

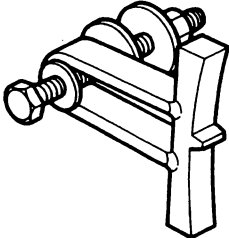
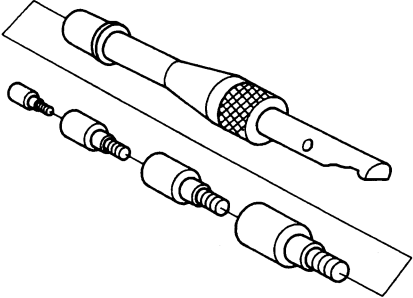
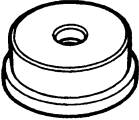
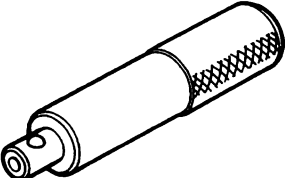
Clutch

Special Tools	12-2
Illustrated Index	12-3
Clutch Pedal	
Adjustment	12-4
Clutch Master Cylinder	
Replacement	12-5
Slave Cylinder	
Replacement	12-7
Pressure Plate	
Removal/Inspection	12-8
Clutch Disc	
Removal/Inspection	12-9
Flywheel	
Inspection/Replacement	12-10
Bearing Replacement	12-11
Clutch Disc, Pressure Plate	
Installation	12-12
Release Bearing	
Replacement	12-13



Special Tools

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	

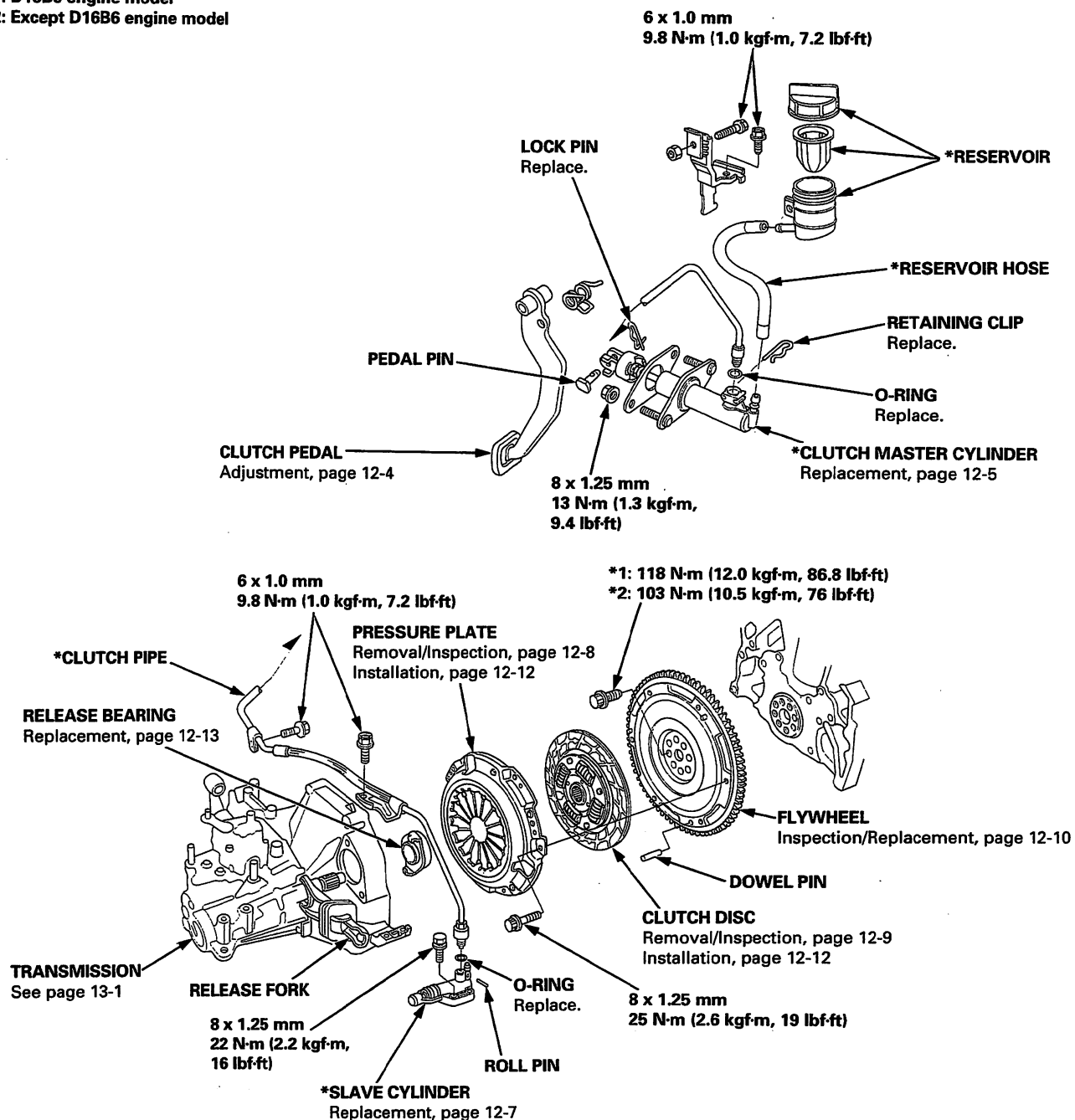
Illustrated Index

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 12-7).
- 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**



Clutch Pedal

Adjustment

NOTE:

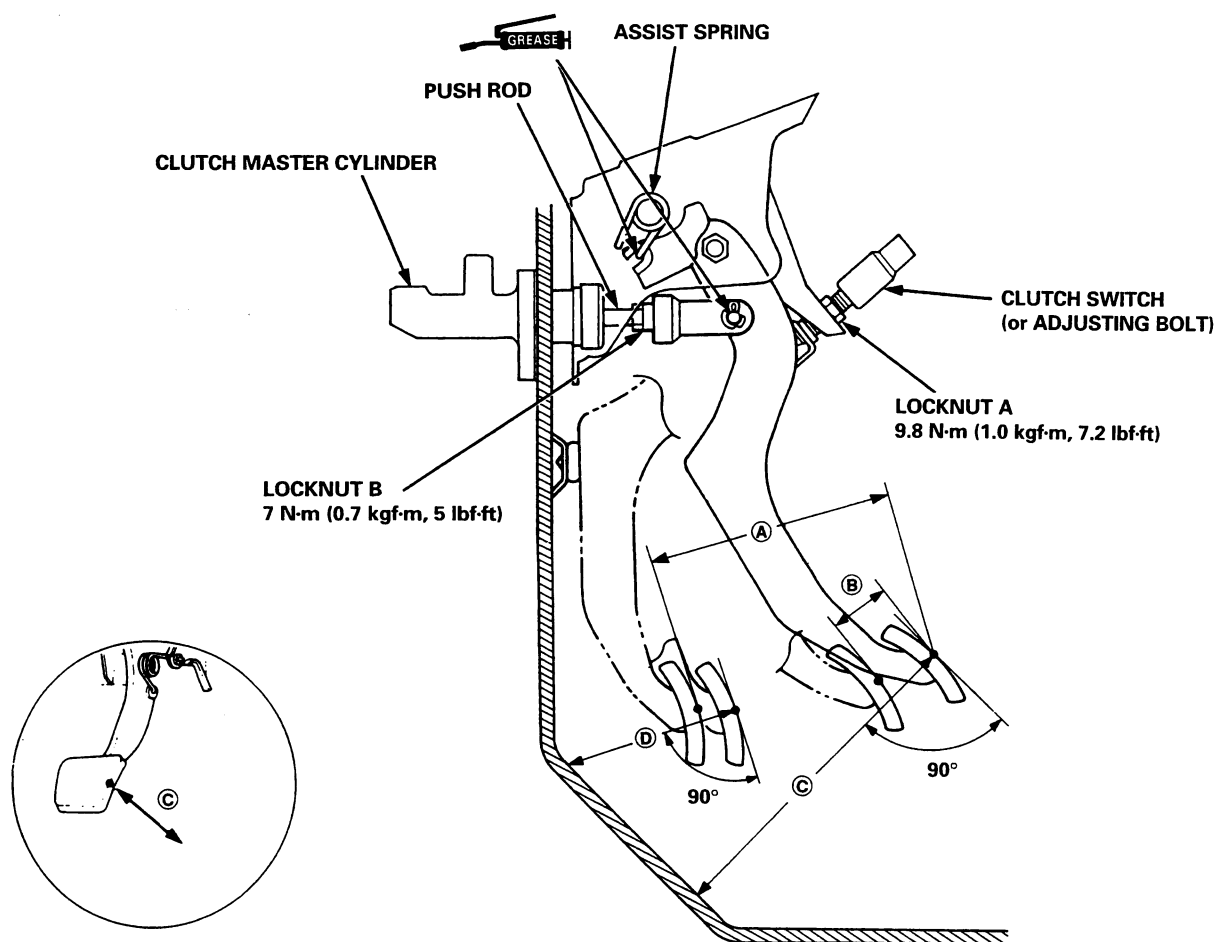
- To check the clutch switch, see section 23.
- The clutch is self-adjusting to compensate for wear.

⚠ 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): 141 – 151 mm (5.55 – 5.94 in)
(B) (TOTAL CLUTCH PEDAL FREE PLAY): 9 – 15 mm (0.4 – 0.6 in) include the pedal play 1.0 – 7.0 mm (0.04 – 0.28 in)
(C) (CLUTCH PEDAL HEIGHT): LHD: 177 – 187 mm (6.97 – 7.36 in) to the floor
RHD: 201 – 211 mm (7.91 – 8.31 in) to the floor
(D) (CLUTCH PEDAL DISENGAGEMENT HEIGHT): LHD: 81 mm (3.19 in) minimum to the floor
RHD: 107 mm (4.21 in) minimum to the floor

Clutch Master Cylinder



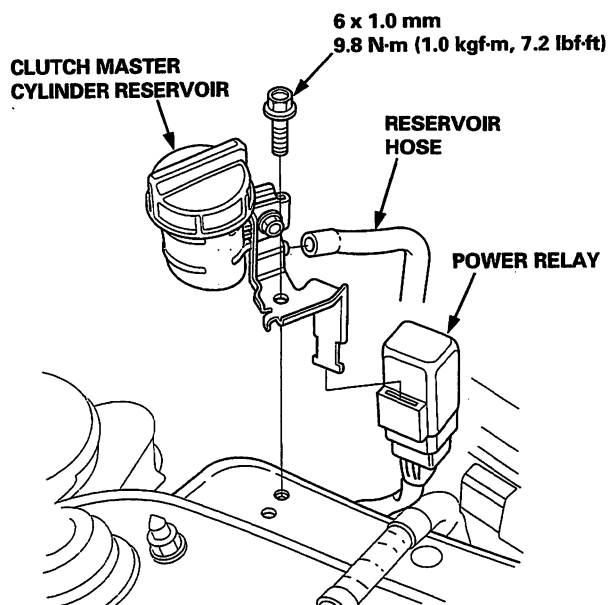
Replacement

⚠ 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.

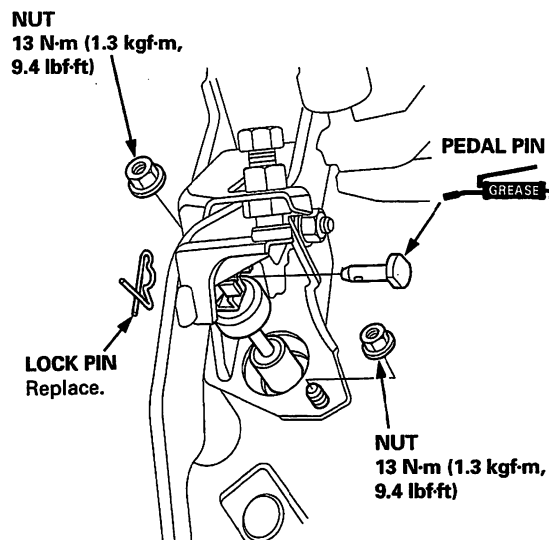
LHD type:

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.

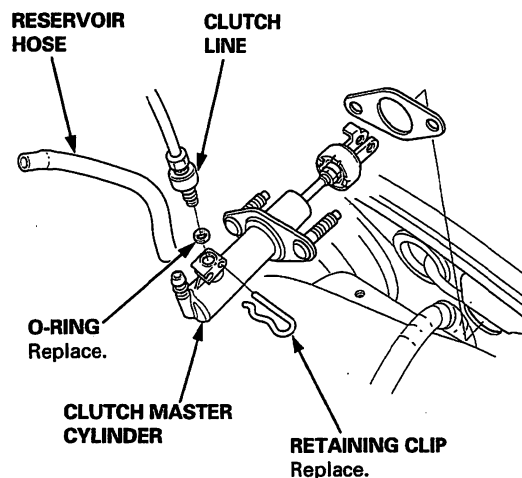


3. Remove the clutch master cylinder reservoir and power relay.

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 12-7).

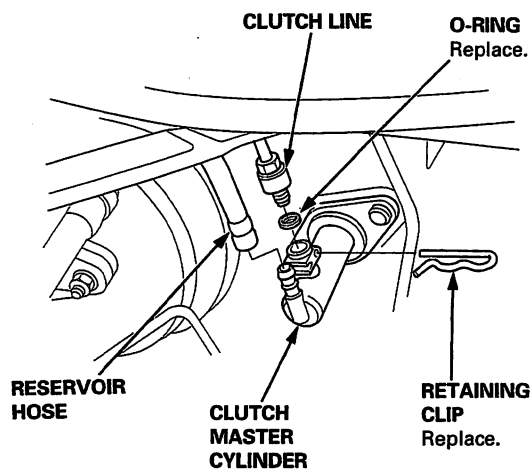
(cont'd)

Clutch Master Cylinder

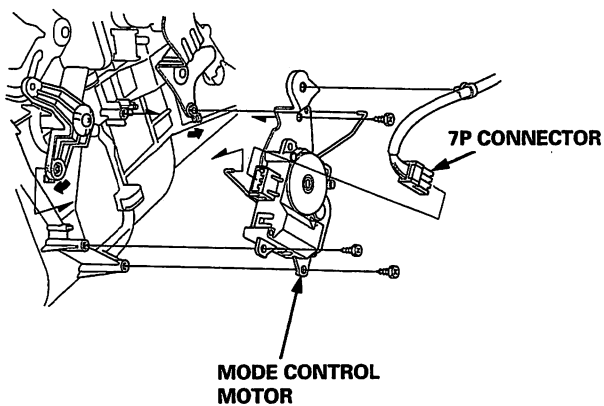
Replacement (cont'd)

RHD type:

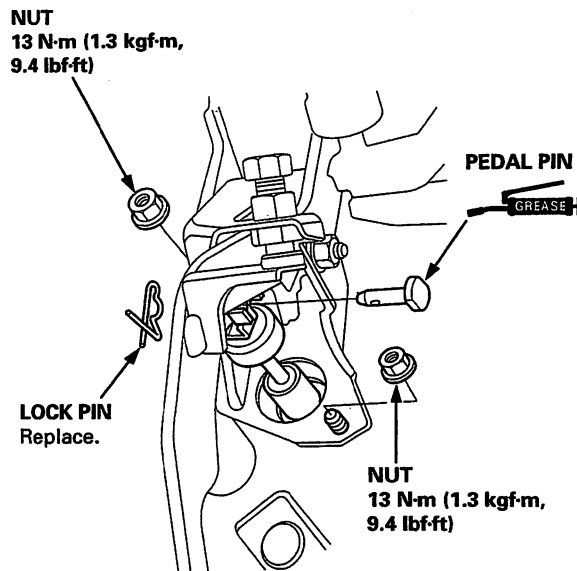
1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Disconnect the reservoir hose from the clutch master cylinder reservoir.



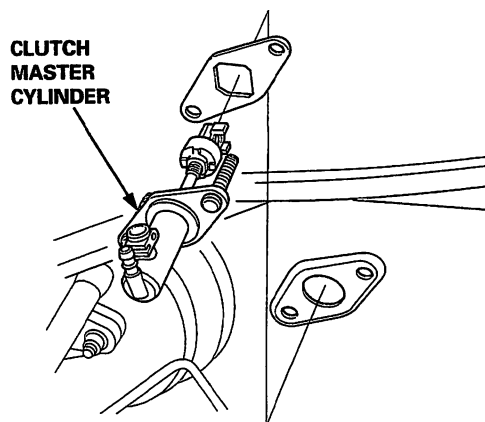
3. Remove the retaining clip. Disconnect the clutch line, and remove the O-ring.
4. Disconnect the connector, then remove the mode control motor.



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 12-7).

Slave Cylinder

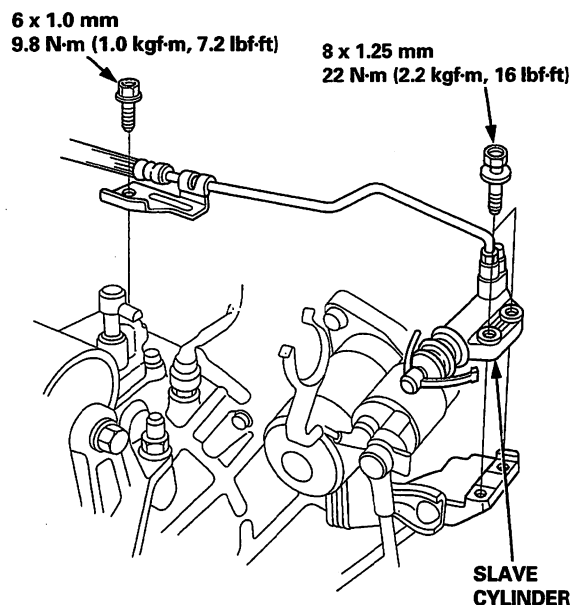


Replacement

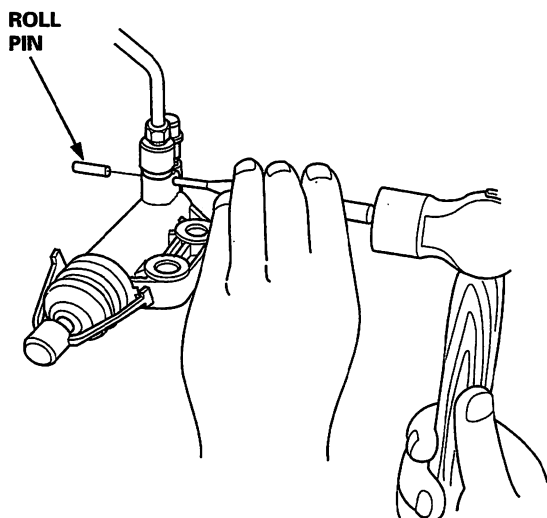
⚠ CAUTION

- 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 with a shop towel to prevent brake fluid from coming out.

1. Remove the mounting bolts, the slave cylinder, and clutch line mounting bolt.

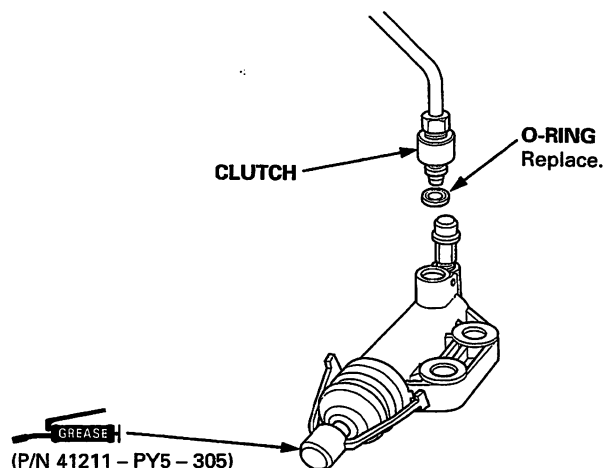


2. Remove the roll pin.



3. Remove the slave cylinder and o-ring.

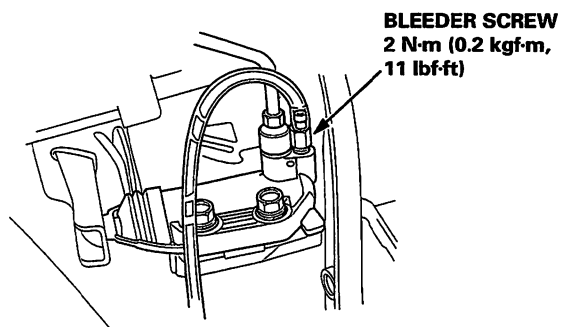
NOTE: Use only Honda Genuine Urea Grease UM 264 (P/N 41211 – PY5 – 305).



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.



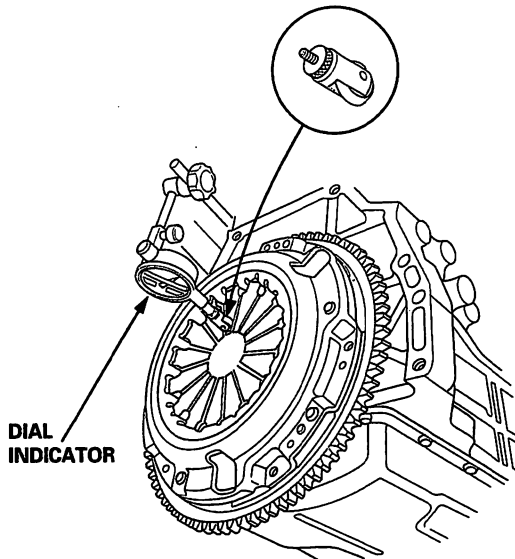
Pressure Plate

Removal/Inspection

1. Check the diaphragm spring fingers for height using the dial indicator.

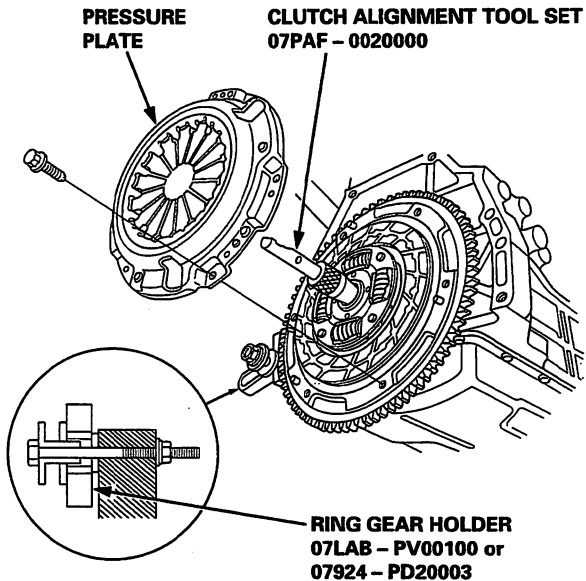
Standard (New): 0.6 mm (0.02 in) max.

Service Limit: 0.8 mm (0.03 in)



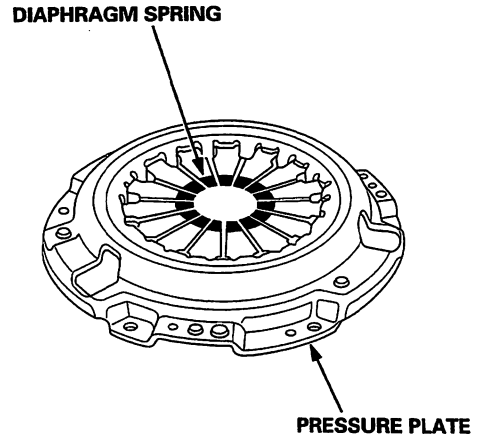
If the height is more than the service limit, replace the pressure plate.

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.

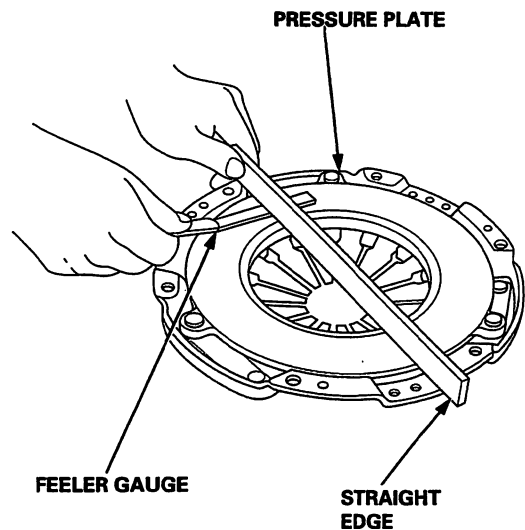
4. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.



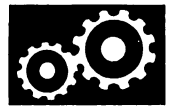
5. Inspect the pressure plate surface for wear, cracks, and burning.
6. Inspect for warpage using a straight edge and feeler gauge. Measure across the pressure plate.

Standard (New): 0.03 mm (0.001 in) max.

Service Limit: 0.15 mm (0.006 in)

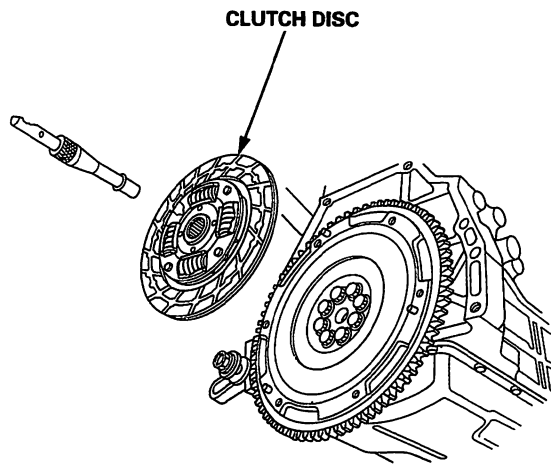


If the warpage is more than the service limit, replace the pressure plate.



Removal/Inspection

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):

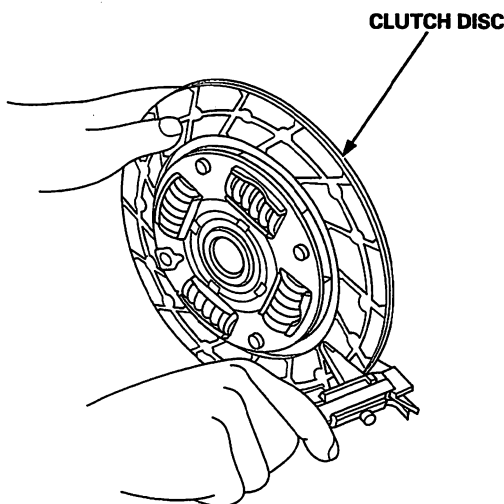
D16B6 engine: 7.7 – 8.2 mm (0.30 – 0.32 in)

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):

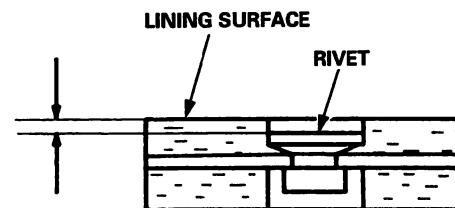
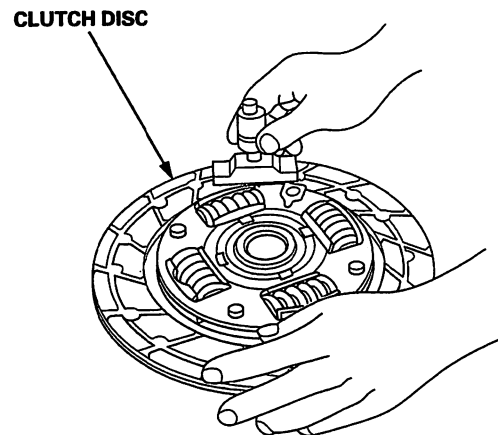
D16B6 engine: 1.3 mm (0.051 in)

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.

Flywheel

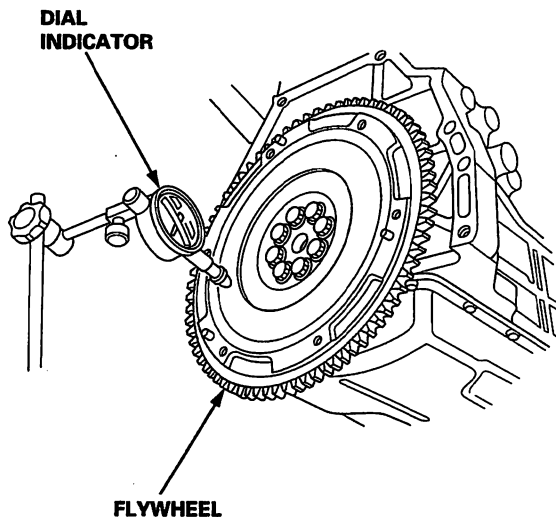
Inspection/Replacement

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.

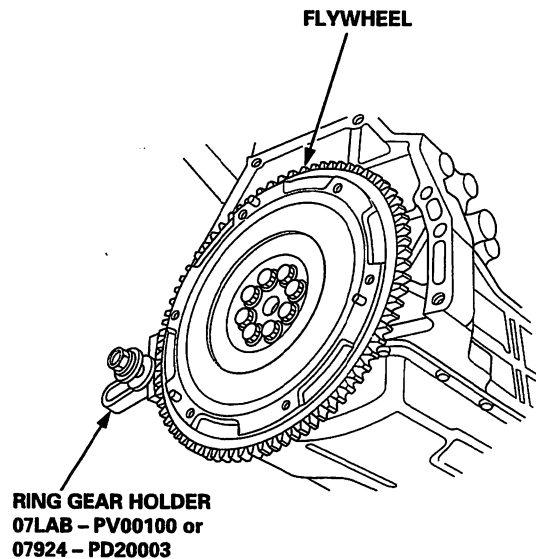
Standard (New): 0.05 mm (0.002 in) max.

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 N·m (12.0 kgf·m, 86.8 lbf·ft)

Except D16B6 engine model:

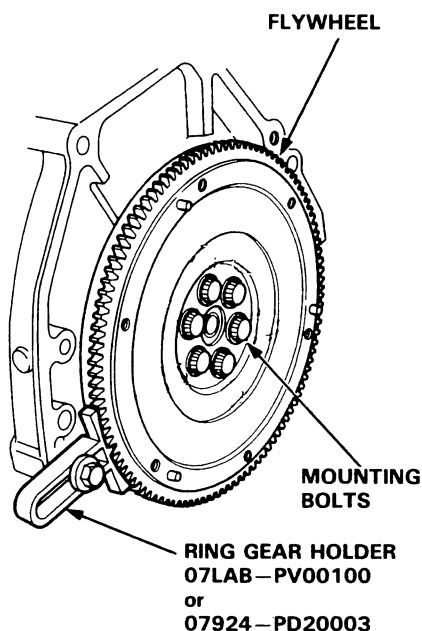
103 N·m (10.5 kgf·m, 76 lbf·ft)

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.

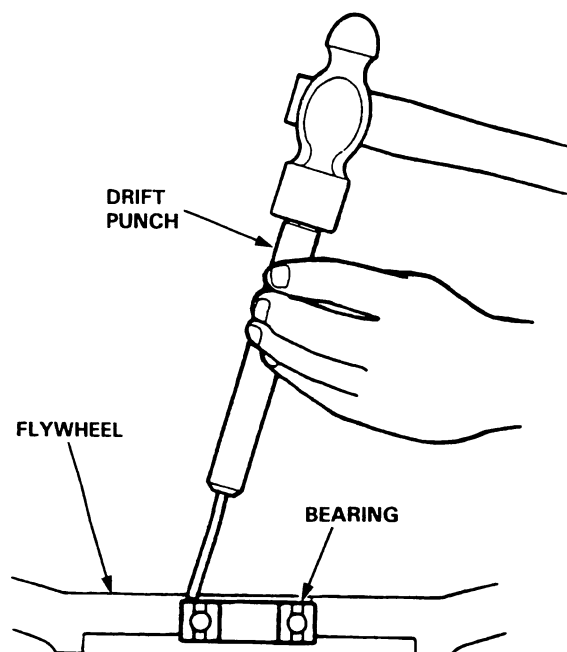


Bearing Replacement (D16B6 engine model)

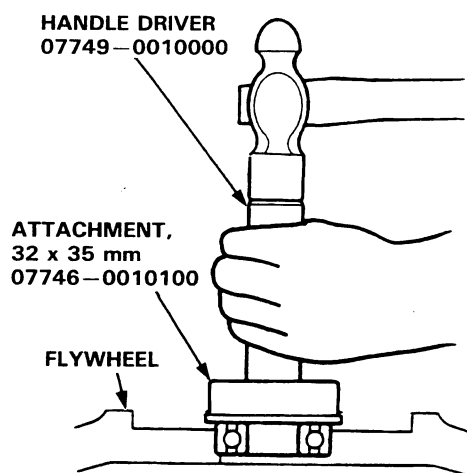
1. Install the special tool as shown.
2. Remove the flywheel mounting bolts in a crisscross pattern in several steps, and remove the flywheel.



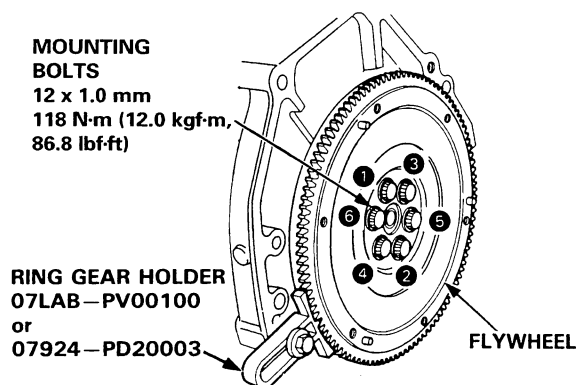
3. Remove the ball bearing from the flywheel.



4. Drive the new bearing into the flywheel using the special tools as shown.



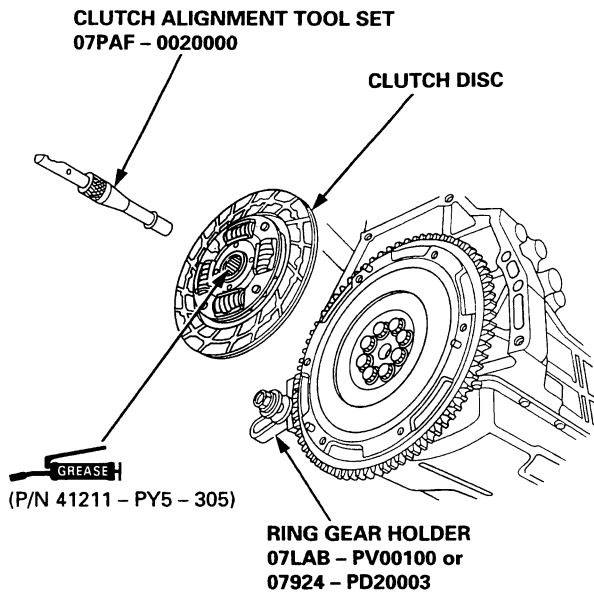
5. Align the hole in the flywheel with the crankshaft dowel pin, and install the flywheel. Install the mounting bolts finger-tight.
6. Install the special tool, then torque the flywheel mounting bolts in a crisscross pattern in several steps as shown.



Clutch Disc, Pressure Plate

Installation

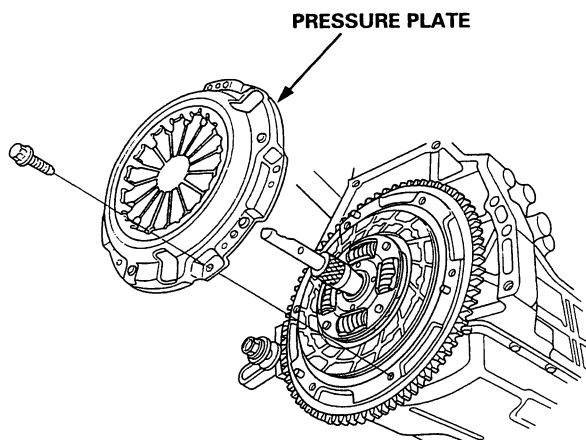
1. Install the ring gear holder.



2. Apply grease to the splines of the clutch disc, then install the clutch disc using the special tools as shown.

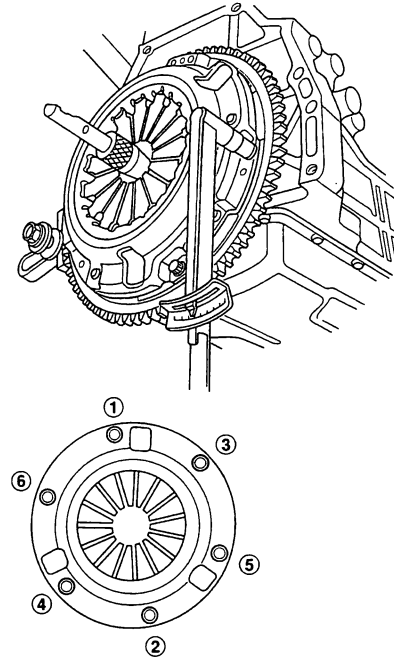
NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305).

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 1.25 mm
25 N-m (2.6 kgf-m, 19 lbf-ft)

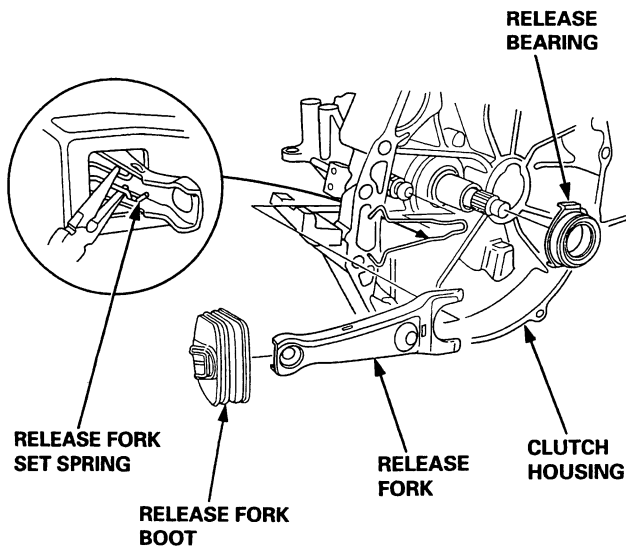


5. Remove the special tools.
6. Check the diaphragm spring fingers for height (see page 12-8).



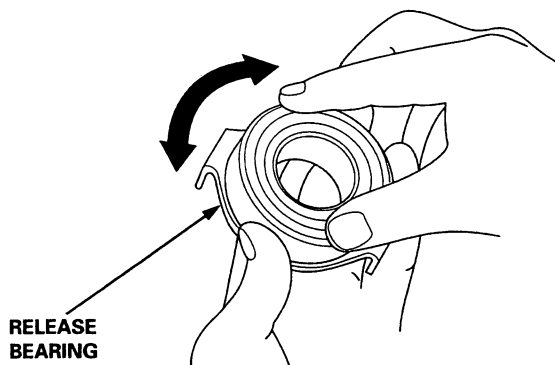
Replacement

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)

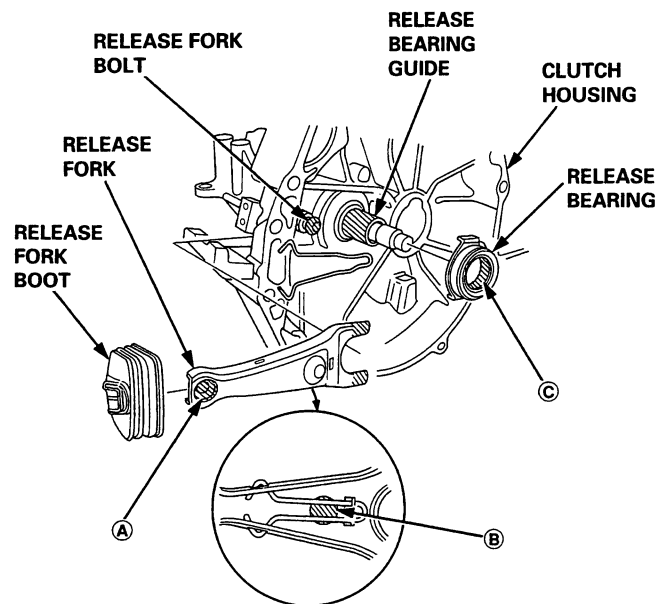
C: 0.5 - 1.1 g (0.02 - 0.04 oz)

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)



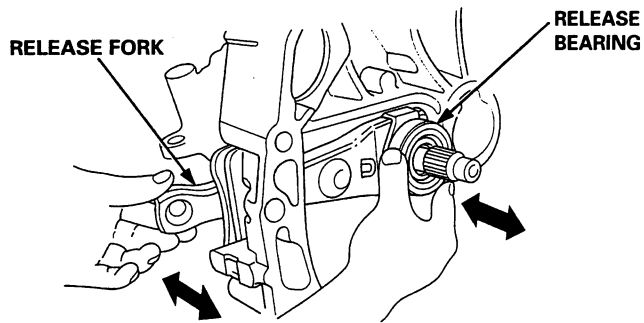
5. Install the release bearing set spring on the release fork, with the release fork slid between the release bearing pawls.
6. Install the release bearing on the mainshaft while inserting the release fork through the hole in the clutch housing.
7. Align the detent of the release fork with the release 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.

(cont'd)

Release Bearing

Replacement (cont'd)

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.



Differential

Manual Transmission Section 13

Automatic Transmission Section 14



Manual Transmission

DH Model

Manual Transmission 13-1

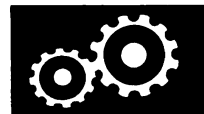
U2J4/U2G5/U2Q7 Model

Manual Transmission 13-53



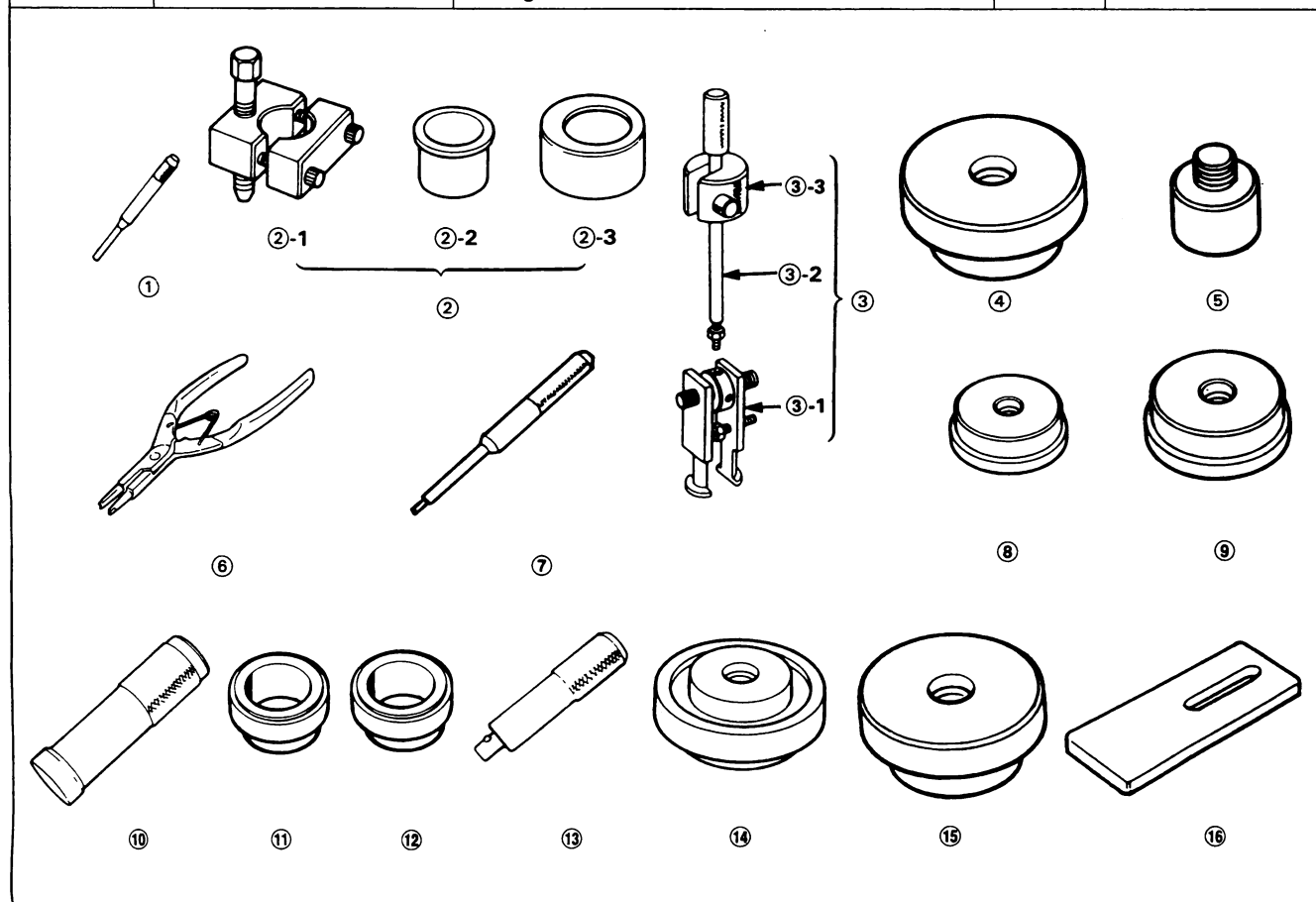
DH Model Manual Transmission (D16B6 engine model)

Special Tools	13-2	Shift Fork Assembly	
Maintenance		Index	13-27
Transmission Fluid	13-3	Clearance Inspection	13-28
Back-up Light Switch		MBS Shift Piece Inspection	13-29
Test/Replacement	13-3	Synchro Sleeve, Synchro Hub	
Troubleshooting	13-4	Inspection/Installation	13-29
Gearshift Mechanism		Synchro Ring, Gear	
Overhaul	13-5	Inspection	13-30
Transmission Assembly		Shift Rod	
Removal	13-6	Removal	13-31
Index	13-12	Differential	
Transmission Housing		Index	13-32
Removal	13-14	Backlash Inspection	13-32
Reverse Shift Holder		Bearing Replacement	13-33
Clearance Inspection	13-15	Final Driven Gear Replacement	13-33
Reverse Idler Gear		Thrust Shim Adjustment	13-34
Removal	13-16	Clutch Housing Bearing	
Mainshaft, Countershaft, Shift Fork		Replacement	13-36
Disassembly	13-16	Mainshaft Thrust Clearance	
Mainshaft Assembly		Adjustment	13-38
Index	13-17	Transmission	
Clearance Inspection	13-18	Reassembly	13-41
Disassembly	13-19	Oil Seals	
Inspection	13-20	Replacement	13-45
Reassembly	13-21	Transmission Assembly	
Countershaft Assembly		Installation	13-46
Index	13-22		
Clearance Inspection	13-23		
Disassembly	13-24		
Inspection	13-25		
Reassembly	13-25		



Special Tools

Ref. No.	Tool Number	Description	Qty	Remark
①	07GAD – PG20100	Pin Driver, 5.0 mm	1	Component Tools
②	07GAJ – PG20102	Mainshaft Clearance Inspection Tool Set	1	
②-1	07GAJ – PG20110	Mainshaft Holder	(1)	
②-2	07GAJ – PG20120	Collar	(1)	
②-3	07GAJ – PG20130	Mainshaft Base	(1)	
③	07JAC – PH80000	Adjustable Bearing Remover Set	1	Component Tools
③-1	07JAC – PH80100	Bearing Remover Attachment	(1)	
③-2	07JAC – PH80200	Remover Handle Assembly	(1)	
③-3	07741 – 0010201	Remover Weight	(1)	
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 Driver Attachment	1	
⑮	07947 – 6110501 or 07947 – 6110500	Seal Driver Attachment	1	
⑯	07979 – PJ40001	Magnet Stand Base	1	

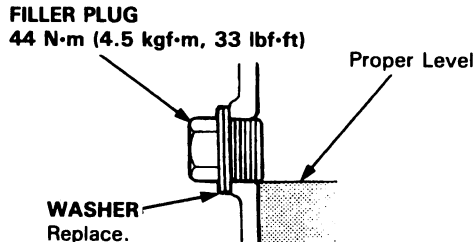




Transmission Fluid

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.

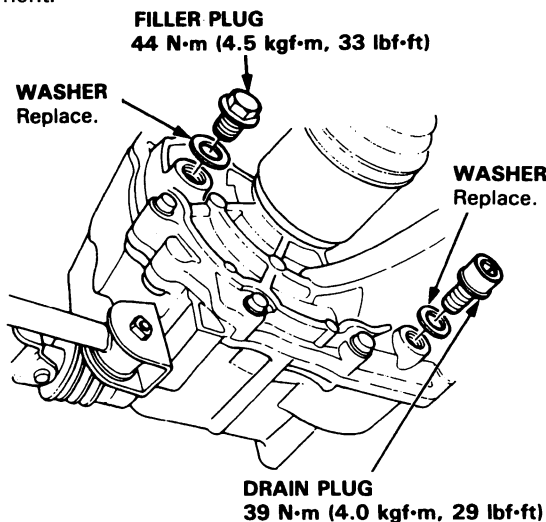
NOTE: The drain plug washer should be replaced at every fluid change.

5. Reinstall the filler plug with a new washer.

Fluid Capacity

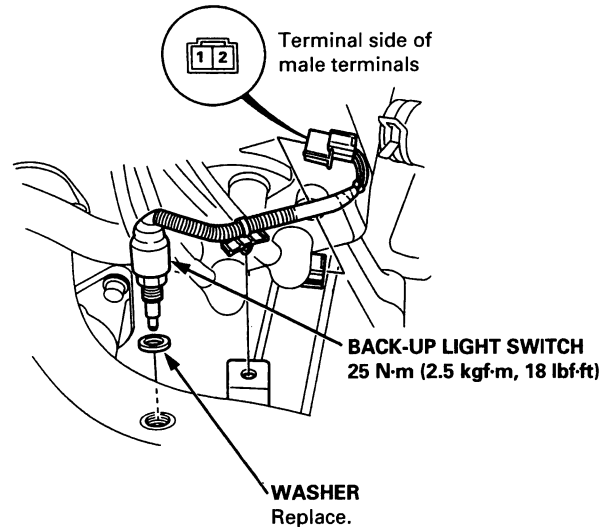
1.8 ℓ (1.9 US qt, 1.6 Imp qt) at fluid change
1.9 ℓ (2.0 US qt, 1.7 Imp qt) at overhaul

Always use genuine Honda manual transmission fluid (MTF). If it is not available, you may use an API service SG, SH or SJ grade motor oil with a viscosity of SAE 10W-30 or 10W-40 as a temporary replacement.



Test/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.

Troubleshooting

Reverse Gear Noise Reduction System

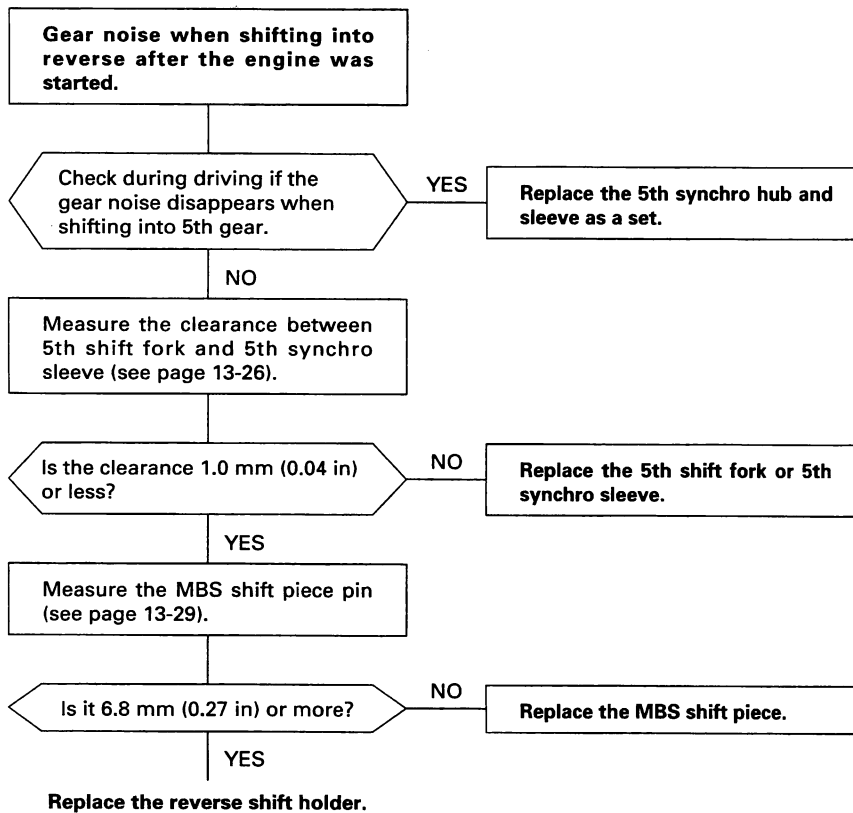
After the clutch pedal was depressed to shift into Reverse, the mainshaft continues to rotate because of its inertia. The resulting speed difference between mainshaft and reverse idler gear produces gear noise.

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.

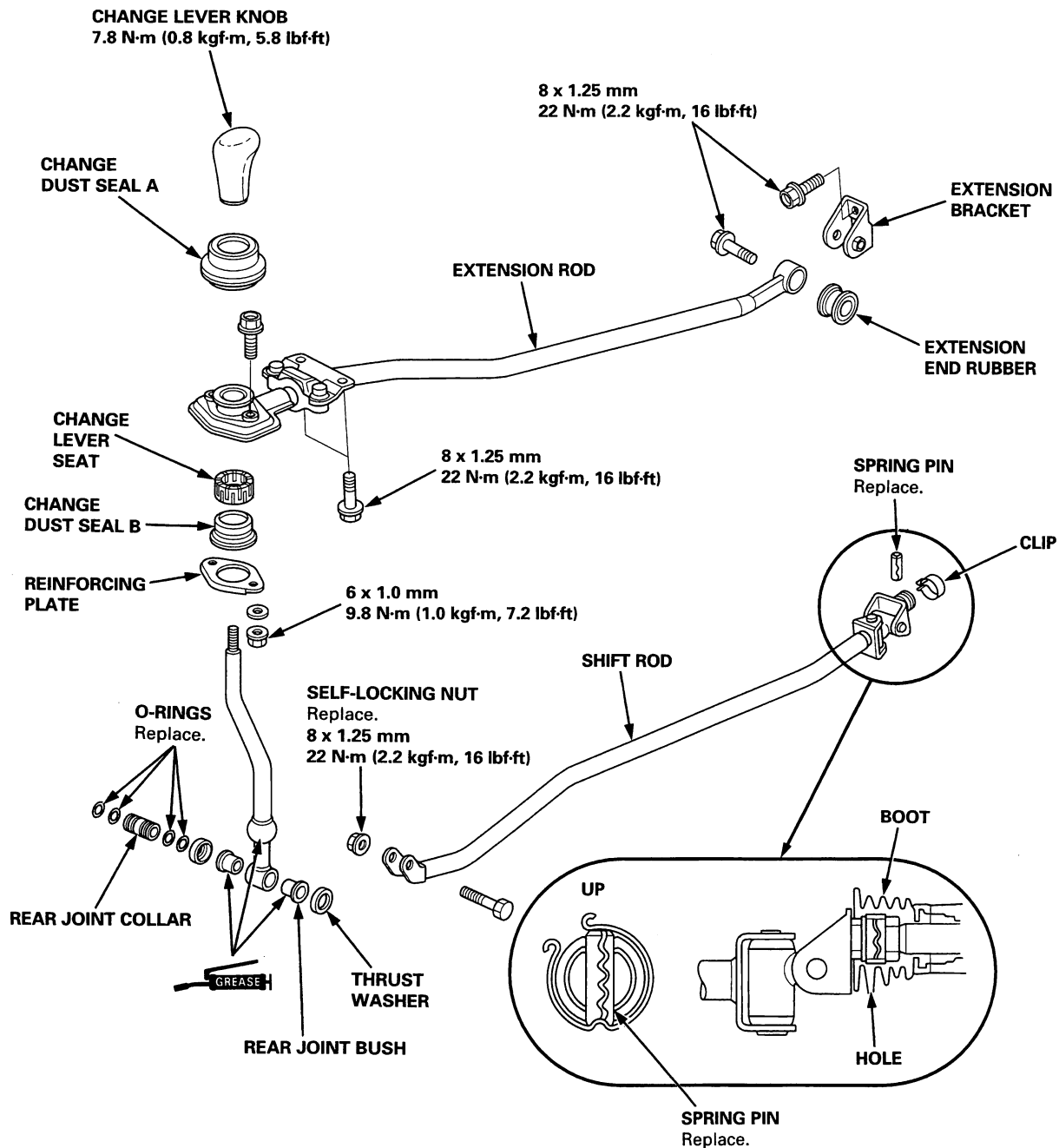




Overhaul

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.



Transmission Assembly

Removal

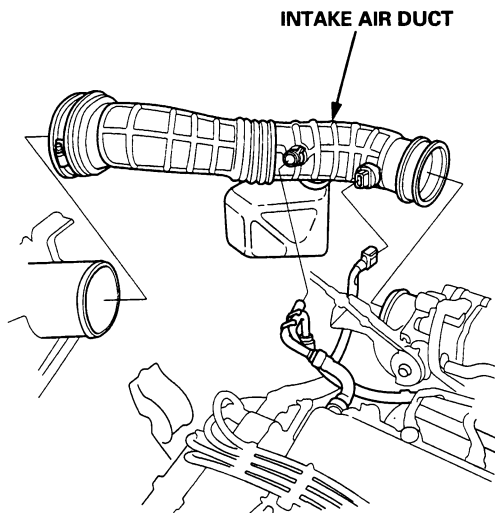
⚠ WARNING

- 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.

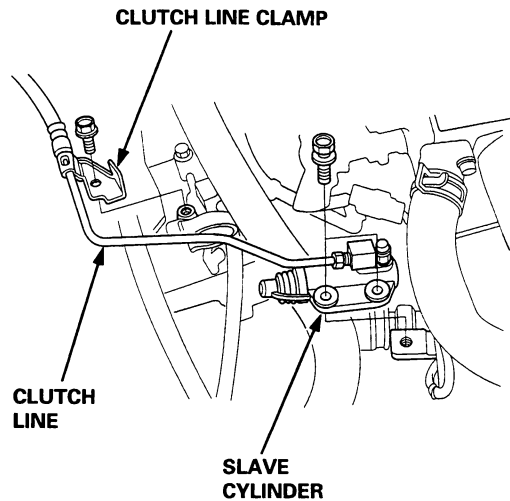
1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery.
2. Remove the intake air duct.



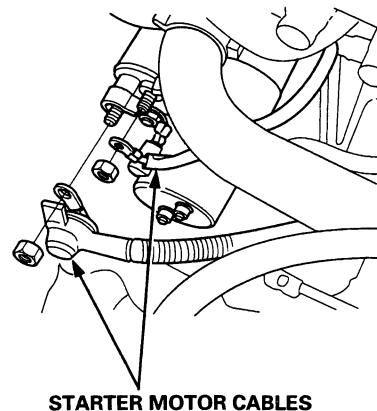
3. Carefully remove the slave cylinder and clutch line clamp so as not to bend the clutch line.

⚠ CAUTION

- Do not operate the clutch pedal once the slave cylinder has been removed.

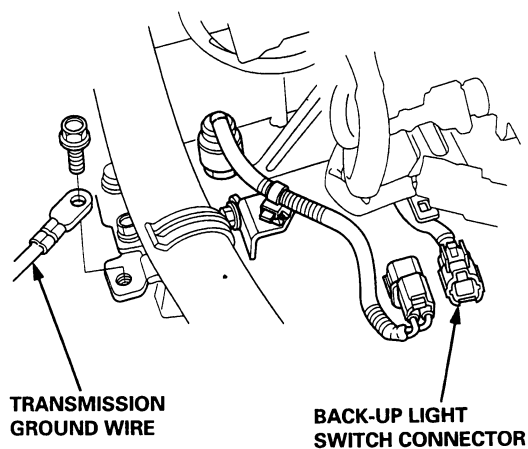


4. Disconnect the starter motor cables.

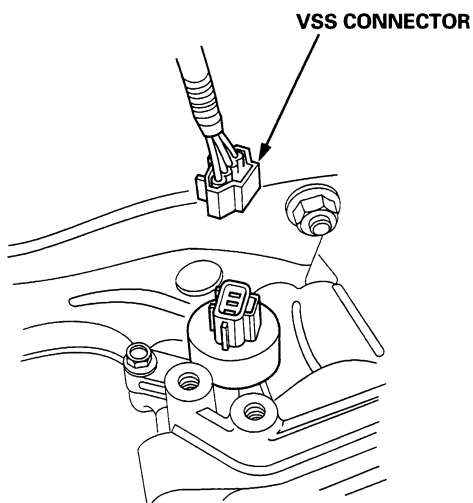




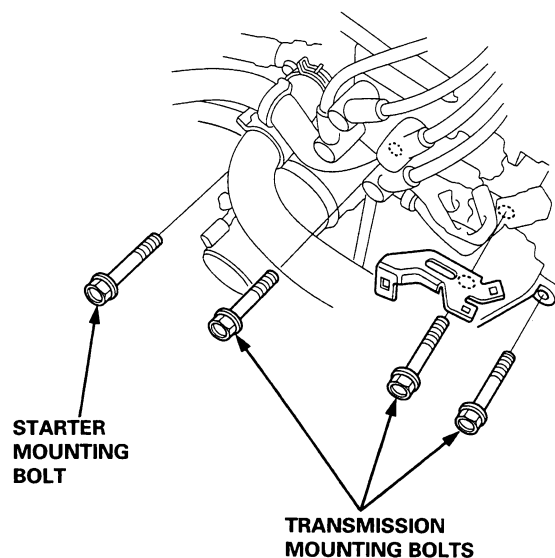
5. Disconnect the back-up light switch connector and transmission ground wire.



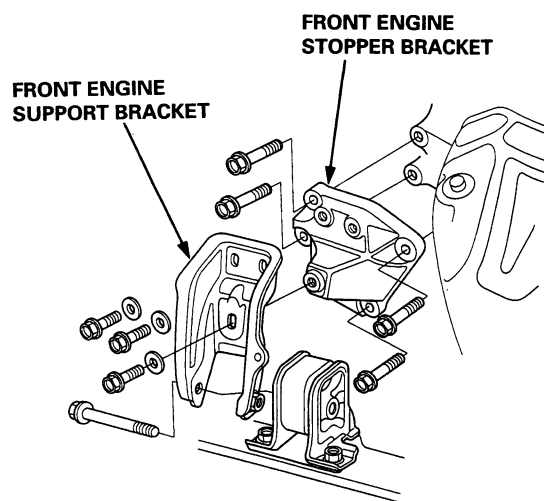
6. Disconnect the vehicle speed sensor (VSS) connector.



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.

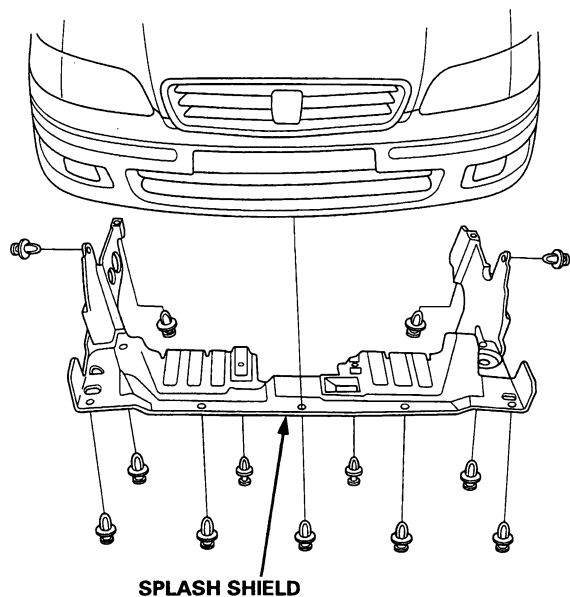


(cont'd)

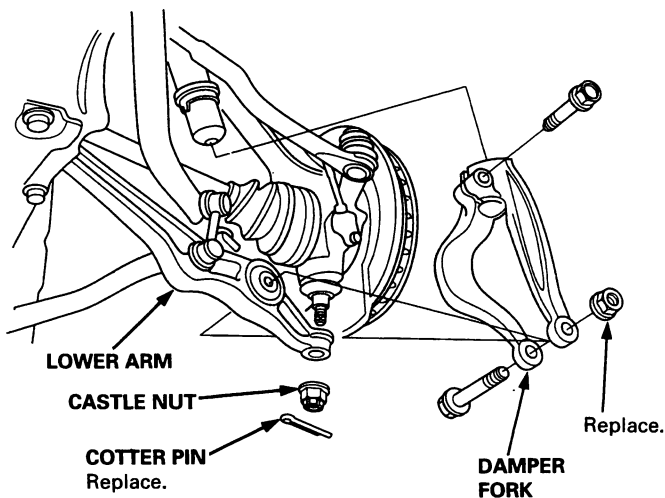
Transmission Assembly

Removal (cont'd)

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.

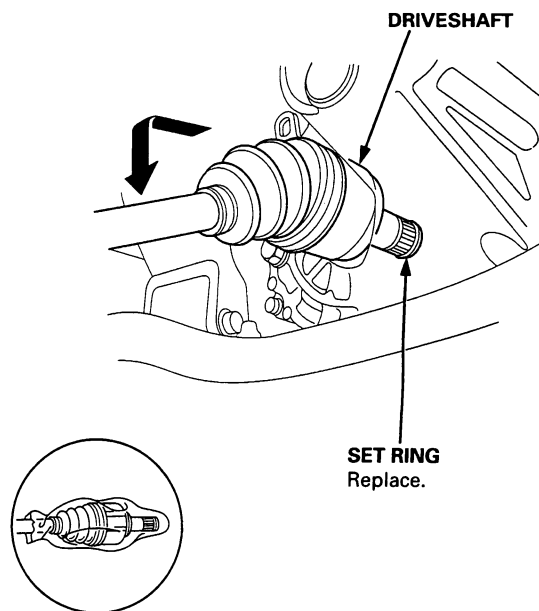


11. Remove the cotter pins, and loosen the castle nuts, then separate the ball joints and lower arms on both sides (see section 18).

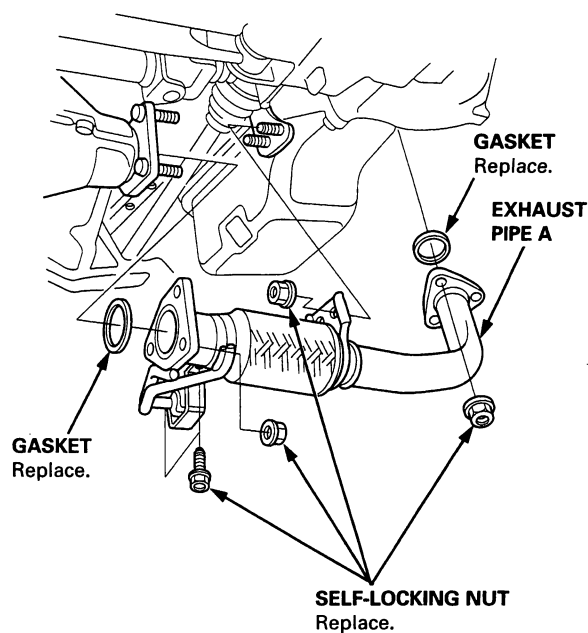


12. Remove the both damper forks.

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.

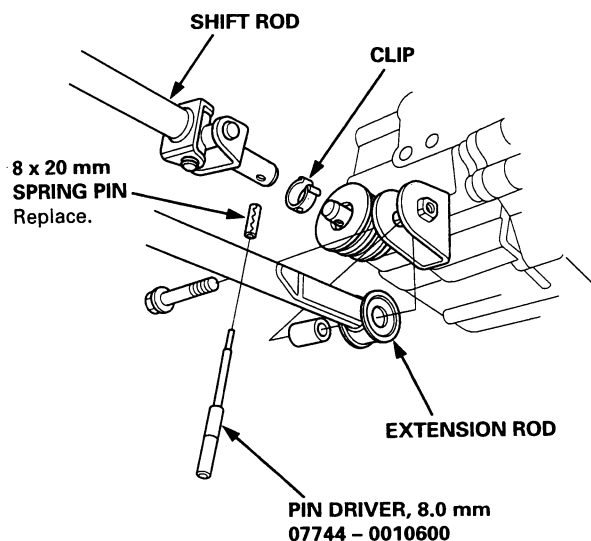


14. Remove the exhaust pipe A.

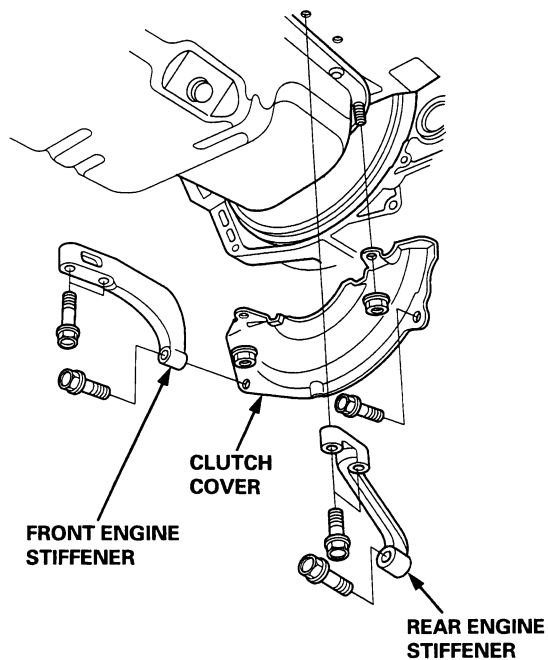




15. Remove the shift rod and extension rod.

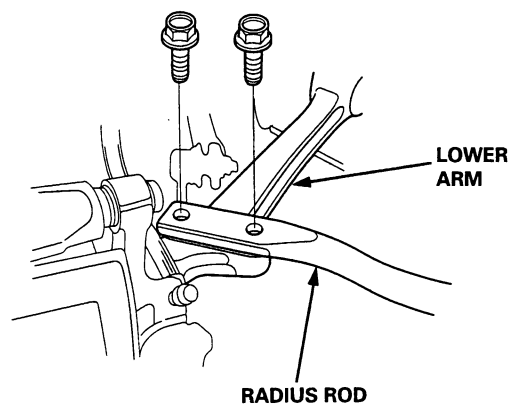


16. Remove the front and rear engine stiffeners.

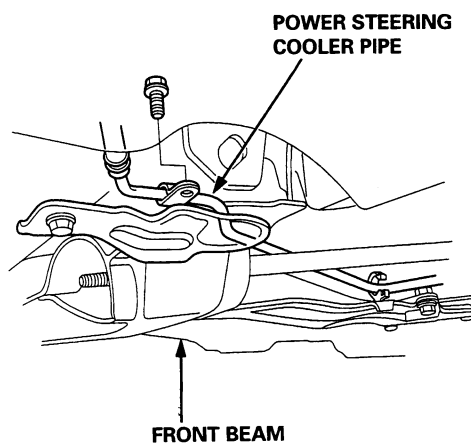


17. Remove the clutch cover.

18. Remove the both radius rods mounting bolts from the lower arm.



19. Remove the power steering cooler pipe from the front beam.

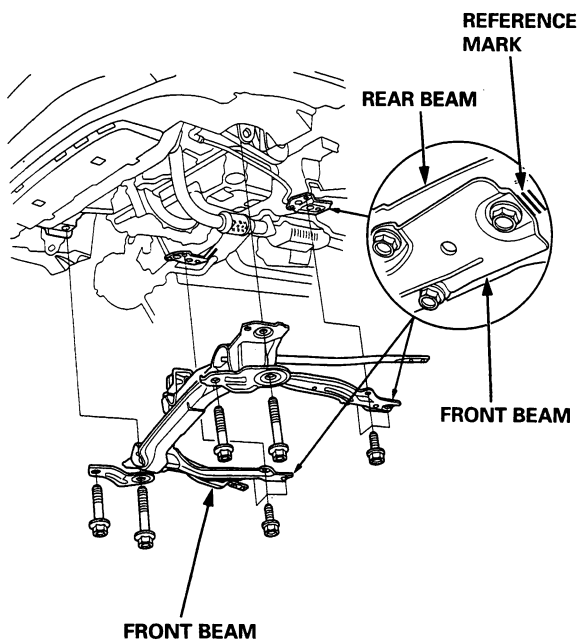


(cont'd)

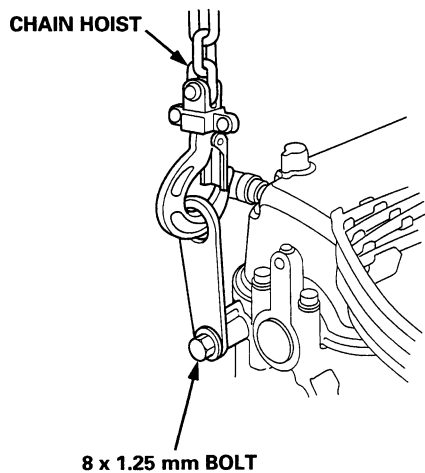
Transmission Assembly

Removal (cont'd)

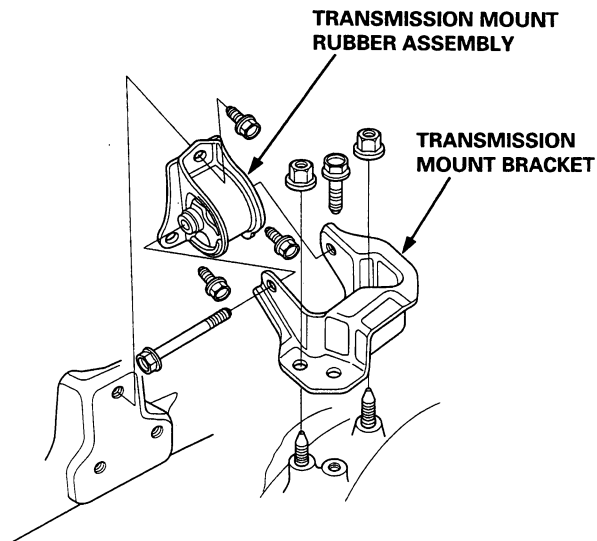
20. Mark reference marks on the rear and front beam, then remove the front beam.



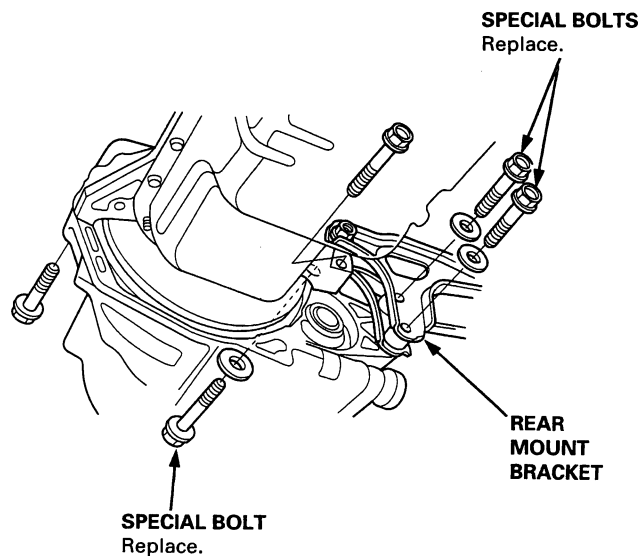
21. Remove the distributor.
22. Attach the chain hoist to the engine, then lift the engine slightly.



23. Place a floor jack under the transmission, and raise the transmission just enough to take weight off of the mounts.
24. Remove the transmission mount bracket and transmission mount rubber assembly.

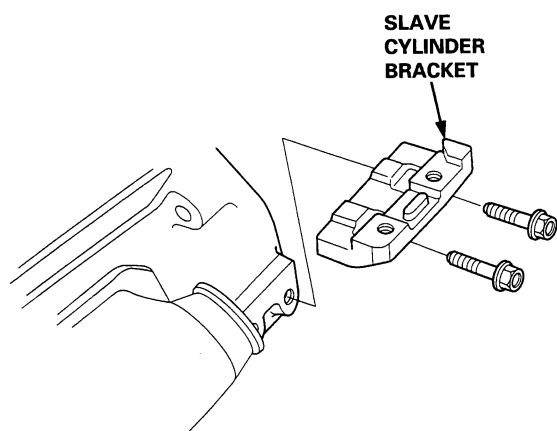


25. Remove the rear engine mount bracket bolts and transmission mounting bolts.






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.



Transmission Assembly

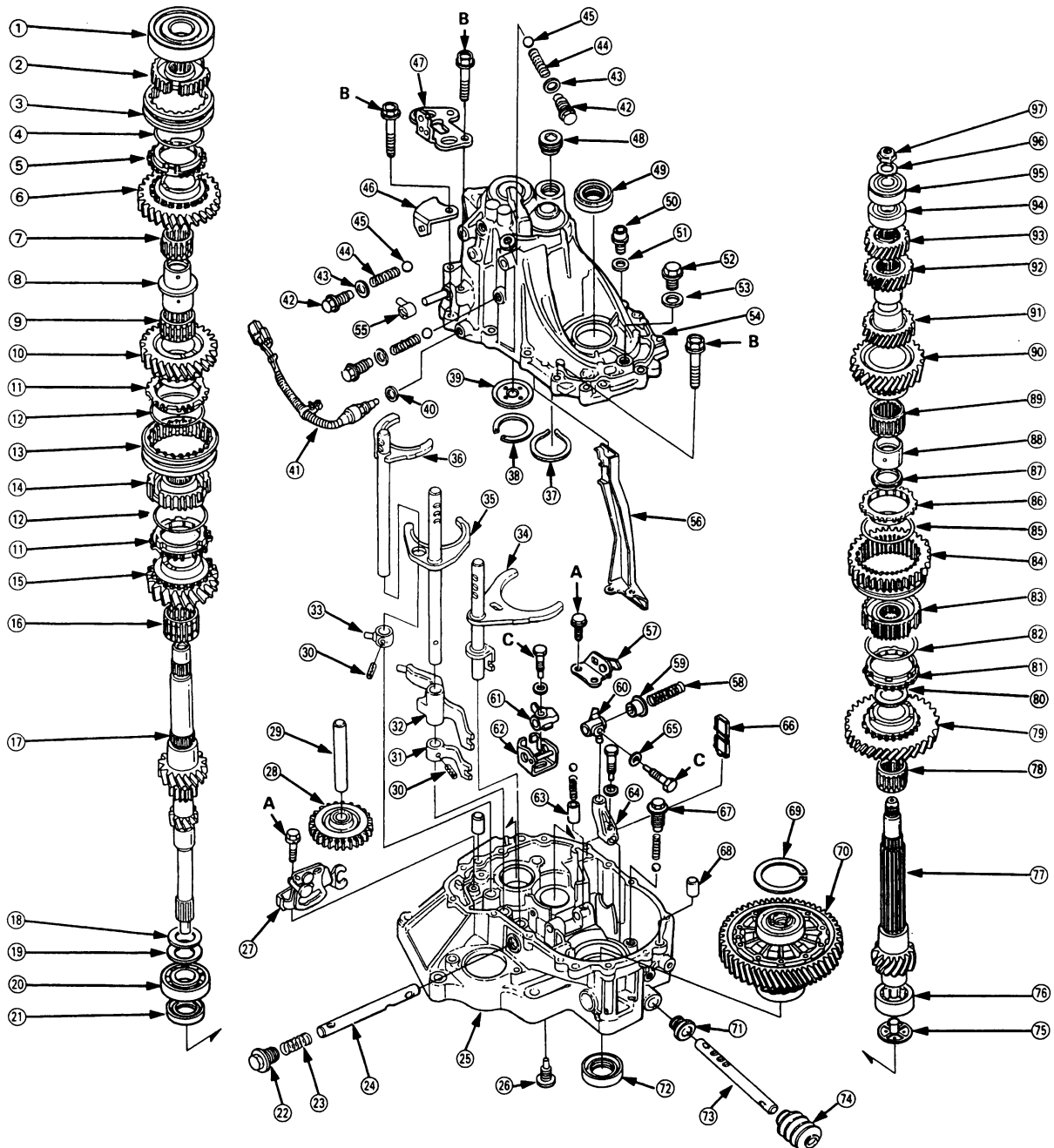
Index

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 N·m (1.5 kgf·m, 11 lbf·ft)
B - 27 N·m (2.8 kgf·m, 20 lbf·ft)
C - 31 N·m (3.2 kgf·m, 23 lbf·ft)

- ① BALL BEARING
- ② 5TH SYNCHRO HUB
- ③ 5TH SYNCHRO SLEEVE
- ④ SYNCHRO SPRING
- ⑤ SYNCHRO RING
- ⑥ 5TH GEAR
- ⑦ 32 x 37 x 23.5 mm
NEEDLE BEARING
- ⑧ SPACER COLLAR
- ⑨ 34 x 39 x 23 mm
NEEDLE BEARING
- ⑩ 4TH GEAR
- ⑪ SYNCHRO RING
- ⑫ SYNCHRO SPRING
- ⑬ 3RD/4TH SYNCHRO SLEEVE
- ⑭ 3RD/4TH SYNCHRO HUB
- ⑮ 3RD GEAR
- ⑯ 34 x 39 x 27.5 mm
NEEDLE BEARING
- ⑰ MAINSHAFT
- ⑱ WASHER
- ⑲ SPRING WASHER
- ⑳ BALL BEARING
Check for wear and
operation.
- ㉑ 26 x 42 x 7 mm OIL SEAL
Replace.
- ㉒ 28 mm PLUG BOLT
54 N·m (5.5 kgf·m, 40 lbf·ft)
- ㉓ 1ST/2ND SELECT SPRING
L. 36.26 mm (1.428 in)
- ㉔ SHIFT ARM SHAFT
- ㉕ CLUTCH HOUSING
- ㉖ INTERLOCK GUIDE BOLT
39 N·m (4.0 kgf·m, 29 lbf·ft)
- ㉗ REVERSE SHIFT HOLDER
- ㉘ REVERSE IDLER GEAR
- ㉙ REVERSE IDLER GEAR SHAFT
- ㉚ 5 x 22 mm SPRING PIN
Replace.
- ㉛ 3RD/4TH SHIFT PIECE
- ㉜ 5TH/REVERSE SHIFT PIECE
- ㉝ MBS SHIFT PIECE
- ㉞ 1ST/2ND SHIFT FORK
- ㉟ 3RD/4TH SHIFT FORK
- ㊱ 5TH/REVERSE SHIFT FORK
- ㊲ 52 mm SNAP RING
- ㊳ 70 mm THRUST SHIM
Selection, page 13-39
- ㊴ OIL GUIDE PLATE
- ㊵ WASHER Replace.
- ㊶ BACK-UP LIGHT SWITCH
25 N·m (2.5 kgf·m, 18 lbf·ft)
- ㊷ SET SCREW
22 N·m (2.2 kgf·m, 16 lbf·ft)
- ㊸ WASHER Replace.
- ㊹ SPRING L. 26.0 mm (1.02 in)
- ㊺ STEEL BALL (5/16 in)
- ㊻ BACK-UP LIGHT
SWITCH HARNESS STAY
- ㊼ TRANSMISSION HANGER
- ㊽ 32 mm SEALING BOLT
25 N·m (2.5 kgf·m, 18 lbf·ft)
- ㊾ 35 x 62 x 8 mm OIL SEAL
Replace.
- ㊿ OIL DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)
- ① WASHER Replace.
- ② FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)
- ③ WASHER Replace.
- ④ TRANSMISSION HOUSING
- ⑤ BREATHER CAP
- ⑥ OIL GUTTER PLATE
- ⑦ REVERSE LOCK CAM
- ⑧ REVERSE SELECT SPRING
L. 63.4 mm (2.496 in)
- ⑨ REVERSE SELECT RETAINER
- ⑩ SHIFT ARM C
- ⑪ SHIFT ARM B
- ⑫ INTERLOCK
- ⑬ COLLAR
- ⑭ SHIFT ARM A
- ⑮ SPRING WASHER
- ⑯ MAGNET
- ⑰ SET BALL SPRING BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)
- ⑱ 14 x 20 mm DOWEL PIN
- ⑲ 80 mm THRUST SHIM
Selection, page 13-34
- ⑳ DIFFERENTIAL ASSEMBLY
See page 13-31
- ㉑ 14 x 25 x 17.5 mm OIL SEAL
Replace.
- ㉒ 35 x 56 x 8 mm OIL SEAL
Replace.
- ㉓ SHIFT ROD
- ㉔ BOOT
- ㉕ OIL GUIDE PLATE
- ㉖ 30 x 55 x 21 mm
NEEDLE BEARING
- ㉗ COUNTERSHAFT
- ㉘ 36 x 41 x 25.5 mm
NEEDLE BEARING
Check for wear and
operation.
- ㉙ 1ST GEAR
- ㉚ FRICTION DAMPER
- ㉛ SYNCHRO RING
- ㉜ SYNCHRO SPRING
- ㉝ 1ST/2ND SYNCHRO HUB
- ㉞ REVERSE GEAR
- ㉟ SYNCHRO SPRING
- ① SYNCHRO RING
- ② FRICTION DAMPER
- ③ SPACER
- ④ 39 x 44 x 27 mm
NEEDLE BEARING
- ⑤ 2ND GEAR
- ⑥ 3RD GEAR
- ⑦ 4TH GEAR
- ⑧ 5TH GEAR
- ⑨ NEEDLE BEARING
- ⑩ BALL BEARING
- ⑪ SPRING WASHER
- ⑫ LOCKNUT Replace.
108 → 0 → 108 N·m
(11.0 → 0 → 11.0 kgf·m,
79.6 → 0 → 79.6 lbf·ft)

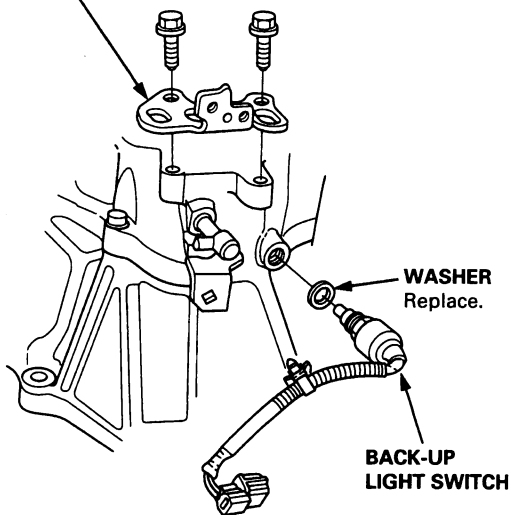
Transmission Housing

Removal

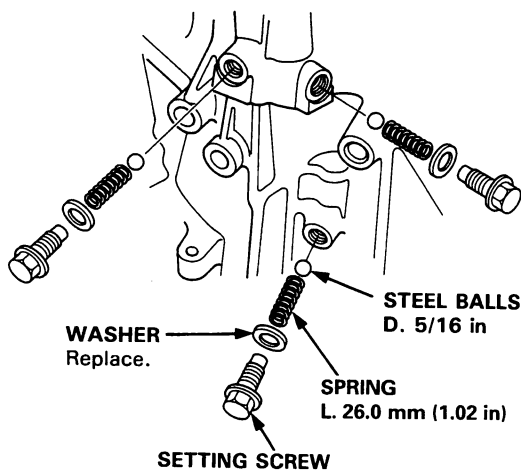
NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

1. Remove the back-up light switch.
2. Remove transmission hanger.

**TRANSMISSION
HANGER**

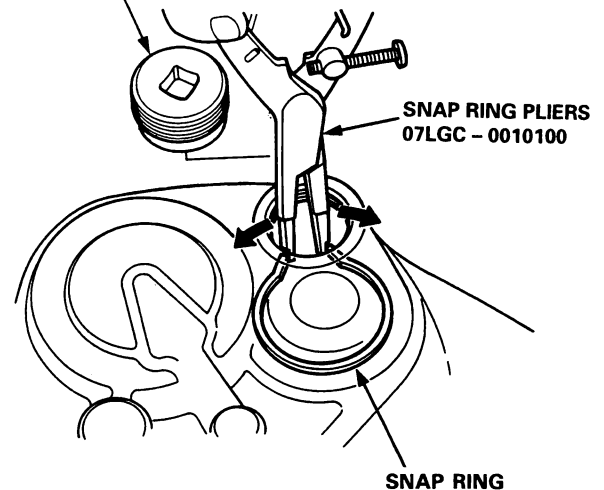


3. Remove the setting screws, washers, springs, and steel balls.

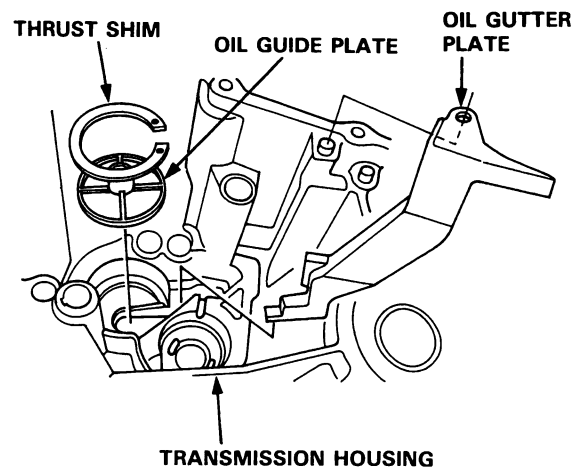


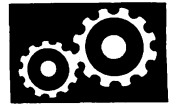
4. Loosen the transmission housing attaching bolts in a crisscross pattern in several steps, then remove them.
5. Remove the 32 mm sealing bolt.
6. Expand the snap ring on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.

32 mm SEALING BOLT



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.

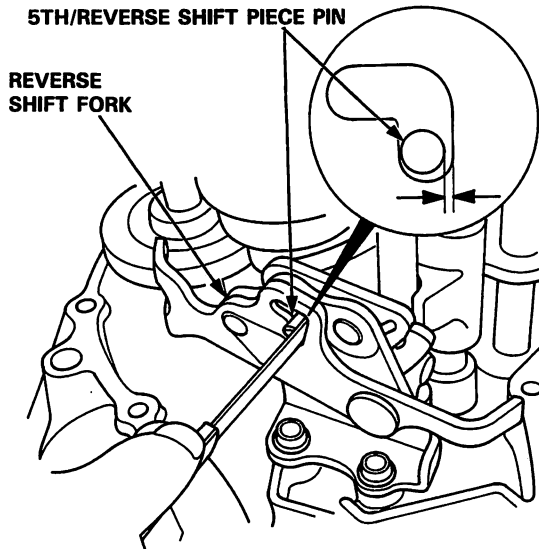




Clearance Inspection

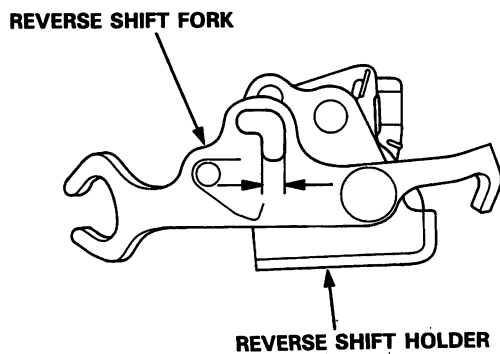
1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

Standard: 0.05 – 0.35 mm (0.002 – 0.014 in)
Service Limit: 0.5 mm (0.02 in)



2. If the clearances are more than the service limit, measure the widths of the groove in the reverse shift fork.

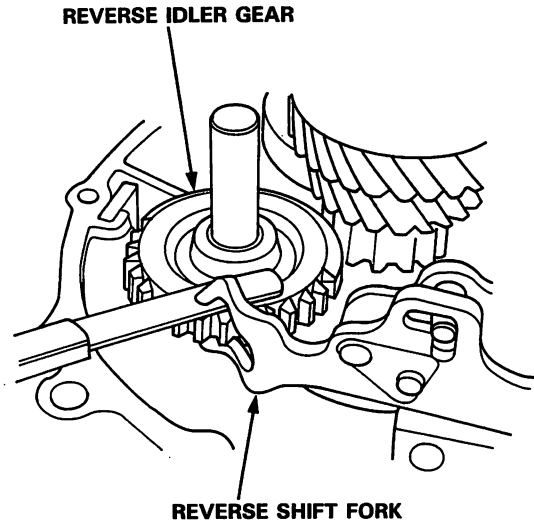
Standard: 7.05 – 7.25 mm (0.278 – 0.285 in)



- 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.

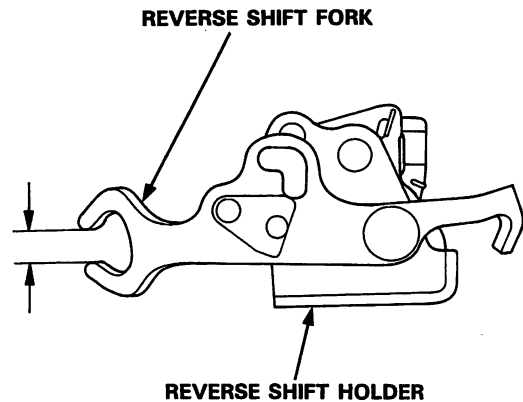
3. Measure the clearance between the reverse idler gear and the reverse shift fork.

Standard: 0.5 – 1.1 mm (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)



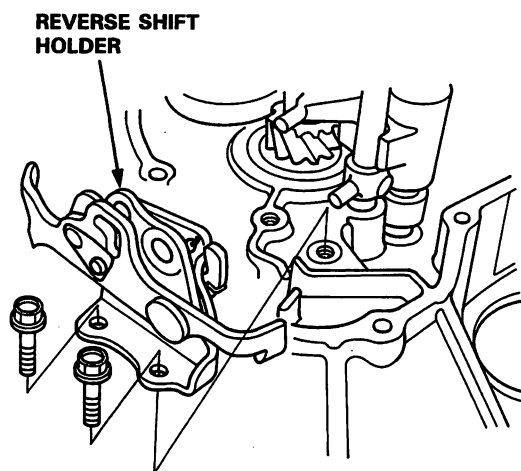
- If the width is not within the standard, replace the reverse shift holder with a new one.
- If the width is within the standard, replace the reverse idler gear with a new one.

Reverse Idler Gear

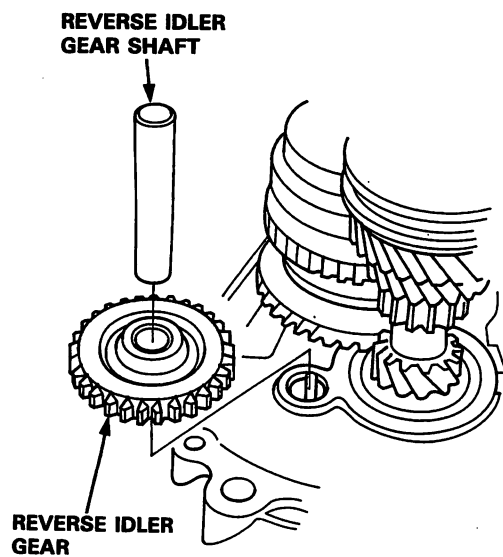
Mainshaft, Countershaft, Shift Fork

Removal

1. Remove the reverse shift holder.

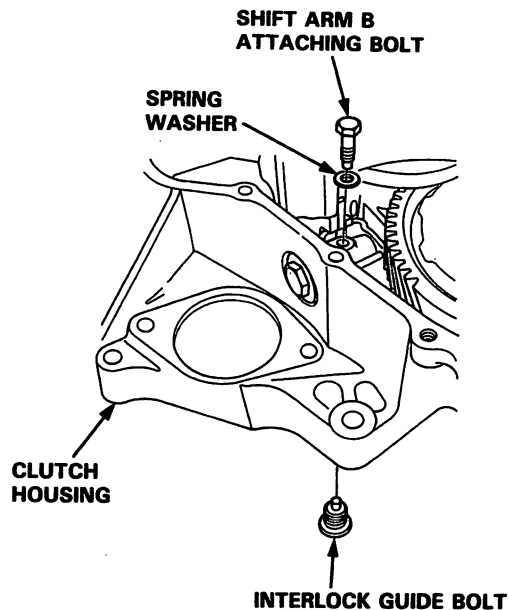


2. Remove the reverse idler gear shaft and reverse idler gear.



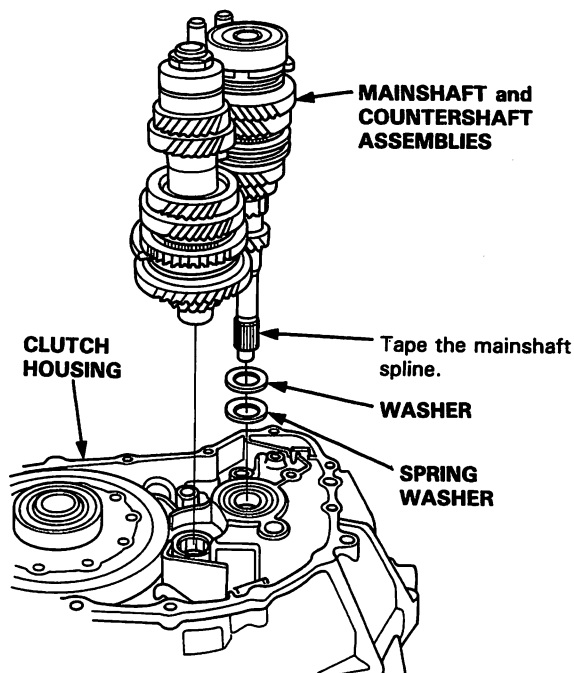
Disassembly

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.




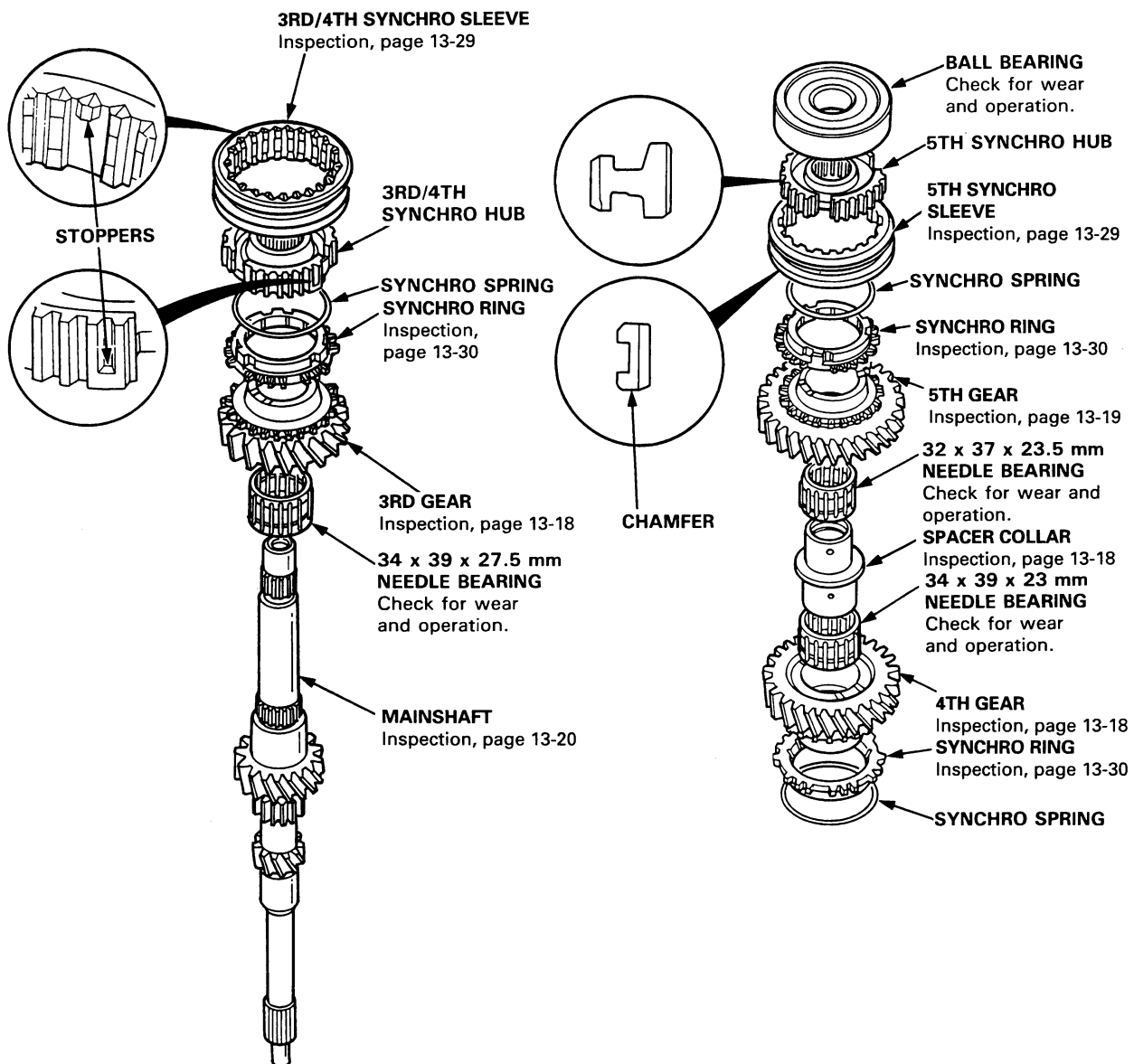
Mainshaft Assembly



Index

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.



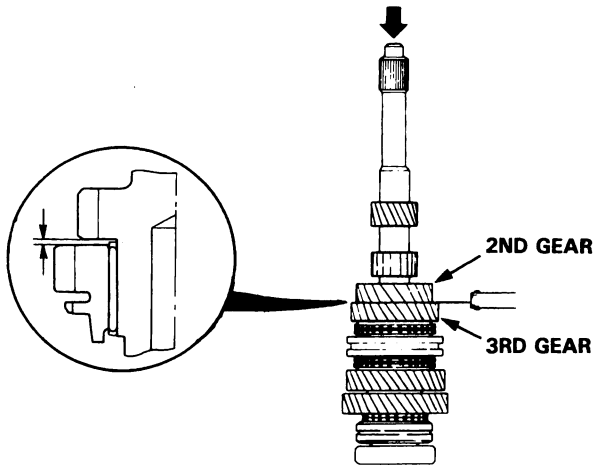
Mainshaft Assembly

Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

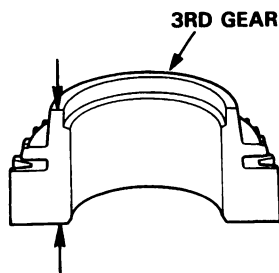
1. Measure the clearance between 2nd and 3rd gears.

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.

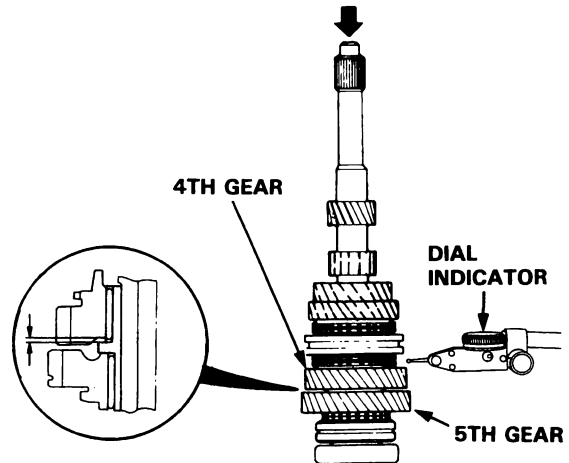
Standard: 30.22 – 30.27 mm
(1.190 – 1.192 in)
Service Limit: 30.15 mm (1.187 in)



- 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.

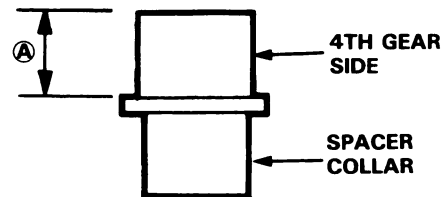
3. Measure the clearance between 4th gear and the spacer collar.

Standard: 0.06 – 0.19 mm (0.002 – 0.007 in)
Service Limit: 0.31 mm (0.012 in)



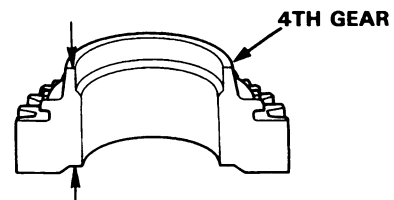
4. If the clearance is more than the service limit, measure distance A on the spacer collar.

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.

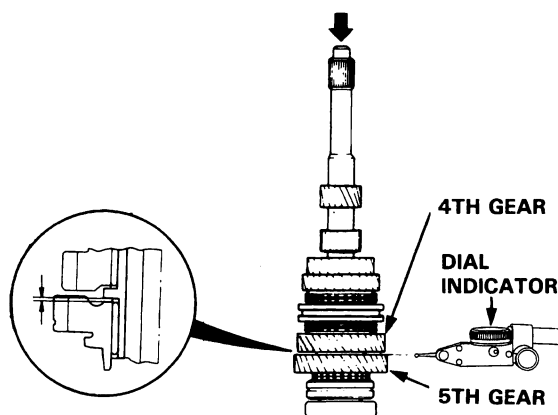


Disassembly

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)

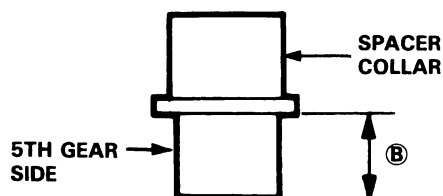


7. If the clearance is more than the service limit, measure distance ⑥ on the spacer collar.

Standard: 23.53 – 23.56 mm

(0.926 – 0.928 in)

Service Limit: 23.51 mm (0.926 in)

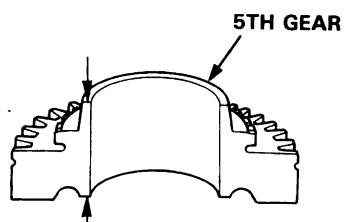


8. If distance ⑥ is less than service limit, replace the spacer collar with a new one.
If distance ⑥ is within the service limit, measure thickness of 5th gear.

Standard: 28.42 – 28.47 mm

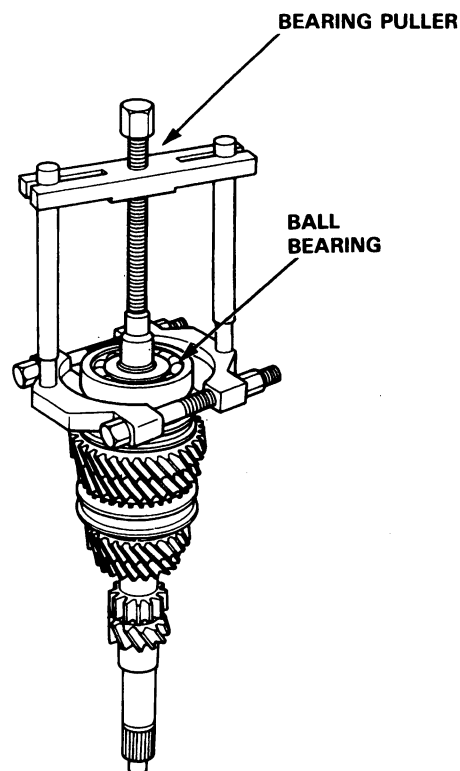
(1.119 – 1.121 in)

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.

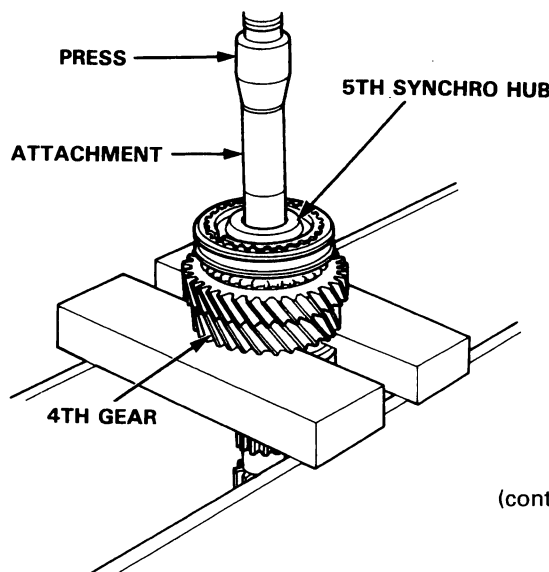
1. Remove the ball bearing using a bearing puller as shown.



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.

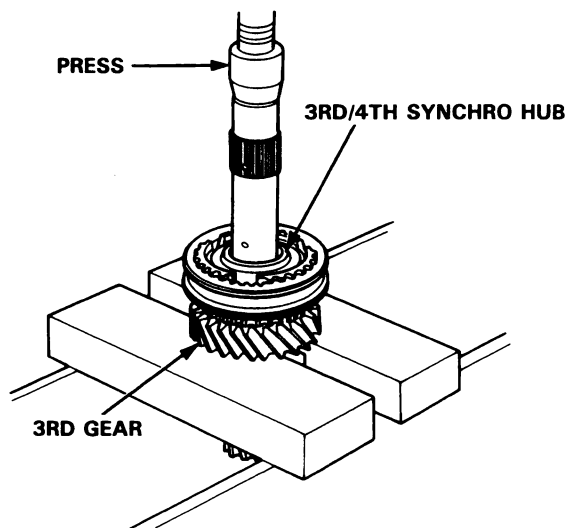


(cont'd)

Mainshaft Assembly

Disassembly (cont'd)

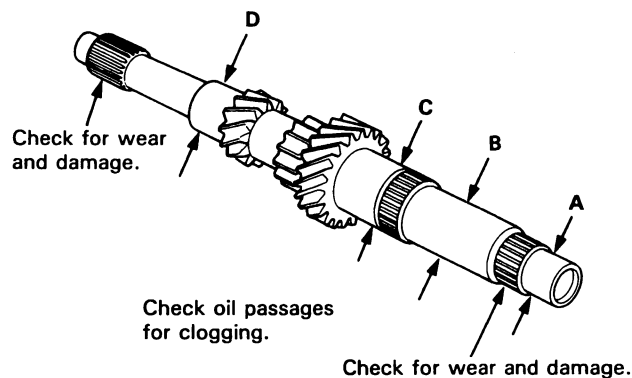
3. Support the 3rd gear on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub as shown.



Inspection

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)

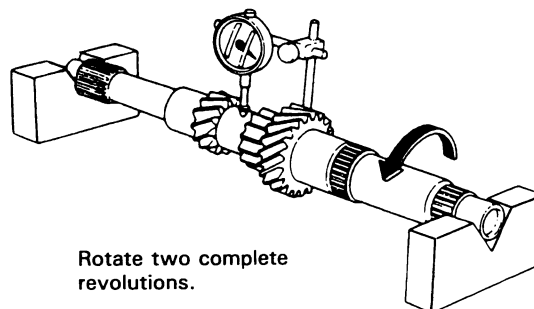


- If any part of the mainshaft is less than the service limit, replace it with a new one.

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.



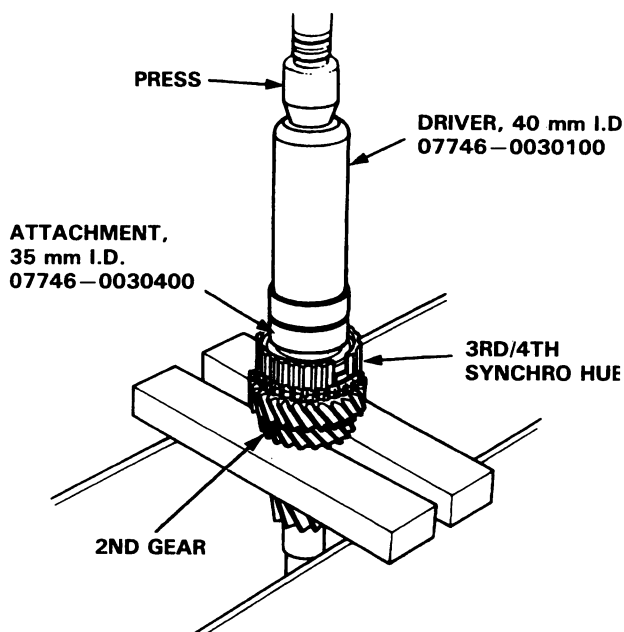
Reassembly

CAUTION

When installing the 3rd/4th and 5th synchro hubs, support the shaft on steel blocks, and install the synchro hubs using a press.

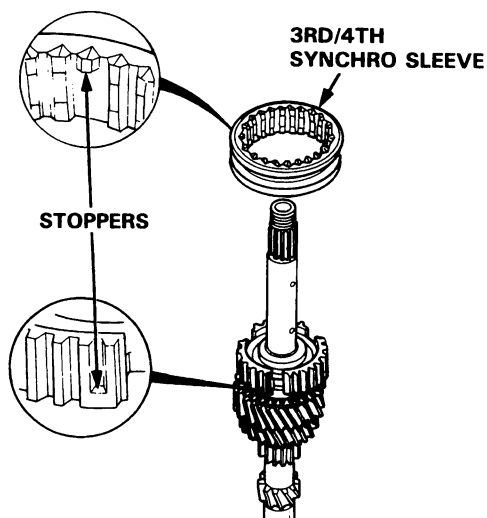
NOTE: Refer to page 13-17 for reassembly sequence.

1. Support 2nd gear on steel blocks, then install the 3rd/4th synchro hub using the special tools and a press as shown.

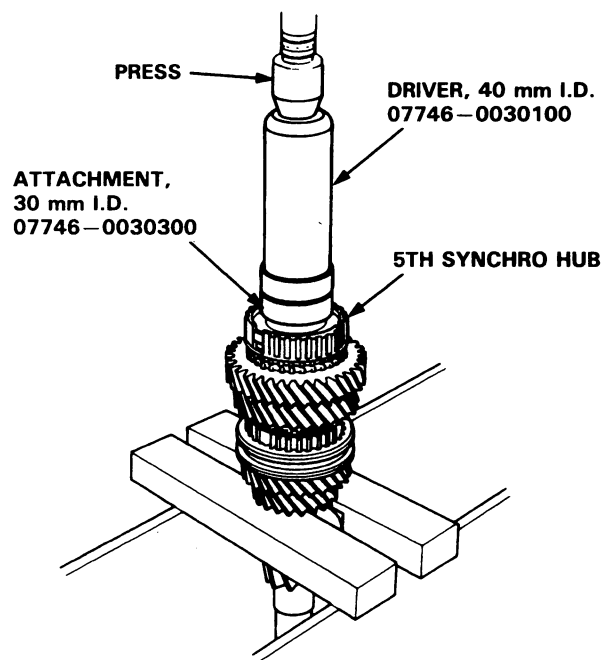


2. Install the 3rd/4th synchro sleeve by aligning the stoppers of the 3rd/4th synchro sleeve and hub.

NOTE: After installing, Check the operation of the 3rd/4th synchro hub set.

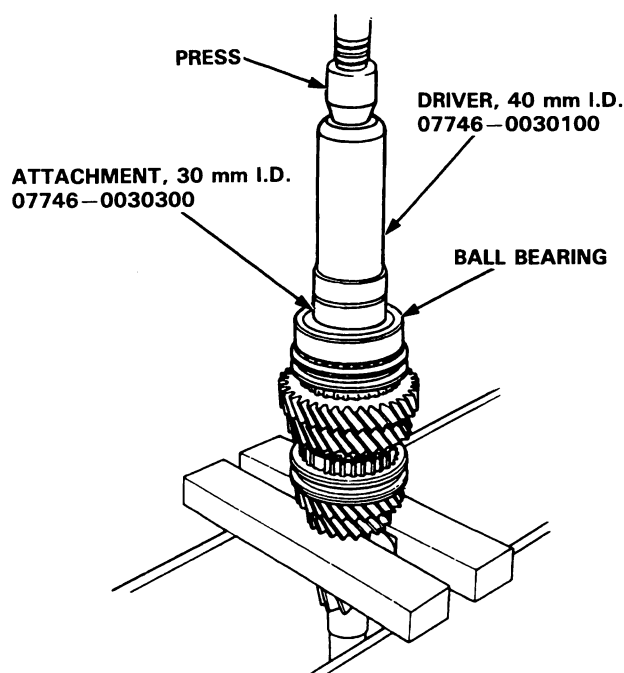


3. Install the 5th synchro hub using the special tools and a press as shown.



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.

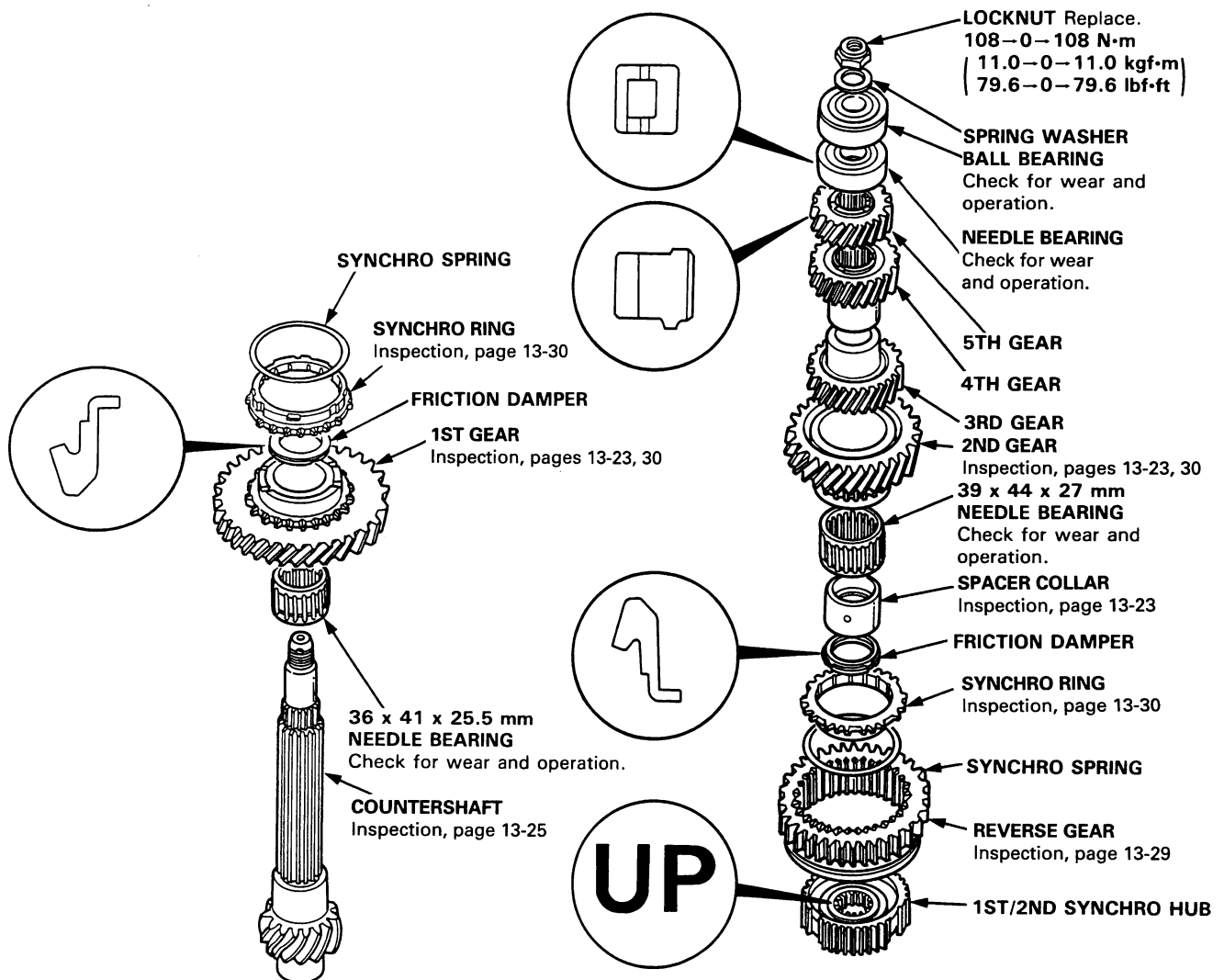


Countershaft Assembly

Index

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.



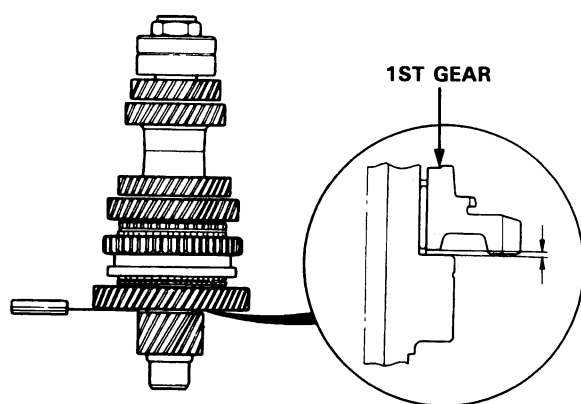


Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

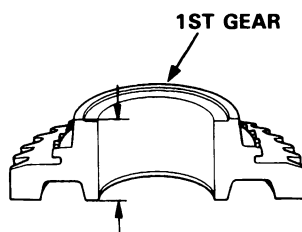
1. Measure the clearance between the countershaft and 1st gear.

Standard: 0.03 – 0.10 mm
(0.001 – 0.004 in)
Service Limit: 0.22 (0.009 in) mm



2. If the clearance is more than the service limit, measure the thickness of 1st gear.

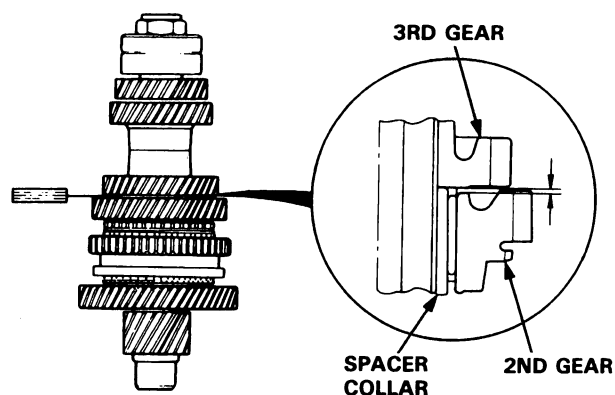
Standard: 30.41 – 30.44 mm
(1.197 – 1.198 in)
Service Limit: 30.36 mm (1.195 in)



- 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.

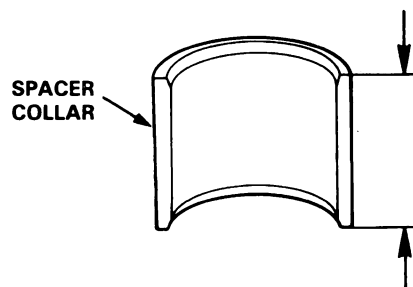
3. Measure clearance between 2nd and 3rd gears.

Standard: 0.04 – 0.12 mm (0.002 – 0.005 in)
Service Limit: 0.24 mm (0.009 in)



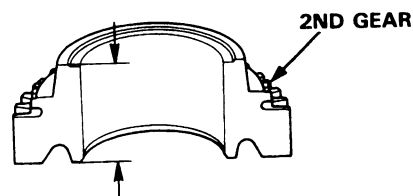
4. If the clearance is more than the service limit, measure the thickness of the spacer collar.

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 – 31.96 mm (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.

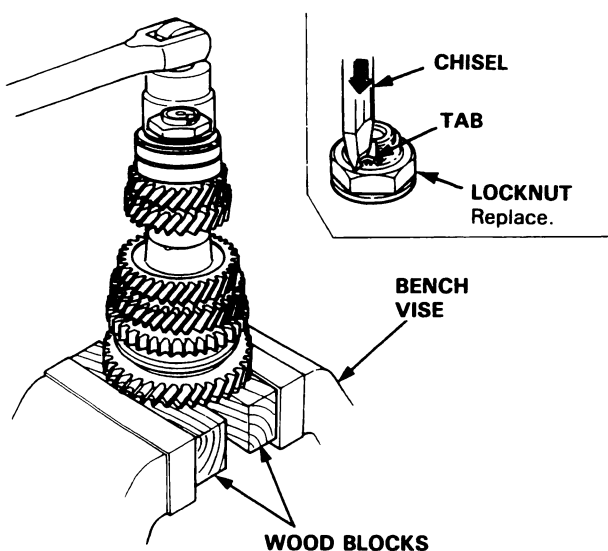
Countershaft Assembly

Disassembly

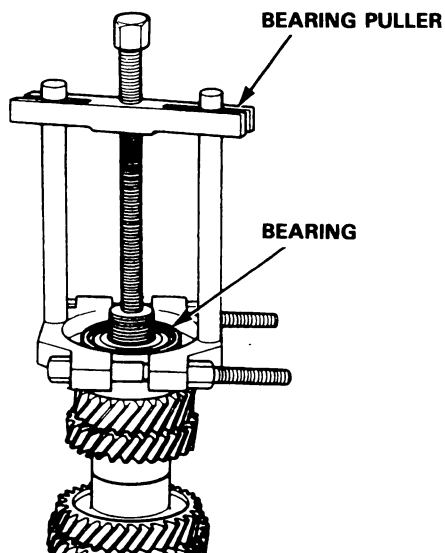
⚠ CAUTION

Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

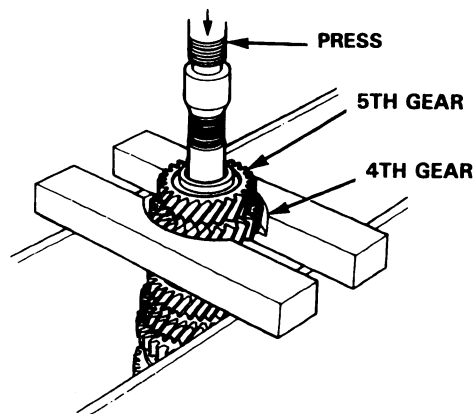
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.
2. Raise the locknut tab from the groove of the countershaft, then remove the locknut and the spring washer.



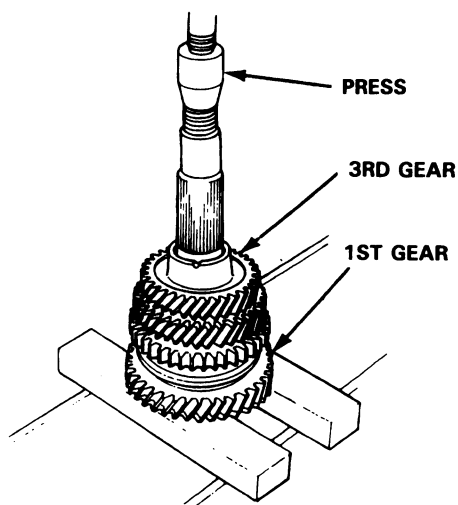
3. Remove the bearings using a bearing puller as shown.



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.



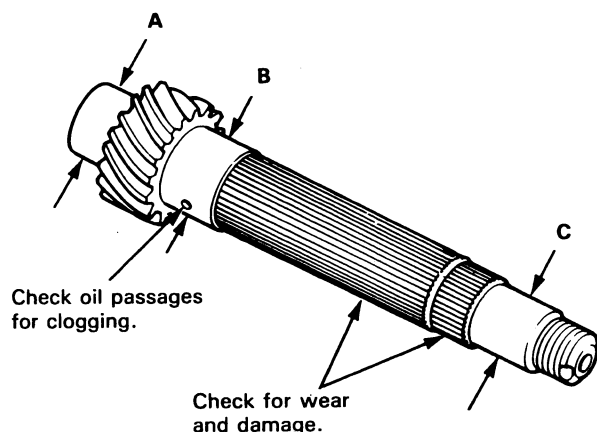


Inspection

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 – 36.000 mm (1.4167 – 1.4173 in)
 C: 24.980 – 24.993 mm (0.9835 – 0.9840 in)

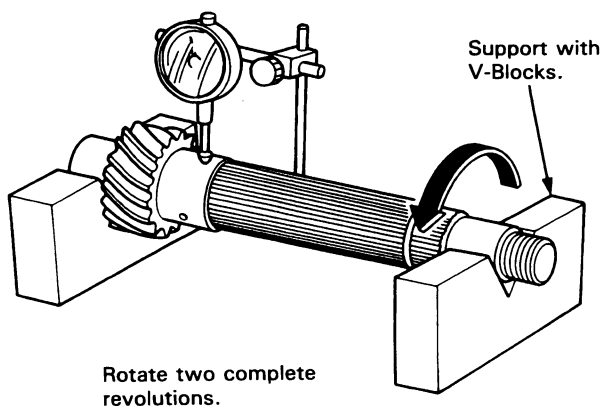
Service Limit: A: 29.950 mm (1.1791 in)
 B: 35.930 mm (1.4146 in)
 C: 24.930 mm (0.9815 in)



- 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.

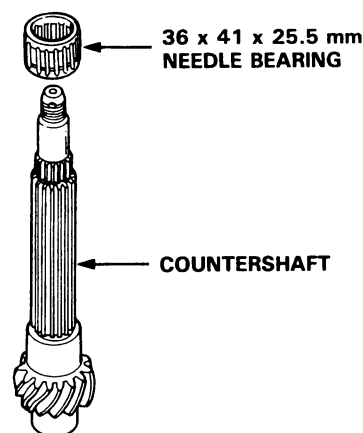
Reassembly

⚠ 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.

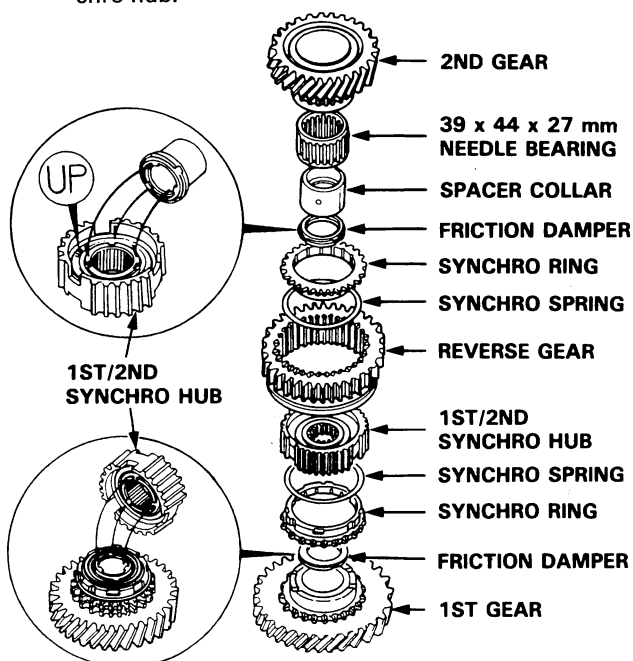
NOTE: Refer to page 13-22 for reassembly sequence.

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.



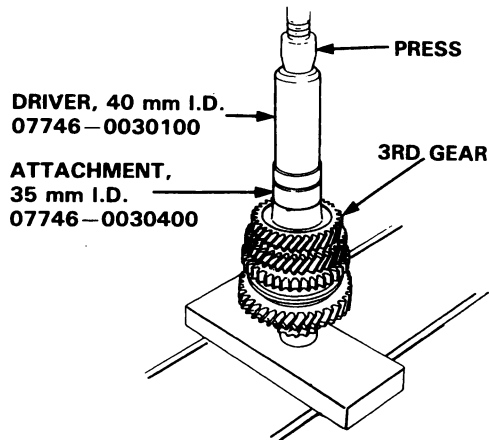
3. Install the parts on the countershaft.

(cont'd)

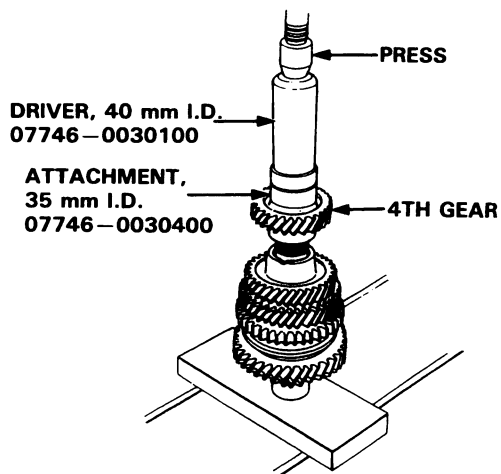
Countershaft Assembly

Reassembly (cont'd)

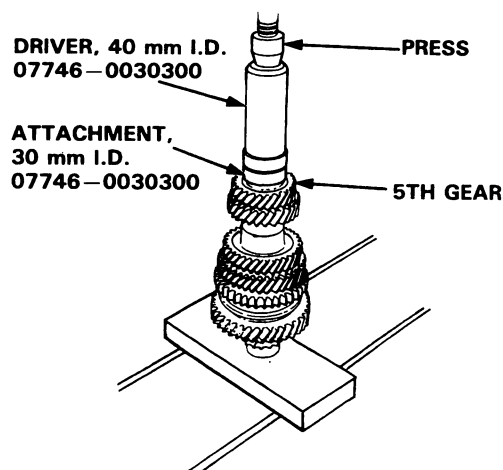
4. Support the countershaft on a steel block as shown and install 3rd gear using the special tools and a press as shown.



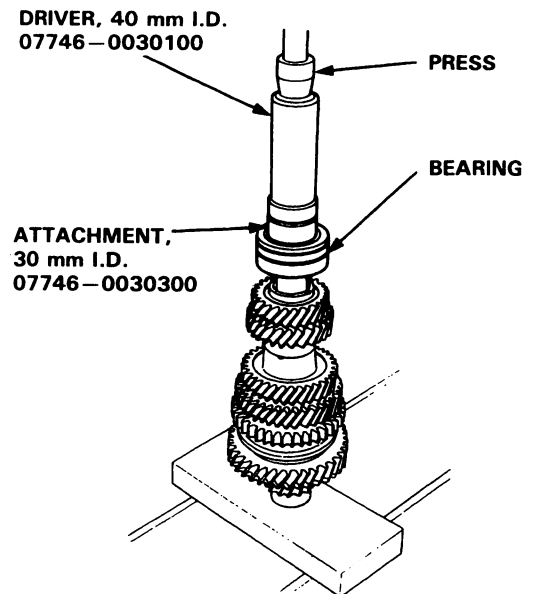
5. Install 4th gear using the special tools and a press as shown.



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.

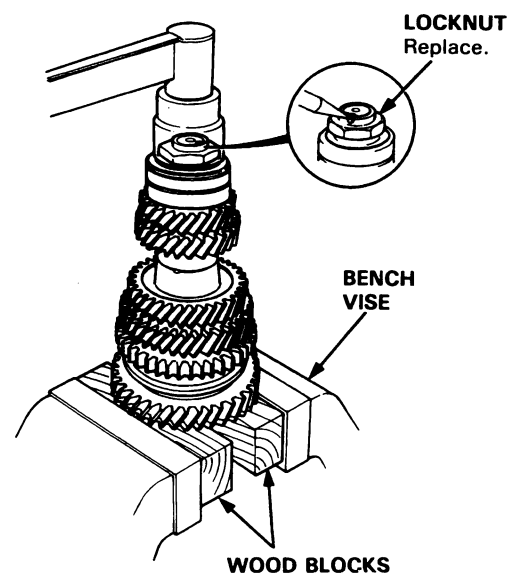


8. Securely clamp the countershaft assembly in a bench vise with wood blocks.
9. Install the spring washer, tighten the locknut, then stake the locknut tab into groove.

LOCKNUT

108 → 0 → 108 N·m

(11.0 → 0 → 11.0 kgf·m, 79.6 → 0 → 79.6 lbf·ft)

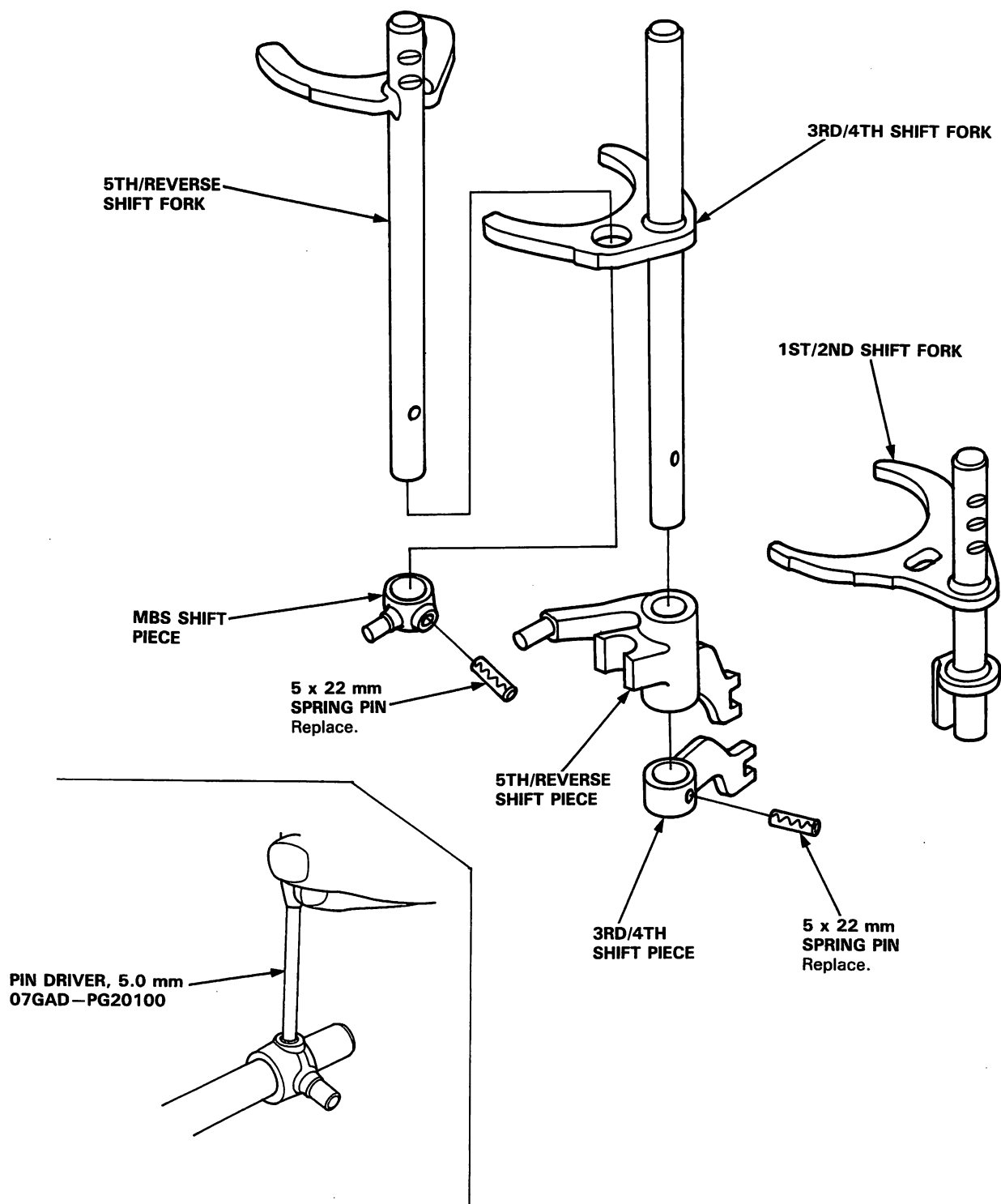


Shift Fork Assembly



Index

 Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



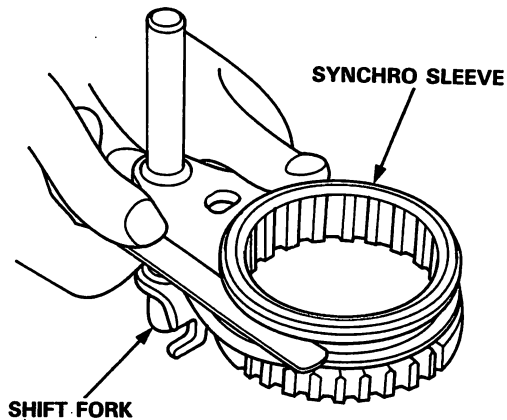
Shift Fork Assembly

Clearance Inspection

NOTE: The synchro sleeve and the synchro hub should be replaced as a set.

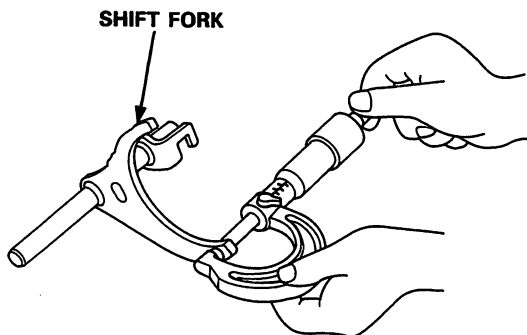
1. Measure the clearance between each shift fork and its matching synchro sleeve.

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.

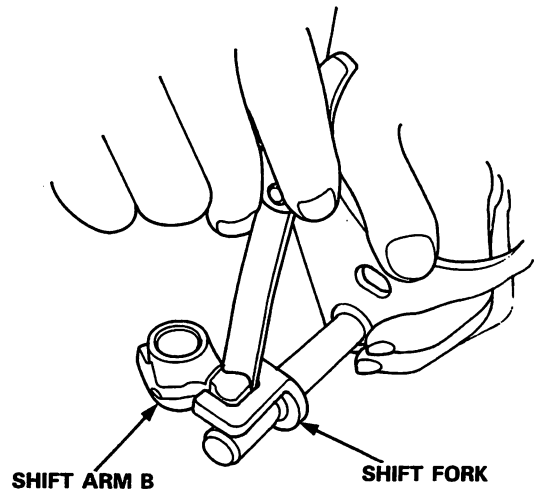
Standard:
3rd/4th: 7.4 – 7.6 mm (0.291 – 0.299 in)
1st/2nd, 5th: 6.2 – 6.4 mm (0.244 – 0.252 in)



- 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.

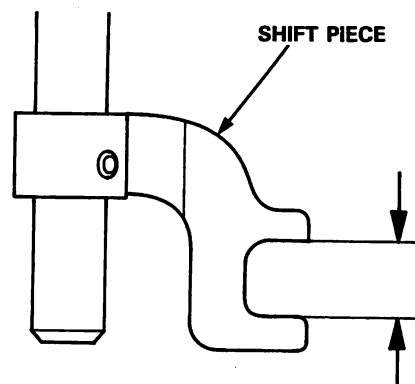
3. Measure the clearance between the shift piece or shift fork and the shift arm B.

Standard: 0.2 – 0.5 mm (0.008 – 0.02 in)
Service Limit: 0.6 mm (0.024 in)

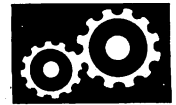


4. If the clearance is more than the service limit, measure the groove of the shift piece or shift fork.

Standard: 13.2 – 13.4 mm (0.520 – 0.528 in)



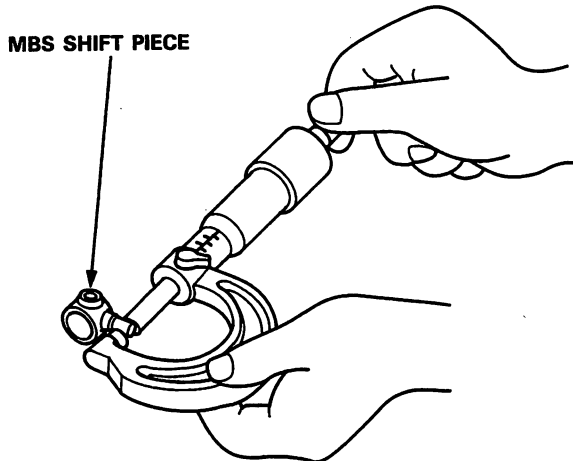
- If the groove of the shift piece or shift fork is not within the standard, replace the shift piece or shift fork with a new one.
- If the groove of the shift piece or shift fork is within the standard, replace the shift arm B with a new one.



MBS Shift Piece Inspection

1. Measure the width of the MBS shift piece.

Standard: 6.9 – 7.1 mm (0.27 – 0.28 in)

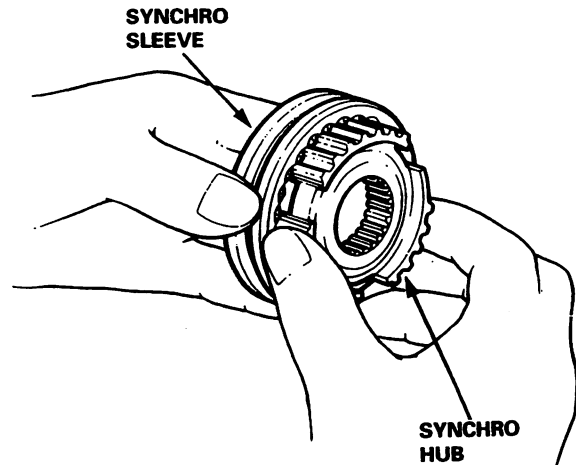


- If the width of the MBS shift piece is not within the standard, replace the MBS shift piece.

Inspection/Installation

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.

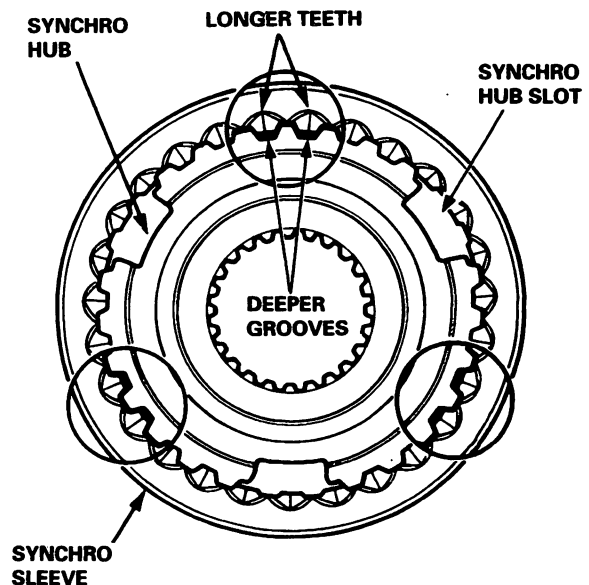
NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



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.



Synchro Ring, Gear

Inspection

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.

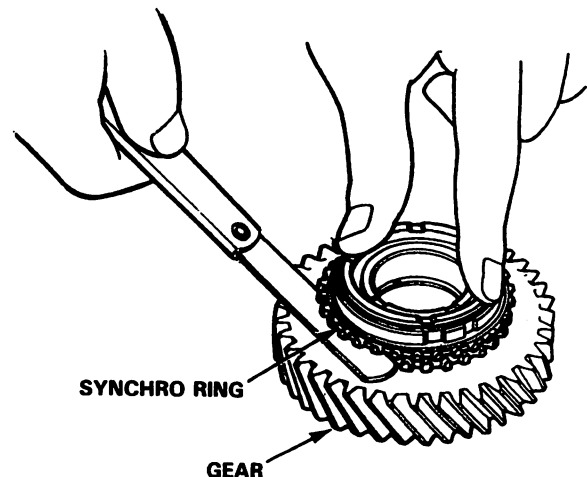
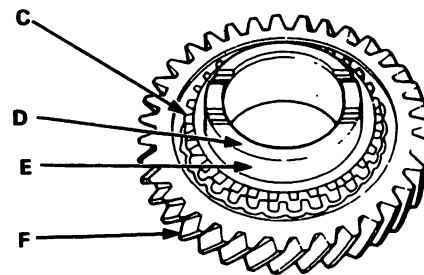
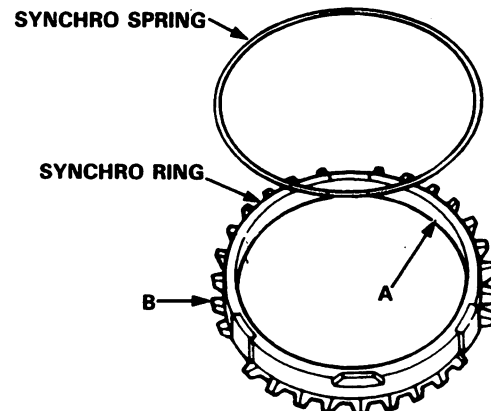
NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

Synchro Ring-to-Gear Clearance

Standard: 0.73 – 1.18 mm (0.029 – 0.046 in)

Service Limit: 0.4 mm (0.016 in)

If the clearance is less than the service limit, replace the synchro ring and synchro cone.



Shift Rod



Removal

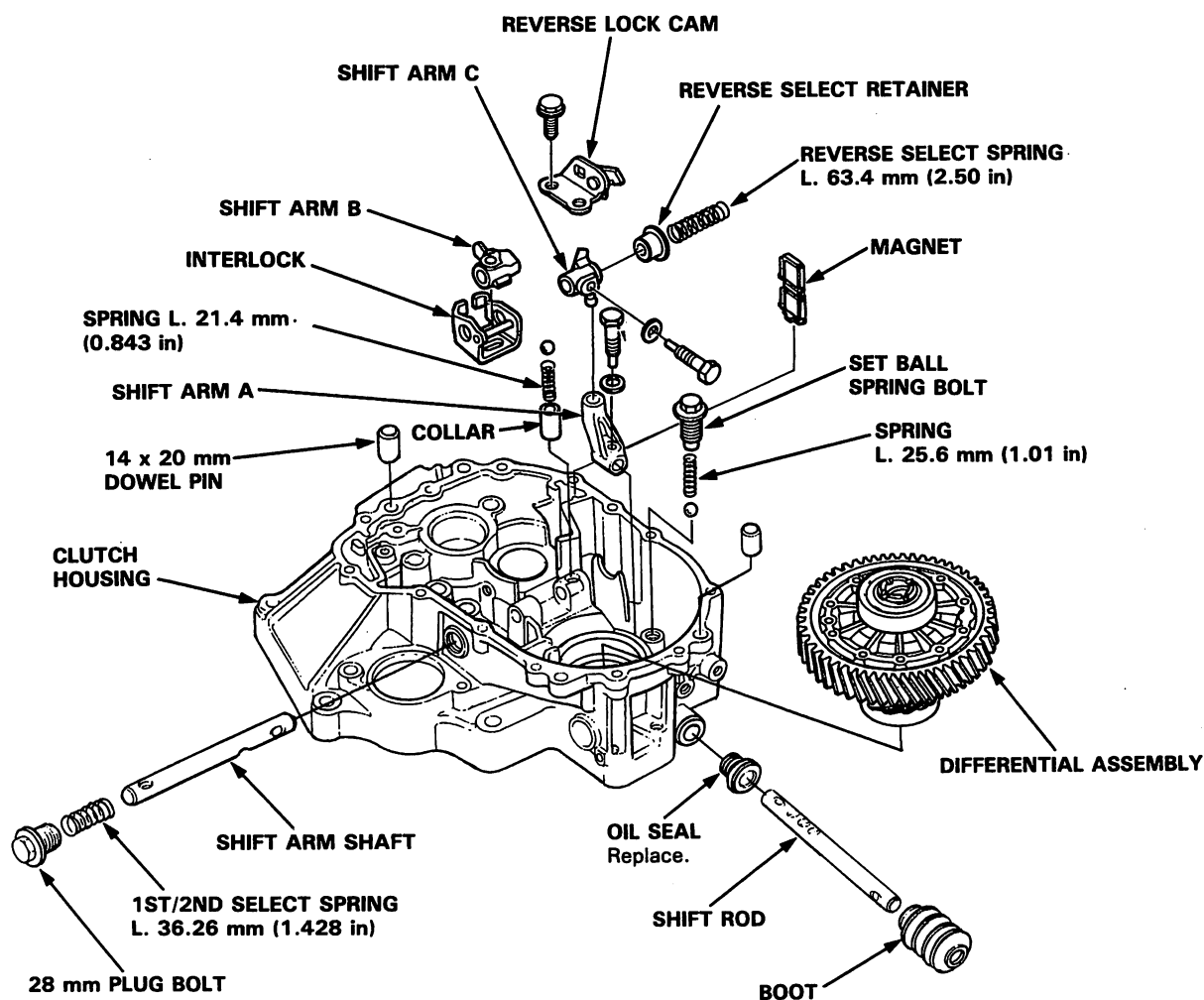
NOTE: The steel balls are all of the same size (5/16 in).

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.

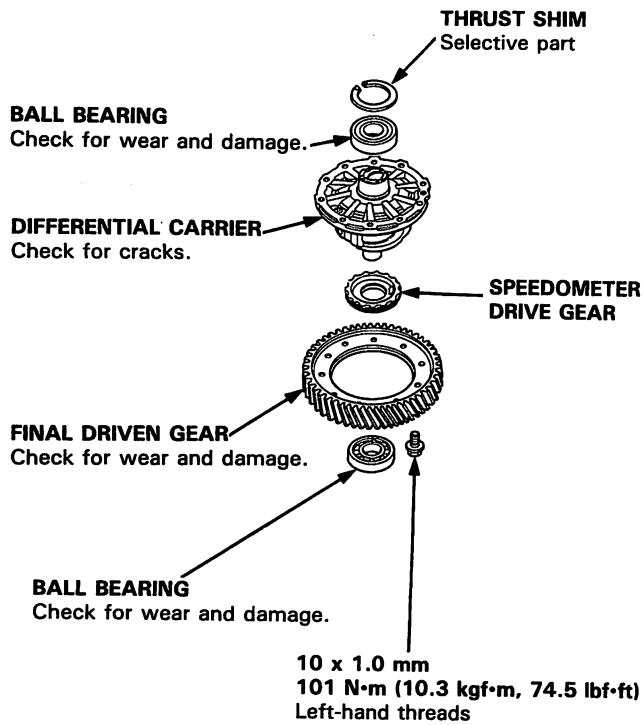
5. Remove the steel ball, spring, and collar.

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.



Differential

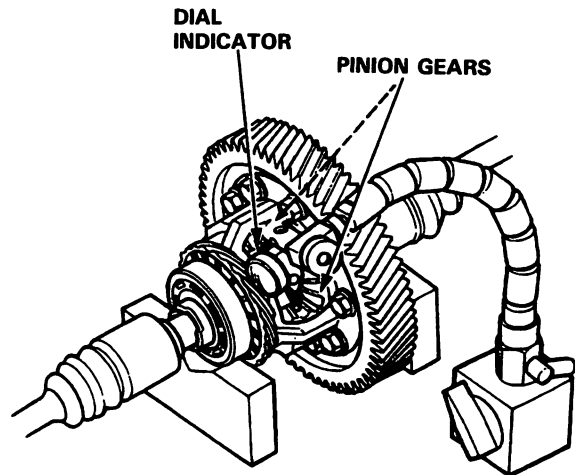
Index



Backlash Inspection

1. Place differential assembly on V-blocks and install both driveshafts.
2. Measure backlash of both pinion gears.

Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)



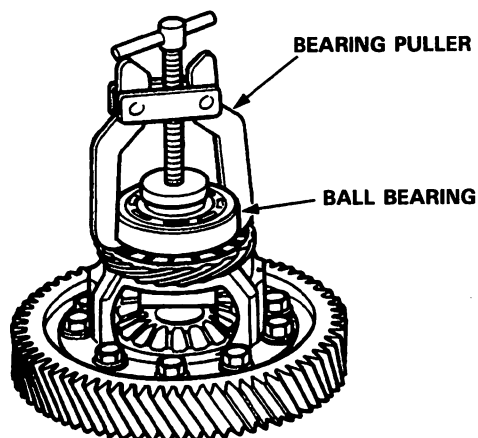
3. If the backlash is not within the standard, replace the differential carrier.



Bearing Replacement

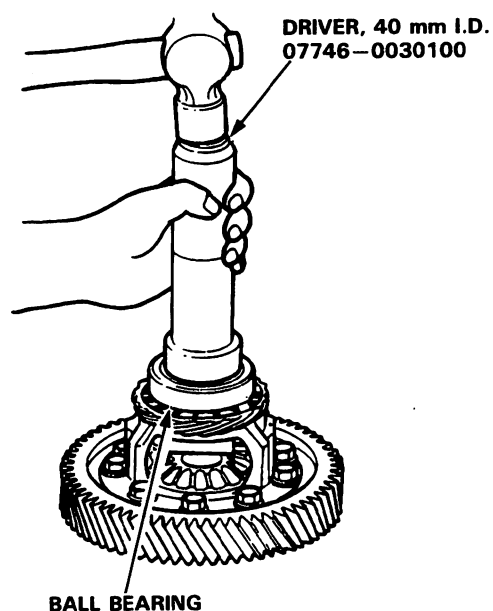
NOTE: Check bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove ball bearings using a bearing puller as shown.



2. Install new ball bearings using the special tool as shown.

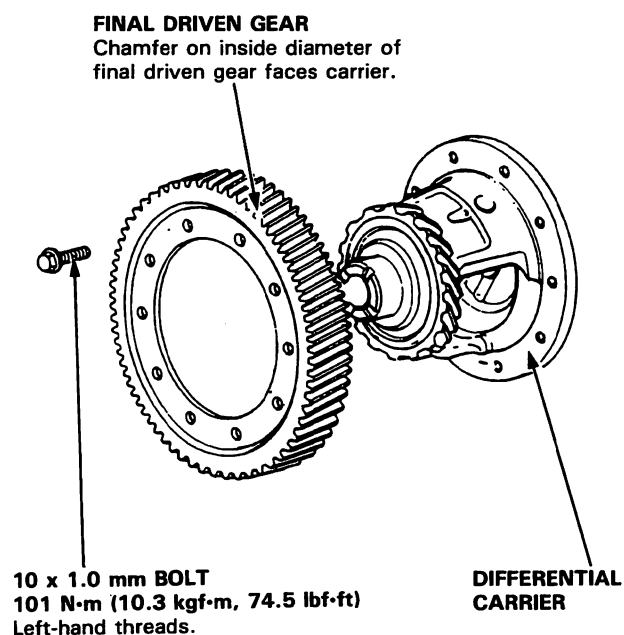
NOTE: Drive the bearings squarely until they bottom against the carrier.



Final Driven Gear Replacement

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.

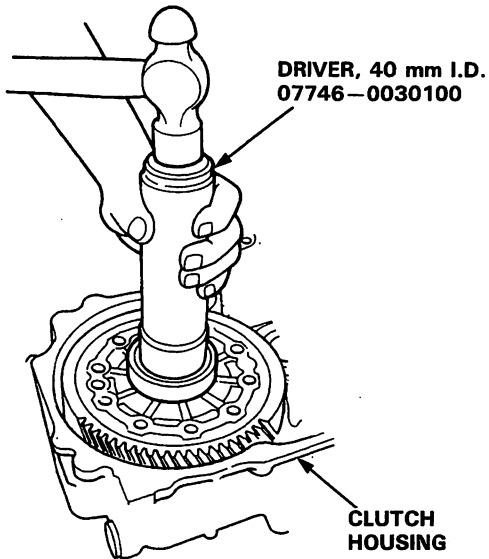


2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

Differential

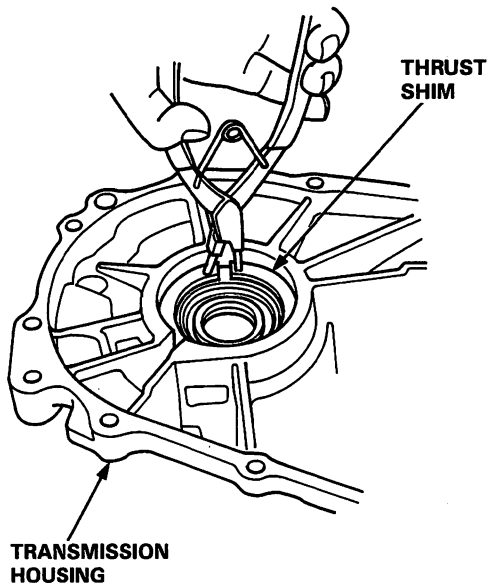
Thrust Shim Adjustment

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.



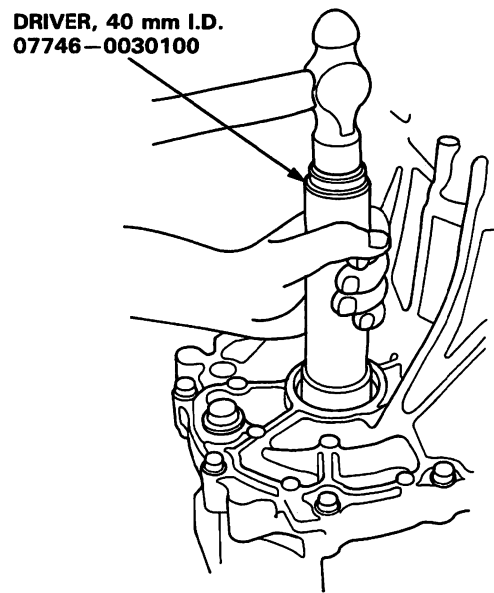
3. Install the transmission housing (see page 13-43).

NOTE: Do not apply liquid gasket to the mating surface of the clutch housing.

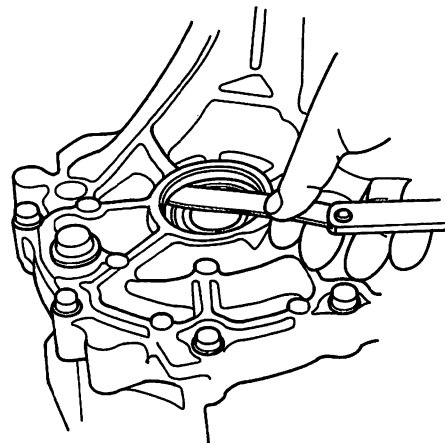
4. Tighten the transmission housing attaching bolts (see page 13-44).

8 x 1.25 mm
27 N·m (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 (0.0394 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)

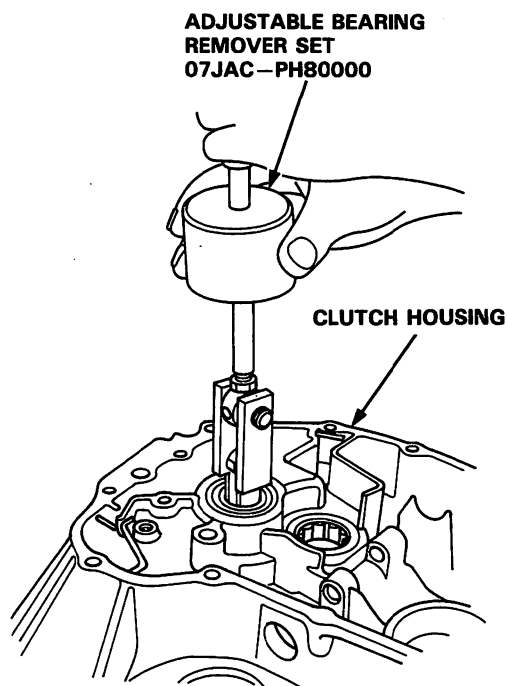
8. Remove the bolts and transmission housing.
9. Replace the thrust shim selected in step 7, then recheck the clearance.
10. Remove the bolts and transmission housing. Apply liquid gasket to the surface of the transmission housing and reassemble.

Clutch Housing Bearing

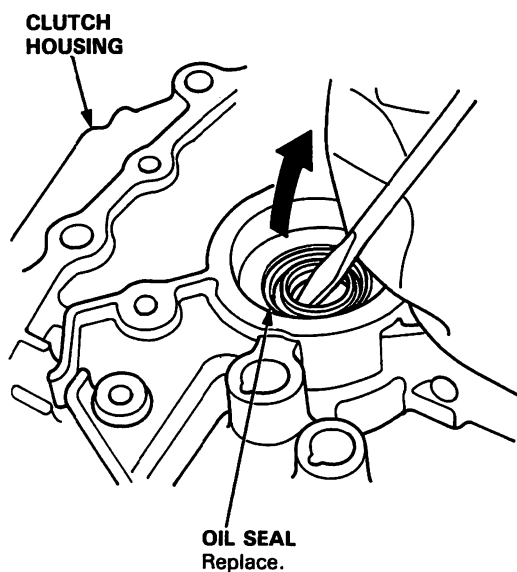
Replacement

Mainshaft

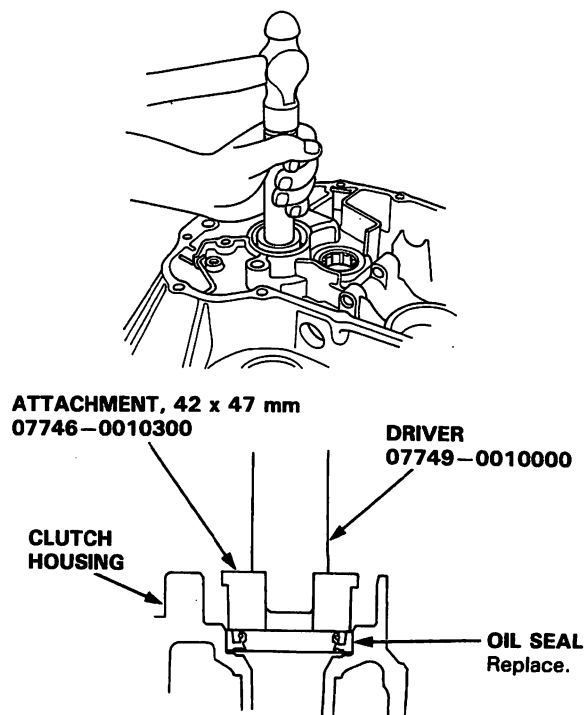
1. Remove the ball bearing using the special tool as shown.



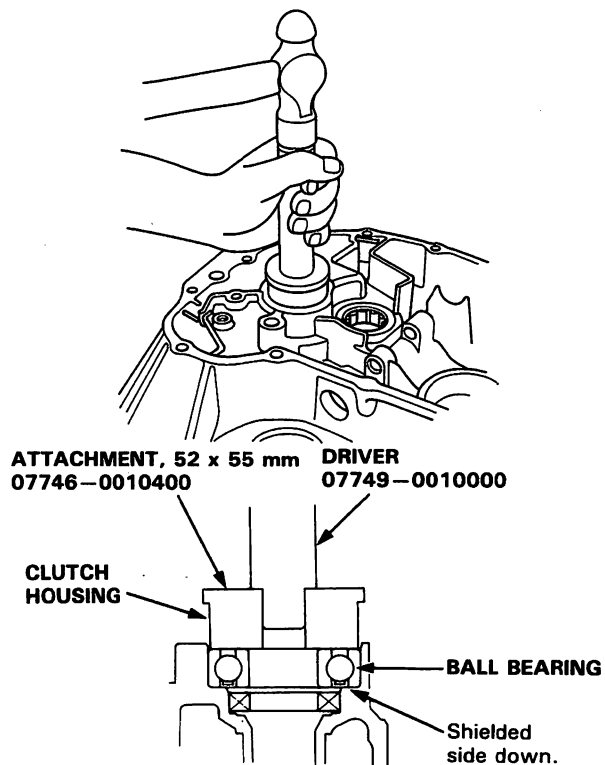
2. Remove the oil seal from the clutch housing.



3. Drive the new oil seal into the clutch housing using the special tools as shown.



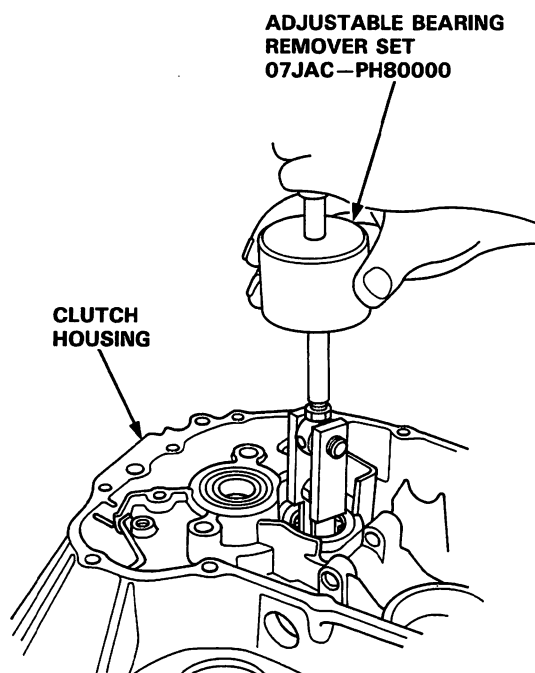
4. Drive the ball bearing into the clutch housing using the special tools as shown.



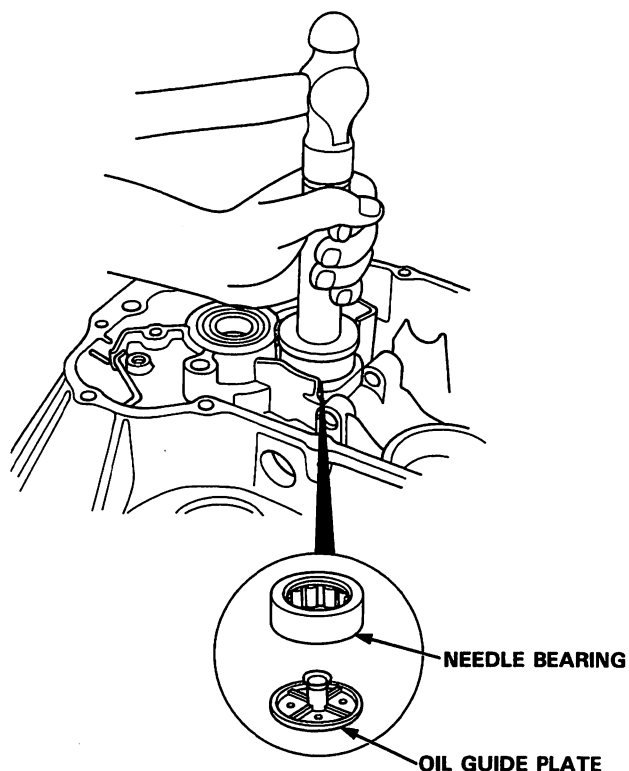


Countershaft

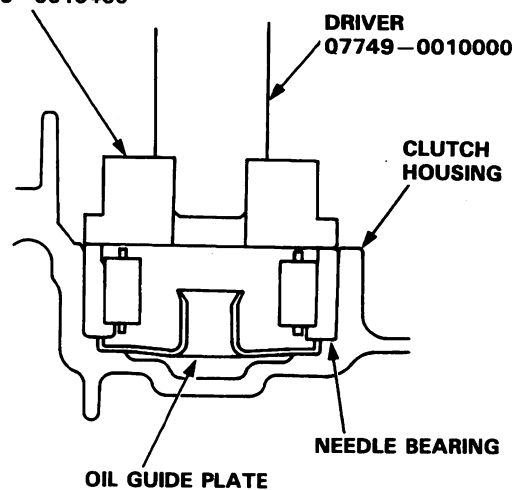
1. Remove the needle bearing using the special tool as shown, then remove the oil guide plate.



2. Install the oil guide plate, then drive the needle bearing into the clutch housing using the special tools as shown.



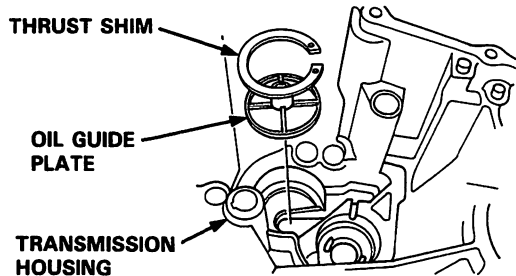
ATTACHMENT, 52 x 55 mm
07746-0010400



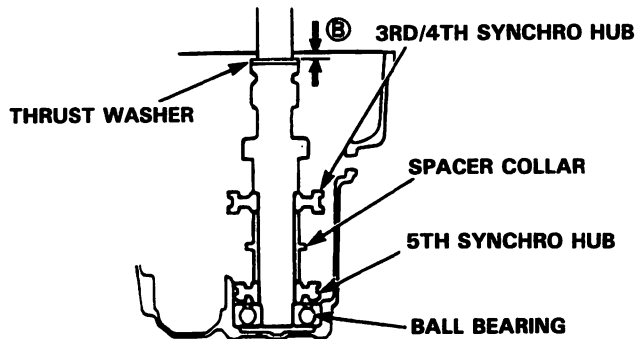
Mainshaft Thrust Clearance

Adjustment

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 ⑧ between the end of the transmission housing and thrust washer.

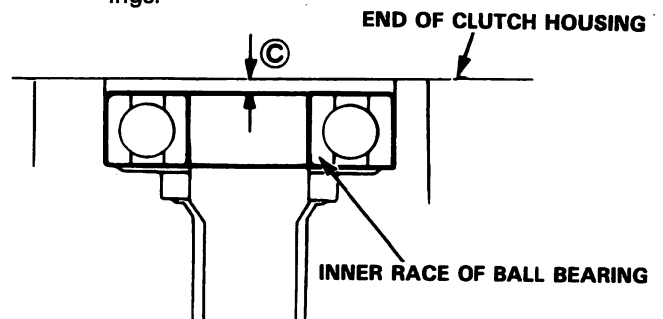
NOTE:

- Use a straight edge and vernier caliper.
- Measure at three locations and average the readings.

4. Measure the distance ⑨ 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:

Distance ⑧ (2.00 mm) + Distance ⑨ (0.09 mm)
= 2.09 mm

subtract the spring washer height (0.95 mm) = the
required thrust shim (1.14 mm)



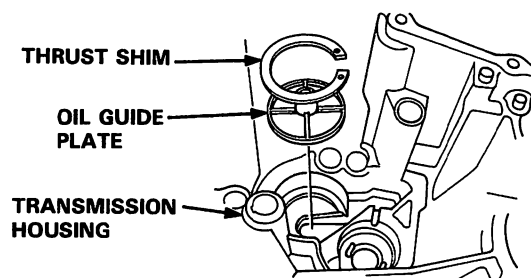
70 mm THRUST SHIM

	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 (0.0378 in)
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 (0.0413 in)
Q	23947 – PL3 – B00	1.08 mm (0.0425 in)
R	23948 – PL3 – B00	1.11 mm (0.0437 in)
S	23949 – PL3 – B00	1.14 mm (0.0449 in)
T	23950 – PL3 – B00	1.17 mm (0.0461 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)

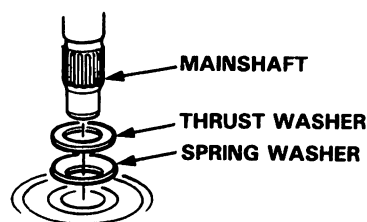
- Install the oil guide plate and selected thrust shim in the transmission housing.

NOTE:

- Clean the thrust washer, spring washer and thrust shim thoroughly before installation.
- Install the thrust washer, spring washer and thrust shim properly.



- Install the thrust washer and spring washer in the mainshaft.



- Install the mainshaft in the clutch housing.
- Place the transmission housing over the mainshaft and onto the clutch housing.
- 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 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)

- Tap the mainshaft with a plastic hammer.

(cont'd)

Mainshaft Thrust Clearance

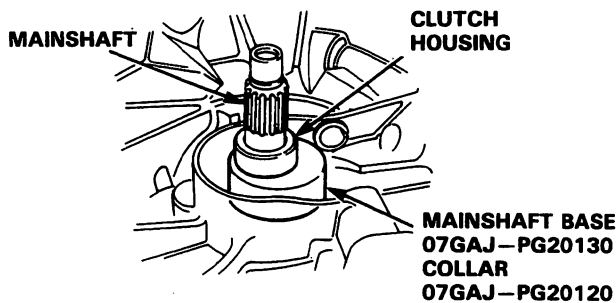
Adjustment (cont'd)

12. Check the thrust clearance in the manner described below.

⚠ CAUTION

Measurement should be made at room temperature.

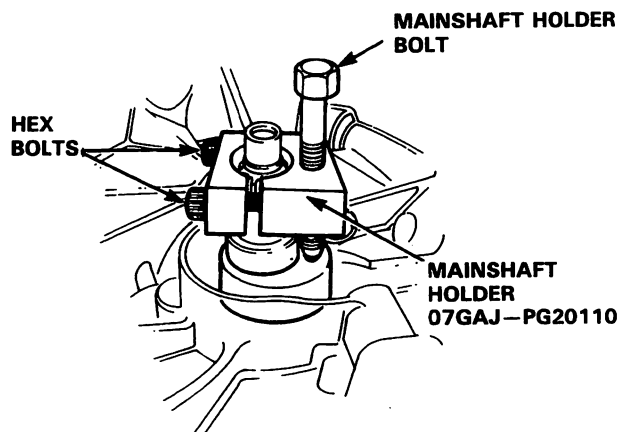
- a. Slide the mainshaft base and the collar over the mainshaft.



- b. Attach the mainshaft holder to the mainshaft as follows:

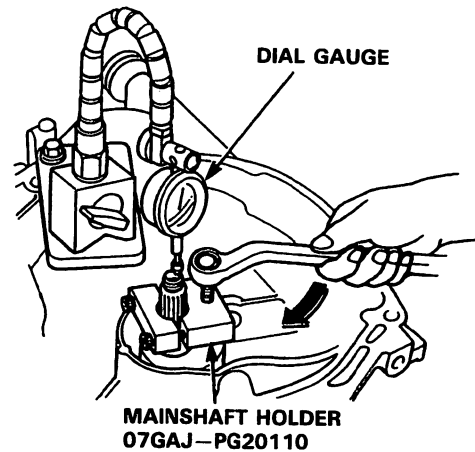
NOTE:

- 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.

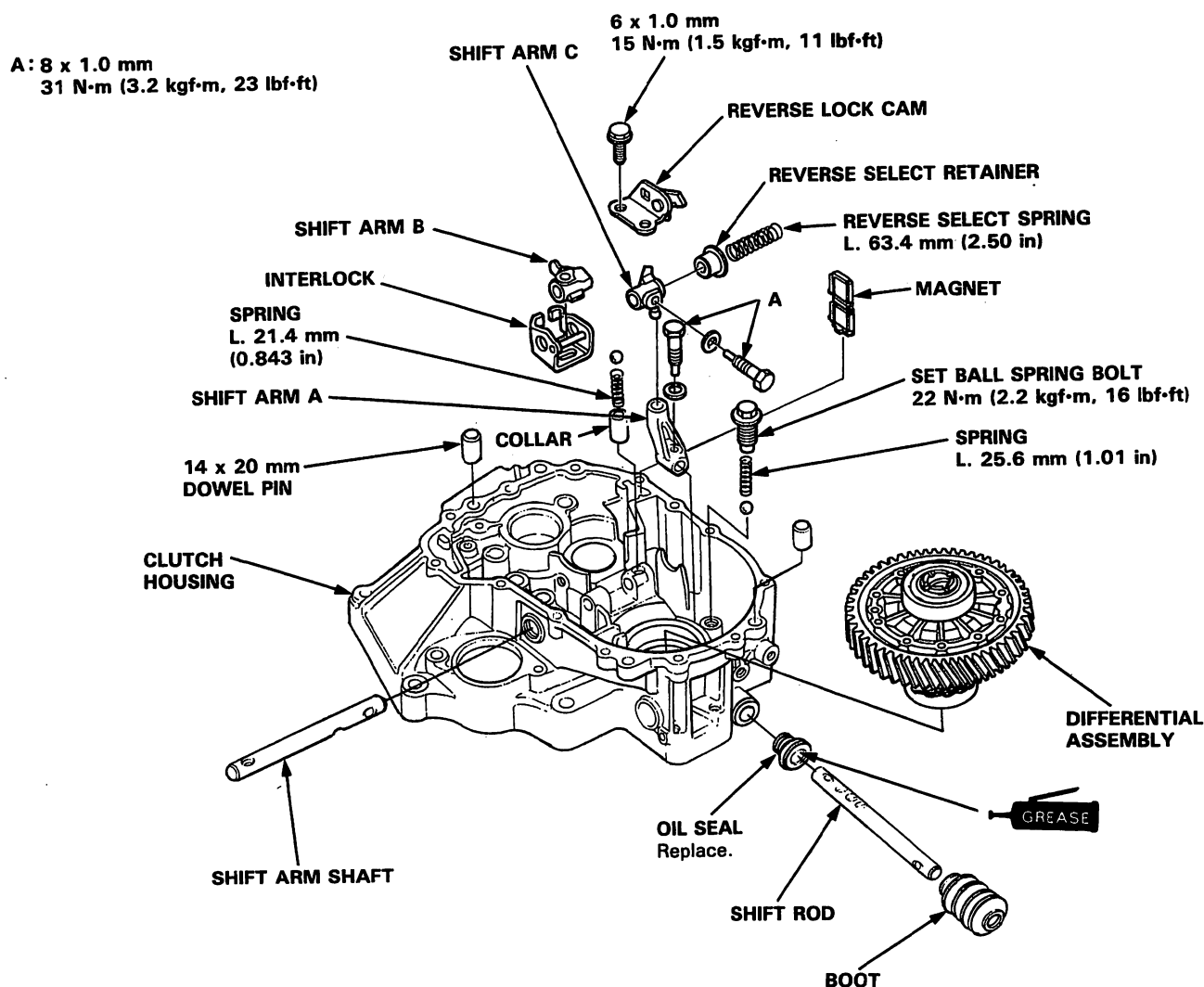
Standard: 0.11 – 0.18 mm (0.004 – 0.007 in)



Reassembly

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.



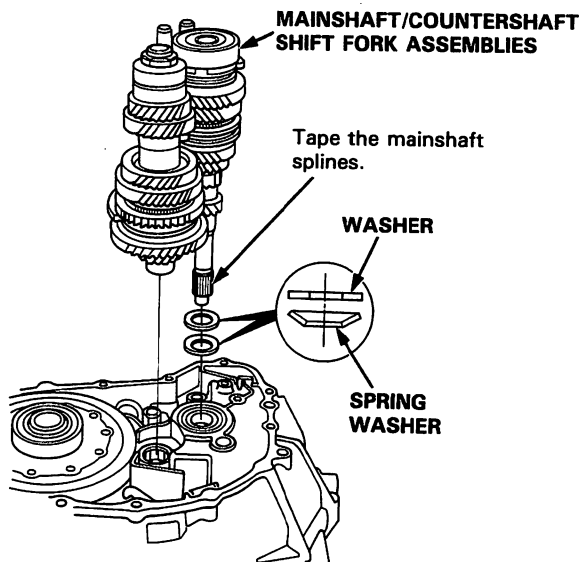
(cont'd)

Transmission

Reassembly (cont'd)

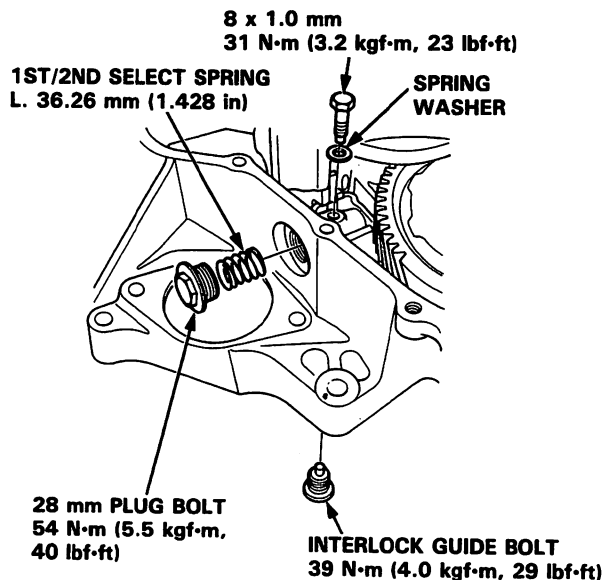
11. Set the 36 mm spring washer and washer.
12. Install the mainshaft, countershaft, and shift fork assemblies.

NOTE: Align the finger of the interlock with the groove in the shift fork shaft.

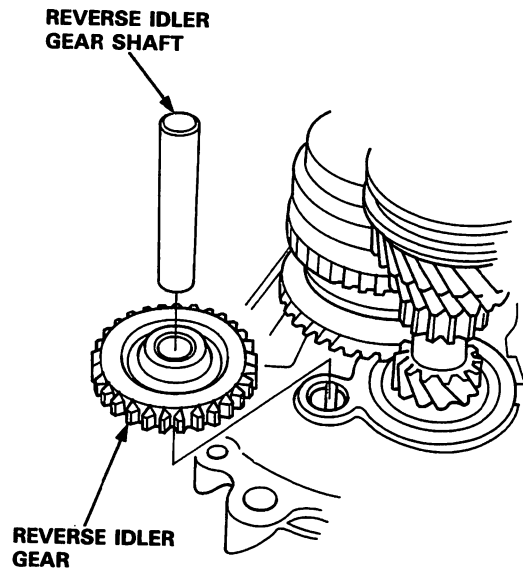


13. Install the spring washer and shift arm B attaching bolt.
14. Install the 1st/2nd select spring, 28 mm plug bolt, and interlock guide bolt.

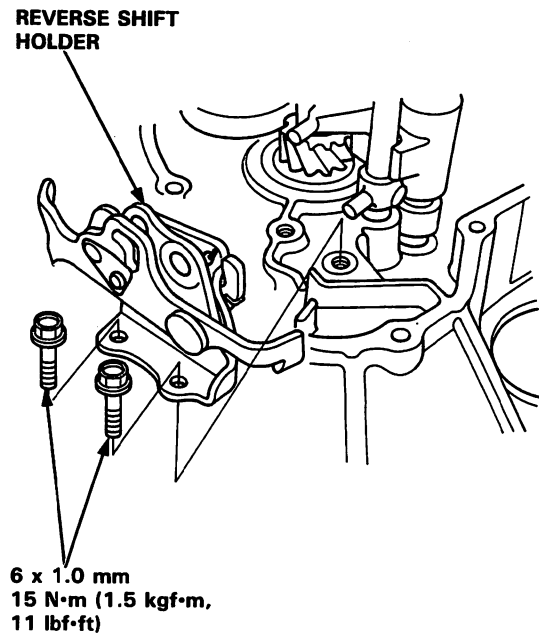
NOTE: Apply liquid gasket (P/N 08C70 - K0234M) to the threads of the 28 mm plug bolt and interlock guide bolt.



15. Install the reverse idler gear and reverse idler gear shaft.



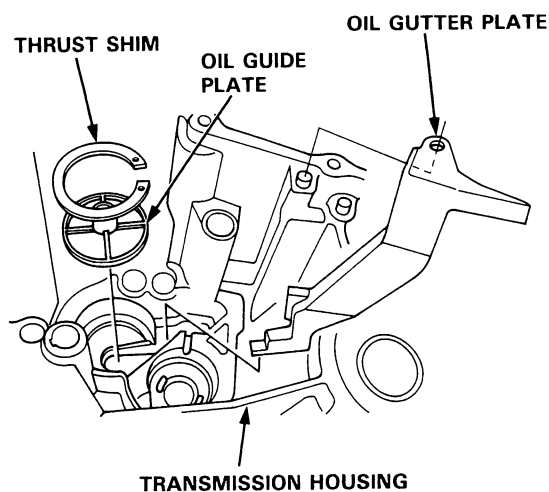
16. Install the reverse shift holder.





17. Install the oil gutter plate.

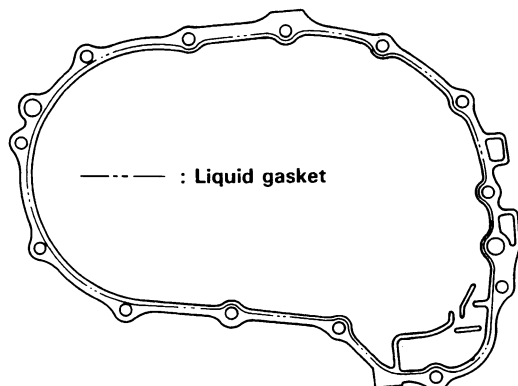
18. Install the oil guide plate and thrust shim on the transmission housing.



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.

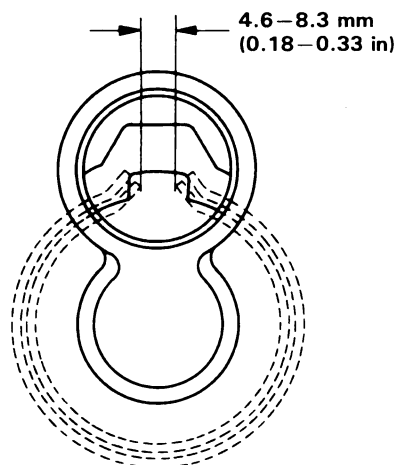
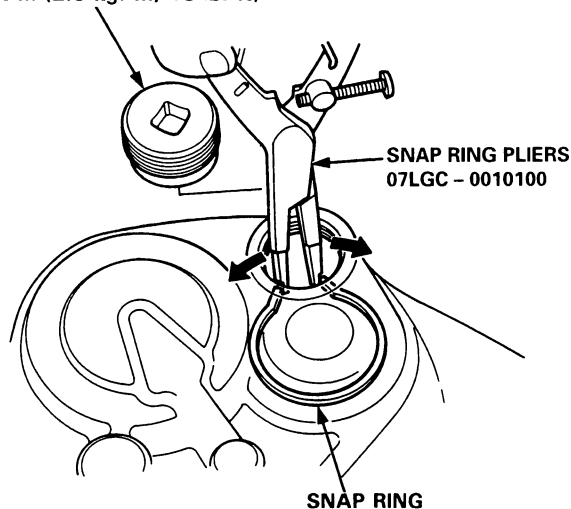
21. Lower the transmission housing with the snap ring pliers, and set the snap ring into the groove of the countershaft bearing.

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)



(cont'd)

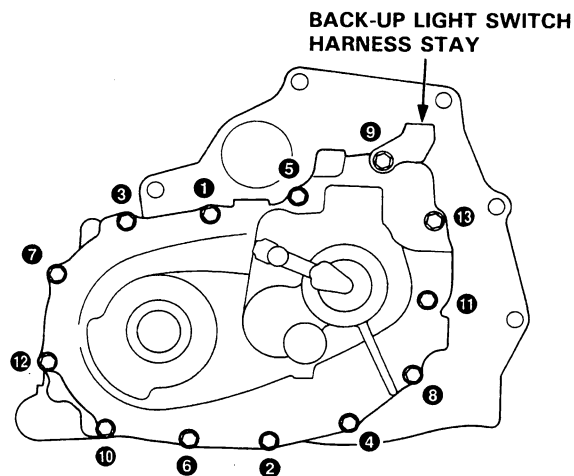
Transmission

Reassembly (cont'd)

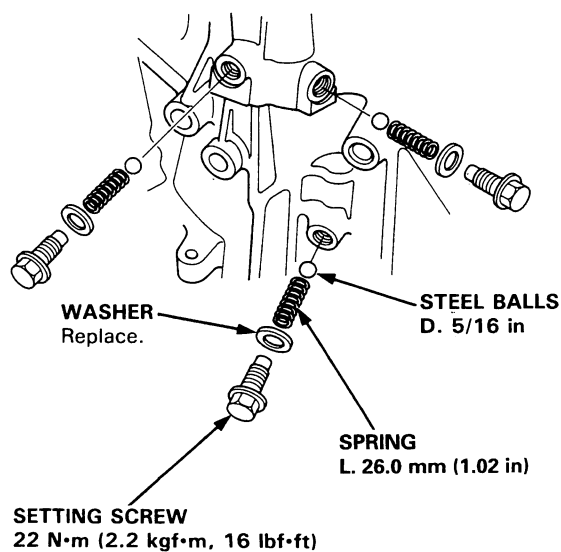
23. Tighten the transmission housing attaching bolts in the numbered sequence in several steps shown below.

8 x 1.25 mm

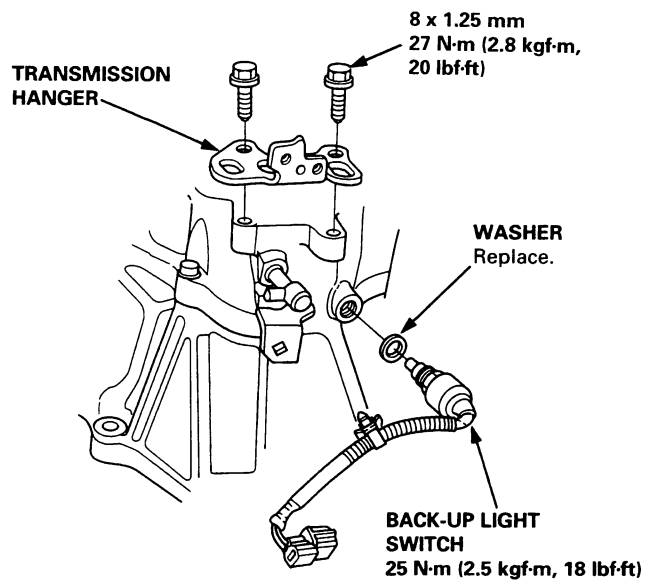
Torque: 27 N·m (2.8 kgf·m 20 lbf·ft)

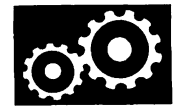


24. Install the steel balls, springs, and set screws.



25. Install the back-up light switch and transmission hanger.

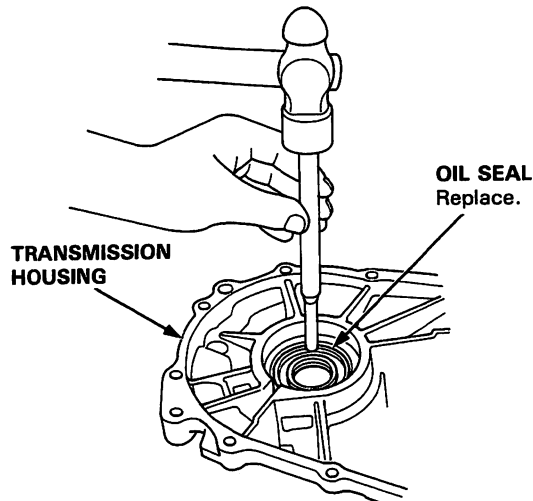




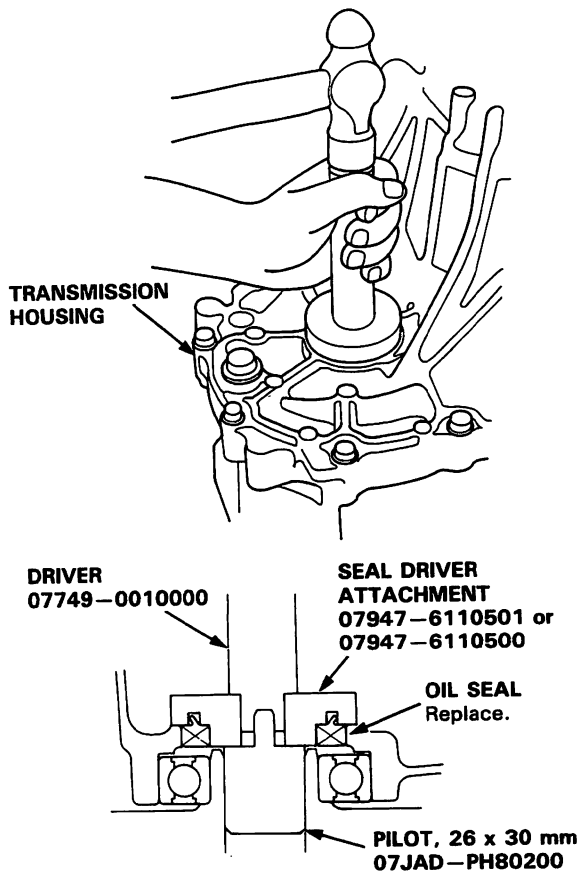
Replacement

Transmission Housing:

1. Remove the oil seal from the transmission housing.

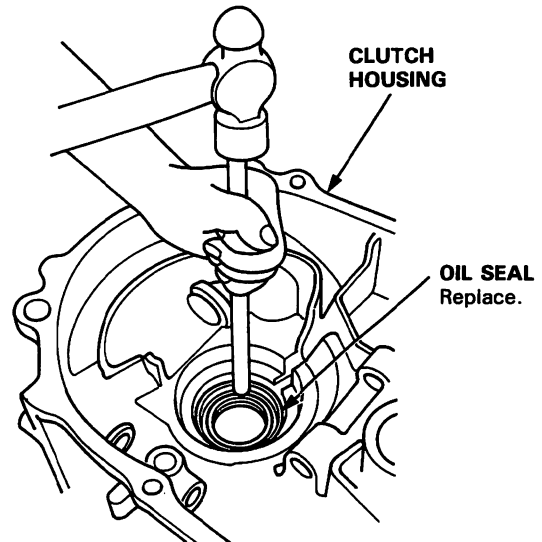


2. Install the oil seal into the transmission housing using the special tools as shown.

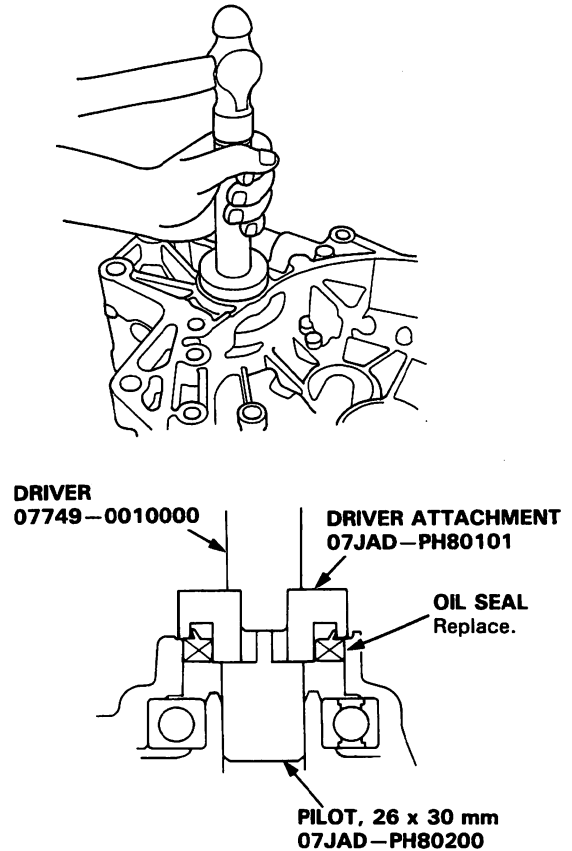


Clutch Housing:

1. Remove the oil seal from the clutch housing.



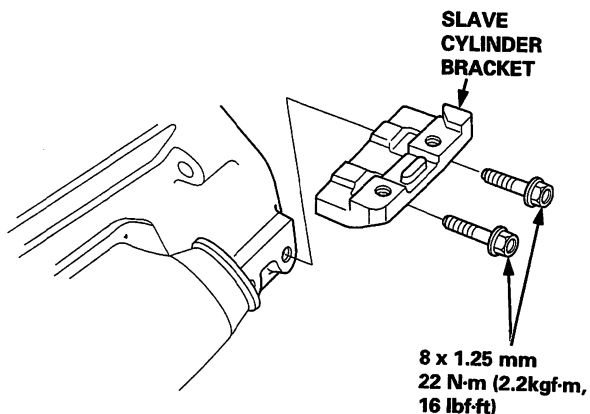
2. Install the oil seal into the clutch housing using the special tools as shown.



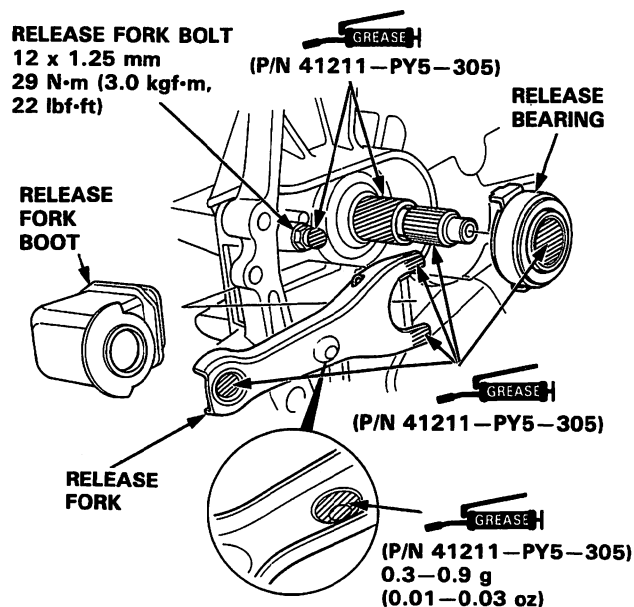
Transmission Assembly

Installation

1. Check the two dowel pins are installed in the clutch housing.
2. Install the slave cylinder bracket to the transmission assembly.

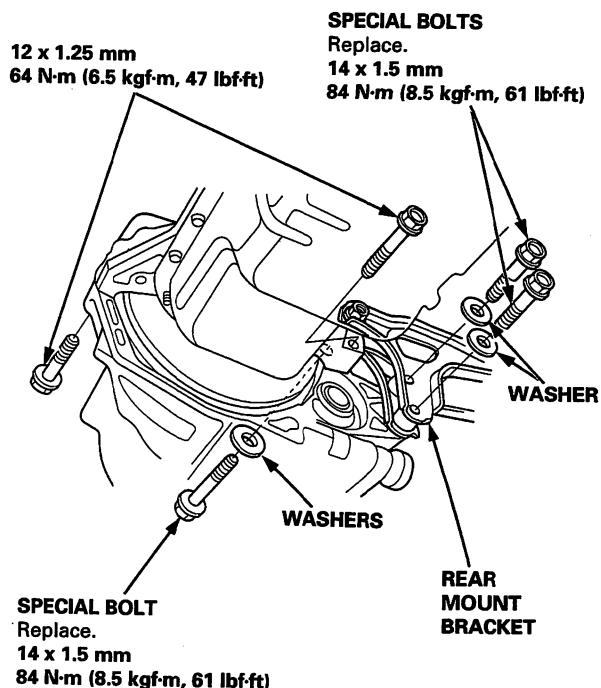


3. Apply HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305) to the release fork, the release fork bolt, the release bearing, and the release bearing guide in the shaded areas.

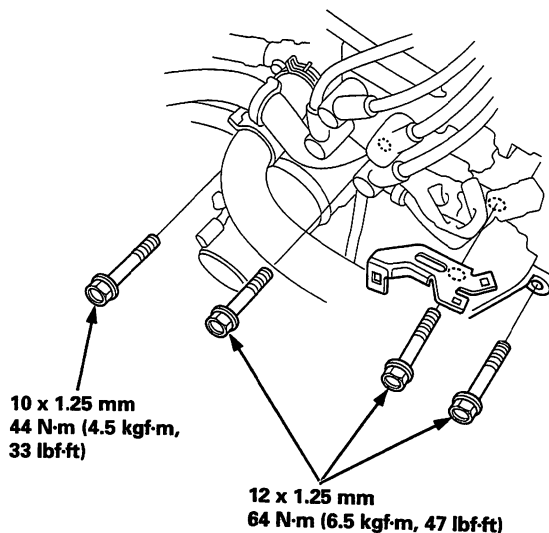


4. Install the release bearing, release fork, and boot on the transmission.

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.

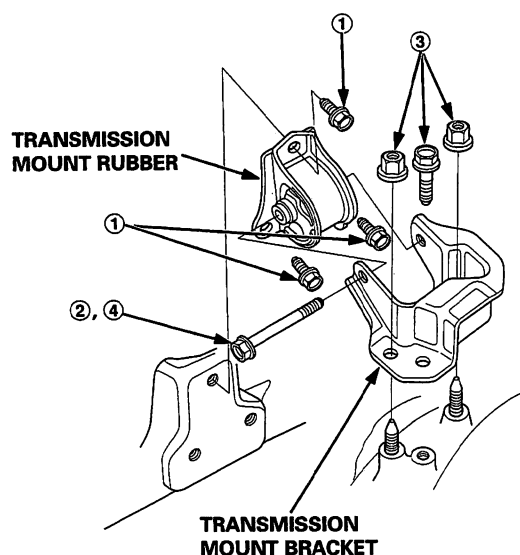




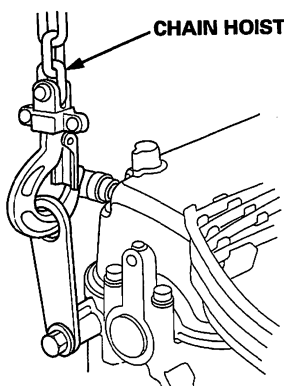
8. Raise the transmission, then install the transmission mount rubber assembly and transmission mount bracket.

- Torque mounting bolts and nut in the sequence shown.
- Make sure the bushings are not twisted or offset.

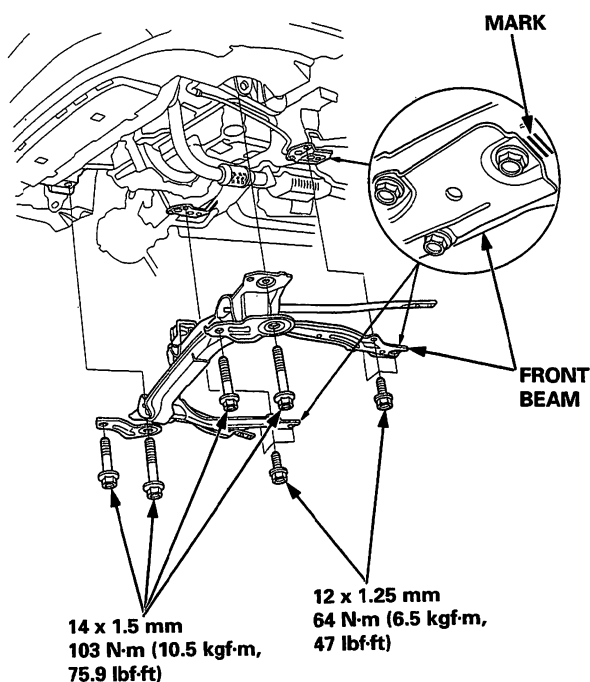
- ① : 12 x 1.25 mm 64 N·m (6.5 kgf·m, 47 lbf·ft)
- ② : Temporary tightening
- ③ : 12 x 1.25 mm 64 N·m (6.5 kgf·m, 47 lbf·ft)
- ④ : 10 x 1.25 mm 64 N·m (6.5 kgf·m, 47 lbf·ft)



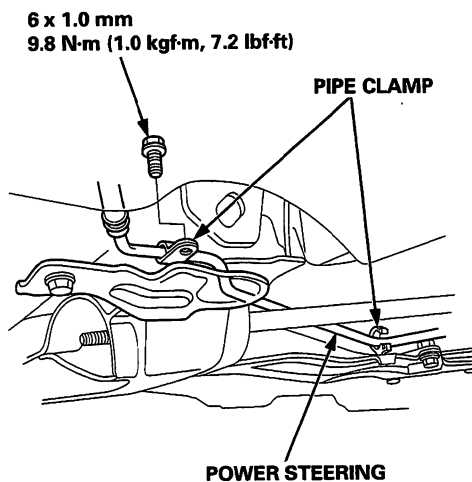
9. Remove the chain hoist.



10. Install the front beam by align the marks.



11. Install the power steering cooler pipe in the pipe clamps.

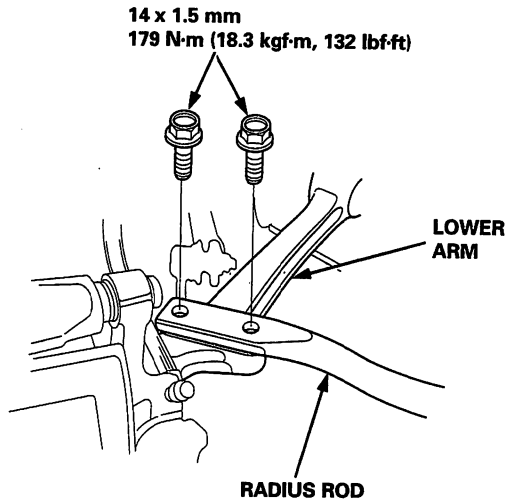


(cont'd)

Transmission Assembly

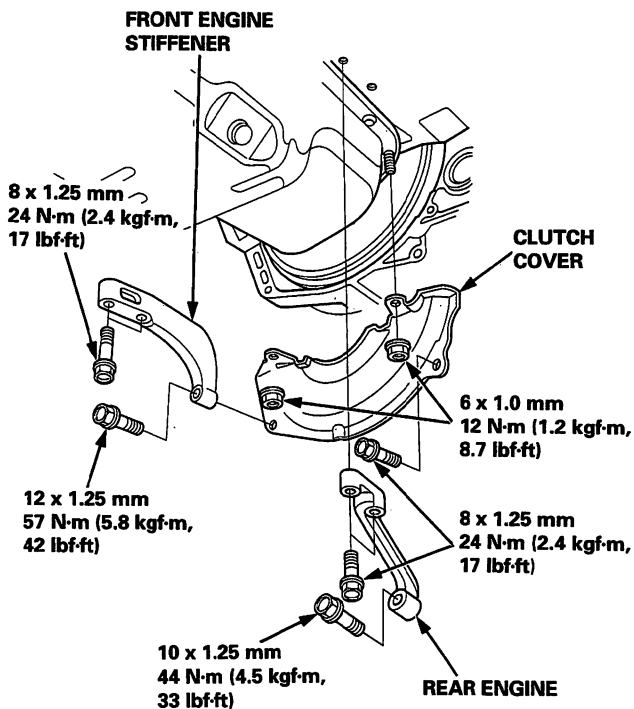
Installation (cont'd)

12. Install both radius rods with new mounting bolts on the lower arm.



13. Install the clutch cover.

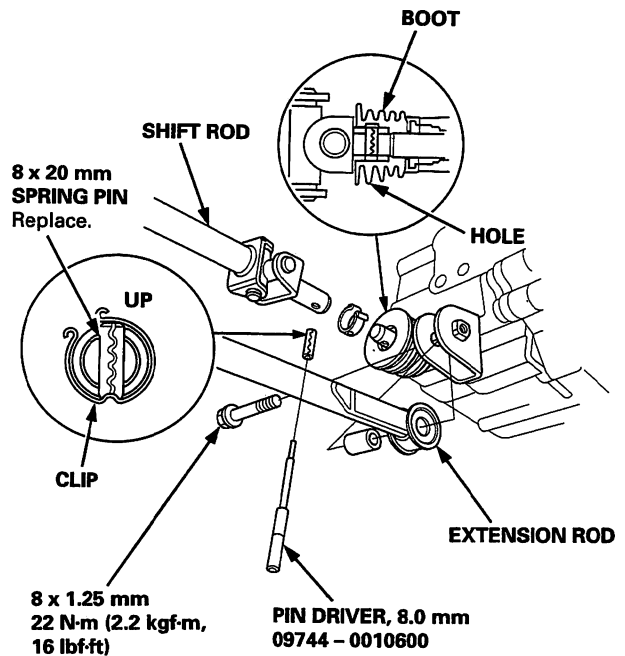
14. Install the front and rear engine stiffeners.



15. Install the shift rod, spring pin, and clip as shown.

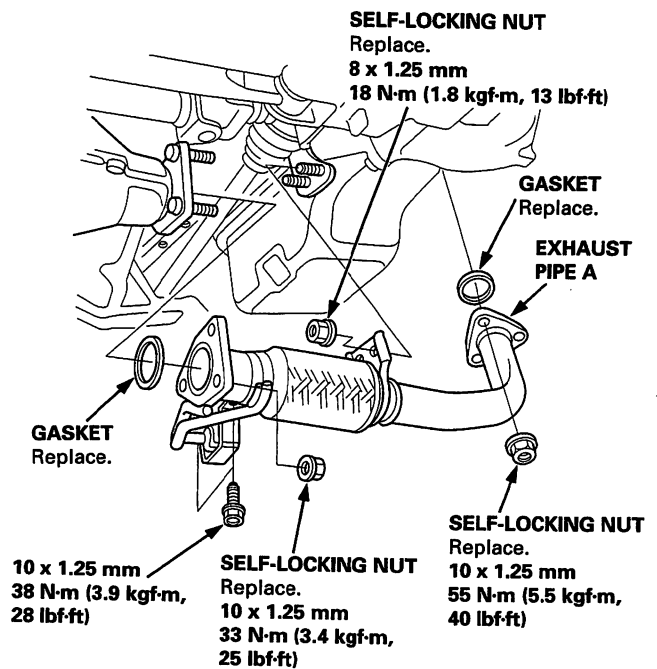
NOTE:

- Turn the boot so the hole is facing down.
- Make sure the boot is installed on the shift rod.



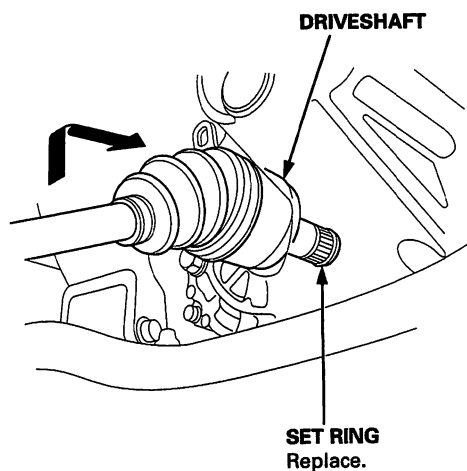
16. Install the extension rod.

17. Install the exhaust pipe A.



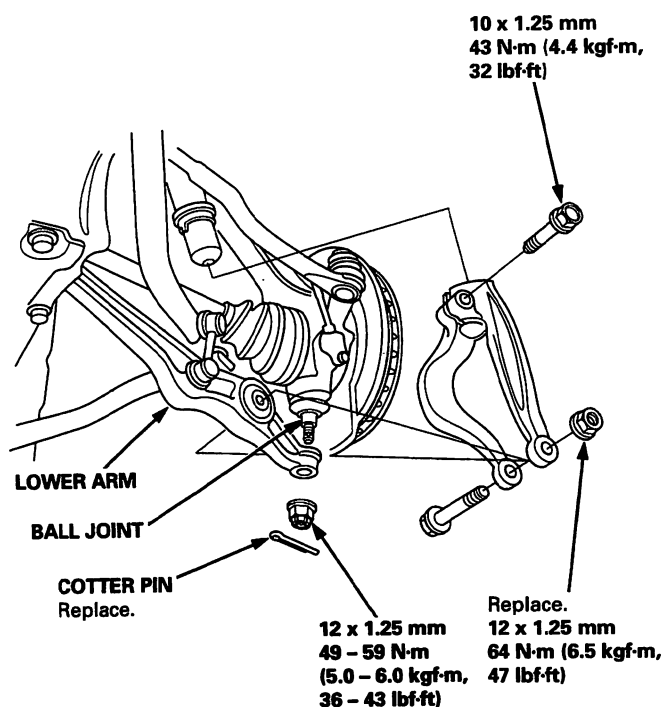


18. Install the driveshafts with new set rings (see section 16).

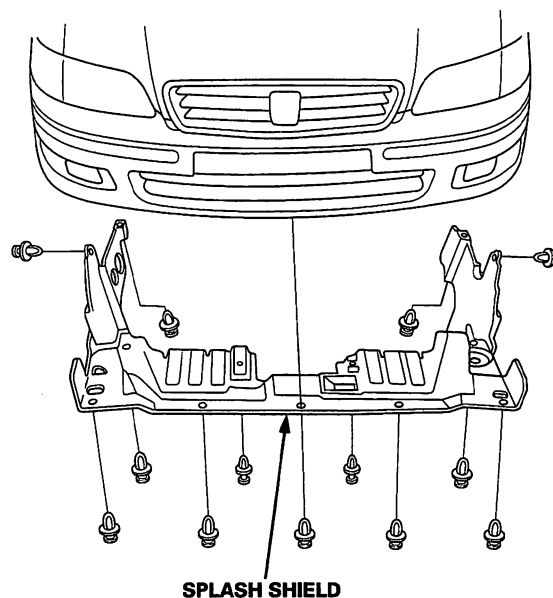


19. Install the both damper forks with new locknuts (see section 19).

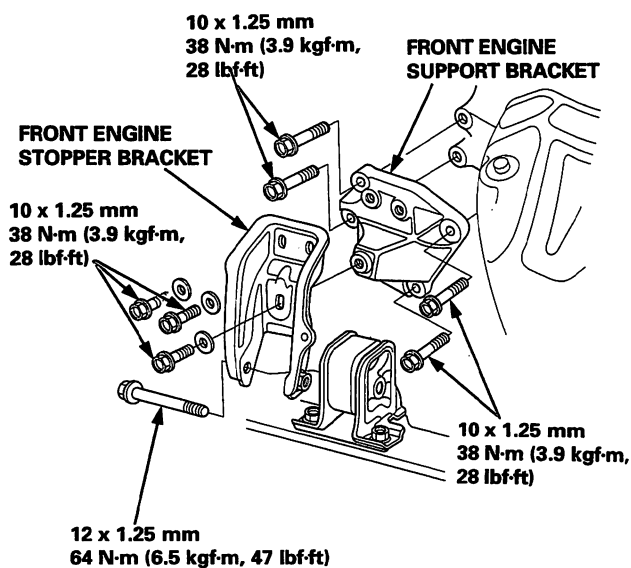
20. Install the ball joint onto the lower arms, then install the castle nuts and new cotter pins (see section 18).



21. Install the splash shield.



22. Install the front engine stopper bracket and front engine support bracket.

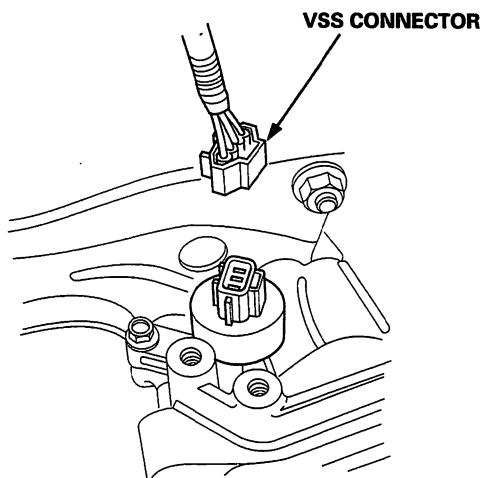


(cont'd)

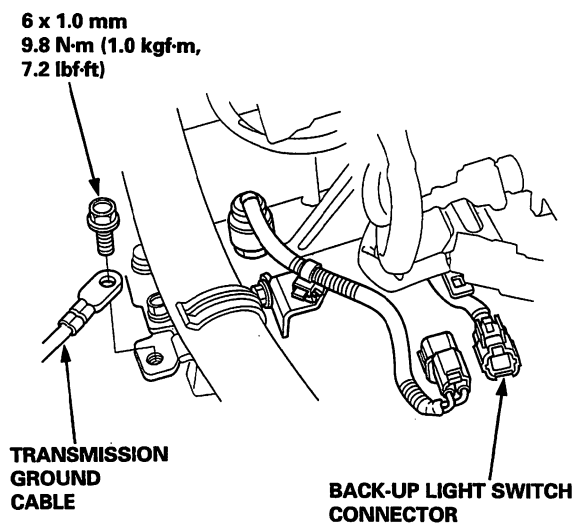
Transmission Assembly

Installation (cont'd)

23. Connect the vehicle speed sensor (VSS) connector.

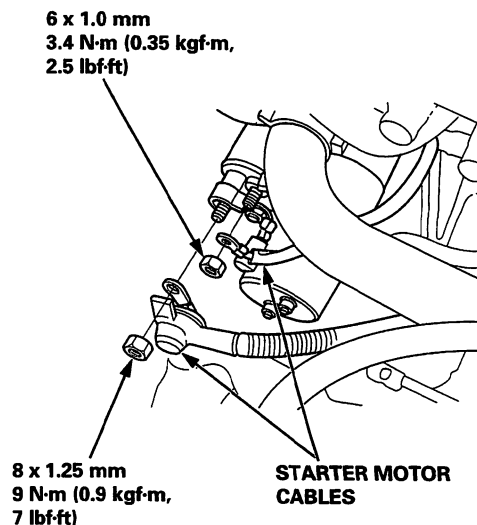


24. Connect the back-up light switch connector.

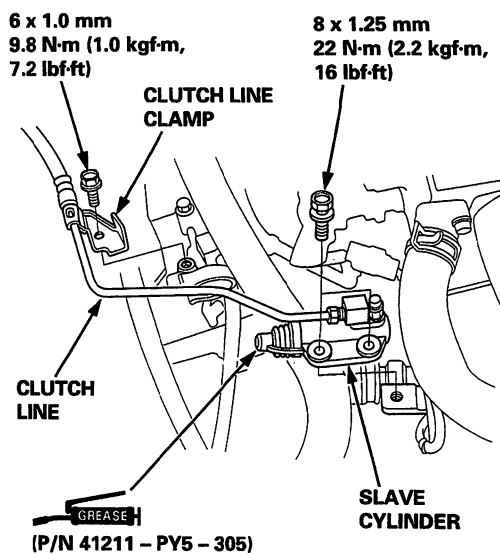


25. Install the transmission ground.

26. Connect the starter motor cables. Make sure the crimped side of the ring terminals is facing out.

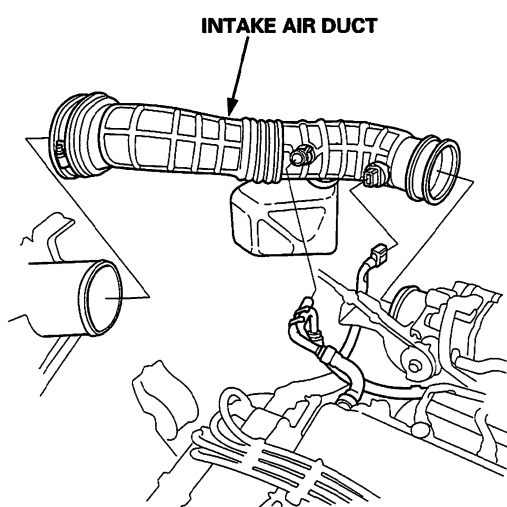


27. Apply HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305) to the end of the slave cylinder rod. Install the slave cylinder and clutch line clamp so as not to bend the clutch line.

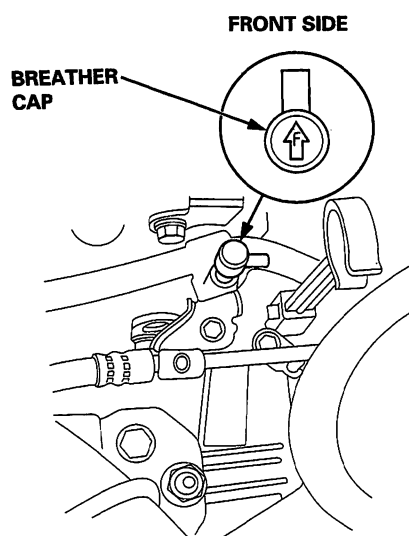




28. Install the intake air duct.



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.

U2J4, U2G5, U2Q7 Model Manual Transmission (F18B2, F18B3, F20B6, H22A7 engine models)

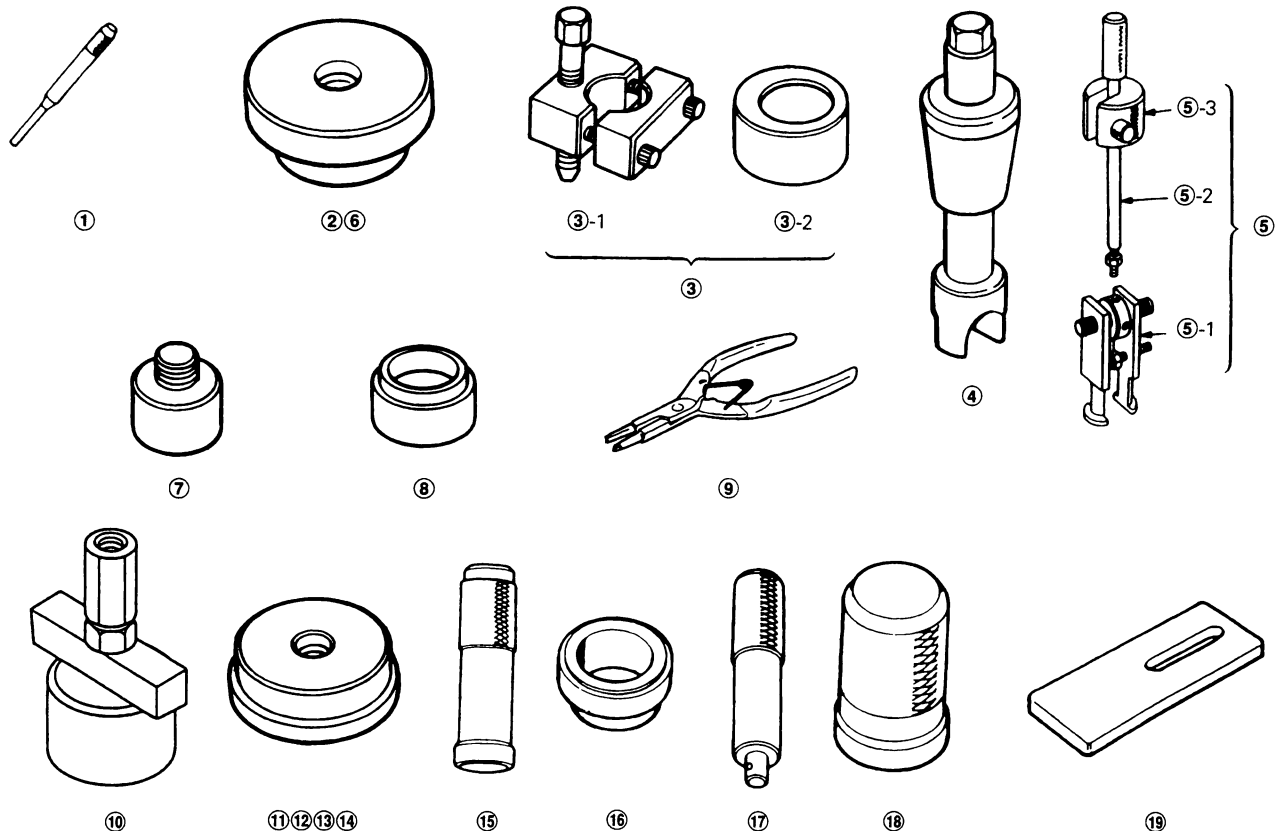
Special Tools	13-54	Countershaft assembly-U2Q7 Transmission	
Description		Index	13-87
Limited Slip Differential (LSD)	13-55	Clearance Inspection	13-88
Maintenance		Disassembly	13-90
Transmission Fluid	13-57	Inspection	13-91
Back-up Light Switch		Reassembly	13-92
Test/Replacement	13-57	Shift Fork Assembly	
Limited Slip Differential (LSD)		Disassembly/Reassembly	13-95
Operational Check	13-58	Clearance Inspection	13-96
Rotating Torque Check	13-58	Synchro Sleeve, Synchro Hub	
Transmission Assembly		Inspection	13-97
Removal	13-59	Installation	13-97
Index	13-66	Synchro Ring, Gear	
Shift Arm Assembly		Inspection	13-98
Index	13-68	Differential	
Disassembly/Reassembly	13-69	Index	13-99
Transmission Assembly		Backlash Inspection-U2J4, U2G5	
Disassembly	13-71	Transmission	13-100
Reverse Shift Fork		Final Driven Gear Replacement	13-100
Clearance Inspection	13-73	Tapered Roller Bearing Replacement	13-101
Mainshaft Assembly		Oil Seal Replacement	13-101
Index	13-74	Bearing Outer Race Replacement	13-102
Clearance Inspection	13-76	Tapered Roller Bearing Preload	
Disassembly	13-78	Adjustment	13-103
Inspection	13-79	Mainshaft Bearing/Oil Seal	
Reassembly	13-85	Replacement	13-106
Countershaft assembly-U2J4, U2G5 Transmissions		Countershaft Bearing	
Index	13-81	Replacement	13-107
Clearance Inspection	13-82	Mainshaft Thrust Bearing	
Disassembly	13-84	Adjustment	13-108
Inspection	13-85	Transmission Assembly	
Reassembly	13-85	Reassembly	13-111
		Installation	13-115
		Gearshift Mechanism	
		Overhaul	13-123



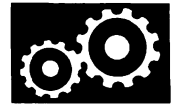
Special Tools

Special Tools

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



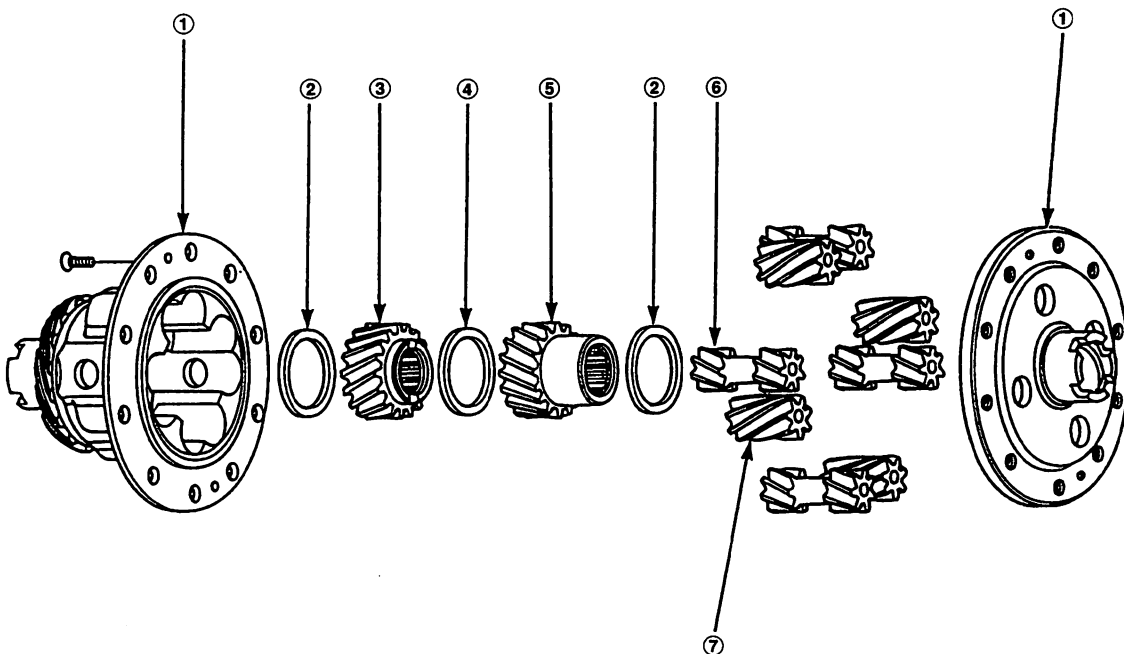
Limited Slip Differential (LSD) (H22A7 engine model)

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.

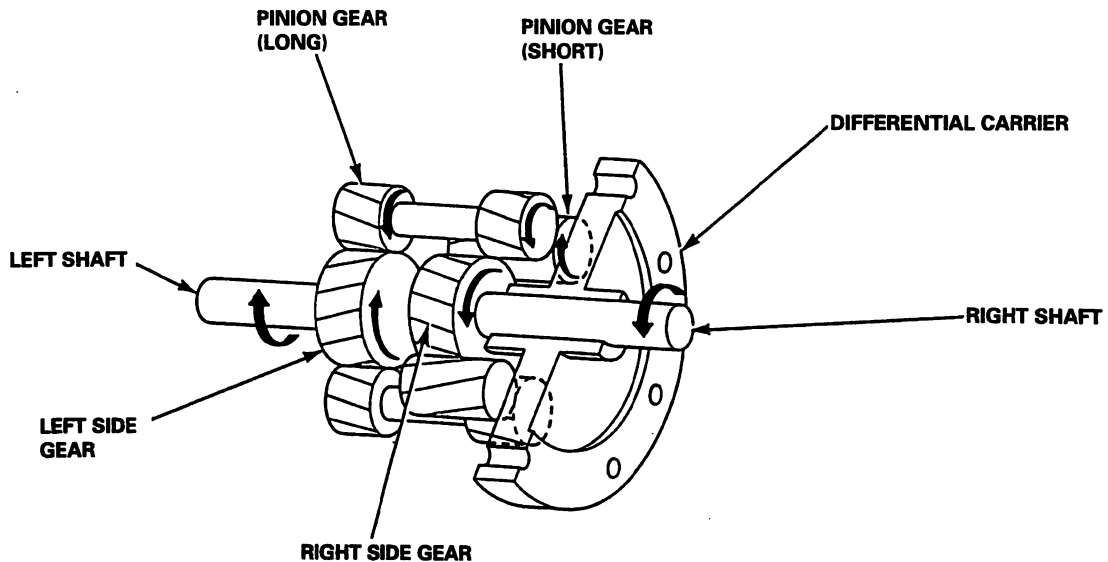
(cont'd)

Description

Limited Slip Differential (LSD) (H22A7 engine model) (cont'd)

- When rounding a curve

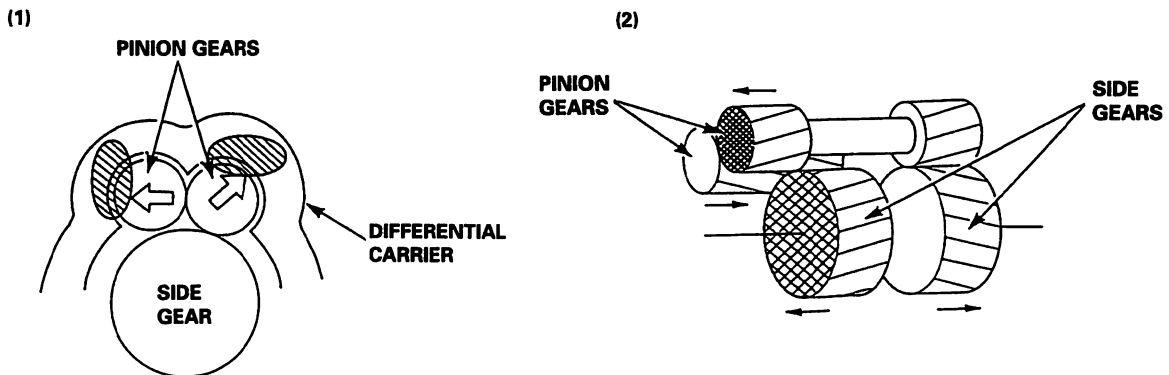
When the vehicle rounds a curve, the differential allows the outer wheel to rotate a little faster than the inner wheel. When this takes place, the short and long pinion gears rotate, and walk around the side gears in the directions shown. If, for example, the right shaft is rotated in a counterclockwise 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:

- (1) The pinions are forced against the differential carrier by the force as they are rotated and repelled outward in engagement.
- (2) The ends of the pinion gears are held firmly against the differential carrier due to the side thrust from the helically cut gears.



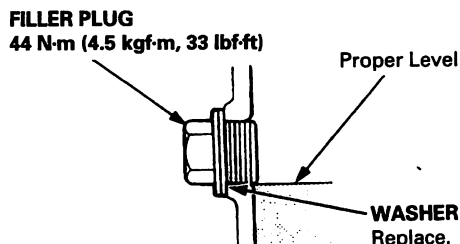
With the pinion gears locked, the torque applied to the slipping wheel is reduced and the torque delivered to the other wheel is increased.



Transmission Fluid

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.

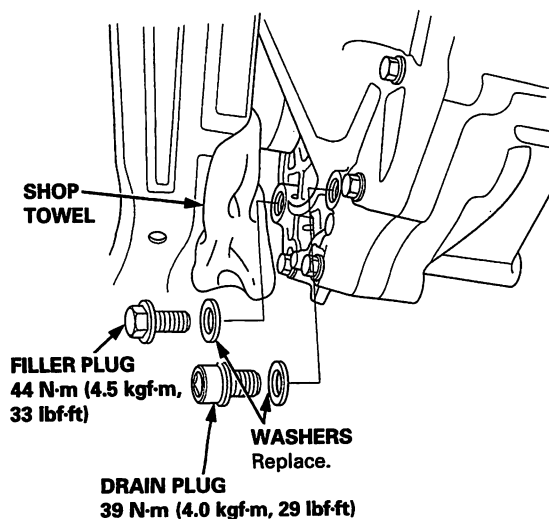
NOTE: The drain plug washer should be replaced at every fluid change.

5. Reinstall the filler plug with a new washer.

Fluid Capacity

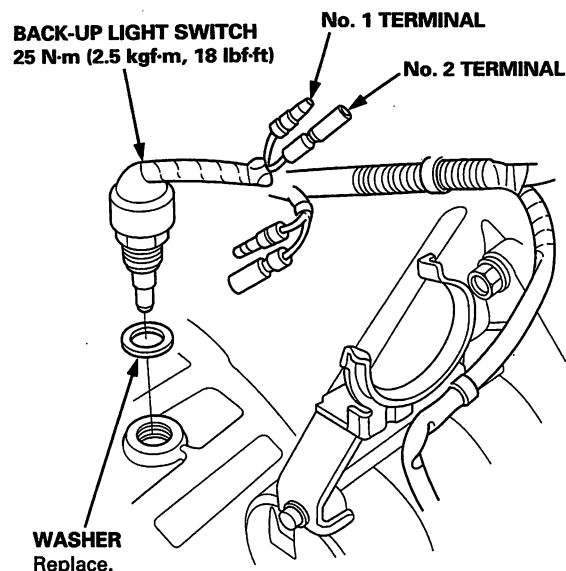
1.9 l (2.0 US qt, 1.7 Imp qt) at fluid change
2.0 l (2.1 US qt, 1.8 Imp qt) at overhaul

Always use genuine Honda Manual Transmission fluid (MTF). If it is not available, you may use an API service SG, SH or SJ grade motor oil with a viscosity of SAE 10 W-30 or 10 W-40 as a temporary replacement.



Test/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.

Limited Slip Differential (LSD) (H22A7 engine model)

Operational Check

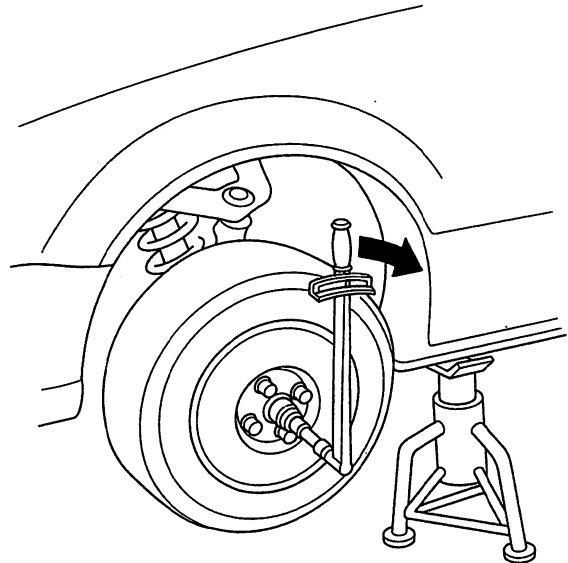
⚠ CAUTION

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 a 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.

Rotating Torque Check

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:
$$\frac{\text{Measurement from step 5}}{\text{Measurement from step 4}} \geq 2.5$$
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.

Transmission Assembly



Removal

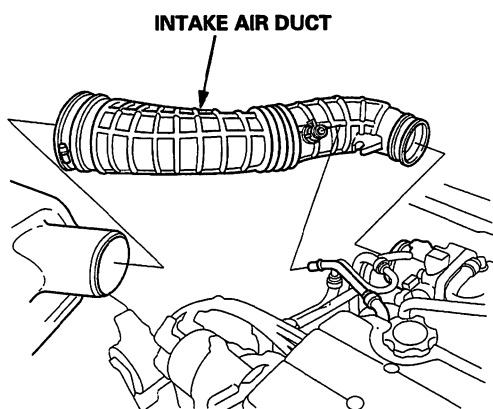
⚠ WARNING

- 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.

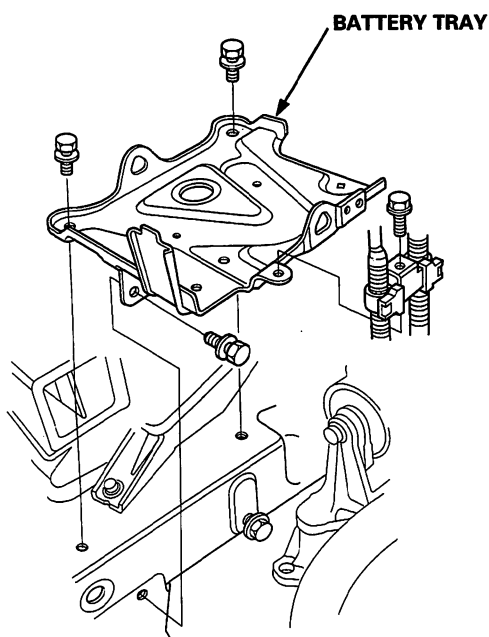
⚠ CAUTION

Use fender covers to avoid damaging painted surfaces.

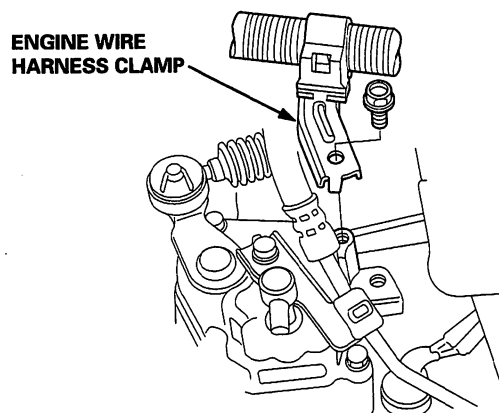
1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery. Remove the battery.
2. Remove the intake air duct .



3. Remove the battery tray.



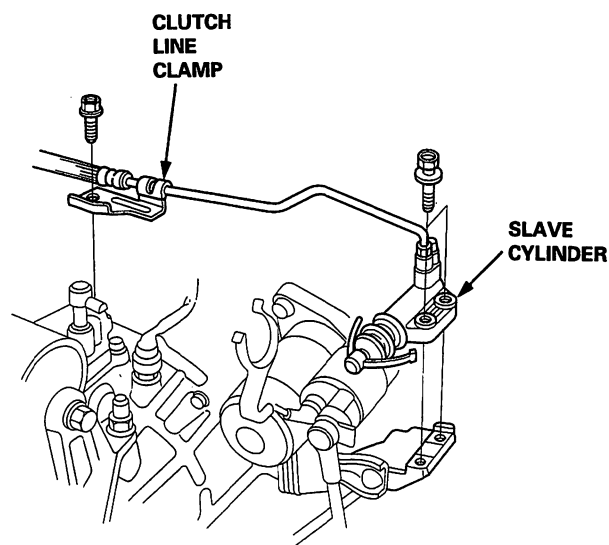
4. Remove the engine wire harness clamp.



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.

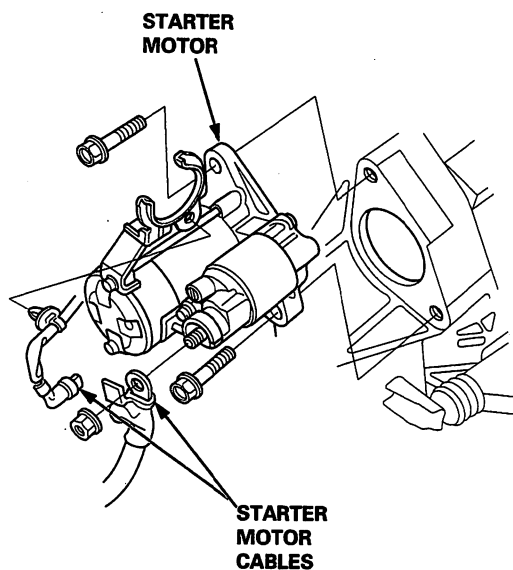


(cont'd)

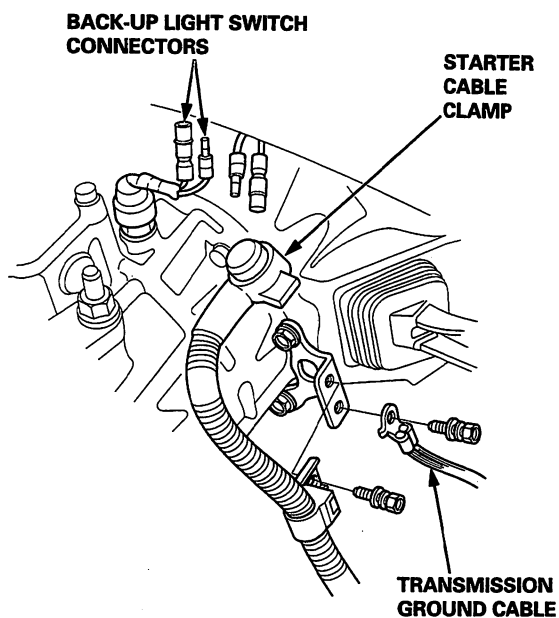
Transmission Assembly

Removal (cont'd)

6. Disconnect the starter motor cables, then remove the starter motor.

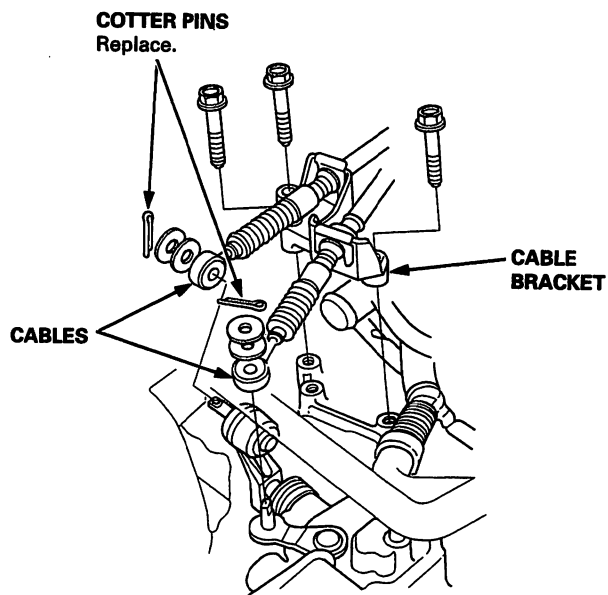


7. Disconnect the back-up light switch connectors.

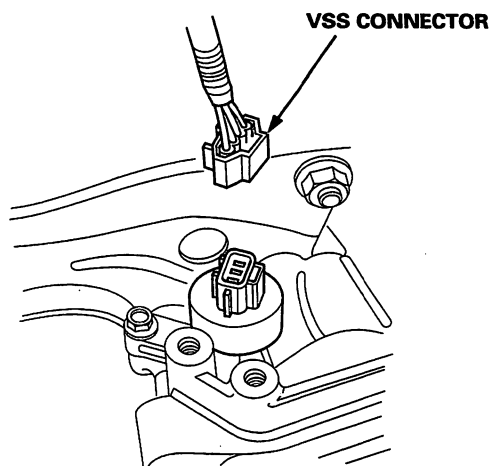


8. Remove the transmission ground cable and starter cable clamp.

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.

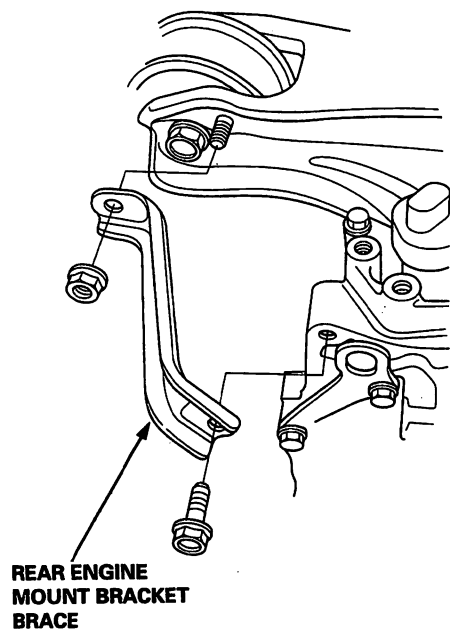


10. Disconnect the vehicle speed sensor (VSS) connector.

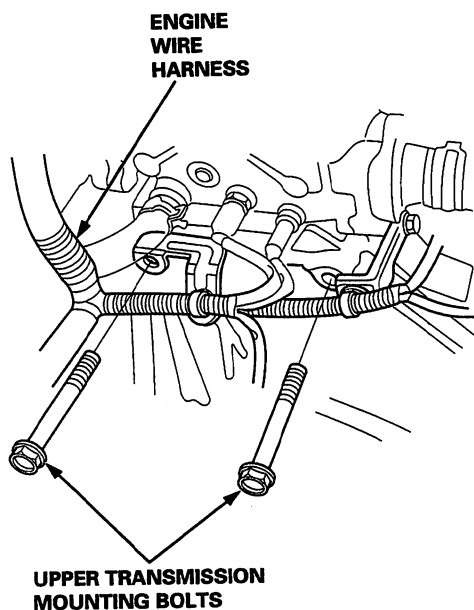




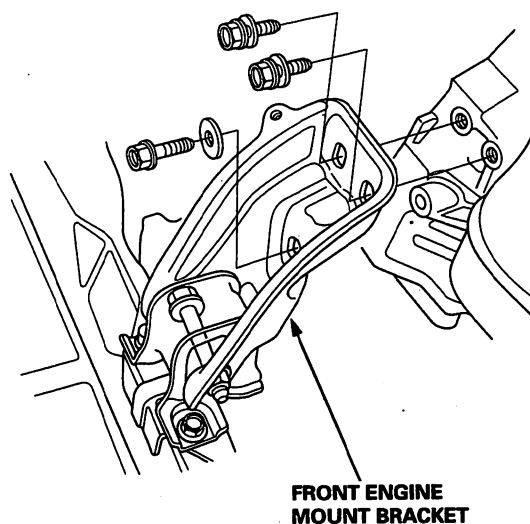
11. Remove the rear engine mount bracket brace.



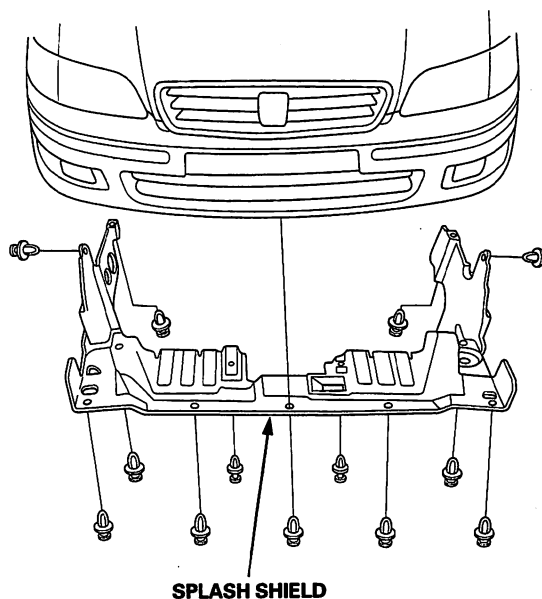
12. Remove the two upper transmission mounting bolts.



13. Remove the front engine stopper bracket three mounting bolts.



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.

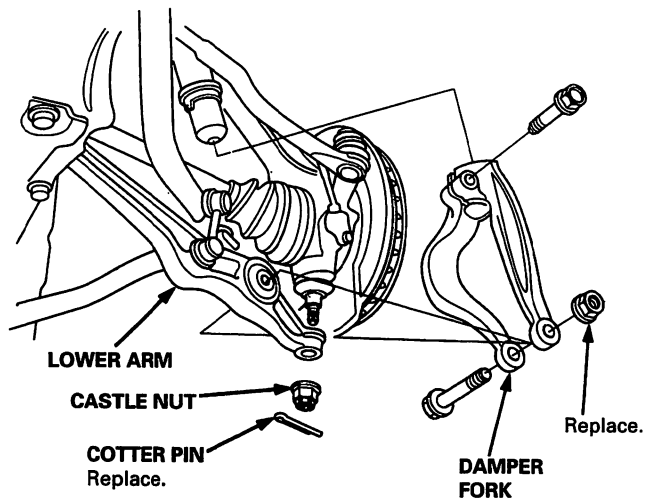


(cont'd)

Transmission Assembly

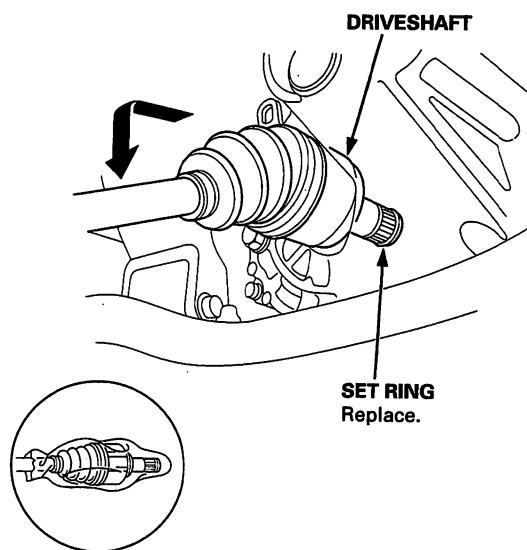
Removal (cont'd)

17. Remove the cotter pins, and loosen the castle nuts, then separate the ball joints and lower arms on both sides (see section 18).

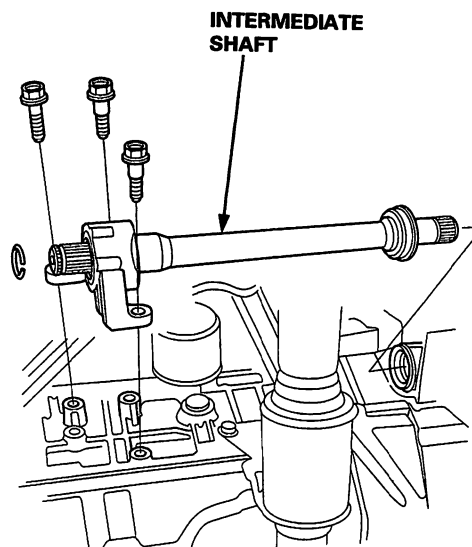


18. Remove the both damper forks.

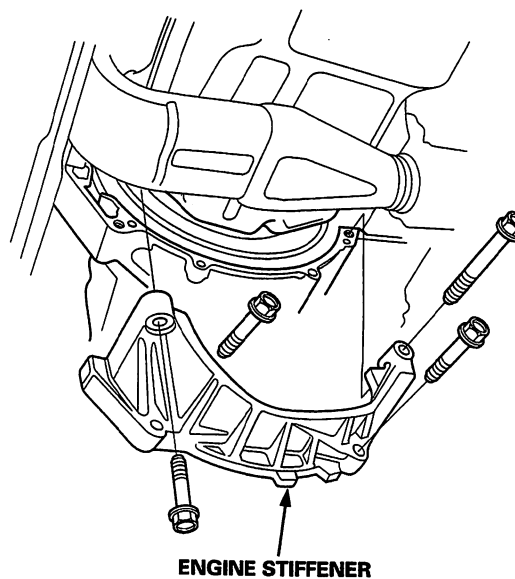
19. Remove the driveshafts from the intermediate shaft and differential (see section 16). Coat all the precision finished surfaces with clean engine oil grease. Tie bags over the driveshaft ends.



20. Remove the intermediate shaft. Coat all the precision finished surfaces with clean engine oil grease. Tie bags over the shaft end.

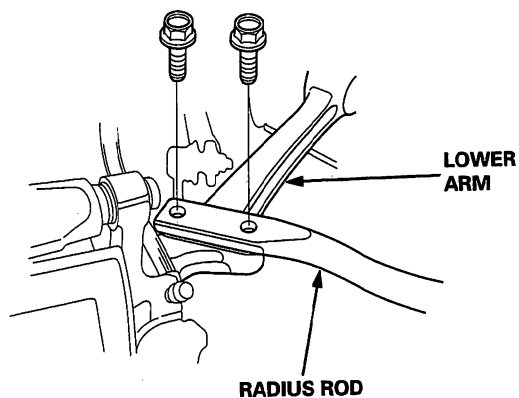


21. Remove the engine stiffener.

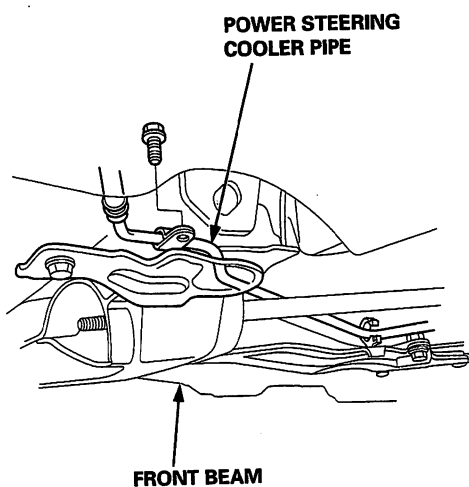




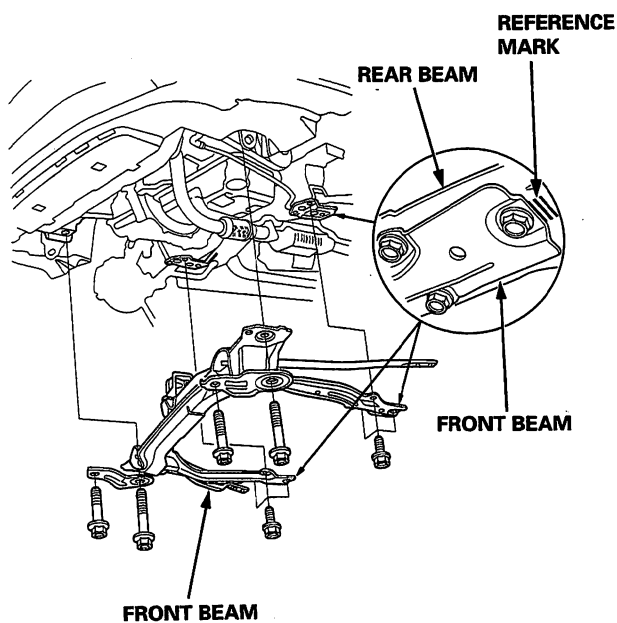
22. Remove the both radius rods mounting bolts from the lower arm.



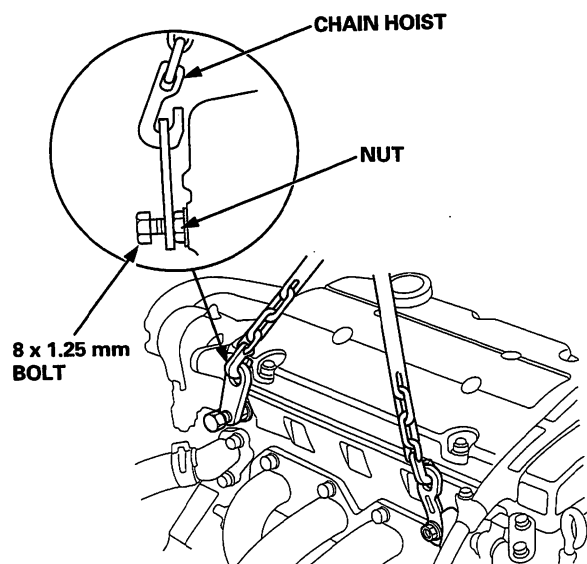
23. Remove the power steering cooler pipe from the front beam.



24. Mark 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.

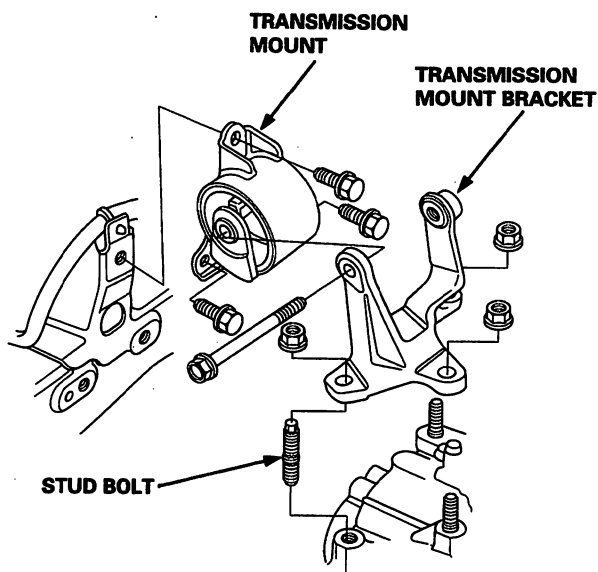


(cont'd)

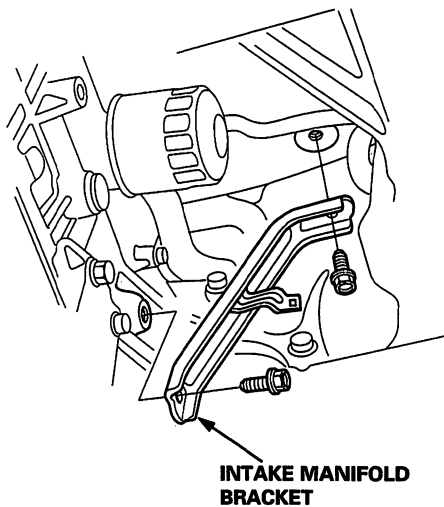
Transmission Assembly

Removal (cont'd)

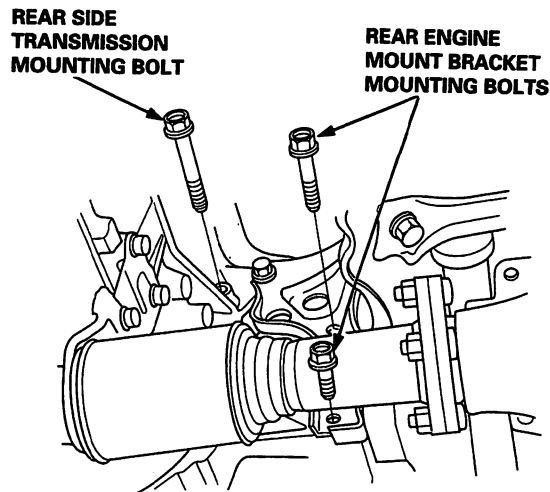
26. Place a floor jack under the transmission, and raise the transmission just enough to take weight off of the mounts.
27. Remove the transmission mount bracket and transmission mount rubber.



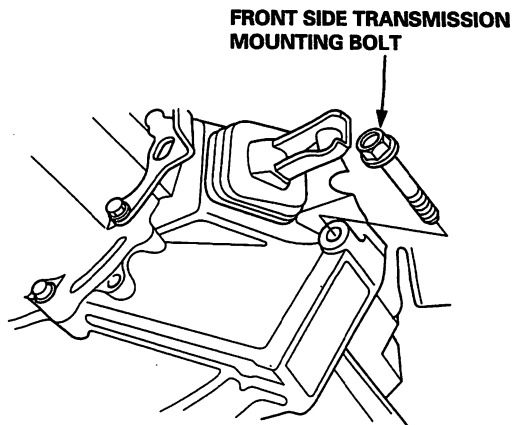
28. Remove the transmission mount stud bolt on the transmission housing.
29. Remove the intake manifold bracket.



30. Remove the two rear engine mount bracket mounting bolts.

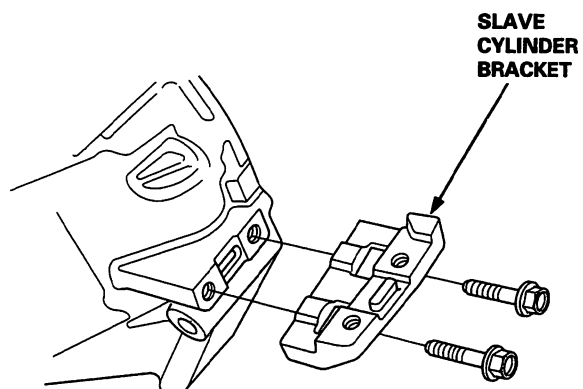


31. Remove the rear side transmission mounting bolt.
32. Remove the front side transmission mounting bolt.

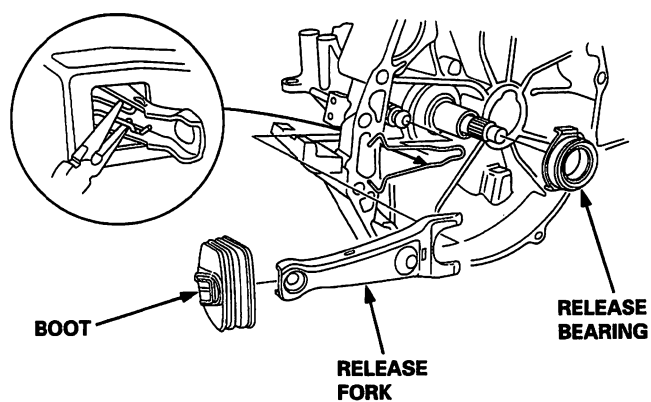




33. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack. Take care not to bend the clutch line.
34. Remove the slave cylinder bracket from the transmission.




35. Remove the boot, the release fork, and the release bearing from the transmission.



Transmission Assembly

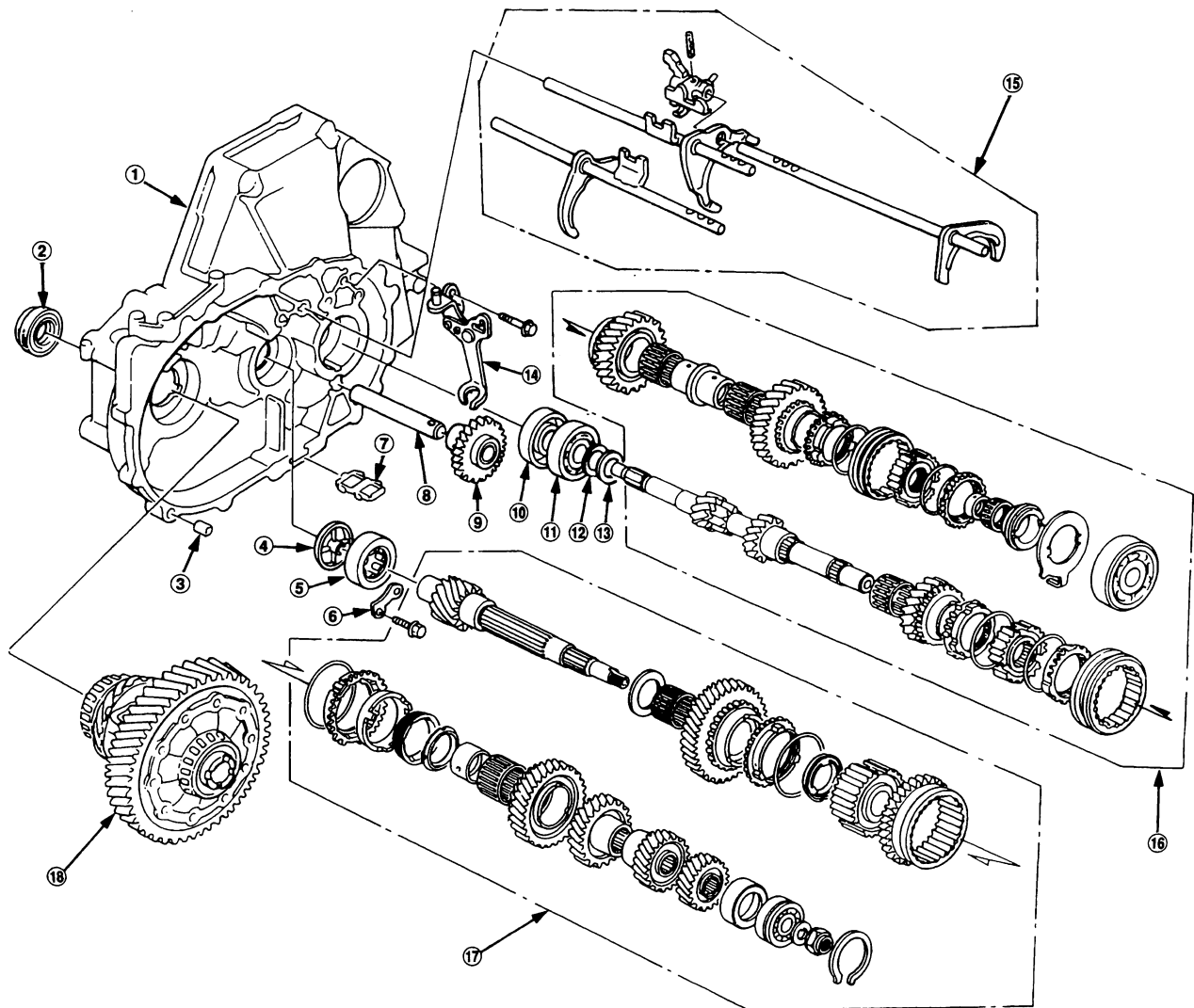
Index

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:

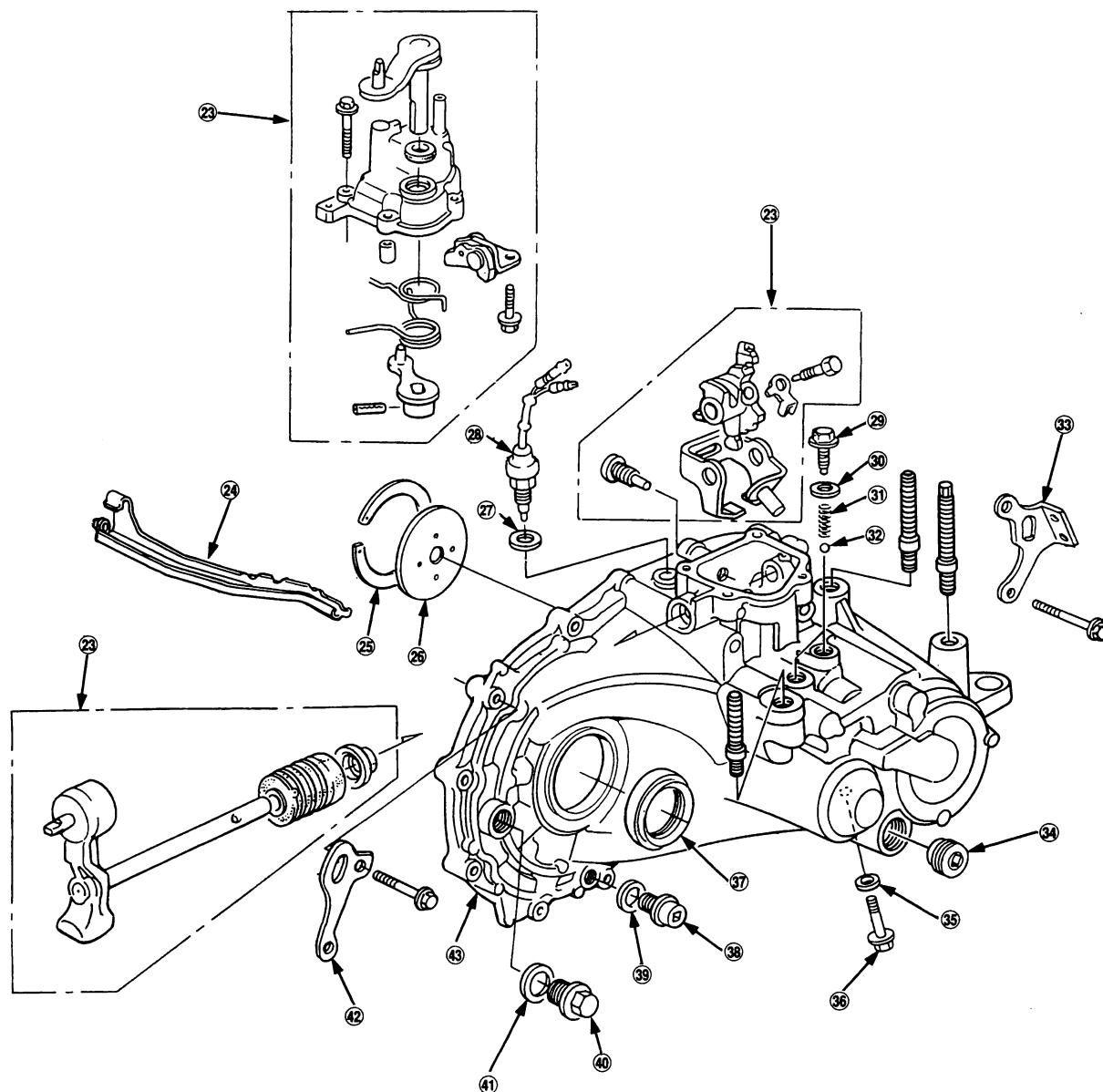
- This transmission uses no gaskets between the major housings; use liquid gasket (P/N 08C70 – K0234M) (see page 13-70, 113).
- Always clean the magnet ⑦ whenever the transmission housing is disassembled.
- Inspect all the bearings for wear and operation.



- 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
 - Index, page 13-74, 75
- ⑰ COUNTERSHAFT ASSEMBLY
 - Index, page 13-81, 87
- ⑱ DIFFERENTIAL ASSEMBLY
 - Index, page 13-99



- 23 **SHIFT ARM ASSEMBLY**
• Index, page 13-68
- 24 **OIL GUTTER PLATE**
- 25 **78 mm SHIM**
• Selection, 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**
- 37 **SHAFT BOLT**
- 38 **OIL SEAL Replace.**

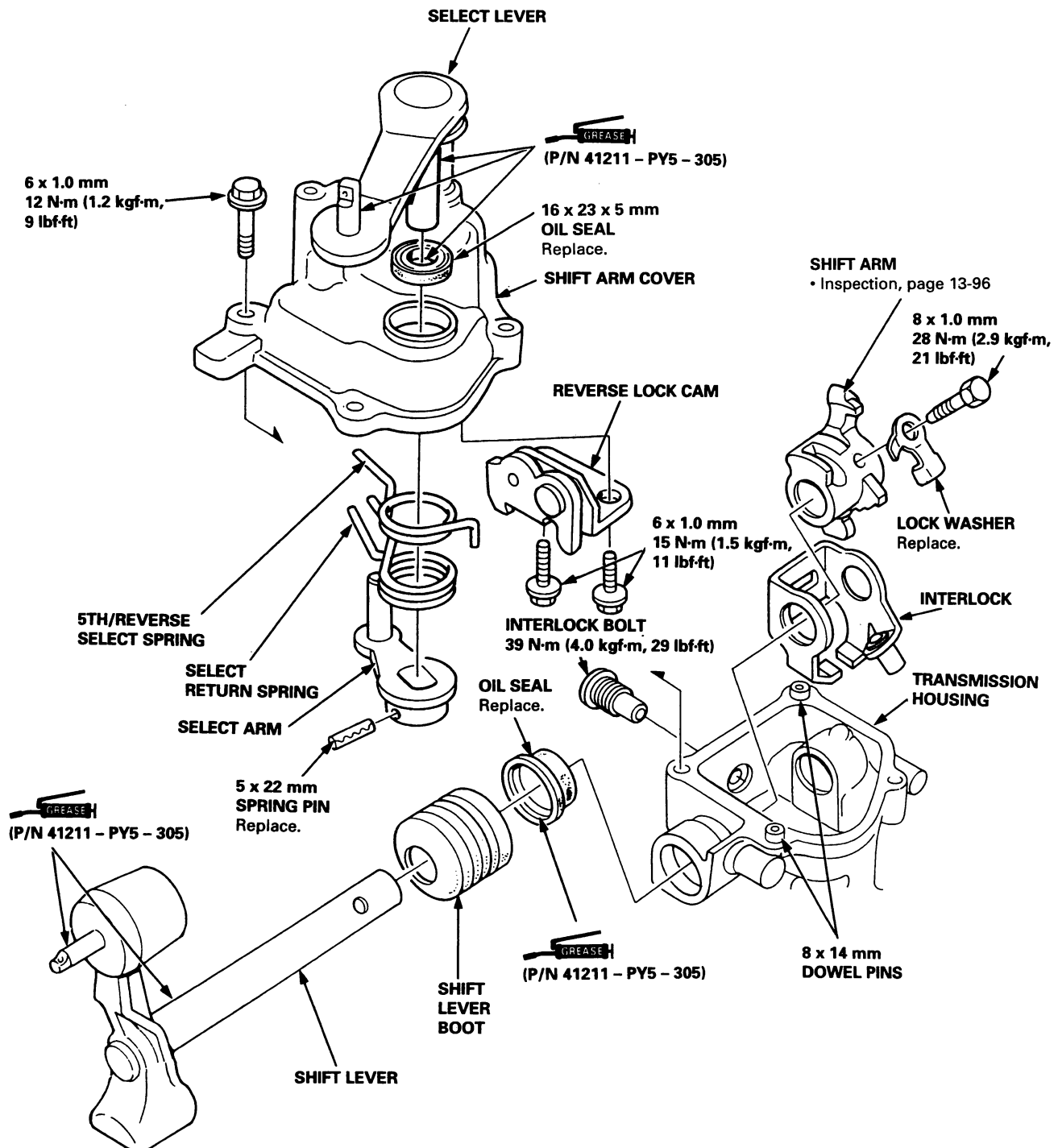
- 39 **DRAIN PLUG**
- 40 **WASHER Replace.**
- 41 **FILLER PLUG**
- 42 **WASHER Replace.**
- 43 **TRANSMISSION HANGER B**
- 44 **TRANSMISSION HOUSING**

Shift Arm Assembly

Index

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/N 41211 - PY5 - 305).



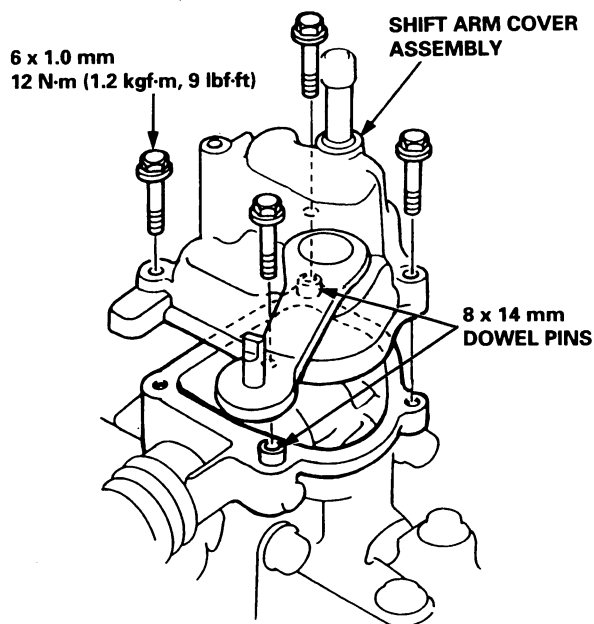


Disassembly/Reassembly

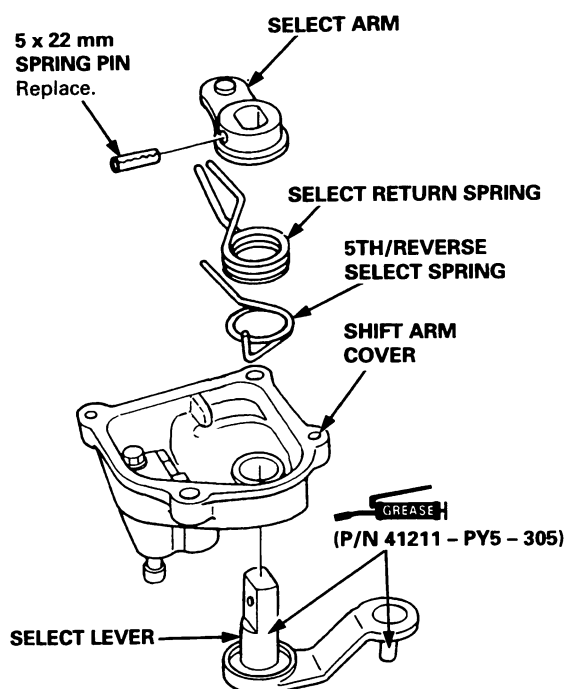
NOTE:

- During reassembly, grease all sliding parts.
- Use only HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305).

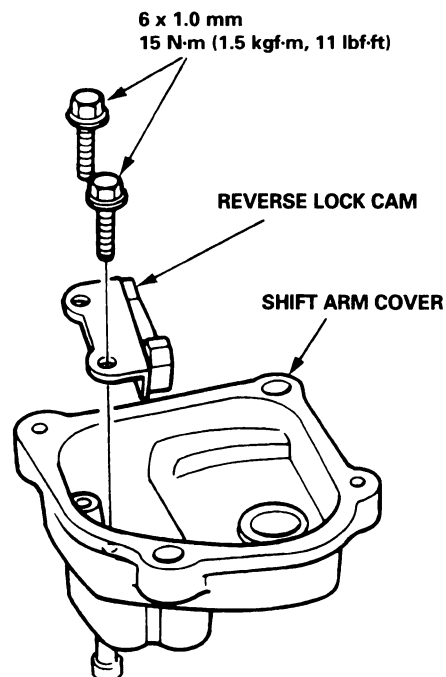
1. Remove the shift arm cover assembly.



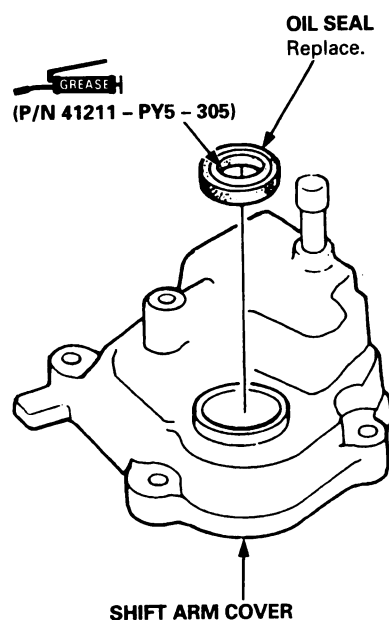
2. Remove the spring pin, then remove the select lever, select arm and springs.



3. Remove the reverse lock cam.



4. Remove the oil seal.



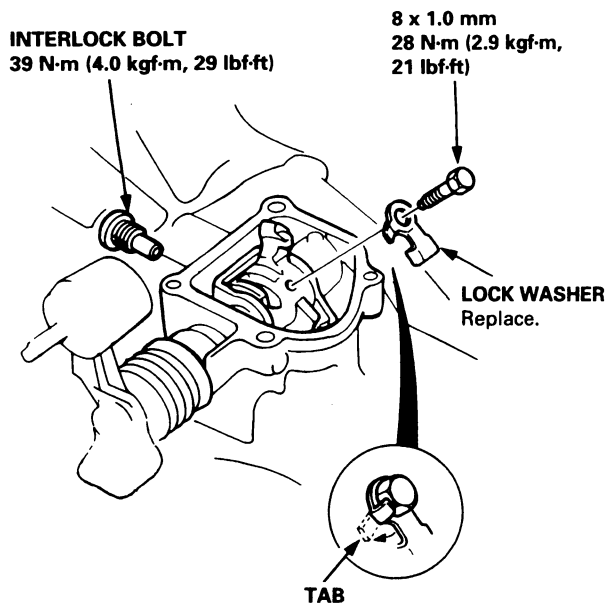
(cont'd)

Shift Arm Assembly

Disassembly/Reassembly (cont'd)

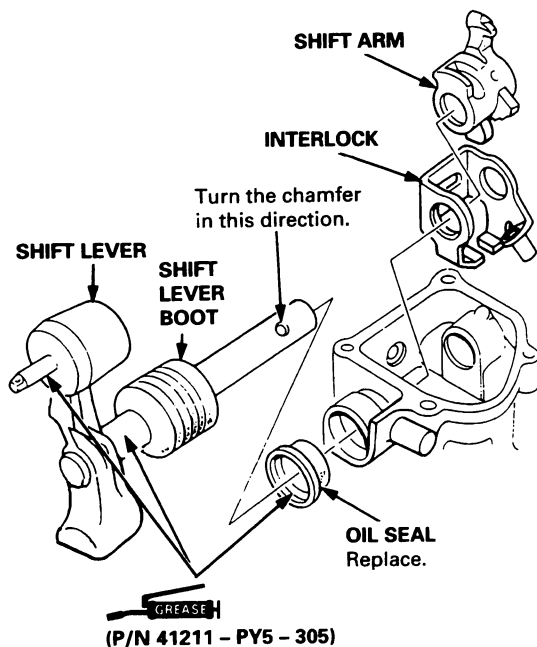
5. Rise the tab of the lock washer, then remove the bolt.
6. Remove the interlock bolt.

NOTE: Apply liquid gasket (P/N 08C70 – K0234M) to the threads before reassembly.



7. Remove the shift lever, shift arm, and interlock.

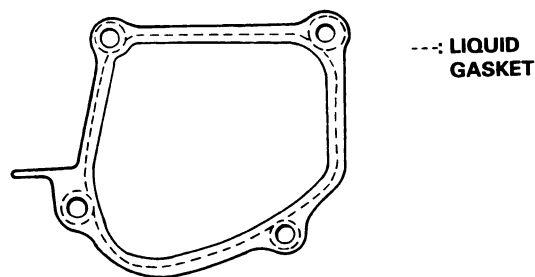
NOTE: Turn the shift lever boot so the hole is facing down.



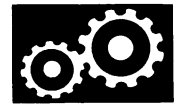
8. Install the shift arm assembly in the reverse order of removal.

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.



Transmission Assembly

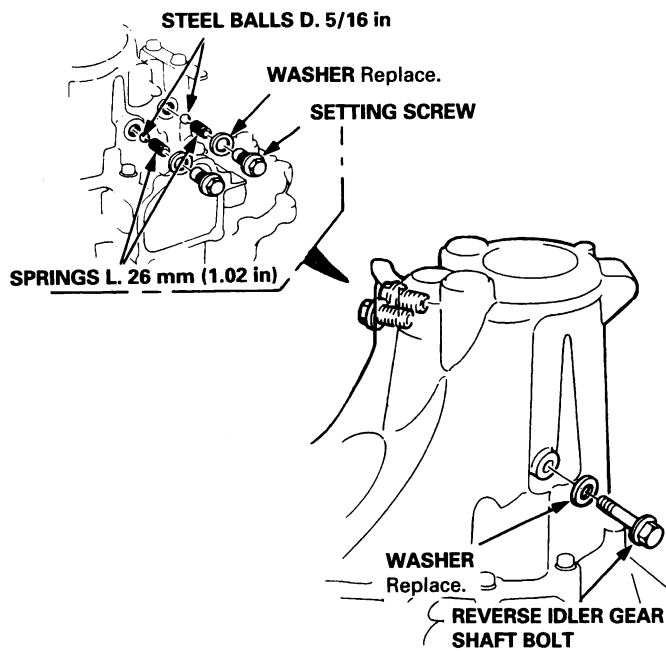


Disassembly

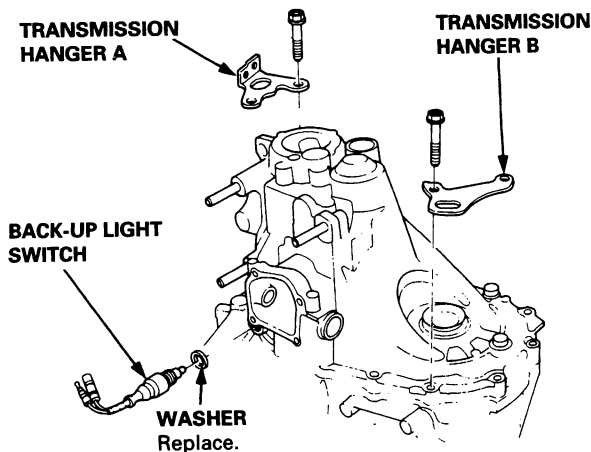
NOTE:

- 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.

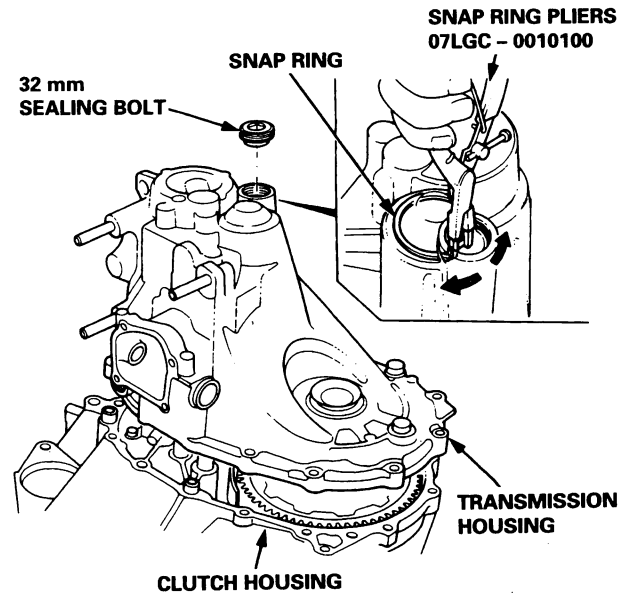
1. Remove the shift arm cover assembly (see page 13-69).
2. Remove the reverse idler gear shaft bolt.
3. Remove the setting screws, then remove the washers, springs, and steel balls.



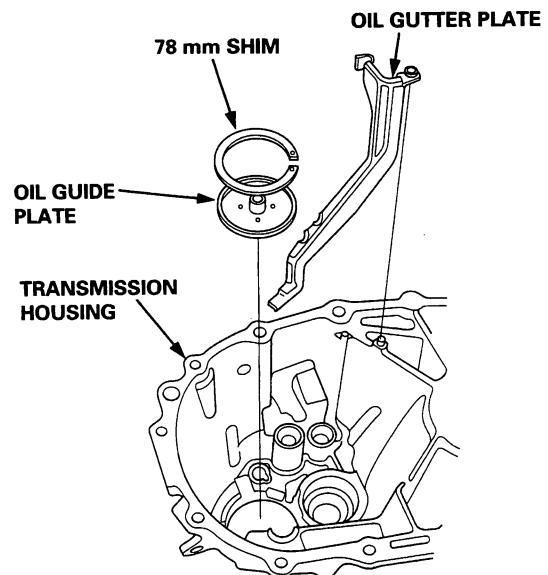
4. Remove the back-up light switch.
5. Remove the 10 mm bolts and 8 mm bolts in a criss-cross pattern in several steps.



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.

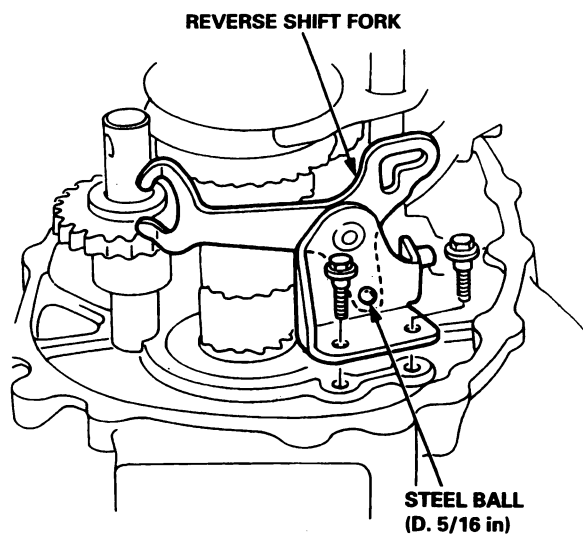


(cont'd)

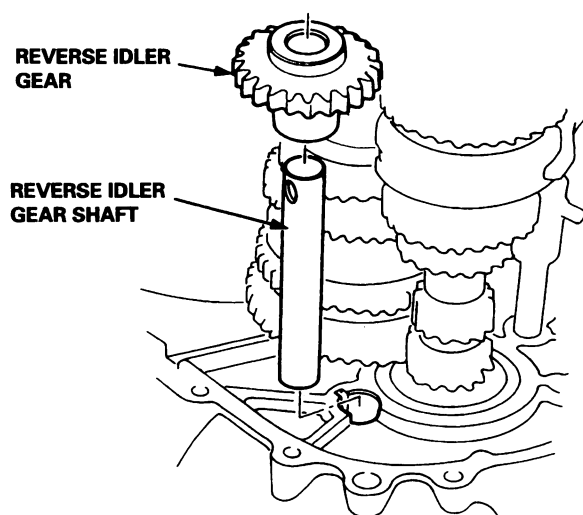
Transmission Assembly

Disassembly (cont'd)

10. Remove the reverse shift fork. Be careful not to loose the steel ball.

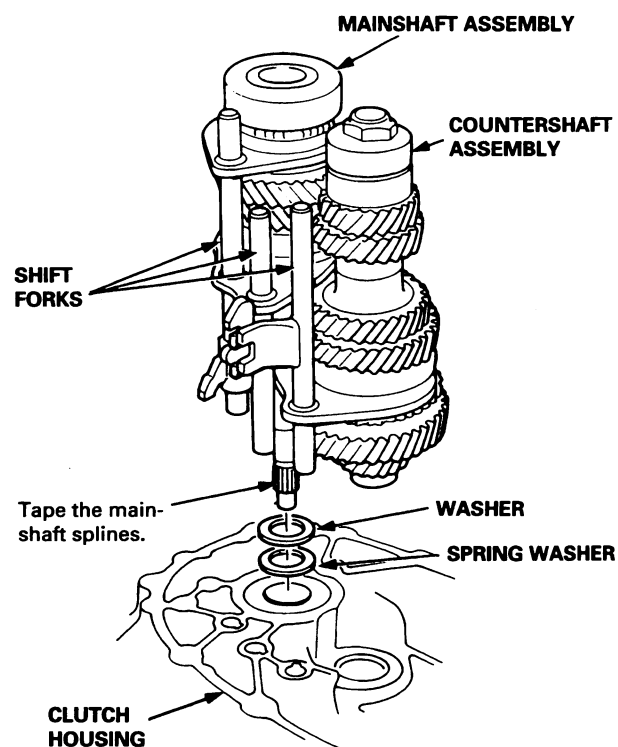


11. Remove the reverse idler gear shaft and the reverse idler gear.

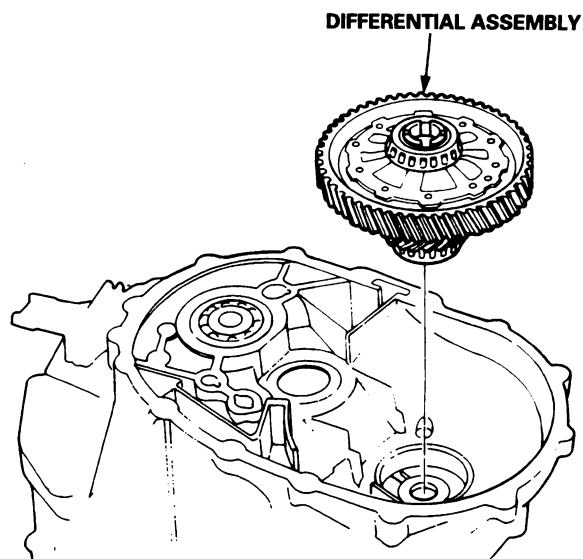


12. Remove the mainshaft and countershaft assemblies with the shift forks from the clutch housing.

NOTE: Before removing the mainshaft and countershaft assemblies, tape the mainshaft spline to protect it.



13. Remove the differential assembly.

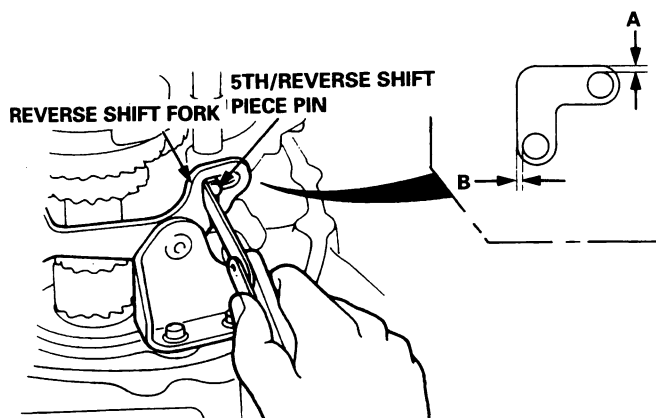




Clearance Inspection

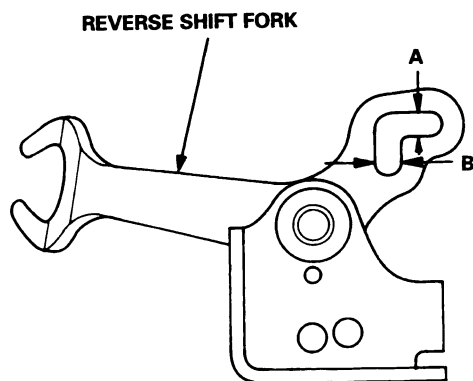
1. Measure the clearances between the reverse shift fork and 5th/reverse shift piece pin.
 - If the clearances are more than the service limit, go to step 2.
 - If the clearances are within the service limit, go to step 3.

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.

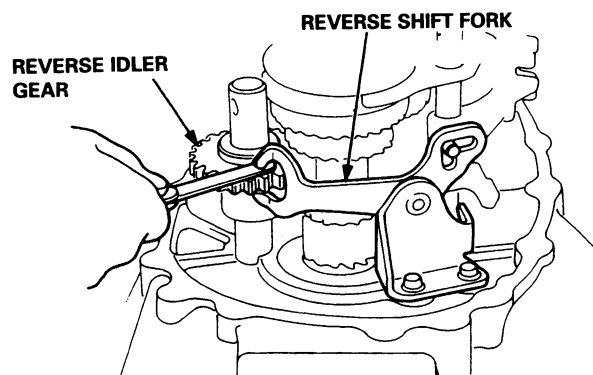
Standard: A: 7.05 – 7.25 mm (0.278 – 0.285 in)
 B: 7.4 – 7.7 mm (0.29 – 0.30 in)



3. Measure the clearance between the reverse idler gear and reverse shift fork.

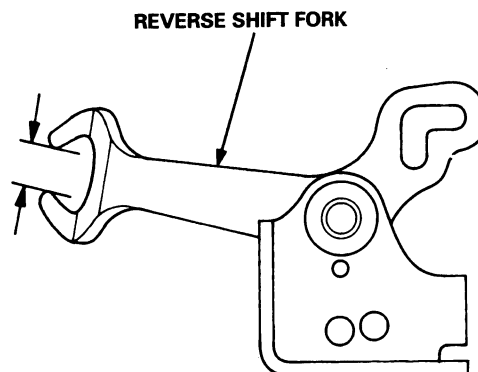
If the clearance is more than the service limit, go to step 4.

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)



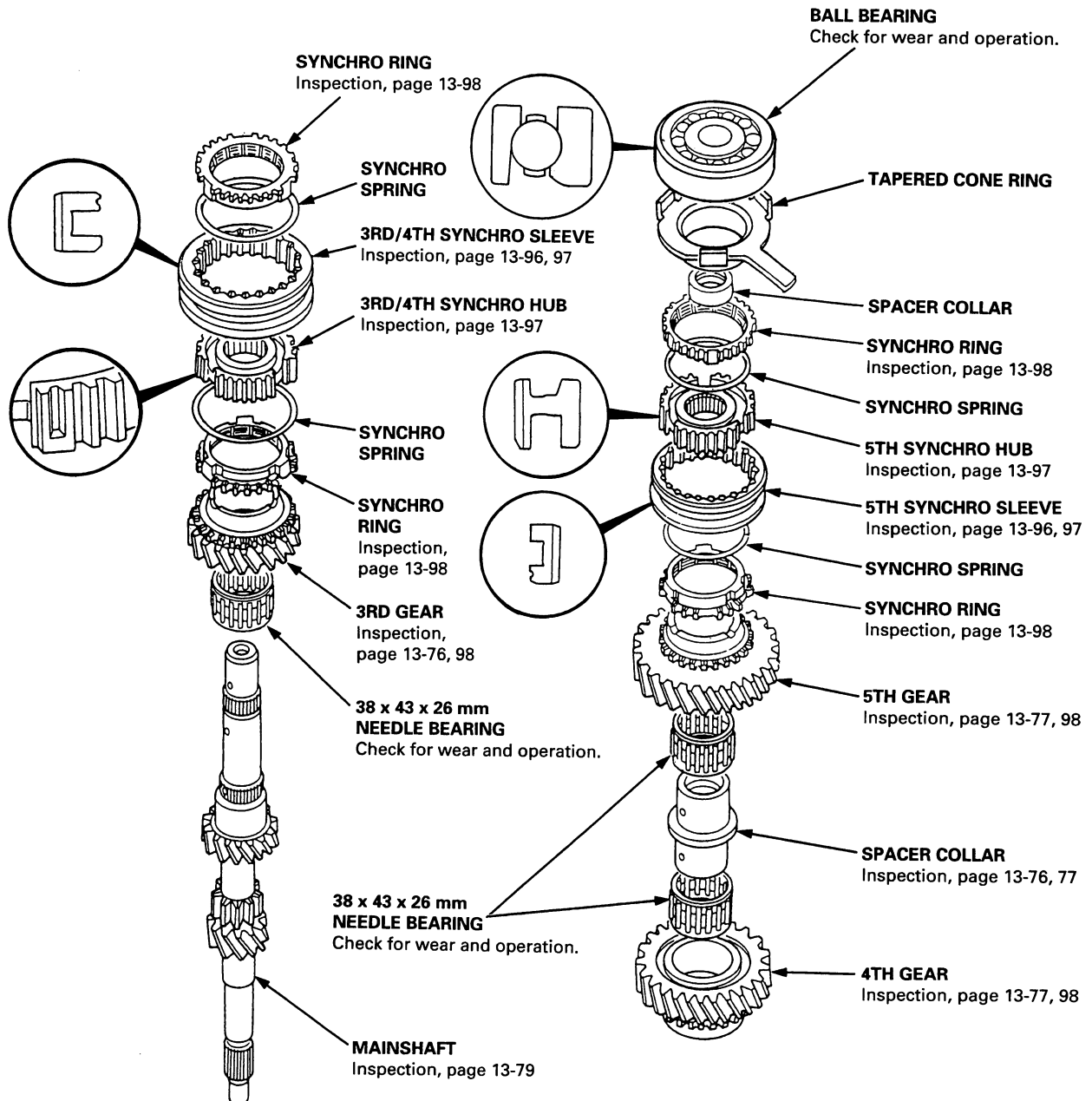
Mainshaft Assembly

Index

NOTE: The 3rd/4th, and 5th synchro hubs, and the ball bearing are installed with a press.

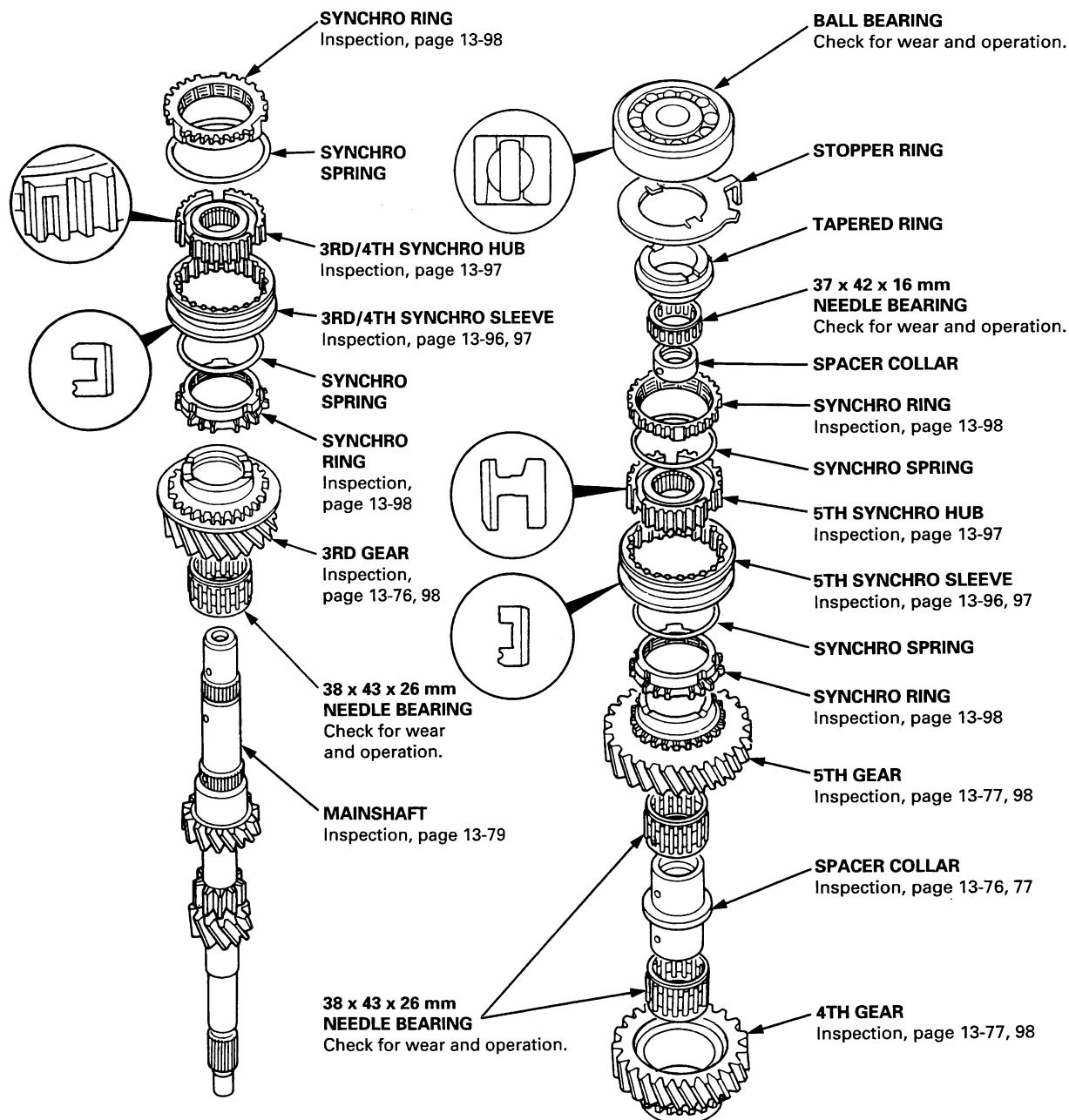
 Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.

U2J4, U2G5 Transmissions:





U2Q7 Transmission:



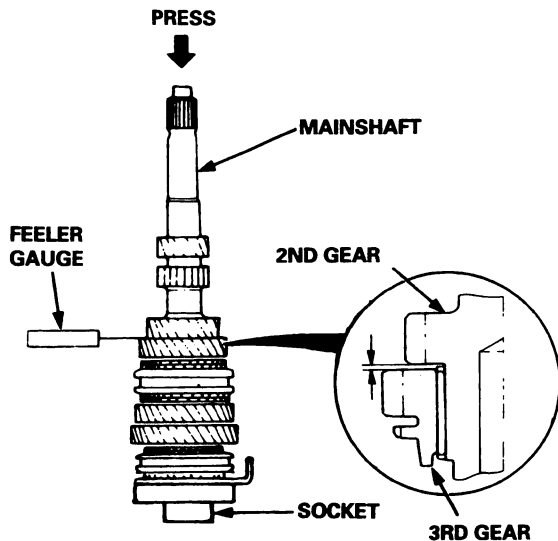
Mainshaft Assembly

Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

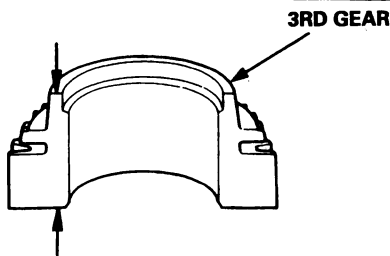
1. Support the bearing inner race with a socket, and push down on the mainshaft.
2. Measure the clearance between 2nd and 3rd gears with a feeler gauge.
 - If the clearance is more than the service limit, go to step 3.
 - If the clearance is within the service limit, go to step 4.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.30 mm (0.012 in)



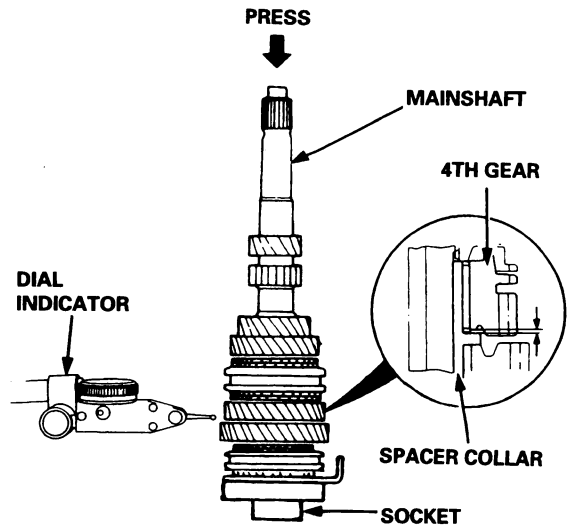
3. Measure the thickness of 3rd gear.
 - If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
 - If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

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)



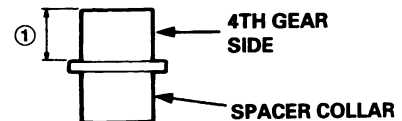
4. Measure the clearance between 4th gear and the spacer collar with a dial indicator. If the clearance is more than the service limit, go to step 5.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.30 mm (0.012 in)



5. 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.

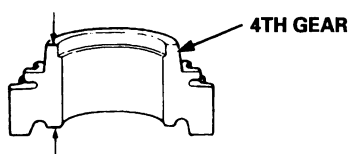
Standard: 26.03 – 26.08 mm (1.025 – 1.027 in)
Service Limit: 26.01 mm (1.024 in)





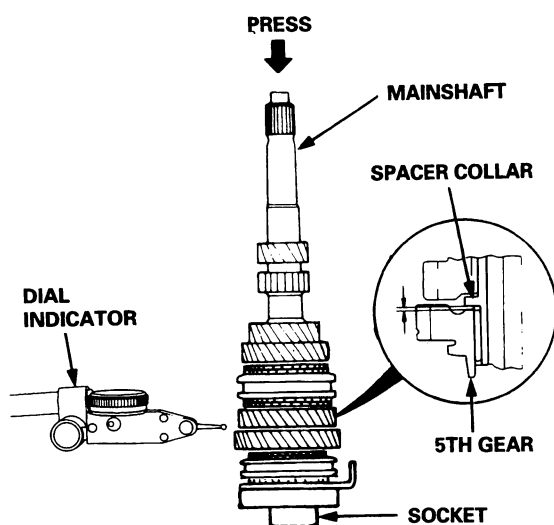
6. Measure the thickness of 4th gear.
- If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
 - If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

Transmission Type	U2Q7	U2J4, U2G5
Standard	31.42 – 31.47 mm (1.237 – 1.239 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)



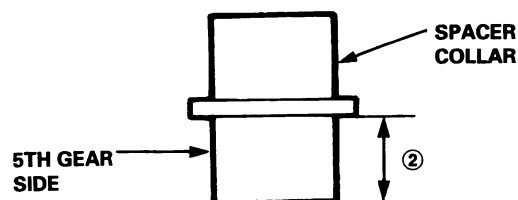
7. Measure the clearance between 5th gear and the spacer collar with a dial indicator.
- If the clearance is more than the service limit, go to step 8.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.30 mm (0.012 in)



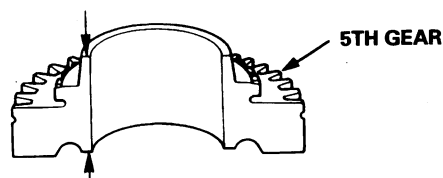
8. Measure distance ② on the spacer collar.
- If distance ② is less than the service limit, replace the spacer collar with a new one.
 - If distance ② is within the service limit, go to step 9.

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)



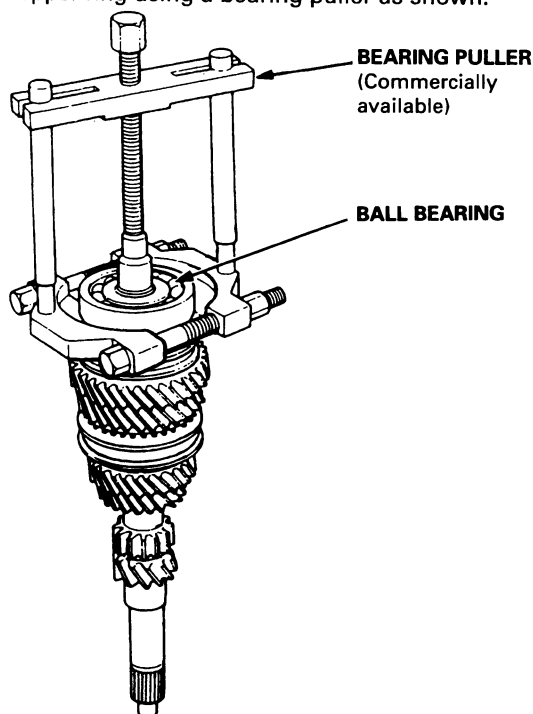
Mainshaft Assembly

Disassembly

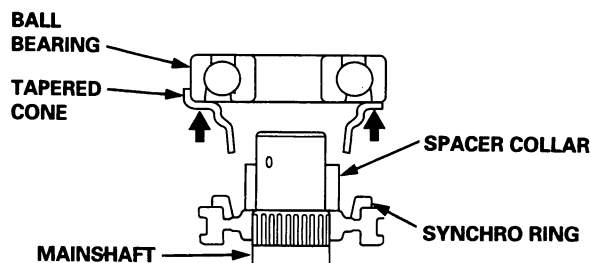
⚠ CAUTION

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.

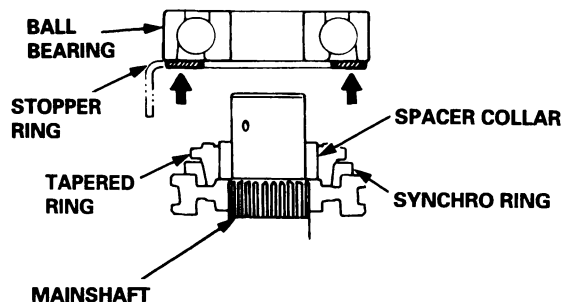
1. Remove the ball bearing and tapered cone ring or stopper ring using a bearing puller as shown.



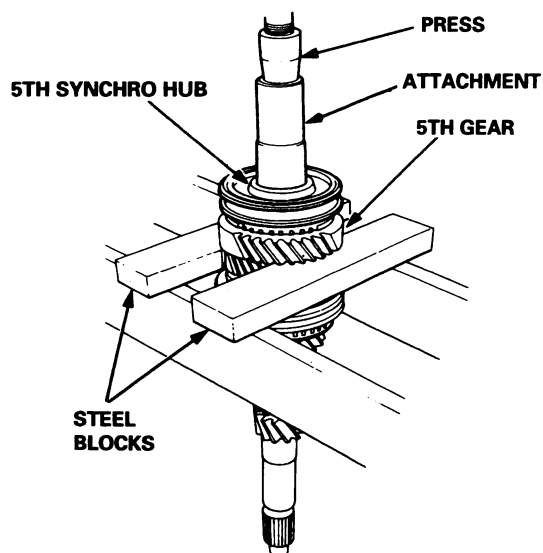
U2J4, U2G5 Transmissions:



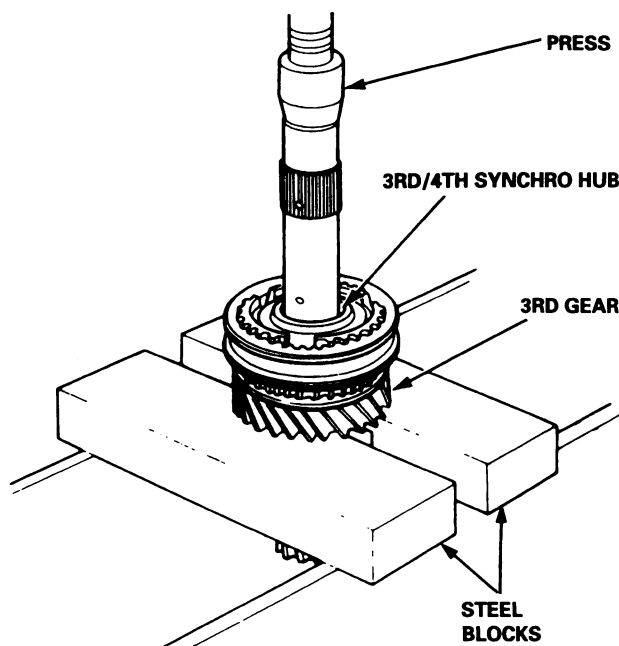
U2Q7 Transmission:



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.





Inspection

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)

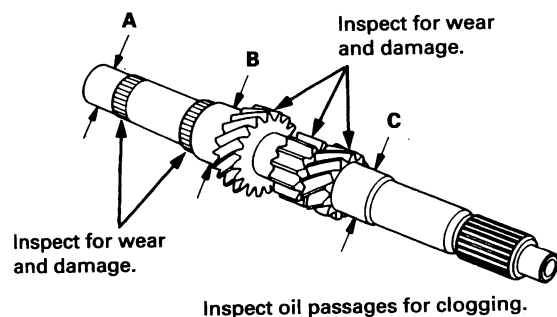
B (Needle bearing surface): 37.984 – 38.000 mm
(1.4954 – 1.4961 in)

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)

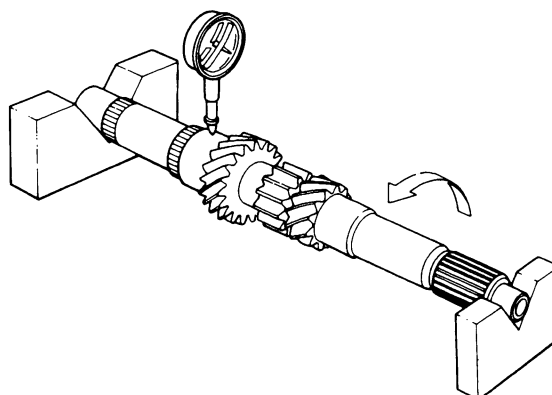


2. Inspect the runout by supporting both ends of the mainshaft. Rotate the mainshaft two complete revolutions when measuring the runout.

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)



Mainshaft Assembly

Reassembly

⚠ CAUTION

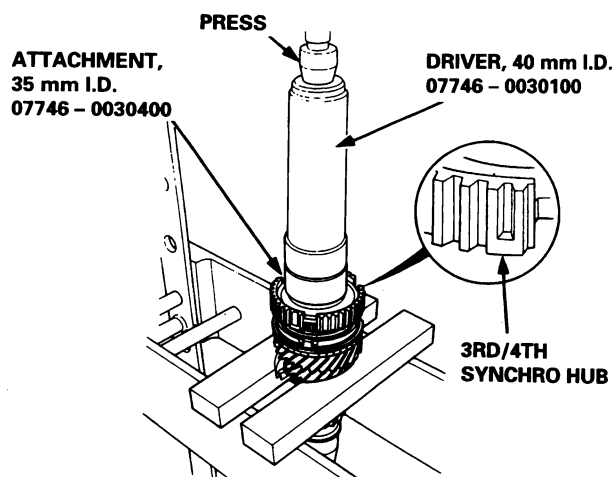
When installing the 3rd/4th and 5th synchro hubs, support the shaft on steel blocks, and install the synchro hubs using a press.

NOTE: Refer to page 13-74, 75 for reassembly sequence.

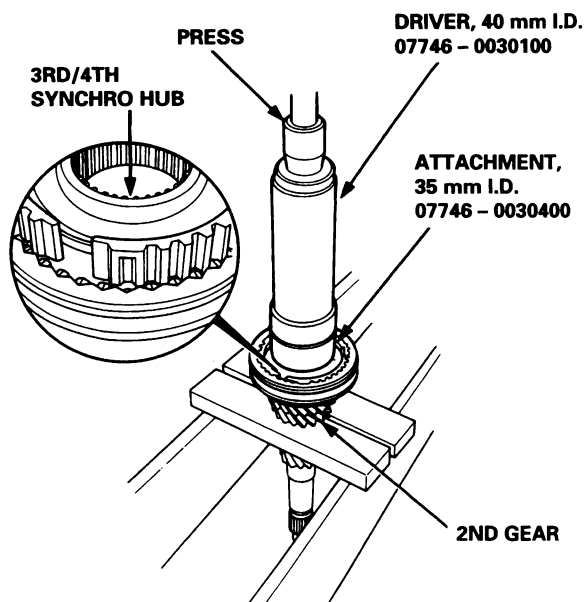
1. Support 2nd gear on steel blocks as shown, then install the 3rd/4th synchro hub using the special tools and a press as shown.

NOTE: After installing, inspect the operation of the 3rd/ 4th synchro hub set.

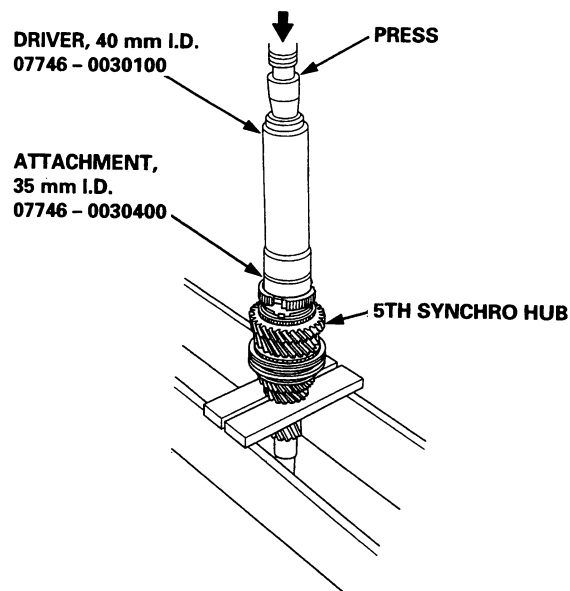
U2J4, U2G5 Transmissions:



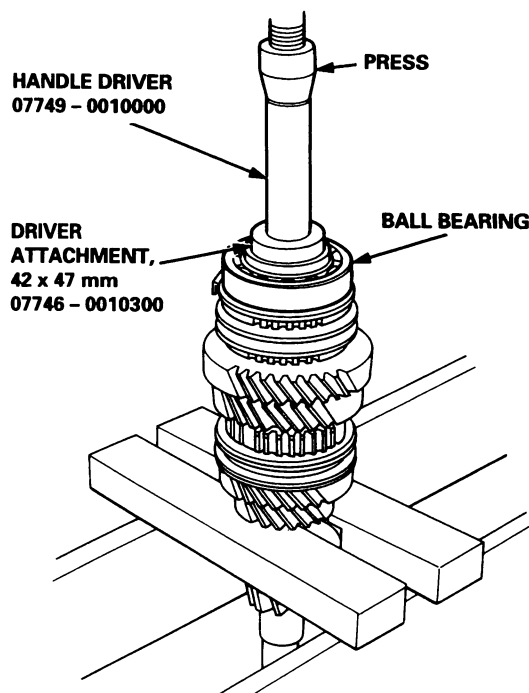
U2Q7 Transmission:



2. Install the 5th synchro hub using the special tools 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.



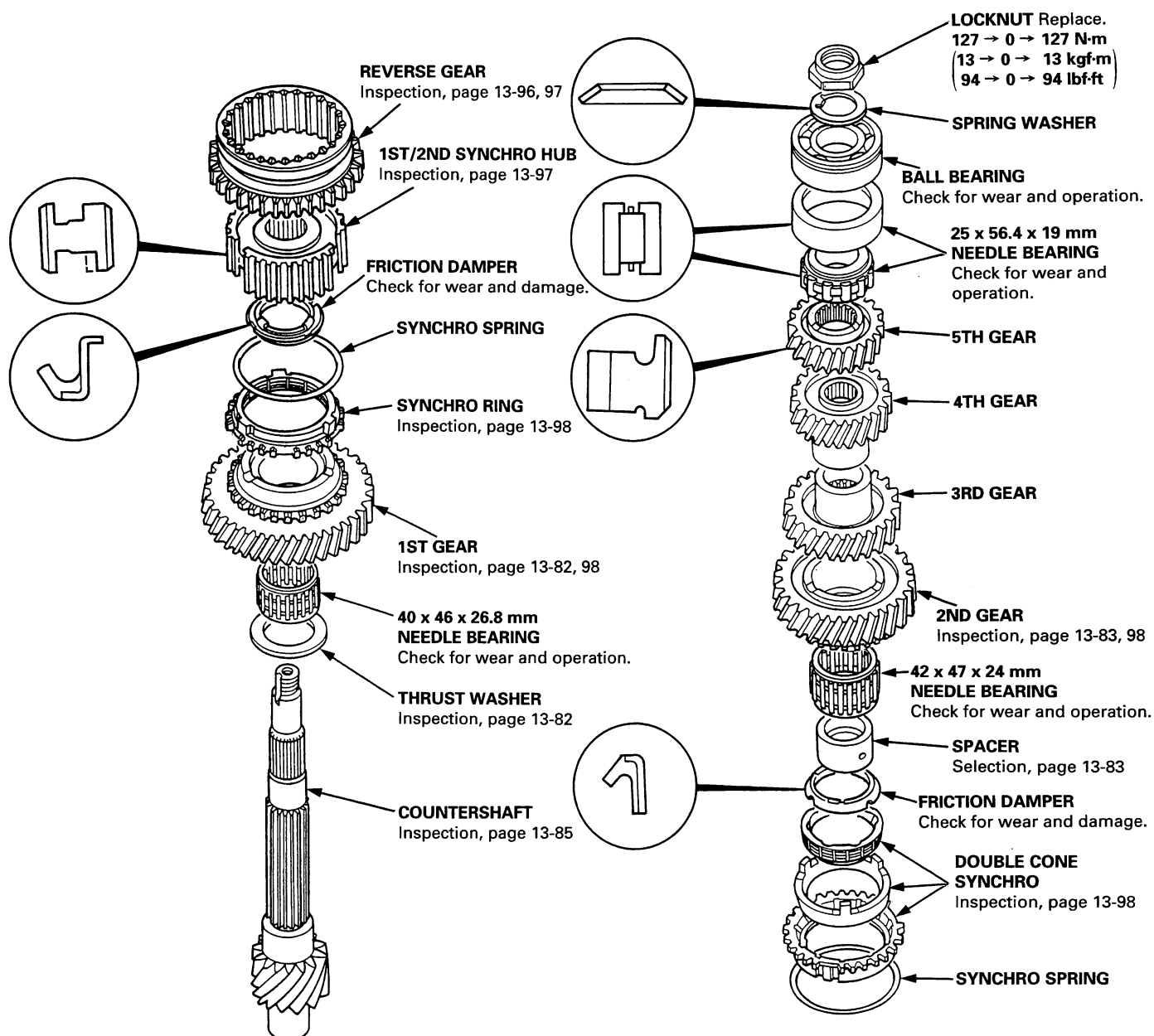
Countershaft Assembly — U2J4, U2G5 Transmissions



Index



Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact surfaces.



Countershaft Assembly — U2J4, U2G5 Transmissions

Clearance Inspection

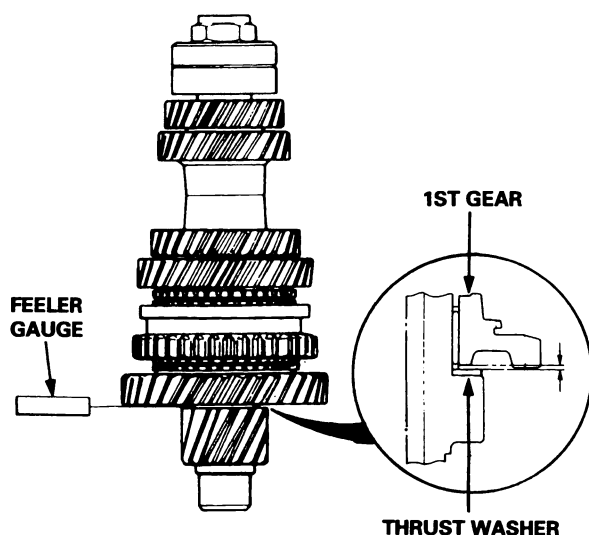
NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

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.

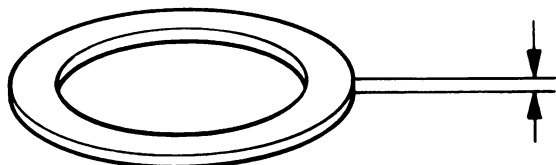
Standard: 0.06 – 0.23 mm (0.002 – 0.009 in)

Service Limit: 0.23 mm (0.009 in)



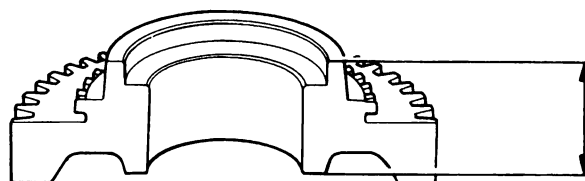
2. Measure the thickness of the thrust washer.
 - If the thickness is less than the standard, replace the thrust washer with a new one.
 - If the thickness is within the standard, go to step 3.

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.

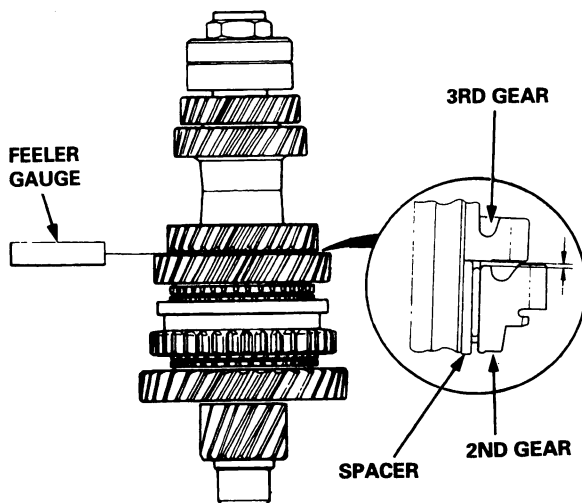
Standard: 32.95 – 33.00 mm (1.297 – 1.299 in)





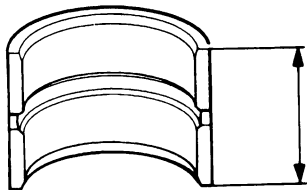
4. Measure the clearance between the 2nd gear and 3rd gear with a feeler gauge.
If the clearance is more than the service limit, go to step 5.

Standard: 0.10 – 0.15 mm (0.004 – 0.006 in)
Service Limit: 0.18 mm (0.007 in)



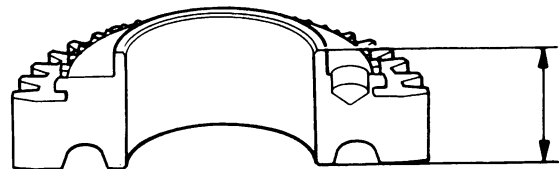
5. Measure the thickness of the spacer.
- If the thickness is less than the standard, replace the spacer with a new one.
 - If the thickness is within the standard, go to step 6.

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)



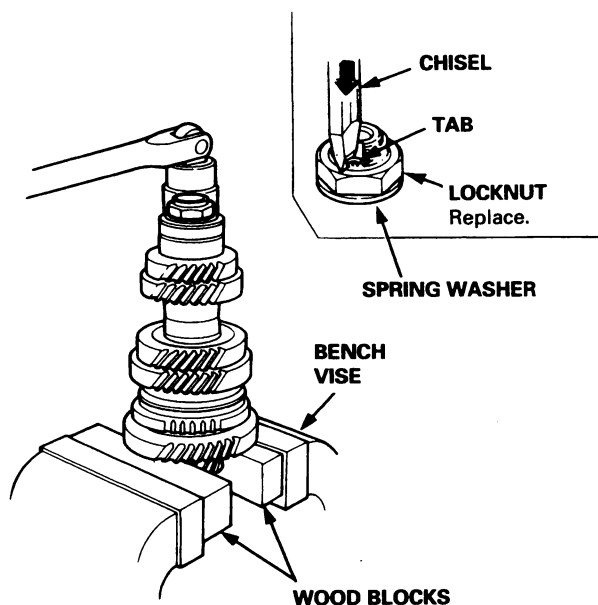
Countershaft Assembly — U2J4, U2G5 Transmissions

Disassembly

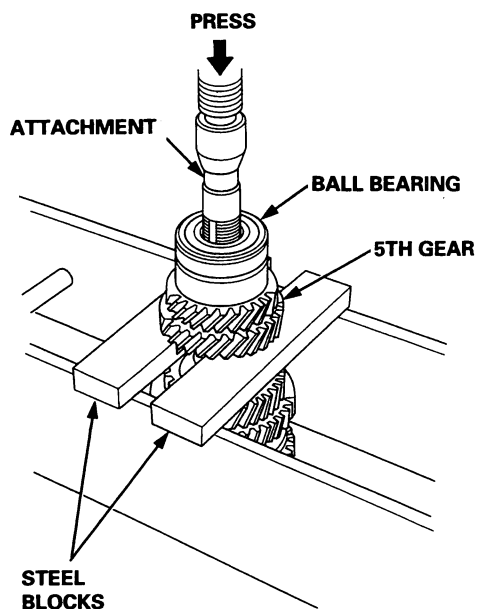
⚠ CAUTION

Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

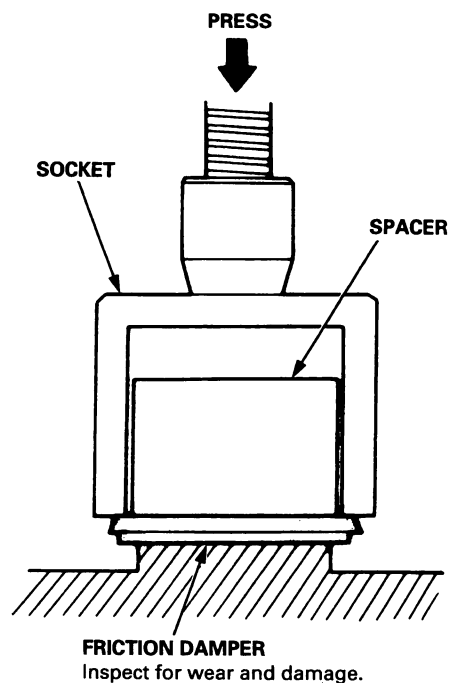
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.
2. Raise the locknut tab from the groove in the countershaft, then remove the locknut and the spring washer.



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.





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)

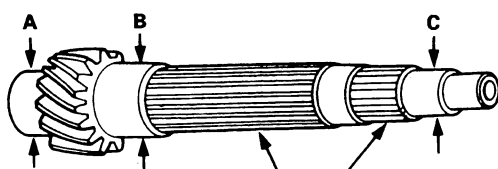
B: 39.984 – 40.000 mm
(1.5742 – 1.5748 in)

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)



Inspect for wear and damage.

2. Inspect for runout.

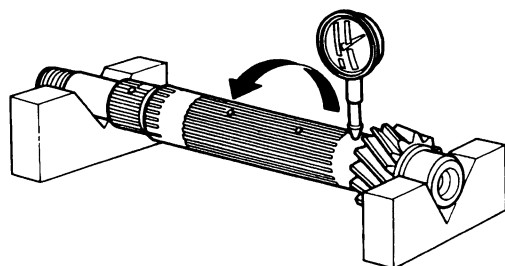
If the runout exceeds the service limit, replace the countershaft with a new one.

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.

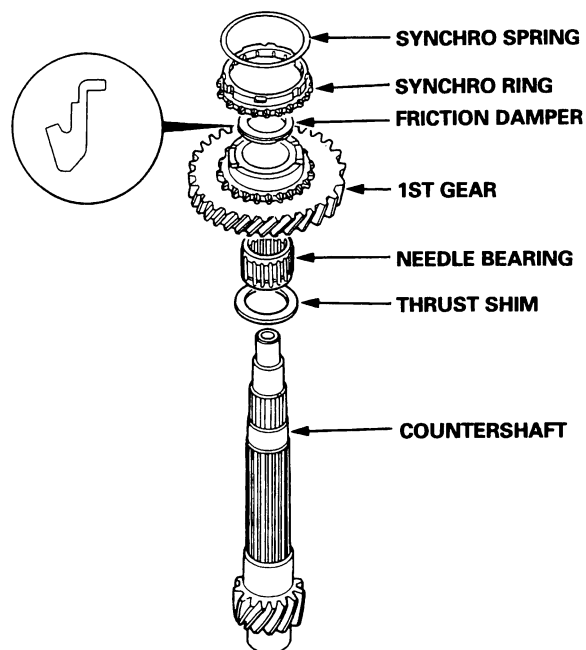


Reassembly

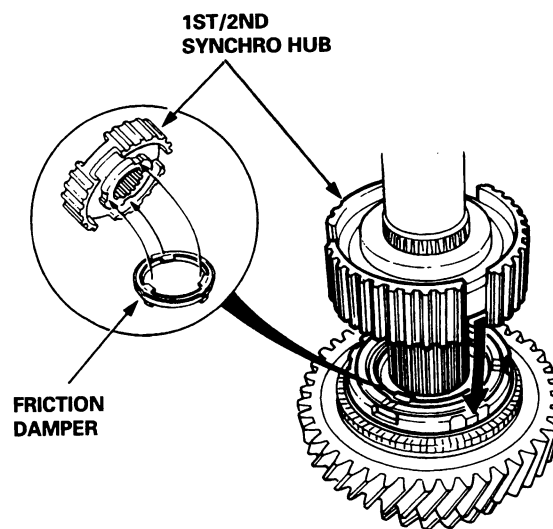
NOTE: Refer to page 13-81 for reassembly sequence.

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.

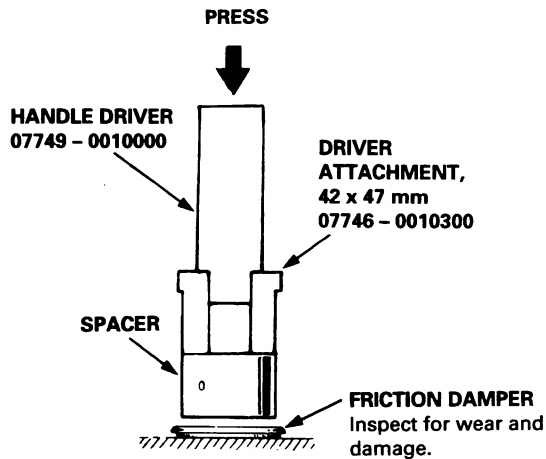


(cont'd)

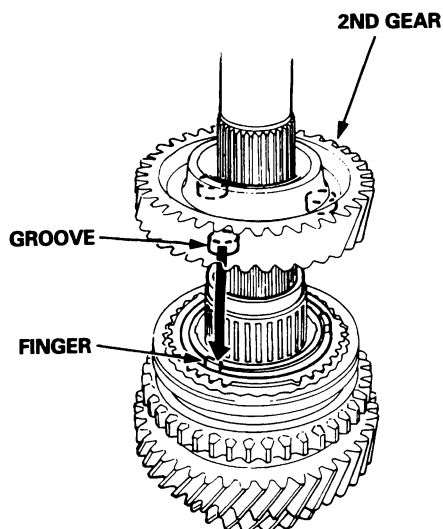
Countershaft Assembly — U2J4, U2G5 Transmissions

Reassembly (cont'd)

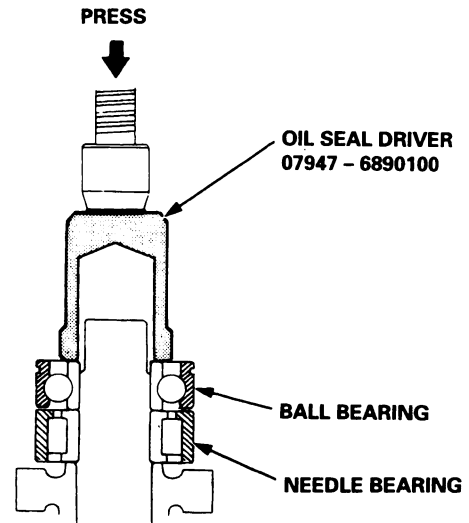
3. Install the friction damper on the spacer using the special tools and a press as shown.



4. Install the 2nd gear by aligning the synchro cone fingers with 2nd gear grooves.

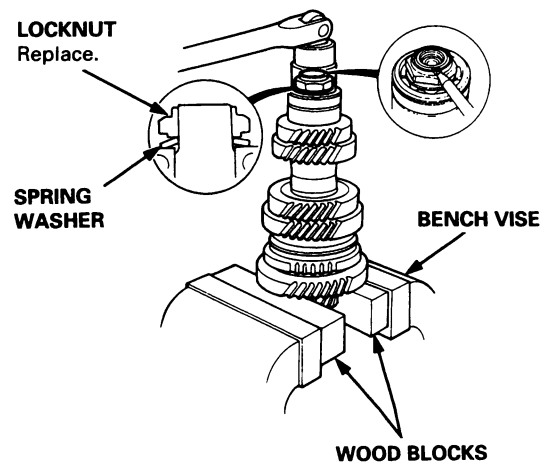


5. Install the needle bearing and the ball bearing using the special tool and a press as shown.

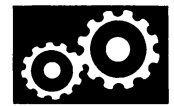


6. Securely clamp the countershaft assembly in a bench vise with wood blocks.
7. Install the spring washer.
8. Tighten the new locknut to the specified-value, then stake the locknut tab into the groove.

Torque: 127 → 0 → 127 N·m (13 → 0 → 13 kgf·m, 94 → 0 → 94 lbf·ft)




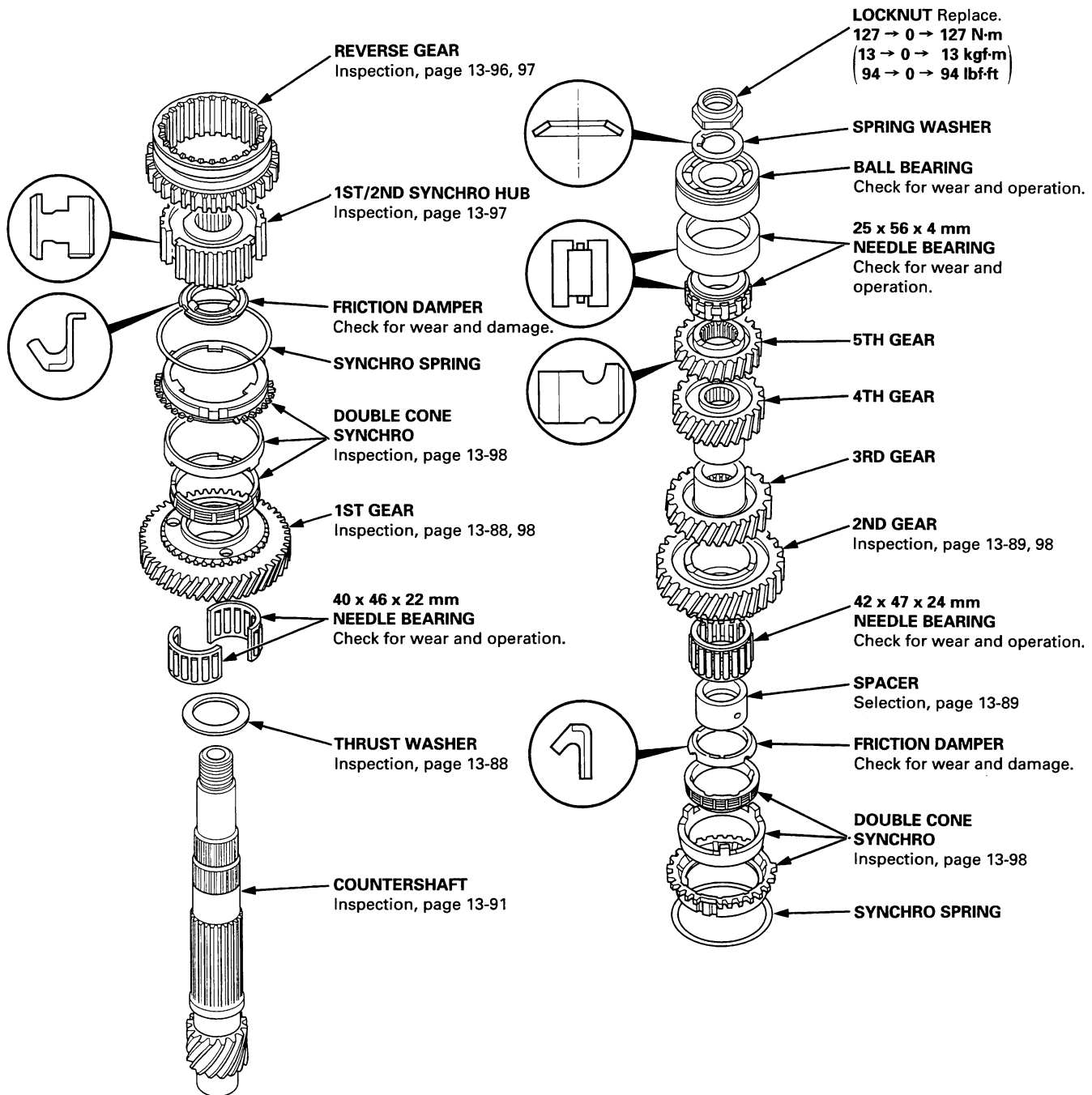
Countershaft Assembly — U2Q7 Transmission



Index

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.



Countershaft Assembly — U2Q7 Transmission

Clearance Inspection

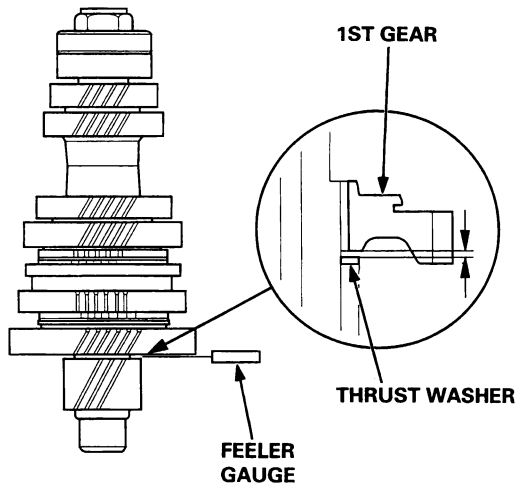
NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

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.

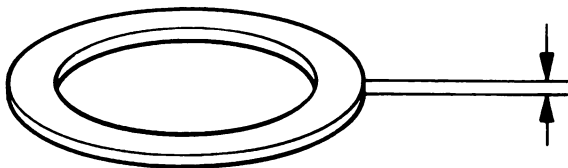
Standard: 0.06 – 0.18 mm (0.002 – 0.007 in)

Service Limit: 0.23 mm (0.009 in)



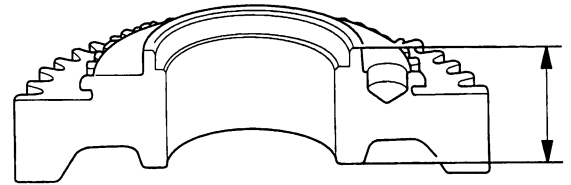
2. Measure the thickness of the thrust washer.
 - If the thickness is less than the standard, replace the thrust washer with a new one.
 - If the thickness is within the standard, go to step 3.

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 in)

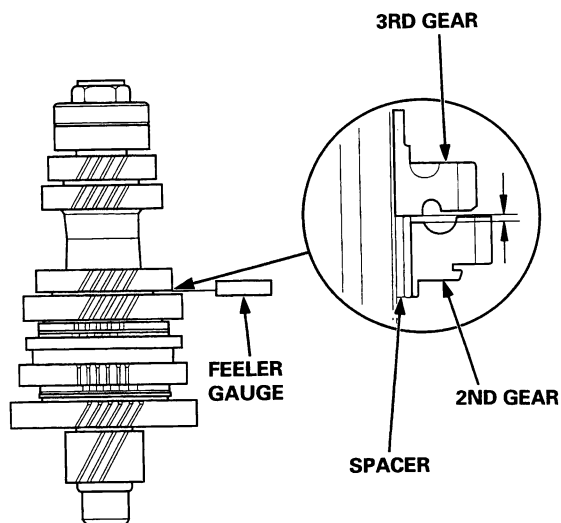




4. Measure the clearance between the 2nd gear and 3rd gear with a feeler gauge. If the clearance is more than the service limit, go to step 5.

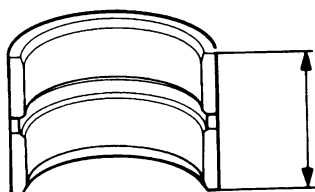
Standard: 0.10 – 0.15 mm (0.004 – 0.006 in)

Service Limit: 0.18 mm (0.007 in)



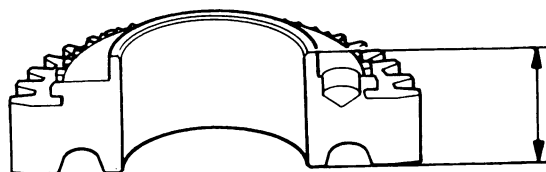
5. Measure the thickness of the spacer.
- If the thickness is less than the standard, replace the spacer with a new one.
 - If the thickness is within the standard, go to step 6.

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)



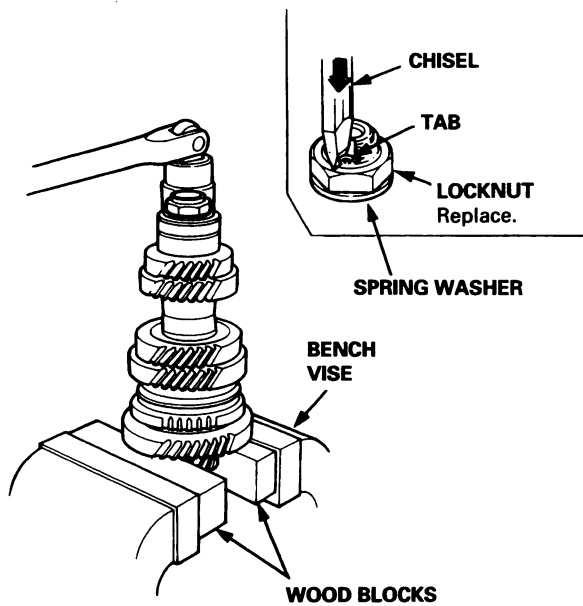
Countershaft Assembly — U2Q7 Transmission

Disassembly

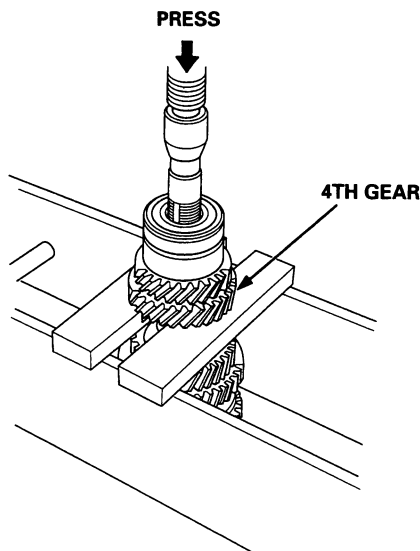
⚠ CAUTION

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.

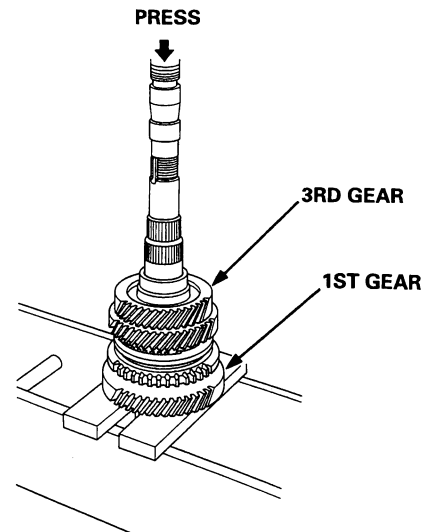
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.
2. Raise the locknut tab from the groove in the countershaft, then remove the locknut and the spring washer.



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.



Inspection

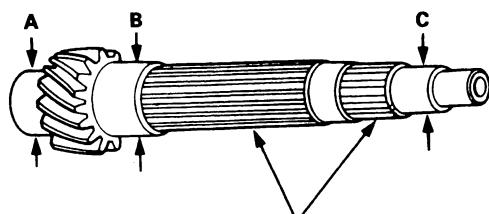
1. Inspect the gear surface and bearing surface for wear and damage, then measure the countershaft at points A, B, and C.
If any part of the countershaft is less than the service limit, replace it with a new one.

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)



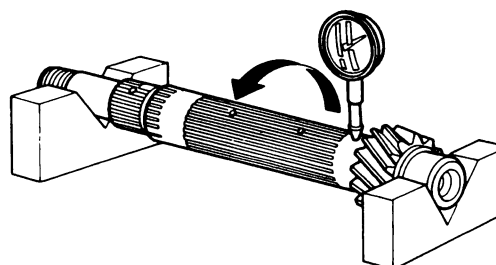
2. Inspect for runout.
If the runout exceeds the service limit, replace the countershaft with a new one.

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.



Countershaft Assembly — U2Q7 Transmission

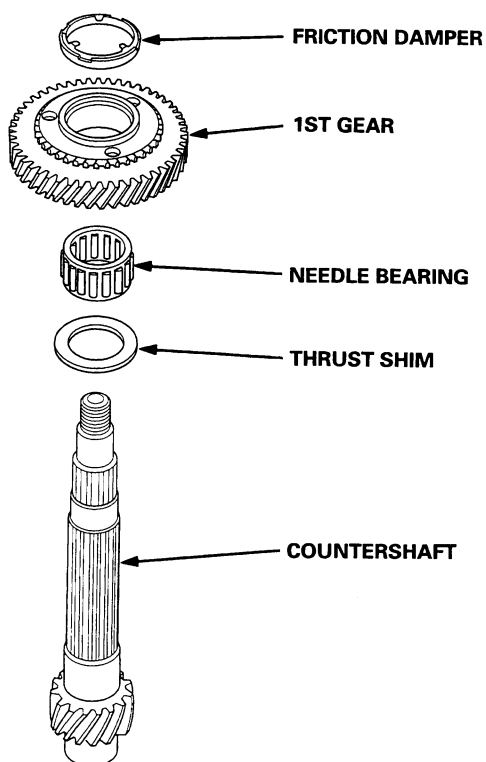
Reassembly

⚠ CAUTION

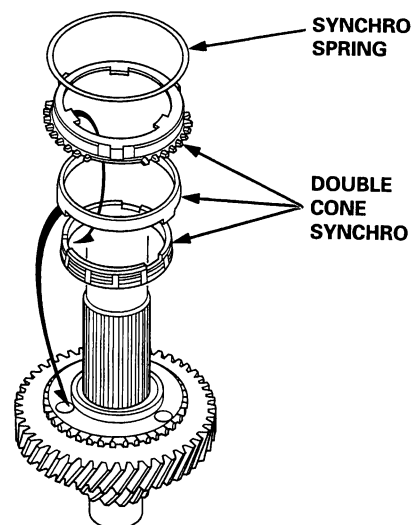
- Press 3rd and 4th gears on the countershaft without lubrication.
- When installing 3rd and 4th gears, support the shaft on steel blocks, and install the gears using a press.

NOTE: Refer to page 13-87 for reassembly sequence.

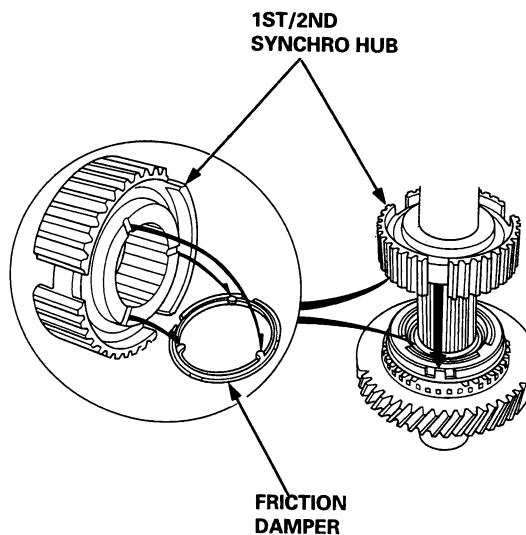
1. Install the thrust washer, needle bearing, 1st gear, and friction damper on the countershaft.



2. Install the double cone synchro and synchro spring as shown.

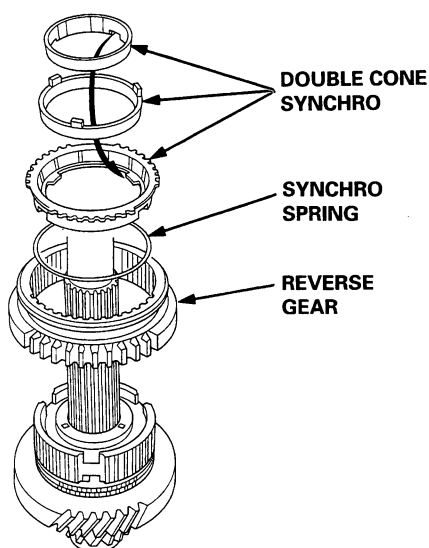


3. Install the 1st/2nd synchro hub as shown.

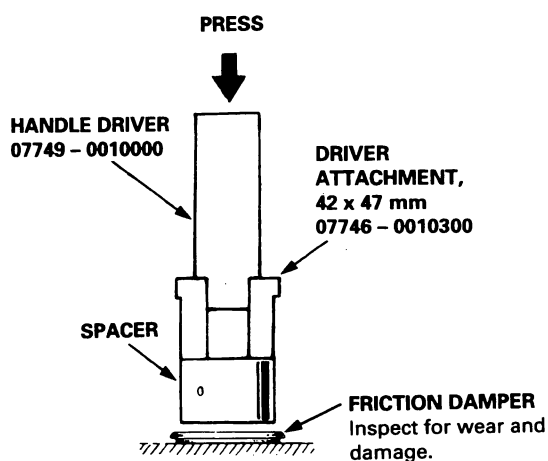




4. Install the reverse gear, synchro spring, and double cone synchro as shown.

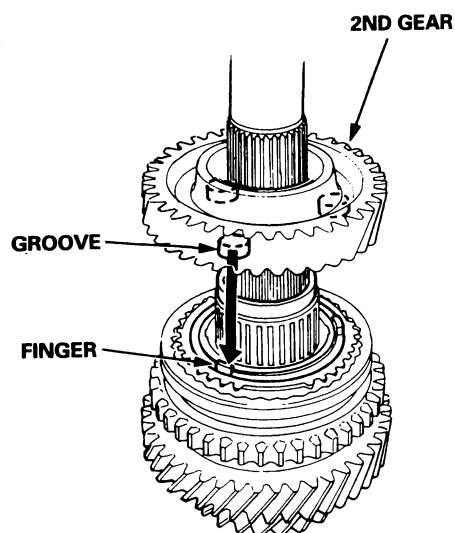


5. Install the friction damper on the spacer using the special tools and press as shown.

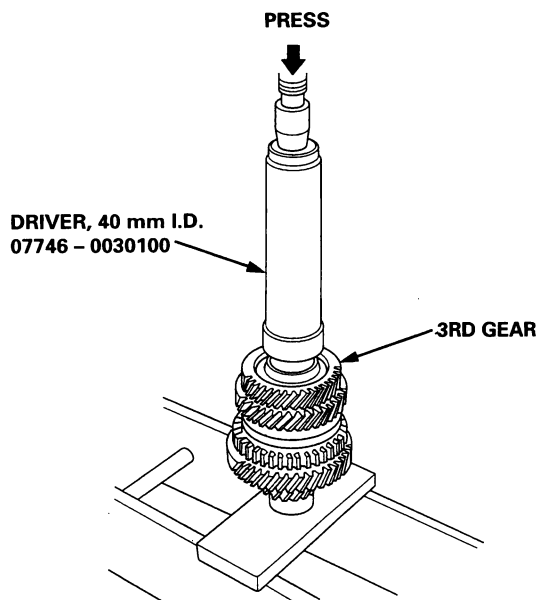


6. Install the distance collar and needle bearing.

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.

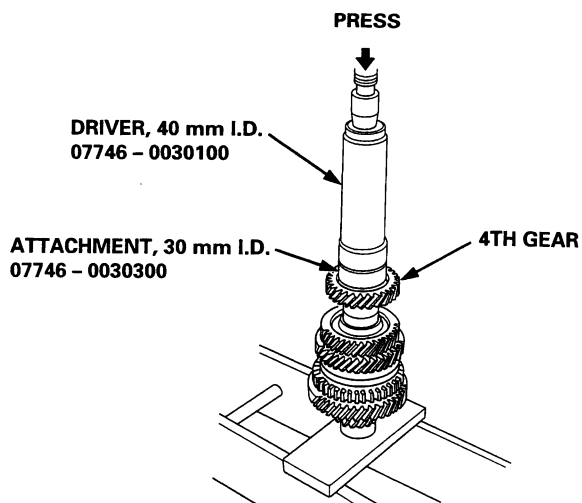


(cont'd)

Countershaft Assembly — U2Q7 Transmission

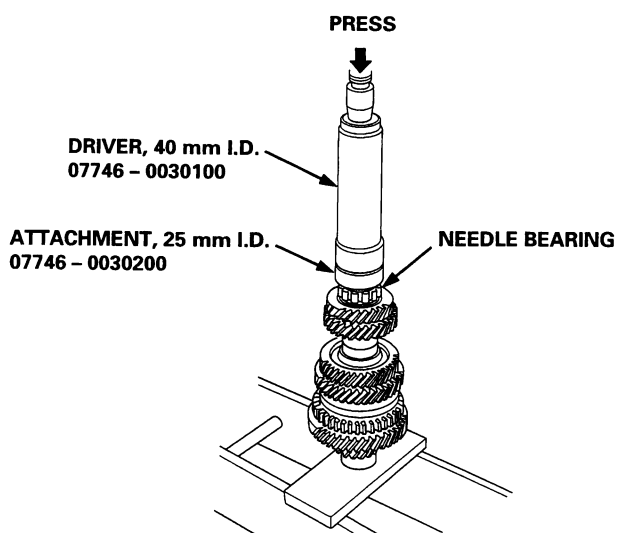
Reassembly (cont'd)

9. Support the countershaft on a steel block, and install 4th gear using the special tools and a press, as shown.



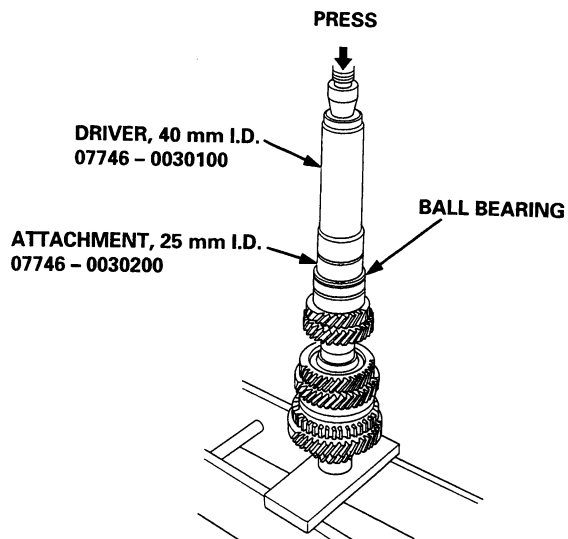
10. Install the 5th gear.

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.

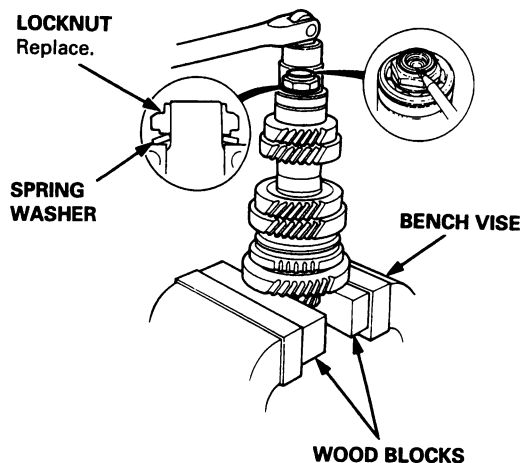


14. Securely clamp the countershaft assembly in a bench vise with wood blocks.

15. Install the spring washer.

16. Tighten the new locknut to the specified-value, then stake the locknut tab into the groove.


**Torque: 127 → 0 → 127 N·m (13 → 0 → 13 kgf·m,
94 → 0 → 94 lbf·ft)**

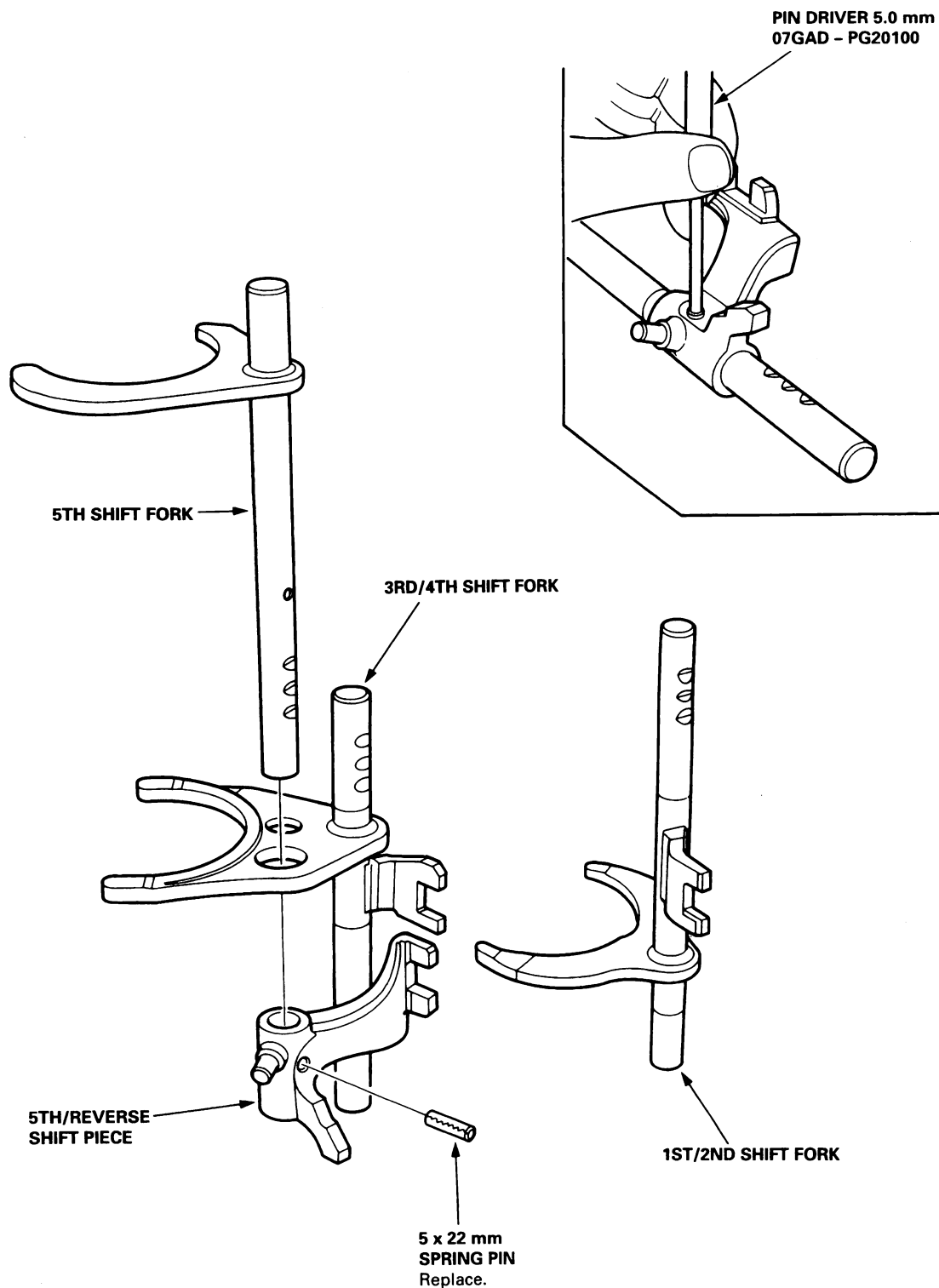


Shift Fork Assembly



Disassembly/Reassembly

 Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



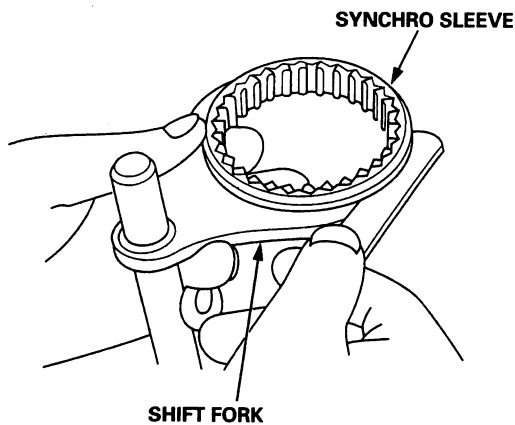
Shift Fork Assembly

Clearance Inspection

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.

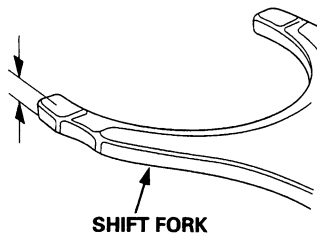
Standard: 0.35 – 0.65 mm (0.014 – 0.026 in)
Service Limit: 1.00 mm (0.039 in)



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.

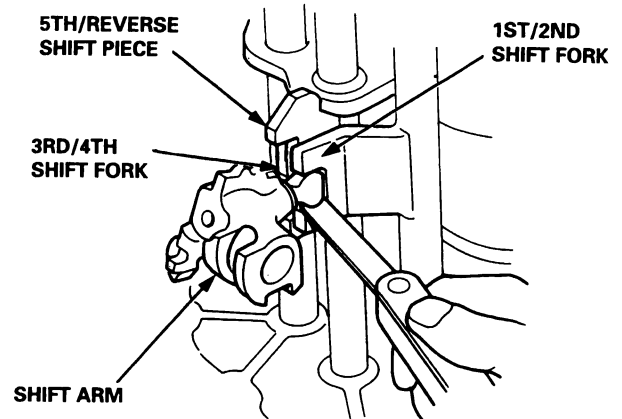
Standard:

3rd/4th shift fork	7.4 – 7.6 mm (0.29 – 0.30 in)
1st/2nd shift fork 5th shift fork	6.2 – 6.4 mm (0.24 – 0.25 in)



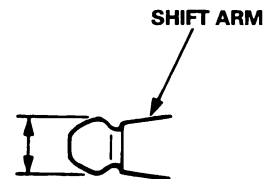
3. Measure the clearance between the shift fork and the shift arm.
If the clearance exceeds the service limit, go to step 4.

Standard: 0.2 – 0.5 mm (0.008-0.020 in)
Service Limit: 0.6 mm (0.024 in)

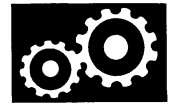


4. Measure the width of the shift arm.
 - If the width of the shift arm is less than the standard, replace the shift arm with a new one.
 - If the width of the shift arm is within the standard, replace the shift fork or shift piece with a new ones.

Standard: 12.9 – 13.0 mm (0.508 – 0.512 in)



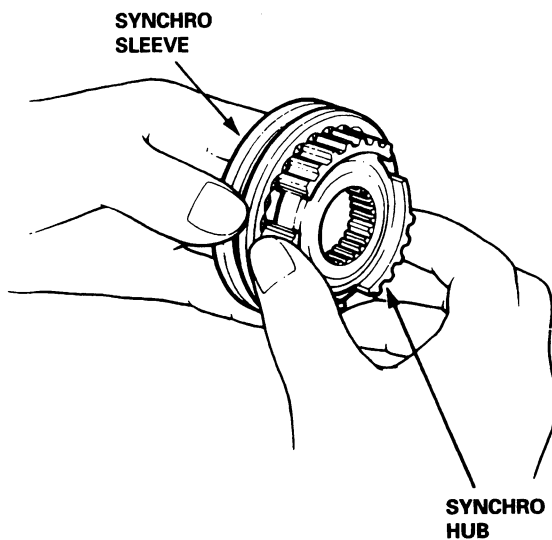
Synchro Sleeve, Synchro Hub



Inspection

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.

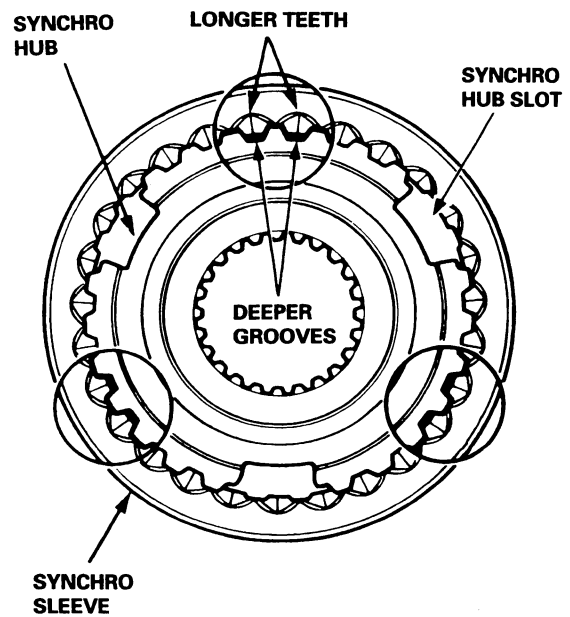


Installation

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.



Synchro Ring, Gear

Inspection

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: 0.85 – 1.10 mm (0.033 – 0.043 in)

Service Limit: 0.40 mm (0.016 in)

Double Cone Synchro-to-Gear Clearance

Standard:

Ⓐ: (Outer Synchro Ring to Synchro Cone)

0.5 – 1.0 mm (0.02 – 0.04 in)

Ⓑ: (Synchro Cone to Gear)

0.5 – 1.0 mm (0.02 – 0.04 in)

Ⓒ: (Outer Synchro Ring to Gear)

0.95 – 1.68 mm (0.037 – 0.066 in)

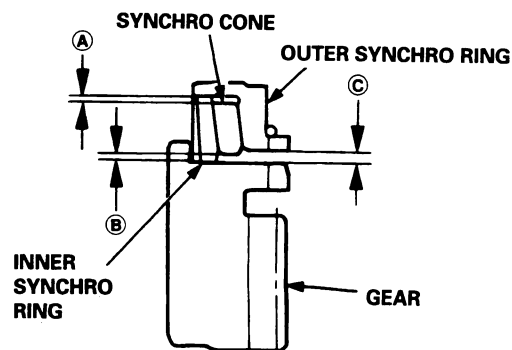
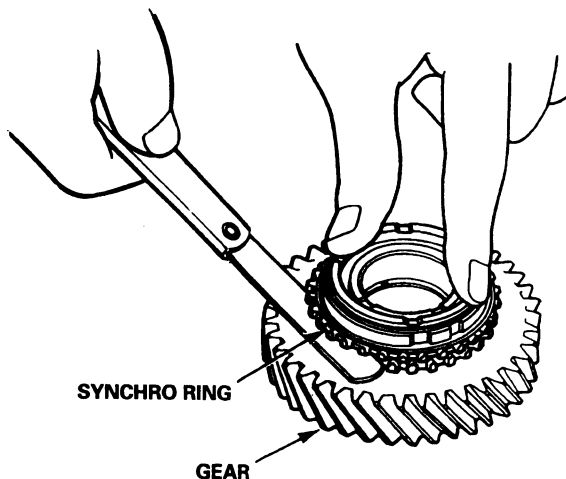
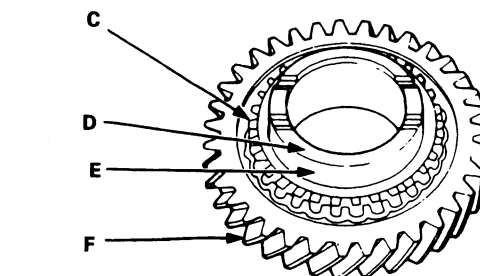
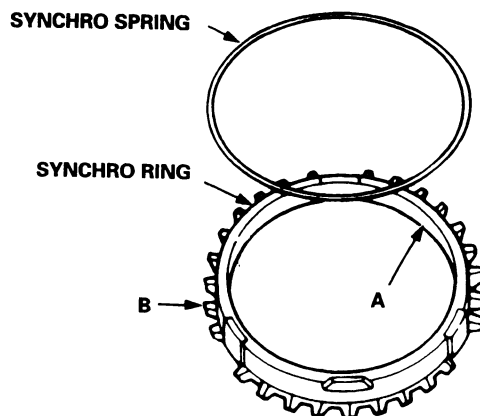
Service Limit:

Ⓐ: 0.3 mm (0.01 in)

Ⓑ: 0.3 mm (0.01 in)

Ⓒ: 0.6 mm (0.02 in)

If the clearance is less than the service limit, replace the synchro ring and synchro cone.





Index

NOTE:

- If parts mark 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.

*THRUST SHIM

Adjustment, page 13-103

*BEARING OUTER RACE

Replacement, page 13-102
Inspect for wear and damage.

*TAPERED ROLLER BEARING

Replacement, page 13-101
Inspect for wear and damage.

*DIFFERENTIAL CARRIER (U2J4, U2G5 TRANSMISSIONS)

Backlash inspection, page 13-100
Inspect for cracks.

FINAL DRIVEN GEAR

Replacement, page 13-100
Inspect for wear and damage.

LIMITED SLIP DIFFERENTIAL (U2Q7 TRANSMISSION)

Inspect for damage.

10 x 1.0 mm
101 N·m (10.3 kgf·m, 74 lbf·ft)
Left-hand threads

*TAPERED ROLLER BEARING
Replacement, page 13-101
Inspect for wear and damage.

*BEARING OUTER RACE
Replacement, page 13-102
Inspect for wear and damage.

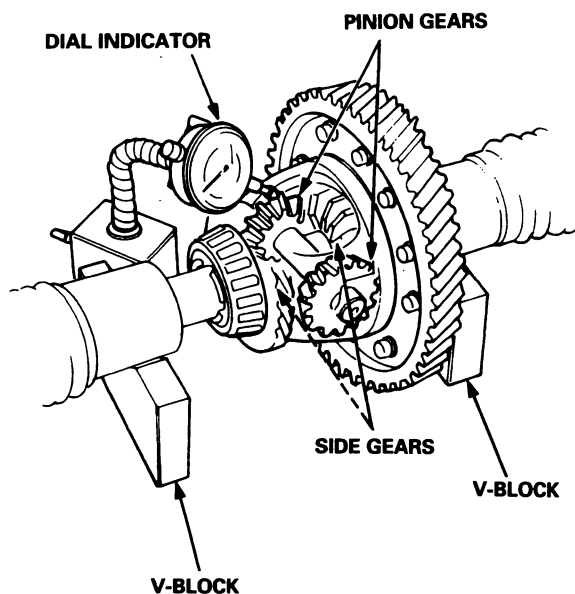
*75 mm SHIM

Differential

Backlash Inspection — U2J4, U2G5 Transmission

1. Place the differential assembly on V-blocks and install both axes.
2. Measure the backlash of both pinion gears. If the backlash is not within the standard, replace the differential carrier.

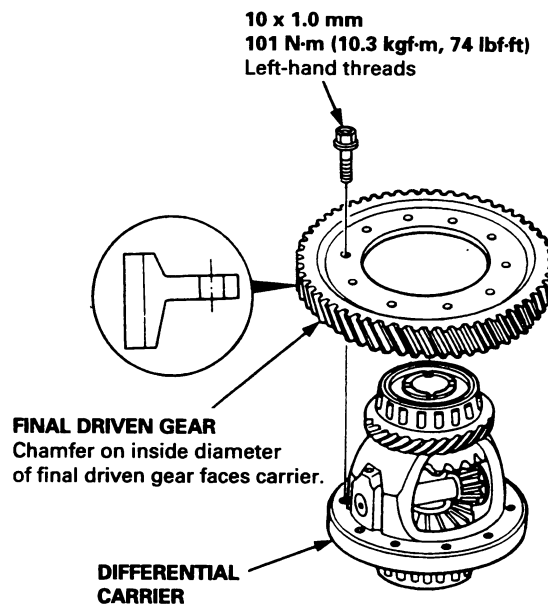
Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)



Final Driven Gear Replacement

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.

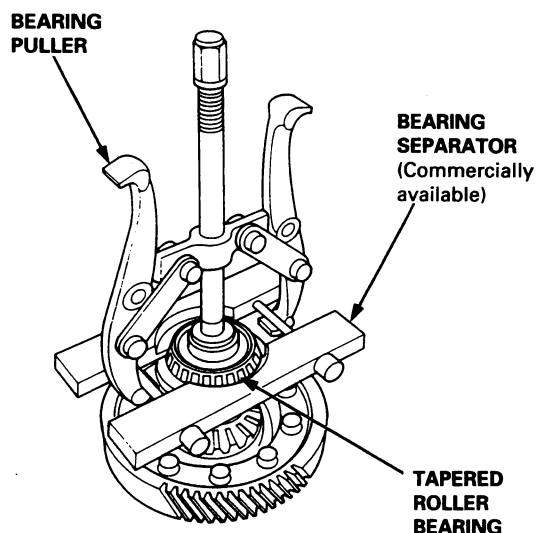


Tapered Roller Bearing Replacement

NOTE:

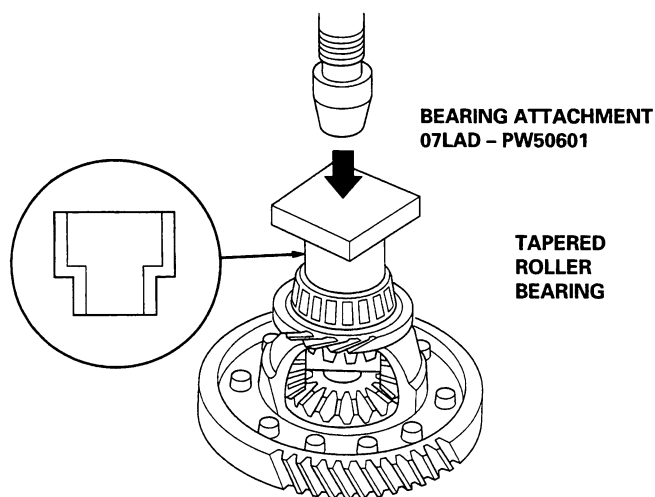
- The tapered roller bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
- Check the tapered roller bearings for wear and rough rotation. If the tapered roller bearings are OK, removal is 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.

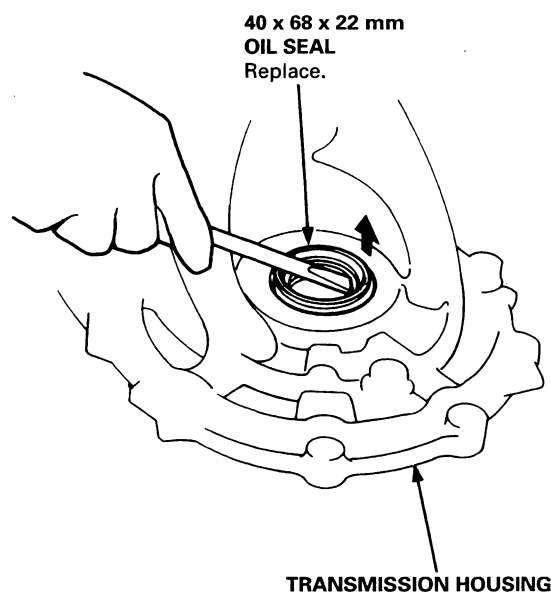
NOTE: Drive the tapered roller bearings on until they bottom against the differential carrier.



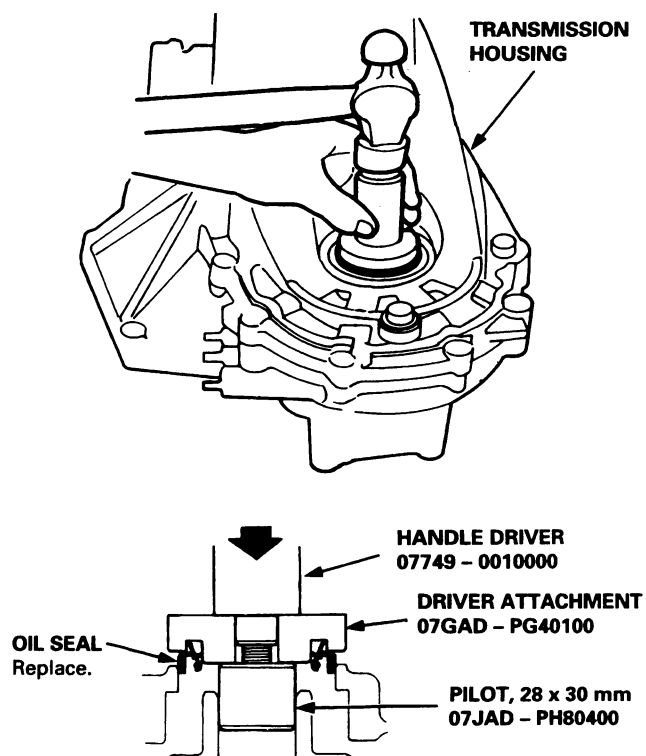
Oil Seal Replacement

Transmission Housing:

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.



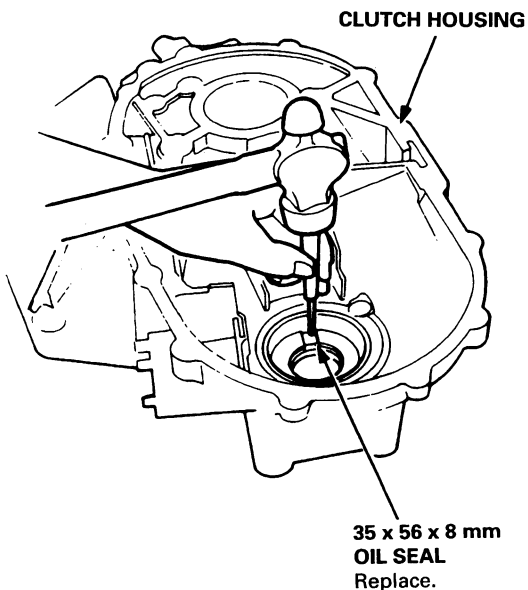
(cont'd)

Differential

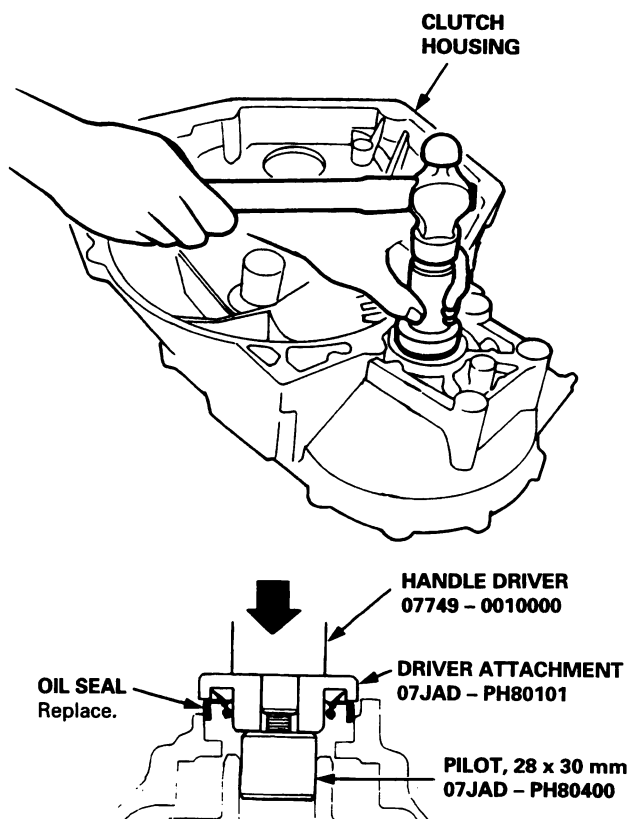
Oil Seal Replacement (cont'd)

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.



Bearing Outer Race Replacement

NOTE:

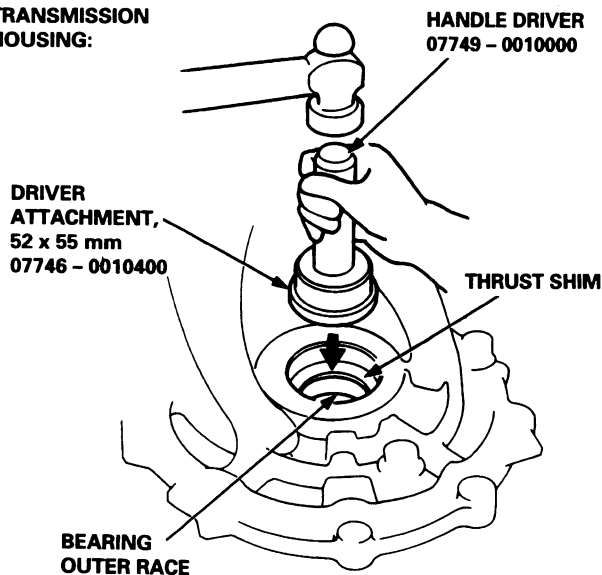
- The bearing outer race and tapered roller bearing should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.

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.

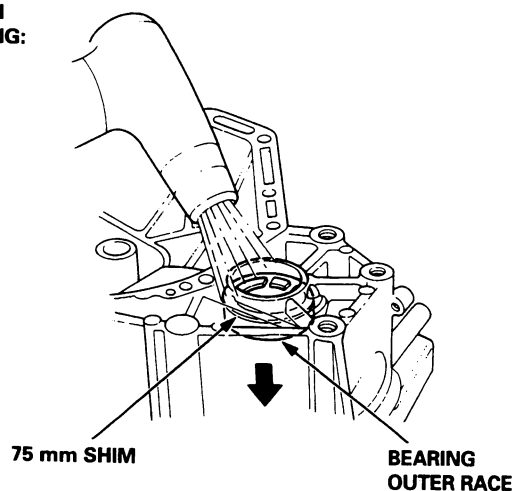
CAUTION

Do not reuse the thrust shim if the outer race was driven out.

TRANSMISSION HOUSING:



CLUTCH HOUSING:



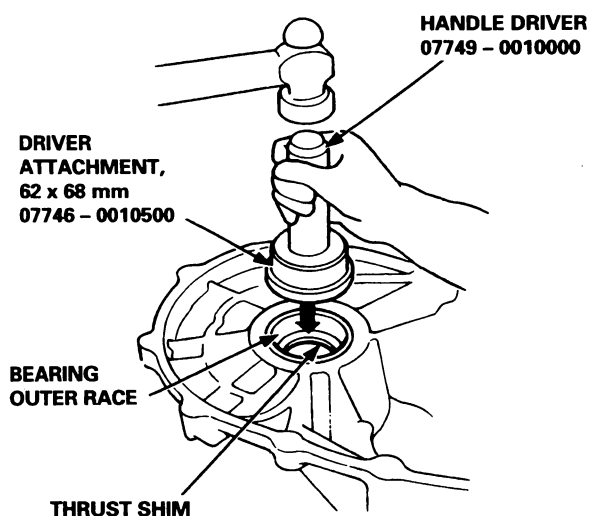


3. Install the thrust shim or 75 mm shim and the bearing outer race in the transmission housing and clutch housing using the special tools as shown.

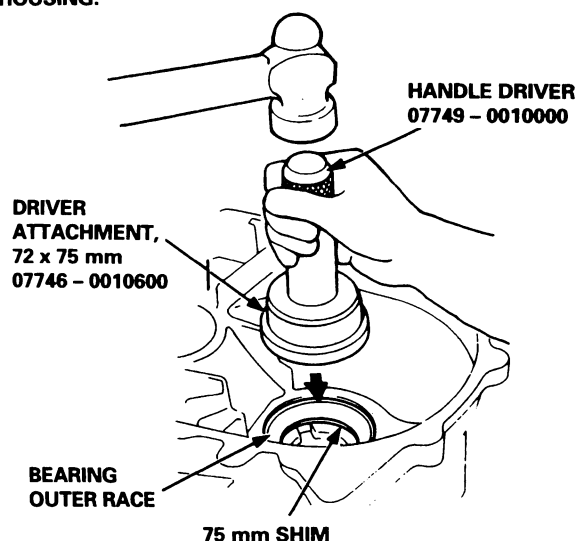
NOTE:

- 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).

Tapered Roller Bearing Preload Adjustment

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

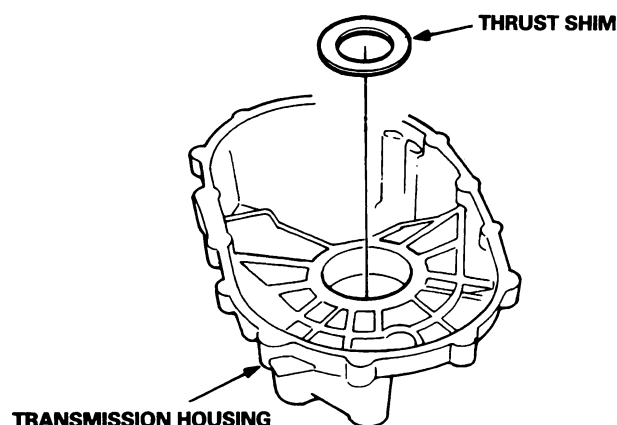
Do not reuse the thrust shim if the bearing outer race was driven out.

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.



(cont'd)

Differential

Tapered Roller Bearing Preload Adjustment (cont'd)

3. After installing the thrust shim, install the bearing outer race in the transmission housing (see page 13-102).

NOTE:

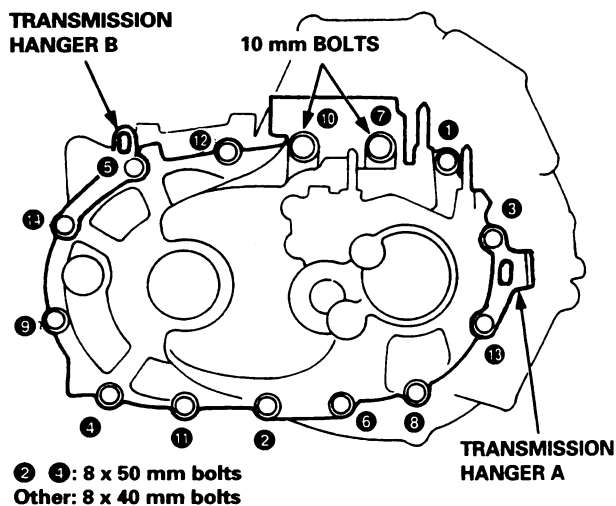
- Install the bearing outer race squarely.
- Check that there is no clearance between the bearing outer race, thrust shim and transmission housing.

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 N·m (2.8 kgf·m, 20 lbf·ft)

10 x 1.25 mm bolts: 47 N·m (4.8 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.

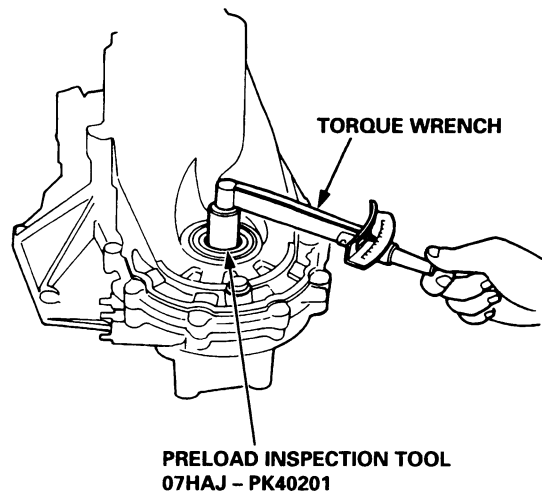
NOTE:

- Measure the tapered roller bearing preload at normal room temperature.
- Measure the tapered roller bearing preload in both directions.

STANDARD: 1.4 – 2.5 N·m

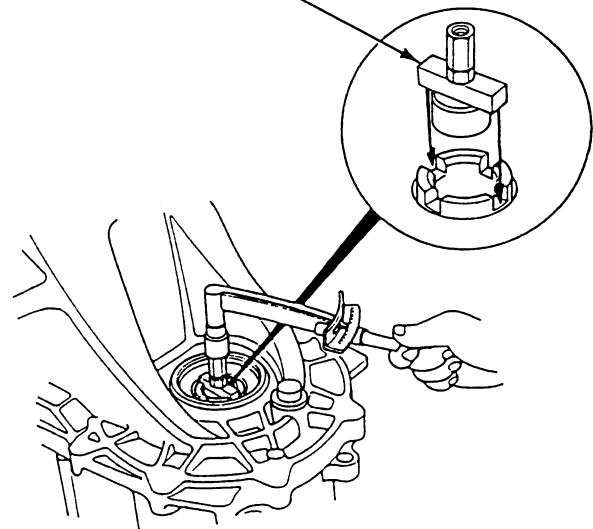
(14 – 26 kgf·cm, 12 – 23 lbf·in)

U2J4, U2G5 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 N·m (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 N·m (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:

$$\begin{array}{rcl} \textcircled{A} \text{ specified} & 2.5 \text{ N·m (26 kgf·cm, 23 lbf·in)} & \\ - \text{you measure} & 0.6 \text{ N·m (6 kgf·cm, 5 lbf·in)} & \\ \hline & 1.9 \text{ N·m (20 kgf·cm, 18 lbf·in) less} & \end{array}$$

$$\begin{array}{rcl} \textcircled{B} \text{ you measure} & 3.3 \text{ N·m (34 kgf·cm, 30 lbf·in)} & \\ - \text{specified} & 2.5 \text{ N·m (26 kgf·cm, 23 lbf·in)} & \\ \hline & 0.8 \text{ N·m (8 kgf·cm, 7 lbf·in) more} & \end{array}$$

- 3) Each shim size up or down from standard makes about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 lbf·in) difference in tapered roller bearing preload.
- In example \textcircled{A} , your measured tapered roller bearing preload was 1.9 N·m (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 \textcircled{B} , your measurement was 0.8 N·m (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:

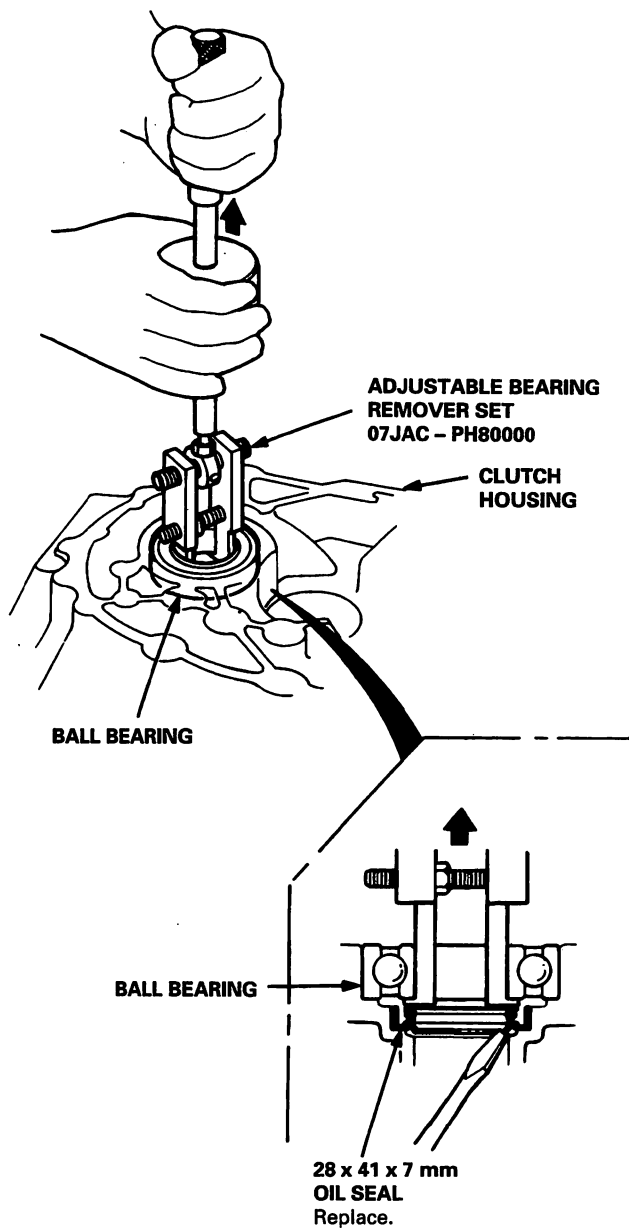
10 x 1.25 mm: 47 N·m (4.8 kgf·m, 35 lbf·ft)
8 x 1.25 mm: 27 N·m (2.8 kgf·m, 20 lbf·ft)

11. Rotate the differential assembly in both directions to seat the tapered roller bearings.

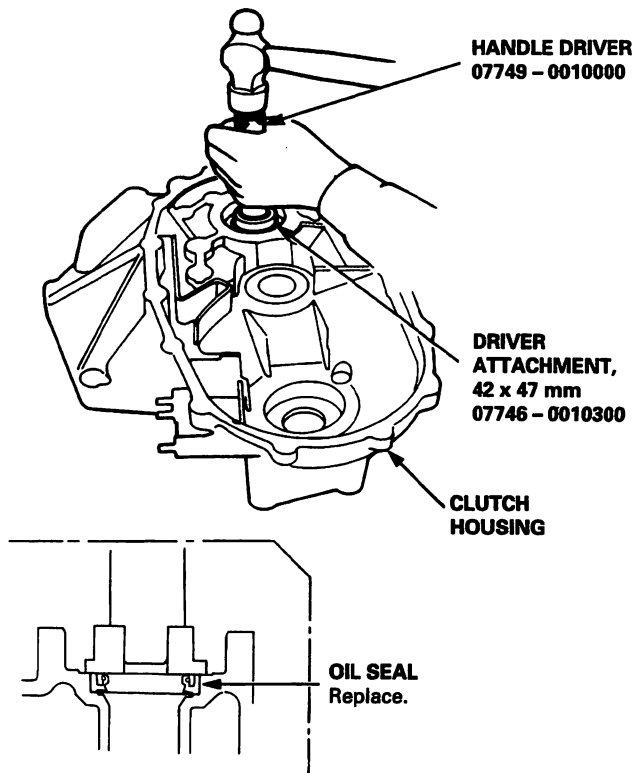
Mainshaft Bearing/Oil Seal

Replacement

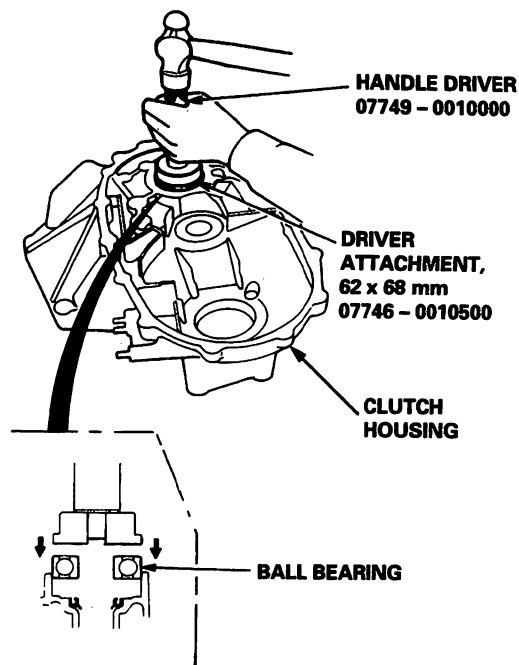
1. Remove the differential assembly.
2. Remove the ball bearing using the special tool as shown.
3. Remove the oil seal from the clutch side.



4. Drive the new oil seal in from the transmission side using the special tools as shown.



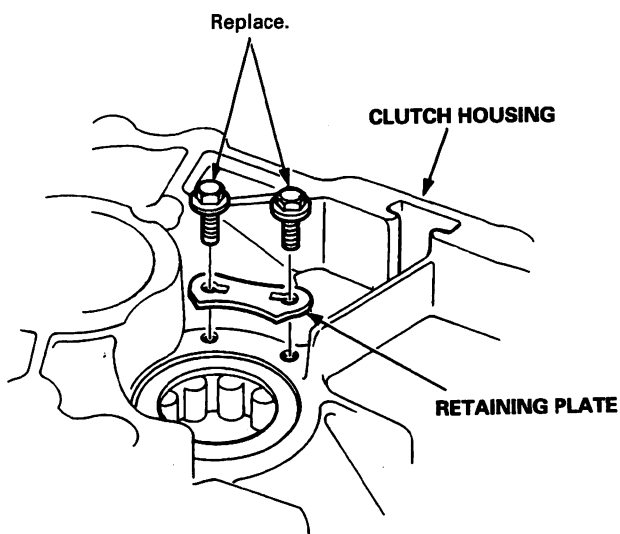
5. Drive the new ball bearing in from the transmission side using the special tools as shown.



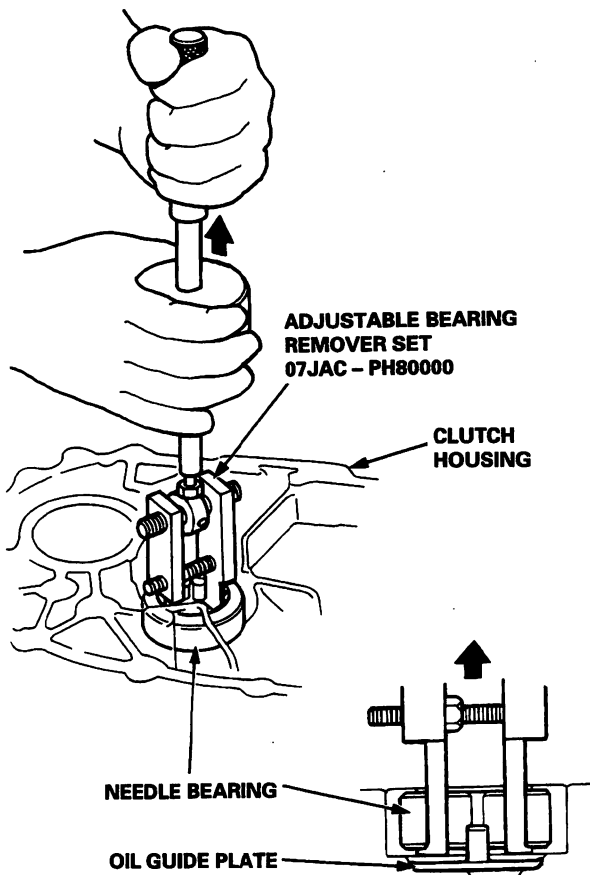


Replacement

1. Remove the retaining plate from the clutch housing.

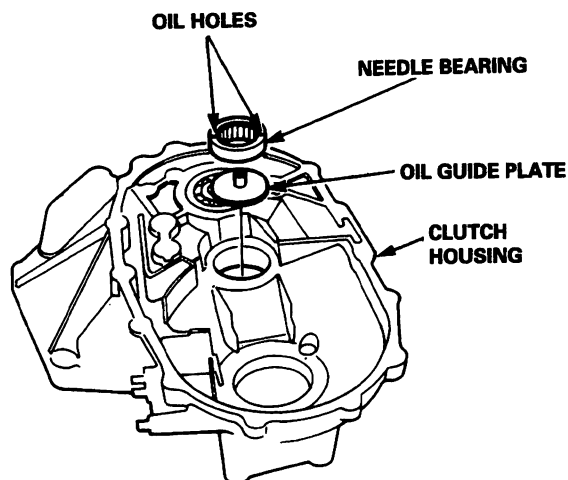


2. Remove the needle bearing using the special tool, then remove the oil guide plate.

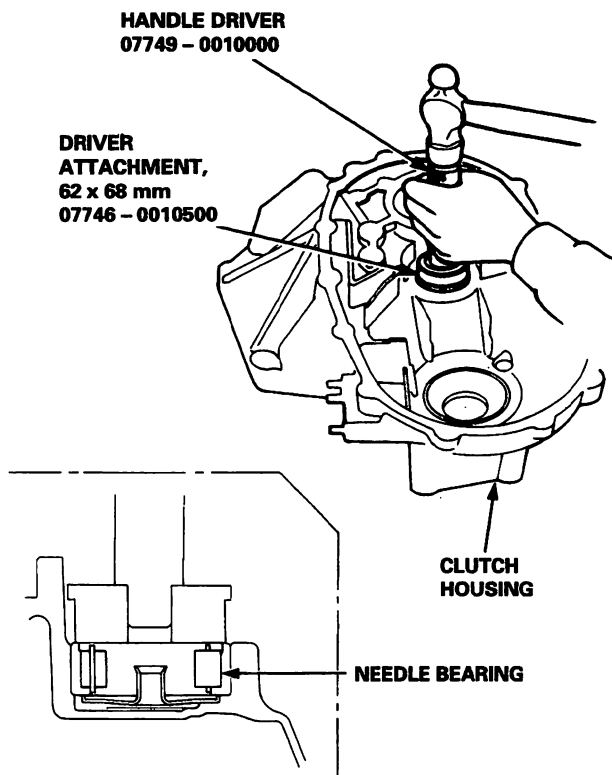


3. Position the oil guide plate and new needle bearing in the bore of the clutch housing.

NOTE: Position the needle bearing with the oil hole facing up.



4. Drive the needle bearing using the special tools as shown.

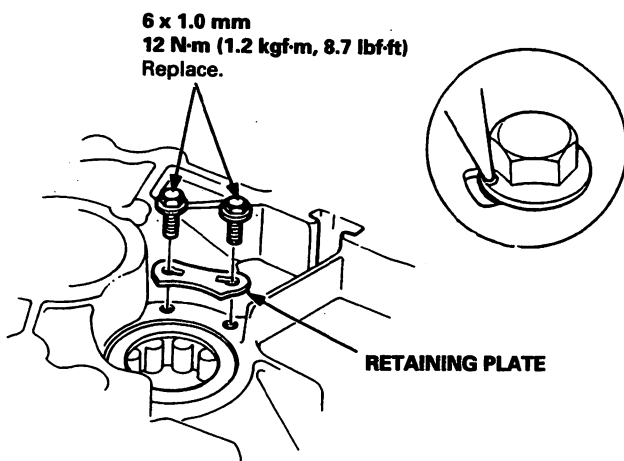


(cont'd)

Countershaft Bearing

Replacement (cont'd)

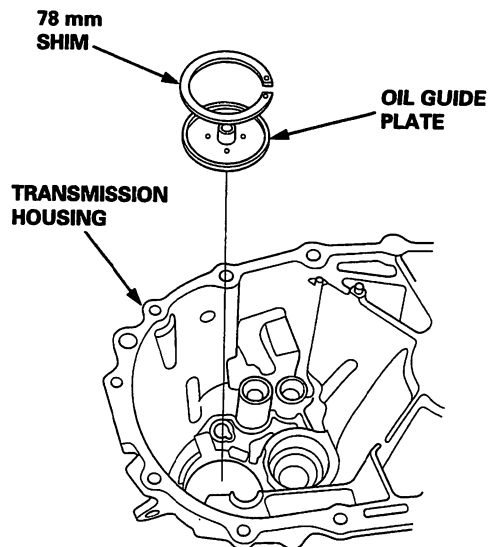
5. Install the retaining plate, and stake the bolt heads into the groove in the retaining plate.



Mainshaft Thrust Clearance

Adjustment

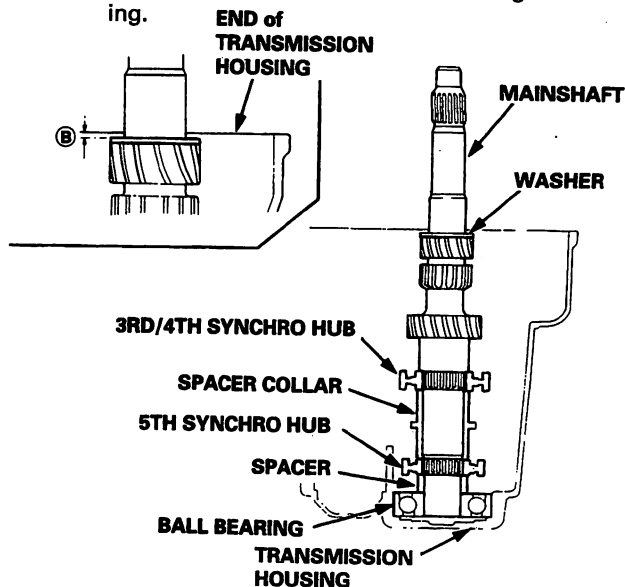
1. Remove the 78 mm shim and oil guide plate from the transmission housing.



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 caliper.
- Measure at three locations and average the reading.

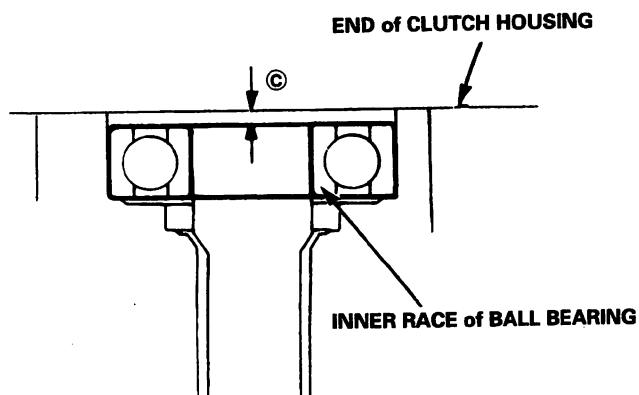




5. Measure distance © between the end of the clutch housing and bearing inner race.

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 © (step 5) to distance ② (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)

$$\begin{array}{rcl}
 \text{B: } 2.39 & 2.61 & \\
 + \text{ C: } 0.22 & - 0.93 & \\
 \hline
 = 2.61 & = 1.68 &
 \end{array}$$

- 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)
AF	23972 - P16 - 000	2.13 mm (0.0839 in)
AG	23973 - P16 - 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 (0.0886 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)

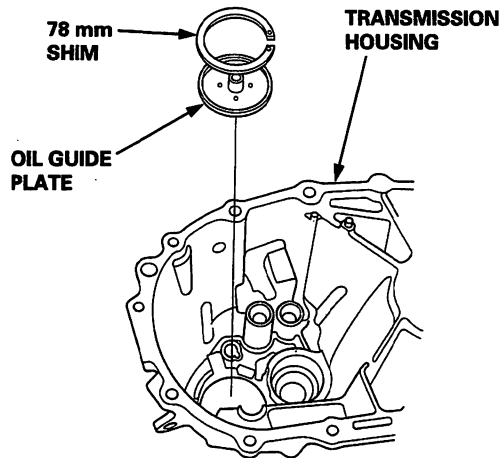
(cont'd)

Mainshaft Thrust Clearance

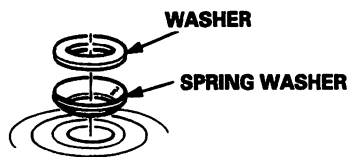
Adjustment (cont'd)

NOTE: Measurement should be made at normal room temperature.

7. Install the 78 mm shim selected and oil guide plate in 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.

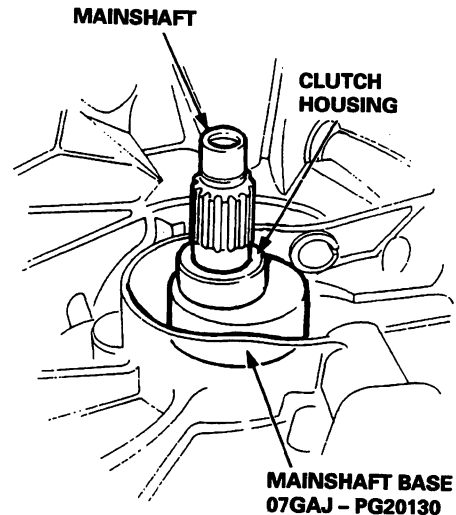


9. Install the mainshaft in the clutch housing.
10. Place the transmission housing over the mainshaft and onto the clutch housing.
11. Tighten the clutch and transmission housings with several 8 mm and 10 mm bolts.

NOTE: It is not necessary to use sealing agent between the housings.

12. Tap the mainshaft with a plastic hammer.

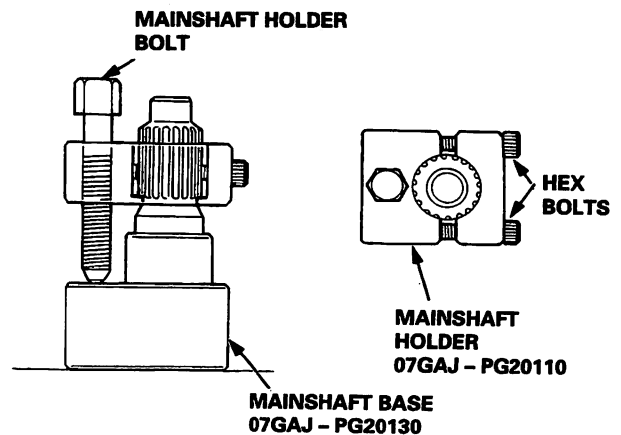
13. Slide the mainshaft base over the mainshaft.



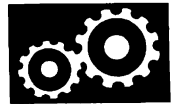
14. Attach the mainshaft holder to the mainshaft as follows:

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.



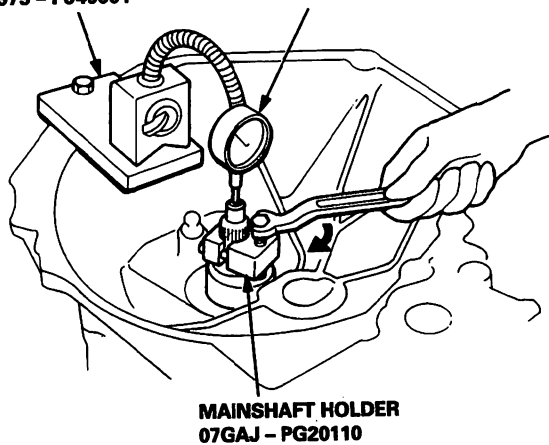
18. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

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

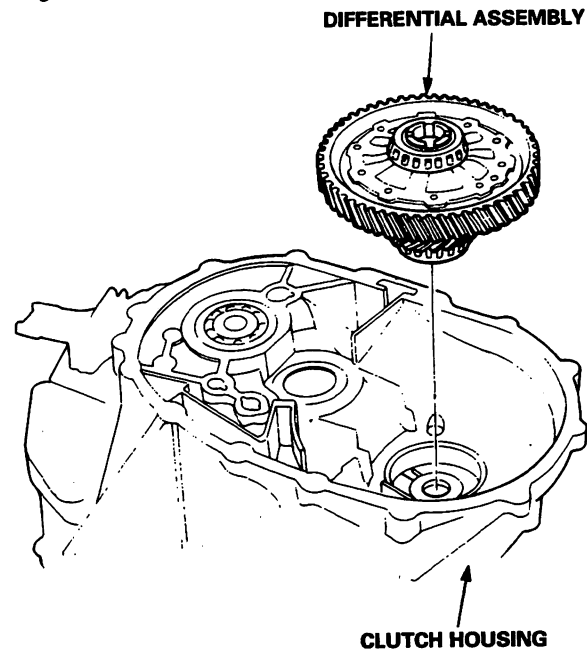


19. If the reading is within the standard, the clearance is correct.
If the reading is not within the standard, recheck the shim thickness.

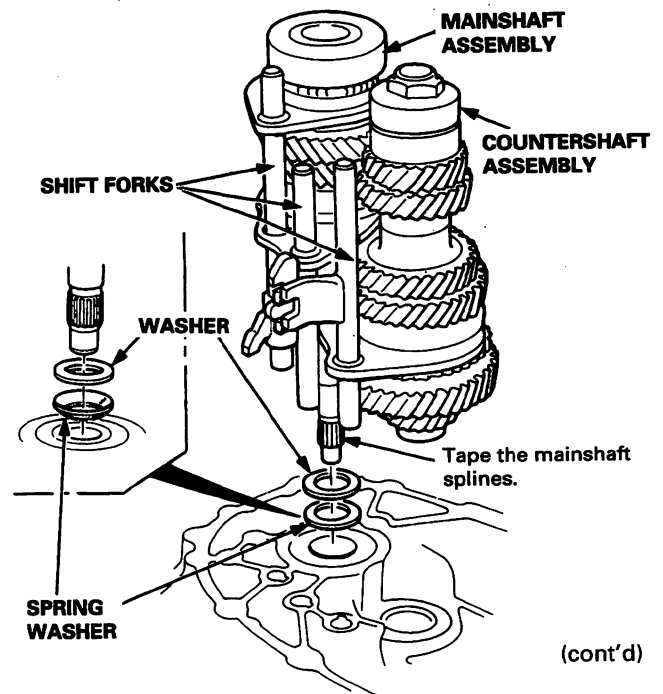
Standard: 0.10 - 0.16 mm (0.004 - 0.006 in)

Reassembly

1. Install the differential assembly in the 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.

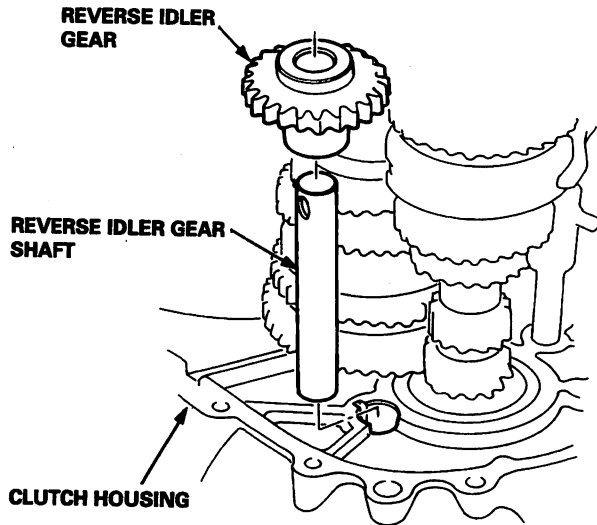


(cont'd)

Transmission Assembly

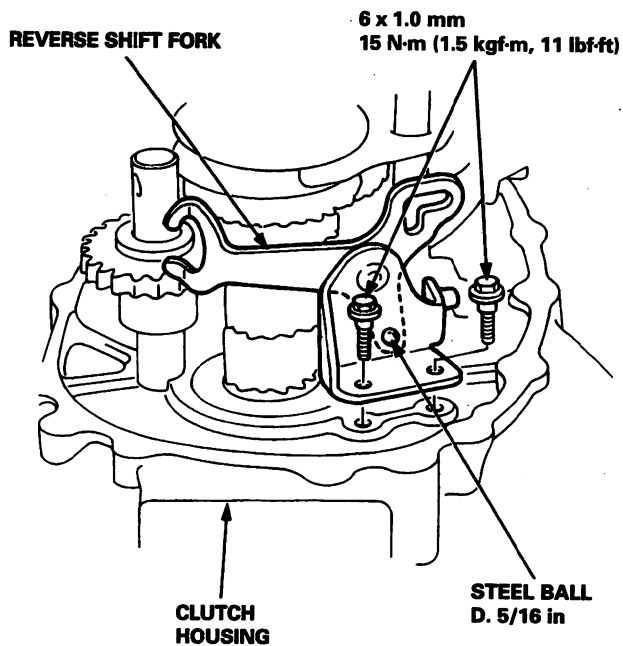
Reassembly (cont'd)

4. Install the reverse idler gear and reverse idler gear shaft in the clutch housing.

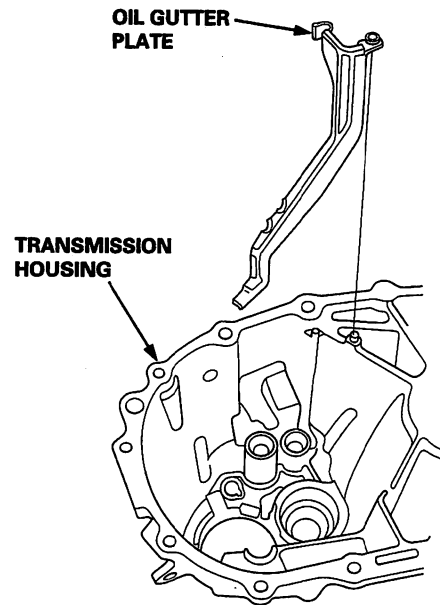


5. Install the reverse shift fork in the clutch housing with the 5th/reverse shift piece pin positioned in the slot of the reverse shift fork.

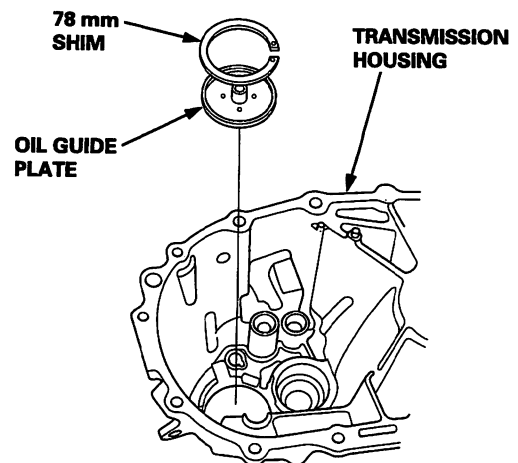
NOTE: Check that the steel ball is in the proper position.



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.

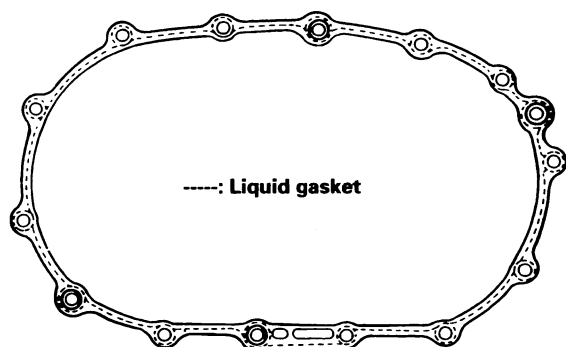




9. Remove the dirt and oil from the transmission housing sealing surface. Apply liquid gasket to the sealing surface of the transmission housing as shown.

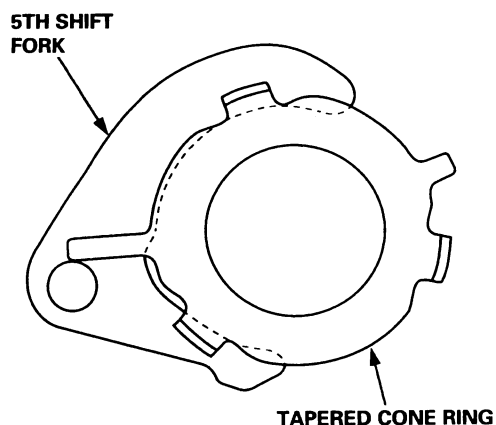
NOTE:

- 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.

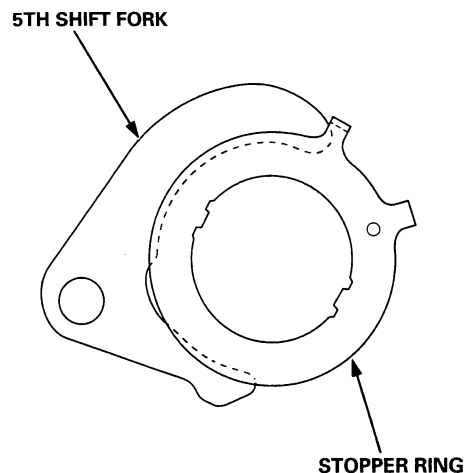


10. Install the 14 x 20 mm dowel pins.
11. Set the tapered cone ring or stopper ring as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.

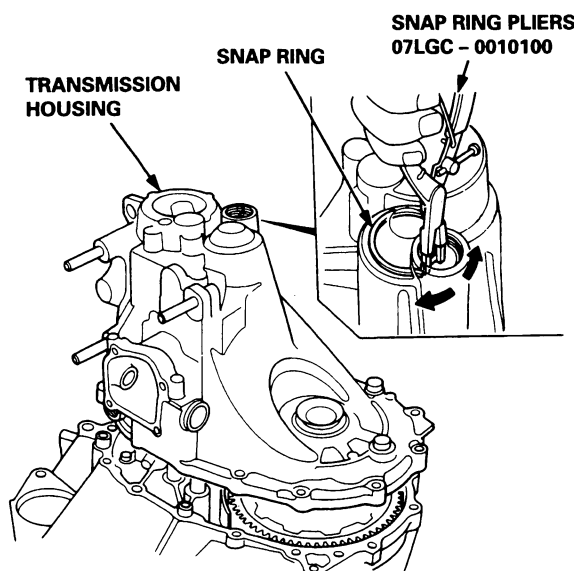
U2J4, U2G5 TRANSMISSIONS:



U2Q7 Transmission:



12. Lower the transmission housing with the snap ring pliers, and set the snap ring into the groove of the countershaft bearing.



(cont'd)

Transmission Assembly

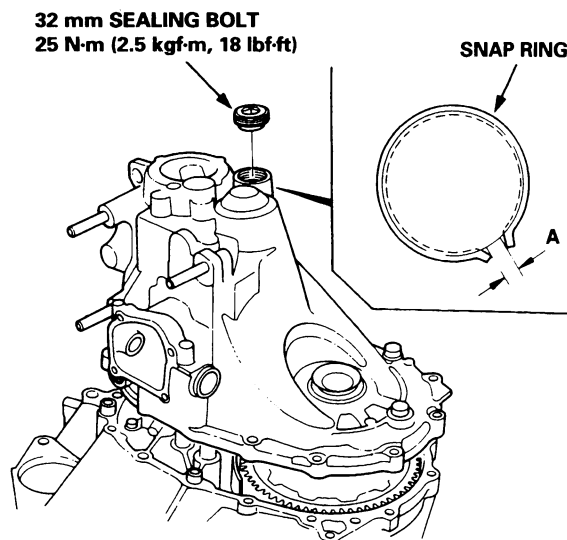
Reassembly (cont'd)

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)**

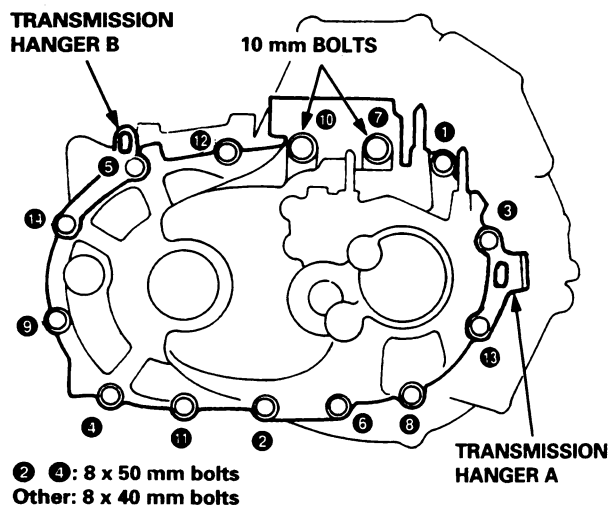
14. Install the 32 mm sealing bolt.

NOTE: Apply liquid gasket (P/N 08C70 – K0234M) to the threads.



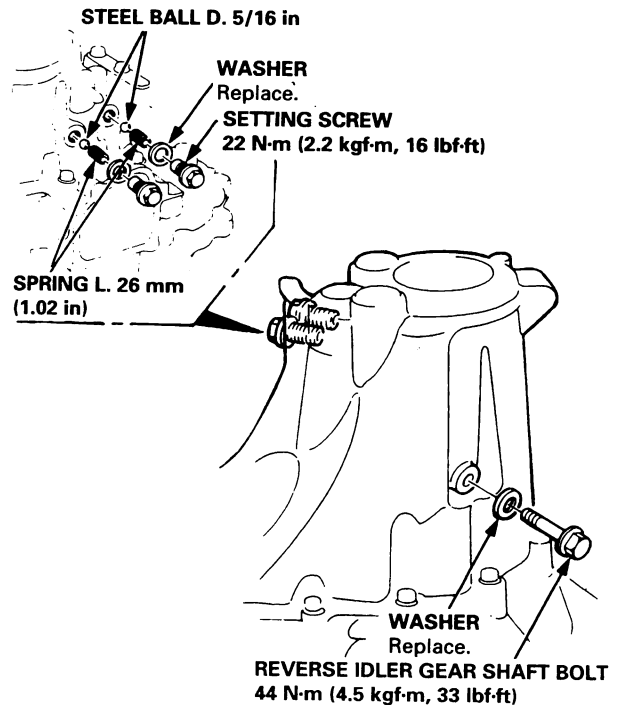
15. Install transmission hangers A and B, then tighten the bolts in a crisscross pattern in several steps as shown.

8 x 1.25 mm bolts: 27 N-m (2.8 kgf-m, 20 lbf-ft)
10 x 1.25 mm bolts: 47 N-m (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.



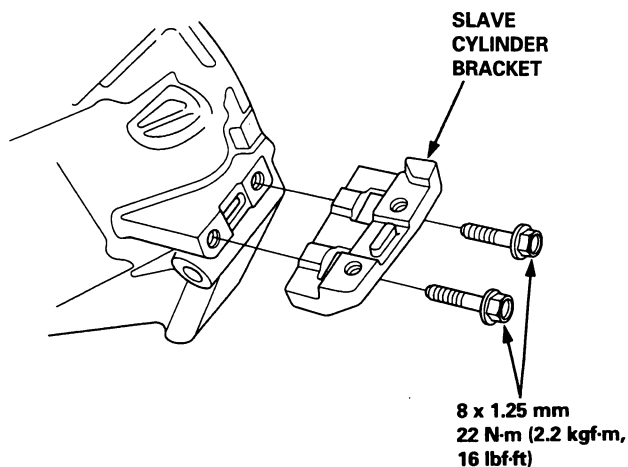
18. Install the shift arm cover assembly (see page 13-69).

19. Shift the transmission through all the gears before installing it.

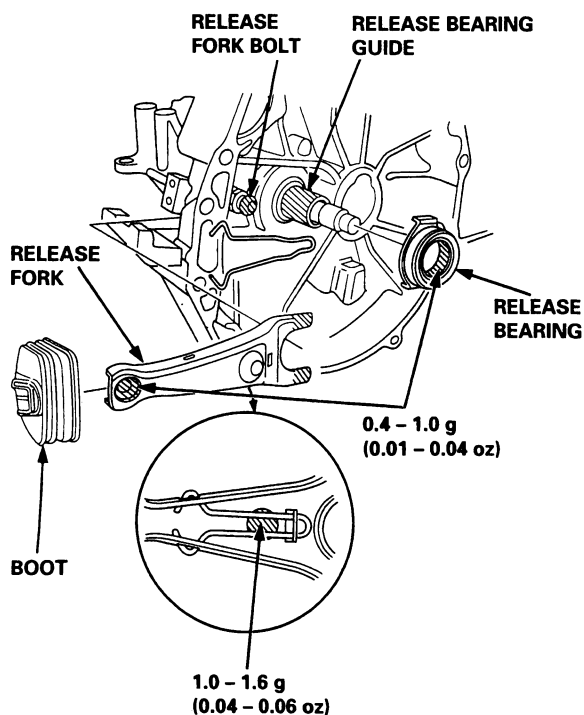


Installation

1. Check the dowel pins are installed in the clutch housing.
2. Install the slave cylinder bracket to the transmission assembly.

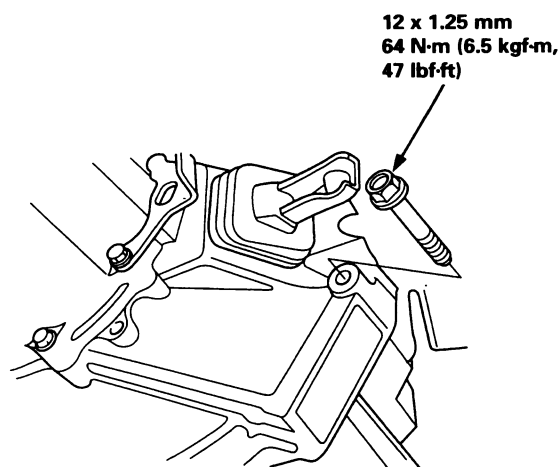


3. Apply HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305) to the release fork, the release fork bolt, the release bearing, and the release bearing guide in the shaded areas.

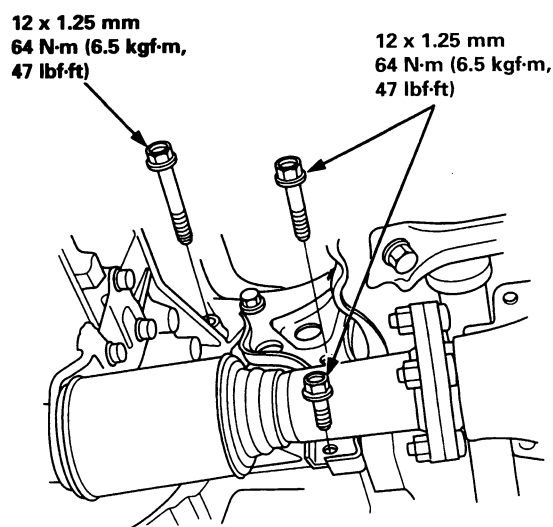


4. Install the release bearing, release fork, and boot on the transmission.

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.

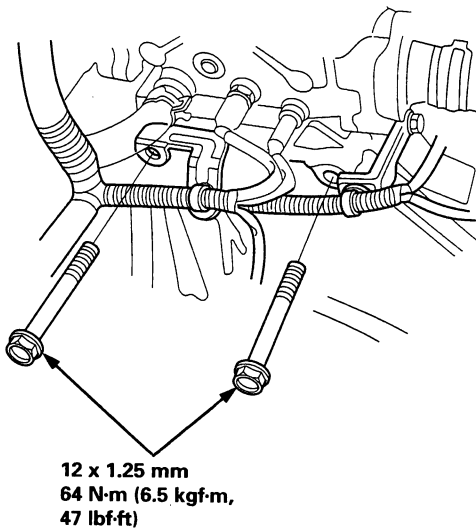


(cont'd)

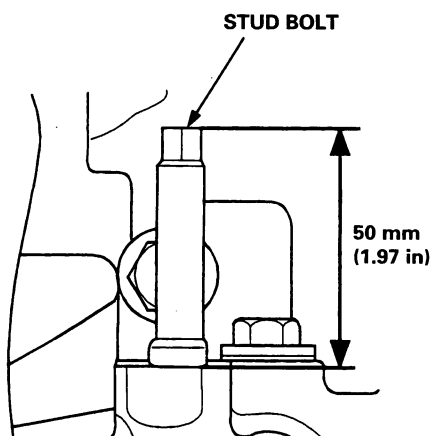
Transmission Assembly

Installation (cont'd)

9. Install the two upper transmission mounting bolts.



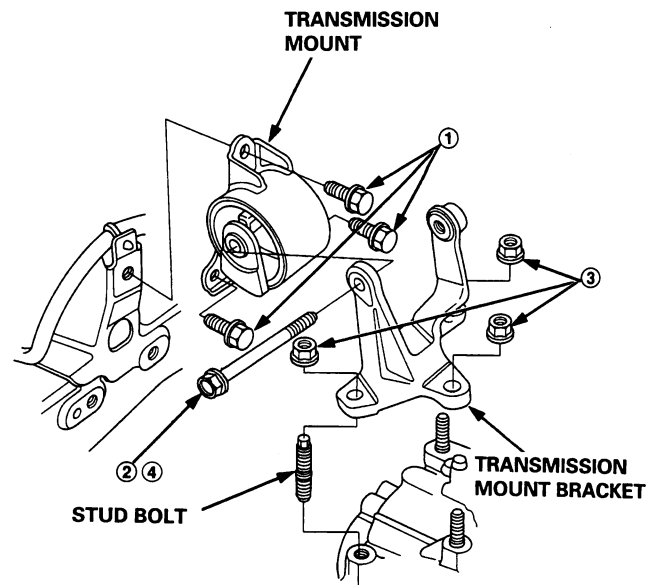
10. Install the transmission mount stud bolt on the transmission housing.



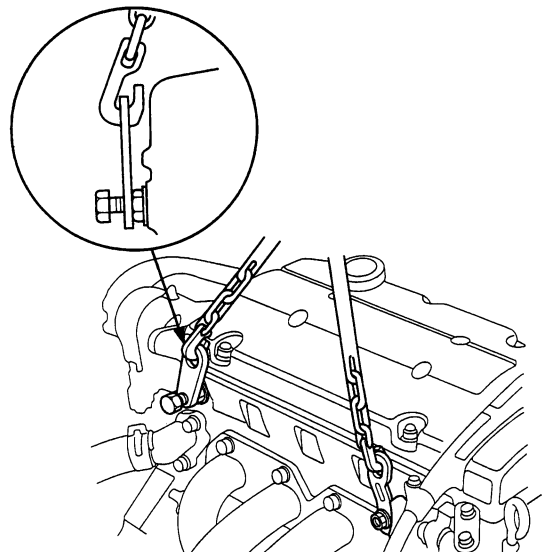
11. Raise the transmission, then install the transmission mount rubber assembly and transmission mount bracket.

- 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 N·m (6.5 kgf·m, 47 lbf·ft)
②: Temporary tightening
③: 10 x 1.25 mm 38 N·m (3.9 kgf·m, 28 lbf·ft)
④: 12 x 1.25 mm 64 N·m (6.5 kgf·m, 47 lbf·ft)

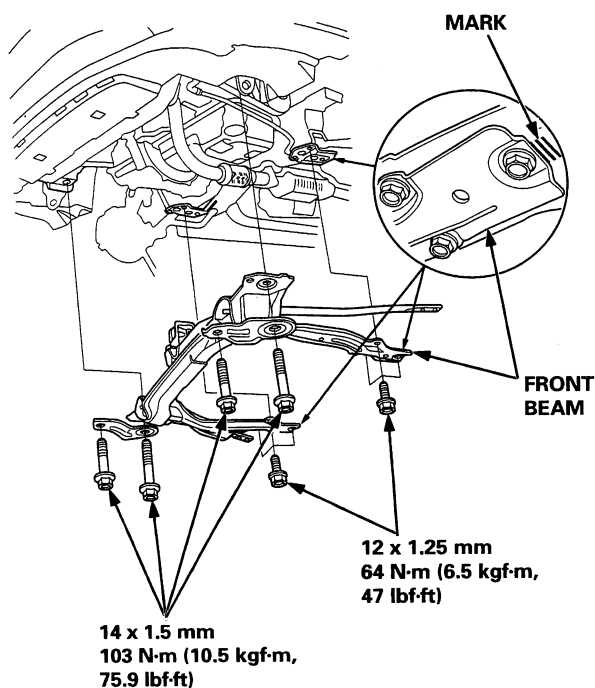


12. Remove the chain hoist.

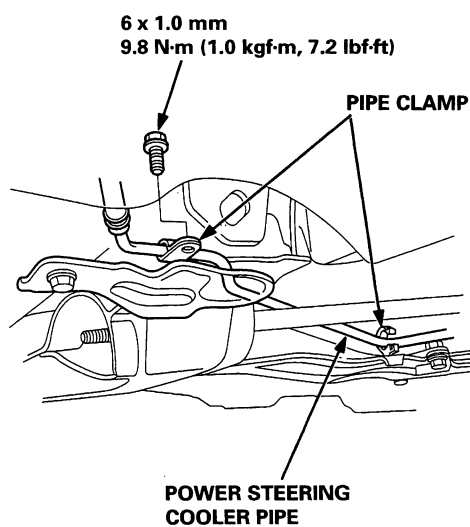




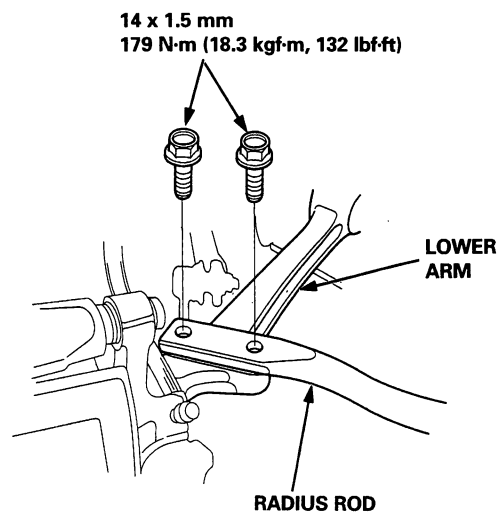
13. Install the front beam by align the marks.



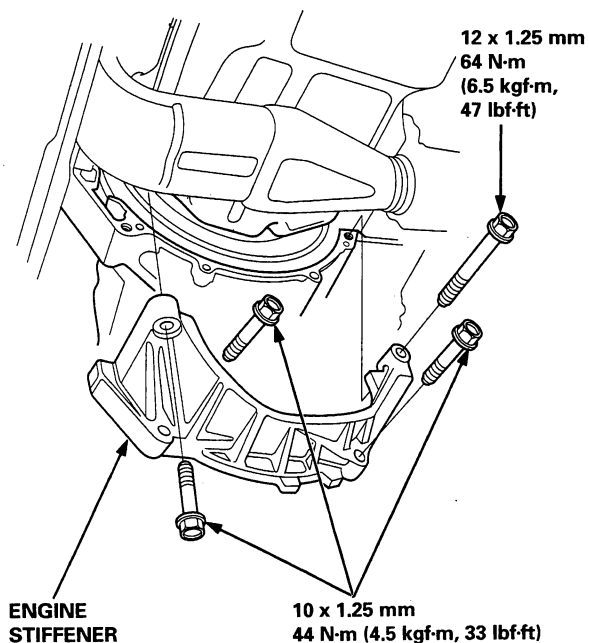
14. Install the power steering cooler pipe in the pipe clamps.



15. Install both radius rods with new mounting bolts on the lower arm.



16. Install the engine stiffener.

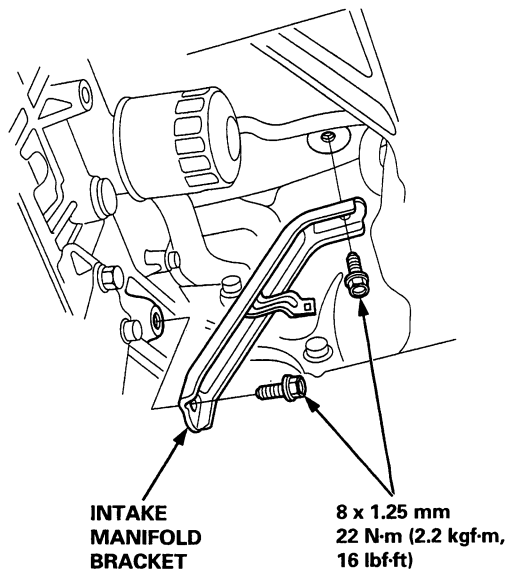


(cont'd)

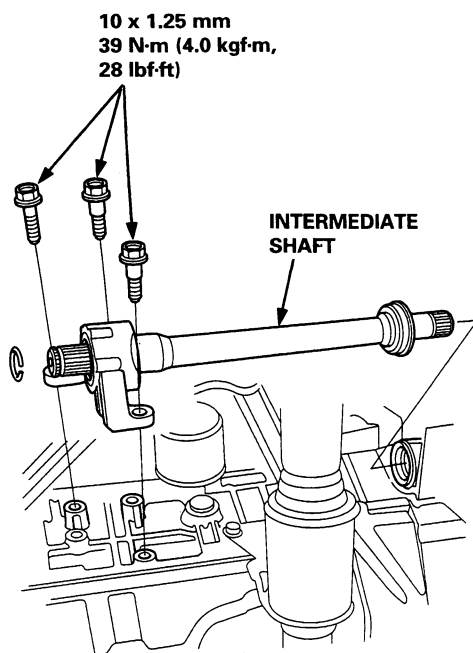
Transmission Assembly

Installation (cont'd)

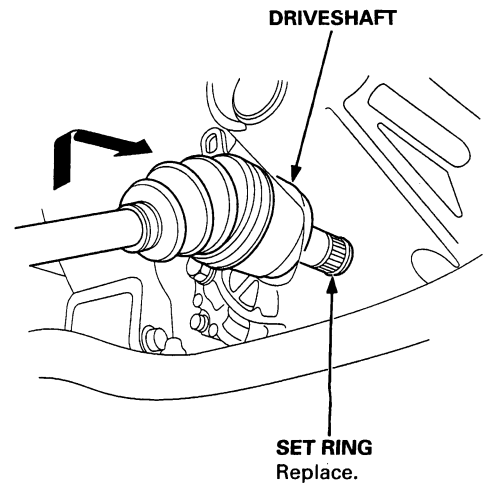
17. Install the intake manifold bracket.



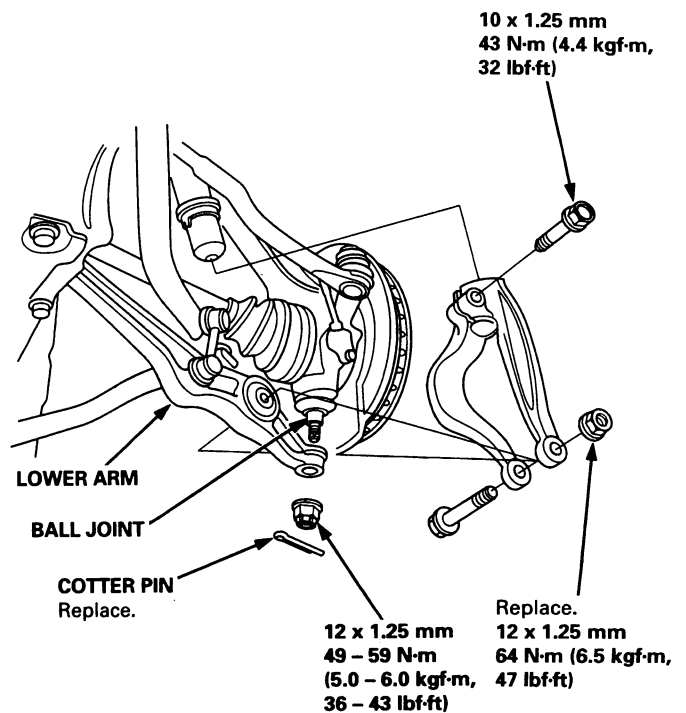
18. Install the intermediate shaft (see section 16).



19. Install the driveshafts with new set rings (see section 16).



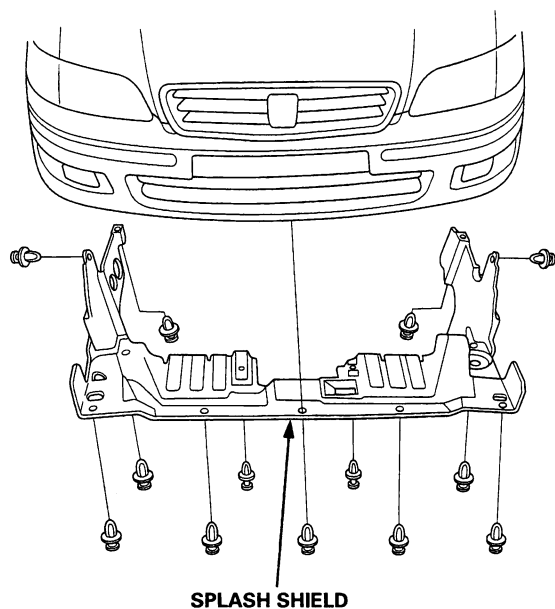
20. Install the both damper forks with new locknuts (see section 18).



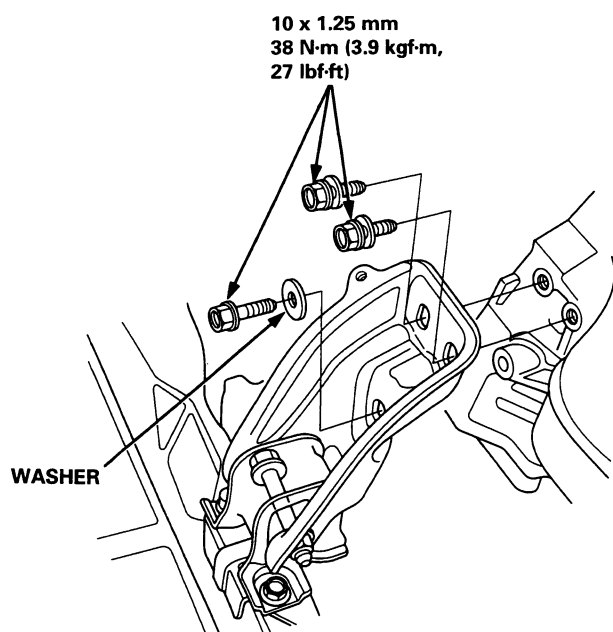
21. Install the ball joint onto the lower arms, then install the castle nuts and new cotter pins (see section 18).



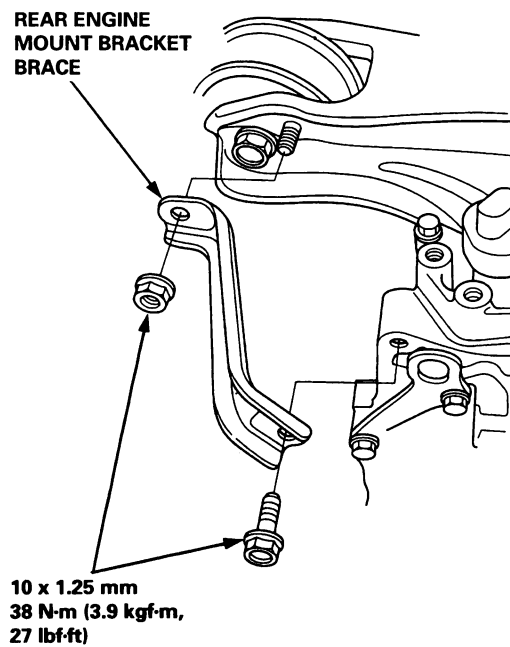
22. Install the splash shield.



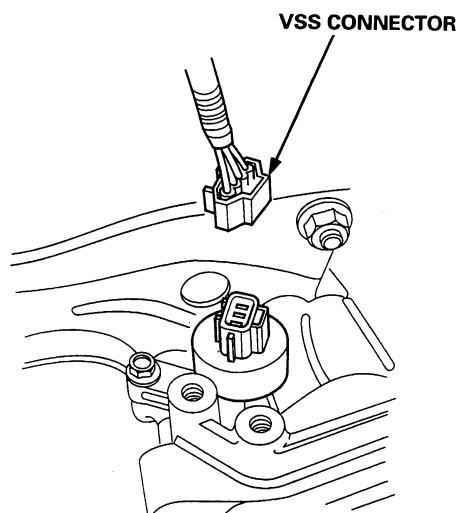
23. Install the washer and front engine bracket mounting bolts.



24. Install the rear engine mount bracket brace.



25. Connect the vehicle speed sensor (VSS) connector.

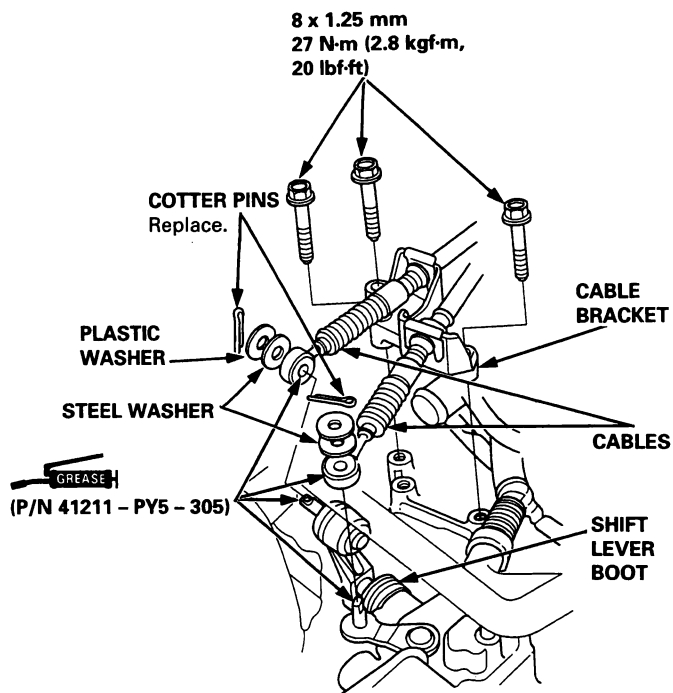


(cont'd)

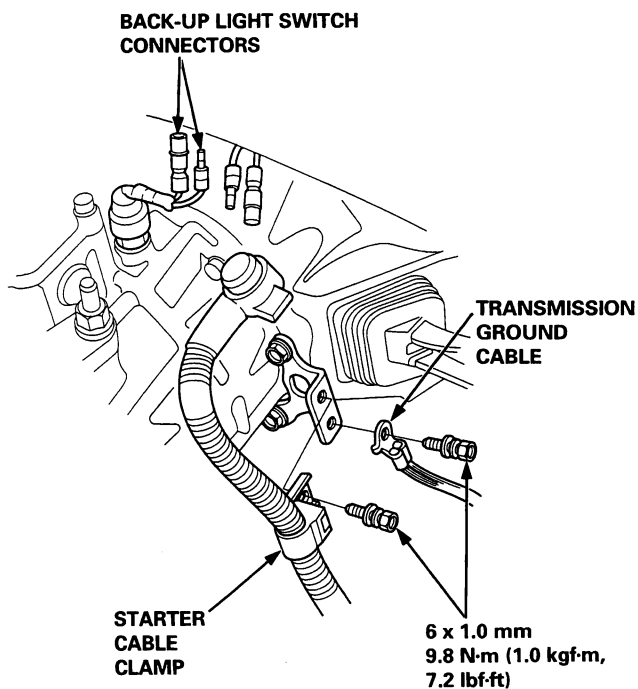
Transmission Assembly

Installation (cont'd)

26. Install the cables to the levers, then install the cable bracket. Turn the shift lever boot so the hole is facing down.

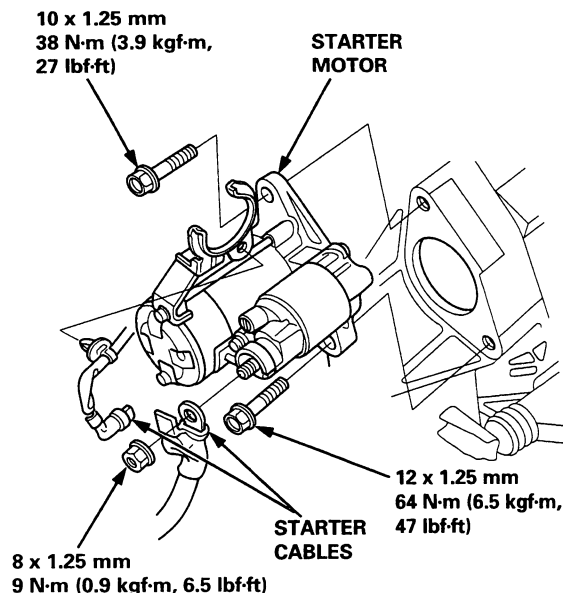


27. Install the transmission ground cable and starter cables clamp.

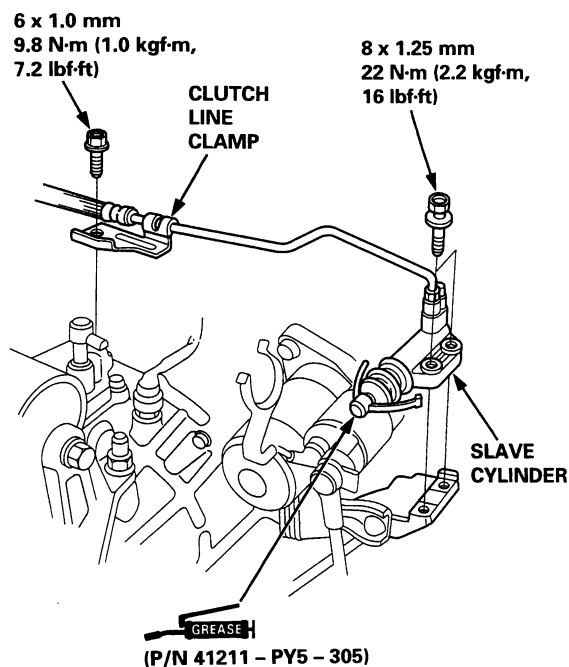


28. Connect the back-up light switch connectors.

29. Install the starter motor, then connect the cables. Make sure the crimped side of the ring terminals is facing out.

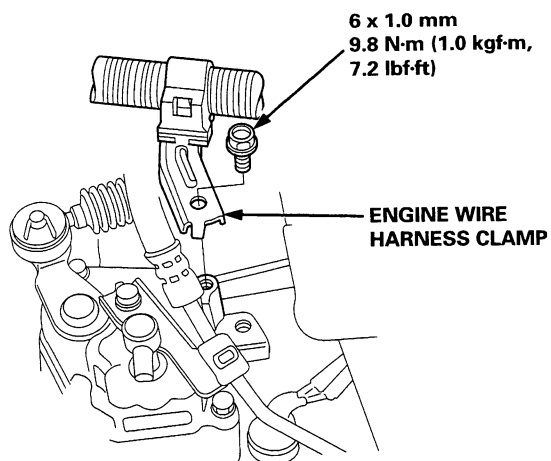


30. Apply HONDA Genuine Urea Grease UM264 (P/N 41211 - PY5 - 305) to the end of the slave cylinder rod. Install the slave cylinder and clutch line clamp so as not bend the clutch line.

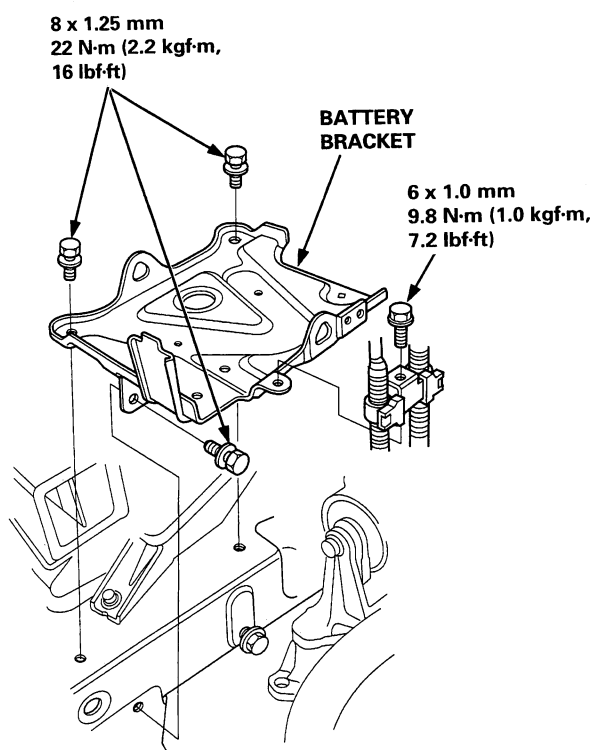




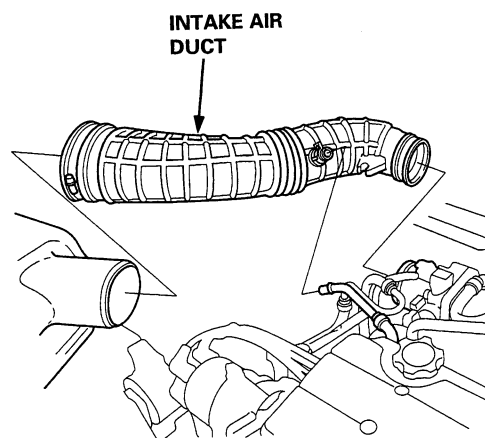
31. Install the engine wire harness clamp.



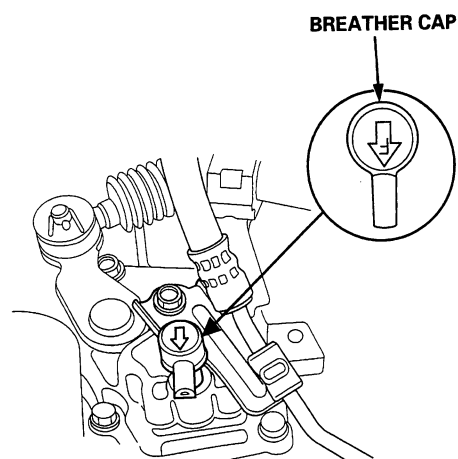
32. Install the battery bracket.



33. Install the intake air duct.



34. Turn the breather cap so that the "F" mark points toward the front of the vehicle.



(cont'd)

Transmission Assembly

Installation (cont'd)

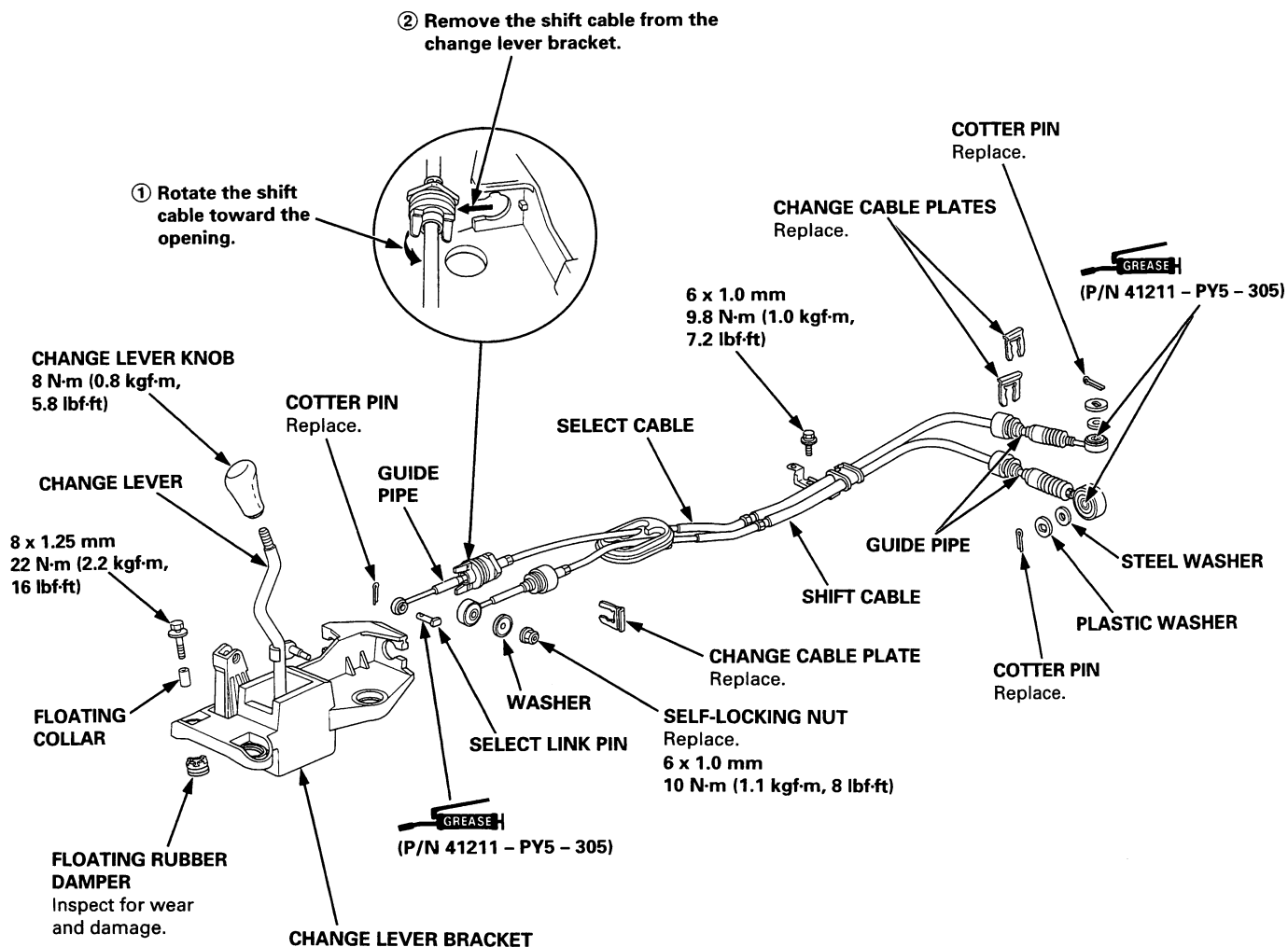
35. Connect the positive (+) cable first, then the negative (-) cable to the battery.
36. Refill the transmission fluid (see page 13-57).
37. Check the transmission and check for smooth operation.
38. Check the clutch operation.
39. Check the front wheel alignment (see section 18).
40. Loosen the three 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.



Overhaul

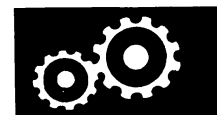
NOTE:

- 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.



Automatic Transmission

Special Tools	14-2	Torque Converter Housing/Valve Body	
Description	14-3	Removal	14-152
Clutches	14-6	Valve Body	
Power Flow	14-8	Repair	14-154
Electronic Control System	14-15	Valve	
Hydraulic Control	14-20	Assembly	14-155
Hydraulic Flow	14-24	Valve Caps	
Lock-up System	14-39	Description	14-156
Shift Lever/Manual Mode Mechanism	14-46	ATF Pump	
Shift Lever/Reverse Lock Mechanism	14-47	Inspection	14-157
Electrical System		Main Valve Body	
Component Locations	14-48	Disassembly/Inspection/Reassembly	14-158
PCM Circuit Diagram (A/T Control System)	14-50	Regulator Valve Body	
PCM Terminal Voltage/Measuring Conditions		Disassembly/Inspection/Reassembly	14-160
A/T Control System	14-52	Accumulator Body	
Troubleshooting Procedures	14-56	Disassembly/Inspection/Reassembly	14-161
Symptom-to-Component Chart		Servo Body	
Electrical System	14-59	Disassembly/Inspection/Reassembly	14-162
Electrical Troubleshooting		Mainshaft	
Troubleshooting Flowcharts	14-62	Disassembly/Inspection/Reassembly	14-163
Lock-up Control Solenoid Valve/		Inspection	14-164
Shift Control Solenoid Valve A Assembly		Sealing Rings	
Test	14-111	Replacement	14-165
Replacement	14-111	Countershaft	
Shift Control Solenoid Valve B/C		Disassembly/Inspection/Reassembly	14-166
Test	14-112	Disassembly	14-167
Replacement	14-112	Reassembly	14-167
A/T Clutch Pressure Control Solenoid		Bearing Hub	
Valve A/B Assembly		Bearing Replacement	14-168
Test	14-113	Secondary Shaft	
Replacement	14-114	Disassembly/Inspection/Reassembly	14-169
Mainshaft/Countershaft Speed Sensors		Inspection	14-170
Replacement	14-114	Secondary Shaft Idler Gear	
2nd Clutch Pressure Switch		Bearing Replacement	14-172
Replacement	14-115	Clutch	
3rd Clutch Pressure Switch		Illustrated Index	14-173
Replacement	14-115	Disassembly	14-175
Mode Switch		Reassembly	14-177
Replacement	14-116	Differential	
PCM		Components	14-181
Replacement	14-116	Backlash Inspection	14-181
A/T Gear Position Switch		Bearing Replacement	14-182
Test	14-117	Differential Carrier Replacement	14-182
Replacement	14-118	Tapered Roller Bearing	
A/T Gear Position Indicator		Preload Adjustment	14-183
Indicator Input Test	14-120	Tapered Roller Bearing Outer Race	
Interlock System		Replacement	14-186
Control Unit Input Test	14-122	Oil Seals Replacement	14-187
Key Interlock Solenoid Test	14-124	Torque Converter Housing Bearings	
Shift Lock Solenoid Test	14-124	Mainshaft Bearing/Oil Seal Replacement	14-188
Shift Lock Solenoid Replacement	14-125	Countershaft Bearing Replacement	14-189
Hydraulic System		Secondary Shaft Bearing Replacement	14-189
Symptom-to-Component Chart		Transmission Housing Bearings	
Hydraulic System	14-126	Removal/Installation	14-190
Road Test	14-130	Parking Brake Stop	
Stall Speed		Inspection/Adjustment	14-191
Test	14-132	Transmission	
Fluid Level		Reassembly	14-192
Checking	14-133	Torque Converter/Drive Plate	14-203
Changing	14-133	Transmission	
Pressure Testing	14-134	Installation	14-204
Transmission		ATF Cooler Hoses	
Transmission		Connection	14-209
Removal	14-136	Shift Lever	
Illustrated Index		Removal	14-210
Right Side Cover	14-142	Disassembly/Reassembly-LHD	14-211
Transmission Housing	14-144	Disassembly/Reassembly-RHD	14-212
Torque Converter Housing/Valve Body	14-146	Shift Lock/Reverse Lock Mechanism	14-213
Right Side Cover		Installation	14-213
Removal	14-148	Shift Cable	
Transmission Housing		Replacement	14-215
Removal	14-150	Adjustment	14-218



Special Tools

Ref. No.	Tool Number	Description	Qty	Remark
①	07GAD - 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 technical drawings illustrate the following tools:

- ①: Driver Attachment, 78 x 90 mm
- ②: Housing Puller
- ③: Preload Inspection Tool
- ④: Adjustable Bearing Remover Set
- ④-1: Bearing Remover Attachment
- ④-2: Remover Handle Assembly
- ④-3: Remover Weight
- ⑤: Driver Attachment, 58 mm
- ⑥: Pilot, 28 x 30 mm
- ⑦: Driver Attachment, 65 x 65 mm
- ⑧: Attachment, 40 x 50 mm
- ⑨: Clutch Spring Compressor Set
- ⑨-1: Clutch Spring Compressor Bolt Assembly
- ⑨-2: Clutch Spring Compressor Attachment
- ⑨-3: Clutch Spring Compressor Attachment
- ⑩: Snap Ring Pliers
- ⑪: Mainshaft Holder Set
- ⑫: SCS Short Connector
- ⑬: A/T Oil Pressure Gauge Set
- ⑭: Driver Attachment, 32 x 35 mm
- ⑮: Driver Attachment, 42 x 47 mm
- ⑯: Driver Attachment, 62 x 68 mm
- ⑰: Driver Attachment, 72 x 75 mm
- ⑱: Driver 40 mm I.D.
- ⑲: Handle Driver

Description



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 mainshaft, 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 countershaft 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 dashboard, 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 pressurizes 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 optimizes the timing of the lock-up mechanism. When 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 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.

(cont'd)

Description

(cont'd)

Gear Selection

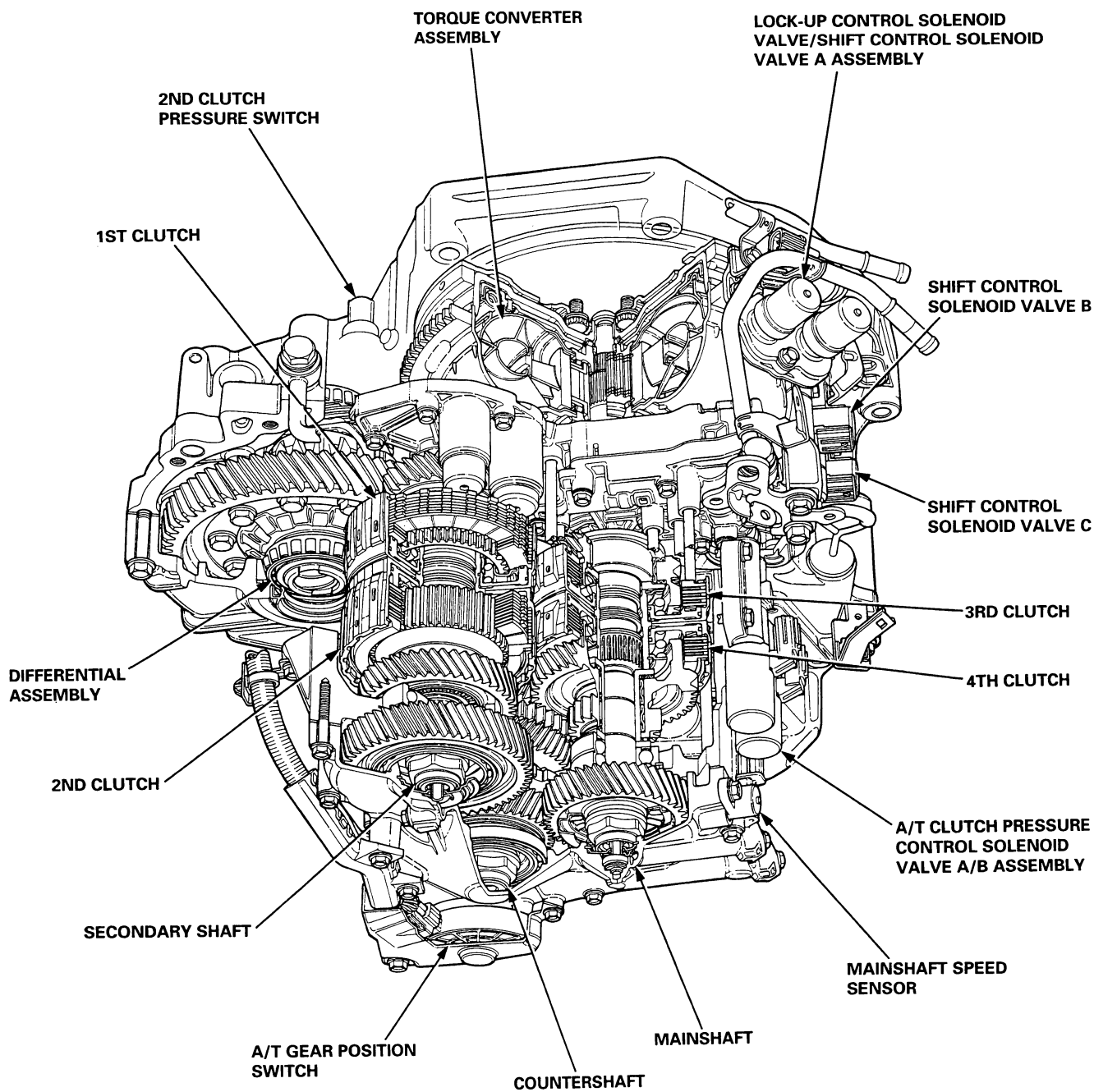
The shift lever has eight positions: **P** PARK, **R** REVERSE, **N** NEUTRAL, **D₄** 1st through 4th gear ranges, **D₃** 1st through 3rd gear ranges, **2** 2nd gear and **1** 1st gear. Also manual mode has been adopted in **D₄** position.

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) 4 or 3 or 2 or 1 DRIVE	Manual shifting driving; shifts gears between 1st and 4th with the shift lever operation, much like a manual transmission. The transmission will automatically downshifts from 4th gear 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 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 mode, the indicator light next to the **D₄** indicator light in the instrument panel will display the gear selected.



Description

Clutches

The four-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. 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 discs 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

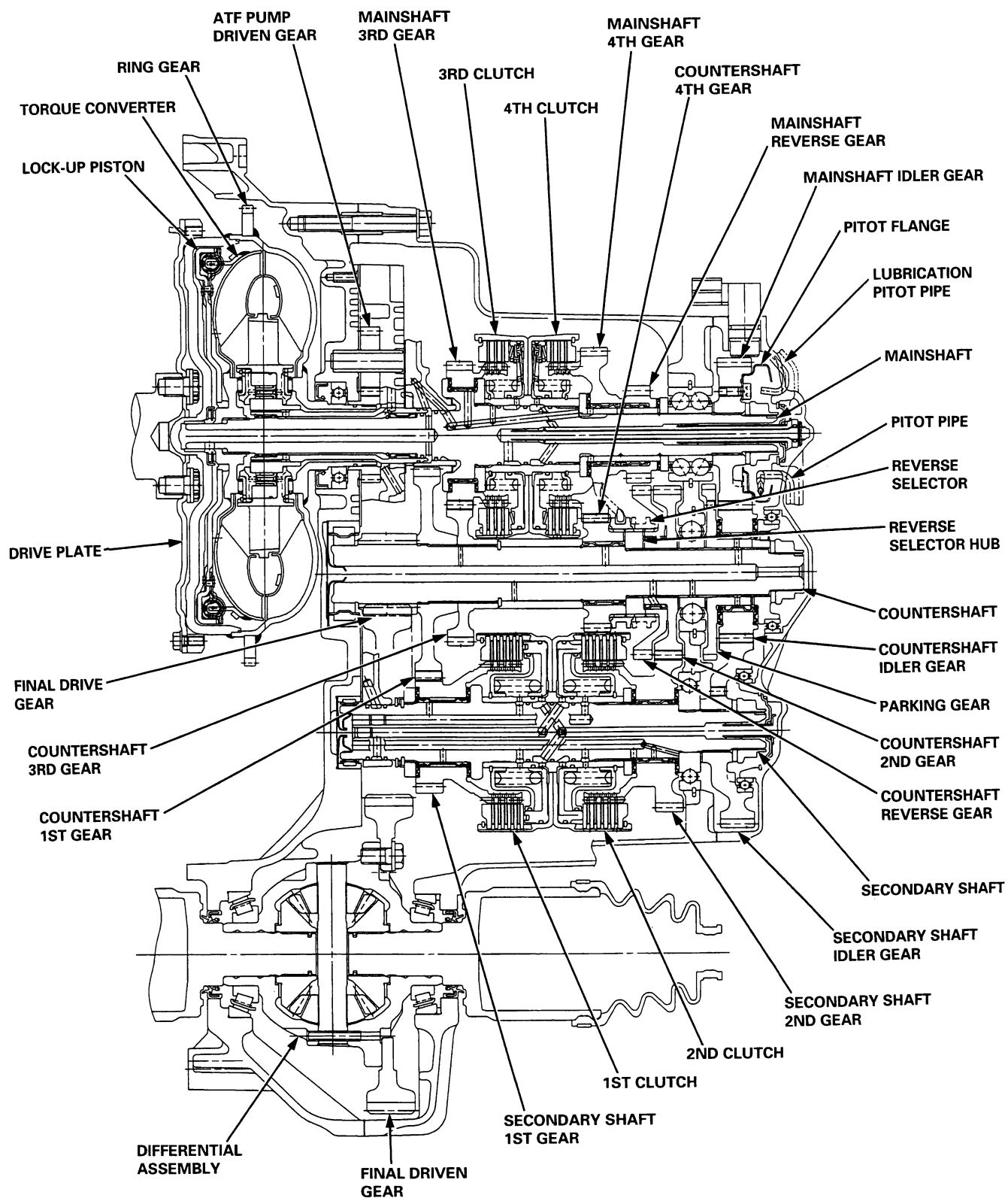
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

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.



Description

Power Flow

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.

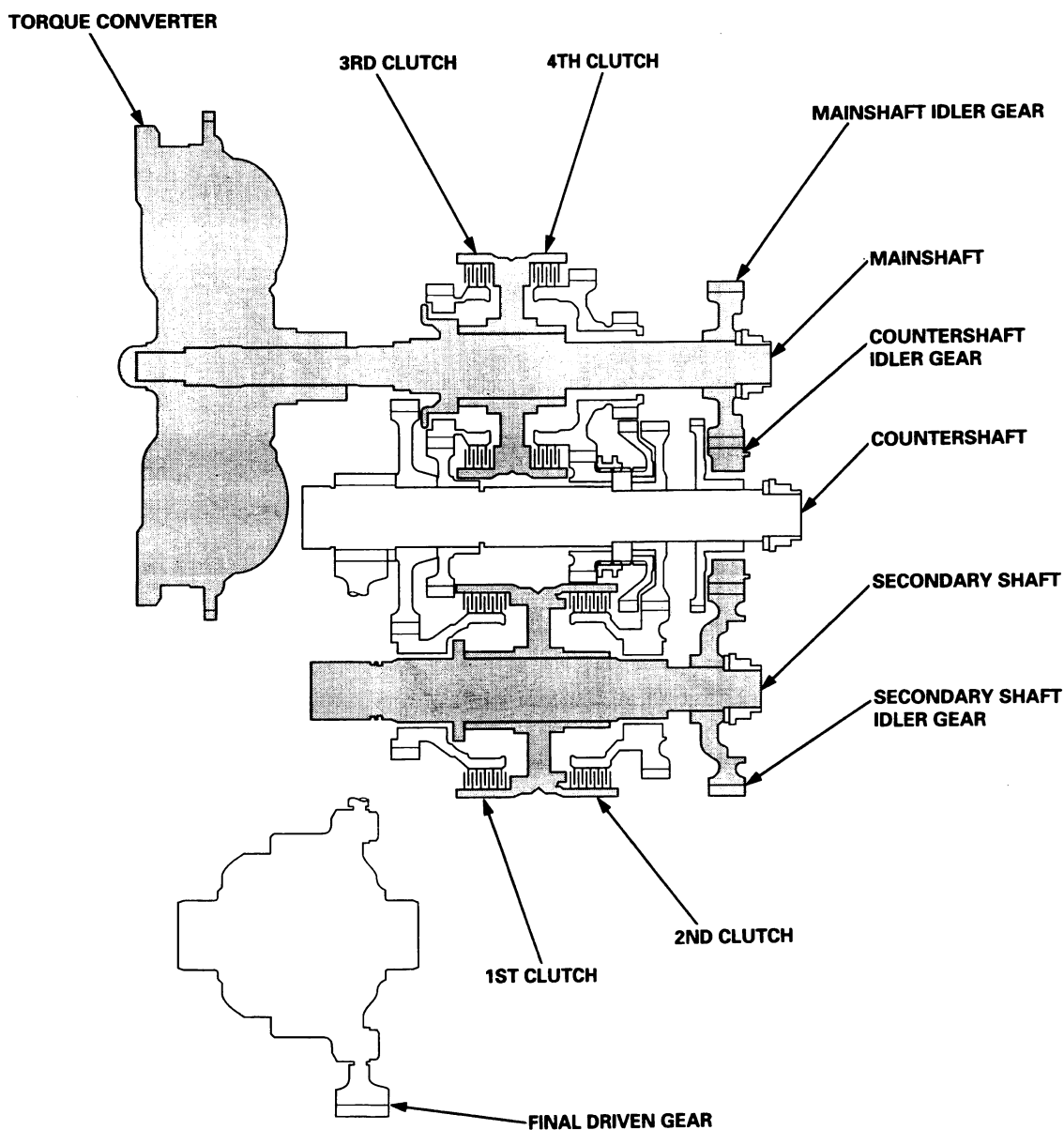


[P] Position

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, the countershaft 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.



(cont'd)

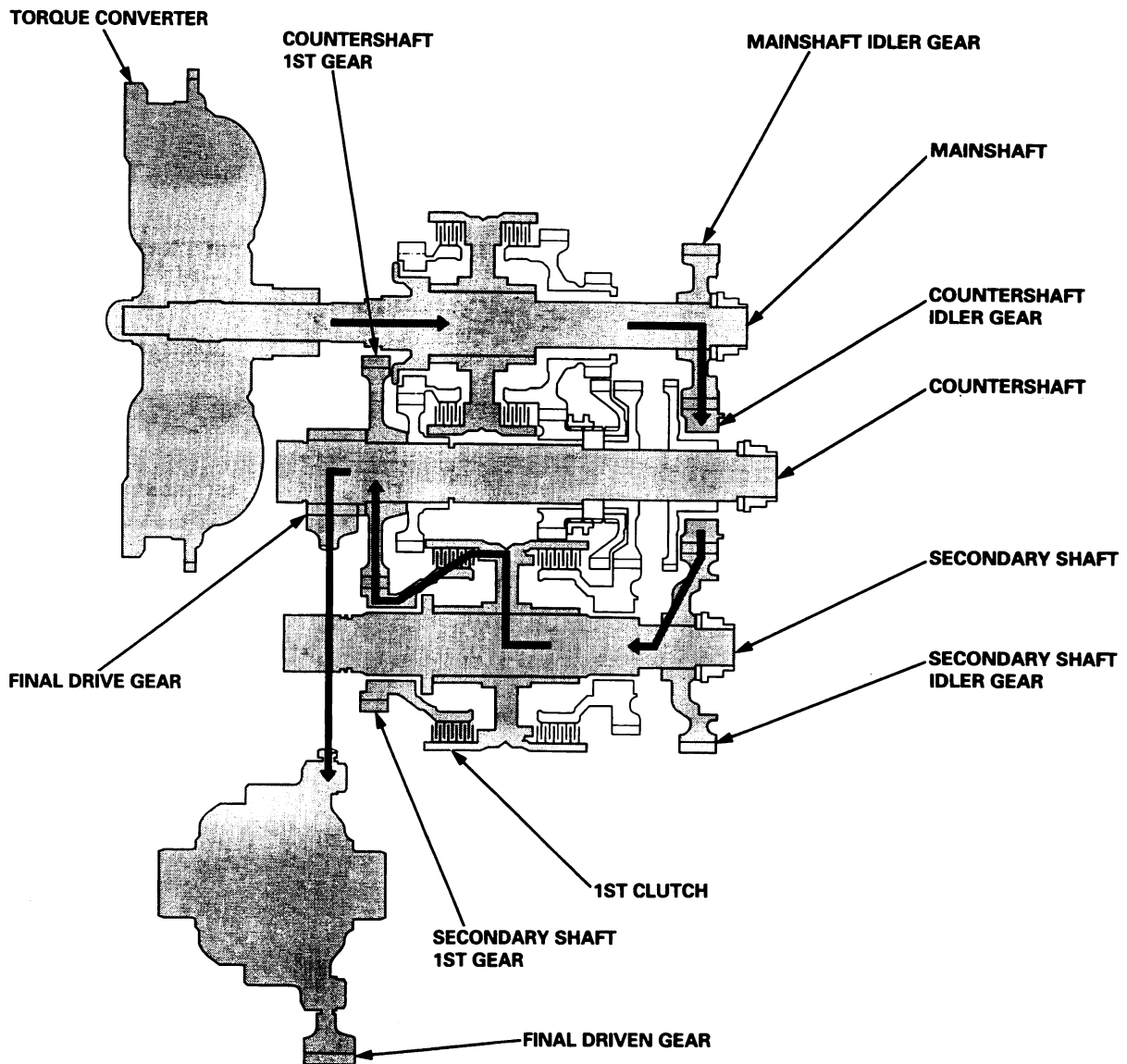
Description

Power Flow (cont'd)

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

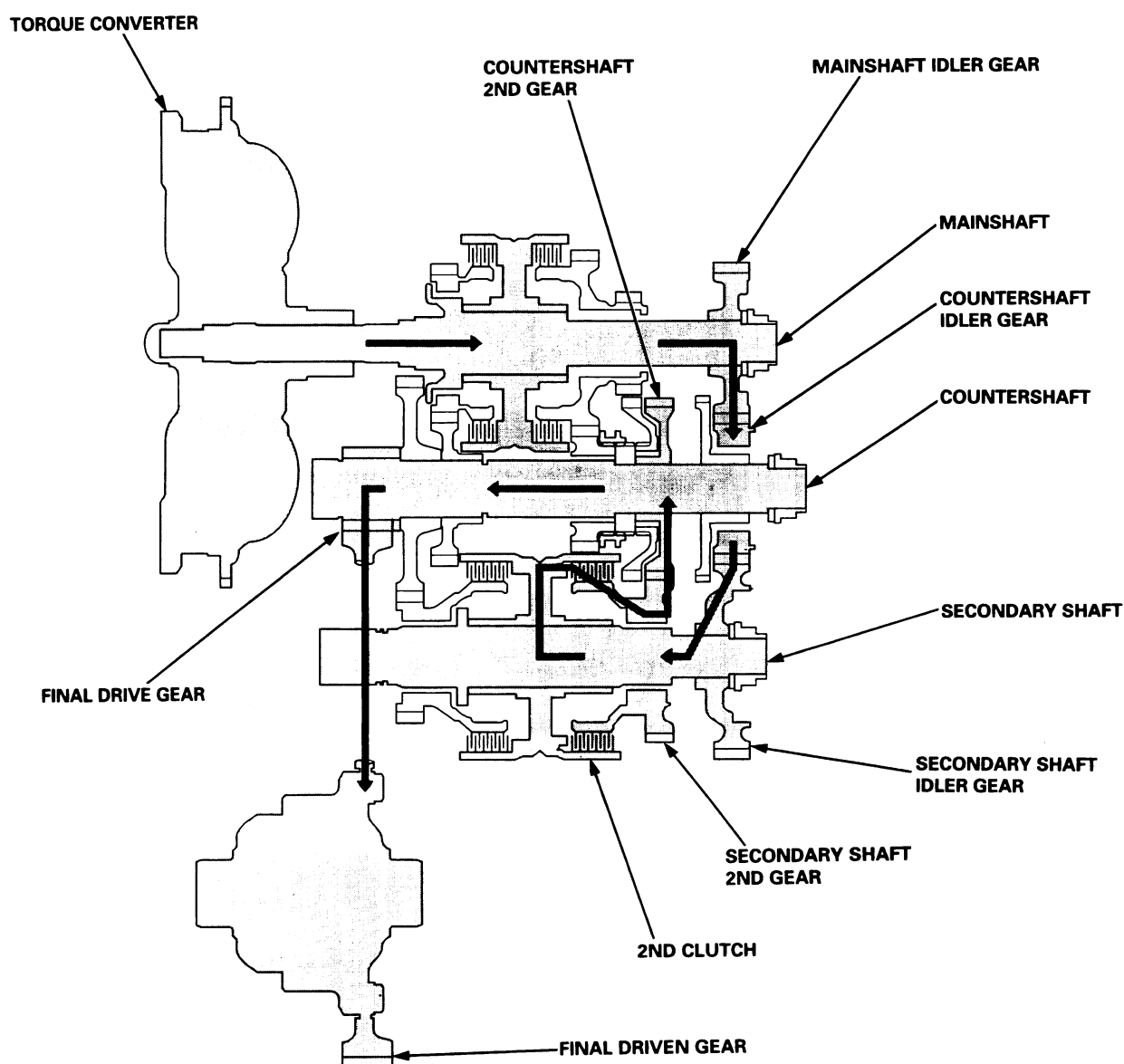
1. Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
2. The mainshaft idler gear drives the secondary shaft via the countershaft idler gear and secondary shaft idler gear.
3. The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
4. Power is transmitted to the final drive gear, which in turn drives the final driven gear.





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.



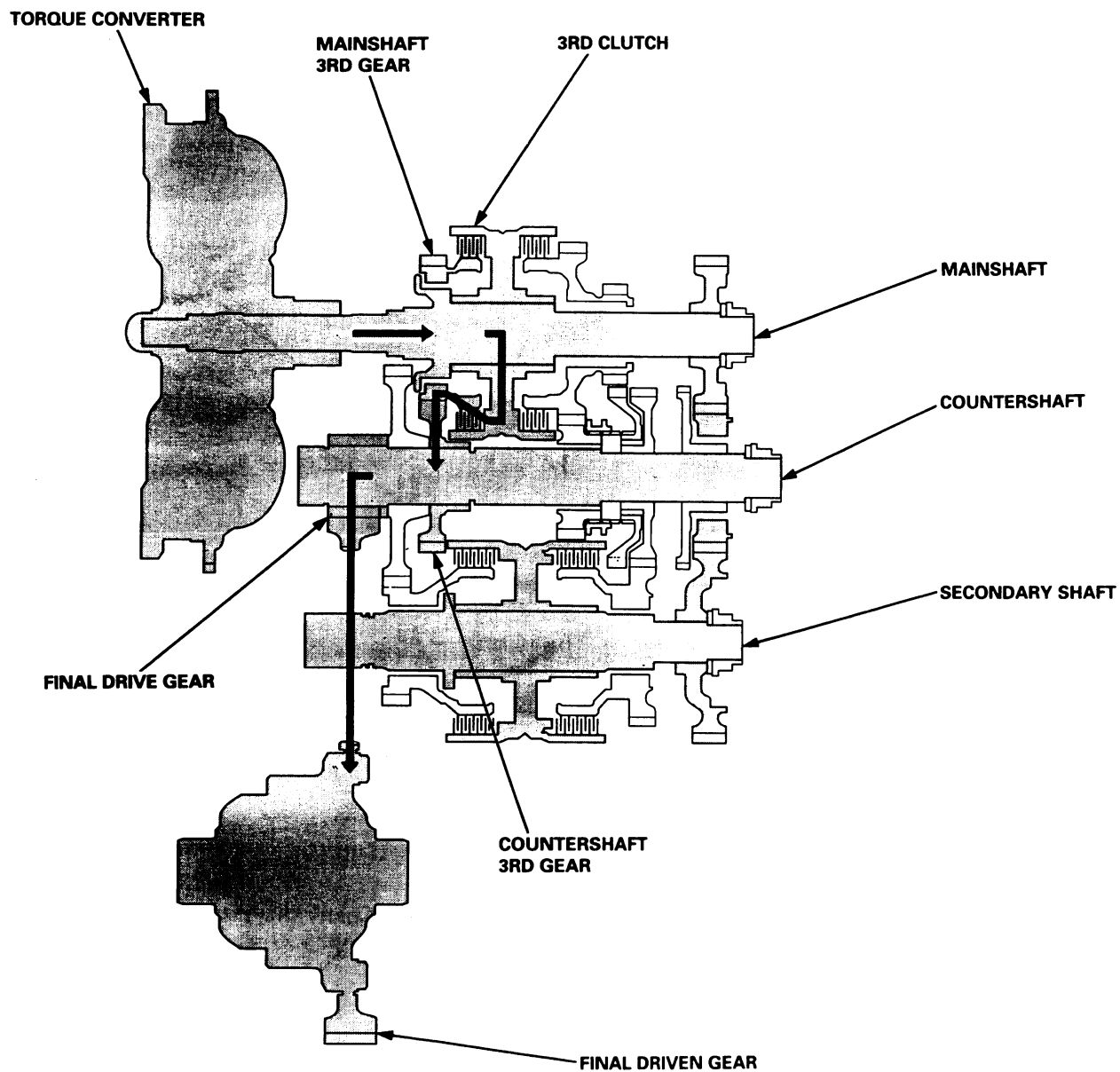
(cont'd)

Description

Power Flow (cont'd)

D₄ or **D₃** Position in 3rd gear

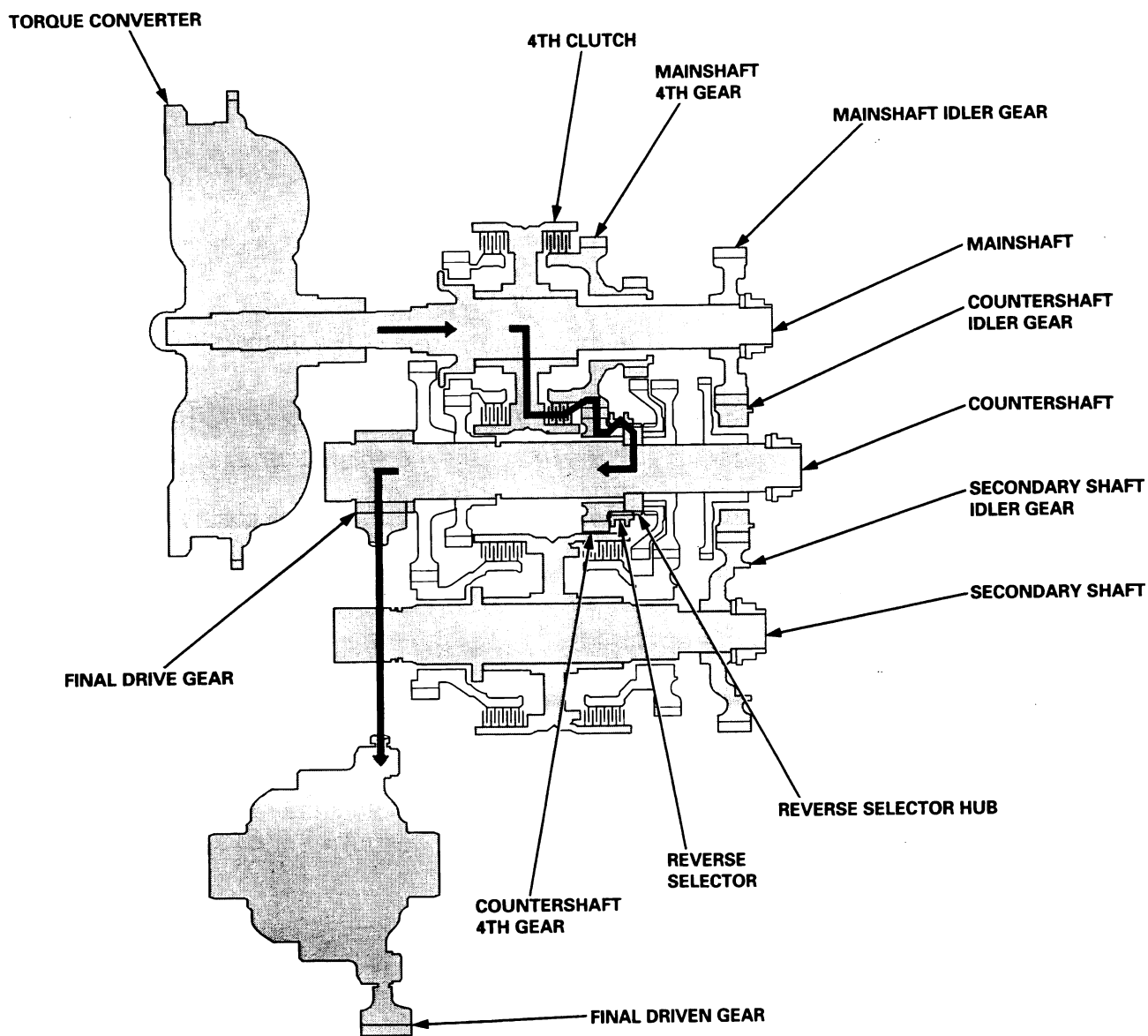
1. Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the mainshaft 3rd gear with the mainshaft.
2. The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
3. Power is transmitted to the final drive gear, which in turn drives the final driven gear.





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.



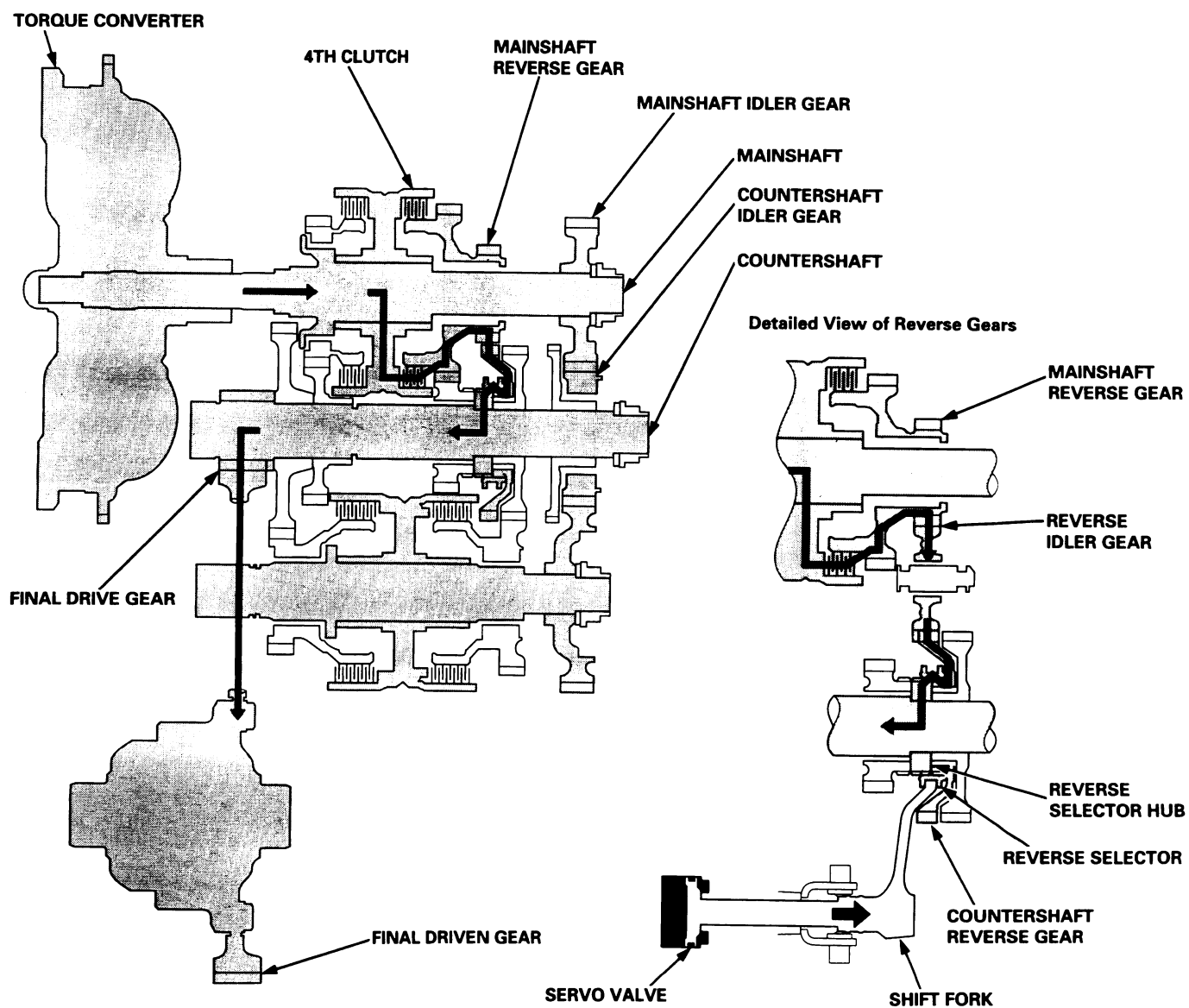
(cont'd)

Description

Power Flow (cont'd)

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.

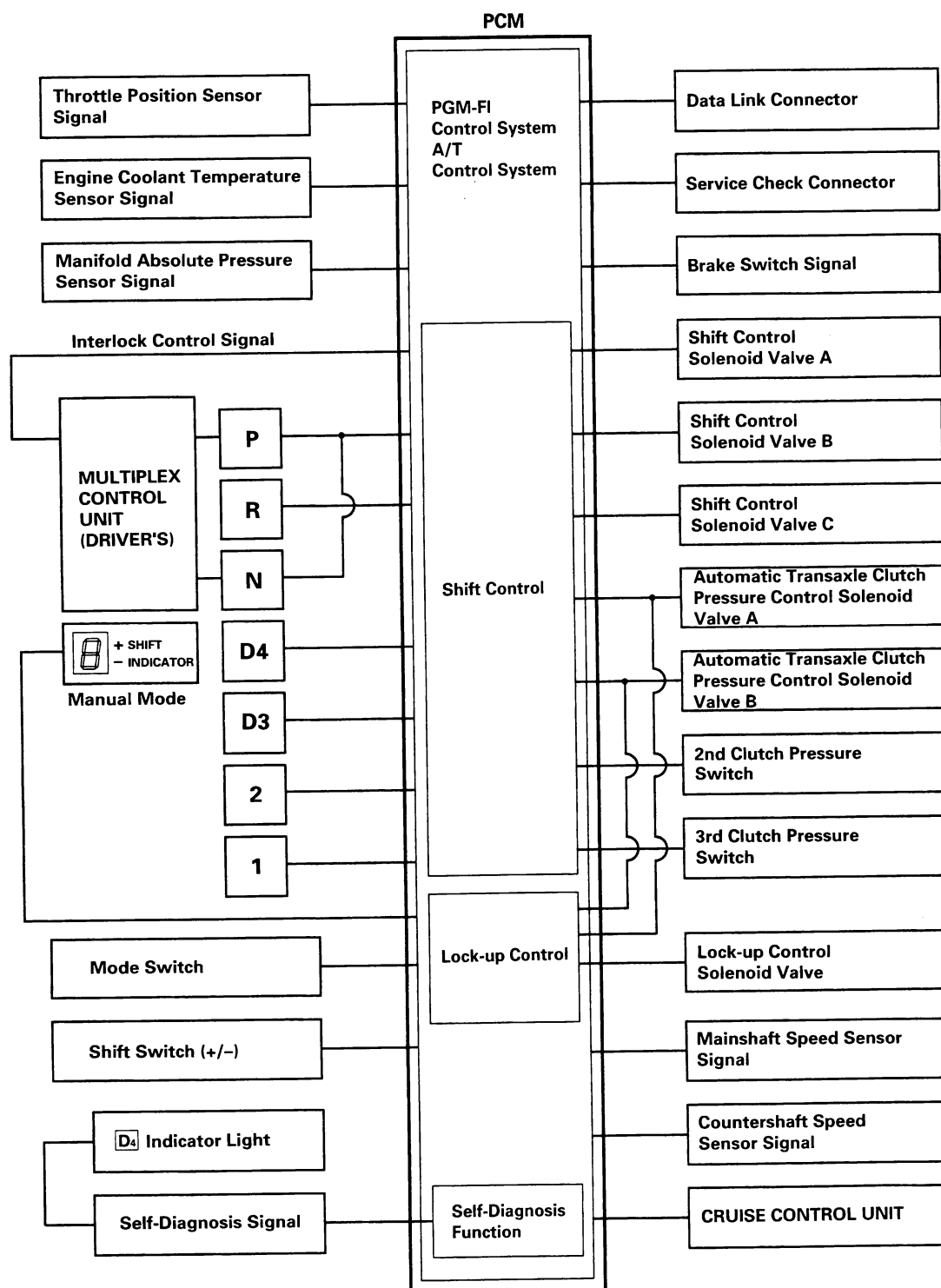




Electronic Control System

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.



(cont'd)

Description

Electronic Control System (cont'd)

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** positions 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
	Stays in 1st	OFF	ON	ON
	Shifting gears between 1st and 2nd	ON	ON	ON
	Stays in 2nd	ON	ON	OFF
	Shifting gears between 2nd and 3rd	ON	OFF	OFF
	Stays in 3rd	ON	OFF	ON
D₄	Shifting gears between 3rd and 4th	OFF	OFF	ON
	Stays in 4th	OFF	OFF	OFF
2	2nd	ON	ON	OFF
1	1st	OFF	ON	ON
R	Shifting from P and N position	OFF	ON	ON
	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.



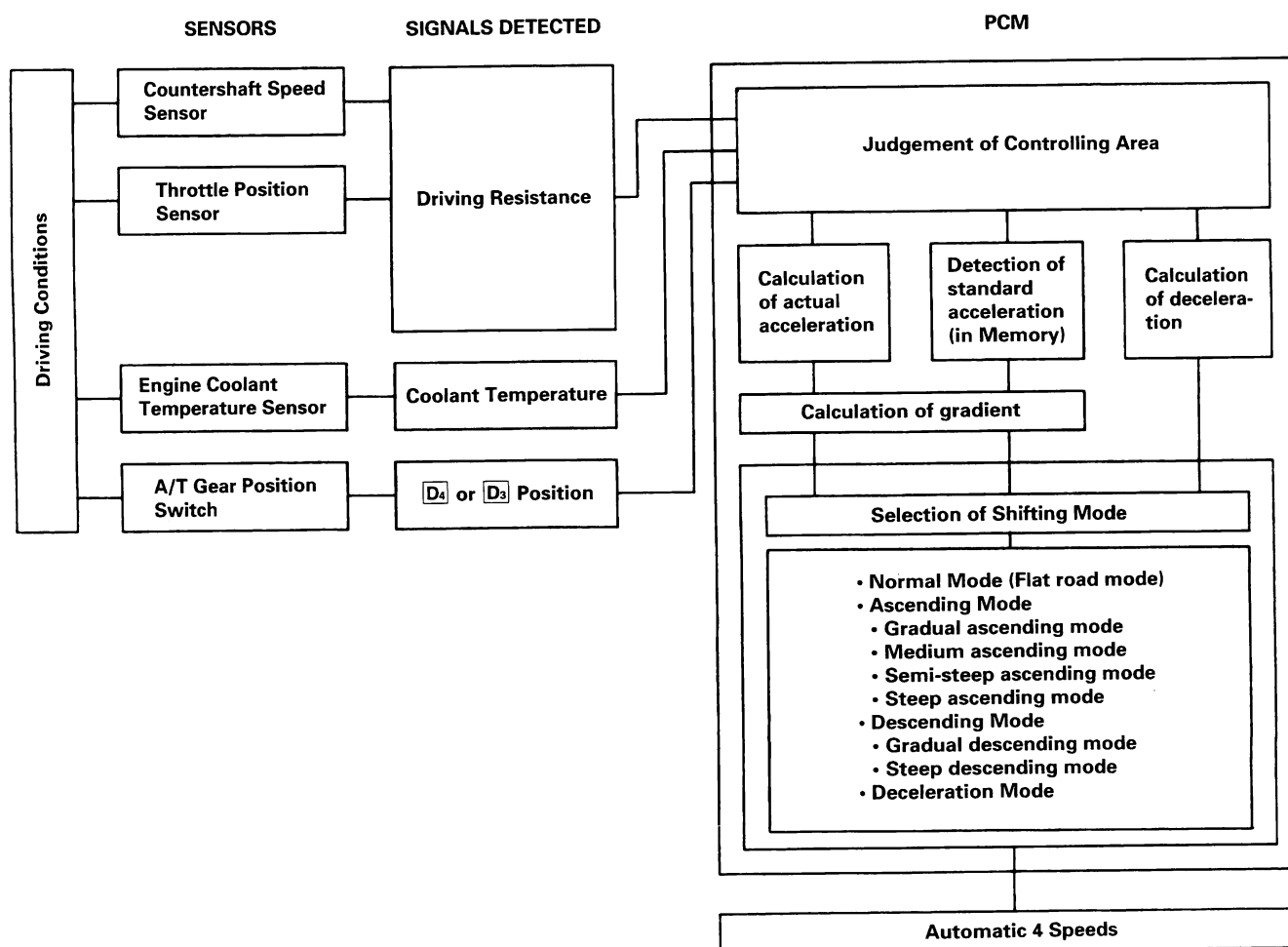
Lock-up Control

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 in **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.



(cont'd)

Description

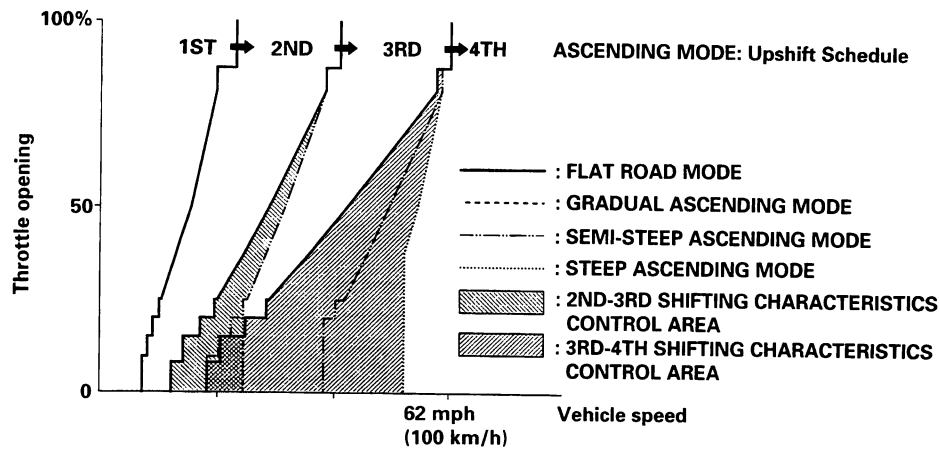
Electronic Control System (cont'd)

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.

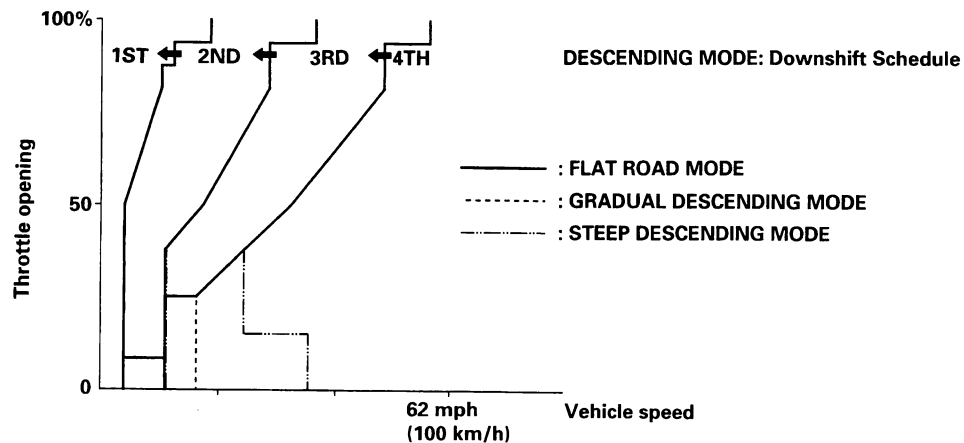
NOTE:

- 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 mind would.



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.



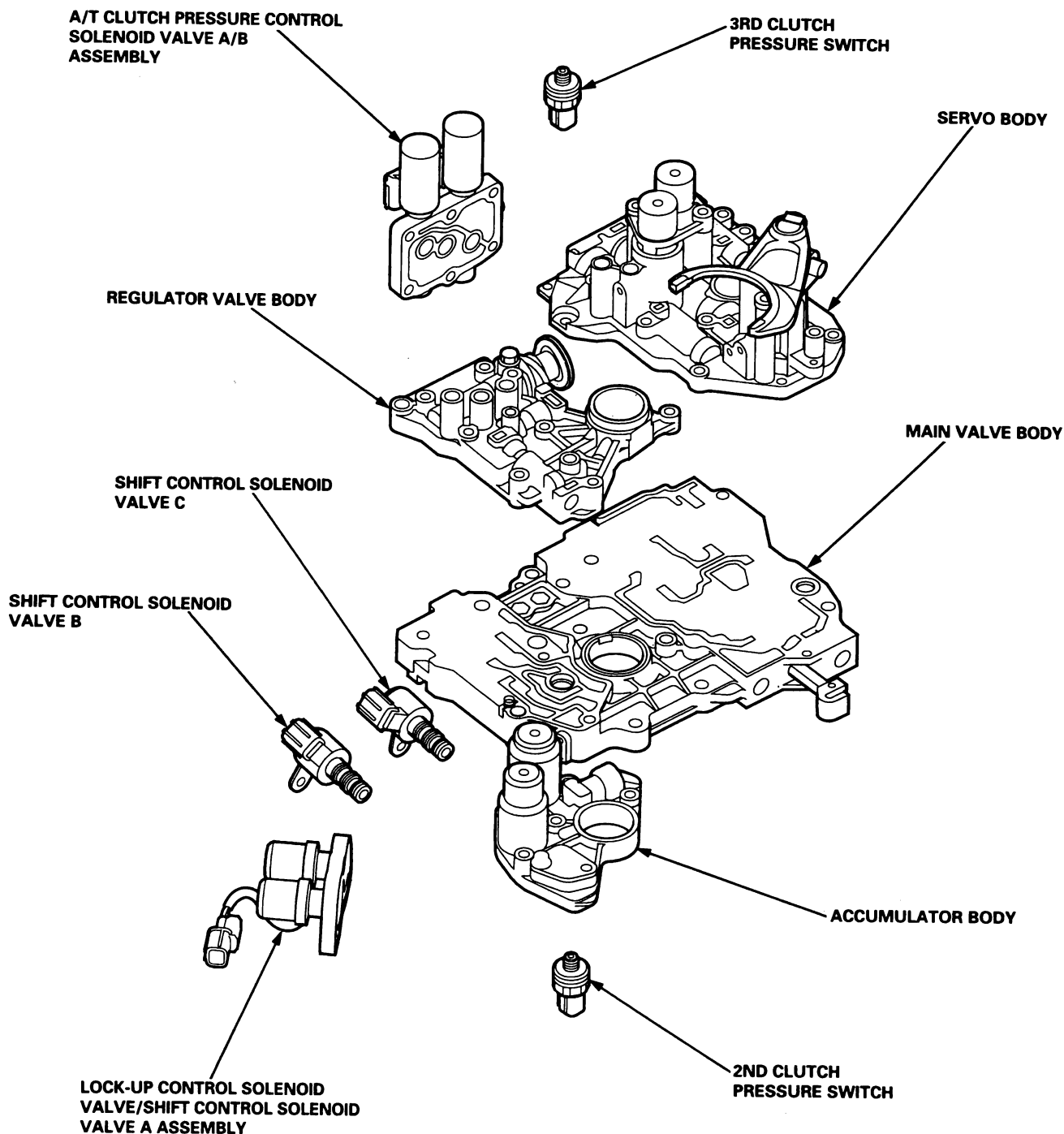
Deceleration Control

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.

Description

Hydraulic Control

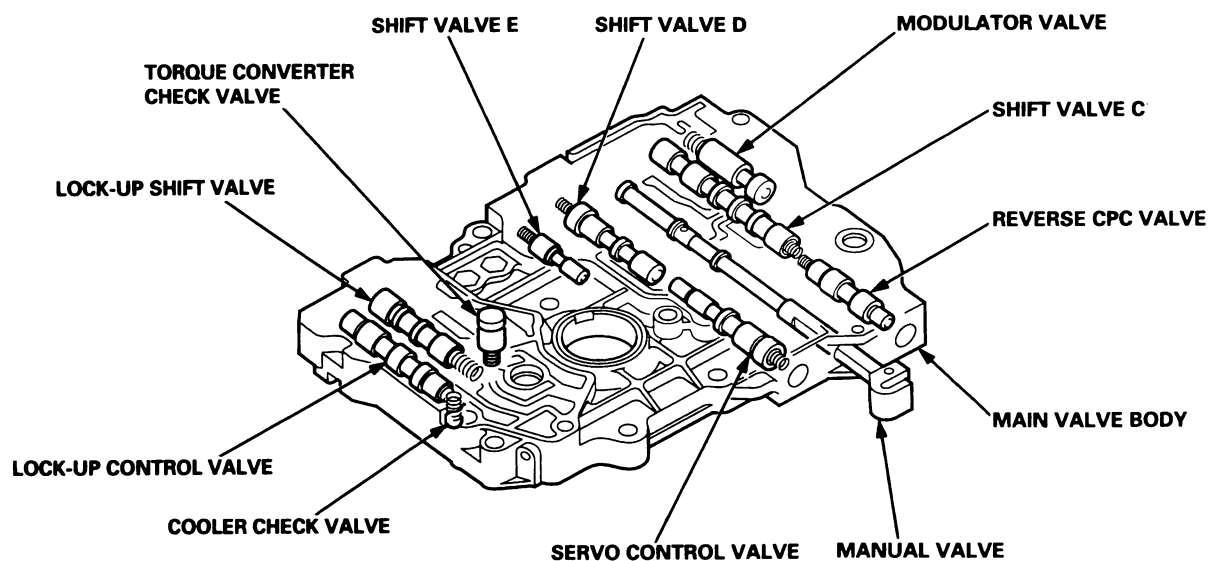
The valve body includes the main valve body, the regulator valve body, the servo body and the accumulator body. The ATF pump is driven by splines on the right end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body, to the manual valve, directing pressure to each of the clutches. The shift control solenoid valves B and C are 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.





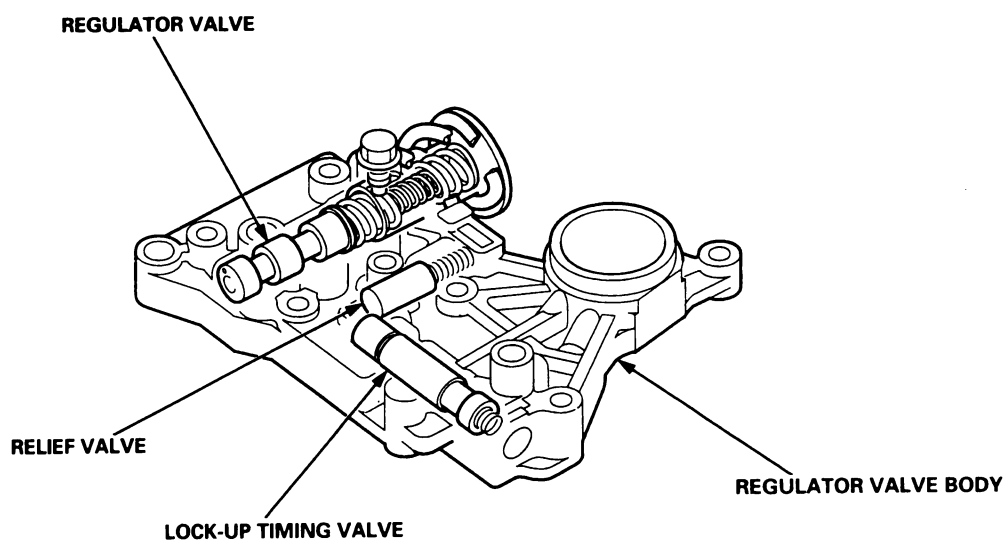
Main Valve Body

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 and 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.



(cont'd)

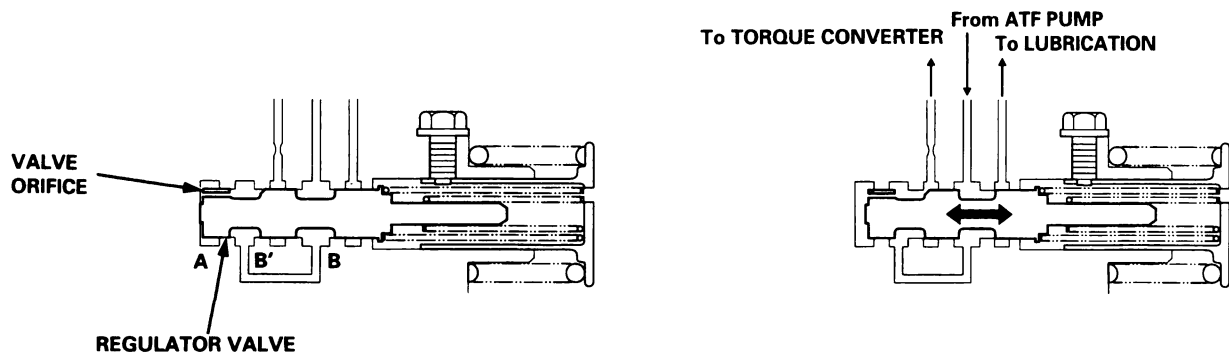
Description

Hydraulic Control (cont'd)

Regulator Valve

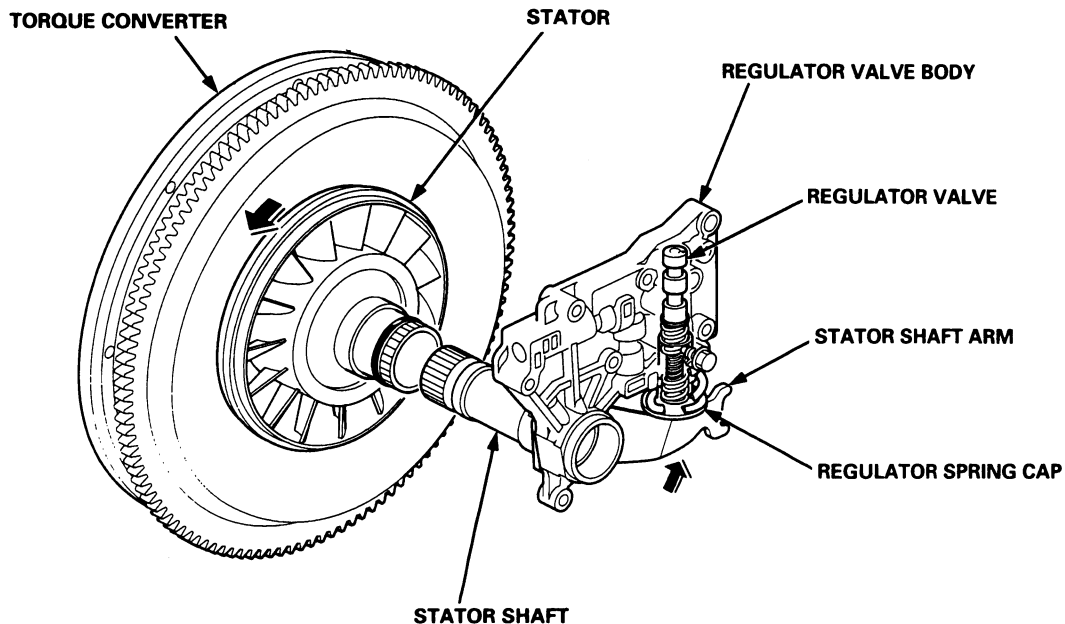
The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. The fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A 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.



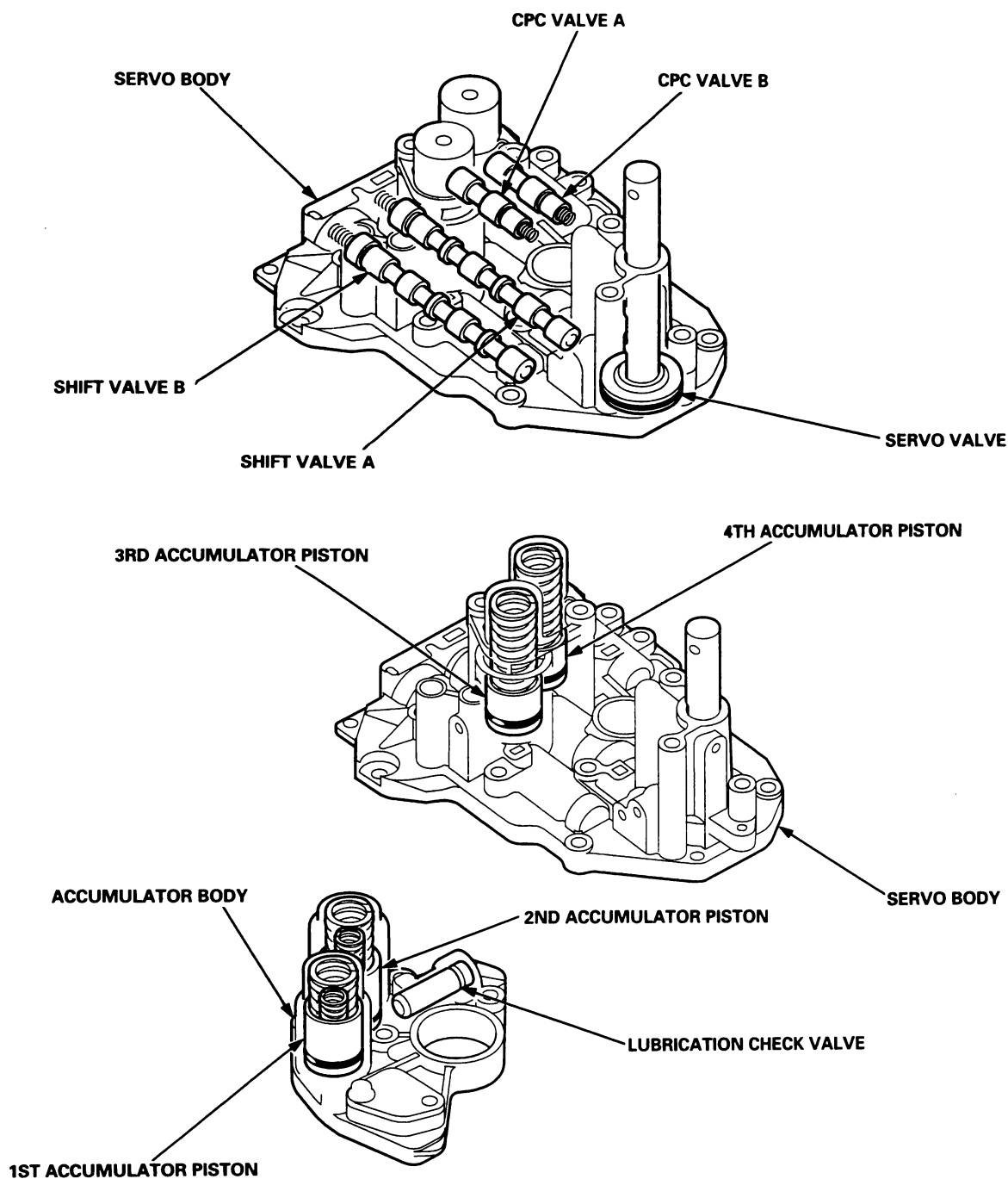


Servo Body

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.



Description

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 is 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



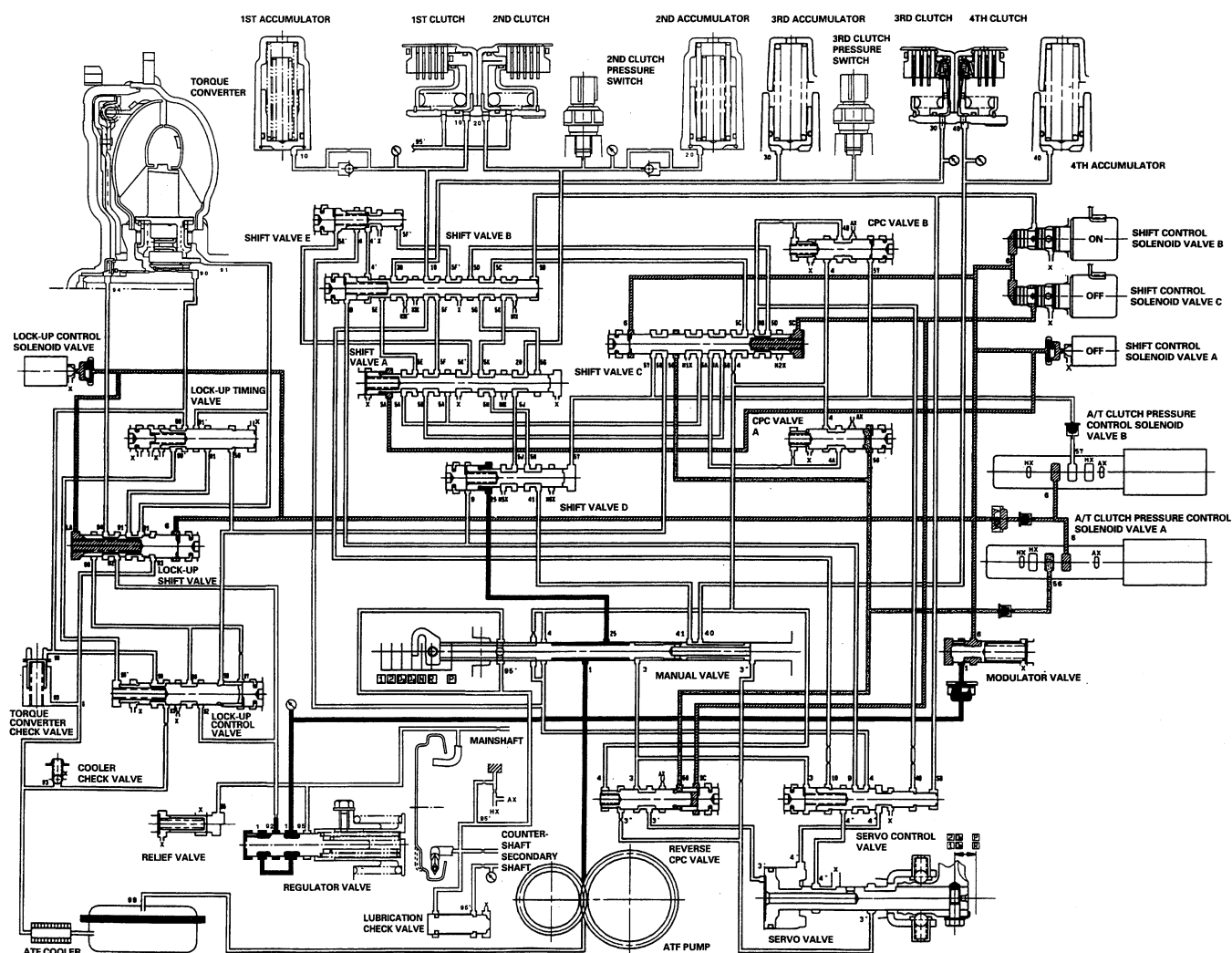
[N] Position

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.



(cont'd)

Description

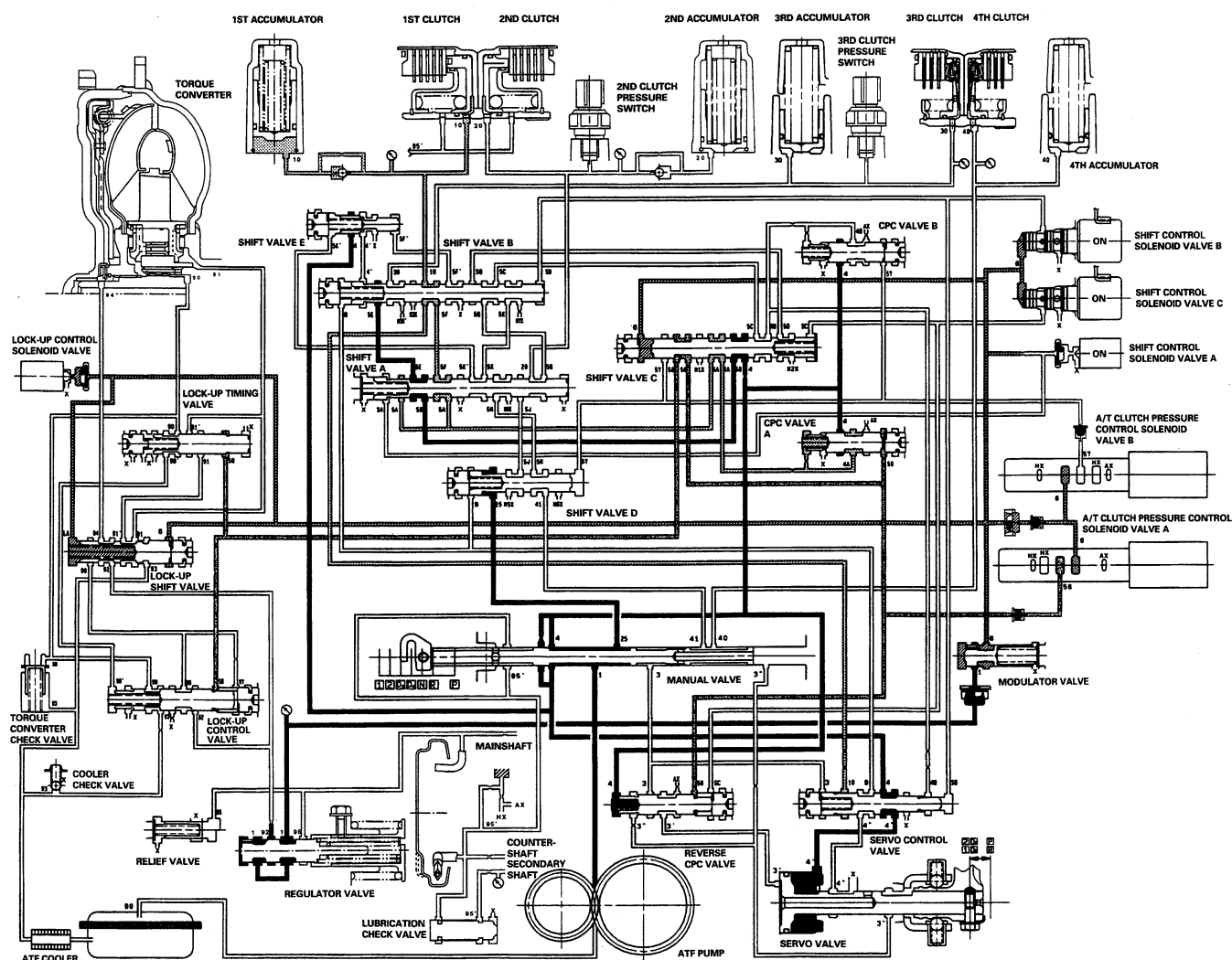
Hydraulic Flow (cont'd)

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.

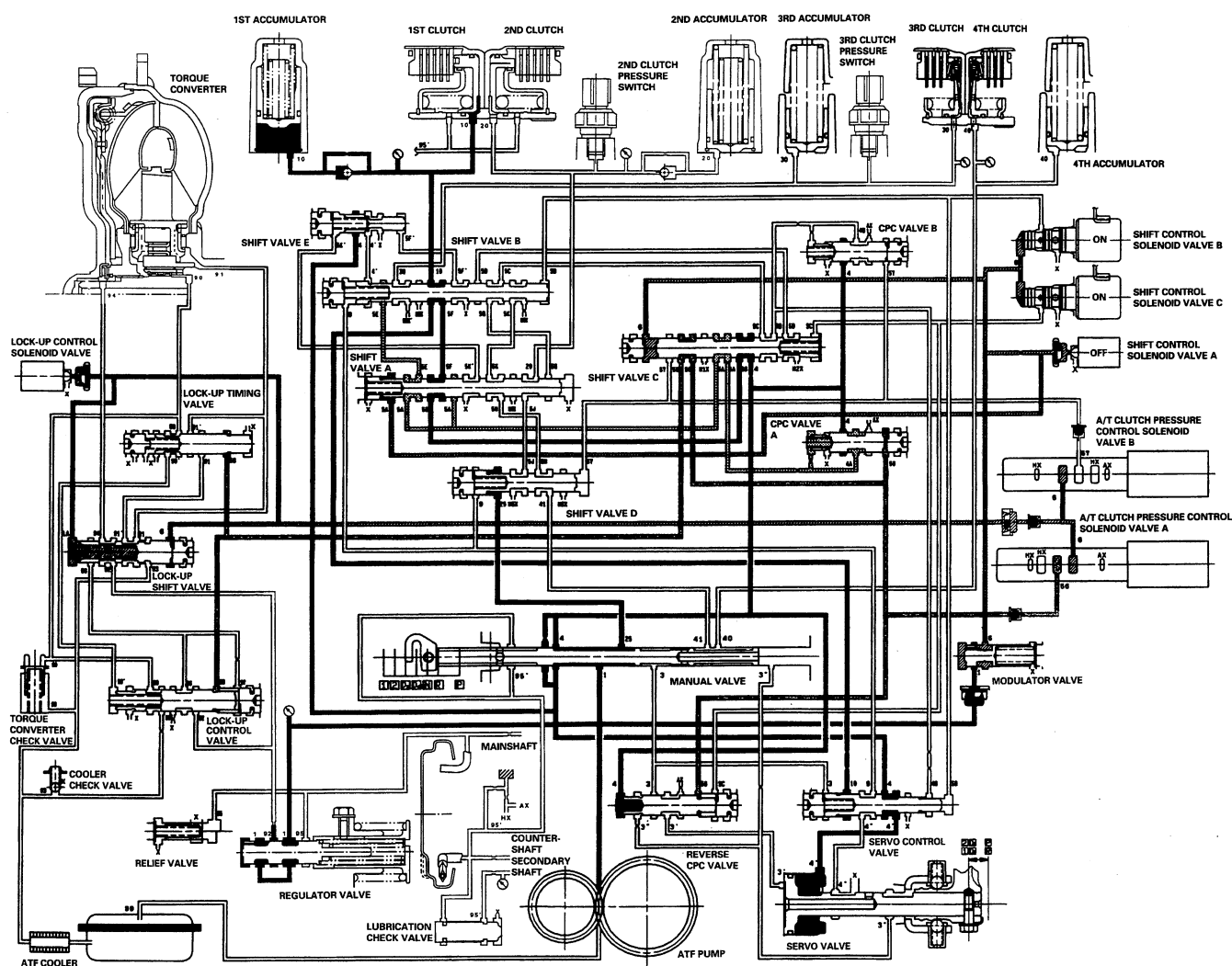




2. Driving in 1st gear

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.



(cont'd)

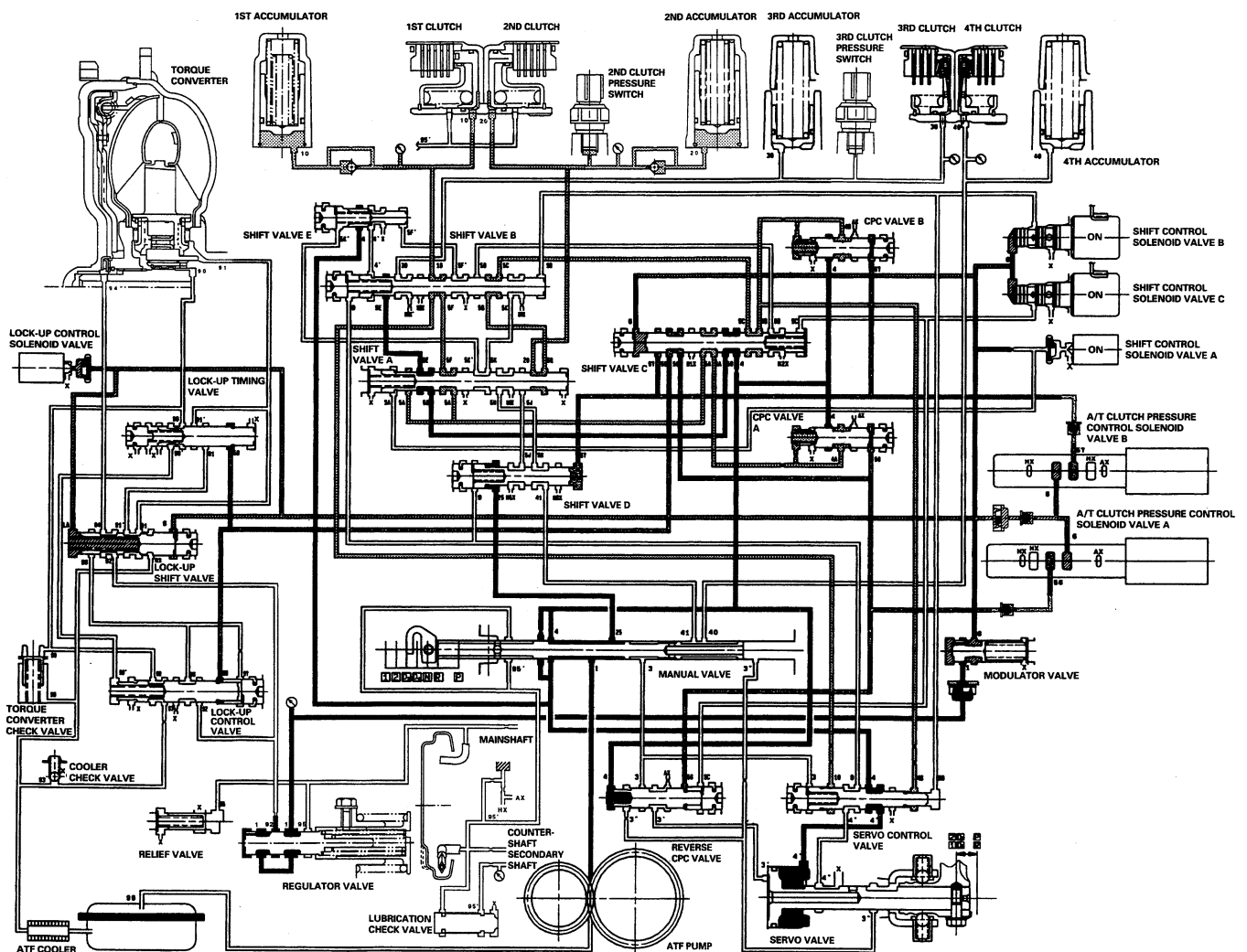
Description

Hydraulic Flow (cont'd)

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.

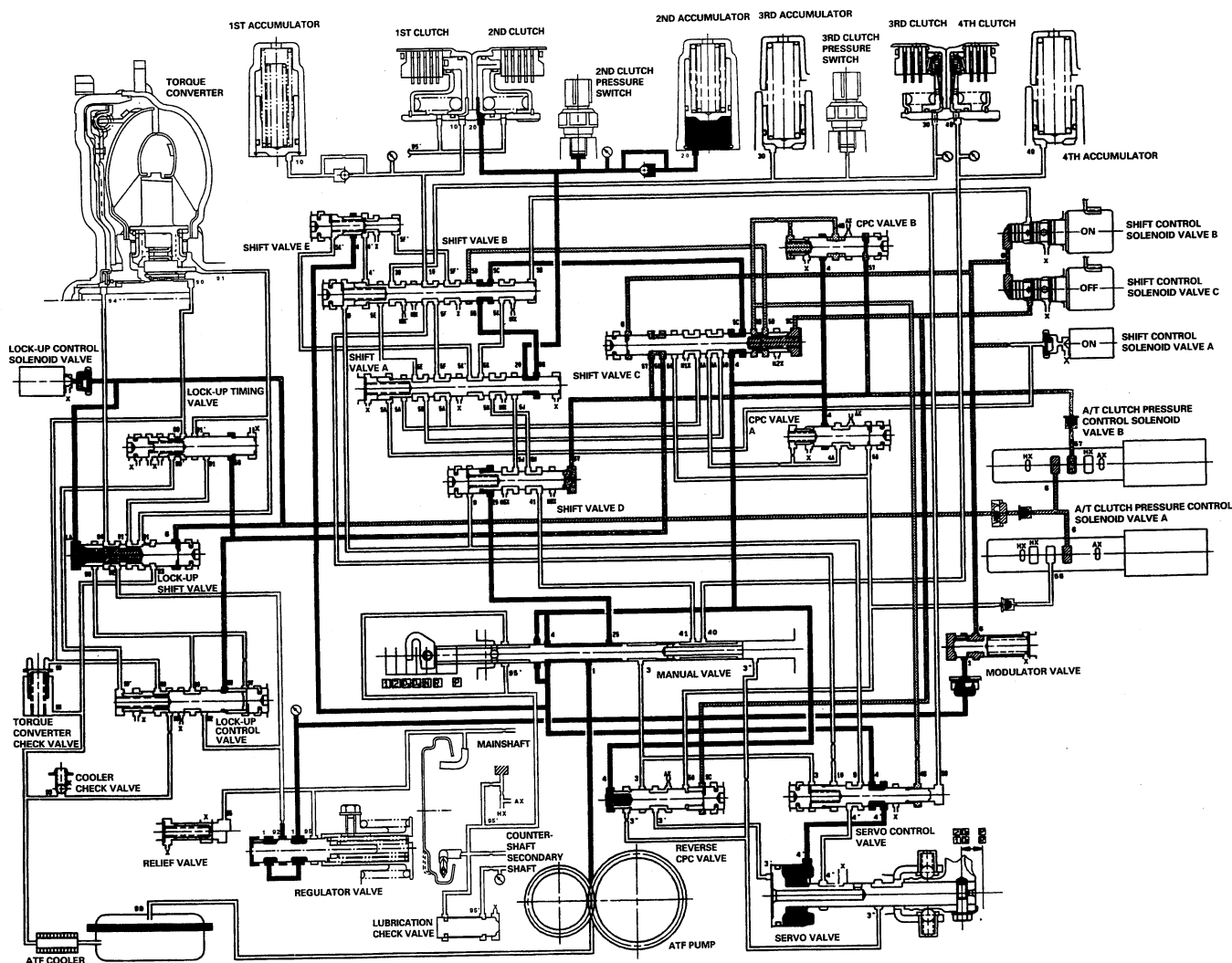




4. Driving in 2nd gear

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.



(cont'd)

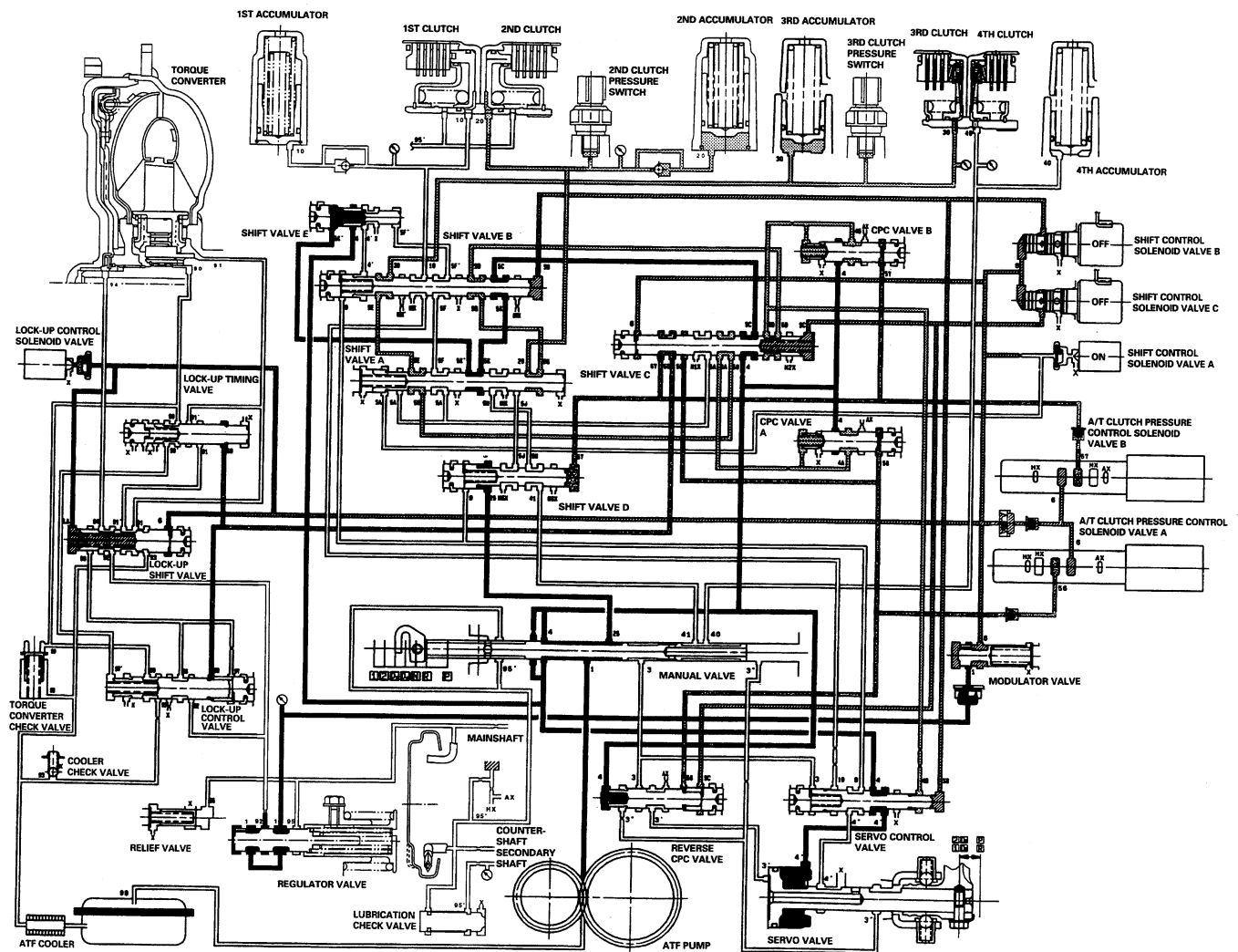
Description

Hydraulic Flow (cont'd)

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.

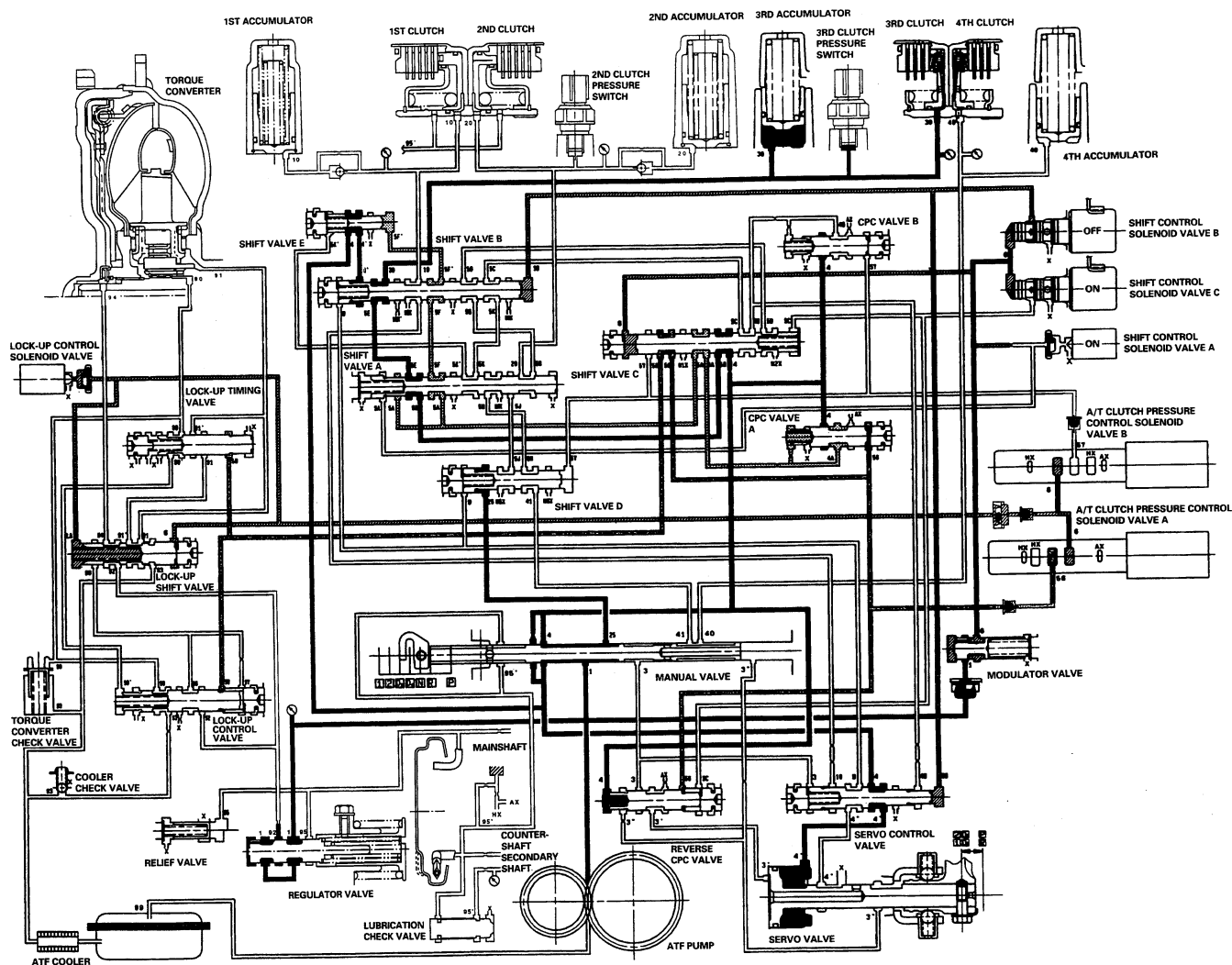




6. Driving in 3rd gear

The PCM turns shift control solenoid valve C ON, and controls A/T clutch pressure control solenoid valve B to release LS B pressure (57). 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.



(cont'd)

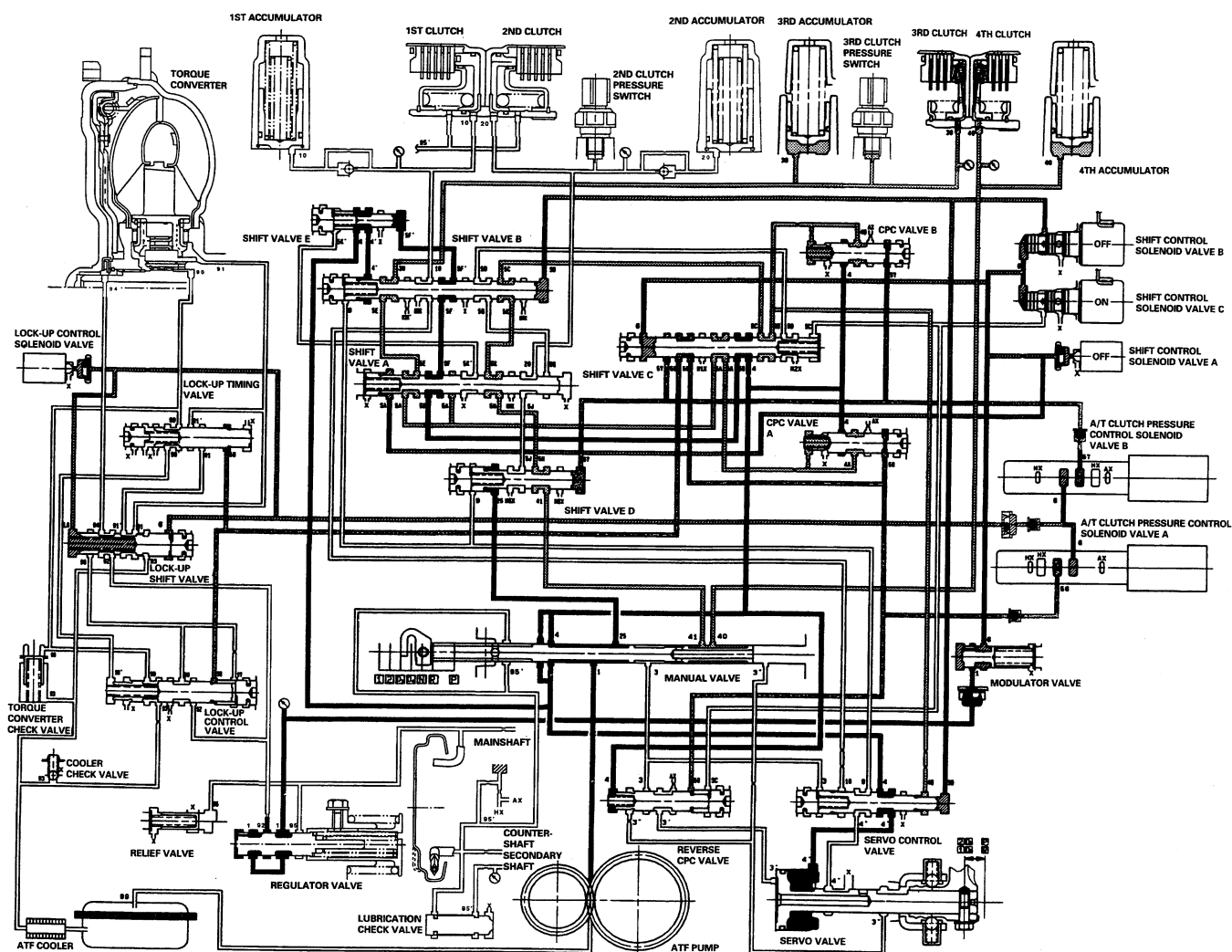
Description

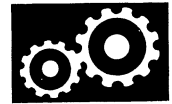
Hydraulic Flow (cont'd)

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.

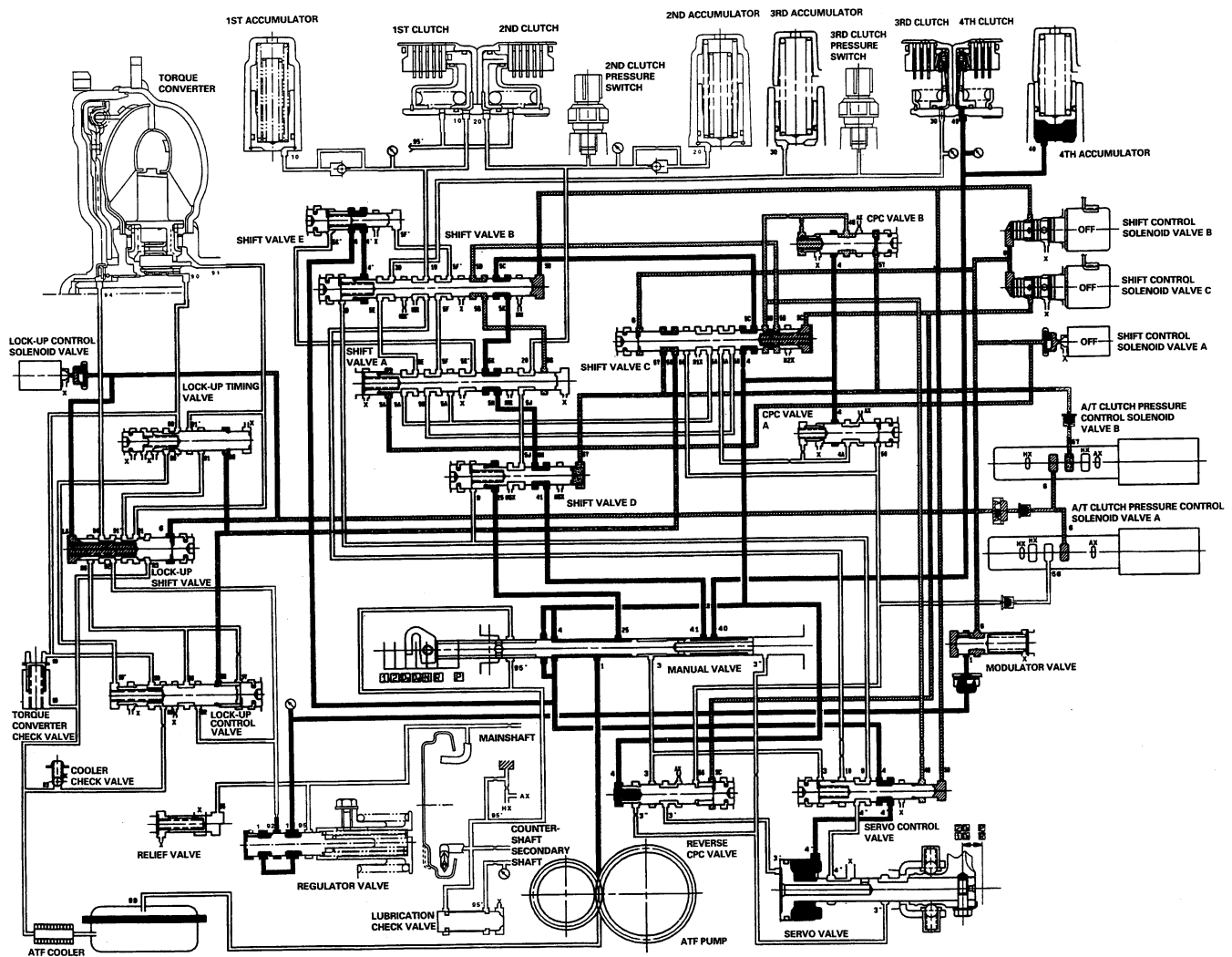




8. Driving in 4th gear

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.



(cont'd)

Description

Hydraulic Flow (cont'd)

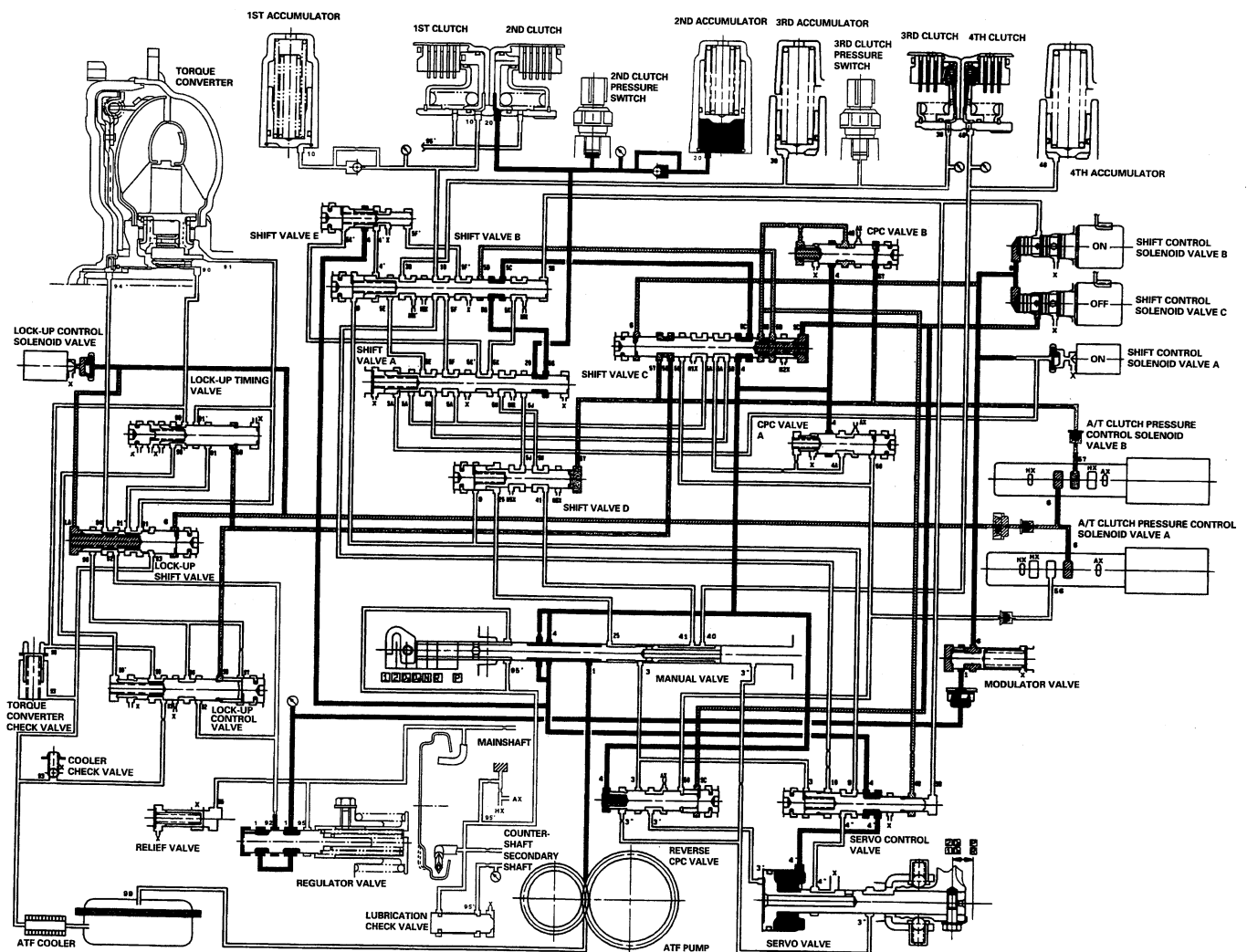
2 Position

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 (5C) 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.





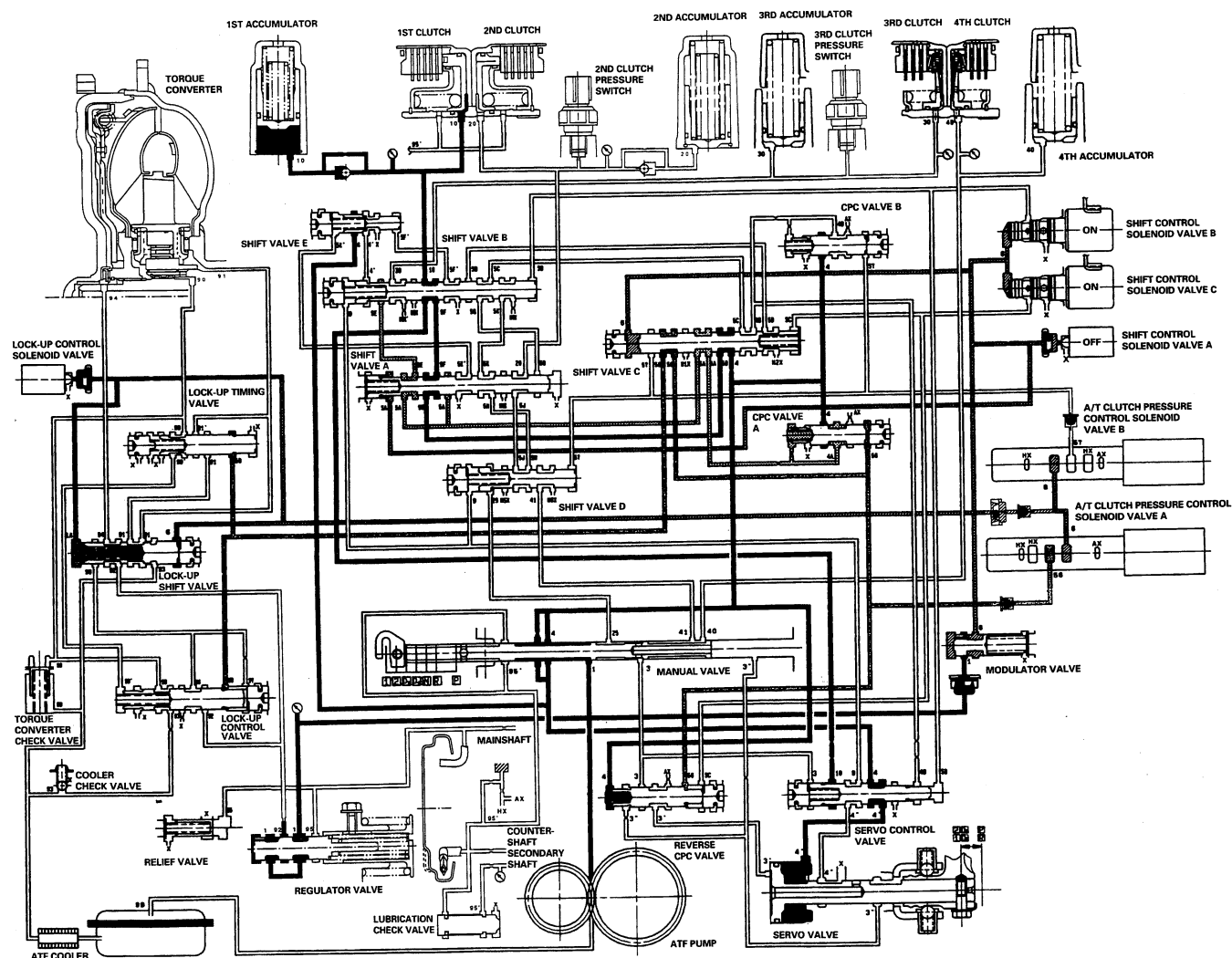
1 Position

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.



(cont'd)

Description

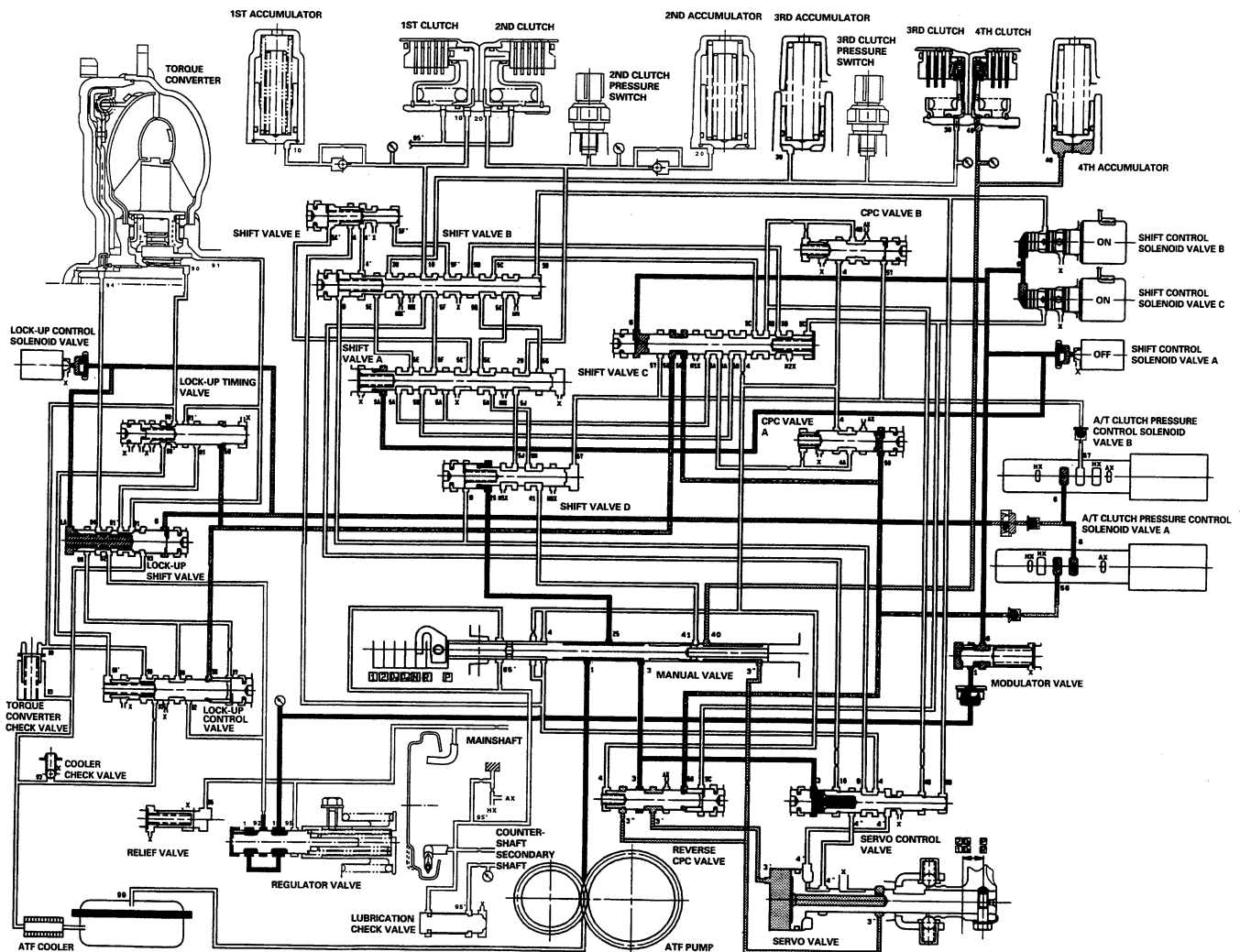
Hydraulic Flow (cont'd)

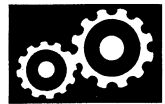
R Position

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.

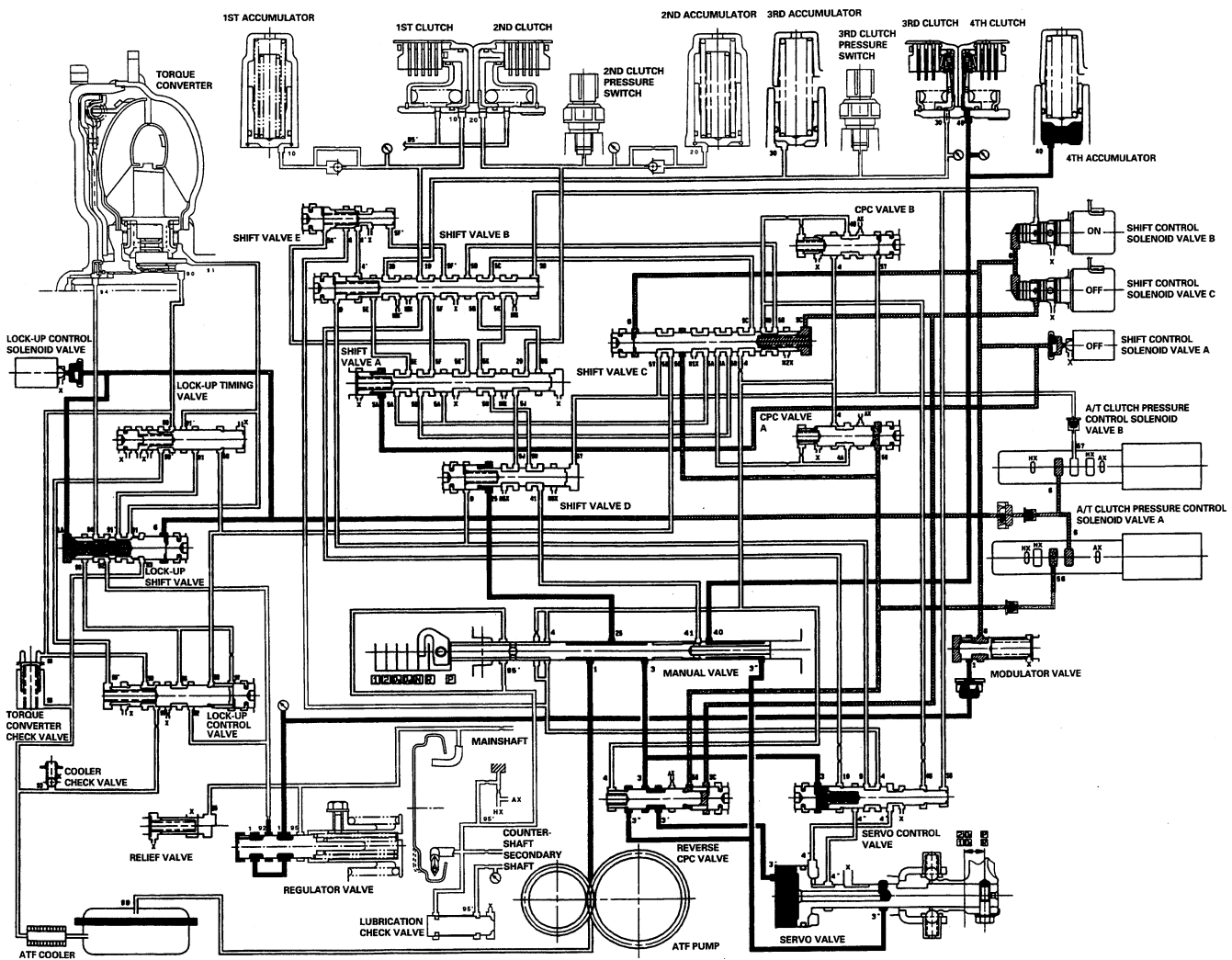




2. Driving in reverse gear

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.



(cont'd)

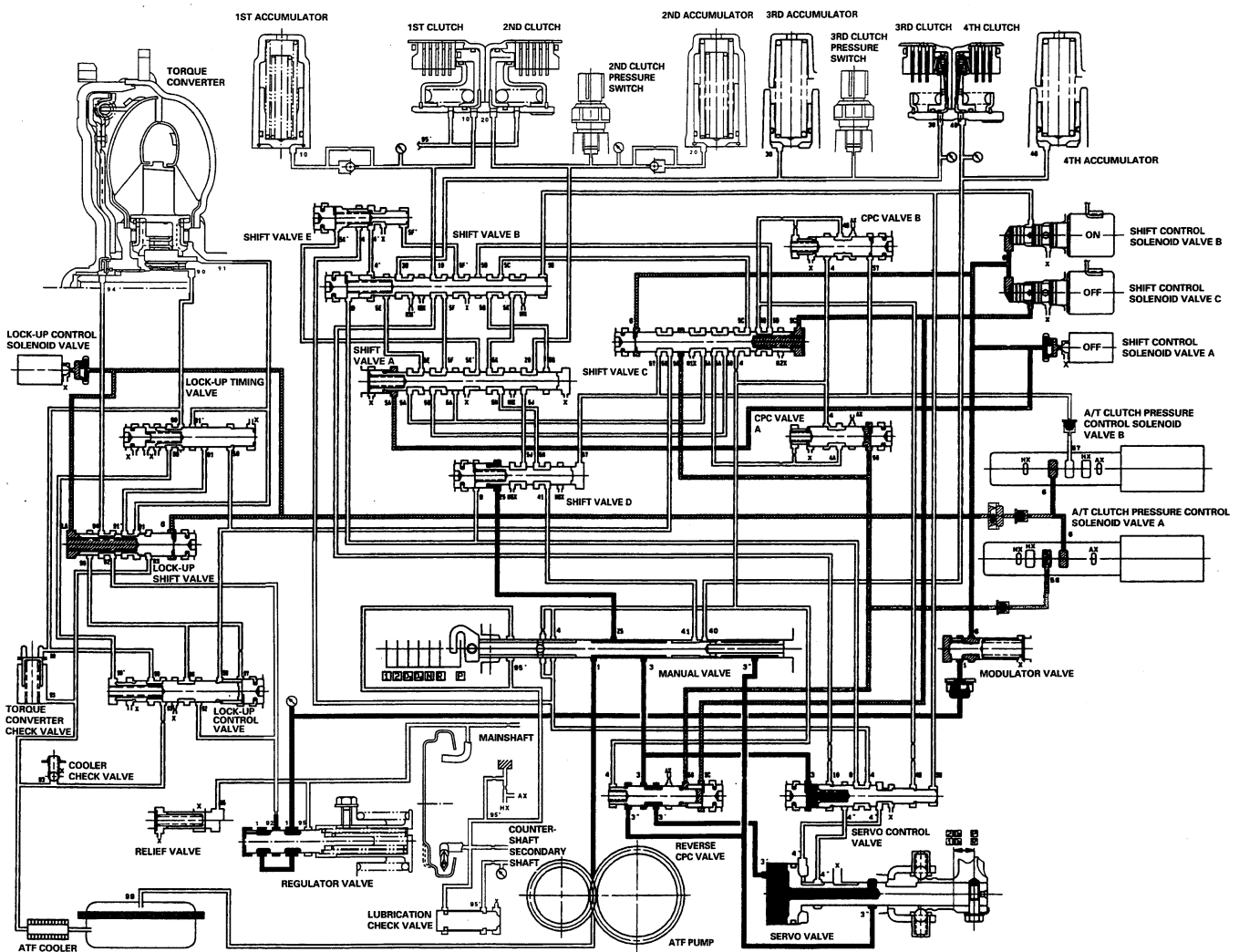
Description

Hydraulic Flow (cont'd)

P Position

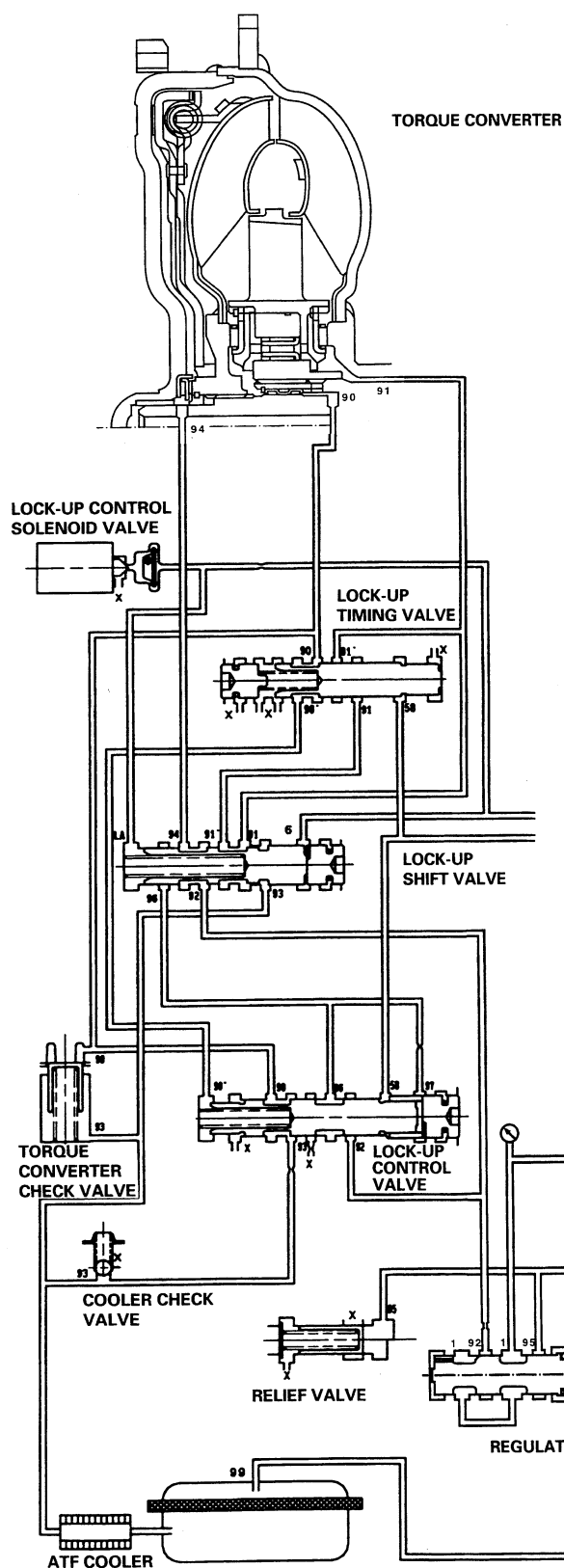
Shift control solenoid valve C is turned OFF by the PCM, and SH C pressure (SC) is applied to the right side of the reverse CPC valve. Then the reverse CPC valve is moved to the left side to uncover the port leading line pressure (3) to the servo valve. Line pressure (3') passes through the servo valve 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.





Lock-up System



In **D₂** position (2nd, 3rd and 4th), and **D₂** 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

(cont'd)

Description

Lock-up System (cont'd)

General Operation

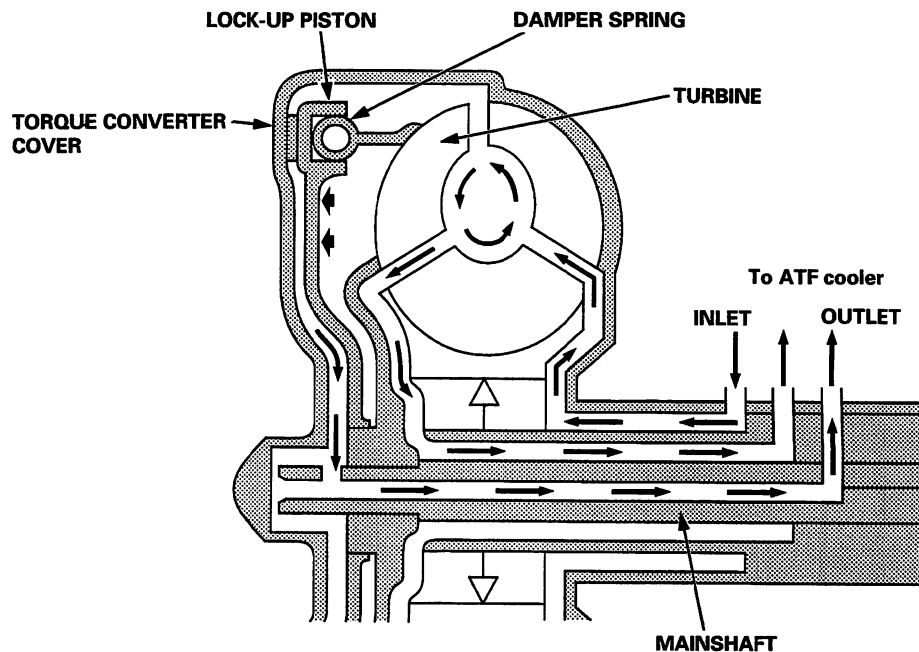
1. Operation (clutch on)

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

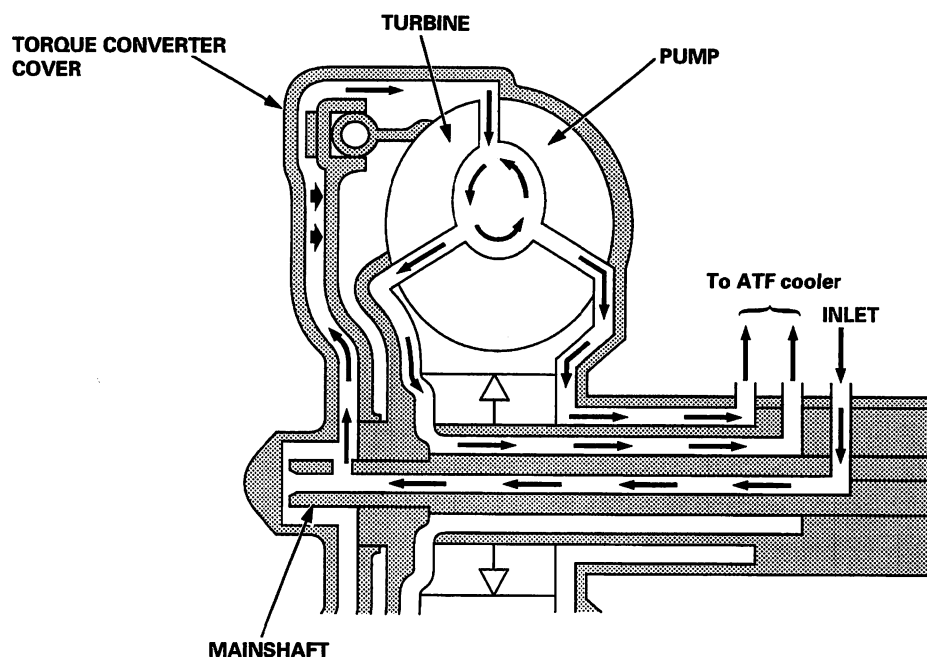


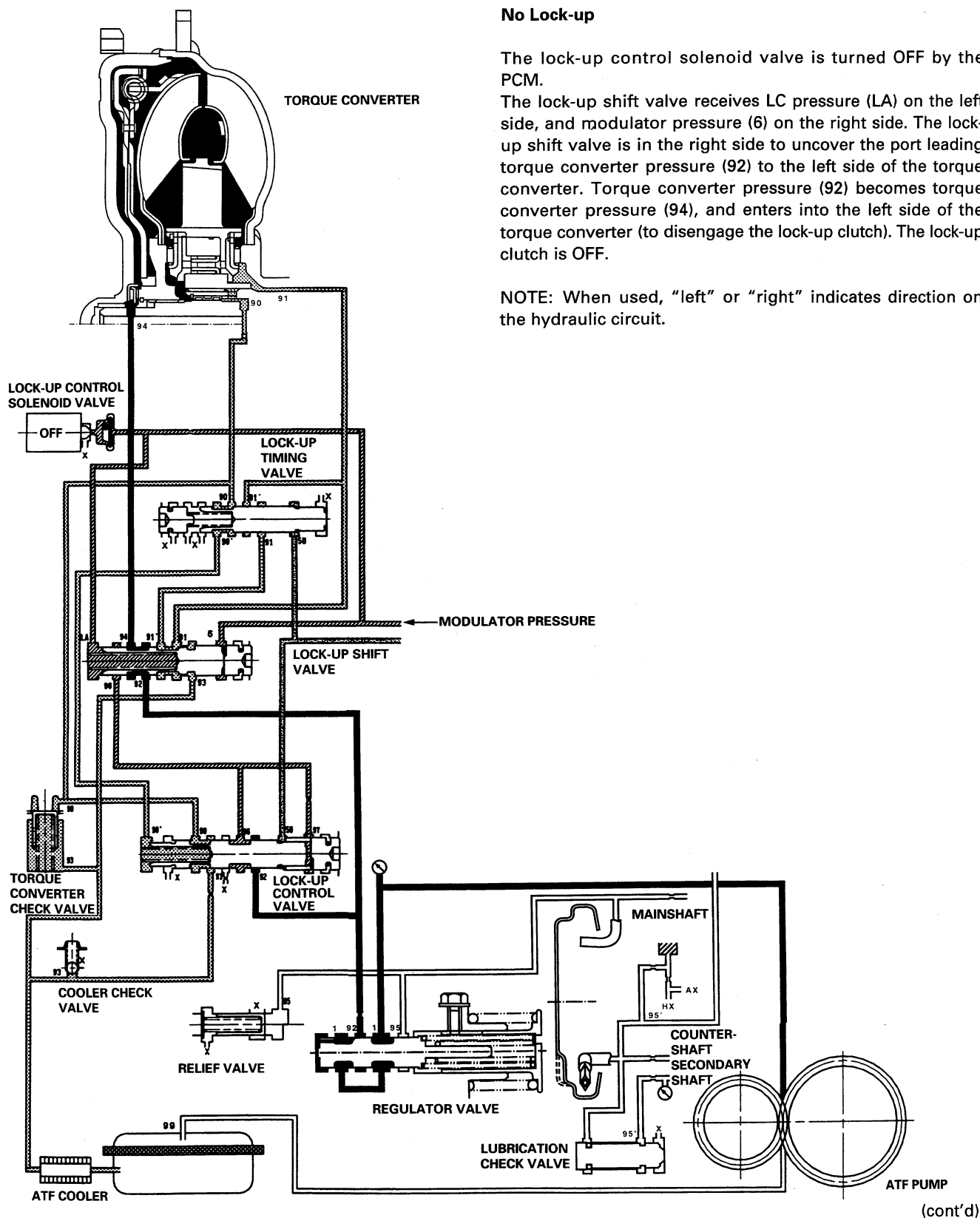
2. Operation (clutch off)

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





No Lock-up

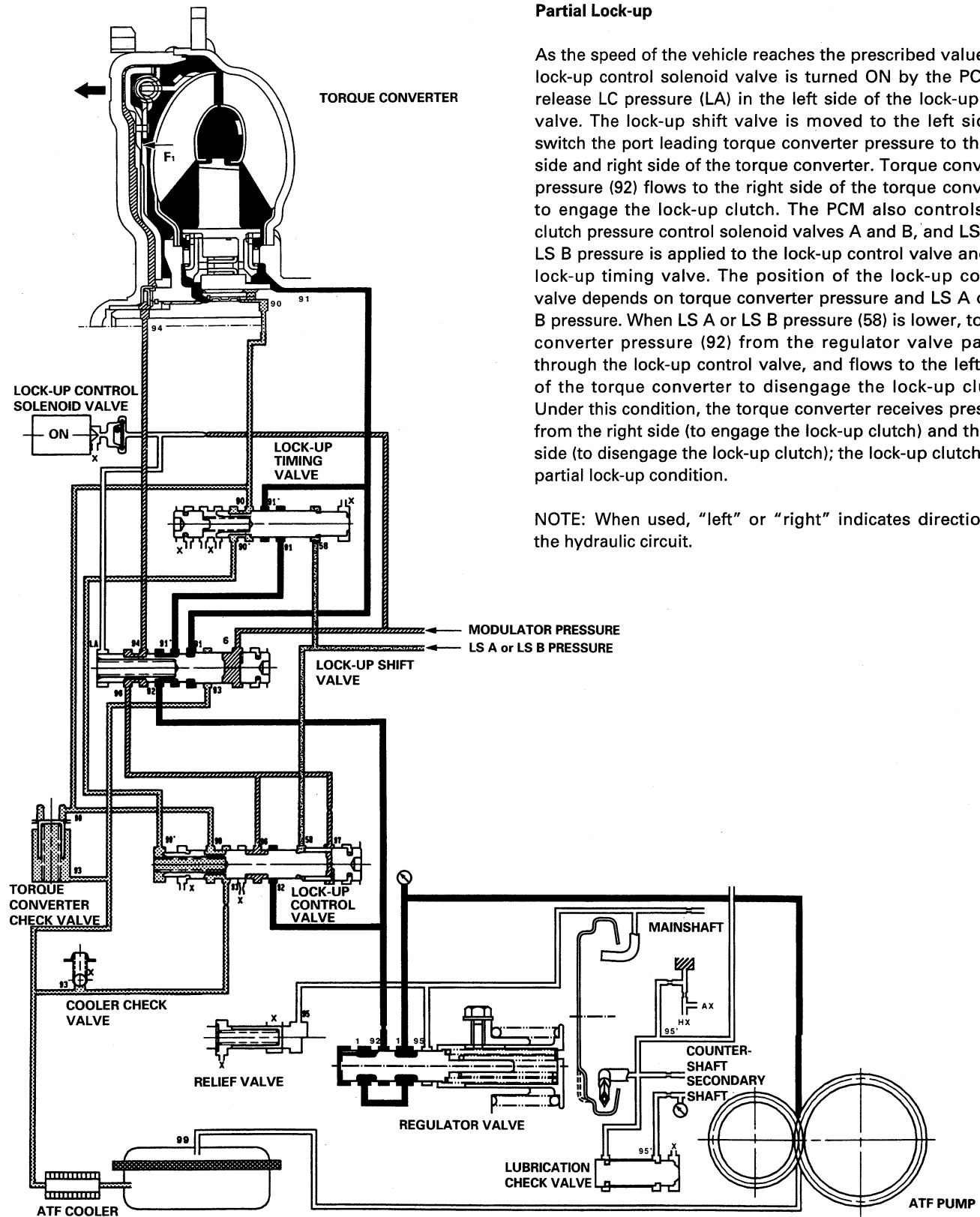
The lock-up control solenoid valve is turned OFF by the PCM.

The lock-up shift valve receives LC pressure (LA) on the left side, and modulator pressure (6) on the right side. The lock-up 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

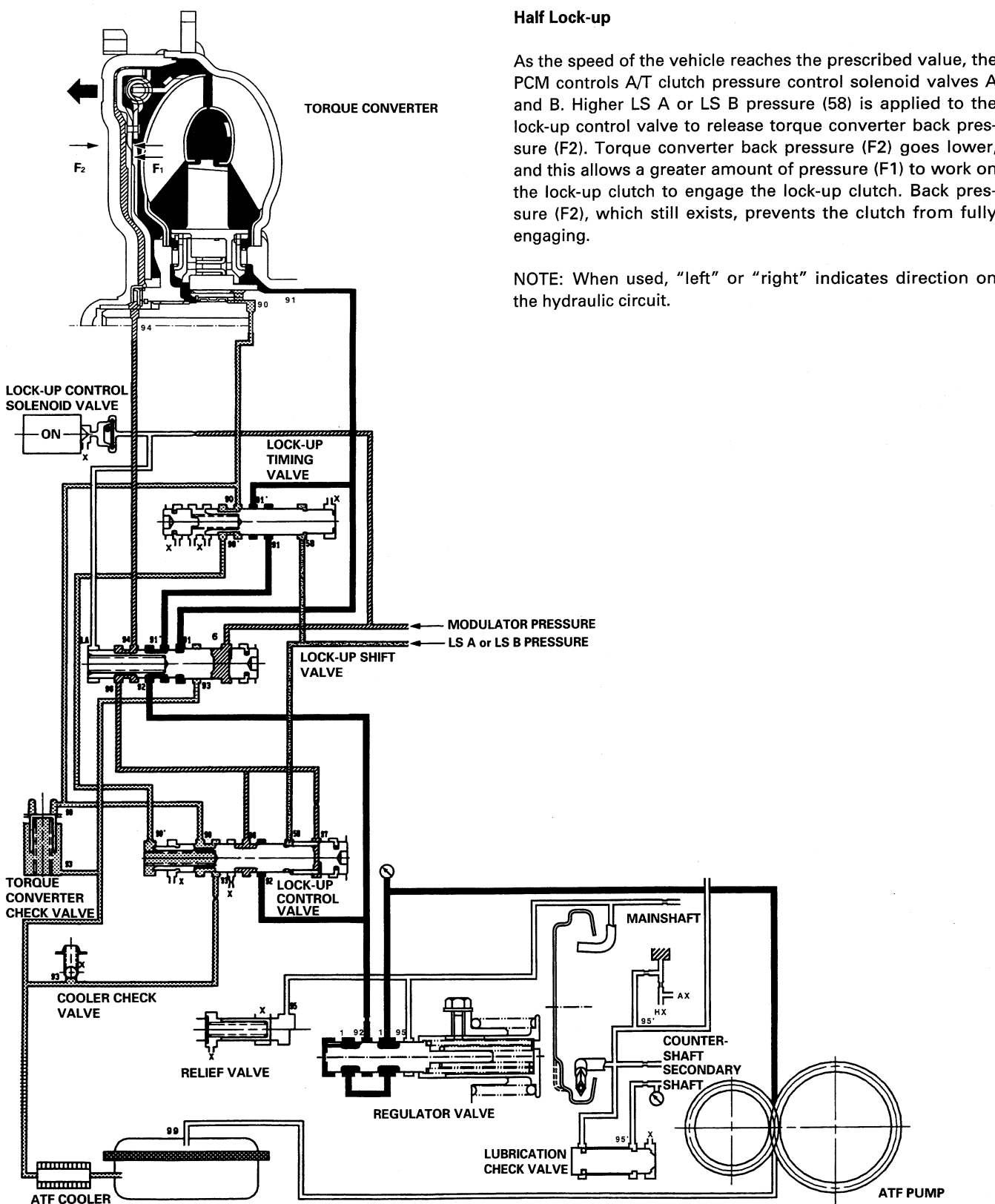
Lock-up System (cont'd)



Partial Lock-up

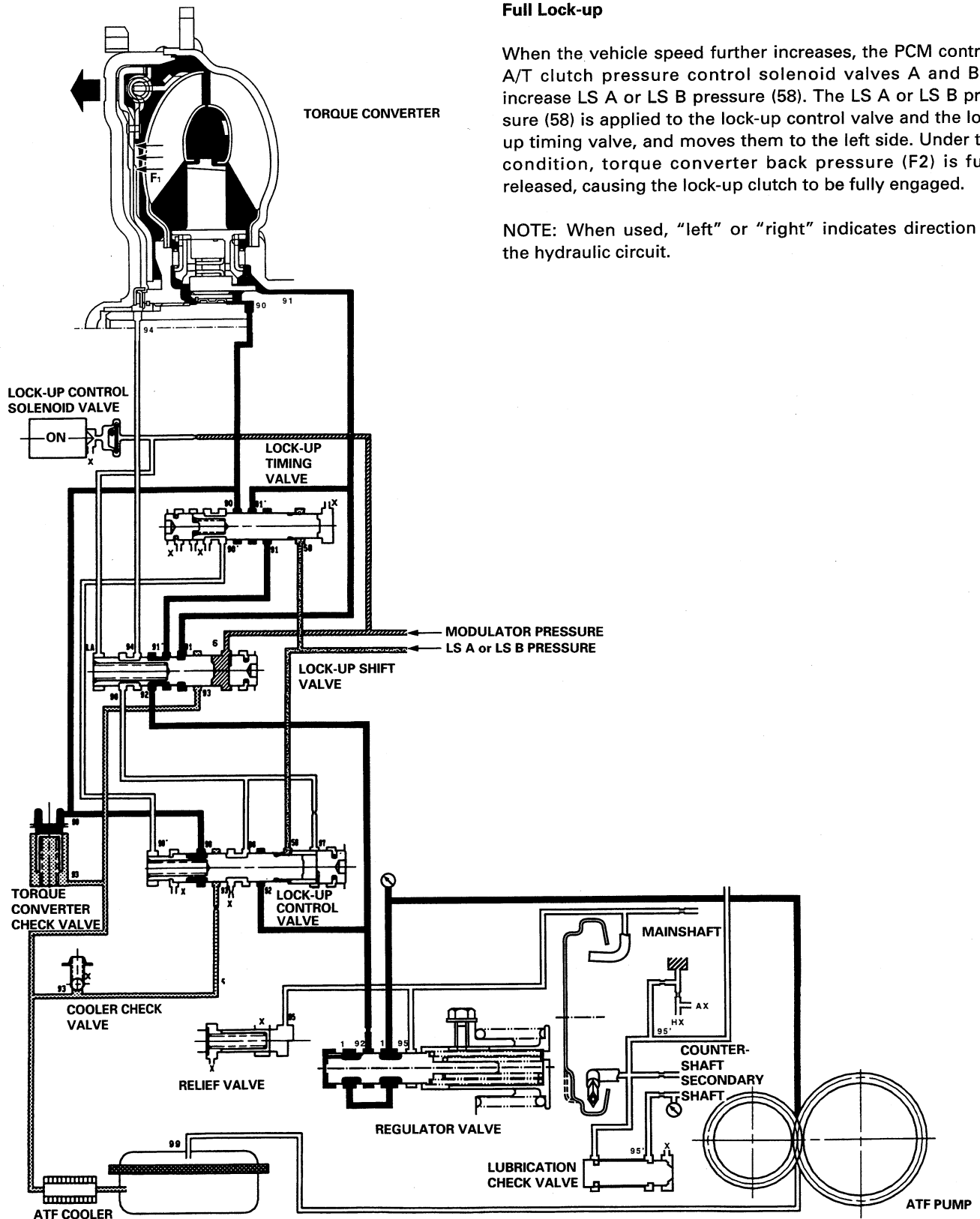
As the speed of the vehicle reaches the prescribed value, the lock-up control solenoid valve is turned ON by the PCM to release LC pressure (LA) in the left side of the lock-up shift valve. The lock-up shift valve is moved to the left side to switch the port leading torque converter pressure to the left 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)



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 (F2) is fully released, causing the lock-up clutch to be fully engaged.

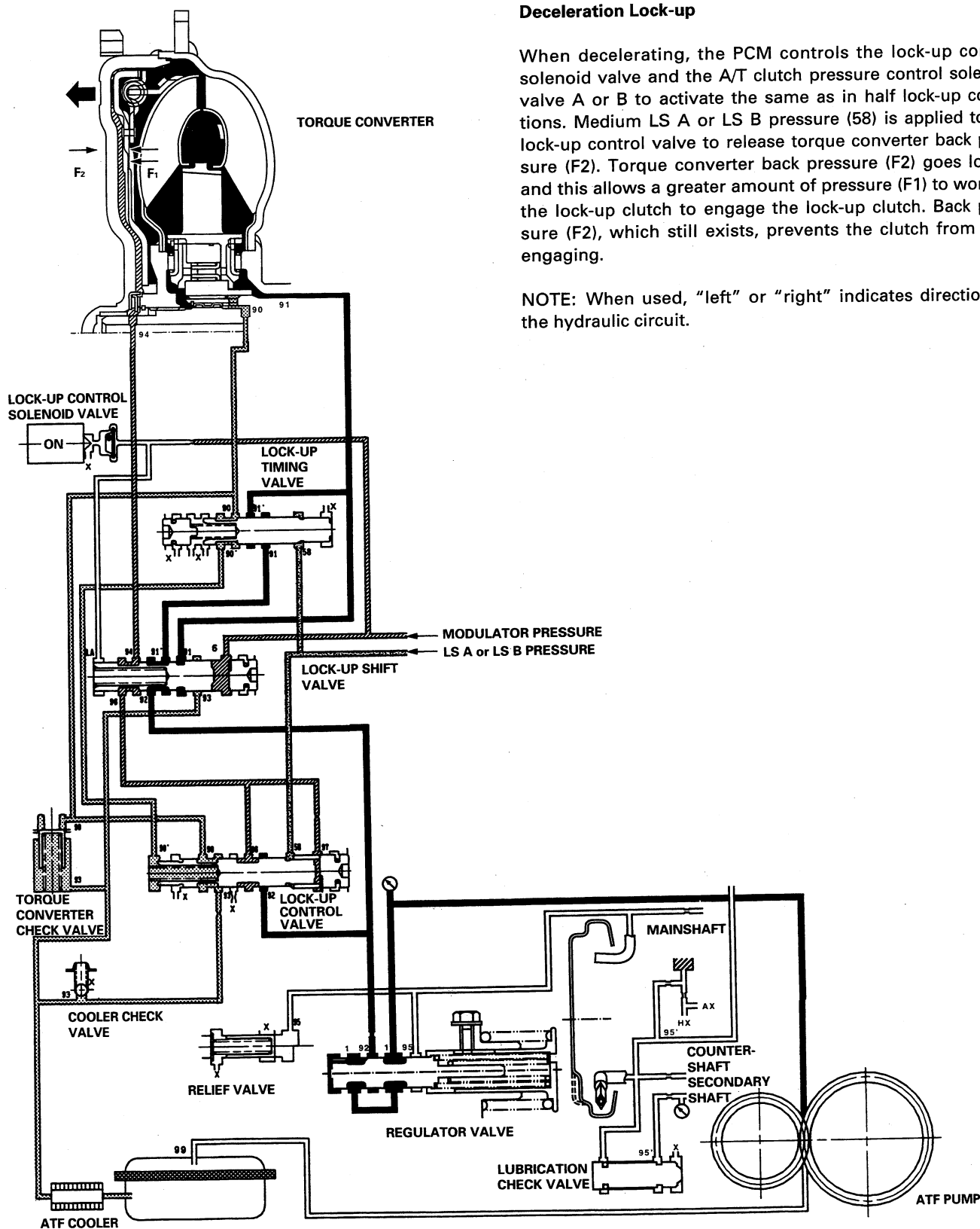
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



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 (F2). Torque converter back pressure (F2) 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 (F2), which still exists, prevents the clutch from fully engaging.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



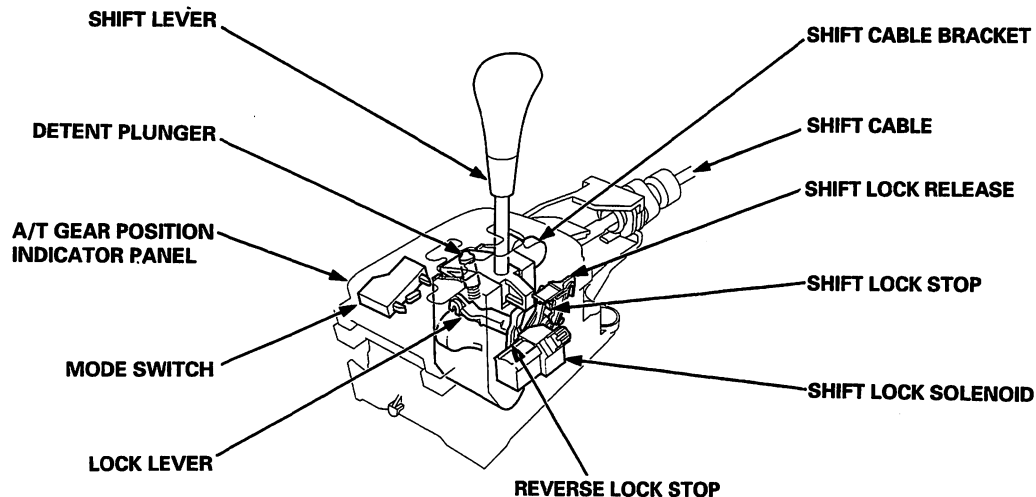
Description

Shift Lever/Manual Mode Mechanism

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 lock 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** and **1** positions, and this unit shifts the transmission shifting positions using the shift cable connected between the shift cable bracket and the transmission control shaft.

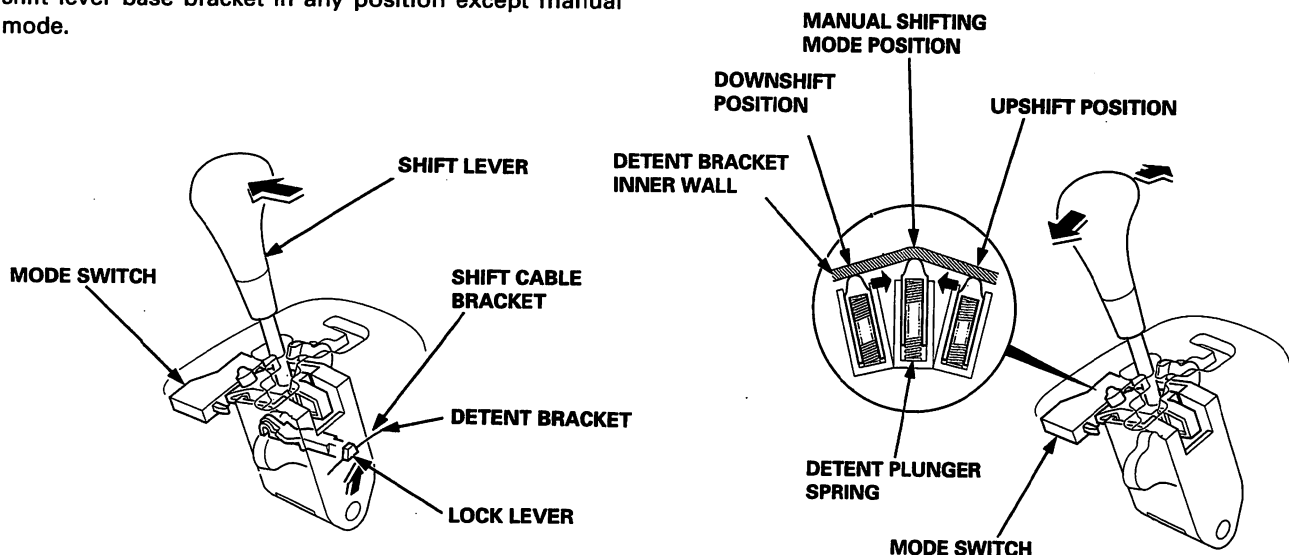
In the manual mode position, the shift lever is disengaged from the shift cable bracket, and the shift lever can use to shift gears electronically with the mode switch between 1st through 4th much like as manual transmission.



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 in **P** position.





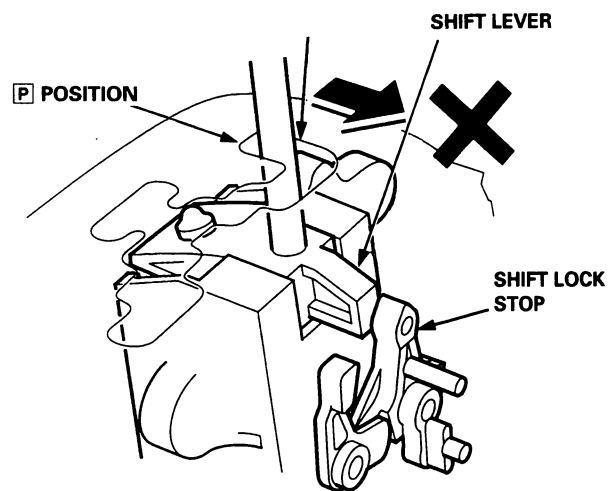
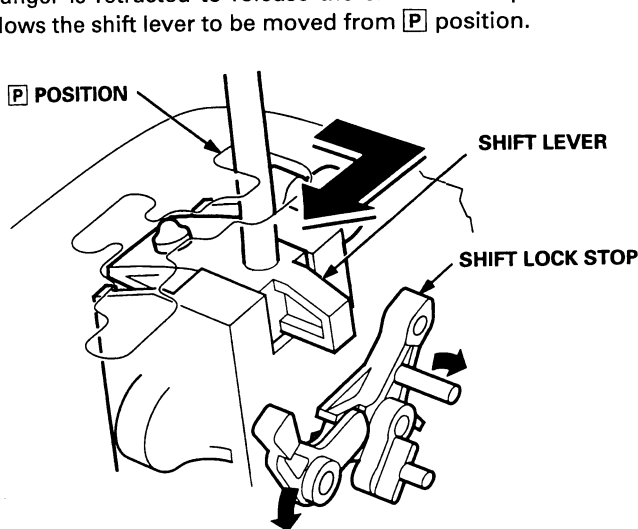
Shift Lock/Reverse Lock Mechanism

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.

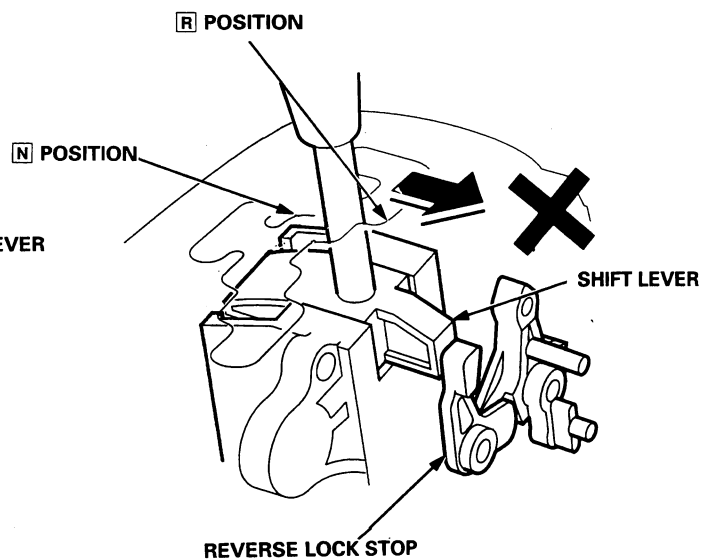
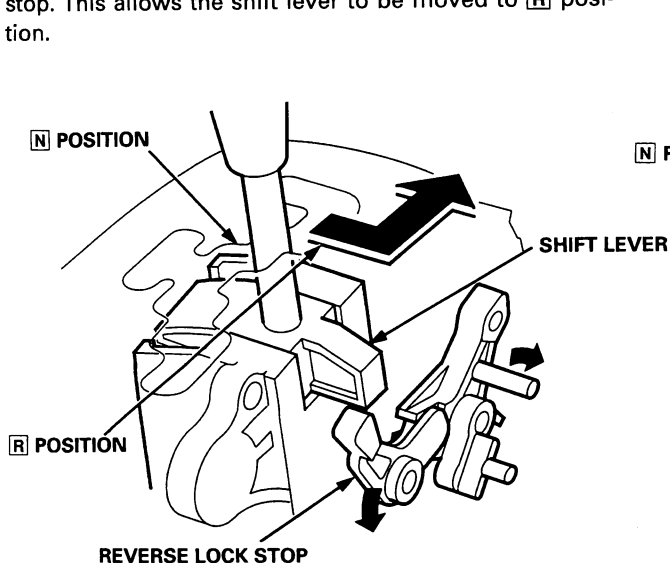
In **P** position while depressing the brake pedal, the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the shift lock stop. This allows the shift lever to be moved from **P** position.

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.



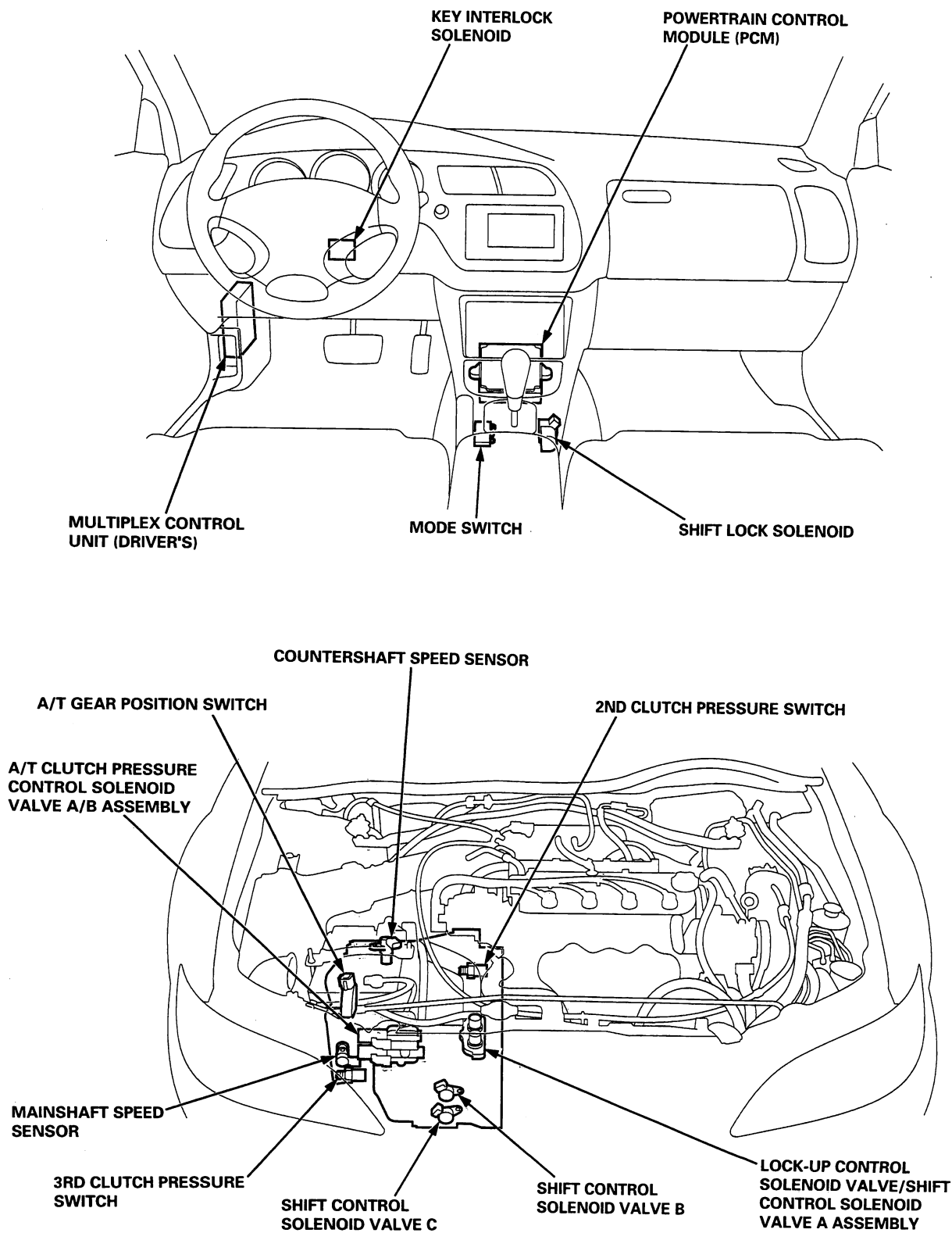
When the shift lever is shifted to **R** position from **D₄** position and **N** position (under certain conditions), the shift lock solenoid is turned ON, and the shift lock solenoid plunger is retracted to release the reverse lock stop. This allows the shift lever to be moved to **R** position.

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.



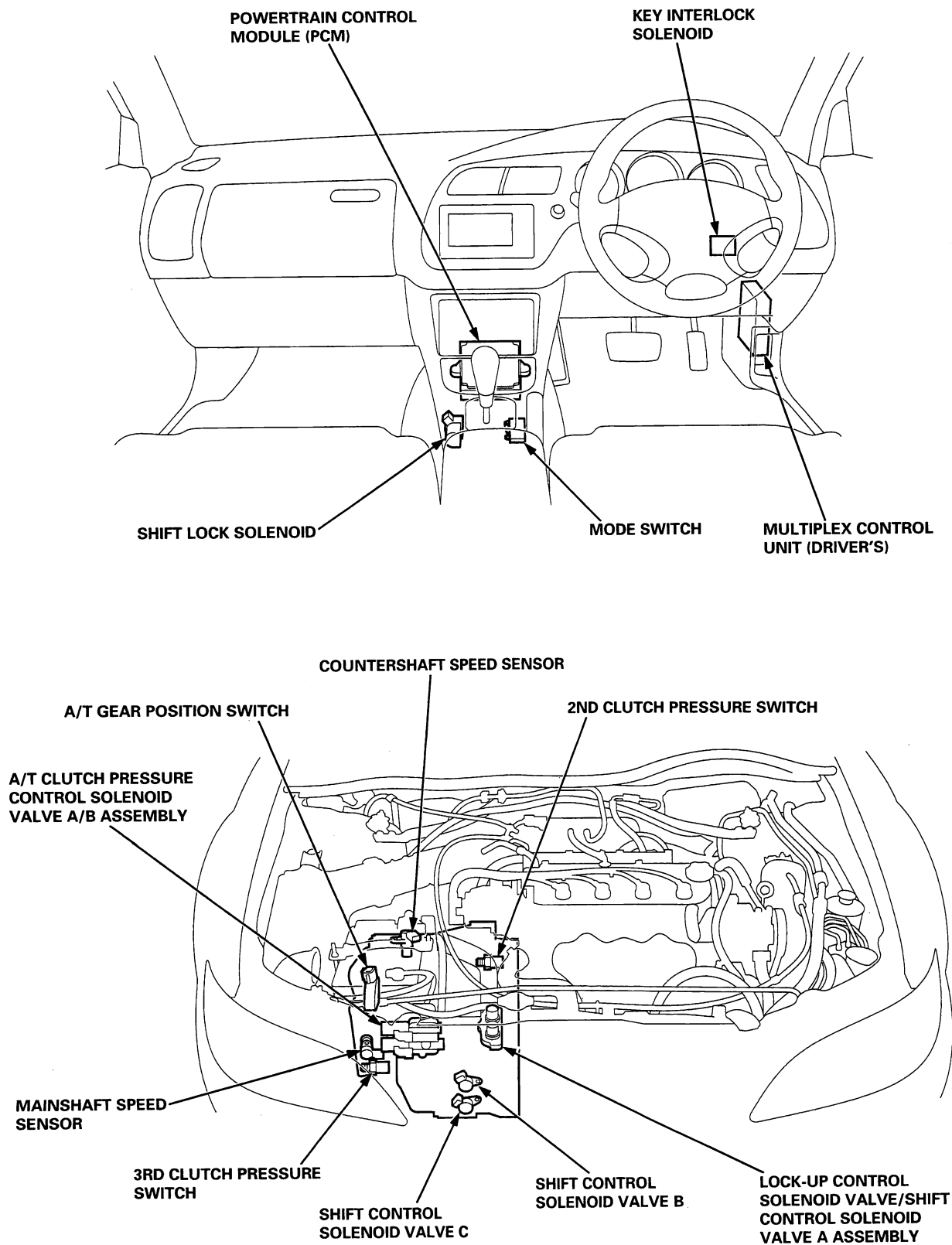
Component Locations

LHD:

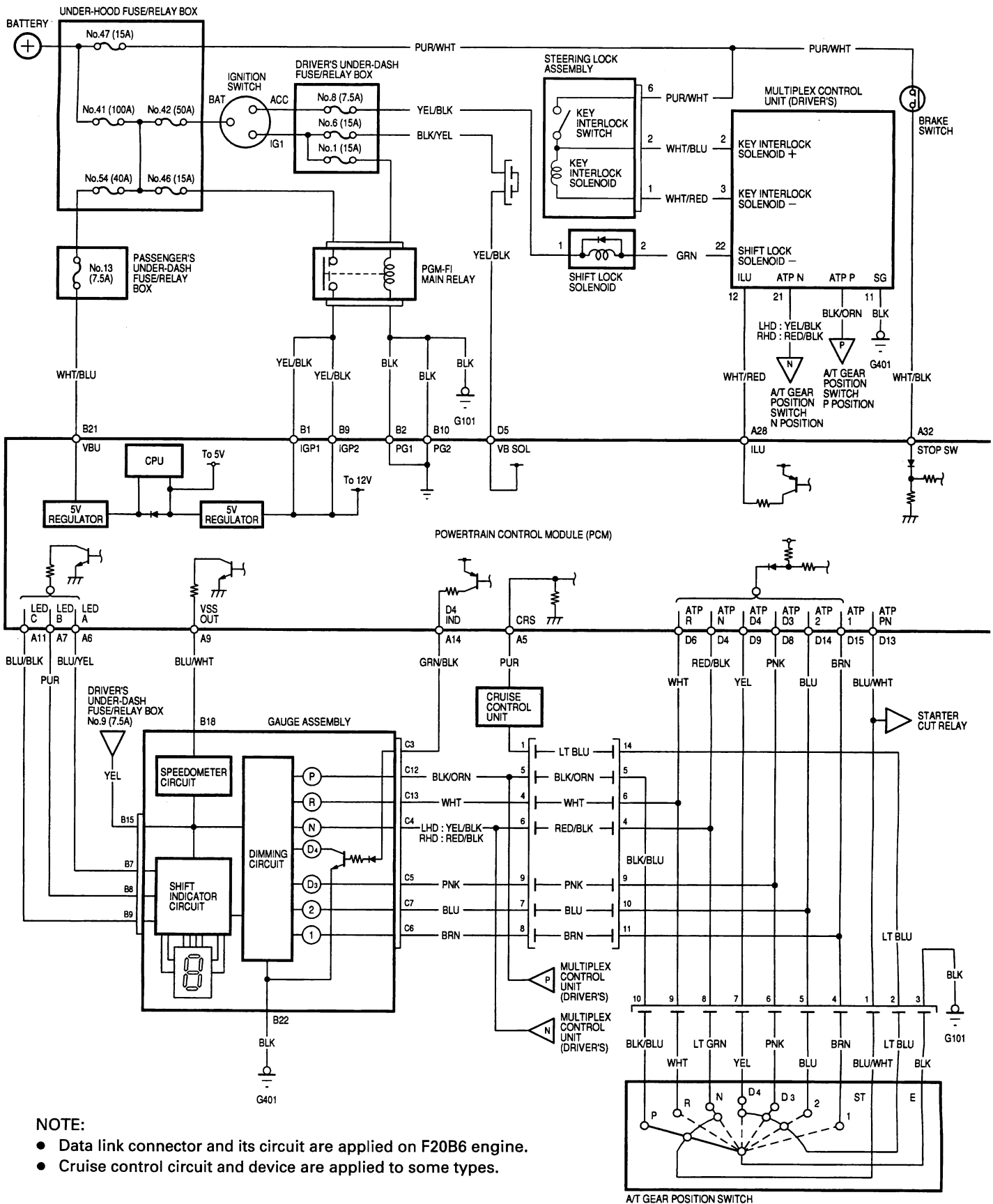


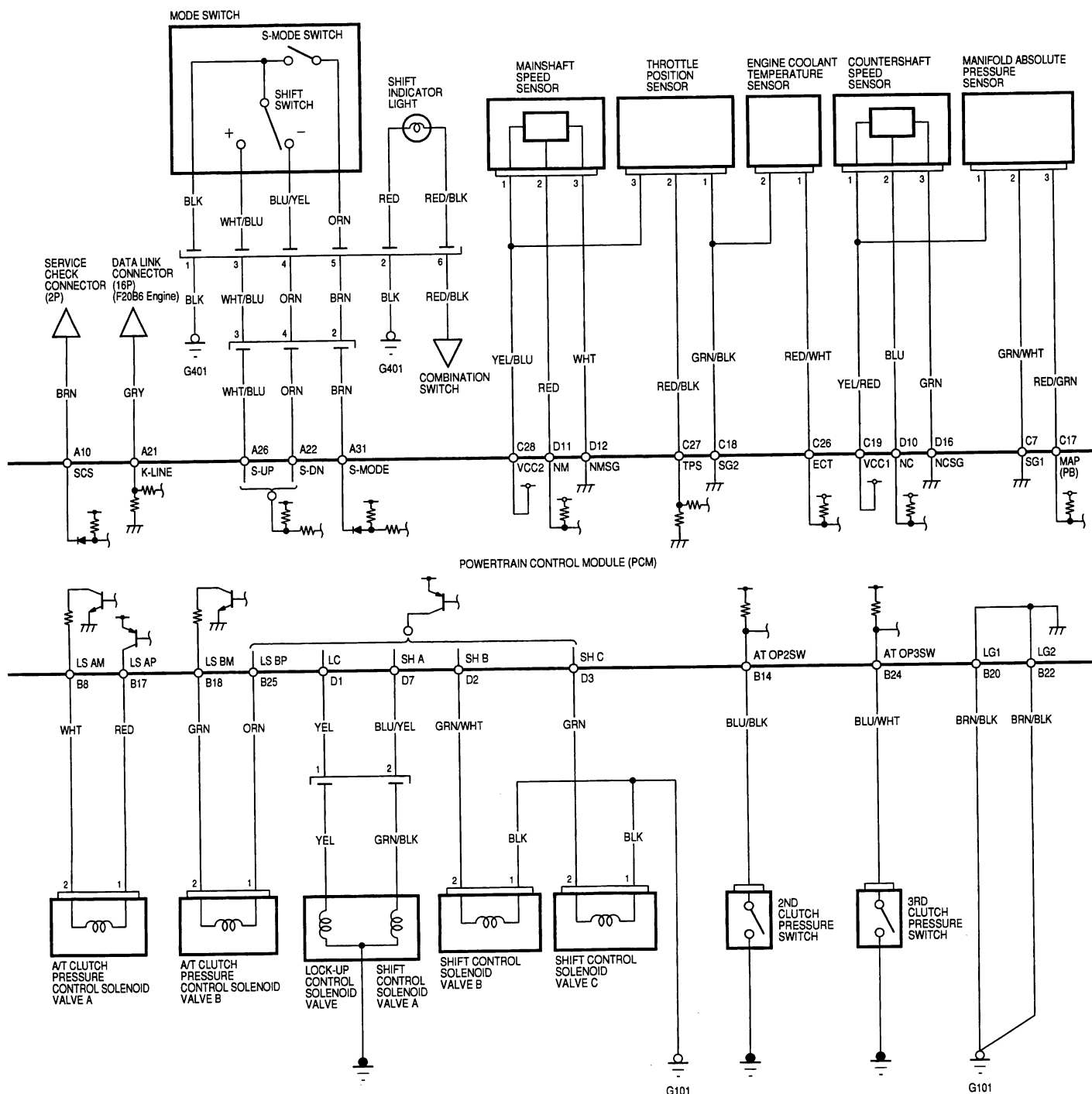


RHD:

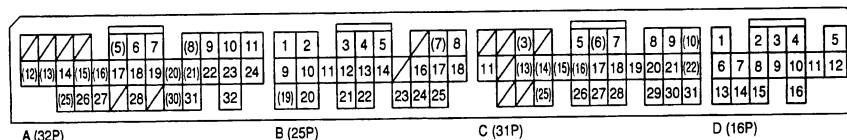


PCM Circuit Diagram (A/T Control System)





PCM Connector Terminal Locations

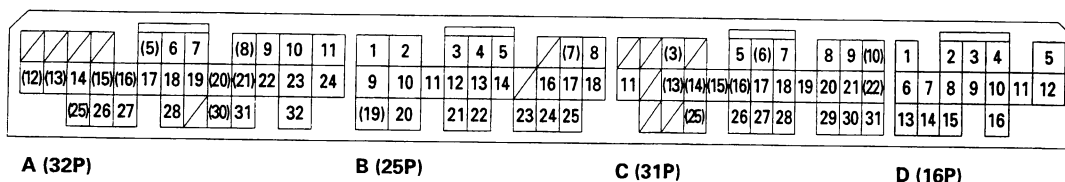


PCM Terminal Voltage/Measuring Conditions

A/T Control System

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 Terminal Locations



PCM CONNECTOR A (32P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A5	CRS	Downshift signal input from 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: 0 V
A7	LED B	Shift indicator light control	In manual mode: • In 2nd and 3rd gear positions: Battery voltage • In 1st and 4th gear positions: 0 V
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 switch ON (II) and service check connector open: 5 V With ignition switch ON (II) and service check connector connected with special tool: 0 V
A11	LED C	Shift indicator light control	In manual mode: • In 1st and 3rd gear positions: Battery voltage • In 2nd and 4th gear positions: 0 V
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 output	With ignition switch ON (II): Approx. 5 V
A22	S-DN	Downshift switch signal input	In manual mode and shift lever pushed toward downshift position (marked with "-"): 0 V In manual mode and shift lever in neutral position: Battery voltage



PCM CONNECTOR A (32P)

Terminal Number	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 "+"): 0 V 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): 0 V In other than manual mode: Battery voltage
A32	STOP SW	Brake switch signal output	Brake pedal depressed: Battery voltage Brake pedal released: 0 V

PCM CONNECTOR B (25P)

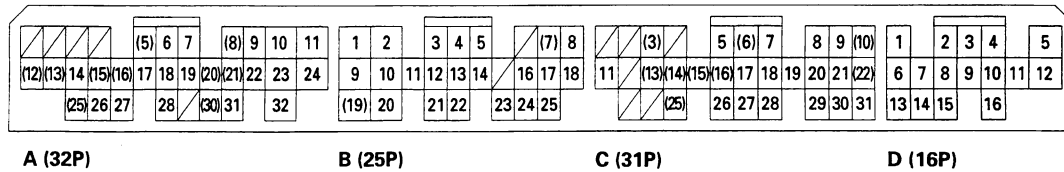
Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
B1	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	PG1	Ground	
B8	LS AM	A/T clutch pressure control solenoid valve A power supply negative electrode	
B9	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
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	

(cont'd)

PCM Terminal Voltage/Measuring Conditions

A/T Control System (cont'd)

PCM Connector Terminal Locations



PCM CONNECTOR B (25P)

Terminal Number	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 Number	Signal	Description	Measuring Conditions/Terminal Voltage
C19	VCC1	Power supply for sensors	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
C28	VCC2	Power supply for sensors	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V

PCM CONNECTOR D (16P)

Terminal Number	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: 0 V
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 0 V in following positions: <ul style="list-style-type: none"> • D₄, and D₃ positions in 3rd gear • D₄ position in 4th gear



PCM CONNECTOR D (16P)

Terminal Number	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 0 V 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
D4	ATP N	A/T gear position switch N position input	In N position: 0 V 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: 0 V
D6	ATP R	A/T gear position switch R position input	In R position: 0 V 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 0 V 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
D8	ATP D3	A/T gear position switch D₃ position input	In D₃ position: 0 V In other than D₃ position: Battery voltage
D9	ATP D4	A/T gear position switch D₄ position input	In D₄ position: 0 V In other than D₄ position: Battery voltage
D10	NC	Countershaft speed sensor input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx. 0 V
D11	NM	Mainshaft speed sensor input	Depending on vehicle speed: Pulsing signal When engine is stopped: Approx. 0 V
D12	NMSG	Mainshaft speed sensor ground	
D13	ATP PN	A/T gear position switch P and N positions input	In P and N positions: 0 V In other than P and N position: Battery voltage
D14	ATP 2	A/T gear position switch 2 position input	In 2 position: 0 V In other than 2 position: Battery voltage
D15	ATP 1	A/T gear position switch 1 position input	In 1 position: 0 V In other than 1 position: Battery voltage
D16	NCSG	Countershaft speed sensor ground	

Troubleshooting Procedures

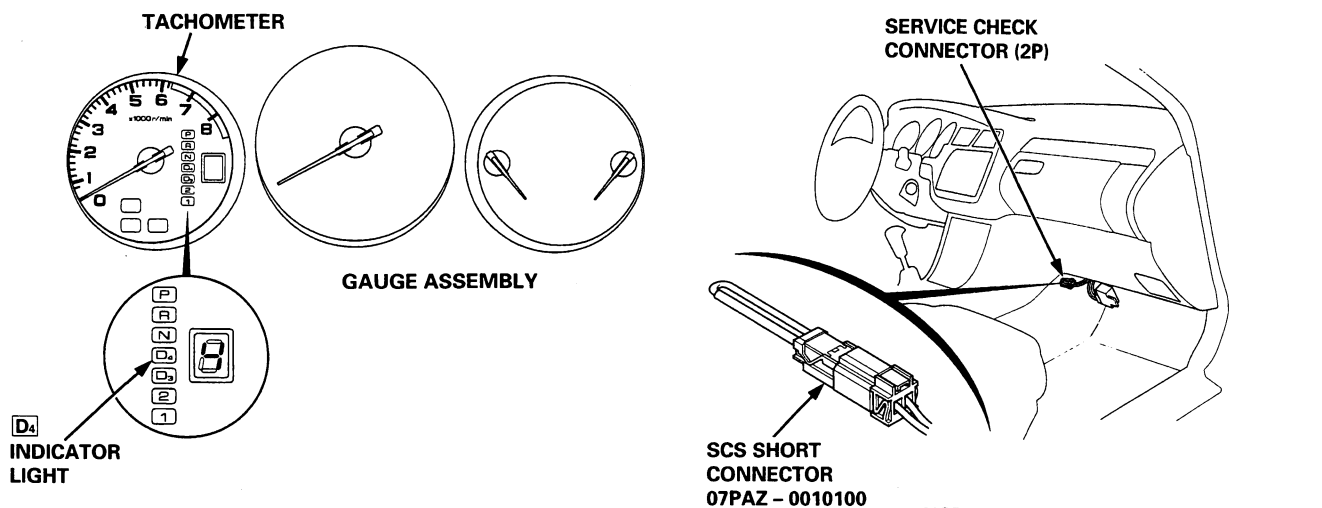
Checking the Diagnostic Trouble Code (DTC)

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.

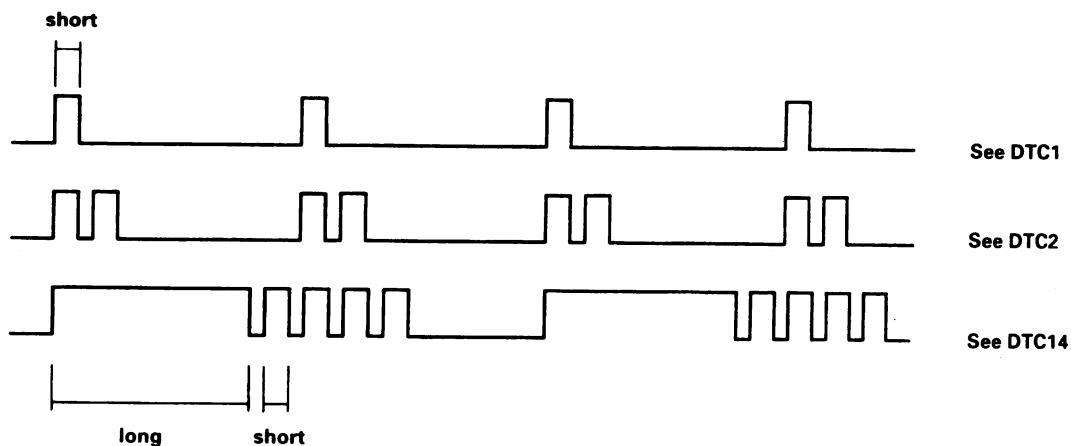
When the Service Check Connector (located under the dash on the passenger side) is connected with the special tool as shown, the **D₄** indicator light will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

When the **D₄** indicator light has been reported on, connect the Service Check Connector with the special tool. Then turn ON (II) the ignition switch and observe the **D₄** indicator light.



NOTE: LHD is shown; RHD is symmetrical.

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 on pages 14-59 thru 14-61.





NOTE:

- If the **D₄** indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow this 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.

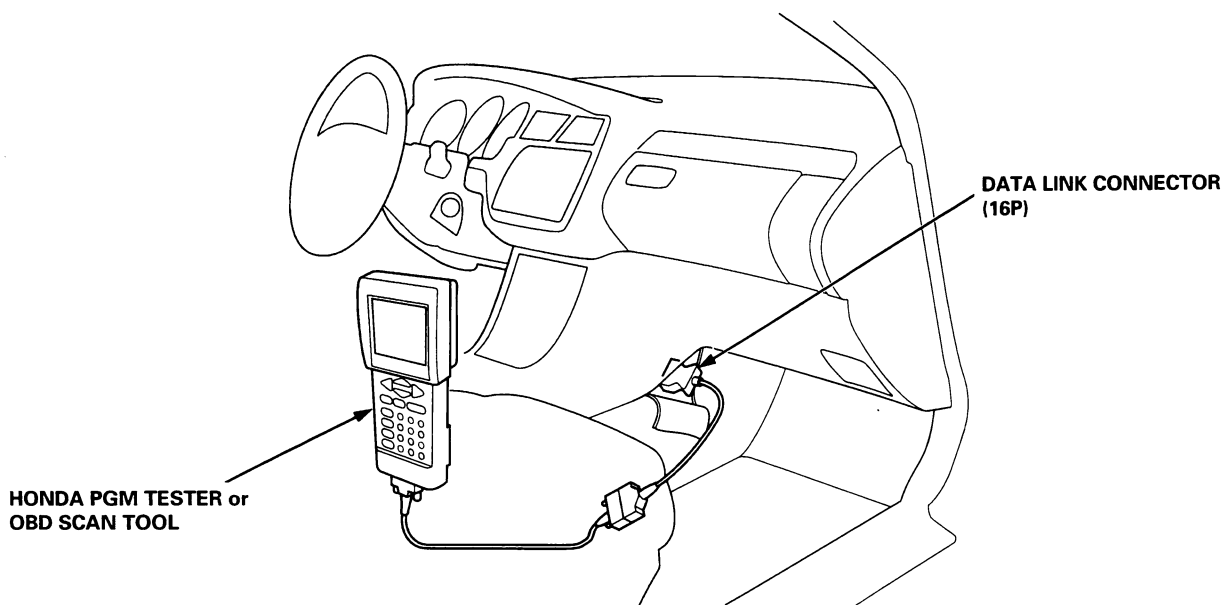


Checking the Diagnostic Trouble Code (DTC) with an OBD Scan Tool or the Honda PGM Tester for F20B6 Engine


When the PCM senses an abnormality in the input or output systems, the  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  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 14-59 thru 14-61.

NOTE: See the OBD Scan Tool or Honda PGM Tester user's manual for specific instructions.



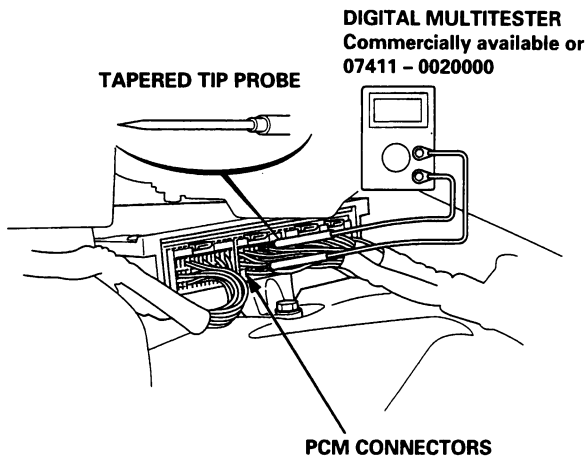
NOTE:

- If the  indicator light and the MIL (Malfunction Indicator Lamp) come on at the same time, follow this 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.

Troubleshooting Procedures

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.

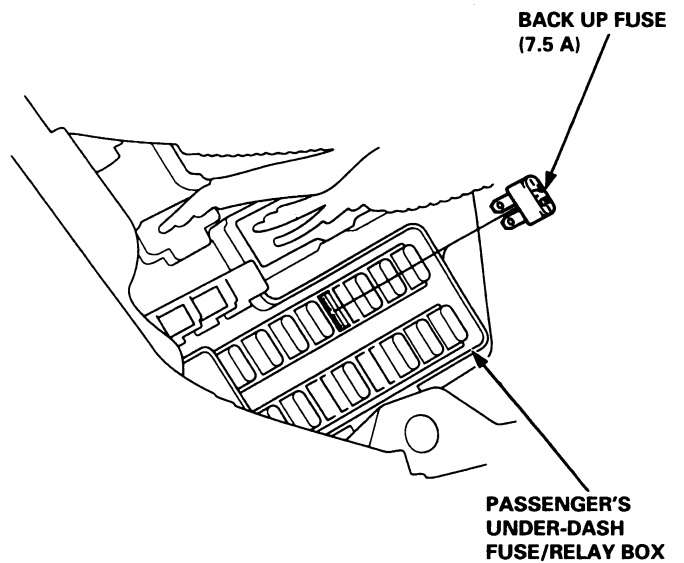
1. Pull back the carpet from passenger's side of the center console to expose the PCM.
2. Inspect the circuit on the PCM according to the troubleshooting flowchart with a digital multimeter and a tapered tip probe as shown.



● 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.

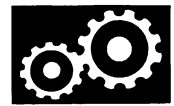


● Final Procedure

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.

Symptom-to-Component Chart



Electrical System



*: F20B6 Engine only

When PCM senses abnormality, D4 indicator light:	Number of D4 Indicator Light indicates	Symptom	Possible Cause	Refer to Page
	DTC on Honda PGM Tester*			
	DTC on OBD Scan Tool*			
Blinks	1	<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 	14-62
	1-1			
	P1753			
Blinks	5	<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 wire Faulty A/T gear position switch 	14-64
	5-1			
	P1705			
Does not blink	6	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 	14-68
	6-1			
	P1706			
Blinks	7	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 shift control solenoid valve A wire Faulty shift control solenoid valve A Open in VB SOL wire 	14-71
	7-1			
	P0753			
Blinks	8	Fails to shift (stuck in 4th gear).	<ul style="list-style-type: none"> Disconnected shift control solenoid valve B connector Short or open in shift control solenoid valve B wire Faulty shift control solenoid valve B Open in VB SOL wire 	14-73
	8-1			
	P0758			
Blinks	9	<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 	14-75
	9-1			
	P0720			

(cont'd)

Symptom-to-Component Chart

Electrical System (cont'd)

When PCM senses abnormality,  indicator light:	Number of  Indicator Light indicates	Symptom	Possible Cause	Refer to Page
	DTC on Honda PGM Tester*			
	DTC on OBD Scan Tool*			
Blinks	15	<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 	14-79
	15-1			
	P0715			
Blinks	16	<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) 	14-83
	16-1			
	P1768			
Blinks	22	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 wire • Faulty shift control solenoid valve C • Open in VB SOL wire 	14-85
	22-1			
	P0763			
Blinks	23	<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) 	14-87
	23-1			
	P1773			
Blinks	24	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 	14-89
	24-1			
	P1709			
Does not blink	25	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 	14-91
	25-1			
	P1738			



*: F20B6 Engine only

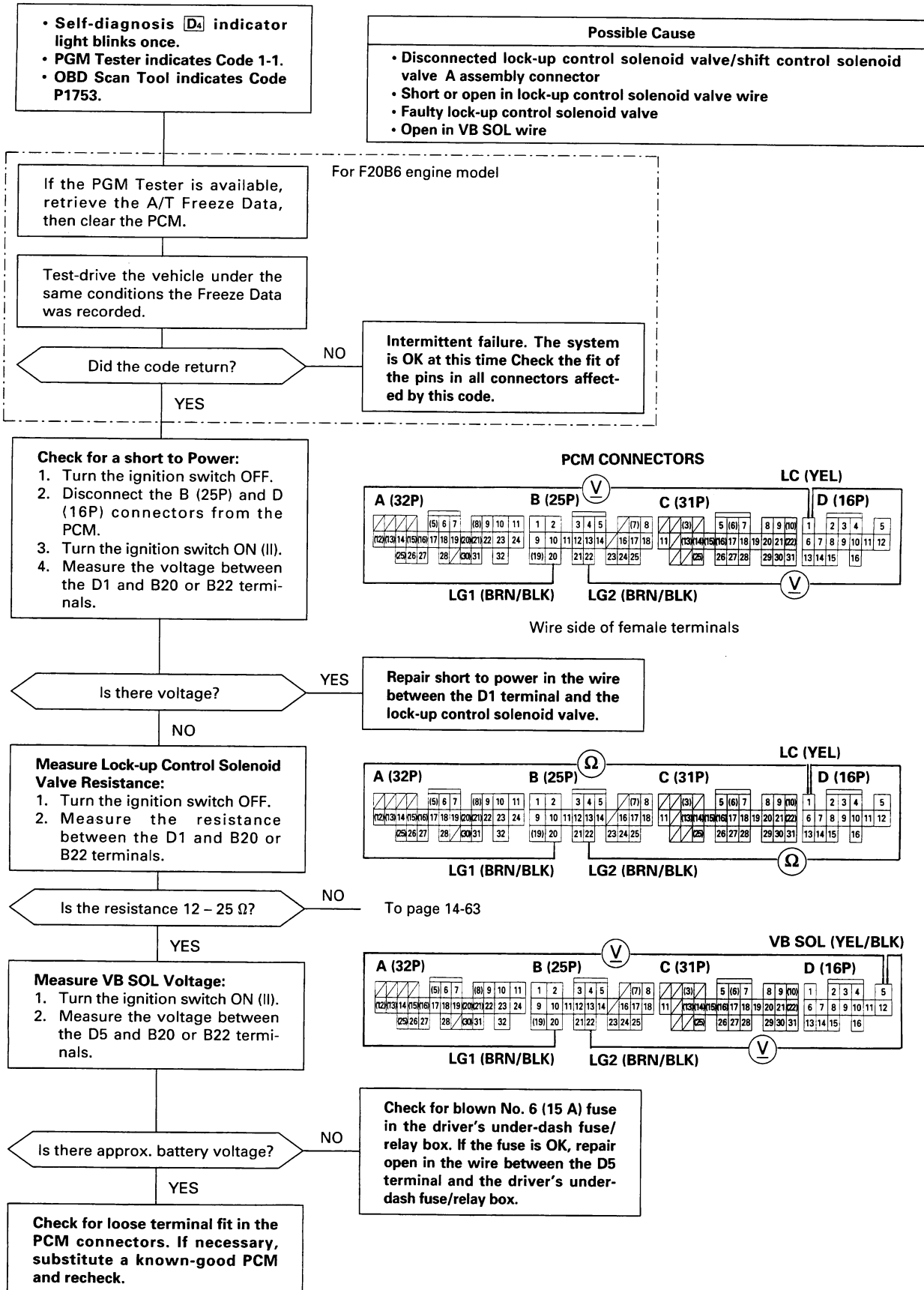
When PCM senses abnormality, D₄ indicator light:	Number of D₄ Indicator Light indicates	Symptom	Possible Cause	Refer to Page
	DTC on Honda PGM Tester*			
	DTC on OBD Scan Tool*			
Does not blink	26	No specific symptom appears.	<ul style="list-style-type: none"> • Disconnected 3rd clutch pressure switch connector • Short or open in 3rd clutch pressure switch wire • Faulty 3rd clutch pressure switch 	14-93
	26-1			
	P1739			
Does not blink	41	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	14-95
	41-1			
	P0730			

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 Page
D₄ indicator light is on constantly (not blinking) whenever the ignition switch is ON (II).	_____	14-97
D₄ indicator light does not come on for two seconds after ignition switch is first turn ON (II).	_____	14-98
Transmission does not shift up and down when operating the shift lever in the manual mode position.	Check shift switch.	14-100
Shift indicator does not indicate selected gear while shift lever is in the manual mode position.	Check shift indicator circuit.	14-103
Shift lever cannot be moved from P position with the brake pedal depressed.	Check interlock system — Shift lock system	14-104
Shift lever cannot pass through R position from N position.	Check interlock system — Reverse lock system	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	14-109

Electrical Troubleshooting

Troubleshooting Flowchart — Lock-up Control Solenoid Valve





From page 14-62

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).

YES

Check Lock-up Control Solenoid Valve for a Short Circuit:

1. Disconnect the 2P connector from the lock-up control solenoid valve/shift control solenoid valve A assembly.
2. Check for continuity between the D1 and B20 or B22 terminals.

Is there continuity?

YES

Repair short to ground in the wire between the D1 terminal and the lock-up control solenoid valve.

NO

Measure Lock-up Control Solenoid Valve Resistance at the Solenoid Connector:

Measure the resistance between the No. 1 terminal of the lock-up control solenoid valve/shift control solenoid valve A assembly connector and body ground.

Is the resistance 12 – 25 Ω ?

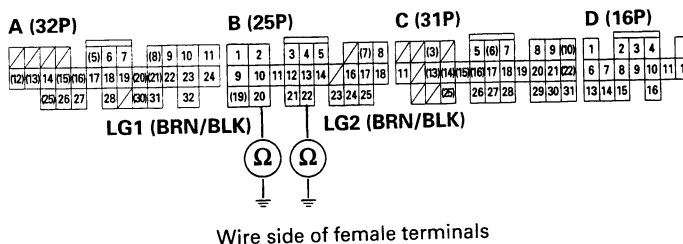
NO

Replace the lock-up control solenoid valve/shift control solenoid valve A assembly.

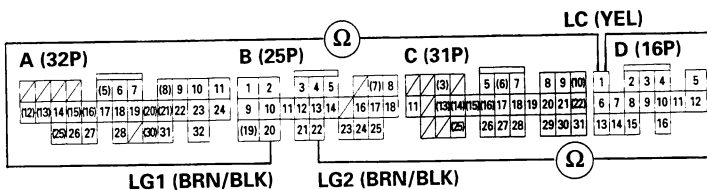
YES

Check for open in the wire between the D1 terminal and the lock-up control solenoid valve.

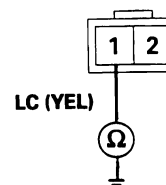
PCM CONNECTORS



Wire side of female terminals



LOCK-UP CONTROL SOLENOID VALVE/SHIFT CONTROL SOLENOID VALVE A ASSEMBLY CONNECTOR (2P)



Terminal side of male terminals

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Gear Position Switch (Short)

- Self-diagnosis **D₅** indicator light blinks five times.
- PGM Tester indicates Code 5-1.
- OBD Scan Tool indicates Code P1705.

Possible Cause

- Short in A/T gear position switch wire
- Faulty A/T gear position switch

NOTE: Code 5, 5-1 or P1705 are caused when the PCM received two gear position inputs at the same time.

Observe the A/T Gear Position Indicator:

1. Turn the ignition switch ON (II).
2. Observe the A/T gear position indicator, and shift each position separately.

Does any indicator stay on when the shift lever is not in that position?

NO

The system is OK at this time. Check the wire harness for damage.

YES

Disconnect the A/T gear position switch connector.

Do all gear position indicators go out?

YES

Replace the A/T gear position switch.

NO

Turn the ignition switch OFF, and connect the A/T gear position switch connector.

Measure ATP R Voltage:

1. Turn the ignition switch ON (II).
2. Shift to all positions other than **R**.
3. Measure the voltage between the D6 and B20 or B22 terminals.

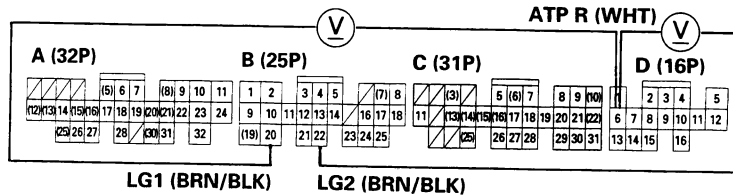
Is there battery voltage?

NO

YES

Check for short in the wire between the D6 terminal and the A/T gear position switch or A/T gear position indicator, and check for open in the wires between the B20 and B22 terminals and body ground (G101). If wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals

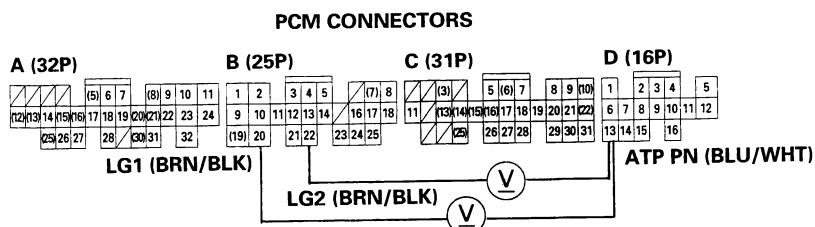
To page 14-65



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.



Wire side of female terminals

Is there approx. 5 V?

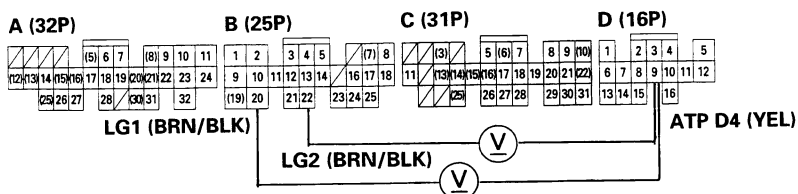
NO

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 terminals 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 **D**.
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

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Gear Position Switch (Short) (cont'd)

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.

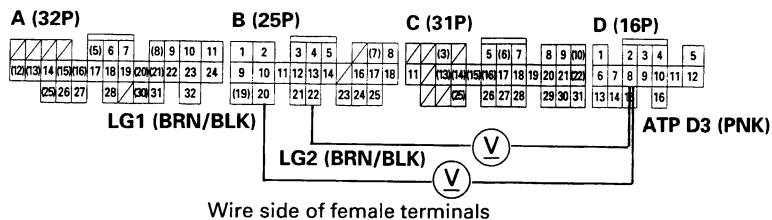
Is there battery voltage?

NO

YES

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.

PCM CONNECTORS



Measure ATP 2 Voltage:

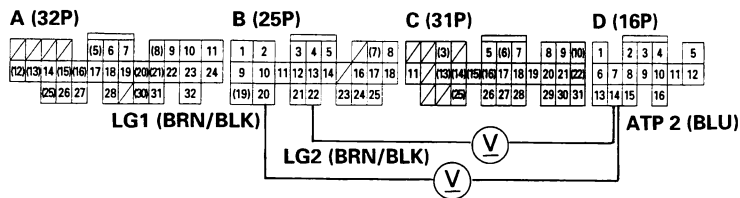
1. Shift to all positions other than **2**.
2. Measure the voltage between the D14 and B20 or B22 terminals.

Is there battery voltage?

NO

YES

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.



To page 14-67



From page 14-66

Measure ATP 1 Voltage:

1. Shift to all positions other than **1**.
2. Measure the voltage between the D15 and B20 or B22 terminals.

Is there battery voltage?

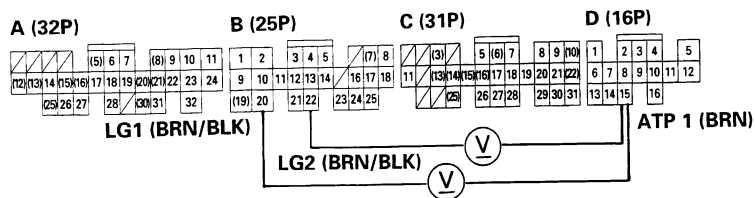
NO

YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

Check for short in the wire between the D15 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.

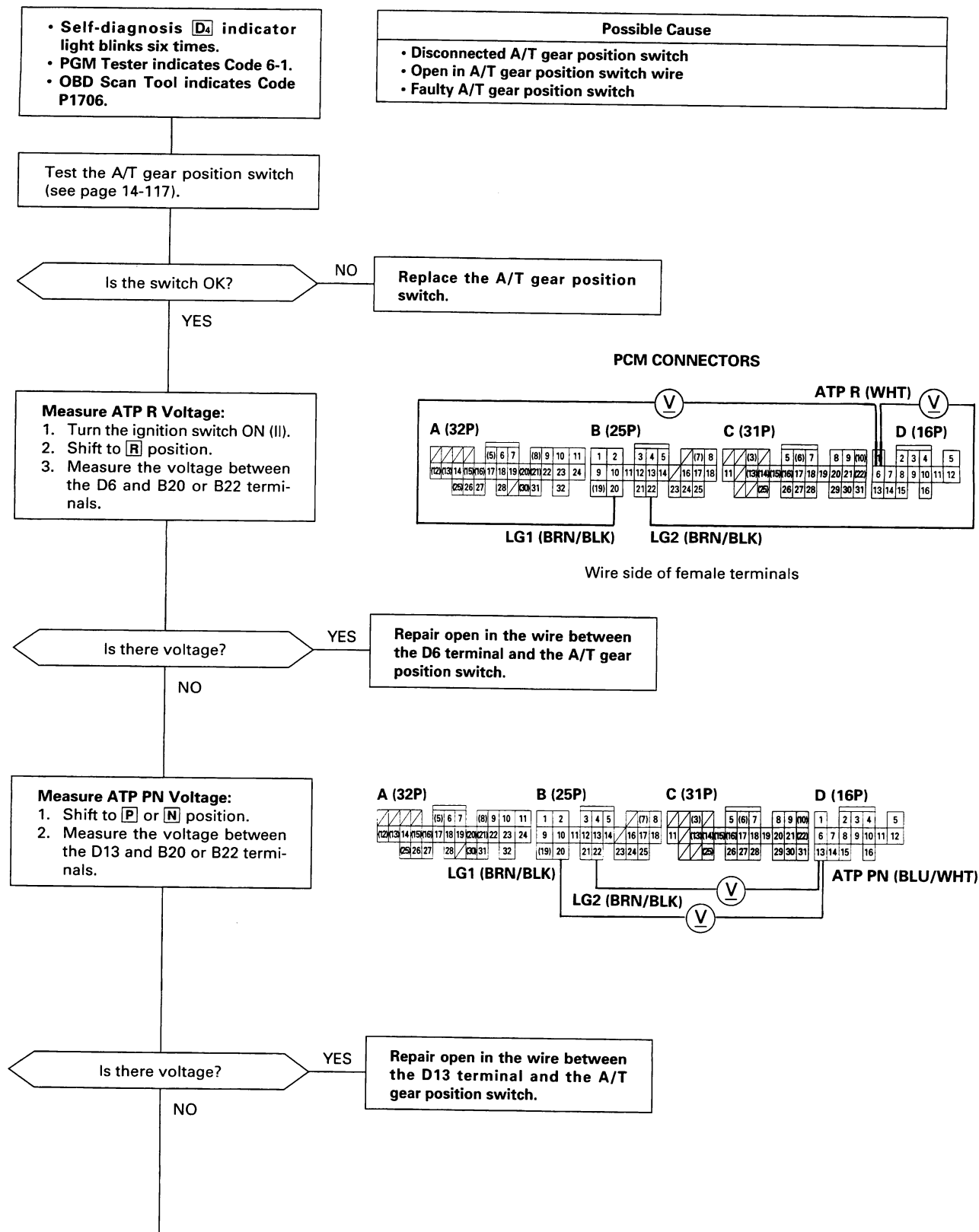
PCM CONNECTORS



Wire side of female terminals

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Gear Position Switch (Open)



To page 14-69



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?

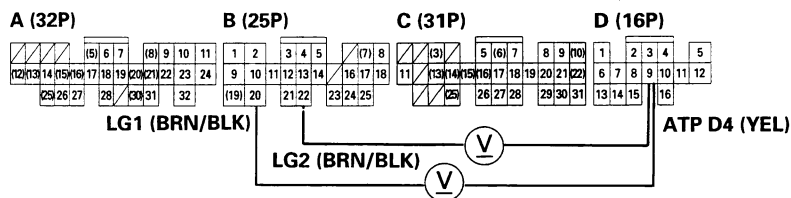
YES

Repair open in the wire between the D14 terminal and the A/T gear position switch.

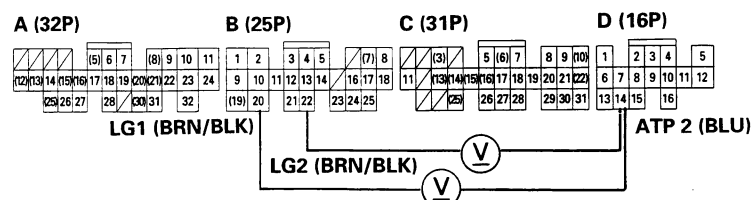
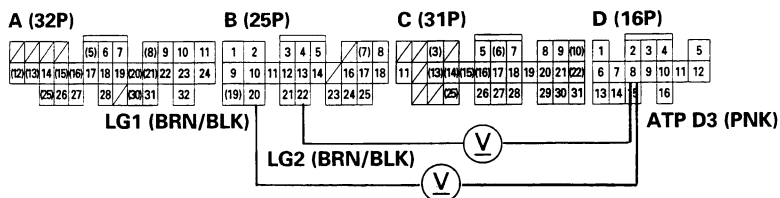
NO

To page 14-70

PCM CONNECTORS



Wire side of female terminals

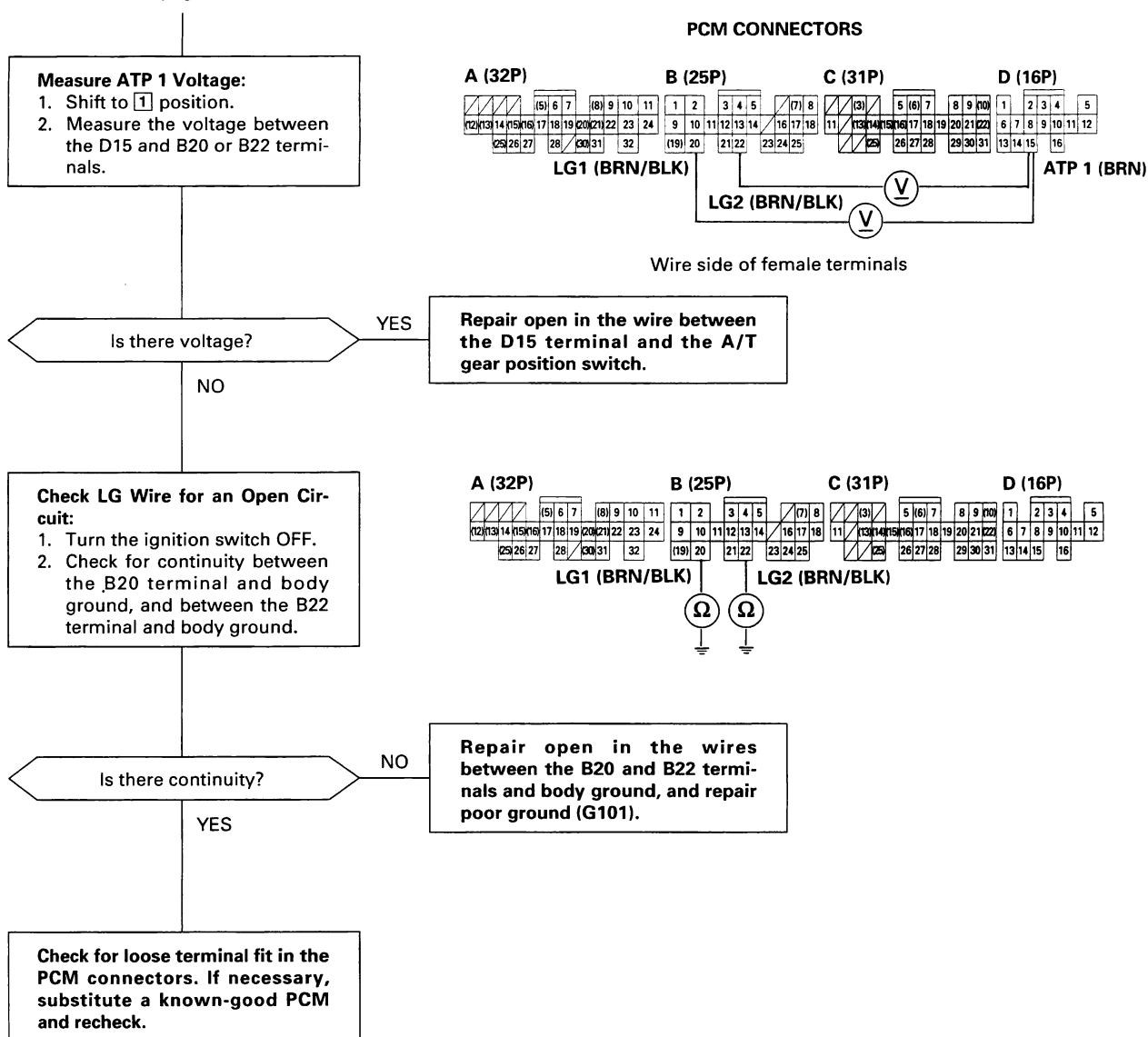


(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Gear Position Switch (Open) (cont'd)

From page 14-69





Troubleshooting Flowchart — Shift Control Solenoid Valve A

- Self-diagnosis **D4** indicator light blinks seven times.
- PGM Tester indicates Code 7-1.
- OBD Scan Tool indicates Code P0753.

Possible Cause

- Disconnected lock-up control solenoid valve/shift control solenoid valve A assembly connector
- Short or open in shift control solenoid valve A wire
- Faulty shift control solenoid valve A
- Open in VB SOL wire

If the PGM Tester is available, retrieve the A/T Freeze Data, then clear the PCM.

Test-drive the vehicle under the same conditions the Freeze Data was recorded.

For F20B6 engine model

Did the code return?

NO

Intermittent failure. The system is OK at this time. Check the fit of the pins in all connectors affected by this code.

YES

Check for a Short to Power:

1. Turn the ignition switch OFF.
2. Disconnect the B (25P) and D (16P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the D7 and B20 or B22 terminals.

Is there voltage?

YES

Repair short to power in the wire between the D7 terminal and the shift control solenoid valve A.

NO

Measure Shift Control Solenoid Valve A Resistance:

1. Turn the ignition switch OFF.
2. Measure the resistance between the D7 and B20 or B22 terminals.

Is the resistance 12 – 25 Ω ?

NO

To page 14-72

YES

Measure VB SOL Voltage:

1. Turn the ignition switch ON (II).
2. Measure the voltage between the D5 and B20 or B22 terminals.

Is there approx. battery voltage?

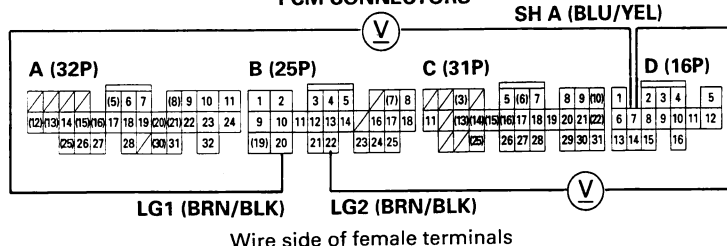
NO

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.

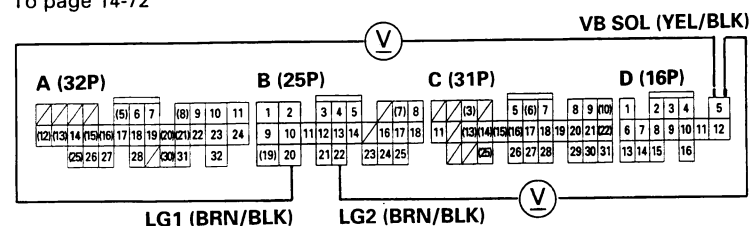
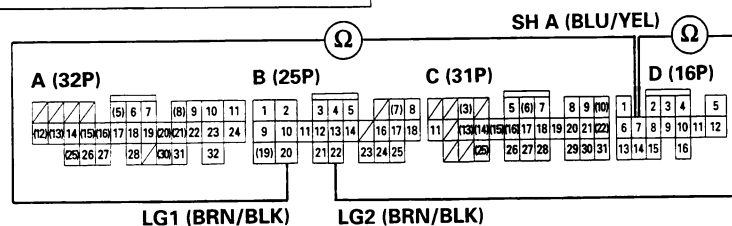
YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals

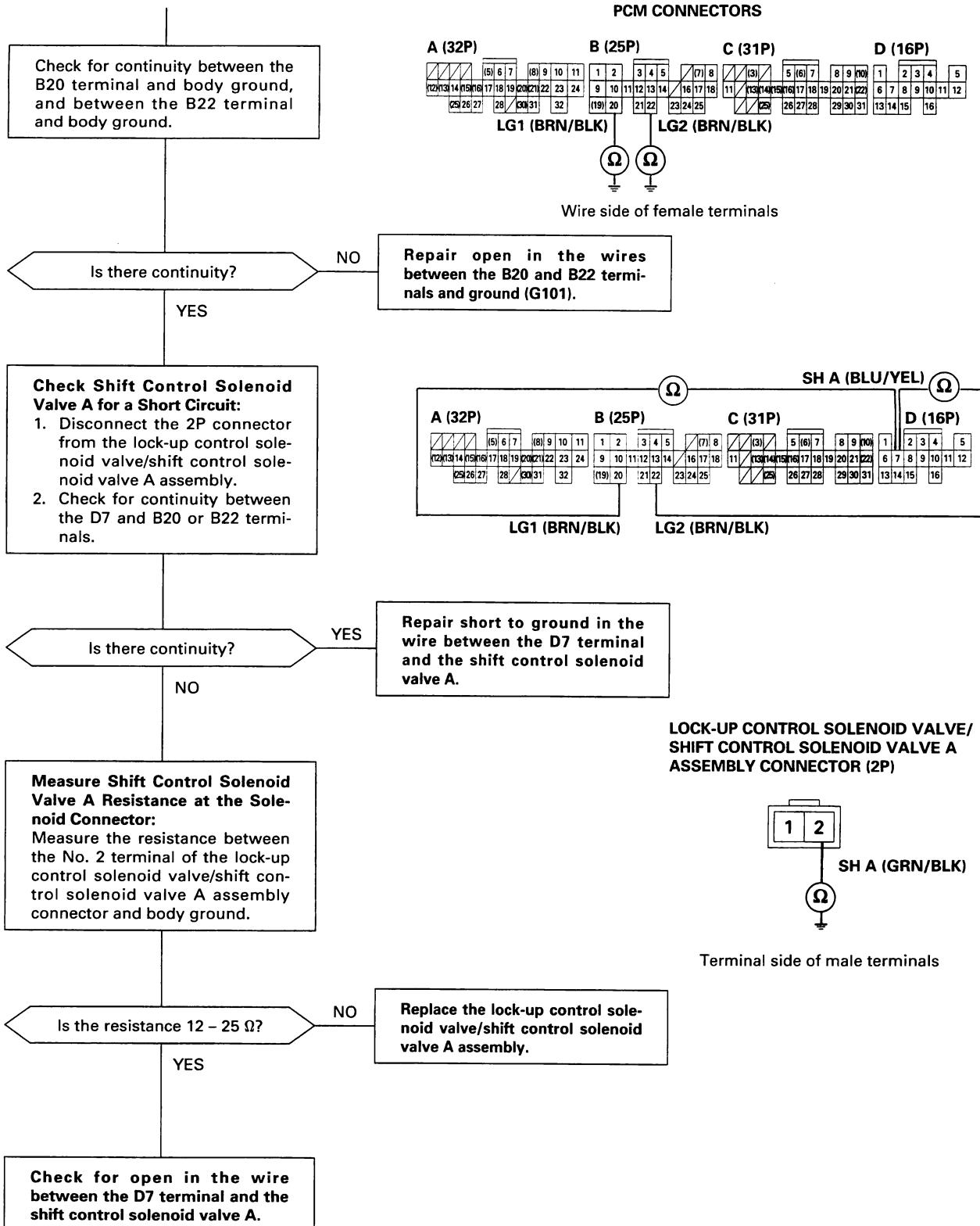


(cont'd)

Electrical Troubleshooting

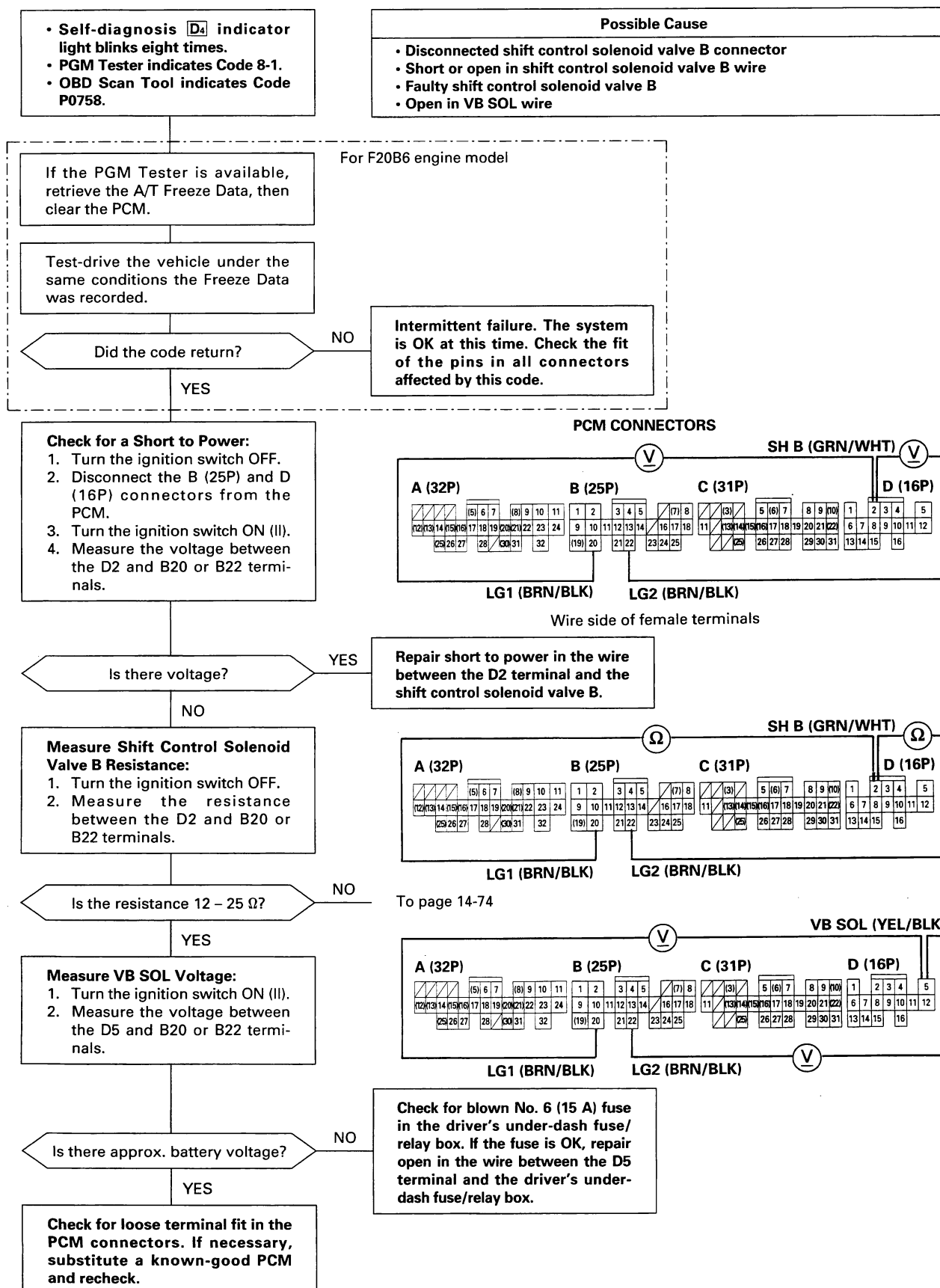
Troubleshooting Flowchart — Shift Control Solenoid Valve A (cont'd)

From page 14-71





Troubleshooting Flowchart — Shift Control Solenoid Valve B

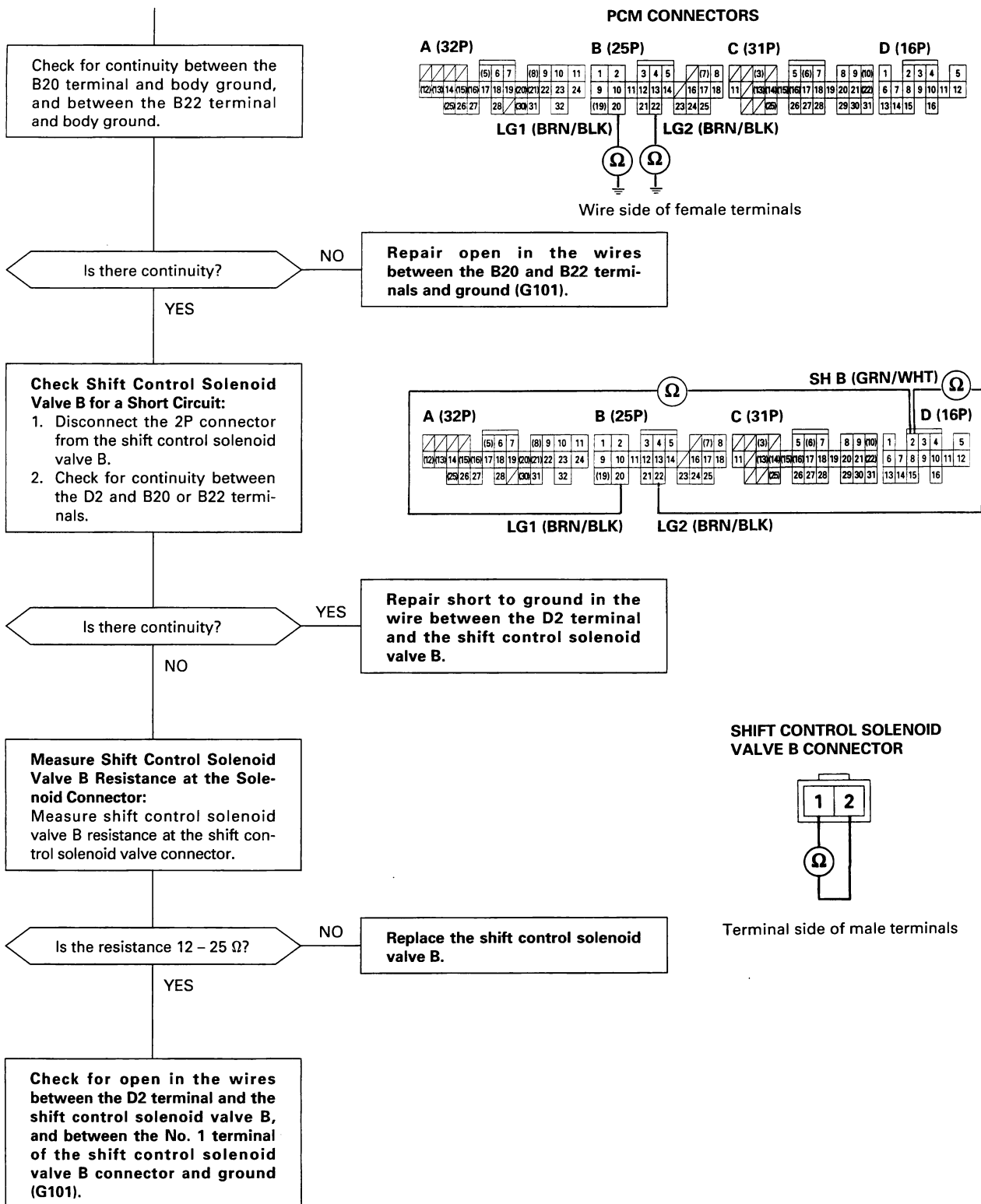


(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Control Solenoid Valve B (cont'd)

From page 14-73





Troubleshooting Flowchart — Countershaft Speed Sensor

- Self-diagnosis **D₃** indicator light blinks nine times.
- PGM Tester indicates Code 9-1.
- OBD Scan Tool indicates Code P0720.

Possible Cause

- Loose or faulty connection between the PCM and vehicle harness
- Disconnected countershaft speed sensor connector
- Short or open in countershaft speed sensor wire
- Faulty countershaft speed sensor

Check for MIL Indication:

1. Turn the ignition switch ON (II).
2. Check whether the Malfunction Indicator Lamp (MIL) indicates DTC of the manifold absolute pressure (MAP) sensor.

Is the MIL indicating DTC of the MAP sensor?

YES

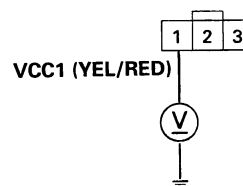
Repair the MAP sensor circuit on the PGM-FI system (see section 11), and recheck.

NO

Measure VCC1 Voltage at the Countershaft Speed Sensor Connector:

1. Turn ignition switch OFF.
2. Disconnect the 3P connector from the countershaft speed sensor.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there approx. 5 V?

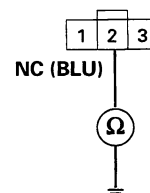
NO

To page 14-78

YES

Check NC for a Short Circuit:

1. Turn the ignition switch OFF.
2. Check for continuity between the No. 2 terminal of the countershaft speed sensor connector and body ground.



Is there continuity?

YES

Repair short to ground in the wire between the D10 terminal and the countershaft speed sensor.

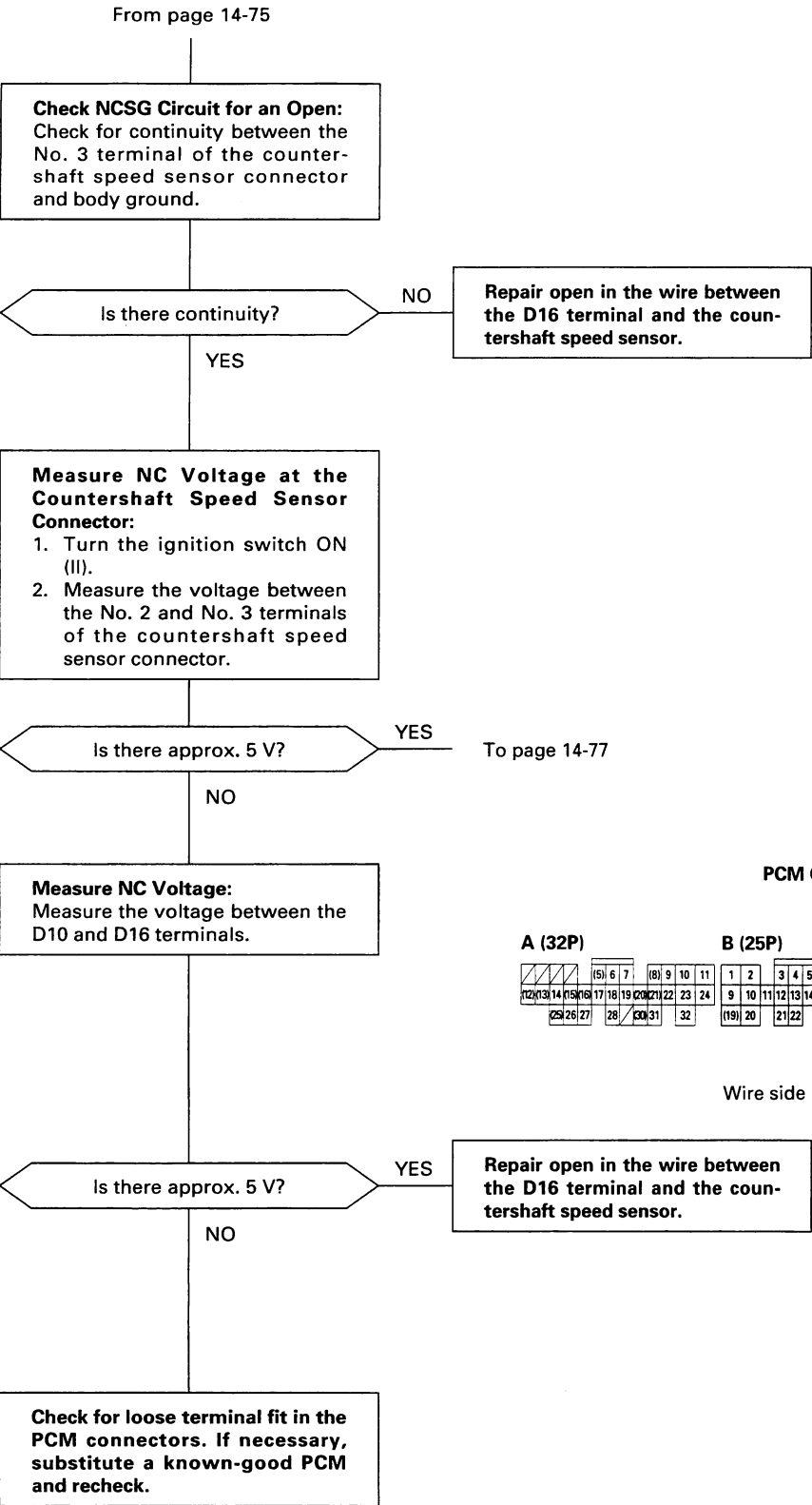
NO

To page 14-76

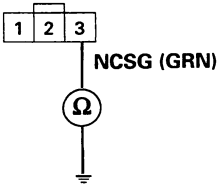
(cont'd)

Electrical Troubleshooting

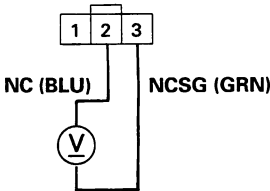
Troubleshooting Flowchart — Countershaft Speed Sensor (cont'd)



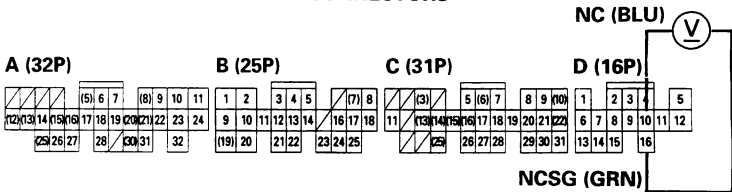
COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals



PCM CONNECTORS



Wire side of female terminals

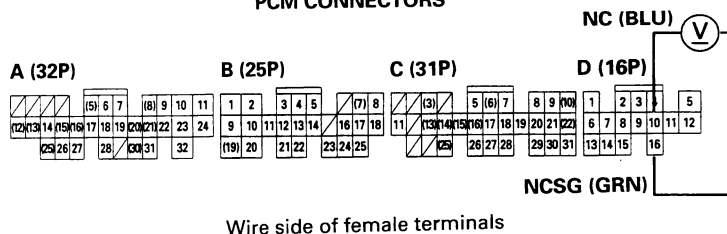


From page 14-76

Measure NC Voltage:

1. Connect the countershaft speed sensor connector.
2. Measure the voltage between the D10 and D16 terminals.

PCM CONNECTORS



Is there approx. 5 V or 0 V?

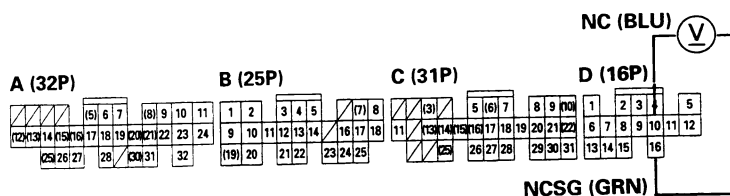
NO

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.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Countershaft Speed Sensor (cont'd)

From page 14-75

Measure VCC1 Voltage:
Measure the voltage between the C19 and body ground.

Is there 4.75 – 5.25 V?

YES

Repair open in the wire between the C19 terminal and the countershaft speed sensor.

NO

Check VCC1 for a Short Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the C (31P) connector from the PCM.
3. Check for continuity between the C19 terminal and body ground.

Is there continuity?

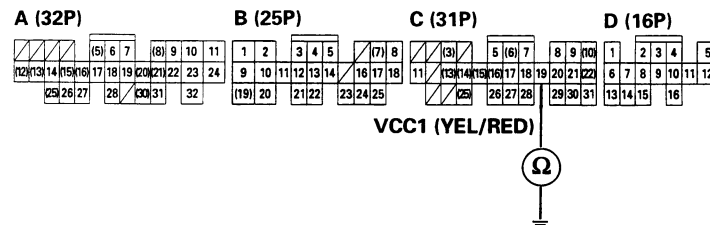
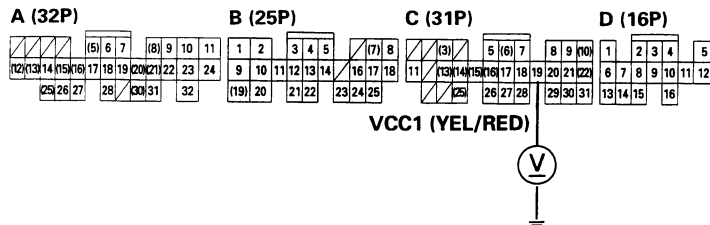
YES

Repair short to ground in the wire between the C19 terminal and the countershaft speed sensor.

NO

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS





Troubleshooting Flowchart — Mainshaft Speed Sensor

- Self-diagnosis **D4** indicator light indicates Code 15.
- PGM Tester indicates Code 15-1.
- OBD Scan Tool indicates Code P0715.

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.

NO

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. 5 V?

NO

To page 14-82

YES

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?

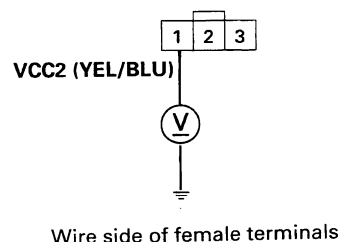
YES

Repair short to ground in the wire between the D11 terminal and the mainshaft speed sensor.

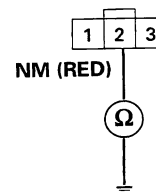
NO

To page 14-80

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Mainshaft Speed Sensor (cont'd)

From page 14-79

Check NMSG Circuit for an Open:
Check for continuity between the No. 3 terminal of the mainshaft speed sensor connector and body ground.

Is there continuity?

NO

Repair open in the wire between the D12 terminal and the mainshaft speed sensor.

YES

Measure NM Voltage at the Mainshaft Speed Sensor Connector:

1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 2 and No. 3 terminals of the mainshaft speed sensor connector.

Is there approx. 5 V?

YES

To page 14-81

NO

Measure NM Voltage:
Measure the voltage between the D11 and D12 terminals.

Is there approx. 5 V?

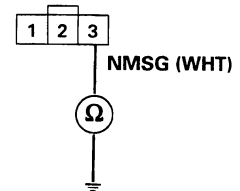
YES

Repair open in the wire between the D11 terminal and the mainshaft speed sensor.

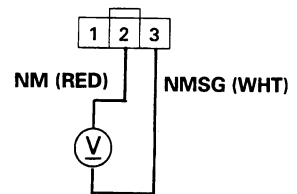
NO

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

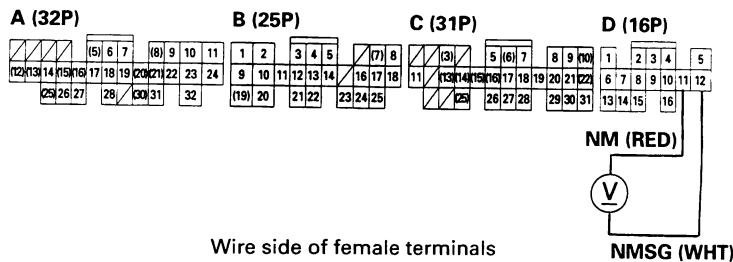
MAINSHAFT SPEED SENSOR CONNECTOR



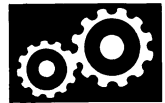
Wire side of female terminals



PCM CONNECTORS



Wire side of female terminals

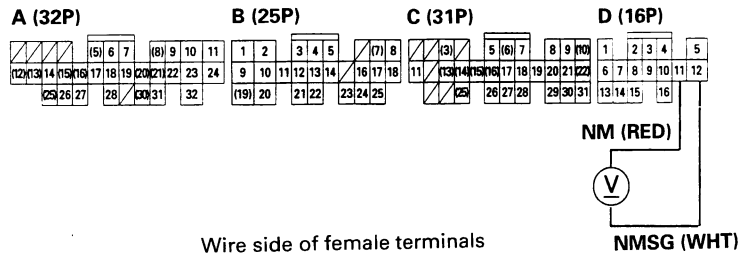


From page 14-80

Measure NM Voltage:

1. Connect the mainshaft speed sensor connector.
2. Measure the voltage between the D11 and D12 terminals.

PCM CONNECTORS



Is there approx. 5 V or 0 V?

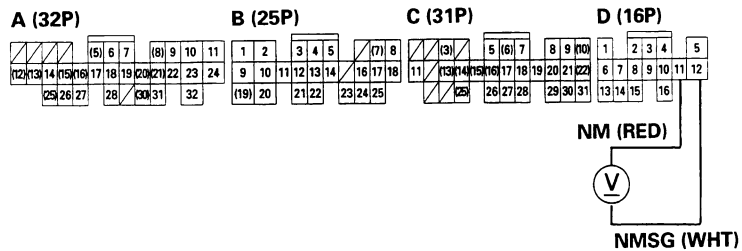
NO

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.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Mainshaft Speed Sensor (cont'd)

From page 14-79

Measure VCC2 Voltage:
Measure the voltage between the C28 and body ground.

Is there 4.75 – 5.25 V?

YES

Repair open in the wire between the C28 terminal and the mainshaft speed sensor.

NO

Check VCC2 for a Short Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the C (31P) connector from the PCM.
3. Check for continuity between the C28 terminal and body ground.

Is there continuity?

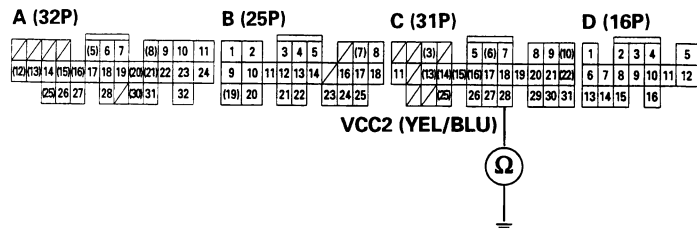
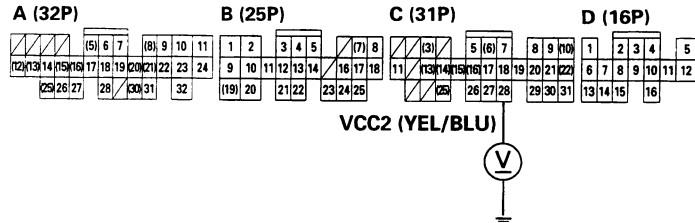
YES

Repair short to ground in the wire between the C28 terminal and the mainshaft speed sensor.

NO

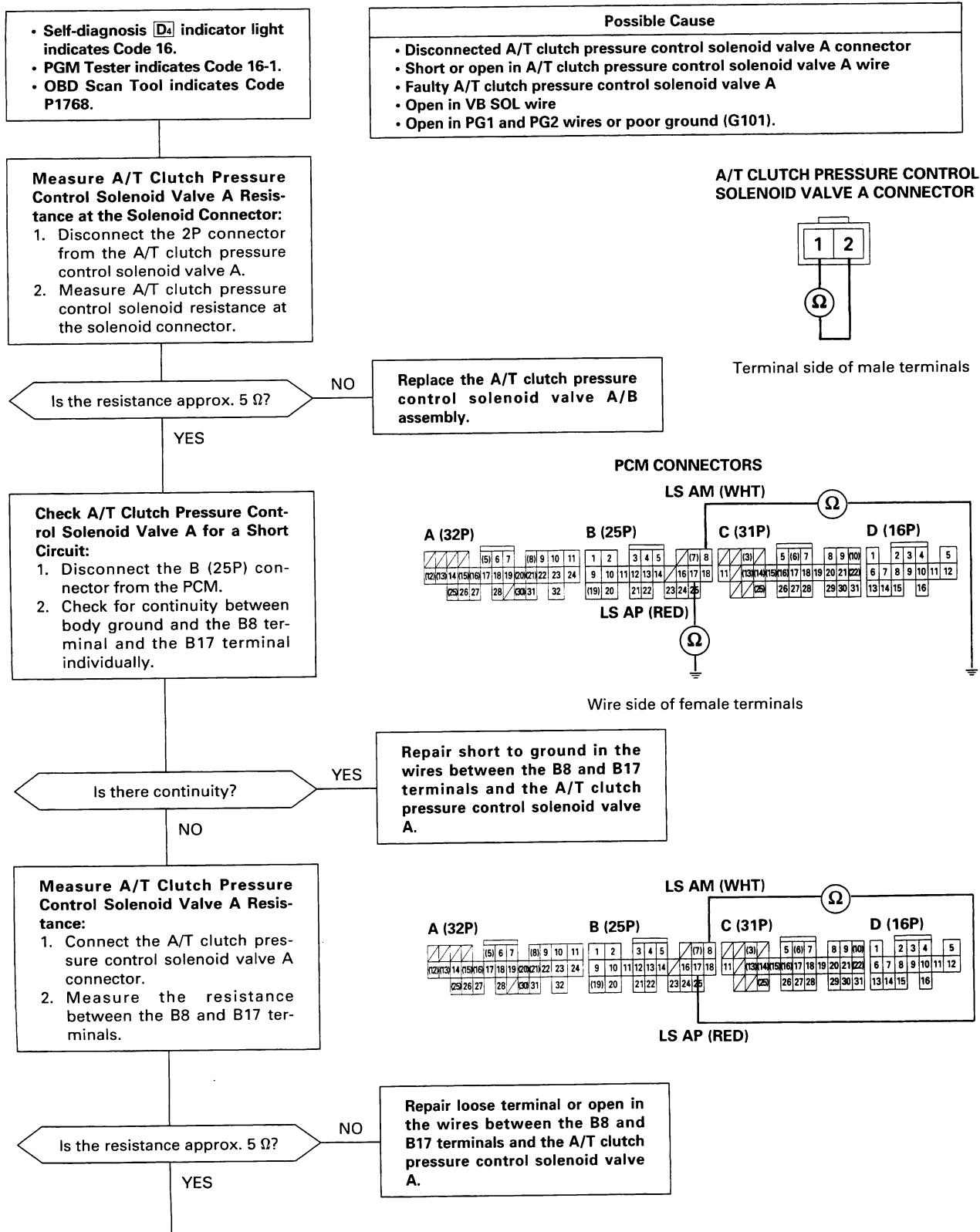
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS





Troubleshooting Flowchart — A/T Clutch Pressure Control Solenoid Valve A



To page 14-84

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Clutch Pressure Control Solenoid Valve A (cont'd)

From page 14-83

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?

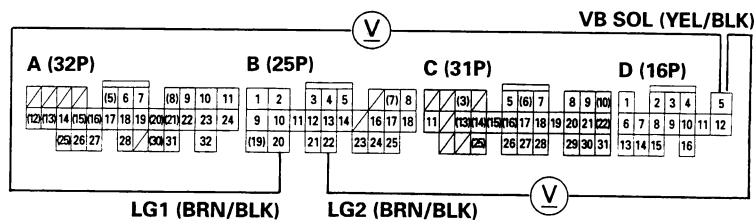
NO

Repair open in the wires between the B2, B10, B20 and B22 terminals and body ground, and repair poor ground (G101).

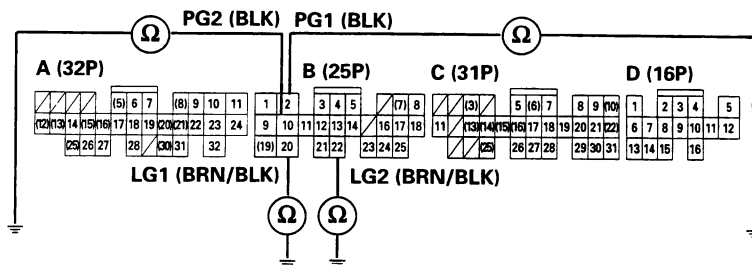
YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS

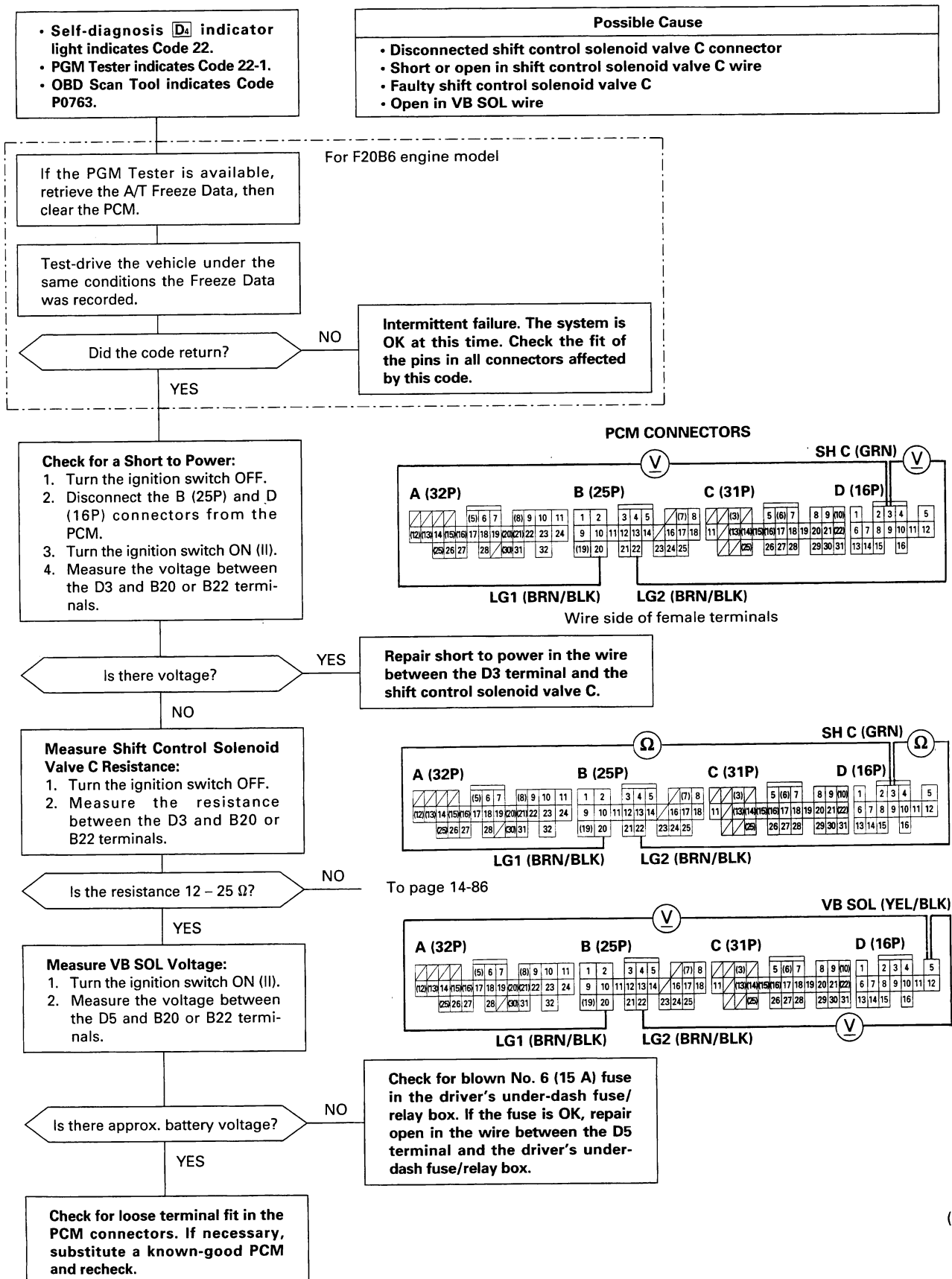


Wire side of female terminals





Troubleshooting Flowchart — Shift Control Solenoid Valve C



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Control Solenoid Valve C (cont'd)

From page 14-85

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).

YES

Check Shift Control Solenoid Valve C for a Short Circuit:

1. Disconnect the 2P connector from the shift control solenoid valve C.
2. Check for continuity between the D3 and B20 or B22 terminals.

Is there continuity?

YES

Repair short to ground in the wire between the D3 terminal and the shift control solenoid valve C.

NO

Measure Shift Control Solenoid Valve C Resistance at the Solenoid Connector:

Measure shift control solenoid valve C resistance at the shift control solenoid valve connector.

Is the resistance 12 – 25 Ω ?

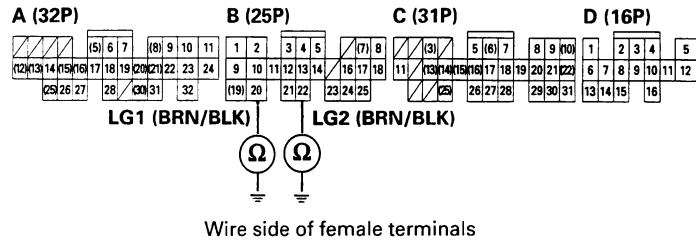
NO

Replace the shift control solenoid valve C.

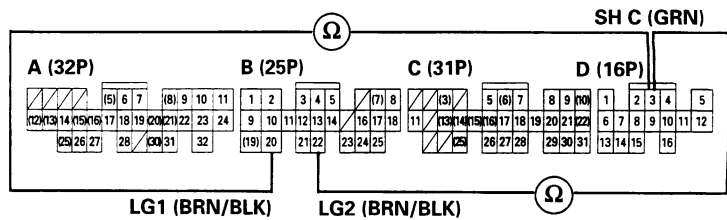
YES

Check for open in the wires between the D3 terminal and the shift control solenoid valve C, and between the No. 1 terminal of the shift control solenoid valve C connector and ground (G101).

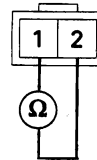
PCM CONNECTORS



Wire side of female terminals



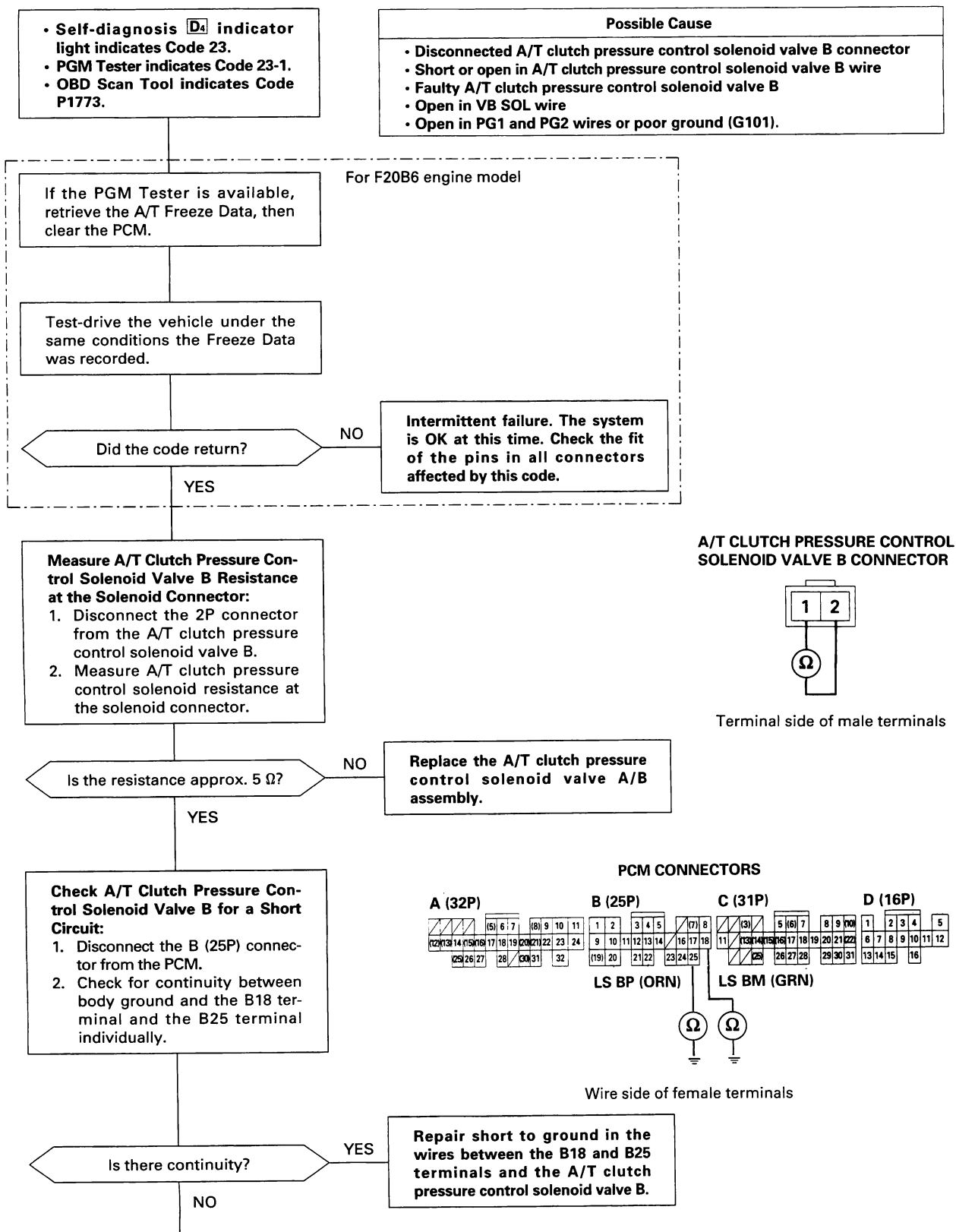
SHIFT CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals



Troubleshooting Flowchart — A/T Clutch Pressure Control Solenoid Valve B



To page 14-88

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — A/T Clutch Pressure Control Solenoid Valve B (cont'd)

From page 14-87

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 Ω ?

NO

Repair loose terminal or 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 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, 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?

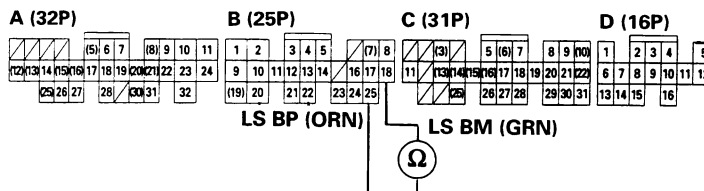
NO

Repair open in the wires between the B2, B10, B20 and B22 terminals and body ground, and repair poor ground (G101).

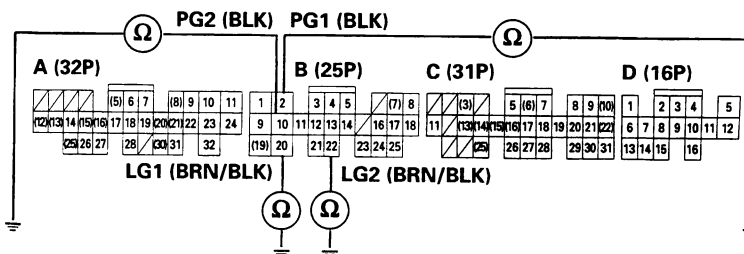
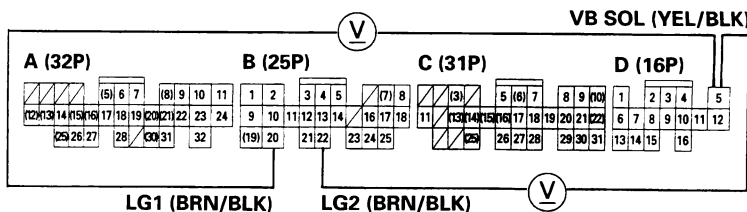
YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals





Troubleshooting Flowchart — Mode Switch

- Self-diagnosis **D4** indicator light indicates Code 24.
- PGM Tester indicates Code 24-1.
- OBD Scan Tool indicates Code P1709.

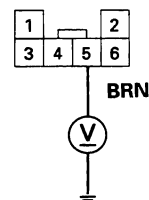
Possible Cause

- Disconnected mode switch connector
- Short or open in mode switch wire
- Faulty mode switch

Measure S-MODE Voltage at the Mode Switch Connector:

1. Turn the ignition switch OFF.
2. Remove the center console (see section 20).
3. Disconnect the mode switch connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 5 terminal of the mode switch connector and body ground.

MODE SWITCH CONNECTOR



Wire side of female terminal

Is there battery voltage?

NO

Repair open or short in the wire between the A31 terminal and the mode switch connector.

YES

Check Mode Switch Ground for a Short Circuit:

Measure the voltage between the No. 1 and No. 5 terminal of the mode switch connector.

Is there battery voltage?

NO

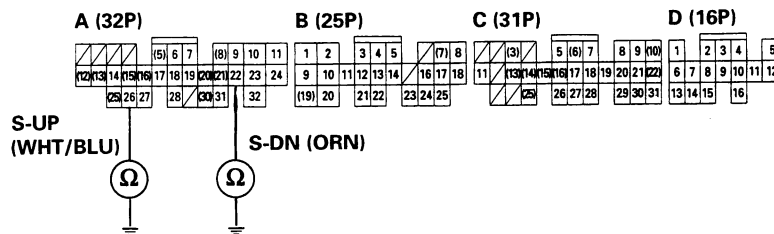
Repair open in the wire between the No. 1 terminal of the mode switch connector and ground, and repair poor ground (G401).

YES

Check S-UP+ and S-DN- for a Short Circuit:

1. Turn the ignition switch OFF.
2. Disconnect the A (32P) connector from the PCM.
3. Check for continuity between the A26 terminal and body ground, and between the A22 terminal and body ground.

PCM CONNECTORS



Wire side of female terminal

Is there continuity?

YES

Repair short to ground in the wire between the A26 and A22 terminals and the mode switch connector.

NO

To page 14-90

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Mode Switch (cont'd)

From page 14-89

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.

Is the resistance 0 Ω in the manual mode position, and 10 M Ω 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 Ω with the shift lever pushing toward the "+" mark, and pulling toward the "-" mark, and 10 M Ω or more with it released?

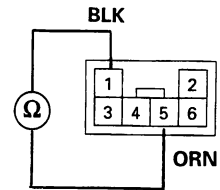
NO

Replace the mode switch.

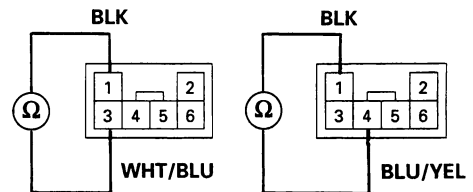
YES

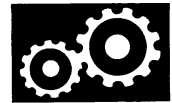
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

MODE SWITCH CONNECTOR

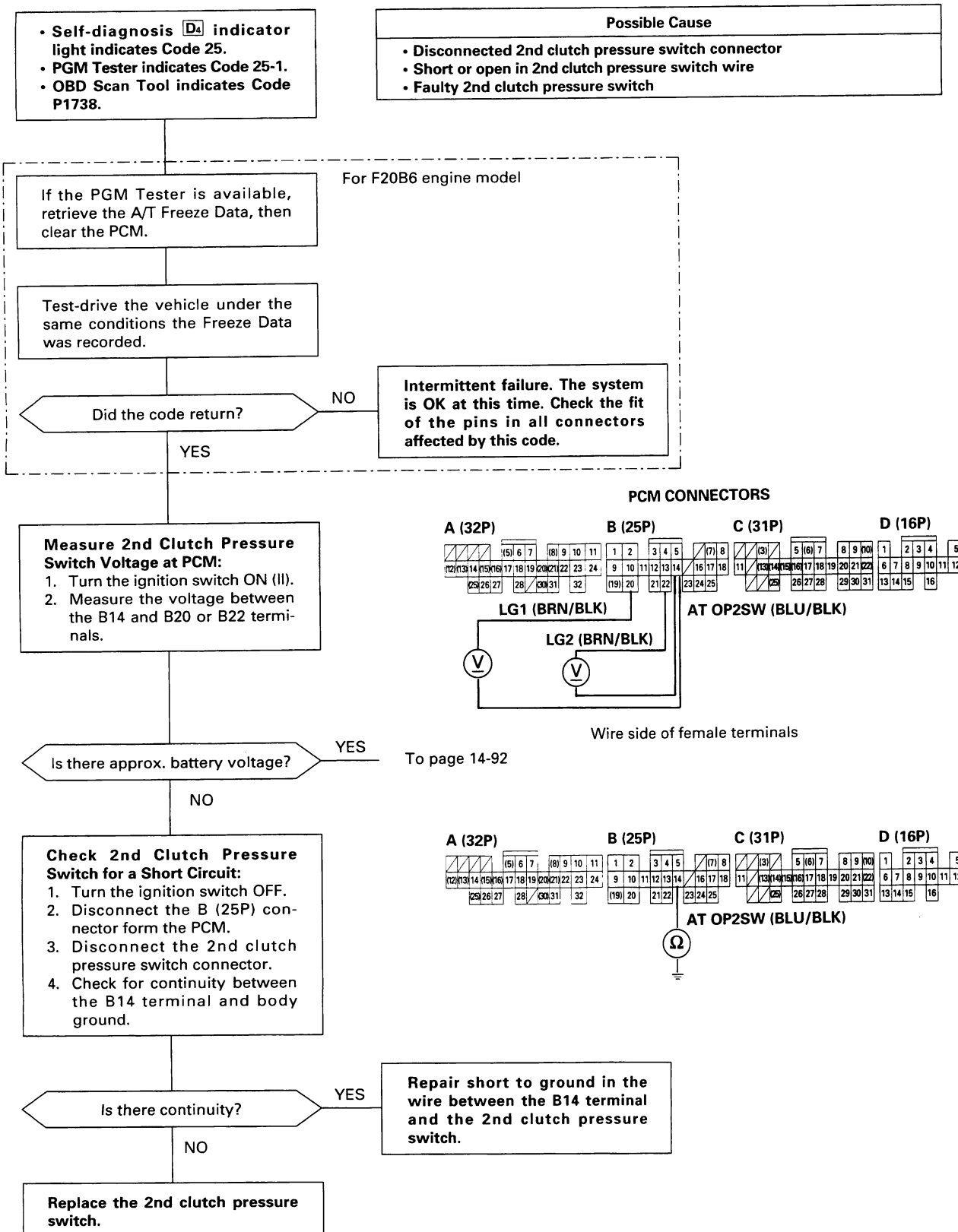


Terminal side of male terminal





Troubleshooting Flowchart — 2nd Clutch Pressure Switch



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — 2nd Clutch Pressure Switch (cont'd)

From page 14-91

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 B14 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 2nd 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.

Is there approx. battery voltage?

NO

Repair open in the wire between the 2nd clutch pressure switch and the PCM.

YES

Check 2nd Clutch Pressure Switch:

Measure the resistance between the 2nd clutch pressure switch connector and body ground.

Is the resistance 10 MΩ and more?

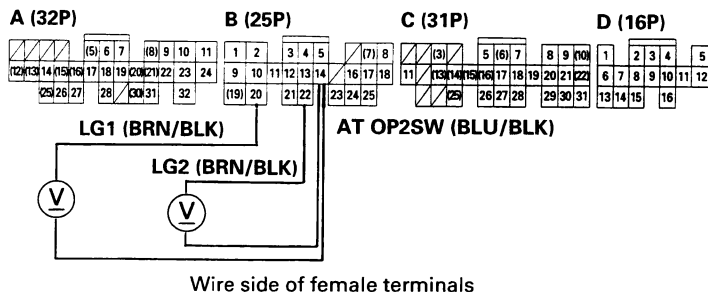
NO

Replace the 2nd clutch pressure switch.

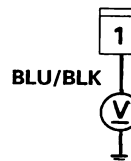
YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



2ND CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminal

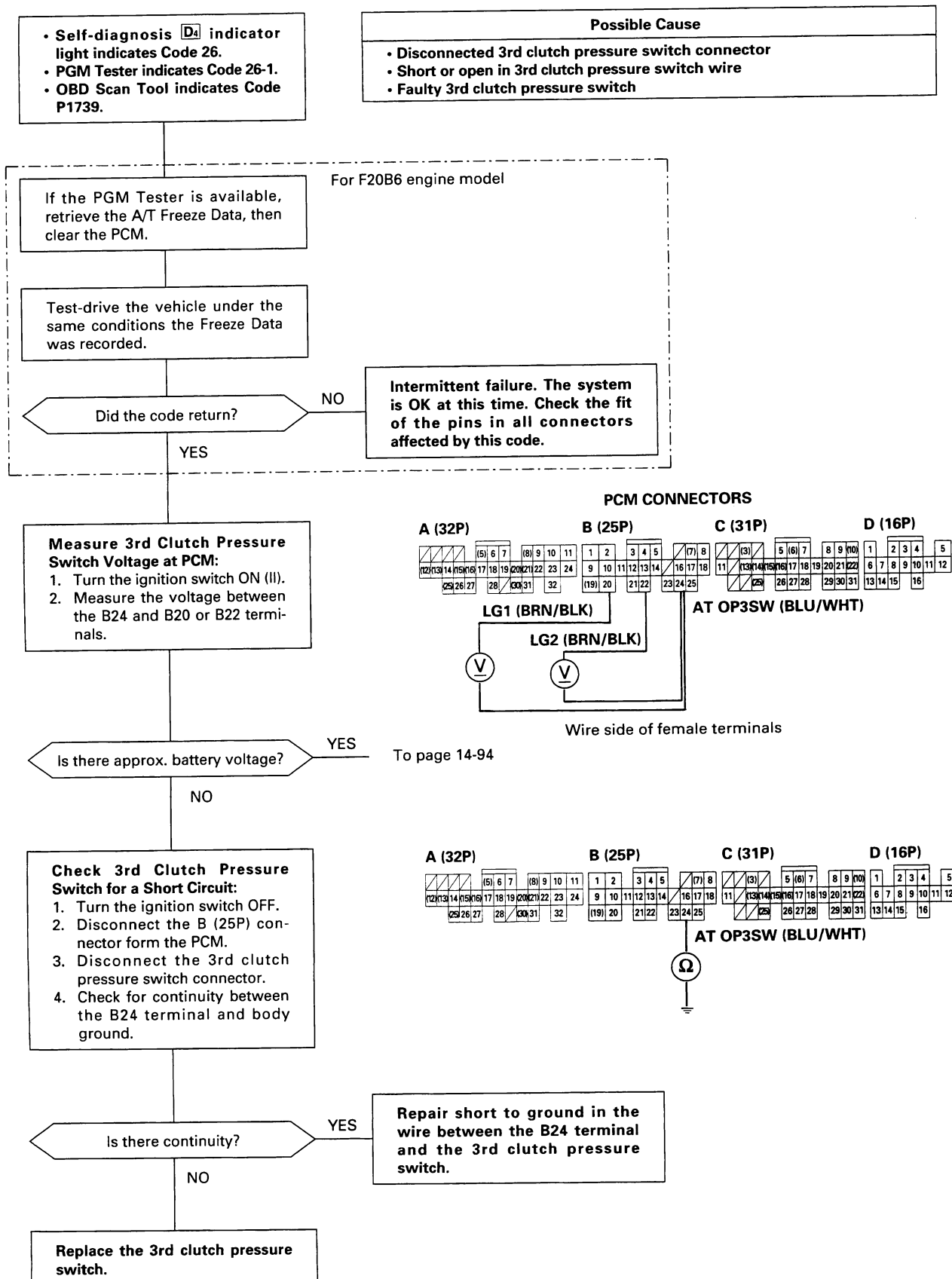
2ND CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminal



Troubleshooting Flowchart — 3rd Clutch Pressure Switch



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — 3rd Clutch Pressure Switch (cont'd)

From page 14-93

Measure 3rd Clutch Pressure Switch Voltage with Engine Running in **D₃** 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 **D₃** 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.

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.

Is the resistance 10 MΩ and more?

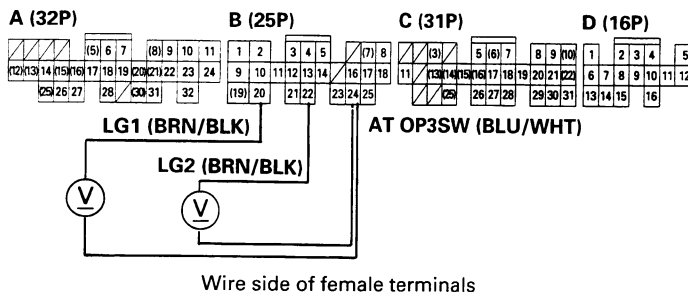
NO

Replace the 3rd clutch pressure switch.

YES

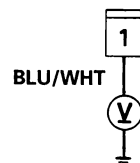
Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals

3RD CLUTCH PRESSURE SWITCH CONNECTOR

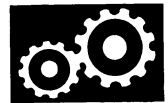


Wire side of female terminal

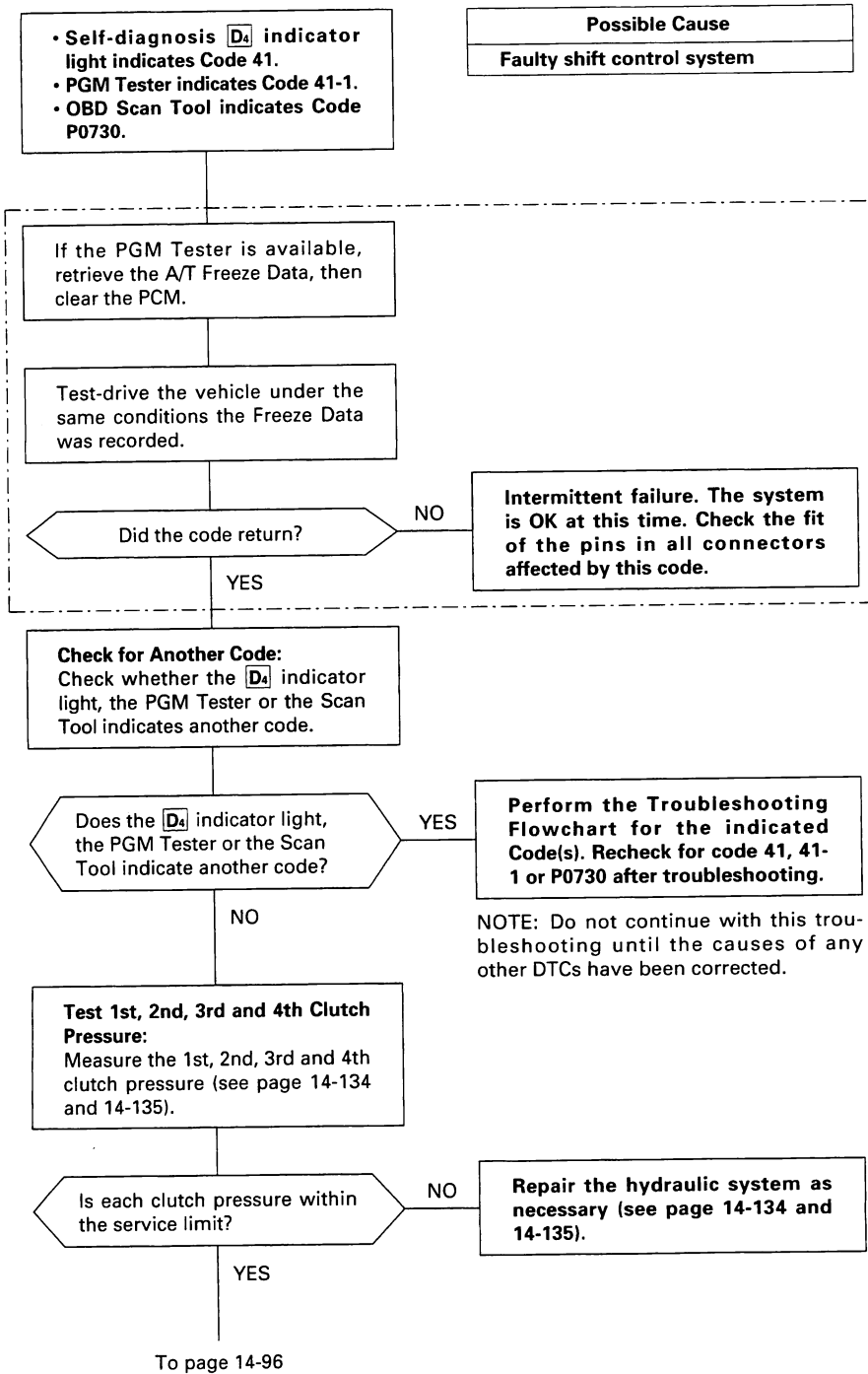
3RD CLUTCH PRESSURE SWITCH CONNECTOR



Terminal side of male terminal



Troubleshooting Flowchart — Shift Control System (F20B6 Engine Model)

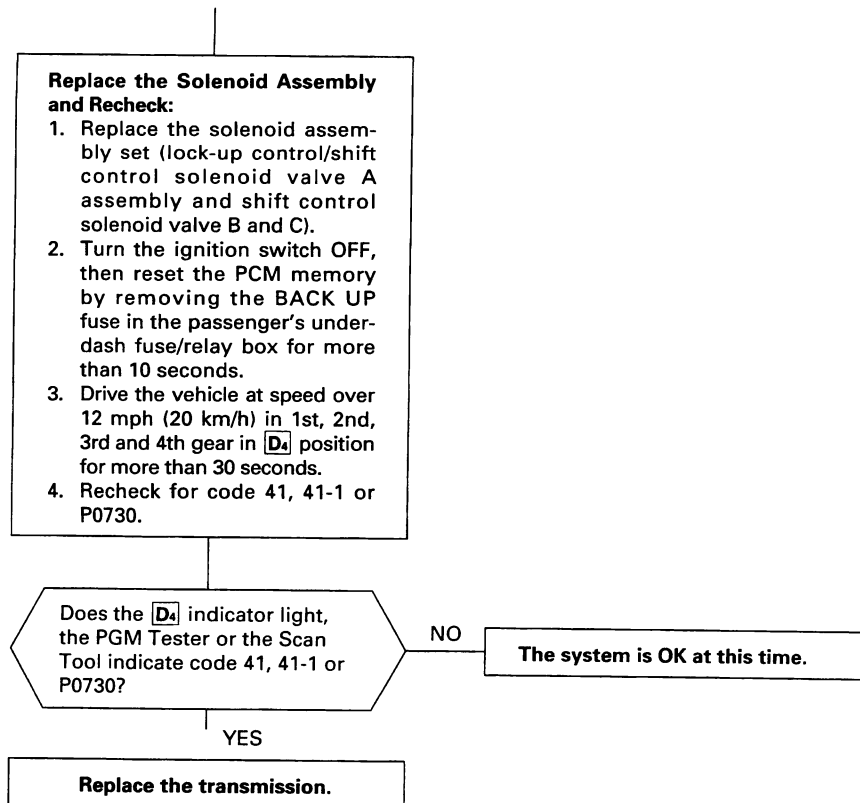


(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Control System (F20B6 Engine Model) (cont'd)

From page 14-95





Troubleshooting Flowchart — **D₄** Indicator Light On Constantly

The **D₄** indicator light is on constantly (not blinking) whenever the ignition switch is ON (II).

Measure D₄ IND Voltage:

1. Turn the ignition switch OFF.
2. Disconnect the A (32P) connector from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the A14 terminal and body ground.

Is there voltage?

YES

Repair short to power in the wire between the A14 terminal and the gauge assembly.

NO

Measure ATP D₄ Voltage:

1. Turn the ignition switch OFF.
2. Connect the A (32P) connector to the PCM.
3. Turn the ignition switch ON (II).
4. Shift to any position other than **D₄**.
5. Measure the voltage between the D9 terminal and body ground.

Is there battery voltage?

YES

Replace the PCM.

NO

Test the A/T gear position switch (see page 14-117).

Is the switch OK?

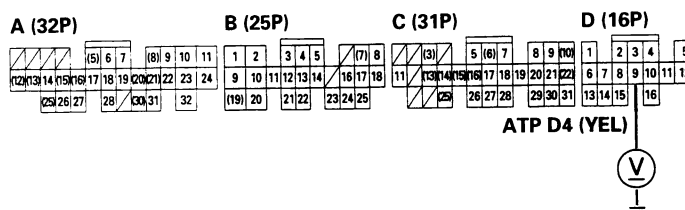
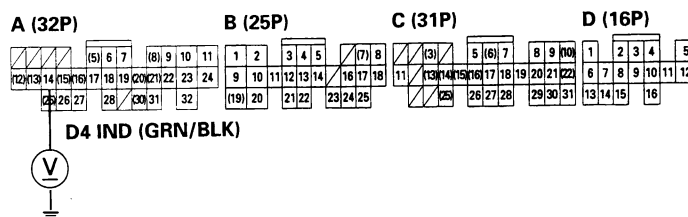
NO

Replace the A/T gear position switch.

YES

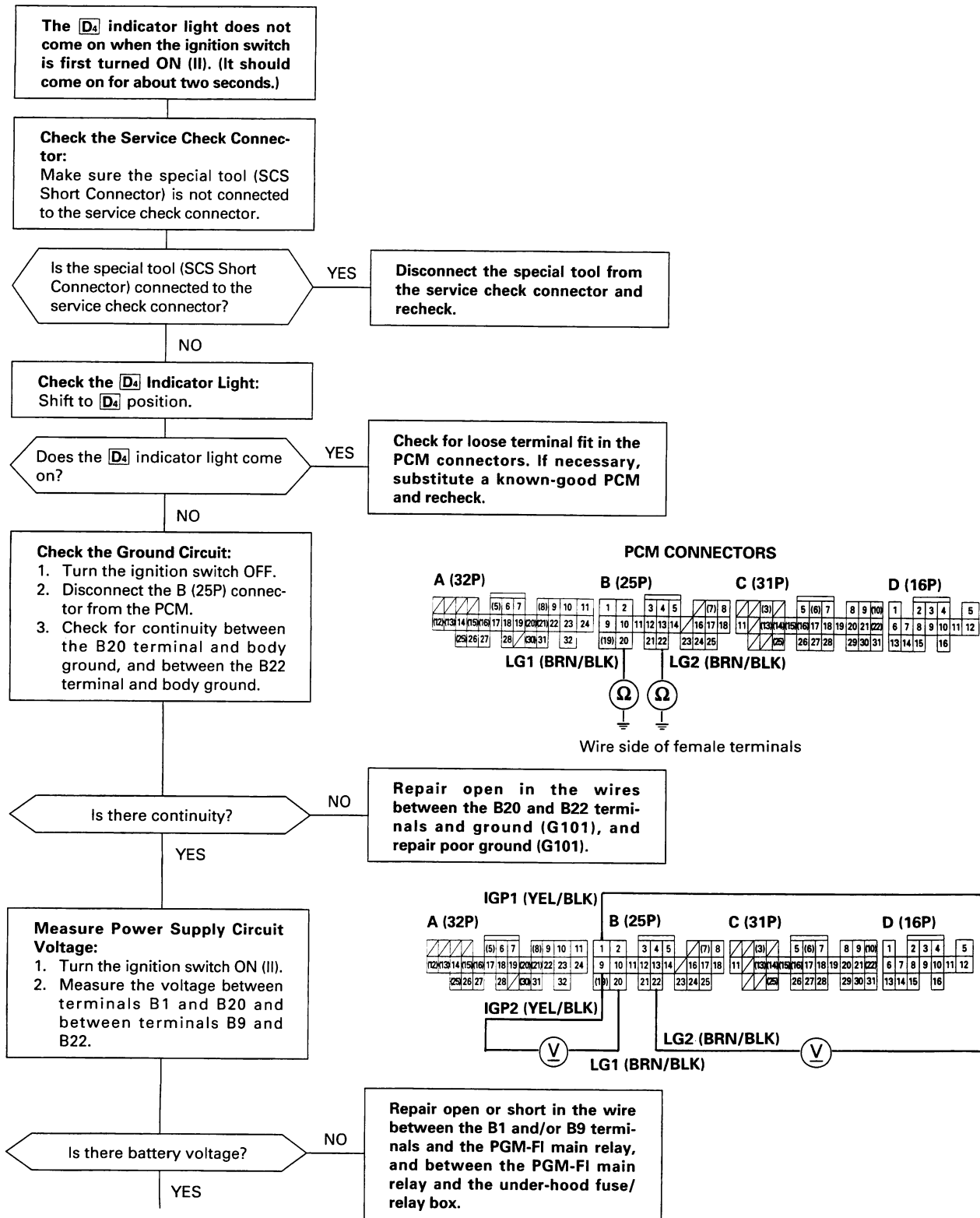
Check for a short to ground in the wire between the D9 terminal and A/T gear position switch. If wire is OK, substitute a known-good PCM and recheck.

PCM CONNECTORS



Electrical Troubleshooting

Troubleshooting Flowchart — **D₄** Indicator Light Does Not Come On

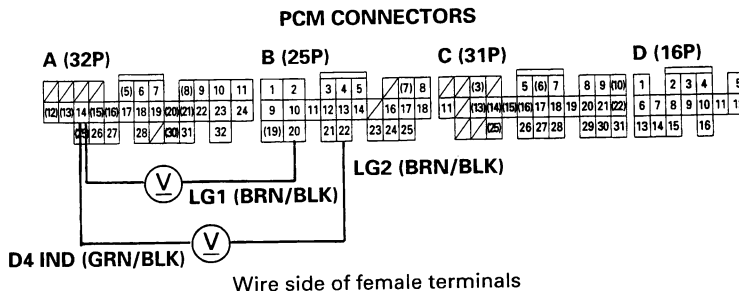




From page 14-98

Measure D4 IND Voltage:

1. Turn the ignition switch OFF.
2. Connect the B (25P) connector to the PCM.
3. Connect a digital multimeter to the A14 and B20 or B22 terminals.
4. Turn the ignition switch ON (II), and make sure that voltage is available for two seconds.



Is there voltage?

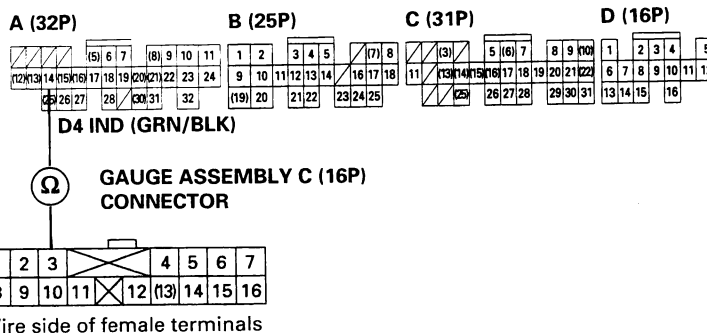
YES

Check for open in the wire between the A14 terminal and the gauge assembly. If wire is OK, check for a faulty indicator light bulb or a faulty gauge assembly printed circuit board.

NO

Check D4 IND for an Open Circuit:

1. Turn the ignition switch OFF.
2. Disconnect the A (32P) connector from the PCM.
3. Check for continuity between the A14 terminal and the C3 terminal of the gauge assembly C (16P) connector.



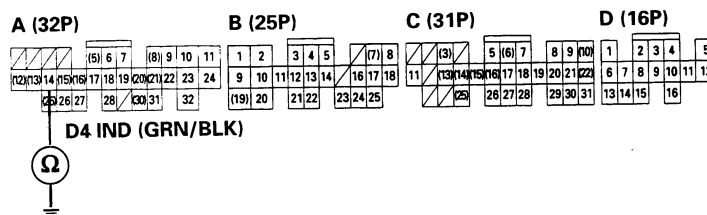
Is there continuity?

NO

Repair open in the wire between the A14 terminal and the gauge assembly.

YES

Check D4 IND for a Short Circuit:
Check for continuity between the A14 terminal and body ground.



Is there continuity?

YES

Repair short in the wire between the A14 terminal and the gauge assembly.

NO

Check for loose terminal fit in the PCM connectors. Check the A/T gear position switch. If necessary, substitute a known-good PCM and recheck.

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Switch Does Not Operate

Transmission does not shift up and down when operating the shift lever in the manual mode position.

Test-drive in **D₄** Position and Recheck DTC:

1. Test-drive the vehicle in **D₄** position, and check whether the transmission shifts up and down normally.
2. Check whether the **D₄** indicator light, the PGM tester or the Scan Tool indicates Code.

Number of D₄ 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.

Does the **D₄** indicator light, the PGM tester or the Scan Tool indicate the Code(s) in the table on the upper right?

YES

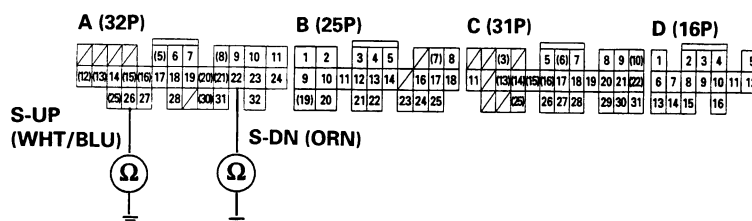
Perform the Troubleshooting Flowchart for the indicated Code(s).

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.

PCM CONNECTORS



Wire side of female terminal

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 toward 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.

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 toward the "+" mark.

Is there continuity with the shift lever pushed toward "+" mark, and no continuity with it released?

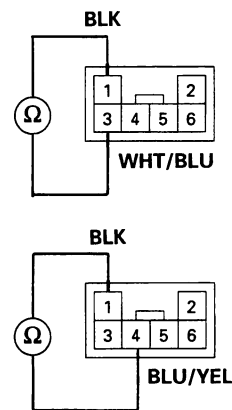
NO

Repair open in the wire between the A26 terminal and the mode switch connector.

YES

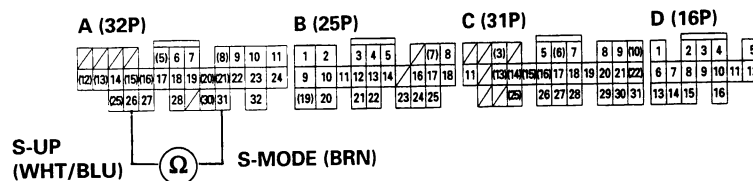
To page 14-102

MODE SWITCH CONNECTOR



Terminal side of male terminal

PCM CONNECTORS



Wire side of female terminal

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Shift Switch Does Not Operate (cont'd)

From page 14-101

Check S-DN for an Open Circuit:
Check for continuity between the A22 and A31 terminals while pulling the shift lever toward the “_” mark.

Is there continuity with the shift lever pulled toward “_” mark, and no continuity with it released?

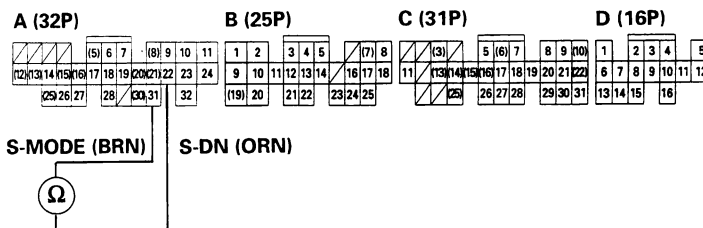
NO

Repair open in the wire between the A22 terminal and the mode switch connector.

YES

Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminal



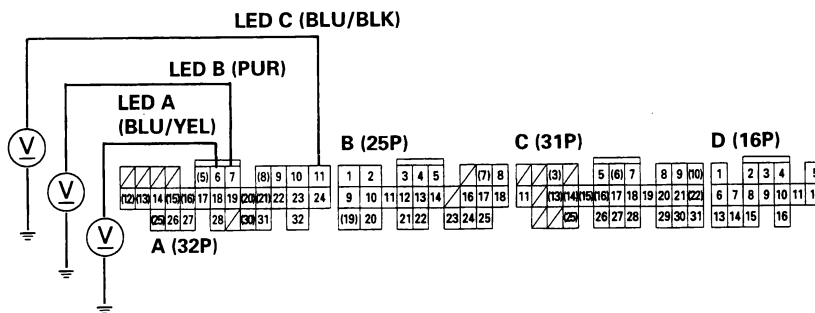
Troubleshooting Flowchart — Shift Indicator Does Not Indicate Selected Gear

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 **D₄** 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.

PCM CONNECTORS



Wire side of female terminal

Manual Mode Gear Position	Terminal Voltage		
	A6 Terminal	A7 Terminal	A11 Terminal
1st	0 V	0 V	Battery voltage
2nd	0 V	Battery voltage	0 V
3rd	0 V	Battery voltage	Battery voltage
4th	Battery voltage	0 V	0 V

Does the voltage match the table?

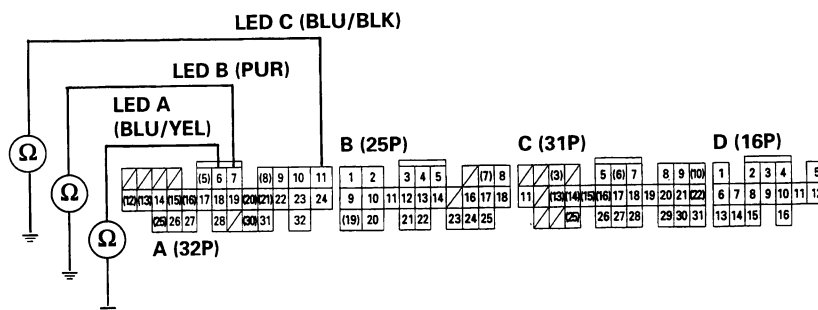
YES

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.

Electrical Troubleshooting

Troubleshooting Flowchart — Interlock System – Shift Lock System

Shift lever cannot be moved from the **P** position when the brake pedal depressed.

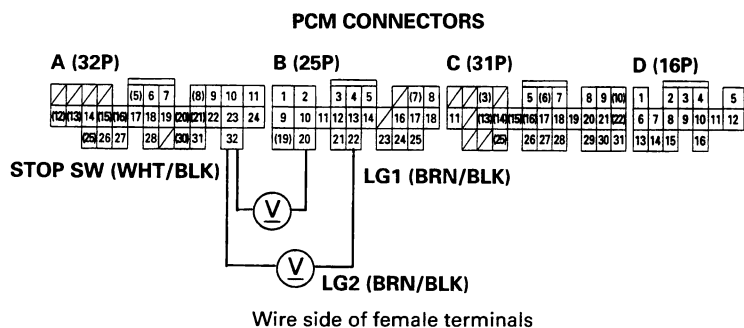
Check Brake Lights Operation:
Depress the brake pedal.

Are the brake lights ON?

NO
Repair faulty brake switch circuit (see section 23).

YES

Measure STOP SW Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and B (25P) connectors from the PCM.
3. Measure the voltage between the A32 and B20 or B22 terminals with the brake pedal depressed.

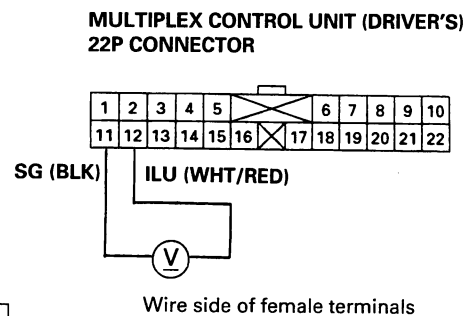


Is there battery voltage?

NO
Repair open in the wire between the A32 terminal and the brake switch.

YES

Measure ILU Voltage:
1. Reconnect the A (32P) and B (25P) connectors to the PCM.
2. Disconnect the multiplex control unit (driver's) 22P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 12 and No. 11 terminals of the multiplex control unit (driver's) 22P connector with the brake pedal depressed.



Is there battery voltage?

NO
Check for open or short in the wire between the A28 terminal and the No. 12 terminal of the multiplex control unit (driver's), and check for open or short between the No. 11 terminal and ground, and check for poor ground. If wires are OK, check for loose terminal fit in the PCM and the multiplex control unit (driver's) connectors. If necessary, substitute a known-good PCM and the multiplex control unit (driver's) and recheck.

YES

To page 14-105



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.

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. If the wire is OK, check for continuity A/T gear position switch terminal (see page 14-115).

YES

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.

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 14-106

**MULTIPLEX CONTROL UNIT (DRIVER'S)
24P CONNECTOR**

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Terminal side of male terminals ATP P

**A/T GEAR POSITION SWITCH
CONNECTOR**

1	2	3
4	5	6
7	8	9
10		

ATP P (BLK/BLU)

Wire side of female terminals

**MULTIPLEX CONTROL UNIT (DRIVER'S)
22P CONNECTOR**

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22								

SHIFT LOCK SOLENOID - (GRN)

**SHIFT LOCK SOLENOID
CONNECTOR**

1	2
---	---

GRN

Wire side of female terminals

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Interlock System – Shift Lock System (cont'd)

From page 14-105

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.

Is there battery voltage?

NO

YES

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 shift lock solenoid connector and the driver's under-dash fuse/relay box.

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 terminal.
2. Check that the shift lock 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.

Does the shift lock solenoid operate properly?

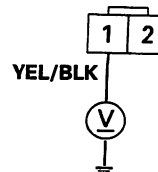
NO

YES

Replace the shift lock solenoid.

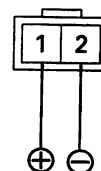
Check for loose terminal fit in the multiplex control unit (driver's) connectors. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.

SHIFT LOCK SOLENOID CONNECTOR



Wire side of female terminals

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals



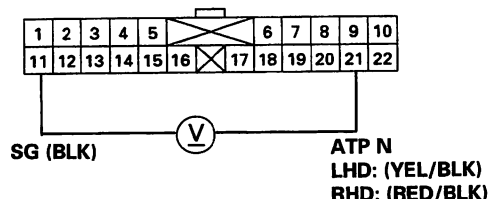
Troubleshooting Flowchart — Interlock System – Reverse Lock System

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



Wire side of female terminals

Is there voltage?

YES

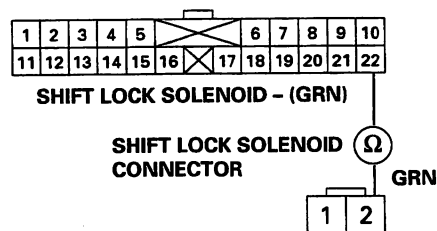
NO

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).

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

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 14-108

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Interlock System – Reverse Lock System (cont'd)

From page 14-107

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.

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 shift lock 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 terminal.
2. Check that the shift lock 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.

Does the shift lock solenoid operate properly?

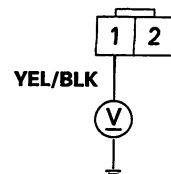
NO

Replace the shift lock solenoid.

YES

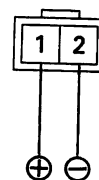
Check for loose terminal fit in the multiplex control unit (driver's) connectors. If necessary, substitute a known-good multiplex control unit (driver's) and recheck.

SHIFT LOCK SOLENOID CONNECTOR

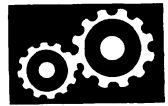


Wire side of female terminals

SHIFT LOCK SOLENOID CONNECTOR



Terminal side of male terminals



Troubleshooting Flowchart — Interlock System – Key Interlock System

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?

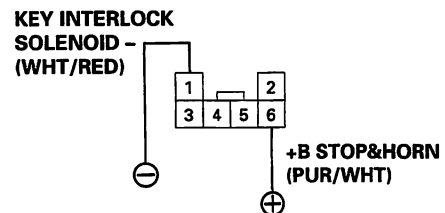
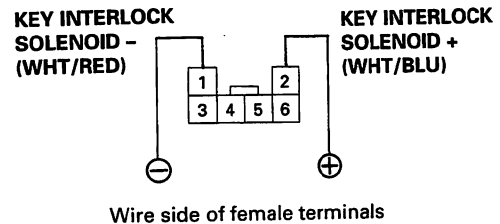
NO

Faulty key interlock switch. Replace the ignition key cylinder/steering lock assembly.

YES

To page 14-110

KEY SWITCH CONNECTOR



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart — Interlock System – Key Interlock System (cont'd)

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.

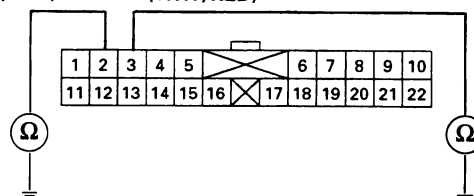
YES

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.

MULTIPLEX CONTROL UNIT (DRIVER'S) 22P CONNECTOR

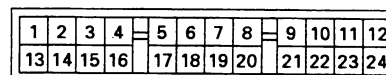
KEY INTERLOCK SOLENOID + (WHT/BLU)

KEY INTERLOCK SOLENOID - (WHT/RED)



Wire side of female terminals

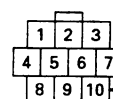
MULTIPLEX CONTROL UNIT (DRIVER'S) 24P CONNECTOR



Terminal side of male terminals

ATP P

A/T GEAR POSITION SWITCH CONNECTOR



ATP P (BLK/BLU)

Wire side of female terminals

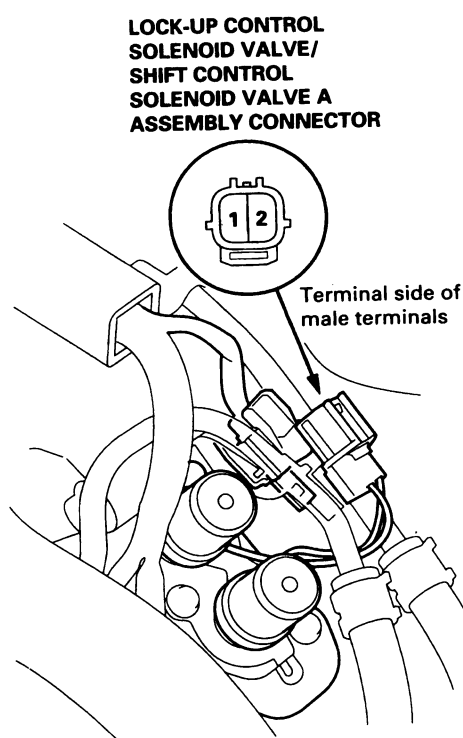
Lock-up Control Solenoid Valve/Shift Control Solenoid Valve A Assembly



Test

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

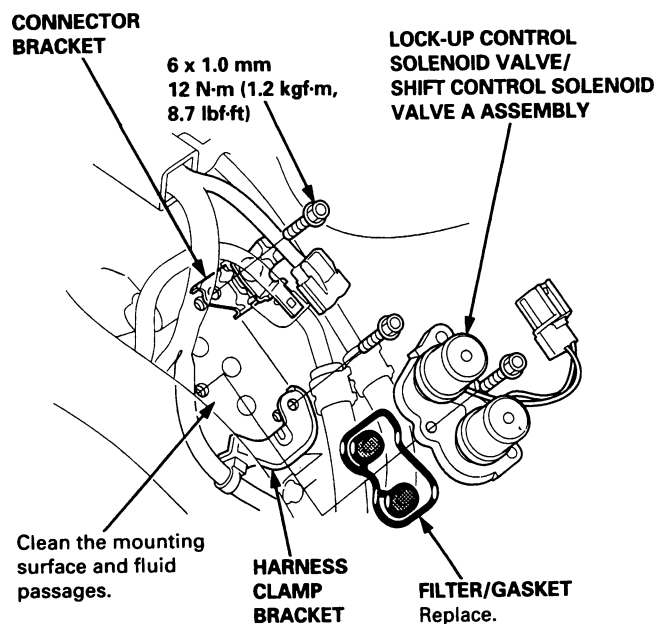


4. Replace the lock-up control solenoid valve/shift control solenoid valve A assembly if either resistance is out of specification.
5. If the resistance is within the standard, connect the No. 1 terminal of the 2P connector to the battery positive terminal. A clicking sound should be heard. Connect the 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.

Replacement

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.



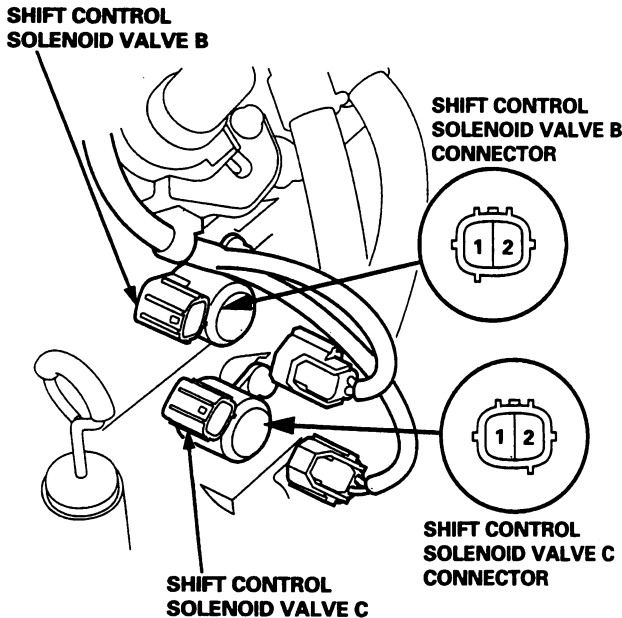
2. Clean the mounting surface and fluid passage of the lock-up control solenoid valve/shift control solenoid valve A assembly, and install a new lock-up control solenoid valve/shift control solenoid valve A assembly with a new filter/gasket.
3. Install the bolts with the connector bracket and the clamp bracket, and tighten the bolts.
4. Check the connector for rust, dirt or oil, then reconnect the connector securely.

Shift Control Solenoid Valve B/C

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.

STANDARD: 12 – 25 Ω

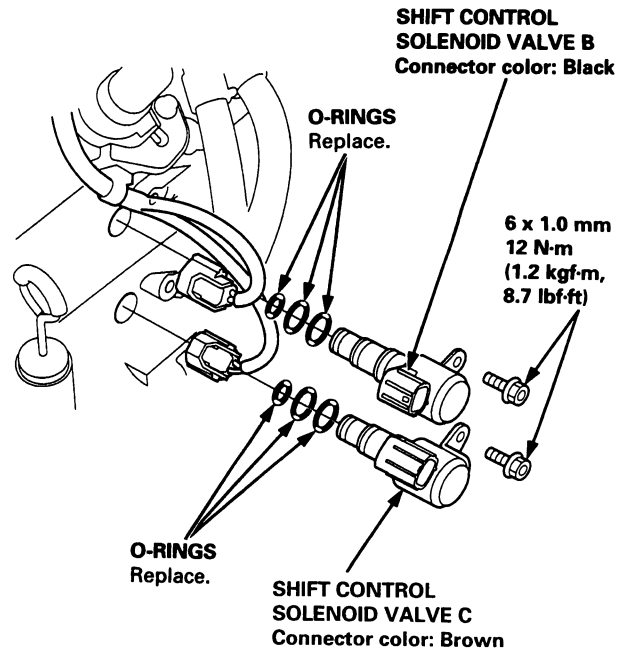


3. Replace the shift control solenoid valve B or C if the resistance is out of specification.
4. If the resistance is within the standard, connect the No. 2 terminal of the shift control solenoid valve B or C connector to the battery positive terminal, and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard. Replace the shift control solenoid valve B or C if no clicking sound is heard.

Replacement

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.

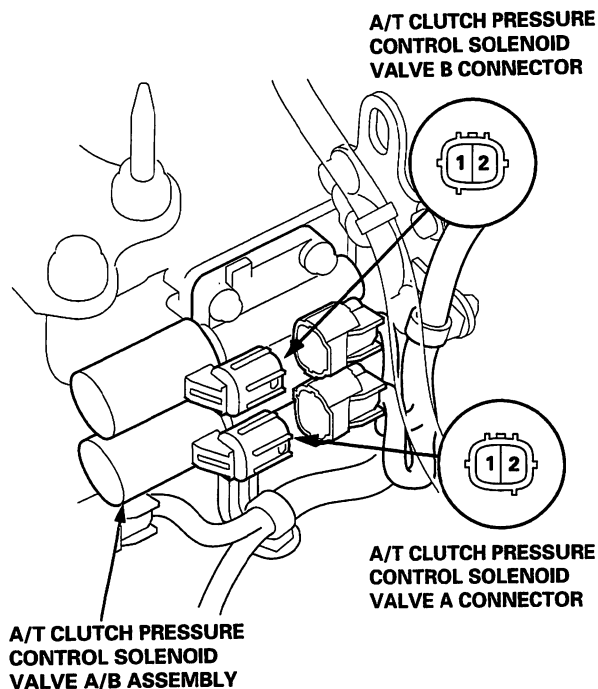
A/T Clutch Pressure Control Solenoid Valve A/B Assembly



Test

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.

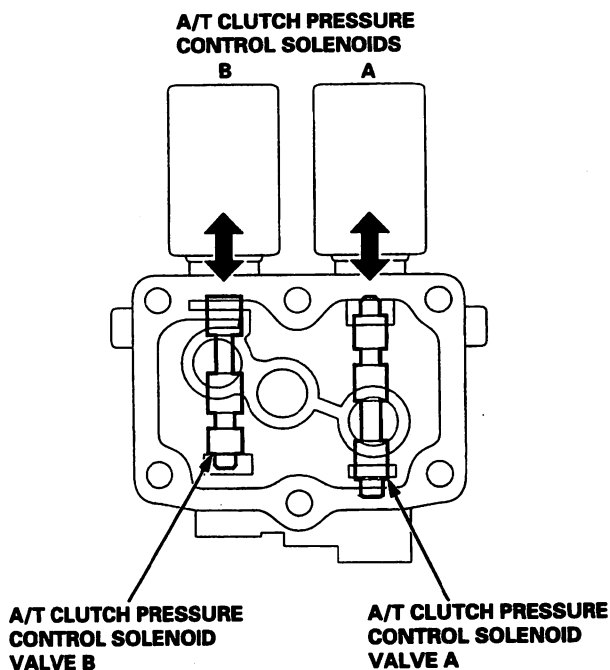
STANDARD: Approx. 5 Ω



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 the 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.

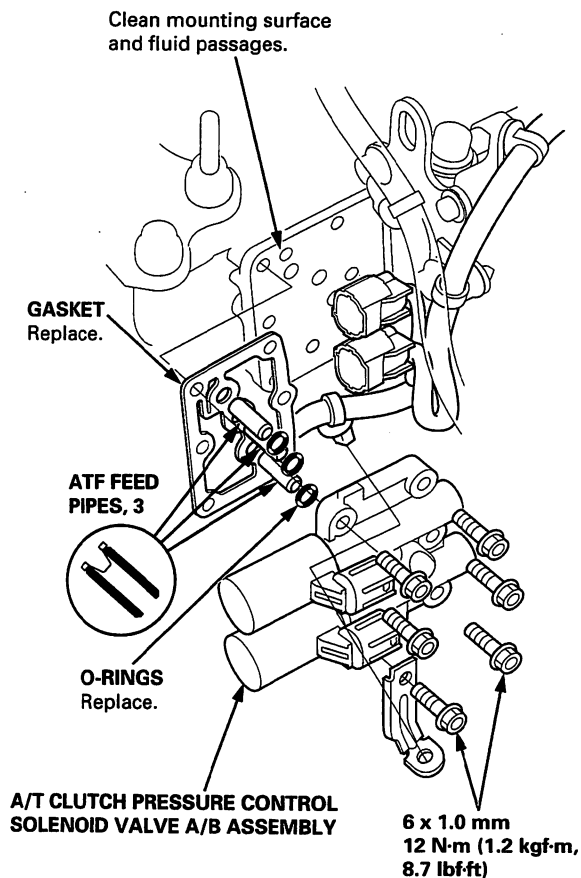


9. If either valve binds, or moves sluggishly, or if the A/T clutch pressure control solenoid does not operate, replace the A/T clutch pressure control solenoid valve A/B assembly.

A/T Clutch Pressure Control Solenoid Valve A/B Assembly

Replacement

1. Remove the mounting bolts and the A/T clutch pressure control solenoid valve A/B assembly



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.

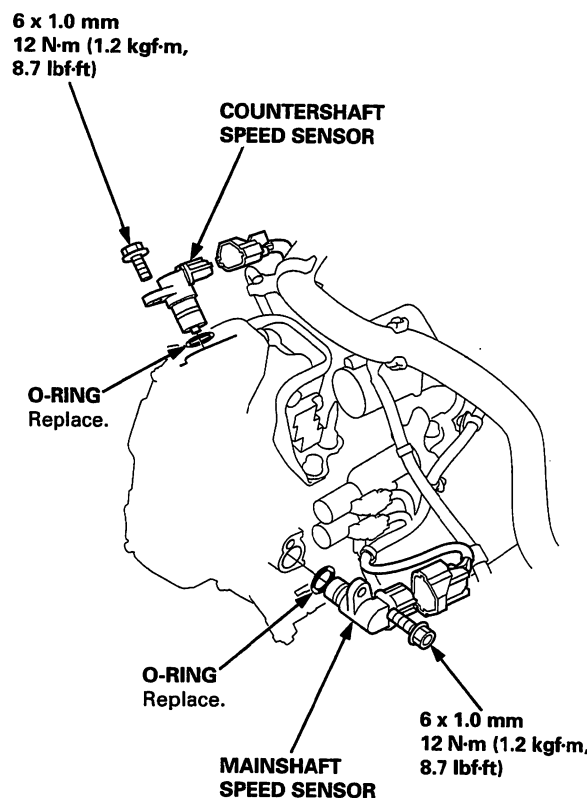
NOTE: Install the filter side of the ATF feed pipes in the transmission housing.

4. Check the A/T clutch pressure control solenoid valve connectors for rust, dirt or oil, and connect them securely.

Mainshaft/Countershaft Speed Sensors

Replacement

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.



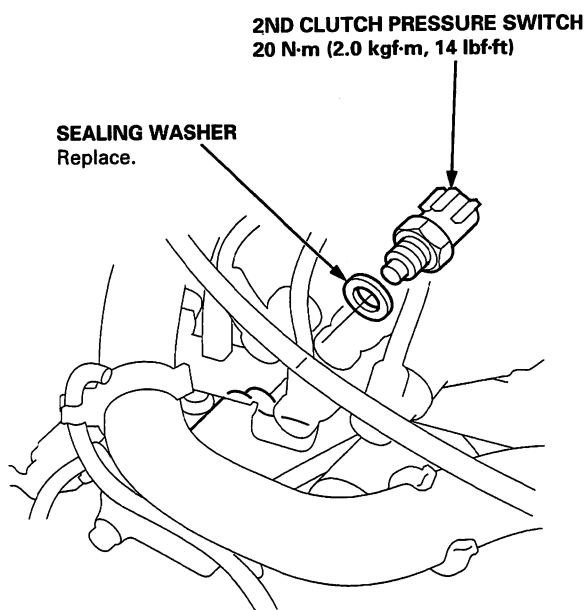
2nd Clutch Pressure Switch

3rd Clutch Pressure Switch



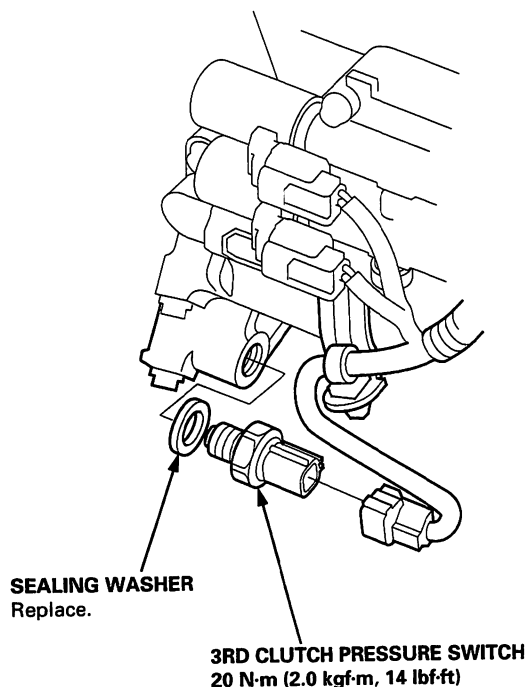
Replacement

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.



Replacement

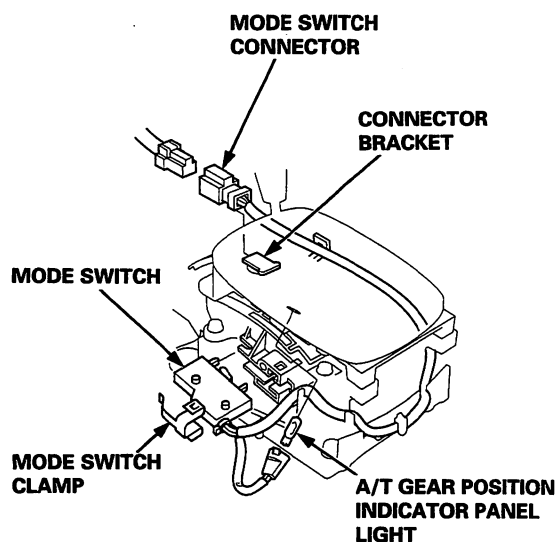
1. Disconnect the connector from the 3rd clutch pressure switch.
2. Replace the 3rd clutch pressure switch, then install a new one with a new sealing washer. Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or other foreign particles inside it.



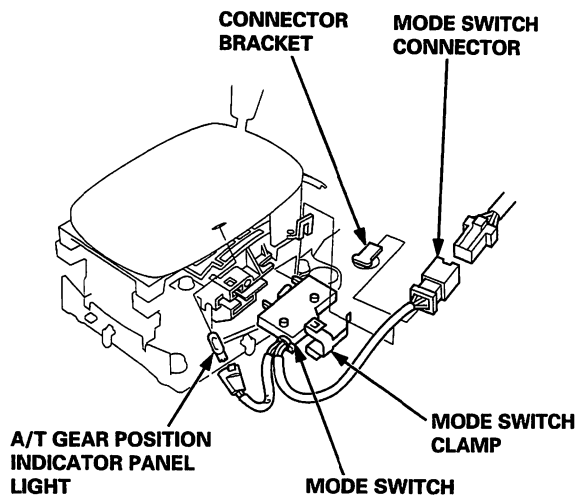
Replacement

1. Remove the center console (see section 20).
2. Remove the A/T 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:

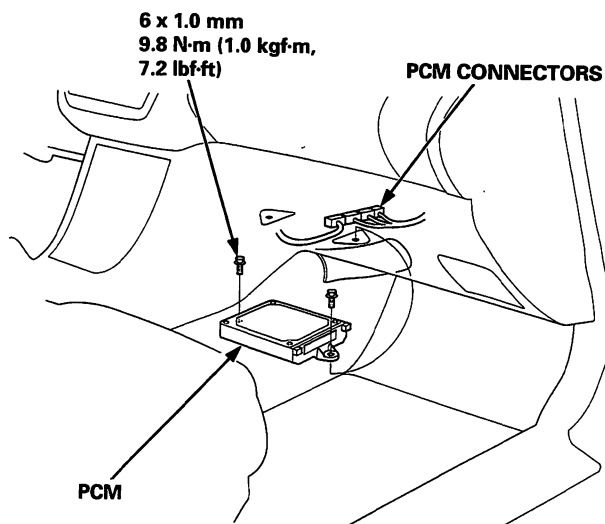


5. Install the new mode switch in the reverse order of removal.

Replacement

1. Remove the foot rest.
2. Pull the carpet from the passenger's 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 code for immobilizer on the new PCM using the PGM Tester (see section 11).

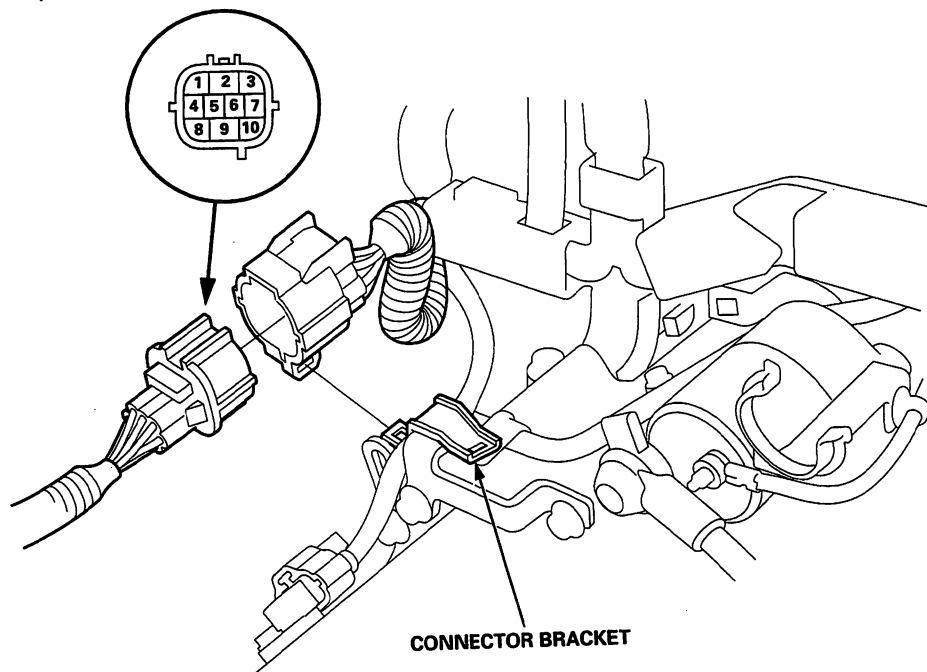


A/T Gear Position Switch

Test

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	○		○					○		
D₄		○	○				○			
D₃		○	○			○				
2		○	○		○					
1			○	○						

NOTE: Terminal No. 1: Neutral position switch

A/T Gear Position Switch

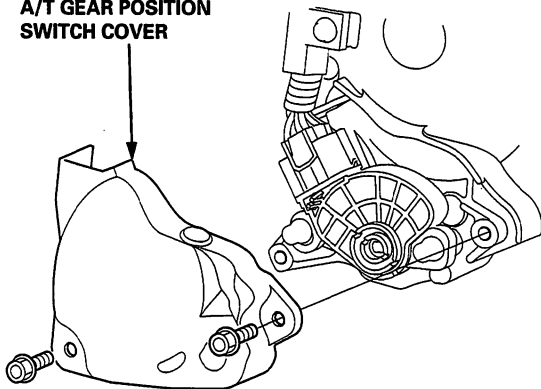
Replacement

⚠ 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.

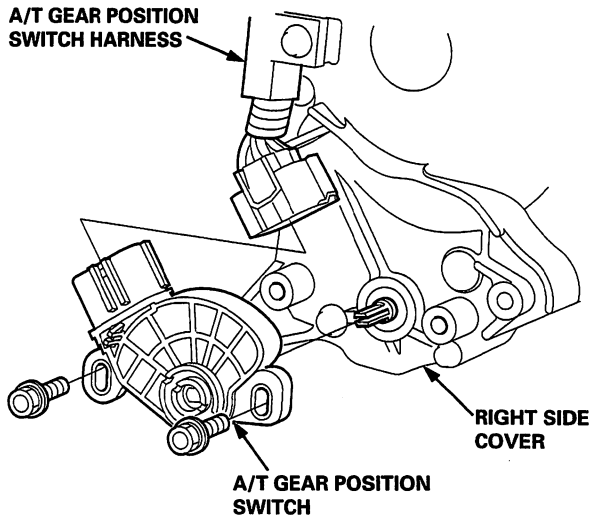
A/T GEAR POSITION
SWITCH COVER



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.

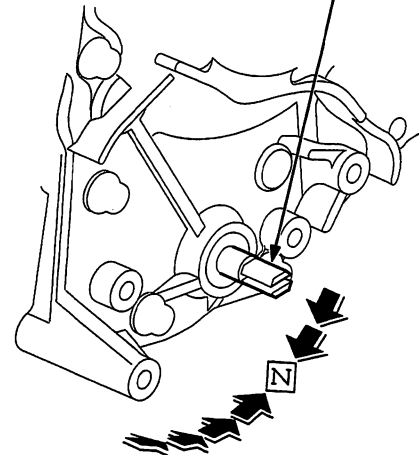
NOTE: Remove the bolt securing the A/T gear position switch harness on the right side cover, if it is tight to disconnect the connector from the A/T gear position switch.

A/T GEAR POSITION
SWITCH HARNESS



6. Replace the new A/T gear position switch.
7. Set the control shaft to **N** position.

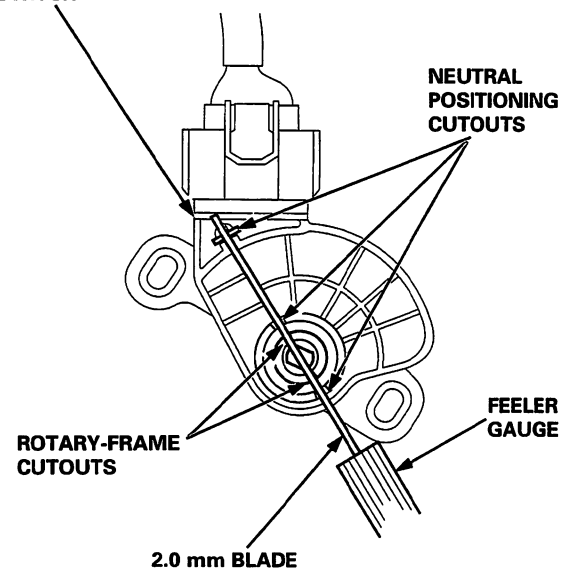
CONTROL SHAFT



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



NEUTRAL
POSITIONING
CUTOUTS

ROTARY-FRAME
CUTOUTS

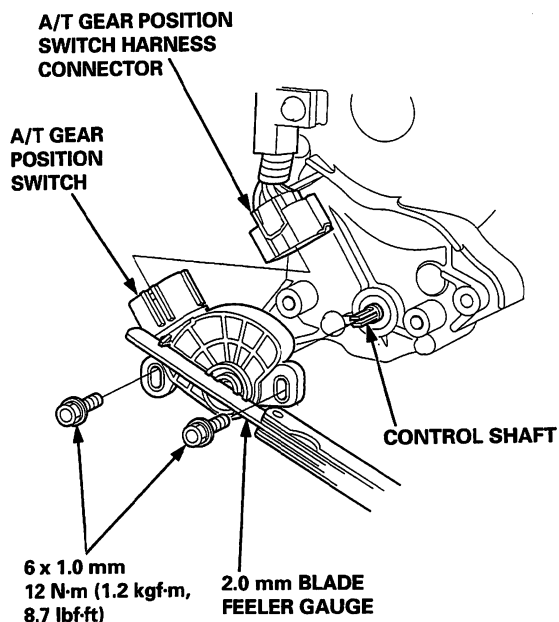
FEELER
GAUGE

2.0 mm BLADE

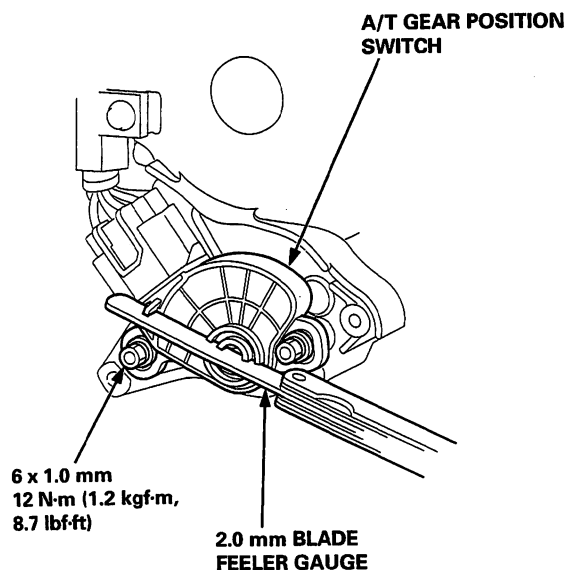


9. Loosely connect the connector, then install the A/T gear position switch gently on the control shaft with holding the **N** position with the 2.0 mm blade.

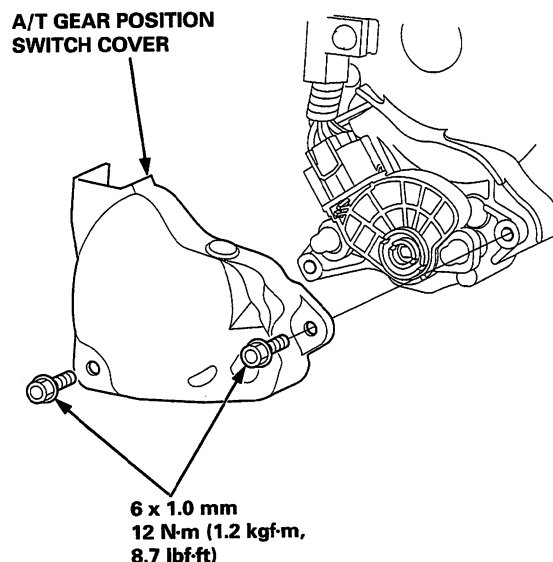
NOTE: Take care not to move the A/T gear position switch when tightening the bolts.



10. Tighten the bolts on the A/T gear position switch with remaining the 2.0 mm blade to hold the **N** position.

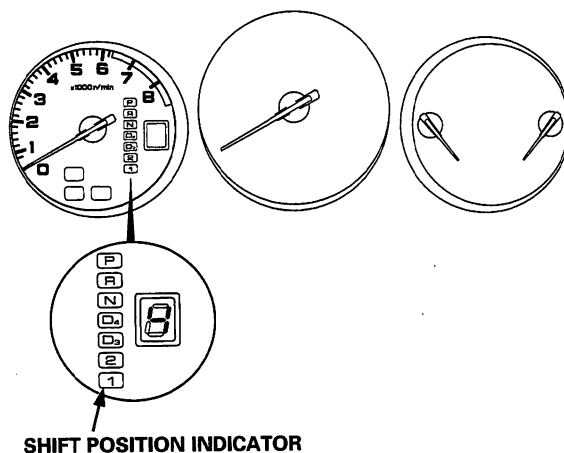


11. Connect the connector securely, then install the A/T gear position switch cover.



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



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

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

B (22P)

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

C (16P)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

Wire side of female terminals

Cavity	Wire Color	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 (7.5 A) 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 D_s	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 Color	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 1 V or less. NOTE: There should be no battery voltage in any other shift lever 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 D₂		
C6	BRN	Ignition switch ON (II) and shift lever in 1		
C7	BLU	Ignition switch ON (II) and shift lever in 2		
C12	BLK/ORN	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 1 V or less. NOTE: There should be no battery voltage in any other shift lever position.	

6. Connect the B (22P) and C (16P) connectors to the gauge assembly, then perform the following input tests.

Cavity	Wire Color	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 0 V.	<ul style="list-style-type: none"> Faulty PCM Faulty mode switch Faulty shift indicator An open in the wire
B8	PUR			
B9	BLU/BLK		Check for voltage to ground: There should be 5 V.	

7. If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.

Interlock System

Control Unit Input Test

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.

MULTIPLEX CONTROL UNIT (DRIVER'S) CONNECTORS

A (24P)

12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

B (22P)

1	2	3	4	5			6	7	8	9	10
11	12	13	14	15	16		17	18	19	20	21

Multiplex Control Unit (Driver's) 24P Connector

Cavity	Wire Color	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 (7.5 A) 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 (G101)• An open in the wire



Multiplex Control Unit (Driver's) 22P Connector

Cavity	Wire Color	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 (15 A) 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 (15 A) fuse in the under-hood fuse/relay box • Faulty steering lock assembly (key interlock solenoid) • 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 (G401) • An open in the wire
B12	WHT/RED	Ignition switch ON (II); and brake pedal pushed	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
		Ignition switch ON (II); brake pedal and accelerator pedal pushed at the same time	Check for voltage to ground: There should be less than 1 V.	
B21	LHD: YEL/BLK RHD: RED/BLK	Shift lever in N	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
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 (7.5 A) fuse in the driver's under-dash fuse/relay box • Faulty shift lock solenoid • An open in the wire

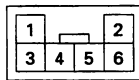
Interlock System

Key Interlock Solenoid Test

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 the 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).

Shift Lock Solenoid Test

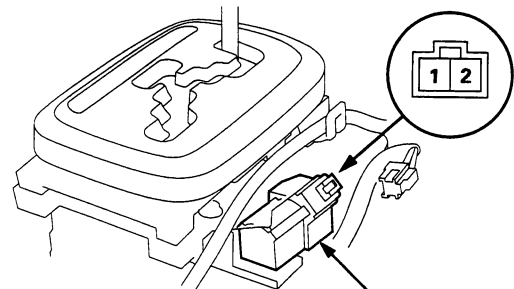
1. Remove the center console (see section 20).
2. Disconnect the shift lock solenoid connector.
3. Connect the No. 1 of the shift lock solenoid connector terminal to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
4. Check that the shift lever can be moved 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:

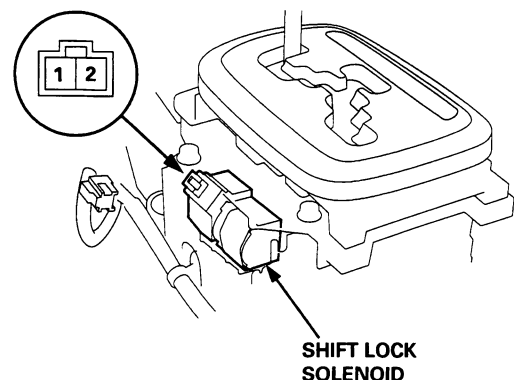
**SHIFT LOCK
SOLENOID
CONNECTOR**



RHD:

**SHIFT LOCK
SOLENOID**

**SHIFT LOCK
SOLENOID
CONNECTOR**

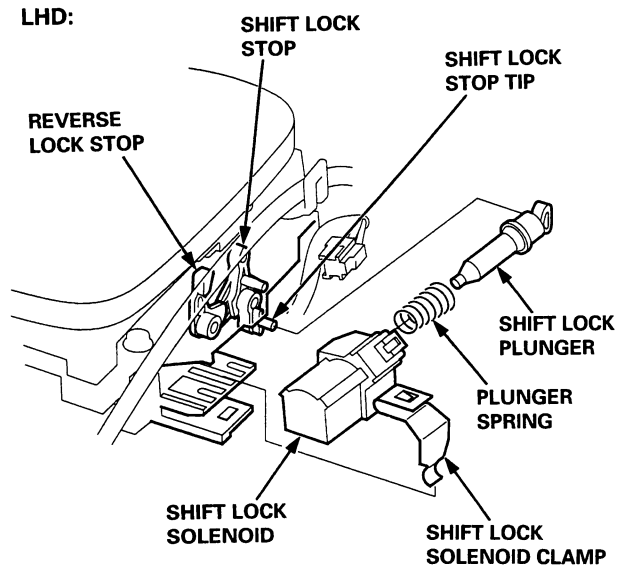




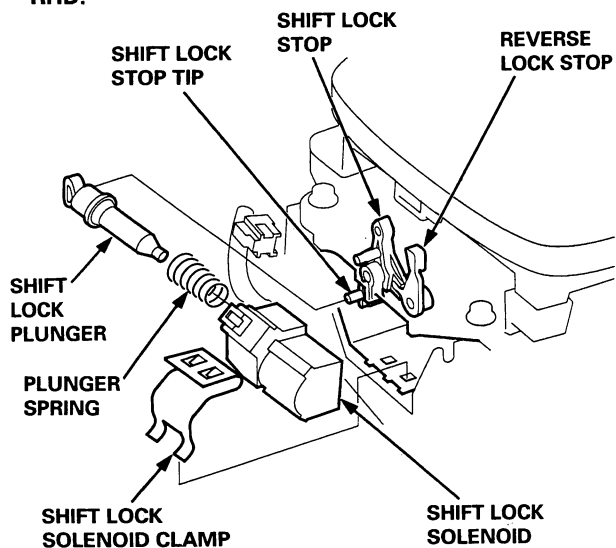
Shift Lock Solenoid Replacement

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

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 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 , 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 , D3 positions		
Stall speed high in D4 , D3 , 2 , 1 positions	1, 11, A, B, U, V	C, H, I, R
Stall speed high in D4 , D3 , 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 , 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 , 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 , D3 positions; between 1st and 2nd	4, C, l, M	D, K
Fails to shift in D4 , D3 , 1 positions; starts off 3rd	4, l, L	D
Excessive shock or flares in all shift lever position	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, 11, 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	



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 misassembled
3	Shift control solenoid valve A defective		
4	Shift control solenoid valve B defective	T3	Engine output low
5	Shift control solenoid valve C defective	T4	Lock-up clutch piston defective
6	Lock-up control solenoid valve defective	Transmission	
7	A/T clutch pressure control solenoid valves A/B defective	a	Mainshaft worn/damaged
		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)
		e	1st clutch defective
9	2nd clutch pressure switch defective	f	2nd gears worn/damaged (2 gears)
10	3rd clutch pressure switch defective	g	2nd clutch defective
11	Shift cable broken/out of adjustment	h	3rd clutch defective
12	Joint in shift cable and transmission or body worn	i	4th clutch defective
		j	Reverse gears worn/damaged (3 gears)
13	Mainshaft speed sensor defective	l	Clutch clearance incorrect
14	Countershaft speed sensor defective	m	Needle bearing seized up or worn/damaged
		n	Thrust washer seized up or worn/damaged
Hydraulic Controls		p	Torque converter housing or transmission housing bearing worn/damaged
A	ATF pump worn or binding		
B	Regulator valve stuck or spring worn		
C	Shift fork shaft stuck		
D	Modulator valve 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		

(cont'd)

Symptom-to-Component Chart

Hydraulic System (cont'd)

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. • 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. If 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



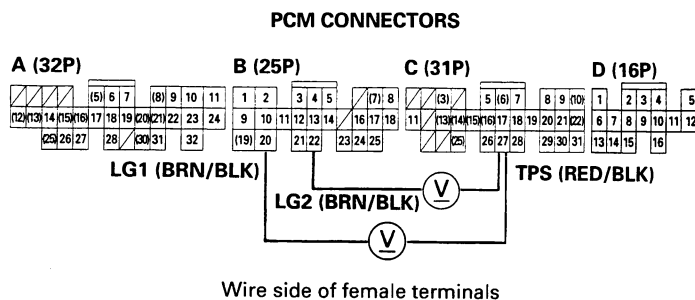
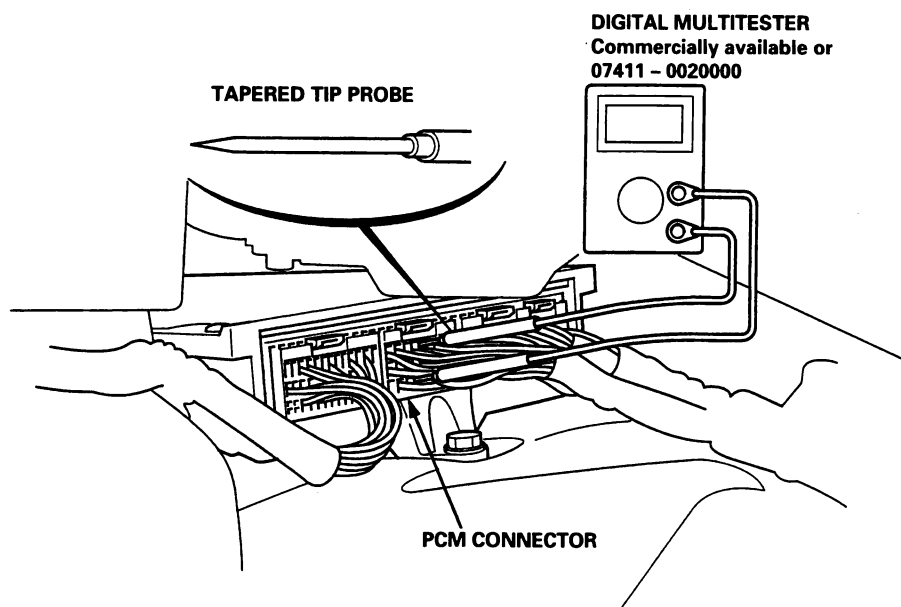
NOTES	
B	Set idle RPM in gear to specified idle speed. If still no good, adjust motor mounts as outlined in engine section of this manual.
C	Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines.
D	Check that the $\boxed{D_4}$ indicator light indication and check for loose connectors. Inspect the O-ring, and the shift control solenoid valve seizure.
E	Check that the $\boxed{D_4}$ 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 $\boxed{D_4}$ 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 out of adjustment, adjust it and the shift cable.
G	Check that the $\boxed{D_4}$ indicator light indication, and check for loose connector. Check that the outlet is not clogged inside of 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 and 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 shaft.
L	If the ATF strainer is clogged with particles of steel or aluminum, 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 feed pipe is damage 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 that 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.

Road Test

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 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 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 → 2nd	2nd → 3rd	3rd → 4th	Lock-up ON
Throttle position sensor voltage: 0.8 V	mph	10 – 12	18 – 20	25 – 27	32 – 35
	km/h	16 – 19	29 – 32	40 – 44	52 – 56
Throttle position sensor voltage: 2.25 V	mph	22 – 25	43 – 46	64 – 67	75 – 79
	km/h	35 – 40	69 – 74	103 – 108	121 – 127
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	mph	34 – 38	62 – 66	91 – 95	102 – 106
	km/h	55 – 61	100 – 106	146 – 153	164 – 171

Downshift

Throttle Opening	Unit of Speed	Lock-up OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.8 V	mph	22 – 25	19 – 21	——	5 – 7 (3rd → 1st)
	km/h	35 – 40	31 – 34	——	8 – 12 (3rd → 1st)
Throttle position sensor voltage: 2.25 V	mph	64 – 67	——	——	——
	km/h	103 – 108	——	——	——
Fully-opened throttle, Throttle position sensor voltage: 4.5 V	mph	95 – 99	85 – 89	54 – 58	26 – 30
	km/h	153 – 159	137 – 143	87 – 93	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

- Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- Upshifts should not occur with the shift lever in this position.

2 (2nd Gear) Position

- Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- 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 into **P** position. Release the brake; the vehicle should not move.

Stall Speed

Test

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]**, **[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]**, **[2]**, **[1]**, and **[R]** positions.
- Do not test stall speed with the A/T pressure gauges installed.

Stall Speed RPM:

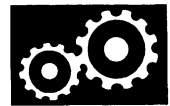
F20B6 Engine: Specification: 2,250 rpm (min⁻¹)

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)

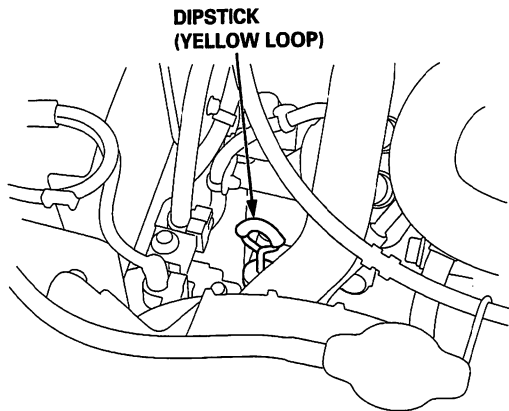
TROUBLE	PROBABLE CAUSE
Stall rpm high in [D₄] , [2] , [1] and [R] positions	<ul style="list-style-type: none">• Low fluid level or ATF pump output• Clogged ATF strainer• Pressure regulator valve stuck closed• Slipping clutch
Stall rpm high in [1] position	<ul style="list-style-type: none">• Slippage 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 slipping



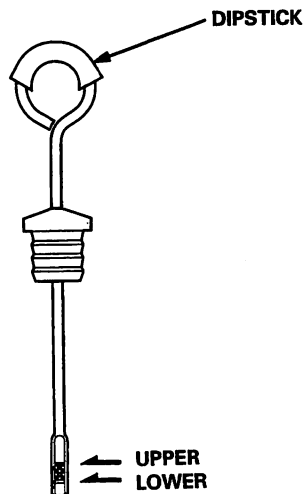
Checking

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.



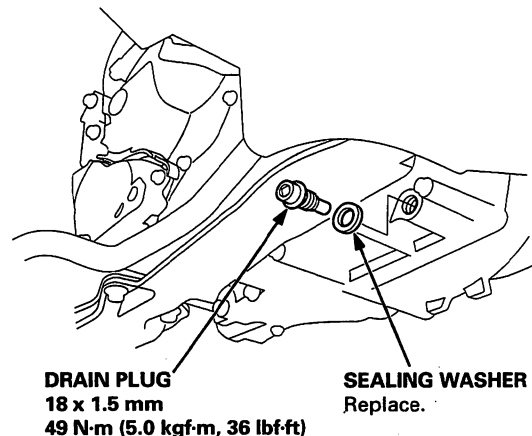
6. If the level is below the lower mark, pour the recommended fluid into the filler hole to bring it to the upper mark. Use Genuine Honda ATF PREMIUM (Automatic Transmission Fluid-PREMIUM) or an equivalent quality DEXRON® II or III ATF only. Using a non-Honda ATF can affect shift quality.
7. Insert the dipstick back into the transmission.

Changing

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 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.

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

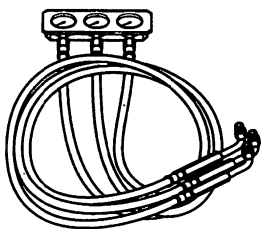


Pressure Testing

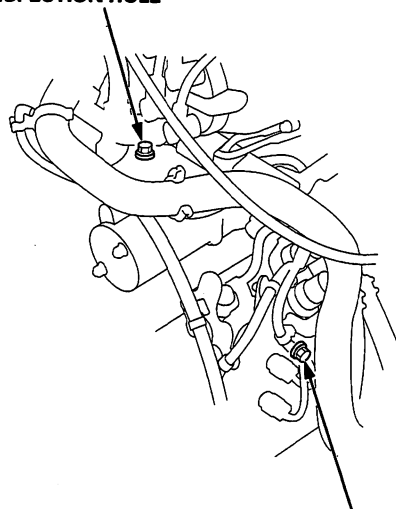
1. Before testing, be sure the transmission fluid is filled to the proper level.
2. Raise the front of the vehicle, and make sure it is securely supported.
3. Set the parking brake, and block rear wheels securely.
4. Allow the front wheels to rotate freely.
5. Warm up the engine (the radiator fan comes 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)

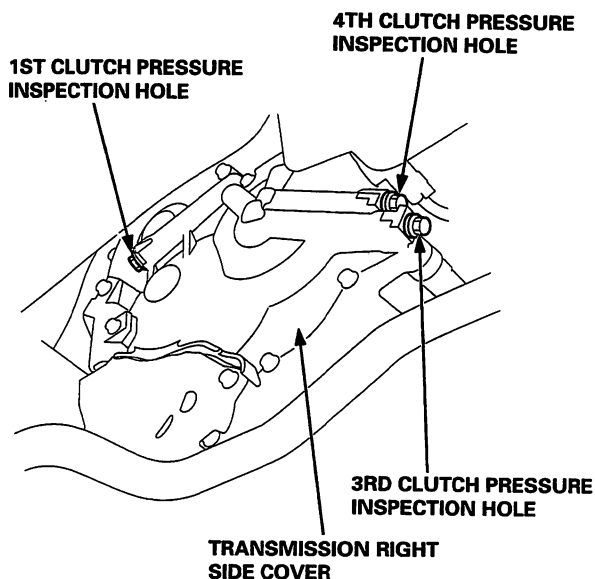
**A/T OIL PRESSURE GAUGE SET
07406 - 0020004**



**2ND CLUTCH PRESSURE
INSPECTION HOLE**



**LINE PRESSURE
INSPECTION HOLE**





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 **[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) line 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 or low 1st pressure	1st clutch	840 – 920 kPa (8.6 – 9.4 kgf/cm ² , 120 – 130 psi)	790 kPa (8.1 kgf/cm ² , 120 psi)
2nd clutch	[2]	No or low 2nd pressure	2nd clutch		
3rd clutch	[D₄]	No or low 3rd pressure	3rd clutch		
4th clutch		No or low 4th pressure	4th clutch		
	[R]		Servo valve or 4th clutch		

17. Install the sealing bolt with a new sealing washer, and tighten the bolt to the specified torque.

TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

NOTE: Do not reuse the old sealing washer.

Transmission

Removal

⚠ WARNING

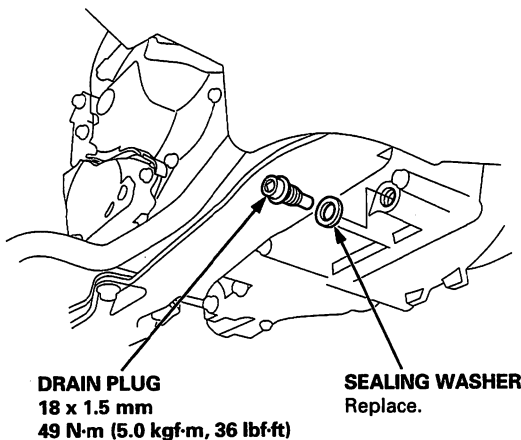
- Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).
- Apply parking brake and block rear wheels, so vehicle will not roll off stands and fall on you while working under it.

⚠ CAUTION

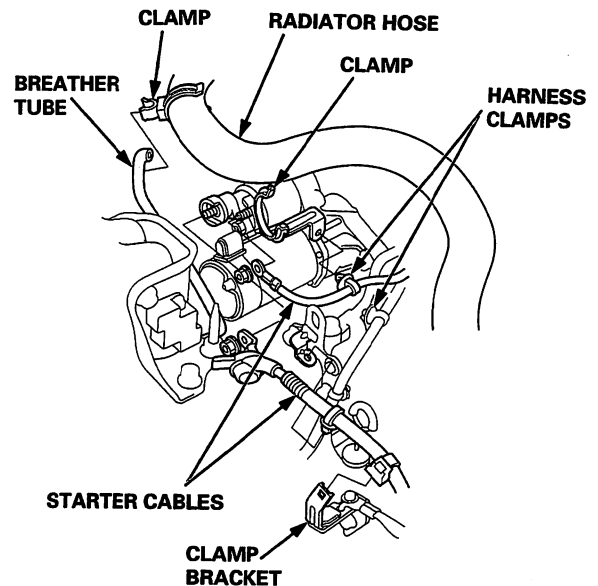
Use fender covers to avoid damaging painted surfaces.

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.

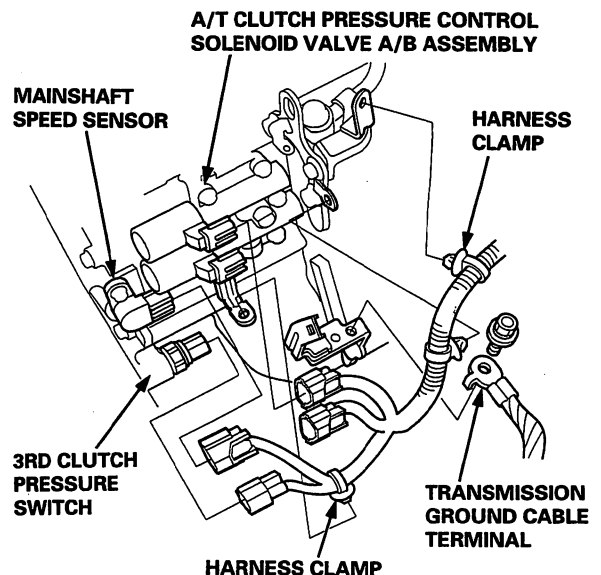


7. Remove the starter cables and harness clamps, and remove the breather tube and radiator hose from the clamps.



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.

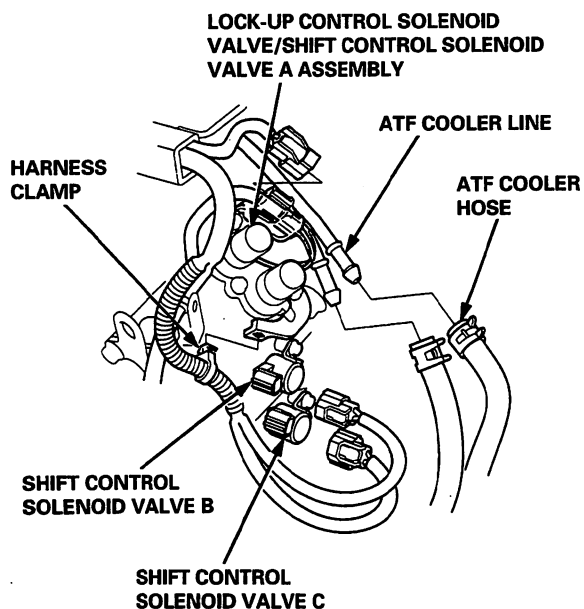




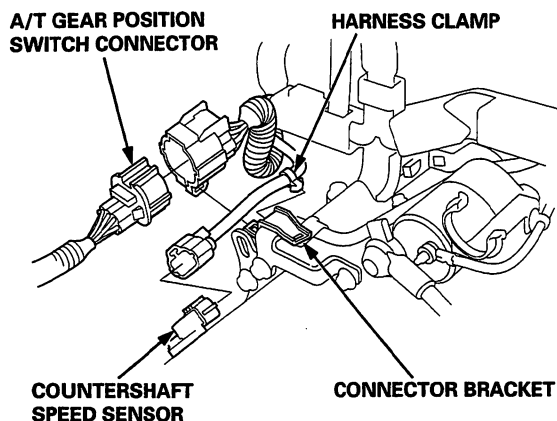
9. Disconnect the lock-up control solenoid valve/shift control solenoid valve A assembly connector.
10. Remove the ATF cooler hoses from the ATF cooler lines. Turn the ends of the ATF cooler hoses and lines up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.

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.

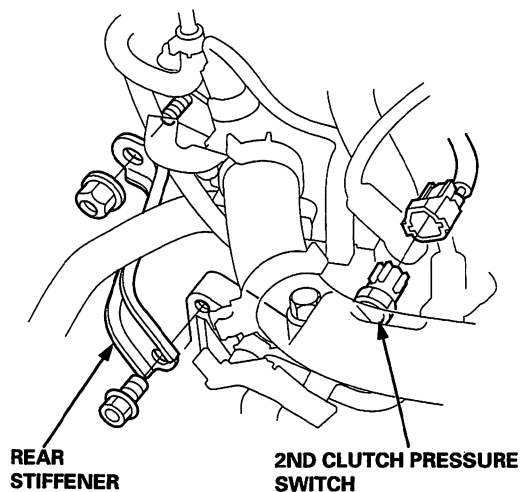


12. Disconnect the countershaft speed sensor connector, and remove the harness clamp from the connector bracket.
13. Remove the A/T gear position switch connector from the connector bracket, then disconnect it.

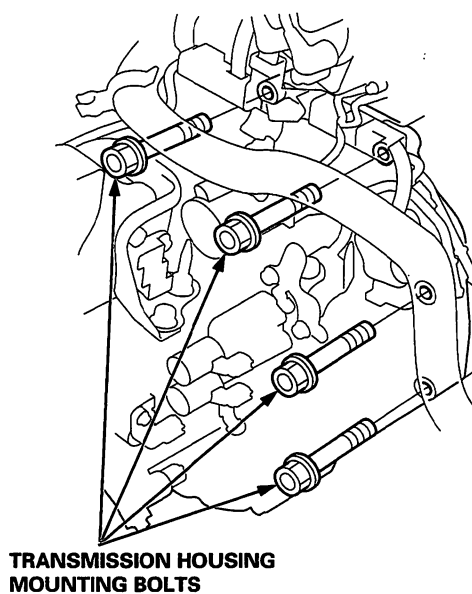


14. Disconnect the 2nd clutch pressure switch connector, then remove the rear stiffener.

NOTE: Do not allow water, fluid, oil, dust, or other foreign particles to get inside the connector.



15. Remove the transmission housing bolts.

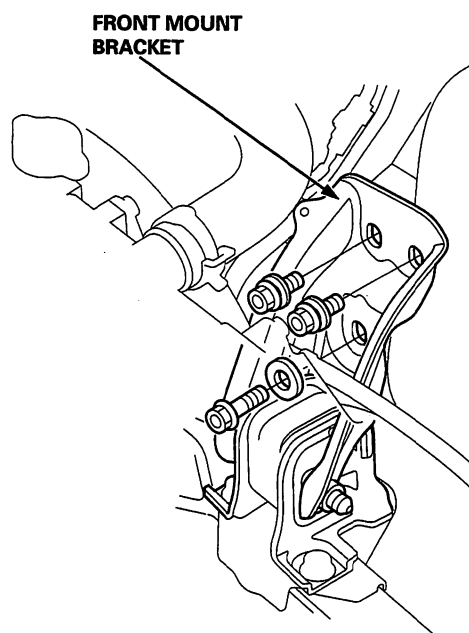


(cont'd)

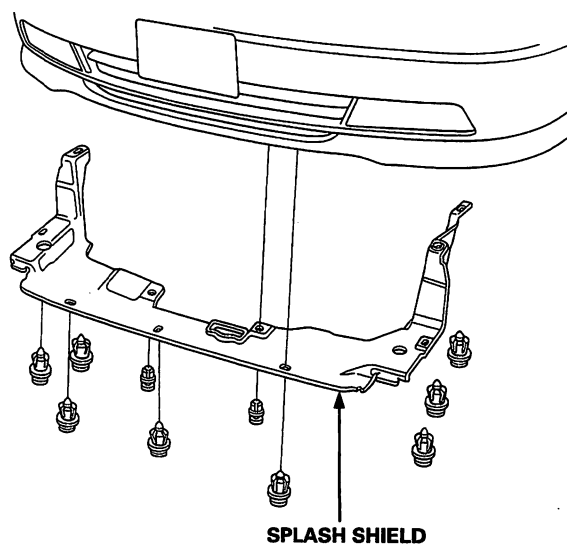
Transmission

Removal (cont'd)

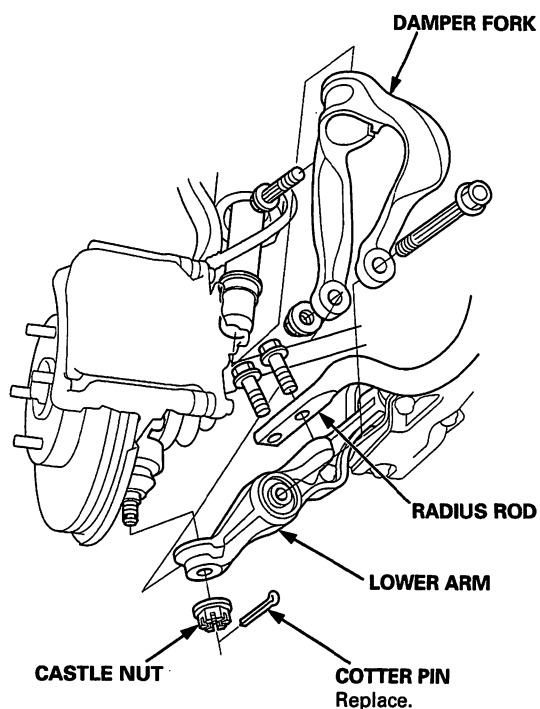
16. Remove the front mount bracket bolts.



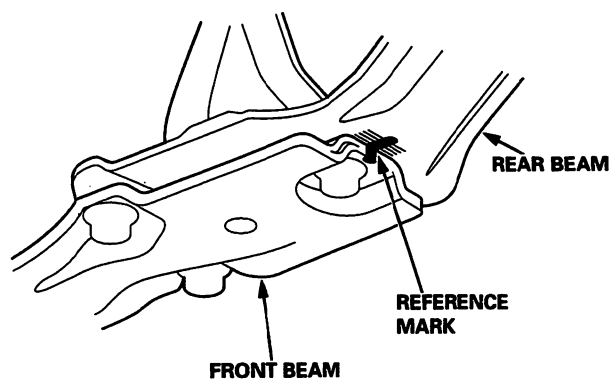
17. Remove the splash shield.



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).

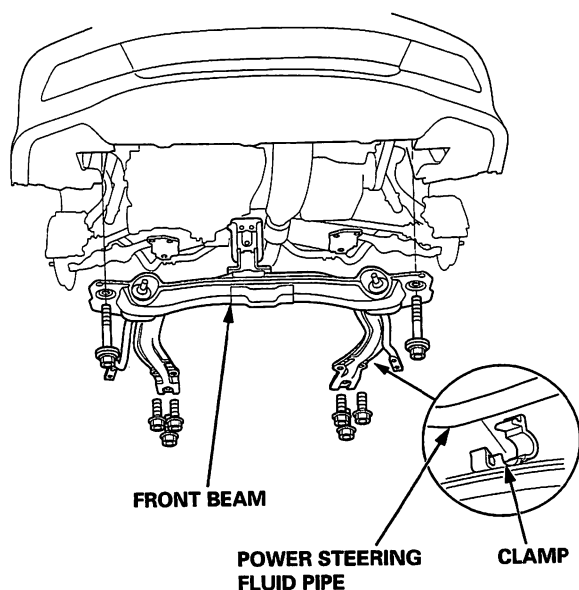


19. Remove the bolts securing the radius rods, then separate the radius rods from the lower arms.
20. Pry the driveshaft out of the differential (see section 16).
21. Make a reference mark across the front beam (both side) and the rear beam.

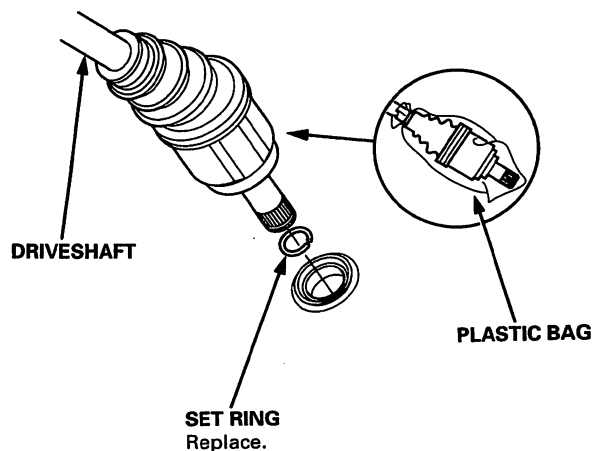




22. Unclamp the power steering fluid pipe from the clamp on the front beam, then remove the front beam.

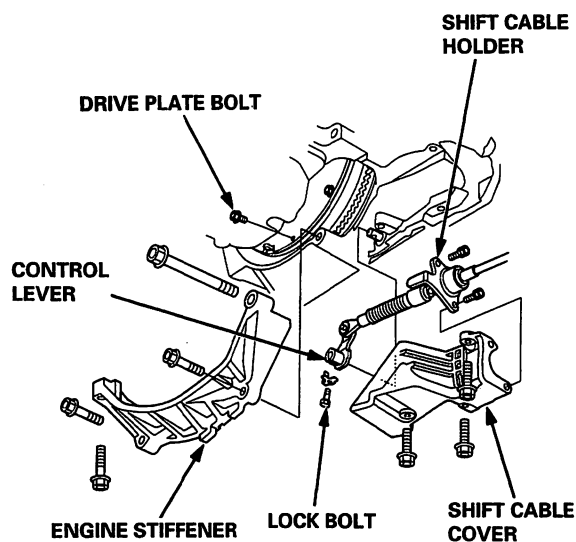


23. Pull on the inboard joints to remove the driveshafts from the differential (see section 16).



24. Coat all precision finished surfaces with clean engine oil, then tie plastic bags over the driveshaft ends.

25. Remove the engine stiffener.



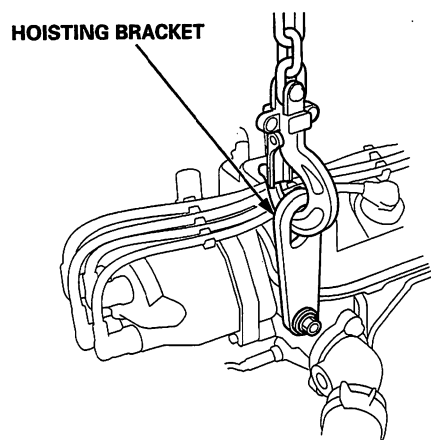
26. Remove the bolts securing the shift cable holder, then remove the shift cable cover.

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.

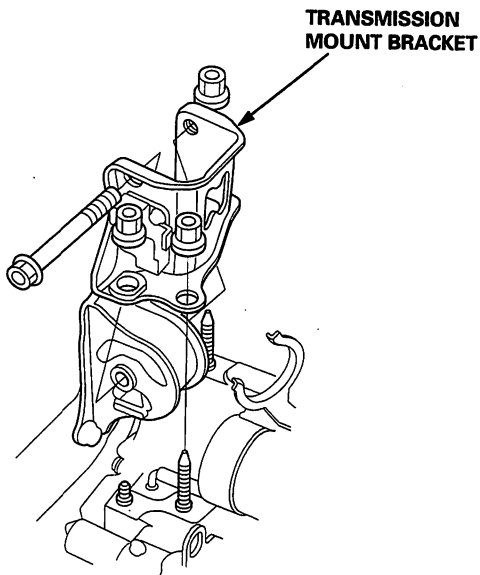


(cont'd)

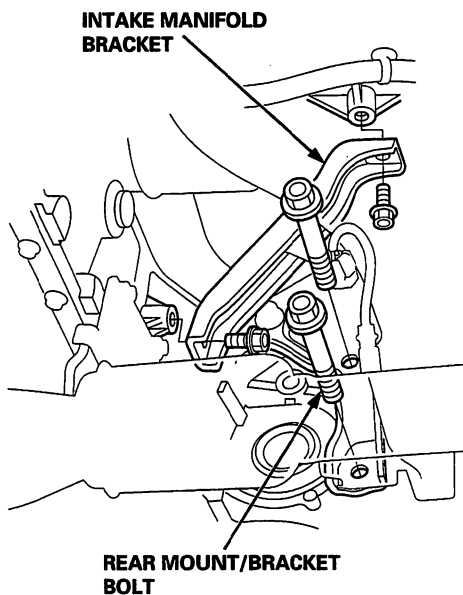
Transmission

Removal (cont'd)

30. Place a jack under the transmission.
31. Remove the transmission mount bracket.

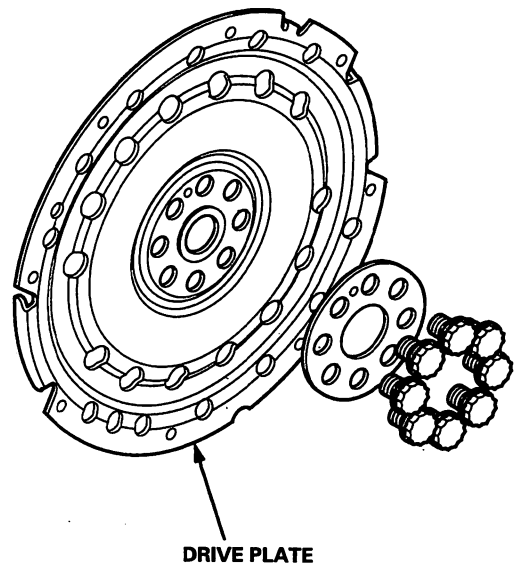


32. Remove the bolts securing the intake manifold bracket.



33. Remove the rear mount/bracket bolts.

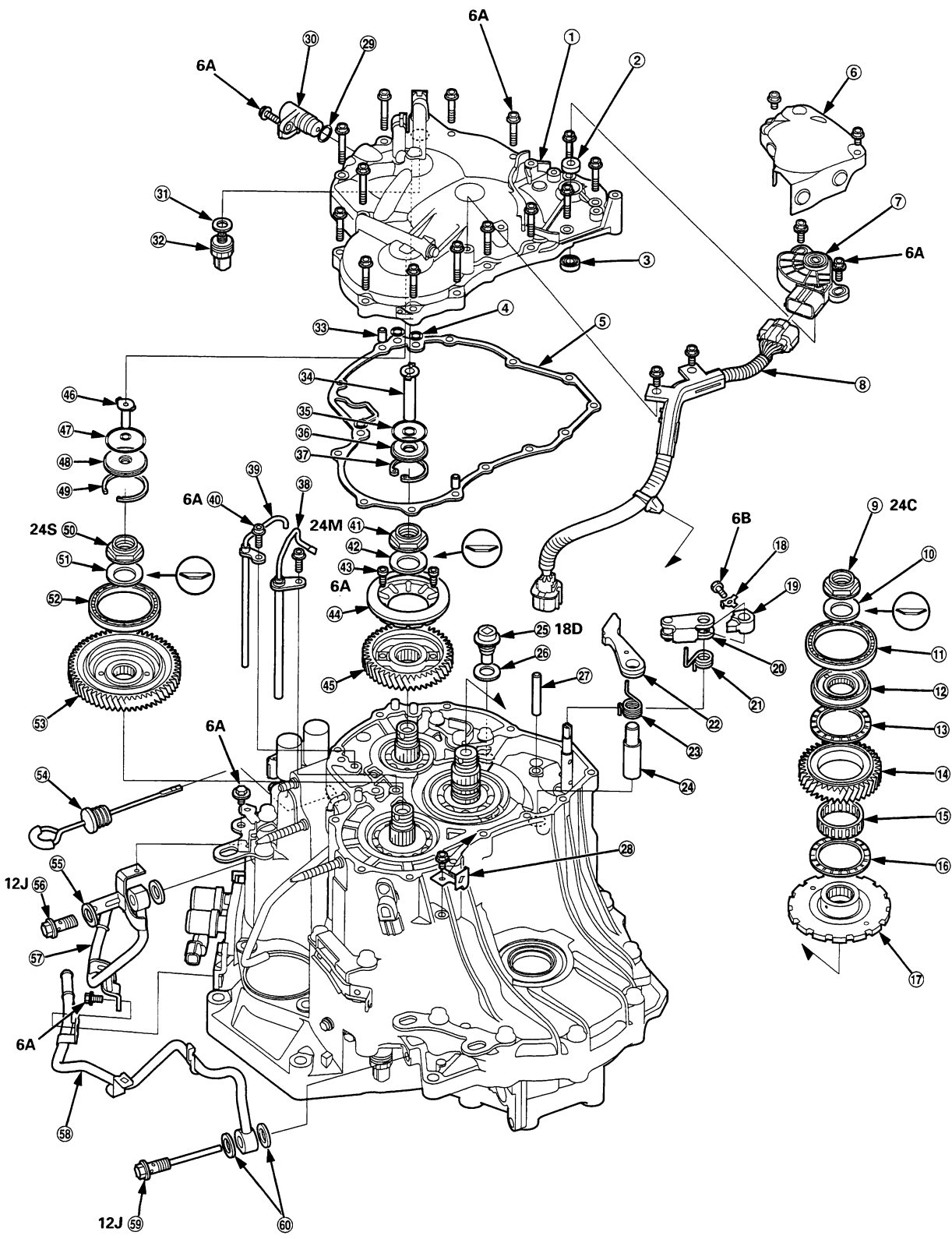
34. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the transmission jack.
35. Remove the torque converter assembly.
36. Remove the starter from the torque converter housing.
37. Inspect the drive plate, and replace it if it's damaged.





Illustrated Index

Right Side Cover





- 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 1.25 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

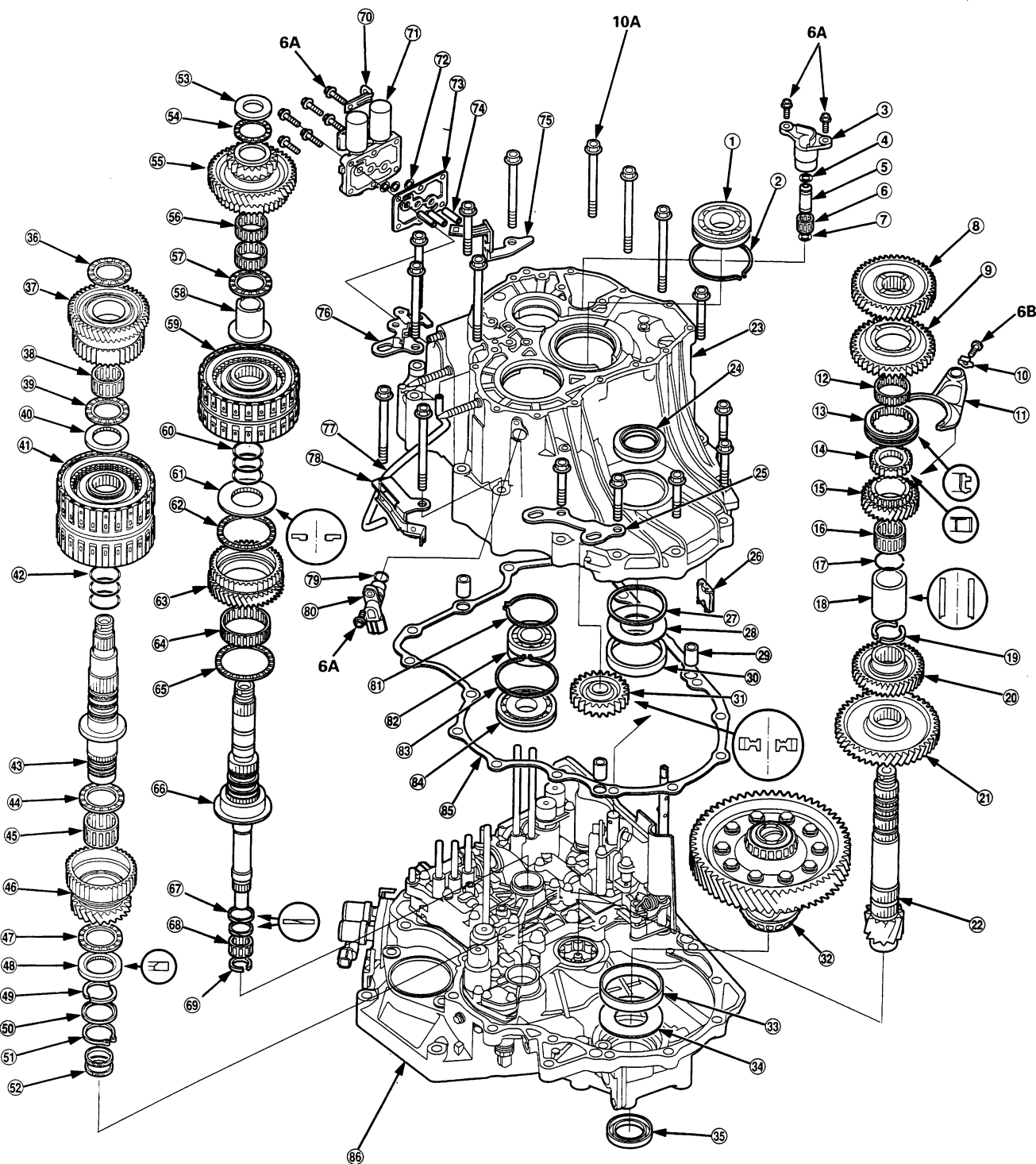
- ㉞ 4TH CLUTCH FEED PIPE
- ㉟ O-RINGS Replace.
- ㊱ FEED PIPE GUIDE
- ㊲ SNAP RING
- ㊳ PITOT PIPE
- ㊴ LUBRICATION PITOT PIPE
- ㊵ HEX HEAD BOLT 6 x 1.0 mm
- ㊶ MAINSHAFT LOCKNUT 24 x 1.25 mm
(Flange nut) Replace.
- ㊷ CONICAL SPRING WASHER Replace.
- ㊸ HEX HEAD BOLT 6 x 1.0 mm
- ㊹ PITOT FLANGE
- ㊺ MAINSHAFT IDLER GEAR
- ㊻ 1ST CLUTCH FEED PIPE
- ㊼ O-RINGS Replace.
- ㊽ FEED PIPE GUIDE
- ㊾ SNAP RING
- ㊿ SECONDARY SHAFT LOCKNUT 24 x 1.25 mm
(Flange nut) Replace.
- ① CONICAL SPRING WASHER Replace.
- ② BALL BEARING
- ③ SECONDARY SHAFT IDLER GEAR
- ④ ATF DIPSTICK
- ⑤ SEALING WASHER Replace.
- ⑥ LINE BOLT
- ⑦ ATF COOLER LINE (OUTLET)
- ⑧ ATF COOLER LINE (INLET)
- ⑨ LINE BOLT
- ⑩ SEALING WASHER Replace.

TORQUE SPECIFICATIONS

Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
6B	14 N·m (1.4 kgf·m, 10 lbf·ft)	6 x 1.0 mm	
12J	28 N·m (2.9 kgf·m, 21 lbf·ft)	12 x 1.25 mm	Line bolt
18D	49 N·m (5.0 kgf·m, 36 lbf·ft)	18 x 1.5 mm	Drain plug
24M	226 N·m (23.0 kgf·m, 166 lbf·ft) → 0 → 167 N·m (17.0 kgf·m, 123 lbf·ft)	24 x 1.25 mm	Mainshaft locknut Left-hand threads
24C	226 N·m (23.0 kgf·m, 166 lbf·ft) → 0 → 167 N·m (17.0 kgf·m, 123 lbf·ft)	24 x 1.25 mm	Countershaft locknut
24S	226 N·m (23.0 kgf·m, 166 lbf·ft) → 0 → 167 N·m (17.0 kgf·m, 123 lbf·ft)	24 x 1.25 mm	Secondary shaft locknut

Illustrated Index

Transmission Housing





- ① COUNTERSHAFT TRANSMISSION HOUSING BEARING
- ② SNAP RING
- ③ REVERSE IDLER GEAR SHAFT HOLDER
- ④ O-RING Replace.
- ⑤ REVERSE IDLER GEAR SHAFT
- ⑥ NEEDLE BEARING
- ⑦ O-RING Replace.
- ⑧ COUNTERSHAFT 2ND GEAR
- ⑨ COUNTERSHAFT REVERSE GEAR
- ⑩ LOCK WASHER Replace.
- ⑪ REVERSE SHIFT FORK
- ⑫ NEEDLE BEARING
- ⑬ REVERSE SELECTOR
- ⑭ REVERSE SELECTOR HUB
- ⑮ COUNTERSHAFT 4TH GEAR
- ⑯ NEEDLE BEARING
- ⑰ SNAP RING
- ⑱ DISTANCE COLLAR
- ⑲ COTTERS, 31 mm
- ⑳ COUNTERSHAFT 3RD GEAR
- ㉑ COUNTERSHAFT 1ST GEAR
- ㉒ COUNTERSHAFT
- ㉓ TRANSMISSION HOUSING
- ㉔ OIL SEAL Replace.
- ㉕ TRANSMISSION HANGER
- ㉖ TRANSMISSION MAGNET
- ㉗ THRUST SHIM, 76 mm Selective part
- ㉘ THRUST WASHER, 76.2 mm
- ㉙ DOWEL PIN
- ㉚ TAPERED ROLLER BEARING OUTER RACE
- ㉛ REVERSE IDLER GEAR
- ㉜ DIFFERENTIAL ASSEMBLY
- ㉝ TAPERED ROLLER BEARING OUTER RACE
- ㉞ THRUST WASHER, 80 mm
- ㉟ OIL SEAL Replace.
- ㊱ THRUST NEEDLE BEARING
- ㊲ SECONDARY SHAFT 2ND GEAR
- ㊳ NEEDLE BEARING
- ㊴ THRUST NEEDLE BEARING
- ㊵ THRUST SHIM, 37 x 55 mm Selective part
- ㊶ 1ST/2ND CLUTCH ASSEMBLY
- ㊷ O-RINGS Replace.
- ㊸ SECONDARY SHAFT
- ㊹ THRUST NEEDLE BEARING
- ㊺ NEEDLE BEARING

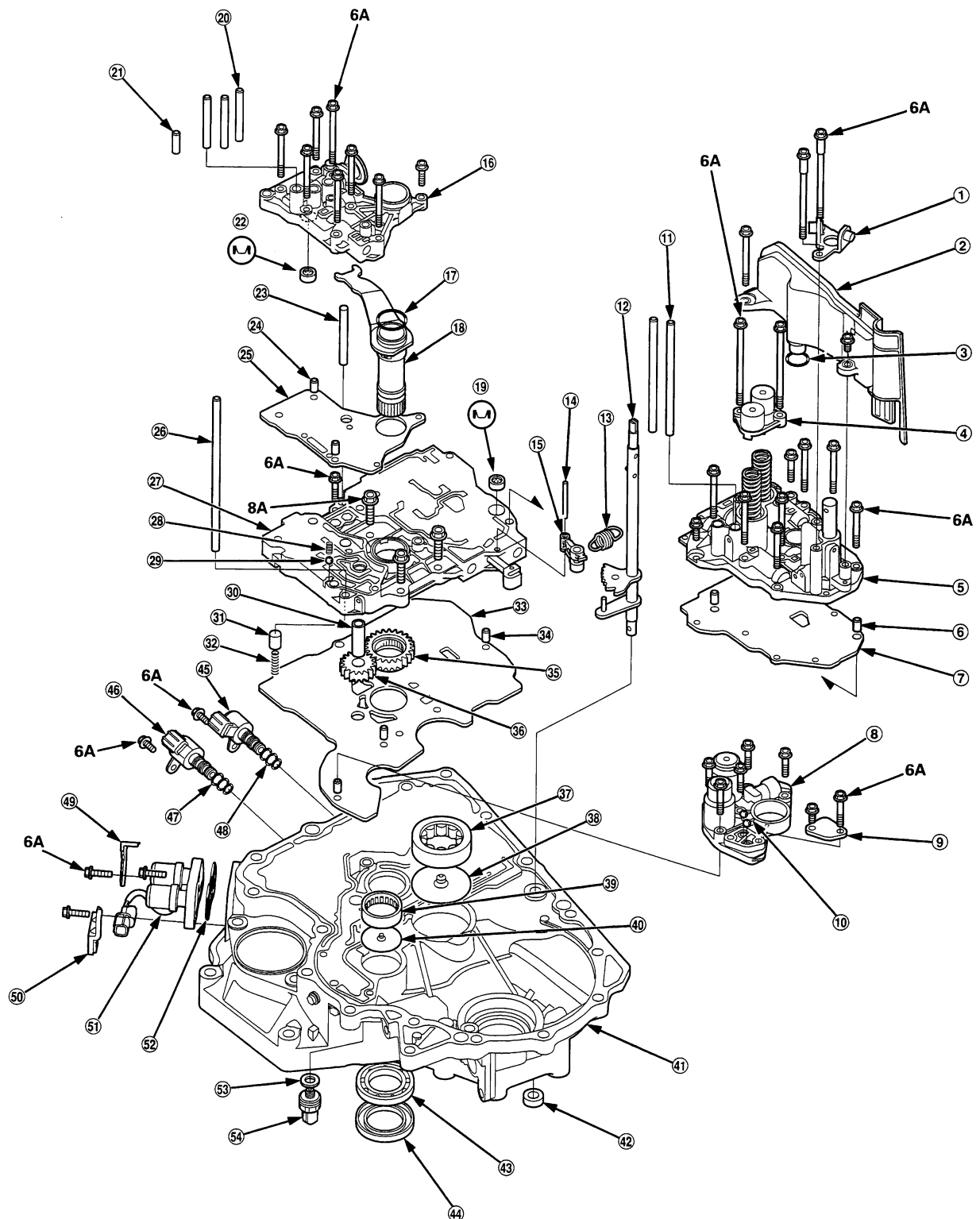
- ㊻ SECONDARY SHAFT 1ST GEAR
- ㊼ THRUST NEEDLE BEARING
- ㊽ SPLINED WASHER, 38 x 56.5 mm Selective part
- ㊾ COTTERS, 32 mm
- ㊿ COTTER RETAINER
- ① SNAP RING
- ② SEALING RINGS
- ③ THRUST WASHER, 27 x 47 x 5 mm
- ④ THRUST NEEDLE BEARING
- ⑤ MAINSHAFT 4TH GEAR
- ⑥ NEEDLE BEARINGS
- ⑦ THRUST NEEDLE BEARING
- ⑧ 4TH GEAR COLLAR
- ⑨ 3RD/4TH CLUTCH ASSEMBLY
- ⑩ O-RINGS Replace.
- ⑪ THRUST SHIM, 41 x 72 mm Selective part
- ⑫ THRUST NEEDLE BEARING
- ⑬ MAINSHAFT 3RD GEAR
- ⑭ NEEDLE BEARING
- ⑮ THRUST NEEDLE BEARING
- ⑯ MAINSHAFT
- ⑰ SEALING RINGS
- ⑱ NEEDLE BEARING
- ⑲ SET RING
- ⑳ HARNESS CLAMP BRACKET
- ㉑ A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A/B ASSEMBLY
- ㉒ O-RINGS Replace.
- ㉓ A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE GASKET Replace.
- ㉔ ATF FEED PIPES
- ㉕ TRANSMISSION GROUND TERMINAL BRACKET/ CONNECTOR BRACKET
- ㉖ TRANSMISSION HANGER
- ㉗ BREATHER TUBE
- ㉘ TRANSMISSION HANGER/CONNECTOR BRACKET
- ㉙ O-RING Replace.
- ㉚ COUNTERSHAFT SPEED SENSOR
- ㉛ SNAP RING
- ㉜ MAINSHAFT TRANSMISSION HOUSING BEARING
- ㉝ SNAP RING
- ㉞ SECONDARY SHAFT TRANSMISSION HOUSING BEARING
- ㉟ TRANSMISSION HOUSING GASKET Replace.
- ㊱ TORQUE CONVERTER HOUSING

TORQUE SPECIFICATIONS

Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
6B	14 N·m (1.4 kgf·m, 10 lbf·ft)	6 x 1.0 mm	
10A	44 N·m (4.5 kgf·m, 33 lbf·ft)	10 x 1.25 mm	

Illustrated Index

Torque Converter Housing/Valve Body





- 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 PIPES, 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

- 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
- ㊽ LOCK-UP CONTROL SOLENOID VALVE/SHIFT CONTROL SOLENOID VALVE A ASSEMBLY
- ㊽ LOCK-UP CONTROL SOLENOID VALVE/SHIFT CONTROL SOLENOID VALVE A FILTER/GASKET Replace.
- ㊽ SEALING WASHER Replace.
- ㊽ 2ND CLUTCH PRESSURE SWITCH

TORQUE SPECIFICATIONS

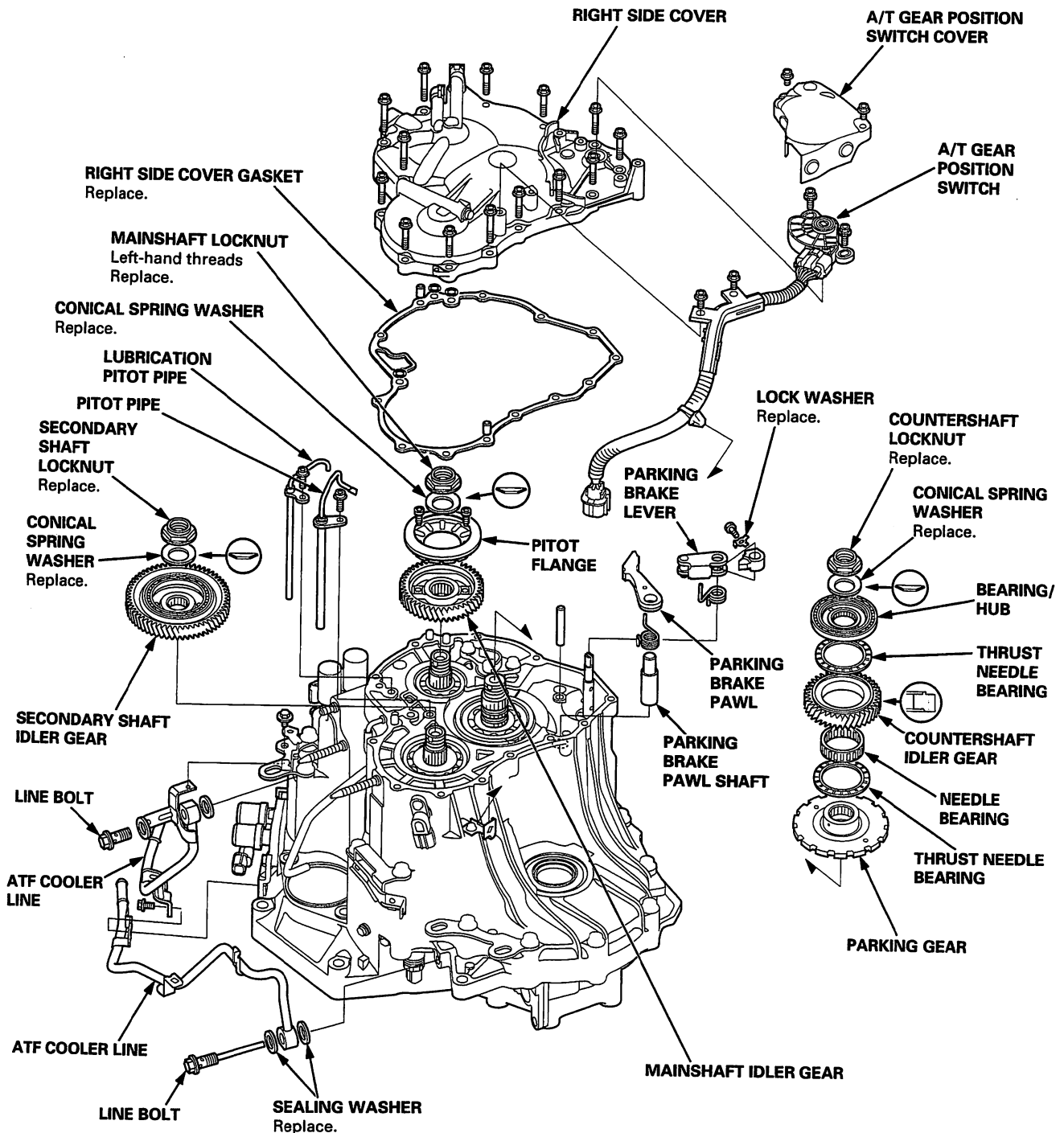
Ref. No.	Torque Value	Bolt Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
8A	18 N·m (1.8 kgf·m, 13 lbf·ft)	8 x 1.25 mm	

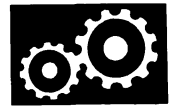
Right Side Cover

Removal

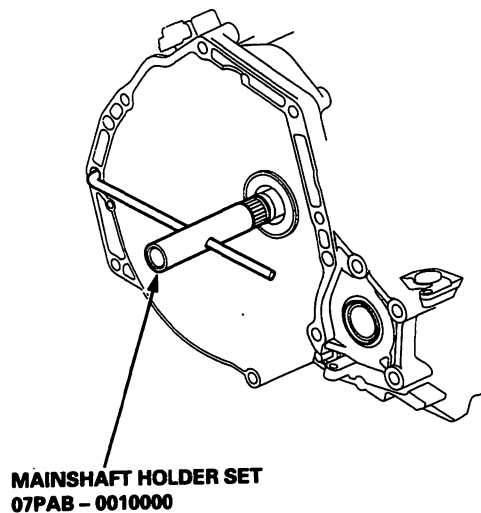
NOTE:

- Clean all parts thoroughly in solvent or carburetor 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





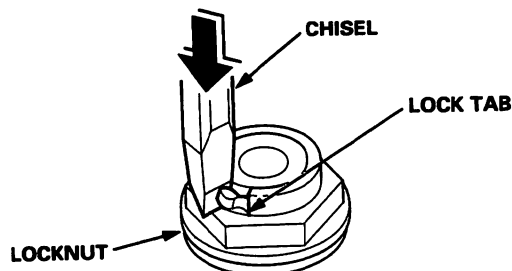
1. Remove the A/T gear position switch cover.
2. Remove the bolts securing the harness clamp (two bolts), then remove the A/T gear position switch.
3. Remove the bolts securing the right side cover (fourteen bolts), then remove the right side cover.
4. Remove the lubrication pitot pipe and the pitot pipe, then remove the pitot flange from the mainshaft 1st gear.
5. Slip the special tool onto the mainshaft as shown.



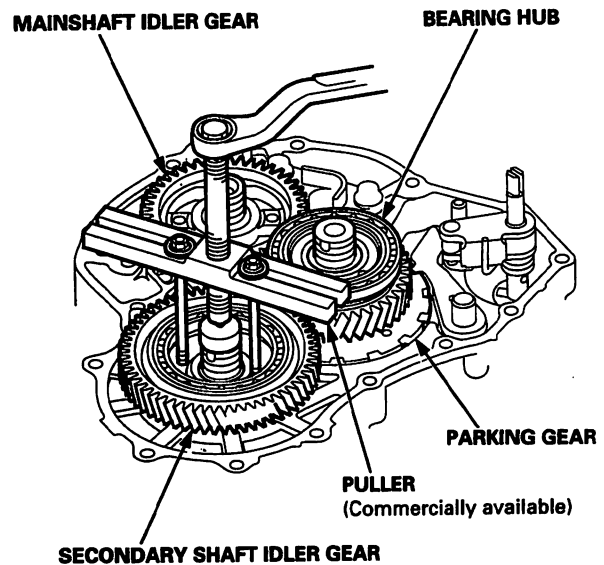
6. Engage the parking brake pawl with the parking gear.
7. Cut the lock tabs of each shaft locknut using a chisel as shown. Then remove the locknuts and conical spring washers from each shaft. Keep all of the chiseled particles out of the transmission.

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.



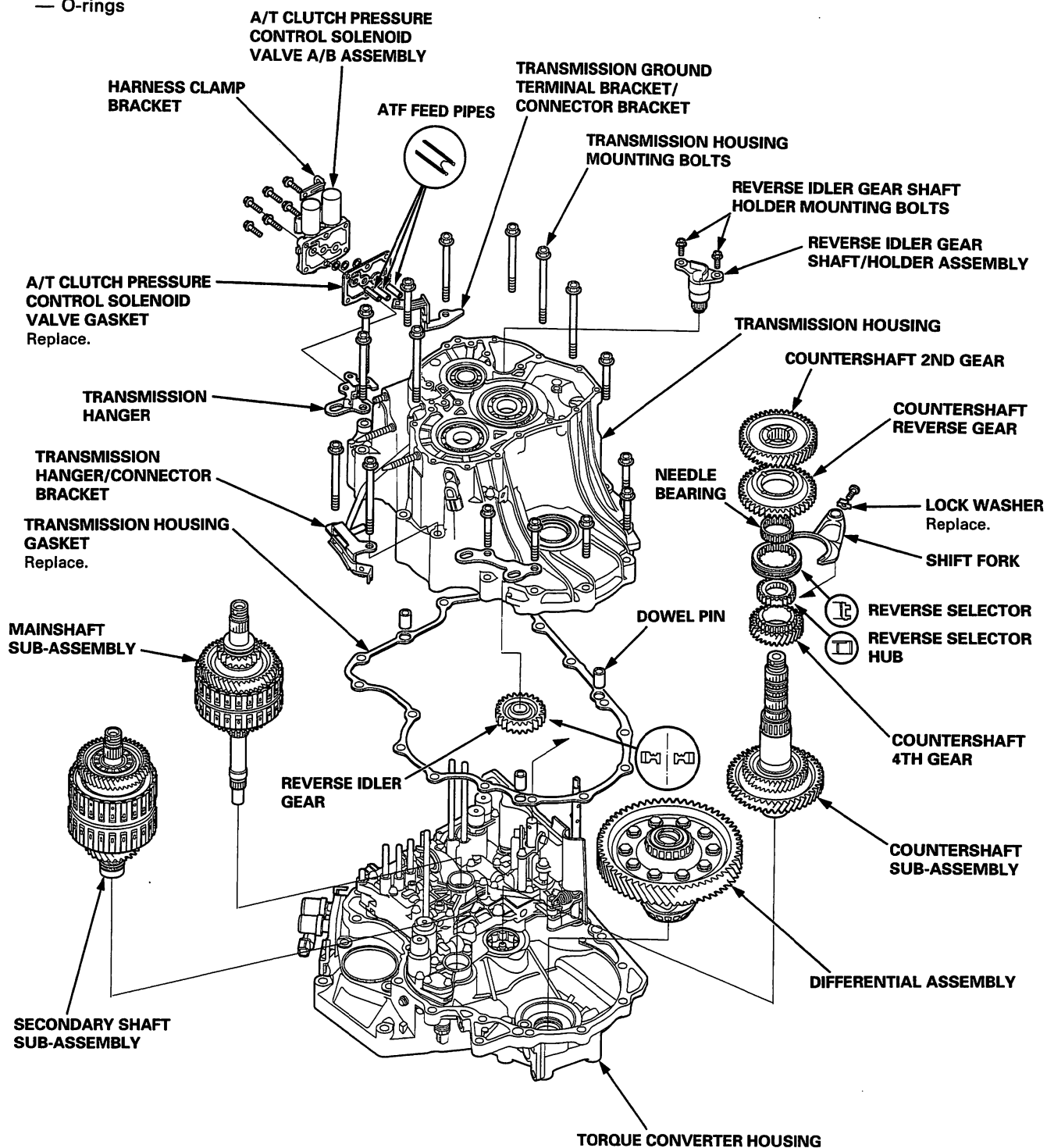
12. Remove the parking brake pawl, spring, shaft, and shaft stop.
13. Remove the parking brake lever from the control shaft.
14. Remove the line bolts, then remove the ATF cooler lines.

Transmission Housing

Removal

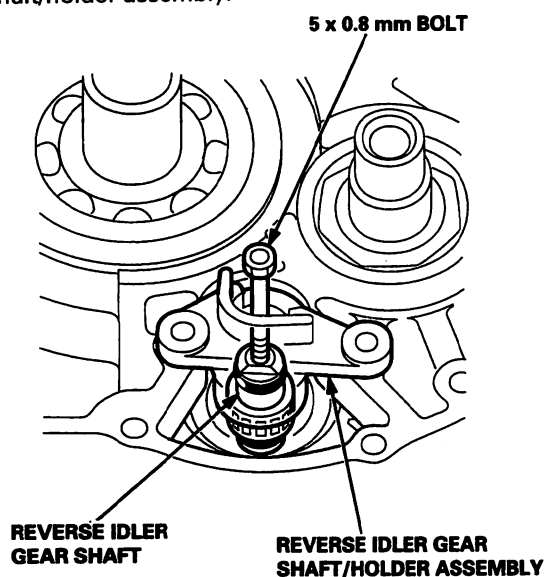
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the transmission housing, replace the following:
 - Transmission housing gasket
 - A/T clutch pressure control solenoid valve gasket
 - Lock washer
 - O-rings



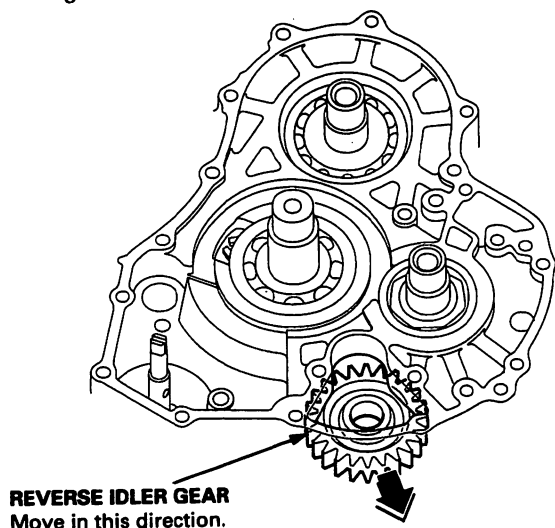


1. Remove the A/T clutch pressure control solenoid valve A/B assembly.
2. Remove the transmission housing mounting bolts (16 bolts), and hangers and brackets.
3. Remove the two bolts securing the reverse idler gear shaft holder.
4. Install a 5 x 0.8 mm bolt in the reverse idler gear shaft as shown, then remove the reverse idler gear shaft/holder assembly.



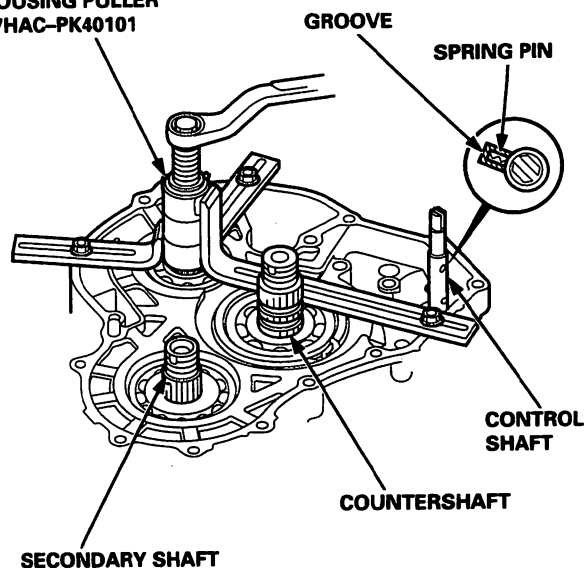
5. Move the reverse idler gear out of way of the countershaft 2nd gear in the direction shown when removing the transmission housing from the torque converter housing.

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.

HOUSING PULLER
07HAC-PK40101



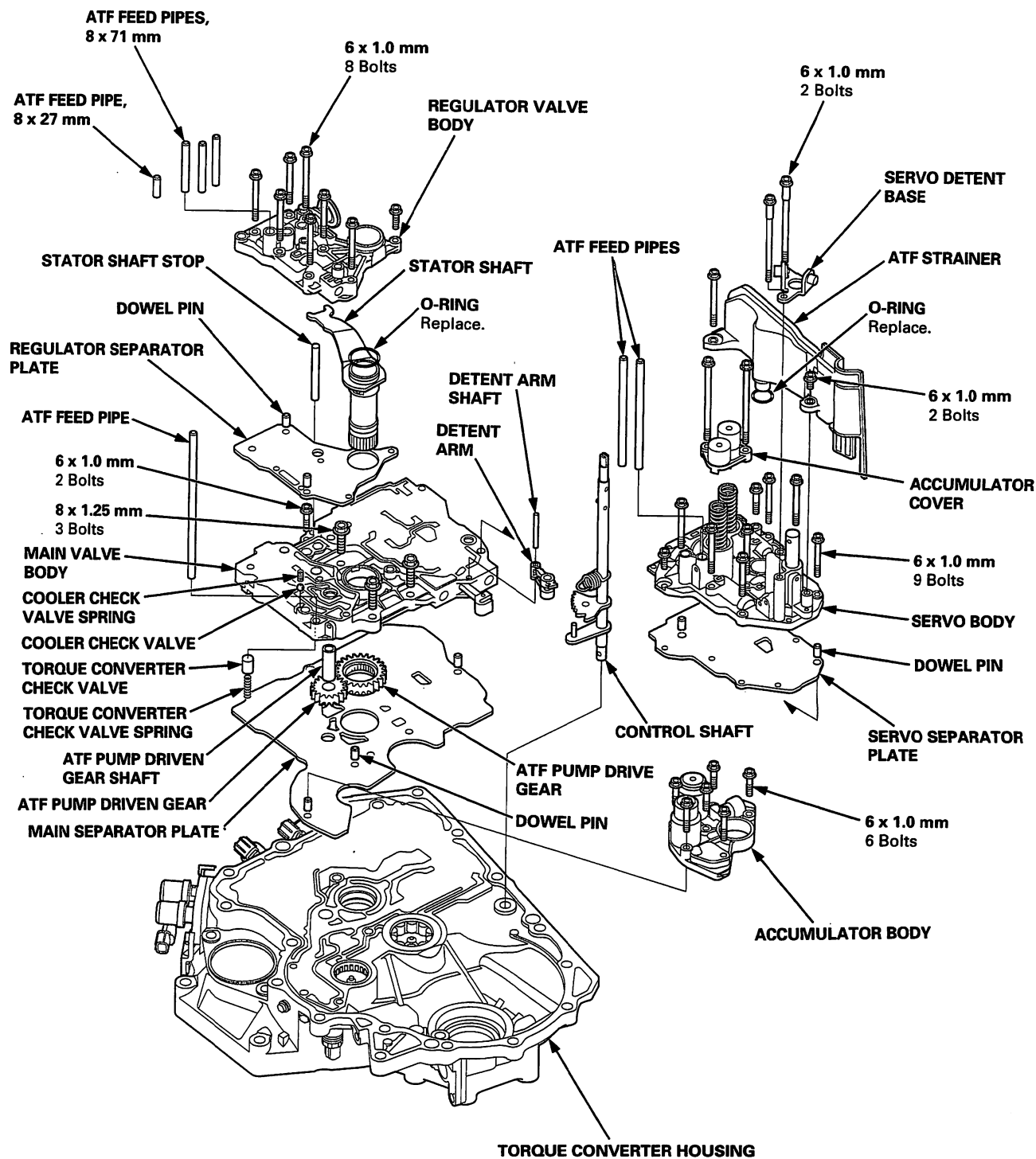
8. Remove the reverse idler gear from the transmission housing.
9. Remove the countershaft 2nd gear, then slide and remove the countershaft reverse gear and the needle bearing.
10. Remove the bolt securing the shift fork, then remove the shift fork, reverse selector, reverse selector hub and countershaft 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.

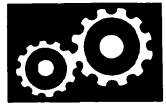
Torque Converter Housing/Valve Body

Removal

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the valve body, replace the O-rings.



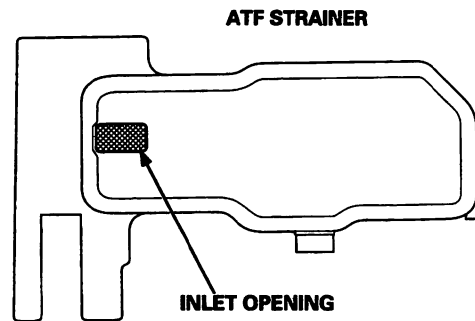


1. Remove the ATF feed pipes from the main valve body, regulator valve body and servo body.
2. Remove the servo detent base (two bolts).
3. Remove the ATF strainer (two bolts).
4. Remove the accumulator cover (two bolts).

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.

Valve Body

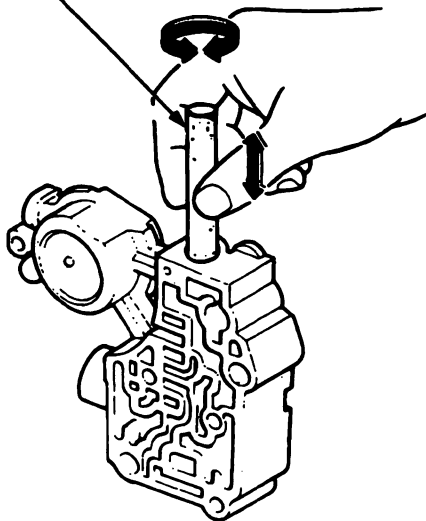
Repair

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.

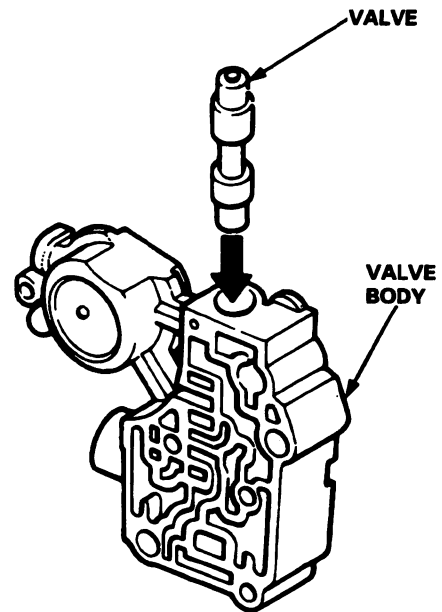
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any 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 aluminum 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.

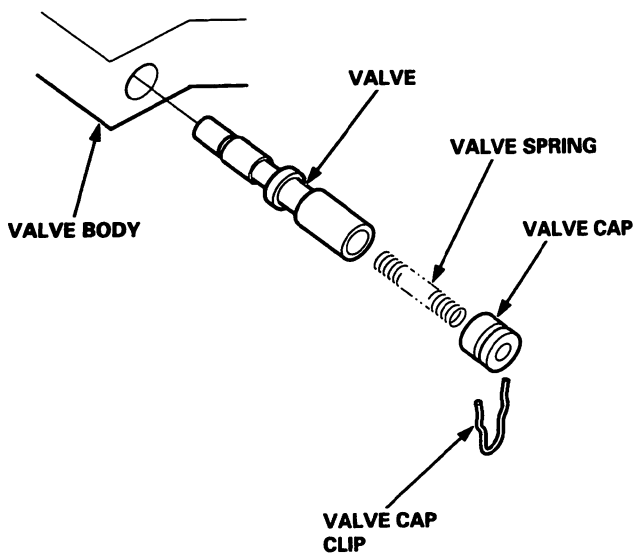
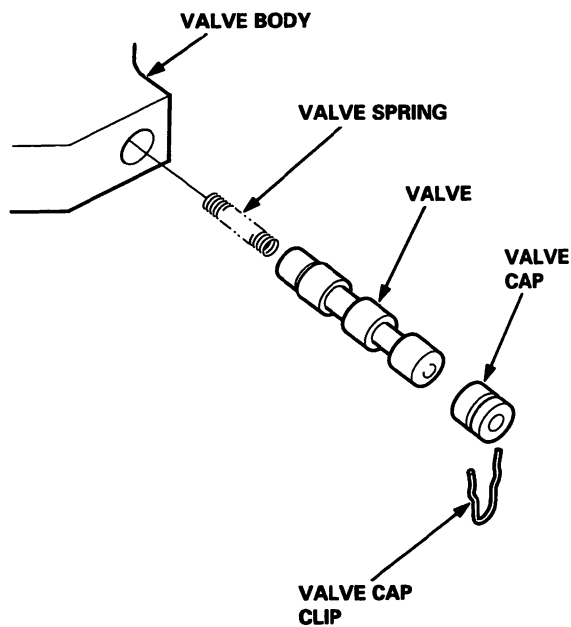
Valve



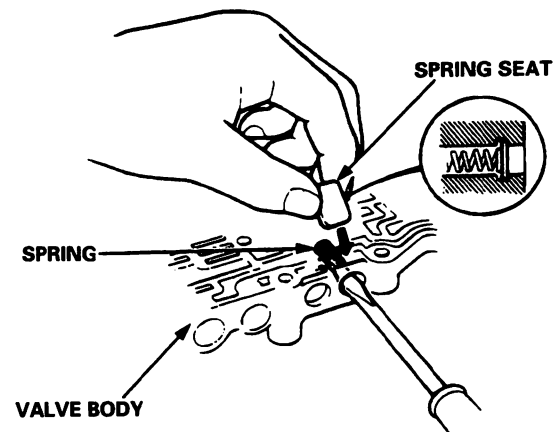
Assembly

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

- 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.

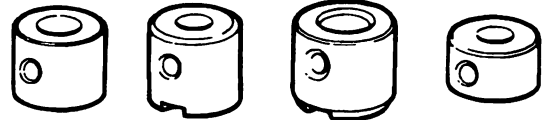
TOWARD OUTSIDE OF VALVE BODY



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

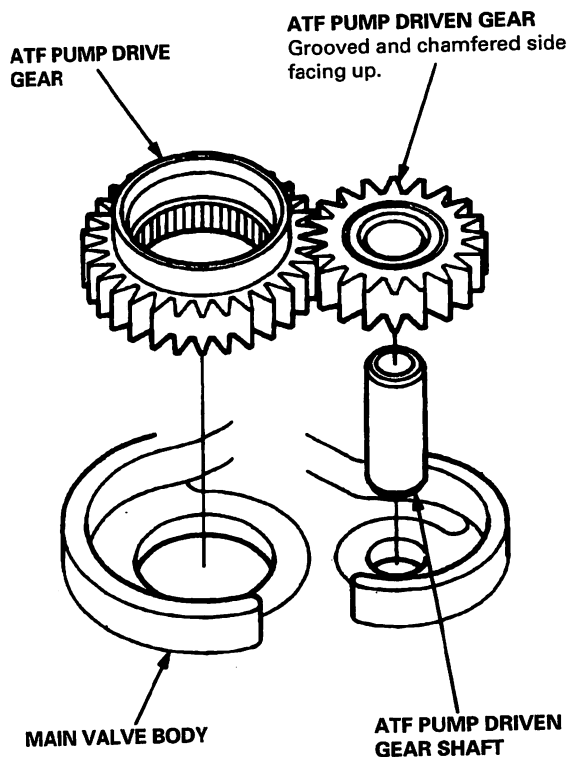


TOWARD INSIDE OF VALVE BODY



Inspection

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):

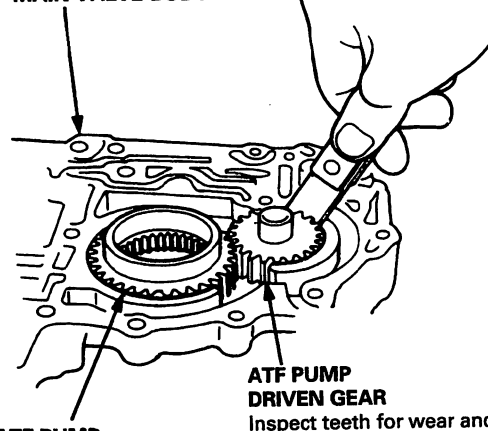
ATF Pump Drive Gear

0.105 – 0.1325 mm (0.004 – 0.005 in)

ATF Pump Driven Gear

0.035 – 0.0625 mm (0.0014 – 0.0025 in)

MAIN VALVE BODY



ATF PUMP DRIVE GEAR

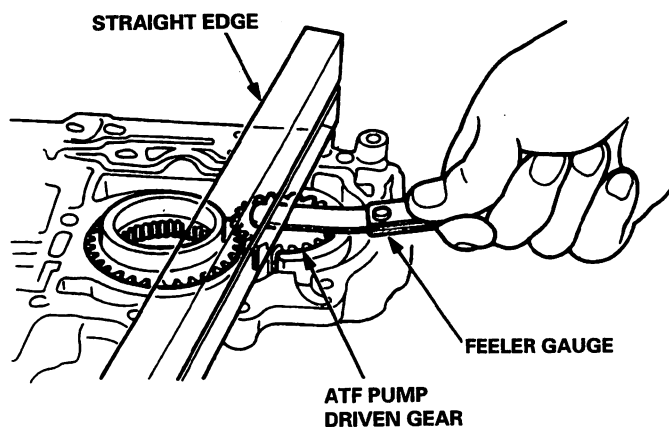
Inspect teeth for wear and damage.

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)

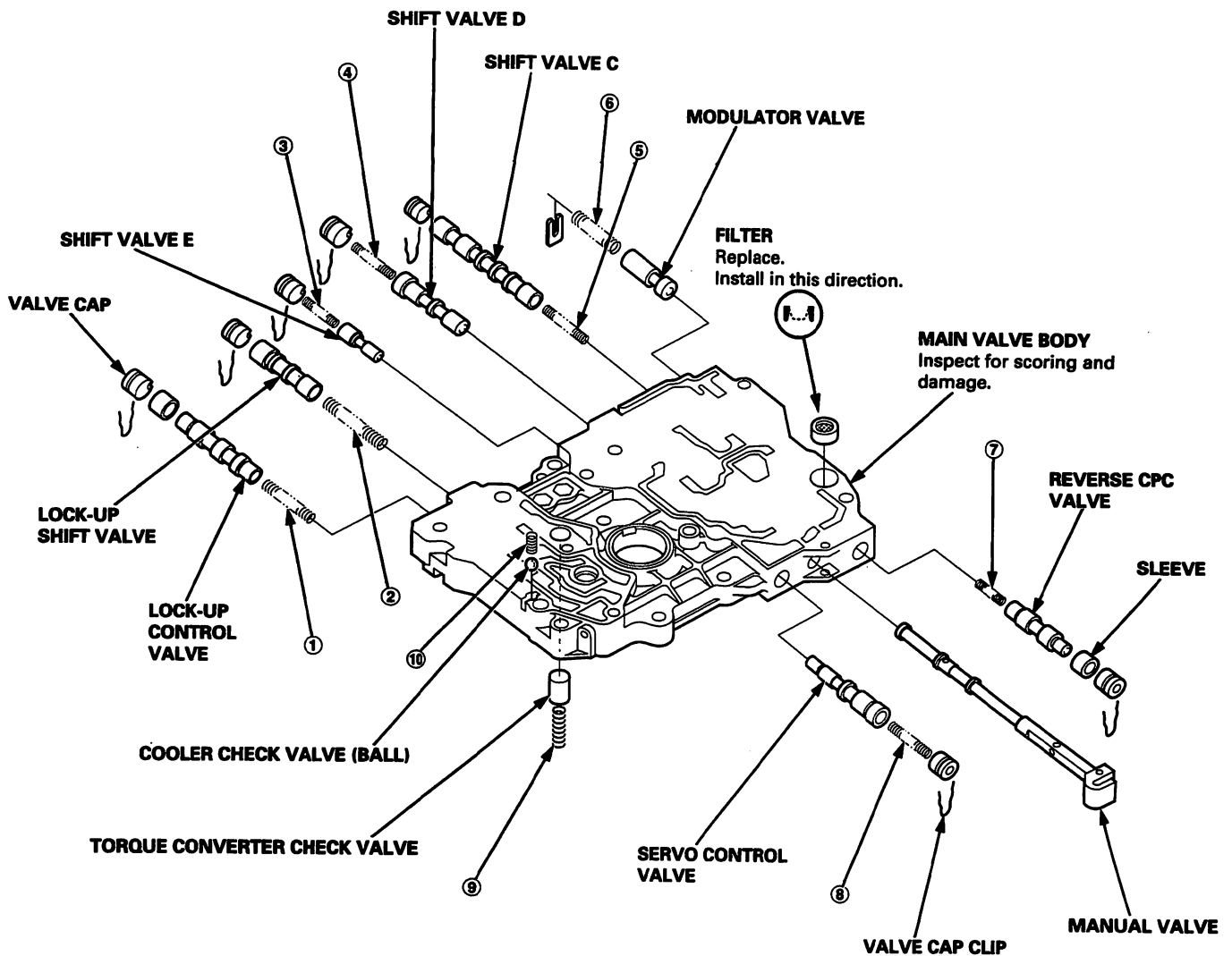


Main Valve Body

Disassembly/Inspection/Reassembly

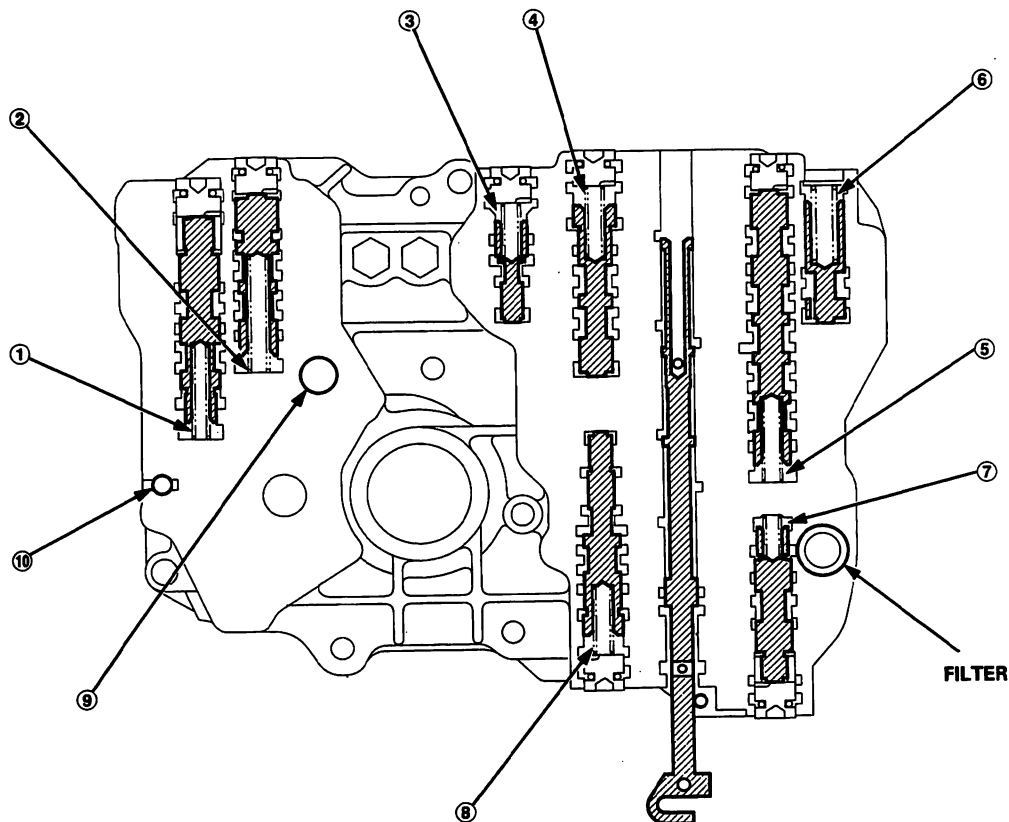
NOTE:

- Do not use a magnet to remove the check valve ball; it may magnetize the ball.
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-154.
- Replace the valve body as an assembly if any parts 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 (0.331)	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

Regulator Valve Body

Disassembly/Inspection/Reassembly

NOTE:

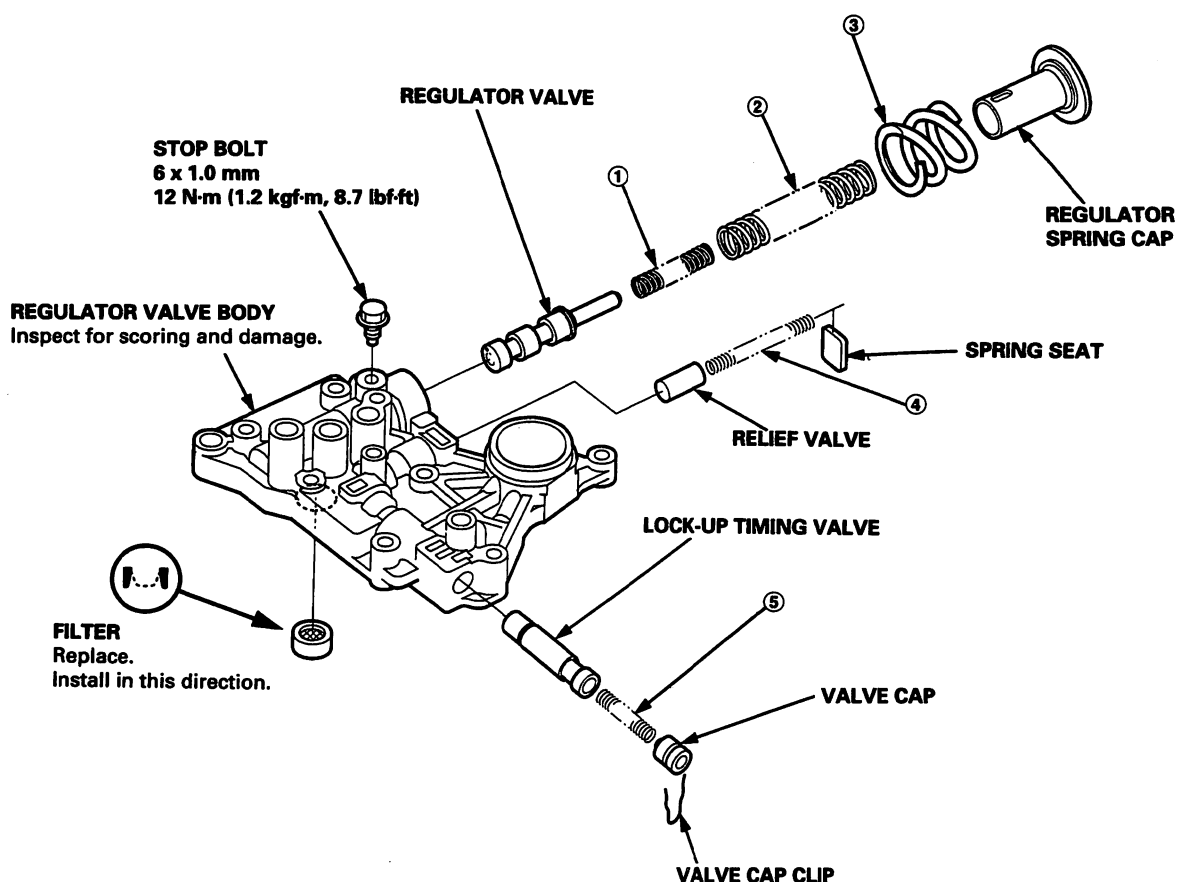
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-154.
- Replace the valve body as an assembly if any parts worn or damaged.

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.
- Align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, then tighten the stop bolt.



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

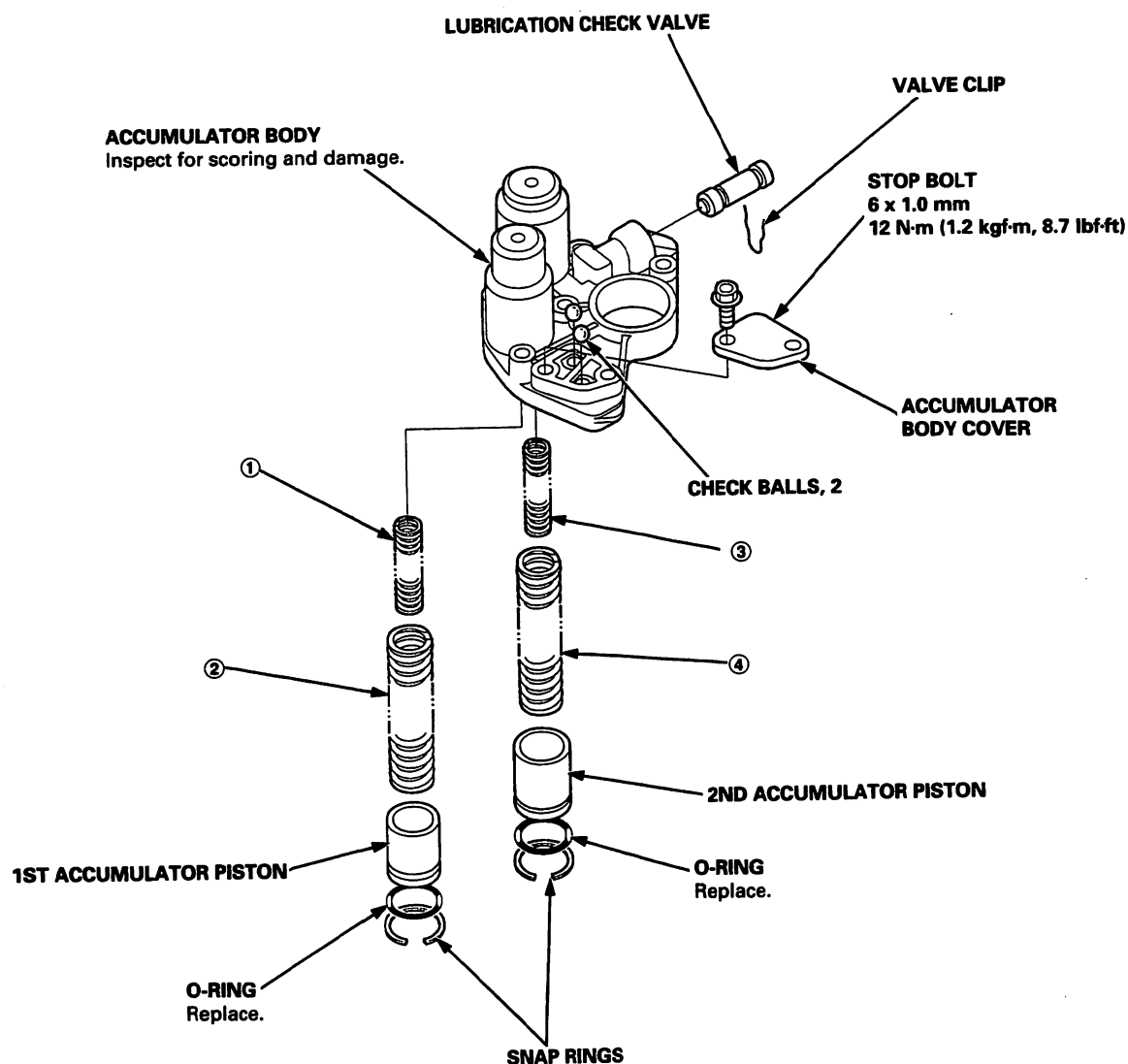


Accumulator Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
- Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

Unit: mm (in)

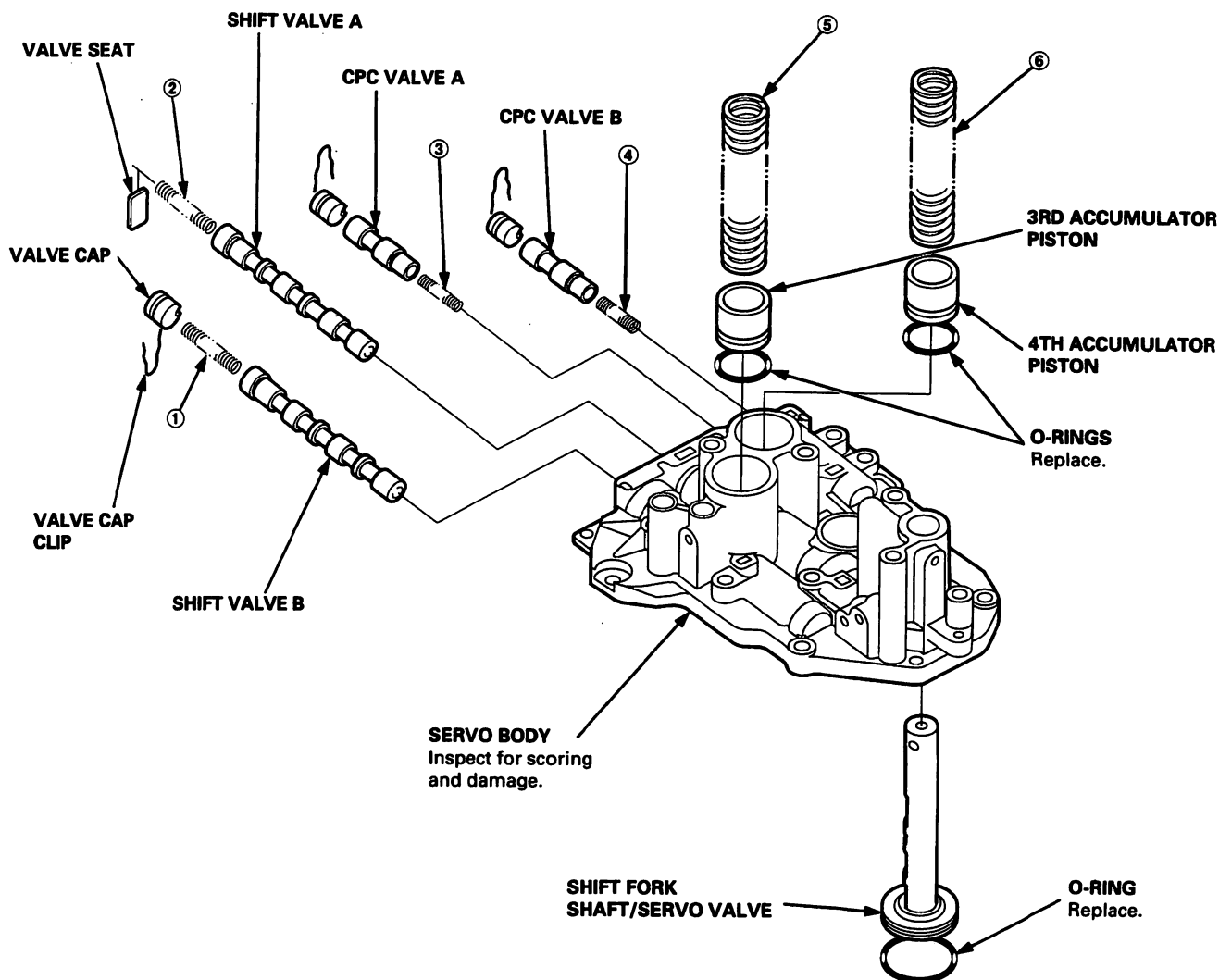
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring B	2.5 (0.098)	12.8 (0.504)	49.5 (1.949)	8.5
②	1st accumulator spring A	2.6 (0.102)	19.6 (0.772)	69.7 (2.744)	10.8
③	2nd accumulator spring B	2.7 (0.106)	14.8 (0.583)	51.0 (2.008)	9.6
④	2nd accumulator spring A	2.6 (0.102)	21.6 (0.850)	73.2 (2.882)	10.0

Servo Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-154.
- Replace the valve body as an assembly if any parts 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)

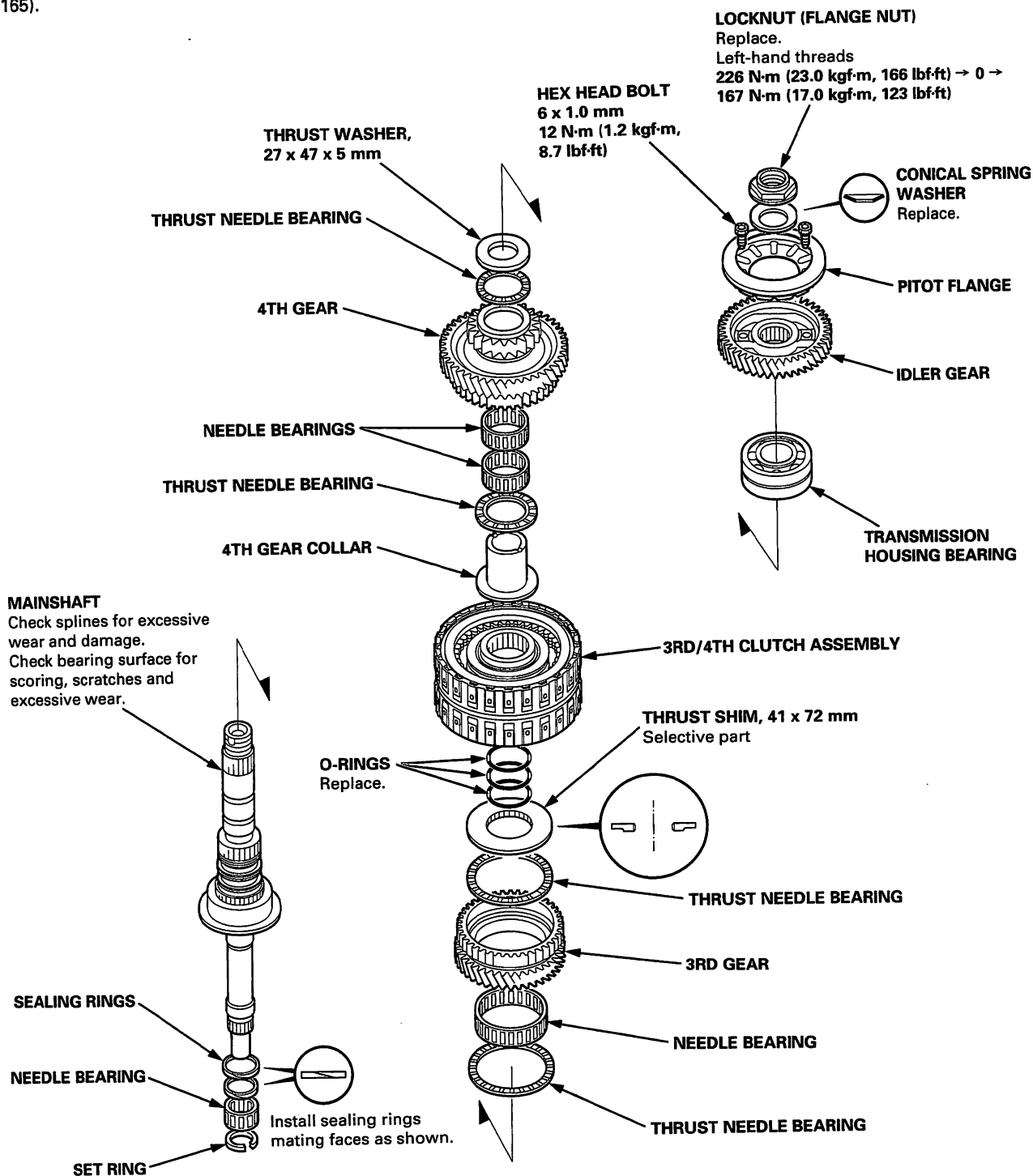
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Shift valve B spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
②	Shift valve A spring	0.8 (0.031)	7.1 (0.280)	40.4 (1.591)	16.9
③	CPC valve A spring	0.7 (0.028)	6.1 (0.240)	17.8 (0.701)	7.9
④	CPC valve B spring	0.7 (0.028)	6.1 (0.240)	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



Disassembly/Inspection/Reassembly

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).



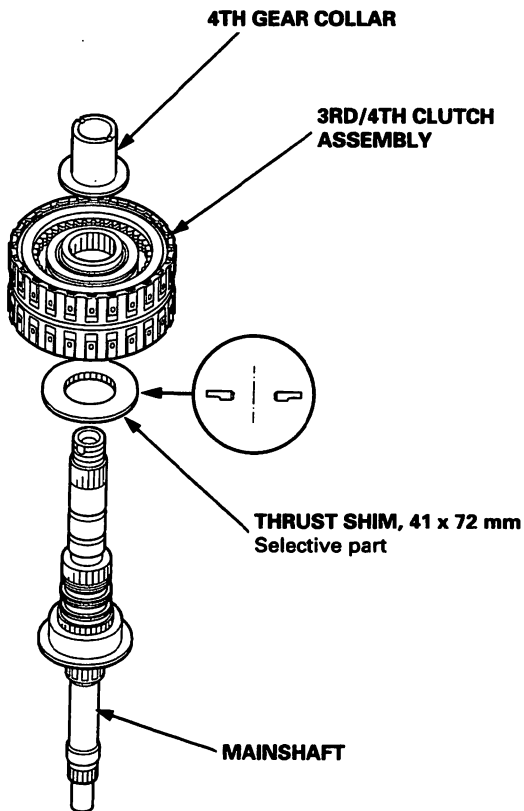
Mainshaft

Inspection

NOTE: Lubricate all parts with ATF during assembly.

1. Assemble the parts below on the mainshaft.

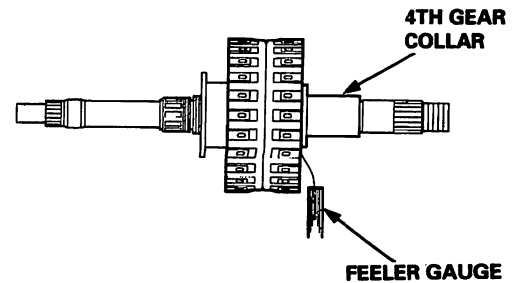
NOTE: Do not assemble the O-rings during inspection.



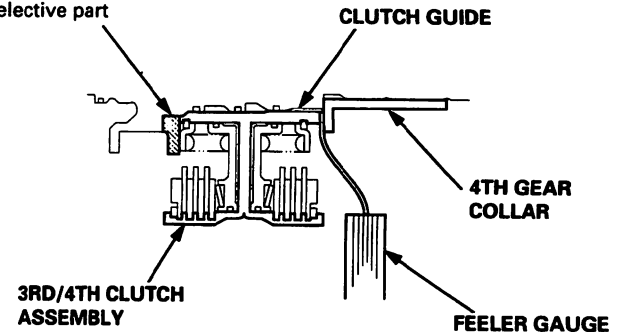
2. Hold the 4th gear collar against the clutch assembly, then measure the clearance between the clutch guide and the 4th gear collar with a feeler gauge as shown.

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.



THRUST SHIM, 41 x 72 mm
Selective part

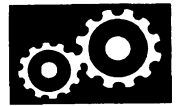


3. If the clearance is out of standard, remove the thrust shim and measure its thickness.
4. Select and install a new shim, then recheck.

THRUST SHIM, 41 x 72 mm

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.

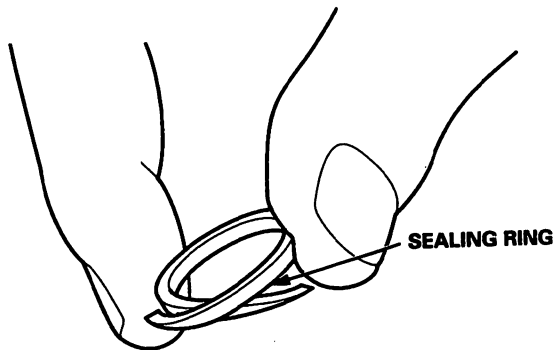


Replacement

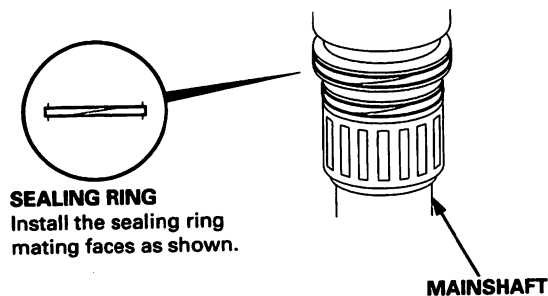
The sealing rings on the mainshaft are synthetic resin with chamfered ends. Check condition of the sealing rings, and replace them only if they are worn, distorted or damaged.

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.

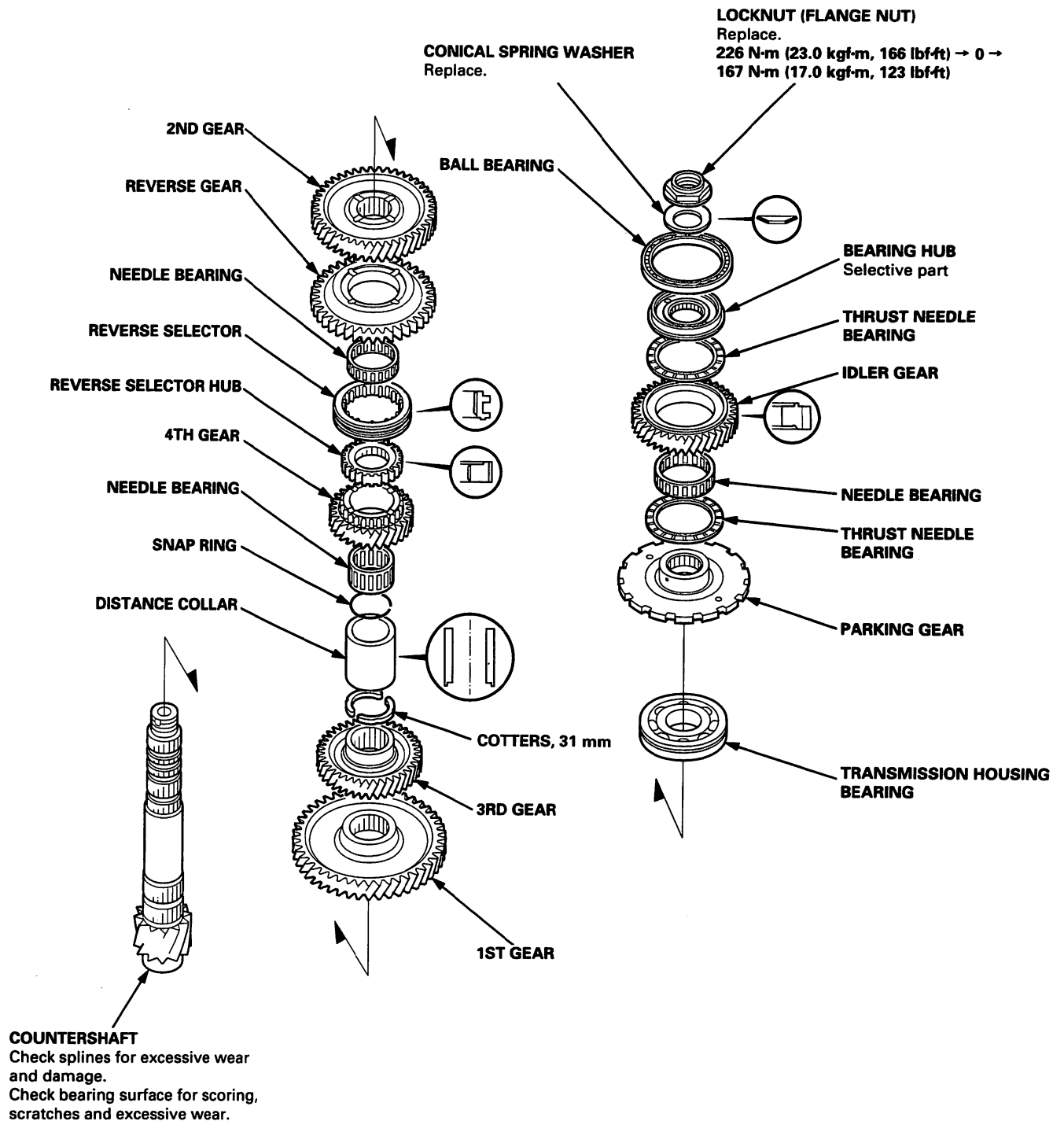


Countershaft

Disassembly/Inspection/Reassembly

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.



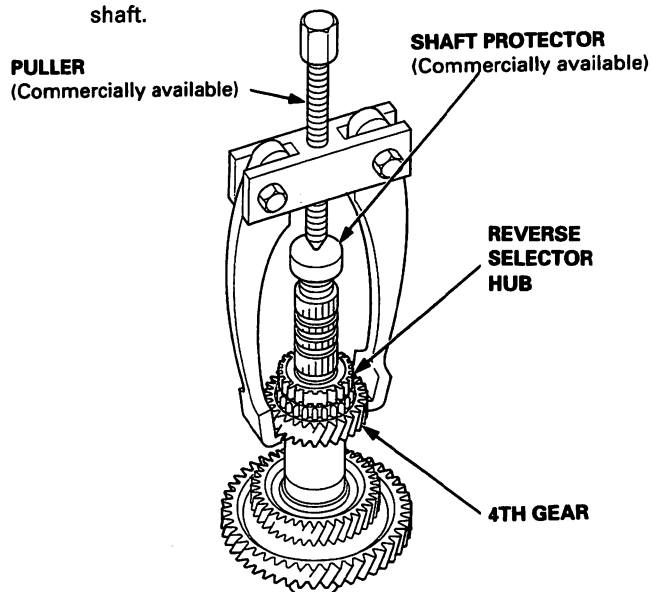


Disassembly

1. Remove the reverse selector hub and the 4th gear using a puller as shown.

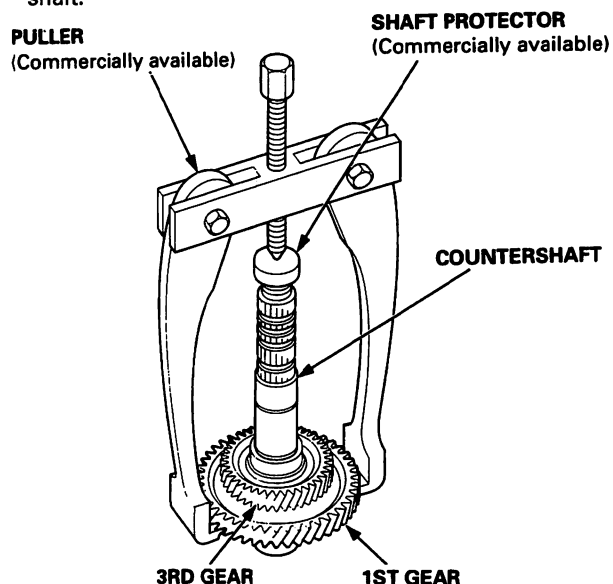
NOTE:

- 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, and 31 mm cotters 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.



Reassembly

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.

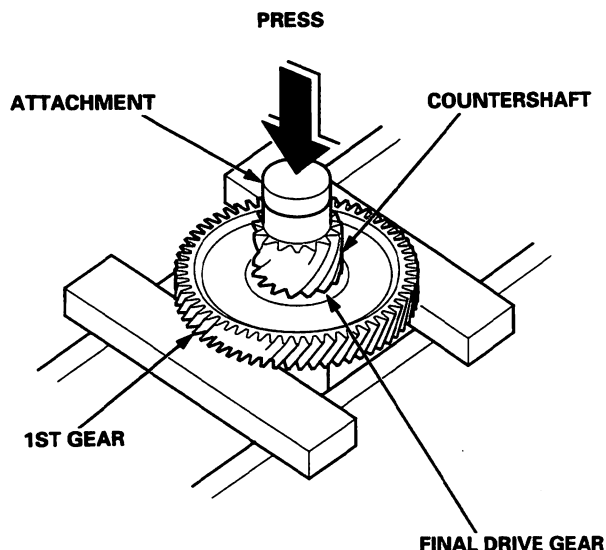
NOTE:

- Place an attachment between the press and countershaft to prevent damaging the countershaft.
- 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.



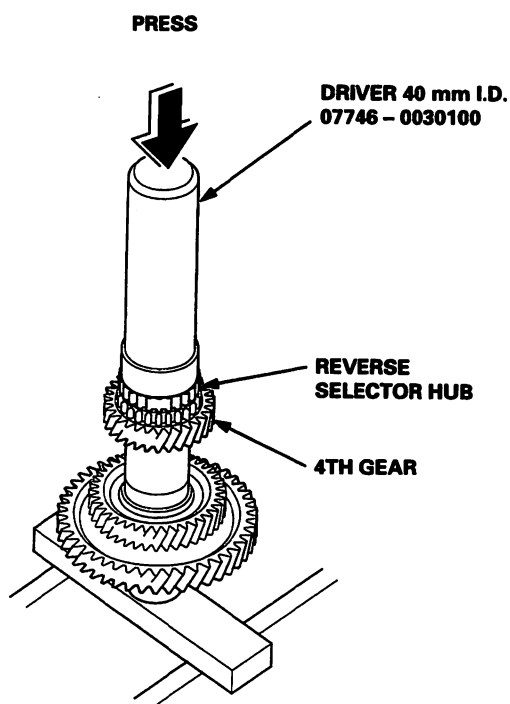
(cont'd)

Countershaft

Reassembly (cont'd)

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.

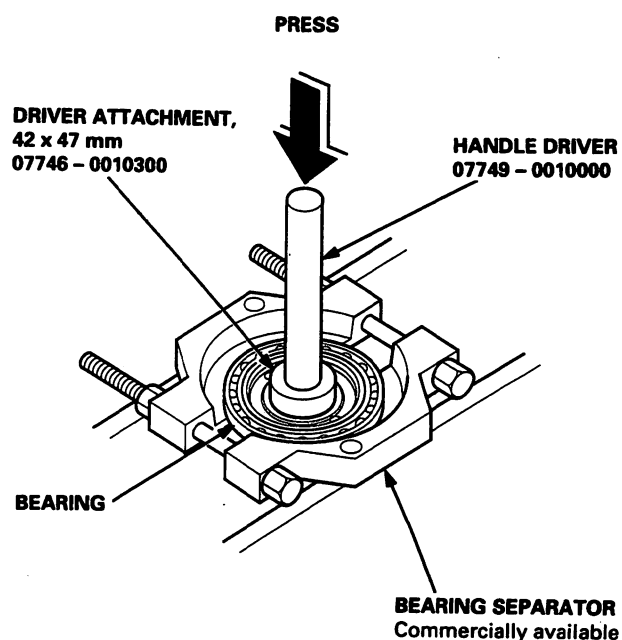


Bearing Hub

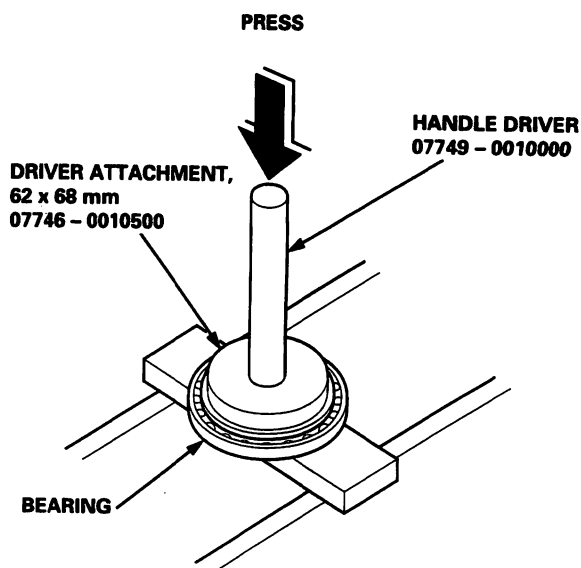
Bearing Replacement

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.



Secondary Shaft



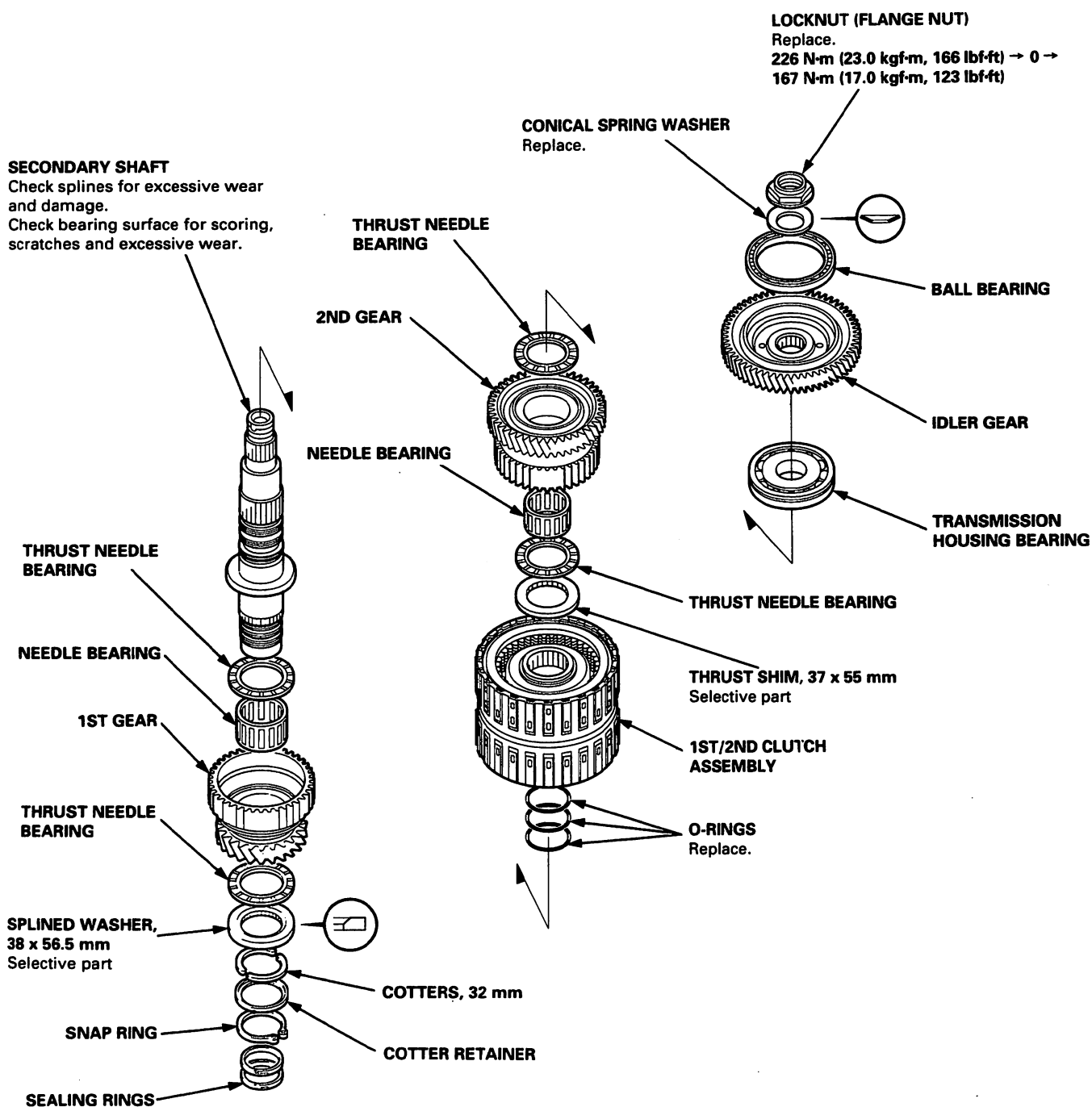
Disassembly/Inspection/Reassembly

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

Check splines for excessive wear and damage.
Check bearing surface for scoring, scratches and excessive wear.

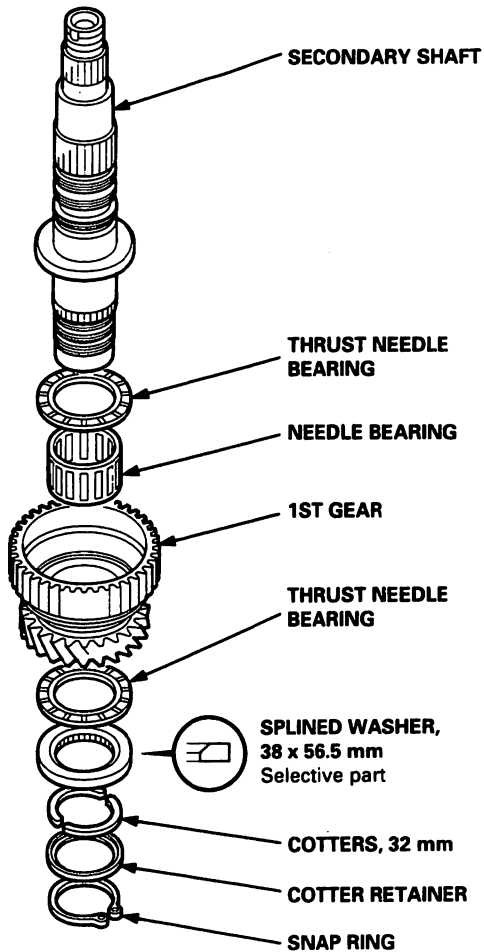


Secondary Shaft

Inspection

NOTE: Lubricate all parts with ATF during assembly.

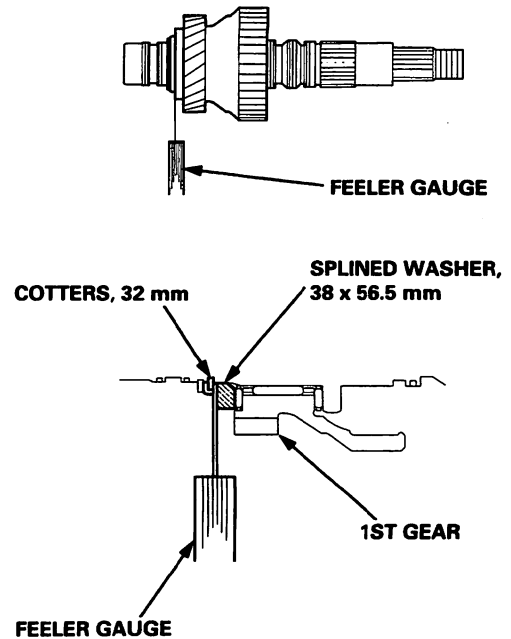
1. Assemble the parts below on the secondary shaft.



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)

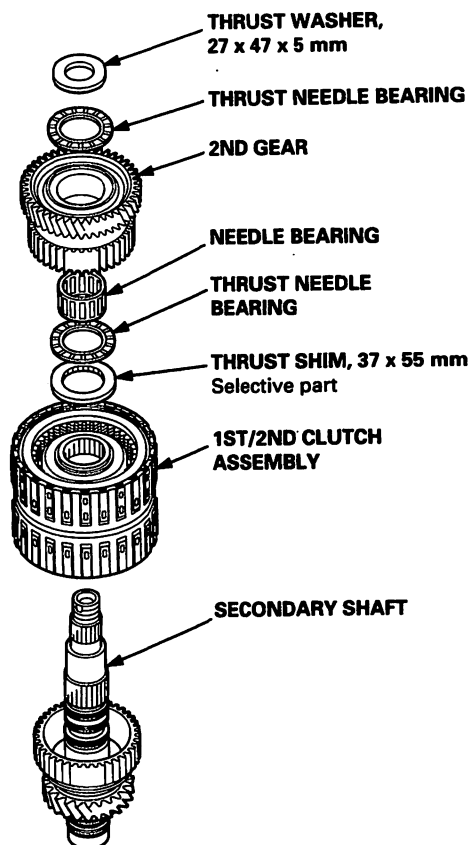
5. After replacing the splined washer, make sure that the clearance is within standard.



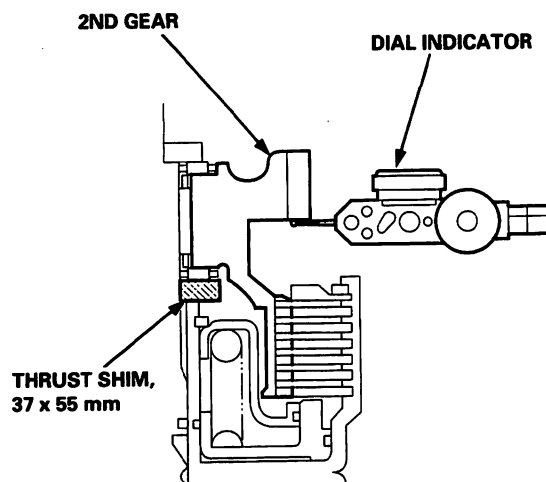
6. Remove the 27 x 47 x 5 mm thrust washer from the mainshaft.

7. Assemble the parts below on the secondary shaft.

NOTE: Do not assemble the O-rings during inspection.



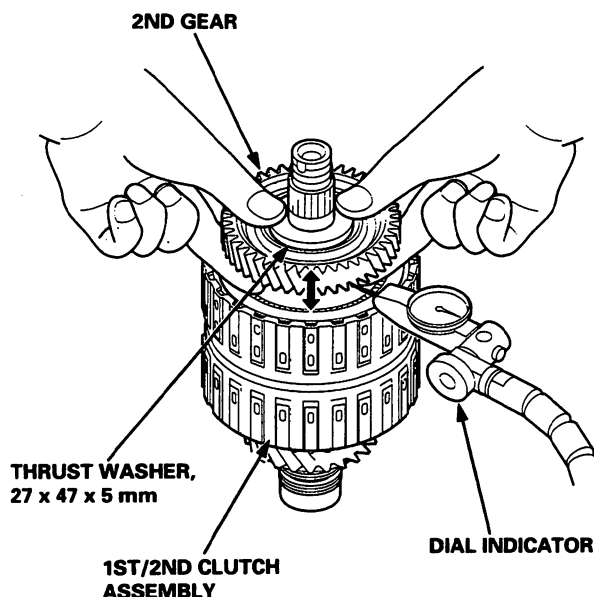
8. Set the dial indicator to the 2nd gear as shown.



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.

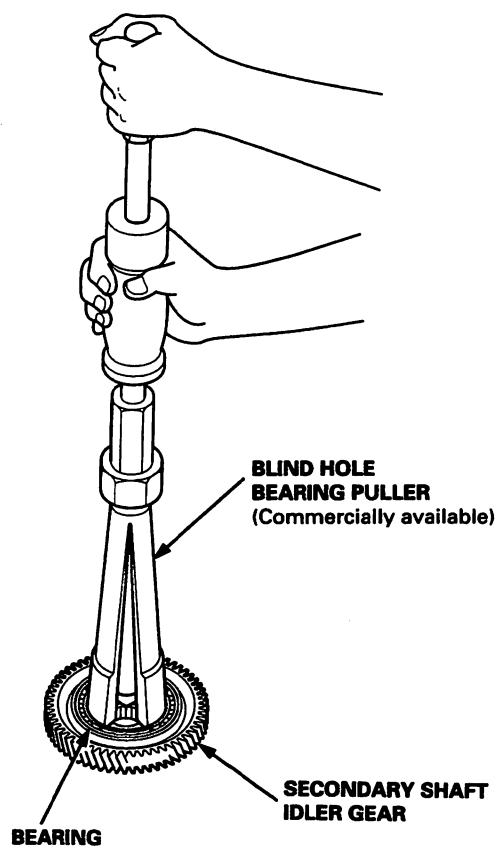
13. Be sure to install the 27 x 47 x 5 mm thrust washer on the mainshaft.

Secondary Shaft Idler Gear

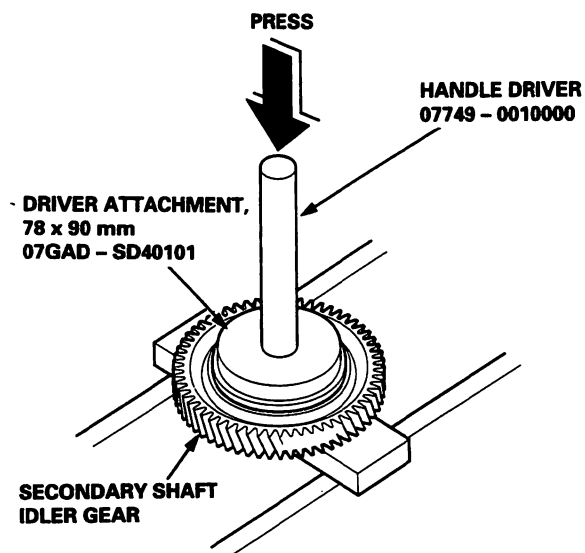
Bearing Replacement

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 vise 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.

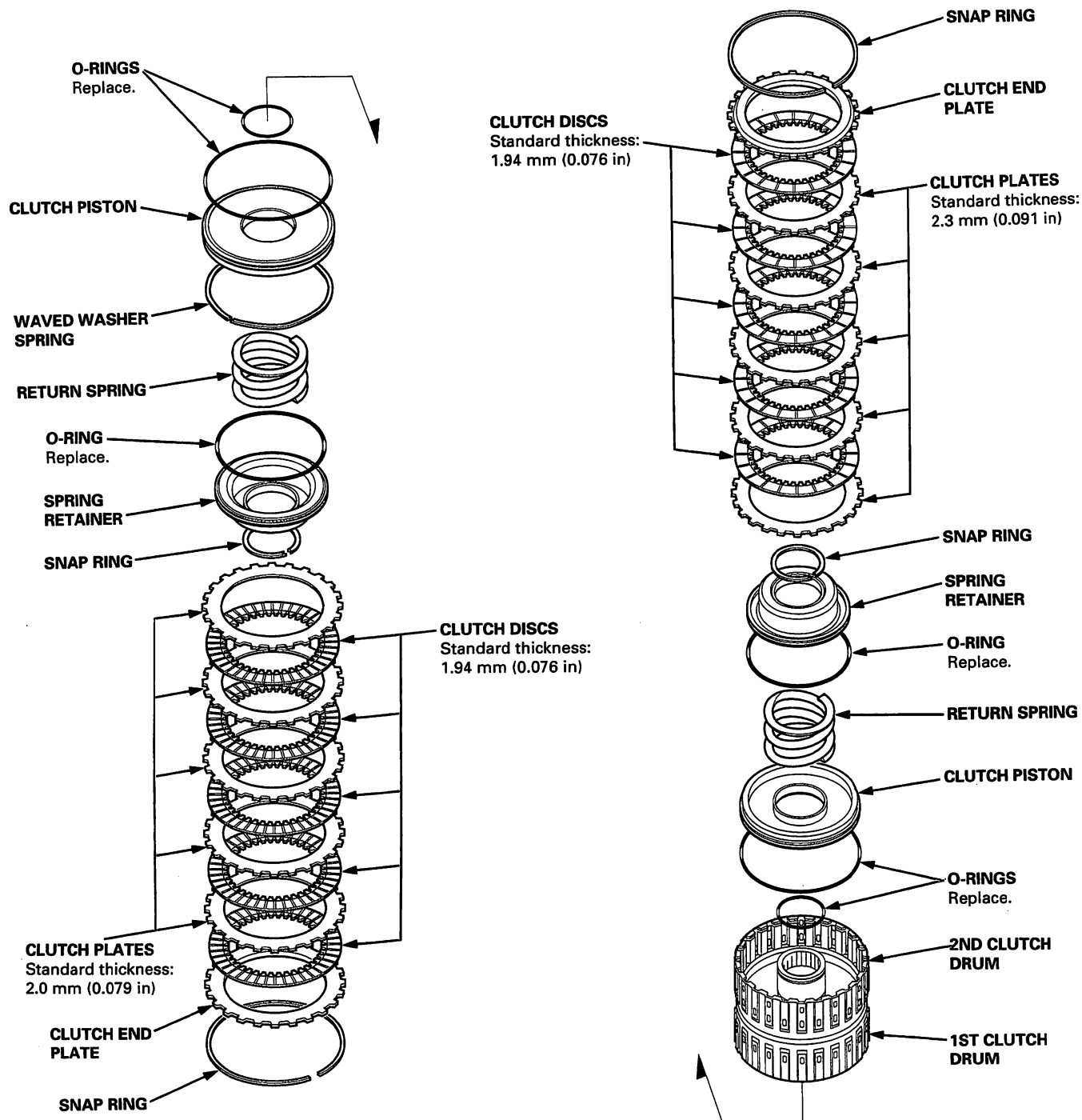


Clutch



Illustrated Index

1ST/2ND CLUTCH

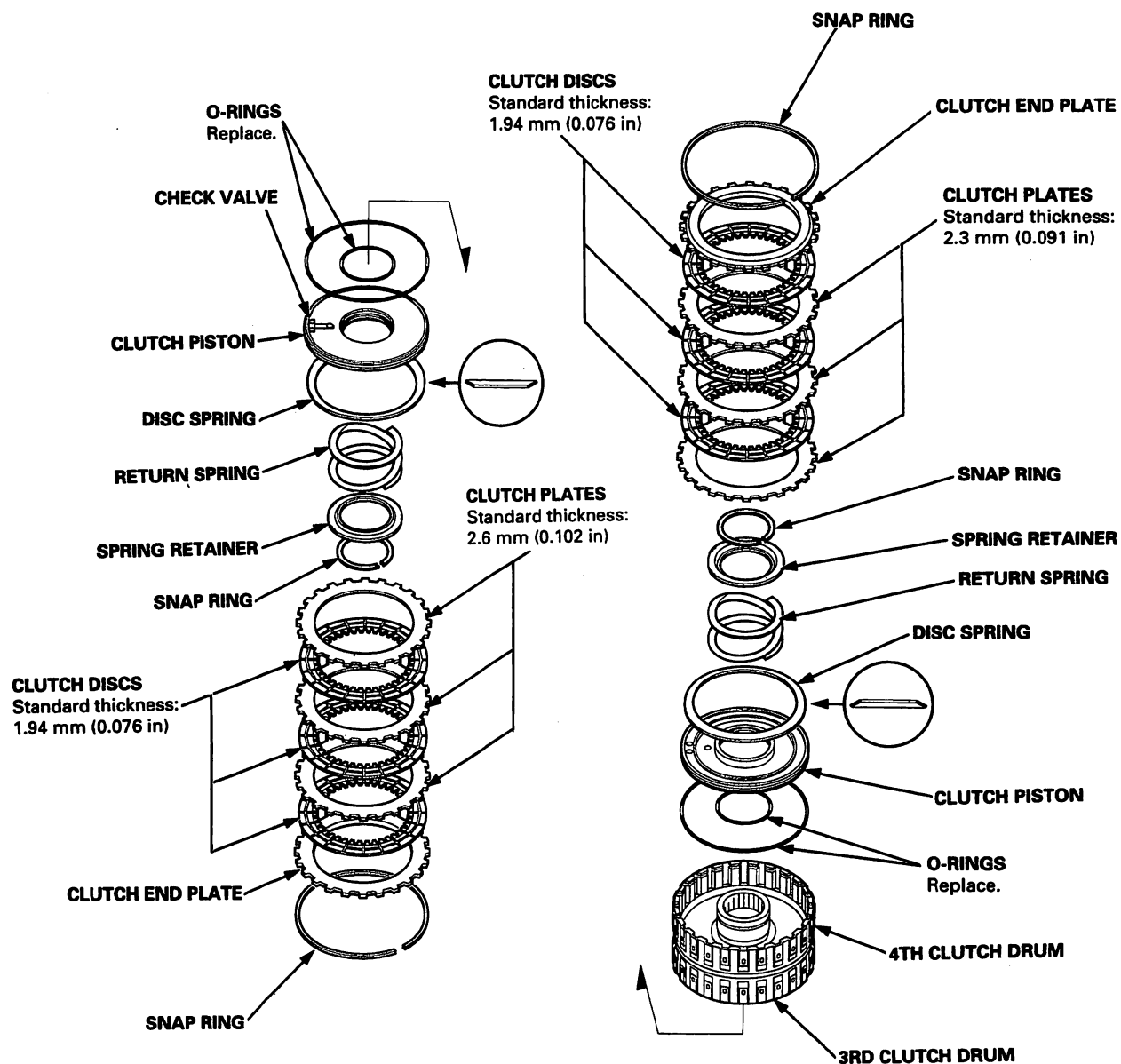


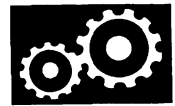
(cont'd)

Clutch

Illustrated Index (cont'd)

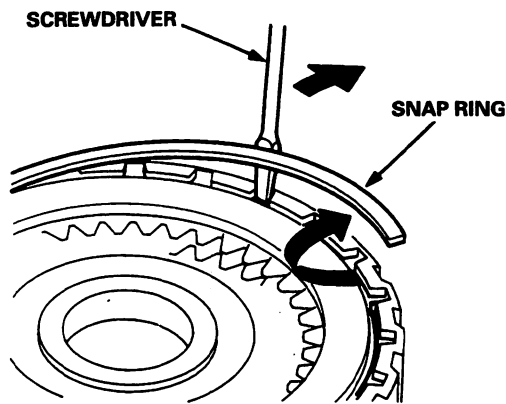
3RD/4TH CLUTCH



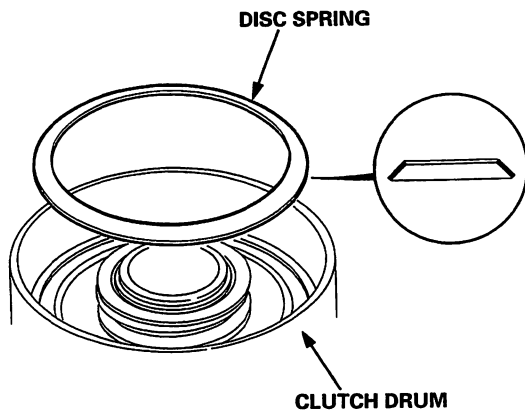


Disassembly

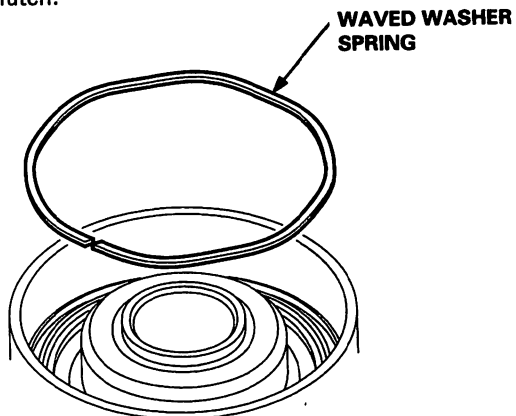
1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.



2. Remove the disc spring from the 3rd and 4th clutches.



3. Remove the waved washer spring from the 1st clutch.



4. Install the special tools as shown.

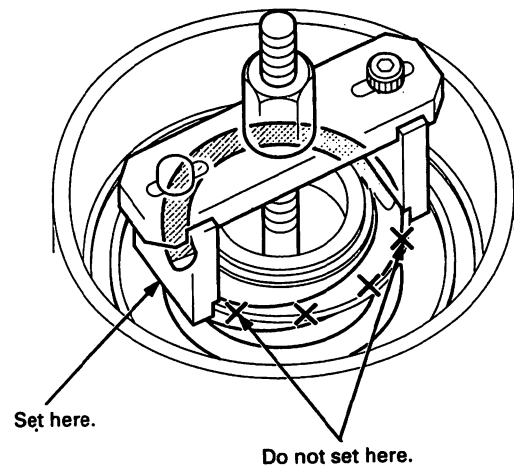
CLUTCH SPRING
COMPRESSOR SET
07LAE - PX40000

CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07LAE - PX40100

CLUTCH SPRING
COMPRESSOR
BOLT ASSEMBLY
07GAE - PG40200

CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07HAE - PL50100

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.



(cont'd)

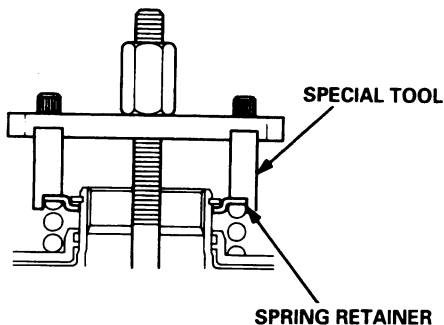
Clutch

Disassembly (cont'd)

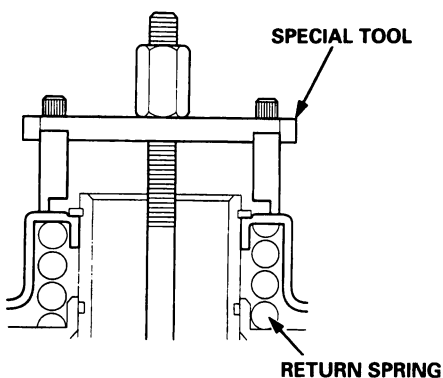
NOTE:

- 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.

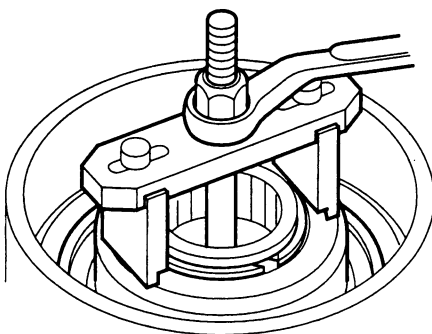
For 3rd and 4th clutches:



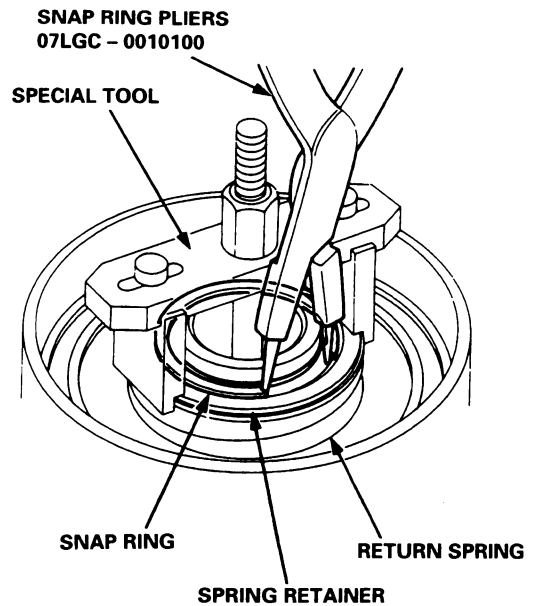
For 1st and 2nd clutches:



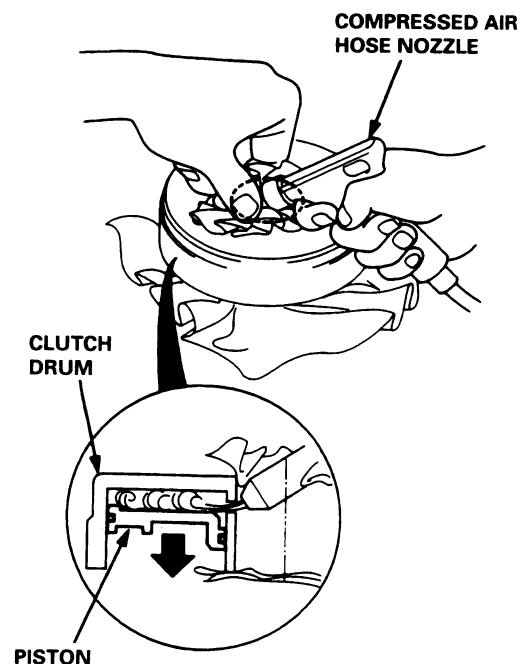
5. Compress the return spring with the special tool.



6. Remove the snap ring. Then remove the special tools, spring retainer and return spring.



7. Wrap a shop rag around the clutch drum, and apply air pressure to the oil passage to remove the piston. Place a finger tip on the other end while applying air pressure.



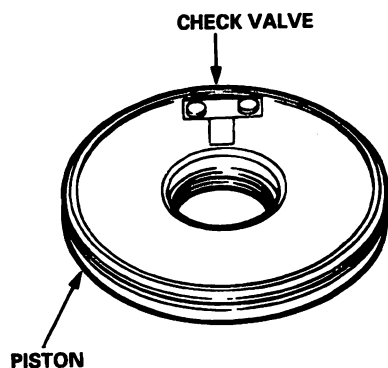


Reassembly

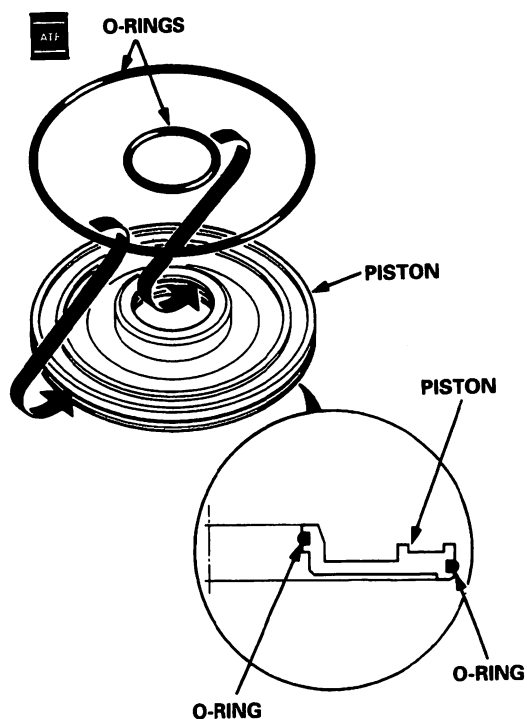
NOTE:

- 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.

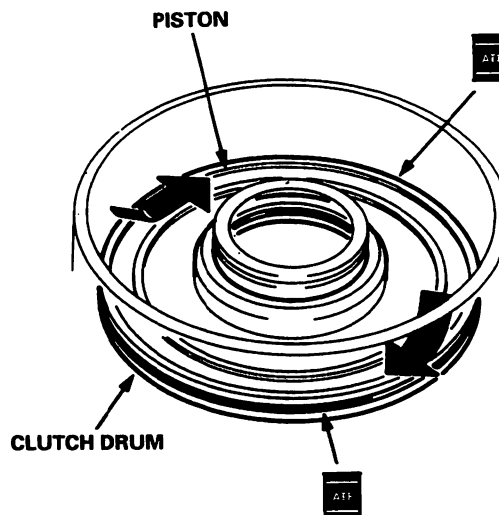


2. Install new O-rings on the piston and the spring retainers of the 1st and 2nd clutches.

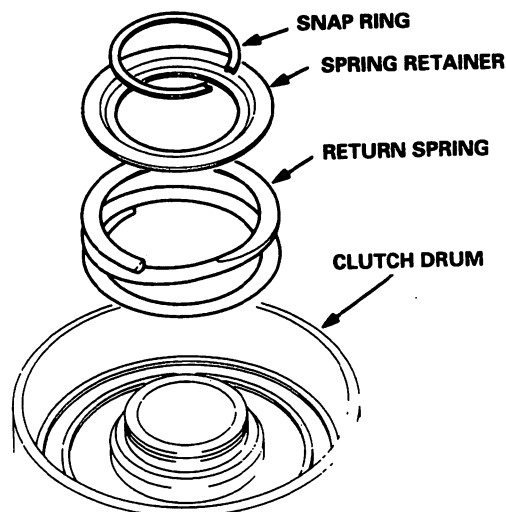


3. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating. Lubricate the piston and O-ring with ATF before installing.

NOTE: Do not pinch the O-ring by installing the piston with too much force.



4. Install the return spring and spring retainer, and position the snap ring on the retainer.

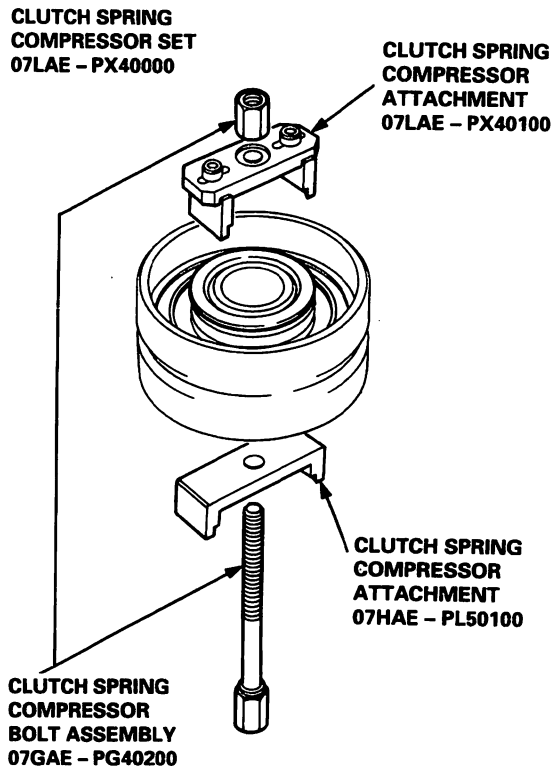


(cont'd)

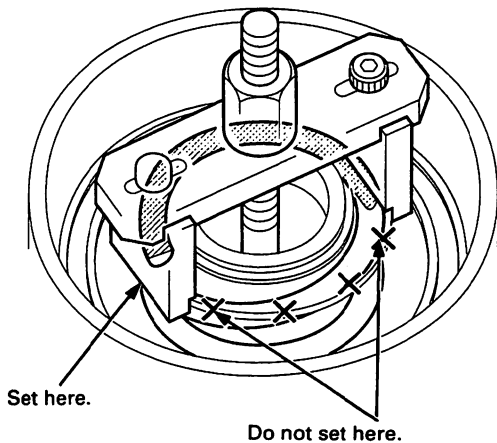
Clutch

Reassembly (cont'd)

5. Install the special tools as shown.



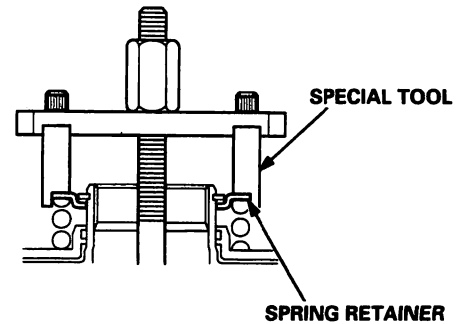
NOTE: Be sure the special tool is adjusted to have full contact with the spring retainer. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



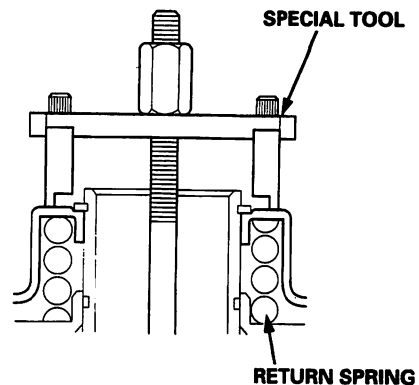
NOTE:

- 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 is such a way that the special tool works on the clutch return spring.

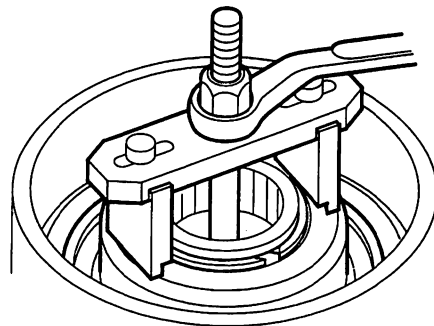
For 3rd and 4th clutches:



For 1st and 2nd clutches:

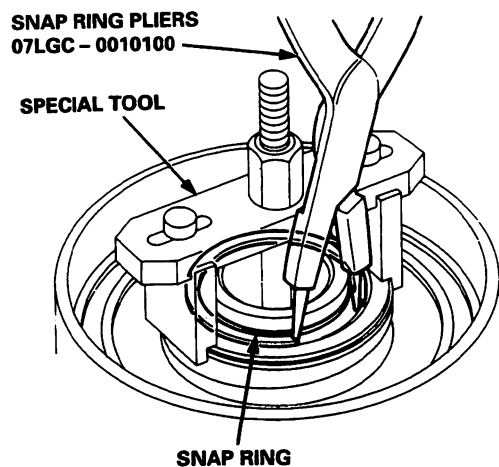


6. Compress the return spring with the special tool.



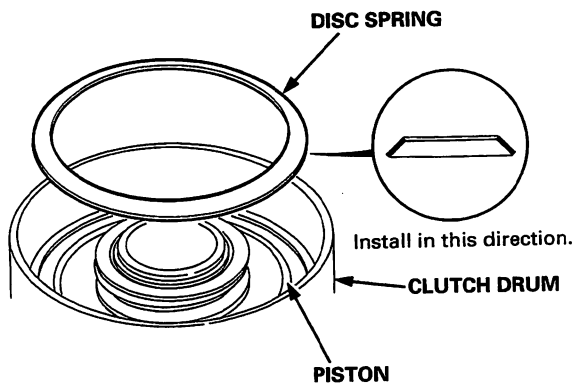


7. Install the snap ring.

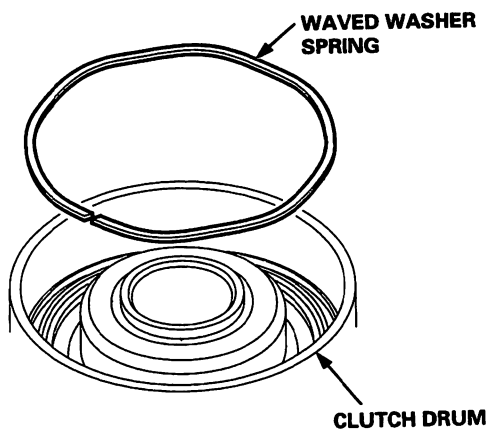


8. Remove the special tools.

9. Install the disc spring in the 3rd and 4th clutches in the direction shown.

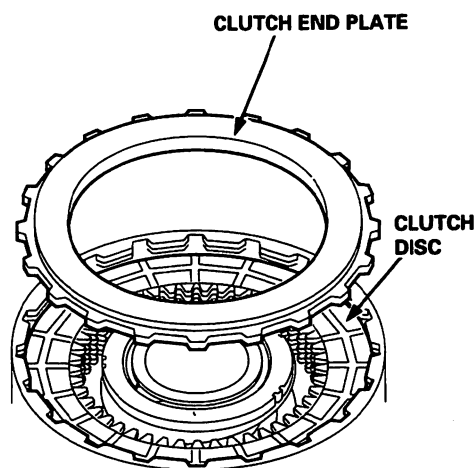


10. Install the waved washer spring in the 1st clutch.

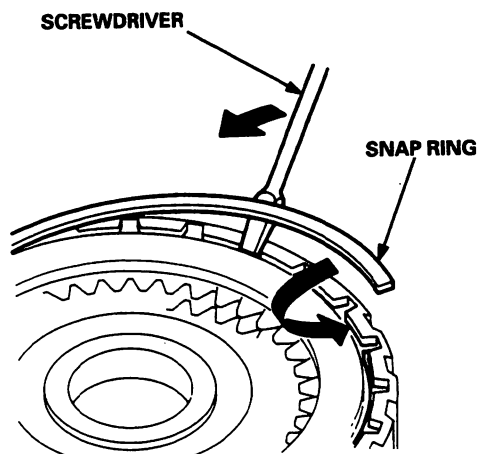


11. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes. Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt and other foreign matter.

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.



(cont'd)

Clutch

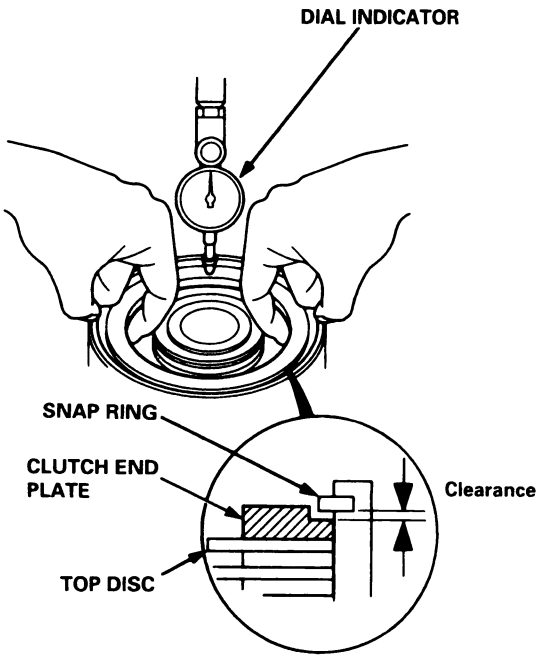
Reassembly (cont'd)

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.

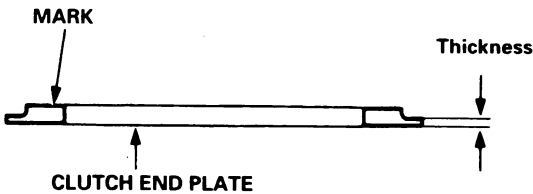
Clutch End Plate-to-Top Disc Clearance:

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.

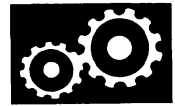


1ST and 2ND CLUTCH END PLATES

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)

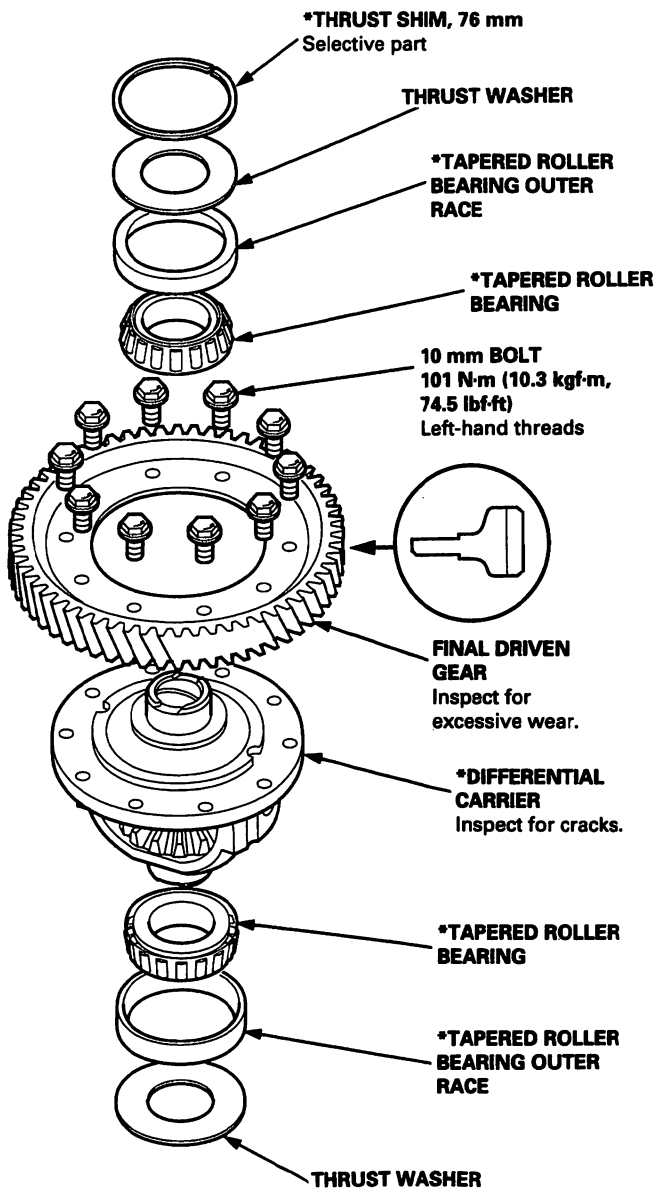
3RD and 4TH CLUTCH END PLATES

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)



Components

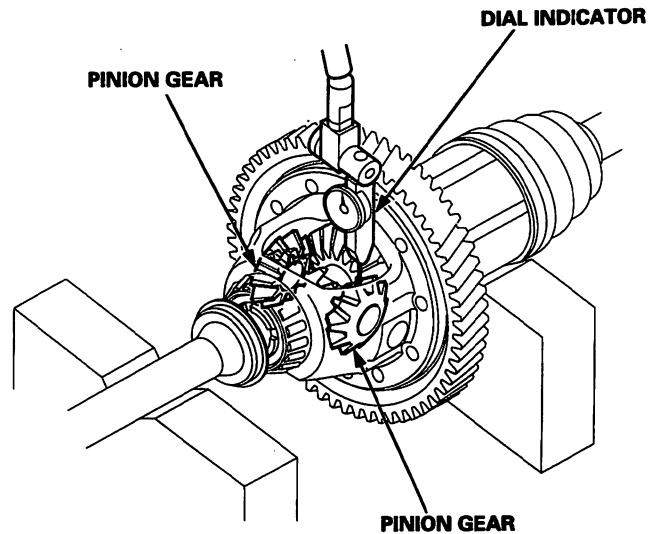
NOTE: If the transmission housing, torque converter housing, or any parts marked with an asterisk (*) were replaced, the tapered roller bearing preload must be adjusted (see page 14-183 thru 14-185).



Backlash Inspection

1. Place the differential assembly on V-blocks, and install both axles.
2. Check the backlash of both pinion gears with a dial indicator.

STANDARD: 0.05 – 0.15 mm (0.002 – 0.006 in)



3. If the backlash is out of standard, replace the differential carrier.

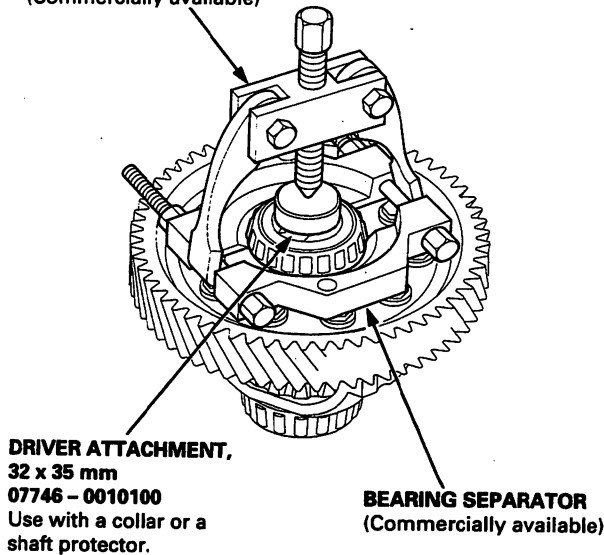
Differential

Bearing Replacement

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.

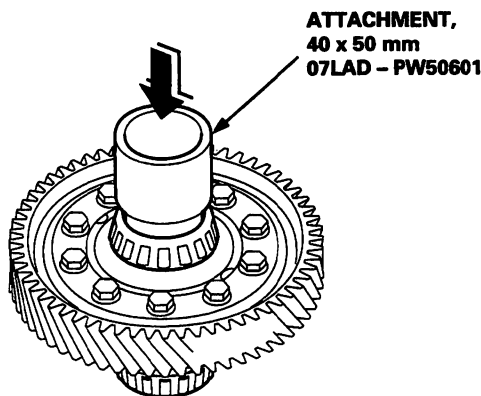
BEARING PULLER
(Commercially available)



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.



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.

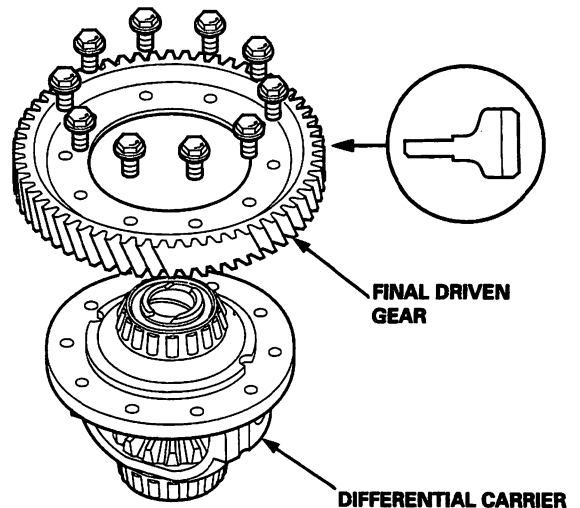
Differential Carrier Replacement

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 criss-cross pattern.

TORQUE: 101 N-m (10.3 kgf-m, 74.5 lbf-ft)





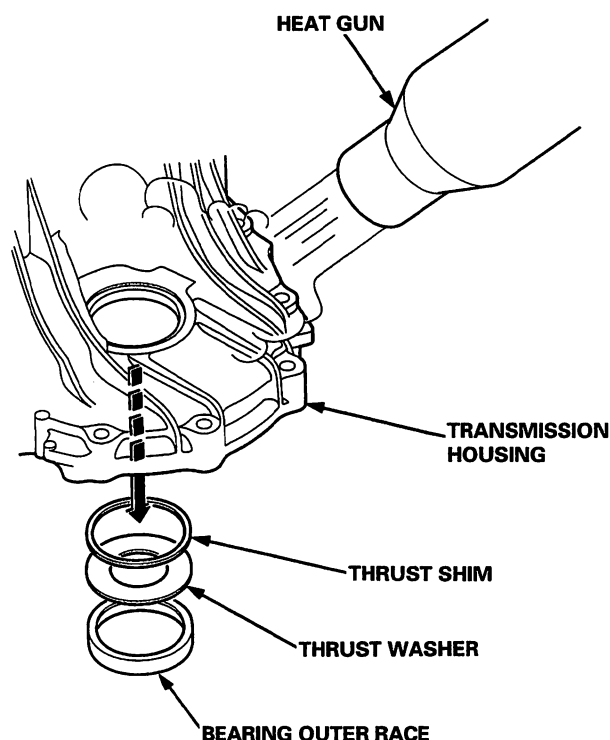
Tapered Roller Bearing Preload Adjustment

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 about 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

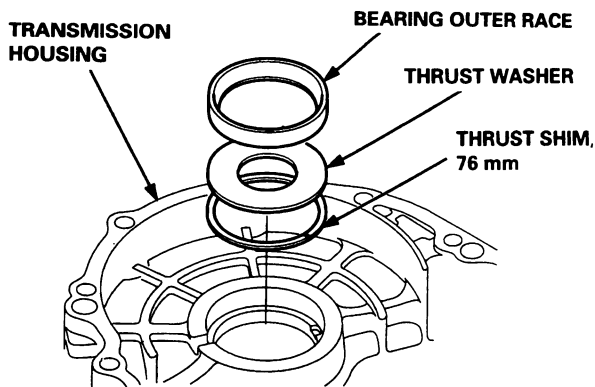
No.	Part Number	Thickness
S	41438 – PX4 – 700	2.05 mm (0.081 in)
T	41439 – PX4 – 700	2.10 mm (0.083 in)
U	41440 – PX4 – 700	2.15 mm (0.085 in)
A	41441 – PK4 – 000	2.20 mm (0.087 in)
B	41442 – PK4 – 000	2.25 mm (0.089 in)
C	41443 – PK4 – 000	2.30 mm (0.091 in)
D	41444 – PK4 – 000	2.35 mm (0.093 in)
E	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)

(cont'd)

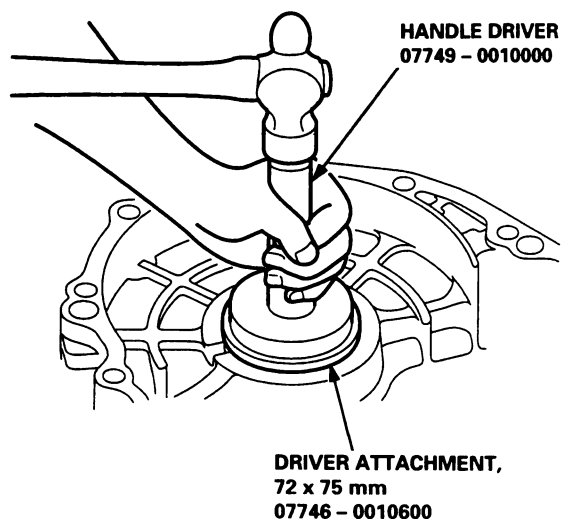
Differential

Tapered Roller Bearing Preload Adjustment (cont'd)

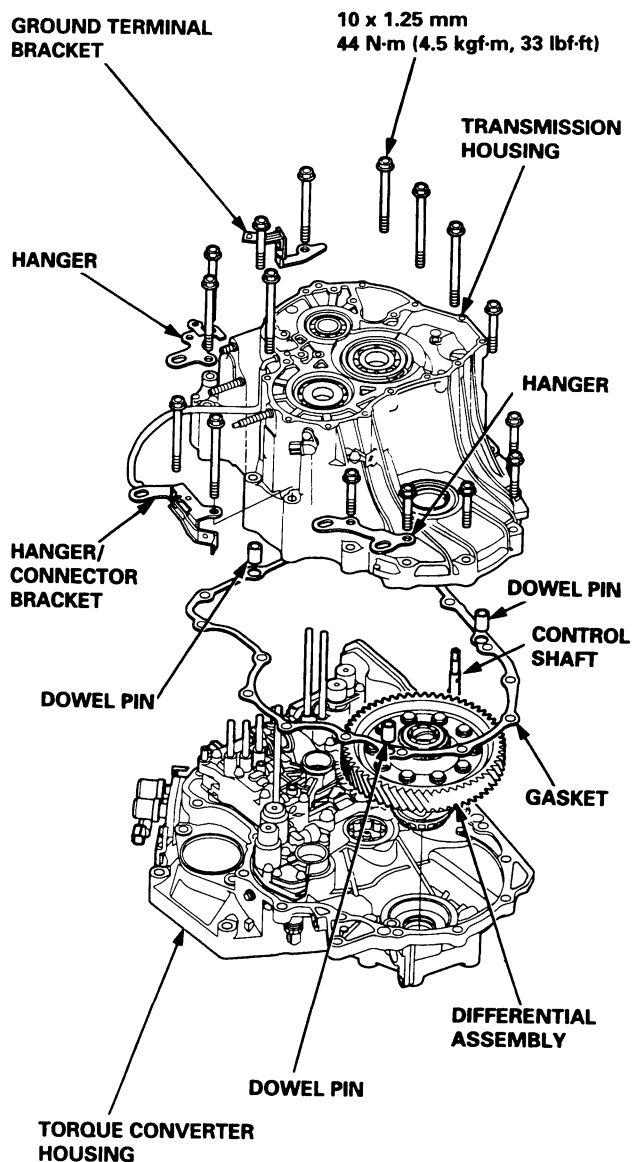
5. Install the thrust shim, thrust washer and bearing outer race in the transmission housing.



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.





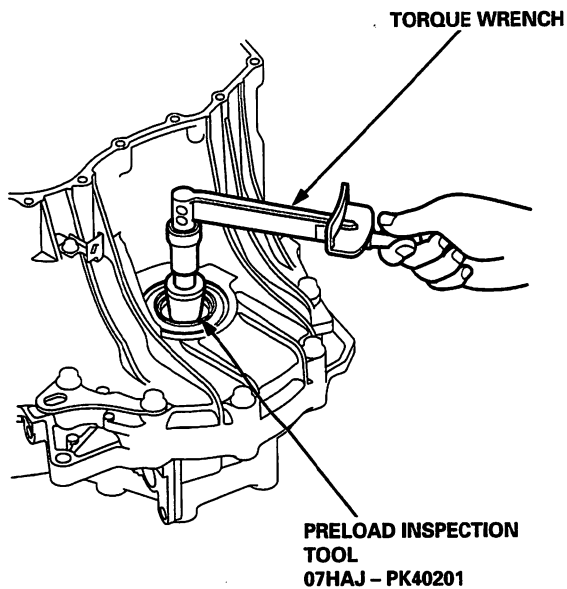
10. Rotate the differential assembly in both directions to seat the bearings.

11. Measure the starting torque of the differential assembly with the special tool and a torque wrench. Measure the starting torque at normal room temperature in both directions.

STANDARD:

New bearings: 2.7 – 3.9 N·m
(28 – 40 kgf·cm, 24 – 35 lbf·in)

Reused bearings: 2.5 – 3.6 N·m
(25 – 37 kgf·cm, 22 – 32 lbf·in)



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 N·m (3 – 4 kgf·cm, 3 – 3 lbf·in).

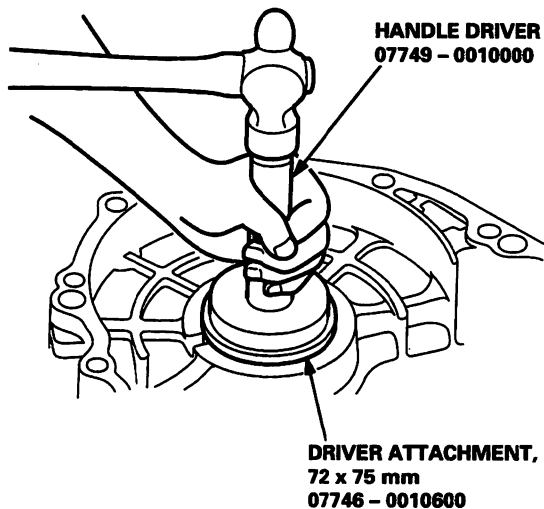
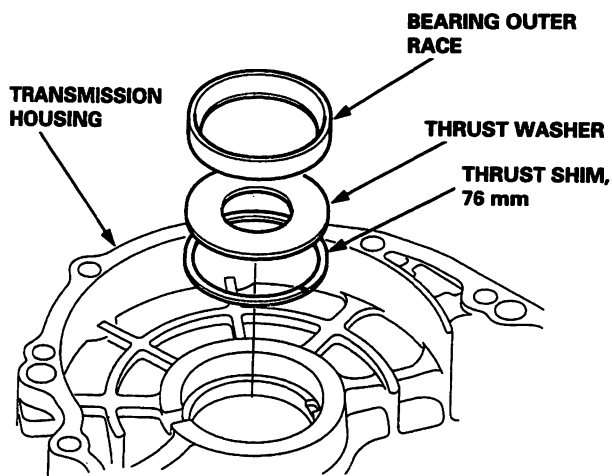
Differential

Tapered Roller Bearing Outer Race Replacement

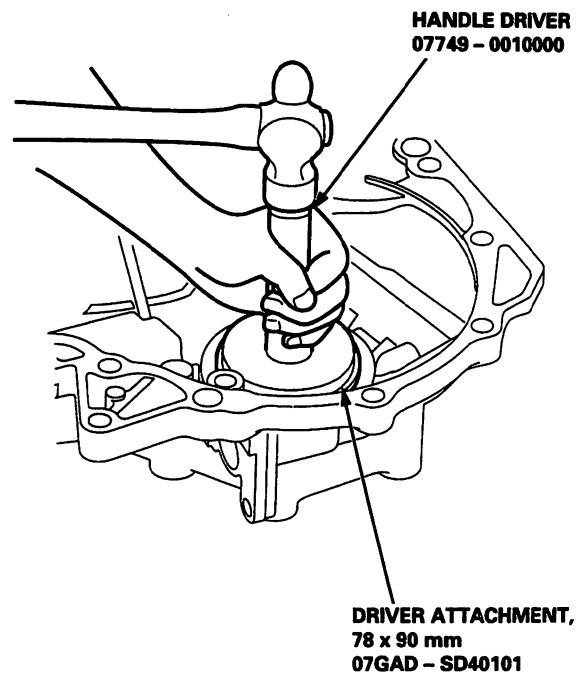
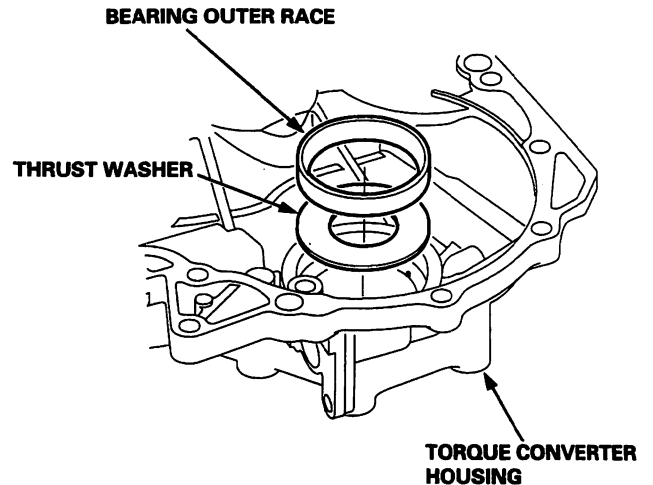
NOTE:

- 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.



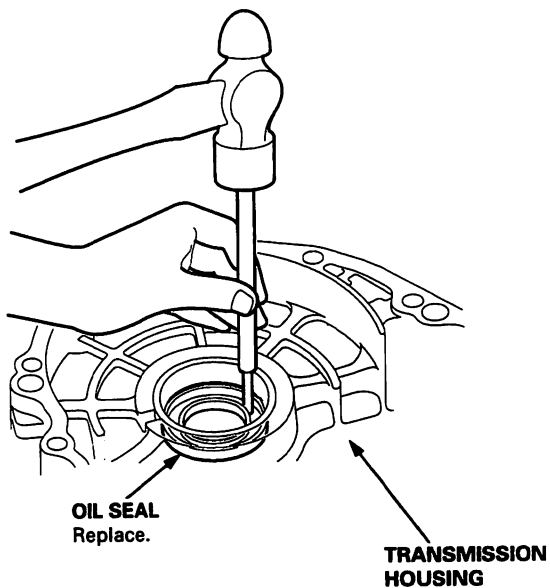
4. Install the thrust washer and outer race in the torque converter housing, and be sure to install the outer race until it bottoms in the housing with the special tools.



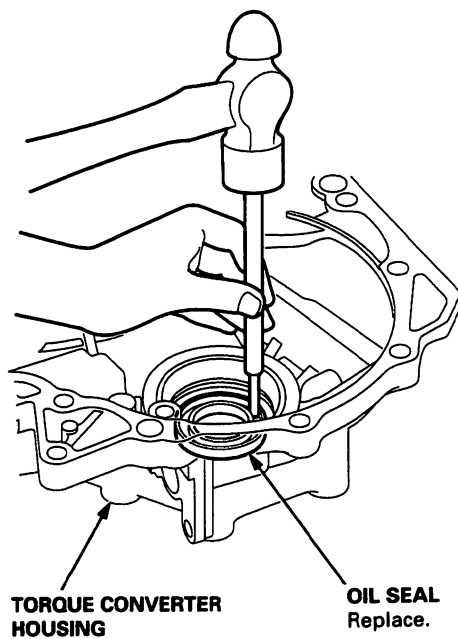


Oil Seals Replacement

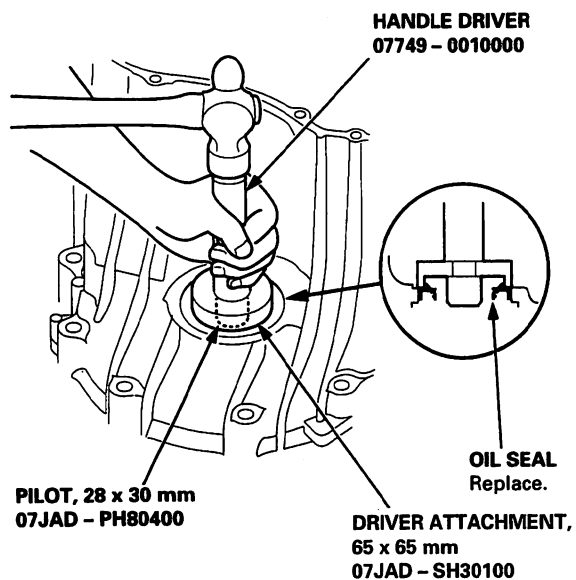
1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



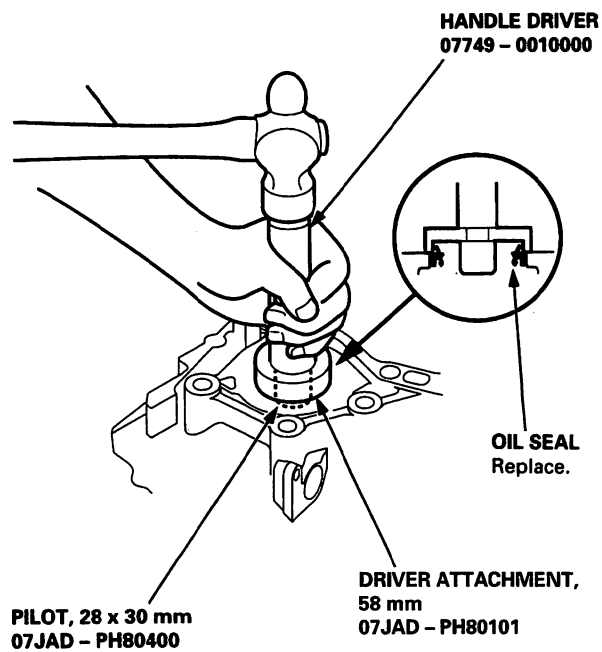
3. Remove the oil seal from the torque converter housing.



4. Install the oil seal in the transmission housing with the special tools.



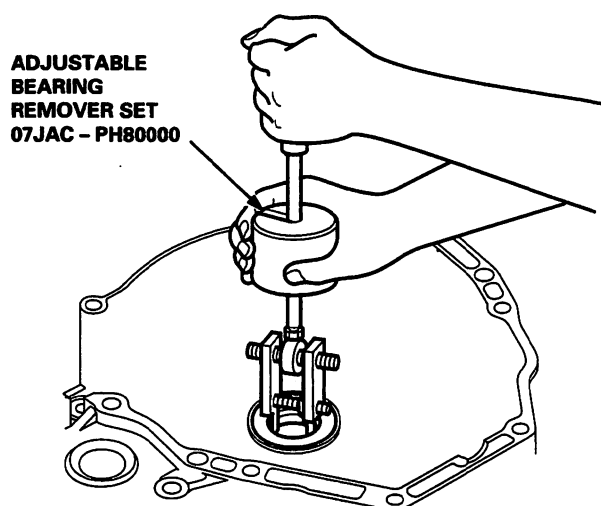
5. Install the oil seal in the torque converter housing with the special tools.



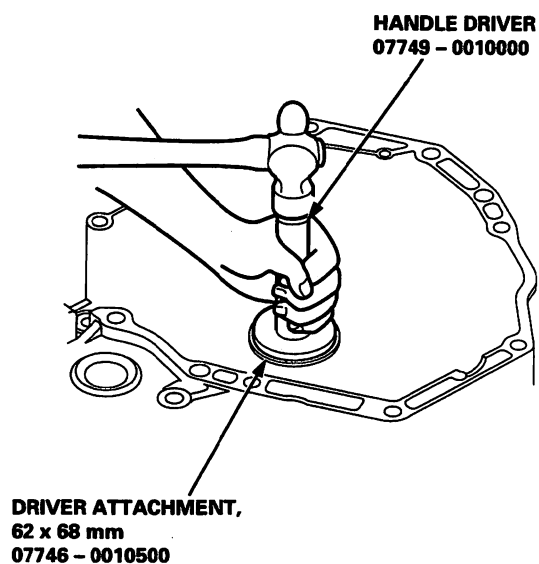
Torque Converter Housing Bearings

Mainshaft Bearing/Oil Seal Replacement

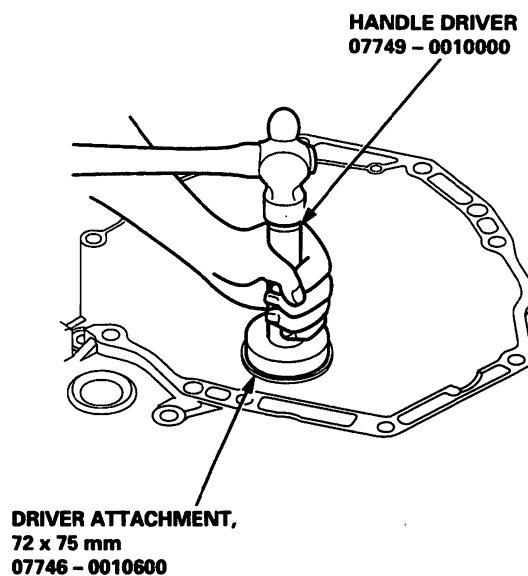
1. Remove the mainshaft bearing and oil seal using the special tool as shown.



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.





Countershaft Bearing Replacement

1. Remove the countershaft bearing using the special tool as shown.

**ADJUSTABLE BEARING
REMOVER SET
07JAC - PH80000**

**COUNTERSHAFT
BEARING**

2. Install the ATF guide plate.
3. Install the new bearing into the housing using the special tools as shown.

**HANDLE DRIVER
07749 - 0010000**

**DRIVER ATTACHMENT,
62 x 68 mm
07746 - 0010500**

BEARING

**0 - 0.03 mm
(0 - 0.001 in)**

**TORQUE CONVERTER
HOUSING**

ATF GUIDE PLATE

Secondary Shaft Bearing Replacement

1. Remove the secondary shaft bearing using the special tool as shown.

**ADJUSTABLE BEARING
REMOVER SET
07JAC - PH80000**

**SECONDARY
SHAFT BEARING**

2. Install the ATF guide plate.
3. Install the new bearing into the housing using the special tools as shown.

**HANDLE DRIVER
07749 - 0010000**

**DRIVER ATTACHMENT,
42 x 47 mm
07746 - 0010300**

BEARING

**0 - 0.03 mm
(0 - 0.001 in)**

**TORQUE CONVERTER
HOUSING**

ATF GUIDE PLATE

Transmission Housing Bearings

Removal/Installation

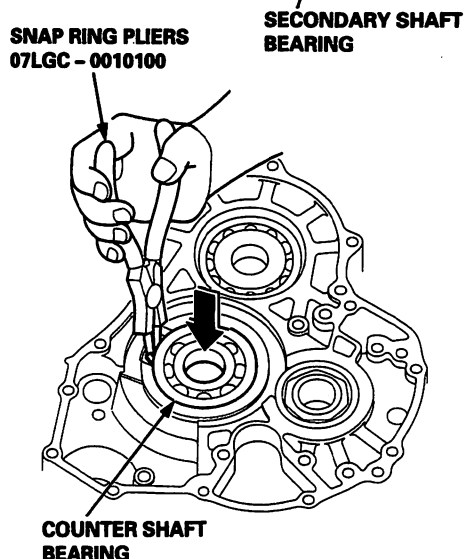
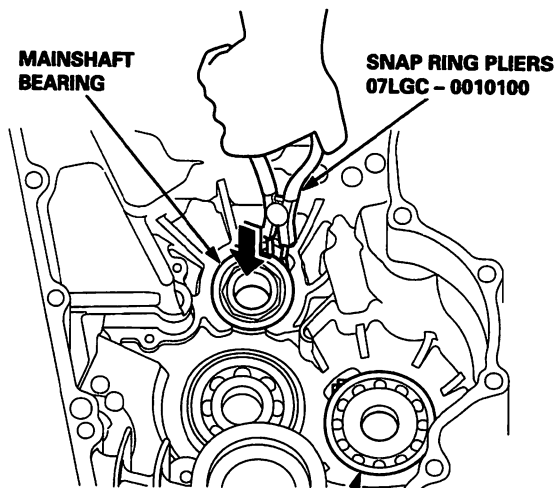
NOTE: Coat all parts with ATF before assembly.

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.

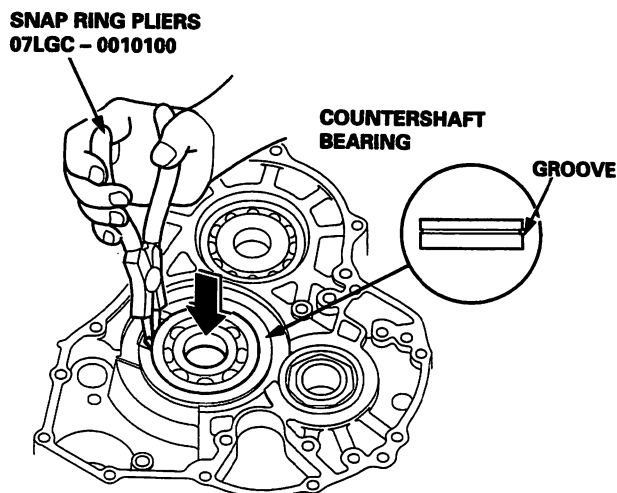
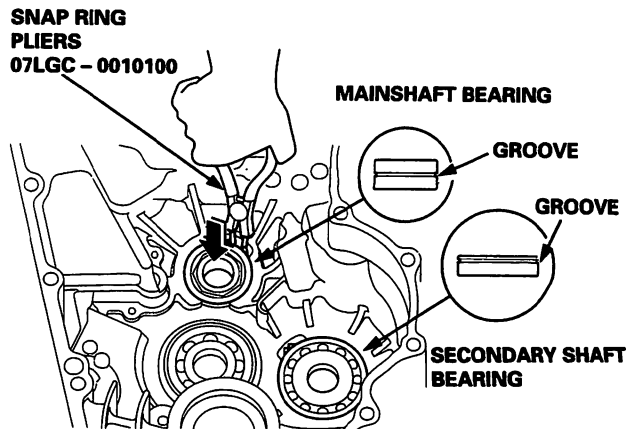
NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.

Special Tools for Transmission Housing Bearings Removal/Installation Use with Handle Driver (07749 - 0010000):

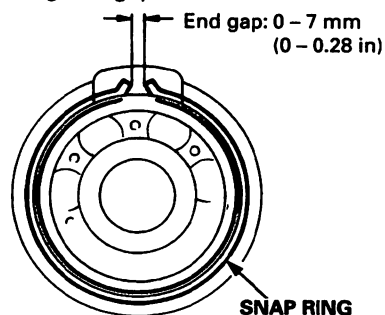
- **Mainshaft:**
Driver Attachment, 58 mm (07JAD-PH80101)
- **Countershaft and Secondary Shaft:**
Driver Attachment, 72 x 75 mm (07746 - 0010600)



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.



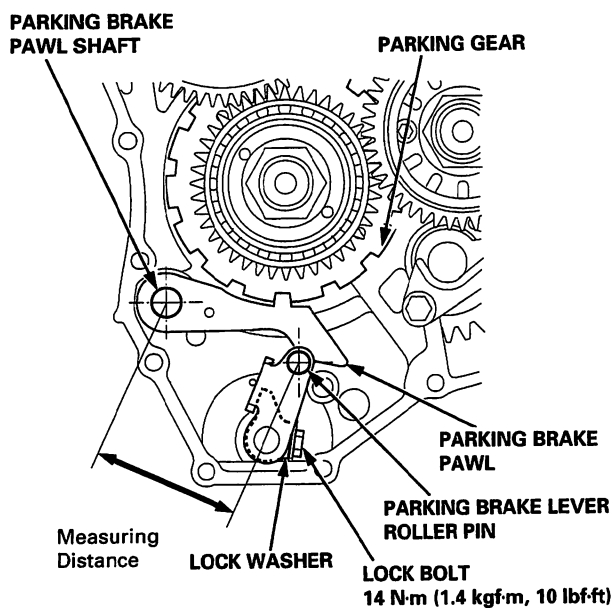


Parking Brake Stop

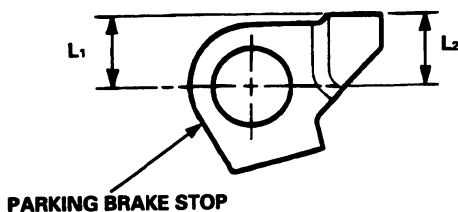
Inspection/Adjustment

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.

Transmission

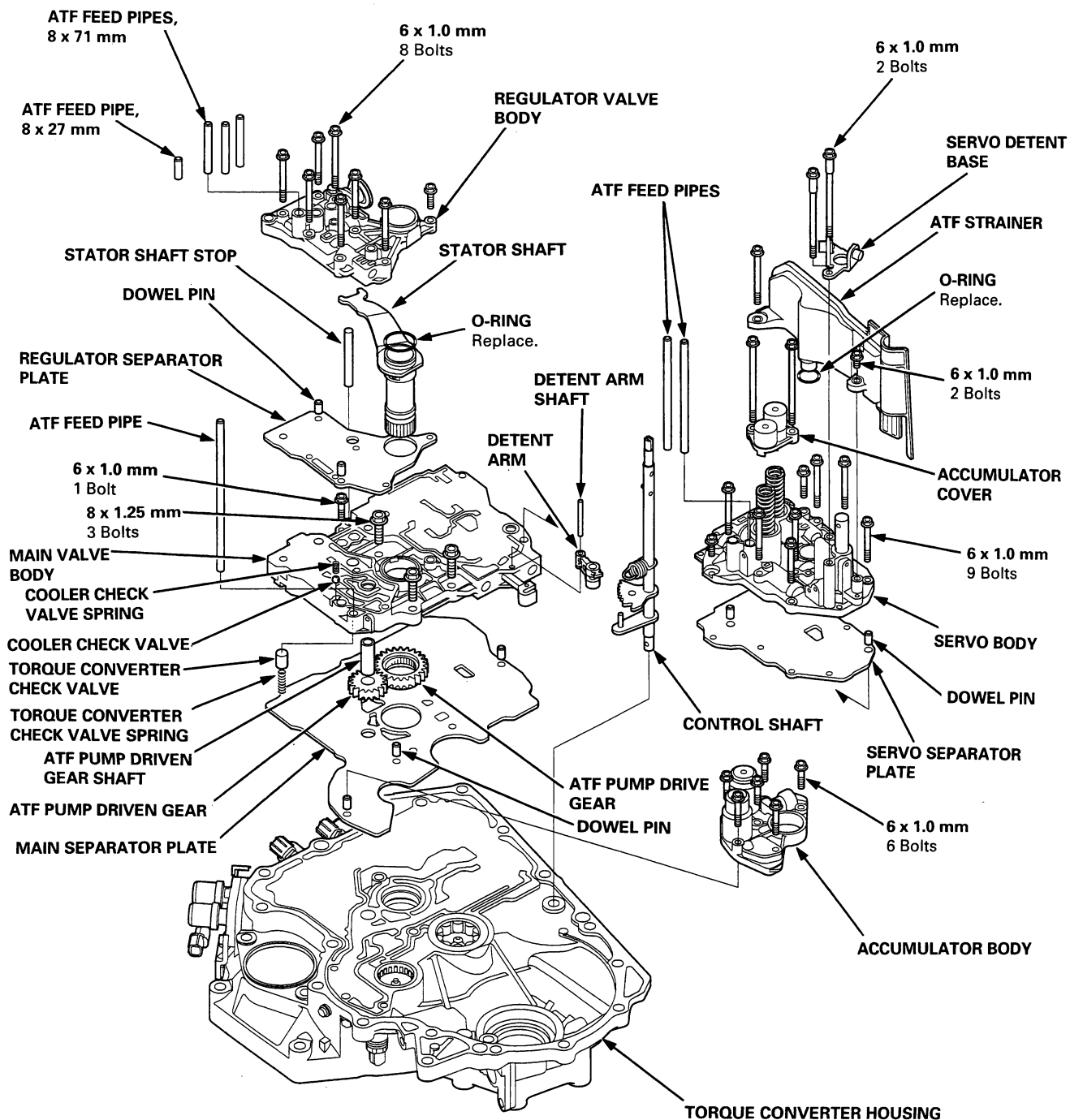
Reassembly

NOTE:

- Coat all parts with ATF.
- Replace the following parts:
 - O-rings
 - Lock washers
 - Gaskets
 - Locknuts and conical spring washers
 - Sealing washers

• Torque:

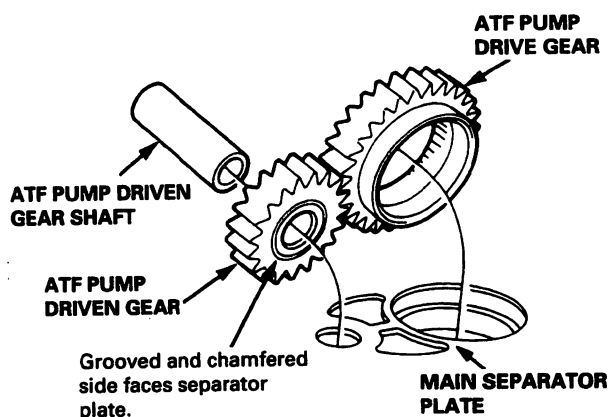
- 6 x 1.0 mm: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
- 8 x 1.25 mm: 18 N·m (1.8 kgf·m, 13 lbf·ft)



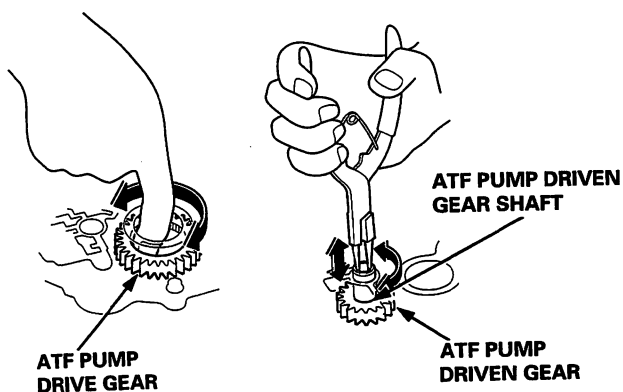


1. Install the main separator plate and three dowel pins on the torque converter housing. Then install the ATF pump gears and ATF pump driven gear shaft.

NOTE: Install the ATF pump driven gear with its grooved and chamfered side faces separator plate.

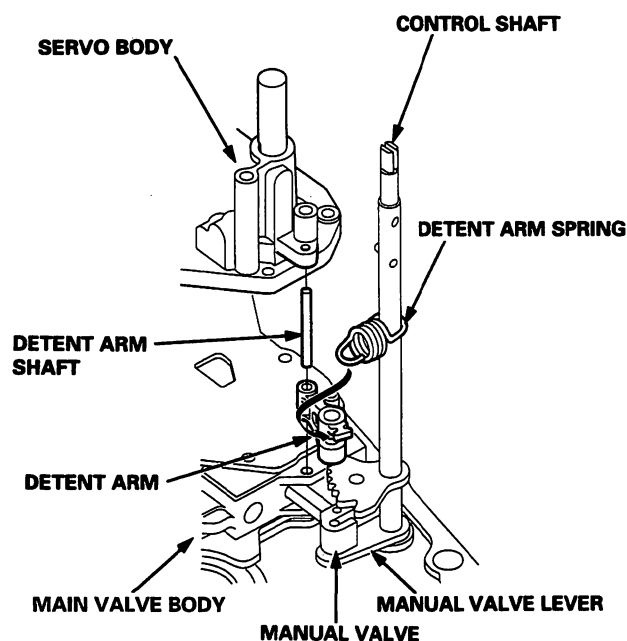


2. Install the torque converter check valve and spring, then install the main valve body (one 6 mm bolt and three 8 mm bolts). Make sure the ATF pump drive gear rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft moves smoothly in the axial and normal operating direction.



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.

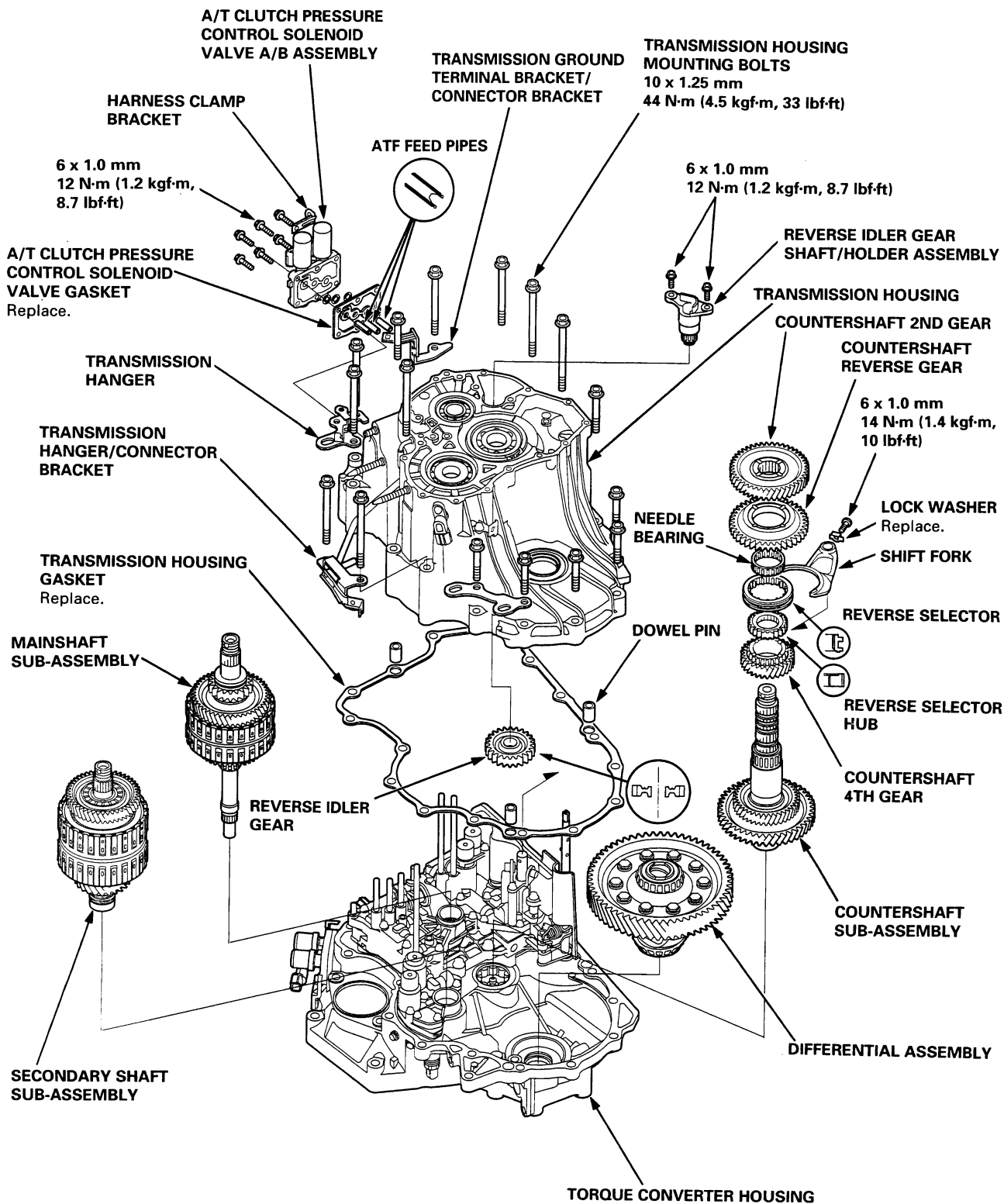


10. Install the servo body (nine bolts).
11. Install the accumulator cover (two bolts).
12. Install the ATF strainer (two bolts).
13. Install the servo detent base (two bolts).
14. Install the accumulator body (six bolts).
15. Install the two ATF feed pipes in the servo body, four pipes in the regulator valve body, and one pipe in the main valve body.

(cont'd)

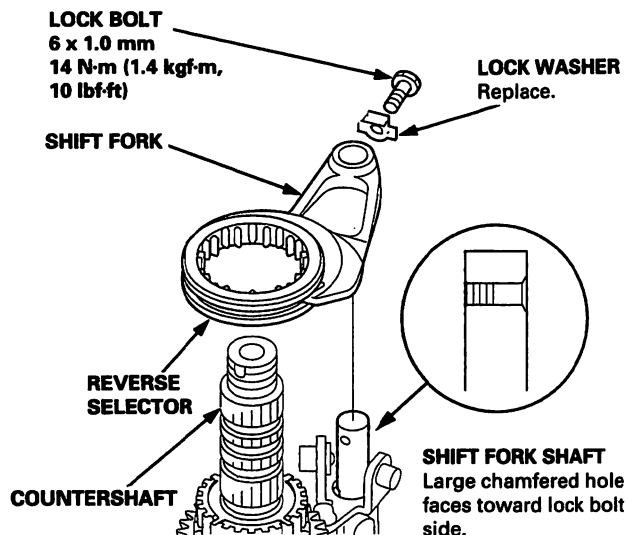
Transmission

Reassembly (cont'd)

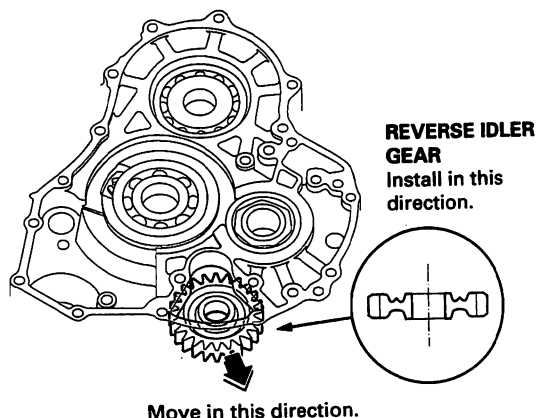




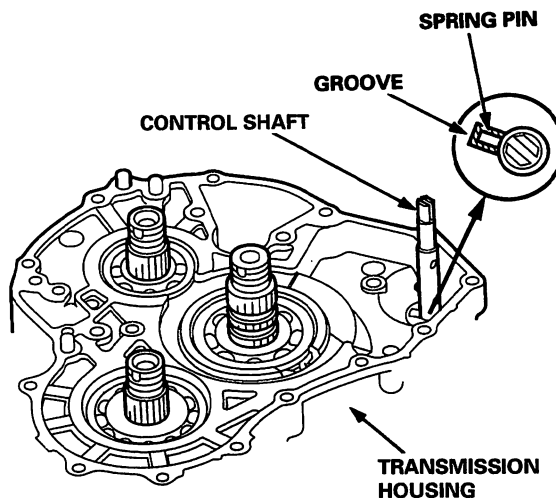
16. Install the countershaft 4th gear and reverse selector hub on the countershaft. If the reverse selector hub is a press-fitted type, refer to page 14-167 and 14-168 for the installation.
17. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly and secondary shaft sub-assembly 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.

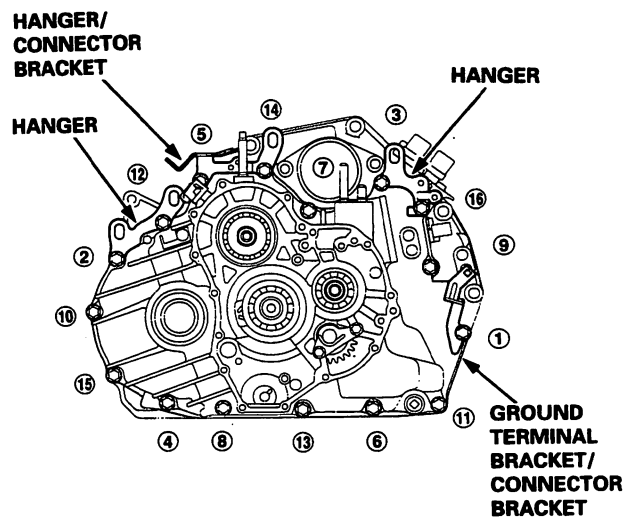


21. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.



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)

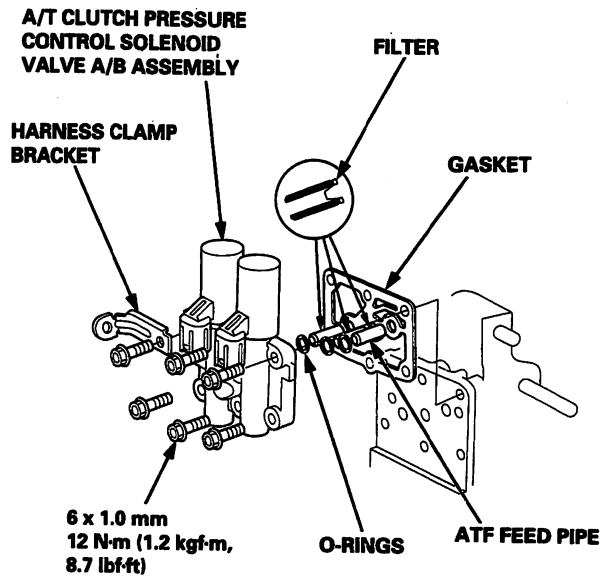


(cont'd)

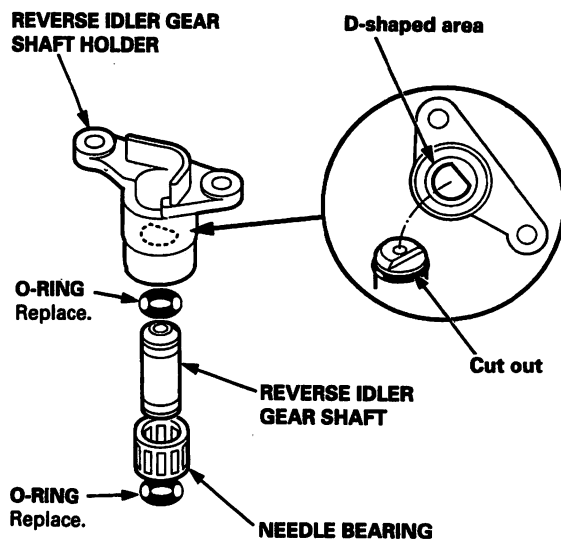
Transmission

Reassembly (cont'd)

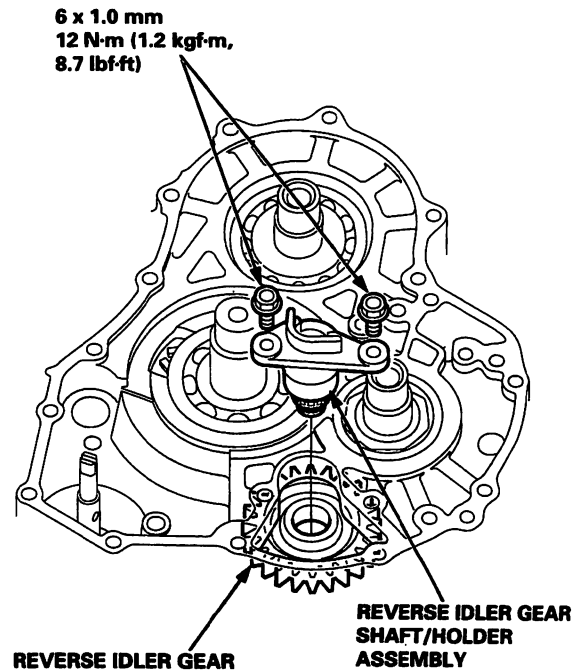
25. Install the ATF feed pipes with their filter side into the transmission housing, then install new O-rings, new gasket, harness clamp bracket and the A/T clutch pressure control solenoid valve A/B assembly over the ATF feed pipes on the transmission housing.



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.

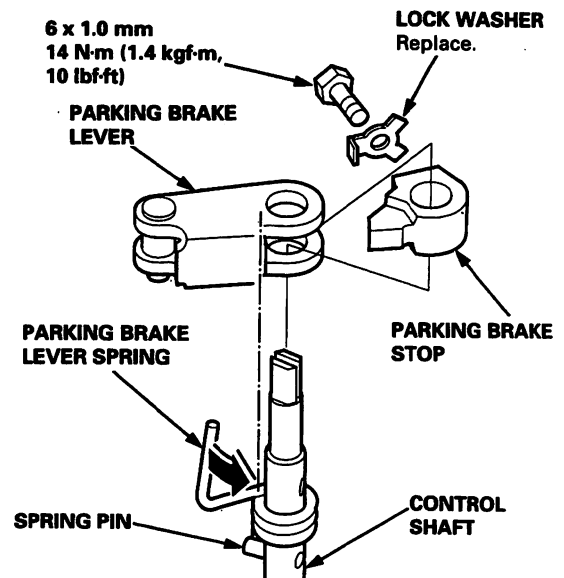


27. Engage the reverse idler gear with the countershaft reverse gear and mainshaft reverse gear, then install the reverse idler gear shaft/holder assembly on the transmission housing.



28. Install the parking brake lever on the control shaft, then install the lock bolt with a new lock washer.

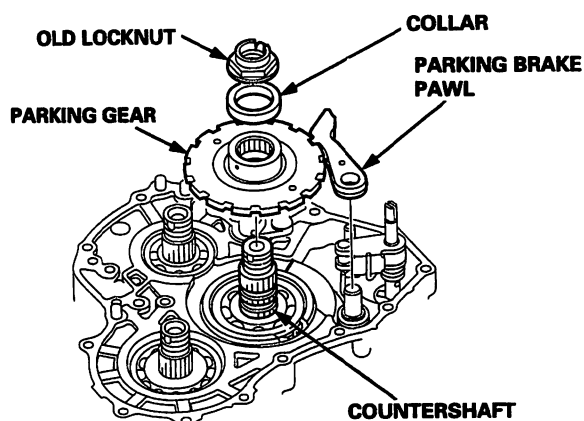
NOTE: Do not bend the lock tab of the lock washer in this step, bend it after checking parking brake pawl engagement in step 51.





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.

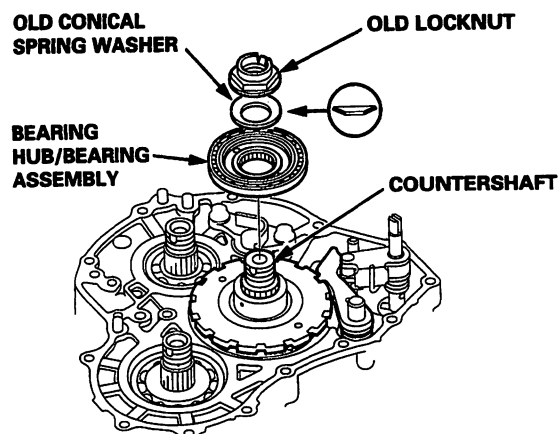
30. Install the parking gear using the old locknut and a collar. Hold the parking brake pawl to engage with the parking gear, then tighten the old locknut until the shaft splines come out slight amount of the splines over the parking gear.



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.

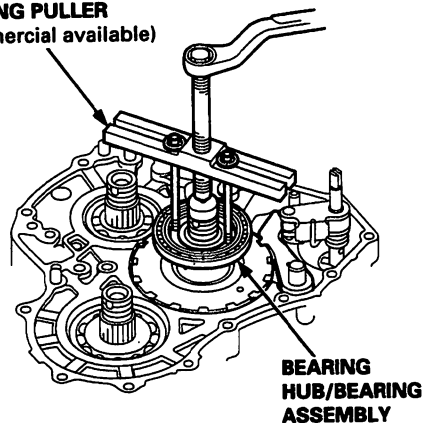
TORQUE: 226 N-m (23.0 kgf-m, 166 lbf-ft)

NOTE: Do not use an impact wrench, always use a torque wrench to tighten the locknut.



32. Remove the bearing hub/bearing assembly using a puller as shown.

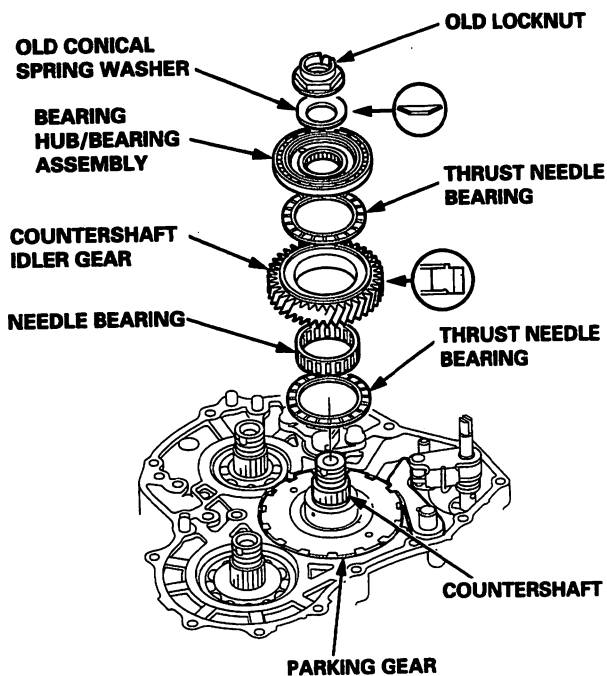
BEARING PULLER
(Commercial available)



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 N-m (17.0 kgf-m, 123 lbf-ft)

NOTE: Do not use an impact wrench, always use a torque wrench to tighten the locknut.

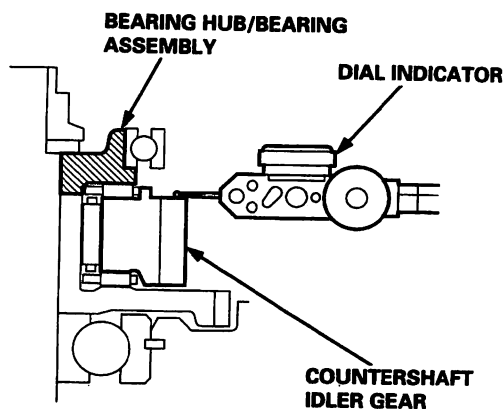


(cont'd)

Transmission

Reassembly (cont'd)

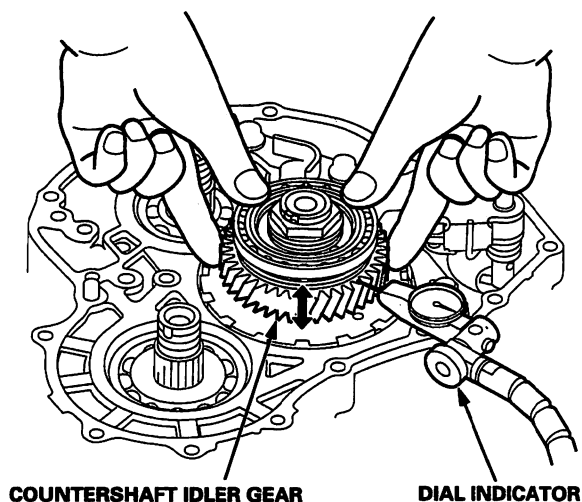
34. Set the dial indicator to the countershaft idler gear as shown.



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)

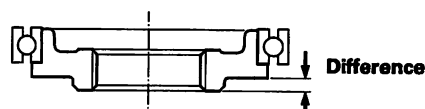
NOTE: Take measurements in at least three places, and use the average as the actual clearance.



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



BEARING HUB

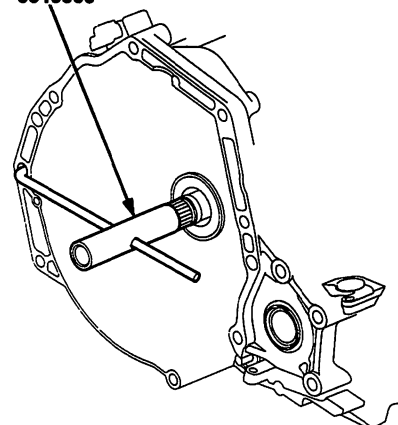
Mark	Part Number	Difference
A	90520 – P6H – 000	3.503 mm (0.1379 in)
B	90521 – P6H – 000	3.490 mm (0.1374 in)
C	90522 – P6H – 000	3.477 mm (0.1369 in)
D	90523 – P6H – 000	3.464 mm (0.1364 in)

38. After replacing the bearing hub/bearing assembly, make sure that the clearance is within the standard.

39. Remove the old locknut and old conical spring washer from the countershaft.

40. Install the special tool onto the mainshaft as shown.

MAINSHAFT HOLDER SET 07PAB – 0010000





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 N-m (23.0 kgf-m, 166 lbf-ft)

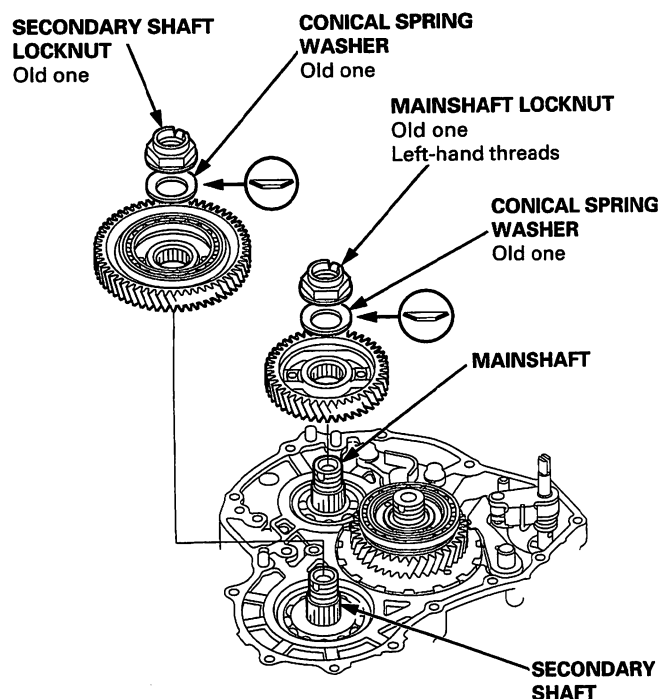
NOTE:

- 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 N-m (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.

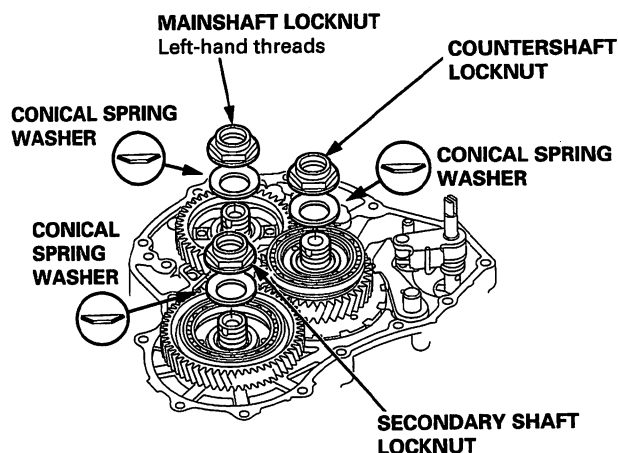
NOTE: Install the conical spring washer in the direction shown.

46. Tighten the locknuts to the specified torque using a torque wrench.

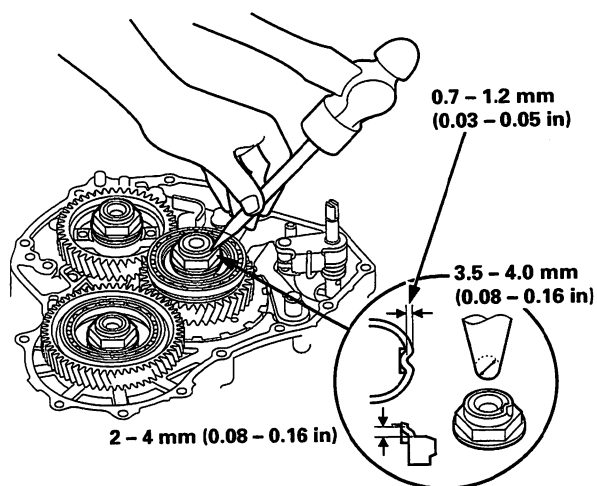
TORQUE: 167 N-m (17.0 kgf-m, 123 lbf-ft)

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.

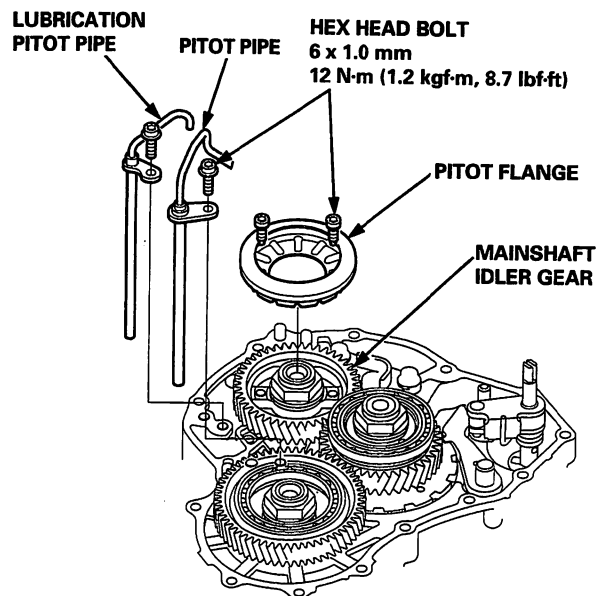


(cont'd)

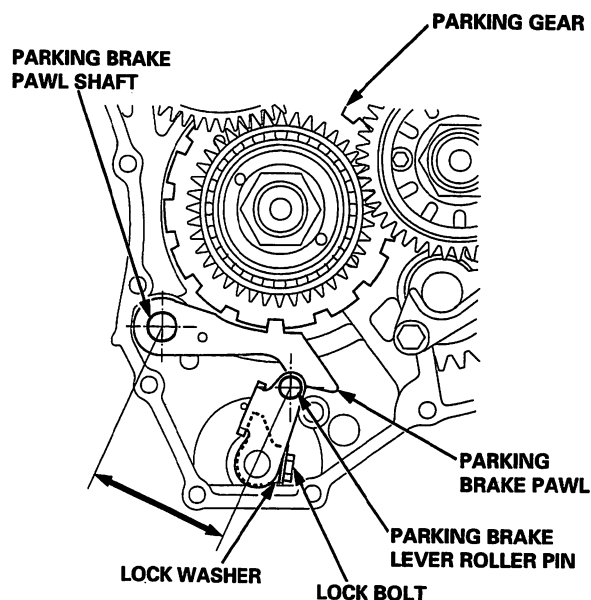
Transmission

Reassembly (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.

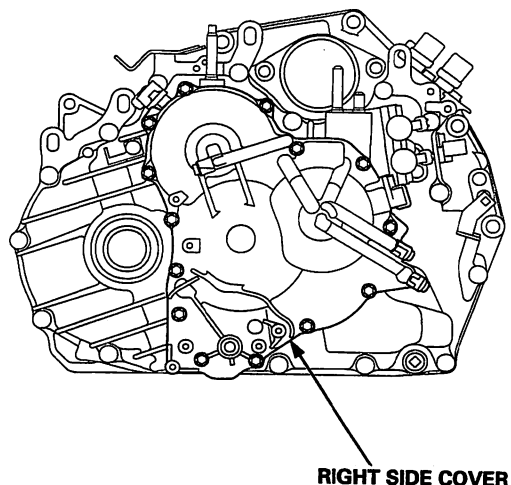


49. Set the parking brake lever in the **P** position, then verify that the parking brake pawl engages the parking gear.
50. If the parking brake pawl does not engage fully, check the distance between the parking brake pawl shaft and the parking brake lever roller pin as described on page 14-191.
51. Tighten the lock bolt, and bend the lock tab against the lock bolt head.

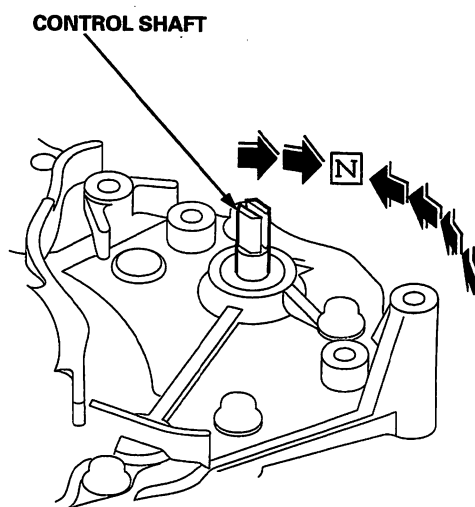


52. Install the right side cover with two dowel pins and new O-rings (14 bolts).

TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



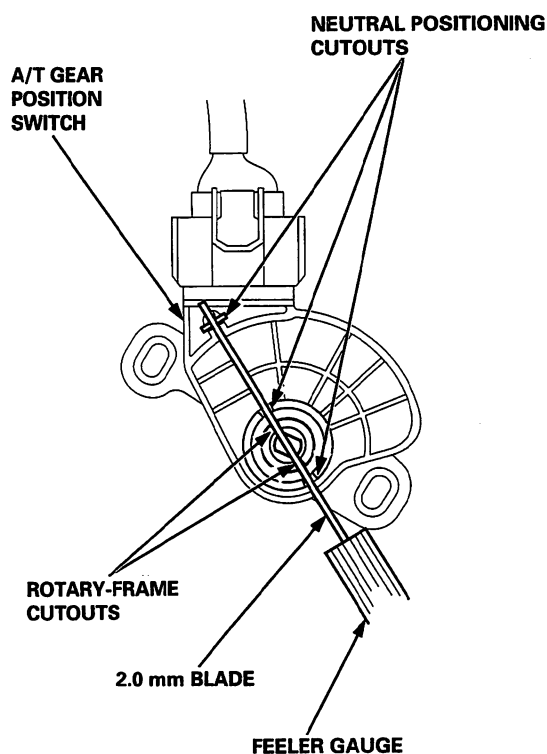
53. Set the control shaft in the **N** position by turning the control shaft.



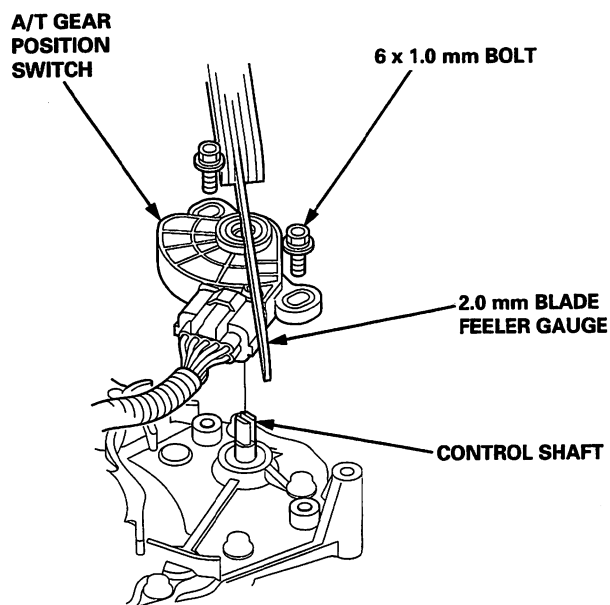


54. Connect the A/T gear position switch harness to the switch connector.
55. Align the cutouts on the rotary-frame with the neutral positioning cutouts on the A/T gear position switch, then put the 2.0 mm blade of the feeler gauge in the cutouts to hold the **N** position.

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.

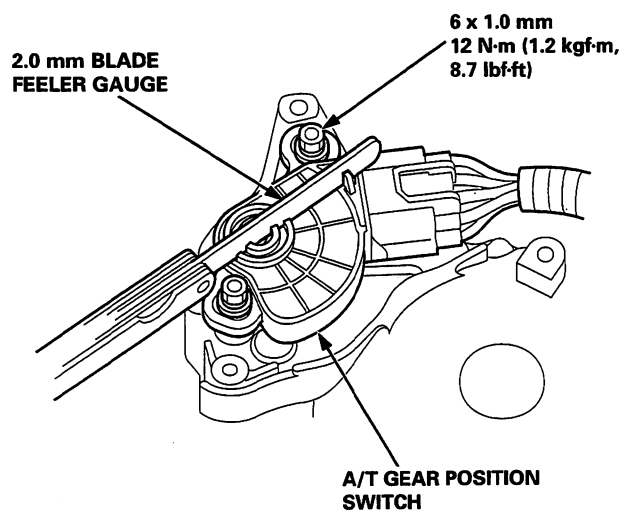


56. Install the A/T gear position switch gently on the control shaft with holding the **N** position with the 2.0 mm blade.



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.

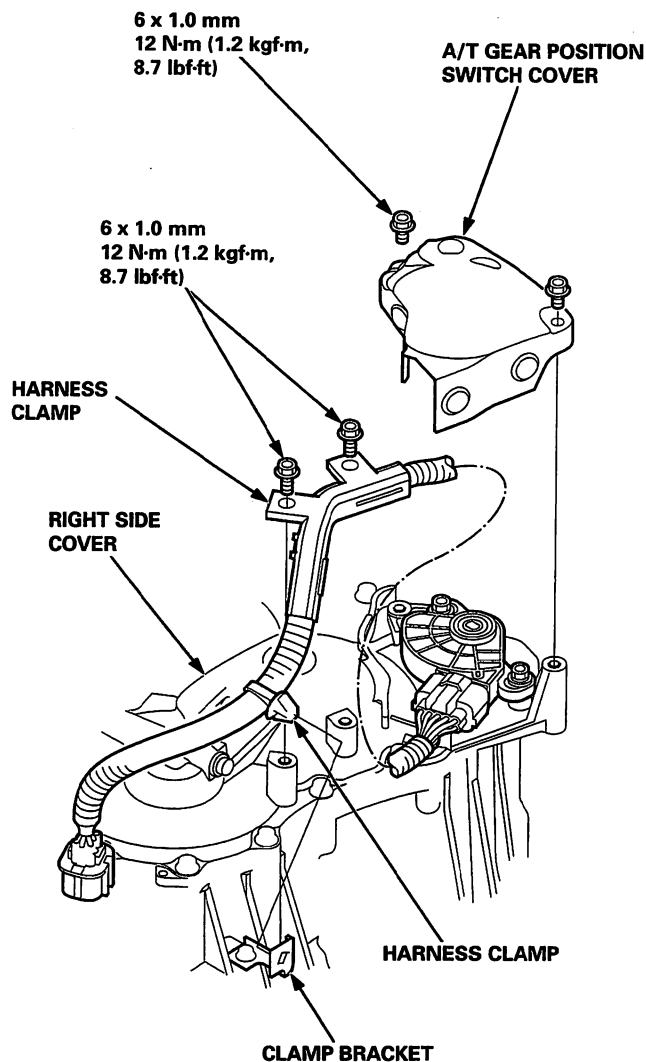


(cont'd)

Transmission

Reassembly (cont'd)

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.



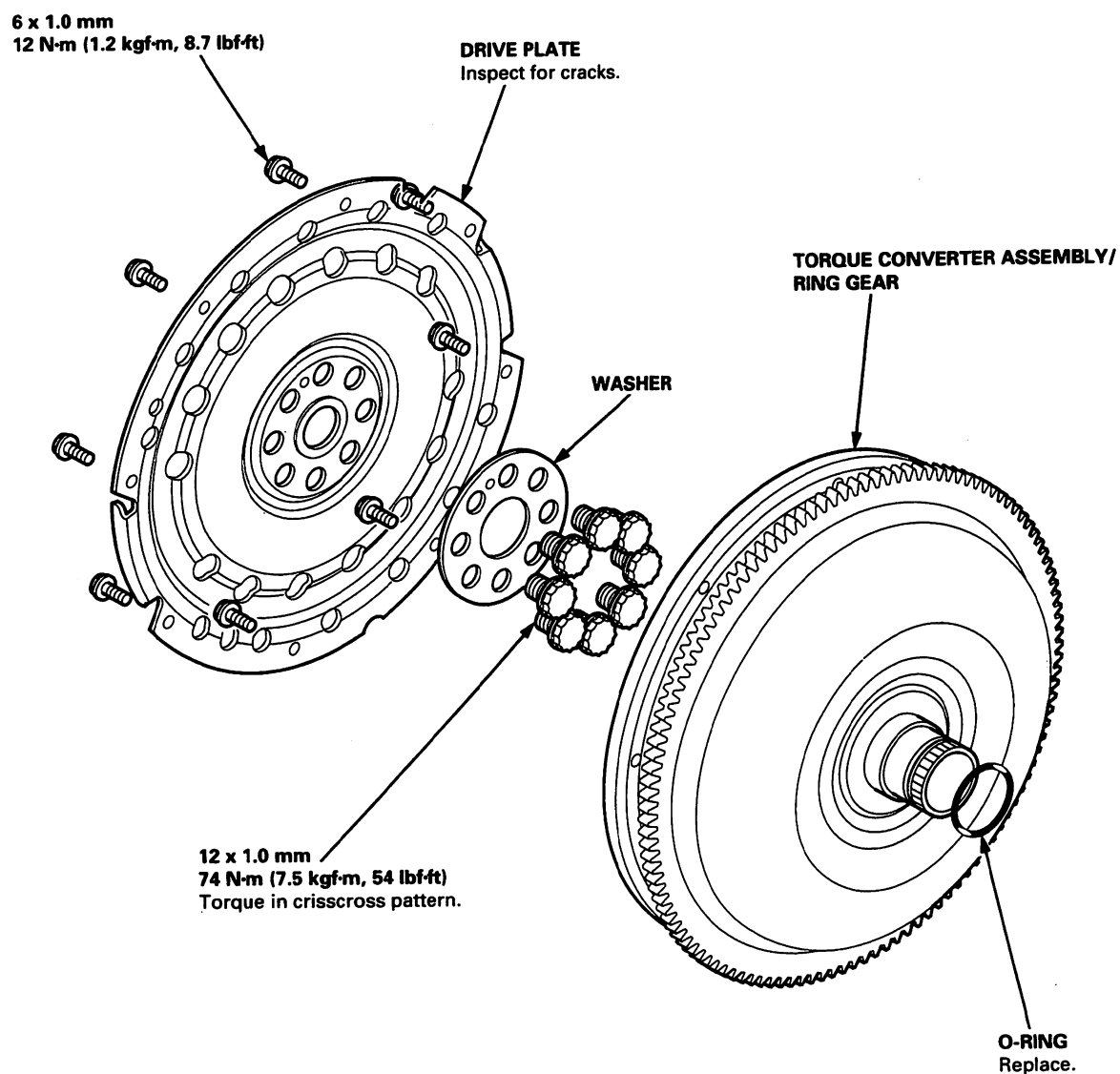
59. Install the ATF cooler lines with new sealing washers.

TORQUE: 28 N-m (2.9 kgf-m, 21 lbf-ft)

60. Install the breather tube.

61. Install the ATF dipstick.

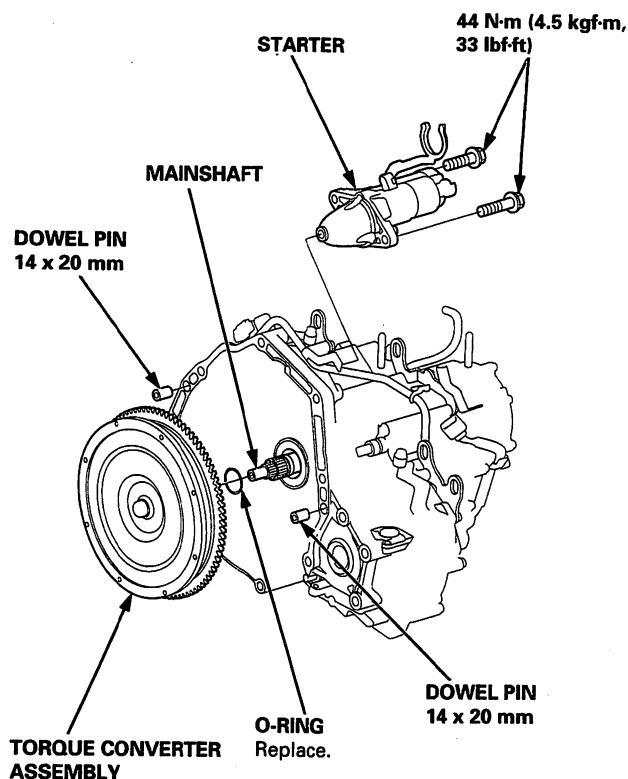
Torque Converter/Drive Plate



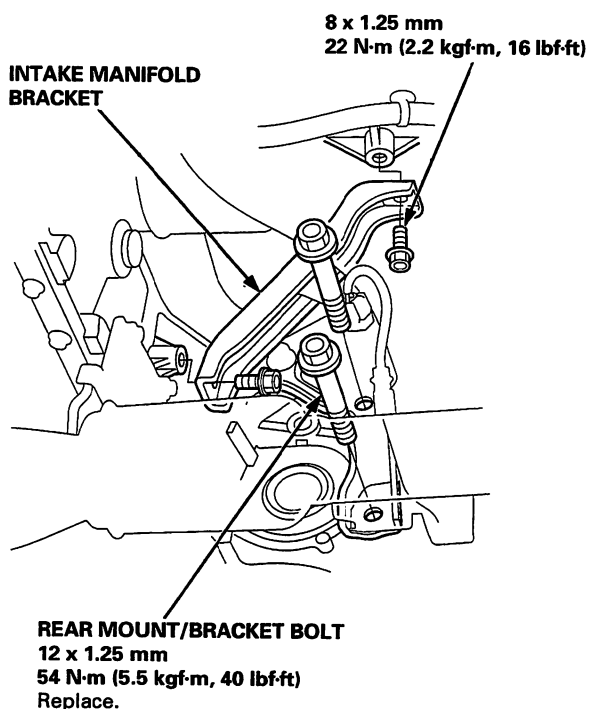
Transmission

Installation

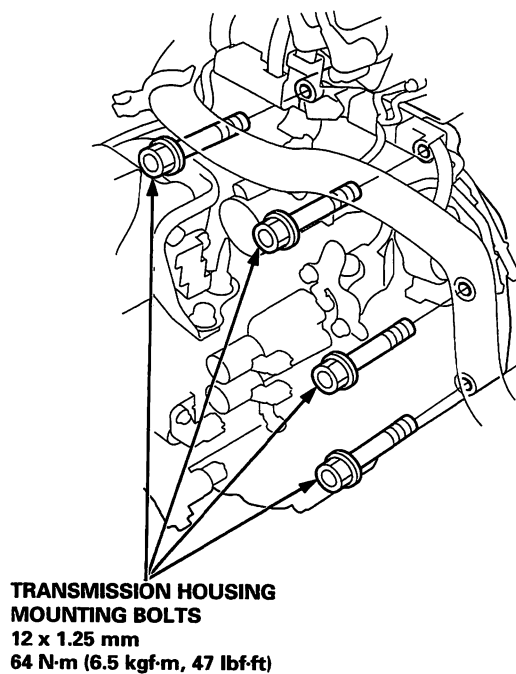
1. Install the torque converter assembly on the mainshaft with a new O-ring.
2. Install the 14 mm dowel pins in the torque converter housing.
3. Install the starter on the torque converter housing.



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.

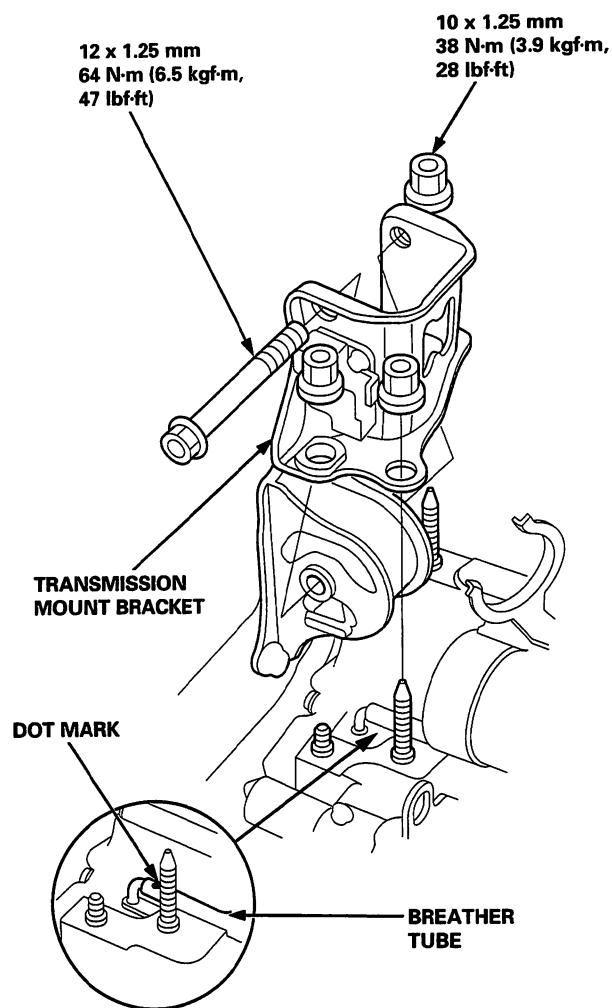


6. Install the transmission housing mounting bolts.





7. Face the dot mark on the breather tube up.



8. Install the transmission mount bracket. 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).

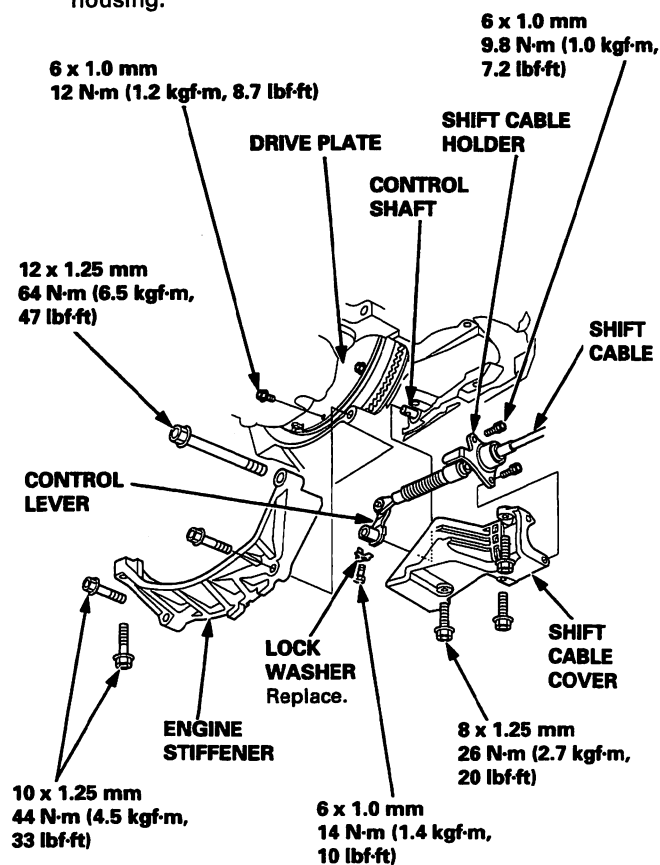
12. Install the control lever with the shift cable on the control shaft. Do not bend the shift cable excessively.

13. Install the lock bolt with a new lock washer, then bend the lock washer tab 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.



(cont'd)

Transmission

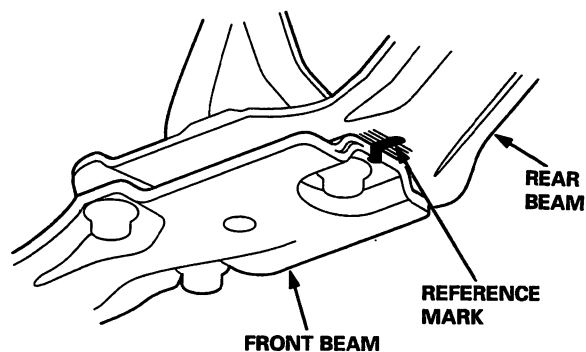
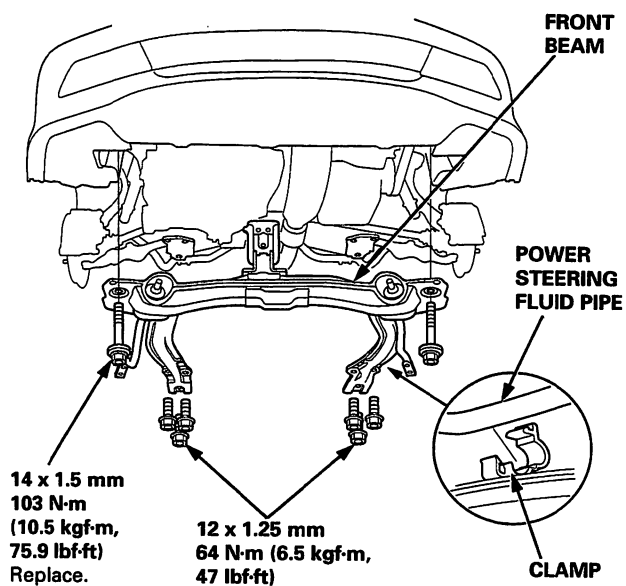
Installation (cont'd)

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.

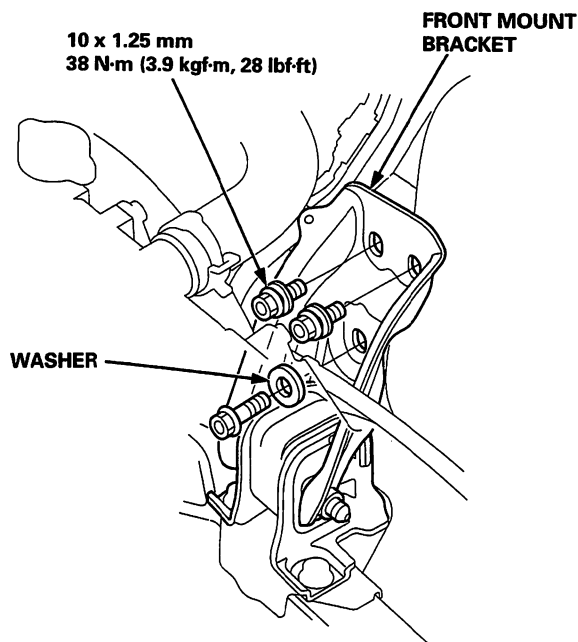
NOTE:

- 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.

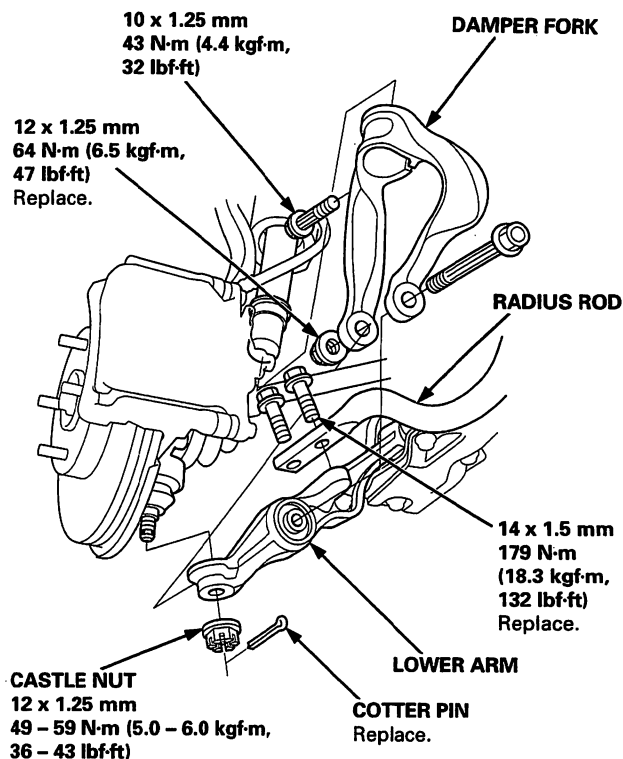
18. Install the front beam by aligning both reference marks on both rear beam, then tighten the bolts. Install the power steering fluid pipe on its clamp.



19. Install the front mount bracket bolts.



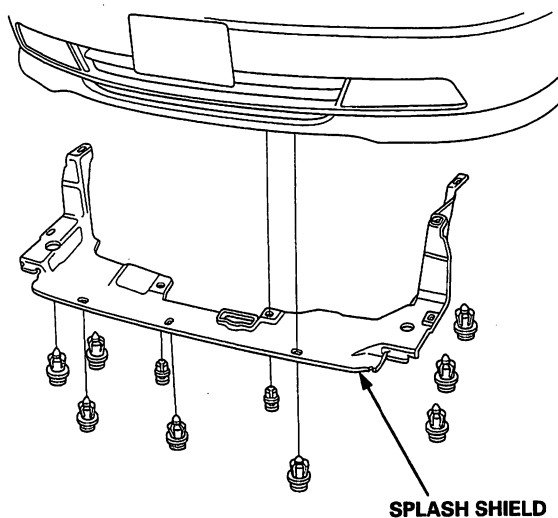
20. Install the ball joints on each lower arms with the castle nuts and new cotter pins.



21. Install the radius rods and damper forks on each lower arm.

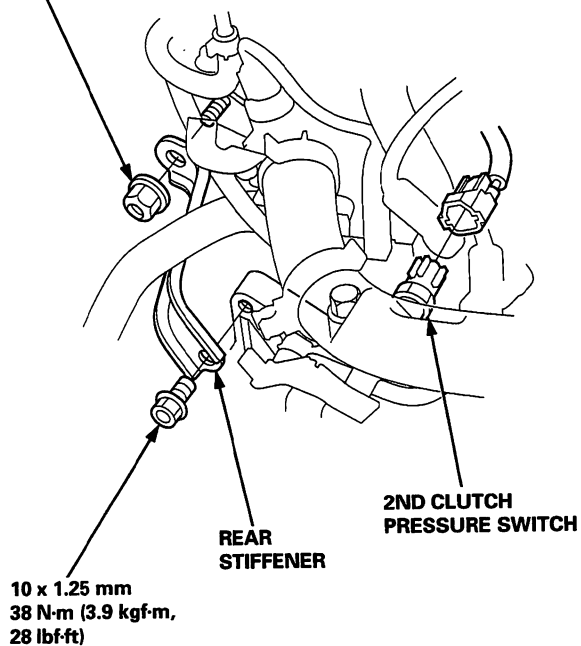


22. Install the splash shield.

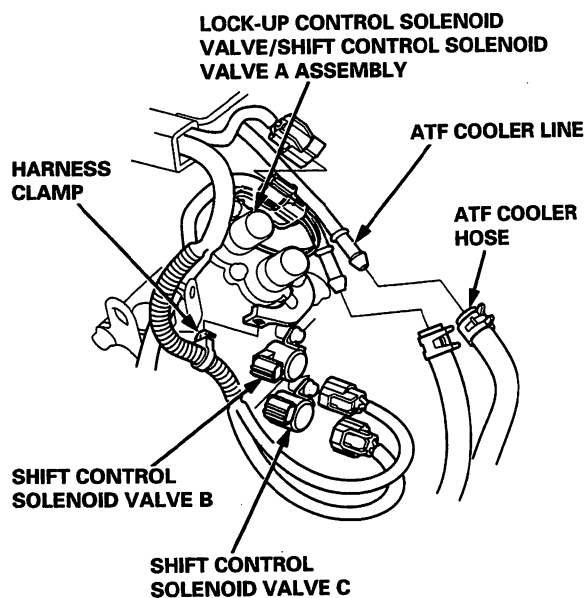


23. Connect the 2nd clutch pressure switch connector, and install the rear stiffener. Do not allow water, fluid, oil, dust, or other foreign particles to get inside the 2nd clutch pressure switch connector.

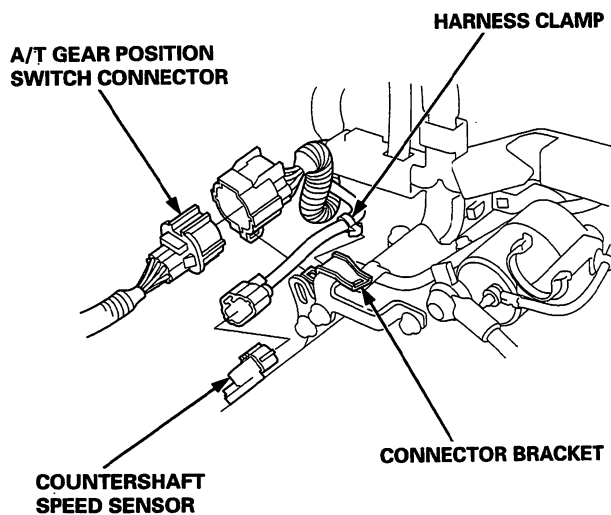
10 x 1.25 mm
38 N·m (3.9 kgf·m,
28 lbf·ft)



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.

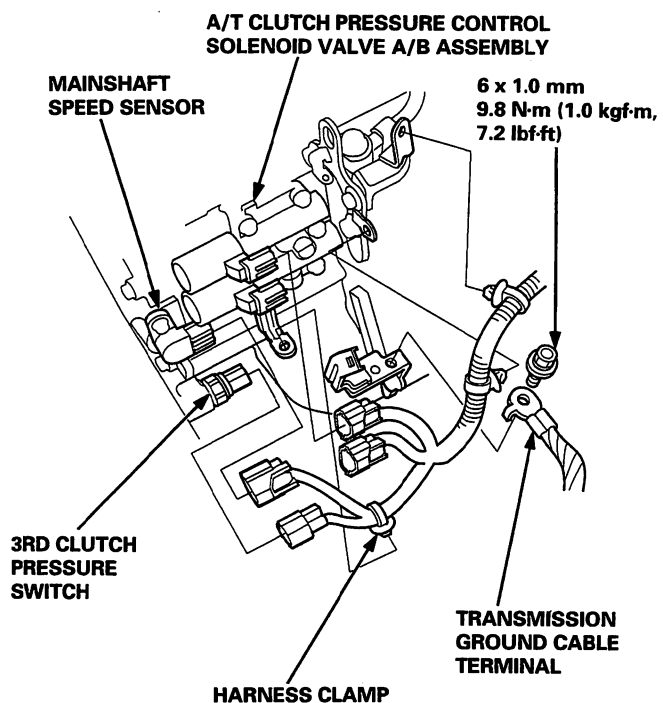


(cont'd)

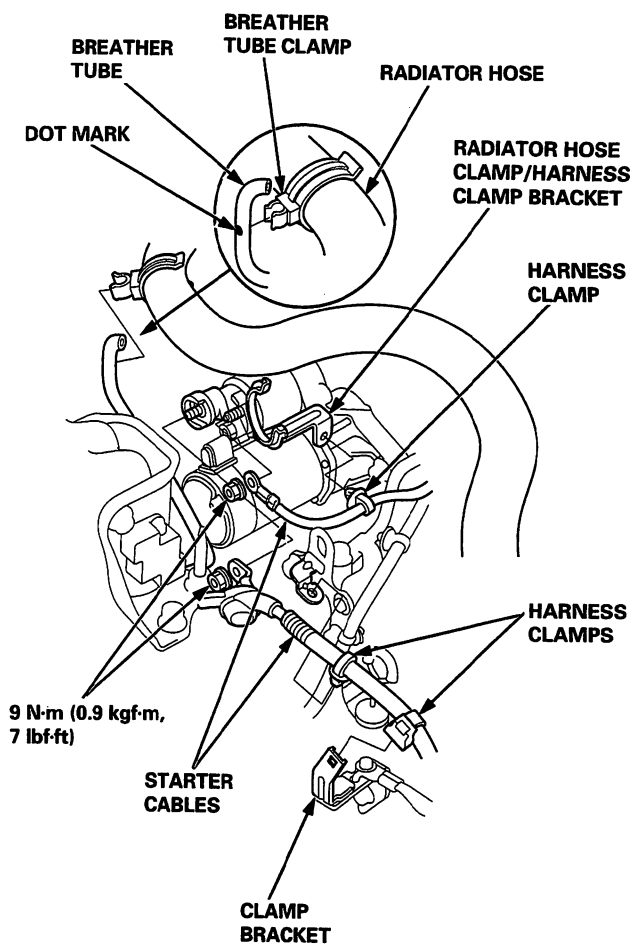
Transmission

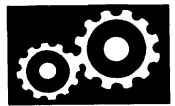
Installation (cont'd)

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.

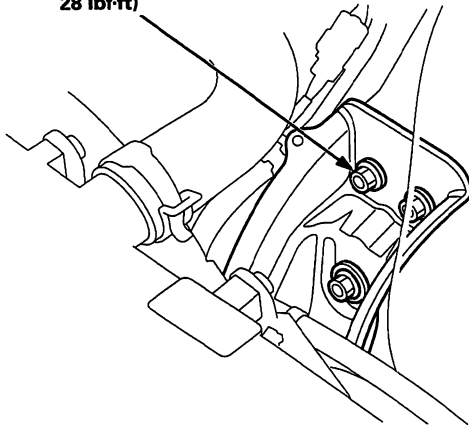




Connection

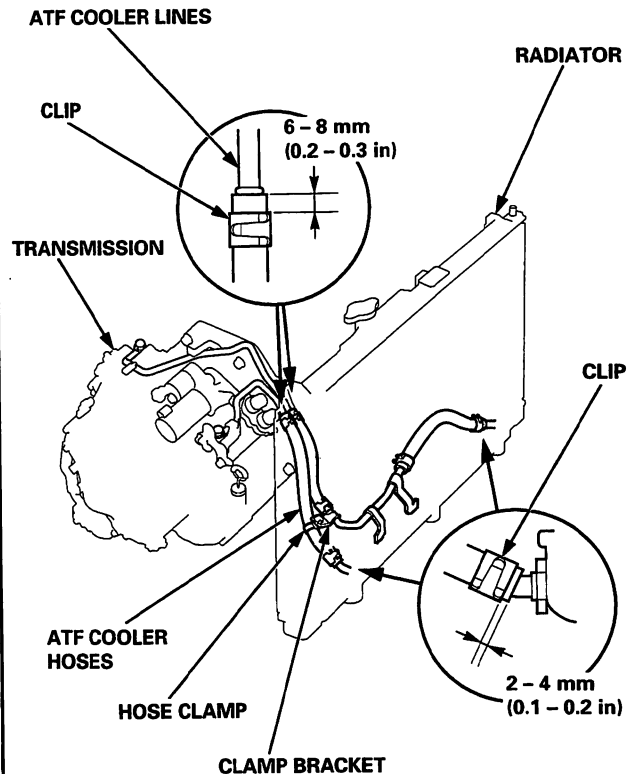
34. Install the battery base.
35. Install the battery cable clamps on the battery base.
36. Install the battery tray and battery, then secure the battery with its hold-down bracket.
37. Install the intake air duct and air cleaner housing assembly.
38. Refill the transmission with ATF (see page 14-133).
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 **N** position, then turn it off and check the ATF level (see page 14-133).
44. Perform a road test (see page 14-130 thru 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 pre-sets.

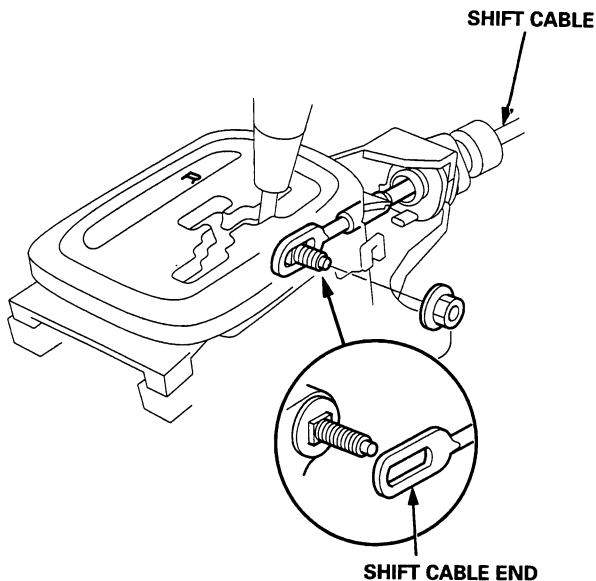
1. Connect the ATF cooler hoses to the ATF cooler lines and ATF cooler, and secure them with the clips as shown.
2. Install the hose clamp on the clamp bracket.



Shift Lever

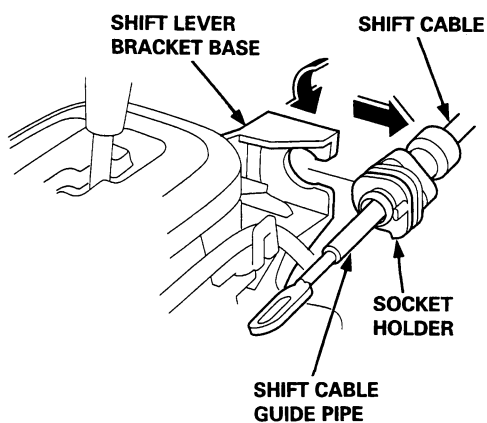
Removal

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.



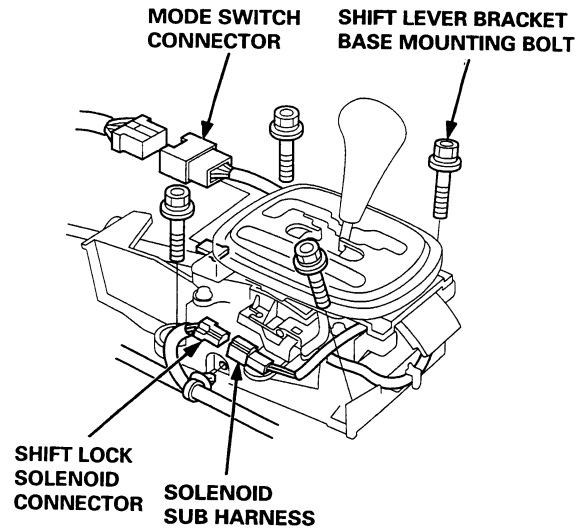
4. Rotate the socket holder on the shift cable counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base.

NOTE: Do not remove the shift cable by the shift cable guide pipe.

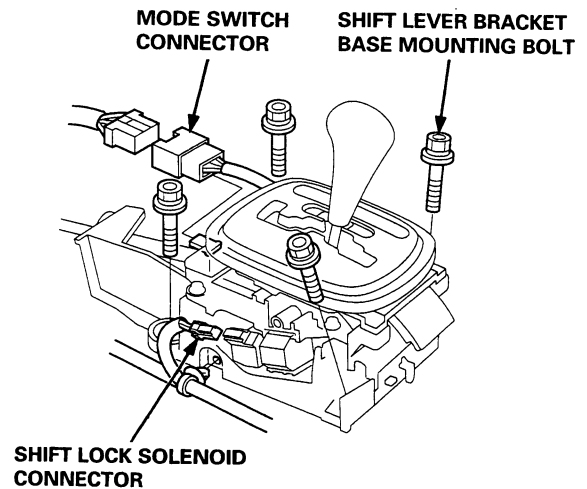


5. Disconnect the mode switch connector.
6. Disconnect the shift lock solenoid connector:
LHD: From the solenoid sub harness.
RHD: From the solenoid.

LHD:



RHD:



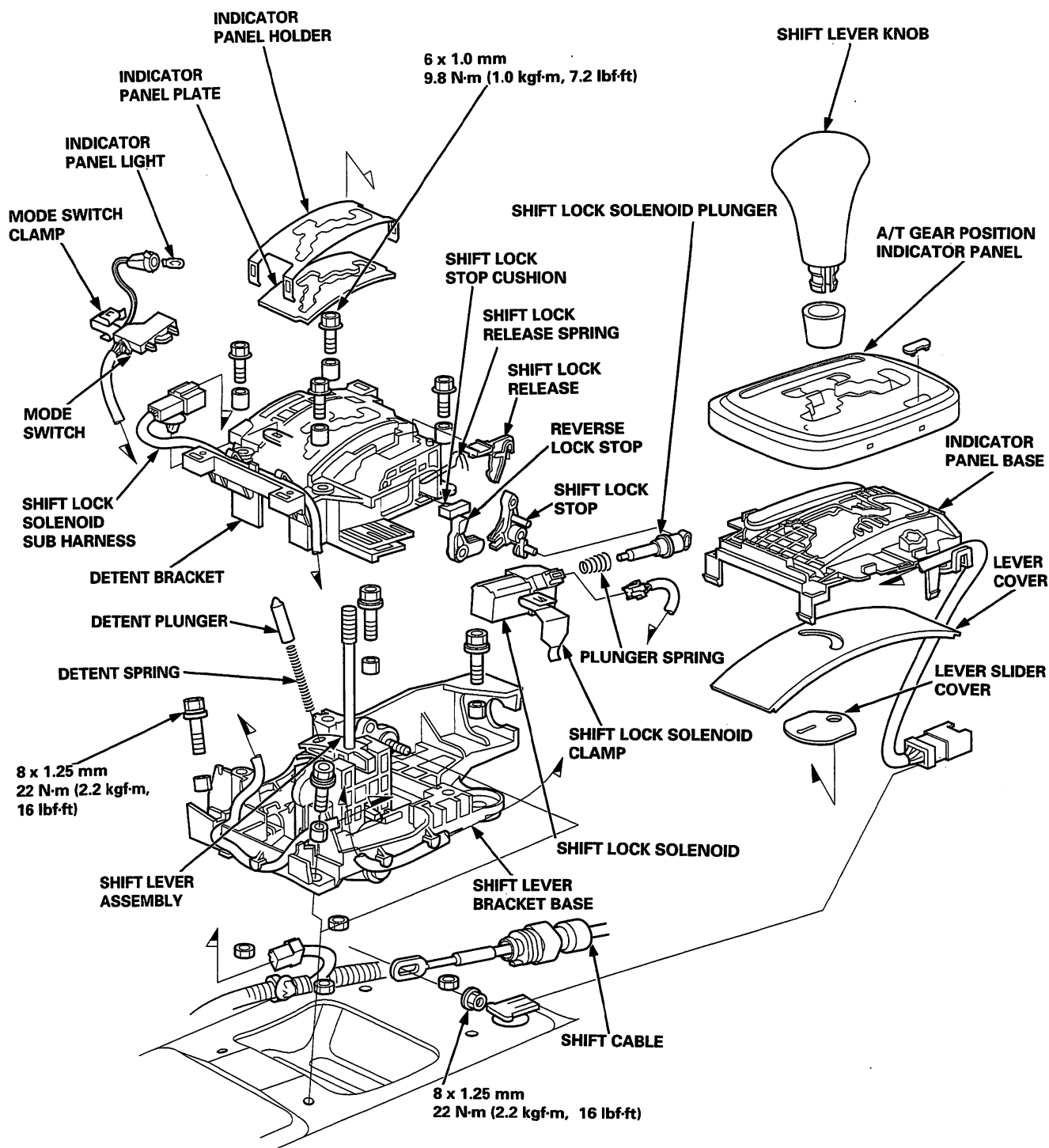
7. Remove the four bolts securing the shift lever bracket base, then remove the shift lever assembly.



Disassembly/Reassembly — LHD

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.

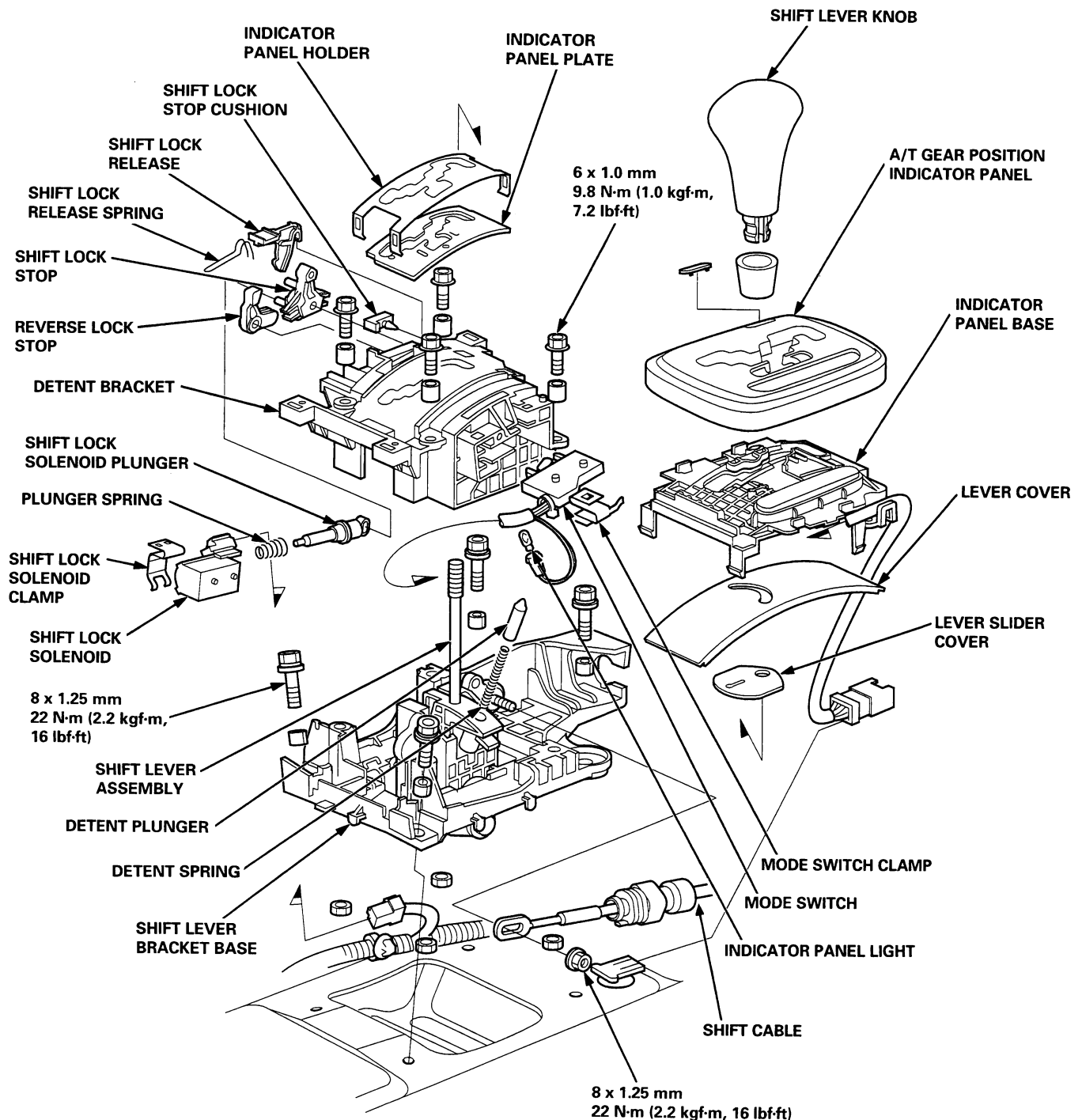


Shift Lever

Disassembly/Reassembly — RHD

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.

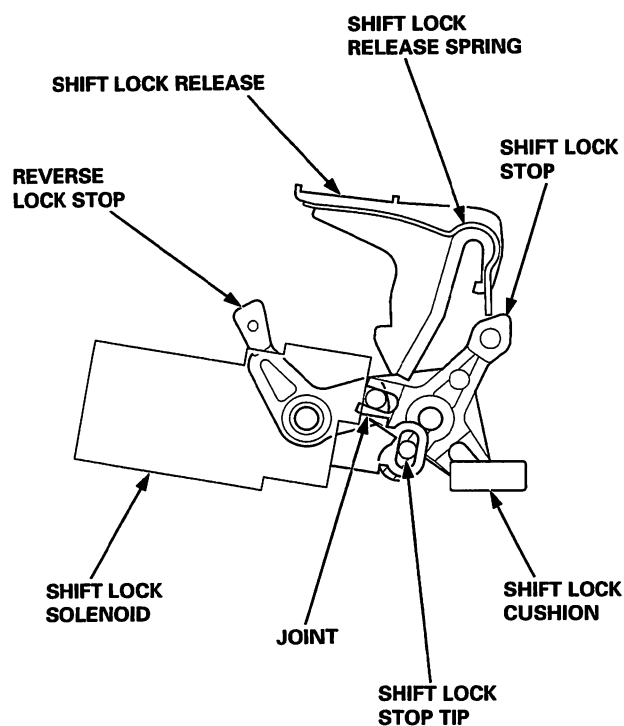




Shift Lock/Reverse Lock Mechanism

NOTE: Shift lock/reverse lock mechanism is assembled incorrectly, shift lever will not operate normally.

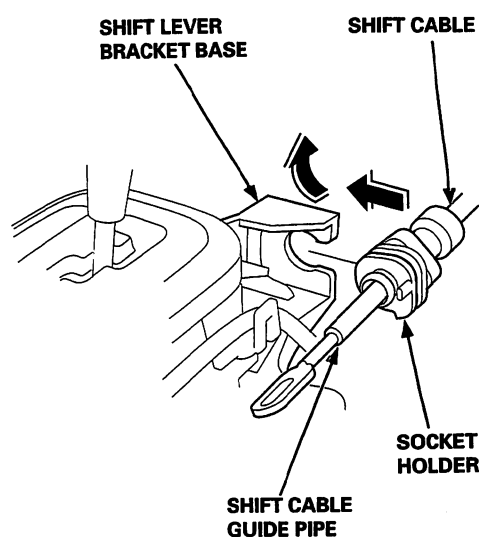
1. Install the shift lock stop and reverse lock stop together with aligning their joint.
2. Install the shift lock release spring on the shift lock release.
3. Make sure the installation direction of the shift lock stop cushion in the direction shown.
4. Install the shift lock solenoid with aligning the shift lock solenoid plunger with the tip of the shift lock stop.



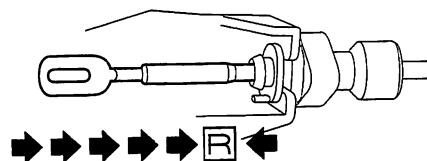
Installation

1. Install the shift lever assembly.
2. 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.



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**.

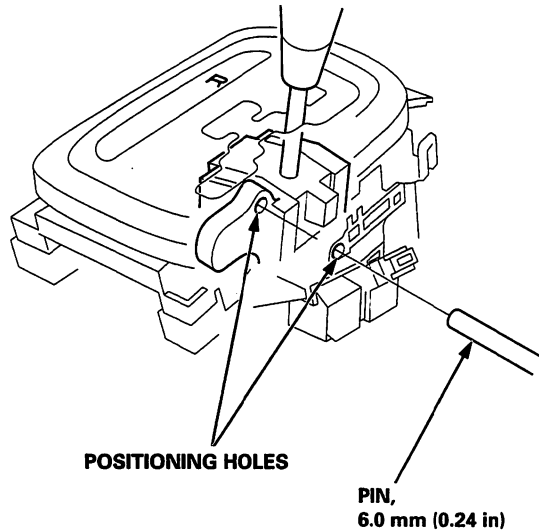


(cont'd)

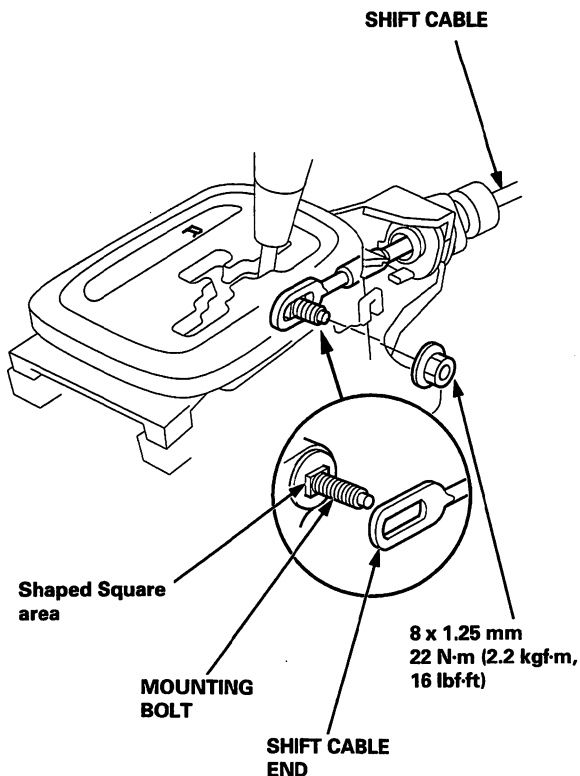
Shift Lever

Installation (cont'd)

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.

Shift Cable

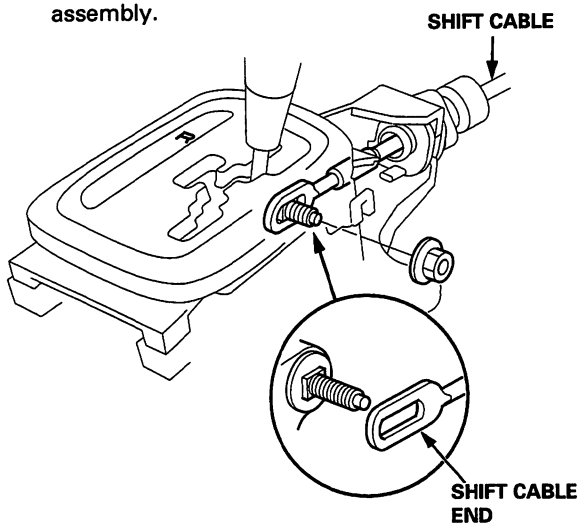


Replacement

⚠ WARNING

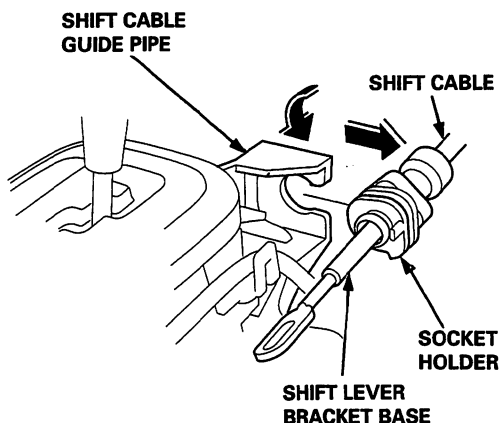
Make sure lifts, jacks, and safety stands are placed properly (see section 1).

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.

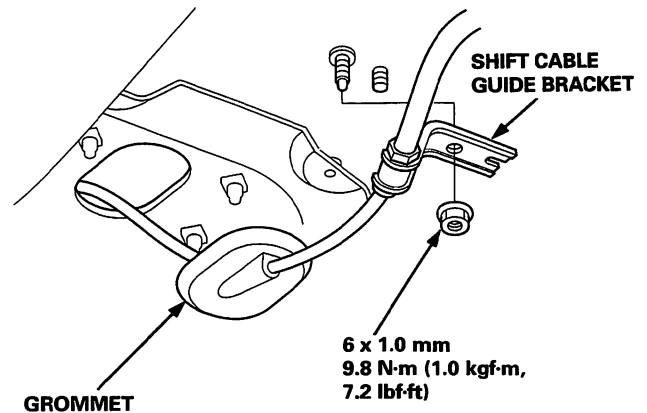


6. Rotate the socket holder on the shift cable counterclockwise a quarter turn, then slide the holder to remove the shift cable from the shift lever bracket base.

NOTE: Do not remove the shift cable by the shift cable guide pipe.

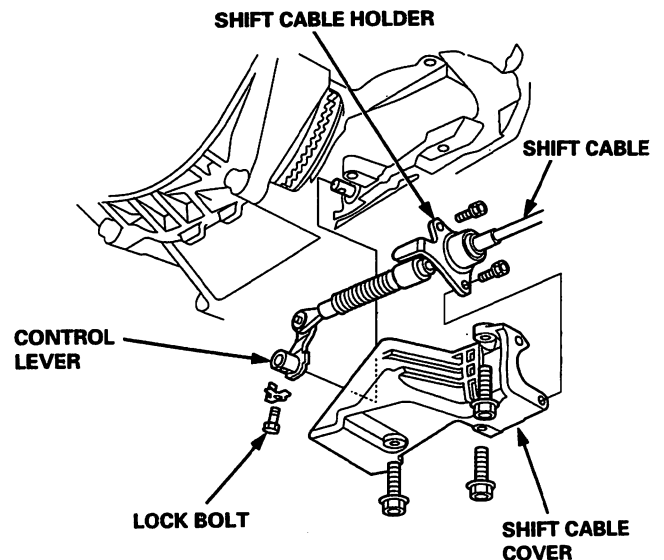


7. Remove the floor heat shield.
8. Remove the shift cable guide bracket and grommet.



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.



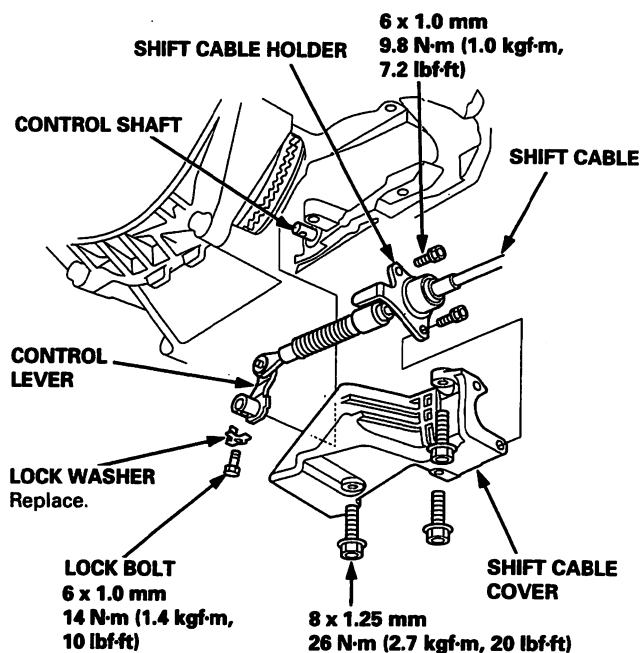
10. Remove the lock bolt securing the control lever, then remove the shift cable with the control lever.

(cont'd)

Shift Cable

Replacement (cont'd)

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.



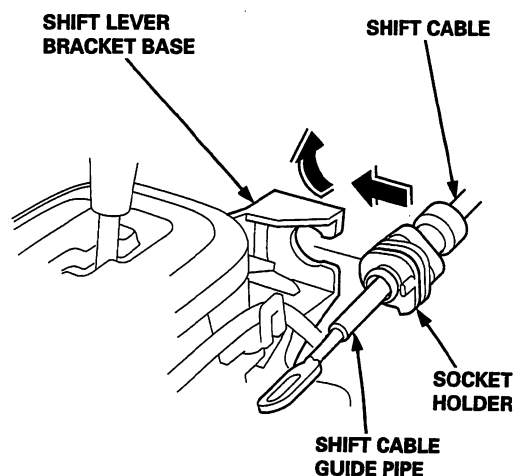
14. Install the lock bolt with a new lock washer, then bend the lock washer tab against the bolt.
15. Install the shift cable cover, then install the shift cable holder on the shift cable cover.

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.

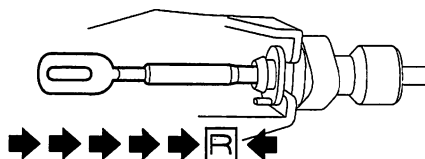
16. Install the floor heat shield.

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.

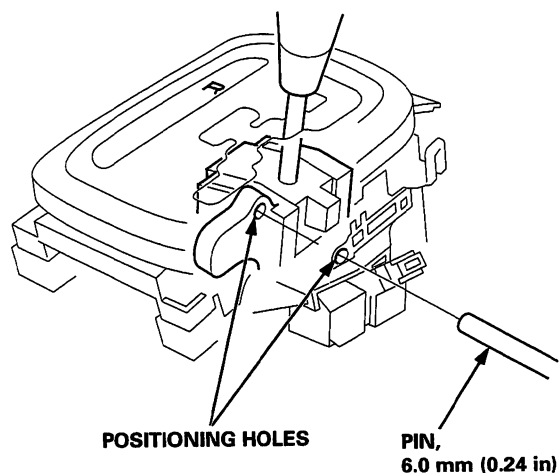


18. Turn the ignition switch ON (II), and verify that the **R** position indicator light comes on.
19. If necessary, push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in the **R** position.

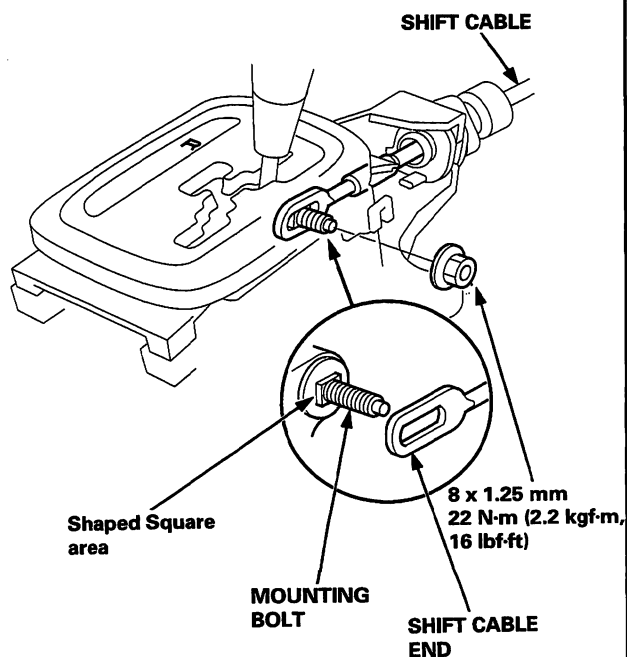




20. Insert a 6.0 mm (0.24 in) pin into the positioning hole on the shift lever bracket base through the positioning hole on the shift lever assembly.



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.

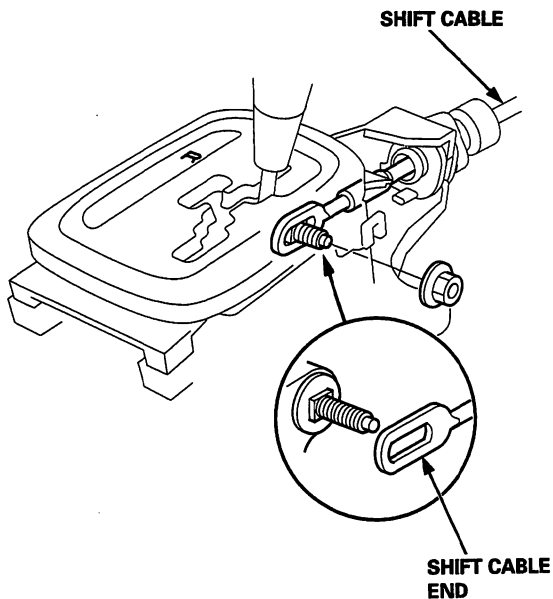


22. Install and tighten the nut to the specified torque.
23. Remove the 6.0 mm (0.24 in) pin that was installed to hold the shift lever.
24. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the A/T gear position switch.
25. Start the engine, and check the shift lever operation in all gears.

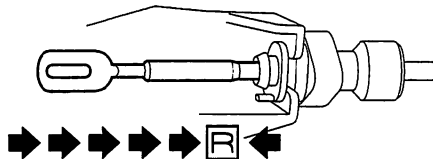
Shift Cable

Adjustment

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.

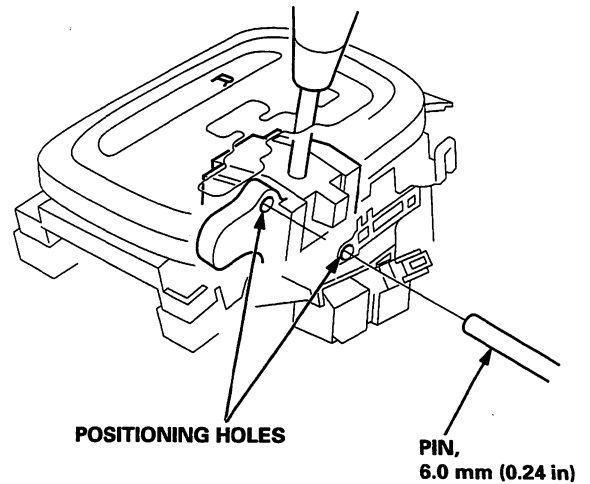


4. Push the shift cable until it stops, then release your hand. Pull the shift cable back one step so that the shift position is in the **R**.

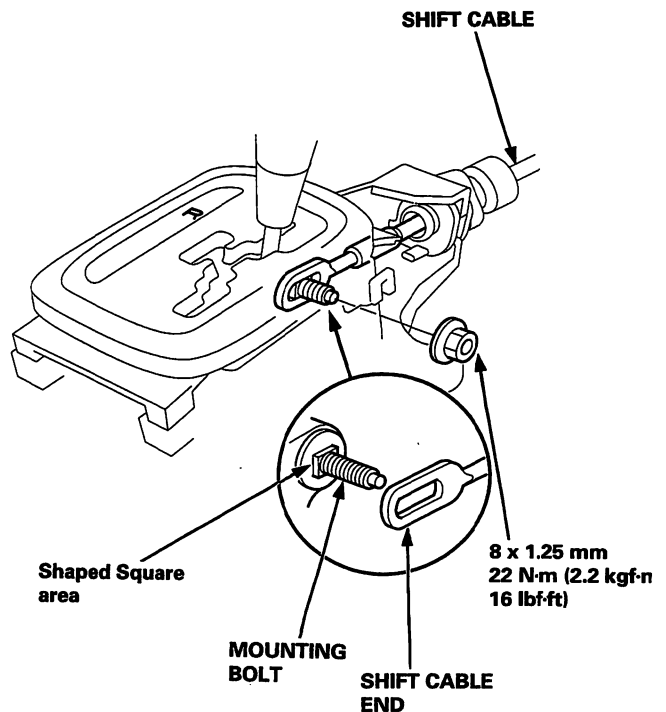


5. Turn the ignition switch ON (II), and verify that the **R** position indicator light comes on.

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.



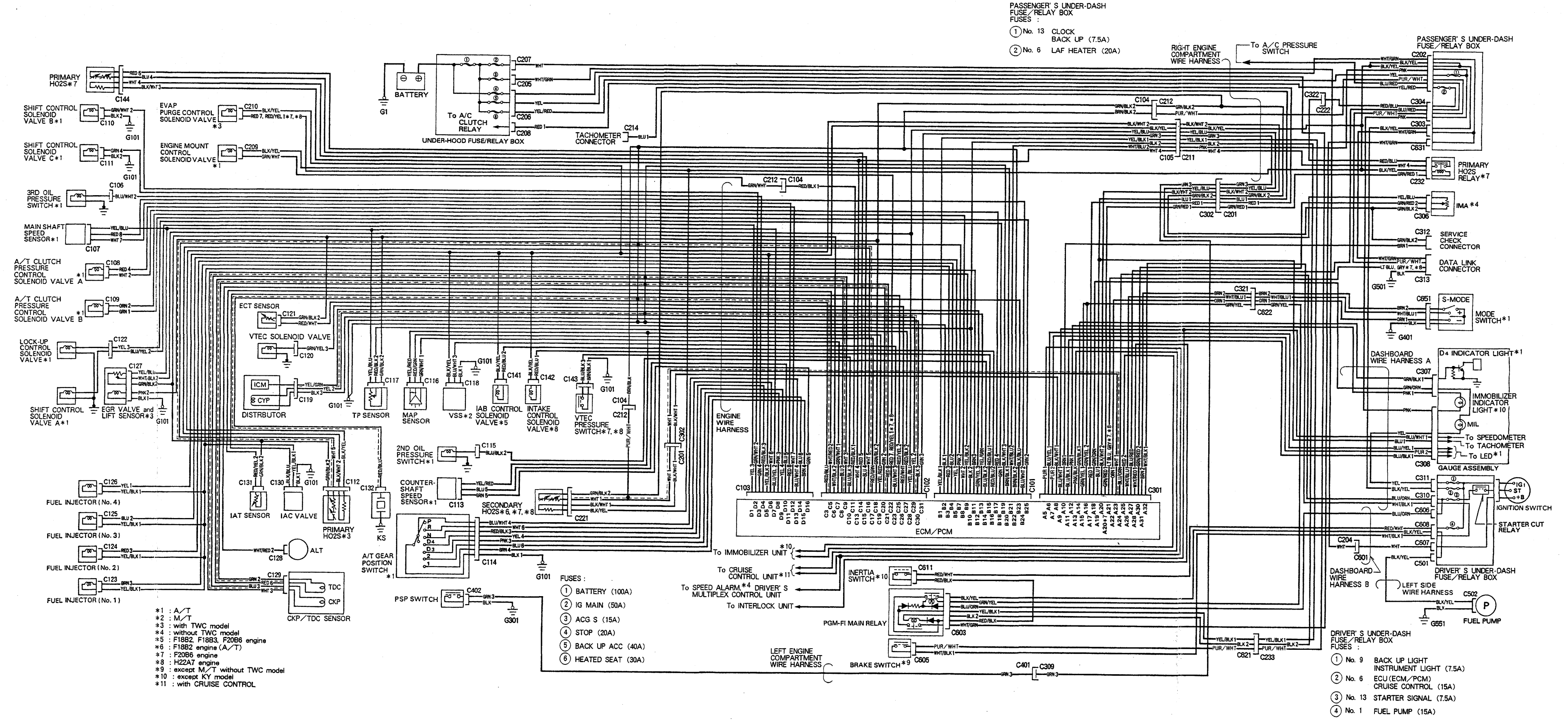
7. Install the shift cable end to the mounting bolt, aligning its flat surfaces with the square shape at the bottom of the mounting bolt.



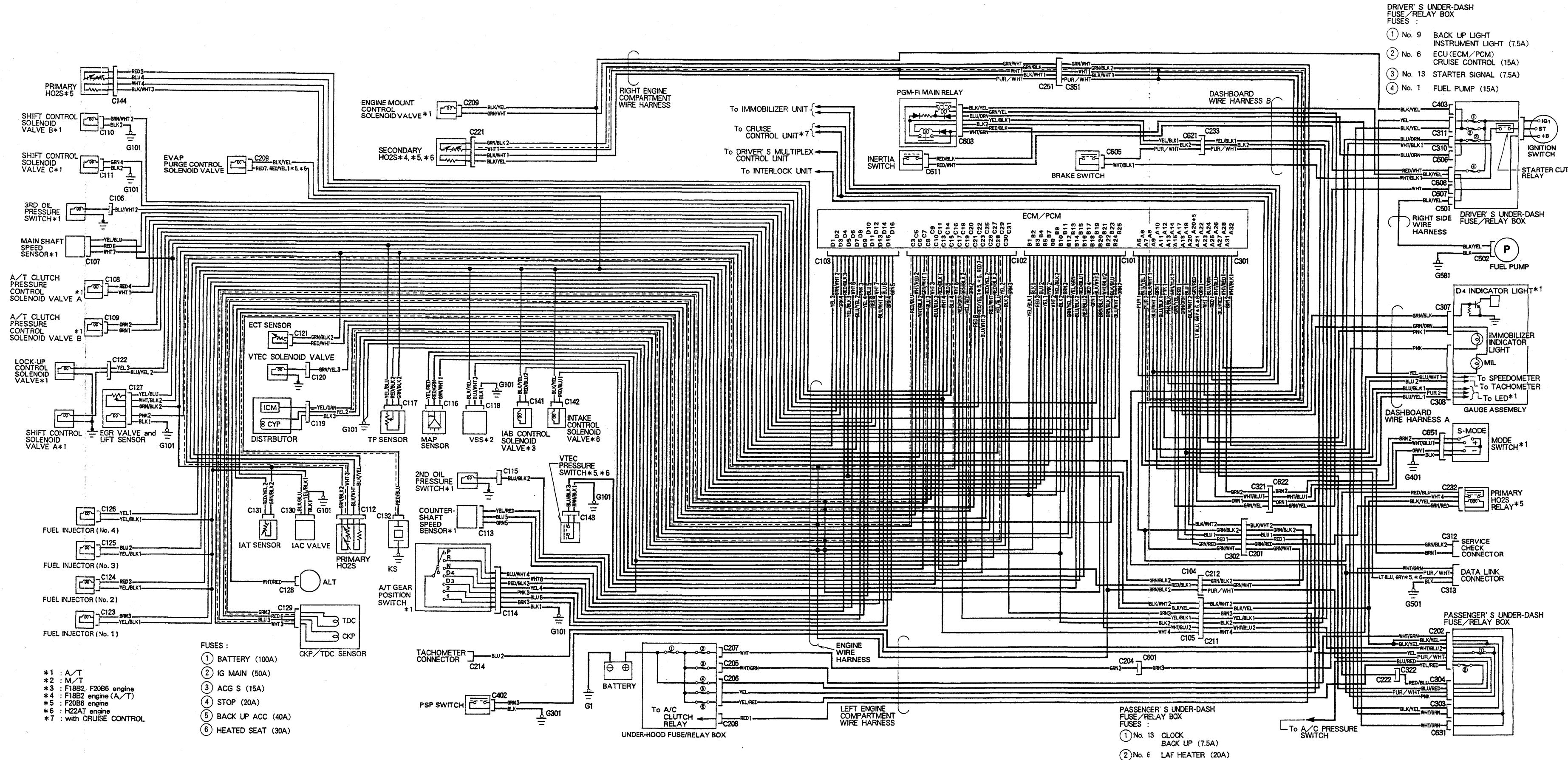


-
8. Install and tighten the nut to the specified torque.
 9. Remove the 6.0 mm (0.24 in) pin that was installed to hold the shift lever.
 10. Move the shift lever to each gear position, and verify that the A/T gear position indicator follows the A/T gear position switch.
 11. Push the shift lock release, and verify that the shift lock is released and shift lock is locked when released the shift lock release.

Fuel-Injected System Diagram
[F18B2, F18B3, F20B6, H22A7 engine: LHD]



Fuel-Injected System Diagram
[F18B2, F20B6, H22A7 engine: RHD]

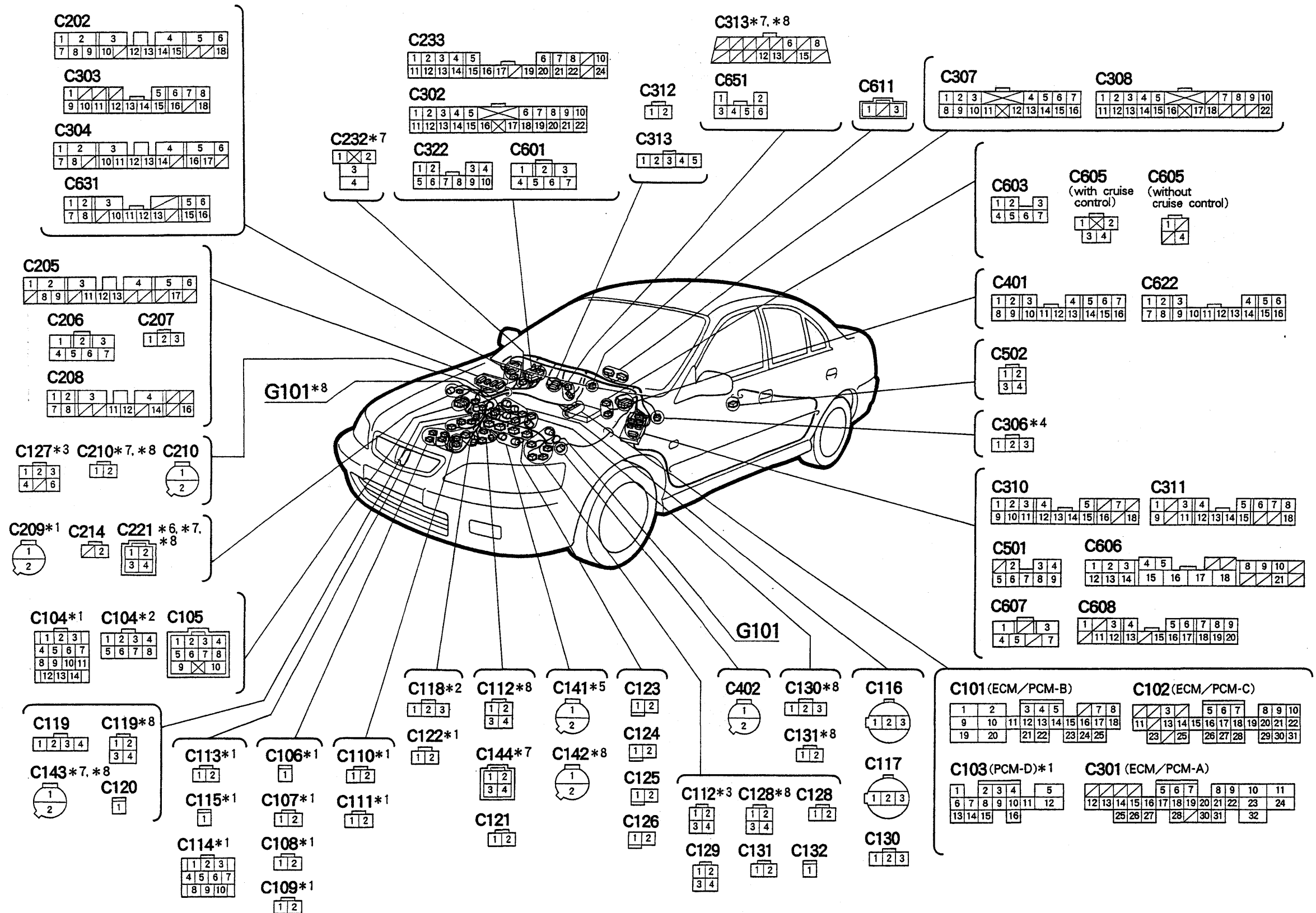


- *1 : A/T
*2 : M/T
*3 : F18B2, F20B6 engine
*4 : F18B2 engine (A/T)
*5 : F20B6 engine
*6 : H22A7 engine
*7 : with CRUISE CONTROL

- FUSES :
① BATTERY (100A)
② IG MAIN (50A)
③ ACG S (15A)
④ STOP (20A)
⑤ BACK UP ACC (40A)
⑥ HEATED SEAT (30A)

- Passenger's Under-Dash Fuse/Relay Box FUSES :
① No. 13 CLOCK BACK UP (7.5A)
② No. 6 LAF HEATER (20A)

Fuel-Injected System Connectors [F18B2, F18B3, F20B6, H22A7 engine: LHD]



① YEL/BLK ¹	⑩ YEL/GRN
② BLK ¹	⑪ BLU/BLK ¹
③ RED ¹	⑫ RED/BLU ¹
④ BLU ¹	⑬ RED/BLU ¹
⑤ YEL ¹	⑭ RED ¹
⑥ —	⑮ GRN ¹
⑦ PNK ¹	⑯ BLK/WHT ¹
⑧ WHT ¹	⑰ BRN/BLK ¹
⑨ YEL/BLK ²	⑱ WHT/BLU ¹
⑩ BLK ²	⑲ BRN/BLK ²
⑪ BRN ²	⑳ BLK/BLU
⑫ GRN/YEL ¹	㉑ BLU/WHT ¹
⑬ —	㉒ ORN ¹

1 —	⑩ WHT ¹	24 —
2 —	⑪ RED ¹	㉑ RED/YEL ¹
③ RED/BLU	⑫ BLU ¹	㉒ RED/WHT
4 —	⑬ WHT ¹	㉓ RED/BLK ¹
⑤ WHT/RED ¹	⑭ GRN/GRN	㉔ YEL/BLU
⑥ WHT/BLK ¹	⑮ GRN/BLK ²	㉕ YEL ¹
⑦ GRN/WHT ¹	⑯ YEL/RED	㉖ BLK ²
⑧ BLU ¹	⑰ GRN ²	㉗ GRN ²
⑨ WHT ²	⑱ RED ²	
⑩ BLU/BLK ²	⑲ RED ²	
⑪ RED/BLK ²	㉑ RED/YEL ²	
12 —	㉒ BLU/WHT ²	

① YEL ¹	⑩ YEL ¹
② GRN/WHT ¹	⑪ BLU ¹
③ GRN ¹	⑫ RED ¹
④ RED/BLK ¹	⑬ WHT ¹
⑤ YEL/BLK ¹	⑭ BLU/WHT ¹
⑥ WHT ¹	⑮ BLU ¹
⑦ BLU/YEL ¹	⑯ BRN ¹
⑧ PNK ¹	⑰ GRN ¹

① BRN/BLK ¹	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	⑩ RED/BLK ¹
7 YEL/RED	14 LT BLU

1 YEL	⑩ BLU/WHT ¹
② BRN/BLK ²	8 GRN/BLK
3 YEL/GRN	7 GRN
④ GRN/BLK ²	8 YEL/RED

1 RED/WHT	⑩ YEL/BLU ¹
② WHT/BLU ¹	7 WHT/BLU
③ BLK/YEL	⑩ BLK ²
④ YEL/BLK ¹	9 BLK/WHT
⑤ GRN ²	10 BLK/YEL
⑥ BLK/WHT ¹	
WHT ¹	

① BLU/WHT ¹	⑩ RED ¹
	⑪ WHT ¹

① YEL/BLU	⑩ ORN ¹
② RED ¹	⑪ GRN ¹
③ WHT ¹	

① BLK ¹	⑩ GRN ¹
② GRN/WHT ¹	

① BLU/WHT ¹	⑩ PNK ²
2 LT BLU	⑪ YEL ¹
③ BLK ¹	⑫ RED/BLK ²
④ BRN ¹	⑬ WHT ¹
⑤ BLU ¹	10 BLK/BLU

① BLU/BLK ¹	⑩ WHT/BLU
	⑪ WHT/RED ¹

① YEL/RED	⑩ GRN/WHT ¹
② GRN/WHT ¹	⑪ RED/GRN

① YEL/RED	⑩ GRN/WHT ¹
② GRN/WHT ¹	⑪ RED/GRN

① BLK ¹	⑩ GRN ¹
② BLK ¹	⑪ RED ¹
③ BLK ¹	⑫ BLU ¹
④ BLK ¹	⑬ WHT ¹

① BLK ¹	⑩ YEL/GRN
② YEL/GRN	⑪ YEL ¹
③ YEL ¹	⑫ YEL/BLK ¹
④ BLK ¹	

① YEL/GRN	⑩ YEL/GRN
② YEL ¹	⑪ YEL/BLK ¹
③ YEL/BLK ¹	⑫ BLK ¹

① GRN/YEL ¹	⑩ GRN/YEL ¹
------------------------	------------------------

① BLK/YEL	⑩ RED/BLU ¹
② RED/BLU ¹	

① BLK/YEL	⑩ BLK/YEL
② WHT ¹	⑪ RED/BLU ¹
③ BLU/YEL ¹	

① BRN ¹	⑩ BRN/BLK ¹
② YEL/BLK ¹	⑪ BLU/BLK ¹

① RED ¹	⑩ YEL/BLK ¹
② YEL/BLK ¹	

① BLU ¹	⑩ BLK ¹
② YEL/BLK ¹	

① YEL ¹	⑩ YEL/BLK ¹
② YEL/BLK ¹	

① WHT/BLK ¹	⑩ GRN/BLK ¹
② GRN/BLK ¹	⑪ YEL/BLU
③ YEL/BLU	⑫ PNK ¹
④ —	⑬ —
⑤ BLK ¹	

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	⑩ PNK
7 RED/BLK	16 —
8 BLK/ORN	17 —
⑨ WHT/GRN	⑩ PUR/WHT

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 —
7 —	16 —
8 BLU/RED	⑩ WHT/GRN
9 BLU/RED	18 —

1 WHT/BLU	⑩ YEL/BLK
2 —	⑪ WHT
③ YEL/RED	⑩ WHT/GRN
4 WHT/GRN	
⑤ PUR/WHT	
6 GRN	
⑦ YEL	

1 BLK/ORN	9 —
2 RED/WHT	10 WHT
3 BLU/BLK	⑩ RED ¹
4 BLU/YEL	12 GRN
5 —	13 —
6 —	14 BLK
7 RED	15 —
8 YEL	16 BLK/ORN

① GRN/WHT	⑩ RED ¹
② BLK/YEL	⑪ BLK/YEL

① BLK/YEL	⑩ RED/YEL ¹
② RED/YEL ¹	

① GRN/BLK ¹	⑩ BLK/YEL
② WHT ¹	⑪ GRN/RED ¹
③ BLK/WHT ¹	⑫ RED/BLU
④ BLK/YEL	⑬ WHT ¹

1 RED/BLU	13 LT GRN/RED
2 BLK	14 LT BLU
3 RED/WHT	⑩ YEL/BLK ¹
④ BLK ¹	16 ORN
5 RED/WHT	⑩ 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

1 —	⑩ PNK/BLK	⑩ WHT ¹
2 —	⑪ GRN/BLK ¹	⑩ BLU/ORN
3 —	⑫ GRN/YEL ¹	⑩ RED ¹
4 —	⑬ GRN/YEL ¹	⑩ WHT/BLU ¹
⑤ PUR ¹	⑩ RED ¹	⑩ BLU/RED
⑥ BLU/YEL ¹	⑩ GRN/ORN	⑩ WHT/RED ¹
⑦ PUR ¹	⑩ BLU ¹	29 —
⑧ BLK/WHT ¹	⑩ BLK/WHT ¹	⑩ GRN/RED ¹
⑨ BLU/WHT ¹	⑩ GRN/RED ¹	⑩ BRN ¹
⑩ BRN ¹	⑩ LT BLU	⑩ WHT/BLK ¹
⑪ BLU/BLK ¹	⑩ GRN ¹	
⑫ PNK ¹	⑩ ORN ¹	

1 LT BLU	12 BLU/BLK
② GRN/RED ¹	⑩ GRN/BLK ²
③ BLK/WHT ¹	⑩ RED ¹
4 YEL	15 YEL/RED
5 BLK/ORN	⑩ GRN ¹
6 WHT	⑩ BLU ¹
7 YEL/BLK	18 YEL/GRN
8 PNK	19 WHT/BLU
9 BLU	20 YEL/GRN
10 BRN	⑩ BLK/WHT ¹
⑪ YEL/BLU	⑩ WHT ¹

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

1 BLU	10 WHT/GRN
2 RED	11 WHT/GRN
3 GRN/WHT	12 YEL/BLK
4 WHT/BLK	13 WHT/RED
5 WHT	⑩ PUR/WHT
6 YEL/GRN	15 —
7 YEL	⑩ PNK
⑧ RED/BLU	⑩ BLU/RED
9 —	18 —

① YEL/BLU	⑩ GRN/RED ¹
② GRN/BLK ¹	

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	⑩ PNK ¹
7 BLU	⑩ GRN/ORN
8 PUR	16 BLK/YEL

1 BLK/WHT	12 GRN/BLK
2 YEL/GRN	13 GRN/WHT
3 GRN/RED	14 GRN/YEL
4 RED/YEL	⑩ YEL
5 ORN	⑩ PNK
6 —	17 BLK
⑦ BLU/YEL ¹	⑩ BLU/WHT ¹
⑧ PUR ¹	19 —
⑨ BLU/BLK ¹	20 —
⑩ BLU ¹	21 —
11 GRN/ORN	22 BLK

1 ORN	10 BLK/ORN
2 GRN/BLK	11 WHT
3 PUR	12 RED/BLU
4 RED/BLU	13 YEL/GRN
5 LT BLU	14 BLK
6 —	15 BLK
⑦ WHT/BLK ¹	16 RED/BLK
8 —	17 —
9 BLK	⑩ BLU/ORN

1 GRN/WHT	10 —
2 —	11 PUR
3 GRN	⑩ 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

① GRN/BLK ¹	⑩ LT BLU
② BRN ¹	2 PUR
	3 BLU/WHT
	⑩ WHT/GRN
	⑩ PUR/WHT

1 —	9 —
2 —	10 —
3 —	11 —
4 —	⑩ BLK
5 —	⑩ PUR/WHT
6 LT BLU	14 —
7 —	⑩ GRN
⑧ WHT/GRN	16 —

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

1 GRN/BLK	9 BRN/WHT
2 PUR/WHT	10 ORN
3 BRN	⑩ GRN ¹
4 BLU/WHT	12 BLU/RED
5 YEL/WHT	13 PUR/WHT
6 PUR	14 LT GRN
7 GRN	15 RED/YEL
8 YEL/GRN	16 BLU

① GRN ¹	
② BLK	

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

① BLK/YEL	⑩ BLK/WHT
② BLK	2 WHT/BLU
3 BLK	⑩ WHT
4 YEL/BLU	5 BLU/YEL
	6 BLU/RED
	7 BLU/BLK

① GRN/YEL ¹	⑩ RED/BLK
② BLU/ORN	⑩ RED/WHT ¹
③ BLK ¹	⑩ YEL/BLK ¹
④ BLK/YEL	⑩ WHT/GRN

1 GRN	⑩ PUR/WHT
2 LT GRN	2 —
③ WHT/BLK ¹	⑩ WHT/BLK ¹
④ PUR/WHT	4 —

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 —

1 BLK/WHT	
2 —	
③ WHT	
4 GRN/BLK	
5 BLK/YEL	
6 —	
7 BLK/YEL	

① RED/WHT	11 YEL/BLK
2 —	12 BLU/WHT ¹
3 RED/BLK	⑩ BLK ¹
4 LT GRN/RED	13 BLK/ORN
5 WHT/RED	14 —
6 BLK	15 YEL
⑦ BLK/YEL	16 LT GRN
8 WHT/BLK	17 BLU/WHT
9 BLU	18 YEL
10 —	19 PNK
	⑩ WHT/BLK ¹

① RED/BLK	
2 —	
③ RED/WHT	

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

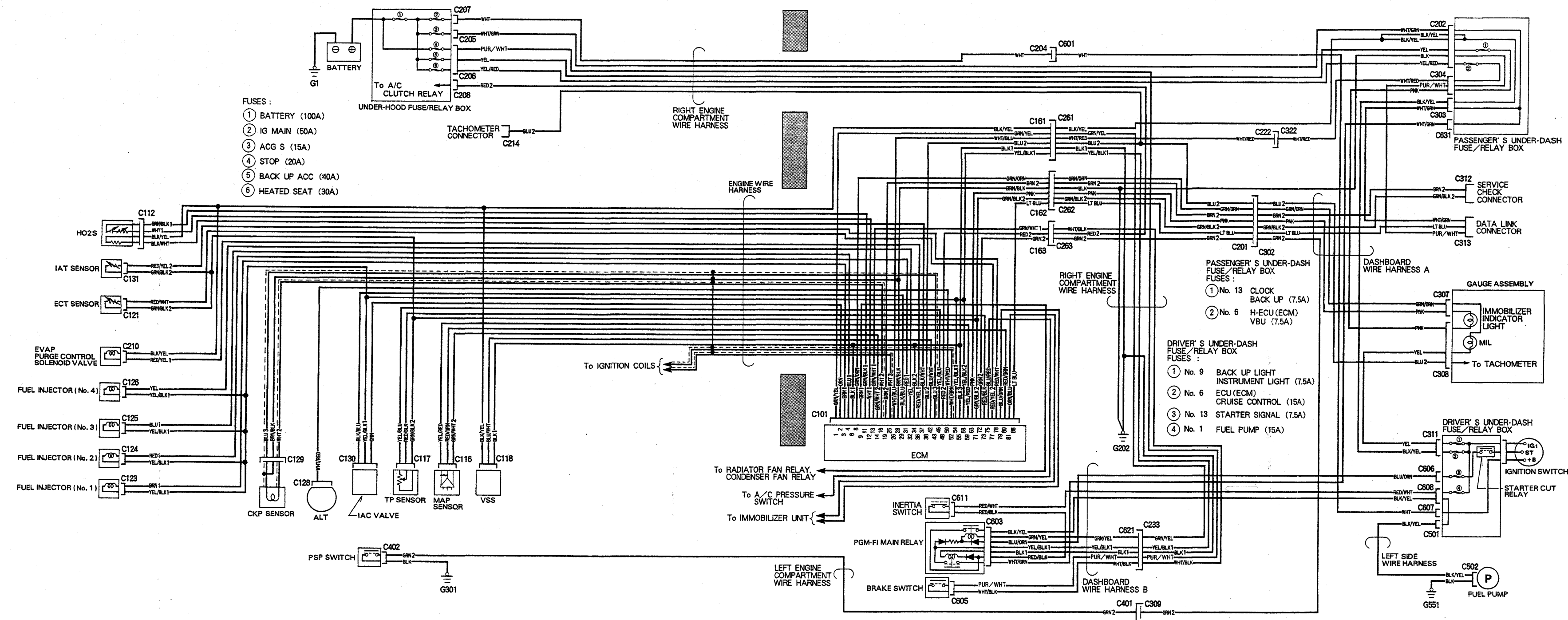
1 WHT/BLU	9 —
2 GRN/YEL	10 BLU/YEL
3 WHT	⑩ WHT/GRN
4 —	12 YEL
5 RED/BLK	13 LT GRN
6 BLK	14 —
7 YEL/BLK	15 BLK/ORN
8 BLU/WHT	16 WHT/BLU

① BLK	
② BLK	
③ WHT/BLU ¹	
④ ORN ¹	
⑤ BRN ¹	
6 RED/BLK	

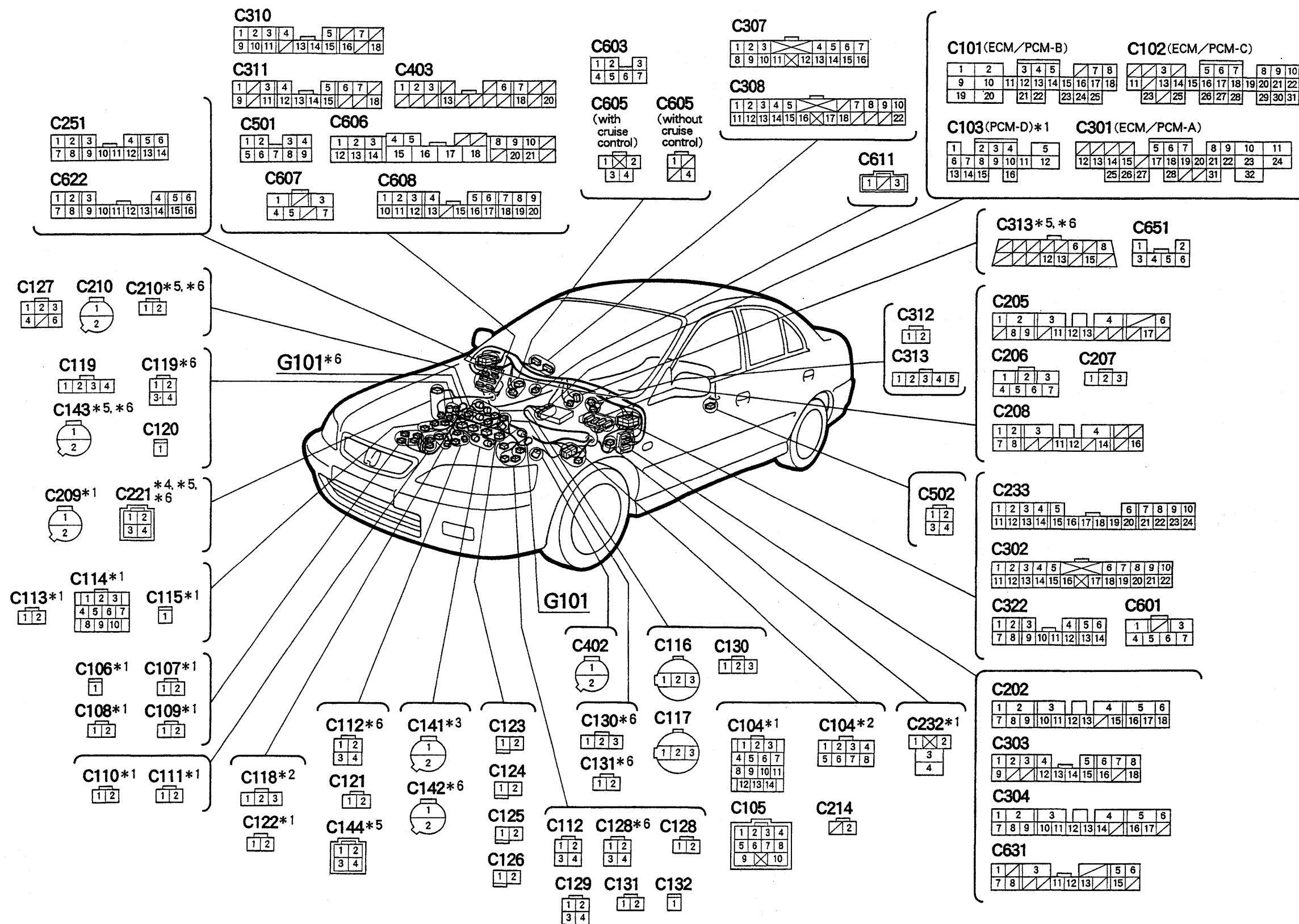
- *1: A/T
- *2: M/T
- *3: with TWC model
- *4: without TWC model
- *5: F1882, F1883, F2086 engine
- *6: F1882 engine (A/T)
- *7: F2086 engine
- *8: H22A7 engine
- *9: except M/T without TWC model
- *10: except KY model
- *11: with CRUISE CONTROL

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

Fuel-Injected System Diagram
[D16B6 engine: LHD]



Fuel-Injected System Connectors [F18B2, F20B6, H22A7 engine: RHD]



① YEL/BLK ¹	③ YEL/GRN
② BLK ¹	④ BLU/BLK ¹
⑤ RED ¹	⑥ RED/BLU ¹
⑦ BLU ¹	⑧ RED/BLU ²
⑨ YEL ¹	⑩ RED ²
⑪ —	⑫ GRN ¹
⑬ PNK ¹	⑭ BLK/WHT ¹
⑮ WHT ¹	⑯ BRN/BLK ¹
⑰ YEL/BLK ²	⑱ WHT/BLU ¹
⑲ BLK ²	⑳ BRN/BLK ²
㉑ BRN ²	㉒ BLK/BLU
㉓ GRN/YEL ¹	㉔ BLU/WHT ¹
㉕ —	㉖ ORN ¹

1 —	⑤ WHT ¹	24 —
2 —	⑥ RED ¹	⑨ RED/YEL ¹
③ RED/BLU	⑦ BLU ¹	⑩ RED/WHT
4 —	⑧ WHT ¹	⑪ RED/BLK ¹
⑤ WHT/RED ¹	⑫ RED/GRN	⑬ YEL/BLU
⑥ WHT/BLK ¹	⑭ GRN/BLK ¹	⑮ YEL ¹
⑦ GRN/WHT ¹	⑯ YEL/RED	⑰ BLK ¹
⑧ BLU ¹	⑱ GRN ¹	⑲ GRN ¹
⑩ WHT ¹	⑳ RED ¹	—
⑪ BLU/BLK ¹	㉑ RED ¹	—
⑫ RED/BLK ¹	㉒ RED/YEL ¹	—
12 —	㉓ BLU/WHT ¹	—

① YEL ¹	③ YEL ¹
② GRN/WHT ¹	④ BLU ¹
⑤ GRN ¹	⑥ RED ¹
⑦ RED/BLK ¹	⑧ WHT ¹
⑨ YEL/BLK ¹	⑩ BLU/WHT ¹
⑪ WHT ¹	⑫ BLU ¹
⑬ BLU/YEL ¹	⑭ BRN ¹
⑮ PNK ¹	⑯ GRN ¹

① BRN/BLK ¹	8 BLU/WHT
2 YEL/GRN	9 PNK
③ GRN/BLK ¹	10 BLU
4 RED/BLK ¹	11 BRN
5 BLK/BLU	12 GRN
6 WHT	③ RED/BLK ¹
7 YEL/RED	14 LT BLU

1 YEL	⑤ BLU/WHT ¹
② BRN/BLK ¹	6 GRN/BLK
3 YEL/GRN	7 GRN
④ GRN/BLK ¹	8 YEL/RED

1 RED/WHT	7 WHT/BLU
② WHT/BLU ¹	③ BLK ¹
④ BLK/YEL	9 BLK/WHT
⑤ YEL/BLK ¹	10 BLK/YEL
⑥ GRN ¹	—
⑦ BLK/WHT ¹	—
WHT ¹	—

① BLU/WHT ¹	① RED ¹
—	② WHT ¹

① YEL/BLU	① ORN ¹
② RED ¹	② GRN ¹
③ WHT ¹	—

① BLK ¹	① BLK ¹
② GRN/WHT ¹	② GRN ¹

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

① BLU/WHT ¹	② PNK ¹
2 LT BLU	③ YEL ¹
③ BLK ¹	④ RED/BLK ¹
④ BRN ¹	⑤ WHT ¹
⑤ BLU ¹	10 BLK/BLU

① BLU/BLK ¹	1 WHT/BLU
—	② WHT/RED ¹

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

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

① BLK ¹	① BLK ¹
② YEL/BLK ¹	② YEL/BLK ¹
③ BLU/WHT ¹	③ BLK/BLU

1 BLK/YEL	① GRN/BLK ¹
② YEL/GRN	② RED/YEL ¹
③ YEL ¹	—
④ BLK ¹	—

① YEL/GRN	① RED/BLU
② YEL ¹	—
③ YEL/BLK ¹	—
④ BLK ¹	—

① BLK/YEL	① BLK/YEL
② RED/BLU ¹	—

① GRN/BLK ¹	① BLK/YEL
② RED/WHT	② RED/BLU ¹

① YEL ¹	① BLU ¹
② BLU/YEL ¹	② RED ¹
—	③ BLK/WHT ¹
—	④ WHT ¹

① BRN ¹	① WHT/BLK ¹
② YEL/BLK ¹	② GRN/BLK ¹
—	③ YEL/BLU
—	④ PNK ¹
—	⑤ —
—	⑥ BLK ¹

① BLU ¹	① WHT/BLK ¹
② YEL/BLK ¹	② GRN/BLK ¹
—	③ YEL/BLU
—	④ PNK ¹
—	⑤ —
—	⑥ BLK ¹

① YEL ¹	① ORN ¹
② YEL/BLK ¹	② GRN ¹
—	—

1 GRN	⑩ BLK/YEL
2 RED/WHT	11 GRN
③ BLK/YEL	⑫ BLU/WHT
④ YEL/RED	13 BLU/RED
⑤ YEL	14 —
⑥ BLU/RED	⑬ PNK
7 BLK/YEL	16 LT BLU
8 BLK/ORN	17 RED/BLK
⑨ WHT/GRN	⑭ PUR/WHT

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	⑦ WHT/GRN
9 BLU/RED	18 —

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

1 BLK/ORN	9 —
2 RED/WHT	10 —
3 BLU/BLK	⑩ RED ¹
4 BLU/YEL	12 GRN
5 —	13 —
6 —	14 BLK
7 RED	15 —
8 BLK/ORN	16 BLK/ORN

① GRN/WHT	① RED ¹
② BLK/YEL	② BLK/YEL

① BLK/YEL	1 —
② RED/YEL ¹	② BLU ¹

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

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	⑨ BLK ¹
8 PUR	⑩ YEL/BLK ¹
9 BLU/WHT	21 PNK/BLK
10 YEL/GRN	22 RED
11 YEL/RED	⑪ PUR/WHT
12 LT GRN/RED	24 YEL

1 GRN/YEL	8 GRN
2 GRN/WHT	⑩ WHT ¹
③ PUR/WHT	⑪ BLK/WHT ¹
4 YEL	⑫ GRN/BLK ¹
5 BLU/BLK	12 BLU/RED
6 YEL/GRN	13 RED/WHT
7 RED	⑬ GRN/WHT ¹

1 —	③ PNK/BLK	② WHT ¹
2 —	④ GRN/BLK ¹	③ BLU/ORN
3 —	⑤ GRN/YEL	④ RED ¹
4 —	⑥ —	⑤ WHT/BLU ¹
⑤ PUR ¹	⑦ RED ¹	⑥ BLU/RED
⑥ BLU/YEL ¹	⑧ GRN/ORN	⑦ WHT/RED ¹
⑦ PUR ¹	⑨ BLU ¹	⑧ —
⑧ BLK/WHT ¹	⑩ BLK/WHT ¹	⑨ BRN ¹
⑨ BLU/WHT ¹	⑪ GRN/RED ¹	⑩ WHT/BLK ¹
⑩ BRN ¹	⑫ LT BLU	—
⑪ BLU/BLK ¹	⑬ GRN ¹	—
⑫ PNK ¹	⑭ ORN ¹	—

1 YEL/GRN	12 YEL
2 BLU/RED	13 BRN
③ GRN/WHT	14 PUR/WHT
4 WHT	④ 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
⑩ GRN/BLK ¹	⑪ GRN/RED
⑫ RED ¹	⑬ BLK/WHT ¹

1 BLU/WHT	10 —
2 RED/WHT	11 —
3 PUR/WHT	⑩ BLK/YEL
4 —	⑪ RED/WHT
5 RED/YEL	14 RED/BLU
6 BRN/WHT	⑫ WHT/GRN
7 BLK/YEL	16 GRN/WHT
8 BLK/WHT	17 —
9 GRN/BLK	18 RED/YEL

1 BLU	10 WHT/GRN
2 RED	11 WHT/GRN
3 GRN/WHT	12 YEL/BLK
4 WHT/BLK	13 WHT/RED
5 WHT	⑩ PUR/WHT
6 YEL/GRN	15 —
7 YEL	⑪ PNK
⑧ RED/BLU	⑫ BLU/RED
9 RED/BLK	18 —

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	⑬ PNK ¹
7 BLU	⑭ GRN/ORN
8 PUR	16 BLK/YEL

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 BLU/YEL ¹	⑯ BLU/WHT ¹
⑧ PUR ¹	19 —
⑨ BLU/BLK ¹	20 —
⑩ BLU ¹	21 —
11 GRN/BLK	22 BLK

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 ¹	16 RED/BLK
8 —	17 —
9 BLK	⑩ BLU/ORN

1 GRN/WHT	10 —
2 —	11 WHT
3 GRN	⑩ 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

① GRN/BLK ¹	① LT BLU
② BRN ¹	2 PUR
—	3 BLU/WHT
—	④ WHT/GRN
—	⑤ PUR/WHT

1 —	9 —
2 —	10 —
3 —	11 —
4 —	⑩ BLK
5 —	⑪ PUR/WHT
6 LT BLU	14 —
7 —	⑫ GRN
⑧ WHT/GRN	16 —

1 LT GRN	8 PUR
2 RED/YEL	9 BLU/WHT
3 ORN	10 GRN/BLK
④ RED/BLU	11 WHT/GRN
5 ORN	12 ORN
6 YEL	13 WHT/RED
7 RED	14 WHT/BLU

① GRN ¹	—
② BLK	—

1 ORN	11 —
2 BLK	12 —
3 GRN/RED	⑩ BLK/YEL
4 —	14 —
5 —	15 —
6 YEL/GRN	16 —
7 LT BLU	17 —
8 —	18 RED/BLK
9 —	19 —
10 —	20 GRN/RED

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

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

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

① BLK	—
② BLK	—
③ WHT/BLU ¹	—
④ ORN ¹	—
⑤ BRN ¹	—
6 RED/BLK	—

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

1 GRN	① PUR/WHT
2 LT GRN	2 —
③ WHT/BLK ¹	④ WHT/BLK ¹
④ PUR/WHT	4 —

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 —

1 BLK/WHT	—
2 —	—
③ WHT	—
4 GRN/BLK	—
5 BLK/YEL	—
6 —	—
7 BLK/YEL	—

① RED/WHT	11 YEL/BLK
2 GRN/YEL	12 BLU/WHT ¹
3 RED/BLK	BLK ¹
4 LT GRN/RED	13 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
—	⑩ WHT/BLK ¹

① RED/BLK	—
2 —	—
③ RED/WHT	—

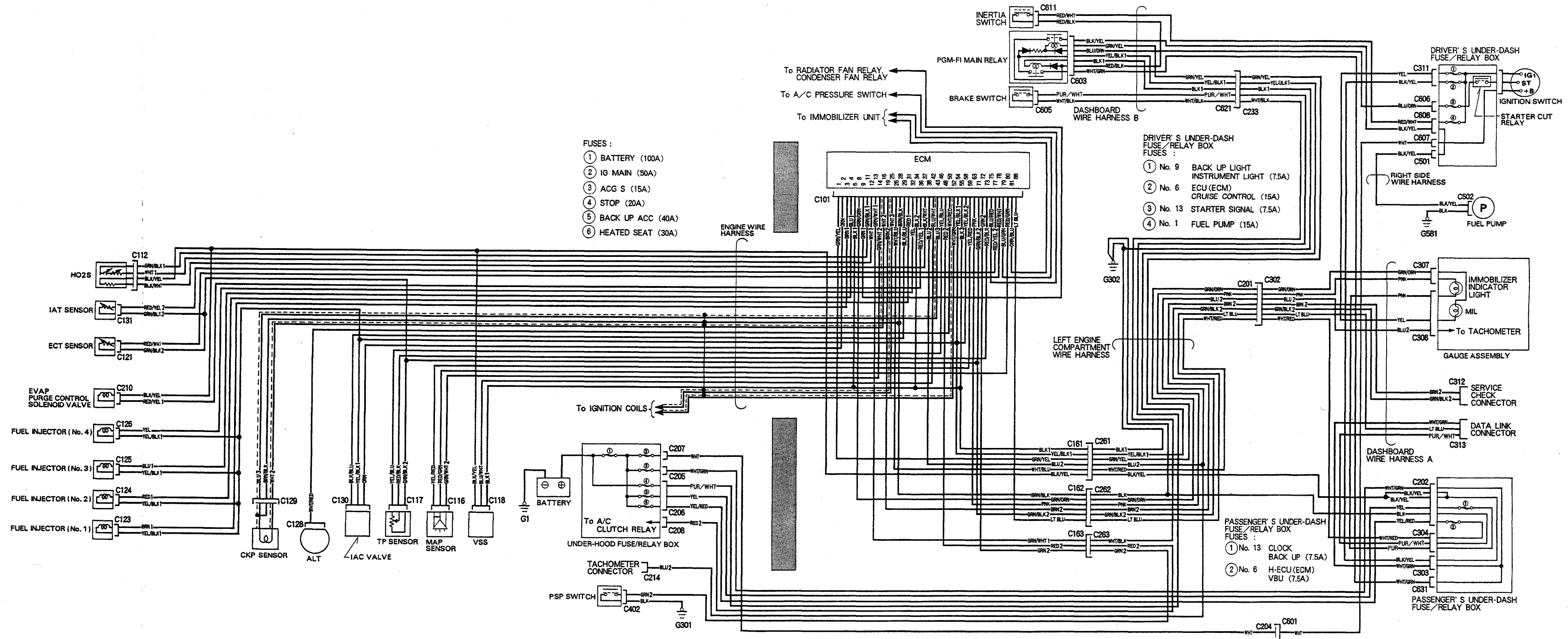
1 GRN	9 GRN/WHT
2 WHT/RED	⑩ GRN/YEL ¹
③ BRN ¹	11 RED
4 GRN	12 PNK/BLK
5 GRN/RED	⑪ ORN ¹
6 YEL/RED	⑫ WHT/BLU ¹
7 WHT/BLU	15 LT GRN/RED
8 YEL/BLK	16 LT GRN/BLK

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 —

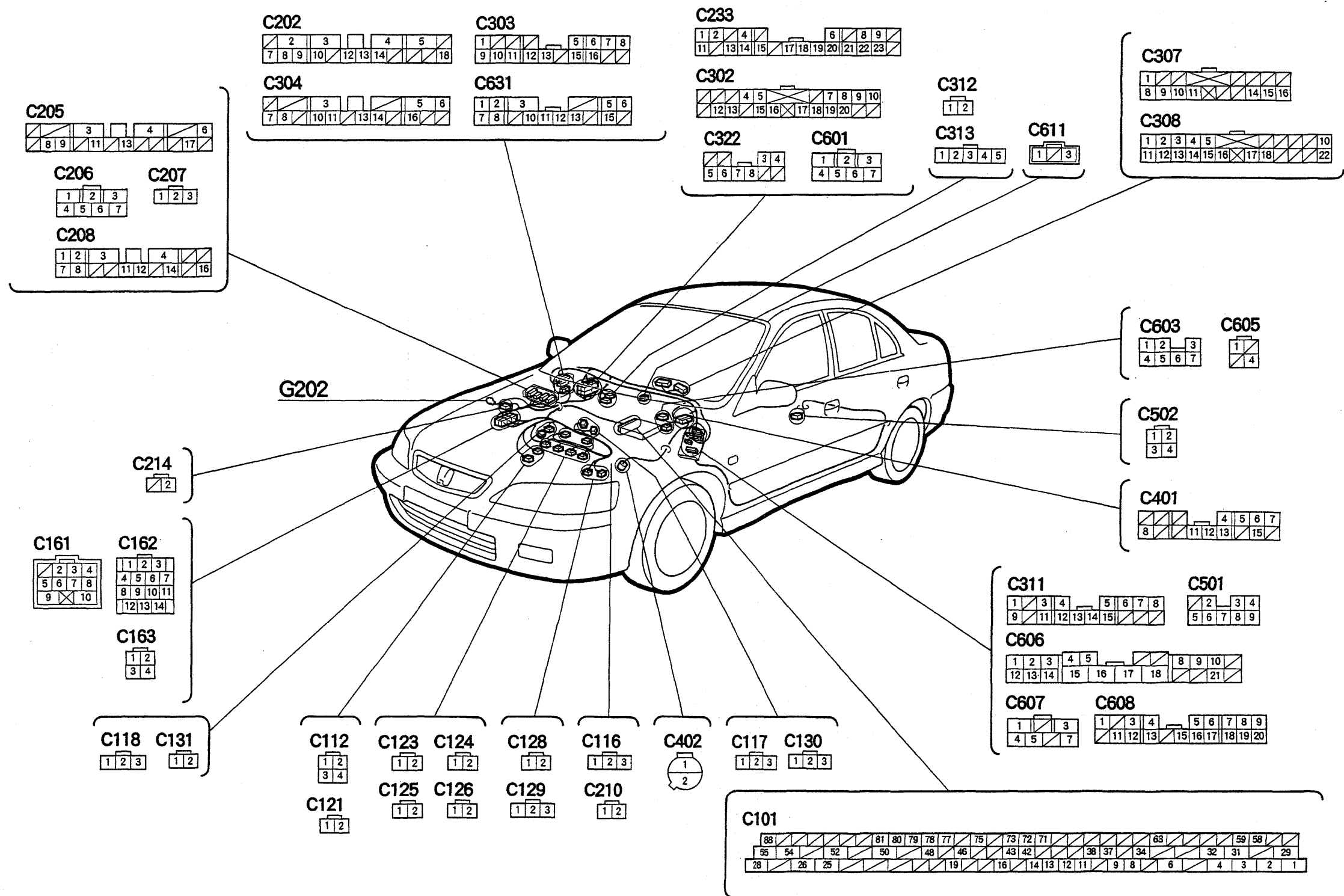
NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).
○: Related to Fuel and Emissions System.
● — Connector with male terminals (double outline): View from terminal side
— Connector with female terminals (single outline): View from wire side

*1: A/T
*2: M/T
*3: F1882, F2086 engine
*4: F18

Fuel-Injected System Diagram
[D16B6 engine: RHD]



Fuel-Injected System Connectors
[D16B6 engine: LHD]



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 ²
⑫ WHT ¹	56	---
⑬ GRN/WHT ¹	57	---
⑭ GRN/WHT ²	58	YEL/BLK
15	59	YEL/RED
⑮ WHT ²	60	---
17	61	---
18	62	---
⑯ BRN ²	63	PNK
20	64	---
21	65	---
22	66	---
23	67	---
24	68	---
⑰ WHT ³	69	---
⑱ WHT/BLU	70	---
27	71	GRN/BLK ²
⑳ BRN/BLK	72	GRN ²
㉑ BLK/BLU	73	RED/BLK
30	74	---
㉒ RED ¹	75	BLU/RED
㉓ YEL	76	---
33	77	RED/YEL ²
㉔ BLK ²	78	RED/WHT
35	79	BLU/GRN
㉕ RED/YEL ¹	80	RED/GRN
㉖ BLK/WHT	81	ORN/BLU
㉗ BLU ²	82	---
39	83	---
40	84	---
41	85	---
㉘ BLU/WHT	86	---
㉙ BLU ³	87	---
44	88	LT BLU

C112		
① BLK/WHT	---	---
② BLK/YEL	---	---
③ GRN/BLK ¹	---	---
④ WHT ¹	---	---

C117		
① RED/BLK	---	---
② GRN/BLK ²	---	---
③ YEL/BLU	---	---

C121		
① GRN/BLK ³	---	---
② RED/WHT	---	---

C124		
① RED ¹	---	---
② YEL/BLK ¹	---	---

C126		
① YEL	---	---
② YEL/BLK ¹	---	---

C116		
① RED/GRN	---	---
② GRN/WHT ²	---	---
③ YEL/RED	---	---

C118		
① BLK/YEL	---	---
② BLK ¹	---	---
③ BLU/WHT	---	---

C123		
① BRN ¹	---	---
② YEL/BLK ¹	---	---

C125		
① BLU ¹	---	---
② YEL/BLK ¹	---	---

C128		
① WHT/BLU	---	---
② WHT/RED	---	---

C129		
① WHT ¹	---	---
② BRN/BLK	---	---
③ BLU ²	---	---

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 ¹	10	BLK/YEL

C162	
① BRN/BLK	⑧ PNK
2 YEL/GRN	⑨ LT BLU
③ GRN/BLK ²	⑩ GRN/ORN
4 BLU/WHT	⑪ BRN ²
5 GRN/BLK	12 GRN
6 YEL	13 BLU/GRN
7 YEL/RED	14 ORN/BLU

C163		
① GRN ²	---	---
② RED ¹	---	---
③ GRN/WHT ¹	---	---
4	---	BLU/RED

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	---	15	---
7	RED/BLK	16	---
8	BLK/ORN	17	---
⑨	WHT/GRN	⑰	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	17	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

C208			
1	BLK/ORN	9	---
2	RED/WHT	10	---
3	BLU/BLK	⑩	RED ¹
4	BLU/YEL	12	GRN
5	---	13	---
6	---	14	BLK
7	RED	15	---
8	BLK/ORN	16	BLK/ORN

C207		
1	---	YEL/BLK
② WHT	---	---
3	---	WHT/GRN

C210		
① BLK/YEL	---	---
② RED/YEL ¹	---	---

C214		
1	---	---
② BLU ²	---	---

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 ¹
3	---	14	---
4	YEL	15	YEL/RED
5	GRN/BLK	16	GRN ²
6	---	17	BLU ²
7	LT BLU	18	YEL/GRN
8	BRN ²	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	---
6	BRN/WHT	15	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	⑩	PUR/WHT
6	YEL/GRN	15	---
7	YEL	⑪	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	---	14	PNK ¹
7	---	15	GRN/ORN
8	PIIR	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	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/WHY	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	---

C312		
① GRN/BLK ²	---	---
② BRN ²	---	---

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	---	11	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 ¹	---	---
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

C313		
① LT BLU	---	---
2	---	PUR
3	---	BLU/WHT
④ WHT/GRN	---	---
⑤ PUR/WHT	---	---

C601		
1	---	BLK/WHT
2	---	WHT/BLU
③ WHT	---	---
4	---	BLU
5	---	BLU/YEL
6	---	BLU/RED
7	---	BLU/BLK

C603		
① GRN/YEL	⑤	RED/BLK
② BLU/ORN	⑥	YEL/BLK ¹
③ BLK ²	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

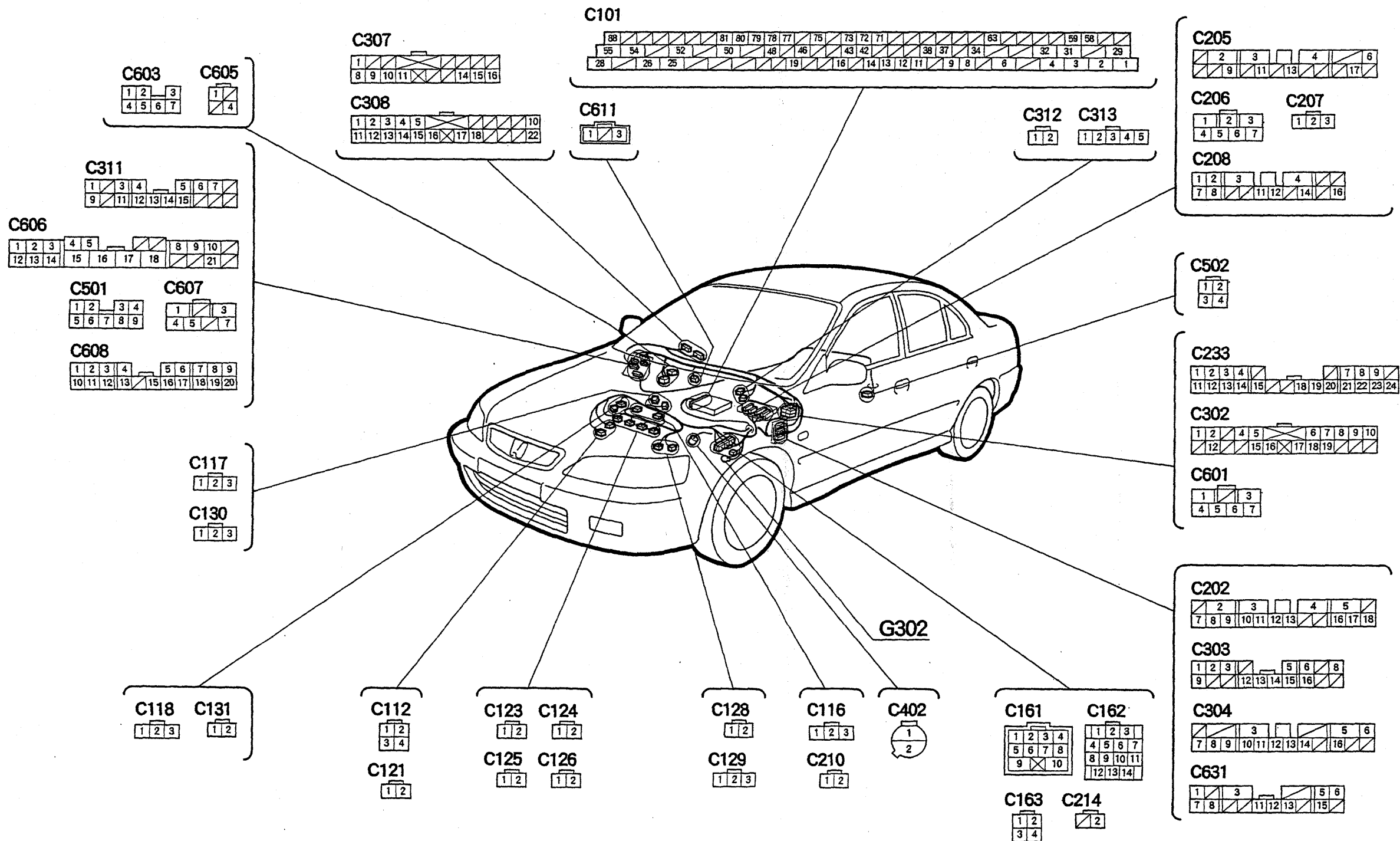
C608			
①	RED/WHT	11	YEL/BLK
2	—	12	BLK
3	RED/BLK	13	BLK/ORN
4	LT GRN/RED	14	—
5	WHT/RED	15	YEL
6	BLK	16	LT GRN
⑦	BLK/YEL	17	BLU/WHT
8	WHT/BLK	18	YEL
9	BLU	19	PNK
10	—	20	WHT/BLK

C611		
① RED/BLK	---	---
2	---	---
③ RED/WHT	---	---

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	—

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

Fuel-Injected System Connectors
[D16B6 engine: RHD]



C101 (ECM)

① GRN/YEL	45	—
② ORN	④ YEL/BLU	—
③ BRN ¹	47	—
④ BLU ¹	④ RED ²	—
5	49	—
⑥ BLK ¹	④ WHT/RED	—
7	51	—
⑧ GRN/ORN	④ WHT/GRN	—
⑨ GRN ¹	53	—
10	④ YEL/BLK ¹	—
⑪ GRN/BLK ¹	④ BLK ²	—
⑫ WHT ¹	56	—
⑬ GRN/WHT ¹	57	—
⑭ GRN/WHT ²	④ YEL/BLK	—
15	④ YEL/RED	—
⑮ WHT ²	60	—
17	61	—
18	62	—
⑯ BRN ²	④ PNK	—
20	64	—
21	65	—
22	66	—
23	67	—
24	68	—
⑰ WHT ³	69	—
⑱ WHT/BLU	70	—
27	⑦ GRN/BLK ¹	—
⑳ BRN/BLK	⑦ GRN ²	—
㉑ BLK/BLU	⑦ RED/BLK	—
30	74	—
㉒ RED ¹	⑦ BLU/RED	—
㉓ YEL	76	—
33	⑦ RED/YEL ²	—
㉔ BLK ²	⑦ RED/WHT	—
35	⑦ BLU/GRN	—
㉕ RED/YEL ¹	⑦ RED/GRN	—
㉖ BLK/WHT	⑦ ORN/BLU	—
㉗ BLU ²	82	—
39	83	—
40	84	—
41	85	—
㉘ BLU/WHT	86	—
㉙ BLU ³	87	—
44	④ 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 BLK/YEL
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

C162

① BRN/BLK	⑧ PNK
2 YEL/GRN	⑨ LT BLU
③ GRN/BLK ²	⑩ GRN/ORN
4 BLU/WHT	⑪ 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 —	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	⑪ BLK

C205

1 —	10 —
2 RED/YEL	11 LT GRN/RED
3 RED/YEL	12 —
4 RED/WHT	13 BLU/RED
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
⑤ PUR/WHT
6 WHT/BLU
⑦ YEL

C207

1 YEL/BLK
② WHT
3 WHT/GRN

C208

1 BLK/ORN	9 —
2 RED/WHT	10 —
3 BLU/BLK	⑩ RED ²
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 ¹

C214

1 —
② BLU ²

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	⑬ BLK ¹
8 PUR	⑰ YEL/BLK ¹
⑨ GRN/YEL	21 PNK/BLK
10 —	22 RED
11 YEL/RED	⑰ PUR/WHT
12 LT GRN/RED	24 YEL

C302

1 YEL/GRN	12 YEL
2 BLU/RED	13 —
3 —	14 —
④ PNK	⑬ BLU ²
⑥ 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 —
⑩ GRN/BLK ²	21 —
11 —	22 —

C303

1 BLU/WHT	10 —
2 RED/WHT	11 —
3 PUR/WHT	⑩ BLK/YEL
4 —	13 RED/WHT
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	⑬ PUR/WHT
6 YEL/GRN	15 —
7 YEL	⑬ 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 —	⑬ PNK
7 —	⑬ GRN/ORN
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	⑬ 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 PUR
3 GRY	⑬ 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 —

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 BLU/RED
7 BLU/BLK

C603

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

C805

① PUR/WHT
2 —
③ WHT/BLK
4 —

C806

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 —
⑩ BLU/ORN	21 GRN/ORN
11 —	22 —

C807

1 BLK/WHT
2 —
③ WHT
4 GRN/BLK
5 BLK/YEL
6 —
7 BLK/YEL

C808

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

C811

① RED/BLK
2 —
③ RED/WHT

C831

1 WHT/BLU	9 —
2 —	10 —
3 WHT	⑦ WHT/GRN
4 —	12 YEL
5 BLK/YEL	13 LT GRN
6 BLK	14 —
7 YEL/BLK	15 BLK/ORN
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

HONDA
HONDA MOTOR CO., LTD. TOKYO, JAPAN