

- ♦ Do not dilute the primer with thinner.
- ♦ Warm the primer if the outside temperature is below 50°F (10°C).
- ♦ Apply the primer to the back of the bumper if the damage is a tear or hole.



4. Drying bumper primer.

! WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

- ♦ Dry the primer thoroughly with an infrared dryer or other dryer suitable for the purpose.

- ♦ If the damage or groove is shallow, heat the entire surface evenly. Apply heat locally if the bumper is gouged or torn open.

Drying time:

Dryer	10 minutes 140°F (60°C)
Natural	20 minutes 68°F (20°C)

NOTE:

- ♦ Use a dryer whenever possible.
- ♦ Do not allow temperature to exceed 158°F (70°C) or the bumper will deform.

BELOW 158°F (70°C)



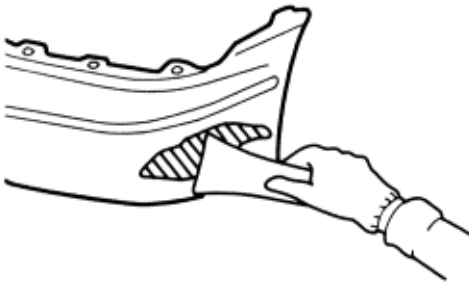
5. Apply filler (BOND QUICK MENDER)

Mix the mender (A) into the hardener (B) at a ratio of 1 to 1, and stir until they are thoroughly mixed.

- 1. Apply the mixture over the damaged area with a putty knife using light pressure.
- 2. Even out the surface to match the contour of the bumper.
- 3. If there is a hole, cover it with a masking tape from the back, then apply the filler over the outside surface.

After the filler has been dried, remove the tape and apply filler to the side that was taped.

NOTE: Apply filler so it extends over more than the damaged area.



6. Drying filler

Drying time:

Almost hardened	5 minutes
Initial hardness	15 minutes
Practical hardness	60 minutes
Sanding 68° F (20°C)	After 3 hours
140°F (60°C)	After 30 minutes

7. Sanding filler

⚠ WARNING

To prevent eye injury, wear goggles or safety glasses whenever sanding, cutting or grinding.

Wet sand first with #240 sandpaper then with #400 sandpaper.

NOTE: Sand the surface evenly, particularly at the area where the PP resin and mender meet.

8. Degreasing/Cleaning

- ♦ Blow off the sanded surface, then clean with wax and grease remover.

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.

- ♦ Wear goggles or safety glasses to prevent eye injury.

- ♦ Remove all dust and dirt with a tack cloth.

9. Spraying dual-liquid bumper primer surfacer (grey).

NOTE: Use the urethane bumper primer.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

Spray the primer surfacer over a wider area than the filler and the exposed surfaces of bumper primer.
NOTE: Spray 2 - 3 coats to get 20 - 25 microns of thickness.

Mixing Ratio: (Reference)

Urethane bumper primer	10
Hardener	1
Thinner	30 - 60%

10. Drying and polishing

Force dry the primer surfacer with infrared lamps or other industrial dryer.

⚠ WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

Drying temperature:

Force drying	140°F (60°C) 20 minutes
Natural drying	68°F (20°C) 2 hours min

NOTE:

- ♦ Use a dryer whenever possible.
 - ♦ Do not allow the temperature to exceed 158°F (70°C).
- 1. After force drying, wet sand the primer surface with #600 sandpaper.

NOTE: Use #600 or finer sandpaper as any paper courser than this might scratch the surface.

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

- 2. Blow the surface to be repaired with compressed air then degrease with a wax and grease remover.
- 3. Also clean and degrease where masking tape will be attached.

11. Intermediate coating

NOTE: Intermediate coating is recommended for bright colors.

- ♦ Use the top coat enamel.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Mix the additive into the solid enamel color, metallic enamel or pearl enamel color in the ration of 1 to 5 (by weight).
- ♦ Mix the hardener into the mixture of pigment and additive described above in the ratio of 1 to 4 (by weight).

NOTE: Keep the correct ratio, especially of the additive. Excessive additive takes longer to dry.

- ♦ Adjust to the proper viscosity for spray by adding the thinner specified for the primer into the mixture of primer additive and hardener.
Viscosity: 68°F (20°C) 11 - 13 sec.

NOTE: It is not necessary to apply the clear coat.

- ♦ Spray 2 - 3 coats of the top coat enamel to get 15 - 20 microns of thickness. The primer surfacer (grey) should not show through the top coat.

NOTE:

- ♦ Apply the top coat enamel to the repaired surface.
- ♦ Apply the top coat enamel to the entire surface of the primer surfacer when replacement is necessary.

12. Degreasing and Cleaning

Air dry the entire surface, then clean with wax and grease remover.

NOTE: For shading or spot painting, polish the area with a polishing compound. Also sand with a #1500 sandpaper to make a better bonding surface for the paint.

13. Masking

- ♦ Remove all existing masking paper, then mask with new paper.
- ♦ Use a heat resistant type masking tape (SCOTCH TAPE) where tape is attached directly to the bumper.
- ♦ Use brown paper or masking roll paper to cover.

NOTE:

- ♦ Mask the area completely to prevent overspray.
- ♦ Protect resin parts with aluminium foil under the brown paper or masking paper to prevent damage due to heat during baking.

14. Top Coating

- ♦ Air dry and degrease the surface before spraying the paint. Also clean the surface with a tack cloth.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.

- ♦ Remove dust and dirt from the surface to be coated with compressed air, then use a tack cloth.
- ♦ Use a strainer when filling the cup with paint.
- ♦ Spray the paint evenly over the surface so the replacement part is completely covered.
- ♦ For application of the top coating refer to step 11 "Intermediate coating".

NOTE: Do not try to cover the surface with one heavy coat. Apply several thin coats.

- ♦ With solid color (2 - coat type), metallic color and pearl color enamels, allow final coat to flash-off (5 - 20 minutes) before applying clear coat.
- ♦ Mix the additive into the clear at a ratio of 1 to 5. Adding the hardener and adjusting viscosity should be done the same way as described on the previous page.

Viscosity: 68°F (20°C) 13 - 15 sec.

Mixing Ratio (weight)

Metallic enamel/Clear solid enamel	Additive	Hardener
5	1 = 4	: 1

15. Drying top coat



WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

- ♦ Before force drying, let it air dry for 5 - 10 minutes.
- ♦ Force dry the sprayed surface under the infrared lamps for 60-90 minutes.
- ♦ Keep the drying temperature between 140°F (60°C) and 158°F (70°C).
NOTE: Take care not to let the head deform the part during the drying process.

16. Polishing and Buffing

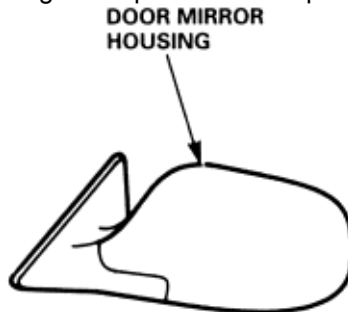
- ♦ Let the paint dry gradually, then polish the surface carefully using a polishing compound and sponge buff.
- ♦ To remove lint or dirt, wet sand the surface with #2000 or finer paper first, then polish with compound.
NOTE: Polish all roughness caused by sanding thoroughly. To do this, first polish with very fine compound, then with ultra fine compound.
- ♦ After polishing, remove the masking paper and tape and wash the entire vehicle thoroughly.

The door mirror housing, license plate trim, and front grille are made from ABS resin.

They can be repaired if the damage or deformation is minor in nature. This section covers ABS repair. Repairing ABS is different from other resins such as PP.

NOTE:

- ♦ The ABS resin is the copolymer resin consisting of the three monomers of acrylonitrile, butadiene and styrene.
- ♦ Polycarbonate is a generic name for high polymers which have the carbonic ester structure in the structural unit. The most prominent feature of polycarbonate is its tensile strength which shows the same level of yielding point as metals in the normal temperature. It also has outstanding impact strength compared to other plastics.



NOTE: The following repair procedures also apply to the door out handle (PC) and front air spoiler, rear lower skirt and trunk lid spoiler (PUR).

Repair Materials

Examples:

Adhesive and filler: Epoxy

- ♦ Kemit TE2301 bond quick mender

Filler

- ♦ R-M Stop zinc (R-M)
- ♦ 3M 5900 Repair Material (Akzo)

NOTE: Follow the manufacturer's specification

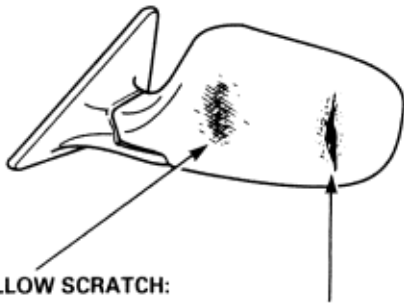
Top Coat:

- ♦ Super ponacle II, Solo de Diamont, Diamont (R-M)
- ♦ Autocryl Auto base (Akzo)
- ♦ Super Centari (Dupont)

Primer/Primer surfacer:

Use when the resin material is exposed.

- ♦ R-M fast filler + R-M flex primer (R-M)
- ♦ Plasto flex primer 2 coat (Akzo)
- ♦ 1220RH-S filler primer (Dupont)



B. SHALLOW SCRATCH:
1 mm approx.
(0.04 in.)

A. DEEP SCRATCH:
2 mm approx.
(0.08 in.)

A. Deep scratches, when filling:

- (1) Sand the damage section. (#120~#240)
- (2) Apply the filler and dry.
- (3) Sand the filler (#240~#400)
- (4) Coat with the primer/primer surfacer and dry.
- (5) Sand the primer surfacer. (#600~#800)
- (6) Top coating.

B. Shallow scratches:

- (1) Coat with the primer/primer surfacer.
- (2) Sand the primer surfacer. (#600~#800)
- (3) Top coating

C. Repaint:

- (1) Sand the primer surfacer. (#600~#800)
- (2) Top coating

1. Base material reconditioning (sanding)

- 1. Repaint the replacement part
Lightly sand the part with #400, #600 or #800.
- 2. Slight scores or scratches
Use a flexible sanding block, wet sand the damaged section with #400, #600 sandpaper.
NOTE: Sand level to remove damage.
- 3. Deep scratches when filling.
Use a flexible sanding block and wets and the damaged section with #240, #400 sandpaper.

2. Degreasing and cleaning

Clean the repaired area with wax and grease remover, then blow with compressed air.

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

NOTE: Wipe dust off surface with a tack cloth.

3. Filling, drying and sanding

Apply the filler in several thin coats.

NOTE: Mix and apply the filler according to the manufacturer's instructions.

- 1. Dry the filler with an infrared dryer for 5 or 6 minutes.
Be sure to keep the dryer 40 - 50 cm (16 - 20 in.) away from the surface.
- 2. Scratch the filled surface with your nail. If the surface is white when scratched, dry sand and wet sand with the #240~#400 sandpaper. Be sure to sand level.

4. Cleaning with compressed air, and degreasing

Blow the entire area to be coated with compressed air, then clean with wax and grease remover.

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

NOTE: Clean the whole surface to the help the masking tape adhere securely.

5. Masking

Use the masking tape and paper to mask the area that should not be sprayed.

6. Coat with primer/primer surfacer, followed by drying and sanding.

- ♦ Spray the primer surfacer over the filled area.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.
- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

- ♦ The coating thickness should be 20 - 25 microns.
NOTE: Follow the primer/primer surfacer manufacturer's instruction.

-1. Drying

- ♦ Let the primer surfacer dry naturally for 5 to 10 minutes, then dry with an infrared dryer.

⚠ WARNING

Body parts being dried with an industrial dryer can get hot enough to cause injury. Do not touch parts being dried.

- ♦ Be sure to keep the dryer 40 - 50 cm (16 - 20 in.) away from the paint film.

-2. Sanding

Lightly dry sand the whole area to be painted with #600, #800 sandpaper.

7. Blow off with compressed air, then clean with wax and grease remover.

⚠ WARNING

- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

NOTE: Clean the whole surface to help the masking tape adhere securely.

8. Top coating

- ♦ Remove dust with a tack cloth before spraying.
- ♦ Spray the top coating. Spray until the primer surfacer is covered.
- ♦ The coating thickness should be 30 - 35 microns.

⚠ WARNING

- ♦ Ventilate when spraying paint. Most paint contains substances that are harmful if inhaled or swallowed. Read the paint label before opening the container.
- ♦ Avoid contact with skin. Wear an approved respirator, gloves, eye protection and appropriate clothing when painting.
- ♦ Paint is flammable. Store it in a safe place, and keep it away from sparks, flames and cigarettes.
- ♦ Do not use high air pressure; use only an approved 210 kPa (2.1 kgf/cm², 30 psi) air nozzle.
- ♦ Wear goggles or safety glasses to prevent eye injury.

NOTE: For the recommended top coat paint, refer to "Example of repair materials".

Solid color: Color enamel + clear coat
Metallic: Metallic enamel + clear coat
Pearl: Pearl enamel + clear coat

9. Drying

After top coating for about 10 minutes, then dry with an infrared dryer.

NOTE: Follow the paint manufacturer's specification to dry properly.

All Paint	Painting of complete surface.
Air blow	Using compressed air to blow away dust and debris.
Block paint	Painting a section only, such as a door.
Clear paint (clear coat)	Clear paint without dye (pigment).
Double coat	Application of two paint coats.
Dry coat	Paint which left the spray gun and dried partially before it reached the surface, thereby making the painted surface rough. Dry coating is caused by too little paint being fed, too high an air pressure, too much distance between the painted surface and the gun, or moving the gun too fast.
Dry film	Paint which has dried completely.
Dust coat	Paint is applied thinner than a dry coat. Painted surface becomes rough.
ED painting	Electrostatic discharge painting.
Enamel	Finishing paint pigmented with dye.
Featheredging	Smoothing off the edges of painted surfaces.
Flash off	Evaporation of the paint solvent. (Flash off time is the period between paint coat applications).
Ford cup	A type of viscosity meter.
Gun stroke	Movement of the paint gun.
Hardener	Hardening agent of two-liquid type paint or fillers. Polycyanates and oxides are used for hardeners.
Heat-hardening acrylic resin paint	Composed of acrylic resin and meramine resin, and hardened (forms a paint film) by baking.

Lacquer	A type of paint that uses cellulose nitrate or other chemicals, and which dries by evaporation of its solvent agent.
Meramine resin	Used as component for aminoalkyd resin paint and heat-hardening acrylic resin paint.
Metallic-base paint	Paint with aluminium powder for metallic tone.
Mist coat	Painting for fade-in sections. A small amount of paint may be dissolved with slow-evaporating thinner, or thinner alone may be applied with low pressure 150 - 200 kPa (1.5 - 2.0 kgf/cm ² , 21.3 - 28.4 psi).
Mixing scale	Color mixing device.
Overlap	Blending of spray patterns.
Overspray	Spraying other than the area that needs painting.
Paddle	A tool to mix paint
Paint dust	Dust of paint formed by spraying
Paper dispenser	A paper posting device (masker) that combines tape and paper.
Scrapes	Traces of scratches.
Scuffing	Particles on the painted surface are lightly polished with fine emery paper (#600 or over).
Set (setting)	Evaporation time of solvent in the paint, before drying the layer forcefully or by baking (May be considered the same as flash-off time).
Single coat	Application of paint in single layer.
Spot paint	Painting of small section, such as for touch-up.
Undercoat	Undercoat paint (such as primer and surfacer). May be applied to lower section of car for noise prevention and rustproofing.

Wet coat	Paint is applied with an excess of solvent, thereby producing a painted surface that is smooth, glossy and has a wet look.
Wet film	Paint which has not dried completely.
Wet on wet	Application of the next coat of paint before the preceding layer has dried completely.
Wool bonnet	Wool grinder for compound polishing.

General Information

Engine - L Series/Cooling system/Clutch

1-1

ENGINE - L SERIES

Type	20T2N - 8 valve SOHC
Cylinder arrangement	4 in line - transverse
Bore - liner	84.5 mm
Stroke	88.9 mm
Capacity	1994 cm ³ (cc)
Firing order	1 - 3 - 4 - 2
Rotation	Clockwise

Valve Timing

Inlet:	Opens at	13° B.T.D.C.
	Closes at	43° A.B.D.C.
	Lift	8.1 mm
Exhaust:	Opens at	68° B.B.D.C.
	Closes at	12° A.T.D.C
	Lift	9.1 mm

Lubrication

System Type	Wet sump, crankshaft driven eccentric rotor pump
Pressure at idle	0.7 bar (minimum) [0.7 kgf/cm ² (minimum)]
Maximum oil pressure at 3000 rev/min (rpm)	3.8 bar (minimum) [3.9 kgf/cm ² (minimum)]
Oil pressure warning light switch opens	0.4 - 0.7 bar [0.4 - 0.7 kgf/cm ²]
Oil filter	Full flow, renewable cartridge

COOLING SYSTEM

Pressure cap opens	110 kPa (2.2 kgf/cm ²)
Thermostat setting	82°C ± 5°C (Bottom Hose)

CLUTCH

Type	Diaphragm spring, hydraulic operation
Clutch plate diameter	228 mm (8.98 in)

General Information**1-2****Manual Gearbox/Final Drive/Wheel & tyres/Electrical****MANUAL GEARBOX**

Gearbox code	PG1 S4 FTU	
Gear ratios:		
Fifth	0.648 : 1	
Fourth	0.848 : 1	
Third	1.222 : 1	
Second	1.894 : 1	
First	3,250 : 1	
Reverse	3.000 : 1	

FINAL DRIVE

Ratio	4.200 : 1	
Road speed at 1000 rev/min	km/h	mph
5th gear	41.0	25.5
4th gear	31.3	19.4
3rd gear	21.7	13.5
2nd gear	14.0	8.7
1st gear	8.2	5.1

WHEELS & TYRES

Wheel size	15 x 6 JJ - Steel and Aluminium	
Tyre size	195/60R15 88V	

Pressures (cold):

Size	Loading Condition		bar (kgf/cm ²)	lbf/in ²
195/60R15 88V	All conditions up to speeds of	100 mph,	Front 2.3 (2.3)	33
		160 kmh/h	Rear 2.2 (2.2)	31
	Speeds above	100 mph,	Front 2.5 (2.6)	37
		60 km/h	Rear 2.5 (2.5)	36

ELECTRICAL

System	12 volt, negative earth	
Battery		
Type - Maintenance free	096	
Cold crank capacity	680 amps	
Reserve capacity	135 amps	
Alternator	Without Air/con	With Air/con
Type (Nippondenso)	K3 AVP-80	K3 AVP-90
Maximum output	80A	90A
Starter Motor		
Type	RA 2 kW	

General Information
Dimensions/Weights

1-3

DIMENSIONS

Overall length	4.595 m (180.9 in)
Overall width	1.750 m (68.9 in)
Overall height	1.430 m (56.3 in)
Wheelbase	2.668 m (105.0 in)
Track:	
Front	1.495 m (58.9 in)
Rear	1.504 m (59.2 in)

WEIGHTS

Unladen (fuel tank full, excluding options)		
TDi, SDi with A/C	1425 kg	3142 lbs
TDi, SDi with A/C and sunroof	1441 kg	3177 lbs
Maximum gross vehicle weight	1900 kg	4189 lbs
Maximum rear axle load	890 kg	1962 lbs
Maximum towing weight with braked trailer	1400 kg	3086 lbs
Towing hitch downward load	50 kg	110 lbs

General Information
Abbreviation and Symbols

1-4

A	Ampere (s)
ABDC	After Bottom Dead Centre
ABS	Anti-lock Brake System
ac	Alternating current
A/C	Air Conditioning, Air Conditioner
ACL	Air Cleaner
AFR	Air Fuel Ratio
ALT	Alternator
ATDC	After Top Dead Centre
BBDC	Before Bottom Dead Centre
BDC	Bottom Dead Centre
BS	British Standards
BTDC	Before Top Dead Centre
C	Celsius (Centigrade)
CFC's	Chlorofluorocarbons
CKP	Crankshaft position
cm	Centimetre
cm ²	Square centimetres
cm ³	Cubic centimetres
CO	Carbon monoxide
dc	Direct current
deg. or °	Degree (angle)
deg. or °	Degree (temperature)
dia.	Diameter
DTI	Dial Test Indicator
EACV	Electronic Air Control Valve
ECM	Engine Control Module
ECT	Engine Coolant Temperature
ECU	Electronic Control Unit
EDC	Electronic Diesel Control
EGR	Exhaust Gas Recirculation
F	Fahrenheit
FIP	Fuel Injection Pump
ft	Foot
g	Gramme (mass)
gal	Gallons (Imperial)
h	Hour
hc	High compression
Hg	Mercury
h.t	High Tension
IAT	Intake Air Intake
i.dia.	Internal diameter
in	Inches
in ²	Square inches
in ³	Cubic inches
ISO	International Organisation for Standardisation
k	Thousand
kg	Kilogramme
km	Kilometre
l	Litre
lc	Low Compression
LED	Light emitting diode
LH	Left-Hand
LHD	Left-Hand drive

m	Metre
MAF	Mass Air Flow
MAP	Manifold Absolute Pressure
max.	Maximum
MFU	Multi-function unit
MIL	Malfunction Indicator Lamp
min	Minimum
mm	Millimetre
mph	Mile per hour
Mpi	Multi-point injection
-	Minus (off tolerance)
'	Minute (angle)
MV	Megavolt
MY	Model Year
(-)	Negative (electrical)
Nm	Newton metre
No.	Number
o.dia.	Outside diameter
PAS	Power assisted steering
PCV	Positive crankcase ventilation
PTC	Positive temperature coefficient
pt	Pint
%	Percentage
±	Plus or minus
+	Plus (tolerance)
+	Positive (electrical)
lb	Pounds mass
r	Radius
:	Ratio
ref.	Reference
RES	Rover Engineering Standards
rev/min	Revolutions per minute
RH	Right-Hand
RHD	Right Hand Drive
"	Second (angle)
SOHC	Singe overhead camshaft
sp.gr	Specific gravity
std.	Standard
S/R	Sun Roof
SRS	Supplementary Restraint System
synchro	Synchroniser synchromesh
TDC	Top Dead Centre
TP	Throttle Position
UK	United Kingdom
US	United States
V	Volt
VIN	Vehicle Identification Number
VSS	Vehicle Speed Sensor
W	Watt

Specifications

Engine Tuning Data - ACCORD diesel ("L" Series)

2-1

Mode: Accord Turbo Diesel

Year: 1999 on

Engine

Type/Capacity 20T2N/1994 cm3 (cc)
Firing order 1 - 3 - 4 - 2
Compression ratio 19.5 : 1
Idle speed 805 ± 50 rev/min (rpm)

Electronic Diesel Control

Fuel injection pump
Make Bosch electronic
Type L 580

Injectors
Make Bosch 2 stage
Type 1 cylinder KBAL 70P45
2, 3, 4 cylinder KBAL 70P46
Opening pressure 20000 - 32000 kPa (200 - 330 kgf/cm²)

Glow plugs
Make BERU
Type 0100226 184

Specifications

Engine Tuning Data - Capacities, Fluids and Lubricants

2-2

CAPACITIES

Fuel tank	65 litres (Diesel fuel only)
Engine oil refill and filter change	
Service refill	5.0 litres
Overhaul Refill	6.5 litres
Manual gearbox refill	2.2 litres
Power gearbox refill	1.1 litres
Cooling system refill	3.2 litres
Washer reservoir	5.7 litres

FLUIDS

Brake Fluid

Use only AP New Premium Super DOT 4 brake fluid or Castro Girling Universal DOT 4 brake/clutch fluid. DO NOT use any other type of fluid.

Anti-freeze solutions

The overall anti-freeze concentration should not fall, by volume, below 50% to ensure that the anti-corrosion properties of the coolant are maintained. Anti-freeze concentrations greater than 60% are not recommended as cooling efficiency will be impaired.

Use **Honda Anti-freeze Coolant** to protect the cooling system.

The cooling system should be drained, flushed and refilled with the correct amount of anti-freeze solution at the intervals given on the Service Maintenance Check Sheet.



CAUTION

No other 'Universal' anti-freeze should be used with Honda Anti-freeze Coolant

If **Honda Anti-freeze Coolant** is not available, use an ethylene glycol based anti-freeze containing no methanol with non-phosphate corrosion inhibitors which meet specifications BS6580 and BS5117 suitable for use in mixed metal engines. To ensure the protection of the cooling system against corrosion, these anti-freezes must be renewed every 12 months.

After filling with anti-freeze solution, attach a warning label to a prominent position on the vehicle stating the type of anti-freeze contained in the cooling system to ensure that the correct type is used for topping up.

The recommended quantities of anti-freeze for different degrees of frost protection are:

Solution	Amount of anti freeze	Commences freezing	Frozen solid
	Litres	°C °F	°C °F
50%			
ACCORD			
Diesel model	3.5	-36 -33	-48 -53

Specifications

Engine Tuning Data - Capacities, Fluids and Lubricants

2-3

LUBRICATION

The engine and other lubricating systems are filled with high-performance lubricants giving prolonged life.



CAUTION

You should always use a high quality oil of the correct viscosity range in the engine and gearbox during maintenance and when topping-up. The use of oil not to the correct specification can lead to high oil and fuel consumption and ultimately to damaged components.

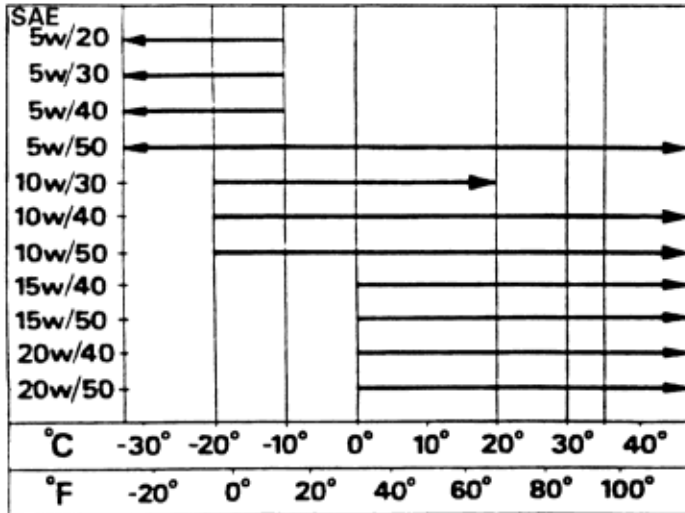
Oil to the correct specification contains additives which disperse the corrosive acids formed by combustion and prevent the formation of sludge which can block the oil ways. Additional oil additives should not be used.

Always adhere to the recommended servicing intervals.

Engine oil

Use oil meeting specification the requirements of CCMC G4 and having a viscosity ban recommended for the temperature range of your locality. Where oils to European specifications are not available, well know brands of oils meeting API SG or SG/CD or API SH quality should be used.

SERVICE LUBRICANTS - ALL SEASONS



ENGINE OIL VISCOSITY/TEMPERATURE RANGES

Manual gearbox

Use a transmission oil of API service SG or SH viscosity SAE 10W/40 for refill or topping-up.

Power Steering

Use a PSF-V.

General Greasing

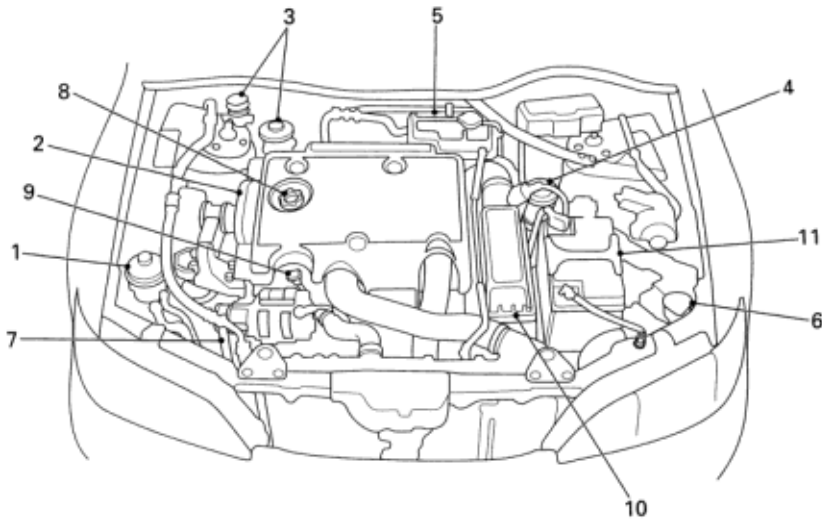
Use Multipurpose Lithium Base Grease N.L.G.I. consistency No. 2.

Bonnet latch

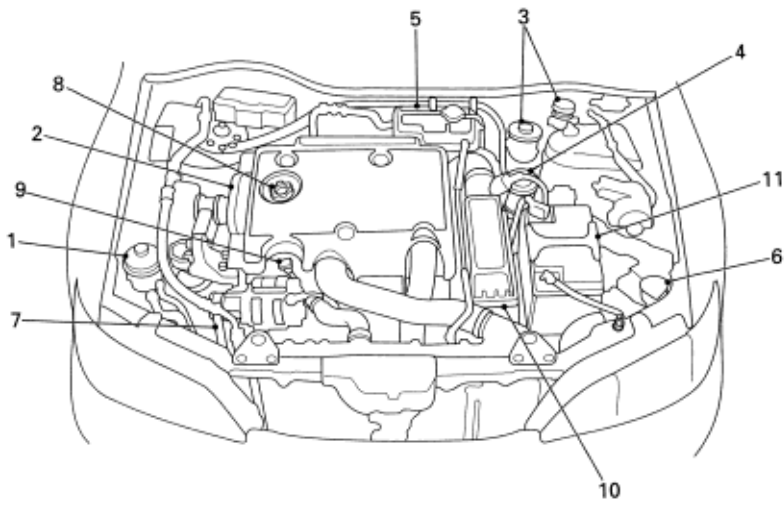
Lubricate cable and latch with oil.

Locks, Latches and Hinges

Use Door Lock and Latch Lubricant, Part No. VWN 10075



- 1. POWER STEERING RESERVOIR
- 2. CAMSHAFT DRIVE BELT
- 3. BRAKE AND CLUTCH FLUID RESERVOIRS
- 4. FUEL FILTER
- 5. COOLANT EXPANSION TANK
- 6. WINDSCREEN WASHER RESERVOIR
- 7. DRIVE BELT
- 8. ENGINE OIL FILLER CAP
- 9. ENGINE OIL DIPSTICK
- 10. AIR CLEANER
- 11. BATTERY



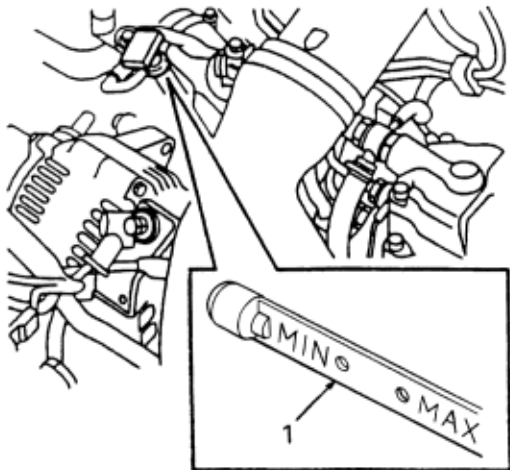
1. POWER STEERING RESERVOIR
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6. WINDSCREEN WASHER RESERVOIR
7. DRIVE BELT
8. ENGINE OIL FILLER CAP
9. ENGINE OIL DIPSTICK
10. AIR CLEANER
11. BATTERY

Check Engine and Transmission/Engine Oil and Filter**Check Engine and Transmission**

Visually inspect for oil leaks from the engine and transmission, pay particular attention to areas of gaskets and seals.

Engine Oil and Filter**Oil level check**

Always check oil level and drain oil with vehicle standing on level ground and use oil of specification API SG or SG/CD or API SH quality SAE 15W/40 for topping up or refilling.



1. Withdraw dipstick and wipe blade, re-insert dipstick fully, withdraw it and check oil level which must be maintained between 'MIN' and 'MAX' marks on dipstick.

**CAUTION**

Ensure NO oil drips onto the alternator when extracting the dipstick.

2. If required, remove filler cap and top-up with new engine oil to specification SAE 15W/40.

**CAUTION**

DO NOT raise oil level above the 'MAX' mark on dipstick.

Oil Drain and refill

Oil should always be drained when engine is warm.

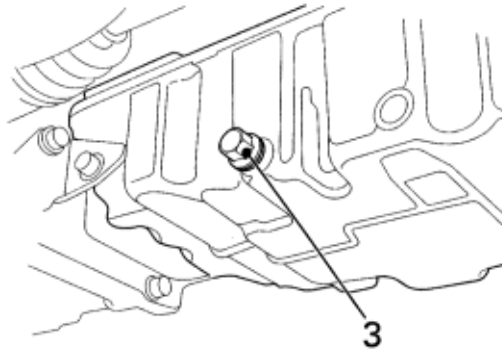
**WARNING**

After engine has been run, exhaust pipes will be hot; take care when working in this area. Observe due care when draining oil as oil can be very hot. Prolonged and repeated contact with used engine oil may cause serious skin disorders wash hands thoroughly after contact. Keep engine oil out of reach of children.

1. Raise front of vehicle.

**WARNING**

Support on safety stands.



2. Place a container beneath sump.
3. Remove drain plug and sealing washer, allow oil to drain; discard sealing washer.
4. Clean drain plug, fit new sealing washer and refit drain plug. Tighten drain plug to 45 Nm (4.6 kgf/m, 33 lbf/ft).
5. Remove oil filler cap, refill engine with oil to specification SAE 15W/40 until oil level is correct.

**CAUTION**

DO NOT raise oil level above the 'MAX' mark on dipstick.

6. Fit oil filler cap.
7. Remove container from beneath sump.
8. Fit oil drain plug.
9. Remove stand(s) and lower vehicle.

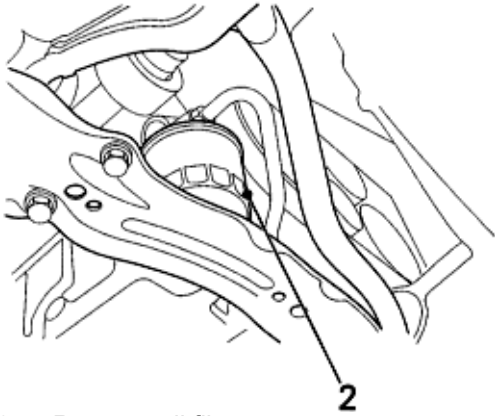
Oil filter renewal

Service Repair No. 12.60.04

Renew

1. Raise front of vehicle.

⚠ WARNING
Support on safety stands.



2. Remove oil filter.
3. Clean area around filter head and place a container beneath engine.
4. Using a strap wrench, unscrew and discard filter.
5. Clean mating face of filter head.
6. Lubricate sealing ring of new filter with engine oil.
7. Screw filter on to filter head by hand until it seats then tighten one complete turn or 17 Nm (1.7 kgf/m, 12 lbf/ft).
8. Fit filter.
9. Remove stand(s) and low vehicle.
10. Top-up engine with engine oil to specification SAE 15W/40 until level is correct.

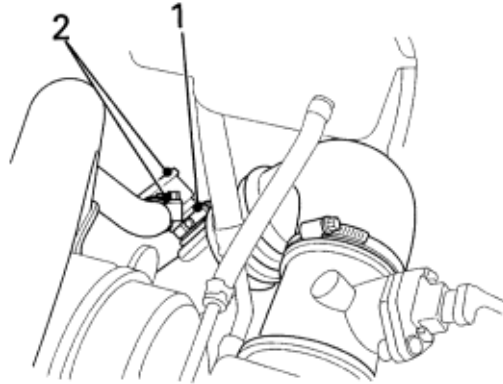
⚠ CAUTION
DO NOT raise oil level above the 'MAX' mark on dipstick.

11. Start and run engine and check for oil leaks.
12. Stop engine, wait a few minutes, then check oil level and top up if necessary.

⚠ CAUTION
Ensure NO oil drips onto the alternator when extracting the dipstick.

Service Repair 17.10.25

Remove



1. Slacken clip and release valve from air intake hose.
2. Slacken clip and remove valve from breather hose.

Refit

1. Fit valve to breather hose and tighten clip.
2. Connect valve to air intake hose and tighten clip.

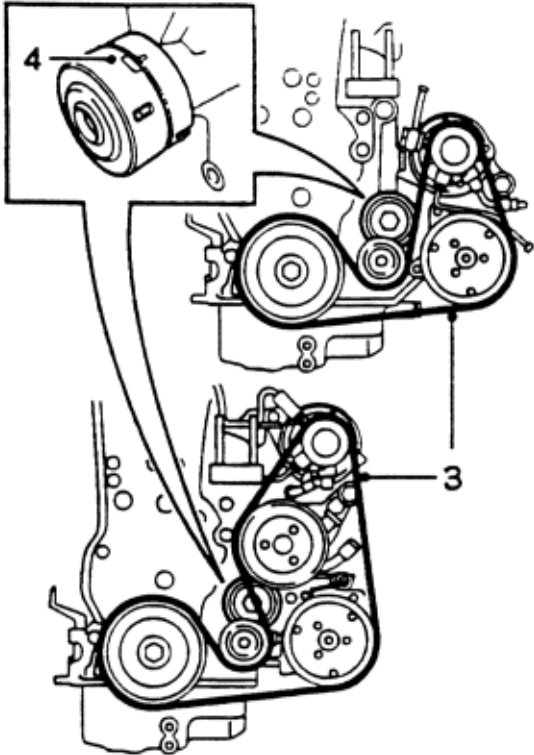
Service Repair No.
Check/adjust tension - 86.10.05
Renew - 86.10.03
Check condition

1. Raise front of vehicle.

WARNING

Support on safety stands.

2. Remove LH under tray, see **BODY - Repairs**.
3. Turn steering to RH lock.



4. Check condition of drive belt, renew a belt that shows signs of wear, splitting or oil.
5. Check belt length, belt must be renewed before indicator reaches RH end of slot.

Renew

1. Using a 15 mm (0.59 in) ring spanner on drive belt tensioner pulley bolt, rotate pulley fully clockwise and hold.
2. Using assistance, release drive belt from alternator pulley.
3. Remove drive belt from remaining pulleys and remove from vehicle.
4. Clean drive belt pulley grooves and ensure grooves are not damaged.

5. Fit new drive belt around pulleys, except alternator pulley, ensure belt is correctly aligned in pulley grooves.
6. Hold tensioner pulley fully clockwise, using assistance fit drive belt around alternator pulley.
7. Remove ring spanner from tensioner pulley bolt.
8. Refit LH under tray, see **BODY - Repairs**.
9. Remove stand(s) and lower vehicle.

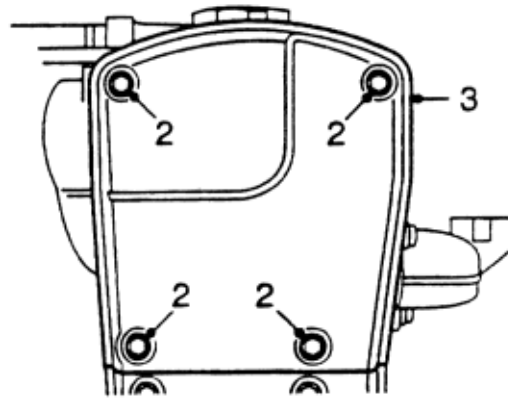
Camshaft Timing Belt Check

Service Repair No. 12.65.17

CAUTION

This check must be carried out at the service intervals specified in the Service maintenance Check Sheet and whenever carrying out any repair which requires the timing belt to be disturbed. Pay particular attention for signs of belt splitting at base of teeth.

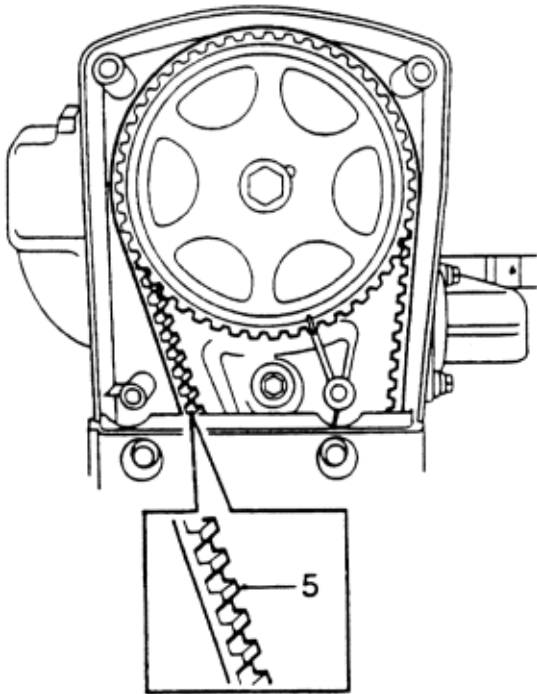
1. Disconnect battery earth lead.



2. Remove 4 bolts securing timing belt top cover.
3. Remove top cover.
4. Using a socket and extension bar on crankshaft pulley bolt, rotate engine a sufficient number of turns to enable timing belt to be inspected.

CAUTION

Do not use camshaft gears or retaining bolts to rotate engine.



5. Check timing belt for condition, renew any timing belt showing signs of oil contamination, cracking, fraying or splitting at base of teeth.



CAUTION

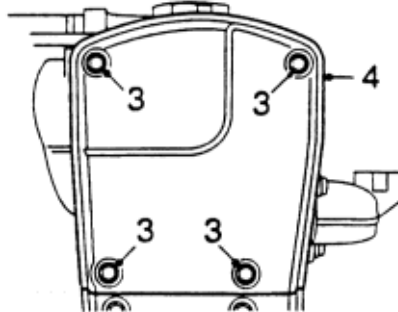
Cause of oil contamination, if present, must be rectified.

6. Clean timing belt top cover.
7. Position top cover.
8. Fit top cover securing bolts and tighten to 5 Nm (0.5 kgf/m 4 lbf/ft).
9. Connect battery earth lead.

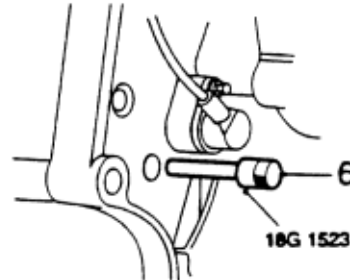
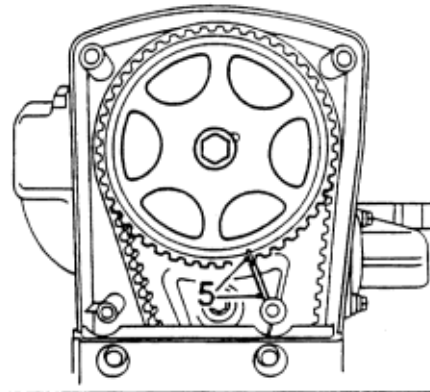
Service Repair 12.65.18

Remove

1. Disconnect battery earth lead.
2. Remove drive belt, see **Drive belt**.



3. Remove 4 bolts securing camshaft timing belt top cover.
4. Remove top cover.



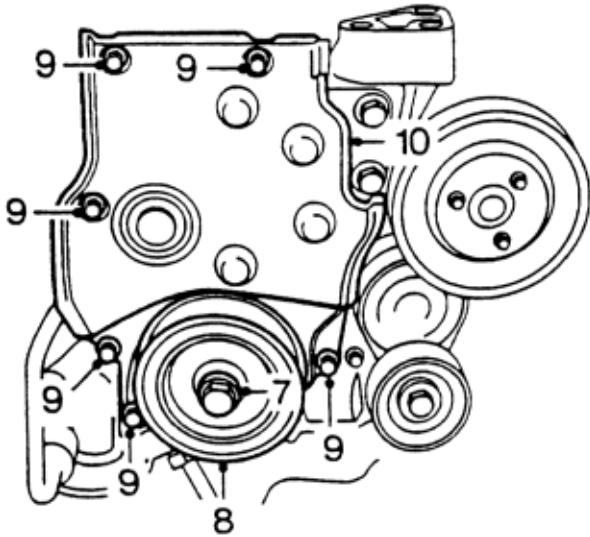
5. Using a socket and extension bar on crankshaft pulley bolt, rotate crankshaft clockwise to align timing marks on camshaft pulley to back cover.



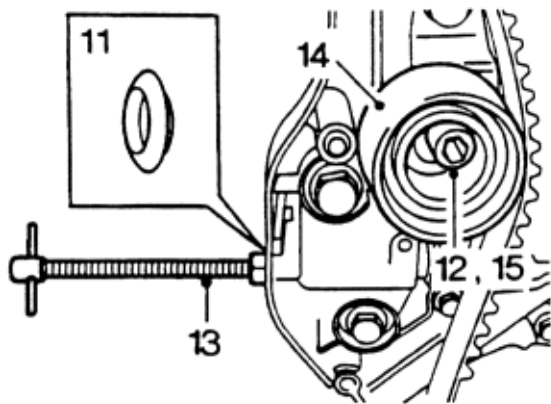
CAUTION

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the camshaft.

6. Insert timing pin tool **18G 1523** through hole in gearbox mounting back plate and into hole in flywheel.



7. Remove crankshaft pulley bolt.
8. Remove crankshaft pulley.
9. Remove 6 bolts securing camshaft timing belt lower cover.
10. Remove lower cover.

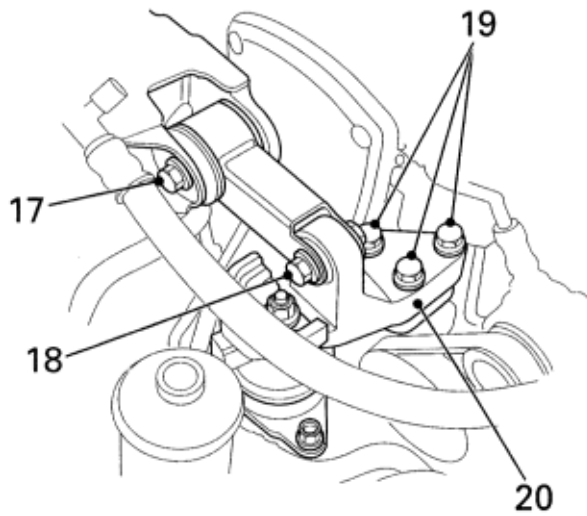


11. Remove camshaft timing belt tensioner access plug from timing belt rear cover.
12. Slacken Allen bolt securing tensioner pulley.
13. Fit tool **18G 1719** to tensioner.
14. Pull back camshaft timing belt tensioner plunger using tool **18G 1719**.
15. Tighten tensioner pulley Allen bolt.
16. Position trolley jack to support engine.

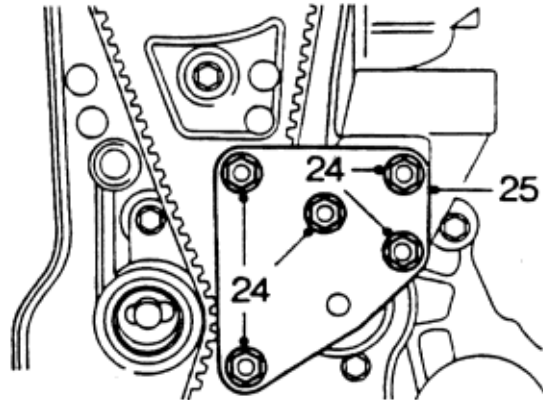


CAUTION

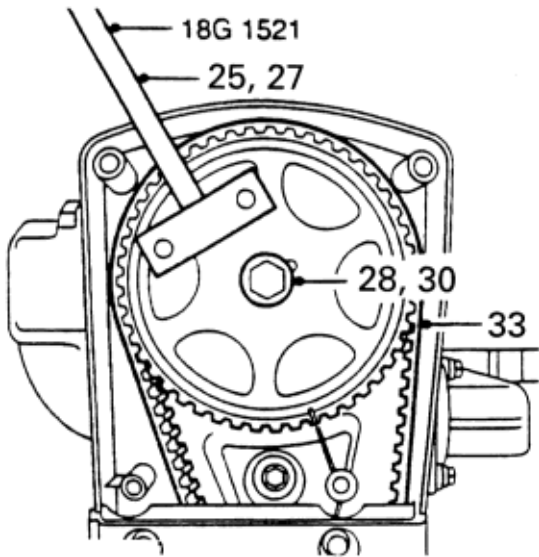
Use a block of wood or hard rubber pad to protect sump.



17. Remove bolt securing engine RH mounting tie to body bracket.
18. Slacken bolt securing engine RH mounting to tie.
19. Remove 3 bolts securing engine RH mounting to engine.
20. Remove engine RH mounting assembly
21. Raise engine on jack.



22. Remove 5 nuts securing engine RH mounting plate.
23. Remove engine mounting plate.
24. If timing belt is to be refitted, mark direction of rotation on belt.



25. Restrain camshaft gear using tool **18G 1521**.
26. Remove camshaft gear bolt.
27. Restrain camshaft gear using tool **18G 1521**.
28. Apply clean engine oil to threads of new bolt, fit camshaft gear bolt.
29. Tighten camshaft gear bolt to 20 Nm (2.0 kgf/m, 15 lbf/ft) + 90°.
30. Remove tool **18G 1521**.
31. Remove timing belt.

⚠ CAUTION

Ease timing belt off gears using fingers only. Metal levers may damage the belt and gears. Do not rotate engine with timing belt removed and cylinder head fitted. Timing belts must be stored and handled with care. Always store a timing belt on its edge with a bend radius greater than 50 mm (2.0 in). do not use a timing belt that has been twisted or bent double as this can fracture reinforcing fibres. Do not use an oil contaminated timing belt. Although the belt has a service life of 84,000 miles, (135,000 km), an existing belt should only be refitted if it has completed less than 42,000 miles, (68,000 km).

Refit

1. Clean timing belt gears and pulleys.

⚠ CAUTION

If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly washed with solvent before refitment. Because of the porous construction of sintered material, oil impregnated in the gear will emerge and contaminate a new belt.

2. Clean crankshaft pulley.

3. Using fingers only, fit timing belt to gears. Ensure the belt run between the crankshaft gear and the camshaft gear is kept taut during the fitting procedure.

⚠ CAUTION

If original belt is to be refitted, ensure direction of rotation is facing the correct way.

4. Fit plate to engine mounting studs.
5. Tighten nuts using the following procedure:
 - i. Tighten nuts to 30 Nm (3.1 kgf/m, 22 lbf/ft)
 - ii. Turn nuts through 120 degrees.
6. Fit engine RH mounting assembly.
7. Lower engine on jack to align engine mounting assembly.
8. Fit 3 bolts securing engine mounting to engine and tighten to 85 Nm (8.7 kgf/m, 63 lbf/ft).
9. Fit mounting restraint bar to mounting, fit and tighten 2 nuts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
10. Align mounting tie bar to body bracket, fit and tighten bolt to 90 Nm (9.2 kgf/m 67 lbf/ft).
11. Tighten bolt securing mounting tie bar to mounting to 90 Nm (9.2 kgf/m, 67 lbf/ft).
12. Remove trolley jack from vehicle.
13. Position camshaft timing belt lower cover, fit 7 bolts and tighten to 5 Nm (0.5 kgf/m, 4 lbf/ft).
14. Fit crankshaft pulley, fit bolt and tighten to 63 Nm (6.4 kgf/m, 46 lbf/ft). + 90°.
15. Slacken tensioner pulley Allen bolt.
16. Release camshaft timing belt tensioner plunger using tool **18G 1719**.
17. Remove timing pin tool **18G 1523** from flywheel.
18. Fit camshaft timing belt tensioner access plug from timing belt lower cover.
19. Rotate crankshaft 2 complete revolutions and align camshaft gear timing mark.
20. Tighten tensioner pulley Allen bolt to 44 Nm (4.5 kgf/m, 33 lbf/ft).

⚠ CAUTION

Do not exceed the specified torque figure.

21. Position camshaft timing belt top cover, fit 4 bolts and tighten to 5 Nm (0.5 kgf/m, 4 lbf/ft).
22. Fit drive belt, see **Drive belt**.
23. Connect battery earth lead.

Service Repair No. 12.65.52

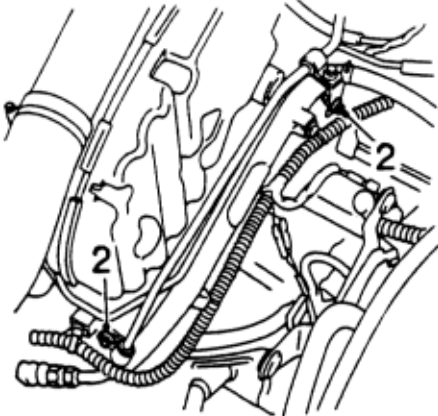
Remove



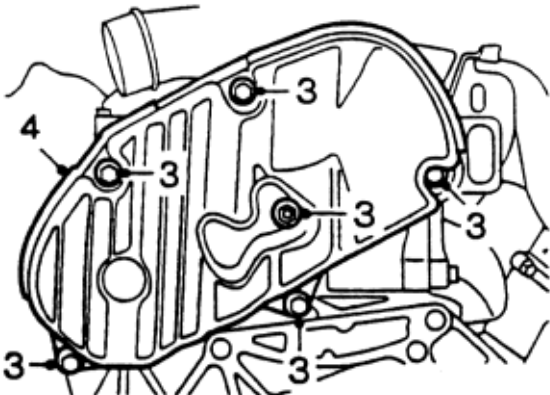
CAUTION

This check must be carried out at the service intervals specified on the service maintenance check sheet and whenever carrying out any repair which requires the timing belt to be disturbed. Pay particular attention for signs of the belt splitting at the base of teeth.

1. Remove air cleaner, see **ENGINE MANAGEMENT SYSTEM - Repairs**.



2. Remove 2 bolts securing PAS pipe to coolant rail.

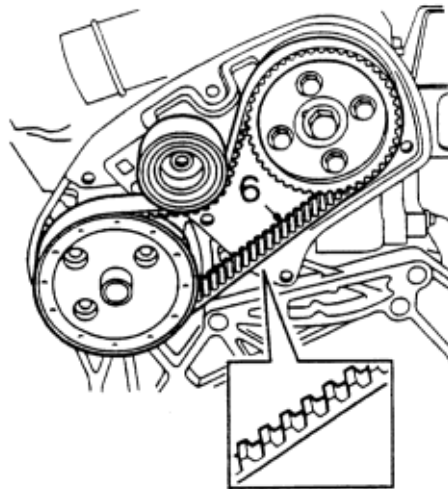


3. Remove 5 bolts and nut securing injection pump timing belt cover.
4. Remove injection pump timing cover.
5. Using a socket and an extension bar on the crankshaft pulley bolt, rotate the engine to enable all of the injection pump timing belt to be inspected.



CAUTION

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the engine.



6. Check timing belt for condition, renew any timing belt that shows signs of splits at base of teeth, fraying, oil contamination or uneven wear. Renew timing belt if it fails inspection, see **Injection pump timing belt**.



CAUTION

Cause of oil contamination must be rectified.

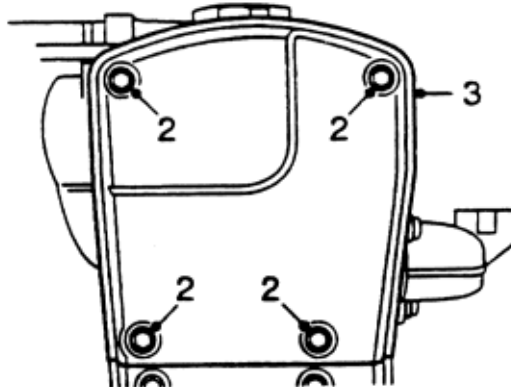
7. Clean injection pump timing belt cover.
8. Position injection pump timing belt cover fit nut and bolts and tighten to 5 Nm (0.5 kgf/m, 4 lbf/ft).
9. Fit air cleaner, see **ENGINE MANAGEMENT SYSTEM - Repairs**.

Injection Pump Timing Belt

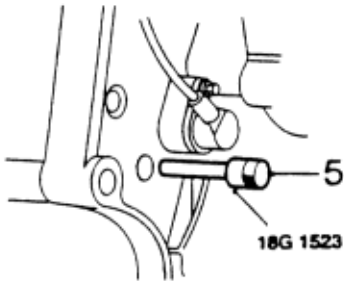
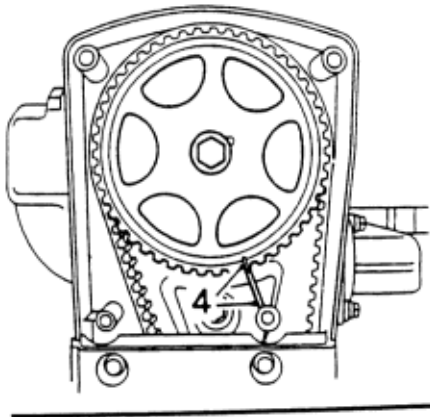
Service Repair No. 12.65.51

Remove

1. Remove air cleaner, see **ENGINE MANAGEMENT SYSTEM - Repairs**.



2. Remove 4 bolts securing camshaft timing belt top cover.
3. Remove camshaft top cover.

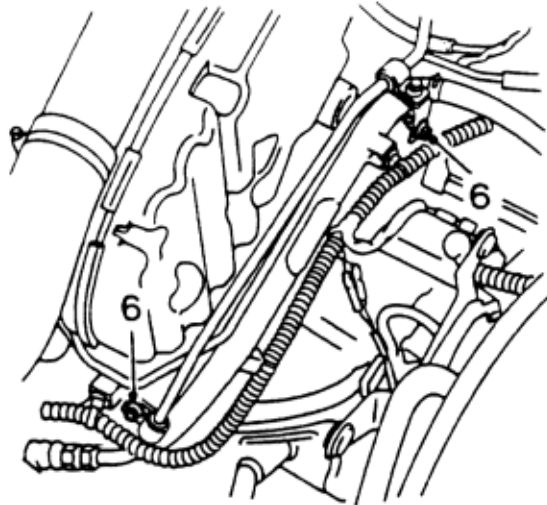


- Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft clockwise to align timing marks on camshaft pulley and back cover.

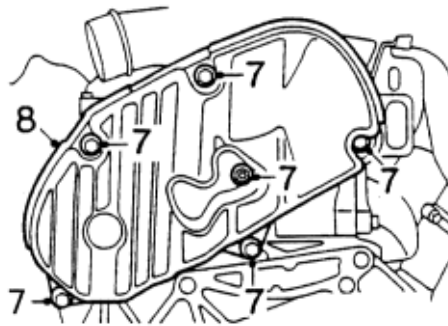
CAUTION

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the camshaft.

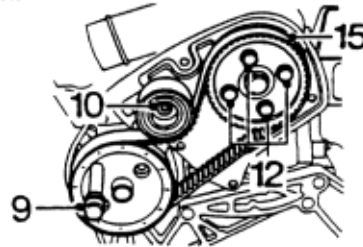
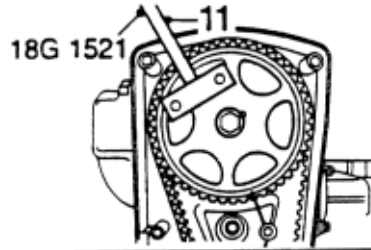
- Insert timing pin tool **18G 1523** through hole in gearbox mounting plate and into hole in flywheel.



- Remove 2 bolts securing PAS pipe to coolant rail.



- Remove 5 bolts and nut securing injection pump timing belt cover.
- Remove injection pump timing cover.



- Insert locking pin tool **18G 1717** through injection pump drive gear and into hole in mounting plate.
- Slacken Allen bolt securing tensioner pulley to mounting plate.
- Restrain front camshaft gear using tool **18G 1521**.
- Slacken 4 bolts securing rear camshaft gear to boss.
- If drive belt is to be refitted, mark direction of rotation on belt.
- Move tensioner aside.
- Remove injection pump timing belt.

CAUTION

Ease timing belt off gears using fingers only. Metal levers may damage the belt and gears. Timing belts must be stored and handled with care. Always store a timing belt on its edge with a bend radius greater than 50 mm, do not use a timing belt that has been twisted or bent double as this can fracture reinforcing fibres. Do not use an oil contaminated timing belt. Although the belt has a service life of 84,000 miles, (135,000 km), an existing belt should only be refitted if it has completed less than 42,000 miles, (68,000 km).

Refit

1. Clean timing belt and gears.



CAUTION

If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly washed with solvent before refitment. Because of the porous construction of sintered material, oil impregnated in the gear will emerge and contaminate a new belt. Cause of oil contamination must be rectified.

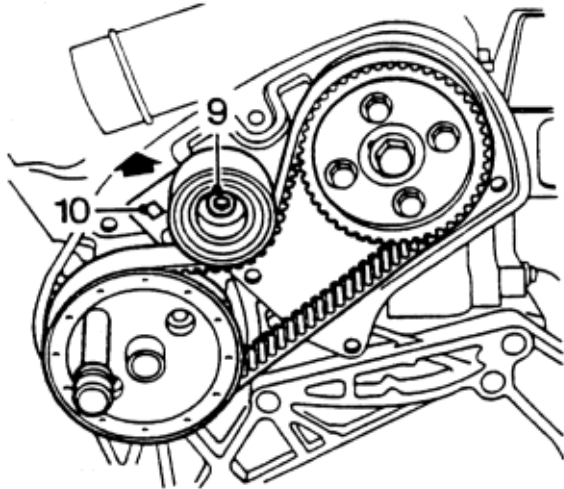
2. Using fingers only, fit timing belt to gears.



CAUTION

If original belt is to be refitted, ensure direction of rotation is facing the correct way.

3. Push timing belt tensioner against belt to remove all slack and tighten tension Allen bolt, do not torque fixing at this stage.
4. Restrain front camshaft gear using tool **18G 1521**.
5. Tighten 4 camshaft gear to boss bolts to 25 Nm (2.5 kgf/m, 18 lbf/ft).
6. Remove tool **18G 1521**.
7. Remove injection pump gear locking pin and engine timing pin.
8. Rotate crankshaft 2 complete turns clockwise until the timing pin and locking pin can be refitted.



9. Slacken timing belt tensioner Allen bolt.
10. Using a dial gauge torque wrench apply a force of 18 kgf (180 N) to the tensioner to tension the belt, tighten tensioner Allen bolt to 44 Nm (4.5 kgf/m 33 lbf/ft).
11. Remove injection pump gear locking pin and engine timing pin.
12. Position injection pump timing belt cover, fit nut and bolts and tighten to 5 Nm (0.5kgf/m, 4 lbf/ft).

13. Fit camshaft timing belt top cover, fit bolts and tighten to 5 Nm (0.5 kgf/m 4 lbf/ft).
14. Fit and tighten bolts securing PAS pipe to coolant rail.
15. Fit air cleaner, see **ENGINE MANAGEMENT SYSTEM - Repairs**.

Fuel System Hoses, pipes and unions

1. Check fuel pipes and connections for chafing and leakage.
2. Check pipes are securely clipped.
3. Check fuel tank connections for security.
4. Check fuel tank is free from leaks and corrosion.
5. Check fuel tank for security of fixings.

Fuel Filter

Service Repair No. 19.25.02

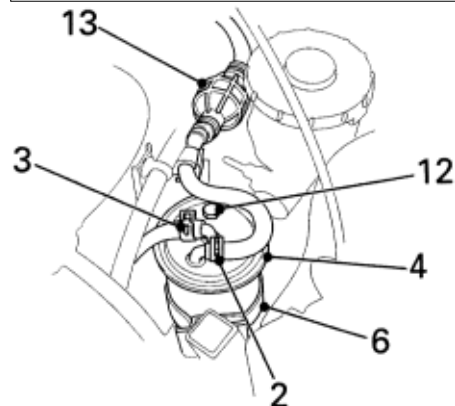
Renew

1. Position absorbent cloth beneath fuel filter.



CAUTION

Avoid any fuel spillage onto starter motor.



2. Release clip and disconnect fuel inlet hose from filter.
3. Release clip and disconnect fuel outlet hose from filter.
4. Remove fuel filter from body mounting bracket.
5. Slacken fuel filter bracket clamp bolt.
6. Remove fuel filter bracket.
7. Fit fuel filter bracket to new filter.

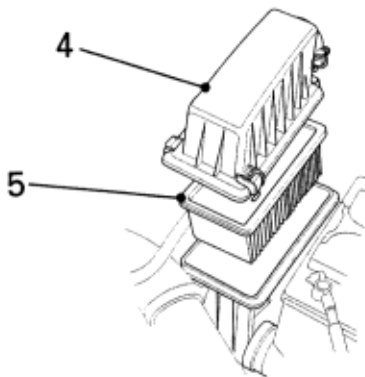
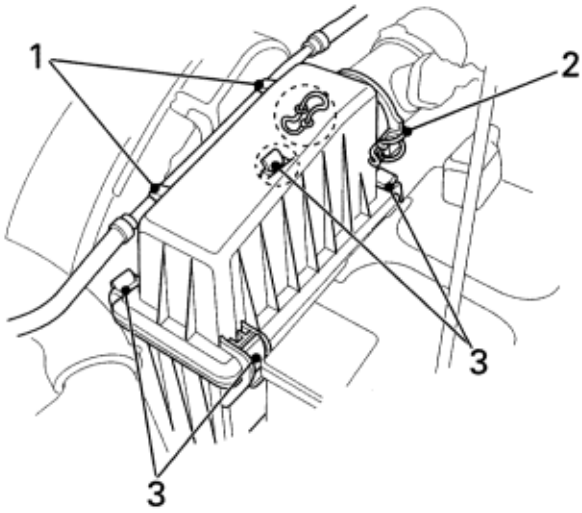
Fuel Filter (cont'd)/Air Cleaner Element

8. Tighten fuel filter bracket clamp bolt.
9. Fit fuel filter to body mounting bracket.
10. Connection fuel outlet hose to filter and secure clip.
11. Connect fuel inlet hose to filter and secure clip.
12. Slacken bleed screw.
13. Repeatedly squeeze fuel hand primer until fuel, issuing from bleed screw is free from air bubbles; tighten bleed screw.
14. Continue to squeeze fuel hand primer until resistance is felt.
15. Remove absorbent cloth.

Air Cleaner Element

Service Repair No. 19.10.10

Renew



1. Release expansion tank return pipe from 2 clips on air cleaner.
2. Release 2 clips securing air flow meter housing to air cleaner.
3. Release 4 clips retaining air cleaner cover.
4. Release and remove cover from air cleaner casing.

5. Remove and discard air cleaner element.
6. Clean inside air cleaner casing and cover.
7. Fit new air cleaner element to casing.
8. Position cover, ensure seal is located in groove and secure with clips.
9. Position air flow meter housing to air cleaner and secure with clips.
10. Secure expansion tank return pipe to clips on air cleaner.

Engine Tuning

Tuning the HONDA ACCORD electronic diesel control (EDC) fuel system must be carried out using Testbook.

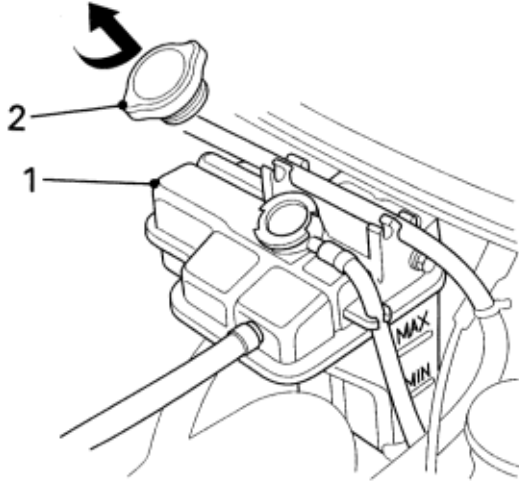
⚠ WARNING

Since injury such as scalding could be caused by escaping steam or coolant, do not remove the pressure relief cap from the expansion tank while system is hot. Wait until system has cooled, use a cloth or gloves to protect hands from escaping steam.

Check level and top-up.

⚠ CAUTION

The coolant level should only be checked when the system is cold.



1. Visually check that the coolant level is below flange on expansion tank. If level is appreciably low, suspect leakage or overheating.

⚠ CAUTION

If coolant is not visible in expansion tank, the system must be refilled in accordance with the Refill procedure.

2. If required, remove coolant expansion tank cap and top-up with the correct anti-freeze mixture to just above the tank flange, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.

⚠ CAUTION

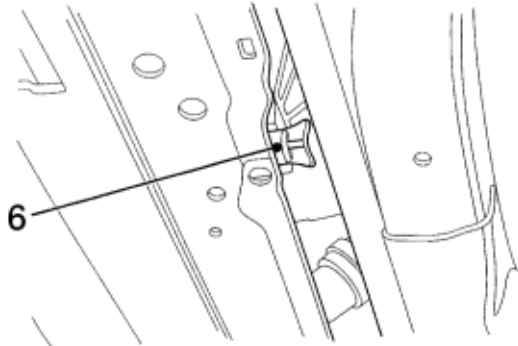
The coolant level must not exceed the maximum level indicator.

3. Check specific gravity of coolant. The overall anti-freeze concentration must not be less than 50% by volume.
4. Refit expansion tank cap.

Drain and refill

Service Repair No. 26.10.01

1. Visually check engine and cooling system for coolant leaks.
2. Examine hoses for signs of cracking, distortion and security of connections.
3. Move heater control to 'HOT' position.
4. Remove cap from expansion tank.
5. Position container to collect drained coolant.



6. Slacken radiator drain plug and allow coolant to drain.
7. Flush system with water under low pressure.

⚠ CAUTION

High pressure water could damage the radiator.

8. Tighten the radiator drain plug.
9. Fill system slowly through coolant expansion tank until the coolant reaches the 'MAX' level indicator.
10. Fit coolant expansion tank cap.
11. Start and run engine until the radiator cooling fan operates. Do not operate the air conditioning system (if fitted).
12. Switch of engine and allow to cool.
13. Check for coolant leaks and top-up coolant to 'MAX' level indicator.

Exhaust System

1. Check for damage and signs of leakage.
2. Check security of system.
3. Check mountings and correct alignment.
4. Check security of heat shields.

Clutch

1. Check operation of clutch and free movement of pedal and release lever.
2. Check fluid level in clutch master cylinder and top-up with Brake Fluid, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.

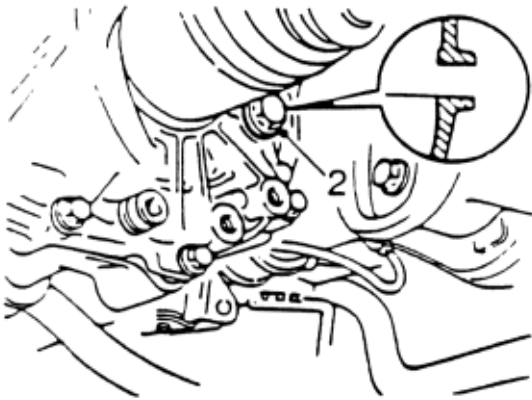
Gearbox

Oil level check and top-up

Ensure vehicle is standing on level surface.

1. Raise vehicle on a ramp.
2. Remove LH under belly panel, see **BODY - Repairs**.
3. Wipe clean area around filler/level plug.

Check level and top-up.



4. Remove filter/level plug.
5. Check that oil is level with bottom of filter/level plug hole.

CAUTION
Oil lodged behind filler/level plug will trickle out when plug is removed and can give impression that level is correct.

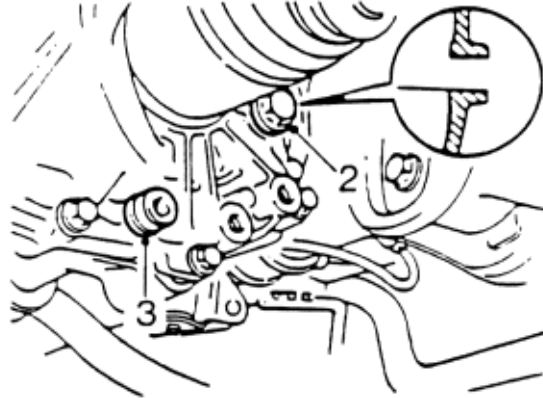
6. Top-up, if required, until oil just runs from filler-level hole. Use the correct specification oil, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.
7. fit filler/level plug and tighten to 40 Nm (4.1 kgf/m 30 lbf/ft).

Drain oil and refill

The oil should be drained when gearbox is warm.

WARNING
Observe due care when draining gearbox as the oil can be very hot.

1. Place a container beneath gearbox.



2. Remove filler/level plug.
3. Remove drain plug and discard sealing washer; allow oil to drain.
4. Clean gearbox drain plug and fit new sealing washer.
5. Fit gearbox drain plug and tighten to 45 Nm (4.6 kgf/m, 34 lbf/ft).
6. Fill gearbox through filler/level plug hole with the specified oil. Allow sufficient time for oil to reach a common level within gearbox. Use the correct specification oil, see **INFORMATION - CAPACITIES, FLUIDS AND LUBRICANTS**.
7. Fit filler/level plug and tighten to 40 Nm (4.1 kgf/m, 30 lbf/ft).
8. Fit LH under belly panel, see **BODY - Repairs**.
9. Lower ramp.

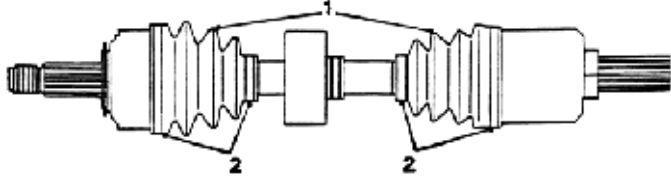
1. Raise front of vehicle.



WARNING

Support on safety stands.

2. Remove LH under tray, see **BODY - Repairs**.

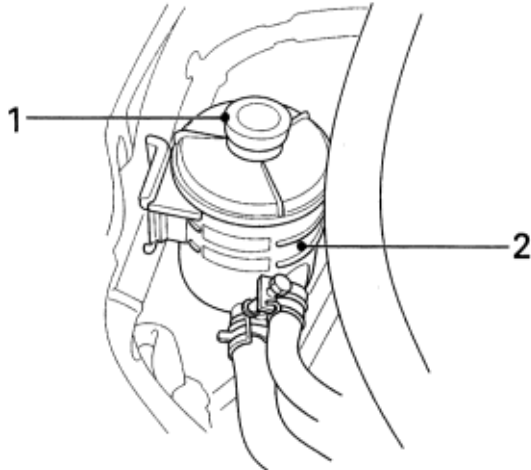


3. Check that drive shaft gaiters are not twisted, split or damaged.
4. Check clips are secure.
5. Fit LH under tray, see **BODY - Repairs**.
6. Remove stand(s) and lower vehicle.

Steering

Check and top-up power steering fluid

NOTE: It is essential that the power steering system is not operated once the engine has been stopped.



1. Clean reservoir around filler cap and level indicators.
2. Visually check fluid level is between level indicators.
3. If required, remove filler cap and top-up with Genuine Honda Power Steering Fluid V. **Do not overfill.**

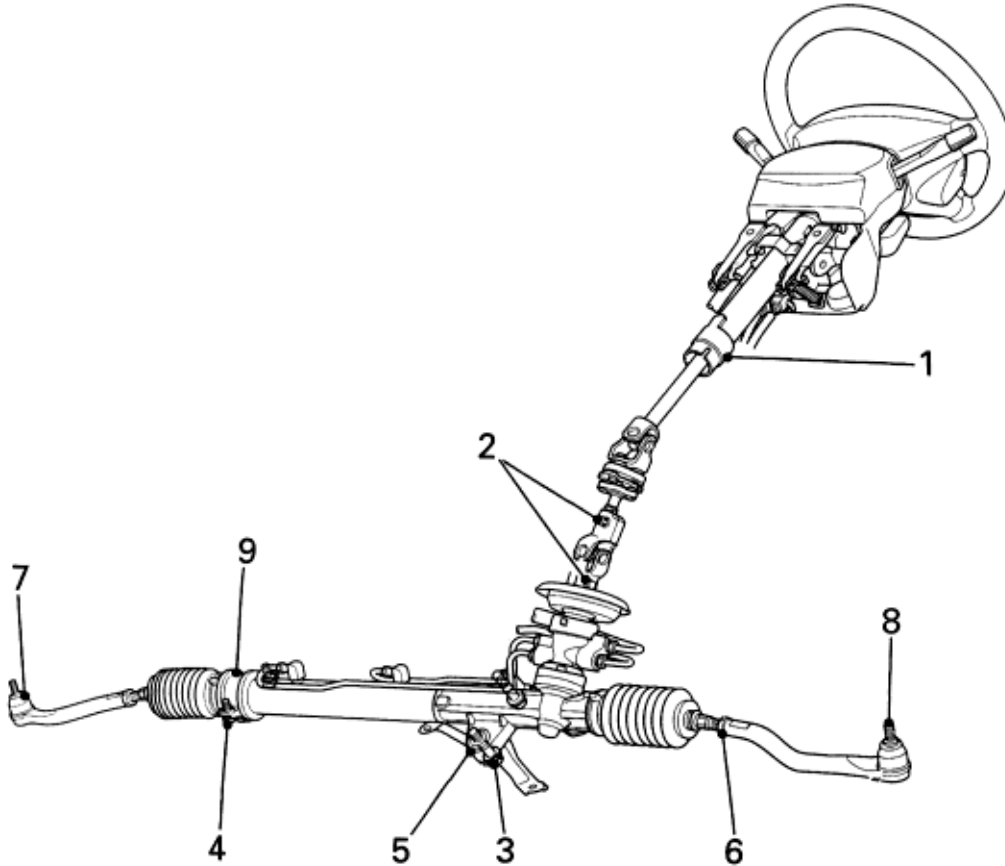


CAUTION

Ensure no dirt is allowed to enter reservoir when cap is removed.

4. Refit filler cap.

Steering column, rack, joints and gaiters



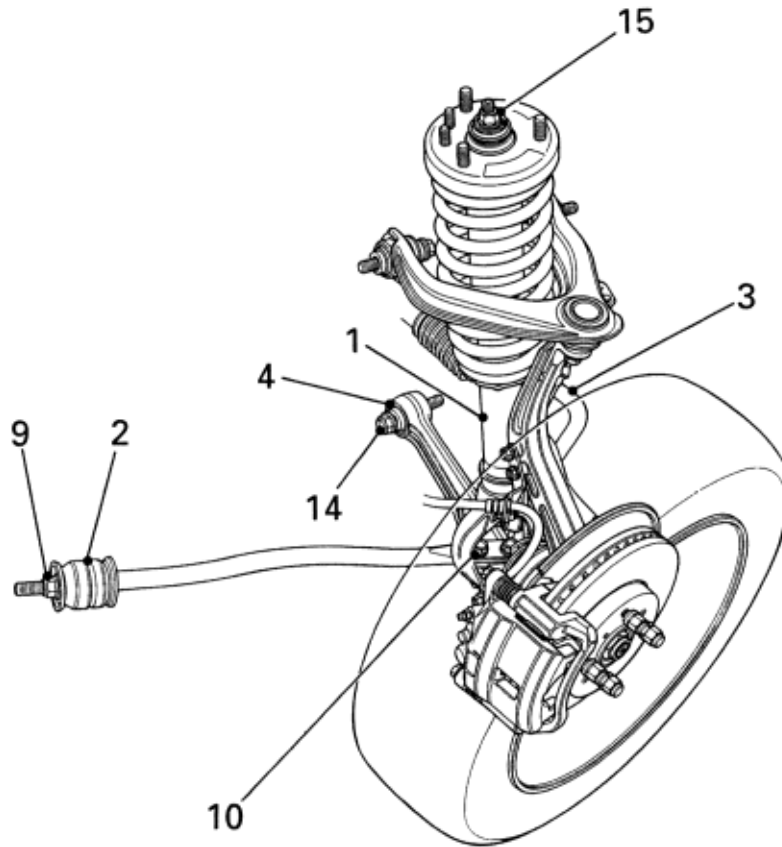
1. Check steering column to body mounting bolts are tight.
2. Check steering column universal joint bolts - 28 Nm (2.9 kgf/m, 21 lbf/ft).
3. Check steering rack to body, bolts - 43 Nm (4.4 kgf/m, 32 lbf/ft).
4. Check steering rack clamp to body, bolts - 43 Nm (4/4 kgf/m, 32 lbf/ft).
5. Inspect steering rack mounting rubbers for signs of deterioration.
6. Restrain ball joint movement and check that steering track rod locknuts are tightened to 45 Nm (4.6 kgf/m, 33 lbf/ft).
7. Check steering rack ball joint boots for signs of damage or deterioration.
8. Check that split pins are fitted to all ball joint nuts.
9. Visually check that the rack sealing gaiters are not twisted or damaged and clips are secure.
10. Check for signs of lubricate leakage.

Maintenance

Suspension Dampers, Ball Joints, Fixings and Gaiters

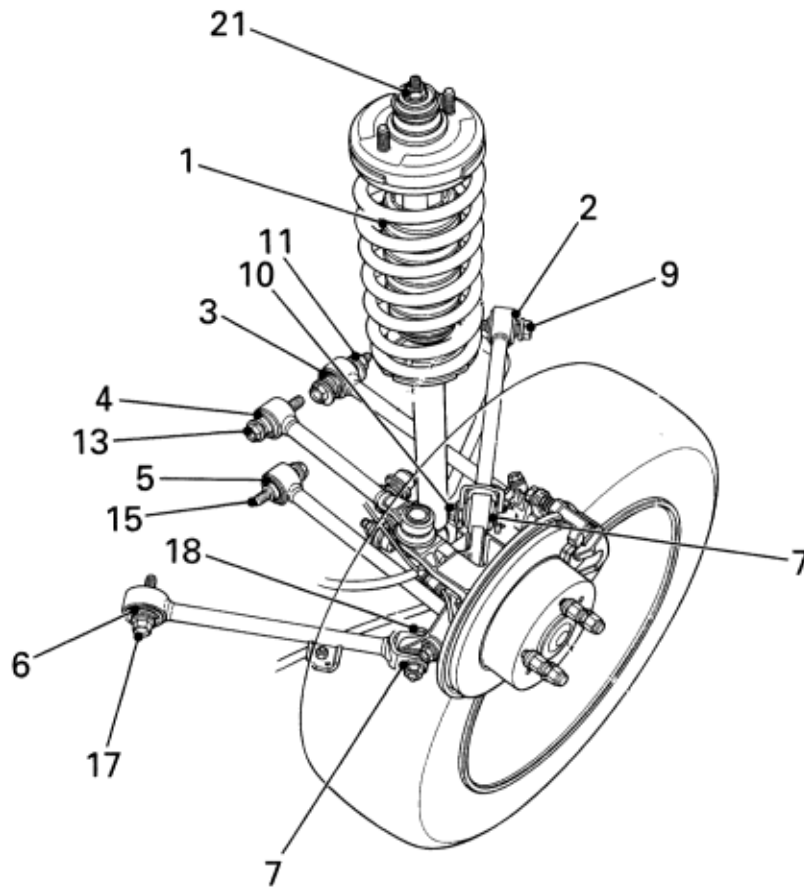
3-18

Front suspension



1. Check suspension dampers for oil leaks.
2. Check condition of radius rod bushes.
3. Check condition of stabiliser bar bushes.
4. Check condition of lower arm bushes.
5. Check that a split pin is fitted to lower arm ball joint nuts.
6. Tie-rod end ball joint nut - 43 Nm (4.4 kgf/m, 32 lbf/ft).

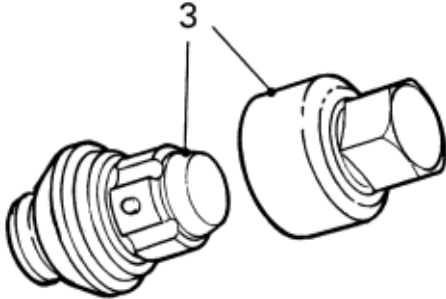
7. Damper fork pinch bolt - 43 Nm (4.4 kgf/m, 32 lbf/ft).
8. Damper fork to lower arm nut - 64 Nm (6.5 kgf/m, 47 lbf/ft).
9. Check radius rod front mounting nut - 54 Nm (5.5 kgf/m, 40 lbf/ft).
10. Check radius rod to lower arm bolts - 181 Nm (18.5 kgf/m, 134 lbf/ft).
11. Check damper top mounting nuts - 38 Nm (3.9 kgf/m, 28 lbf/ft).
12. Check stabiliser bar to lower arm nuts - 39 Nm (4.0 kgf/m, 29 lbf/ft).
13. Check stabiliser bar clamp bolts - 39 Nm (4.0 kgf/m, 29 lbf/ft).
14. Check lower arm to body bolt - 64 Nm (6.5 kgf/m, 47 lbf/ft).
15. Check damper top nut - 29 Nm (3.0 kgf/m, 22 lbf/ft).

Rear suspension

1. Check suspension dampers for oil leaks.
2. Check condition of leading arm bush.
3. Check condition of control arm bushes.
4. Check condition of upper arm bush.
5. Check condition of lower arm bushes.
6. Check condition of trailing arm bush.
7. Check condition of knuckle bushes.
8. Check damper top mounting, nuts - 38 Nm (3.9 kgf/m, 28 lbf/ft).
9. Check leading arm to body, bolt - 59 Nm (6.0 kgf/m, 43 lbf/ft).
10. Check leading arm to knuckle, bolt - 59 Nm (6.0 kgf/m, 43 lbf/ft).
11. Check control arm to body, nut - 54 Nm (5.5 kgf/m, 40 lbf/ft).
12. Check control arm to knuckle, nut - 59 Nm (6.0 kgf/m, 43 lbf/ft).
13. Check upper arm to body, bolt - 59 Nm (6.0 kgf/m, 43 lbf/ft).
14. Check upper arm to castle nut - 49 - 50 Nm (5.0 - 6.0 kgf/m, 36 - 43 lbf/ft).
15. Check lower arm to body, bolt - 59 Nm (6.0 kgf/m, 43 lbf/ft).
16. Check lower arm to knuckle, nut - 59 Nm (6.0 kgf/m, 43 lbf/ft).
17. Check trailing arm to body, bolt - 39 Nm (4.0 kgf/m, 29 lbf/ft).
18. Check trailing arm to knuckle, bolt - 59 Nm (6.0 kgf/m, 43 lbf/ft).
19. Check stabiliser to stabiliser link, nut - 38 Nm (3.9 kgf/m, 28 lbf/ft).
20. Check stabiliser to body, bolt - 22 Nm (2.2 kgf/m, 16 lbf/ft).
21. Check damper self-locking nut - 29 Nm (3.0 kgf/m, 22 lbf/ft).

1. Check condition of road wheels including spare for signs of cracking and rim damage.

NOTE: Steel wheels: Wheels are removed without disturbing wheel covers.



Alloy wheels

2. Push extractor tool **18G 1722** over head of nut cover and pull to remove.
3. Fit key socket over locking wheel nut, then fit wheel nut spanner over key socket and unscrew.

All wheels

4. Working in a diagonal sequence slacken each nut 1/2 turn and then tighten to 108 Nm (11.0 kgf/m, 80 lbf/ft).

Type Pressures and Condition

1. Check for signs of tyre wear indicator in tread pattern.
2. Check all tyres including spare for uneven wear, external cuts in fabric, exposure of ply or cord structure, lumps and bulges.
3. Check and adjust tyre pressures, see **INFORMATION - GENERAL DATA**.

Footbrake Check



1. Press brake pedal and check for firm resistance after short pedal movements.

Handbrake Check

1. Apply handbrake lever one notch at a time and count number of notches to apply the brakes firmly, equivalent to 196 N (20 kgf) pull applied at 50 mm from end of lever.

DATA: Handbrake lever travel = 6-9 notches.

2. Adjust handbrake cable tension if travel is outside limits.

CAUTION

Handbrake travel must not be less than 6 notches.

Adjustment

Service Repair No. 70.35.10

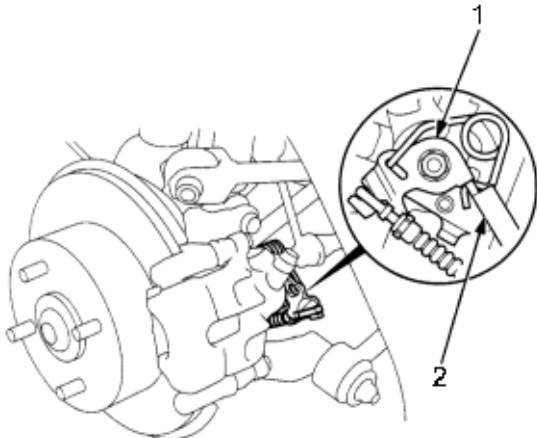
NOTE: After rear brake calliper servicing, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

1. Raise the rear of the vehicle and made sure it is securely supported.

WARNING

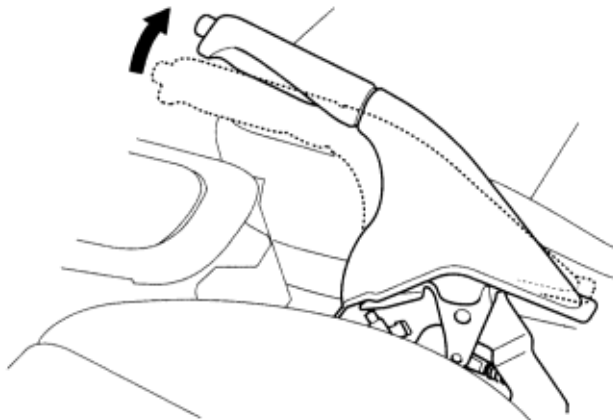
Block the front wheels before jacking up the rear of the vehicle.

2. Make sure the parking brake arm on the rear brake calliper contacts the cable abutment

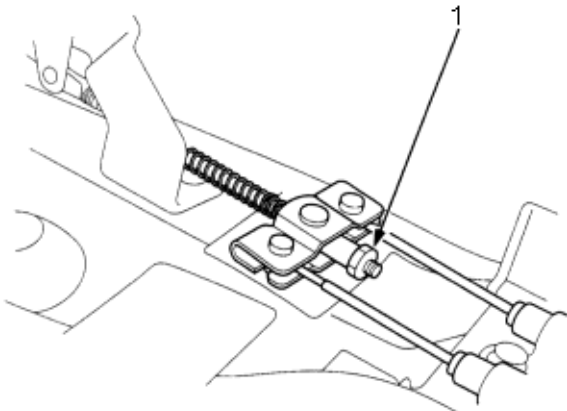


1. PARKING BRAKE ARM
2. CABLE ABUTMENT

3. Remove rear console end cover.
4. Pull the parking brake lever up one notch.



5. Tighten the adjusting nut until the parking brakes drag slightly when the rear wheels are turned.



1. ADJUSTING NUT

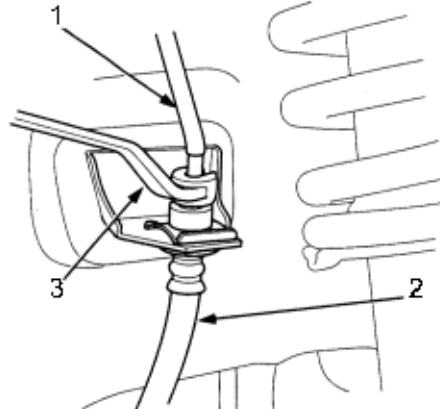
6. Release the parking brake lever fully and check that the parking brakes do not drag when the rear wheels are turned. Readjust if necessary.
7. Make sure the parking brakes are fully applied when the parking brake lever is pulled up fully.
8. Reinstall the rear console end cover.

1. Visually check all brake fluid pipes, hoses and connections for correct routing and security.
2. Check for signs of chafing, leakage or corrosion.

Hose Replacement

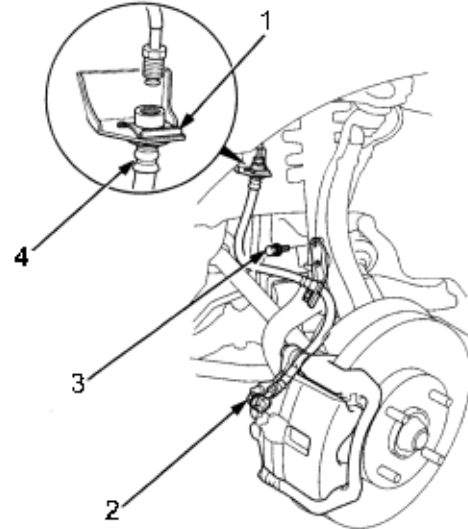
NOTE:

- ♦ Before reassembling, check that all parts are free of dust and other foreign particles.
 - ♦ Replace parts with new ones whenever specified to do so.
 - ♦ Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
1. Replace the brake hose if the hose is twisted, cracked, or if it leaks.
 2. Disconnect the brake hose from the brake line using a 10 mm (0.39 in) flare -nut wrench.



1. BRAKE LINE
2. BRAKE HOSE
3. FLARE NUT WRENCH
(Commercially available)

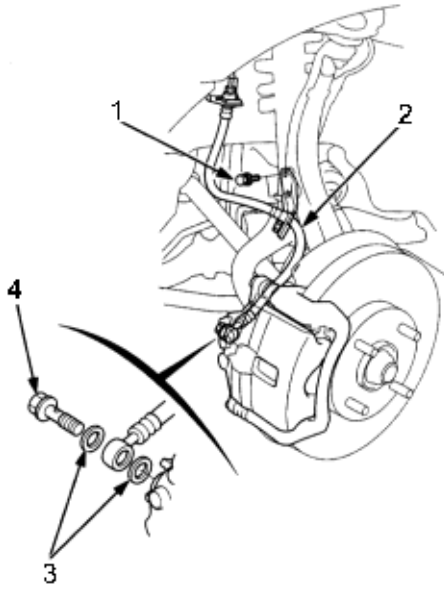
3. Remove and discard the brake hose clip from the brake hose.



1. BRAKE HOSE CLIP
Replace.
2. BANJO BOLT
3. BRAKE HOSE MOUNTING BOLTS
4. BRAKE HOSE

4. Remove the banjo bolt and disconnect the brake hose from the calliper.
5. Remove the brake hose from the knuckle.

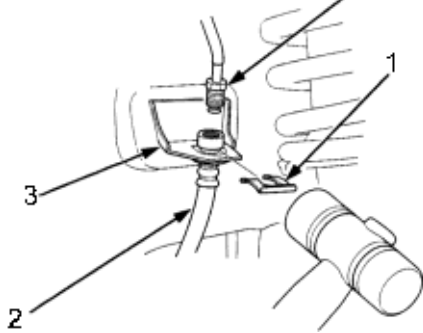
6. Install the brake hose on the knuckle with two 6 mm (0.2 in) brake hose mounting bolts first, then connect the brake hose to the calliper with the banjo bolt and new sealing washers.



1. BRAKE HOSE MOUNTING BOLTS
6 x 1.0 mm 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
2. BRAKE HOSE
3. SEALING WASHER
Replace.
4. BANJO BOLT
34 Nm (3.5 kgf/m, 25 lbf/ft)

7. Install the brake hose on the upper brake hose bracket with a new brake hose clip.

15 N·m (1.5 kgf·m, 11 lbf·ft)



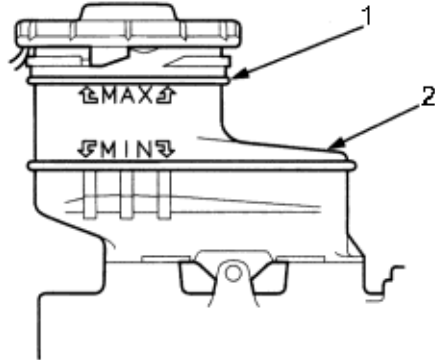
1. BRAKE HOSE CLIP
Replace.
2. BRAKE HOSE
3. UPPER BRAKE HOSE BRACKET

8. Connect the brake line to the brake hose.
9. After installing the brake hose, bleed the brake system.
10. Perform the following checks.
 - ♦ Check the brake hose and line joint for leaks and tighten if necessary.
 - ♦ Check the brake hoses for interference and twisting.

Bleeding

NOTE:

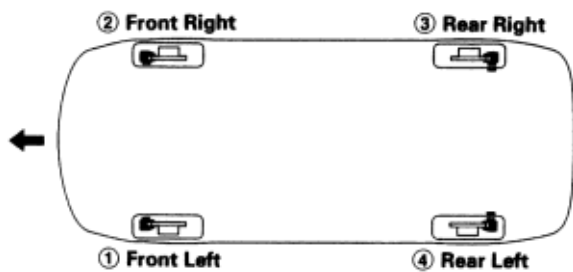
- ◆ Do not reuse the drained fluid.
 - ◆ Use only clean Genuine Honda brake fluid or an equivalent DOT 3 or DOT 4 brake fluid.
 - ◆ Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
 - ◆ Do not spill brake fluid on the vehicle, it may damage the paint; wash it off immediately with water.
 - ◆ The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of bleeding procedure and checked after bleeding each brake calliper. Add fluid as required.
1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line.



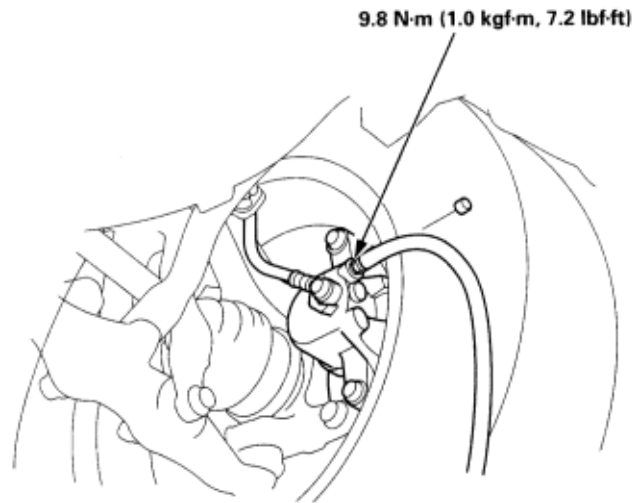
1. MAX (upper) LEVEL LINE
2. RESERVOIR

2. Have someone slowly pump the brake pedal several times, then apply steady pressure.
3. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
4. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the field.
5. Refill the master cylinder reservoir to the MAX (upper) level line.

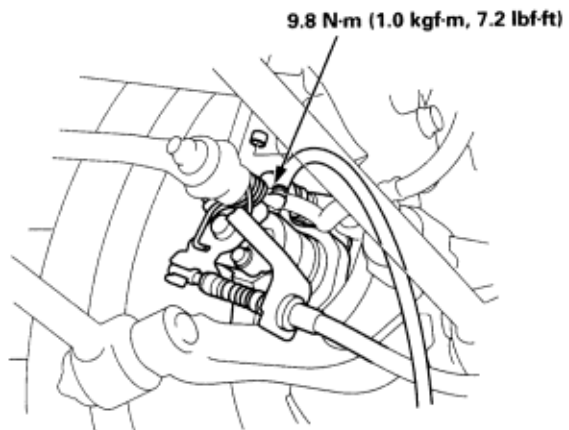
BLEEDING SEQUENCE:



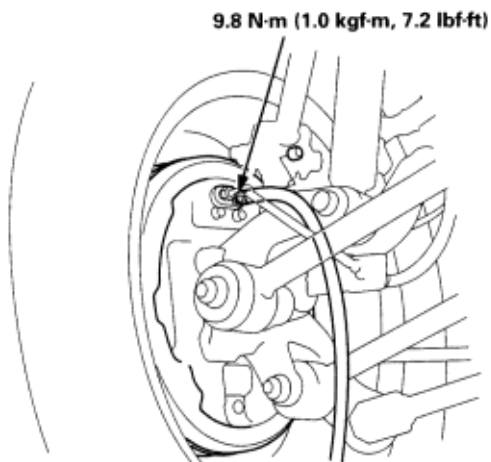
FRONT:



REAR DISC BRAKE:



REAR DRUM BRAKE:



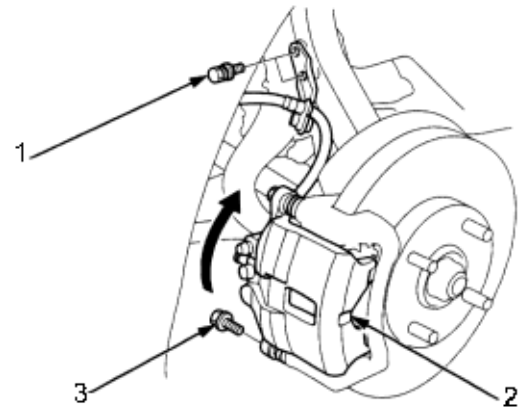
Check

CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner

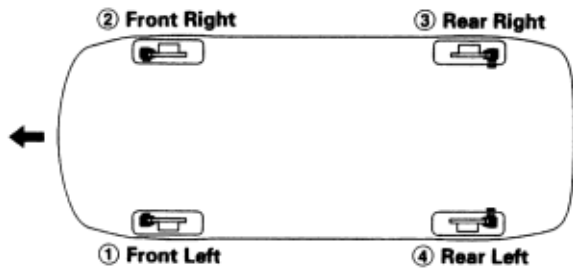
1. Loosen the front wheel nuts slightly. Raise the front of the vehicle and make sure it is securely supported. Remove the front wheels.
2. Remove the brake hose mounting bolts from the knuckle.
3. Remove the calliper bolt and pivot the calliper up out of the way. Check the hoses and pin boots for damage and deterioration.



1. BRAKE HOSE MOUNTING BOLTS
6 x 1.0 mm 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
2. CALLIPER
3. CALLIPER BOLT

4. Remove the pads, shims (if equipped) and pad retainers.

BLEEDING SEQUENCE:

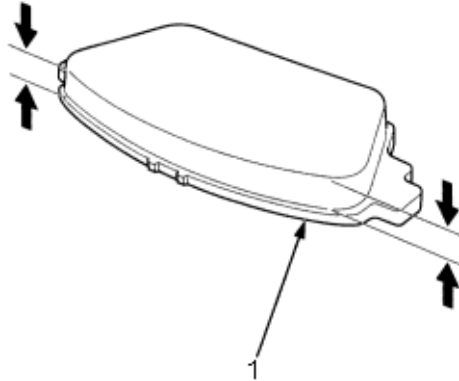


1. PAD RETAINERS
2. PISTON SHIM
Check for weakness.
3. OUTER PAD SHIM
Check for weakness.
4. OUTER PAD
Check for wear.
5. INNER PAD
Check for wear.
6. INNER PAD SHIM
Check for weakness.

5. Using vernier callipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

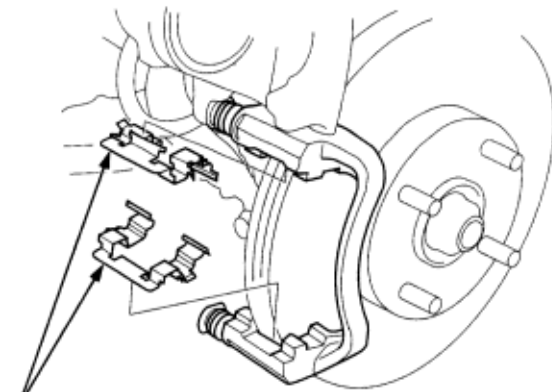
Brake Pad Thickness:

- Standard: 10.5 - 11.5 mm (0.41 - 0.45 in).**
Service Limit: 1.6 mm (0.06 in).



1. BACKING PLATE

6. If the brake pad thickness is less than service limit, replace the front pads and shims together as a set.
7. Clean the calliper thoroughly; remove any rust and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.



1. PAD RETAINERS

WARNING

- ♦ When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- ♦ Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

Check

CAUTION

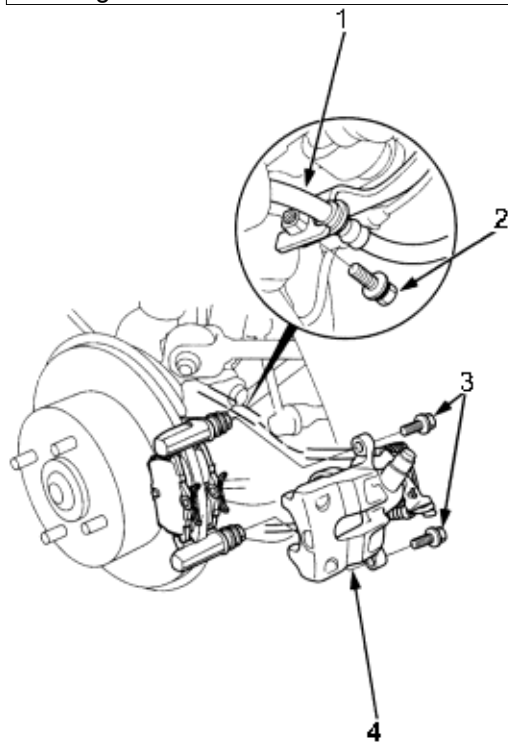
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- ♦ Avoid breathing dust particles.
- ♦ Never use an air hose or brush to clean brake assemblies. Use a vacuum cleaner

1. Raise the rear of the vehicle and make sure it is securely supported. Remove the rear wheel.
2. Release the parking brake.
3. Remove the brake hose from the suspension arm by removing the mounting bolt.

CAUTION

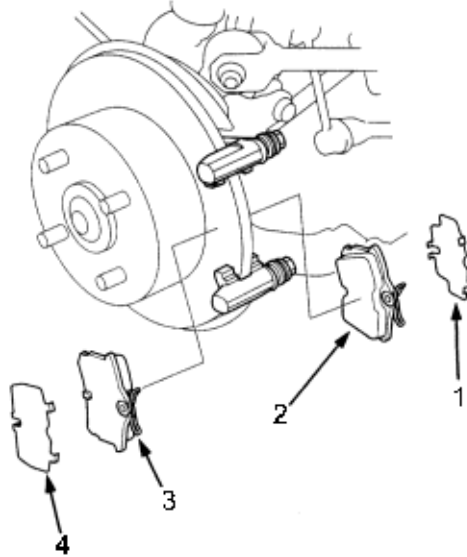
- ♦ Thoroughly clean the outside of the calliper to prevent dust and dirt from entering inside.
- ♦ Support the calliper with a piece of wire so that it does not hang from the brake hose.



1. BRAKE HOSE
2. BRAKE HOSE MOUNTING BOLT
3. CALLIPER BOLTS
4. CALLIPER

4. Hold the calliper pin with a wrench, being careful not to damage the pin boot. Remove the two calliper bolts with another wrench and calliper from the bracket.

5. Remove the pad shims and brake pads.



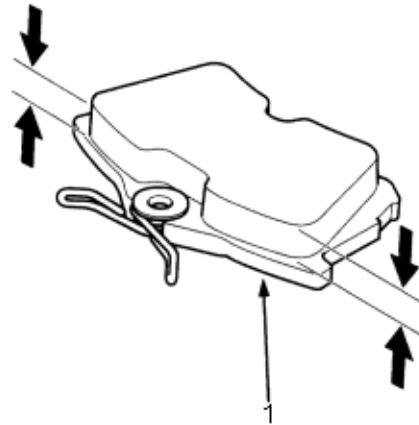
1. INNER PAD SHIM
Check for weakness.
2. INNER PAD
Check for wear.
3. OUTER PAD
Check for wear.
4. OUTER PAD SHIM
Check for weakness.

6. Using vernier callipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:

Standard: 8.5 - 9.5 mm (0.33 - 0.37 in).

Service Limit: 1.6 mm (0.06 in).



1. BACKING PLATE
7. Clean the calliper thoroughly; remove any rust and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the brake pads and pad shim on the calliper bracket. Install the inner pad with its wear indicator facing downward.

WARNING

- ♦ When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- ♦ Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

Locks, hinges and latch mechanism (not steering lock)

1. Functionally check operation of all locks.
2. Operate front door lock and check that electric central door locking operates.
3. Ensure that all locks, hinges and latch mechanisms are lubricated using Door Lock and Latch Lubricant. Inject grease sparingly into lock barrels. Clean off any surplus grease.
DO NOT lubricate the steering lock.
4. Lubricate sunroof lid seal very sparingly using Non-Staining Grease BAU 5812 (Corning No. 7).

Exterior paintwork and body panels

Visually check paintwork and body panels for damage corrosion.

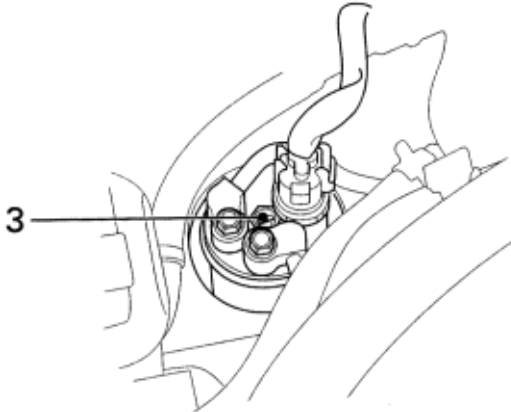
Underbody sealer

Visually check underbody sealer for damage and continuity.

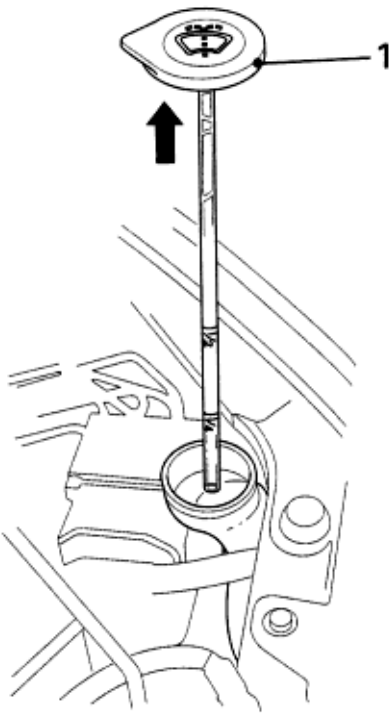
Air Conditioning

Air conditioner refrigerant sight glass - check

1. Start engine and switch on air conditioner.
2. Run engine at fast idle for a few minutes.



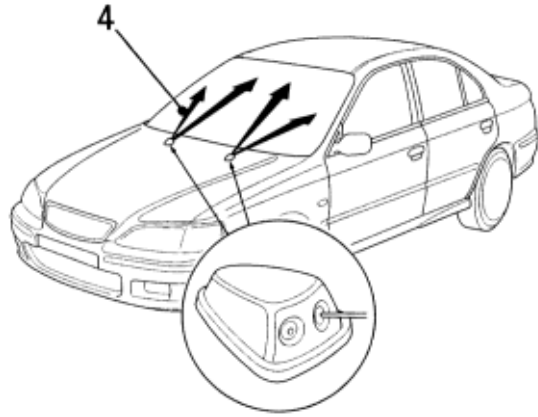
3. Observe sight glass. Occasional bubbles indicates normal condition. A constant stream of bubbles indicates low refrigerant. A clouded or streaky sight glass indicates a compressor fault or drier desiccant circulating.



1. Remove filler cap, visually check mixture level in reservoir by looking at top of level gauge.
2. Top-up by adding a mixture of water and 'Screenwash' at required concentration.

Reservoir capacity	Temperature °C		
	-3°	-7°	-12°
4.5 litre	0.5 ltr	0.9 ltr	1.8 ltr

3. Clean windscreen washer jets using thin wire as a probe. Disconnect tube from jet and remove debris. Reconnect washer tube.

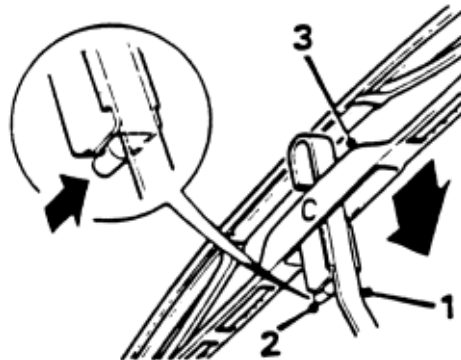


4. Operate windscreen washer and check that jets strike top and centre of area to be wiped.
5. Adjust jet by inserting a needle into jet hole and repositioning.
6. Check operation of programmed wash/wipe by switching on ignition and operating washer lever.
7. Observe that washer and wiper operate for as long as lever is operated and wiper operates for a further 5 seconds after lever is released.
8. After adjustments, top-up fluid level in reservoir.

Screen Wipers and Blades

1. Operate front screen wiper.
2. Check that blades wipe screen without smearing.
3. Check that wipers park correctly.
4. Operate wiper switch in all modes.
5. Check that wipers operate at speeds selected.

Renew blade



1. Lift wiper arm.
2. Press retaining lever.
3. Slide blade down arm.
4. Withdraw blade assembly from arm.
5. Position new blade on wiper arm.

Screen Wipers and Blades/Lamps, Horns and Warning Indicators/Battery Connections/Fusebox

6. Push blade into engagement with arm.
7. Check that it is retained.

Lamps, Horns and Warning Indicators

1. Switch on sidelamps and check that sidelamps, headlamps in the dipped mode, tail lamps, rear number plate lamps, panel illumination lamps and panel sidelamp indicators illuminate.
2. Switch ON ignition.
3. Switch on headlamps and check that headlamps, tail lamps and rear number plate lamps illuminate.
4. Operate dip switch and check that headlamp dip and main beams and panel main beam indicator illuminate.
5. Operate direction warning indicator switch to right and left and check that warning indicators flash at front and rear.
6. Operate direction warning indicator switch to right and left and check that warning indicators flash at front and rear.
7. Switch OFF ignition.
8. Open doors and luggage compartment and check that interior lights illuminate.
9. Press horn switches and check that horns operate.
10. Operate hazard warning switch and check that all warning indicators flash.

Battery Connections

1. Pull back flexible terminal protector.
2. Wipe battery top clean and dry, smear terminal posts with petroleum jelly.
3. Ensure terminals are tight.
4. Replace protector.

Fusebox**Engine compartment fusebox**

1. Release and lift off cover.
2. Check condition of fusible links and security of connections.
3. Refit cover and secure.

Engine performance and throttle operation

1. Check that throttle pedal movement is free and unrestricted.
2. Start engine and check that it starts easily and maintains idle speed.
3. Check that 'oil pressure' and 'no charge' warning lamps extinguish.
4. Check that engine is responsive to throttle movement.

Clutch and Gear Selection**Normal driving conditions**

1. Check that clutch engages smoothly without judder, slipping or noise.
2. Check for abnormal transmission noise.
3. Check for smooth quiet gear change and that gear selected engages easily.

Steering

1. Check for noise, effort required, free play and self-centralising.

Suspension

1. Check for noise, irregularity in ride (e.g. dampers) and wheel imbalance.

Footbrake

1. Check for pedal effort, travel, braking efficiency, pulling and binding.

Instruments

1. Check that all instruments operate.
2. Check speedometer for steady operation, noise and operation of distance recorder.
3. Check warning lights for bulb failure.

Body and trim

1. Check for abnormal body noise.

Seat belts

1. Check for operation of inertia reels and condition of belt webbing.

Handbrake

1. Apply handbrake firmly, check travel and ratchet hold and release.

Data

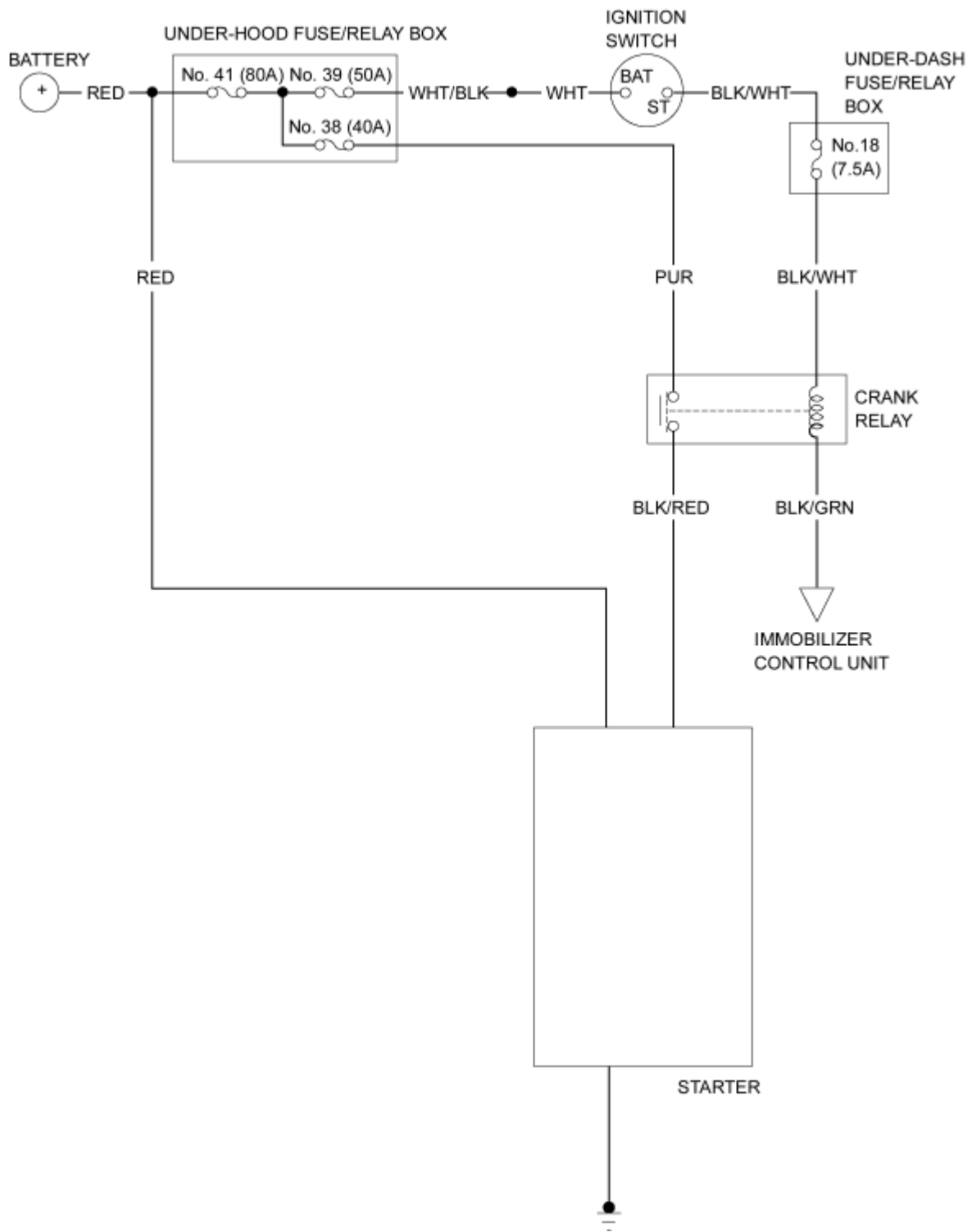
Injection pump timing belt tension 180N (18 kgf)

Torque Settings

Gearbox drain plug	45 Nm (4.6 kgf/m, 33 lb/ft)
Gearbox filler/level plug	40 Nm (4.1 kgf/m, 30 lb/ft)
Engine sump plug	35 Nm (3.6 kgf/m, 26 lb/ft)
Engine RH mounting to engine bolts	85 Nm (8.7 kgf/m, 63 lb/ft)
Engine RH mounting restraint bar nuts	45 Nm (4.6 kgf/m, 33 lb/ft)
Engine RH mounting tie bar bolts	90 Nm (9.2 kgf/m, 67 lb/ft)
Timing belt upper front cover screws	5 Nm (0.5 kgf/m, 4 lb/ft)
Timing belt lower cover screws	5 Nm (0.5 kgf/m, 4 lb/ft)
Injection pump timing belt cover nut and bolts	5 Nm (0.5 kgf/m, 4 lb/ft)
Camshaft gear to boss bolts	25 Nm (2.5 kgf/m, 18 lb/ft)
Camshaft gear bolt	20 Nm (2.0 kgf/m, 15 lb/ft) + 90°
Crankshaft pulley bolt	63 Nm (6.4 kgf/m, 46 lb/ft) + 90°
Camshaft tensioner pulley Allen bolt	44 Nm (4.5 kgf/m, 33 lb/ft)
Engine RH mounting support plate nuts	30 Nm (3.1 kgf/m, 22 lb/ft) + 120°
Road wheel nuts	108 Nm (11.0 kgf/m, 80 lb/ft)
Steering column universal joint bolts	28 Nm (2.9 kgf/m, 21 lb/ft)
Steering rack to body bolts	43 Nm (4.4 kgf/m, 32 lb/ft)
Steering rack clamp to body bolts	43 Nm (4.4 kgf/m, 32 lb/ft)
Track rod end locknuts	45 Nm (4.6 kgf/m, 33 lb/ft)
Steering arm ball pin nut	43 Nm (4.4 kgf/m, 32 lb/ft)
Damper fork pinch bolt	43 Nm (4.4 kgf/m, 32 lb/ft)
Damper fork to lower arm nut	64 Nm (6.5 kgf/m, 47 lb/ft)
Radius rod front mounting nut	54 Nm (5.5 kgf/m, 40 lb/ft)
Radius rod to lower arm bolts	181 Nm (18.5 kgf/m, 134 lb/ft)
Damper top mounting nuts	38 Nm (3.9 kgf/m, 28 lb/ft)
Stabiliser bar to lower arm nuts	39 Nm (4.0 kgf/m, 29 lb/ft)
Stabiliser bar clamp bolts	39 Nm (4.0 kgf/m, 29 lb/ft)
Lower arm to body bolt	64 Nm (6.5 kgf/m, 47 lb/ft)
Damper top nut	29 Nm (3.0 kgf/m, 22 lb/ft)
Damper top mounting nuts	38 Nm (3.9 kgf/m, 28 lb/ft)
Leading arm to body bolt	59 Nm (6.0 kgf/m, 43 lb/ft)
Leading arm to knuckle bolt	59 Nm (6.0 kgf/m, 43 lb/ft)
Control arm to body nut	54 Nm (5.5 kgf/m, 40 lb/ft)
Control arm to knuckle nut	59 Nm (6.0 kgf/m, 43 lb/ft)
Upper arm to body bolt	59 Nm (6.0 kgf/m, 43 lb/ft)
Upper arm to castle nut	49-59 Nm (5.0-6.0 kgf/m, 36-43 lb/ft)
Lower arm to body bolt	59 Nm (6.0 kgf/m, 43 lb/ft)
Lower arm to knuckle nut	59 Nm (6.0 kgf/m, 43 lb/ft)
Trailing arm to body bolt	39 Nm (4.0 kgf/m, 29 lb/ft)
Trailing arm to knuckle bolt	59 Nm (6.0 kgf/m, 43 lb/ft)
Stabiliser to stabiliser link nut	38 Nm (3.9 kgf/m, 28 lb/ft)
Stabiliser to body bolt	22 Nm (2.2 kgf/m, 16 lb/ft)
Damper self-locking nut	29 Nm (3.0 kgf/m, 22 lb/ft)
Brake hose to calliper banjo bolt	34 Nm (3.5 kgf/m, 25 lb/ft)
Brake hose to brake pipe union	15 Nm (1.5 kgf/m, 11 lb/ft)
Brake calliper bleed screw	10 Nm (1.0 kgf/m, 7 lb/ft)

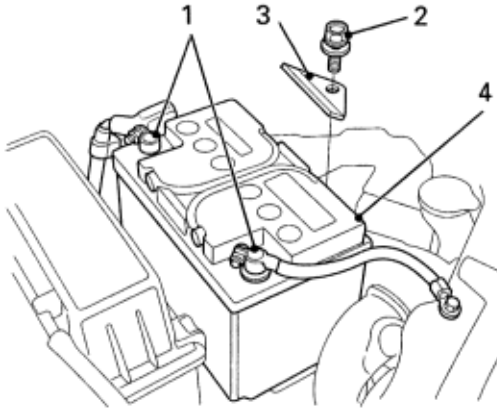
Tool Numbers

18G 1523	Flywheel locking/timing pin
18G 1717	Injection pump timing pin
18G 1719	Cambelt tensioner pulley retracting tool
18G 1521	Camshaft gear holding tool
18G 1722	Locking wheel nut cap extractor



Remove

1. Disconnect both battery leads, earth lead first.



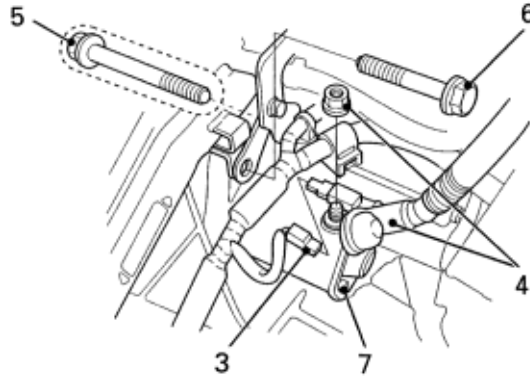
2. Remove bolt securing battery clamp to battery tray.
3. Remove battery clamp.
4. Release and remove battery from vehicle.

Refit

1. Clean battery terminals and coat with petroleum jelly.
2. Position battery to battery tray.
3. Fit battery clamp and secure with bolt.
4. Position and connect battery leads, earth lead last.

Remove

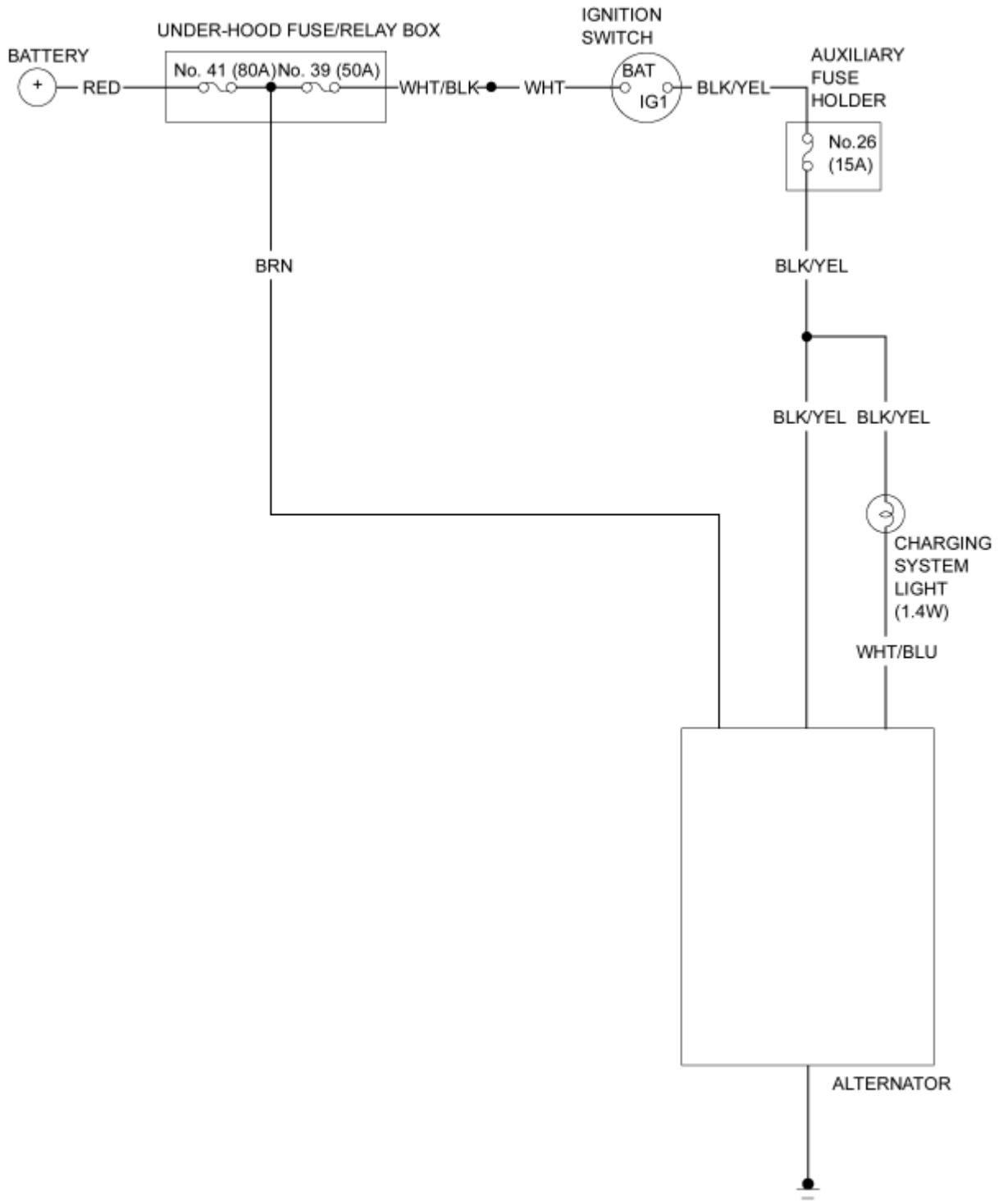
1. Disconnect battery earth lead.
2. Remove air cleaner, See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs**.



3. Disconnect connector from starter solenoid.
4. Remove nut and disconnect battery lead from starter solenoid.
5. Remove lower bolt securing starter motor.
6. Remove upper bolt securing starter motor.
7. Remove starter motor.

Refit

1. Clean mating faces of starter motor and gearbox.
2. Fit starter motor and fit lower bolt but do not tighten.
3. Fit upper retaining bolt.
4. Tighten both retaining bolts to 85 Nm (8.7 kgf/m, 63 lbf/ft).
5. Connect battery cable to starter solenoid, fit nut and tighten to 4 Nm (0.4 kgf/m, 3 lbf/ft).
6. Connect connector to solenoid.
7. Fit air cleaner. See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs**.
8. Connect battery earth lead.



Remove

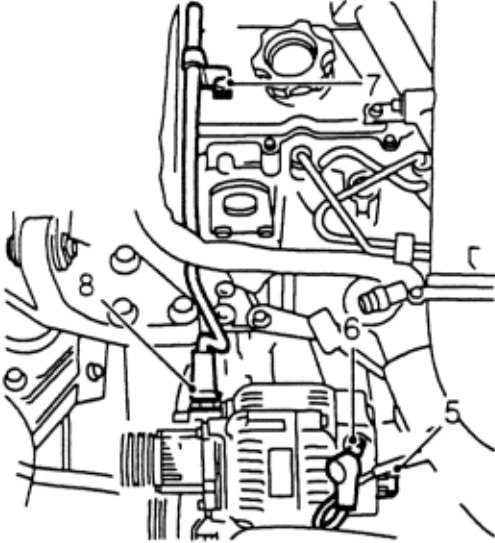
1. Disconnect battery earth lead.
2. Raise front of vehicle



WARNING

Support on safety stands.

3. Remove auxiliary drive belt. **See this section.**
4. Remove engine acoustic cover. **See BODY Exterior fittings section.**



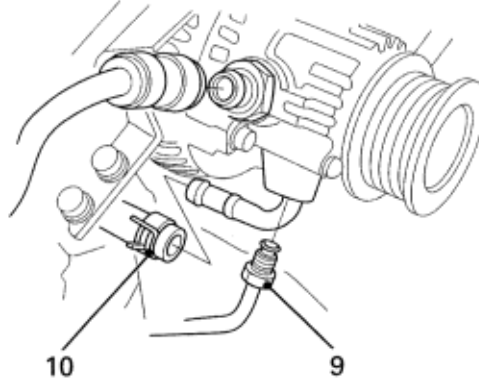
5. Disconnect multiplug from alternator.
6. Release cover, remove nut and disconnect battery cable from alternator.

Models with Air Conditioning fitted.

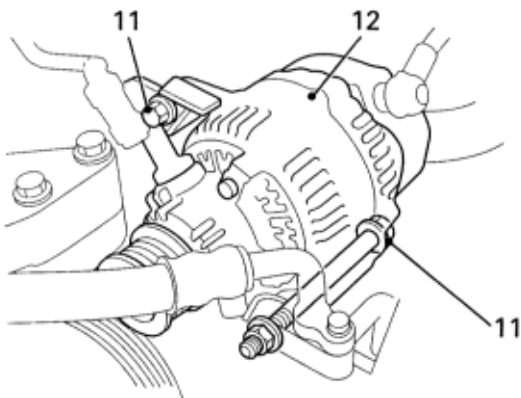
7. Remove bolt securing brake servo vacuum pipe to camshaft cover.

All Models.

8. Release clip and disconnect vacuum hose from vacuum pump.
9. Disconnect oil feed pipe from vacuum pump.



10. Release clip and disconnect oil return hose from vacuum pump.



11. Remove 2 bolts securing alternator to mounting bracket.
12. Remove alternator from vehicle.



CAUTION

Plug the connections.
Do not carry out further dismantling if component is removed for access only.

13. Fit vacuum pump to new alternator. **See BRAKES, Repairs section.**

Refit

1. Remove plugs from connections.
2. Clean all pipe connections.
3. Position alternator to mounting bracket.
4. Connect oil return hose to vacuum pump and secure hose with clip.
5. Fit bolts securing alternator to mounting bracket and tighten the lower bolt to 45 Nm (4.6 kgf/m, 33 lbf/ft) and the upper bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).
6. Tighten oil feed pipe unit on to vacuum pump.
7. Connect vacuum hose to vacuum pump and secure hose with clip.

Models with Air Conditioning fitted.

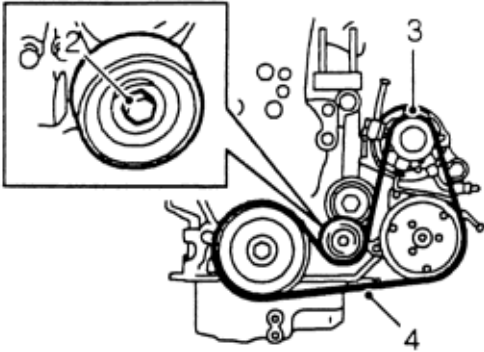
8. Align vacuum pipe bracket to camshaft cover and tighten bolt.

All Models

9. Remove stand(s) and lower vehicle.
10. Connect battery cable to alternator stud tighten nut to 4 Nm (0.4 kgf/m, 3 lbf/ft).
11. Connect multiplug to alternator.
12. Fit auxiliary drive belt. **See this section.**
13. Fit engine acoustic cover. **See BODY Exterior fittings section.**
14. Connect battery earth lead.

Remove

1. Remove underbelly panel. See BODY Exterior fittings section.



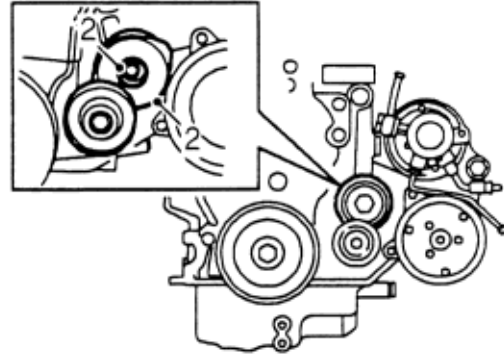
2. Using a 15 mm ring spanner on drive belt tensioner pulley bolt, rotate pulley fully clockwise and hold.
3. With assistance, release drive belt from alternator pulley.
4. Remove drive belt from remaining pulleys and remove from vehicle.

Refit

1. Clean drive belt pulley grooves and ensure grooves are not damaged.
2. Fit new drive belt around pulleys, except alternator pulley, ensure belt is correctly aligned in pulley grooves.
3. Hold tensioner pulley fully clockwise, with assistance fit drive belt around alternator pulley.
4. Fit underbelly panel. **See BODY, Exterior fittings section.**

Remove

1. Remove alternator drive belt. **See this section.**



2. Remove bolt and remove drive belt tensioner.

Refit

1. Clean tensioner and mating face.
2. Fit tensioner locate with dowel and tighten retaining bolt to 45 Nm (4.6 kgf/m, 33 lbf/ft).
3. Fit drive belt. **See this section**

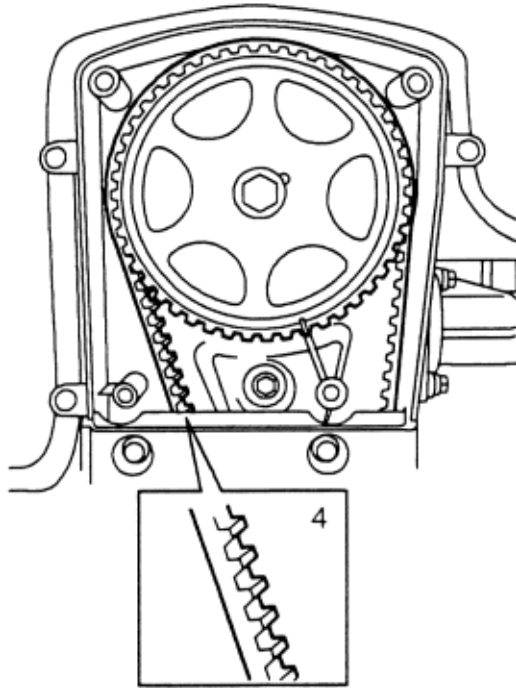
Check**CAUTION**

This check must be carried out at the service intervals specified in the service maintenance Check Sheet and whenever carrying out a repair that requires the timing belt to be disturbed. Pay particular attention for signs of belt splitting at base of teeth.

1. Remove underbelly panel for access to crankshaft pulley bolt. **See BODY, Exterior fittings.**
2. Remove timing belt upper cover. **See Repairs.**
3. Use a socket on the crankshaft pulley bolt to rotate the engine.

**CAUTION**

Do not use camshaft gears or retaining bolts to rotate engine.



4. Check timing belt for condition and renew any belt showing signs of oil contamination, cracking, fraying or splitting at the base of the teeth.

**CAUTION**

Cause of oil contamination, if present must be rectified.

5. Fit timing belt upper cover. **See Repairs.**
6. Fit underbelly panel. **See BODY, Exterior fittings .**

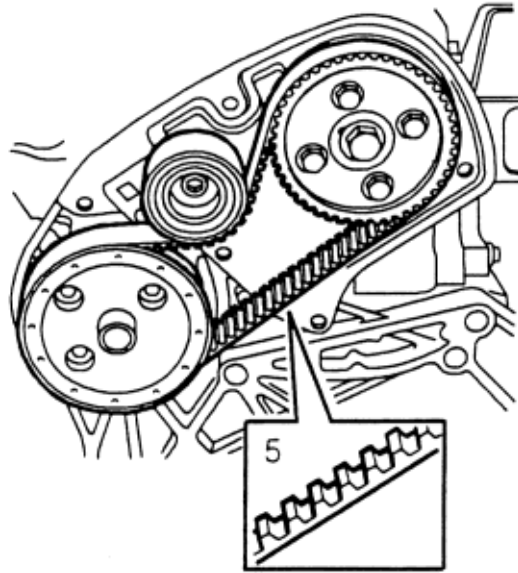
**CAUTION**

This check must be carried out at the service intervals specified in the service maintenance Check Sheet and whenever carrying out a repair that requires the timing belt to be disturbed. Pay particular attention for signs of belt splitting at base of teeth.

1. Disconnect battery earth lead.
2. Remove belt cover. **See Repairs.**
3. Remove underbelly panel for access to crankshaft pulley bolt. **See BODY, Exterior fittings.**
4. Using a socket and an extension bar on the crankshaft pulley bolt, rotate the engine and inspect the injection pump timing belt.

**CAUTION**

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the engine.



5. Renew a timing belt that shows signs of splits at base of teeth, fraying, oil contamination or uneven wear. **See Repairs.**

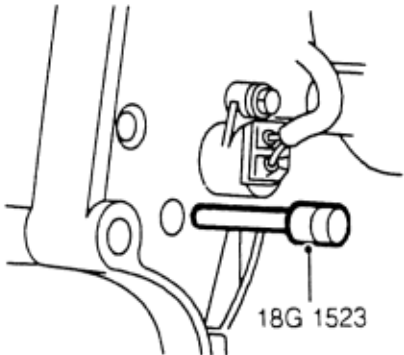
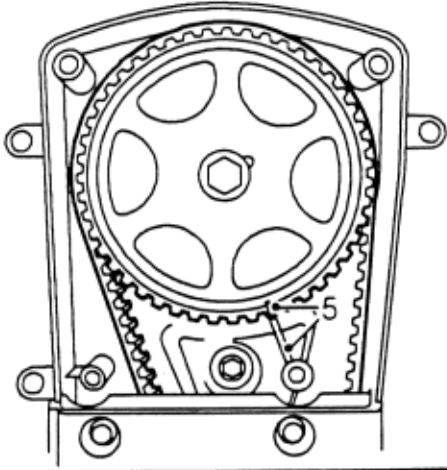
**WARNING**

Cause of oil contamination must be rectified.

6. Fit underbelly panel. **See BODY, Exterior fittings.**
7. Fit injection pump timing belt cover. **See Repairs.**
8. Connect battery earth lead.

Remove

1. Remove underbelly panel. **See BODY, Exterior fittings.**
2. Remove RH front road wheel.
3. Disconnect battery earth lead.
4. Remove camshaft timing belt upper cover. **See this section.**

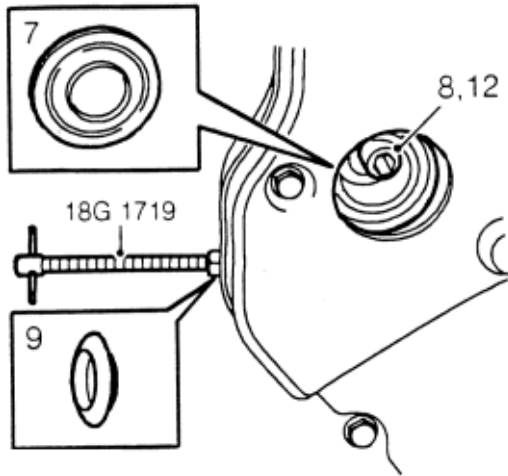


5. Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft clockwise to align timing marks on camshaft pulley to back cover.

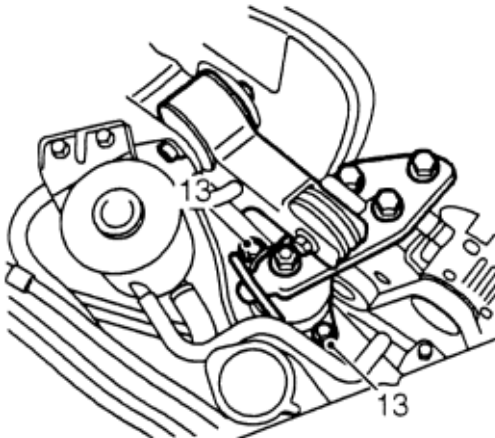
CAUTION

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the camshaft.

6. Insert timing pin tool **18G 1523** through hole in gearbox mounting back plate and into hole in flywheel.



7. Remove tensioner access plug from camshaft timing belt lower cover.
8. Slacken Allen bolt securing tensioner pulley.
9. Remove tensioner access plug from rear cover
10. Fit tool **18G 1719** to tensioner.
11. Pull back tensioner plunger using tool **18G 1719**
12. Tighten tensioner pulley Allen bolt.



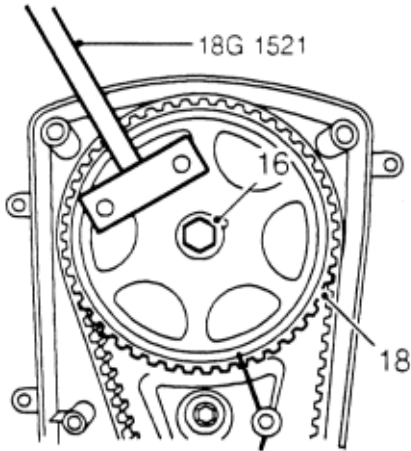
13. Remove 2 bolts securing RH engine mounting to body and remove safety bar.

14. Raise RH side of engine on a jack sufficiently only to give access to fit seal removal tool **18G 1476**.



CAUTION

Place a suitable piece of wood on jack to protect sump.



15. Restrain camshaft gear using tool **18G 1521**.
16. Remove camshaft gear retaining bolt.
17. Remove tool **18G 1521**.
18. Release camshaft gear from camshaft and remove from belt.



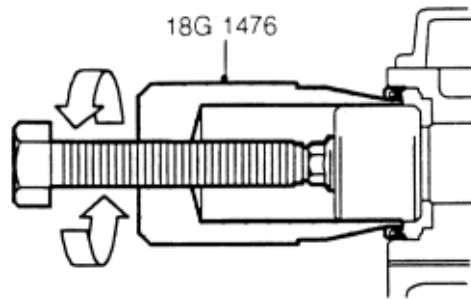
CAUTION

If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly washed with solvent before refitment. Because of the porous construction of the sintered material, oil impregnated in the gear will emerge and contaminate a new belt.



CAUTION

If camshaft timing belt shows any sign of oil contamination renew camshaft timing belt. **See MAINTENANCE.**

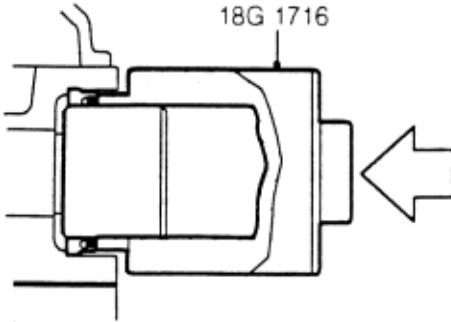


19. Fit but do not tighten the old camshaft gear retaining bolt.
20. Fit and tighten seal remover tool **18G 1476** to camshaft seal.
21. Tighten seal remover centre screw to remove camshaft seal.
22. Remove seal remove **18G 1476**.
23. Remove and discard seal from seal remover tool.
24. Remove and discard camshaft gear retaining bolt.

Camshaft Front Oil Seal (cont'd)

Refit

1. Clean seal recess and camshaft.
2. Grease outer edge of new seal.
3. Lubricate the inner tip of the seal with clean engine oil.



4. Ensure seal fitting tool **18G 1716** is clean.
5. Fit camshaft oil seal using **18G 1716**.
6. Clean camshaft gear and mating face.
7. Fit camshaft gear to belt and position gear to camshaft.

**CAUTION**

Ensure timing marks on camshaft gear and rear cover are aligned.

8. Restrain camshaft gear using tool **18G 1521**.
9. Apply clean engine oil to threads of new bolt. Fit camshaft gear bolt and tighten to 20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°.
10. Remove tool **18G1521**.
11. Lower RH side of engine to body.
12. Fit 2 bolts securing RH engine mounting and safety bar to body.
13. Tighten 2 bolts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
14. Remove jack.
15. Slacken tensioner pulley Allen bolt.
16. Release cambelt tensioner plunger using tool **18G 1719**.
17. Remove tool **18G 1719** from camshaft timing belt tensioner.
18. Remove timing pin tool **18G 1523** from flywheel.
19. Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft two turns clockwise until the flywheel timing pin can be refitted.

20. Check the camshaft gear timing mark is correctly aligned with the back cover timing mark.
21. Slacken Allen bolt securing belt tensioner pulley, to allow the tensioner to react and tighten to 44 Nm (4.5 kgf/m, 33 lbf/ft).

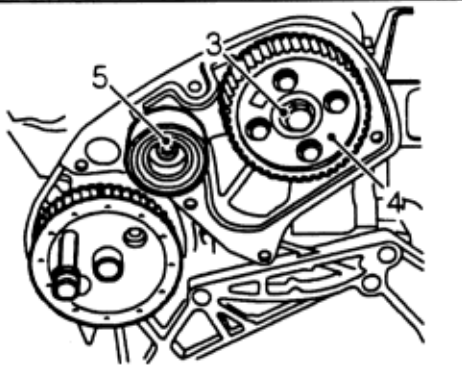
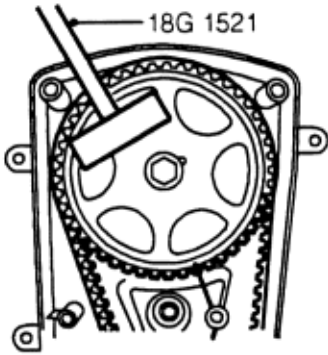
**CAUTION**

Do not exceed the specified torque figure.

22. Fit access plugs to lower cover and rear cover.
23. Fit underbelly panel. **See BODY, Exterior fittings.**
24. Fit camshaft timing belt upper cover. **See this section.**
25. Fit road wheel and tighten nuts to 110 Nm (11.2 kgf/m, 81 lbf/ft).
26. Connect battery earth lead.

Remove

1. Remove fuel injection pump (FIP) timing belt. **See this section.**



2. Restrain camshaft gear using tool **18G 1521**.
3. Remove FIP belt drive gear bolt.
4. Remove FIP belt drive gear.



CAUTION

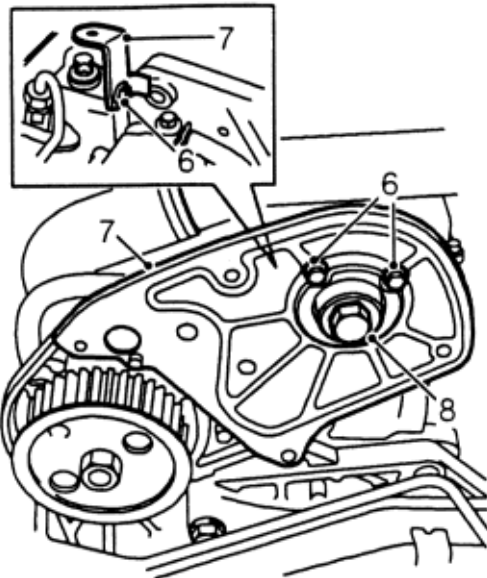
If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly washed with solvent before refitment. Because of the porous construction of the sintered material, oil impregnated in the gear will emerge and contaminate a new belt.



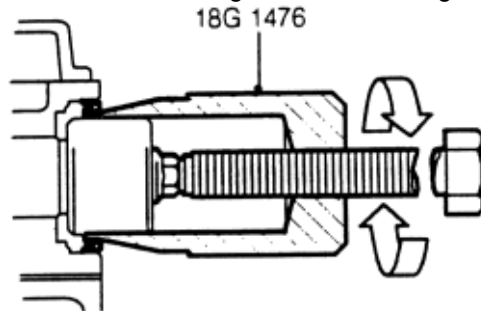
CAUTION

If FIP belt shows any sign of oil contamination renew camshaft timing belt. See **MAINTENANCE**.

5. Remove Allen bolt securing FIP drive and remove tensioner.



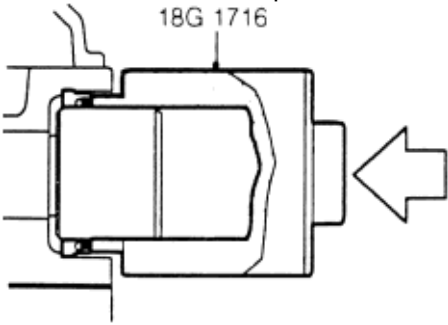
6. Remove 3 bolts securing FIP drive belt rear cover.
7. Remove rear cover and acoustic cover bracket.
8. Fit but do not tighten the old FIP gear retaining bolt.



9. Fit and tighten seal remover tool **18G 1476** to camshaft seal.
10. Tighten seal remover centre screw to remove camshaft seal.
11. Remove seal remover **18G 1476**.
12. Remove and discard seal from seal remover tool.
13. Remove and discard FIP gear retaining bolt.

Refit

1. Clean seal recess and camshaft.
2. Grease outer edge of new seal.
3. Lubricate the inner lip of the seal with clean engine oil.



4. Ensure seal fitting tool **18G 1716** is clean.
5. Fit camshaft oil seal using **18G 1716**.
6. Fit rear cover and acoustic cover bracket.
7. Fit 3 bolts securing FIP drive belt rear cover.
8. Fit drive belt tensioner, fit Allen bolt.
9. Clean camshaft gear and mating face.
10. Fit FIP gear to camshaft.
11. Restrain camshaft gear using tool **18G 1521**.
12. Apply clean engine oil to threads of new bolt. Fit FIP gear bolt and tighten to 20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°.
13. Remove tool **18G 1521**.
14. Fit injection pump timing belt. **See this section.**

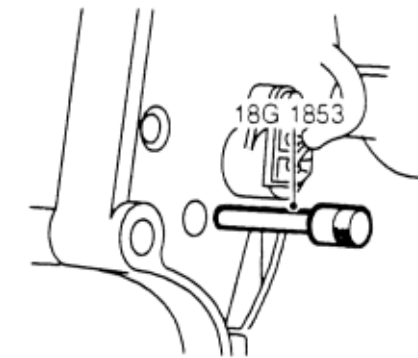
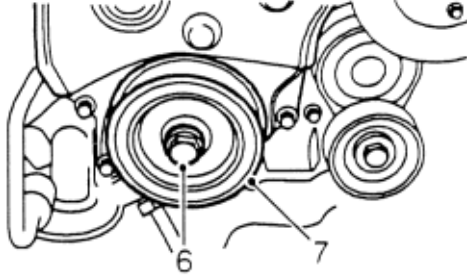
Remove

1. Disconnect battery earth lead.
2. Raise front of vehicle.



Support on safety stands.

3. Remove auxiliary drive belt. See **Electrical, Repairs.**
4. Remove RH front road wheel.



5. Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft until **18G 1853** can be fitted through gearbox adaptor plate to lock flywheel.



Never use the camshaft timing gear, gear retaining bolt, or timing belt to rotate the engine.

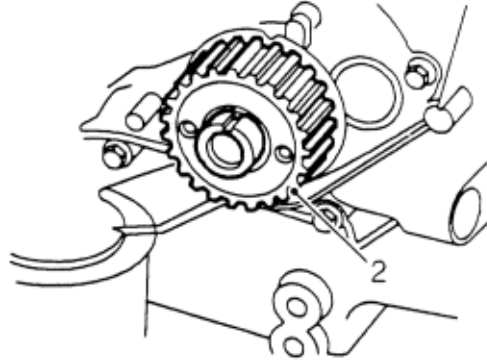
6. Remove bolt securing crankshaft pulley.
7. Remove crankshaft pulley.

Refit

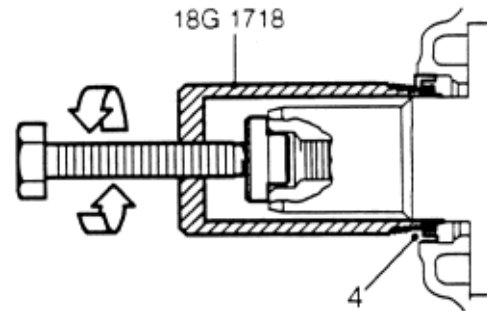
1. Clean and fit pulley to crankshaft, tighten crankshaft pulley bolt to 63 Nm (6.4 kgf/m, 46 lbf/ft) + 90°.
2. Fit auxiliary drive belt. See **ELECTRICAL, Repairs**.
3. Remove timing pin **18G 1523** from gearbox adaptor plate.
4. Fit road wheel and tighten nuts to 110 Nm (11.2 kgf/m, 81 lbf/ft).
5. Remove stand(s) and lower vehicle.
6. Connect battery earth lead.

Remove

1. Remove camshaft timing belt. **See this section.**



2. Remove timing gear from crankshaft.

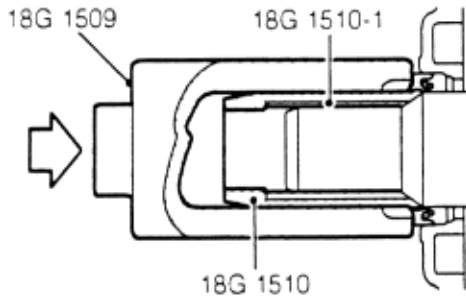


3. Ensure bore of tool **18G 1718** is burr free, screw tool into crankshaft front oil seal.
4. Remove oil seal by tightening centre bolt of tool.

Crankshaft Front Oil Seal (cont'd)

Refit

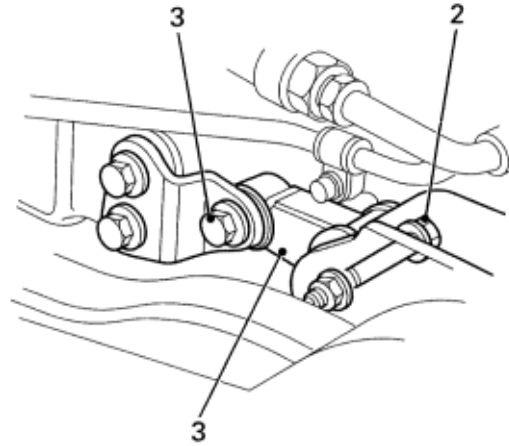
1. Use lint free cloth and thoroughly clean seal recess in oil pump and running surface on crankshaft.



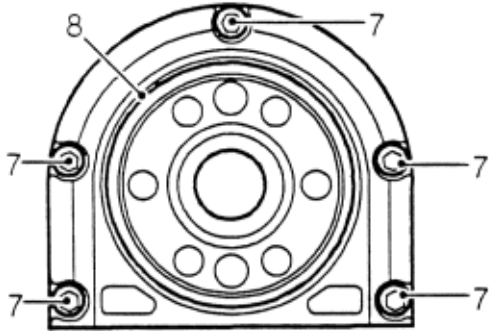
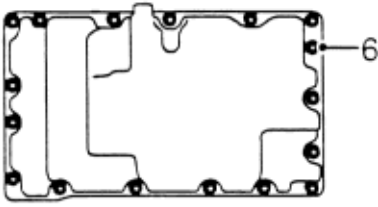
2. Fit guide tools **18G 1510** and **18G 1510-1** onto crankshaft.
3. Lubricate oil pump seal recess and guide tools with clean engine oil.
4. Using guide tools position new oil seal on crankshaft journal and against oil pump, drift into place using tool **18G 1509**.
5. Remove guide tools from crankshaft.
6. Clean crankshaft timing gear and slide onto crankshaft.
7. Fit camshaft timing belt. **See this section.**

Remove

1. Remove flywheel. **See this section.**



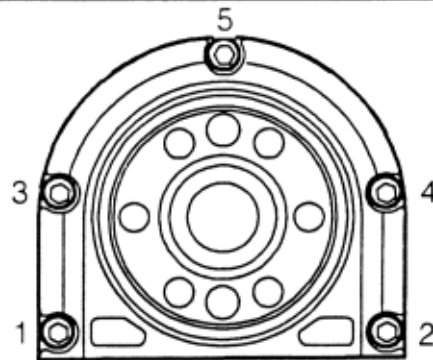
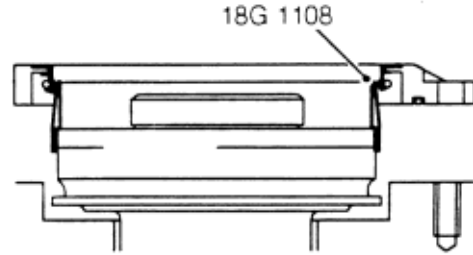
2. Slacken bolt engine lower tie rod to sub frame.
3. Remove bolt engine lower tie rod to bracket on sump. Release rod from bracket.
4. Drain engine oil. **See MAINTENANCE.**
5. Fit oil drain plug using NEW sealing washer and tighten to 25 Nm (2.6 kgf/m, 19 lbf/ft).



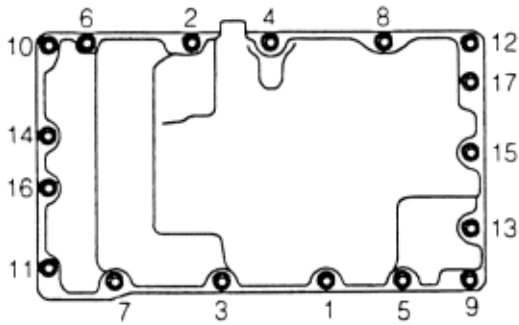
6. Loosen 17 sump bolts by approximately 3 turns, allowing sump to drop away from rear oil seal housing.
7. Remove 5 bolts securing oil seal housing.
8. Remove seal and housing.

Refit

1. Clean seal seating area of block and accessible area of sump gasket. The sump gasket must be replaced if damaged. **See this section.**
2. Lubricate oil seal and sealing surfaces with clean engine oil.



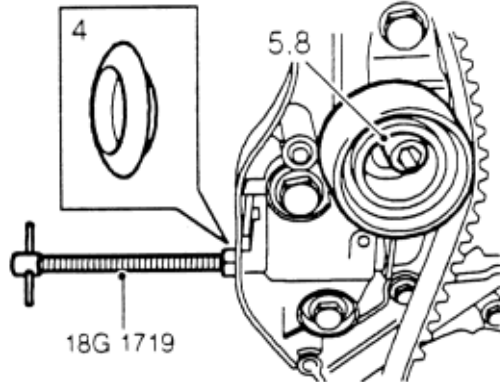
3. Fit tool **18G 1108** over crankshaft boss and fit oil seal.
4. Remove tool **18G 1108**.
5. Fit and tighten seal housing bolts to 10 Nm (1.0 kgf/m, 7.2 lbf/ft) in sequence shown.



6. Tighten engine sump bolts progressively in the sequence shown to 25 Nm (2.6 kgf/m, 19 lbf/ft).
7. Align lower tie rod to bracket on sump and tighten bolts to 80 Nm (8.2 kgf/m, 59 lbf/ft).
8. Fit flywheel. **See this section.**
9. Fill engine with oil. See **MAINTENANCE.**

Remove

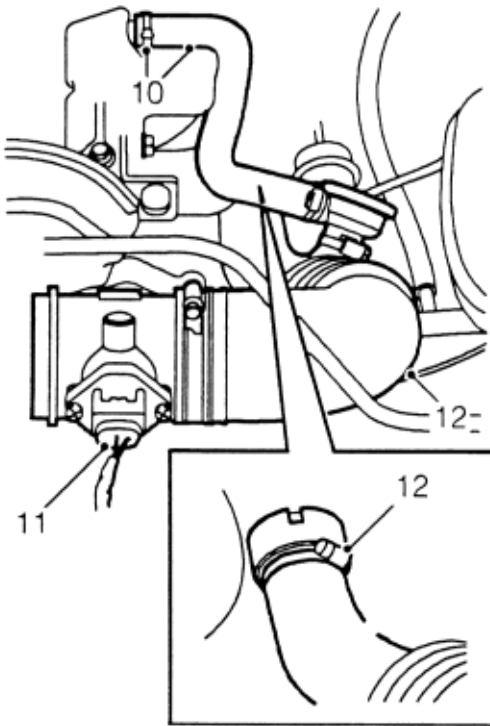
1. Drain cooling system. See **Cooling, Adjustments.**
2. Remove camshaft timing belt lower cover. **See this section.**
3. Remove fuel injection pump (FIP) timing belt. **See this section.**



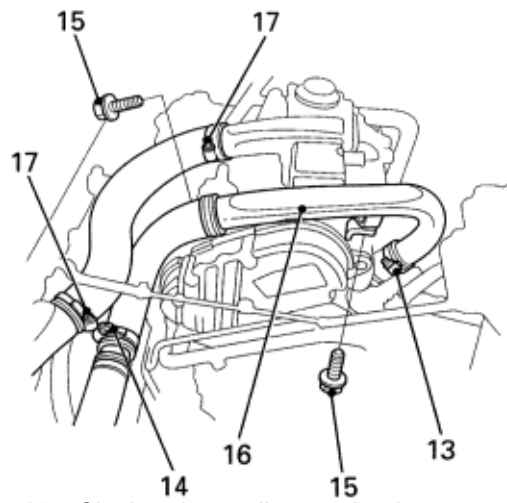
4. Remove camshaft timing belt tensioner access plug from belt rear cover.
5. Slacken Allen bolt securing belt tensioner pulley.
6. Fit **18G 1719** to tensioner.
7. Pull back camshaft timing belt tensioner plunger using **18G 1719**.
8. Tighten tensioner pulley Allen bolt.
9. Release timing belt from camshaft gear.

**CAUTION**

Ease timing belt from gears using fingers only. Metal levers may damage the belt and gears. Do not rotate engine with timing belt removed and cylinder head fitted.



10. Slacken clip and disconnect breather hose from camshaft cover.
11. Disconnect multiplug from mass air flow (MAF) sensor.
12. Slacken clip and disconnect air intake pipe from turbocharger, remove air intake pipe assembly.

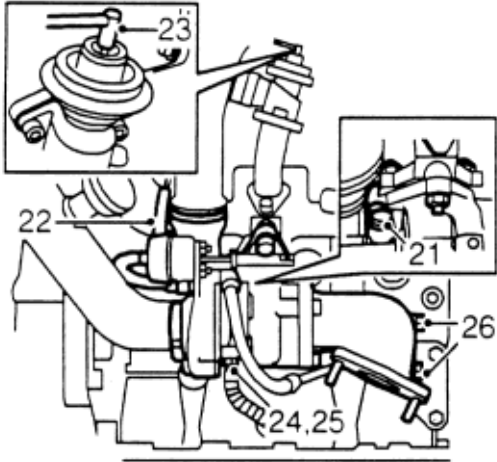


13. Slacken hose clip at turbocharger outlet.
14. Slacken hose clip at intercooler inlet.
15. Remove 2 bolts securing turbocharger outlet pipe to cylinder head and engine lifting eye bracket.
16. Remove pipe and hose assembly.
17. Slacken hose clips at intercooler outlet and plenum chamber.
18. Remove intercooler outlet hose.

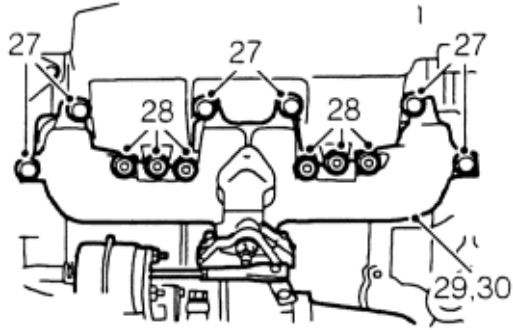
All models



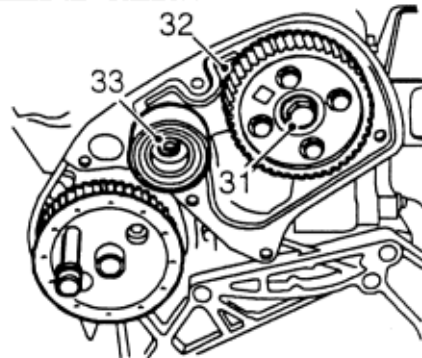
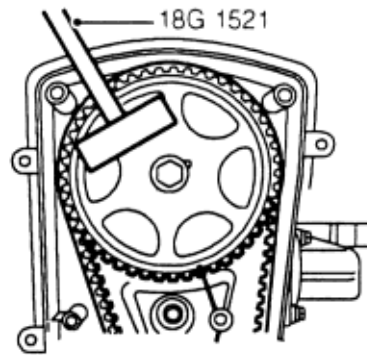
19. Remove 3 nuts securing exhaust front pipe to manifold.
20. Release exhaust front pipe from manifold, remove and discard gasket.



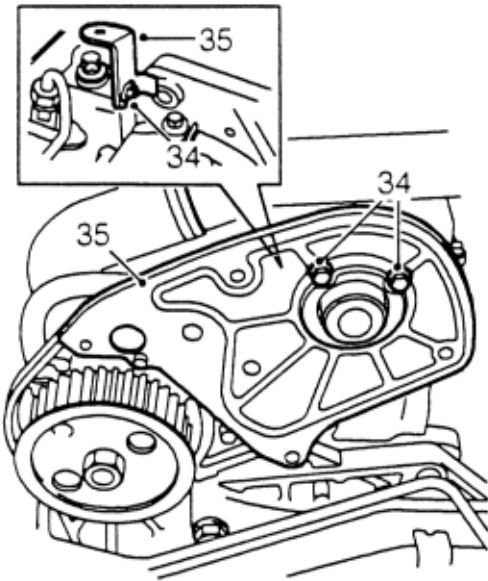
21. Remove banjo bolt securing oil feed pipe to turbocharger, collect 2 sealing washers.
22. Disconnect boost pressure sensing pipe from turbocharger.
23. Disconnect vacuum pipe from EGR valve.
24. Remove 2 bolts securing oil drain pipe flange to turbocharger.
25. Remove and discard gasket.
26. Remove 2 bolts securing exhaust manifold to mounting bracket.



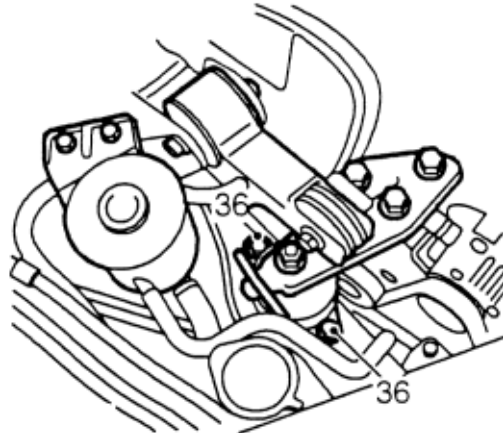
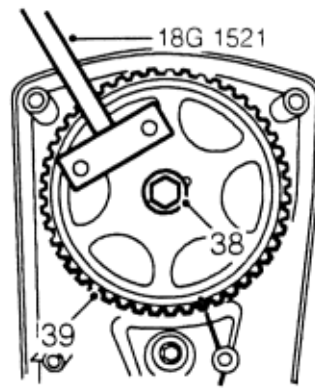
27. Remove 6 bolts securing exhaust manifold to cylinder head.
28. Remove 6 nuts securing exhaust manifold to cylinder head.
29. Release and remove manifolds and turbocharger assembly.
30. Remove and discard manifold gasket.



31. Use **18G 1521** to hold camshaft drive gear, remove and discard fuel injection pump (FIP) belt drive gear bolt.
32. Remove FIP belt drive gear.
33. Remove Allen bolt securing FIP drive belt tensioner and remove tensioner.



- 34. Remove 3 bolts securing FIP drive belt rear cover.
- 35. Remove rear cover and acoustic cover bracket.



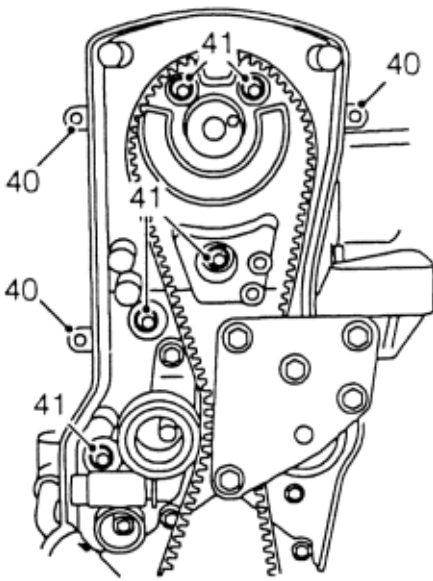
- 36. Remove 2 bolts securing RH engine mounting and safety bar to body.
- 37. Raise RH side of engine on a jack sufficiently only to give access to camshaft drive gear bolt.



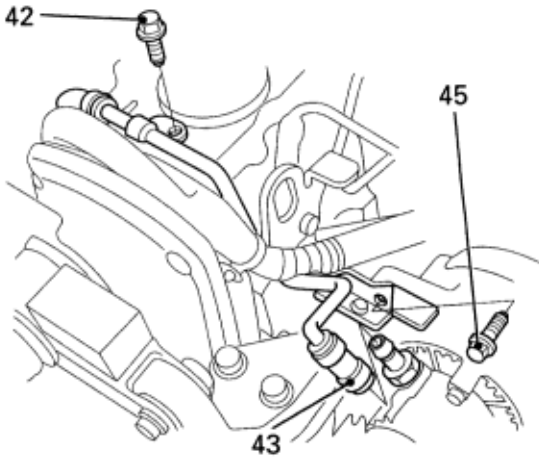
CAUTION

Place a suitable piece of wood on jack to protect sump.

- 38. Use **18G 1521** to hold camshaft drive gear, remove and discard retaining bolt.
- 39. Remove camshaft drive gear.



- 40. Release engine harness clips from camshaft drive belt rear cover.
- 41. Remove 5 bolts and remove camshaft timing belt rear cover.



- 42. Remove bolt securing brake servo vacuum pipe to camshaft cover.
- 43. Release clip and disconnect brake servo vacuum hose from vacuum pump.



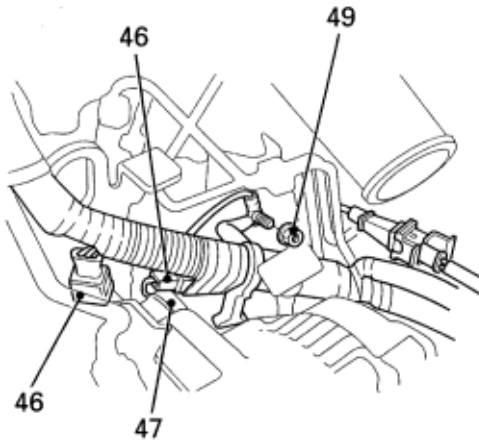
CAUTION

Plug hose and pump.

- 44. Move vacuum pipe aside.

Models with air conditioning

- 45. Remove alternator upper fixing bolt.

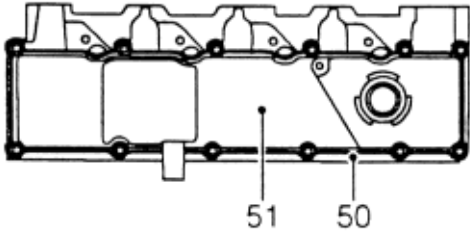


- 46. Disconnect multiplug from coolant temperature sensor and coolant temperature transmitter lead from engine harness.
- 47. Slacken top hose clip and disconnect hose from engine.
- 48. Remove fuel injection pipes.
- 49. Remove nut and disconnect feed lead from glow plug.

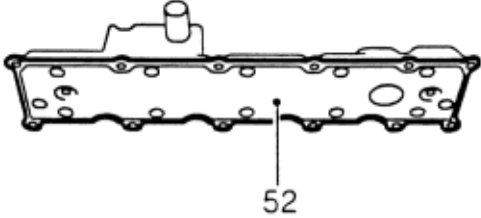
Repairs

Cylinder Head Gasket (cont'd)

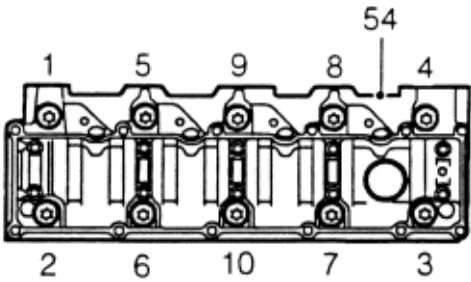
5-16



50. Remove 12 bolts securing camshaft cover.
51. Remove camshaft cover.



52. Release gasket from fixings on camshaft cover and discard gasket.

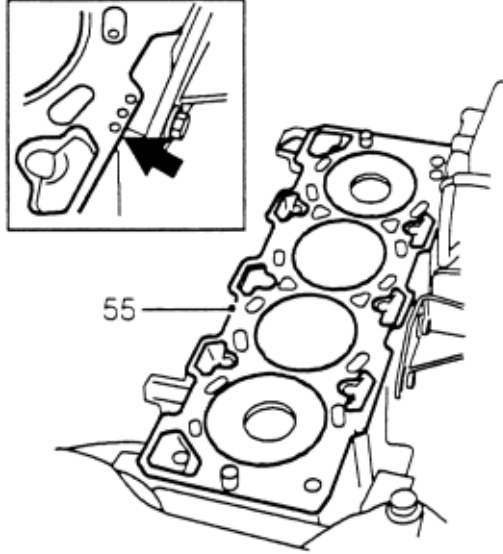


53. Working in the sequence shown, progressively loosen and remove 10 cylinder head bolts.
NOTE: Store cylinder head bolts in their original positions for refitment.
54. Remove cylinder head assembly and place on wooden blocks or stands.



CAUTION

The tip of the injectors and glow plugs protrude below the face of the cylinder head and could be damaged if the cylinder head is placed face down on a work bench.



55. Remove cylinder head gasket.



CAUTION

Note the gasket thickness indicator and ensure the same thickness gasket is used on refitment of cylinder head.

Cylinder Head Gasket (cont'd)

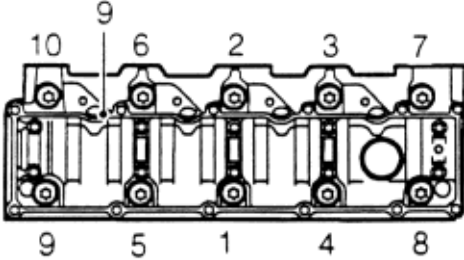
Refit

1. Clean mating face of cylinder head and block.
2. Ensure oil and coolant passages are clean.
3. Clean dowels and dowel holes.
4. Clean and dry cylinder head bolts.
5. Measure length of cylinder head bolts. If any bolt exceeds the maximum length of 243.41 mm (9.5831 in); then all bolts must be renewed.
6. Ensure dowels are fitted to cylinder block and fit new cylinder head gasket, dry over the dowels.
7. Use clean engine oil to lubricate the thread and under side of each cylinder head bolt head.

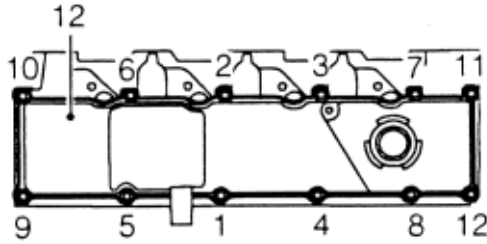
**CAUTION**

Do not lubricate under side of washers.

8. Fit cylinder head onto cylinder block, carefully locating onto dowels.



9. Fit and tighten the cylinder head bolts progressively in the sequence shown, using the following procedure.
 1. Tighten all bolts to 30 Nm (3.1 kgf/m 22 lbf/ft).
 2. Tighten all bolts to 65 Nm (6.6 kgf/m, 4.8 lbf/ft).
 3. Tighten each bolt through 90°.
 4. Tighten each bolt through a further 90°.
10. Clean camshaft cover and mating face on camshaft carrier.
11. Fit new gasket to camshaft cover.



12. Fit camshaft cover and tighten bolts in sequence shown to 9 Nm (0.9 kgf/m, 6.5 lbf/ft).
13. Connect glow plug feed lead and tighten nut to 2.5 Nm (0.26 kgf/m 1.9 lbf/ft).
14. Fit injector pipes.
15. Connect top hose to engine and tighten hose clip.

Models with air conditioning.

16. Fit alternator upper fixing bolt and tighten to 25 Nm (2.6 kgf/m 19 lbf/ft).

All models

17. Connect multiplug to coolant temperature sensor and coolant temperature transmitter lead to engine harness.
18. Connect brake servo vacuum hose to vacuum pump and secure with clip.
19. Align brake servo vacuum pipe to camshaft cover and secure with bolt.
20. Fit FIP drive belt rear cover and acoustic cover support bracket.
21. Secure cover and bracket with bolts.
22. Clean FIP drive belt tensioner.
23. Hold tensioner off and fit Allen bolt.
24. Fit camshaft drive belt rear cover and secure with bolts.
25. Align engine harness to belt cover and secure with clips.
26. Clean camshaft drive gear and mating face.
27. Fit camshaft drive gear and tighten new bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft).

28. Clean FIP belt drive gear and mating face.
29. Fit FIP belt drive gear and tighten new bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft).
30. Lower RH side of engine on jack.
31. Fit safety bar to mounting.
32. Fit bolts securing RH engine mounting to body and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
33. Clean mating faces of manifold and cylinder head.
34. Fit new manifold gasket.
35. Clean mating faces of exhaust manifold and exhaust front pipe.
36. Fit manifold flange gasket.
37. Manoeuvre manifold and turbocharger assembly into position and align to cylinder head.
38. Fit nuts, bolts and washers securing manifold to cylinder head.
39. Working in the sequence illustrated tighten manifold nuts and bolts to 25 Nm (2.6 kgf/m, 19 lbf/ft).
40. Fit 2 bolts securing exhaust manifold to mounting bracket,
41. Clean mating faces of oil drain pipe and turbocharger.
42. Fit new gasket to turbocharger oil drain pipe. Align pipe to turbocharger, fit bolts and tighten to 25 Nm (2.6 kgf/m, 19 lbf/ft).
43. Align exhaust front pipe to exhaust manifold. Fit 3 nuts and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
44. Connect vacuum pipe from EGR solenoid to EGR valve.
45. Connect boost pressure sensing pipe to turbocharger.
46. Clean turbocharger oil feed pipe union and banjo bolt.
47. Fit new sealing washers to banjo bolt.
48. Connect oil feed pipe to turbocharger and tighten union to 20 Nm (2.0 kgf/m, 14 lbf/ft).
49. Connect intercooler outlet hose to intercooler outlet and plenum chamber.
50. Tighten hose clips at intercooler outlet and plenum chamber.
51. Fit turbocharger outlet pipe to cylinder head and engine lifting eye bracket.
52. Fit 2 bolts and tighten to 25 Nm (2.6 kgf/m 19 lbf/ft).
53. Tighten hose clips at turbocharger inlet and outlet.

54. Position air intake pipe and connect to turbocharger, tighten clip.
55. Connect multiplug to MAF sensor.
56. Connect breather hose to camshaft cover and tighten clip.
57. Check for correct alignment of camshaft gear. Using fingers only, fit timing belt to gears.
58. Ensure the belt run between the crankshaft gear and camshaft gear is kept taut during the fitting procedure.



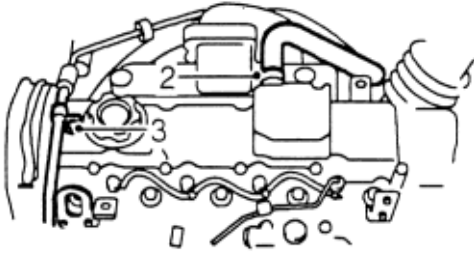
CAUTION

If original belt is to be refitted ensure direction of rotation is correct.

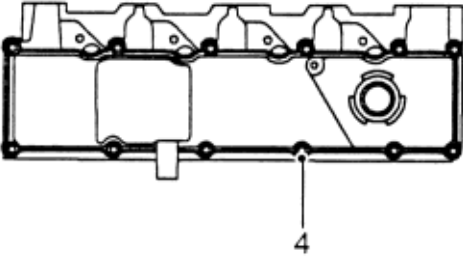
59. Slacken Allen bolt securing belt tensioner pulley.
60. Release camshaft timing belt tensioner plunger using **18G 1719**.
61. Remove **18G 1719** from tensioner.
62. Nip up tensioner pulley Allen bolt.
63. Fit tensioner access plug to camshaft timing belt rear cover.
64. Fit camshaft timing belt lower cover. **See this section.**
65. Remove timing pin **18G 1523** from flywheel.
66. Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft two turns clockwise until the flywheel timing pin can be refitted.
67. Check the camshaft gear timing mark is correctly aligned with the back cover timing mark.
68. Slacken Allen bolt securing belt tensioner pulley, to allow the tensioner to react and then tighten to 44 Nm (4.5 kgf/m, 33 lbf/ft).
69. Remove timing pin **18G 1523** from flywheel.
70. Fit Allen bolt access plug to lower cover.
71. Fit FIP drive belt. **See this section.**
72. Connect battery earth lead.
73. Refill cooling system. **See COOLING Adjustments.**

Remove

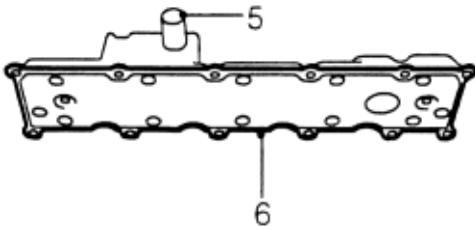
1. Remove engine acoustic cover. See **BODY, Exterior fittings**.



2. Slacken clip and disconnect engine breather hose from camshaft cover.
3. Remove bolt securing brake servo vacuum pipe to camshaft cover.



4. Remove 12 bolts securing camshaft cover.



5. Remove camshaft cover.
6. Release gasket from fixings on camshaft cover and discard gasket.

Refit

1. Clean camshaft cover and mating face on camshaft carrier.
2. Fit new gasket to camshaft cover.
3. Fit camshaft cover and tighten bolts in sequence shown to 9 Nm (0.9 kgf/m, 6.5 lbf/ft).
4. Align brake servo vacuum pipe bracket to camshaft cover and secure with bolt.
5. Connect engine breather hose to camshaft cover and tighten clip.
6. Fit engine acoustic cover. See **BODY, Exterior fittings**.

Remove

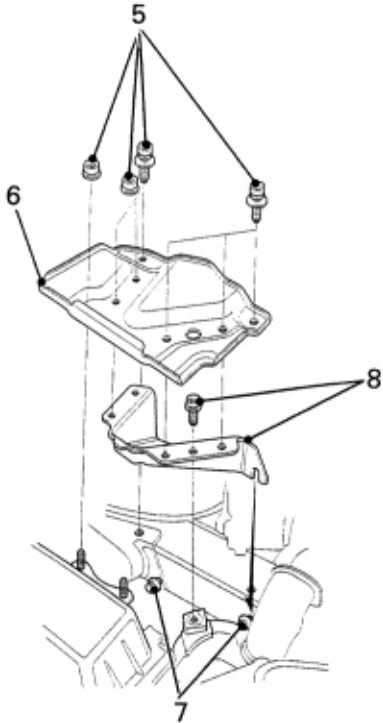
1. Raise front of vehicle.



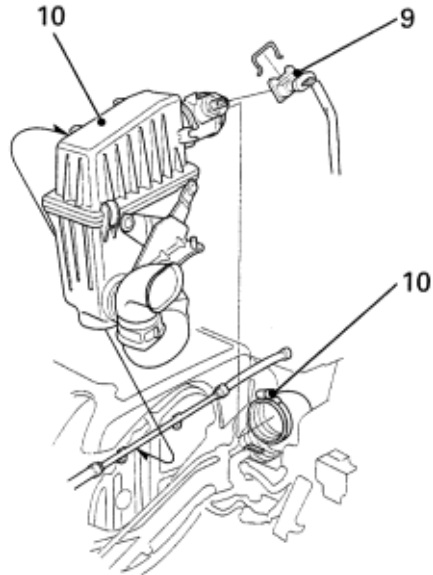
WARNING

Support on safety stands.

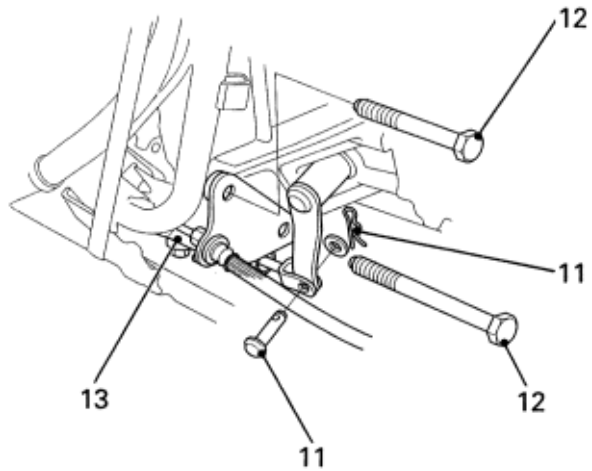
2. Drain cooling system. See **COOLING Adjustments**.
3. Drain gearbox oil. See **MANUAL GEARBOX PG1, Adjustments**.
4. If necessary, drain engine oil. See **MAINTENANCE**.



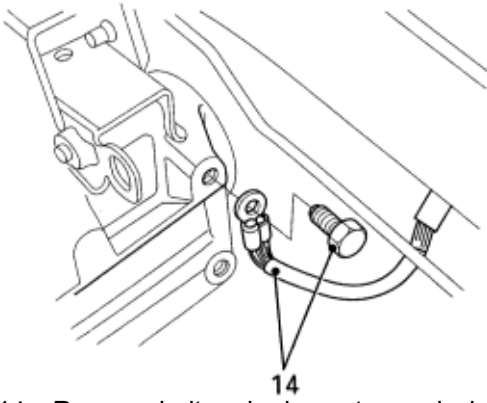
5. Remove 6 bolts and 2 nuts securing battery tray.
6. Remove battery tray.
7. Loosen 2 bolts securing battery tray bracket.
8. Remove a bolt and remove battery tray bracket.



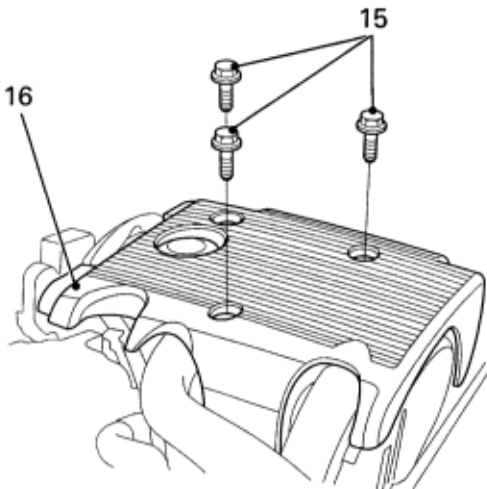
9. Disconnect multiplug from MAF sensor.
10. Loosen clip and remove air cleaner.



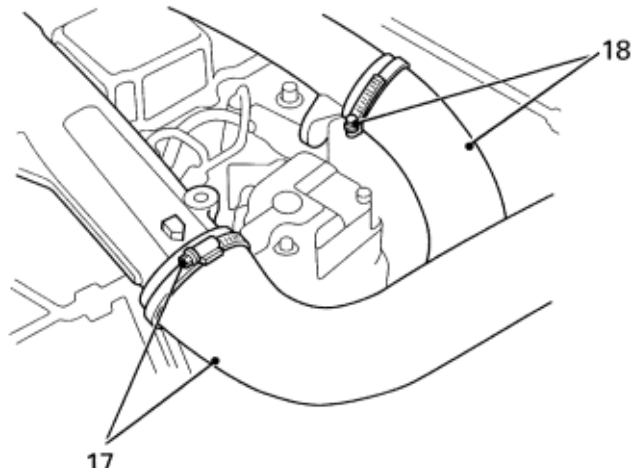
11. Remove spring clip, then remove pin.
12. Remove two bolts securing clutch slave cylinder bracket.
13. Remove clutch slave cylinder.



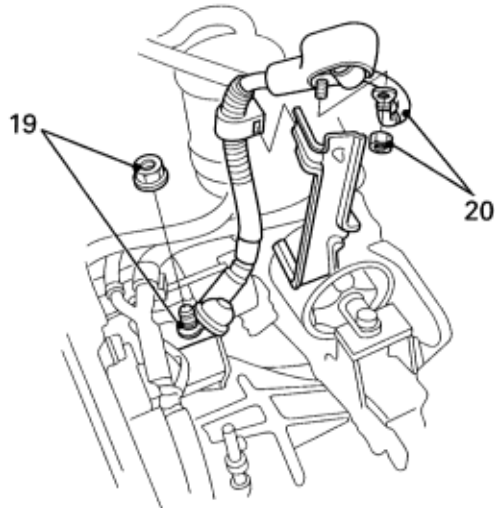
14. Remove bolt and release transmission ground cable.



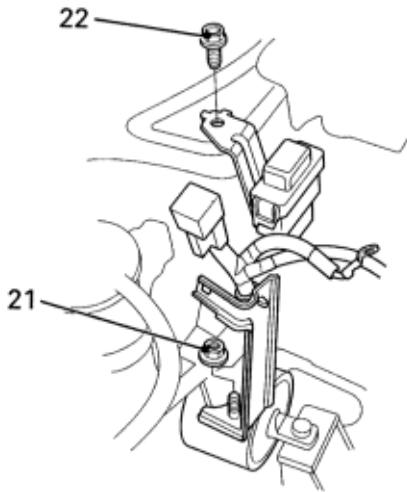
15. Remove 3 bolts securing sound deadening pad and engine.
16. Remove sound deadening pad.



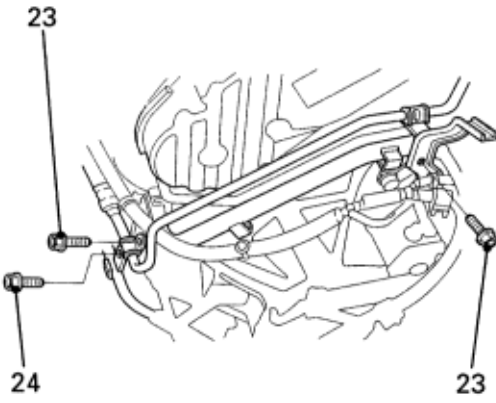
17. Slacken hose clip and disconnect intercooler outlet hose from air intake pipe.
18. Slacken hose clip and disconnect intercooler inlet hose from turbocharger outlet pipe.



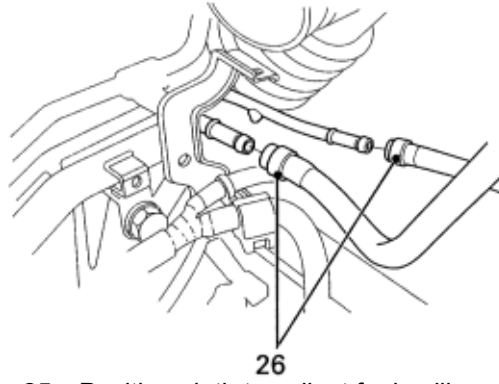
19. Remove nut and disconnect battery lead from starter solenoid.
20. Remove nut and disconnect battery lead from battery positive lead.



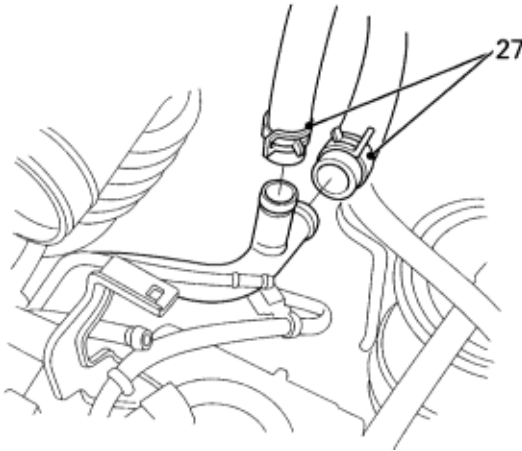
- 21. Remove nut securing wire harness clamp.
- 22. Remove bolt securing relay block bracket.



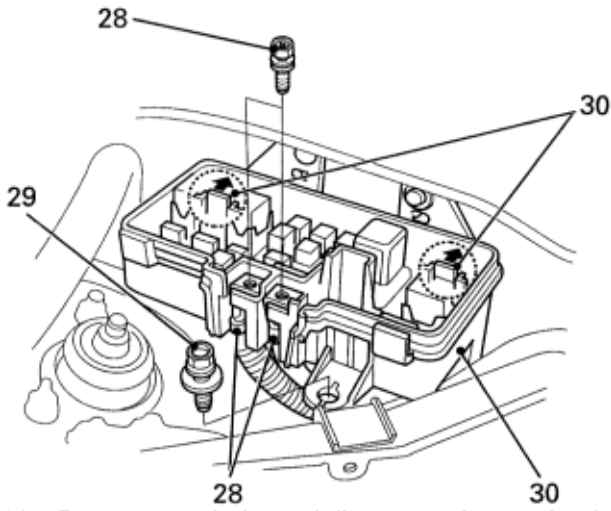
- 23. Remove 2 bolts securing PAS pipe.
- 24. Remove bolt securing compressor pipe.



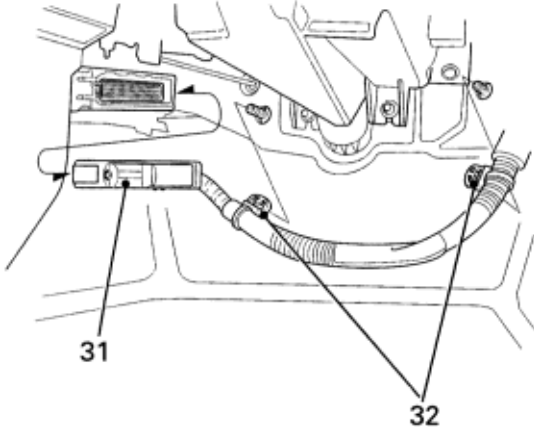
- 25. Position cloth to collect fuel spillage.
- 26. Release clips and disconnect fuel hoses from pipes.



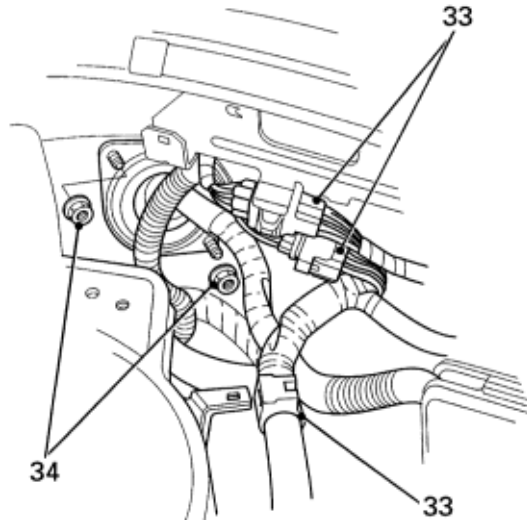
- 27. Release clips and disconnect heater hoses from coolant rail.



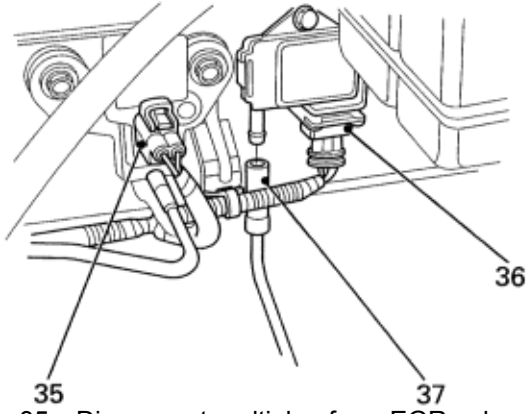
- 28. Remove two bolts and disconnect battery leads from under-hood fuse relay box.
- 29. Remove bolt securing under-hood fuse relay box.
- 30. Push tabs and pull up under-hood fuse relay box.



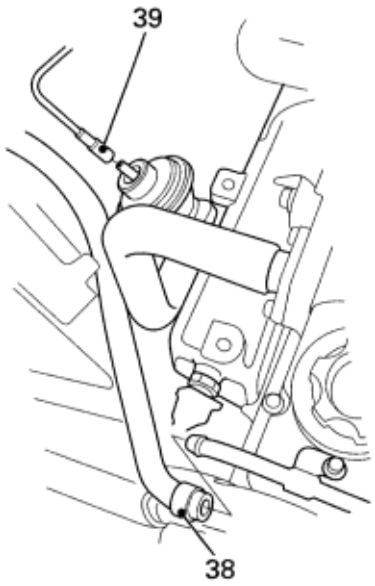
- 31. Disconnect engine control module (ECM) connector from ECU.
- 32. Remove two wire harness clamps.



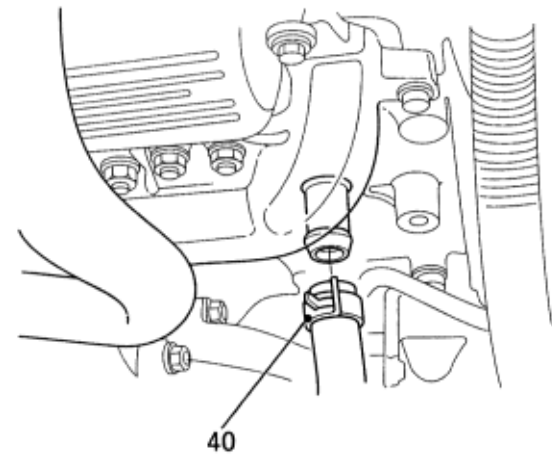
- 33. Remove wire harness clamp and disconnect engine wire harness connectors.
- 34. Remove two nuts and pull out ECM connector.



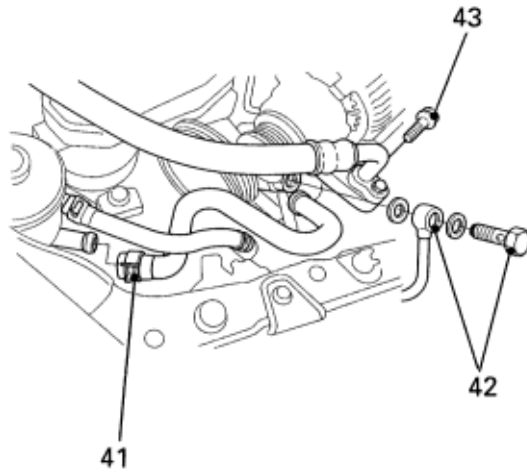
- 35. Disconnect multiplug from EGR solenoid.
- 36. Disconnect multiplug from boost pressure sensor.
- 37. Disconnect boost pipe from boost pressure sensor.



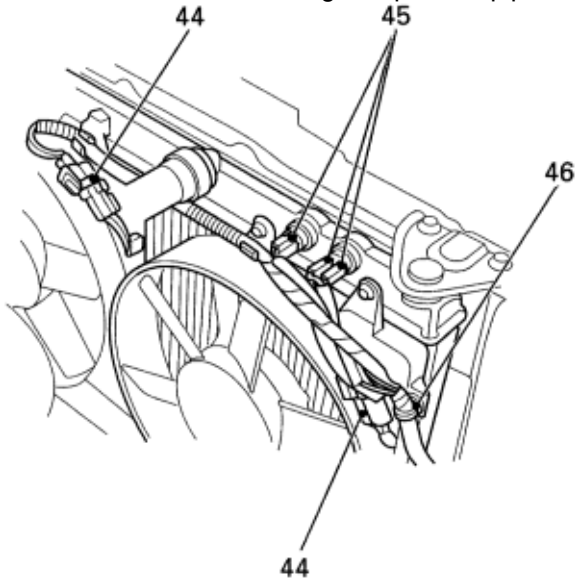
- 38. Release clip and disconnect brake servo vacuum hose from pipe at camshaft cover.
- 39. Disconnect vacuum pip from EGR valve.



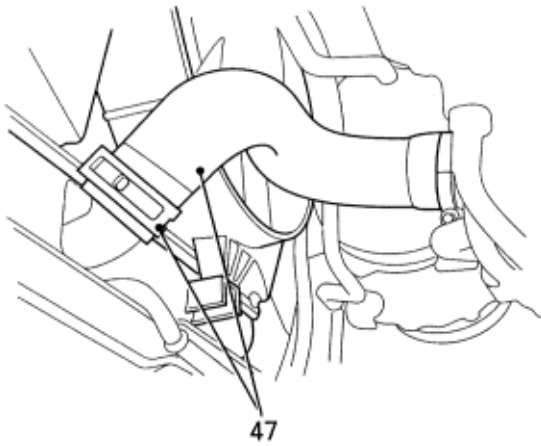
- 40. Release clip and disconnect coolant hose from cylinder block.



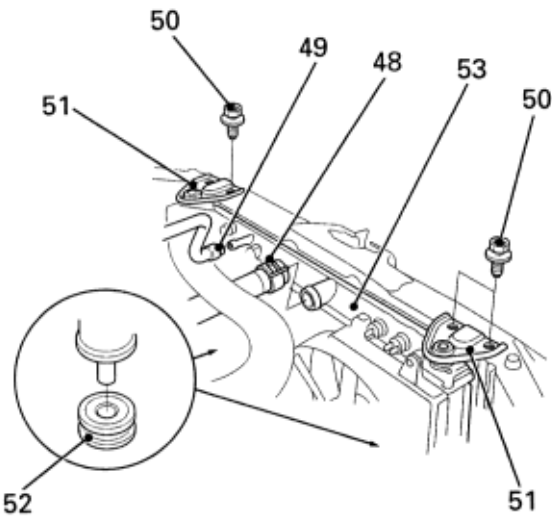
- 41. Release clip and disconnect outlet hose from PAS reservoir.
- 42. Remove banjo bolt and disconnect PAS high pressure hose from PAS pump.
- 43. Remove bolt securing compressor pipe.



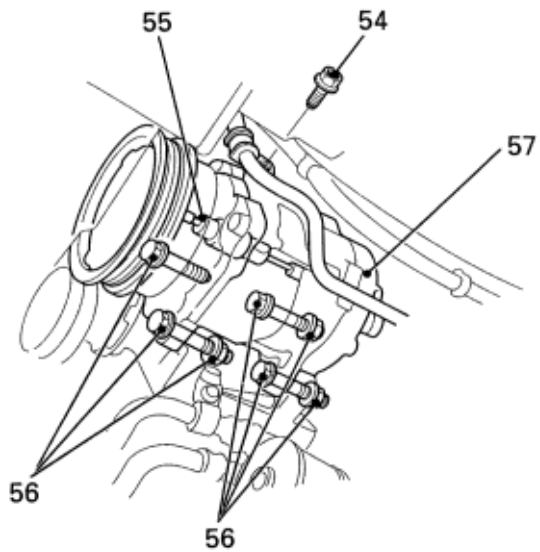
- 44. Disconnect connectors from fan motors.
- 45. Disconnect connectors from radiator.
- 46. Remove wire harness clamp from fan shroud.



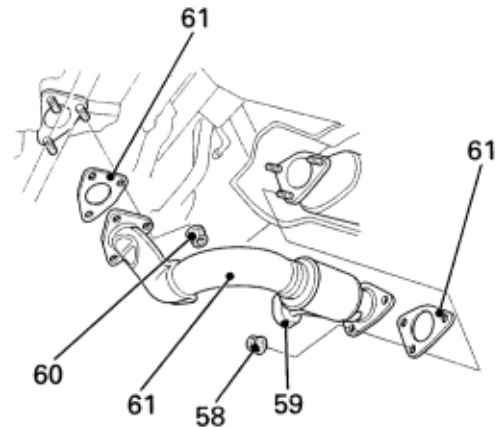
47. Loosen clip and disconnect bottom hose from radiator.



- 48. Loosen clip and disconnect top hose from radiator.
- 49. Loosen clip and disconnect coolant expansion hose from radiator.
- 50. Remove radiator top mounting brackets.
- 52. Release radiator from 2 lower mountings.
- 53. Remove radiator from vehicle.

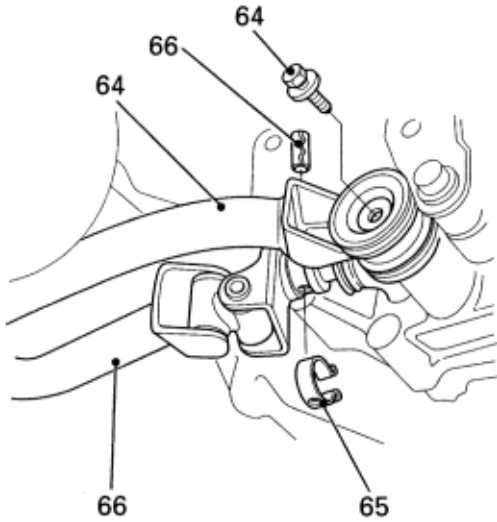


- 54. Remove bolt securing PAS pipe from compressor.
- 55. Disconnect connector from compressor.
- 56. Remove 4 bolts and 3 nuts securing compressor.
- 57. Remove compressor from engine.

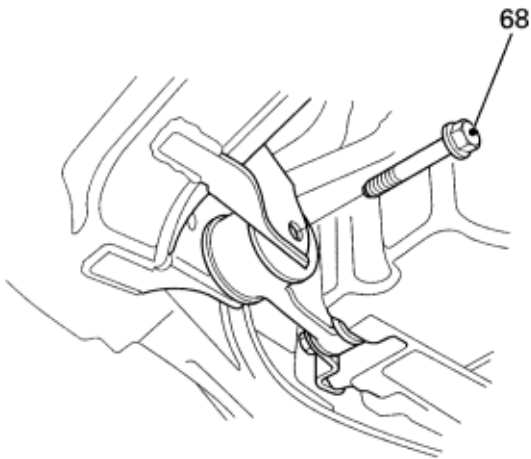


- 58. Remove 3 flange nuts securing front pipe to catalytic converter.
- 59. Release mounting rubber from pipe bracket.
- 60. Remove 3 flange nuts securing front pipe to manifold.
- 61. Remove front pipe and flange gaskets.

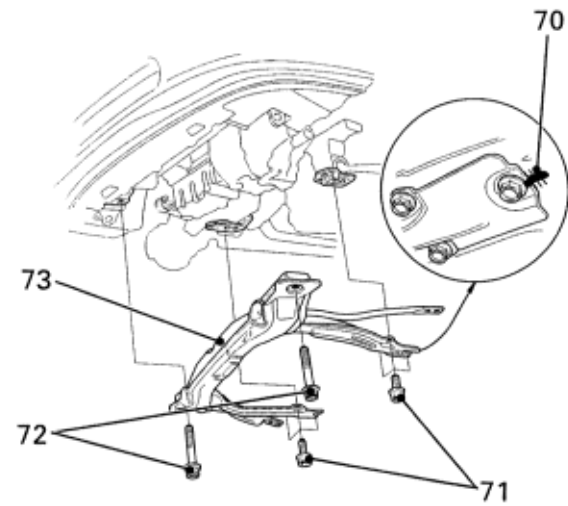
- 62. Remove LH front and RH front road wheels.
- 63. Remove LH and RH drive shafts. See **DRIVE SHAFTS, Repairs.**



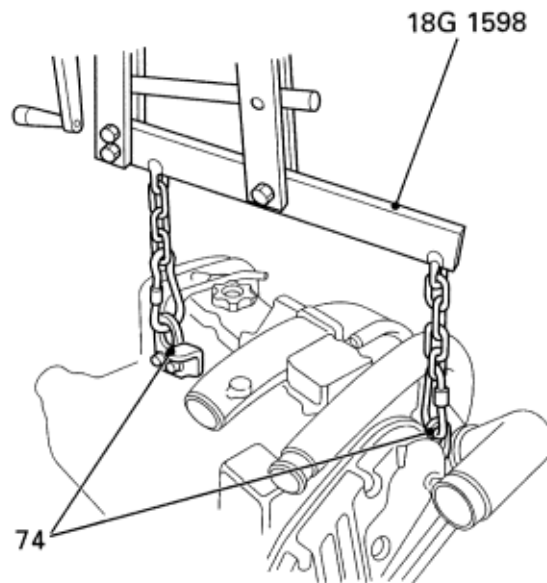
- 64. Remove bolt and disconnect gear change steady bar from gear box, collect 2 washers.
- 65. Remove clip from selector rod.
- 66. Using a suitable punch, drive out roll pin and release selector rod from shaft.
- 67. Tie selector bar and steady bar aside.



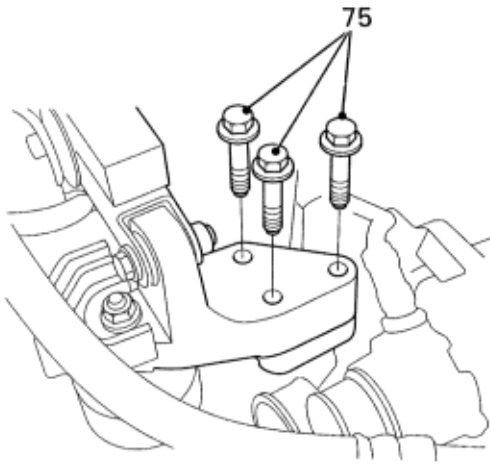
- 68. Remove bolt securing lower tie rod to sub frame.
- 69. Remove 4 bolts securing LH and RH radius rods.



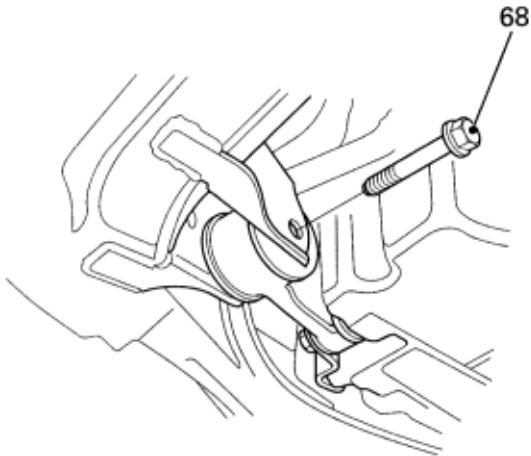
- 70. Mark on sub frame and rear beam.
- 71. Remove 6 bolts securing front sub frame to rear beam.
- 72. Remove 2 bolts securing front sub frame to body.
- 73. Release front sub frame.



- 74. Fit **18G 1598** to suitable engine lifting equipment and connect to engine lifting eyes.



75. Remove 3 bolts securing mounting bracket to engine.



76. Remove 2 bolts securing LH engine mounting to bracket on gearbox.

77. Slowly lower engine and gearbox approximately 150 mm (6 in). Check that all hoses and wires are disconnected from engine and gearbox.
78. Lower engine and gearbox all the way. Remove engine lifter from engine.
79. Remove engine and gearbox from under the vehicle.

Refit

1. Push engine and gearbox under the vehicle. Fit **18G 1598** to suitable engine lifting equipment and connect to engine lifting eyes.
2. Lift engine and gearbox into position in the vehicle.
3. Fit bolts securing LH engine mounting to bracket and tighten bolts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
4. Fit bolts securing RH mounting bracket to engine and tighten bolts to 105 Nm (10.7 kgf/m, 77 lbf/ft).
5. Fit front sub frame and align the marks on the rear beam and front sub frame.
6. Tighten bolts securing front sub frame to body to 103 Nm (10.5 kgf/m, 76 lbf/ft).
7. Tighten bolts securing front sub frame to rear beam to 64 Nm (6.5 kgf/m, 47 lbf/ft).
8. Clean mating faces of gear change selector and steady bar.
9. Connect selector rod to shaft and align holes.
10. Fit new roll pin securing selector rod to shaft and fit roll pin retaining clip.
11. Fit washer to gear change steady bar and connect bar to gearbox.
12. Fit steady bar retaining bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
13. Fit LH and RH driveshafts. See **DRIVE SHAFTS, Repairs.**
14. Fit new gasket to catalytic converter flange.
15. Fit front pipe to catalytic converter, fit nuts but do not tighten.
16. Fit new gasket to manifold flange.
17. Raise front pipe and engage flange.
18. Fit nuts securing manifold to front pipe and tighten nuts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
19. Tighten flange nuts securing front pipe to catalytic converter to 22 Nm (2.2 kgf/m, 16 lbf/ft).
20. Connect rubber mounting to front pipe bracket.
21. Fit both front road wheels and tighten nuts to 110 Nm (11.2 kgf/m, 81 lbf/ft).
22. Fit compressor and tighten bolts to 45 Nm (4.6 kgf/m 33 lbf/ft).
23. Fit radiator into position.
24. Fit top mounting to radiator and align to body.
25. Fit bolts securing top mounting to bonnet platform and tighten bolts to 9 Nm (0.9 kgf/m, 7 lbf/ft).
26. Connect top hose and bottom hose to radiator and tighten hose clips.
27. Connect PAS pump feed hose to reservoir and secure hose with clip.
28. Clean PAS high pressure pipe and banjo bolt.
29. Fit PAS high pressure pipe and washers on PAS pump and tighten banjo bolt to 49 Nm (5.0 kgf/m 36 lbf/ft).
30. Connect coolant hose to cylinder block and secure hose with clip.
31. Connect vacuum pipe to EGR valve.
32. Connect brake servo vacuum hose to pipe at camshaft cover and secure hose with clip.
33. Connect vacuum hose to boost pressure sensor.
34. Connect multiplug to boost pressure sensor.
35. Connect multiplug to EGR solenoid.
36. Put in ECU connectors and fit the grommet.
37. Tighten nuts securing grommet to frame to 11 Nm (1.1 kgf/m, 8.0 lbf/ft).
38. Connect engine wire harness connectors.
39. Connect wire harness clamp to bracket.
40. Connect ECU connector to ECU.
41. Connect wire harness clamp to bracket.
42. Fit under-hood fuse relay box on the bracket.
43. Tighten bolt securing under-hood fuse relay box and bracket.
44. Fit battery leads on the under-hood fuse relay box and tighten bolts to 9 Nm (0.9 kgf/m, 7 lbf/ft).
45. Connect heater hoses to coolant rail and secure with clips.
46. Connect fuel feed and return hoses to pipes and secure hoses with clips.
47. Tighten bolt securing compressor pipe to cylinder block to 10 Nm (1.0 kgf/m, 7.21 lbf/ft).
48. Tighten bolts securing PAS pipe to cylinder block to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).

49. Fit harness bracket on LH engine mounting and tighten nut to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
50. Fit relay block bracket on frame and tighten bolt to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
51. Fit battery lead on battery positive lead and tighten nut.
52. Connect battery lead to starter solenoid, fit nut and tighten to 4 Nm (0.4 kgf/m, 3 lbf/ft).
53. Connect intercooler inlet hose to turbocharger outlet pipe and tighten hose clip.
54. Connect intercooler outlet hose to air intake pipe and tighten hose clip.
55. Fit sound deadening pad on engine.
56. Tighten bolts securing sound deadening pad to engine to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
57. Fit transmission ground cable on transmission and tighten bolt to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
58. Fit clutch slave cylinder.
59. Fit bolts securing clutch slave cylinder bracket to transmission and tighten bolts to 24 Nm (2.4 kgf/m 17 lbf/ft).
60. Align push rod to release lever and fit slave cylinder pin.
61. Fit clip securing slave cylinder pin.
62. Fit air cleaner.
63. Connect air hose to air cleaner and tighten hose clip.
64. Connect multiplug to MAF sensor.
65. Fit battery tray bracket and tighten bolts.
66. Fit battery tray and tighten bolts and nuts.
67. If drained, refill engine with oil. See **MAINTENANCE**.
68. Fill gearbox with oil. See **MANUAL GEARBOX PG1, Adjustments**.
69. Fill cooling system. See **COOLING Adjustments**.
70. Remove stand(s) and lower vehicle.

Remove

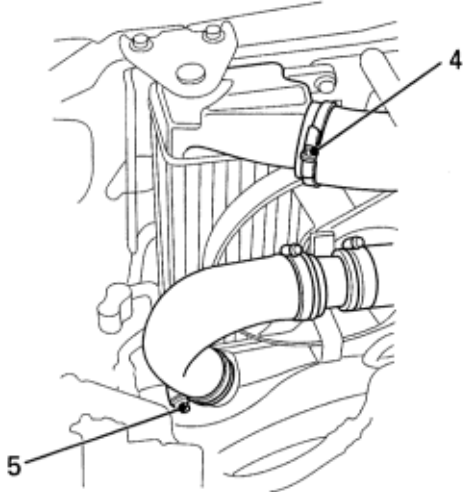
1. Disconnect battery earth lead.
2. Raise front of vehicle.



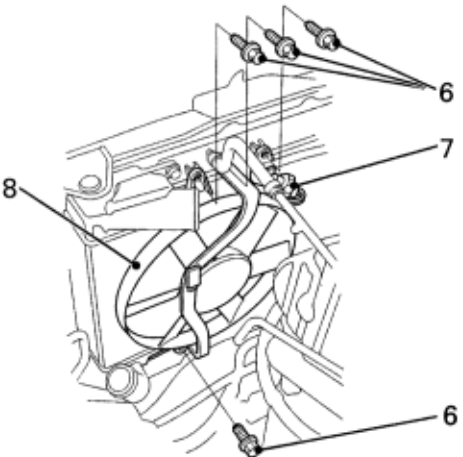
WARNING

Support on safety stands.

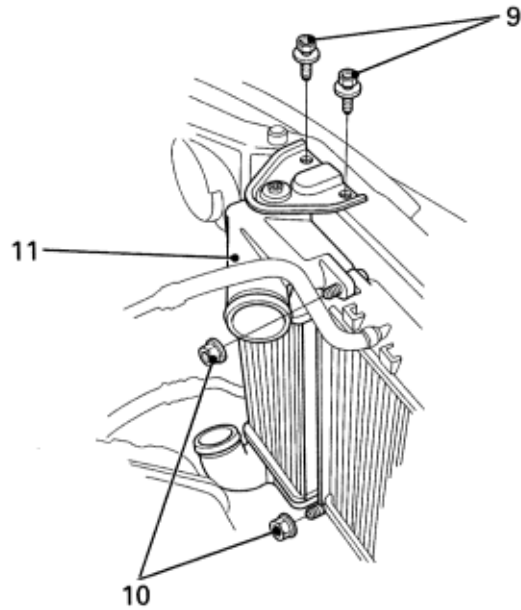
3. Remove under belly panel, see **BODY Repairs**.



4. Slacken hose clip and release hose from top of intercooler.
5. Slacken clip and release air hose from bottom of intercooler.



6. Remove 4 bolts securing cooling fan housing to radiator.
7. Disconnect multiplug from condenser fan motor.
8. Remove cooling fan housing.



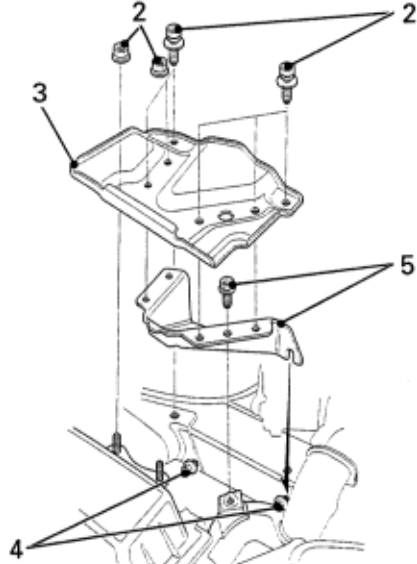
9. Remove 2 bolts securing intercooler support bracket to bonnet lock platform.
10. Remove 2 Tx40 Torx bolts and nuts securing intercooler to radiator.
11. Release and remove intercooler.
12. Retain rubber mounting.

Refit

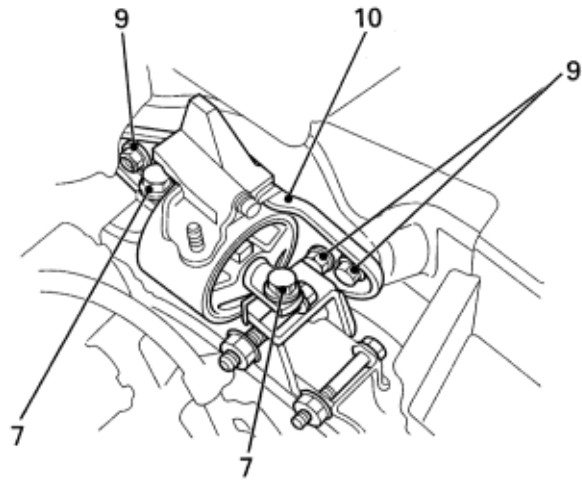
1. Ensure rubber mounting is fitted correctly.
2. Fit and tighten nuts and Torx bolts securing intercooler and radiator.
3. Fit intercooler into position.
4. Fit intercooler support bracket to bonnet lock platform, fit bolts and tighten bolts to 9 Nm (0.9 kgf/m, 7 lbf/ft).
5. Fit cooling fan housing into position.
6. Fit 4 bolts securing cooling fan housing to radiator and tighten to 9 Nm (0.9 kgf/m, 7 lbf/ft).
7. Connect multiplug to condenser fan motor.
8. Fit hoses to top and bottom of intercooler and secure with clips.
9. Fit under belly panel, see **BODY - Repairs**.
10. Remove stand(s) and lower vehicle.
11. Connect battery earth lead.

Remove

1. Remove underbelly panel. See **BODY, Exterior fittings**.



2. Remove 6 bolts and 2 nuts securing battery tray.
3. Remove battery tray.
4. Loosen 2 bolts securing battery tray bracket.
5. Remove a bolt and remove battery tray bracket.
6. Fit wooden block to jack and position jack to support gearbox.



7. Remove 2 bolts securing engine mounting to bracket on gearbox.
8. Lower gearbox on jack sufficiently only for access to mounting bolts.

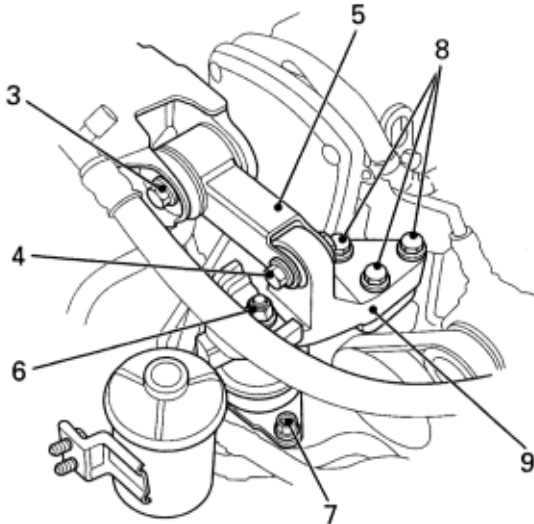
9. Remove 4 bolts securing engine mounting to body.
10. Remove engine mounting.

Refit

1. Fit engine mounting to body and tighten bolts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
2. Raise unit on jack and align bracket on gearbox with engine mounting.
3. Fit bolts securing mounting to bracket and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
4. Remove jack.
5. Fit battery tray bracket and tighten bolts.
6. Fit battery tray and tighten bolts and nuts.
7. Fit underbelly panel. See **BODY, Exterior fittings**.

Remove

1. Remove underbelly panel. See **BODY, Exterior fittings**.
2. Fit wooden block to jack and position jack to support engine



3. Slacken through bolt steady bar to body.
4. Remove through bolt securing steady bar to engine mounting bracket.
5. Pivot steady bar for access.
6. Remove nut engine bracket to mounting.
7. Remove 2 bolts securing engine mounting to body.
8. Remove 3 bolts securing engine mounting bracket to engine.
9. Remove RH engine mounting bracket.
10. Remove RH mounting.

Refit

1. Clean engine mounting bracket, dowels and dowel holes.
2. Fit engine mounting and engine bracket.
3. Tighten bolts bracket to engine to 105 Nm (10.7 kgf/m, 77 lbf/ft).
4. Fit nut mounting to engine bracket but do not tighten.
5. Align mounting to body. Tighten bolts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
6. Remove supporting jack.
7. Tighten nut mounting to engine bracket to 80 Nm (8.2 kgf/m, 59 lbf/ft).
8. Align steady bar to engine mounting fit through bolt but do not tighten.
9. Tighten steady bar bolts to 80 Nm (8.2 kgf/m, 59 lbf/ft). Through bolt to body first.
10. Fit underbelly panel. See **BODY, Exterior fittings**.

Engine Steady Bar - Upper

Remove

1. Remove through bolt securing steady bar to body.
2. Remove through bolt securing steady bar to engine mounting.
3. Remove steady bar.

Refit

1. Align steady bar to body fit through bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
2. Align steady bar to engine mounting fit bolts and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).

Remove

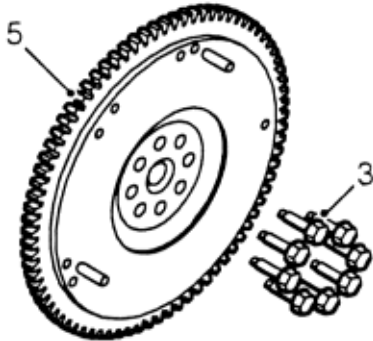
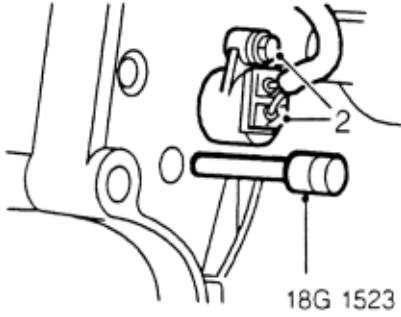
1. Remove underbelly panel. See **BODY, Exterior fittings.**
2. Remove through bolt securing steady bar to engine bracket.
3. Remove through bolt securing steady bar to sub frame.
4. Remove steady bar.

Refit

1. Clean area of sub frame where engine steady bar is fitted.
2. Align steady bar to sub frame fit through bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
3. Align steady bar to sub frame fit through bolt and tighten to 80 Nm (8.2 kgf/m, 59 lbf/ft).
4. Fit underbelly panel. See **BODY, Exterior fittings.**

Remove

1. Remove clutch assembly. See **CLUTCH, Repairs**.



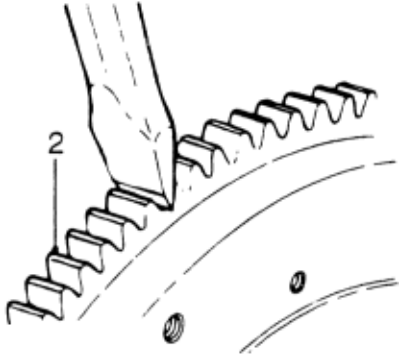
2. Remove bolt securing CKP sensor and release sensor from gearbox mounting plate.
3. Remove and discard 6 bolts securing flywheel to crankshaft.
4. Remove flywheel locking pin tool **18G 1523**.
5. Remove flywheel from crankshaft.

Refit

1. Using an old flywheel retaining bolt with saw cuts at 45° to bolt shank, clean old adhesive from thread of flywheel bolt holes in crankshaft.
2. Clean flywheel and mating face of crankshaft.
3. Clean dowel and dowel hole.
4. Fit flywheel to crankshaft.
5. Fit flywheel locking pin tool **18G 1523**.
6. Fit NEW bolts securing flywheel to crankshaft and working in a diagonal sequence tighten bolts to 15 Nm (1.5 kgf/m, 11 lbf/ft).
7. Clean CKP sensor and mating face.
8. Fit CKP sensor and secure with bolt.
9. Fit clutch assembly. See **CLUTCH, Repairs**.

Remove

1. Remove engine flywheel. **See this section.**



2. Apply a cold chisel in root of one of ring gear teeth, strike chisel with hammer to break ring gear.
3. Remove starter ring gear.

Refit

1. Clean flywheel and starter ring gear.
2. Heat neat starter ring gear evenly to 350°C (662°F).
3. Locate ring gear on flywheel and press ring gear hard against flange on flywheel.
4. Ensure ring gear is correctly seated around the complete circumference of flywheel and allow to cool.
5. Fit flywheel. **See this section.**

Remove

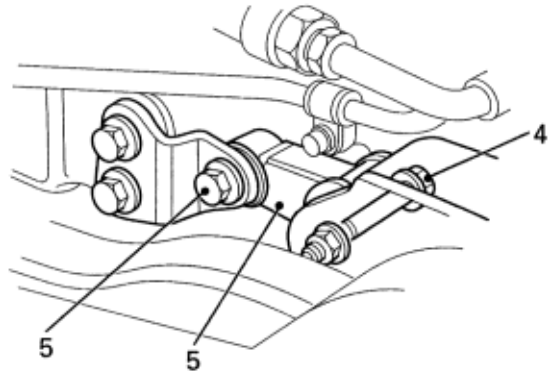
1. Raise front of vehicle.



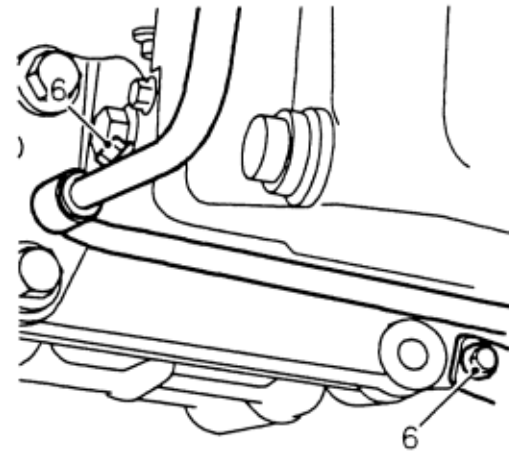
WARNING

Support on safety stands.

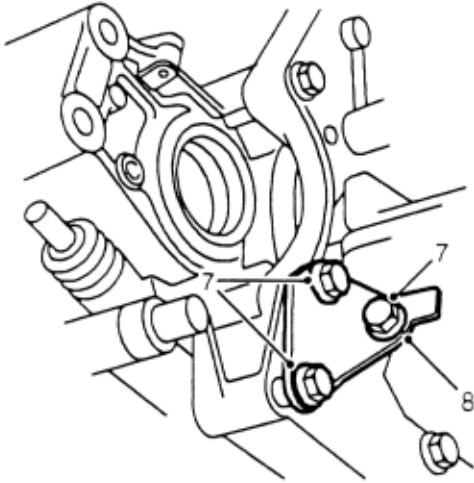
2. Drain engine oil. **See MAINTENANCE.**
3. Remove oil filter. **See MAINTENANCE.**



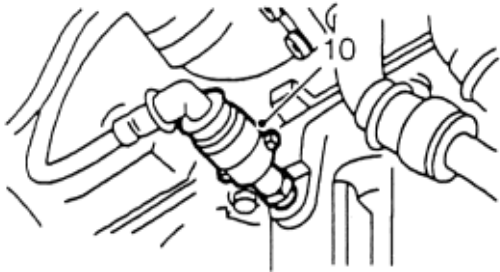
4. Slacken bolt engine lower tie rod to sub frame.
5. Remove bolt engine lower tie rod to bracket on sump. Release rod from bracket.



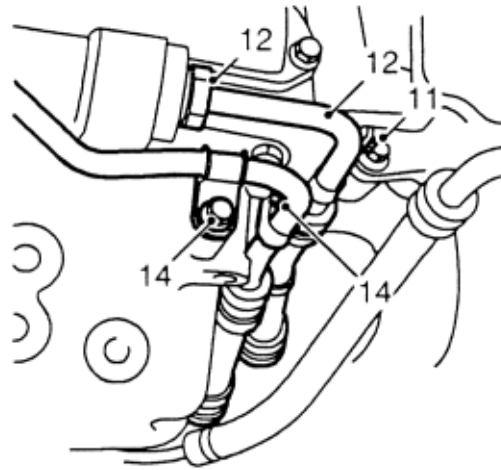
6. Remove 2 bolts securing PAS pipes to sump and gearbox to engine support bracket.



7. Remove 3 bolts securing support bracket to gearbox and sump.
8. Remove bracket.
9. Position container to collect spillage from vacuum pump and oil cooler pipe unions.



10. Release vacuum pump oil return pipe from adaptor on sump.

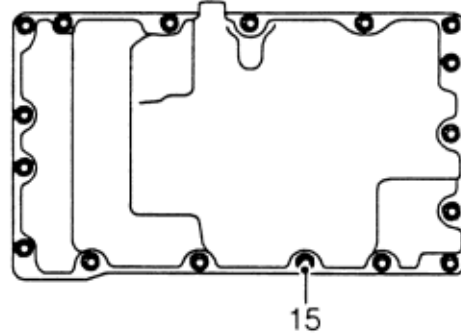


11. Remove bolt securing oil cooler pipe clip to bracket on coolant pump mounting.
12. Remove oil cooler pipe union nut from oil pump and release pipe from pump.
13. Remove and discard 'O' ring seal.

⚠ WARNING

Plug the connections.

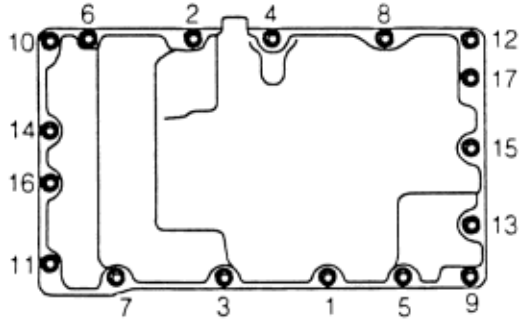
14. Remove 2 bolts securing oil cooler pipe to sump.



15. Remove 17 bolts securing sump to cylinder block.
16. Remove sump.
17. Remove gasket from sump.

Refit

1. Clean sump and cylinder block mating faces.
2. Fit gasket to sump.



3. Fit sump to block and tighten bolts in sequence shown to 25 Nm (2,6 kgf/m, 19 lbf/ft).
4. Fit 2 bolts securing oil cooler pipe clips to sump.
5. Clean oil cooler pipe union.
6. Fit new 'O' ring seal to pipe.
7. Connect pipe to oil pump and tighten union nut to 25 Nm (2.6 kgf/m, 19 lbf/ft).
8. Fit bolt securing oil cooler pipe clip to coolant pump mounting.
9. Connect vacuum return pipe to sump.
10. Fit support bracket and tighten bolts, bracket to adaptor plate to 70 Nm (7.1 kgf/m, 52 lbf/ft) and bolt bracket to sump to 25 Nm (2.6 kgf/m, 19 lbf/ft).
11. Fit 2 bolts securing PAS pipe to sump and engine to gearbox support bracket.
12. Align lower tie rod to bracket on sump and tighten bolts to 80 Nm (8.2 kgf/m, 59 lbf/ft).
13. Fit oil filter. See **MAINTENANCE**.
14. Fill with engine oil. See **MAINTENANCE**.
15. Remove stand(s) and lower vehicle.

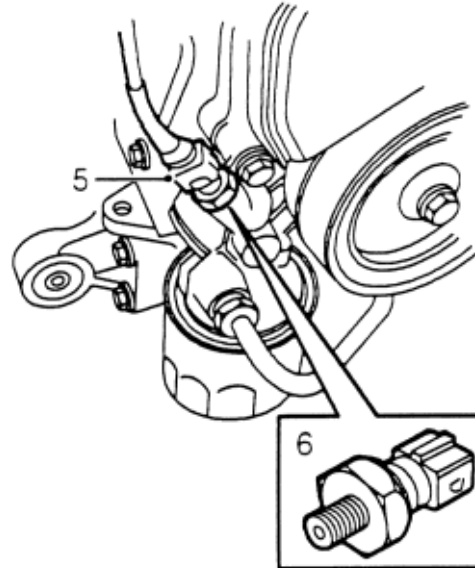
Remove

1. Disconnect battery earth lead.
2. Raise front of vehicle.



Support on safety stands.

3. Remove underbelly panel. See **BODY, Exterior fittings**.
4. Position drain tin below engine oil filter.



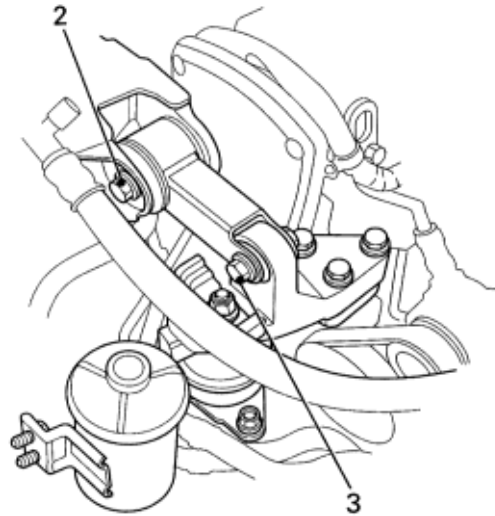
5. Disconnect multiplug from oil pressure switch.
6. Remove oil pressure switch.

Refit

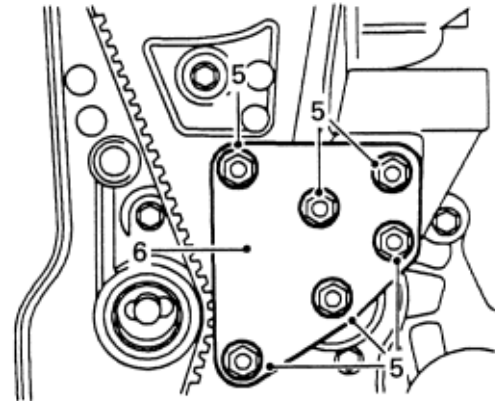
1. Clean oil pressure switch threads.
2. Fit oil pressure switch and tighten to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).
3. Connect multiplug to oil pressure switch.
4. Fit underbelly panel. See **BODY, Exterior fittings**.
5. Remove stand(s) and lower vehicle.
6. Top up engine oil. See **MAINTENANCE**.
7. Connect battery earth lead.

Remove

1. Remove camshaft timing belt lower cover. See **this section**.

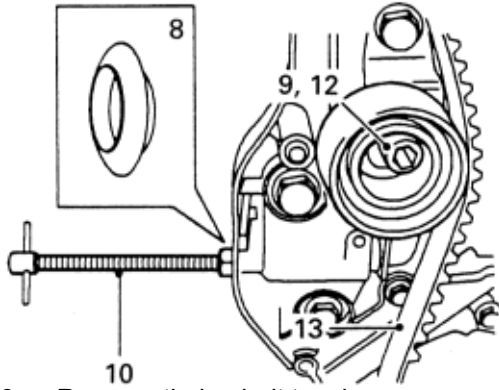


2. Remove through bolt steady bar to body.
3. Slacken through bolt steady bar to engine mounting.
4. Pivot steady bar forwards for access.



5. Remove 6 nuts from RH engine mounting plate.
6. Remove RH engine mounting plate.

7. If timing belt is to be refitted mark direction of rotation.



8. Remove timing belt tensioner access plug.
9. Slacken Allen bolt securing belt tensioner pulley.
10. Fit **18G 1719** to tensioner.
11. Pull back camshaft timing belt tensioner plunger using **18G 1719**.
12. Tighten tensioner pulley Allen bolt.
13. Remove timing belt.

CAUTION

Ease timing belt from gears using fingers only. Metal levers may damage the belt and gears. Do not rotate engine with timing belt removed and cylinder head fitted. Timing belts must be stored and handled with care. Store belt on its edge with a radius greater than 50 mm (2.0). Do not use a belt which has been twisted or bent double as this can fracture reinforcing fibres. Do not use an oil contaminated belt. Although the belt has a service life of 84,000 miles, (135,000 km) an existing belt should only be refitted if it has completed less than 42,000 miles (65,000 km).

Refit

1. Clean timing belt gears and pulleys.

CAUTION

If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly clean and dry before reuse. The cause of oil contamination must be rectified.

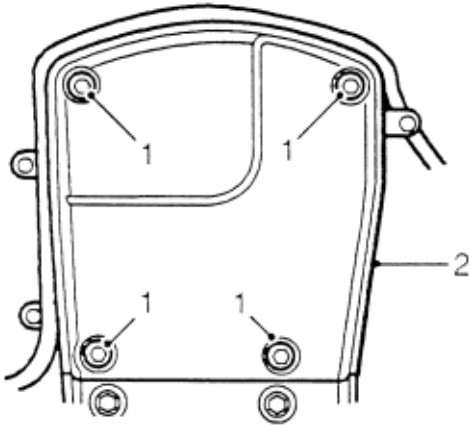
2. Using fingers only, fit timing belt to gears. Ensure the belt runs between the crankshaft gear and camshaft gear is kept taut during the fitting procedure.

CAUTION

If original belt is to be refitted ensure direction of rotation is facing the correct way.

3. Clean mounting plate faces.
4. Fit engine mounting plate and secure with 6 nuts. Tighten to 30 Nm (3.1 kgf/m, 22 lbf/ft) + 120°.
5. Align steady bar to body, fit and tighten bolt to 80 Nm (8.2 kgf/m, 59 lbf/ft).
6. Tighten bolt securing steady bar to engine mounting to 80 Nm (8.2 kgf/m, 59 lbf/ft).
7. Slacken Allen bolt securing belt tensioner pulley.
8. Release camshaft timing belt tensioner plunger using **18G 1719**.
9. Remove **18G 1719** from tensioner.
10. Nip up tensioner pulley Allen bolt.
11. Fit timing belt tensioner access plug to belt cover.
12. Remove Allen access plug from lower cover.
13. Fit camshaft timing belt lower cover. **See this section.**
14. Using a socket and extension bar on the crankshaft pulley bolt, rotate crankshaft two turns clockwise until the flywheel timing pin can be re-fitted.
15. Check the camshaft gear timing mark is correctly aligned with the back cover timing mark.
16. Slacken Allen bolt securing belt tensioner pulley, to allow the tensioner to react and then tighten to 44 Nm (4.5 kgf/m, 33 lbf/ft).
17. Remove timing pin **18G 1523** from flywheel.
18. Fit Allen bolt access plug to lower cover.

Remove



1. Remove 4 bolts securing timing belt upper cover to rear cover.
2. Remove timing belt upper cover.

Refit

1. Fit timing belt upper cover and tighten bolts to 5 Nm (0.5 kgf/m, 3.5 lbf/ft).

Remove

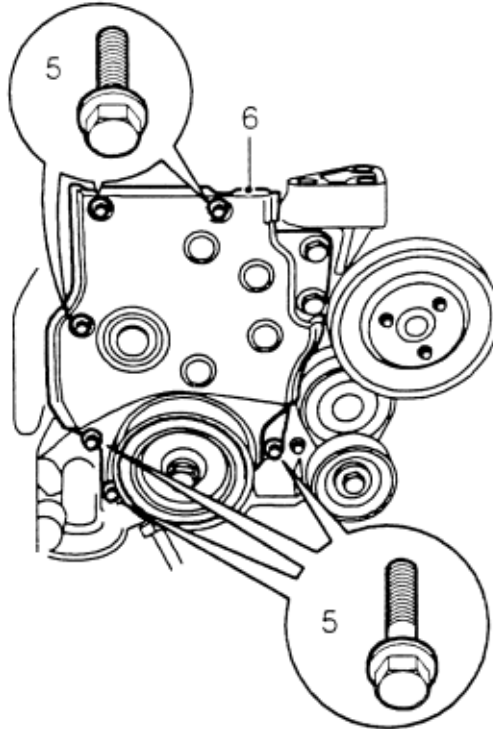
1. Disconnect battery earth lead.
2. Raise front of vehicle.



WARNING

Support on safety stands.

3. Remove timing belt upper cover. **See this section.**
4. Remove crankshaft pulley. **See this section.**



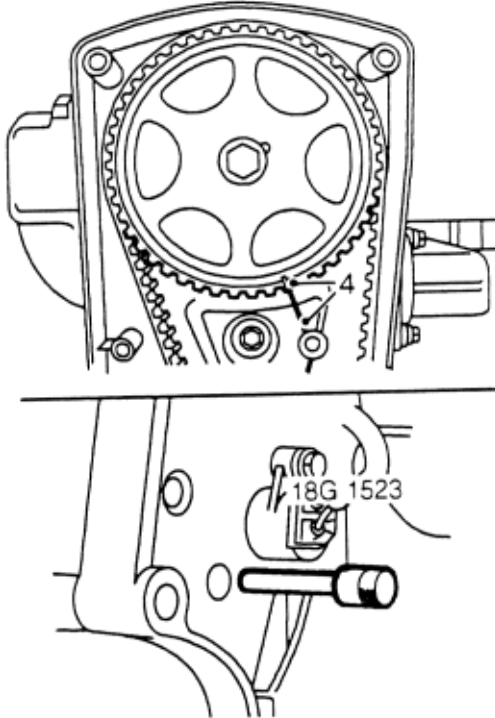
5. Remove 6 bolts securing lower cover.
6. Remove lower cover.

Refit

1. Fit lower cover to engine and tighten bolts to 5 Nm (0.5 kgf/m, 3.5 lbf/ft).
2. Fit crankshaft pulley. **See this section.**
3. Fit timing belt upper cover. **See this section.**
4. Remove stand(s) and lower vehicle.
5. Connect battery earth lead.

Remove

1. Remove injection pump timing belt cover. **See this section.**
2. Remove camshaft timing belt upper cover. **See this section.**
3. Remove underbelly panel for access to crankshaft pulley bolt. See **BODY, Exterior fittings.**



4. Using a socket with extension bar on the crankshaft pulley bolt, rotate crankshaft clockwise to align timing marks on camshaft pulley and back cover.

**CAUTION**

Never use the camshaft gear, gear retaining bolt or timing belt to rotate the camshaft.

5. Fit timing pin **18G 1523** through hole in gearbox adaptor plate and flywheel.

Injection Pump Timing Belt (cont'd)

6. Fit locking pin **18G 1717** through injection pump drive gear and into hole in mounting plate.
7. Restrain camshaft drive gear using **18G 1521**.
8. Slacken 4 bolts securing FIP derive belt gear to hub on camshaft.

**CAUTION**

If drive belt is to be refitted, mark direction of rotation on belt.

9. Slacken Allen bolt securing tensioner pulley, move tensioner away from belt and tighten Allen bolt.
10. Remove injection pump timing belt.

**CAUTION**

Ease timing belt from gears using fingers only. Metal levers may damage the belt and gears. Timing belts must be stored and handled with care. Store belt on its edge with a radius greater than 50 mm (2.0). Do not use a belt which has been twisted or bent double as this can fracture reinforcing fibres. Do not use an oil contaminated belt. Although the belt has a service life of 84,000 miles, (135,000 km) an existing belt should only be refitted if it has completed less than 42,000 miles (65,000 km).

Refit

1. Clean timing belt gears.

**CAUTION**

If the sintered gears have been subjected to prolonged oil contamination, they must be soaked in a solvent bath and thoroughly clean and dry before reuse. The cause of oil contamination must be rectified.

2. Leave the 4 bolts securing the FIP belt drive gear to hub just loose enough for the gear to rotate within slots without tipping.
3. Fit timing belt using fingers only rotating the FIP belt drive gear fully clockwise within the slots and then anti-clockwise until the drive belt locates in the gear teeth. Fitting the belt in the other possible position will not allow for correct belt adjustment.

**CAUTION**

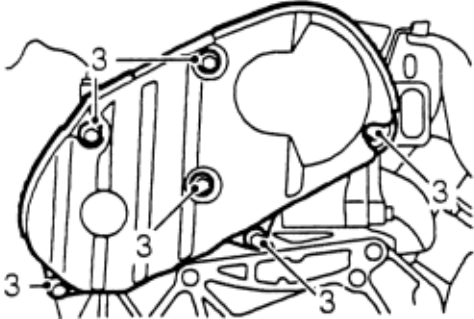
If original belt is to be refitted ensure direction of rotation is correct.

4. Slacken tension pulley Allen bolt.
5. Using a torque wrench fitted to the tensioner plate, tension the belt to 6 Nm (0.6 kgf/m, 5.2 lbf/ft).
6. Tighten the Allen bolt.
7. Restrain camshaft gear using **18G 1521** and tighten 4 bolts securing FIP drive belt gear.
8. Remove injection pump gear locking pin and engine timing pin.
9. Rotate crankshaft 2 complete turns clockwise and fit flywheel timing pin.
10. Slacken 4 bolts securing FIP belt drive gear hub and fit FIP gear locking pin.
11. Slacken timing belt tensioner Allen bolt.
12. Using a torque wrench fitted to the tensioner plate set the tension to 6 Nm (0.6 kgf/m, 5.2 lbf/ft) and tighten the tensioner Allen bolt to 44 Nm (4.5 kgf/m, 33 lbf/ft).
13. Fit a torque wrench to FIP drive belt gear and apply an anti-clockwise torque of 25 Nm (2.6 kgf/m, 19 lbf/t).
14. Tighten 4 camshaft gear bolts to 25 Nm (2.6 kgf/m, 19 lbf/t).
15. Remove injection pump gear locking pin and engine timing pin.
16. Fit injection pump timing belt cover. **See this section.**
17. Fit timing belt upper cover. **See this section.**
18. Fit underbelly panel. **See BODY, Exterior fittings.**

Injection Pump Timing Belt Cover

Remove

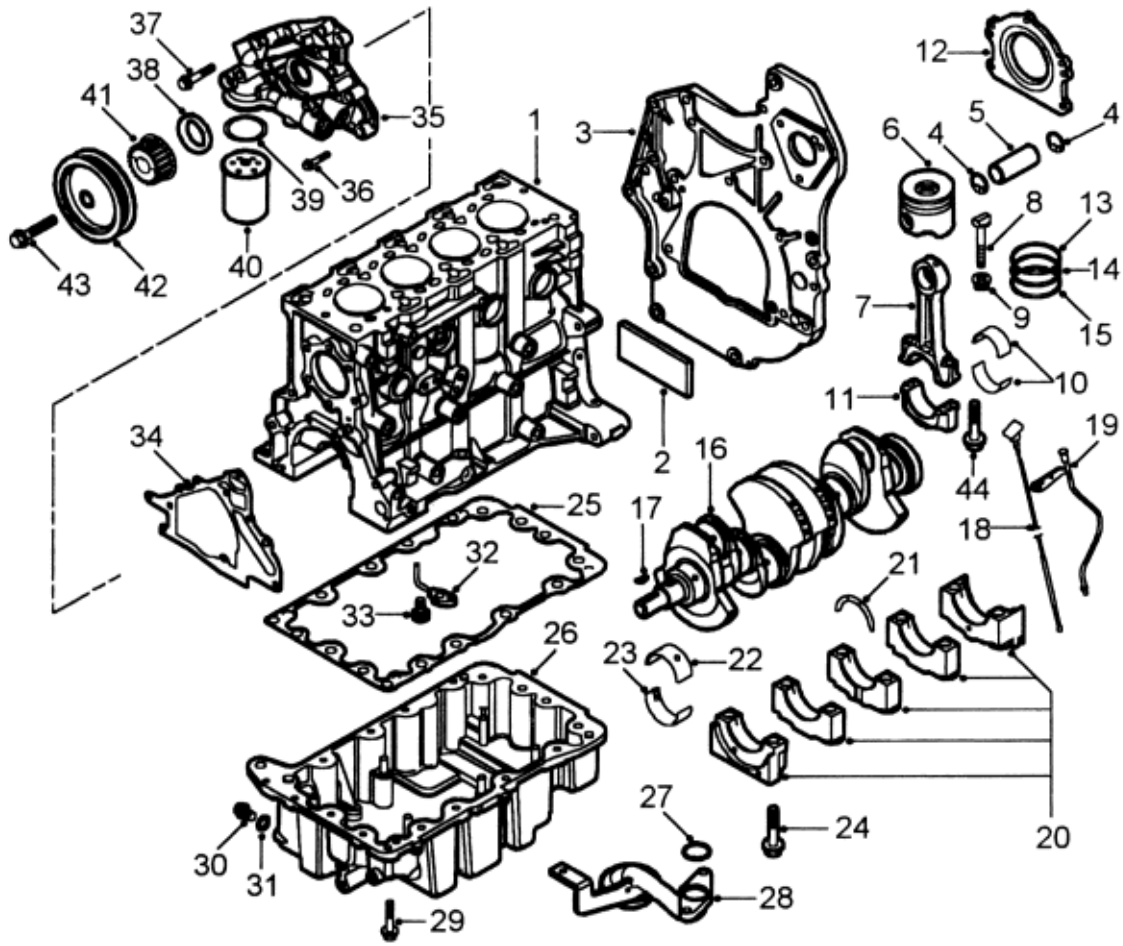
1. Remove engine acoustic. See **BODY, Exterior fittings.**
2. Remove air cleaner. See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs.**



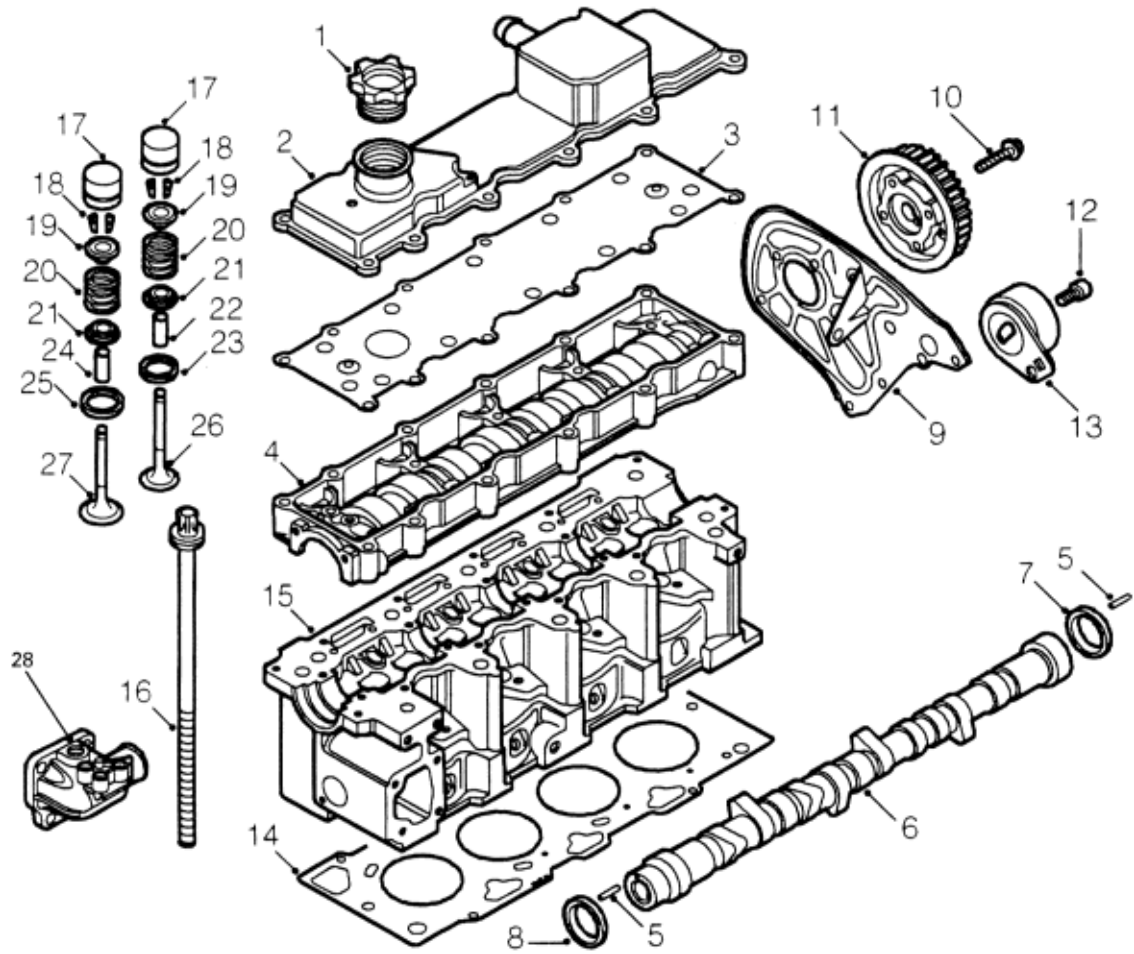
3. Remove 6 bolts and remove injection pump timing belt cover.

Refit

1. Fit timing belt upper cover and tighten bolts to 5 Nm (0.5 kgf/m, 3.7 lbf/ft).
2. Remove air cleaner. See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs.**
3. Fit engine acoustic. See **BODY, Exterior fittings.**



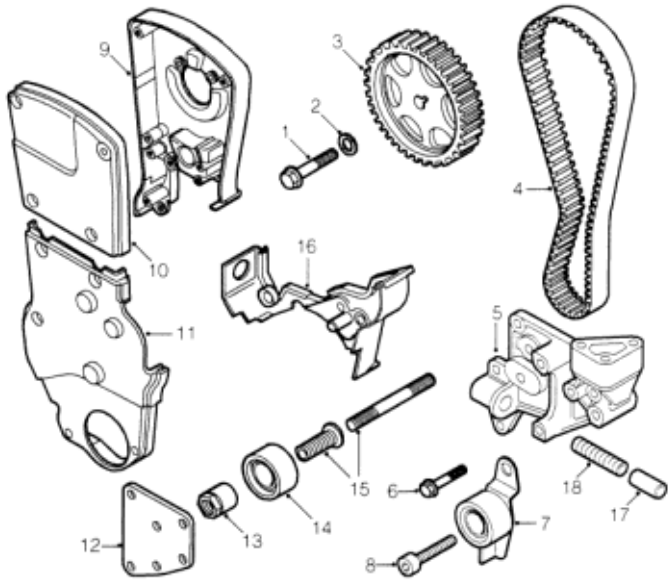
-
- | | |
|--|--------------------------------------|
| 1. Cylinder Block | 23. Lower Main Bearing Shell - Plain |
| 2. Foam Pad | 24. Bolt - Main Bearing Cap |
| 3. Gearbox Adaptor Plate | 25. Gasket - Sump |
| 4. Circlip - Gudgeon Pin | 26. Sump |
| 5. Gudgeon Pin | 27. 'O' Ring |
| 6. Piston | 28. Oil Strainer And Pick-Up Pipe |
| 7. Connecting Rod | 29. Bolt - Sump |
| 8. Bolt - Connecting Rod | 30. Drain Plug |
| 9. Nut | 31. Sealing Washer |
| 10. Big-End Bearing Shells | 32. Oil Squirt Jet |
| 11. Big-End Bearing Cap | 33. Banjo Bolt |
| 12. Crankshaft Rear Oil Seal And Housing | 34. Gasket - Oil Pump |
| 13. Top Compression Ring | 35. Oil Pump |
| 14. 2nd Compression Ring | 36. Bolt - M6 |
| 15. Oil Control Ring | 37. Bolt - M10 |
| 16. Crankshaft | 38. Crankshaft Front Oil Seal |
| 17. Woodruff Key | 39. Sealing Ring |
| 18. Dipstick | 40. Oil Filter Element |
| 19. Dipstick Tube | 41. Timing Gear |
| 20. Main Bearing Cap | 42. Crankshaft Pulley |
| 21. Thrust Washer | 43. Bolt - Crankshaft Pulley |
| 22. Upper Main Bearing Shell - Grooved | 44. Bolt - Connecting Rod* |
- * Type 'B' engines



- | | |
|--|---|
| 1. Oil Filter Cap | 15. Cylinder Head |
| 2. Camshaft Cover | 16. Bolt - Cylinder Head |
| 3. Gasket - Camshaft Cover | 17. Tappet |
| 4. Camshaft Carrier | 18. Collets |
| 5. Drive Pin | 19. Spring Cap |
| 6. Camshaft | 20. Valve Spring |
| 7. Camshaft Rear Oil Seal | 21. Spring Seat And Valve Stem Oil Seal |
| 8. Camshaft Front Oil Seal | 22. Valve Guide - Exhaust |
| 9. Fuel Injection Pump Drive Belt Rear Cover | 23. Valve Guide seat insert - exhaust |
| 10. Bolt - Fuel Injection Pump Drive Gear | 24. Valve Guide - Inlet |
| 11. Fuel Injection Pump Drive Gear | 25. Valve Seat Insert - Inlet |
| 12. Allen Screw | 26. Exhaust Valve |
| 13. Fuel Injection Pump Drive Belt Tensioner | 27. Inlet Valve |
| 14. Gasket - Cylinder Head | 28. Coolant Outlet Elbow |

Description and Operation
Camshaft Timing Belt Components

5-52



1. BOLT - TIMING BELT GEAR
2. WASHER
3. TIMING BELT GEAR
4. CAMSHAFT TIMING BELT
5. TENSIONER HOUSING
6. BOLT - TENSIONER PULLEY
7. TENSIONER PULLEY
8. ALLEN SCREW - TENSIONER PULLEY
9. TIMING BELT UPPER REAR COVER
10. TIMING BELT UPPER FRONT COVER
11. TIMING BELT LOWER FRONT COVER
12. ENGINE FRONT MOUNTING COVER PLATE
13. NUT - IDLER PULLEY
14. IDLER PULLEY
15. STUD AND ADAPTOR - IDLER PULLEY
16. TIMING BELT LOWER REAR COVER
17. TENSIONER PLUNGER
18. TENSIONER SPRING

Description

The engine is a 4 cylinder, in-line, direct injection diesel engine having 2 valves per cylinder operated by a single overhead camshaft. A cast iron cylinder block incorporates direct bored cylinders, each pair of cylinders being strategically positioned to reduce engine length and give good structural rigidity. An alloy camshaft carrier is bolted directly to the alloy cylinder head, the camshaft bearing journals are line bored between the two components. The camshaft operates the valves via hydraulic tappets and is driven from a gear on the crankshaft by an internally toothed belt. Belt tension is by means of a semi-automatic tensioner and an idler pulley is also fitted. A gear on the rear end of the camshaft drives the fuel injection pump belt. A single spring is fitted to each valve, the valve stem oil seals are moulded on to a metal base which also forms the valve spring seat on the cylinder head. The valve stems run in guides pressed into the cylinder head.

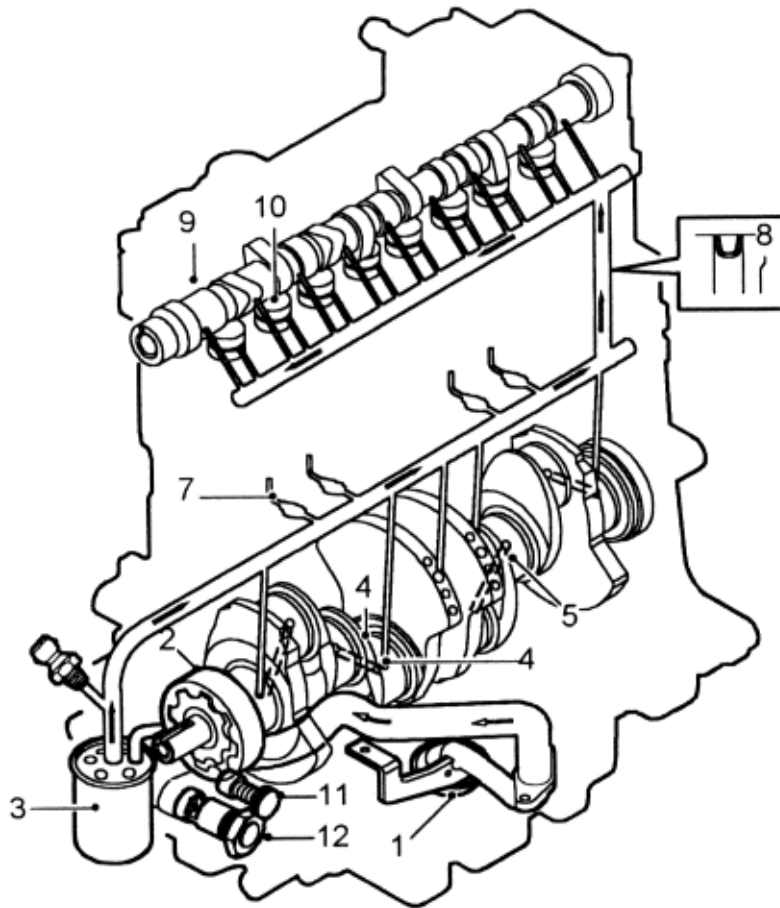
The aluminium alloy, graphite coated pistons are fitted with two compression and an oil control ring, the top ring is located in a steel insert which helps to provide a minimal reaction to compression forces. The piston crowns are domed in the centre, the combustion chamber being formed in a bowl around the dome. Fully floating gudgeon pins retain the pistons to the connecting rods, the pins are offset towards the thrust side of the pistons and are secured in the pistons by circlips. Oil squirt jets located in the cylinder block provide additional piston cooling and gudgeon pin lubrication. Plain big-end bearing shells are fitted, the connecting rod caps being retained by dowel bolts and nuts.

A new process in the manufacture of the connecting rods has been introduced, known as 'Fracture Split' connecting rods, where the bearing cap is fractured from the connecting rod. Plain big-end shells without location tags are fitted, with flange headed bolts retaining the bearing cap to the connecting rod. To prevent incorrect fitment of the bearing cap to the connecting rod, the retaining bolt threads in the connecting rod, the retaining bolt threads in the connecting rod are machined off-set by 1 mm.

The crankshaft runs in 5 main bearings, grooved bearing shells are fitted in the cylinder block with plain bearing shells in each main bearing cap. Positive location of each main bearing cap is by means of hollow dowels. Crankshaft end-float is controlled by single size thrust washers, located each side of the centre - Number 3 main bearing in the cylinder block. The crankshaft front oil seal is located in the oil pump body whilst the rear oil seal is integral with a housing bolted to the rear of the cylinder block. Additional oil sealing is provided by RTV sealant injected into grooves and along the joint lines of the front main - Number 1 bearing cap and the crankshaft rear oil seal.

A rotor type oil pump is driven from the front of the crankshaft, the pump is sealed to the cylinder block with a gasket.

The case alloy sump is bolted to the cylinder block and rear main bearing cap and is sealed to the block with a rubber gasket which incorporates locating lugs for the block and sump. Compression limiters in the bolt holes prevent distortion of the gasket.



Lubrication

Oil is drawn through a gauze strainer (1) and through a passage in the cylinder block to the oil pump (2). Pressurised oil flows via the full flow filter (3) to the main oil gallery in the cylinder block.

Drillings from the main oil gallery direct oil to the crankshaft main bearings (4) and cross drillings in the crankshaft direct oil to the big-end bearings (5). Additional drillings in the cylinder block supply oil at reduced pressure to the oil squirt jets (7) for piston cooling and gudgeon pin lubrication and via a restrictor (8) in the top of the cylinder block to the rear of the cylinder head. A full length drilling in the cylinder head directs oil to the camshaft journals (9) and tappets (10).

An oil pressure relief valve (11) is located in the oil pump body which also carries the oil filter adapter and the return union for the externally mounted oil cooler.

A thermostatic valve (12), comprising a valve, spring and diverter plug is located in the oil pump body. The oil flow union to the oil cooler is screwed into the end of the diverter plug. The valve is closed during engine warm-up thereby preventing oil flow to the oil cooler. As soon as the oil reaches a pre-determined temperature, the valve opens and allows oil to flow to the cooler.

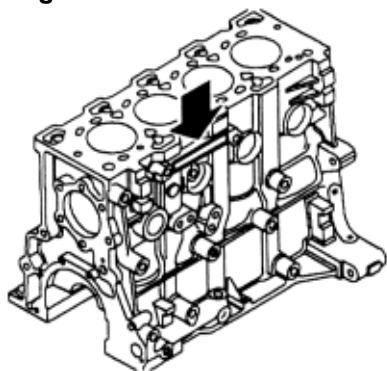
Crankcase ventilation

A positive crankcase ventilation system is used to vent crankcase gases to the air induction system.

The gases are drawn from the camshaft cover, through a depression limiting valve and into the turbocharger intake.

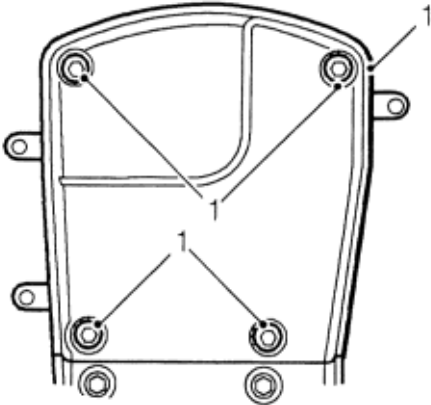
As engine speed increases, the depression limiting valve progressively closes thereby limiting the depression in the crankcase.

Engine number location

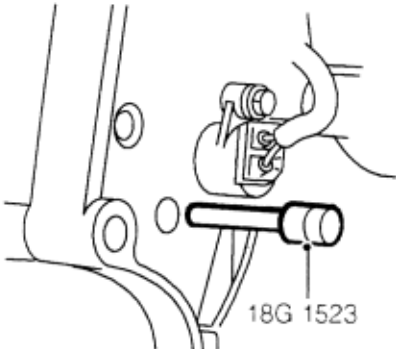
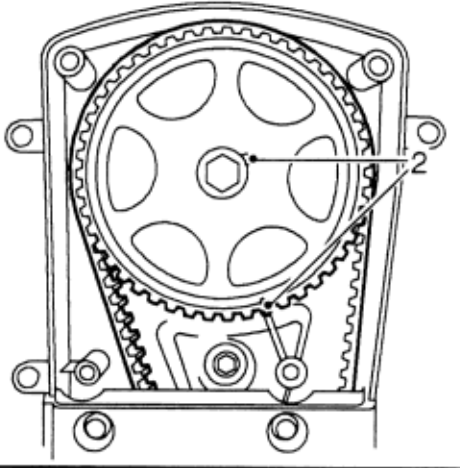


The engine number will be found on the side of the cylinder block adjacent to No. 2 cylinder.

Camshaft timing belt - remove



1. Remove 4 screws securing camshaft timing belt upper front cover, remove cover.

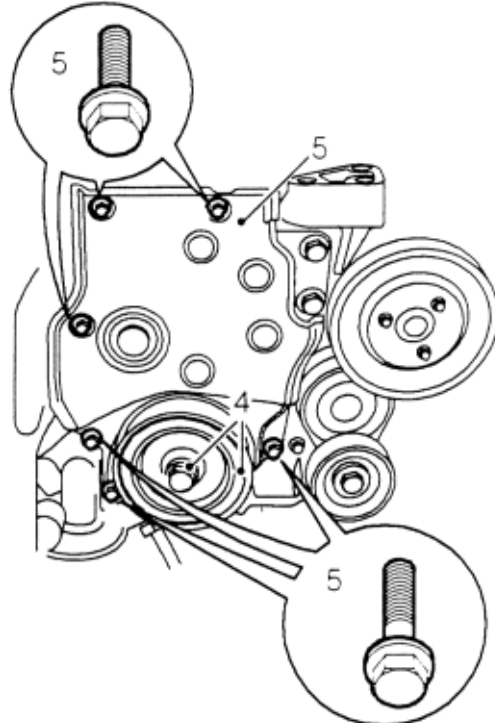


2. Using crankshaft pulley bolt, rotate crankshaft until camshaft gear timing mark is aligned with pointer on timing belt top backplate and drive pin is at 2 o'clock position.

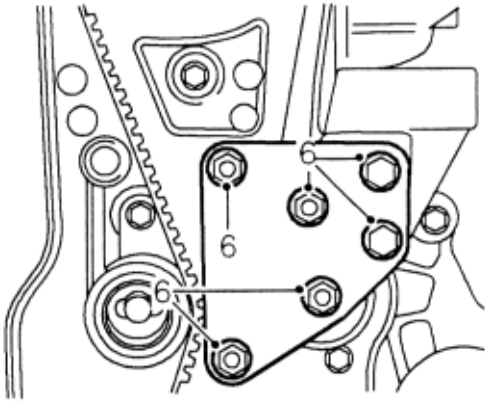
CAUTION

Do not use camshaft timing belt gear or fuel injection pump drive belt gear to rotate crankshaft.

3. Insert timing pin **18G 1523** into flywheel.

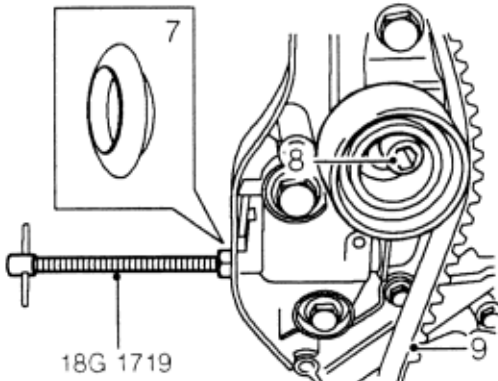


4. Remove crankshaft pulley bolt, withdraw pulley.
5. Noting fitted position of 3 longest screws, remove 6 screws securing camshaft timing belt lower front cover. Remove cover.

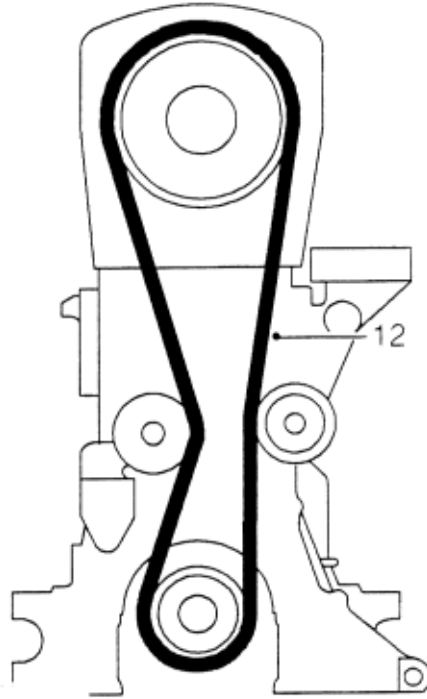


6. Remove 6 nuts securing engine front mounting cover plate, remove plate.

NOTE: Six nuts are fitted on certain applications.



7. Remove access plug from camshaft timing belt lower rear cover.
8. Slacken but do not remove Allen screw securing timing belt tensioner pulley.
9. Screw timing belt tensioner retractor tool **18G 1719** into timing belt tensioner plunger.
10. Tighten nut on tool **18G 1719** until timing belt tension is released.
11. If original timing belt is to be refitted, mark direction of rotation on belt.



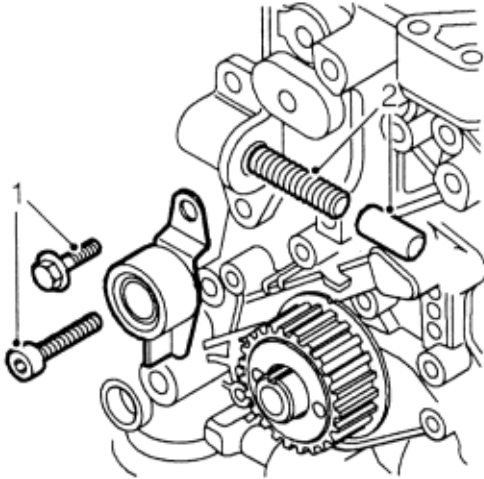
12. Using the fingers only, ease timing belt from gears.



CAUTION

Do not rotate camshaft or camshaft with timing belt removed and cylinder head fitted.

Tensioner - remove



1. Remove Allen screw and bolt securing timing belt tensioner, remove tensioner.
2. Remove tensioner spring and plunger.

Camshaft timing belt and tensioner - inspection

1. Inspect timing belt for signs of splits at base of teeth, fraying, oil contamination or uneven wear. Renew timing belt if it fails inspection or if it has been used for more than 48,000 miles, 80,000 km.

**CAUTION**

If timing belt is contaminated with oil, cause of oil contamination must be rectified. Timing belts must be stored and handled with care. Always store a belt on its edge with a band radius greater than 30 mm (1.2 in). Do not use a belt which has been bent double or twisted as this can fracture the reinforcing fibres. Do not use a belt that has been contaminated with oil.



2. Check tensioner spring for distortion, check spring free length.
Free length = 65 mm (2.6 in)
3. Check tensioner plunger and bore of housing for wear and corrosion.

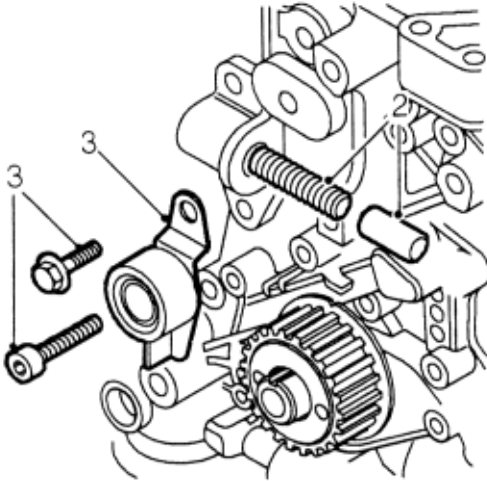
**CAUTION**

Do not attempt to remove corrosion by means of emery cloth, components must be replaced.

4. Check that tensioner and idler pulleys rotate smoothly and belt surfaces are smooth and clean.
5. Check that sealing strips in upper and lower covers are not split or damaged, replace as necessary.

Tensioner - refit

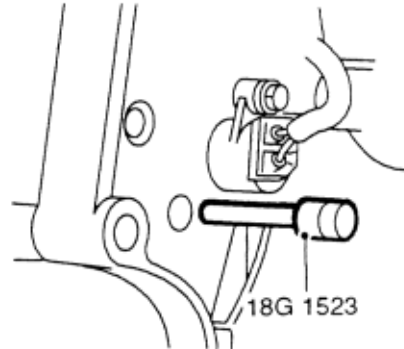
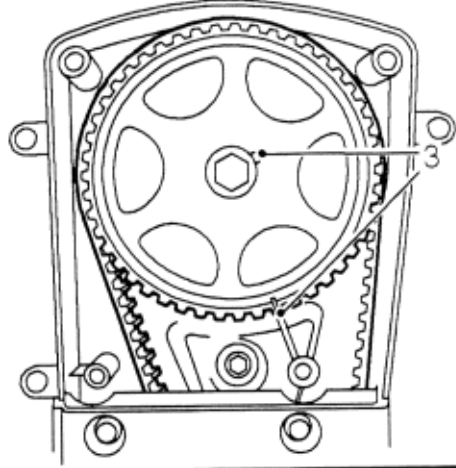
1. Ensure that bore of plunger housing is clean.



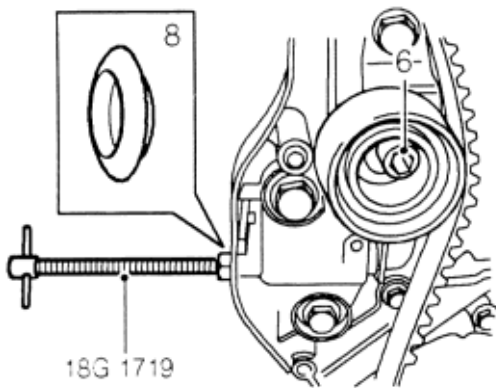
2. Smear tensioner plunger with molybdenum disulphide based grease, locate spring and plunger in housing.
3. Position tensioner on cylinder block, fit bolt and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft), fit but do not fully tighten Allen screw.

Camshaft timing belt - refit and adjust

1. Clean tensioner and idler pulleys and timing belt gears.
2. Check that camshaft timing belt upper and lower cover sealing strips are correctly located in covers.



3. Ensure that timing pin **18G 1523** is inserted in flywheel, camshaft gear timing mark is aligned exactly with pointer on timing belt backplate and that drive pin is at 2 o'clock position.



4. Screw timing belt tensioner retractor tool **18G 1719** into tensioner plunger, tighten nut on tool and fully retract tensioner.
5. Using the fingers only, ease timing belt over crankshaft and camshaft gears keeping it as taut as possible on the idler pulley side.

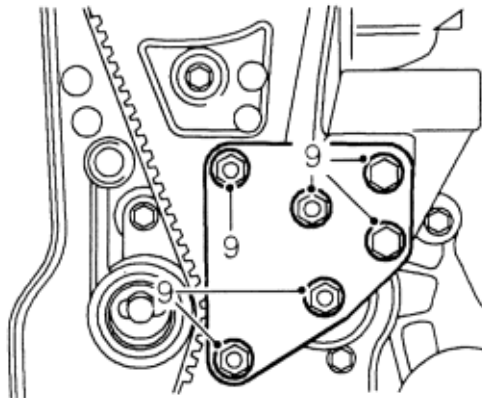
**CAUTION**

Original belt - ensure that direction of rotation mark is facing the correct way.

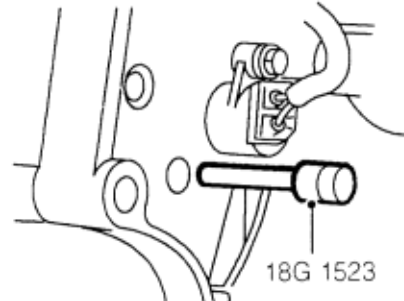
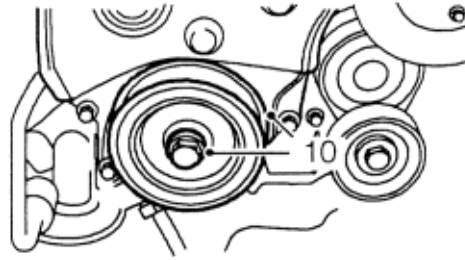
6. Slacken Allen screw until tensioner pulley moves easily without tipping.
7. Slacken nut on tool **18G 1719** until tensioner is released; tighten Allen screw to 55 Nm (5.6 kgf/m, 41 lbf/ft) and remove tool.
8. Insert access plug in lower rear cover.

**CAUTION**

If the engine front mounting bracket is removed, clean all traces of oil and old Loctite from bracket and cylinder block. Reseal bracket to cylinder block using Loctite 638.



9. Fit engine front mounting cover plate, fit 6 nuts and tighten nuts to 30 Nm (3.1 kgf/m, 22 lbf/ft). + 120°.

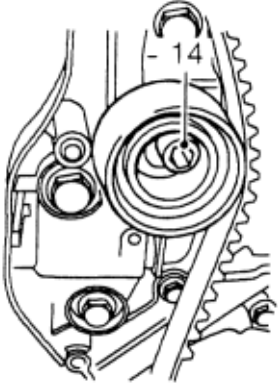


10. Locate crankshaft pulley on crankshaft, fit bolt and tighten to 63 Nm (6.4 kgf/m, 46 lbf/ft). Do not tighten bolt further at this state.
11. Remove timing pin **18G 1523**.
12. Using crankshaft pulley bolt, rotate crankshaft 2 turns in a clockwise direction and refit timing pin **18G 1523**.

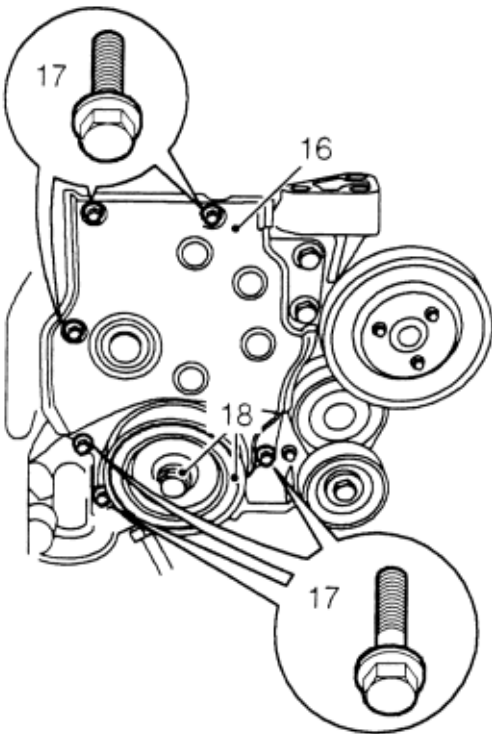
**CAUTION**

Do not use camshaft timing belt gear or fuel injection pump drive belt gear to rotate crankshaft.

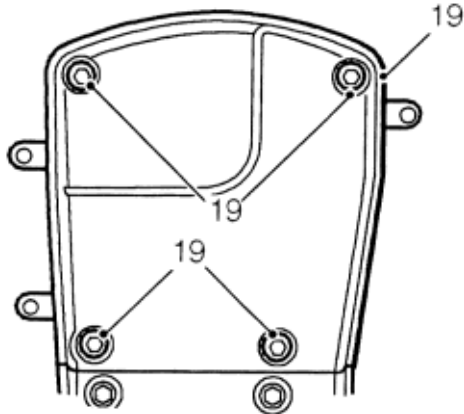
13. Check that camshaft gear timing mark is aligned with pointer on timing belt top backplate and that drive pin is at 2 o'clock position.



14. Slacken Allen screw until tensioner pulley moves to tension belt that tighten screw to 55 Nm (5.6 kgf/m, 41 lbf/ft).
15. Remove crankshaft pulley bolt, pulley and timing pin **18G 1523**.



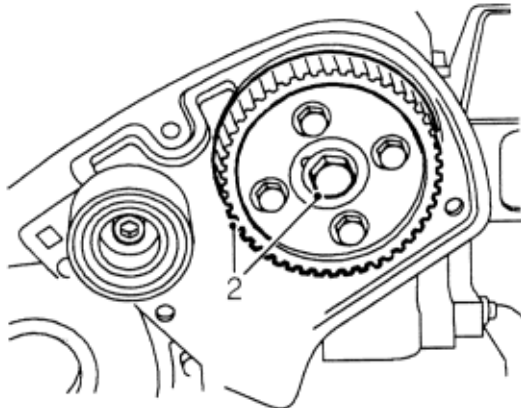
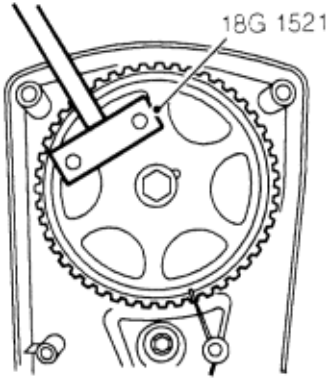
17. Fit lower front cover securing screws ensuring that 3 longest screws are in correct fitted position, tighten all screws to 5 Nm (0.5 kgf/m, 3.7 lbf/ft).
18. Fit crankshaft pulley and bolt, tighten bolt to 60 Nm (6.1 kgf/m, 44 lbf/ft).



19. Position camshaft timing belt upper front cover to rear cover, fit and tighten screws to 5 Nm (0.5 kgf/m, 3.7 lbf/ft).

Remove

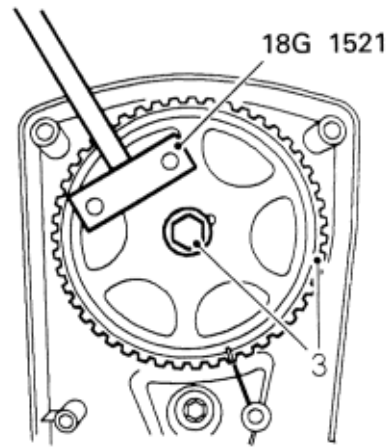
1. Remove camshaft timing belt. **See this section.**



2. Restrain camshaft timing belt gear using tool **18G 1521** and remove bolt securing fuel injection pump drive belt gear to camshaft, remove gear, discard bolt.

CAUTION

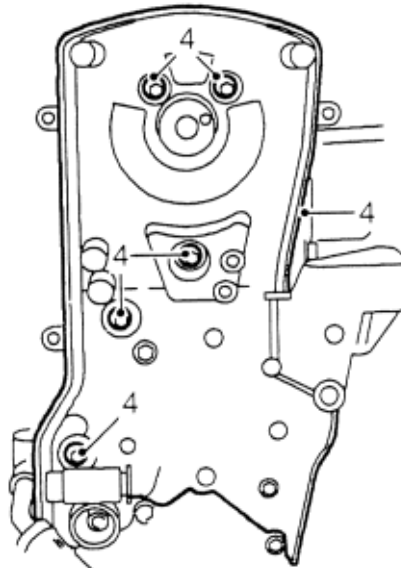
Ensure camshaft does not rotate when removing bolt and do not rotate crankshaft or camshaft with timing belt removed and cylinder head fitted.



3. Restrain camshaft timing belt gear using tool **18G 1521** and remove bolt securing camshaft timing belt gear, remove gear, discard bolt.

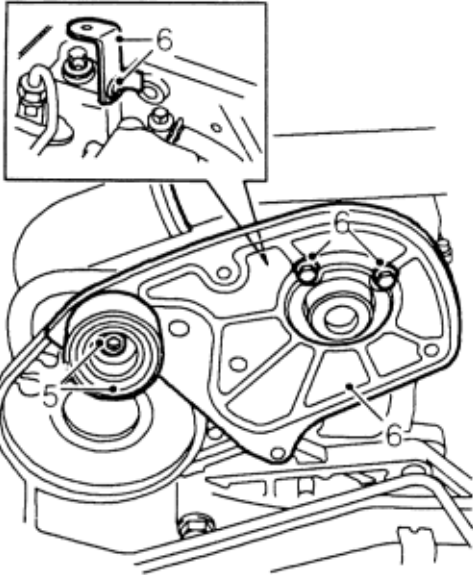
CAUTION

Ensure camshaft does not rotate when removing bolt and do not rotate crankshaft or camshaft with timing belt removed and cylinder head fitted.

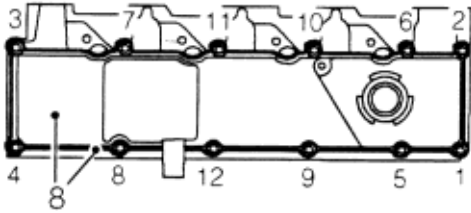


4. Remove 5 screws securing camshaft timing belt upper rear cover, remove cover, recover sealing strip.

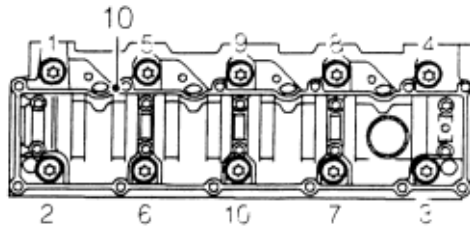
NOTE: Shortest screws are fitted in camshaft carrier.



5. Remove Allen screw securing fuel injection pump drive belt tensioner, remove tensioner.
6. Remove 3 screws securing fuel injection pump drive belt rear cover, remove cover, recover bracket.



7. Using sequence shown, progressively slacken then remove 12 bolts securing camshaft cover.
8. Remove camshaft cover, remove and discard gasket.



9. Using sequence shown, progressively slacken then remove 10 cylinder head Torx bolts and washers.

CAUTION

Keep bolts in their fitted order, do not attempt to remove washers from bolts.

10. Remove cylinder head assembly and support each end of cylinder head on blocks of wood to protect valves which, when open protrude below face of cylinder head.

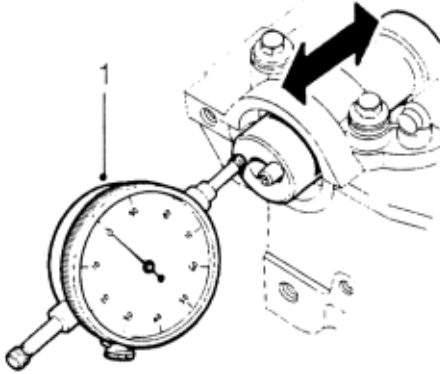
CAUTION

Cylinder head is dowel located, do not tap it sideways to free it from cylinder block.

11. Remove and discard cylinder head gasket.

Camshaft - check end-float

NOTE: Prior to removing the camshaft, check end-float.



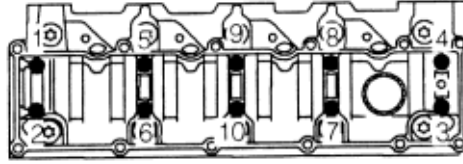
1. Attach a magnetic base DTI* to front of cylinder block, move camshaft rearwards, position stylus of DTI on end of camshaft and zero DTI. Move camshaft forwards and measure end-float. End-float (maximum) = 0.51 mm (0.02 in).

CAUTION

Camshaft end-float is controlled by the width of No. 1 bearing in the camshaft carrier. If end-float exceeds the above dimension, remove the camshaft and repeat the end-float check using a new camshaft. If end-float still exceeds the maximum, a new cylinder head and camshaft carrier assembly must be fitted.

*DTI : Dial Test Indicator

Camshaft - remove



1. Using sequence shown, slacken the 10 camshaft carrier retaining bolts 2 to 3 turns.

CAUTION

Do not fully remove bolts at this stage.

2. Gently tap the camshaft carrier upwards to break the sealant bond.

CAUTION

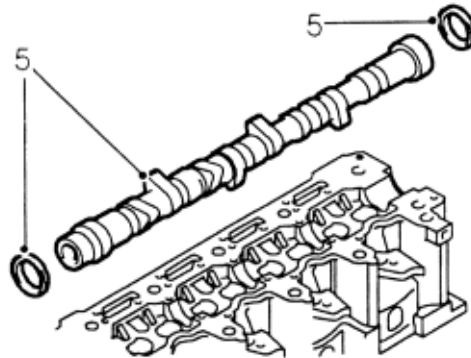
Camshaft carrier is dowel located, do not tap it sideways.

3. Using the same sequence, continue to progressively slacken the carrier retaining bolts until all loading is removed from the carrier.

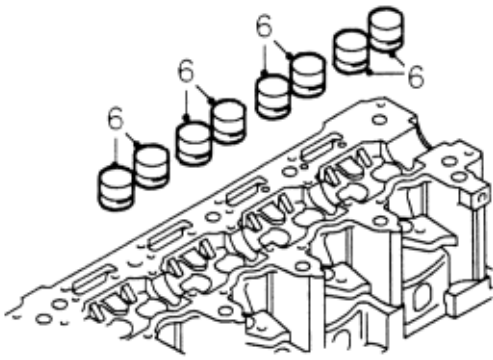
CAUTION

If bolts are removed completely before loading is removed from the camshaft carrier, the carrier may be suddenly released and damage caused as a result.

4. Remove retaining bolts, remove camshaft carrier.



5. Remove camshaft, remove and discard front and rear oil seals.



6. Using a stick magnet, remove 8 tappets from the cylinder head.

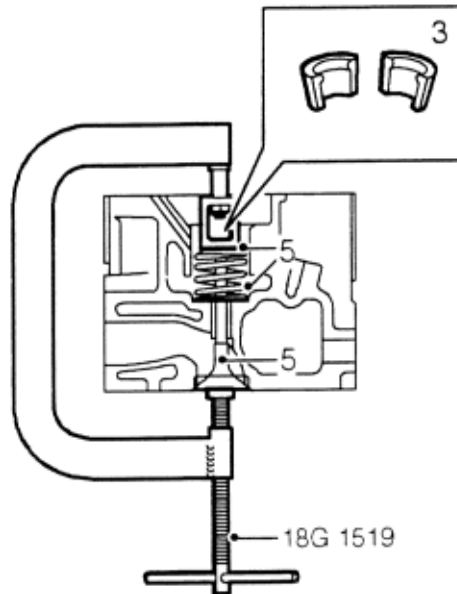


CAUTION

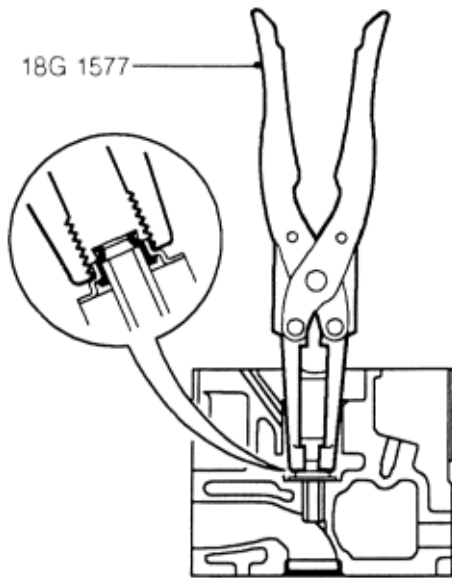
Keep tappets in their fitted order and store inverted to prevent oil loss. Do not squeeze tappet chambers together.

Valves and springs - remove

1. Support cylinder head clear of valves, use a hollow drift and tap each spring cap to free collets.



2. Using tool **18G 1519**, compress valve spring.
3. Remove 2 collets from valve stem using a stick magnet.
4. Remove tool **18G 1519**.
5. Remove spring cap and valve spring, remove valve.



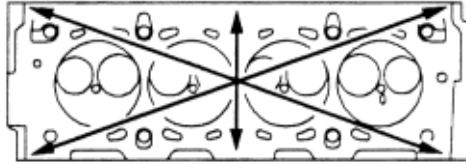
6. Using a tool **18G 1577**, remove valve stem oil seal; discard seal.
7. Repeat above operations to remove remaining valves.



CAUTION

Keep component parts of each valve assembly in their fitted order.

Cylinder head - inspection



1. Check cylinder head for warpage across centre and from corner to corner:
Maximum warpage - 0.010 mm (0.00039 in)



CAUTION

Cylinder head may not be refaced, replace head assembly if warpage exceeds figure given.

2. Check tappet bores for scoring and signs of wear or damage. Slight scoring or burring may be removed using fine emery cloth.

Tappets - inspection

1. Check tappets for signs of wear, scoring and overheating, replace as necessary.
2. Ensure oil hole in each tappet is clear.
3. Check outside diameter of each tappet.
Diameter = 34.959 to 34.975 mm (1.3763 to 1.3770 in).

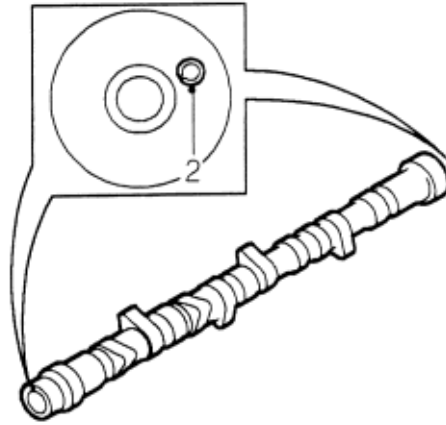


CAUTION

Keep tappets in their fitted order and store inverted to prevent oil loss. Do not squeeze tappet chambers together.

Camshaft and bearings - inspection

1. Check camshaft cams and bearing journals for signs of scoring and excessive wear.



2. Check camshaft timing belt gear and fuel injection pump drive belt gear drive pins for damage and wear, replace if necessary ensuring that split in pin faces towards centre of camshaft.
3. Check bearing journals in cylinder head and camshaft carrier for signs of scoring and excessive wear.

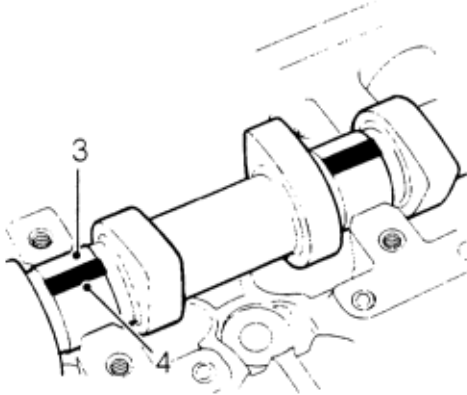


CAUTION

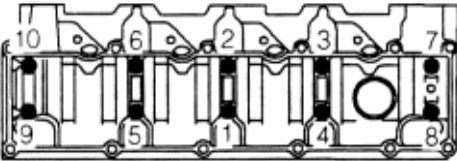
Cylinder head and camshaft carrier are machined together as an assembly. If bearing journals in either component are found to be damaged, complete assembly must be replaced.

Camshaft bearings - check clearance

1. Clean all traces of oil from camshaft, cylinder head and camshaft carrier.
2. Using sealant remover from sealant kit, Part No. LW10002B, remove all traces of sealant from cylinder head and camshaft carrier.

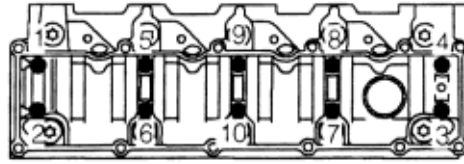


3. Position camshaft in cylinder head.
4. Place a piece of Plastigage along the centre line of each camshaft journal.
5. Support each end of cylinder head on blocks of wood.

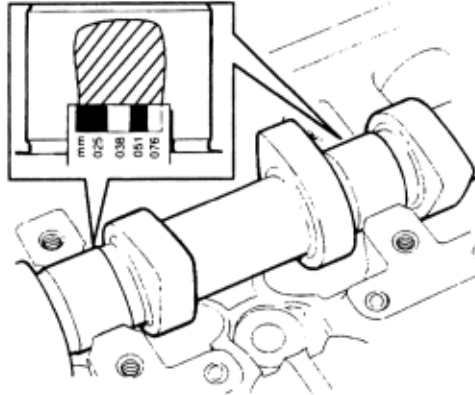


6. Carefully fit the camshaft carrier, fit 10 retaining bolts and tighten in sequence shown to 8 Nm (0.8 kgf/m, 5.9 lbf/ft).

CAUTION
Do not rotate camshaft.



7. Using sequence shown, progressively slacken, then remove 10 retaining bolts.
8. Carefully remove camshaft carrier.

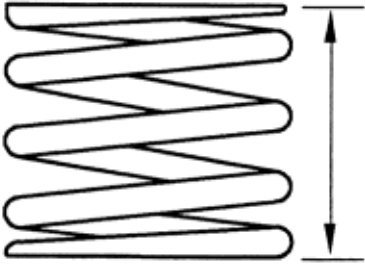


9. Measure and record widest portion of Plastigage on each camshaft journal.
10. Compare figures obtained with camshaft bearing clearance.
Bearing clearance = 0.043 to 0.094 mm (0.0017 to 0.0037 in).
11. If any bearing clearance is found to be excessive, repeat the above procedure using a new camshaft.

CAUTION
If, after repeating the bearing clearance check with a new camshaft the clearances are still excessive, a new cylinder head and camshaft carrier assembly must be fitted.

12. Remove Plastigage using an oily rag, do not use a scraper.

Valve springs - inspection



1. Check valve springs free length.
Free length = 37.0 mm (1.46 in).

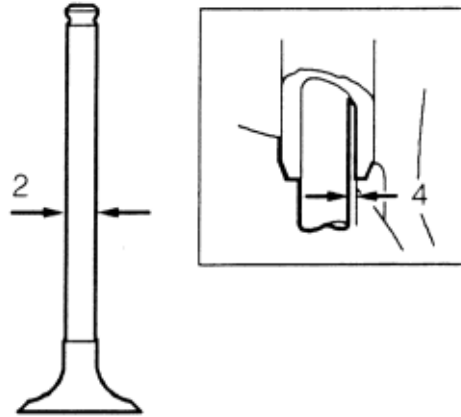


CAUTION

Valve springs must be replaced as a set.

Valves and valve guides = inspection

1. Clean carbon from valves, check valves for burning, pitting or cracking; replace as necessary.



2. Check and record diameter of each valve stem.
Inlet = 6.907 to 6.923 mm (0.2719 to 0.2726 in).
Exhaust = 6.897 to 6.913 mm (0.2715 to 0.2722 in).
3. Renew any valve if stem diameter is less than specified.
4. Insert each valve into its respective guide, check and record valve stem to guide clearance.
Inlet valve = 0.056 mm (0.0022 in).
Exhaust valve = 0.066 mm (0.0026 in).
5. Renew any guide and its associated valve if clearance is excessive.

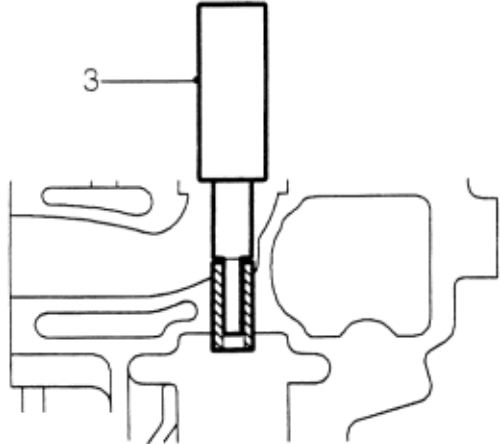
Valve guides - renew

1. Check area on camshaft side of cylinder head around valve guide to be replaced for marks denoting previous valve guide replacement:
+ denotes 1st replacement
- denotes 2nd replacement

CAUTION
Valve guides may only be replaced twice.

2. Heat cylinder head uniformly to a temperature of 120°C (248°F).

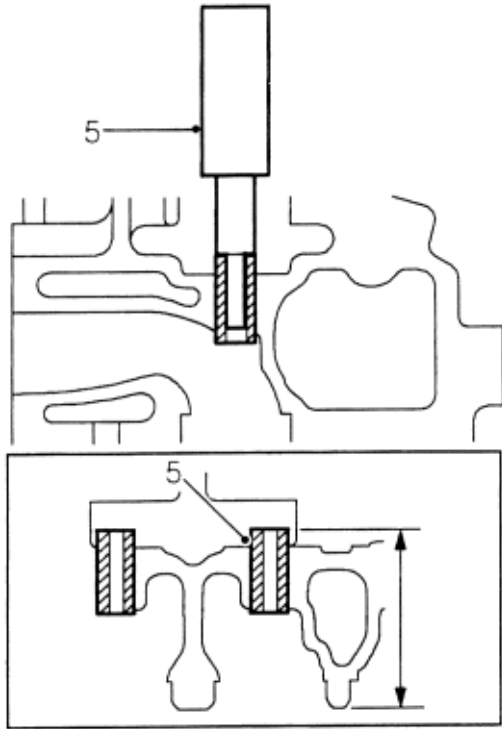
WARNING
Take care when handling hot cylinder head.



3. Using a suitable piloted mandrel, press valve guide out of cylinder head from combustion face side; discard guide.

NOTE: Only one size of replacement guide is available.

4. Reheat cylinder head to 120°C (248°F)



5. Using the piloted mandrel, press replacement valve guide into cylinder head from camshaft side of head until fitted height of guide from combustion face side of cylinder head to top of guide is 61.1 to 61.7 mm (2.41 to 2.43 in).
6. Allow cylinder head to air cool.
7. Ream bores of replacement valve guide ensuring that reamer is kept perpendicular to and concentric with valve seat.
Valve guide bore diameter = 6.950 to 6.963 mm (0.2736 to 0.2741 in).

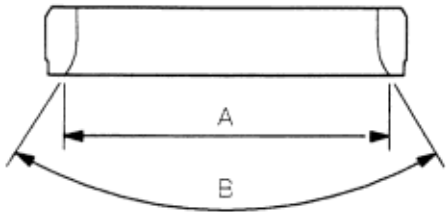
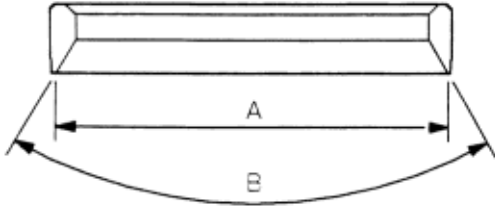
CAUTION
If valve seat insert has also been replaced, guide and insert must be machined together.

8. Suitably mark cylinder head on camshaft side of head to denote that guide has been replaced.
1st replacement guide +
2nd replacement valve guide -

CAUTION
A new valve must always be fitted whenever a guide is replaced.

Valve seat inserts and valves - refacing and lapping-in**Refacing valve seat inserts**

1. Check valve seat inserts for pitting and burning, if necessary, valve seats may be recut providing valve head stand down is within limits after recutting.



2. Using a suitable piloted cutter, cut valve seat insert to correct angle and width.

Inlet valve seat insert:

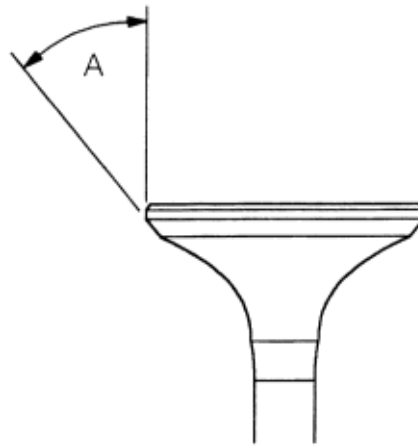
Seat width A = 35.697 mm (1.4054 in)

Seat angle B = 60°

Exhaust valve insert:

Seat width A = 31.5 to 31.55 mm (1.222 to 1.242 in)

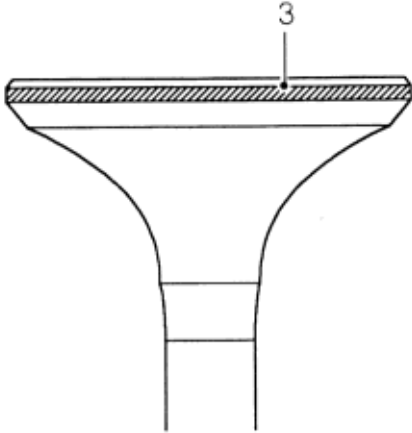
Seat angle B = 58° to 62°



3. Check face angle **A** of each valve, renew any valve with incorrect face angles, do not attempt to recut. Valve face angle - Inlet and exhaust = 45° to 45°30'.

Lapping-in valves

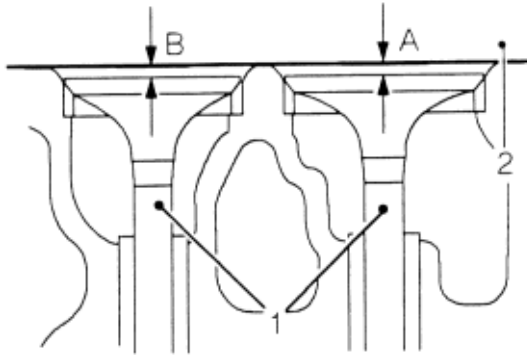
1. Lap each valve to its seat using grinding paste.
2. Apply Prussian Blue to valve seat, insert valve into guide and press it firmly, without rotating, on to seat.



3. Remove valve and check that a continuous, even line of Prussian Blue has been transferred on to valve face; continue lapping-in valve as necessary.

NOTE: Line does not have to be across whole width of valve face.

4. On completion of lapping-in, check valve head stand down. **See this section.**

Valve head stand down

1. Insert each valve into its respective guide.
2. Using a straight-edge and feeler gauges, check and record stand down of each valve head.
3. Compare figures obtained with figures given below. If any valve has a stand down greater than specified, valve seat insert and valve must be replaced.

Valve head stand down:

Inlet valve A = 1.45 mm (0.0571 in)

Exhaust valve B = 1.35 mm (0.0531 in)

Valve seat inserts - replace

1. Taking care not to damage cylinder head, grind a crescent into insert to reduce wall thickness. Break insert at thin section, remove insert.



CAUTION

Do not damage counterbore.

2. Heat cylinder head to 120°C (248°F) and using a piloted mandrel, press valve seat insert into head ensuring insert is kept square to counterbore.



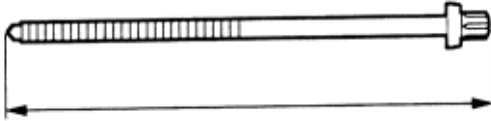
CAUTION

Take care when handling hot cylinder head.

3. Allow cylinder head to air cool.
4. Lap valve to its seat and check valve head stand down.
See this section.

Cylinder head bolts - inspection

1. Keeping bolts in their fitted order, clean bolts and washers, lightly oil threads.



2. Check bolt heads and threads for damage, replace individual bolts as necessary.
3. Check length of bolt from top of bolt head to end of bolt. If any bolt exceeds 243.41 mm (9.5831 in) in length, all 10 bolts and washers must be replaced.



CAUTION

Do not attempt to remove washers from bolts.

Cylinder head and camshaft carrier - cleaning**CAUTION**

Use Liquid Sealant Kit, Part No. LVV 10002B which contains sealant remover and liquid sealant.

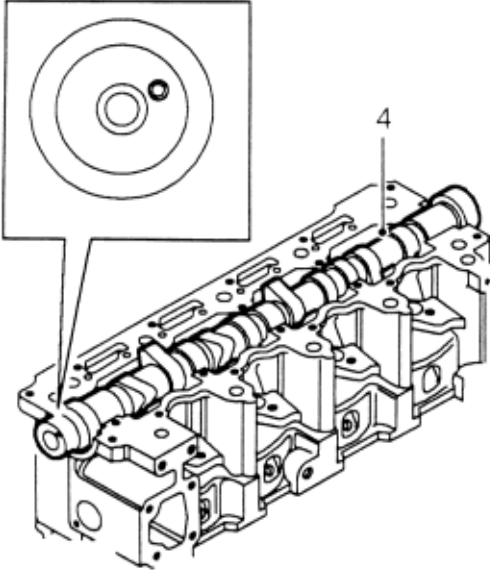
1. Clean mating surfaces of cylinder head and camshaft carrier, remove any deposits from camshaft oil seal recesses using a plastic scraper.
2. Clean gasket material from cylinder head and block using gasket removal spray and plastic scraper. **DO NOT USE A METAL SCRAPER.**
3. Clean all traces of carbon from combustion face areas.
4. Blow out all oilways and waterways.
5. Ensure threaded holes in cylinder block and camshaft carrier are clean and dry.
6. Check core plugs for corrosion and sign of leakage and replace if necessary, use Loctite 572 to seal replacement plugs.

Valves - assembling

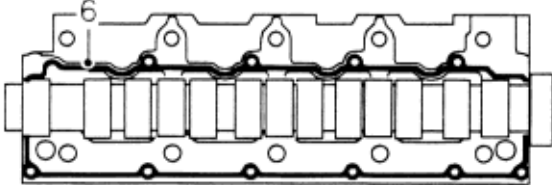
1. Using tool **18G 1577**, fit new valve stem oil seals.
2. Lubricate valve stem oil seals, valve guides, valve stems, spring caps and springs with engine oil.
3. Assemble valves, springs and spring caps ensuring that they are in their correct fitted order.
4. Compress valve springs using tool **18G 1519**, fit collets, remove tool.
5. Using a wooden dowel and mallet, tap each spring cap lightly to seat collets.

Tappets and camshafts - assembling

1. Lubricate tappets and tappet bores with engine oil.
2. Fit tappets ensuring they are in their correct fitted order.
3. Lubricate cams and bearing journals on camshaft, cylinder head and camshaft carrier with engine oil.



4. Position camshaft in cylinder head with timing belt gear drive pin at approximately 2 o'clock position.
5. Support ends of cylinder head on blocks of wood.



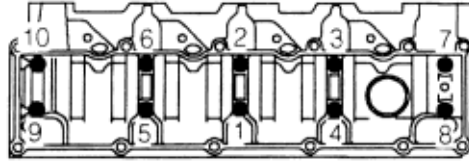
6. Using sealant from kit, Part No. LW10002B, apply an even film of sealant to cylinder head; spread sealant to an even film using a brush or roller.



CAUTION

Ensure sealant does not block oilways or is spread on to bearing journals.

7. Fit camshaft carrier, fit and finger tighten bolts.



CAUTION

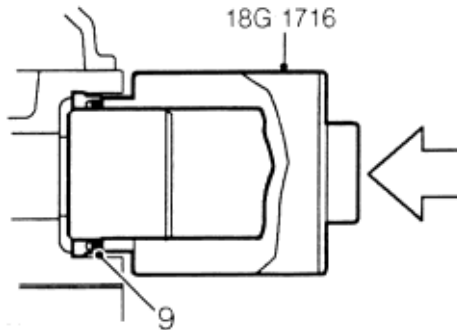
With camshaft carrier bolted down, some valves will protrude below face of cylinder head; support each end of cylinder head on blocks of wood.

8. Using sequence shown, progressively tighten camshaft carrier bolts to 11 Nm (1.1 kgf/m, 8 lbf/ft).

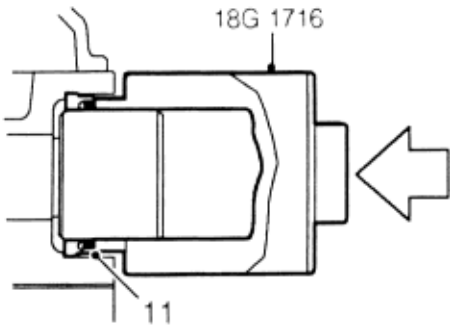


CAUTION

Bolts must be tightened to correct torque within 20 minutes of applying sealant.



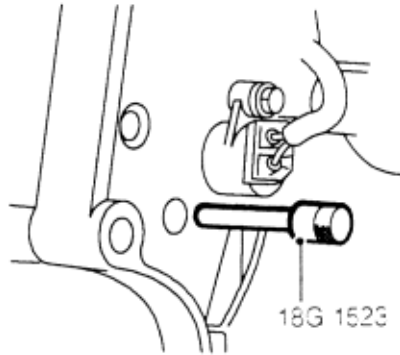
9. Lubricate a new camshaft front oil seal with engine oil.
10. Fit oil seal using tool **18G 1716**.



11. Lubricate a new camshaft rear oil seal with engine oil.
12. Fit oil seal using tool **18G 1716**.

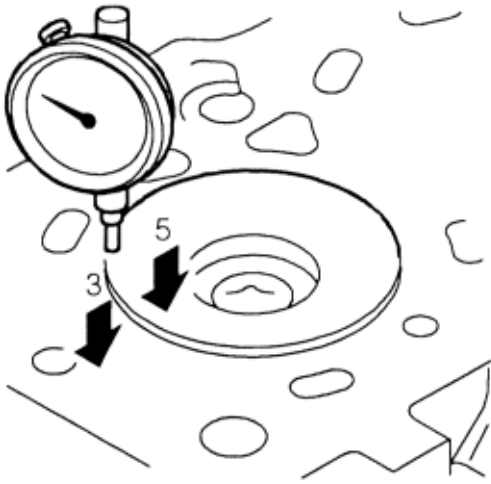
Cylinder head gasket selection

NOTE: There are three thicknesses of cylinder head gasket available and in order that the correct gasket is fitted, it is necessary to determine the stand proud (protrusion) of each piston above the top face of the cylinder block.



NOTE; Gaskets have either 1, 2 or 3 identification holes and the following procedure must be followed in order that the correct gasket is selected.

1. Temporarily assemble pulley to crankshaft, fit and finger tighten bolt.
2. Remove timing pin **18G 1523** (if fitted).



3. Assemble a magnetic base DTI* to cylinder block top face, zero DTI with stylus touching block top face.
4. Rotate crankshaft in a clockwise direction until No. 1 piston is at TDC**.
5. Position stylus near edge of piston crown, measure and record No. 1 piston protrusion.



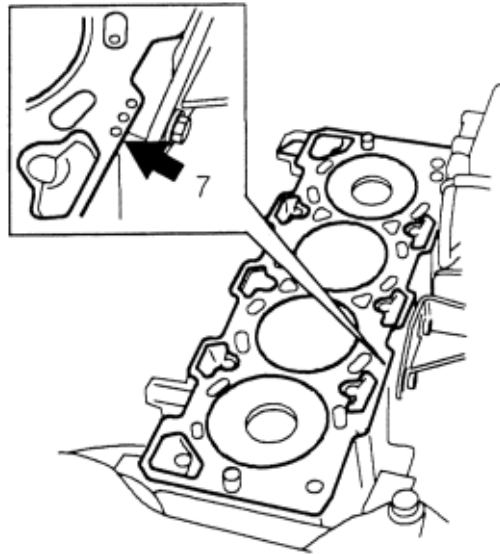
CAUTION

Measurement must be taken at front and rear of piston.

6. Repeat above procedure for remaining pistons.

*DTI : Dial Test Indicator

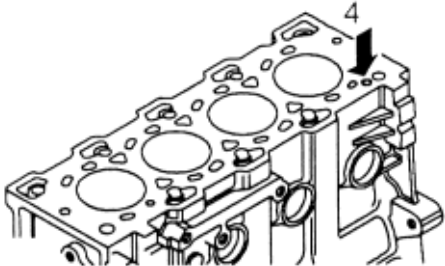
** TDC : Top Dead Centre



7. From readings obtained, determine highest piston protrusion figure and select the appropriate cylinder head gasket.
Protrusion 0.10 to 0.25 mm (0.0039 to 0.0098 in) -
Select gasket with one identification hole.
Protrusion 0.25 to 0.40 mm (0.0098 to 0.016 in) -
Select gasket with two identification holes.
Protrusion 0.40 to 0.55 mm (0.016 to 0.022 in) -
Select gasket with three identification holes.

Cylinder head - refit

1. Fit crankshaft pulley bolt and washer and tighten bolt to 63 Nm (6.4 kgf/m, 46 lbf/ft). Do not tighten bolt further at this state.
2. Remove timing pin **18G 1523**.
3. Ensure cylinder block and head faces are clean and dry and all traces of gasket material have been removed. Check that cylinder head location dowels are fitted in cylinder block.



4. Check oil feed restrictor in cylinder block is clear and that restrictor is below block face.
5. Ensure that cylinder head bolt holes in cylinder block are clean and dry.
6. Using crankshaft pulley bolt, rotate crankshaft anti-clockwise until Nos. 1 and 4 pistons are approximately 25 mm (0.98 in) below cylinder block top face.
7. Position camshaft timing gear drive pin at 2 o'clock.
8. Position selected cylinder head gasket on cylinder block ensuring that it is the correct way round.

**CAUTION**

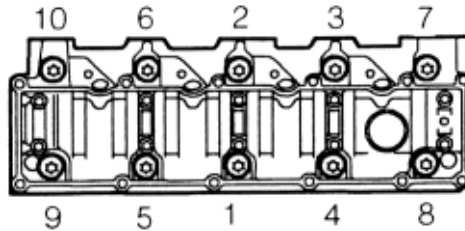
Gasket must be fitted dry.

9. Using assistance, fit cylinder head ensuring that it is correctly located on dowels.
10. Lubricate cylinder head bolt threads and undersides of bolt heads with engine oil.

**CAUTION**

Do not oil undersides of washers.

11. Carefully enter cylinder head bolts in their fitted order.
DO NOT DROP BOLTS INTO CYLINDER BLOCK.

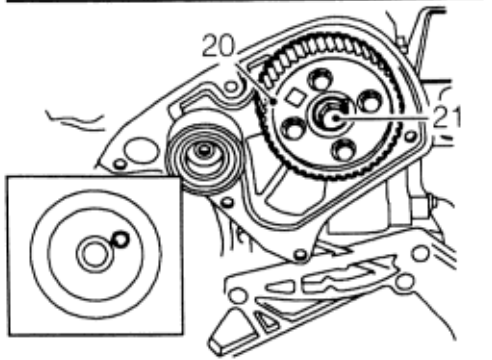
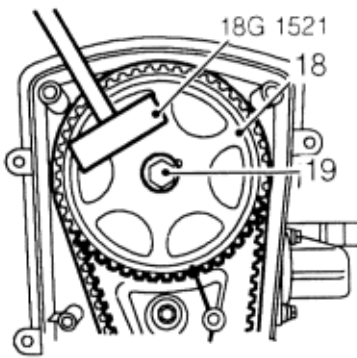


12. Using sequence shown, tighten cylinder head bolts to:
 - Stage 1 - 30 Nm (3.1 kgf/m, 22 lbf/ft).
 - Stage 2 - 65 Nm (6.6 kgf/m, 48 lbf/ft).
 - Stage 3 - Further 90°
 - Stage 4 - Further 90°

**CAUTION**

Ensure that correct tightening sequence is followed for all four tightening stages.

13. Fit fuel injection pump drive belt rear cover and mounting bracket, fit 3 screws and tighten to 8 Nm (0.8 kgf/m, 6 lbf/ft).
14. Fit fuel injection pump drive belt tensioner, fit but do not fully tighten Allen screw.
15. Ensure sealing strip is correctly located on camshaft timing belt upper rear cover.
16. Fit upper rear cover ensuring that 2 shortest screws are fitted in camshaft carrier.
17. Tighten screws to 8 Nm (0.8 kgf/m, 6 lbf/ft).

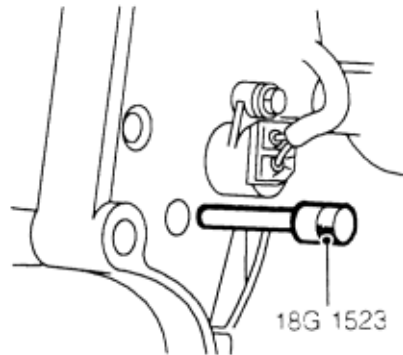
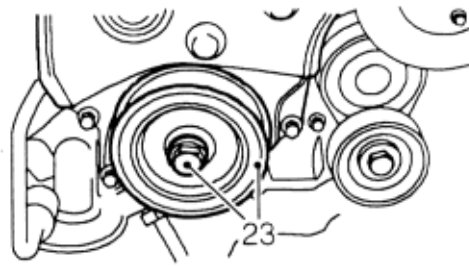


18. Fit camshaft timing belt gear, fit a new bolt.
19. Restrain camshaft timing belt gear using tool **18G 1521** and tighten bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft) then a further 90°.
20. Fit fuel pump drive belt gear to camshaft, use a new bolt.
21. Restrain camshaft timing belt gear using tool **18G 1521** and tighten fuel pump drive belt gear bolt to 20 Nm (2.0 kgf/m, 14 lbf/ft) then a further 90°.

⚠ CAUTION

Ensure camshaft does not rotate as bolts are tightened.

22. Ensure that camshaft timing gear drive pin is still at 2 o'clock position and camshaft gear timing mark is aligned with pointer on timing belt rear cover.



23. Using crankshaft pulley bolt, carefully rotate crankshaft clockwise until timing pin **18G 1523** can be inserted in hole in flywheel.

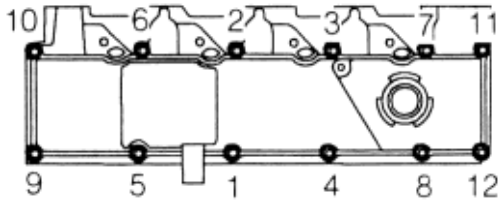
⚠ CAUTION

Do not rotate crankshaft too far, pistons may contact the valves.

24. Remove crankshaft pulley bolt and washer.
25. Fit timing belt and adjust tension. **See this section.**
26. Fit a new gasket to camshaft cover ensuring that raised holes in gasket are towards the cover and are located on the tow spigots.

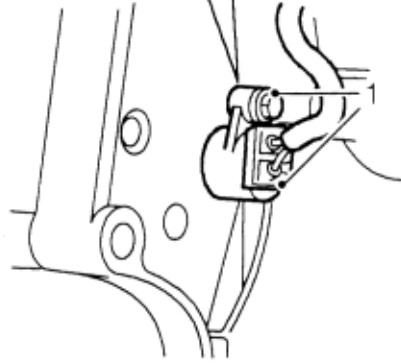
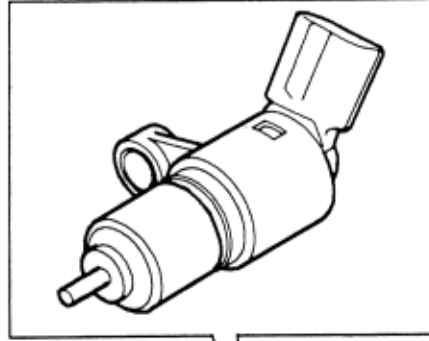
⚠ CAUTION

Gasket must be fitted dry.

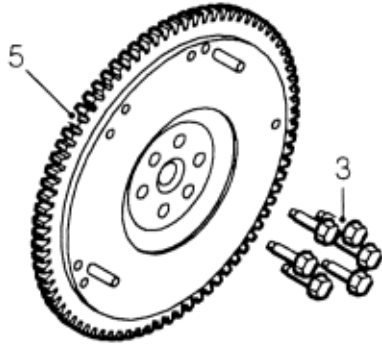
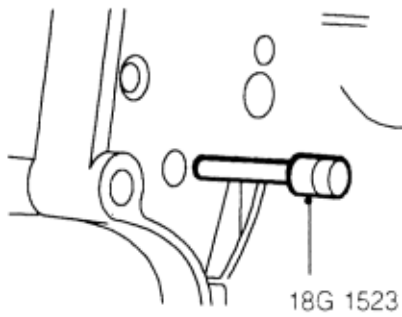


27. Fit camshaft cover bolts and tighten in sequence shown to 12 Nm (1.2 kgf/m, 8.9 lbf/ft).

Flywheel - remove



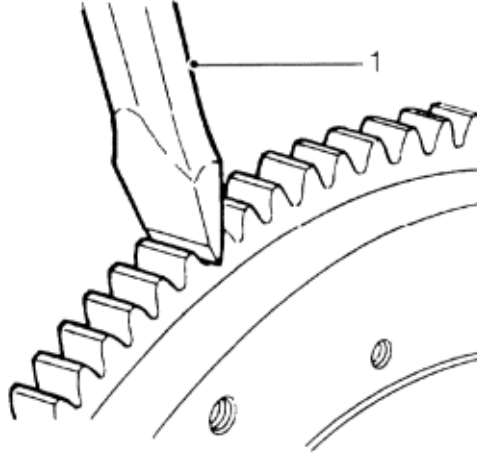
1. Remove bolt securing camshaft sensor to gearbox adaptor plate, remove sensor.



2. Insert timing pin **18G 1523**.
3. Remove and discard 6 bolts securing flywheel to crankshaft.
4. Remove timing pin **18G 1523**.
5. Using assistance, remove flywheel.

NOTE: Dowel located.

Starter Ring Gear - remove



1. Apply a cold chisel to root of tooth, break ring gear and remove from flywheel.

⚠ WARNING

Suitable eye protection must be worn.

Starter Ring Gear - refit

1. Heat ring gear evenly to 350° (662°F) indicated by light blue colour. Locate ring gear on flywheel and press on to flange.

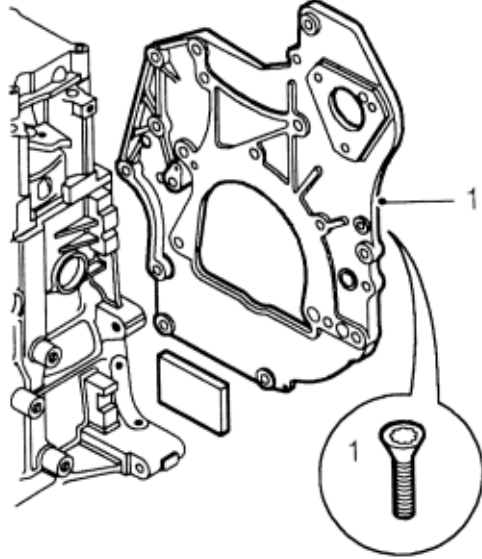
⚠ WARNING

Handle hot ring gear with care.

2. Allow ring gear to air cool.

Flywheel - refit

1. Clean threads in crankshaft using an old flywheel bolt having 2 saw cuts at 45° along thread of bolt. DO NOT USE A TAP TO CLEAN THREADS.
2. Clean flywheel faces.
3. Using assistance, position flywheel on crankshaft, fit and finger tighten new Patchlok bolts.
4. Insert timing pin **18G 1523** into flywheel.
5. Tighten bolts to 15 Nm (1.5 kgf/m, 11 lbf/ft) then a further 90°.
6. Position crankshaft sensor to gearbox adaptor plate, fit and tighten bolt to 8 Nm (0.8 kgf/m, 6 lbf/ft).

Remove

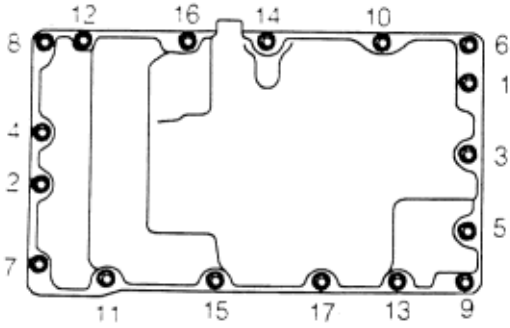
1. Remove 4 Torx screws securing adaptor plate to cylinder block, remove plate.

Refit

1. Check condition of foam rubber pad, replace if necessary.
2. Remove all traces of Loctite from Torx screws.
3. Ensure tapped holes in cylinder block are clean and dry.
4. Apply Loctite 275 to threads of Torx screws.
5. Position adaptor plate to cylinder block, fit and tighten Torx screws to 45 Nm (4.6 kgf/m, 33 lbf/ft).

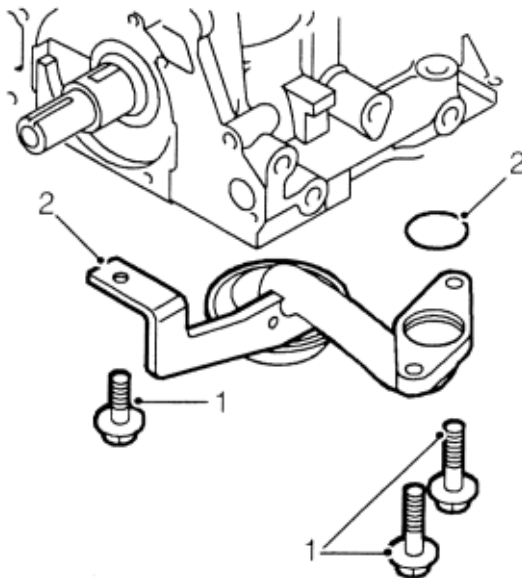
Sump - remove

1. Remove dipstick.
2. Remove and discard oil filter element.



3. Using sequence shown, remove 17 bolts securing sump to cylinder block.
4. Remove sump, remove and discard gasket.

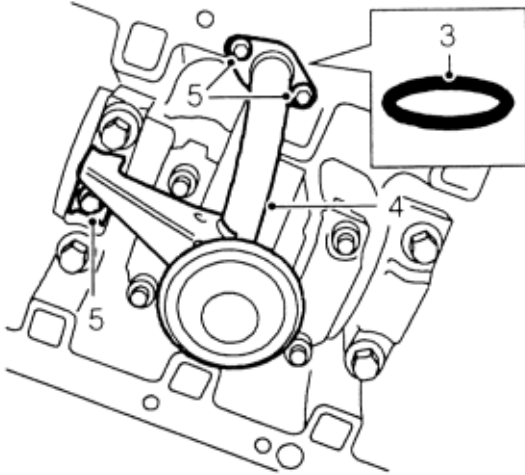
Oil Strainer - remove



1. Remove 3 bolts securing oil strainer to cylinder block and main bearing cap noting fitted position of shortest bolt.
2. Remove oil strainer, remove and discard 'O' ring.

Oil Strainer - refit

1. Clean strainer and pick-up pipe.
2. Ensure bolt holes in cylinder block and main bearing cap are clean and dry.

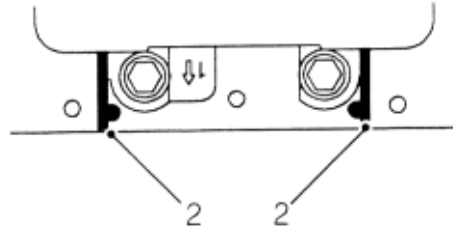


3. Lubricate a new 'O' ring with engine oil and fit to pick-up flange.
4. Position strainer to cylinder block and main bearing cap.
5. Fit 3 bolts noting that shortest bolt is fitted into main bearing cap. Tighten bolts to 8 Nm (0.8 kgf/m 6 lbf/ft).

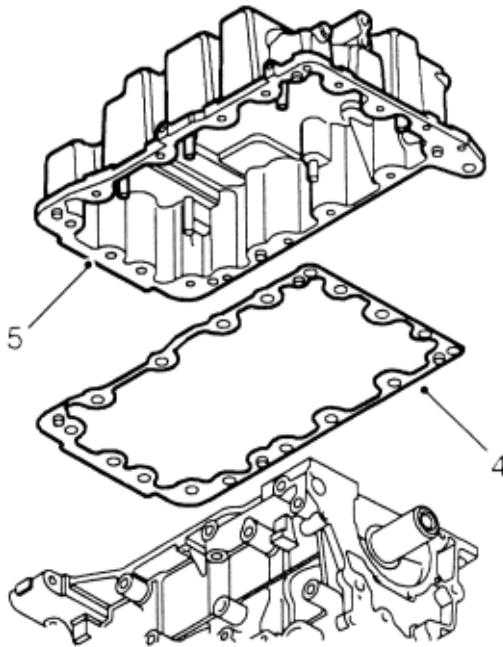
NOTE: Patchlok bolts may be re-used provided threads are undamaged.

Sump - refit

1. Clean sump flange and mating surfaces of cylinder block, ensure bolt holes in cylinder block and main bearing cap are clean and dry.



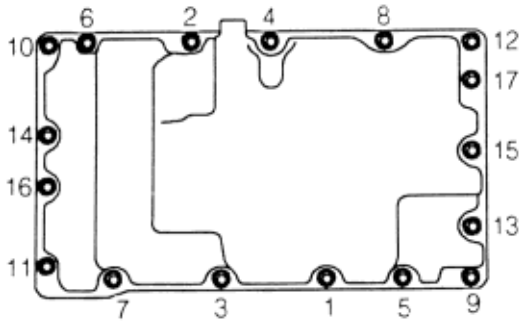
2. Using sealant from kit, Part No. LVV10002B, fill grooves on each side of front - No. 1 main bearing cap and apply a bead of sealant to joint line of main bearing cap and cylinder block.
3. Using a brush or roller, spread sealant to an even film.



4. Position new gasket to sump ensuring that locating lugs are inserted in holes in sump.

NOTE: Gasket must be fitted dry.

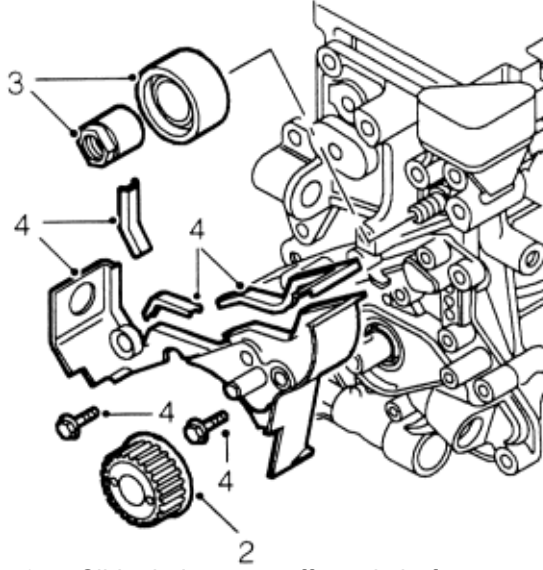
5. Position sump to cylinder block ensuring that locating lugs are inserted in holes in block.



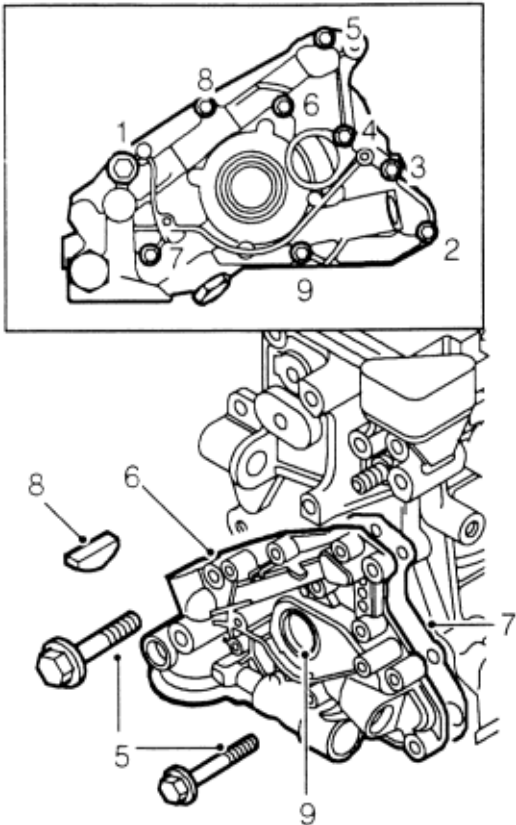
6. Fit and finger tighten 17 bolts
7. Using sequence shown, tighten bolts to 25 Nm (2.5 kgf/m 18 lbf/ft).
8. Using the same sequence, recheck that all bolts are torqued to 25 Nm (2.5 kgf/m 18 lbf/ft).
9. Fit dipstick.
10. Fit a new oil filter element.

Remove

1. Remove camshaft timing belt. **See this section.**



2. Slide timing gear off crankshaft.
NOTE: The Woodruff key is an integral part of the gear.
3. Remove nut securing camshaft timing belt idler pulley, remove pulley.
NOTE: Idler pulley mounting stud may be unscrewed as nut is removed.
4. Remove 2 bolts securing camshaft timing belt lower rear cover, remove cover and sealing strips.

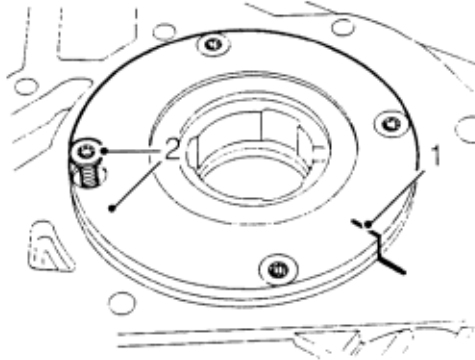


5. Using sequence shown, remove 1 M10 and 9 M6 bolts securing oil pump to cylinder block.
- NOTE: Longest M6 bolt is fitted at position 9.
6. Remove oil pump.
 7. Remove and discard gasket.
 8. Recover Woodruff key from crankshaft.
 9. Remove and discard crankshaft front oil seal from oil pump body.

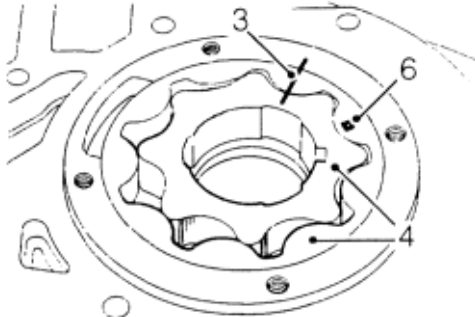
Oil pump and oil pressure relief valve - inspection
Oil pump

CAUTION

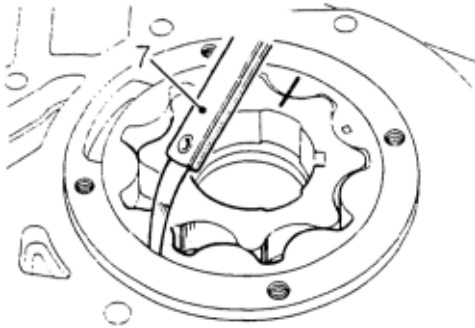
Overhaul procedures for the oil pump are limited to carrying out dimensional checks. In the event of wear or damage being found, a replacement pump must be fitted.



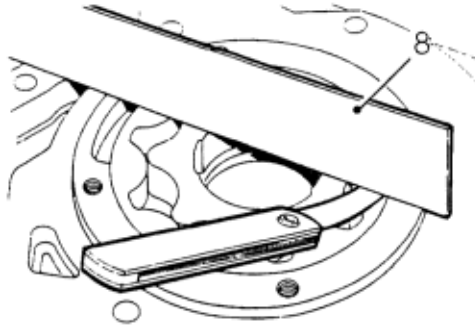
1. Make suitable alignment mark between pump backplate and body.
2. Remove 4 Torx screws securing backplate to body, remove backplate.



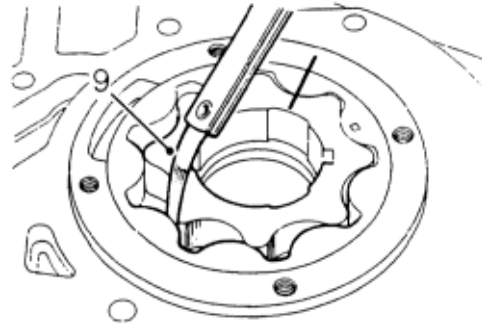
3. Using a felt tipped pen, make suitable alignment marks between inner and outer rotors and pump body.
4. Remove inner and outer rotors.
5. Check rotors and pump body for signs of scoring and wear.
6. Fit rotors into pump body ensuring that reference marks are aligned and outer rotor identification mark faces outwards.



7. Using feeler gauges, check pump body to rotor clearance.
Clearance = 0.05 to 0.10 mm (0.002 to 0.0039 in).

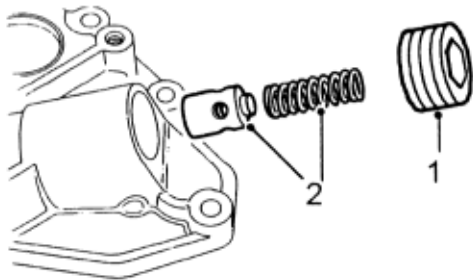


8. Place a straight edge across pump body and using feeler gauges, measure end-float of outer rotor.
End-float = 0.03 to 0.08 mm (0.001 to 0.003 in).



9. Using feeler gauges, check clearance between inner and outer rotor lobes.
Clearance = 0.025 to 0.12 mm (0.0010 to 0.0047 in).
10. Renew oil pump assembly if scoring exists or clearances are excessive.

Oil pressure relief valve



1. Remove and discard plug.
2. Remove spring and relief valve plunger.
3. Check plunger and bore for wear, corrosion and scoring.
NOTE: Light scoring may be removed using grade 600 emery cloth soaked in oil.
4. Check spring free length.
Free length - 38.8 mm (1.531 in).
5. Renew relief valve as an assembly.
6. Remove all traces of sealant from plug threads in oil pump body.
7. Lubricate spring, relief valve plunger and bore with engine oil.
8. Fit plunger and spring, fit and tighten a new plug.

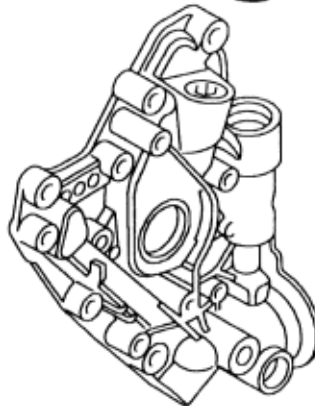
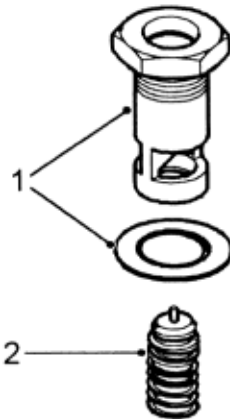


CAUTION

Do not attempt to re-seal and fit the original plug.

9. Check oil pressure switch - if fitted for damage, replace as necessary. Apply Loctite 577 to threads of replacement switch and tighten to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).

Thermostatic valve



1. Remove diverter plug, remove and discard Dowty washer.
2. Withdraw spring and valve from oil pump body.



CAUTION

Do not separate spring from valve.

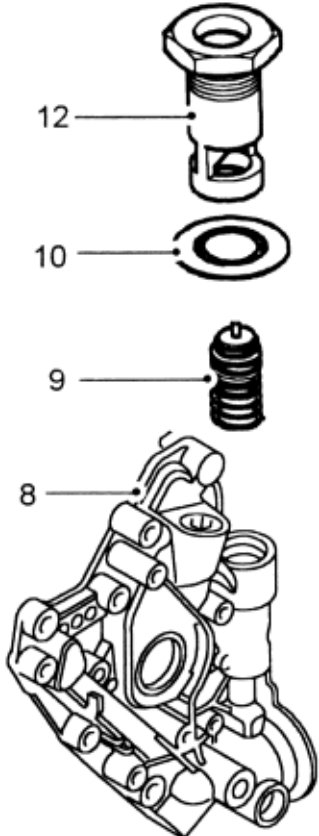
3. Check spring for distortion and corrosion.
4. Check valve for corrosion, seating faces of valve and diverter plug for damage and pitting; replace valve as an assembly.
5. Check valve bore for corrosion.
NOTE: Light corrosion may be removed from valve bore using grade 600 emery cloth soaked in oil.
6. Remove all traces of Loctite from threads of diverter valve plug and oil pump body.

Thermostatic valve



CAUTION

Do not remove blanking plug from oil gallery below thermostatic valve bore.



7. Lubricate valve, spring and bore with engine oil.
8. Secure oil pump body in a soft-jawed vice with thermostatic valve bore facing upwards.



CAUTION

Valve bore must be as near vertical as possible.

9. Insert valve and spring in bore ensuring that it is positioned centrally in bore.



CAUTION

Valve will not seat correctly in diverter plug if it is not positioned centrally.

10. Fit a new Dowty washer to diverter plug.
11. Apply Loctite 577 to threads of diverter plug.
12. Fit diverter plug, carefully tighten plug by hand ensuring that valve is not displaced as plug is tightened.
13. When diverter plug is screwed fully down, tighten to 35 Nm (3.6 kgf/m, 26 lbf/ft).

Oil pump - assembling

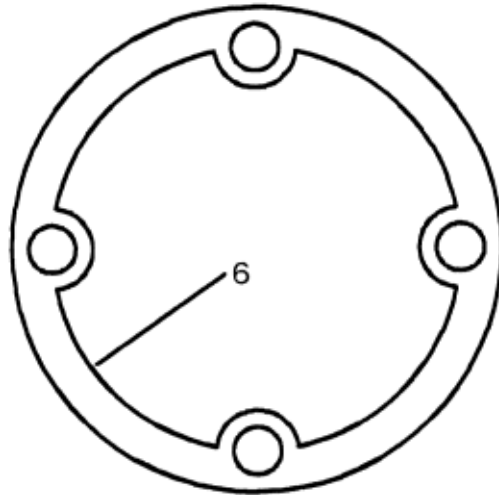
1. Using gasket removal spray and plastic scraper, remove all traces of gasket material from oil pump body.
2. Use a suitable cleaning solvent, remove all traces of sealant from oil pump body and backplate.
3. Remove all traces of Loctite from Torx screws and holes in oil pump body, ensure holes are clean and dry.



CAUTION

Do not use a tap.

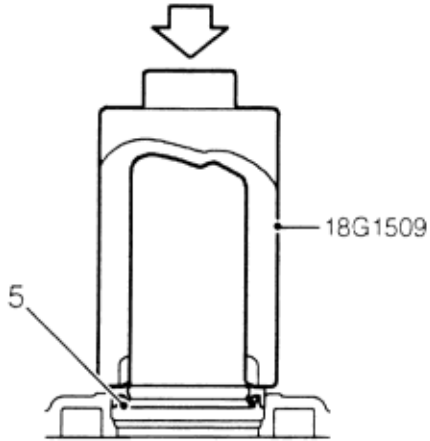
4. Ensure all components are clean, lubricate rotors and housing with engine oil.
5. Fit rotors ensuring that reference marks are aligned and chamfered side of outer rotor carrying a square identification mark is facing away from backplate side of pump body.



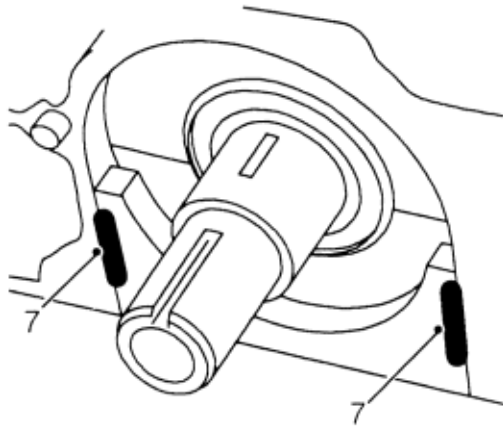
6. Apply a 1 mm bead of Loctite 573 to pump backplate as shown.
7. Fit pump backplate ensuring reference marks on backplate and pump body are aligned.
8. Apply Loctite 222 to threads of Torx screws, fit and tighten screws.
9. Check that pump rotates freely.

Oil pump - refit (cont'd)

1. Using gasket removal spray and plastic scraper, remove all traces of gasket from cylinder block.
2. Remove all traces of sealant from joint faces of front - No. 1 main bearing cap.
3. Lubricate oil seal running surface on crankshaft with engine oil.
4. Fit Woodruff key to crankshaft.



5. Lubricate a new crankshaft front oil seal with engine oil.
6. Fit oil seal using tool **18G 1509**.



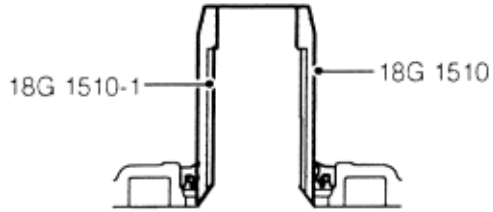
7. Using sealant from kit, Part No. LVV10002B, apply a bead of sealant to joint line of front - No. 1 main bearing cap.



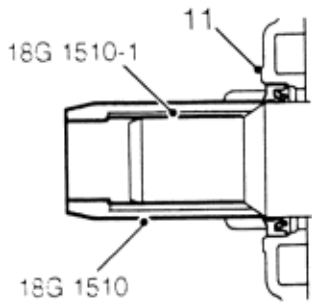
CAUTION

Do not fill grooves on either side of main bearing cap until immediately before sump is fitted.

8. Position a new gasket to cylinder block.
NOTE: Gasket must be fitted dry.

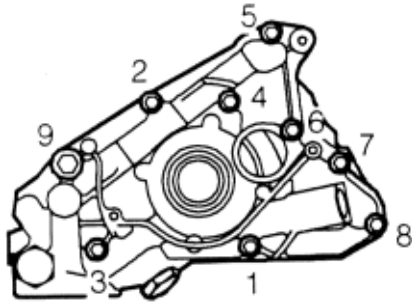


9. Align Woodruff key slots in oil pump inner rotor with Woodruff key.
10. Insert oil seal protector **18G 1510** and adaptor sleeve **18G 1510 - 1** into oil pump inner rotor.
NOTE: This will assist in locating oil pump inner rotor on Woodruff key.



11. Slide oil pump over crankshaft ensuring Woodruff key is located in keyway in inner rotor.

NOTE: Tools **18G 1510** and **18G 1510** will be displaced a pump is fitted



12. Fit bolts ensuring that longest M6 bolt is fitted at position 1.

13. Tighten bolts in sequence shown to:
M10 bolts - 45 Nm (4.6 kgf/m, 33 lbf/ft)
M16 bolts - 10 Nm (1.0 kgf/m, 7 lbf/ft).

NOTE: Patchlok bolts may be re-used provided threads are undamaged.

14. Ensure sealing strips are fitted to camshaft timing belt lower rear cover

15. Fit lower rear cover, fit and tighten screws to 8 Nm (0.8 kgf/m, 6 lbf/ft).

16. Fit camshaft timing belt idler pulley ensuring that recessed side of centre boss faces away from engine.

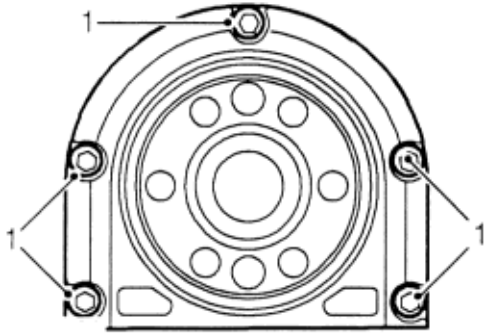
17. Apply Loctite 275 to threads of idler pulley nut, fit and tighten nut to 45 Nm (4.6 kgf/m, 33 lbf/ft).

NOTE: If stud was unscrewed during nut removal, clean oil Loctite from threads of stud and ensure hole in cylinder block is clean and dry. Apply Loctite 275 to threads of stud and screw it into block, tighten stud to 12 Nm (1.2 kgf/m, 8.9 lbf/ft).

18. Slide timing gear on to crankshaft.

19. Fit camshaft timing belt and adjust tension. **See this section.**

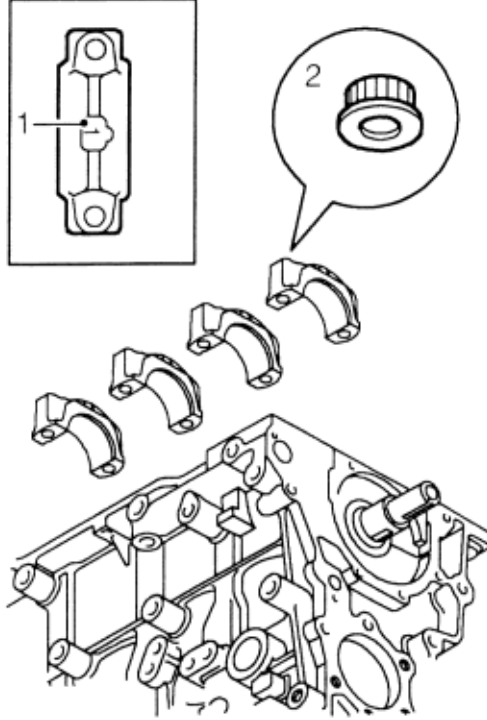
Crankshaft rear oil seal - remove



1. Remove 5 bolts securing rear oil seal housing to cylinder block, remove and discard housing and oil seal.

NOTE: Dowel located, ensure dowels are retained in cylinder block.

Big-end bearings - remove



1. Suitably mark cylinder reference number on each big-end bearing cap, noting that tapered portion of machined flat on each cap faces towards front of engine.
2. Remove 2 nuts securing each big-end bearing cap, remove caps and recover big-end bearing shells.



CAUTION

Keep nuts and bearing caps in their fitted order. Big-end bearing shells should always be replaced whenever crankshaft is removed.

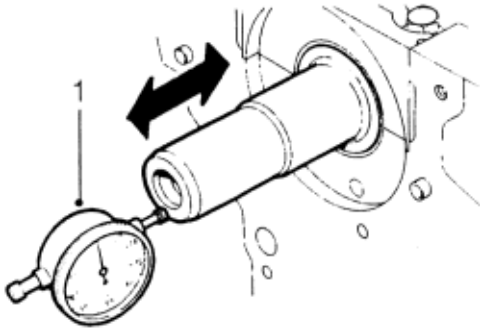
3. Slide suitable lengths of plastic tubing over threads of connecting rod bolts.
4. Push each connecting rod up cylinder bore until connecting rod bolts are clear of crankshaft journals.



CAUTION

Ensure connecting rods do not contact oil squirt jets or cylinder bores.

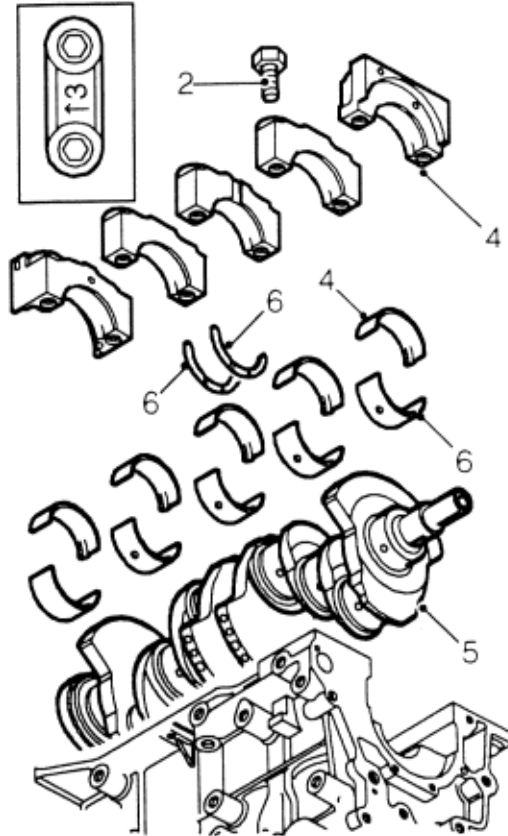
Crankshaft end-float - check



1. Attach a magnetic base DTI* to front of cylinder block, move crankshaft rearwards, position stylus on end of crankshaft and zero DTI.
2. Move crankshaft forwards, measure and record end-float figure obtained.
End-float = 0.03 to 0.26 mm (0.001 to 0.010 in).
3. If end-float exceeds above dimension, new thrust washers must be fitted.
Thrust washer thickness = 2.31 to 2.36 mm (0.0909 to 0.0929 in).

*DTI Dial Test Indicator

Crankshaft - remove



1. Check that identification marks are etched on each main bearing cap, if necessary, number caps 1 to 5 from front of engine and indicate fitted direction.
2. Starting at centre main - No. 3 main bearing cap and working outwards, progressively slacken, then remove 2 bolts securing each cap.

CAUTION
Keep bolts in their fitted order.

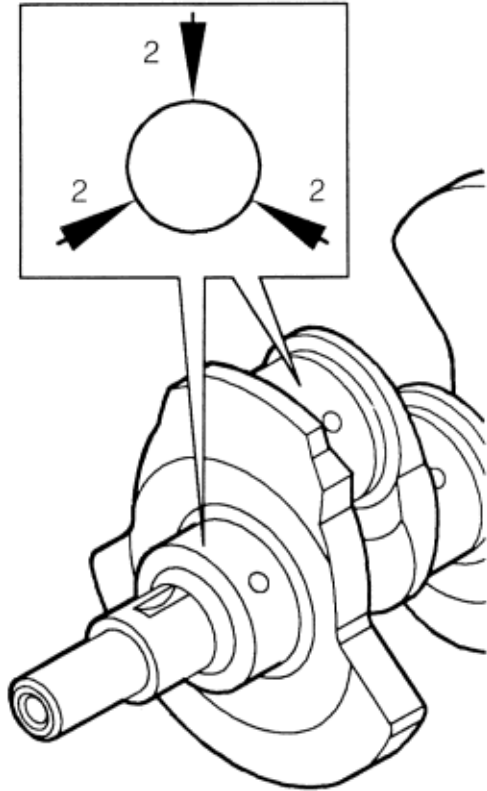
3. Using fingers only, rock each main bearing cap until it is released from locating dowels.

CAUTION
Do not tap caps sideways.

4. Remove main bearing caps and plain bearing shells.
5. Using assistance, remove crankshaft.
6. Recover upper, grooved main bearing shells and 2 thrust washers.
7. Remove sealant from front - No. 1 main bearing cap and cylinder block.

Crankshaft - inspection

1. Clean crankshaft, ensure all oilways are clear.



2. Check crankshaft journals for wear and ovality, make three checks at 120° intervals in centre of journals. Crankshaft bearing journal diameters:
Main bearings = 60.703 to 60.719 mm (2.3899 to 2.3905 in).
Big-end bearings = 57.683 to 57.696 mm (2.2710 to 2.2715 in).
Clearance in bearings = ± 0.005 mm (0.0002 in)

**CAUTION**

Crankshaft journals may not be reground undersize, if journals are worn, crankshaft must be replaced. Main and big-end bearings are only available in one size and should always be replaced whenever crankshaft has been removed.

3. Check thrust washers for wear and scoring, replace as necessary.
Thrust washer thickness = 2.31 to 2.36 mm (0.0909 to 0.0929 in).

Crankshaft - refit**CAUTION**

If crankshaft end-float exceeded 0.26 mm (0.010 in), new thrust washers must be fitted.

1. Clean main bearing shell locations in cylinder block, clean main bearing caps.
2. Check that ring dowels are fitted in main bearing cap locations and that bolt holes are clean and dry.
3. Check threads of main bearing cap bolts for damage, renew bolts in pairs.
4. Lubricate new upper main bearing shells with engine oil and ensuring that they are centrally positioned, fit to their locations in cylinder block.

NOTE: These bearing shells are grooved.

5. Lubricate thrust washers with engine oil and fit oil groove side outwards to each side of centre - NO.3 main bearing in cylinder block.
6. Lubricate crankshaft journals with engine oil and using assistance, position crankshaft in cylinder block.

**CAUTION**

Ensure thrust washers are not displaced as crankshaft is fitted.

7. Lubricate new main bearing shells with engine oil and fit to main bearing caps.

NOTE: These bearing shells are plain.

8. Fit main bearing caps ensuring that they are the correct way round and in their fitted order.

**CAUTION**

Do not apply sealant to grooves in front - No. 1 main bearing cap until immediately before sump is fitted.

9. Lubricate threads of main bearing cap bolts with engine oil, fit and finger tighten bolts.
10. Starting from the centre - NO. 3 main bearing cap and working outwards, tighten bolts to 112 Nm (11.4 kgf/m, 82.5 lbf/ft).
11. Check that crankshaft rotates smoothly.
12. Recheck crankshaft end-float. **See this section.**

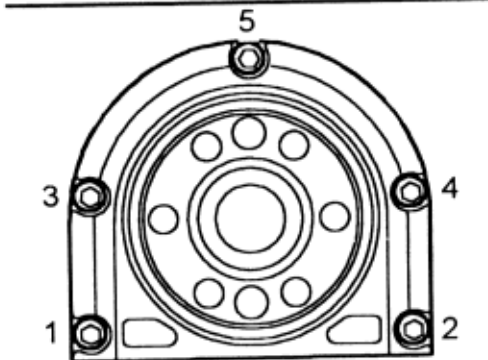
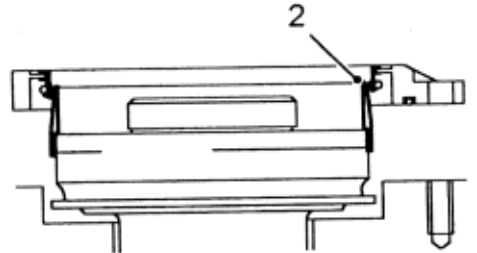
**CAUTION**

If original thrust washers have been refitted and end-float exceeds 0.26 mm (0.010 in), crankshaft must be removed and new thrust washers fitted. If, with new thrust washers fitted, end-float is still excessive, crankshaft must be replaced.

Crankshaft rear oil seal - refit**CAUTION**

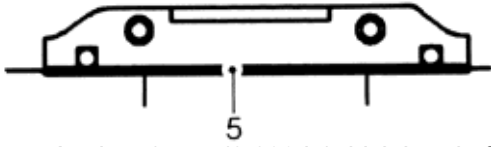
Rear oil seal and housing must be fitted prior to fitting sump.

1. Ensure oil seal running surfaces on crankshaft and oil seal housing mating surface on cylinder block are clean and oil free and that bolt and dowel holes are clean and dry.

**CAUTION**

The oil seal is pre-lubricated at manufacture. Do not lubricate oil seal or running surface on crankshaft. Do not separate protector sleeve from oil seal and do not touch lip of seal. If seal is inadvertently handled it must not be fitted as the coating applied to the seal during manufacture will be destroyed and oil leakage can result.

2. Slide oil seal protector sleeve, oil seal and housing over end of crankshaft.
 3. Position oil seal and housing on cylinder block.
- NOTE: Oil seal protector will be displaced as seal and housing are fitted.
4. Fit bolts and working in sequence shown, tighten to 8 Nm (0.8 kgf/m, 6 lbf/ft).



5. Apply a 1 mm (0.039 in) thick bead of sealant from kit, Part Number GUG 705548 GM along joint line of seal housing, rear main bearing cap and cylinder block.

**CAUTION**

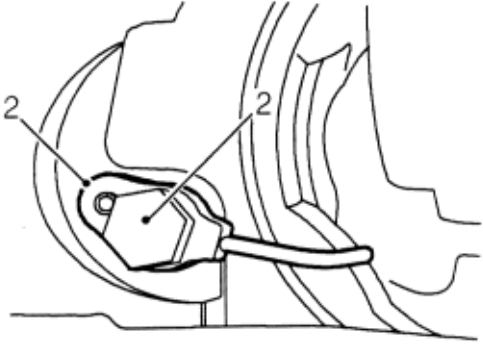
Do not apply sealant until immediately prior to fitted sump.
Do not spread sealant bead.

Big-end bearings - refit

1. Rotate crankshaft until big-end bearing journals are correctly positioned.
2. Lubricate crankshaft big-end journals with engine oil.
3. Fit new big-end bearing shells to connecting rods, lubricate shells with engine oil.
4. Taking care not to damage oil squirt jets or to displace bearing shells, pull connecting rods on to crankshaft journals.
5. Type 'A' engine: Remove plastic sleeves from connecting rod bolts.
6. Check that new big-end bearing shells are correctly located on big-end bearing caps, lubricate shells with engine oil.
7. Fit big-end bearing caps ensuring that they are in their correct fitted order, and that on Type 'A' engines, the tapered portion of machined flat on each cap is facing towards front of engine. For the Type 'B' engine ensure the identification marks on the connecting rod and bearing cap are on the same side.
8. Type 'A' engine: Lubricate threads of connecting rod bolts with engine oil. Fit nuts to their respective connecting rods and tighten to 48 Nm (4.9 kgf/m, 35 lbf/ft).
Type 'B' engine: lubrication threads and fit bolts to their respective connecting rods and tighten to 20 Nm (2.0 kgf/m, 14 lbf/ft) then a further 85°.

Pistons and connecting rods - remove

1. Remove crankshaft. **See this section.**



2. Remove banjo bolts securing oil squirt jets to cylinder block, remove jets.

NOTE: Each jet is located by means of a roll pin.

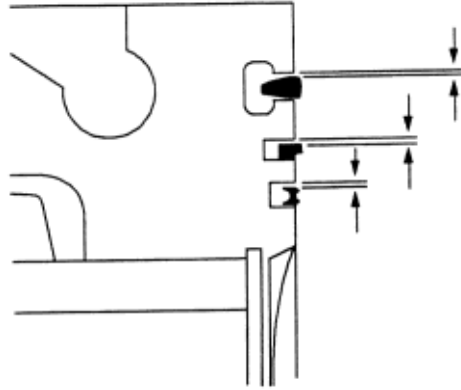
3. Suitably identify each piston and connecting rod assembly to its respective cylinder bore.
4. Using assistance, lay cylinder block on its side.
5. Check that plastic tubes are still on connecting rod bolts.
6. Push each piston and connecting rod up cylinder bore taking care to keep connecting rod clear of bore walls; remove pistons and connecting rods.
7. Recover big-end bearing shells from connecting rods.

Piston rings - remove

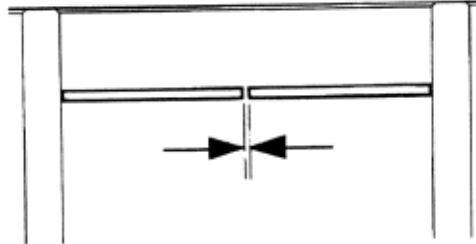
1. Using a suitable expander, remove old piston rings.
2. Use a squared off end of a broken piston ring to clean groove in piston.

**CAUTION**

Do not use a wire brush or emery cloth.



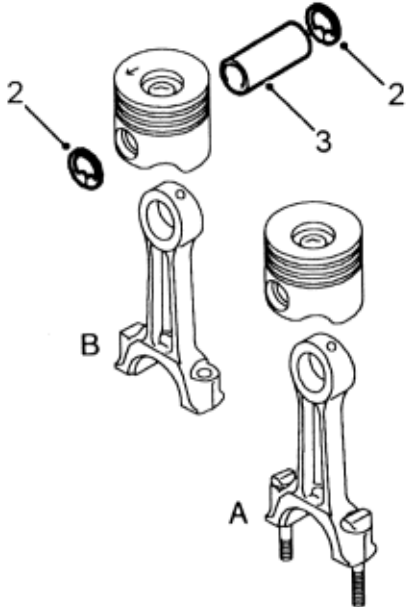
3. Check new ring to groove clearance.
Top compression = 0.115 to 0.135 mm (0.00453 to 0.00531 in).
2nd compression = 0.050 to 0.082 mm (0.0020 to 0.0032 in).
Oil control = 0.050 to 0.082 mm (0.0020 to 0.0032 in).



4. Check new ring fitted gap 30 mm from top of cylinder bore, ensure rings are kept square to bore when checking gaps.
Fitted gap:
Top compression = 0.25 to 0.27 mm (0.0098 to 0.011 in).
2nd compression = 0.40 to 0.42 mm (0.016 to 0.027 in).
Oil control rails = 0.30 to 0.32 mm (0.012 to 0.013 in).

Pistons - Remove

1. Type 'A' engine: Suitably identify each piston to its connecting rod, note position of bearing shell tag recess in connecting rod relative to arrow on piston crown.
Type 'B' engine: Suitably identify each piston to its connecting rod noting the position of the cast boss on the connecting rod relative to the arrow on piston crown.



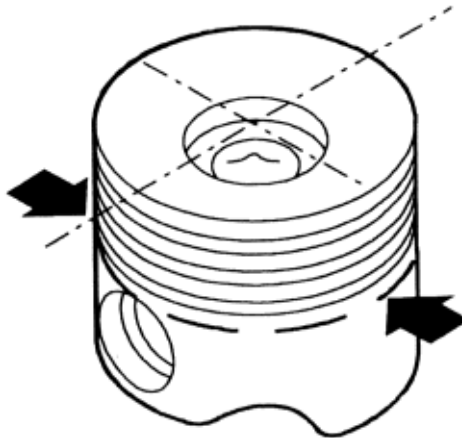
2. Remove and discard circlips securing gudgeon pin.
3. Push gudgeon pin out of piston and connecting rod.

CAUTION

Keep gudgeon pins with their respective pistons.

Pistons and connecting rods - inspection

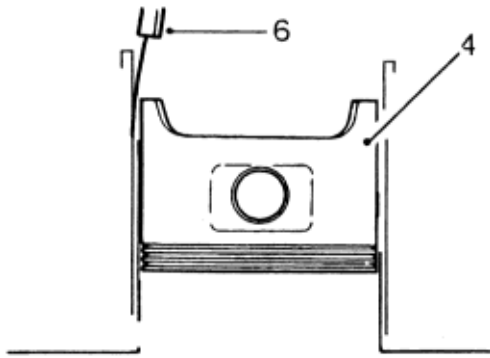
1. Clean carbon from pistons using fine emery cloth, do not use a wire brush or scraper.
2. Check pistons for cracks, distortion and damage.



3. Measure and record piston diameter at right angles to gudgeon pin hole and 44 mm (1.73 in) from bottom of skirt:
Diameter = 84.262 mm (3.3174 in)
2. Use a squared off end of a broken piston ring to clean groove in piston.

CAUTION

Measurement point must be on the ungraphited area of the piston.

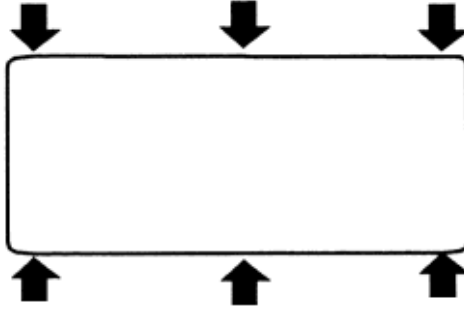


4. Starting with Number 1 piston, invert piston and with arrow on piston crown pointing towards REAR of cylinder block, insert piston into top of Number 1 cylinder bore.
5. Position with bottom of skirt 25 mm (0.98 in) from top of cylinder bore.
6. Using feeler gauges, measure and record clearance between piston skirt and left hand side of cylinder bore 70 mm (2.75 in) from top of bore (viewed from front of cylinder block).
Piston to cylinder bore clearance = 0.18 to 0.2 mm (0.0071 to 0.008 in).
7. Repeat procedures for remaining pistons.

**CAUTION**

Oversize pistons are not available, if clearances are excessive, measure diameter of cylinder bore before proceeding further. If, after inspection, cylinder bores are found to be the correct size, pistons must be replaced.

8. Check fit of each gudgeon pin in its respective pistons, pin must be a tight, sliding fit with no perceptible side play.



9. Measure gudgeon pin diameter at each end and centre of pin:
Diameter = 29.995 to 30.000 mm (1.1809 to 1.1811 in)
10. Renew gudgeon pins and pistons as an assembly if diameters are less than specified or if excessive pin to piston side play is evident.
11. Check connecting rods for alignment, reject any connecting rod which is bent.
12. Check small-end bushes for wear, check that gudgeon pin is a close, sliding fit in the bush with no perceptible side play

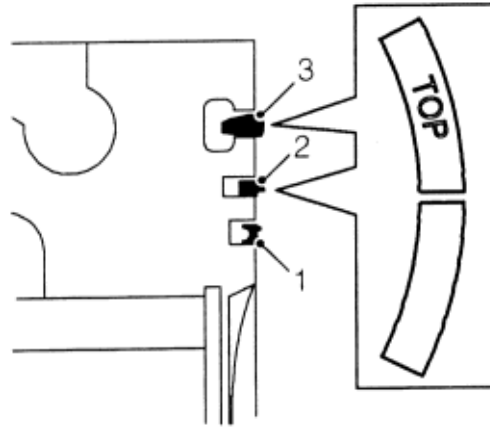
**CAUTION**

Small-end bushes may not be replaced, a new connecting rod must be fitted.

13. Type 'A' engine: Using fingers only, check that each big-end bearing cap nut runs freely on the threads of its respective dowel bolt. If any nut is tight, then both bolts and nuts from that connecting rod must be replaced. Retain nuts with their respective bolts.
Type 'B' engine: Check that each big-end bearing cap bolt turns freely in the connecting rod, if there is any sign of binding on the threads, the bolts must be replaced.

Pistons - refit

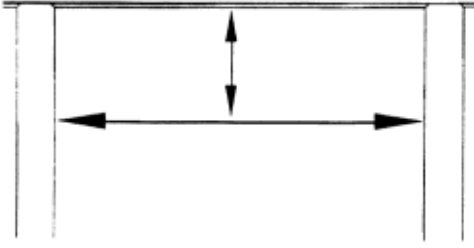
1. Lubricate gudgeon pin and small-end bush with engine oil.
2. Position piston to its respective connecting rod ensuring that bearing shell tag recess in connecting rod is to the left of the arrow on the piston crown when piston is viewed from the rear.
3. Fit gudgeon pin, fit new circlips ensuring they are fully seated in their grooves.
4. Repeat above procedures for remaining pistons.

Piston rings - refit

1. Fit oil control rails and spring.
2. Fit 2nd compression ring with 'TOP' marking upwards.
3. Fit top compression ring with 'TOP' marking upwards.
4. Check that rings are free to rotate, position ring gaps at 120° to each other and away from thrust side of piston.
5. Check ring fitted gaps:
Top compression = 0.30 to 0.50 mm (0.012 to 0.020 in).
2nd compression = 0.40 to 0.60 mm (0.016 to 0.024 in).
Oil control = 0.25 to 0.50 mm (0.0098 to 0.020 in).

Cylinder bores - inspection

1. Check cylinder bores for scoring.



2. Check cylinder bores for wear, measure and record diameter of each bore, 30 mm (0.12 in) from top of bore.

**CAUTION**

Measurements must be taken from side to side and front to rear of bore.

Bore diameter = 84.442 to 84.460 mm (3.3245 to 3.3252 in).

**CAUTION**

No reboring, honing or glaze busting of cylinder bores is permissible; cylinder block must be replaced.

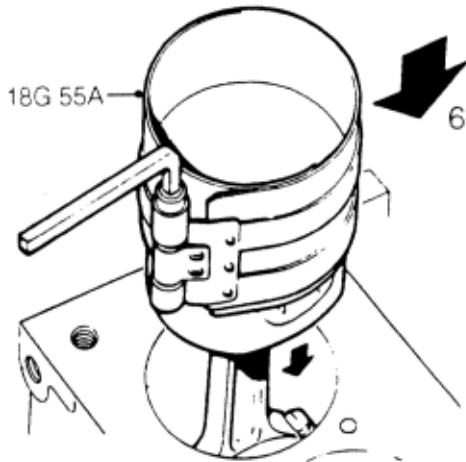
Cylinder block

1. Check that all oilways are clear and that oil restrictor located in oilway to cylinder head is fitted below face of cylinder block.
2. Check that main bearing cap, crankshaft rear oil seal housing and cylinder head locating dowels are fitted.
3. Check core plugs for leakage and corrosion, replace as necessary.

NOTE: Seal replacement core plugs and main oil gallery plug on rear of cylinder block with Loctite 572, tighten main oil gallery plug to 8 Nm (0.8 kgf/m, 6 lbf/ft).

Pistons and connecting rods - refit

1. Lubricate cylinder bores, pistons, rings and crankshaft big-end journals with engine oil.
2. Lubricate new big-end bearing shells with engine oil and fit to connecting rods and bearing caps.
3. Ensure arrows on big-end bolts are facing away from connecting rods.
4. Slide suitable lengths of plastic tubing over threads of connecting rod bolts.
5. Check that piston ring gaps are positioned at 120° to each other and away from thrust side of piston.



6. Fit ring clamp **18G 55A** to each piston in turn and ensuring that pistons are in their correct fitted order and that arrow on piston crown is facing towards front of engine, push pistons into their respective cylinder bores.

**CAUTION**

Ensure that connecting rods do not contact cylinder bores.

7. Do not pull connecting rods fully down cylinder bores at this stage.
8. Check that cut-out in each piston skirt is positioned above oil squirt jet location.
9. Ensure oil squirt jets are clear and that roll pins are inserted in jet housings.
10. Clean all traces of Loctite from threads of banjo bolts.
11. Position oil squirt jets in cylinder block ensuring that roll pins are inserted in locating holes.
12. Apply Loctite 275 to threads of banjo bolts.

**CAUTION**

Do not allow Loctite to enter oil hole in banjo bolts.

13. Fit banjo bolts and tighten to 12 Nm (1.2 kgf/m, 8.7 lbf/ft).
14. Fit crankshaft and big-end bearings. **See this section.**

Oil pump

Outer rotor to body clearance	0.05 to 0.10 mm (0.002 to 0.0039 in)
Rotor lobe clearance	0.025 to 0.12 mm (0.0010 to 0.0047 in)
Outer rotor end float	0.03 to 0.08 mm (0.001 to 0.003 in)
Relief valve spring free length	38.9 mm (1.531 in)

Camshaft

Camshaft end float	0.51 mm (.0020 in) - max.
Camshaft bearing clearance	0.043 to 0.094mm (0.0017 to 0.0037 in)
Camshaft timing belt tensioner spring free length	65 mm (2.6 in)

Tappets

Tappet outside diameter	34.959 to 34.975 mm (1.3763 to 1.3770 in)
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Cylinder head

Cylinder head maximum warpage	0.010 mm (0.00039 in)
Cylinder head bolt length	243.41 mm (9.5831 in)

Valve springs

Free length	37.0 mm (1.46 in)
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Valves

Valve stem diameter:	
Inlet	6.907 to 6.923 mm (0.2719 to 0.2726 in)
Exhaust	6.897 to 6.913 mm (0.2715 to 0.2722 in)

Valve stem to guide clearance:	
Inlet	0.056 mm (0.0022 in)
Exhaust	0.066 mm (0.0026 in)

Valve face angle	45° to 45°30'
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Valve head stand down:	
Inlet	1.45 mm (0.0571 in)
Exhaust	1.35 mm (0.0531 in)

Valve guides:	
Inside diameter after reaming	6.950 to 6.963 mm (0.2736 to 0.2741 in)
Fitted length above cylinder head	61.1 to 61.7 mm (2.41 to 2.43 in)

Valve seat inserts:

Seat angle	
Inlet	60°
Exhaust	58° to 62°

Insert diameter	
Inlet	35.697 mm (1.4054 in)
Exhaust	31.05 to 31.55 mm (1.222 to 1.242 in)

Crankshaft

End-float	0.03 to 0.26 mm (0.001 to 0.010 in)
Thrust washer halves thickness	2.31 to 2.36 mm (0.0909 to 0.0929 in)
Main journal diameter	60.703 to 60.719 mm (2.3899 to 2.3905 in)
Clearance in bearings	± 0.005 mm (0.0002 in)
Big-end journal diameter	57.683 to 57.696 mm (2.2710 to 2.2715 in)
Clearance in bearings	± 0.005 mm (0.0002 in)

Piston rings

New ring to groove clearance:	
Top compression	0.115 to 0.135 mm (0.00453 to 0.00531 in)
2nd compression	0.050 to 0.082 mm (0.0020 to 0.0032 in)
Oil control	0.050 to 0.082 mm (0.0020 to 0.0032 in)
Ring fitted gap 30 mm (1.2 in) from top of cylinder bore:	
Top compression	0.25 to 0.27 mm (0.0098 to 0.011 in)
2nd compression	0.40 to 0.42 mm (0.016 to 0.017 in)
Oil control rails	0.30 to 0.32 mm (0.012 to 0.013 in)

Pistons

Piston diameter	84.262 mm 3.3174 in)
Clearance in bore	0.18 to 0.2 mm (0.0071 to 0.008 in)

Cylinder block

Cylinder bore	84.442 to 84.460 mm (3.3245 to 3.3252 in)
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Camshaft timing belt top cover screws	5 Nm (0.5 kgf/m, 4 lbf/ft)
Camshaft timing belt bottom cover screws	5 Nm (0.5 kgf/m, 4 lbf/ft)
Camshaft timing belt top backplate screws	8 Nm (0.8 kgf/m, 6 lbf/ft)
Camshaft timing belt bottom backplate screws	8 Nm (0.8 kgf/m, 6 lbf/ft)
Camshaft timing belt tensioner bolt	45 Nm (4.6 kgf/m, 33 lbf/ft)
Camshaft timing belt Allen screw	55 Nm (5.6 kgf/m, 41 lbf/ft)
Camshaft timing belt idler pulley nut	45 Nm (4.6 kgf/m, 33 lbf/ft)
Idler pulley stud	12 Nm (1.2 kgf/m, 8.9 lbf/ft)
Engine front mounting cover plate nuts	35 Nm (3.6 kgf/m, 26 lbf/ft)
Engine front mounting cover plate bolts	45 Nm (4.6 kgf/m, 33 lbf/ft)
Crankshaft pulley bolt	63 Nm (6.4 kgf/m, 46 lbf/ft) + 90°
Oil pump bolts - Patchlok:	
M6	8 Nm (0.8 kgf/m, 6 lbf/ft)
M10	45 Nm (4.6 kgf/m, 33 lbf/ft)
Thermostatic valve diverter plug	35 Nm (3.6 kgf/m, 26 lbf/ft)
Oil pressure switch	16 Nm (1.6 kgf/m, 12 lbf/ft)
Oil pick-up pipe bolts - Patchlok	8 Nm (0.8 kgf/m, 6 lbf/ft)
Fuel injection pump drive belt backplate screws	8 Nm (0.8 kgf/m, 6 lbf/ft)
Camshaft timing belt gear bolt	20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°
Fuel injection pump drive belt gear bolt	20 Nm (2.0 kgf/m, 14 lbf/ft) + 90°
Camshaft cover bolts	12 Nm (1.2 kgf/m, 8.9 lbf/ft)
Camshaft carrier to cylinder head bolts	11 Nm (1.1 kgf/m, 8 lbf/ft)
Cylinder head Torx bolts	
Stage 1	30 Nm (3.1 kgf/m, 22 lbf/ft)
Stage 2	65 Nm (6.6 kgf/m, 48 lbf/ft)
Stage 3	Further 90°
Stage 4	Then further 90°
Flywheel bolts - Patchlok	15 Nm (1.5 kgf/m, 11 lbf/ft) + 90°
Gearbox adaptor plate Torx screws	45 Nm (4.6 kgf/m, 33 lbf/ft)
Crankshaft sensor to adaptor plate screws	8 Nm (0.8 kgf/m, 6 lbf/ft)
Oil sump bolts	25 Nm (2.5 kgf/m, 18 lbf/ft)
Oil sump drain plug	25 Nm (2.5 kgf/m, 18 lbf/ft)
Main bearing cap bolts	112 Nm (11.4 kgf/m, 82 lbf/ft)
Connecting rod cap nuts	48 Nm (4.9 kgf/m, 35 lbf/ft)
Connection rod bolts	20 Nm (2.0 kgf/m, 14 lbf/ft) + 85°
Crankshaft rear oil seal housing screws	8 Nm (0.8 kgf/m, 6 lbf/ft)
Oil squirt jet banjo bolts	12 Nm (1.2 kgf/m, 8.9 lbf/ft)
Main oil gallery plug	12 Nm (1.2 kgf/m, 8.9 lbf/ft)

18G 55A	Piston Ring Clamp
18G 1509	Replacer - Crankshaft Oil Seal
18G 1510	Oil Seal Protection Sleeve
18G 1510-1	Adaptor Sleeve
18G 1519	Valve Spring Compressor
18G 1521	Timing Gear Holding Tool
18G 1523	Timing Pin
18G 1577	Valve Stem Oil Seal Remover/replacer
18G 1716	Replace - Camshaft Oil Seals
18G 1719	Camshaft Timing Belt Tensioner Retractor

Inlet Manifold

The inlet manifold is manufactured from aluminum alloy and the gasket is a multi-leaf type which also seals the exhaust manifold.

On vehicles fitted with an intercooler, an intake air temperature sensor is located at the timing belt end to measure the temperature of the boosted air supply.

Exhaust Manifold

The cast iron exhaust manifold carries an EGR valve and a variable wastegate Garrett turbocharger.

There are two tapings on the compressor housing; the 'N' port to the wastegate and the 'J' port to the boost pressure sensor on the bulkhead.

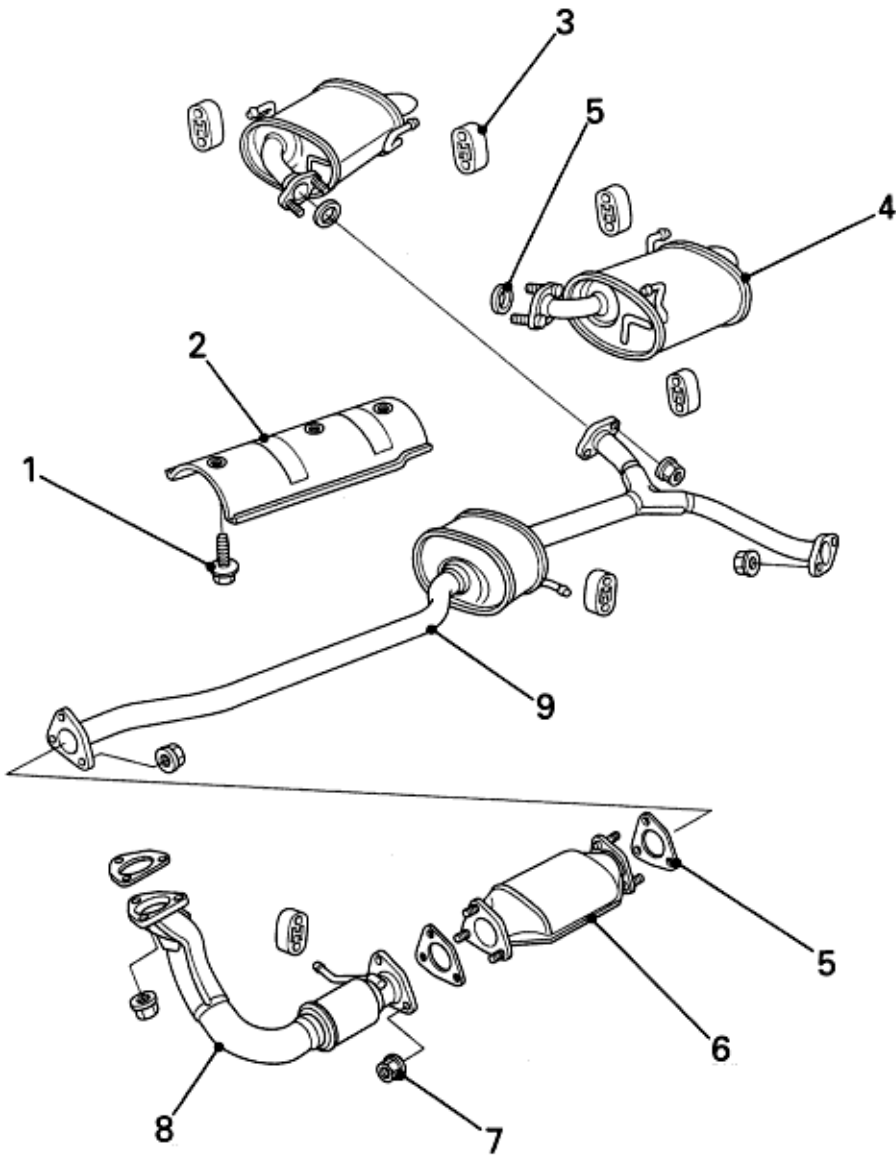
NOTE: Gaskets are NOT fitted between the manifold to turbocharger joint or between the turbocharger to exhaust outlet pipe joint.

Exhaust System

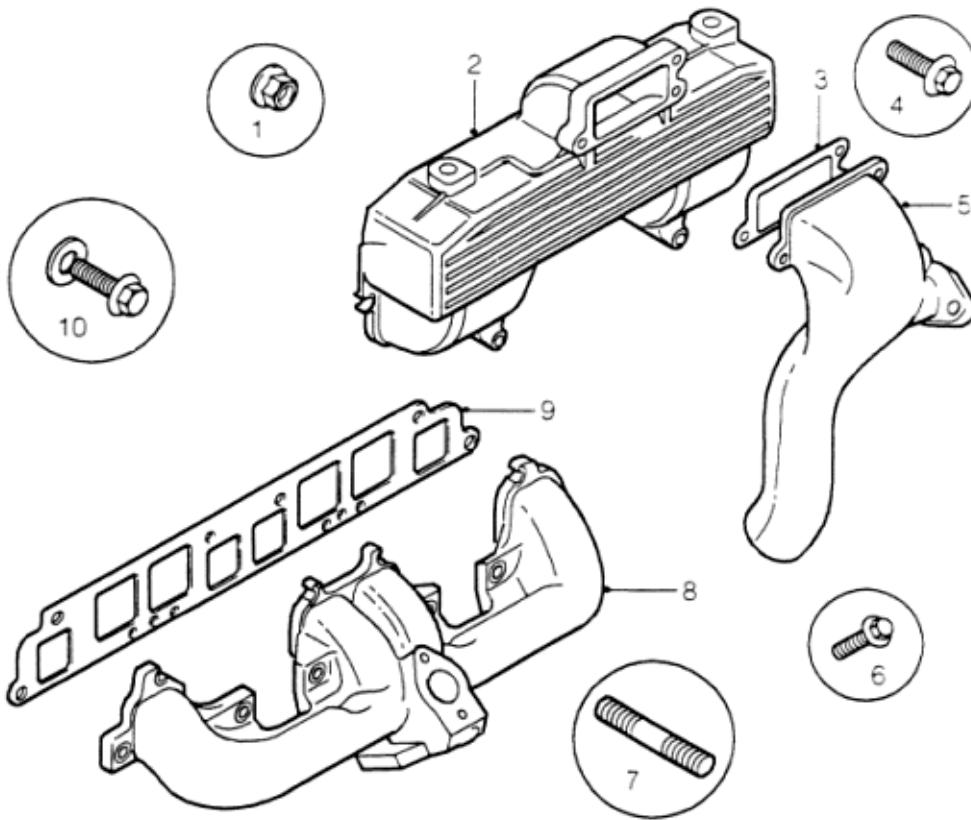
The exhaust system consists of a front pipe, catalytic converter, intermediate pipe and tail pipe assembly which contains a large capacity silencer.

The front pipe consists of a single constant diameter pipe with integral flexible joint.

All the silencers contain a series of expansion chambers, resonators and baffles designed to give an improved exhaust system, which reduces condensation and increases the life of the system.



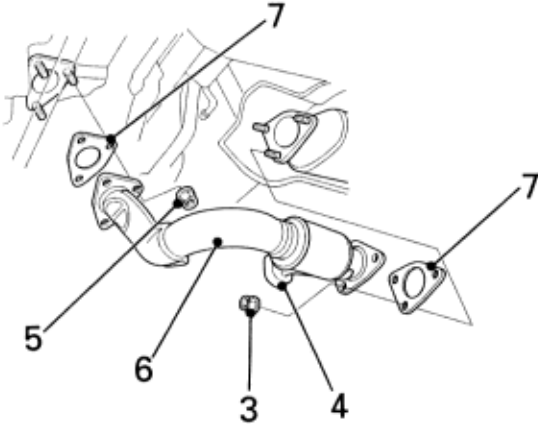
1. BOLT, HEAT SHIELD - 3 off
2. HEAT SHIELD
3. MOUNTING RUBBER - 6 off
4. EXHAUST TAIL PIPE
5. GASKET - 5 off - PIPE FLANGE
6. CATALYTIC CONVERTER
7. FLANGE NUT - 13 off
8. EXHAUST FRONT PIPE
9. EXHAUST INTERMEDIATE PIPE



1. FLANGE NUT, INLET/EXHAUST MANIFOLD
2. INLET MANIFOLD
3. GASKET, INLET MANIFOLD TO TURBOCHARGER ADAPTOR
4. BOLT, INLET MANIFOLD TO TURBOCHARGER ADAPTOR
5. INLET MANIFOLD TO TURBOCHARGER ADAPTOR
6. BOLT, EXHAUST MANIFOLD TO EGR PIPE
7. STUD, INLET/EXHAUST MANIFOLD TO CYLINDER HEAD
8. EXHAUST MANIFOLD
9. GASKET, INLET/EXHAUST MANIFOLD
10. FLANGE BOLT AND PLAIN WASHER, INLET/EXHAUST MANIFOLD

Remove

1. Raise vehicle on 4 post ramp.
2. Remove underbelly panel. See **BODY, Exterior fittings section.**



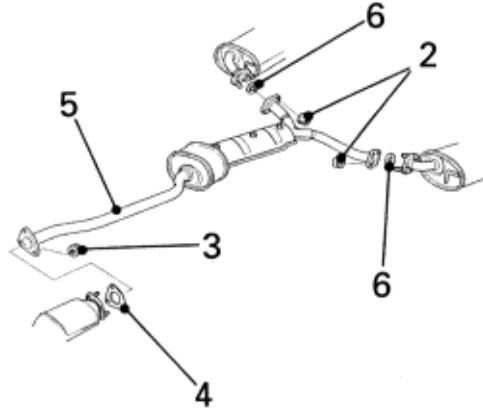
3. Remove 3 flange nuts securing front pipe to catalytic converter.
4. Release mounting rubber from pipe bracket.
5. Remove 3 flange nuts securing front pipe to manifold.
6. Release front pipe from manifold and remove from catalytic converter.
7. Remove flange gaskets.

Refit

1. Clean pipe flanges.
2. Fit new gasket to catalytic converter flange.
3. Fit front pipe to catalytic converter, fit nuts but DO NOT tighten.
4. Fit new gasket to manifold flange.
5. Raise front pipe and engage flange.
6. Fit manifold to front pipe flange nuts and tighten to 45 Nm (4.6 kgf/m 33 lbf/ft).
7. Tighten flange nuts securing front pipe to catalytic converter to 22 Nm (2.2 kgf/m, 16 lbf/ft).
8. Connect rubber mounting to front pipe bracket.
9. Fit underbelly panel, See **BODY, Exterior fittings section.**
10. Lower vehicle.

Remove

1. Raise vehicle on 4 post ramp.



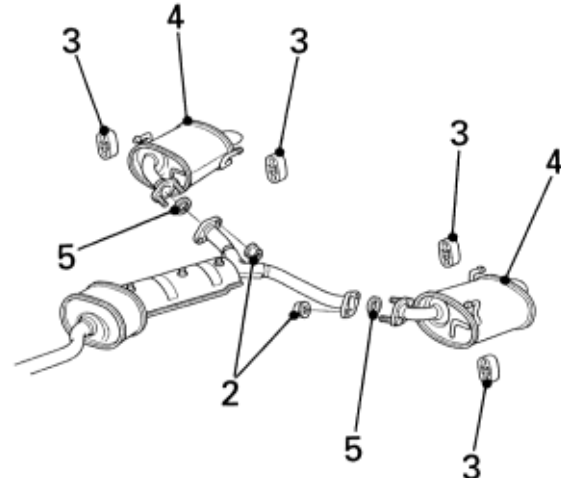
2. Remove 4 nuts securing tail pipes to intermediate pipe.
3. Remove 3 nuts securing intermediate pipe to catalytic converter.
4. Release intermediate pipe from catalytic converter. Remove and discard gasket.
5. Release and remove intermediate pipe.
6. Remove and discard gaskets from tail pipe flange ends of intermediate pipe.

Refit

1. Clean mating faces of intermediate pipe, catalytic converter and tail pipes.
2. Fit new gaskets to tail pipe flange end of intermediate pipe and catalytic converter flange.
3. Fit intermediate pipe to tail pipes, align and connect to catalytic converter flange. Fit nuts and tighten intermediate pipe flange nuts and tighten intermediate pipe flange nuts to 34 Nm (3.5 kgf/m, 25 lbf/ft) and tail pipe flange nuts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
4. Connect mounting rubbers.
5. Lower vehicle.

Remove

1. Raise vehicle on 4 post ramp.



2. Remove 4 nuts securing intermediate pipe to tail pipes.
3. Release 4 rubber mountings from tail pipes.
4. Remove tail pipes.
5. Remove and discard gaskets.

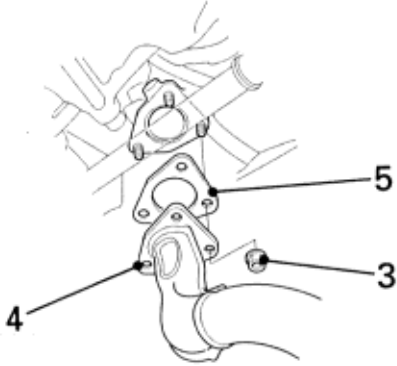
Refit

1. Clean intermediate pipe and tail pipe mating faces.
2. Fit new gaskets to intermediate pipe flange studs.
3. Fit tail pipes and connect rubber mountings.
4. Fit nuts to flange and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
5. Lower vehicle.

Front Pipe to Manifold Gasket (cont'd)

Remove

1. Raise vehicle on 4 post ramp.
2. Remove underbelly panel. See **BODY, Exterior fittings section.**



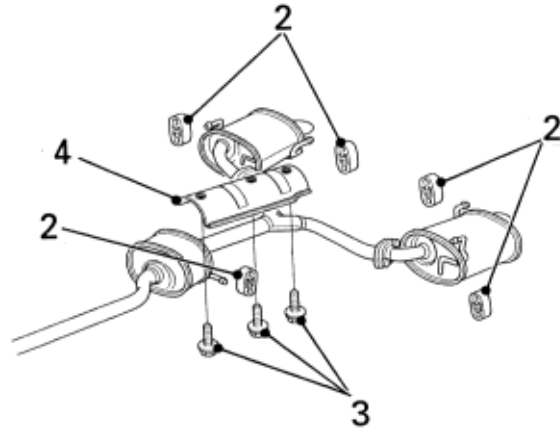
3. Remove 3 flange nuts securing front pipe to manifold.
4. Release front pipe from manifold.
5. Remove gasket from manifold flange.

Refit

1. Clean manifold and front pipe flanges.
2. Fit new gaskets to manifold flange.
3. Position front pipe to manifold and fit and tighten bolts to 45 Nm (4.6 kgf/m, 33 lbf/ft).
4. Fit underbelly panel. See **BODY, Exterior fittings section.**

Remove

1. Raise vehicle on 4 post ramp.



2. Release exhaust tail pipe and intermediate pipe from mounting rubbers.
3. Remove 3 bolts securing exhaust heat shield to body.
4. Remove heat shield.

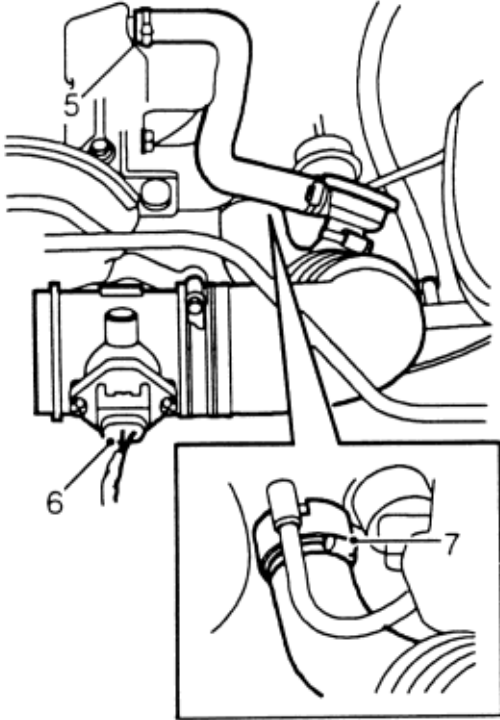
Refit

1. Fit heat shield and tighten bolts to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
2. Raise exhaust pipe into position and connect rubber mountings.
3. Lower vehicle.

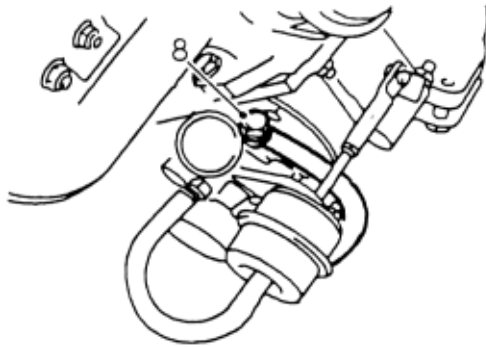
Inlet and Exhaust Manifold Gasket

Remove

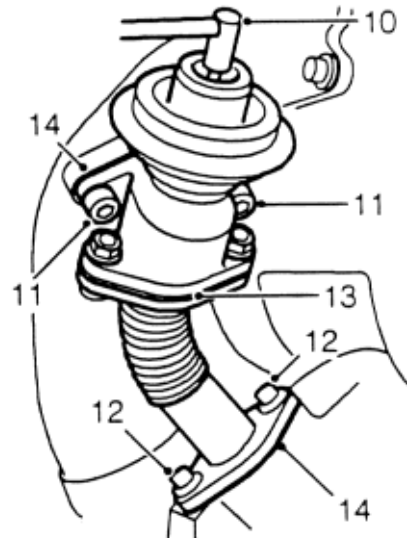
1. Disconnect battery earth lead.
2. Remove underbelly panel. See **BODY, Exterior fittings section.**
3. Remove engine acoustic cover. See **BODY, Exterior fittings section.**
4. Remove air cleaner. See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs.**



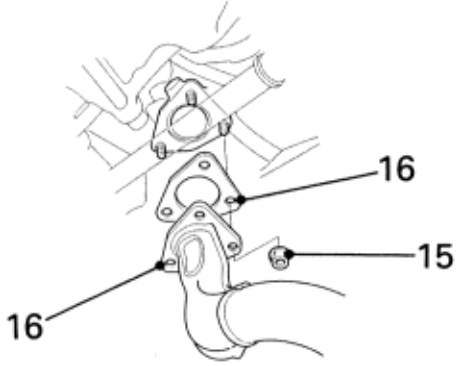
5. Slacken clip and disconnect breather hose from camshaft cover.
6. Disconnect multiplug from MAF sensor.
7. Slacken clip and disconnect air intake pipe from turbocharger, remove air intake pipe assembly.



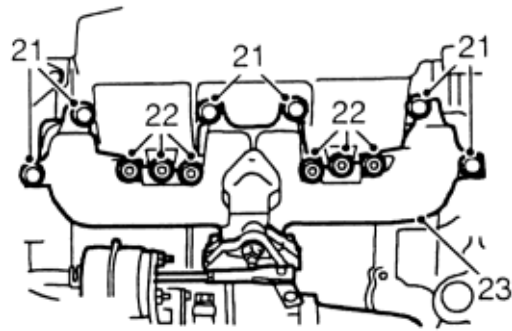
8. Remove banjo bolt securing oil feed pipe to turbocharger, collect 2 sealing washers.
9. Disconnect boost pressure sensing pipe from turbocharger.



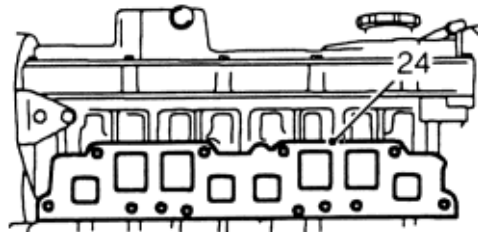
10. Disconnect vacuum pipe from EGR valve.
11. Remove 2 Allen screws securing EGR valve to inlet manifold.
12. Remove 2 bolts securing EGR valve recirculation pipe to exhaust manifold.
13. Release and remove EGR valve.
14. Remove and discard 2 gaskets.



15. Remove 3 bolts securing exhaust front pipe to exhaust manifold.
16. Release exhaust from pipe from exhaust manifold, remove and discard manifold flange gasket.
17. Remove 2 bolts securing oil drain pipe flange to turbocharger.
18. Remove and discard gasket.
19. Remove 2 bolts securing exhaust manifold to mounting bracket.



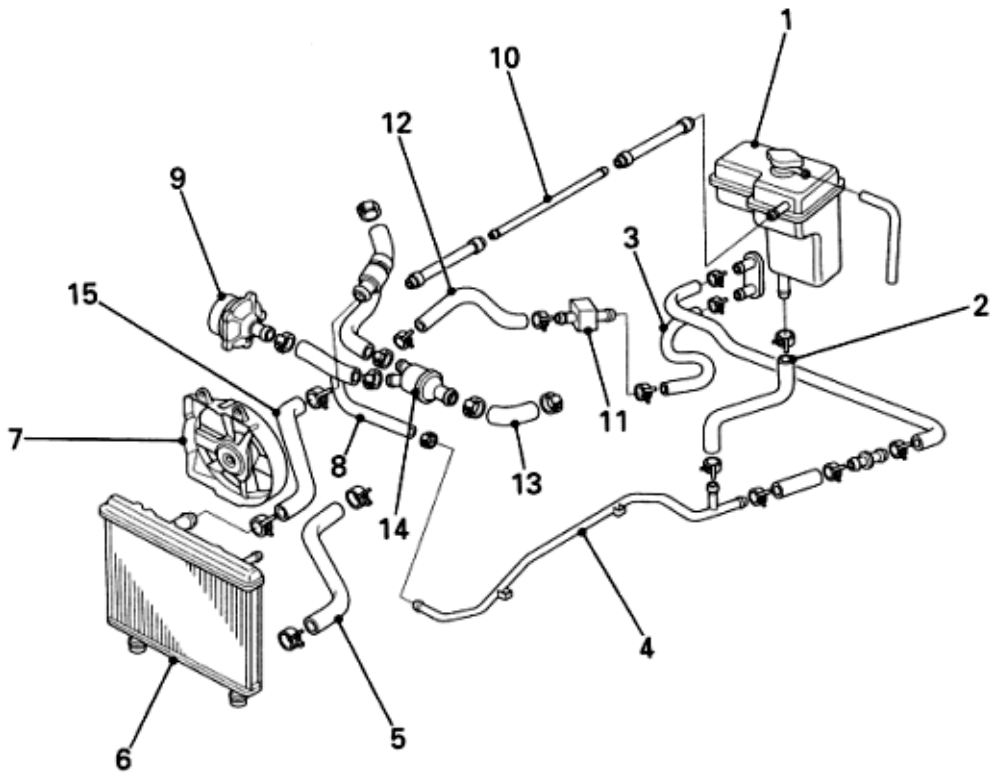
20. Slacken 6 bolts and 6 nuts securing inlet manifold and exhaust manifold to cylinder head.
21. Remove 6 bolts securing exhaust manifold to cylinder head, collect 4 washers.
22. Remove 6 nuts securing exhaust manifold to cylinder head.
23. Release and remove manifolds and turbocharger assembly.



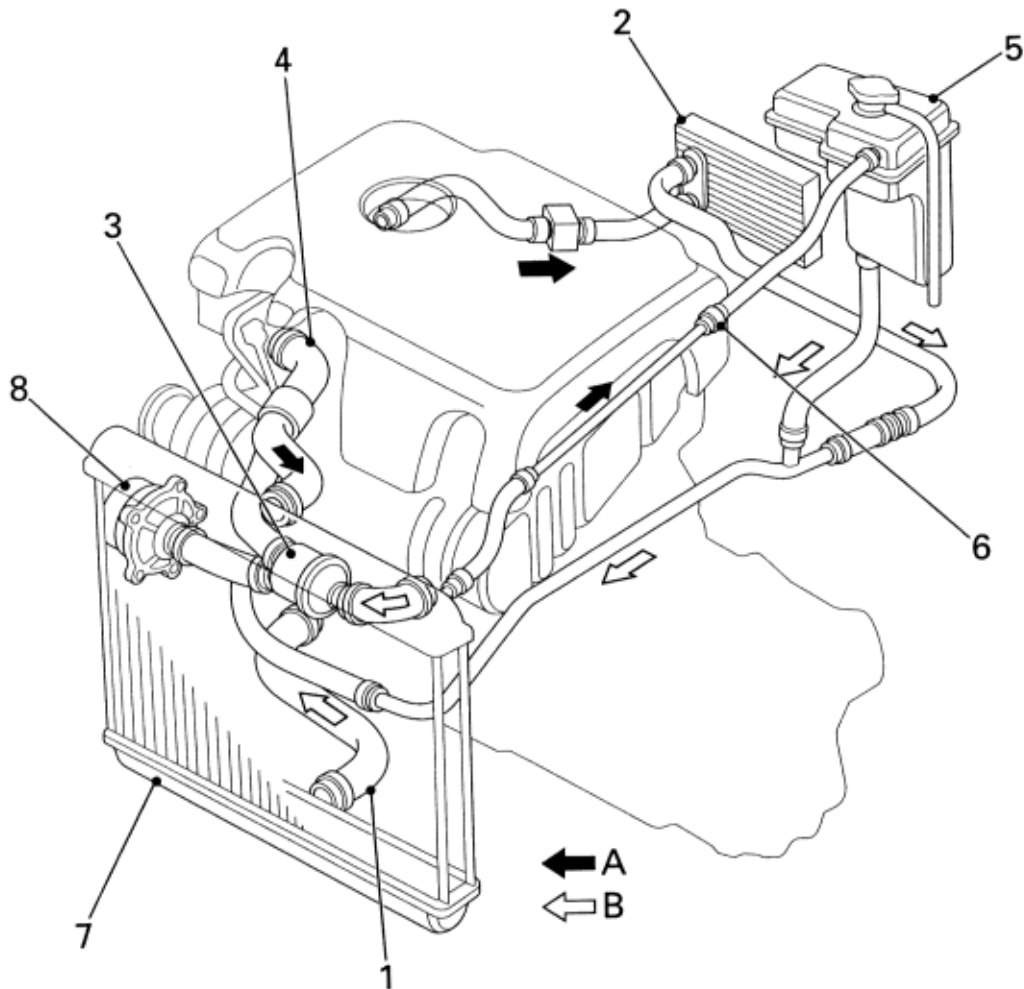
24. Remove and discard manifold gasket.

Refit

1. Clean mating faces of manifold and cylinder head.
2. Fit new manifold gasket.
3. Clean mating faces of exhaust manifold and exhaust front pipe.
4. Fit manifold flange gasket.
5. Manoeuvre manifold and turbocharger assembly into position and align to cylinder head.
6. Fit nuts, bolts and washers securing manifold to cylinder head.
7. Working in the sequence illustrated tighten manifold nuts and bolts to 25 Nm (2.6 kgf/m, 19 lbf/ft).
8. Fit 2 bolts securing exhaust manifold to mounting bracket.
9. Clean mating faces of oil drain pipe and turbocharger.
10. Fit new gasket to turbocharger oil drain pipe. Align pipe to turbocharger, fit bolts and tighten to 25 Nm (2.6 kgf/m, 19 lbf/ft).
11. Align exhaust front pipe to exhaust manifold. Fit 3 nuts and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
12. Clean mating faces of EGR valve, inlet manifold and exhaust manifold.
13. Fit new gaskets to EGR valve and recirculation pipe.
14. Align EGR valve and recirculation pipe to inlet and exhaust manifolds.
15. Fit 2 bolts securing EGR valve recirculation pipe to exhaust manifold and tighten to 9 Nm (0.9 kgf/, 6.5 lbf/ft).
16. Fit 2 Allen bolts securing EGR valve to inlet manifold and tighten to 25 Nm (2.6 kgf/m, 19 lbf/ft).
17. Connect vacuum pipe from EGR solenoid to EGR valve.
18. Connect boost pressure sensing pipe to turbocharger.
19. Clean turbocharger oil feed pipe union and banjo bolt.
20. Fit new sealing washers to banjo bolt.
21. Connect oil feed pipe to turbocharger and tighten union to 20 Nm (2.0 kgf/m, 14 lbf/ft).
22. Position air intake pipe and connect to turbocharger, tighten clip to secure.
23. Connect multiplug to MAF sensor.
24. Connect breather hose to camshaft cover and tighten clip.
25. Fit air cleaner. See **ENGINE MANAGEMENT SYSTEM - EDC, Repairs section**.
26. Fit engine acoustic cover. See **BODY, Exterior fitting section**.
27. Fit underbelly panel. See **BODY, Exterior fittings section**.
28. Connect battery earth lead.



1. EXPANSION TANK
2. EXPANSION TANK TO COOLANT RAIL
3. HOSE - HEATER VALVE TO HEATER
4. COOLANT RAIL
5. BOTTOM HOSE
6. RADIATOR
7. COOLING FAN AND COWL
8. HOSE - COOLANT PUMP TO THERMOSTAT HOUSING
9. COOLANT PUMP
10. COOLANT EXPANSION PIPE
11. HEATER TEMPERATURE CONTROL VALVE
12. HOSE - ENGINE TO HEATER VALVE
13. HOSE - OIL COOLER TO THERMOSTAT HOUSING
14. THERMOSTAT HOUSING
15. TOP HOSE



A = HOT B = COLD

The cooling system employed is the bypass type. When the engine is cold the thermostat closes off the coolant feed from the radiator bottom hose (1). Coolant is drawn via the heater matrix (2) from the top of the cylinder block, this allows some heat transfer to the radiator via the top hose by convection while retaining the majority of the heat within the cylinder block.

The siting of the thermostat (3) in the inlet rather than the outlet side of the system provides a reduced warm up time by circulating a small amount of coolant around a shorter tract, this also prevents temperature build up within the cylinder head prior to the thermostat opening.

As temperature increases the thermostat gradually opens, bleeding cool fluid into the cylinder block and allowing hot coolant to flow to the radiator via the top hose (4), balancing the flow of hot and cold fluid to maintain temperature. As the thermostat opens further so the full flow of coolant is drawn through the radiator. Any excess coolant created by heat expansion is returned to the expansion tank (5) via hose (6). The radiator (7) is a copper/brass cross-flow type with moulded plastic end tanks which incorporate sensor mountings and is mounted on rubber bushes directly into the front body member. The top of the radiator is supported by means of mounting brackets bolted in the radiator and bonnet locking platform.

For additional air flow, at times when the vehicle is stationary, an electric cooling fan is fitted. This is triggered by the Engine Control Module (ECM).

The coolant pump (8) is a rotor type pump which draws coolant directly from the thermostat. The pump is driven by a geared pulley from the camshaft timing belt.

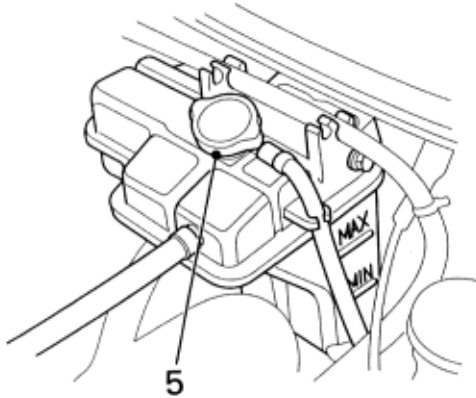


WARNING

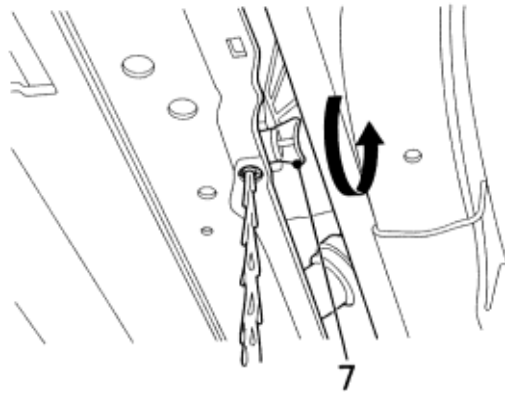
Since injury such as scalding could be caused by escaping steam or coolant, do not remove the pressure relief cap from the expansion tank while system is hot. Wait until system has cooled, use a cloth or gloves to protect hands from escaping steam.

Drain

1. Visually check engine and cooling system for signs of coolant leaks.
2. Examine hoses for signs of cracking, distortion and security of connections.
3. Remove underbelly panel. See **BODY, Exterior fittings section.**
4. Position heater temperature control to maximum hot position.



5. Remove expansion tank filler cap.
6. Position drain tin to collect coolant.



7. Loosen drain plug.
8. Allow cooling system to drain.

Refill

1. Flush system with water under low pressure.



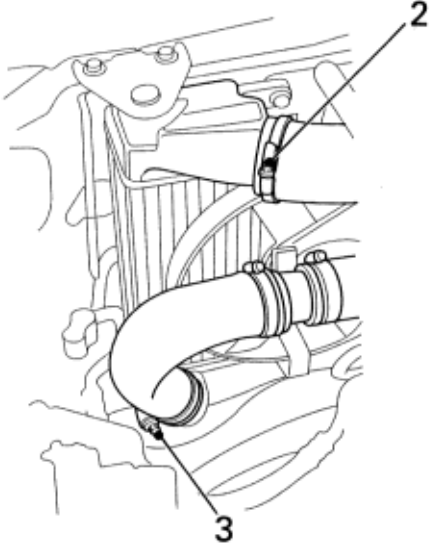
CAUTION

High pressure water could damage the radiator.

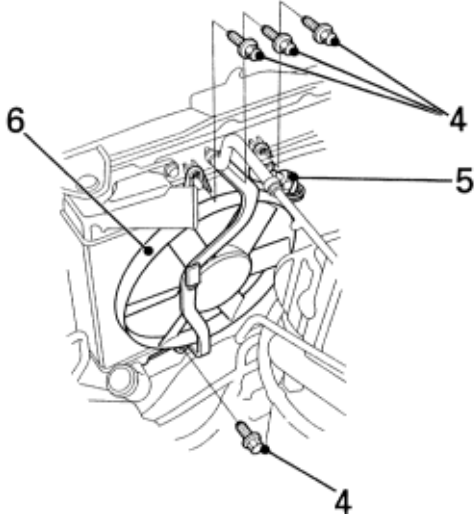
2. Tighten drain plug.
3. Prepare coolant to required concentration capacities, fluids and lubricants.
4. Position heater temperature control to maximum hot position.
5. Fill system slowly through coolant expansion tank, until the coolant reaches the 'MAX' mark on expansion tank.
6. Fit expansion tank filler cap.
7. Fit underbelly panel. See **BODY, Exterior fittings section.**
8. Start and run engine until radiator cooling fan operates.
If fitted DO NOT operate air conditioning.
9. Switch off engine and allow to cool.
10. Check for leaks and top-up coolant to 'MAX' mark on expansion tank.

Remove

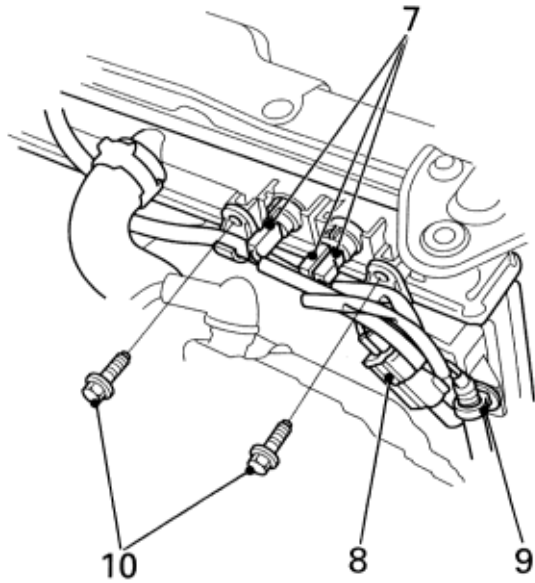
1. Disconnect battery earth lead.



2. Slacken clip and release hose from top of intercooler.
3. Slacken clip and release air hose from bottom of intercooler.



4. Remove 4 bolts securing cooling fan housing to radiator.
5. Disconnect multiplug from condenser fan motor.
6. Remove cooling fan housing.



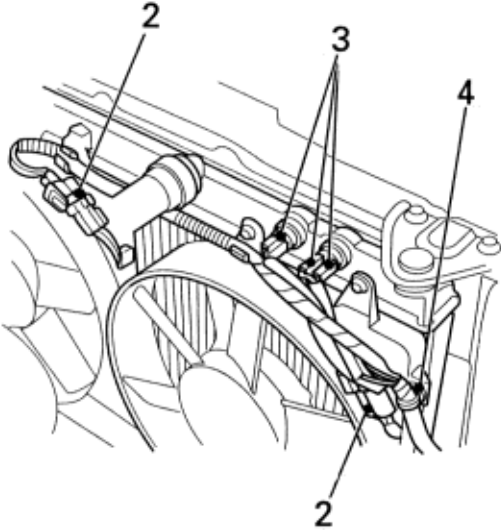
7. Disconnect multiplugs from radiator.
8. Disconnect multiplug from radiator fan motor.
9. Remove wire harness clamp from radiator fan housing.
10. Remove 2 bolts securing radiator fan housing to radiator.
11. Release radiator fan housing from stud on radiator.
12. Remove radiator fan housing from condenser fan side.

Refit

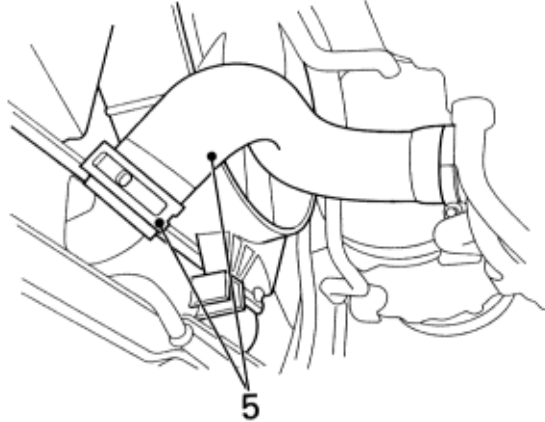
1. Fit radiator fan housing into position on radiator stud.
2. Fit bolts securing radiator fan housing to radiator and tighten to 9 Nm (0.9 kgf/m, 6.6 lbf/ft).
3. Connect multiplug to radiator fan motor.
4. Connect multiplug to radiator.
5. Fit cooling fan housing into position on radiator.
6. Connect multiplug to condenser fan motor.
7. Fit bolts securing cooling fan housing to radiator and tighten to 9 Nm (0.9 kgf/m, 6.6 lbf/ft).
8. Fit hoses to top and bottom of intercooler and secure with clips.
9. Connect battery earth lead.

Remove

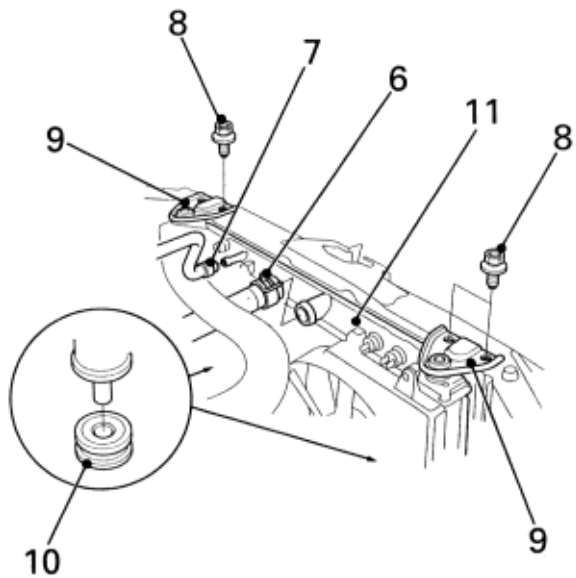
1. Drain cooling system. See **Adjustments** section.



2. Disconnect multiplugs from fan motors.
3. Disconnect multiplugs from radiator.
4. Remove wire harness clamp from fan housing.



5. Loosen clip and disconnect bottom hose from radiator.



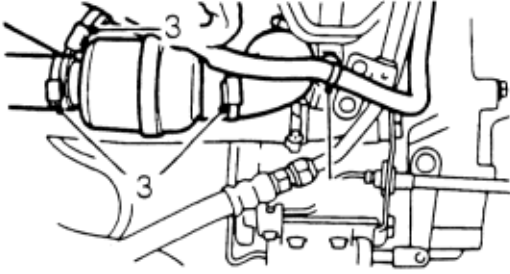
6. Loosen clip and disconnect top hose from radiator.
7. Loosen clip and disconnect coolant expansion hose from radiator.
8. Remove 4 bolts securing radiator top mounting brackets.
9. Remove radiator top mounting brackets.
10. Release radiator from 2 lower mountings.
11. Remove radiator from vehicle.

Refit

1. Fit radiator into position and locate on lower mounting.
2. Fit top mounting to radiator and align to body.
3. Fit bolts securing top mounting to bonnet platform and tighten bolts to 9 Nm (0.9 kgf/m, 6.6 lbf/ft).
4. Connect top hose and bottom hose to radiator and tighten hose clips.
5. Connect multiplugs to fan motors.
6. Connect multiplugs to radiator.
7. Fill cooling system. See **Adjustments** section.

Remove

1. Remove engine acoustic cover. See **BODY, Exterior fittings section**.
2. Drain cooling system. See **Adjustments section**.

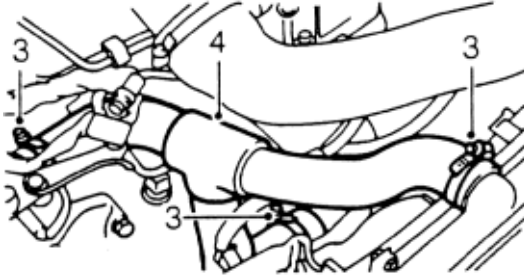


3. Loosen 3 clips and disconnect hoses from thermostat housing.

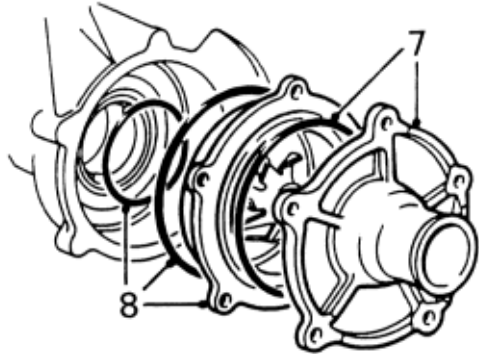
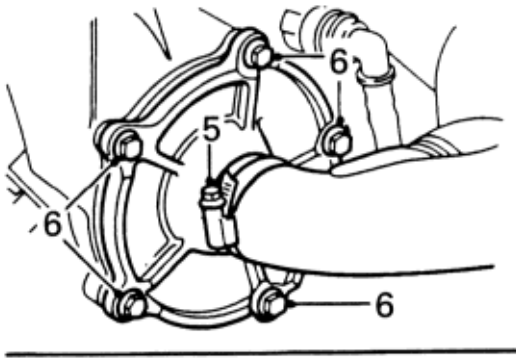
Refit

1. Fit thermostat housing.
2. Connect hoses to thermostat housing and tighten clips.
3. Refill cooling system. See **Adjustments section**.
4. Fit engine acoustic cover. See **BODY, Exterior fittings section**.

1. Remove alternator. See **ELECTRICAL, Repairs section**.
2. Drain cooling system. See **Adjustments section**.



3. Slacken clips and release radiator top hose from engine, radiator and thermostat housing.
4. Remove radiator top hose from engine.



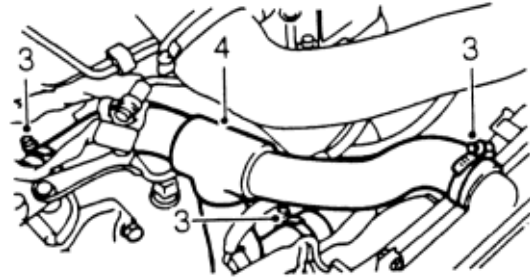
5. Slacken clip and release coolant hose from pump housing.
6. Remove 5 bolts securing cover to coolant pump.
7. Remove cover and discard 'O' ring.
8. Remove coolant pump from housing and discard 'O' ring.

Refit

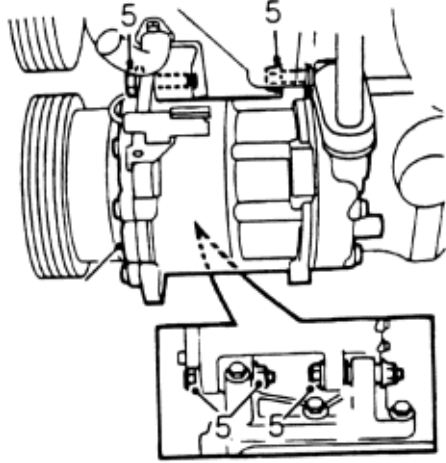
1. Clean coolant pump housing and mating faces.
2. Fit 'O' ring to coolant pump and coolant pump cover.
3. Fit coolant pump and cover.
4. Fit 5 bolts and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
5. Connect hose to coolant pump housing and tighten clip.
6. Fit top hose to engine and tighten clip.
7. Connect top hose to radiator and thermostat housing and tighten clips.
8. Refill cooling system. See **Adjustment** section.
9. Fit alternator. See **ELECTRICAL, Repairs** section.

Remove

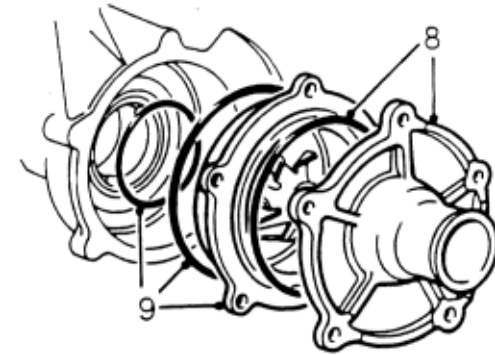
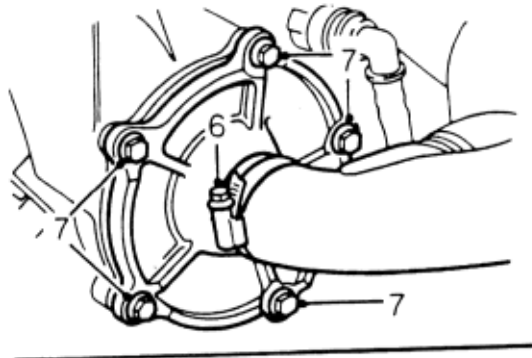
1. Remove alternator. See **ELECTRICAL, Repairs section.**
2. Drain cooling system. See **Adjustments section.**



3. Slacken clips and release radiator top hose from engine, radiator and thermostat housing.
4. Remove radiator top hose from engine.



5. Remove 4 bolts and 3 nuts from A/C compressor and pivot forwards.



6. Slacken clip and release coolant hose from pump housing.
7. Remove 5 bolts securing cover to coolant pump.
8. Remove cover and discard 'O' ring.
9. Remove coolant pump from housing and discard 'O' ring.

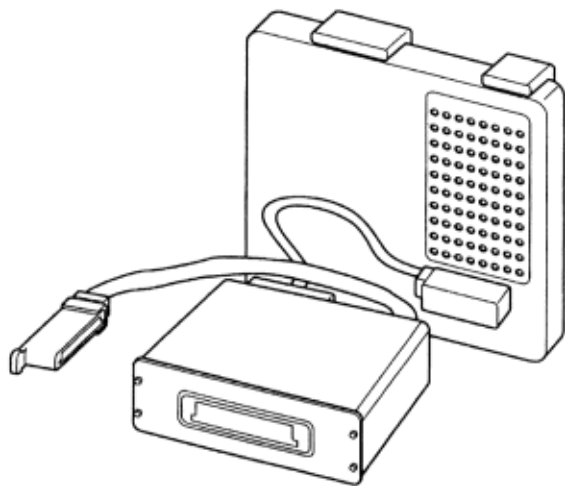
Refit

1. Clean coolant pump housing and mating faces.
2. Lubricate new 'O' rings with Loctite 405 and fit to coolant pump and cover.
3. Fit coolant pump and cover.
4. Fit 5 bolts and tighten to 45 Nm (4.6 kgf/m, 33 lbf/ft).
5. Connect hose to coolant pump housing and tighten clip.
6. Position A/C compressor, fit 4 bolts 3 nuts and 2 washers to secure.
7. Fit radiator top hose to engine and tighten clip.
8. Connect radiator top hose to radiator and thermostat housing and tighten clips.
9. Refill cooling system. See **Adjustments section.**

Special Tools

11-2

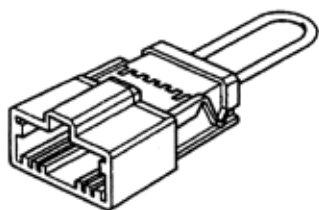
Ref No.	Tool Number	Description	Qty	Remark
1	HO 10042	Test Harness	1	VL-Churchill unique tool number
2	18G 1512B	Pull-off Device	1	
3	OZTAZ-ST30100	ABS Short Connector	1	



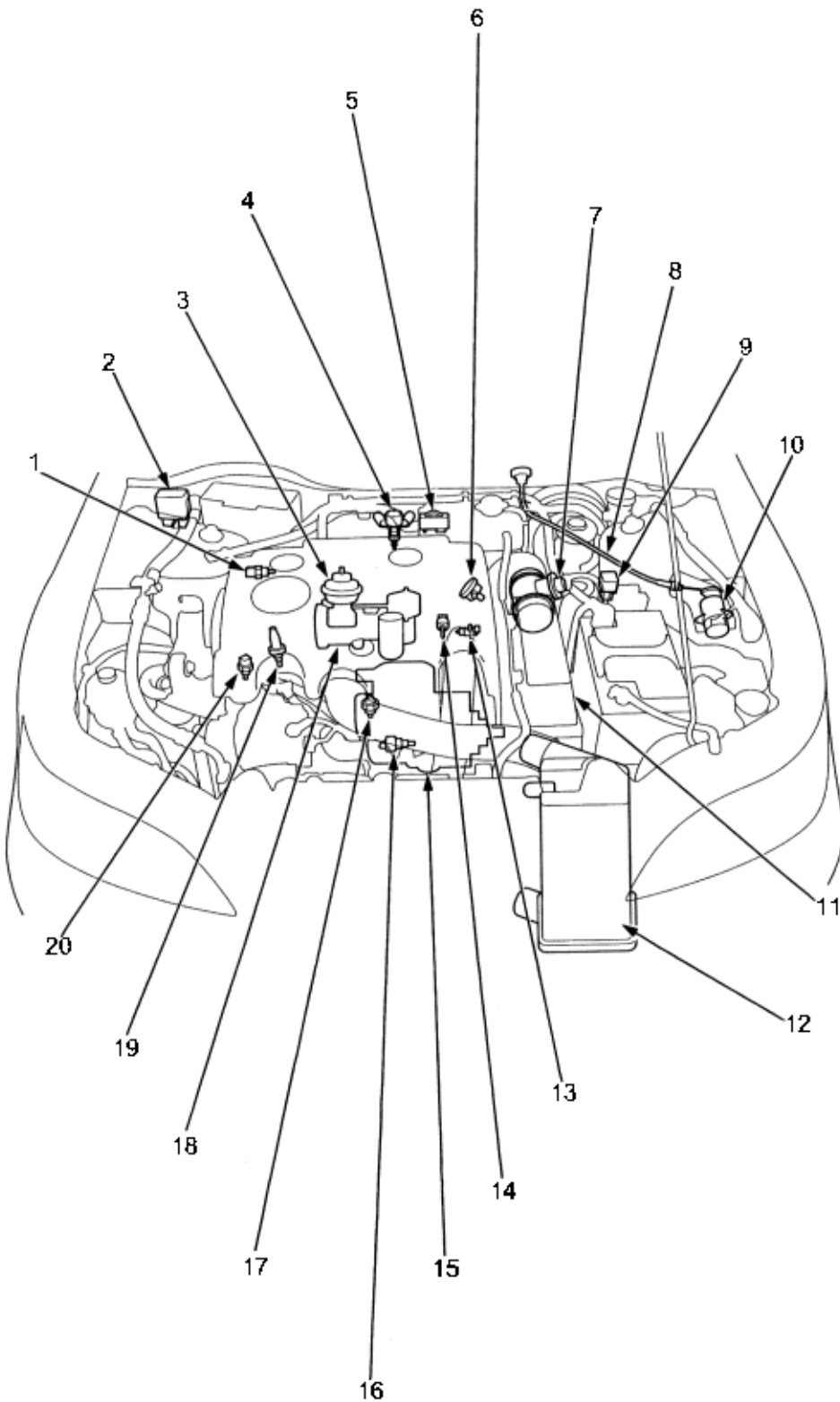
①



②

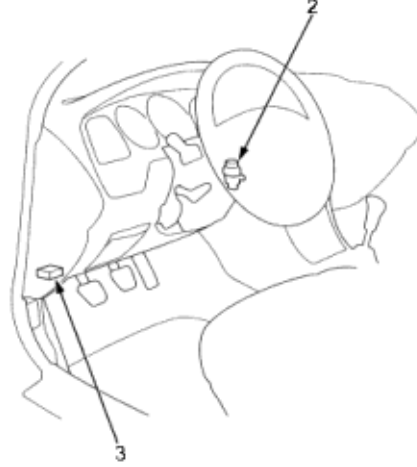
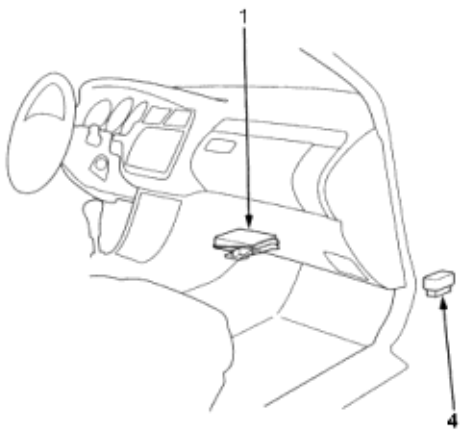


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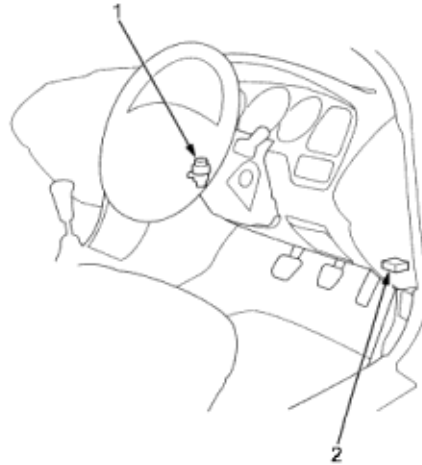
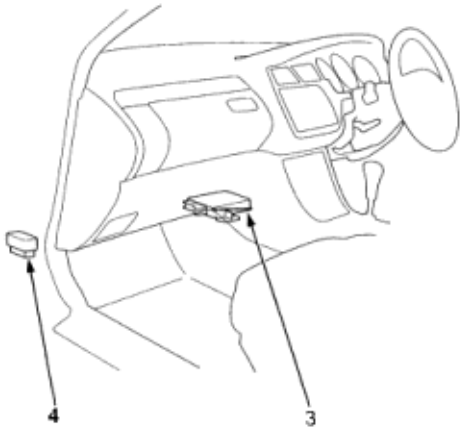
1. **INTAKE AIR TEMPERATURE (IAT) SENSOR**
Troubleshooting, (See Page 11-116)
2. **RADIATOR FAN RELAY UNIT**
3. **EXHAUST GAS RECIRCULATION (EGR) VALVE**
Troubleshooting, (See Page 11-124)
4. **EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE**
Troubleshooting, (See Page 11-124)
5. **BOOST PRESSURE SENSOR**
Troubleshooting, (See Page 11-51)
6. **CRANKCASE PRESSURE LIMITING VALVE**
7. **MASS AIR FLOW (MAF) SENSOR**
Troubleshooting, (See Page 11-107)
8. **THROTTLE CABLE**
9. **GLOW PLUG RELAY**
Testing, (See Page 11-79)
10. **THROTTLE PEDAL POSITION SENSOR**
Troubleshooting, (See Page 11-36)
11. **AIR CLEANER (ACL)**
Replacement, (See Page 11-104)
12. **INTERCOOLER**
13. **CRANKSHAFT POSITION (CKP) SENSOR**
Troubleshooting, (See Page 11-31)
14. **VEHICLE SPEED SENSOR (VSS)**
Troubleshooting, (See Page 11-46)
15. **FUEL INJECTION PUMP ASSEMBLY**
Testing, (See Page 11-77)
Replacement, (See Page 11-78)
16. **FUEL TIMING SOLENOID**
Troubleshooting, (See Page 11-87)
17. **FUEL SHUT-OFF SOLENOID**
Troubleshooting, (See Page 11-89)
18. **TURBOCHARGER**
Inspection, (See Page 11-106)
Replacement, (See Page 11-106)
19. **NEEDLE LIFT SENSOR**
Troubleshooting, (See Page 11-62)
20. **ENGINE COOLANT TEMPERATURE (ECT) SENSOR**
Troubleshooting, (See Page 11-26)

LHD:

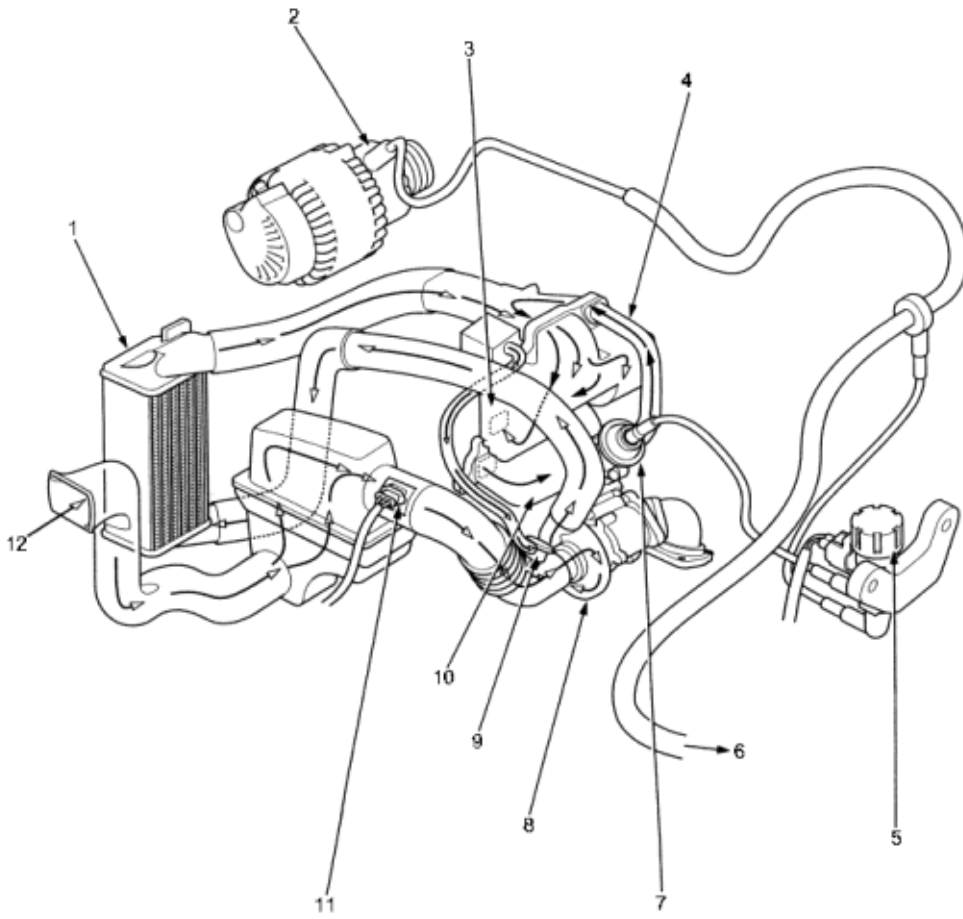


1. **ENGINE CONTROL MODULE (ECM)**
Troubleshooting Procedures, ([See Page 11-12](#))
Troubleshooting, ([See Page 11-21](#))
2. **INERTIA SWITCH**
Testing, ([See Page 11-22](#))
3. **DATA LINK CONNECTOR (DLC) (5P)**
4. **MAIN RELAY**
Testing, ([See Page 11-20](#))

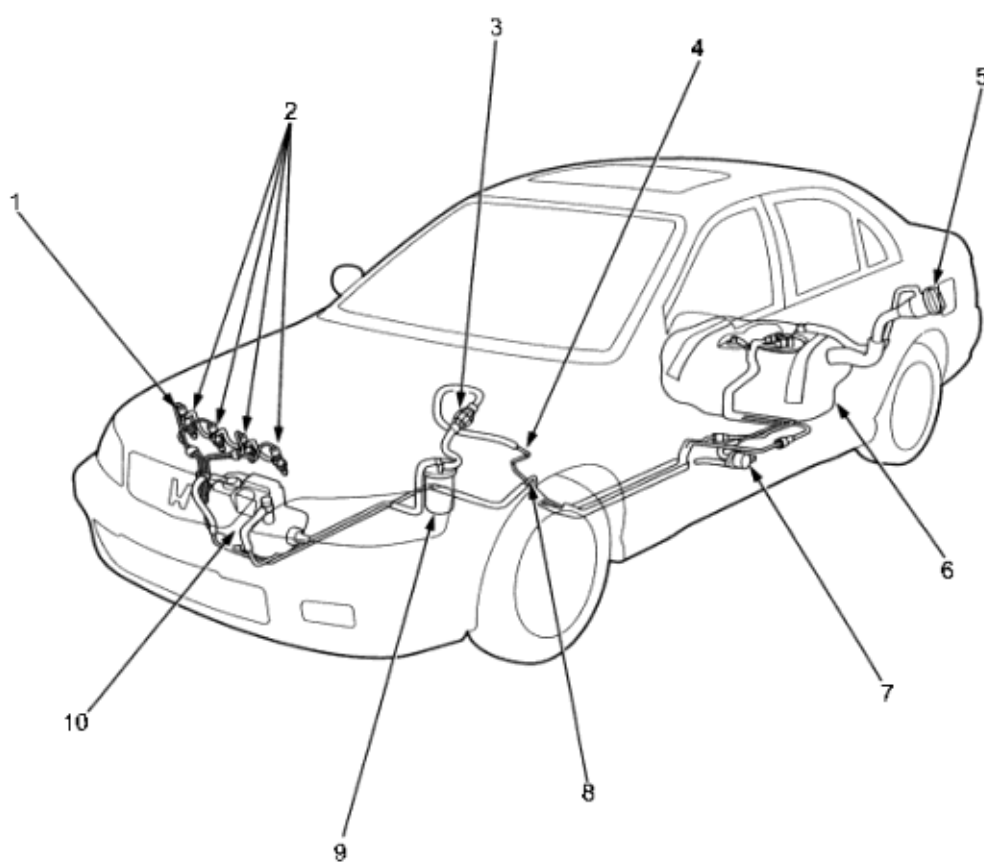
RHD:



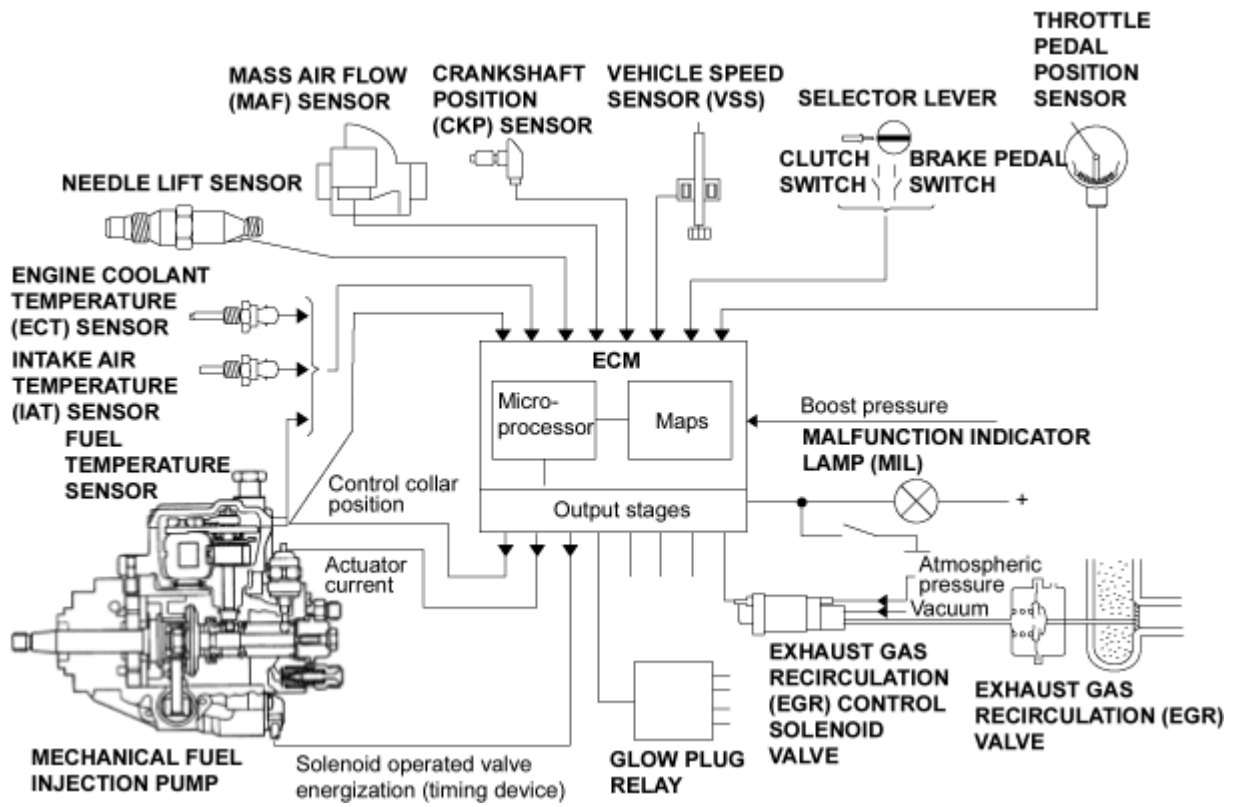
1. **INERTIA SWITCH**
Testing, ([See Page 11-22](#))
2. **DATA LINK CONNECTOR (DLC) (5P)**
3. **ENGINE CONTROL MODULE (ECM)**
Troubleshooting Procedures, ([See Page 11-12](#))
Troubleshooting, ([See Page 11-21](#))
4. **MAIN RELAY**
Testing, ([See Page 11-20](#))

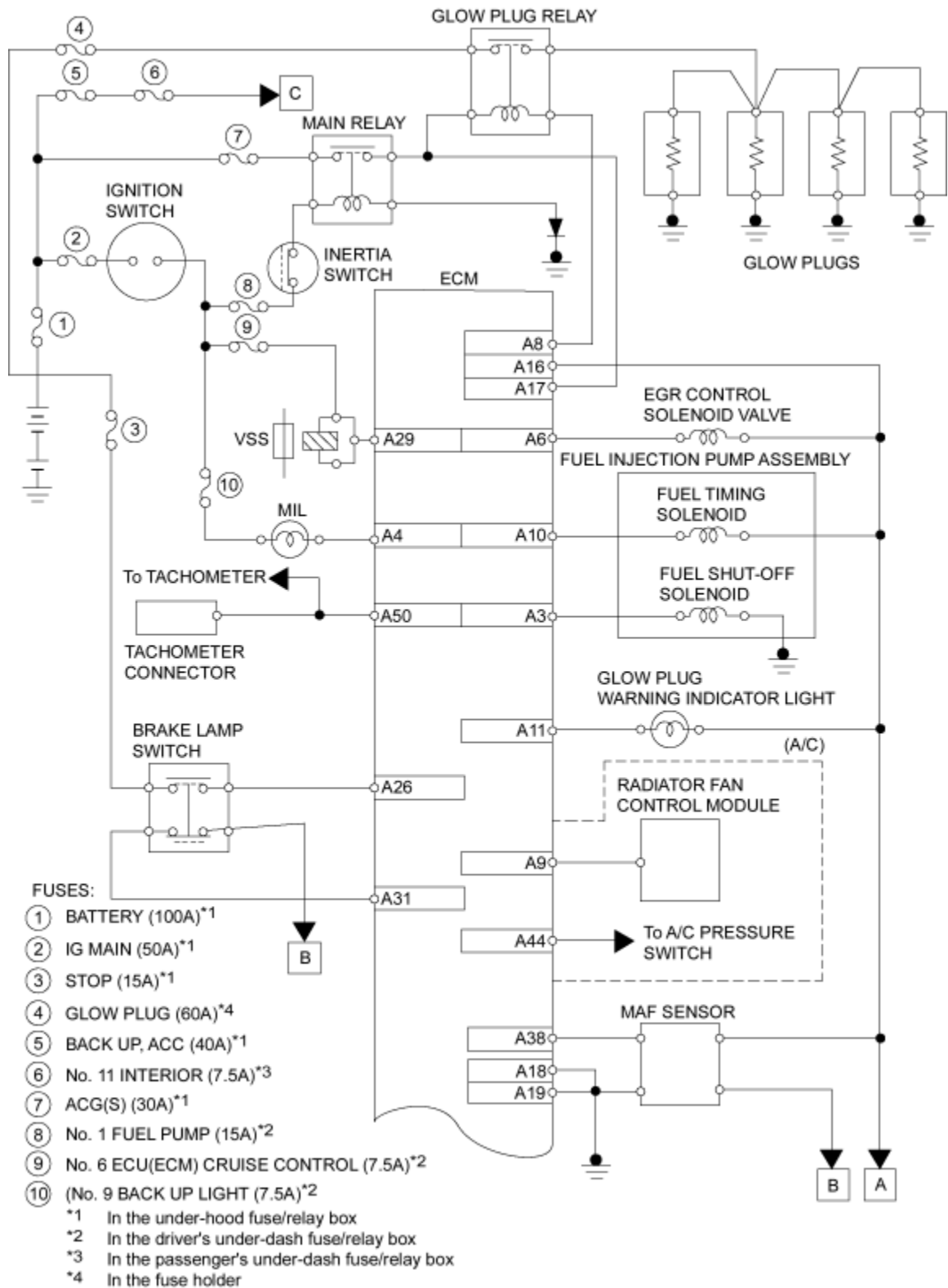


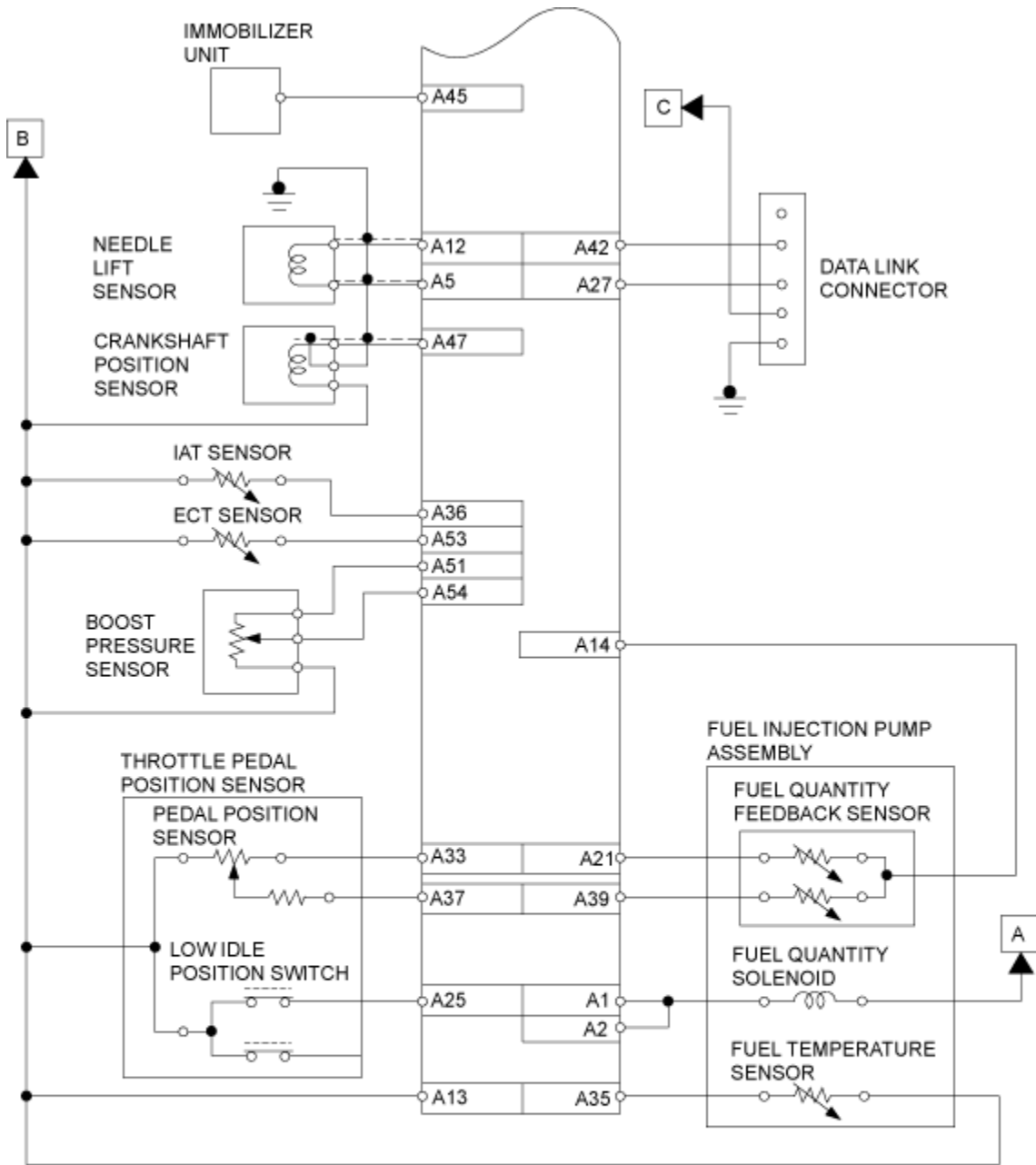
1. INTERCOOLER
2. ALTERNATOR DRIVEN-VACUUM PUMP
3. INTAKE MANIFOLD
4. EXHAUST GAS RECIRCULATION FROM EXHAUST MANIFOLD
5. EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE
Troubleshooting, (See Page 11-124)
6. To BRAKE MASTER CYLINDER
7. EXHAUST GAS RECIRCULATION (EGR) VALVE
Troubleshooting, (See Page 11-124)
8. TURBOCHARGER
Replacement, (See Page 11-106)
9. VENT IN FROM CAMCOVER
10. EXHAUST MANIFOLD
11. MASS AIR FLOW (MAF) SENSOR
Troubleshooting, (See Page 11-107)
12. AIR INTAKE



1. **NEEDLE LIFT SENSOR**
Troubleshooting, ([See Page 11-62](#))
2. **FUEL INJECTORS**
Replacement, ([See Page 11-74](#))
3. **HAND PRIMER**
4. **FUEL FEED PIPE**
5. **FUEL FILL CAP**
6. **FUEL TANK**
7. **EVAPORATIVE EMISSION (EVAP) TWO-WAY VALVE**
Testing, ([See Page 11-130](#))
8. **FUEL RETURN PIPE**
9. **FUEL FILTER**
Replacement, ([See Page 11-76](#))
10. **FUEL INJECTION PUMP ASSEMBLY**
Testing, ([See Page 11-77](#))
Replacement, ([See Page 11-78](#))







ECM-A (55P)

1	2	3	4	5	6	/	8	9	10	11	12	13	14	15	16	17	18	19
/	21	/	/	/	25	26	27	/	29	/	31	/	33	/	35	36	37	/
38	39	/	/	42	/	44	45	/	47	/	/	50	51	/	53	54	/	/

TERMINAL LOCATIONS

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with 1. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column.

If inspection shows the system is OK, try the next most likely system 2, etc.

PAGE	SUB-SYSTEM	ENGINE MANAGEMENT SYSTEM									FUEL SUPPLY SYSTEM	
		MAIN RELAY	ECM	ENGINE COOLANT TEMPERATURE SENSOR	CRANK-SHAFT POSITION SENSOR	THROTTLE PEDAL POSITION SENSOR	VEHICLE SPEED SENSOR	BRAKE LIGHT SWITCH	BOOST PRESSURE SENSOR	NEEDLE LIFT SENSOR	FUEL LINKS	FUEL INJECTION PUMP ASSEMBLY
SYMPTOM		11-20	11-21	11-26	11-31	11-36	11-46	11-48	11-51	11-62	11-72	11-77
MALFUNCTION INDICATOR LAMP (MIL) TURNS ON												
MALFUNCTION INDICATOR LAMP (MIL) BLINKS												
ENGINE WON'T START	EMITS BLACK SMOKE											
	EMITS WHITE SMOKE											
	NO SMOKE APPARENT	①	⑥								③	
ENGINE STARTS, BUT STALLS ALMOST AT ONCE											①	
LOSS OF POWER				⑤	⑤	⑤						
LOSS OF POWER, ABNORMAL FUEL CONSUMPTION AND EXHAUST SMOKE				⑤								⑥
MISFIRING, UNEVEN RUNNING						③					②	④
MAXIMUM REV/MIN TOO LOW						⑤					④	
MAXIMUM REV/MIN TOO HIGH												
COMPRESSED AIR LEAK (BLOWING)												
KNOCKING IN ENGINE												②

To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-20)
- (See Page 11-21)
- (See Page 11-26)
- (See Page 11-31)
- (See Page 11-36)
- (See Page 11-46)
- (See Page 11-48)
- (See Page 11-51)
- (See Page 11-62)
- (See Page 11-72)
- (See Page 11-77)

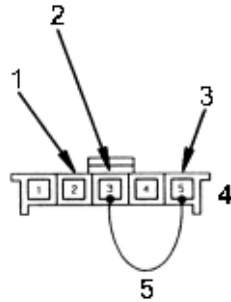
FUEL SUPPLY SYSTEM							AIR INTAKE SYSTEM			EMMISSION CONTROL SYSTEM		
FUEL FILTER	FUEL INJECTORS	FUEL TIMING SOLENOID	FUEL QUANTITY SOLENOID	FUEL QUANTITY FEEDBACK SENSOR	FUEL SHUT-OFF SOLENOID	FUEL TEMPERATURE SENSOR	GLOW PLUGS/ COLD STARTING SYSTEM	MASS AIR FLOW SENSOR	AIR CLEANER	TURBO-CHARGER	EXHAUST-GAS RE-IRCLATION (EGR) CONTROL SOLENOID	EXHAUST GAS REC-CIRCLAT-ION (EGR) VALVE
11-76	11-73	11-87	11-100	11-92	11-89	11-82	11-79, 80	11-107	11-104	11-106	11-124	11-124
	②	③	④						①	⑤		
		②					①					
②			⑤	⑥	④							
②		③	④									
②	①	③							④	⑥		
	②	③							①			④
	①											
③	②	①							①			
		①	②				②					
	①											
	②	①										

To go to the pages referenced on the diagram above, click on the following:

- (See Page 11-73)
- (See Page 11-76)
- (See Page 11-79)
- (See Page 11-80)
- (See Page 11-82)
- (See Page 11-87)
- (See Page 11-89)
- (See Page 11-92)
- (See Page 11-100)
- (See Page 11-104)
- (See Page 11-106)
- (See Page 11-107)
- (See Page 11-124)

- I. When the Malfunction indicator Lamp (MIL) has been reported on, do the following:
- a) Procedure with Honda PGM Tester:
Connect the Honda PGM Tester with the 5P Data Link Connector (DLC) located under the dash on the passenger's side of the vehicle.
The Honda PGM Tester will display the Diagnostic Trouble Code (DTC).
 - b) Procedure without Honda PGM Tester:
Connect the Data Link Connector terminal 3 (L-Line) to terminal 5 (GND) with a jumper wire as shown or with ABS short-Connector (the Data Link Connector (5P) is located under the dash on the driver's side of the vehicle). Turn the ignition switch ON (II).

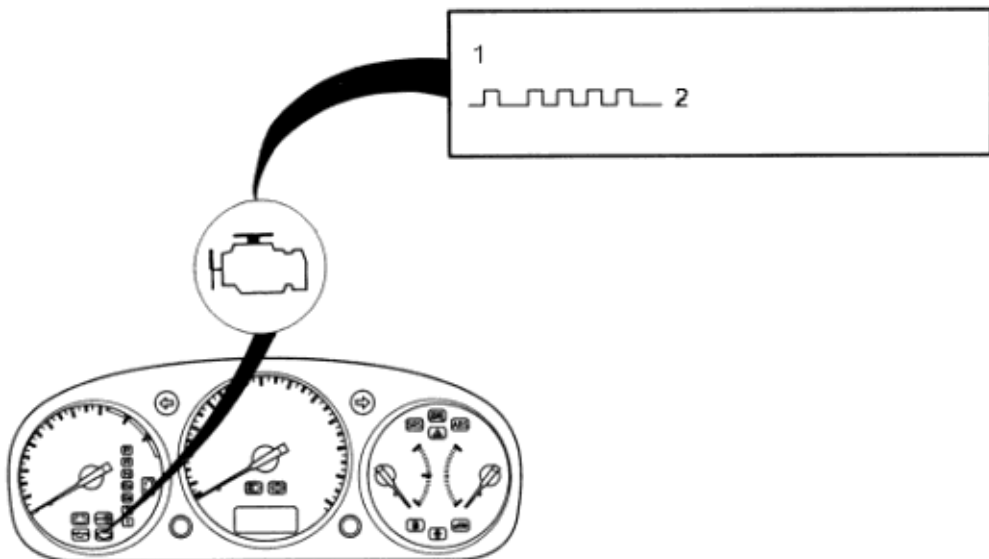
⚠ WARNING
Do not connect pin 4 to ground because this pin is battery +.



- 1. (K-Line)
WHT/RED
- 2. (L-Line)
GRN
- 3. (GRD)
BLK
- 4. Data Link Connector (5P)
- 5. jumper wire

- II. Note the Diagnostic Trouble Code (DTC): the MIL indicates a failure code by a number of blinks until the jumper wire is removed from the DLC (5P). Each blink code is indicated three times in succession, beginning with blink code 12 (initialisation code-OK).

MALFUNCTION INDICATOR LAMP (MIL)



- 1. i.e. blink code 14
- 2. DTC 14

III. Engine Control Module (ECM) Reset Procedure

1. Turn the ignition switch off.

Reset Procedure:

If the Honda PGM Tester is available please use the Honda PGM Tester and follow the instructions in its manual for resetting the ECM.

If the Honda PGM Tester is not available please follow the instructions below:

Reset the ECM by switching on and off the ignition switch approximately 50 times.

IV Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the jumper wire.

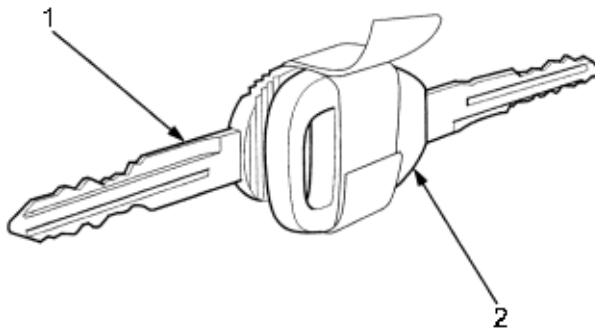
NOTE: If the service check connector is jumped the MIL will stay on.

2. Do the ECM Reset Procedure.

V. Known-Good ECM Substitution

Use the following procedure if you need a known-good ECM to test a vehicle. It allows you to swap an ECM from a "donor" vehicle without having to program it to the test vehicle's ignition key.

1. Cut a temporary ignition key for the test vehicle with a non-immobiliser key blank.
2. Remove the ECM from the test vehicle.
3. Write the test vehicle's VIN on the ECM you just removed to avoid confusing it with the donor vehicle's ECM.
4. Remove the known-good ECM from the donor vehicle and install it in the test vehicle.
5. Tape the donor vehicle's ignition key head-to-head to the test vehicle's temporary key. The ECM will recognise the code from the donor vehicle's key and allow you to start the engine with the temporary key.



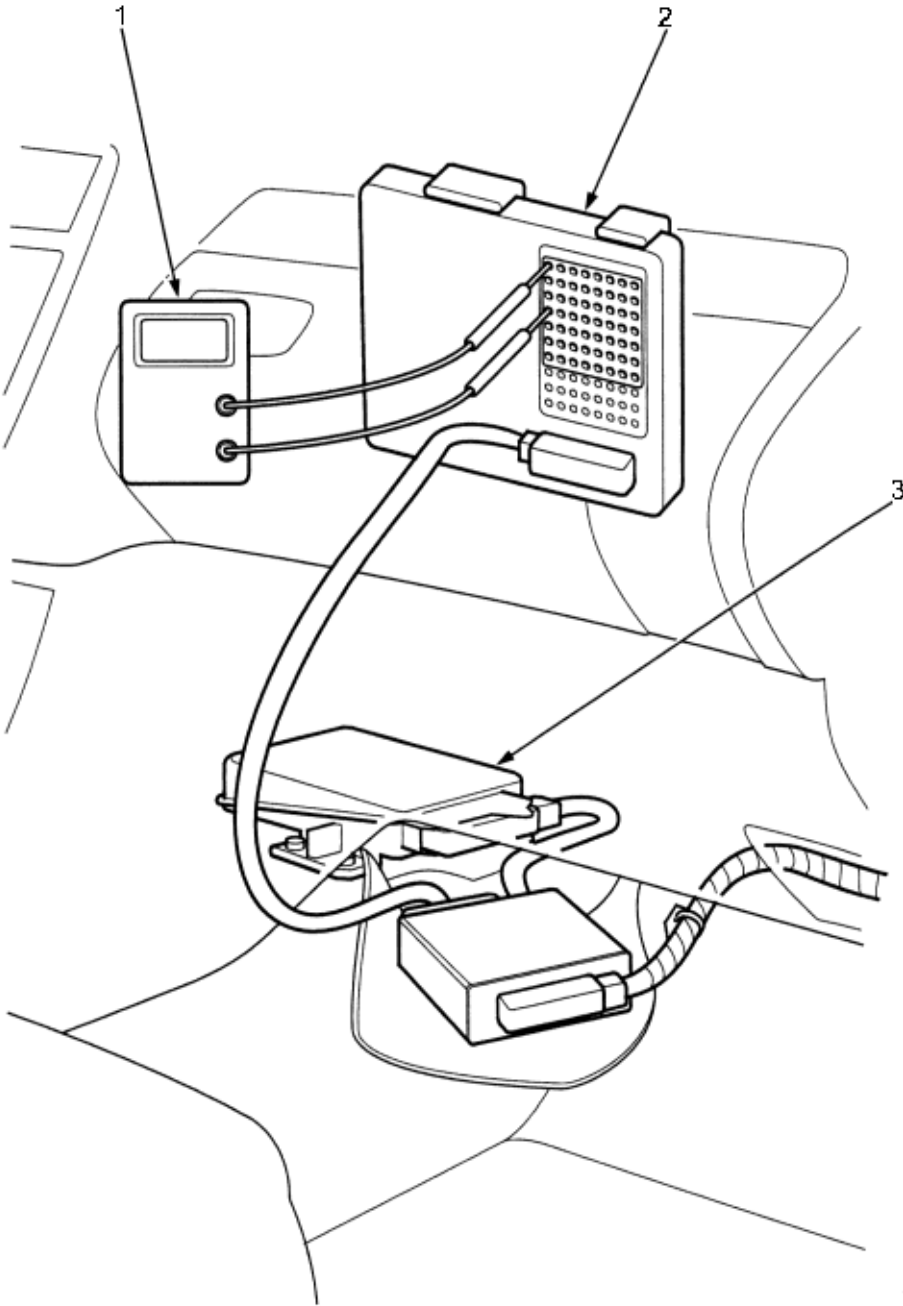
1. **TEMPORARY KEY**
2. **DONOR KEY**

Diagnostic Trouble Code (DTC)	System indicated	Page
12	Initialisation Code-OK)	-
14	Engine coolant temperature sensor-below setpoint	(see page 11-26)
15	Engine coolant temperature sensor-above setpoint	(see page 11-29)
16	Fuel temperature sensor-below setpoint	(see page 11-82)
17	Fuel temperature sensor-above setpoint	(see page 11-85)
19	Crankshaft position sensor-implausible	(see page 11-31)
21	Throttle pedal position sensor-above setpoint	(see page 11-36)
22	Throttle pedal position sensor-implausible with low idle switch	(see page 11-39)
23	Throttle pedal position sensor-below setpoint	(see page 11-43)
24	Vehicle speed sensor-implausible	(see page 11-46)
27	Mass air flow sensor-below setpoint	(see page 11-107)
28	Mass air flow sensor-above setpoint	(see page 11-110)
29	Mass air flow sensor-not plausible	(see page 11-113)
31	Crankshaft position sensor-no signal	(see page 11-34)
33	EGR-setpoint not achievable	(see page 11-124)
34	Fuel timing solenoid-setpoint not achievable	(see page 11-87)
37	Brake light switch-implausible	(see page 11-48)
41	Boost pressure-below setpoint	(see page 11-51)
42	Boost pressure-below setpoint	(see page 11-55)
43	Boost pressure-implausible with atmospheric pressure	(see page 11-58)
48	Battery voltage too low	(see page 11-60)
54	Fuel shut-off solenoid defective	(see page 11-89)
55	ECM fault present	(see page 11-25)
61	Fuel quantity feedback sensor-above or below setpoint	(see page 11-92)
62	Fuel quantity feedback sensor-implausible with needle lift sensor	(see page 11-96)
64	Fuel quantity solenoid-setpoint not achievable	(see page 11-100)
71	Intake air temperature sensor-below setpoint	(see page 11-116)
72	Intake air temperature sensor-above setpoint	(see page 11-119)
81	Needle lift sensor-no signal	(see page 11-62)
82	Needle lift sensor-implausible with engine speed sensor	(see page 11-65)

- ? If codes other than those listed above are indicated, verify the code. If the code indicated is not listed above, replace the ECM. (The only exception is DTC 39 for a defective Theft Alarm).
- ? The Malfunction Indicator Lamp (MIL) may come on, indicating a system problem when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessary.

If the inspection for a particular failure code requires the test harness, turn the ignition switch OFF, wait at least three minutes until main relay power off, disconnect the ECM connector and connect the test harness. Then check the system according to the procedure described for the appropriate code(s) listed on the following pages.

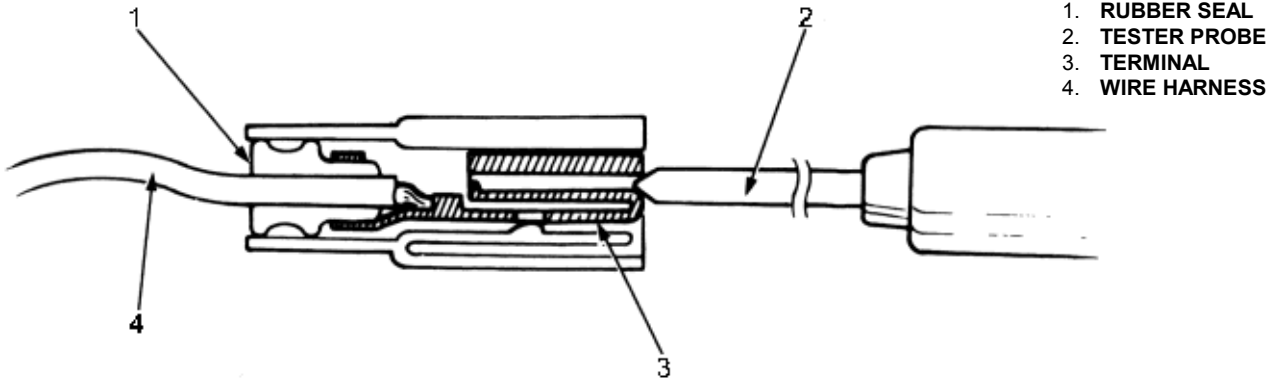
1. **DIGITAL MULTIMETER**
(Commercially available)
2. **TEST HARNESS HO10042**
3. **ECM**



NOTICE

For testing at connectors, bring the tester probe into contact with the terminal from the connector side of wire harness connectors in the engine compartment. For female connectors, just touch lightly with the tester probe and do not force insert the probe.

Puncturing the insulation on a wire can cause poor or intermittent electrical connections.



A flowchart is designed to be used from start to final repair. It is like a map showing you the shortest distance. But beware: if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

START
(bold type)

Describes the conditions or situation to start a troubleshooting flowchart.

ACTION

Asks you to do something; perform a test, set up a condition etc.

DECISION

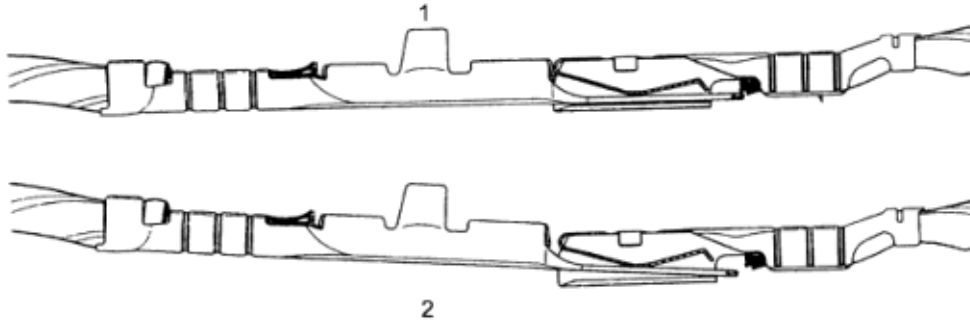
Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.

STOP
(bold type)

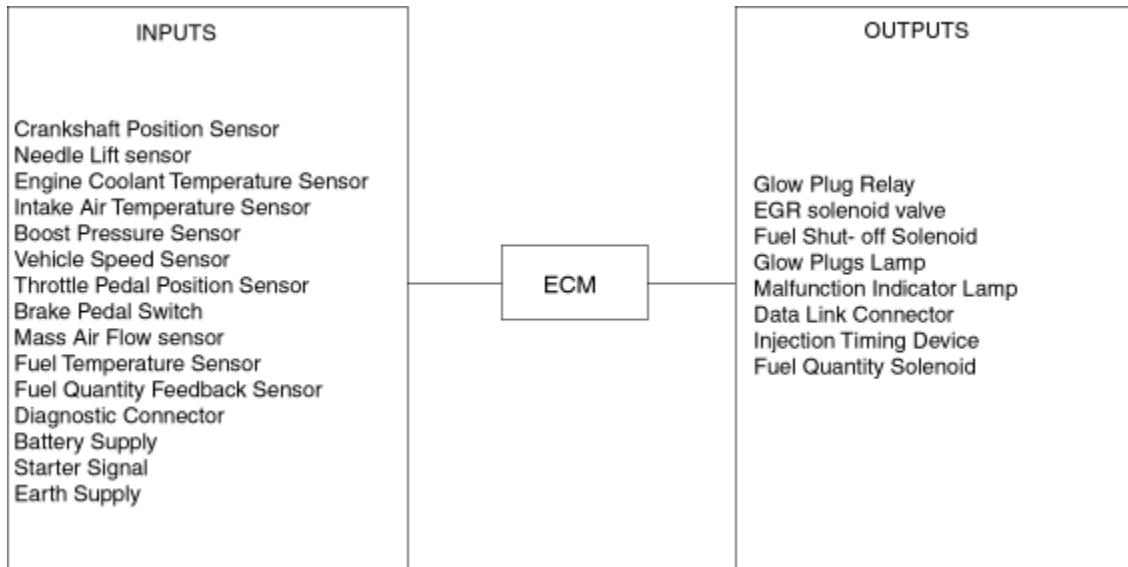
The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

NOTE:

- ? The term "intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- ? Most of the troubleshooting flowcharts have you reset the Engine Control Module (ECM) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you cannot duplicate the code, do not continue through the flowchart. To do so will only result in confusion and possibly, a needlessly replaced ECM.
- ? "Open" and "Short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something will not work at all. In complex electronics (like ECM's) this can sometimes mean something works, but not the way it is supposed to.
- ? If the electrical readings are not as specified when using the test harness, check the test harness connections before proceeding.



- 1. **TIGHT**
- 2. **LOOSE**



Diesel Engine Management System

Electronic diesel control operation is necessary in order to achieve optimum combustion of fuel in the cylinder using sensors located at strategic points around the engine. The signals from these sensors are used to adjust the fuel injection quantity and timing according to performance conditions.

The ECM therefore, contains control maps for each sensor related to performance conditions which are updated during driving.

The ECM incorporates short-circuit protection and can store intermittent faults on certain inputs. In case of system failure the ECM implements a back-up facility to continue functioning, although at a reduced level of performance. A separate Data Link Connector is used to read out the diagnostic trouble codes without disconnecting the ECM.

Fuel Injector Timing and Duration

Fuel injection timing and quantity control is done with the ECM comparing the actual values of performance with the ones stored in so-called control maps in the ECM and then adjusting the solenoids and actuators as necessary.

Idle Control System

Idle speed is controlled from the ECM only with the amount of fuel being injected into the cylinders.

Fuel Supply System

A close "co-operation" between ECM and Fuel Injection Pump is necessary to achieve an optimum in the combustion process. Therefore the Fuel Injection Pump Assembly contains different devices controlling the actual fuel injection quantity and timing. In case of any major fault or any problem in the electric supply circuit to the Fuel Injection Pump, the Fuel Shut-off Solenoid cuts off the fuel supply immediately.

Intake Air System

The Intake Air System contains Air Cleaner, Turbocharger, the Intake Manifold, Intercooler and Mass Air Flow Sensor.

Emission Control System

Effective Emission Control is done by use of an Exhaust Gas Recirculation (EGR) Solenoid Valve, Exhaust Gas Recirculation (EGR) Valve, Crankcase Emission Control and Fuel Vapour Evaporative Loss Control. When EGR is required for control of oxides of nitrogen (NOx) emissions, the ECM supplies ground to EGR Control Solenoid Valve which then supplies regulated vacuum to the EGR Valve and exhaust gas is drawn back into the Intake Manifold to decrease combustion temperatures and therefore, emissions of NOx.

ECM Fail-safe/Back-up Functions

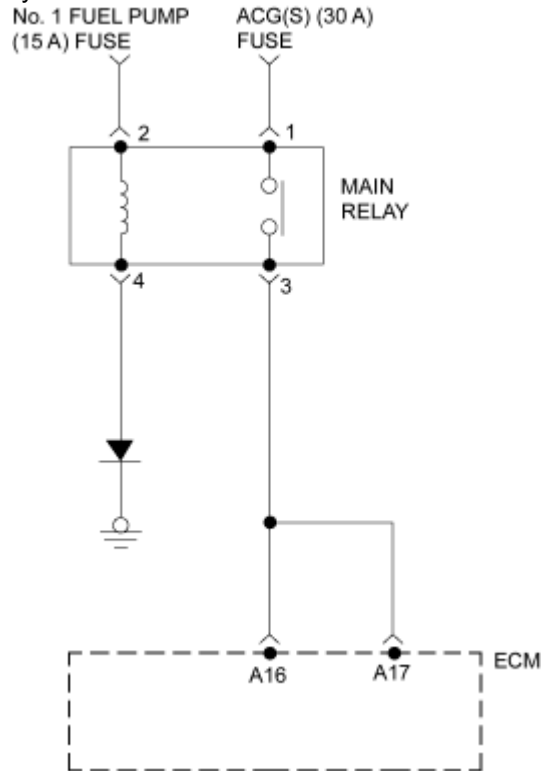
1. Fail-safe Function
When an abnormality occurs in a signal from a sensor, the ECM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run, although at a reduced level of performance.
2. Back-up Function
When an abnormality occurs in the ECM itself, the ECM implements back-up to allow the engine running although at a reduced level of performance.
3. Self-diagnosis Function (Malfunction Indicator Lamp (MIL))
When an abnormality occurs in a signal from a sensor, the ECM lights the MIL and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is initially turned on, the ECM supplies ground for the MIL for two seconds to check MIL bulb condition.

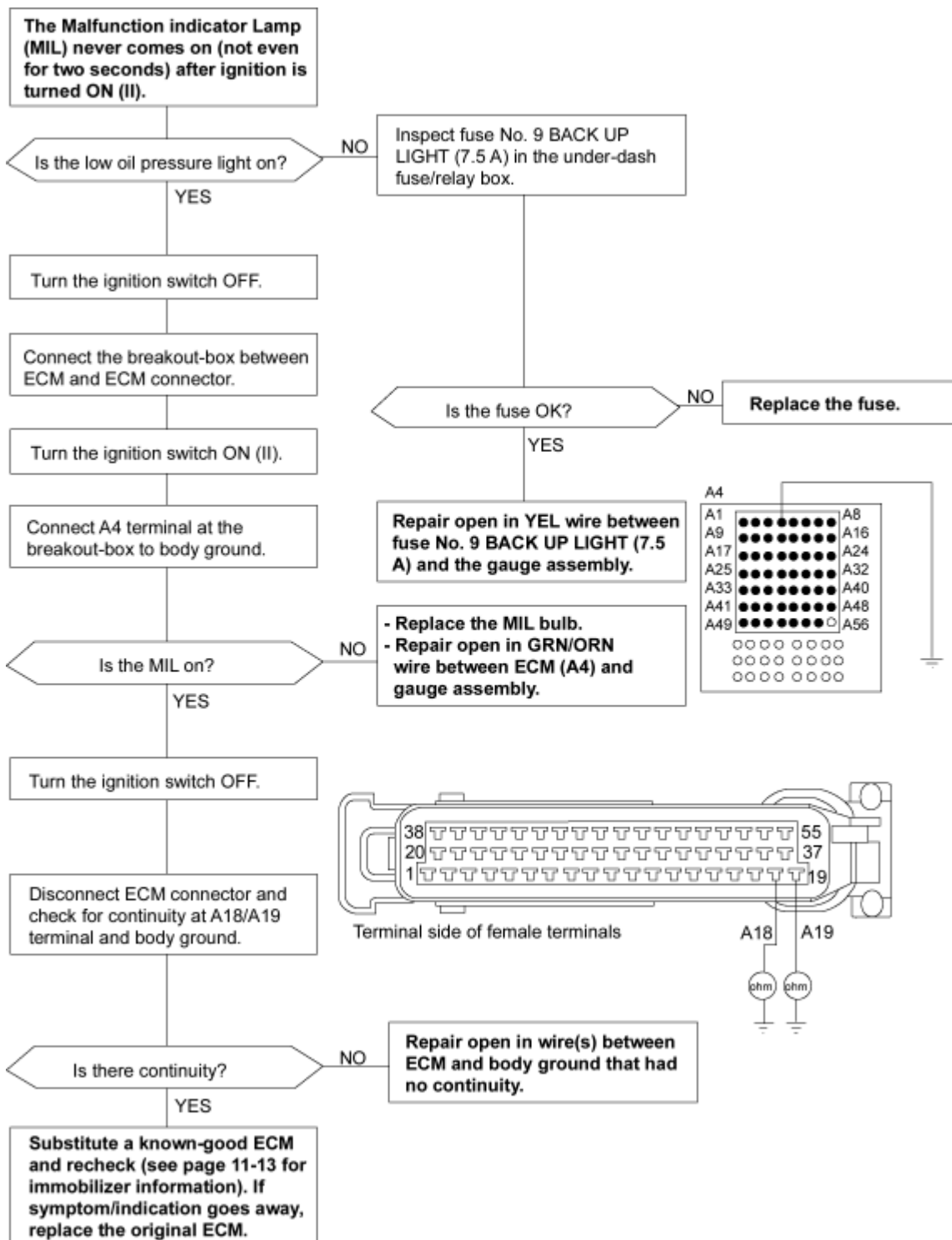
System Description

The Main Relay is energised by the ECM as soon as the ECM receives the signal from the ignition switch. The Main Relay supplied battery voltage to the ECM and varying other sensors and actuators enabling the engine to start.

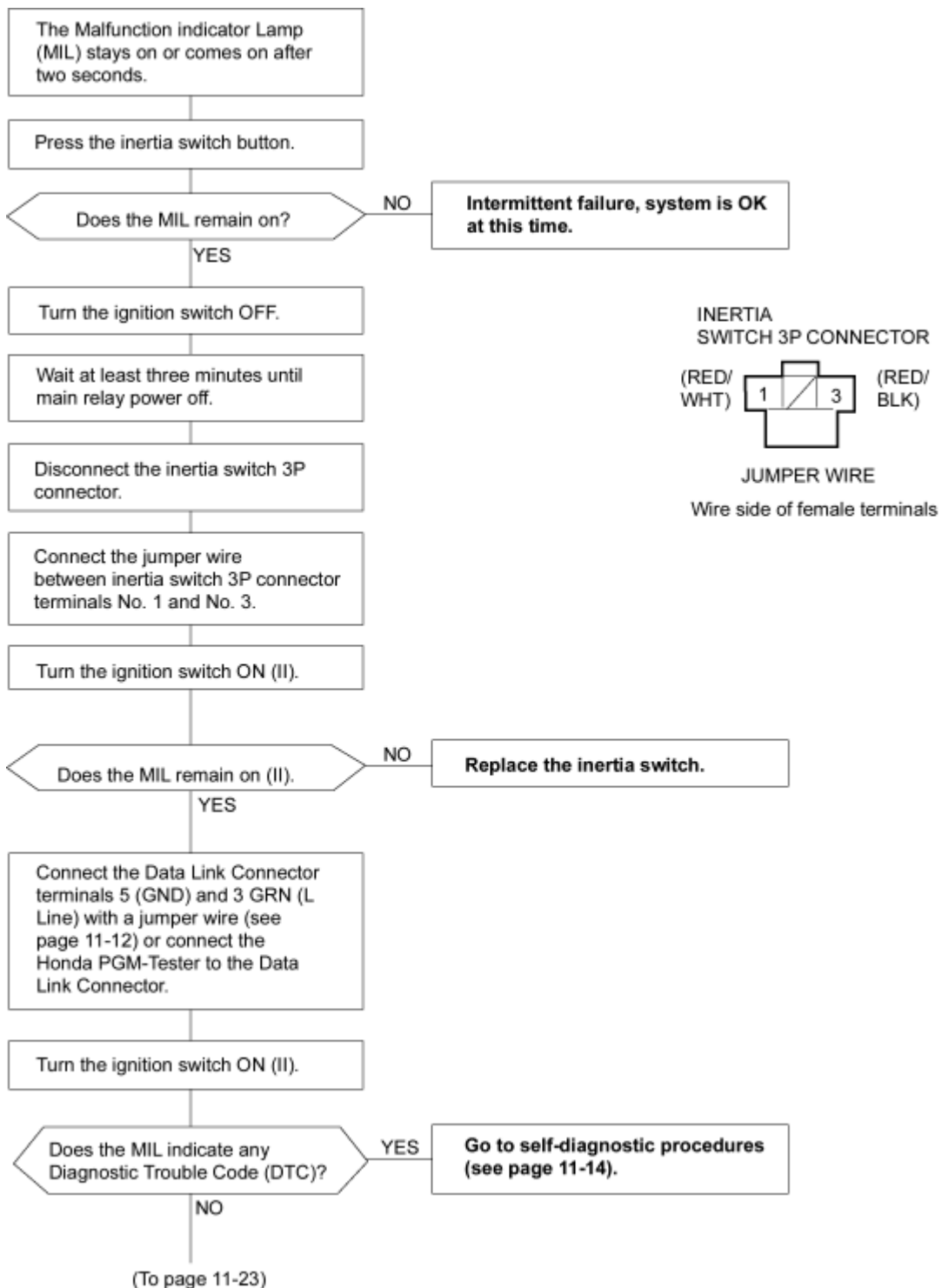
Testing

1. Remove the Main Relay
2. Attach the battery positive terminal to the No. 2 terminal and the battery negative terminal to the No. 4 terminal of the Main Relay. Then check for continuity between the No. 1 terminal and No. 3 of the Main Relay.
 - ? If there is no continuity, replace the Main Relay and retest.
 - ? If there is continuity, the Main Relay is OK.

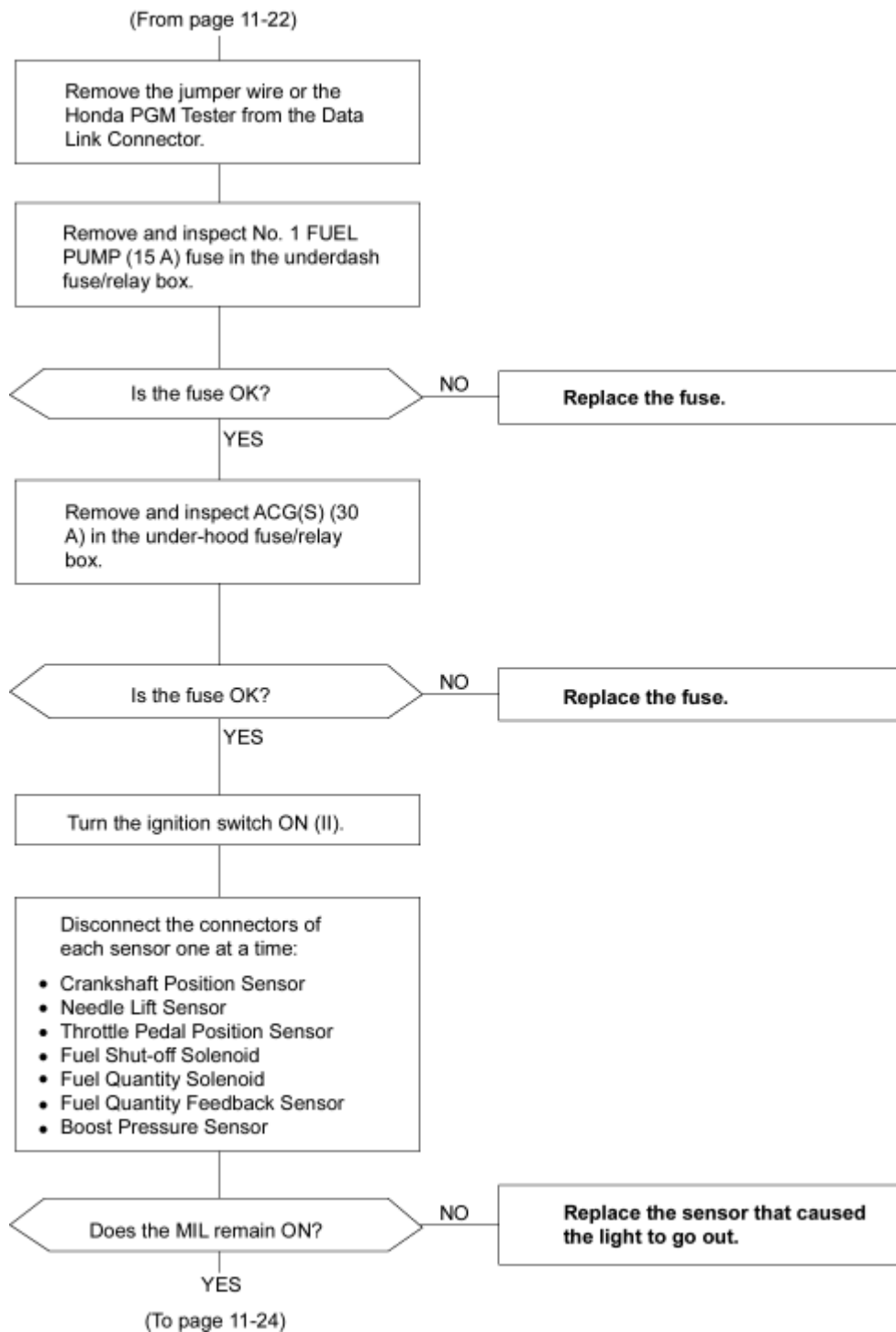


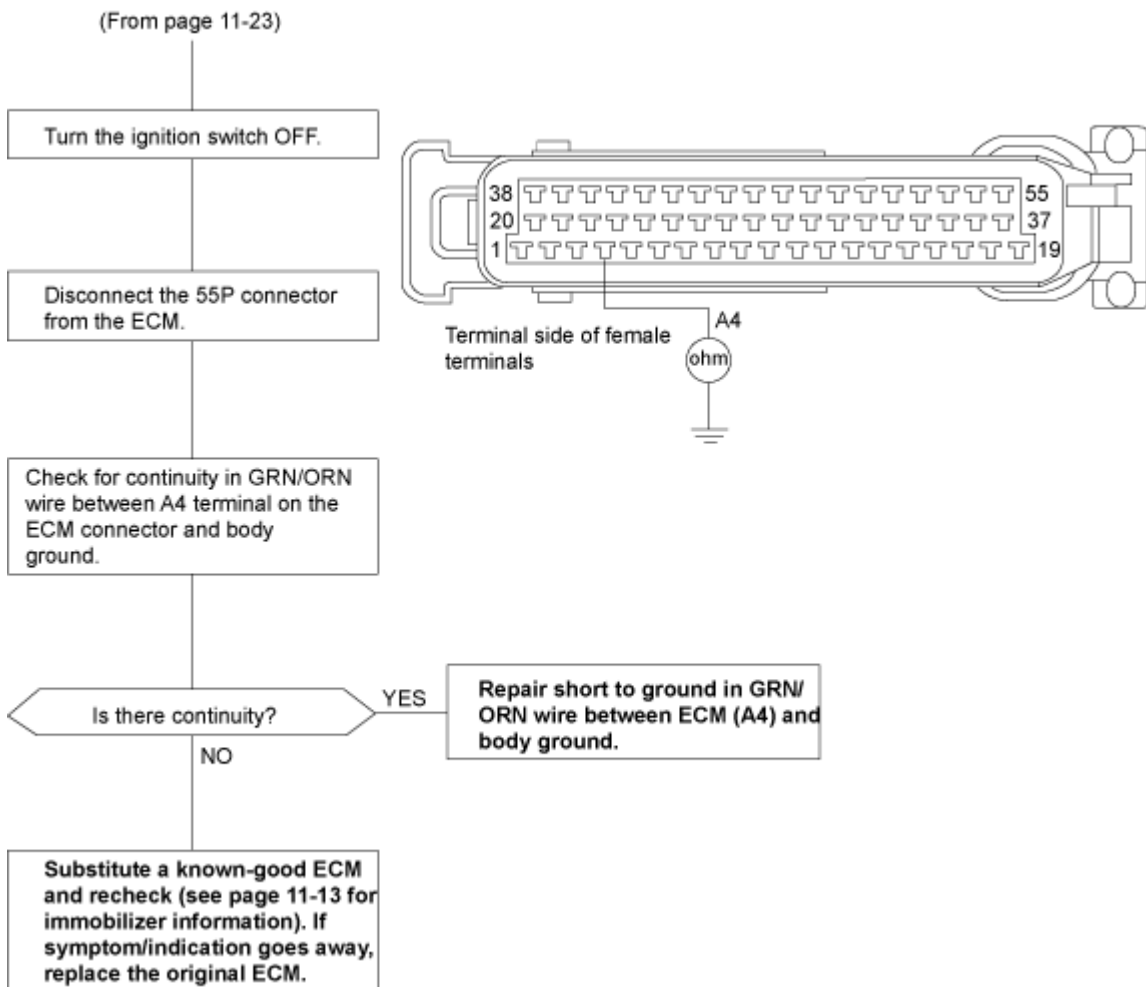


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



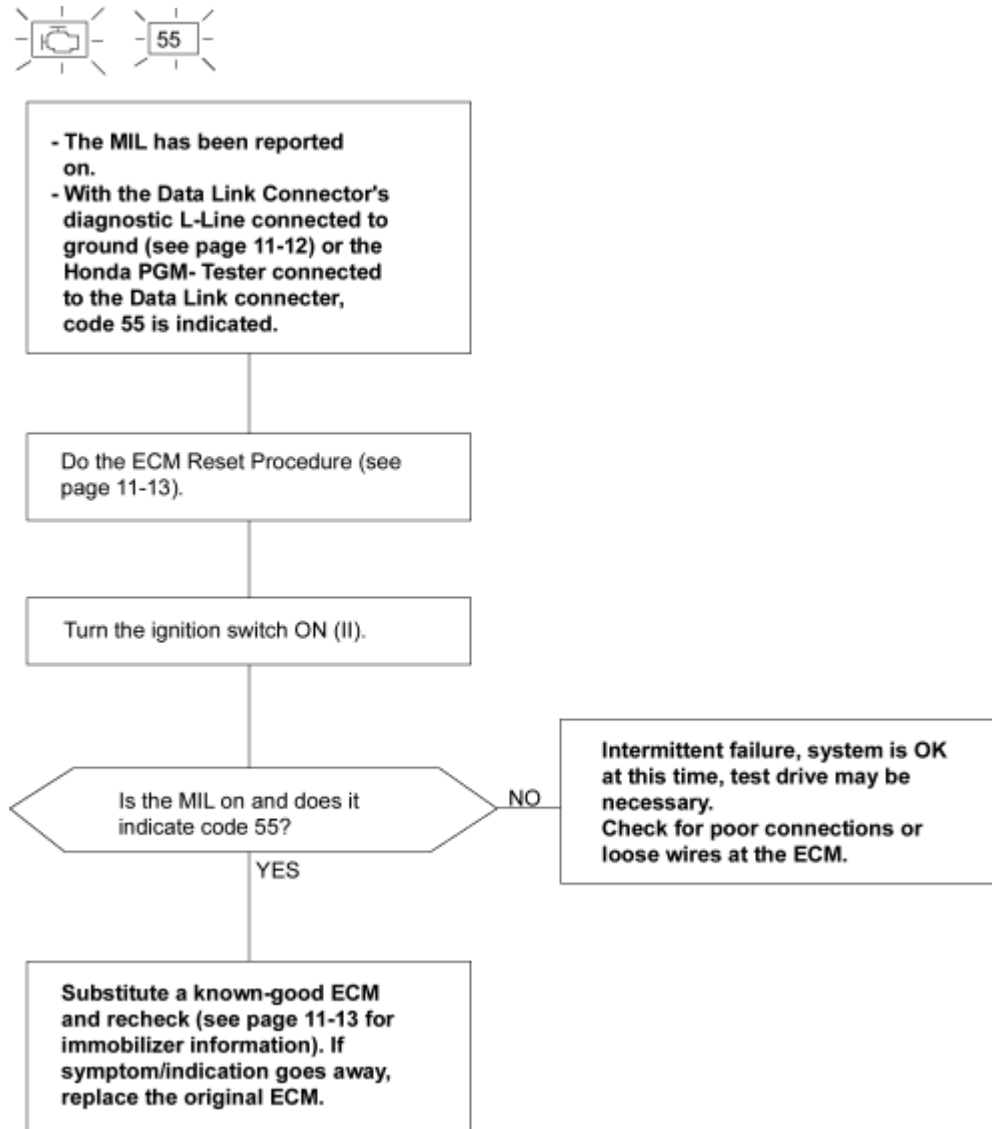
To go to the page referenced on the diagram above, click on the following:
(See Page 11-12)
(See Page 11-14)





To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

55 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 55: A problem in the ECM.

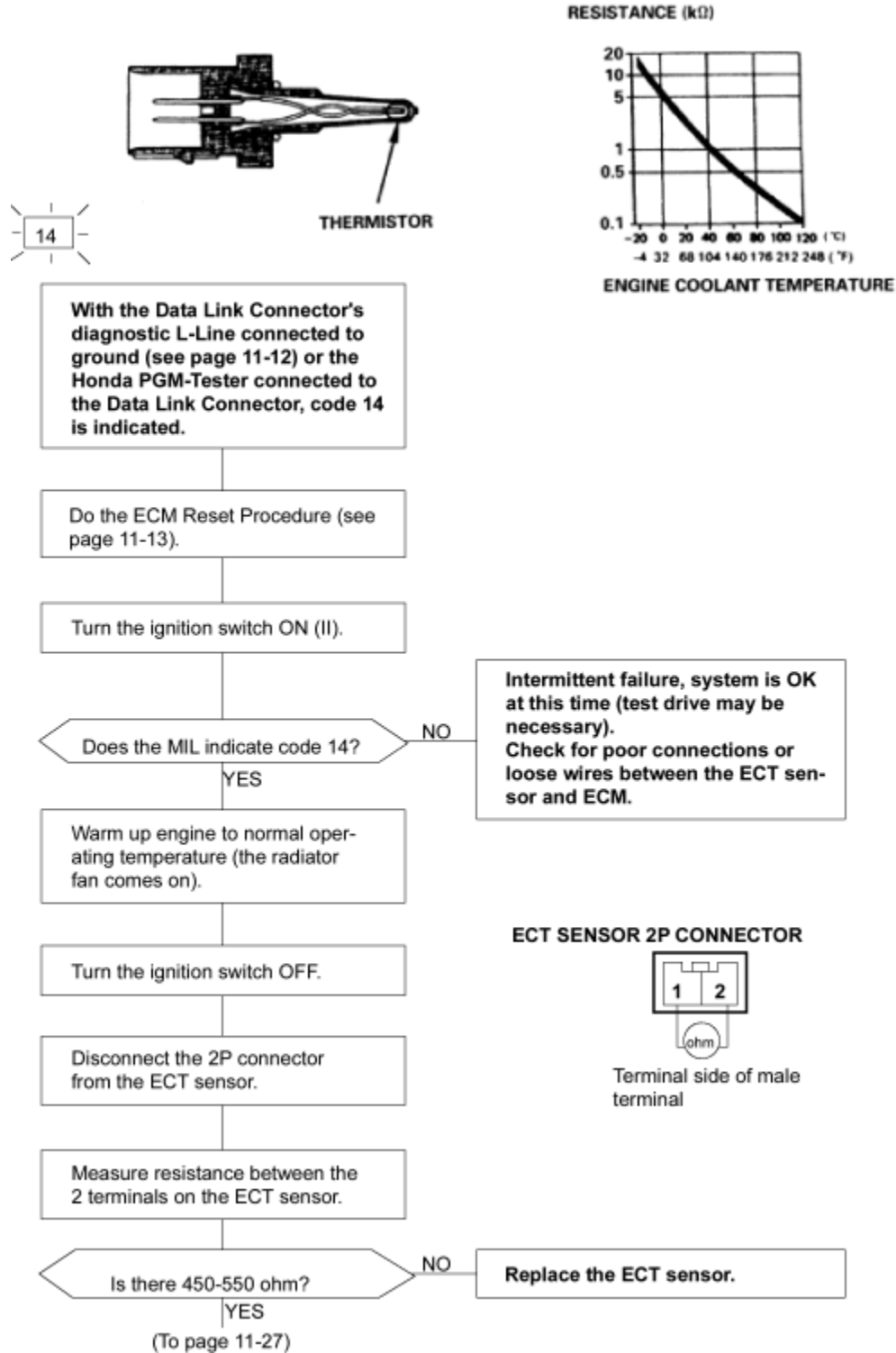


To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

(See Page 11-13)

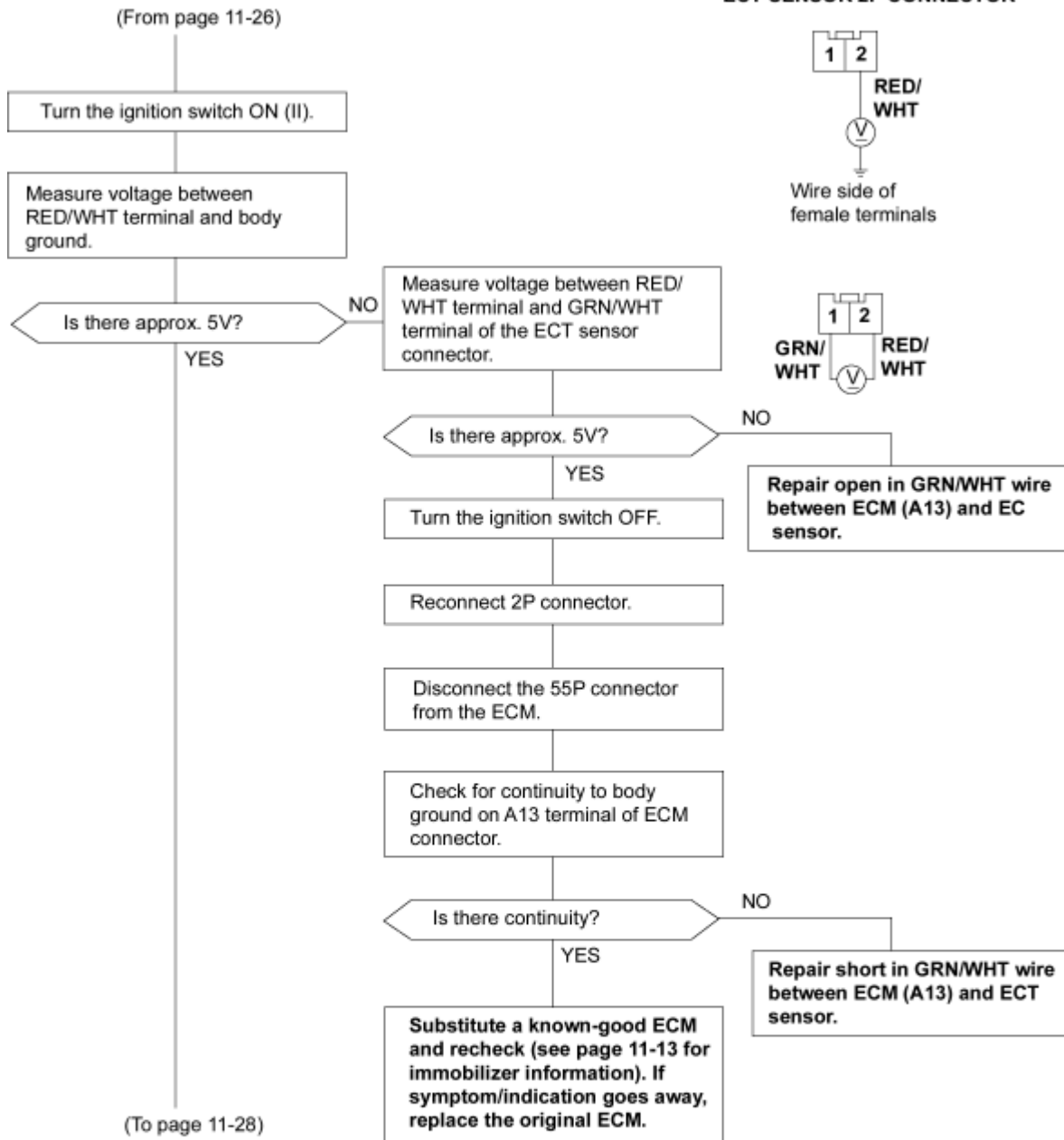
14 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 14: A problem in the Engine Coolant Temperature (ECT) sensor circuit (signal below setpoint). The ECT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below:



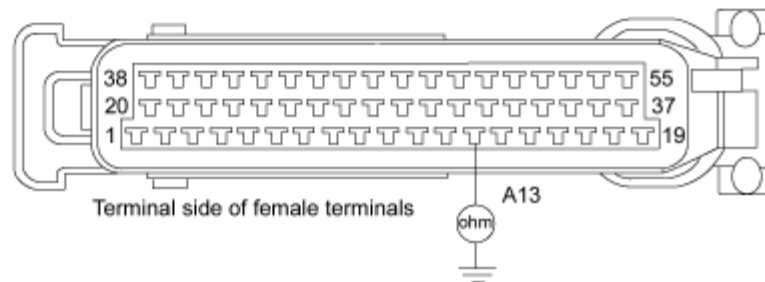
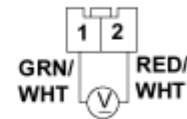
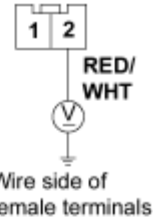
To go to the page referenced on the diagram above, click on the following:

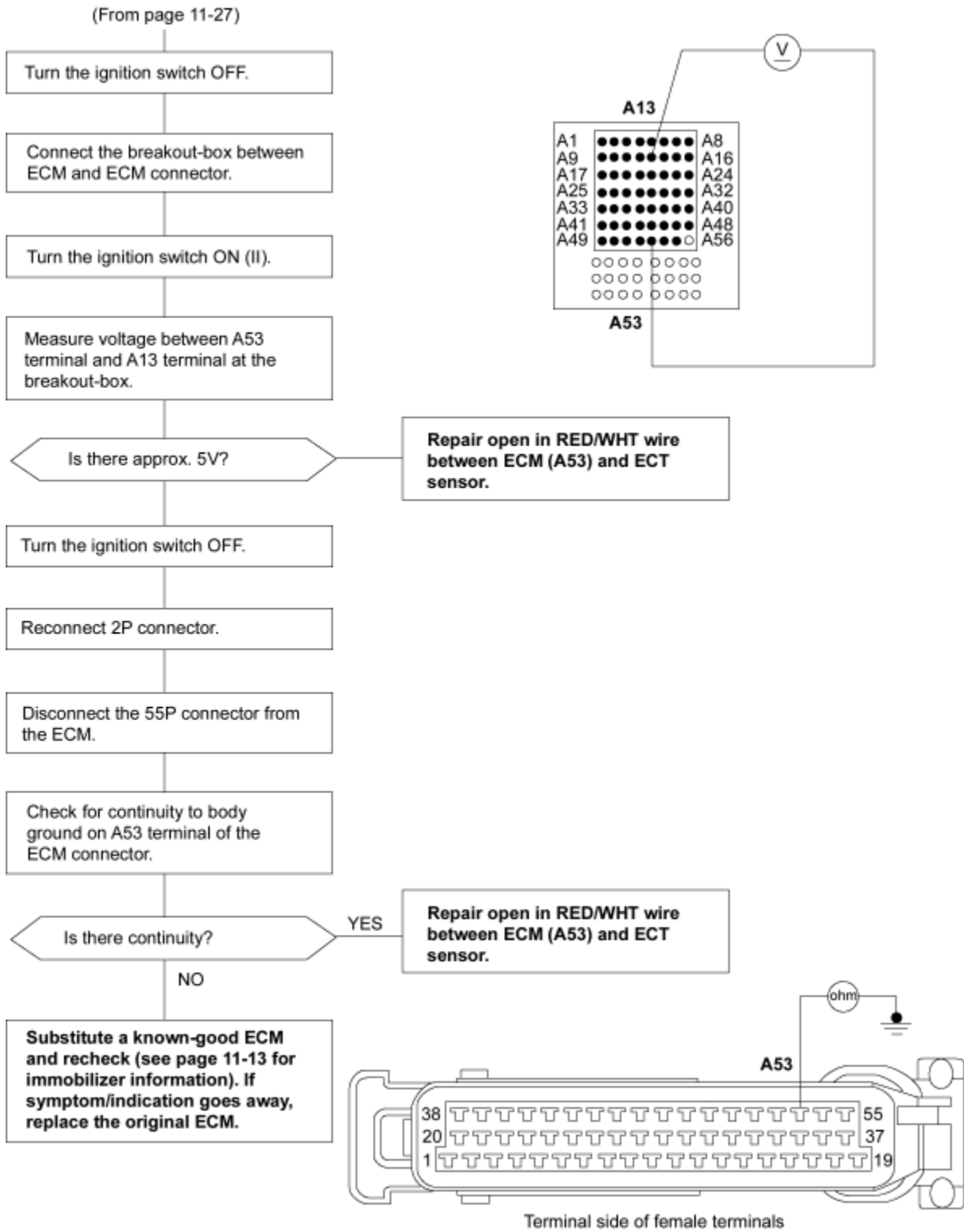
(See Page 11-12)

(See Page 11-13)



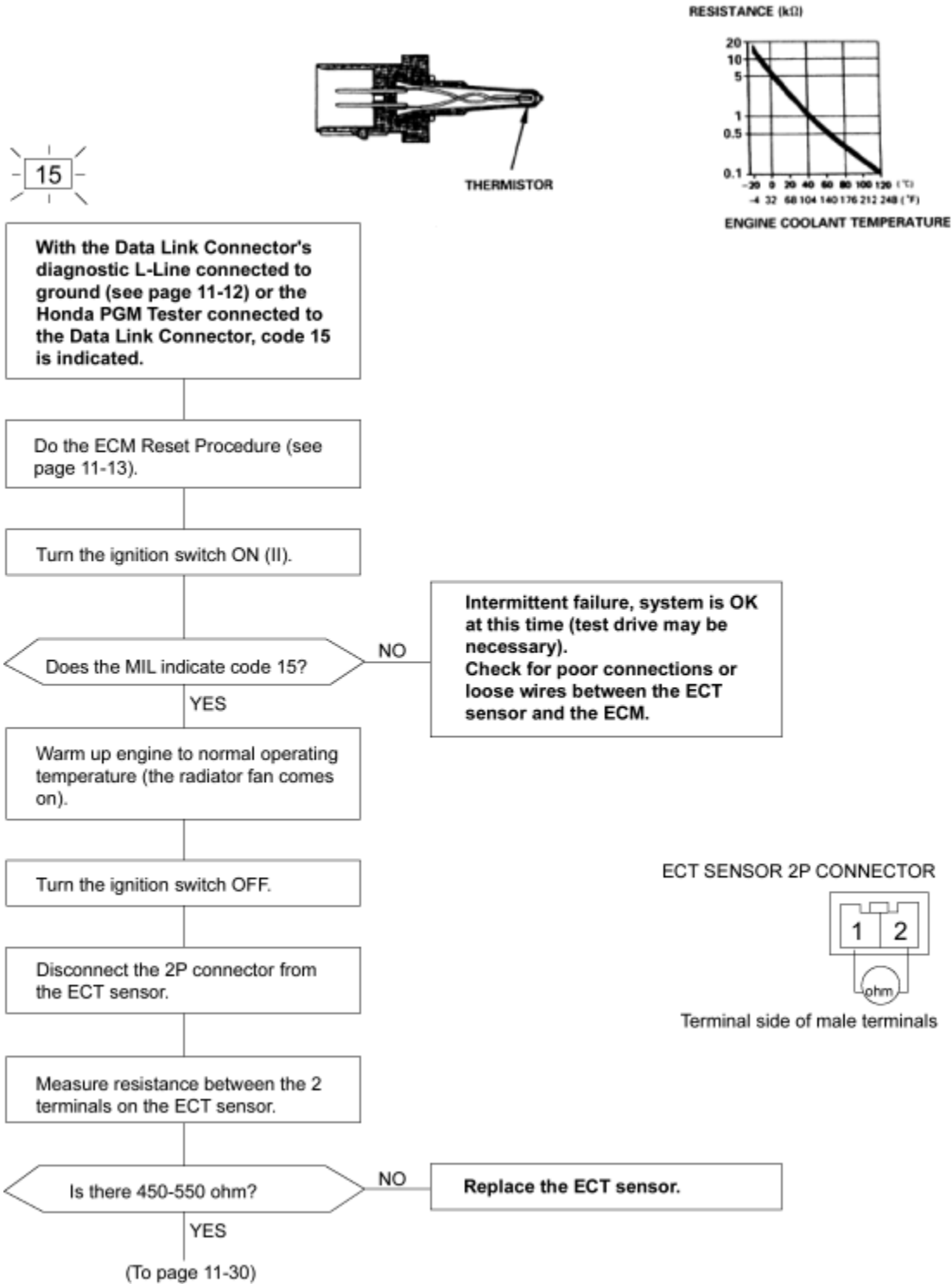
ECT SENSOR 2P CONNECTOR



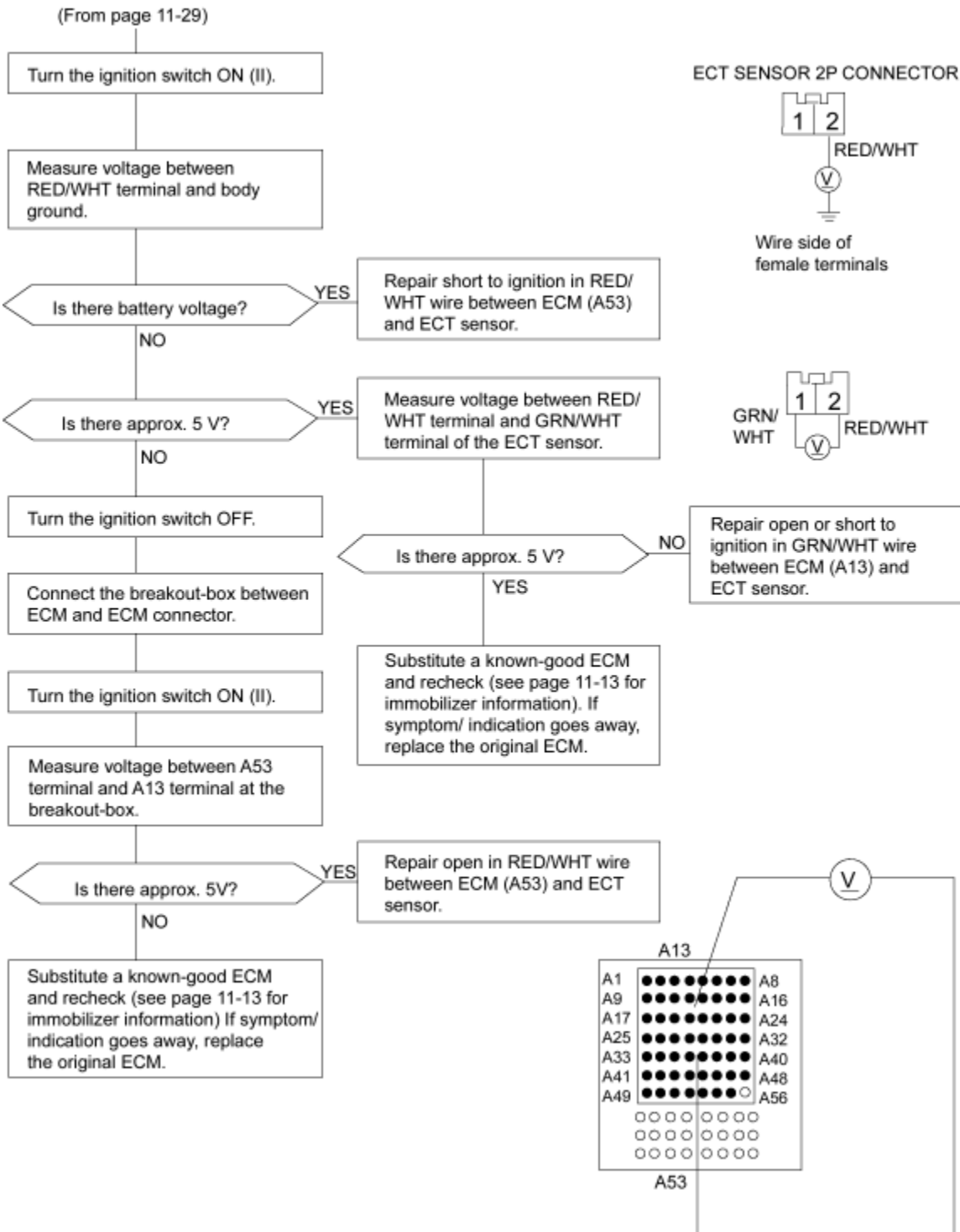


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

15 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 15: A problem in the Engine Coolant Temperature (ECT) sensor circuit (signal above setpoint). The ECT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below:



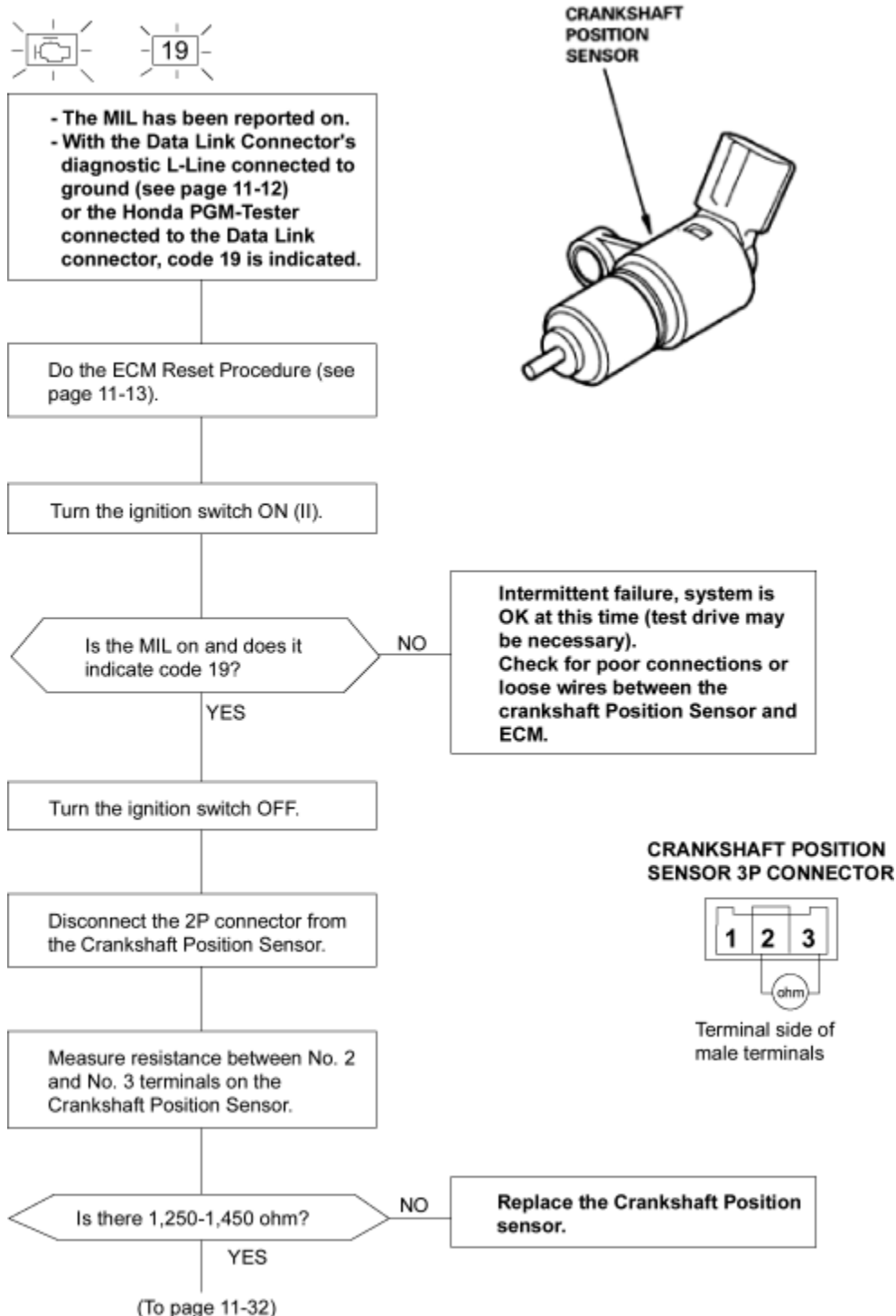
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-12)
 (See Page 11-13)



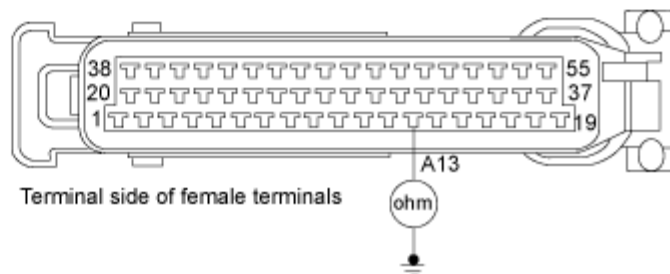
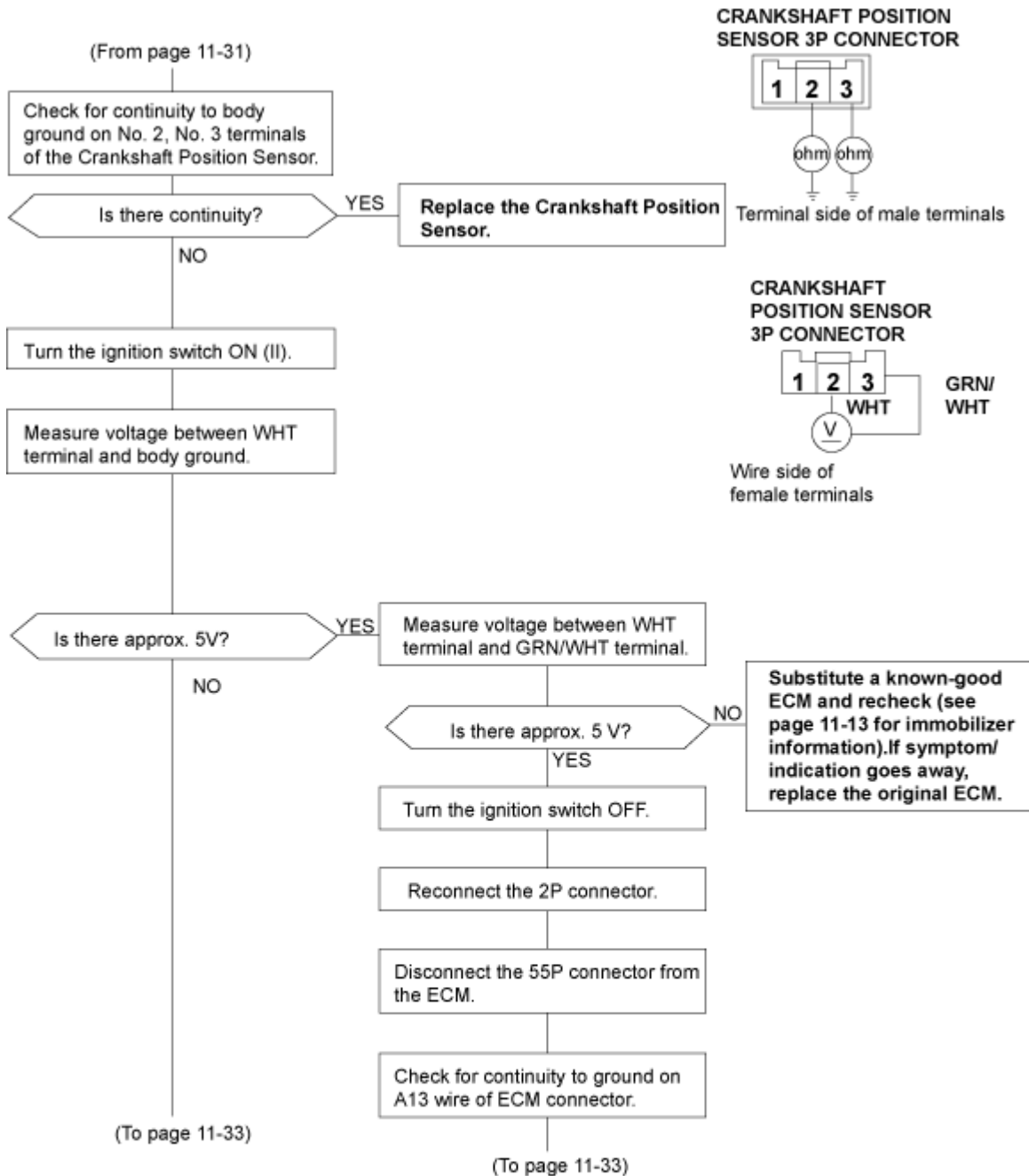
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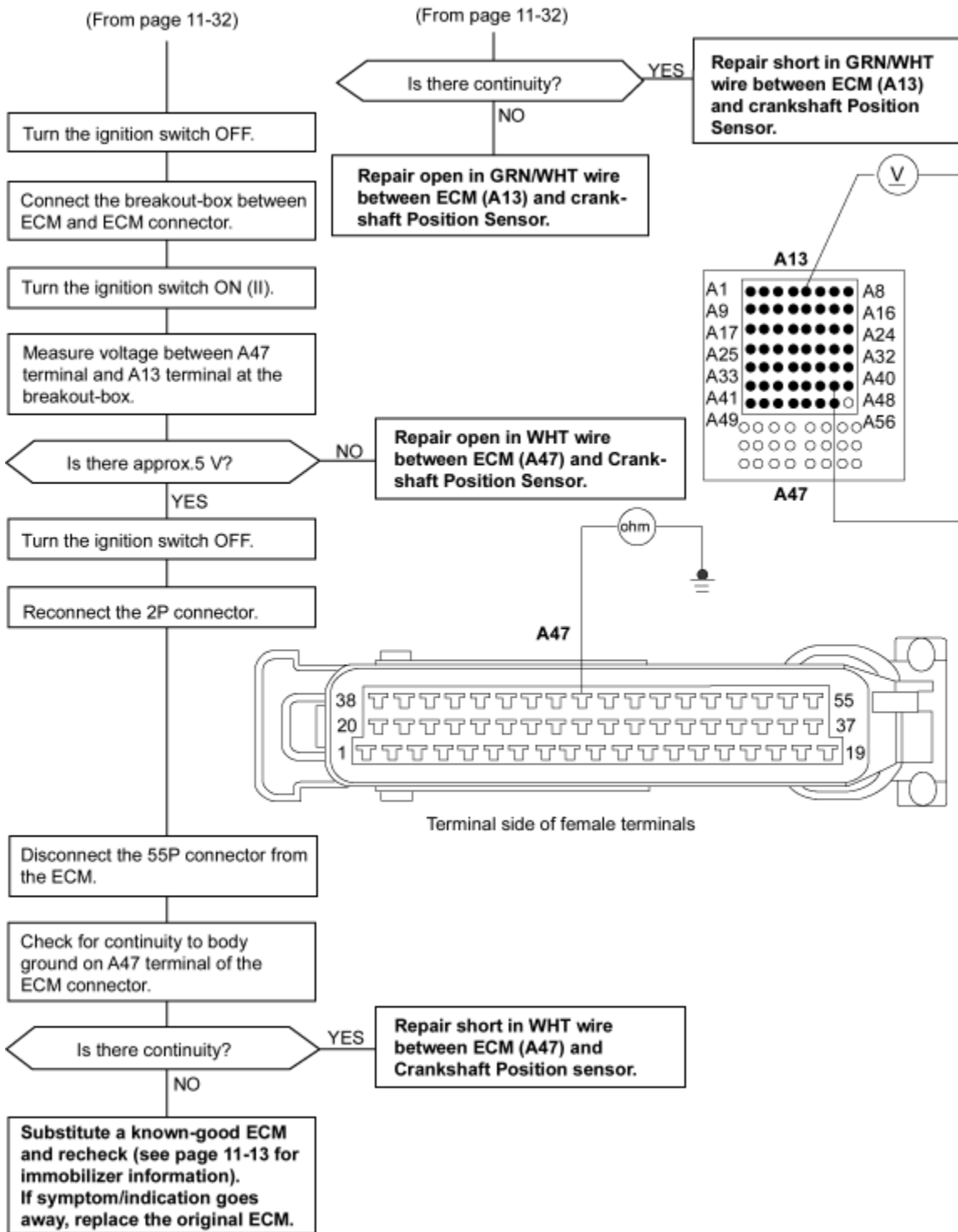
19 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 19: A problem in the Crankshaft Position Sensor circuit (signal implausible).
 The Crankshaft Position Sensor determines engine speed and position of the crankshaft.



To go to the page referenced on the diagram above, click on the following:
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To go to the page referenced on the diagram above, click on the following:
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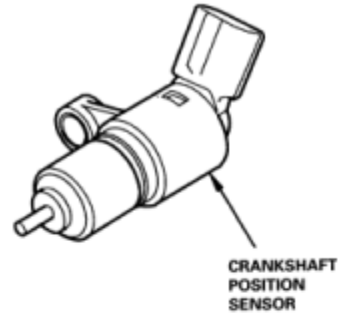
To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

31 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 31: A problem in the Crankshaft Position Sensor circuit (no signal).
The Crankshaft Position Sensor determines engine speed, position and speed.



- The MIL has been reported on.
- With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12) or the Honda PGM-Tester connected to the Data Link connector, code 31 is indicated.



Do the ECM Reset Procedure (see page 11-13).

Start the engine.

Is the MIL on and does it indicate code 31?

NO

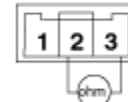
Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the crankshaft Position Sensor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 3P connector from the Crankshaft Position Sensor.

CRANKSHAFT POSITION SENSOR 3P CONNECTOR



Terminal side of male terminals

Measure resistance between No. 2 and No. 3 terminals on the Crankshaft Position Sensor.

Is there 1,250-1,450 ohm?

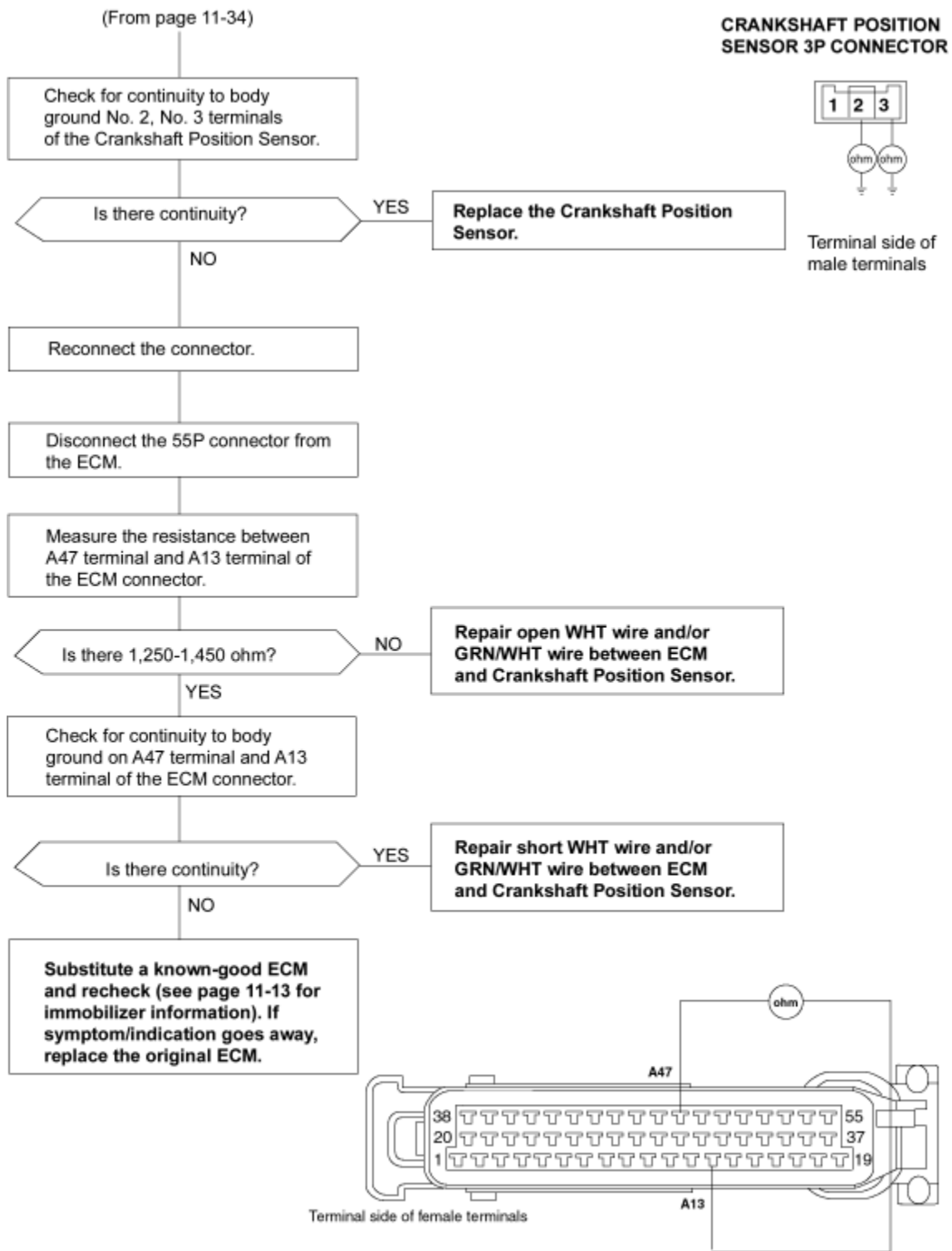
NO

Replace the Crankshaft Position sensor.

YES

(To page 11-35)

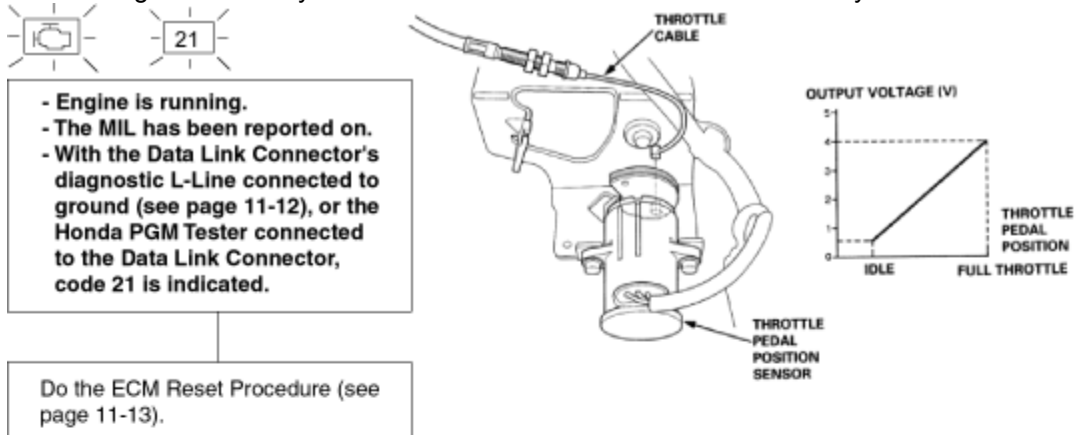
To go to the page referenced on the diagram above, click on the following:
(See Page 11-12)
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

21 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 21: A problem in the Throttle Pedal Position Sensor circuit (signal above setpoint)

The Throttle Position Pedal Sensor consists of a potentiometer and a sender switch. When the throttle pedal has moved more than 9° the switch closes. This signal is used by the ECM to detect if the sensor works correctly.



- Engine is running.
 - The MIL has been reported on.
 - With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12), or the Honda PGM Tester connected to the Data Link Connector, code 21 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Start the engine.

Is the MIL on and does it indicate code 21?

NO
 Intermittent failure, system is OK at this time (test drive may be necessary).
 Check for poor connections or loose wires between the Throttle Pedal Position Sensor and the ECM.

Turn the ignition switch OFF

Disconnect the 4P connector from the Throttle Pedal Position Sensor.

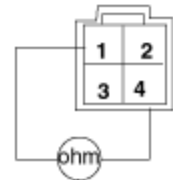
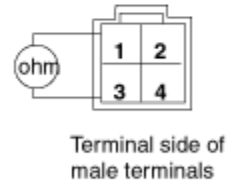
Measure resistance between terminal 3 and terminal 1 of the Throttle Pedal Position Sensor.

Is there 700-1,300 ohm?

NO
 Replace the Throttle Pedal Position sensor.

Measure resistance between terminal 4 and terminal 1 of the Throttle Pedal Position Sensor connector.

THROTTLE PEDAL POSITION SENSOR 4P CONNECTOR

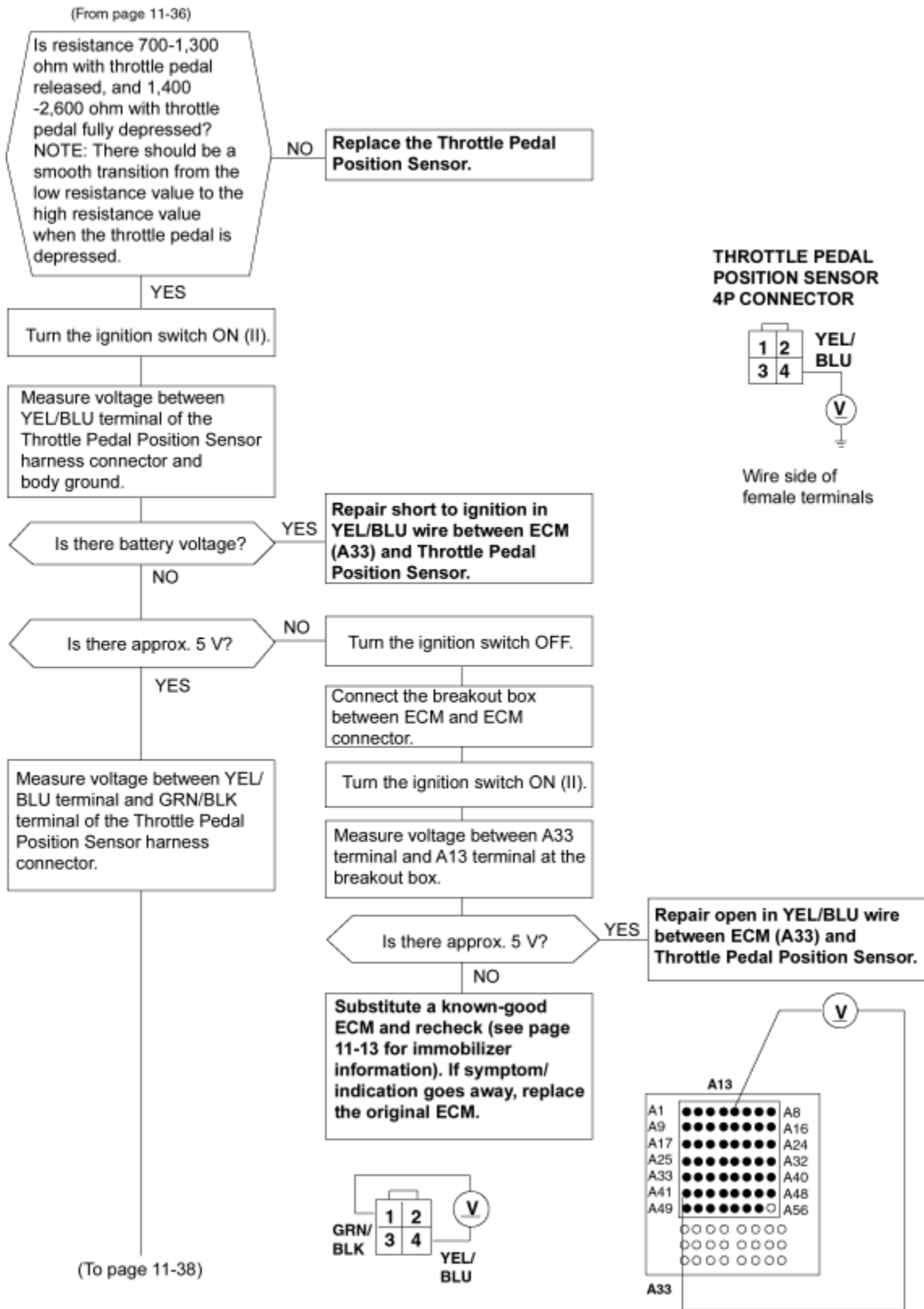


(To page 11-37)

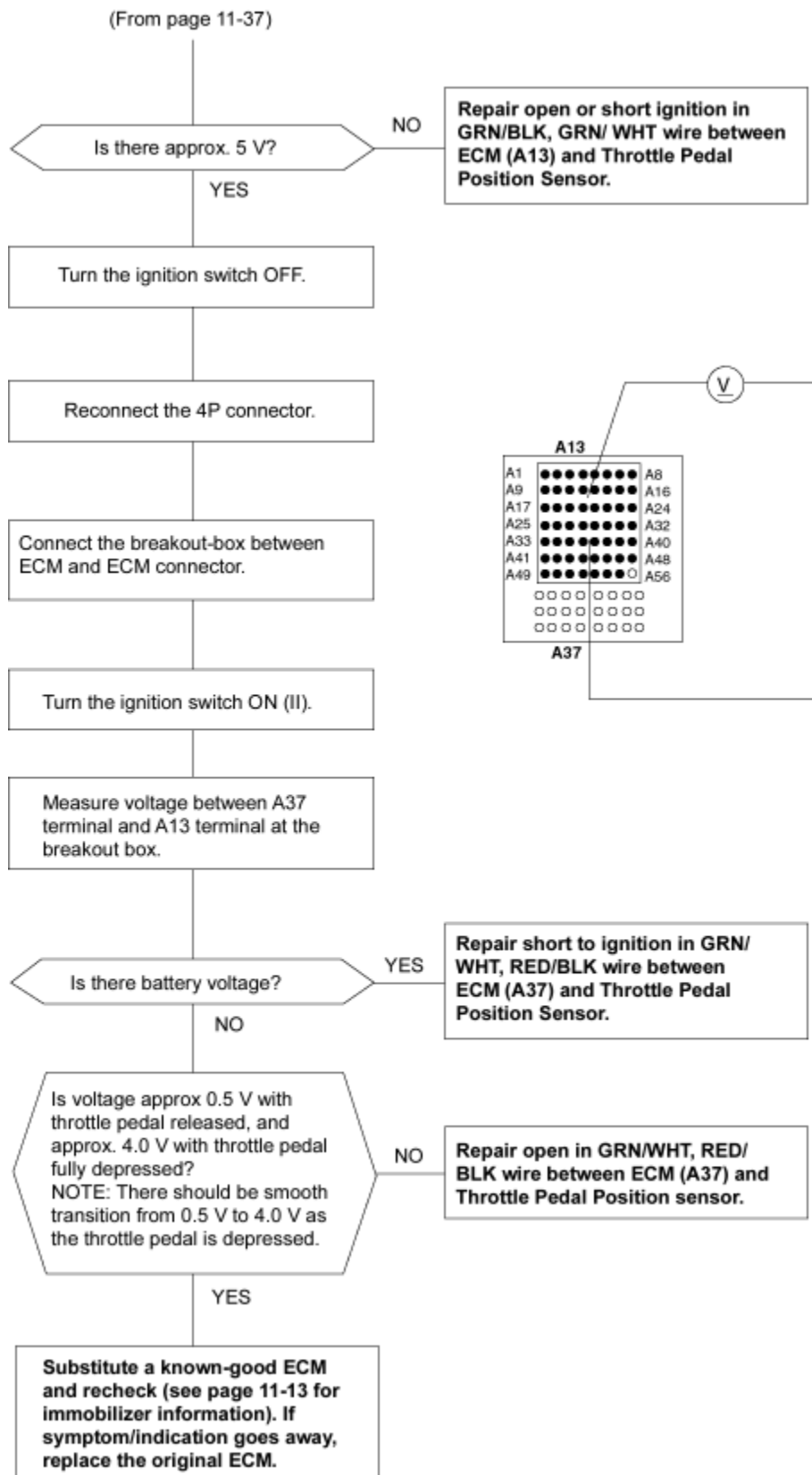
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(See Page 11-13)



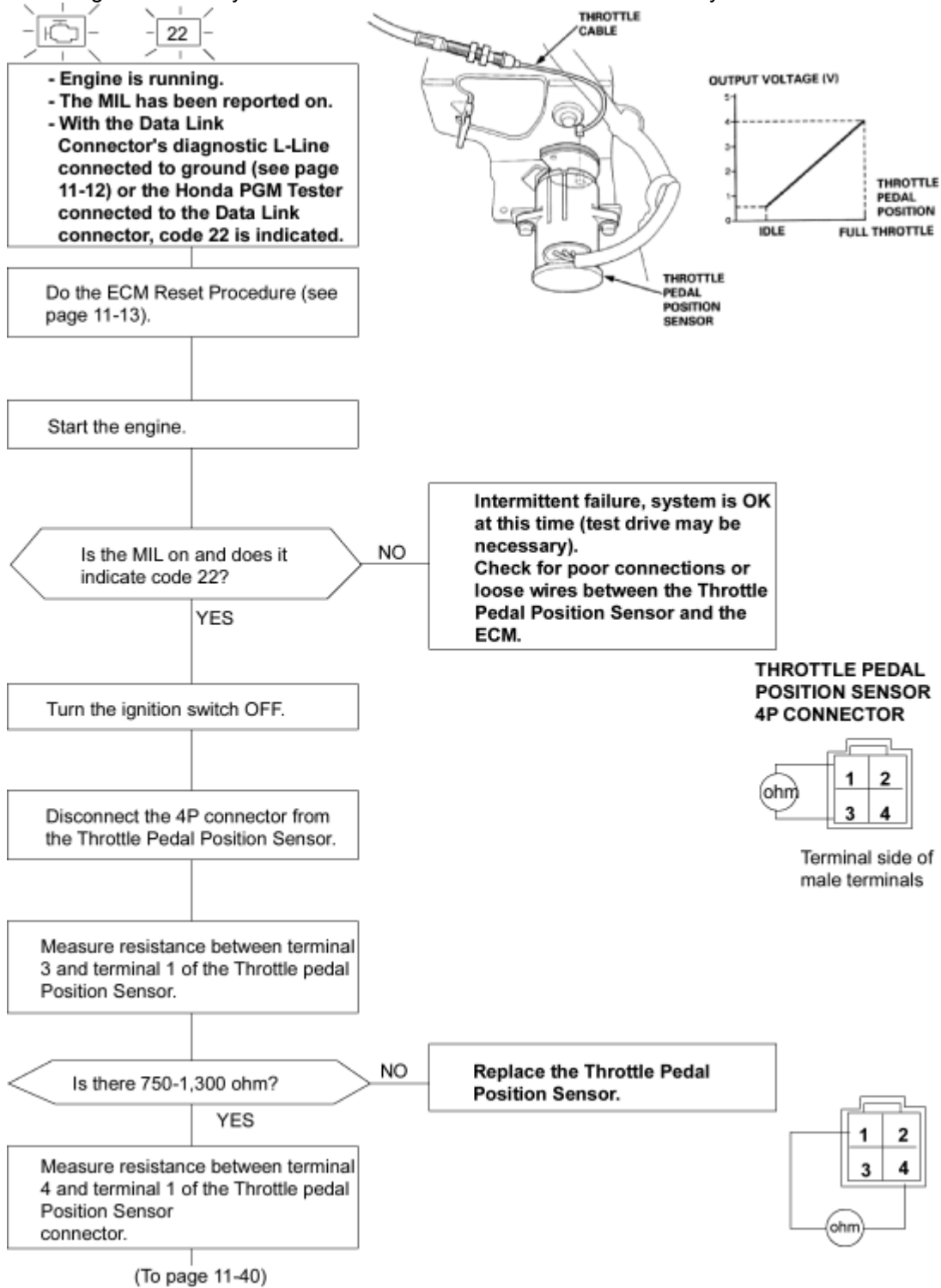
To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

22 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 22: A problem in the Throttle Pedal Position Sensor circuit (signal below setpoint)

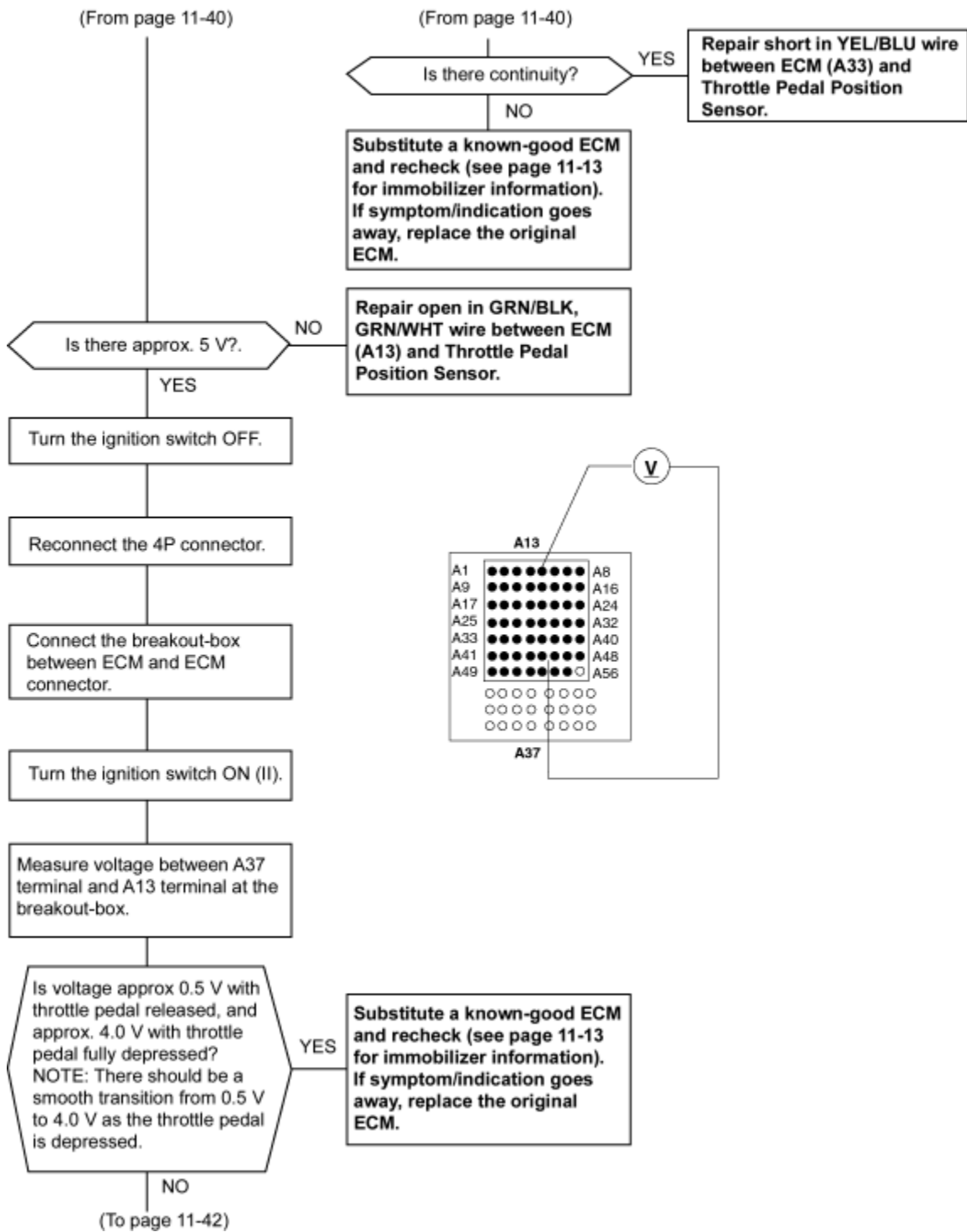
The Throttle Position Pedal Sensor consists of a potentiometer and a sender switch. When the throttle pedal has moved more than 9° the switch closes. This signal is used by the ECM to detect if the sensor works correctly.



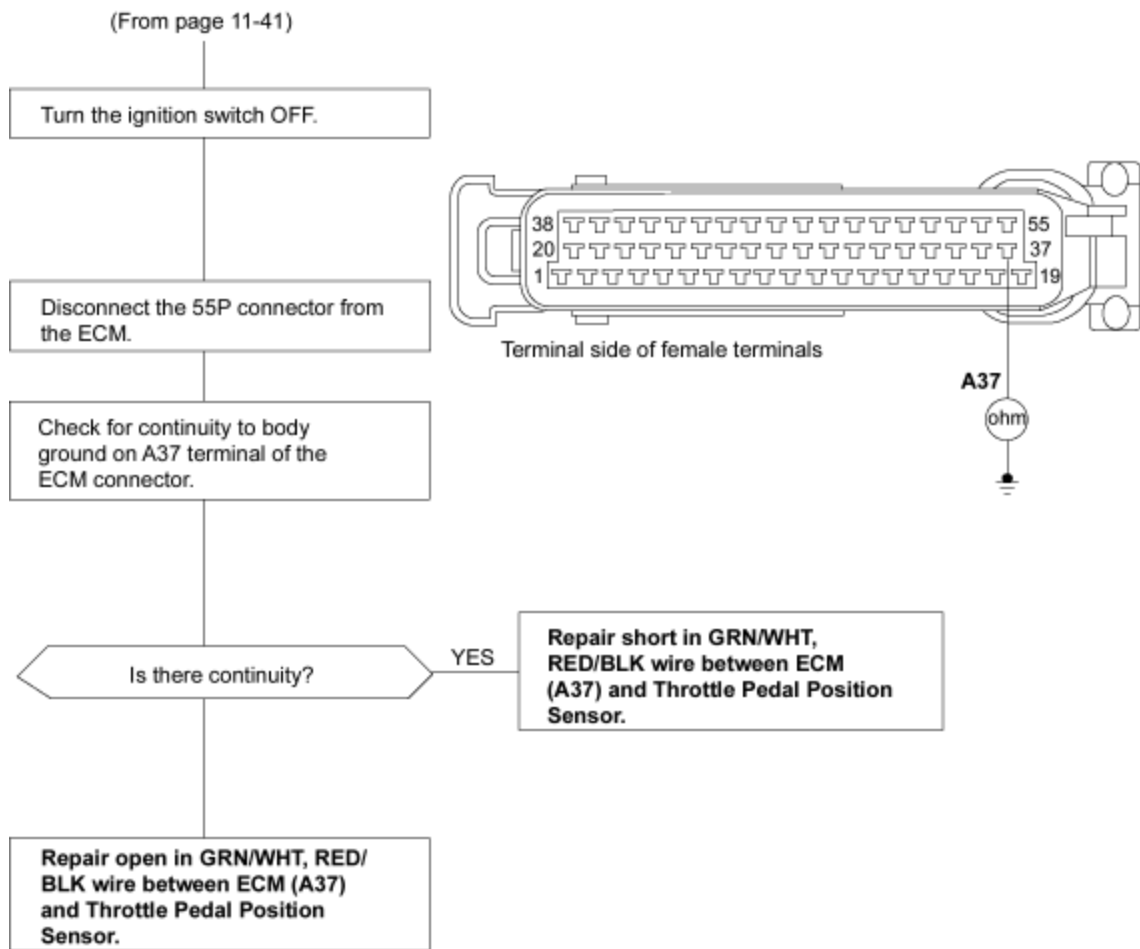
To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

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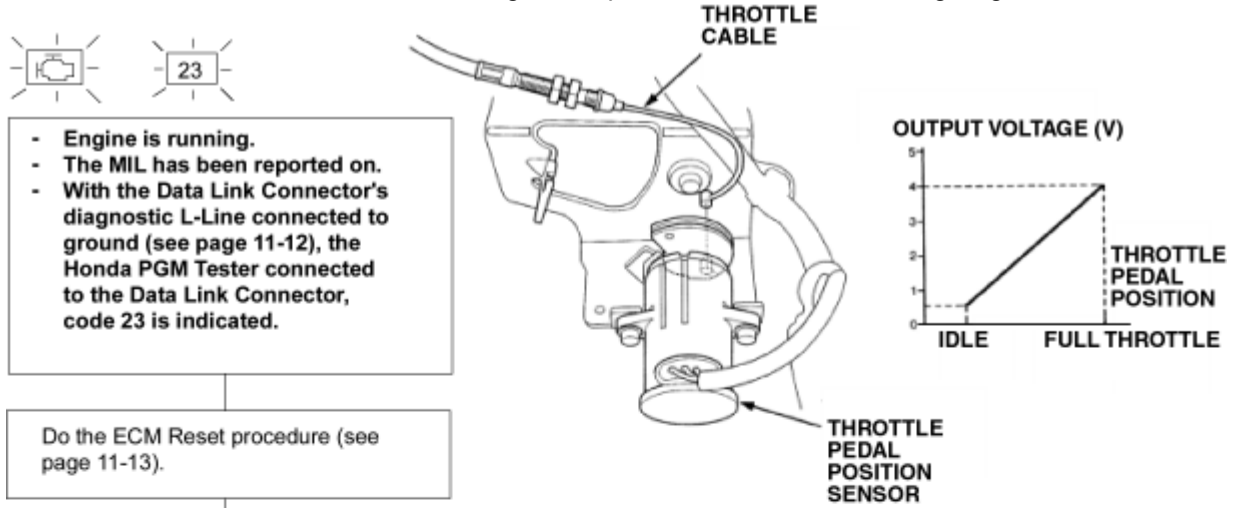


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



23 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 23: A problem in the Throttle Pedal Position Sensor circuit (implausible with idle switch)

The Throttle Position Pedal Sensor consists of a potentiometer and a sender switch. When the throttle pedal has moved more than 9° the switch closes. As the Throttle Pedal Position changes, the potentiometer sends a voltage signal to the ECM.



- Engine is running.
- The MIL has been reported on.
- With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12), the Honda PGM Tester connected to the Data Link Connector, code 23 is indicated.

Do the ECM Reset procedure (see page 11-13).

Start the engine.

Is the MIL on and does it indicate code 23?

NO

Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the Throttle Pedal Position Sensor and the ECM.

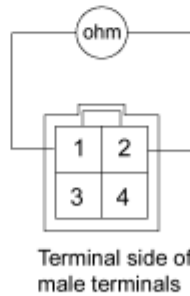
YES

Turn the ignition switch off

Disconnect the 4P connector from the Throttle Pedal Position Sensor.

Measure resistance between terminal 2 and terminal 1 of the Throttle Pedal Position Sensor.

THROTTLE PEDAL POSITION SENSOR 4P CONNECTOR



Is there 700 - 1,300 ohm with throttle released, and infinite resistance with throttle pedal depressed more than 9°?

NO

Replace Throttle Pedal Position Sensor.

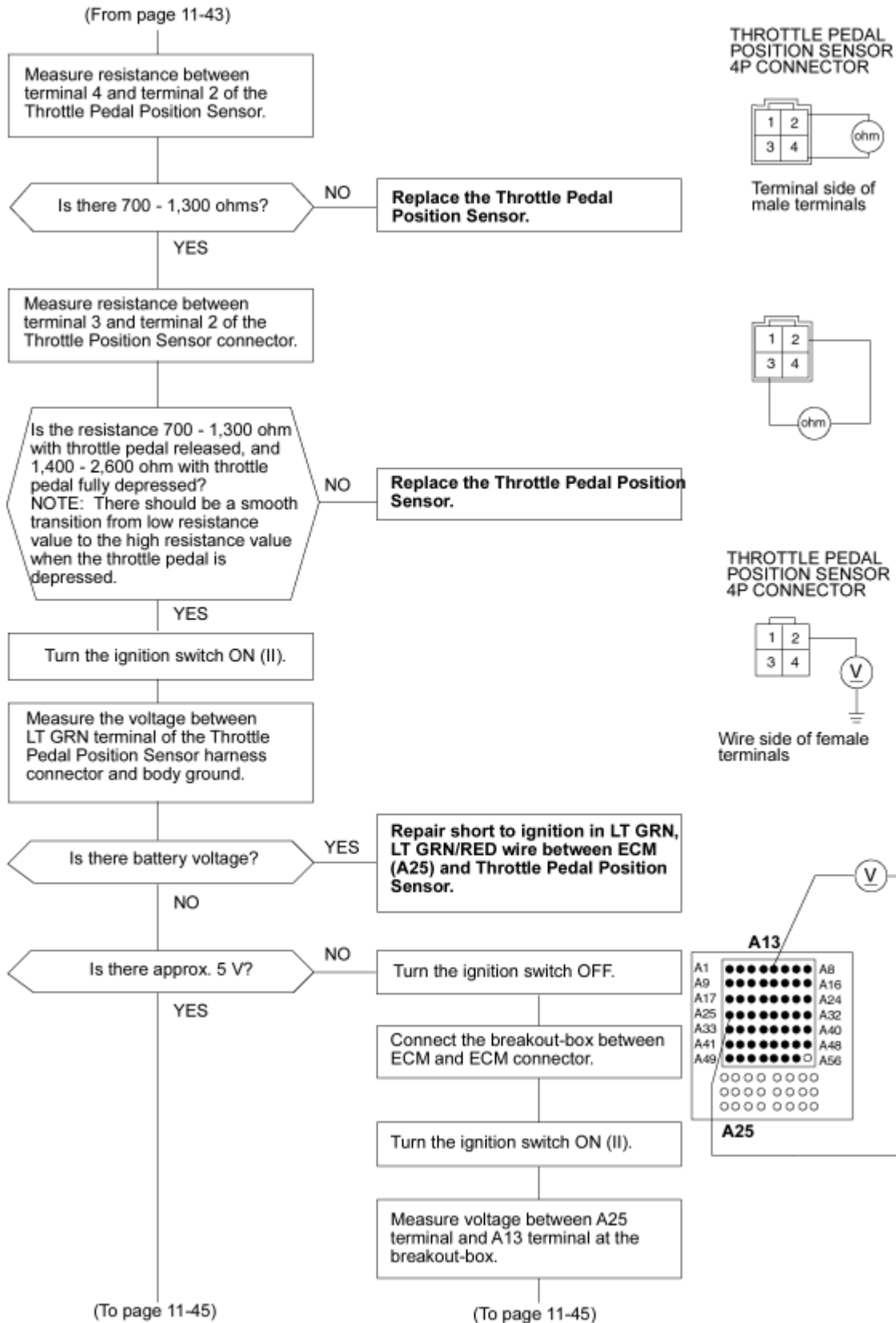
YES

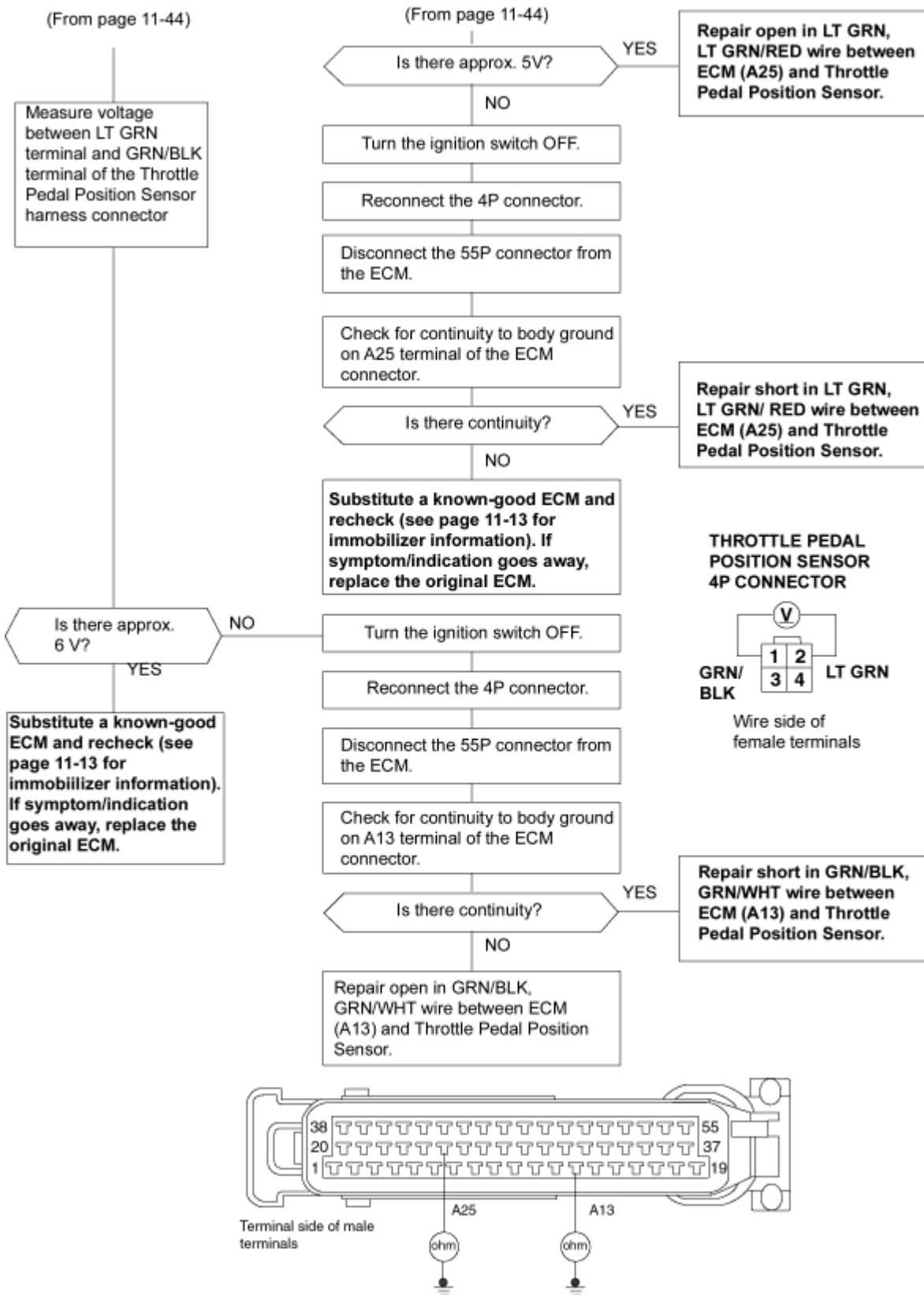
(To page 11-44)

To go to the page referenced on the diagram above, click on the following:

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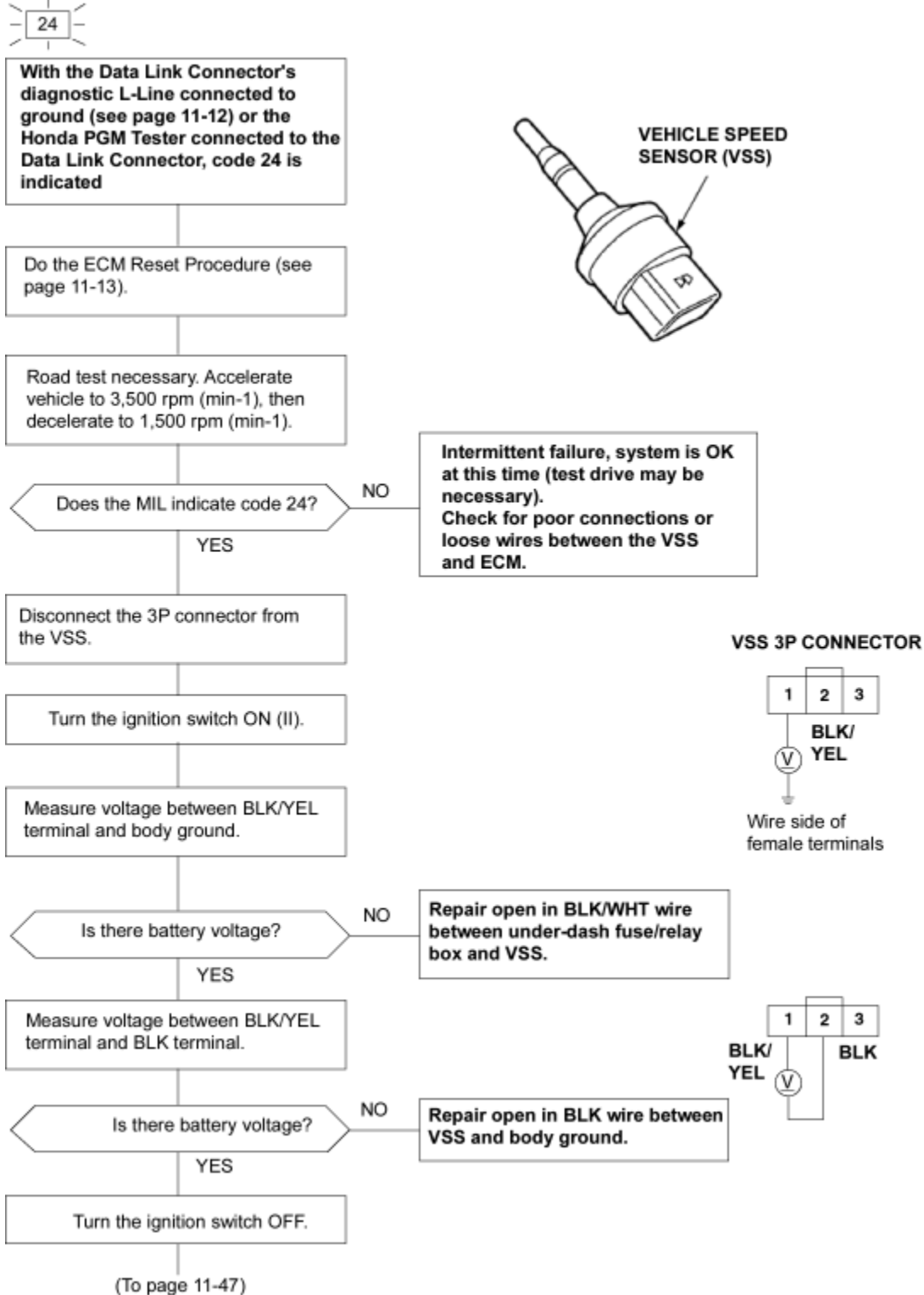




To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

24 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 24: A problem in the Vehicle Speed Sensor circuit.

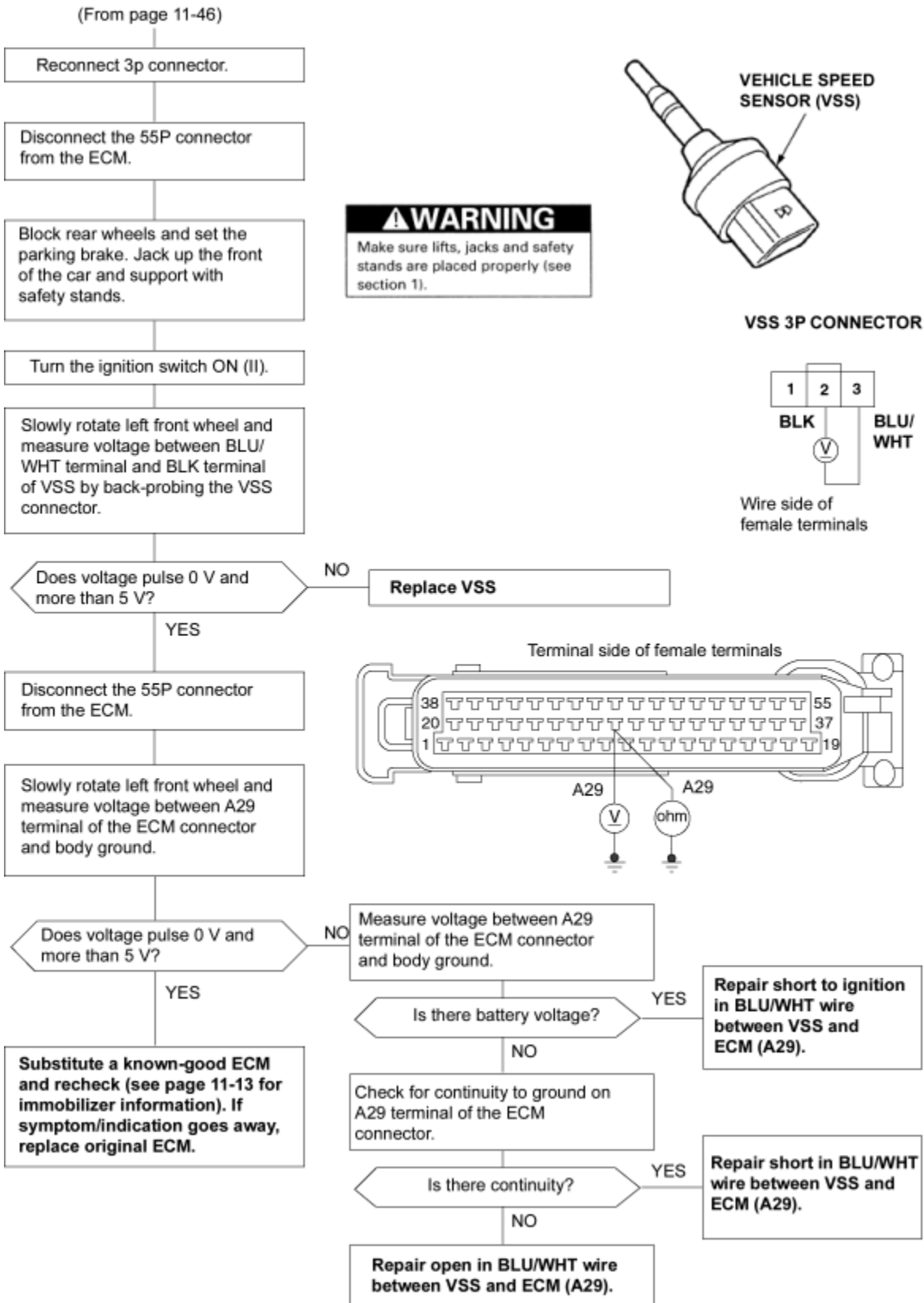
The VSS is located on top of the differential housing. The VSS is driven by a shaft from the final drive gear and produces an electrical output signal (pulsing squarewave) proportional to the vehicle speed. The VSS signal is sent to the ECM and the speedometer. The ECM uses this signal to provide active surge damping and adjust idle stabilisation and the quantity of fuel being delivered to the injectors.



To go to the page referenced on the diagram above, click on the following:

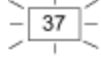
(See Page 11-12)

(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

37 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 37: A problem in the Brake Light Switch circuit.
 The ECM utilises two Brake Light Switch inputs, of opposite polarity, to determine brake pedal position.



With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12) or the Honda PGM-Tester Connected to the Data Link Connector, code 37 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Turn the ignition switch ON (II).

Does the MIL indicate code 37?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
 Check for poor connections or loose wires between the Brake Light Switch and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 4P connector from the Brake Light Switch.

Check for continuity between terminals 2 and 1 of the Brake Light Switch.

Is there continuity when the brake pedal is released and open circuit when brake pedal is depressed?

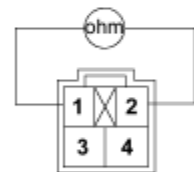
NO

Replace Brake Light Switch.

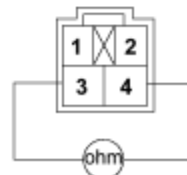
YES

Check for continuity between terminals 4 and 3 of the Brake Light Switch.

BRAKE LIGHT SWITCH 4P CONNECTOR



Terminal side of male terminals

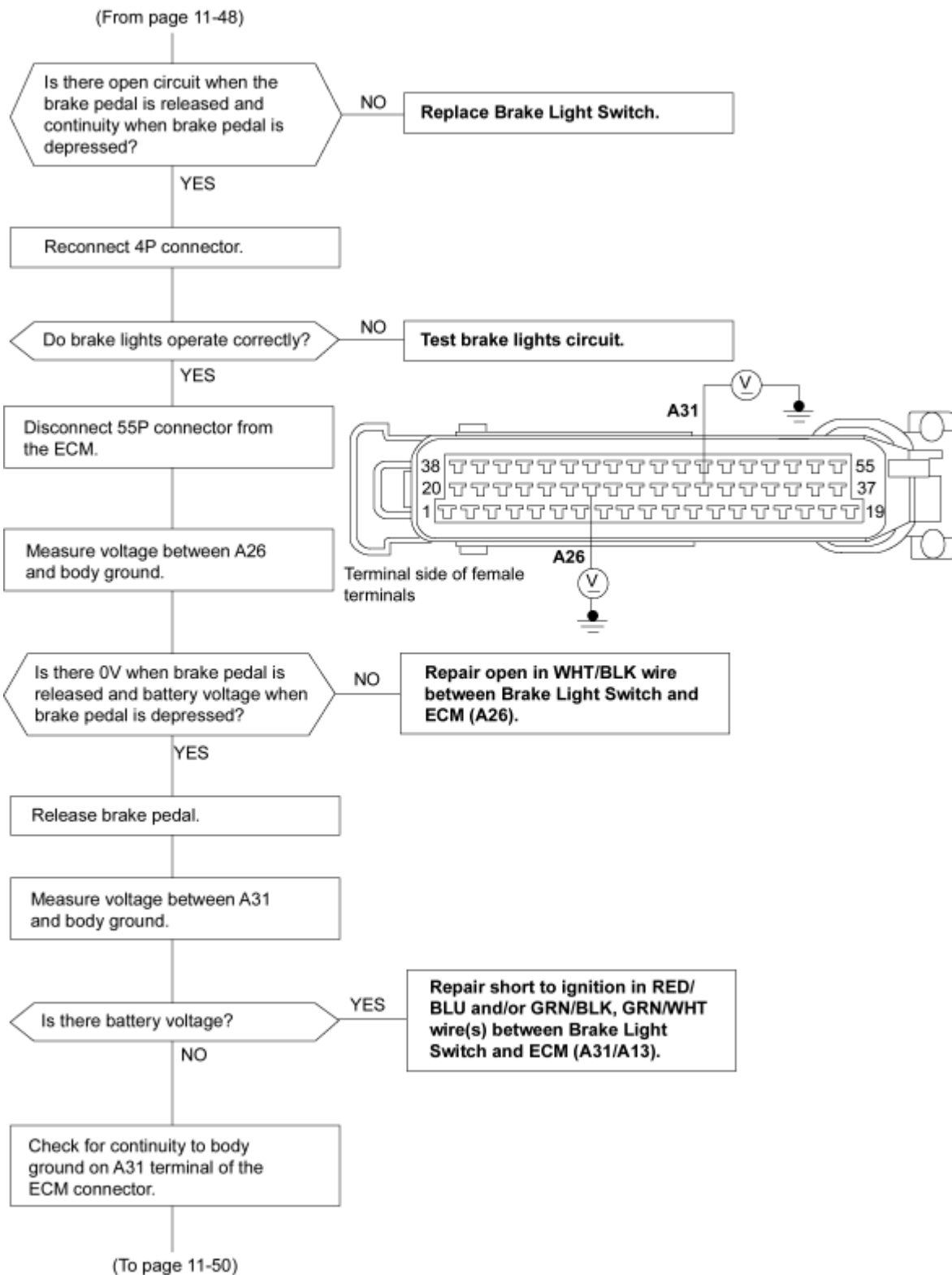


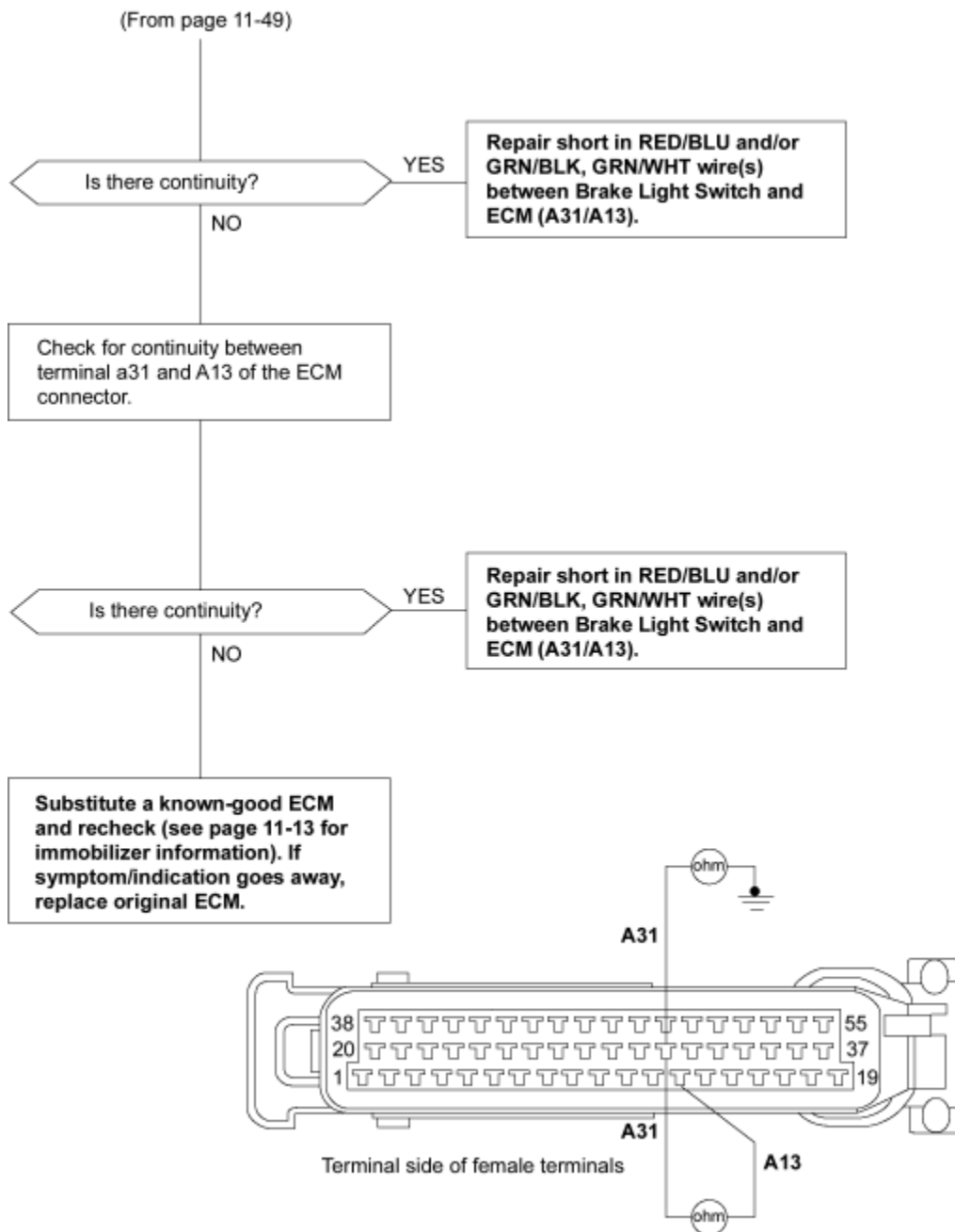
(To page 11-49)

To go to the page referenced on the diagram above, click on the following:

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(See Page 11-13)

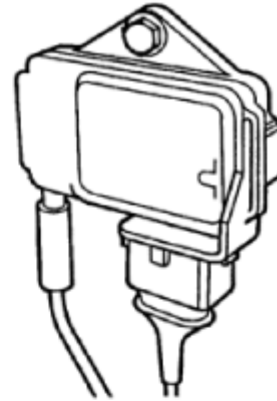
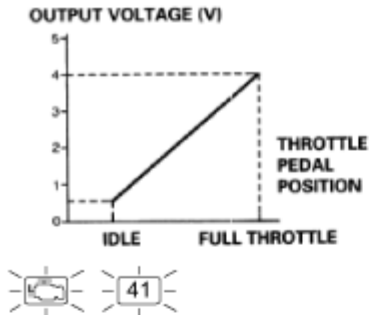




To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

41 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 41: A problem in the Boost Pressure Sensor (signal below setpoint).

The Boost Pressure Sensor converts turbocharger boost pressure into electrical signal inputs to the ECM.



BOOST PRESSURE SENSOR

– The MIL has been reported on.
– With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12) or the Honda PGM-Tester connected to the Data Link Connector, code 41 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Start the engine.

Is the MIL on and does it indicate code 41?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between Boost Pressure Sensor and ECM.

YES

Turn the ignition switch OFF.

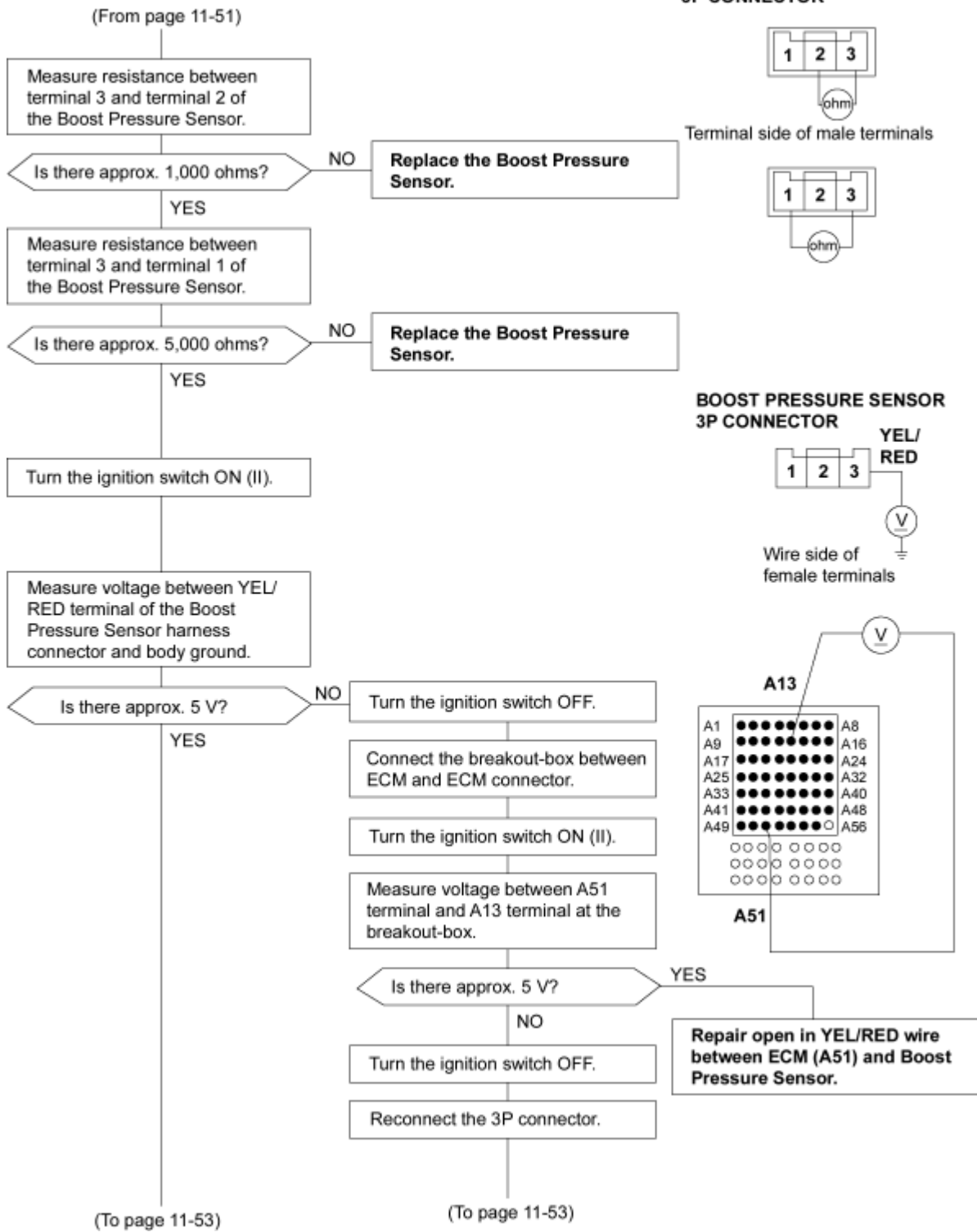
Disconnect the 3P connector from the Boost Pressure Sensor.

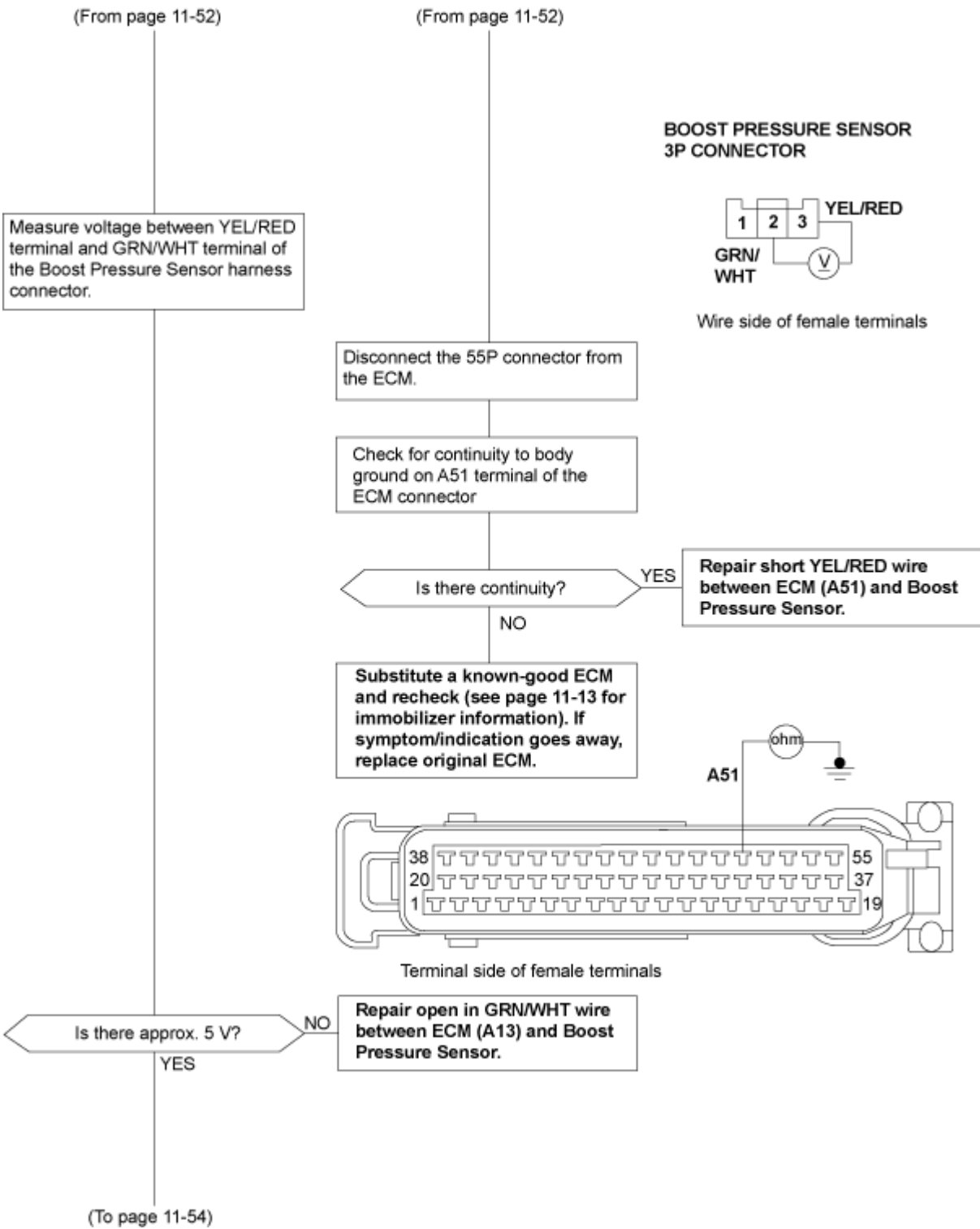
(To page 11-52)

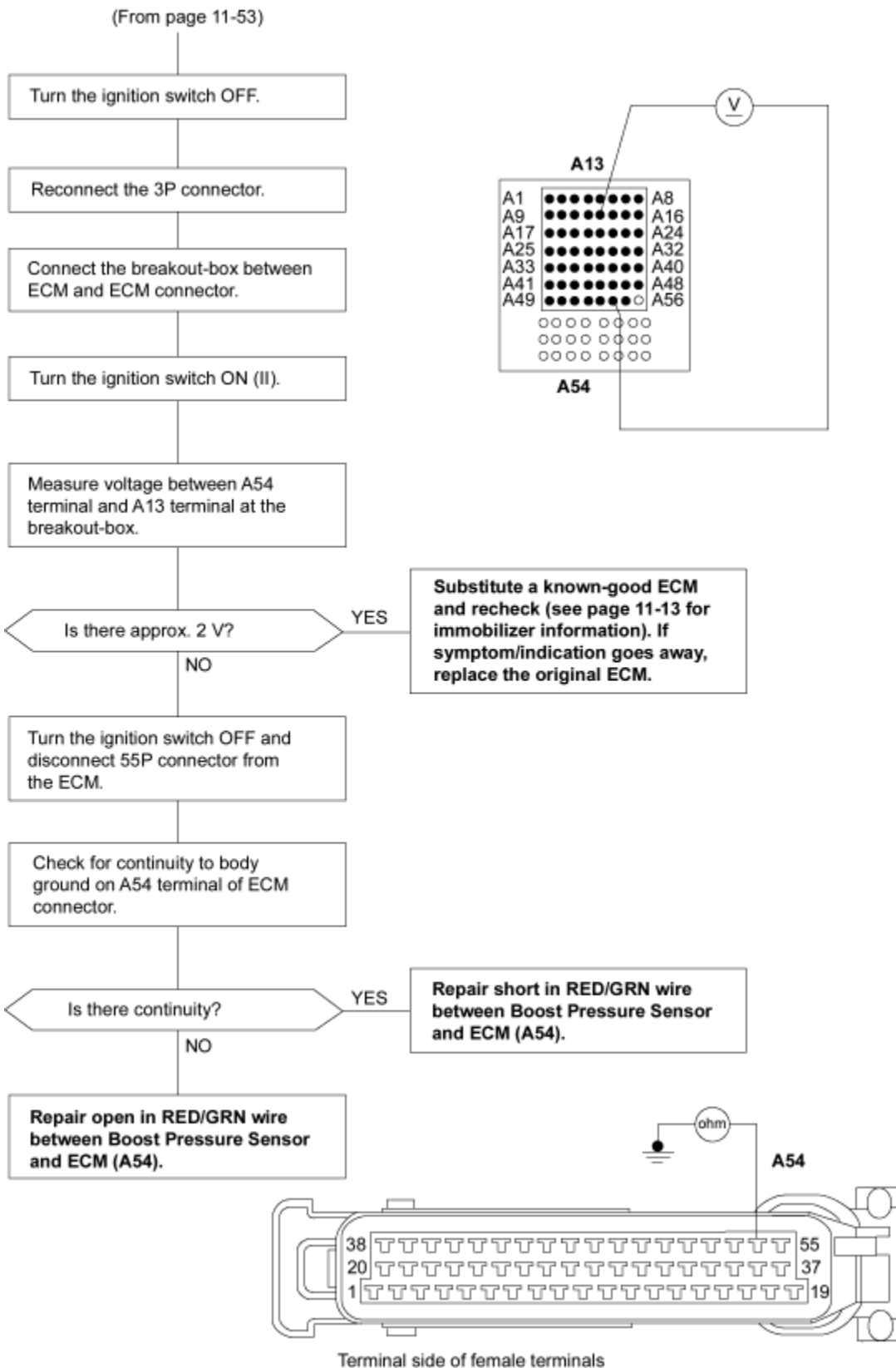
To go to the page referenced on the diagram above, click on the following:

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(See Page 11-13)

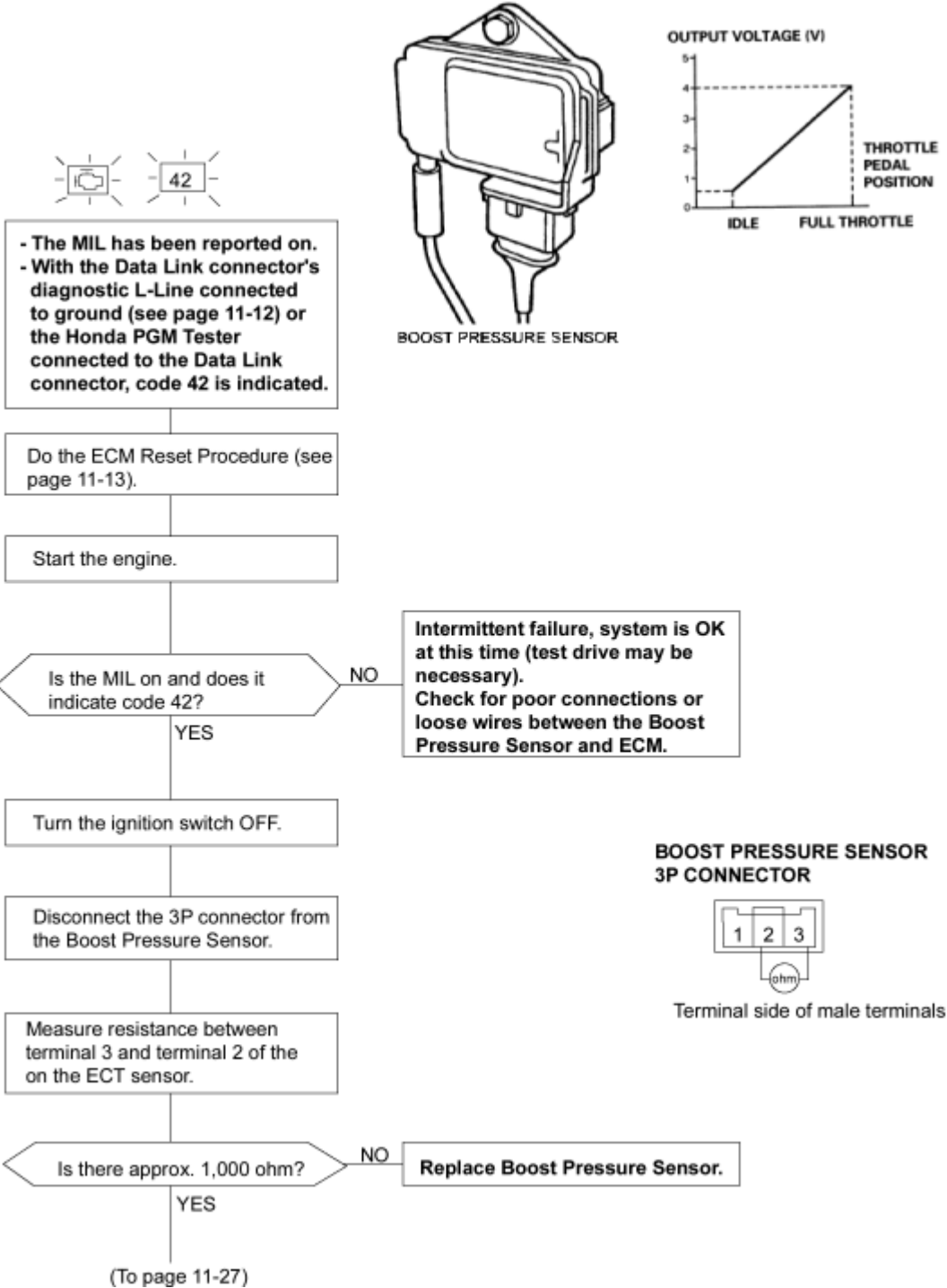




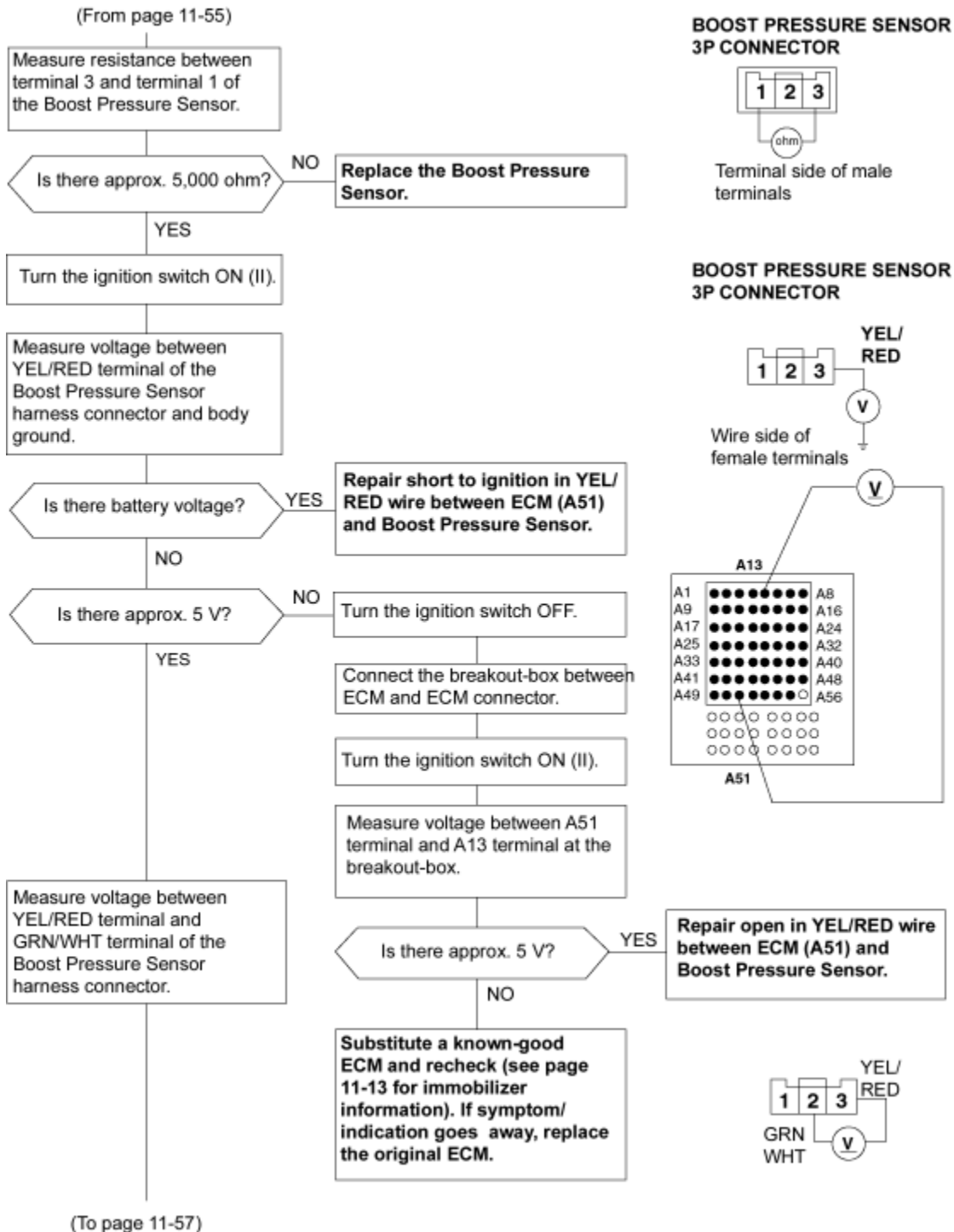


To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

42 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 42: An electrical problem in the problem in the Boost Pressure Sensor (signal above setpoint). The Boost Pressure Sensor converts turbocharger boost pressure into electrical signal inputs to the ECM.

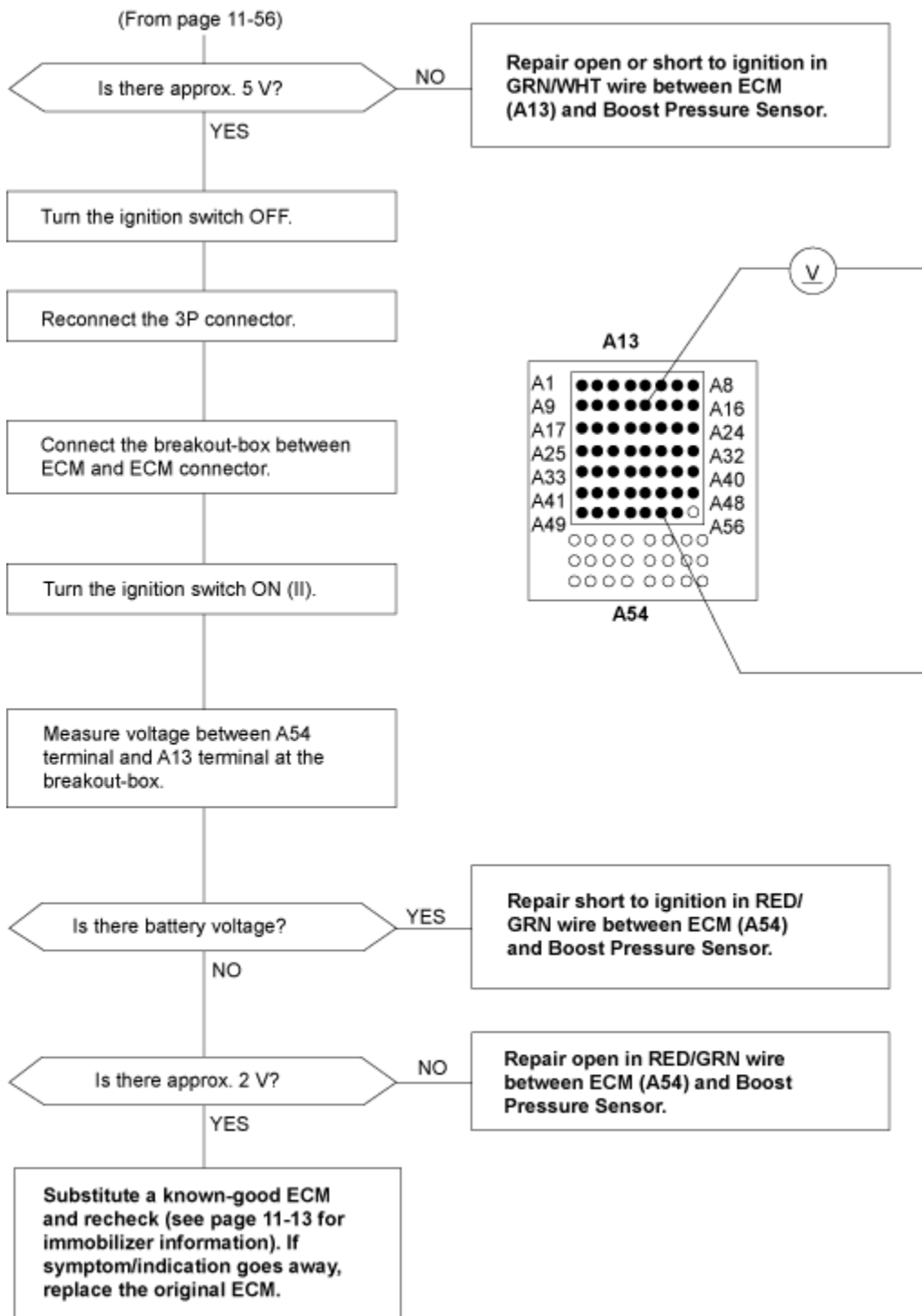


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(To page 11-57)

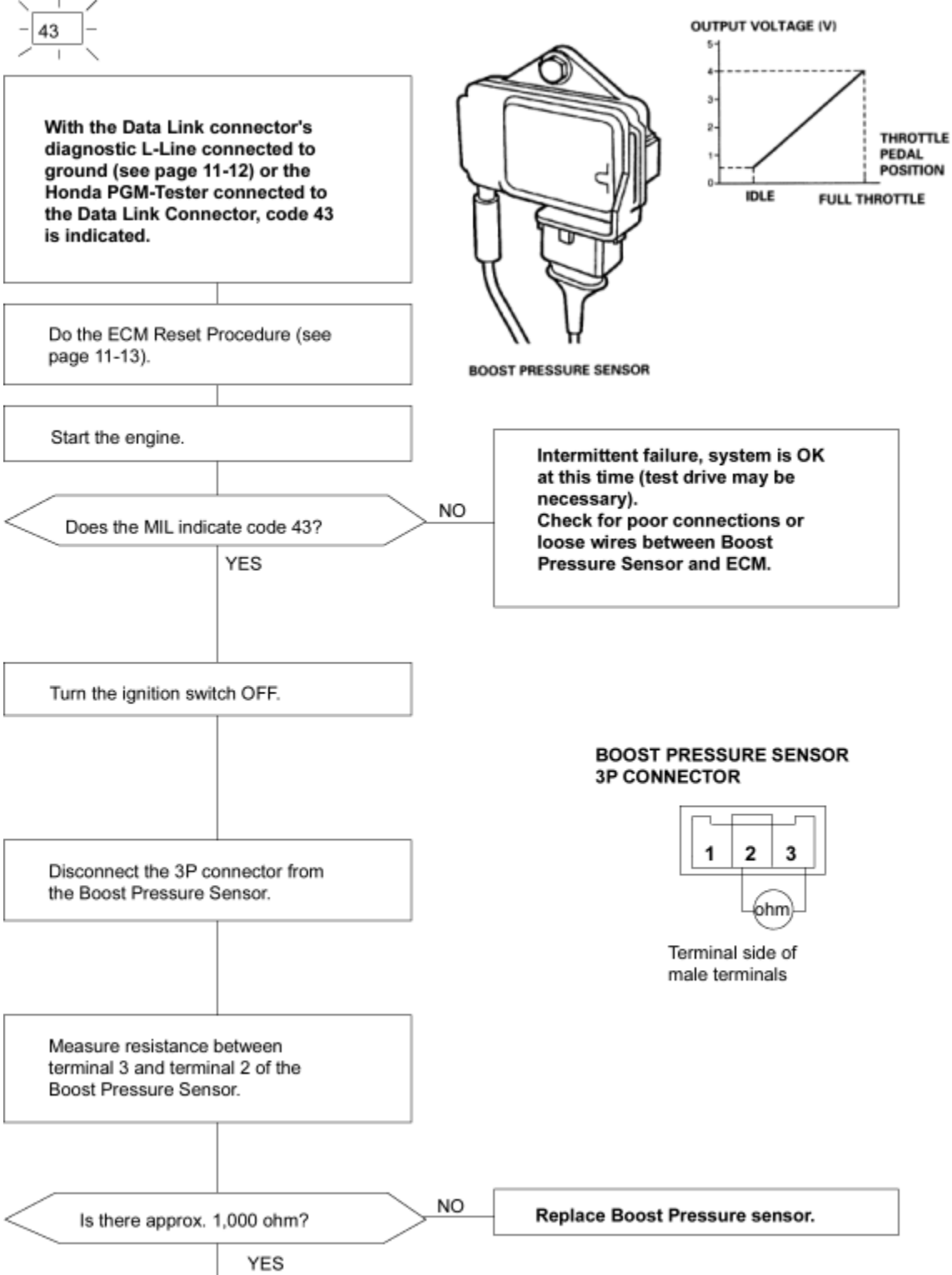
To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

43 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 43: An electrical problem in the Boost Pressure Sensor (implausible with atm. pressure sensor). The Boost Pressure Sensor converts turbocharger boost pressure into electrical signal inputs to the ECM.

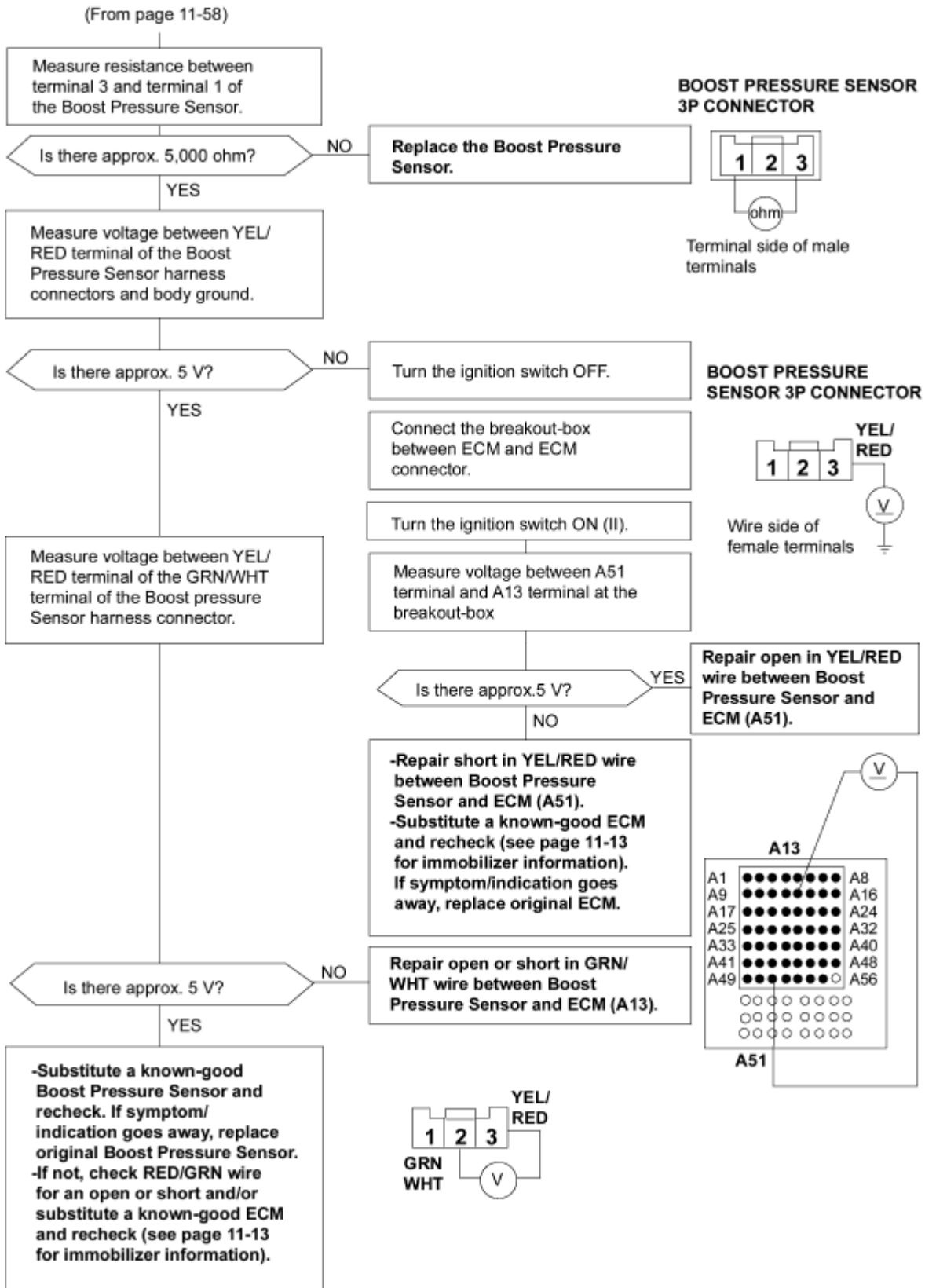


(To page 11-59)

To go to the page referenced on the diagram above, click on the following:

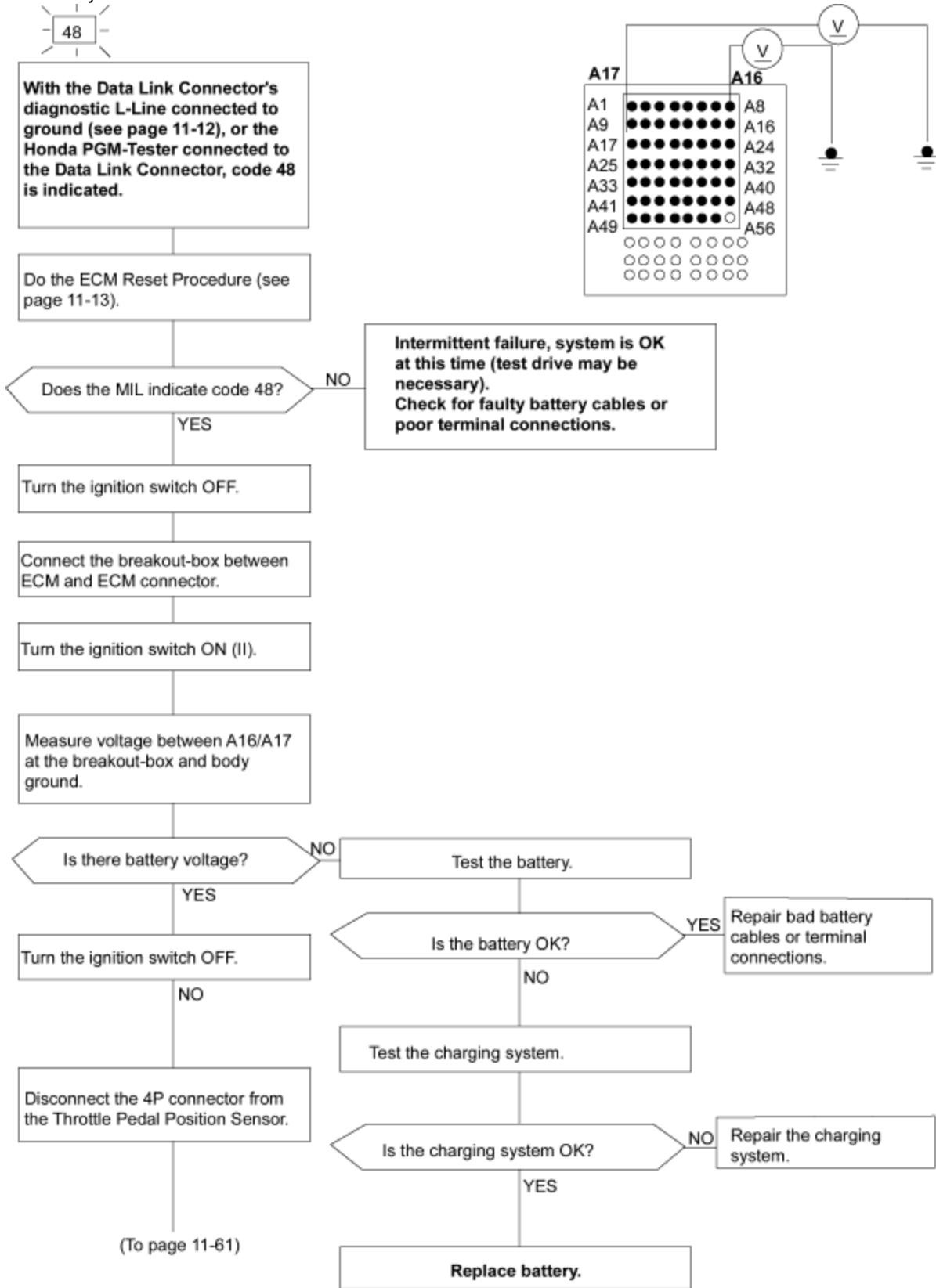
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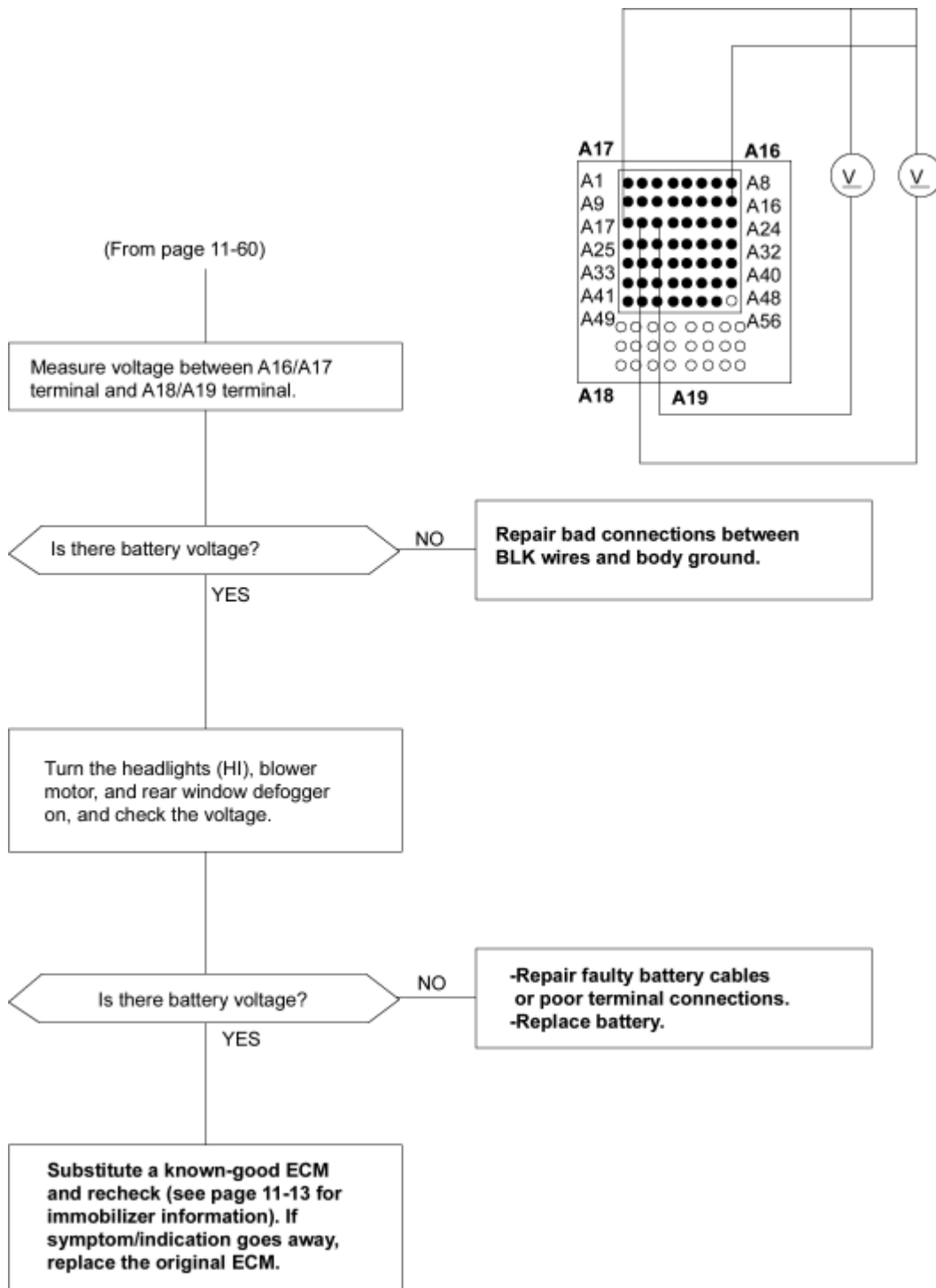
48 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 48: A problem in the Battery circuit.



To go to the page referenced on the diagram above, click on the following:

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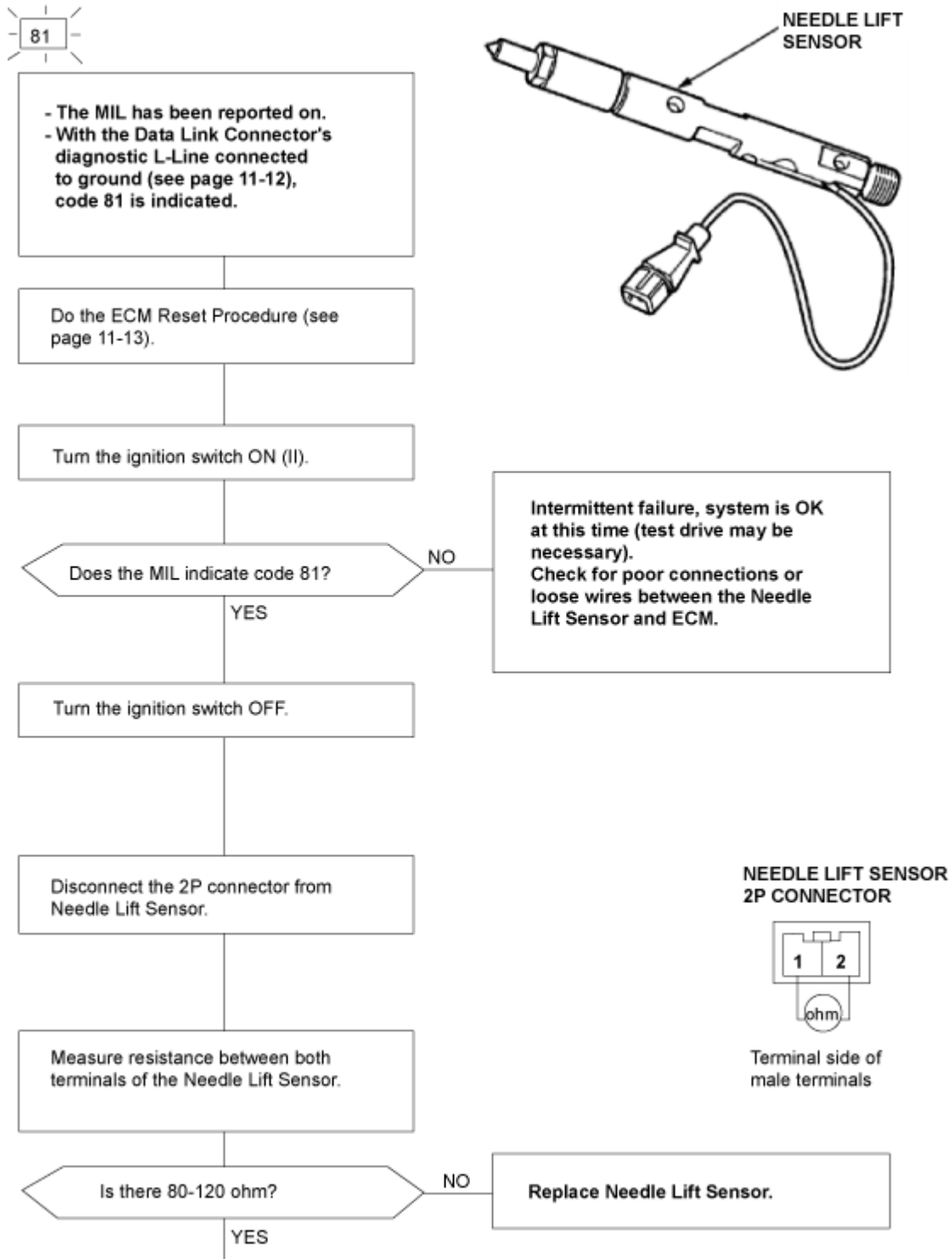


To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

81 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 81: A problem in the Needle Lift Sensor circuit (no signal).

The needle lift sensor consists of a coil which surrounds the shaft of an extended injection needle. The coil is fed a DC supply from the ECM which produces a magnetic field. When the needle is moved under the influence of fuel pressure, the magnetic field is disturbed which induces an AC voltage in the coil. The induced voltage is sent to the ECM as a reference point for the start of the injection sequence.

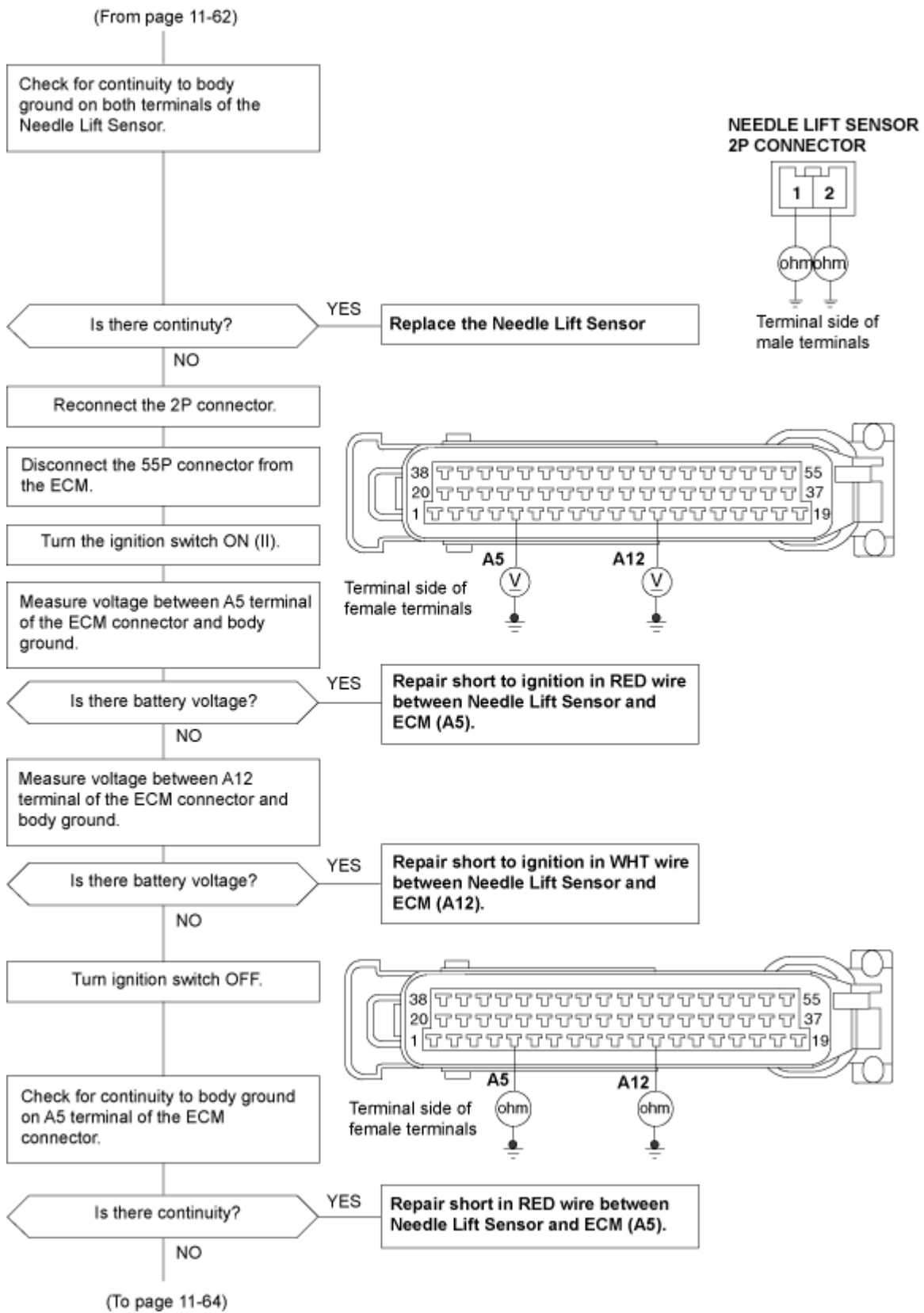


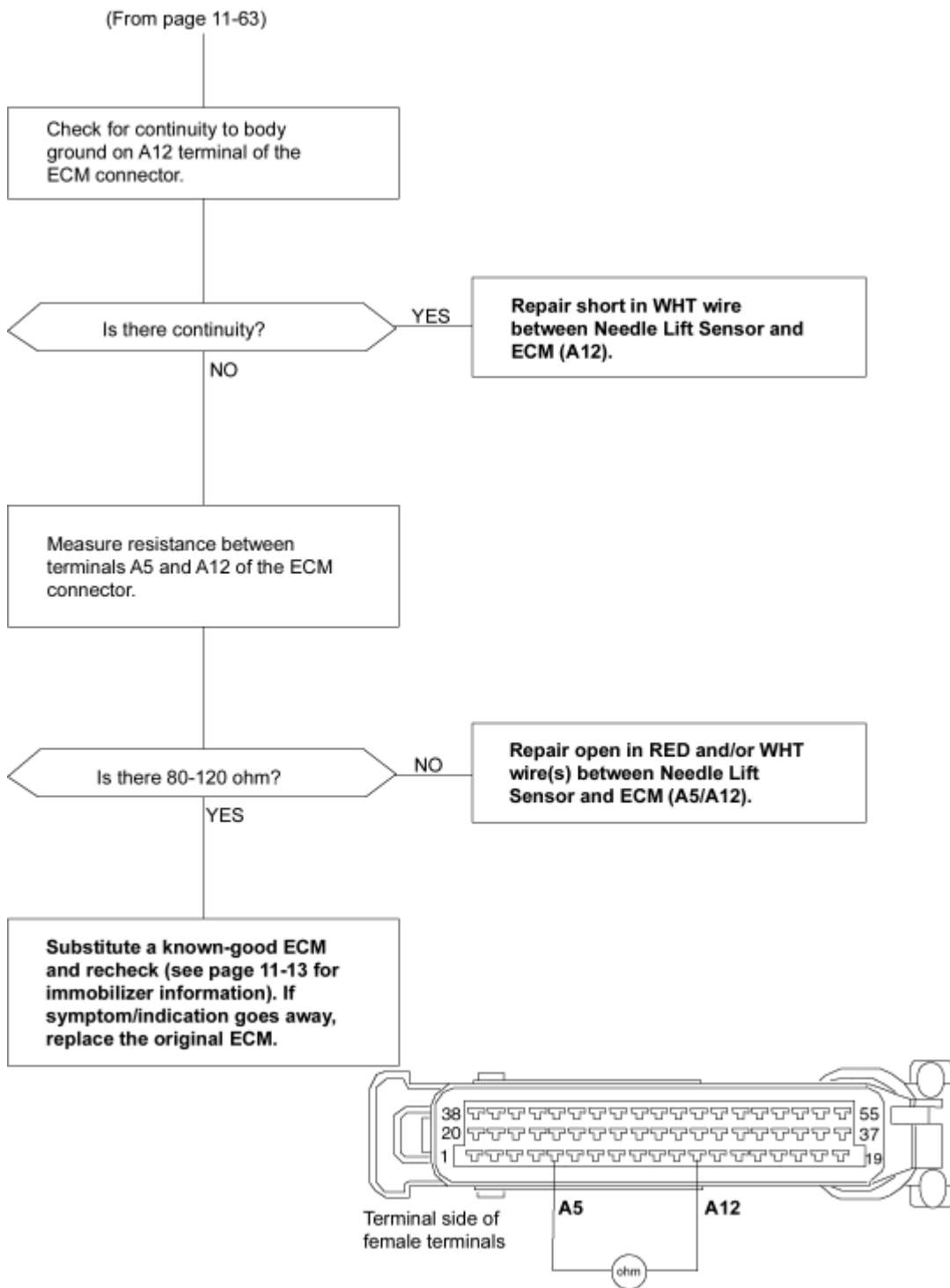
(To page 11-63)

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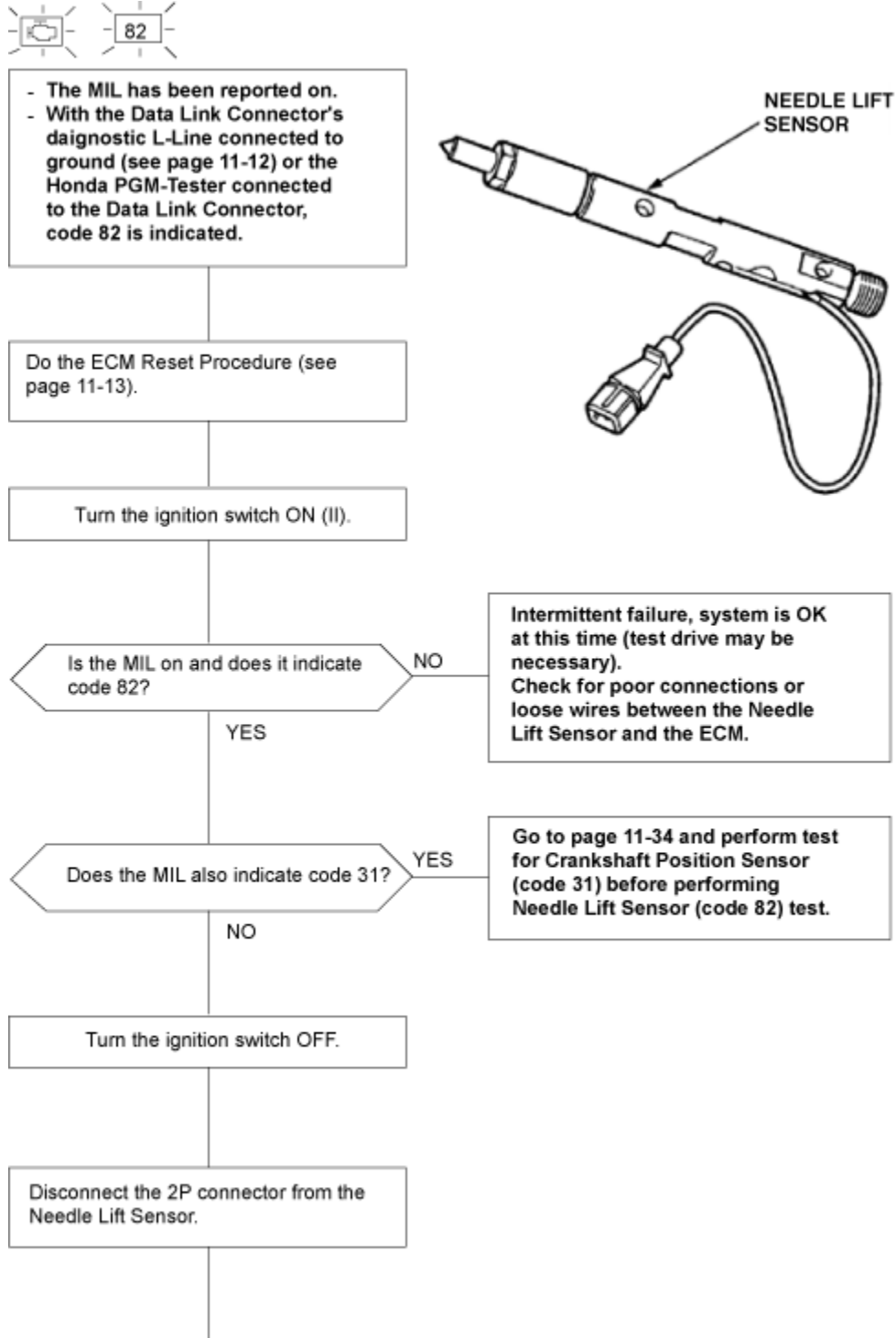




To go to the page referenced on the diagram above, click on the following:
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82 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 82: A problem in the Needle Lift Sensor circuit together with a problem in the Crankshaft Position Sensor circuit.

The needle lift sensor consists of a coil which surrounds the shaft of an extended injection needle. The coil is fed a DC supply from the ECM which produces a magnetic field. When the needle is moved under the influence of fuel pressure, the magnetic field is disturbed which induces an AC voltage in the coil. The induced voltage is sent to the ECM as a reference point for the start of the injection sequence.



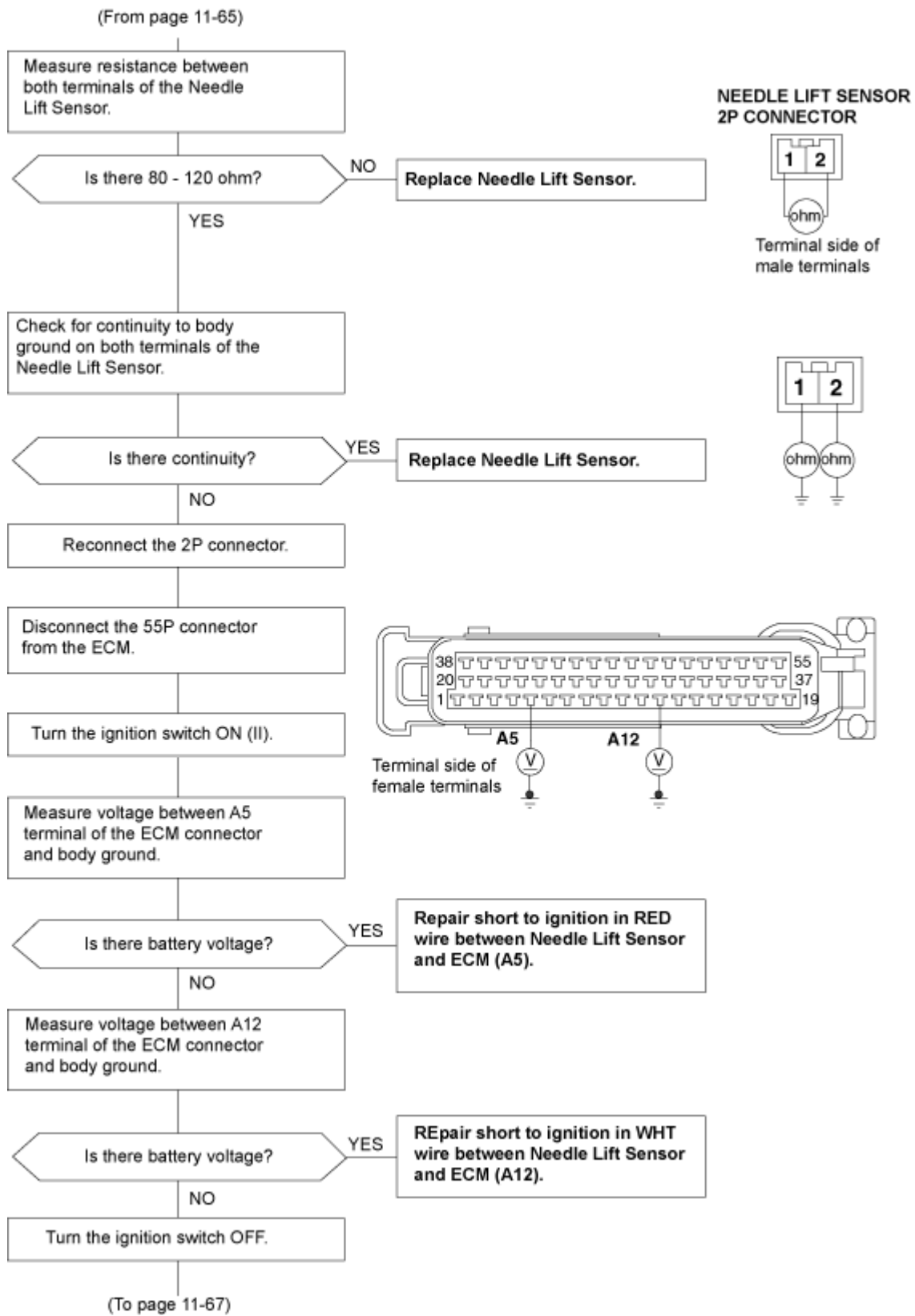
(To page 11-66)

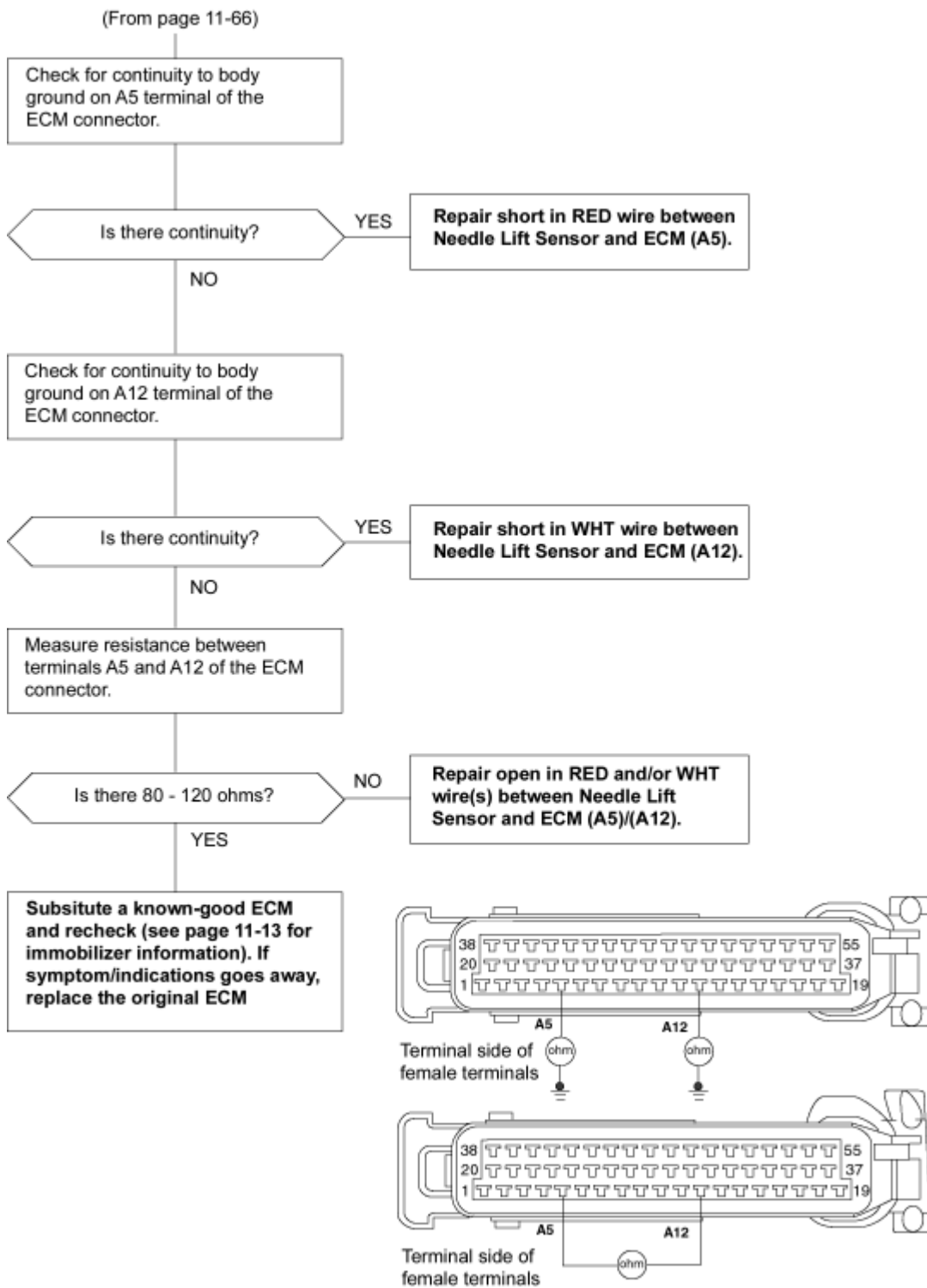
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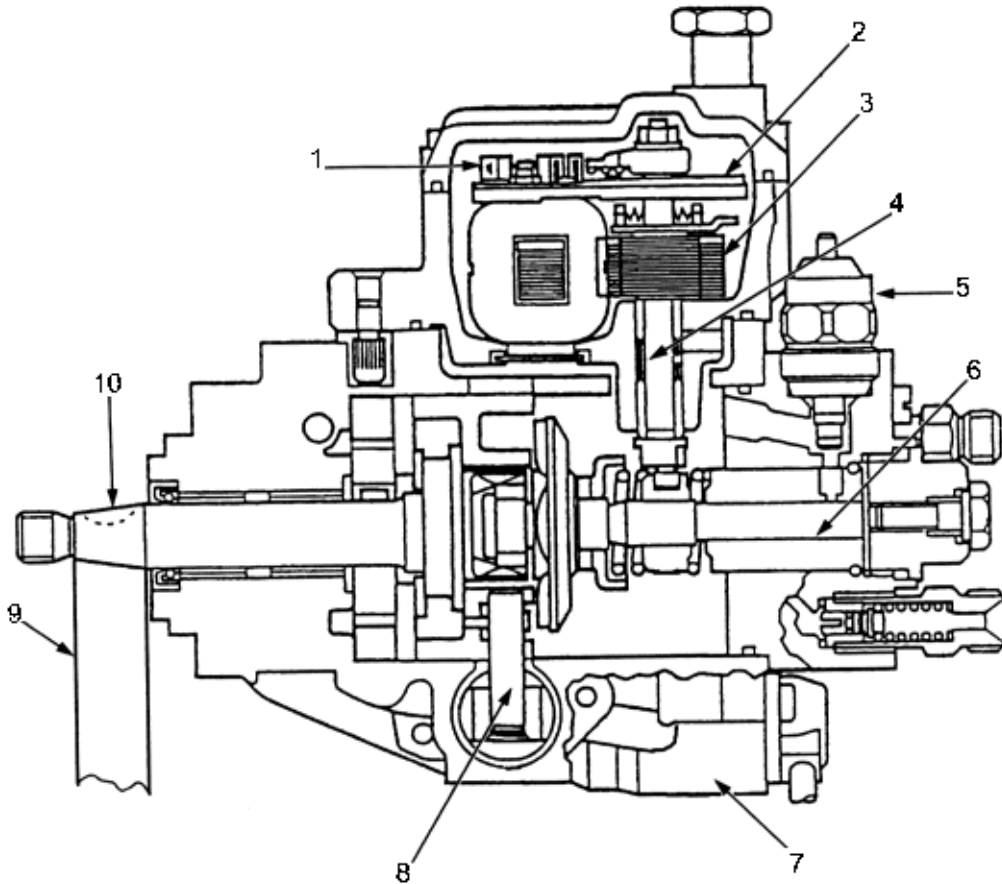
To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

NOTE: Across each row in the chart, the subsystems that could be sources of a symptom are ranked in the order they should be inspected starting with **1**. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system **2**, etc.

SUB-SYSTEM	FUEL LINES	FUEL INJECTION PUMP ASSEMBLY	FUEL FILTER	FUEL TIMING SOLENOID	FUEL QUANTITY SOLENOID	FUEL QUANTITY FEED-BACK SENSOR	FUEL SHUT-OFF SOLENOID	FUEL TEMPERATURE SENSOR	FUEL INJECTORS	GLOW/PLUGS/ COLD STARTING DEVICE
PAGE	11-72	11-77	11-76	11-87	11-100	11-92	11-89	11-82	11-73	11-79, 11-80
SYMPTOM										
ENGINE WILL NOT START			1	3			2			
DIFFICULT TO START ENGINE WHEN COLD			1	2						1
ROUGH IDLE			1						2	
FREQUENT STALLING			2						1	
MISFIRE OR TOUGH RUNNING	2	3							1	
LOSS OF POWER			2	3					1	
FUEL CONSUMPTION TOO HIGH		2							1	
KNOCKING IN ENGINE		2							1	

The Fuel Supply System contains the electronic Fuel Injection Pump Assembly (including fuel pump), fuel injectors, the fuel filter and the fuel tank. Additional sensors are located in the engine compartment in order to supply the control ECM with the necessary inputs to achieve an optimum in combustion.

Fuel Injection Pump Assembly



1. FUEL TEMPERATURE SENSOR
2. ACTUATOR FEEDBACK SENSOR
3. FUEL ACTUATOR
4. SPINDLE WITH OFFSET PIN
5. FUEL SHUT-OFF SOLENOID
6. PUMPING PLUNGER
7. INJECTION TIMING SOLENOID
8. INJECTION TIMING DEVICE
9. DRIVING BELT
10. INJECTION PUMP DRIVE SHAFT

The injection pump assembly is driven by a belt from the rear end of the camshaft and is a vane-type pump. The control spool is used for the delivery of fuel from the fuel injection pump to the injectors. The amount of fuel to be injected into the cylinders is also controlled by the control spool. At the top of the pump a fuel temperature sensor is located to keep the amount of fuel injected into the cylinders constant independent of the fuel density (varying to temperature). In case of any major fault the fuel shut-off solenoid cuts off the fuel supply to the injectors immediately.

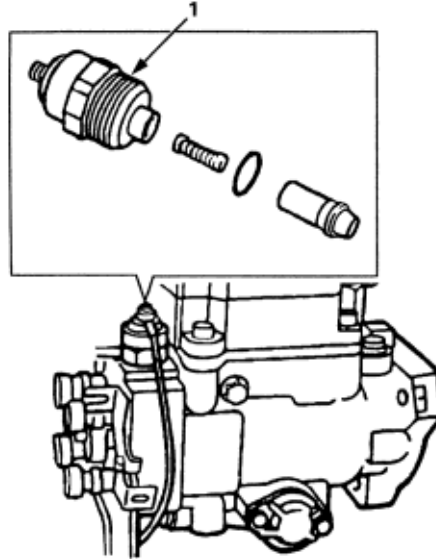
- Fuel Shut-off Solenoid (1)

The Fuel Shut-off Solenoid is used to cut off the fuel delivery immediately after the ECM detects any major fault or when a problem occurs in the power supply to the injection Pump Assembly.

When the engine is started, the Fuel Shut-off Solenoid is energised and opens the fuel delivery.

Diagnostic Trouble Code (DTC) 54 has been developed to detect a defect Fuel Shut-off Solenoid and/or a problem in its electrical circuit.

In case of failure the single Fuel Shut-of Solenoid can be replaced without replacing the entire Fuel Pump Assembly.



- Injection Timing Device and Injection Timing Solenoid

The timing device for the Injection Pump Assembly contains an Injection Timing Solenoid (1) and a spring loaded Pump Plunger (2) moving under the influence of pump working pressure.

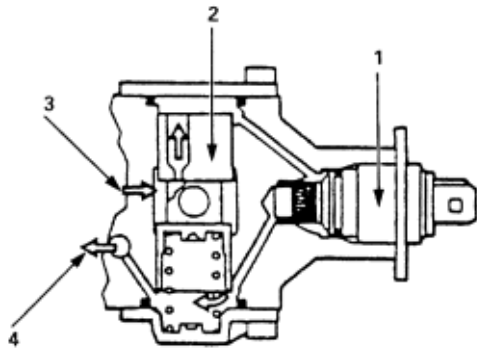
The timing solenoid is responsible for the 50 Hz "buzzing" sound when the ignition is turned on. The ECM controls injection timing by varying the operating frequency which alters the fuel pressure on the plunger and moves it against spring tension.

This motion changes the height of the plunger and therefore the ignition is retarded.

Injection timing is controlled by the ECM by comparing the signal from the Needle Lift Sensor (actual start of injection) with the Fuel Timing Solenoid. The ECM then alters the signal to the timing solenoid in order to correct injection timing. In case a change does not occur differs by a substantial amount the ECM assumes a fault and the amount of injected fuel will be reduced.

Diagnostic Trouble Code 34 has been developed for the Timing Solenoid to detect a defect Injection Timing Solenoid and/or a problem in its electrical circuits.

Injection timing device



1. INJECTION TIMING SOLENOID
2. SPRING LOADED PLUNGER
3. PUMP INTERNAL PRESSURE
4. PUMP FEED PRESSURE

- Fuel Quantity Solenoid and Control Spool

This unit is used to accurately control the amount of fuel delivered to the injectors. The amount of fuel is controlled by the use of a Fuel Quantity Solenoid (2) producing a magnetic field and causing the rotary magnet (mounted on an eccentric shaft) to rotate. This rotation is converted into a linear motion by the Control Spool (3). The Control Spool (3) position is proportional to the amount of fuel actually delivered to the injectors.

The Fuel Quantity Feedback Sensor (1) signals the quantity to the ECM. In case the fuel quantity actuator (B) is de-energised the return spring (4) causes the rotary magnet and eccentric shaft to move back to the initial position.

A failure of this sensor will cause the engine to stall or not to start as the ECM will activate the Fuel Shut-off Solenoid.

Diagnostic Trouble Code 64 has been developed to detect a defect Fuel Quantity Actuator or an electrical problem in this particular circuit.

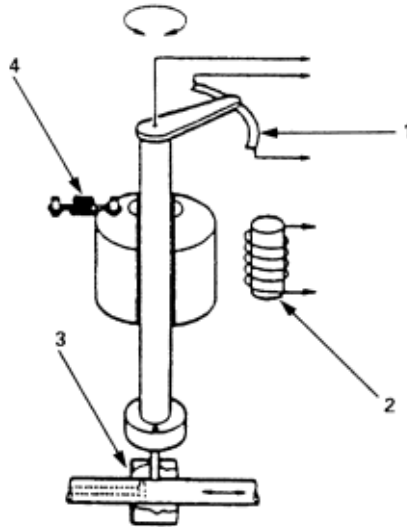
- Fuel Quantity Feedback Sensor (1)

The Fuel Quantity Feedback Sensor located inside the injection pump assembly above the eccentric shaft is a rotary potentiometer. This potentiometer signals the ECM information regarding the position of the control speed (3) and therefore the amount of fuel actually delivered to the injectors.

Failure of this sensor causes the engine to stall or not to start.

Diagnostic Trouble Codes (DTC) 61 and 62 have been developed to detect a defect Fuel Quantity Feedback Sensor or an electrical problem in its circuit. In case of a defect Fuel Quantity Feedback Sensor the complete fuel injection pump assembly has to be replaced.

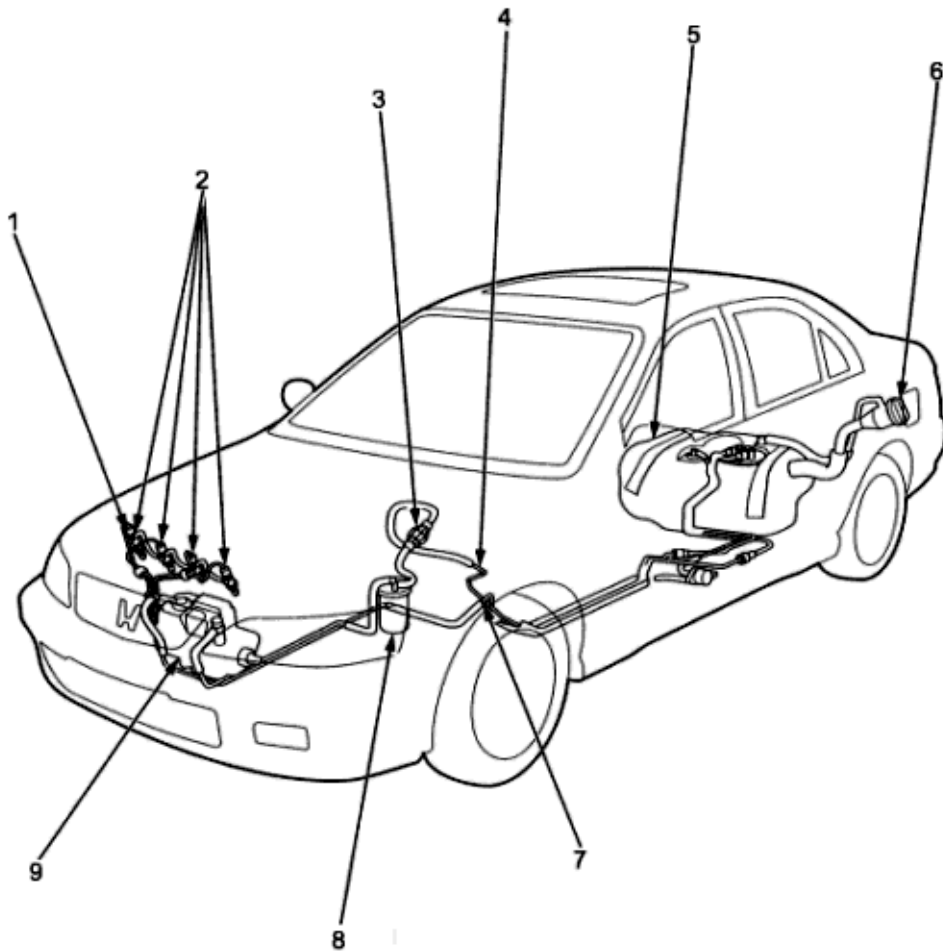
Quantity servo control unit



Inspection

1. Inspect the Fuel Hoses for damage, leaks interference or twisting.
2. Check the Fuel Lines for damage, tipping, rusting or leakage. Also check for bent Fuel Lines.
3. Check for leaks at Hose and line joints or connections and retighten if necessary.

NOTE: Check fuel system lines, hoses and fuel filter for damage, leaks or deterioration and replace if necessary.

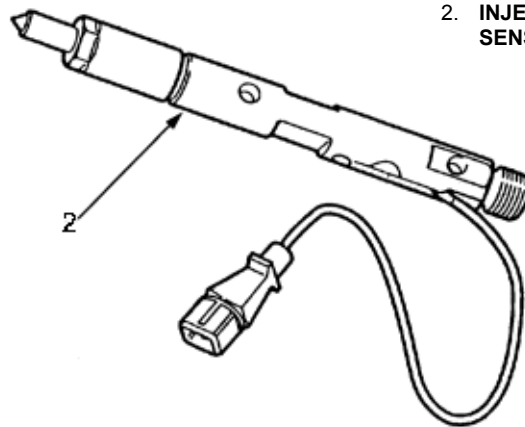
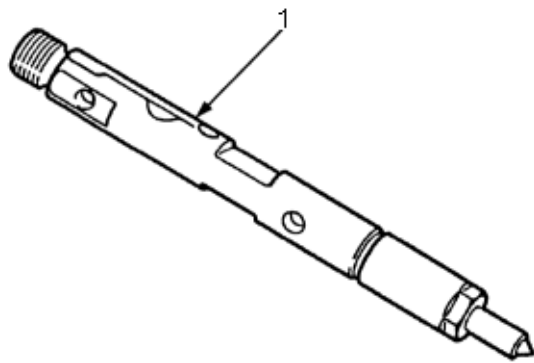


1. NEEDLE LIFT SENSOR
2. FUEL INJECTORS
3. HAND PRIMER
4. FUEL FEED PIPE
5. FUEL TANK
6. FUEL FILL CAP
7. FUEL RETURN PIPE
8. FUEL FILTER
9. FUEL INJECTION

Injectors

The "Two Stage Injectors" are spring loaded valves, operated by fuel pressure. Injectors 2-4 are of the same type, injector No. 1 has the needle lift sensor located on top of the injector.

If the fuel pressure is much higher than the counterforce from the spring, the valve opens very fast and an accurately controlled amount of fuel is injected into the cylinder. In order to optimise combustion the injected fuel is atomised at the multihole end of the injector. If fuel pressure falls below spring pressure the valve closes and the fuel injection is interrupted.



1. INJECTOR
2. INJECTOR WITH NEEDLE LIFT SENSOR

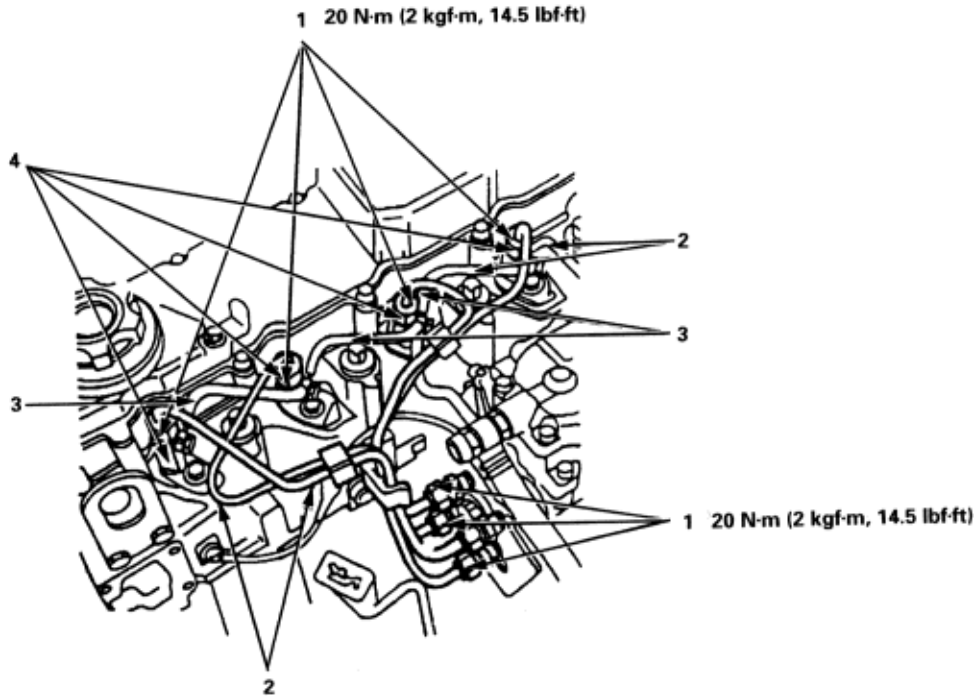
Injector No. 1 contains the needle lift sensor. This sensor consists of a coil which surrounds the extended shaft of the injector needle. This coil is fed with DC-voltage, therefore producing a magnetic field around the shaft. While the needle is moving under the influence of the fuel pressure the magnetic flux is disturbed. A certain amount of disturbance in the magnetic flux signals the ECM the actual start of injection.

Replacement

⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Disconnect battery earth lead.
2. Remove sound deadening pad.
3. Remove Intercooler Top Hose from Intake Manifold and Inlet Manifold Intake Pipe.
4. Slacken Injector Pipe Unions (1) at Fuel Injector and Injection Pump Assembly.
5. Remove Injection Pipes (2).
6. Remove the spill return pipes (3).
7. Remove the Fuel Injectors (4).
8. Disconnect the fuel rail.



Refit:

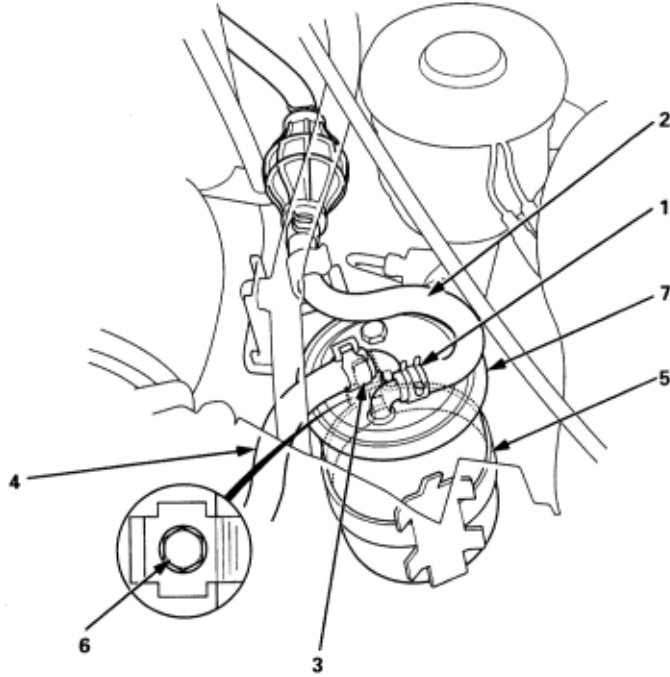
8. Clean Fuel Injectors and Injector Seat in cylinder head.
9. Fit new sealing washer to each Fuel Injector and fit Fuel Injectors to cylinder head.
10. Fit the Injector Clamp Plate and tighten Injector Clamp Plate bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).
11. Connect spill return pipes to Fuel Injectors and secure retaining clips.
12. Tighten Injector Pipes to Injector Unions to 20 Nm (2 kgf/m, 14.5 lbf/ft).
13. Tighten Injector Pipes to Injection Pump Unions to 20 Nm (2 kgf/m, 14.5 lbf/ft).
14. Fit Inlet Manifold Intake Pipe and tighten bolts to 20 Nm (2 kgf/m, 14.5 lbf/ft).
15. Fit EGR recirculation pipe to Inlet Manifold and tighten to 25 Nm (2.5 kgf/m, 18 lbf/ft).
16. Fit bolt securing Inlet Manifold Intake Pipe to camshaft cover and tighten to 9 Nm (0.9 kgf/m, 6.5 lbf/ft).
17. Connect Intercooler Top Hose to Inlet Manifold and tighten clip.
18. Position sound deadening pad and connect battery earth lead.

Replacement

⚠ WARNING

Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area.

1. Disconnect battery earth lead.
2. Place a shop towel under and around the Fuel Filter.
3. Release the clip (1) and remove fuel outlet hose (2) from Fuel Filter.
4. Release the clip (3), and remove fuel feed hose (4) from Fuel Filter.
5. Remove the Fuel Filter bracket (5) from body mounting.



6. Slacken clamp bolt (6) from Fuel Filter bracket.
7. Remove Fuel Filter (7).
8. Refit in the reverse order of removal and use new washers.

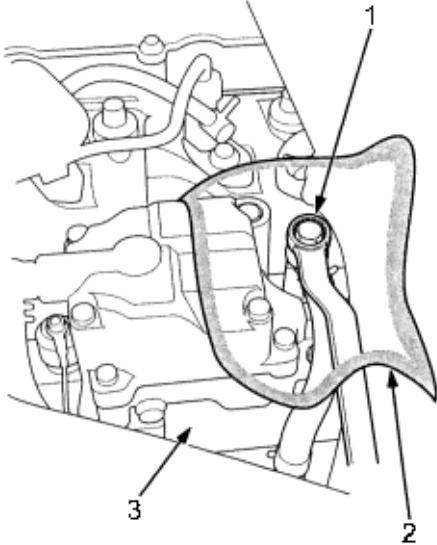
Testing



WARNING

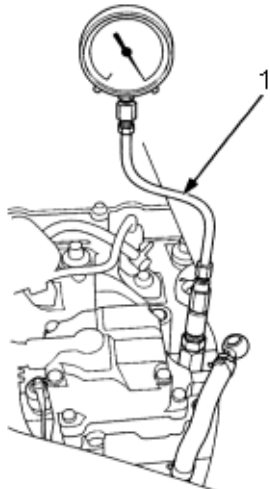
Do not smoke while working on the fuel system. Keep open flame or sparks away from the work area. Be careful when working with diesel fuels. Some people can experience severe allergic reactions.

1. Place a rag or shop towel over the fuel bleeding bolt on the fuel injection pump assembly.
2. Remove the fuel bleeding bolt.



1. FUEL BLEEDING BOLT
2. SHOP TOWEL
3. FUEL INJECTION PUMP ASSEMBLY

3. Attach the fuel supply tester



1. FUEL SUPPLY TESTER
(Commercially available)

4. Start the engine, measure the fuel vacuum pressure at idle.

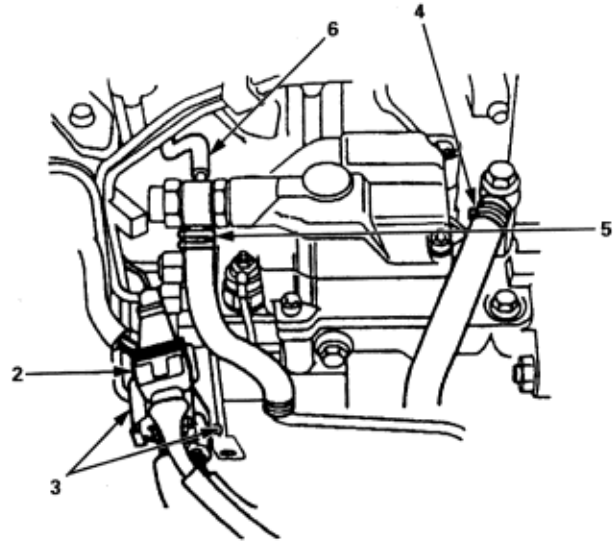
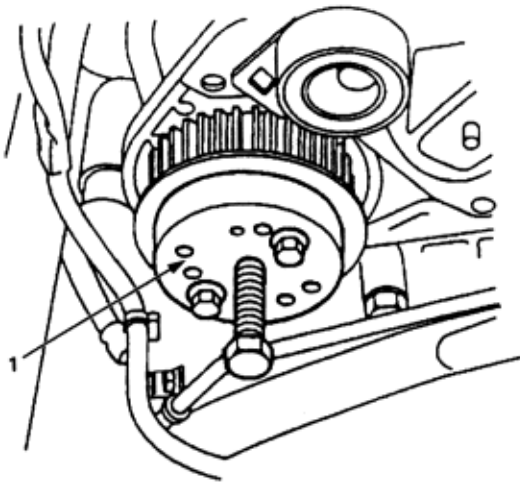
**Vacuum pressure should be:
more than 30 kPa (230 mmHg, 9in Hg)**

NOTE: The engine will stop because fuel will have been consumed in the fuel injection pump assembly, measure the fuel vacuum pressure soon after starting the engine.

If the fuel vacuum pressure is not as specified, replace the fuel injection pump assembly.

Replacement

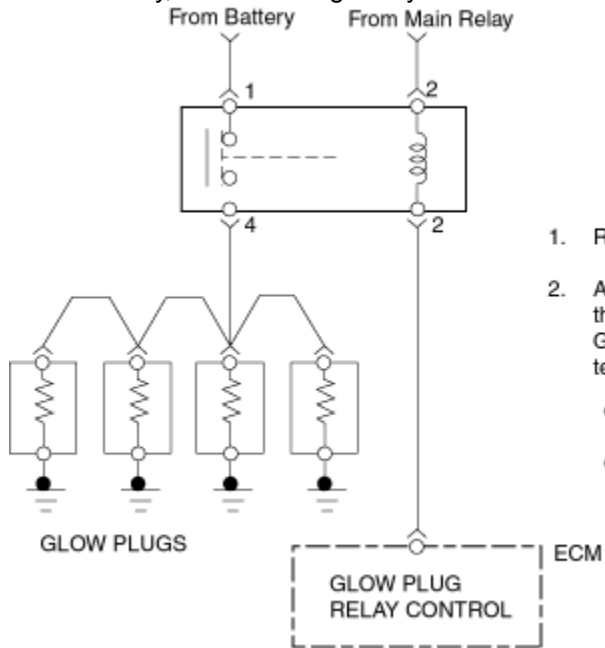
1. Disconnect battery earth lead and sound deadening pad.
2. Remove Injector Pump Assembly timing belt (MAINTENANCE).
3. Loosen Injection Pump Assembly shaft clamp bolt, remove spacer and tighten clamp bolt again to 31 Nm (3.1 kgf/m, 22.5 lbf/ft).
4. Remove Injection Pump Assembly drive gear regaining nut 60 Nm (6.0 kgf/m, 43.5 lbf/ft).
5. Remove locking pin from drive gear.
6. Use special tool (1) to remove drive gear from tapes.
7. Remove Intercooler Hose and EGR recirculation pipe 9 Nm (0.9 kgf/m, 6.5 lbf/ft) from Inlet Manifold Intake Pipe.
8. Remove Inlet Manifold Intake Pipe from manifold chamber 25 Nm (2.5 kgf/m, 18 lbf/ft).
9. Disconnect multiplug (2) from Needle Lift Sensor and multiplugs (3) from Fuel Injection Pump Assembly.
10. Remove fuel feed hose (4), fuel return hose (5) and spill return hose (6).
11. Remove Injector Pipe Unions (REPLACEMENT OF INJECTORS).
12. Remove Fuel Injector Pump Assembly.
13. Refit in the reverse order of removal and discard gaskets. Position new spacer beneath clamp bolt (sec 3.) and tighten bolt to 25 Nm (2.5 kgf/m, 18 lbf/ft).



When the ignition switch is turned on the Glow Plug Relay is energised and a Glow Plug Indicator Lamp in the gauge assembly illuminates. The Glow Plug Relay supplies current from the battery to the four Glow Plugs to increase the temperature of the compressed air in the cylinder to ignition point, especially at cold starting

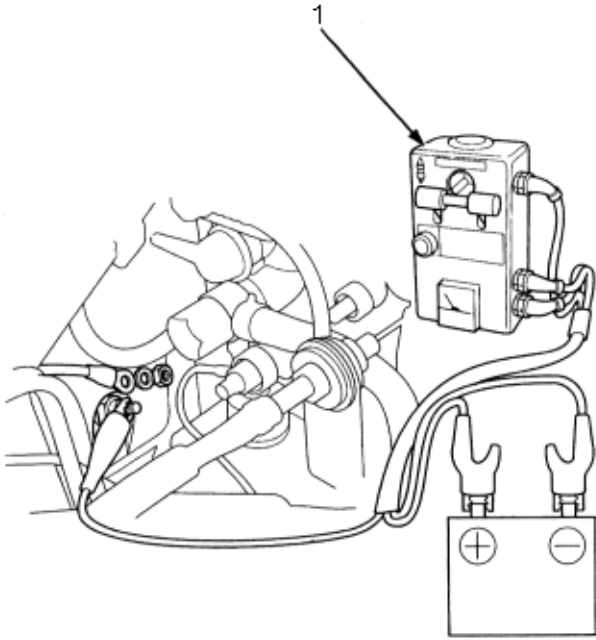
Relay Testing

1. Remove the Glow Plug Relay.
2. Attach the battery positive terminal to the No. 4 terminal and the battery negative terminal to the No. 2 terminal of the Glow Plug Relay. Then check for continuity between the No. 1 terminal and No. 3 terminal.
 - ? If there is no continuity, replace the Glow Plug Relay and retest.
 - ? If there is continuity, the Glow Plug Relay is OK.



1. Remove the Glow Plug Relay.
2. Attach the battery positive terminal to the No. 4 terminal and the battery negative terminal to the No. 2 terminal of the Glow Plug Relay. Then check for continuity between the No. 1 terminal and No. 3 terminal.
 - If there is continuity, replace the Glow Plug Relay and retest.
 - If there is continuity, The Glow Plug Relay is OK.

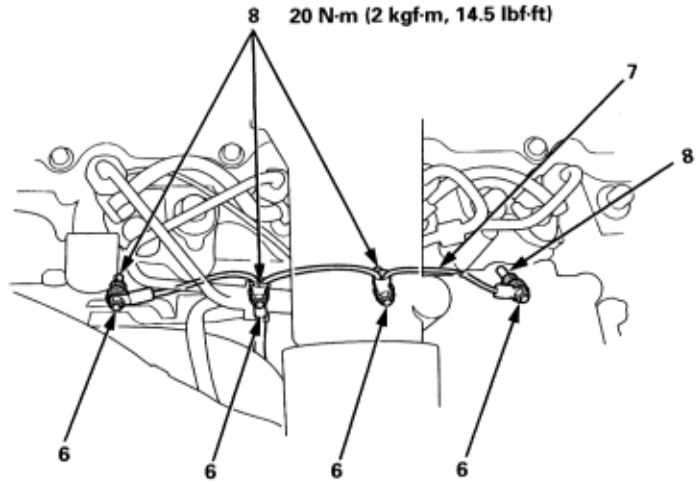
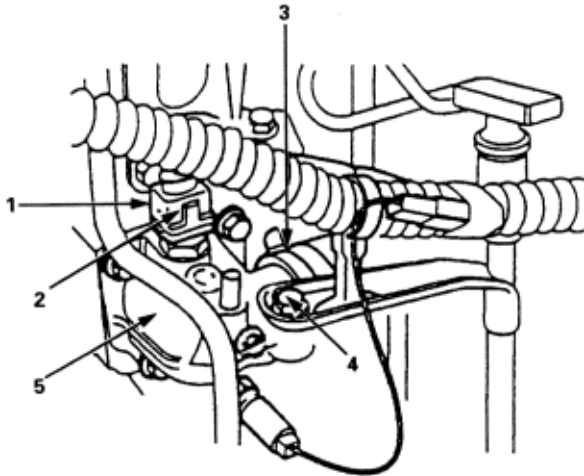
1. Isolate all the glow plugs from each other and from their supply by disconnecting all the electrical wires.
2. Connect the glow plugs tester.



1. GLOW PLUGS TESTER
(Commercially available)
 3. Depress the "TEST" button and note the initial current drawn and how long the current takes to stabilise by observing the LED's which illuminate at five second intervals
 4. Repeat and record results on all glow plugs.
 5. When the test button is pressed, the ammeter needle will initially read about 25 amps but will quickly start to fall. The needle will then stabilise after a short time.
Current should be:
Initial current draw approximately 25 amps.
Current draw after 20 seconds 11 to 12 amps.
- ? If out of spec, replace the glow plug.

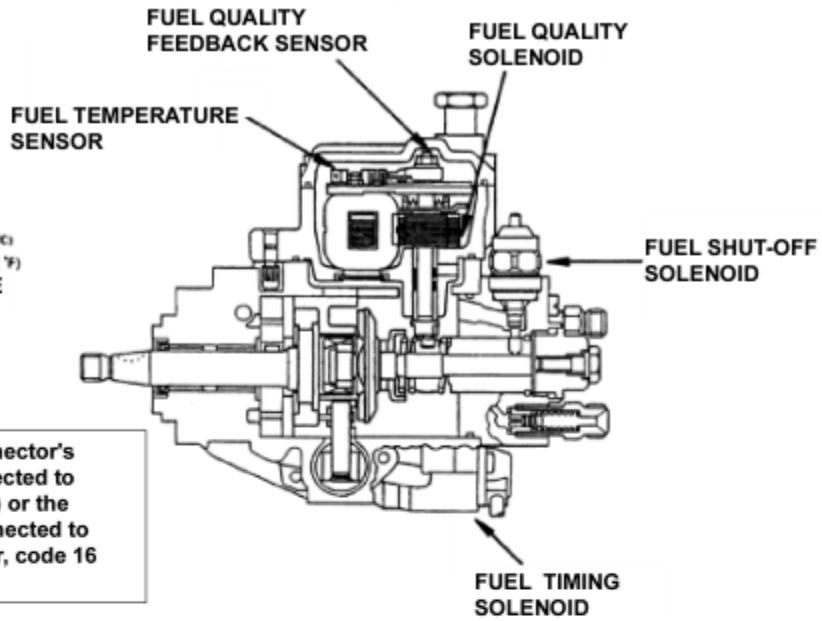
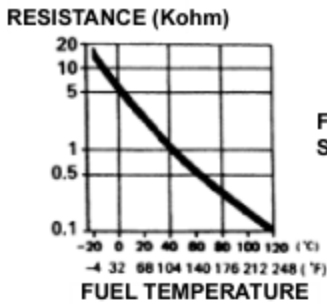
Replacement

1. Remove battery earth lead.
2. Remove sound deadening pad.
3. Remove Intercooler Top Hose from Intake Manifold.
4. Remove alternator (only for models with a/c ELECTRICAL). Drain cooling system.
5. Disconnect engine coolant temperature sensor connector (1).
6. Remove engine coolant temperature sensor (2) from harness.
7. Remove radiator top hose (3) from coolant outlet elbow.
8. Remove bolt (4) 25 Nm (2.5 kgf/m, 18 lbf/ft) securing the dipstick tube bracket to the coolant outlet elbow.
9. Unscrew 4 bolts and remove coolant outlet elbow (5).
10. Remove nuts (6), glow plugs leads (7) and Glow Plugs (8) 20 Nm (2 kgf/m, 14.5 lbf/ft).
11. Refit in the reverse order of removal.



16 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 16: A problem in the Fuel Temperature Sensor circuit (signal below setpoint).

The Fuel Temperature Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the fuel temperature increases as shown below. The Fuel Temperature Sensor is located inside the fuel injection pump assembly



16

With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12) or the Honda PGM-Tester connected to the Data Link Connector, code 16 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Turn the ignition switch ON (II).

Does the MIL indicate code 16?

NO

Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the Fuel Injection Pump Assembly (Fuel Temperature Sensor).

YES

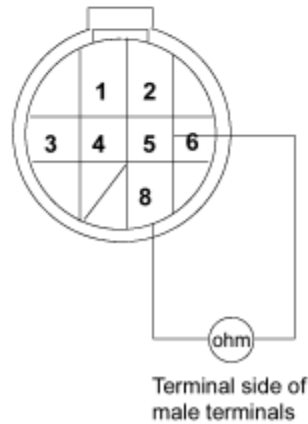
Warm up engine to normal operating temperature (the radiator fan comes on).

Turn the ignition switch OFF.

Disconnect the 8P connector from the Fuel Injection Pump Assembly connector.

Measure resistance between terminal 5 and terminal 8 of the Fuel Injections Pump Assembly connector.

FUEL INJECTION PUMP ASSEMBLY 8P CONNECTOR

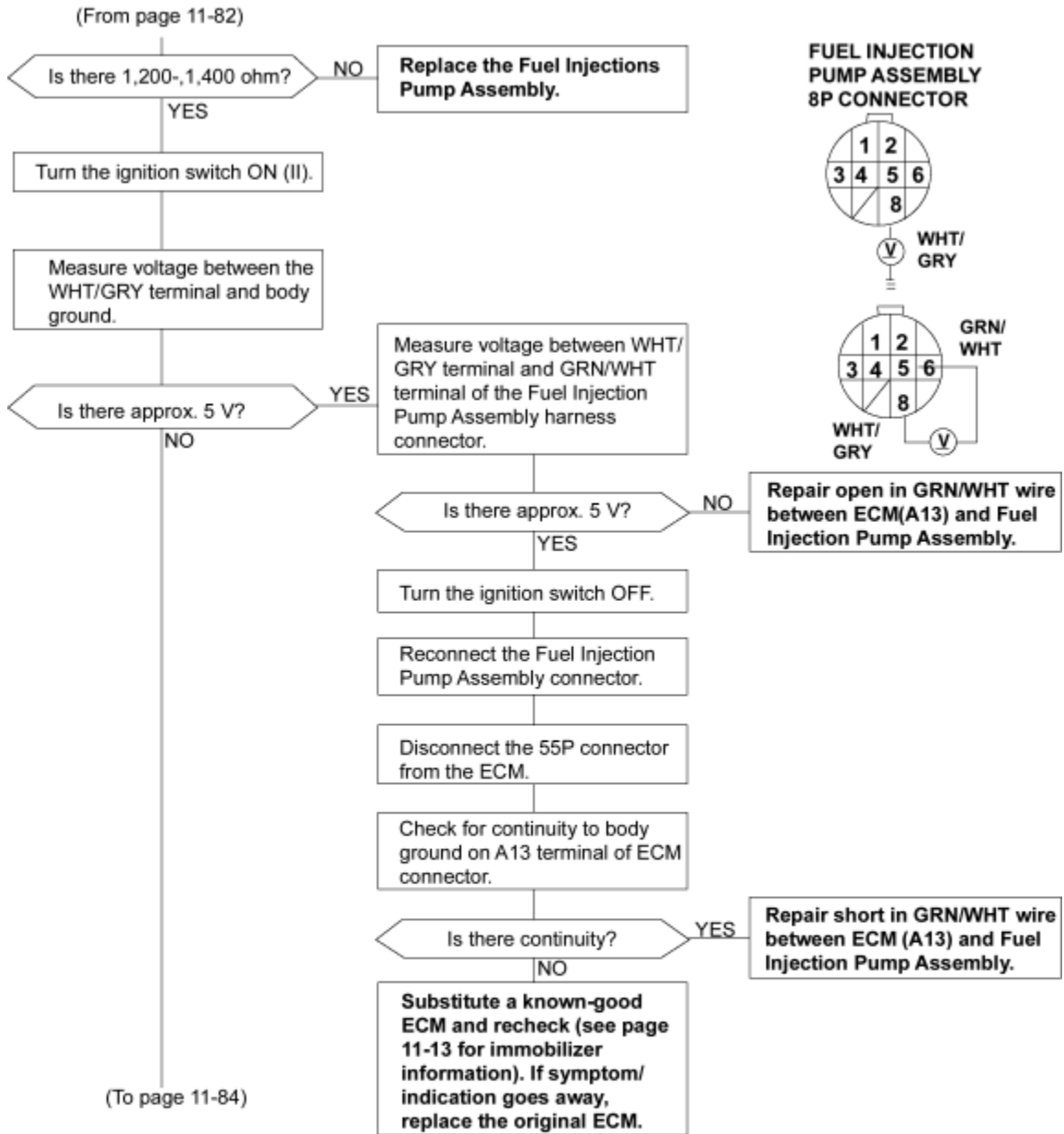


(To page 11-83)

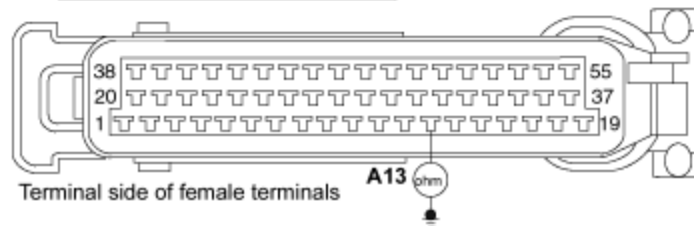
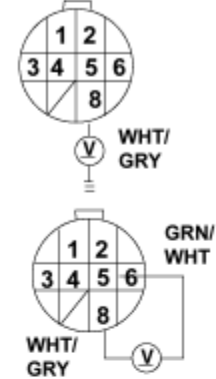
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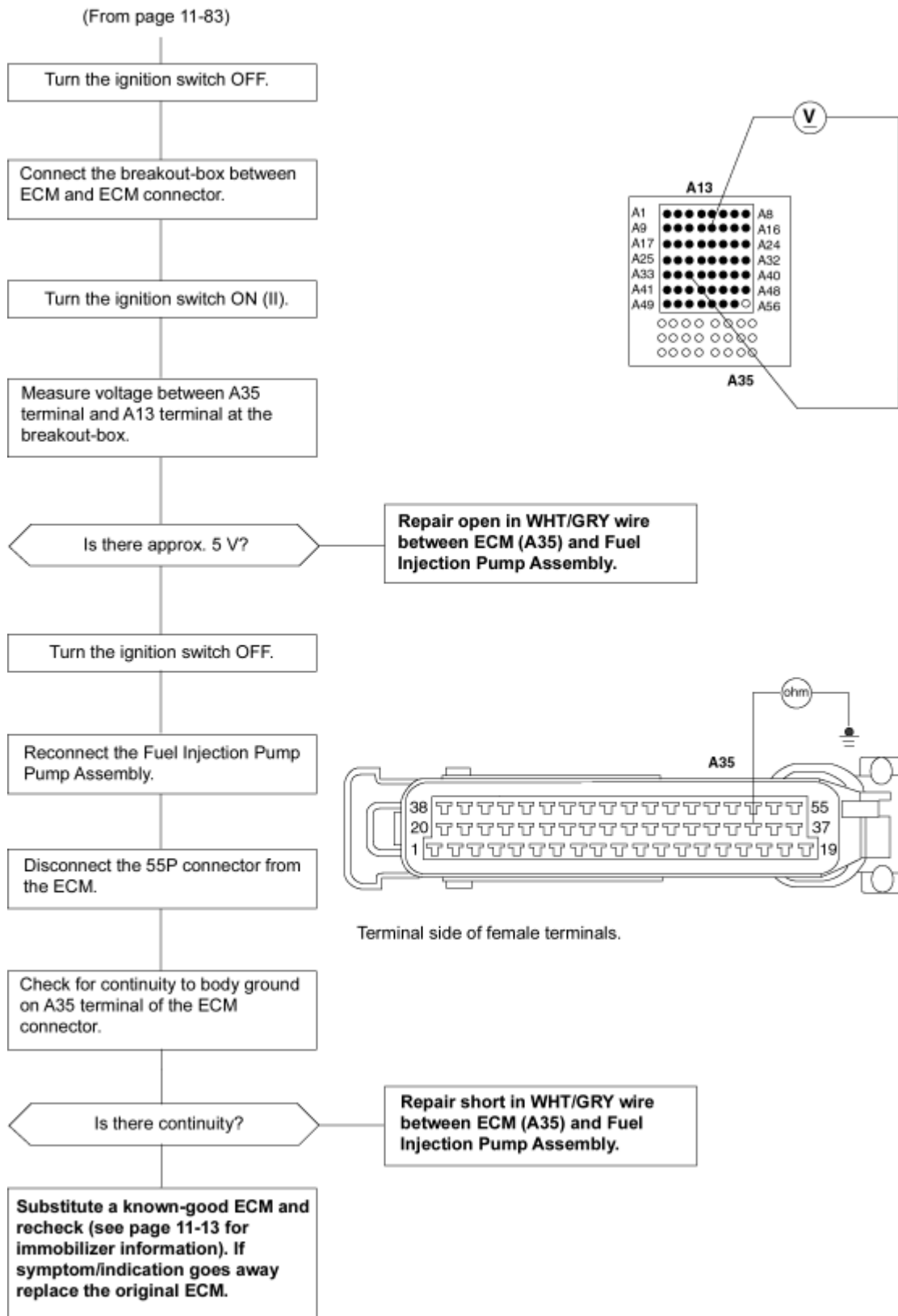
(See Page 11-12)

(See Page 11-13)



FUEL INJECTION PUMP ASSEMBLY 8P CONNECTOR

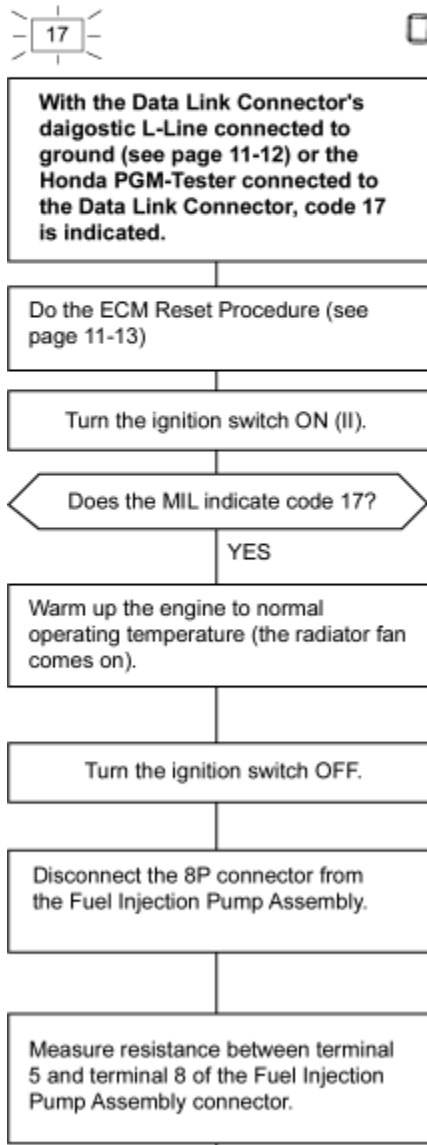
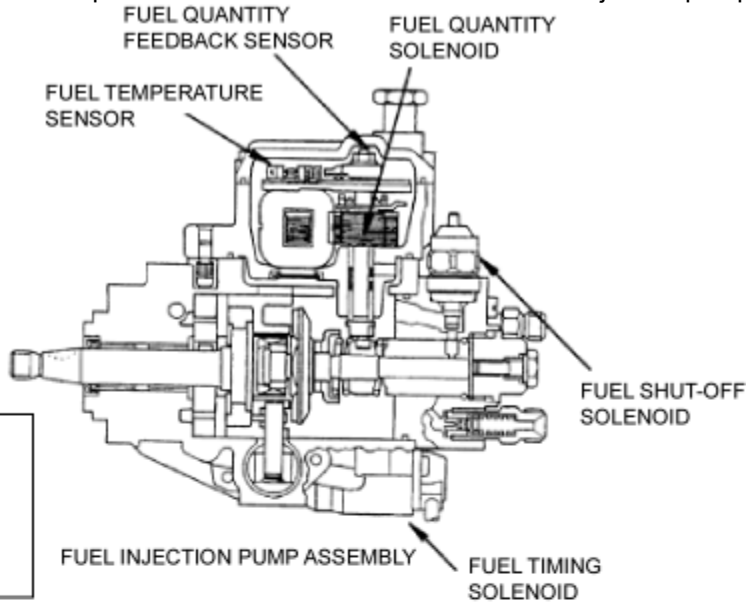
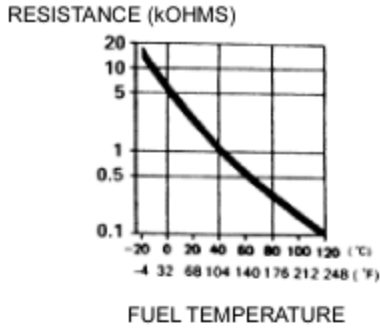




To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

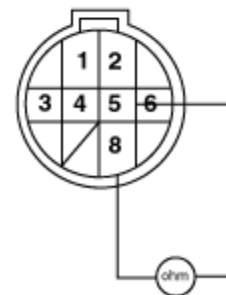
17 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 17: A problem in the Fuel Temperature Sensor circuit (signal above setpoint).

The Fuel Temperature Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the fuel temperature increases as shown below. The Fuel Temperature Sensor is located inside the fuel injection pump assembly



Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the Fuel Injection Pump Assembly (Fuel Temperature Sensor).

FUEL INJECTION PUMP ASSEMBLY 8P CONNECTOR



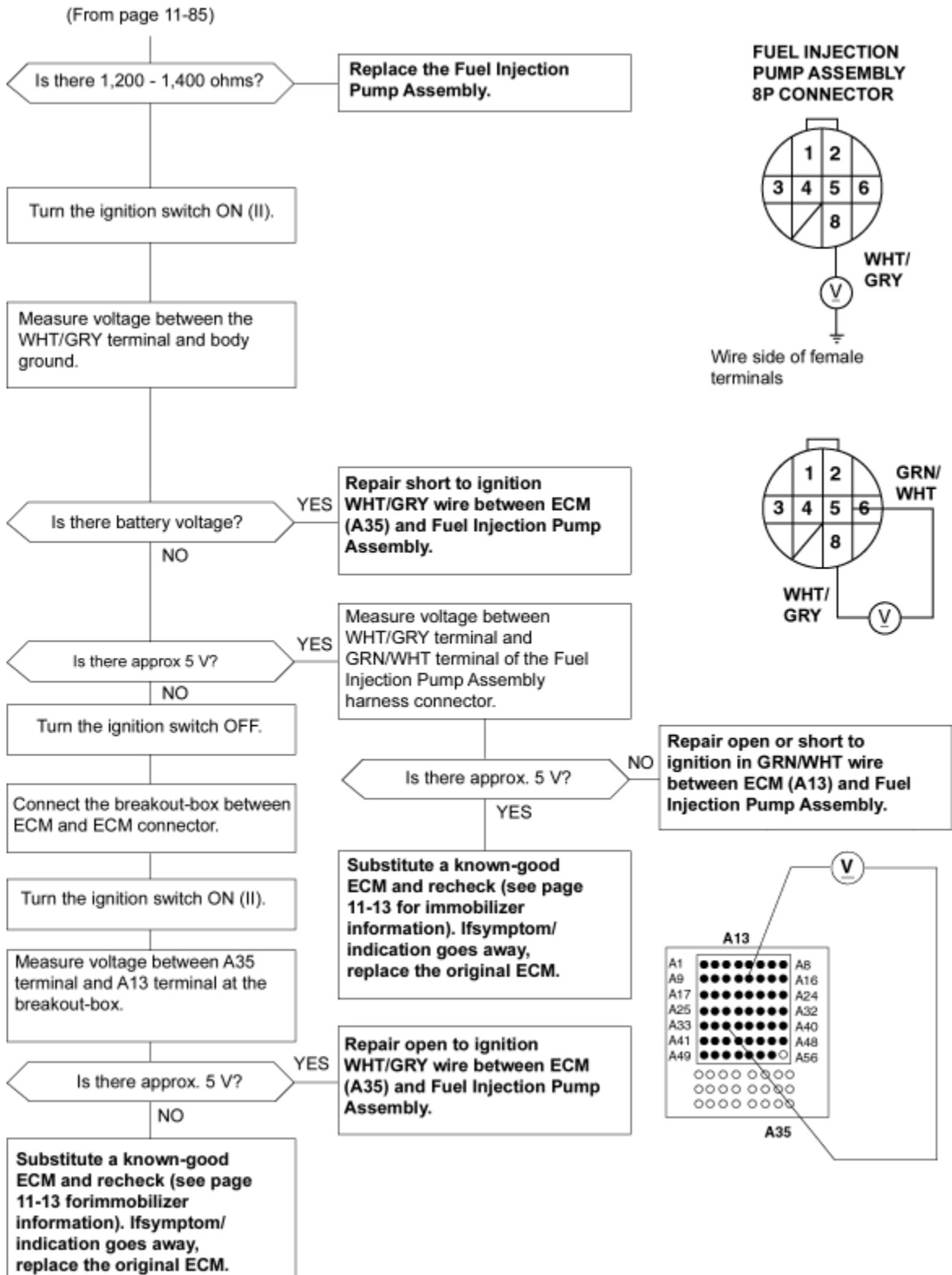
Terminal side of male terminals

(To page 11-86)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

(See Page 11-13)

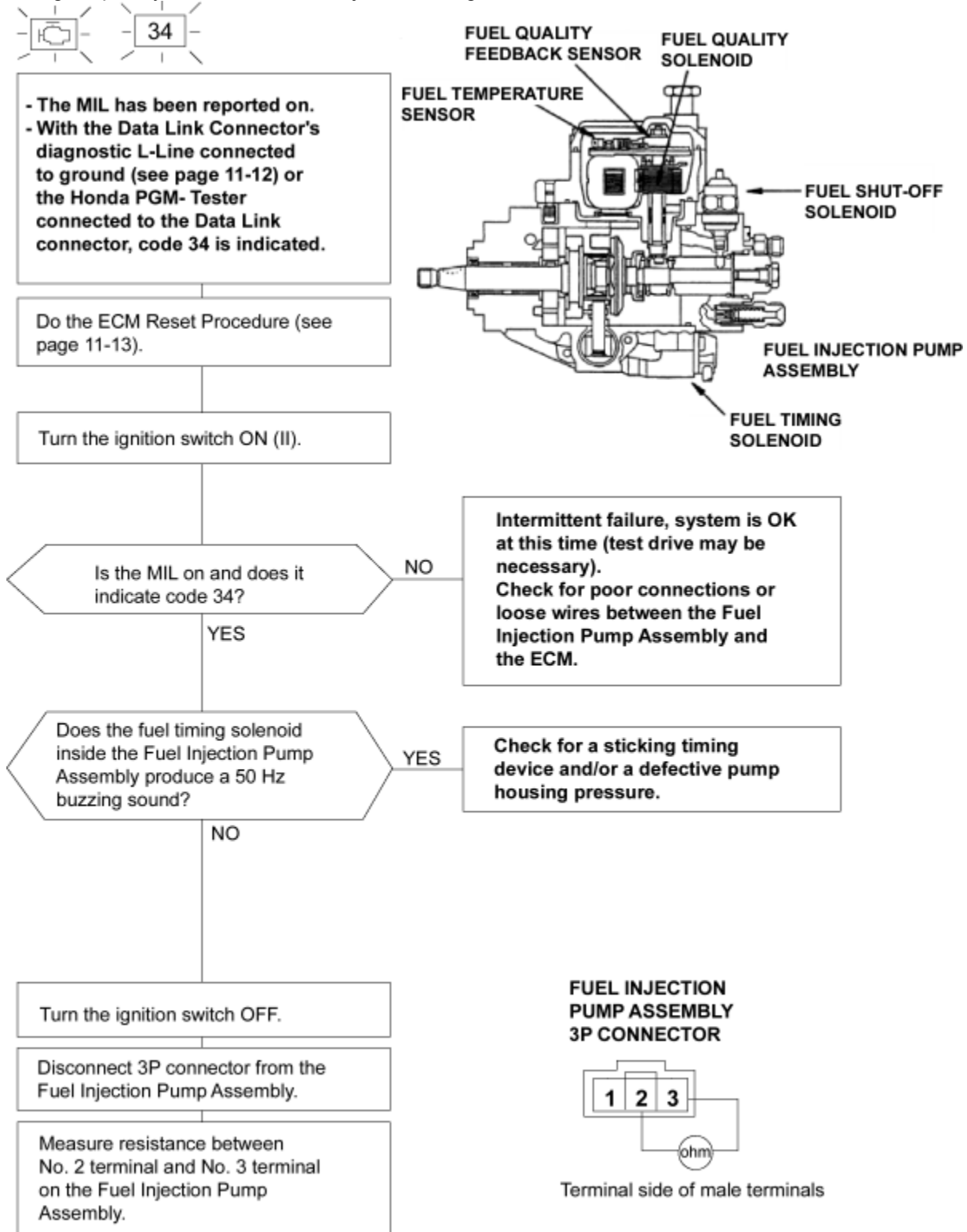


To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

34 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 34: A problem in the Fuel Timing circuit.

The Fuel Timing Solenoid is controlled by the ECM to provide optimum fuel injection timing. The solenoid operates at 50 Hz and by varying the operating frequency the ECM controls injection timing.

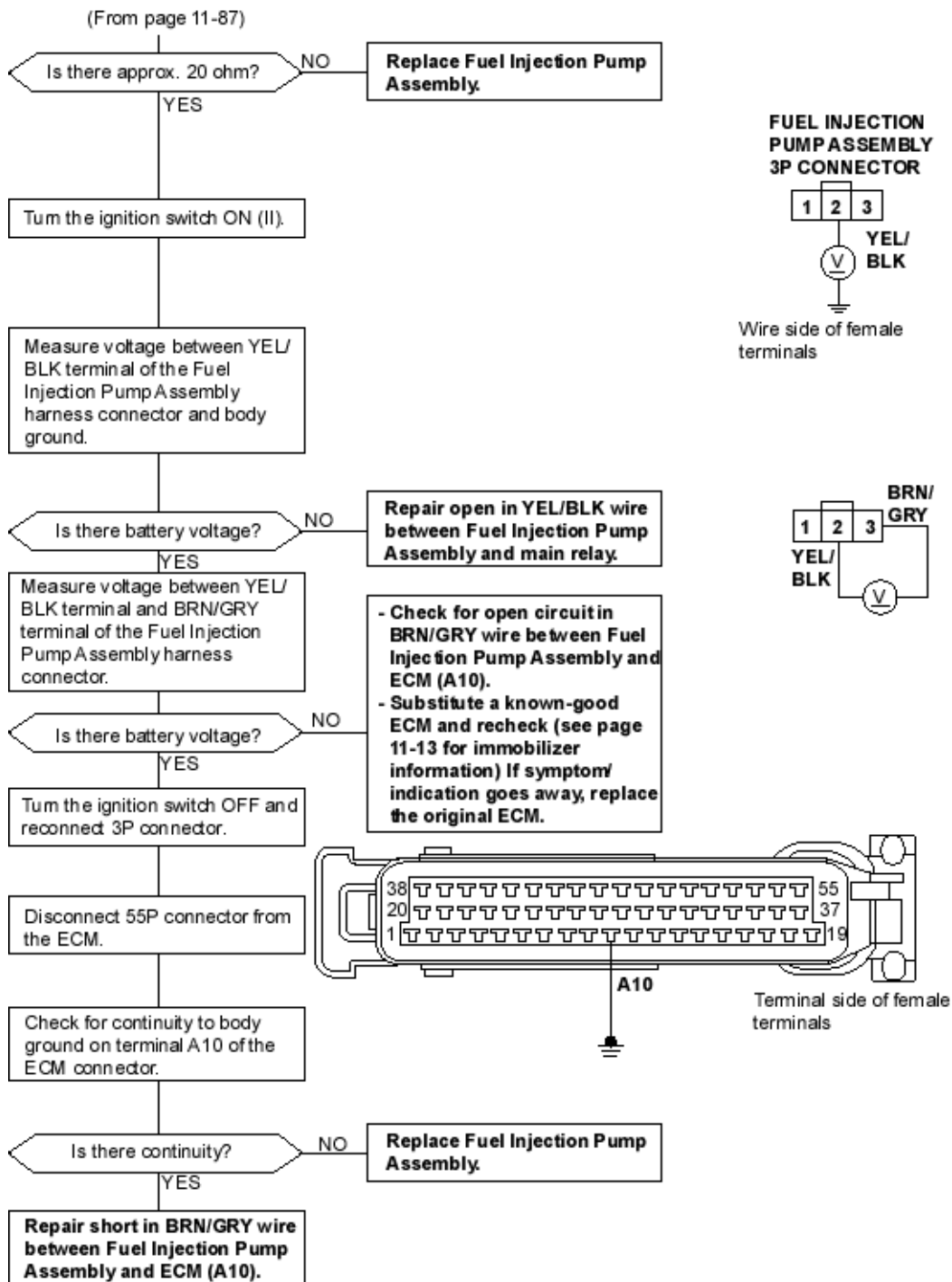


(To page 11-88)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

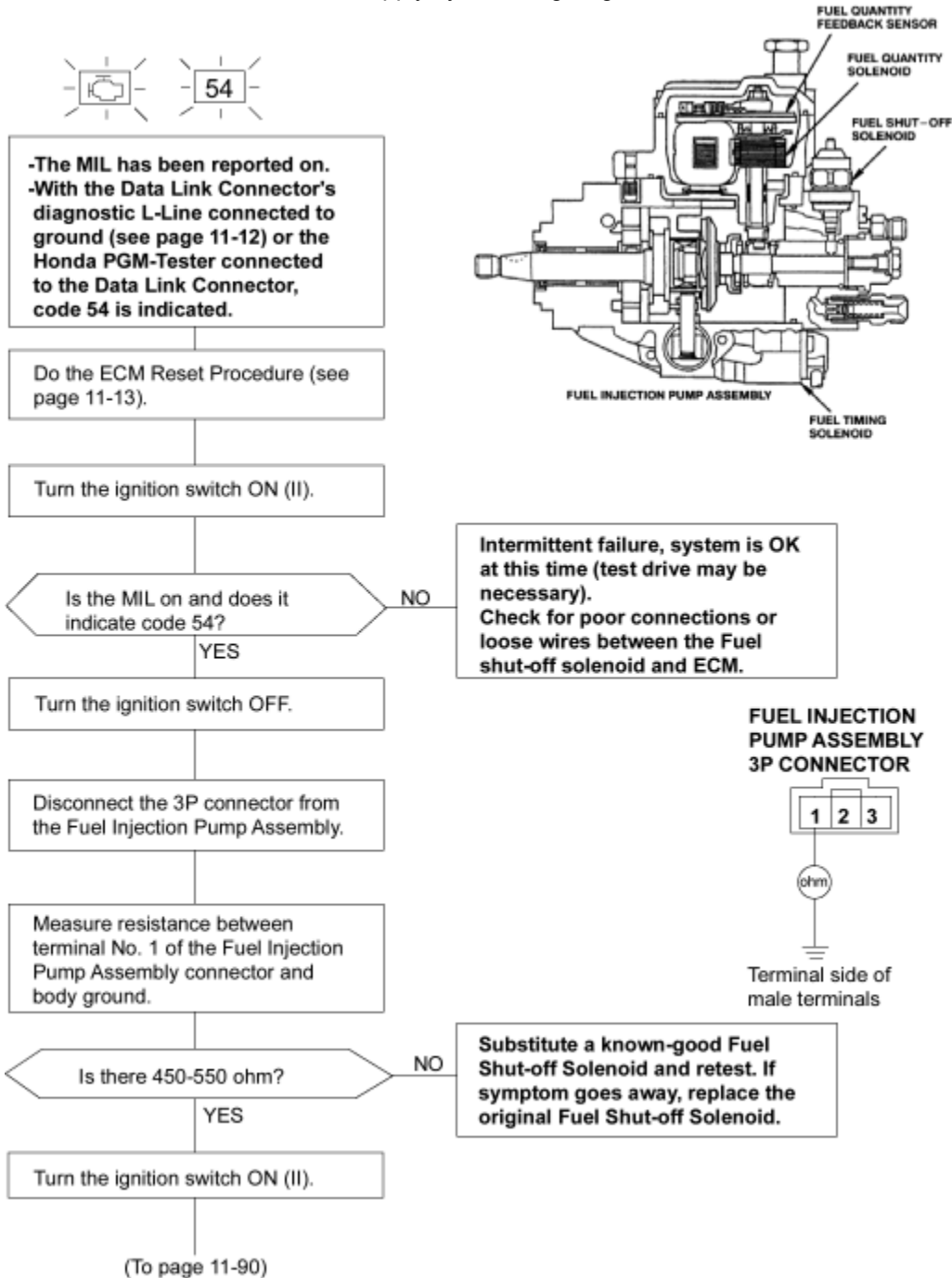
(See Page 11-13)



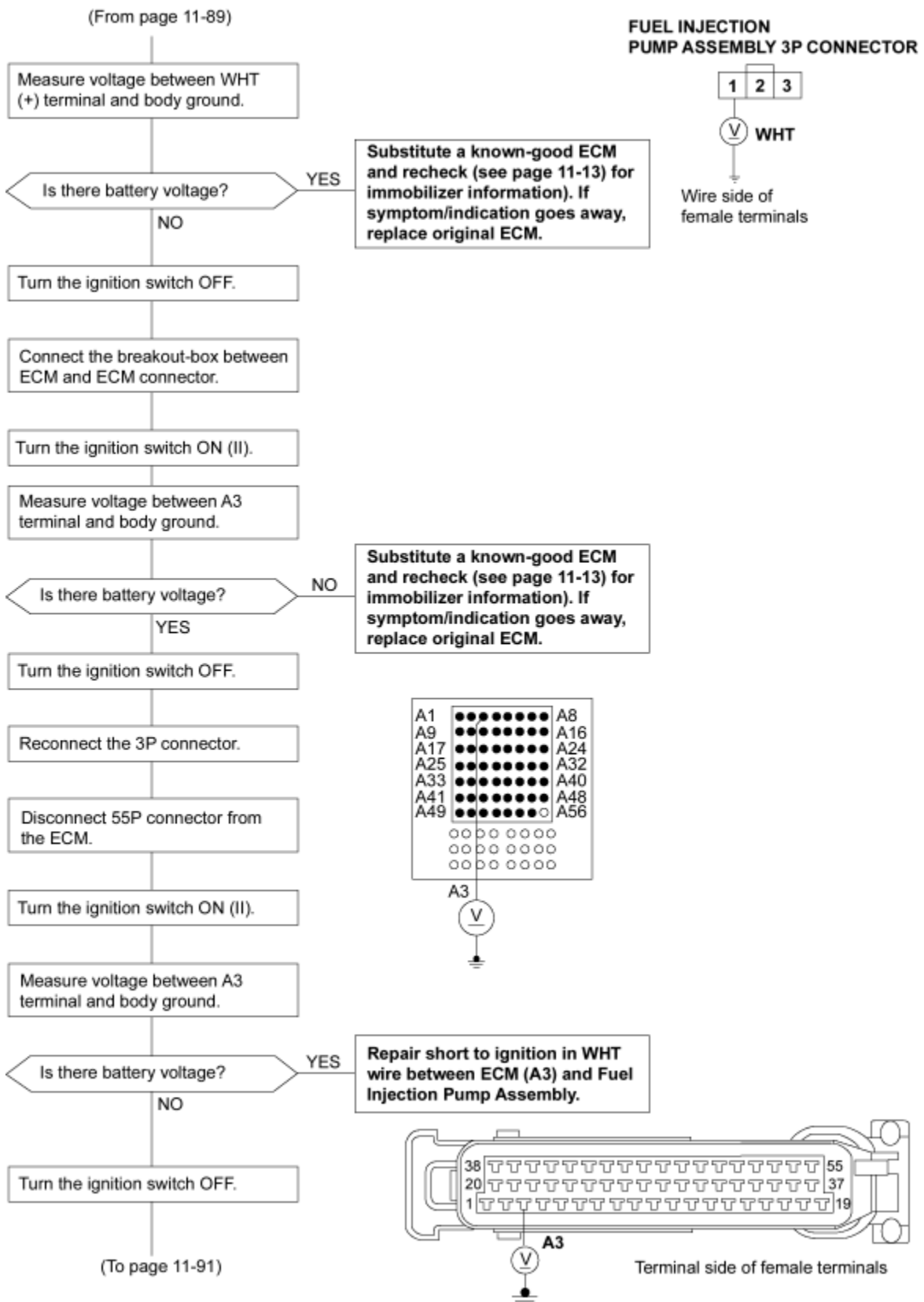
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

54 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 54: A problem in the Fuel Shut-off Solenoid (defective).

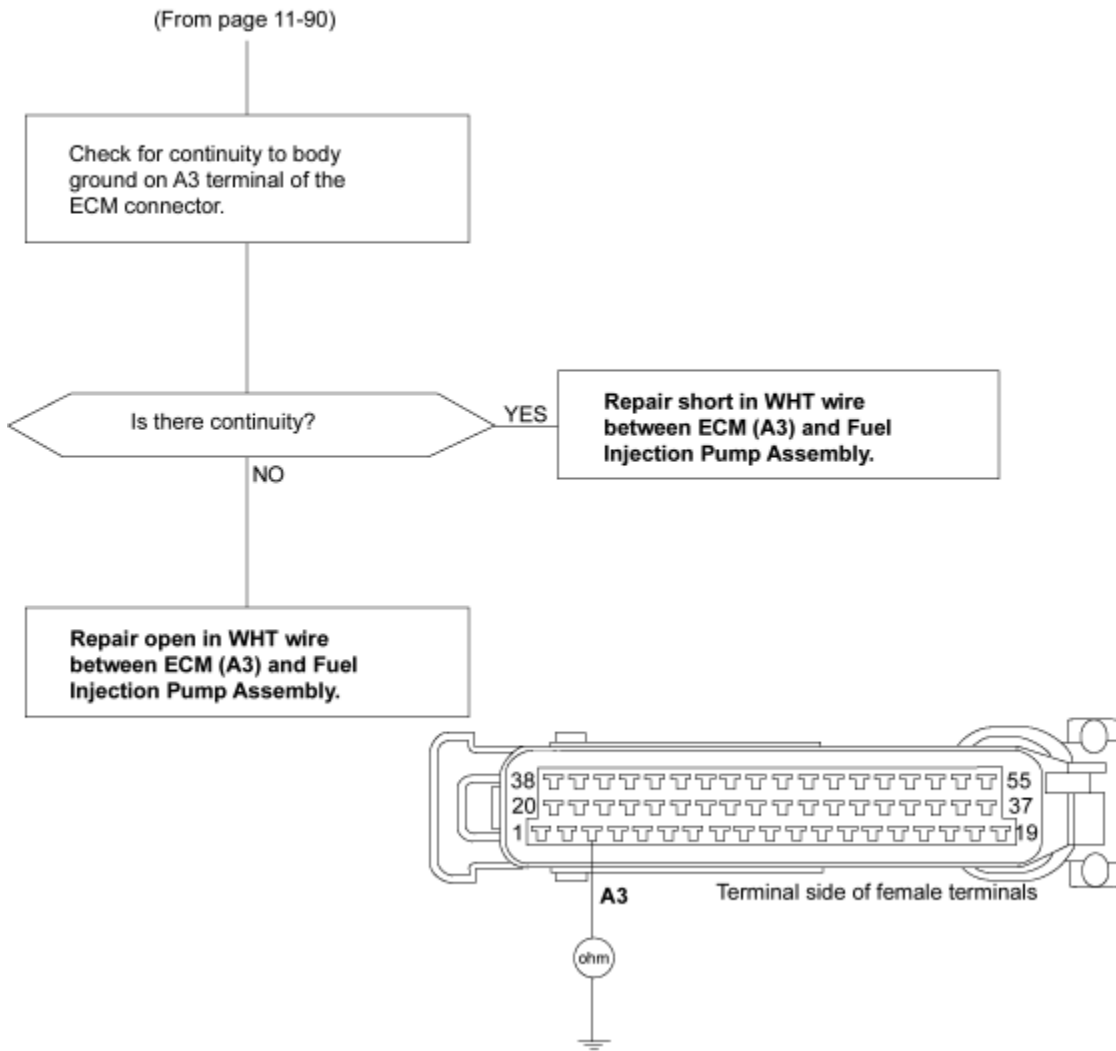
The Fuel Shut-off Solenoid is located in the high pressure section of the Fuel Injection Pump Assembly. The ECM opens the fuel supply by energising the solenoid and cuts off the fuel supply by de-energising the solenoid.



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-12)
 (See Page 11-13)

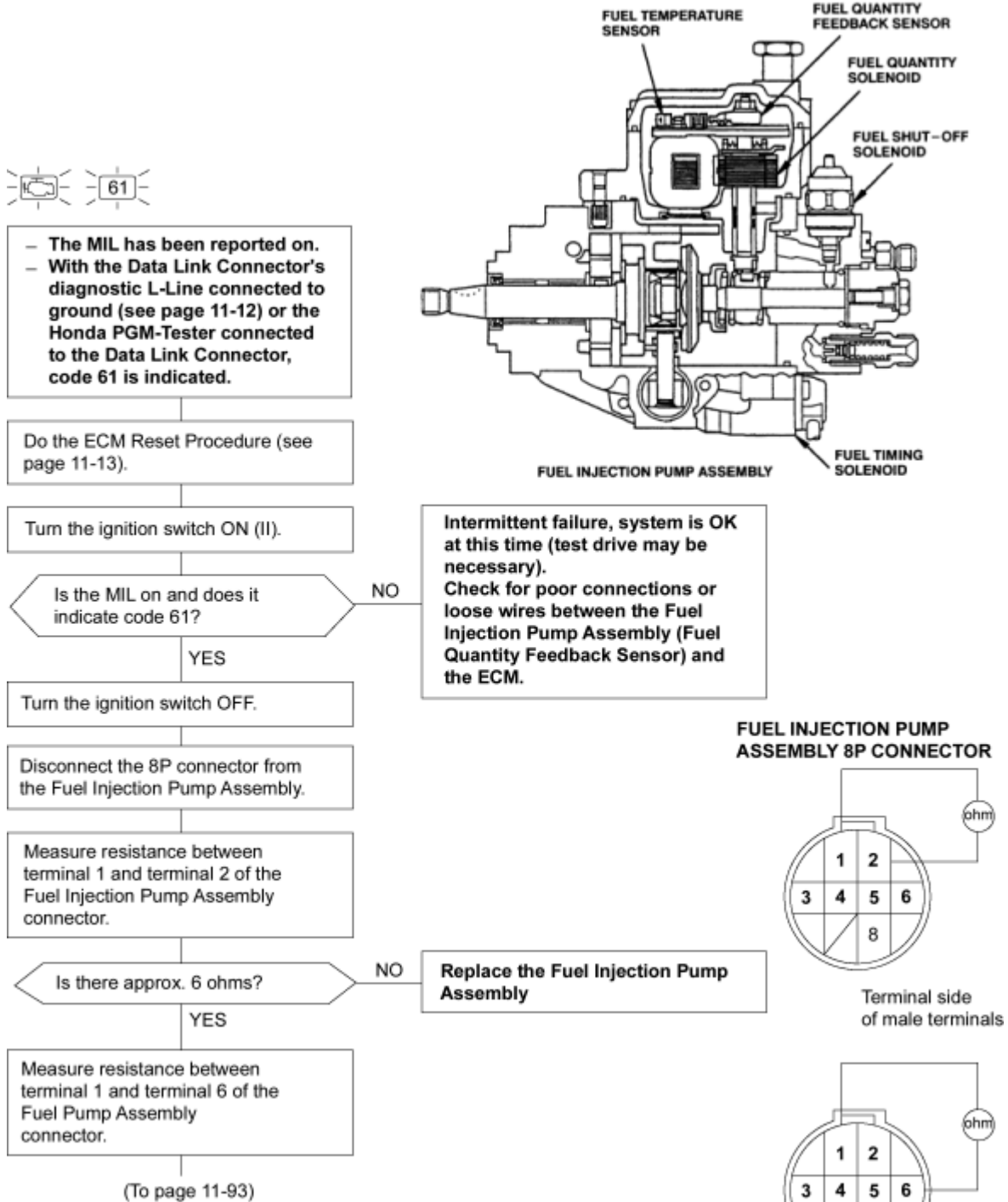


To go to the page referenced on the diagram above, click on the following:
[\(See Page 11-13\)](#)



61 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 61: A problem in the Fuel Quantity Feedback Sensor circuit (signal above or below setpoint).

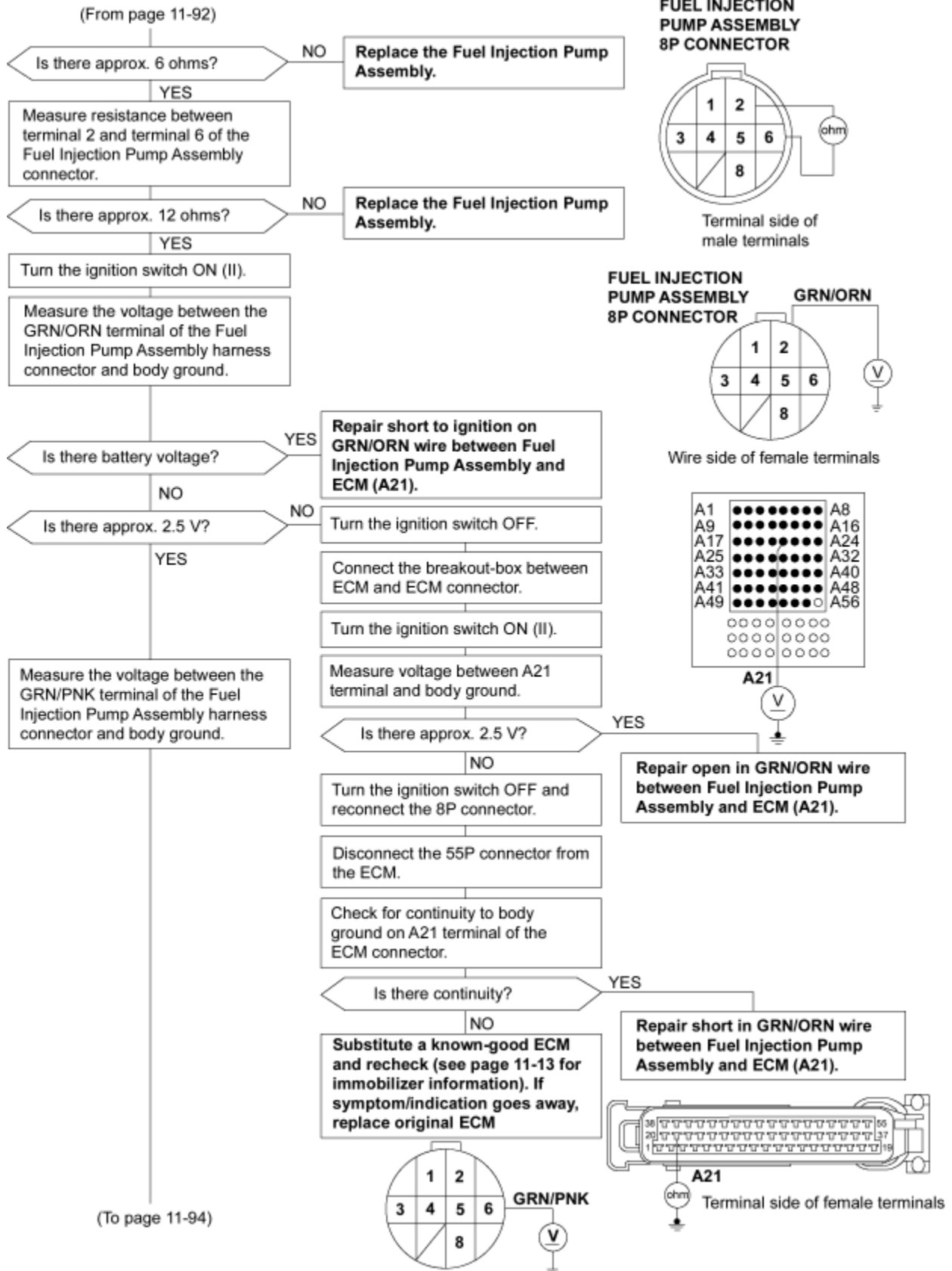
The Fuel Quantity Feedback Sensor is a potentiometer mounted on top of the fuel quantity servo control unit inside the Fuel Injection Pump Assembly. The potentiometer sends a voltage signal, proportional to the amount of fuel being delivered to the ECM.



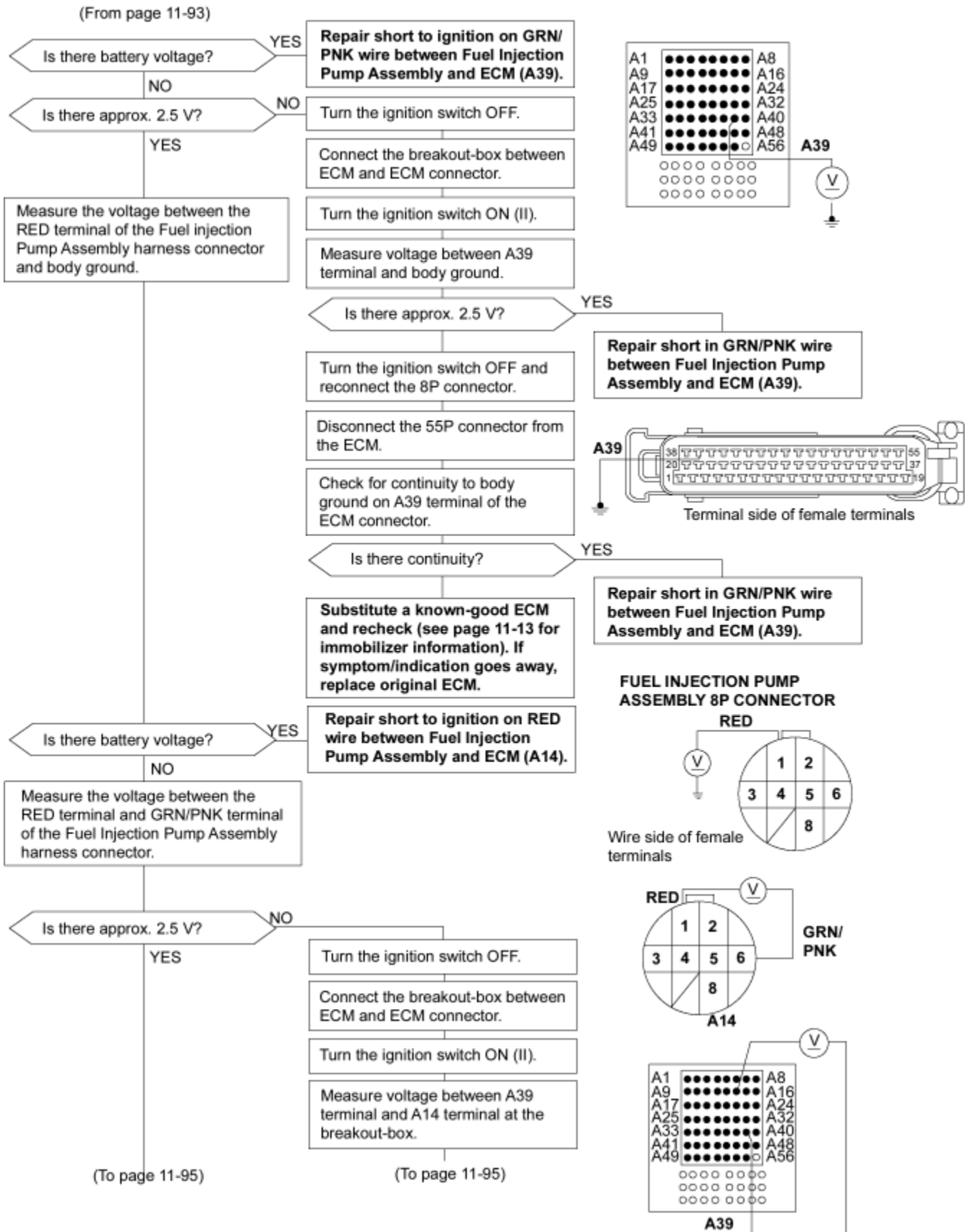
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(See Page 11-12)

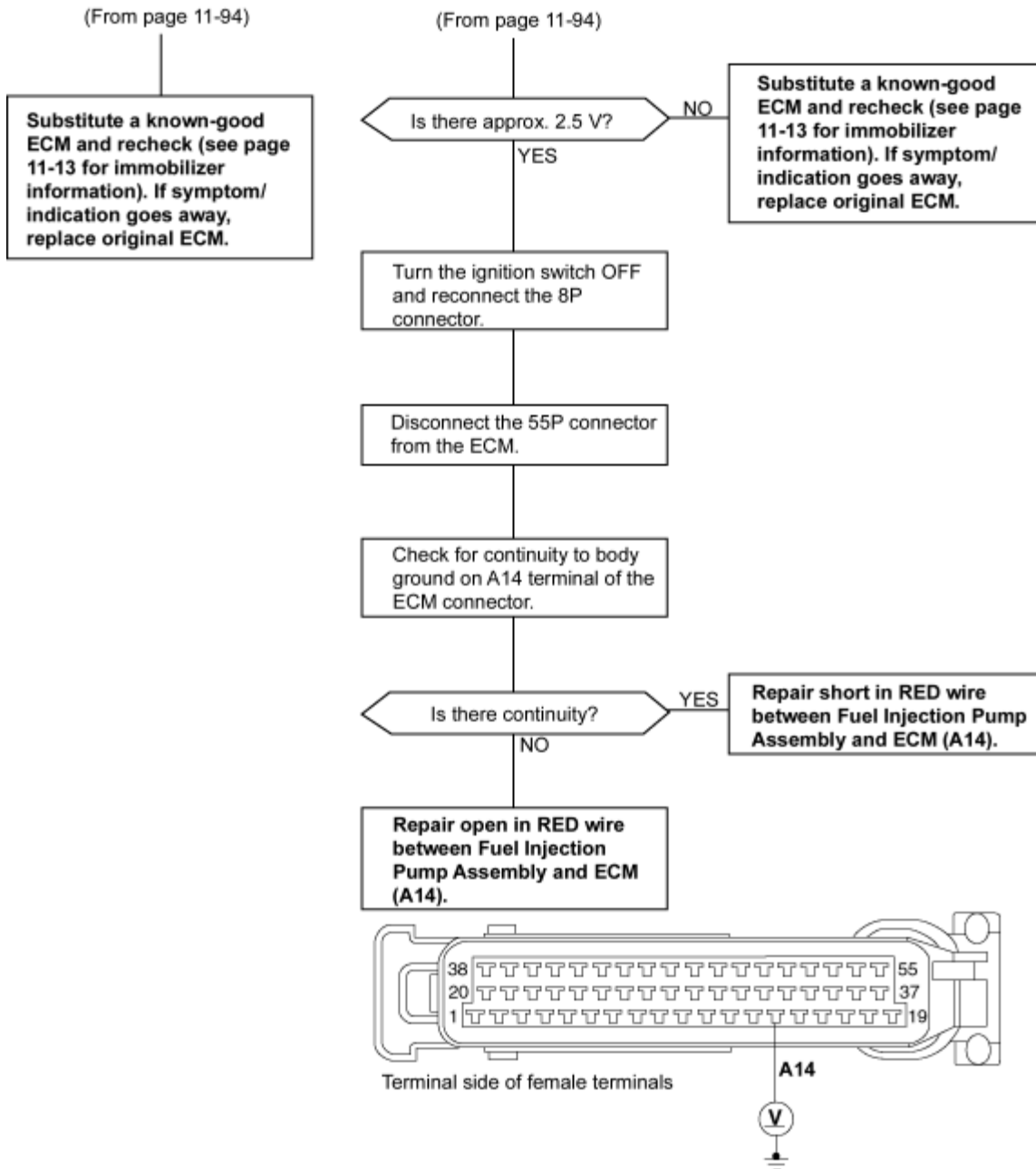
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



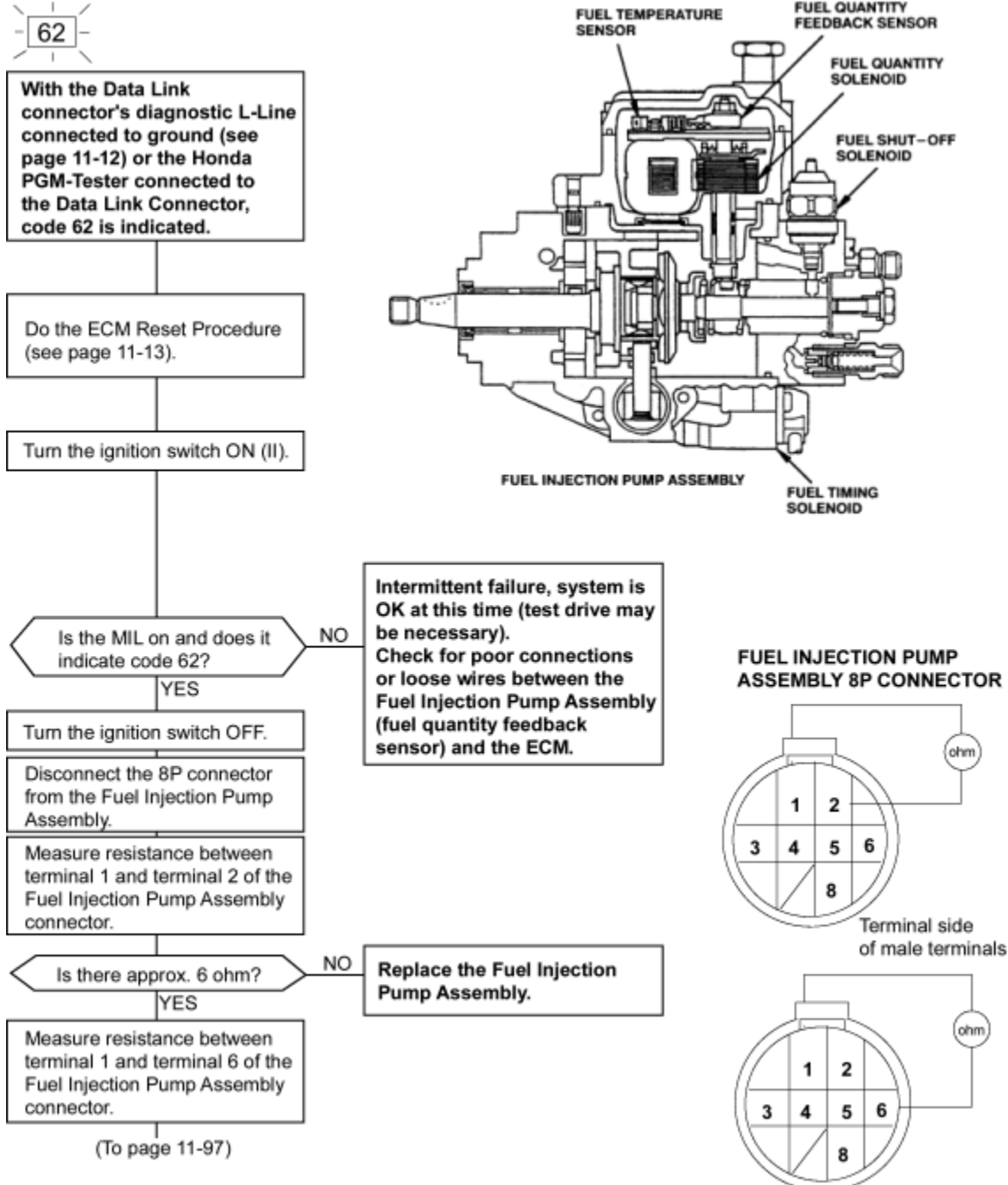
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

62 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 62: A problem in the Fuel Quantity Feedback Sensor (implausible with Needle Lift Sensor).

The Fuel Quantity Feedback Sensor is a potentiometer mounted on top of the fuel quantity servo control unit inside the Fuel Injection Pump Assembly. The potentiometer sends a voltage signal, proportional to the amount of fuel being delivered to the ECM.

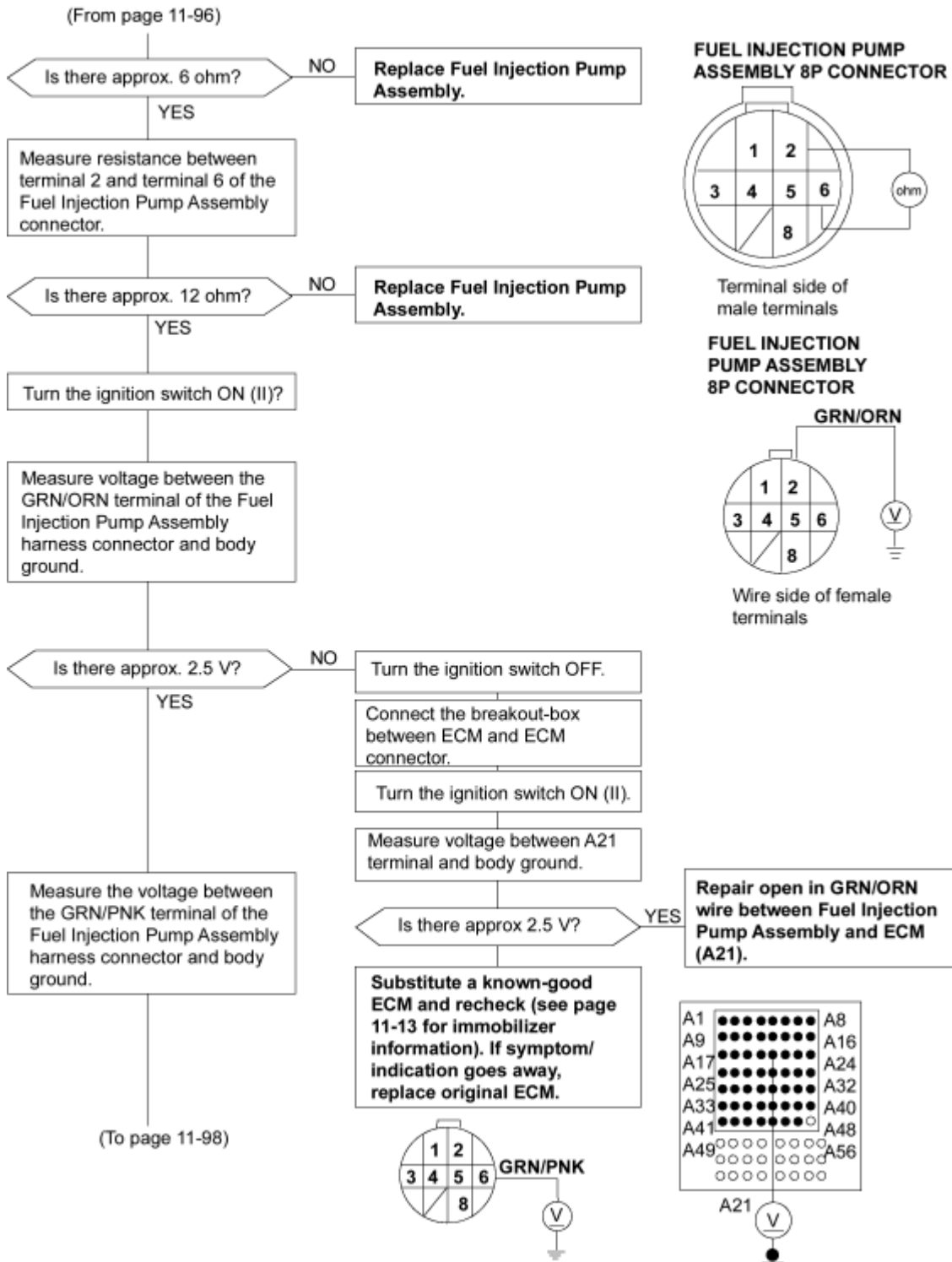


(To page 11-97)

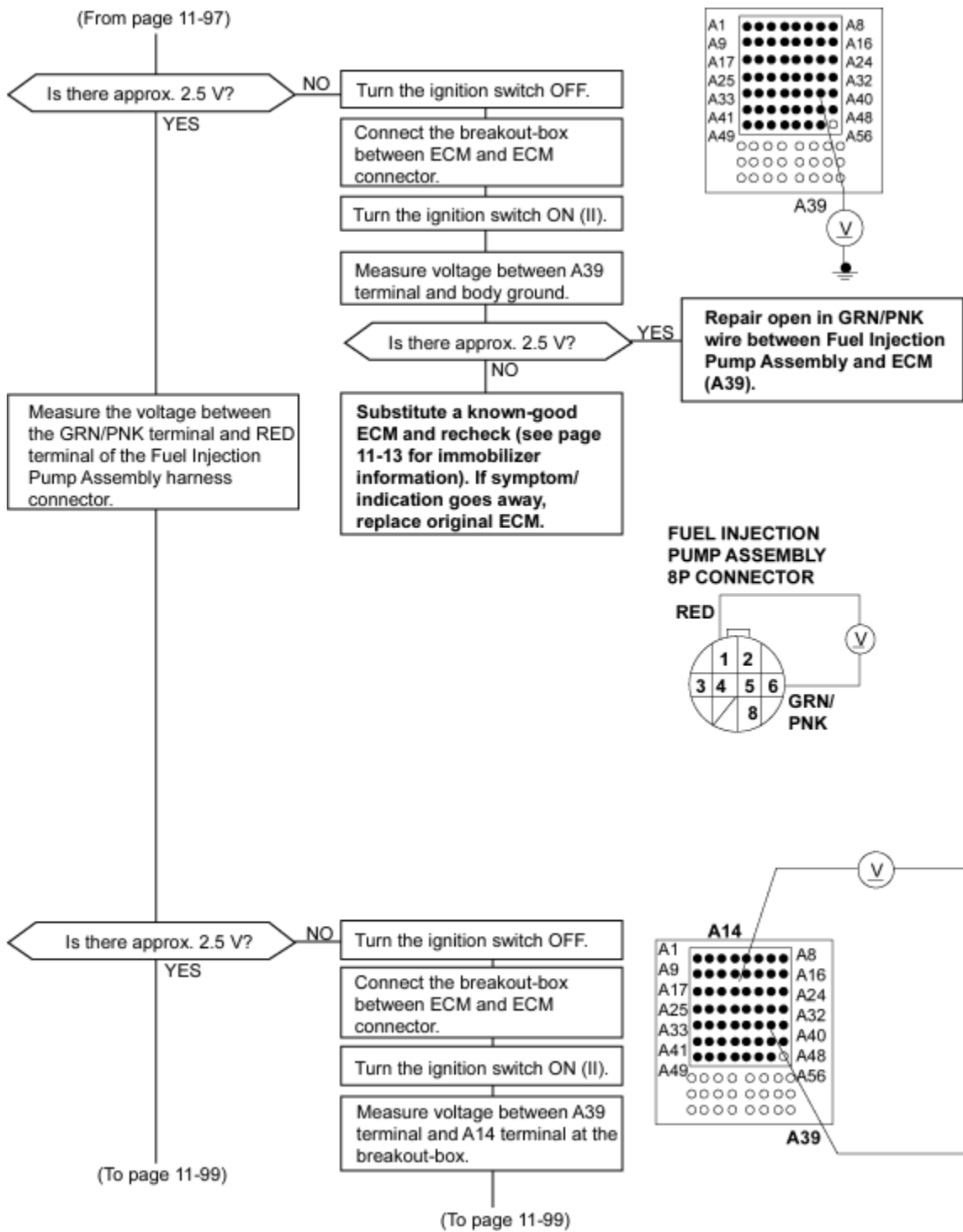
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(See Page 11-12)

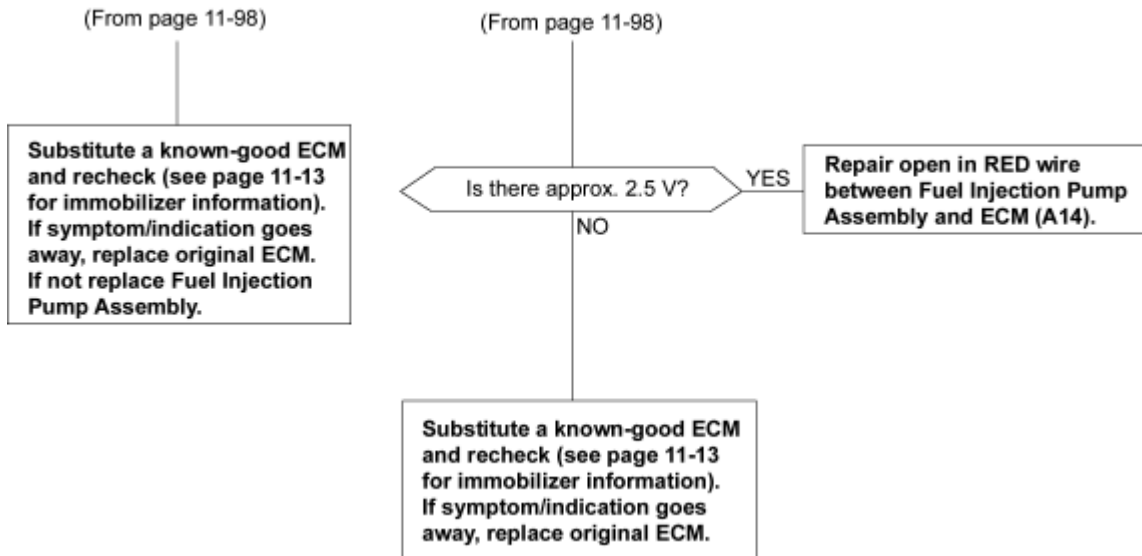
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

64 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 64 A problem in the Fuel Quantity Solenoid (setpoint not achievable).



- The MIL has been reported on.
 - With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12) or the Honda PGM-Tester connected to the Data Link Connector, code 64 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Turn the ignition switch ON (II).

Is the MIL on and does it indicate code 64?

Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the Fuel Injection Pump Assembly (fuel quantity solenoid) and ECM.

Turn the ignition switch OFF.

Disconnect the 8P connector from the Fuel Injection Pump Assembly.

Measure the resistance between terminal 3 and terminal 4 of the Fuel Injection Pump Assembly connector.

Is there approx. 1 ohm?

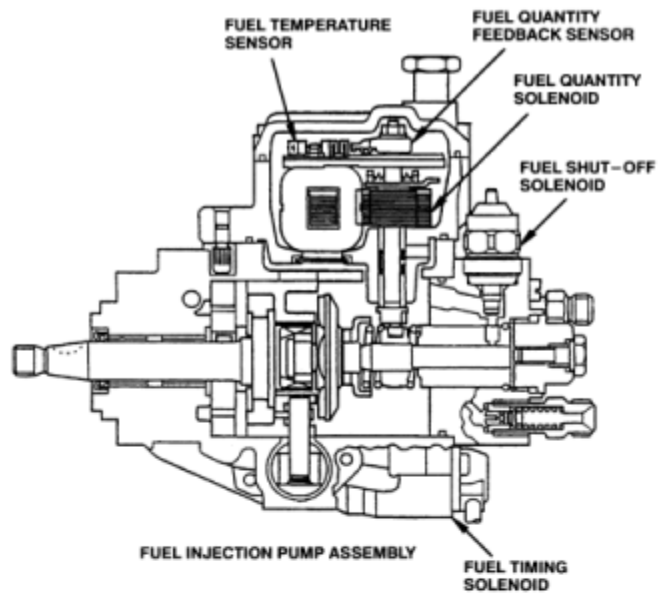
Replace the Fuel Injection Pump Assembly.

(To page 11-101)

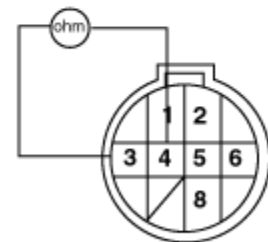
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(See Page 11-12)

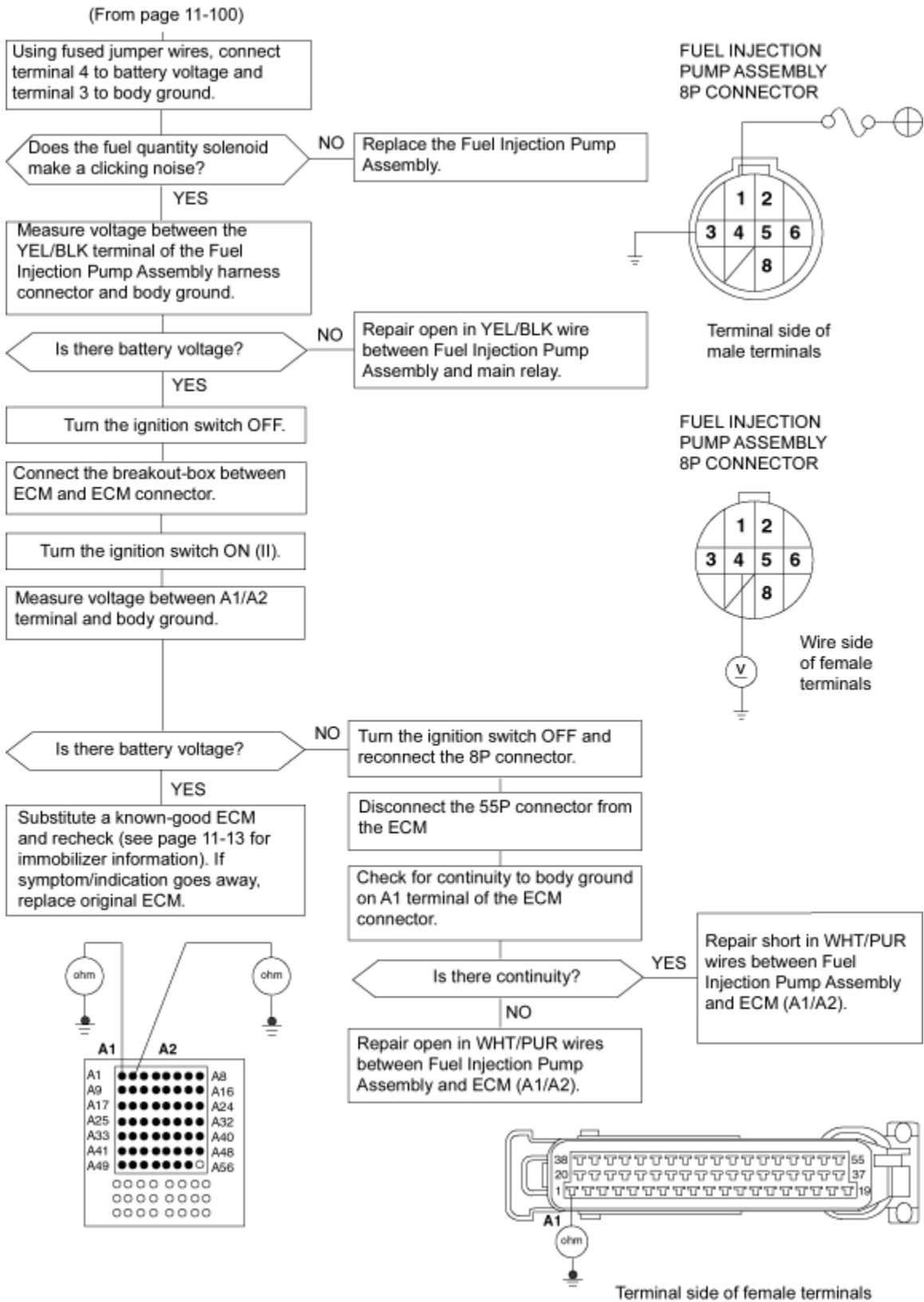
(See Page 11-13)



FUEL INJECTION PUMP ASSEMBLY 8P CONNECTOR



Terminal side of male terminals



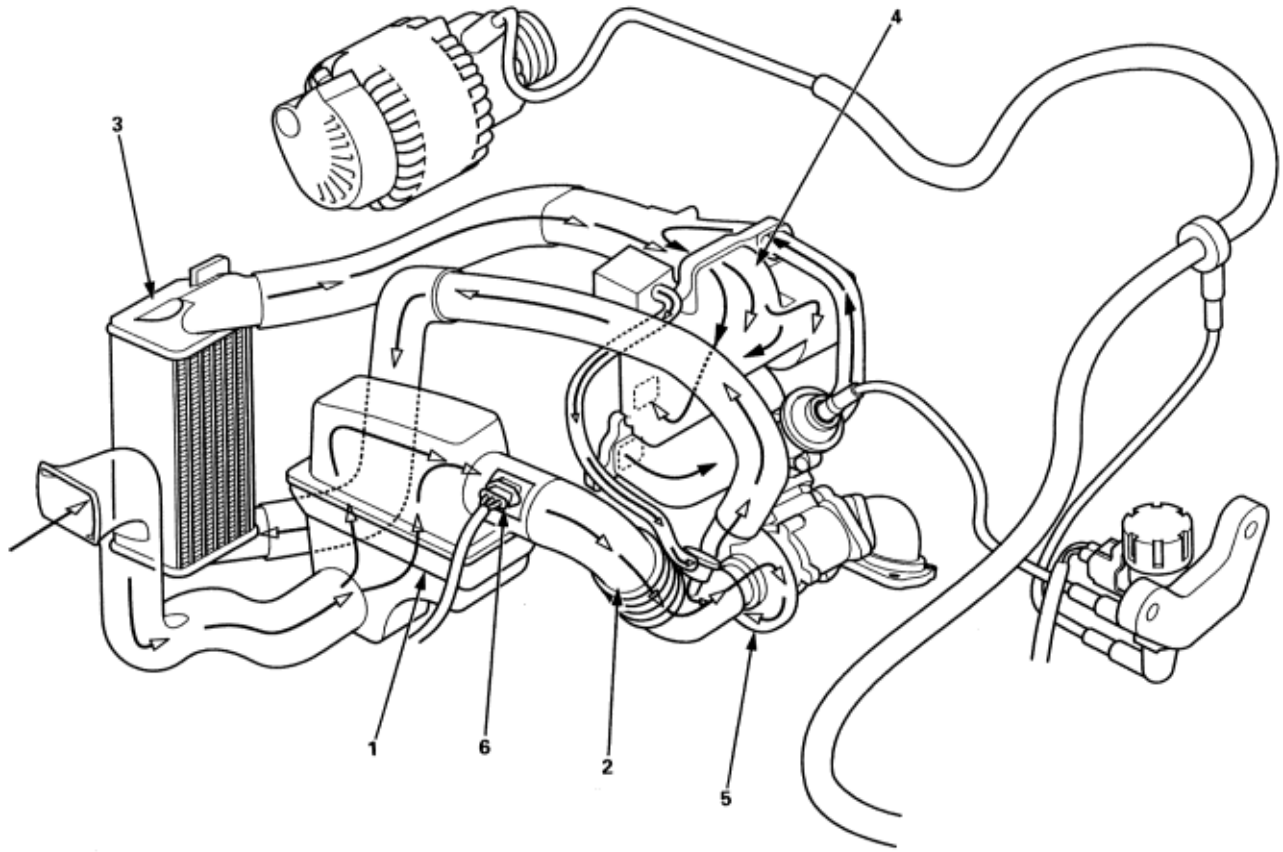
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

Intake Air System
System Troubleshooting Guide

11-102

NOTE: Across each row in the chart, the subsystems that could be sources of a symptom are ranked in the order they should be inspected starting with **1**. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspections shows the system is OK, try the next most likely system **2**, etc.

SUBSYSTEM	AIR CLEANER AND INTAKE AIR DUCT	TURBOCHARGER	
PAGE	11-104	11-106	
SYMPTOM			
LOSS OF POWER	1	2	
WHEN WARM IDLE SPEED TOO HIGH	1	2	

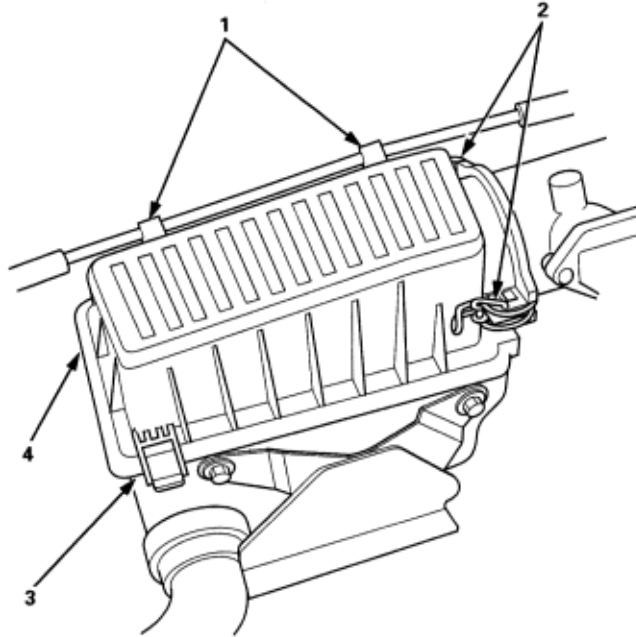


The intake air system consists of the Air Cleaner (1), Intake Air Duct (2), Intercooler (3), Inlet Manifold (4), Turbocharger (5) and Mass Air Flow Sensor (MAF) (6).

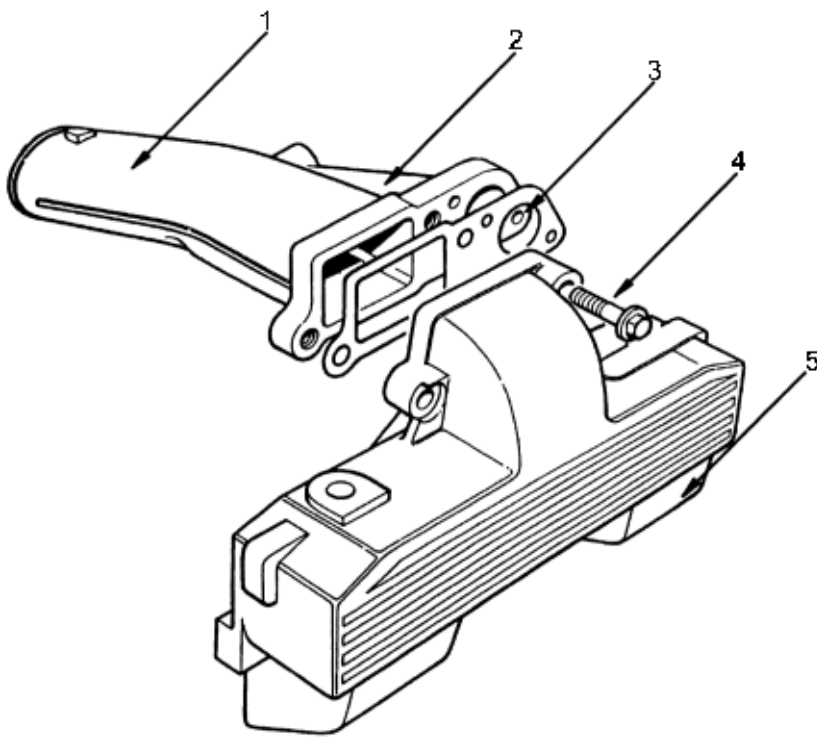
Air Cleaners are used to trap particles and only pass clean air through. Therefore they have to be replaced every 40,000 km (24,000 miles) or 24 months whichever comes first under the normal conditions, to be cleaned every 20,000 km (12,000 miles) or 12 months and replaced every 40,000 km (24,000 miles) or 24 months which ever comes first under the severe conditions as a blocked Air Filter can cause air starvation and excessive heat. Air Cleaners are also necessary to avoid damage to the compressor blades of the Turbocharger and introduction of metallic particles into the engine.

Replacement

1. Disconnect both battery leads.
2. Remove battery.
3. Release two clips (1) from the expansion tank return pipe.



4. Release the two security clips (2) from the mass air flow sensor.
5. Release the four clips (3) from the Air Cleaner Case.
6. Remove air cleaner cover (4).
7. Reinstall in the reverse order of removal



1. AIR INTAKE PIPE
2. EXHAUST GAS RECIRCULATION PIPE
3. GASKET-INTAKE MANIFOLD (REPLACE)
4. BOLT-INTAKE MANIFOLD
25 Nm (2.5 kgf/m, 18 lbf/ft)
5. INTAKE MANIFOLD

The Air Intake Pipe leads the compressed air from the Turbocharger into the cylinders. Depending on operating conditions a certain amount of exhaust gas is recirculated into the Intake Manifold to decrease combustion temperature and therefore the amount of NOx.

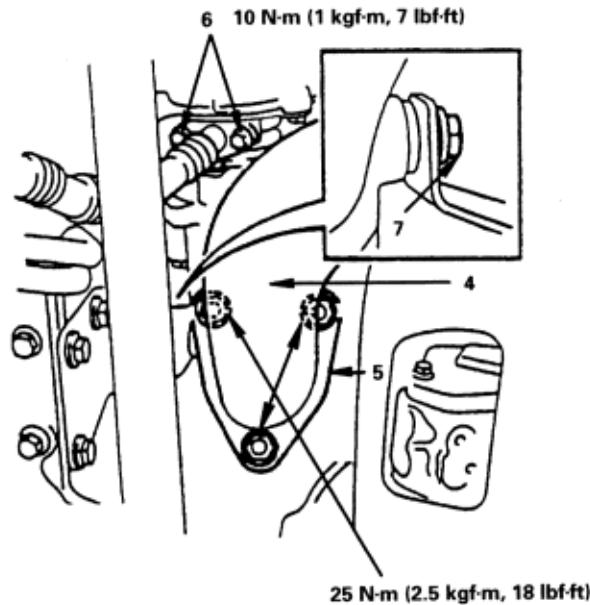
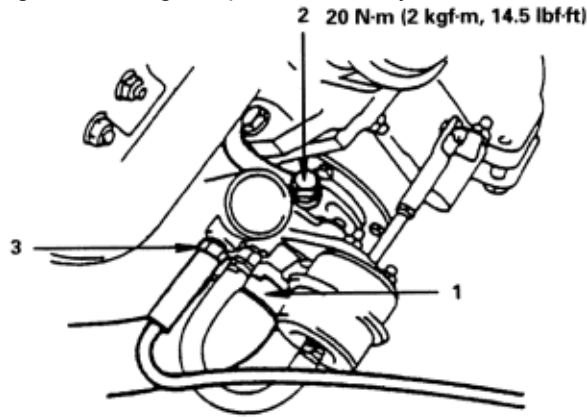
Turbochargers are used to increase the power output of an engine without any major changes in the engine design. They are driven by exhaust gases passing a radial turbine. On the other end of the turbine shaft a compressor wheel compresses the intake air.

Inspection

Make a visual check for damage, leak and sound check for noise.

Replacement

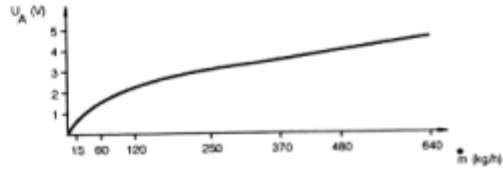
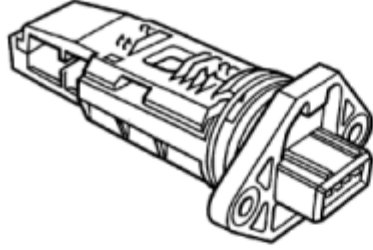
1. Disconnect battery earth lead.
2. Remove sound deadening pad.
3. Remove intercooler hose from Turbocharger Pipe.
4. Remove Turbocharger Pipe from cylinder head (Refit: Two bolts are securing Turbocharger Pipe to cylinder head: 25 Nm (2.5 kgf/m, 18 lbf/ft). One bolt is securing Turbocharger Pipe to front of cylinder head: 9 Nm (0.9 kgf/m, 6.5 lbf/ft).



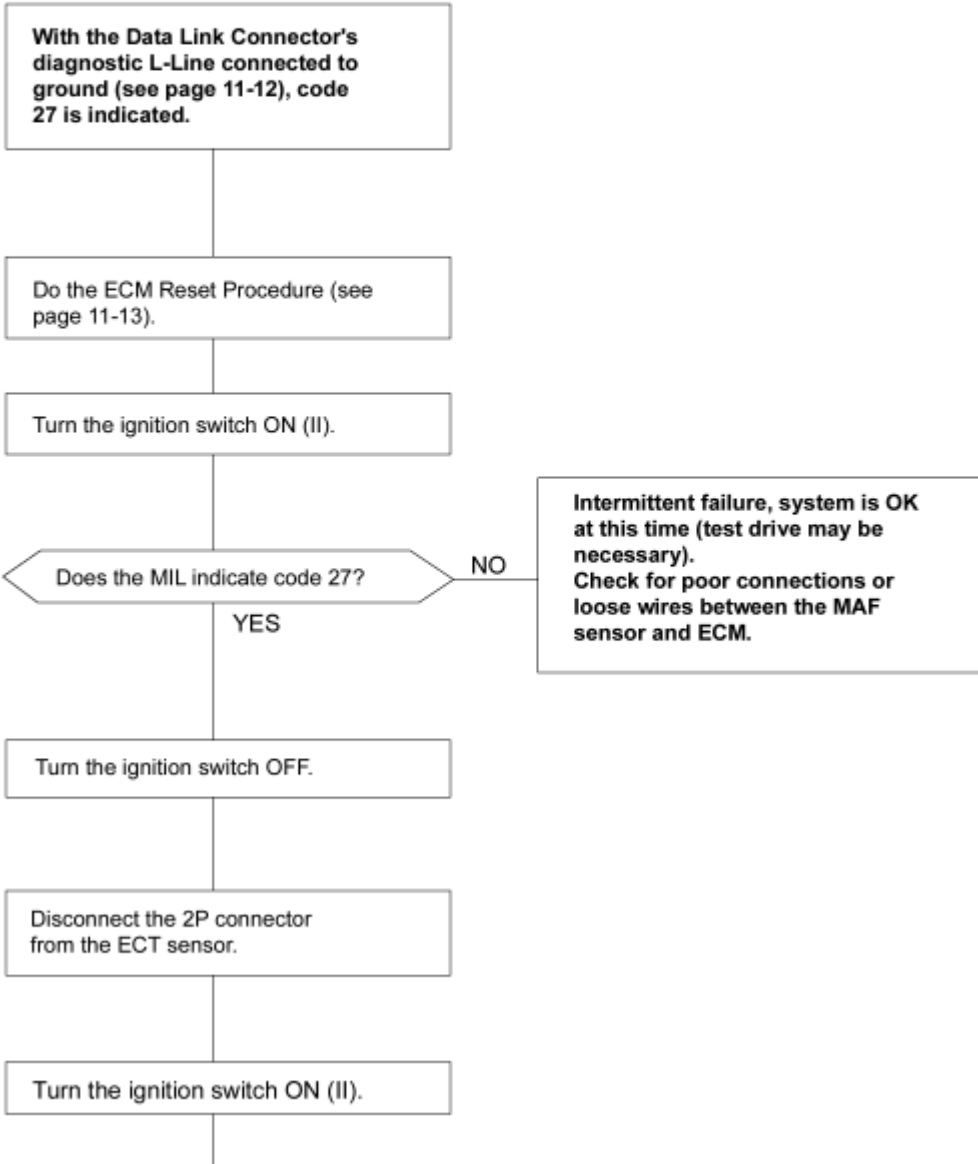
5. Remove Air Intake Hose (1) from Turbocharger.
6. Disconnect oil feed pipe (2).
7. Disconnect boost pressure sensing pipe (3) from Turbocharger.
8. Remove RH under tray (BODY).
9. Remove exhaust front pipe (4) from exhaust manifold (5).
10. Remove 2 bolts (6) securing oil drain pipe and discard gasket.
11. Remove bolt (7) securing exhaust manifold to mounting bracket.
12. Remove 3 nuts securing Turbocharger to exhaust manifold (Refit: 25 Nm (2.5 kgf/m, 18 lbf/ft).
13. Remove Turbocharger.
14. Refit in the reverse order of removal.

27 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 27: A problem in the MAF Sensor circuit (signal below setpoint).

The Mass Air Flow Sensor determines the amount of intake air by its cooling effect while flowing over a hot-film sensor. The ECM uses this signal to monitor the recirculation of exhaust gases.



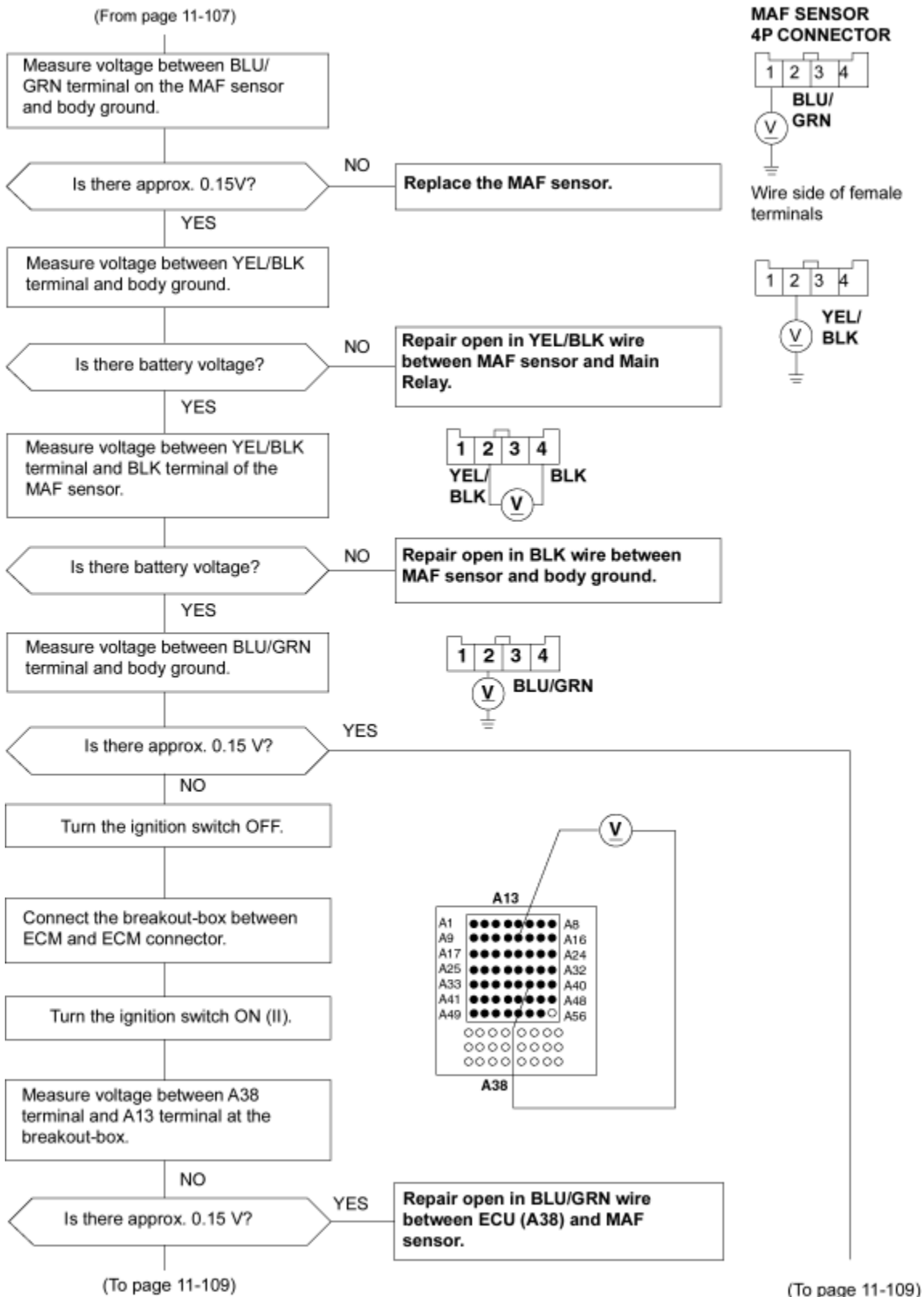
27

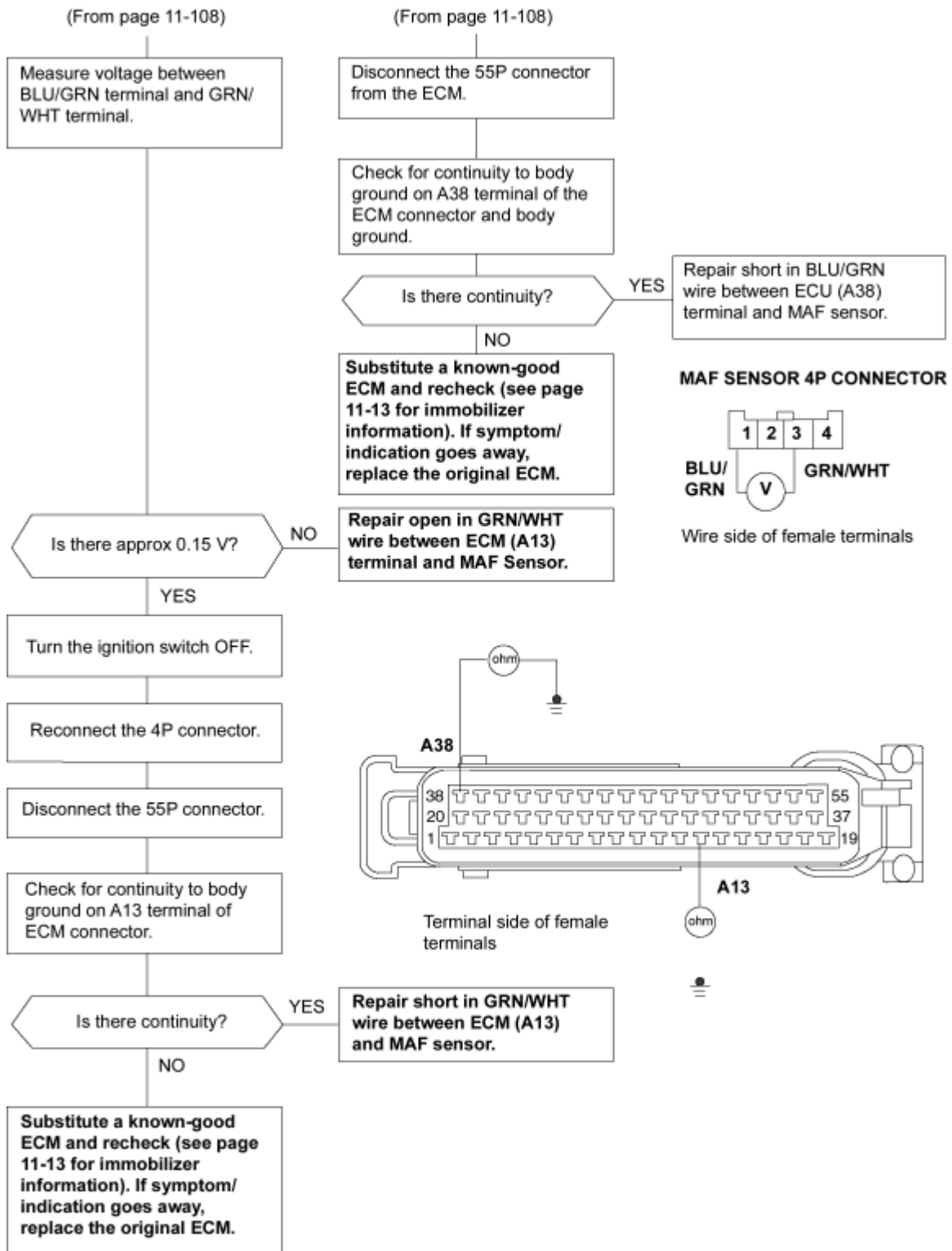


To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

(See Page 11-13)

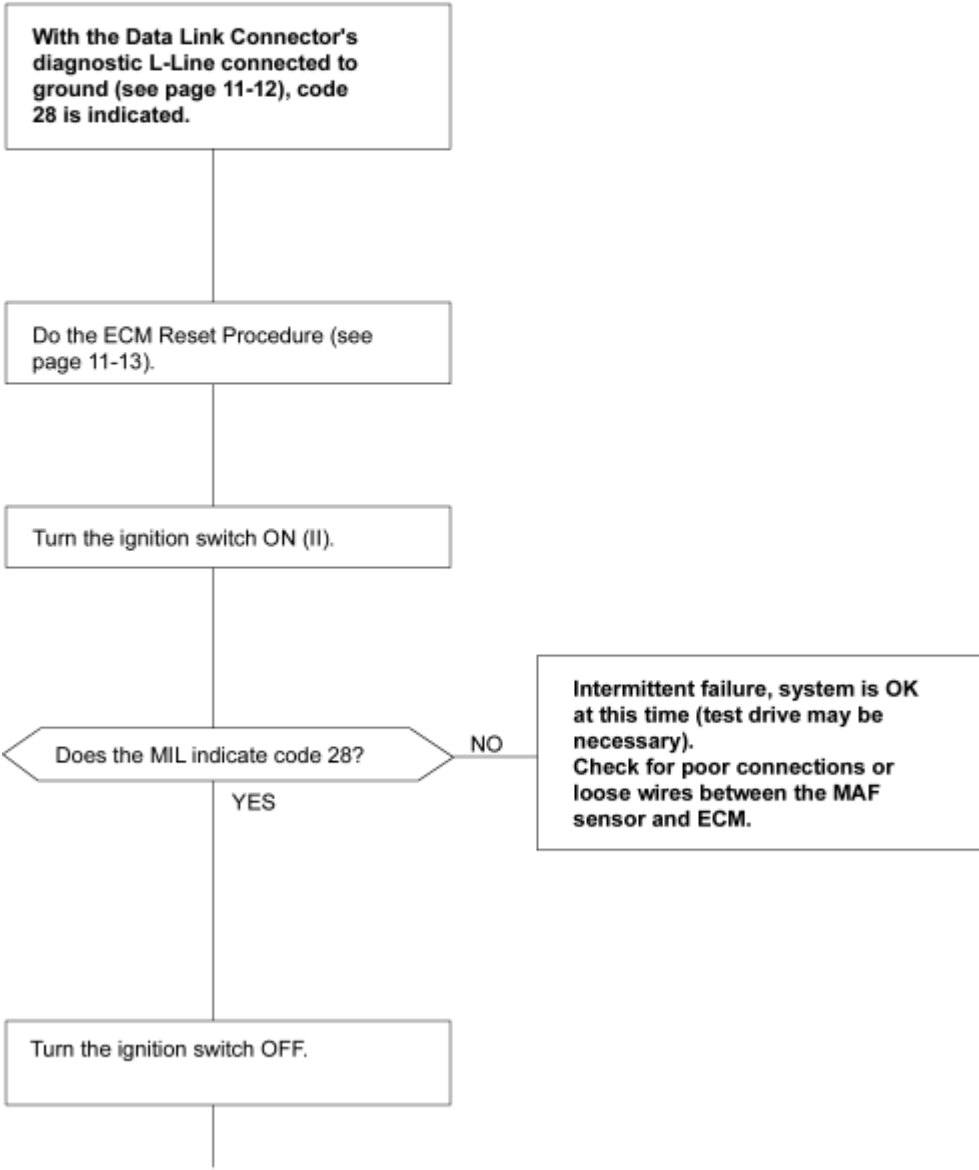
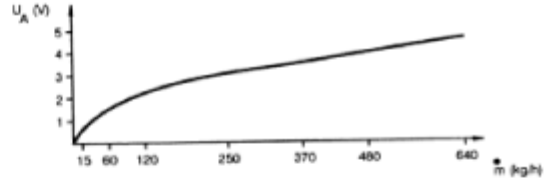
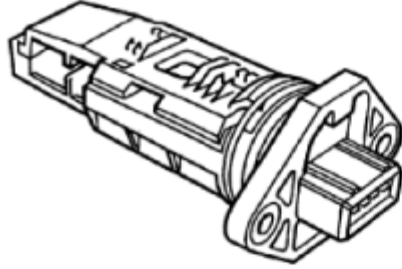




To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

28 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 28: A problem in the MAF Sensor circuit (signal above setpoint).

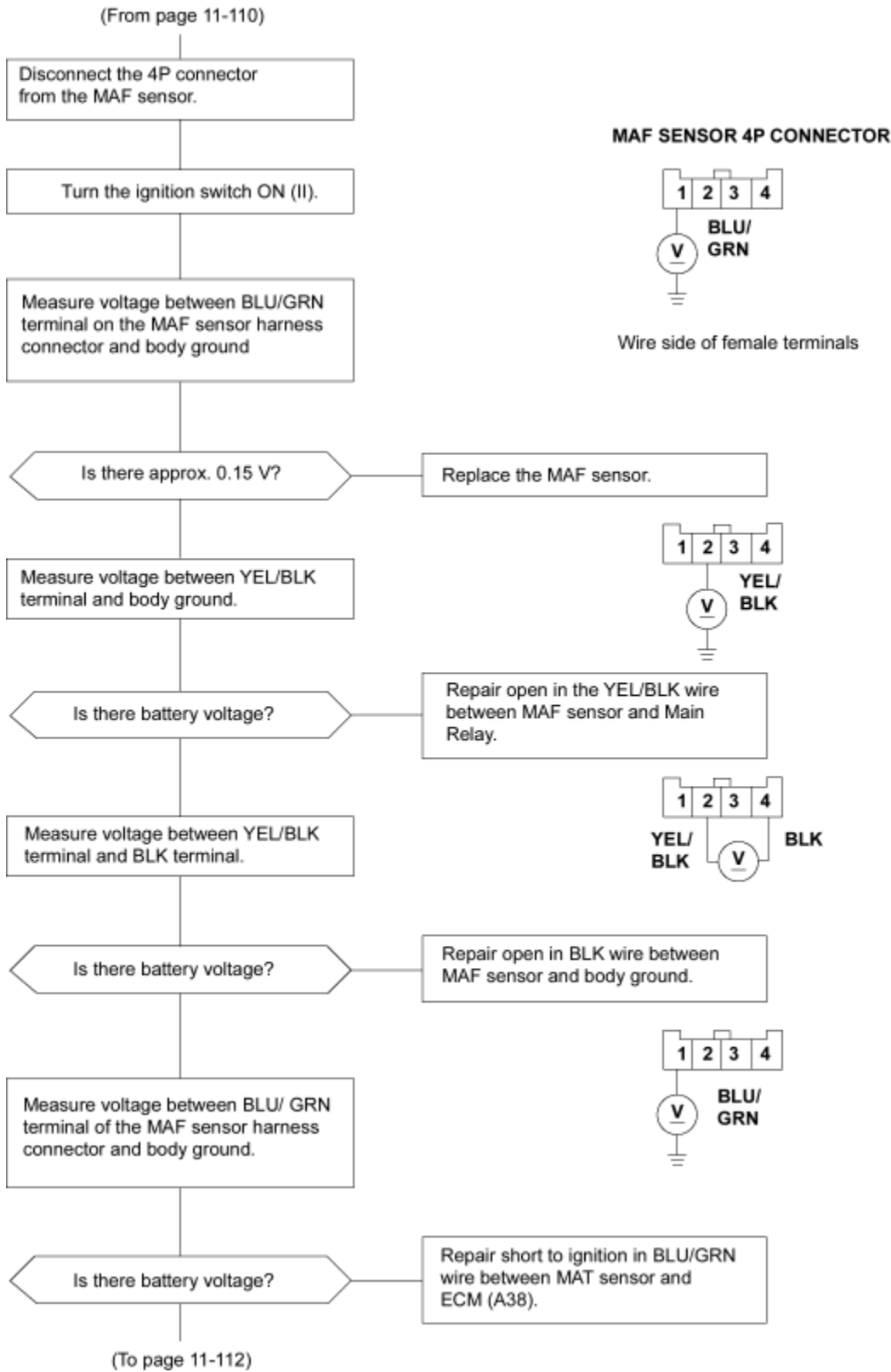
The Mass Air Flow Sensor determines the amount of intake air by its cooling effect while flowing over a hot-film sensor. The ECM uses this signal to monitor the recirculation of exhaust gases.

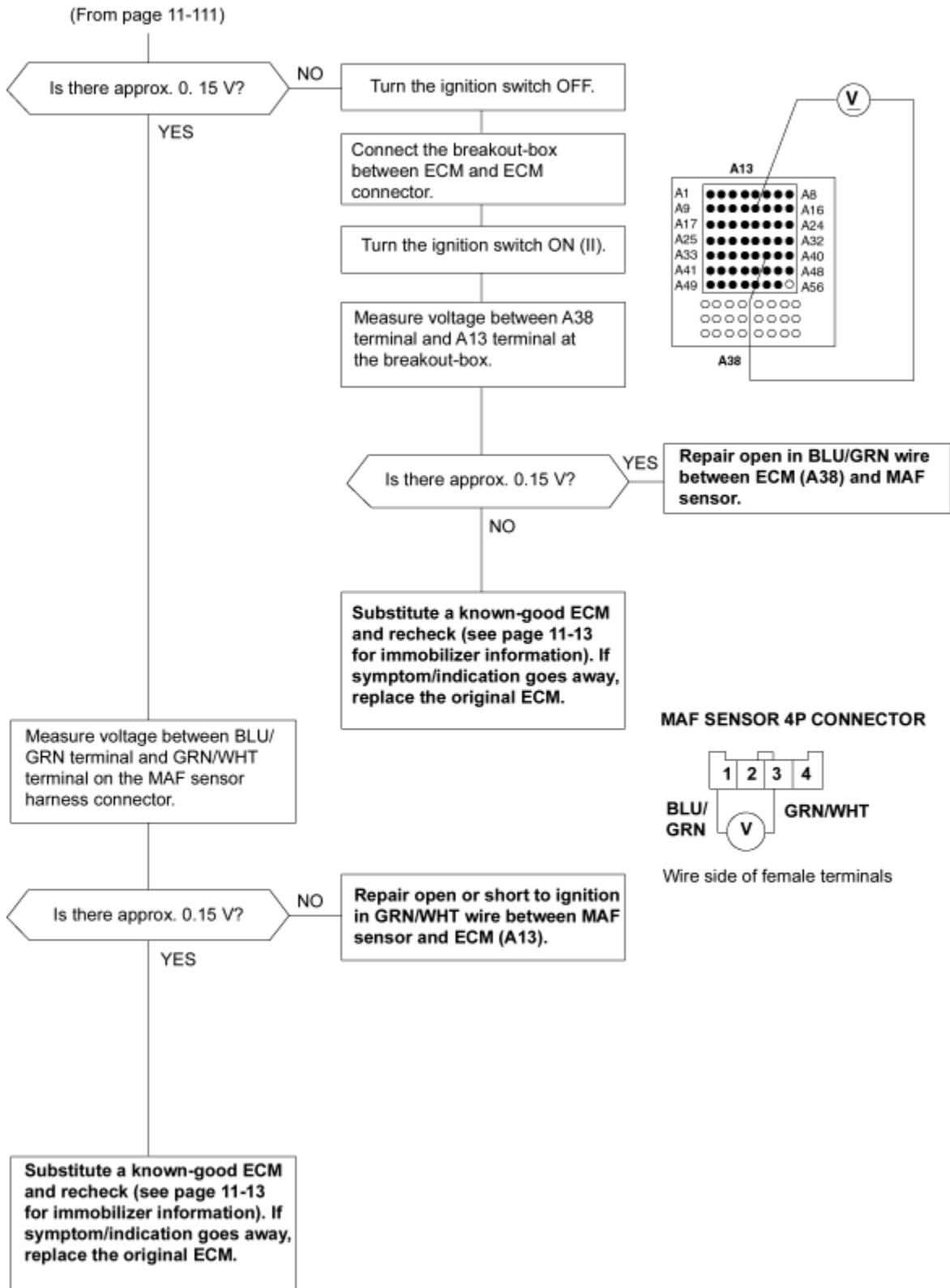


(To page 11-111)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-13)

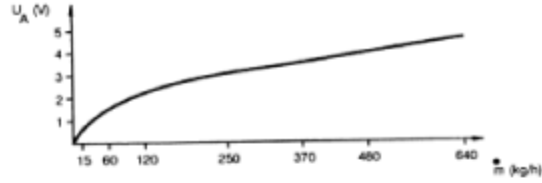
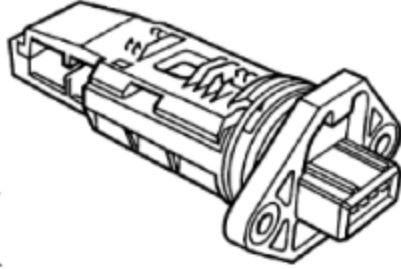




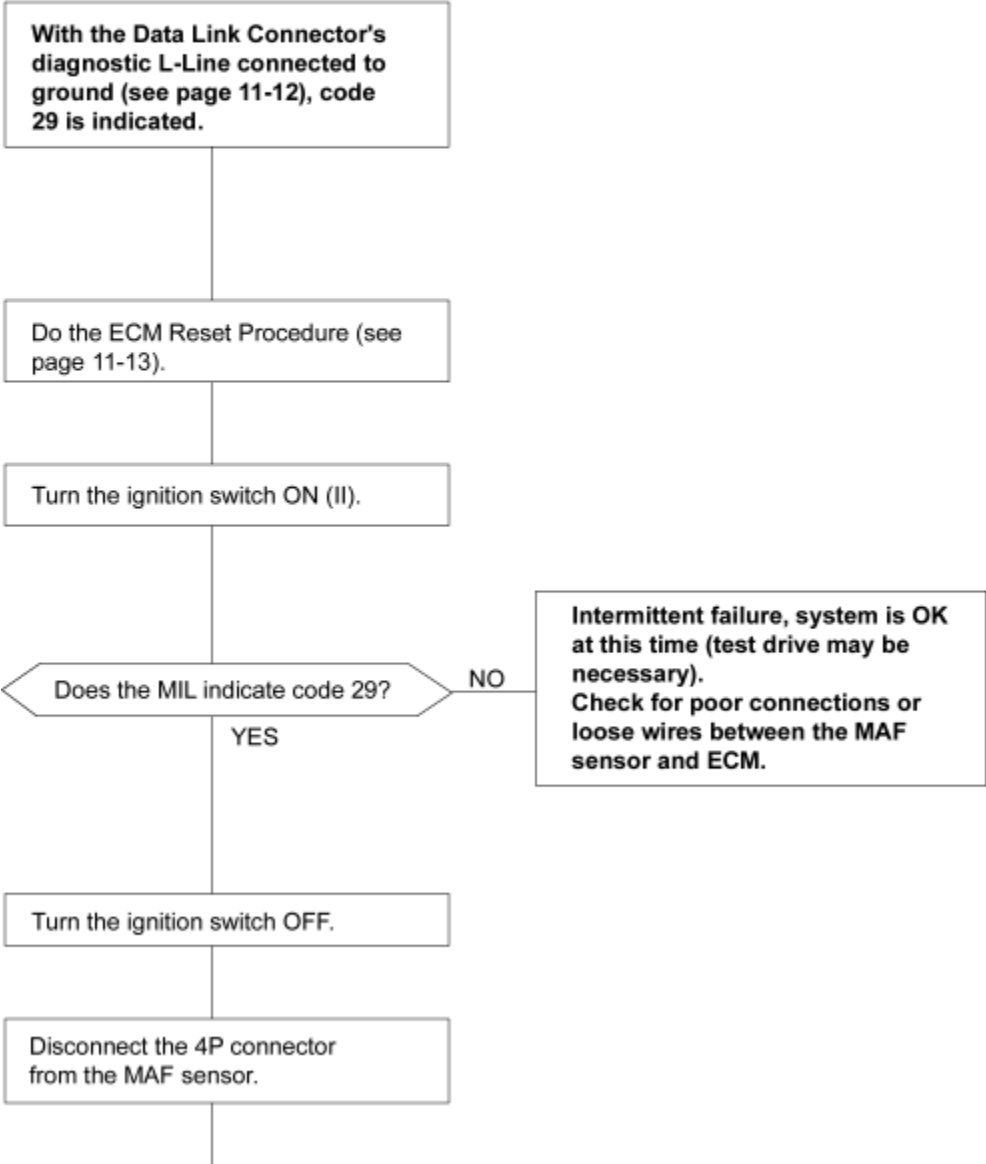
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

29 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 29: An implausible signal from the MAF Sensor.

The Mass Air Flow Sensor determines the amount of intake air by its cooling effect while flowing over a hot-film sensor. The ECM uses this signal to monitor the recirculation of exhaust gases.



29

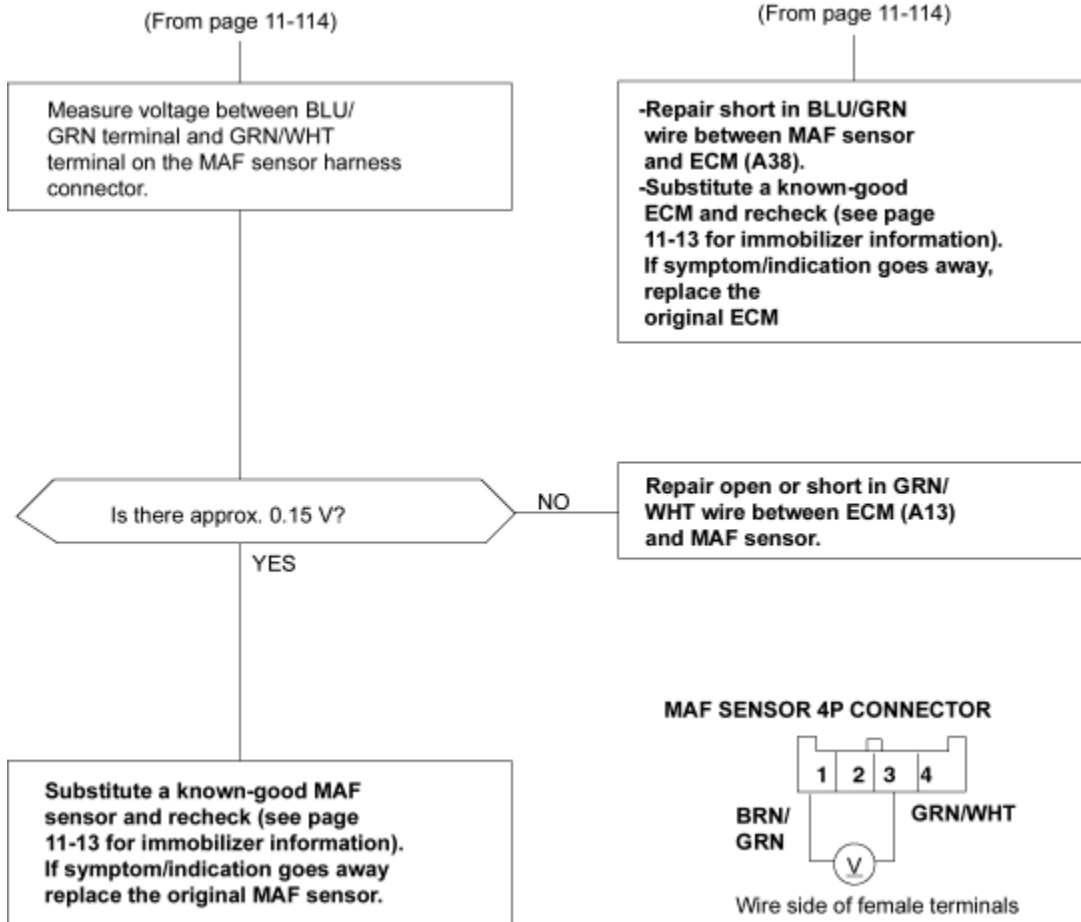


(To page 11-114)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

(See Page 11-13)

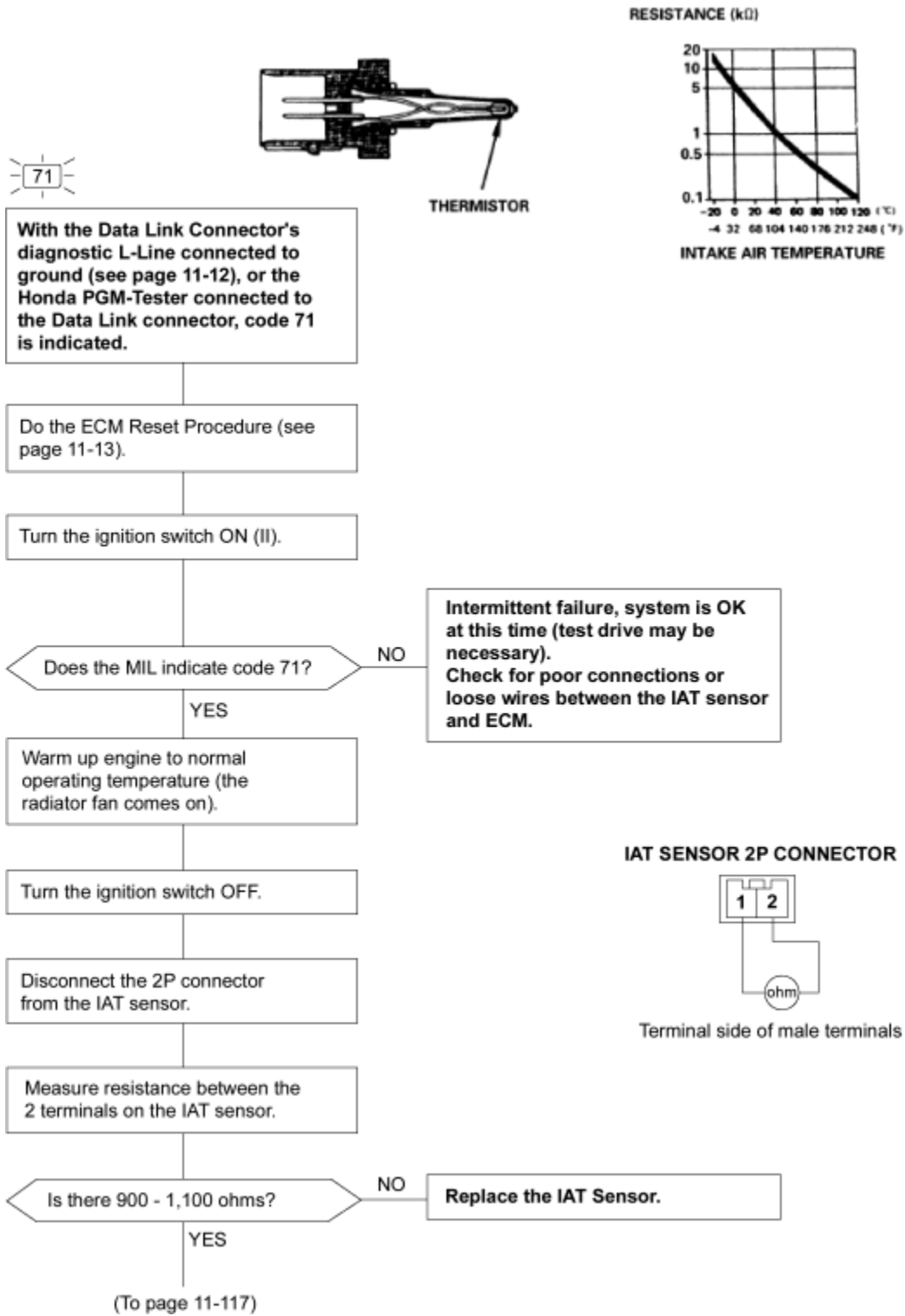


To go to the page referenced on the diagram above, click on the following:

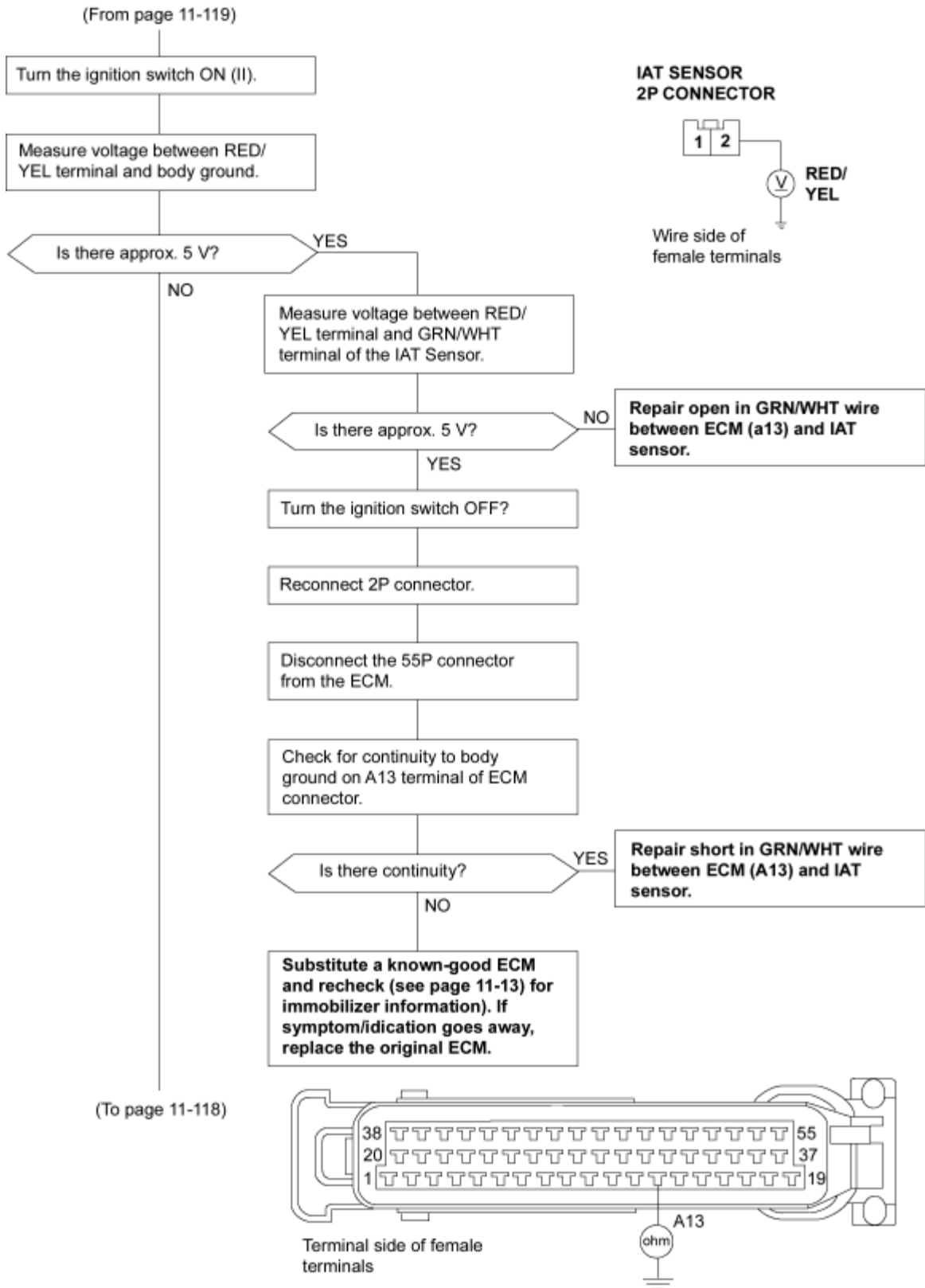
(See Page 11-13)

71 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 71: A problem in the Intake Air Temperature (IAT) Sensor circuit (signal below setpoint).

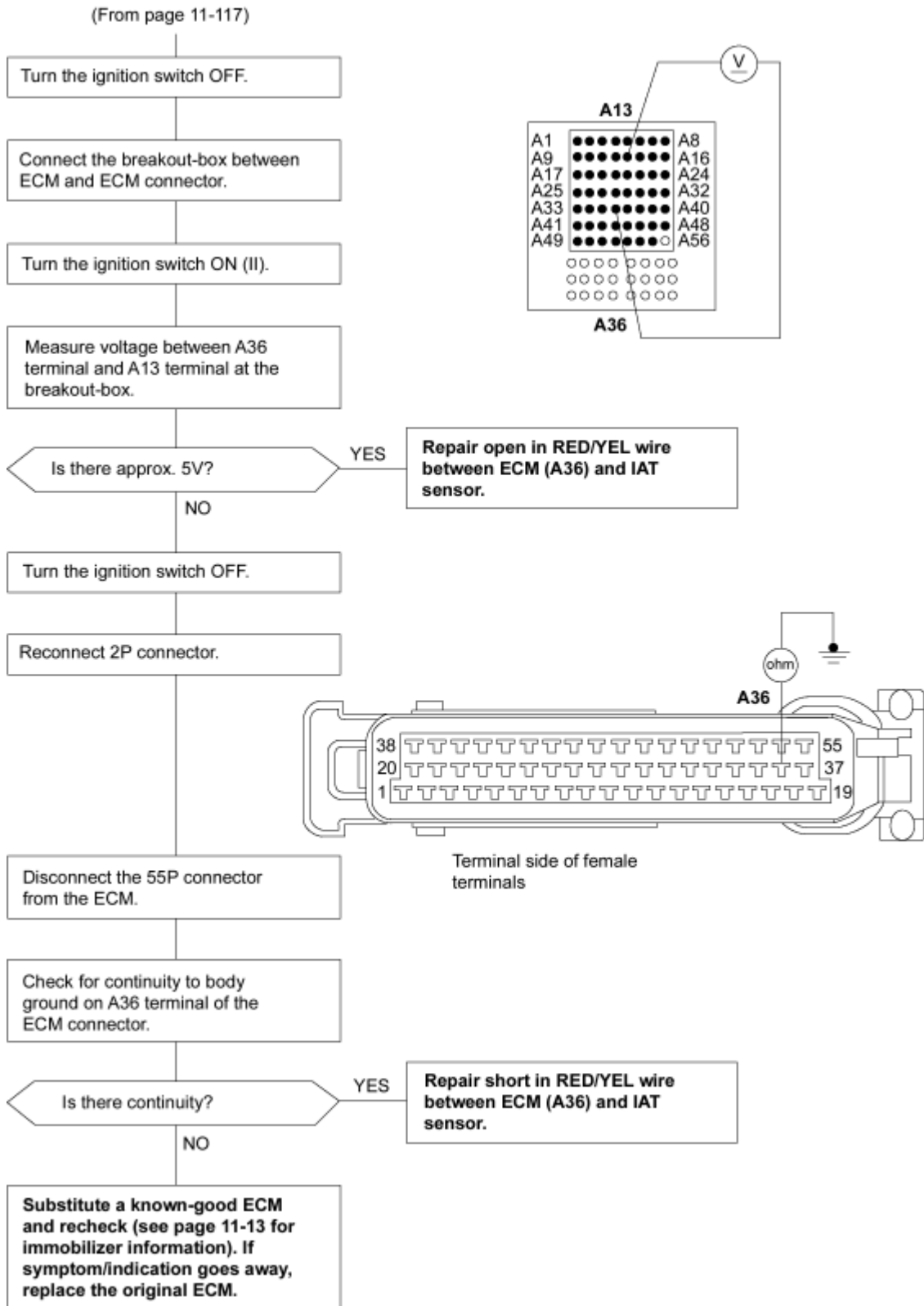
The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increase as shown below.



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)



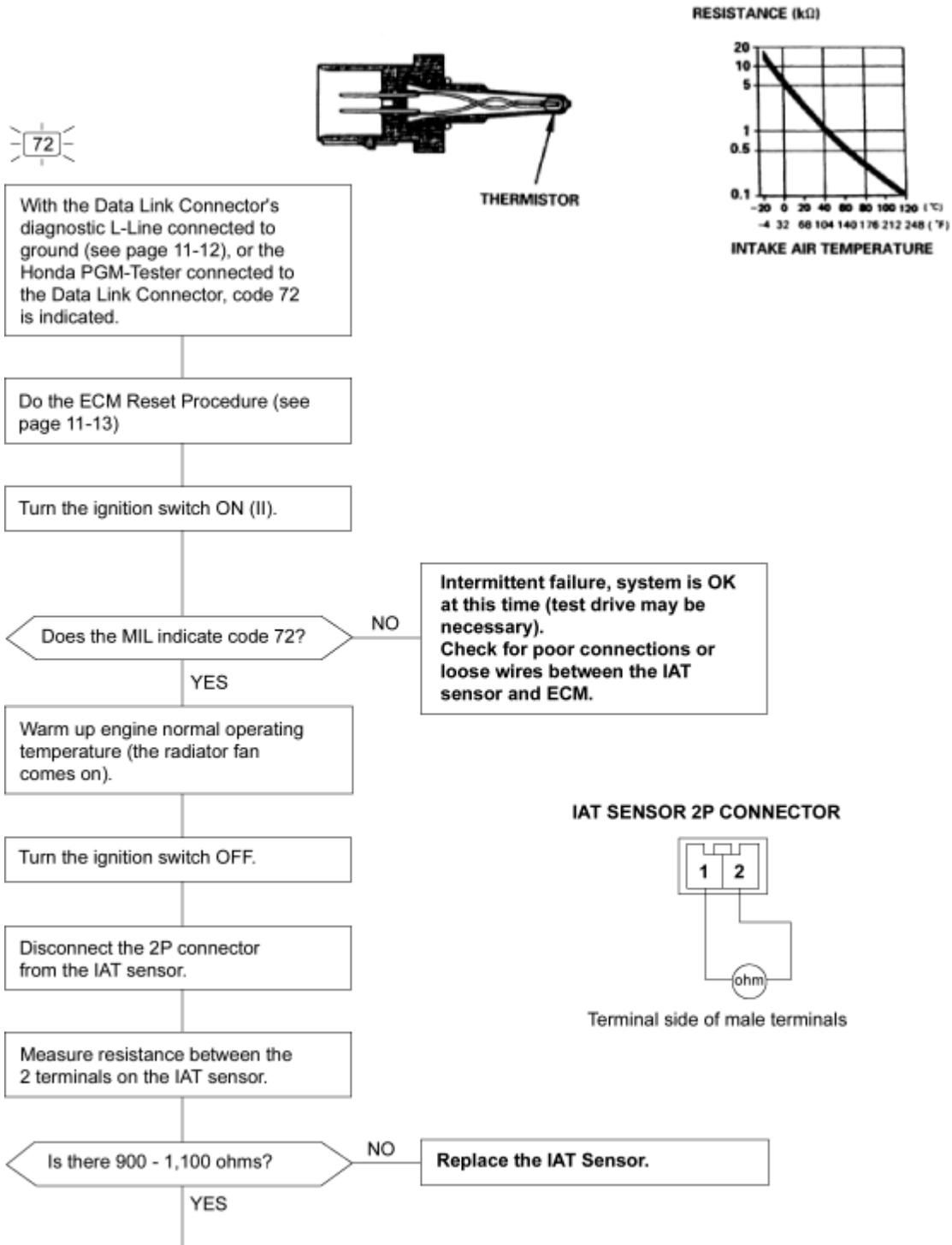
To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

72 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 72: A problem in the Intake Air Temperature (IAT) Sensor circuit (signal above setpoint).

The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increase as shown below.

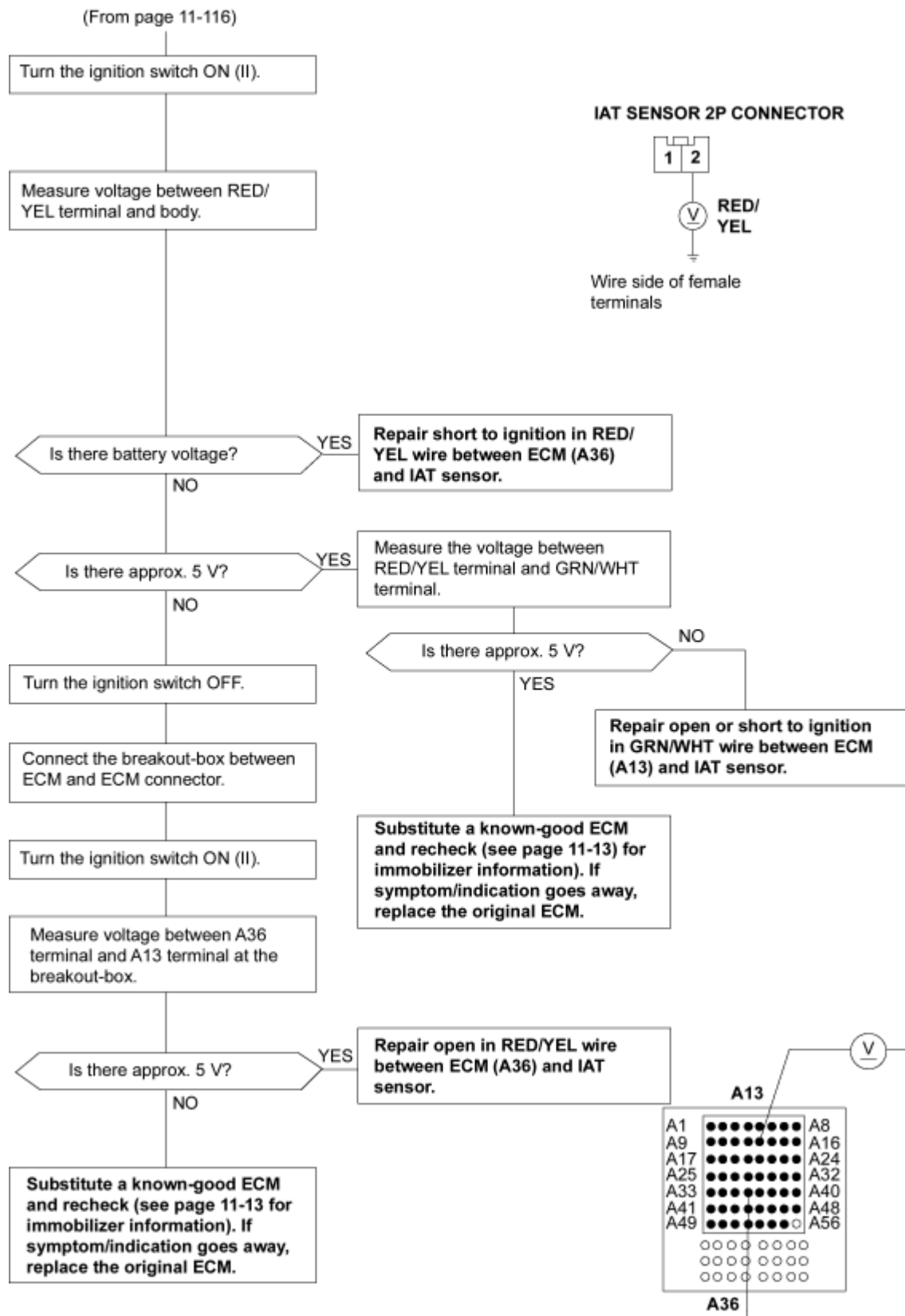


(To page 11-120)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

(See Page 11-13)



To go to the page referenced on the diagram above, click on the following:
(See Page 11-13)

NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with **1**. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspections shows the system is OK, try the next most likely system **2**, etc.

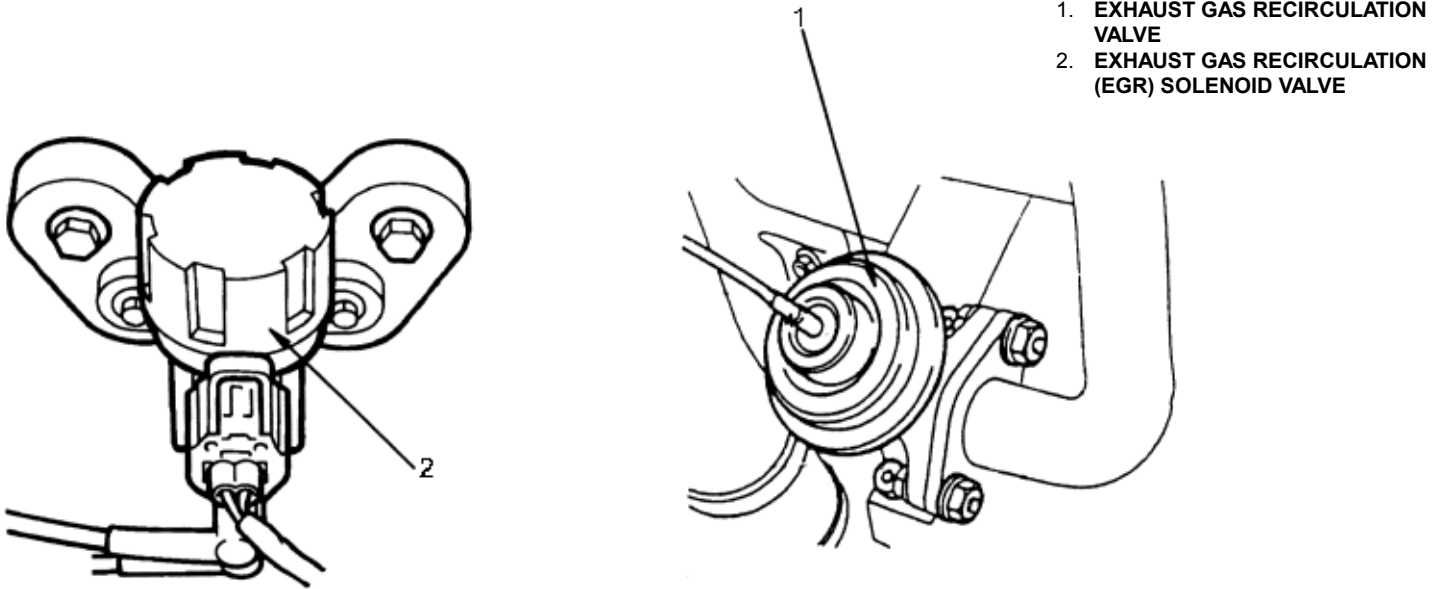
SUBSYSTEM		AIR CLEANER AND INTAKE AIR DUCT	TURBOCHARGER	
PAGE		11-123	11-124	
SYMPTOM				
ROUGH IDLE			1	
FREQUENT STALLING			1	
POOR PERFORMANCE	MISFIRING OR ROUGH RUNNING		1	
POOR PERFORMANCE	FAIL EMISSION TEST	1	2	
POOR PERFORMANCE	LOSS OF POWER	1	2	

The Emission Control System includes an Oxidation Catalytic Converter, Exhaust Gas Recirculation (EGR) system and Crankcase Emission Control.

The Crankcase Emission Control System leads gases from the cylinder head cover to the inlet manifold. The amount of gases to be drawn into the intake air is controlled via a crankcase pressure limiting valve closing progressively as engine speed increases. Exhaust emission control is done by measuring the oxygen content of the exhaust gases to adapt the amount of fuel injected to the cylinders. The amount of carbon monoxide (CO) and hydro carbons (HC) is decreased by the use of an Oxidation Catalytic Converter. The correct operation of the Oxidation Catalytic Converter depends on the oxygen concentration in the exhaust gases. Dependent on the oxygen concentration the ECM determines the rate of change of fuel being injected to achieve an optimum in combustion and thereby minimising the emissions.

The Exhaust Gas Recirculation (EGR) system is designed to reduce oxides of nitrogen emission (NO_x) by recirculating exhaust gas through the EGR valve and the inlet manifold into the combustion chambers. It is composed of the EGR valve, EGR control solenoid, ECM and various sensors.

Exhaust Gas Recirculation (EGR) Control Solenoid Valve and Exhaust Gas Recirculation (EGR) Valve.



During certain operating conditions exhaust gases are drawn back into the intake manifold to reduce combustion temperatures and therefore the amount of exhaust gases.

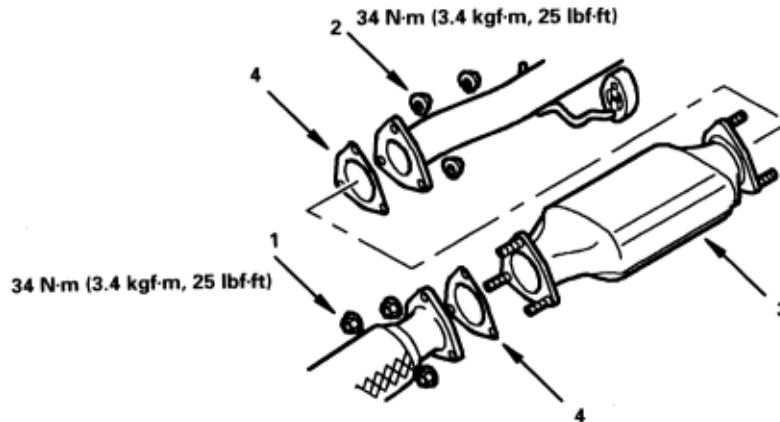
If the ECM determines that exhaust gas recirculation is necessary, the EGR Control Solenoid Valve is modulated and the EGR Valve opens because of vacuum supplied by the alternator driven vacuum pump.

The correct amount of Exhaust Gas Recirculation is calculated by the use of a mass air flow sensor. An increase in intake air flow leads to a decrease in exhaust gas.

Description

The Oxidation Catalytic Converter is used to reduce the emission of carbon monoxide (CO) and hydrocarbons (HC) in the exhaust gas.

Replacement



1. Raise the vehicle on four post ramps.
2. Remove three nuts (1) securing Oxidation catalytic converter to front pipe
3. Remove three nuts (2) securing Oxidation catalytic converter to intermediate pipe.
4. Remove Oxidation Catalytic Converter (3).
5. Remove and discard gaskets (4).
6. Refit in the reverse order of replacement.

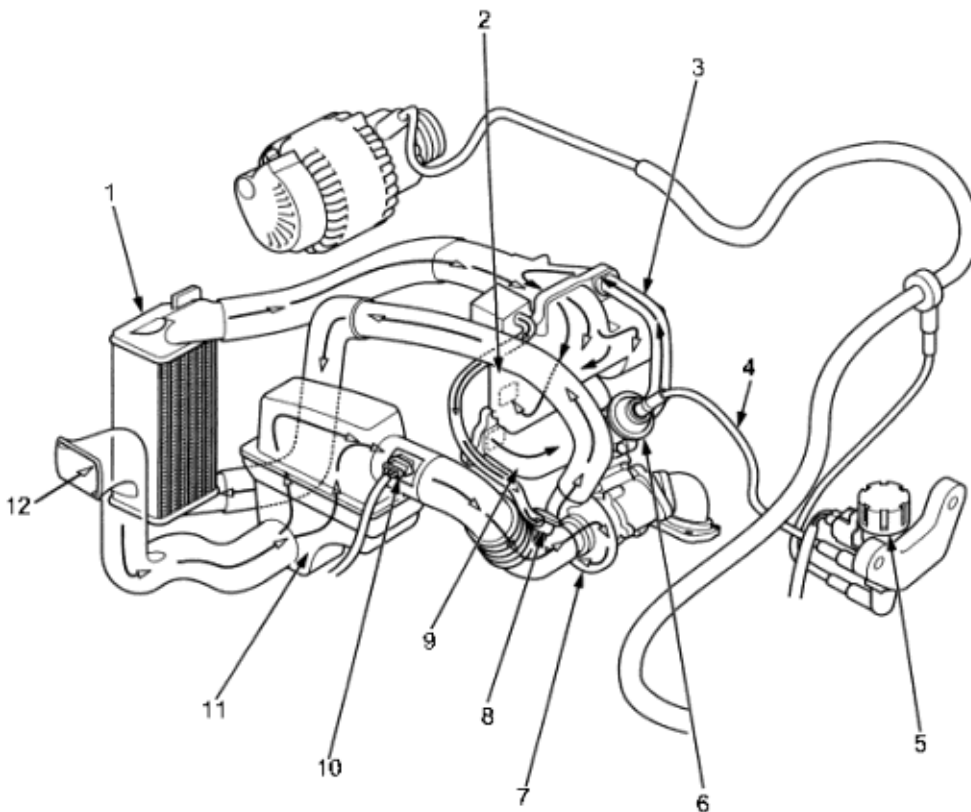
Troubleshooting Flowchart

33 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 33: A problem in the Exhaust Gas Recirculation (EGR) system.

The EGR system is designed to reduce oxides of nitrogen emissions (NOx) by recirculating exhaust gas through the EGR Valve and the intake manifold into the combustion chambers. It is composed of the EGR Valve, EGR Control Solenoid, ECM and various sensors.

The ECM memory contains ideal EGR Valve lifts for varying operating conditions. The EGR Valve is vacuum operated and controlled by the EGR Control Solenoid. When the ECM determines that EGR is needed, the EGR Control Solenoid is energised and vacuum is applied to the EGR Valve. The EGR Valve opens and exhaust gases are fed through a pipe into the exhaust manifold.

The MAF sensor, mounted in the air intake pipe, senses the volume of air entering the intake. Due to the fact that an increase in EGR will cause a decrease in the intake air flow, the MAF sensor is used by the ECM to monitor the amount of EGR. This signal enables the ECM to accurately control the volume of exhaust gases being recirculated.



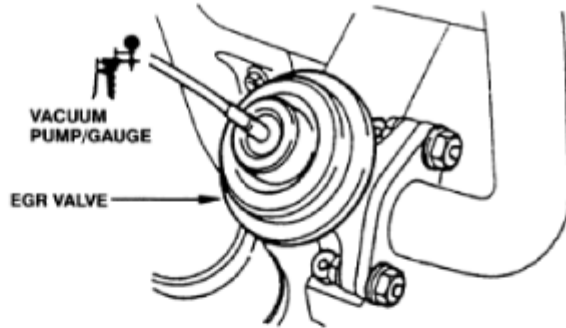
1. INTERCOOLER
2. INTAKE MANIFOLD
3. EXHAUST GAS RECIRCULATION FROM EXHAUST MANIFOLD
4. VACUUM LINE To EXHAUST GAS RECIRCULATION (EGR) VALVE
5. EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE
6. EXHAUST GAS RECIRCULATION (EGR) VALVE
7. TURBOCHARGER
8. VENT IN FROM CAMCOVER
9. EXHAUST MANIFOLD
10. MASS AIR FLOW (MAF) SENSOR
11. AIR CLEANER
12. AIR INTAKE

33

With the Data Link Connector's diagnostic L-Line connected to ground (see page 11-12), code 33 is indicated.

Do the ECM Reset Procedure (see page 11-13).

Test-drive necessary: Warm up the engine to normal operating temperature (the radiator fan comes on). Drive the vehicle on the road for approx. 10 minutes. Keep the engine speed in the 1,700-2,500 rpm (min⁻¹) range.



Does the MIL indicate code 33?

YES

NO

Intermittent failure, system is OK at this time.
Check for poor connections or loose wires between the EGR control solenoid valve, MAF sensor, and ECM.

With the engine at idle, disconnect the hose from the EGR valve and connect a vacuum pump/gauge to the hose.

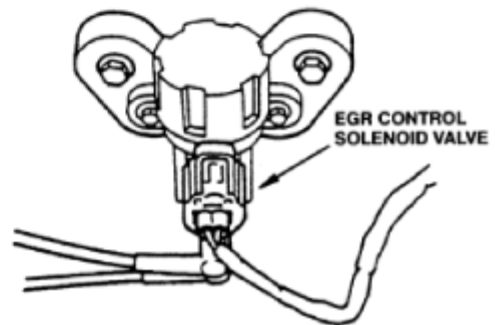
Is there any vacuum?

NO

YES

Disconnect 2P connector from the EGR control solenoid valve and check the hose for vacuum again.

Move the vacuum pump/gauge to the EGR valve.



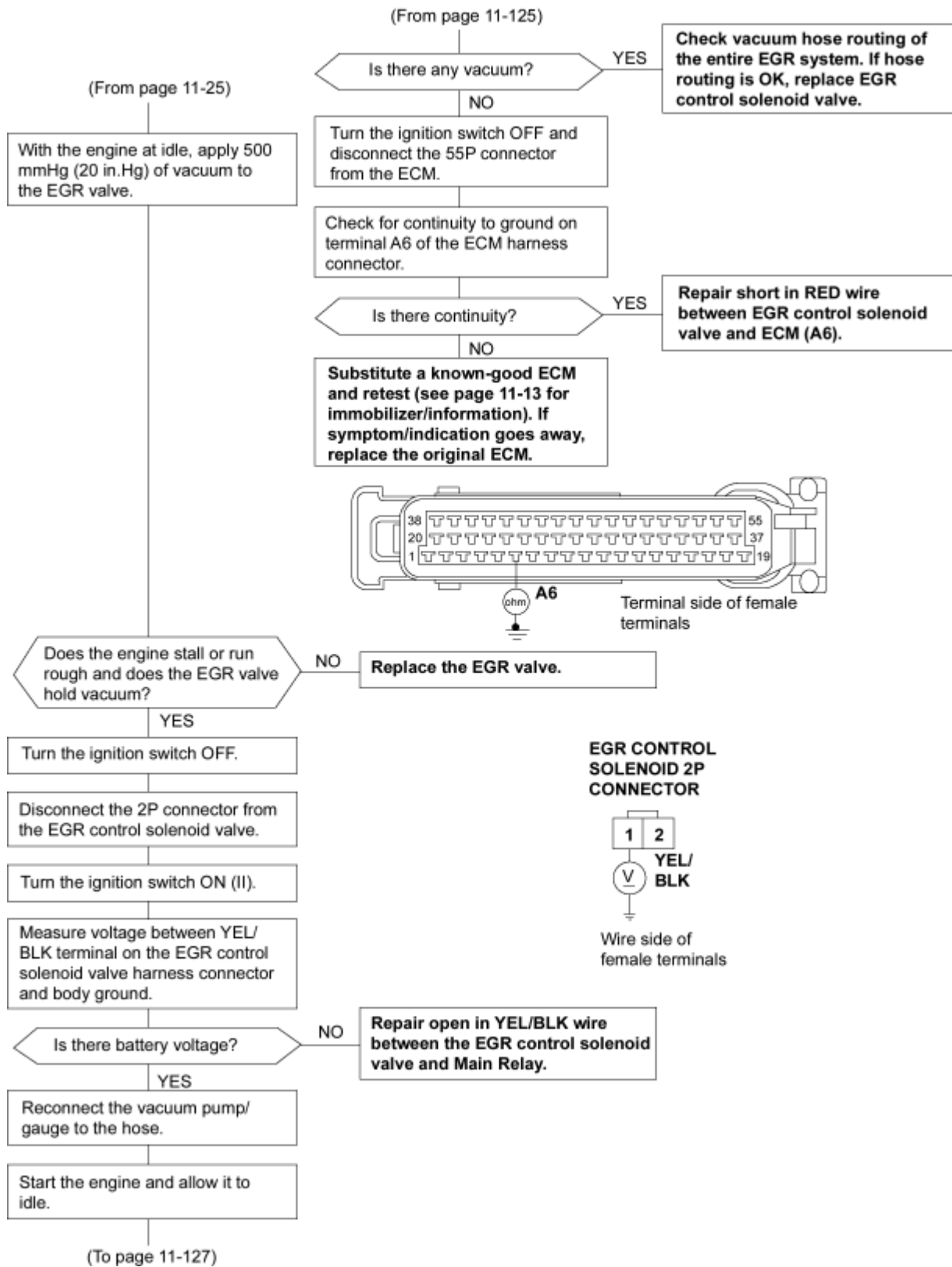
(To page 11-126)

(To page 11-126)

To go to the page referenced on the diagram above, click on the following:

(See Page 11-12)

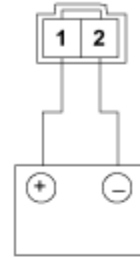
(See Page 11-13)



(From page 11-26)

Connect battery power to terminal No. 1 of the EGR Control Solenoid valve. While watching the vacuum gauge, ground terminal No. 2 of the EGR control solenoid valve.

EGR CONTROL SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there approx. 760 mmHg (30 in. Hg) within 1 second?

NO Turn the ignition switch OFF and inspect all vacuum hoses for leaks, restrictions, or misroutings.

Are the hoses OK?

NO Correct as necessary.

YES

Turn the ignition switch OFF and reconnect the 2P connector to the EGR control solenoid valve.

Disconnect the lower hose on EGR Control Solenoid valve and connect a vacuum gauge to the hose.

Turn the ignition switch OFF.

Start the engine and allow it to idle.

Connect the breakout-box between ECM and ECM connector.

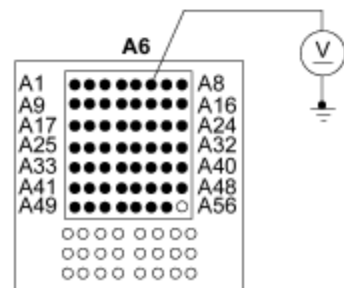
Is there approx. 600 mmHg (24 in. Hg) of vacuum?

NO Replace vacuum pump.

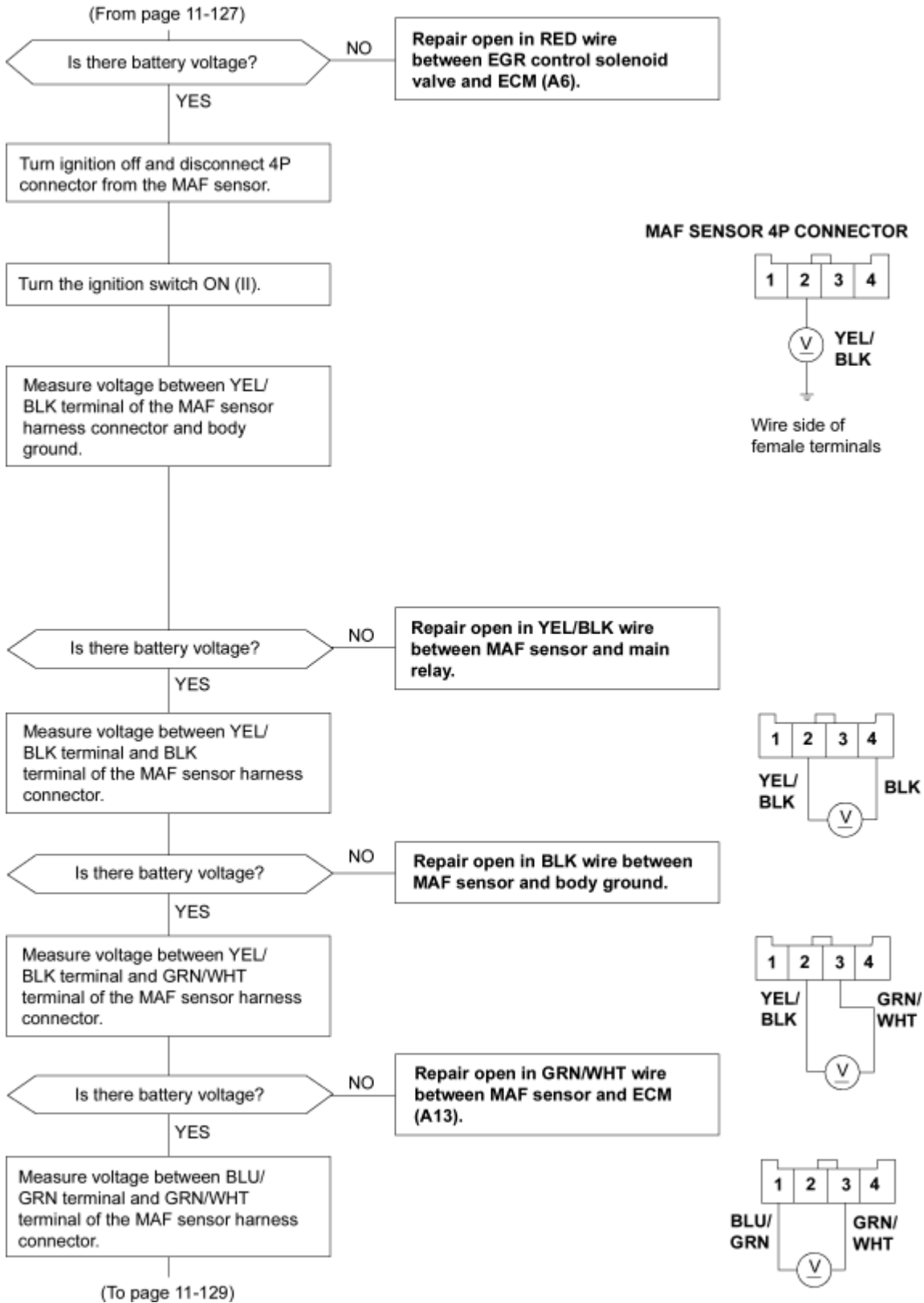
Turn the ignition switch ON (II).

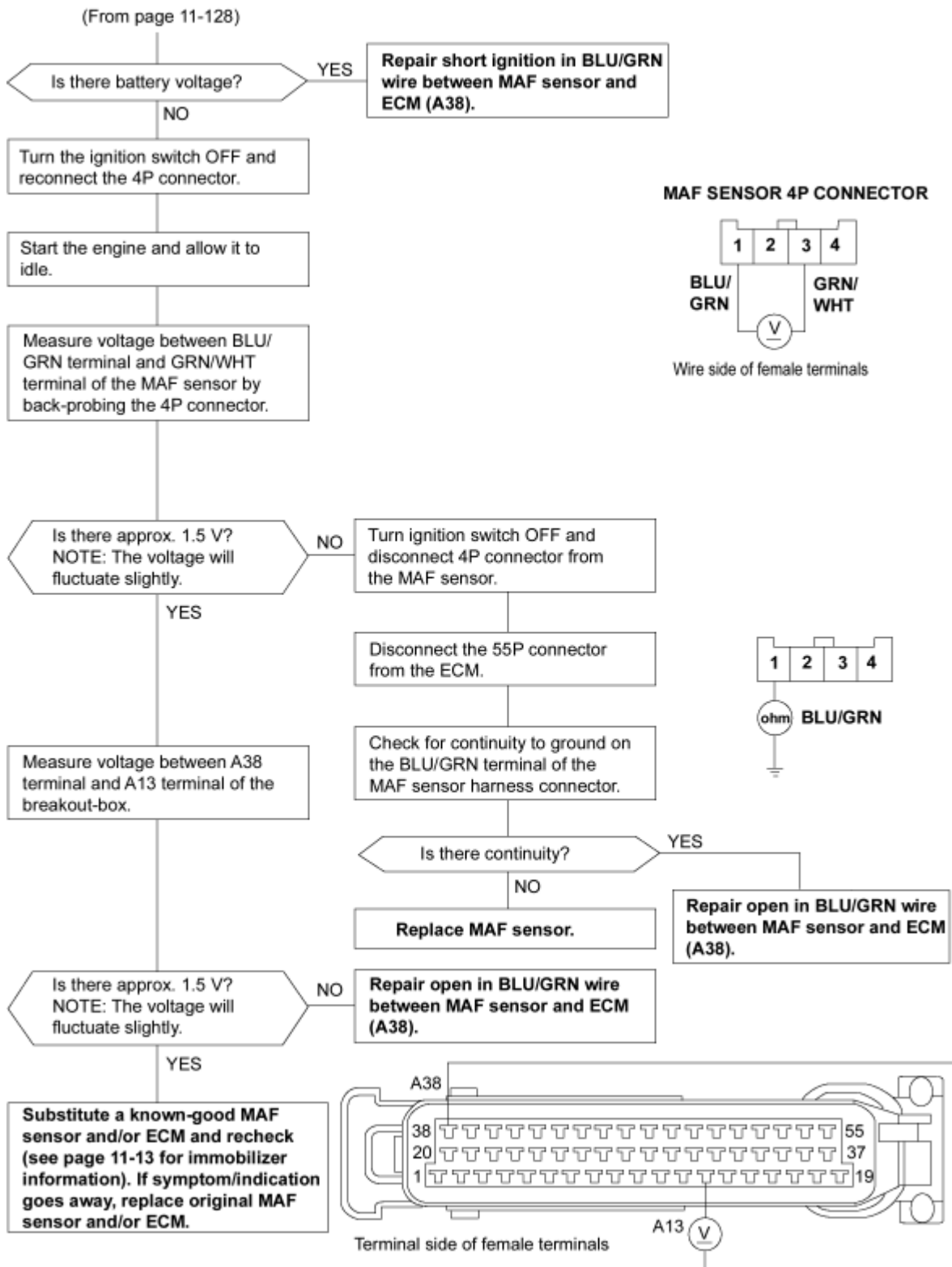
Replace the EGR control Solenoid valve.

Measure voltage between A6 terminal at the breakout-box and body ground.



(To page 11-128)

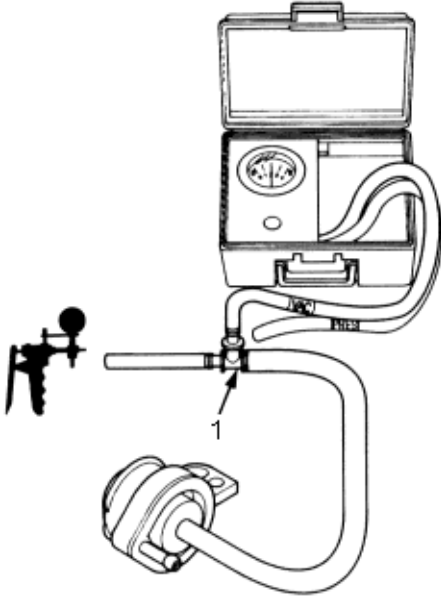




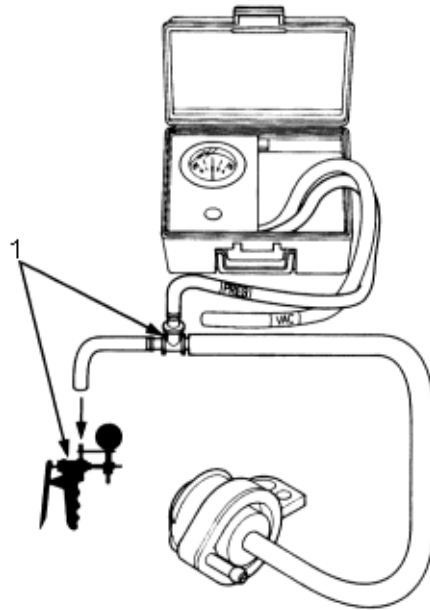
To go to the page referenced on the diagram above, click on the following:
 (See Page 11-13)

Evaporative Emission (EVAP) Two Way Valve Testing

1. Remove the fuel fill cap.
2. Remove vapour line from the two way valve on the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.



1. T-FITTING
3. Apply vacuum slowly and continuously while watching the gauge.
Vacuum should stabilise momentarily at 0.7-2.0 kPa (5-15 mm Hg, 0.2-0.6 in. Hg)
? If vacuum stabilises (valve opens) below 0.7 kPa (5 mm Hg, 0.2 in. Hg) or above 2.0 kPa (15 mm Hg, 0.6 in. Hg) install a new valve and retest.
4. Move vacuum pump hose from vacuum to pressure fitting and move vacuum gauge hose from vacuum to pressure side as shown.



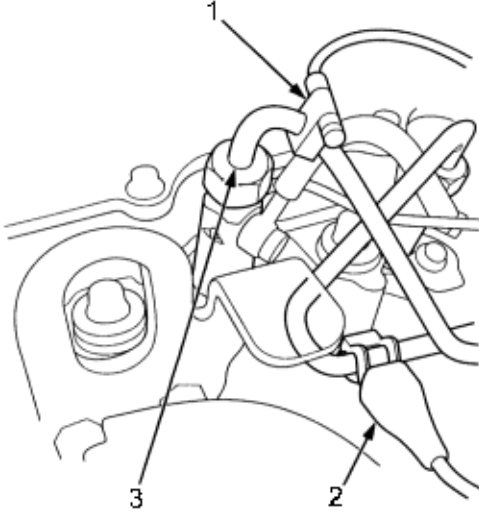
1. PRESSURE SIDE
5. Slowly pressurise the vapour line while watching the gauge.
Pressure should stabilise at 1.3-4.7 kPa (10-35 mm Hg, 0.4-1.4 in. Hg).
? If pressure momentarily stabilises (valve opens) at 1.3-4.7 kPa (10-35 mm Hg, 0.4-1.4 in. Hg), the valve is OK.
? If pressure stabilises below 1.3 kPa (10 mm Hg, 0.4 in. Hg) or above 4.7 kPa (35 mm Hg, 1.4 in. Hg), install a new valve and retest.

Inspection

Adjust the idle speed using a Honda PGM Tester if possible.
If not, use the following procedure:

NOTE:

- ? Before setting the idle speed, check the following items:
- The MIL has not been reported on.
 - Air cleaner
 - Crankcase emission control
1. Connect a tachometer using a special clamp on one of the fuel injector tubes.



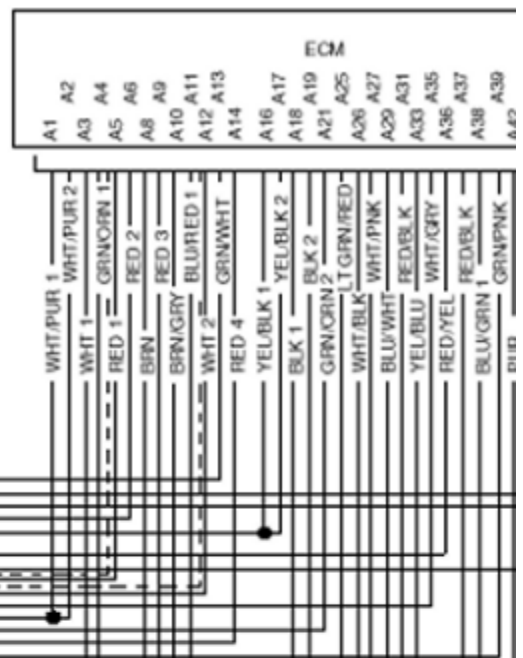
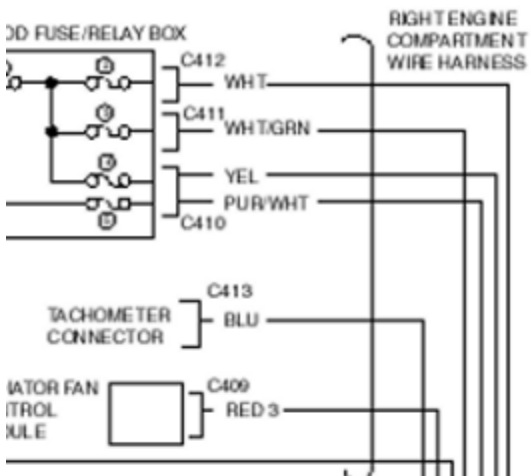
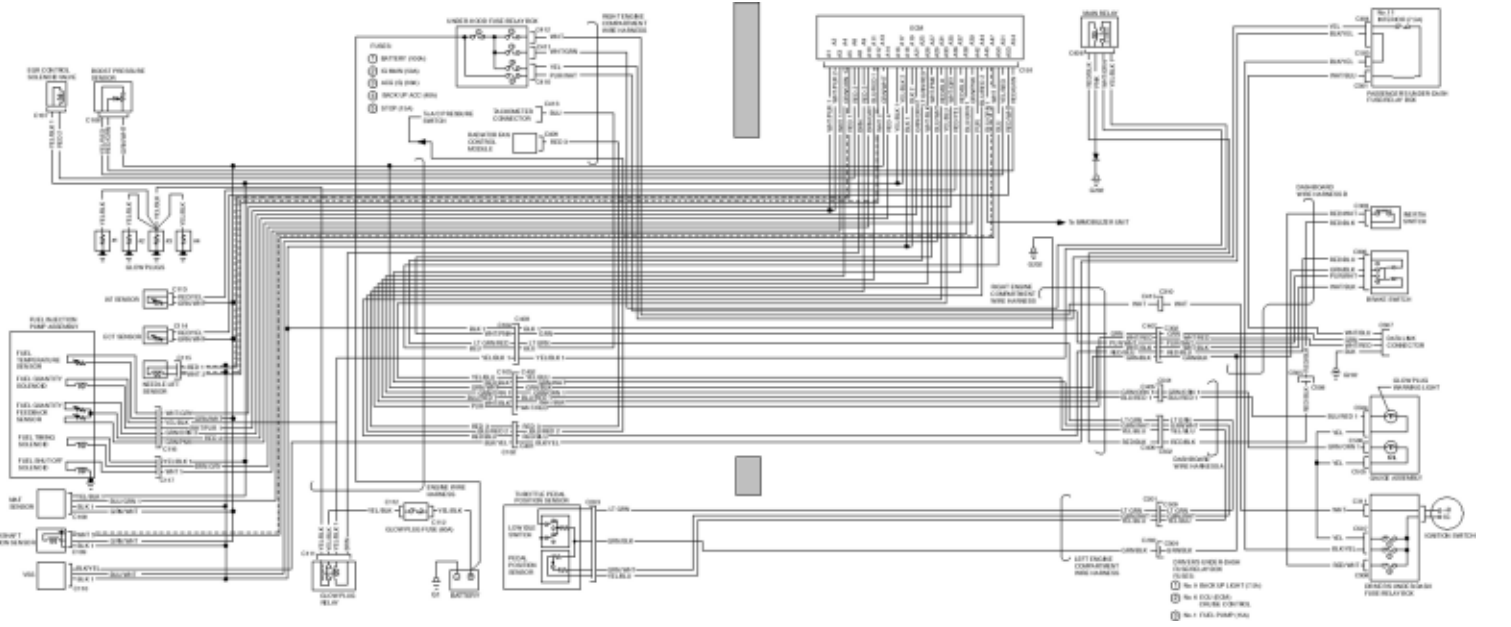
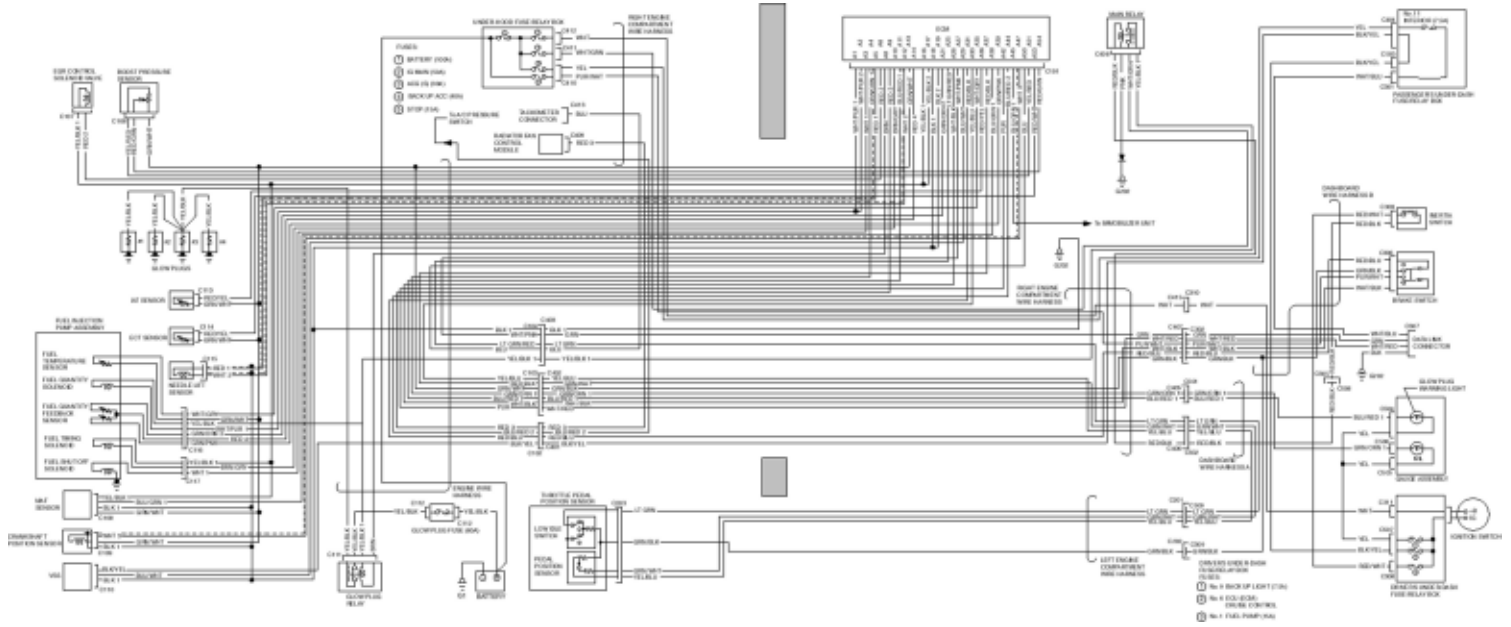
- 1. SPECIAL CLAMP
- 2. EARTH CLAMP
- 3. FUEL INJECTOR TUBE

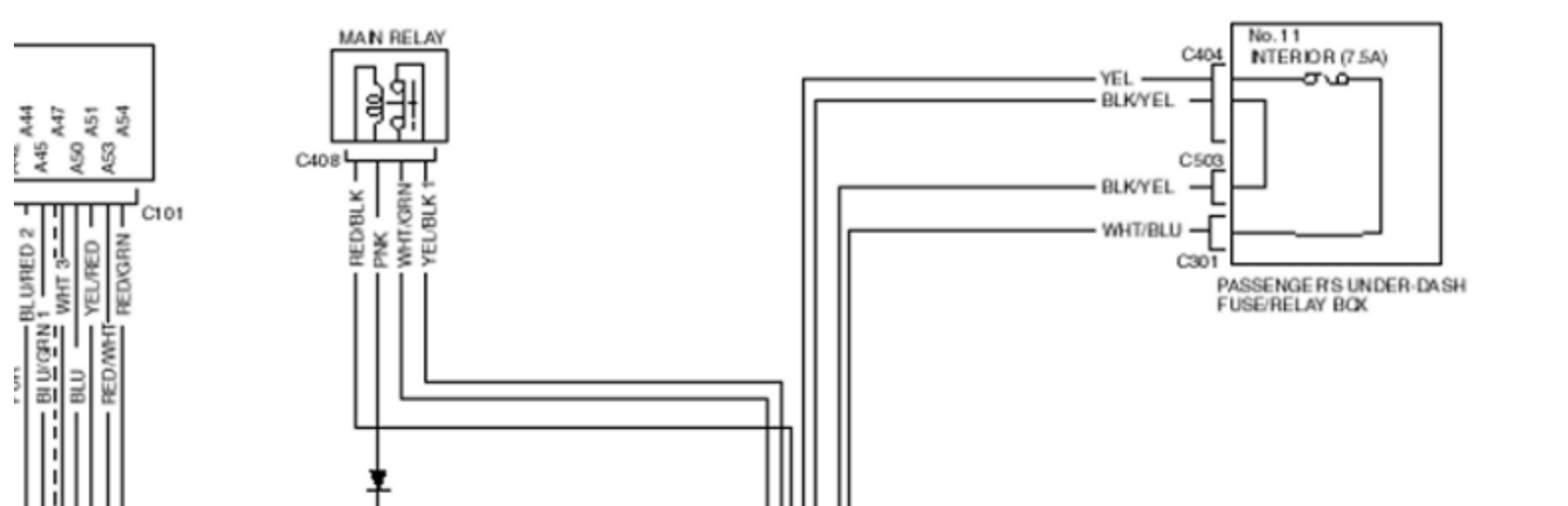
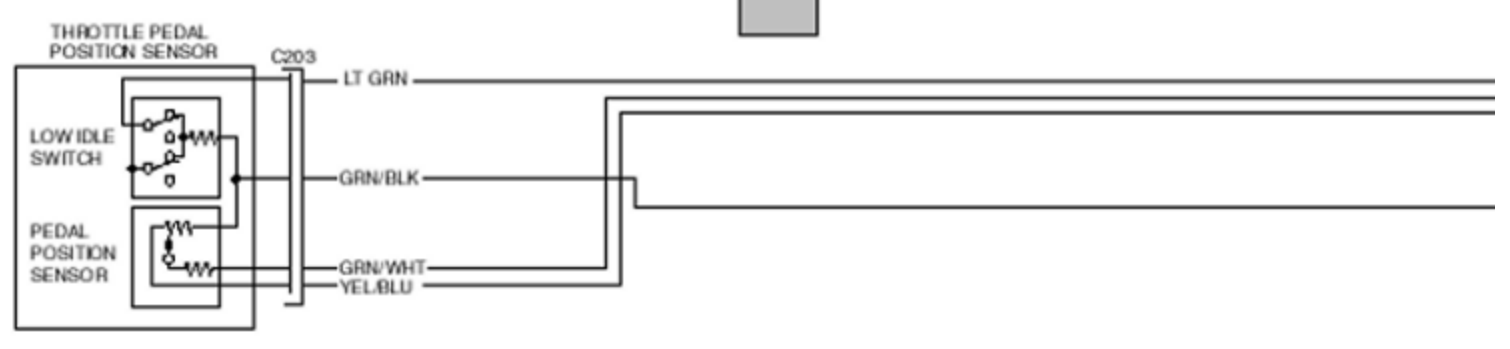
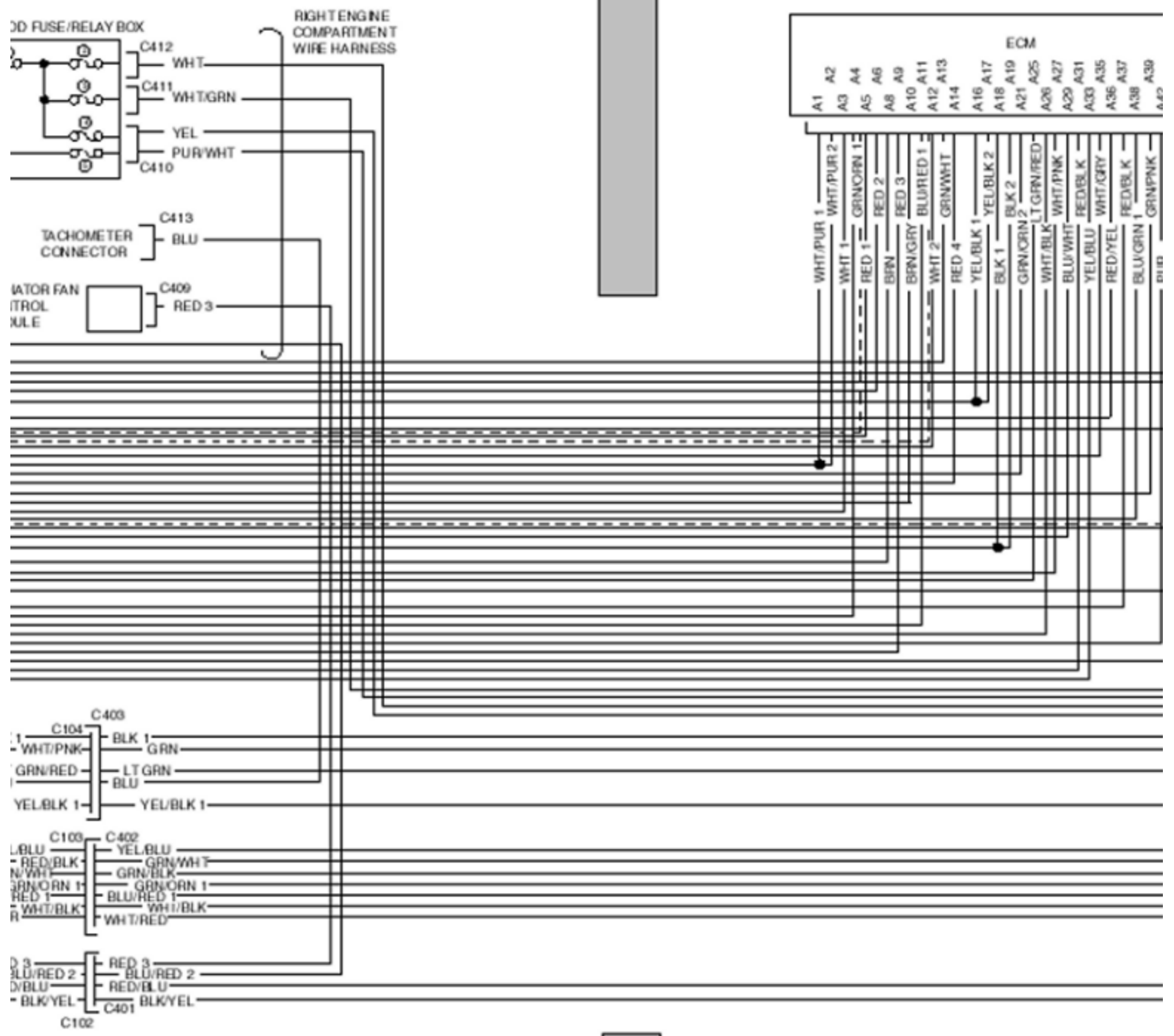
2. Start the engine. Hold the engine at 3,000 rpm (min-1) with no-load (M/T in neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed with no-load condition: headlights, blower fan, rear defogger, radiator fan and air conditioner are not operating.

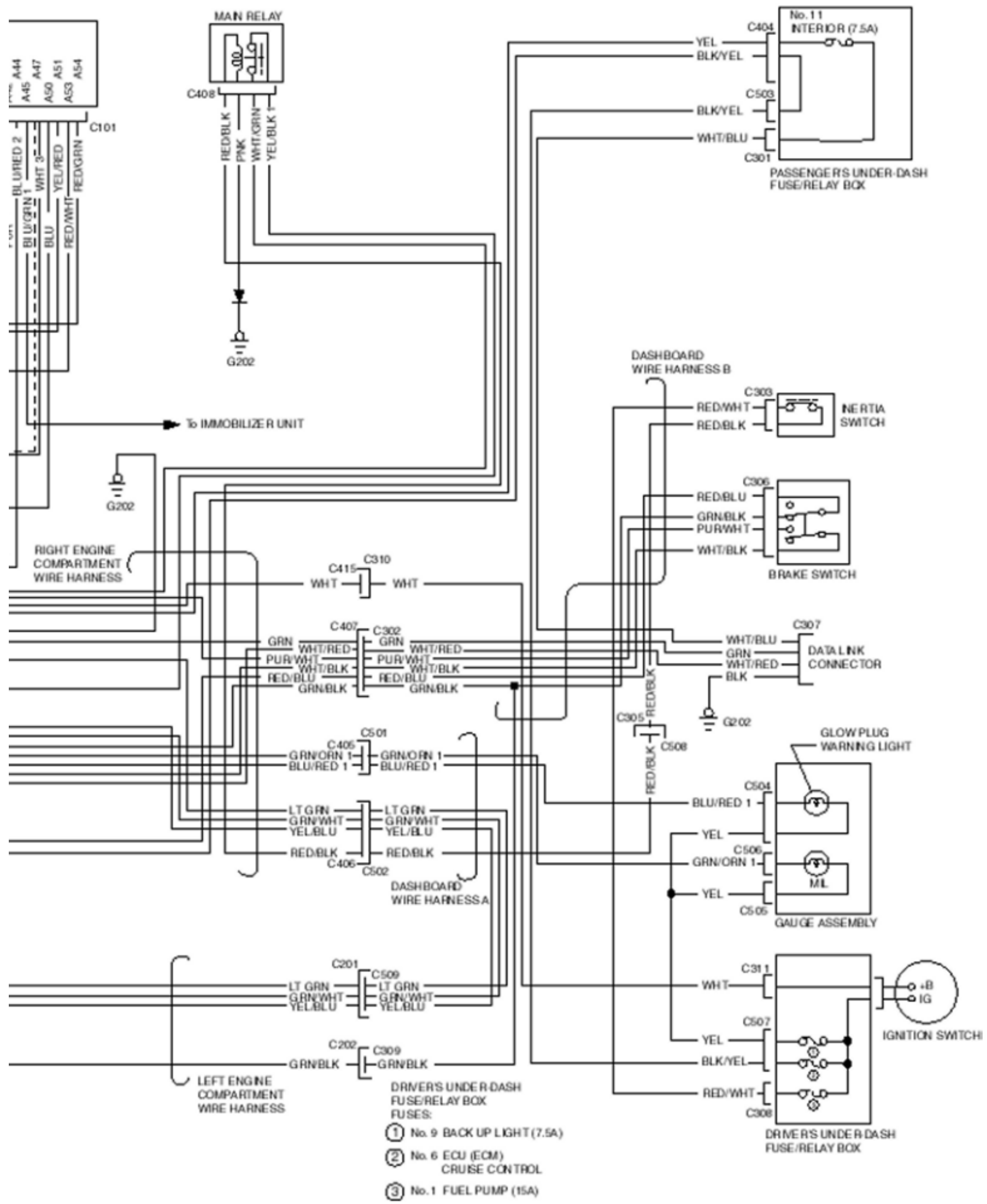
Idle speed should be:
805 ± 50 rpm (min-1)

Diagrams
Fuel-injected System Diagram (LHD)

11-132



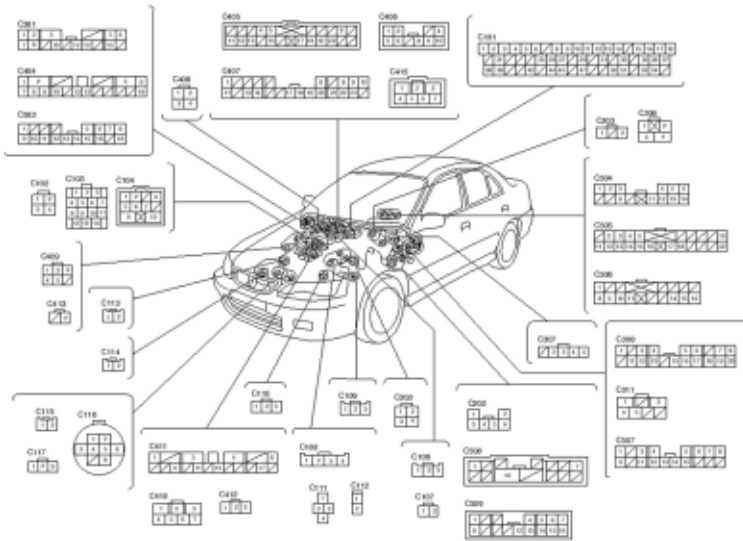




Diagrams

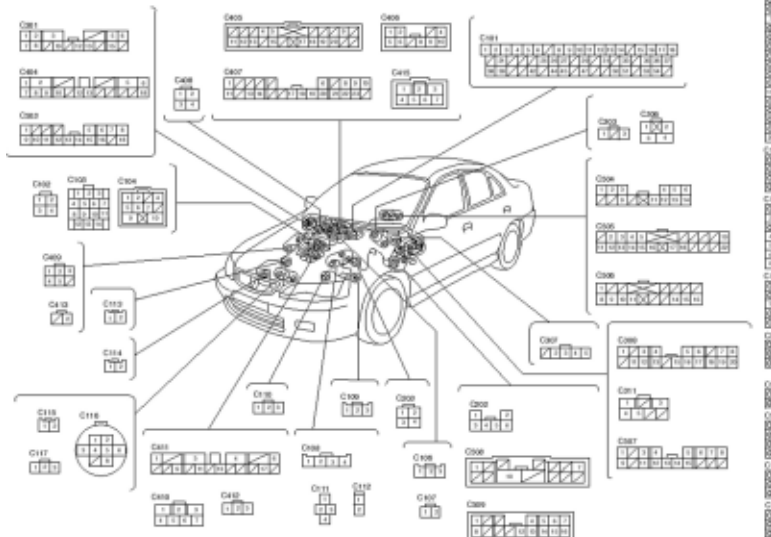
Fuel-injected System Connectors (LHD)

11-133



C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306
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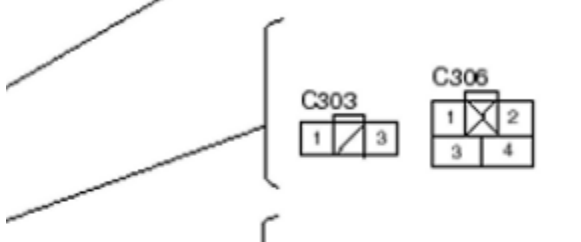
NOTE: * Different view with the same color from the same pin number will be highlighted then the example.
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C101	C102	C103	C104	C105	C106	C107	C108	C109	C110	C111	C112	C113	C114	C115	C116	C117	C118	C119	C120	C121	C122	C123	C124	C125	C126	C127	C128	C129	C130	C131	C132	C133	C134	C135	C136	C137	C138	C139	C140	C141	C142	C143	C144	C145	C146	C147	C148	C149	C150	C151	C152	C153	C154	C155	C156	C157	C158	C159	C160	C161	C162	C163	C164	C165	C166	C167	C168	C169	C170	C171	C172	C173	C174	C175	C176	C177	C178	C179	C180	C181	C182	C183	C184	C185	C186	C187	C188	C189	C190	C191	C192	C193	C194	C195	C196	C197	C198	C199	C200	C201	C202	C203	C204	C205	C206	C207	C208	C209	C210	C211	C212	C213	C214	C215	C216	C217	C218	C219	C220	C221	C222	C223	C224	C225	C226	C227	C228	C229	C230	C231	C232	C233	C234	C235	C236	C237	C238	C239	C240	C241	C242	C243	C244	C245	C246	C247	C248	C249	C250	C251	C252	C253	C254	C255	C256	C257	C258	C259	C260	C261	C262	C263	C264	C265	C266	C267	C268	C269	C270	C271	C272	C273	C274	C275	C276	C277	C278	C279	C280	C281	C282	C283	C284	C285	C286	C287	C288	C289	C290	C291	C292	C293	C294	C295	C296	C297	C298	C299	C300	C301	C302	C303	C304	C305	C306
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3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
					25	26	27	29	31	33	35	36	37		
			42	44	45	47			50	51	53	54			



C101	1	WHT/PUR ¹	2	GRN/ORN ²	41	—
	3	WHT/PUR ²	22	—	42	PUR
	4	WHT ¹	23	—	43	—
	5	GRN/ORN ¹	24	—	44	BLU/RED ²
	6	RED ¹	25	LT GRN/RED	45	BLU/GRN ²
	7	RED ²	26	WHT/BLK	46	—
	8	BRN	27	WHT/PNK	47	WHT ³
	9	RED ³	28	—	48	—
	10	BRN/GRY	29	BLU/WHT	49	—
	11	BLU/RED ¹	30	—	50	BLU
	12	WHT ²	31	RED/BLU	51	YEL/RED
	13	GRN/WHT	32	—	52	—
	14	RED ⁴	33	YEL/BLU	53	RED/WHT
	15	—	34	—	54	RED/GRN
	16	YEL/BLK ¹	35	WHT/GRY	55	—
	17	YEL/BLK ²	36	RED/YEL		
	18	BLK ¹	37	RED/BLK		
	19	BLK ²	38	BLU/GRN ¹		
	20	—	39	GRN/PNK		
			40	—		

C116	1	RED ⁴
	2	GRN/ORN
	3	WHT/PUR
	4	YEL/BLK ¹
	5	GRN/WHT
	6	GRN/PUR
	7	—
	8	WHT/GRY

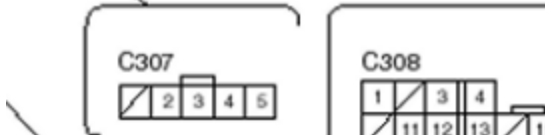
C117	1	WHT ¹
	2	YEL/BLK ¹
	3	BRN/GRY

C202	1	GRN/YEL
	2	GRN/BLK
	3	BLU/YEL
	4	YEL/RED
	5	GRN/BLK
	6	GRN

C203	1	GRN/BLK
	2	LT GRN

C102	1	RED/BLU
	2	RED ³

3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			25	26	27	28	29	30	31	32	33	34	35	36	37
		42	43	44	45	46	47	48	49	50	51	52	53	54	



C101

① WHT/PUR ¹	② GRN/ORN ²	41 —
③ WHT/PUR ²	22 —	④ PUR
⑤ WHT ¹	23 —	43 —
⑥ GRN/ORN ¹	24 —	⑤ BLU/RED ²
⑦ RED ¹	⑧ LT GRN/RED	⑥ BLU/GRN ²
⑨ RED ²	⑩ WHT/BLK	46 —
7 —	⑪ WHT/PNK	⑦ WHT ²
⑫ BRN	28 —	48 —
⑬ RED ³	⑭ BLU/WHT	49 —
⑮ BRN/GRY	30 —	⑱ BLU
⑯ BLU/RED ¹	⑰ RED/BLU	⑳ YEL/RED
⑲ WHT ²	32 —	52 —
⑳ GRN/WHT	⑳ YEL/BLU	㉑ RED ¹ /WHT
㉒ RED ⁴	34 —	㉒ RED ¹ /GRN
15 —	㉓ WHT/GRY	55 —
㉔ YEL/BLK ¹	㉔ RED ¹ /YEL	
㉕ YEL/BLK ²	㉕ RED ² /BLK	
㉖ BLK ¹	㉖ BLU/GRN ¹	
㉗ BLK ²	㉗ GRN/PNK	
20 —	40 —	

C102

① RED/BLU
② RED ³
③ BLK/YEL
④ BLU/RED ²

C103

① RED/BLK	⑫ BLU/RED ¹
② YEL/GRN	⑬ PUR
③ GRN/WHT	⑭ GRN/ORN ¹
④ BLU/WHT	⑮ WHT/BLK
⑤ GRN/WHT	⑯ YEL/BLU
⑥ YEL	⑰ BLU/GRN
⑧ YEL/RED	⑱ RED

C104

① BLK ¹	⑥ BLK/YEL
② WHT/PNK	⑦ WHT/BLU
③ —	⑧ —
④ LT GRN/RED	⑨ BLK/WHT
⑤ BLU	⑩ YEL/BLK ¹

C106

① RED/GRN
② GRN/WHT
③ YEL/RED

C111

① YEL/BLK
② BRN
③ YEL/BLK ¹
④ YEL/BLK

C107

① YEL/BLK ¹
② RED ²

C112

① YEL/BLK
② YEL/BLK

C108

① BLU/GRN ¹
② YEL/BLK ¹
③ GRN/WHT
④ BLK ¹

C113

① GRN/WHT
② RED ¹ /YEL

C109

① BLK ¹
② WHT ³
③ GRN/WHT

C114

① GRN/WHT
② RED ¹ /WHT

C110

① BLK/YEL
② BLK ¹
③ BLU/WHT

C115

① WHT ²
② RED ¹

C116

① RED ⁴
② GRN/ORN
③ WHT/PUR
④ YEL/BLK ¹
⑤ GRN/WHT
⑥ GRN/PUR
7 —
⑦ WHT/GRY

C117

① WHT ¹
② YEL/BLK ¹
③ BRN/GRY

C202

1 GRN/YEL
2 GRN/BLK
3 BLU/YEL
4 YEL/RED
⑤ GRN/BLK
6 GRN

C203

① GRN/BLK
② LT GRN
③ GRN/WHT
④ YEL/BLU

C301

① WHT/BLU
② GRN/YEL
③ WHT
4 —
⑤ RED/BLK
⑥ BLK
⑦ YEL/BLK
⑧ BLU/WHT

C303

① RED/WHT
2 —
③ RED/BLK

C306

① GRN/BLK
② RED/BLU
③ WHT/BLK
④ PUR/WHT

C307

1 —
② WHT/RED
③ GRN
④ WHT/BLU
⑤ BLK

C308

① RED/WHT
2 —
③ RED/BLK
④ LT GRN/RED
⑤ WHT/RED
⑥ BLK
7 —
⑧ WHT/BLK
⑨ BLU
10 —

NOTE: ● DI
○ YI
□ 0
● -

C311

1 BLK/WHT
2 —
③ WHT
④ GRN/BLK
⑤ BLK/YEL
6 —
7 —

C409

1 BLK/ORN
② GRN
③ BRN
④ BLK/ORN
⑤ RED ³
6 —

C410

1 WHT/BLU
② BLU/ORN
③ BLU/WHT
④ WHT/GRN
⑤ PUR/WHT
⑥ GRN
⑦ YEL

C504

1 BLU/RED	8 —
② GRN	⑨ YEL/GRN
③ PNK	10 —
④ WHT/RED	⑪ RED/BLU
⑤ BLU/RED ¹	⑫ WHT/GRN
⑥ YEL	⑬ BLU
7 —	⑭ LT BLU

C505

1 —	⑫ GRN/BLK
② YEL/GRN	⑬ GRN/WHT
③ GRN/RED	⑭ GRN/YEL
④ RED/YEL	⑮ YEL
⑤ ORN	⑯ PNK
⑥ —	⑰ BLK
⑦ —	⑱ BLU/WHT
⑧ —	⑲ —

C311

1	BLK/WHT
2	—
3	WHT
4	GRN/BLK
⑤	BLK/YEL
6	—
7	—

C404

1	GRN	⑩	BLK/YEL
2	RED/YEL	11	—
3	—	12	BLU/WHT
4	—	13	BLU/RED
⑫	YEL	14	—
6	BRN	15	—
7	RED/BLK	16	—
8	BLK/ORN	17	—
9	WHT/GRN	18	BLK

C405

1	—	12	BLU/BLK
2	—	13	GRN/BLK
3	—	14	—
4	YEL	15	YEL/RED
5	GRN/BLK	16	—
6	—	17	BLU
7	—	18	YEL/GRN
8	—	19	WHT/BLU
⑬	GRN/ORN ¹	20	YEL/GRN
10	—	18	—
⑭	BLU/RED ¹	18	—

C406

⑮	RED/BLK	6	PUR/WHT
⑯	GRN/WHT	7	—
3	—	8	YEL
4	WHT/GRN	9	YEL/BLU
5	ORN	10	LT GRN

C407

⑰	GRN/BLK	13	LT GRN/RED
2	—	14	LT BLU
3	—	15	—
4	—	16	—
5	—	⑱	PUR/WHT
6	YEL*	⑲	WHT/BLK
7	—	19	GRN
⑳	RED/BLU	20	GRN/BLK
㉑	RED	21	RED/WHT
㉒	GRN	22	WHT/GRN
11	YEL/BLU	㉓	WHT/RED
12	—	24	—

* with manual A/C

C408

⑳	WHT/GRN
㉑	RED/BLK
㉒	YEL/BLK ¹
㉓	PNK

C409

1	BLK/ORN
2	GRN
3	BRN
4	BLK/ORN
⑳	RED ²
6	—

C410

1	WHT/BLU
2	BLU/ORN
3	BLU/WHT
4	WHT/GRN
⑳	PUR/WHT
6	GRN
㉑	YEL

C411

1	—	10	—
2	—	11	LT GRN/RED
3	RED/YEL	12	—
4	RED/WHT	13	BLU/RED
5	—	14	—
6	PUR/WHT	15	—
7	—	16	—
8	—	㉑	WHT/GRN
9	BLU/RED	18	—

C412

1	YEL/BLK
⑳	WHT
3	WHT/GRN

C413

1	—
⑳	BLU

C415

1	BLK/WHT
2	WHT/BLU
⑳	WHT
4	BLU*
5	BLU/YEL*
6	BLU/RED*
7	BLU/BLK*

* with manual A/C

C503

1	BLU/WHT	10	RED/WHT
2	—	11	PUR/WHT
3	—	⑳	BLK/YEL
4	—	13	RED/YEL
5	RED/YEL	14	RED/BLU
6	BRN/WHT	15	WHT/GRN
7	RED/BLK	16	GRN/WHT
8	BLK/WHT	17	—
9	GRN/BLK	18	RED/YEL

C504

1	BLU/RED	8	—
2	GRN	9	YEL/GRN
3	PNK	10	—
4	WHT/RED	11	RED/BLU
⑳	BLU/RED ¹	12	WHT/GRN
㉑	YEL	13	BLU
7	—	14	LT BLU

C505

1	—	12	GRN/BLK
2	YEL/GRN	13	GRN/WHT
3	GRN/RED	14	GRN/YEL
4	RED/YEL	㉑	YEL
5	ORN	16	PNK
6	—	17	BLK
7	—	18	BLU/WHT
8	—	19	—
9	—	20	—
10	BLU	21	—
11	GRN/ORN	22	BLK

C506

1	YEL/BLU	9	RED/BLK
2	—	10	YEL/RED
3	—	11	WHT/BLU
4	—	12	—
5	—	13	—
6	—	14	PNK
7	—	㉑	GRN/ORN ¹
8	PUR	16	BLK/YEL

C507

1	GRN/WHT	10	—
2	—	11	PUR
3	GRY	㉑	BLK/YEL
⑳	YEL	13	RED/BLK
5	YEL/GRN	14	GRN/ORN
6	BLK	15	GRN/YEL
7	YEL/RED	16	—
8	RED/BLK	17	—
9	GRN/RED	18	—

C508

1	RED/YEL	8	—
2	—	9	—
3	—	10	GRN
4	—	11	—
5	—	12	—
6	—	13	—
⑳	RED/BLK	14	—

C509

⑰	GRN/WHT	9	—
2	—	10	—
3	—	11	—
4	BLU/WHT	12	BLU/RED
5	BLU/BLK	13	PUR/WHT
6	PUR	㉑	YEL/BLU
7	GRN	15	RED/YEL
8	YEL/GRN	㉒	LT GRN

1	—
2	—
3	—
4	—
5	—
6	—
7	—

8	—
9	—
10	—
11	—
12	—
13	—
14	—
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16	—

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27	—
28	—
29	—
30	—

31	—
32	—
33	—
34	—
35	—
36	—

9	—
10	BLU/YEL
11	—
12	YEL
13	LT GRN
14	—
15	BLK/ORN
16	—

17	—
18	—
19	—
20	—
21	—
22	—

23	—
24	—
25	—
26	—
27	—
28	—

29	—
30	—
31	—
32	—
33	—
34	—

35	—
36	—
37	—
38	—
39	—
40	—

11	YEL/BLK
12	GRN
13	BLK/ORN
14	BLK/YEL
15	YEL/BLK
16	LT GRN
17	BLU/WHT
18	YEL
19	PNK
20	WHT/BLK

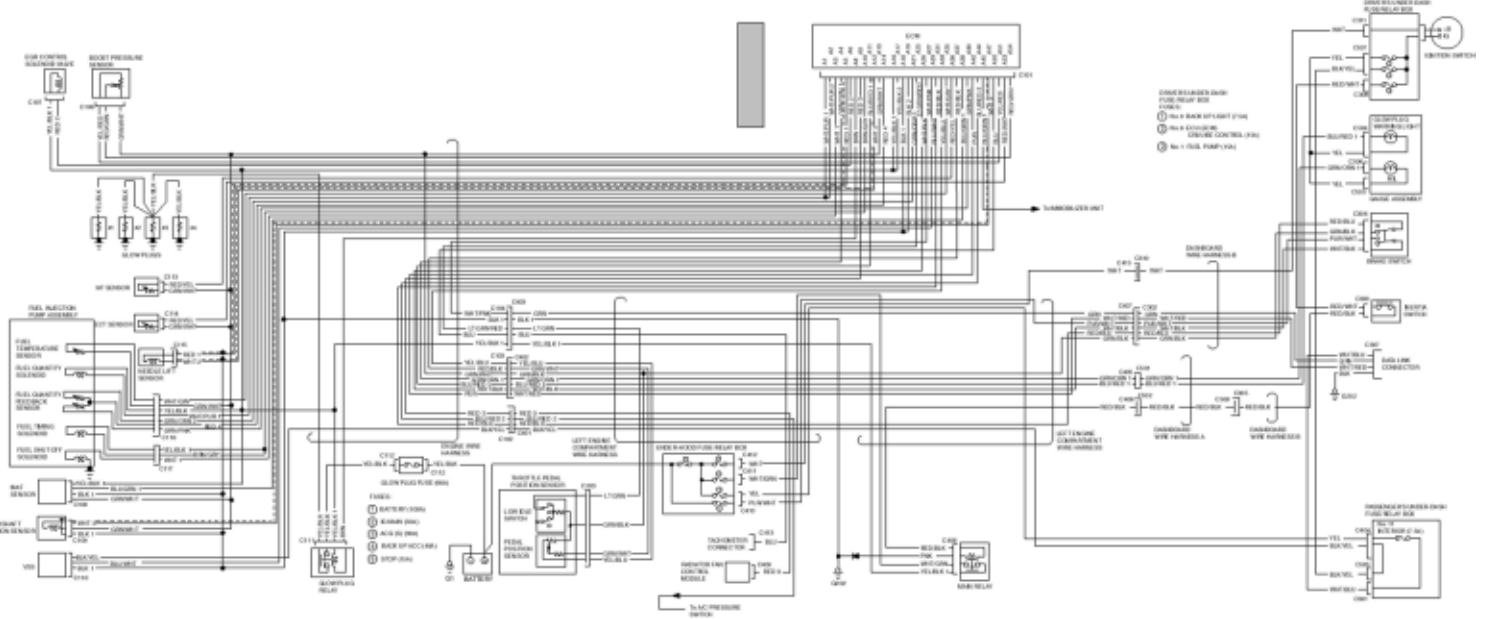
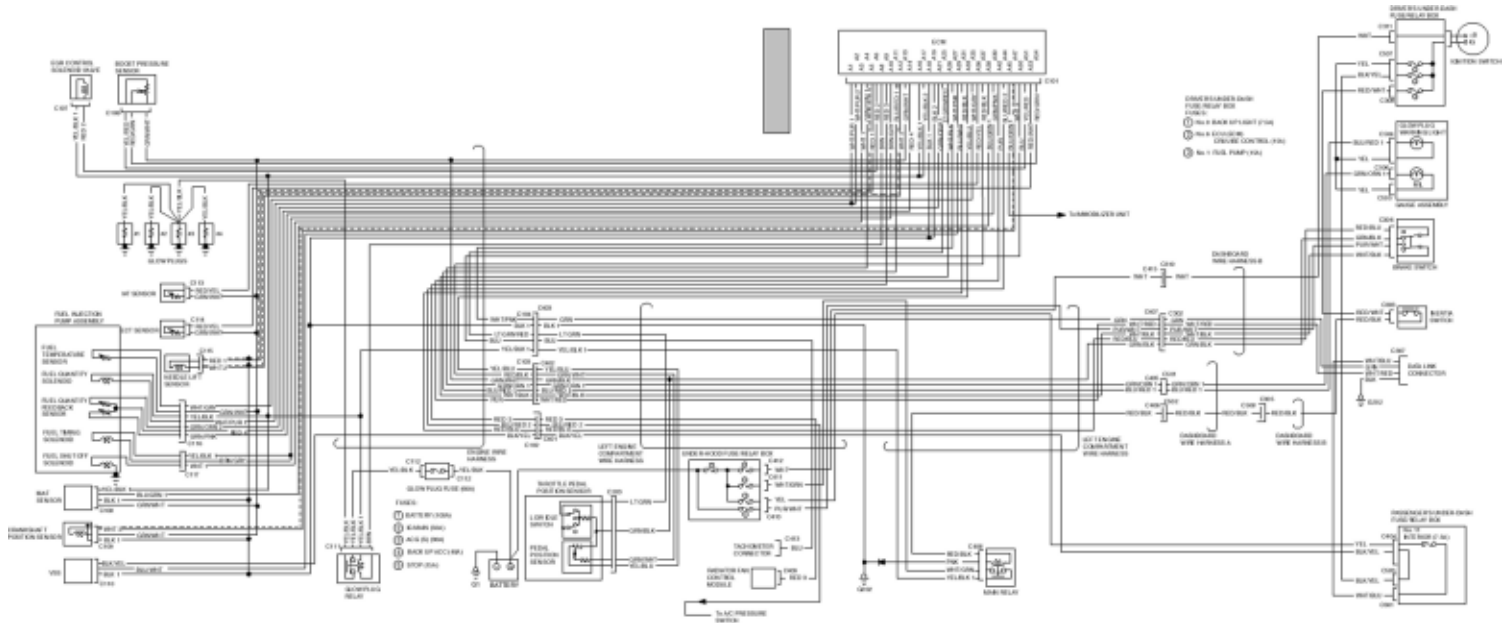
Front wires with the same color have been given a number suffix to distinguish them (for example, BLK/BLK¹ and YEL/BLK² are not the same).

⑰ : Related to Fuel and Emissions System.

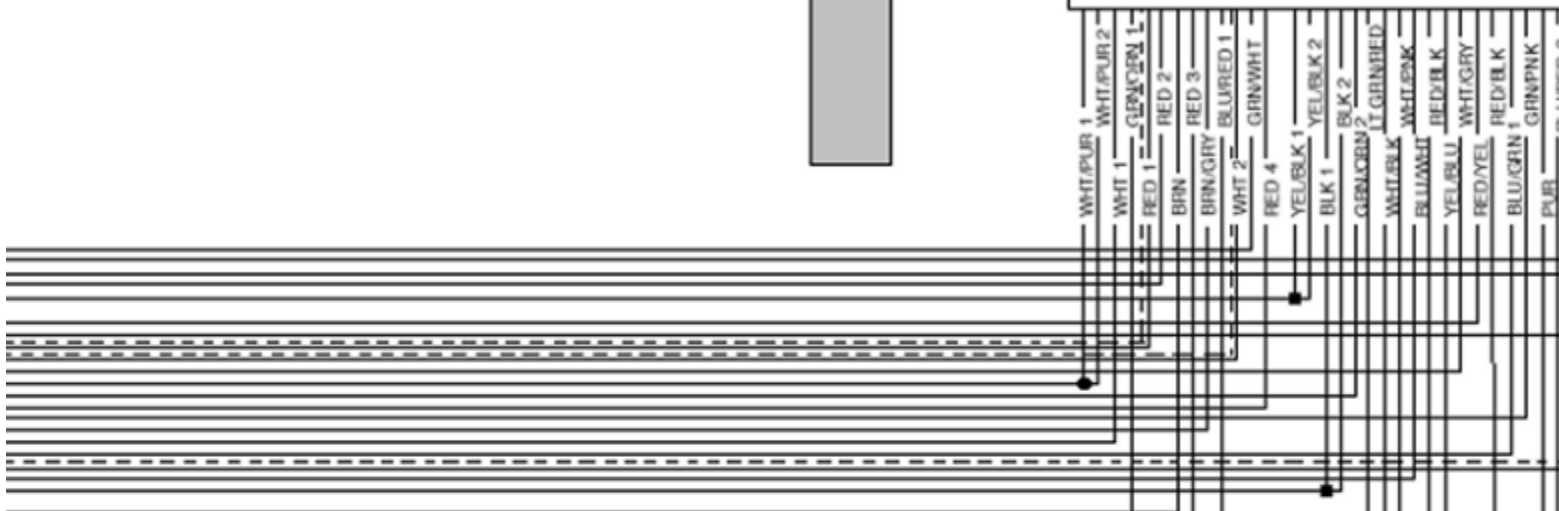
⑳ : Connect or with male terminals (double outline): View from terminal side

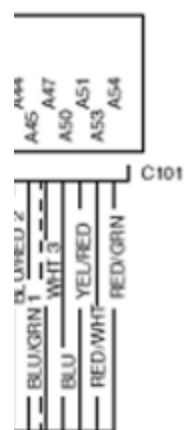
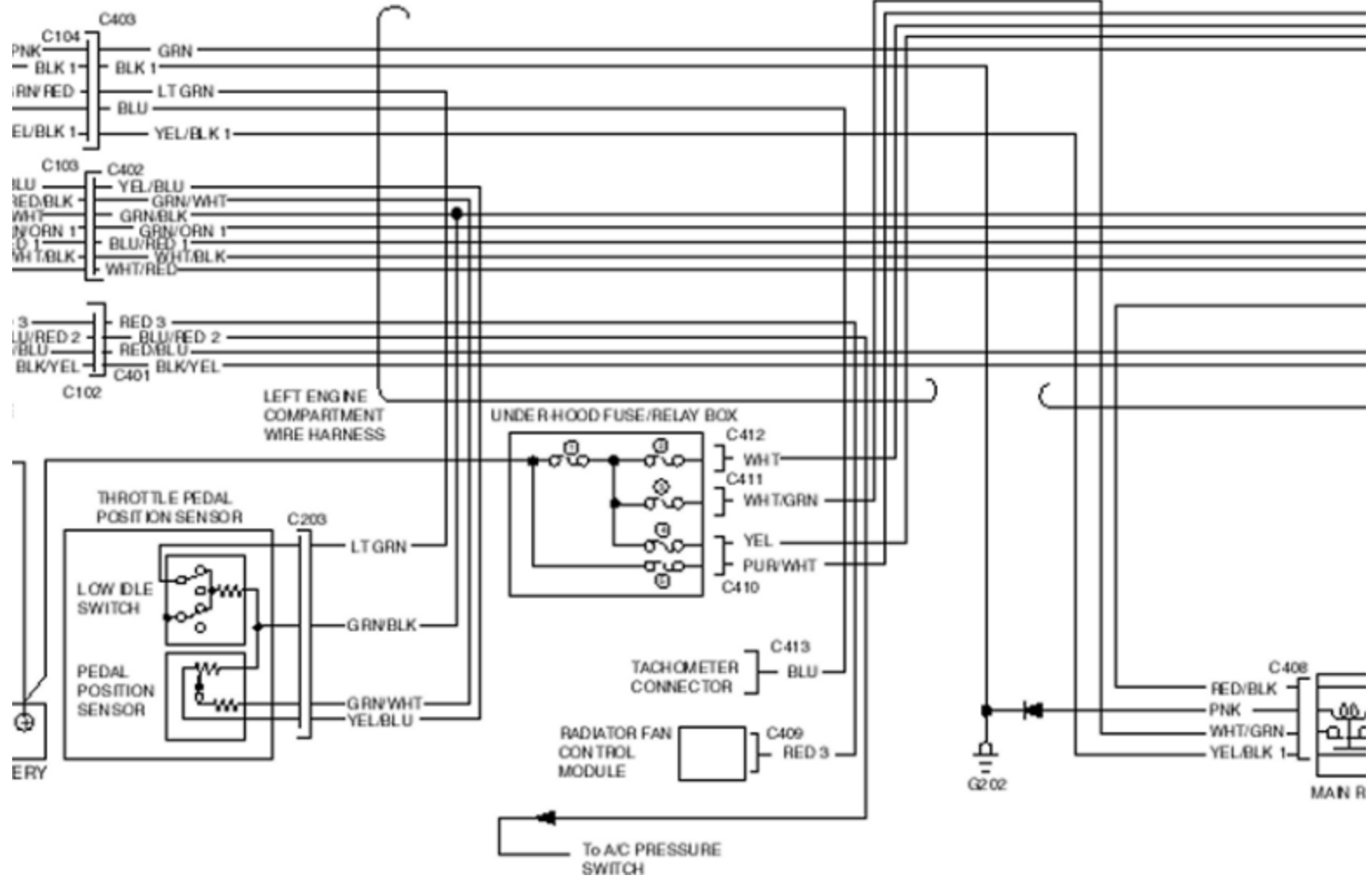
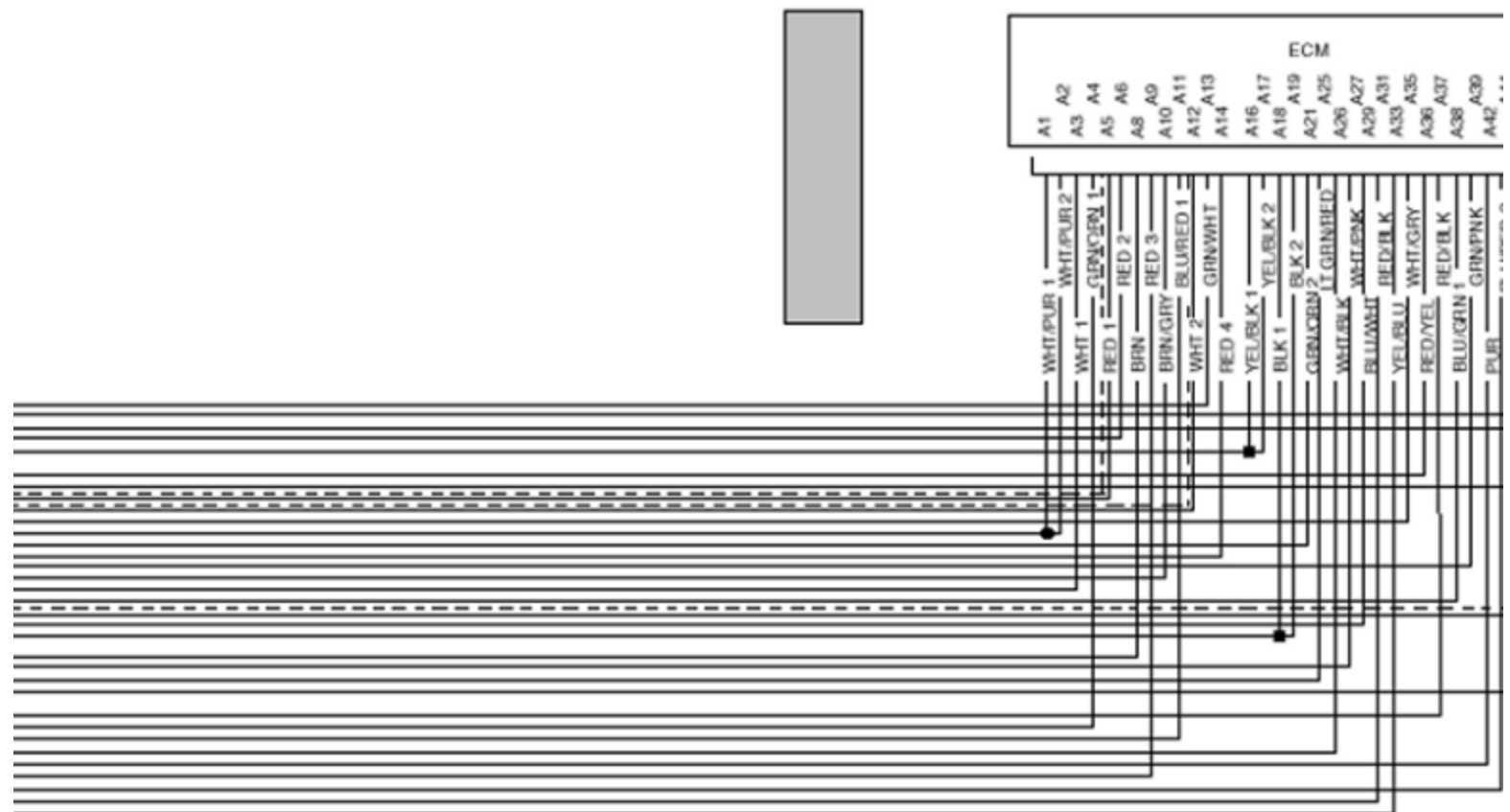
Diagrams
Fuel-injected System Diagram (RHD)

11-134

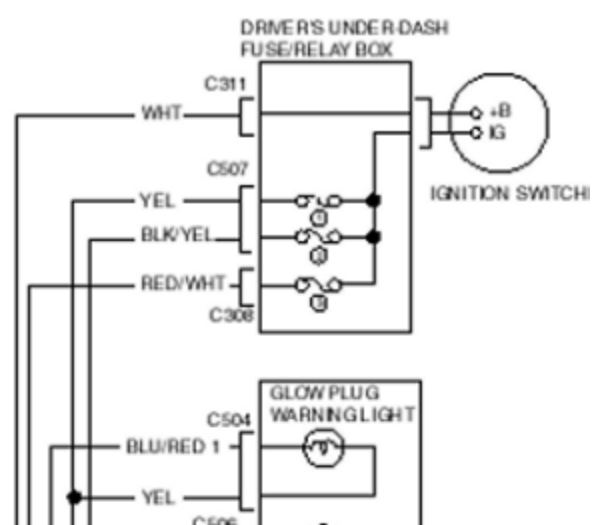


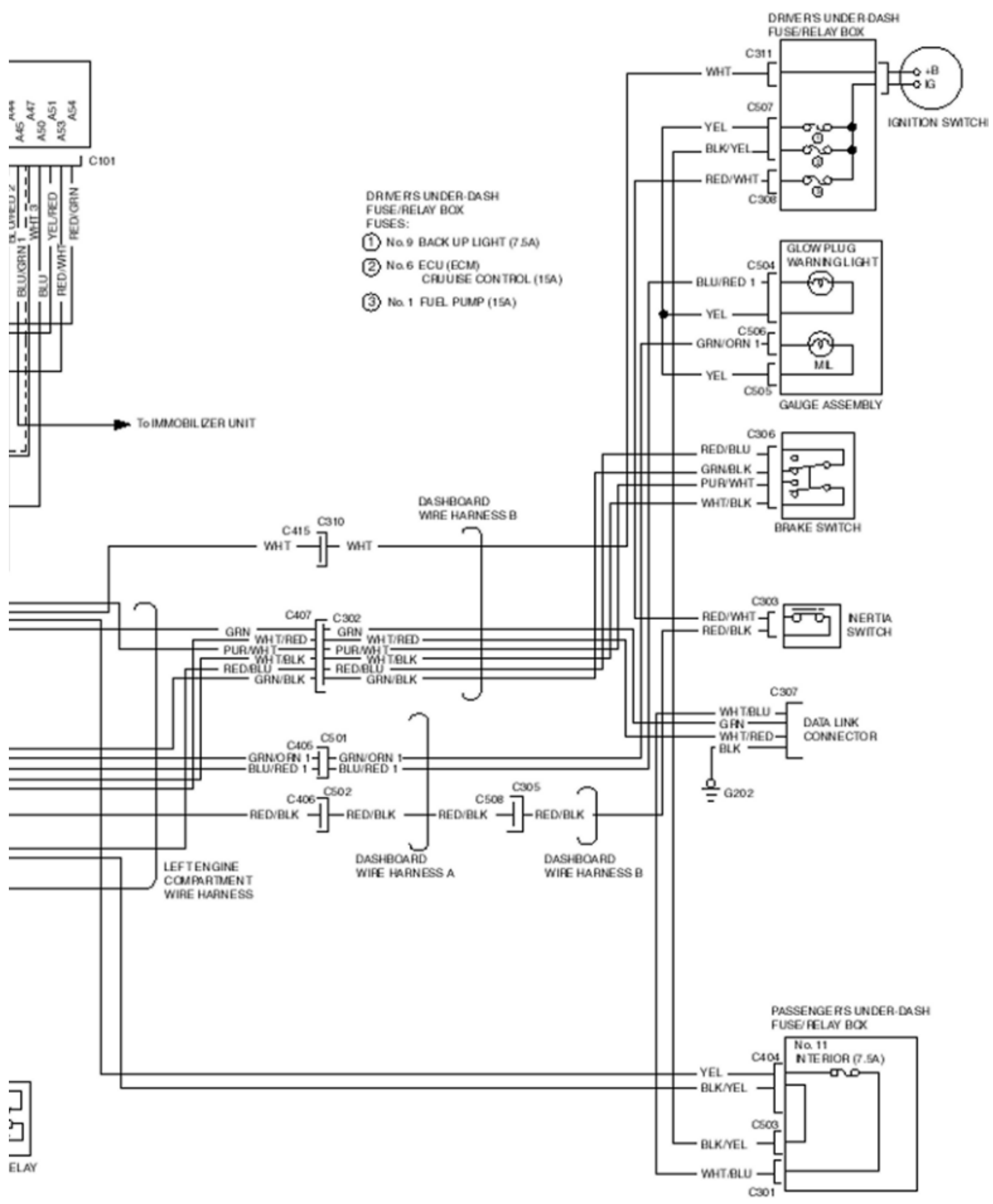
ECM	
A1	A2
A3	A4
A5	A6
A8	A9
A10	A11
A12	A13
A14	
A16	A17
A18	A19
A21	A25
A26	A27
A29	A31
A33	A35
A36	A37
A38	A39
A42	





- DRIVERS UNDER-DASH FUSE/RELAY BOX
- FUSES:
- ① No. 9 BACK UP LIGHT (7.5A)
 - ② No. 6 ECU (ECM) CRUISE CONTROL (15A)
 - ③ No. 1 FUEL PUMP (15A)

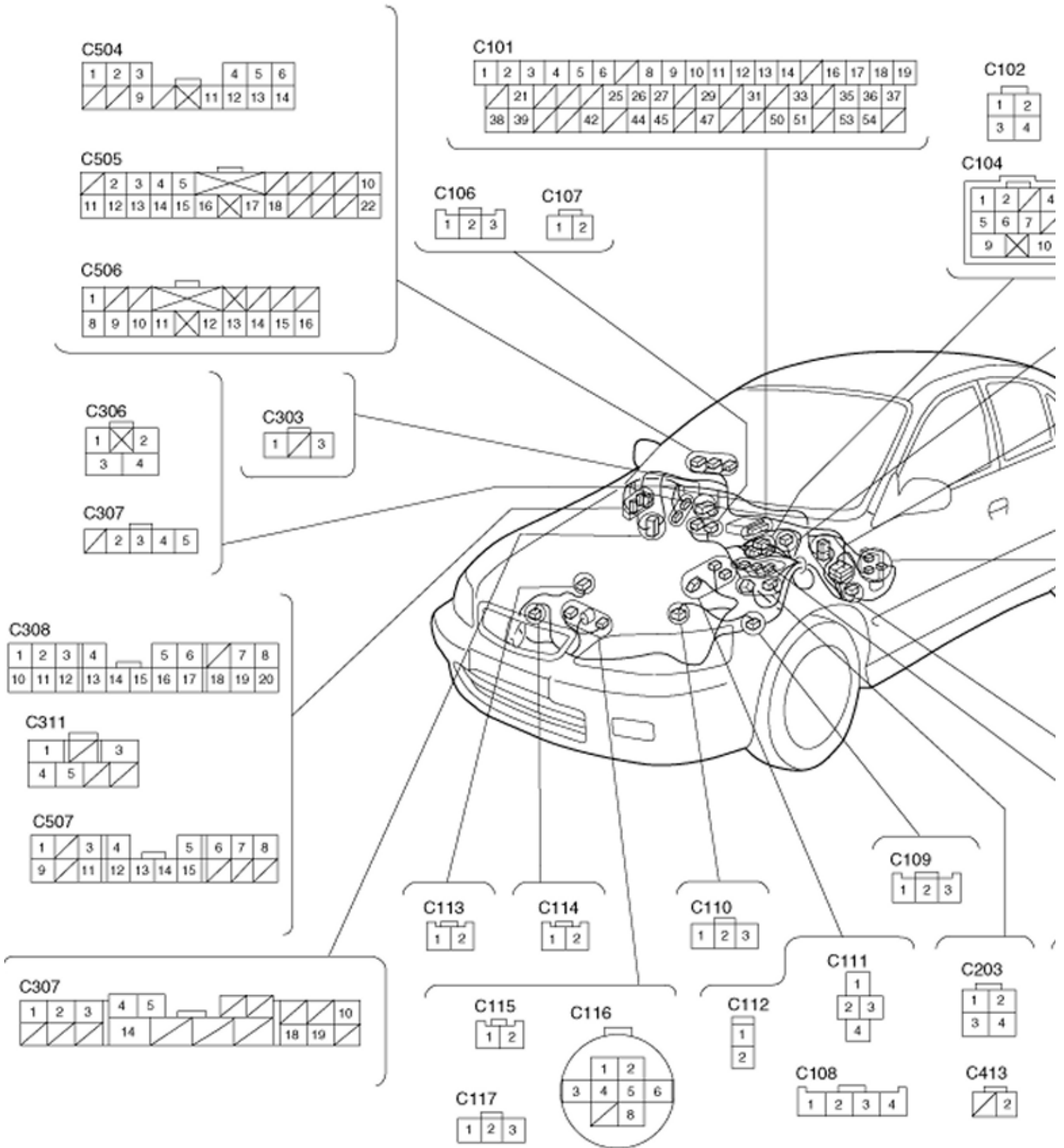




Diagrams

Fuel-injected System Connectors (RHD)

11-135



C504



C505



C506



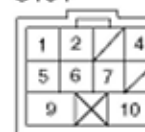
C101



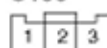
C102



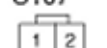
C104



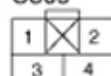
C106



C107



C306



C303



C307



C308



C311



C507



C307



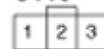
C113



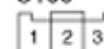
C114



C110



C109



C111



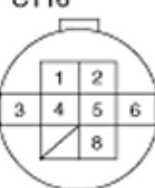
C203



C115



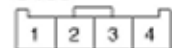
C116



C112



C108



C413



C103



C405



C406



C407



C409



C101

①	WHT/PUR ¹	②	GRN/ORN ²	41	—
②	WHT/PUR ²	22	—	⑤	PUR
③	WHT ¹	23	—	43	—
④	GRN/ORN ¹	24	—	⑥	BLU/RED ²
⑤	RED ¹	⑦	LT GRN/RED	⑧	BLU/GRN ²
⑥	RED ²	⑧	WHT/BLK	46	—
7	—	⑨	WHT/PNK	⑩	WHT ³
⑧	BRN	28	—	48	—
⑨	RED ³	⑪	BLU/WHT	49	—
⑩	BRN/GRY	30	—	⑫	BLU
⑪	BLU/RED ¹	⑬	RED/BLU	⑭	YEL/RED
⑫	WHT ²	32	—	52	—
⑬	GRN/WHT	⑮	YEL/BLU	⑯	RED/WHT
⑭	RED ⁴	34	—	⑰	RED/GRN
15	—	⑱	WHT/GRY	55	—
⑰	YEL/BLK ¹	⑲	RED/YEL		
⑱	YEL/BLK ²	⑳	RED/BLK		

C116

①	RED ⁴
②	GRN/OF
③	WHT/PL
④	YEL/BLU
⑤	GRN/WHT
⑥	GRN/PL
7	—
⑧	WHT/GF

C117

①	WHT ¹
②	YEL/BLU
③	BRN/GF

C203

①	GRN/BL
②	LT GRN
③	GRN/WHT

C103

1	2	3
4	5	6
8	9	10
12	13	14

C409

1	2	3
4	5	6

C405

1	2	3	5	6	7	8	9	10
12	13	14	15	16	17	18	19	20

C406

1	2	3	4	5	6
8	9	10	11	12	14

C407

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

C415

1	2	3
4	5	6
7	8	9

C301

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

C404

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

C503

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24

C408

1	2
3	4

C411

1	2	3	4	5	6
9	10	11	12	13	14
15	16	17	18	19	20

C410

1	2	3
4	5	6
7	8	9

C412

1	2	3
---	---	---

C101

① WHT/PUR ¹	② GRN/ORN ²	41 —
② WHT/PUR ²	22 —	④ PUR
③ WHT ¹	23 —	43 —
④ GRN/ORN ¹	24 —	⑥ BLU/RED ²
⑤ RED ¹	⑦ LT GRN/RED	⑦ BLU/GRN ²
⑥ RED ²	⑧ WHT/BLK	46 —
7 —	⑨ WHT/PNK	⑧ WHT ³
⑧ BRN	28 —	48 —
⑨ RED ³	⑩ BLU/WHT	49 —
⑩ BRN/GRY	30 —	⑩ BLU
⑪ BLU/RED ¹	⑪ RED/BLU	⑪ YEL/RED
⑫ WHT ²	32 —	52 —
⑬ GRN/WHT	⑬ YEL/BLU	⑬ RED/WHT
⑭ RED ⁴	34 —	⑭ RED/GRN
15 —	⑭ WHT/GRY	55 —
⑮ YEL/BLK ¹	⑮ RED/YEL	
⑯ YEL/BLK ²	⑯ RED/BLK	
⑰ BLK ¹	⑰ BLU/GRN ¹	
⑱ BLK ²	⑱ GRN/PNK	
20 —	40 —	

C102

① RED ³
② RED/BLU
③ BLU/RED ²
④ BLK/YEL

C103

① RED/BLK	⑧ BLU/RED ¹
2 YEL/GRN	⑨ PUR
③ GRN/WHT	⑩ GRN/ORN ¹
4 BLU/WHT	⑪ WHT/BLK
5 GRN/WHT	⑫ YEL/BLU
6 YEL	13 BLU/GRN
7 YEL/RED	14 RED

C104

① BLK ¹	6 BLK/YEL
② WHT/PNK	7 WHT/BLU
3 —	8 —
④ LT GRN/RED	9 BLK/WHT
⑤ BLU	⑩ YEL/BLK ¹

C106

① RED/GRN
② GRN/WHT
③ YEL/RED

C111

① YEL/BLK
② BRN
③ YEL/BLK ¹
④ YEL/BLK

C107

① YEL/BLK ¹
② RED ²

C112

① YEL/BLK
② YEL/BLK

C108

① BLU/GRN ¹
② YEL/BLK ¹
③ GRN/WHT
④ BLK ¹

C113

① GRN/WHT
② RED/YEL

C109

① BLK ¹
② WHT ³
③ GRN/WHT

C114

① GRN/WHT
② RED/WHT

C110

① BLK/YEL
② BLK ¹
③ BLU/WHT

C115

① WHT ²
② RED ¹

C116

① RED ⁴
② GRN/OF
③ WHT/PL
④ YEL/BLU
⑤ GRN/WHT
⑥ GRN/PL
7 —
⑦ WHT/GF

C117

① WHT ¹
② YEL/BLU
③ BRN/GF

C203

① GRN/BL
② LT GRN
③ GRN/WHT
④ YEL/BLU

C301

① WHT/BL
2 —
3 WHT
4 —
5 BLK/YEL
6 BLK
7 YEL/BLU
8 BLU/WHT

C303

① RED/WHT
2 —
③ RED/BLU

C305

1 BLU
2 GRY/BLU
④ RED/BLU
4 BLU/BLU
5 GRN/WHT
6 —
7 —
8 —
9 —
10 WHT/RE

C306

① GRN/BL
② RED/BL
③ WHT/BL
④ PUR/WHT

C307

1 —
② WHT/RE
③ GRN
④ WHT/BL
⑤ BLK

NOTE: ● Different wires
 ● YEL/BLK¹ and
 ○ : Related to
 ● — Connector
 — Connector

C308

① RED/WHT	11 YEL/BLK
2 GRN/YEL	12 GRN
3 RED/BLK	13 BLK/ORN
4 LT GRN/RED	14 BLK/YEL
5 WHT/RED	15 YEL/BLK
6 BLK	16 LT GRN
7 —	17 BLU/WHT
8 WHT/BLK	18 YEL
9 BLU	19 PNK
10 BLU/YEL	20 WHT/BLK

C311

1 BLK/WHT
2 —
③ WHT
4 GRN/BLK
5 BLK/YEL
6 —
7 —

C404

1 GRN	⑤ BLK/YEL
2 RED/WHT	11 GRY
3 —	12 BLU/WHT
4 —	13 BLU/RED
⑤ YEL	14 —
⑥ BRN	15 —
7 BLK/YEL	16 LT BLU
8 BLK/ORN	17 RED/BLK

C409

1 BLK/ORN
2 GRN
3 BRN
4 BLK/ORN
⑤ RED ³
6 —

C410

1 WHT/BLU
2 BLU/ORN
3 BLU/WHT
4 WHT/GRN
⑤ PUR/WHT
6 GRN
⑦ YEL

C411

C504

1 BLU/RED	8 —
2 GRN	9 YEL
3 PNK	10 —
4 WHT/RED	11 RED
⑤ BLU/RED ¹	12 WHT
⑥ YEL	13 BLU
7 —	14 LT

C505

1 —	12 GF
2 YEL/GRN	13 GF
3 GRN/RED	14 GF
4 RED/YEL	⑬ YEL
5 ORN	16 PNK
6 —	17 BLU
7 —	18 BLU
8 —	19 —

C308

① RED/WHT	11 YEL/BLK
2 GRN/YEL	12 GRN
3 RED/BLK	13 BLK/ORN
4 LT GRN/RED	14 BLK/YEL
5 WHT/RED	15 YEL/BLK
6 BLK	16 LT GRN
7 —	17 BLU/WHT
8 WHT/BLK	18 YEL
9 BLU	19 PNK
10 BLU/YEL	20 WHT/BLK

C311

1 BLK/WHT
2 —
③ WHT
4 GRN/BLK
5 BLK/YEL
6 —
7 —

C409

1 BLK/ORN
2 GRN
3 BRN
4 BLK/ORN
⑤ RED ³
6 —

C504

1 BLU/RED	8 —
2 GRN	9 YEL
3 PNK	10 —
4 WHT/RED	11 RED
⑤ BLU/RED ¹	12 WHT
⑥ YEL	13 BLK
7 —	14 LT

C404

1 GRN	④ BLK/YEL
2 RED/WHT	11 GRY
3 —	12 BLU/WHT
4 —	13 BLU/RED
⑤ YEL	14 —
⑥ BRN	15 —
7 BLK/YEL	16 LT BLU
8 BLK/ORN	17 RED/BLK
9 WHT/GRN	18 BLK

C410

1 WHT/BLU
2 BLU/ORN
3 BLU/WHT
4 WHT/GRN
⑤ PUR/WHT
6 GRN
⑦ YEL

C505

1 —	12 GRN
2 YEL/GRN	13 GRN
3 GRN/RED	14 GRN
4 RED/YEL	⑨ YEL
5 ORN	16 PNK
6 —	17 BLU
7 —	18 BLU
8 —	19 —
9 —	20 —
10 BLU	21 —
11 GRN/BLK	22 BLU

C405

1 YEL/GRN	12 YEL
2 BLU/RED	13 —
③ BLU/RED ¹	14 —
4 —	15 BLU
5 GRN/ORN ¹	16 YEL/GRN
6 —	17 YEL/GRN
7 —	18 BLU/BLK
8 —	19 YEL/RED
9 GRN/BLK	20 —
10 GRN/BLK	21 —
11 —	22 —

C411

1 —	10 —
2 —	11 LT GRN/RED
3 RED/YEL	12 —
4 RED/WHT	13 BLU/RED
5 —	14 —
6 PUR/WHT	15 —
7 —	16 —
8 —	④ WHT/GRN
9 BLU/RED	18 —

C506

1 YEL/BLU	9 RED
2 —	10 YEL
3 —	11 WHT
4 —	12 —
5 —	13 —
6 —	14 PNK
7 —	⑧ GRN
8 PUR	16 BLU

C412

1 YEL/BLK
② WHT
3 WHT/GRN

C413

1 —
② BLU

C415

1 BLK/WHT
2 —
③ WHT
4 BLU
5 BLU/YEL
6 BLU/RED
7 BLU/BLK

C503

1 BLU/WHT	10 —
2 RED/WHT	11 —
3 PUR/WHT	④ BLK/YEL
4 —	13 RED/WHT
5 RED/YEL	14 RED/BLU
6 BRN/WHT	15 WHT/GRN
7 —	16 GRN/WHT
8 BLK/WHT	17 —
9 GRN/BLK	18 RED/YEL

C406

① RED/BLK	8 PUR
2 —	9 BLU/WHT
3 —	10 —
4 —	11 WHT/GRN
5 —	12 ORN
6 YEL	13 —
7 —	14 WHT/BLU

C407

1 BLU/YEL	③ WHT/BLK
2 GRN/YEL	14 WHT/GRN
3 GRN	15 RED/WHTN
4 GRN/BLK	16 —
5 —	17 —
⑥ RED/BLU	18 —
7 YEL/BLU	19 —
8 YEL	20 —
⑦ GRN/BLK	④ WHT/RED
⑧ GRN	22 RED
11 YEL/RED	⑤ PUR/WHT
12 LT GRN/RED	24 YEL

C408

① WHT/GRN
② RED/BLK
③ YEL/BLK ¹
④ PNK

IN²
JR¹
C1
IT
IR
RY
C1
RY
K
IT
J

U	9 —
	10 —
	11 —
	12 YEL
	13 LT GRN
	14 —
C	15 BLK/ORN
IT	16 —

IT
K

	11 —
U	12 —
K	13 —
C	14 GRN
IT	15 —
	16 —
	17 —
	18 RED/YEL
	19 YEL/BLK
D	20 —

K
U
K
IT

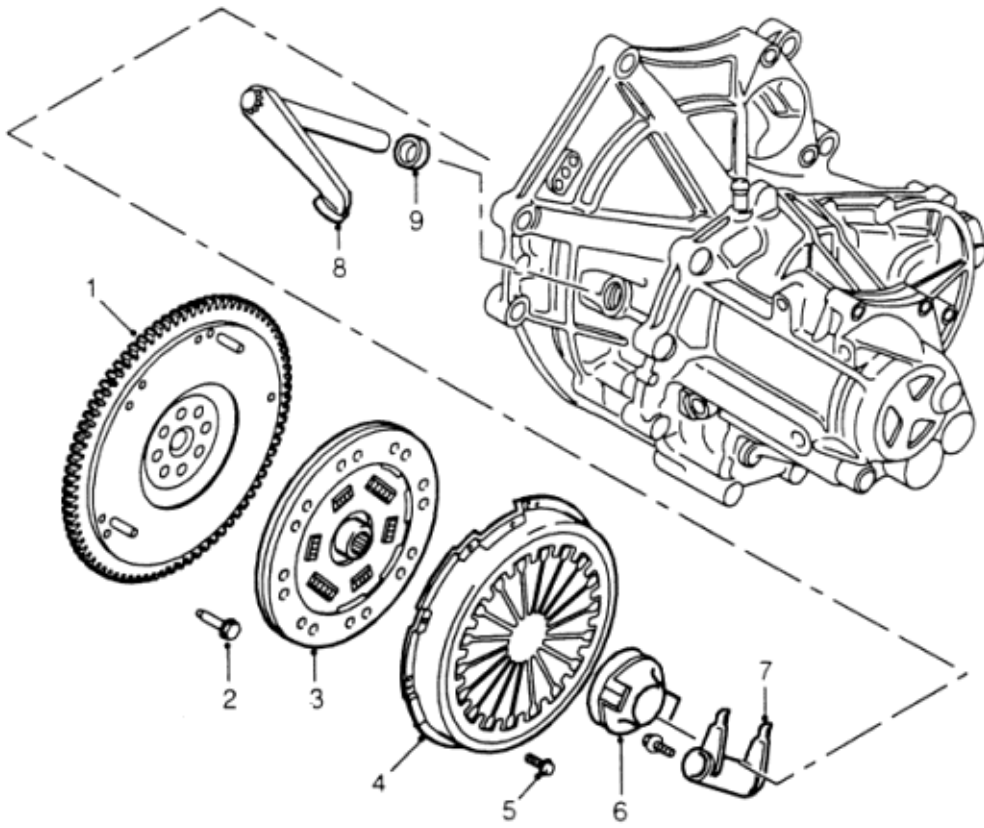
D
U

with the same color have been given a number suffix to distinguish them (for example, YEL/BLK² are not the same).

Fuel and Emissions System.

with male terminals (double outline): View from terminal side

with female terminals (single outline): View from wire side



1. FLYWHEEL
2. FLYWHEEL BOLTS
3. CLUTCH DRIVE PLATE
4. CLUTCH PRESSURE PLATE
5. CLUTCH PRESSURE PLATE BOLTS
6. RELEASE BEARING
7. RELEASE FORK
8. RELEASE LEVER
9. RELEASE SHAFT, OIL SEAL

The diaphragm type clutch is operated via a hydraulic system which is sealed for life and self bleeding.

When pressure is applied to the clutch pedal, fluid is pumped from the master cylinder to the slave cylinder causing the slave cylinder piston to apply pressure to the release lever. The release lever rotates the release fork and shaft. The release fork changes rotary movement of the release lever into linear movement pushing the release bearing against the pressure plate diaphragm fingers, applying pressure to the drive plate springs and disengaging the clutch.

When pressure is released from the clutch pedal the master cylinder piston is returned by a spring which causes a pressure decrease. The drop in pressure allows the diaphragm fingers to push the release bearing back, decreasing the pressure on the drive plate springs and re-engaging the clutch.

The clutch master cylinder is connected to the slave cylinder via a quick release connector. The quick release connector has a valve in each end preventing fluid loss when disconnected.

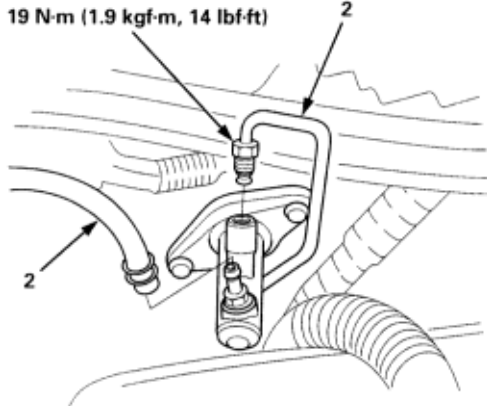
Replacement

CAUTION

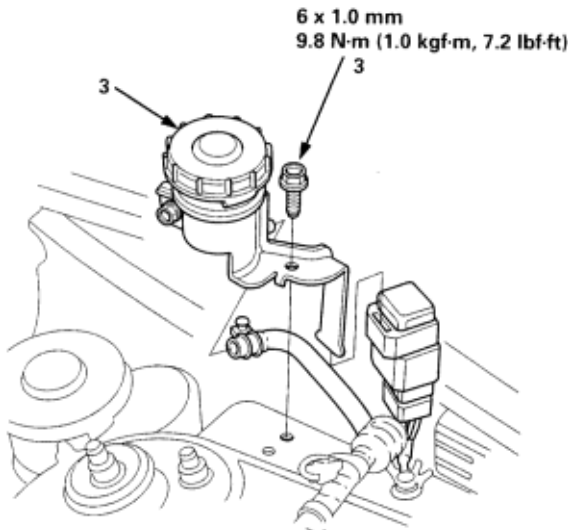
? Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

? Plug the end of the clutch line and reservoir hose with a shop towel to prevent brake fluid from coming out.

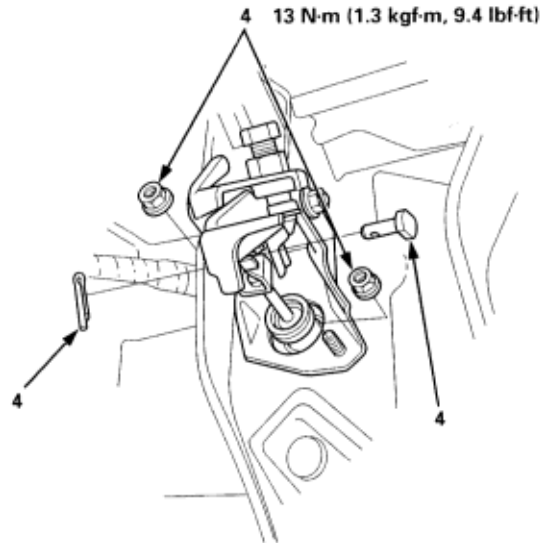
1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Disconnect the reservoir hose and the clutch line from the clutch master cylinder.



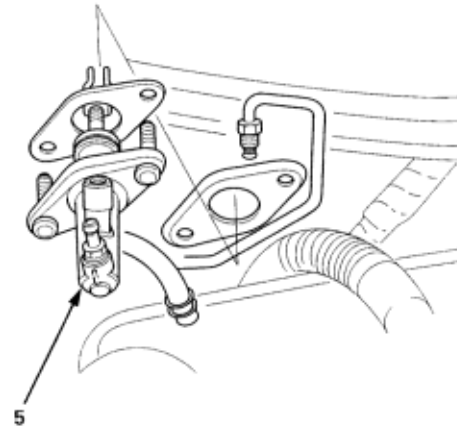
3. Remove the clutch master cylinder reservoir.



4. Remove the cotter pin and pull the pedal pin out of the yoke. Remove the nuts.



5. Remove the clutch master cylinder.



6. Install the clutch master cylinder in the reverse order of removal.
7. Bleed the clutch hydraulic system

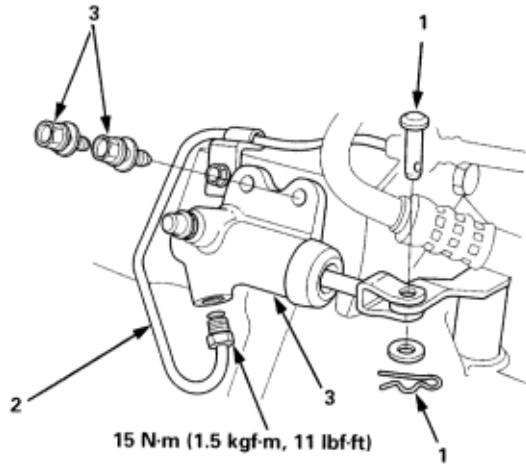
Replacement

CAUTION

? Do not spill brake fluid on the vehicle may damage the paint; if brake fluid does contact the paint, wash it off immediately with water
? Plug the end of the clutch line reservoir hose with a shop towel to prevent brake fluid from coming out.

1. Disconnect the release fork and push rod by removing the rock pin and washer.
2. Disconnect the clutch line from the slave cylinder.
3. Remove the two slave cylinder mounting bolts, then remove the slave cylinder from the bracket.

8 x 1.25 mm
22 N·m (2.2 kgf·m, 16 lbf·ft)



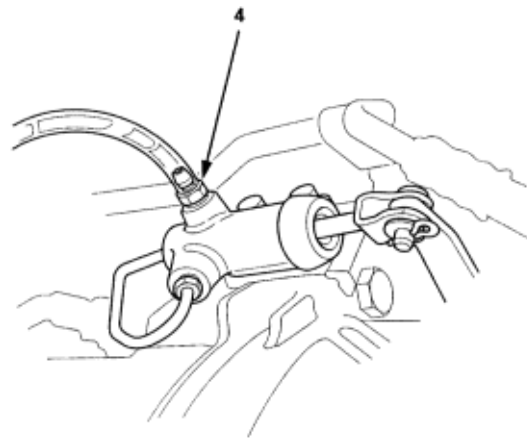
4. Install the slave cylinder in the reverse order of removal.

5. Bleed the clutch hydraulic system.

NOTE: Be careful not to damage the slave cylinder body with over tightening the bleeder screw.

- ? Attach a hose to the bleeder screw and suspend the hose in a container of brake fluid.
- ? Make sure there is an adequate supply of fluid at the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
- ? Refill the clutch master cylinder with fluid when done.
- ? Use only genuine Honda Super Duty DOT 3 brake fluid or an equivalent DOT 3 or DOT 4 brake fluid.
- ? Confirm clutch operation and check for leaking fluid.

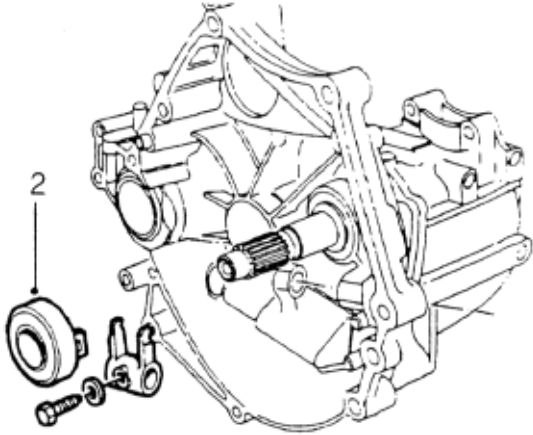
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



Service Repair No. 33.10.07

Remove

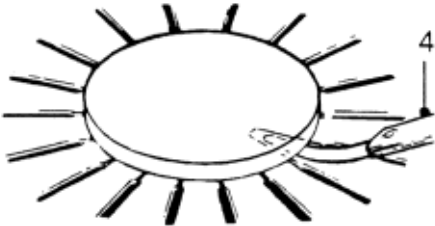
1. Remove gearbox assembly. See **MANUAL GEARBOX, Repairs section.**



2. Remove release bearing from guide sleeve and release fork.
3. Examine release bearing for signs of wear or damage, renew if necessary.

**CAUTION**

Bearing is packed with grease, DO NOT wash in solvent



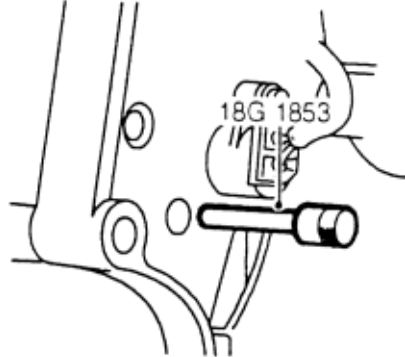
4. Place a circular piece of flat plate across diaphragm fingers and insert feeler gauges between plate and fingers.
Diaphragm finger clearance limit = 1.0 mm (0.04 in).

5. Measure diaphragm finger height above bolted surface of pressure plate.

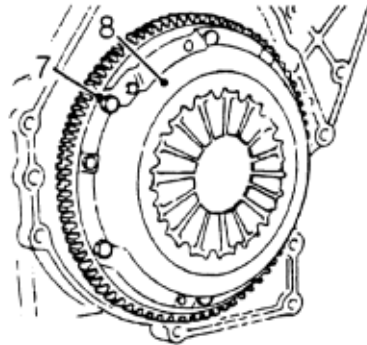
Diaphragm finger height:

New clutch plate = 29.1 - 32.0 mm (1.15 - 1.26 in)

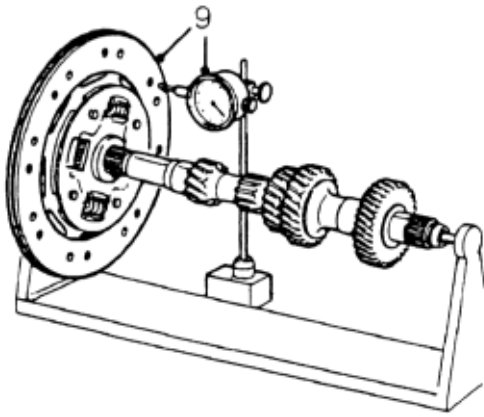
Service limit = 36.5 mm (1.44 in).



6. Using a socket and extension bar on crankshaft pulley bolt, rotate crankshaft until flywheel locking pin **18G 1523** can be inserted through hole in gearbox mounting plate and into hole in flywheel.



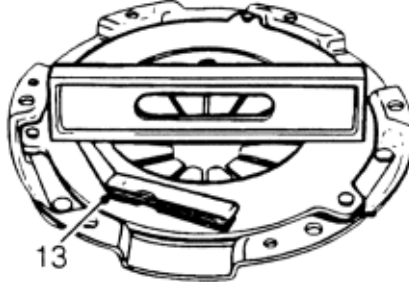
7. Progressively loosen and then remove 6 bolts securing pressure plate to flywheel.
8. Remove clutch pressure plate and collect drive plate.



9. Inspect clutch drive plate for signs of wear or oil contamination. Check for broken or loose springs and signs of cracking at spring windows. Renew drive plate if necessary.
10. Measure depth of rivets on drive plate, renew drive plate if less than service limit.
Drive plate rivet depth:
New clutch plate = 1.0 mm (0.04 in) minimum
Service limit = 0.2 mm (0.008 in)
11. Measure drive plate run-out by fitting drive plate to a gearbox mainshaft and use a dial gauge as drive plate is rotated. Renew drive plate if outside service limit.
Drive plate run-out:
New clutch plate = 0.8 mm (0.03 in)
Service limit = 1.0 mm (0.04 in)

12. Check pressure plate for signs of wear or damage. Check for signs of overheating on drive straps (deep yellow to blue colour), renew pressure plate if necessary.

NOTE: Renew a pressure plate which has been accidentally dropped.

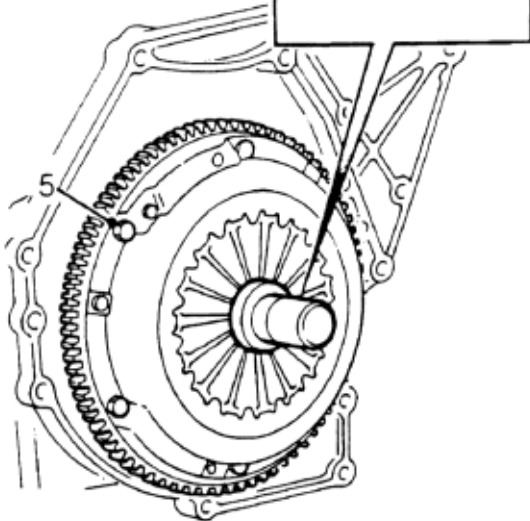


13. Using a straight edge and feeler gauges check the surface of the pressure plate for flatness at 4 separate points. Renew pressure plate if warping exceeds service limit.
Pressure plate warping:
Service limit = 0.18 mm (0.007 in) maximum

Refit

1. Clean pressure plate and flywheel, dowels and dowel holes.
2. Inspect flywheel for signs of scoring or other damage. Renew if worn or damaged.
3. Smear clutch drive plate splines with molybdenum disulphide grease.

18G 1463

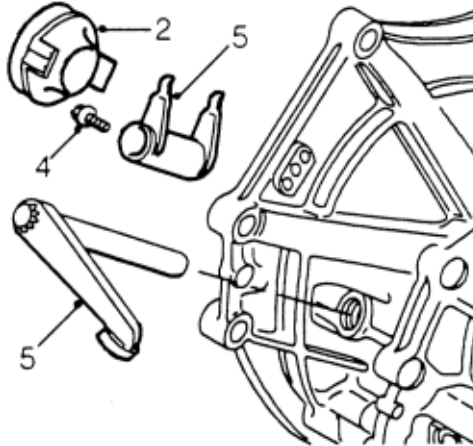


4. Position drive plate to flywheel with 'FLYWHEEL SIDE' marking towards flywheel.
5. Fit pressure plate to flywheel and fit alignment tool **18G 1483**.
6. Fit 6 bolts securing pressure plate to flywheel finger tight.
7. Working in a diagonal sequence, progressively tighten bolts to 26 Nm (2.7 kgf/m, 20 lbf/ft).
8. Remove drive plate alignment tool **18G 1483**.
9. Remove flywheel locking pin tool **18G 1523**.
10. Clean clutch release fork and release bearing guide sleeve.
11. Smear release fork shaft and bore of release bearing with Molybdenum disulphide grease.
12. Fit release bearing to release fork and slide onto guide sleeve.
13. Operate release lever to ensure that release bearing is correctly located on release fork and slides smoothly on guide sleeve.
14. Fit gearbox assembly. See **MANUAL GEARBOX, Repairs section**.

Service Repair No. 33.25.18

Remove

1. Remove gearbox assembly. See **MANUAL GEARBOX, Repairs section**.



2. Remove release bearing from guide sleeve and release fork.
3. Examine release bearing for signs of wear or damage; renew if necessary.

**CAUTION**

Bearing is packed with grease, DO NOT wash in solvent

4. Remove bolt and washer securing fork to release shaft.
5. Withdraw clutch release shaft from gearbox and remove fork.
6. Examine clutch release shaft for signs of scoring or damage, renew if necessary.
7. Renew clutch release shaft bushes if necessary. See **MANUAL GEARBOX, Repairs section**.

Refit

1. Position release fork and fit clutch release shaft.
2. Align holes in release fork and shaft.
3. Fit bolt and washer securing release fork to shaft and tighten to 29 Nm (3.0 kgf/m, 22 lbf/ft).
4. Smear release bearing bore and spigot with Molybdenum disulphide grease.
5. Fit release bearing to release fork and slide onto guide sleeve.
6. Operate release lever to ensure that release bearing is correctly located on release fork and slides smoothly on guide sleeve.
7. Fit gearbox assembly. See **MANUAL GEARBOX, Repairs section**.

Removal

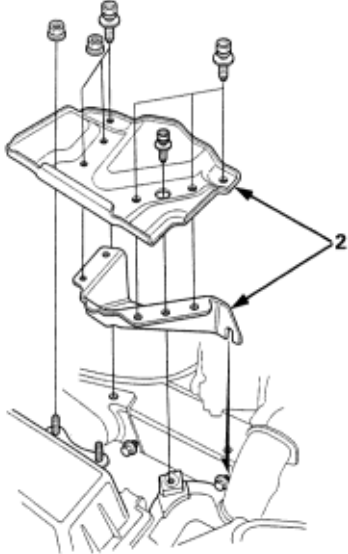
⚠ WARNING

- ? Make sure jacks and safety stands are placed properly
- ? Apply parking brake and block rear wheels so vehicle will not roll off stands and fall on you while working under it.

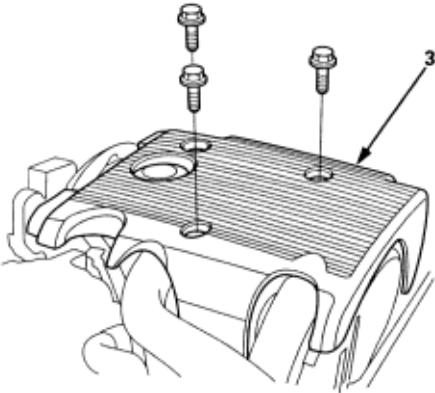
⚠ CAUTION

Use fender covers to avoid damaging painted surfaces

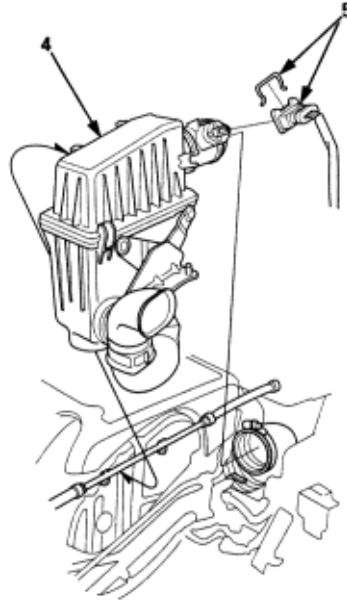
1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery. Remove the battery.
2. Remove the battery tray and tray bracket.



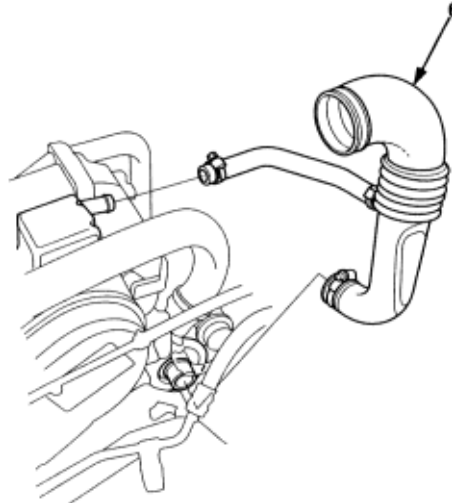
3. Remove the sound deadening pad.



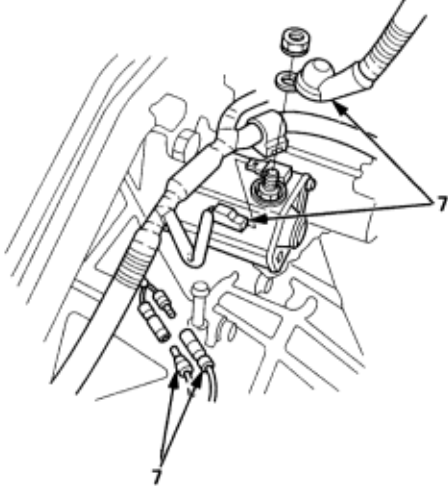
4. Remove the air cleaner housing assembly.
5. Disconnect the MAF sensor connector with removed clip.



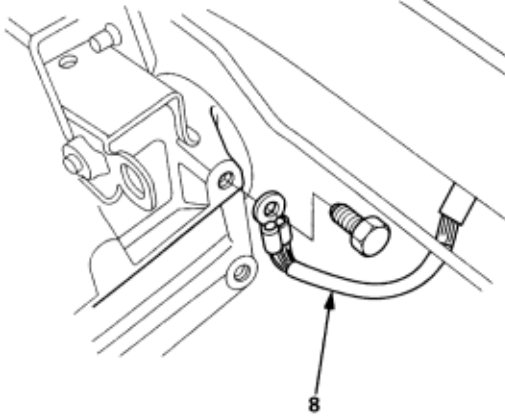
6. Remove the intake air duct.



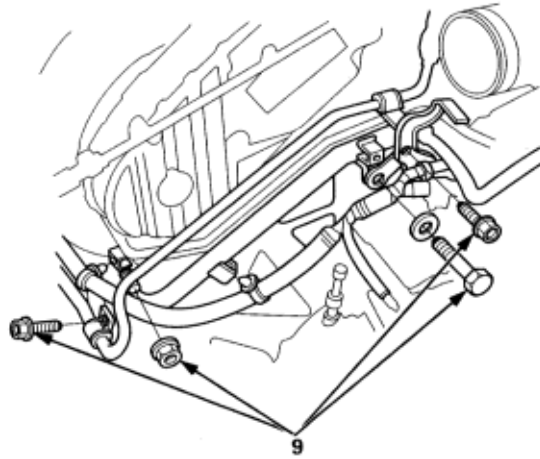
7. Disconnect the starter motor cables and back-up light switch connectors.



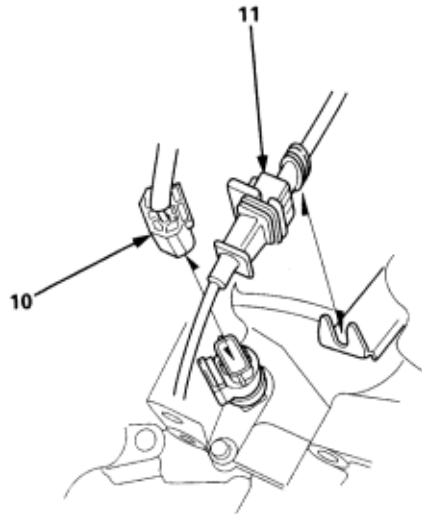
8. Disconnect the gearbox ground cable.



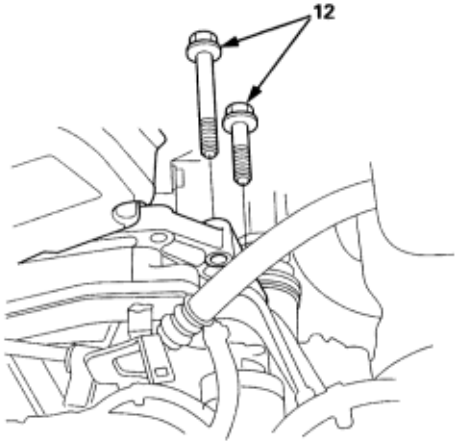
9. Remove the heater and fuel pipe mounting nut and bolts.



10. Disconnect the vehicle speed sensor (VSS) connector.
11. Remove the connector from the bracket.

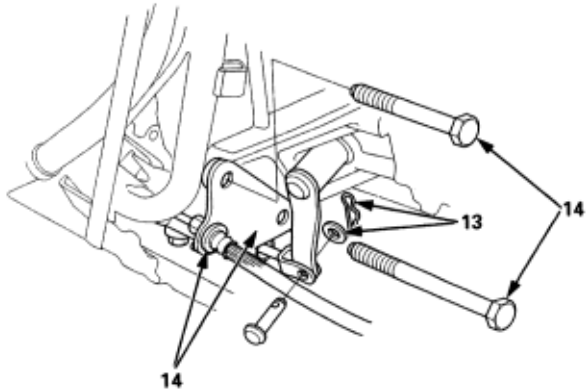


12. Remove the starter motor and gearbox mounting bolts.

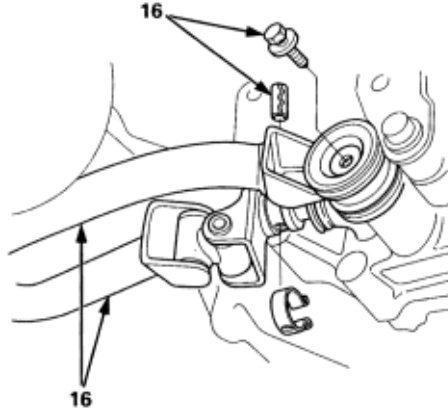


13. Remove the lock pin and washer.
14. Remove the gearbox mounting bolts, then remove the slave cylinder and bracket assembly.

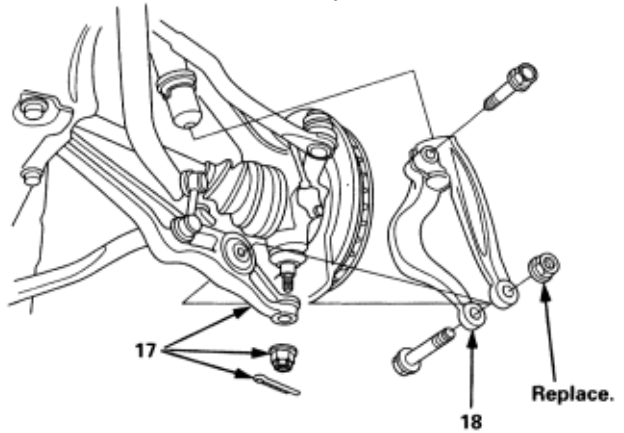
⚠ CAUTION
Do not operate the clutch pedal once the slave cylinder has been removed.



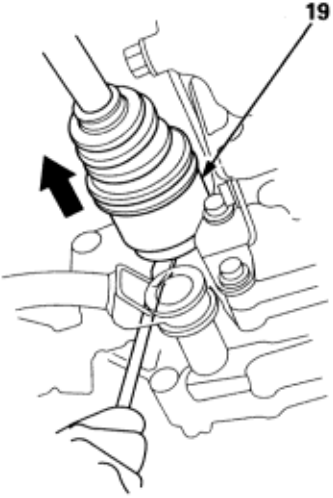
15. Drain the gearbox oil. See **MAINTENANCE section.**
16. Remove the spring pin and bolt, then disconnect the shift rod and extension rod from the gearbox.



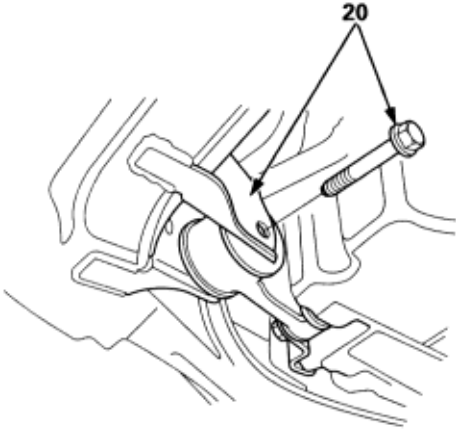
17. Remove the cotter pins and loosen the castle nuts, then separate the knuckle and lower arms on both sides. See **DRIVESHAFTS section.**
18. Remove the both damper fork.



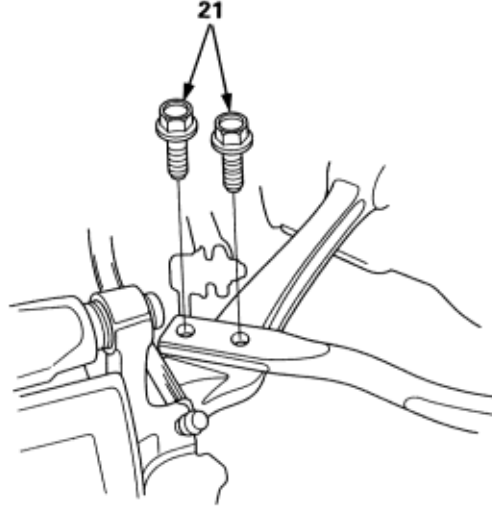
19. Pull the driveshafts out of the differential. Coat all the precision finished surfaces with clean engine oil grease. Tie plastic bags over the driveshaft ends.



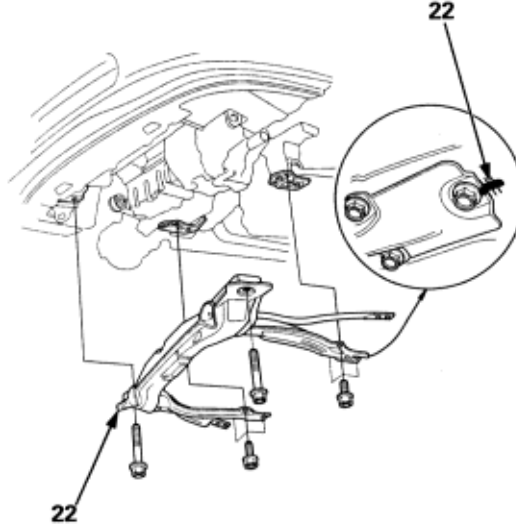
20. Remove the mounting bolt, then separate the front torque rod and front beam.



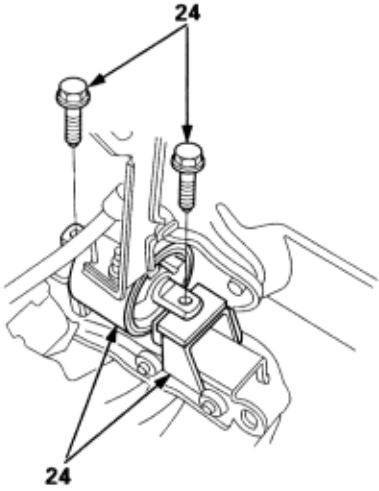
21. Remove the both radius rods mounting bolts from the lower arm.



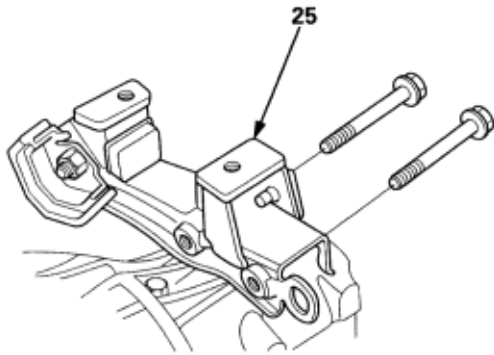
22. Make reference marks on the rear and front beam, then remove the front beam.



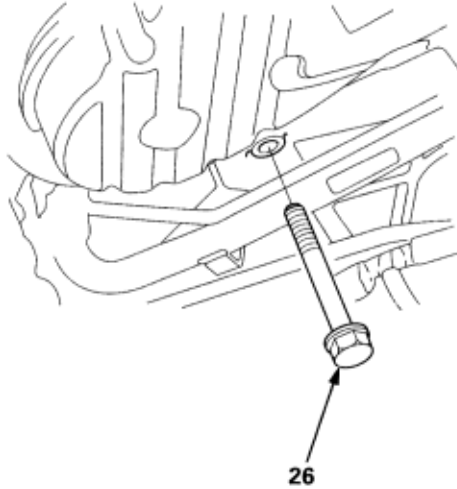
23. Place a floor jack under the gear box and raise the gear box just enough to take weight off the mounts.
24. Remove the two mounting bolts, then separate the gearbox mount bracket and gearbox mount rubber.



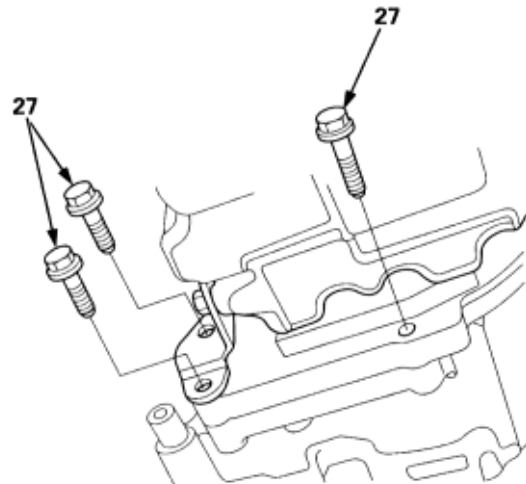
25. Lower the gearbox, then remove the gearbox mount bracket from the gearbox.



26. Remove the upper gearbox mounting bolt.



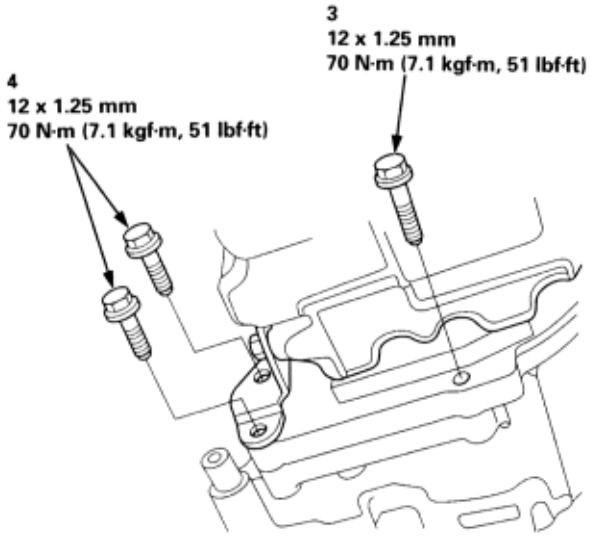
27. Remove the rear engine stiffener mounting bolts and lower gearbox mounting bolt.



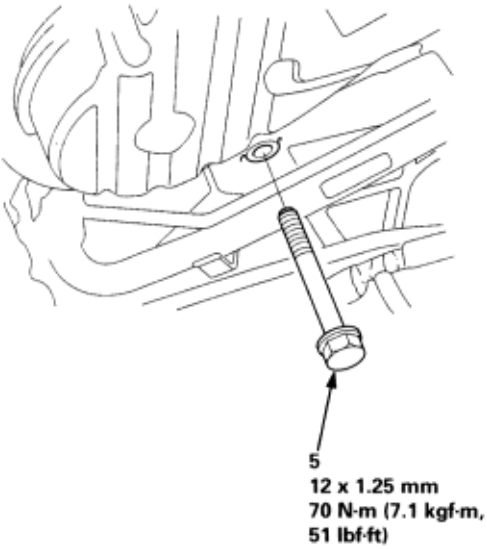
28. Place a floor jack under the gearbox away from the engine until it clears the mainshaft, then lower it on the gearbox jack. Take care not to bend clutch line.

Installation

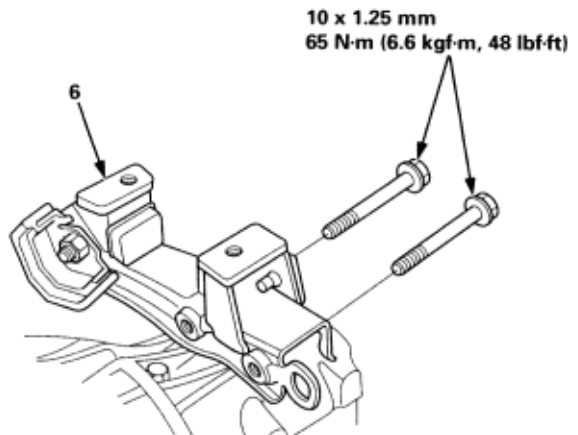
1. Check the two dowel pins, release bearing and release fork are installed in the clutch housing.
2. Place the gearbox on the gearbox jack and raise it to the engine level.
3. Install the lower gearbox mounting bolt.
4. Install the two rear engine stiffener mounting bolts.



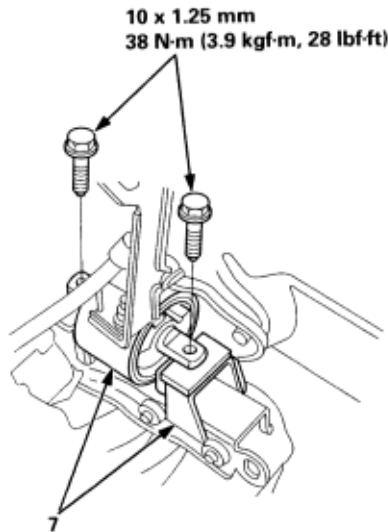
5. Install the upper gearbox mounting bolt.



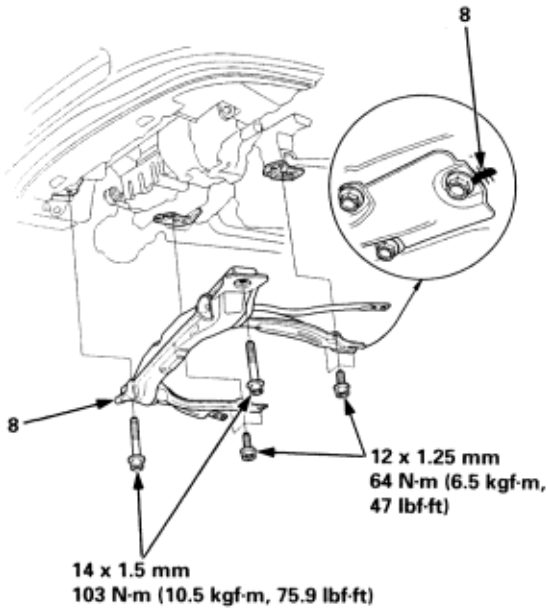
6. Install the gearbox mount bracket.



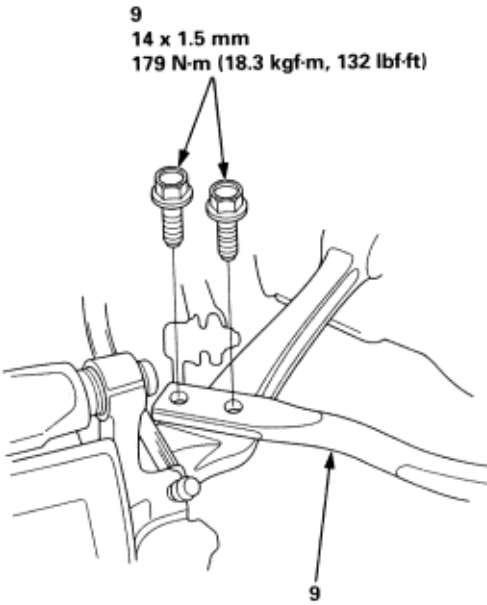
7. Raise the gearbox, then install the gearbox mount bracket to the gearbox mount rubber.



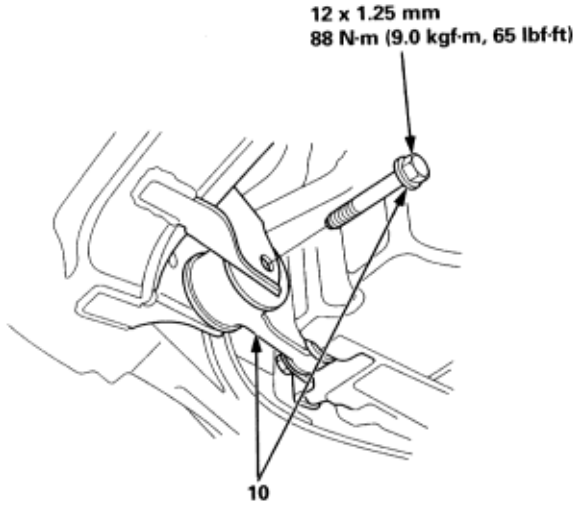
8. Install the front beam by align the marks.



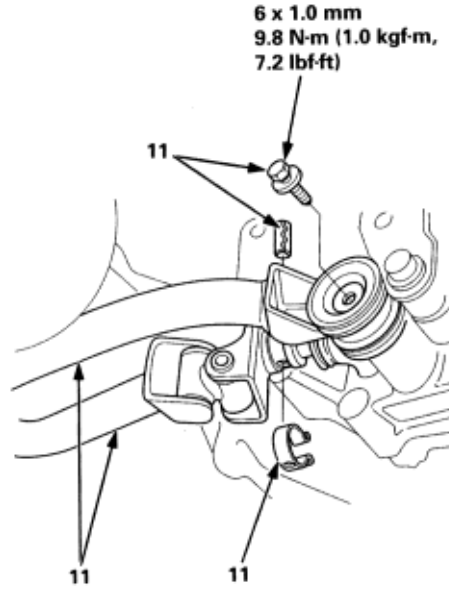
9. Install the both radius rods with new mounting bolts on the lower arm.



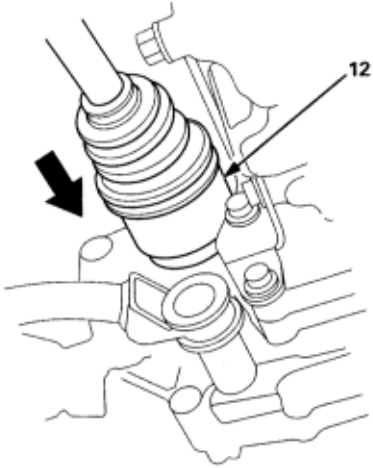
10. Install the front torque rod mounting bolt.



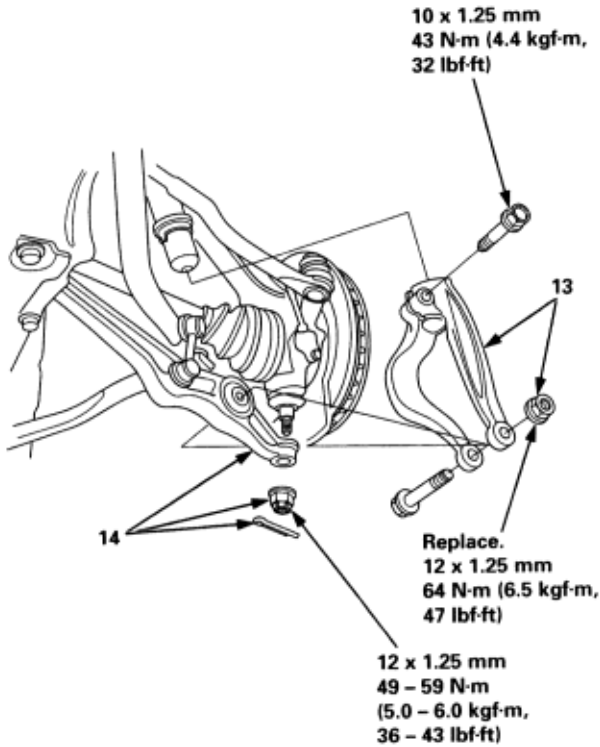
11. Connect the shift rod and extension rod.



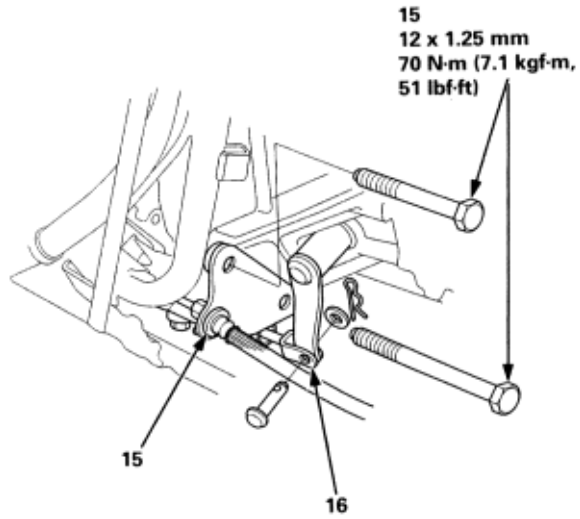
12. Install the driveshafts with new set rings. See **DRIVESHAFTS** section.



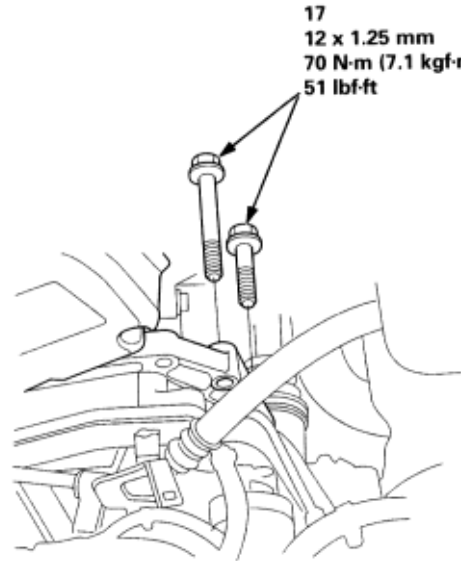
13. Install the both damper forks with new locknuts.
14. Install the knuckle onto the lower arms and install the castle nuts and cotter pins. See **DRIVESHAFTS** section.



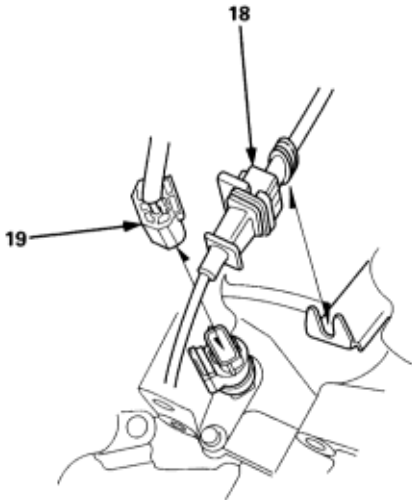
15. Install the slave cylinder and bracket assembly and two gearbox mounting bolts.
16. Connect the release fork and push rod.



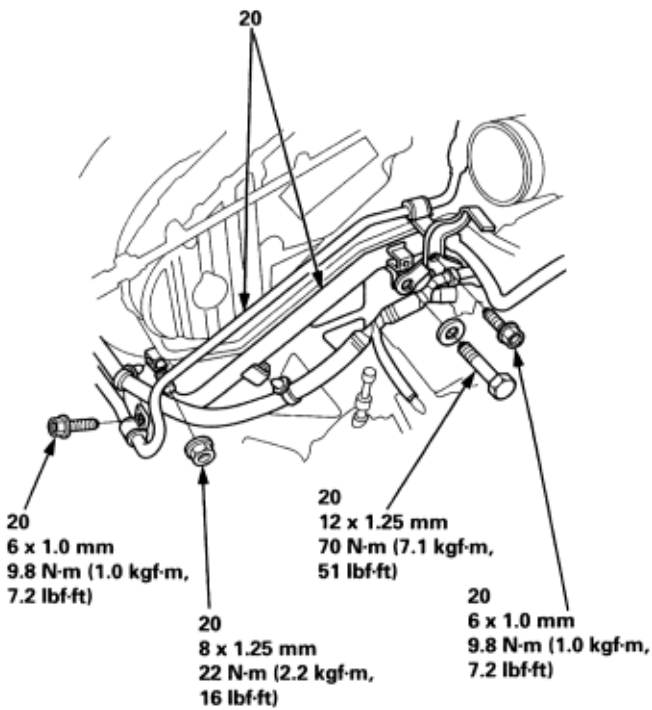
17. Install the starter motor and gearbox mounting bolts.



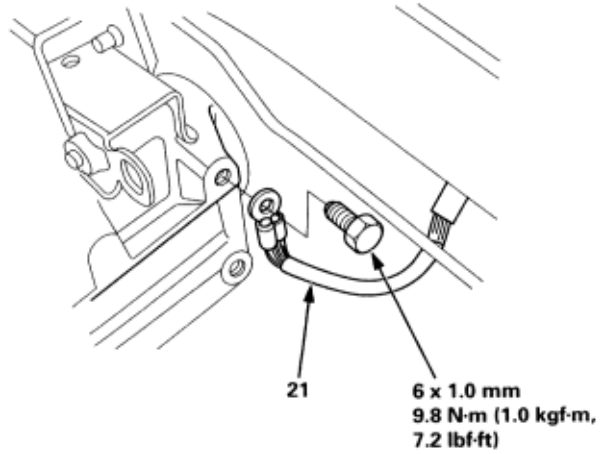
18. Install the connector on the bracket.
19. Connect the vehicle speed sensor (VSS) connector.



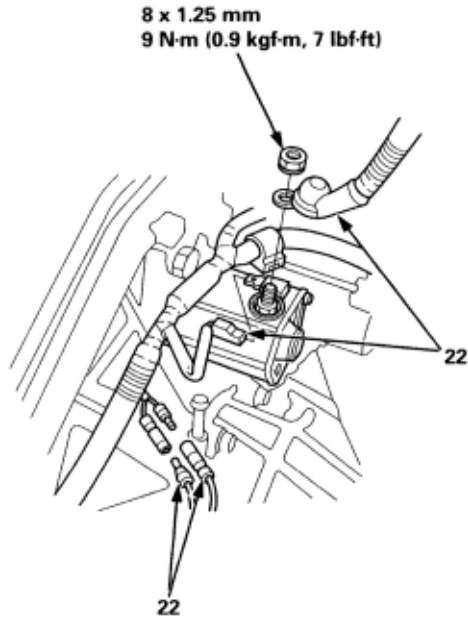
20. Install the heater and fuel pipe mounting nut and bolts.



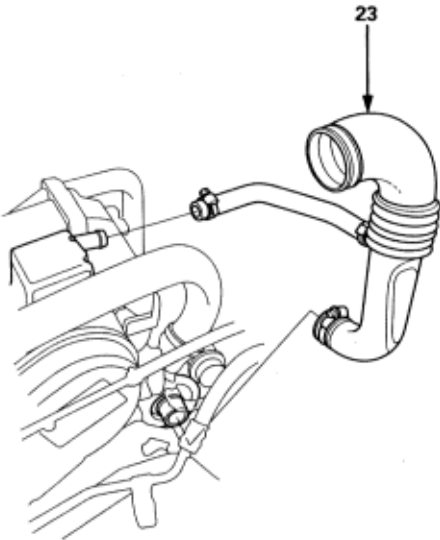
21. Connect the gearbox ground cable.



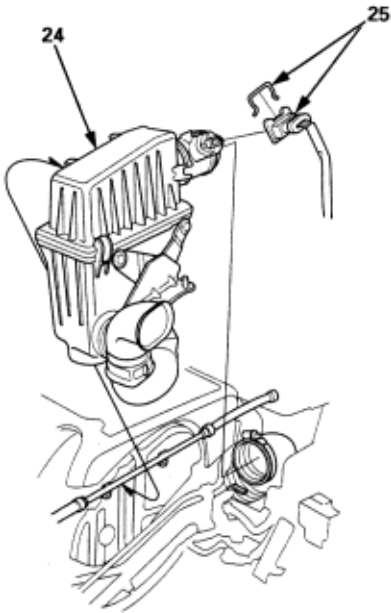
22. Connect the starter motor cables and back-up light switch connectors.



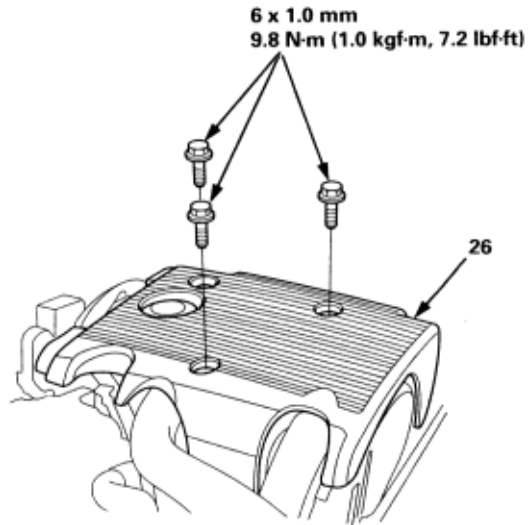
23. Install the intake air duct to the turbocharger.



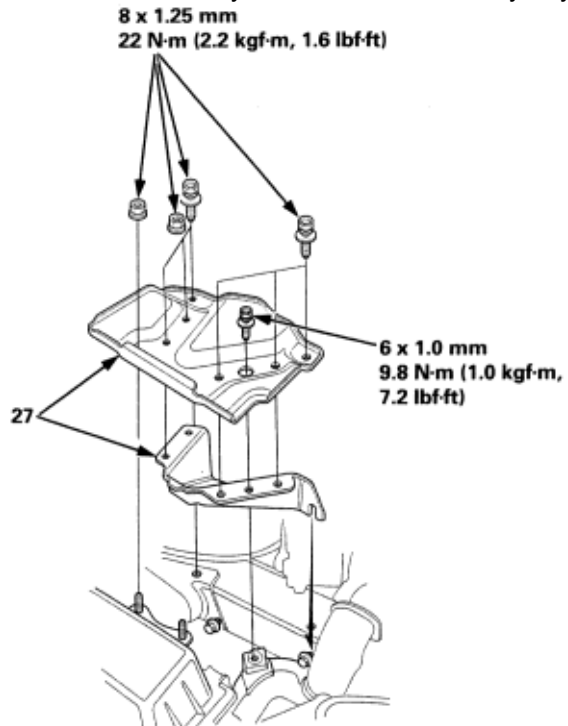
24. Install the air cleaner housing assembly.
25. Connect the MAF sensor connector, then install the clip.



26. Install the sound deadening pad.



27. Install the tray bracket and the battery tray.



28. Install the battery. Connect the positive (+) cable first, then the negative (-) cable to the battery.
29. Refill the gearbox oil. See **MAINTENANCE section**.
30. Test drive the vehicle.
31. Check the clutch operation.
32. Check the gearbox for noise and smooth operation.
33. Check the front wheel alignment. See **SUSPENSION section**.

Service Repair No. - 37.23.10

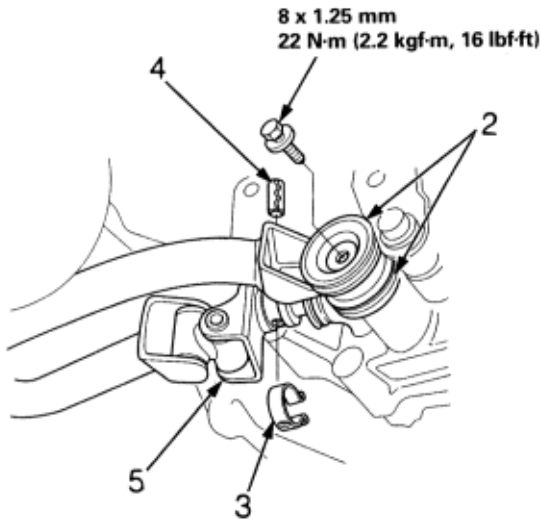
Remove

1. Raise front of vehicle.

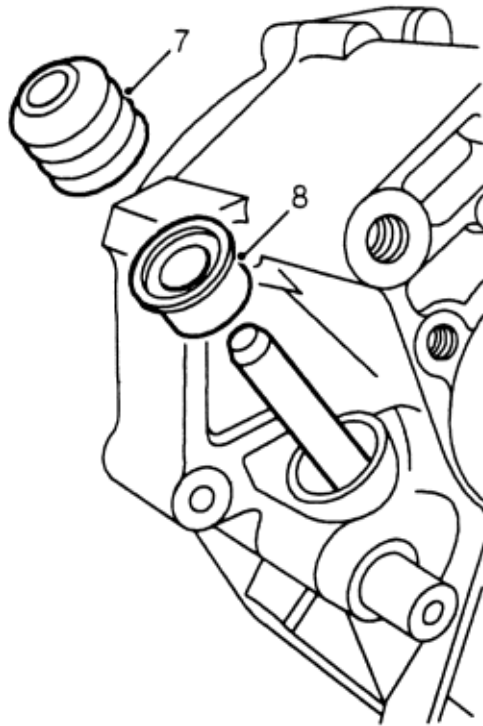


CAUTION

Support on safety stands.



2. Remove bolt and disconnect gear change steady bar from gearbox; collect 2 washers.
3. Remove clip retaining selector rod roll pin securing selector rod to selector shaft. Discard roll pin.
4. Using a suitable punch, drive out roll pin securing selector rod to selector shaft. Discard roll pin.
5. Release selector rod from selector shaft.



6. Position container beneath gearbox to catch fluid loss.
7. Remove gaiter from selector shaft.
8. Remove and discard selector shaft oil seal.

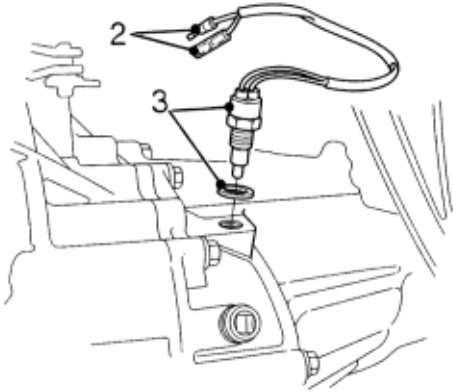
Refit

1. Clean selector shaft.
2. Using a suitable piece of tubing, fit new selector shaft oil seal.
3. Fit gaiter to selector shaft and ensure lip on gaiter is located in groove on gearbox casing.
4. Remove container from beneath gearbox.
5. Connect selector rod to shaft and align holes.
6. Fit new roll pin securing selector rod to shaft and fit roll pin retaining clip.
7. Fit washers to gear change steady bar and connect to gearbox.
8. Fit bolt securing gear change steady bar to gearbox and tighten to 10 Nm (1.0 kgf/m, 7.2 lbf/ft).
9. Remove stand(s) and lower vehicle.
10. Top-up gearbox oil. See **MAINTENANCE** section.

Service Repair No. 37.27.01

Remove

1. Remove air cleaner. See **FUEL DELIVERY SYSTEM, Repairs section.**



2. Disconnect reverse lamp switch leads from engine harness.
3. Remove reverse lamp switch and discard sealing washer.

Refit

1. Clean mating faces of reverse lamp switch and gearbox.
2. Fit new sealing washer to reverse lamp switch.
3. Fit reverse lamp switch and tighten to 25 Nm (2.5 kgf/m, 18 lbf/ft).
4. Connect reverse lamp switch leads.
5. Fit air cleaner. See **FUEL DELIVERY SYSTEM, Repairs section.**

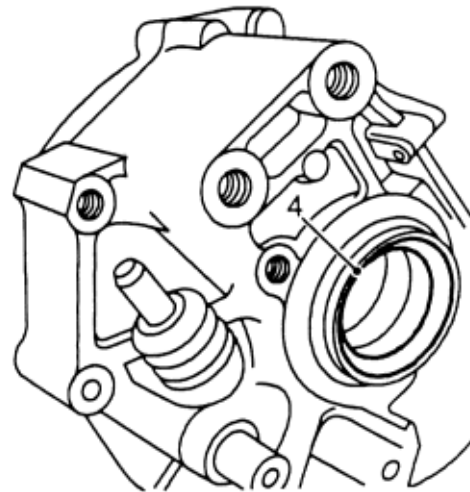
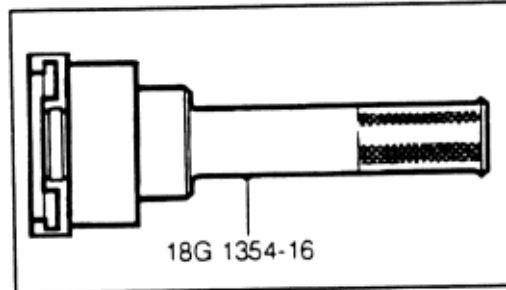
Service Repair No. 54.10.18

Remove

1. Remove LH drive shaft. See **DRIVESHAFTS, Repairs section.**
2. Carefully remove oil seal from differential housing, discard seal.

Refit

1. Thoroughly clean oil seal recess and splines of driveshaft.
2. Lubricate new oil seal with gearbox oil. See **INFORMATION, Capabilities, fluids and lubricants section.**



3. Locate new seal on tool **18G 1354-16** with sealing lip facing towards differential housing.
4. Carefully drift oil seal into differential housing until it is fully seated in recess.
5. Remove tool **18G 1354-16**.
6. Fit LH driveshaft. See **DRIVESHAFTS, Repairs section.**

Repairs

RH Differential Oil Seal

13-14

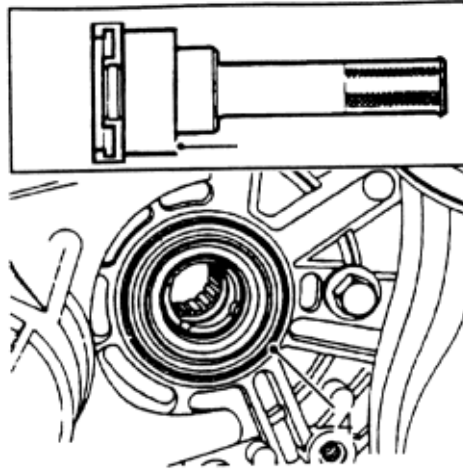
Service Repair No. 54.10.21

Remove

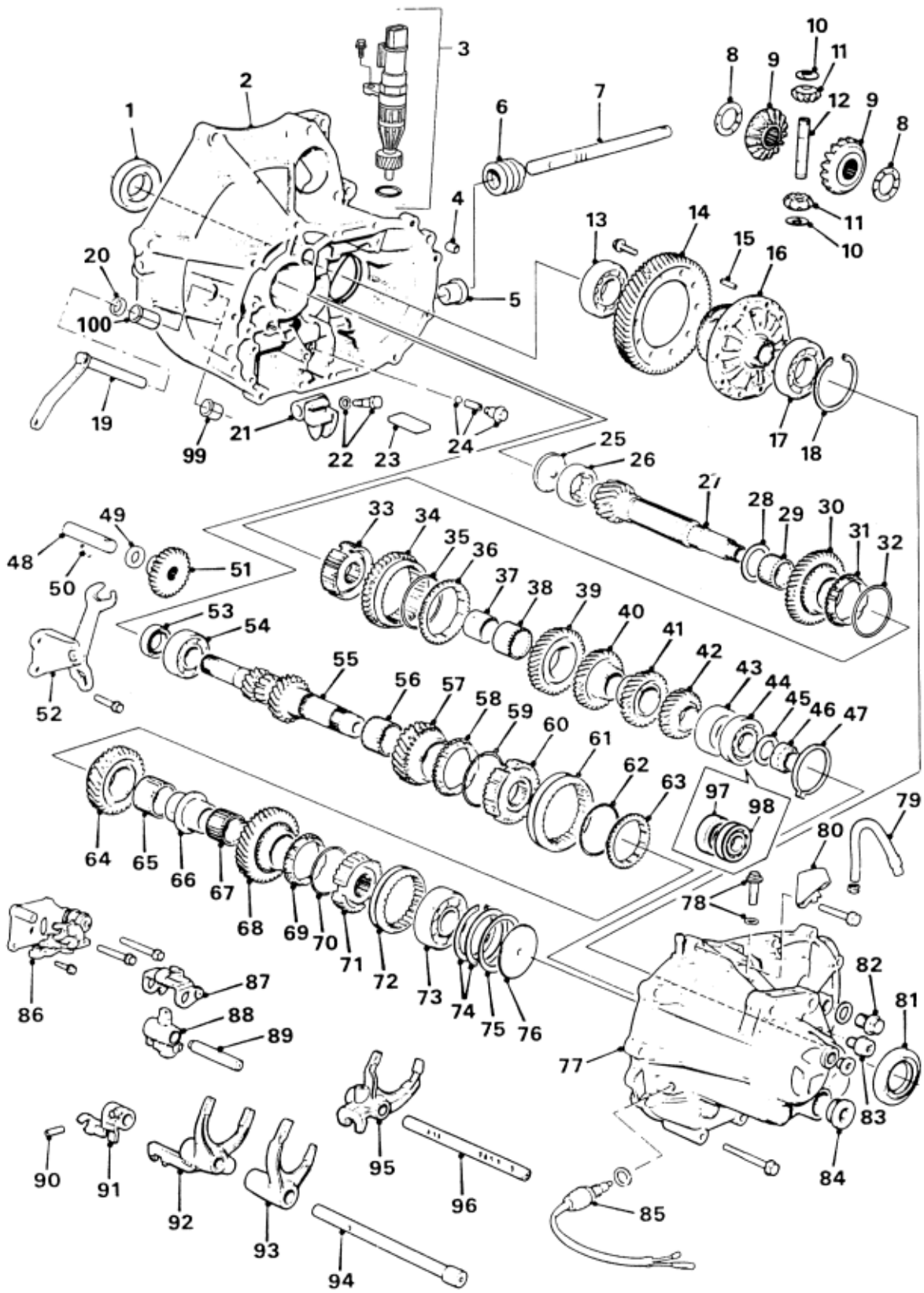
1. Remove RH driveshaft. See **DRIVESHAFTS, Repair section.**
2. Position container to collect fluid loss from gearbox.
3. Carefully remove oil seal from differential housing, discard seal.

Refit

1. Thoroughly clean oil seal recess and splines of driveshaft.
2. Lubricate new oil seal with gearbox oil. See **INFORMATION, Capacities, fluids and lubricants section.**

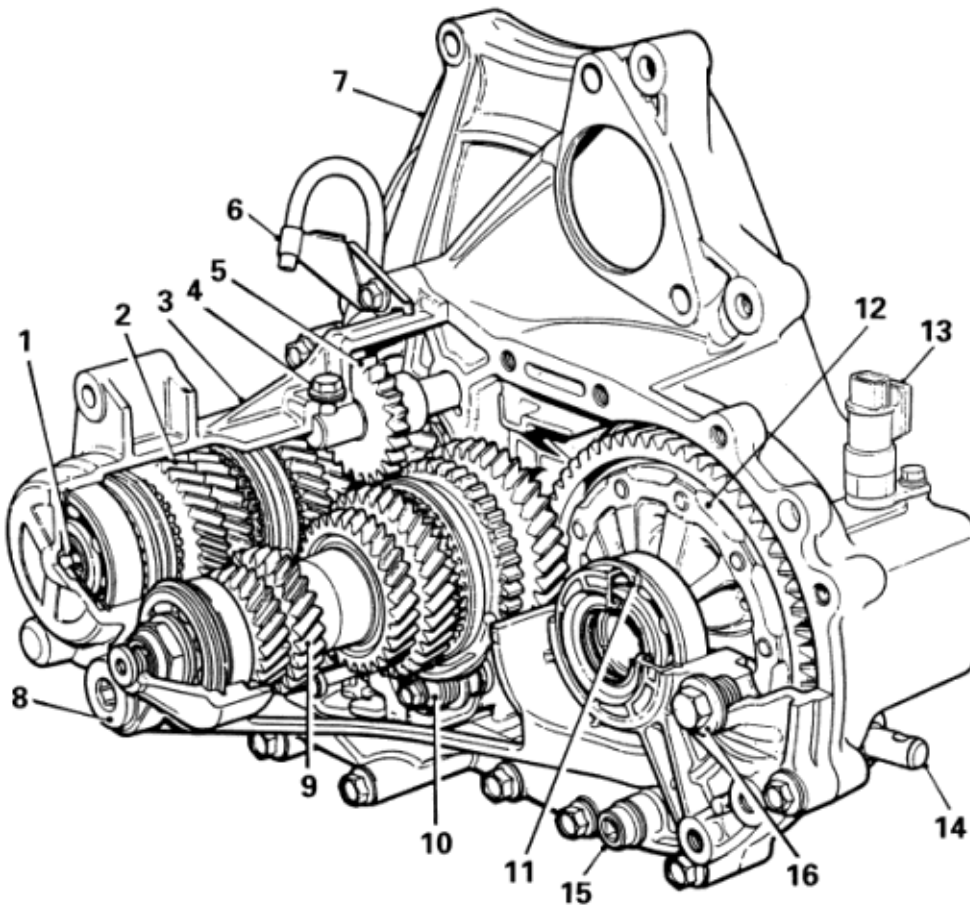


3. Locate new seal on tool **18G 1354-16** with sealing lip facing towards housing.
4. Carefully drift oil seal into differential housing until it is fully seated in recess.
5. Remove tool **18G 1354-16**.
6. Refit RH drive shaft. See **DRIVESHAFTS, Repairs section.**



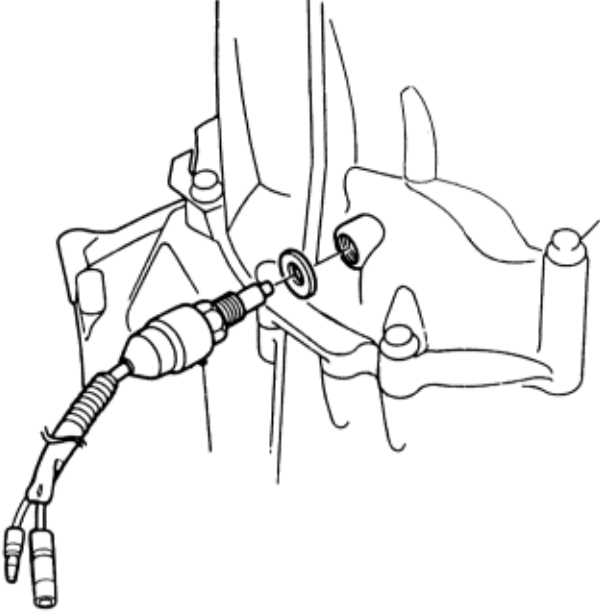
1	Oil seal - differential	38	Needle roller bearing- 2nd gear	73	Ball bearing - input shaft
2	Differential housing	39	2nd gear	74	Selective snap rings - input shaft end thrust
3	Speed sensor	40	3rd gear	75	Belleville washer - input shaft end thrust
4	Dowel	41	4th gear	76	Oil guide plate
5	Oil seal - selector shaft	42	5th gear	77	Gearbox casing
6	Boot	43	Ball bearing - output shaft*	78	Reverse idler shaft bolt and washer
7	Selector shaft	44	Ball bearing - output shaft*	79	Breather pipe
8	Thrust washer - sun gear	45	Tongued washer	80	Breather pipe bracket
9	Sun gear	46	Output shaft nut - L.H. thread	81	Oil seal - differential
10	Thrust washer - planet gear	47	Circlip	82	Filler/level plug
11	Planet gear	48	Reverse idler shaft	83	Drain plug
12	Pinion shaft	49	Thrust washer - reverse idler gear	84	Access plug - output shaft bearing circlip
13	Ball bearing - differential	50	Roll pin - reverse idler shaft	85	Reverse light switch
14	Final drive gear	51	Reverse idler gear	86	Interlock assembly
15	Roll pin - differential pinion shaft	52	Reverse selector fork	87	Gearshift holder
16	Differential casing	53	Oil seal - input shaft	88	Gearshift arm guide
17	Ball bearing - differential	54	Ball bearing - input shaft	89	Shift shaft
18	Selective shim	55	Input shaft	90	Roll pin - 5th/reverse gear selector
19	Clutch release shaft	56	Needle roller bearing - 3rd gear	91	Gear selector - 5th/reverse gears
20	Oil seal - clutch release shaft	57	3rd gear	92	Selector fork - 3rd/4th gears
21	Selector shaft guide	58	Synchro ring - 3rd gear	93	Selector fork - 5th gear
22	Dowel bolt and washer	59	Synchro spring	94	Selector shaft - 5th/reverse gears
23	Magnet	60	Synchro hub - 3rd/4th gears	95	Selector fork - 1st/2nd gears
24	Detent cap bolt, ball and spring - selector shaft	61	Synchro sleeve - 3rd/4th gears	96	Selector shaft - 1st/2nd gears
25	Oil guide plate	62	Synchro spring	97	Bearing - roller*
26	Parallel roller bearing output shaft	63	Synchro ring - 4th gear	98	Bearing - ball*
27	Output shaft	64	4th gear	99	Clutch release shaft bush - inner
28	Selective thrust washer - 1st gear end float	65	Needle roller bearing - 4th gear	100	Clutch release shaft bush - outer
29	Needle roller bearing - 1st gear	66	Distance collar - 4th/5th gears		
30	1st gear	67	Needle bearing - 5th gear		
31	Synchro ring - 1st gear	68	5th gear		
32	Synchro spring	69	Synchro ring - 5th gear		
33	Synchro hub - 1st/2nd gear	70	Synchro spring - 5th gear		
34	Synchro sleeve - 1st/2nd gear	71	Synchro hub - 5th gear		
35	Synchro spring	72	Synchro sleeve- 5th gear		
36	Synchro ring - 2nd gear				
37	Selective collar - 2nd gear end float				

* Depending on application

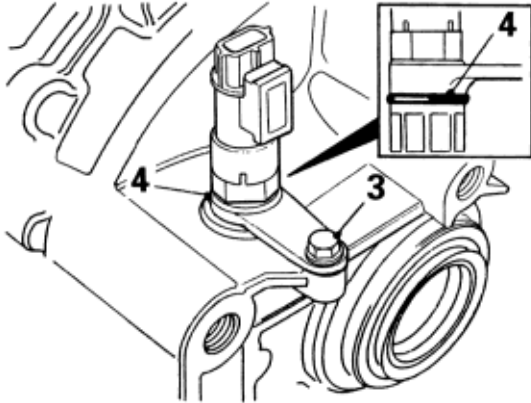


1. OIL GUIDE PLATE
2. INPUT SHAFT ASSEMBLY
3. GEAR CASE
4. REVERSE IDLER SHAFT BOLT
5. REVERSE IDLER GEAR
6. BREATHER PIPE AND BRACKET
7. DIFFERENTIAL HOUSING
8. ACCESS PLUG - OUTPUT SHAFT BEARING CIRCLIP
9. OUTPUT SHAFT ASSEMBLY
10. SHIFT ARM ASSEMBLY AND INTERLOCK
11. SELECTIVE SHIM
12. FINAL DRIVE ASSEMBLY
13. SPEED SENSOR
14. SELECTOR SHAFT
15. OIL DRAIN PLUG
16. OIL FILLER/LEVEL PLUG

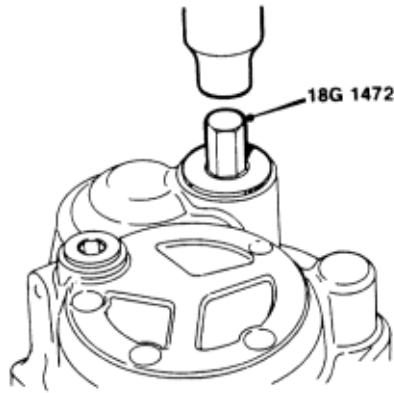
1. Thoroughly clean exterior gearbox.



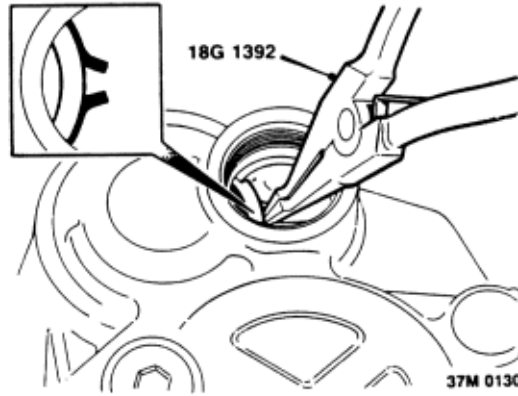
2. Remove reverse light switch; discard washer.



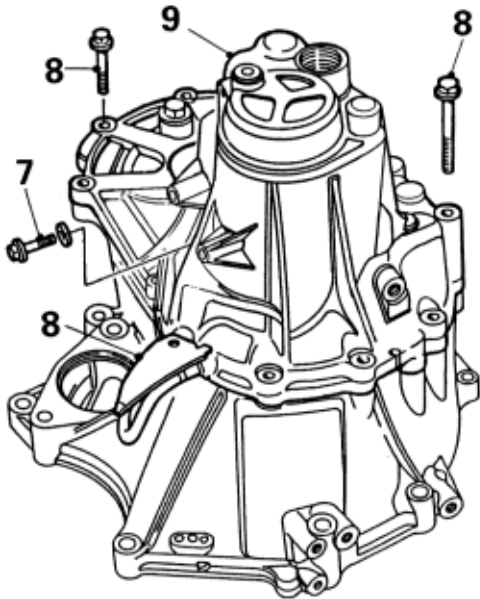
3. Remove bolt securing speedometer drive pinion and housing.
4. Remove speedometer drive pinion and housing, discard 'O' ring.



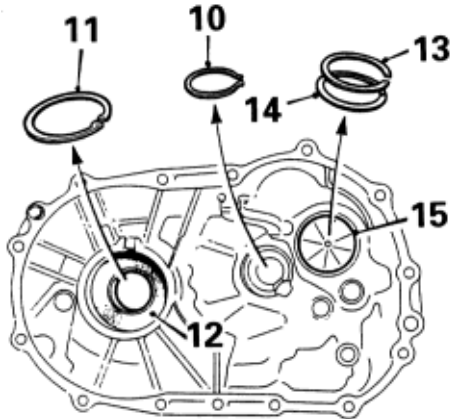
5. Remove access plug using tool **18G 1472**.



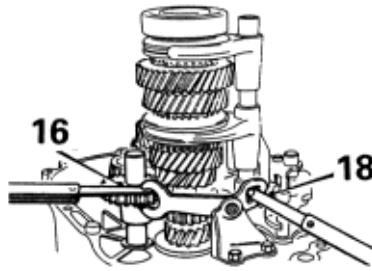
6. Using tool **18G 1392**, release circlip
6. Using tool **18G 1392**, release circlip retaining output shaft bearing.



7. Remove bolt retaining reverse idler shaft, discard washer.
8. Noting their fitted position, remove 14 bolts securing gear case to differential housing; release breather pipe bracket.
9. Using a soft-faced mallet, release gear case from differential housing; remove gear case.



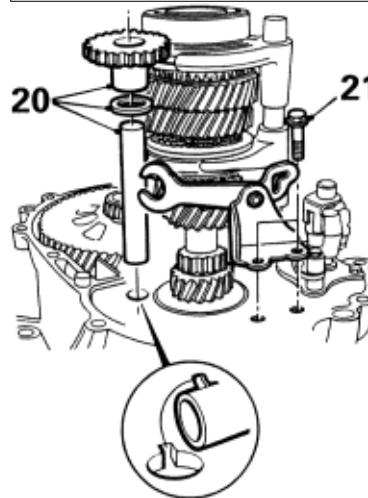
10. Remove and discard output shaft bearing circlip from gear case.
11. Remove selective circlip from differential bearing recess in gear case; retain circlip.
12. Remove and discard differential oil seal.
13. Remove selective circlip(s).
14. Remove and discard Belleville washer.
15. Remove input shaft oil guide plate.



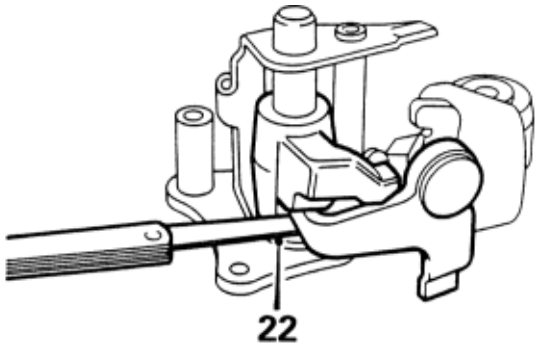
16. Using feeler gauges, measure clearance between reverse idler gear and selector fork.
 Clearance = 0.5 to 1.1 mm (0.02 - 0.04 in).
17. If clearance obtained exceeds above figure, measure width across prongs of selector fork.
 Prong width = 13.0 - 13.3 mm (0.51 - 0.52 in)
18. Using feeler gauges, measure clearance between pin and selector fork groove.
 Standard = 0.05 to 0.35 mm (0.002 - 0.014 in)
 Service limit = 0.5 mm (0.02 in)
19. If clearance obtained exceeds service limit, measure width of selector fork groove.
 Groove width = 7.05 to 7.25 mm (0.278 - 0.285 in)

⚠ CAUTION

If dimensions obtained exceed figures given, selector fork must be replaced.



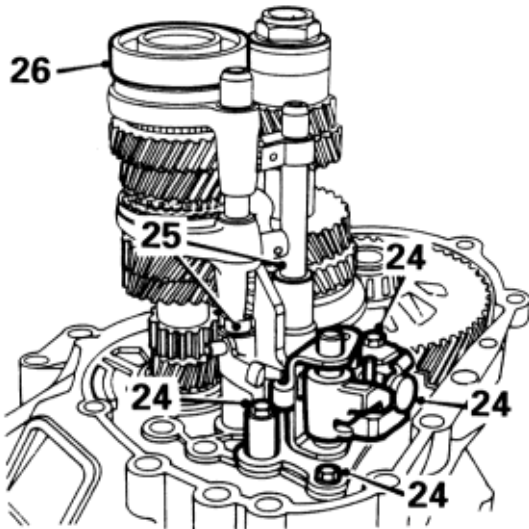
20. Remove reverse idler gear, thrust washer and idler shaft.
21. Remove 2 bolts securing reverse selector fork bracket; remove bracket and fork.



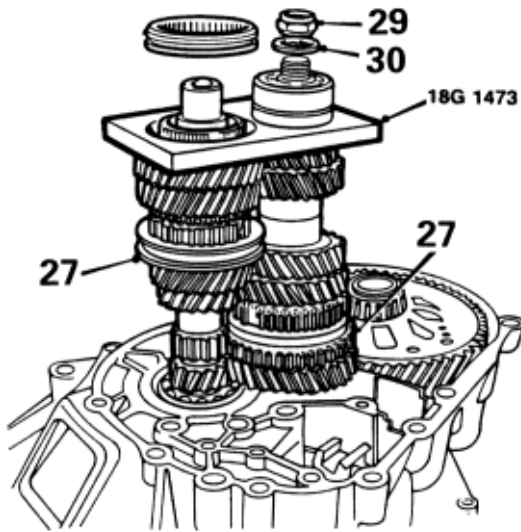
22. Using feeler gauges, measure clearance between interlock shift arm and guide.
Standard = 0.2 to 0.3 mm (0.008 - 0.012 in)
Service limit = 0.55 mm (0.022 in).
23. If clearance obtained exceeds service limit, measure width of groove in guide.
Groove width = (8.1 to 8.2 mm 0.319- 0.323 in)

⚠ CAUTION

If dimensions obtained exceed figures given, selector fork must be replaced.



24. Noting their fitted position, remove 2 plain bolts and should bolt retaining interlock assembly; remove assembly.
25. Raise both input and output shafts slightly, remove selector forks and rails.
26. Using 2 suitable levers, remove input shaft bearing.

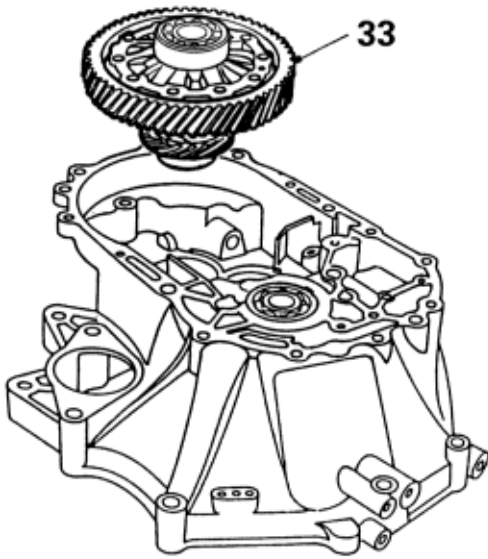


27. Move synchro sleeve to engage 1st and 4th gears.

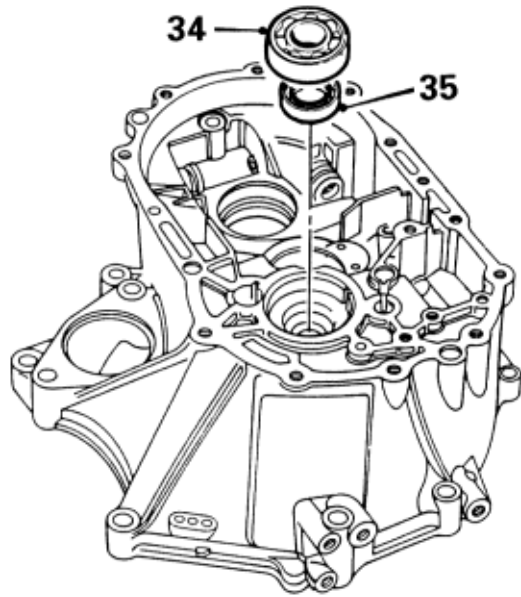
⚠ CAUTION

Damage to components will result if gears other than 1st and 4th are engaged.

28. Position tool **18G 1473** on input shaft and around output shaft bearing.
29. Release staking, remove and discard nut from output shaft.
NOTE: Nut has a L.H. thread.
30. Remove and discard tongued washer.
31. Remove tool **18G 1473**.
32. Remove input and output shafts from differential housing.

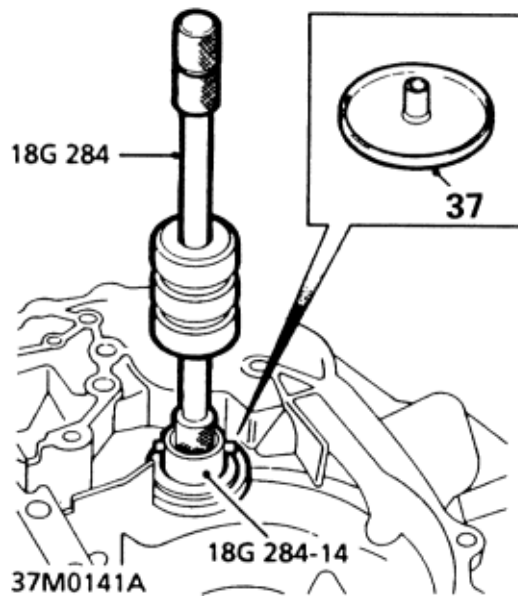


33. Lift differential assembly out of housing.



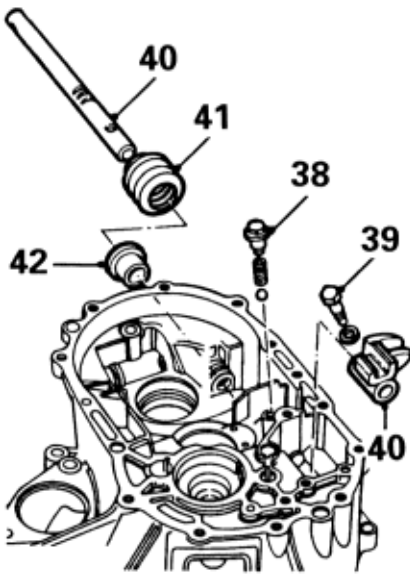
34. Using a soft metal drift, remove input shaft bearing from differential housing; discard bearing.

35. Remove and discard input shaft oil seal.

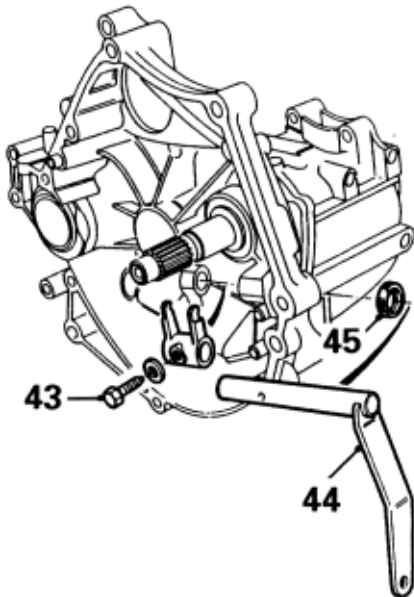


36. Remove output shaft bearing using tools **18G 284** and **18G 284 - 14** discard bearing.

37. Remove output shaft oil guide plate.



38. Remove detent cap bolt and washer, recover detent spring and ball.
NOTE: Use a stick magnet to recover ball.
39. Remove bolt and washer securing selector shaft guide to shaft.
40. Withdraw selector shaft; remove selector shaft guide.
41. Remove gaiter from shaft.
42. Remove and discard oil seal.

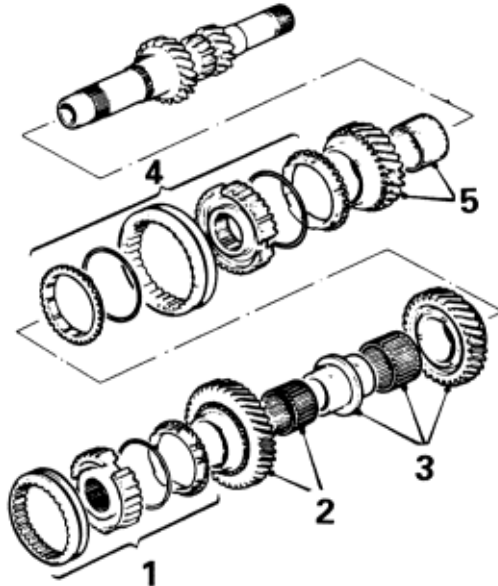


43. Remove bolt and washer securing clutch release fork to release shaft.
44. Withdraw release shaft.

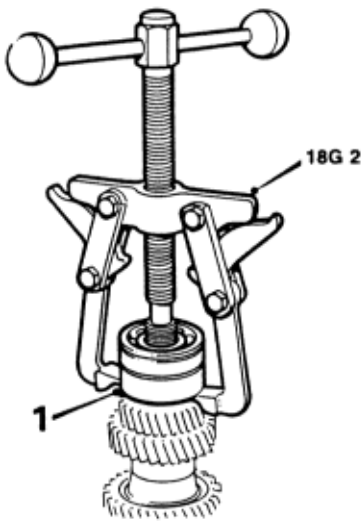
45. Remove and discard release shaft oil seal.

Input Shaft - Dismantling

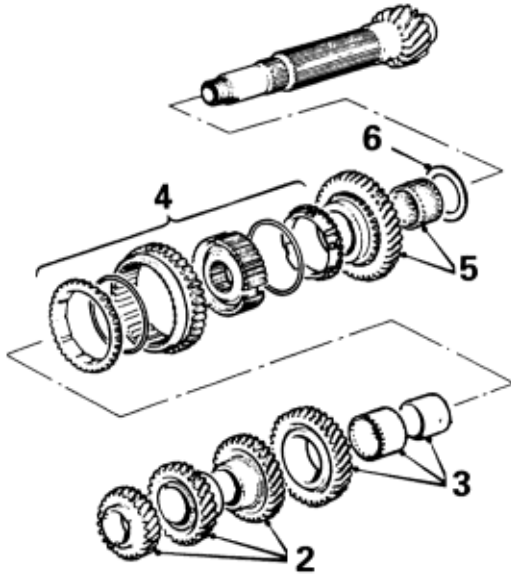
CAUTION
Keep component parts of each synchro assembly together.



1. Remove 5th gear synchro assembly.
2. Remove 5th gear and needle bearing.
3. Remove 4th gear together with collar and needle bearing.
4. Remove 3rd/4th synchro assembly.
5. Remove 3rd gear and needle bearing.



1. Remove bearings using tool **18G 2**, note type of bearing fitted; discard bearings.

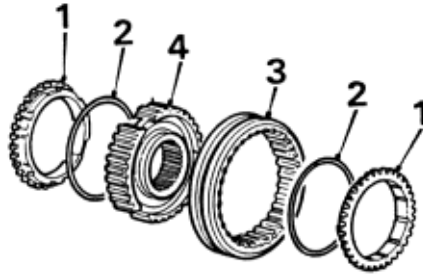


2. Remove 5th, 4th and 3rd gears.
3. Remove 2nd gear, needle bearing and collar.
4. Remove 1st/2nd synchro assembly.

CAUTION

Keep component parts of synchro assembly together.

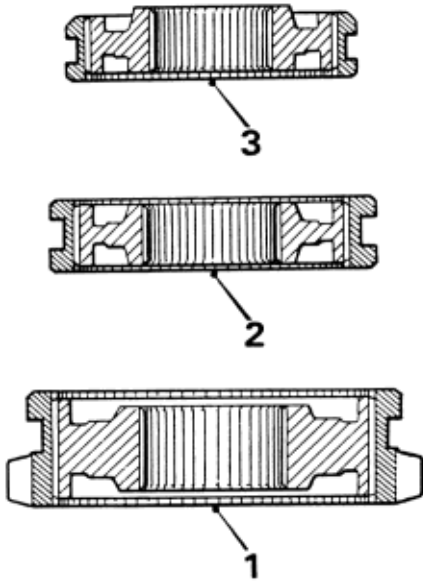
5. Remove 1st gear and needle bearing.
6. Remove and retain selective thrust washer.



Synchro Assembly Components

1. Synchro ring.
2. Spring ring
3. Synchro sleeve
4. synchro hub

NOTE: Only one synchro ring and spring ring are fitted to 5th speed synchro assembly.



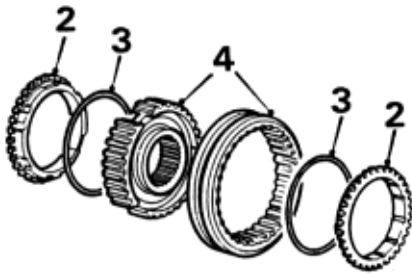
Synchro Assembly Identification

1. 1st/2nd synchro
2. 3rd/4th synchro
3. 5th synchro

CAUTION

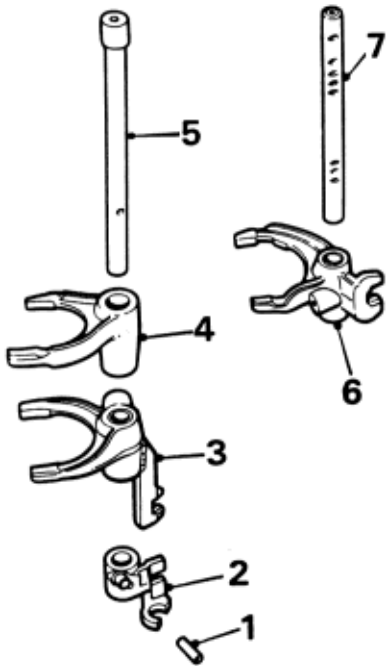
Keep component parts of synchro assembly together.

1. Suitably mark relative position of each synchro hub to its respective sleeve.



2. Remove 2 synchro rings
3. Remove 2 spring rings.
NOTE: Only one synchro ring and spring ring are fitted to 5th synchro.
4. Remove synchro hub from sleeve.

Selector Shafts



Selector Shaft Components

1. Roll pin
2. 5th/reverse gear selector
3. 3rd/4th gear selector fork
4. 5th gear selector fork
5. 5th/reverse selector shaft
6. 1st/2nd gear selector fork
7. 1st/2nd selector shaft.

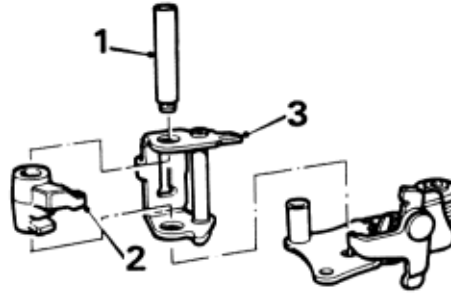


CAUTION

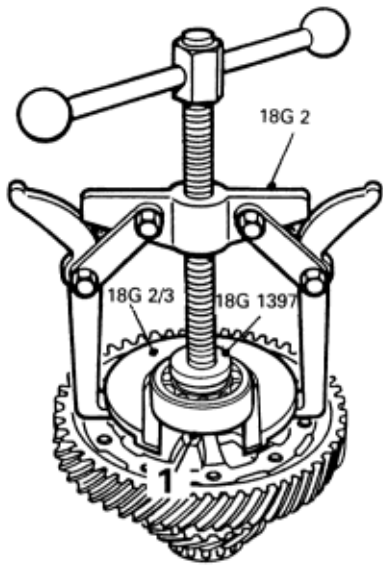
Suitably identify each selector fork and its fitted position to the relevant selector shaft.

1. Slide 1st/2nd gear selector fork off 1st/2nd selector shaft.
2. Slide 1st/2nd selector shaft out of 5th/reverse gear selector.
3. Using a suitable punch, remove roll pin securing 5th/reverse gear selector; discard roll pin.
4. Slide 5th/reverse gear selector off 5th/reverse selector shaft.
5. Slide 3rd/4th and 5th selector forks off 5th/reverse selector shaft.

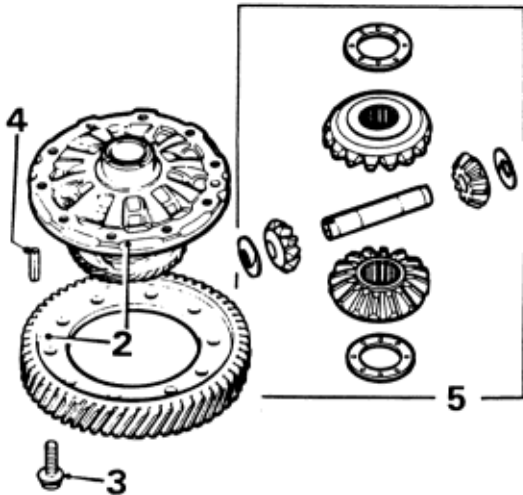
Interlock Assembly - Dismantling



1. Withdraw shift shaft from gearshift holder and arm guide.
2. Release lug on arm guide from slot in interlock.
3. Slide gearshift holder off arm guide.



1. Remove bearings using tools **18G 2**, **18G 2/3** and **18G 1397**; discard bearings.



2. Suitably mark fitted position of final drive gear to carrier.
3. Progressively slacken, then remove 10 bolts securing final drive gear to carrier; remove gear.
4. Using a suitable punch, remove roll pin securing pinion shaft; discard pin.
5. Remove pinion shaft, sun gears, planet gears and thrust washers; retain thrust washers - if fitted.
NOTE: Selective thrust washers are fitted to planet gears, non-selective washers are fitted to sun gears.

1. Clean all components ensure all traces of RTV sealant are removed from gear case, differential housing and access plug. Ensure oil drillings in input and output shafts and oil guide plates are clear. Ensure gearbox breather is unobstructed.

Input and Output Shaft Assemblies

1. Check gears for worn or chipped teeth, cracks or uneven wear.
2. Check coning surfaces of gears for wear.
3. Check needle bearings for wear and overheating.



CAUTION

Where any of the above are evident, all bearings on the shaft must be replaced.

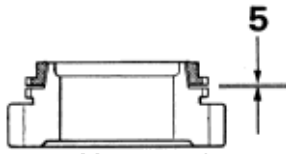
4. Check shaft splines for war and threads of output shaft for damage.
5. Check bearing collars for wear and damage.

Reverse Idler Shaft and Gear

1. Check idler shaft for wear.
2. Check gear for wear, chipping or cracking of teeth.
3. Check needle bearings for wear, replace gear and bearings as an assembly if wear is evident.

Synchro Assemblies

1. Check component parts of each synchro assembly for wear or damage, ensure teeth on hubs and sleeves are not chipped or rounded off.
2. Ensure teeth on synchro rings are not chipped or damaged, check inner surfaces of rings for wear.
3. Ensure each hub moves freely in its respective sleeve.
4. Place a synchro ring on its respective gear cone and rotate it until it stops (approximately 10° to 20°.



5. Measure clearance between synchro ring and gear.
Ring to gear clearance:
Standard = 0.85 to 1.1 mm (0.033 - 0.043 in)
Service limit = 0.4 mm (0.02 in)
6. Repeat for remaining rings and gears.



CAUTION

If any ring to gear clearance is less than above service limit, synchro assembly must be replaced.

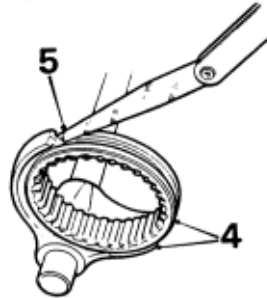
Selector Shafts and Forks

1. Check shafts for wear and alignment.
2. Check forks for wear, cracks or damage.
3. Check the retained detent balls and springs, there must be no visible 'flats' on the balls and springs must keep balls in contact with the staked portion of the fork.



CAUTION

It is not possible to replace balls or springs, fork must be replaced.

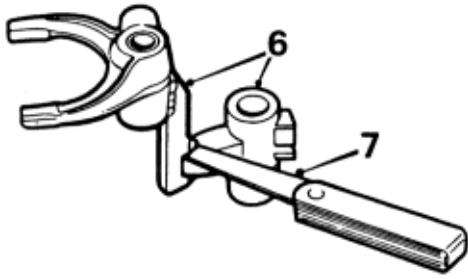


4. Assemble each fork to its respective synchro sleeve.
5. Check clearance of fork in synchro sleeve groove.
Fork to groove clearance:
Standard = 0.45 to 0.65 mm (0.018 - 0.026 in)
Service limit = 1.0 mm (0.04 in)



CAUTION

If clearance is found to exceed service limit, fork must be replaced,



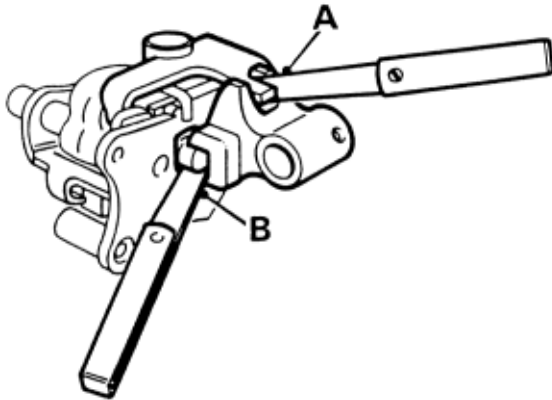
6. Assemble 5th/reverse gear selector to 3rd/4th selector fork.
7. Using feeler gauges, measure clearance between selector and fork.
Standard = 0.2 to 0.5 mm (0.01 - 0.02 in)
Service limit = 0.8 mm (0.03 in)
8. If clearance obtained exceeds service limit, measure width of tongue to selector.
Standard = 11.9 to 12.0 mm (0.469 - 0.472 in).

⚠ CAUTION

If width of tongue is within limits, selector fork must be replaced, if width of tongue is less than quoted, selector must be replaced.

Interlock Assembly

1. Check components for wear or damage, replace assembly if necessary.



2. Assemble gearshift arm guide to interlock assembly
3. Using feeler gauges, measure clearance **A**.
Clearance A:
Standard = 0.05 to 0.35 (0.002 - 0.014 in)
Service limit = 0.6 mm (0.02 in)

4. If clearance exceeds service limit, check width of groove in gearshift arm guide.
Groove width = 13.05 to 13.25 mm (0.514 - 0.522 in).

⚠ CAUTION

If width of groove exceeds above dimension, gearshift arm guide must be replaced, If width of groove is within service limit, replace interlock assembly.

5. Using feeler gauges, measure clearance **B** between interlock ball and gearshift arm guide.
Clearance **B**:
Standard = 0.05 to 0.25 mm (0.0002 - 0.010 in)
Service limit = 0.5 mm (0.02 in)
6. If clearance exceeds service limit, measure outside diameter of interlock ball.
Interlock ball outside diameter = 12.05 to 12.15 mm (0.474 - 0.478 in).

⚠ CAUTION

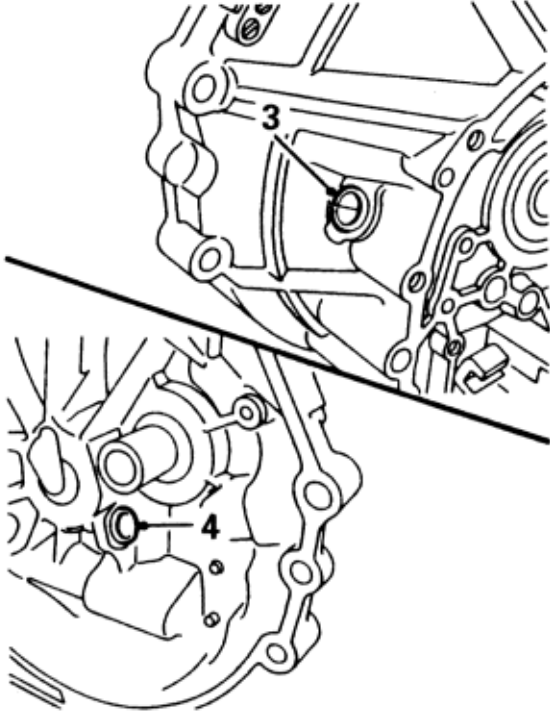
If diameter of ball is within limits, replace gearshift arm guide, if diameter of ball is less than 12.05 mm (0.474 in), replace interlock assembly.

Differential Assembly

1. Check gear teeth for wear, chipping and signs of overheating.
2. Check pinion shaft for wear.

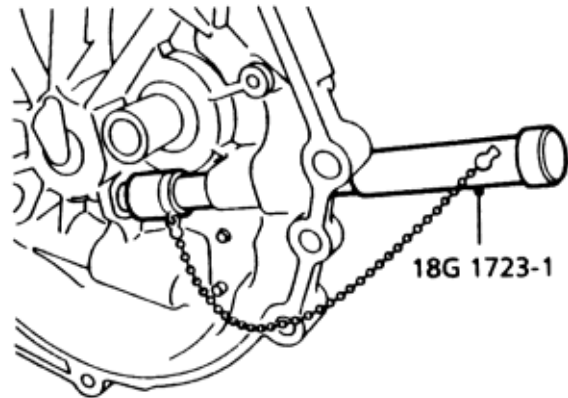
1. Check housing for damage, check that locating dowels are fitted.
2. Check clutch release shaft bushes for damage or wear and that shaft is free to turn; replace if necessary using the following procedure.

Remove

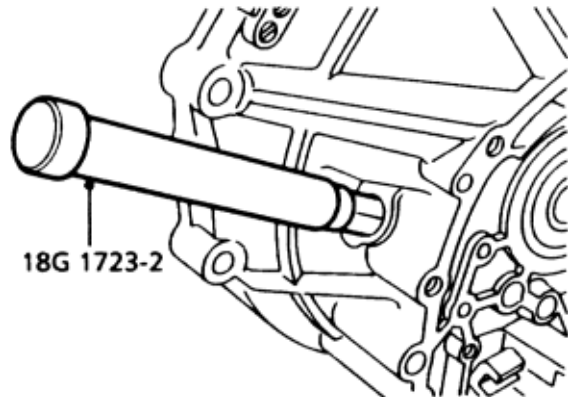


3. Outer bush: Using a hacksaw blade, carefully cut a longitudinal slot opposite the split in the bush; prise bush out of differential housing.
4. Inner bush: Carefully prise inner bush out of differential housing.

Refit



5. Inner bush: Using tool **18G 1723-1**, drift inner bush into differential housing.



6. Outer bush: Using tool **18G 1723-2**, drift outer bush into differential housing.



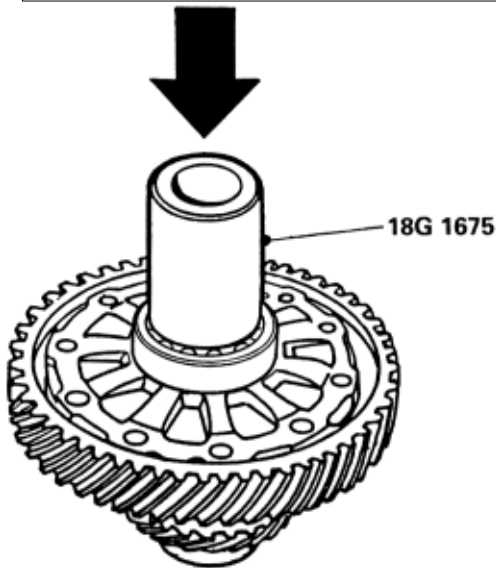
CAUTION

Ensure end of tool **18G 1723-2** is located in inner bush.

Differential - Reassembling

1. Assemble planet gears and original thrust washer.
2. Fit sun gears and original thrust washers - if fitted.
3. Rotate gears and thrust washers to align drillings in carrier.

CAUTION
Do not fit roll pin or final drive gear at this state.



4. Fit new ball bearings to carrier using tool **18G 1675**.
NOTE: Larger of the two bearings is fitted on speedometer drive gear side.

Synchro Assemblies - Reassembling

1. Assemble each synchro hub to its respective sleeve ensuring that raised teeth on sleeve are aligned with grooves in hub.
2. Fit spring rings to retain hub.
NOTE: Only one spring ring is fitted on 5th speed synchro.
3. Assemble synchro rings to their respective sleeves.

Selector Shafts - Reassembling

1. Slide 5th and 3rd/4th selector forks on to 5th/reverse selector shaft.

CAUTION
Ensure that longest portion of selector fork lugs face away from shoulder of shaft.

2. Slide 5th/reverse selector on to 5th/reverse selector shaft; secure selector with a new roll pin.
3. Slide 1st/2nd gear selector fork on to 1st/2nd selector shaft.
4. Locate 1st/2nd selector shaft in 5/reverse gear selector.
5. Locate lug on shift arm guide in gearshift holder.
6. Position gear shift holder to interlock; fit shaft.

Reverse Idler Gear and Shaft - Reassembling

1. Fit a new thrust washer.
2. Smear needle bearing rollers with petroleum jelly and fit in idler gear.
3. Fit reverse idler gear to shaft.
NOTE: Boss on gear must face towards thrust washer.

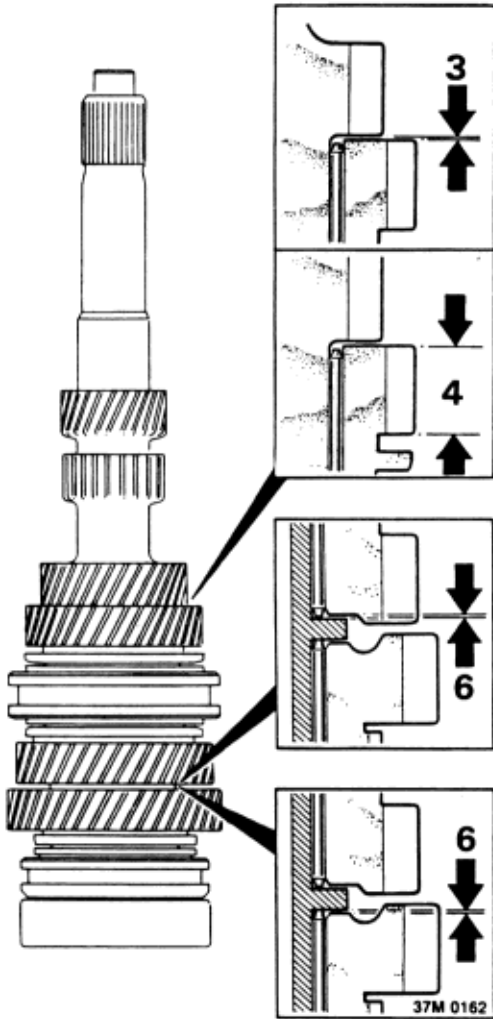
Input Shaft - Reassembling

NOTE: Smear needle bearing rollers with petroleum jelly prior to assembly.

1. Fit needle bearing rollers in third gear.
2. Fit 3rd gear on shaft.
3. Fit 3rd/4th synchro assembly.
4. Fit needle bearing rollers in 4th gear, position gear on collar and fit assembly on shaft.
5. Fit needle bearing rollers in 5th gear, position gear on collar.
NOTE: Boss on 5th gear must face away from 4th gear.
6. Fit 5th synchro assembly.
NOTE: Machined groove in synchro hub must face towards 5th gear and large chamfer on synchro sleeve must face away from 5th gear.
7. Fit a new input shaft bearing.

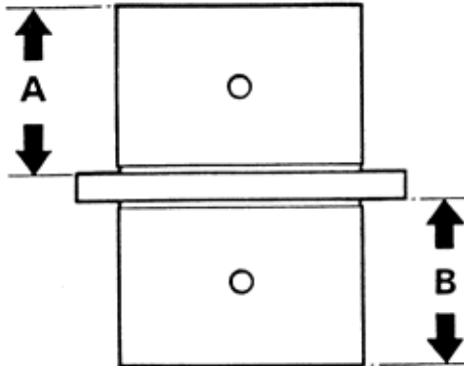
Input Shaft Gear End - float - Check

1. Position input shaft on bed of a hand press with bearing located on a suitable socket
2. Apply downward pressure to input shaft.
 NOTE: Maintain pressure whilst checks are carried out.



3. Using feeler gauges, measure clearance between 2nd and 3rd gears.
 3rd gear clearance:
 Standard = 0.06 to 0.21 mm (0.002 - 0.008 in)
 Service limit = 0.3 mm (0.01 in)
4. If clearance exceeds service limit, measure thickness of 3rd gear.
 3rd gear thickness:
 Standard = 35.42 to 35.47 mm (1.394 - 1.396 in)
 Service limit = 35.30 mm (1.390 in)

5. If 3rd gear thickness is greater than service limit, replace 3rd gear synchro assembly; if thickness is less than service limit, replace 3rd gear.
6. Using feeler gauges, measure clearance between the spacer collar and 4th gear, and spacer collar and 5th gear.
 4th and 5th gear clearance:
 Standard = 0.06 to 0.21 mm (0.002 - 0.008 in)
 Service limit = 0.3 mm (0.01 in)



7. If clearance of either gear exceeds service limit measure length of appropriate side of spacer collar **A** or **B**.
 Length **A** = 4th gear side
 Length **B** = 5th gear side
 Spacer collar length **A** or **B**:
 Standard = 26.03 to 26.08 mm (1.025 - 1.027 in)
 Service limit = 26.01 mm (1.024 in)
8. If length **A** exceeds service limit, measure thickness of 4th gear.
 4th gear thickness:
 Standard = 30.92 to 30.97 mm (1.217 - 1.219 in)
 Service limit = 30.80 mm (1.213 in)
9. If thickness of 4th gear exceeds service limit, replace 3rd/4th synchro assembly; if thickness of gear is less than service limit, replace gear.
10. If length **B** exceeds service limit, measure thickness of 5th gear.
 5th gear thickness:
 Standard = 30.42 to 30.47 mm (1.198 - 1.200 in)
 Service limit = 30.30 mm (1.193 in)
11. If thickness of 5th gear exceeds service limit, replace 5th synchro assembly; if thickness of gear is less than service limit, replace gear.

Output Shaft - Reassembling

NOTE: Smear needle bearing rollers with petroleum jelly prior to assembly.

1. Measure and record thickness of original thrust washer.
2. Fit original thrust washer on shaft.
3. Fit needle bearing rollers in 1st gear.
4. Fit 1st gear on shaft.
5. Fit 1st/2nd synchro assembly.



CAUTION

Ensure reverse gear on synchro sleeve is adjacent to 1st gear.

6. Measure and record length of 2nd gear collar.
7. Fit 2nd gear collar on shaft ensuring lubrication groove is towards 1st/2nd synchro assembly.
8. Fit needle bearing rollers in 2nd gear.
9. Fit 2nd gear on shaft.
10. Fit 3rd and 4th gears ensuring that bosses on gears are adjacent to each other.
11. Fit 5th gear ensuring that large boss on gear is towards threaded portion of shaft.
12. Fit new output shaft bearings ensuring that snap ring groove in ball race is towards thread portion of shaft.

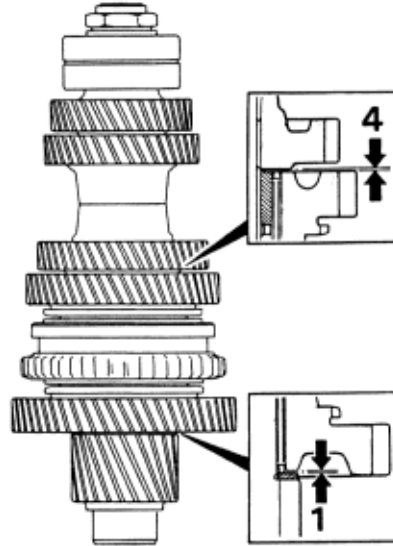


CAUTION

Ensure that replacement bearings are the same as originally fitted. Where a roller bearing and single ballrace is to be fitted, the single ballrace must be adjacent to threaded portion of shaft.

13. Fit a new tongued washer with dished side of washer towards bearing.
14. Secure final drive pinion of shaft in soft-jawed vice.
15. Fit a new nut and tighten to 110 Nm (11.2 kgf, 81.1 lbf/ft).
NOTE: Nut has a L.H. thread; do not stake nut at this stage.

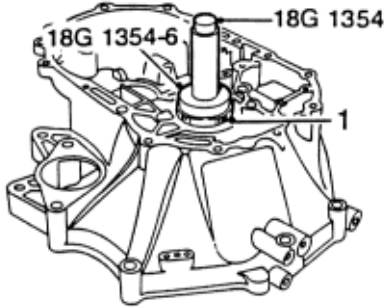
Output Shaft Gear End - float - Check



1. Using feeler gauges measure clearance between 1st gear and thrust washer.
Standard = 0.03 to 0.08 (0.001 - 0.003 in).
Service limit = 0.18 mm (0.007 in)
2. From clearance obtained, calculate thickness of thrust washer required to give correct clearance. If clearance obtained exceeds service limit, fit a thicker thrust washer; if it is less than 0.03 mm (0.001 in), fit a thinner thrust washer.
NOTE: Thrust washers are available as follows: 1.96 to 2.08 mm (0.077 - 0.082 in) thick in increments of 0.03 mm (0.001 in).
3. Select a thrust washer of the required thickness to bring end-float within limits.
4. Using feeler gauges measure clearance between 2nd and 3rd gears.
2nd/3rd gear clearance = 0.03 to 0.10 mm (0.0001 - 0.004 in)
5. If clearance exceeds figure given, it will be necessary to fit a short 2nd gear collar; if clearance is less than figure given, it will be necessary to fit a longer collar.
6. Compare length of original collar and select a collar which will provide specified clearance.
Collars are available in the following lengths: 28.99 mm (1.141 in) and 29.04 mm (1.143 in)

7. Having determined thickness of selective thrust washer and length of 2nd gear collar required, fit thrust washer and collar.
8. Secure output shaft nut by sstaking.

Input Shaft End - Thrust - Check and Adjust

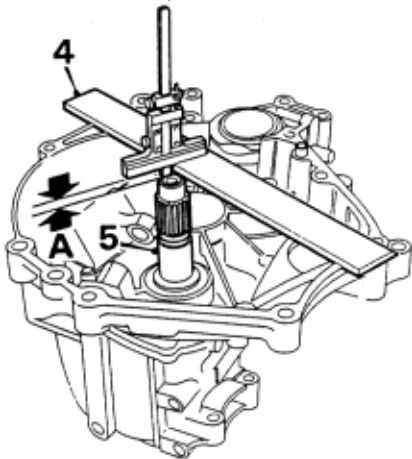


1. Fit a new input shaft bearing in differential housing using tools **18G 1354** and **18G 1354-6**.

CAUTION

Do not fit oil seal at this stage.

2. Position input shaft assembly in differential housing ensuring it is fully inserted in bearing.
NOTE: Position housing so that end of shaft is clear of bench.
3. Fit gear case, fit and tighten bolts to 45 Nm (4.6 kgf/m, 33.2 lbf/ft).



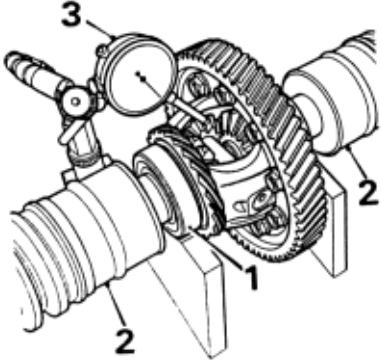
4. Position a straight edge and depth gauge across face of differential housing.
5. Pull input shaft into differential housing and position end of depth gauge on end of shaft; record measurement shown on gauge.
6. Push input shaft towards gear case, record measurement shown on gauge.
7. Subtract thickness of straight edge from above readings.
8. Subtract first measurement from second measurement; record figure obtained. Calculate the resultant figure **A**.
9. Calculate thickness of circlip(s) required by subtracting 0.97 mm (0.038 in) from dimension **A**.
Input shaft end thrust = 0.14 to 0.21 mm (0.006 - 0.008 in).
10. Select circlip(s) from sizes available which equal thickness required. Fourteen circlips are available ranging from 0.5 mm to 1.15 mm (0.020 - 0.045 in) thick in increments of 0.05 mm (0.002 in).

CAUTION

No more than two circlips may be fitted. It may not always be possible to select the exact thickness of circlips required; where this occurs, always fit a slightly thinner pack to avoid pre-loading bearings.

11. Remove bolts securing gear case; remove gear case.
12. Remove input shaft assembly.

Pinion Gear Backlash - Check and Adjust



1. Position differential assembly with bearings located in V blocks.
2. Fit both inboard drive shaft joints to align gears.
3. Assemble a D.T.I. gauge with stylus of gauge contacting one of the planet gears; zero the gauge.
4. Measure and record planet gear backlash.
5. Repeat procedure for other planet gear.
6. Compare backlash figures obtained with the following:
Planet gear backlash = 0.05 to 00.15 mm (0.002 - 0.006 in)
7. If backlash is not as specified, remove planet gears, measure thickness of original thrust washers and from figures obtained, calculate thickness of thrust washers required to give correct backlash.
NOTE: Thrust washers are available from 0.70 to 0.90 mm (0.028 - 0.035 in) thick in increments of 0.20 mm (0.008 in).



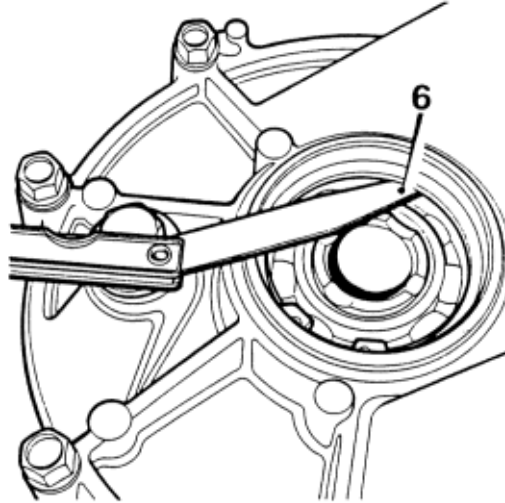
CAUTION

Thrust washers selected must be of equal thickness.

8. Fit selected thrust washers, secure pinion shaft with a new pin.
9. Fit final drive gear to carrier ensuring reference marks are aligned.
10. Fit 10 bolts and tighten progressively to 110 Nm (11.2 kgf/m, 81.1 lbf/ft).

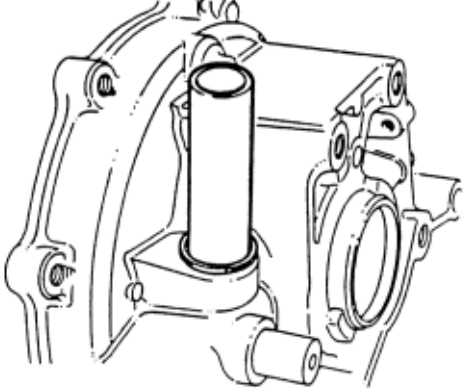
Differential Bearing Pre-load - Check and Adjust

1. Position original selective circlip in gear case.
2. Position differential assembly in differential housing.
3. Fit gear case, fit and tighten bolts to 45 Nm (4.6 kgf/m, 33.2 lbf/ft).
4. Lightly drive differential assembly into gear case to seat circlip.
5. Lightly drive differential into differential housing to settle bearing.

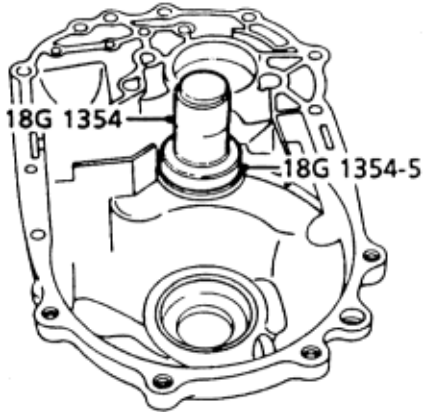


6. Using feeler gauges measure and record clearance between circlip and bearing outer face. Correct clearance = 0.15 mm (0.006 in) maximum.
7. If clearance is not as specified, select the appropriate circlip from the range available.
NOTE: Circlips are available from 2.50 to 3.00 mm (0.098 - 0.118 in) thick in increments of 0.10 mm (0.004 in).
8. Remove original circlip through oil seal aperture using tool **18G 1392**.
9. Fit selected circlip using tool **18G 1392**.
10. Re-check bearing pre-load using above procedure.
11. Remove differential assembly, retain selected circlip.

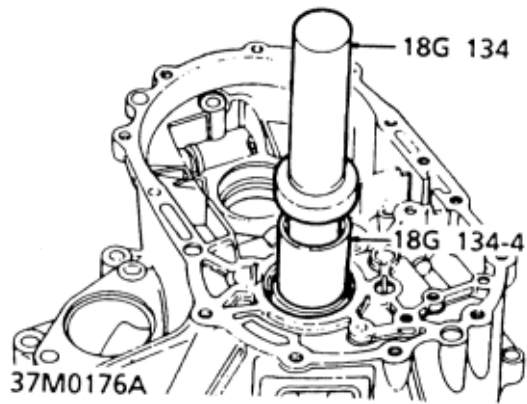
1. Lightly lubricate all components with gearbox oil.



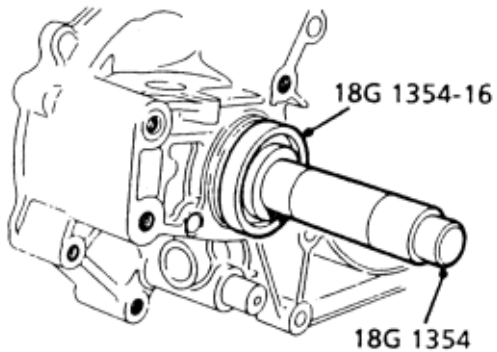
2. Using a suitable piece of tubing, fit a new selector shaft oil seal.
3. Fit output shaft oil guide plate in differential housing



4. Fit a new output shaft bearing in differential housing using tools **18G 1354** and **18G 1354-5**
NOTE: Oil holes in bearing must face towards output shaft.



5. Fit a new input shaft oil seal in differential housing using tools **18G 134** and **18G 134-4**



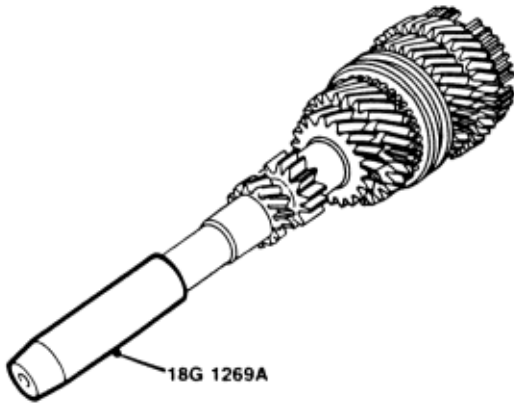
6. Fit a new differential oil seal in differential housing using tools **18G 1354** and **18G 1354-16**.
7. Fit output shaft bearing retaining plate.



CAUTION

Ensure side marked TOP is facing towards output shaft.

8. Fit selector shaft and selector shaft guide.
9. Fit and tighten dowel bolt to 28 Nm (2.9 kgf/m, 20.7 lbf/ft).
10. Fit detent ball, spring and cap bolt, tighten bolt to 22 Nm (2.2 kgf/m, 16.2 lbf/ft).
11. Position differential assembly into housing.



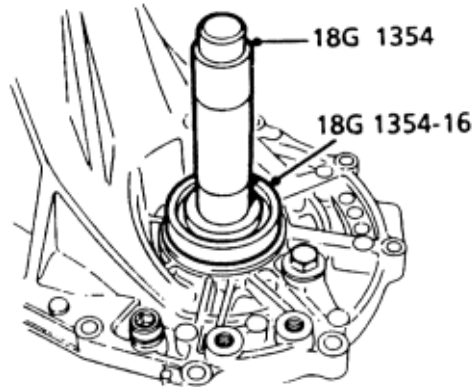
18G 1269A

12. Fit seal protector, tool **18G 1269A** to input shaft.
13. Place input and output shafts together and fit assembly in differential housing.
NOTE: Position housing so that when fitted, end of input shaft is clear of bench.
14. Remove tool **18G 1269A**.
15. Ensure output shaft nut is staked.
16. Position gears in neutral.
17. Raise both shafts slightly and fit selector forks assembly ensuring forks are located in grooves in synchro sleeves.
18. Fit reverse idler gear, thrust washer and shaft.
NOTE: Large boss on idler gear must be towards differential housing.
19. Fit reverse selector fork and bracket.
20. Fit and tighten retaining bolts.
21. Fit interlock assembly ensuring base of interlock locates in slot at lower end of 1st/2nd selector shaft.
22. Fit and tighten interlock retaining bolts.



CAUTION

Ensure should bolt is fitted in its correct location.



18G 1354

18G 1354-16

23. Fit new differential oil seal in gear case using tools **18G 1354** and **18G 1354-16**.
24. Fit input shaft oil guide plate in gear case.
25. Fit a new Belleville washer and selected circlip(s).
26. Fit new output shaft circlip in gear case.
27. Fit selected circlip in differential bearing recess in gear case.
28. Apply a bead of RTV silicone sealant to mating face of gear case.
29. Position gear case over differential housing keeping gear case square to housing.
30. Lower gear case into position and at the same time, expand output shaft bearing circlip using tool **18G 1392**.
31. Push gear case fully down on to differential housing.
32. Ensure circlip is fully seated in groove in output shaft bearing, raise output shaft and a click will be heard as circlip enters groove.
33. Fit and progressively tighten gear case bolts to 45 Nm (4.6 kgf/m, 33.2 lbf/ft).
34. Fit reverse idle shaft bolt and tighten to 67 Nm (6.8 kgf/m, 49.4 lbf/ft). Use a new washer.
35. Apply thread sealant to access plug, fit and tighten plug using tool **18G 1472**.
36. Fit reverse light switch and new washer.
37. Fit speedometer drive pinion and housing, use a new 'O' ring: tighten bolt to 15 Nm (1.5 kgf/m, 11.1 lbf/ft).
38. Fit new clutch release shaft oil seal.
39. Fit clutch release shaft and fork.
40. Fit and tighten bolt to 29 Nm (3.0 kgf/m, 21.4 lbf/ft).

Data

Reverse idler gear to selector fork clearance	0.5 to 1.1 mm (0.02 - 0.04 in)
Selector fork prong width	13.0 to 13.3 mm (0.51 - 0.52 in)
Selector fork groove to pin clearance:	
Standard	0.05 to 0.35 mm (0.002 - 0.014 in)
Service limit	0.5 mm (0.02 in)
Selector fork groove width	7.05 to 7.25 mm (0.278 - 0.285 in)
Interlock shift arm to guide clearance:	
Standard	0.2 to 0.3 mm (0.008 to 0.012 in)
Service	0.55 mm (0.022 in)
Interlock shift guide groove width	8.1 to 8.2 mm (0.319 - 0.323 in)
Synchro ring to gear clearance:	
Standard	0.85 to 1.1 mm (0.033 - 0.043 in)
Service limit (minimum clearance)	0.4 mm (0.02 in)
Selector shaft forks in synchro sleeve grooves clearance:	
Standard	0.45 to 0.65 mm (0.018 - 0.026 in)
Service limit	1.0 mm (0.04 in)
Selector to fork clearance:	
Standard	0.2 to 0.5 mm (0.01 - 0.02 in)
Service limit	0.8 mm (0.03 in)
Selector tongue width	11.9 to 12.0 mm (0.469 - 0.472 in)
Gearshift arm guide to interlock assembly clearance:	
Standard	0.05 to 0.35 mm (0.02 - 0.014 in)
Service limit	0.6 mm (0.02 in)
Gearshift arm guide groove width	13.05 to 13.25 mm (0.514 - 0.522 in)
Interlock ball to gearshift arm guide clearance:	
Standard	0.05 to 0.25 mm (0.002 - 0.010 in)
Service limit	0.5 mm (0.02 in)
Interlock ball outside diameter	12.05 to 12.15 mm (0.474 - 0.478 in)
2nd to 3rd gear clearance:	
Standard	0.06 to 0.21 mm (0.002 - 0.008 in)
Service limit	0.3 mm (0.01 in)
3rd gear thickness:	
Standard	35.42 to 35.47 mm (1.394 - 1.396 in)
Service limit	35.30 mm (1.390 in)
4th to 5th gear clearance:	
Standard	0.06 to 0.21 mm (0.002 - 0.008 in)
Service limit	0.3 mm (0.01 in)
Spacer collar length:	
Standard	26.03 to 26.08 mm (1.025 - 1.027 in)
Service limit	26.01 mm (1.024 in)
4th gear thickness:	
Standard	30.92 to 30.97 mm (1.217 - 1.219 in)
Service limit	30.80 mm (1.213 in)
5th gear thickness:	
Standard	30.42 to 30.47 mm (1.198 - 1.200 in)
Service limit	30.30 mm (1.193 in)
1st gear to thrust washer clearance:	
Standard	0.03 to 0.08 mm (0.001 - 0.003 in)
Service limit	0.18 mm (0.007 in)
2nd to 3rd gear clearance	0.03 to 0.10 mm (0.001 - 0.004 in)

Input shaft end thrust	0.14 to 0.21 mm (0.006 - 0.008 in)
Planet gear backlash	0.05 to 0.15 mm (0.002 - 0.006 in)
Differential bearing to circlip clearance	0.15 mm (0.006 in) maximum

Torque Settings

Final drive pinion nut	110 Nm (11.2 kgf/m, 81.1 lbf/ft)
Differential housing to gearcase bolts	45 Nm (4.6 kgf/m 33.2 lbf/ft)
Selector shaft guide to selector shaft bolt	28 Nm (2.9 kgf/m, 20.7 lbf/ft)
Cap bolts - detent balls and springs	22 Nm (2.2 kgf/m, 16.2 lbf/ft)
Reverse idler shaft bolt	67 Nm (6.8 kgf/m, 49.4 lbf/ft)
Speedometer drive pinion, retaining plate bolt	15 Nm (1.5 kgf/m, 11.1 lbf/ft)
Clutch release shaft pivot bolt	29 Nm (3.0 kgf/m, 21.4 lbf/ft)
Final drive gear to carrier bolts	110 Nm (11.2 kgf/m, 81.1 lbf/ft)
Output shaft bearing retainer bolts - if fitted	8 Nm (0.8 kgf/m, 5.9 lbf/ft)

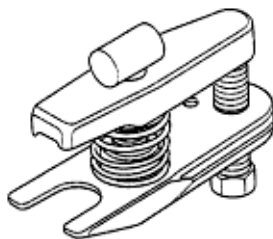
Tool Numbers

18G 2	General purpose puller
18G 2/3	Adaptor - Differential bearing remover
18G 134	Driver handle (main tool)
18G 134-4	Input shaft oil seal replacer
18G 191-6	Adaptor plate - Differential and float
18G 284	Slide hammer
18G 284-17	Adaptor - Slide hammer
18G 1269A	Oil seal protector sleeve
18G 1354	Driver handle (main tool)
18G 1354-5	Bearing replacer
18G 1354-6	Adaptor - Input shaft differential bearing
18G 1354-16	Adaptor - Differential oil seal replacer
18G 1392	Circlip pliers
18G 1397	Bearing puller thrust pad
18G 1472	14 mm Hex key access plug
18G 1473	Anti-spread plate
18G 1527	Turning tool - Differential bearing pre-load
18G 1528	Dial gauge base
18G 1675	Differential bearing replacer
MS 103	Pre-load gauge
18G 1723-1	Clutch release shaft inner bush replacer
18G 1723-2	Clutch release shaft outer bush replacer

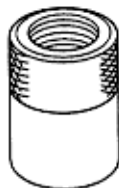
Special Tools

16-2

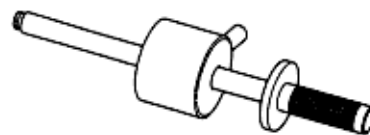
Ref No.	Tool Number	Description	Qty	Remark
1	07MAC - SL00200	Ball Joint Remover, 28 mm	1	
2	07XAC - 0010200	Threaded Adapter, 24 x 1.5 mm	1	
3	07936 - 5790001	Sliding Hammer Set	1	



①

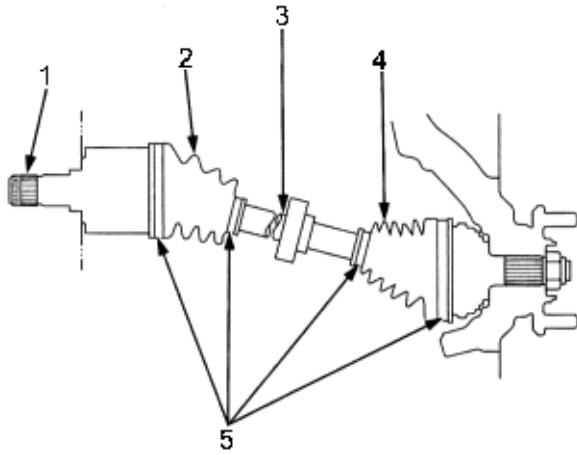


②



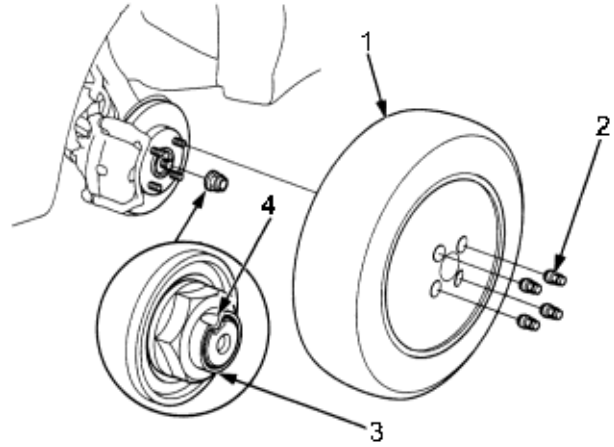
③

1. Check the inboard boot and the outboard boot on the driveshaft for cracks, damage, leaking grease and loose boot bands. If any damage is found, replace the boot and boot bands.
2. Turn the driveshaft by hand, and make sure the splines and joint are not excessively loose.
3. Make sure the driveshaft is not twisted or cracked, it is, replace it.



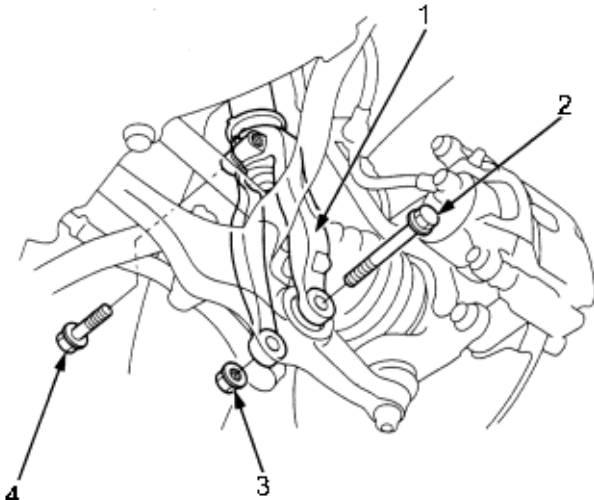
1. SPLINES
2. INBOARD BOOT
3. DRIVESHAFT
4. OUTBOARD BOOT
5. BOOT BANDS

1. Loosen the wheel nuts slightly.
2. Raise the front of vehicle and support it with safety stands in the proper locations (see section 1)
3. Remove the wheel nuts and front wheels.
4. Lift up the locking tab on the spindle nut, then remove the nut.



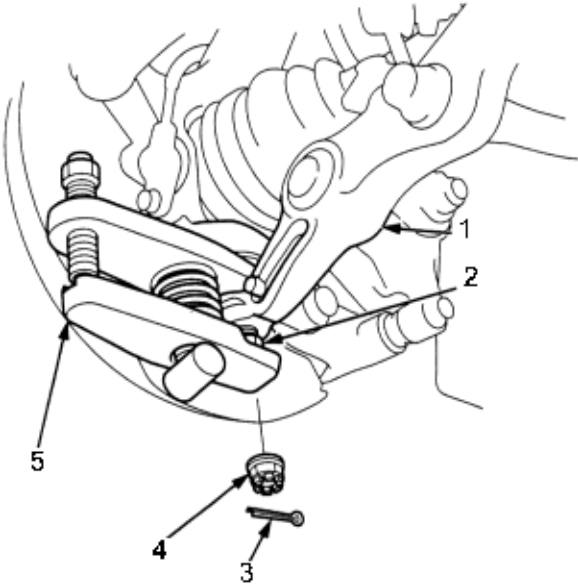
1. FRONT WHEEL
2. WHEEL NUT
3. SPINDLE NUT 24 x 1.5 mm Replace.
4. LOCKING TAB

5. If the right driveshaft is removed, drain the transmission fluid (see section 3).
6. Remove the self-locking nut and 10 mm flange bolts, then remove the damper fork.



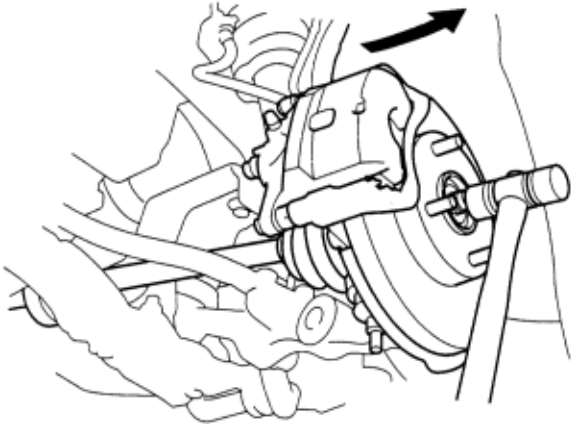
1. DAMPER FORK
2. 10 x 1.25 mm FLANGE BOLT
3. SELF-LOCKING NUT Replace.
4. 10 x 1.25 mm FLANGE BOLT

7. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.

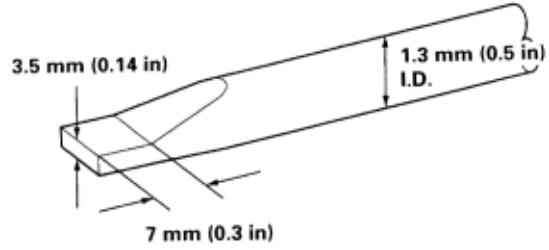


1. LOWER ARM
2. HEX NUT
3. COTTER PIN Replace.
4. CASTLE NUT
5. BALL JOINT REMOVER, 28 mm 07MAC - SL00200

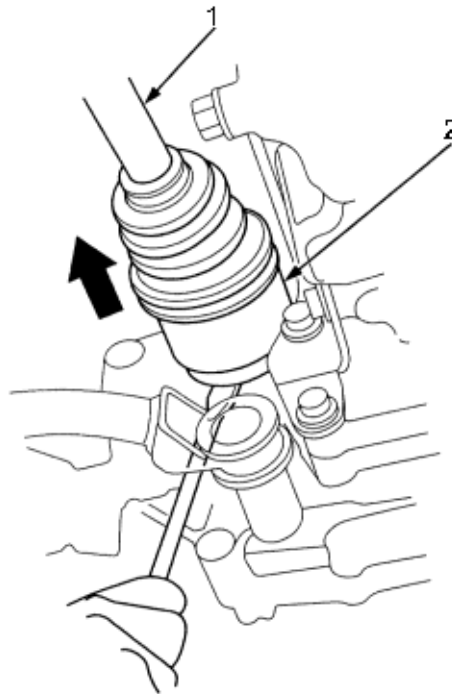
8. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.
9. Use the special tool as shown, to separate the ball joint and lower arm. Be careful not to damage the ball joint boot. If necessary, apply penetrating type lubricant to loosen the ball joint.
10. Pull the knuckle outward and remove the driveshaft outboard pin from the front wheel hub using a plastic hammer.



11. Pry the driveshaft assembly with a screwdriver as shown, to force the set ring at the driveshaft end past the groove. Be careful not to damage the oil seals when prying.



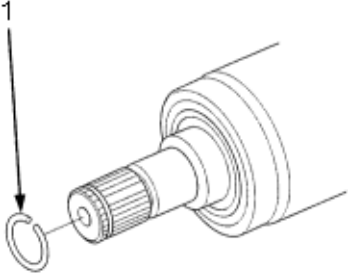
12. Pull the inboard joint, and remove the driveshaft from the differential case as an assembly. Do not pull on the driveshaft, the inboard joint may come apart. Pull the driveshaft straight out to avoid damaging the differential oil seal.



1. DRIVESHAFT
2. INBOARD JOINT

Inboard Joint Side

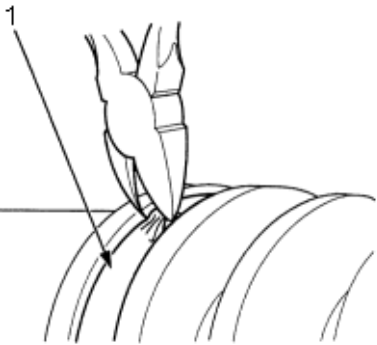
1. Remove the set ring from the inboard joint



1. SET RING Replace.

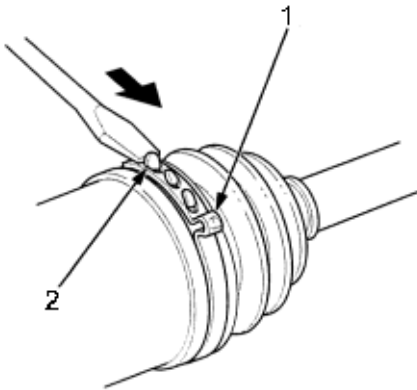
2. Remove the boot bands. Take care not to damage the boot and dynamic damper.
 - ♦ If the boot band is a welded type, cut the boot band.
 - ♦ If the boot band is an ear clamp type, raise the three tabs with a screwdriver.

Welded Type:



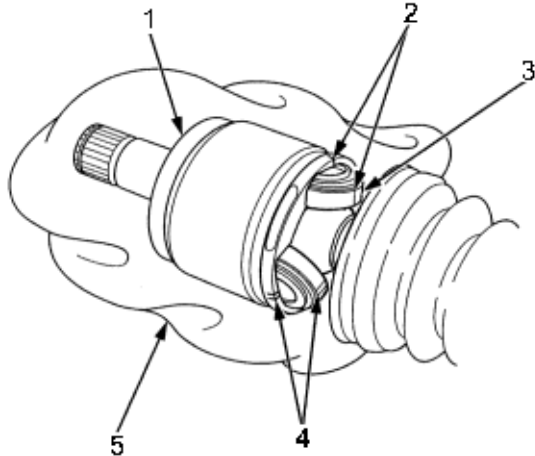
1. WELDED BAND Replace.

Ear Clamp Type:



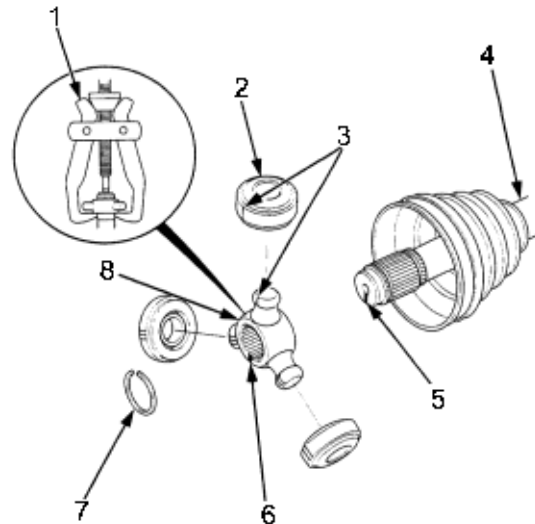
1. EAR CLAMP BAND Replace.

3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel. Be careful not to drop the rollers when separating them from the inboard joint.



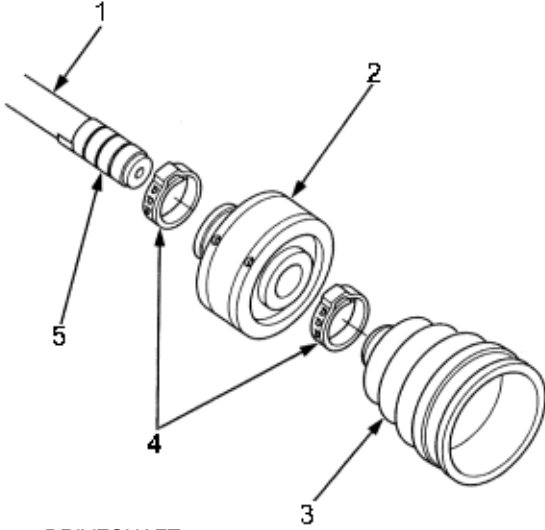
1. INBOARD JOINT
Check splines for wear or damage.
Check inside bore for wear.
Inspect for cracks.
2. Marks
3. ROLLER
4. Marks
5. SHOP TOWEL

4. Make a mark on the rollers and spider to identify the locations of rollers on the spider, then remove the rollers.
5. Remove the circlip
6. Mark the spider and driveshaft to identify the position of the spider on the shaft.
7. Remove the spider using a commercially available bearing remover.



1. BEARING REMOVER
2. ROLLER
3. Marks
4. DRIVESHAFT
5. Mark
6. Mark
7. CIRCLIP
8. SPIDER

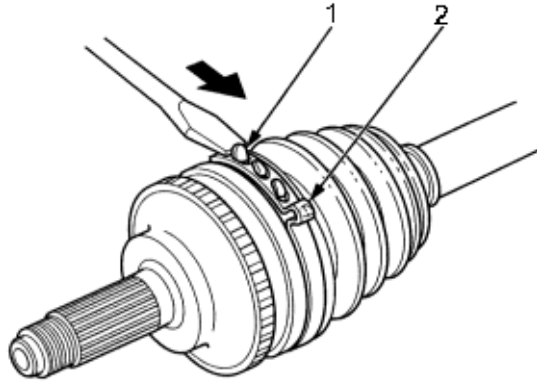
8. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boot and dynamic damper.
9. Remove the inboard boot, ear clamp bands and dynamic damper. Take care not to damage the boot and dynamic damper.
10. Remove the vinyl tape.



1. DRIVESHAFT
2. DYNAMIC DAMPER
Check for damage.
3. INBOARD BOOT
Inspect for cracking, splitting and wear.
4. EAR CLAMP BANDS
Replace.
5. VINYL TAPE

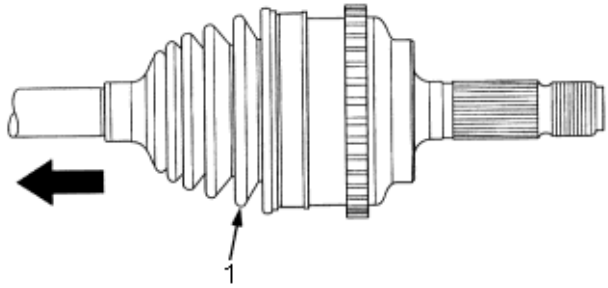
Outboard Joint Side:

1. Lift up the three tabs with a screwdriver, then remove the boot bands. Take care not to damage the boot.



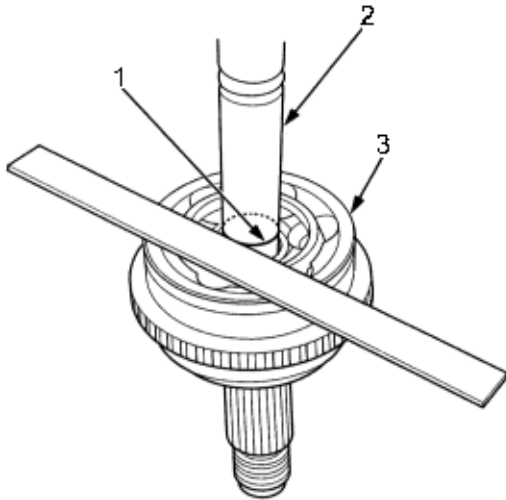
1. TAB
2. EAR CLAMP BAND
Replace.

2. Slide the outboard boot to the inboard joint side. Take care not to damage the boot.



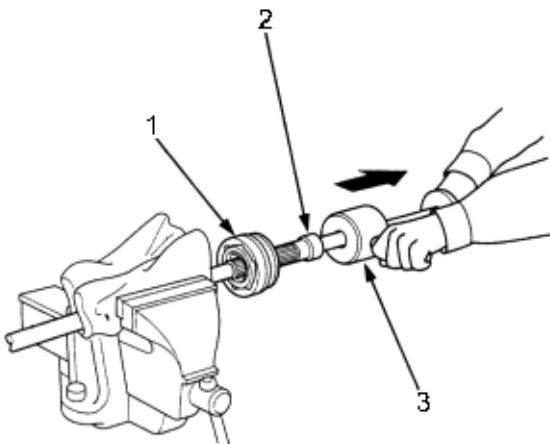
1. OUTBOARD BOOT

3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
4. Mark the driveshaft at the same position of the outboard joint end with paint.



1. PAINT MARK
2. DRIVESHAFT
3. OUTBOARD JOINT END

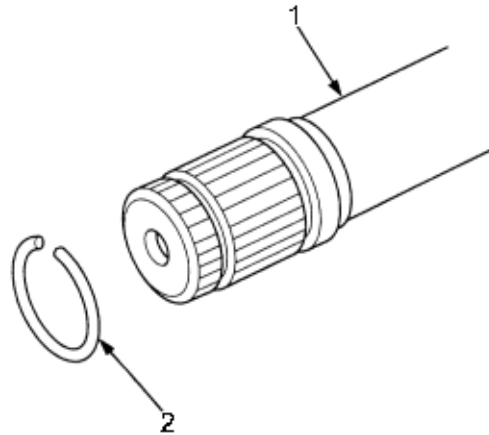
5. Carefully clamp the driveshaft in a vice.
6. Remove the outboard joint using a special tool.



1. OUTBOARD JOINT
2. THREADED ADAPTER, 24 X 1.5 mm
3. SLIDING HAMMER SET
07936-5790001

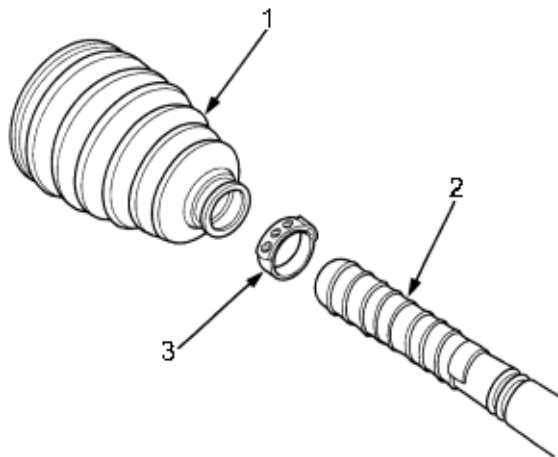
7. Remove the driveshaft from the vice.

8. Remove the stopper ring from the driveshaft.



1. DRIVESHAFT
2. STOP RING
Replace.

9. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the outboard boot.
10. Remove the outboard boot. Take care not to damage the boot.
11. Remove the vinyl tape.



1. OUTBOARD BOOT
2. VINYL TAPE
3. BOOT BAND
Replace.

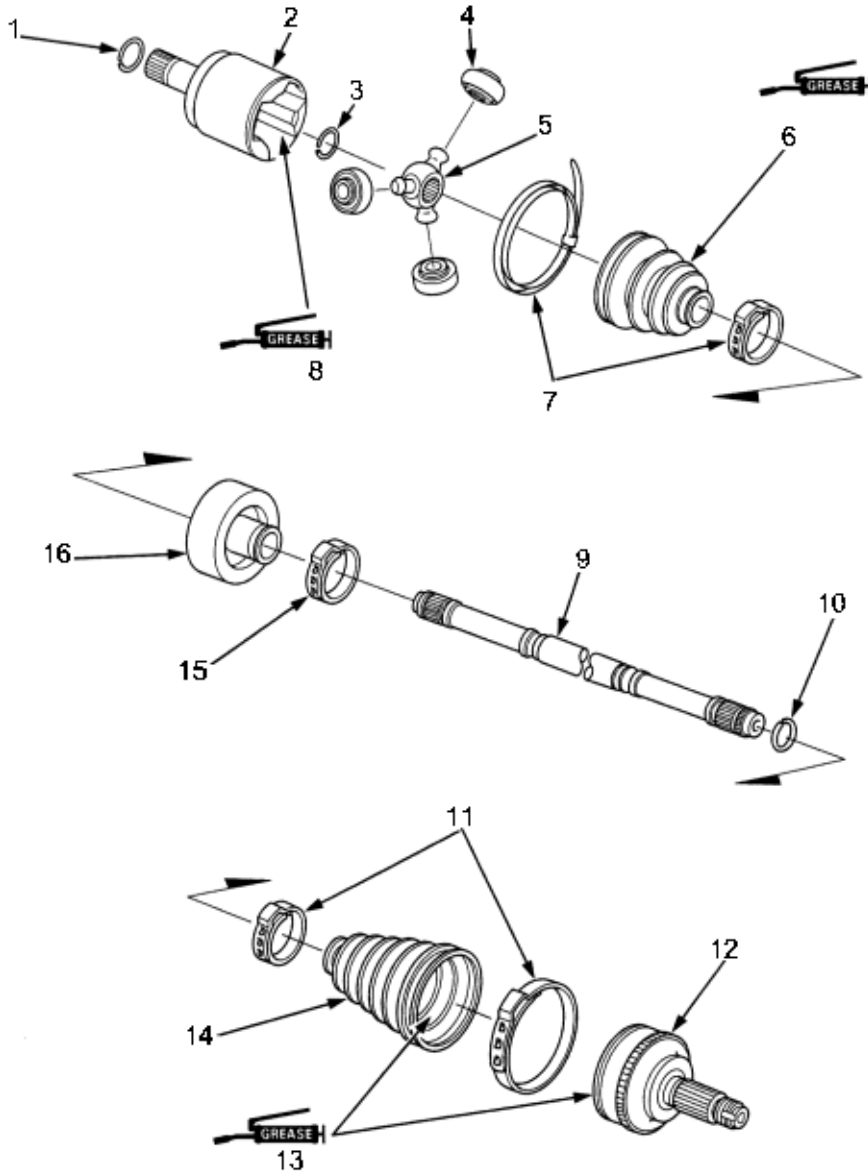
Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- ♦ Thoroughly pack both joints and boots with the joint grease included in the new driveshaft set.
- ♦ The uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the car clamp type boot band in the outboard joint boot set.

Grease quantity

Inboard joint: 120-130 g (4.2 - 4.6 oz)

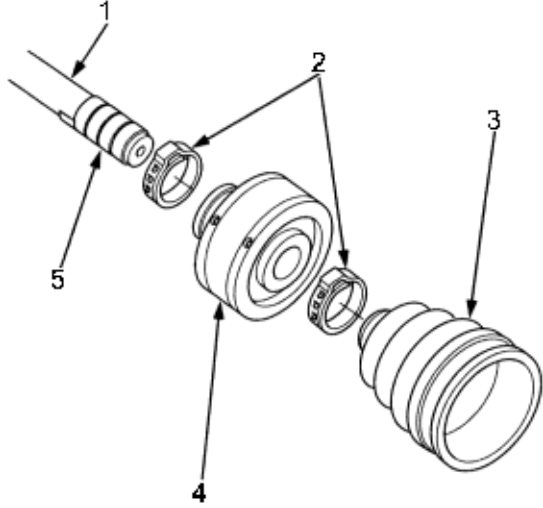
Outboard joint: 72.4-90.5 g (2.6 - 3.2 oz)



1. **SET RING**
Replace.
2. **INBOARD JOINT**
3. **CIRCLIP**
4. **ROLLER**
5. **SPIDER**
6. **INBOARD BOOT**
Pack cavity with grease.
7. **BOOT BANDS**
Replace.
8. Pack cavity with grease.
9. **DRIVESHAFT**
10. **STOP RING**
Replace.
11. **BOOT BANDS**
Replace.
12. **OUTBOARD JOINT**
13. Pack cavity with grease.
14. **OUTBOARD BOOT (TPE)**
15. **DYNAMIC DAMPER BAND**
Replace.
16. **DYNAMIC DAMPER**

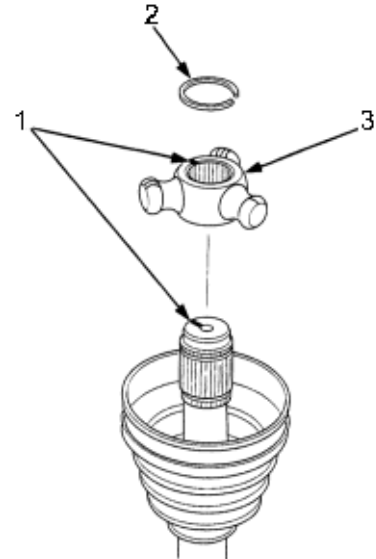
Inboard Joint Side:

1. Wrap the splines with vinyl tape prevent damage to the boot, ear clamp bands and dynamic damper
2. Install the dynamic damper and inboard boot to driveshaft, then remove the vinyl tape. Take care not to damage the boot and dynamic damper.



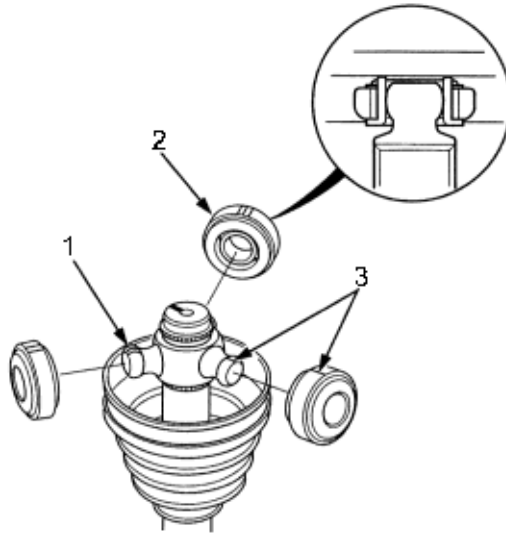
1. DRIVESHAFT
2. EAR CLAMP BANDS
Replace.
3. INBOARD BOOT
4. DYNAMIC DAMPER
5. VINYL TAPE

3. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.
4. Fit the circlip into the driveshaft groove. Always rotate the circlip in its groove to be sure it is fully seated.



1. Marks
2. CIRCLIP
3. SPIDER

5. Fit the rollers to the spider with their high shoulders facing outward, and note these items:
 - ♦ Reinstall the rollers in their original positions on the spider by aligning the marks.
 - ♦ Hold the driveshaft pointed up to prevent the rollers from facing off.



1. SPIDER
2. ROLLER
3. Marks

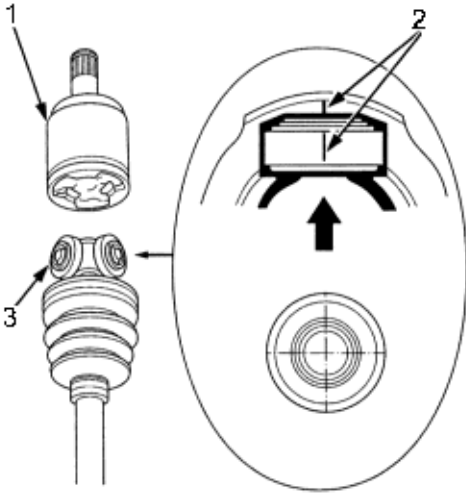
6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity

Inboard joint: 120 - 130 g (4.2 - 4.6 oz)



7. Fit the inboard joint onto the driveshaft, and note these items:
- ♦ Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint and the rollers.
 - ♦ Hold the driveshaft so the inboard joint points up to prevent it from falling off.



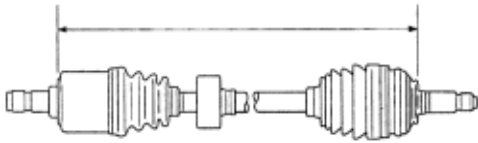
- 1. INBOARD JOINT
- 2. Marks
- 3. ROLLER

8. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of boot seats in the groove of the driveshaft and joint.

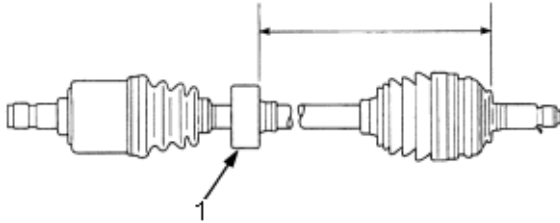
Standard:

Left driveshaft: 850-855 mm (33.5-33.7 in)

Right driveshaft: 483-488 mm (19.0-19.2 in)

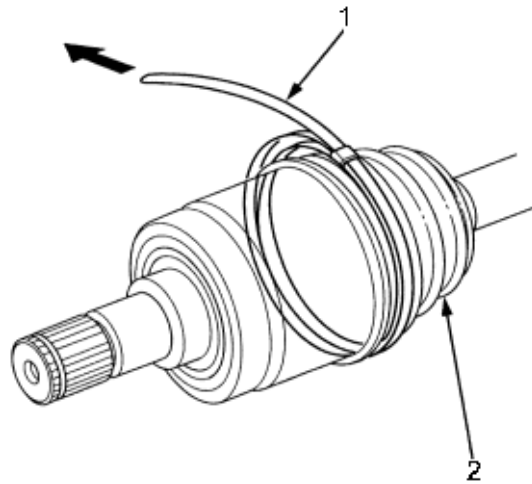


9. Position the dynamic damper as shown below.
- Standard:**
Left driveshaft: 238-242 mm (9.37-9.53 in)
Right driveshaft: 280-284 mm (11.0-11.2 in)



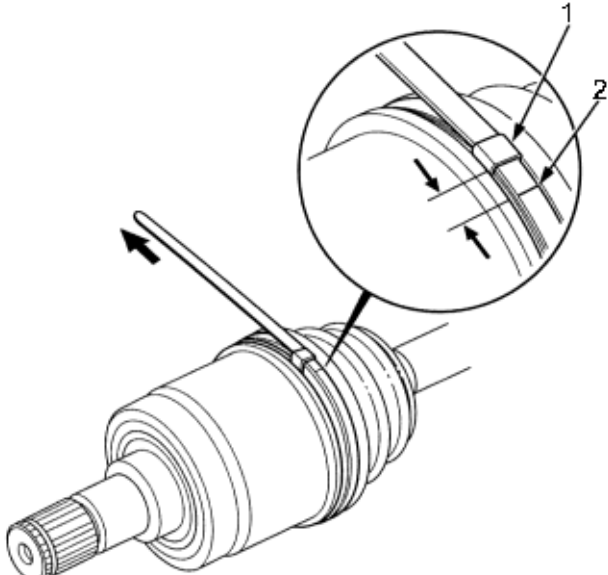
- 1. DYNAMIC DAMPER

10. Fit the boot ends onto the driveshaft and the inboard joint, then install the boot bands with the band end toward to front of the vehicle.



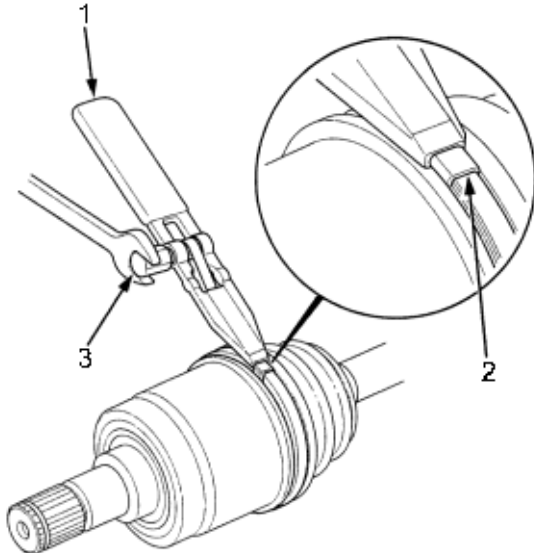
- 1. DOUBLE LOOP BAND
Replace.
- 2. BOOT

11. Pull up the slack in the band by hand.
12. Mark a position on the band 10-14 mm (0.4-0.6 in) from the clip.



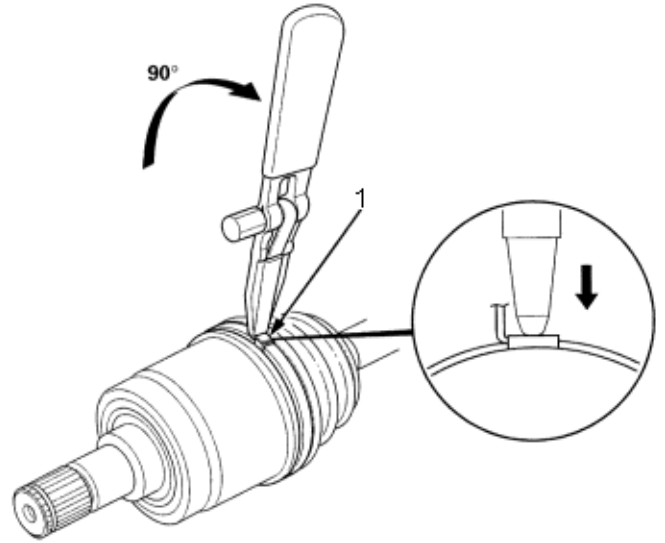
1. CLIP
2. Mark

13. Thread the free end of the band through the nose section of the commercially available band tightening tool KD-3191 or equivalent and into the slot on the winding mandrel.
14. Place a wrench on the winding mandrel of the band tightening tool, and tighten the band until the marked spot on the band meets the edge of the clip.



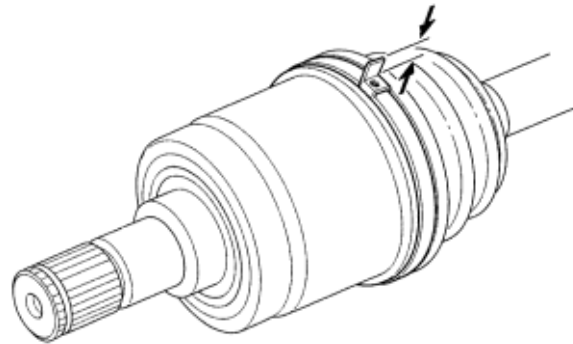
1. BAND TIGHTENING TOOL
(Commercially available)
2. Mark spot.
3. WINDING MANDREL

15. Lift up the band tightening tool to bend the free end of the band 90 degrees to the clip. Centre punch the clip, then fold over the remaining tail onto the clip.



1. CLIP

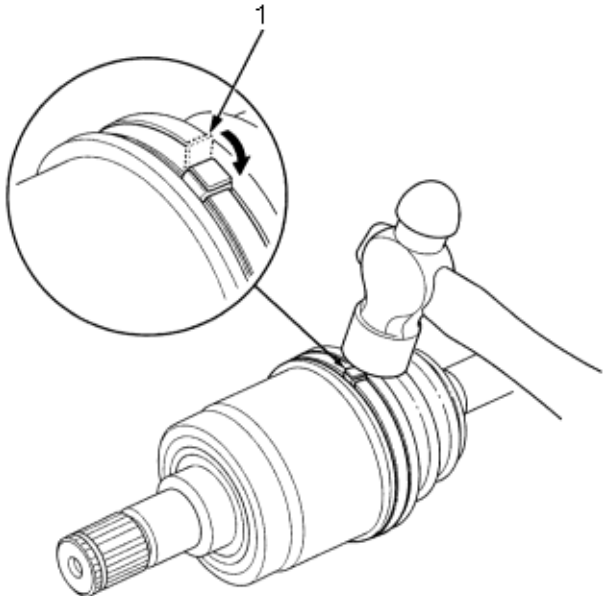
16. Unwind the band tightening tool, and cut off the excess free end of the band to leave a 5-10 mm (0.2-0.5 in) tail protruding from the clip.



17. Bend the band end by tapping it down with a hammer.

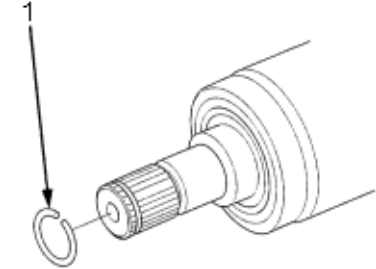
NOTE:

- ♦ Make sure the band and clip does not interfere with anything and the band does not move.
- ♦ Remove any grease remaining in the surrounding surfaces.



1. Band end.

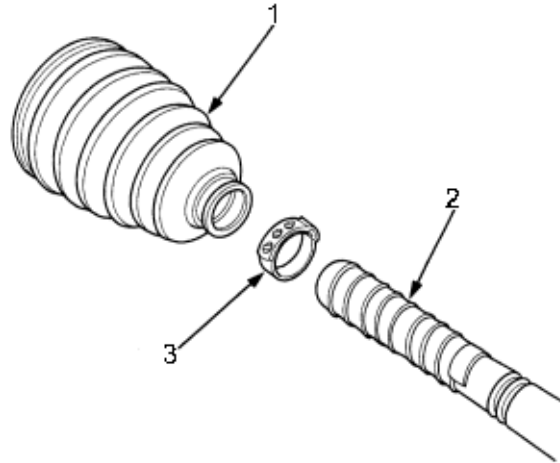
18. Install the new set ring.



1. SET RING
Replace.

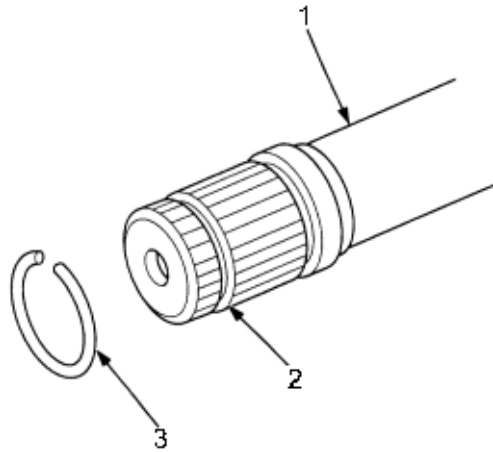
Outboard Joint Side:

1. Wrap the splines with vinyl tape to prevent damage to the boot.
2. Install the boot band and outboard boot, then remove the vinyl tape. Take care not to damage the boot.
3. Remove the vinyl tape.



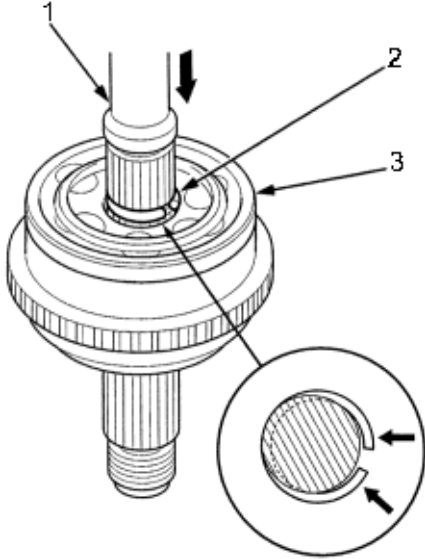
1. OUTBOARD BOOT
2. VINYL TAPE
3. BOOT BAND Replace.

4. Install the stopper ring into the driveshaft groove.



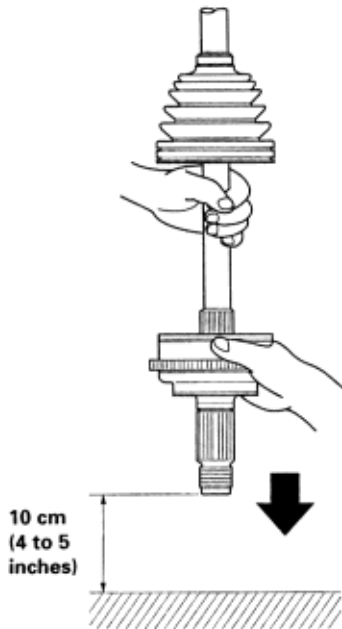
1. DRIVESHAFT
2. GROOVE
3. STOP RING
Replace.

5. Insert the driveshaft in the outboard joint until the stopper ring is close on the joint.

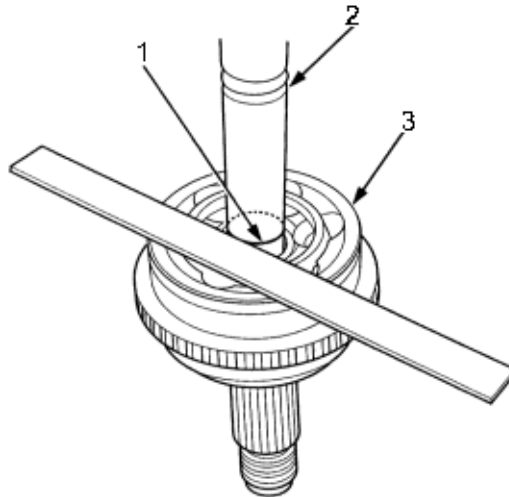


1. DRIVESHAFT
2. STOP RING
Replace.
3. OUTBOARD JOINT

6. To completely seat the outboard joint, pick up the driveshaft and joint and drop them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.



7. Check the alignment of the paint mark with the outboard joint end.



1. PAINT MARK
2. DRIVESHAFT
3. OUTBOARD JOINT END

8. Pack the outboard joint with the joint grease included in the new joint boot set.

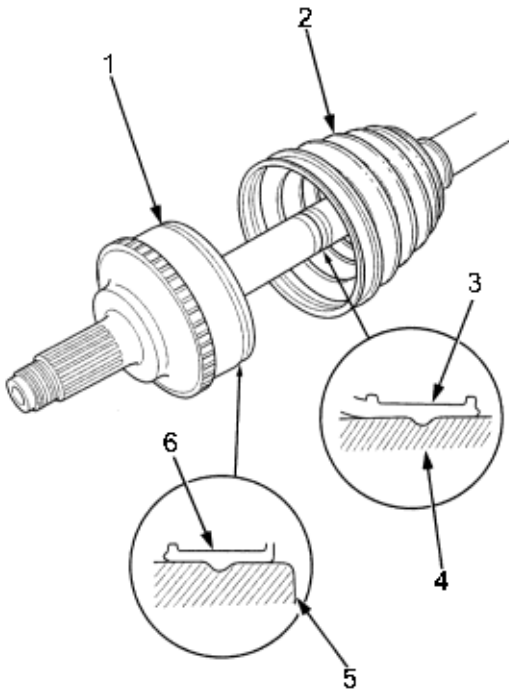
Grease quantity

Outboard joint: 72.4-90.5 g (2.6-3.2 oz)



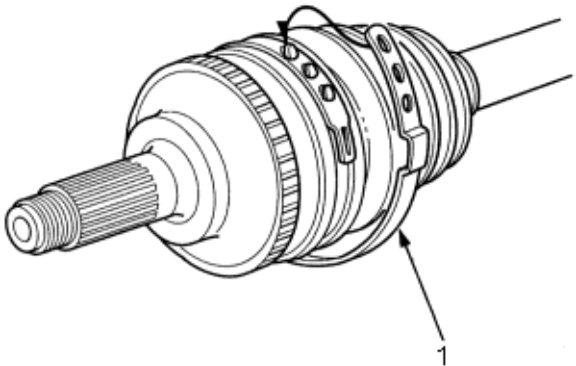
1. DRIVESHAFT
2. OUTBOARD JOINT

9. Fit the boot ends onto the driveshaft and outboard joint.



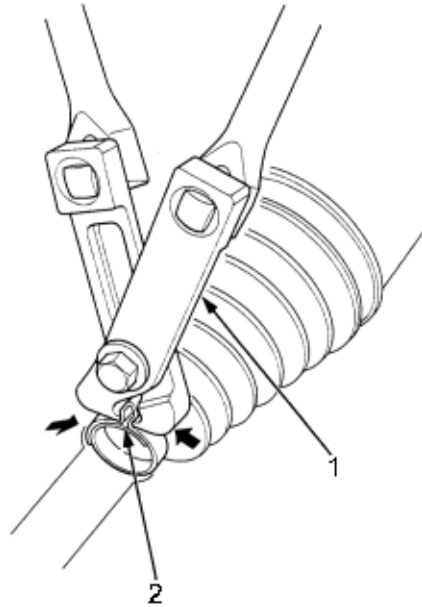
- 1. OUTBOARD JOINT
- 2. OUTBOARD BOOT
- 3. OUTBOARD BOOT
- 4. DRIVESHAFT
- 5. OUTBOARD JOINT
- 6. OUTBOARD BOOT

10. Set the ear clamp band by caught the tab into holes of the band.



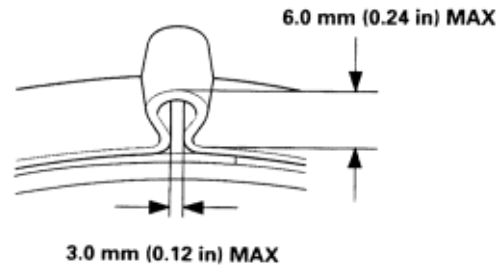
- 1. EAR CLAMP BAND
Replace.

11. Close the ear portion of the band with commercially available boot band pincers.

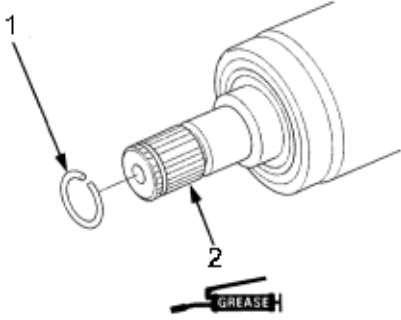


- 1. BOOT BAND PINCERS
(Commercially available)
KENT-MOORE J-35910 or equivalent
- 2. EAR PORTION

12. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.

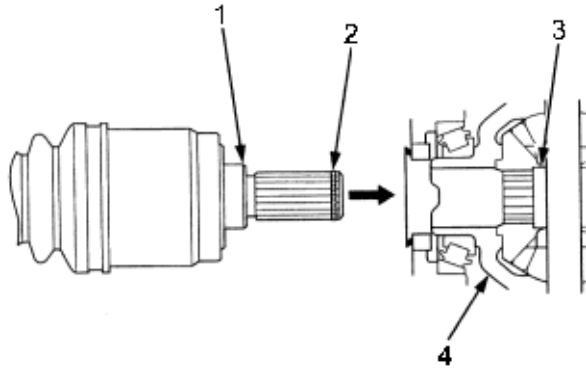


1. Install a new set ring onto the set ring groove of the driveshaft.



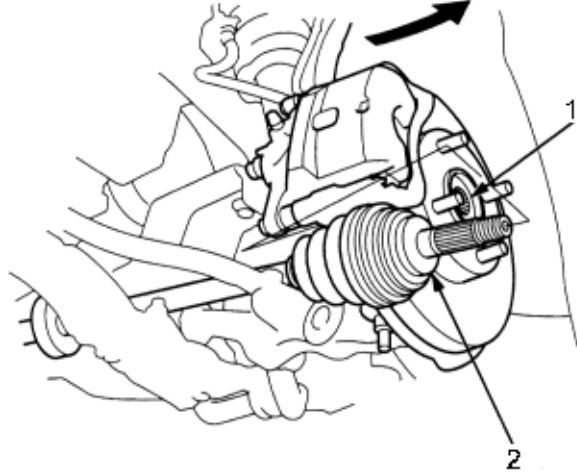
1. SET RING
Replace.
2. Splined surface.

2. Apply 0.3-1.0 g (0.01-04 oz) of specified grease to the whole splined surface. After applying grease, remove the grease from the splined grooves at intervals of 2-3 splines and from the set ring groove.
3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or carburettor cleaner and dry with compressed air. Insert the inboard end of the driveshaft into the differential until the set ring locks in the groove.



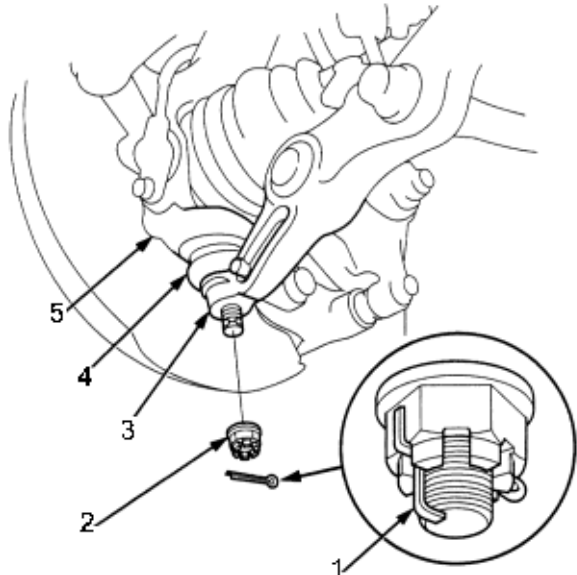
1. INBOARD END
2. SET RING
3. Groove.
4. DIFFERENTIAL

4. Install the outboard joint into the front hub.



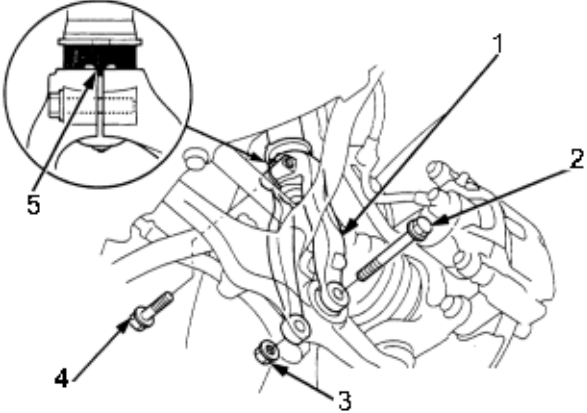
1. FRONT HUB
2. OUTBOARD JOINT

5. Install the knuckle on the lower arm. Be careful not to damage the ball joint boot. Wipe off the grease before tightening the nut at the ball joint. Torque the castle nut to the lower torque specification, then tighten it only enough to align the slot with the pin hole. Do not align the nut by loosening.
6. Install the new cotter pin into the pin hole and bend the cotter pin as shown.



1. COTTER PIN
Replace.
2. CASTLE NUT
12 x 1.25 mm 49 - 59 Nm (5.0 - 6.0 kgf/m, 43 lbf/ft)
3. LOWER ARM
4. BALL JOINT BOOT
5. KNUCKLE

7. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork. Loosely install the flange bolt.



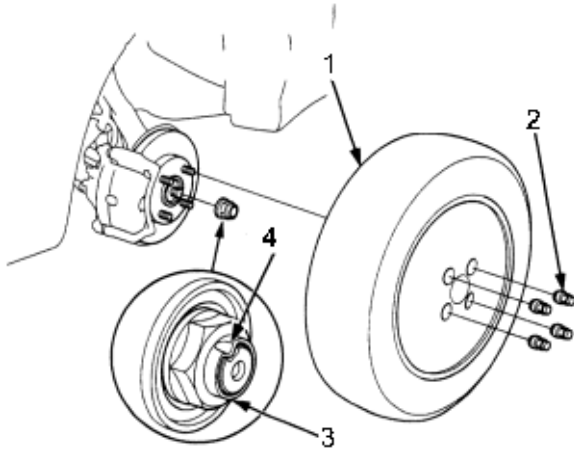
1. DAMPER FORK
2. 10 x 1.25 mm FLANGE BOLT
3. 12 x 1.25 mm SELF-LOCKING NUT

Replace.

64 Nm (6.5 kgf/m, 47 lbf/ft)

4. 10 x 1.25 mm FLANGE BOLT 43 Nm (4.4 kgf/m, 32 lbf/ft)
5. ALIGNING TAB

8. Loosely install the flange bolt and a new self locking nut.
9. Install a new spindle nut, then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.



1. FRONT WHEEL
2. WHEEL NUT 12 x 1.5 mm 108 Nm (11.0 kgf/m, 79.6 lbf/ft)
3. SPINDLE NUT 24 x 1.5 mm

Replace.

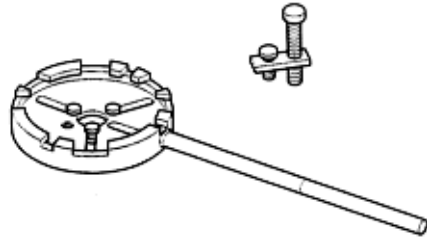
245 Nm (25.0 kgf/m, 181 lbf/ft)

10. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.
11. Tighten the flange bolts and the self-locking nut with the vehicle's weight on the damper.
12. Refill the transmission with recommended MTF (see section 3).
13. Check the front wheel alignment and adjust if necessary (see section 18 in the 1999 Accord Service Manual, P/N 62S1A00B).

Special Tools

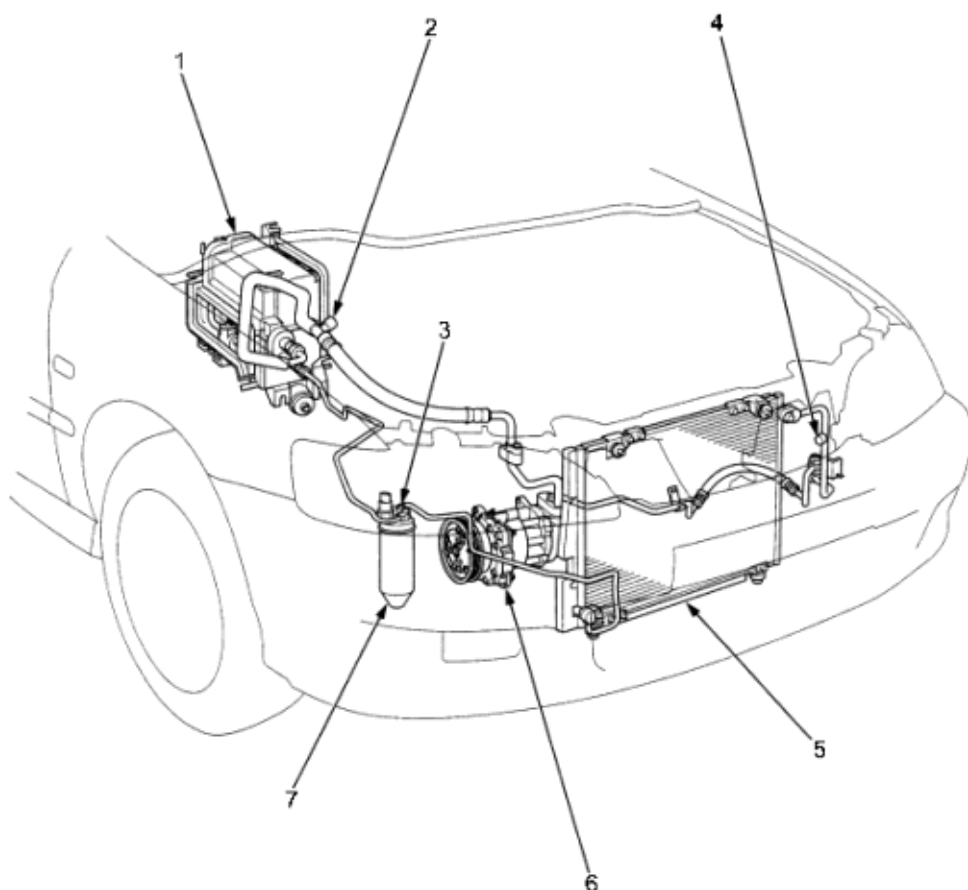
22-2

Ref No.	Tool Number	Description	Qty	Remark
1	07NAB - HAC0101	A/C Clutch Holder	1	



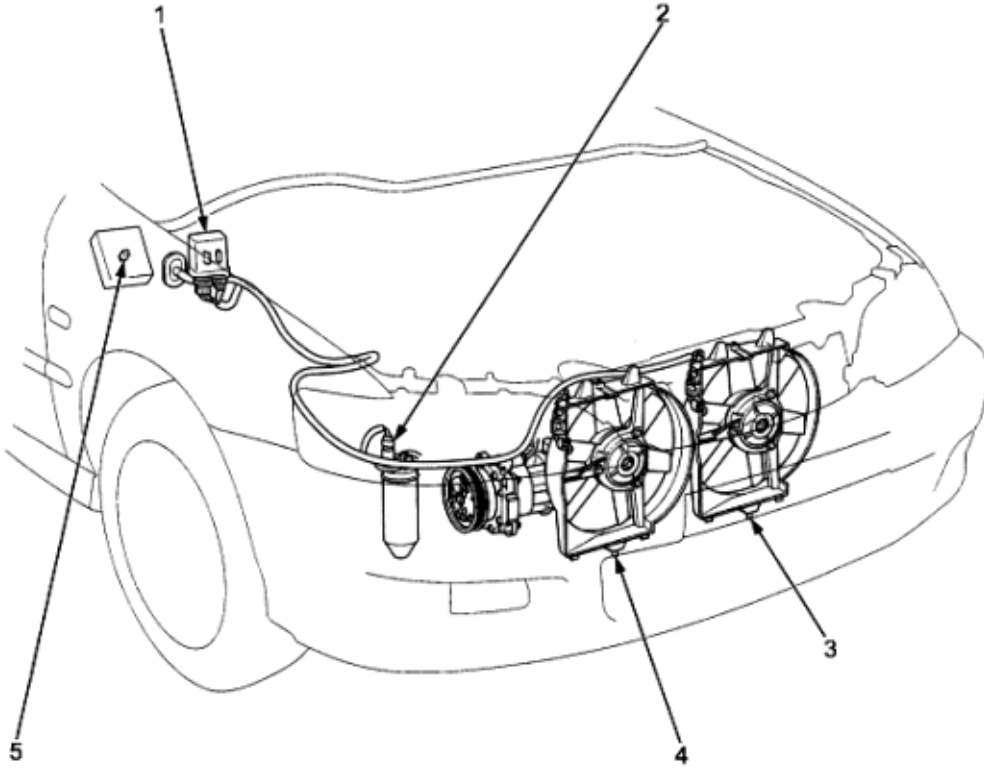
①

NOTE: LHD type is shown, RHD type is symmetrical.



1. **EVAPORATOR**
2. **SERVICE VALVE (LOW-PRESSURE SIDE)**
3. **SIGHT GLASS**
4. **SERVICE VALVE (HIGH-PRESSURE SIDE)**
5. **CONDENSER**
Replacement, (**See Page** 22-14)
6. **COMPRESSOR**
Replacement, (**See Page** 22-8)
Clutch Inspection, (**See Page** 22-11)
Clutch Overhaul, (**See Page** 22-12)
Relief Valve Replacement,
(**See Page** 22-13)
7. **RECEIVER/DRYER**

NOTE: LHD type is shown, RHD type is symmetrical.

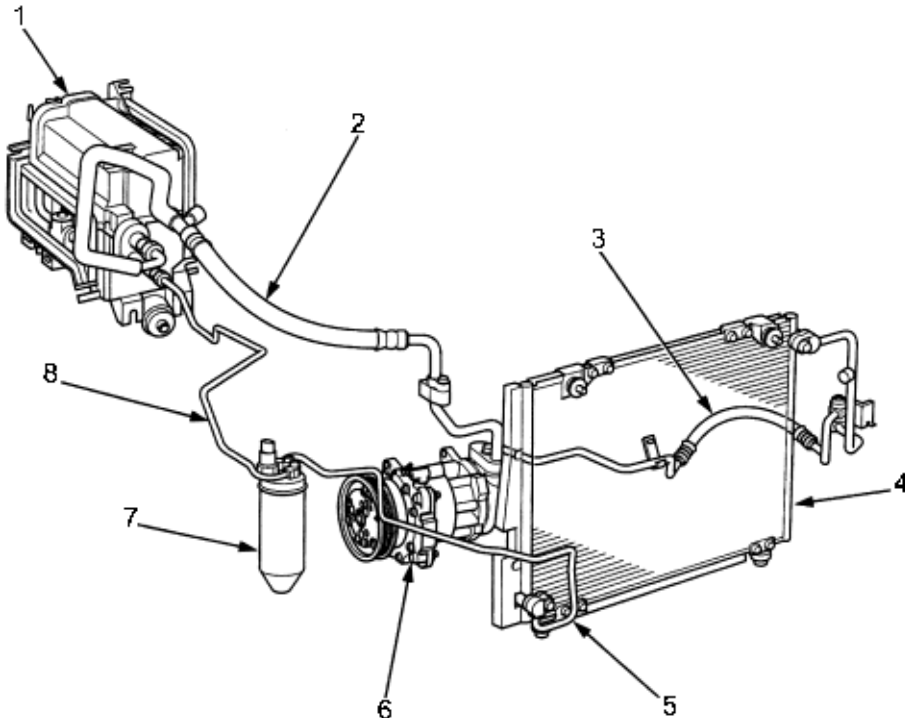
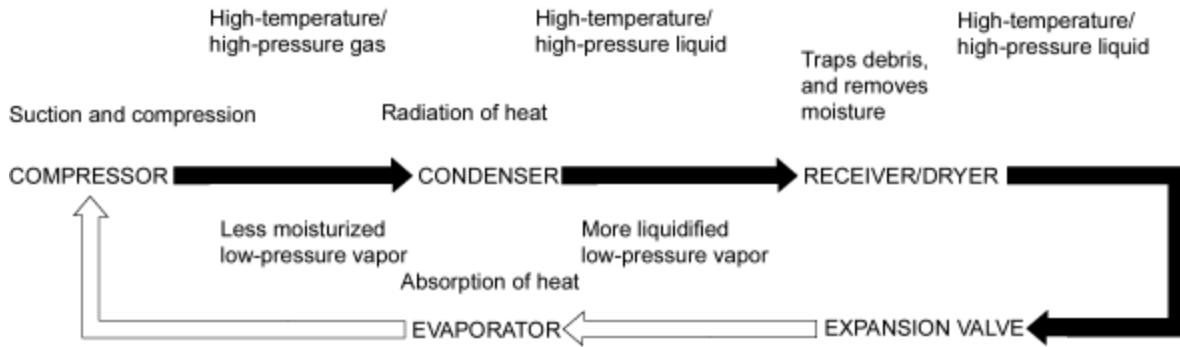


1. **RADIATOR FAN RELAY UNIT**
2. **A/C PRESSURE SWITCH**
When the refrigerant pressure is below 200 kPa (2.0 kgf/cm², 28 psi) or above 3,200 kPa (32 kgf/cm², 455 psi), the A/C pressure switch A (High-Low) is open. When the refrigerant pressure is above 1,550 kPa (15.5 kgf/cm², 220 psi), the A/C pressure switch B (Middle) is closed.
3. **RADIATOR FAN**
4. **CONDENSER FAN**
5. **A/C DIODE**
(Located in the passenger's under-dash fuse/relay box).

Description

22-5

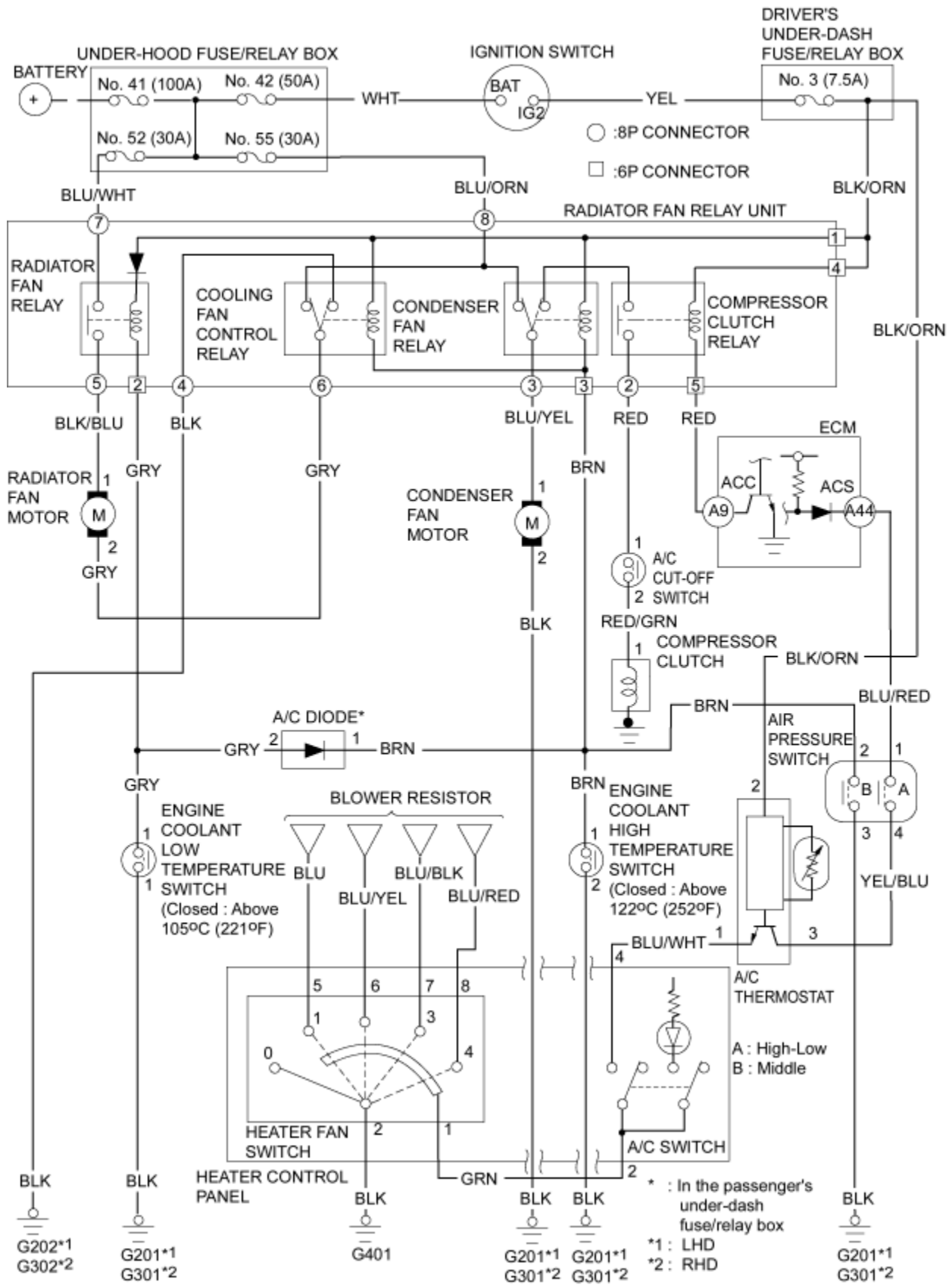
The air conditioner system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.



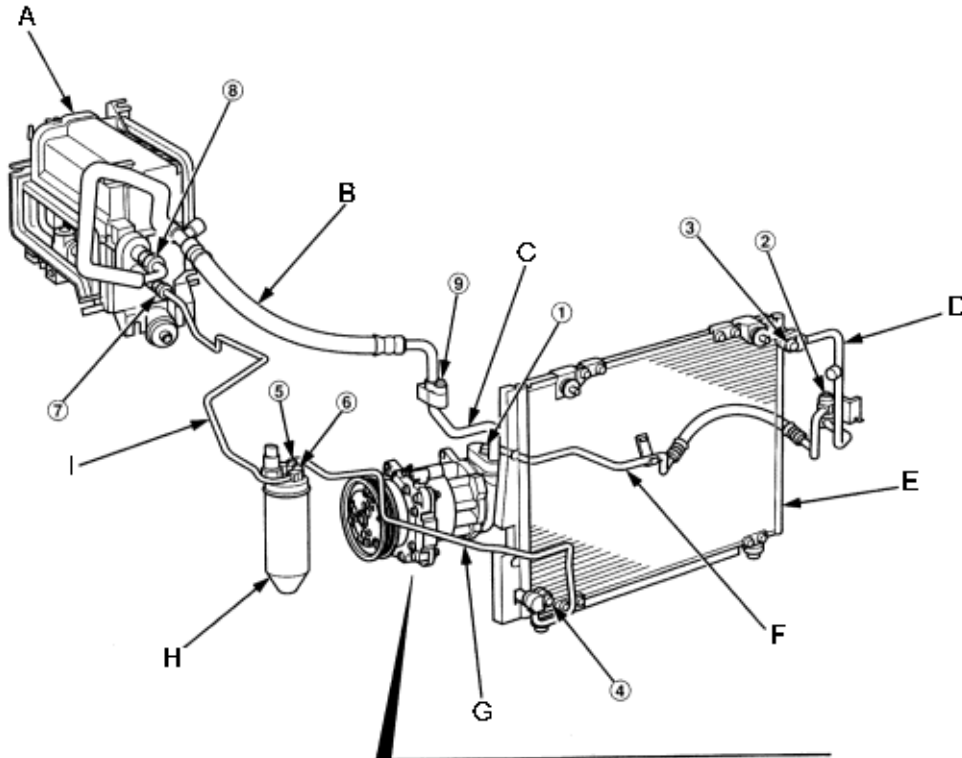
1. EVAPORATOR
2. SUCTION LINE (LOW-PRESSURE SIDE)
3. DISCHARGE LINE (HIGH-PRESSURE SIDE)
4. CONDENSER
5. CONDENSER LINE
6. COMPRESSOR
7. RECEIVER/DRYER
8. LIQUID LINE

The vehicle uses HFC-134a (R-134a) refrigerant, which does not contain chlorofluorocarbons. Pay attention to the following service items:

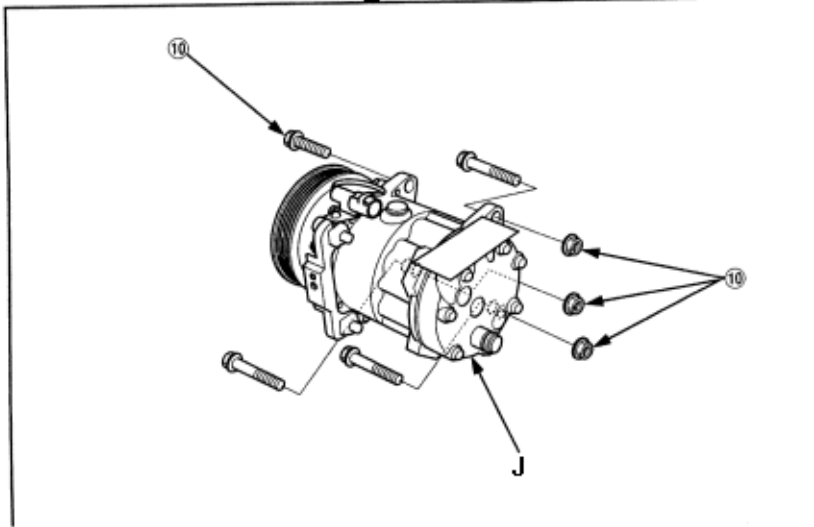
- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (SANDEN, SP-10) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joint(s)) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
- Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.



NOTE: LHD type is shown, RHD type is similar.



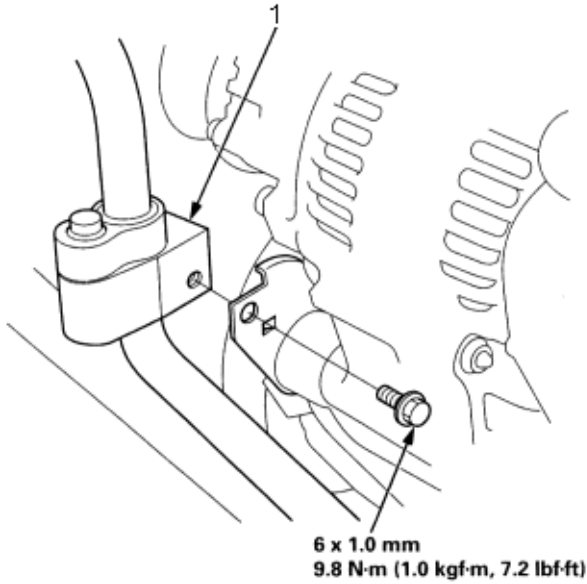
- A. EVAPORATOR
- B. SUCTION HOSE
- C. SUCTION LINE
- D. DISCHARGE LINE
- E. CONDENSER
- F. DISCHARGE HOSE
- G. CONDENSER LINE
- H. RECEIVER/DRYER
- I. RECEIVER LINE
- J. COMPRESSOR



1	Discharge hose/suction line to the compressor (10 x 1.25 mm)	18 Nm (1.8 kgf/m, 13 lbf/ft)
2	Discharge hose to the discharge line (6 x 10 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
3	Discharge line to the condenser (6 x 1.0 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
4	Condenser line to the condenser (6 x 1.0 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
5	Condenser line to the receiver/dryer (6 x 1.0 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
6	Receiver line to the receiver/dryer (6 x 1.0 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
7	Receiver line to the evaporator	13 Nm (1.3 kgf/m, 9.4 lbf/ft)
8	Suction hose to the evaporator	31 Nm (3.2 kgf/m, 23 lbf/ft)
9	Suction hose to suction line (6 x 1.0 mm)	9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
10	Compressor to compressor bracket	45 Nm (4.6 kgf/m, 33 lbf/ft)

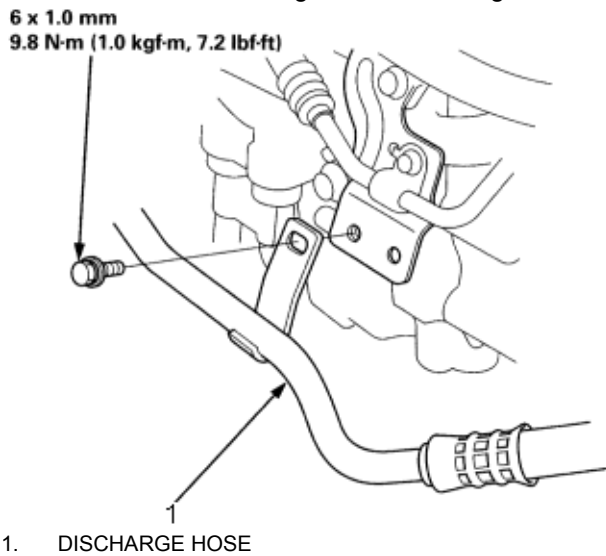
NOTE: LHD type is shown, RHD type is similar.

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Discharge the refrigerant.
3. Remove the radiator (see section 10).
4. Remove the drive belt (see section 4).
5. Remove the suction line mounting bolt.



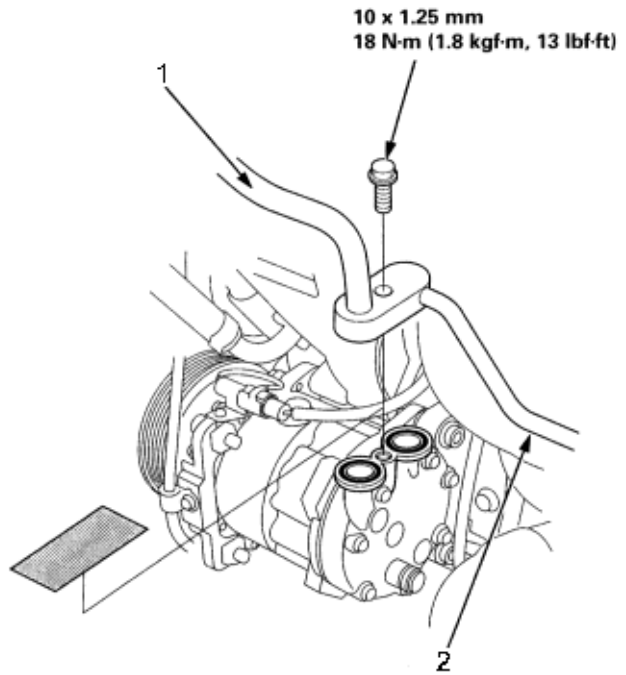
1. SUCTION LINE

6. Remove the discharge hose mounting bolt.



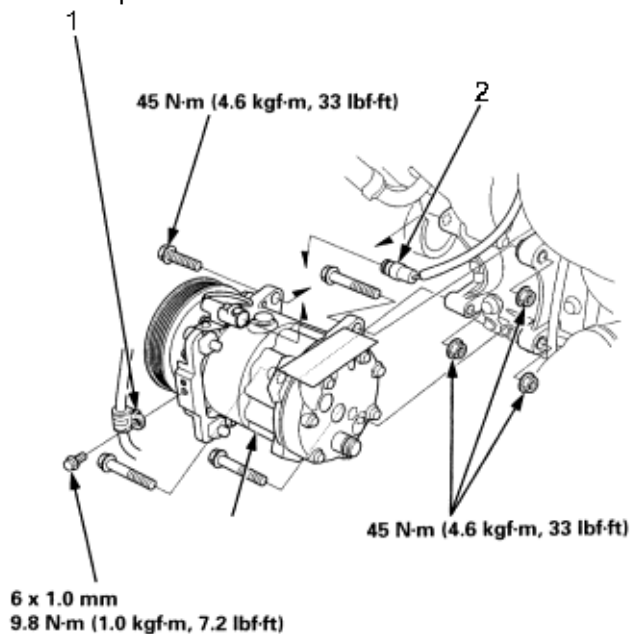
1. DISCHARGE HOSE

7. Remove the bolt, then disconnect the discharge hose/suction line from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



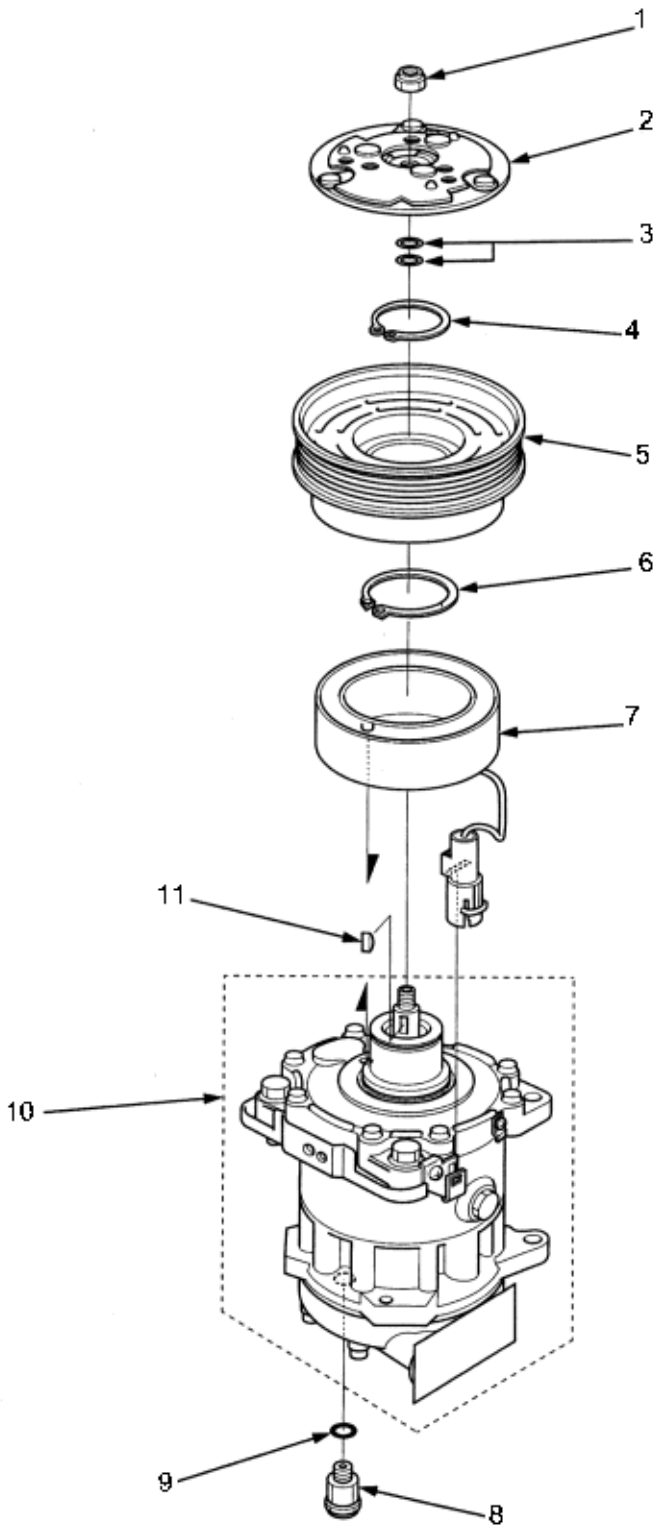
1. SUCTION LINE
1. DISCHARGE HOSE

8. Remove the bolt and the power steering fluid line bracket from the compressor. Disconnect the compressor clutch connector, then remove the mounting bolts, the mounting nuts and the compressor.



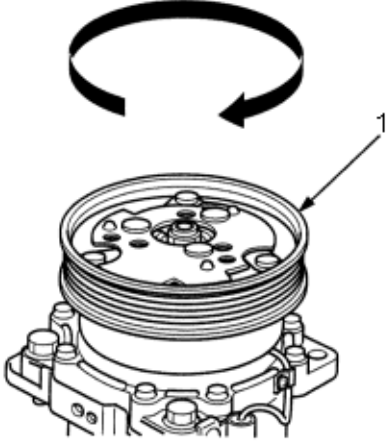
1. POWER STEERING FLUID LINE BRACKET
2. COMPRESSOR CLUTCH CONNECTOR
3. COMPRESSOR

9. Install in the reverse order of removal, and note these items:
 - ♦ If you are installing a new compressor, drain all the refrigerant oil from the removed compressor and measure its volume. Subtract the volume of drained oil from 135 ml (4 1/2 fl.oz, 4.8 Imp.oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
 - ♦ Replace the O-rings with new ones at each fitting and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Use refrigerant oil (SANDEN, SP-10) for HFC-134a SANDEN piston type compressor only.
 - ♦ To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
 - ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
 - ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
 - ♦ Charge the system (**See Page 22-17**).



1. **CENTRE NUT**
Replace
2. **ARMATURE PLATE**
Inspection, (**See Page 22-11**)
3. **SHIM(S)**
Replace.
4. **SNAP RING B**
Replace.
5. **ROTOR PULLEY**
Inspection, (**See Page 22-11**)
6. **SNAP RING A**
Replace.
7. **FIELD COIL**
Inspection, (**See Page 22-11**)
8. **RELIEF VALVE**
Replacement, (**See Page 22-13**)
9. **O-RING**
Replace.
10. **COMPRESSOR**
(Do not disassemble).
11. **KEY**

- ♦ Check the plated parts of the armature plate for colour changes, peeling or other damage. If there is damage, replace the clutch set.
- ♦ Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.

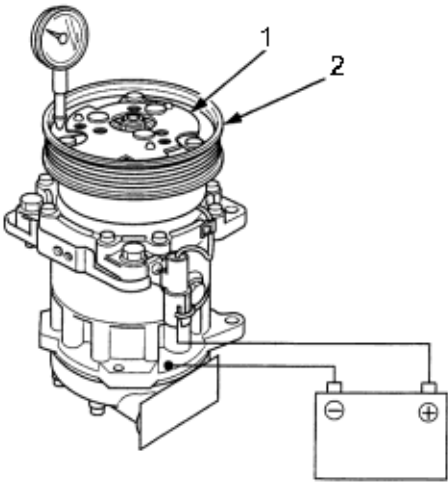


1. ROTOR PULLEY

- ♦ Measure the clearance between the rotor pulley and the armature plate with a dial indicator. Zero out the indicator, then apply battery voltage to the compressor clutch. Measure the movement of the armature plate when the voltage is applied. If the clearance is not within specified limits, the armature plate must be reshimmed (**See Page 22-12**).

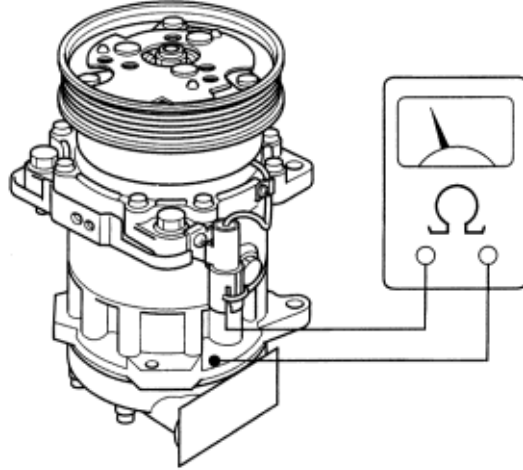
Clearance: 0.6 ± 0.2 mm (0.024 ± 0.008 in)

NOTE: The shims are available in three thickness: 0.1 mm, 0.3 mm and 0.5 mm.

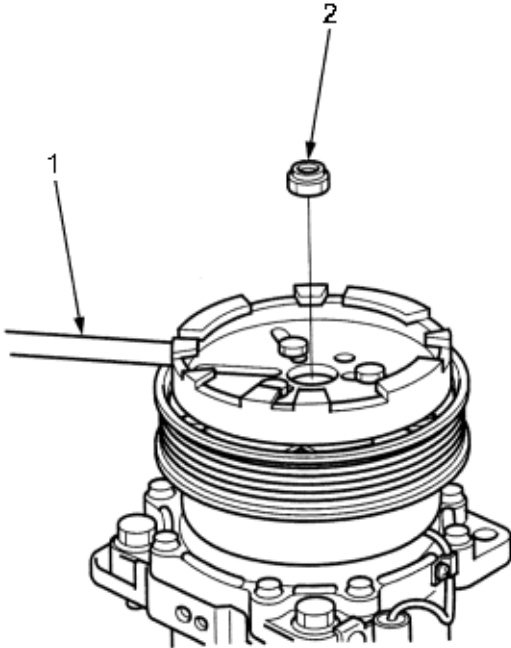


1. ARMATURE PLATE
2. ROTOR PULLEY

- ♦ Check resistance of the field coil. If resistance is not within specifications, replace the field coil.
Field Coil Resistance: 3.5 ± 0.15 ohms at 20°C (68°F)

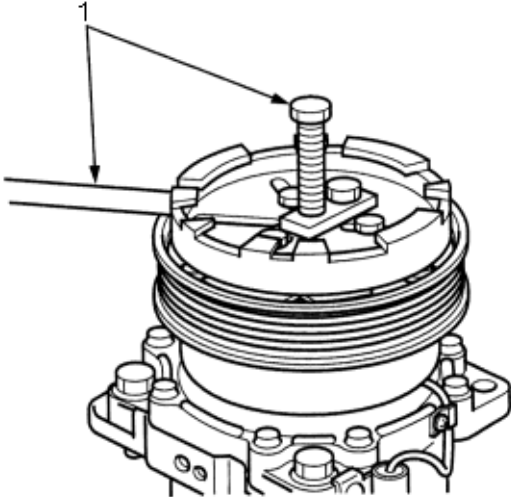


1. Remove the centre nut while holding the armature plate with the special tool.



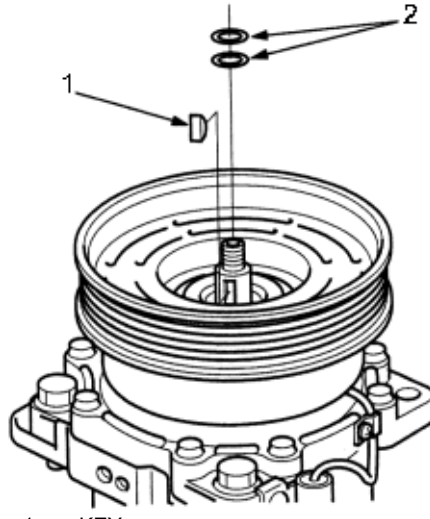
1. A/C CLUTCH HOLDER
07NAB-HAC0101
2. CENTRE NUT
17.6 Nm (1.8 kgf/m, 13 lbf/ft)
Replace

2. Remove the armature plate from the shaft with the special tool.



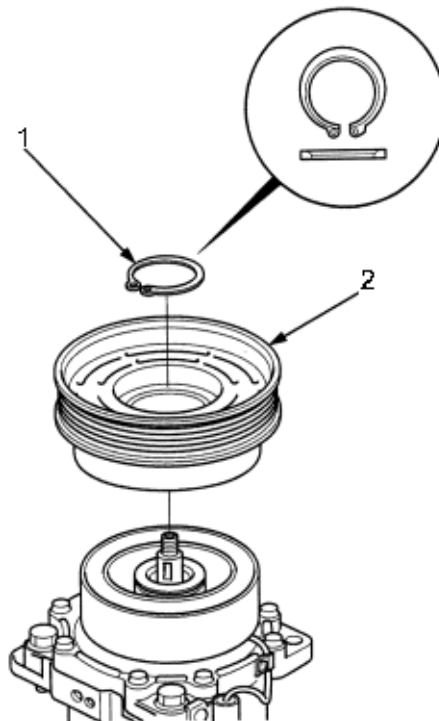
1. A/C CLUTCH HOLDER
07NAB-HAC0101

3. Remove the shim(s) and the key, taking care not to lose the shims(s) and the key. If the clutch needs adjustment, increase or decrease the number and thickness of shims as necessary, then reinstall the armature plate, and recheck its clearance (See Page 22-11).



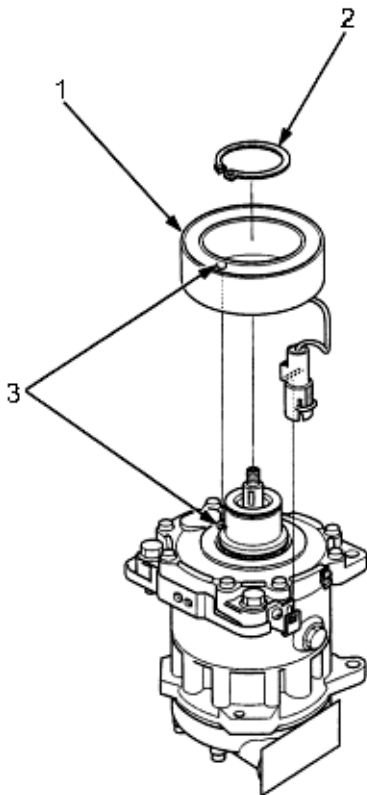
1. KEY
2. SHIM(S) Replace.

4. Remove the snap ring B with snap ring pliers, then remove the rotor pulley. Be careful not to damage the rotor pulley and the compressor.



1. SNAP RING B Replace.
2. ROTOR PULLEY

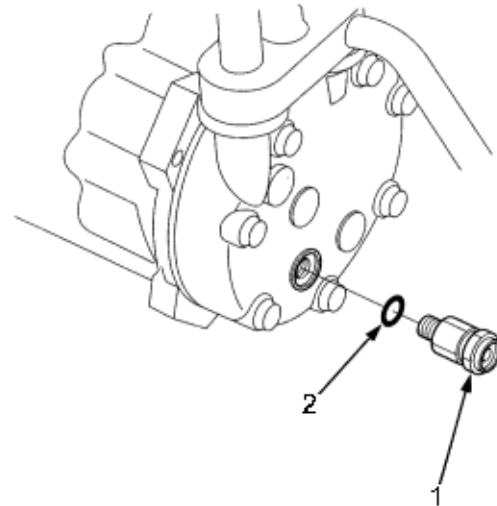
5. Remove the connector. Remove the snap ring A with snap ring pliers, then remove the field coil. Be careful not to damage the field coil and the compressor.



1. FIELD COIL
2. SNAP RING A
Replace.
3. ALIGN

6. Reassemble the compressor clutch in the reverse order of disassemble and note these items.
 - ♦ Install the field coil with the wire side facing down and align the boss on the field coil with the hole in the compressor.
 - ♦ Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
 - ♦ Install new snap rings, and make sure they are fully seated in the groove.
 - ♦ Make sure that the pulley turns smoothly after it's reassembled.

1. Discharge the refrigerant.
2. Remove the relief valve and the O-ring. Plug the opening to keep foreign matter from entering system and the compressor oil from running out.

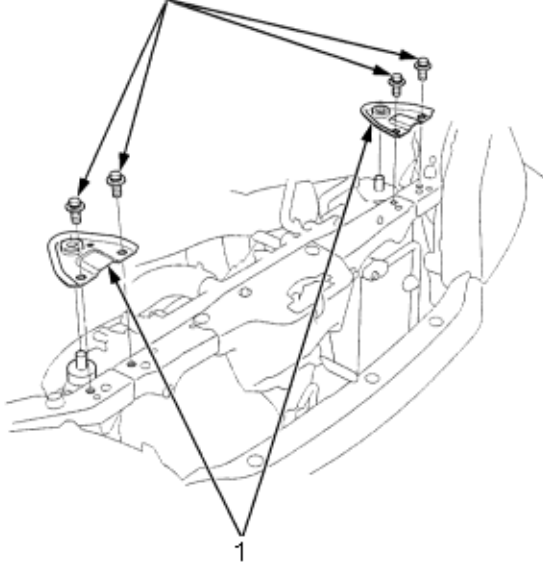


1. RELIEF VALVE 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft)
2. O-RING Replace.
3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (**See Page 22-17**).

NOTE: LHD type is shown, RHD type is similar.

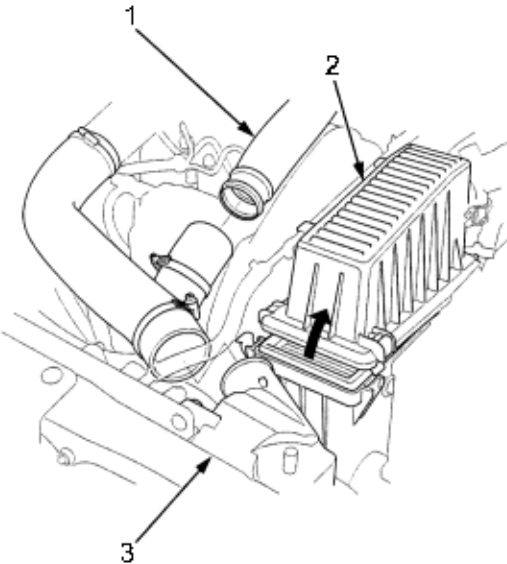
1. Discharge the refrigerant.
2. Remove the bolts, then remove the upper mount brackets from the radiator.

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



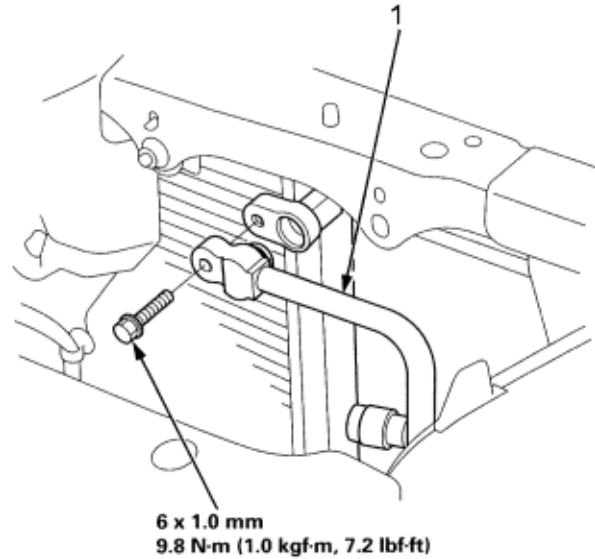
1. UPPER MOUNT BRACKETS

3. Remove the sound deadening pad (see section 5).
4. Loosen the clamps, then disconnect the hoses from the intercooler and the turbocharger pipe. Remove the air cleaner housing cover as shown.



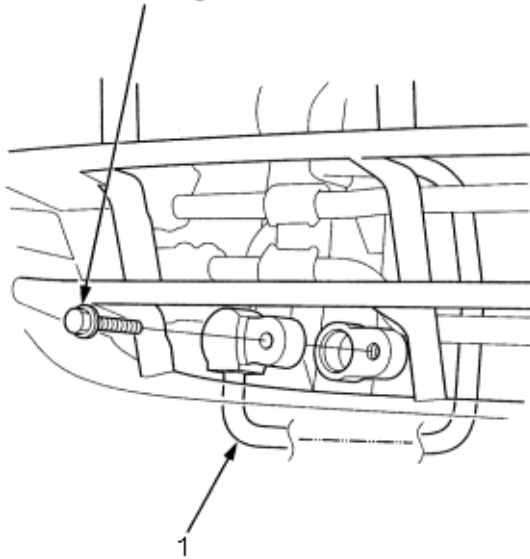
1. TURBOCHARGER PIPE
2. AIR CLEANER HOUSING COVER
3. INTERCOOLER

5. Remove the bolt, then disconnect the discharge line from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



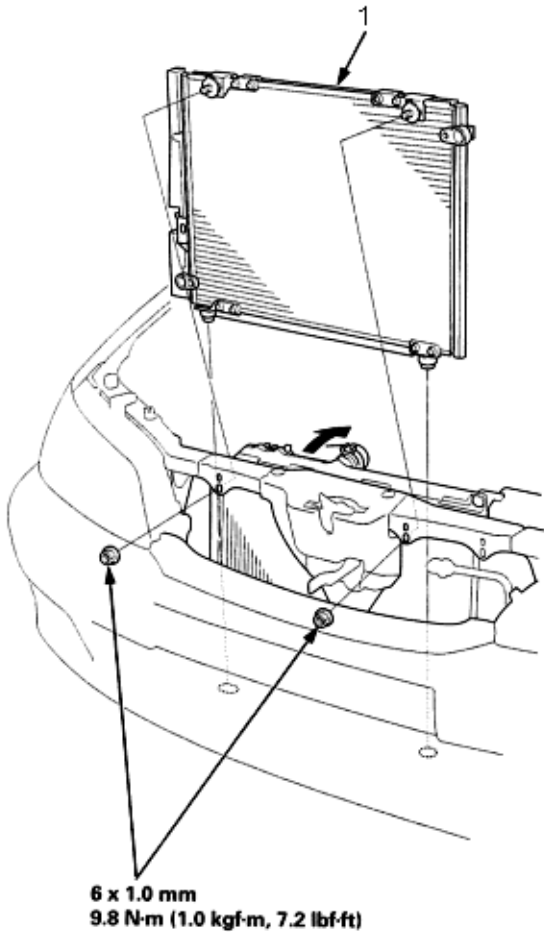
6. Remove the bolt, then disconnect the condenser line from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)



1. CONDENSER LINE

7. Remove the mounting nuts, then remove the condenser by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser.
8. Install in the reverse order of removal and note these items:
 - ♦ If you're installing a new condenser, add refrigerant oil (SANDEN SP-10) (**See Page 22-16**).
 - ♦ Replace the O-rings with new ones at each fitting and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
 - ♦ Be careful not to damage the radiator and condenser fins when installing the condenser.
 - ♦ Be sure to install the lower mount cushions of condenser securely into the holes.
 - ♦ Charge the system (**See Page 22-17**).



1. CONDENSER

The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil *, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.

*SANDEN, SP-10:

- ♦ P/N 38897-P13-003: 120 ml (4 fl-oz, 4.2 Imp.oz)
- ♦ P/N 38898-P13-003: 250 ml (8 1/3 f-oz, 8.8 Imp.oz)
- ♦ P/N 38899-P13-A01: 40 ml (1 1/3 fl-oz, 1.4 Imp.oz).

Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

⚠ CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose or throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service. R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING

- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

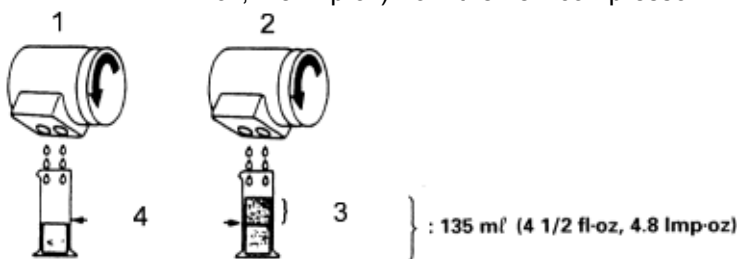
1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, don't let refrigerant escape too fast; it will draw the compressor oil out of the system.
6. Add refrigerant oil after replacing the following parts:

Note these items when handling refrigerant oil:

- ♦ To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- ♦ Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- ♦ Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

Condenser	25 ml (5/6 fl. oz, 0.9 Imp.oz)
Evaporator	40 ml (1 1/3 fl. oz, 1.4 Imp.oz)
Line or hose	10 ml (1/3 fl. oz, 0.4 Imp.oz)
Receiver/Dryer	10 ml (1/3 fl. oz, 0.4 Imp.oz)
Leakage repair	25 ml (5/6 fl. oz, 0.9 Imp.oz)
Compressor	For compressor replacement, subtract the volume of oil drained from the removed compressor from 135 ml (4 1/2 fl.oz, 4.8 Imp.oz) and drain the calculated volume of oil from the new compressor: 130ml (4 1/3 fl.oz, 4.6 Imp.oz) - Volume of removed compressor = Volume to drain from new compressor.

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 ml (1 2/3 fl. oz, 1.8 Imp.oz) from the new compressor.



1. **REMOVED COMPRESSOR**
2. **NEW COMPRESSOR**
3. **DRAINING VOLUME**
135 ml (4 1/2 fl.oz, 4.8 Imp.oz)
4. **SAME LEVEL**

NOTE:

- ♦ Use only a gauge set for refrigerant HFC-134a (R-134a).
- ♦ Use a vacuum pump adapter, which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

⚠ CAUTION

- ♦ Air conditioning refrigerant or lubricant vapour can irritate your eyes, nose and throat.
- ♦ Be careful when connecting service equipment.
- ♦ Do not breathe refrigerant or vapour.

If accidental system discharge occurs, ventilate work area before resuming service.

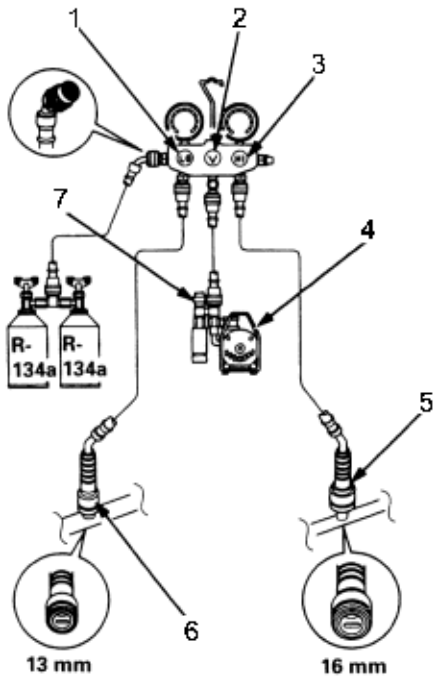
R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING

- ♦ Compressed air mixed with R-134a forms a combustible vapour.
- ♦ The vapour can burn or explode causing serious injury.
- ♦ Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

THREE VALVE GAUGE



1. LOW-PRESSURE VALVE
2. EVACUATION VALVE
3. HIGH-PRESSURE VALVE
4. VACUUM PUMP
5. HIGH-PRESSURE QUICK JOINT
6. LOW-PRESSURE QUICK JOINT
7. CHECK VALVE

1. After the leak test, check that the high-pressure valve is closed, and start the engine.
 NOTE: Run the engine below 1,500 rpm (min-1).
2. Open the front door.
 Turn the A/C switch ON.
 Set the temperature control dial to MAX COOL.
 Set the mode control dial to VENT.
 Turn the fan switch to MAX.
3. Open the low-pressure valve, and charge with R-134a refrigerant.

⚠ WARNING

- ♦ Do not open the high-pressure valve.
- ♦ Do not turn the cans upside down.

4. Charge the system with refrigerant capacity. Do not overcharge the system; the compressor will be damaged.

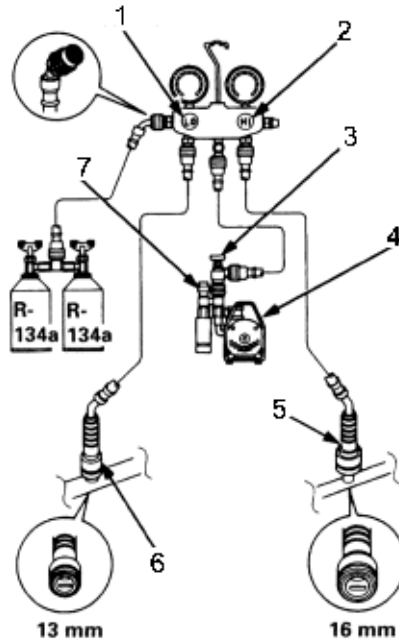
Refrigerant capacity: 550 + 0, - 50 g (19.4 + 0 - 1.8 oz)

5. When fully charged, close the low-pressure valve and the refrigerant cans. Check the system.
6. Stop the engine, and disconnect the charge hose quickly.

7. Check the system for leaks using a leak detector proper to refrigerant R-134a.

NOTE: Particularly check for leaks around the compressor, condenser and receiver/dryer.

TWO VALVE GAUGE

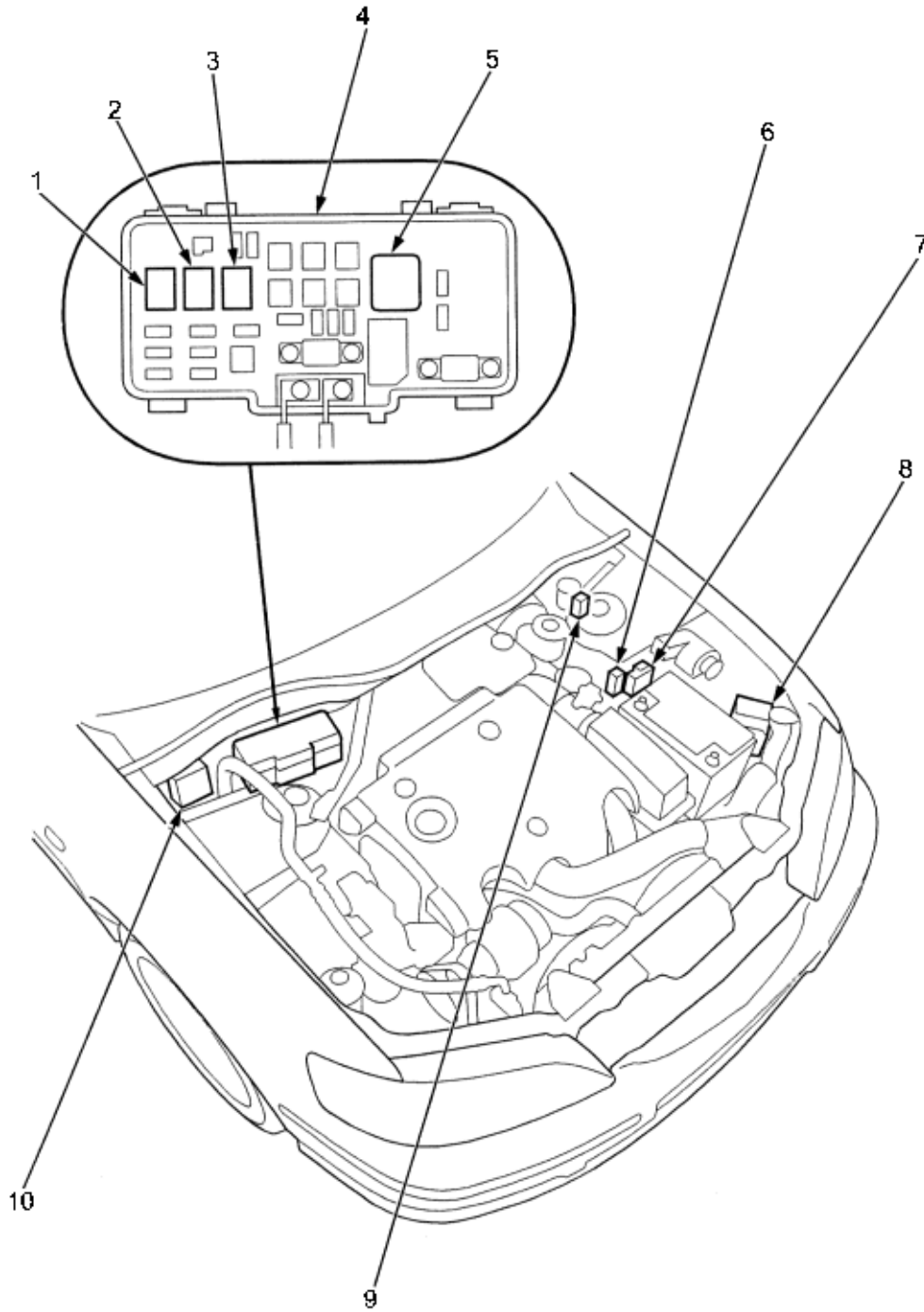


1. LOW-PRESSURE VALVE
2. HIGH-PRESSURE VALVE
3. EVACUATION STOP VALVE
4. VACUUM PUMP
5. HIGH-PRESSURE QUICK JOINT
6. LOW-PRESSURE QUICK JOINT
7. CHECK VALVE

Relay and Control Unit Locations
Engine Compartment

23-A-2

NOTE: LHD type is shown, RHD type is similar.



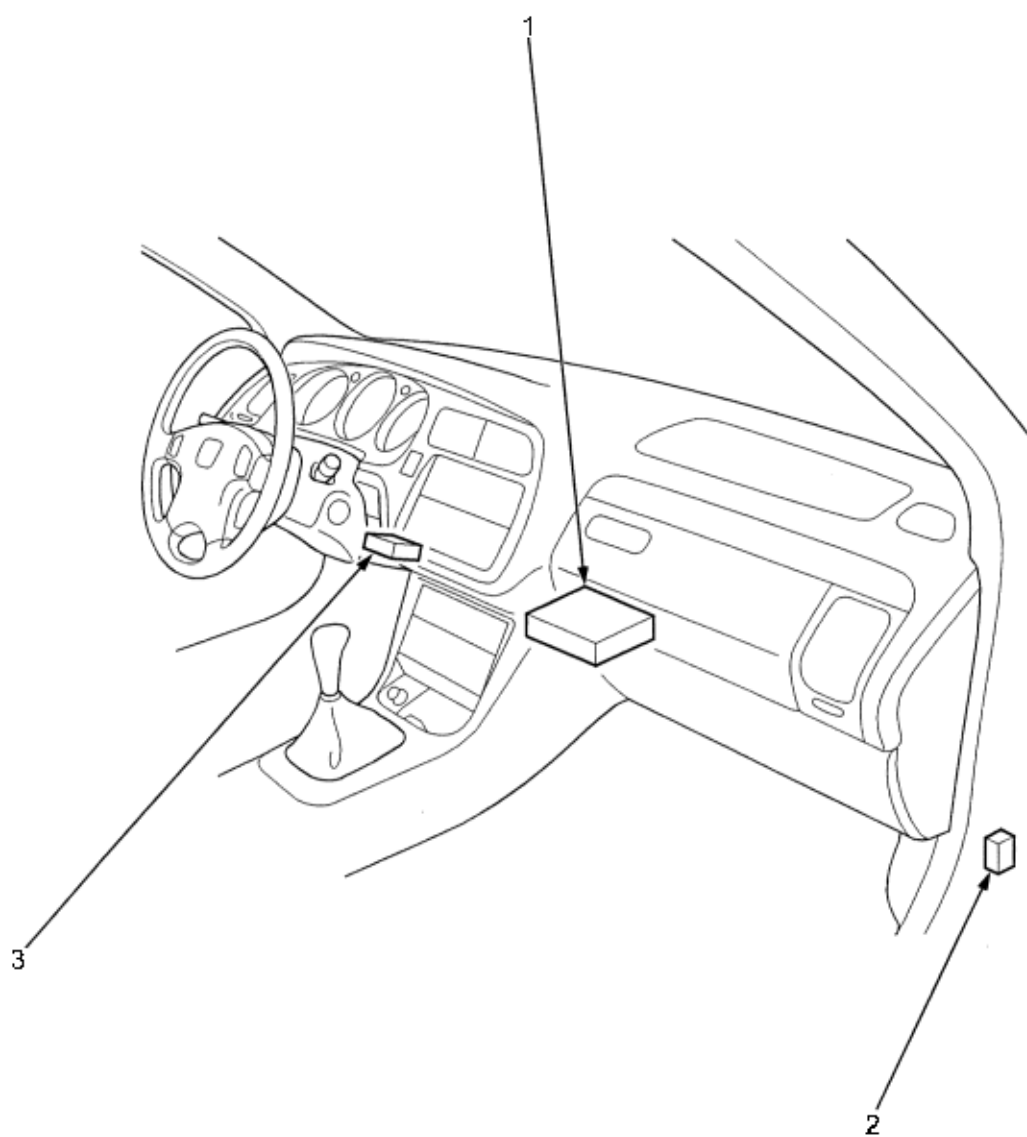
1. HEADLIGHT RELAY 1
2. HEADLIGHT RELAY 2
3. HORN RELAY
4. UNDER-HOOD FUSE/RELAY BOX
5. BLOWER MOTOR RELAY
6. GLOW PLUG RELAY
[Wire colours: YEL/BLK, YEL/BLK,]
[YEL/BLK and BRN]
7. FUSE HOLDER
8. ABS MODULATOR ASSEMBLY
9. INTERMITTENT WIPER RELAY
[Wire colours: GRN/BLK,]
[WHT, BLK, GRN/RED and
BLU/WHT]
10. RADIATOR FAN RELAY UNIT

Relay and Control Unit Locations
Dashboard

23-A-3

NOTE: LHD type is shown, RHD type is similar.

1. ECM
2. MAIN RELAY
[Wire colours: RED/BLK, WHT/GRN,
[PNK and YEL/BLK]
3. IMMOBILIZER CONTROL UNIT

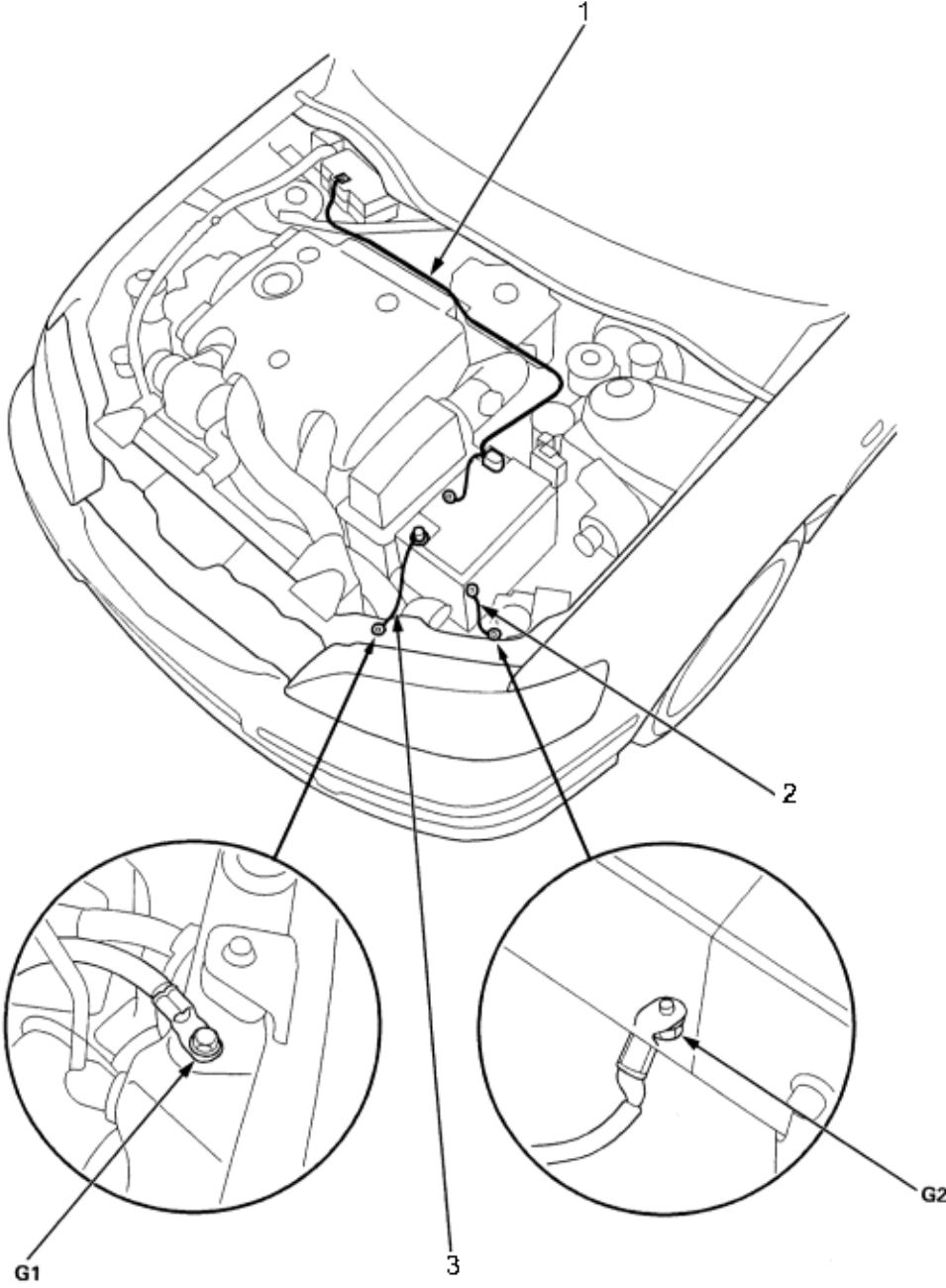


Wire Harness and Ground Locations
Engine Compartment

23-A-4

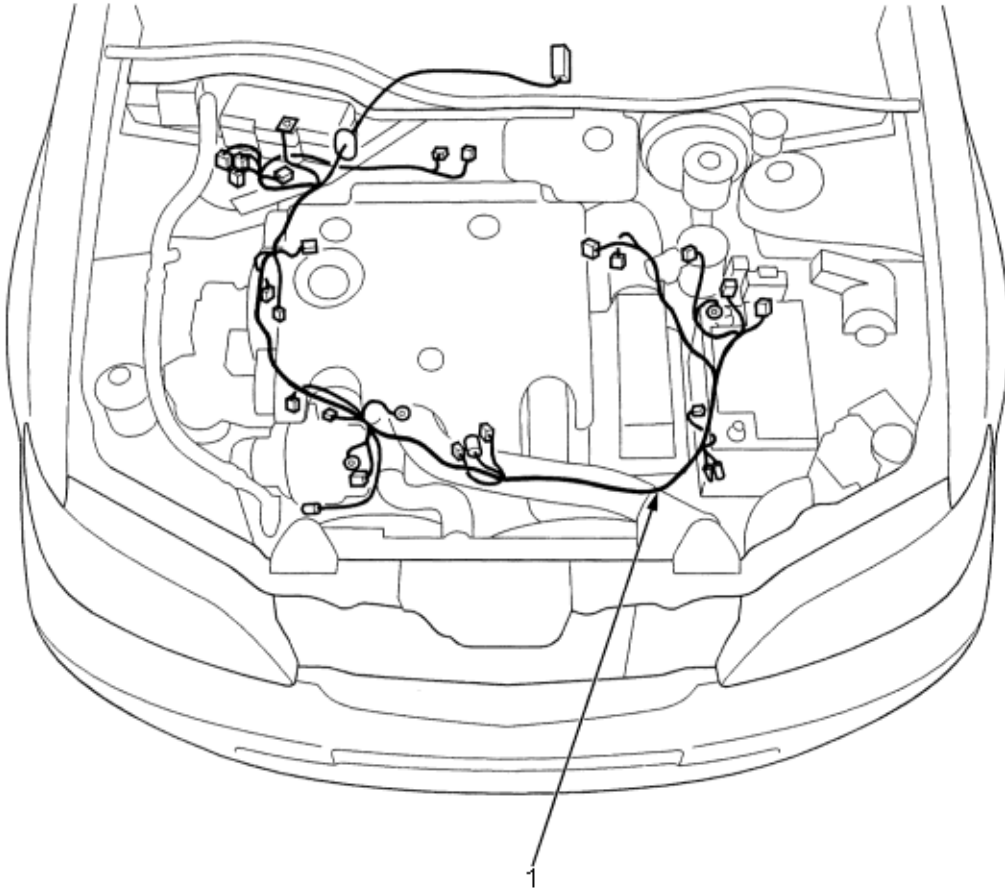
NOTE: LHD type is shown, RHD type is similar.

- 1. STARTER CABLE
- 2. ENGINE GROUND CABLE
- 3. BATTERY GROUND CABLE



NOTE: LHD type is shown, RHD type is similar.

1. ENGINE WIRE HARNESS

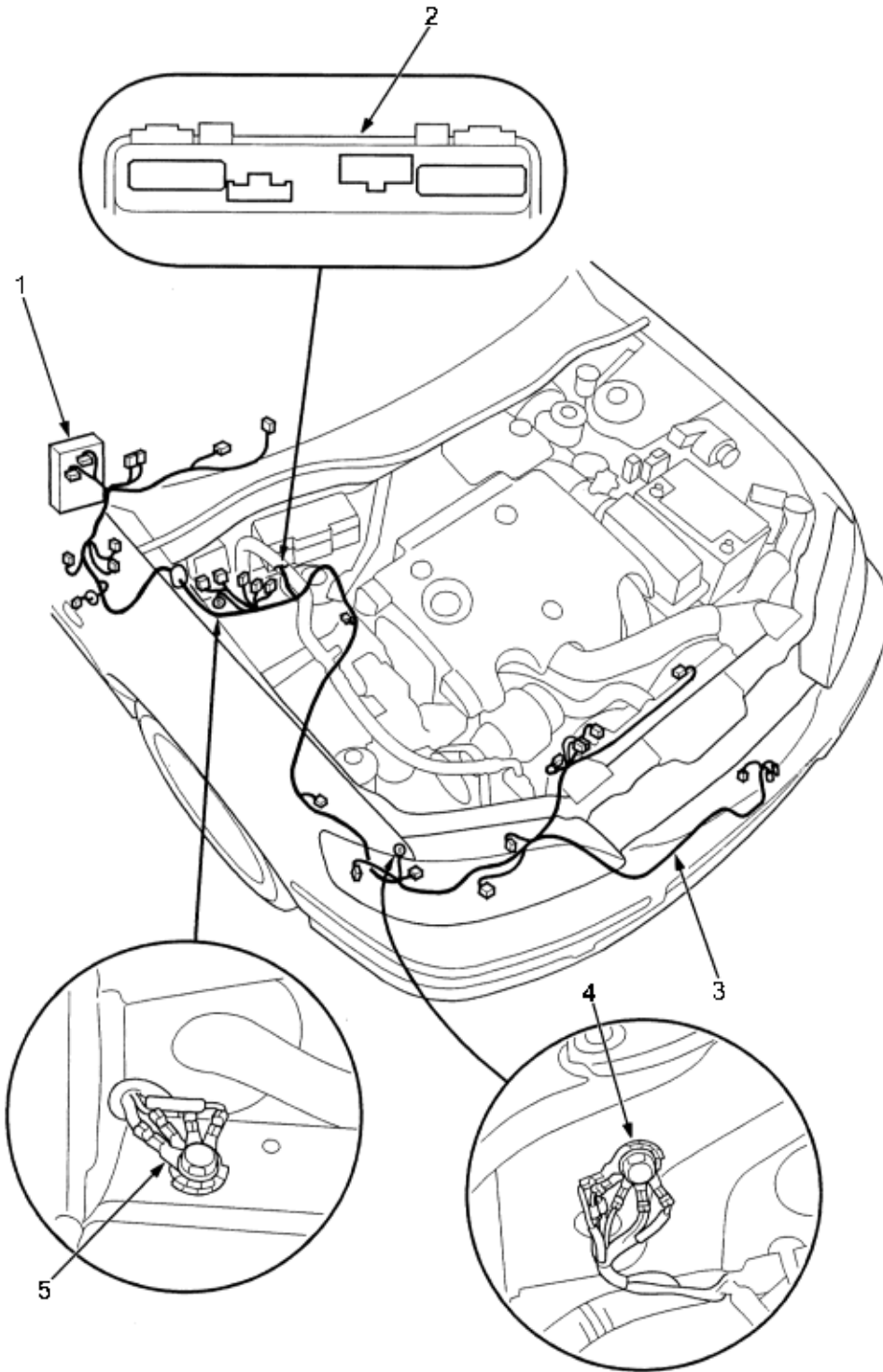


Wire Harness and Ground Locations
Engine Compartment (cont'd)

23-A-6

NOTE: LHD type is shown, RHD type is similar.

1. PASSENGER'S UNDER-DASH FUSE/RELAY BOX
2. UNDER-HOOD FUSE/RELAY BOX
3. RIGHT ENGINE COMPARTMENT WIRE HARNESS
4. G201
5. G202: LHD type

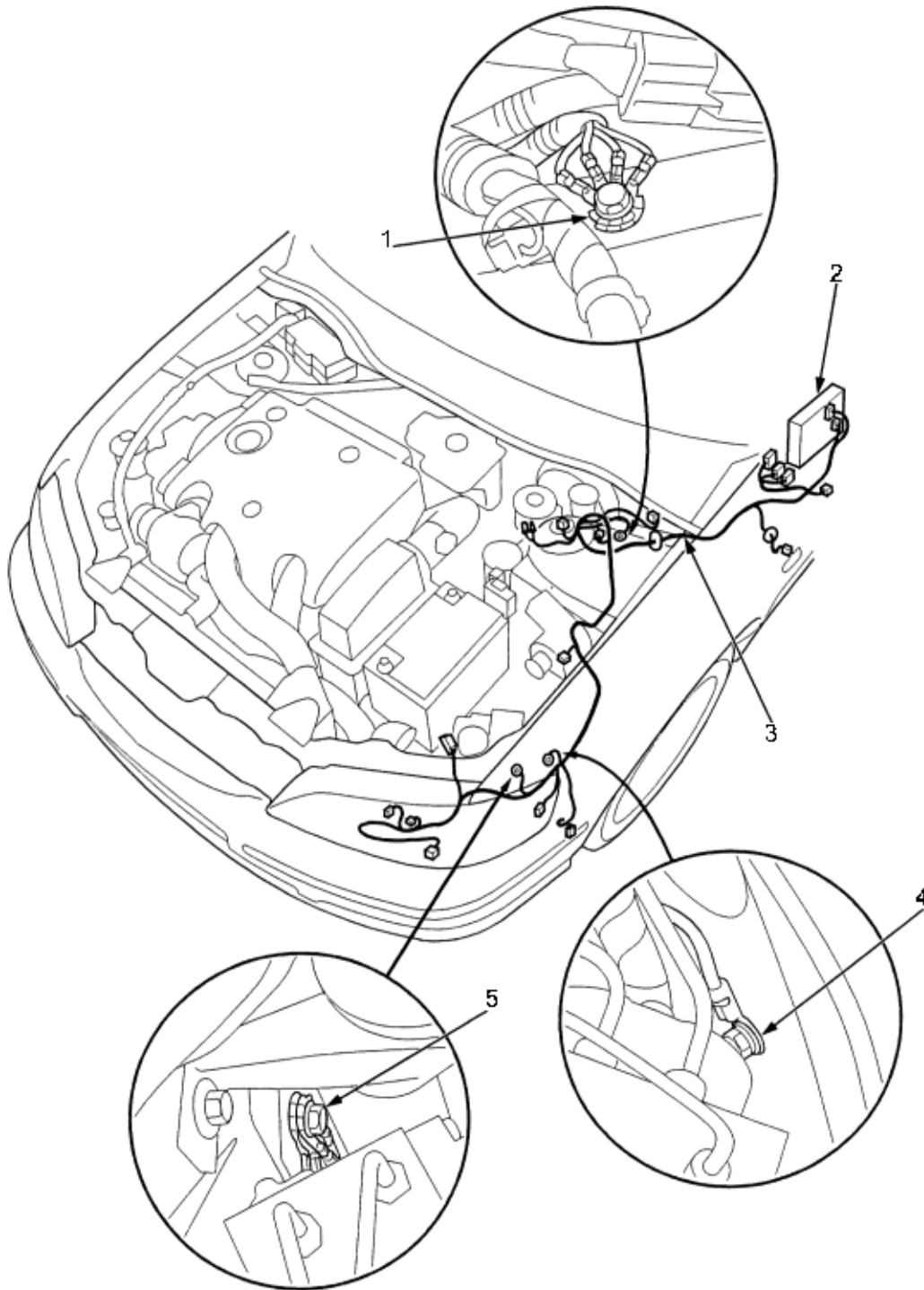


Wire Harness and Ground Locations
Engine Compartment (cont'd)

23-A-7

NOTE: LHD type is shown, RHD type is similar.

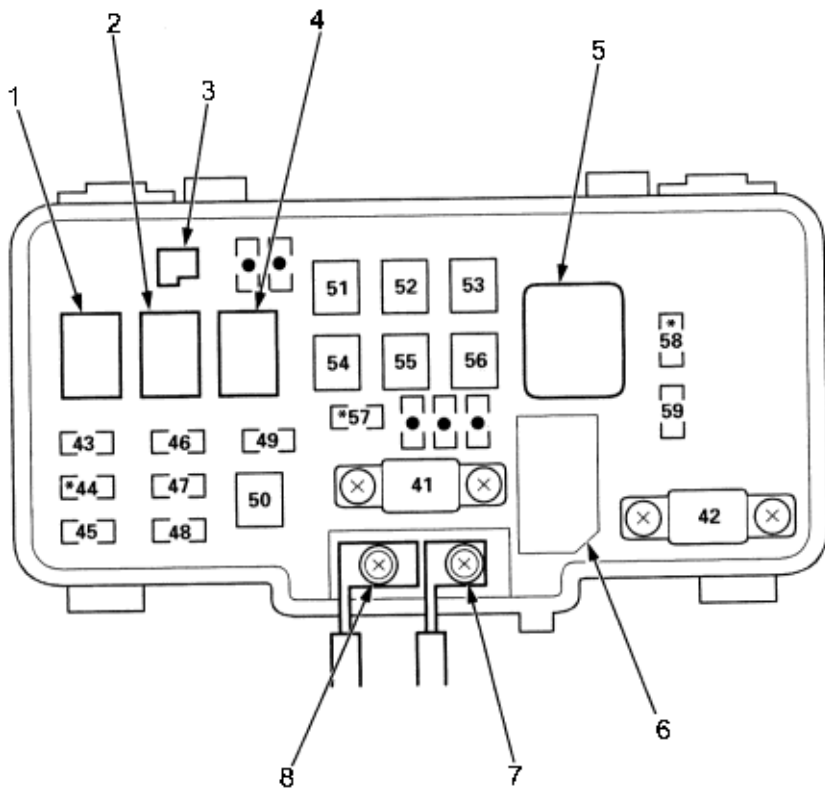
1. G202
2. DRIVER'S UNDER-DASH FUSE/RELAY BOX
3. LEFT ENGINE COMPARTMENT WIRE HARNESS
4. G303
5. G301



Fuses

Under-hood Fuse Box/Relay Box

23-B-2

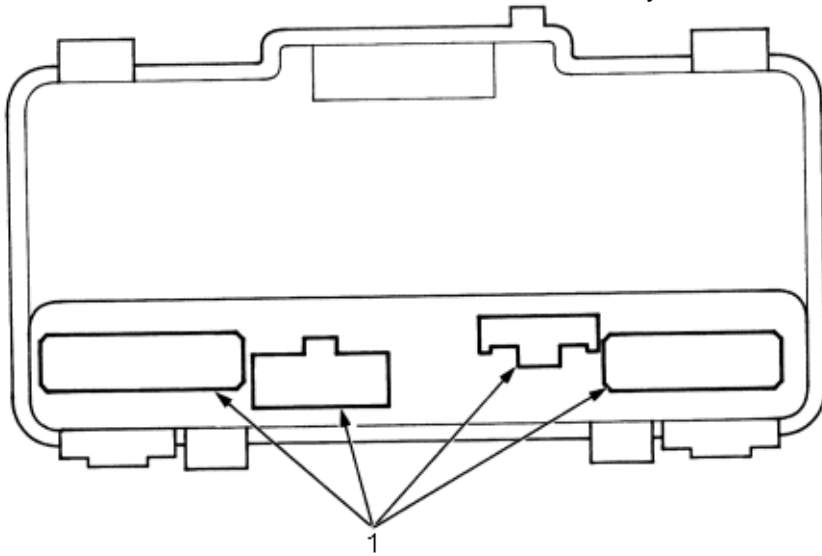


1. To headlight relay 1
2. To headlight relay 2
3. Not used
4. To horn relay
5. To blower motor relay
6. Not used
7. To engine wire harness
8. To starter cables

◆: Spare fuse

*: Not used

NOTE: View from the backside of under-hood fuse/relay box.



1. ◆ To right engine compartment wire harness (LHD type)
◆ To left engine compartment wire harness (RHD type)

Fuses

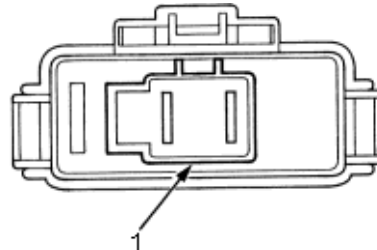
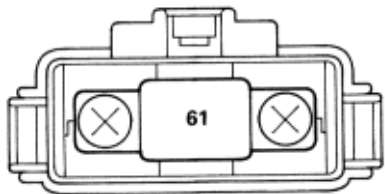
23-B-3

Under-hood Fuse/Relay Box (cont'd)

Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
41	100A	-	Battery, power distribution
42	50A	WHT	Ignition switch (BAT)
43	20A	RED/WHT	Right headlight, High beam indicator light (RHD type)
44	-	-	Not used
45	20A	RED/YEL	Left headlight, High beam indicator light (LHD type)
46	30A	WHT/GRN	Data link connector (DLC), Main relay
47	15A	PUR/WHT	Ignition key light, Security horn (RHD type), ECM, ABS modulator assembly, Multiplex control unit (driver's), Brake lights
48	20A	PUR/WHT	ABS modulator assembly (FSR)
49	10A	WHT/GRN	Hazard warning lights, Turn signal/hazard lights (Via relay)
50	40A	WHT/BLU	ABS modulator assembly (+B MR)
51	40A	GRN [WHT/BLU]	No 1, 7, 8, 15 and 16 fuses (in passenger's under-dash fuse/relay box)
52	30A	BLU/WHT	Radiator fan motor (Via radiator fan relay unit)
53	30A	WHT/GRN	Rear window defogger, Noise condenser
54	40A	YEL	No 9, 10, 11, 12 and 13 fuses (in passenger's under-dash fuse/relay box)
55	30A	BLU/ORN	Condenser fan motor (Via radiator fan relay unit), A/C compressor clutch (Via radiator fan relay unit)
56	40A	YEL/BLK	Blower motor
57	-	-	Not used
58	-	-	Not used
59	15A	RED/WHT	Cigarette lighter light, Ashtray light, Hazard warning switch light, Clock, Front parking lights, Taillights, License plate lights

[]: RHD type

Fuse Holder



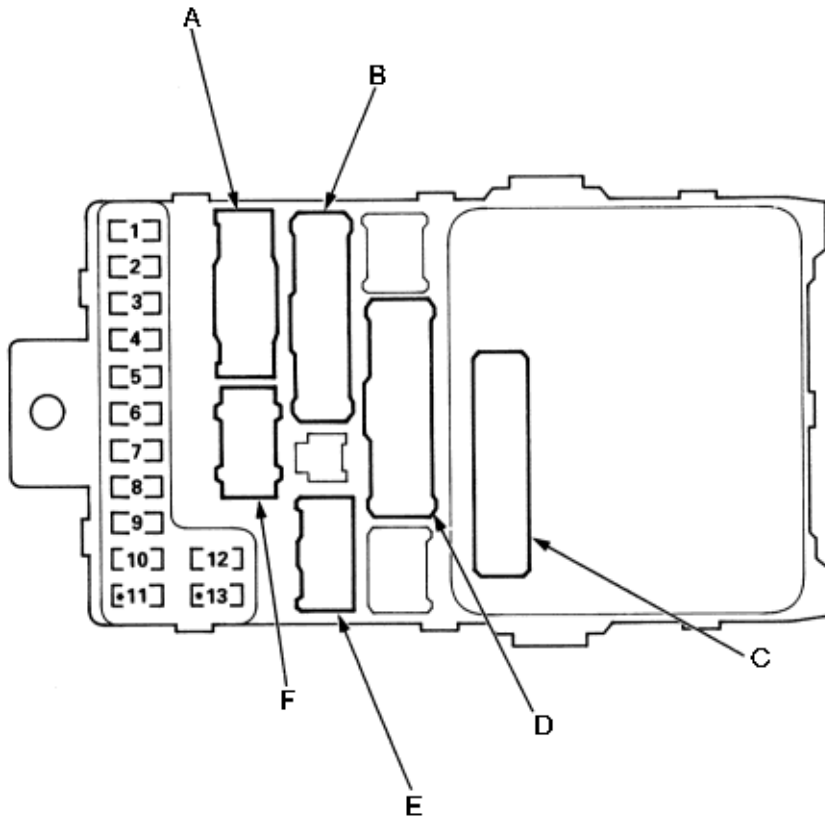
1. To engine wire harness

Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
61	60A	YEL/BLK	Glow plug (Via glow plug relay)

Fuses

Driver's Under-dash Fuse/Relay Box

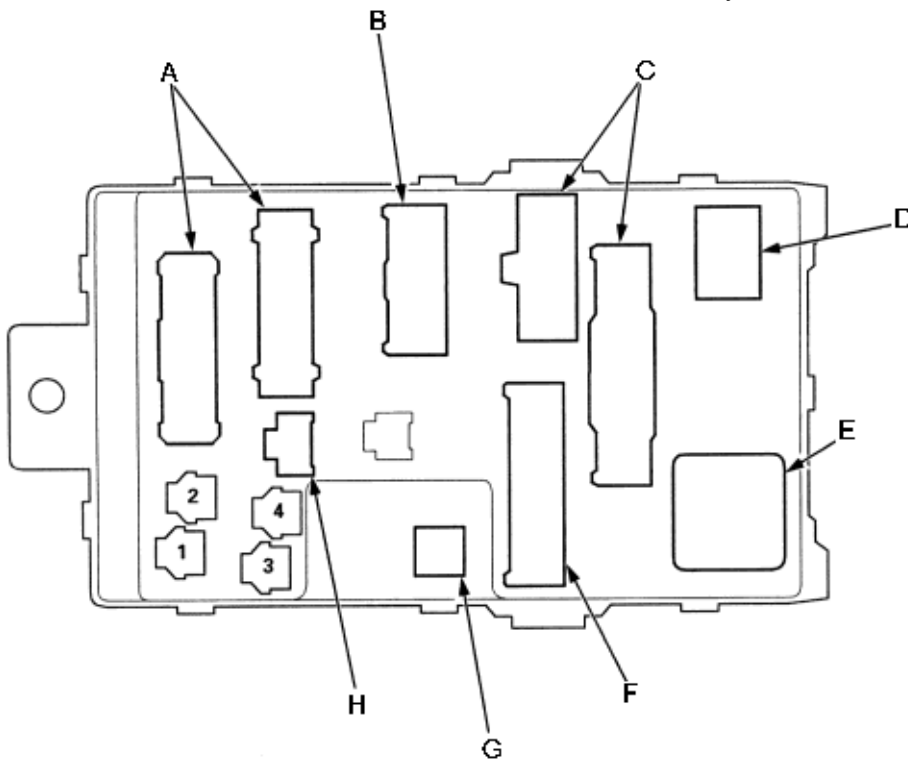
23-B-4



- A. To driver's side wire harness
- B. • To left engine compartment wire harness (LHD type)
• To right engine compartment wire harness (RHD type)
- C To multiplex control unit (driver's) (Plugs directly into the fuse box)
- D. To driver's door wire harness
- E. • To left engine compartment wire harness (LHD type)
• To right engine compartment wire harness (RHD type)
- F. To driver' side wire harness

* : Not used

NOTE: View from the backside of driver's under-dash fuse/relay box.



- A. To dashboard wire harness
- B. To ignition switch
- C To steering beam wire harness
- D. To starter cut relay
- E. To turn signal/hazard relay
- F. To steering beam wire harness
- G To SRS main harness
- H. Service check connector

- 1: Option connector (AGC)
- 2: Option connector (IG2)
- 3: Option connector (+B)
- 4: Option connector

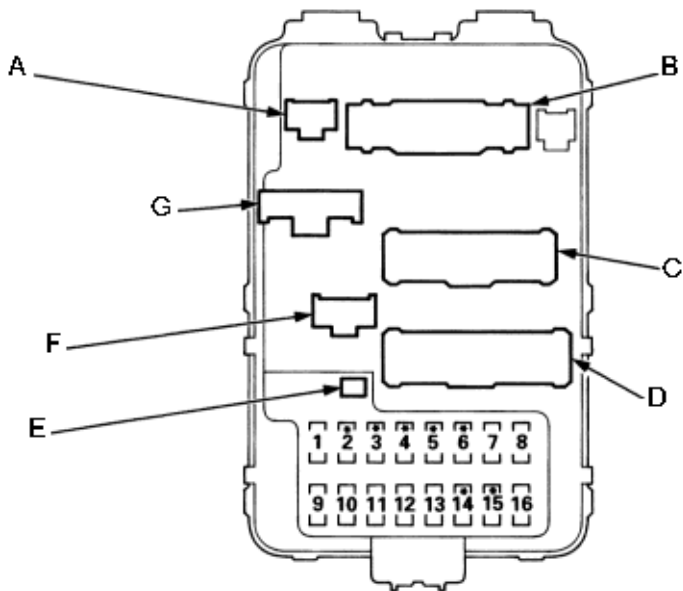
Fuses**23-B-5****Driver's Under-dash Fuse/Relay Box (cont'd)**

Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	15A	RED/WHT GRN (RED/WHT)	Inertia switch SRS unit (VA)
2	10A	GRN (BLK/RED)	SRS unit (VB)
3	7.5A	BLK/ORN	Radiator fan relay, Condenser fan relay, A/C compressor clutch relay, Cooling fan control relay, Rear window defogger relay, Blower motor relay, Recirculation control motor, A/C thermostat, Heater control panel
4	7.5A	YEL/BLK Fuse/relay box socket	Power mirror actuators, Power mirror defoggers (RHD type) Optional connector
5	10A	YEL/RED	ABS modulator unit (IG2)
6	15A	BLK/YEL	Immobilizer control unit, Charging system light, Vehicle speed sensor, Alternator, ECM
7	10A	YEL/GRN	Headlight adjuster control unit, Headlight adjuster switch, Power window relay, Multiplex control unit (door)
8	7.5A	YEL/BLK Fuse/relay box socket	Cigarette light relay Optional connector
9	7.5A	YEL Fuse/relay box socket	Gauge assembly, Keyless receiver unit, Glow plug indicator light, Clock, Back-up lights, Multiplex control unit (passenger's) Multiplex control unit (driver's)
10	7.5A	YEL/RED	Turn signal/hazard relay
11	-	-	Not used
12	30A	GRN/BLK	Windshield wiper intermittent relay, Windshield wiper motor, Multiplex control unit (driver's)
13	-	-	Not used

Fuses

Passenger's Under-dash Fuse/Relay Box

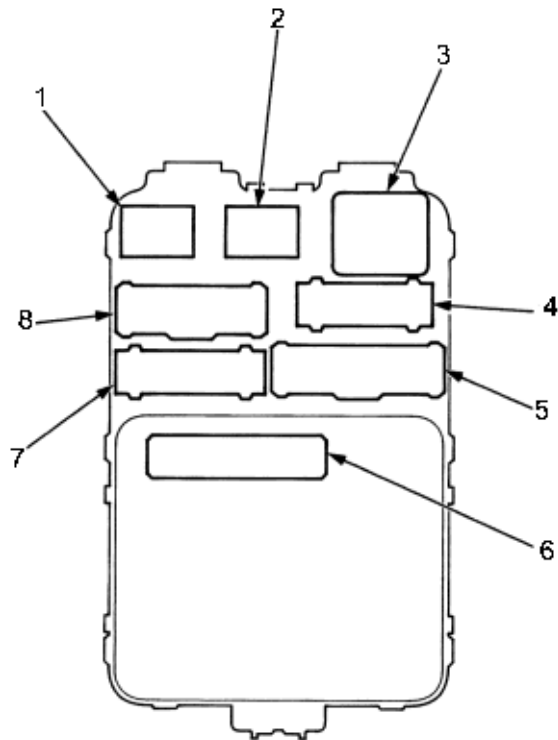
23-B-6



- A. To passenger's side wire harness
- B. To passenger's side wire harness
- C. ♦ To right engine compartment wire harness (LHD type)
♦ To left engine compartment wire harness (RHD type)
- D. To front passenger's door wire harness
- E. Diode
- F. To roof wire harness
- G. ♦ To right engine compartment wire harness (LHD type)
♦ To left engine compartment wire harness (RHD type)

*: Not used

NOTE: View from the backside of driver's under-dash fuse/relay box.

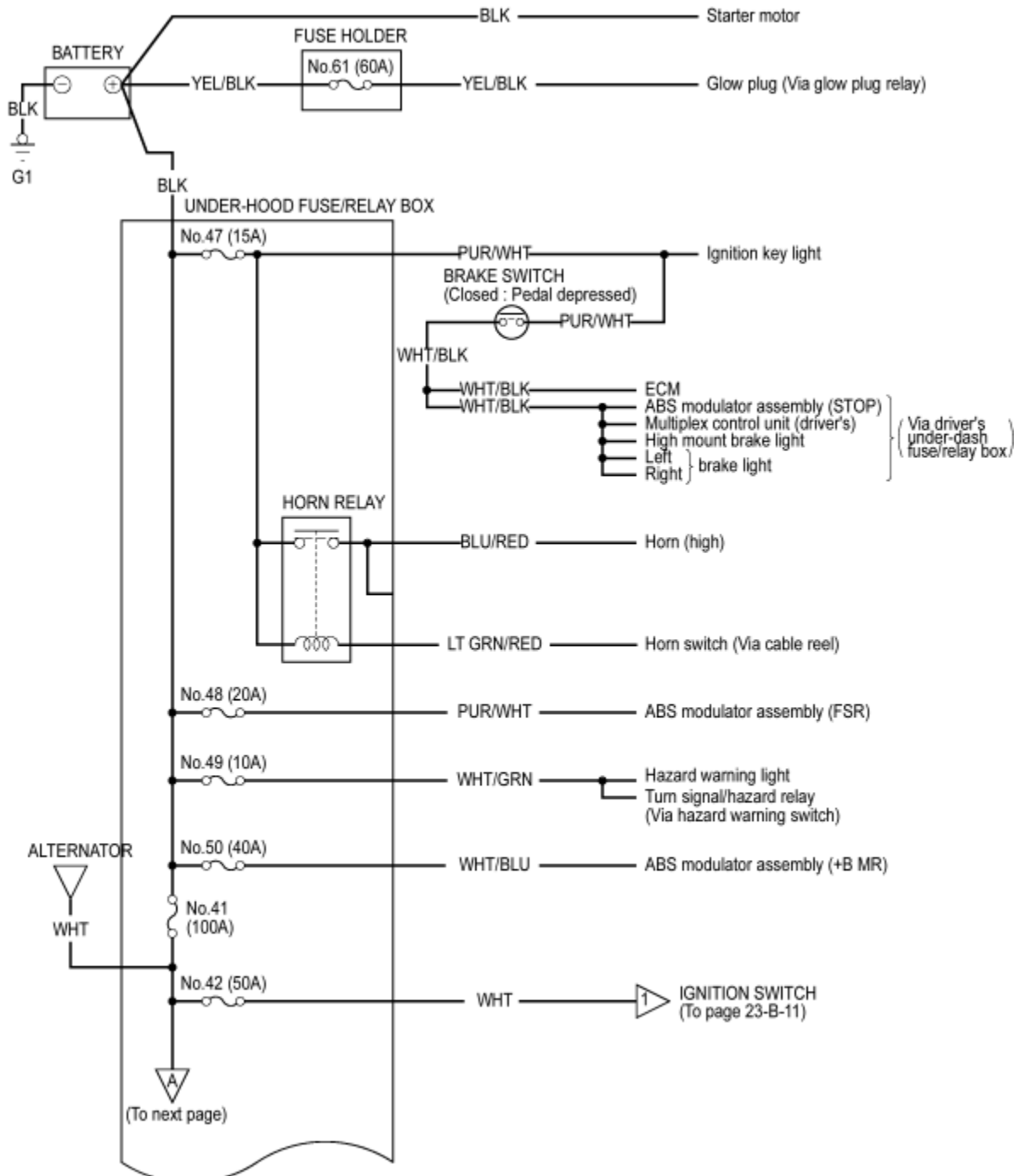


- 1. To power window relay
- 2. To cigarette lighter relay
- 3. To rear window defogger relay
- 4. To steering beam wire harness
- 5. To dashboard wire harness
- 6. To multiplex control unit (passenger's) (plugs directly into the fuse box)
- 7. To dashboard wire harness
- 8. To steering beam wire harness

Fuses**23-B-7****Passenger's Under-dash Fuse/Relay Box (cont'd)**

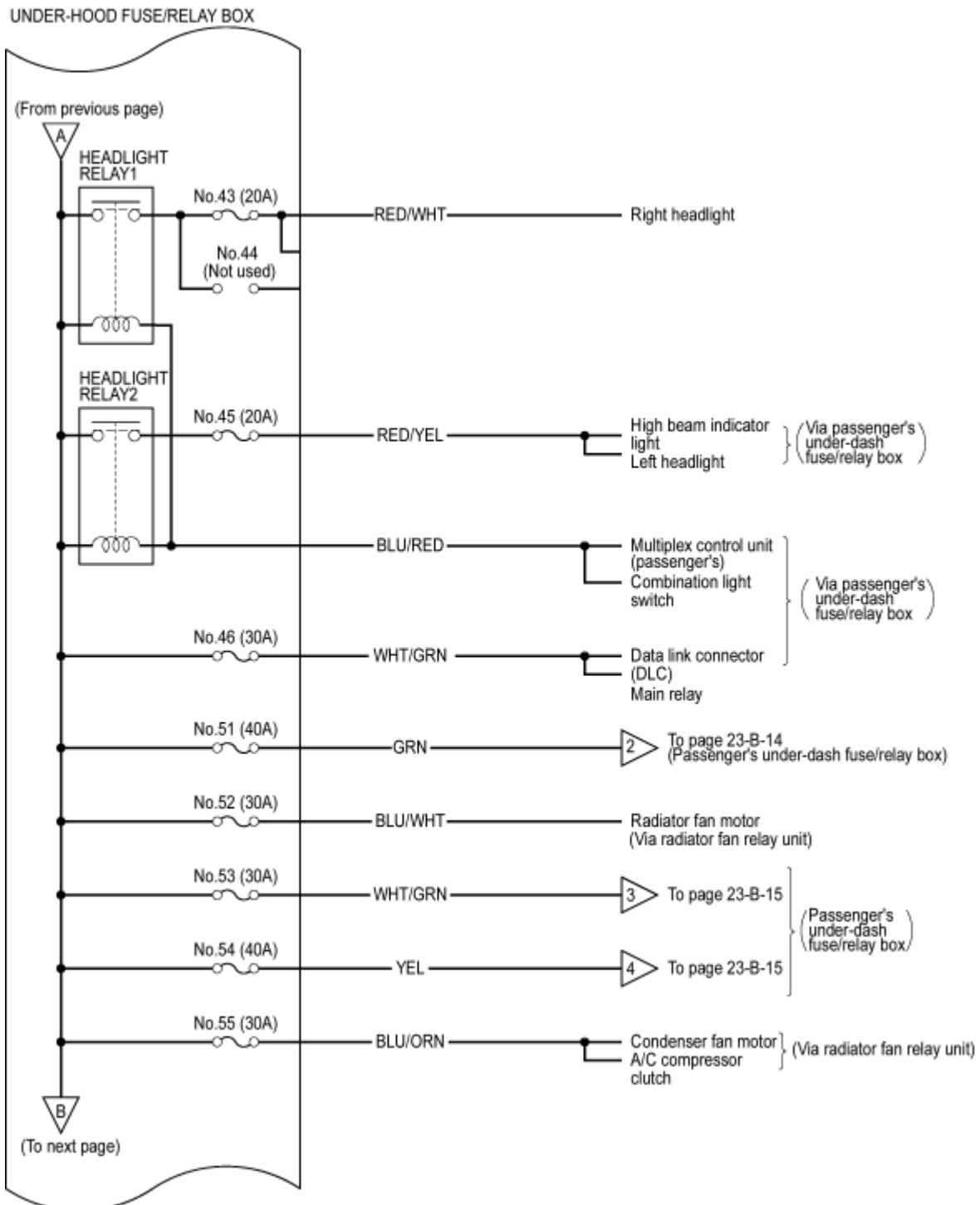
Fuse No.	Amps	Wire colour	Component(s) or Circuit(s) Protected
1	20A	GRN/WHT	Power window control unit, Driver's power window motor
2	-	-	Not used
3	-	-	Not used
4	-	-	Not used
5	-	-	Not used
6	-	-	Not used
7	20A	WHT/GRN	Left [right] rear power window motor
8	20A	BLU/BLK	Front passenger's power window motor
9	15A	WHT/GRN Fuse/relay box socket	Audio unit Cigarette lighter
10	20A	RED/YEL	Multiplex control unit (passenger's)
11	7.5A	WHT/BLU	Ceiling lights, Trunk light, Trailer lighting connector, Power antenna motor, Data link connector (DIAG)
12	20A	WHT Fuse/relay box socket	Keyless door lock control unit Multiplex control unit (passenger's)
13	7.5A	PNK Fuse/relay box socket	Immobilizer control unit, Clock, Immobilizer indicator light, Security indicator light (RHD type), Multiplex control unit (door) Multiplex control unit (passenger's)
14	-	-	Not used
15	-	-	Not used
16	20A	WHT/BLK	Right [left] rear power window motor

[]: RHD type



To go to the pages referenced on the diagram above, click on the following:

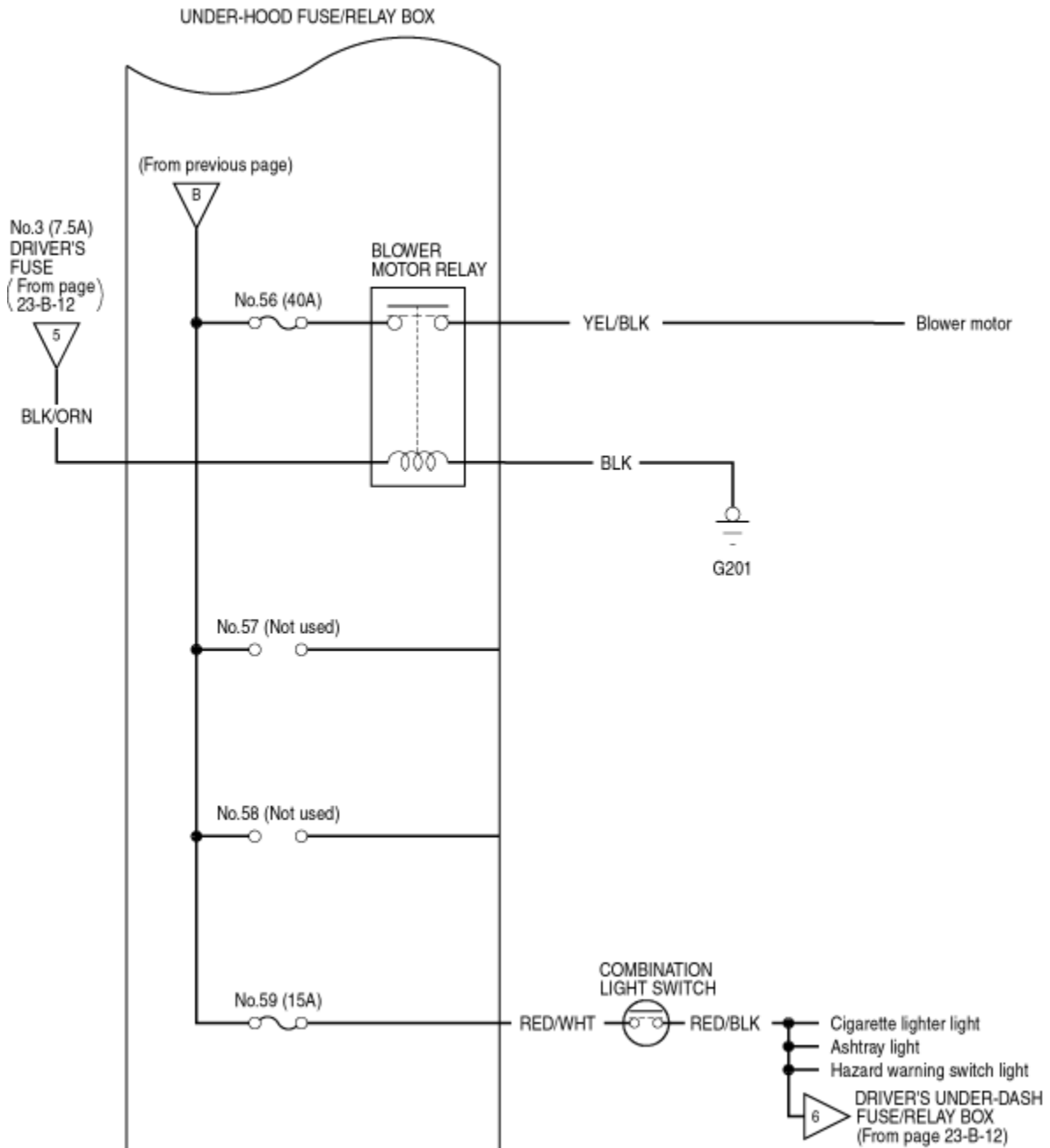
(See Page 23-B-11)



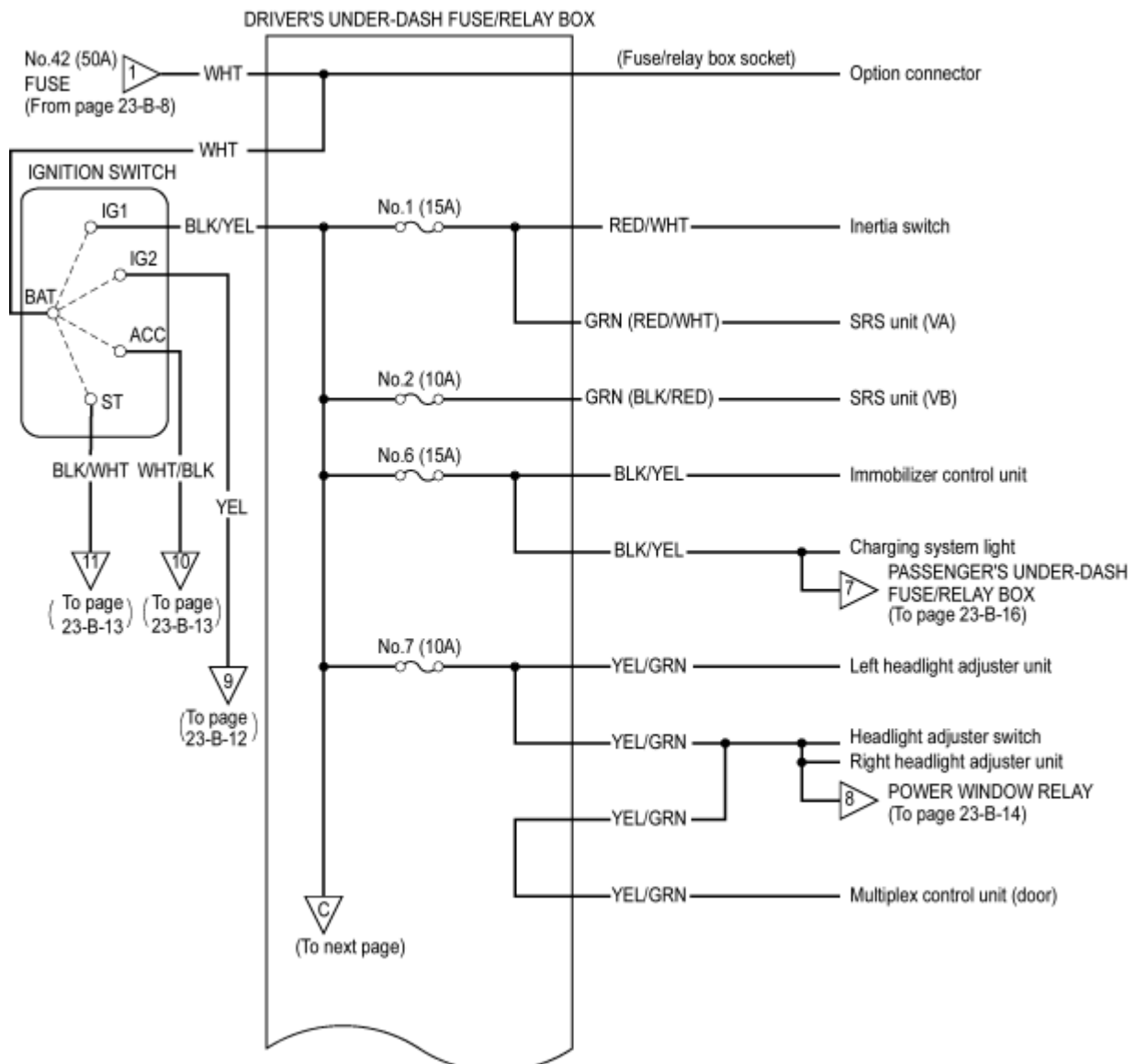
To go to the pages referenced on the diagram above, click on the following:

(See Page 23-B-14)

(See Page 23-B-15)



To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-12)

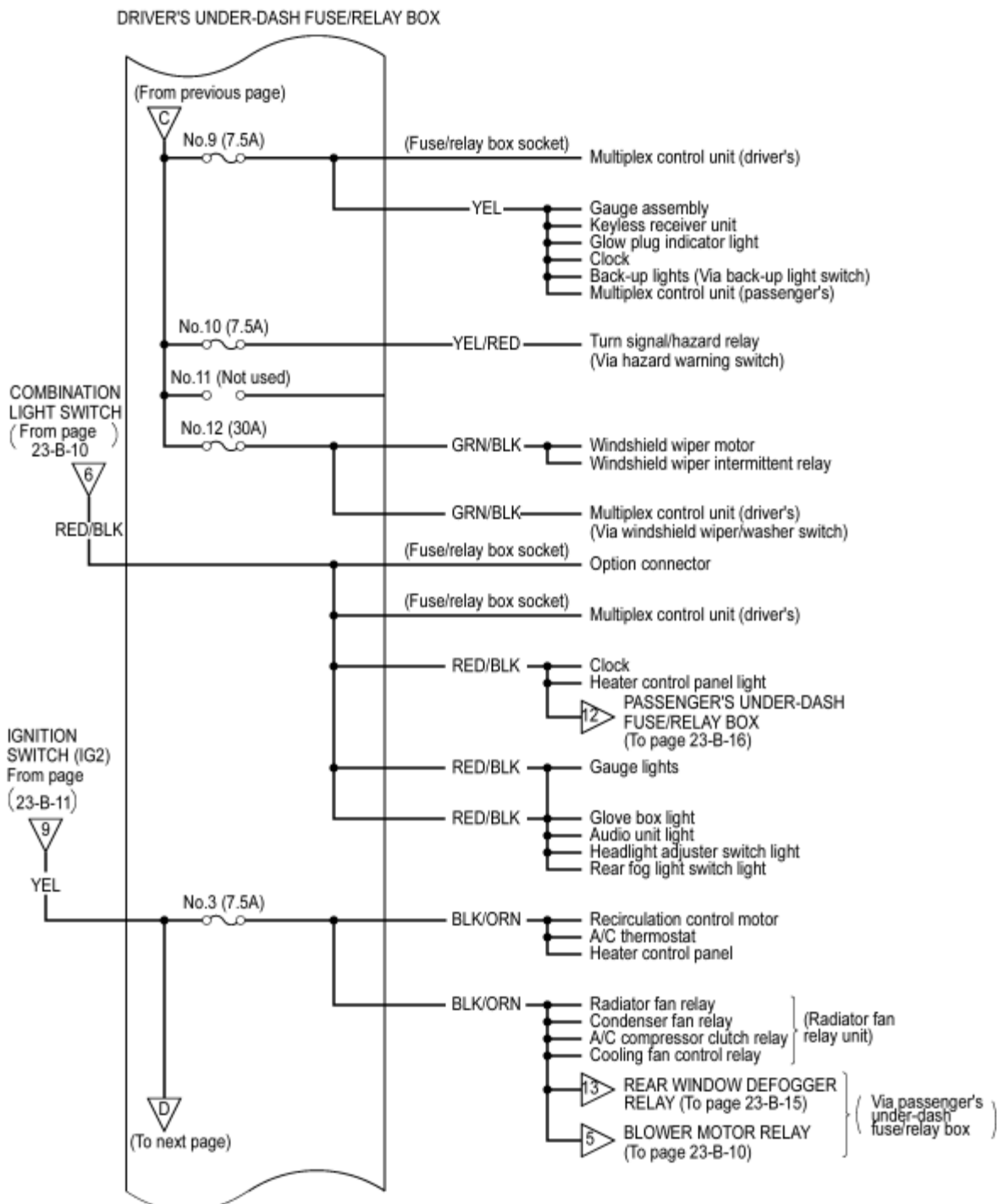


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(See Page 23-B-8)

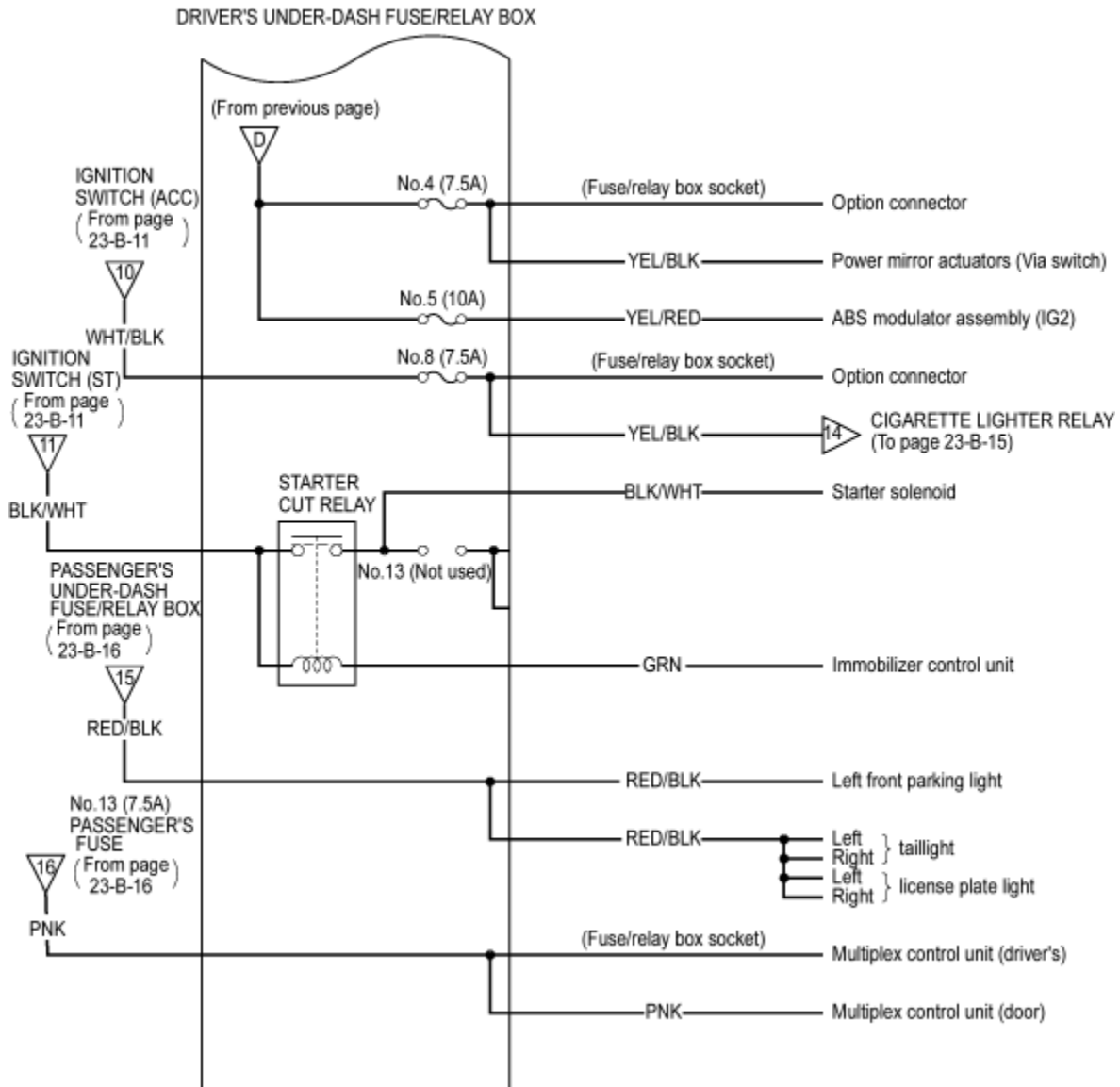
(See Page 23-B-16)

(See Page 23-B-14)



To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-10)
- (See Page 23-B-11)
- (See Page 23-B-15)
- (See Page 23-B-16)

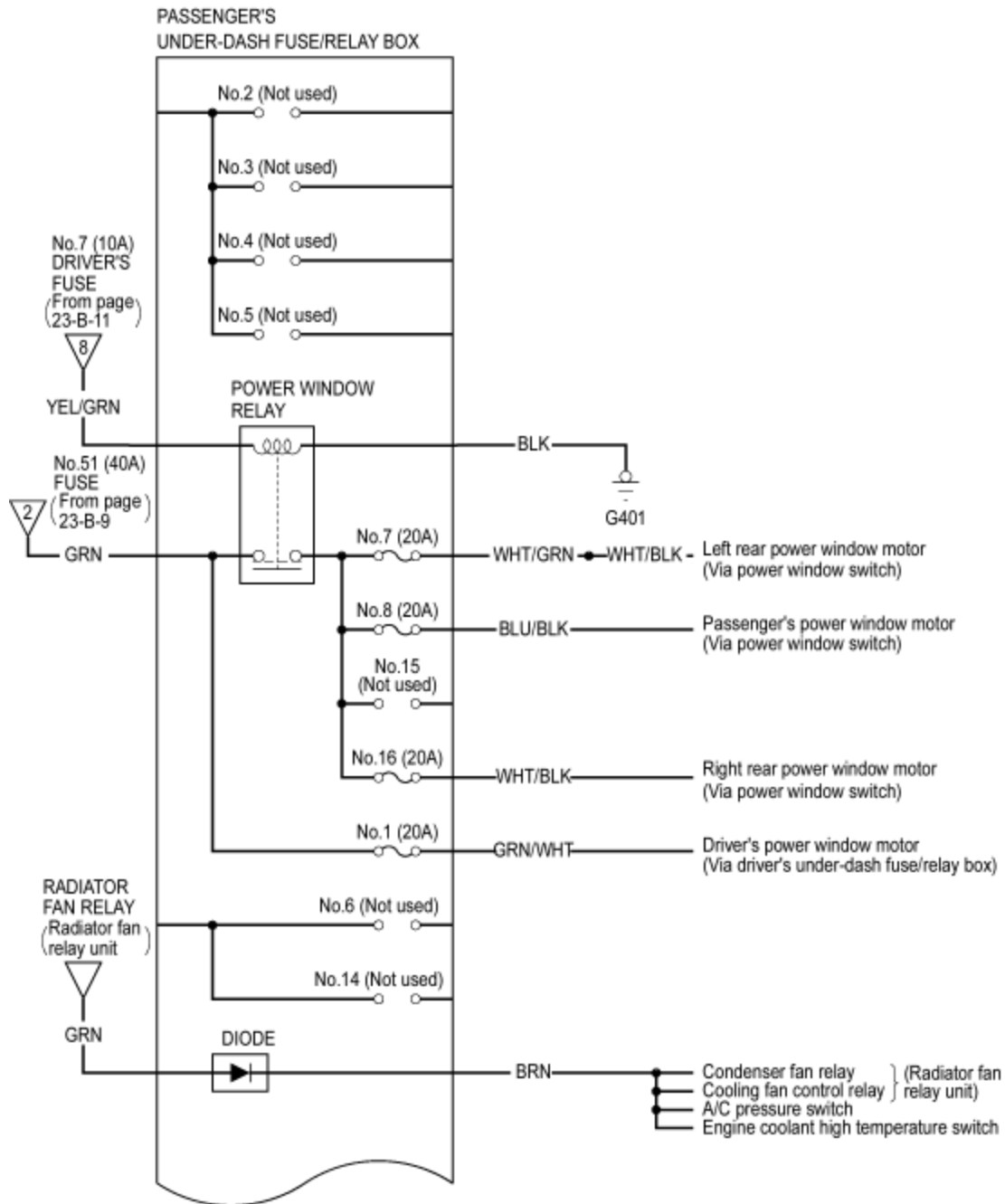


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(See Page 23-B-11)

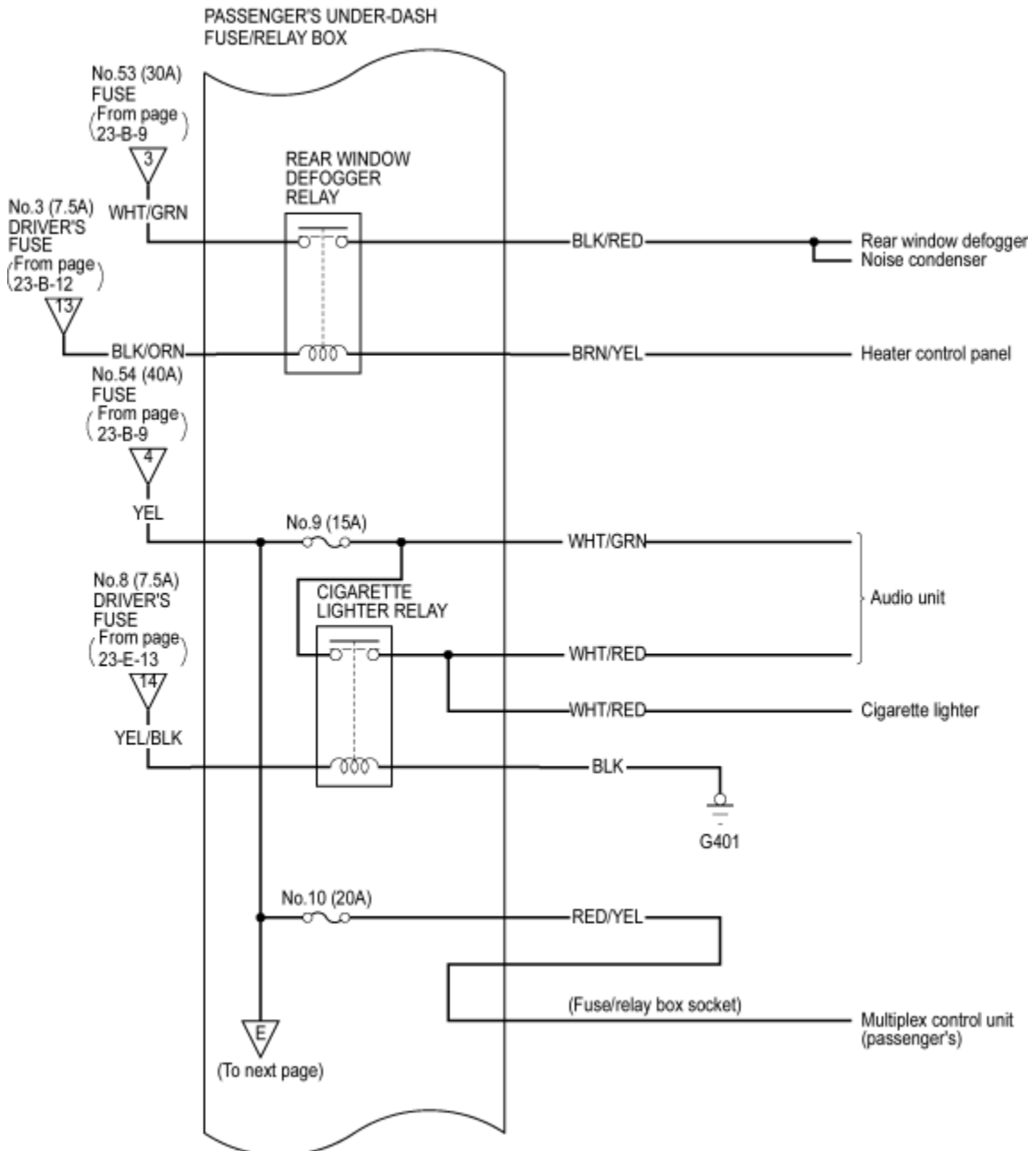
(See Page 23-B-15)

(See Page 23-B-16)



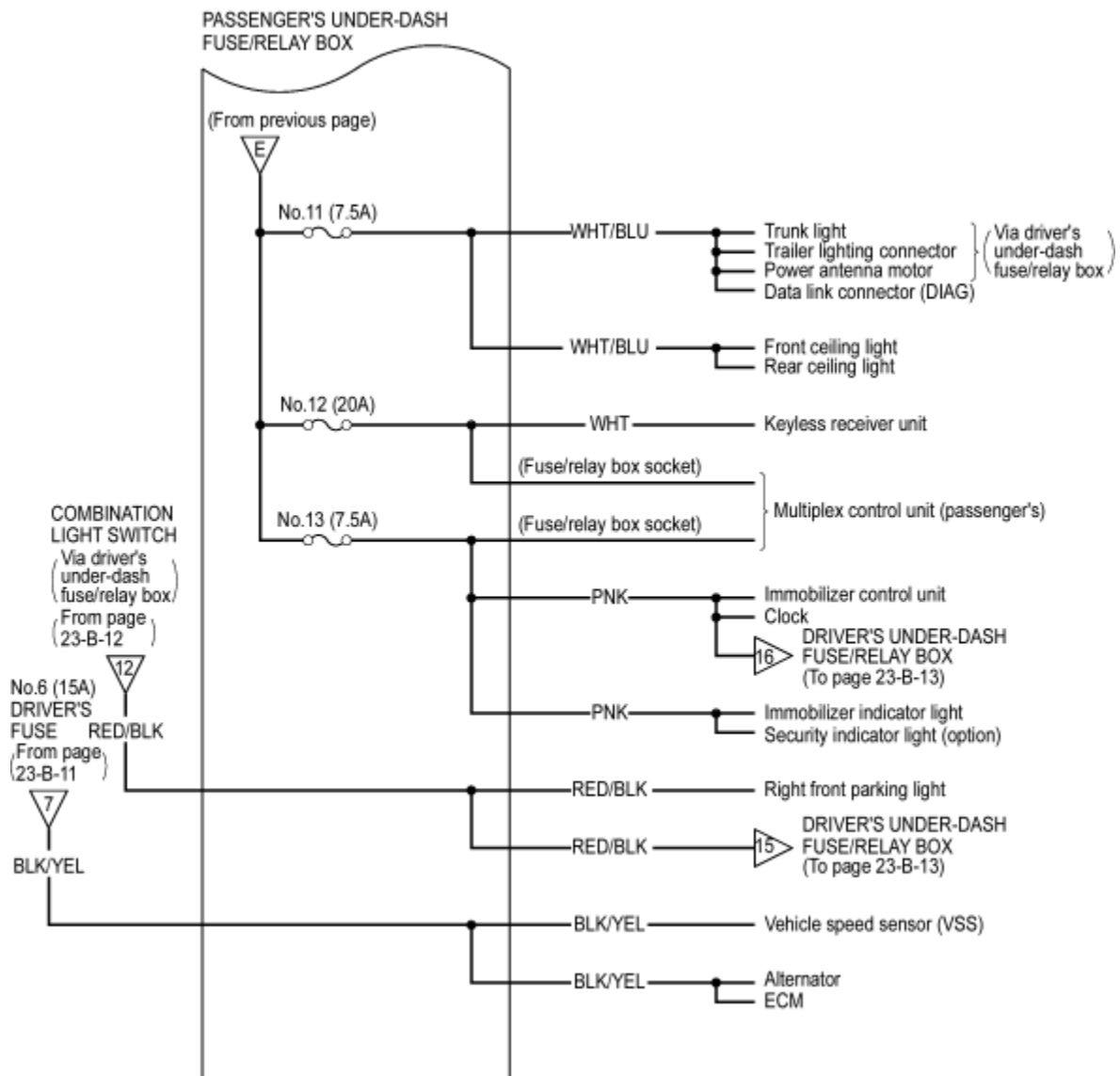
To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-9)
- (See Page 23-B-11)



To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-9)
- (See Page 23-B-12)
- (See Page 23-B-13)

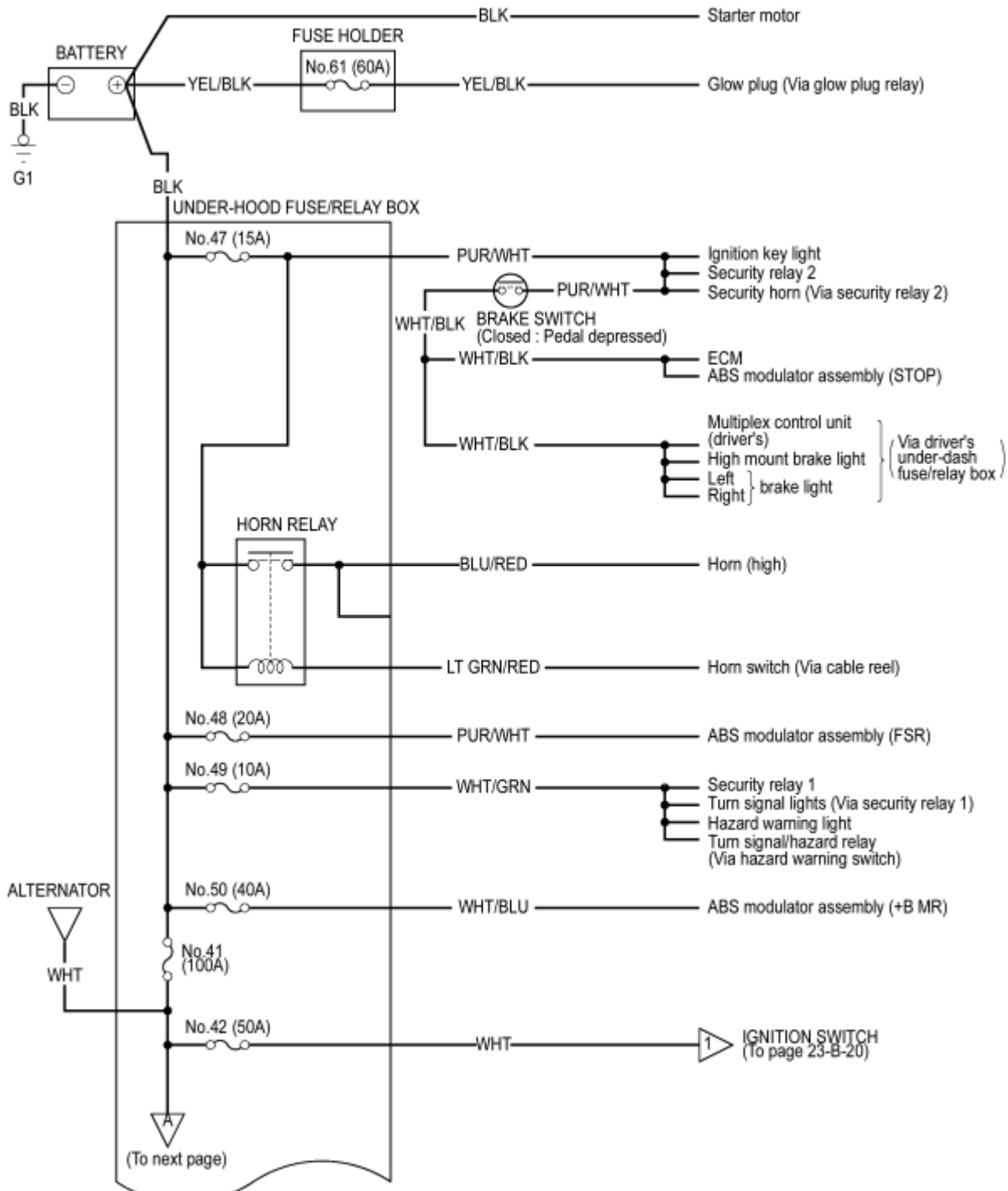


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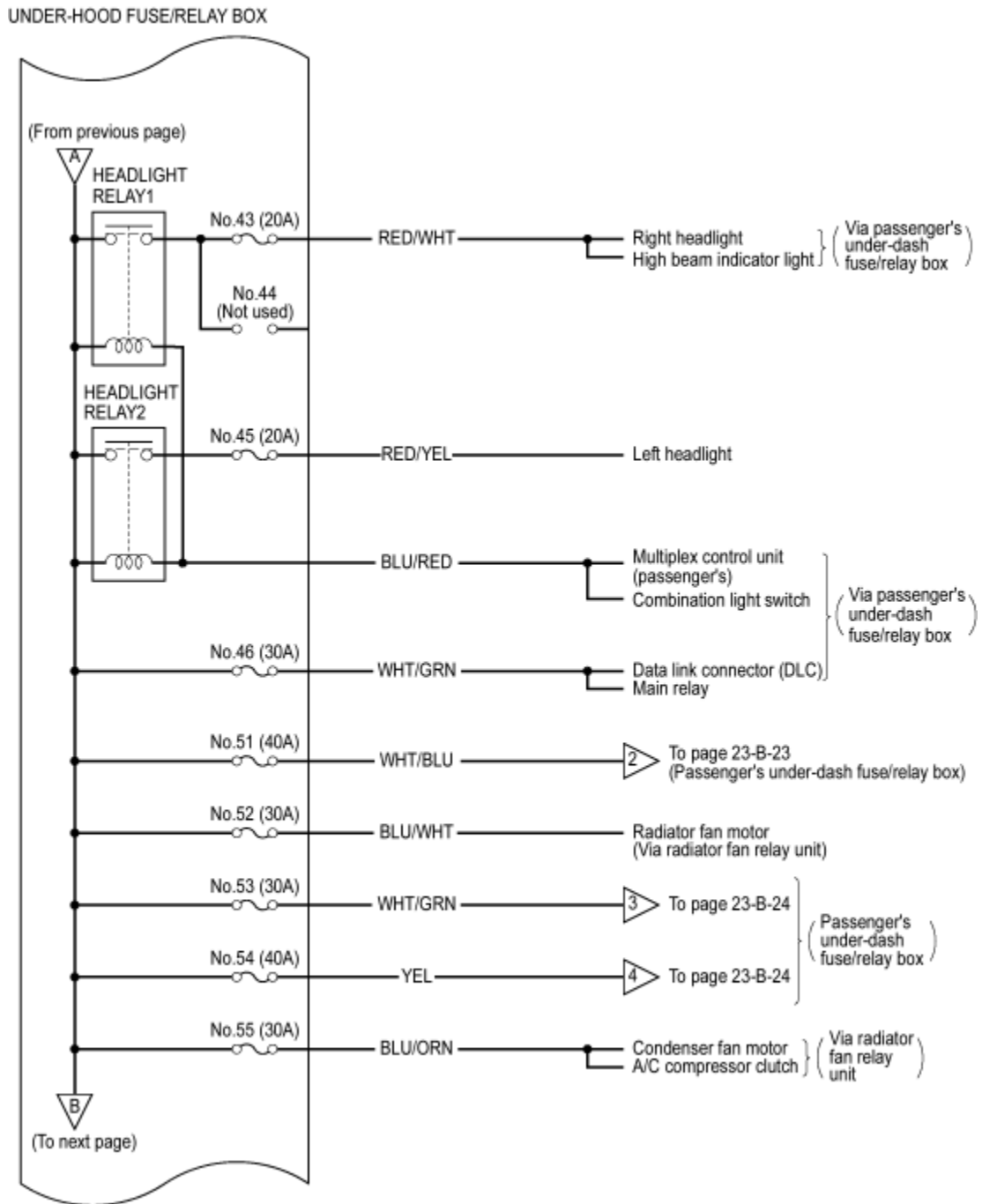
[\(See Page 23-B-11\)](#)

[\(See Page 23-B-12\)](#)

[\(See Page 23-B-13\)](#)



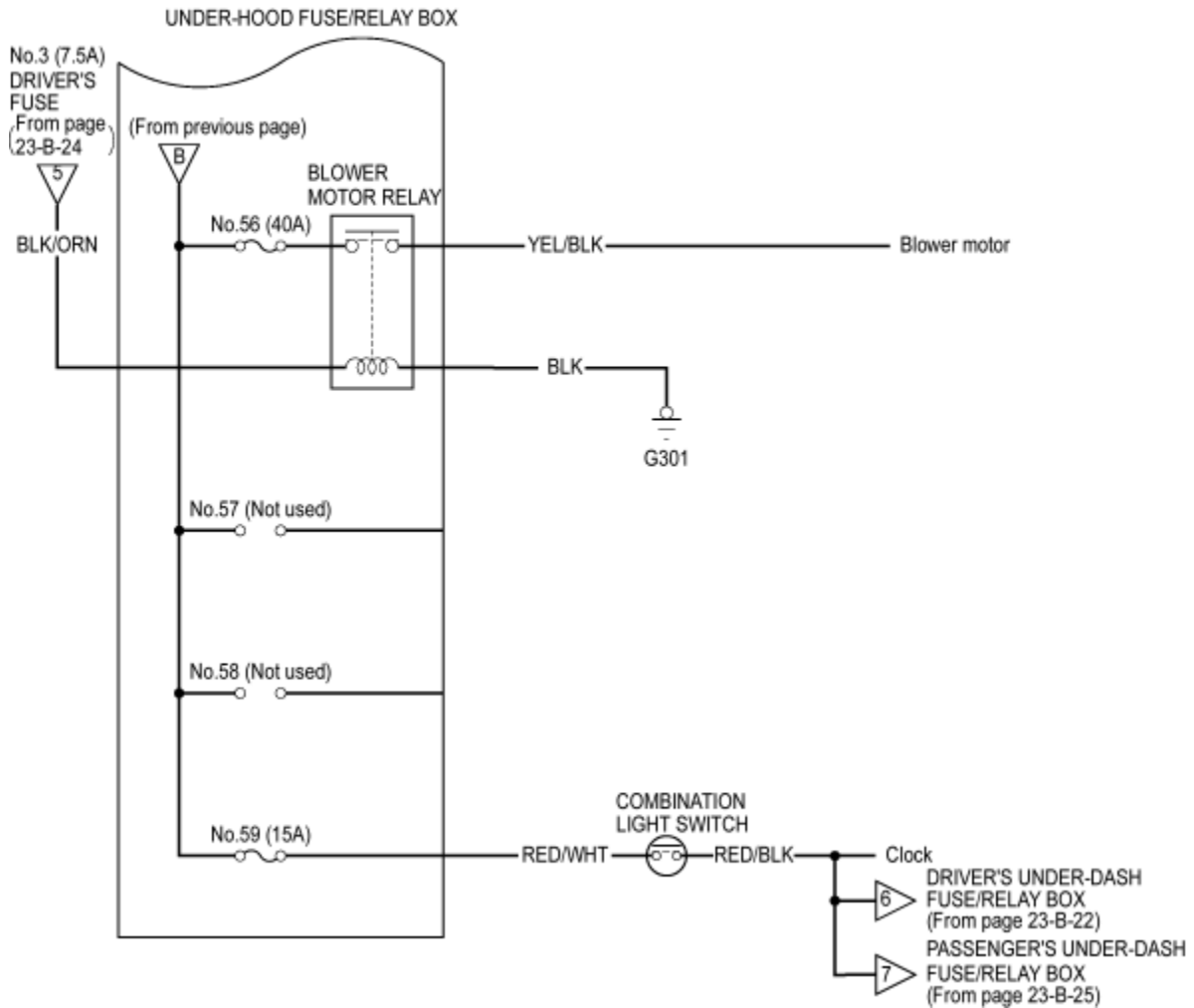
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(See Page 23-B-20)



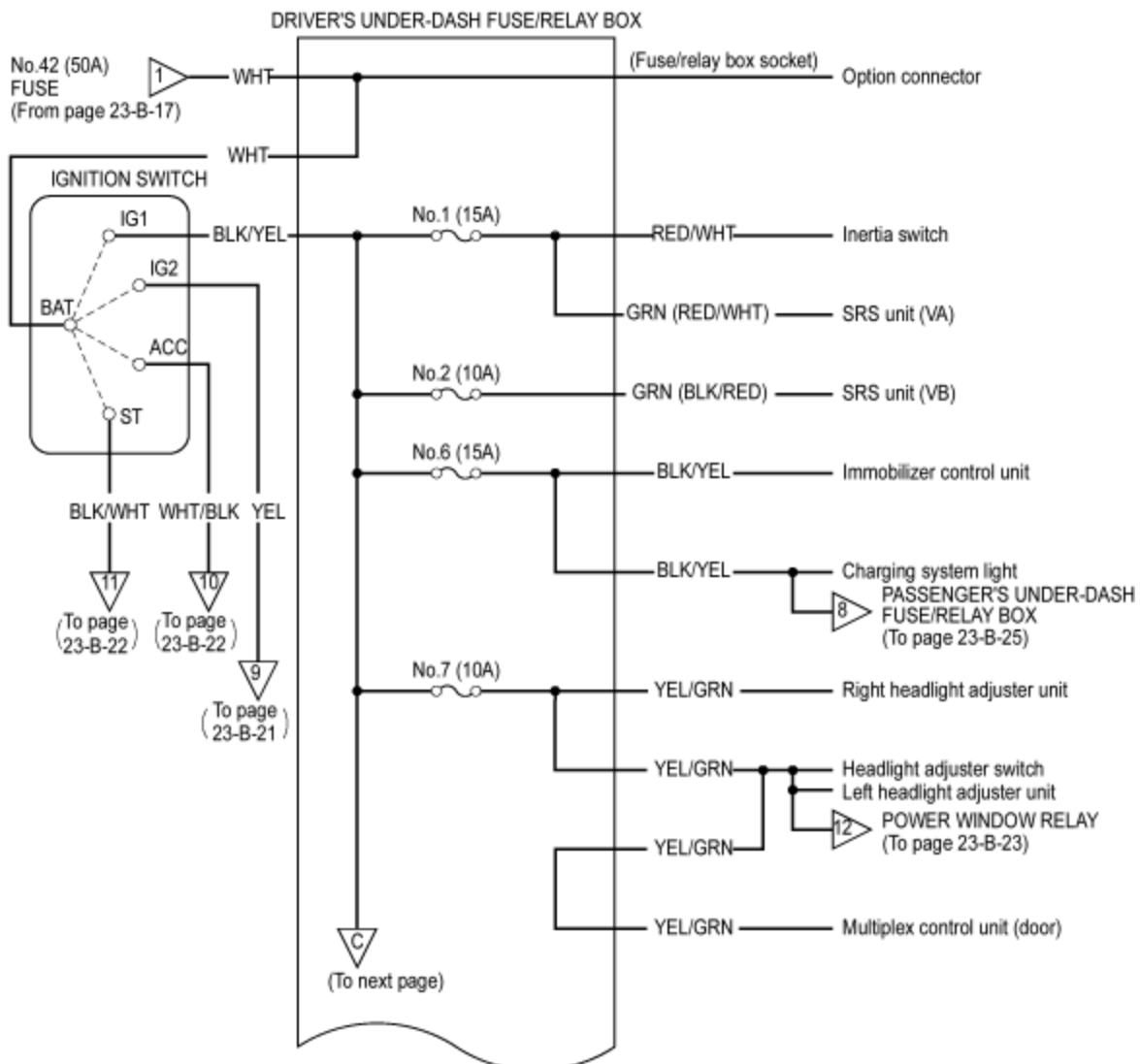
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(See Page 23-B-23)

(See Page 23-B-24)

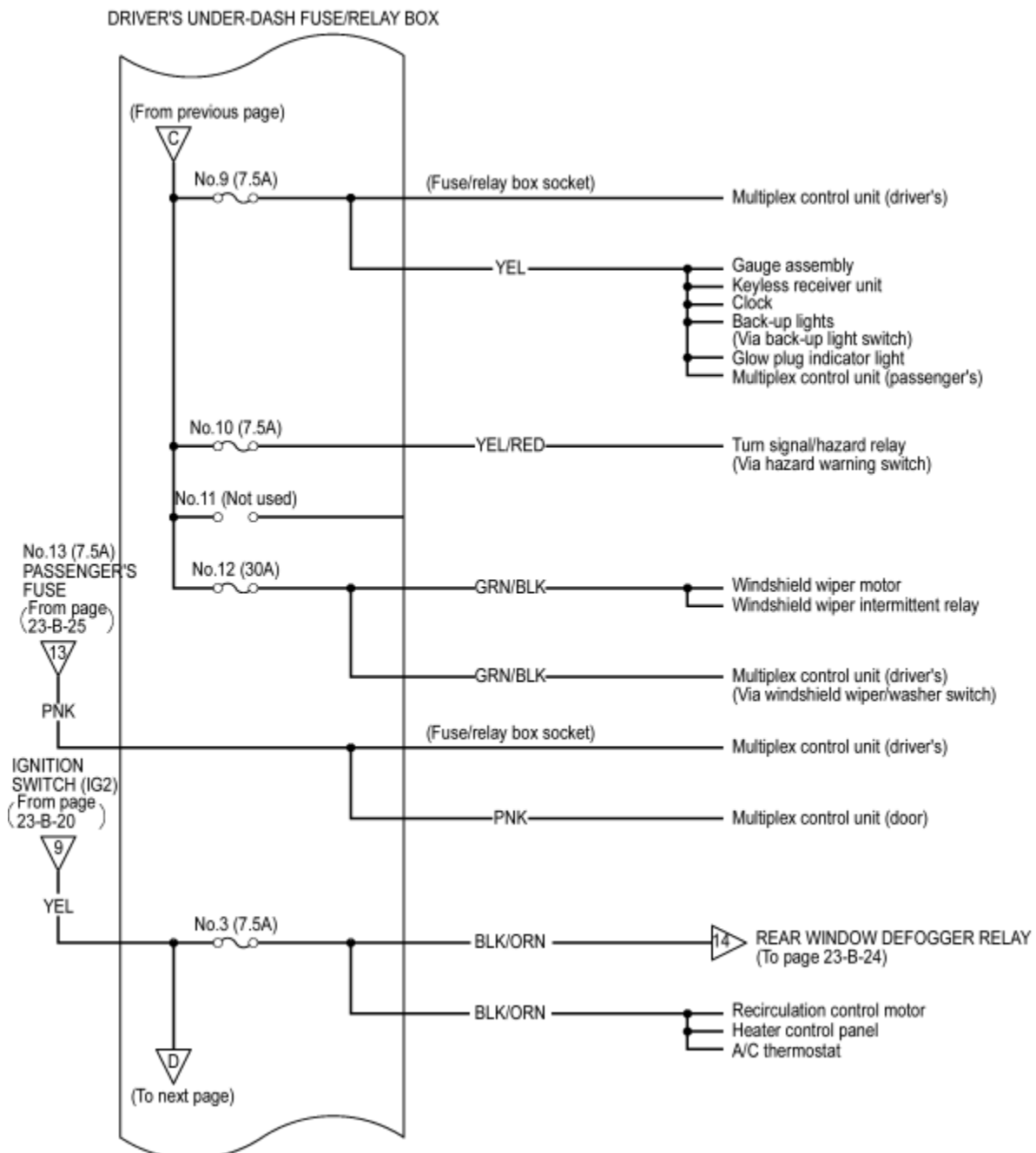


To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-22)
(See Page 23-B-24)
(See Page 23-B-25)



To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-17)
- (See Page 23-B-21)
- (See Page 23-B-22)
- (See Page 23-B-23)

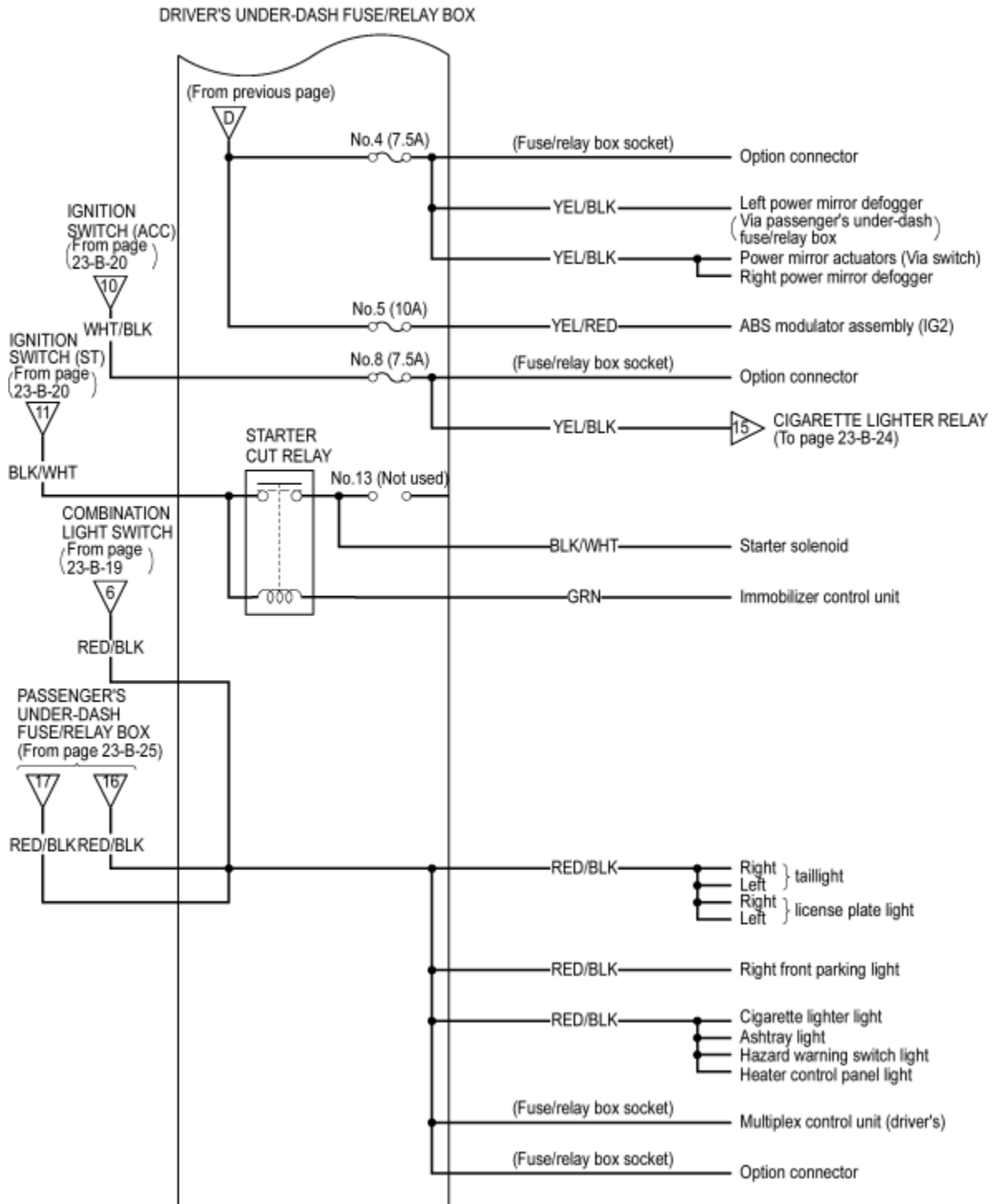


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(See Page 23-B-20)

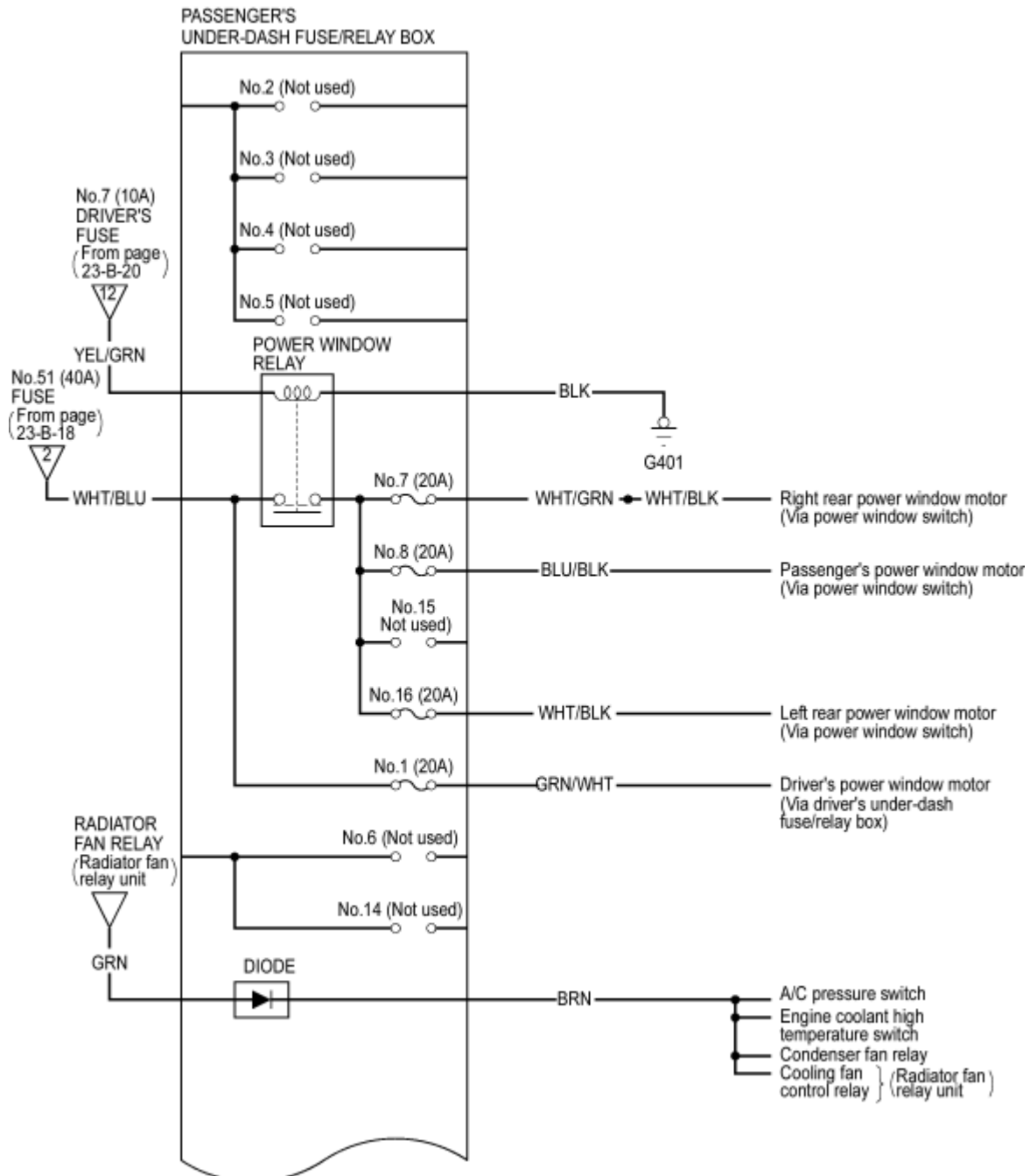
(See Page 23-B-24)

(See Page 23-B-25)



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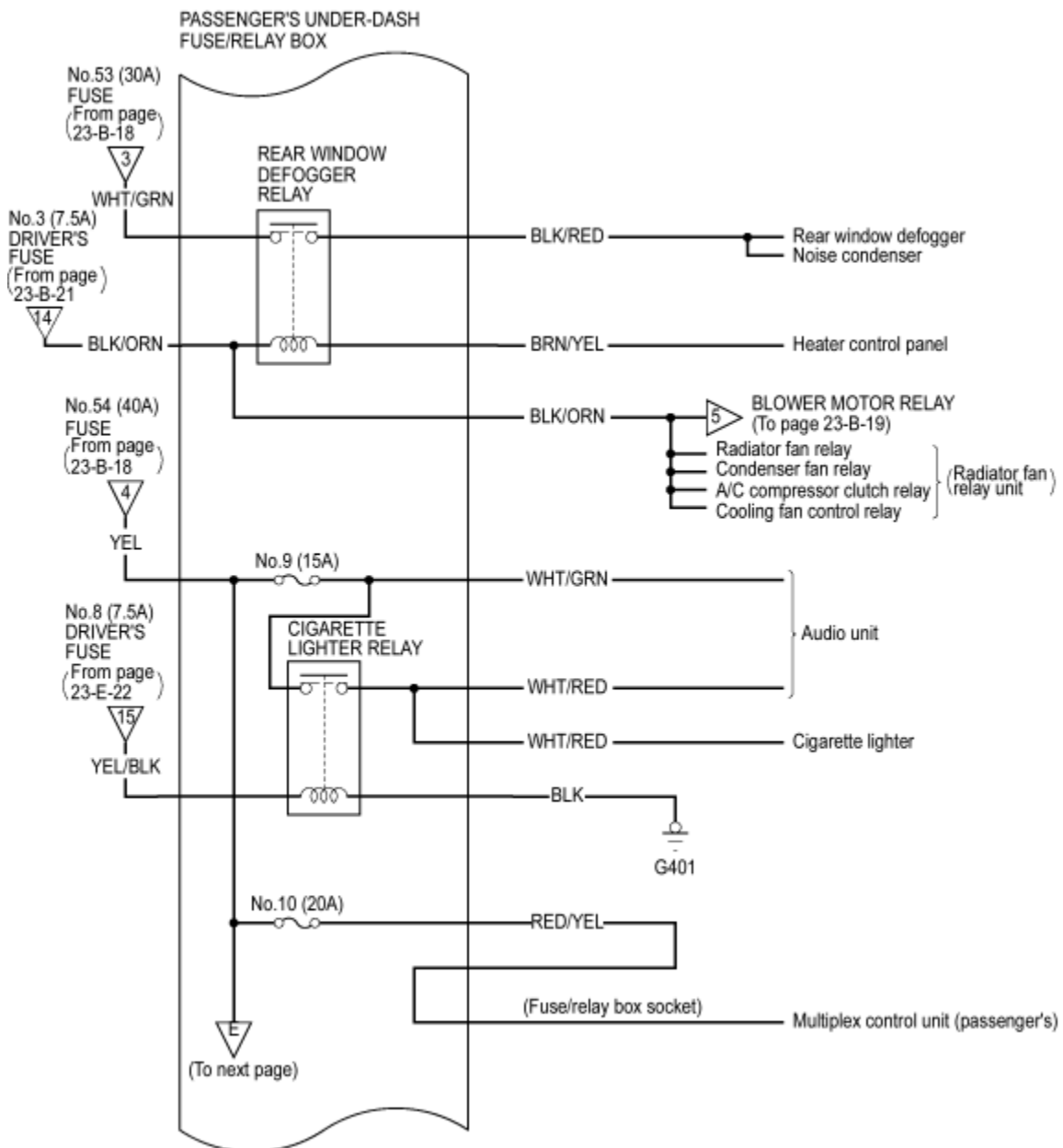
- (See Page 23-B-11)
- (See Page 23-B-19)
- (See Page 23-B-20)
- (See Page 23-B-24)
- (See Page 23-B-25)



To go to the pages referenced on the diagram above, click on the following:

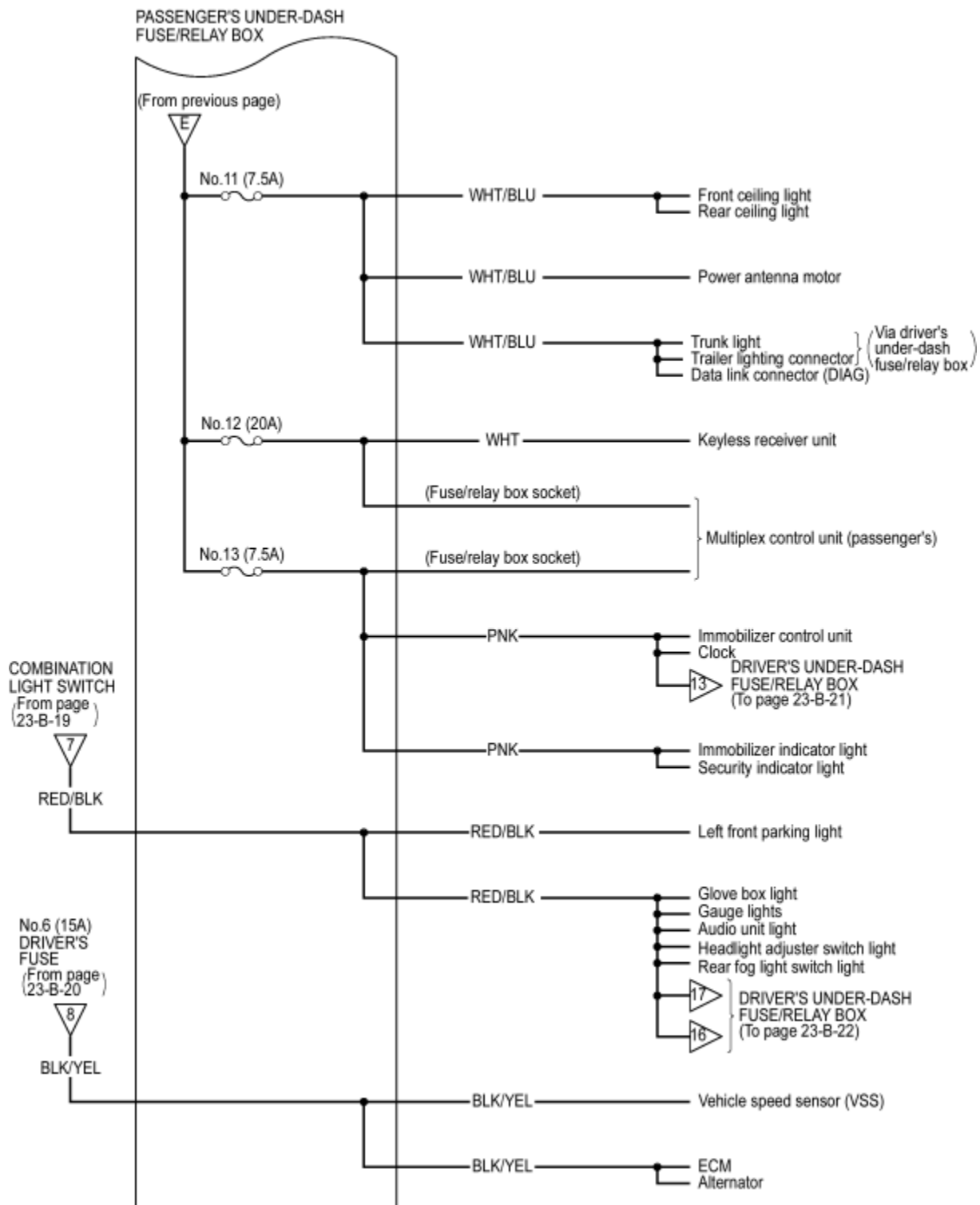
(See Page 23-B-18)

(See Page 23-B-20)



To go to the pages referenced on the diagram above, click on the following:

- (See Page 23-B-18)
- (See Page 23-B-19)
- (See Page 23-B-21)
- (See Page 23-B-22)



To go to the pages referenced on the diagram above, click on the following:

(See Page 23-B-19)

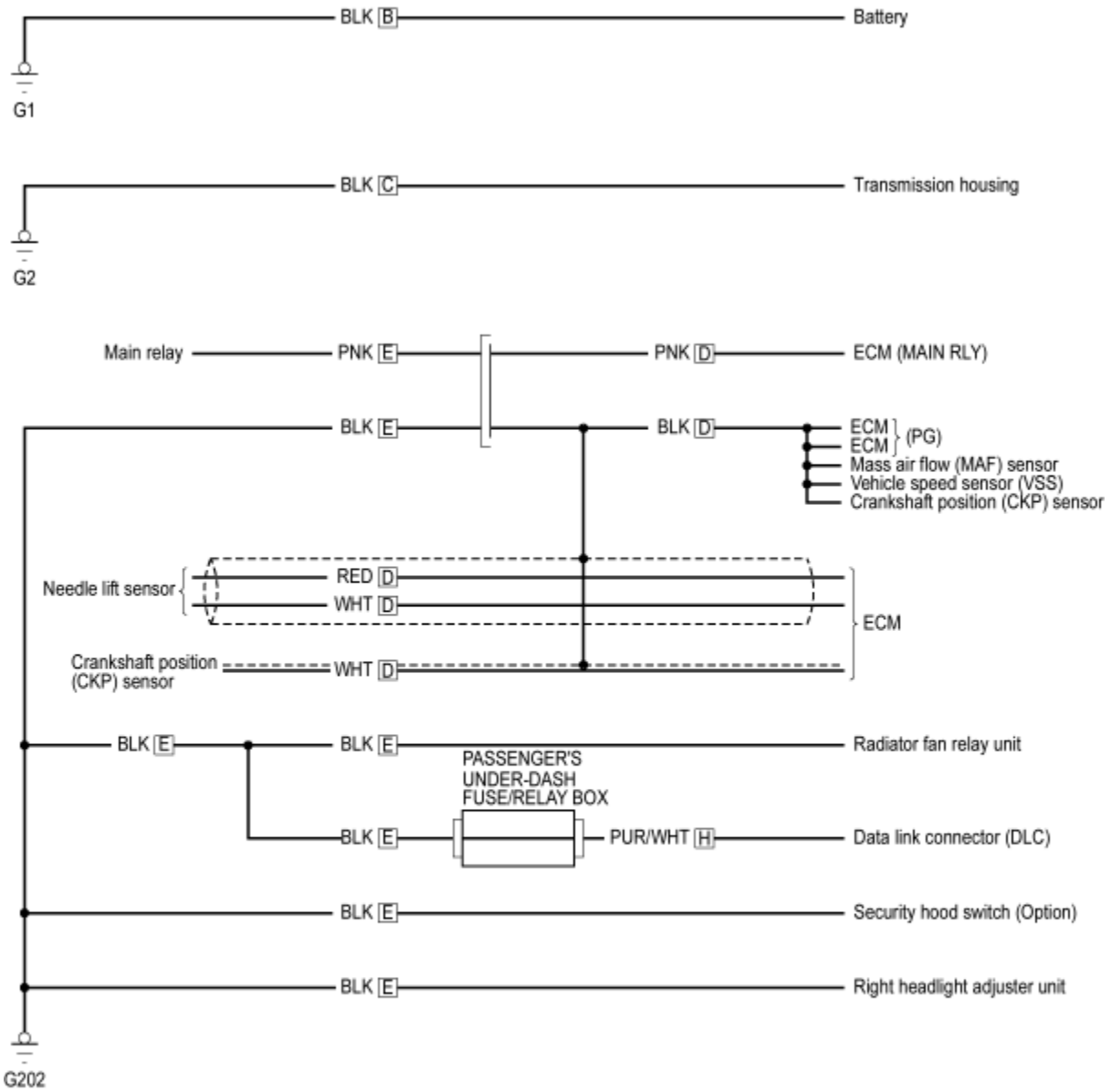
(See Page 23-B-20)

(See Page 23-B-28)

(See Page 23-B-22)

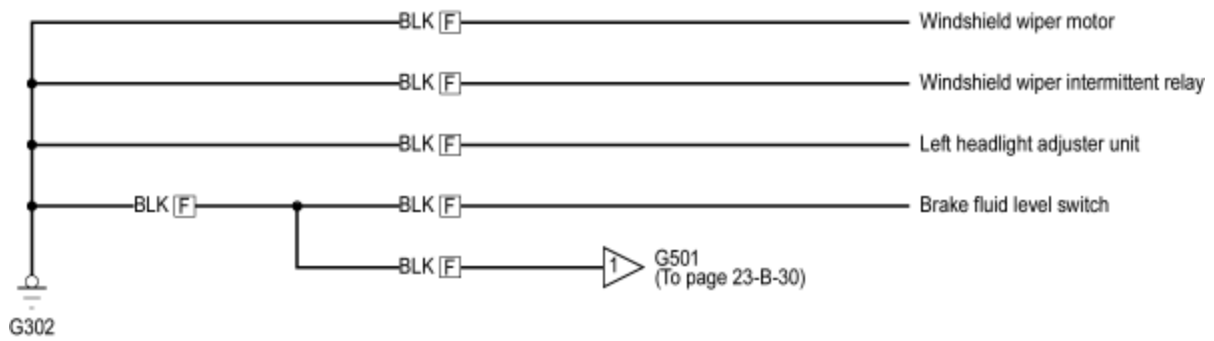
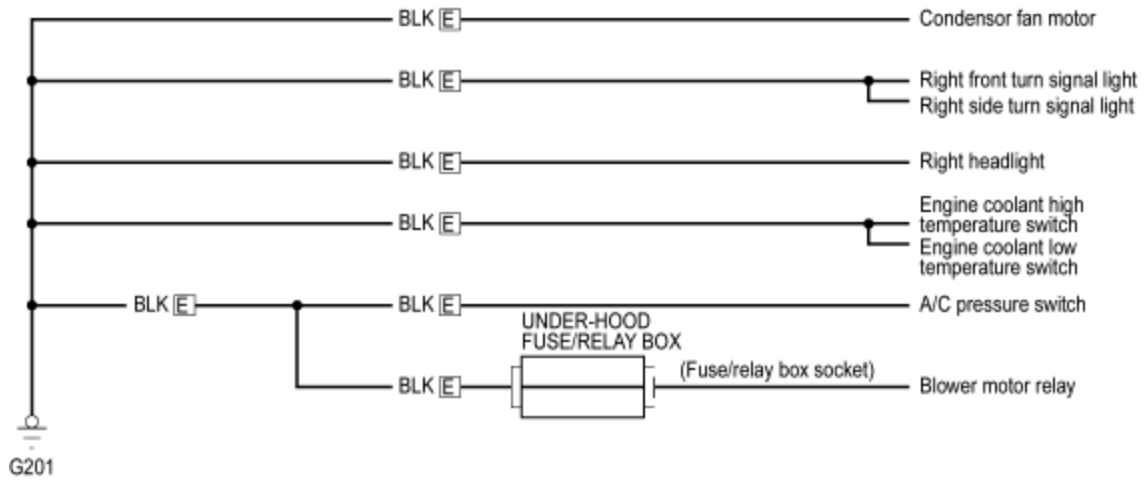
Ground Distribution
Circuit Identification (LHD type)

23-B-26

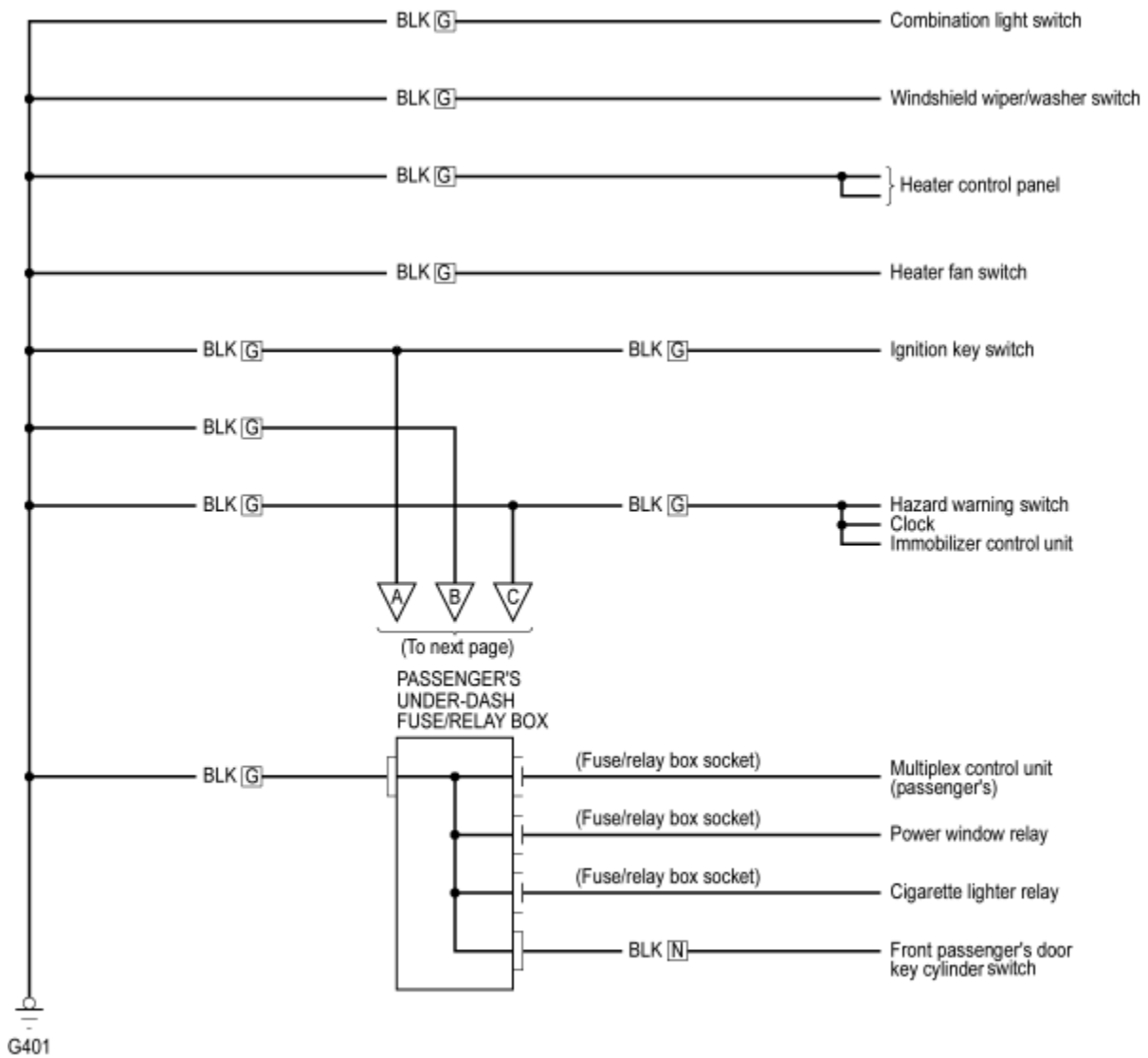


[B] : Battery ground cable
 [C] : Engine ground cable
 [D] : Engine wire harness

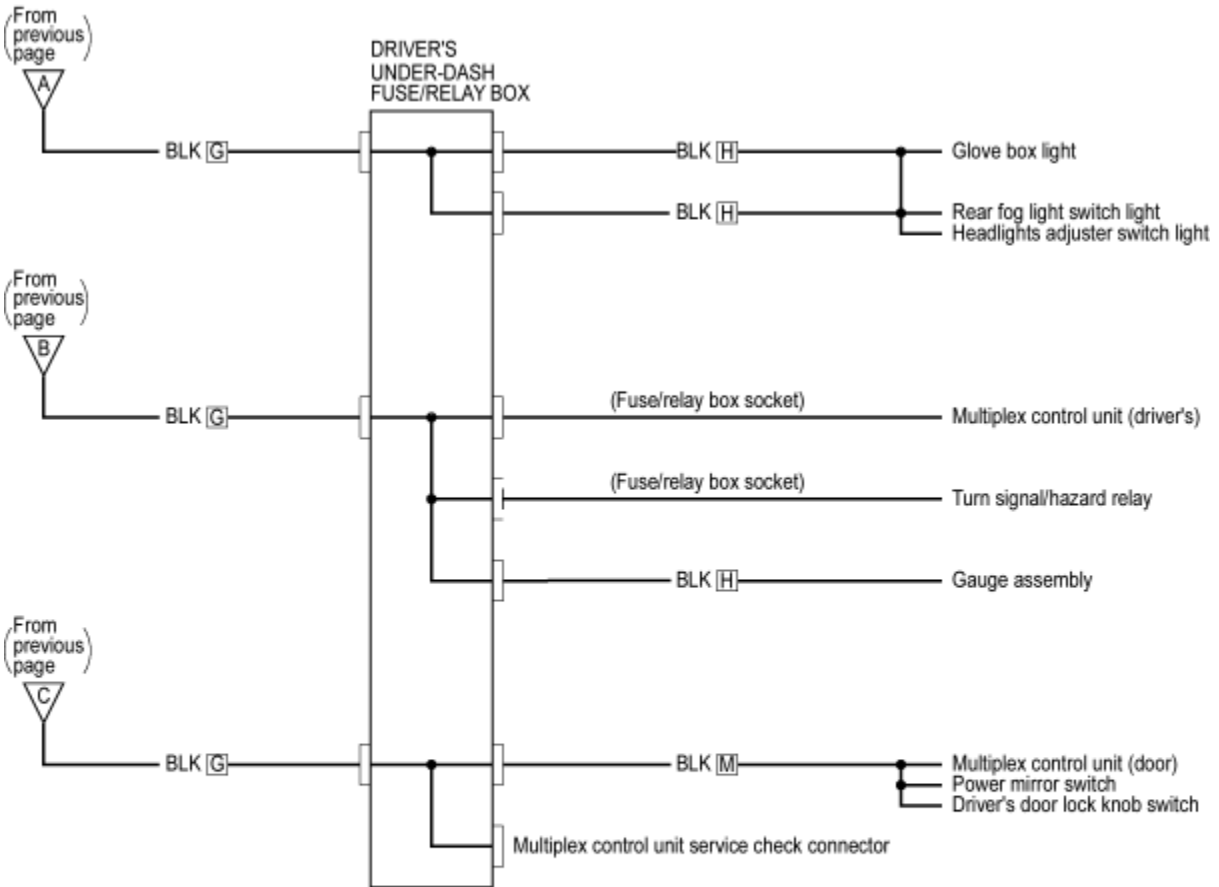
[E] : Right engine compartment wire harness ----- : Shielding
 [F] : Left engine compartment wire harness
 [H] : Dashboard wire harness



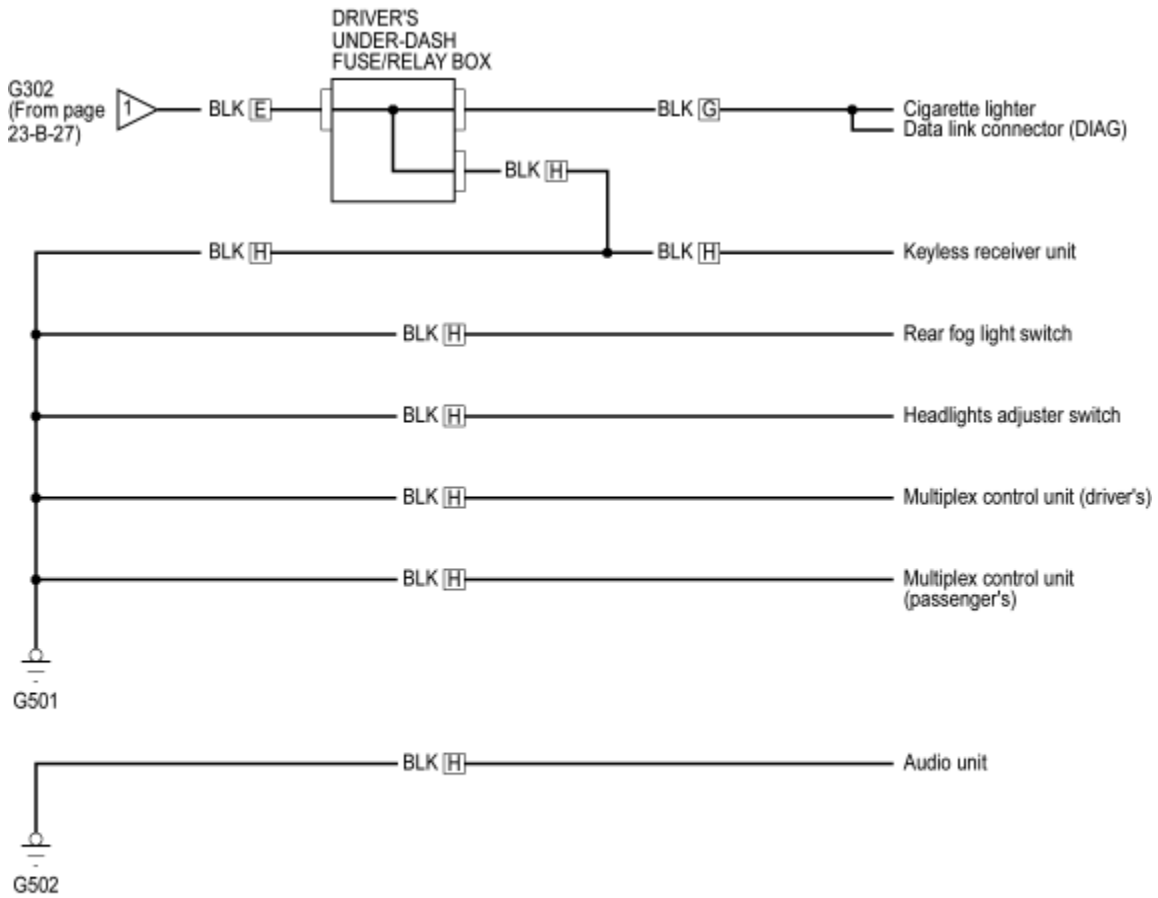
[E] : Right engine compartment wire harness
 [F] : Left engine compartment wire harness



[G] : Steering beam wire harness
 [N] : Front passenger's door wire harness



- [G] : Steering beam wire harness
- [H] : Dashboard wire harness
- [M] : Driver's door wire harness

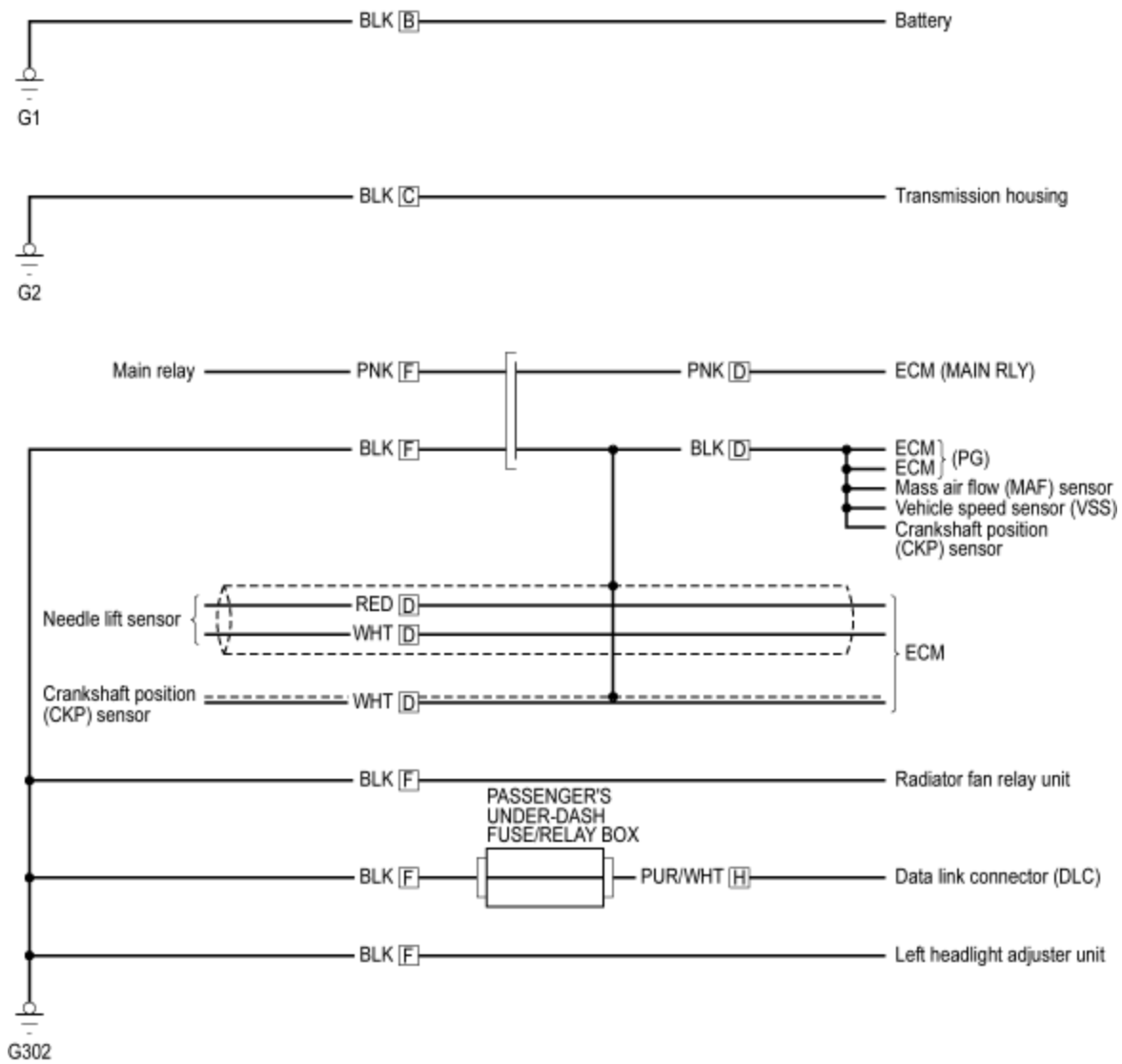


- [E] : Right engine compartment wire harness
- [G] : Steering beam wire harness
- [H] : Dashboard wire harness

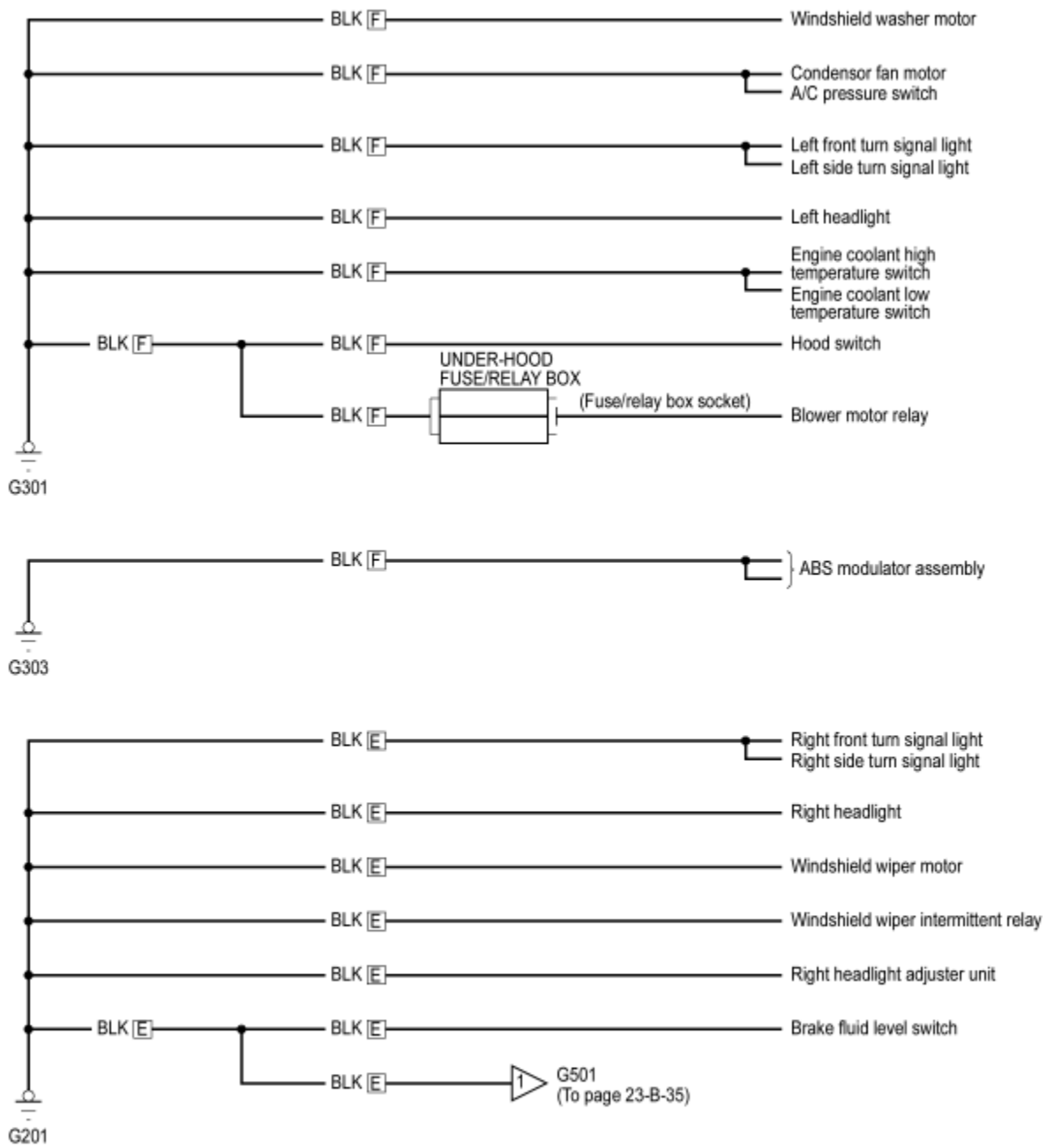
To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-27)

Ground Distribution
Circuit Identification (RHD type)

23-B-31

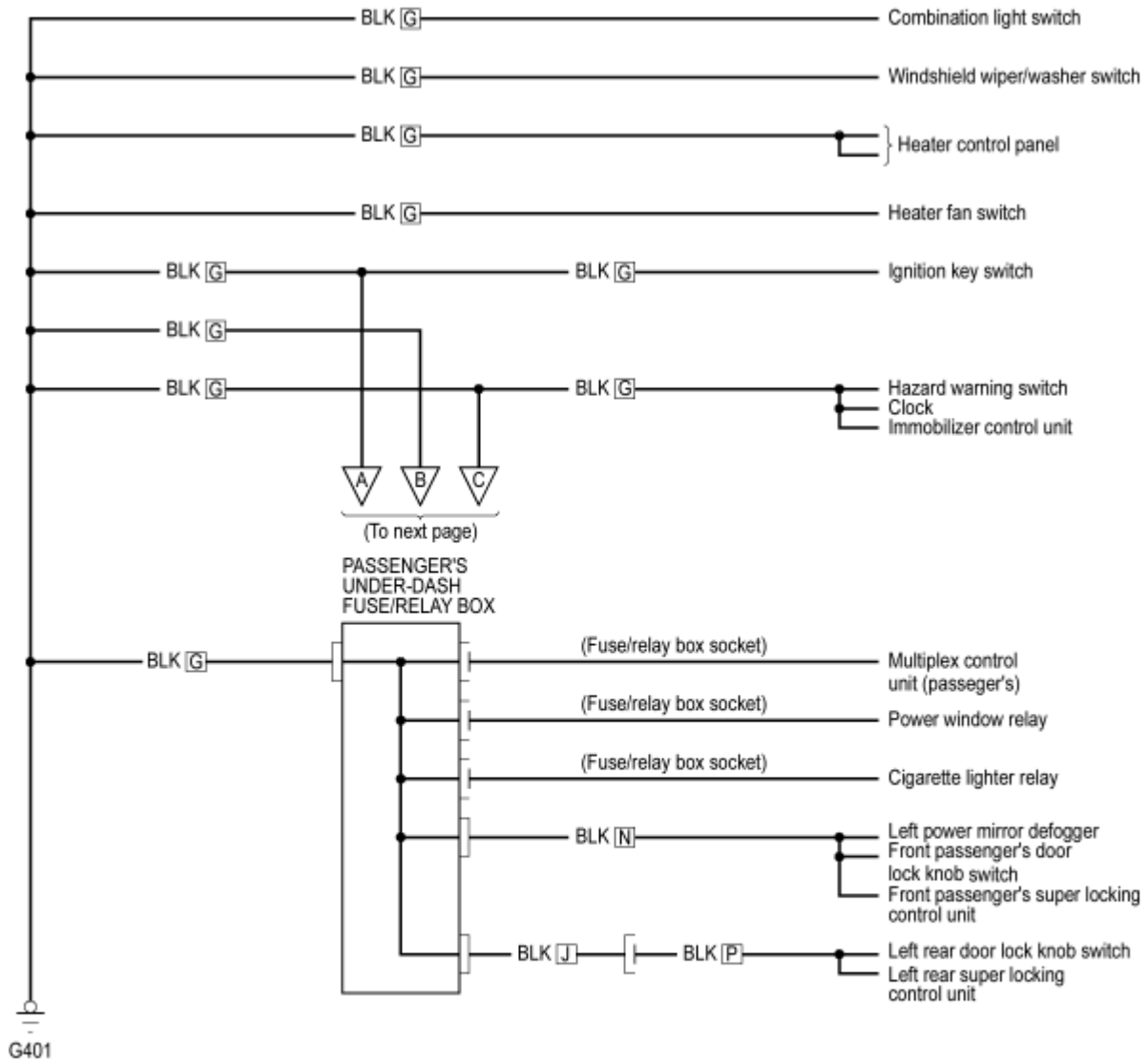


- [B] : Battery ground cable
- [C] : Engine ground cable
- [D] : Engine wire harness
- [F] : Left engine compartment wire harness
- [H] : Dashboard wire harness
- : Shielding

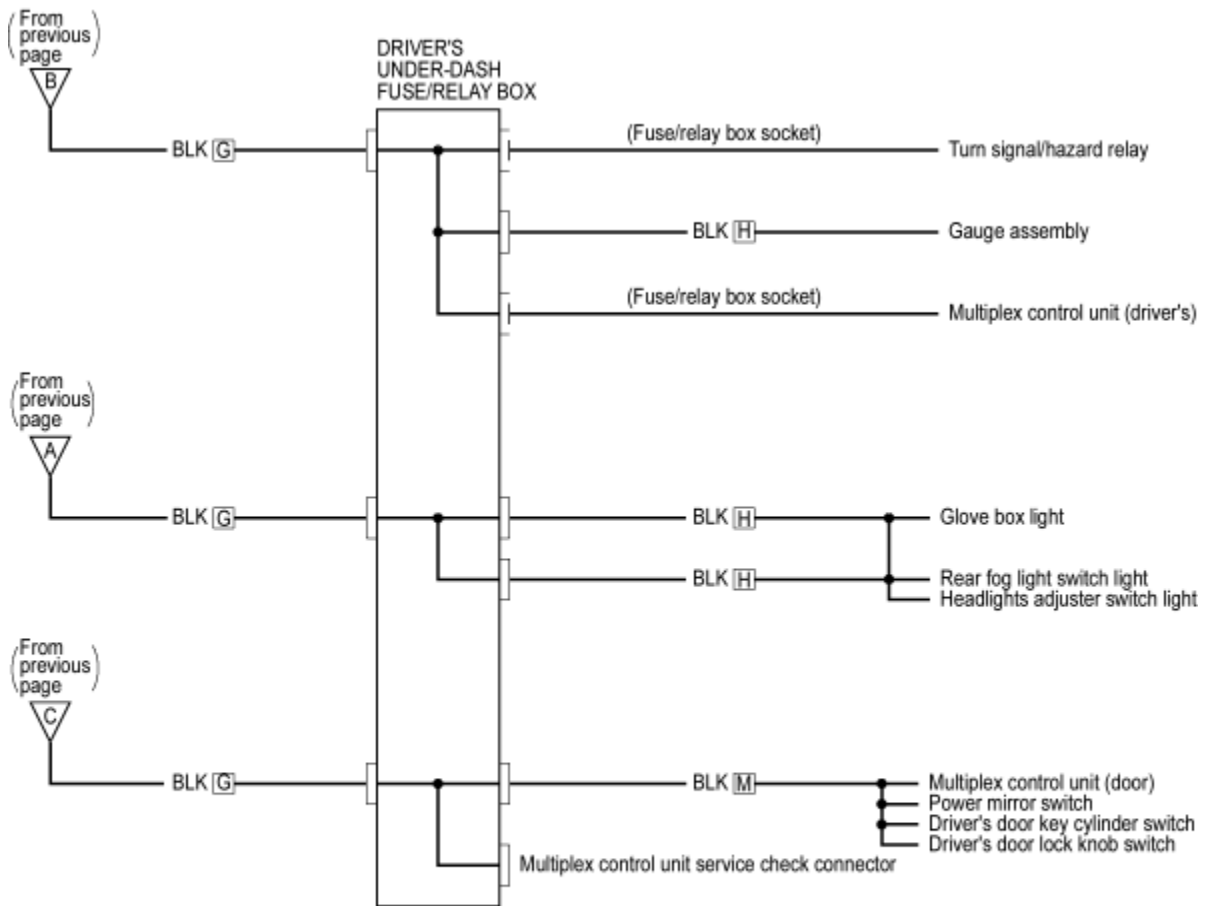


[E] : Right engine compartment wire harness
 [F] : Left engine compartment wire harness

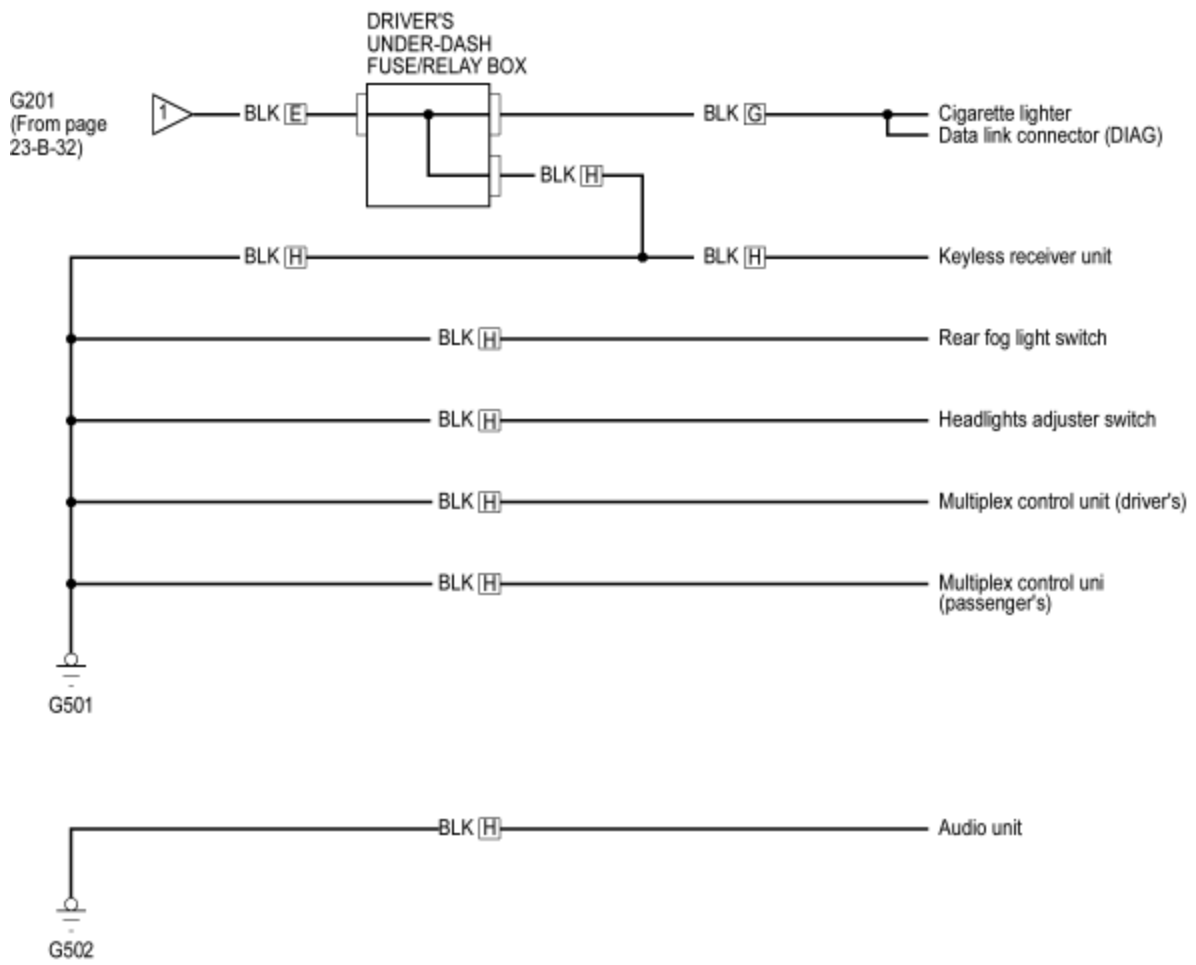
To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-35)



- [G] : Steering beam wire harness [P] : Left rear door wire harness
- [J] : Front passenger's side wire harness
- [N] : Front passenger's door wire harness



- G : Steering beam wire harness
- H : Dashboard wire harness
- M : Driver's door wire harness



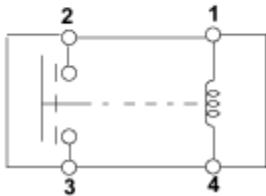
- [E] : Right engine compartment wire harness
- [G] : Steering beam wire harness
- [H] : Dashboard wire harness

To go to the pages referenced on the diagram above, click on the following:
(See Page 23-B-32)

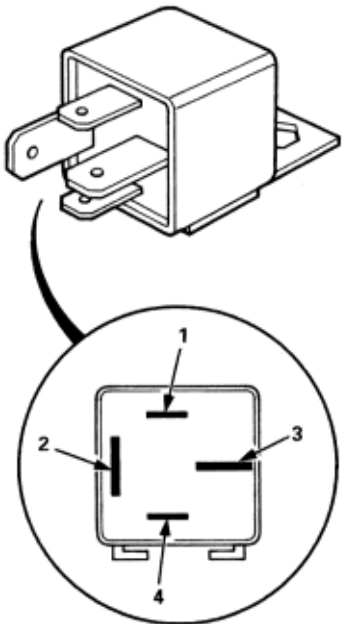
Normally-open type:

1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 2 and No. 3 terminals when power and ground are connected to the No. 1 and No. 4 terminals.
 - ♦ There should be no continuity between the No. 2 and No. 3 terminals when power is disconnected.

Terminal	2	3
Power (No.1-No.4)		
Disconnected		
Connected	○	○



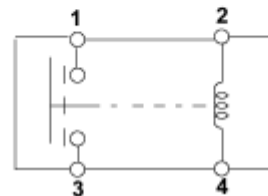
♦ Glow plug relay



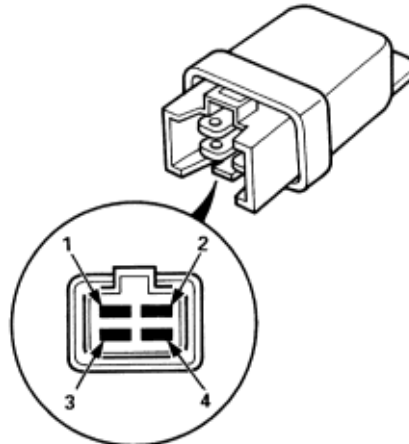
Normally-open type:

1. Check for continuity between the terminals.
 - ♦ There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
 - ♦ There should be continuity between the No. 2 and No. 3 terminals when power is disconnected.

Terminal	1	3
Power (No.2-No.4)		
Disconnected		
Connected	○	○



♦ Main relay

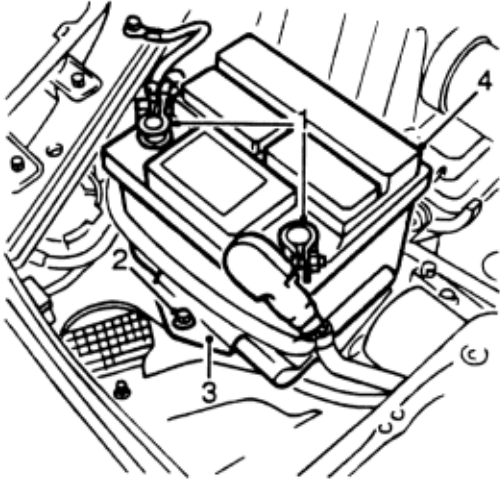


Battery - "L" Series

Service repair no. - 86.15.01

Remove

1. Disconnect both battery leads, earth lead first.



2. Remove bolt securing battery clamp to battery tray.
3. Remove battery clamp.
4. Release and remove battery from vehicle.

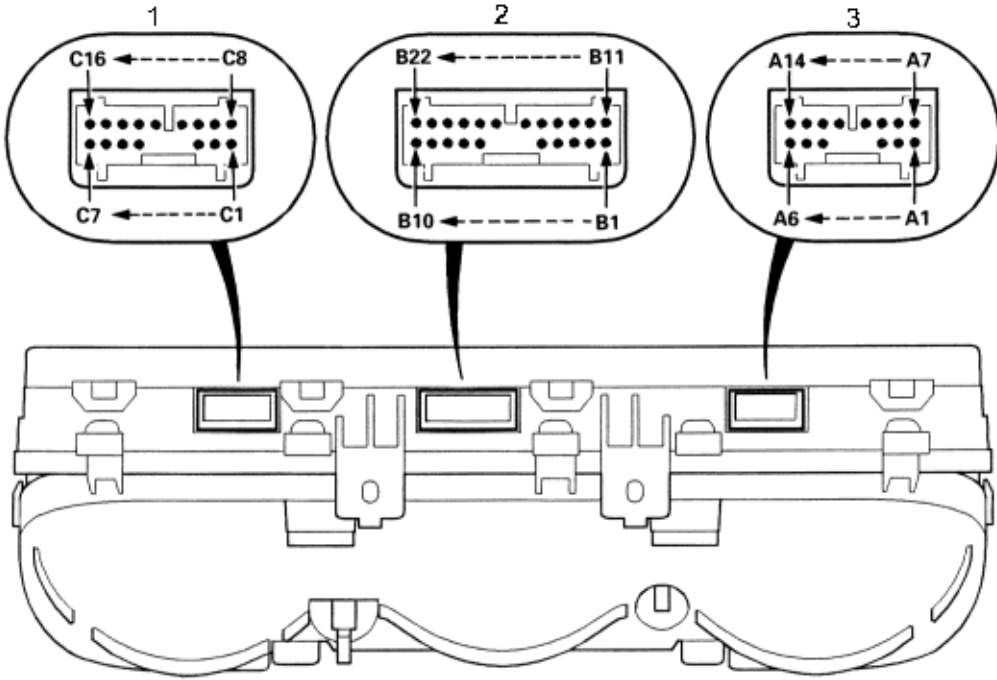
Refit

1. Clean battery terminals and coat with petroleum jelly.
2. Position battery to battery tray.
3. Fit battery clamp and secure with bolt.
4. Position and connect battery leads earth lead last.

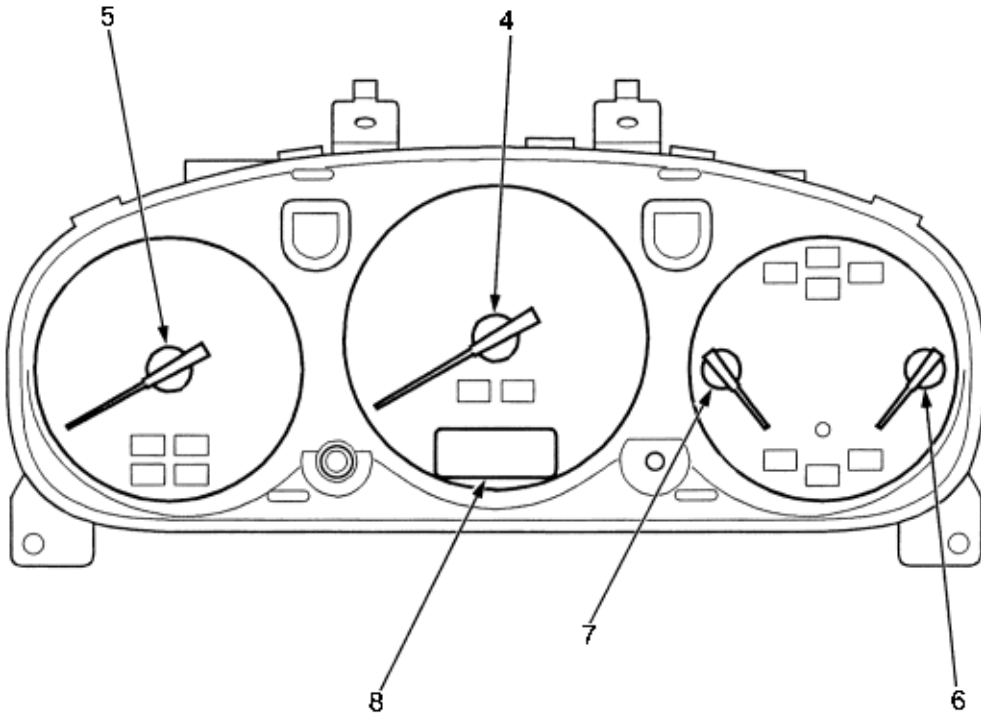
Gauges

Gauge/indicator/Terminal Location Index

23-C-2

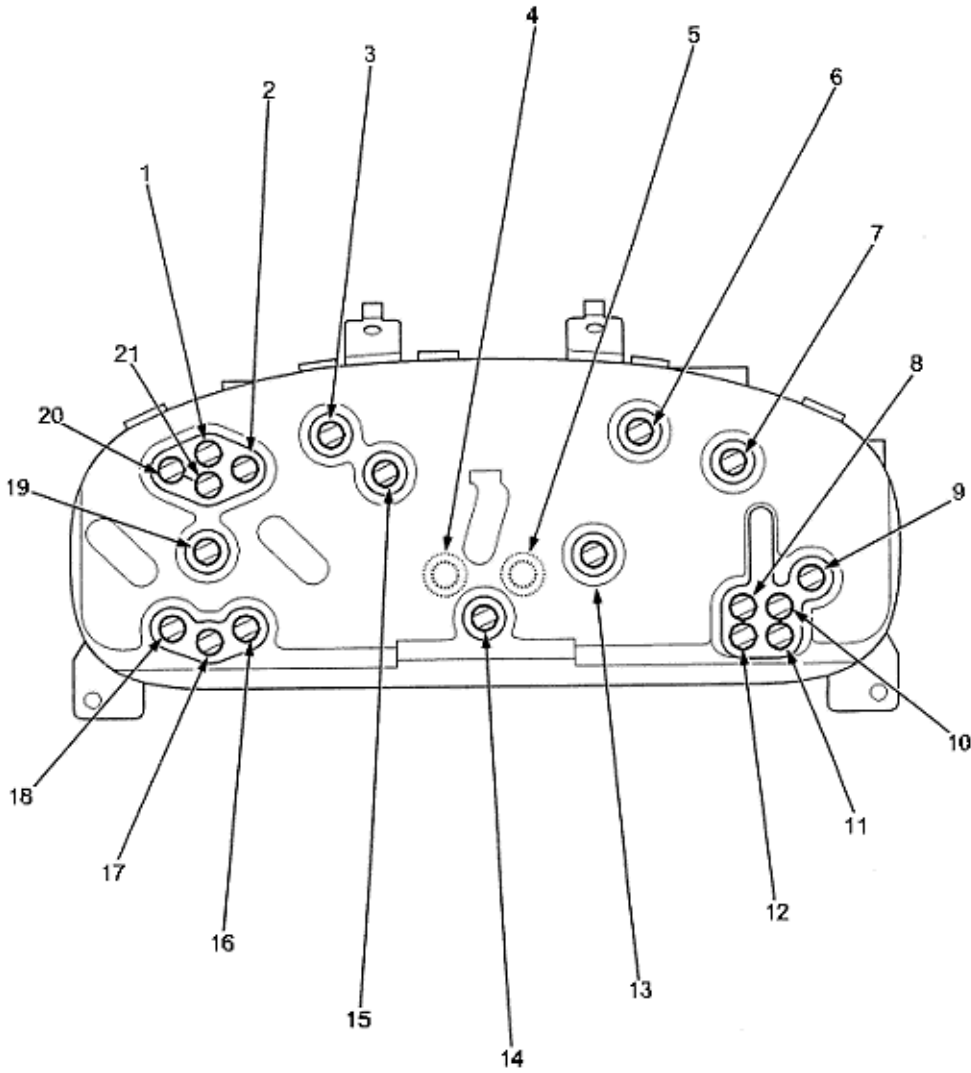


1. CONNECTOR "C"
2. CONNECTOR "B"
3. CONNECTOR "A"
4. SPEEDOMETER :
Indicates 60 km/h at 640 rpm (min-1)
or 60 mph at 1,030 rpm (min-1) of
the vehicle speed sensor (VSS)
5. TACHOMETER :
Indicates 100 rpm (min-1) at 200
pulses per minute of the ECM.
6. ENGINE COOLANT
TEMPERATURE (ECT) GAUGE
7. FUEL GAUGE
8. ODO/TRIP METER/OUTSIDE AIR
TEMPERATURE INDICATOR

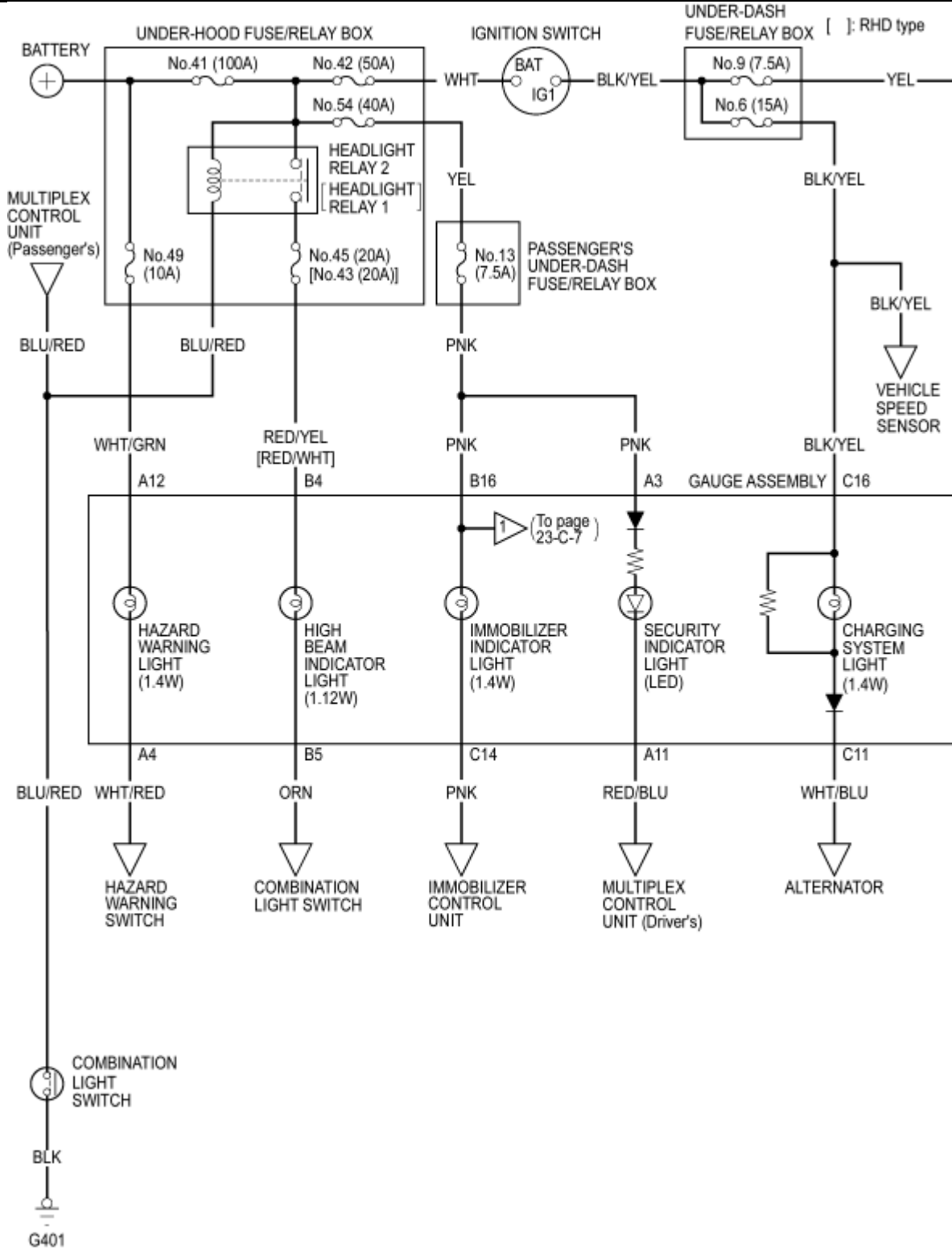


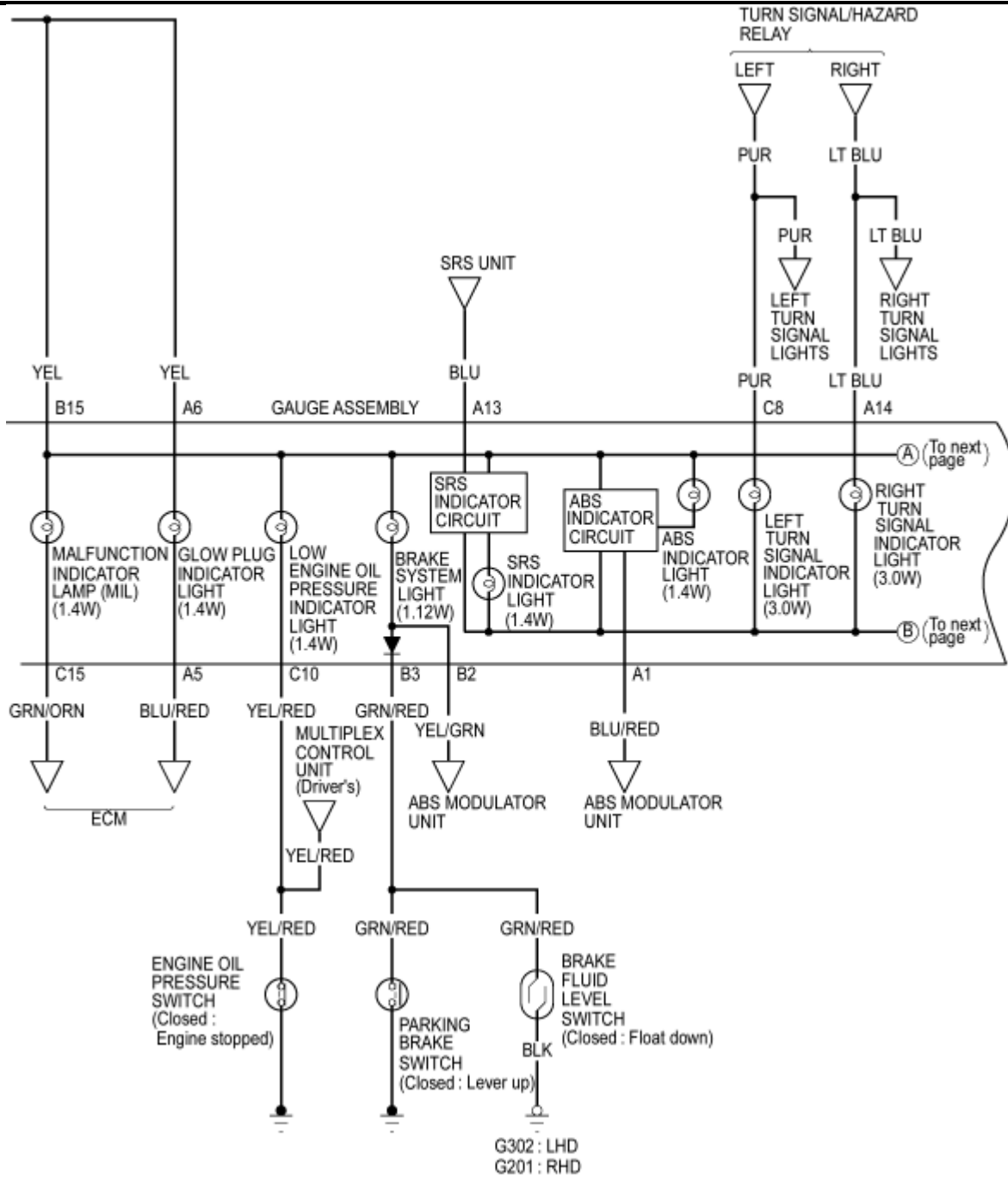
Gauges
Bulb Locations

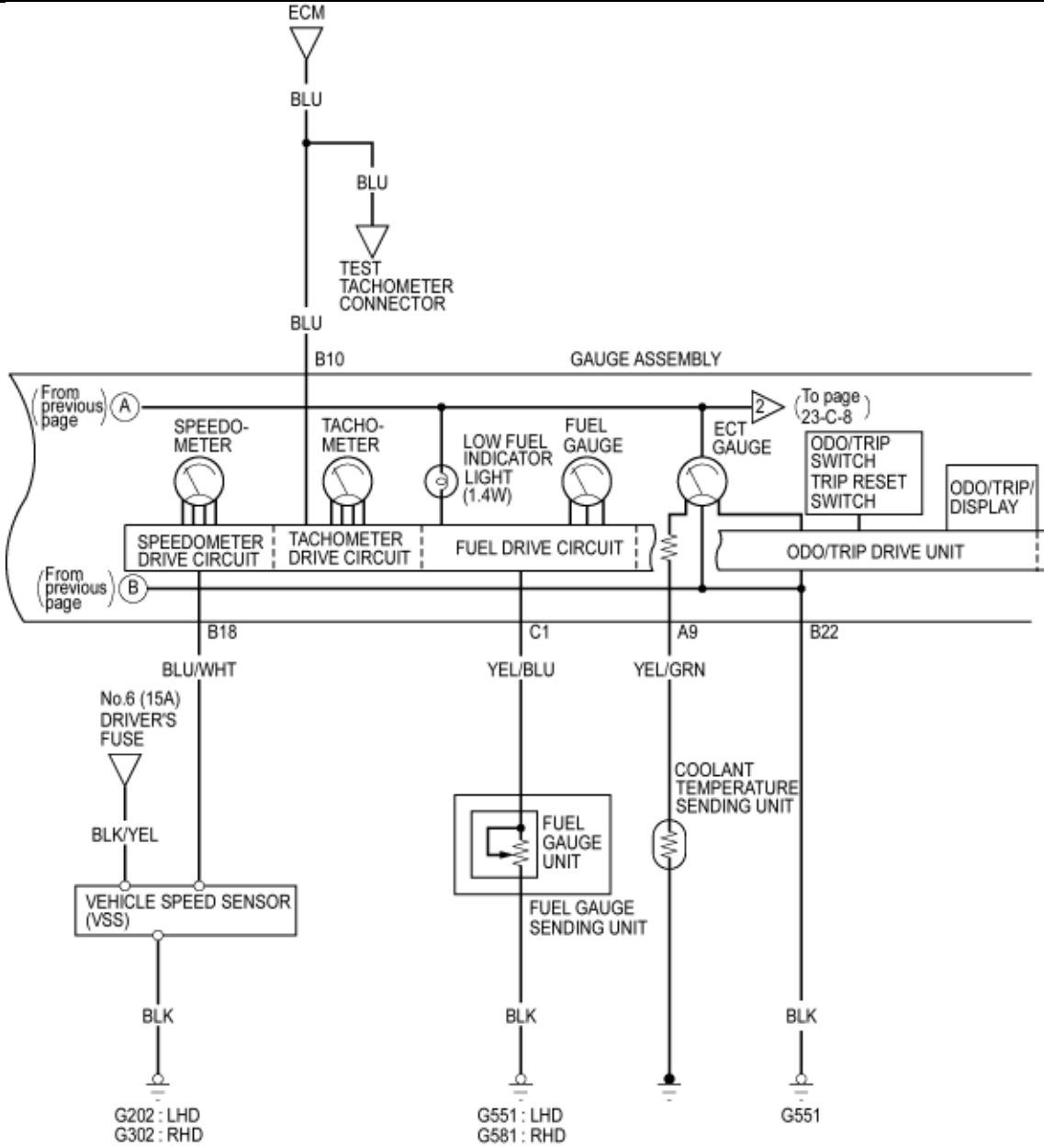
23-C-3

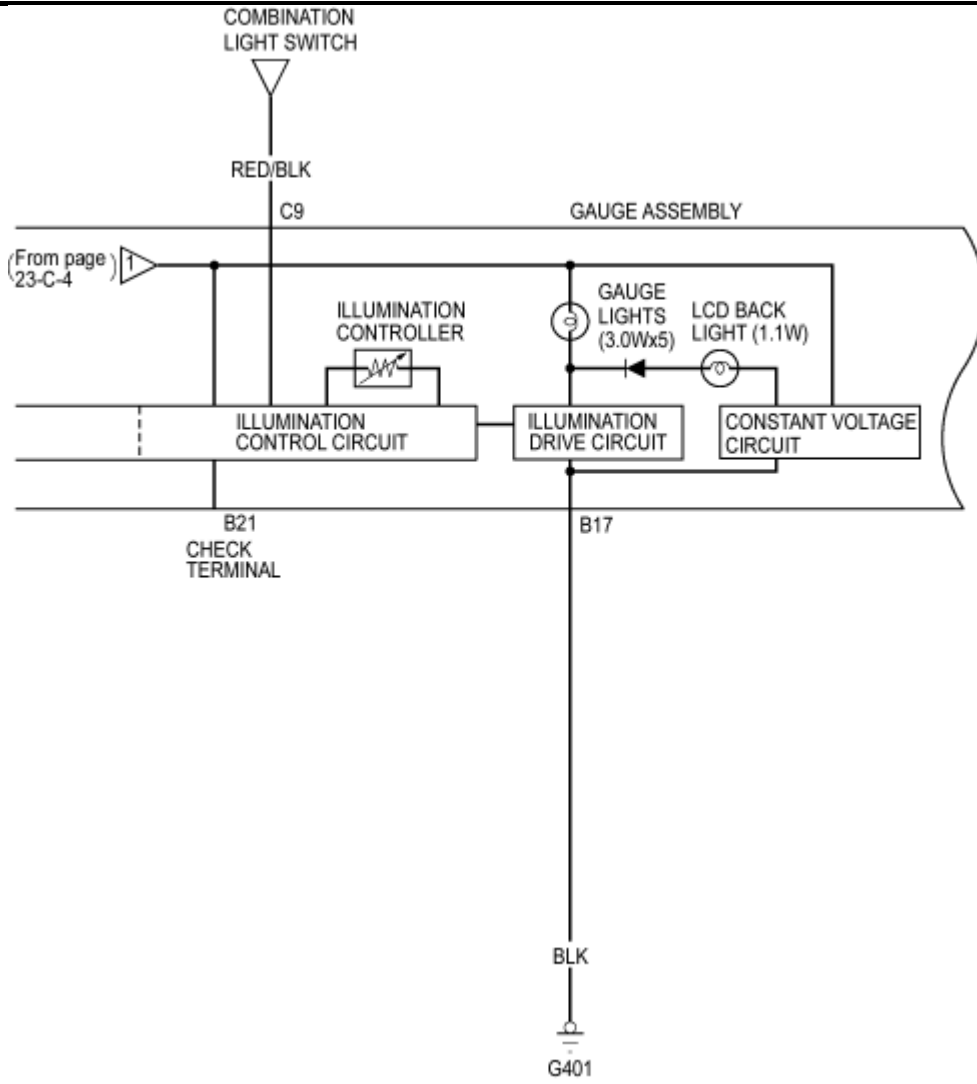


1. GROW PLUG INDICATOR LIGHT (1.4 W)
2. SRS INDICATOR LIGHT (1.4 W)
3. RIGHT TURN SIGNAL INDICATOR LIGHT (3.0 W)
4. BRAKE SYSTEM LIGHT (1.12 W)
5. HIGH BEAM INDICATOR LIGHT (1.12 W)
6. LEFT TURN SIGNAL INDICATOR LIGHT (3.0 W)
7. GAUGE LIGHT (3.0 W)
8. IMMOBILIZER INDICATOR LIGHT (1.4 W)
9. GAUGE LIGHT (3.0 W)
10. CHARGING SYSTEMS LIGHT (1.4 W)
11. LOW ENGINE OIL PRESSURE INDICATOR LIGHT (1.4 W)
12. MALFUNCTION INDICATOR LAMP (MIL) (1.4 W)
13. GAUGE LIGHT (3.0 W)
14. LCD BACK LIGHT (1.1 W)
15. GAUGE LIGHT (3.0 W)
16. LOW FUEL INDICATOR LIGHT (1.4 W)
17. DOOR INDICATOR LIGHT (1.4 W)
18. TRUNK INDICATOR LIGHT (1.4 W)
19. GAUGE LIGHT (3.0 W)
20. ABS INDICATOR LIGHT (1.4 W)
21. HAZARD WARNING LIGHT (1.4 W)

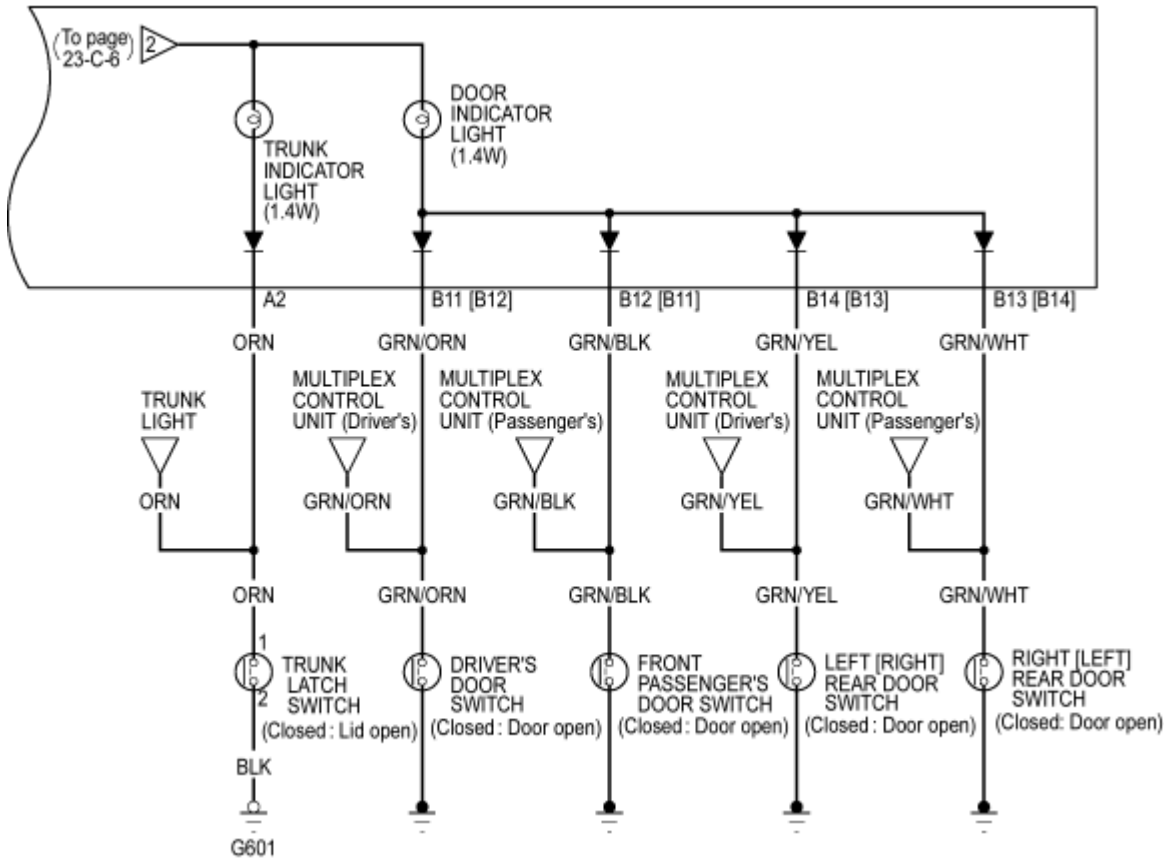








GAUGE ASSEMBLY



Vehicle Speed Sensor (VSS)

Repair

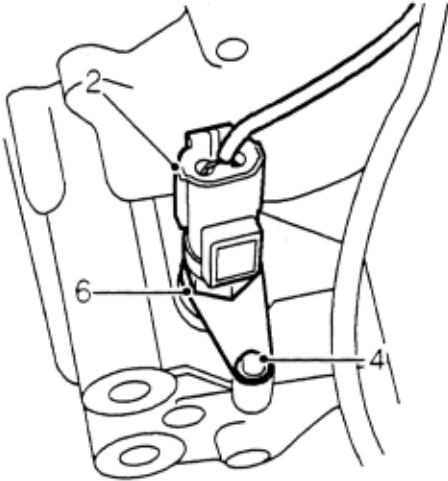
23-C-9

Vehicle Speed Sensor – 'L' Series

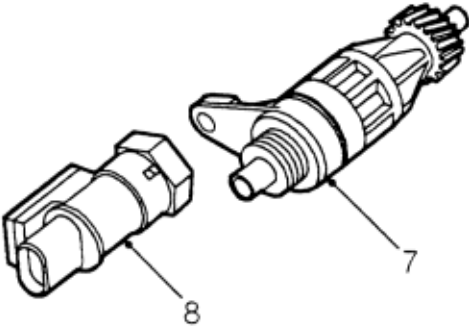
Service repair no. – 88.30.14

Remove

1. Disconnect battery earth lead.



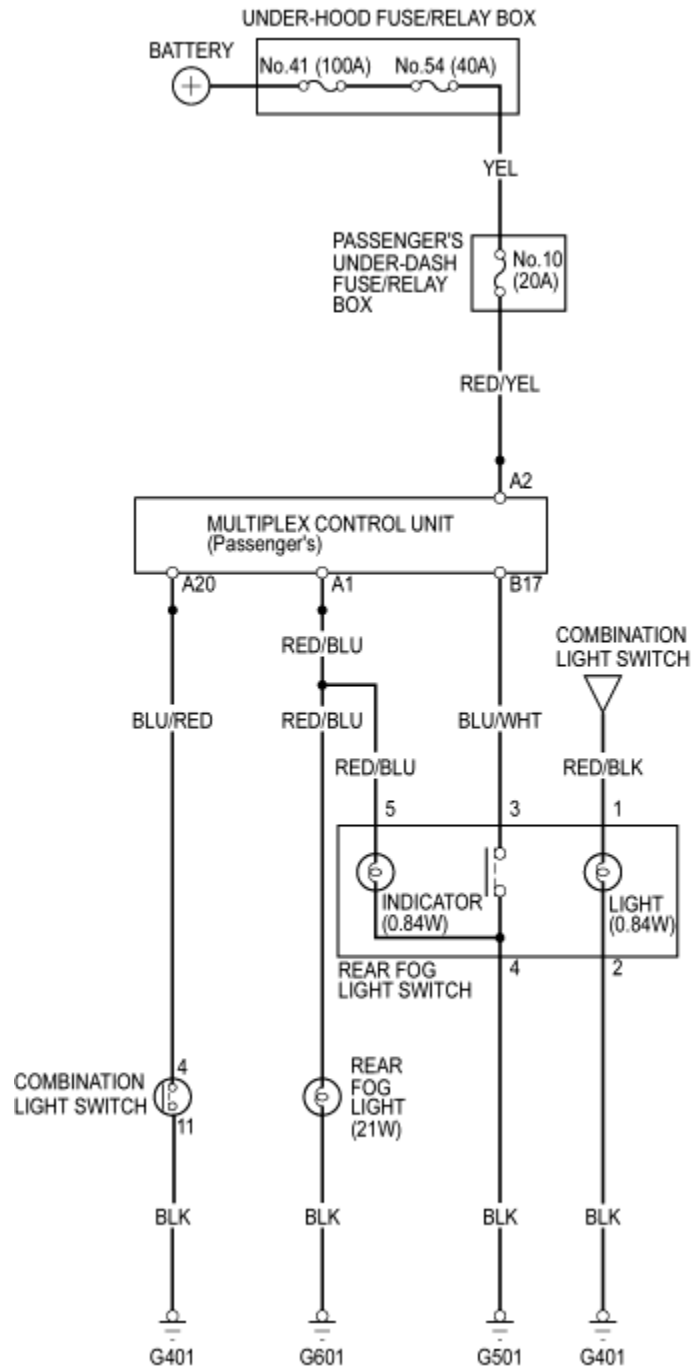
2. Disconnect multiplug from vehicle speed sensor.
3. Position container to collect fluid loss from gear box.
4. Remove bolt securing speedometer drive pinion housing to gearbox.
5. Release speedometer drive pinion housing from gearbox.
6. Remove speedometer drive pinion housing.



7. Remove and discard 'O' ring seal from speedometer drive pinion housing.
8. Remove vehicle speed sensor.

Refit

1. Fit and tighten vehicle speed sensor to speedometer drive pinion housing.
2. Clean mating faces of gearbox and speedometer drive pinion housing.
3. Lubricate with gearbox oil and fit new 'O' ring seal to speedometer drive pinion housing.
4. Fit speedometer drive pinion housing to gearbox and align bolt holes.
5. Fit bolt securing speedometer drive pinion housing to gearbox and tighten to 9 Nm (0.9 kgf/m, 7 lbf/ft).
6. Connect multiplug to vehicle speed sensor.
7. Top-up gearbox oil level. See MAINTENANCE.
8. Remove positioned to collect fluid loss from gearbox.
9. Connect battery earth lead.



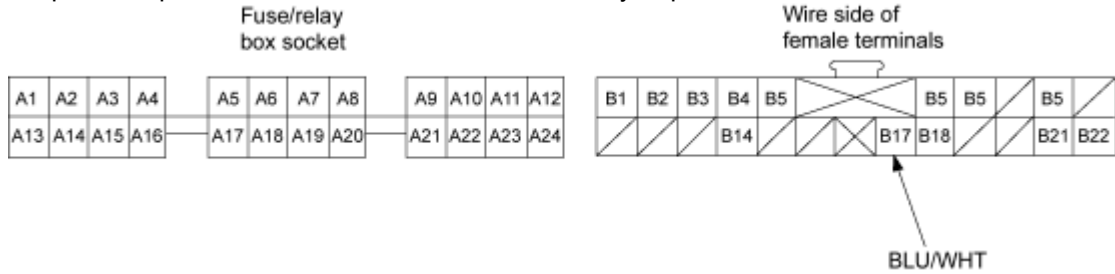
**Rear Fog Light
Control Unit Input Test**

23-D-3

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide.

Multiplex Control Unit (Passenger's):

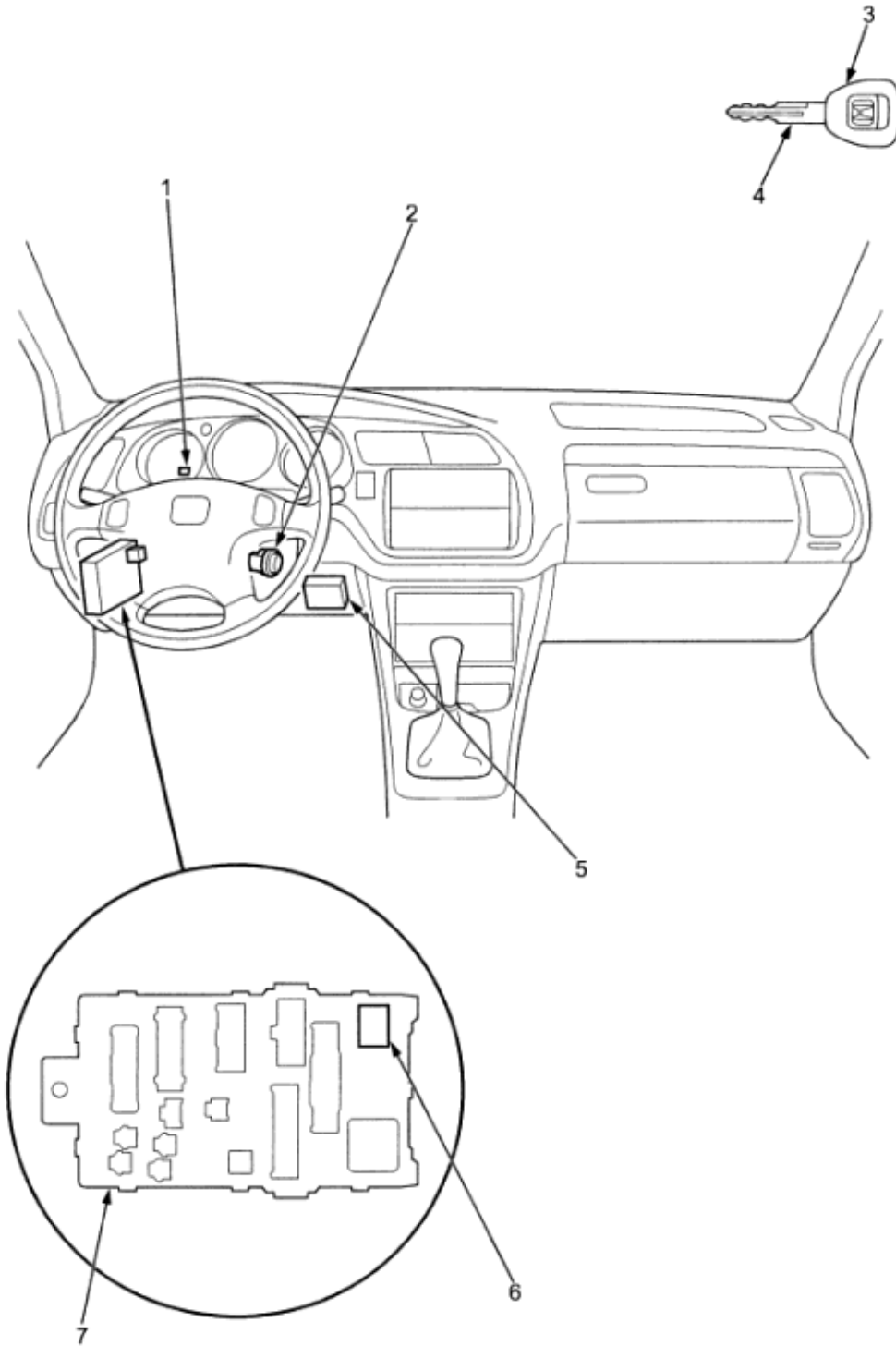
1. Remove the passenger's under-dash fuse/relay box.
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Disconnect the connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	Fuse/relay box socket	Under all conditions	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Blown bulb ♦ Poor ground (G601) ♦ An open in the wire
A2	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 5 (20A) fuse in the passenger's fuse/relay box.
A20	Fuse/relay box socket	Combination light switch ON	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty lighting switch ♦ Poor ground (G401) ♦ An open in the wire
B17	BLU/WHT	Rear fog light switch ON	Check for continuity to ground: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty rear fog light switch ♦ Poor ground (G501) ♦ An open in the wire

NOTE: LHD type is shown, RHD type is similar



1. **IMMOBILIZER INDICATOR LIGHT**
Bulb Locations, ([See Page 23-C-3](#))
2. **IMMOBILIZER RECEIVER**
Test, ([See Page 23-G-8](#))
Replacement, ([See Page 23-G-9](#))
3. **TRANSPONDER**
(Built into the ignition key)
([See Page 23-G-8](#))
4. **IGNITION KEY**
(Master keys)
5. **IMMOBILIZER CONTROL UNIT**
Input Test, ([See Page 23-G-7](#))
6. **STARTER CUT RELAY**
7. **DRIVER'S UNDER-DASH
FUSE/RELAY BOX**

Immobilizer System

Description

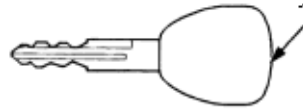
23-G-3

The vehicle is equipped with an Immobilizer system that will disable the vehicle unless the proper ignition key is used. This system consists of a transponder located in the ignition key, a receiver, a control unit, an indicator light and the ECM.

The vehicle has three kinds of keys.

♦ The master key is for:

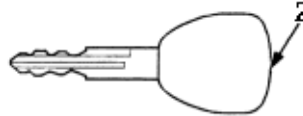
- ignition key.
- door locks.
- trunk lock.



- 1. BLACK
- 2. GREY
- 3. RED

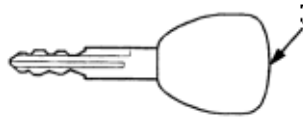
♦ The valet key is for:

- ignition switch.
- door locks.



♦ Learning key is for rewriting the immobilizer system.

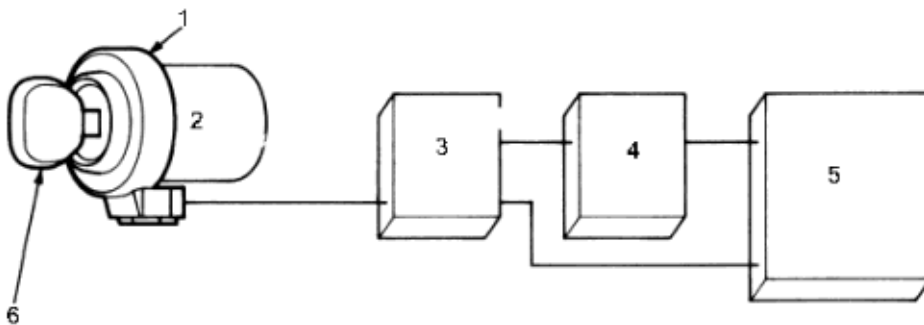
NOTE: This key cannot start the engine; do not use it except for rewriting the system. If someone tries to start the engine with the learning key, all master and valet keys must be relearned.



When the key is inserted in the ignition and turned to the (II) position, the immobilizer control unit sends power to the transponder through the receiver.

The transponder then sends a coded signal back through the receiver to the control unit.

The control unit in turn signals the ECM, as well as the starter cut relay.



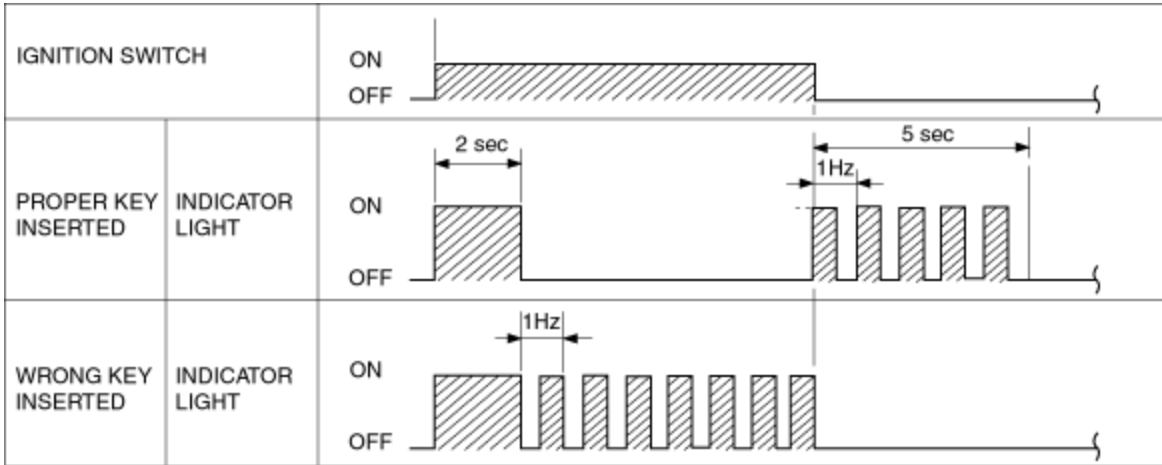
- 1. **IMMOBILIZER RECEIVER**
- 2. **KEY CYLINDER)**
- 3. **IMMOBILIZER CONTROL UNIT**
- 4. **ECM**
- 5. **FUEL SUPPLY SYSTEM**
- 6. **STARTING SYSTEM**
- (Has built-in transponder)

Immobilizer System
Description (cont'd)

23-G-4

- If the proper key has been used, the starter cut relay will be energised and the ECM will energise the fuel supply system. The immobilizer indicator light in the gauge assembly will simultaneously come on for about two seconds, then go off, thereby signalling that the immobilizer unit has recognised the code sent by the transponder.
- If the wrong key has been used whose code was not received or recognised by the unit, or which was not approved by Honda, the indicator light will come on for about two seconds, then it will go on blinking until the ignition switch is turned OFF.
- If the ignition switch is turned OFF, the indicator will blink for about five seconds to signal that the unit has been set correctly then the indicator will go off.

IMMOBILIZER INDICATOR LIGHT BLINKING PATTERN:



Problems and Replacement Parts:

Problem	Parts set	PGM-Tester required?
1. Master or valet key has been lost or additional master or valet key is required.	A	YES
2. All master and valet keys have been lost.	A x 2 and B	YES
3. Learning key has been lost.	B	YES
4. Immobilizer receiver does not work.	C	NO
5. Immobilizer control unit does not work.	B	YES
6. ECM does not work.	E	YES
7. Ignition switch does not work.	D	YES
8. Door key cylinder has been broken.	F (G)	NO (YES)

Parts Set:

- | | |
|--|--|
| A: Blank key | E: ECM |
| B: Immobilizer control unit | F: Door key cylinder |
| Master key | Master keys for doors open or locked |
| Learning key | G: Ignition switch with immobilizer receiver |
| C: Immobilizer receiver | Immobilizer control unit |
| D: Ignition switch with immobilizer receiver | Master key |
| Immobilizer control unit | Learning key |
| Master key | Door key cylinders |
| Learning key | Trunk key cylinder |

NOTE:

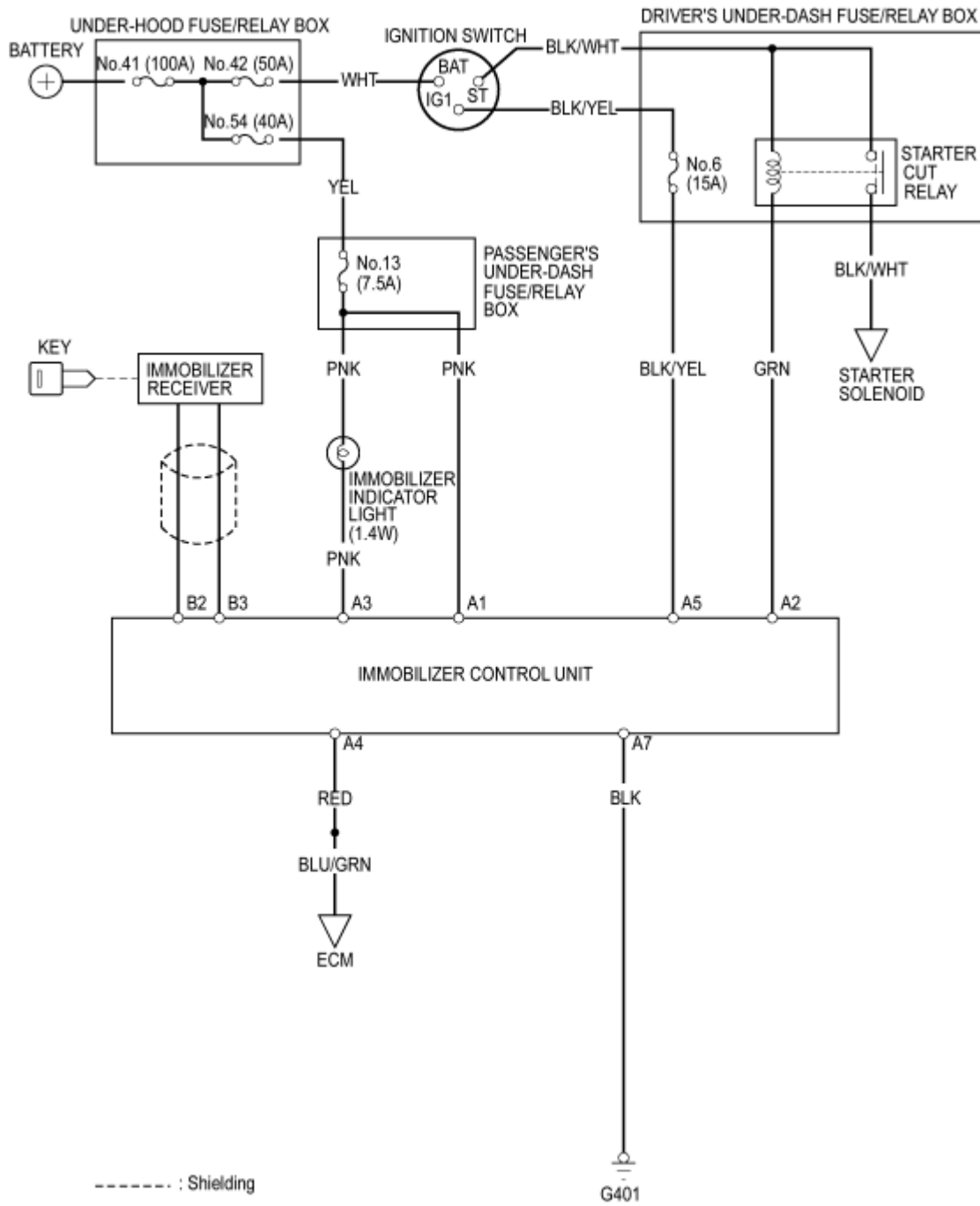
- ♦ The immobilizer system can store up to five key codes.
- ♦ If it is necessary to rewrite the immobilizer control unit to learn a new key, the dealer needs the customer's vehicle, all its master keys and valet keys, its learning key and the Honda PGM Tester equipped with an immobilizer program card. Any key that is not learned during rewriting will not longer start the engine.
- ♦ If the customer has lost his key and cannot start the engine, contact Honda Customer Relations or Roadside Assistance.

Before Testing:

- ♦ Due to the action of the immobilizer system, the engine takes slightly more time to start than engines of vehicles without an immobilizer.
- ♦ When the system is normal and the proper key is inserted, the indicator light comes on for two seconds, then it will go off.
- ♦ If the indicator starts to blink after two seconds, or if the engine does not start, repeat the starting procedure.
 - If the engine still does not start, perform the immobilizer control unit input test and transponder and immobilizer receiver test.
- ♦ If all the input tests and transponder and immobilizer receiver test prove OK, check the ECM (see section 11).
 - If the ECM is OK, the immobilizer control unit must be faulty; replace the immobilizer control unit, master key and learning key together and then rewrite the ECM with the Honda PGM Test.
 - If the ECM is faulty, substitute a known-good ECM and recheck. However, since the known-good ECM has a different code stored into it, it must be rewritten with the Honda PGM Tester. Otherwise, the engine will not start.

Immobilizer System
Circuit Diagram

23-G-6

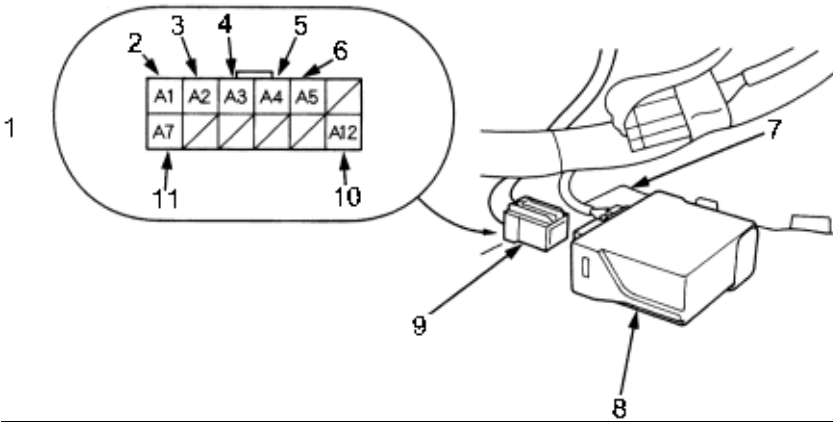


Immobilizer System
Control Unit Input Test

23-G-7

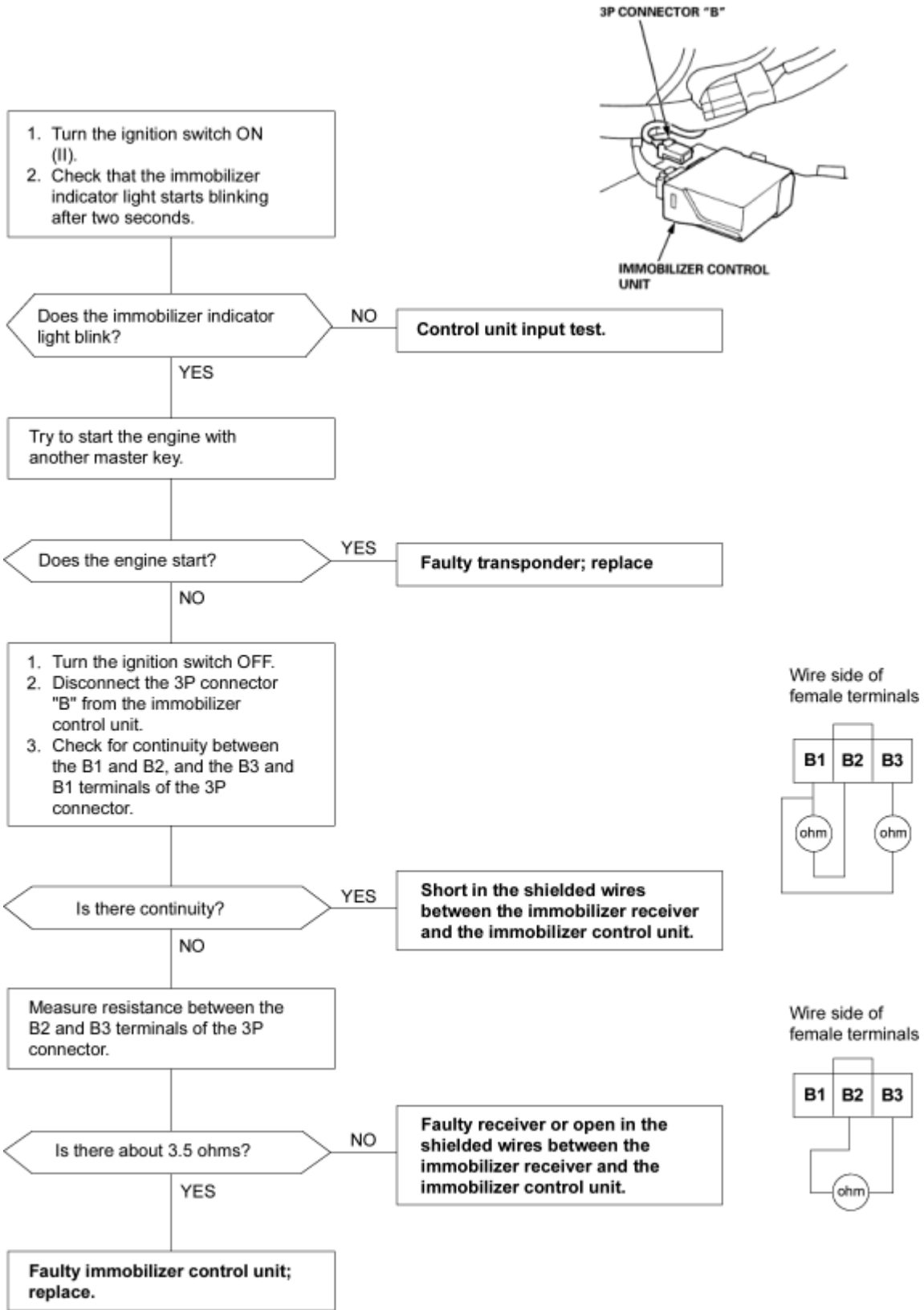
1. Remove the dashboard lower cover.
2. Disconnect the 12P connector "A" from the immobilizer control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose, or corroded, repair them as necessary and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, check the immobilizer receiver and transponder

***1 GRN/RED: Not used**



1. Wire side of female terminals
2. **PNK**
3. **GRN**
4. **PNK**
5. **RED**
6. **BLK/YEL**
7. **DASHBOARD LOWER COVER**
8. **IMMOBILIZER CONTROL UNIT**
9. **12P CONNECTOR**
10. ***1 GRN/RED**
11. **BLK**

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A7	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A1	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
A5	BLK/YEL	Ignition switch to ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Blown No 6 (15A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A2	GRN	Ignition switch to START (III)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> ♦ Faulty starter cut relay ♦ An open in the wire
A3	PNK	Under all conditions	Attach to ground: The immobilizer indicator light should come on.	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Faulty gauge assembly ♦ An open in the wire
A4	RED	Under all conditions	Check for continuity between the A4 terminal and No. 11 terminal of the ECM 55P connector: There should be continuity.	<ul style="list-style-type: none"> ♦ An open in the wire



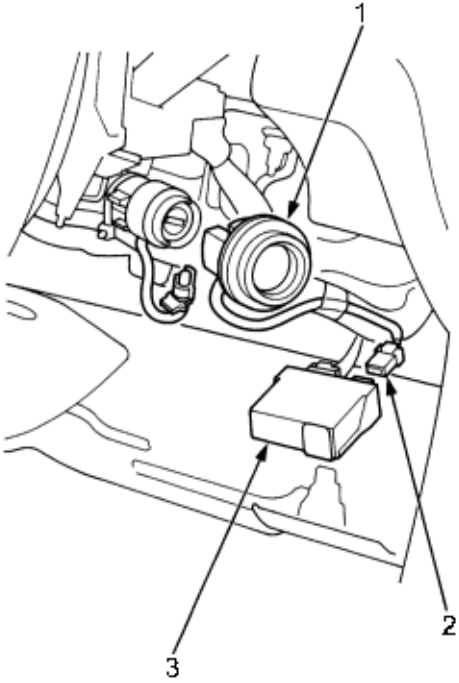
1. Remove the dashboard lower cover.
2. Remove the steering column covers.
3. Disconnect the 3P connector from the immobilizer control unit.



CAUTION

Be careful not to damage the receiver and key cylinder

4. Remove the receiver from the ignition key cylinder.
5. Remove the ignition key light from the receiver.



1. IMMOBILIZER RECEIVER
2. 3P CONNECTOR
3. IMMOBILIZER CONTROL UNIT

6. Install in the reverse order of removal.
NOTE: As this harness serves as communication link, install it carefully.
7. After replacement, check the immobilizer system.

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General Information

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Specifications

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Outline of Model Changes

- ♦ Ignition system has been changed
- ♦ F23Z5 engine has been added. For related information, refer to the F18B2 engine information on this CD.

Engine Index

Cylinder Head

D16B6, D16B7 engines **6-1**

Engine Block

F18B2, F18B3, F20B6, H22A7 engines **7-1**

Intake Manifold/Exhaust System **9-1**

NOTE: F23Z5 engine has been added. For related maintenance and repair information refer to the F18B2 engine on this CD and changed specifications (see Specifications section).

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Outline of Model Change

The CYL sensor has been adopted on the D16B6, D16B7 engines.

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Outline of Model Change

- ◆ Main bearing identification has been changed.
- ◆ Piston diameter has been changed.
- ◆ F23Z5 engine has been added. For related maintenance, repair information refer to the F18B2 engine information in the 1999 Accord Shop Manual on this CD and changed Specifications (see Specification section).

Engine Index

Cylinder Head

D16B6, D16B7 engines **6-1**

Engine Block

F18B2, F18B3, F20B6, H22A7 engines **7-1**

Intake Manifold/Exhaust System **9-1**

Exhaust Pipe and Muffler

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Outline of Model Change

- ♦ Secondary heated oxygen sensor has been adopted on D16B6, D16B7 engines.
- ♦ F23Z5 engine has been added. For related information refer to the F18B2 engine information in the 2000 Accord Shop Manual on this CD.

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Outline of Model Change Engine Coolant has been changed

Fuel and Emissions Index

**F18B2, F18B3, F23Z5 Engine
D16B6 Engine**

**11-B-1
11-C-1**

Fuel and Emissions Index

F18B2, F18B3, F23Z5 Engine

11-B-1

Outline of Model Change

F23Z5 engine has been added. For related information refer to the F18B2 engine information on this CD.

D16B6 Engine

11-C-1

Fuel and Emissions Index

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Outline of Model Changes

- ◆ The ECM has been changed.
- ◆ The Secondary Heated Oxygen Sensor (Secondary HO2S) has been added.
- ◆ The Crankshaft Position (CKP) Sensor has been changed
- ◆ The Cylinder Position (CYP) Sensor has been added.
- ◆ The Ignition System has been changed

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Transaxle Index

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Outline of Model Change

- ◆ The inspection procedure for clutch disc has been added

Transaxle Index

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Manual Transmission	13-1
U2J4, U2L4, U2Q7, U2N4 Model Manual Transmission (F18B2, F18B3, F20B6, H22A7, F23Z5 engine models)	
Automatic Transmission	14-1
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Outline of Model Change

- ◆ The U2N4 Model Manual Transmission (F23Z5 engine model) has been added.

Transaxle Index

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Outline of Model Changes

- ◆ Checking DTC procedure with OBD scan tool and Honda PGM Tester on electrical troubleshooting procedures has been adopted to F23Z5 engine model.
- ◆ The PCM can now detect mechanical problems in the hydraulic control system. Troubleshooting for DTC's 45, 45-1, P0780, 46, 46-1, P1750, 47, 47-1 and P1751: Mechanical problem in the hydraulic control system have been added to F18B2, F20B6 and F23Z5 engine models.
- ◆ Shift schedules have been changed.

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Outline of Model Change

- ♦ The replacement procedure for low profile type boot bands has been added.

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NOTE: Refer to the 1999 Accord Shop Manual, the 1999 Accord 5 Door/Accord 5 Door Turbo Diesel Shop Manual Supplement and the 2000 Accord/Accord 5 Door Shop Manual Supplement on this CD for items not shown in this section.

Outline of Model Changes

- ♦ The front and rear door outer handle mounting nuts have been changed to the self lock nuts and the tightening torque of them was reduced to 5 Nm (0.5 kgf/m, 4 lbf/ft).
- ♦ The immobiliser label has been changed
- ♦ The VTEC emblem has been added instead of the VTEC sticker (for some models).
- ♦ The front "H" emblem has been changed.
- ♦ On the RH models, the attachment point of the ACCORD emblem has been changed and these emblems have been added:
 - Grade emblem A (2.3i)
 - Grade emblem B (S, SE, SE EXECUTIVE)

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Security	23-G-1
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Outline of Model Changes

- ◆ Hazard warning light has been disconnected
- ◆ Passenger's power window switch has been changed
- ◆ Radio antenna has been changed
- ◆ Ultrasonic system has been added

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Outline of Model Changes

- ♦ Display unit operation keys were changed; description was entered.
- ♦ Navigation unit was changed; circuit diagram, connector locations, terminal arrangement, troubleshooting, CD-ROM replacement, navigation unit removal/installation were entered.
- ♦ Picture diagnosis was changed; all picture diagnosis was entered.

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NOTE Refer to 99 Accord Shop Manual on this CD for items not shown in this section

Outline of Model Change

- ◆ Side impact sensor has been changed (with Side Airbag types)


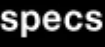









INTRODUCTION

How to Use This Manual

This CD covers the base Shop Manual plus all Subsequent Supplements

Description	Code No.
HONDA Accord MAINTENANCE, REPAIR and CONSTRUCTION 99 VOL. 1 and VOL. 2	62S1A00A 62S1A00B
HONDA Accord 5 Door/Accord 5 Door Turbo Diesel SUPPLEMENT 99	62S1A21
HONDA Accord Turbo Diesel/Accord 5 Door Turbo Diesel SUPPLEMENT 99	62S1A22
HONDA Accord/Accord 5 Door Turbo Diesel Fuel and Emissions SUPPLEMENT 99	62S1A23
Honda Accord/Accord 5 door 2000	62S1A23

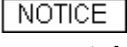
This manual is divided into 6 sections. Click on the chapter you want to look at from the opening screen, this is followed by a contents list of the chapter, click on the page you require. The symbols printed at the top corner of each page can also be used as a quick reference system.

General Info	
Specifications	
Maintenance	
Engine Electrical	
Engine	
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Fuel & Emmissions	
* Transaxle	
* Body	
* Body Electrical	
* Restraints	


Special Information

 **WARNING** : Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

 **CAUTION** : Indicates a possibility of personal injury or equipment damage if instructions are not followed.

 **NOTICE** : The purpose of these messages is intended to help prevent damage to the vehicle, other property, or the environment.

NOTE: Gives helpful information.

 **CAUTION**

Detailed descriptions of standard workshop procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause PERSONAL INJURY, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA, might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, must satisfy themselves thoroughly that neither personal safety nor vehicle safety will be jeopardised.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

First Edition 8/2000 308 pages **HONDA MOTOR CO., LTD.**
 All Rights Reserved **Service Publication Office**
 As sections with * include SRS components; special precautions are required when servicing.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

This model has an SRS which includes a driver's airbag located in the steering wheel hub and a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors and some types include side airbags in the front seat-backs.

Information necessary to safely service the SRS is included in this '99 Accord Shop Manual, 62S1A00.

Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorised Honda dealer.





WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorised Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags and seat belt tensioners.
- SRS electrical wiring harnesses are identified by yellow colour coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, front seats and around the floor. Do not use electrical test equipment on these circuits.

Outline of Model Changes

ITEM	DESCRIPTION	99 MODEL	99 MODEL	99 MODEL	2000 MODEL	2001 MODEL	REF. SECT.
General	5 door model added	O	O				-
	F23Z5 engine model added					O	-
Engine Electrical	Alternator replacement procedure changed		O				-
	<ul style="list-style-type: none"> • Ignition system changed • F23Z5 engine added 					O	4
Engine Electrical	VTEC Control System of F18B2 and F18B4 engine changed				O		-
	Secondary heated Oxygen sensor adopted to F18B2 engine (M/T) and F18B4 engine (M/T)				O		-
	CYL sensor adopted to D16B6 and D16B7 engines					O	6
	Changed <ul style="list-style-type: none"> • Main bearing identification • Piston diameter • F23Z5 engine added 					O	7
	<ul style="list-style-type: none"> • Secondary heated oxygen sensor adopted to D166 and D16B7 engines • F23Z5 engine added 					O	9
Cooling	Cooling system components and operation changed		O				-
	Engine coolant changed					O	10
Fuel and Emission	20T2N engine (turbocharger with intercooler) modified			O			-
	F18B2, F18B4 engines changed on KE, KG, KS and KR models				O		-
	F23Z5 engine model added					O	11
Clutch	Refit of the clutch assembly changed		O				-
	Clutch disc inspection procedure added					O	12
Manual Transmission	Special tool of refit of the differential oil seals added		O				-
	U2N4 transmission added to F23Z5 engine					O	13
Automatic Transmission	<ul style="list-style-type: none"> • Checking DTC procedure adopted for F23Z5 engine model • PCM changed • Shift schedule changed 					O	14
Driveshaft	Replacement procedure for low profile boot bands changed					O	16
Body	Changed <ul style="list-style-type: none"> • Component parts of the rear window • Component parts of the interior trim • Headliner and attached clips • Rear seat and related parts • Tailgate and related parts • Fuel lid opener and fuel lid opener cable Added <ul style="list-style-type: none"> • Type V emblems for some models • Rear pillar moulding 	O					-
	Tailgate latch and tailgate lock cylinder replacement procedure changed for 5 door models				O		-
	Changed <ul style="list-style-type: none"> • Front and rear door outer handle mounting nut • Immobiliser label • Front "H" emblem • Accord emblem attaching point on RHD 					O	20

	models						
	Added						
	♦ VTEC emblems for some models						
Body	Added						
Electrical	♦ Accessory socket						
	♦ Tailgate light						
	♦ Tweeter speaker	O					-
	♦ Rear window wiper and washer						
	Changed						
	♦ High mount brake light						
	♦ Stereo amplifier						
	♦ Keyless entry and security alarm system						
	♦ Hazard warning light discontinued					O	23
	♦ Passenger's power window switch changed						
	♦ Radio antenna changed						
	♦ Ultrasonic system added						
Navigation	Locations of the navigation unit and GPS						
System	antenna changed	O					-
	Navigation unit and picture diagnosis changed					O	23
Seat Belts	♦ Rear seat belt changed						
	♦ Rear centre shoulder belt adopted	O					-
	Side impact sensor changed					O	24

Chassis and Engine Numbers

4 door:

1-2

Vehicle Identification Number _____
SHH CG7 2 4 * 1 U 100001

Manufacturer, Make and Type of Vehicle _____
SHH: HONDA OF THE UK
MFG., LTD. U.K.
HONDA Passenger car

Line, Body and Engine Type _____
CG7: ACCORD SEDAN/D16B6,
D16B7
CG8: ACCORD SEDAN/F18B2
CG9: ACCORD SEDAN/F20B6
CH1: ACCORD SEDAN/H22A7
CL3: ACCORD SEDAN/F23Z5

Body and Transmission Type _____
5: 4-door Sedan/5-speed Manual
6: 4-door Sedan/4-speed Automatic

Vehicle Grade _____
1: 1.8i S
2: 1.6i S, 1.8i S, 2.3i LS
4: 1.6i SE, 1.6i LS, 1.8i SE, 1.8i LS
2.0i SE, 2.0i LS, 2.3i SEE, 2.3i ES
5: 2.3i SEE, 2.3i ES
7: 1.8i SEE, 1.8i ES, 2.0i SEE, 2.0i ES
2.3i V
8: 1.8i SEE, 1.8i ES, 2.0i SEE, 2.0i ES
2.2i R, 2.2i Ri, 2.3i V
9: 2.2i R

Check Digit _____

Model Year _____
1: 2001

Factory Code _____
U: Honda of the U.K. Manufacturing in U.K.

Serial Number _____

Engine Number _____
D16B6 - E200001

Engine Type _____

D16B6, D16B7:
1.6/ SOHC 16-valves Sequential
Multiport Fuel-injected Unleaded
gasoline with CATA

F18B2: 1.8/ SOHC 16-valves VTEC Sequential
Multiport Fuel-injected Unleaded
gasoline with CATA

F20B6: 2.0/ SOHC 16-valves VTEC Sequential
Multiport Fuel-injected Unleaded
gasoline with CATA

H22A7: 2.0/ SOHC 16-valves VTEC Sequential
Multiport Fuel-injected Unleaded
gasoline with CATA

F23Z5: 2.3/ SOHC 16-valves VTEC Sequential
Multiport Fuel-injected Unleaded
gasoline with CATA

Serial Number _____

H22A7: 1000001-
F23Z5: 1000001-
Except H22A7, F23Z5: E200001-

Transmission Number _____
DH - 1000001

Transmission Type _____

DH: 5-speed Manual
U2L4: 5-speed Manual
U2Q7: 5-speed Manual
U2N4: 5-speed Manual
MDJA: 4-speed Automatic

Serial Number _____

Chassis and Engine Numbers

1-3

4 door: (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number List

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
ACCORD Sedan	KE	1.6i SE	5MT	SHHCG754*1U100001~	D16B6-E200001~	DH-1000001~
		1.8i S	5MT	SHHCG852*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	4AT	SHHCG862*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SE	5MT	SHHCG854*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SE	4AT	SHHCG864*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SEE	5MT	SHHCG857*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SEE	5MT*1	SHHCG858*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SEE	4AT	SHHCG867*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SEE	4AT*1	SHHCG868*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i SE	5MT	SHHCG954*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SE	4AT	SHHCG964*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i SEE	5MT	SHHCG957*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SEE	5MT*1	SHHCG958*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SEE	4AT	SHHCG967*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.2i R	5MT	SHHCH159*1U100001~	H22A7-1000001~	U2Q7-1000001~
		2.2i R	5MT*2	SHHCH158*1U100001~	H22A7-1000001~	U2Q7-1000001~
		2.3i SEE	5MT	SHHCL354*1U100001~	F23Z5-1000001~	U2N4-1000001~
		2.3i SEE	5MT*1	SHHCL355*1U100001~	F23Z5-1000001~	U2N4-1000001~
		2.3i SEE	4AT	SHHCL364*1U100001~	F23Z5-1000001~	MDJA-3000001~
		2.3i SEE	4AT*1	SHHCL365*1U100001~	F23Z5-1000001~	MDJA-3000001~
2.3i V	5MT	SHHCL357*1U100001~	F23Z5-1000001~	U2N4-1000001~		
2.3i V	5MT*1	SHHCL358*1U100001~	F23Z5-1000001~	U2N4-1000001~		
2.3i V	4AT	SHHCL367*1U100001~	F23Z5-1000001~	MDJA-3000001~		
2.3i V	4AT*1	SHHCL368*1U100001~	F23Z5-1000001~	MDJA-3000001~		
ACCORD Sedan	KG	1.6i S	5MT	SHHCG752*1U100001~	D16B6-E200001~	DH-1000001~
		1.6i LS	5MT	SHHCG754*1U100001~	D16B6-E200001~	DH-1000001~
		1.8i S	5MT	SHHCG852*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	4AT	SHHCG862*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i LS	5MT	SHHCG854*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	4AT	SHHCG864*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i ES	5MT	SHHCG857*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i ES	5MT*1	SHHCG858*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i ES	4AT	SHHCG867*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i ES	4AT*1	SHHCG868*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i LS	5MT	SHHCG954*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i LS	4AT	SHHCG964*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i ES	5MT	SHHCG957*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	5MT*1	SHHCG958*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	4AT	SHHCG967*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i ES	4AT*1	SHHCH968*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.2i R	5MT	SHHCH158*1U100001~	H22A7-1000001~	U2Q7-1000001~
		2.3i LS	5MT	SHHCL352*1U100001~	F23Z5-1000001~	U2N4-1000001~
		2.3i LS	4AT	SHHCL362*1U100001~	F23Z5-1000001~	MDJA-3000001~
		2.3i ES	5MT	SHHCL354*1U100001~	F23Z5-1000001~	U2N4-1000001~
2.3i ES	5MT*1	SHHCL355*1U100001~	F23Z5-1000001~	U2N4-1000001~		
2.3i ES	4AT	SHHCL364*1U100001~	F23Z5-1000001~	MDJA-3000001~		
2.3i ES	4AT*1	SHHCL365*1U100001~	F23Z5-1000001~	MDJA-3000001~		

*1: with Navigation System

*2: with Trunk Spoiler

Chassis and Engine Numbers

1-4

4 door: (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number List

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
		1.6i S	5MT	SHHCG752*1U100001~	D16B6-E200001~	DH-1000001~
		1.6i LS	5MT	SHHCG754*1U100001~	D16B6-E200001~	DH-1000001~
		1.6i LS7	5MT	SHHCG755*1U100001~	D16B7-E200001~	DH-1000001~
		1.8i LS	5MT	SHHCG854*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	4AT	SHHCG864*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i ES	5MT	SHHCG857*1U100001~	F18B2-E200001~	U2L4-1000001~
	KR	2.0i LS	5MT	SHHCG954*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	5MT	SHHCG957*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	5MT*1	SHHCG958*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	4AT	SHHCG967*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i ES	4AT*1	SHHCG968*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.3i ES	5MT	SHHCL354*1U100001~	F23Z56-1000001~	U2N4-1000001~
		1.8i S	5MT	SHHCG852*1U100001~	F18B2-E200001~	U2L4-1000001~
Accord SEDAN	KS	1.8i LS	5MT	SHHCG854*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	4AT	SHHCG864*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i LS	5MT	SHHCG954*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i ES	5MT	SHHCG957*1U100001~	F20B6-E200001~	U2L4-1000001~
	KR	1.8i S	5MT*2	SHHCG852*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	5MT	SHHCG851*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	5MT*2	SHHCG862*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i S	5MT	SHHCG861*1U100001~	F18B2-E200001~	MDJA-3000001~

*1: with Navigation System

*2: with Trunk Spoiler

Chassis and Engine Numbers

1-5

5 door:

Vehicle Identification Number							
SHH	CH5	5	4	*	1	U	100001
Manufacturer, Make and Type of Vehicle							
SHH: HONDA OF THE UK MFG., LTD. U.K. HONDA Passenger car							
Line, Body and Engine Type							
CH5: ACCORD 5-door/D16B6, D16B7 CH6: ACCORD 5-door/F18B2 CH7: ACCORD 5-door/F20B6 CL4: ACCORD 5-door/F23Z5							
Body and Transmission Type							
5: 5-door Hatchback/5-speed Manual 6: 4-door Hatchback/ 4-speed Automatic							
Vehicle Grade							
1: 1.6i S, 1.8i S, 2.3i V 3: 2.3i V 4: 1.6 SE, 1.6 LS, 1.8i SE, 1.8i LS 2.0i SE, 2.0i LS 5: 1.6 LS7 7: 1.8i SEE, 2.0i SEE, 2.0i ES, 2.3i SEE 2.3i ES 8: 1.8i SEE, 2.0i SEE, 2.3i SEE							
Check Digit							
Model Year							
1: 2001							
Factory Code							
U: Honda of the U.K. Manufacturing in U.K.							
Serial Number							

Engine Number	
D16B6 - E200001	
Engine Type	
D16B6, D16B7: 1.6/ SOHC 16-valves Sequential Multiport Fuel-injected Unleaded gasoline with CATA	
F18B2: 1.8/ SOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA	
F20B6: 2.0/ SOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA	
F23Z5: 2.3/ SOHC 16-valves VTEC Sequential Multiport Fuel-injected Unleaded gasoline with CATA	
Serial Number	
F23Z5: 1 000001 - Except H22A7, F23Z5: E200001 -	
Transmission Number	
DH - 1000001	
Transmission Type	
DH: 5-speed Manual U2L4: 5-speed Manual U2Q7: 5-speed Manual U2N4: 5-speed Manual MDJA: 4-speed Automatic	
Serial Number	

Chassis and Engine Numbers

1-6

5 door:

Applicable Area Code/VIN/Engine Number/Transmission Number List

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
	KE	1.6 SE	5MT	SHHCH574*1U100001~	D16B6-E200001~	DH-1000001~
		1.8i S	5MT	SHHCH672*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	4AT	SHHCH682*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SE	5MT	SHHCH674*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SE	4AT	SHHCH684*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SEE	5MT	SHHCH677*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SEE	5MT*1	SHHCH678*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i SEE	4AT	SHHCH687*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i SEE	4AT*1	SHHCH688*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i SE	5MT	SHHCH774*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SE	4AT	SHHCH784*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i SEE	5MT	SHHCH777*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SEE	5MT*1	SHHCH778*1U100001~	F20B6-E200001~	U2L4-1000001~
		2.0i SEE	4AT	SHHCH787*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.0i SEE	4AT*1	SHHCH788*1U100001~	F20B6-E200001~	MDJA-3000001~
		2.3i SEE	5MT	SHHCL477*1U100001~	F23Z5-1000001~	U2N4-1000001~
		2.3i SEE	5MT*1	SHHCL478*1U100001~	F23Z5-1000001~	U2N4-1000001~
		2.3i SEE	4AT	SHHCL487*1U100001~	F23Z5-1000001~	MDJA-3000001~
		2.3i SEE	4AT*1	SHHCL488*1U100001~	F23Z5-1000001~	MDJA-3000001~
		2.3i V	5MT	SHHCL472*1U200001~	F23Z5-1000001~	U2N4-1000001~
	2.3i Vi	5MT*1	SHHCL473*1U20000X~	F23Z5-1000001~	U2N4-1000001~	
	2.3i Vi	4AT	SHHCL482*1U20000X~	F23Z5-1000001~	MDJA-3000001~	
	2.3i Vi	4AT*1	SHHCL483*1U20000X~	F23Z5-1000001~	MDJA-3000001~	
ACCORD 5-door	KG	1.6 S	5MT	SHHCH572*1U100001~	D16B6-E200001~	DH-1000001~
		1.8i S	5MT	SHHCH672*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i S	4AT	SHHCH682*1U100001~	F18B2-E200001~	MDJA-3000001~
		1.8i LS	5MT	SHHCH674*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	4AT	SHHCH684*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i LS	5MT	SHHCH774*1U100001~	F20B6-E100001~	U2L4-1000001~
		2.0i LS	4AT	SHHCH784*1U100001~	F20B6-E100001~	MDJA-3000001~
		2.0i ES	5MT	SHHCH777*1U100001~	F20B6-E100001~	U2L4-1000001~
		2.0i ES	4AT	SHHCH787*1U100001~	F20B6-E100001~	MDJA-1000001~
	KR	1.6i LS	5MT	SHHCH574*1U100001~	D16B6-E200001~	DH-1000001~
		1.6i LS7	5MT	SHHCH575*1U100001~	D16B7-E200001~	DH-1000001~
		1.8i LS	5MT	SHHCH674*1U100001~	F18B2-E200001~	U2L4-1000001~
		2.0i ES	5MT	SHHCH777*1U100001~	F20B6-E100001~	U2L4-1000001~
		2.0i ES	4AT	SHHCH787*1U100001~	F20B6-E100001~	MDJA-3000001~
		2.3i ES	5MT	SHHCL477*1U100001~	F23Z5-1000001~	U2N4-1000001~
	KS	1.8i S	5MT	SHHCH672*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	5MT	SHHCH674*1U100001~	F18B2-E200001~	U2L4-1000001~
		1.8i LS	4AT	SHHCH684*1U100001~	F18B2-E200001~	MDJA-3000001~
		2.0i LS	5MT	SHHCH774*1U100001~	F20B6-E100001~	U2L4-1000001~
		2.0i ES	5MT	SHHCH777*1U100001~	F20B6-E100001~	U2L4-1000001~

*1: with Navigation System

Abbreviations

1-7

List of automotive abbreviations which may be used in shop manual.

ABS	Anti-lock Brake System	EGR	Exhaust Gas Recirculation
A/C	Air Conditioning, Air Conditioner	ELD	Electrical Load Detector
ACL	Air Cleaner	EPR	Evaporator Pressure Regulator
A/F	Air Fuel Ratio	EPS	Electrical Power Steering
ALR	Automatic Locking Retractor	EVAP	Evaporative
ALT	Alternator	EX	Exhaust
AMP	Ampere (s)	F	Front
ANT	Antenna	FIA	Fuel Injection Air
API	American Petroleum Institute	FL	Front Left
APPROX.	Approximately	FP	Fuel Pump
ASSY	Assembly	FR	Front Right
A/T	Automatic Transmission	FSR	Fail Safe Relay
ATDC	After Top Dead Centre	FWD	Front Wheel Drive
ATF	Automatic Transmission Fluid	GAL	Gallon
ATT	Attachment	GND	Ground
ATTS	Active Torque Transfer System	GPS	Global Positioning System
AUTO	Automatic	H/B	Hatchback
AUX	Auxiliary	HC	Hydrocarbons
BARO	Barometric	HID	High Intensity Discharge
BAT	Battery	H02S	Heated Oxygen Sensor
BDC	Bottom Dead Centre	IAB	Intake Air Bypass
BTDC	Before Top Dead Centre	IAC	Idle Air Control
CARB	Carburettor	IACV	Idle Air Control Valve
CAT	Catalytic Converter	IAR	Intake Air Resonator
or CATA		IAT	Intake Air Temperature
CHG	Charge	ICM	Ignition Control Module
CKF	Crankshaft Speed Fluctuation	ID	Identification
CKP	Crankshaft Position	ID or I.D.	Inside Diameter
CO	Carbon Monoxide	IG or IGN	Ignition
COMP	Complete	IMA	Idle Mixture Adjustment
CPB	Clutch Pressure Back up	IMMOBI.	Immobiliser
CPC	Clutch Pressure Control	IN	Intake
CPU	Central Processing Unit	INJ	Injection
CVT	Continuously Variable Transmission	INT	Intermittent
CYL	Cylinder	KS	Knock Sensor
CYP	Cylinder Position	L	Left
DI	Distributor Ignition	L/C	Lock-up Clutch
DIFF	Differential	LCD	Liquid Crystal Display
DLC	Data Link Connector	LED	Light Emitting Diode
DOHC	Double Overhead Camshaft	LF	Left Front
DPI	Dual Point Injection	LH	Left Handle
DTC	Diagnostic Trouble Code	LHD	Left Handle Drive
EBD	Electronic Brake Distribution	LR	Left Rear
ECM	Engine Control Module	LSD	Limited Slip Differential
ECT	Engine Coolant Temperature	L-4	In-line Four Cylinder (engine)

Abbreviations

(cont'd)

1-8

MAP	Manifold Absolute Pressure	T	Torque
MAX.	Maximum	TB	Throttle Body
MBS	Mainshaft Brake System	T/B	Timing Belt
MCK	Motor Check	TC	Torque Converter
MCU	Moment Control Unit	TCM	Transmission Control Module
MIL	Malfunction Indicator Light	TCS	Traction Control System
MIN.	Minimum	TDC	Top Dead Centre
MPI	Multi Point Injection	TFT	Thin Film Transistor
M/S	Manual Steering	T/N	Tool Number
M/T	Manual Transmission	TP	Throttle Position
		TWC	Three Way Catalytic Converter
N	Neutral		
NOx	Oxides of Nitrogen	VC	Viscous Coupling
		VDP	Variable Displacement Pump
OBD	On-board Diagnostic	VFV	Variable Force Control Valve
O2S	Oxygen Sensor	VGR	Variable Gear Ratio
OD or O.D.	Outside Diameter	VIN	Vehicle Identification Number
		VSC	Variable Space Column
P	Park	VSS	Vehicle Speed Sensor
PAIR	Pulsed Secondary Air Injection	VTEC	Variable Valve Timing & Valve Lift Electronic Control
PCM	Powertrain Control Module		
PCV	Positive Crankcase Ventilation	VVIS	Variable Volume Intake System
	Proportioning Control Valve		
PGM-FI	Programmed-fuel Injection	W	With
PGM-IG	Programmed Ignition	W/O	Without
PH	Pressure High	WOT	Wide Open Throttle
PL	Pilot Light or Pressure Low		
PMR	Pump Motor Relay	2WD	Two Wheel Drive
P/N	Part Number	4WD	Four Wheel Drive
PRI	Primary	2WS	Two Wheel Steering
P/S	Power Steering	4WS	Four Wheel Steering
PSF	Power Steering Fluid	4AT	4-speed Automatic Transmission
PSP	Power Steering Pressure	5MT	5-speed Manual Transmission
PSW	Pressure Switch	6MT	6-speed Manual Transmission
		P	Park
Qty	Quantity	R	Reverse
		N	Neutral
R	Right	D4	Drive (1st through 4th gear)
REF	Reference	D3	Drive (1st through 3rd gear)
RGB	Red, Green, Black	2	Second
RHD	Right Handle Drive	1	First
RL	Rear Left	D	Drive
RON	Research Octane Number	S	Second
RR	Rear Right	L	Low
		O/D	Over Drive
SAE	Society of Automotive Engineers	1ST	Low (gear)
SCS	Service Check Signal	2ND	Second (gear)
SEC	Second/Secondary	3RD	Third (gear)
SOHC	Single Overhead Camshaft	4TH	Fourth (gear)
SOL	Solenoid	5TH	Fifth (gear)
SPEC	Specification	6TH	Sixth (gear)
S/R	Sun Roof		
SRS	Supplemental Restraint System		
STD	Standard		
SW	Switch		

		MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V		12	
	Primary winding resistance at 20°C (68°F) ohms	Except H22A7 engine	0.45-0.55	
		H22A7 engine	0.63-0.77	
	Secondary winding resistance at 20°C (68°F) k ohms	F18B2, F18B3, F20B4, F20B7 F23Z5 engines	22.4-33.6	
		H22A7 engine	12.8-19.2	
Ignition wire	Resistance at 20°C (68°F) k ohms		25 max.	
	Firing order	D16B6, D16B7 engines	1 - 4 - 2 - 3	
		Except D16B6, D16B7 engines	1 - 3 - 4 - 2	
Spark plug	Type		STANDARD (NEW)	
	Gap	Except H22A7 engine	See section 4	SERVICE LIMIT
		H22A7 engine	1.0-1.1 (0.039-0.043)	-
		1.0-1.1 (0.039-0.043)	1.3 (0.051)	
Ignition timing	At idle	Except H22A7 engine M/T	12 ± 2 (Neutral)	
	BTDC (Red)	A/T	12 ± 2 (N or P position)	
		H22A7 engine	15 ± 2 (Neutral)	
Alternator Belt*1 (D16B6 engine)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.0-10.5 (0.28-0.41) with used belt	
			5.0-7.0 (0.20-0.28) with new belt	
	Belt tension N (kgf, lbf)		340-490 (35-50, 77-110) with used belt	
		Measured with belt tension gauge	640-780 (65-80, 140-180) with new belt	
Alternator Belt*1 (D16B6 engine with A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-12.0 (0.39-0.47) with used belt	
			5.5-7.5 (0.22-0.30) with new belt	
	Belt tension N (kgf, lbf)		390-540 940-55, 88-120) with used belt	
		Measured with belt tension gauge	880-1,030 (90-105, 200-230 with new belt	
Alternator Belt*1 (Except D16B6 engine without A/C)	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		10.0-13.0 (0.39-0.51) with used belt	
			7.5-10.0 (0.30-0.39) with new belt	
	Belt tension N (kgf, lbf)		290-440 (30-45, 66-99) with used belt	
		Measured with belt tension gauge	540-740 (55-75, 120-170) with new belt	
Alternator (Except H22A7 engine)	Output 13.5 V at hot		STANDARD (NEW)	
	D16B6, D16B7 engines	85 A	SERVICE LIMIT	
	Except D16B6, D16B7 engines	90 A		
	Coil resistance (rotor) at 20°C (68°F) ohm			
	D16B6, D16B7 engines	2.6	-	
	Except D16B6, D16B7 engines	2.4	-	
	Slip ring O.D.	15.4 (0.61)	14.15 (0.557)	
Brush length	13.2 (0.52)	3.2 (0.13)		
Brush spring tension N (kgf, lbf)	1.9 (0.19, 0.42)	-		
Alternator (H22A7 engine)	Output 13.5 V at hot	95 A		
	Coil resistance (rotor) at 20°C (68°F) ohm	2.2-3.0	-	
	Slip ring O.D.	14.4 (0.57)	14.0 (0.55)	
	Brush length	10.5 (0.41)	1.5 (0.06)	
	Brush spring tension N (kgf, lbf)	2.9-3.5 (0.30-0.36, 0.66-0.79)	-	
Starter (Except H22A7 engine)	Manufacturer	VALEO		
	Output	1.0 kW		
	Commutator mica depth	0.5-0.9 (0.020-0.035)	0.2 (0.08)	
	Commutator runout	0-01 (0-0004) max.	0.015 (0.0006)	
	Brush length	18 (0.7)	5 (0.2)	
	Brush spring tension N (kgf, lbf)	15.3-19.2 (1.56-1.96, 3.44-4.32)	-	
Starter (H22A7 engine)	Manufacturer	DENSO		
	Output	1.0 kW		
	Commutator mica depth	0.5-0.8 (0.020-0.031)	0.2 (0.08)	
	Commutator runout	0.02 (0-0008) max.	0.05 (0.002)	
	Commutator O.D.	27.9-28.0 (1.098, 1.102)	27.0 (1.06)	
	Brush length	14.0-14.5 (0.55-0.57)	9.0 (0.35)	
	Brush spring tension N (kgf, lbf)	13.7-17.7 (1.4-1.8, 3.09-3.97)	-	

*1: When using a new belt, adjust deflection or tension to new belt values. Run the engine for 5 minutes then turn it off. Readjust

deflection or tension to used belt values.

Standards and Service Limits**2-3****Cylinder Head/Valve Train (D16B6, D16B7 engines) -
Section 6**

Unit of length: mm (in)

MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT
Compression	250 rpm (min*1) and wide open throttle	Minimum	930 (9.5, 135)	
	kPa (kgf/cm ² , psi)	Maximum variation	200 (2.0, 28)	
Cylinder head	Warpage		-	0.05 (0.002)
	Height		92.95-93.05 (3.659-3.663)	-
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)
	Total runout		0.03 (0.001) max.	0.04 (0.002)
	Cam lobe height	IN	35.019 (1.3787)*1, 34.734(1.3675)*2	-
		EX	37.904 (1.4923)	-
Valve	Valve clearance (Cold)	IN	0.18-0.22 (0.007-0.009)	-
		EX	0.23-0.27 (0.009-0.011)	-
	Valve stem O.D.	IN	5.48-5.49 (0.2157-0.2161)	5.45 (0.2146)
		EX	5.45-5.46 (0.2146-0.2150)	5.42 (0.2134)
	Stem-to-guide clearance	IN	0.02-0.05 (0.001-0.002)	0.08 (0.003)
		EX	0.05-0.08 (0.002-0.003)	0.11 (0.004)
Valve seat	Width	IN	0.85-1.15 (0.033-0.045)	1.6 (0.063)
		EX	1.25-1.55 (0.049-0.061)	2.0 (0.079)
	Stem installed height	IN	53.17-53.64 (2.093-2.112)	53.89 (2.122)
		EX	53.17-53.64 (2.093-2.112)	53.89 (2.122)
Valve spring	Free length	IN and EX	58.7 (2.31)	-
Valve guide	I.D.	IN	5.51-5.53 (0.217-0.218)	5.55 (0.219)
		EX	5.51-5.53 (0.217-0.218)	5.55 (0.219)
	Installed height	IN	17.85-18.35 (0.703-0.722)	-
		EX	18.65-19.15 (0.734-0.754)	-
Rocker arm	Arm-to-shaft clearance	IN	0.017-0.050 (0.0007-0.0020)	0.08 (0.003)
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)

*1: Timing belt side, *2: Distributor side

Standards and Service Limits
Cylinder Head/Valve Train (F18B2, F20B6, F23Z5
engines) - Section 6

2-4

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Compression	250 rpm (min*1) and wide open throttle kPa (kgf/cm ² , psi)				
		Minimum	930 (9.5, 135)		
		Maximum variation	200 (2.0, 28)		
Cylinder head	Warpage		-	0.05 (0.002)	
	Height		99.95-100.05 (3.935-3.939)	-	
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)	
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)	
	Total runout		0.03 (0.001) max.	0.04 (0.002)	
	Cam lobe height F18B2, F18B3 engines				
		IN	Primary	38.539 (1.5173)	-
			Mid	39.223 (1.5442)	-
			Secondary	33.913 (1.3352)	-
		EX		38.645 (1.5215)	-
	F20B6 engine				
		IN	Primary	38.539 (1.5173)	-
			Mid	39.725 (1.5640)	-
			Secondary	33.913 (1.3352)	-
		EX		38.645 (1.5215)	-
	F23Z5 engine				
		IN	Primary	37.775 (1.4872)	-
		Mid	39.725 (1.5640)	-	
		Secondary	34.471 (1.3571)	-	
	EX		38.338 (1.5094)	-	
Valve	Valve clearance (Cold)	IN	0.24-0.28 (0.009-0.011)	-	
		EX	0.28-0.32 (0.011-0.013)	-	
	Valve stem O.D.	IN	5.485-5.495 (0.2159-0.2163)	5.455 (0.2148)	
		EX	5.450-5.460 (0.2146-0.2150)	5.420(0.2134)	
	Stem-to-guide clearance	IN	0.020-0.045 (0.0008-0.0018)	0.08 (0.003)	
		EX	0.055-0.080 (0.0022-0.0031)	0.12 (0.005)	
Valve seat	Width	IN	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
	Stem installed height	IN	46.75-47.55 (1.841-1.872)	47.80 (1.882)	
		EX	46.68-47.48 (1.838-1.869)	47.73 (1.879)	
Valve spring	Free length	IN	51.08 (2.011)	-	
		EX	55.58 (2.188)	-	
Valve guide	I.D.	IN	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
		EX	5.515-5.530 (0.2171-0.2177)	5.55 (0.219)	
	Installed height	IN	21.20-22.20 (0.835-0.874)	-	
		EX	20.63-21.63 (0.812-0.852)	-	
Rocker arm	Arm-to-shaft clearance	IN	0.026-0.067 (0.0010-0.0026)	0.08 (0.003)	
		EX	0.018-0.054 (0.0007-0.0021)	0.08 (0.003)	

Standards and Service Limits
2-5
Cylinder Head/Valve Train (H22A7 engine) - Section 6

Unit of length: mm (in)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Compression	250 rpm (min ⁻¹)	Nominal	1,270 (13.0, 185)		
	wide open throttle	Minimum	930 (9.5, 135)		
	kPa (kgf/cm ² , psi)	Maximum variation	200 (2.0, 28)		
Cylinder head	Warpage		-	0.05 (0.002)	
	Height		146.95-147.05 (5.785-5.789)	-	
Camshaft	End play		0.05-0.15 (0.002-0.006)	0.5 (0.02)	
	Camshaft-to-holder oil clearance		0.050-0.089 (0.0020-0.0035)	0.15 (0.006)	
	Total runout		0.03 (0.001) max.	0.04 (0.002)	
	Cam lobe height	IN	Primary	34.041 (1.3402)	-
			Mid	37.229 (1.4657)	-
			Secondary	34.071 (1.3414)	-
		EX	Primary	33.745 (1.3285)	-
			Mid	36.704 (1.4450)	-
			Secondary	34.683 (1.3655)	-
Valve	Valve clearance (Cold)	IN	0.15-0.19 (0.006-0.007)*1	-	
		EX	0.17-0.21 (0.007-0.008)*1	-	
	Valve stem O.D.	IN	5.475-5.485 (0.2156-0.2159)	5.445 (0.2144)	
		EX	5.475-5.485 (0.2156-0.2156)	5.445 (0.2144)	
	Stem-to-guide clearance	IN	0.025-0.055 (0.0010-0.0022)	0.08 (0.003)	
		EX	0.050-0.080 (0.0020-0.0031)	0.11 (0.004)	
Valve seat	Width	IN	1.30-1.50 (0.051-0.059)	2.00 (0.079)	
		EX	1.25-1.55 (0.049-0.061)	2.00 (0.079)	
	Stem installed height	IN	42.5-42.7 (1.673-1.681)	42.95 (1.691)	
		EX	43.9-44.1 (1.728-1.736)	44.35 (1.746)	
Valve spring	Free length	IN	Outer	44.10 (1.736)	
			Inner	41.32 (1.627)	
		EX	Outer	44.92 (1.769)	
			Inner	40.01 (1.575)	
Valve guide	I.D.	IN	5.510-5.530 (0.2169-0.2177)	5.55 (0.219)	
		EX	5.535-5.555 (0.2179-0.2187)	5.60 (0.220)	
	Installed height	IN	14.55-15.05 (0.573-0.593)	-	
		EX	14.95-15.45 (0.589-0.608)	-	
Rocker arm	Arm-to-shaft clearance	IN	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)	
		EX	0.025-0.052 (0.0010-0.0020)	0.08 (0.003)	

*1: Measuring point between camshaft and rocker arm.

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	75.00-75.02 (2.953-2.954)	75.07 (2.956)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.5 (0.02)	
Piston	Skirt O.D. at 5 mm (0.2 in) from bottom of skirt	74.980-74.990 (2.9520-2.9524)	74.970 (2.9516)	
	Clearance in cylinder	0.010-0.040 (0.0004-0.0016)	0.05 (0.002)	
	Groove width (for ring)	Top	1.020-1.030 (0.0402-0.0406)	1.05 (0.041)
		Second	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
Piston ring	Ring-to-groove clearance	Top	0.030-0.060 (0.0012-0.0024)	0.13 (0.005)
		Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)
	Ring end gap	Top	0.15-0.30 (0.006-0.012)	0.70 (0.028)
		Second	0.20-0.70 (0.008-0.028)	0.80 (0.031)
Piston pin	O.D.	Oil	0.20-0.80 (0.008-0.031)	0.90 (0.035)
	Pin-to-piston clearance		18.994-19.000 (0.7478-0.7480)	-
			0.010 - 0.022 (0.0004-0.0009)	-
Connecting rod	Pin-to-rod clearance	0.014-0.040 (0.0006-0.0016)	-	
	Small end bore diameter	18.96-18.98 (0.746-0.747)	-	
	Large end bore diameter	Nominal 48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter	54.976-55.000 (2.1644-2.1654)	-	
	Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-	
	Taper	0.0025 (0.0001) max.	0.005 (0.0002)	
	Out of round	0.0025 (0.0001) max.	0.005 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Total runout	0.03 (0.001) max.	0.04 (0.002)	
Bearing	Main bearing-to-journal oil clearance	No. 1 and 5 journals	0.018-0.036 (0.0007-0.0014)	0.05 (0.002)
		No. 2, 3 and 4 journals	0.024-0.042 (0.0009-0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance	0.020-0.038 (0.0008-0.0015)	0.05 (0.002)	

Standards and Service Limits

Engine Block (F18B2, F18B3, F18B6, F23Z5 engines)

- Section 7

2-7

Unit of length: mm (in)

MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.		0.10 (0.004)	
	Bore diameter				
	Except F23Z5 engine	A or I	85.010-85.020 (3.3468-3.3472)	85.070 (3.3492)	
		B or II	85.000-85.010 (3.3465-3.3468)	85.070 (3.3492)	
	F23Z5 engine	A or I	86.010-86.020 (3.3862-3.3866)	86.070 (3.3886)	
		B or II	86.000-86.010 (3.3858-3.3862)	86.070 (3.3886)	
	Bore taper	-		0.05 (0.002)	
	Reboring limit	-		0.25 (0.01)	
Piston	Skirt O.D. [at 16mm (0.6in) from bottom of skirt]	Except F23Z5 engine	No letter	84.980-84.990 (3.3457-3.3461)	84.970 (3.3453)
			Letter B	84.970-84.980 (3.3453-3.3457)	84.960 (3.3449)
		F23Z5 engine	No letter	85.980-85.990 (3.3850-3.3854)	85.970 (3.3846)
			Letter B	85.970-85.980 (3.3846-3.3850)	85.960 (3.3842)
	Clearance in cylinder	0.020-0.040 (0.0008-0.0016)		0.05 (0.002)	
	Groove width (For ring)	Top	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)	
Second		1.220-1.230 (0.0480-0.0484)	1.25 (0.049)		
Oil		2.805-2.825 (0.1104-0.1112)	2.85 (0.112)		
Piston ring	Ring-to-groove clearance	Top	0.035-0.060 (0.0014-0.0024)	0.13 (0.005)	
		Second	0.030-0.055 (0.0012-0.0022)	0.13 (0.005)	
	Ring end gap	Top	0.20-0.35 (0.008-0.014)	0.60 (0.024)	
		Second	0.40-0.55 (0.016-0.022)	0.70 (0.028)	
		Oil	0.20-0.70 (0.008-0.028)	0.80 (0.031)	
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)		21.953 (0.8643)	
	Pin-to-piston clearance	-0.0050-+0.0020 (-0.00020-+0.00008)		0.004 (0.0002)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.0006)		0.020 (0.0008)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)		-	
	Large end bore diameter	Nominal	48.0 (1.89)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)		0.40 (0.016)	
Crankshaft	Main journal diameter	No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655)	-	
		No. 3 journal	54.976-55.000 (2.1644-2.1654)	-	
		No. 5 journal	54.992-55.016 (2.1650-2.1660)	-	
		Rod journal diameter	44.976-45.000 (1.7707-1.7717)	-	
	Taper	0.005 (0.0002) max.		0.010 (0.0004)	
	Out-of-round	0.005 (0.0002) max.		0.010 (0.0004)	
	End play	0.10-0.35 (0.004-0.014)		0.45 (0.018)	
	Runout	0.02 (0.001) max.		0.04 (0.002)	
Bearings	Main bearing-to-journal oil clearance	No. 1 and No. 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)	
		No. 2 journal	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)	
		No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)	
		No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)	
		Rod bearing-to-journal clearance	0.015-0.043 (0.0006-0.0017)	0.050 (0.0020)	
	Balancer shaft	Journal diameter	No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)
No. 1 rear journal			20.938-20.950 (0.8243-0.8248)	20.92 (0.824)	
No. 2 front and rear journals			38.712-38.724 (1.5241-1.5246)	38.70 (1.524)	
No. 3 front and rear journals			34.722-34.734 (1.3670-1.3675)	34.71 (1.367)	
Journal taper			0.005 (0.0002) max.		-
End play		Front	0.10-0.40 (0.004-0.016)	-	
		Rear	0.04-0.15 (0.002-0.006)	-	
Total runout		0.02 (0.001) max.		0.03 (0.001)	
Shaft-to-bearing oil clearance		No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)		0.12 (0.005)
		No. 1 rear journal	0.050-0.075 (0.0020-0.0030)		0.09 (0.004)
		No. 2 front and rear journals	0.076-0.108 (0.0030-0.0043)		0.13 (0.005)
Balancer shaft bearing	I.D.	No. 1 front journal	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)	
		No. 1 rear journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)	
		No. 2 front and rear journals	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)	
		No. 3 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)	

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.	0.10 (0.004)	
	Bore diameter	A or I 87.010-27.020 (3.4256-3.4260) B or II 87.000-87.010 (3.4252-3.4256)	87.070 (3.4279) 87.070 (3.4279)	
	Bore taper	-	0.05 (0.002)	
	Reboring limit	-	0.25 (0.010)	
Piston	Skirt O.D. [at 15 mm (0.6 in) from bottom skirt]	No letter 86.993-87.006 (3.4249-3.4254) Letter B 86.983-86.996 (3.4245-3.4250)	86.980 (3.4244) 86.970 (3.4240)	
	Clearance in cylinder	0.004-0.027 (0.0002-0.0011)	0.04 (0.002)	
	Groove width (For ring)	Top	1.240-1.255 (0.0488-0.0494)	1.275 (0.0502)
		Second	1.230-1.245 (0.0484-0.0490)	1.265 (0.0498)
		Oil	2.805-2.825 (0.1104-0.1112)	2.85 (0.112)
Piston ring	Ring-to-groove clearance	Top	0.055-0.085 (0.0022-0.0033)	0.13 (0.005)
		Second	0.040-0.070 (0.0016-0.0028)	0.13 (0.005)
	Ring end gap	Top	0.25-0.35 (0.010-0.014)	0.60 (0.024)
		Second	0.60-0.70 (0.024-0.028)	0.90 (0.035)
		Oil	0.20-0.70 (0.008-0.028)*1 0.20-0.50 (0.008-0.020)*2	0.80 (0.031)*1 0.60 (0.024)*2
Piston pin	O.D.	21.961-21.965 (0.8646-0.8648)	21.953 (0.8643)	
	Pin-to-piston clearance	-0.0030-+0.0060 (-0.00012-+0.00024)	0.009 (0.0004)	
Connecting rod	Pin-to-rod clearance	0.005-0.015 (0.0002-0.006)	0.002 (0.0001)	
	Small end bore diameter	21.970-21.976 (0.8650-0.8652)	-	
	Large end bore diameter	Nominal 51.0 (2.01)	-	
	End play installed on crankshaft	0.15-0.30 (0.006-0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter	No. 1, 2 and 4 journals	54.980-55.004 (2.1646-2.1655)	-
		No. 3 journal	54.976-55.000 (2.1644-2.1654)	-
		No. 5 journal	54.992-55.016 (2.1650-2.1660)	-
		Rod journal diameter	47.976-48.000 (1.8888-1.8898)	-
	Taper	0.005 (0.0002) max.	0.006 (0.0002)	
	Out-of-round	0.004 (0.0002) max.	0.006 (0.0002)	
	End play	0.10-0.35 (0.004-0.014)	0.45 (0.018)	
	Runout	0.03 (0.001) max.	0.04 (0.002)	
Bearings	Main bearing-to-journal oil clearance	No. 1 and No. 4 journals	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)
		No. 2 journal	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)
		No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)
		No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)
		Rod bearing-to-journal oil clearance	0.027-0.055 (0.0011-0.0022)	0.060 (0.0024)
	Balancer shaft	Journal diameter	No. 1 front journal	42.722-42.734 (1.6820-1.6824)
No. 1 rear journal			20.938-20.950 (0.8243-0.8248)	20.92 (0.824)
No. 2 front and rear journals			38.712-38.724 (1.5241-1.5246)	38.70 (1.524)
No. 3 front and rear journals			34.722-34.734 (1.3670-1.3675)	34.71 (1.367)
Journal taper			0.005 (0.0002) max.	-
End play		Front	0.10-0.40 (0.004-0.016)	-
		Rear	0.04-0.15 (0.002-0.006)	-
Total runout		0.02 (0.001) max.	0.03 (0.001)	
Shaft-to-bearing oil clearance		No. 1 front, No. 3 front and rear journals	0.066-0.098 (0.0026-0.0039)	0.12 (0.005)
		No. 1 rear journal	0.050-0.075 (0.0020-0.0030)	0.09 (0.004)
	No. 2 front and rear journals	0.076-0.108 (0.0030-0.0043)	0.13 (0.005)	
Balancer shaft bearing	I.D.	No. 1 front journal	42.800-42.820 (1.6850-1.6858)	42.83 (1.686)
		No. 1 rear journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)
		No. 2 front and rear journals	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)
		No. 3 front and rear journals	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)

*1: RIKEN manufactured piston ring.

*2: TEIKOKU PISTON RING manufactured piston ring.

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity / (US qt, Imp qt)	D16B6, D16B7 engines: 4.0 (4.2, 3.5) for engine overhaul 3.6 (3.8, 3.2) for oil change, including filter 3.3 (3.5, 2.9) for oil change, without filter F18B2, F18B3, F20B6 engines: 5.7 (6.0, 5.0) for engine overhaul 4.4 (4.6, 3.9) for oil change, including filter 4.1 (4.3, 3.6) for oil change, without filter F23Z5 engine: 5.6 (5.9, 5.0) for engine overhaul 4.3 (4.5, 3.8) for oil change, including filter 4.0 (4.2, 3.6) for oil change, without filter H22A7 engine: 5.9 (6.2, 5.2) for engine overhaul 4.8 (5.1, 4.2) for oil change, including filter 4.5 (4.8, 4.0) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing-to-outer rotor clearance D16B6, D16B7 engines Except D16B6, D16B7 engines Pump housing-to-rotor axial clearance D16B6, D16B7 engines Except D16B6, D16B7 engines	0.02-0.14 (0.001-0.006) 0.02-0.16 (0.001-0.006) 0.10-0.18 (0.004-0.007) 0.10-0.19 (0.004-0.007) 0.03-0.08 (0.001-0.003) 0.02-0.07 (0.001-0.003)	0.20 (0.008) 0.20 (0.008) 0.20 (0.008) 0.21 (0.008) 0.15 (0.006) 0.12 (0.005)
Relief valve	Pressure setting at engine oil temp. 80°C (176°F) kPa (kgf/cm ² , psi) at idle at 3,000 rpm (min ⁻¹)	70 (0.7, 10) min. 340 (3.5, 50) min.	

Cooling - Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity / (US qt, Imp qt) [including engine, heater, cooling line and reservoir] Reservoir capacity: 0.55 / (0.58 US qt, 0.48 Imp qt)	D16B6, D16B7 engines: 4.6 (4.9, 4.1) for overhaul 3.9 (4.1, 3.4) for coolant change F18B2, F18B3, F10B4, F20B6 engines: M/T: 5.8 (6.1, 5.1) for overhaul 4.2 (4.4, 3.7) for coolant change A/T: 5.7 (6.0, 5.0) for overhaul 4.1 (4.3, 3.6) for coolant change H22A7 engine: 6.9 (7.3, 6.1) for overhaul 3.3 (3.5, 2.9) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm ² , psi)	93-123 (0.95-1.25, 14-18)
Thermostat	Start to open °C (°F) Fully open °C (°F) Valve lift at fully open Except H22A7 engine H22A7 engine	76-80 (169-176) 90 (194) 8.0 (0.31) min. 10.0 (0.39) min.
Cooling fan	Thermoswitch "ON" temperature °C (°F) Except H22A7 engine H22A7 engine Thermoswitch "OFF" temperature °C (°F) Except H22A7 engine H22A7 engine Fan timer "ON" temperature °C (°F) Fan timer "OFF" temperature °C (°F)	91-95 (196-203) 92-98 (198-208) Subtract 3-8 (5-15) from actual "ON" temperature Subtract 2-7 (4-12) from actual "ON" temperature 103-109 (217-228) Subtract 4-9 (7-16) from actual "ON" temperature

	MEASUREMENT	STANDARD (NEW)
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kgf/cm ² , psi)	D16B6 engine 290-300 (3.0-3.1, 43-44) F18B2, F18B3, F20B6 engines 270-320 (2.8-3.3, 40-47) H22A7 engine 270-370 (2.8-3.8, 40-54)
Fuel tank	Capacity / (US gal, Imp gal)	65.0 (17.2, 14.3)
Engine	Idle speed with headlight and cooling fan off rpm (min ⁻¹)	D16B6, F18B3 engines 750 ± 50 (M/T: neutral) F18B2, F20B6 engines 750 ± 50 (M/T: neutral) 730 ± 50 (A/T: N or P position) H22A7 engine 790 ± 50 (M/T: neutral)
Engine	Idle CO %	With TWC model: 0.1 max. Without TWC model: 1.0 ± 1.0

Clutch - Section 12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Clutch pedal	Pedal height	to floor		
		LHD	177-187 (7.0-7.4)	-
		RHD	201-211 (7.9-8.3)	-
	Stroke		141-151 (5.55-5.94)	-
		Free play	9-15 (0.4-0.6)	-
	Pedal play	1.0-7.0 (0.04-0.28)	-	
	Disengagement height	to floor		
LHD		81 (3.2) min.	-	
RHD		107 (4.21) min.	-	
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)	
Clutch disc	Rivet head depth	U2J4, U2L4	1.4 (0.06) min	0.2 (0.008)
		DH	1.3 (0.05) min	0.2 (0.008)
		U2Q7	1.2-1.7 (0.05-0.07)	0.2 (0.008)
		U2N4	1.65-2.25 (0.065-0.089)	0.2 (0.008)
	Surface runout	0.6 (0.02) max.	1.0 (0.04)	
	Thickness	U2J4, U2L4	7.9-8.4 (0.31-0.33)	6.0 (0.24)
		DH	7.7-8.2 (0.30-0.32)	6.0 (0.24)
U2Q7		8.3-9.0 (0.33-0.35)	6.0 (0.24)	
U2N4	8.4-9.0 (0.33-0.35)	6.0 (0.24)		
Pressure plate	Warpage	0.03 (0.001) max.	0.15 (0.006)	
	Diaphragm spring finger alignment	0.6 (0.02) max.	0.8 (0.03)	

Manual Transmission (DH) - Section 13


	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission fluid	Capacity / (US qt, Imp qt)	1.8 (1.9, 1.6) at fluid change 1.9 (2.0, 1.7) at overhaul		
Mainshaft	End play	0.11-0.18 (0.004-0.007)	Adjust	
	Diameter of ball bearing contact area A (Transmission housing side)	21.987-22.000 (0.8656-0.8661)	21.930 (0.8634)	
	Diameter of 4th, 5th gear contact area B	26.980-26.993 (1.0622-1.0627)	26.930 (1.0602)	
	Diameter of 3rd gear contact area C	33.984-34.000 (1.3380-1.3386)	33.930 (1.3358)	
	Diameter of ball bearing contact area D (Clutch housing side)	25.977-25.990 (1.0227-1.0232)	25.920 (1.0205)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	
Mainshaft 3rd and 4th gears	I.D.	39.009-39.025 (1.5358-1.5364)	39.07 (1.5382)	
	End play	3rd	0.06-0.21 (0.002-0.008)	0.33 (0.013)
		4th	0.06-0.19 (0.002-0.007)	0.31 (0.012)
	Thickness	3rd	30.22-30.27 (1.190-1.192)	30.15 (1.187)
		4th	30.12-30.17 (1.186-1.188)	30.05 (1.183)
Mainshaft 5th gear	I.D.	37.009-37.025 (1.4570-1.4577)	37.07 (1.459)	
	End play	0.06-0.19 (0.002-0.007)	0.31 (0.012)	
	Thickness	28.42-28.47 (1.119-1.121)	28.35 (1.116)	
Countershaft	Diameter of needle bearing contact area A	30.000-30.015 (1.1811-1.1817)	29.95 (1.179)	
	Diameter of 1st gear contact area B	35.984-36.000 (1.4167-1.4173)	35.93 (1.415)	
	Diameter of ball bearing contact area C	24.980-24.993 (0.9835-0.9840)	24.93 (0.982)	
	Runout	0.02 (0.001) max.	0.05 (0.002)	

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Countershaft 1st gear	I.D.	41.009-41.025 (1.6145-1.6152)	41.07 (1.617)
	End play (When tightened by the specified torque)	0.03-0.10 (0.001-0.004)	0.22 (0.009)
	Thickness	30.41-30.44 (1.197-1.198)	30.36 (1.195)
Countershaft 2nd gear	I.D.	44.009-44.025 (1.7326-1.7333)	44.07 (1.735)
	End play (When tightened by the specified torque)	0.04-0.12 (0.002-0.005)	0.24 (0.009)
	Thickness	31.91-31.96 (1.256-1.258)	31.85 (1.254)
Spacer collar (Countershaft 2nd gear)	I.D.	33.000-33.010 (1.2992-1.2996)	33.04 (1.301)
	O.D.	38-989-39.000 (1.5350-1.5354)	38.93 (1.533)
	Length	32.03-32.06 (1.261-1.262)	32.01 (1.260)
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	27.002-27.012 (1.0631-1.0635)	27.06 (1.065)
	O.D.	33.989-34.000 (1.3381-1.3386)	33.93 (1.336)
		31.989-32.000 (1.2594-1.2598)	31.93 (1.257)
	Length	22.83-22.86 (0.899-0.900)	22.81 (0.898)
		23.53-23.56 (0.926-0.928)	23.51 (0.926)
Reverse idler gear	I.D.	15.016-15.043 (0.5912-0.5922)	15.08 (0.594)
	Gear-to-reverse gear shaft clearance	0.032-0.077 (0.0013-0.0030)	0.14 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.73-1.18 (0.029-0.046)	0.4 (0.016)
Shift fork	Finger thickness	1st/2nd/5th 3rd/4th	6.2-6.4 (0.24-0.25) 7.4-7.6 (0.29-0.30)
	Fork-to-synchro sleeve clearance		0.35-0.65 (0.014-0.026)
			-
Reverse shift fork	Fork pawl groove width		12.7-13.0 (0.50-0.51)
	Fork-to-reverse idler gear clearance		0.5-1.1 (0.02-0.04)
	L-groove width		7.05-7.25 (0.278-0.285)
	Fork-to-6th/reverse shift shaft piece pin clearance		0.05-0.35 (0.002-0.014)
Shift arm A	Inner diameter of shift arm A contact point		13.05-13.13 (0.514-0.517)
	Shift arm A-to-shift arm C clearance		0.05-0.23 (0.002-0.009)
Shift arm B	Inner diameter of shift arm B shaft contact point		13.973-14.000 (0.5501-0.5512)
	Shift arm B-to-shaft clearance		0.013-0.070 (0.0005-0.0028)
	Shift arm B-to-shift piece clearance		0.2-0.05 (0.01-0.02)
	Diameter of shift fork contact point		12.900-13.0 -0.5118)
	Shift fork 1st-2nd/shift piece groove width		13.2-13.4 (0.52-0.53)
MBS shift piece	Diameter of pin		6.9-7.1 (0.27-0.28)
Differential carrier	Pinion shaft bore diameter		18.010-18.028 (0.7091-0.7098)
	Carrier-to-pinion shaft clearance		0.023-0.057 (0.0009-0.0022)
	Driveshaft bore diameter		26.025-26.045 (1.0246-1.0254)
	Carrier-to-driveshaft clearance		0.045-0.086 (0.0018-0.0034)
Differential pinion gear	Backlash		0.05-0.15 (0.002-0.006)
	Pinion gear bore diameter		18.042-18.066 (0.7103-0.7113)
	Pinion gear-to-pinion shaft clearance		0.055-0.095 (0.0022-0.0037)
Set ring-to-bearing outer race		0-0.1 (0-0.004)	Adjust

Standards and Service Limits
Manual Transmission (U2J4/U2L4/U2Q7/U2N4) -
Section 13

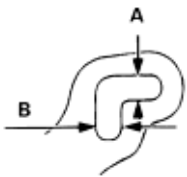
2-12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity / (US qt, Imp qt)	1.9 (2.0, 1.7) at fluid change 2.0 (2.1, 1.8) at overhaul	
Mainshaft	End play Diameter of ball bearing contact area C Diameter of needle bearing contact area B Diameter of ball bearing contact area A Diameter of 4th/5th contact area Runout	0.10-0.16 (0.004-0.006) 27.977-27.990 (1.1015-1.1020) 37.984-38.000 (1.4954-1.4961) 27.987-28.000 (1.1018-1.1024) 30.987-31.000 (1.2200-1.2205) 0.02 (0.001) max.	Adjust 27.93 (1.100) 37.93 (1.493) 27.94 (1.100) 30.93 (1.218) 0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D. End play Thickness 3rd gear Except U2Q7 4th gear Except U2Q7 U2Q7	43.009-43.025 (1.6933-1.6939) 0.06-0.21 (0.002-0.008) 32.42-32.47 (1.276-1.278) 34.92-34.97 (1.375-1.377) 30.92-30.97 (1.217-1.219) 31.42-31.47 (1.237-1.239)	43.080 (1.6961) 0.30 (0.012) 32.3 (1.27) 34.8 (1.37) 30.8 (1.21) 31.3 (1.23)
Mainshaft 5th gear	I.D. End play Thickness	43.009-43.025 (1.6933-1.6939) 0.06-0.21 (0.002-0.008) 30.92-30.97 (1.217-1.219)	43.080 (1.6961) 0.30 (0.012) 30.8 (1.21)
Countershaft	Diameter of needle bearing contact area A Diameter of ball bearing and needle bearing contact area C Diameter of 1st gear contact area B Runout	38.000-38.015 (1.4961-1.4967) 24.987-25.000 (0.9837-0.9843) 39.984-40.000 (1.5742-1.5748) 0.02 (0.001) max.	37.95 (1.494) 24.94 (0.982) 39.93 (1.572) 0.05 (0.002)
Countershaft 1st gear	I.D. End play Thickness	46.009-46.025 (1.8114-1.8120) 0.06-0.23 (0.002-0.009) 0.06-0.18 (0.002-0.007) 32.95-33.00 (1.297-1.299) 26.95-27.000 (1.061-1.063)	46.08 (1.814) 0.23 (0.009) 0.23 (0.009) - -
Countershaft 2nd gear	I.D. End play Thickness	47.009-47.025 (1.8507-1.8514) 0.10-0.15 (0.004-0.006) 28.94-28.97 (1.139-1.141)	47.08 (1.854) 0.18 (0.007) -
Thrust washer (Countershaft 1st gear)	Thickness	1.95-1.97 (0.077-0.078)	-
Spacer collar (Countershaft 2nd gear)	I.D. O.D. Length	36.48-36.49 (1.436-1.437) 41.989-42.000 (1.6531-1.6535) 29.07-29.09 (1.144-1.145)	36.50 (1.437) 41.94 (1.651) -
Spacer collar (Mainshaft 4th and 5th gears)	I.D. O.D. Length 	31.002-31.012 (1.2205-1.2209) 37.989-38.000 (1.4956-1.4961) 56.45-56.55 (2.222-2.226) 26.03-26.08 (1.025-1.027)	31.06 (1.223) 37.94 (1.494) - 26.01 (1.024)
Reverse idler gear	I.D. Gear-to-reverse gear shaft clearance	20.016-20.043 (0.7880-0.7891) 0.036-0.084 (0.0014-0.0033)	20.09 (0.7909) 0.160 (0.0063)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.85-1.10 (0.033-0.043)	0.40 (0.016)
Double cone synchro	Clearance (ring pushed against gear) Outer synchro ring-to-synchro cone Inner synchro ring-to-gear Outer synchro ring-to-gear	0.5-1.0 (0.02-0.04) min 0.5-1.0 (0.02-0.04) min 0.95-1.68 (0.037-0.066)	0.3 (0.01) 0.3 (0.01) 0.6 (0.02)

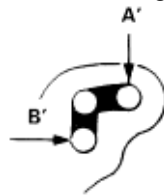
Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Shift fork	Finger thickness 1st/2nd/5th	6.2-6.4 (0.24-0.25)	-	
	3rd/4th	7.4-7.6 (0.29-0.30)	-	
	Fork-to-synchro sleeve clearance	0.35-0.65 (0.014-0.026)	1.0 (0.04)	
Reverse shift fork	Pawl groove width	13.0-13.3 (0.51-0.52)	-	
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)	
	Groove width*1	at A	7.05-7.25 (0.278-0.285)	-
		at B	7.4-7.7 (0.29-0.30)	-
	Fork-to-5th/reverse shift shaft Clearance*2	at A'	0.05-0.35 (0.002-0.014)	0.5 (0.02)
at B'	0.4-0.8 (0.02-0.03)	1.0 (0.04)		
Shift arm	I.D.	15.973-16.000 (0.6289-0.6299)	-	
	Shift arm-to-shaft clearance	0.005-0.059 (0.0002-0.0023)	-	
	Shift fork diameter contact area	12.9-13.0 (0.508-0.512)	-	
	Shift arm-to-shift fork shaft clearance	0.2-0.5 (0.01-0.02)	0.6 (0.02)	
Select lever	Shaft outer diameter	15.941-15.968 (0.6276-0.6287)	-	
	Shift arm cover clearance	0.032-0.102 (0.0013-0.0040)	-	
Shift lever	O.D.	15.941-15.968 (0.6276-0.6287)	-	
	Transmission housing clearance	0.021-0.141 (0.0008-0.0056)	-	
Interlock	Bore diameter	16.00-16.05 (0.630-0.632)	-	
	Shift arm clearance	0.032-0.109 (0.0013-0.0043)	-	
Differential carrier	Pinion shaft contact area I.D.			
	Except U2Q7	18.000-18.018 (0.7087-0.7094)	-	
	Carrier-to-pinion shaft clearance			
	Except U2Q7	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)	
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	-	
Carrier-to-driveshaft clearance	R	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)	
	L	0.055-0.091 (0.0022-0.0036)	0.15 (0.006)	
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	-	
	I.D.	18.042-18.066 (0.7103-0.7113)	-	
	Except U2Q7	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.0022-0.0037)	0.15 (0.006)
Tapered roller bearing preload	Starting torque Nm (kgf/cm, lbf/in)	1.4-2.5 (14-26, 12-23)	Adjust	

*1: Measuring points



*2: Measuring points



	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity	/ (US qt, Imp qt)	6.1 (6.4, 5.4) at overhaul 2.5 (2.6, 2.2) at fluid change	
Hydraulic pressure kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm (min ⁻¹) in N or P position		850-910 (8.7-9.3, 120-130)	800 (8.2, 120)
Hydraulic pressure kPa (kgf/cm ² , psi)	4th clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 3rd clutch pressure at 2,000 rpm (min ⁻¹) in D4 position 2nd clutch pressure at 2,000 rpm (min ⁻¹) in 2 position 1st clutch pressure at 2,000 rpm (min ⁻¹) in 1 position		840-920 (8.6-9.4, 120-130)	790 (8.1, 120)
Stall speed rpm (min ⁻¹) (Check with vehicle on level ground)	F20B6, F23Z5 engines F18B2 engine		2,250 2,450	1,950-2,550 2,150-2,750
Clutch	Clutch initial clearance	1st 2nd 3rd 4th	1.15-1.35 (0.045-0.053) 0.7-0.9 (0.028-0.035) 0.6-0.8 (0.024-0.031) 0.4-0.6 (0.016-0.024)	- - - -
	Clutch return spring free length	1st, 2nd 3rd, 4th	45.7 (1.80) 33.5 (1.32)	43.7 (1.72) 31.5 (1.24)
	Clutch disc thickness		1.88-2.00 (0.074-0.079)	Until grooves worn out
	Clutch plate thickness	1st 2nd 3rd 4th	1.95-2.05 (0.077-0.081) 2.25-2.35 (0.089-0.093) 2.55-2.65 (0.100-0.104) 2.25-2.35 (0.089-0.093)	Discoloration Discoloration Discoloration Discoloration
Clutch	Clutch end plate thickness	Mark 6 1st, 2nd clutches Mark 7 Mark 8 Mark 9 Mark 0 Mark 1 Mark 2 Mark 3 Mark 4	2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114) 2.95-3.00 (0.116-0.118) 3.05-3.10 (0.120-0.122) 3.15-3.20 (0.124-0.126) 3.25-3.30 (0.128-0.130) 3.35-3.40 (0.132-0.134)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
Clutch	Clutch end plate thickness	Mark 1 3rd, 4th clutches Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9	2.05-2.10 (0.081-0.083) 2.15-2.20 (0.085-0.087) 2.25-2.30 (0.089-0.091) 2.35-2.40 (0.093-0.094) 2.45-2.50 (0.096-0.098) 2.55-2.60 (0.100-0.102) 2.65-2.70 (0.104-0.106) 2.75-2.80 (0.108-0.110) 2.85-2.90 (0.112-0.114)	Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration Discoloration
Valve body	Stator shaft needle bearing contact I.D.	Torque converter side	27.000-27.021 (1.0630-1.0638)	Wear or damage
		ATF pump side	29.000-29.021 (1.1417-1.1426)	-
	ATF pump gear thrust clearance		0.03-0.05 (0.001-0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance	Drive Driven	0.210-0.265 (0.0083-0.0104) 0.070-0.125 (0.0028-0.0049)	- -
	ATF pump driven gear I.D.		14.016-14.034 (0.5518-0.5525)	Wear or damage
	ATF pump driven gear shaft O.D.		13.980-13.990 (0.5504-0.5508)	Wear or damage
Shifting device and parking brake	Reverse shift fork finger thickness		5.90-6.00 (0.232-0.236)	5.40 (0.213)
	Parking brake pawl		-	Wear or other defect
	Parking gear		-	Wear or other defect
Servo body	Shift fork shaft bore I.D.		14.000-14.010 (0.5512-0.5516)	-
	Shift fork shaft valve bore I.D.		37.000-37.039 (1.4567-1.4582)	37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.		32.000-32.025 (1.2598-1.2608)	32.050 (1.2618)

Accumulator body	Sealing ring contact I.D.	35.000-35.025 (1.3780-1.3789)	35.05 (1.3799)
Stator shaft	Sealing ring contact I.D.	29.000-29.021 (1.1417-1.1426)	29.050 (1.1437)

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 3rd gear thrust shim, 41 x 72 mm thickness	6.32-6.35 (0.2488-0.2500)	Wear or damage
		6.37-6.40 (0.2508-0.2520)	Wear or damage
		6.42-6.45 (0.2528-0.2539)	Wear or damage
		6.47-6.50 (0.2547-0.2559)	Wear or damage
		6.52-6.55 (0.2567-0.2579)	Wear or damage
		6.57-6.60 (0.2587-0.2598)	Wear or damage
Transmission	Mainshaft 4th gear thrust washer, 27 x 47 mm thickness	4.95-5.00 (0.1949-0.1969)	Wear or damage
Transmission	Secondary shaft splined washer, 38 x 56.5 mm thickness	6.82-6.85 (0.269-0.270)	Wear or damage
		6.87-6.90 (0.270-0.272)	Wear or damage
		6.92-6.95 (0.272-0.274)	Wear or damage
		6.97-7.00 (0.274-0.276)	Wear or damage
		7.02-7.05 (0.276-0.278)	Wear or damage
		7.07-7.10 (0.278-0.280)	Wear or damage
Transmission	Secondary shaft thrust shim, 37 x 55 mm thickness	4.87-4.90 (0.192-0.193)	Wear or damage
		4.92-4.95 (0.194-0.195)	Wear or damage
		4.97-5.00 (0.196-0.197)	Wear or damage
		5.02-5.05 (0.198-0.199)	Wear or damage
		5.07-5.10 (0.200-0.201)	Wear or damage
		5.12-5.15 (0.202-0.203)	Wear or damage
		5.17-5.20 (0.204-0.205)	Wear or damage
Transmission	Mainshaft 4th gear collar length	49.40-49.50 (1.945-1.949)	-
	Mainshaft 4th gear collar flange thickness	4.35-4.50 (0.171-0.177)	Wear or damage
	Countershaft distance collar length	50.42-50.46 (1.985-1.987)	-
	Cotter thickness	1.99-2.02 (0.078-0.080)	-
	Secondary shaft sealing ring, 35 mm thickness	1.890-1.950 (0.074-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 32 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring, 29 mm thickness	1.850-1.950 (0.073-0.077)	1.800 (0.071)
	Mainshaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Secondary shaft sealing ring groove width	2.025-2.060 (0.080-0.081)	2.080 (0.082)
	Mainshaft 4th clutch feed pipe O.D.	11.47-11.48 (0.4516-0.4520)	11.45 (0.4508)
	Mainshaft 3rd clutch feed pipe O.D.	5.97-5.98 (0.2350-0.2354)	5.95 (0.2343)
	Secondary shaft feed pipe O.D.	7.97-7.98 (0.3138-0.3142)	7.95 (0.3130)
	Mainshaft 4th clutch feed pipe bushing I.D.	11.500-11.518 (0.4528-0.4535)	11.530 (0.4539)
	Mainshaft 3rd clutch feed pipe bushing I.D.	6.018-6.030 (0.2369-0.2374)	6.045 (0.2380)
	Secondary shaft bushing I.D.	8.000-8.015 (0.3150-0.3156)	8.030 (0.3161)
	Diameter of needle bearing contact area		
	On mainshaft of stator shaft	22.984-23.000 (0.9049-0.9055)	Wear or damage
	On mainshaft of 3rd gear	55.975-55.991 (2.2037-2.2044)	Wear or damage
	On mainshaft of 4th gear collar	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 4th gear	33.975-33.991 (1.3376-1.3382)	Wear or damage
	On countershaft of 2nd gear	39.979-40.000 (1.5740-1.5748)	Wear or damage
	On countershaft of L. side	36.005-36.015 (1.4175-1.4179)	Wear or damage
	On parking gear	41.964-41.980 (1.6521-1.6528)	Wear or damage
	On secondary shaft of 1st gear	37.978-37.993 (1.4952-1.4958)	Wear or damage
	On secondary shaft of 2nd gear	33.986-33.999 (1.3380-1.3385)	Wear or damage
	On secondary shaft of L. side	34.000-34.013 (1.3386-1.3391)	Wear or damage
	On reverse idler gear shaft	14.985-15.000 (0.5900-0.5906)	Wear or damage
	Transmission housing of reverse idler gear shaft contact area I.D.	14.800-14.818 (0.5827-0.5834)	-
	Reverse idler gear shaft holder I.D.	14.800-14.824 (0.5827-0.5836)	Wear or damage
	Reverse selector hub O.D.	55.87-55.90 (2.1996-2.2008)	Wear or damage
	Inside Diameter		
	Mainshaft 3rd gear	61.000-61.019 (2.4016-2.4033)	Wear or damage
	Mainshaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft 4th gear	40.000-40.016 (1.5748-1.5754)	Wear or damage
	Countershaft idler gear	50.000-50.016 (1.9685-1.9691)	Wear or damage
	Countershaft reverse gear	46.000-46.016 (1.8110-1.8116)	Wear or damage
Reverse idler gear	20.007-20.020 (0.7877-0.7882)	Wear or damage	
Secondary shaft 1st gear	44.000-44.016 (1.7323-1.7329)	Wear or damage	
Secondary shaft 2nd gear	40.000-40.016 (1.5748-1.5754)	Wear or damage	

	MEASUREMENT	STANDARD (NEW)			SERVICE LIMIT
Transmission (cont'd)	End play				
	Mainshaft 3rd gear	0.03-0.11 (0.001-0.004)			-
	Mainshaft 4th gear	0.10-0.22 (0.004-0.009)			-
	Countershaft 1st gear	0.00-0.33 (0.000-0.013)			-
	Countershaft 4th gear	0.04-0.28 (0.002-0.011)			-
	Countershaft idler gear	0.015-0.045 (0.0006-0.0018)			-
	Countershaft reverse gear	0.10-0.25 (0.004-0.010)			-
	Reverse idler gear	0.20-0.55 (0.008-0.022)			-
	Secondary shaft 1st gear	0.07-0.15 (0.003-0.006)			-
	Secondary shaft 2nd gear	0.04-0.12 (0.002-0.005)			-
Differential carrier	Pinion shaft contact area I.D.	18.010-18.028 (0.709-0.710)			-
	Carrier-to-pinion shaft clearance	0.023-0.057 (0.001-0.002)			0.1 (0.004)
	Driveshaft contact area I.D.	28.025-28.045 (1.103-1.104)			-
	Carrier-to-driveshaft clearance	0.045-0.086 (0.002-0.003)			0.12 (0.005)
Differential pinion gear	Backlash	0.050-0.150 (0.002-0.006)			-
	I.D.	18.042-18.066 (0.710-0.711)			-
	Pinion gear-to-pinion shaft clearance	0.055-0.095 (0.002-0.004)			0.12 (0.005)
Differential tapered roller bearing preload	For new bearing	2.7-3.9 (28-40, 24-35)			Adjust
	For used bearing	2.5-3.6 (25-37, 22-32)			Adjust
Starting torque Nm (kgf/cm, lbf/in)					
	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Modulator valve spring	1.6 (0.063)	10.4 (0.409)	33.5 (1.319)	9.8
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0
	Relief valve spring	0.9 (0.035)	6.6 (0.260)	39.8 (1.567)	20.4
	Cooler check valve spring	0.6 (0.024)	5.8 (0.228)	14.5 (0.571)	6.8
	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
	Shift valve C spring	0.8 (0.031)	6.6 (0.260)	49.1 (1.933)	21.7
	Shift valve E spring	0.7 (0.028)	6.6 (0.260)	32.2 (1.268)	13.4
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	63.0 (2.480)	22.4
	Lock-up timing valve spring	0.65 (0.026)	6.6 (0.260)	34.8 (1.370)	15.6
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	42.9 (1.689)	14.2
	Shift valve D spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
	Reverse CPC valve spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
	1st accumulator spring A	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5	
3rd accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
4th accumulator spring	3.8 (0.150)	19.6 (0.772)	59.8 (2.354)	7.8	
2nd accumulator spring A	2.6 (0.102)	21.6 (0.850)	73.2 (2.882)	10.0	
2nd accumulator spring B	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6	

Unit of length: mm (in)

MEASUREMENT		STANDARD (NEW)	
Steering wheel	Rotation play at steering wheel circumference	0-10 (0-0.39)	
	Starting load at steering wheel circumference N (kgf, lbf) Engine running	30 (3.1, 6.8)	
Gearbox	Angle of rack-guide-screw loosened from locked position	5° - 10°	
Pump	Pump pressure with shut-off valve closed kPa (kgf/cm ² , psi).		
	D16B6 engine model	5,700-6,400 (58-65, 820-920)	
	F18B2, F18B3, F20B6 engines model	6,700-7,400 (68-75, 970-1,070)	
	H22A7 engine model	6,900-7,600 (70-77, 1,000-1,090)	
Power steering fluid	Recommended fluid	Honda power steering fluid S	
	Fluid capacity / (US qt. Imp qt) For overhaul		
	D16B6 engine model	1.0 (1.1, 0.9)	
	RHD (Except D16B6 engine)	1.1 (1.2, 1.0)	
	LHD (Except D16B6 engine)	1.0 (1.1, 0.9)	
	For fluid change	0.4 (0.42, 0.35)	
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	D16B6 engine model	10.5-14.0 (0.41-0.55) with used belt 7.5-10.0 (0.30-0.39) with new belt
		Except D16B6 engine model	13.0-16.5 (0.51-0.65) with used belt 8.5-11.0 (0.33-0.43) with new belt
	Belt tension N (kgf, lbf)		
Power steering belt*	Measured with belt tension gauge	D16B6 engine model	340-490 (35-50, 77-110) with used belt 640-780 (65-80, 143-176) with new belt
		Except D16B6 engine model	390-540 (40-55, 88-121) with used belt 740-880 (75-90, 165-198) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Suspension - Section 18

MEASUREMENT		STANDARD (NEW)			
Wheel alignment	Camber	Front H22A7 engine model	-0° 15' ± 1°		
		Except H22A7 engine model	0° ± 1°, 0°10' ± 1°*1		
	Rear	H22A7 engine model	-1°15' ± 30'		
		Except H22A7 engine model	-1°00' ± 30', -0°50' ± 30°*1		
	Caster	Front H22A7 engine model	3°00' ± 1°		
		Except H22A7 engine model	2°50' ± 1°, 2°45' ± 1°*1		
	Total toe	Front	0 ± 2 (0 ± 0.08)		
		Rear	IN 2 + 2 -1 (0.08 + 0.08 -0.04)		
	Front wheel turning angle	Inward wheel	H22A7 engine model	36°06' ± 2°	
			Except H22A7 engine model	39°10' ± 2°, 39°27' ± 2°	
		Outward wheel	H22A7 engine model	29°12' (Reference)	
Except H22A7 engine model			30°58' (Reference), 31°14' (Reference) *1		
Wheel bearing	End play	Front	0-0.05 (0-0.002)		
		Rear	0-0.05 (0-0.002)		
Wheel	Rim runout	Aluminium wheel	Axial	STANDARD (NEW)	SERVICE LIMIT
			Radial	0-0.7 (0-0.03)	2.0 (0.08)
	Steel Wheel	Axial	0-0.7 (0-0.03)	1.5 (0.06)	
		Radial	0-1.0 (0-0.04)	2.0 (0.08)	
			0-1.0 (0-0.04)	1.5 (0.06)	

*1: KY model

		MEASUREMENT	STANDARD (NEW)	
Parking brake lever		Play in stroke at 196 N (20 kgf, 44 lbf) lever force	To be locked when pulled 6-9 notches	
Foot brake pedal		Pedal height (With floor mat removed)		
		M/T	168.5 (6.63)	
		A/T	173.5 (6.83)	
		Free play	1-5 (0.04-0.20)	
Master cylinder		Piston-to-pushrod clearance	0-0.4 (0.-0.02)	
Disc brakes			STANDARD (NEW)	SERVICE LIMIT
		Disc thickness		
		H22A7 engine mode	27.9-28.1 (1.10-1.11)	26.0 (1.02)
		Except D16B6, D16B7 H22A7 engines model	24.9-25.1 (0.98-0.99)	23.0 (0.91)
		D16B6, D16B7 engines model	22.9-23.1 (0.90-0.91)	21.0 (0.83)
		Rear	9.9-10.1 (0.390-0.398)	8.0 (0.31)
		Disc runout		
		Front	-	0.10 (0.004)
	Rear	-	0.10 (0.004)	
	Disc parallelism	Front and rear	-	0.015 (0.0006)
	Pad thickness			
	Front	10.5-11.5 (0.41-0.45)	1.6 (0.06)	
	Rear	8.5-9.5 (0.33-0.37)	1.6 (0.06)	
Drum brake		Drum I.D.	228.6-228.7 (9.000-9.004)	229.6 (9.039)
		Lining thickness	5.0 (0.20)	2.0 (0.08)
Brake booster		Characteristics at 98 N (10 kgf, 22 lbf) and 294 (30 kgf, 68 lbf) pedal force		
			Minimum line pressure	
			D16B6 engine model	
		Vacuum	N (kgf, lbf)	kPa kgf/cm ² , psi
		kPa (mm Hg, in Hg)		
		0 (0, 0)	98 (10, 22)	0 (0, 0)
			294 (30, 66)	1,470 (15, 213)
		66.7 (500, 19.7)	98 (10, 22)	3,040 (31, 441)
			294 (30, 66)	6,860 (70, 995)
Brake booster		Characteristics at 98 N (10 kgf, 22 lbf) and 294 (30 kgf, 68 lbf) pedal force		
			Minimum line pressure	
			Except D16B6 engine model	
		Vacuum	N (kgf, lbf)	kPa kgf/cm ² , psi
		kPa (mm Hg, in Hg)		
		0 (0, 0)	98 (10, 22)	0 (0, 0)
			294 (30, 66)	1,275 (13, 185)
		66.7 (500, 19.7)	98 (10, 22)	3,825 (39, 555)
			294 (30, 66)	8,238 (84, 1, 194)

Air Conditioning - Section 22

		MEASUREMENT	STANDARD (NEW)	
Air conditioning system SANDEN		Lubricant type: SP-10 (P/N 38897-P13-003, 38898-P13-003 or 38899-P13-A01) (For Refrigerant: HFC-134a (R-134a))		
		Lubricant capacity	Condenser	25 (5/6, 0.9)
		m/ (fl oz, Imp oz)	Evaporator	40 (1 1/3, 1.4)
			Line or hose	10 (1/3, 0.4)
			Receiver	10 (1/3, 0.4)
DENSO		Lubricant type: ND-OIL8 (P/N 38897-PR7-003, 38898-PR7-003 or 38899-PR7-A01) (For Refrigerant: HFC-134a (R-134a))		
		Lubricant capacity	Condenser	25 (5/6, 0.9)
		m/ (fl oz, Imp oz)	Evaporator	40 (1 1/3, 1.4)
			Line or hose	10 (1/3, 0.4)
			Receiver	10 (1/3, 0.4)
Compressor SANDEN		Lubricant type: SP-10		
		Lubricant capacity	m/ (fl oz, Imp oz) 130 (4 1/3, 4.6)	
		Field coil resistance at 20°C (68°F) ohms	3.05-3.35	
		Pulley-to-pressure plate clearance	0.5 + 0.15 (0.02 + 0.006)	
Compressor DENSO		Lubricant type: ND-OIL8		
		Lubricant capacity	m/ (fl oz, Imp oz) 160 (5 1/3, 5.6)	
		Stator coil resistance at 20°C (68°F) ohms	3.9-4.3	
		Pulley-to-pressure plate clearance	0.5 + 0.15 (0.02 + 0.006)	
Compressor belt*		Deflection with 98 N (10 kgf, 22 lbf) between pulleys		
		D16B6, D16B7 engines	7.5-9.5 (0.30-0.37) with used belt	
			5.0-6.5 (0.20-0.26) with new belt	
		All except D16B6, D16B7 engines	10.0-12.0 (0.39-0.47) with used belt	
		5.5-7.5 (0.22-0.30) with new belt		
Compressor belt*		Belt Tension N (kgf, lbf)		
		Measured with belt tension gauge		
	D16B6, D16B7 engines	340-490 (35-50, 77-110) with used belt		

All except D16B6, D16B7 engines	690-830 (70-85, 150-190) with new belt
	390-540 (40-55, 88-120) with used belt
	880-1,030 (90-105, 200-231) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

	ITEM		METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length		4,595 mm	180.9 in	
	Overall Width		1,750 mm	68.9 in	
	Overall Height	Except KY model	1,430 mm	56.3 in	
		KY model	1,445 mm	56.9 in	
	Wheelbase	Except TYPE R	2,668 mm	105.0 in	
		TYPE R	2,670 mm	105.1 in	
	Track Front/Rear	Except TYPE R	1,495/1,504 mm	58.9/59.2 in	
TYPE R		1,507/1,515 mm	59.3/59.6 in		
Wheel Arch Front/Rear		666/669 mm	26.2/26.3 in	EU	
	Seating Capacity		Five		
WEIGHT 4-door	Curb Weight	KE	1.6iS M/T	1,270 kg	2,800 lbs
			M/T with A/C, S/R	1,301 kg	2,868 lbs
	1.6iLS M/T with A/C, S/R	1,301 kg	2,868 lbs		
	1.8iS	M/T	1,345 kg	2,965 lbs	
		A/T	1,370 kg	3,020 lbs	
	M/T with A/C		1,360 kg	2,998 lbs	
		A/T with A/C	1,385 kg	3,053 lbs	
	M/T with S/R		1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
	1.8iLS	M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
	M/T with A/C, S/R		1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
	1.8iES	M/T	1,406 kg	3,100 lbs	
		A/T	1,431 kg	3,155 lbs	
	2.0iLS	M/T with S/R	1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
	M/T with A/C, S/R		1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
	2.0iES	M/T	1,406 kg	3,100 lbs	
		A/T	1,431 kg	3,155 lbs	
	TYPE R	M/T	1,345 kg	2,965 lbs	
	KG	1.6iS	M/T with A/C	1,285 kg	2,833 lbs
			M/T with S/R	1,286 kg	2,835 lbs
	1.6iLS	M/T with A/C	1,285 kg	2,833 lbs	
		M/T with S/R	1,286 kg	2,835 lbs	
	M/T with A/C, S/R		1,301 kg	2,868 lbs	
		A/T with A/C	1,360 kg	2,998 lbs	
	1.8iS	M/T with A/C	1,385 kg	3,053 lbs	
		M/T with S/R	1,361 kg	3,000 lbs	
	1.8iLS	M/T	1,345 kg	2,965 lbs	
		A/T	1,370 kg	3,020 lbs	
	M/T with A/C		1,360 kg	2,998 lbs	
		A/T with A/C	1,385 kg	3,053 lbs	
	M/T with S/R		1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
	M/T with A/C, S/R		1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
	1.8iES	M/T	1,406 kg	3,100 lbs	
		A/T	1,431 kg	3,155 lbs	
	2.0iLS	M/T	1,345 kg	2,965 lbs	
		A/T	1,370 kg	3,020 lbs	
	M/T with A/C		1,360 kg	2,998 lbs	
		A/T with A/C	1,365 kg	3,053 lbs	
	M/T with S/R		1,361 kg	3,000 lbs	
		A/T with S/R	1,386 kg	3,056 lbs	
	M/T with A/C, S/R		1,376 kg	3,034 lbs	
		A/T with A/C, S/R	1,401 kg	3,089 lbs	
	2.0iES	M/T	1,406 kg	3,100 lbs	
A/T		1,431 kg	3,155 lbs		
TYPE R	M/T	1,345 kg	2,965 lbs		
KS	1.6iS	M/T	1,270 kg	2,800 lbs	
		M/T with A/C	1,285 kg	2,833 lbs	
1.6iLS	M/T with A/C	1,285 kg	2,833 lbs		
1.8iS	M/T with A/C	1,360 kg	2,998 lbs		
1.8iLS	A/T	1,375 kg	3,031 lbs		
	M/T with A/C	1,360 kg	2,998 lbs		

	ITEM			METRIC	ENGLISH	NOTES
WEIGHT 4-door	KS	2.0iLS	M/T	1,345 kg	2,965 lbs	
		2.0iES	M/T with A/C	1,390 kg	3,064 lbs	
	KR	1.6iS	M/T	1,265 kg	2,789 lbs	
			M/T with ABS	1,270 kg	2,800 lbs	
			M/T with ABS, A/C	1,285 kg	2,833 lbs	
		1.6iLS	M/T with A/C	1,285 kg	2,833 lbs	
			M/T with A/C, S/R	1,301 kg	2,868 lbs	
		1.8iS	M/T with A/C	1,360 kg	3,998 lbs	
		1.8iLS	M/T	1,345 kg	2,965 lbs	
			A/T	1,370 kg	3,020 lbs	
			M/T with A/C	1,360 kg	2,998 lbs	
			A/T with A/C	1,385 kg	3,053 lbs	
		M/T with A/C, S/R	1,376 kg	3,034 lbs		
		1.8iES	M/T	1,375 kg	3,031 lbs	
		2.0LS	M/T	1,360 kg	2,998 lbs	
		2.0ES	M/T	1,406 kg	3,100 lbs	
			A/T	1,431 kg	3,155 lbs	
		TYPE R	M/T	1,345 kg	2,965 lbs	
	KY	1.8iS	M/T	1,340 kg	2,954 lbs	
			A/T	1,365 kg	3,009 lbs	
WEIGHT 4-door	Weight Distributions (Front/Rear)					
	KE	1.6iS	M/T	730/540 kg	1,610/1,190 lbs	
			M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
		1.6iLS	M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
			1.8iS	M/T	805/540 kg	1,775/1,190 lbs
			A/T	830/540 kg	1,830/1,190 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			A/T with A/C	845/540 kg	1,863/1,190 lbs	
			M/T with S/R	813/548 kg	1,792/1,208 lbs	
			A/T with S/R	838/548 kg	1,848/1,208 lbs	
		1.8iLS	M/T with S/R	813/548 kg	1,792/1,208 lbs	
	A/T with S/R		838/548 kg	1,848/1,208 lbs		
	M/T with A/C, S/R		828/548 kg	1,826/1,208 lbs		
	A/T with A/C, S/R		853/548 kg	1,881/1,208 lbs		
	1.8iES		M/T	838/568 kg	1,848/1,252 lbs	
			A/T	863/568 kg	1,903/1,252 lbs	
	2.0iLS	M/T with S/R	823/538 kg	1,814/1,186 lbs		
		A/T with S/R	848/538 kg	1,870/1,186 lbs		
		M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs		
		A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs		
	2.0iES	M/T	848/558 kg	1,870/1,230 lbs		
		A/T	873/558 kg	1,925/1,230 lbs		
	TYPE R	M/T	820/525 kg	1,808/1,157 lbs		
	KG	1.6iS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with S/R	738/548 kg	1,627/1,208 lbs	
		1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with S/R	738/548 kg	1,627/1,208 lbs	
			M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
		1.8iS	M/T with A/C	820/540 kg	1,808/1,190 lbs	
			A/T with A/C	845/540 kg	1,863/1,190 lbs	
			M/T with S/R	813/548 kg	1,792/1,208 lbs	
		1.8iLS	M/T	805/540 kg	1,775/1,190 lbs	
			A/T	803/540 kg	1,830/1,190 lbs	
		M/T with A/C	820/540 kg	1,808/1,190 lbs		
		A/T with A/C	845/540 kg	1,863/1,190 lbs		
		M/T with S/R	813/548 kg	1,792/1,208 lbs		
		A/T with S/R	838/548 kg	1,848/1,208 lbs		
		M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs		
		A/T with A/C, S/R	853/548 kg	1,881/1,208 lbs		
	1.8iES	M/T	838/568 kg	1,848/1,252 lbs		
		A/T	863/568 kg	1,903/1,252 lbs		
	2.0iLS	M/T	815/530 kg	1,797/1,168 lbs		
		A/T	840/530 kg	1,852/1,168 lbs		
			M/T with A/C	830/530 kg	1,830/1,168 lbs	
			A/T with A/C	855/530 kg	1,885/1,168 lbs	
			M/T with S/R	823/538 kg	1,814/1,186 lbs	
			A/T with S/R	848/538 kg	1,870/1,186 lbs	
			M/T with A/C, S/R	838/538 kg	1,848/1,186 lbs	
			A/T with A/C, S/R	863/538 kg	1,903/1,186 lbs	

	ITEM			METRIC	ENGLISH	NOTES
WEIGHT	KG	2.0iES	M/T	848/558 kg	1,870/1,230 lbs	
			A/T	873/558 kg	1,925/1,230 lbs	
	KS	1.6iS	TYPE R M/T	820/525 kg	1,808/1,157 lbs	
			M/T	730/540 kg	1,610/1,190 lbs	
	KR	1.6iLS	M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	830/530 kg	1,830/1,168 lbs	
			A/T	815/560 kg	1,797/1,234 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			M/T	815/530 kg	1,797/1,168 lbs	
		1.8iS	M/T with A/C	840/550 kg	1,852/1,212 lbs	
			M/T	725/540 kg	1,598/1,191 lbs	
			M/T with ABS	730/540 kg	1,610/1,190 lbs	
			M/T with ABS, A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C	745/540 kg	1,643/1,190 lbs	
			M/T with A/C, S/R	753/548 kg	1,660/1,208 lbs	
	KY	1.8iLS	M/T with A/C	820/540 kg	1,808/1,190 lbs	
			M/T	805/540 kg	1,775/1,190 lbs	
			A/T	830/540 kg	1,830/1,190 lbs	
			M/T with A/C	820/540 kg	1,808/1,190 lbs	
			A/T with A/C	845/540 kg	1,863/1,190 lbs	
			M/T with A/C, S/R	828/548 kg	1,826/1,208 lbs	
		2.0iES	M/T	815/560 kg	1,797/1,234 lbs	
			M/T	830/530 kg	1,830/1,168 lbs	
			M/T	848/558 kg	1,870/1,230 lbs	
			A/T	873/558 kg	1,925/1,230 lbs	
			TYPE R M/T	820/525 kg	1,808/1,157 lbs	
			1.8iS M/T	805/535 kg	1,775/1,179 lbs	
			A/T	830/535 kg	1,830/1,179 lbs	
	WEIGHT	Max. Permissible Weight (EU)				
D16B6 engine models			1,740 kg	3,836 lbs		
F18B2, F18B3, F20B6 engine models			1,890 kg	4,167 lbs		
H22A7 engine model			1,820 kg	4,012 lbs		
WEIGHT 5-door	Curb Weight					
	KE 1.6LS	1.6iLS	M/T with SRS	1,314 kg	2,897 lbs	
			M/T with SRS	1,314 kg	2,897 lbs	
	1.8iS	1.8iLS	M/T with SRS, A/C	1,389 kg	3,062 lbs	
			M/T with SRS, S/R	1,404 kg	3,095 lbs	
			A/T with SRS, A/C	1,414 kg	3,117 lbs	
			A/T with SRS S/R	1,429 kg	3,150 lbs	
			M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs	
			A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
		1.8iES	M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs	
			M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs	
			M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs	
			M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs	
			A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs	
			A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	2.0iLS	2.0iLS	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
			A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
			M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs	
			A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs	
			M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
			M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs	
		2.0iV	M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs	
			A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
			A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
			A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs	
			M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs	
			M/T with SRS, A/C, S/R, Power seat, NAVI.	1,439 kg	3,172 lbs	
	2.0TDi	2.0iV	A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs	
			A/T with SRS, A/C, S/R, Power seat, NAVI.	1,464 kg	3,228 lbs	
			M/T with SRS, A/C	1,464 kg	3,228 lbs	
20SDi		M/T with SRS, A/C, S/R	1,479 kg	3,261 lbs		

	ITEM	METRIC	ENGLISH	NOTES
WEIGHT 5-door	KG 1.6iS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
	1.6iLS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
		M/T with SRS, side SRS	1,309 kg	2,885 lbs
	1.8iS	M/T	1,390 kg	3,064 lbs
		M/T with SRS	1,419 kg	3,128 lbs
		M/T with SRS, side SRS	1,386 kg	3,056 lbs
		A/T with SRS	1,417 kg	3,124 lbs
	1.8iLS	M/T	1,390 kg	3,064 lbs
		M/T with side SRS	1,390 kg	3,064 lbs
		M/T with SRS, A/C	1,392 kg	3,068 lbs
		M/T with SRS, A/C, S/R	1,409 kg	3,106 lbs
		M/T with SRS	1,376 kg	3,034 lbs
		A/T with SRS, A/C	1,417 kg	3,123 lbs
		A/T with SRS, A/C, S/R	1,434 kg	3,161 lbs
	1.8iES	M/T with SRS, A/C, S/R	1,420 kg	3,131 lbs
		M/T with SRS, A/C, S/R, Power seat	1,426 kg	3,144 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,425 kg	3,142 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	1,431 kg	3,155 lbs
		M/T with SRS, S/R	1,389 kg	3,062 lbs
		A/T with SRS, A/C, S/R	1,445 kg	3,186 lbs
		A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs
		A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs
		A/T with SRS, A/C, S/R, power seat, NAVI.	1,456 kg	3,210 lbs
	KG 2.0iLS	M/T with SRS, A/C	1,396 kg	3,077 lbs
		M/T with SRS, A/C, S/R	1,411 kg	3,110 lbs
		A/T with SRS, A/C	1,419 kg	3,128 lbs
		A/T with SRS, A/C, S/R	1,436 kg	3,165 lbs
	2.0iES	M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs
		M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	1,433 kg	3,159 lbs
		A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs
		A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs
		A/T with SRS, A/C, S/R, Power seat	1,450 kg	3,197 lbs
		A/T with SRS, A/C, S/R, Power seat, NAVI.	1,456 kg	3,210 lbs
	2.0iV	M/T with SRS, A/C, S/R	1,434 kg	3,161 lbs
		M/T with SRS, A/C, S/R, NAVI.	1,439 kg	3,172 lbs
		A/T with SRS, A/C, S/R	1,459 kg	3,217 lbs
		A/T with SRS, A/C, S/R, NAVI.	1,464 kg	3,228 lbs
	2.0TDi	M/T with SRS, A/C	1,464 kg	3,228 lbs
	2.0SDi	M/T with SRS, A/C	1,464 kg	3,228 lbs
		M/T with SRS, A/C, S/R	1,479 kg	3,260 lbs
	KS 1.6iS	M/T	1,312 kg	2,892 lbs
		M/T with SRS	1,314 kg	2,897 lbs
	1.6iLS	M/T with SRS	1,314 kg	2,897 lbs
	1.8iS	M/T with SRS	1,419 kg	3,128 lbs
	1.8iLS	M/T with SRS, A/C	1,392 kg	3,068 lbs
		A/T with SRS, A/C	1,417 kg	3,123 lbs
	2.0iLS	M/T with SRS, A/C	1,396 kg	3,077 lbs
	2.0iES	M/T with SRS, A/C	1,409 kg	3,106 lbs
	KR 1.6iS	M/T	1,307 kg	2,881 lbs
		M/T with SRS	1,314 kg	2,897 lbs
1.6iLS	M/T with SRS	1,314 kg	2,897 lbs	
1.8iLS	M/T with SRS	1,419 kg	3,128 lbs	
1.8iLS	M/T with SRS, A/C	1,408 kg	3,104 lbs	
	M/T with SRS, A/C (AUTO)	1,408 kg	3,104 lbs	
	M/T with SRS, A/C, S/R	1,423 kg	3,137 lbs	
	A/T with SRS, A/C	1,433 kg	3,159 lbs	
	A/T with SRS, A/C (AUTO)	1,433 kg	3,159 lbs	
2.0iES	M/T with SRS, A/C, S/R	1,422 kg	3,135 lbs	
	M/T with SRS, A/C, S/R, Power seat	1,428 kg	3,148 lbs	
	M/T with SRS, A/C, S/R, NAVI.	1,427 kg	3,146 lbs	
	A/T with SRS, A/C, S/R	1,442 kg	3,179 lbs	
	A/T with SRS, A/C, S/R, Power seat	1,451 kg	3,199 lbs	
	A/T with SRS, A/C, S/R, NAVI.	1,450 kg	3,197 lbs	
2.0TDi	M/T with SRS, A/C	1,464 kg	3,228 lbs	
2.0SDi	M/T with SRS, A/C	1,464 kg	3,228 lbs	

	ITEM	METRIC	ENGLISH	NOTES
WEIGHT	Weight Distribution (Front/Rear)			
	KE 1.6iS	M/T with SRS	739/575 kg	1,629/1,268 lbs
	1.6iLS	M/T with SRS	739/575 kg	1,629/1,268 lbs
	1.8iS	M/T with SRS, A/C	802/587 kg	1,768/1,294 lbs
		M/T with SRS, S/R	810/594 kg	1,786/1,309 lbs
		A/T with SRS, A/C	827/587 kg	1,823/1,294 lbs
		A/T with SRS, S/R	835/594 kg	1,840/1,310 lbs
	1.8iLS	M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs
		A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs
	1.8iES	M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs
		M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs
		M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,835/1,307 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	835/596 kg	1,841/1,314 lbs
		A/T with SRS, A/C, S/R	851/594 kg	1,876/1,310 lbs
		A/T with SRS, A/C, S/R, Power seat	854/597 kg	1,883/1,316 lbs
		A/T with SRS, A/C, S/R, NAVI.	856/594 kg	1,887/1,310 lbs
		A/T with SRS, A/C, S/R, Power seat, NAVI.	859/597 kg	1,894/1,316 lbs
	2.0iLS	M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs
		A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs
	2.0iES	M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs
		M/T with SRS, A/C, S/R, NAVI.	827/600 kg	1,823/1,323 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs
		A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs
		A/T with SRS, A/C, S/R, NAVI	858/592 kg	1,892/1,305 lbs
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs
	2.0iV	M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs
		M/T with SRS, A/C, S/R, Power seat, NAVI.	836/603 kg	1,843/1,329 lbs
		A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/603 kg	1,899/1,329 lbs
	2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs
	2.0SDi	M/T with SRS, A/C, S/R	881/598 kg	1,942/1,319 lbs
	KG 1.6iS	M/T	738/574 kg	1,627/1,265 lbs
		M/T with SRS	738/576 kg	1,627/1,270 lbs
	1.6iLS	M/T	738/574 kg	1,627/1,265 lbs
		M/T with SRS	739/575 kg	1,629/1,268 lbs
	1.8iS	M/T with SRS, side SRS	730/578 kg	1,610/1,275 lbs
		M/T	806/584 kg	1,777/1,287 lbs
		M/T with SRS	809/610 kg	1,783/1,345 lbs
		M/T with SRS, side SRS	813/573 kg	1,793/1,263 lbs
	1.8iLS	A/T with SRS	832/585 kg	1,834/1,290 lbs
		M/T	806/584 kg	1,777/1,287 lbs
		M/T with side SRS	806/584 kg	1,777/1,287 lbs
		M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs
		M/T with SRS, A/C, S/R	817/592 kg	1,801/1,305 lbs
		M/T with SRS	805/570 kg	1,775/1,259 lbs
		A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs
		A/T with SRS, A/C, S/R	841/593 kg	1,854/1,307 lbs
	1.8iES	M/T with SRS, A/C, S/R	827/593 kg	1,824/1,307 lbs
		M/T with SRS, A/C, S/R, Power seat	830/596 kg	1,830/1,314 lbs
		M/T with SRS, A/C, S/R, NAVI.	832/593 kg	1,834/1,308 lbs
M/T with SRS, A/C, S/R, Power seat, NAVI.		835/596 kg	1,841/1,314 lbs	
	M/T with SRS, S/R	803/586 kg	1,770/1,292 lbs	
	A/T with SRS, A/C, S/R	851/594 kg	1,876/1,310 lbs	
	A/T with SRS, A/C, S/R, Power seat	854/597 kg	1,883/1,316 lbs	
	A/T with SRS, A/C, S/R, NAVI.	856/594 kg	1,887/1,310 lbs	
	A/T with SRS, A/C, S/R, Power seat, NAVI.	859/597 kg	1,894/1,316 lbs	
	2.0iLS	M/T with SRS, A/C	801/595 kg	1,765/1,312 lbs
	M/T with SRS, A/C, S/R	809/602 kg	1,783/1,327 lbs	
	A/T with SRS, A/C	824/595 kg	1,816/1,312 lbs	
	A/T with SRS, A/C, S/R	834/602 kg	1,838/1,327 lbs	

	ITEM	METRIC	ENGLISH	NOTES		
WEIGHT 5-door	KG 2.0iES	M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs		
		M/T with SRS, A/C, S/R, Power seat	825/603 kg	1,819/1,329 lbs		
		M/T with SRS, A/C, S/R NAVI.	827/600 kg	1,823/1,323 lbs		
		M/T with SRS, A/C, S/R, Power seat, NAVI.	830/603 kg	1,830/1,329 lbs		
		A/T with SRS, A/C, S/R	848/594 kg	1,870/1,309 lbs		
		A/T with SRS, A/C, S/R, Power seat	856/595 kg	1,887/1,312 lbs		
		A/T with SRS, A/C, S/R, NAVI.	858/592 kg	1,892/1,305 lbs		
		A/T with SRS, A/C, S/R, Power seat, NAVI.	861/595 kg	1,898/1,312 lbs		
		2.0iV	M/T with SRS, A/C, S/R	831/603 kg	1,832/1,329 lbs	
			M/T with SRS, A/C, S/R, NAVI.	836/603 kg	1,843/1,329 lbs	
			A/T with SRS, A/C, S/R	856/603 kg	1,888/1,329 lbs	
			A/T with SRS, A/C, S/R NAVI.	861/603 kg	1,899/1,329 lbs	
		2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs	
		2.0SDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs	
	M/T with SRS, A/C, S/R		881/598 kg	1,942/1,318 lbs		
	KS	1.6iS	M/T	738/574 kg	1,627/1,265 lbs	
			M/T with SRS	739/575 kg	1,629/1,268 lbs	
		1.6iLS	M/T with SRS	739/575 kg	1,629/1,268 lbs	
		1.8iS	M/T with SRS	809/610 kg	1,783/1,345 lbs	
		1.8iLS	M/T with SRS, A/C	807/585 kg	1,779/1,289 lbs	
			A/T with SRS, A/C	831/586 kg	1,832/1,291 lbs	
		.0iLS	M/T with SRS, A/C	801/595 kg	1,766/1,311 lbs	
		2.0iES	M/T with SRS, A/C	816/592 kg	1,799/1,305 lbs	
		KR	1.6iS	M/T	733/574 kg	1,616/1,265 lbs
				M/T with SRS	739/575 kg	1,629/1,268 lbs
	1.6iLS		M/T with SRS	739/575 kg	1,629/1,268 lbs	
	1.8iS		M/T with SRS	809/610 kg	1,784/1,344 lbs	
	1.8iLS		M/T with SRS, A/C	823/585 kg	1,814/1,290 lbs	
			M/T with SRS, A/C (AUTO)	823/585 kg	1,814/1,290 lbs	
			M/T with SRS, A/C, S/R	830/593 kg	1,830/1,307 lbs	
			A/T with SRS, A/C	847/586 kg	1,867/1,292 lbs	
			A/T with A/C (AUTO)	847/586 kg	1,867/1,292 lbs	
	2.0iES		M/T with SRS, A/C, S/R	822/600 kg	1,812/1,323 lbs	
M/T with SRS, A/C, S/R, Power seat			825/603 kg	1,819/1,329 lbs		
M/T with SRS, A/C, S/R, NAVI			827/600 kg	1,823/1,323 lbs		
A/T with SRS, A/C, S/R			848/594 kg	1,869/1,310 lbs		
A/T with SRS, A/C S/R, Power seat		856/595 kg	1,887/1,312 lbs			
A/T with SRS, A/C, S/R, NAVI		858/592 kg	1,892/1,305 lbs			
2.0TDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs			
2.0SDi	M/T with SRS, A/C	873/591 kg	1,925/1,303 lbs			
WEIGHT 5-door	Max. Permissible Weight (EU)					
	D16B6, D16B7 engine models		1,740 kg	3,241 lbs		
	F18B2, F18B4, F20B6 engine models		1,930 kg	4,255 lbs		
	20T2N engine model		1,940 kg	4,277 lbs		

	ITEM	METRIC	ENGLISH	NOTES	
ENGINE	Type	D16B6, D16B7 engines	Water-cooled, 4-stroke SOHC gasoline engine		
		F18B2, F18B3, F20B6, F23Z5 engines	Water cooled, 4-stroke SOHC VTEC gasoline engine		
		H22A7 engine	Water-cooled, 4 stroke DOHC VTEC gasoline engine		
	Cylinder Arrangement		Inline-4-cylinder, transverse		
	Bore and Stroke				
		D16B6, D16B7 engine	75.0 x 90.0 mm	2.95 x 3.54 in	
		F18B2, F18B3 engines	85.0 x 81.5 mm	3.35 x 3.21 in	
		F20B6 engine	85.0 x 88.0 mm	3.35 x 3.46 in	
		F23Z5 engine	86.0 x 97.0 mm	3.35 x 3.82 in	
		H22A7 engine	87.0 x 90.7 mm	3.43 x 3.57 in	
	Displacement				
		D16B6, D16B7 engine	1,590 cm ³ (m/)	97.0 cu-in	
		F18B2, F18B3 engines	1,850 cm ³ (m/)	112.9 cu-in	
		F20B6 engine	1,997 cm ³ (m/)	121.9 cu-in	
		F23Z5 engine	2,253 cm ³ (m/)	137.4 cu-in	
		H22A7 engine	2,157 cm ³ (m/)	131.6 cu-in	
	Compression Ratio				
		D16B6, D16B7 engine		9.6	
		F18B2, F18B3, F20B6, F20B7 engines		10.0	
		F23Z5 engine		9.8	
		H22A7 engine		11.0	
	Valve Train				
		D16B6, D16B7 engine	Belt Driven, SOHC 4 valve per cylinder		
	F18B2, F18B3, F20B6, F23Z5 engines	Belt Driven, SOHC VTEC 4 valve per cylinder			
	H22A7 engine	Belt Driven, DOHC VTEC 4 valve per cylinder			
Lubrication System		Forced and wet sump, trochoid pump			
Oil Pump Displacement					
	D16B6, D16B7 engines	35.4 l (37.4 US qt, 31.1 Imp qt)		at 6,000 engine rpm (min ⁻¹)	
	Except D16B6, D16B7 engines	73.5 l (77.7 US qt, 64.7 Imp qt)		at 6,000 engine rpm (min ⁻¹)	
Water Pump Displacement					
	D16B6, D16B7 engines	125 l (132 US qt, 110 Imp qt)		at 6,000 engine rpm (min ⁻¹)	
	Except D16B6, D16B7 engines	160 l (169 US qt, 141 Imp qt)		at 6,000 engine rpm (min ⁻¹)	
Fuel Required					
	D16B6, D16B7, F18B2, F20B6 F23Z5 engines	Premium UNLEADED gasoline with a Research Octane Number (RON) of 95 or higher			
	F18B3 engine	LEADED gasoline with a Research Octane Number (RON) of 91 or higher*1			
	H22A7 engine	Super plus UNLEADED gasoline with a Research Octane Number (RON) of 98 or higher			
STARTER	Type	Gear reduction			
	Normal Output	1.0 kW			
	Normal Voltage	12 V			
	Hour Rating	30 seconds			
	Direction of Rotation	Clockwise as viewed from gear end			

	ITEM		METRIC	ENGLISH		NOTES		
CLUTCH	Type	M/T	Single plate dry, diaphragm spring					
	Facing Area	A/T	Torque converter					
TRANSMISSION	Type	M/T	176 cm ²	27.3 sq-in				
	Primary Reduction	A/T	Synchronised 5-speed forward, 1 reverse					
TRANSMISSION	Type/Ratio		Electronically controlled					
	Final Reduction Gear		4-speed automatic, 1 reverse					
TRANSMISSION	Manual Transmission	Gear Ratio	DH	U2J4	U2Q7	U2L4	U2N4	
			D16B6	F18B3	H22A7	F18B2	F23Z5	
				engines	engine	engine	engine	engine
	1st	3.250	3.285	3.285	3.285	3.285		
	2nd	1.782	1.807	2.090	1.956	1.807		
	3rd	1.250	1.266	1.481	1.344	1.266		
	4th	0.937	0.966	1.071	0.966	0.933		
	5th	0.750	0.787	0.870	0.787	0.735		
	Reverse	3.153	3.000	3.000	3.000	3.000		
	Final Reduction Gear	Ratio	4.437	4.266	4.266	4.266	4.266	
	Type	Single helical gear						
TRANSMISSION	Automatic transmission	Gear Ratio	1st	2.528				
			2nd	1.427				
			3rd	0.976				
			4th	0.653				
			Reverse	1.863				
			Final Reduction Gear	Ratio	4.466			
	Type	Single helical gear						
AIR CONDITIONING	Cooling Capacity		4,780 Kcal/h	19,000 BTU/h		KY model		
			3,910 Kcal/h	15,500 BTU/h		KR model		
			3,740 Kcal/h	14,800 BTU/h		KG, KE, KS models		
AIR CONDITIONING	Compressor:	SANDEN	Type	Scroll				
			Capacity	85.7 cm ³ /rev	5.23 cu-in/rev			
	Max. Speed	10,000 rpm (min ⁻¹)						
	Lubricant Type	SP-10						
	Lubricant Capacity	130 cm ³	4.1/3 fl oz, 4.6 Imp oz					
	DENSO	Type	Swash-plate					
	No. of Cylinder	10						
	Capacity	188.0 cm ³ /rev	11.47 cu-in/rev					
	Max. speed	7,600 rpm (min ⁻¹)						
	Lubricant Type	ND-OIL8						
Lubricant Capacity	160 cm ³	5 1/3 fl oz, 5.6 Imp oz						
AIR CONDITIONING	Condenser	Type	Corrugated fin					
AIR CONDITIONING	Evaporator	Type	Corrugated fin					
AIR CONDITIONING	Blower	Type	Sirocco fan					
		Motor Input	220 W/12 V max.					
		Speed Control	4-speed*1/Infinite variable*2			*1: Manual A/C		
	Max. Capacity	470 m ³ /h	16,600 cu-ft/h			*2: AUTO A/C		
AIR CONDITIONING	Temp. Control	Type	Air-Mix					
AIR CONDITIONING	Compressor Clutch	Type	Dry, single plate, poly-V belt drive					
		Power Consumption	40 W max/12 V					
		SANDEN	40 W max/12 V					
	DENSO							
AIR CONDITIONING	Refrigerant	Type	HFC-134a (R-134a)					
		Quantity	500-550 g	18-19 oz				
STEERING SYSTEM	Type	Power assisted, rack and pinion						
	Overall Ratio	Except H22A7 engine model		15.50				
		H22A7 engine model		15.74				
	Turns, Lock-to-Lock							

	Except H22A7 engine model		3.02		
	H22A7 engine model		2.88		
	Steering Wheel Dia.	380 mm		15.0 in	

	ITEM		METRIC	ENGLISH	NOTES
SUSPENSION	Type	Front	Independent double wishbone, coil spring with stabiliser		
		Rear	Independent double wishbone, coil spring with stabiliser		
	Shock Absorber	Front and Rear	Telescopic, hydraulic nitrogen gas-filled		
WHEEL ALIGNMENT 4-door	Camber	Front	H22A7 engine model -0°15'		
		Except H22A7 engine model	0°00', 0°10'*1		
	Rear	H22A7 engine model	-1° 15'		
		Except H22A7 engine model	-1°00', -0°50'*1		
	Caster	Front	H22A7 engine model 3°00'		
		Except H22A7 engine model	2°50', 2°45'*1		
Total Toe	Front	0 mm	0 in		
	Rear	In 2 mm	In 0.08 in		
WHEEL ALIGNMENT 5-door	Camber	Front	0°00'		
		Rear	-1°00'		
	Caster	Front	2°50'		
		Total Toe	Front	0 mm	0 in
	Rear	In 2 mm	In 0.08 in		
BRAKE SYSTEM	Type	Front	Power-assisted self-adjusting ventilated disc		
		Rear	Power-assisted self-adjusting solid disc*2		
			Power-assisted self-adjusting drum*3		
	Pad Surface Area	Front	53.2 cm ² x 2	8.25 sq-in x 2	H22A7 engine model
			47.6 cm ² x 2	7.38 sq-in x 2	Except H22A7, D16B6 engine model
			40.0 cm ² x 2	6.20 sq-in x 2	D16B6 engine model
	Lining Surface Area	Rear	25.4 cm ² x 2	3.94 sq-in x 2	Disc brake
Rear		86.8 cm ² x 2	13.45 sq-in x 2	Drum brake	
Parking brake	Type	Mechanical actuating, rear two wheel brakes			
TYRE	Size and Pressure	See tyre label			
WASHER RESERVOIR	Capacity / (US qt, Imp qt)	4.5*8 (4.8, 4.0) 6.9*9 (7.3, 6.1)			
ELECTRICAL	Battery		*412 V-47 AH-20 HR *512 V-57 AH-20 HR		
	Under-hood fuse/relay box		100 A, 50 A, 40 A, 30 A, 20 A, 15 A, 10 A, 7.5 A		
	Driver's under-dash fuse/relay box		30 A, 15 A, 10 A, 7.5 A		
	Passenger's under-dash fuse/relay box		30 A, 20 A, 7.5 A		
	Headlight high beam		12 V - 55 W		
	Headlight low beam		*612 V-35 W, *712V-55 W		
	Front turn signal lights		12 V - 21 W		
	Front parking lights		12 V - 5 W		
	Front fog lights		12 V - 55 W		
	Side turn signal lights		12 V - 5 W		
	Rear turn signal lights		12 V - 21 W		
	Brake lights		12 V - 21 W		
	Tail lights		12 V - 5 W		
	High mount brake light		12 V - 5 W		
	Back-up lights		12 V - 21 W		
	Rear fog light		12 V - 21 W		
	License plate lights		12 V - 5 W		
	Front ceiling light		12 V - 5 W		
	Rear ceiling light		12 V - 5 W		
	Trunk Light		12 V - 5 W		
	Glove box light		12 V - 3.4 W		
Spotlights		12 V - 5 W			
Gauge lights		14 V - 1.12 W, 1.4 W, 3.0 W, 9.5			

		V - 1.1 W	
	Indicator lights	12 V - LED, 14 V - 0.84 W, 1.4 W	
	Panel and pilot lights	14 V - 0.84 W, 1.2 W	

- *1: KY model
- *2: Except B16B6 engine model
- *3: B16B6 engine model
- *4: CG7 (Vehicle type)
- *5: Except CG7 (Vehicle type)
- *6: With HID lamp
- *7: Without HID lamp
- *8: Without Headlight Washer
- *9: With Headlight Washer

Maintenance Schedule
European Model - Normal Conditions

3-2

Follow the Normal Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
	miles x 1,000	9	18	27	36	45	54	63	72	81	90	99		
	months	12	24	36	48	60	72	84	96	108	120	132		
Replace engine oil and oil filter		*	*	*	*	*	*	*	*	*	*	*		*1 8-7 to 8-10
Replace air cleaner element				*			*			*				*1 11-A-119
Inspect valve clearance				*			*			*			Check the valve clearance.	*1 6-A-3, 6-B-12, 6-C-9
Replace fuel filter								*						*1 11-A-105
Replace spark plugs	Normal type Platinum type			*			*			*				*1 4-31
Replace timing belt, timing balancer belt and inspect water pump									*				Check water pump for signs of seal leakage.	*1 6-A-8, 6-B-18, 6-C-14, 10-17
Inspect and adjust drive belts				*			*			*			<ul style="list-style-type: none"> Check for cracks and damage. Check deflection and tension 	*1 4-46, 4-47, 4-48, *2 17-14, 22-53, 22-54
Inspect idle speed								*						*1 11-A-94, 11-B-65, 11-C-57
Replace engine coolant		200,000 km (120,000 miles) or 120 months, thereafter every 75,000 km (45,000 miles) or 60 months											Check specific gravity for freezing point.	*1 10-7 to 10-10
Replace transmission fluid	MT								*				Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF - Z1 (ATF)	*1 13-3, 13-57
Replace transmission fluid	AT					*			*3		*		Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF - Z1 (ATF)	*1 14-132
Inspect front and rear brakes		*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> Check the brake pad and disc thickness. Check for damage or cracks. Check the callipers for damage, leaks and tightness. 	*2 19-A-4, 19-A-10, 19-A-12, 19-A-14, 19-A-15, 19-A-17, 19-A-26, 19-A-28, 19-A-30, 19-A-31
Replace brake fluid		Every 3 years											Use only DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*2 19-A-7
Check parking brake adjustment		*	*		*		*		*		*		Check the parking brake operation	*2 19-A-6
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months												*2 22-39
Check lights alignment		*	*	*	*	*	*	*	*	*	*	*	Check the position of the headlights.	*2 23-D-9
Test drive (noise, stability, dashboard operations)		*	*	*	*	*	*	*	*	*	*	*	Check for road stability, noise, vibrations and dashboard operation.	-

*1: Refer to base shop manual on this CD

*2: Refer to base shop manual on this CD

*3: Inspect at 45,000 km (27,000 miles/36 months and every 45,000 km (27,000 miles/36 months after replacement).

*4: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule

3-3

European Model - Normal Conditions (cont'd)

Service at the indicated distance or time whichever comes first	km x 1,000	15	30	45	60	75	90	105	120	135	150	165	NOTES	SECTION and PAGE
miles x 1,000	9	18	27	36	45	54	63	72	81	90	99			
months	12	24	36	48	60	72	84	96	108	120	132			
Visually inspect the following items													<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten 	-
Tie rod ends, steering gearbox, and boots	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-13, 17-26
Suspension components	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22
Driveshaft boots	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3
Brake hoses and lines (including ABS)	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage.	*2 19-A-3, 19-A-36
Exhaust system	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness.	*1 9-9 to 9-12
Fuel lines and connections	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts.	*1 11-A-95, 11-C-59
Tyre condition	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	Check for pressure, puncture or cuts and irregular tread wear.	-

*1: Refer to base shop manual on this CD

*2: Refer to base shop manual on this CD

Maintenance Schedule

European Model - Severe Conditions

3-4

Service at the indicated distance or time whichever comes first	km x 1,000	7.5 4.5 6	15 9 12	22.5 13.5 18	30 18 24	37.5 22.5 30	45 27 36	52.5 31.5 42	60 36 48	67.5 40.5 54	75 45 60	82.5 49.5 66	90 54 72	97.5 58.5 78	105 63 84	112.5 67.5 90	120 72 96	NOTES	SECTION and PAGE
Replace engine oil and oil filter		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*1 8-7 to 8-10
Clean (O) or replace (*) air cleaner element - Use normal schedule except in dusty conditions	Except 1.6 / 1.6 /			O			*			O			*			O			*1 11-A-119 *1 11-A-119
Inspect valve clearance							*						*					Check the valve clearance	*1 6-A-3, 6-B-12, 6-C-9
Replace fuel filter							*						*						*1 11-A-105
Replace spark plugs	Normal type Platinum type						*						*				*		*1 4-31
Replace timing belt, timing balancer belt and inspect water pump																	*3	Check water pump for signs of seal leakage	*1 6-A-8, 6-B-18, 6-C-14, 10-17
Inspect and adjust drive belts							*						*					<ul style="list-style-type: none"> Check for cracks and damage. Check for deflection and tension. 	*1 4-46, 4-47, 4-48, *2 17-14, 22-53, 22-54
Inspect idle speed																*			*1 11-A-94, 11-B-65, 11-C-57
Replace engine coolant		200,000 km (120,000 miles) or 120 months, thereafter every 100,000 km (60,000 miles) or 60 months															Check specific gravity for freezing point	*1 10-7, to 10-10	
Replace transmission fluid	MT AT								*			*					*	Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF - Z1 (ATF) Manual transmission: Genuine Honda MTF Automatic transmission: Genuine Honda ATF - Z1 (ATF)	*1 13-3, 13-57 *1 14-132
Inspect front and rear brakes		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<ul style="list-style-type: none"> Check the brake pad and disc thickness. Check for damage or cracks. Check the callipers for damage, leaks and tightness. 	*2 19-A-4, 19-A-10, 19-A-12, 19-A-14, 19-A-15, 19-A-17, 19-A-26, 19-A-28, 19-A-30, 19-A-31
Replace brake fluid		Every three years															Use DOT3 or DOT4*4 fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	*2 19-A-7	
Check parking brake adjustment			*		*				*				*				*	Check the parking brake operation	*2 19-A-6
Replace pollen filter		Every 30,000 km (18,000 miles) or 12 months																*2 22-39	
Check lights alignment			*		*		*		*		*		*		*		*	Check the position of the headlights	*2 23-D-9
Test drive (noise, stability, dashboard operations)			*		*		*		*		*		*		*		*	Check for road stability, noise, vibrations, and dashboard operation.	-

*1: Refer to base shop manual on this CD.

*2: Refer to base shop manual on this CD.

*3: These belts should normally be replaced at the intervals shown in the maintenance schedule. (Normal Conditions)

Replace these belts at 75,000 km or 45,000 miles if you regularly drive your vehicle in one or more of these conditions.

- In very high temperatures [43°C (110°F) above]

- In very low temperatures [-29°C (-20°F) under]

*4: We recommend Genuine Honda Brake Fluid.

Maintenance Schedule
European Model - Severe Conditions (cont'd)

3-5

Service at the indicated distance or time whichever comes first	km x 1,000	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90	97.5	105	112.5	120	NOTES	SECTION and PAGE	
	miles x 1,000	4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54	58.5	63	67.5	72			
	months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96			
Visually inspect the following items:																			<ul style="list-style-type: none"> • Check for correct installation and position, check for cracks, deterioration, rust and leaks. • Check tightness of screws, nuts and joints. If necessary, retighten. 	-
Tie rod ends, steering gearbox and boots	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check rack grease and steering linkage. • Check the boot for damage and leaking grease. • Check the fluid line for damage and leaks 	*2 17-13, 17-26
Suspension components	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check the bolts for tightness. • Check all the dust covers for deterioration and damage. 	*2 18-9, 18-10, 18-11, 18-20, 18-21, 18-22
Driveshaft boots	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	<ul style="list-style-type: none"> • Check boots and boot band for cracks. • Check rack grease. 	*2 16-3
Brake hoses and lines (including ABS)		•		•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check the master cylinder, proportioning control valve and ABS modulator for damage and leakage. 	*2 19-A-3, 19-A-36
Exhaust system		•		•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check the catalytic converter heat shield, exhaust pipe and muffler for damage, leaks and tightness. 	*1 9-9 to 9-12
Fuel lines and connections		•		•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. 	*1 11-A-95, 11-C-59
Tyre condition		•		•		•		•		•		•		•		•		•	<ul style="list-style-type: none"> • Check for pressure, puncture or cuts and irregular tread wear. 	-

*1: Refer to base shop manual on this CD.

*2: Refer to base shop manual on this CD.

Follow the Severe Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

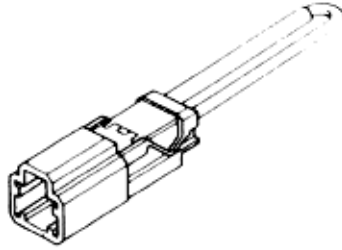
- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot [over 32°C, (90°F)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty or de-iced roads.

NOTE: If the customer's vehicle is driven OCCASIONALLY under severe conditions, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

Special Tools

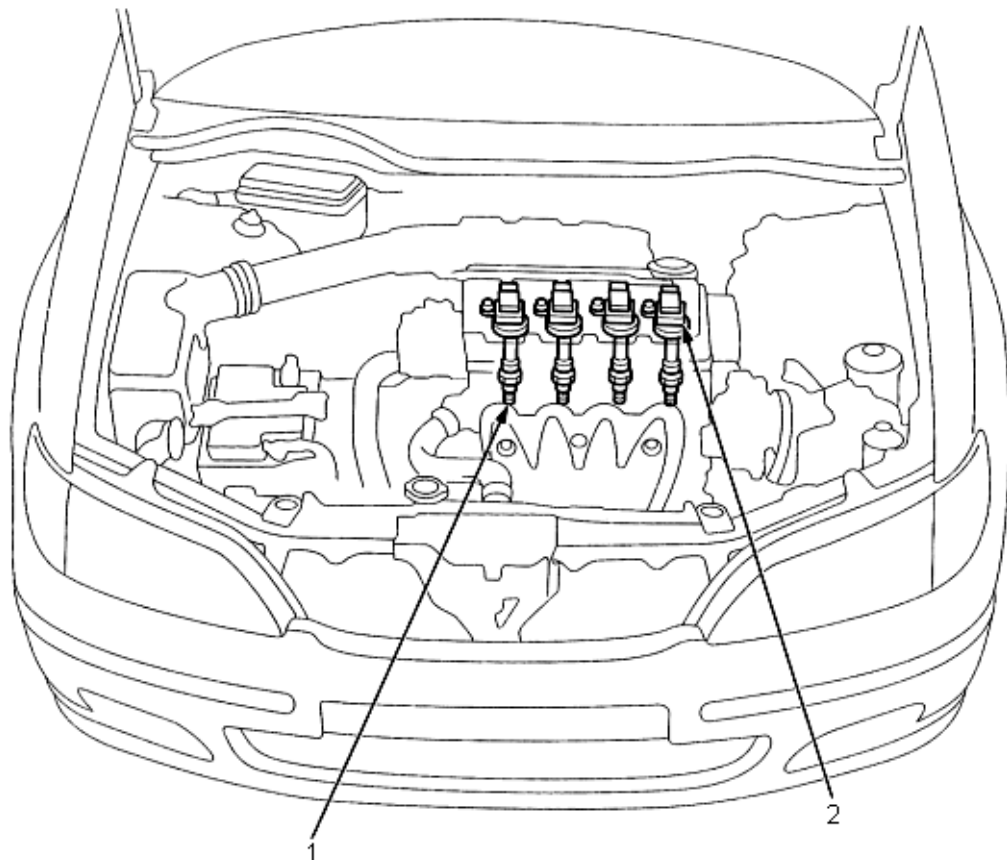
4-2

Ref No.	Tool Number	Description	Qty	Remark
1	07PAZ - 0010100	SRS Short Connector	1	



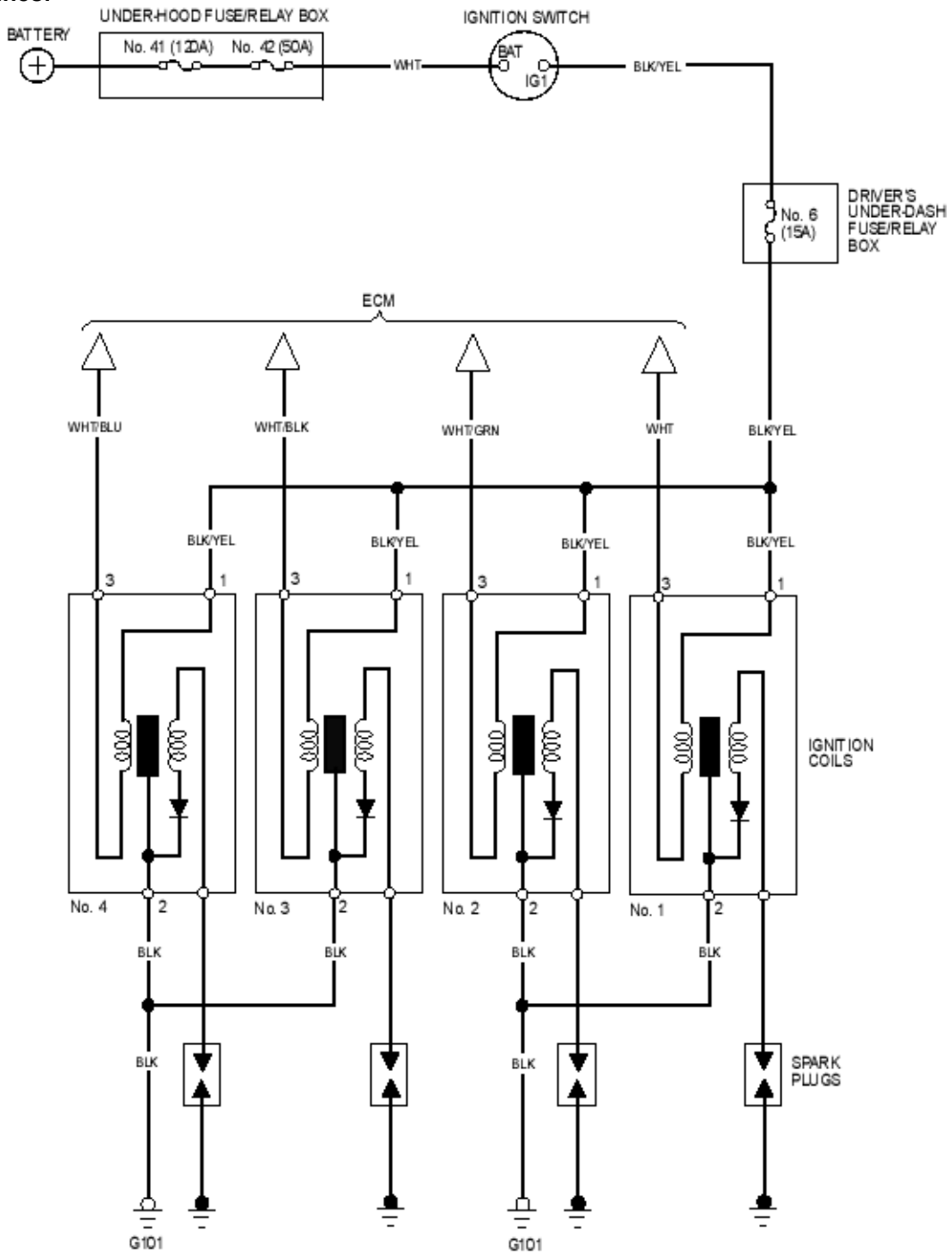
①

D16B6, D16B7 engines:



1. **SPARK PLUG**
Inspection, **see page** 4-6)
2. **IGNITION COIL**

D16B6, D16B7 engines:

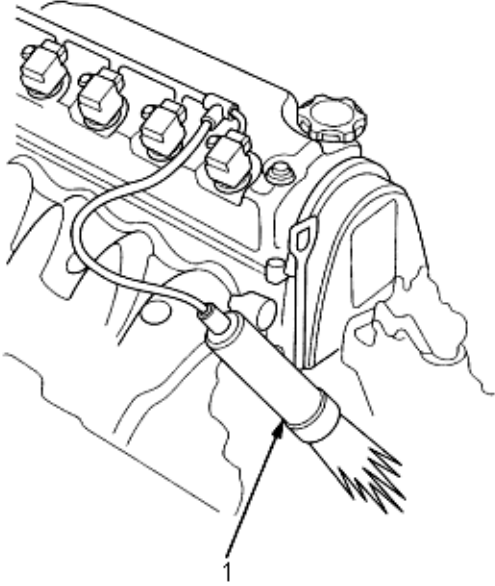


Ignition System

Ignition Timing Inspection

4-5

1. Start the engine. Hold the engine at 3,000 rpm (min.-1) with no load, shift lever in neutral until the radiator fan comes on, then let it idle
2. Check the idle speed and adjust it if necessary (see section 11).
3. Pull out the service check connector 2P (GRN/BLK and BRN wires) from the connector located under the dash on the front passenger side, then connect the SCS short connector (T/N 07PAZ - 0010100) to it.
4. Connect a timing light to the No. 1 ignition coil wire, then point the light toward the pointer on the timing belt cover.

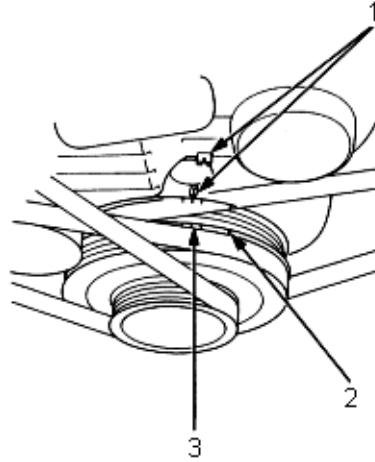


1. TIMING LIGHT

5. Check the ignition timing under no load conditions; headlights, blower fan, rear window defogger and air conditioner are not operating. If the ignition timing differs from the specification below, replace the ECM (see section 11).

Ignition Timing:

12° ± 2° BTDC (RED) during idling in neutral



1. POINTER
2. WHT MARK (TDC)
3. RED MARK

6. Disconnect the SCS short connector from the service check connector.

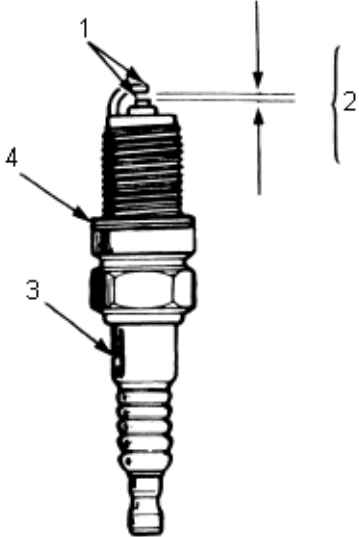
Ignition System

Spark Plug Inspection

4-6

Except H22A7 engine:

1. Inspect the electrodes and ceramic insulator for:



1. WORN OR DEFORMED ELECTRODES
2. Improper gap
Oil-fouling
Carbon deposits
Cracked centre electrode insulator
3. CRACKED INSULATOR
4. DAMAGED GASKET

Burned or worn electrodes may be caused by:

- ♦ Advanced ignition timing
- ♦ Loose spark plug
- ♦ Plug heat range too hot
- ♦ Insufficient cooling

Fouled plug may be caused by:

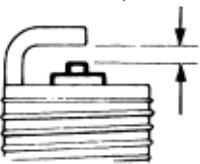
- ♦ Retarded ignition timing
- ♦ Oil in combustion chamber
- ♦ Incorrect spark plug gap
- ♦ Plug heat range too cold
- ♦ Excessive idling/low speed running
- ♦ Clogged air cleaner element
- ♦ Deteriorated ignition coil or ignition wires

2. Check the electrode gap.
 - ♦ Adjust the gap with a suitable gapping tool.

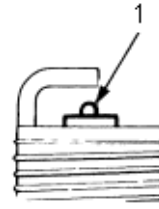
Electrode Gap

Standard 1.1 - 0.1 mm (0.043 - 0.004 in)

1.1 mm
(0.043 in.)



- ♦ Replace the plug if the centre electrode is rounded as shown below:



1. ROUNDED ELECTRODE

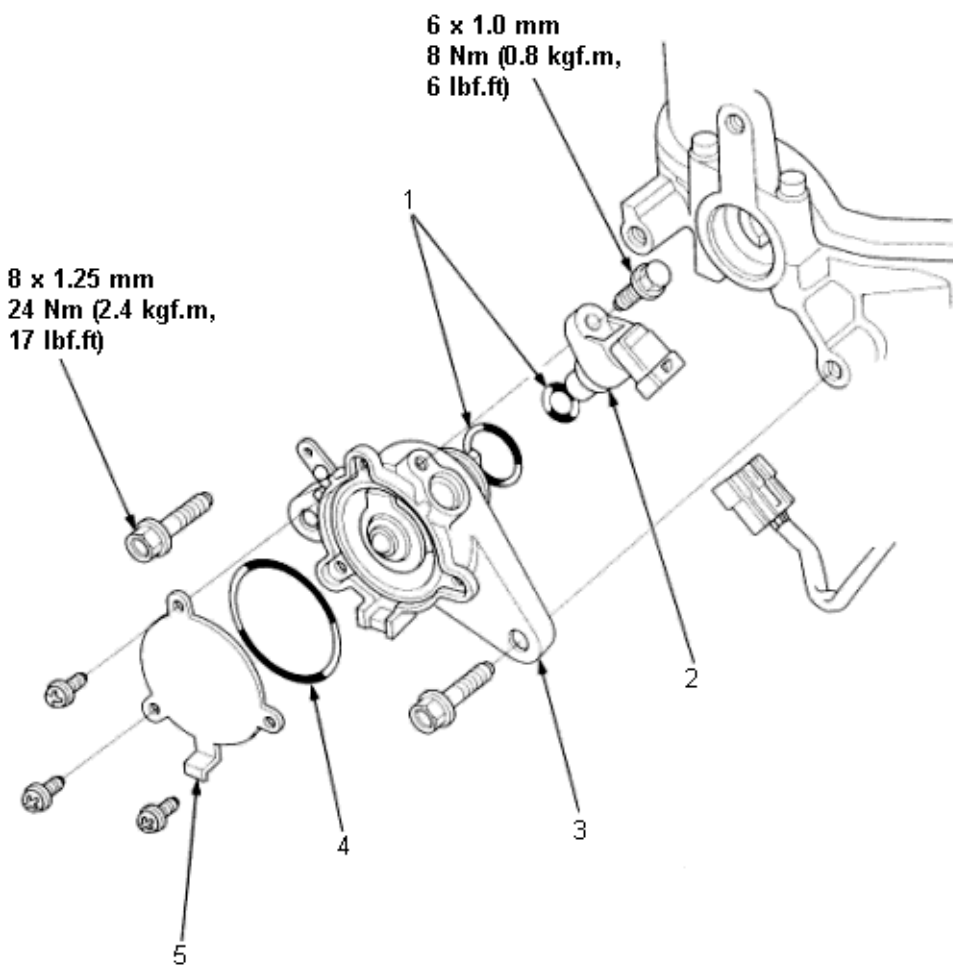
Spark Plugs

Engine Type	Spark Plug Type
D16B6	ZFR5F-11 (NGK)
D16B7	KJ16CR-L11 (DENSO)
F18B3	
F18B2	ZFR6F-11 (NGK)
F20B6	KJ20CR-L11 (DENSO)
F23Z5	

3. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 Nm (1.8 kgf/m, 13 lbf/ft).

**CYL Sensor
Replacement**

6-A-2



1. **O-RINGS**, Replace
2. **CYL SENSOR**
3. **CYL SENSOR HOUSING**
4. **O-RING**, Replace
5. **COVER**

Main Bearings Selection

7-B-2

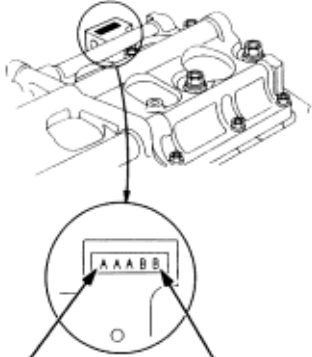
Except H22A7 engine:

NOTE: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Crankshaft Bore Code Location

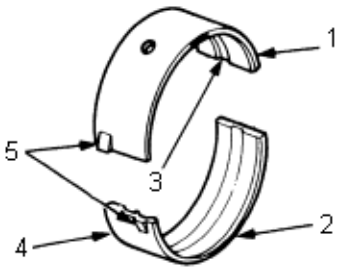
Numbers or Letters or Bars have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.

Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



1. No. 1 JOURNAL (PULLEY END)
2. No. 5 JOURNAL (FLYWHEEL END)

Bearing Design



1. UPPER
2. COLOUR
3. GROOVE
4. LOWER
5. PROJECTION

No. 1 and 2 journals:

Bearing identification
Colour code is on the edge of the bearing.

→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII

1 or I	↓
2 or II	↓
3 or III	↓
4 or IIII	↓
5 or IIIII	↓
6 or IIIIII	↓

Smaller main journal Smaller bearing (Thicker)

→ Smaller bearing (Thicker)			
Pink	Pink	Pink/Yellow	Yellow
Pink	Pink/Yellow	Yellow	Yellow/Green
Pink/Yellow	Yellow	Yellow/Green	Green
Yellow	Yellow/Green	Green	Green/Brown
Yellow/Green	Green	Green/Brown	Brown
Green	Green/Brown	Brown	Brown/Black

NOTE: When using bearing halves of different colours, it does not matter which colour is used in the top or bottom.

No. 3 journal:

Bearing identification
Colour code is on the edge of the bearing.

→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII

1 or I	↓
2 or II	↓
3 or III	↓
4 or IIII	↓
5 or IIIII	↓
6 or IIIIII	↓

Smaller main journal Smaller bearing (Thicker)

→ Smaller bearing (Thicker)			
Pink/Yellow	Yellow	Yellow/Green	Green
Yellow	Yellow/Green	Green	Green/Brown
Yellow/Green	Green	Green/Brown	Brown
Green	Green/Brown	Brown	Brown/Black
Green/Brown	Brown	Brown/Black	Black
Brown	Brown/Black	Black	Black/Blue

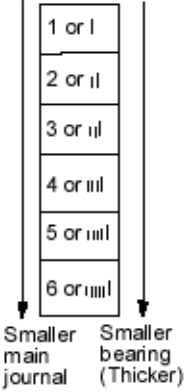
NOTE: When using bearing halves of different colours, it does not matter which colour is used in the top or bottom.

Main Bearings Selection (cont'd)

7-B-3

No. 4 journal:

Bearing identification
Colour code is on the edge of the bearing.

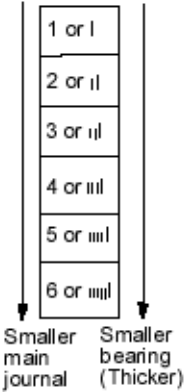


→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII
→ Smaller bearing (Thicker)			
Yellow	Yellow/ Green	Green	Green/ Brown
Yellow/ Green	Green	Green/ Brown	Brown
Green	Green/ Brown	Brown	Brown/ Black
Green/ Brown	Brown	Brown/ Black	Black
Brown	Brown/ Black	Black	Black/ Blue
Brown/ Black	Black	Black/ Blue	Blue

NOTE: When using bearing halves of different colours, it does not matter which colour is used in the top or bottom.

No. 5 journal:

Bearing identification
Colour code is on the edge of the bearing.



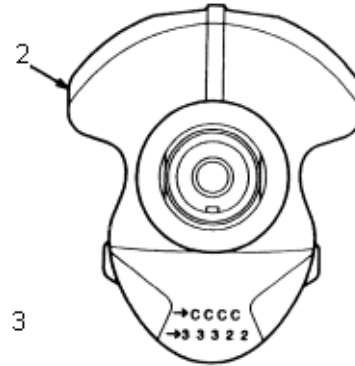
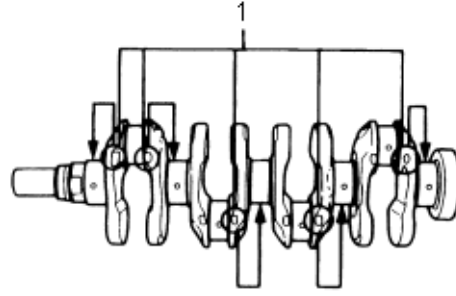
→ Larger crank bore			
1 or A or I	2 or B or II	3 or C or III	4 or D or IIII
→ Smaller bearing (Thicker)			
Pink	Pink/ Yellow	Yellow	Yellow/ Green
Pink/ Yellow	Yellow	Yellow/ Green	Green
Yellow	Yellow/ Green	Green	Green/ Brown
Yellow/ Green	Green	Green/ Brown	Brown
Green	Green/ Brown	Brown	Brown/ Black
Green/ Brown	Brown	Brown/ Black	Black

NOTE: When using bearing halves of different colours, it does not matter which colour is used in the top or bottom.

Main Journal Code Locations (Numbers or Bars)

The Main Journal Codes are stamped in one of the following locations.

Except H22A7 engine:



1. Main Journal Code Locations (Numbers or Bars)
2. No. 1 CRANK WEB
3. Arrows point to No. 1 main and connecting rod journal codes

1. Check the piston for distortion or cracks.
NOTE: If the cylinder is bored, an oversized piston must be used.
2. Measure the piston diameter at a point A from the bottom of the skirt.

Point A:

F18B2, F18B3, F20B6, F23Z5 engines: 16 mm (0.6 in)

H22A7 engine: 15 mm (0.6 in)

NOTE: There are two standard-size pistons (No Letter or A, and B). The letter is stamped on the top of the piston. Letters are also stamped on the block as cylinder bore sizes.

Piston Diameter:

F18B2, F18B3, F20B6 engines:

Standard (New):

- No Letter (A): 84.980 - 84.990 mm (3.3457 - 3.3461 in)**
- B: 84.970 - 84.980 mm (3.3453 - 3.3457 in)**

Service Limit:

- No Letter (A): 84.970 mm (3.3453 in)**
- B: 84.960 mm (3.3449 in)**

F23Z5 engine:

Standard (New):

- No Letter (A): 85.980 - 85.990 mm (3.3850 - 3.3854 in)**
- B: 85.970 - 85.980 mm (3.3846 - 3.3850 in)**

Service Limit:

- No Letter (A): 85.970 mm (3.3846 in)**
- B: 85.960 mm (3.3842 in)**

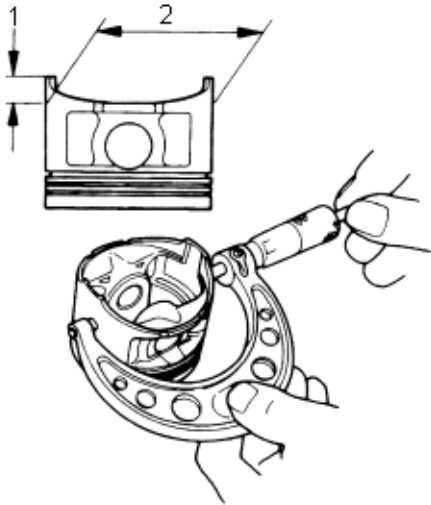
H22A7 engine:

Standard (New):

- No Letter (A): 86.993 - 87.006 mm (3.4249 - 3.4254 in)**
- B: 86.983 - 86.996 mm (3.4245 - 3.4250 in)**

Service Limit:

- No Letter (A): 86.980 mm (3.4244 in)**
- B: 86.970 mm (3.4240 in)**



1. POINT A
2. SKIRT DIAMETER

3. Calculate the difference between the cylinder bore diameter and piston diameter.

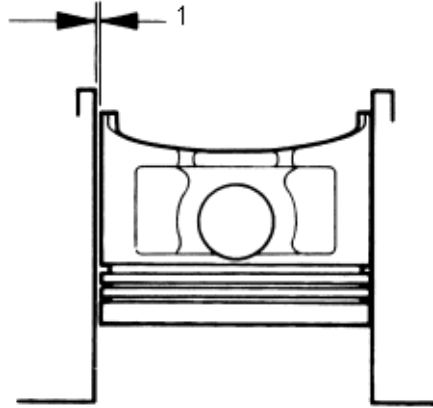
Piston-to-Cylinder Clearance:

F18B2, F18B3, F20B6 engines:

- Standard (New): 0.020 - 0.040 mm (0.0008 - 0.0016 in)**
- Service Limit: 0.05 mm (0.002 in)**

H22A7 engine:

- Standard (New): 0.004 - 0.027 mm (0.0002 - 0.0011 in)**
- Service Limit: 0.04 mm (0.002 in)**



1. PISTON-TO-CYLINDER CLEARANCE

If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

Oversize Piston Diameter:

F18B2, F18B3, F20B6 engines:

0.25: 85.230 - 85.240 mm (3.3555 - 3.3559 in)

F23Z5 engine:

0.25: 86.230 - 86.240 mm (3.3949 - 3.3953 in)

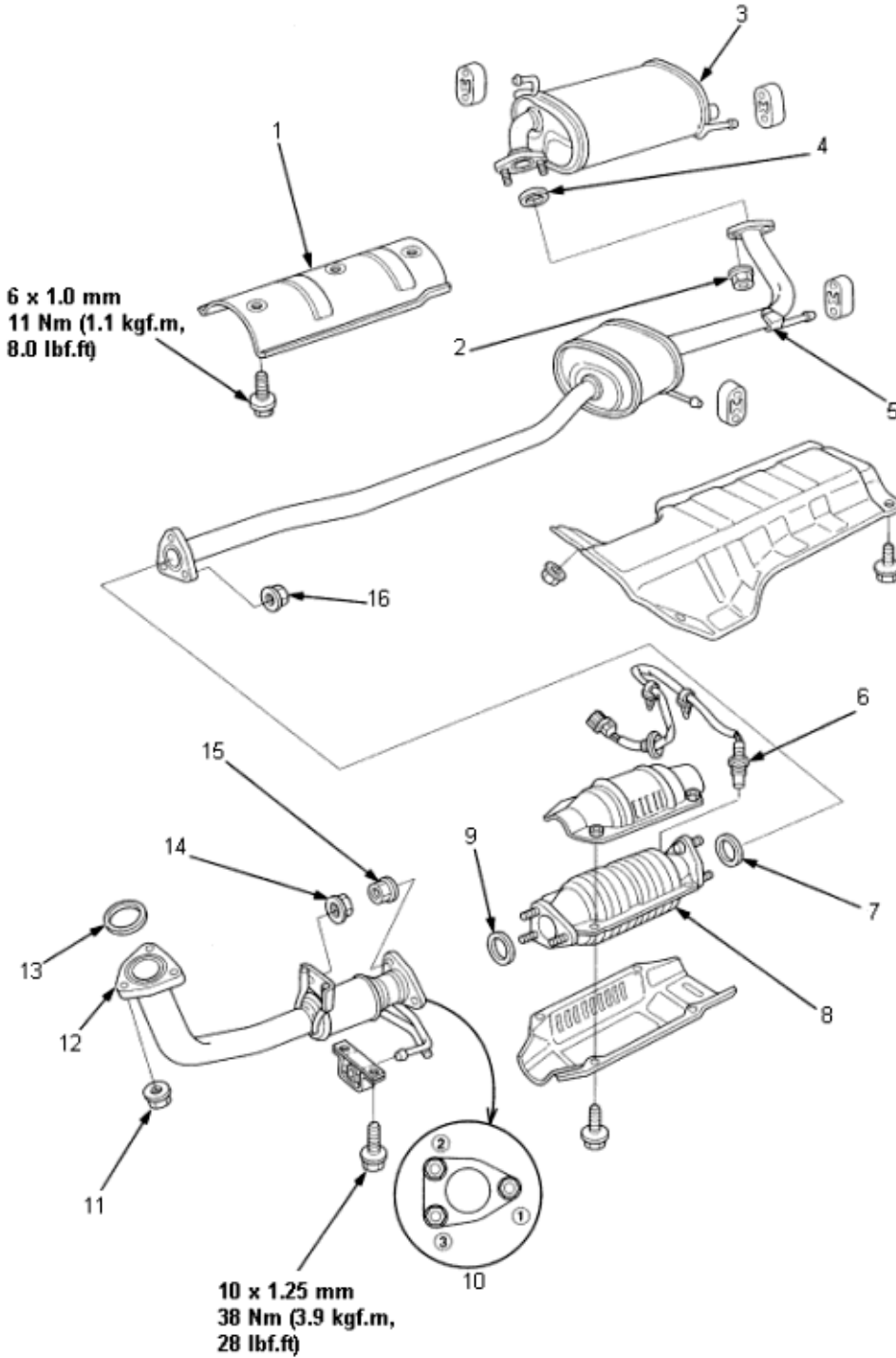
H22A7 engine:

0.25: 87.233 - 87.246 mm (3.4344 - 3.4349 in)

Exhaust Pipe and Muffler Replacement

9-2

Note: Use new O-rings and gaskets when reassembling.
D16B6, D16B7 engines:



1. **HEAT SHIELD**
2. **SELF-LOCKING NUT**,
10 x 1.25 mm, 54 Nm
(5.4 kgf/m, 40 lbf/ft), Replace
3. **MUFFLER**
4. **GASKET**, Replace
5. **EXHAUST PIPE B**
6. **SECONDARY HEATED OXYGEN
SENSOR (SECONDARY H02S)**
44 Nm (4.5 kgf/m, 33 lbf/ft)
7. **GASKET**
8. **THREE WAY CATALYTIC
CONVERTER**
9. **GASKET**, Replace
10. **THREE WAY CATALYTIC
CONVERTER TIGHTENING
SEQUENCE**
11. **SELF-LOCKING NUT**,
10 x 1.25 mm, 54 Nm
(5.5 kgf/m, 40 lbf/ft), Replace
12. **EXHAUST PIPE A**
13. **GASKET**, Replace
14. **SELF-LOCKING NUT**,
8 x 1.25 mm, 18 Nm
(1.8 kgf/m, 13 lbf/ft), Replace
15. **SELF-LOCKING NUT**,
10 x 1.25 mm, 33 Nm
(3.4 kgf/m, 25 lbf/ft), Replace
16. **SELF-LOCKING NUT**,
10 x 1.25 mm, 33 Nm
(3.4 kgf/m, 25 lbf/ft), Replace

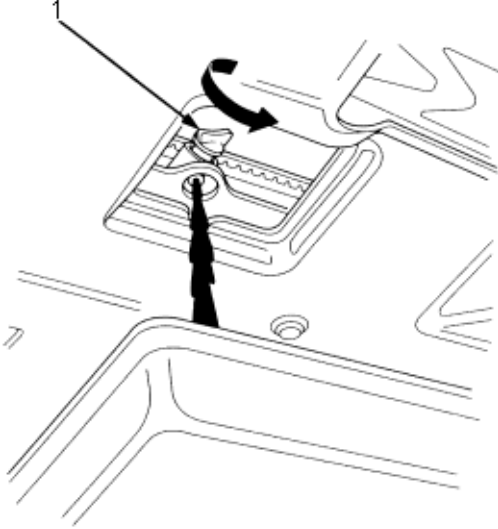
Radiator

Engine Coolant Refilling and Bleeding

10-2

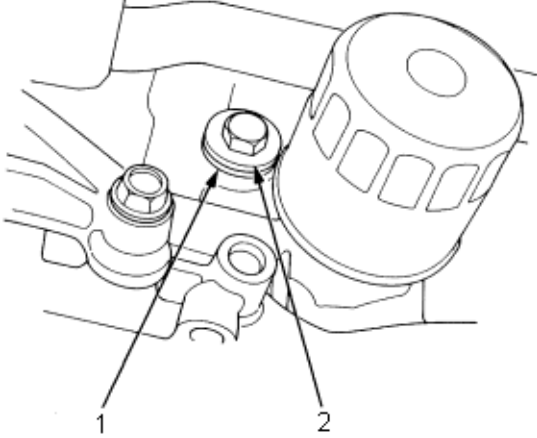
Except H22A7 engine:

1. Start the engine. Set the heater temperature control dial to maximum heat, then turn off the engine. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug, and drain the coolant.



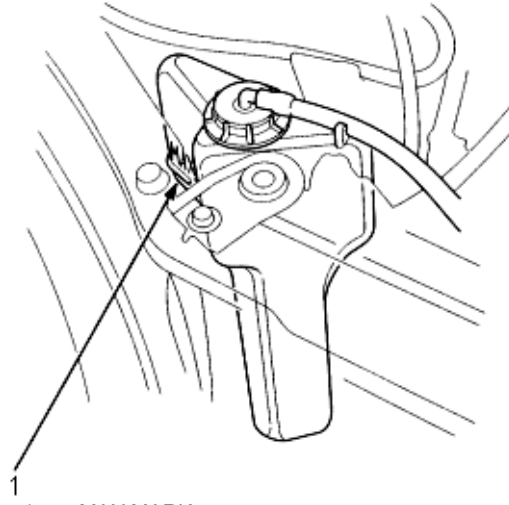
1. DRAIN PLUG

4. Remove the drain bolt from the rear side of the cylinder block.



1. WASHER, Replace
2. DRAIN BOLT, 83 Nm (8.5 kgf/m, 61 lbf/ft)

5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank to the MAX mark with genuine Honda All Season Antifreeze/Coolant Type 2.



1. MAX MARK

Radiator

Engine Coolant Refilling and Bleeding (cont'd)

10-3

- Pour genuine Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

NOTE:

- Always use Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- Genuine Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Pre-mixing is not required.

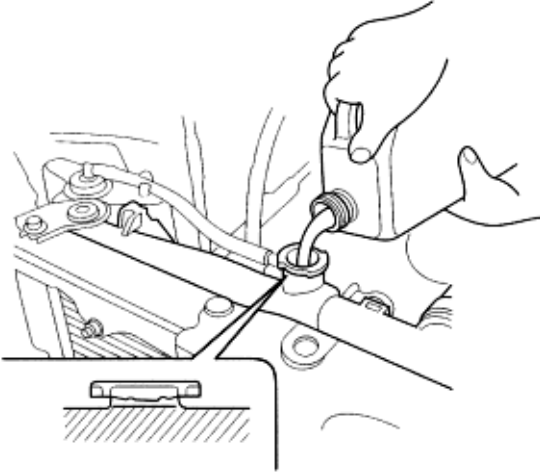
Engine Coolant Refill Capacity (including reservoir 0.55 / (0.58 US qt, 0.48 Imp qt)):

D16B6, D16B7 engines: 3.9 / (4.1 US qt, 3.4 Imp qt)

F18B2, F18B3, F20B6, F23Z5 engines:

M/T: 4.2 / (4.4 US qt, 3.7 Imp qt)

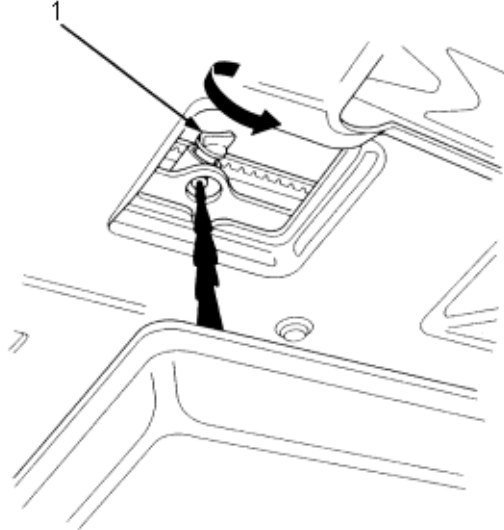
A/T: 4.1 / (4.3 US qt, 3.6 Imp qt)



- Install the radiator cap loosely.
- Start the engine and let it run until it warms up (the radiator fan comes on at least twice).
- Turn off the engine. Check the level in the radiator and add Honda All Season Antifreeze/Coolant Type 2 if needed.
- Put the radiator cap on tightly, then run the engine again and check for leaks.

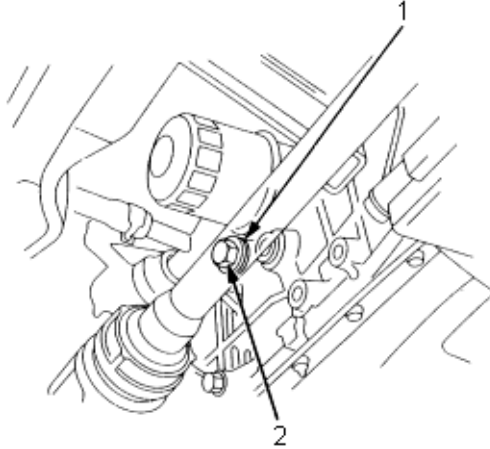
H22A7 engine:

- Start the engine. Set the heater temperature control dial to maximum heat, then turn off the engine. Make sure the engine and radiator are cool to the touch.
- Remove the radiator cap.
- Loosen the drain plug, and drain the coolant.



- DRAIN PLUG

- Remove the drain bolt from the rear side of the cylinder block.



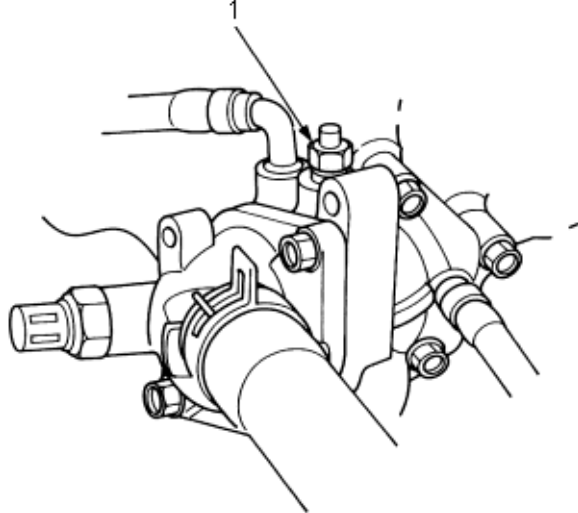
- WASHER, Replace
- DRAIN BOLT, 83 Nm (8.5 kgf/m, 61 lbf/ft)

5. After the coolant has drained, apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank to the MAX mark with Honda All Season Antifreeze/Coolant Type 2.
8. Loosen the air bleed bolt in the thermostat housing, then pour genuine Honda All Season Antifreeze/Coolant Type 2 into the radiator to the bottom of the filler neck. Do not let coolant spill on any electrical parts or the paint. If any coolant spills, rinse it off immediately.

NOTE:

- ♦ Always use Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
- ♦ Genuine Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Pre-mixing is not required.

**Engine Coolant Refill Capacity (including reservoir 0.55 / (0.58 US qt, 0.48 Imp qt):
3.5 / (4.1 US qt, 2.9 Imp qt)**



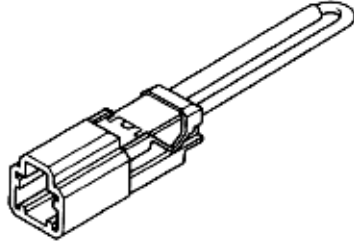
1. BLEED BOLT, 9.8 Nm (1.0 kgf/m, 7 lbf/ft)

9. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream.
10. With the radiator cap off, start the engine and let it run until warmed up (radiator fan comes on at least twice). Then, if necessary, add more Honda All Season Antifreeze/Coolant Type 2 to bring the level back up to the bottom of the filler neck.
11. Put the radiator cap on tightly, then run the engine again and check for leaks.

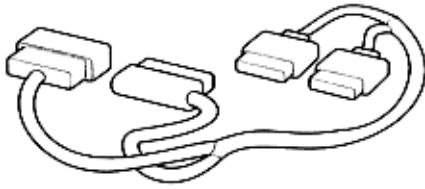
Special Tools

11-C-2

Ref. No.	Tool Number	Description	Qty	Remark
1	07PAZ - 0010100	SCS Short Connector	1	
2	07XAZ - SIA0300	ECM Test Harness	1	
3	07XAZ - 0010100	Test Pin Box (Pin Box 130 Seem)	1	



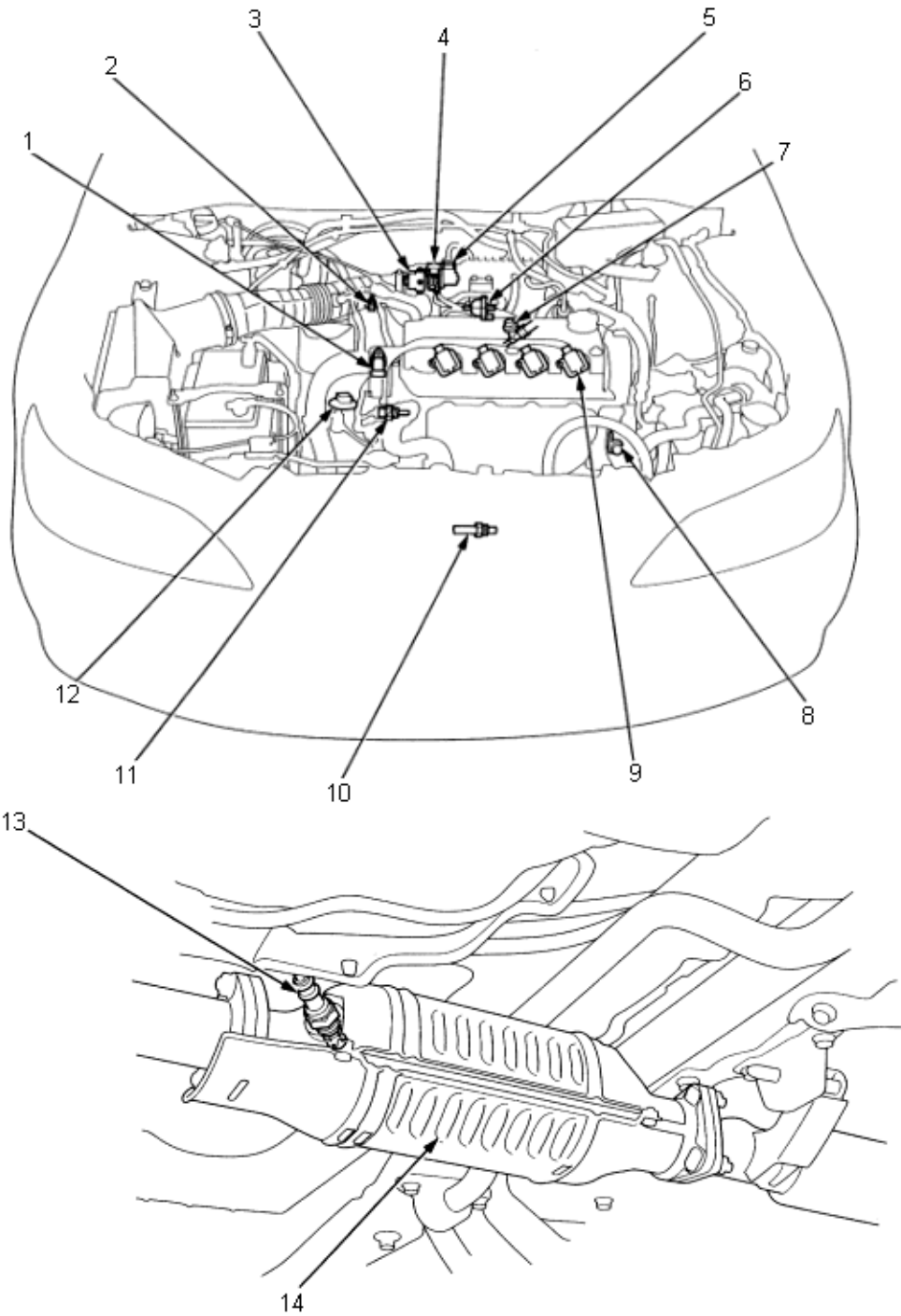
①



②

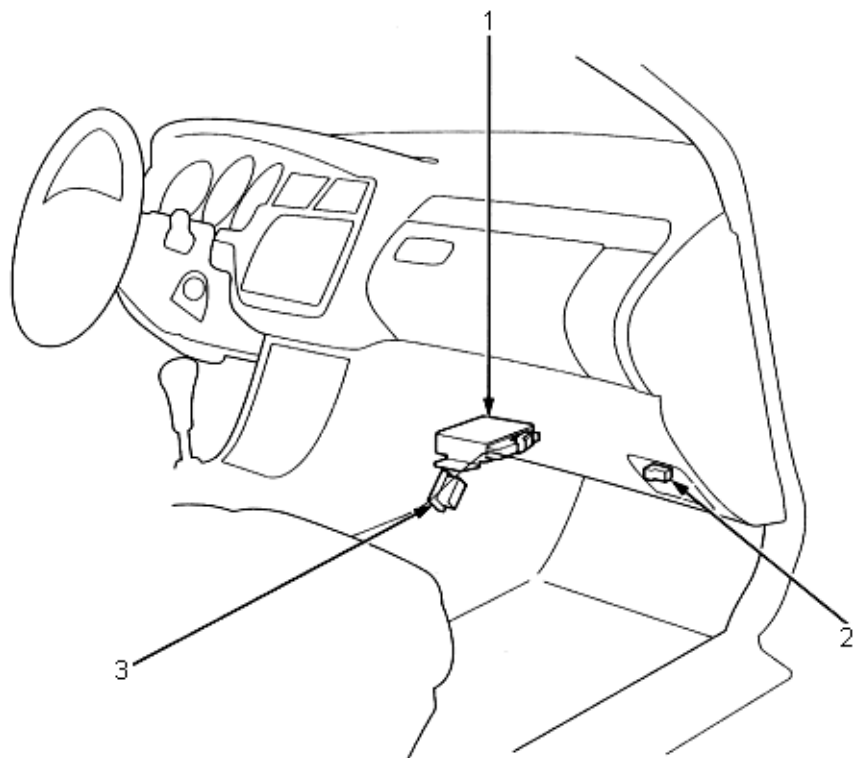


③



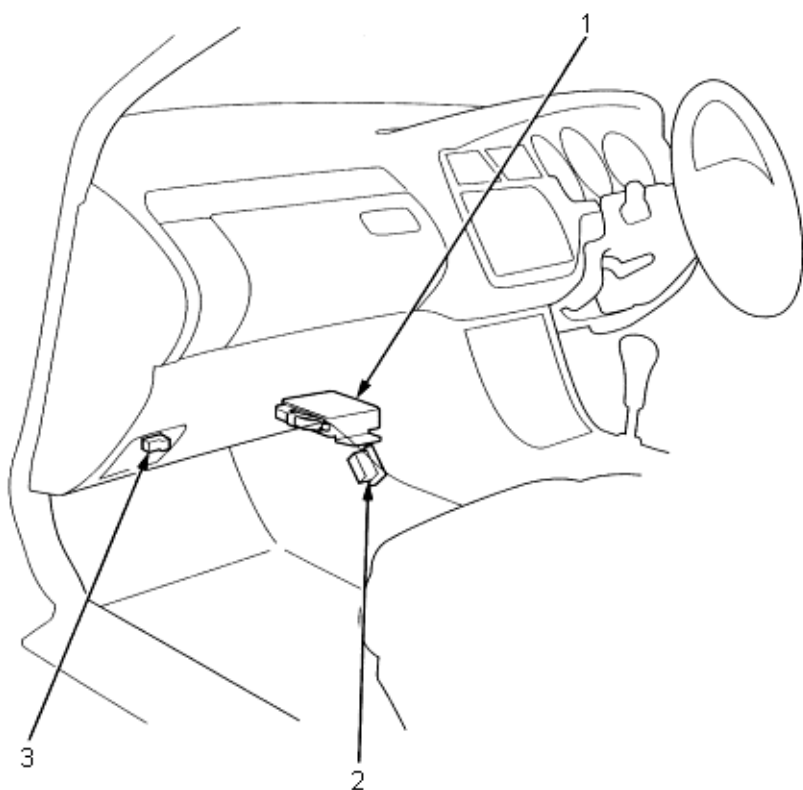
1. **CYLINDER POSITION (CYP) SENSOR**
Troubleshooting, **See Page** 11-C-83
2. **INTAKE AIR TEMPERATURE (IAT) SENSOR**
Troubleshooting, **See Page** 11-C-49
3. **THROTTLE POSITION (TP) SENSOR**
Troubleshooting, **See Page** 11-C-54
4. **MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR**
Troubleshooting, **See Page** 11-C-45
5. **IDLE AIR CONTROL (IAC) VALVE**
Troubleshooting, **See Page** 11-C-99
6. **EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE**
Troubleshooting, **See Page** 11-C-103
7. **POWER STEERING PRESSURE (PSP) SWITCH**
8. **CRANKSHAFT POSITION (CKP) SENSOR**
Troubleshooting, **See Page** 11-C-85
9. **IGNITION COILS**
10. **PRIMARY HEATED OXYGEN SENSOR (HO2S) (SENSOR 1)**
Troubleshooting, **See Page** 11-C-58
Replacement, **See Page** 11-C-98
11. **ENGINE COOLANT TEMPERATURE (ECT) SENSOR**
Troubleshooting, **See Page** 11-C-51
12. **VEHICLE SPEED SENSOR (VSS)**
Troubleshooting, **See Page** 11-C-87
13. **SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)**
Troubleshooting, **See Page** 11-C-66
Replacement, **See Page** 11-C-98
14. **THREE WAY CATALYTIC CONVERTER (TWC)**

LHD:



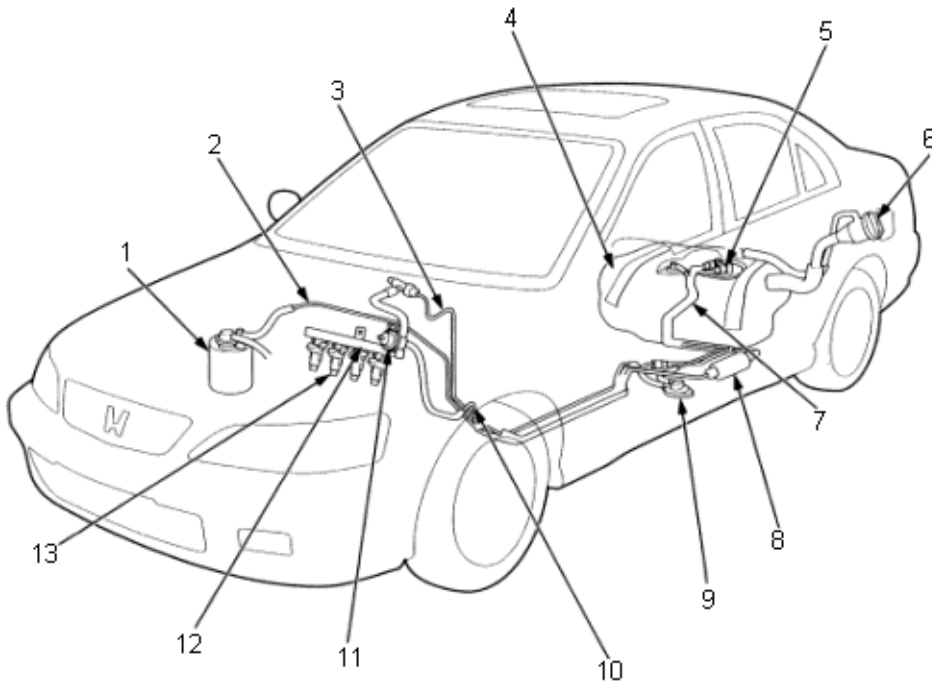
1. **ENGINE CONTROL MODULE (ECM)**
Troubleshooting, **See Page** 11-C-91
2. **SERVICE CHECK CONNECTOR**
3. **DATA LINK CONNECTOR (DLC)**

RHD:



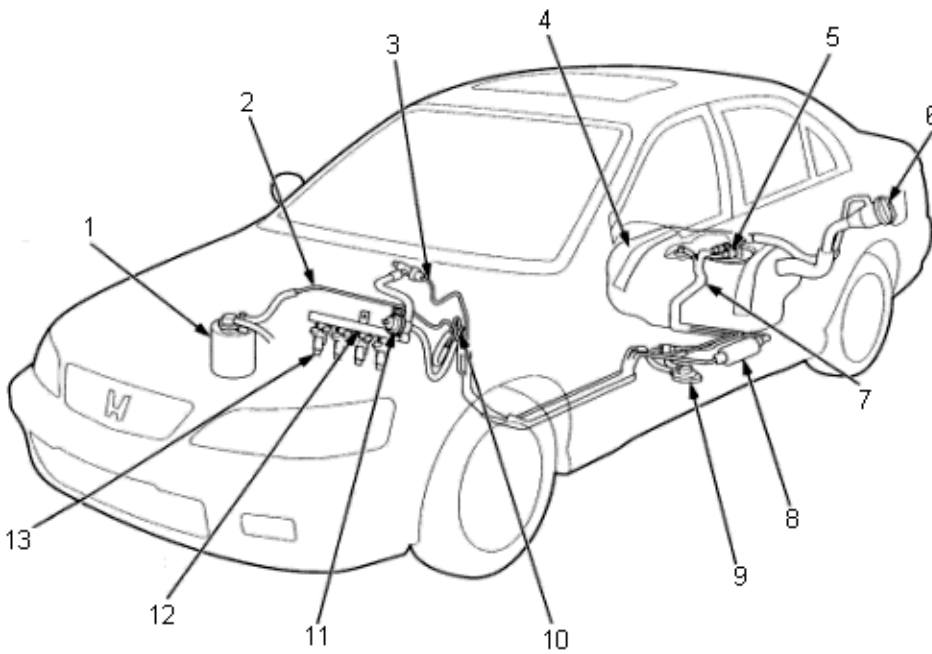
1. **ENGINE CONTROL MODULE (ECM)**
Troubleshooting, **See Page** 11-C-91
2. **DATA LINK CONNECTOR (DLC)**
3. **SERVICE CHECK CONNECTOR**

LHD:

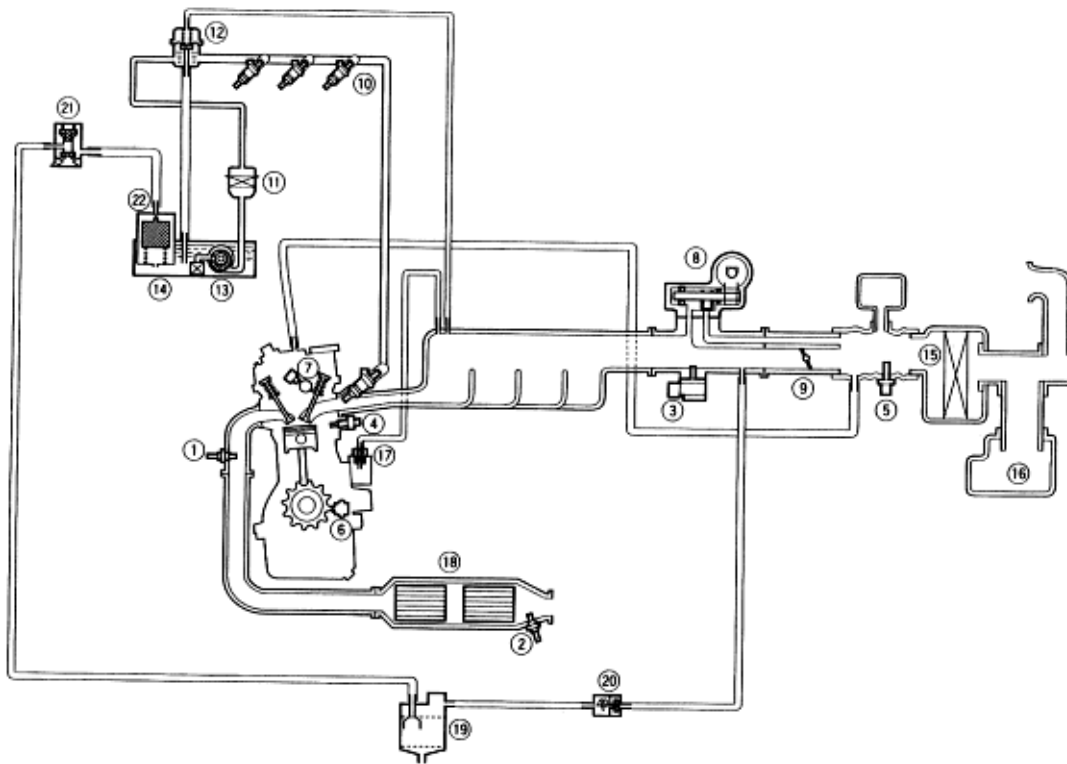


1. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
Inspection, [See Page 11-C-107](#)
2. FUEL VAPOUR PIPE
3. FUEL FEED PIPE
4. FUEL TANK
5. FUEL PUMP FUEL SENDING UNIT
6. FUEL FILL CAP
7. FUEL TUBE/QUICK-CONNECT FITTINGS
8. FUEL FILTER
9. EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
10. FUEL RETURN PIPE
11. FUEL PRESSURE REGULATOR
12. FUEL RAIL
13. FUEL INJECTORS,
Troubleshooting, [See Page 11-C-72](#)

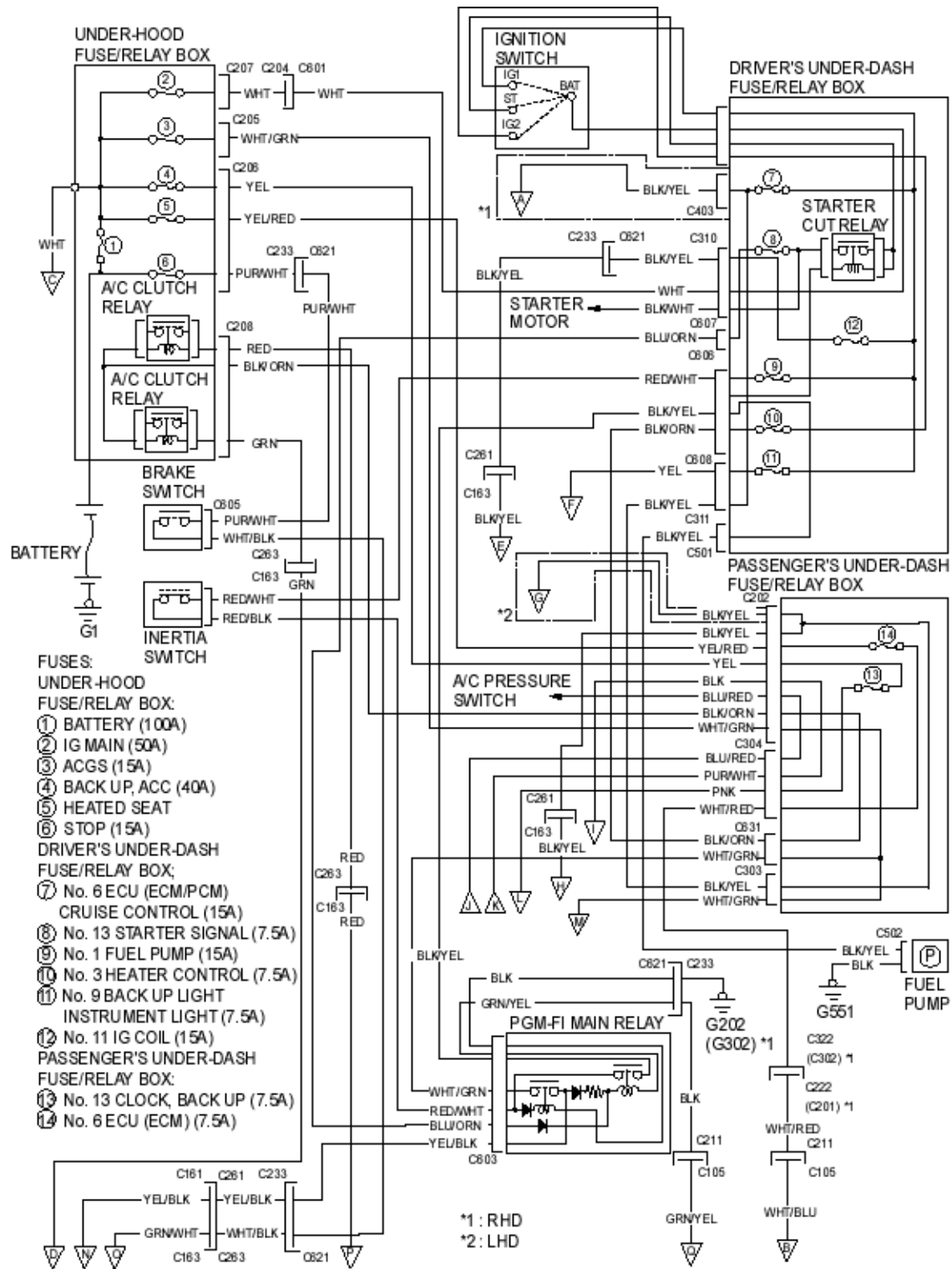
RHD:

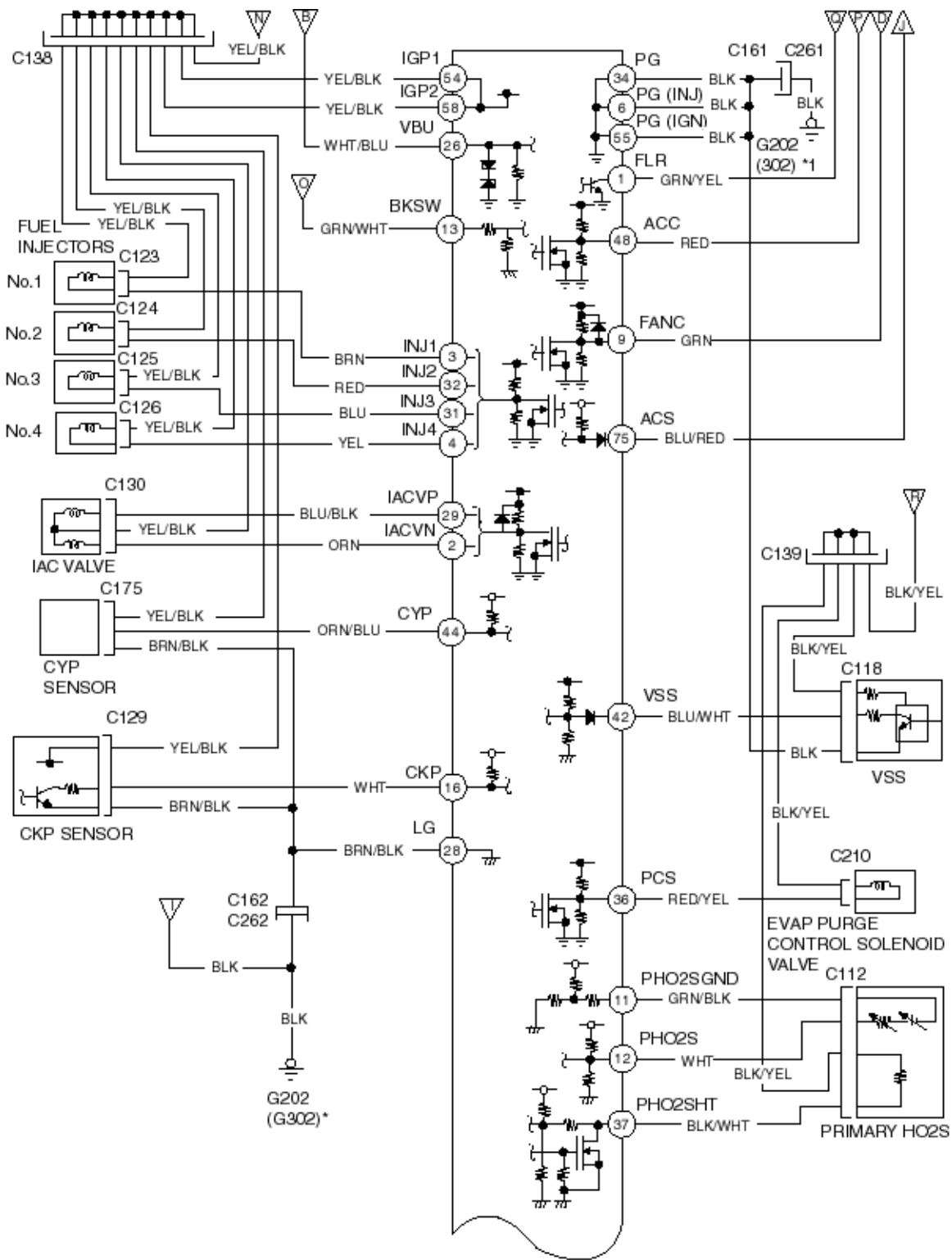


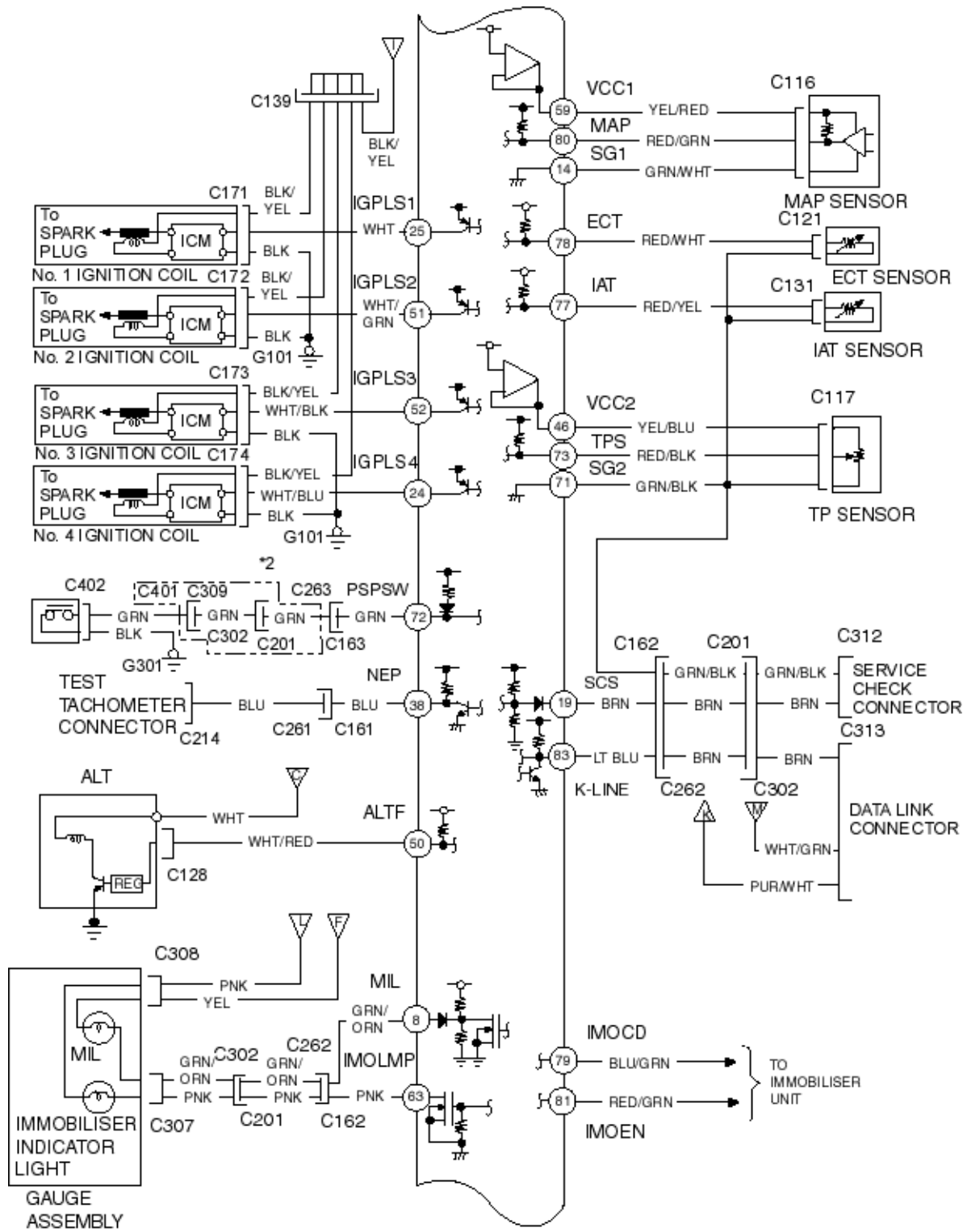
1. EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
Inspection, [See Page 11-C-107](#)
2. FUEL VAPOUR PIPE
3. FUEL FEED PIPE
4. FUEL TANK
5. FUEL PUMP FUEL SENDING UNIT
6. FUEL FILL CAP
7. FUEL TUBE/QUICK-CONNECT FITTINGS
8. FUEL FILTER
9. EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
10. FUEL RETURN PIPE
11. FUEL PRESSURE REGULATOR
12. FUEL RAIL
13. FUEL INJECTORS,
Troubleshooting, [See Page 11-C-72](#)



- | | |
|--|--|
| 1. Primary heated oxygen sensor (Primary HO2S) | 12. Fuel pressure regulator |
| 2. Secondary heated oxygen sensor (Secondary HO2S) | 13. Fuel pump (FP) |
| 3. Manifold absolute pressure (MAP) sensor | 14. Fuel tank |
| 4. Engine coolant temperature (ECT) sensor | 15. Air cleaner |
| 5. Intake air temperature (IAT) sensor | 16. Resonator |
| 6. Crankshaft position (CKP) sensor | 17. Positive crankcase ventilation (PCV) valve |
| 7. Cylinder Position (CYP) Sensor | 18. Three way catalytic converter |
| 8. Idle air control (IAC) valve | 19. Evaporative emission (EVAP) control canister |
| 9. Throttle body (TB) | 20. Evaporative emission (EVAP) purge control solenoid valve |
| 10. Fuel injector | 21. Evaporative emission (EVAP) two way valve |
| 11. Fuel filter | 22. Fuel tank evaporative emission (EVAP) valve |

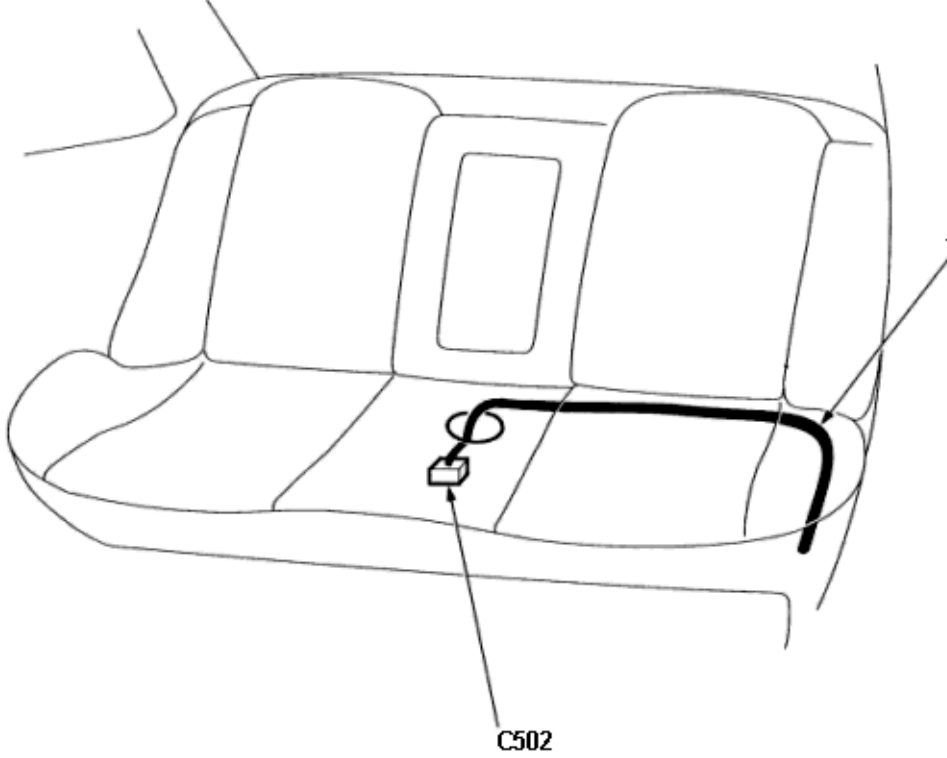






Fuel Pump (LHD)

1. LEFT SIDE WIRE HARNESS



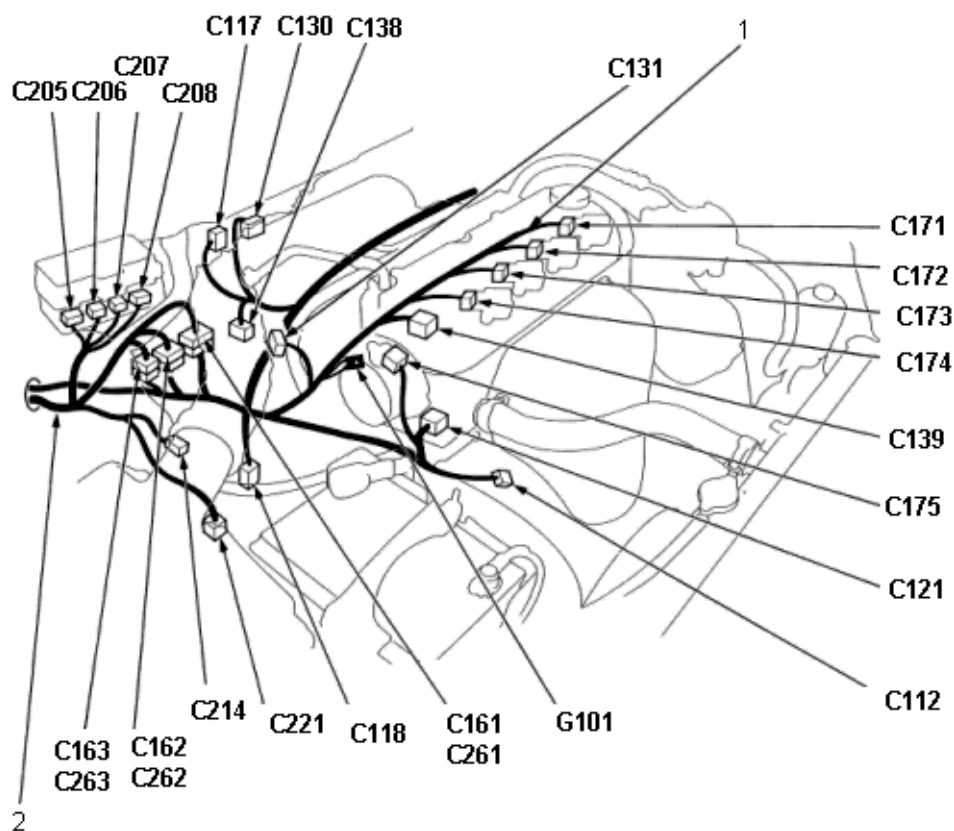
C502



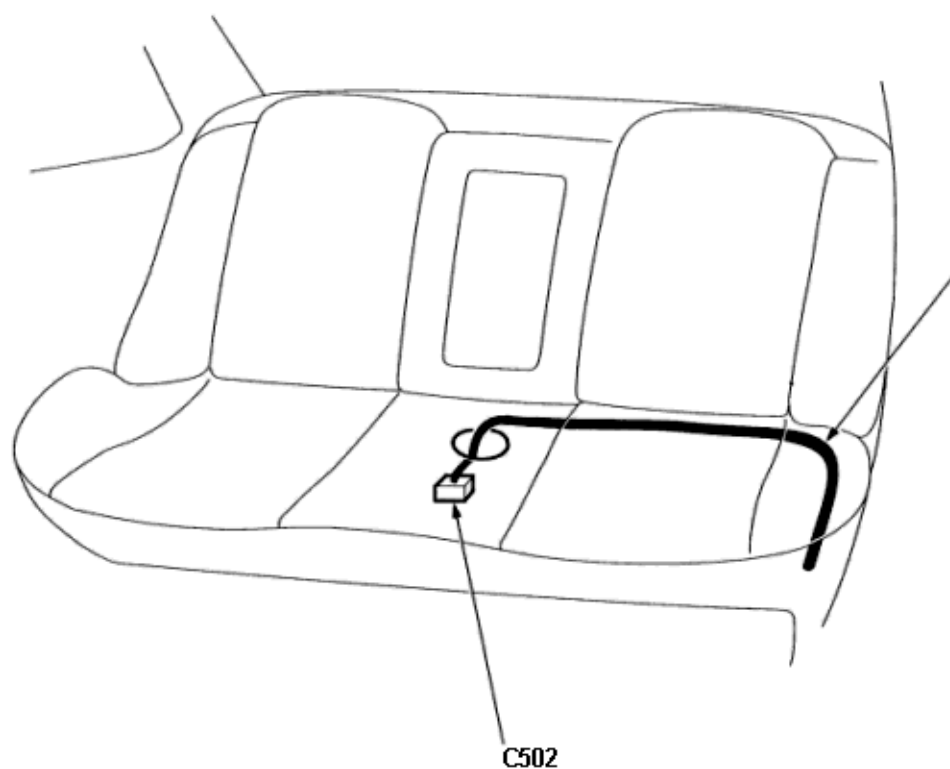
①	BLK/YEL
②	BLK
3	BLK
4	YEL/BLU

- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (LHD)



1. ENGINE WIRE HARNESS
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS



C502

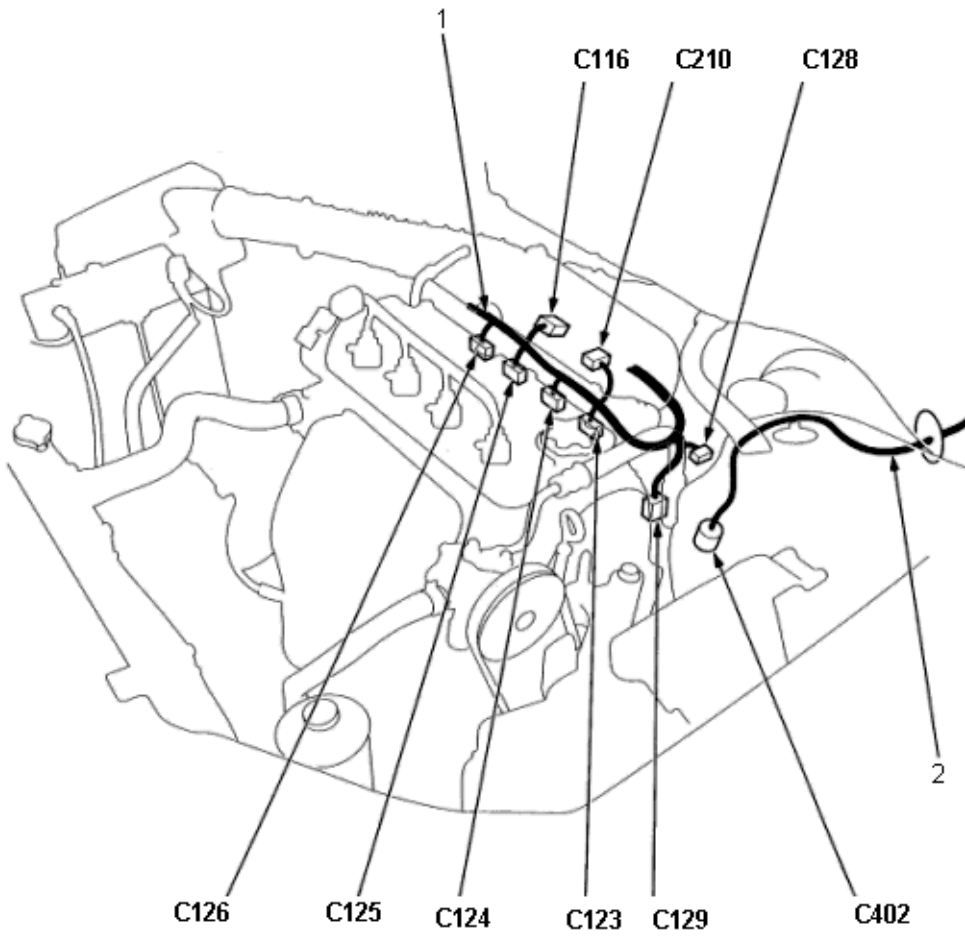


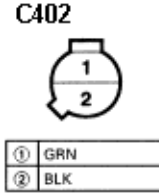
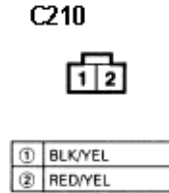
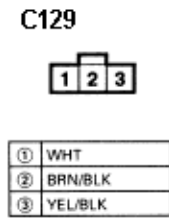
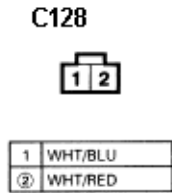
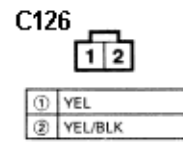
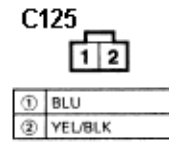
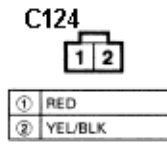
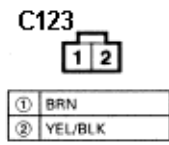
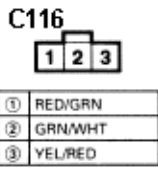
①	BLK/YEL
②	BLK
3	BLK
4	YEL/BLU

- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (LHD)

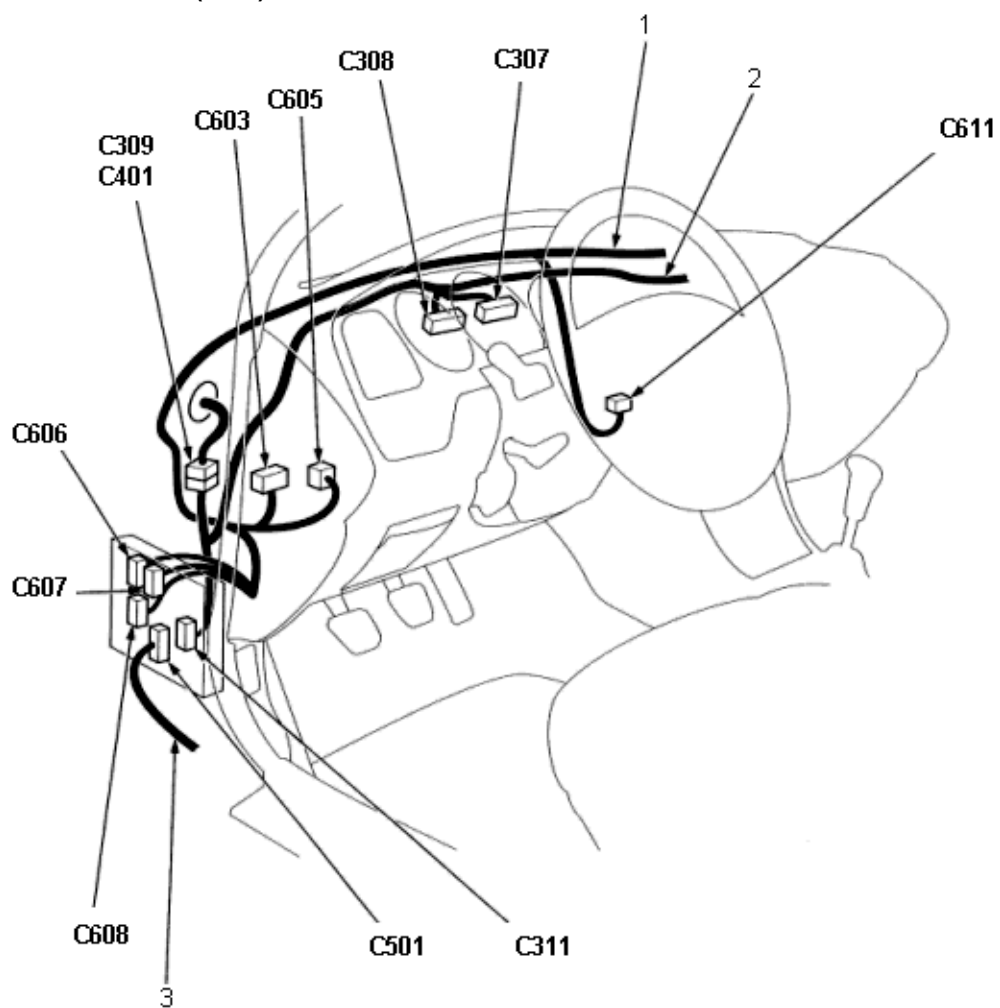
- 1. ENGINE WIRE HARNESS
- 2. LEFT ENGINE COMPARTMENT WIRE HARNESS





- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (LHD)



1. DASHBOARD WIRE HARNESS B
2. DASHBOARD WIRE HARNESS A
3. LEFT SIDE WIRE HARNESS

C307



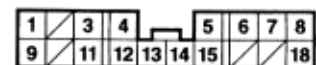
1	YEL/BLU	9	RED/BLK
2	---	10	YEL/RED
3	---	11	WHT/BLU
4	---	12	---
5	---	13	---
6	---	⑩	PNK
7	---	⑪	GRN/ORN
8	PUR	16	BLK/YEL

C308



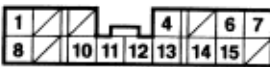
1	---	12	GRN/BLK
2	YEL/GRN	13	GRN/WHT
3	GRN/RED	14	GRN/YEL
4	RED/YEL	⑮	YEL
5	ORN	⑯	PNK
6	---	17	BLK
7	---	18	BLU/WHT
8	---	19	---
9	---	20	---
10	BLU	21	---
11	GRN/ORN	22	BLK

C311



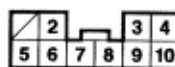
1	GRN/WHT	10	---
2	---	11	PUR
3	GRY	⑫	BLK/YEL
④	YEL	13	RED/BLK
5	YEL/GRN	14	GRN/ORN
6	BLK	15	GRN/YEL
7	YEL/RED	16	---
8	RED/BLK	17	---
9	GRN/RED	18	PNK/BLU

C401



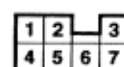
1	GRN/BLK	9	---
2	---	10	ORN
3	---	⑪	GRN
4	BLU/WHT	12	BLU/RED
5	---	13	PUR/WHT
6	PUR	14	LT GRN
7	GRN	15	RED/YEL
8	YEL/GRN	16	---

C501



1	---	6	GRN/BLK
2	GRN	7	RED/BLU
3	GRN/ORN	8	PUR
④	BLK/YEL	9	LT BLU
5	GRN/ORN	10	GRN/YEL

C603



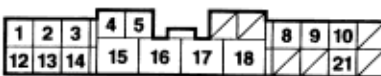
①	GRN/YEL	⑤	RED/BLK
②	BLU/ORN	⑥	YEL/BLK
③	BLK	⑦	WHT/GRN
④	BLK/YEL		

C605



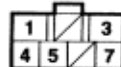
①	PUR/WHT
2	---
③	WHT/BLK
4	---

C606



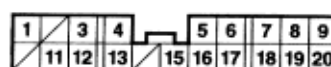
1	PUR	12	ORN
2	WHT/BLU	13	GRN/WHT
3	GRN/RED	14	YEL/RED
4	BLK	15	BLK
5	BLK/ORN	16	WHT
6	---	17	LT BLU
7	---	18	GRN
8	RED/BLK	19	---
9	BLK	20	---
⑩	BLU/ORN	21	GRN/ORN
11	---	22	---

C607



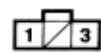
①	BLK/WHT
2	---
③	WHT
4	GRN/BLK
5	BLK/YEL
6	---
⑦	BLK/YEL

C608



①	RED/WHT	11	YEL/BLK
2	---	12	BLK
3	RED/BLK	⑬	BLK/ORN
4	LT GRN/RED	14	---
5	WHT/RED	15	YEL
6	BLK	16	LT GRN
⑦	BLK/YEL	17	BLU/WHT
8	WHT/BLK	18	YEL
9	BLU	19	PNK
10	---	20	WHT/BLK

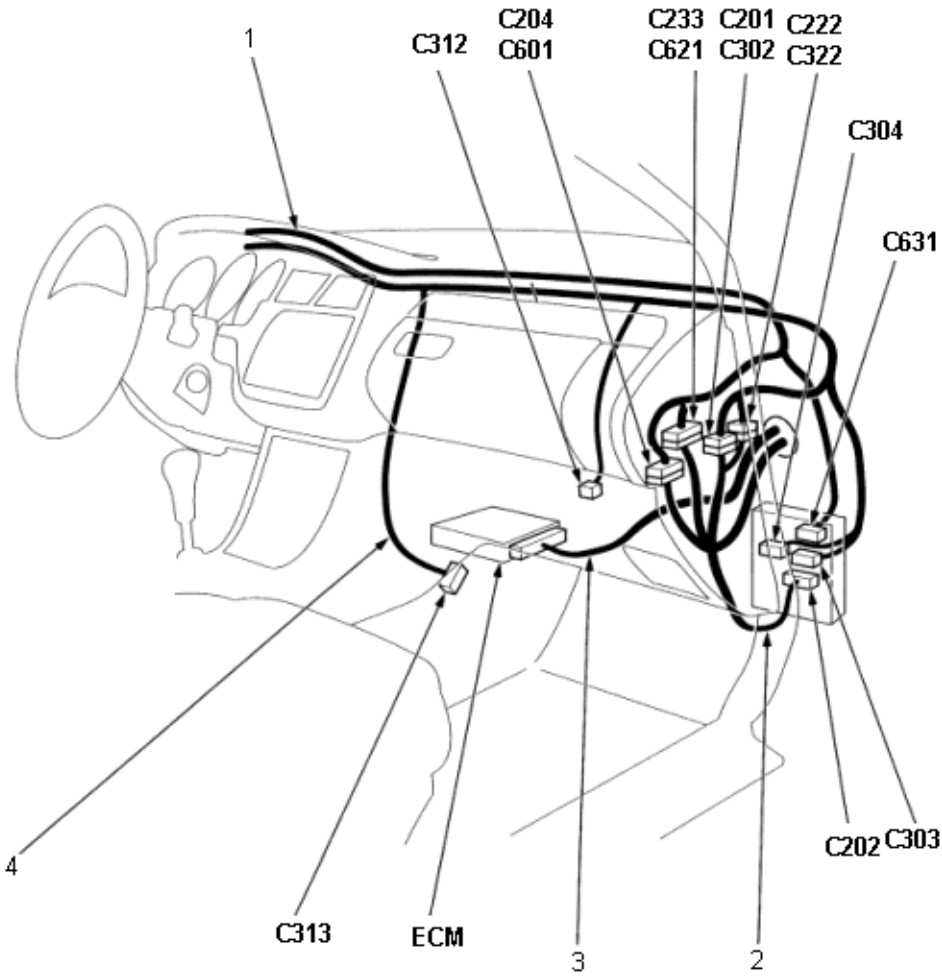
C611



①	BLK/WHT
2	---
③	RED/BLK

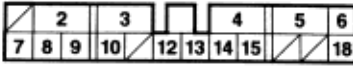
- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (LHD)



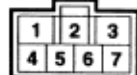
1. DASHBOARD WIRE HARNESS B
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS
3. ENGINE WIRE HARNESS
4. DASHBOARD WIRE HARNESS A

C202



1	---	10	BLK/YEL
2	RED/YEL	11	---
3	BLK/YEL	12	BLU/WHT
4	YEL/RED	13	BLU/RED
5	YEL	14	GRN/YEL
6	BLU/RED	15	PNK
7	RED/BLK	16	---
8	BLK/ORN	17	---
9	WHT/GRN	18	BLK

C204



1	BLK/WHT
2	WHT/BLU
3	WHT
4	BLU
5	BLU/YEL
6	BLU/RED
7	BLU/BLK

C233



1	RED/BLU	13	LT GRN/RED
2	GRN/YEL	14	LT BLU
3	---	15	YEL/BLK
4	BLK	16	---
5	---	17	PUR/WHT
6	YEL	18	WHT/BLK
7	---	19	GRN
8	BLK/YEL	20	GRN/BLK
9	RED	21	RED/WHT
10	---	22	WHT/GRN
11	YEL/BLU	23	PNK/BLK
12	---	24	---

C302



1	---	12	BLU/BLK
2	---	13	GRN/BLK
3	---	14	---
4	YEL	15	YEL/RED
5	GRN/BLK	16	GRN
6	---	17	BLU
7	LT BLU	18	YEL/GRN
8	BRN	19	WHT/BLU
9	GRN/ORN	20	YEL/GRN
10	PNK	21	---
11	---	22	---

C303



1	BLU/WHT	10	RED/WHT
2	---	11	PUR/WHT
3	---	12	BLK/YEL
4	---	13	RED/YEL
5	RED/YEL	14	RED/BLU
6	BRN/WHT	15	WHT/GRN
7	RED/BLK	16	GRN/WHT
8	BLK/WHT	17	---
9	GRN/BLK	18	RED/YEL

C304



1	---	10	WHT/GRN
2	---	11	WHT/GRN
3	GRN/WHT	12	---
4	---	13	WHT/RED
5	WHT	14	PUR/WHT
6	YEL/GRN	15	---
7	YEL	16	PNK
8	WHT/RED	17	BLU/RED
9	---	18	---

C312



1	GRN/BLK
2	BRN

C313



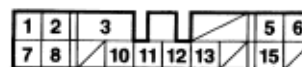
1	---	9	---
2	---	10	---
3	---	11	---
4	---	12	BLK
5	---	13	PUR/WHT
6	LT BLU	14	---
7	---	15	GRY
8	WHT/GRN	16	---

C322



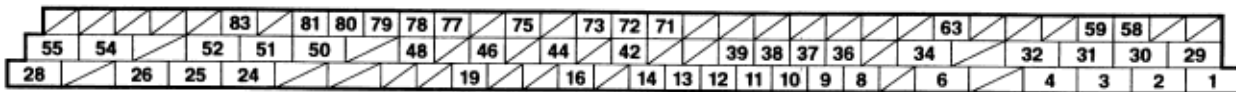
1	---	6	PUR/WHT
2	---	7	BLU/BLK
3	WHT/RED	8	YEL
4	WHT/GRN	9	---
5	ORN	10	---

C631



1	WHT/BLU	9	---
2	GRN/YEL	10	BLU/YEL
3	WHT	11	WHT/GRN
4	---	12	YEL
5	RED/BLK	13	LT GRN
6	BLK	14	---
7	YEL/BLK	15	BLK/ORN
8	BLU/WHT	16	---

ECM

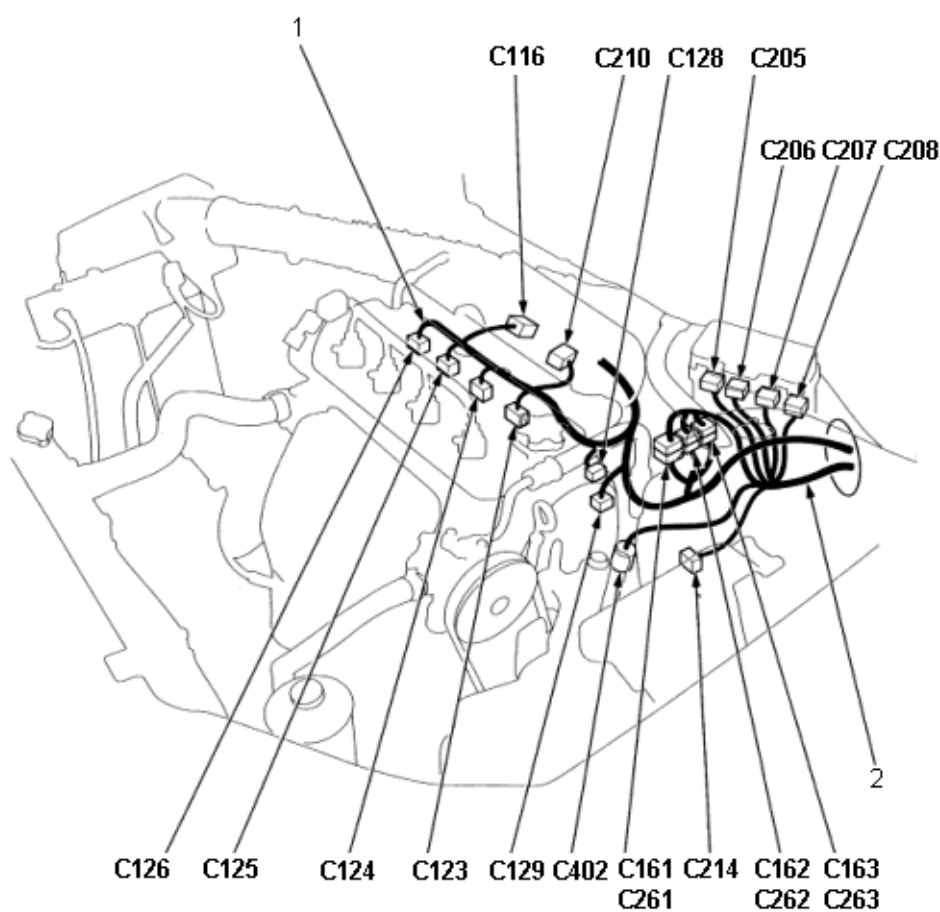


1	GRN/YEL	23	---	45	---	67	---
2	ORN	24	WHT/BLU	46	YEL/BLU	68	---
3	BRN	25	WHT	47	---	69	---
4	YEL	26	WHT/BLU	48	RED	70	---
5	---	27	---	49	---	71	GRN/BLK
6	BLK	28	BRN/BLK	50	WHT/RED	72	GRN
7	---	29	BLK/BLU	51	WHT/GRN	73	RED/BLK
8	GRN/ORN	30	BLK/WHT	52	WHT/BLK	74	---
9	GRN	31	BLU	53	---	75	BLU/RED
10	GRN/BLK	32	RED	54	YEL/BLK	76	---
11	GRN/BLK	33	---	55	BLK	77	RED/YEL
12	WHT	34	BLK	56	---	78	RED/WHT
13	GRN/WHT	35	---	57	---	79	BLU/GRN
14	GRN/WHT	36	RED/YEL	58	YEL/BLK	80	RED/GRN
15	---	37	BLK/WHT	59	YEL/RED	81	ORN/BLU
16	WHT	38	BLU	60	---	82	---
17	---	39	WHT/RED	61	---	83	LT BLU
18	---	40	---	62	---	84	---
19	BRN	41	---	63	PNK	85	---
20	---	42	BLU/WHT	64	---	86	---
21	---	43	---	65	---	87	---
22	---	44	ORN/BLU	66	---	88	---

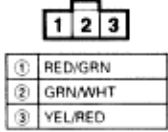
- NOTE:
- O: Related to Fuel and Emissions System
 - Connector with male terminals (double outline): View from terminal side
 - Connector with female terminals (single outline): View from wire side

Engine Compartment (RHD)

- 1. ENGINE WIRE HARNESS
- 2. LEFT ENGINE COMPARTMENT WIRE HARNESS



C116



C123



C124



C125



C126



C128



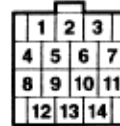
C129



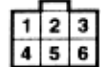
C161



C162



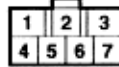
C163



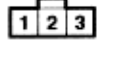
C205



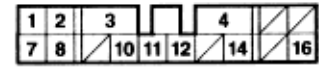
C206



C207



C208



C210



C214

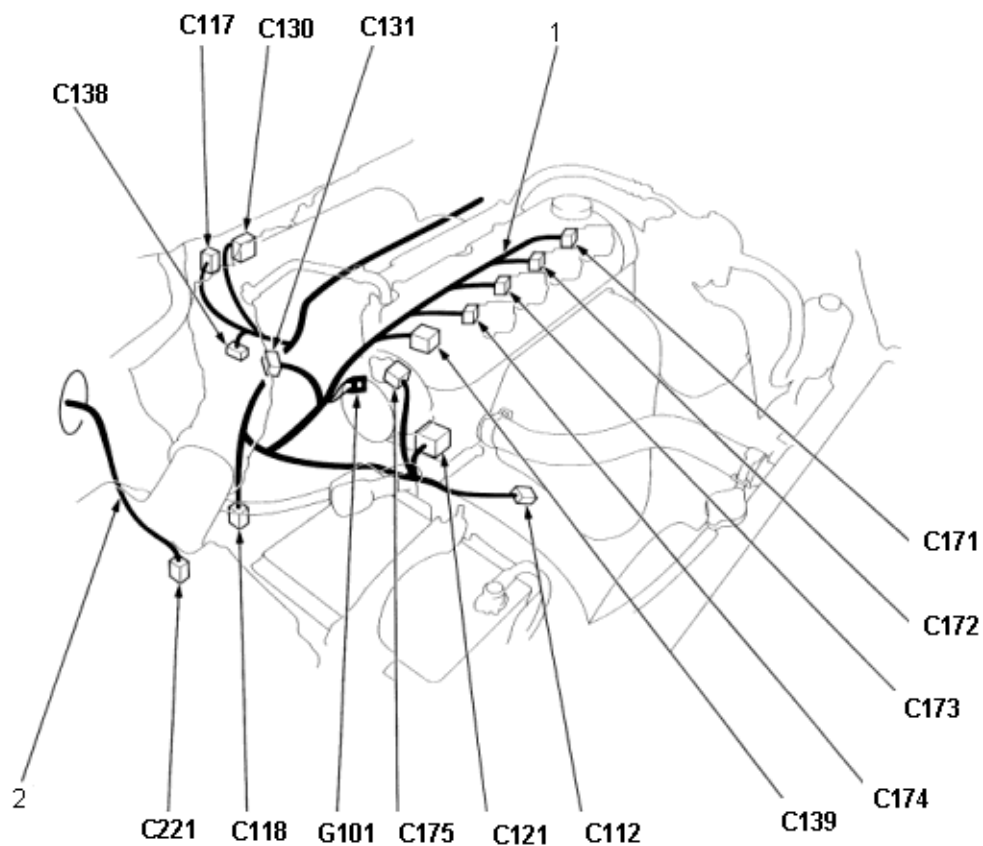


C402



- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Engine Compartment (RHD)



1. ENGINE WIRE HARNESS
2. RIGHT ENGINE COMPARTMENT WIRE HARNESS

C112



①	BLK/WHT
②	BLK/YEL
③	GRN/BLK
④	WHT

C117



①	RED/BLK
②	GRN/BLK
③	YEL/BLU

C118



①	BLK/YEL
②	BLK
③	BLU/WHT

C121



①	GRN/BLK
②	RED/WHT

C130



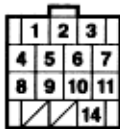
①	BLK/BLU
②	YEL/BLK
③	ORN

C131



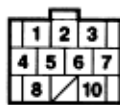
①	GRN/BLK
②	RED/YEL

C138



①	YEL/BLK	⑧	YEL/BLK
②	YEL/BLK	⑨	YEL/BLK
③	YEL/BLK	⑩	YEL/BLK
④	YEL/BLK	⑪	YEL/BLK
⑤	YEL/BLK	12	—
⑥	YEL/BLK	13	—
⑦	YEL/BLK	⑭	YEL/BLK

C139



①	BLK/YEL	⑥	BLK/YEL
②	BLK/YEL	⑦	BLK/YEL
③	BLK/YEL	⑧	BLK/YEL
④	BLK/YEL	9	—
⑤	BLK/YEL	⑩	BLK/YEL

C171



①	BLK/YEL
②	BLK
③	WHT

C172



①	BLK/YEL
②	BLK
③	WHT/GRN

C173



①	BLK/YEL
②	BLK
③	WHT/BLK

C174



①	BLK/YEL
②	BLK
③	WHT/BLU

C175



①	YEL/BLK
②	ORN/BLU
③	BRN/BLK

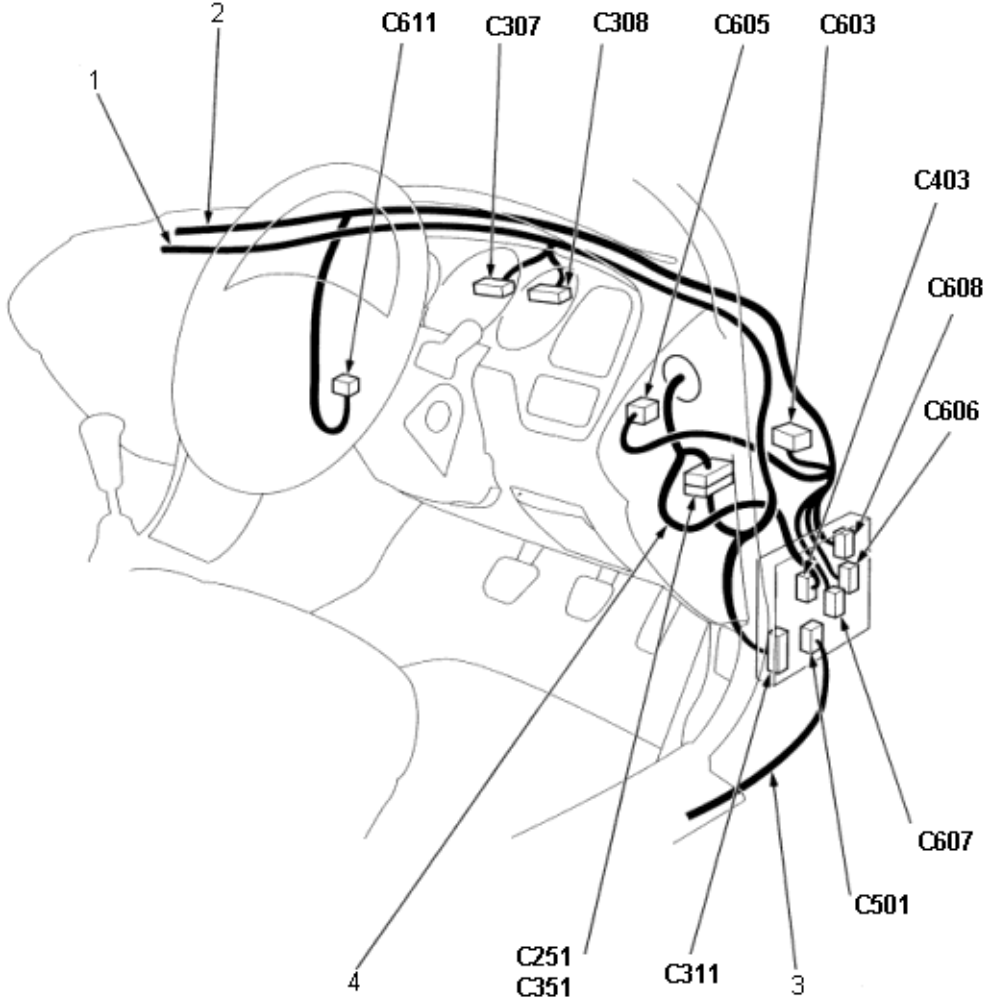
C221



①	RED/YEL
②	WHT
③	BLK/WHT
④	BLK/YEL

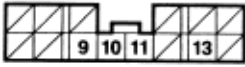
- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

Dash and Floor (RHD)



1. DASHBOARD WIRE HARNESS A
2. DASHBOARD WIRE HARNESS B
3. RIGHT SIDE WIRE HARNESS
4. RIGHT ENGINE COMPARTMENT WIRE HARNESS

C251



1	---	8	---
2	---	⑨	WHT
3	---	⑩	BLK/WHT
4	---	⑪	GRN/BLK
5	---	12	---
6	---	13	RED/WHT
7	---	14	---

C307



1	YEL/BLU	9	RED/BLK
2	---	10	YEL/RED
3	---	11	WHT/BLU
4	---	12	---
5	---	13	---
6	---	⑭	PNK
7	---	⑮	GRN/ORN
8	PUR	16	BLK/YEL

C308



1	---	12	GRN/BLK
2	YEL/GRN	13	GRN/WHT
3	GRN/RED	14	GRN/YEL
4	RED/YEL	⑮	YEL
5	ORN	⑯	PNK
6	---	17	BLK
7	---	18	BLU/WHT
8	---	19	---
9	---	20	---
10	BLU	21	---
11	GRN/ORN	22	BLK

C311



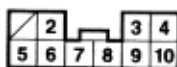
1	GRN/WHT	10	---
2	---	11	PUR
3	GRY	⑫	BLK/YEL
⑬	YEL	13	RED/BLK
5	YEL/GRN	14	GRN/ORN
6	BLK	15	GRN/YEL
7	YEL/RED	16	---
8	RED/BLK	17	---
9	GRN/RED	18	PNK/BLU

C403



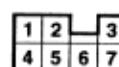
1	ORN	11	---
2	BLK	12	---
3	GRN/RED	⑬	BLK/YEL
4	---	14	---
5	---	15	---
6	YEL/GRN	16	---
7	LT BLU	17	---
8	---	18	RED/BLK
9	---	19	---
10	---	20	GRN/RED

C501



1	---	6	GRN/BLK
2	GRN	7	RED/BLU
3	GRN/ORN	8	PUR
④	BLK/YEL	9	LT BLU
5	GRN/ORN	10	GRN/YEL

C603



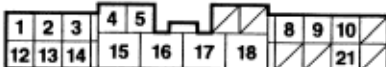
①	GRN/YEL	⑤	RED/BLK
②	BLU/ORN	⑥	YEL/BLK
③	BLK	⑦	WHT/GRN
④	BLK/YEL		

C605



①	PUR/WHT
2	---
③	WHT/BLK
4	---

C606



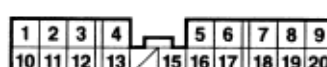
1	LT BLU	12	ORN
2	WHT/BLU	13	GRN/WHT
3	GRN/RED	14	YEL/RED
4	BLK	15	BLK
5	BLK/ORN	16	WHT
6	---	17	LT BLU
7	---	18	GRN
8	RED/BLK	19	---
9	BLK	20	---
⑩	BLU/ORN	21	GRN/ORN
11	---	22	---

C607



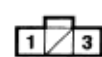
①	BLK/WHT
2	---
③	WHT
4	GRN/BLK
5	BLK/YEL
6	---
⑦	BLK/YEL

C608



①	RED/WHT	11	YEL/BLK
2	GRN/YEL	12	BLK
3	RED/BLK	⑬	BLK/ORN
4	LT GRN/RED	14	---
5	WHT/RED	15	YEL/BLK
6	BLK	16	LT GRN
⑦	BLK/YEL	17	BLU/WHT
8	WHT/BLK	18	YEL
9	BLU	19	PNK
10	BLU/YEL	20	WHT/BLK

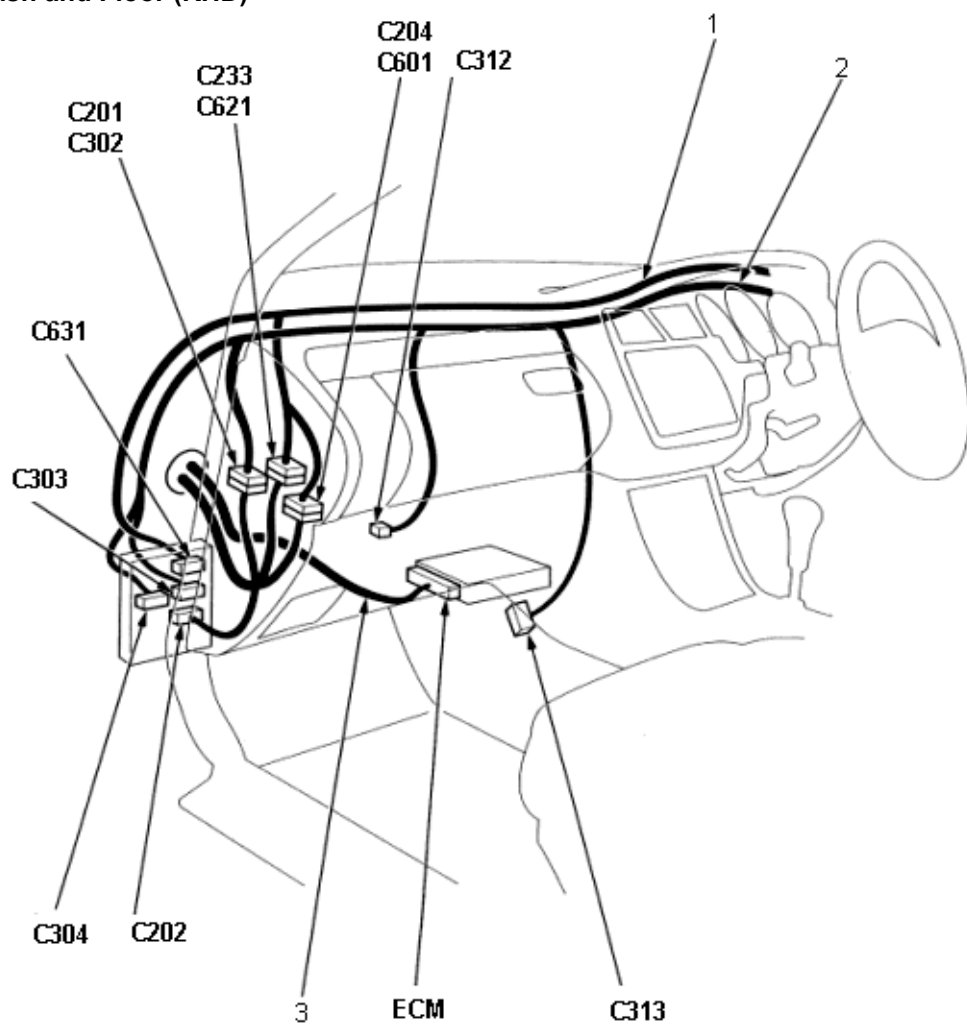
C611



①	BLK/WHT
2	---
③	RED/BLK

- NOTE:
- O: Related to Fuel and Emissions System
 - Connector with male terminals (double outline): View from terminal side
 - Connector with female terminals (single outline): View from wire side

Dash and Floor (RHD)



1. DASHBOARD WIRE HARNESS B
2. DASHBOARD WIRE HARNESS A
3. ENGINE WIRE HARNESS

C202



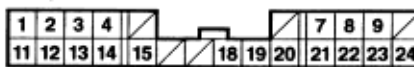
1	---	10	BLK/YEL
2	RED/WHT	11	GRY
③	BLK/YEL	12	BLU/WHT
④	YEL/RED	⑬	BLU/RED
⑤	YEL	14	---
6	---	15	---
7	BLK/YEL	16	LT BLU
⑧	BLK/ORN	17	RED/BLK
⑨	WHT/GRN	⑩	BLK

C204



1	BLK/WHT
2	---
③	WHT
4	BLU
5	BLU/YEL
6	BLU/RED
7	BLU/BLK

C233



1	BLU/YEL	⑬	WHT/BLK
2	GRN/YEL	14	WHT/GRN
3	GRN	15	RED/WHT
4	GRN/BLK	16	---
5	---	17	---
6	---	18	BLK/YEL
7	YEL/BLU	⑩	BLK
8	PUR	⑭	YEL/BLK
⑨	GRN/YEL	21	PNK/BLK
10	---	22	RED
11	YEL/RED	⑮	PUR/WHT
12	LT GRN/RED	24	YEL

C302



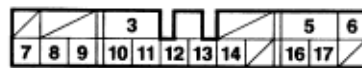
1	YEL/GRN	12	YEL
2	BLU/RED	13	---
③	RED/YEL	14	---
④	PNK	15	BLU
⑤	GRN/ORN	16	YEL/GRN
⑥	BRN	17	YEL/GRN
⑦	GRY	18	BLU/BLK
⑧	WHT/RED	19	YEL/RED
9	GRN/BLK	20	---
⑩	GRN/BLK	⑰	BLK/WHT
11	---	⑱	WHT

C303



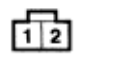
1	BLU/WHT	10	---
2	RED/WHT	11	---
3	PUR/WHT	⑩	BLK/YEL
4	---	13	RED/YEL
5	RED/YEL	14	RED/BLU
6	BRN/WHT	⑬	WHT/GRN
7	---	16	GRN/WHT
8	BLK/WHT	17	---
9	GRN/BLK	18	RED/YEL

C304



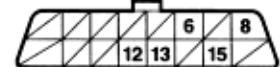
1	---	10	WHT/GRN
2	---	11	WHT/GRN
3	GRN/WHT	12	YEL/BLK
4	---	13	WHT/RED
5	WHT	⑩	PUR/WHT
6	YEL/GRN	15	---
7	YEL	⑬	PNK
⑧	WHT/RED	⑰	BLU/RED
9	RED/BLK	18	---

C312



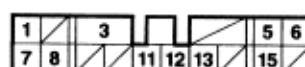
①	GRN/BLK
②	BRN

C313



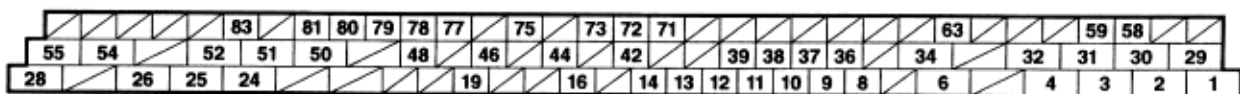
1	---	9	---
2	---	10	---
3	---	11	---
4	---	12	BLK
5	---	⑬	PUR/WHT
6	LT BLU	14	---
7	---	⑰	GRY
⑧	WHT/GRN	16	---

C631



1	WHT/BLU	9	---
2	---	10	---
3	WHT	⑩	WHT/GRN
4	---	12	YEL
5	BLK/YEL	13	LT GRN
6	BLK	14	---
7	YEL/BLK	⑬	BLK/ORN
8	BLU/WHT	16	---

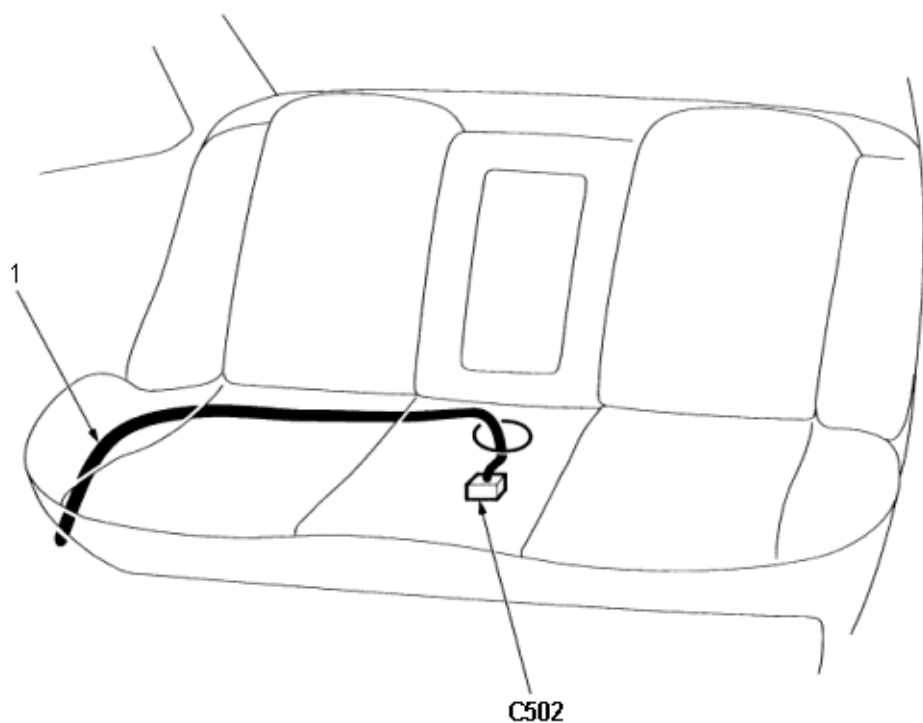
ECM



①	GRN/YEL	23	---	45	---	67	---
②	ORN	⑳	WHT/BLU	⑳	YEL/BLU	68	---
③	BRN	㉑	WHT	47	---	69	---
④	YEL	㉒	WHT/BLU	㉑	RED	70	---
5	---	27	---	49	---	㉒	GRN/BLK
⑥	BLK	㉓	BRN/BLK	㉑	WHT/RED	㉒	GRN
7	---	㉔	BLK/BLU	⑤	WHT/GRN	㉒	RED/BLK
⑧	GRN/ORN	㉕	BLK/WHT	⑩	WHT/BLK	㉒	---
⑨	GRN	⑪	BLU	53	---	㉒	BLU/RED
⑩	GRN/BLK	㉖	RED	⑤	YEL/BLK	76	---
⑪	GRN/BLK	33	---	㉓	BLK	㉒	RED/YEL
⑫	WHT	㉗	BLK	56	---	㉒	RED/WHT
⑬	GRN/WHT	35	---	57	---	㉒	BLU/GRN
⑭	GRN/WHT	㉘	RED/YEL	㉓	YEL/BLK	㉑	RED/GRN
15	---	㉔	BLK/WHT	㉓	YEL/RED	⑩	ORN/BLU
⑯	WHT	㉕	BLU	60	---	82	---
17	---	㉖	WHT/RED	61	---	⑩	LT BLU
18	---	40	---	62	---	84	---
⑰	BRN	41	---	⑩	PNK	85	---
20	---	㉗	BLU/WHT	64	---	86	---
21	---	43	---	65	---	87	---
22	---	㉘	ORN/BLU	66	---	88	---

- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

1. RIGHT SIDE WIRE HARNESS



C502

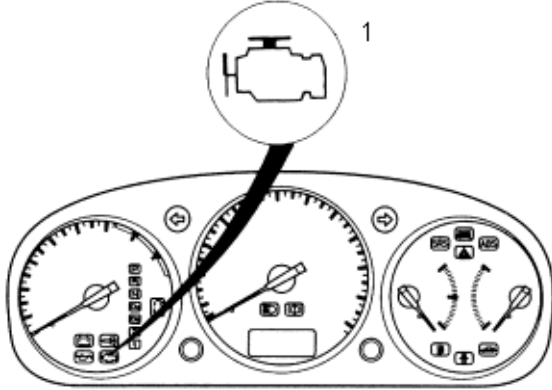


①	BLK/WEL
②	BLK
③	BLK
④	YEL/BLU

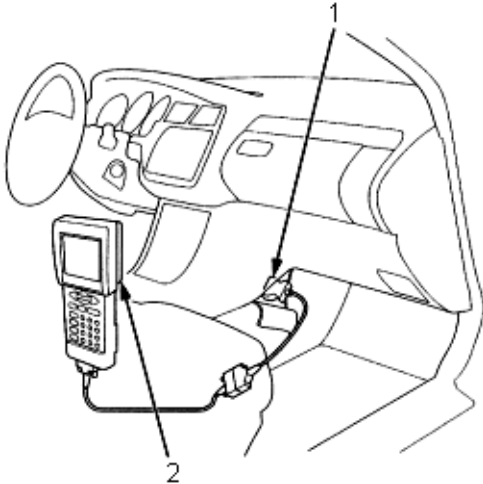
- NOTE:
- ♦ O: Related to Fuel and Emissions System
 - ♦ Connector with male terminals (double outline): View from terminal side
 - ♦ Connector with female terminals (single outline): View from wire side

If the MIL (Malfunction Indicator Lamp) has come on

1. Start the engine and check the MIL.



1. MALFUNCTION INDICATOR LAMP (MIL)
2. If the MIL stays on, turn the ignition switch OFF and connect the Honda PGM Tester or a scan tool to the Data Link Connector (DLC) located on the passenger's side of the centre console.



1. DATA LINK CONNECTOR (DLC)
 2. SCAN TOOL or HONDA PGM TESTER
- The illustration shows LHD type. RHD type is symmetrical.
3. Turn the ignition switch ON (II).
 4. Check the Diagnostic Trouble Codes (DTC) and note it. Also check the freeze frame data. Refer to the DTC Troubleshooting Index and begin the appropriate troubleshooting procedure.

NOTE:

- ♦ Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected.
- ♦ The scan tool and the Honda PGM Tester can read the DTC, freeze frame data, current data and other ECM data.
- ♦ For specific operations, refer to the user's manual that came with the scan tool or Honda PGM Tester.

If the MIL did not come on

If the MIL did not come on but there is a driveability problem, refer to the Symptom Troubleshooting Index (**See Page 11-C-36**).

If you cannot duplicate the DTC

Some of the troubleshooting in this section requires you to reset the Engine Control Module (ECM) and try to duplicate the DTC. If the problem is intermittent and you cannot duplicate the code, do not continue through the procedure. To do so will only result in confusion and possibly, a needlessly replaced ECM.

General Troubleshooting Information

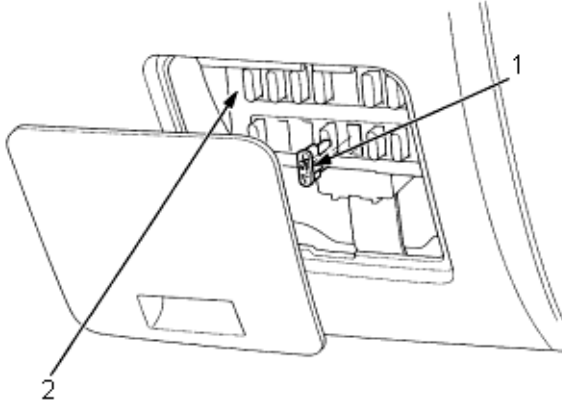
How to Reset the ECM

11-C-30

How to Substitute the ECM for Testing Purpose

You can reset the ECM in either of two ways:

- ♦ Use the scan tool or Honda PGM Tester to clear the ECM's/PCM's memory. See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- ♦ Turn the ignition switch OFF. Remove the No. 6 ECU (ECM) (7.5A) fuse from the passenger's under-dash fuse/relay box for 10 seconds.



1. No. 6 ECU (ECM) (7.5A) FUSE
2. PASSENGER'S UNDER-DASH FUSE/RELAY BOX

The illustration shows LHD type. RHD type is symmetrical.

How to End a Troubleshooting Session

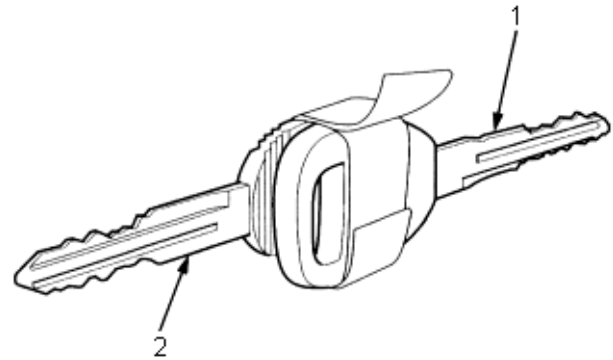
This procedure must be done after any troubleshooting.

1. Do the ECM Reset Procedure.
2. Turn the ignition switch OFF.
3. Discard the scan tool or Honda PGM Tester from the Data Link Connector (DLC).

NOTE: The ECM is part of the immobiliser system. If you replace ECM, the ECM will have a different immobiliser code. In order for the engine to start, you must rewrite the immobiliser code with the Honda PGM Tester.

Use this procedure if you need a known-good ECM to test a vehicle. It allows you to swap an ECM from a "donor" vehicle without having to program it to the test vehicle's ignition key.

1. Cut a temporary ignition key from the test vehicle with a non-immobiliser key blank.
2. Remove the ECM from the test vehicle.
3. Write the test vehicle's VIN on the ECM that you just removed to avoid confusing it with the donor vehicle's ECM.
4. Remove the known-good ECM from the donor vehicle and install it in the test vehicle.
5. Tape the donor vehicle's ignition key head-to-head to the test vehicle's temporary key. The ECM will recognise the code from the donor vehicle's key and allow you to start the engine with the temporary key.



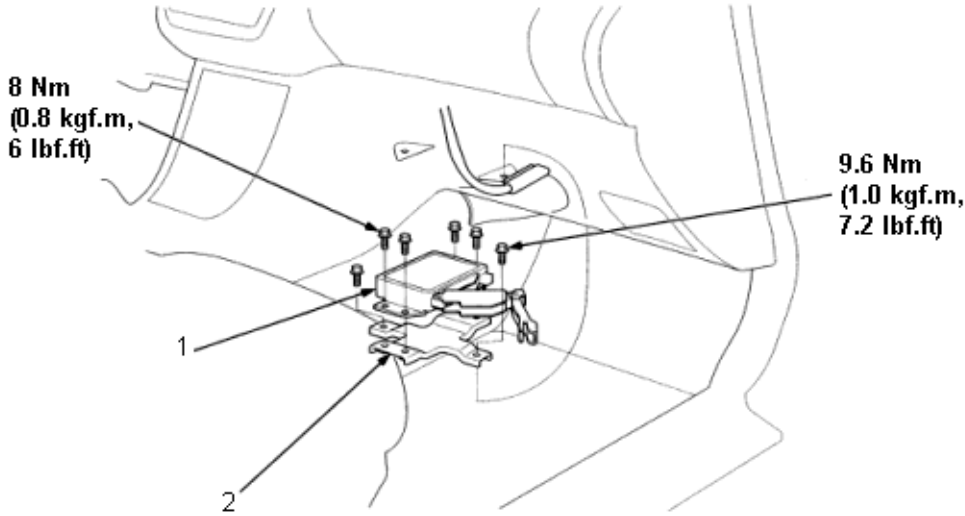
1. VEHICLE'S KEY (DONOR)
2. TEMPORARY KEY

6. After completing your tests, reinstall both ECM's and destroy the temporary key.

ECM Removal

Pull the carpet from the passenger's side of the centre console to expose the ECM. Unbolt the ECM bracket. Remove the four bolts from the ECM.

1. ECM
2. ECM BRACKET

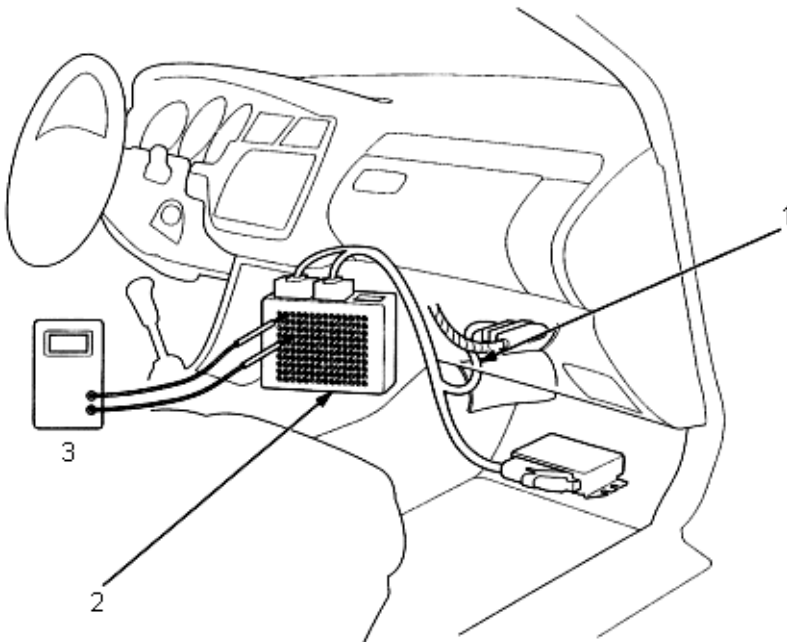


The illustration shows LHD type, RHD type is symmetrical.

Checking The ECM Connector Terminals

When checking the ECM connector terminals, connect the ECM test harness and test pin box. Check the system according to the procedure described for the appropriate DTC listed on the following pages.

1. ECM TEST HARNESS,
07XAZ-S1A0300
2. TEST PIN BOX (PIN BOX 130
SEEM) 07XAZ-0010100
3. DIGITAL CIRCUIT TESTER
Commercially available or
07411-0020000



The illustration shows LHD type, RHD type is symmetrical.

Scan Tool		Honda DTC (MIL indication)*	Detection Item	Page
DTC	Temporary DTC			
P0101	-	3-1 (3)	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	11-C-45
P0108	-	3-2 (3)	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	11-C-47
P0112	-	10-1 (10)	Intake Air Temperature (IAT) Sensor Circuit Low Voltage	11-C-49
P0113	-	10-2 (10)	Intake Air Temperature (IAT) Sensor Circuit High Voltage	11-C-50
P0117	-	6-1 (6)	Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	11-C-51
P0118	-	6-2 (6)	Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	11-C-52
P0122	-	7-1 (7)	Throttle Position (TP) Sensor Circuit Low Voltage	11-C-54
P0123	-	7-2 (7)	Throttle Position (TP) Sensor Circuit High Voltage	11-C-56
P0125	-	86-2 (86)	Cooling System Malfunction	11-C-53
P0130	-	61-8 (61)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Range/Performance Problem	11-C-58
P0131	-	1-1 (1)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit Low Voltage	11-C-59
P0132	-	1-2 (1)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit High Voltage	11-C-61
P0133	P0133	61-1 (61)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Slow Response	11-C-62
P0134	-	61-7 (61)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit Open Problem	11-C-63
P0135	-	41-3 (41)	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater Circuit Malfunction	11-C-64
P0136	-	63-8 (63)	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 1) Range/Performance Problem	11-C-66
P0137	P0136	63-1 (63)	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 1) Circuit Low Voltage	11-C-67
P0138	P0136	63-2 (63)	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 1) Circuit High Voltage	11-C-68
P0140	-	63-7 (63)	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 1) Circuit Open Problem	11-C-69
P0141	-	65-3 (65)	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 1) Heater Circuit Malfunction	11-C-64

*: These DTC's will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

Scan Tool		Honda DTC (MIL indication)*	Detection Item	Page
DTC	Temporary DTC			
P0171	P0171	45-2 (45)	Fuel System Too Lean	11-C-70
P0172	P0170	45-1 (45)	Fuel System Too Rich	11-C-70
P0201	-	71-5 (71)	Fuel Injector Open Circuit - No. 1 Cylinder	11-C-72
P0202	-	72-5 (72)	Fuel Injector Open Circuit - No. 2 Cylinder	11-C-72
P0203	-	73-5 (73)	Fuel Injector Open Circuit - No. 3 Cylinder	11-C-72
P0204	-	74-5 (74)	Fuel Injector Open Circuit - No. 4 Cylinder	11-C-72
P0261	-	71-6 (71)	Fuel Injector Circuit Short to Ground - No. 1 Cylinder	11-C-74
P0262	-	71-7 (71)	Fuel Injector Circuit Short to Voltage - No. 1 Cylinder	11-C-75
P0264	-	72-6 (72)	Fuel Injector Circuit Short to Ground - No. 2 Cylinder	11-C-74
P0265	-	72-7 (72)	Fuel Injector Circuit Short to Voltage - No. 2 Cylinder	11-C-75
P0267	-	73-6 (73)	Fuel Injector Circuit Short to Ground - No. 3 Cylinder	11-C-74
P0268	-	73-7 (73)	Fuel Injector Circuit Short to Voltage - No. 3 Cylinder	11-C-75
P0270	P0133	74-6 (74)	Fuel Injector Circuit Short to Ground - No. 4 Cylinder	11-C-74
P0271	-	74-7 (74)	Fuel Injector Circuit Short to Voltage - No. 4 Cylinder	11-C-75
P0300 and some of P0301 P0302 P0303 P0304	P1399	75-4 (75) and some of 71-1 (71) 72-1 (72) 73-1 (73) 74-1 (74)	Random Misfire	11-C-76
P0301	P1399	71-1 (71)	No. 1 Cylinder Misfire	11-C-77
P0302	P1399	72-1 (72)	No. 2 Cylinder Misfire	11-C-77
P0303	P1399	73-1 (73)	No. 3 Cylinder Misfire	11-C-77
P0304	P1399	74-1 (74)	No. 4 Cylinder Misfire	11-C-77
P0335	-	4-1 (4)	Crankshaft Position (CKP) Sensor No Signal	11-C-83
P0336	-	4-2 (4)	Crankshaft Position (CKP) Sensor Intermittent Interruption	11-C-83
P0342	-	9-3 (9)	Cylinder Position Sensor (CYP) Circuit Low Voltage	11-C-85
P0343	-	9-4 (9)	Cylinder Position Sensor (CYP) Circuit High Voltage	11-C-85
P0420	-	67-1 (67)	Catalyst System Efficiency Below Threshold	11-C-102
P0444	-	92-5 (92)	Evaporative Emission (EVAP) Purge Control Solenoid Valve Circuit Open Problem	11-C-103
P0445	-	96-6 (92)	Evaporative Emission (EVAP) Purge Control Solenoid Valve Circuit Short Problem	11-C-105

*: These DTC's will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

Scan Tool		Honda DTC (MIL indication)*	Detection Item	Page
DTC	Temporary DTC			
P0500	-	17-1 (17)	Vehicle Speed Sensor (VSS) Malfunction	11-C-87
P0560	-	34-1 (34)	Engine Control Module (ECM) Back Up System Voltage Problem	11-C-88
P0562	-	34-3 (34)	Engine Control Module (ECM) Back Up Circuit Low Voltage	11-C-89
P0563	-	34-4 (34)	Engine Control Module (ECM) Back Up Circuit High Voltage	11-C-89
P0601	-	0-6 (-)	Engine Control Module (ECM) Internal Circuit Malfunction	11-C-91
P0604	-	0-5 (-)	Engine Control Module (ECM) Internal Circuit Malfunction	11-C-91
P1515	-	14-7 (14)	Idle Air Control (IAC) Valve Circuit Short Problem	11-C-99
P1516	-	14-8 (14)	Idle Air Control (IAC) Valve Circuit Short Problem	11-C-99
P1517	-	14-5 (14)	Idle Air Control (IAC) Valve Circuit Open Problem	11-C-100
P1517	-	14-6 (14)	Idle Air Control (IAC) Valve Circuit Open Problem	11-C-100
P1607	-	0-2 (-)	Engine Control Module (ECM) Internal Circuit Malfunction	11-C-91

*: These DTC's will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) when the SCS short connector is connected.

General Troubleshooting Information
Symptom Troubleshooting Index (cont'd)

11-C-37

FUEL SUPPLY					INTAKE AIR				EMISSION CONTROL		
FUEL LINES, FUEL PRESSURE	FUEL INJECTOR	FUEL FILTER	FUEL PUMP	PGM-FI MAIN RELAY	FUEL	AIR CLEANER	THROTTLE WIRE	THROTTLE BODY	TWC	PCV SYSTEM	EVAP EMISSION CONTROL SYSTEM
-----	-----	-----	-----	-----	-----	-----	-----	-----	11-C-102	-----	11-C-103
1	3		2	2	1			3			
1	3	2	2		1			3			
							2	2			
							2	2			
								2			
								2			
2	2				3					3	
1	2		2		2						
2	2				3				1		3
1	3	2	2		3	2	2	2	2		

ECM Data

You can retrieve data from the ECM by connecting the scan tool or the PGM Tester to the Data Link Connector (DLC). The items listed in the table below can be indicated by both scan tool and Honda PGM tester. The Honda PGM Tester also reads data beyond these items. Understanding this data may help you find the causes of intermittent problems.

NOTE:

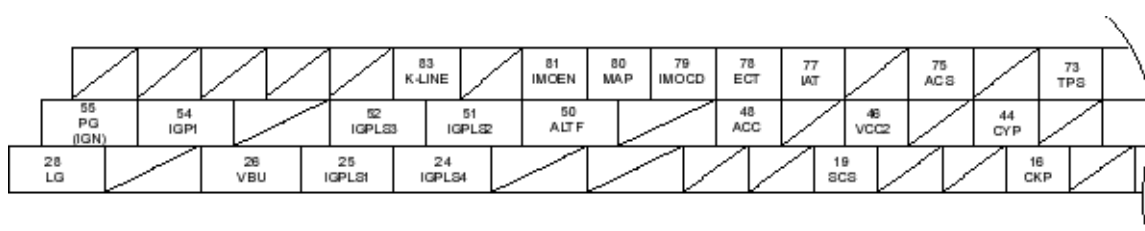
- ♦ The "operating values" listed are approximate and may vary depending on the environment and the individual vehicle.
- ♦ Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up. A/T in park or neutral, M/T in neutral, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM detects a problem, it will store it as a code consisting of one letter and four numbers.	If no problem is detected, there is no output	YES
Engine Speed	The ECM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication. At idle speed: 750 ± 50 rpm (min-1)	YES
Vehicle Speed	The ECM converts pulse signals from the Vehicle Speed Sensor (VSS) into speed data.	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure. At idle speed: 24-30 kPa (180-225 mm Hg, 7.1-8.9 in Hg)	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT. With engine warmed up: approx: 80-97°C (176-207°F)	YES
Heated Oxygen Sensor (HO2S) (Primary Sensor 1) (Secondary Sensor 2)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM. Based on these signals, the ECM controls the air/fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometer ratio) the voltage signal is lower. When the oxygen content is low (that is, when the ration is richer than the stoichiometric ratio), the voltage signal is higher.	0.0-1.25V At idle speed: about 0.1-0.9V	YES (Primary, Sensor 1 only)
HO2S .Feedback Loop Status	Loop status is indicated as "open" or "closed". Closed: Based on the HO2S output, the ECM determines the air/fuel ratio and controls the amount of injected fuel. Open: Ignoring the HO2S output, the ECM refers to signals from the TP, MAP and ECT sensors to control the amount of injected fuel.	At idle speed: Closed	YES

Data	Description	Operating Value	Freeze Data
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO2S feedback is in the closed loop status. When the signal from the HO2S feedback is weak, short term fuel trim gets higher and the ECM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO2S output. Consequently, the short term fuel trim is lowered, and the ECM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	0.75-1.25	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	0.75-1.25	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM. When intake air temperature is low, the internal resistance of the sensor increases and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: approx. 10%	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the ECM. The ECM matches ignition timing to the driving conditions.	At idle speed: 12° + 2° BTDC with SCS service signal line is jumped with the Honda PGM tester	NO
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 24-30%	NO

General Troubleshooting Information
Engine Control Module (ECM) Terminal Arrangement

11-C-40



Wire side female terminals

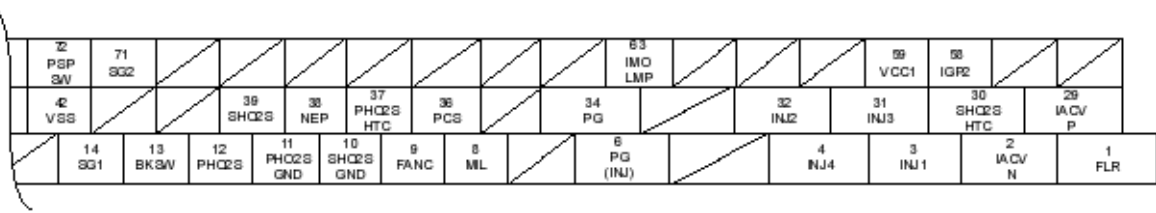
NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
1	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay	0V for 2 seconds after turning ignition switch ON (II), then battery voltage
2	ORN	IACV N (IDLE AIR CONTROL VALVE N SIDE)	Drives IAC valve N side coil	With engine running: pulses
3	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector	With ignition switch ON (II): battery voltage At idle: duty controlled
4	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector	With ignition switch ON (II): battery voltage At idle: duty controlled
6	BLK	PG (INJ) (POWER GROUND)	Ground for circuit injector	Less than 1.0V at all times
8	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL	With MIL turned ON: 0V With MIL turned OFF: battery voltage
9	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay	With radiator fan running: 0V With radiator fan stopped: battery voltage
10	GRN/BLK	ISHO2S GND (SECONDARY HO2S GROUND)	Ground for secondary HO2S	Less than 1.0V at all times
11	GRN/BLK	PHO2S GND (PRIMARY HO2S GROUND)	Ground for primary HO2S	Less than 1.0V at all times
12	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR)	Detects primary HO2S signal	With throttle fully opened from idle with fully warmed up engine: above 0.9V With throttle quickly closed: below 0.6V
13	GRN/WHT	BKSW (BRAKE SWITCH)	Detects brake switch signal	With brake pedal released: 0V With brake pedal depressed: battery voltage
14	GRN/WHT	SG1 (SENSOR GROUND)	Ground for Map sensor	Less than 1.0V at all times
16	WHT	CKP (CKP SENSOR SIDE)	Detects CKP sensor	With engine running: pulses
19	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0V With the terminal disconnected: battery voltage
24	WHT/BLU	IGPLS4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil	With engine running: pulses
25	WHT	IGPLS4 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil	With engine running: pulses
26	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM control circuit Power source for the DTC memory	Battery voltage at this time
28	BRN/BLK	LG (LOGIC GROUND)	Ground for the ECM control circuit	Less than 1.0V at all times
29	BLK/BLU	IACV P (IDLE AIR CONTROL VALVE P SIDE)	Drives IAC valve P side coil	With engine running: pulses
30	BLK/WHT	SHO2SHTC (SECONDARY HEATED OXYGEN	Drives secondary HO2S sensor	With ignition switch ON (II): battery voltage With fully warmed up engine

		SENSOR HEATER CONTROL)		running: duty controlled
31	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector	With the ignition switch ON (II): battery voltage At idle: duty controlled
32	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector	With the ignition switch ON (II): battery voltage At idle: duty controlled
34	BLK	PG (POWER GROUND)	Ground for the ECM control circuit	Less than 1.0V at all times
36	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve	With engine running, engine coolant, below 40.5°C (104.9°F): battery voltage With engine running, engine coolant, above 40.5°C (104.9°F): duty controlled
37	BLK/WHT	PHO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
38	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse	With engine running: pulses
39	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary HO2S signal	With throttle fully opened from idle with fully warmed up engine: above 0.9V With throttle quickly closed: below 0.6V

General Troubleshooting Information
Engine Control Module (ECM) Terminal
Arrangement (cont'd)

11-C-41



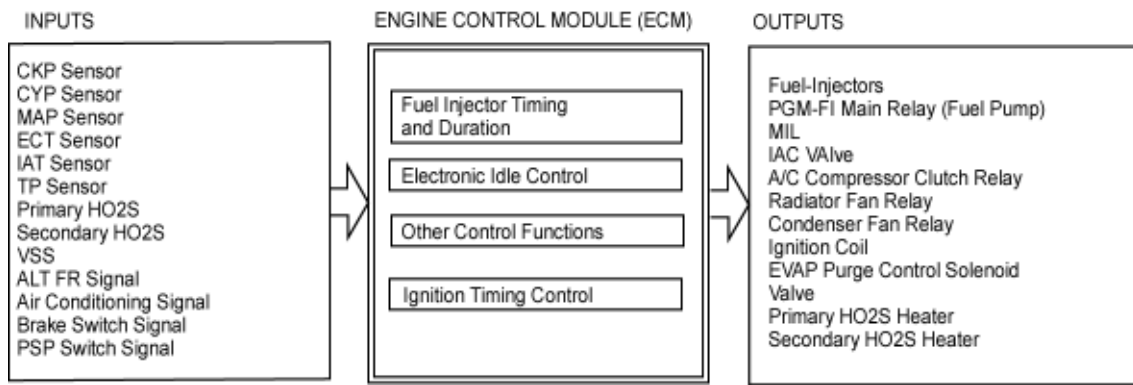
Wire side female terminals

NOTE: Standard battery voltage is 12V.

Terminal No.	Wire Colour	Terminal Name	Description	Signal
42	BLU/WHT	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal	With ignition switch ON (II) and front wheels rotating: cycles 0V - 5V
44	ORN/BLU	CYP (CYP SENSOR)	Detects CYP sensor	With engine running: pulses
46	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5V With ignition switch OFF: 0V
48	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay	With compressor ON: 0V With compressor OFF: battery voltage
50	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With fully warmed up engine running: 0V - battery voltage (depending on electrical load)
51	WHT/GRN	IGPLS2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil	With engine running: pulses
52	WHT/BLK	IGPLS3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil	With engine running: pulses
54	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM control circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: 0V
55	BLK	PG (IGN) (POWER GROUND)	Ground for the ignition system	Less than 1.0V at all times
58	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM control circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: 0V
59	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor	With ignition switch ON (II): about 5V With ignition switch OFF: 0V
63	PNK	SG1 (SENSOR GROUND)	Drives immobiliser indicator light	With immobiliser indicator light turned ON: 0V With immobiliser indicator light turned OFF: battery voltage
71	GRN/BLK	CKP (CKP SENSOR SIDE)	Sensor ground	Less than 1.0V at all times
72	GRN	IMOLMP (IMMOBILISER INDICATOR LIGHT)	Detects PSP switch signal	At idle with steering wheel in straight ahead position: 0V At idle with steering wheel at full lock: battery voltage
73	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal	With throttle fully open: about 4.3V With throttle fully closed: about 0.5V
75	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal	With A/C switch ON: 0V With A/C switch OFF: about 5V
77	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal	With ignition switch ON (II): about 0.1 - 4.8V (depending on intake air temperature)
78	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal	With ignition switch ON (II): about 0.1 - 4.8V (depending on intake air temperature)
79	BLU/GRN	IMOCD (IMMOBILISER CODE)	Detects immobiliser signal	
80	RED/GRN	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 3V At idle: about 1.0V (depending on engine speed)
81	ORN/BLU	IMOEN (IMMOBILISER ENABLE SIGNAL)	Sends immobiliser enable signal	
83	LT BLU	K-LINE (DLC)	Sends and receives	With the ignition switch ON (II):

| scan tool signal

| pulses



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM contains memories for the basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

Idle Air Control

When the engine is cold, the A/C compressor is on, the brake pedal is depressed, the P/S load is high, or the alternator is charging, the ECM controls duty to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

The ECM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.

Other Control Functions

1. Starting control
When the engine is started, the ECM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
 - ♦ When the engine is running, the ECM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
 - ♦ When the engine is not running and the ignition is ON (II), the ECM cuts ground to the PGM-FI main relay, which cuts current to the fuel pump.

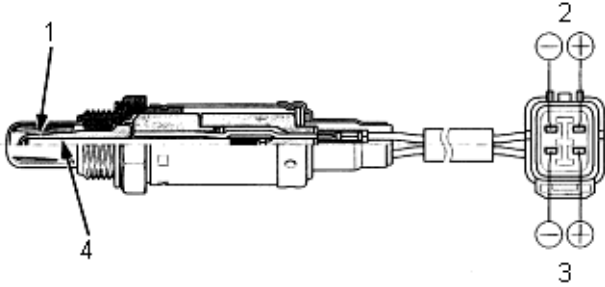
3. Fuel Cut-off Control
 - ♦ During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over 1,160 rpm (min⁻¹).
 - ♦ Fuel cut-off action also takes place when engine speed exceeds 6,800 rpm (min⁻¹), regardless of the position of the throttle valve to protect the engine from over-revving.
4. A/C Compressor Clutch Relay
When the ECM receives a demand for cooling from the air conditioning system, it delays the compressor from being energised.
5. Evaporation Emission (EVAP) Purge Control Solenoid Valve
When the engine coolant temperature is above 40.5°C (104.9°F), the ECM controls the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.

ECM Fail-safe/Self-diagnosis Functions

1. Fail safe Function
When an abnormally occurs in a signal from a sensor, the ECM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. Self-diagnosis Function (Malfunction Indicator Lamp (MIL))
When an abnormally occurs in a signal from a sensor, the ECM supplies ground for the MIL and stores the code in erasable memory. When the ignition is initially turned ON (II), the ECM supplies ground for the MIL for two seconds to check the MIL bulb condition.

Secondary Heated Oxygen Sensor (Secondary HO2S)

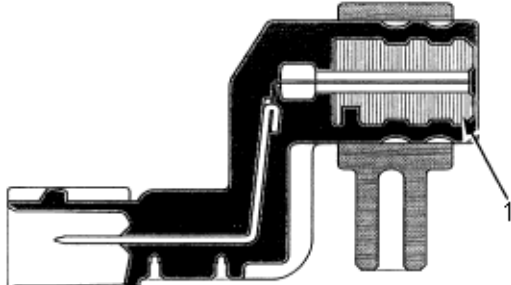
The Secondary HO2S detects the oxygen content in the exhaust gas in the downstream of the Three Way Catalytic Converter (TWC) and sends signals to the ECM, which varies the duration of fuel injection accordingly. To stabilise its output, the sensor has an internal heater. The Secondary HO2S is installed in the TWC.



1. ZIRCONIA ELEMENT
2. SENSOR TERMINALS
3. HEATER TERMINALS
4. HEATER

Crankshaft Position (CKP) Sensor

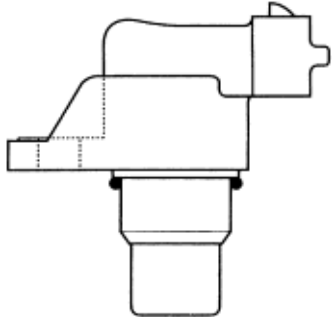
The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed.



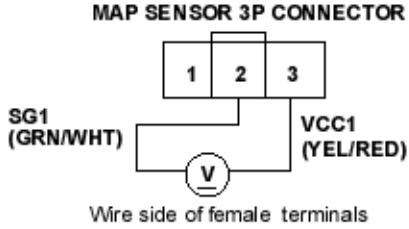
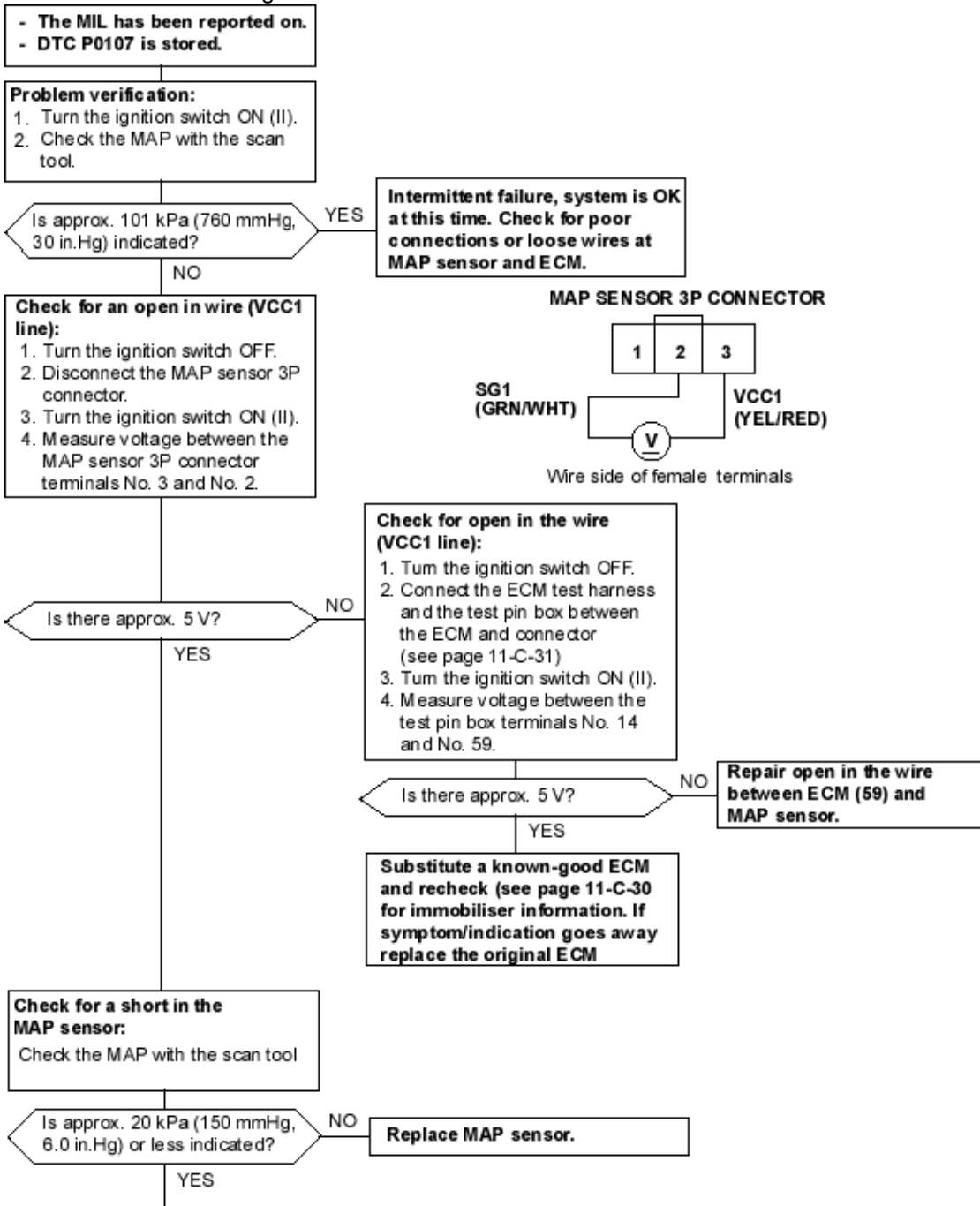
1. MAGNET

Cylinder Position (CYP) Sensor

The CYP Sensor detects the position of No. 1 cylinder for sequential fuel injection to each cylinder.



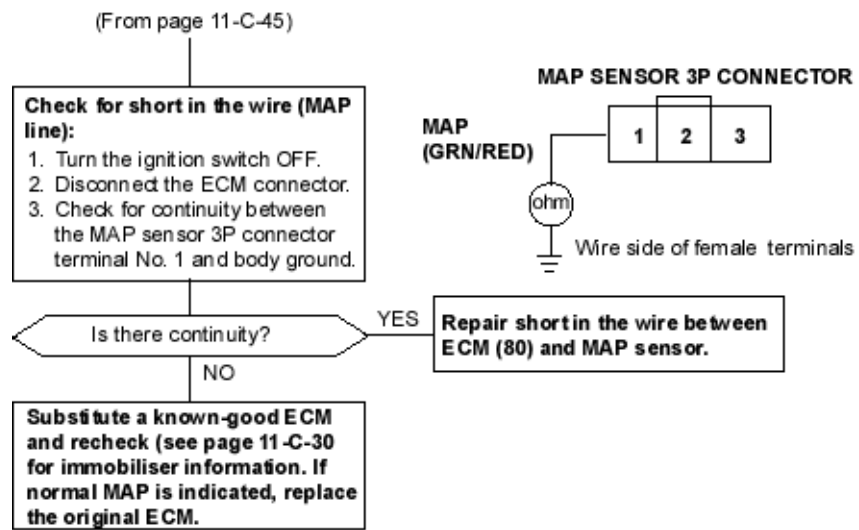
DTC P0107: MAP Sensor Circuit Low Voltage



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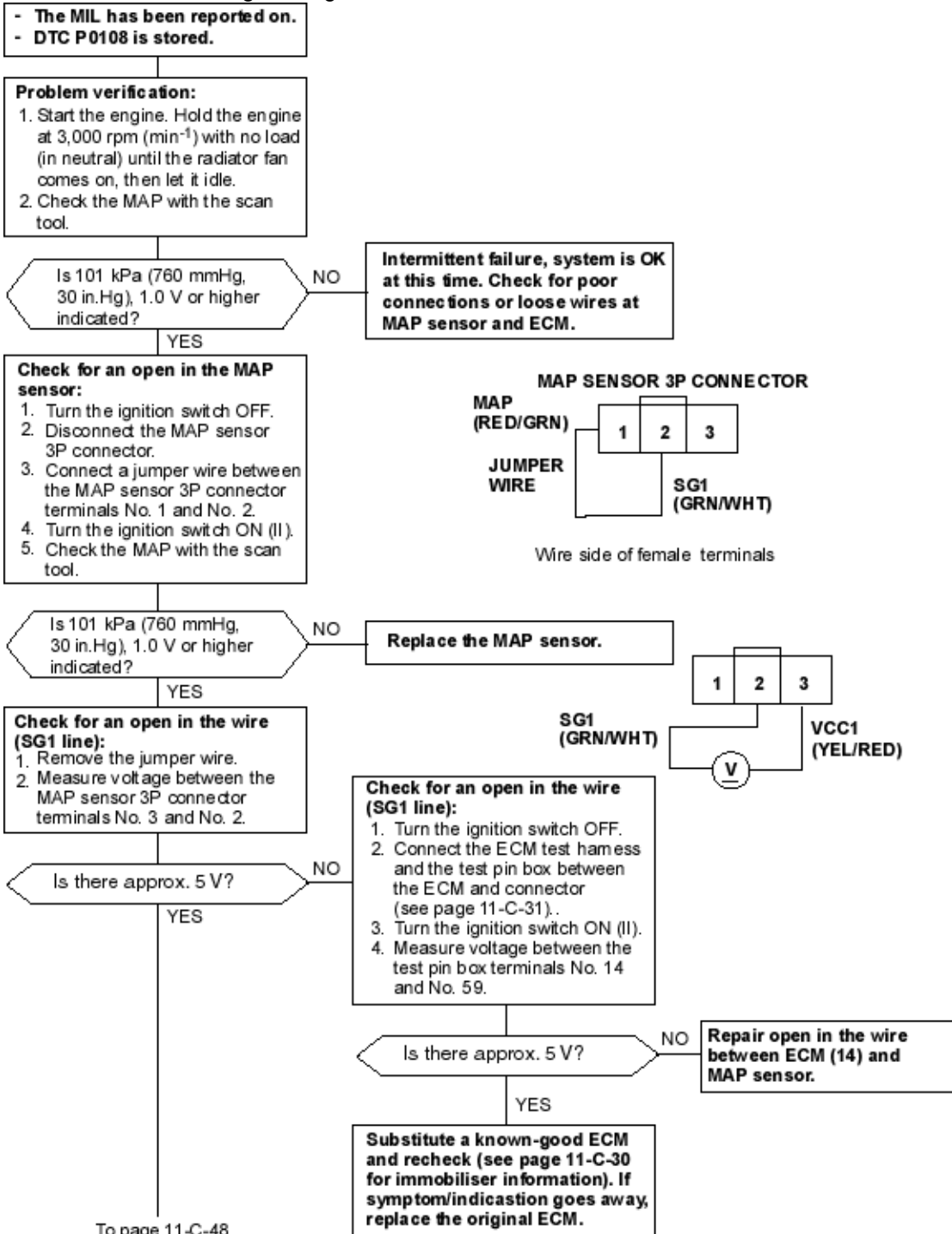
[\(See Page 23-C-31\)](#)

[\(See Page 23-C-30\)](#)



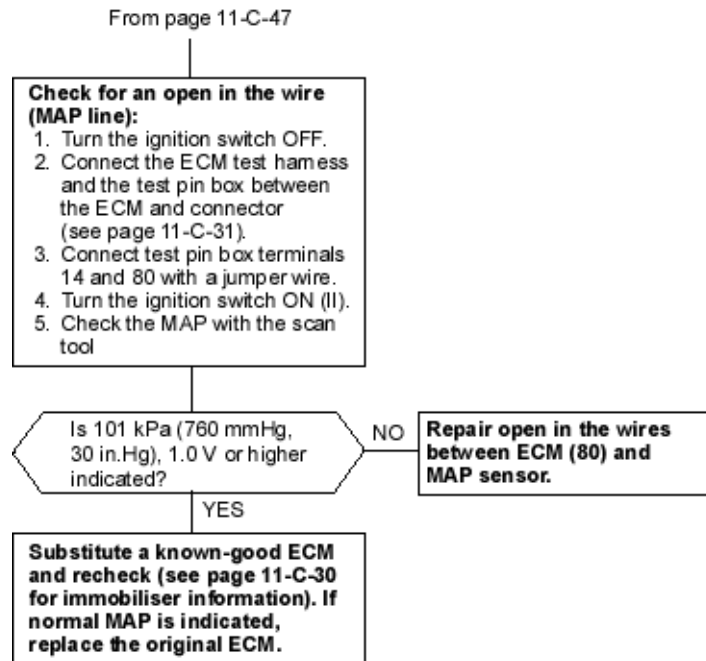
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(See Page 23-C-30)

DTC P0108: MAP Sensor Circuit High Voltage



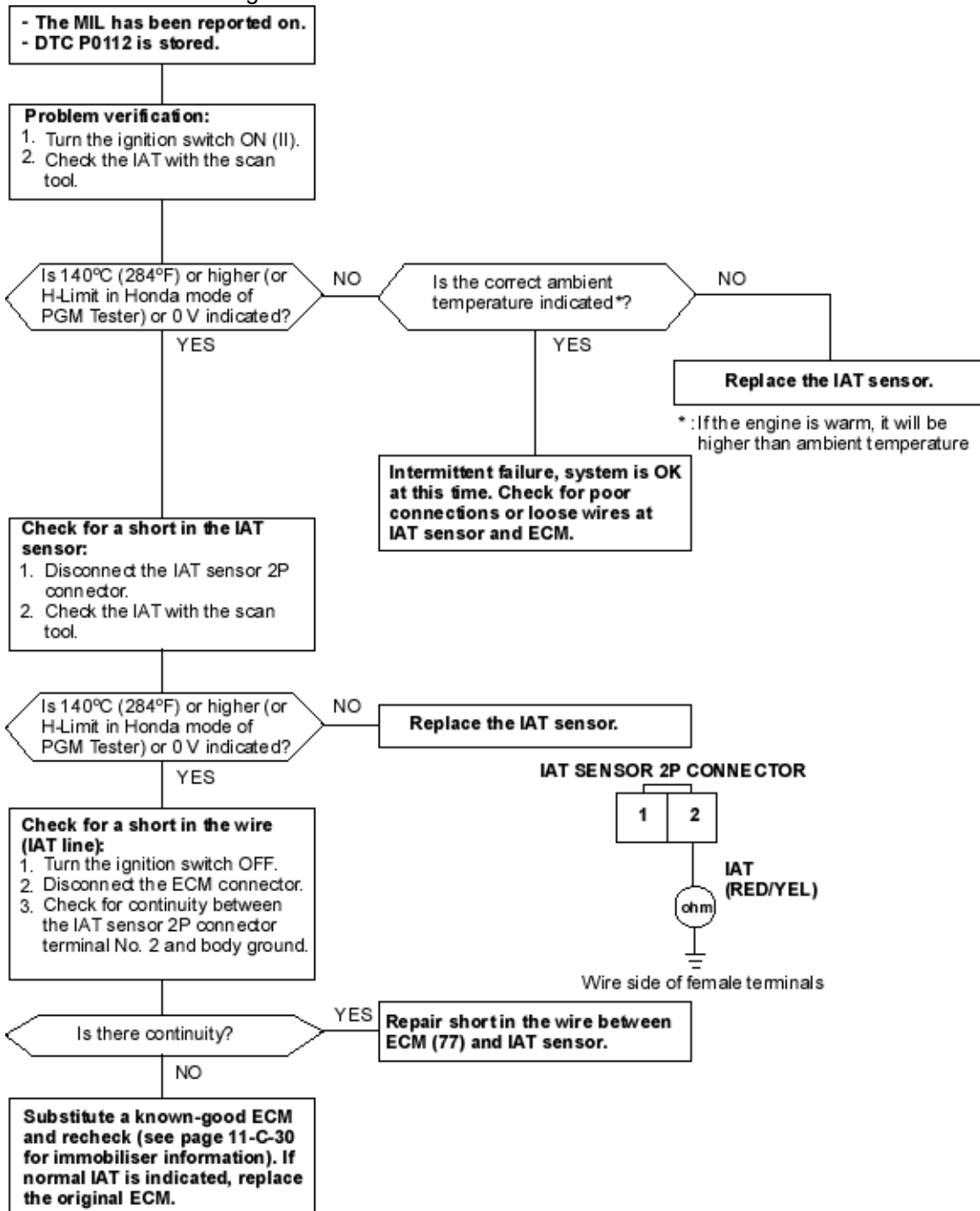
To page 11-C-48

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(See Page 23-C-30)



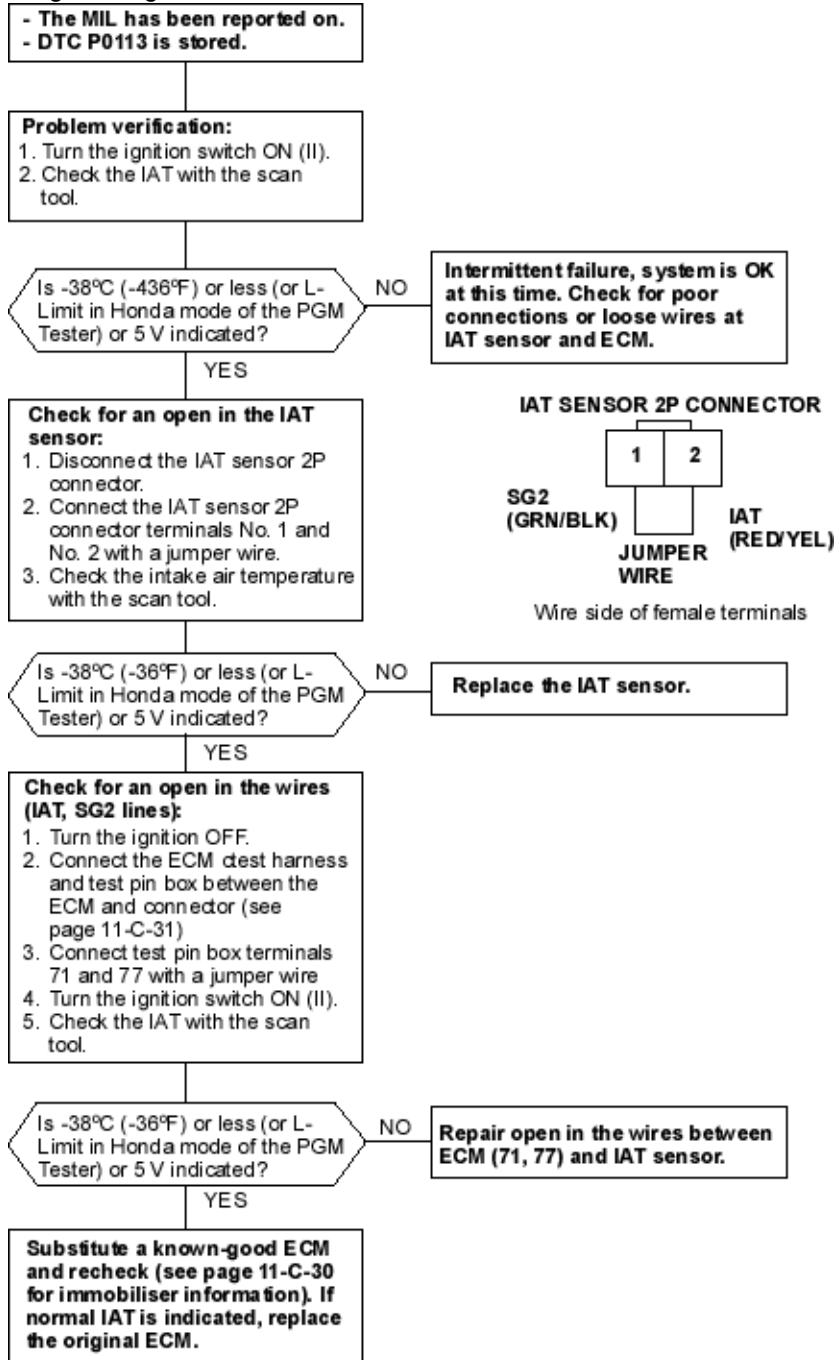
To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

DTC P0112: IAT Sensor Circuit Low Voltage



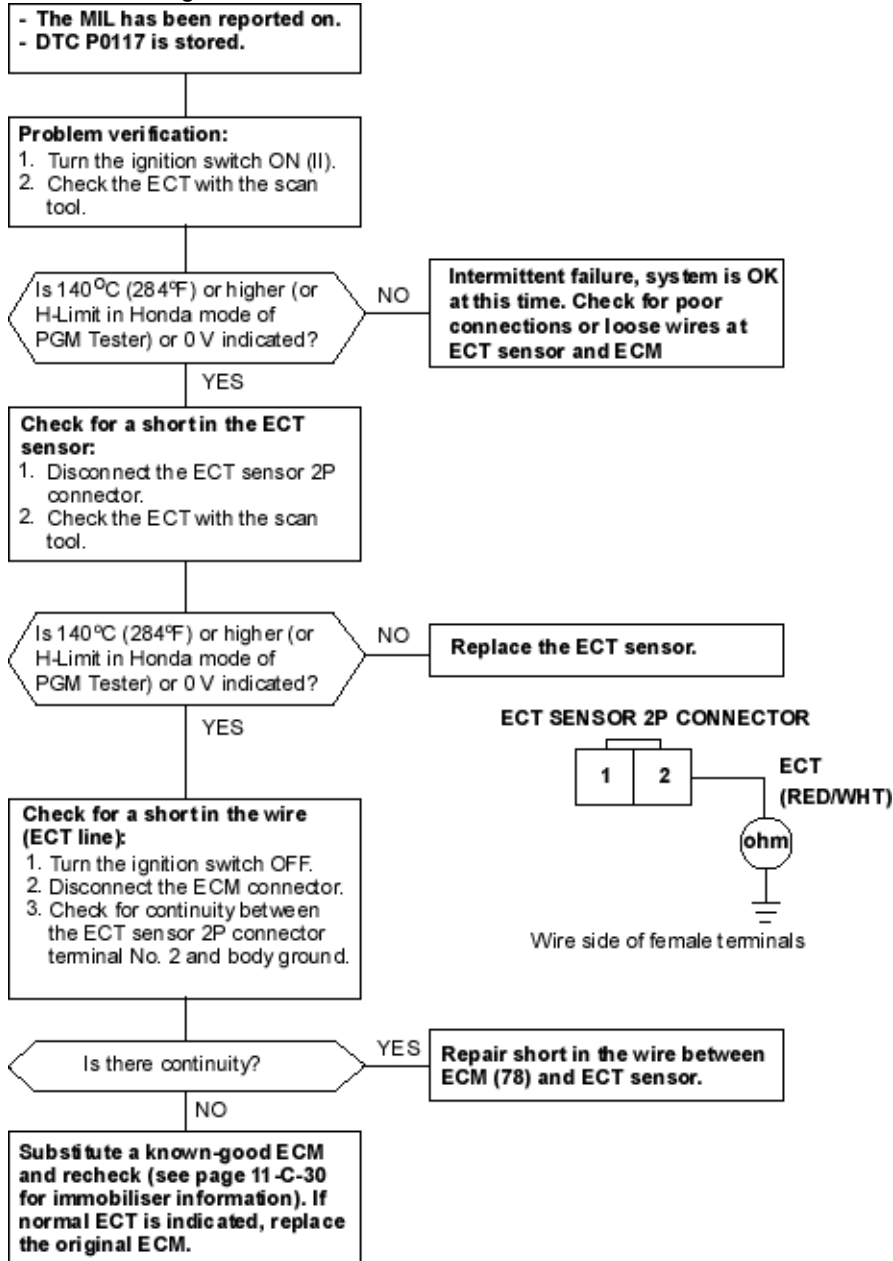
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 (See Page 23-C-30)

DTC P0113: IAT Sensor Circuit High Voltage



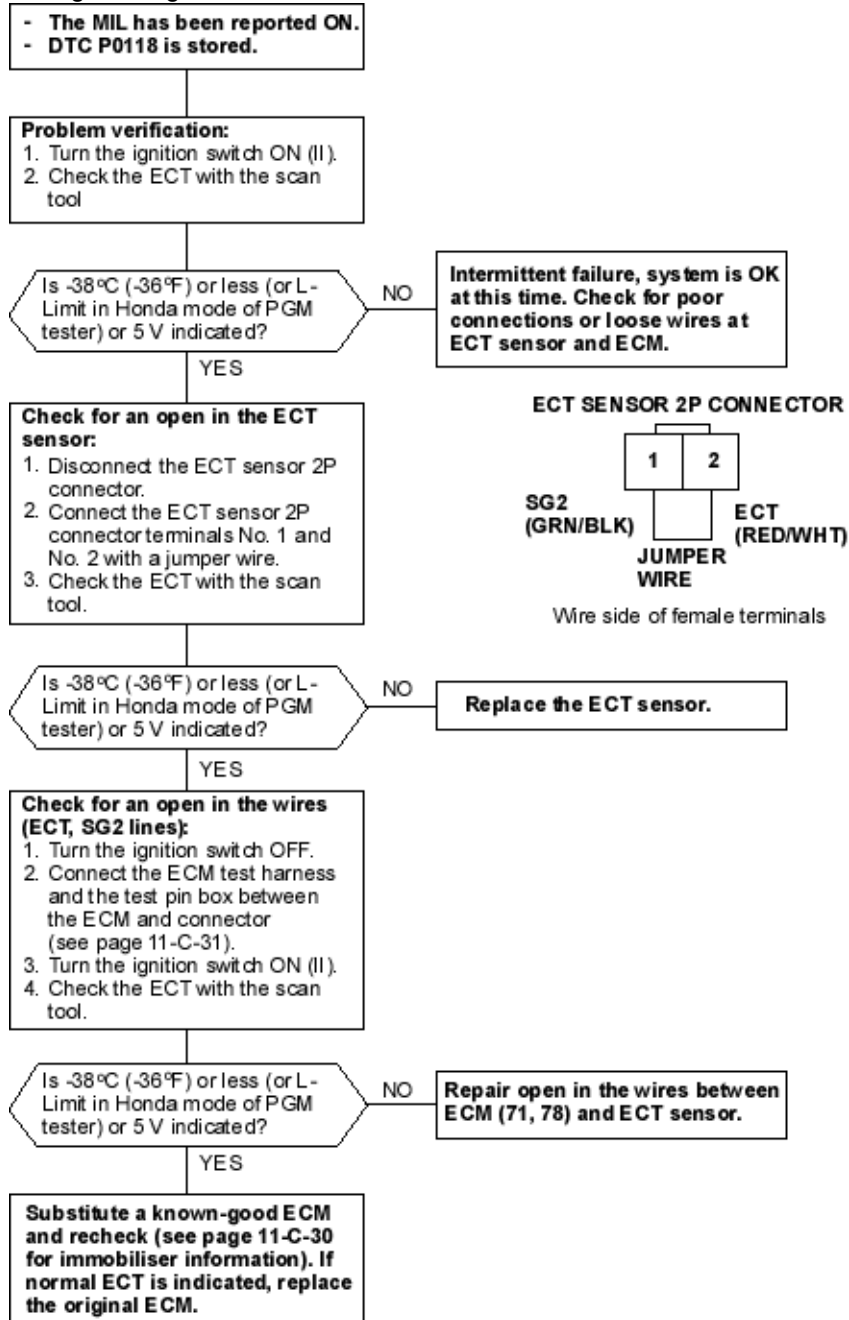
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(See Page 23-C-30)

DTC P0117: ECT Sensor Circuit Low Voltage



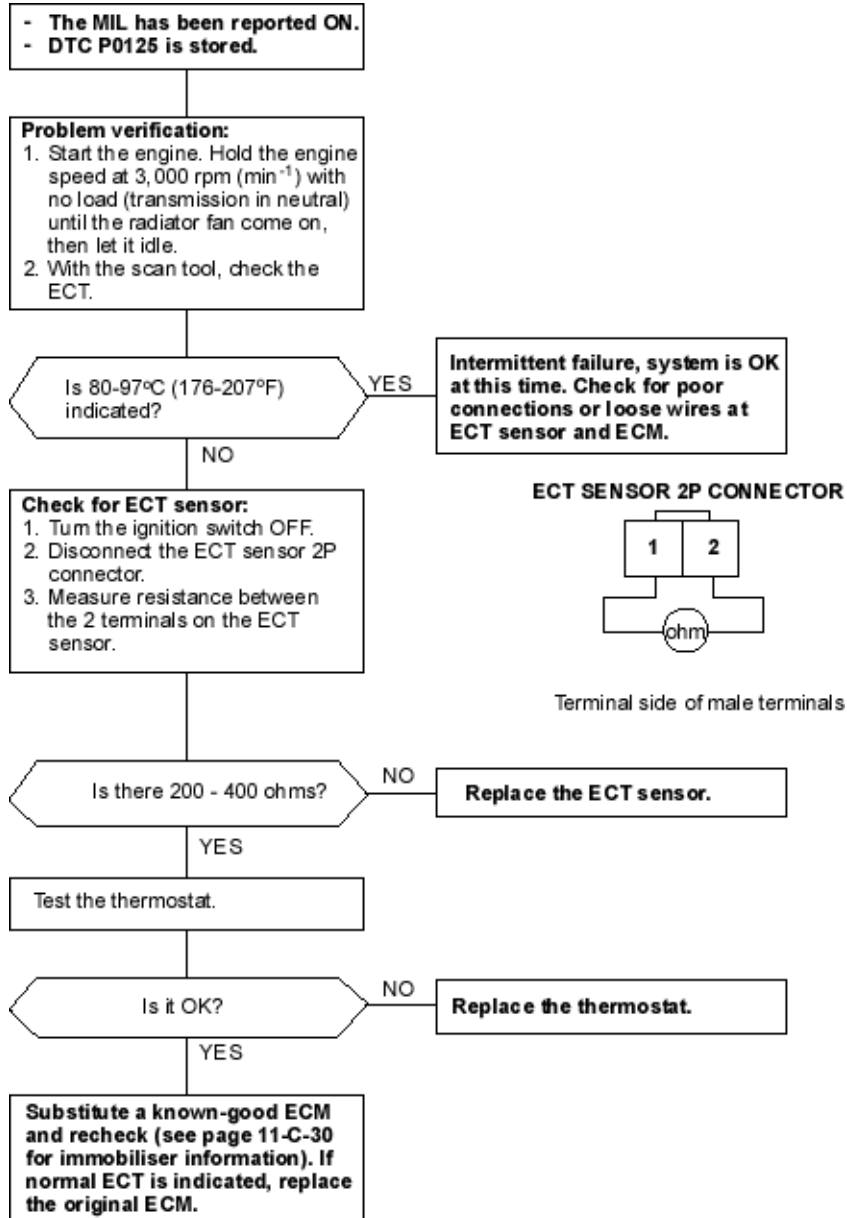
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(See Page 23-C-30)

DTC P0118: ECT Sensor Circuit High Voltage



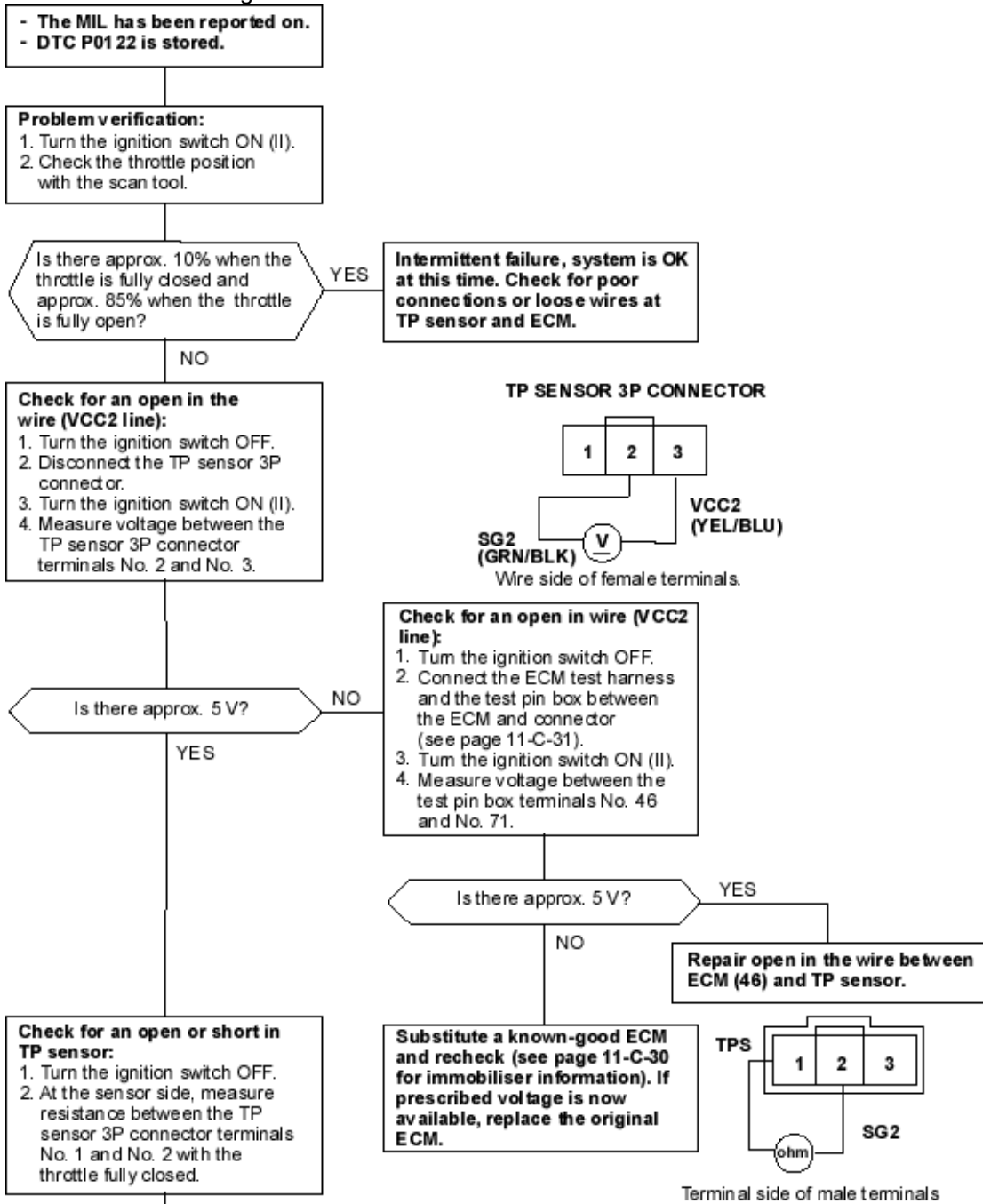
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P0125: Cooling System Malfunction



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(See Page 23-C-30)

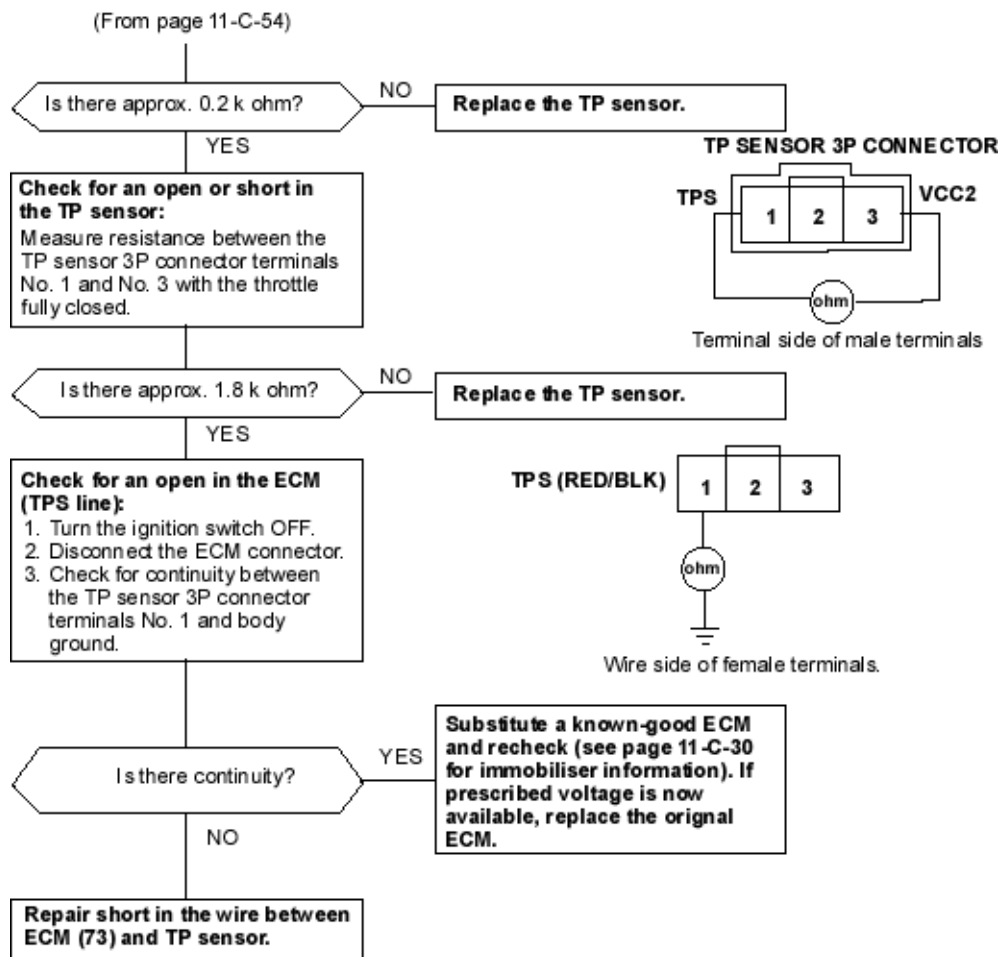
DTC P0122: TP Sensor Circuit Low Voltage



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(See Page 23-C-31)

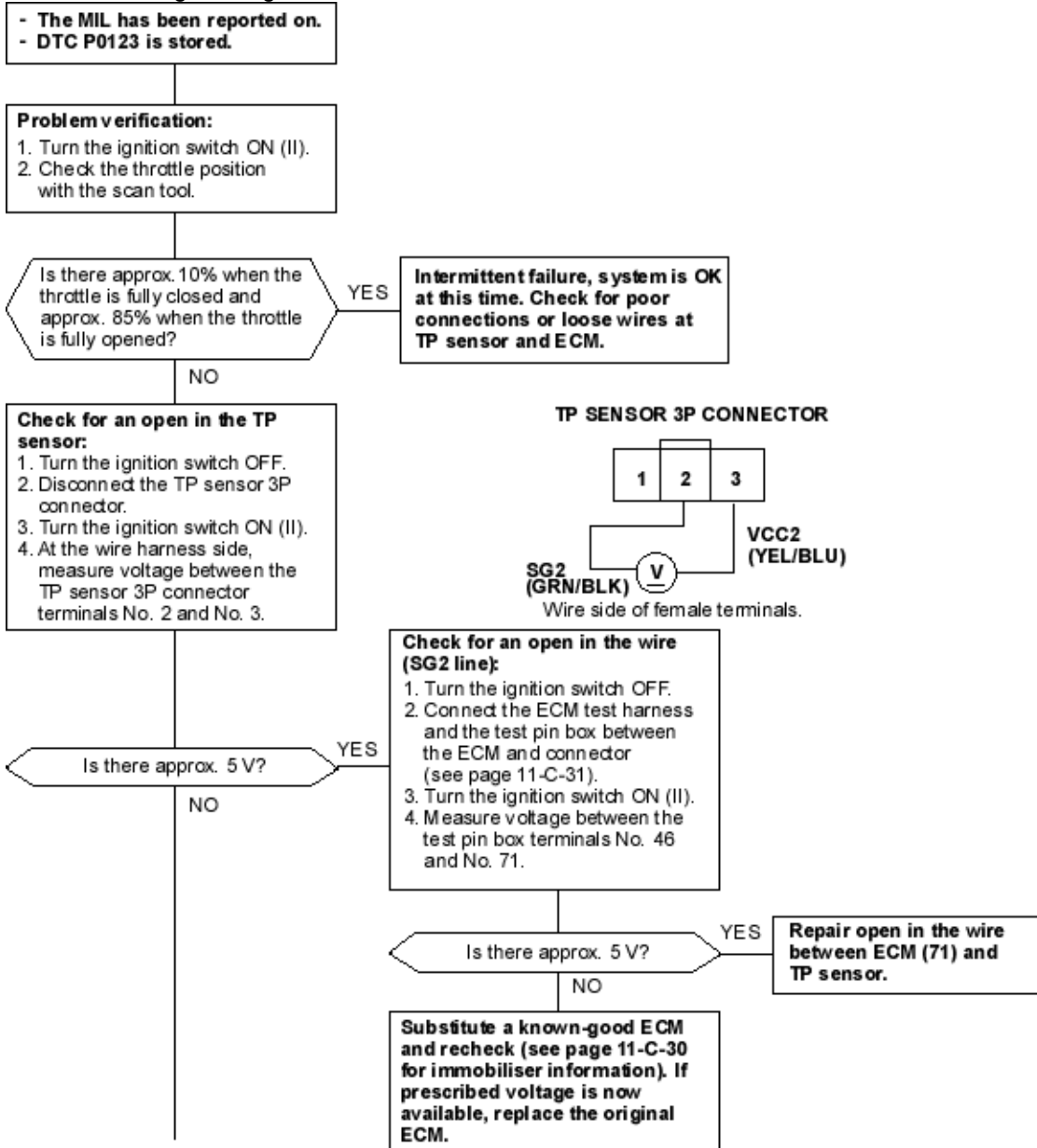
(See Page 23-C-30)



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(See Page 23-C-30)

DTC P0123: TP Sensor Circuit High Voltage

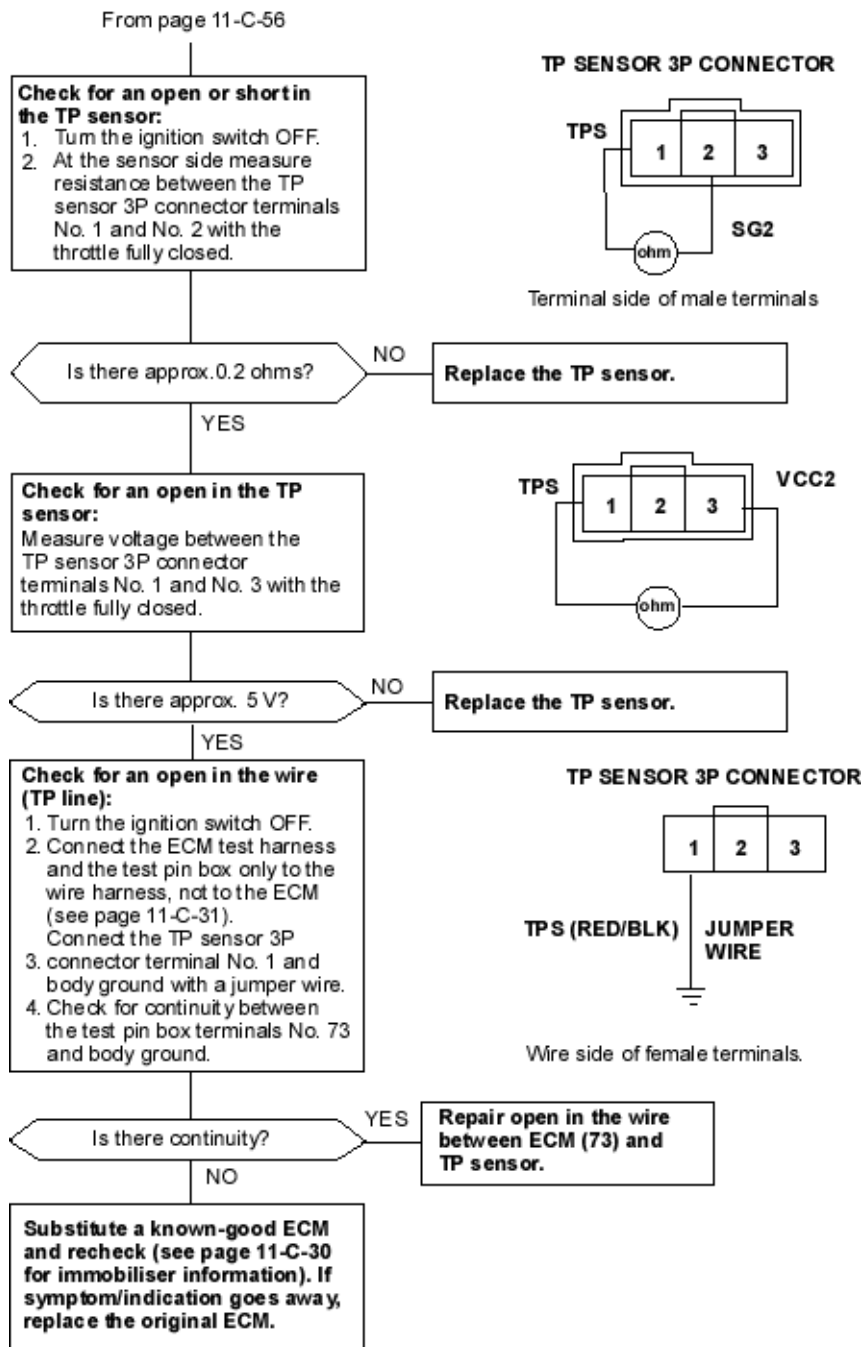


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(See Page 23-C-31)

(See Page 23-C-30)



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

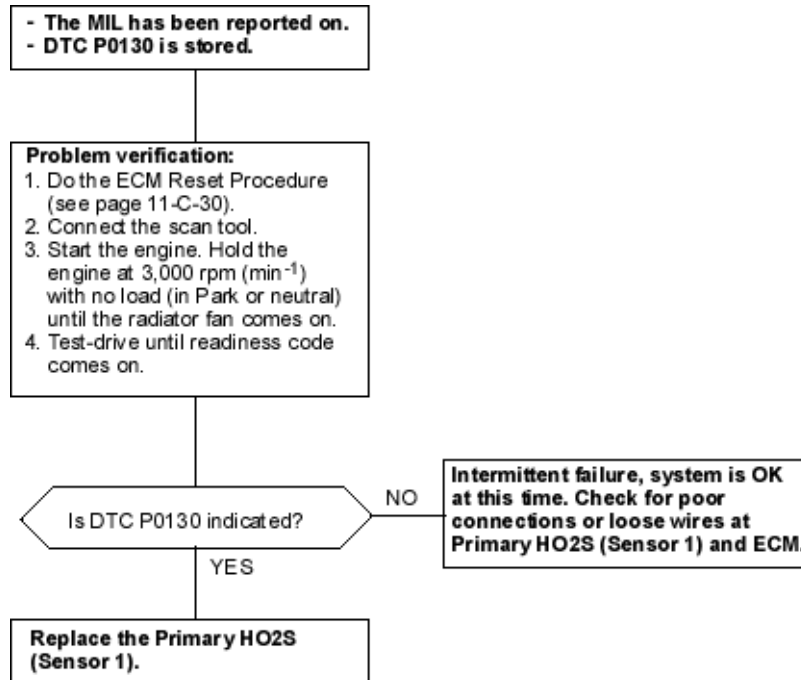
P0130: Primary HO2S (Sensor 1) Range/Performance Problem

NOTE: If some of the DTC's listed below are stored at the same time as DTC P0130, troubleshoot those DTC's first, then troubleshoot DTC P0130.

P0136, P0137, P0138, P0140: Secondary HO2S (sensor 2)

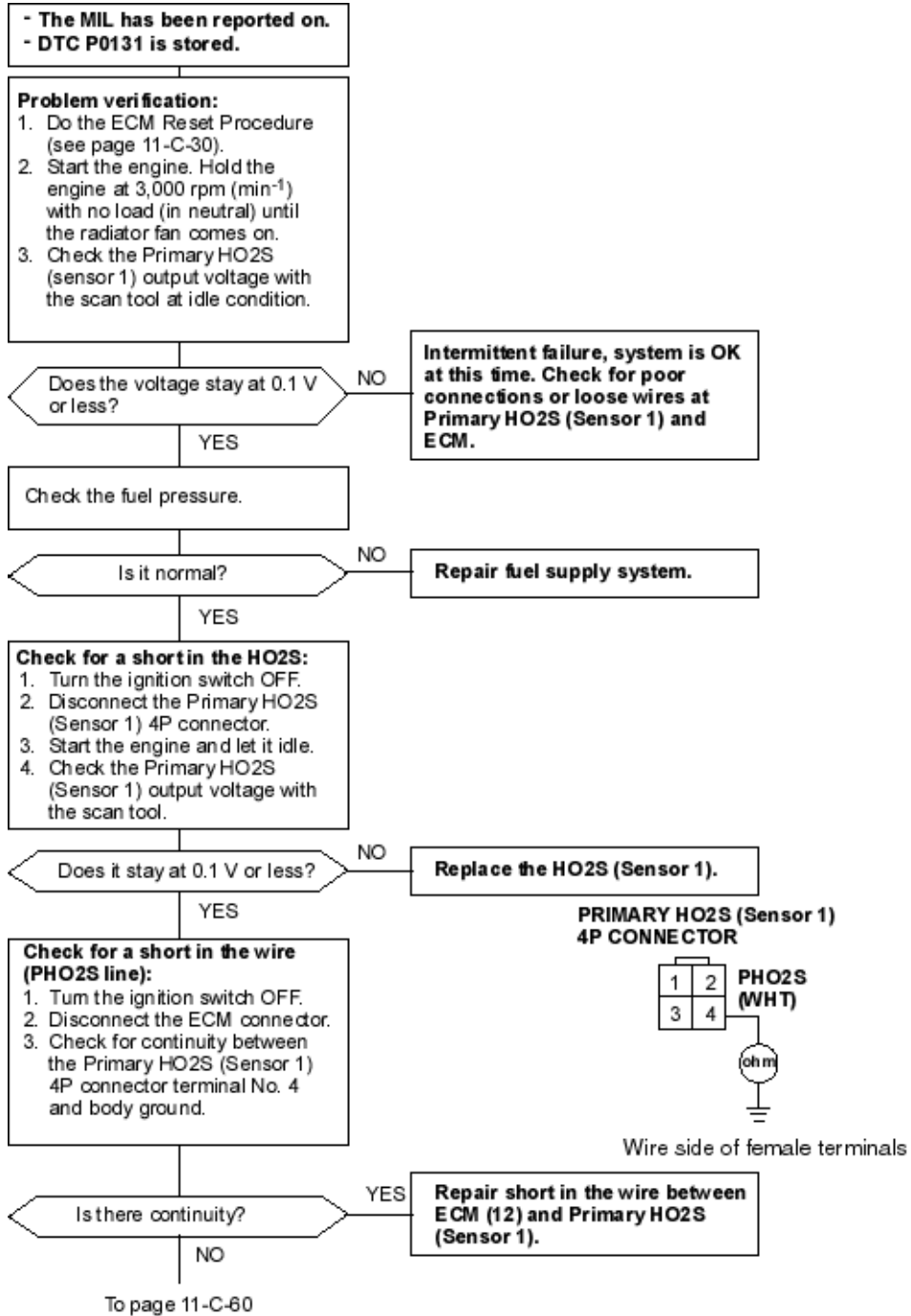
P0141: Secondary HO2S (sensor 2) Heater

Troubleshooting Flowchart

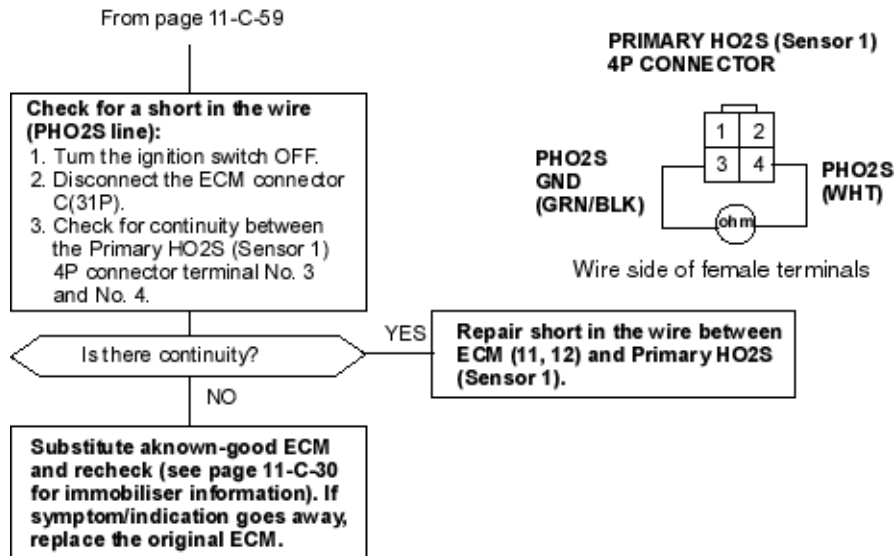


To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

DTC P0131: Primary HO2S (Sensor 1) Circuit Low Voltage
 NOTE: Lack of fuel may cause the DTC P0131

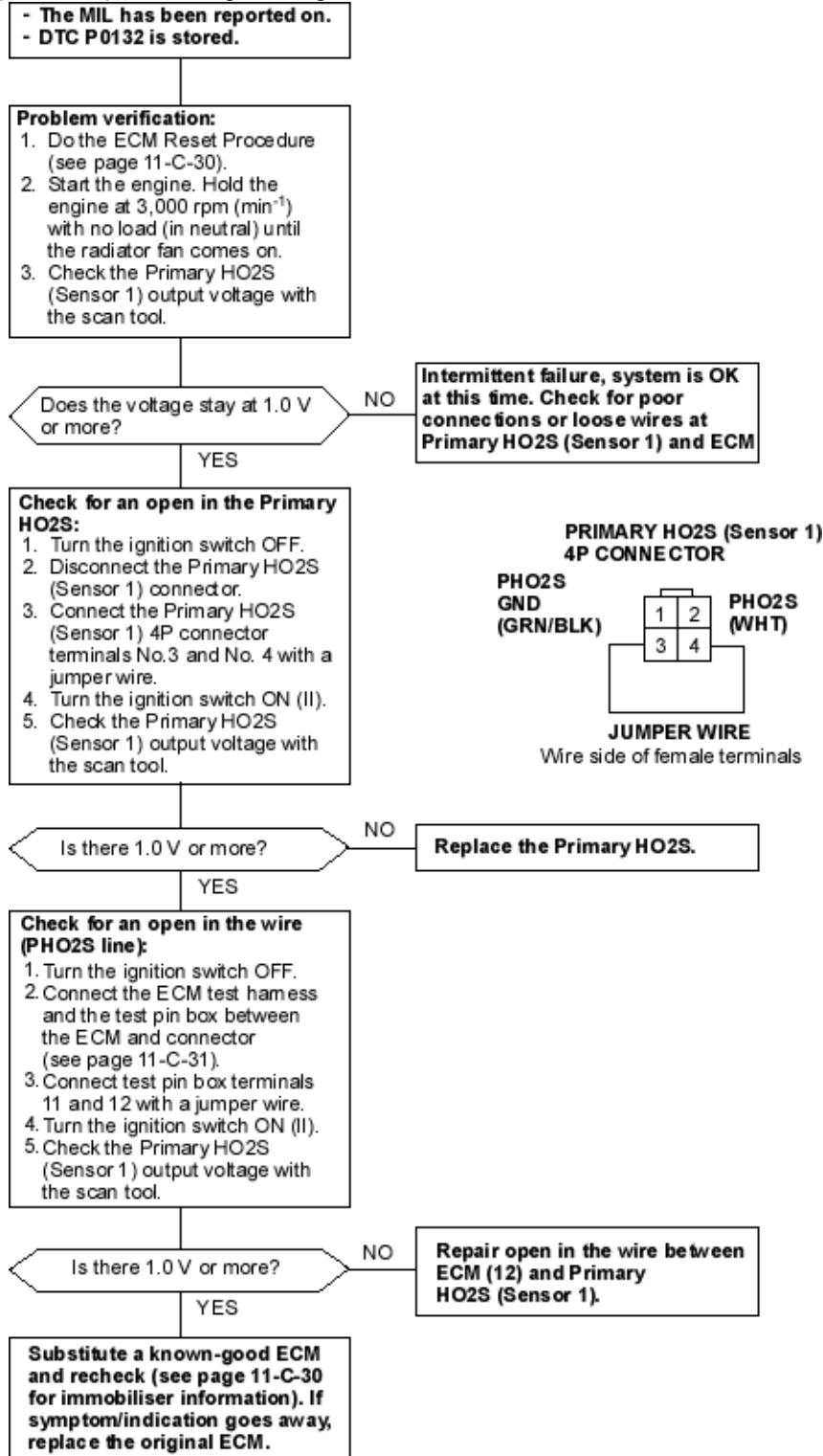


To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

DTC P0132: Primary HO2S (Sensor 1) Circuit High Voltage



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

DTC P0133: Primary HO2S (Sensor 1) Slow Response

Description

By controlling the air/fuel ratio with a Primary HO2S (Sensor 1) and a Secondary HO2S (Sensor 2), the deterioration of the Primary HO2S (Sensor 1) can be evaluated by its feedback period. When the feedback period of the HO2S exceeds a certain value during stable driving conditions, the sensor will be judged as deteriorated.

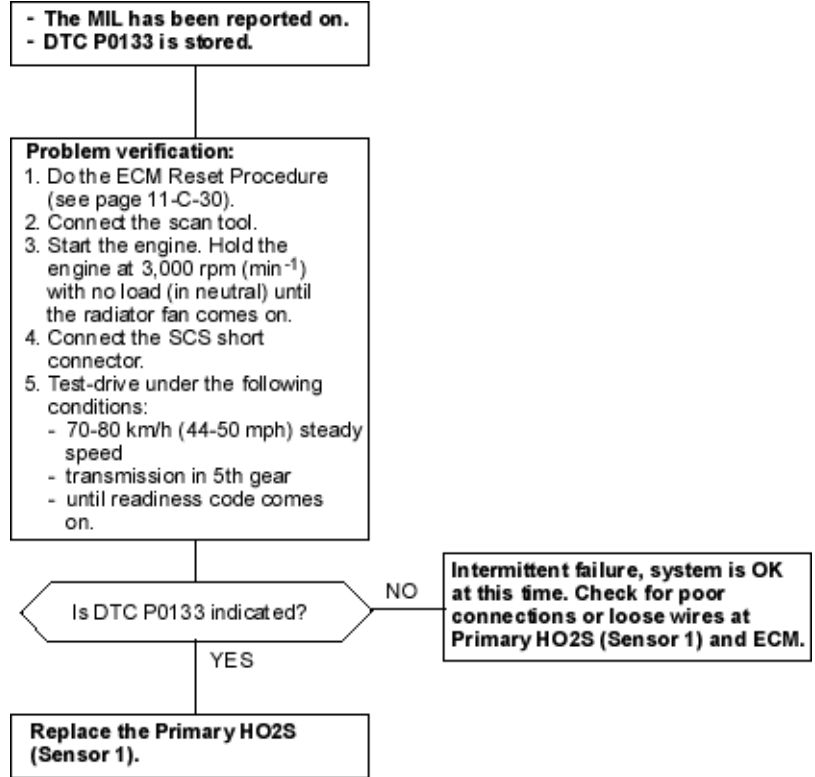
When deterioration has been detected during two consecutive trips, the MIL comes on and DTC P0133 will be stored.

NOTE: If DTC P0130, P0131, P0132 and/or P0134 are stored at the same time as DTC P0133, troubleshoot those DTC's first, then troubleshoot DTC P0133.

Possible Cause

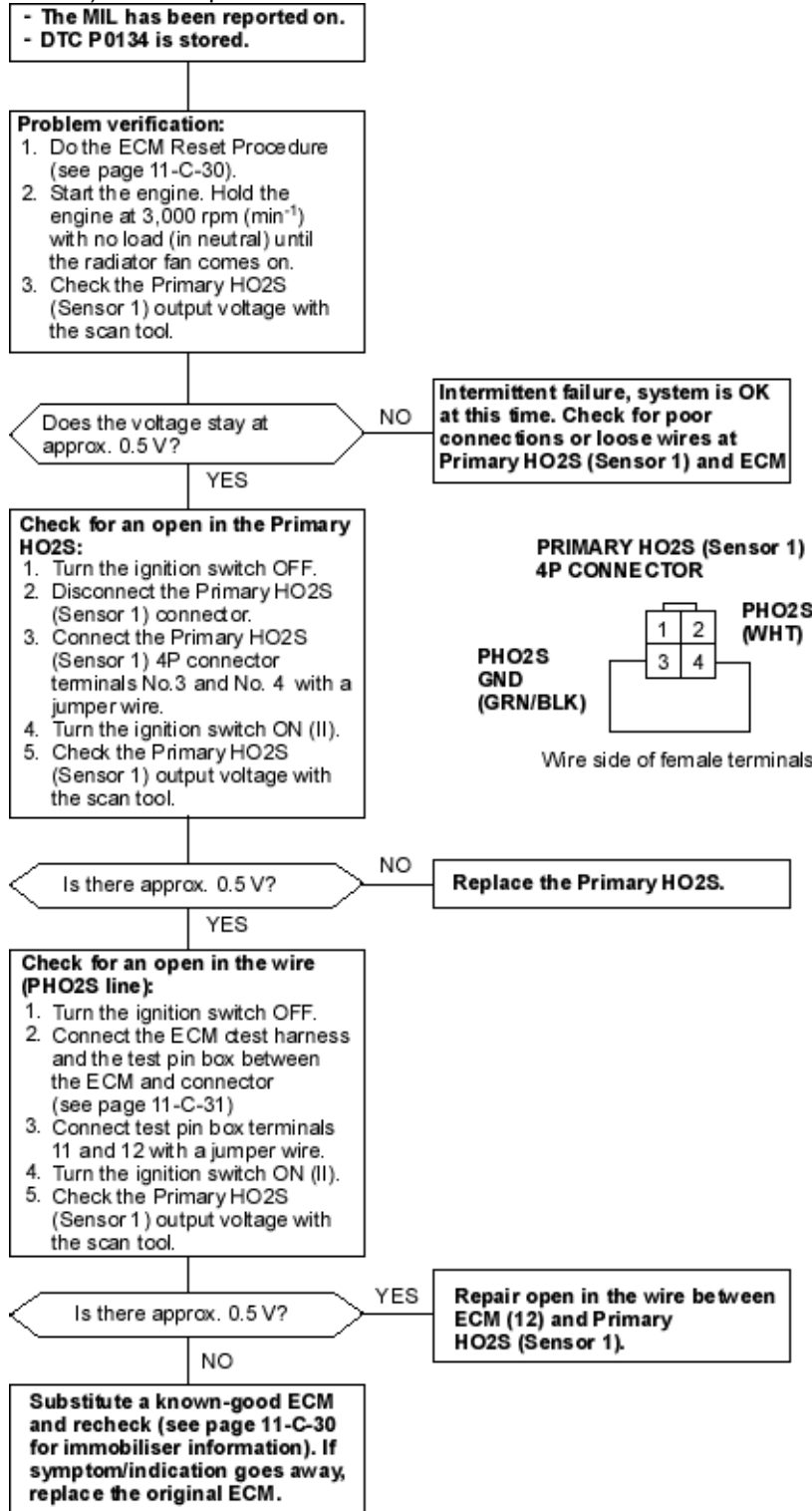
- ♦ Primary HO2S (Sensor 1) Deterioration
- ♦ Primary HO2S Heater (Sensor 1) Deterioration
- ♦ Exhaust System Leakage

Troubleshooting Flowchart



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

DTC P0134: Primary HO2S (Sensor 1) Circuit Open Problem

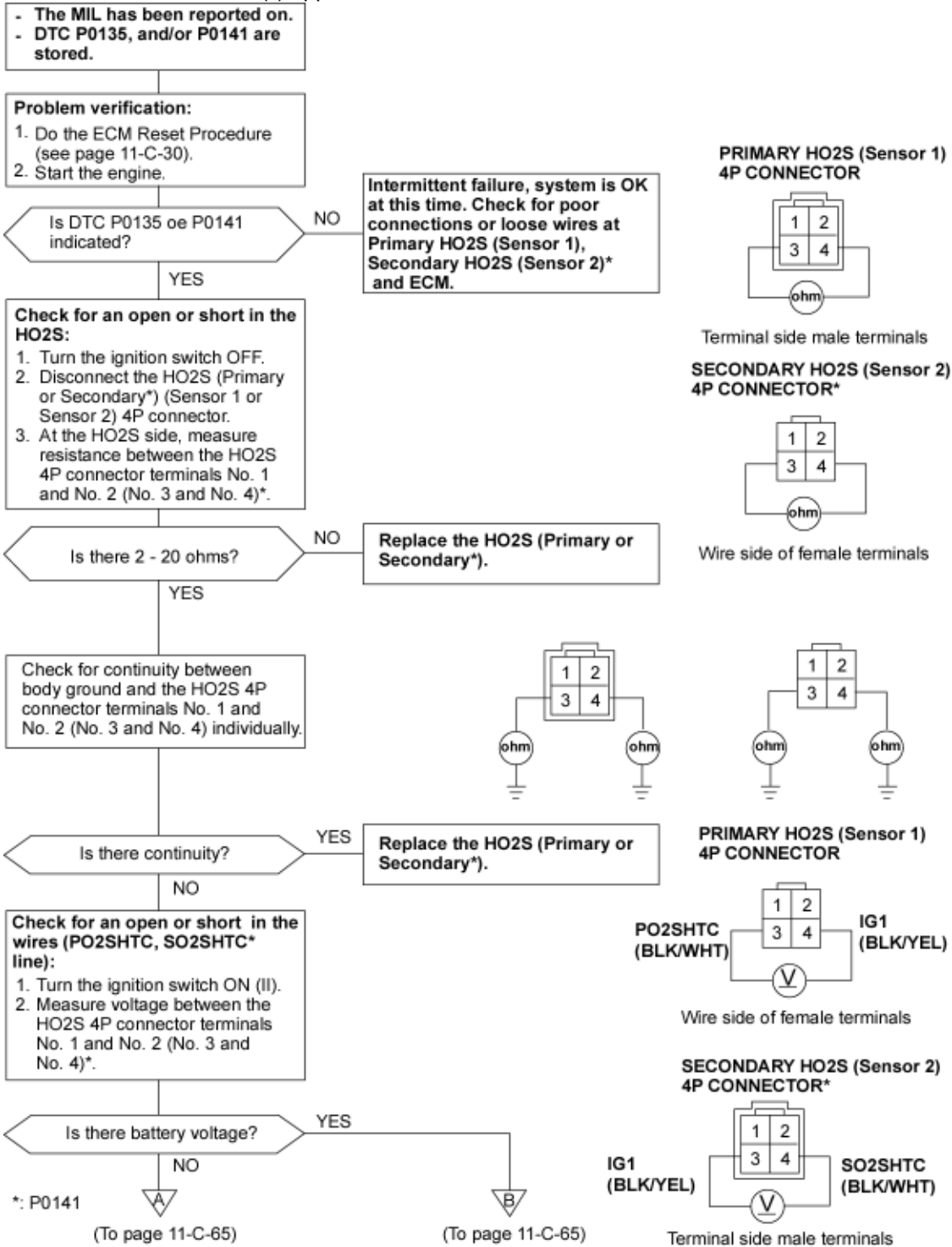


To go to the pages referenced on the picture above, click on the following:

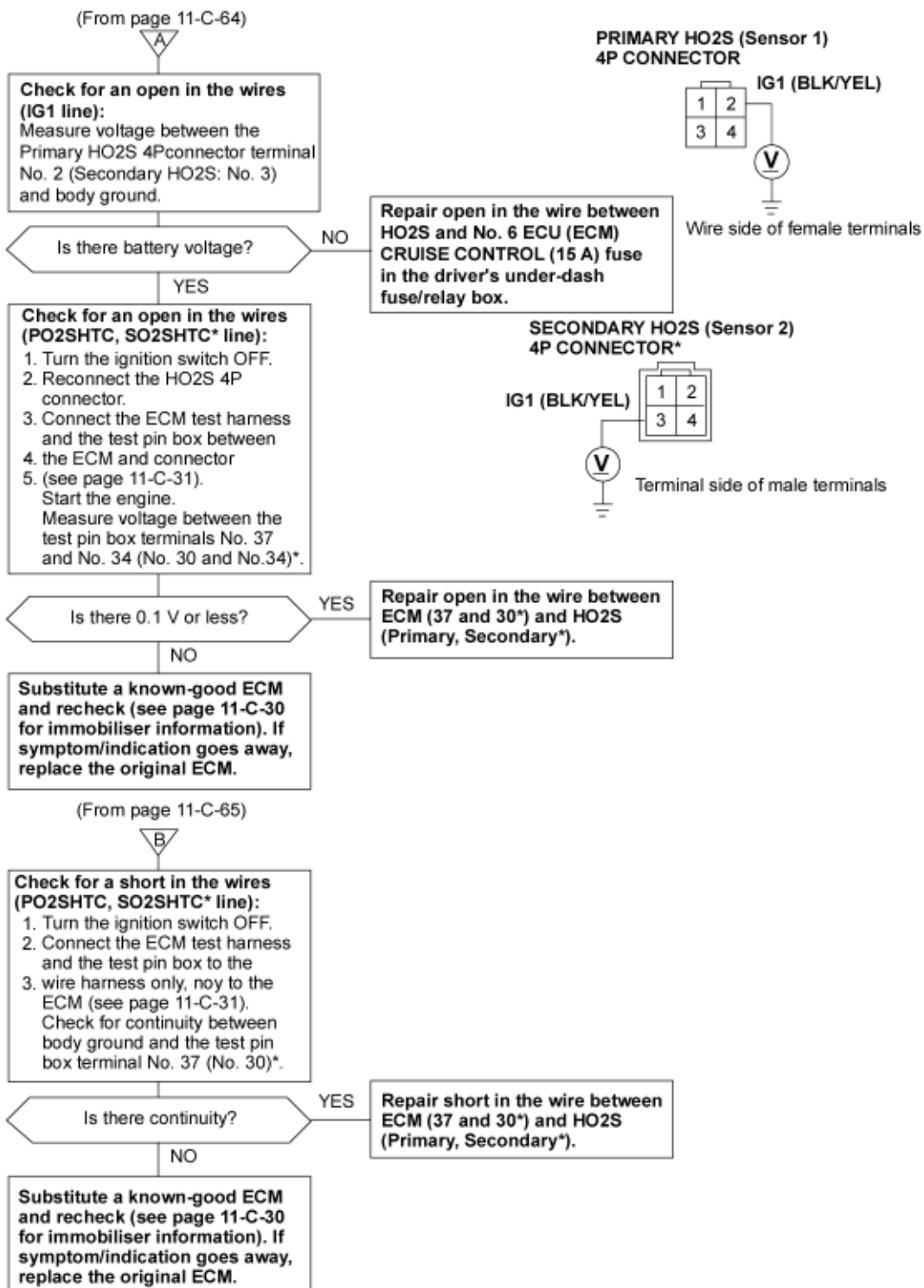
(See Page 23-C-31)

(See Page 23-C-30)

DTC P0135: Primary HO2S (Sensor 1) Heater Circuit Malfunction
DTC P0141: Secondary HO2S (Sensor 2) Heater Circuit Malfunction
 NOTE: Information marked with an asterisk (*) applies to DTC P0141



To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)



*: P0141

To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

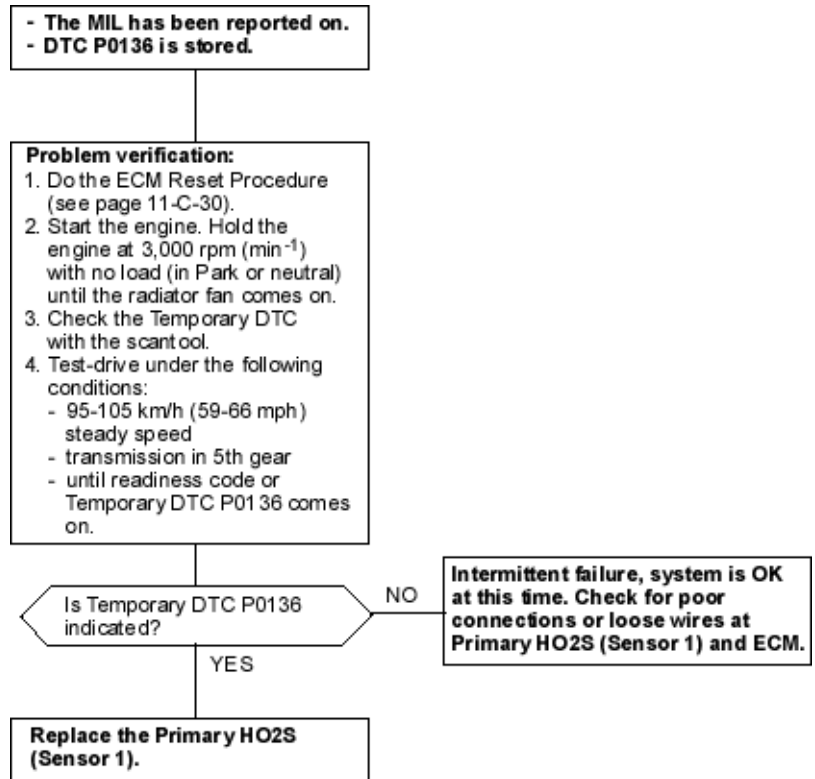
DTC P0136: Secondary HO2S (Sensor 2) Range/Performance Problem

NOTE: If some of the DTC's listed below are stored at the same time as DTC P0136, troubleshoot those DTC's first, then troubleshoot DTC P0136.

P0130, P0131, P0132, P0133, P0134: Primary HO2S (Sensor 1)

P0135: Primary HO2S (Sensor 1) Heater

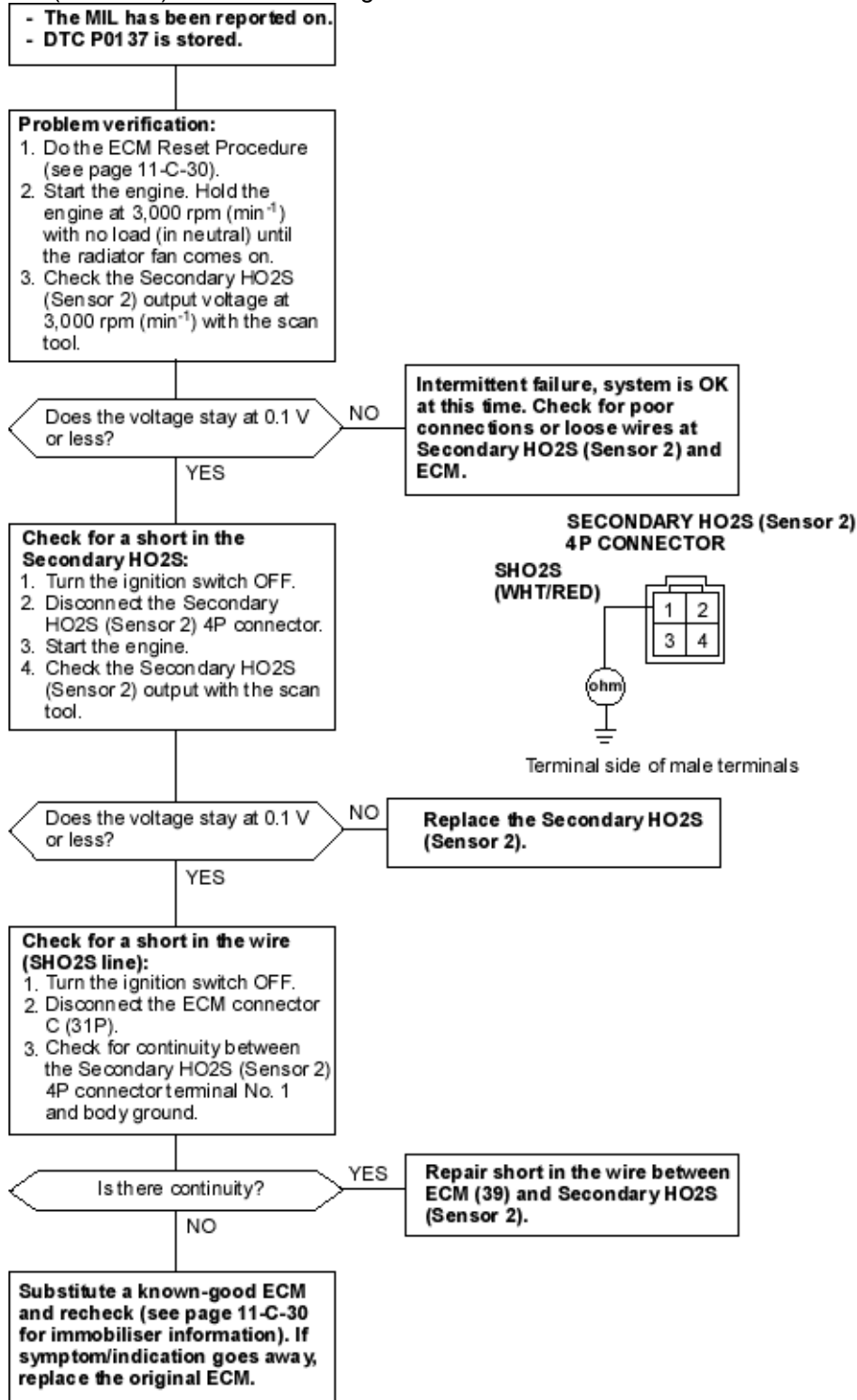
Troubleshooting Flowchart



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-30)

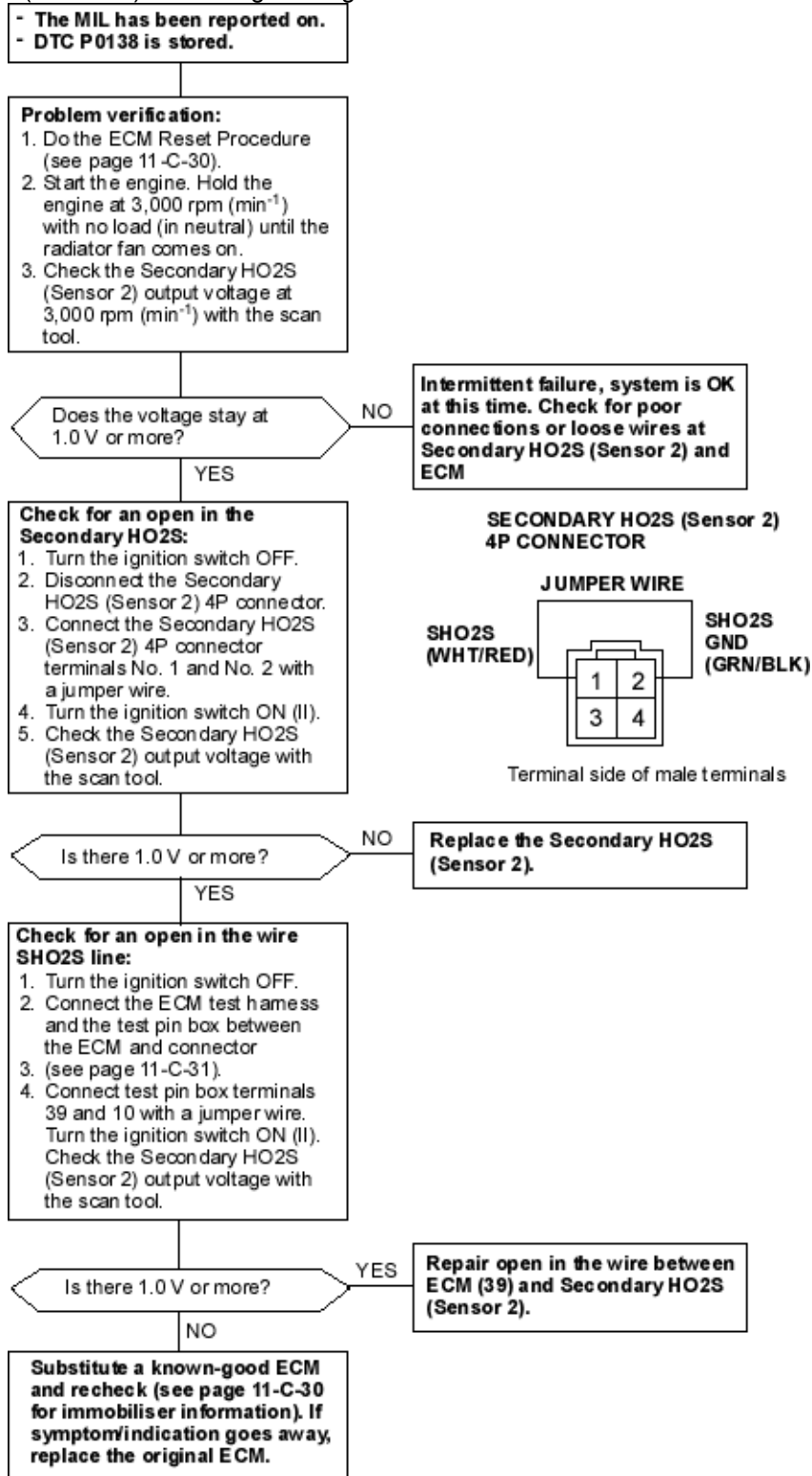
DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-30)

DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage

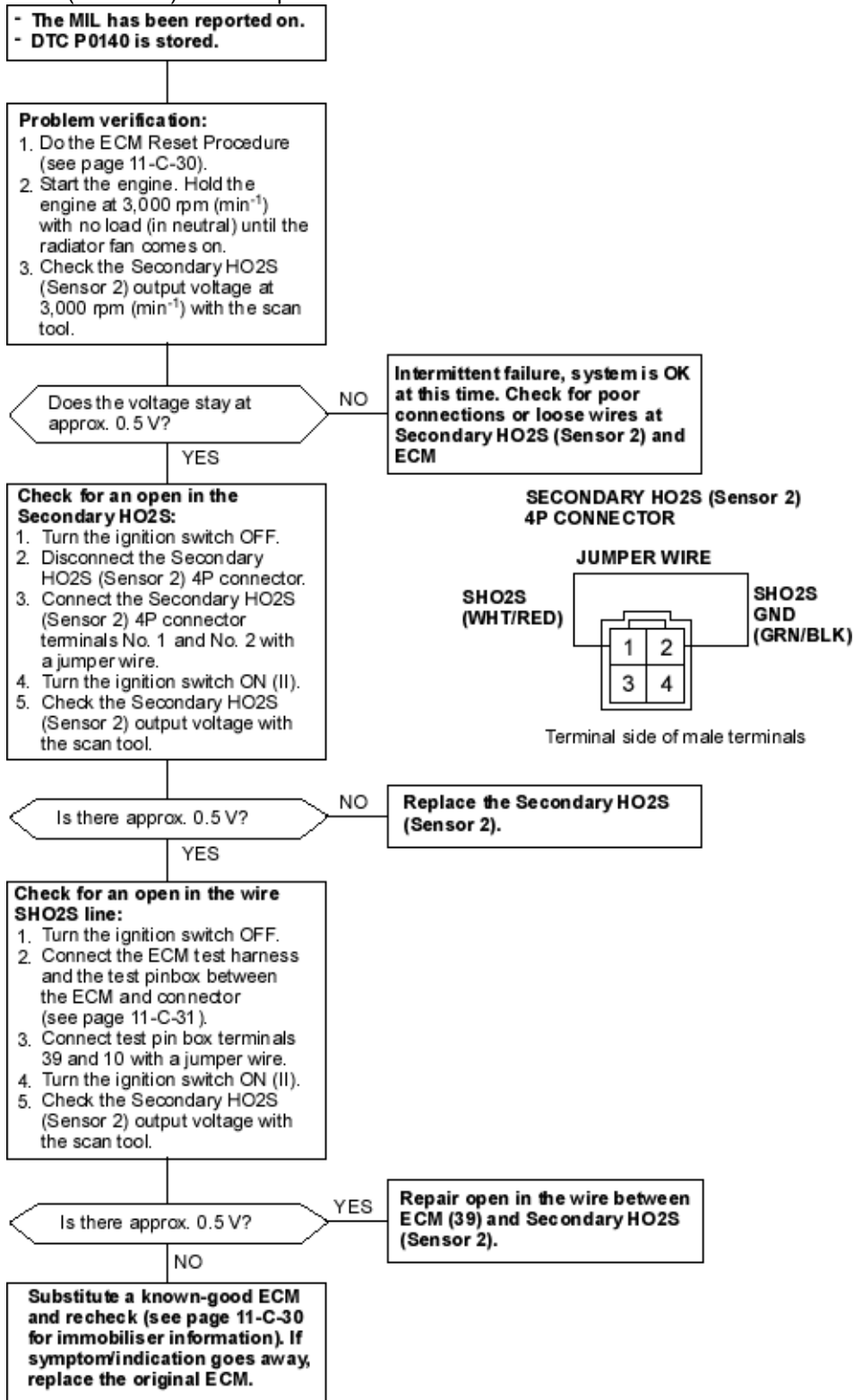


To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

DTC P0140: Secondary HO2S (Sensor 2) Circuit Open Problem



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

DTC P0171: Fuel System Too Lean

DTC P0172: Fuel System Too Rich

NOTE: If some of the DTC's listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTC's first, then recheck the system.

P0107, P0108: MAP sensor.
P0130, P0131, P0132, P0134: Primary HO2S (Sensor 1)
P0135: Primary HO2S (Sensor 1) Heater
P0136, P0137, P0138, P0140: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) Heater
P0444, P0445: EVAP Purge Control Solenoid Valve Circuit.

Possible Cause

DTC P0171

System too lean

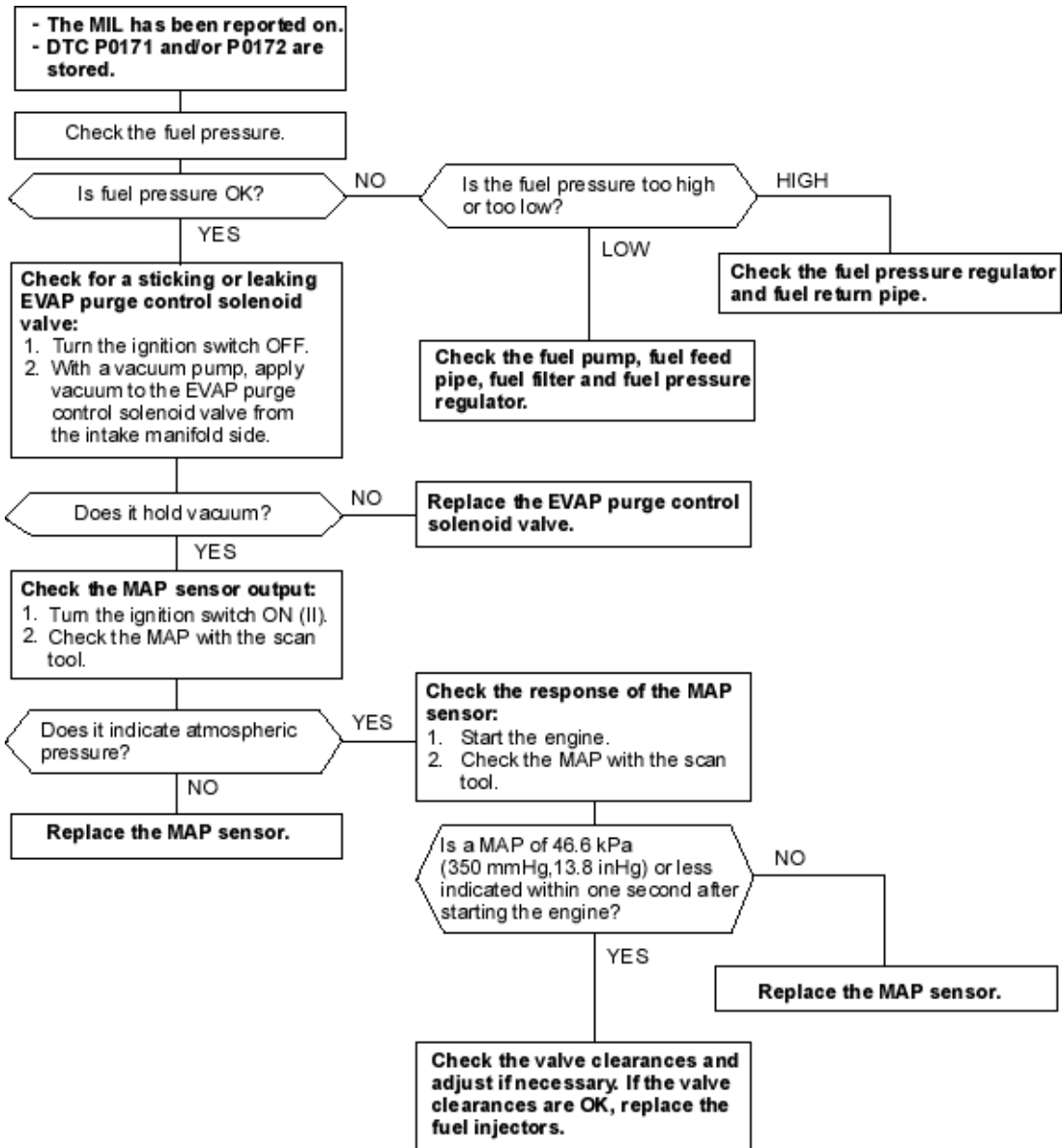
- ♦ Fuel Pump insufficient flow/pressure
- ♦ Fuel Feed Line clogged, leaking
- ♦ Fuel Pressure Regulator stuck open
- ♦ Fuel Filter clogged
- ♦ Fuel Injector clogged, air inclusion
- ♦ Gasoline doesn't meet Owner's Manual spec.
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ Valve Clearance
- ♦ Exhaust leak

DTC P0172

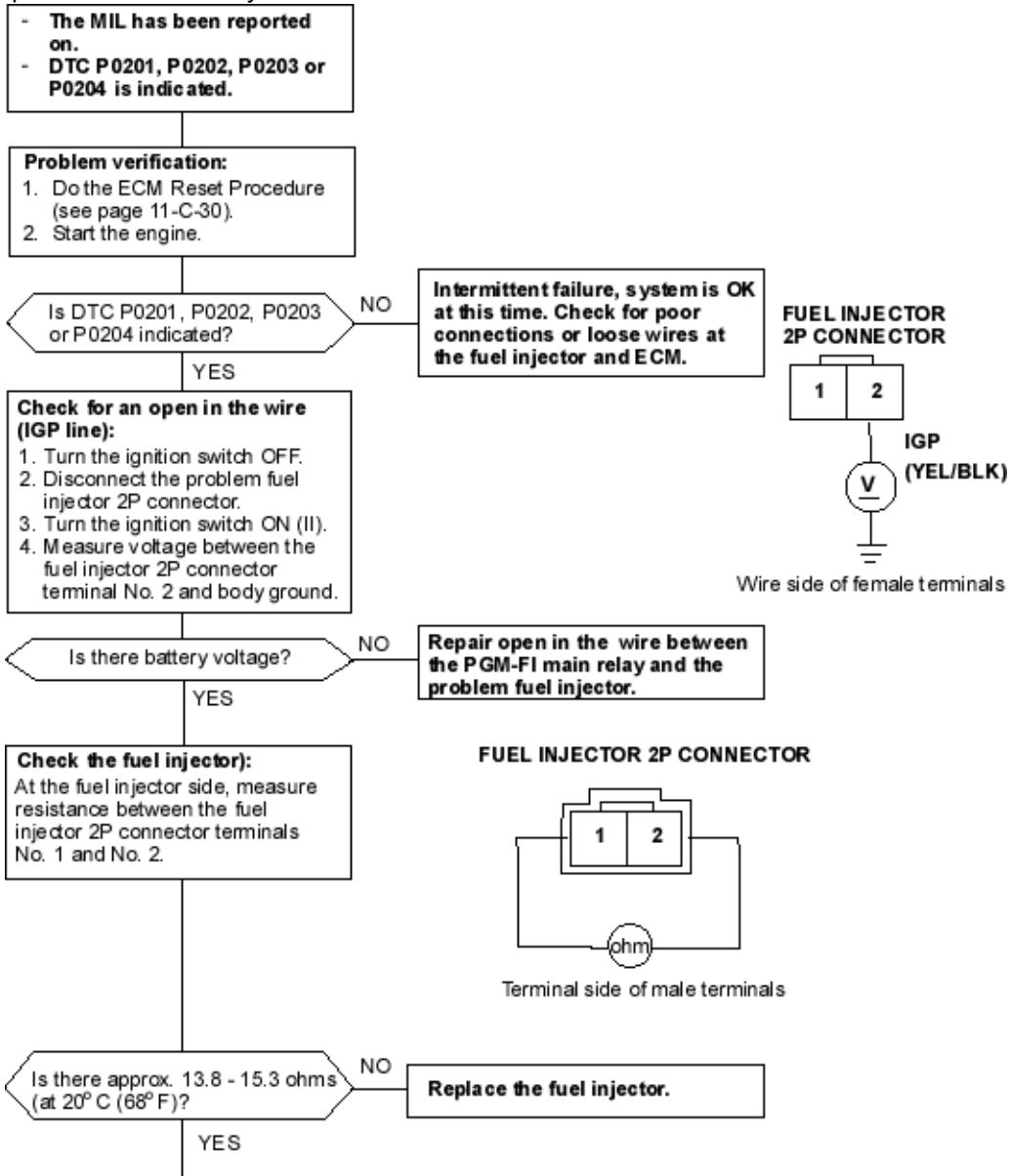
System too rich

- ♦ Fuel Pump insufficient flow/pressure
- ♦ Fuel Feed Line clogged, leaking
- ♦ Fuel Injector leaking
- ♦ Gasoline doesn't meet Owner's Manual spec.
- ♦ Primary HO2S (Sensor 1) deteriorated
- ♦ MAP Sensor range/performance
- ♦ EVAP Purge Control Solenoid Valve leaking, stuck open
- ♦ Valve Clearance

Troubleshooting Flowchart

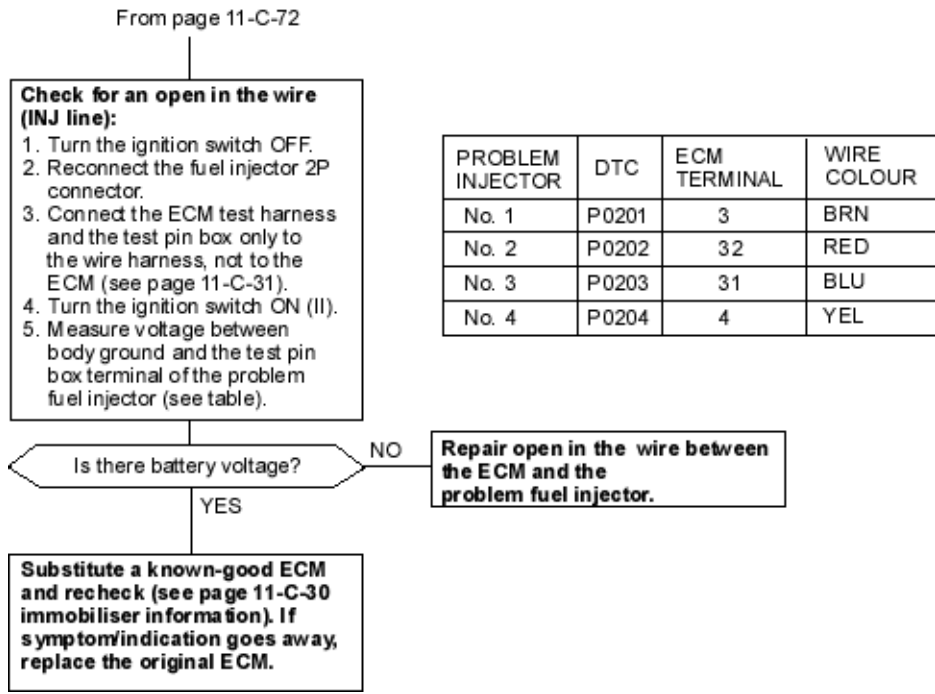


P0201: Fuel Injector Open Circuit - No. 1 Cylinder
P0202: Fuel Injector Open Circuit - No. 2 Cylinder
P0203: Fuel Injector Open Circuit - No. 3 Cylinder
P0204: Fuel Injector Open Circuit - No. 4 Cylinder



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To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)

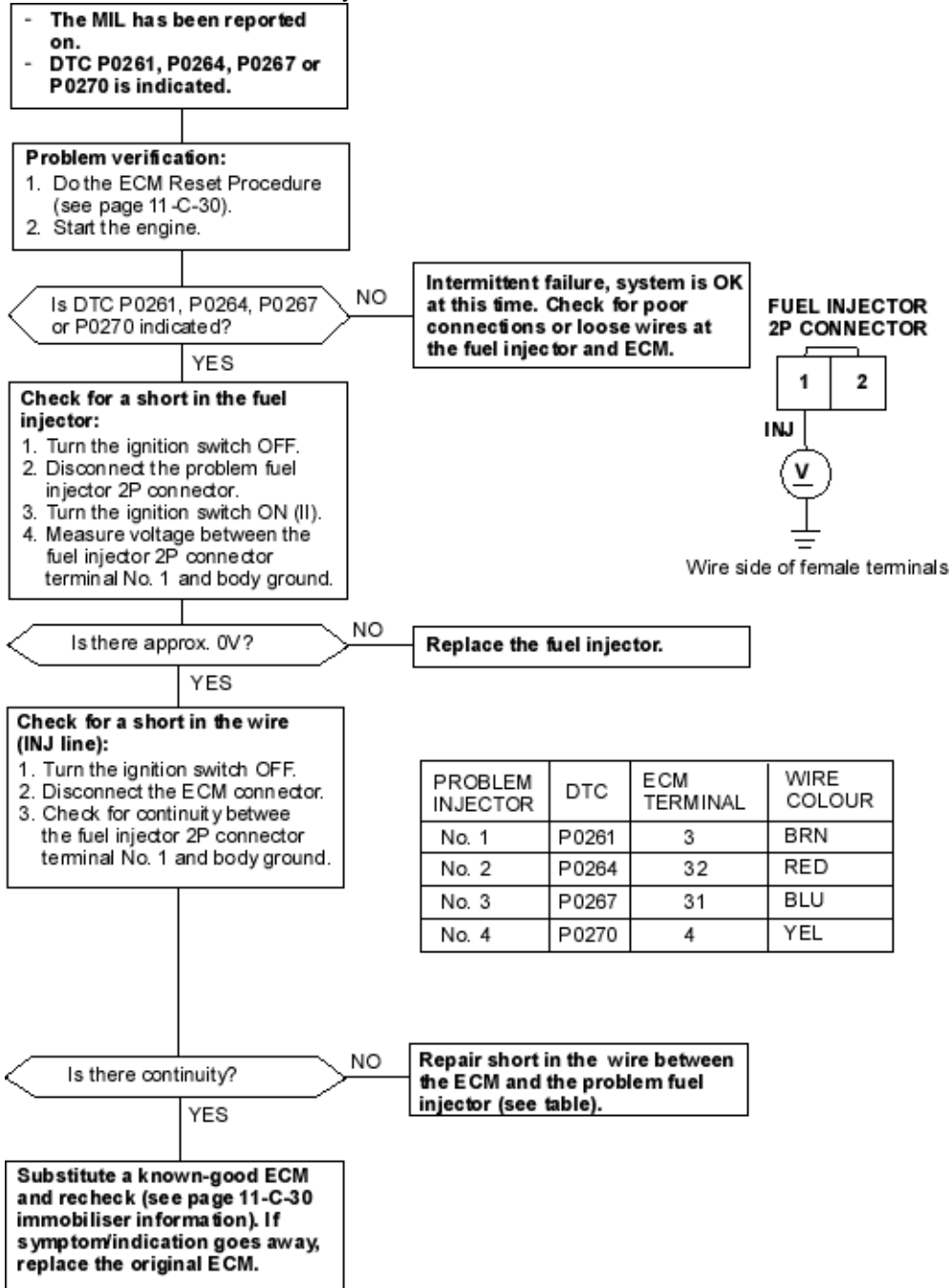


To go to the pages referenced on the picture above, click on the following:

[\(See Page 23-C-31\)](#)

[\(See Page 23-C-30\)](#)

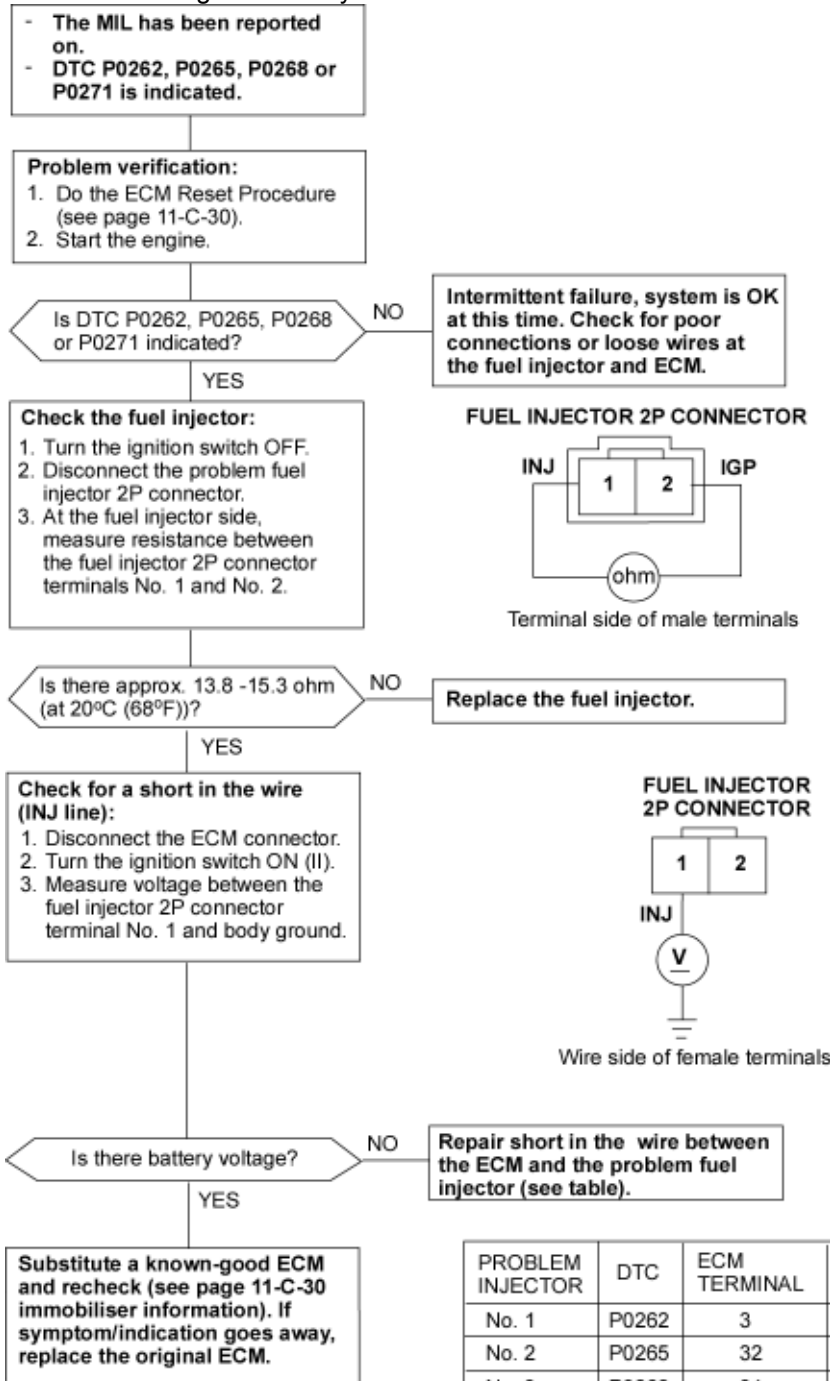
- P0261:** Fuel Injector Circuit Short to Ground - No. 1 Cylinder
- P0264:** Fuel Injector Circuit Short to Ground - No. 2 Cylinder
- P0267:** Fuel Injector Circuit Short to Ground - No. 3 Cylinder
- P0270:** Fuel Injector Circuit Short to Ground - No. 4 Cylinder



PROBLEM INJECTOR	DTC	ECM TERMINAL	WIRE COLOUR
No. 1	P0261	3	BRN
No. 2	P0264	32	RED
No. 3	P0267	31	BLU
No. 4	P0270	4	YEL

To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)

- P0262:** Fuel Injector Circuit Short to Voltage - No. 1 Cylinder
- P0265:** Fuel Injector Circuit Short to Voltage - No. 2 Cylinder
- P0268:** Fuel Injector Circuit Short to Voltage - No. 3 Cylinder
- P0271:** Fuel Injector Circuit Short to Voltage - No. 4 Cylinder



To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)

DTC P0300: Random misfire and any combination of the following:

DTC P0301: No. 1 Cylinder misfire

DTC P0302: No. 2 Cylinder misfire

DTC P0303: No. 3 Cylinder misfire

DTC P0304: No. 4 Cylinder misfire

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft position (CKP) sensor that is attached to the crankshaft. If misfiring is strong enough to cause damage, the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0300 and some of DTC's P0301 through P0304 will be stored. Then, after misfire has ceased, the MIL will come on. If misfiring increases, emissions are detected during two consecutive driving cycles, the MIL will come on, and DTC P0300 and some of DTC's P0301 through P0304 will be stored.

NOTE: If some of the DTC's listed below are stored at the same time as a misfire DTC, troubleshoot those DTC's first, then troubleshoot the misfire DTC.

P0107, P0108: MAP Sensor
 P0171, P0172: Fuel metering
 P0342, P0343: CYP sensor
 P1515, P1516, P1517, P1518: IAC valve

Possible Cause

- ♦ Fuel pump insufficient fuel pressure, amount of flow
- ♦ Fuel line clogging, blockage, leakage
- ♦ Fuel filter clogging
- ♦ Fuel pressure regulator stuck open
- ♦ MAP sensor range/performance, poor response
- ♦ Valves carbon deposit
- ♦ Compression low
- ♦ IAC valve malfunction
- ♦ Fuel does not meet Owner's Manual spec., lack of fuel

Troubleshooting

By test-driving, determine the conditions during which misfire occurs. Depending on these conditions, test in the order described in the table below.

Possible cause	MAP sensor	Crankshaft position sensor	Fuel pressure	Ignition Coil	Valve Clearance	IAC Valve
Page	11-C-45	11-C-78	-	-	-	11-C-99
Condition						
Only low rpm and load	2	4	3		5	1
Only accelerating	3		2	1		
Only high rpm and load	3	4	1	2	4	
Not specific	3	4	1	2	4	

NOTE: If misfire doesn't recur, some possible causes are fuel that doesn't meet owner's manual spec, lack of fuel, carbon deposits on spark plugs, etc.

DTC P0301: No. 1 Cylinder misfire detected

DTC P0302: No. 2 Cylinder misfire detected

DTC P0303: No. 3 Cylinder misfire detected

DTC P0304: No. 4 Cylinder misfire detected

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft position (CKP) sensor that is attached to the crankshaft. If misfiring is strong enough to cause damage, the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0300 and some of DTC's P0301 through P0304 will be stored. Then, after misfire has ceased, the MIL will come on. If misfiring increases, emissions are detected during two consecutive driving cycles, the MIL will come on, and DTC P0300 and some of DTC's P0301 through P0304 will be stored.

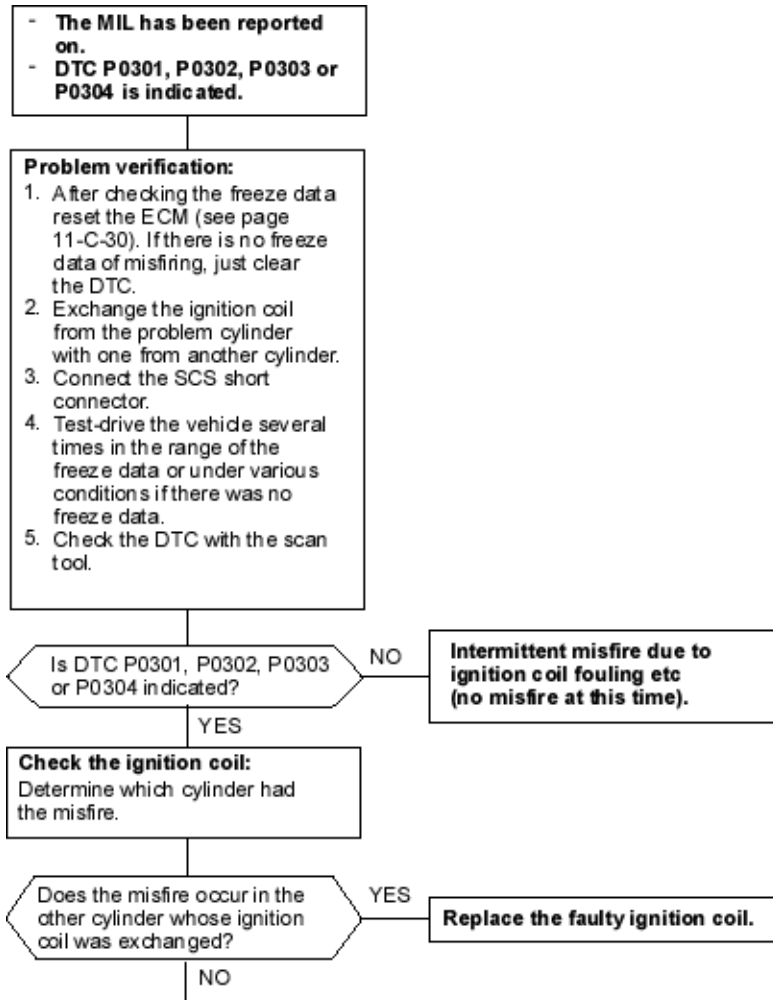
NOTE: If some of the DTC's listed below are stored at the same time as a misfire DTC, troubleshoot those DTC's first, then troubleshoot the misfire DTC.

P0201 - P0204, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271: Fuel Injector

Possible Cause

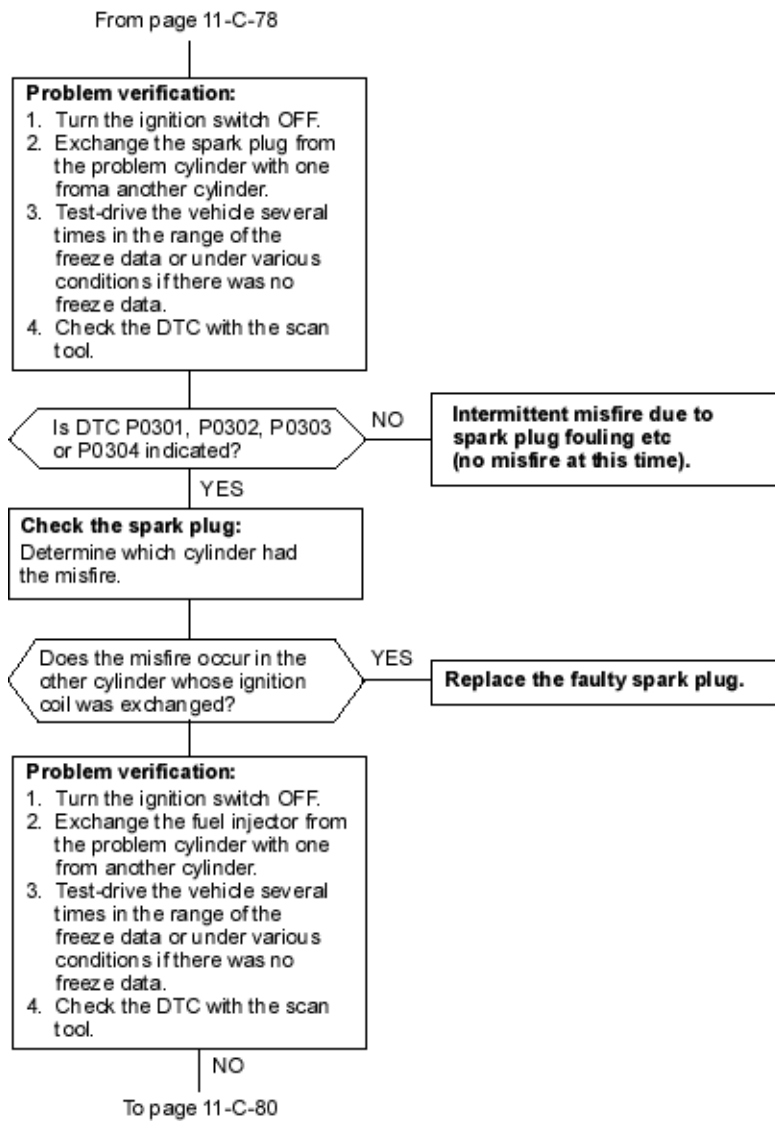
- ◆ Fuel injector clogging, fuel leakage, air leakage
- ◆ Fuel injector circuit open or shorted
- ◆ Spark plug carbon deposits, fouling, malfunction
- ◆ Ignition coil wires open, leaking
- ◆ Compression low
- ◆ Valve clearance out of spec.

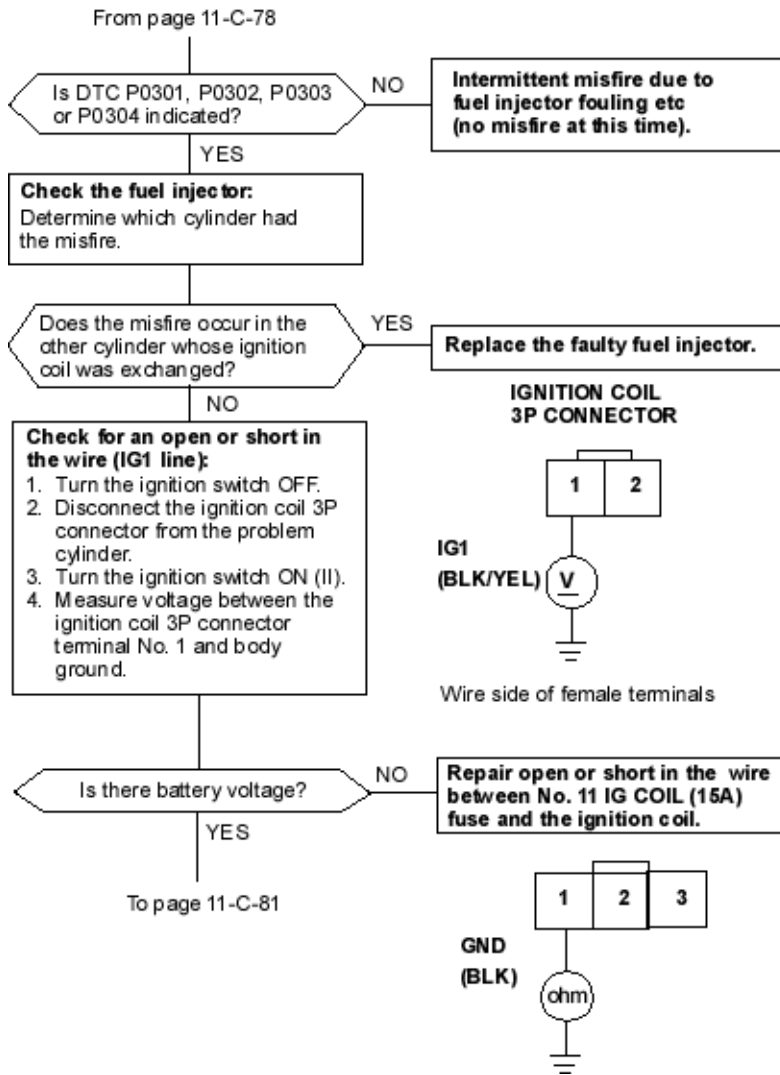
Troubleshooting

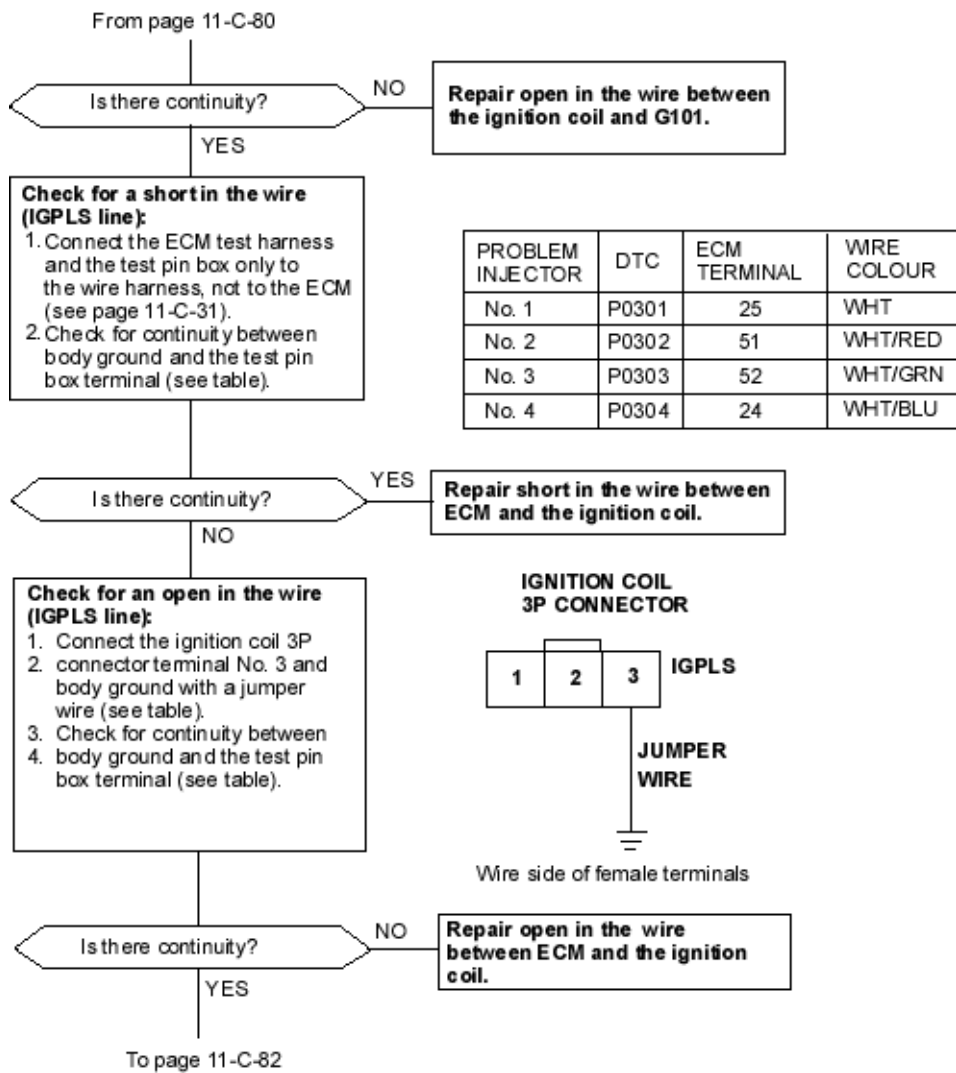


To page 11-C-79

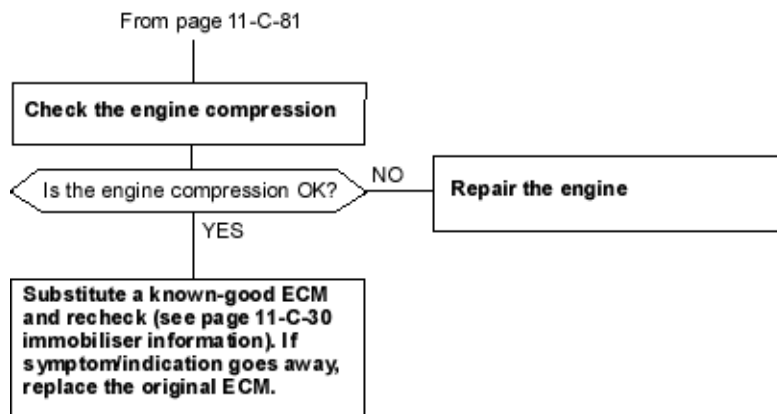
To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)





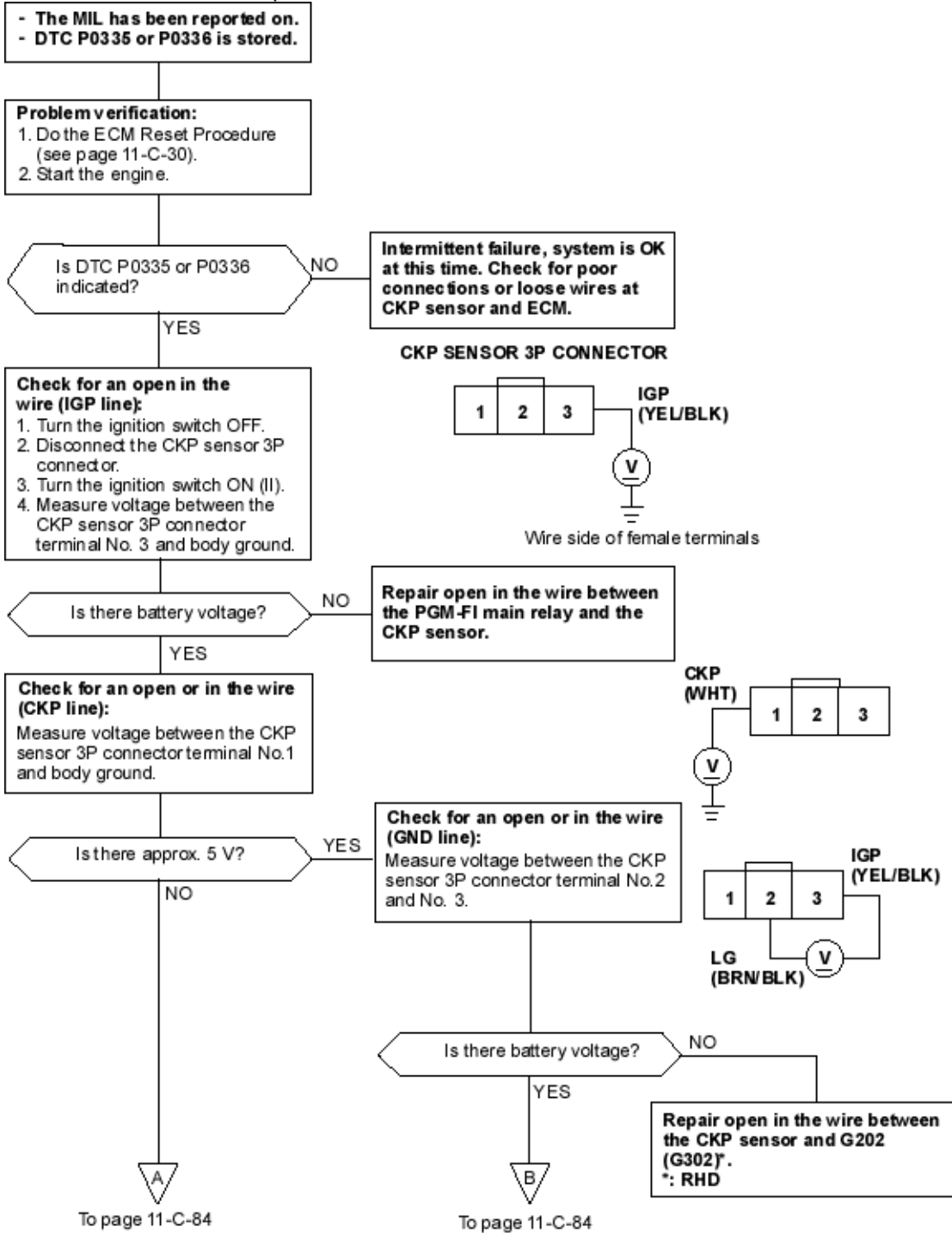


To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-31)



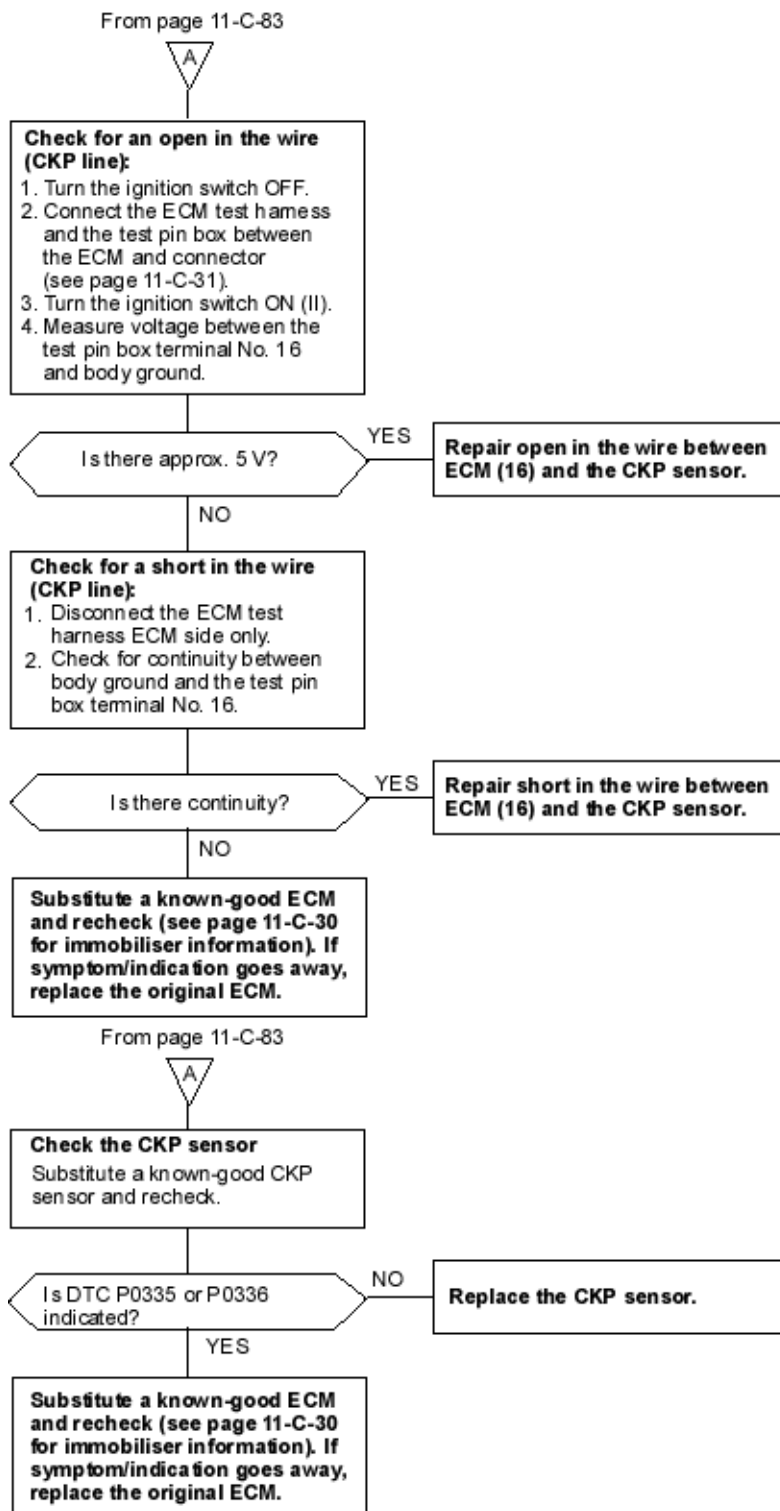
To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

DTC P0335: CKP Sensor No Signal
DTC: P0336: CKP Sensor intermittent interruption



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-30)

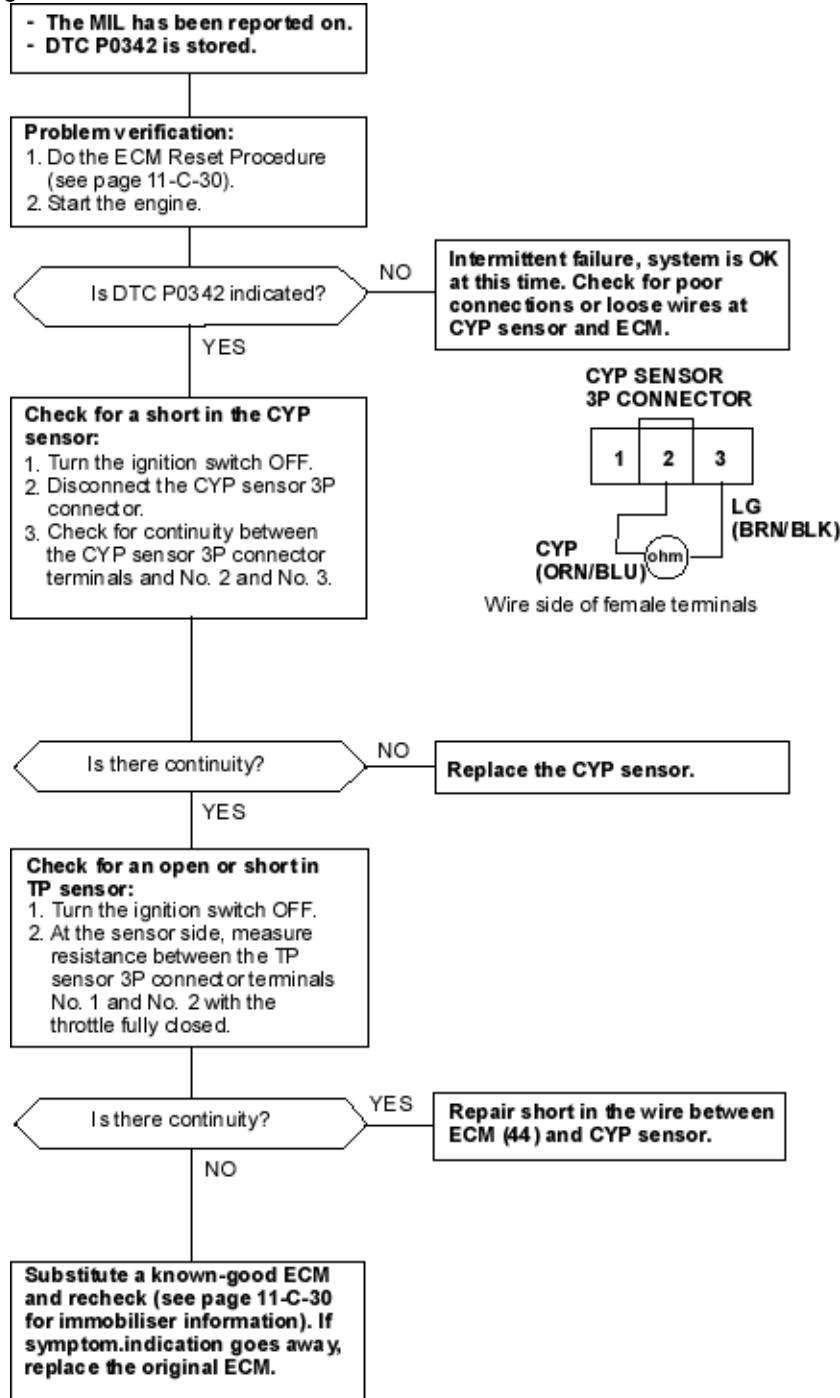


To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

P0342: CYP Circuit Low Voltage

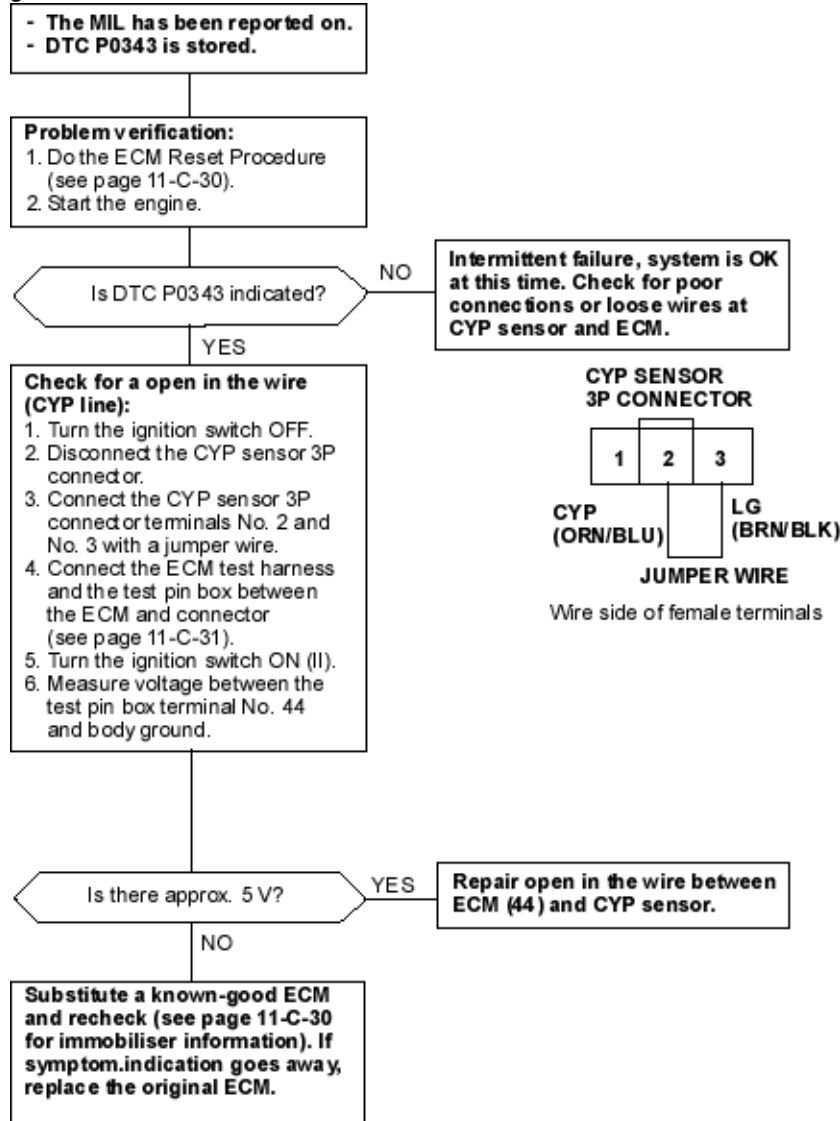


To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

P0343: CYP Circuit High Voltage

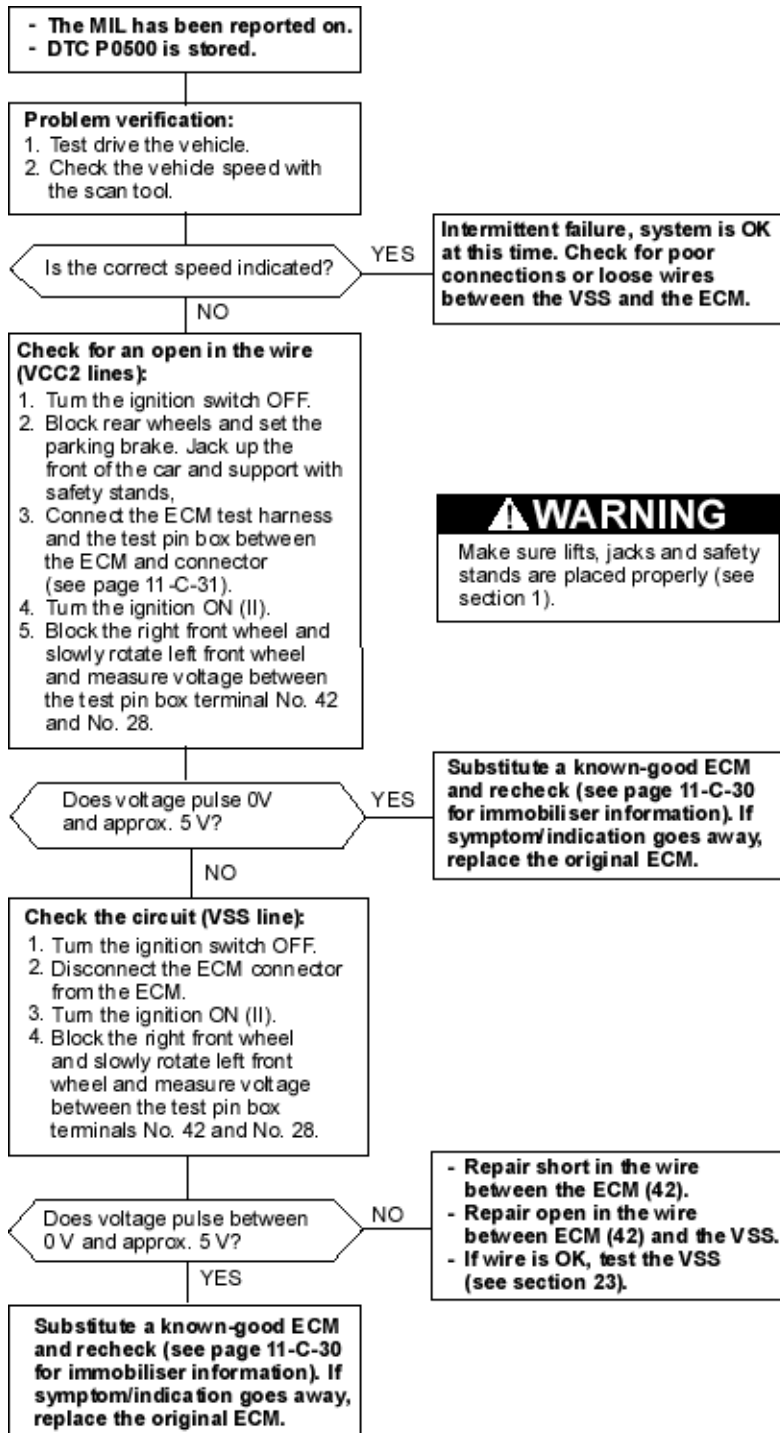


To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

P0500: VSS Malfunction

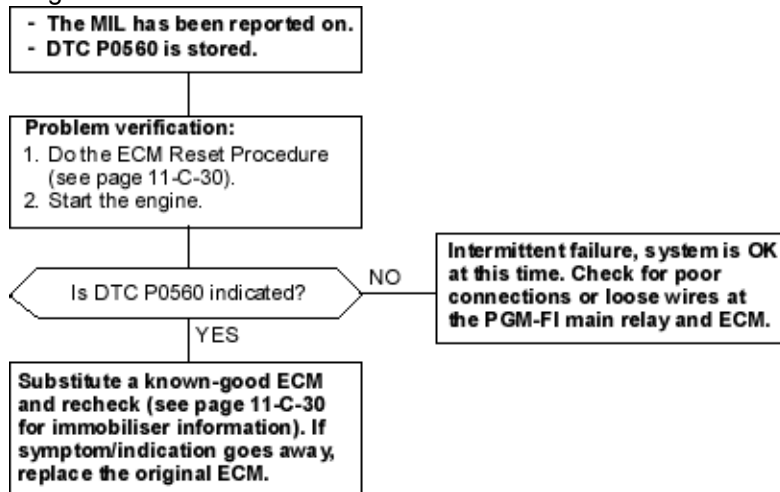


To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

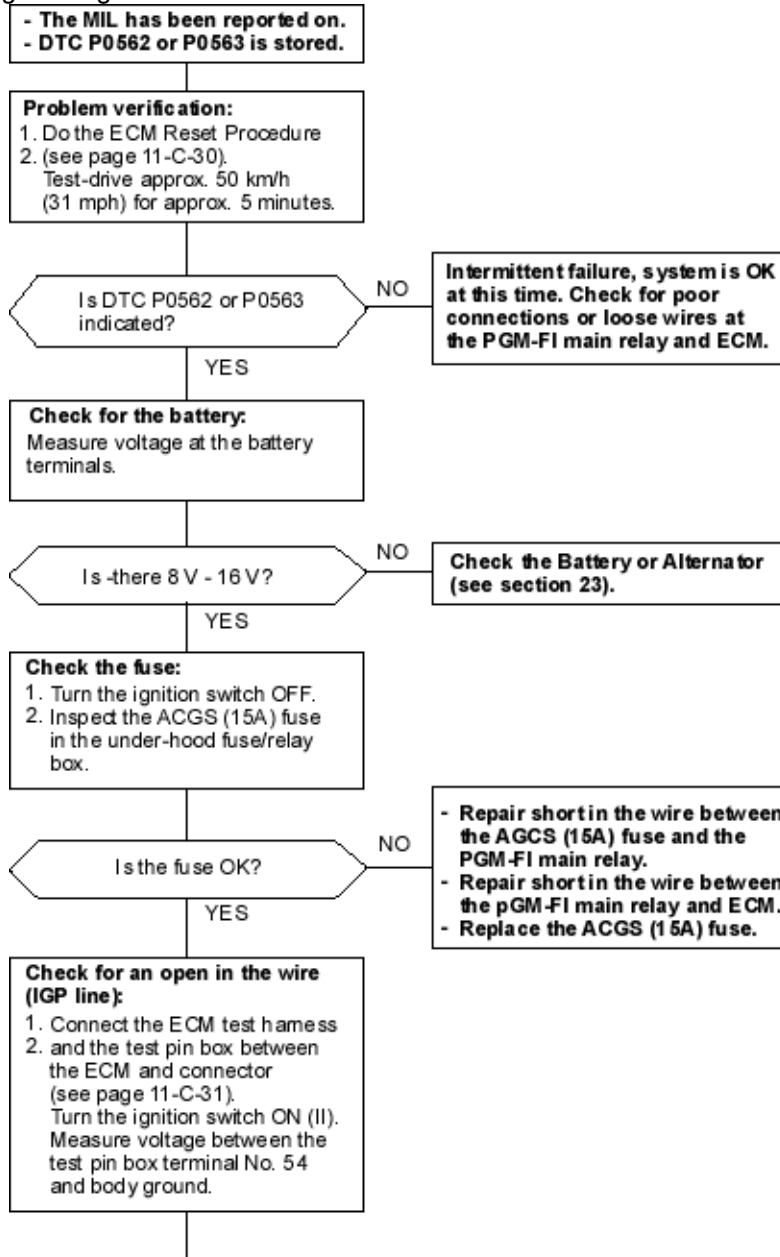
(See Page 23-C-30)

P0560: ECM Back Up System Voltage Problem



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

P0652: ECM Back Up Circuit Low Voltage
P0653: ECM Back Up Circuit High Voltage

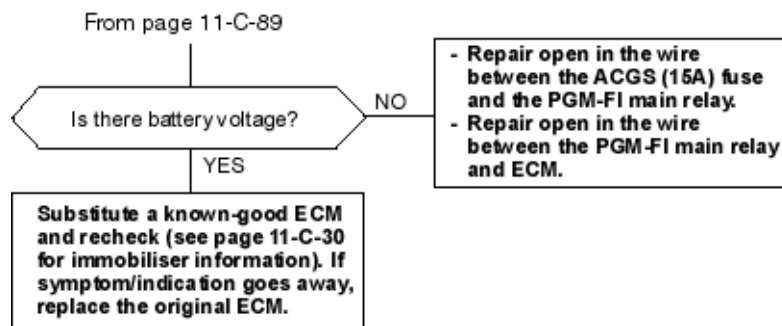


To page 11-C-90

To go to the pages referenced on the picture above, click on the following:

[\(See Page 23-C-31\)](#)

[\(See Page 23-C-30\)](#)

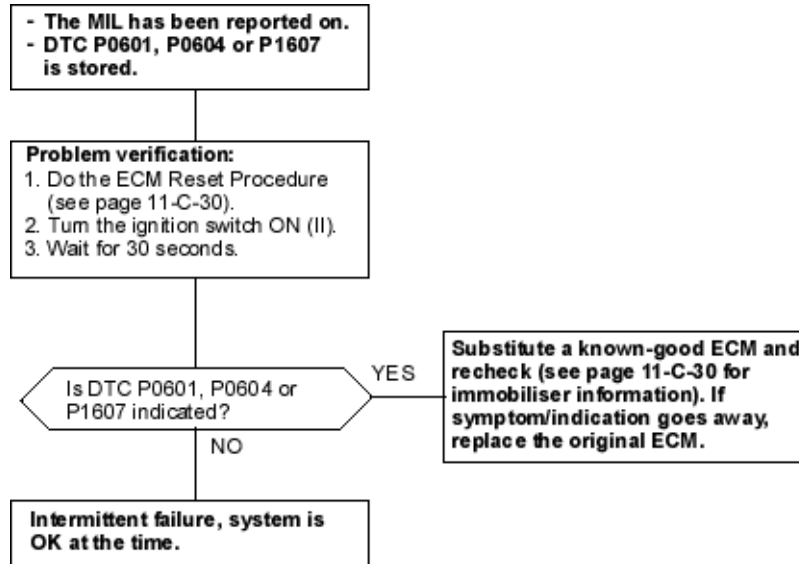


To go to the pages referenced on the picture above, click on the following:
(**See Page** 23-C-30)

DTC P0601: ECM Internal Circuit Malfunction

DTC P0604: ECM Internal Circuit Malfunction

DTC P1607: ECM Internal Circuit Malfunction



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

NOTE:

If this symptom is intermittent, check the following problems.

- The MIL never comes on after the ignition switch is turned ON (II).
 - A loose ACGS (15 A) fuse in the under hood fuse/relay box.
 - A loose No. 9 BACK UP LIGHT INSTRUMENT LIGHT (7.5 A) fuse in the driver's under-dash fuse/relay box.
 - A loose No. 1 FUEL PUMP fuse (15 A) in the driver's under-dash fuse/relay box.
 - An intermittent short in the wire between the ECM (8) and the gauge assembly.
 - An intermittent short in the wire between the ECM (59) and the MAP sensor.
 - An intermittent short in the wire between the ECM (46) and the TP sensor.
 - PGM-FI main relay
- The MIL stays on or comes on after two seconds with the ignition switch turned ON (II).
 - An intermittent short in the wire between the ECM (19) and the service check connector.
 - An intermittent short in the wire between the ECM (8) and the gauge assembly.
- See the scan tool or Honda PGM Tester user's manuals for specific operating instructions.

Does the MIL come on and stay on?

YES

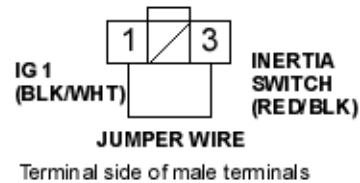


(To page 11-C-95)

NO

Check the inertia switch:
 1. Turn the ignition switch OFF.
 2. Press the inertia switch button.
 3. Turn the ignition switch ON (II).

INERTIA SWITCH 3P CONNECTOR



Does the MIL come on for two seconds after ignition switch is turned ON (II)?

YES

Intermittent failure, system is OK at this time.

NO

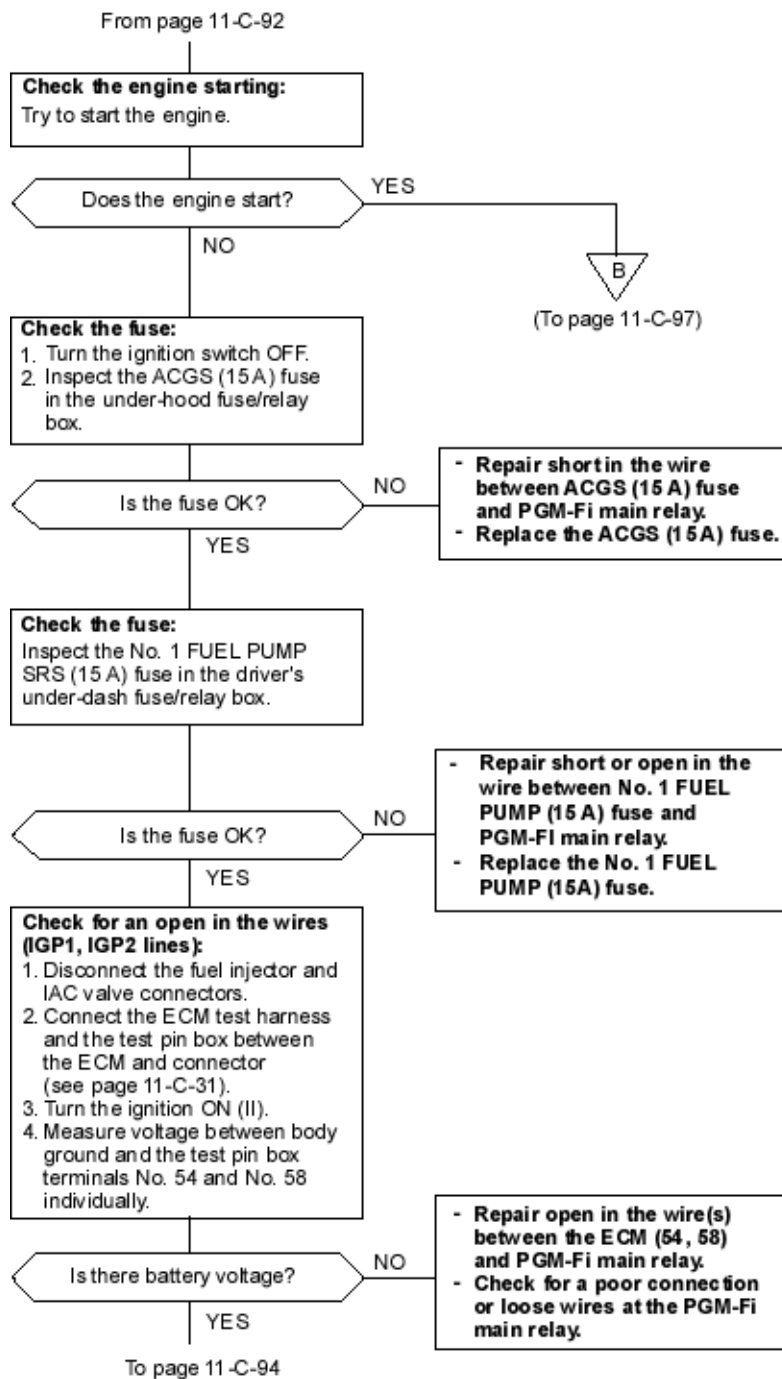
Check the fuse:
 1. Turn the ignition switch OFF.
 2. Turn the ignition switch ON (II).

Does the low oil pressure indicator light come on?

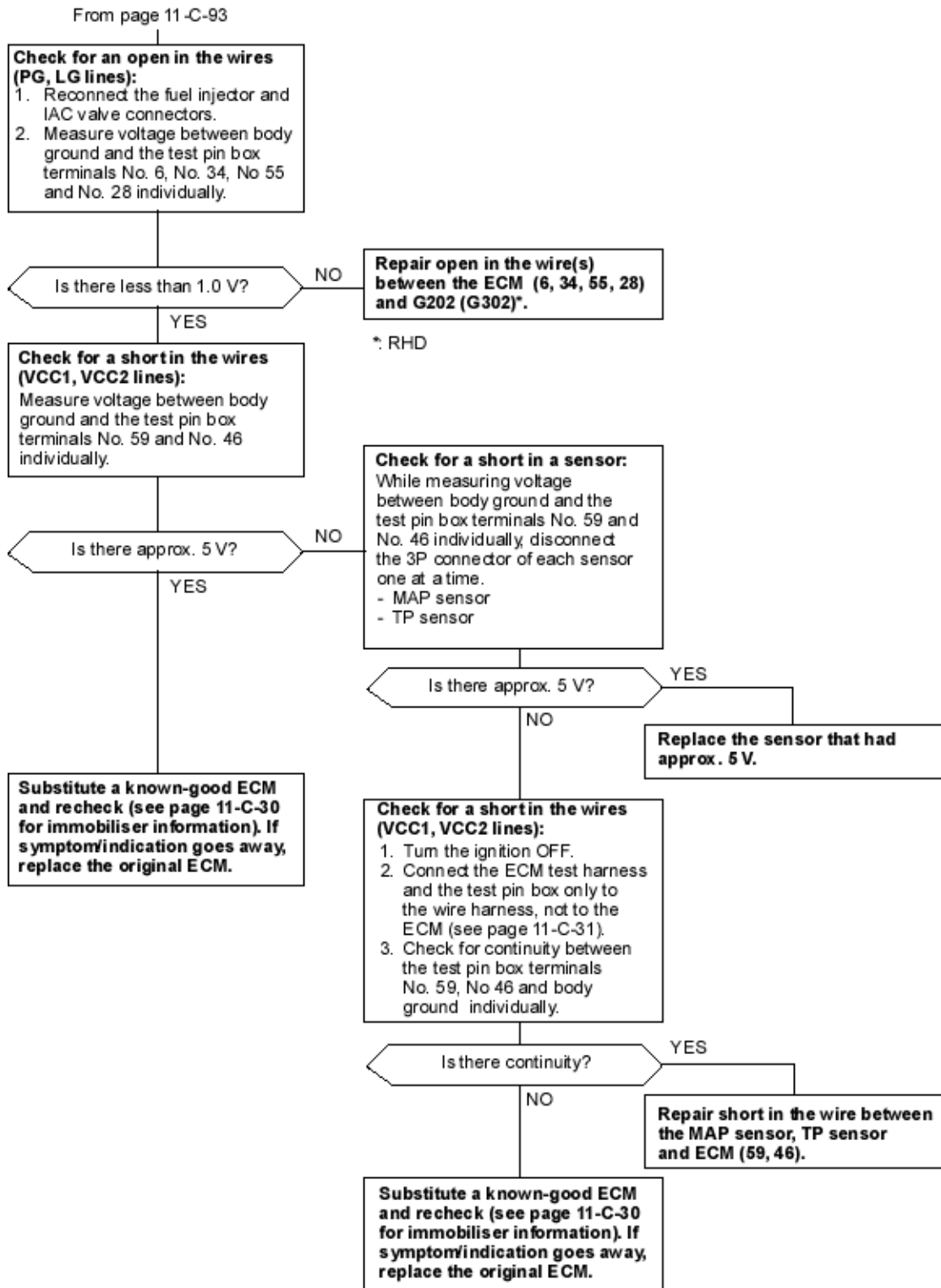
NO

- Repair short or open in the wire between No. 9 INSTRUMENT LIGHT (7.5 A) fuse and gauge assembly.
- Replace the No. 9 INSTRUMENT LIGHT (7.5 A) fuse.

YES
 To page 11-C-93



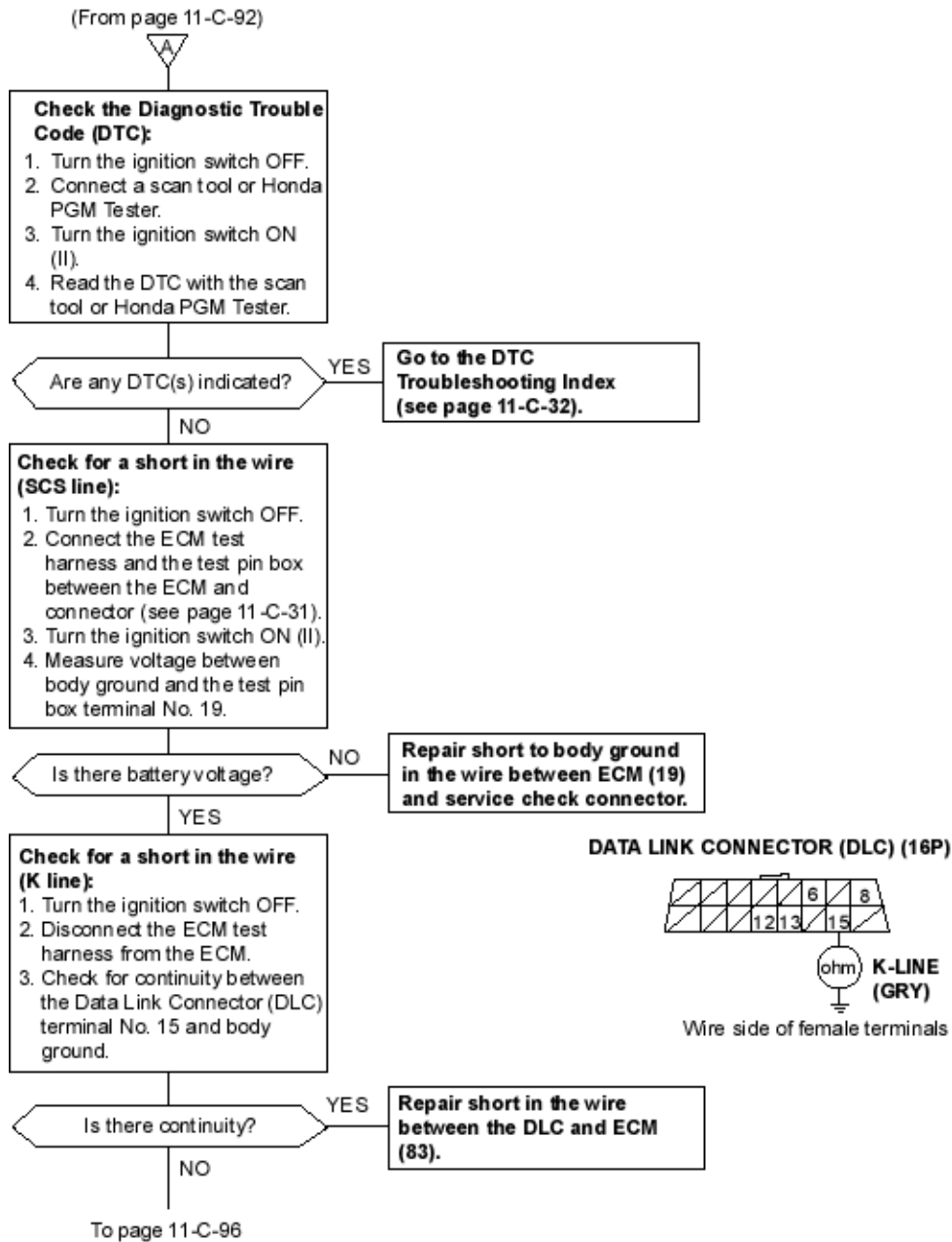
To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-31)



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

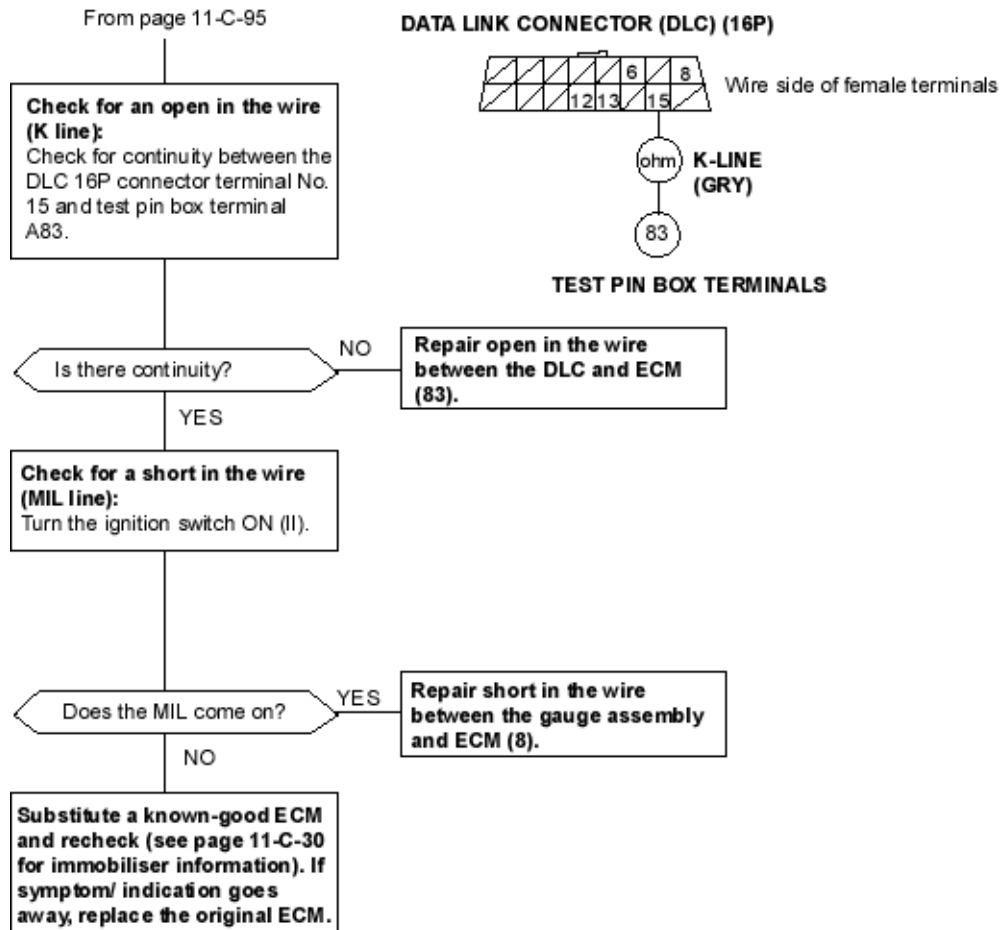
(See Page 23-C-30)



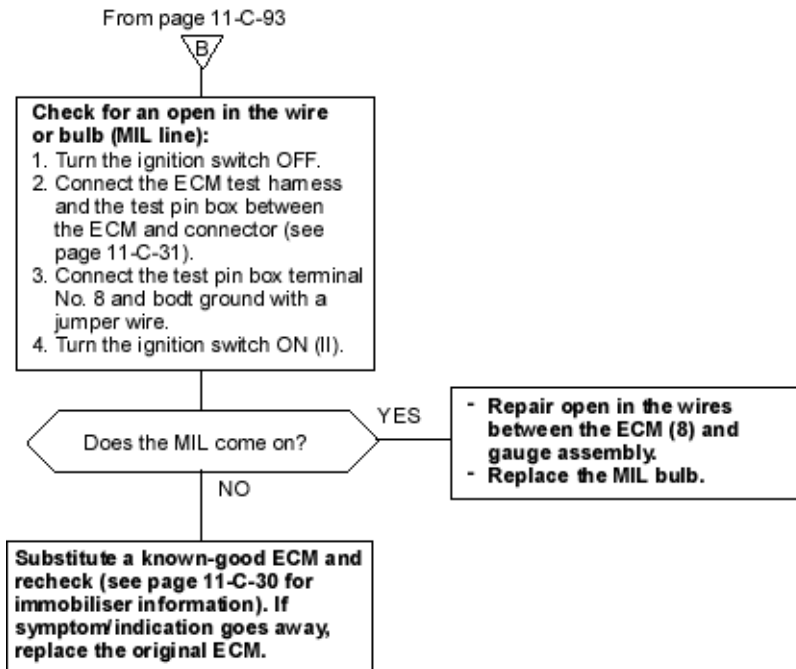
To go to the pages referenced on the picture above, click on the following:

[\(See Page 23-C-31\)](#)

[\(See Page 23-C-32\)](#)



To go to the pages referenced on the picture above, click on the following:
[\(See Page 23-C-30\)](#)



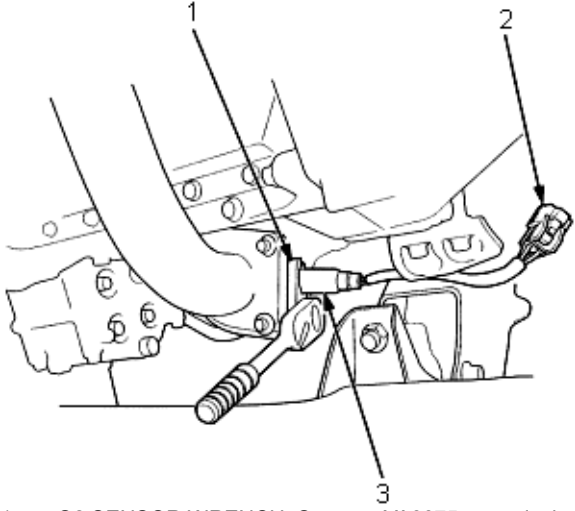
To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

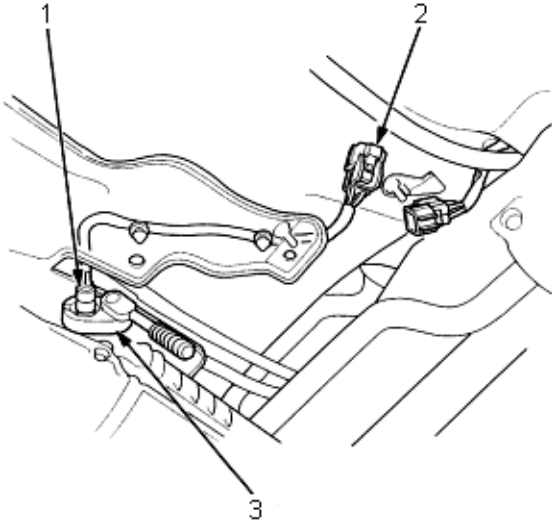
1. Disconnect the HO2S 4P connector, then remove the HO2S.

Primary HO2S:



1. O2 SENSOR WRENCH, Snap-on YA8875 or equivalent
2. HO2S 4P CONNECTOR
3. PRIMARY HO2S, 44 Nm (4.5 kgf/m, 33 lbf/ft)

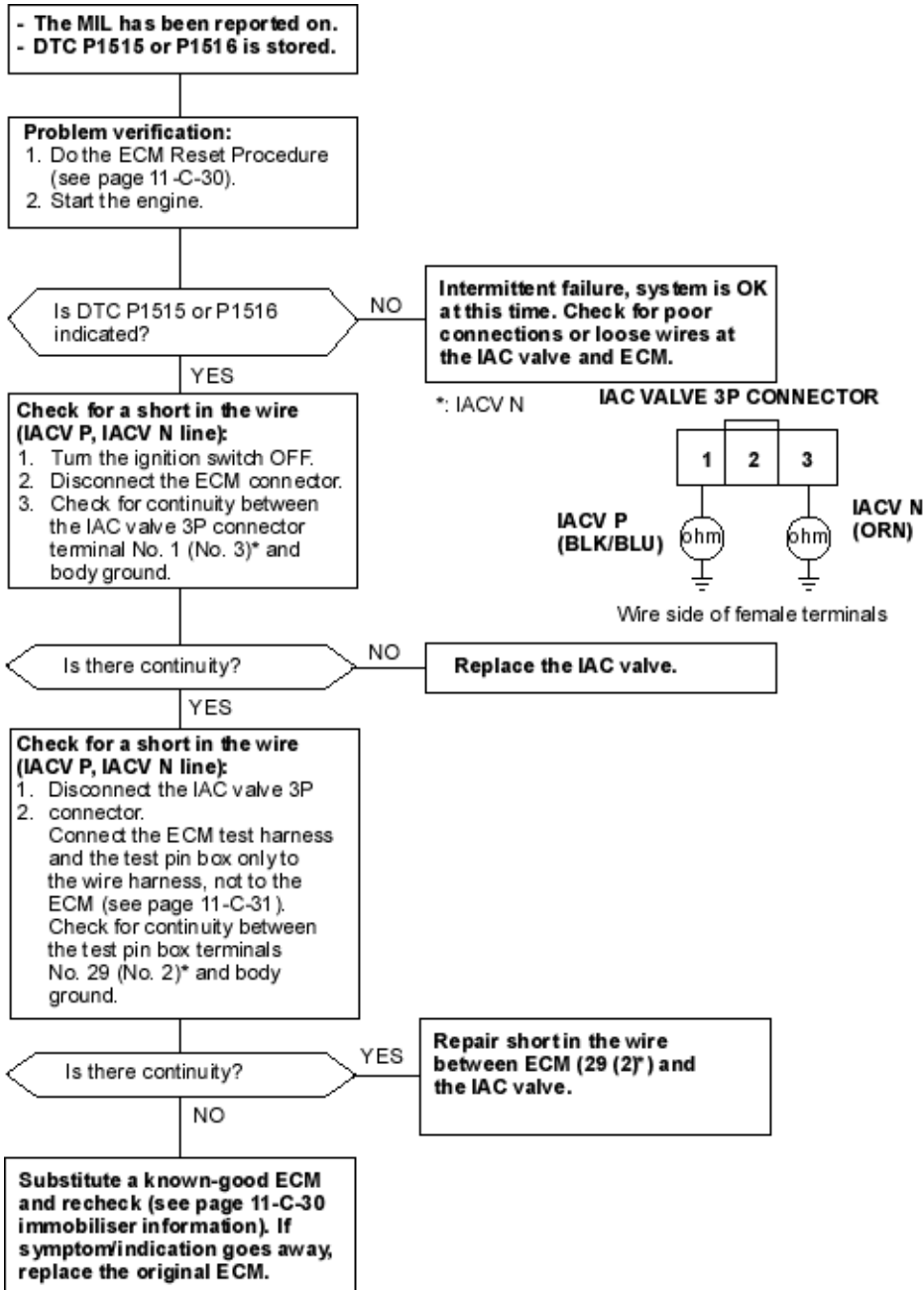
Secondary HO2S:



1. SECONDARY HO2S, 44 Nm (4.5 kgf/m, 33 lbf/ft)
2. HO2S 4P CONNECTOR
3. O2 SENSOR WRENCH, Snap-on YA8875 or equivalent

2. Install the HO2S in reverse order of removal.

DTC P1515: IAC Valve Circuit Short Problem
DTC P1516: IAC Valve Circuit Short Problem

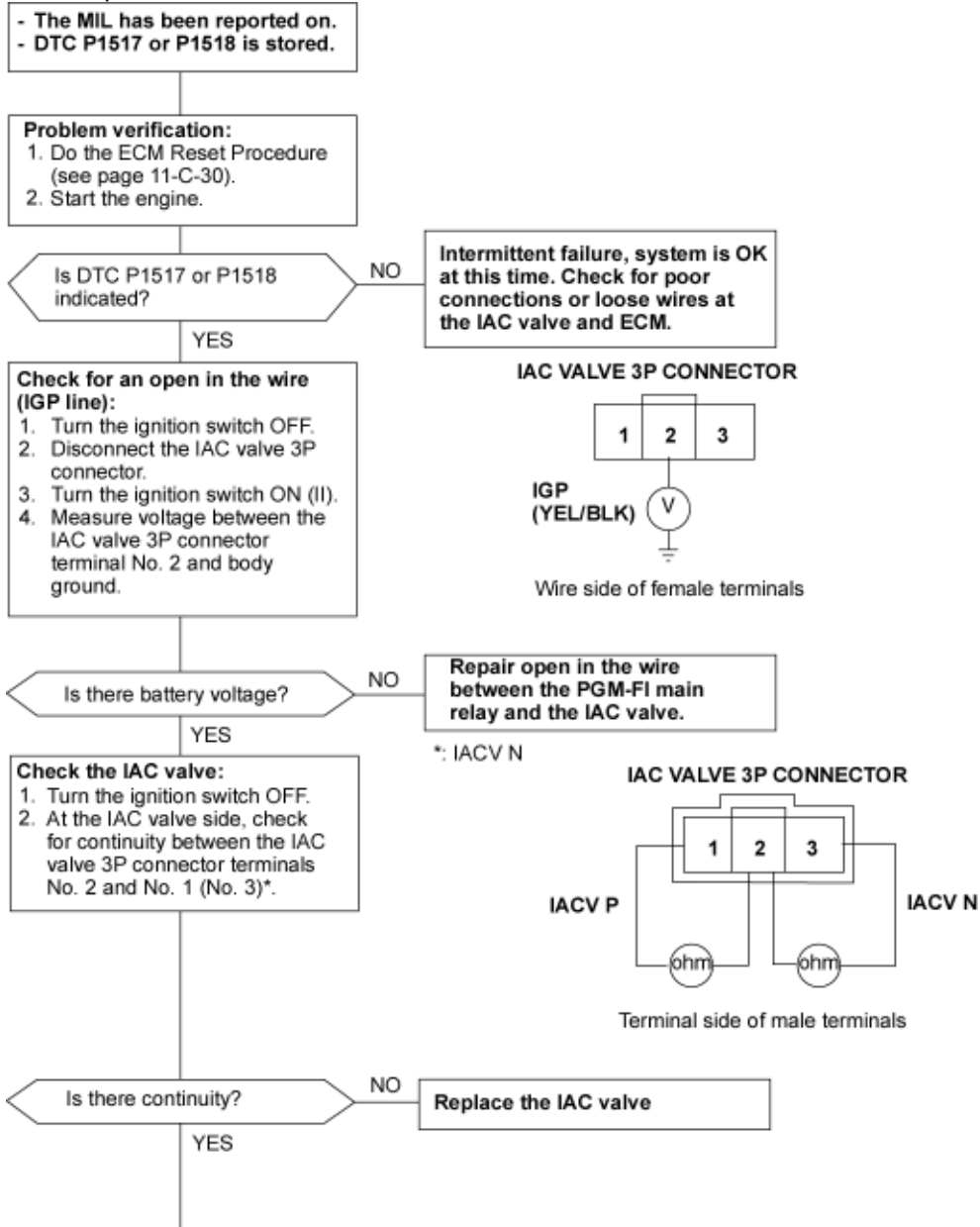


To go to the pages referenced on the picture above, click on the following:

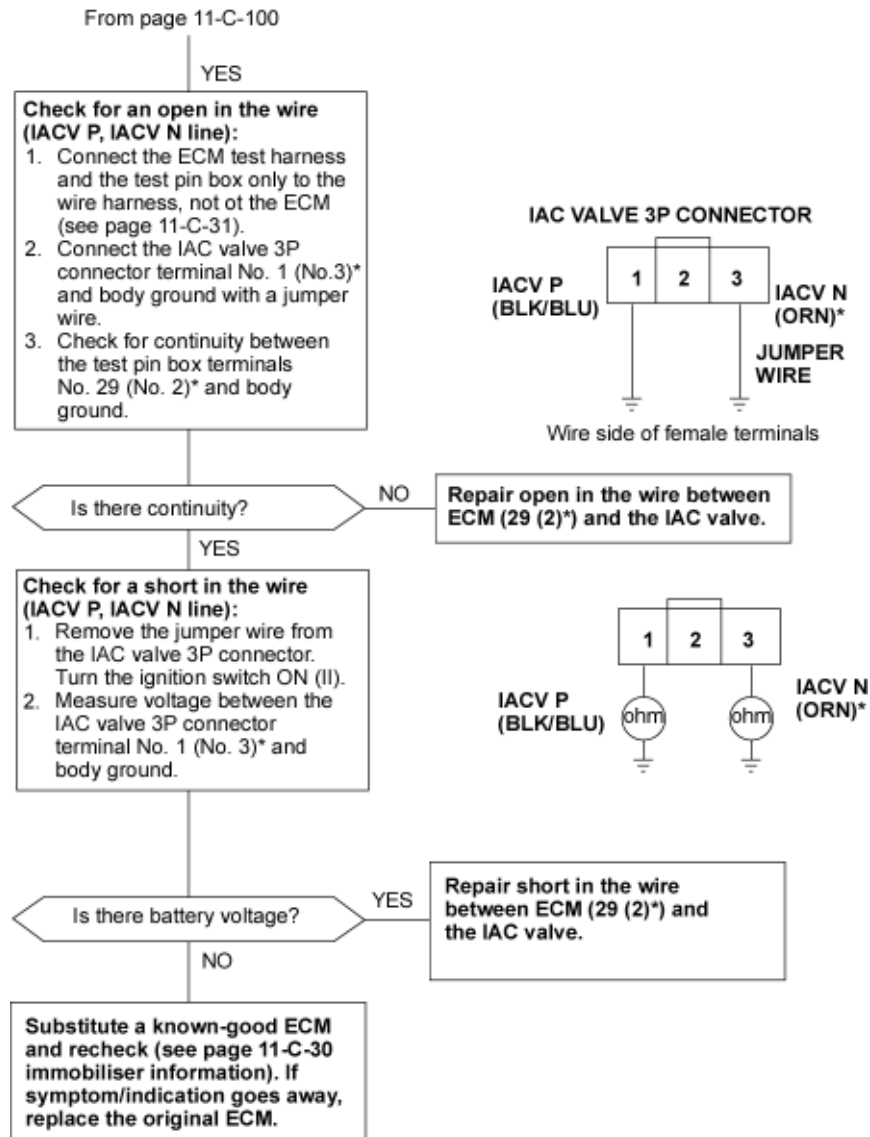
(See Page 23-C-31)

(See Page 23-C-30)

DTC P1517: IAC Valve Circuit Open Problem
DTC P1518: IAC Valve Circuit Open Problem



To go to the pages referenced on the picture above, click on the following:
 (See Page 23-C-30)



To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-31)

(See Page 23-C-30)

DTC P0420: Catalytic System Efficiency Below Threshold

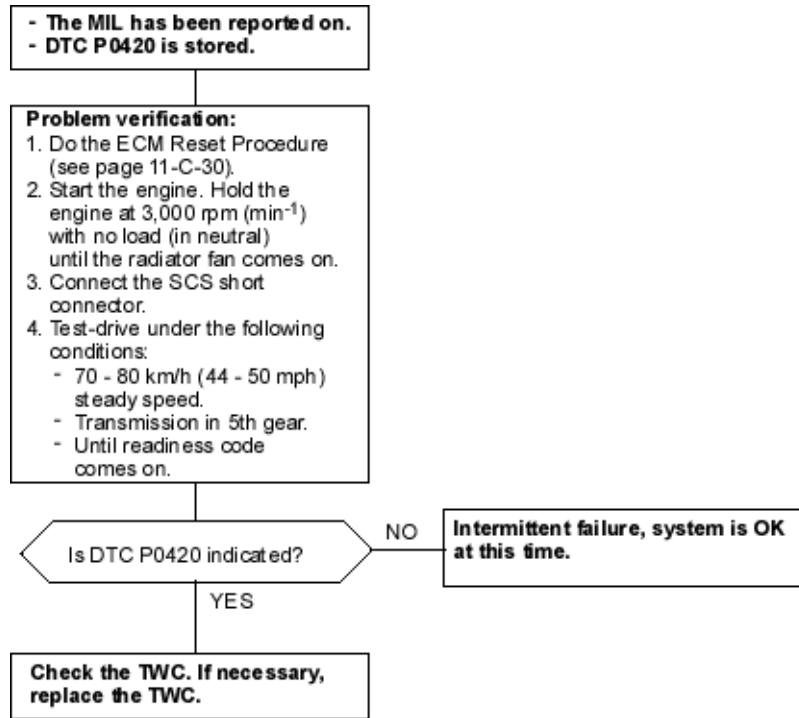
NOTE: If some of the DTC's listed below are stored at the same time as DTC P0420, troubleshoot those DTC's first, then troubleshoot DTC P0420.

P0137, P0138: Secondary HO2S (Sensor 2)

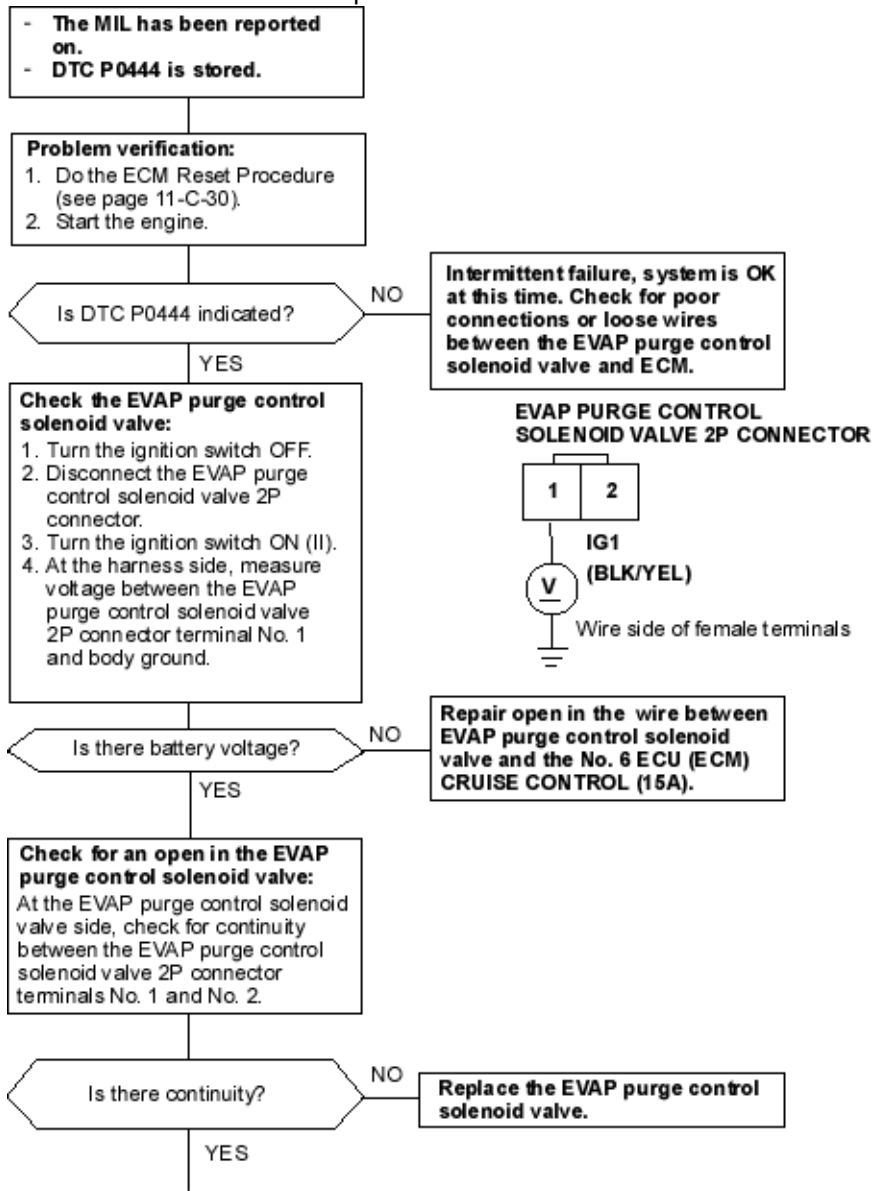
P0141: Secondary HO2S (Sensor 2) Heater

Possible Cause

- ♦ TWC Deterioration
- ♦ Exhaust System Leakage



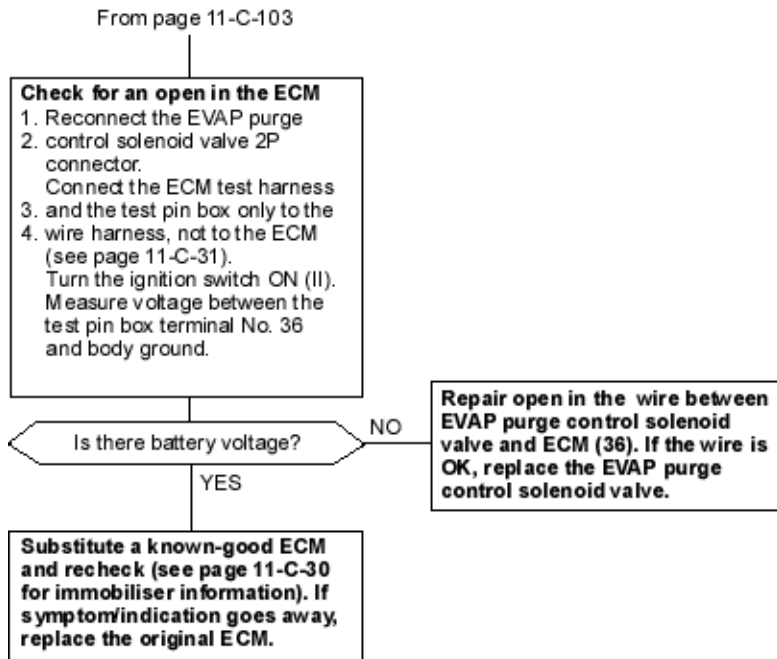
DTC P0444: EVAP Purge Control Solenoid Valve Circuit Open Problem



To page 11-C-104

To go to the pages referenced on the picture above, click on the following:

(See Page 23-C-30)

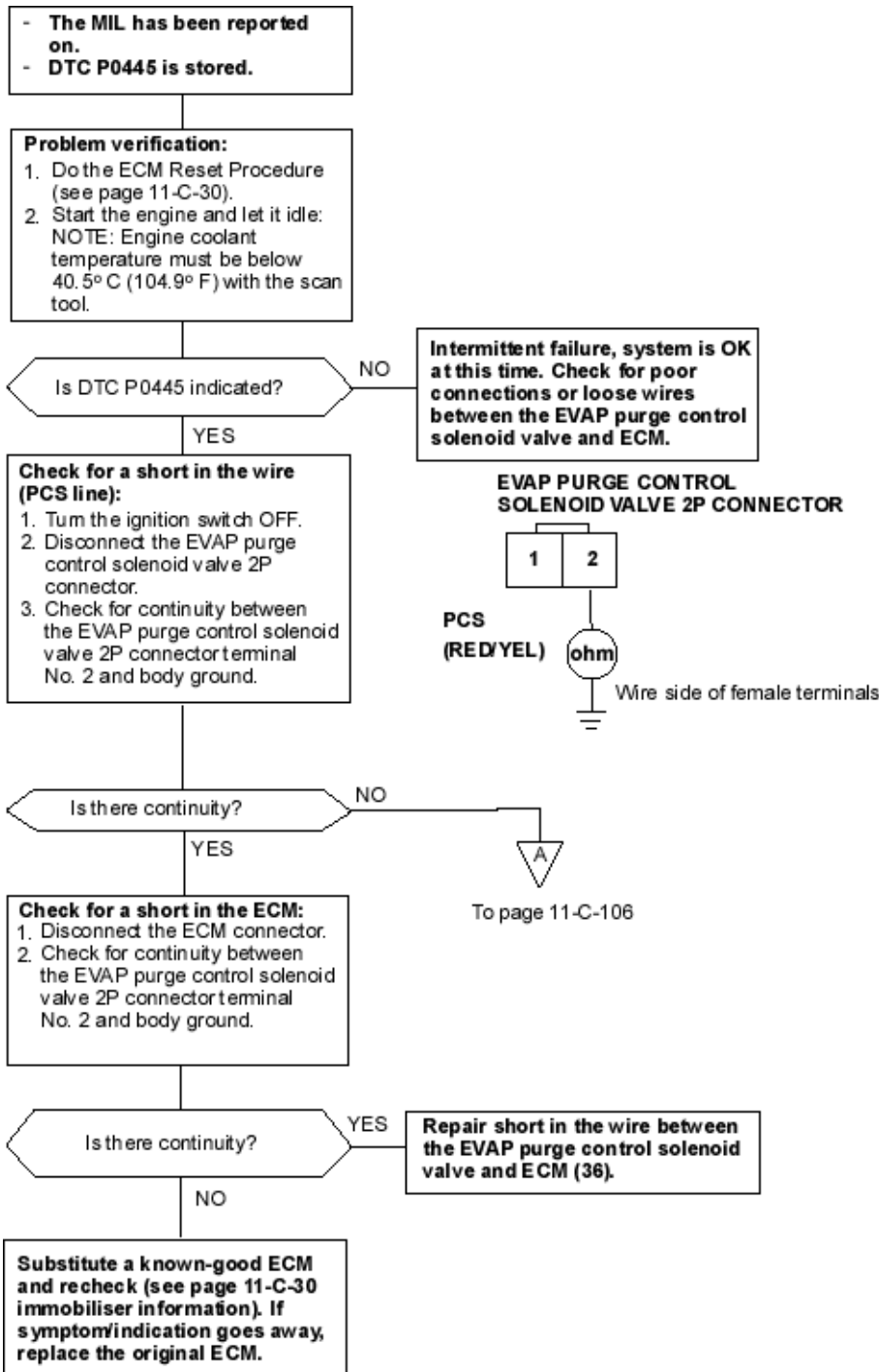


To go to the pages referenced on the picture above, click on the following:

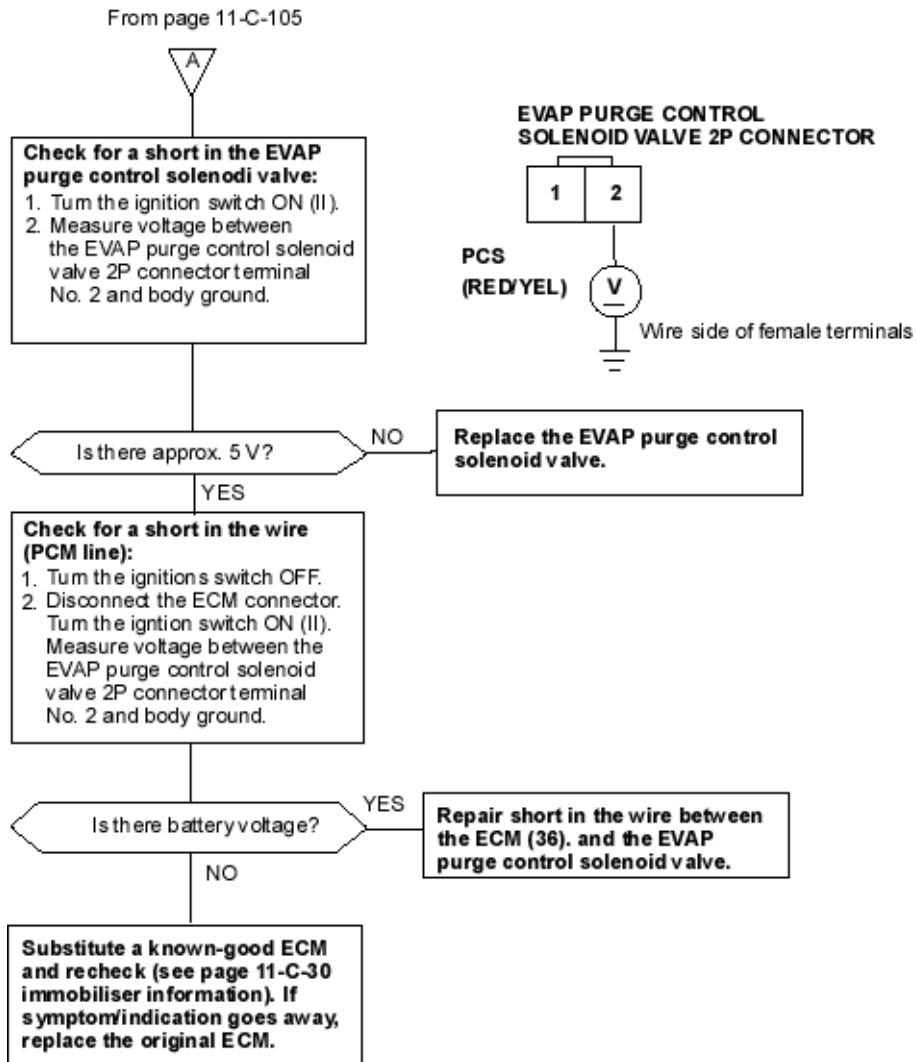
(See Page 23-C-31)

(See Page 23-C-30)

DTC P0445: EVAP Purge Control Solenoid Valve Circuit Short Problem



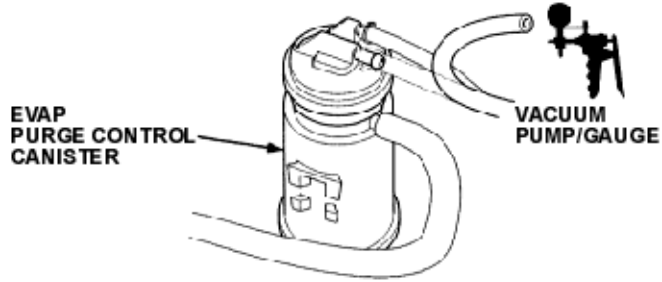
To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)



To go to the pages referenced on the picture above, click on the following:
(See Page 23-C-30)

Inspection of Evaporative Emission Controls

Check the vacuum when cold:
 1. Disconnect the vacuum hose from the EVAP purge control canister and connect a vacuum gauge to the hose.
 2. Start the engine and let it idle:
 NOTE: Engine coolant temperature must be below 40°C (104.9°F) with the scan tool.



Is there vacuum? YES

Inspect vacuum hose routing. If OK, replace the EVAP purge control solenoid valve.

NO

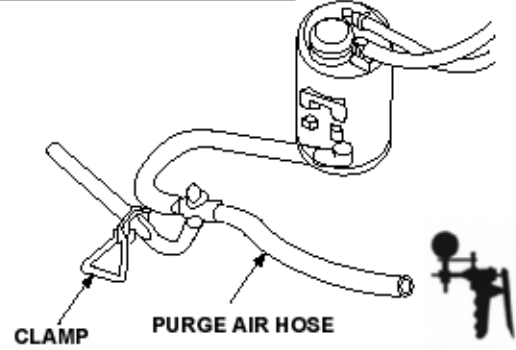
Check the vacuum when hot:
 1. Hold the engine at 3,000 rpm (min⁻¹) with no load (in neutral) until the radiator fan comes on, then let it idle for at least 2 minutes.
 2. Check for vacuum at the vacuum hose.

Is there vacuum? NO

Inspect vacuum hose routing. If OK, replace EVAP purge control solenoid valve.

YES

Check the EVAP control canister:
 1. Turn the ignition switch OFF.
 2. Reconnect the vacuum hose to the EVAP purge control canister.
 3. Remove the fuel fill cap.
 4. Connect a vacuum gauge to canister purge air hose.
 5. Start the engine and let it idle for at least 2 minutes.



Is there vacuum? NO

Replace the EVAP control canister.

YES

See EVAP two way valve test to complete. Evaporative emission controls are OK.

Clutch Disc Inspection

12-2

1. Inspect the lining of the clutch disc for signs of slipping or oil. If the clutch disc is burned black or oil soaked, replace it.

2. Measure the clutch disc thickness.

Standard (New)

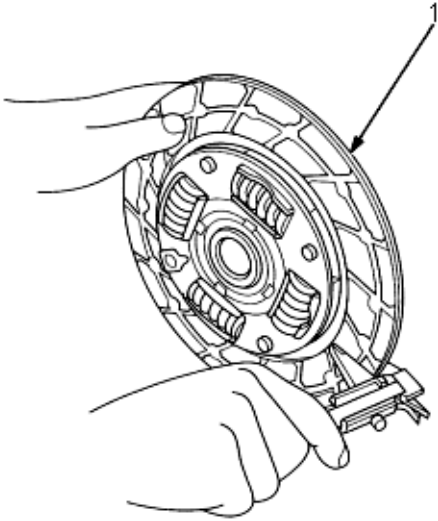
D16B6 engine: 7.7-8.2 mm (0.30-0.32 in.)

F18B2, F18B3, F20B6 engines:
7.9-8.4 mm (0.31-0.33 in.)

H22A7 engine: 8.3-9.0 mm (0.33-0.35 in.)

F23Z5 engine: 8.4-9.0 mm (0.33-0.35 in.)

Service Limit: 6.0 mm (0.24 in)



1. CLUTCH DISC
If the thickness is less than the service limit, replace the clutch disc.

3. Measure the rivet depth from the lining surface to the rivets, on both sides.

Standard (New)

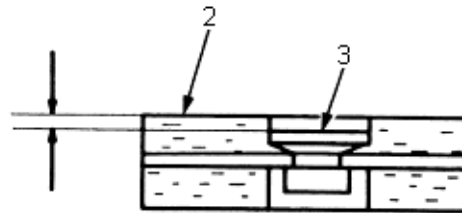
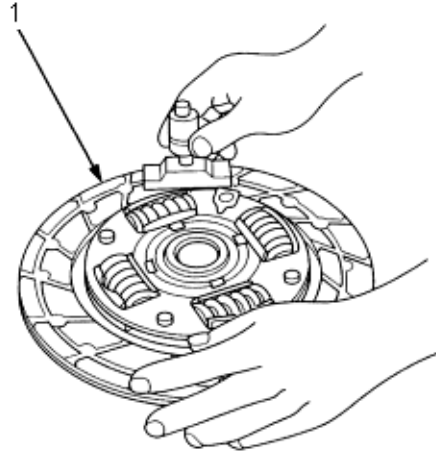
D16B6 engine: 1.3 mm (0.051 in.)

F18B2, F18B3, F20B6 engines:
1.4 mm (0.055 in.)

H22A7 engine: 1.2-1.7 mm (0.047-0.067 in.)

F23Z5 engine: 1.65-2.25 mm (0.065-0.089 in.)

Service Limit: 0.2 mm (0.008 in.)



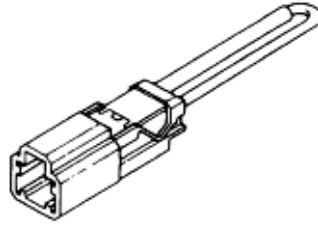
1. CLUTCH DISC
2. LINING SURFACE
3. RIVET

If the rivet depth is less than the service limit, replace the clutch disc.

Special Tools

14-2

Ref. No.	Tool Number	Description	Qty	Remark
1	07PAZ - 0010100	SCS Short Connector	1	



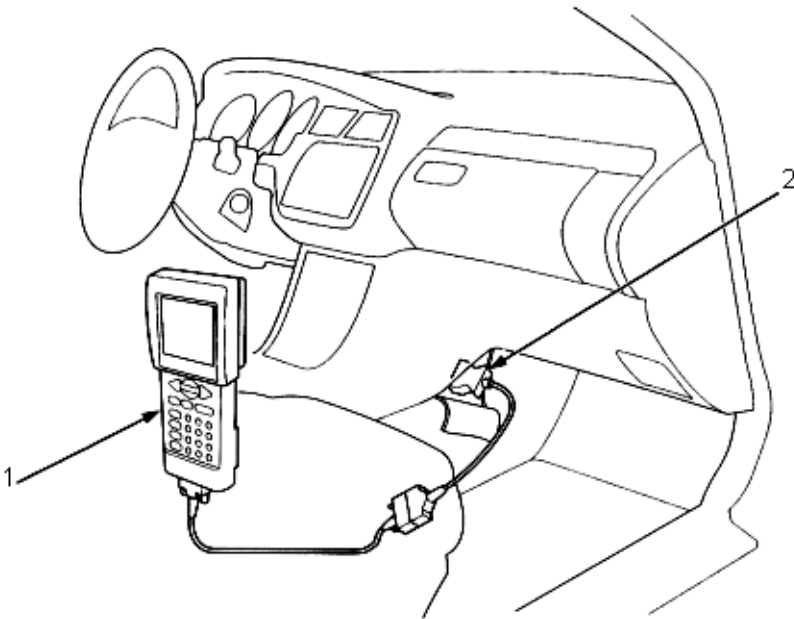
①

Checking the Diagnostic Trouble Code (DTC) with an OBD Scan Tool or the Honda PGM Tester for F20B6 and F23Z5 engines.

When the PCM senses an abnormality in the input or output systems, the **D4** indicator light in the gauge assembly will blink. When the 16P Data Link Connector (DLC) (located under the dash on the passenger side) is connected to the OBD Scan Tool or Honda PGM Tester as shown, the scan tool or tester will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the **D4** indicator light has been reported on, connect the OBD Scan Tool or Honda PGM Tester to the DLC (16P). Turn the ignition switch ON (II) and observe the DTC on the screen of the Scan Tool or Honda PGM tester. After determining the DTC, refer to the Symptom-to-Component Chart Electrical System on pages (see page 14-6) to (see page 14-9 in this supplement).
 NOTE: See the OBD Scan Tool or Honda PGM Tester user's manual for specific instructions.

1. HONDA PGM TESTER or OBD SCAN TOOL
2. DATA LINK CONNECTOR (16P)



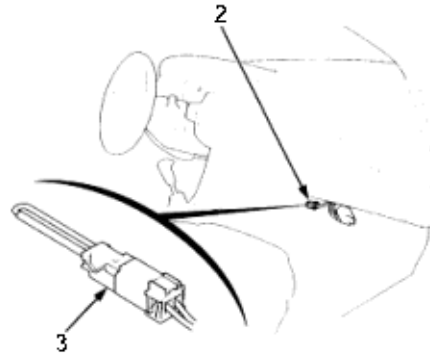
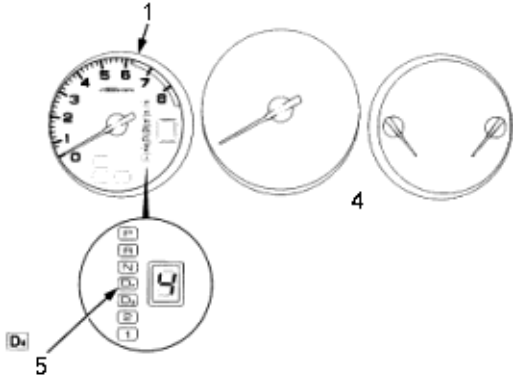
NOTE:

- ♦ If the **D4** indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow these procedures:
 1. Record the DTC's for the fuel/emissions and A/T systems.
 2. Check the fuel and emission system indicated by the DTC.
 3. Write down the numbers of the customer's radio station presets.
 4. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-hood fuse/relay box for more than 10 seconds.
 5. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), and then recheck the DTC's.
- ♦ Disconnecting the BACK UP fuse also cancels the radio station presets and the clock setting.

Checking the Diagnostic Trouble Code (DTC) connecting with the Special Tool to the Service Check Connector for All Models

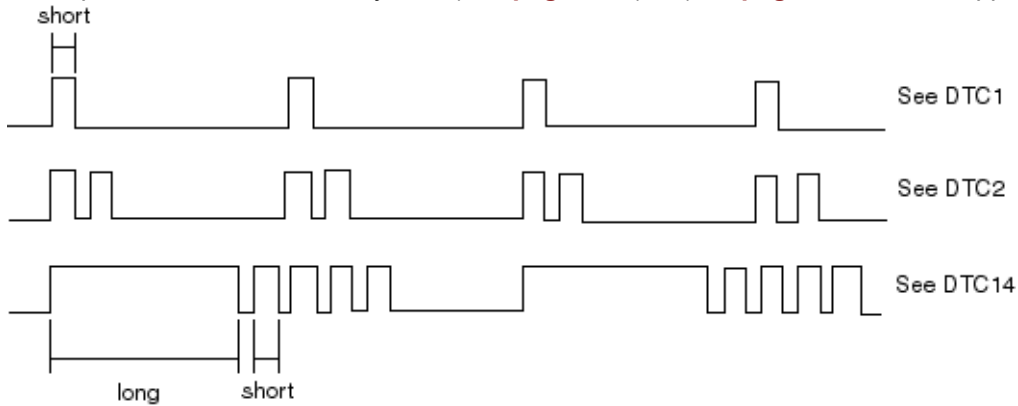
When the PCM senses an abnormality in the input or output systems, the **D4** indicator light in the gauge assembly will blink. When the Service Check Connector (located under the dash on the passenger side) is connected with the special tool as shown, the **D4** indicator light will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the **D4** indicator light has been reported on, connect the Service Check Connector with the special tool. Turn ON (II) the ignition switch and observe the **D4** indicator light.



1. TACHOMETER
2. SERVICE CHECK CONNECTOR (2P)
3. SCS SHORT CONNECTOR, 07PAZ-0010100
4. GAUGE ASSEMBLY
5. **D4** INDICATOR LIGHT

Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the Symptom to Component Chart Electrical System ([see page 14-6](#)) to ([see page 14-9](#) in this supplement).

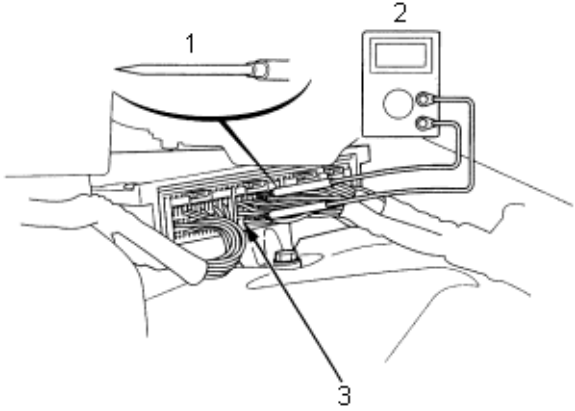


NOTE:

- ♦ If the **D4** indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow these procedures:
 1. Record the DTC's for the fuel/emissions and A/T systems.
 2. Check the fuel and emission system indicated by the DTC.
 3. Write down the numbers of the customer's radio station presets.
 4. Reset the PCM memory by removing the BACK UP fuse in the passenger's under-hood fuse/relay box for more than 10 seconds.
 5. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), and then recheck the DTC's.
- ♦ Disconnecting the BACK UP fuse also cancels the radio station presets and the clock setting.

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Pull back the carpet from passenger's side of the center console to expose the PCM.
2. Inspect the circuit on the PCM according to the troubleshooting flowchart with a digital multimeter and a tapered tip probe as shown

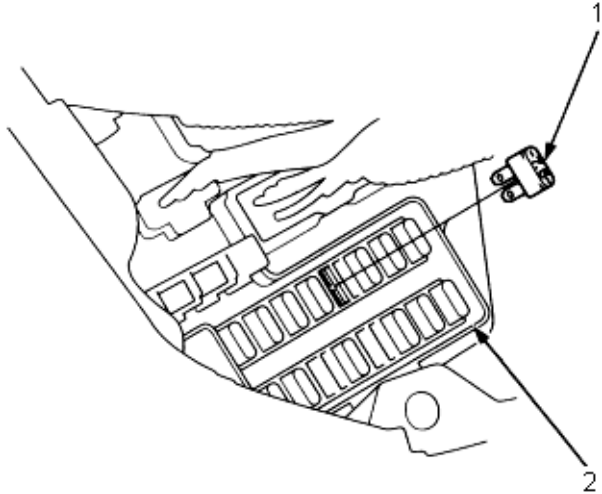


1. TAPERED TIP PROBE
2. DIGITAL MULTITESTER, Commercially available or 07411-0020000
3. PCM CONNECTORS

♦ **PCM Reset Procedure**

1. Turn the ignition switch OFF.
2. Remove the BACK UP fuse (7.5 A) from the passenger's under-dash fuse/relay box for 10 seconds to reset the PCM.

NOTE: Disconnecting the BACK UP fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.



1. BACK UP FUSE (7.5A)
2. PASSENGER'S UNDER-DASH FUSE/RELAY BOX

♦ **Final Procedure**

NOTE: This procedure must be done after any troubleshooting.



1. Remove the special tool from the Service Check Connector.
2. Reset the PCM.
3. Set the radio preset stations and clock setting.

When PCM senses abnormality, D4 indicator light	Number of D4 Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Refer to the base Shop Manual on this CD
Blinks	1 1-1 P1753	<ul style="list-style-type: none"> Lock-up clutch does not engage Fails to shift (stuck in 4th gear) 	<ul style="list-style-type: none"> Disconnected lock-up control solenoid valve/shift control solenoid valve A assembly connector Short or open in lock-up control solenoid valve wire Faulty lock-up control solenoid valve Open in VB SOL wire 	(See page 14-62)
Blinks	5 5-1 P1705	<ul style="list-style-type: none"> Fails to shift other than 2nd/3rd gears Lock-up clutch does not engage 	<ul style="list-style-type: none"> Short in A/T gear position switch connector Faulty A/T gear position switch 	(See page 14-64)
Does not blink	6 6-1 P1706	No specific symptom appears	<ul style="list-style-type: none"> Disconnected A/T gear position switch connector Open in A/T gear position switch wire Faulty A/T gear position switch 	(See page 14-68)
Blinks	7 7-1 P0753	Fails to shift (stuck in 4th gear)	<ul style="list-style-type: none"> Disconnected lock-up control solenoid valve/shift control solenoid valve A assembly connector Short or open in lock-up control solenoid valve A wire Faulty lock-up control solenoid valve A Open in VB SOL wire 	(See page 14-71)
Blinks	8 8-1 P0758	Fails to shift (stuck in 4th gear)	<ul style="list-style-type: none"> Disconnected shift control solenoid valve B assembly connector Short or open in lock-up control solenoid valve B wire Faulty lock-up control solenoid valve B Open in VB SOL wire 	(See page 14-73)
Blinks	9 9-1 P0720	<ul style="list-style-type: none"> Fails to shift (between 2nd/3rd, downshift to 3rd gear only) Speedometer does not operate Lock-up clutch does not engage 	<ul style="list-style-type: none"> Disconnected countershaft speed sensor connector Short or open in countershaft speed sensor wire Faulty countershaft speed sensor 	(See page 14-75)
Blinks	15 15-1 P0715	<ul style="list-style-type: none"> Fails to shift (between 2nd/3rd, downshift to 3rd gear only) Lock-up clutch does not engage 	<ul style="list-style-type: none"> Disconnected mainshaft speed sensor connector Short or open in mainshaft speed sensor wire Faulty mainshaft speed sensor 	(See page 14-79)

*: DTC's on Honda PGM Tester and OBD Scan Tool apply to F18B2, F20B6 and F23Z5 engine models.

When PCM senses abnormality, D4 indicator light	Number of D4 Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Refer to the base Shop Manual on this CD
Blinks	16 16-1 P1768	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected A/T clutch pressure control solenoid valve A connector ♦ Short or open in A/T clutch pressure control solenoid valve A wire ♦ Faulty A/T clutch pressure control solenoid valve A ♦ Open in VB SOL wire ♦ Open in PG1 or PG2 wires or poor ground (101) 	(See page 14-83)
Blinks	22 22-1 P0763	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) 	<ul style="list-style-type: none"> ♦ Disconnected shift control solenoid valve C connector ♦ Short or open in shift control solenoid valve C connector ♦ Faulty shift control solenoid valve C ♦ Open in VB SOL wire 	(See page 14-85)
Blinks	23 23-1 P1773	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 4th gear) ♦ Lock-up clutch does not engage 	<ul style="list-style-type: none"> ♦ Disconnected A/T clutch pressure control solenoid valve B connector ♦ Short or open in A/T clutch pressure control solenoid valve B wire ♦ Faulty A/T clutch pressure control solenoid valve B ♦ Open in VB SOL wire ♦ Open in PG1 or PG2 wires or poor ground (101) 	(See page 14-87)
Blinks	24 24-1 P1709	Transmission does not shift into manual mode	<ul style="list-style-type: none"> ♦ Disconnected mode switch connector ♦ Short or open in mode switch wire ♦ Faulty mode switch 	(See page 14-89)
Does not blink	25 25-1 P1738	No specific symptom appears	<ul style="list-style-type: none"> ♦ Disconnected 2nd clutch pressure switch connector ♦ Short or open in 2nd clutch pressure switch wire ♦ Faulty 2nd clutch pressure switch 	(See page 14-91)
Does not blink	26 26-1 P1739	No specific symptom appears	<ul style="list-style-type: none"> ♦ Disconnected 3rd clutch pressure switch connector ♦ Short or open in 3rd clutch pressure switch wire ♦ Faulty 3rd clutch pressure switch 	(See page 14-93)
Does not blink	41 41-1 P0730	<ul style="list-style-type: none"> ♦ Fails to shift (between 1st/2nd, 1st/2nd/3rd, 1st/3rd/4th or 2nd/3rd/4th gears only) ♦ Fails to shift (stuck in 4th gear) 	Faulty shift control system	(See page 14-95)

*: DTC's on Honda PGM Tester and OBD Scan Tool apply to F18B2, F20B6 and F23Z5 engine models.

When PCM senses abnormality,  indicator light	Number of  Indicator Light Indicates DTC on Honda PGM Tester * DTC on OBD Scan Tool *	Symptom	Possible Cause	Refer to page in this supplement
Blinks	45* 45-1* P0780*	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 1st gear or 3rd gear). ♦ Fails to shift (down-shift to 2nd gear at 3-4 upshift point) 	<ul style="list-style-type: none"> ♦ Mechanical problem in the hydraulic control system for shift control solenoid valve A and A/T clutch pressure control solenoid valves A and B. ♦ Faulty transmission hydraulic control system ♦ Faulty PCM 	(See page 14-10)
Blinks	46* 46-1* P1750*	<ul style="list-style-type: none"> ♦ Fails to shift (clutch slips when upshifting) 	<ul style="list-style-type: none"> ♦ Mechanical problem in the hydraulic control system for A/T clutch pressure control solenoid valves A and B. ♦ Faulty transmission hydraulic control system ♦ Faulty PCM 	(See page 14-12)
Blinks	47* 47-1* P1751*	<ul style="list-style-type: none"> ♦ Fails to shift (stuck in 2nd gear) 	<ul style="list-style-type: none"> ♦ Mechanical problem in the hydraulic control system for shift control solenoid valve B and A/T clutch pressure control solenoid valves A and B. ♦ Faulty transmission hydraulic control system ♦ Faulty PCM 	(See page 14-14)

*: DTC's on Honda PGM Tester and OBD Scan Tool and DTC's 45, 45-1, P0780, 46, 46-1, P1750, 47, 47-1 and P1751 apply to F18B2, F20B6 and F23Z5 engine models.

Symptom-to-Component Chart
Electrical System (cont'd)

14-9

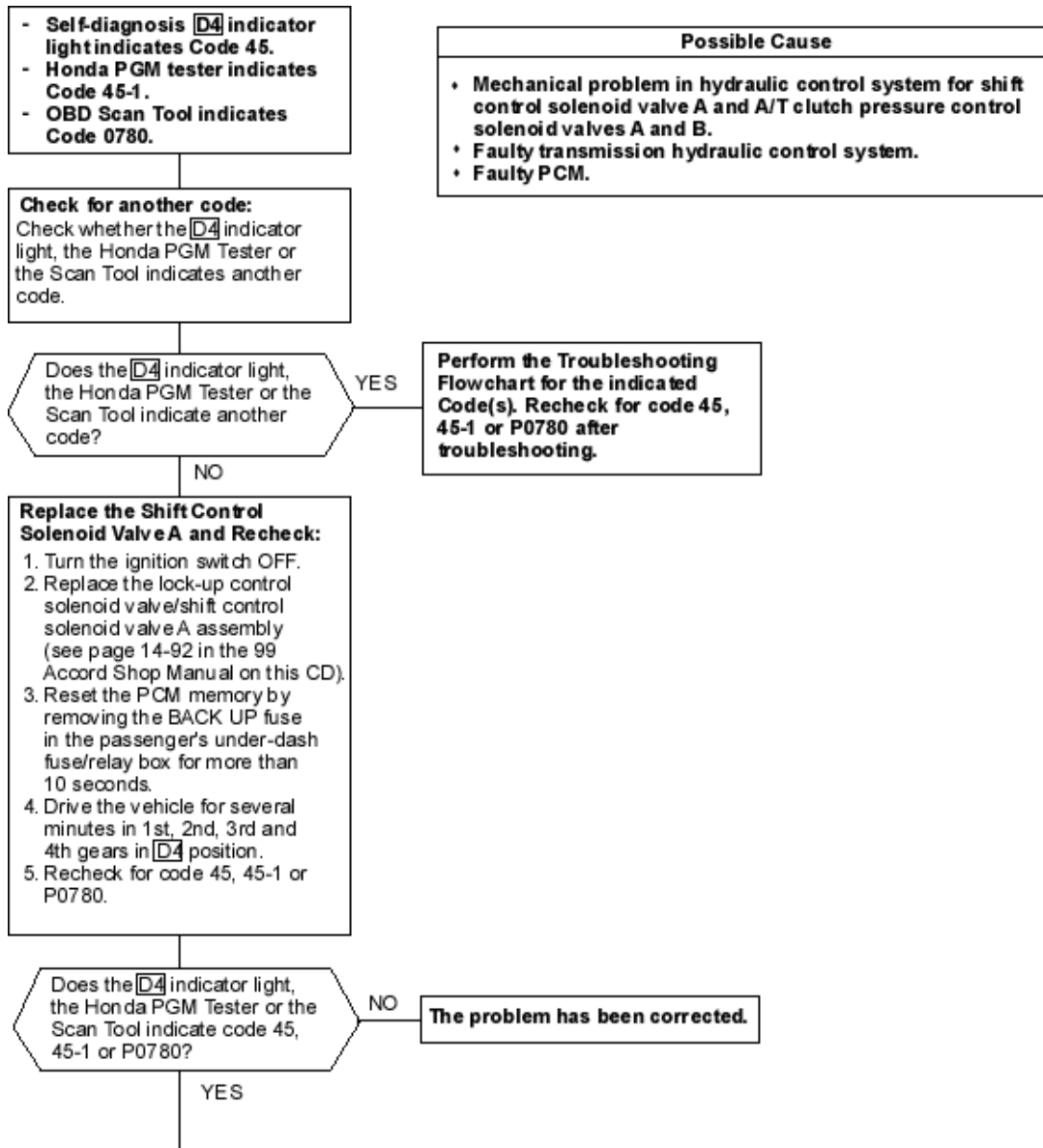
The following symptom appears if the self-diagnostic **D4** indicator light does not blink, perform an inspection according to the table below.

Symptom	Possible Cause	Refer to the base Shop Manual on this CD
D4 indicator light is on constantly (not blinking) whenever the ignition switch is ON (II)	-	(see page 14-97)
D4 indicator light does not come on for two seconds after ignition switch is first turned ON (II)	-	(see page 14-98)
Transmission does not shift up and down when operating the shift lever in the manual mode position	Check shift switch	(see page 14-100)
Shift indicator does not indicate selected gear while shift lever is in the manual mode position	Check shift indicator circuit	(see page 14-103)
Shift lever cannot be moved from P position with the brake pedal depressed	Check interlock system - Shift lock system	(see page 14-104)
Shift lever cannot pass through R position from N position	Check interlock circuit - Reverse lock system	(see page 14-107)
Ignition key cannot be moved from ACC (I) position to LOCK (0) position while pushing the ignition key with the shift lever in P position	Check interlock system - Key interlock system	(see page 14-109)

Electrical Troubleshooting

14-10

Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for Shift Control Solenoid Valve A and A/T Clutch Pressure Control Solenoid Valves A and B



To page 14-11

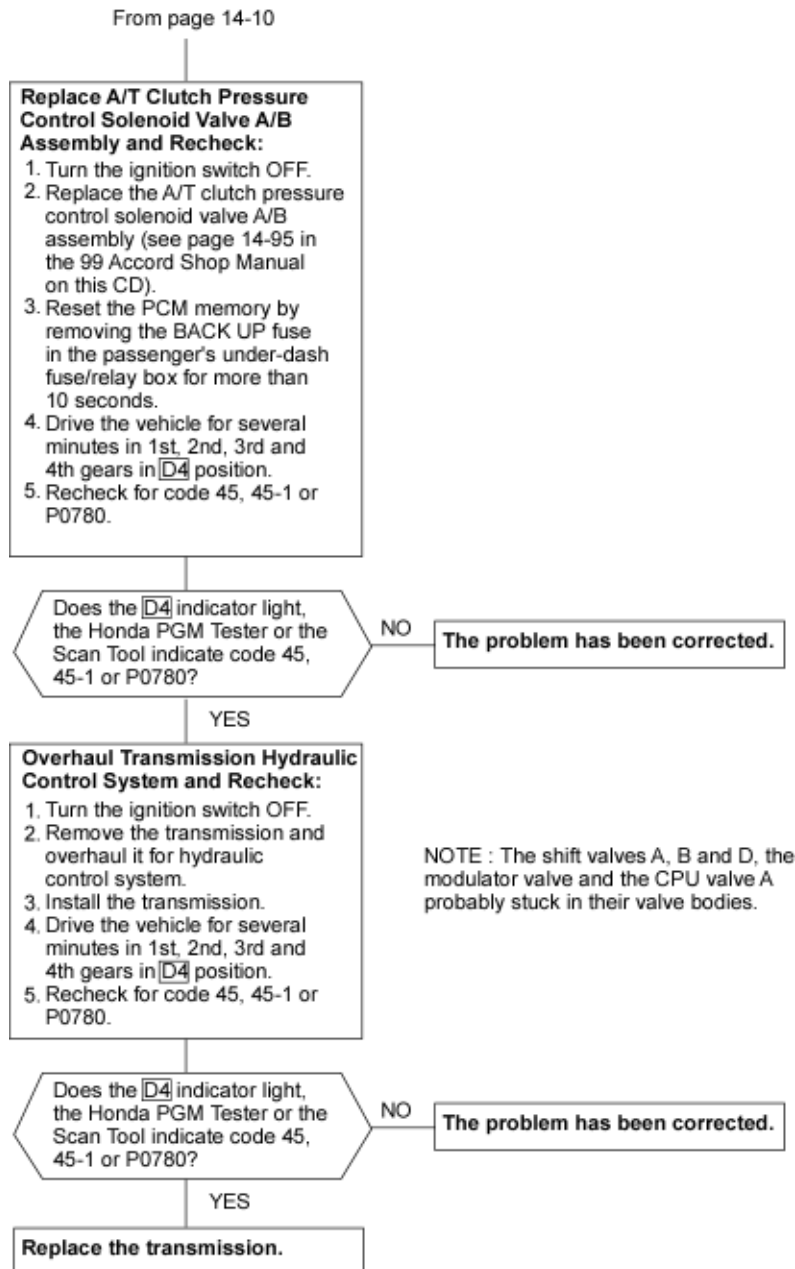
To go to the pages referenced on the picture above, click on the following:

(See Page 14-92)

Electrical Troubleshooting

14-11

Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for Shift Control Solenoid Valve A and A/T Clutch Pressure Control Solenoid Valves A and B (cont'd)



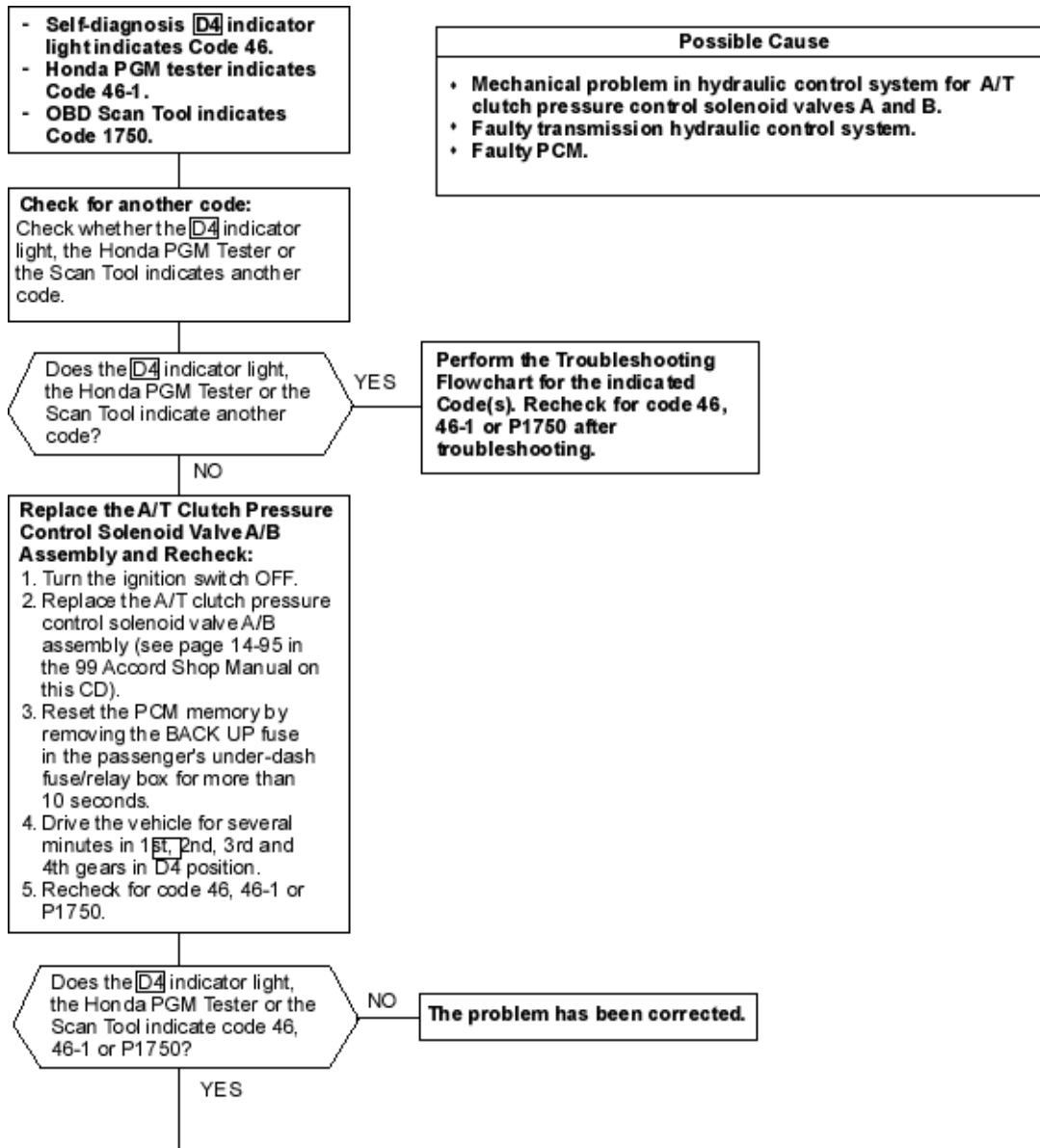
To go to the pages referenced on the picture above, click on the following:

(See Page 14-95)

Electrical Troubleshooting

14-12

Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for A/T Clutch Pressure Control Solenoid Valves A and B



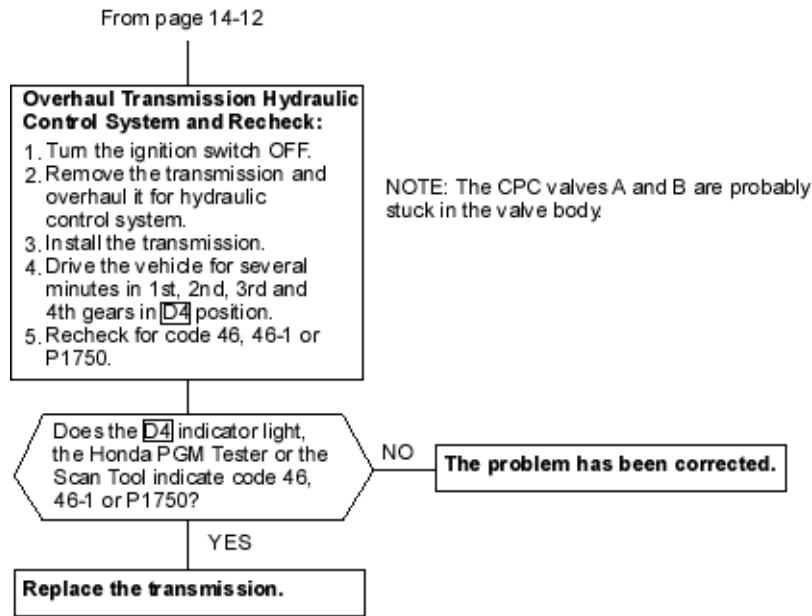
To page 14-13

To go to the pages referenced on the picture above, click on the following:
(See Page 14-95)

Electrical Troubleshooting

14-13

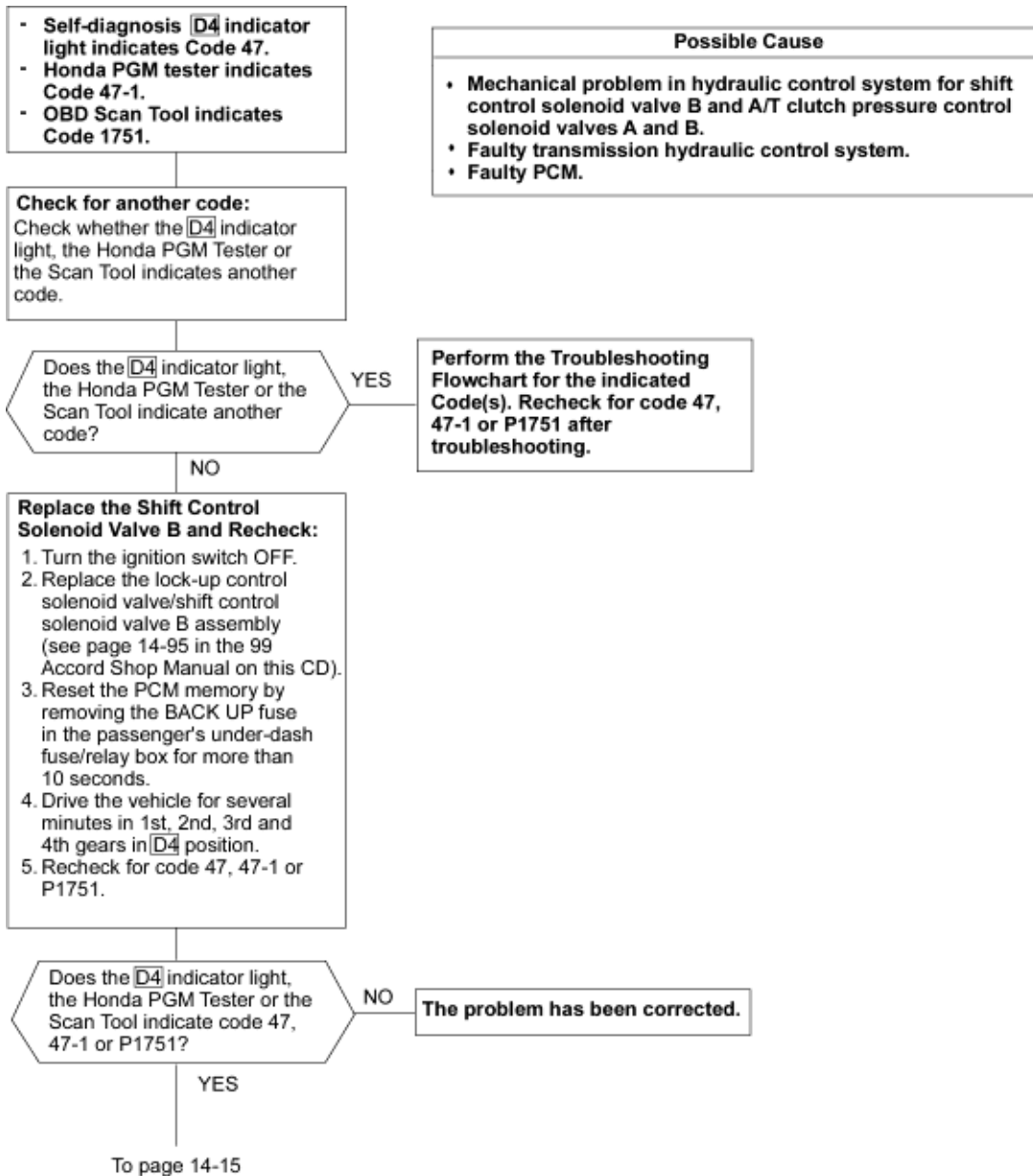
Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for A/T Clutch Pressure Control Solenoid Valves A and B (cont'd)



Electrical Troubleshooting

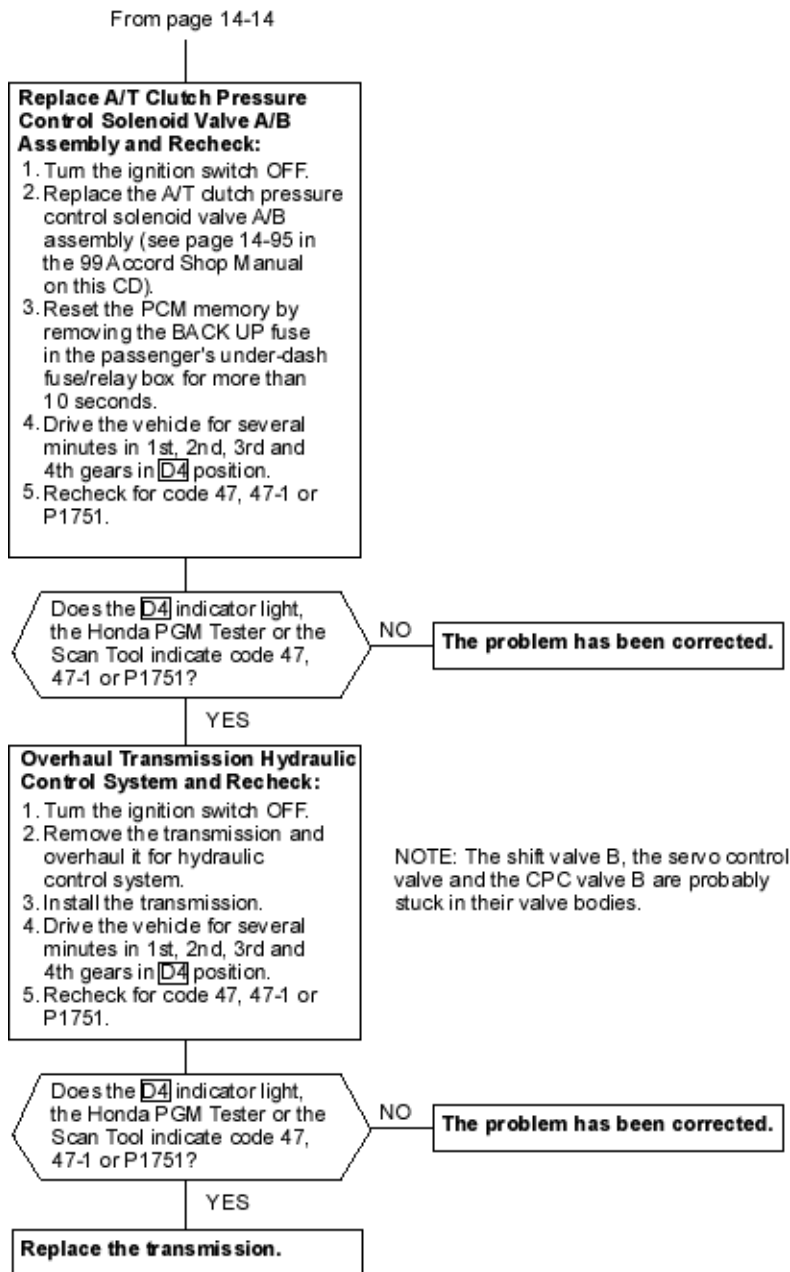
14-14

Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for Shift Control Solenoid Valve B and A/T Clutch Pressure Control Solenoid Valves A and B



To go to the pages referenced on the picture above, click on the following:
(See Page 14-95)

Troubleshooting Flowchart - Hydraulic Control System (F18B2, F20B6 and F23Z5 engine models) - Mechanical Problem in Hydraulic Control System for Shift Control Solenoid Valve B and A/T Clutch Pressure Control Solenoid Valves A and B (cont'd)



To go to the pages referenced on the picture above, click on the following:
(See Page 14-95)

F18B2 Engine (Except KY model) and F20B6 Engine **D4** Position:

Upshift

Throttle Opening	Unit of Speed	1st to 2nd	2nd to 3rd	3rd to 4th
Throttle position sensor voltage: 0.75V	mph	10-12	17-20	25-29
	km/h	16-20	28-32	40-46
Throttle position sensor voltage: 2.25V	mph	21-23	40-42	58-62
	km/h	33-37	64-68	94-100
Fully-opened throttle	mph	32-35	56-60	88-92
Throttle position sensor voltage: 4.5V	km/h	51-57	90-96	142-148

Downshift

Throttle Opening	Unit of Speed	4th to 3rd	3rd to 2nd	2nd to 1st
Throttle position sensor voltage: 0.75V	mph	16-18	-	5-7
	km/h	25-29	-	8-12
Fully-opened throttle	mph	83-87	50-54	24-28
Throttle position sensor voltage: 4.5V	km/h	134-140	81-87	39-45

Lock-up points

Throttle Opening	Unit of Speed	D4 Position and 4th gear in manual mode: Lock-up points		D3 Position: Lock-up points		2nd and 3rd gears in manual mode: Lock-up points	
		ON	OFF	ON	OFF	ON	OFF
Throttle position sensor voltage: 0.8V	mph	44-47	43-45	61-63	58-60	38-40	26-29
	km/h	71-75	69-73	98-102	93-97	61-65	42-46
Throttle position sensor voltage: 2.25V	mph	69-73	59-63	69-73	59-63	101-104	94-98
	km/h	111-117	95-101	111-117	95-101	162-168	152-158
Fully-opened throttle	mph	101-105	95-99	101-105	95-99	101-105	95-99
Throttle position sensor voltage: 4.5V	km/h	163-169	153-159	163-169	153-159	163-169	153-159

F18B2 Engine (KY model) D4 Position:

Upshift

Throttle Opening	Unit of Speed	1st to 2nd	2nd to 3rd	3rd to 4th
Throttle position sensor voltage: 0.75V	mph	10-12	17-20	25-29
	km/h	16-20	28-32	40-46
Throttle position sensor voltage: 2.25V	mph	21-23	40-42	58-62
	km/h	33-37	64-68	94-100
Fully-opened throttle	mph	32-35	61-65	91-95
Throttle position sensor voltage: 4.5V	km/h	53-59	98-104	147-153

Downshift

Throttle Opening	Unit of Speed	4th to 3rd	3rd to 2nd	2nd to 1st
Throttle position sensor voltage: 0.75V	mph	16-18	-	5-7
	km/h	25-29	-	8-12
Fully-opened throttle	mph	85-89	54-58	26-30
Throttle position sensor voltage: 4.5V	km/h	137-143	87-93	42-48

Lock-up points

Throttle Opening	Unit of Speed	D4 Position and 4th gear in manual mode: Lock-up points		D3 Position: Lock-up points		2nd and 3rd gears in manual mode: Lock-up points	
		ON	OFF	ON	OFF	ON	OFF
Throttle position sensor voltage: 0.8V	mph	48-50	47-49	61-63	58-60	38-40	26-29
	km/h	77-81	75-79	98-102	93-97	61-65	42-46
Throttle position sensor voltage: 2.25V	mph	69-73	59-63	69-73	59-63	101-104	94-98
	km/h	111-117	95-101	111-117	95-101	162-168	152-158
Fully-opened throttle	mph	101-105	95-99	101-105	95-99	101-105	95-99
Throttle position sensor voltage: 4.5V	km/h	163-169	153-159	163-169	153-159	163-169	153-159

F23Z5 Engine D4 Position:

Upshift

Throttle Opening	Unit of Speed	1st to 2nd	2nd to 3rd	3rd to 4th
Throttle position sensor voltage: 0.75V	mph	10-12	17-20	25-29
	km/h	16-20	28-32	40-46
Throttle position sensor voltage: 2.25V	mph	21-23	40-42	58-62
	km/h	33-37	64-68	94-100
Fully-opened throttle	mph	32-35	58-62	91-95
Throttle position sensor voltage: 4.5V	km/h	52-58	94-100	147-153

Downshift

Throttle Opening	Unit of Speed	4th to 3rd	3rd to 2nd	2nd to 1st
Throttle position sensor voltage: 0.75V	mph	16-18	-	5-7
	km/h	25-29	-	8-12
Fully-opened throttle	mph	86-89	52-56	25-29
Throttle position sensor voltage: 4.5V	km/h	138-144	84-90	40-46

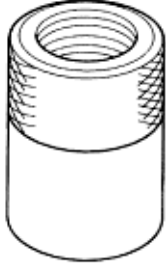
Lock-up points

Throttle Opening	Unit of Speed	D4 Position and 4th gear in manual mode: Lock-up points		D3 Position: Lock-up points		2nd and 3rd gears in manual mode: Lock-up points	
		ON	OFF	ON	OFF	ON	OFF
Throttle position sensor voltage: 0.8V	mph	46-48	45-47	61-63	58-60	38-40	26-29
	km/h	74-78	72-76	98-102	93-97	61-65	42-46
Throttle position sensor voltage: 2.25V	mph	69-73	59-63	69-73	59-63	101-104	94-98
	km/h	111-117	95-101	111-117	95-101	162-168	152-158
Fully-opened throttle	mph	101-105	95-99	101-105	95-99	101-105	95-99
Throttle position sensor voltage: 4.5V	km/h	163-169	153-159	163-169	153-159	163-169	153-159

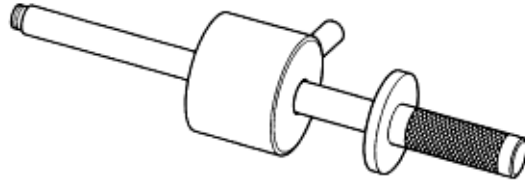
Special Tools

16-2

Ref. No.	Tool Number	Description	Qty	Remark
1	07XAC - 010100	Threaded Adapter, 22 x 1.5 mm	1	
2	07XAC - 010200	Threaded Adapter, 24 x 1.5 mm	1	
3	07936 - 5790001	Sliding Hammer Set	1	



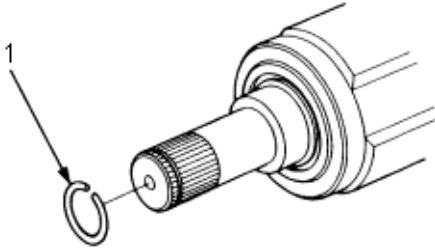
① ②



③

Inboard Joint Side

1. Remove the set ring from the inboard joint



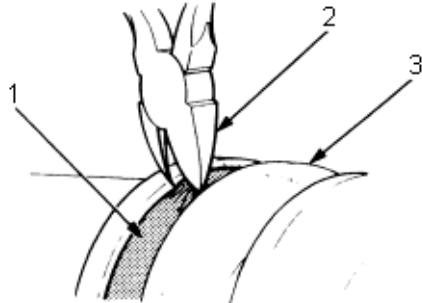
- 1, SET RING, Replace

2. Remove the boot bands. Take care not to damage the boot and dynamic damper.

NOTE:

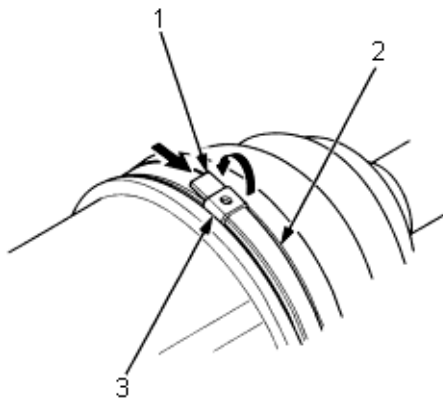
- ♦ If the boot band is a welded type, cut the boot band.
- ♦ If the boot band is a double loop type, raise the band bend.
- ♦ If the boot band is a low profile type, pinch and remove the boot band with a commercially available boot band pincer.
- ♦ If the boot band is an ear clamp type, lift up the three tabs with a screwdriver (**See Page 16-5**).

Welded Type:



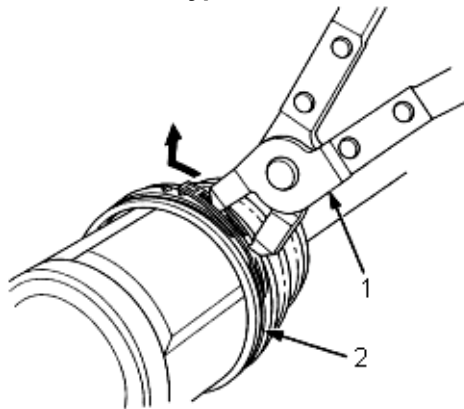
1. BOOT BAND, Replace
2. DIAGONAL COTTER
3. BOOT

Double Loop Type:



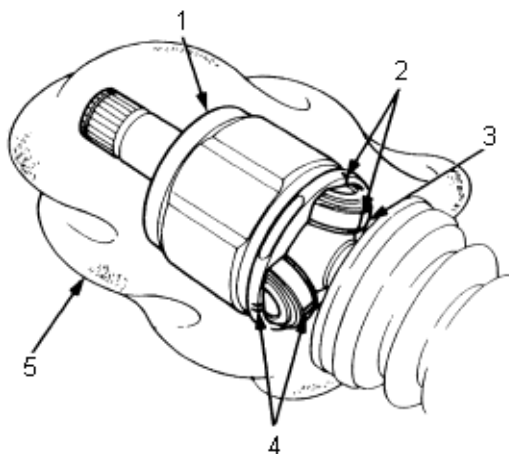
1. BAND END
2. BOOT BAND, Replace
3. CLIP

Low Profile Type:



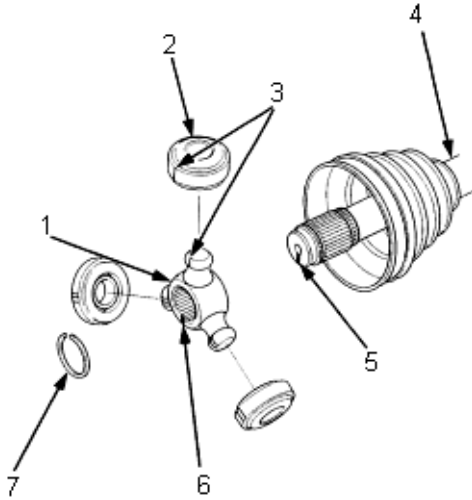
1. BOOT BAND PINCER
2. BOOT BAND, Replace

3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel. Be careful not to drop the rollers when separating them from the inboard joint.



1. INBOARD JOINT
2. Marks
3. ROLLER
4. Marks
5. SHOP TOWEL

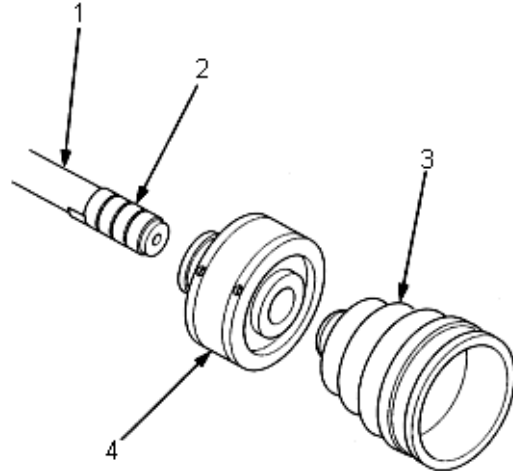
4. Make a mark on the rollers and spider to identify the locations of rollers on the spider, then remove the rollers.



- 1. SPIDER
- 2. ROLLER
- 3. Marks
- 4. DRIVESHAFT
- 5. Mark
- 6. Mark
- 7. CIRCLIP

5. Remove the circlip.
6. Mark the spider and driveshaft to identify the position of the spider on the shaft.
7. Remove the spider using.

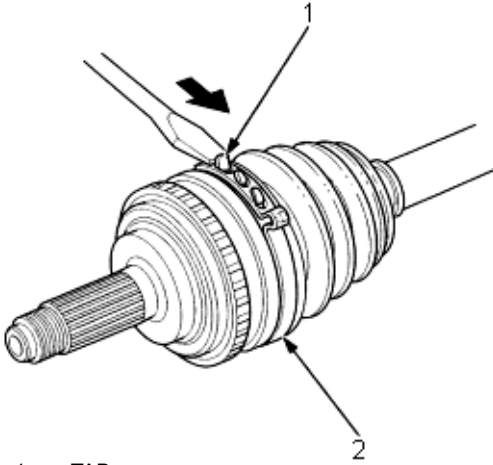
8. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boot and dynamic damper.



- 1. DRIVESHAFT
- 2. VINYL TAPE
- 3. INBOARD BOOT
- 4. DYNAMIC DAMPER
(L-4 engine A/T models left driveshaft and L-4 engine right driveshaft)

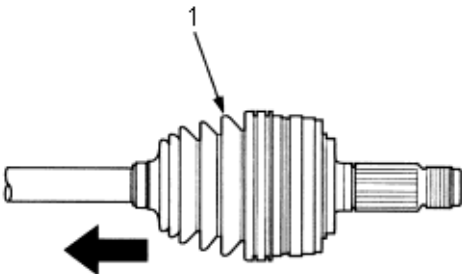
9. Remove the inboard boot and dynamic damper.

1. Pry up the three tabs with a screwdriver, then remove the boot bands. Take care not to damage the boot.



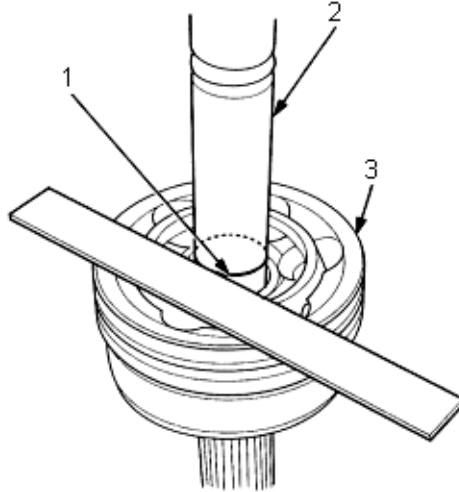
1. TAB
2. BOOT BAND, Replace

2. Slide the outboard boot to the inboard joint side. Take care no to damage the boot.



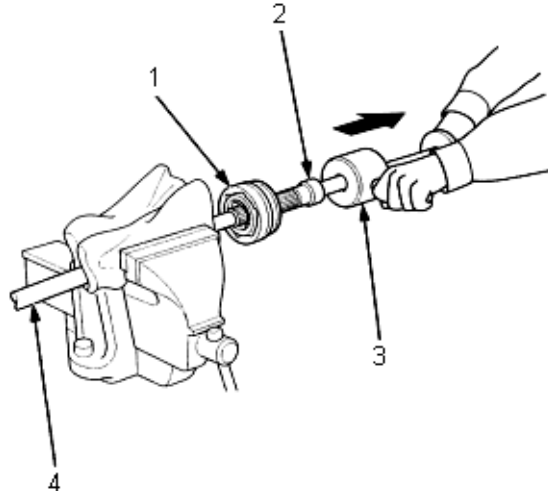
1. OUTBOARD BOOT

3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
4. Make a mark on the driveshaft at the same position of the outboard joint end.



1. PAINT MARK
2. DRIVE SHAFT
3. OUTBOARD JOINT END

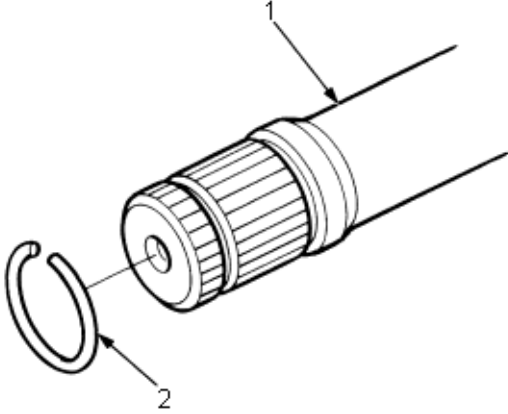
5. Carefully clamp the driveshaft in a vice.



1. OUTBOARD JOINT
2. D16B6, D16B7 engine model: THREADED ADAPTER, 22 x 1.5 mm, 07XAC-0010100
3. SLIDING HAMMER SET, 07936-5790001
4. DRIVESHAFT

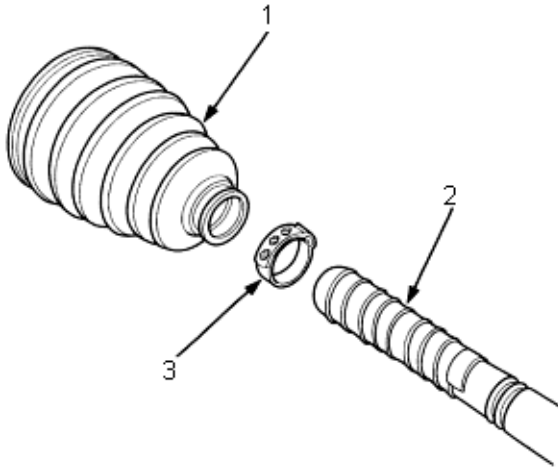
6. Remove the outboard joint using a special tool as shown.
7. Remove the driveshaft from the vice.

8. Remove the stopper ring from the driveshaft.



1. DRIVESHAFT
2. STOP RING, Replace

9. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boot.



1. OUTBOARD BOOT
2. VINYL TAPE
3. BOOT BAND, Replace

10. Remove the outboard boot. Take care not to damage the boot.
11. Remove the vinyl tape.

Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- ♦ Thoroughly pack both joints and boots with the joint grease included in the new driveshaft set.
- ♦ The uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the car clamp type boot band in the outboard joint boot set.

D16B6, D16B7 engine models:

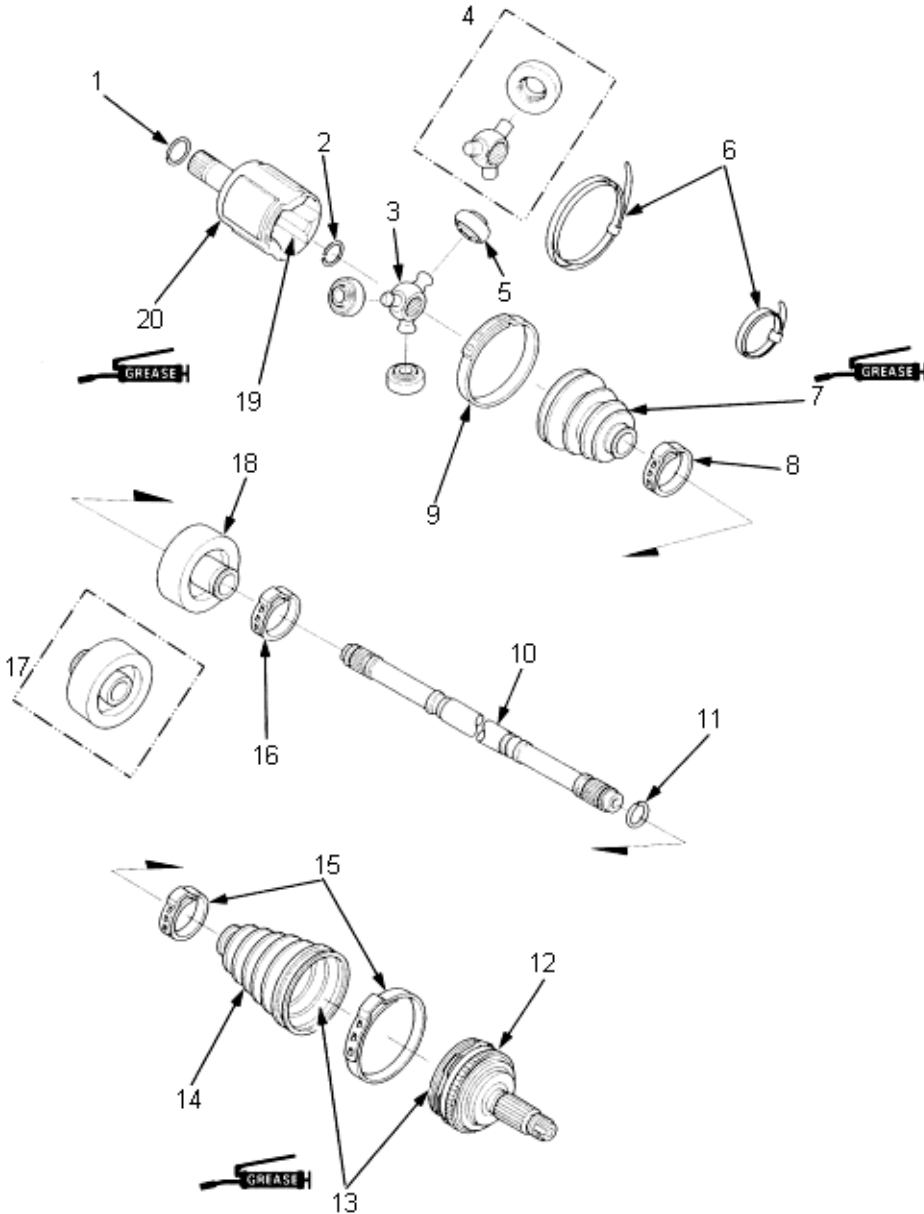
Grease quantity

Inboard joint:

Left side: 125.5-135.5 g (4.4-4.8 oz)

Right side: 120-130 g (4.2-4.6 oz)

Outboard joint: 85.5-103.5 g (3.0-3.7 oz)



1. SET RING, Replace
2. CIRCLIP
3. SPIDER
4. Left Driveshaft:
5. ROLLER
6. DOUBLE LOOP BAND (Replacement parts only), Replace
7. INBOARD BOOT
Pack cavity with grease
8. EAR CLAMP BAND, Replace
9. LOW PROFILE BAND, Replace
10. DRIVESHAFT
11. STOPPER RING
12. OUTBOARD JOINT
13. Pack cavity with grease
14. OUTBOARD BOOT (TPE)
15. BOOT BANDS, Replace
16. DYNAMIC DAMPER BAND, Replace
17. Left Driveshaft:
18. DYNAMIC DAMPER
19. Pack cavity with grease
20. INBOARD JOINT

Note these items during reassembly:

- ♦ Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- ♦ Thoroughly pack both joints and both joint boots with the joint grease included in the new driveshaft set.
- ♦ The uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the car clamp type boot band in the outboard joint boot set.

F18B2 F18B3 F20B6 H22A7, F23Z5 engine models:

Grease quantity

Inboard joint:

F18B2 F18B3, F20B6 engine models and F23Z5 engine A/T model: 120-130 g (4.2-4.6 oz)

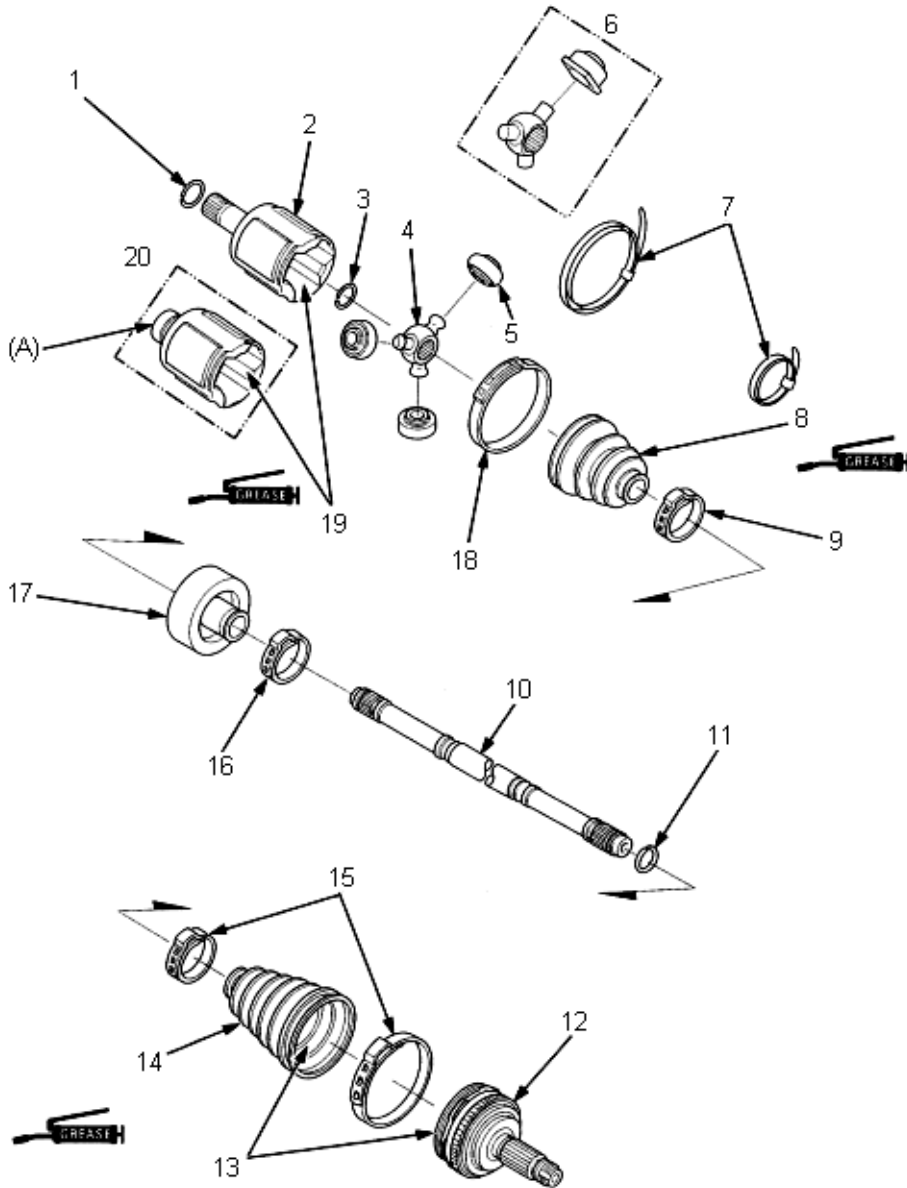
H22A7 engine model and F23Z5 M/T model: 130-140 g (4.6-4.9 oz)

Outboard joint

F18B2, F18B3, F20B6 engine models and F23Z5 engine A/T model: 72.4-90.5 g (2.6-3.2 oz)

H22A7 engine model and F23Z5 engine M/T model: 140-150 g (4.9-5.3 oz)

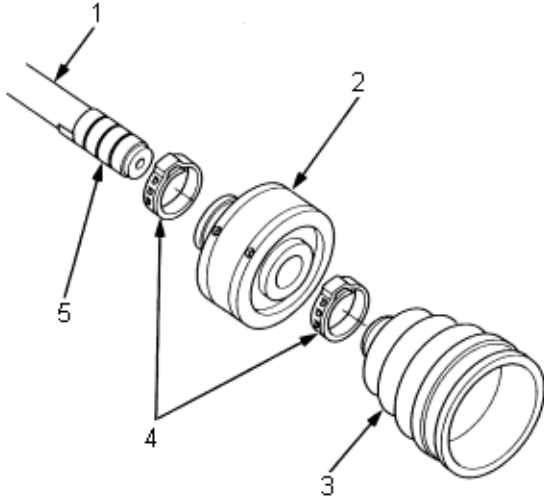
Inboard joint spline (A): 0.5-1 .0 g (0.018-0.035 oz).



1. SET RING, Replace
2. INBOARD JOINT
3. CIRCLIP
4. SPIDER
5. ROLLER
6. H22A7 engine model:
7. DOUBLE LOOP BAND (H22A7, F23Z5 engine M/T model and except H22A7, F23Z5 engine M/T model replacement parts only), Replace
8. INBOARD BOOT
Pack cavity with grease
9. EAR CLAMP BAND, (Except H22A7, F23Z5 engine M/T model), Replace
10. DRIVESHAFT
11. STOPPER RING
12. OUTBOARD JOINT
13. Pack cavity with grease
14. OUTBOARD BOOT (TPE)
15. BOOT BANDS, Replace
16. DYNAMIC DAMPER BAND, Replace
17. DYNAMIC DAMPER, Left
Driveshaft A/T:
18. LOW PROFILE BAND (Except H22A7, F23Z5 engine M/T model), Replace
19. Pack cavity with grease
20. Left Driveshaft:

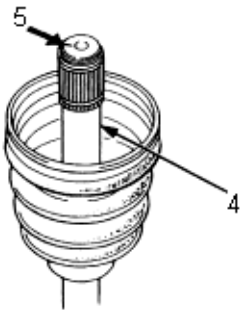
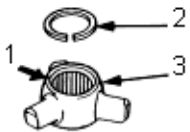
Inboard Joint Side:

1. Wrap the splines with vinyl tape prevent damage to the boot and dynamic damper



1. DRIVESHAFT
2. DYNAMIC DAMPER
3. INBOARD BOOT
4. EAR CLAMP BAND
5. VINYL TAPE

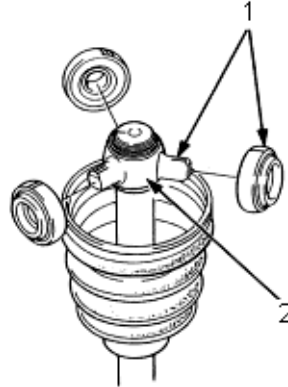
2. Install the dynamic damper and inboard drive shaft, then remove the vinyl tape. Take care not to damage the boot and dynamic damper.
3. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.



1. Mark
2. CIRCLIP
3. SPIDER
4. DRIVESHAFT
5. Mark

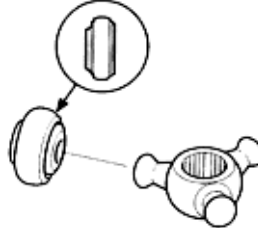
4. Fit the circlip into the driveshaft groove. Always rotate the circlip in its groove to be sure it is fully seated.

5. Fit the rollers to the spider with their high shoulders facing outward, and note these items;
 - ♦ Reinstall the rollers in their original positions on the spider by aligning the marks.
 - ♦ Hold the driveshaft pointed up to prevent the rollers from facing off.

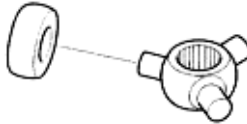


1. Marks
2. SPIDER

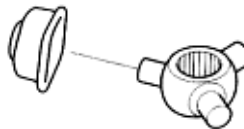
D16B6, D16B7 (Right driveshaft), F18B2, F18B3, F20B6, F23Z5 engine models:



D16B6, D16B7 (Left driveshaft) engine models:



H22A7 engine model:



6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity

Inboard joint:

D16B6, D16B7 engine models:

Left side: 125.5-135.5 g (4.4-4.8 oz)

Right side: 120-130 g (4.2-4.6 oz)

F18B2, F18B3, F20B6 engine models and F23Z5 engine A/T model:

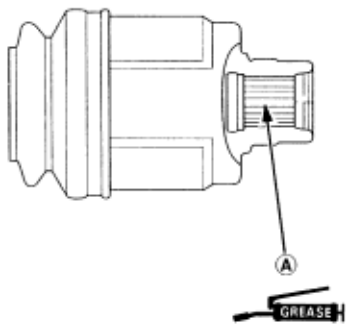
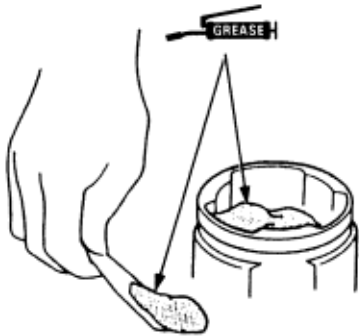
120-130 g (4.2-4.6 oz)

H22A7 engine model and F23Z5 engine M/T model:

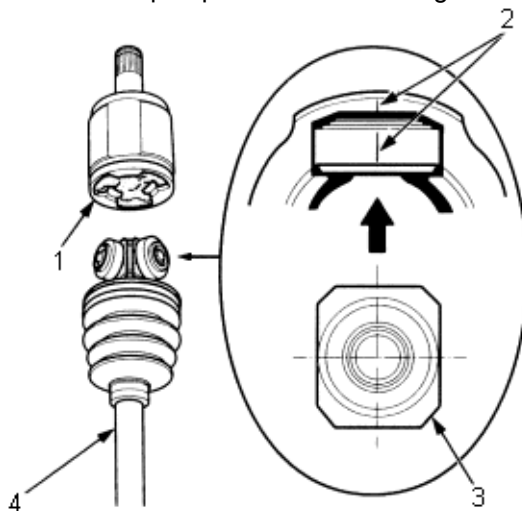
130-140g (4.6-4.9 oz)

Inboard joint spline A:

0.5-1.0g (0.018-0.035 oz)



7. Fit the inboard joint onto the driveshaft, and note these items;
- ♦ Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint and the rollers.
 - ♦ Hold the driveshaft so the inboard joint points up to prevent it from falling off.



- 1. INBOARD JOINT
- 2. Marks
- 3. HOLDER
- 4. DRIVESHAFT

8. Adjust the length of the driveshafts to the figure below, then adjust the boot to halfway between full compression and full extension. Make sure the ends of boots seat in the groove of the driveshaft and joint.

D16B6, D16B7 engine models:

Left: 802-807 mm (31.6-31.8 in)

Right: 523-528 mm (20.6-20.8 in)

F18B2, F18B3, F20B6 engine models:

Left: M/T: 476-481 mm (18.7-18.9 in)

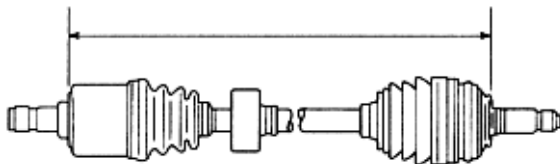
A/T: 842-847 mm (33.1-33.3 in)

Right: 485-490 mm (19.1-19.3 in)

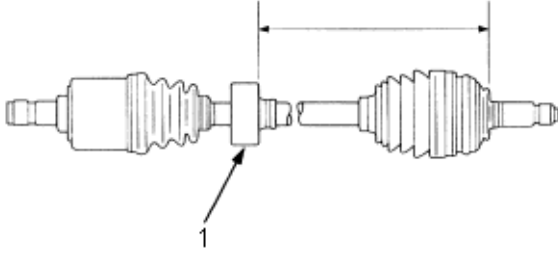
H22A7 engine model and F23Z5 engine M/T model:

Left: 478-483 mm (18.8-19.0 in)

Right: 485-490 mm (19.1-19.3 in)



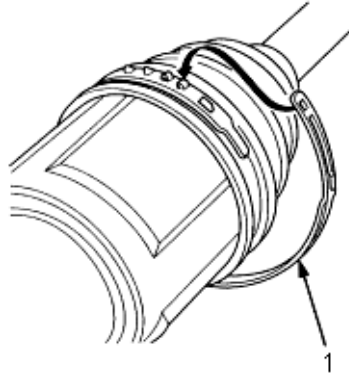
9. Position the dynamic damper as shown below.
D16B6, D16B7 engine model:
Left: 519,3-524 mm (20,4-20,6 in.)
Right: 279.7-284.7 mm (11.0-11.2 in)
F18B2, F18B3, F20B6 engine models and F23Z5 engine A/T model:
484 mm-488 mm (19.10-19.2 in) 19.2 in)



1. DYNAMIC DAMPER

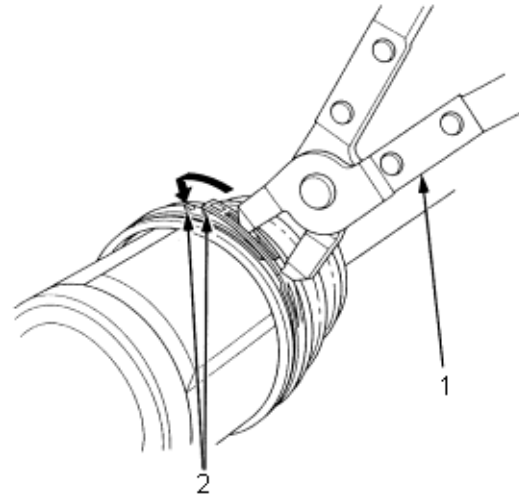
10. Install the bands.
- ♦ for the double loop type, go to step 13.
 - ♦ for the low profile type, go to step 11.
 - ♦ for the ear clamp type, go to step 22.

11. Install the new low profile band onto the boot and dynamic damper, then hook the tab of the band.



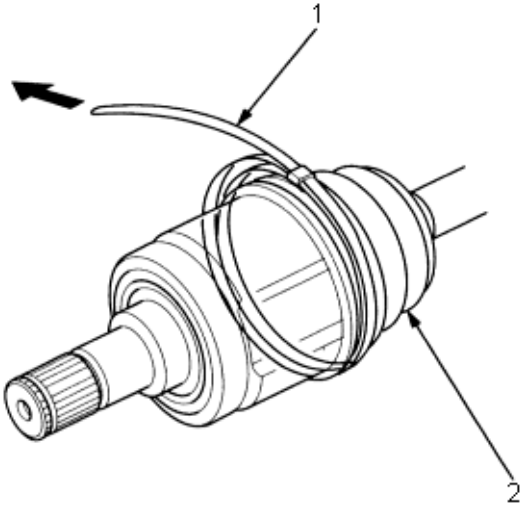
1. LOW PROFILE BAND, Replace

12. Close the hook portion of the band with a commercially available boot band pincers or equivalent, then hook the tabs of the band.



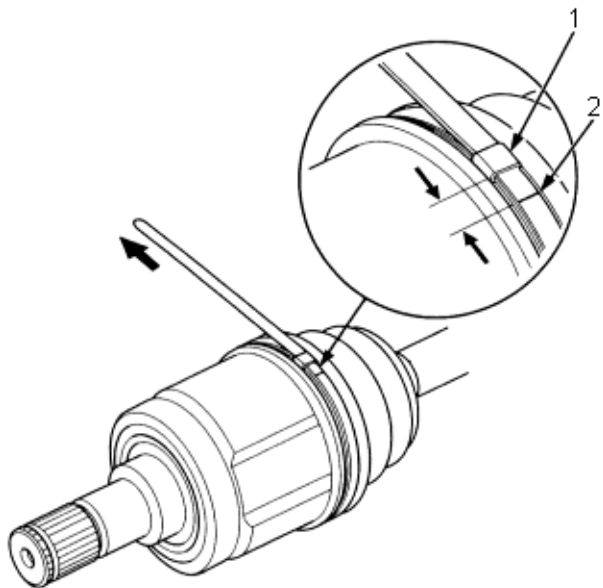
1. BOOT BAND PINCER
2. TABS

13. Set the new double loop band onto the boot with the band end towards the front of the vehicle.



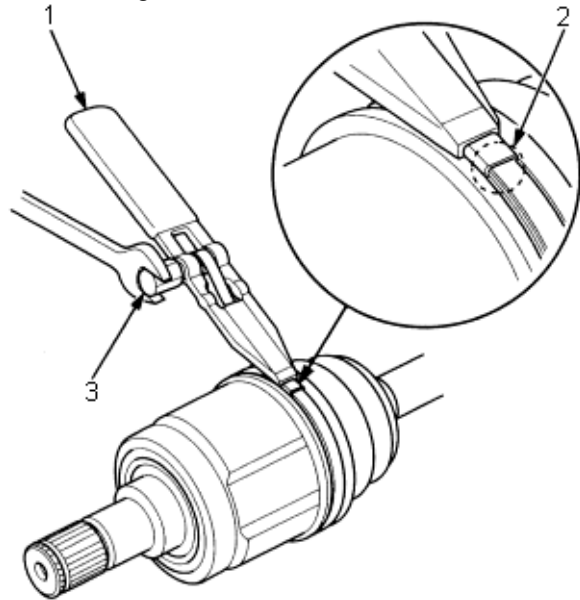
1. DOUBLE LOOP BAND, Replace

14. Pull up the slack in the band by hand.
15. Make a mark on the band 10-14 mm (0.4-0.6 in.) from the clip.



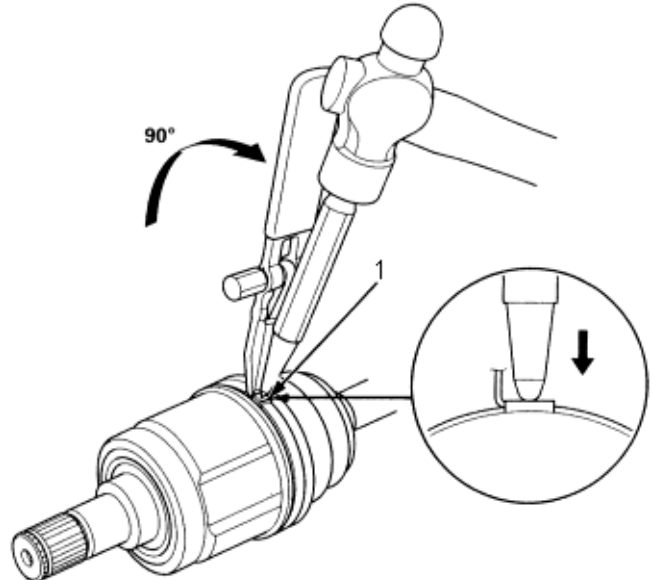
1. CLIP
2. Mark

16. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equivalent and into the slot on the winding mandrel.



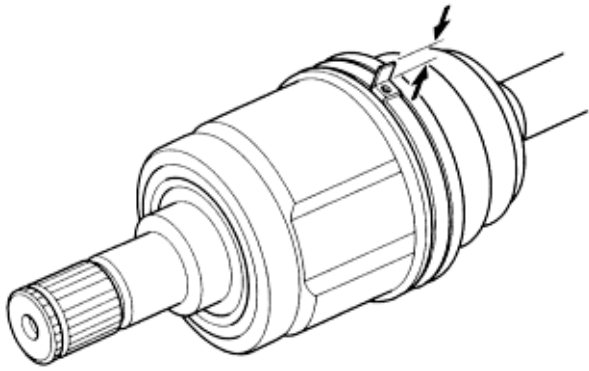
1. BOOT BAND TOOL, KD-3191 or equivalent
2. Mark spot
3. WINDING MANDREL

17. Place a wrench on the winding mandrel of the boot band tool and tighten the band until the marked spot on the band meets the edge of the clip.
18. Lift up the boot band tool to bend the free end of the band 90 degrees to the clip. Centre-punch the clip, then fold over remaining tail onto the clip.

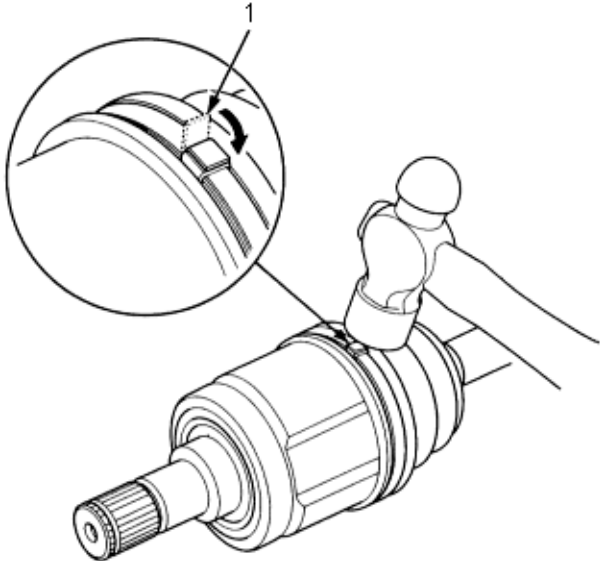


1. CLIP

19. Unwind the boot band tool and cut off the excess free end of the bend to leave a 5-10 mm (0.2-0.4 in.) tail protruding from the clip.



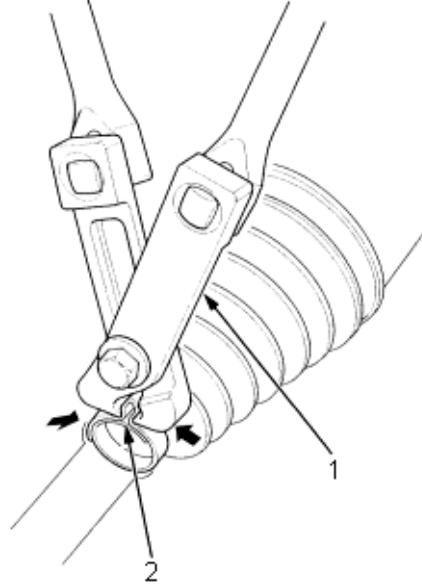
20. Bend the band end by tapping it down with a hammer.
NOTE:
- ♦ Make sure the band and clip do not interfere with anything and the band does not move.
 - ♦ Remove any grease remaining on the surrounding surfaces.



1. Band end

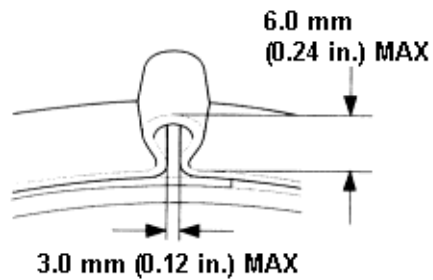
21. Install the boot band on the other end of the boot, repeat steps 11 through 20.

22. Close the ear portion of the band with a commercially available boot band pincers KENT-MOORE J-35910 or equivalent.

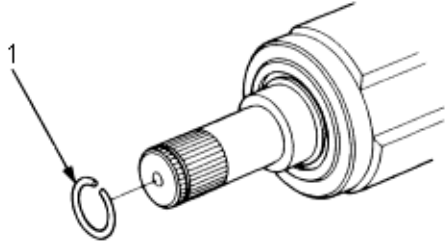


1. BOOT BAND PINCERS, KENT-MOORE J-35910 or equivalent
2. EAR PORTION

23. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.



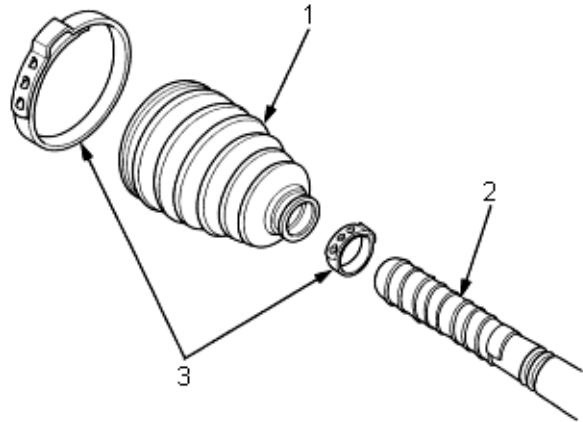
24. Install the new set ring.



1. SET RING, Replace

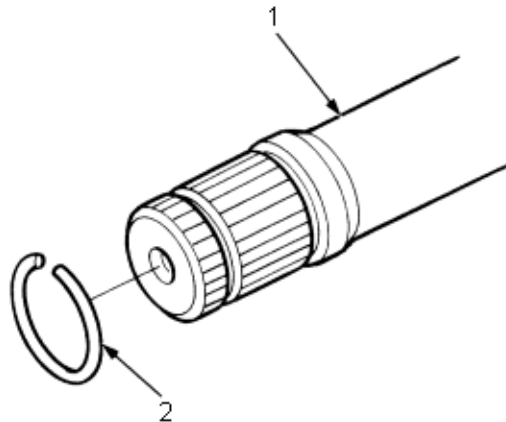
Outboard Joint Side:

1. Wrap the splines with vinyl tape to prevent damage to the boot.



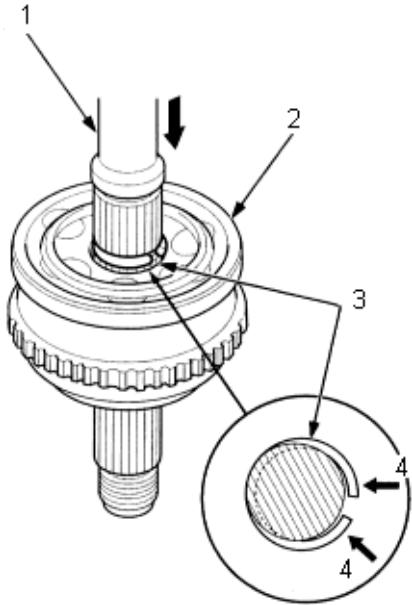
1. OUTBOARD BOOT
2. VINYL TAPE
3. EAR CLAMP BAND, Replace

2. Install the new ear clamp bands and outboard boot, then remove the vinyl tape. Take care not to damage the outboard boot.
3. Install the stopper ring into the driveshaft groove.

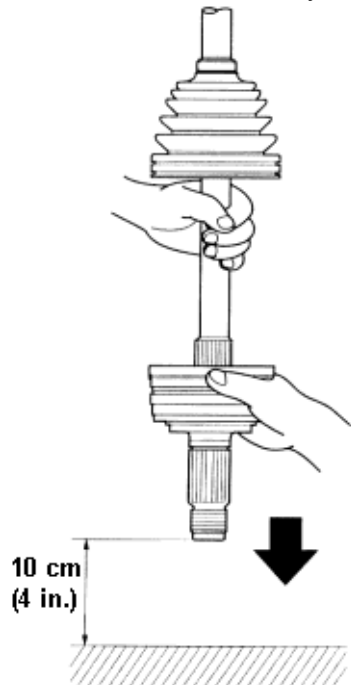


1. DRIVESHAFT
2. STOP RING, Replace

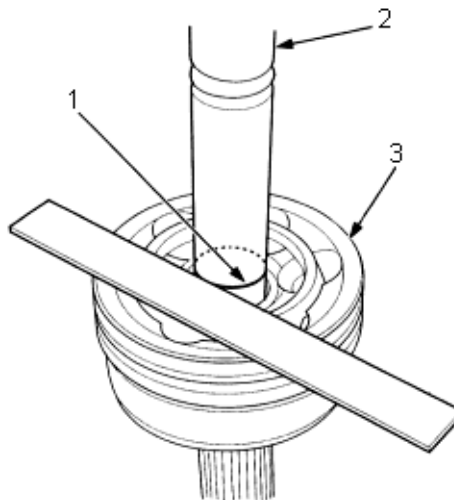
4. Insert the driveshaft in the outboard joint until the stopper ring is close on the joint.



5. To completely seat the outboard joint, pick up the driveshaft and joint, and let them fall from about 10 cm (4 inches) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.



6. Check the alignment of the paint mark with the outboard joint.



7. pack the outboard joint with the joint grease included in the new joint boot set.

Grease quantity

Outboard joint:

D16B6, D16B7 engine model:

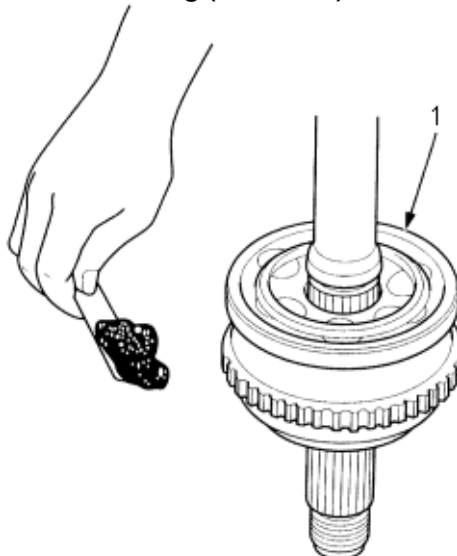
85.5-103.5 g (3.0-3.7 oz)

F18B2 F18B3, F20B6 engine models and F23Z5 engine A/T model:

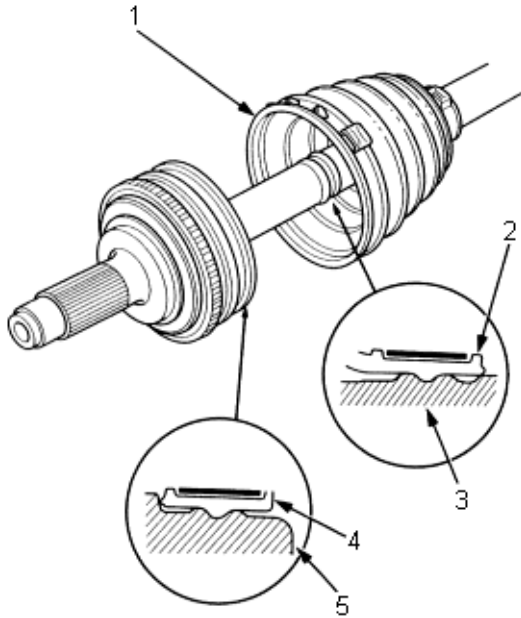
72.4-90.5 g (2.6-3.2 oz)

H22A7 engine model and F23Z5 M/T model:

140-150 g (4.9-5.3 oz)

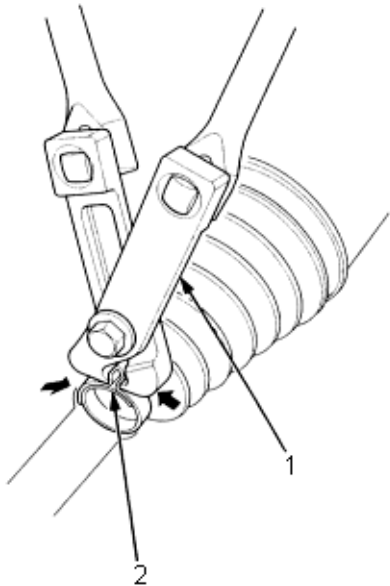


8. Fit the boot ends onto the driveshaft and outboard joint.



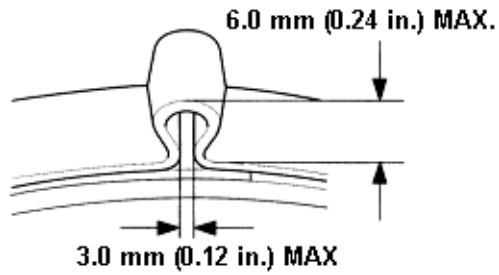
1. BOOT
2. BOOT
3. driveshaft
4. BOOT
5. OUTBOARD JOINT

9. Close the ear portion of the band with a commercially available boot band pincers.



1. BOOT BAND PINCERS, KENT-MOORE J-35910 or equivalent
2. EAR PORTION

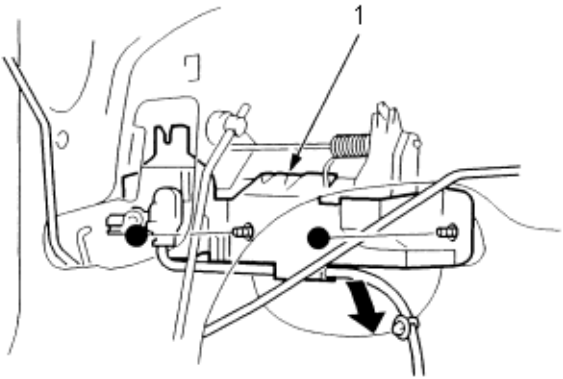
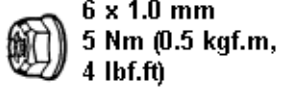
10. Check the clearance between the closed ear portion of the bands. If the clearance is not within the standard, close the ear portion of the bands further.



11. Repeat steps 9 and 10 for the band on the other end of the boot.

1. Raise the glass fully.
2. Remove:
 - ♦ Door panel
 - ♦ Plastic cover, as necessary
 - ♦ Panel bracket
 - ♦ Centre lower channel
 - ♦ Rod protector (with Super Locking)
 - ♦ Lock rod protector (without Super Locking)
3. Disconnect the cylinder rod, the cylinder switch connector and detach the harness clip.
4. Remove the self lock nuts securing the outer handle, then remove the outer handle protector.

●: Self Lock Nut Locations, 2



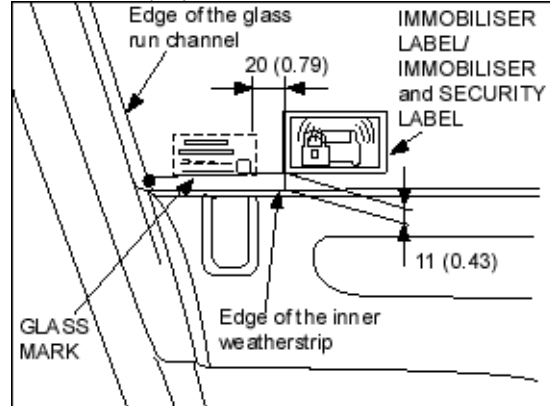
1. OUTER HANDLE PROTECTOR

5. If necessary, remove the lock cylinder, then separate the lock cylinder and cylinder switch.
6. Release the inner handle rod from the rod holder and remove the screws securing the latch.
7. Pull out the outer handle by releasing the hook. Pry the outer handle rod out of its joint using a diagonal cutter.
8. Replace the bushing on the outer handle.
9. Install in the reverse order of removal and note the following items:
 - ♦ Make sure the cylinder switch harness is routed properly.
 - ♦ Make sure the connector is plugged in properly and each rod is connected separately.
 - ♦ Make sure the door locks and opens properly.
 - ♦ Replace the self lock nuts with new ones.

For some models:

1. Raise the glass fully.
2. Apply the immobiliser label/immobiliser and security label on the inside face of the front door glass in parallel with the glass mark where shown.

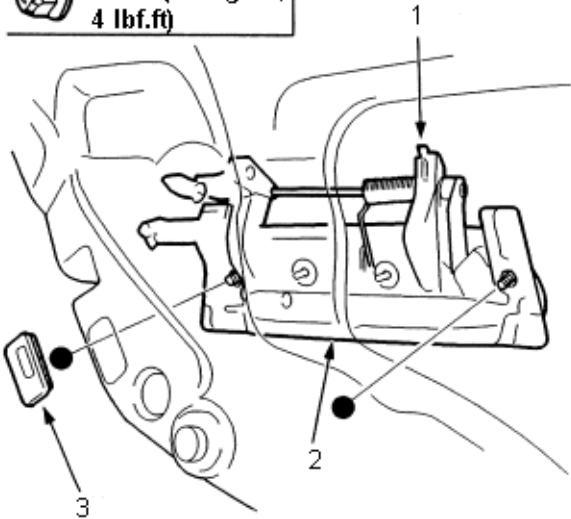
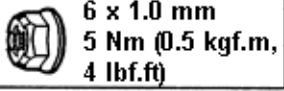
Unit: mm (in.)



Rear Door Outer Handle Replacement

1. Raise the glass fully.
2. Remove:
 - ♦ Door panel.
 - ♦ Plastic cover, as necessary.
 - ♦ Power door lock actuator (without Super Locking).
3. Disconnect the lock rod from the lock crank and release the inner handle rod and lock rod from the rod holder.
4. Without Super Locking: Remove the rod protector.
5. Remove the screws securing the latch, then move down.
6. Remove the child lock cap and remove the self lock nuts securing the outer handle protector and outer handle.

●: Self Lock Nut Locations, 2



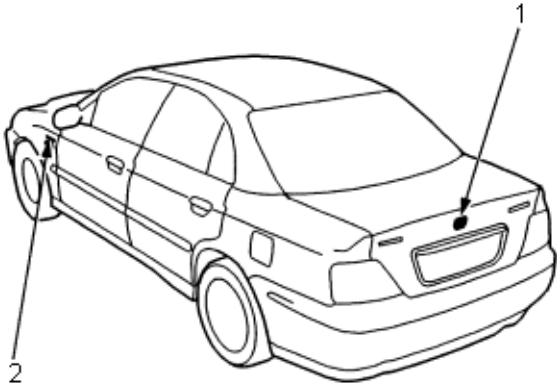
1. OUTER HANDLE
2. OUTER HANDLE PROTECTOR
3. CHILD LOCK CAP

7. Remove the outer handle protector from the outer handle.
8. Pull out the outer handle by releasing the hook.
9. Install in the reverse order of removal and note the following items:
 - ♦ Make sure the door locks and opens properly.
 - ♦ Replace the self lock nuts with new ones.

Apply the emblem where shown.

- NOTE:
- Before applying, clean the trunk lid and both fenders surface with a sponge dampened in alcohol.
 - After cleaning, keep oil, grease and water from getting on the surface.

Attachment Point (Reference):

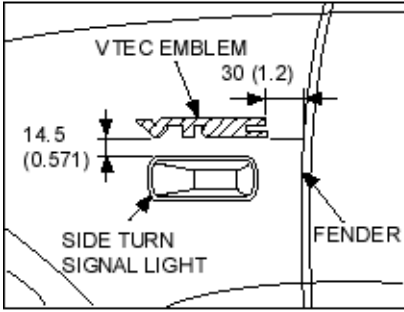


1. REAR "H" EMBLEM
2. VTEC EMBLEM (For some models)

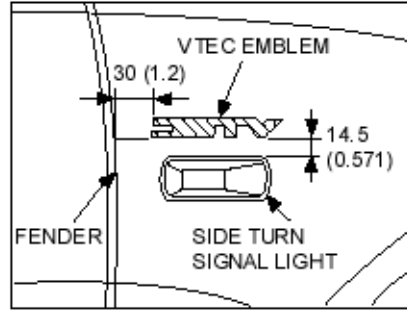
Unit: mm (in.)

Cross hatched area: **Adhesive tape (3M 4213, or equivalent)**

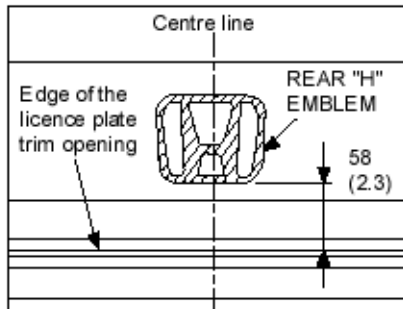
VTEC emblem (Left side)



VTEC emblem (Right side)



Rear "H" emblem



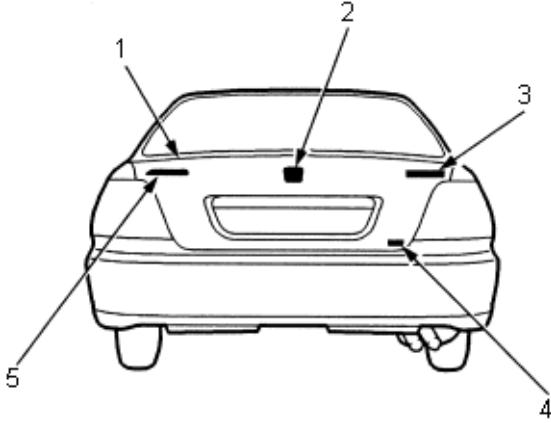
RHD models:

Apply the emblem where shown.

NOTE:

- Grade emblem B (SE/SE EXECUTIVE): Put the emblem with the application guide foam and application tape on the trunk lid as shown, then press the emblem into place. Remove the application tape and the application guide foam.
- Before applying, clean the trunk lid surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.

Attachment Point (Reference):

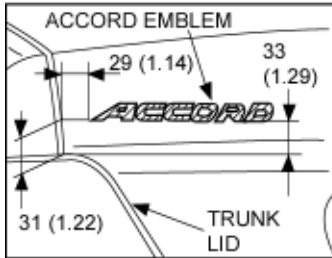


1. TRUNK LID
2. "H" EMBLEM
3. GRADE EMBLEM B
4. GRADE EMBLEM A
5. ACCORD EMBLEM

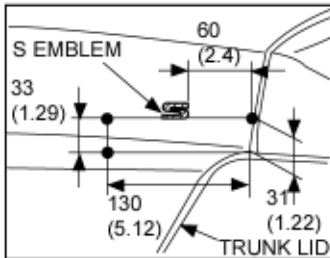
Unit: mm (in.)

Cross hatched area: **Adhesive tape (3M 4213, or equivalent)**

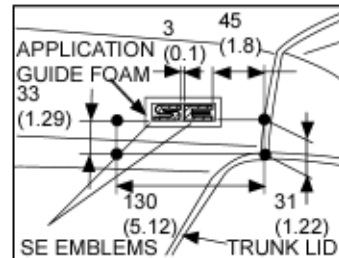
ACCORD emblem



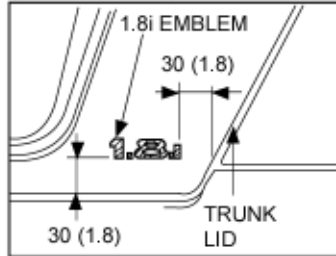
GRADE EMBLEM B (S)



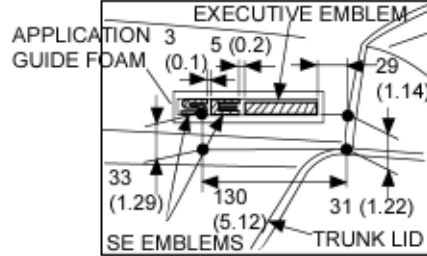
GRADE EMBLEM B (SE)

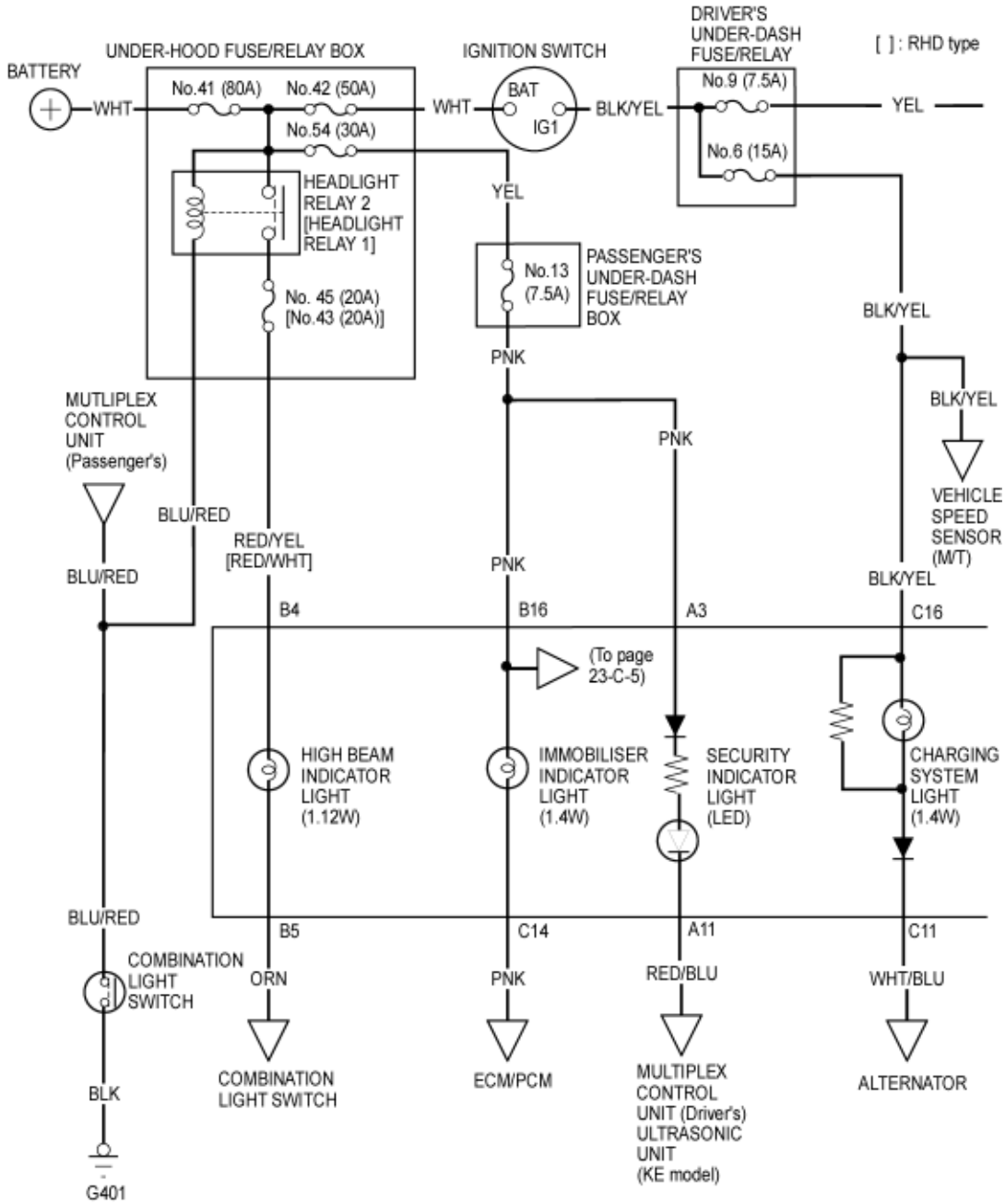


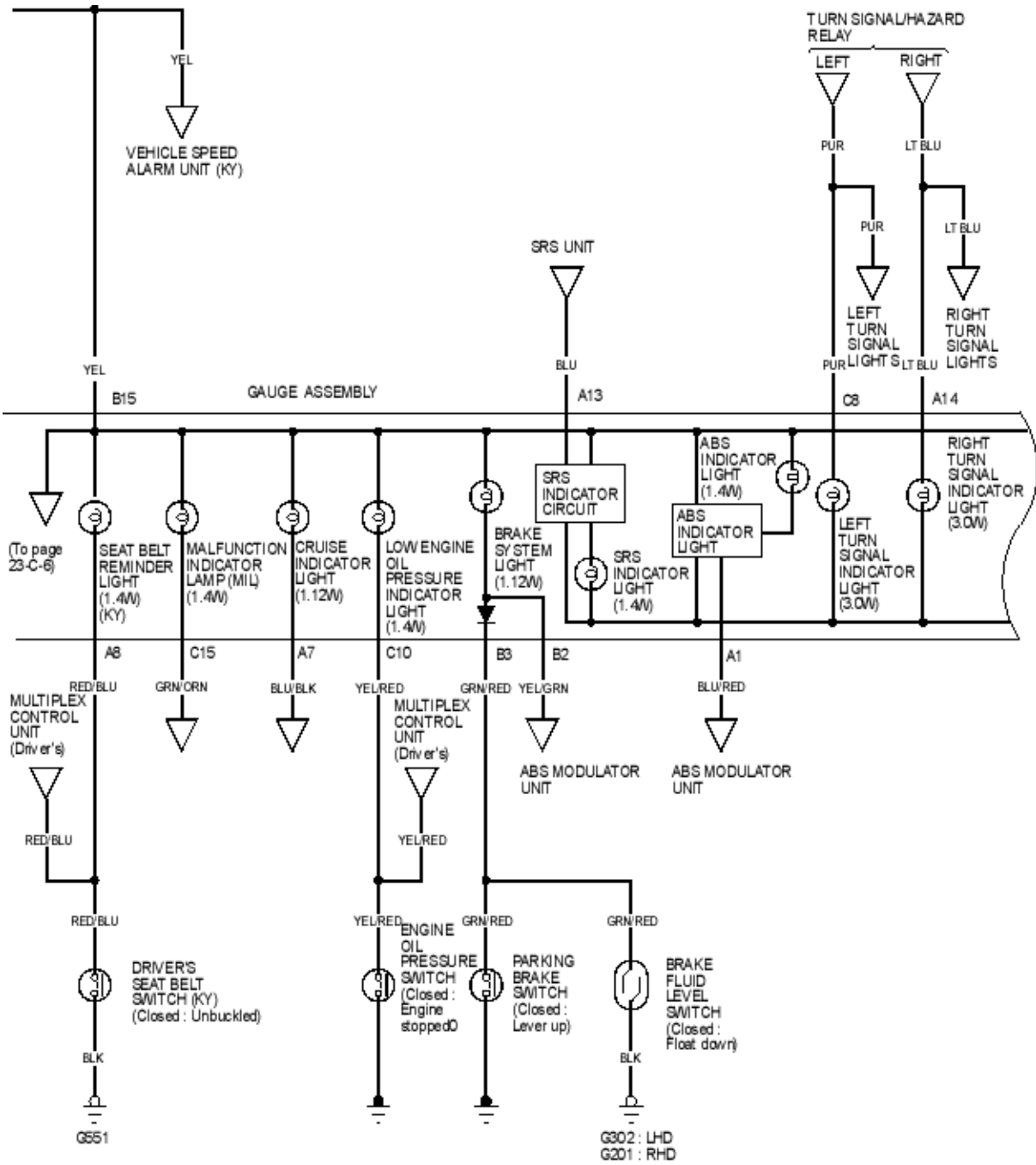
GRADE EMBLEM A
(1.6i/1.8i/2.0i/2.3i)

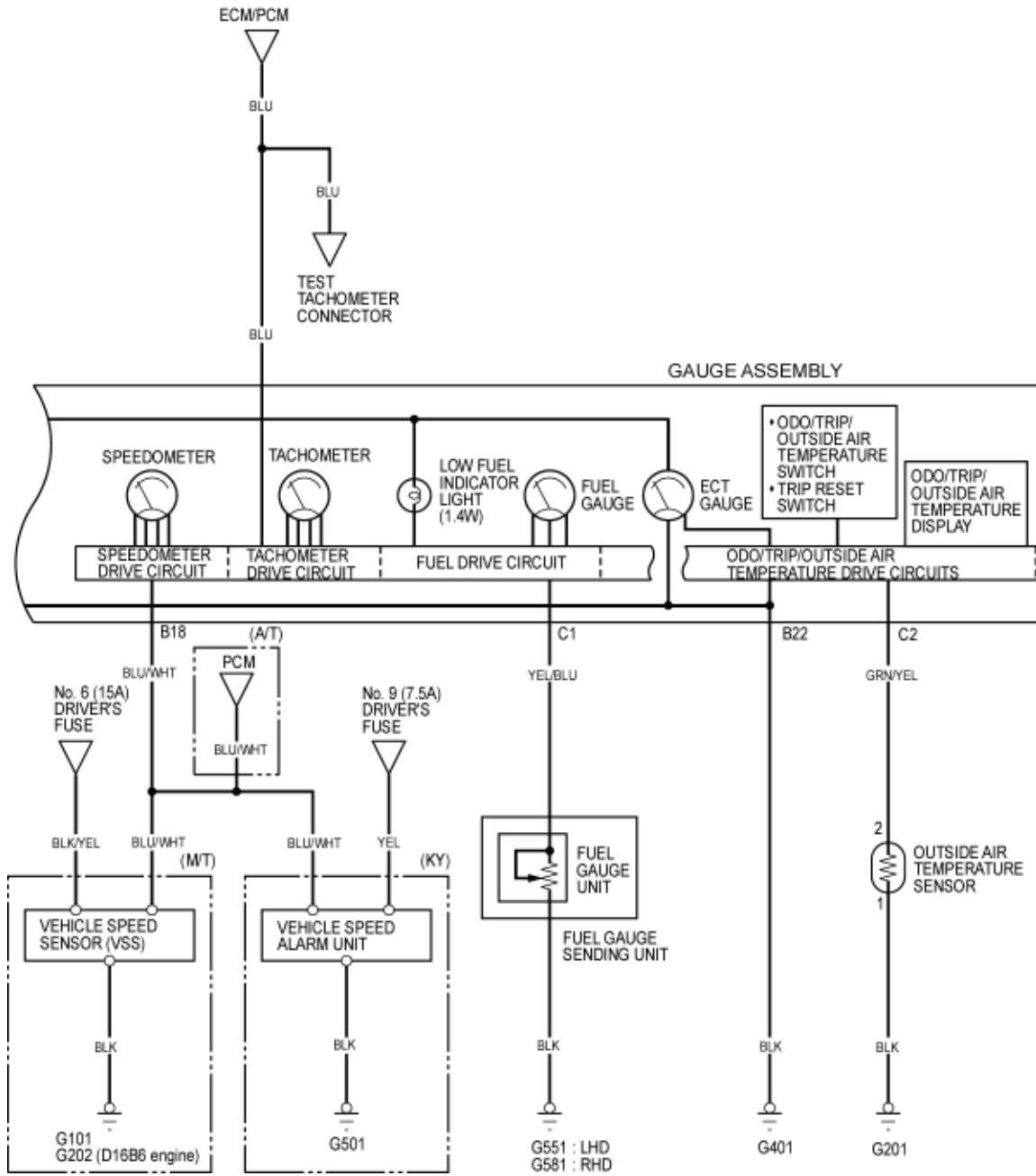


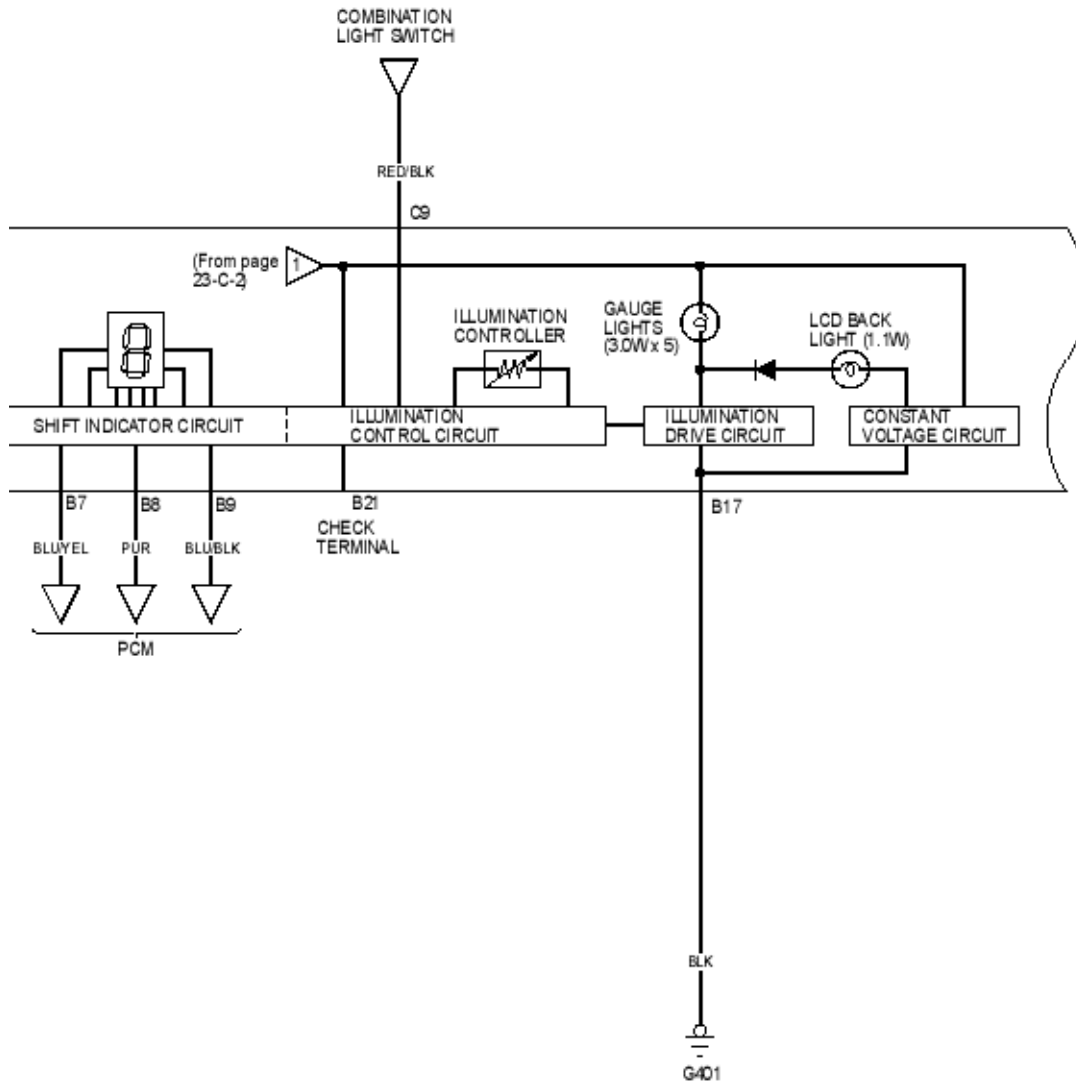
GRADE EMBLEM B
(SE EXECUTIVE)

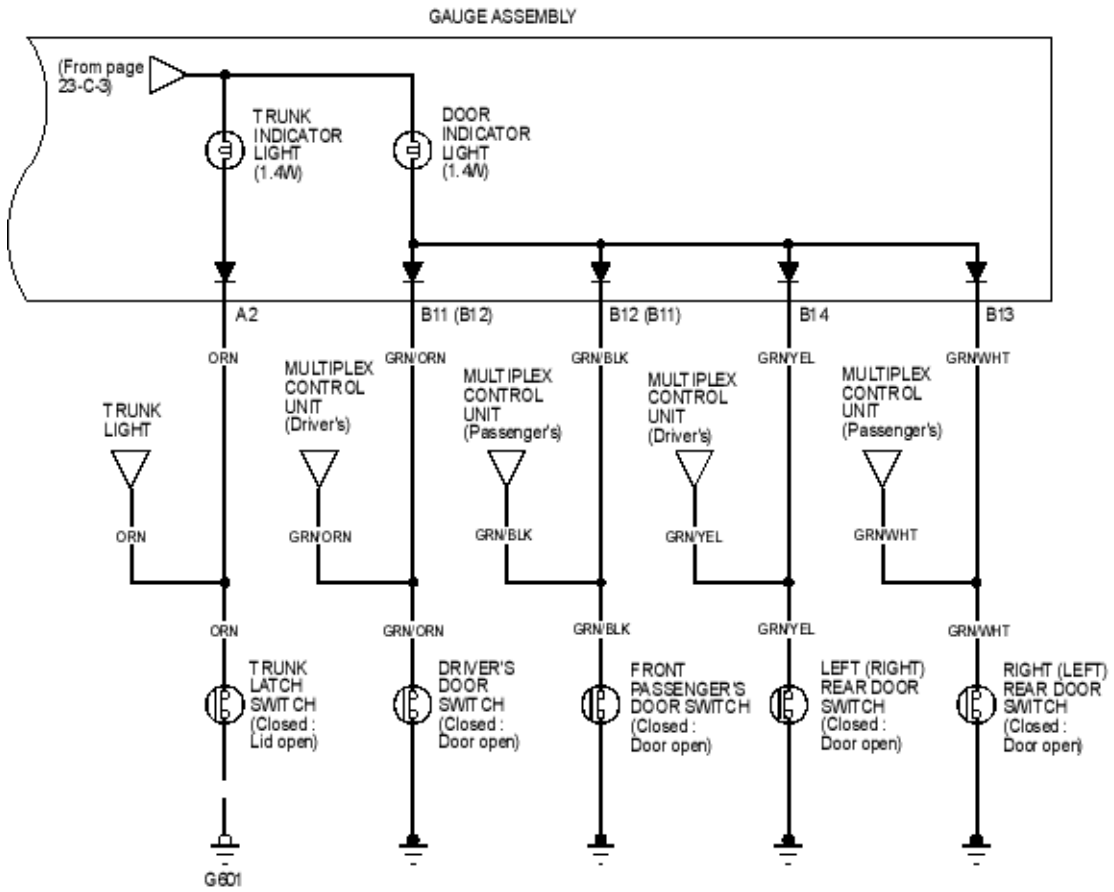


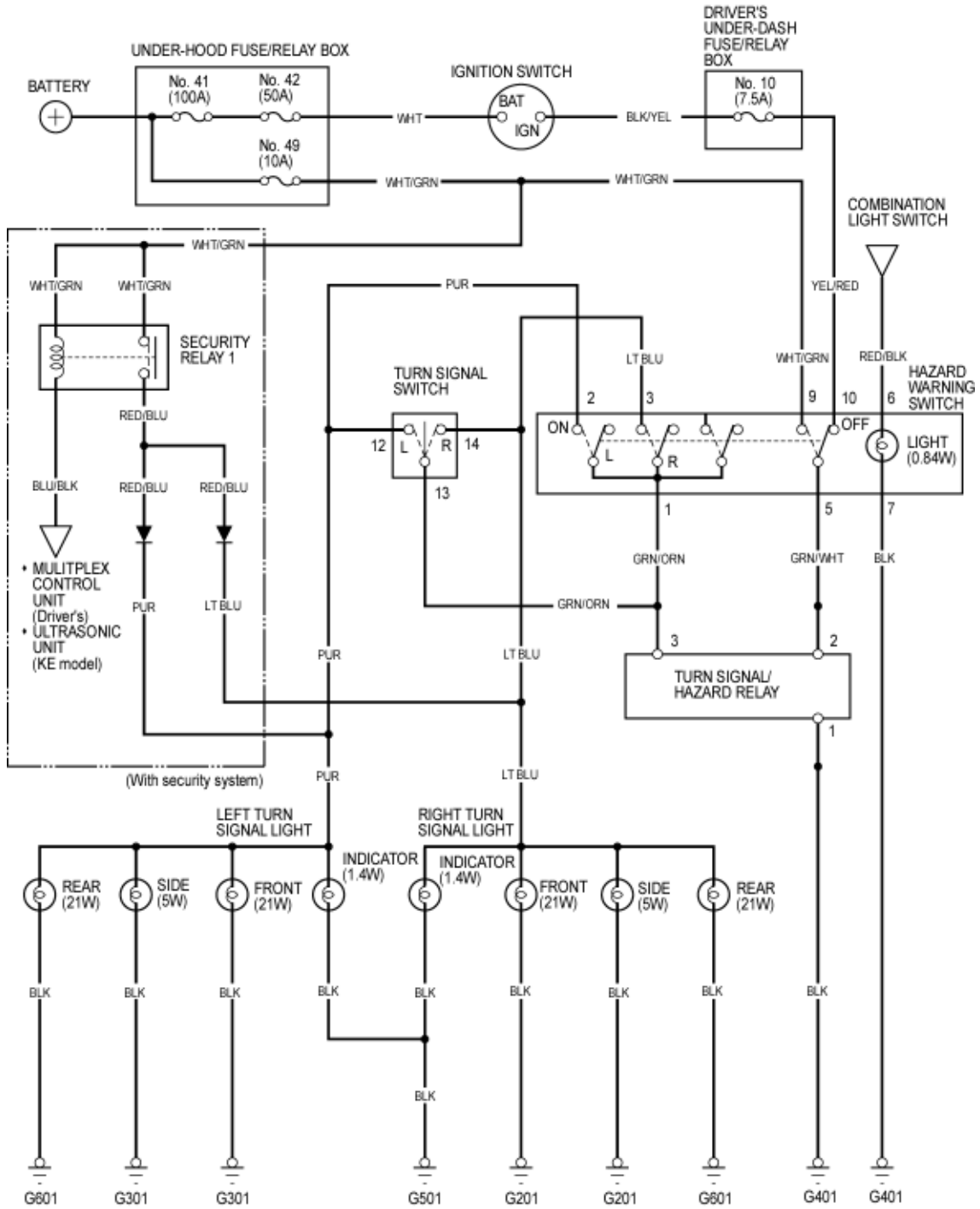




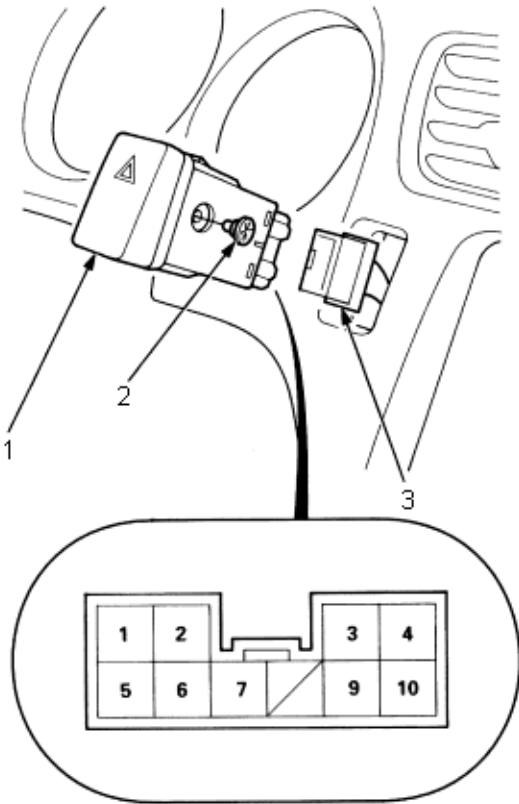








- Carefully pry the hazard warning switch out of the centre panel.
 NOTE: LHD type is shown, RHD type is similar.

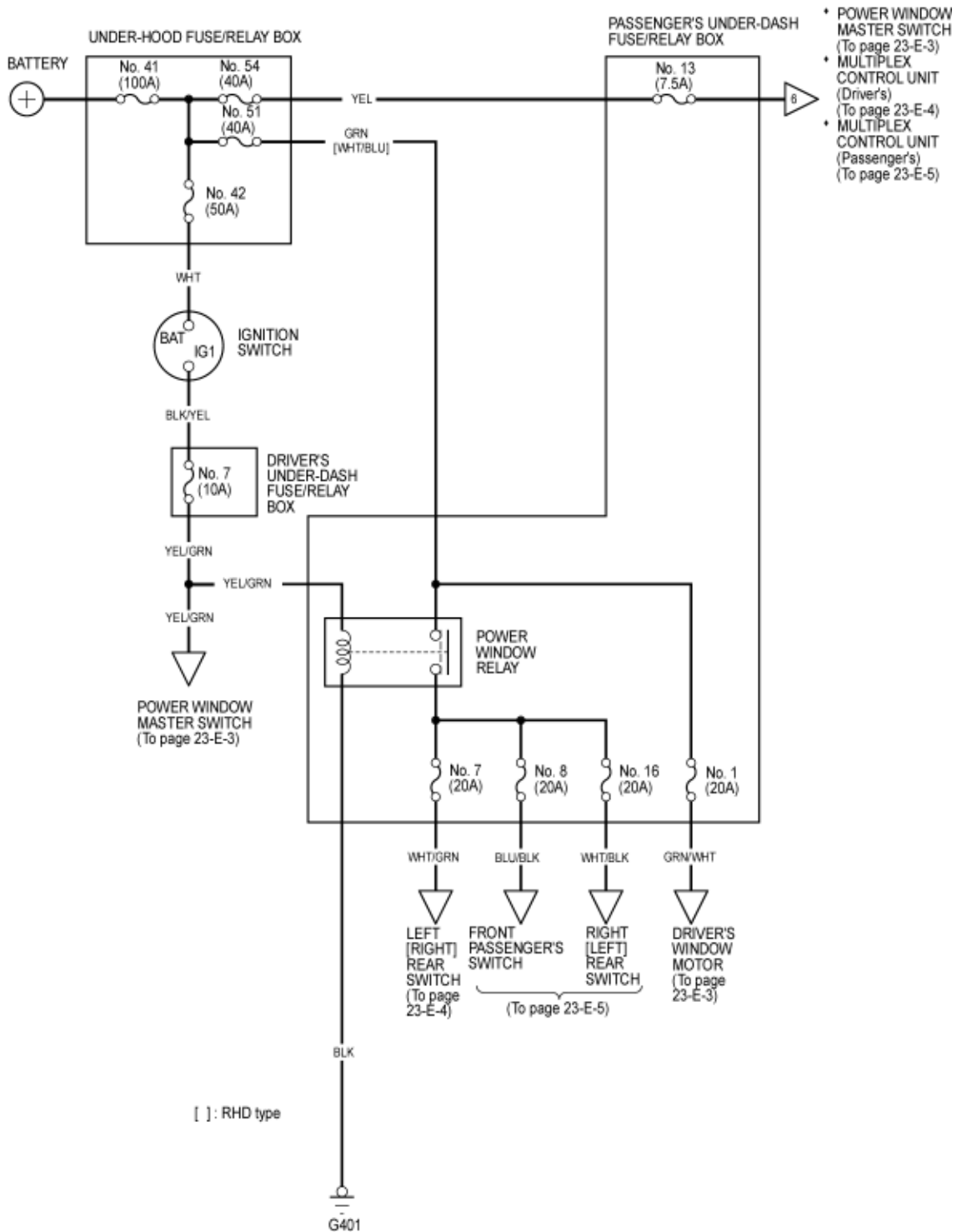


Terminal side of male terminals

- HAZARD WARNING SWITCH
 - BULB (0.84W)
 - 10P CONNECTOR
- Disconnect the 10P connector from the hazard warning switch.
 - Check for continuity between the terminals in each switch position according to the table.

Terminal Position	6	7	1	2	3	4 (*)	5	9	10
OFF	○	○	○				○	○	
ON	○	○	○	○	○	○	○	○	

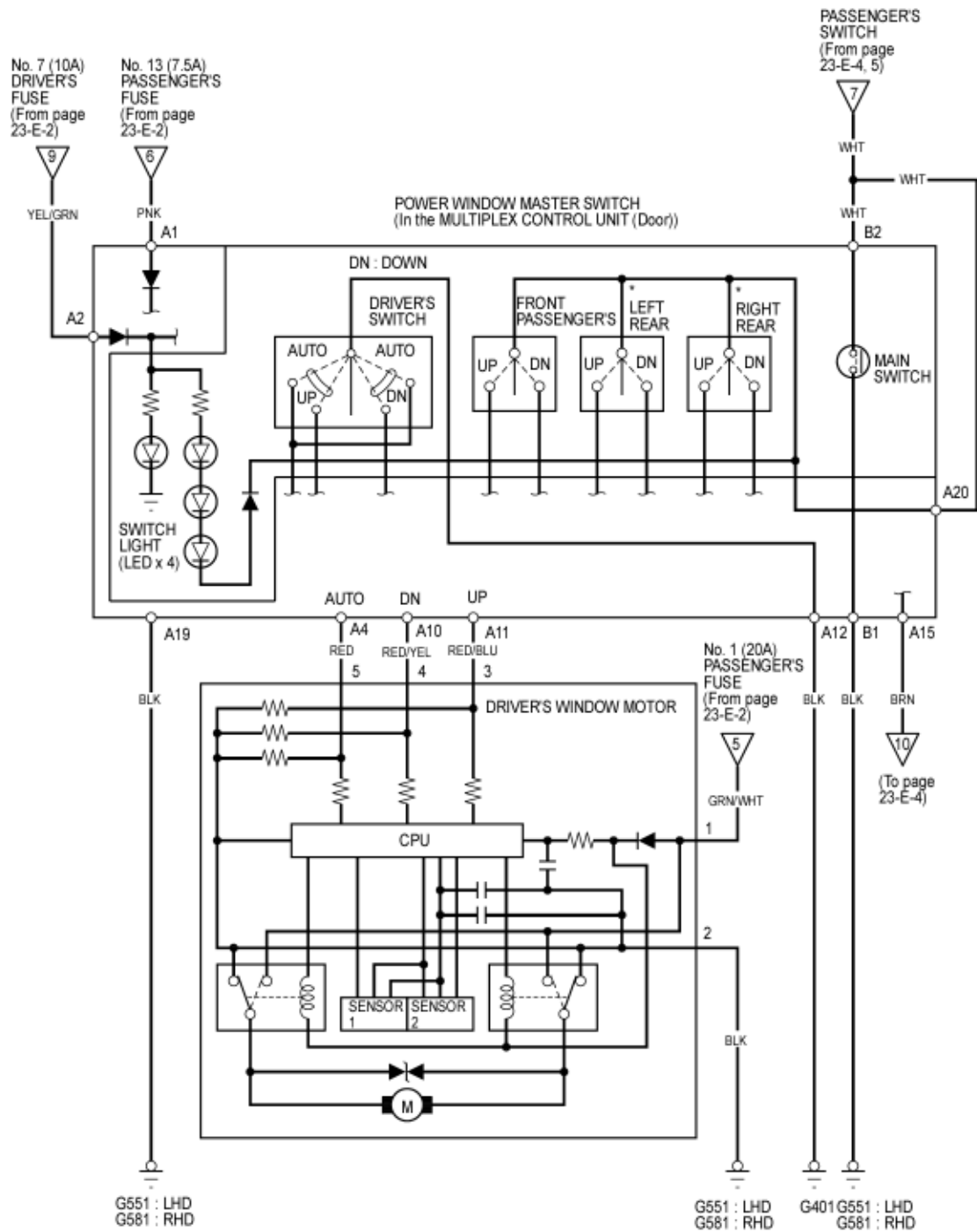
*: Not used



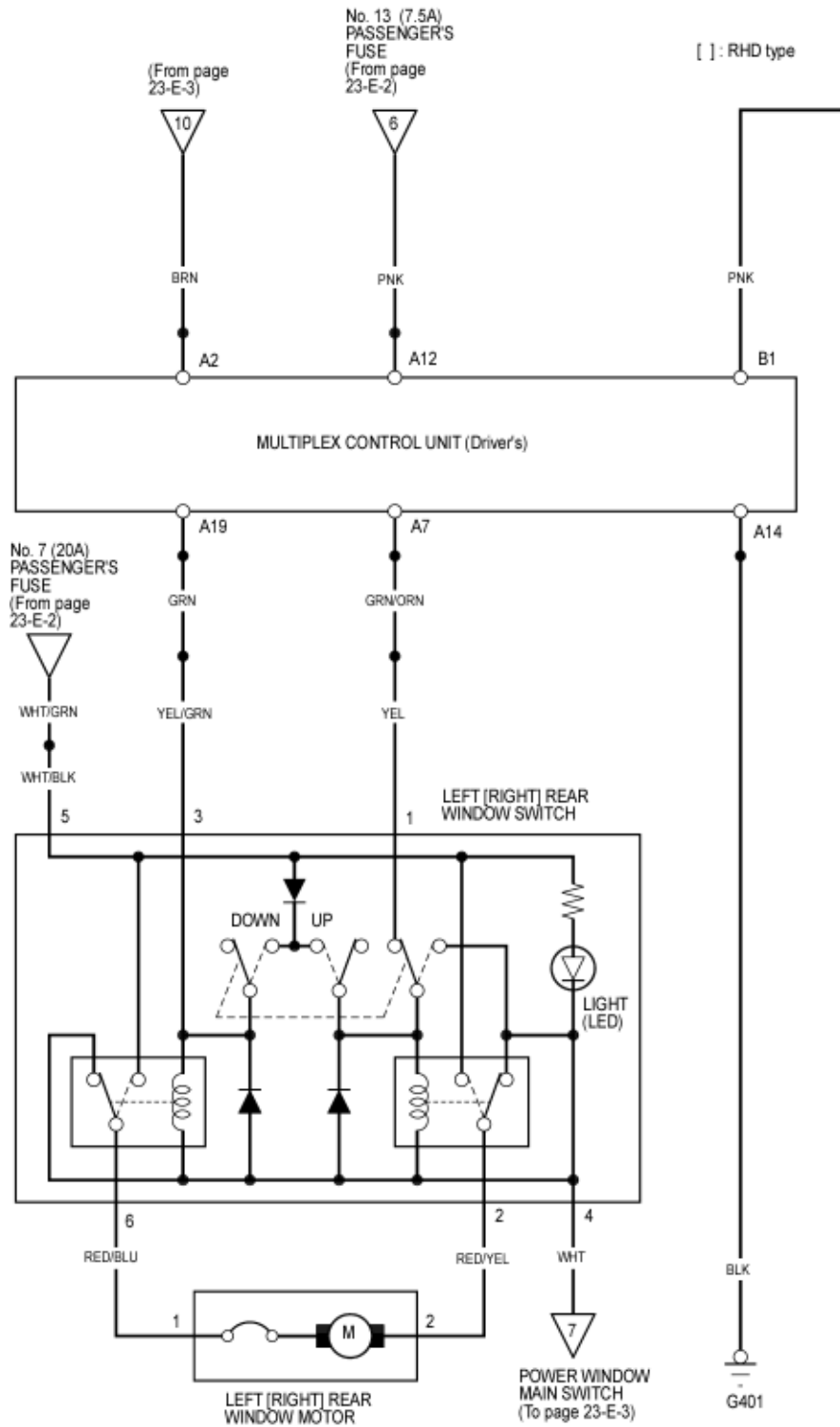
- POWER WINDOW MASTER SWITCH (To page 23-E-3)
- MULTIPLEX CONTROL UNIT (Driver's) (To page 23-E-4)
- MULTIPLEX CONTROL UNIT (Passenger's) (To page 23-E-5)

To go to the pages referenced on the diagram above, click on the following:
[\(See Page 23-E-3\)](#)
[\(See Page 23-E-4\)](#)
[\(See Page 23-E-5\)](#)

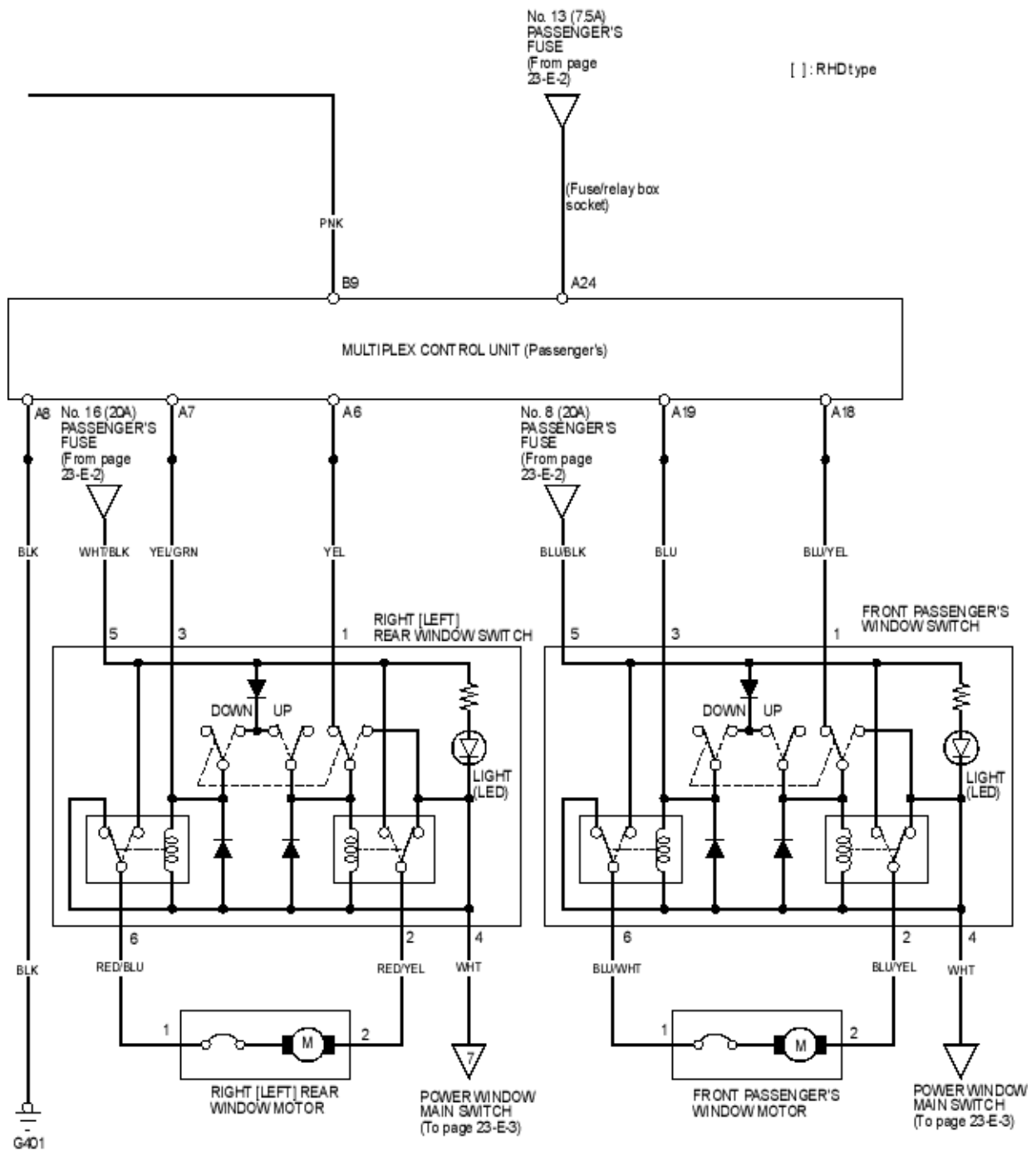
* : With rear power window



To go to the pages referenced on the diagram above,
click on the following:
(See Page 23-E-4)



To go to the pages referenced on the diagram above,
 click on the following:
 (See Page 23-E-3)



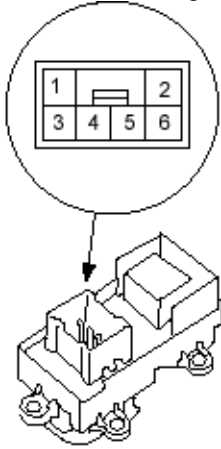
To go to the pages referenced on the diagram above,
 click on the following:
 (See Page 23-E-3)

Power Windows

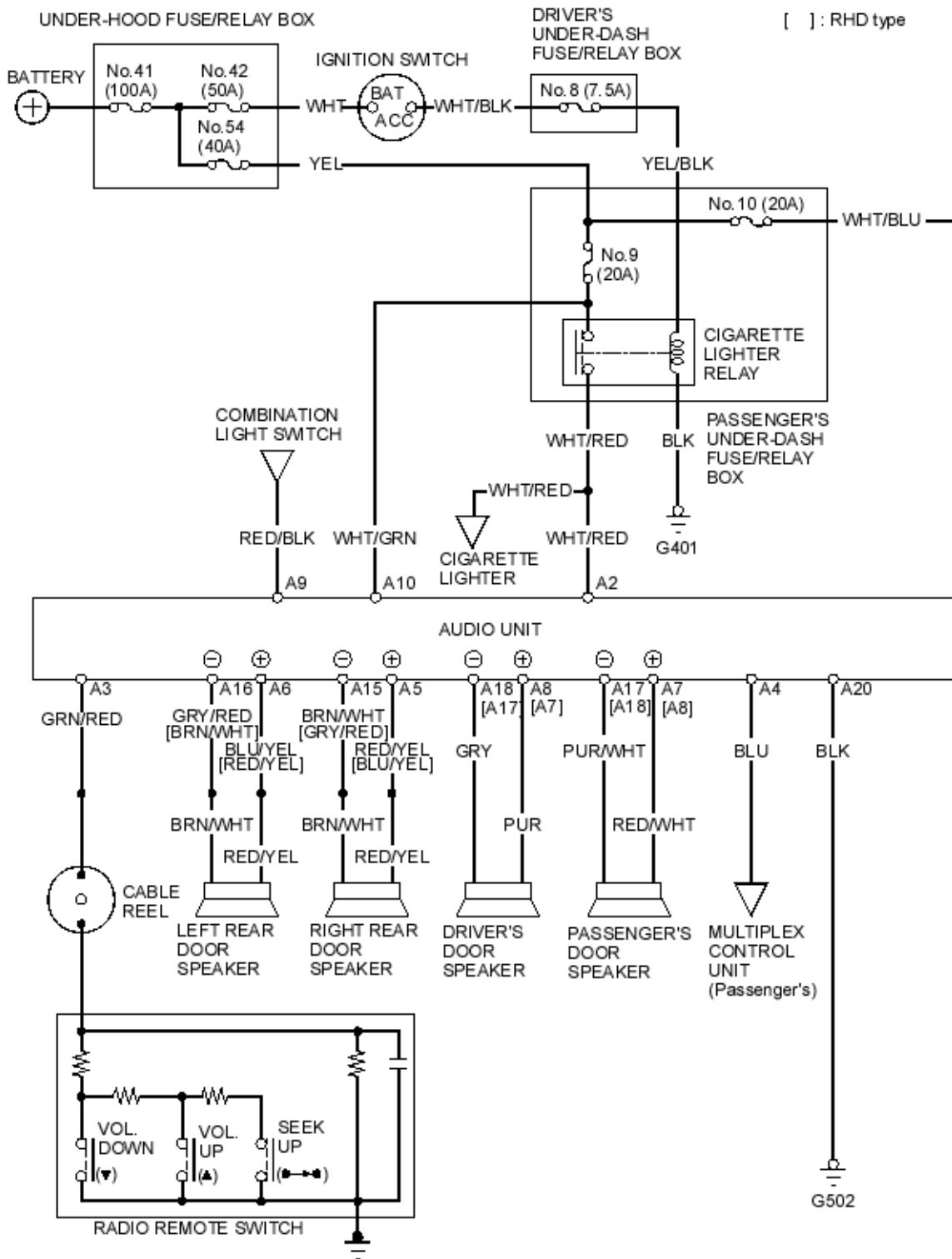
Passenger's Window Switch Test

23-E-6

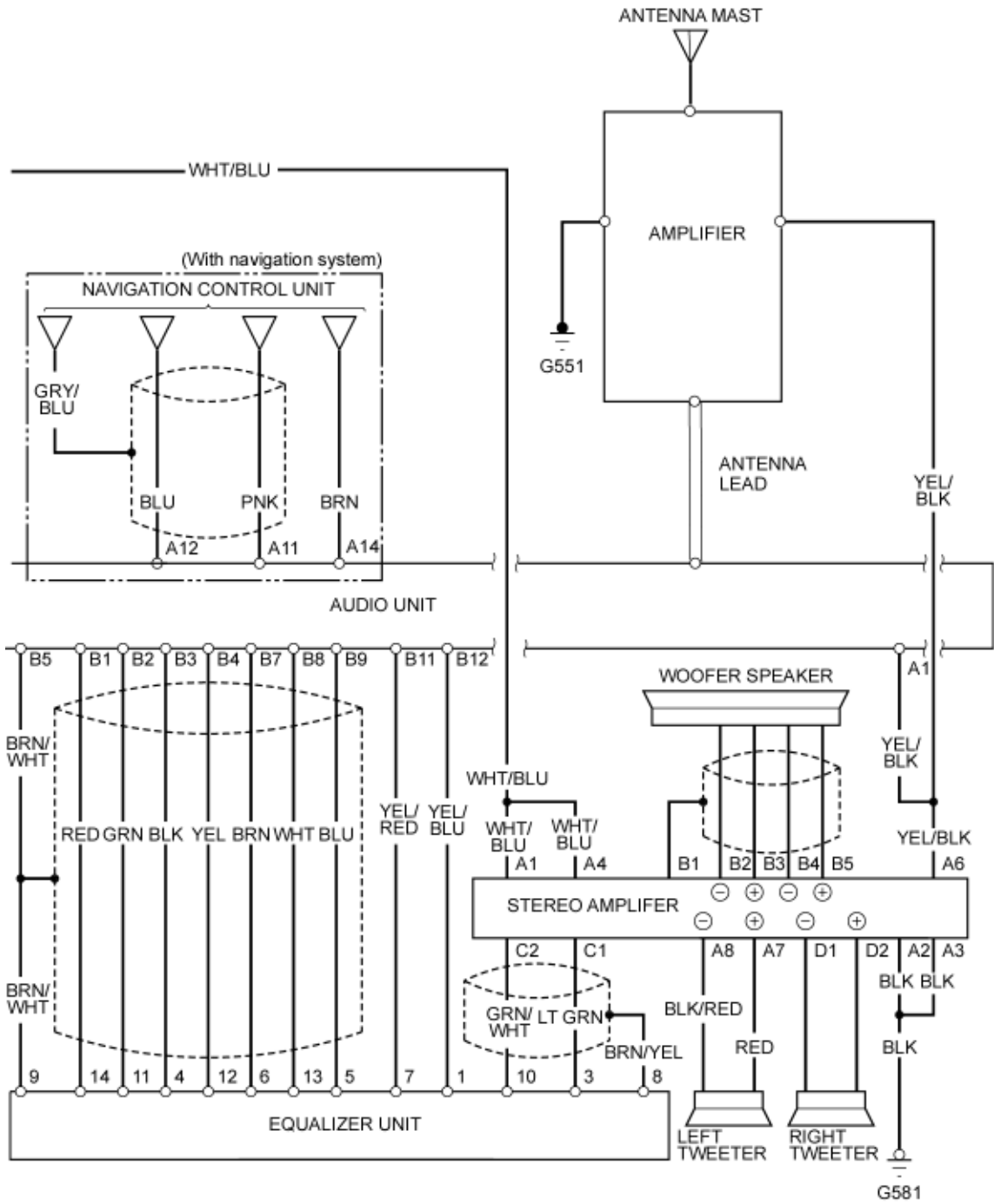
1. Remove the passenger's switch assembly from the armrest.
2. Check for continuity between the terminals in each switch position according to the table.



Terminal Position	1	2	3	4	5	6
UP	○—○	○—○	○—○	○—○	○—○	○—○
OFF	○—○	○—○	○—○	○—○	○—○	○—○
DOWN		○—○	○—○	○—○	○—○	○—○

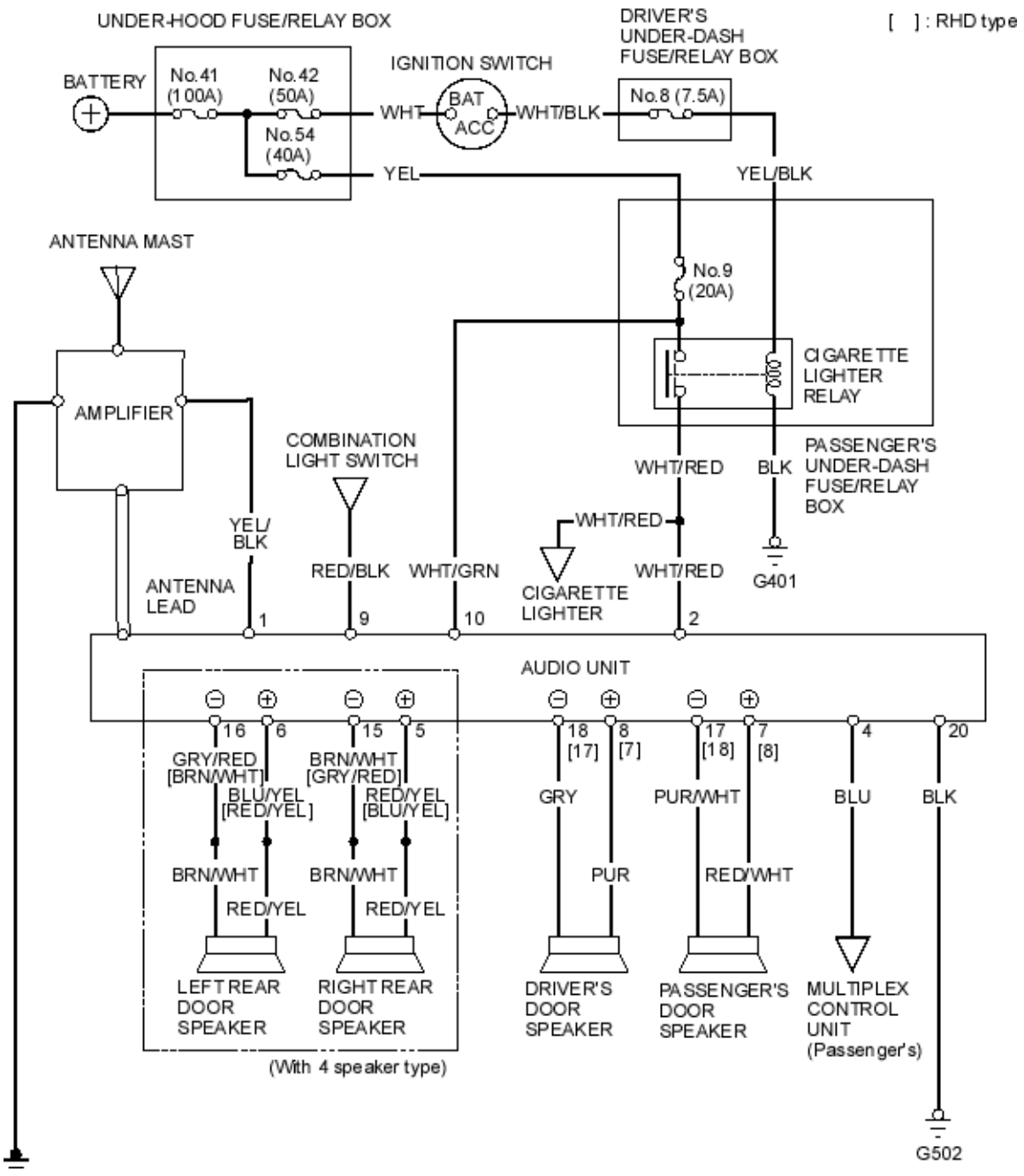


----- : Shielding



Stereo Sound System
Circuit Diagram (Without Bose Sound System)

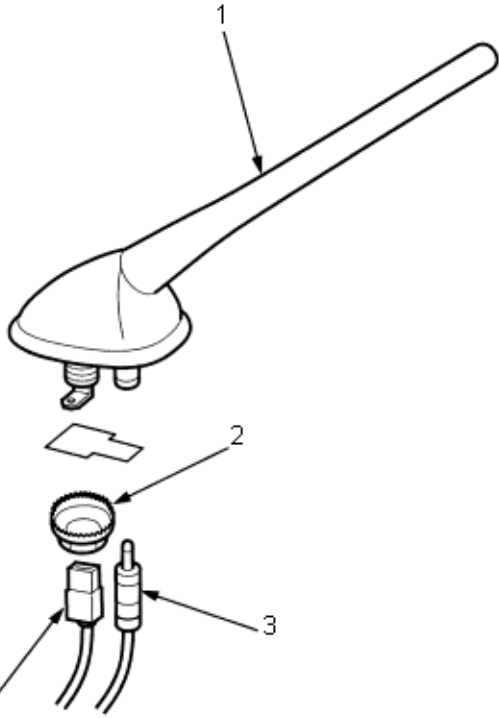
23-F-4



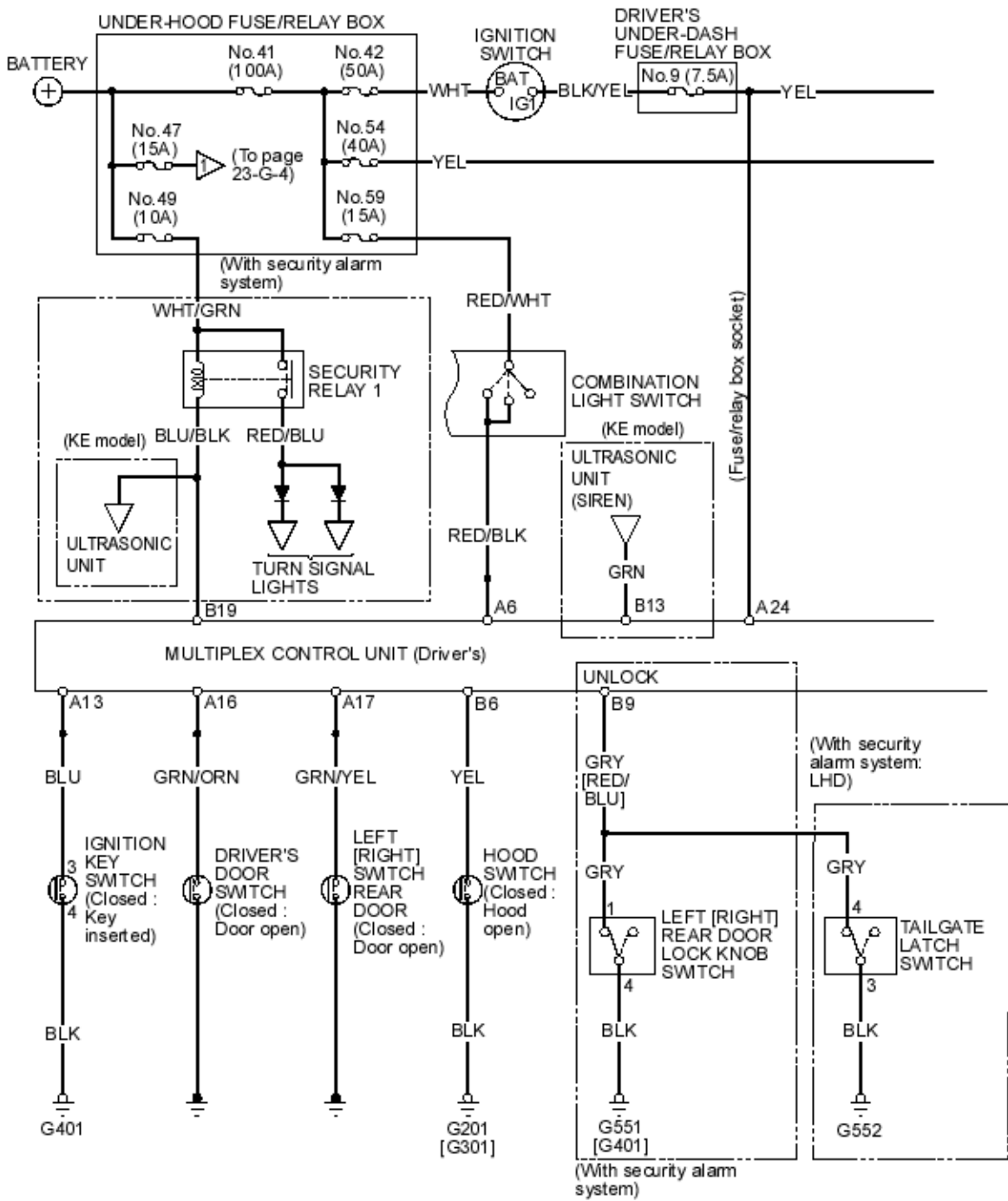
Stereo Sound System
Radio Antenna Replacement

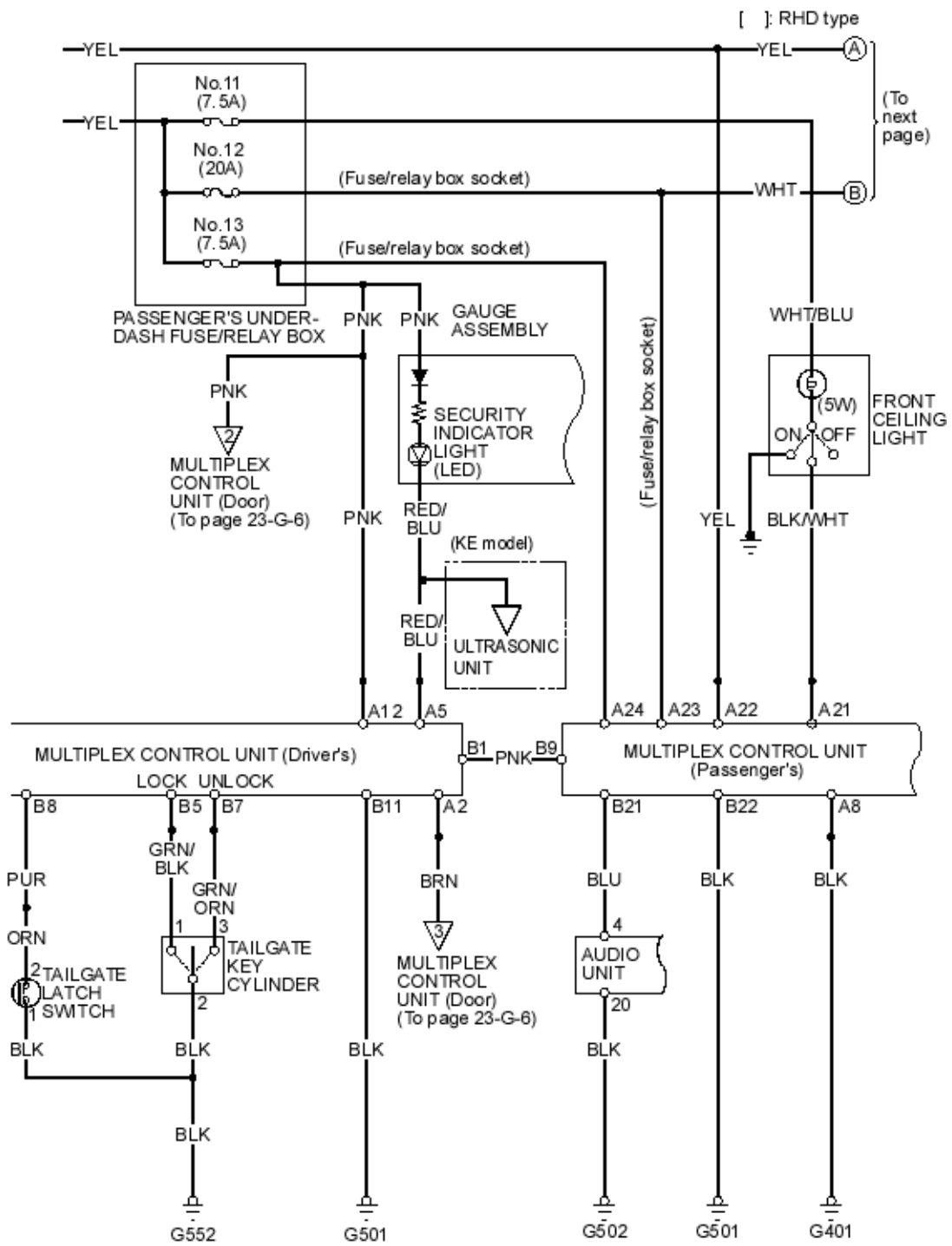
23-F-5

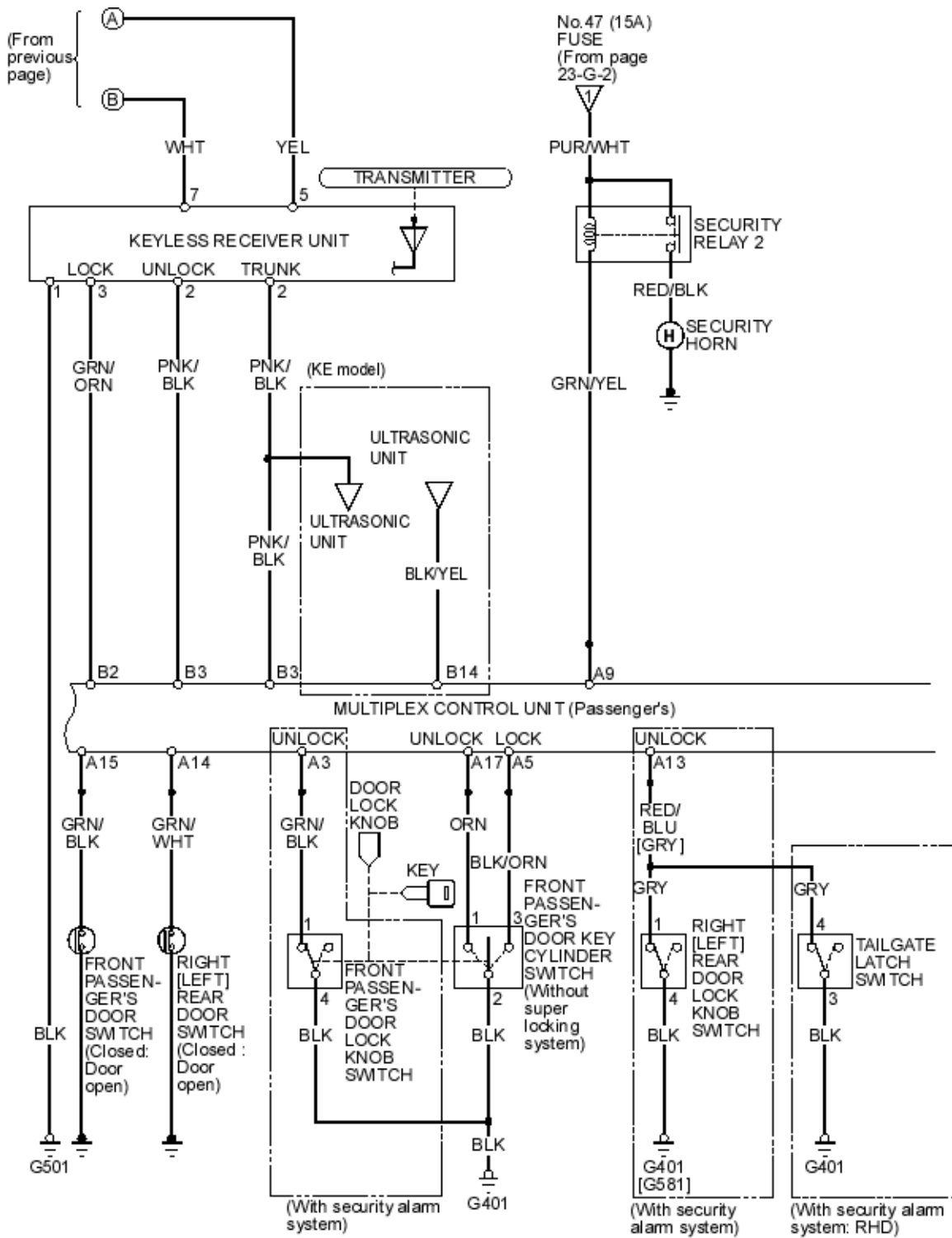
1. Remove the headliner (see section 20).
2. Disconnect the 1P connector and the antenna feeder from the radio antenna.
3. Replace the radio antenna.



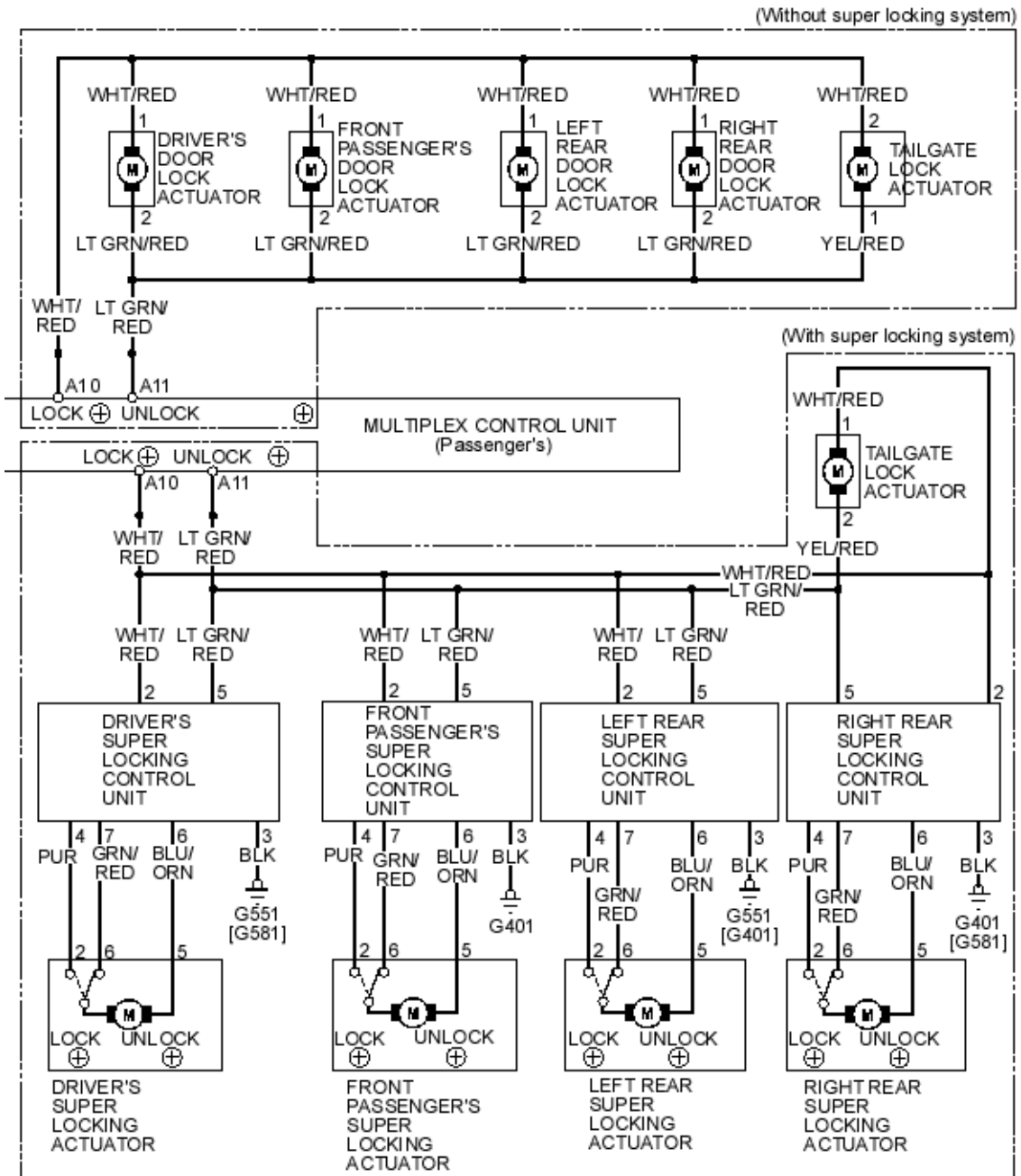
1. RADIO ANTENNA
2. NUT
3. ANTENNA FEEDER
4. 1P CONNECTOR



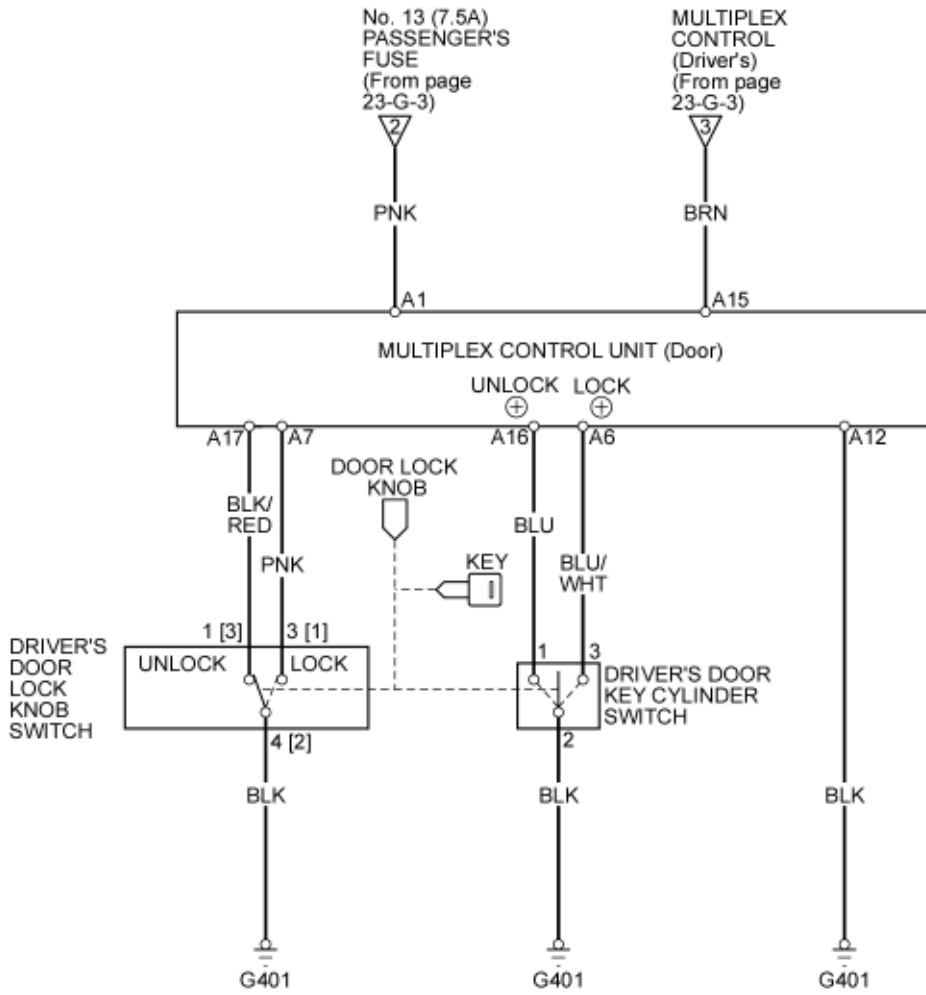




[]: RHD type



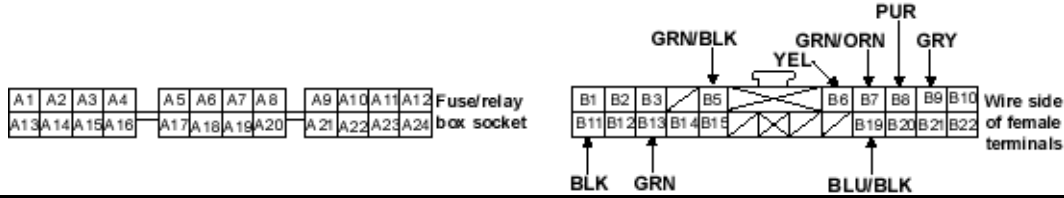
[] : Without super locking system



NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide.

Multiplex Control Unit (Driver's):

1. Remove the driver's under-dash fuse/relay box.
2. Remove the driver's unit from the driver's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.

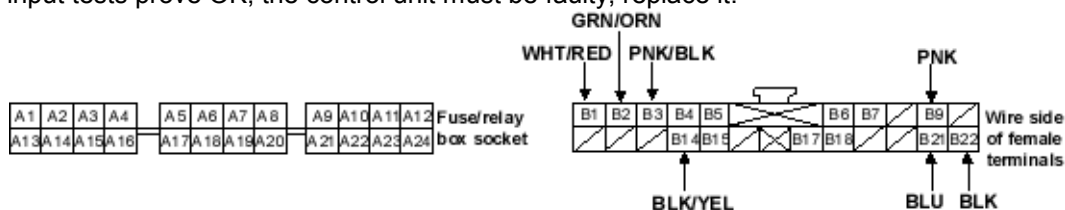


Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B11	BLK	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire
A12	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ An open in the wire
A24	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No. 9 (7.5A) fuse in the driver's under-dash fuse/relay box ♦ An open in the wire
A5	Fuse/relay box socket	Under all conditions	Connect to ground: The security light should come on	<ul style="list-style-type: none"> ♦ Blown No. 13 (7.5A) fuse in the passenger's under-dash fuse/relay box ♦ Faulty security indicator light (LED) ♦ An open in the wire
A6	Fuse/relay box socket	Combination light switch ON	Connect to ground: The small lights should come on	<ul style="list-style-type: none"> ♦ Blown No. 59 (15A) fuse in the under-hood fuse/relay box ♦ Faulty combination light switch ♦ An open in the wire
B13	GRN	Under all conditions	Check for continuity between the B13 terminal and No. 2 terminal of the ultrasonic unit: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
B19	BLU/BLK	Under all conditions	Connect to ground: The turn signal lights should come on	<ul style="list-style-type: none"> ♦ Blown No. 49 (10A) fuse in the under-hood fuse/relay box ♦ Faulty security relay 1 ♦ An open in the wire

NOTE: Before testing, go to the Multiplex Control System Troubleshooting Guide.

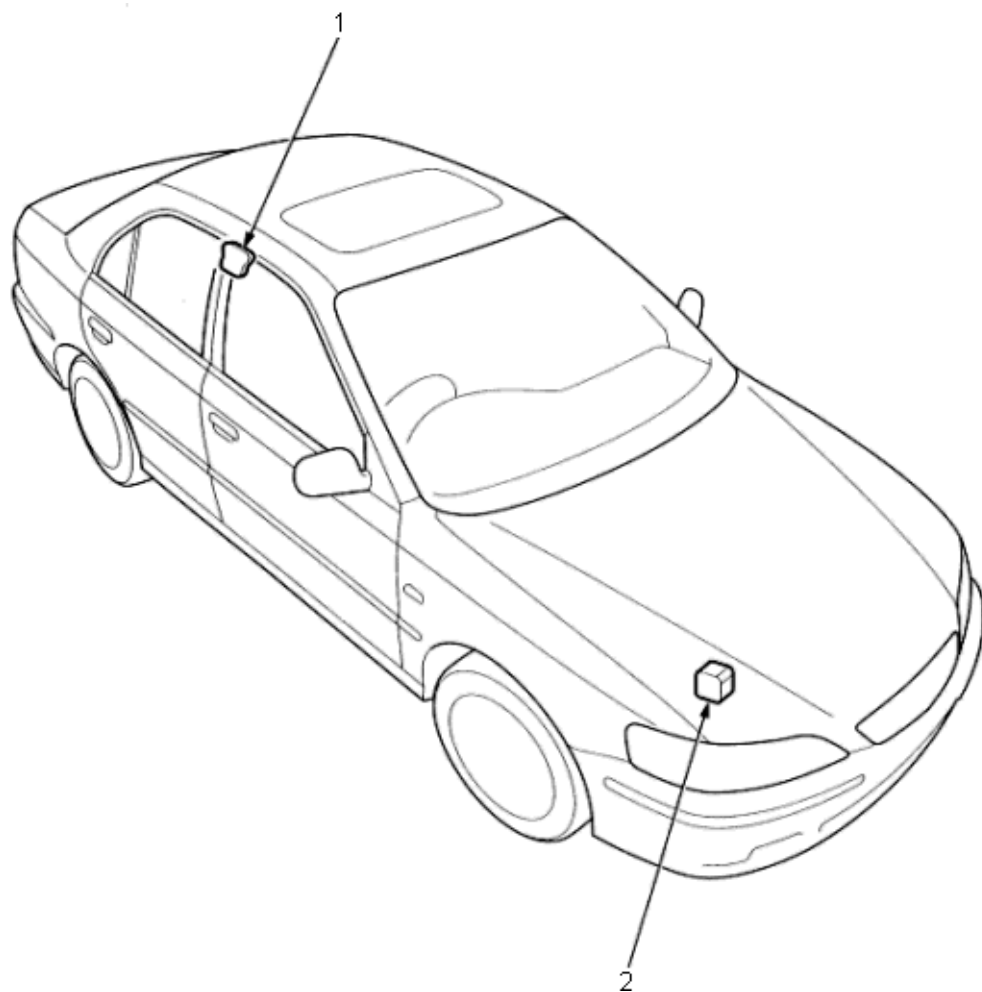
Multiplex Control Unit (Passenger's):

1. Remove the passenger's under-dash fuse/relay box.
2. Remove the passenger's unit from the passenger's under-dash fuse/relay box.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.

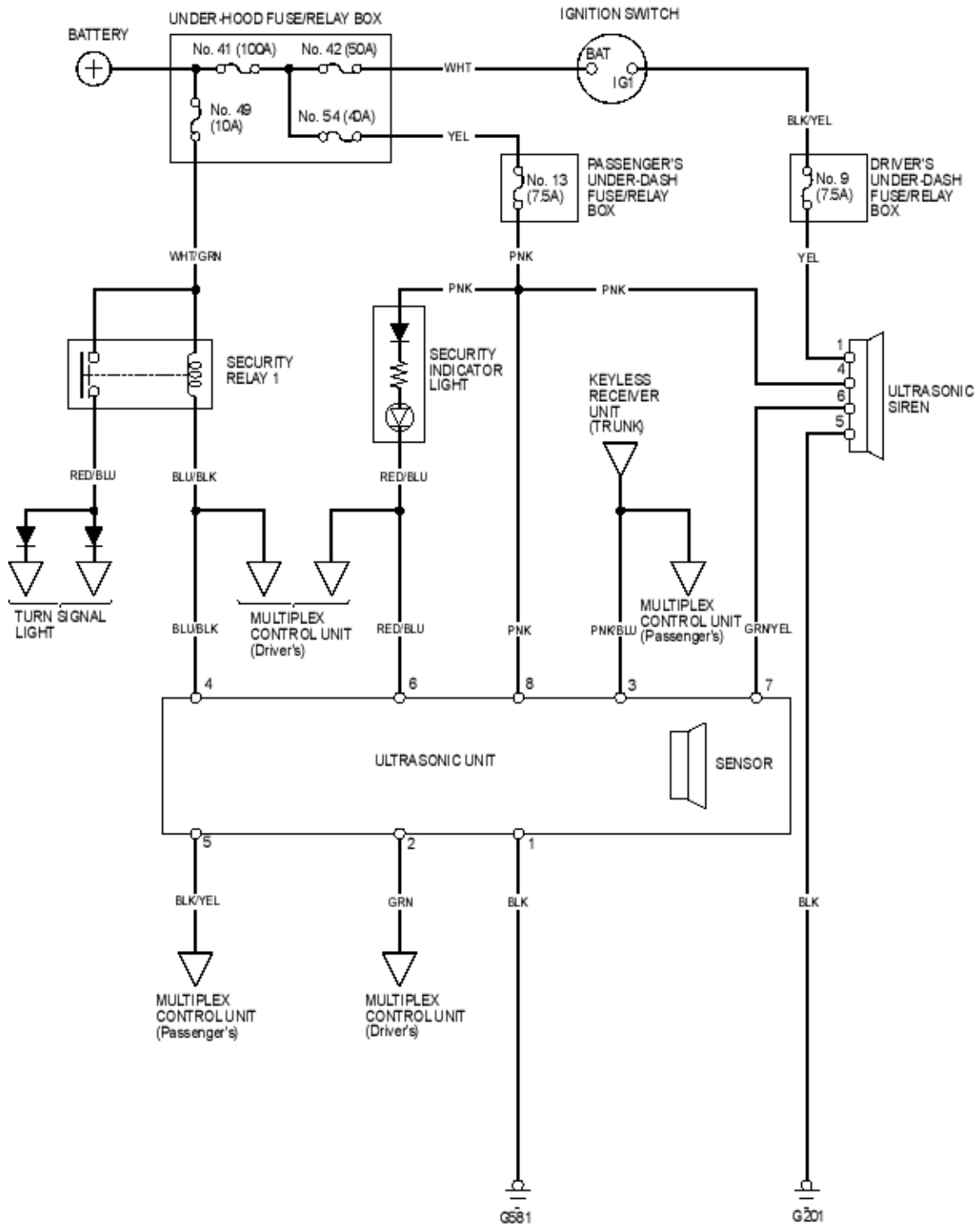


Disconnect the connectors from the unit.

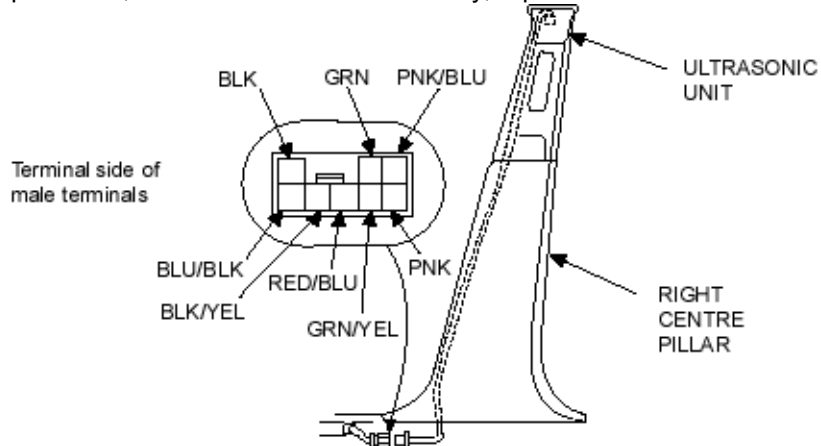
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G401) ♦ An open in the wire
A9	Fuse/relay box socket	Under all conditions	Connect to ground: There security horn should sound	<ul style="list-style-type: none"> ♦ Blown No 47 (15A) fuse in the under-hood fuse/relay box. ♦ Faulty security horn ♦ Faulty security relay 2 ♦ An open in the wire
A21	Fuse/relay box socket	Ceiling light switch in "middle" position	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 11 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ Blown ceiling light bulb ♦ Faulty ceiling light ♦ An open in the wire
A22	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
A23	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 12 (20A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire
B14	BLK/YEL	Under all conditions	Check for continuity between the B14 terminal and No. 5 terminal of the ultrasonic unit: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
B21	BLU	Under all conditions	Check for continuity between B21 terminal and audio unit No. 4 terminal: There should be continuity	<ul style="list-style-type: none"> ♦ Faulty audio unit ♦ Poor ground (G502) ♦ An open in the wire
B22	BLK	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G501) ♦ An open in the wire



1. **ULTRASONIC UNIT**
Input Test, (See Page 23-G-11)
Replacement, (See Page 23-G-12)
2. **ULTRASONIC SIREN**
Input Test, (See Page 23-G-13)

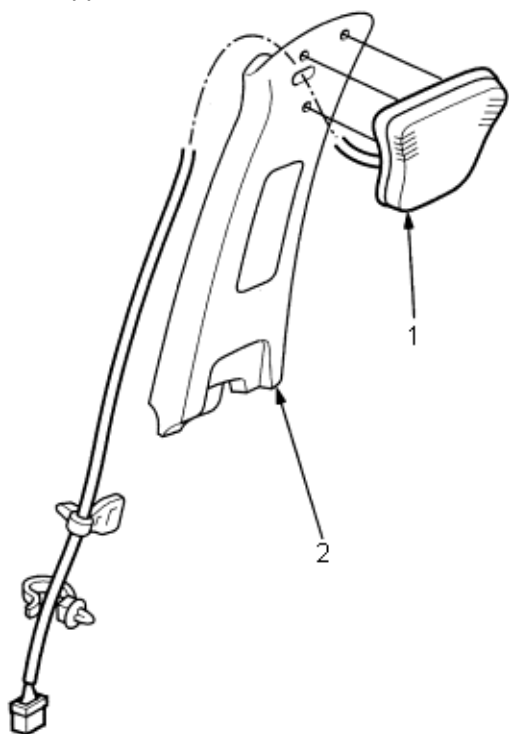


1. Remove the right rear side trim (see section 20).
2. Disconnect the 8P connector.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G581) ♦ An open in the wire
2	GRN	Under all conditions	Check for continuity between the No. 2 terminal and B13 terminal of the driver's multiplex control unit: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
3	PNK/BLU	Under all conditions	Check for continuity between the No. 3 terminal and No. 2 terminal of the keyless receiver unit: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
4	BLU/BLK	Under all conditions	Connect to ground: The turn signal lights should come on	<ul style="list-style-type: none"> ♦ Blown No 49 (10A) fuse in the under-hood fuse/relay box. ♦ Faulty security relay 1 ♦ An open in the wire
5	BLK/YEL	Under all conditions	Check for continuity between the No. 5 terminal and B14 terminal of the passenger's multiplex control unit: There should be continuity	<ul style="list-style-type: none"> ♦ An open in the wire
6	RED/BLU	Under all conditions	Connect to ground: The security indicator light should come on	<ul style="list-style-type: none"> ♦ Blown No 49 (10A) fuse in the under-hood fuse/relay box. ♦ Faulty security relay 1 ♦ An open in the wire
7	GRN/YEL	Under all conditions	Connect to ground: The ultrasonic siren should sound	<ul style="list-style-type: none"> ♦ Faulty ultrasonic siren ♦ An open in the wire
8	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire

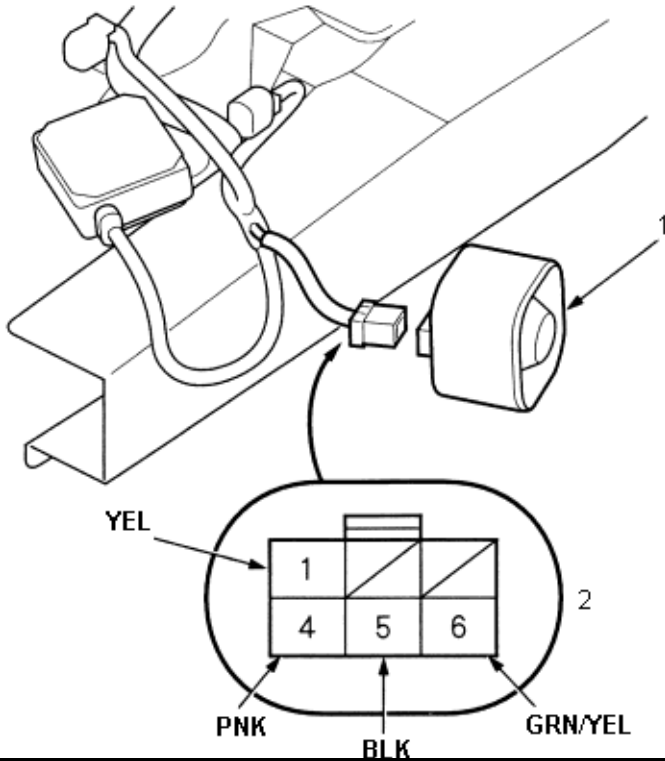
1. Remove the right centre pillar upper trim (see section 20).
2. Remove the ultrasonic unit from the right centre pillar upper trim.



1. ULTRASONIC UNIT
2. RIGHT CENTRE PILLAR UPPER TRIM

1. Open the hood.
2. Disconnect the 4P connector from the siren.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
 - ♦ If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - ♦ If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
 - If any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the control unit must be faulty; replace it.

1. **ULTRASONIC UNIT**
2. **Wire side of female terminals**

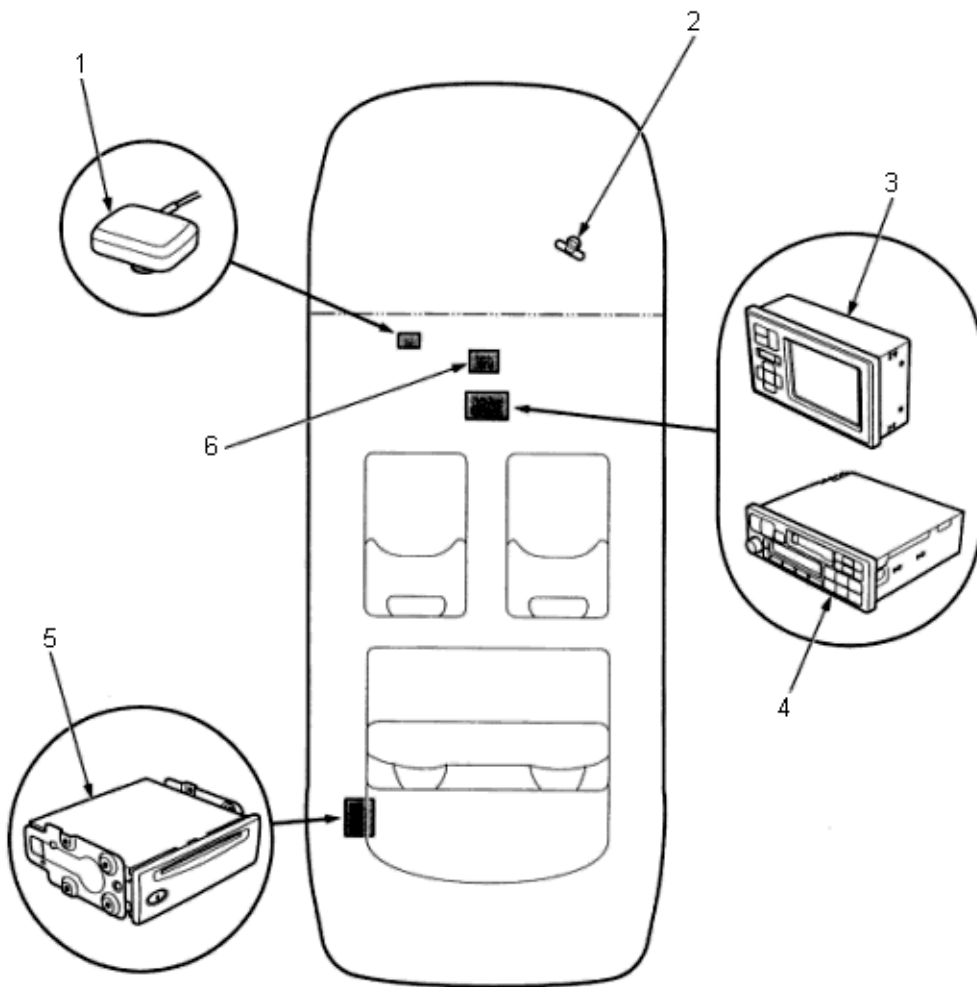


Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
5	BLK	Under all conditions	Check for continuity: There should be continuity	<ul style="list-style-type: none"> ♦ Poor ground (G201) ♦ An open in the wire
6	GRN/YEL	Under all conditions	Connect to ground: The ultrasonic siren should sound	<ul style="list-style-type: none"> ♦ Faulty ultrasonic siren ♦ An open in the wire
1	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 9 (7.5A) fuse in the driver's under-dash fuse/relay box. ♦ An open in the wire
4	PNK	Under all conditions	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> ♦ Blown No 13 (7.5A) fuse in the passenger's under-dash fuse/relay box. ♦ An open in the wire

Description
Component Locations

23-H-2

The parts with an asterisk (*): LHD type is shown, RHD type is symmetrical.
The illustration indicates 5-door model.



1. *GPS ANTENNA
(located behind the gauge assembly)
2. VEHICLE SPEED SENSOR (VSS)
(M/T)
3. DISPLAY UNIT
4. AUDIO UNIT
5. NAVIGATION LIGHT
6. PCM (A/T) for vehicle speed signal

Description

Component Locations (cont'd)

23-H-3

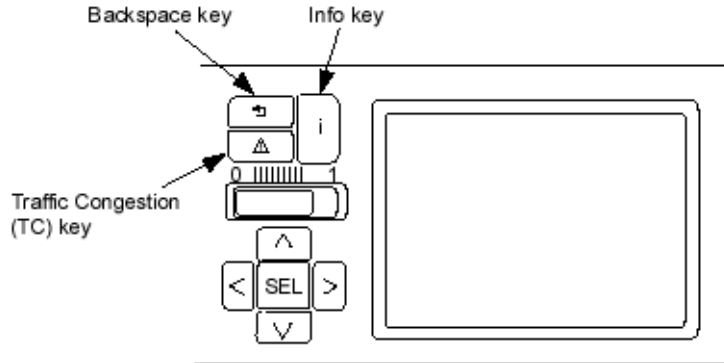
Audio Unit

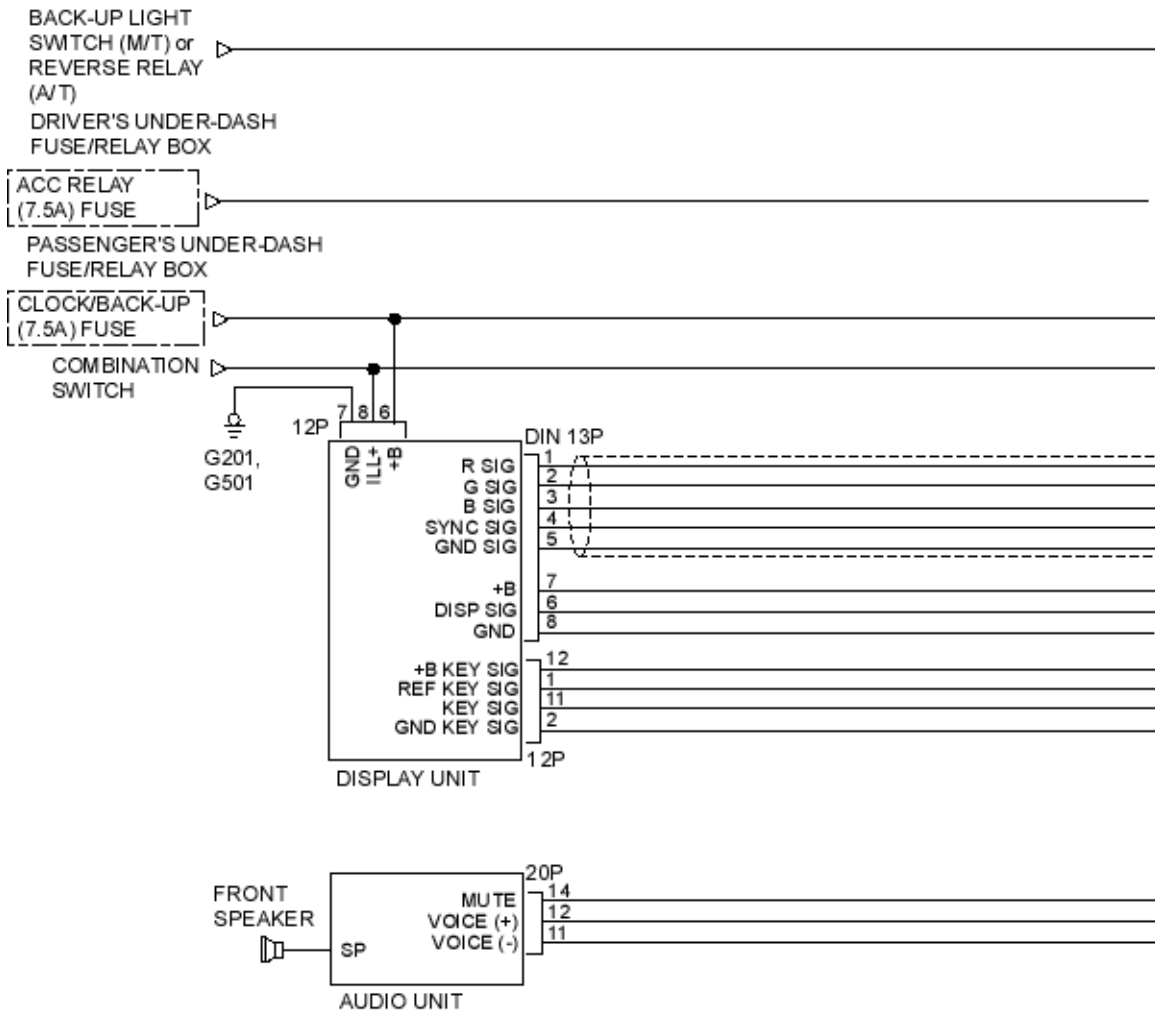
The audio unit receives the voice driving instructions from the navigation unit and transmits the instructions through the front speakers even when the audio system is in use.

Display Unit

The display unit uses a liquid crystal display (LCD). The LCD is a five inch size Thin Film Transistor (TFT), stripe type. The colour film and fluorescent light are laid out on the back of the liquid crystal film. The display unit transmits the signal from each operation key to the navigation unit.

Display unit and operation keys





DISPLAY UNIT CONNECTORS

12P CONNECTOR



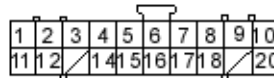
Wire side of female terminals

DIN 13P CONNECTOR

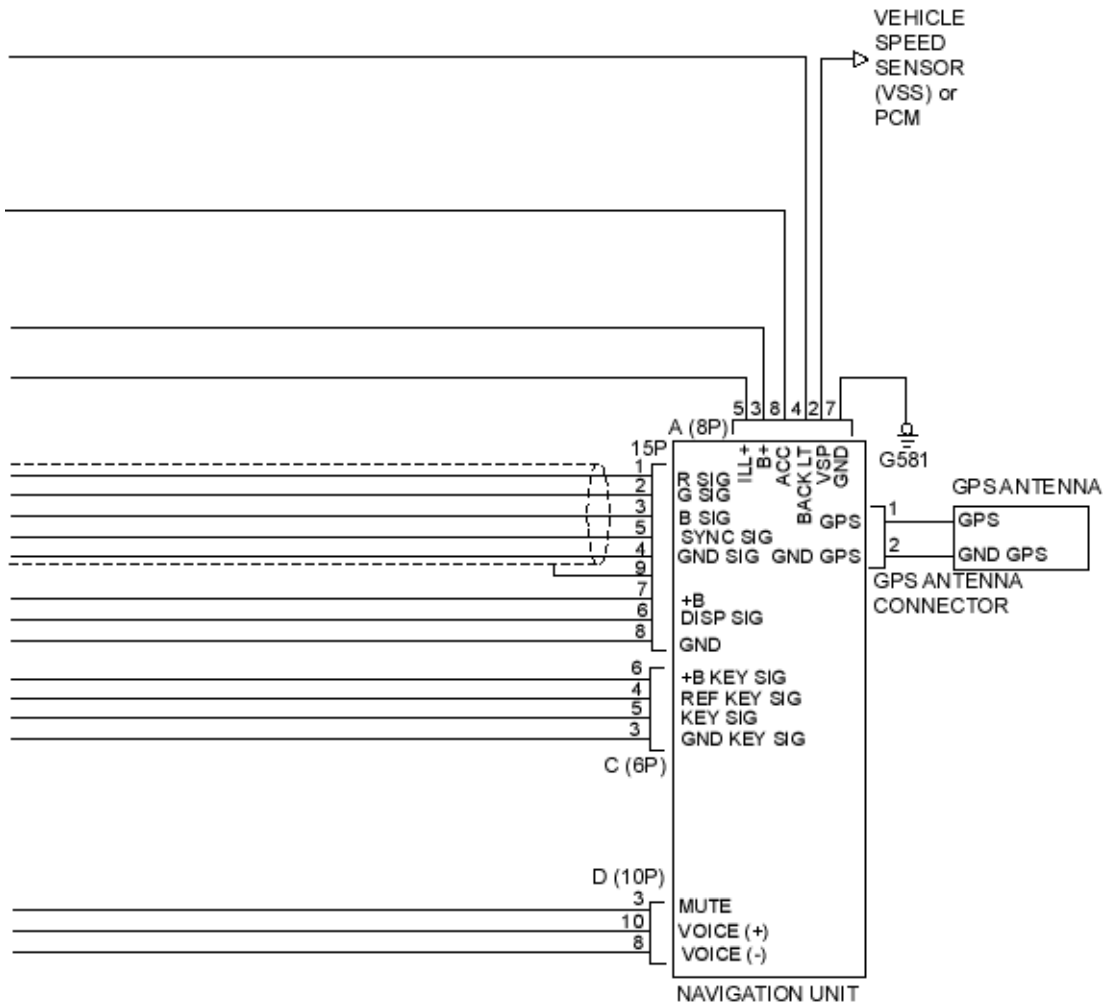


Terminal side of male terminals

AUDIO UNIT 20P CONNECTOR



Wire side of female terminals



CONNECTOR
A (8P)



Wire side of female terminals

CONNECTOR
C (6P)



CONNECTOR
D (10P)



15P CONNECTOR

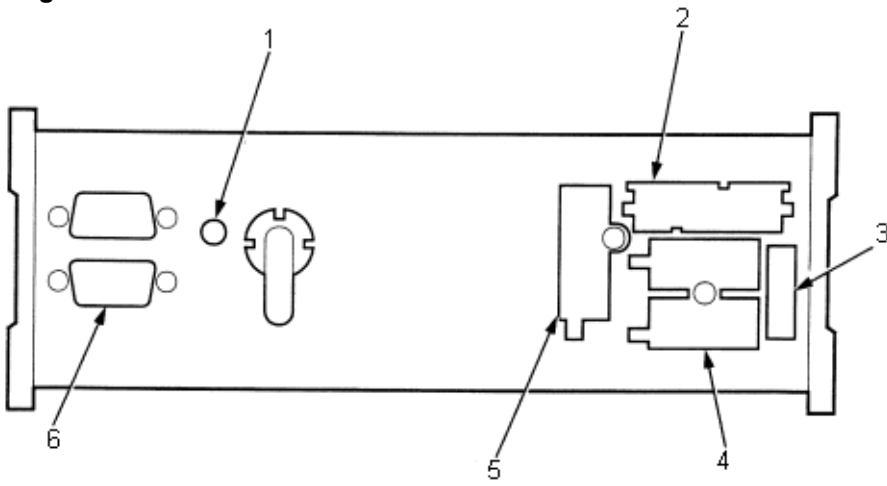


Terminal side of male terminals

GPS ANTENNA
CONNECTOR

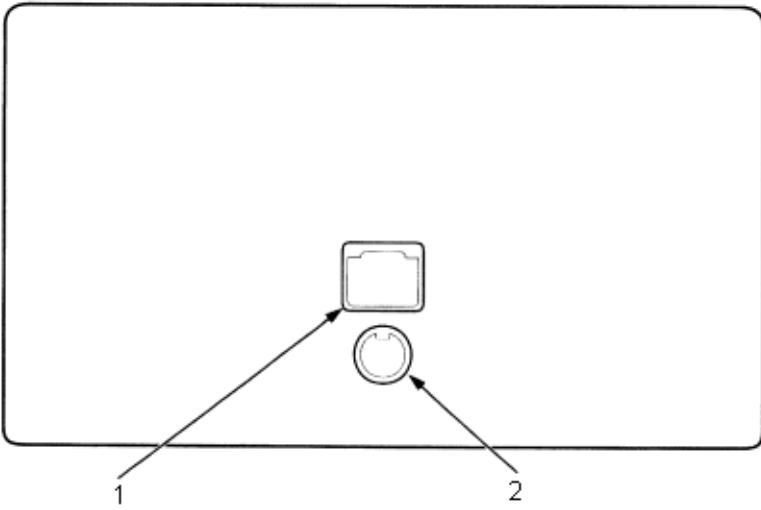


Navigation unit:



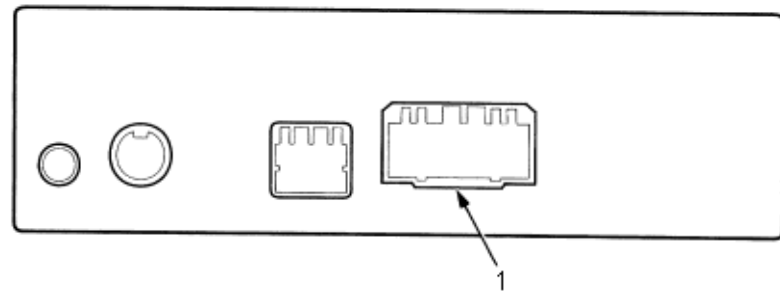
- 1. GPS ANTENNA
- 2. CONNECTOR C (6P)
- 3. FUSE (5A)
- 4. CONNECTOR A (8P)
- 5. CONNECTOR D (10P)
- 6. 15P CONNECTOR

Display unit:



- 1. 12P CONNECTOR
- 2. DIN 13P CONNECTOR

Audio unit:



- 1. 20P CONNECTOR

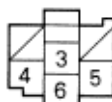
Navigation unit connector A (8P)



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
2	-	VSP	Vehicle speed pulse	Vehicle speed signal
3	-	+B	+B power source	Power source for navigation unit
4	-	BACK LT	Back light	Reverse signal of shift lever
5	-	ILL+	Illumination	Illumination ON signal
7	-	GND	Ground	Ground for navigation unit
8	-	ACC	Accessory	Power source for accessory

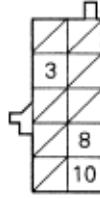
Navigation unit connector C (6P)



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
3	-	GND KEY SIG	Ground key signal	Ground for operation key signal
4	-	REF KEY SIG	Reference key signal	Operation key reference key signal
5	-	KEY SIG	Key signal	Operation key signal
6	-	+B KEY SIG	+B key signal	Power source for operation key

Navigation unit connector D (10P)



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
3	-	MUTE	Mute	Signal to mute the audio
8	-	VOICE (-)	Voice negative	Voice signal negative
10	-	VOICE (+)	Voice positive	Voice signal positive

GPS antenna connector



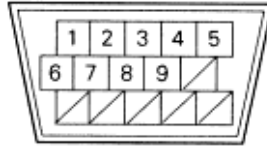
Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	GPS	GPS	GPS signal
2	-	GND GPS	Ground for GPS signal	Ground for GPS signal

Terminal Arrangement
(cont'd)

23-H-9

Navigation unit 15P connector



Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	R SIG	Red signal	Red colour signal
2	-	G SIG	Green signal	Green colour signal
3	-	B SIG	Blue signal	Blue colour signal
4	-	GND SIG	Ground signal	Ground for colour signal
5	-	C SIG	Composite signal	Composite video (vertical/horizontal) synchronising signal.
6	-	DISP SIG	Display signal	Display ON/OFF signal
7	-	+B	+B power source	Power source for display signal
8	-	GND	Ground	Ground for display signal
9	-	SH SIG	Shield signal	Shield for terminal Nos, 1, 2, 3, 4 & 5

Display unit DIN 13P connector



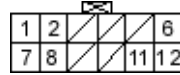
Terminal side of male terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	-	R SIG	Red signal	Red colour signal
2	-	G SIG	Green signal	Green colour signal
3	-	B SIG	Blue signal	Blue colour signal
4	-	GND SIG	Ground signal	Ground for colour signal
5	-	C SIG	Composite signal	Composite video (vertical/horizontal) synchronising signal.
6	-	DISP SIG	Display signal	Display ON/OFF signal
7	-	+B	+B power source	Power source for display signal
8	-	GND	Ground	Ground for display signal

Terminal Arrangement
(cont'd)

23-H-10

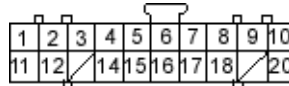
Display unit 12P connector



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
1	RED/BLK	REF KEY SIG	Reference key signal	Operation key reference signal
2	ORN	GND KEY SIG	Ground key signal	Ground for operation key signal
6	PNK	+B	+B power source	Power source for display unit
7	BLK	GND	Ground	Ground for display unit
8	RED/BLK	ILL+	Illumination	Illumination ON signal
11	BLK	KEY SIG	Key signal	Operation key signal
12	WHT	+B KEY SIG	+B key signal	Power source for operation key

Audio unit 20P connector



Wire side of female terminals

Terminal No	Wire Colour	Terminal	Terminal Name	Description
11	PNK	VOICE (-)	Voice negative	Voice signal negative
12	BLU	VOICE (+)	Voice positive	Voice signal positive
14	BRN	MUTE	Mute	Signal to mute the audio

NOTE: Circles (O) in the table indicate which parts to inspect.

PROBLEM SYMPTOM	RELATED UNIT, OTHER PROBLEM ITEMS						DIAGNOSIS METHOD						Refer to troubleshooting page	
	NAVIGATION UNIT	DISPLAY UNIT	GPS ANTENNA	CD-ROM	AUDIO UNIT	HARNESS	STATIC TEST	DYNAMIC TEST	CALIBRATION	GPS STATUS	SENSOR TEST	KEYBOARD TEST		LCD TEST
No picture is shown on the display	<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>							<input type="checkbox"/>	23-H-22
Display indication is not correct												<input type="checkbox"/>		* 23-H-30
Map is not shown on the display	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>								* 23-H-30
Display unit operation key does not work		<input type="checkbox"/>				<input type="checkbox"/>						<input type="checkbox"/>		* 23-H-30
Distance of vehicle position mark is not correct	<input type="checkbox"/>							<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>			* 23-H-30
Vehicle position mark does not turn or does not move straight forward (or rotate)	<input type="checkbox"/>									<input type="checkbox"/>				* 23-H-30
GPS mark is not indicated	<input type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>					* 23-H-30
Guidance voice cannot be heard	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>								* 23-H-31

To go to the pages referenced on the table above, click on the following:

(See Page 23-H-22)

(See Page 23-H-30)

(See Page 23-H-31)

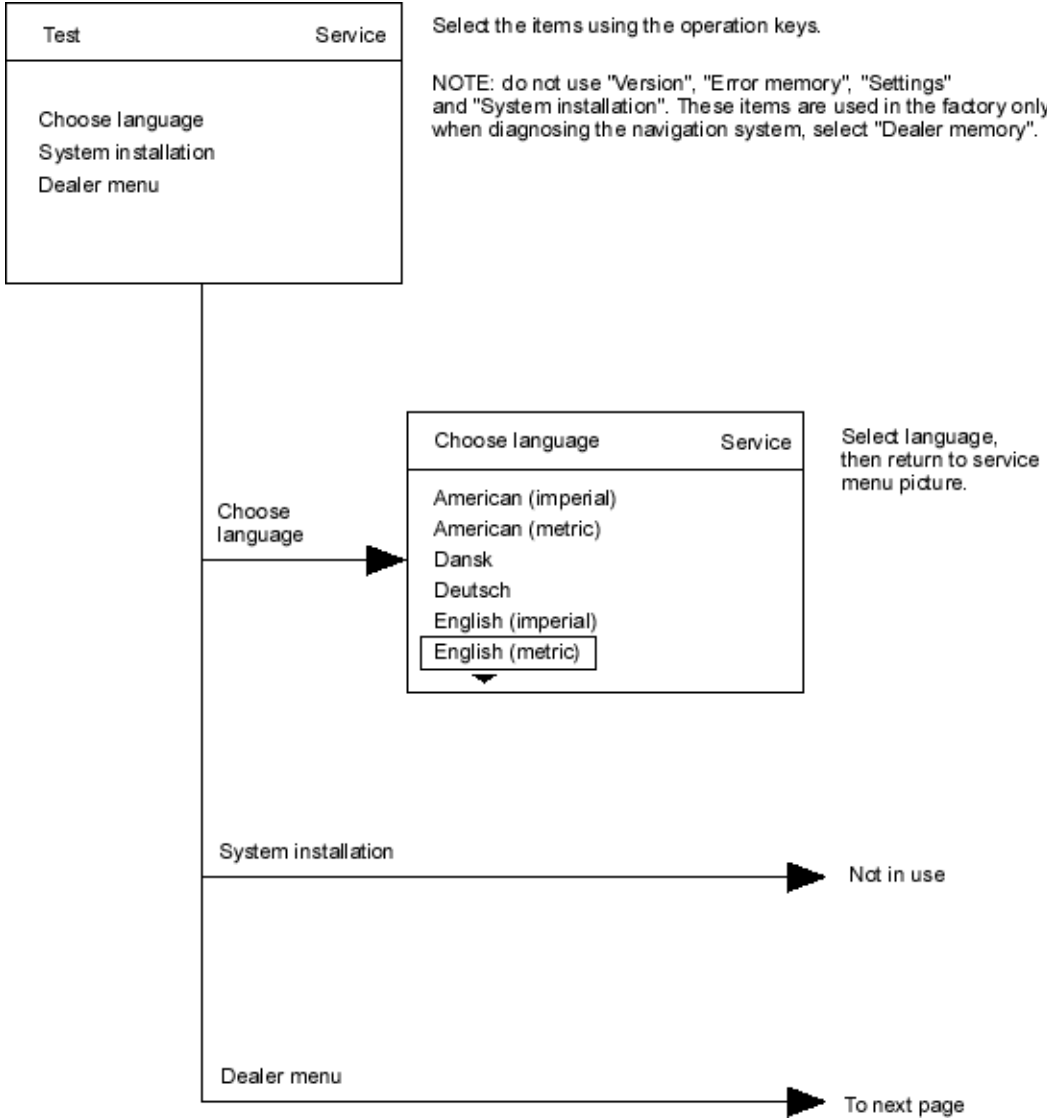
* Refer to Accord 5 Door/Accord 5 Door Turbo Diesel Shop Manual on this CD

Turn the ignition switch to ACC (I) while pushing the info key, then the display indicates the service menu picture.

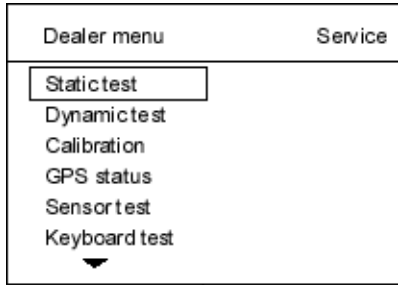
NOTE:

- ♦ If the display unit indicates the navigation picture, set the "Standby time" to "off" on the "Settings" menu then retry operation.
- ♦ The picture illustrations are indicated in English.

Service menu

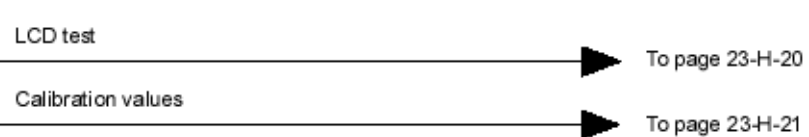
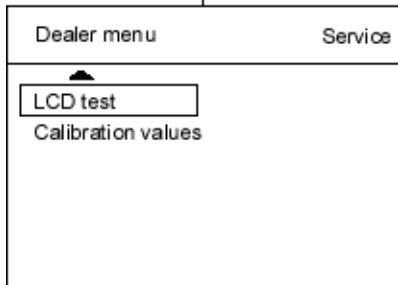


Dealer menu



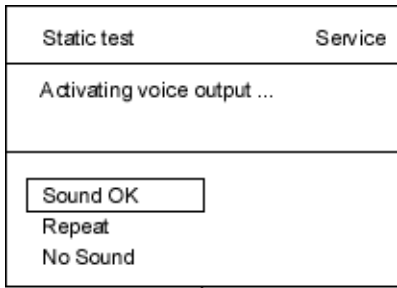
Selected the items using the operation keys.

Push the backspace key to return to the service menu picture.



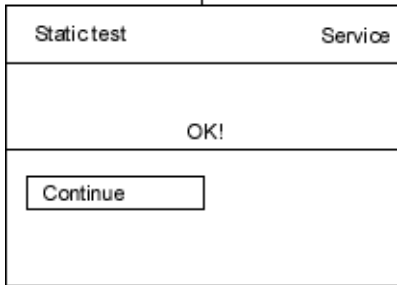
To go to the pages referenced on the diagram above, click on the following:
(See Page 23-H-14)
(See Page 23-H-15)
(See Page 23-H-16)
(See Page 23-H-18)
(See Page 23-H-19)
(See Page 23-H-20)
(See Page 23-H-21)

Static test



- On the "Static test", diagnose for the GPS antenna. GPS receiver (inside of the navigation unit) and guidance voice output.
- When changing to this picture, guidance voice is output from the front speakers for the first three seconds.
- If you select "Sound OK", guidance voice output becomes OK. If you select "No sound", guidance voice output becomes NG.

NOTE: If the guidance voice data in the memory of the navigation unit is erased by the battery being disconnected, guidance voice is not outputted (noise will be heard). In this case, turn the ignition switch OFF to ON (II) and wait until the navigation menu is indicated (guidance voice data is loading during this time). Then perform the "Static test" again.



- If "Static test" is OK, this picture is indicated.
- If there is a problem, item's problem error code is indicated. These items are:
 - GPS: Disconnected GPS antenna or faulty GPS antenna or GPS receiver (inside of the navigation unit).
 - Radio: Open or short to body ground in the guidance voice signal line.

Continue

Return to dealer menu picture

Dynamic test

Dynamic test	Service
drive forward Impulses: OK Rev. light: OK	
<input type="button" value="OK"/>	

- On the "Dynamic test", diagnose for the vehicle speed signal and back-up light signal.
- When driving the vehicle forward and vehicle speed signal input to navigation unit, the display indicates "Impulses OK".
- When driving the vehicle backwards and back-up light signal input to navigation unit, the display indicates "Rev. light OK".

Both "Impulses" and "Rev. light" are OK or select "OK"

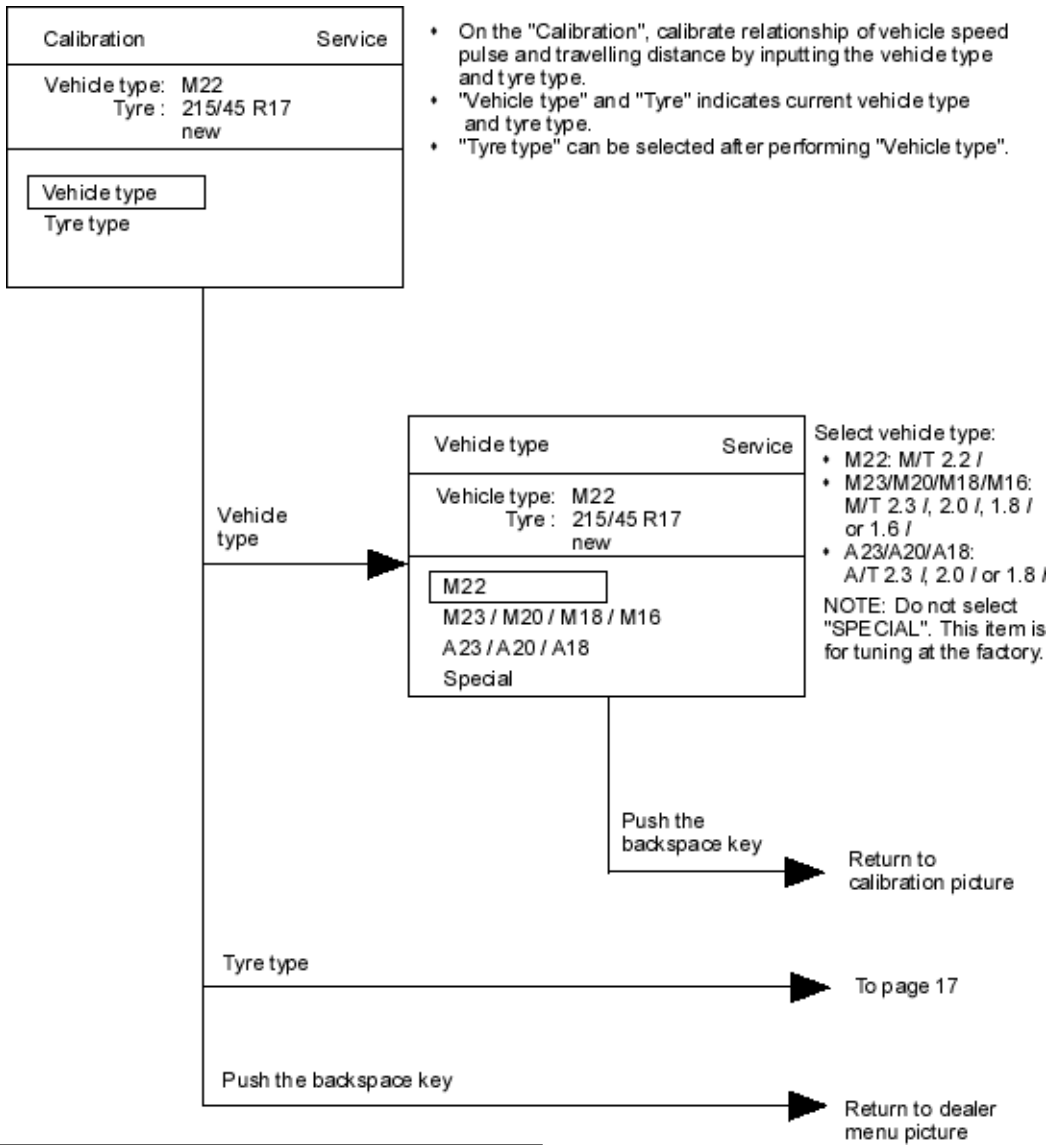
Dynamic test	Service
OK!	
<input type="button" value="Continue"/>	

- If both "Impulses" and "Rev. light" are OK, this picture is indicated.
- If there is a problem, item's problem error code is indicated. These items are:
 - Impulses: Open in the vehicle speed signal wire.
 - Rev. light: Open in the back-up light signal wire.
 -

Continue

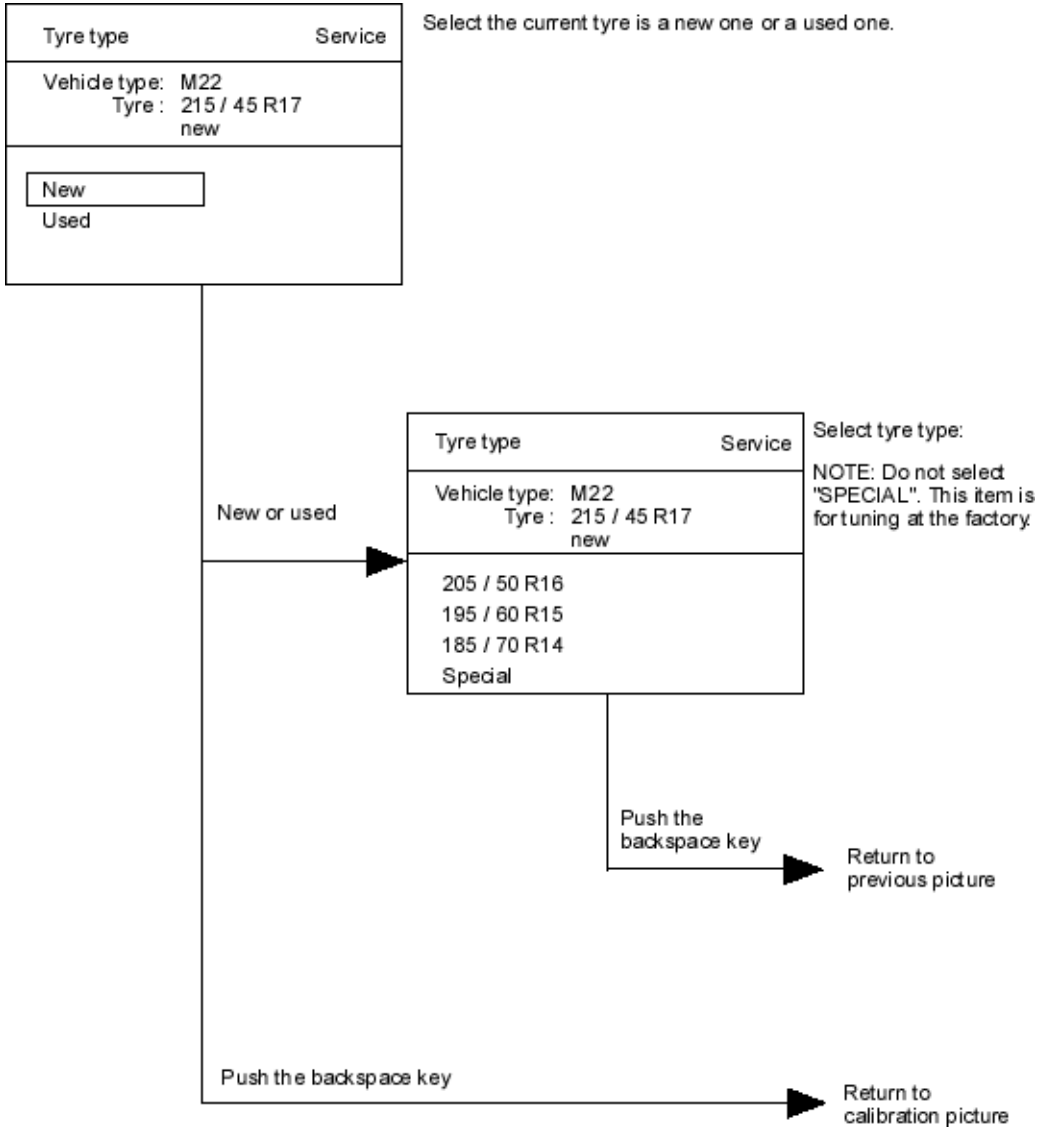
Return to dealer menu picture

Calibration



To go to the pages referenced on the diagram above, click on the following:
(See Page 23-H-17)

Tyre type



GPS status

On the "GPS status" one of the following pictures is indicated.

GPS status	Service
X Sat. sichtbar 0 Sat. received Longitude: XXX°XX'XX" E Latitude: XXX°XX'XX" N	

The vehicle position is identified by received GPS signal.

GPS status	Service
X Sat. sichtbar 0 Sat. received No GPS position	

The vehicle position cannot be identified if the vehicle is behind buildings etc.

GPS status	Service
Error: GPS antenna or antenna cable defective	

Open in the GPS antenna wire or faulty GPS antenna.

Sensor test

Sensor test	Service
Gyro: XXXX Speedom.: XXXXXX km/h: XXXX Direction: forward	

On the "Sensor test", diagnose for the following items:

- Oscillation gyro
- Speedometer
- Vehide speed signal
- Vehide direction (forward or backward)

Display item and diagnosis method

Display	Test	Display OK	Corrective measure in event of error
Gyro	Move vehicle and change direction	Value change during steering motions within the varied range 30 - 994	Replace the oscillation gyro and/or navigation unit
Speedometer	Move vehicle forward	Value increases during motion (return to 65535)	Check the wiring for connection and signal
km/h	Move vehicle forward	Display roughly matches the speedometer display ($\pm 15\%$)	Conduct calibration
Direction	Move gear lever into and out of reverse	Display "backward" when gear lever is in reverse. Display "forward" when otherwise	Check back-up light wiring

Keyboard test

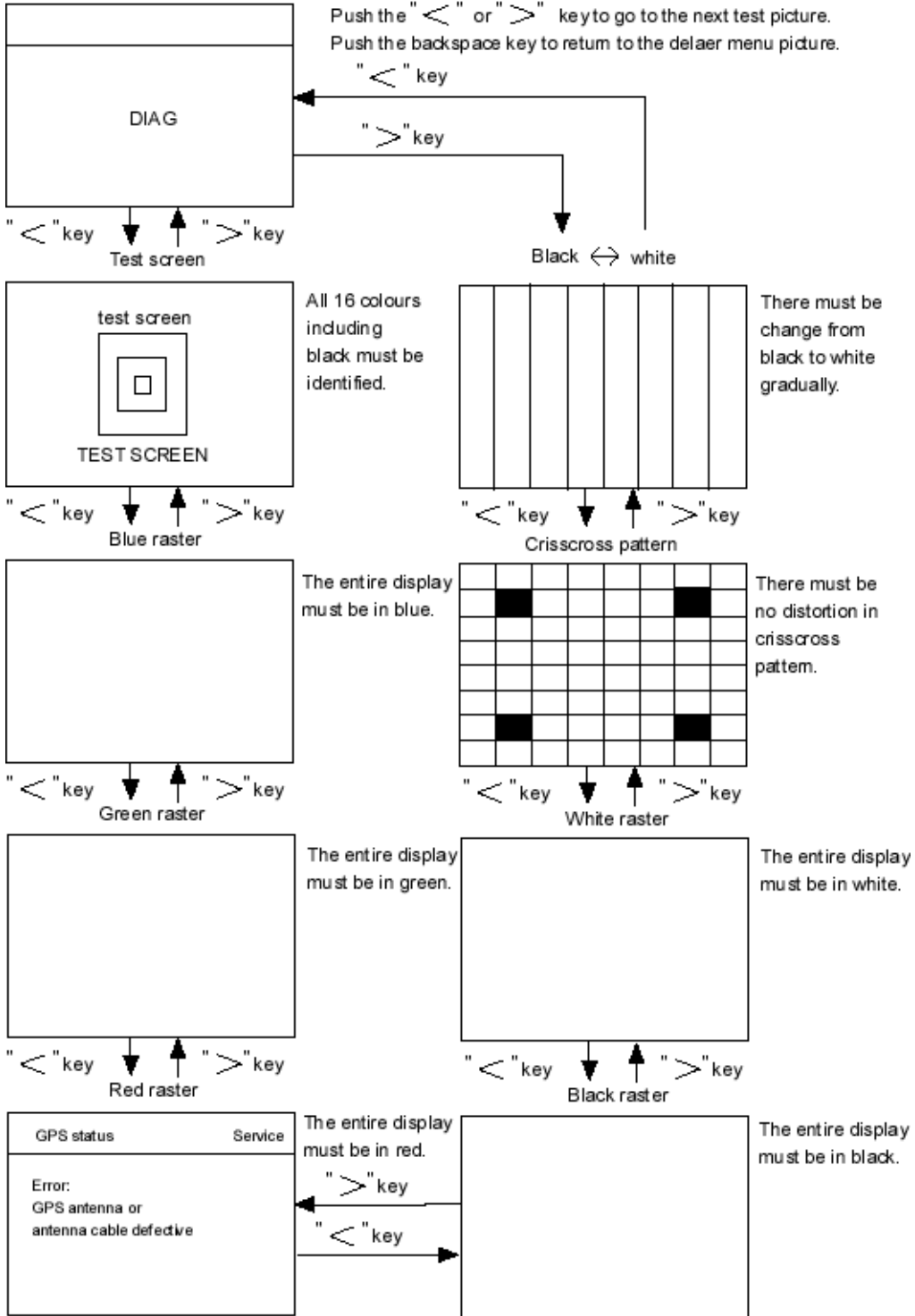
Keyboard test	Service
Key pressed: Congestion	

Check the operation keys by pushing the key. When the backspace key is pushed, indicates "ESC" on the display. When the backspace key is pushed again, returns to dealer menu picture.

Operation key	Backspace	TC	Info	∧	V	<	>	SEL
Display indication	ESC	Congestion	Info	↑	↓	←	→	SEL

LCD test

LCD test is used to check that the display indicates picture correctly.

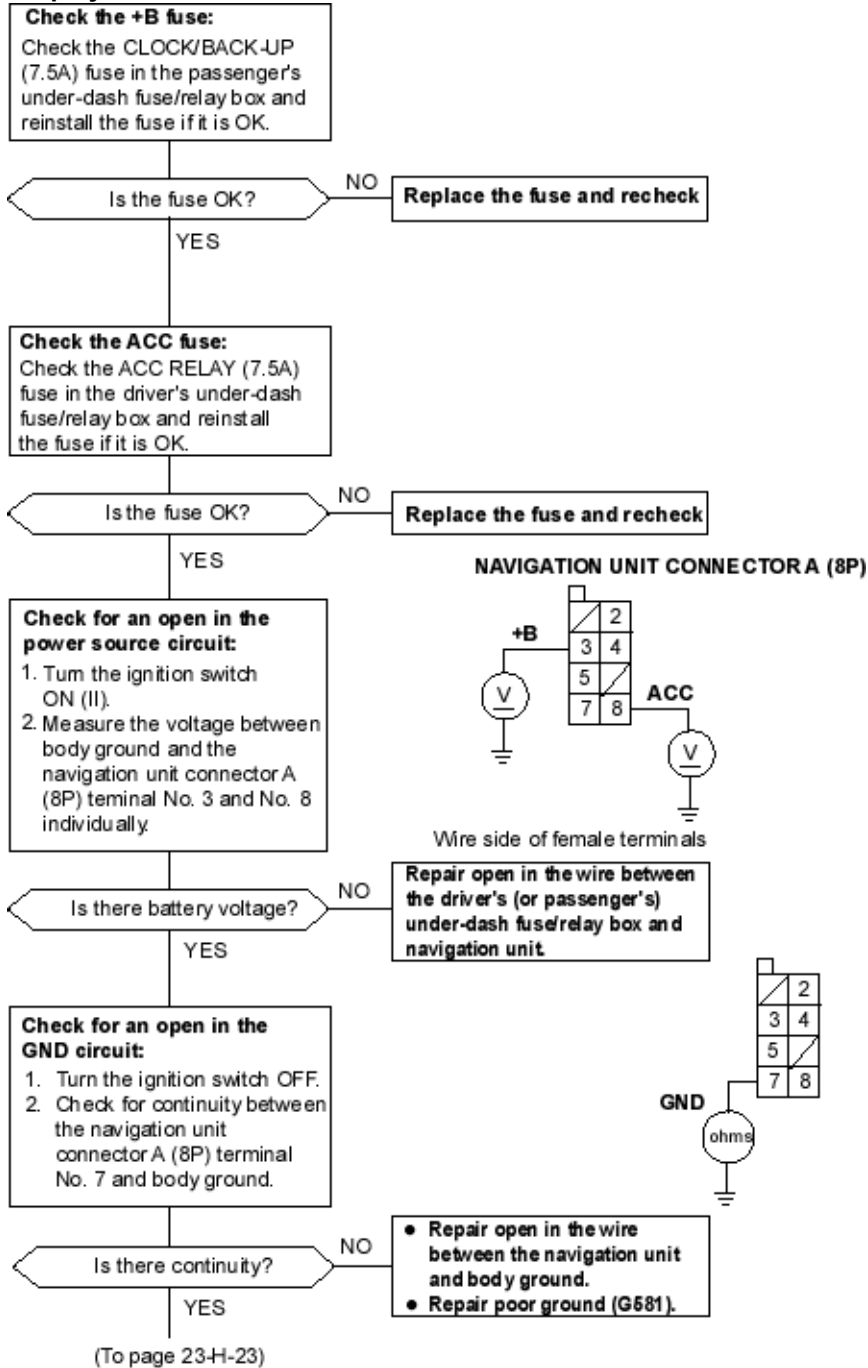


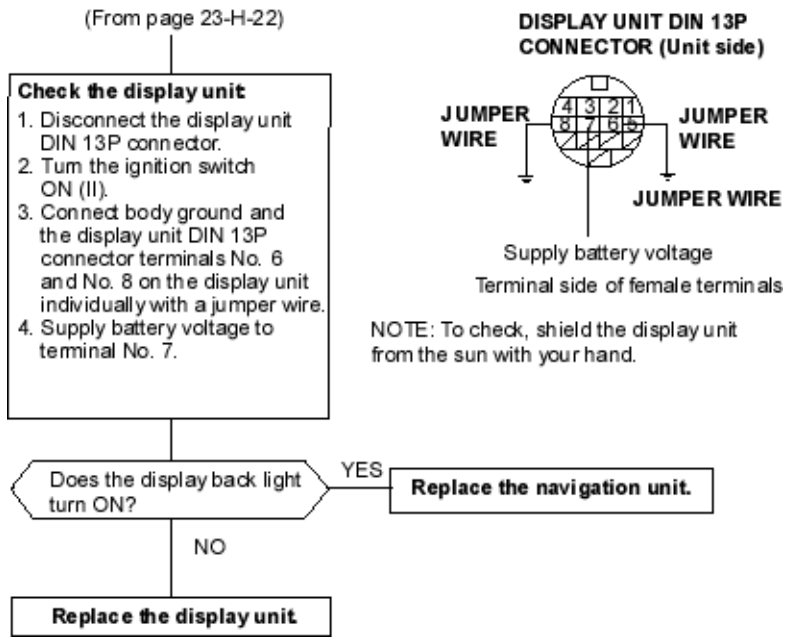
Calibration values

Calibration values	Service
Nr. 1 : XXXXX	
Nr. 2 : XXXXX	
Nr. 3 : XXXXX	
Nr. 4 : XXXXX	

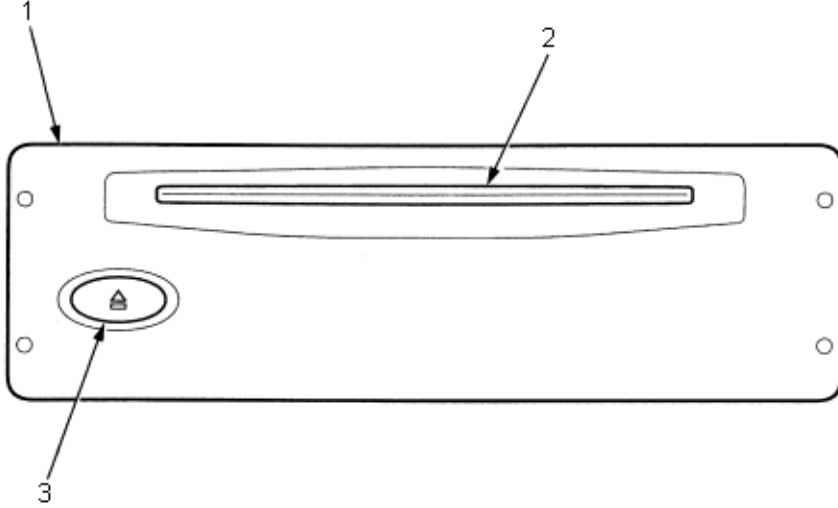
In this picture, you can check the previous calibration values.
Push the backspace key to return to dealer menu picture.

No picture is shown on the display





1. Turn the ignition switch ON (II).
2. Push the eject button.

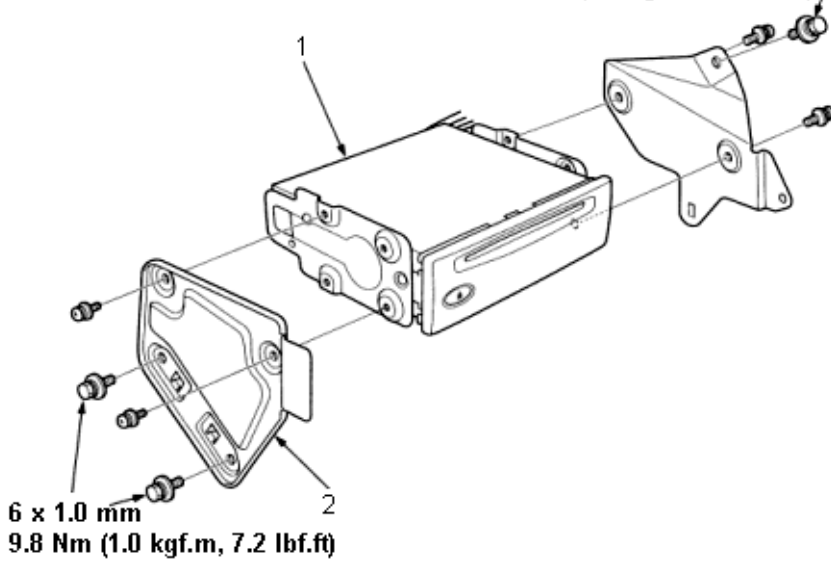


1. NAVIGATION UNIT
2. CD SLOT
3. EJECT BUTTON

3. Remove the CD-ROM.
4. Insert the CD-ROM with the label facing up, carefully into the CD slot until it is automatically pulled into the CD-ROM drive.

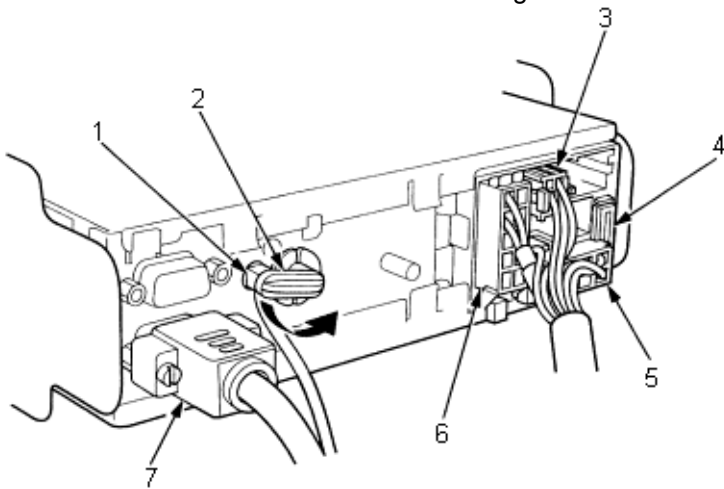
1. Remove the left trunk side trim.
2. Remove the navigation unit bracket from the frame.
The illustration indicates 5-door model.

**6 x 1.0 mm
9.8 Nm (1.0 kgf.m, 7.2 lbf.ft)**



1. NAVIGATION UNIT
2. BRACKET

3. Remove the navigation unit from the bracket.
4. Disconnect the connectors from the navigation unit.



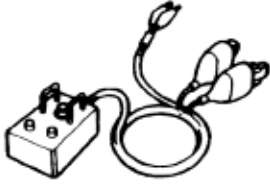
1. GPS ANTENNA CONNECTOR
2. LEVER
Turn the lever to downward to disconnect the GPS antenna connector
3. CONNECTOR C (6P)
4. FUSE (5A)
5. CONNECTOR A (8P)
6. CONNECTOR D (10P)
7. 15P CONNECTOR

5. Install the parts in the reverse order of removal.

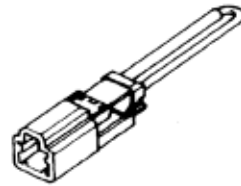
Ref. No.	Tool Number	Description	Qty	Remark
1 *1	07HAZ - SG00500	Deployment Tool	1	
2 *1	07PAZ - 0010100	SCS Short Connector	1	
3	07SAZ - TB4011A	SRS Inflator Simulator	1	
4	07TAZ - SZ5011A	SRS Simulator Lead C	1	
5 *2	07TAZ - 001020A	Backprobe Adapter, 17 mm	2	
6	07XAZ - S1A0200	SRS Simulator Lead D	1	
7	07XAZ - S3A0100	SRS Simulator Lead H	1	

*1: Included in SRS Tool Set 07MAZ - SM5000B.

*2: Use with the stacking patch cords from T/N 07SAZ - 001000A, Backprobe Set.



①



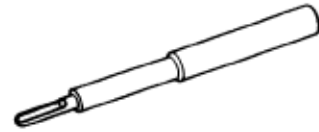
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③



④



⑤



⑥



⑦

Troubleshooting**24-3****Diagnostic Trouble Code (DTC) Chart**

SRS indicator light	DTC	Possible cause	Corrective action	See page
doesn't come on	none (doesn't come on)	Faulty SRS indicator light circuit	Troubleshooting	(See Page 24-38)
comes on	none (doesn't go off)	Faulty SRS indicator light circuit, internal failure of SRS unit, faulty SRS power supply (VB line)	Troubleshooting	(See Page 24-40)
comes on	1-1	Open or increased resistance in the driver's airbag inflator	Troubleshooting	(See Page 24-43)
comes on	1-3	Short to another wire or decreased resistance in the driver's airbag inflator	Troubleshooting	(See Page 24-44)
comes on	1-4	Short to power in the driver's airbag inflator	Troubleshooting	(See Page 24-45)
comes on	1-5	Short to ground in the driver's airbag inflator	Troubleshooting	(See Page 24-46)
comes on	2-1	Open or increased resistance in the passenger's airbag inflator	Troubleshooting	(See Page 24-47)
comes on	2-3	Short to another wire or decreased resistance in the passenger's airbag inflator	Troubleshooting	(See Page 24-48)
comes on	2-4	Short to power in the passenger's airbag inflator	Troubleshooting	(See Page 24-49)
comes on	2-5	Short to ground in the passenger's airbag inflator	Troubleshooting	(See Page 24-50)
comes on	3-1	Open or increased resistance in the left side seat belt tensioner	Troubleshooting	(See Page 24-51)
comes on	3-3	Short to another wire or decreased resistance in the left side seat belt tensioner	Troubleshooting	(See Page 24-52)
comes on	3-4	Short to power in the left side seat belt tensioner	Troubleshooting	(See Page 24-53)
comes on	3-5	Short to ground in the left side seat belt tensioner	Troubleshooting	(See Page 24-54)
comes on	4-1	Open or increased resistance in the right side seat belt tensioner	Troubleshooting	(See Page 24-55)
comes on	4-3	Short to another wire or decreased resistance in the right side seat belt tensioner	Troubleshooting	(See Page 24-56)
comes on	4-4	Short to power in the right side seat belt tensioner	Troubleshooting	(See Page 24-57)
comes on	4-5	Short to ground in the right side seat belt tensioner	Troubleshooting	(See Page 24-58)

NOTE: All see pages on this page refer to the 99 Accord Shop Manual on this CD.

SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	5-1 5-2 5-3 5-4 5-5 5-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	6-1 6-2 6-3 6-4 6-5 6-6 6-7 6-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	7-1 7-2 7-3	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	8-1 8-2 8-3 8-4 8-5 8-6 8-7 8-8	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)
comes on	9-1 *1 9-2 *2	Internal failure of the SRS unit	SRS unit replacement	(See Page 24-83)

NOTE:

All see pages on this page refer to the 99 Accord Shop Manual on this CD.

*1: In case of an intermittent failure DTC 9-1, it means there was an internal failure of the SRS unit or faulty SRS indicator light circuit. Do the troubleshooting for intermittent failures.

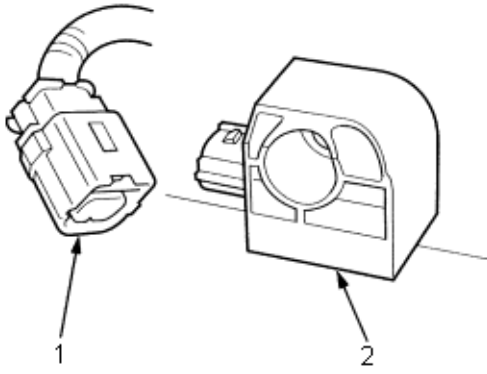
*2: In case of an intermittent failure DTC 9-2, it means there was an internal failure or the power supply (VB line). Do the troubleshooting for intermittent failures.

Troubleshooting**24-5****Diagnostic Trouble Code (DTC) Chart (cont'd)**

SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	10-1	Airbags and seat belt tensioners deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-2	Left side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-3	Right side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-4	Airbags and seat belt tensioners and left side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-5	Airbags and seat belt tensioners and right side airbag deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-6	Side airbags deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	10-7	Airbags and seat belt tensioners and side airbags deployed	SRS unit and deployment related parts replacement	(See Page 24-83)
comes on	11-1	Open or increased resistance in the left side airbag inflator	Troubleshooting	(See Page 24-59)
comes on	11-3	Short to another wire or decreased resistance in the left side, side airbag inflator	Troubleshooting	(See Page 24-60)
comes on	11-4	Short to power in the left side, side airbag inflator	Troubleshooting	(See Page 24-61)
comes on	11-5	Short to power in the right side, side airbag inflator	Troubleshooting	(See Page 24-62)
comes on	12-1	Open or increased resistance in the right side, side airbag inflator	Troubleshooting	(See Page 24-63)
comes on	12-3	Short to another wire or decreased resistance in the right side, side airbag inflator	Troubleshooting	(See Page 24-64)
comes on	12-4	Short to power in the right side, side airbag inflator	Troubleshooting	(See Page 24-65)
comes on	12-5	Short to ground in the right side, side airbag inflator	Troubleshooting	(See Page 24-66)
comes on	13-1	Internal failure of the left side, side impact sensor	Left side, side impact sensor replacement	(See Page 24-84)
comes on	13-2	Internal failure of the left side, side impact sensor	Left side, side impact sensor replacement	(See Page 24-84)
comes on	13-3	Faulty signal line of the left side, side impact sensor	Troubleshooting	(See Page 24-67)
comes on	13-4	Faulty power line of the left side, side impact sensor	Troubleshooting	(See Page 24-68)
comes on	14-1	Internal failure of the right side, side impact sensor	Right side, side impact sensor replacement	(See Page 24-83)
comes on	14-2	Internal failure of the right side, side impact sensor	Right side, side impact sensor replacement	(See Page 24-83)
comes on	14-3	Faulty signal line of the right side, side impact sensor	Troubleshooting	(See Page 24-70)
comes on	14-4	Faulty power line of the right side, side impact sensor	Troubleshooting	(See Page 24-71)

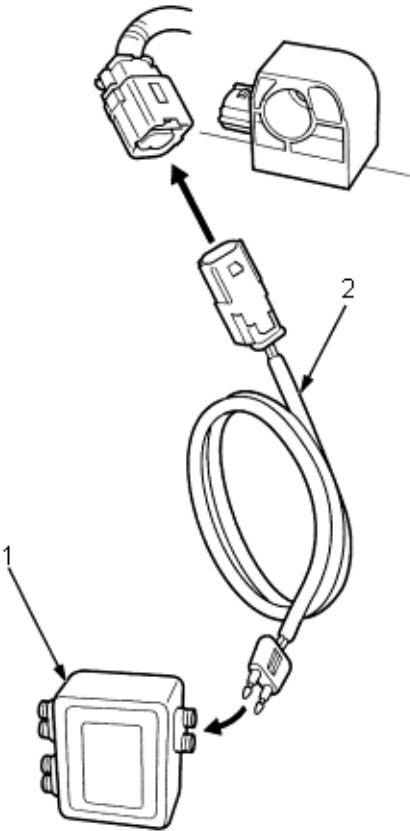
All see pages on this page refer to the 99 Accord Shop Manual on this CD.

ILi connector (left side) or IRi connector (right side):



- 1. ILi (IRi) CONNECTOR
- 2. SIDE IMPACT SENSOR

Connecting the special tool to the ILi (IRi) connector:



- 1. 07SAZ-TB4011A (JUMPER)
- 2. 07YAZ-S3A0100

CAUTION

Follow the precautions/procedures described beforehand in this section without fail or the airbags could accidentally deploy and cause damage or injuries.

Wiring Diagram:



Possible Causes of Failures:

- Faulty signal line between the U2o and ILi connectors.
- Faulty left side side impact sensor.
- Faulty SRS unit.

Try to reproduce the SRS indicator light

1. Erase the DTC memory.
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures.

Check for poor contact at the ILi connector:

1. Turn the ignition switch OFF, disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SLi connector from the SLo connector.
3. Check for connections between the ILi connector and the left side side impact sensor.

Are the connections OK?

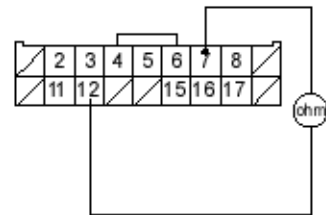
YES NO

Poor contact at the ILi connector; connect the ILi connector securely.

(A)

Check for an open in the SRS floor harness:

1. Disconnect the TL, TR and SR connectors.
2. Disconnect the ILi connector from the left side, side impact sensor.
3. Connect the special tool to the ILi connector.
4. Disconnect the U2o connector from the SRS unit.
5. Check resistance between the No. 7 and No. 12 terminals of the U2o connector. There should be 0 - 1.0 ohm.



Wire side of female terminals.

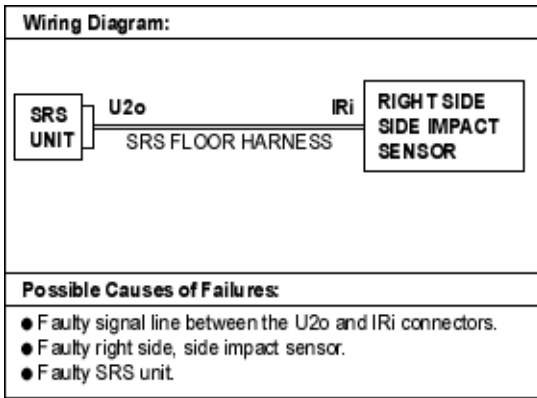
Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

Faulty left side impact sensor or SRS unit; replace the left side impact sensor. If the problem is still present, replace the SRS unit.

(A)



Try to reproduce the SRS indicator light:

1. Erase the DTC memory.
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6.5 seconds, and then goes off.

Does the SRS indicator light stay on?

YES NO

Intermittent failure, system is OK at this time. See Troubleshooting Intermittent Failures.

Check for poor contact at the IRi connector:

1. Turn the ignition switch OFF, disconnect the negative battery cable, and wait for three minutes.
2. Disconnect the SRi connector from the SRo connector.
3. Check for connections between the IRi connector and the right side impact sensor.

Are the connections OK?

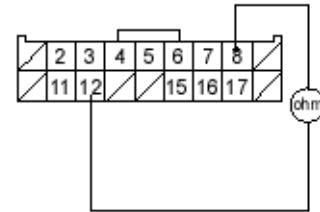
YES NO

Poor contact at the IRi connector; connect the IRi connector securely.

(A)

(A)

- Check for an open in the SRS floor harness:**
1. Disconnect the TL, TR and SL connectors.
 2. Disconnect the IRi connector from the right side, side impact sensor.
 3. Connect the special tool to the IRi connector.
 4. Disconnect the U2o connector from the SRS unit.
 5. Check the resistance between the No. 8 and No. 11 terminals of the U2o connector.
There should be 0 - 1.0 ohm.



Wire side of female terminals

Is the resistance as specified?

YES NO

Open in the SRS floor harness; replace the SRS floor harness.

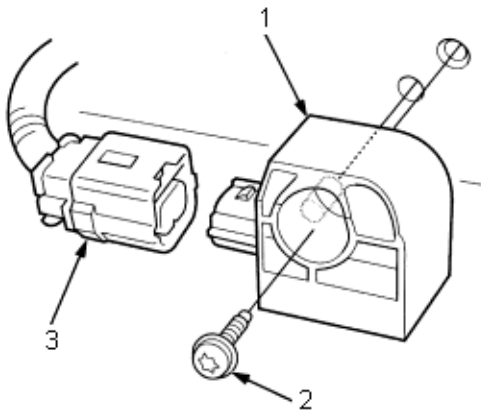
Faulty right side impactsensor or SRS unit; replace the right side impact sensor. If the problem is still present, replace the SRS unit.

CAUTION

Removal of the airbag must be performed according to the precautions/procedures described before.

Removal

1. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
2. Remove:
 - ♦ Seat assembly
 - ♦ Front side trim
 - ♦ Centre pillar lower trim panel
 - ♦ Lower anchor bolt
3. Turn up the carpet, then remove the two mounting bolts and the plate.



1. SIDE IMPACT SENSOR
2. TORX BOLT
3. SRS FLOOR HARNESS 2P CONNECTOR

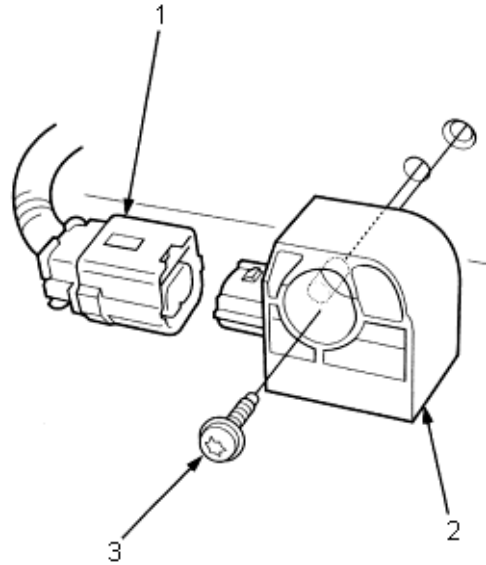
4. Remove the Torx bolt using a Torx T30 bit, then remove the side impact sensor.

Installation

CAUTION

Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Install the new side impact sensor with a new Torx bolt, then connect the SRS floor harness 2P connector to the side impact sensor.



1. SRS FLOOR HARNESS 2P CONNECTOR
2. SIDE IMPACT SENSOR
3. TORX BOLTS, 9.8 Nm (1.0 kgf/m, 7.2 lbf/ft), Use a Torx T30 bit

2. Reconnect the negative battery cable.
3. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about 6.5 seconds and then go off.