

Transaxle

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Clutch

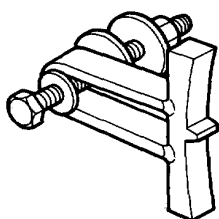
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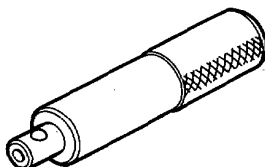
Special Tools

Special Tools

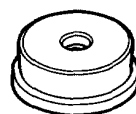
Ref.No.	Tool Number	Description	Q'ty	Remarks
①	07924-PD20003	Ring Gear Holder	1	
②	07749-0010000	Outer Handle A	1	
③	07746-0010200	Outer Driver, 37 x 40 mm	1	
④	07936-3710100	Handle	1	
⑤	07MAF-PR80100	Clutch Alignment Shaft	1	



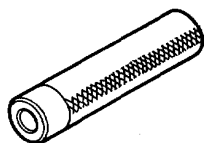
①



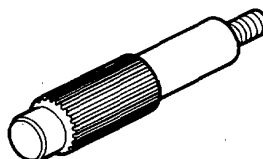
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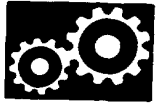
③



④

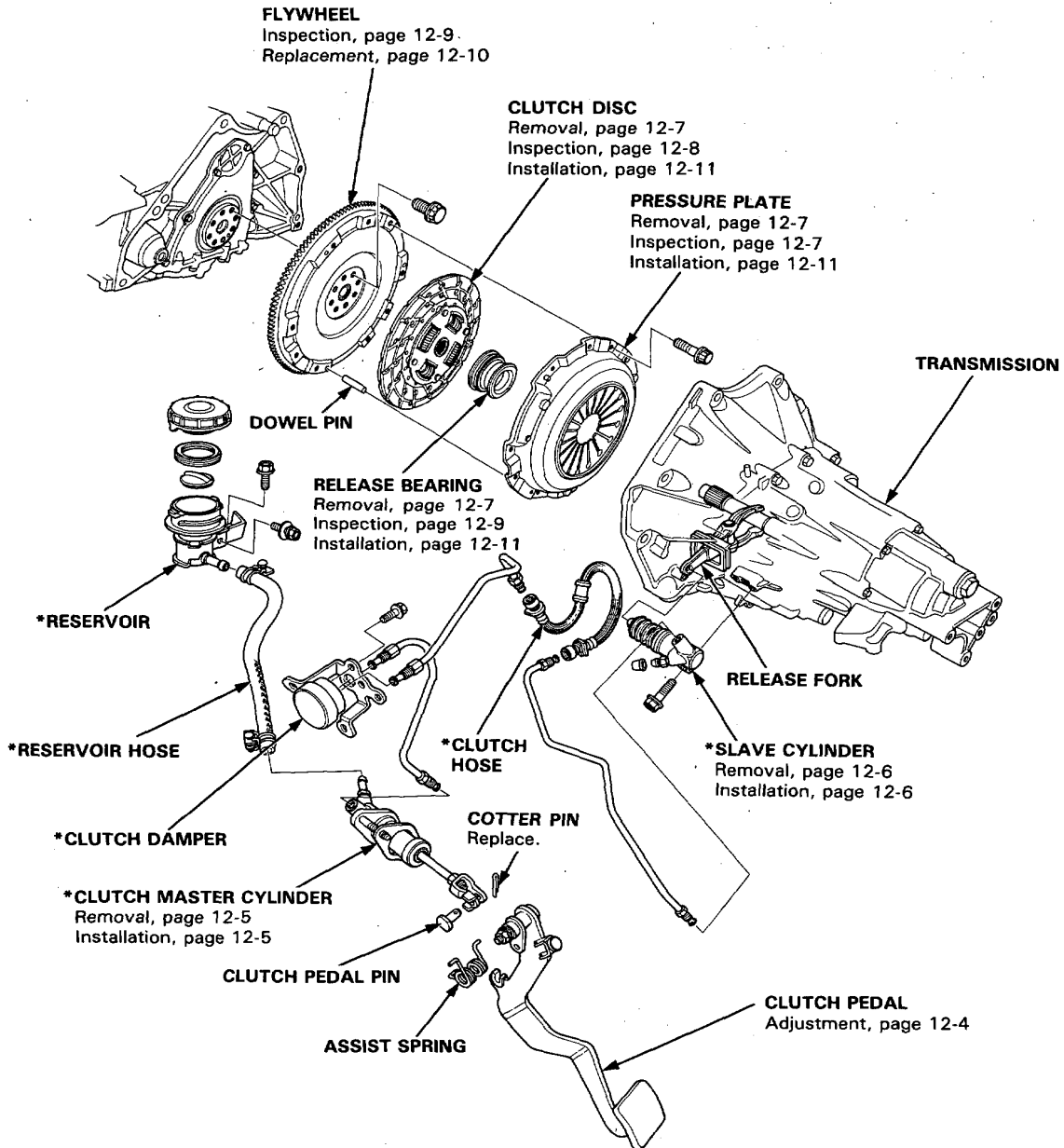


⑤



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.



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Pedal Free Play

NOTE:

- The clutch is self-adjusting to compensate for wear.
- Total clutch pedal free play is 9–15 mm (0.35–0.59 in).

CAUTION: If there is no clearance between the 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 pedal switch until it no longer touches the clutch pedal.
2. Loosen locknut C, and turn the push rod in or out to get the specified stroke and height at the clutch pedal.
3. Tighten locknut C.

4. Thread in the clutch pedal switch A in until it contacts the clutch pedal.

5. Turn the switch in 1/4–1/2 turn further.

6. Tighten locknut A.

7. Loosen locknut B and pedal switch B.

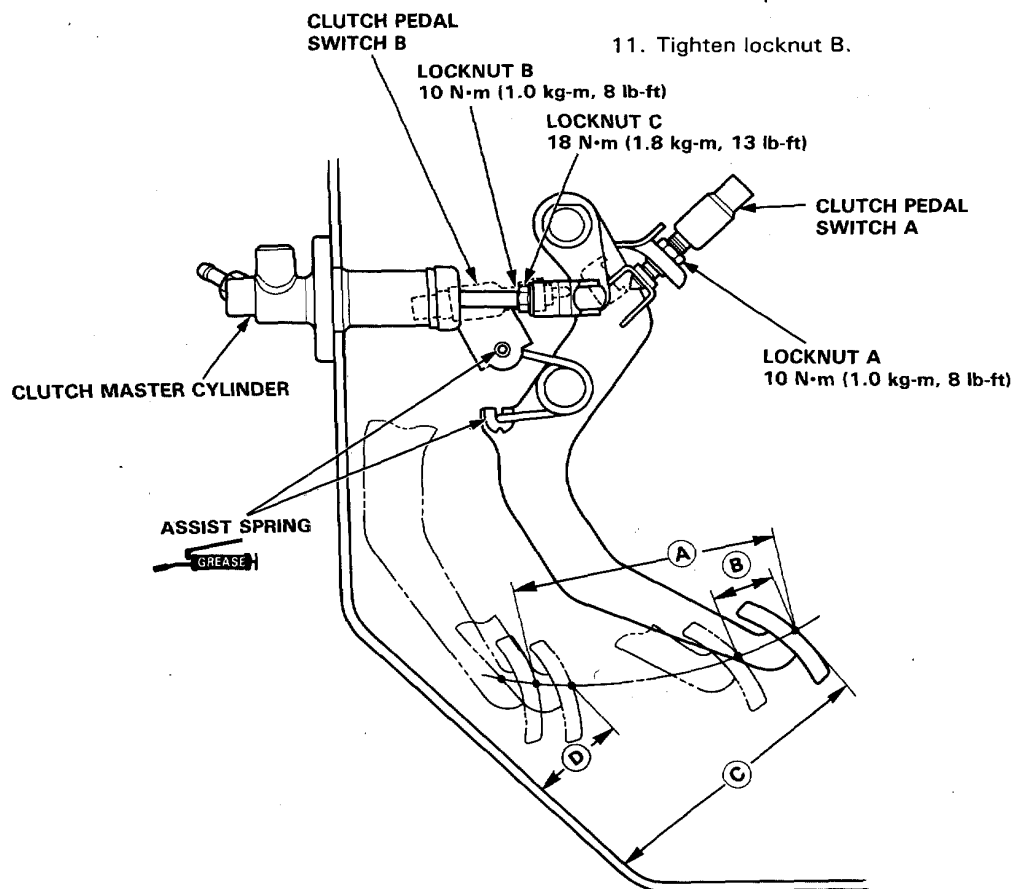
8. Measure the clearance between the floor board and clutch pedal with the clutch pedal fully depressed.

9. Release the clutch pedal 15–20 mm from the fully depressed position and hold it there.

Adjust the position of pedal switch B so that the engine will start with the clutch pedal in this position.

10. Thread in pedal switch B 1/4–1/2 turn further.

11. Tighten locknut B.



Ⓐ STROKE AT PEDAL: 142–148 mm (5.59–5.82 in)

Ⓑ PEDAL PLAY: 1.0–7.0 mm (0.04–0.28 in)

Ⓒ CLUTCH PEDAL HEIGHT: 199.5 mm (7.85 in)

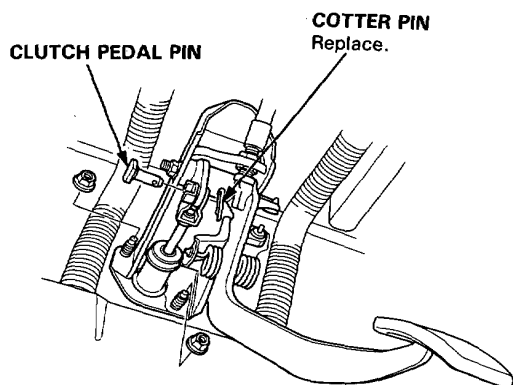
Ⓓ CLUTCH PEDAL DISENGAGEMENT HEIGHT: 90 mm (3.54 in) minimum to the floor.

Clutch Master Cylinder



Removal

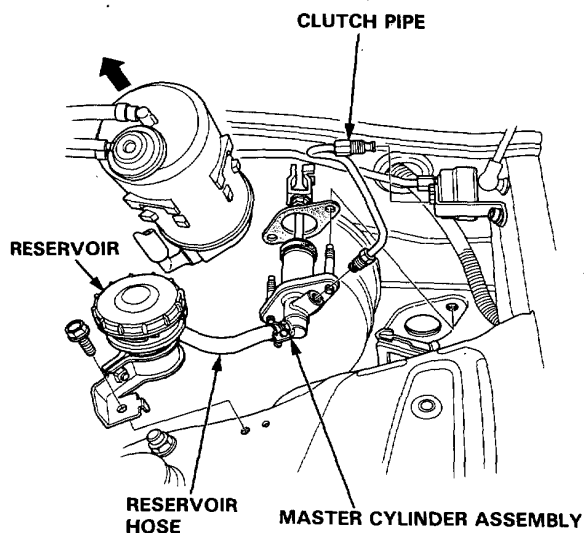
1. Pry out the cotter pin, and pull the pedal pin out of the yoke.



2. Remove the nuts and bolts attaching the master cylinder and remove the cylinder from the engine compartment.
3. Remove the clutch pipe and reservoir hose from the master cylinder.

CAUTION:

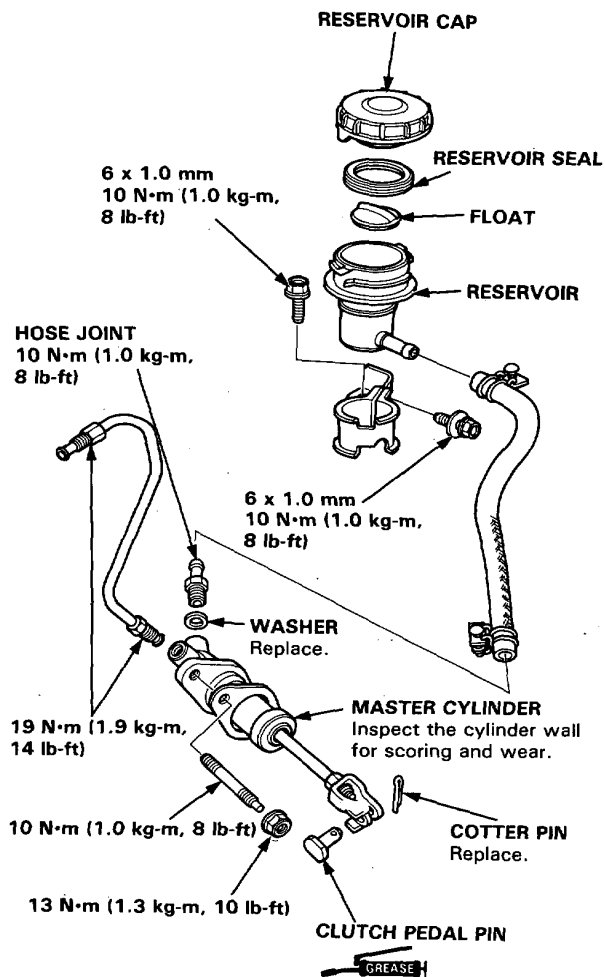
- Avoid spilling brake fluid on painted surface as it may damage the finish.
- Plug the end of the clutch pipe and reservoir hose with a shop towel to prevent fluid from flowing out of the clutch pipe and reservoir hose after disconnecting.



Installation

1. Install the clutch master cylinder in the reverse order of removal.

NOTE: Bleed the clutch hydraulic system (page 12-6).



Slave Cylinder

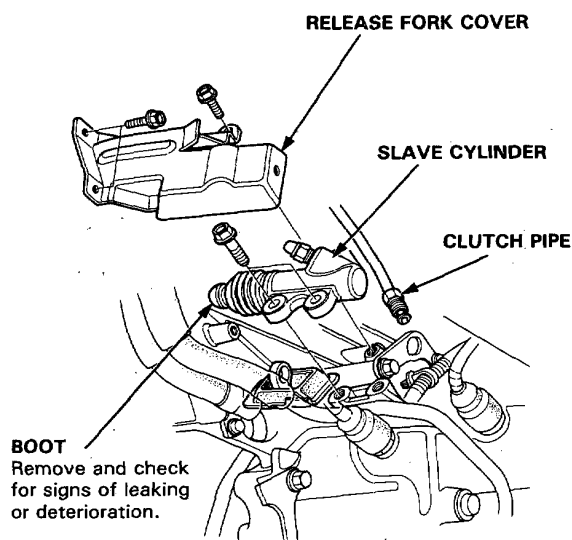
Removal

1. Remove the release fork cover.
2. Disconnect the clutch pipe from the slave cylinder.

CAUTION:

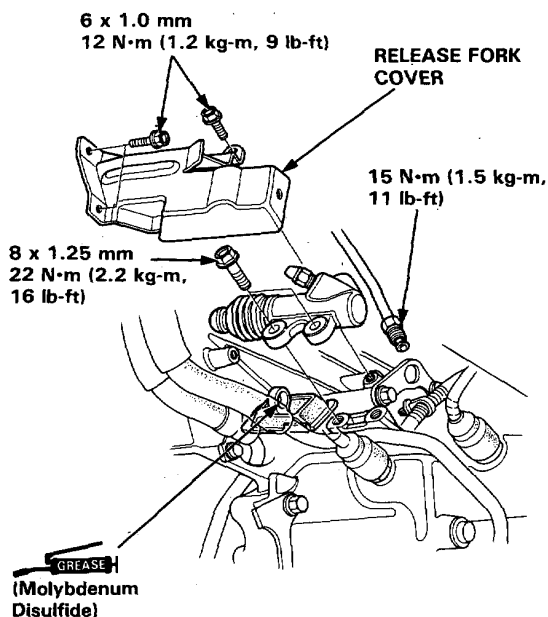
- Avoid spilling brake fluid on the painted surfaces, as it may damage the finish.
- Plug the end of the clutch pipe with a shop towel to prevent brake fluid from coming out.

3. Remove the slave cylinder from the clutch housing.



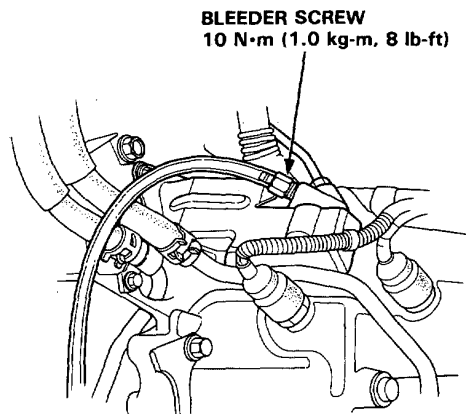
Installation

1. Install the slave cylinder assembly on the clutch housing.



2. Install the release fork cover.
3. Bleed the clutch hydraulic system:

- 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 master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
- Re-fill the master cylinder fluid when done.
- Use only DOT 3 or 4 brake fluid.

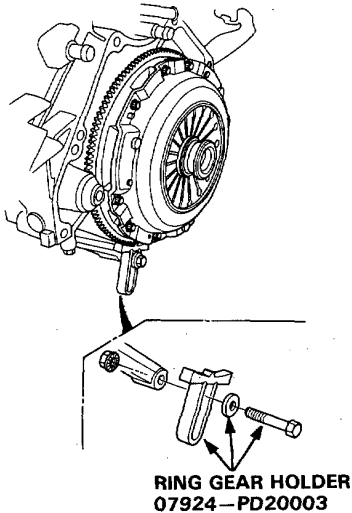




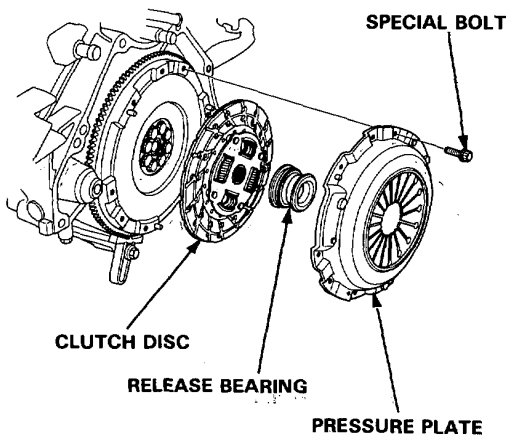
Pressure Plate, Clutch Disc

Removal

1. Install the Ring Gear Holder as shown.



2. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern, then remove the pressure plate and the clutch disc.
3. Remove the release bearing from the pressure plate.

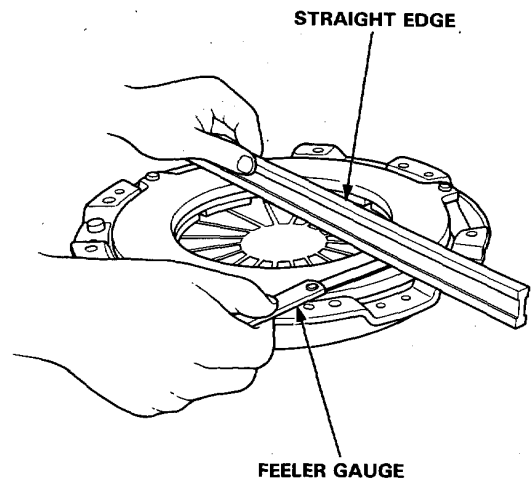


Pressure Plate

Inspection

1. Inspect the pressure plate surface for wear, cracks, or burning.
2. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.
3. Inspect for warpage using a straight edge and feeler gauge. Measure across the pressure plate.

Standard (New): 0.03 mm (0.0012 in) min.
Service Limit: 0.15 mm (0.0059 in)



Clutch Disc

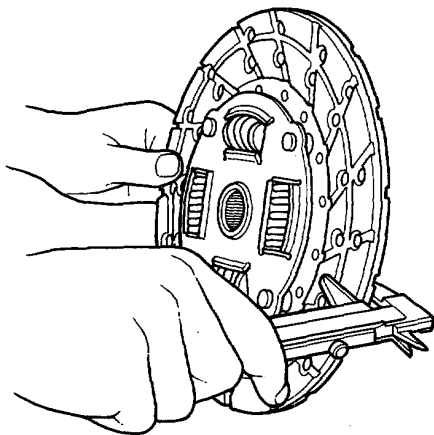
Inspection

1. Inspect the lining of the clutch disc for signs of slipping or oil. Replace it if it is burned black or oil soaked.
2. Measure the clutch disc thickness.

Clutch Disc Thickness:

Standard (New): 9.6—10.3 mm (0.38—0.41 in)

Service Limit: 6.8 mm (0.26 in)

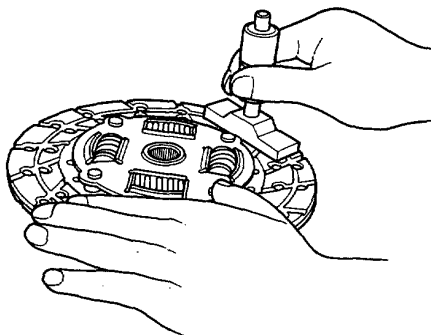


3. Measure the depth from the lining surface to the rivets, on both sides.

Rivet Depth:

Standard (New): 1.5 mm (0.059 in) min.

Service Limit: 0.5 mm (0.019 in)

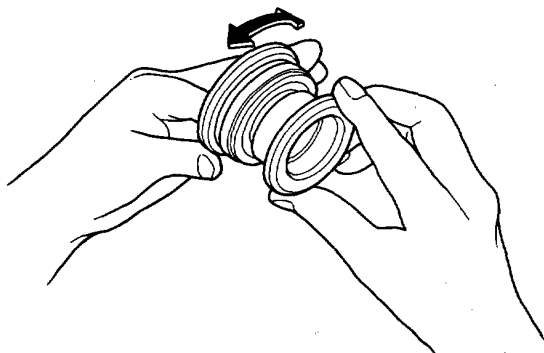


Release Bearing

Inspection

1. Check the release bearing for excessive play by spinning it by hand.

CAUTION: Do not wash it in solvent.



2. Replace the release bearing with a new one if there is excessive play.

Flywheel, Flywheel Bearing



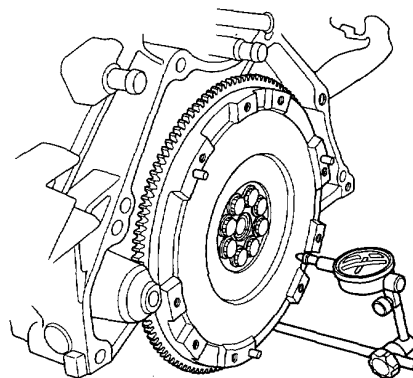
Inspection

1. Inspect the ring gear teeth for wear or damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks or 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.

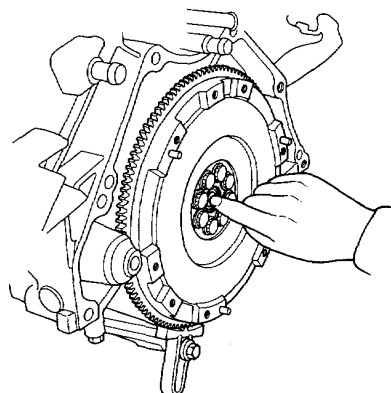
NOTE: The runout can be measured with engine installed.

Standard (New): 0.05 mm (0.0020 in) max.

Service Limit: 0.15 mm (0.0059 in)



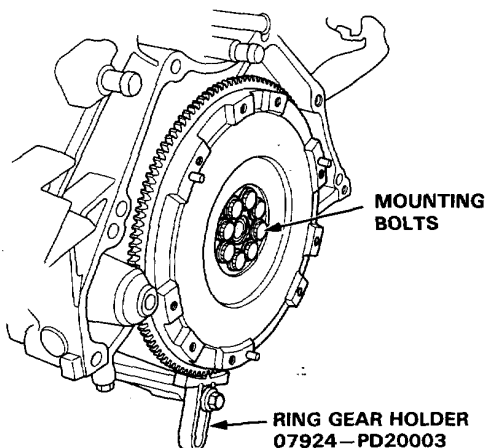
4. Turn the inner race of the flywheel bearing with your finger. The bearing should turn smoothly and quietly. Check that the bearing outer race fits tightly in the flywheel. Replace the bearing if the race does not turn smoothly, quietly, or fit tight in the flywheel.



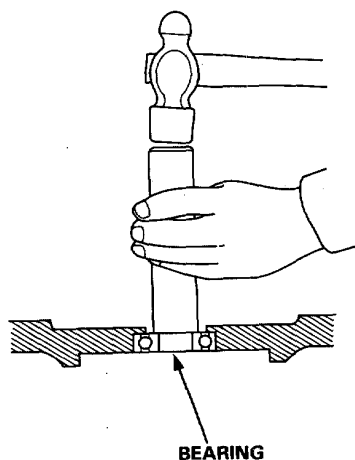
Flywheel, Flywheel Bearing

Replacement

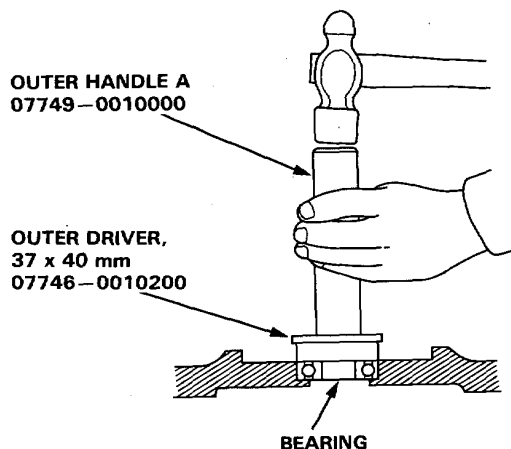
1. Remove the flywheel mounting bolts and the flywheel.



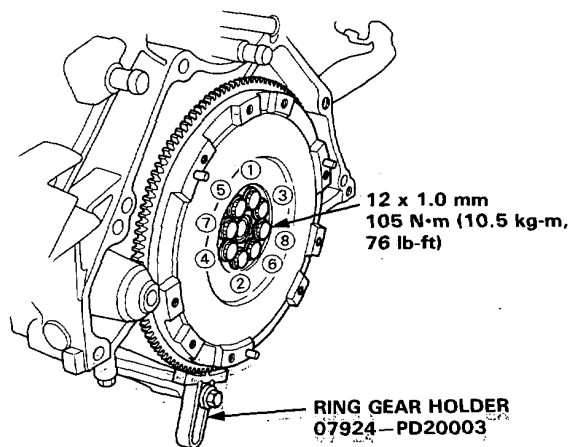
2. Remove the bearing from the flywheel.



3. Drive in the new bearing into the flywheel using the special tools.



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

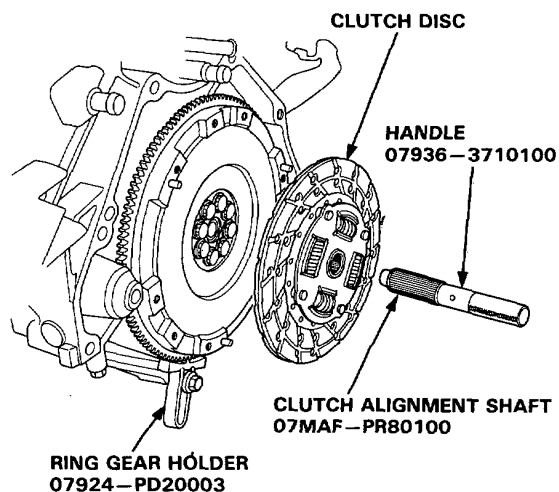




Pressure Plate, Clutch Disc

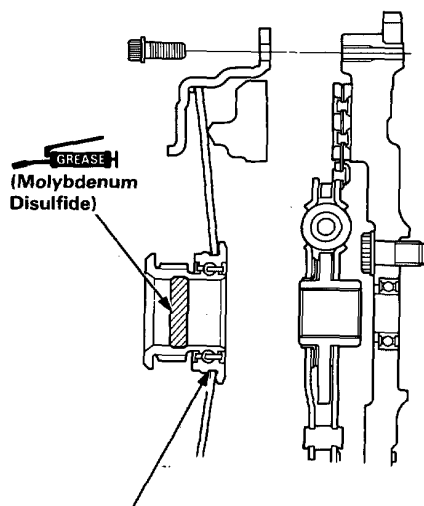
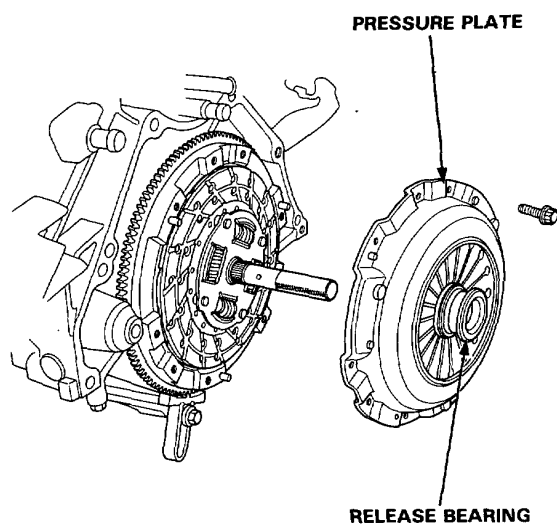
Installation

1. Install the ring gear holder.
2. Install the clutch disc.
3. Install the clutch alignment shaft.



4. Install the release bearing on the pressure plate.
5. Install the pressure plate.

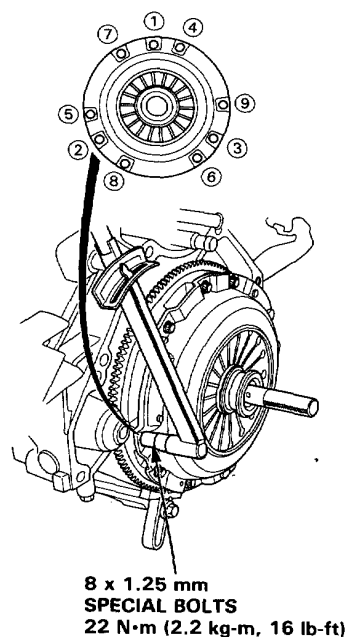
NOTE: After installed, make sure the release bearing does not come off.



Place the diaphragm spring fingers in the groove of the release bearing.

6. Torque the bolts in a crisscross pattern as shown. Tighten them two turns at a time to prevent warping the diaphragm spring.

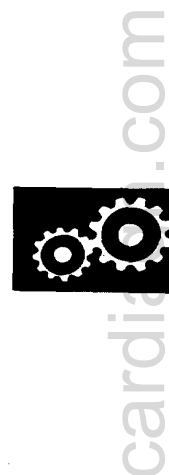
NOTE: After installed, make sure the release bearing does not come off.



7. Remove the alignment tool and ring gear holder.

Manual Transmission

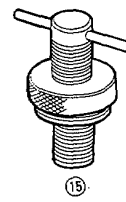
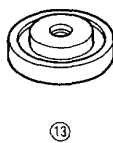
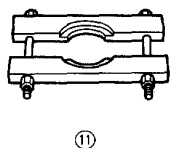
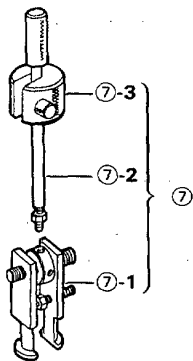
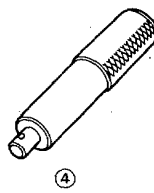
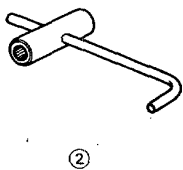
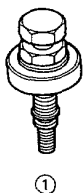
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Special Tools

Special Tools

Ref. No.	Tool Number	Description	Qty	Remarks
①	07LAC—PW50100	Extension Shaft Remover	1	Component Tool
②	07LAB—PW50101	Mainshaft Holder	1	
③	07744—0010400	Pin Driver, 5.0 mm	1	
④	07749—0010000	Outer Handle A	1	
⑤	07GAD—PG40100	Oil Seal Driver	1	
⑥	07746—0010600	Outer Driver, 72 x 75 mm	1	
⑦	07JAC—PH80000	Adjustable Bearing Remover Set	1	
⑦-1	07JAC—PH80100	Bearing Remover Attachment	(1)	
⑦-2	07JAC—PH80200	Remover Handle Assembly	(1)	
⑦-3	07741—0010201	Remover Weight	(1)	
⑧	07746—0010400	Outer Driver, 52 x 55 mm	1	
⑨	07746—0010500	Outer Driver, 62 x 68 mm	1	
⑩	07746—0010300	Outer Driver, 42 x 47 mm	1	
⑪	07KAF—PS30200	Bearing Race Remover	1	
⑫	07MAD—PR90100	Attachment, 45 x 55 mm	1	
⑬	07LAD—SM40100	Oil Seal Driver	1	
⑭	07GAD—SD40101	Attachment, 78 x 90 mm	1	
⑮	07MAF—PY40100	Extension Shaft Installer	1	

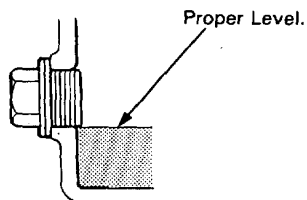


Maintenance

Transmission Oil

NOTE: Check the oil at operating temperature, engine OFF, and the car on level ground.

1. Remove the oil filler plug, then check the level and condition of the oil.



2. The oil level must be up to the fill hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug.
3. If the oil is dirty, remove drain plug and drain transmission.
4. Reinstall the drain plug with a new washer, and refill to proper level.

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

5. Reinstall the oil filler plug with a new washer.

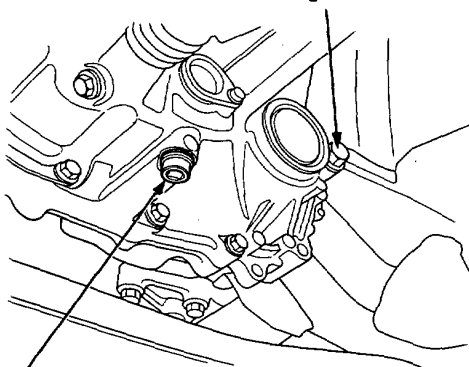
Oil Capacity

2.3 ℓ (2.4 U.S. qt.) after drain.

2.6 ℓ (2.7 U.S. qt.) after overhaul.

Use only SAE10W-30 or 10W-40, SF or SG grade.

OIL FILLER PLUG
45 N·m (4.5 kg-m, 33 lb-ft)



DRAIN PLUG
40 N·m (4.0 kg-m, 29 lb-ft)

Back-up Light Switch, Neutral Switch



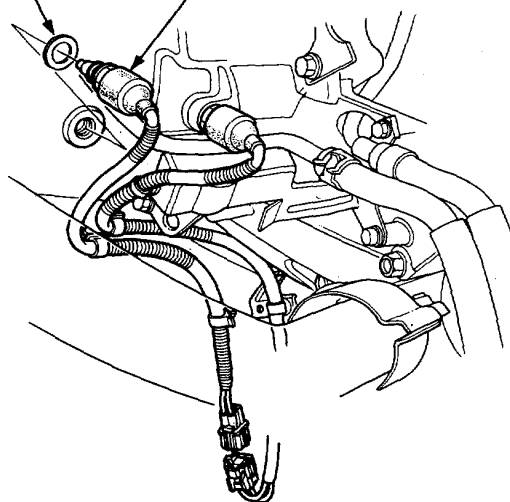
Replacement

NOTE: To check the switch, see section 23.

1. Disconnect the connector, then remove the switch connector from the connector clamp.
2. Remove the switch.
3. Apply liquid gasket (P/N08718-0001) to the switch threads, then install the switch.

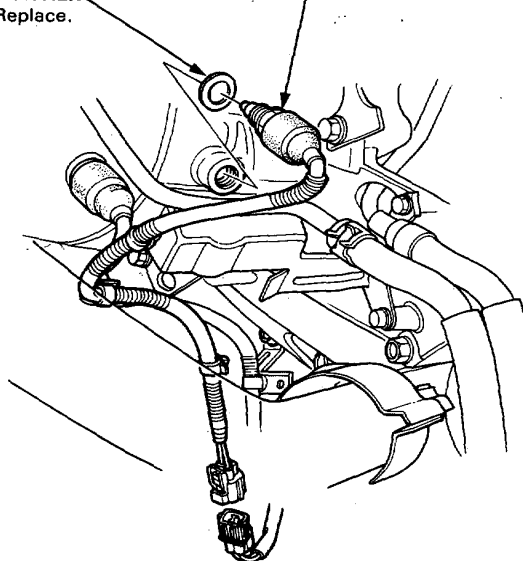
NEUTRAL SWITCH
25 N·m (2.5 kg-m, 18 lb-ft)

WASHER
Replace.



WASHER
Replace.

BACK-UP LIGHT SWITCH
25 N·m (2.5 kg-m, 18 lb-ft)



Transmission Assembly

Removal

⚠ WARNING

- Make sure jacks and safety stands are placed properly, and hoist brackets are attached to correct positions on the engine.
- Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

CAUTION: Use fender covers to avoid damaging painted surfaces.

NOTE: The L and LS model radios have a coded theft protection circuit. If servicing to the car requires any of the following, be sure you get the customer's code number before you begin work:

- disconnecting the battery.
- removal of No. 56 fuse.
- removal of the radio.

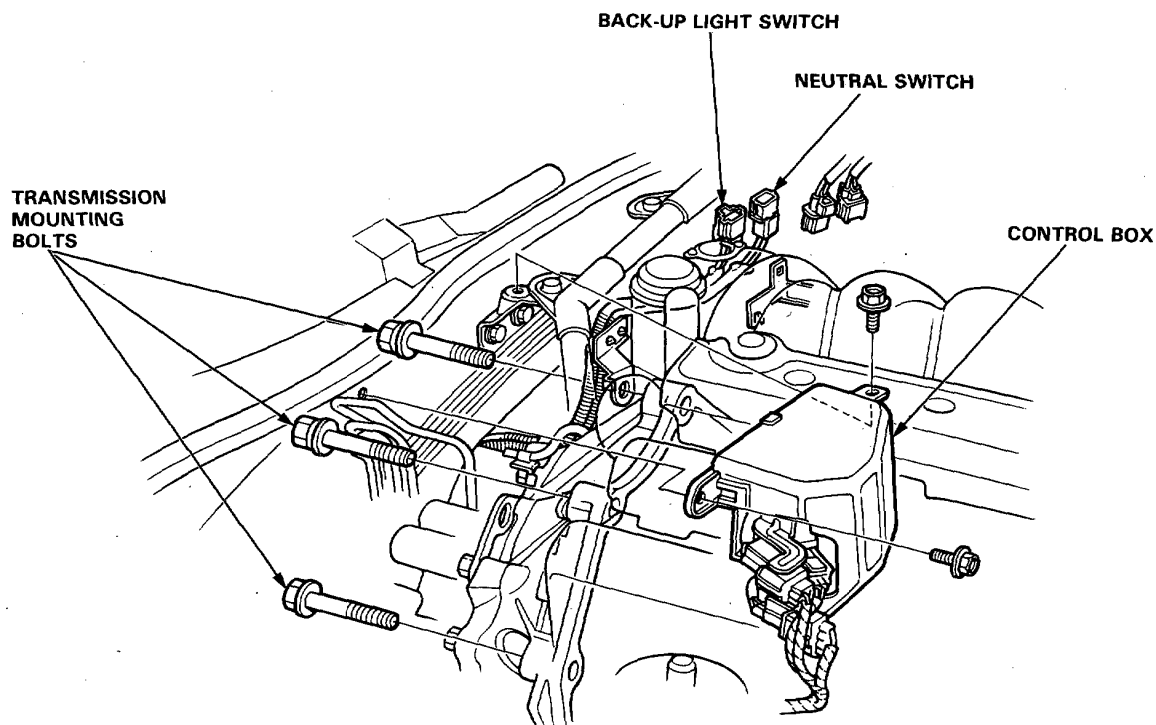
After service, reconnect power to the radio and turn it on.

The word "CODE" will be displayed. Enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative (-) and positive (+) cables from the battery.
2. Remove the strut bar.
3. Drain the transmission oil.
Reinstall the drain plug with a new washer.
4. Remove the control box.

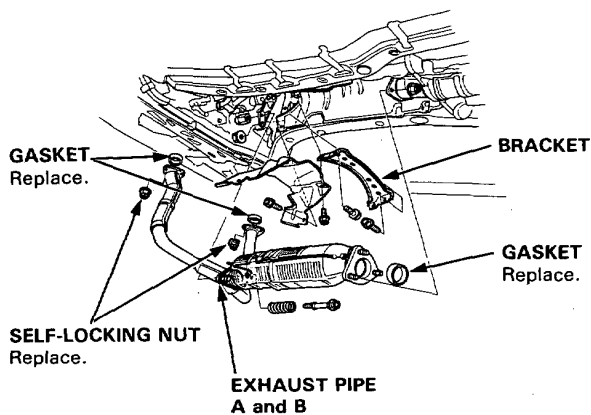
CAUTION: Do not remove the vacuum tubes from the control box.

5. Disconnect the switch connectors.
6. Remove the transmission housing bolts.
7. Remove the clutch hose bracket from the rear engine hanger.





8. Remove the exhaust pipe B and A.
9. Remove the heat shield and bracket.



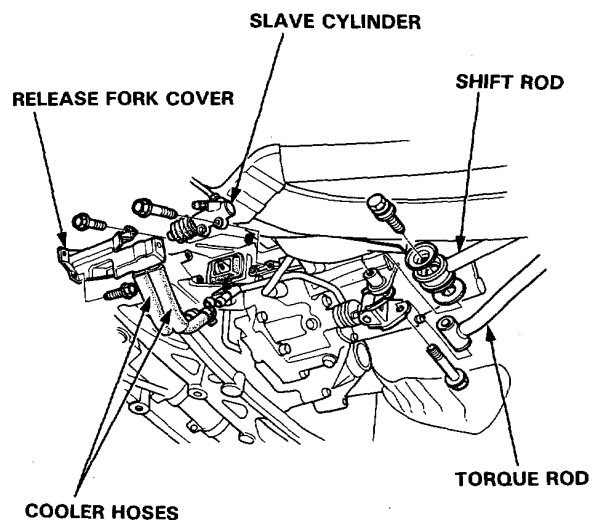
10. Remove the shift rod and torque rod.
11. Disconnect the cooler hoses from the oil pump pipes.

NOTE: Check for any signs of leakage at the oil pump pipes.

12. Remove the release fork cover and slave cylinder.

NOTE:

- Do not operate the clutch pedal once the slave cylinder has been removed.
- Take care not to bend the pipe.



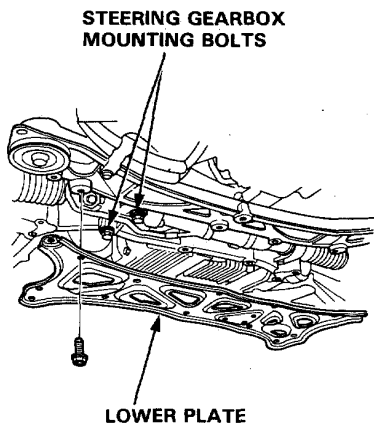
(cont'd)

Transmission Assembly

Removal (cont'd)

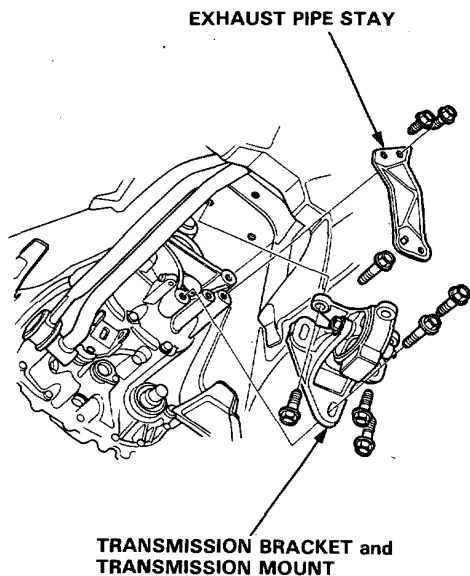
13. Remove the lower plate.

NOTE: Reinstall the steering gearbox mounting bolts.



14. Remove the exhaust pipe stay.

15. Remove the transmission bracket and transmission mount.



16. Remove the secondary cover and 36 mm sealing bolt.

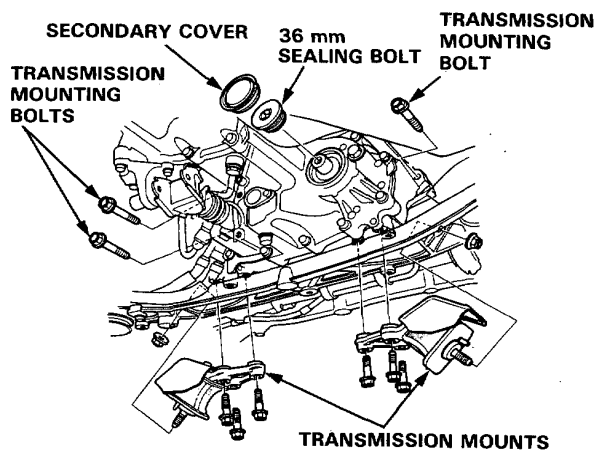
NOTE: Shift the transmission to low gear to lock the secondary gear.

17. Place a jack under the transmission.

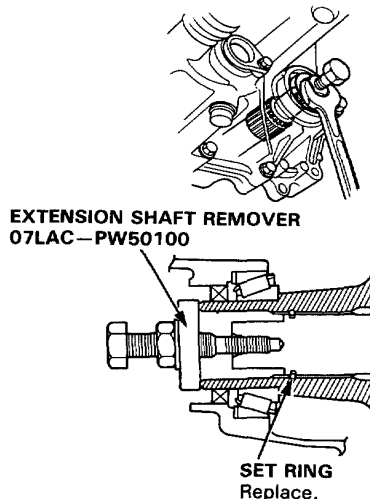
18. Remove the transmission mounts.

19. Remove the release fork from the clutch release hanger, then hang the release fork on the clutch housing.

20. Remove the transmission housing mounting bolts.

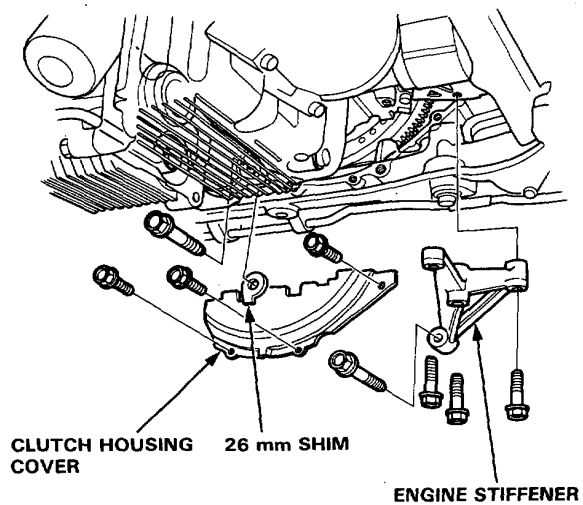


21. Disconnect the extension shaft from the differential using the special tool.

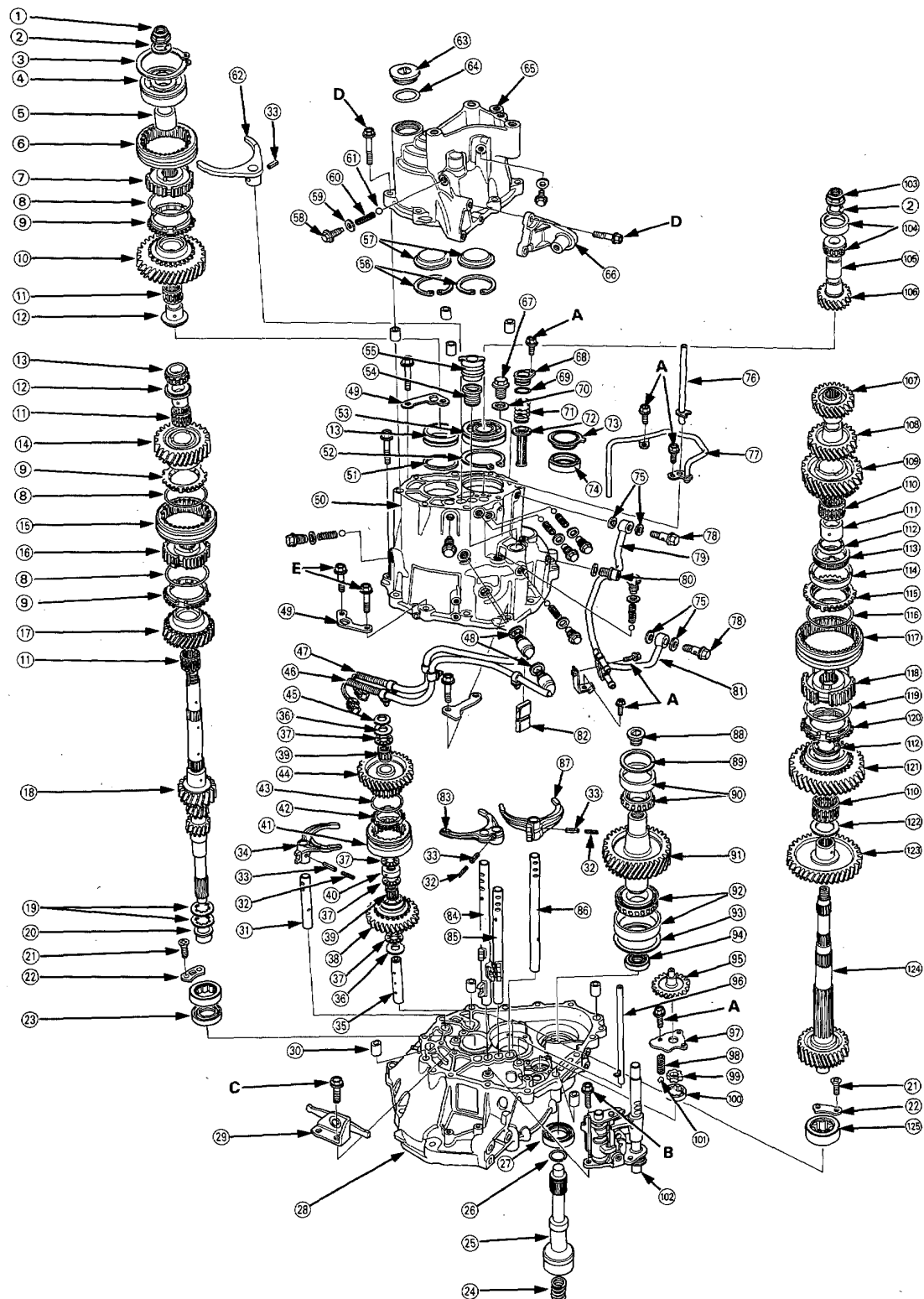




23. Remove the engine stiffener.
24. Remove the clutch cover.
25. Remove the transmission mounting bolts and 26 mm shim.



Illustrated Index





NOTE: Always clean the magnet ⑧② whenever the transmission housing is disassembled.

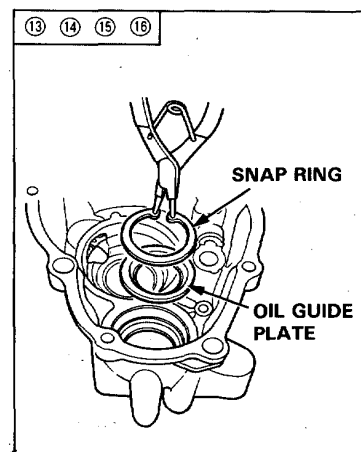
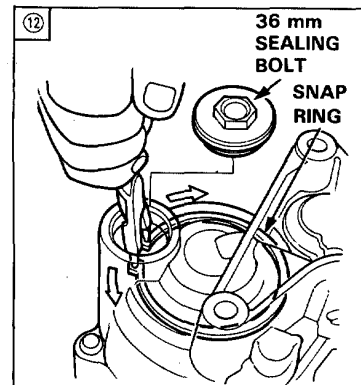
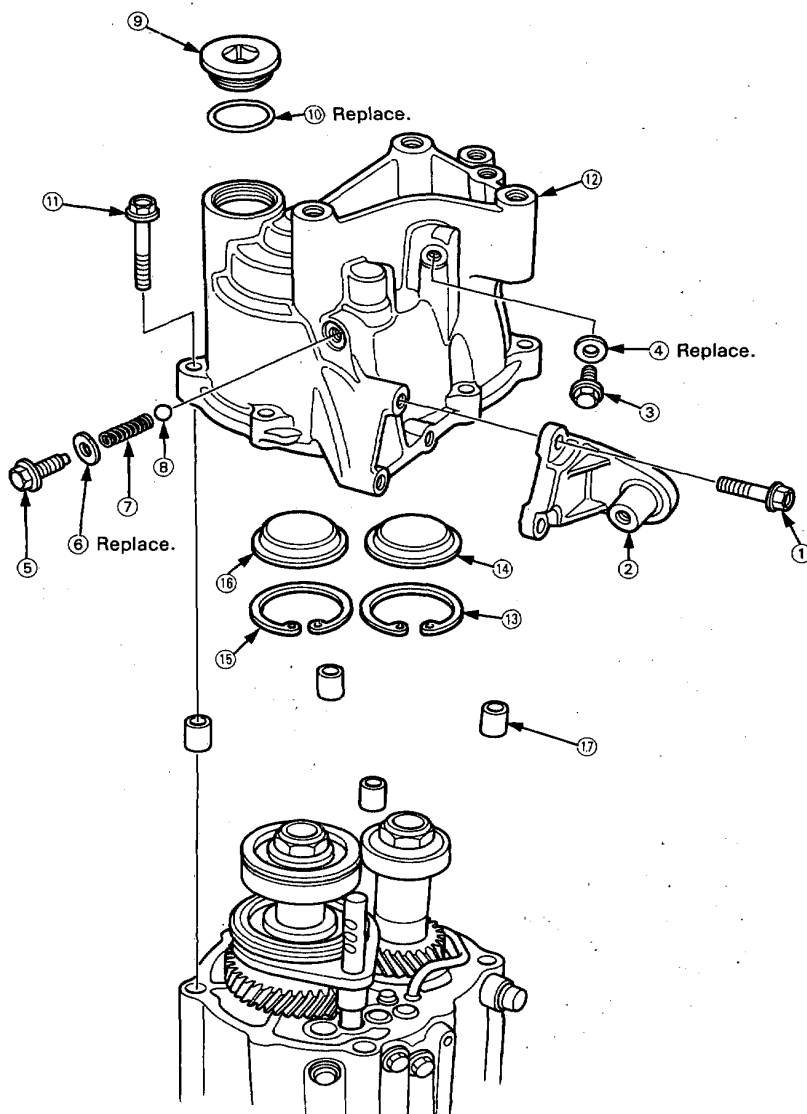
Torque Value	Bolt Size
A—12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm
B—15 N·m (1.5 kg-m, 11 lb-ft)	6 x 1.0 mm
C—26 N·m (2.6 kg-m, 19 lb-ft)	8 x 1.25 mm
D—28 N·m (2.8 kg-m, 21 lb-ft)	8 x 1.25 mm
E—45 N·m (4.5 kg-m, 33 lb-ft)	10 x 1.25 mm

- ① LOCKNUT Replace.
160 → 0 → 160 N·m
(16 → 0 → 16 kg-m,
116 → 0 → 116 lb-ft)
- ② SPRING WASHER
- ③ SNAP RING
- ④ BALL BEARING
- ⑤ 28 x 37 x 34 mm DISTANCE COLLAR
- ⑥ 5TH SYNCHRO SLEEVE
- ⑦ 5TH SYNCHRO HUB
- ⑧ SYNCHRO SPRING
- ⑨ SYNCHRO RING
- ⑩ 5TH GEAR
- ⑪ 38 x 44 x 29.5 mm NEEDLE BEARING
- ⑫ 31 x 38 x 34 mm DISTANCE COLLAR
- ⑬ NEEDLE BEARING
- ⑭ 4TH GEAR
- ⑮ 3RD/4TH SYNCHRO SLEEVE
- ⑯ 3RD/4TH SYNCHRO HUB
- ⑰ 3RD GEAR
- ⑱ MAINSHAFT
- ⑲ MAINSHAFT WASHER
- ⑳ 28 x 53 x 19 mm NEEDLE BEARING
- ㉑ FLAT SCREW Replace.
- ㉒ NEEDLE SET PLATE
- ㉓ 28 x 43 x 7 mm OIL SEAL Replace.
- ㉔ SECONDARY SPRING
- ㉕ EXTENSION SHAFT
- ㉖ SET RING Replace.
- ㉗ 55 x 75 x 11 mm OIL SEAL Replace.
- ㉘ CLUTCH HOUSING
- ㉙ REVERSE SHIFT HOLDER
- ㉚ 14 x 20 mm DOWEL PIN
- ㉛ REVERSE SHIFT FORK SHAFT
- ㉜ SPRING PIN 3 x 22 mm Replace.
- ㉝ SPRING PIN 5 X 22 mm Replace.
- ㉞ REVERSE SHIFT FORK
- ㉟ REVERSE GEAR SHAFT
- ㊱ 20 x 36 x 2 mm THRUST WASHER
- ㊲ 20 x 37 x 2.5 mm NEEDLE BEARING
- ㊳ REVERSE DRIVE GEAR
- ㊴ 20 x 25 x 26.5 mm NEEDLE BEARING
- ㊵ 20 x 36 x 9.5 mm DISTANCE COLLAR
- ㊶ REVERSE SYNCHRO SLEEVE
- ㊷ SYNCHRO RING
- ㊸ SYNCHRO SPRING
- ㊹ REVERSE SYNCHRO HUB
- ㊺ SPRING WASHER
- ㊻ BACK-UP LIGHT SWITCH
- ㊼ 25 N·m (2.5 kg-m, 18 lb-ft)
- ㊽ NEUTRAL SWITCH
- ㊾ 25 N·m (2.5 kg-m, 18 lb-ft)
- ㊿ WASHER Replace.
- ① TRANSMISSION HANGER
- ② TRANSMISSION HOUSING
- ③ 62 mm SNAP RING
- ④ 78 mm SNAP RING
- ⑤ 32 x 78 x 20 mm BALL BEARING
- ⑥ 16 x 27 x 16 mm OIL SEAL Replace.
- ⑦ SHIFT ROD BOOT
- ⑧ SNAP RING
- ⑨ OIL GUIDE PLATE
- ⑩ SEALING BOLT
- ⑪ WASHER Replace.
- ⑫ SPRING
- ⑬ STEEL BALL
- ⑭ 5TH SHIFT FORK
- ⑮ SEALING BOLT
- ⑯ 25 N·m (2.5 kg-m, 18 lb-ft)
- ⑰ 35.5 x 3 mm O-RING Replace.
- ⑱ TRANSMISSION COVER
- ⑲ EXTENSION STAY
- ⑳ OIL FILLER PLUG
- ㉑ 45 N·m (4.5 kg-m, 33 lb-ft)
- ㉒ STRAINER COVER
- ㉓ 29.7 X 2.4 mm O-RING Replace.
- ㉔ WASHER Replace.
- ㉕ STRAINER SET SPRING
- ㉖ OIL PUMP STRAINER
- ㉗ SECONDARY COVER
- ㉘ 45 x 61 x 8 mm OIL SEAL Replace.
- ㉙ WASHER Replace.
- ㉚ OIL GUIDE PIPE
- ㉛ REVERSE PIPE
- ㉜ JOINT BOLT
- ㉝ 29 N·m (2.9 kg-m, 21 lb-ft)
- ㉞ OIL PUMP PIPE B
- ㉟ DRAIN PLUG
- ㊱ 40 N·m (4.0 kg-m, 29 lb-ft)
- ㊲ OIL PUMP PIPE A
- ㊳ MAGNET
- ㊴ 3RD/4TH SHIFT FORK
- ㊵ 5TH/REVERSE SHIFT FORK SHAFT
- ㊶ 3RD/4TH SHIFT FORK SHAFT
- ㊷ 1ST/2ND SHIFT FORK SHAFT
- ㊸ 1ST/2ND SHIFT FORK
- ㊹ 36 mm SEALING BOLT
- ㊺ 80 N·m (8.0 kg-m, 58 lb-ft)
- ① 75 mm THRUST SHIM
Selection, page 13-32
- ② TAPERED ROLLER BEARING
- ③ SECONDARY GEAR
- ④ TAPERED ROLLER BEARING
- ⑤ 90 mm THRUST WASHER
- ⑥ 37.5 x 47 x 7 mm OIL SEAL Replace.
- ⑦ OIL PUMP SHAFT
- ⑧ OIL GUIDE PIPE C
- ⑨ OIL PUMP PLATE
- ⑩ RELIEF VALVE SPRING
- ⑪ OIL PUMP INNER
- ⑫ OIL PUMP OUTER
- ⑬ STEEL BALL
- ⑭ CHANGE HOLDER
- ⑮ LOCKNUT Replace.
160 → 0 → 160 N·m
(16 → 0 → 16 kg-m,
116 → 0 → 116 lb-ft)
- ⑯ 28 x 62 x 16 mm NEEDLE BEARING
- ⑰ 31 x 38 x 43 mm DISTANCE COLLAR
- ⑱ 5TH GEAR
- ⑲ 4TH GEAR
- ⑳ 3RD GEAR
- ㉑ 2ND GEAR
- ㉒ 47 x 53 x 31 mm NEEDLE BEARING
- ㉓ SPACER COLLAR
Selection, page 13-27
- ㉔ FRICTION DAMPER
- ㉕ INNER SYNCHRO RING
- ㉖ SYNCHRO CONE
- ㉗ OUTER SYNCHRO RING
- ㉘ SYNCHRO SPRING
- ㉙ 1ST/2ND SYNCHRO SLEEVE
- ㉚ 1ST/2ND SYNCHRO HUB
- ㉛ SYNCHRO SPRING
- ㉜ SYNCHRO RING
- ㉝ LOW GEAR
- ㉞ 60 mm THRUST SHIM
Selection, page 13-27
- ㉟ REVERSE GEAR
- ㊱ COUNTERSHAFT
- ㊲ 33 x 62 x 22 mm NEEDLE BEARING

Transmission Cover

Removal

1. Remove the transmission cover following the numbered sequence.



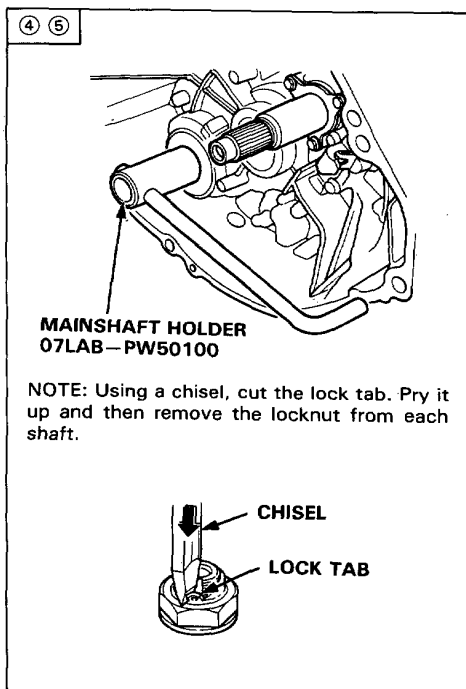
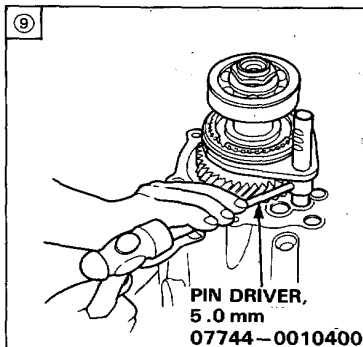
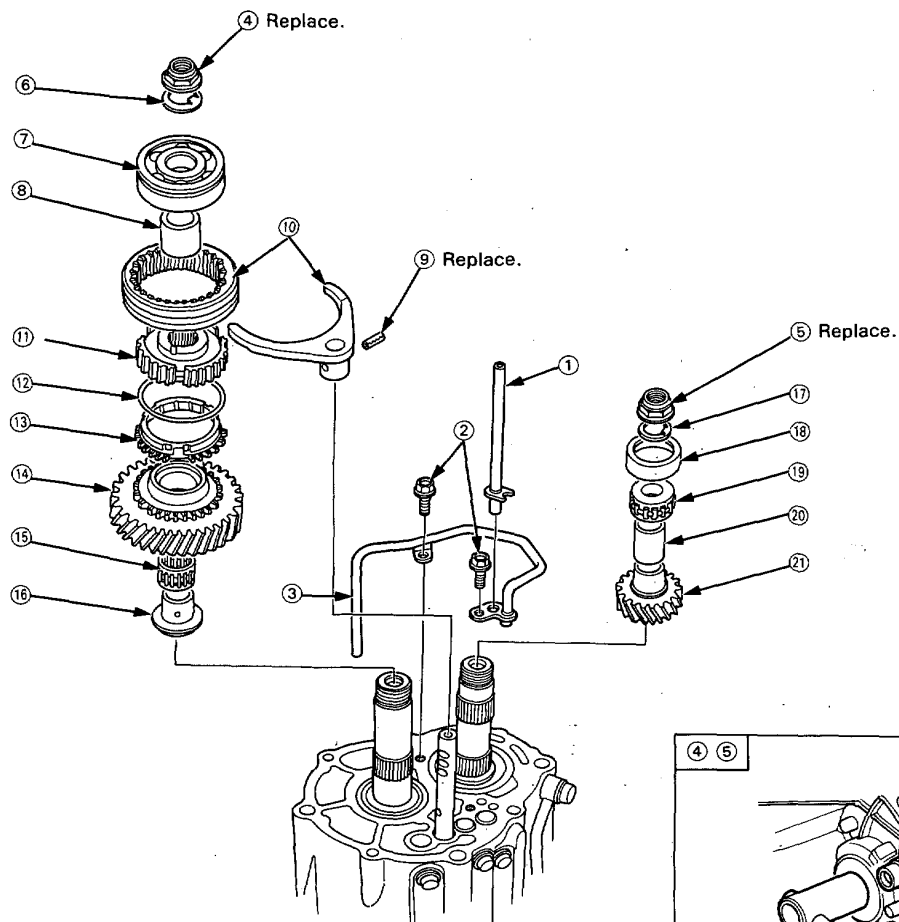
5th Gear



Removal

1. Remove 5th gear following the numbered sequence.

NOTE: Countershaft locknut has left-hand threads.



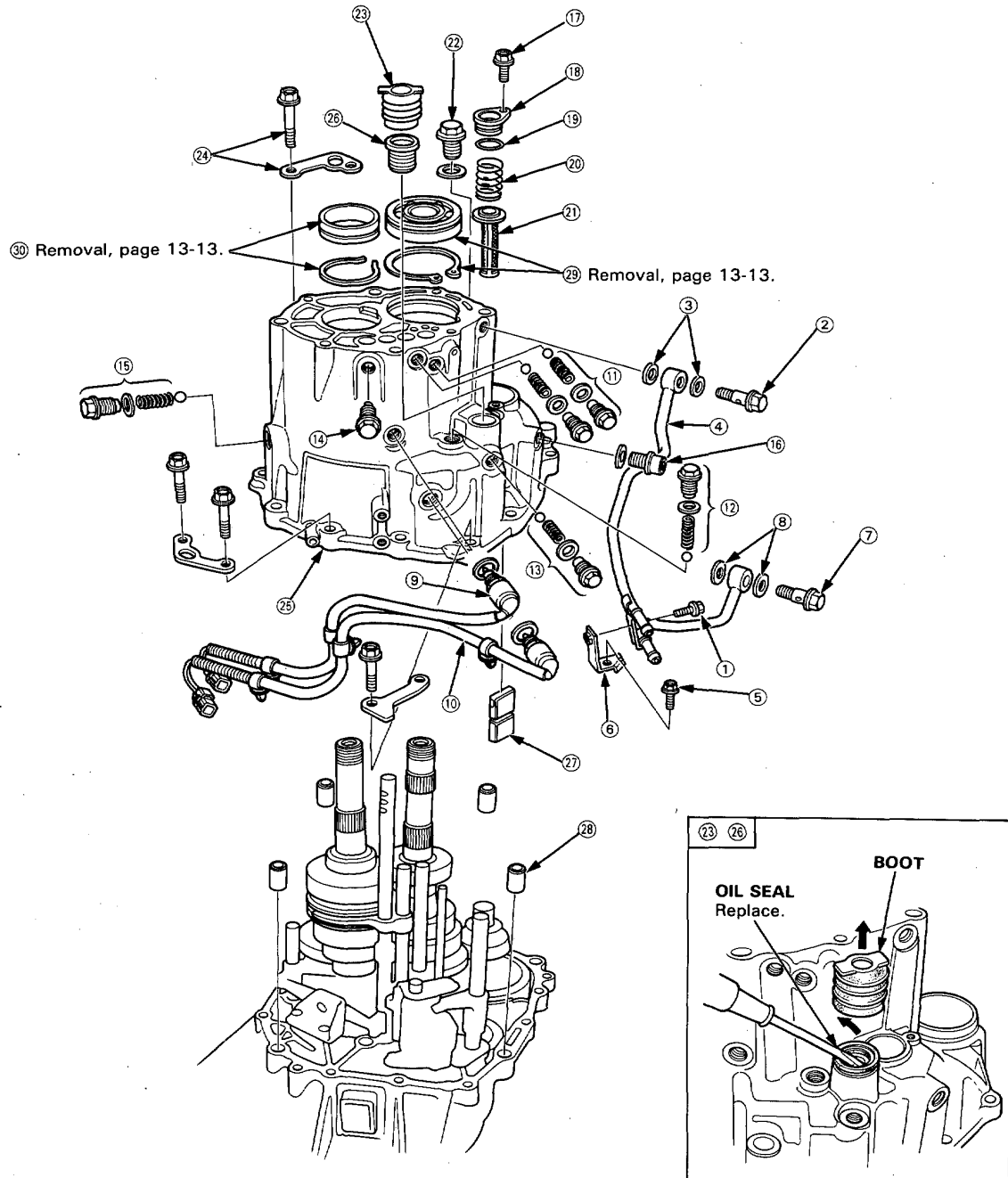
Transmission Housing

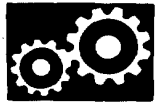
Removal

NOTE:

- Replace all sealing washers, O-rings and oil seals.
- Always clean the magnet (27).

1. Remove the transmission housing following the numbered sequence.

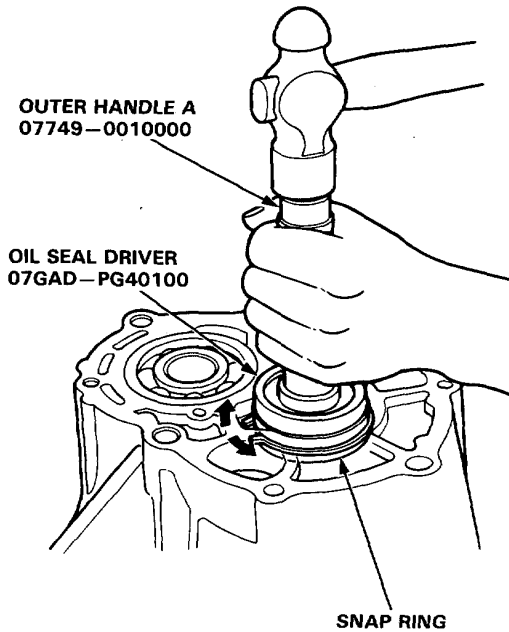




Bearing Removal

Mainshaft Side:

1. Remove the mainshaft ball bearing while expanding the snap ring, using the special tools.

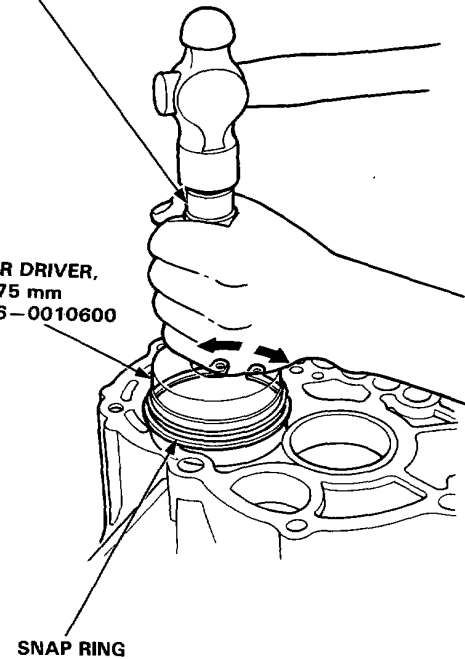


Countershaft Side:

1. Remove the countershaft bearing outer race while expanding the snap ring, using the special tools.

OUTER HANDLE A
07749-0010000

OUTER DRIVER,
72 x 75 mm
07746-0010600

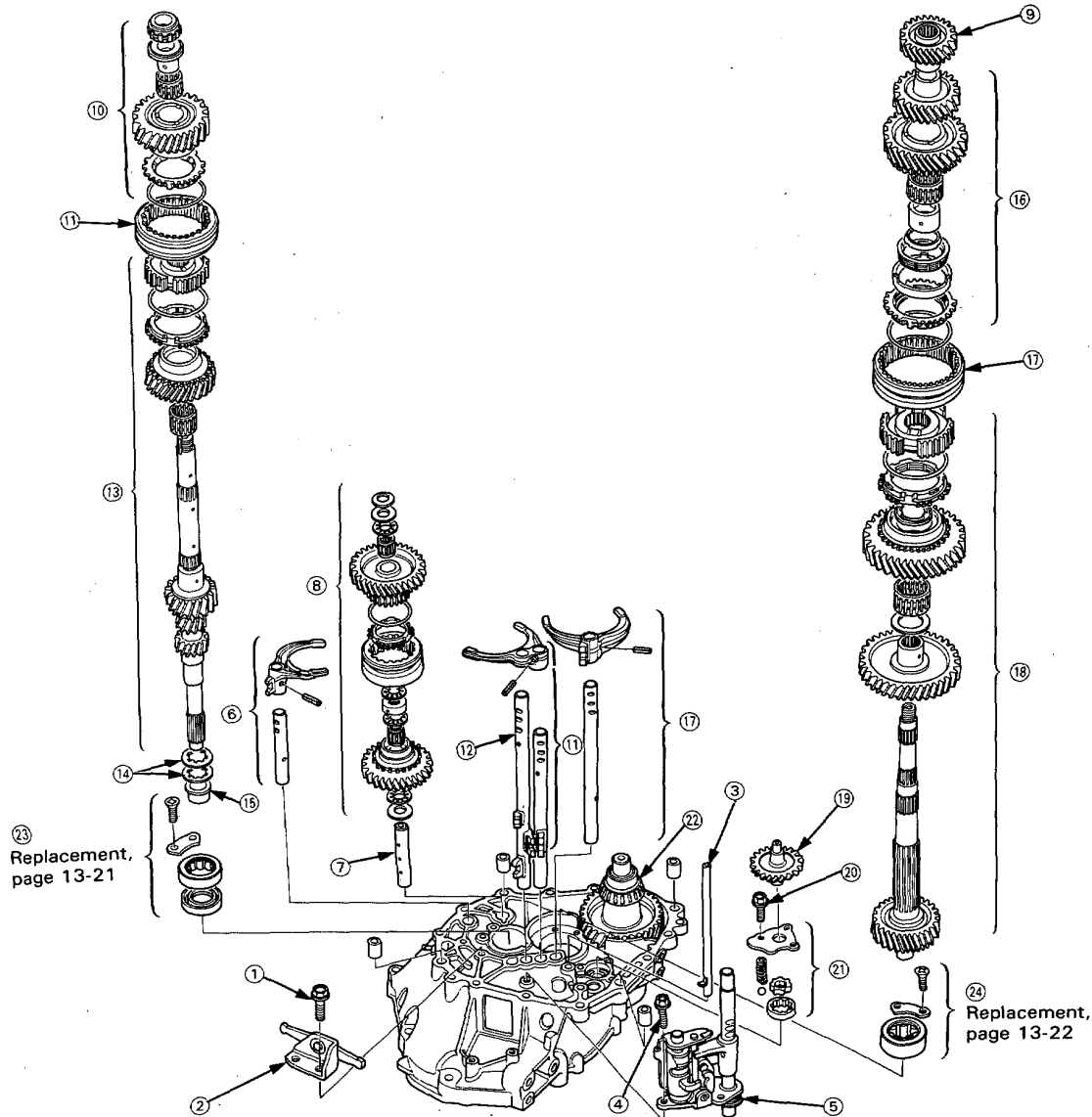
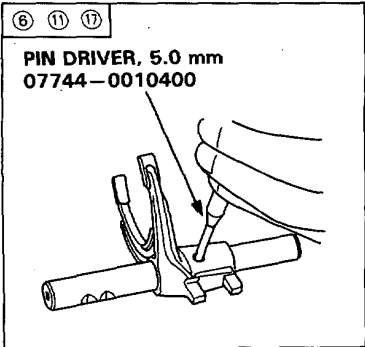


Mainshaft, Countershaft, Reverse Gear Shaft

Disassembly

1. Disassemble the mainshaft, countershaft and the reverse gear shaft assemblies following the numbered sequence.

NOTE: Always replace the spring pins when removed.



Mainshaft, Countershaft



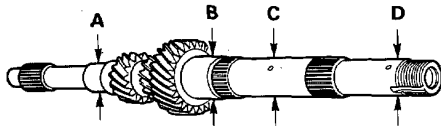
Inspection

1. Inspect the mainshaft surface for wear or damage, then measure the mainshaft at points A, B, C and D.

Standard:

- A (Needle bearing surface):**
27.977–27.990 mm
(1.1015–1.1020 in)
- B (Needle bearing surface):**
37.989–38.000 mm
(1.4956–1.4961 in)
- C (Needle bearing surface):**
30.987–31.000 mm
(1.2200–1.2205 in)
- D (Ball bearing surface):**
27.987–28.000 mm
(1.1018–1.1024 in)

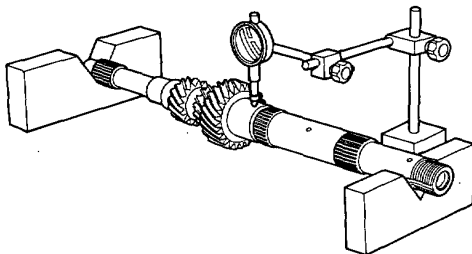
Service Limit: A: 27.93 mm (1.0996 in)
B: 37.935 mm (1.4935 in)
C: 30.94 mm (1.2181 in)
D: 27.937 mm (1.0999 in)



Replace the mainshaft if any part of it is less than the service limit.

2. Inspect for runout.

Standard: 0.02 mm (0.0008 in)
Service Limit: 0.05 mm (0.0020 in)



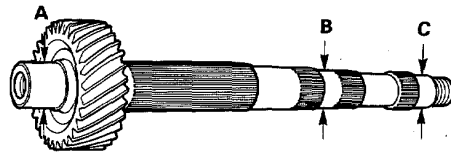
Replace the mainshaft if the runout exceeds the service limit.

3. Inspect the countershaft surface for wear or damage, then measure the countershaft at points A, B and C.

Standard:

- A (Needle bearing surface):**
33.000–33.015 mm
(1.2992–1.2998 in)
- B (Ball bearing surface):**
31.975–31.988 mm
(1.2589–1.2594 in)
- C (Needle bearing surface):**
27.987–28.000 mm
(1.1018–1.1024 in)

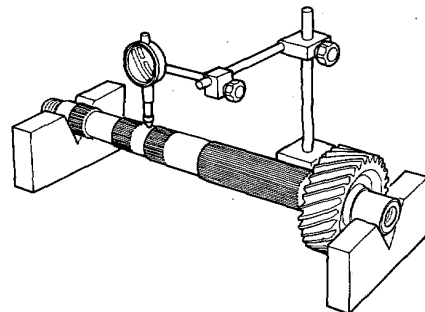
Service Limit: A: 32.95 mm (1.2972 in)
B: 31.928 mm (1.2570 in)
C: 27.937 mm (1.0999 in)



Replace the countershaft if any part of it is less than the service limit.

4. Inspect for runout.

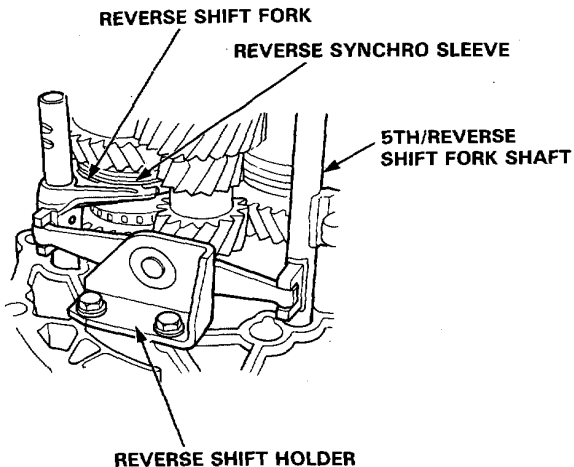
Standard: 0.02 mm (0.0008 in)
Service Limit: 0.05 mm (0.0020 in)



Replace the countershaft if the runout exceeds the service limit.

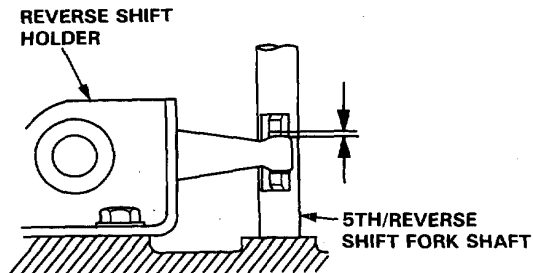
Reverse Shift Holder, Shift Fork

Clearance Inspection



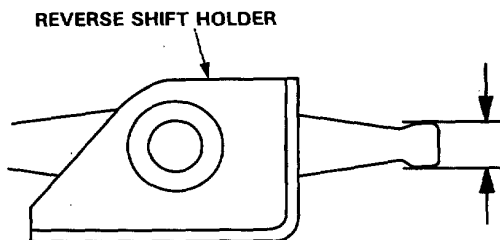
1. Measure the clearance between the reverse shift holder and 5th/reverse shift fork shaft.

Standard: 0.20–0.50 mm
(0.0079–0.0197 in)
Service Limit: 0.8 mm (0.0315 in)



2. If the clearance exceeds the service limit, measure the width of the reverse shift holder.

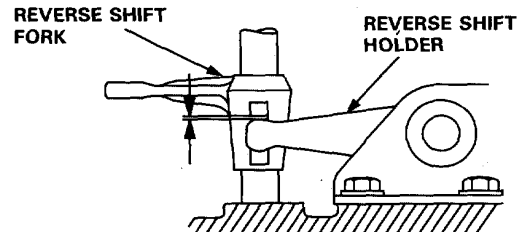
Standard: 12.80–13.00 mm (0.504–0.512 in)



If the width is less than the standard, replace the reverse shift holder.

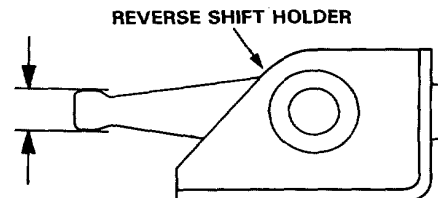
3. Measure the clearance between the reverse shift holder and reverse shift fork.

Standard: 0.20–0.50 mm
(0.0079–0.0197 in)
Service Limit: 0.8 mm (0.0315 in)



4. If the clearance exceeds the service limit, measure the width of the reverse shift holder.

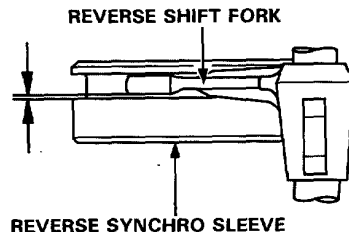
Standard: 12.80–13.00 mm (0.504–0.512 in)



If the width is less than the standard, replace the reverse shift holder.

5. Measure the clearance between the reverse shift fork and reverse synchro sleeve.

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



6. If the clearance exceeds the service limit, measure the width of the reverse shift fork fingers.

Standard: 6.4–6.6 mm (0.252–0.260 in)

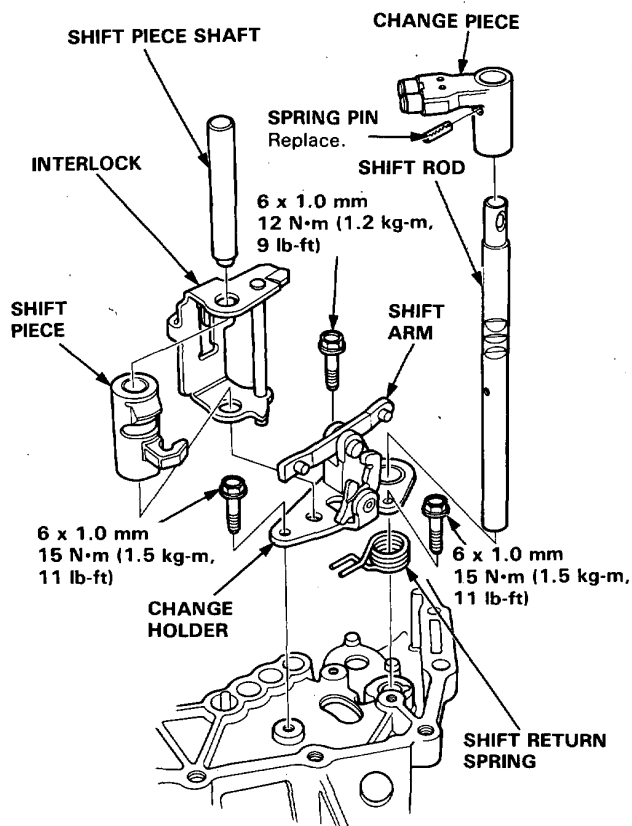


If the width is less than the standard, replace the reverse shift fork.



Change Holder, Shift Fork

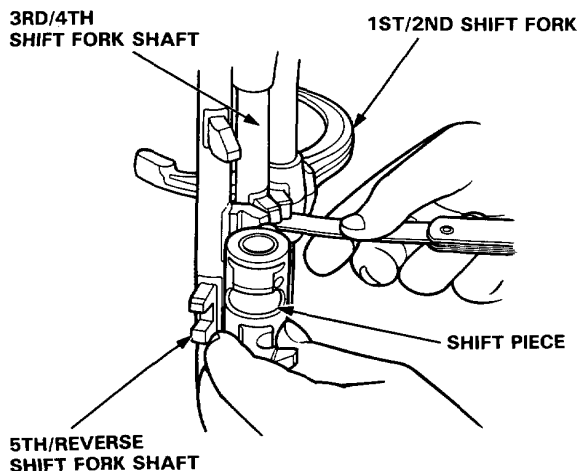
Clearance Inspection



1. Measure the clearance between the shift fork shafts, the shift fork and shift piece.

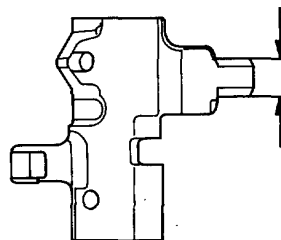
Standard: 0.25–0.55 mm
(0.0098–0.0217 in)

Service Limit: 0.85 mm (0.0335 in)



2. If the clearance exceeds the service limit, measure the width of shift piece.

Standard: 11.850–11.950 mm
(0.4665–0.4705 in)

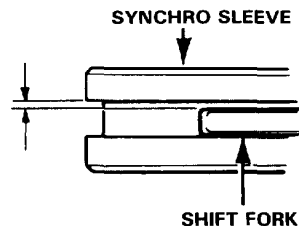


If the width is less than the standard, replace the shift piece.

3. Measure the clearance between the shift forks and synchro sleeves.

Standard: 0.35–0.65 mm
(0.0138–0.0256 in)

Service Limit: 1.00 mm (0.3937 in)



4. If the clearance exceeds the service limit, measure the width of the shift fork.

Standard: 7.4–7.6 mm (0.2913–0.2992 in)



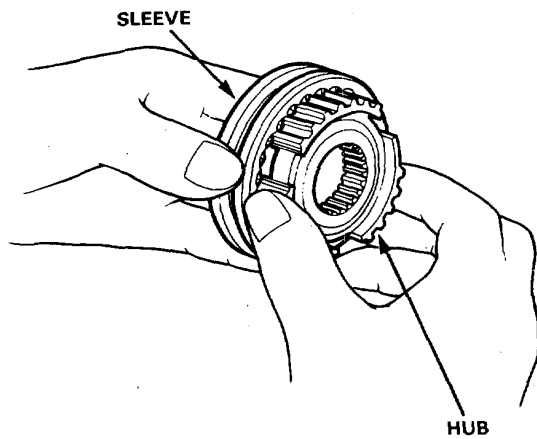
If the width is less than the standard, replace the shift fork.

Synchro Sleeve, Synchro Hub

Inspection

1. Inspect gear teeth on all synchro hubs and sleeves for rounded off corners, which indicates wear.
2. Install each hub in its mating sleeve and check for freedom of movement.

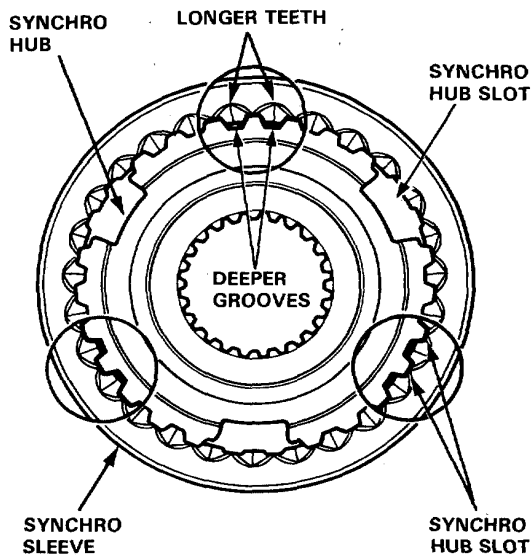
NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.



Installation

Each synchro sleeve has three sets of longer teeth (120 degrees apart) that must be matched with the three sets of deeper grooves in the hub when assembled.

NOTE: Installing the synchro sleeve with its longer teeth in the 1st/2nd synchro hub slots will damage the spring ring.





Synchro Ring, Gear

Inspection

1. Inspect the inside of the synchro ring for wear.
2. Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).



SYNCHRO RING

SYNCHRO SPRING

3. Inspect the synchro sleeve teeth and matching teeth on the gear for wear (rounded off).



4. Inspect the gear hub thrust surface for wear.
5. Inspect the cone surface for wear or roughness.
6. Inspect the teeth on all gears for uneven wear, scoring, galling, cracks.
7. Coat the cone surface of the gear with oil and place the synchro ring on the matching gear. Rotate the ring, making sure that it does not slip.

Measure the clearance between the ring and gear all the way around.

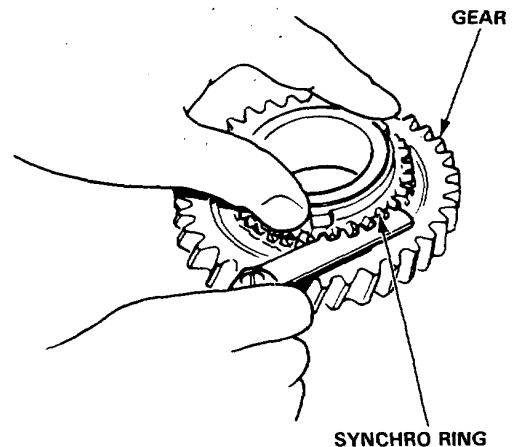
NOTE: Hold the ring against the gear evenly while measuring the clearance.

Ring-to-Gear Clearance

Standard: 0.85–1.1 mm
(0.0335–0.0433 in)

Service Limit: 0.4 mm (0.0157 in)

8. Separate the synchro ring and gear, then coat them with oil.
9. Install the synchro spring on the synchro ring, then set it aside for later reassembly.



Oil Pump

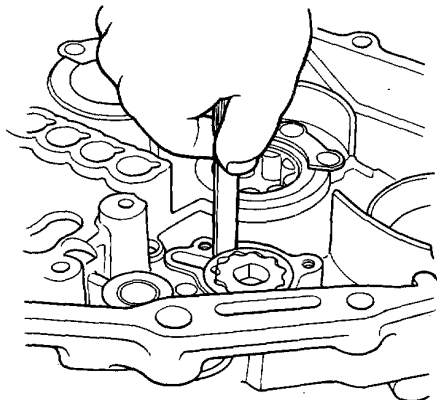
Clearance Inspection

1. Check the clearance on the pump rotor.

Clutch Housing-to-Outer Rotor Clearance

Standard: 0.03–0.13 mm
(0.0012–0.0051 in)

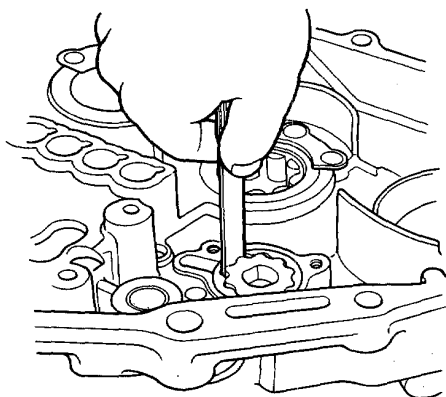
Service Limit: 0.18 mm (0.0071 in)



2. Check the clearance on the pump rotor.

Inner Rotor-to-Outer Rotor Clearance

Standard: 0.14 mm (0.0055 in)
Service Limit: 0.2 mm (0.008 in)

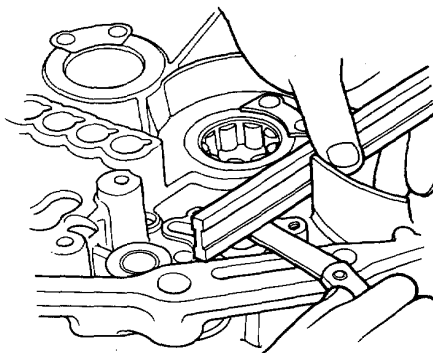


3. Check the clearance between the clutch housing and the rotor.

Clutch Housing-to-Rotor Clearance

Standard: 0.1–0.2 mm (0.0039–0.0079 in)

Service Limit: 0.22 mm (0.0087 in)



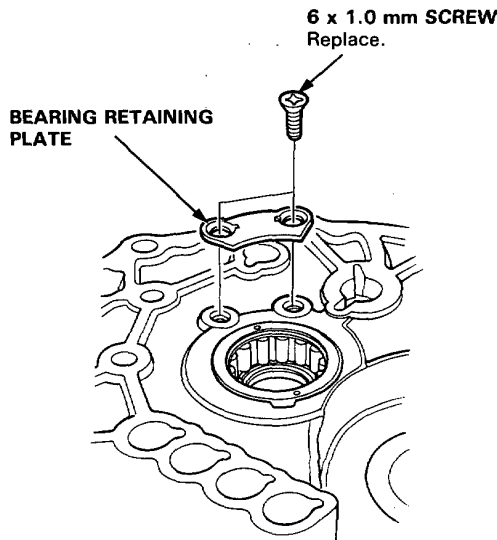
Mainshaft Bearing (Clutch Housing)



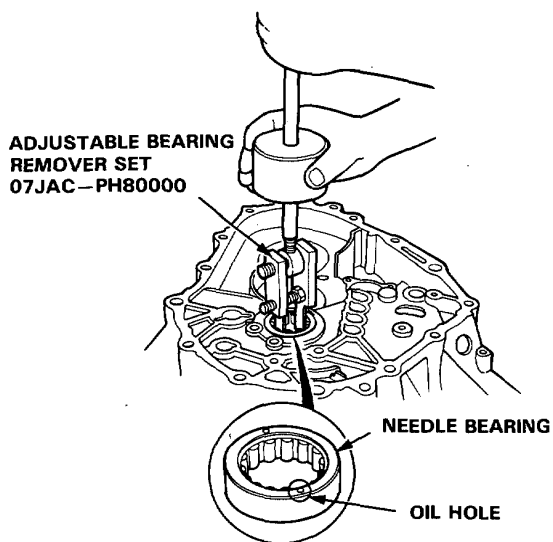
Replacement

NOTE: If replacement is required, always replace the bearing and inner race as an assembly.

1. Remove the bearing retaining plate.



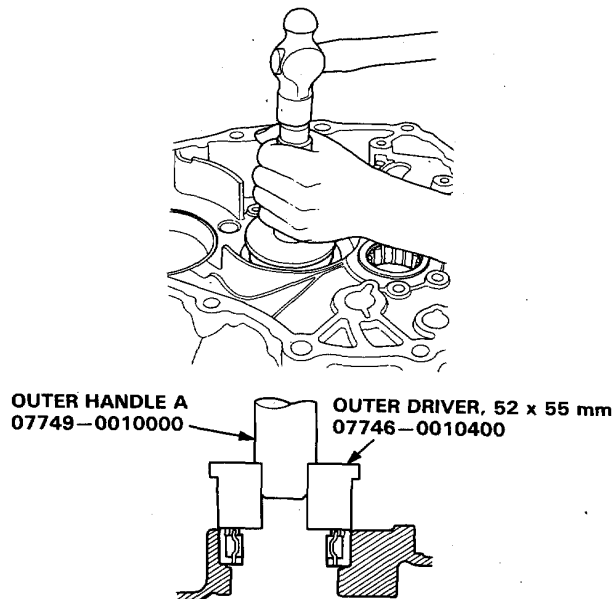
2. Remove the needle bearing with the special tool.



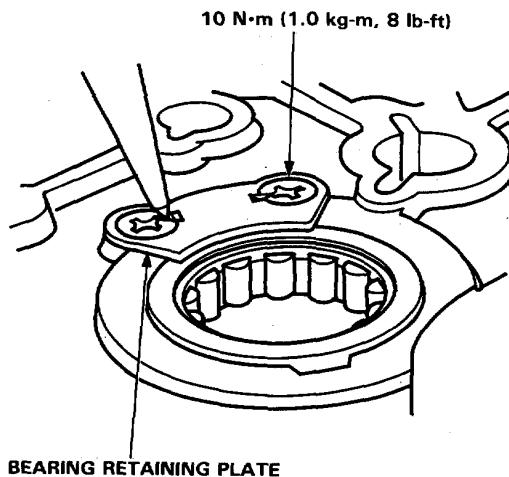
3. Position the new needle bearing in the bore of the clutch housing.

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

4. Drive the needle bearing in using the special tools.



5. Install the bearing retaining plate and stake the screw heads in the groove in the bearing retaining plate.



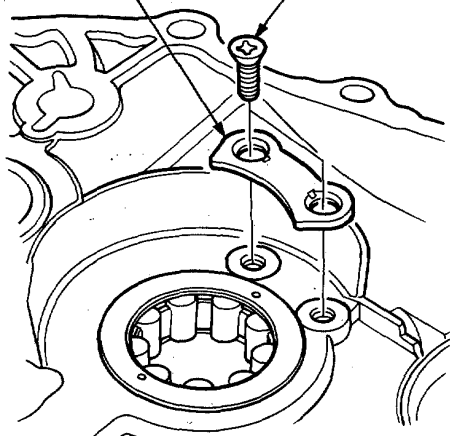
Countershaft Bearing (Clutch Housing)

Replacement

1. Remove the bearing retaining plate.

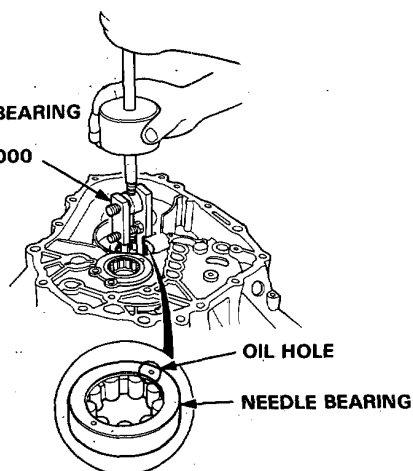
BEARING RETAINING PLATE

6 x 1.0 mm SCREWS
Replace.



2. Remove the needle bearing with the special tool.

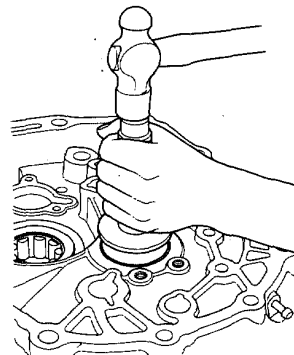
ADJUSTABLE BEARING
REMOVER SET
07JAC-PH80000



3. Position the new needle bearing in the bore of the clutch housing.

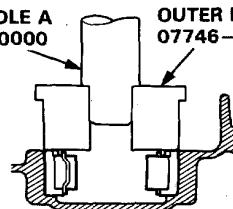
NOTE: Position the needle bearing with the oil hole facing up.

4. Drive the needle bearing in using the special tools.



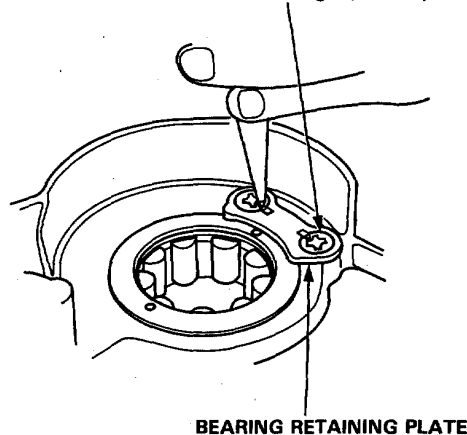
OUTER HANDLE A
07749-0010000

OUTER DRIVER, 62 x 68 mm
07746-0010500



5. Install the bearing retaining plate and stake the screw heads in the groove in the bearing retaining plate.

10 N·m (1.0 kg-m, 8 lb-ft)

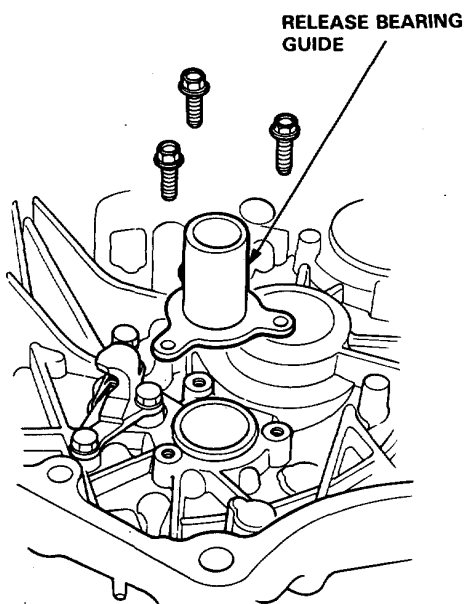




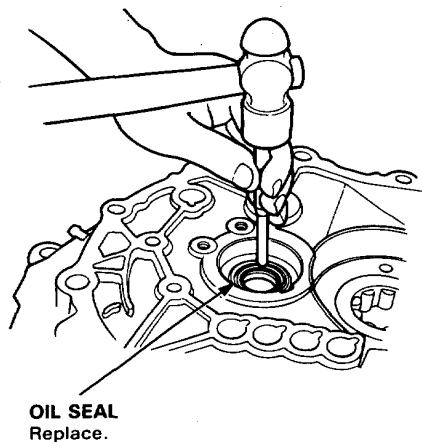
Mainshaft Oil Seal (Clutch Housing)

Replacement

1. Remove the release bearing guide.

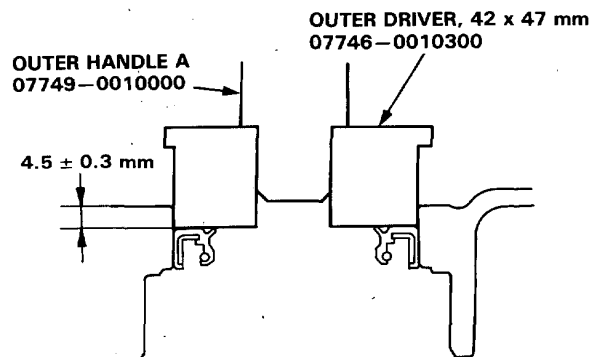


2. Remove the oil seal.

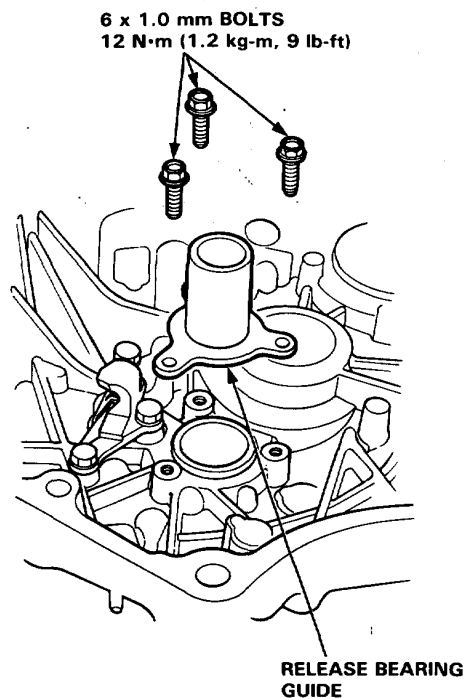


3. Drive in a new oil seal from the transmission side using the special tools.

NOTE: After installation, measure the clearance between the transmission housing surface end and the oil seal.



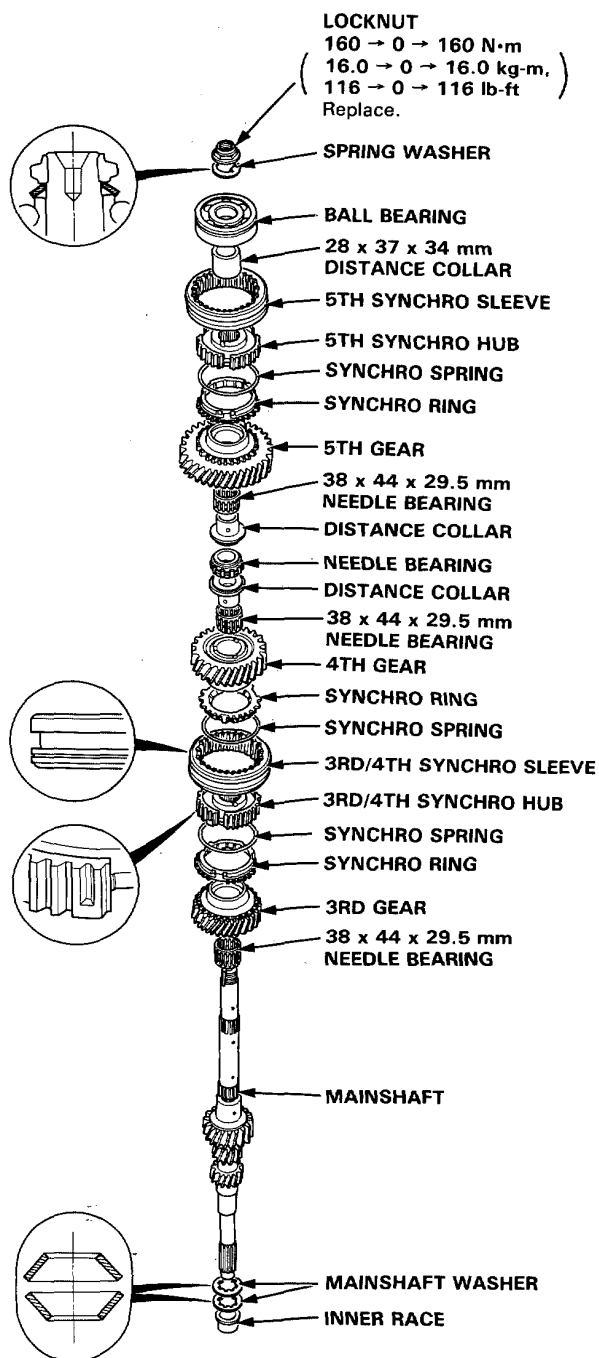
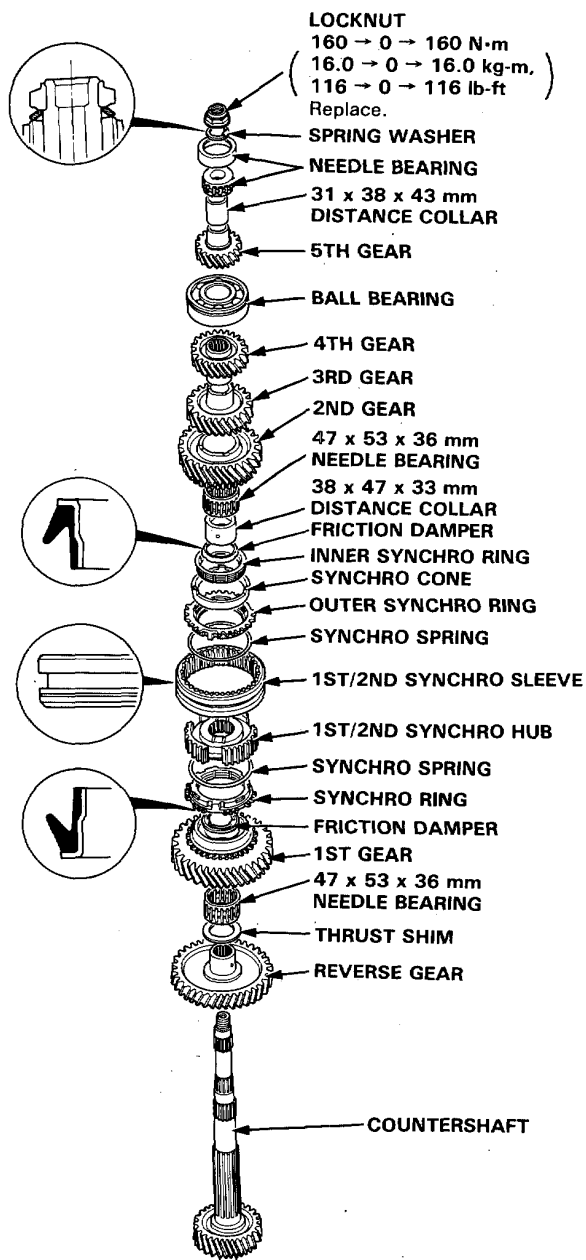
4. Install the release bearing guide.



Mainshaft/Countershaft

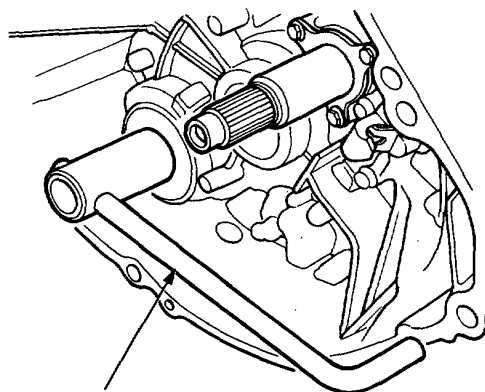
Reassembly, Clearance Inspection

1. Reassemble the mainshaft and countershaft as shown.





2. Install the mainshaft and countershaft on the clutch housing.
3. Install the special tool, then shift the 1st/2nd synchro sleeve to the 1st gear side.



MAINSHAFT HOLDER
07LAB-PW50100

4. Tighten the locknut.

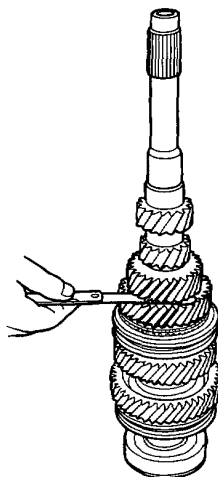
NOTE: Countershaft locknut has left-hand threads.

LOCKNUT

160 → 0 → 160 N·m

(16 → 0 → 16 kg-m, 116 lb-ft → 0 → 116 lb-ft)

5. Measure the clearance using a feeler gauge.

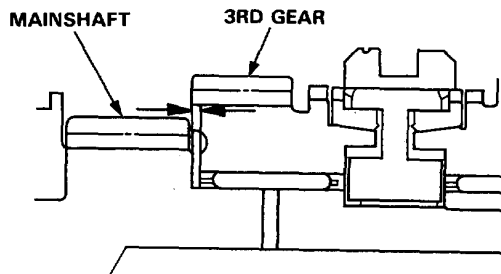


Mainshaft:

1. Measure the clearance between the 3rd gear and mainshaft.

Standard: 0.06–0.19 mm
(0.0024–0.0075 in)

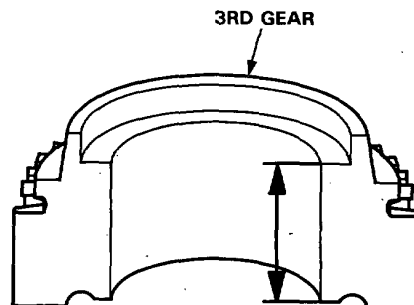
Service Limit: 0.3 mm (0.0118 in)



2. If the clearance exceeds the service limit, measure the thickness of 3rd gear.

Standard: 31.39–31.47 mm
(1.2358–1.2390 in)

Service Limit: 31.32 mm (1.2331 in)



If the thickness is less than the service limit, replace 3rd gear.

(cont'd)

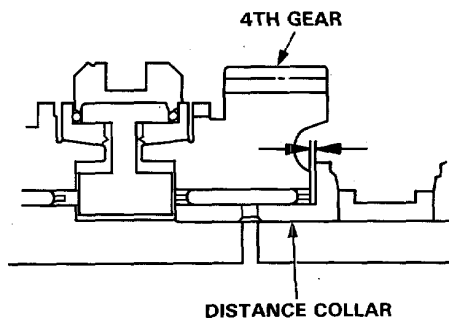
Mainshaft/Countershaft

Reassembly, Clearance Inspection (cont'd)

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

Standard: 0.06–0.19 mm
(0.0024–0.0075 in)

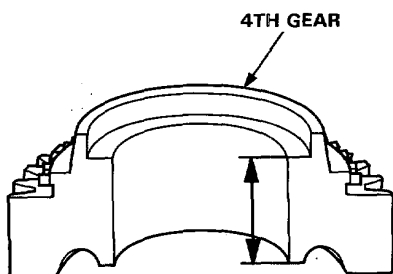
Service Limit: 0.3 mm (0.0118 in)



4. If the clearance exceeds the service limit, measure the thickness of 4th gear.

Standard: 29.39–29.47 mm
(1.1571–1.1602 in)

Service Limit: 29.32 mm (1.1543 in)

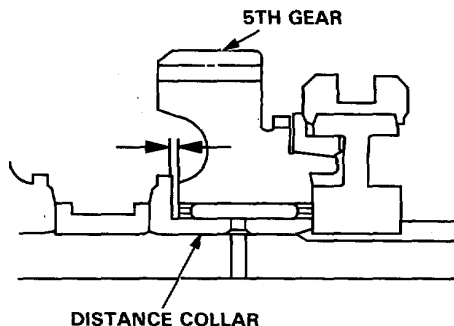


If the thickness is less than the service limit, replace 4th gear.

5. Measure the clearance between the 5th gear and distance collar.

Standard: 0.06–0.19 mm
(0.0024–0.0075 in)

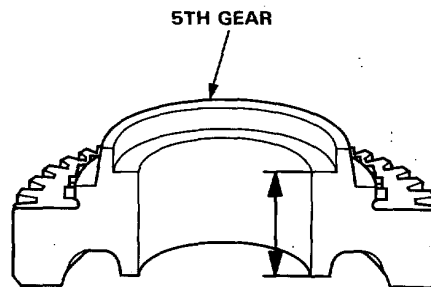
Service Limit: 0.3 mm (0.0118 in)



6. If the clearance exceeds the service limit, measure the thickness of 5th gear.

Standard: 29.39–29.47 mm
(1.1571–1.1602 in)

Service Limit: 29.32 mm (1.1543 in)



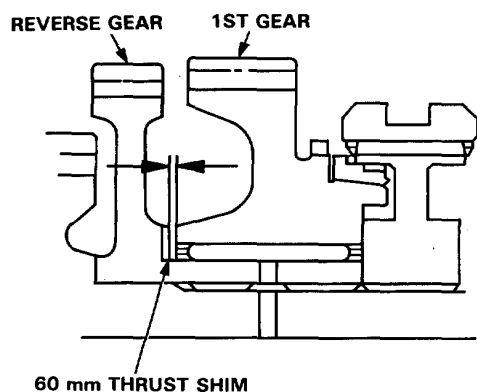
If the thickness is less than the service limit, replace 5th gear.



Countershaft:

1. Measure the clearance between the 1st gear and 60 mm thrust shim.

Standard: 0.04–0.10 mm (0.0016–0.0047 in)



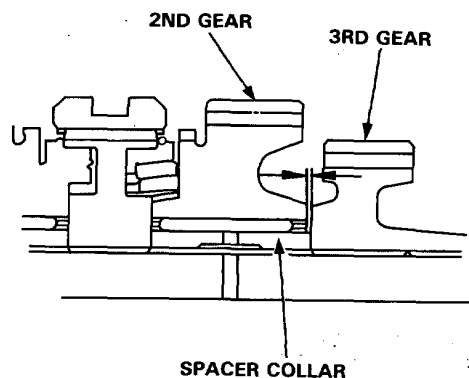
2. If the clearance exceeds the service limit, select the appropriate 60 mm thrust shim for the correct clearance from the chart below.

60 mm THRUST SHIM

	Part Number	Thickness
A	23971-PY5-000	1.42 mm (0.0559 in)
B	23972-PY5-000	1.46 mm (0.0575 in)
C	23973-PY5-000	1.50 mm (0.0591 in)
D	23974-PY5-000	1.54 mm (0.0606 in)

3. Measure the clearance between the 2nd gear and 3rd gear.

Standard: 0.04–0.10 mm (0.0016–0.0047 in)



4. If the clearance exceeds the service limit, select the appropriate spacer collar for the correct clearance.

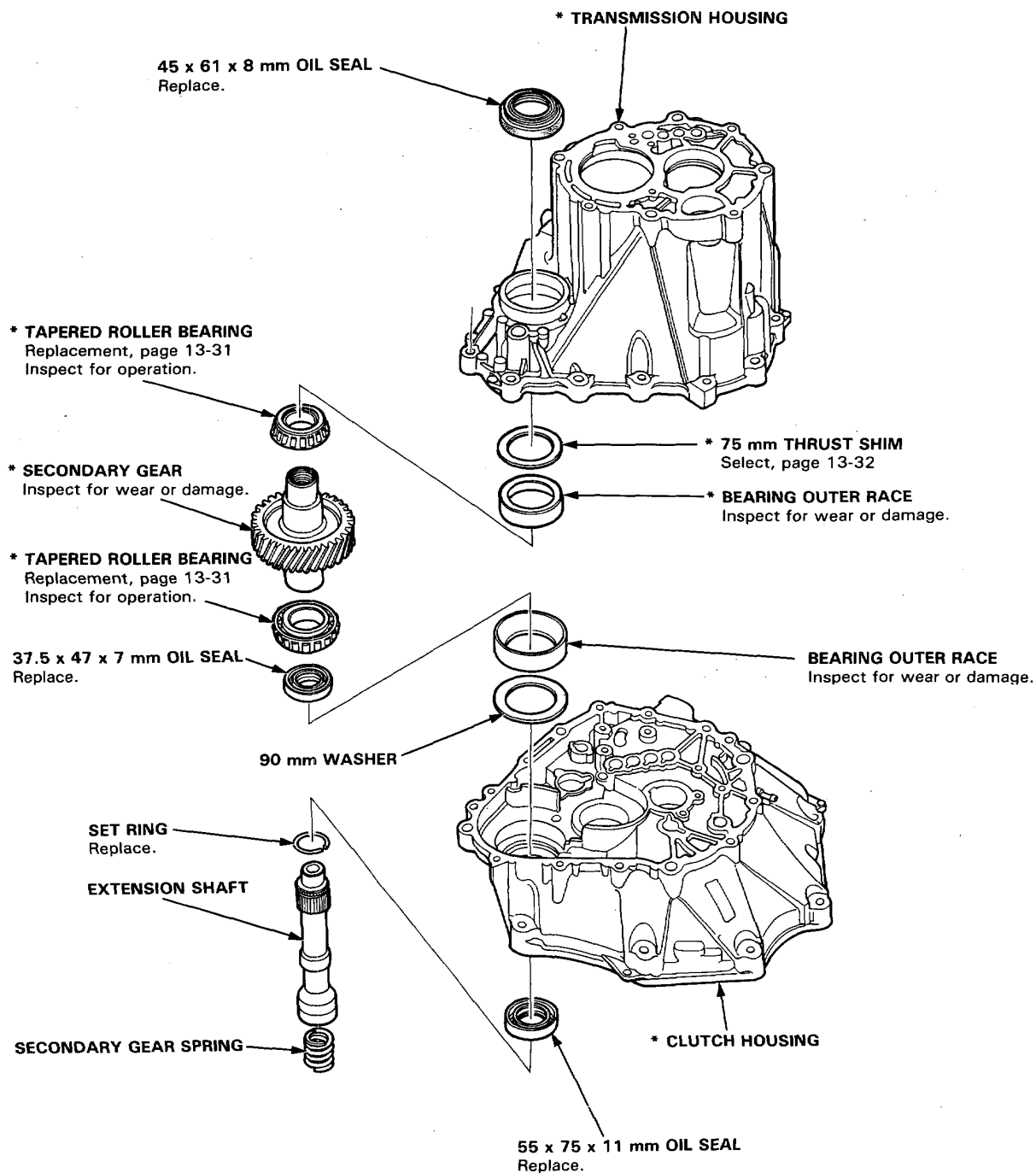
SPACER COLLAR

	Part Number	Thickness
A	23911-PY5-000	33.007–33.009 mm (1.2995–1.2996 in)
B	23912-PY5-000	33.003–33.005 mm (1.2993–1.2994 in)

Secondary Gear Assembly

Index

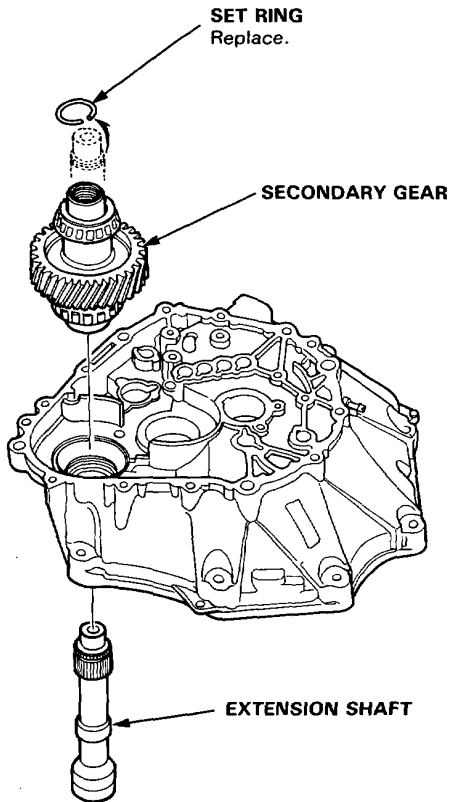
NOTE: If the parts marked * are replaced, the bearing preload must be adjusted (page 13-32).



Extension Shaft

Removal

1. Remove the set ring, then remove the extension shaft from the secondary gear.

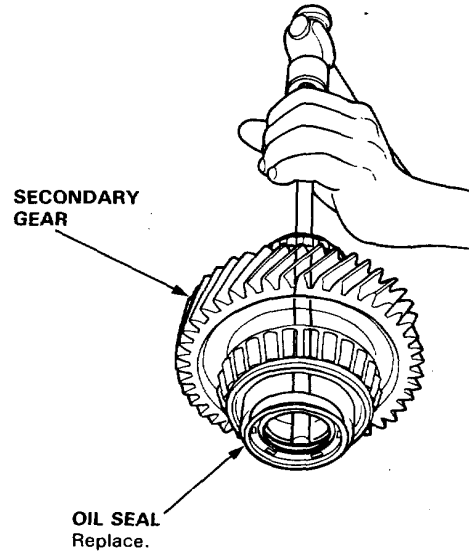


Oil Seal (Secondary Gear)



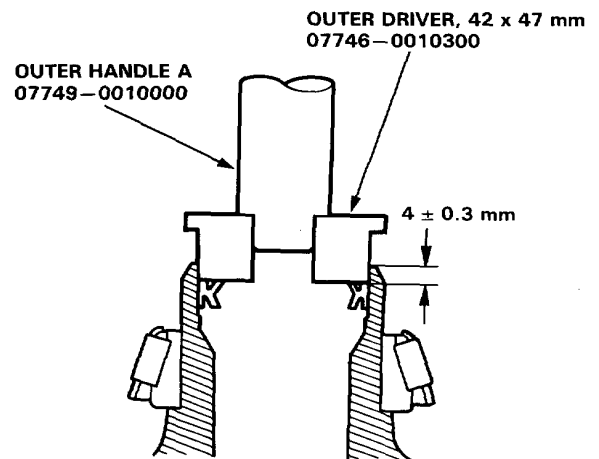
Replacement

1. Remove the oil seal.



2. Install the oil seal in the secondary gear using the special tools.

NOTE: After installation, measure the clearance between the secondary gear end and the oil seal.

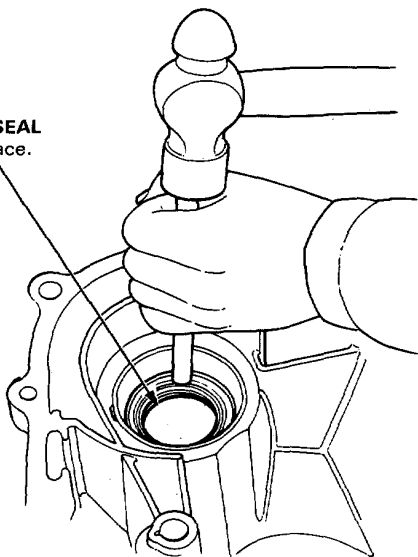


Oil Seal

Removal

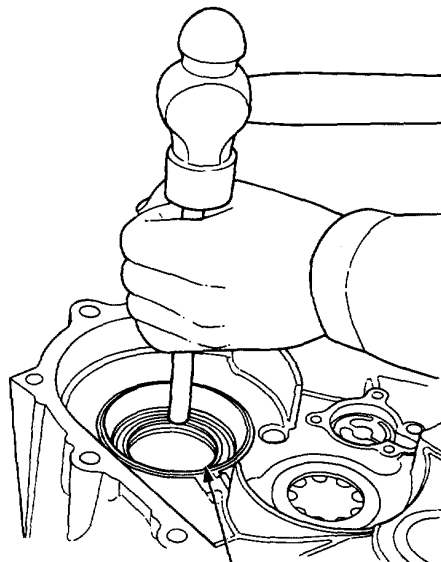
1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.

OIL SEAL
Replace.



3. Remove the oil seal from the clutch housing.

OIL SEAL
Replace.





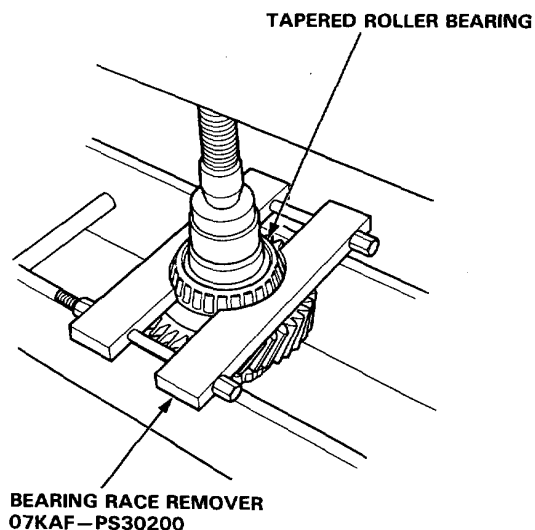
Tapered Roller Bearing

Replacement

NOTE:

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

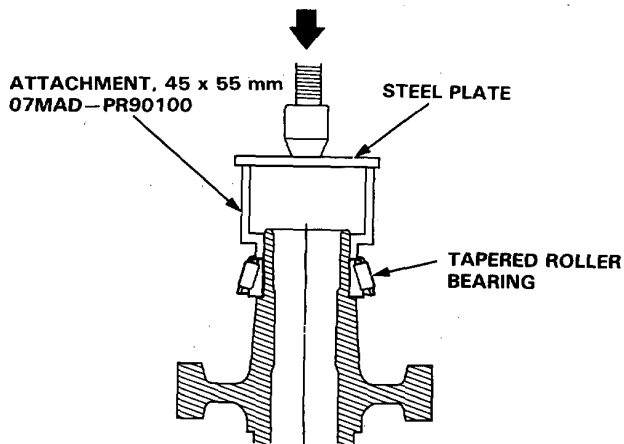
1. Remove the bearings using a press and steel blocks as shown.



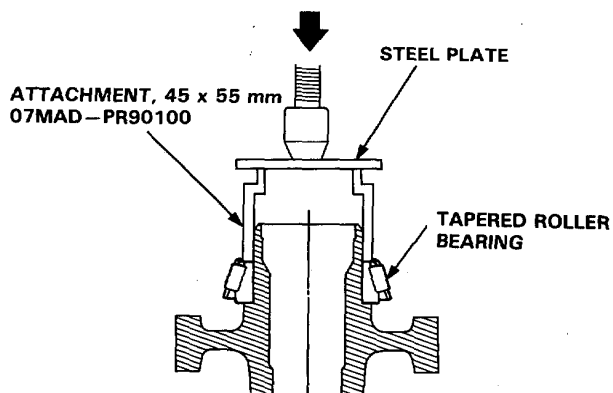
2. Install the bearings using a press as shown.

NOTE: Press the bearings squarely until they bottom against the case.

Transmission Housing Side:



Clutch Housing Side:



Bearing Preload

Adjustment

NOTE: If any of the items listed below are replaced, the bearing preload must be adjusted.

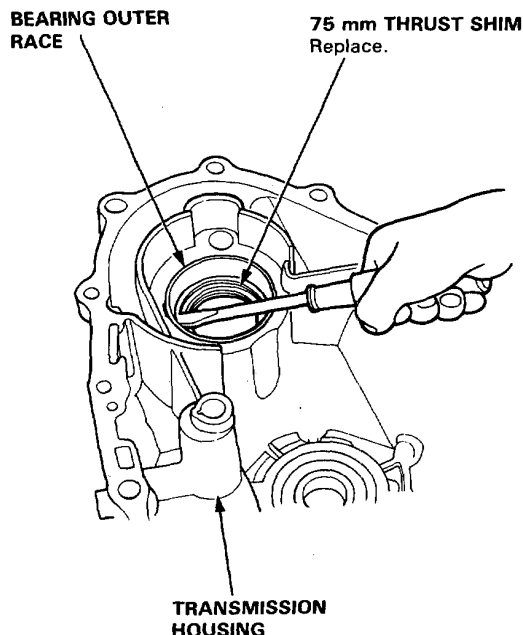
- TRANSMISSION HOUSING
- CLUTCH HOUSING
- SECONDARY GEAR
- TAPERED ROLLER BEARING and OUTER RACE
- 75 mm THRUST SHIM
- 90 mm WASHER

1. Remove the bearing outer race and 75 mm thrust shim from the transmission housing by prying up on the bearing outer race or by heating the housing to about 100°C (212°F).

CAUTION: Do not reuse the thrust shim if the outer race was pried out.

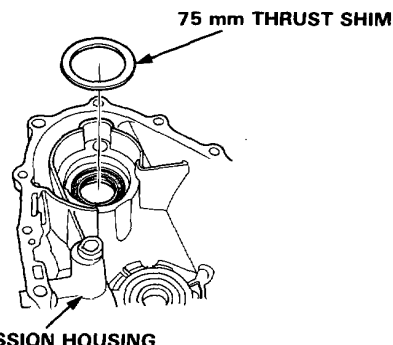
NOTE:

- Let the transmission cool to room temperature if the outer race was removed by heating the case before adjusting the bearing preload.
- Do not heat the transmission housing in excess of 100°C (212°F).
- Replace the bearing with a new one whenever the outer race is replaced.
- Repeat on the clutch side.
- There is no shim on the clutch side.



2. First try the thrust shim that was removed.

CAUTION: Do not use more than one shim to adjust the bearing preload.



3. Select shim from the following table.

75 mm THRUST SHIM

	Part Number	Thickness
A	23941-PY5-000	1.56 mm (0.0614 in)
B	23942-PY5-000	1.59 mm (0.0626 in)
C	23943-PY5-000	1.62 mm (0.0638 in)
D	23944-PY5-000	1.65 mm (0.0650 in)
E	23945-PY5-000	1.68 mm (0.0661 in)
F	23946-PY5-000	1.71 mm (0.0673 in)
G	23947-PY5-000	1.74 mm (0.0685 in)
H	23948-PY5-000	1.77 mm (0.0697 in)
I	23949-PY5-000	1.80 mm (0.0709 in)
J	23950-PY5-000	1.83 mm (0.0720 in)
K	23951-PY5-000	1.86 mm (0.0732 in)
L	23952-PY5-000	1.89 mm (0.0744 in)
M	23953-PY5-000	1.92 mm (0.0756 in)
N	23954-PY5-000	1.95 mm (0.0768 in)
O	23955-PY5-000	1.98 mm (0.0780 in)
P	23956-PY5-000	2.01 mm (0.0791 in)
Q	23957-PY5-000	2.04 mm (0.0803 in)
R	23958-PY5-000	2.07 mm (0.0815 in)
S	23959-PY5-000	2.10 mm (0.0827 in)
T	23960-PY5-000	2.13 mm (0.0839 in)
U	23961-PY5-000	2.16 mm (0.0850 in)
V	23962-PY5-000	2.19 mm (0.0862 in)
W	23963-PY5-000	2.22 mm (0.0874 in)
X	23964-PY5-000	2.25 mm (0.0886 in)
Y	23965-PY5-000	2.28 mm (0.0898 in)
Z	23966-PY5-000	2.31 mm (0.0909 in)
AA	23967-PY5-000	2.34 mm (0.0921 in)
AB	23968-PY5-000	2.37 mm (0.0933 in)
AC	23969-PY5-000	2.40 mm (0.0945 in)
AD	23970-PY5-000	2.43 mm (0.0957 in)



4. After installing the shim, install the outer race in the transmission housing.

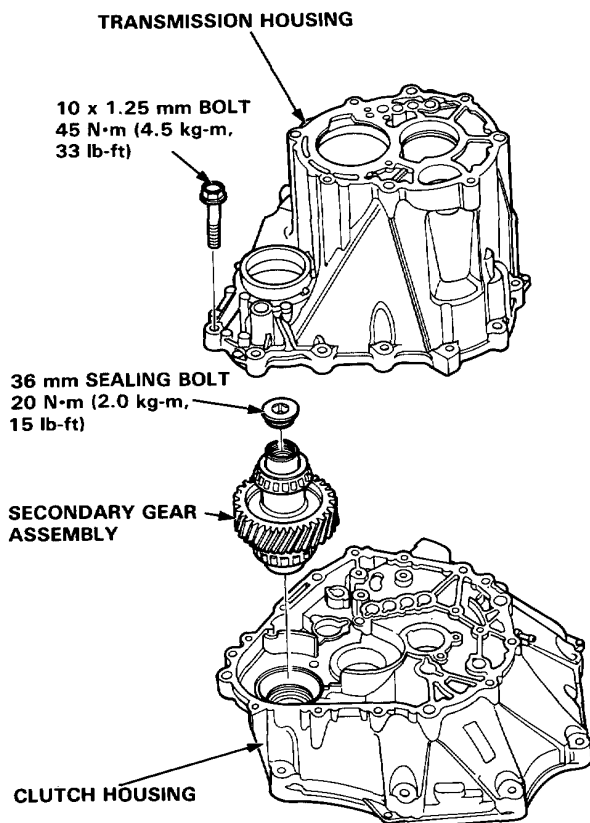
NOTE:

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

5. Install the 36 mm sealing bolt on the secondary gear assembly.
6. Install the secondary gear assembly in the clutch housing, then install the transmission housing.

NOTE: Do not install the mainshaft, countershaft and reverse idle gear shaft assembly.

Torque: 50 N·m (5.0 kg-m, 36 lb-ft)



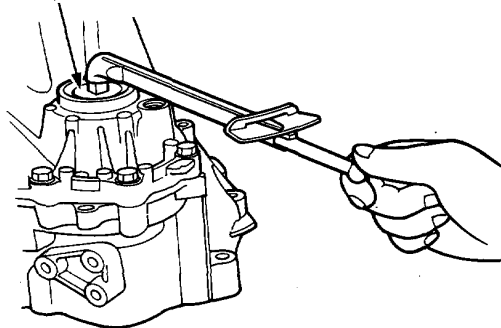
7. Rotate the secondary gear assembly in both directions to seat the bearings.

8. Measure the starting torque of the secondary gear assembly with a torque wrench.

NOTE: Measure the bearing preload at normal room temperature in both directions.

Standard: 1.4–2.6 N·m
(14–26 kg-cm, 12–23 lb-in)

36 mm SEALING BOLT



9. If the bearing preload is beyond the standard, select the shim that will give you the correct preload and recheck.

NOTE: Changing one of the shims to the next size will increase or decrease preload about 3–4 kg-cm (2.60–3.47 lb-in).

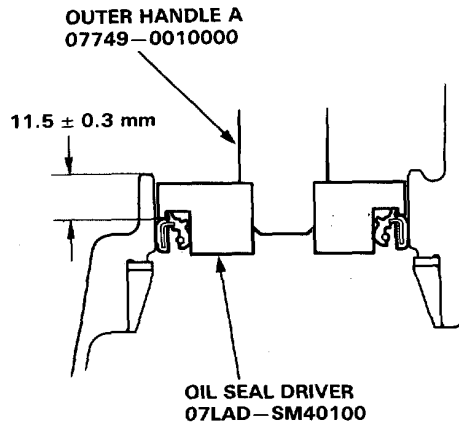
Oil Seal

Installation

Transmission Housing Side:

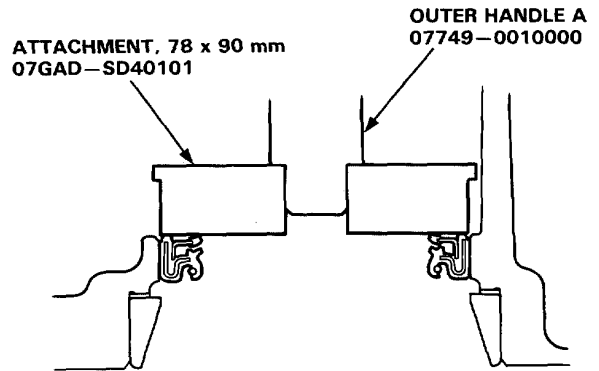
1. Install the oil seal using the special tools as shown.

NOTE: After installation, measure the clearance between the transmission housing end and the oil seal.



Clutch Housing Side:

1. Install the oil seal using the special tools as shown.



Mainshaft, Countershaft, Reverse Gear Shaft

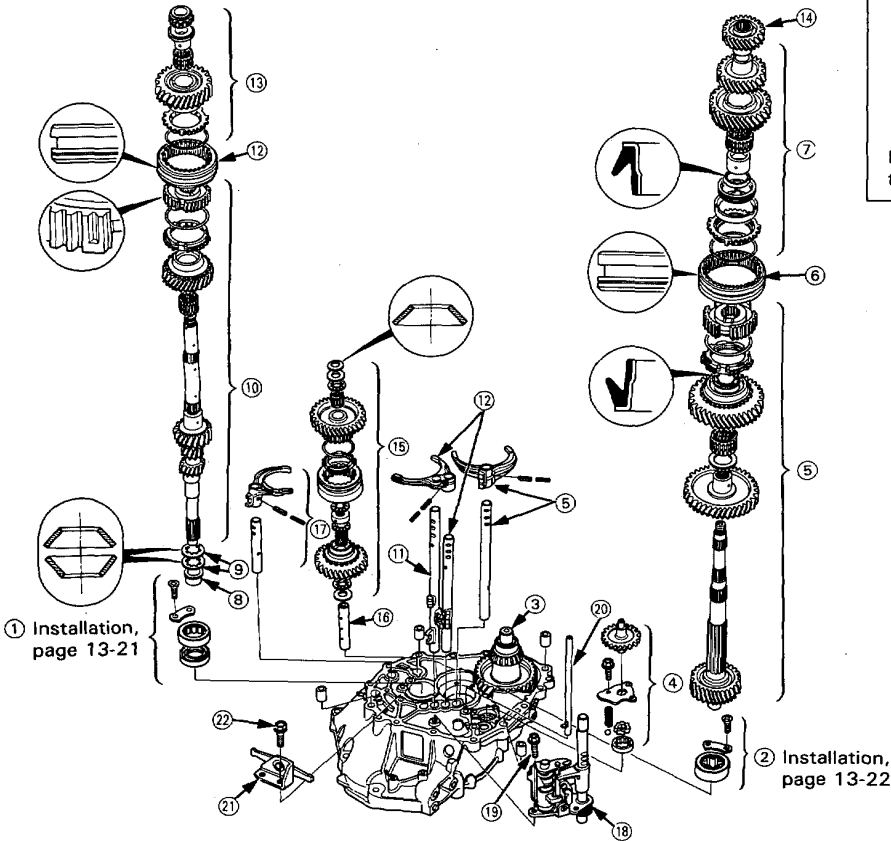
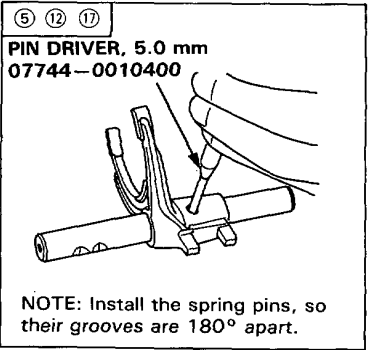
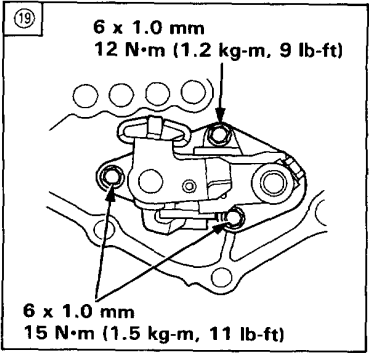


Installation

NOTE: Replace the spring pins and friction dampers.

1. Reassemble the parts following the numbered sequence.

	Bolt	Torque
④	6 x 1.0 mm	12 N·m (1.2 kg-m, 9 lb-ft)
②②	8 x 1.25 mm	26 N·m (2.6 kg-m, 19 lb-ft)



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Transmission Housing

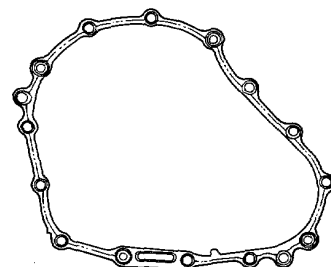
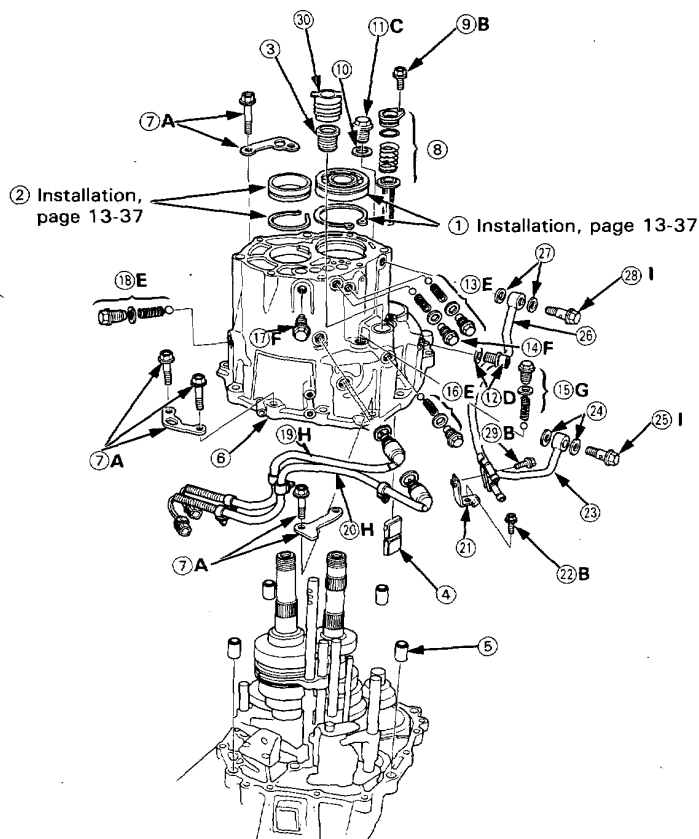
Reassembly

NOTE:

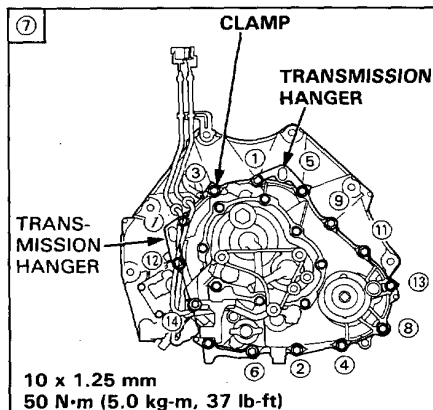
- Replace all sealing washers, oil seals and O-rings.
- Apply liquid gasket (P/N 08718-0001) to the threads of the sealing bolts, back-up light and neutral switches.

1. Reassemble the parts following the numbered sequence.

	Bolt Size	Torque Value	Sequence Number
A	10 x 1.25 mm	45 N·m (4.5 kg-m, 33 lb-ft)	⑦
B	6 x 1.0 mm	12 N·m (1.2 kg-m, 9 lb-ft)	⑨ ②② ②⑨
C	DRAIN PLUG	45 N·m (4.5 kg-m, 33 lb-ft)	⑪
D	FILLER PLUG	40 N·m (4.0 kg-m, 29 lb-ft)	⑫
E	12 mm SEALING BOLT (L = 19.6 mm)	22 N·m (2.2 kg-m, 16 lb-ft)	⑬ ⑬ ⑬
F	12 mm SEALING BOLT (L = 24.6 mm)	22 N·m (2.2 kg-m, 16 lb-ft)	⑭
G	14 mm SEALING BOLT	33 N·m (3.3 kg-m, 24 lb-ft)	⑮
H	SWITCH	25 N·m (2.5 kg-m, 18 lb-ft)	⑲ ⑲
I	JOINT BOLT	29 N·m (2.9 kg-m, 21 lb-ft)	⑳ ㉑



NOTE: This transmission uses no gasket between the major housings; use liquid gasket (P/N 08718-0001). Assemble the housing within 20 minutes after applying the liquid gasket and allow it to cure at least 30 minutes after assembly before filling it with oil.





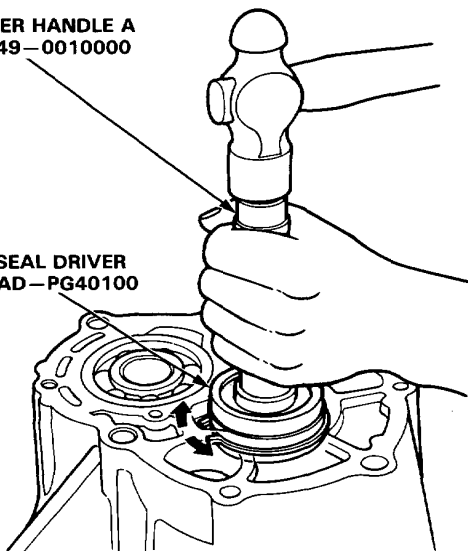
Bearing Installation

Mainshaft Side:

1. Expand the snap ring, then drive in the bearing using the special tools.

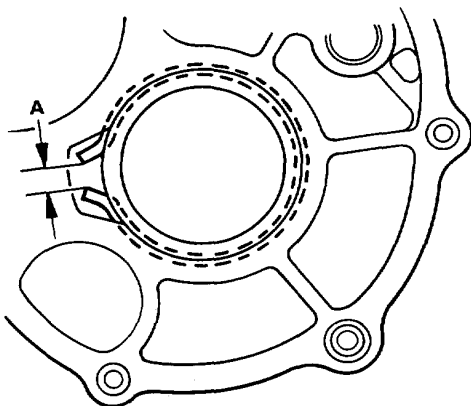
OUTER HANDLE A
07749-0010000

OIL SEAL DRIVER
07GAD-PG40100



2. Check that the snap ring is securely seated in the groove of the mainshaft bearing.

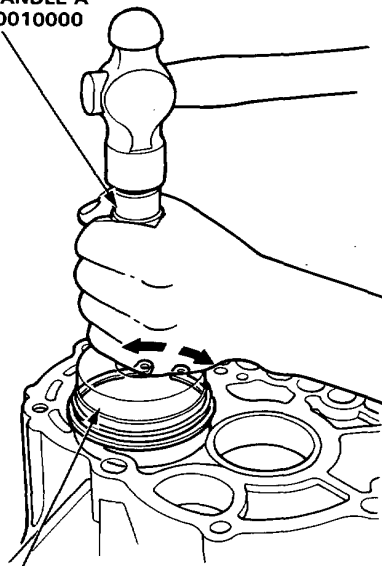
Dimension A as installed: 2.03–4.67 mm
(0.0799–0.1839 in)



Countershaft Side:

1. Expand the snap ring, then drive in the oil seal.

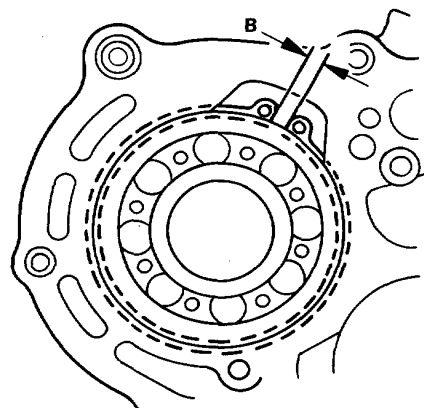
OUTER HANDLE A
07749-0010000



OUTER DRIVER,
72 x 75 mm
07746-0010600

2. Check that the snap ring is securely seated in the groove of the countershaft bearing.

Dimension B as installed: 3.43–8.4 mm
(0.1350–0.3307 in)



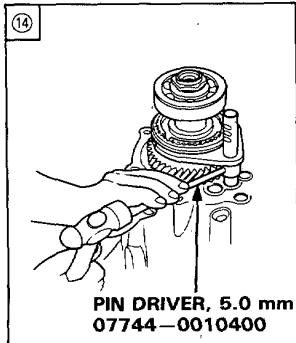
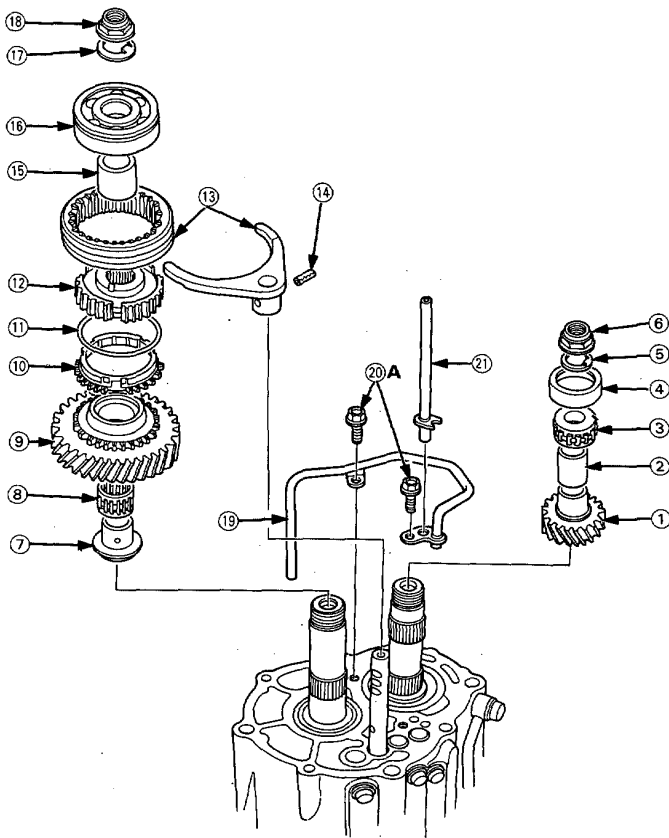
5th Gear

Installation

NOTE: Replace all locknuts and spring pins.

1. Reassemble the parts following the numbered sequence.

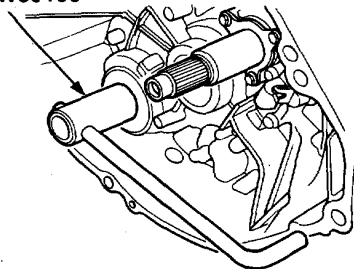
	Bolt Size	Torque Value	
A	6 x 1.0 mm	12 N·m (1.2 kg-m, 9 lb-ft)	(20)



(6) (18)

— 1. Install the mainshaft holder.

MAINSHAFT HOLDER
07LAB-PW50100



— 2. Tighten the locknut, then stake the locknut tab into the groove.

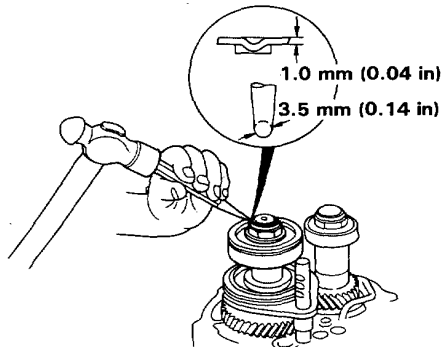
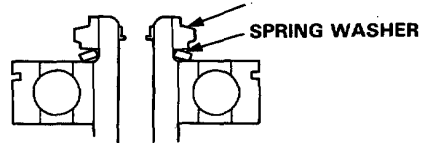
NOTE: Countershaft locknut has left-hand threads.

LOCKNUT

160 → 0 → 160 N·m

(16 → 0 → 16 kg-m, 116 → 0 → 16 lb-ft)

LOCKNUT



Transmission Cover

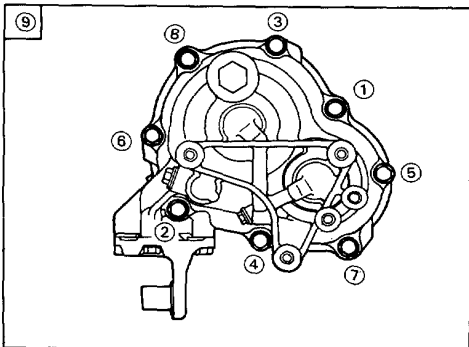
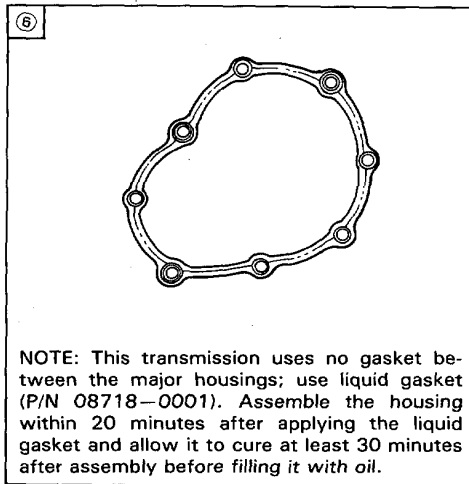
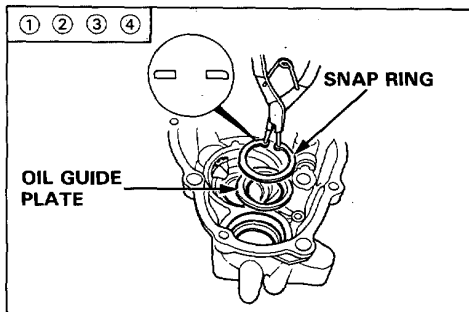
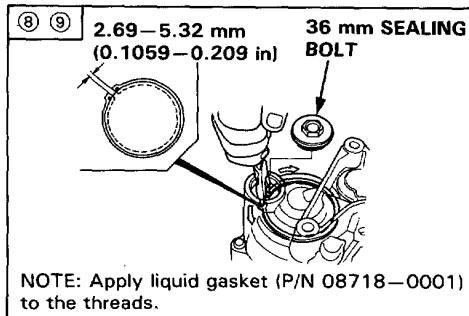
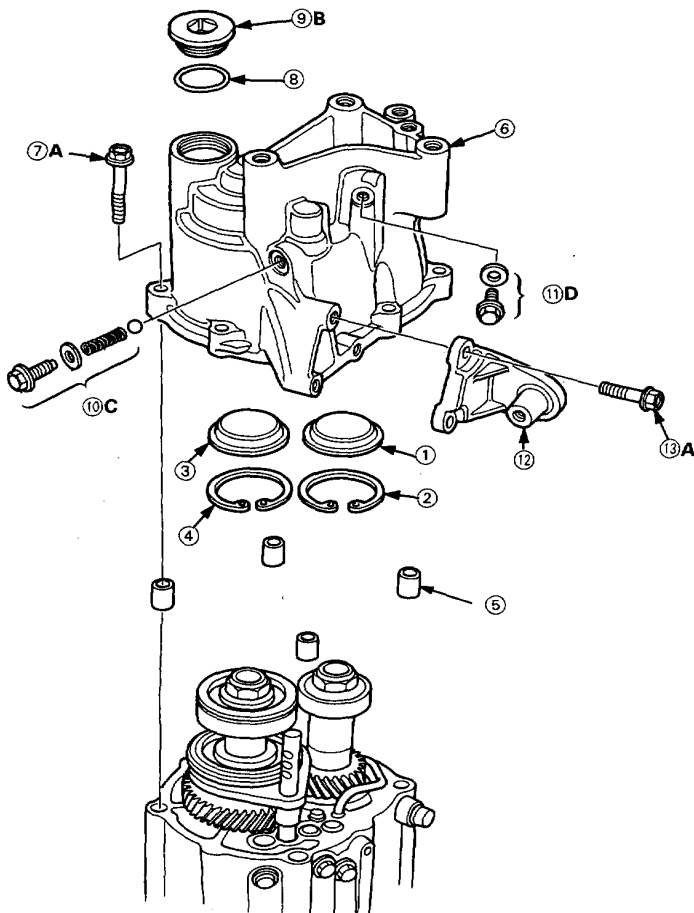


Installation

NOTE: Replace all O-rings and washers.

1. Reassemble the parts following the numbered sequence.

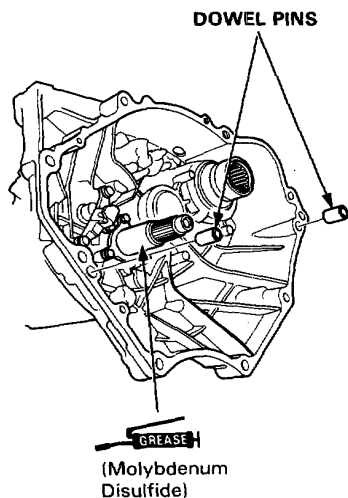
	Bolt Size	Torque Value	Sequence Number
A	8 x 1.25 mm	28 N·m (2.8 kg-m, 21 lb-ft)	⑦ ⑬
B	36 mm SEALING BOLT	25 N·m (2.5 kg-m, 18 lb-ft)	⑨
C	12 mm SEALING BOLT	22 N·m (2.2 kg-m, 16 lb-ft)	⑩
D	8 mm SEALING BOLT	18 N·m (1.8 kg-m, 13 lb-ft)	⑪



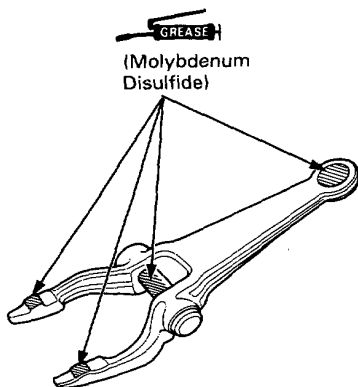
Transmission Assembly

Installation

NOTE: Check that the two dowel pins are installed in the clutch housing.

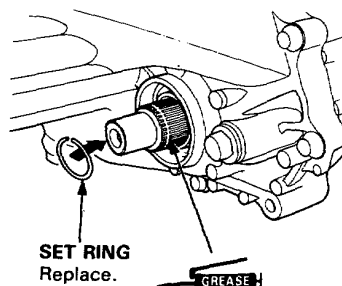


1. Set the release fork in the clutch housing.



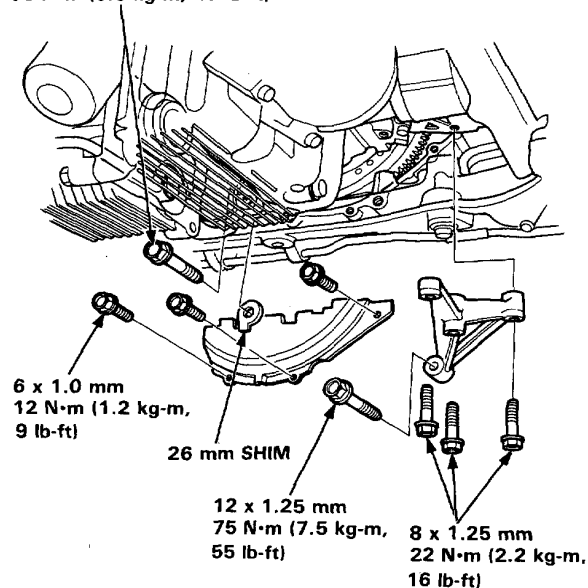
2. Set the extension shaft to the transmission, then install the set ring.

NOTE: Apply Honda Genuine grease UM264 (P/N 41211-PY5-305) to the extension shaft spline.



3. Place the transmission on the transmission jack, and raise it to the engine level.
4. Install the clutch cover.
5. Install the engine stiffener.
6. Install the transmission mounting bolts and 26 mm shim.

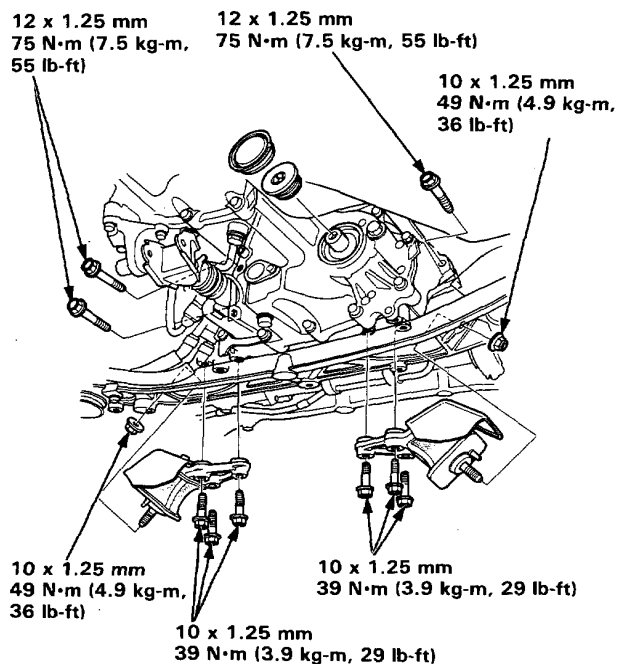
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)





7. Install the transmission mounting bolts.

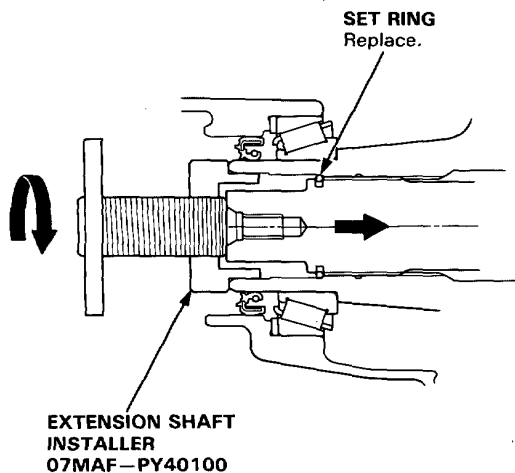
8. Install the transmission mounts.



9. Install the extension shaft using the special tool as shown.

NOTE:

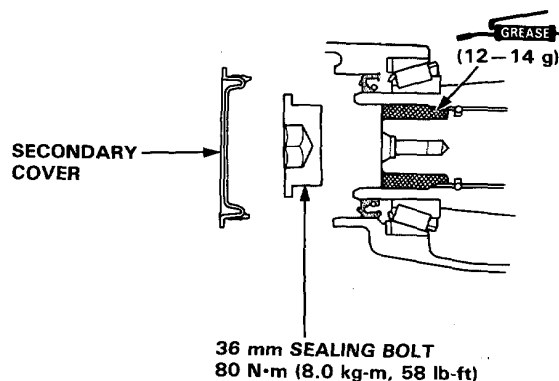
- Shift the transmission to low gear to lock the secondary gear.
- Make sure the extension shaft locks in the secondary gear groove.



10. Install the 36 mm sealing bolt and secondary cover.

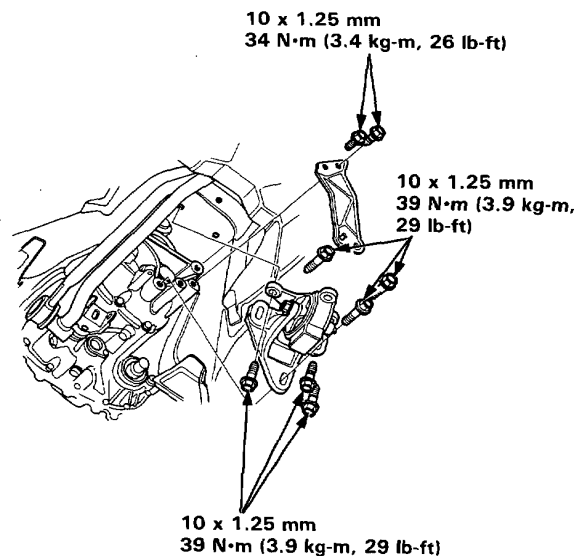
NOTE:

- Shift the transmission to low gear to lock the secondary gear.
- Apply liquid gasket (P/N 08718-0001) to the threads.
- Fill Honda Genuine grease UM264 (P/N 41211-PY5-305) in the secondary gear.



11. Install the transmission bracket and transmission mount.

12. Install the exhaust pipe stay.

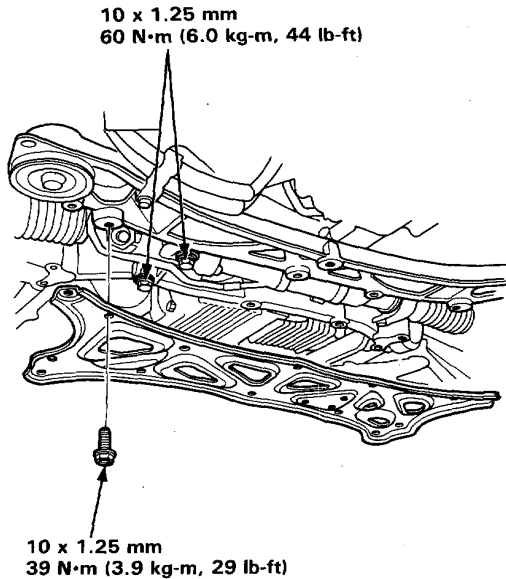


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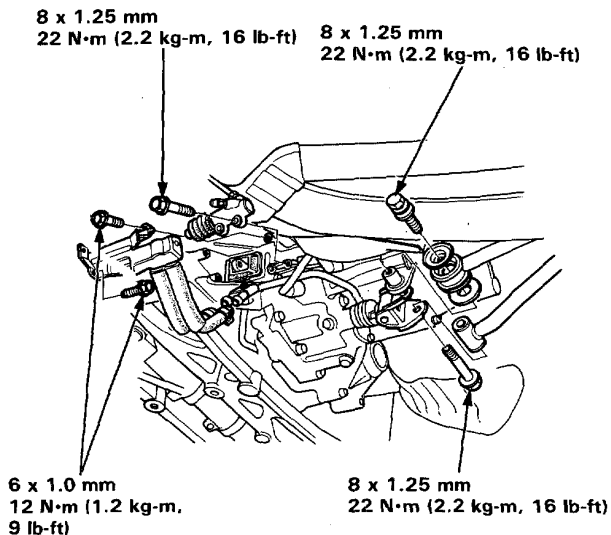
Transmission Assembly

Installation (cont'd)

13. Remove the steering gear box mounting bolts, then install the lower plate.

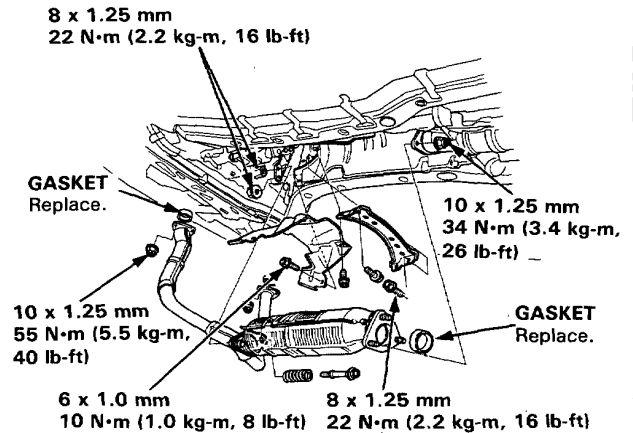


14. Install the release fork and boot.
15. Install the slave cylinder and release fork cover.
16. Connect the cooler hoses.
17. Install the shift rod and torque rod.



18. Install the bracket and heat shield.

19. Install the exhaust pipe.



20. Install the clutch hose bracket.

21. Install the transmission mounting bolts.

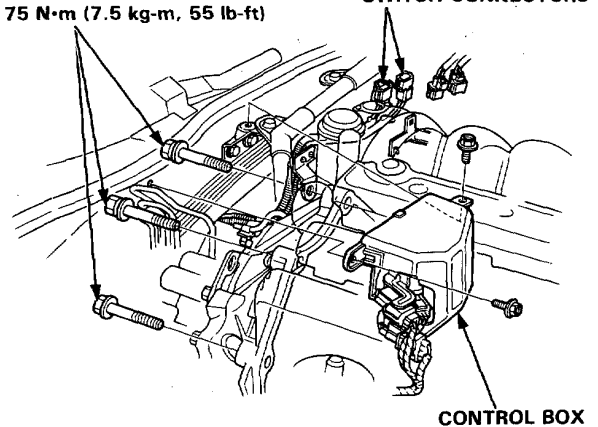
22. Install the control box.

23. Install the strut bar.

TRANSMISSION MOUNTING BOLTS

12 x 1.25 mm
75 N·m (7.5 kg-m, 55 lb-ft)

SWITCH CONNECTORS



24. Refill the transmission with oil.

25. Refill the radiator coolant. (See Section 10)

26. Connect the battery positive (+) and negative (-) cables to the battery.

27. Check the clutch operation.

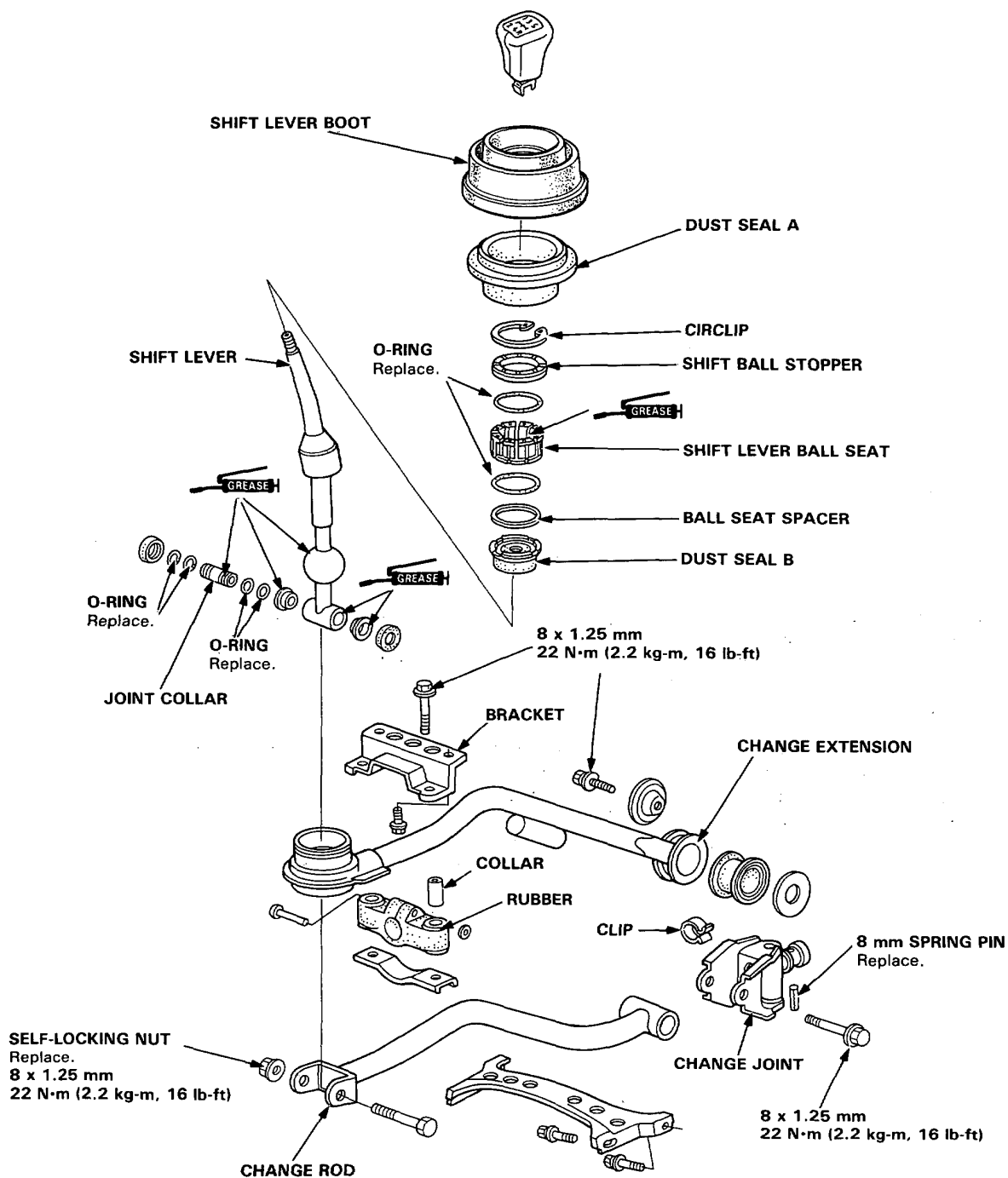
28. Shift the transmission and check for smooth operation.



Gearshift Mechanism

Overhaul

NOTE: Inspect rubber parts for wear or damage when disassembling.



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If automatic transmission maintenance is required)

The Legend includes a driver's side Airbag, located in the steering wheel hub. Information necessary to safely service the SRS is included in this Shop Manual. Items marked * in each section table of contents include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the Airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, center armrest and dashboard lower panel. Do not use electrical test equipment on these circuits.

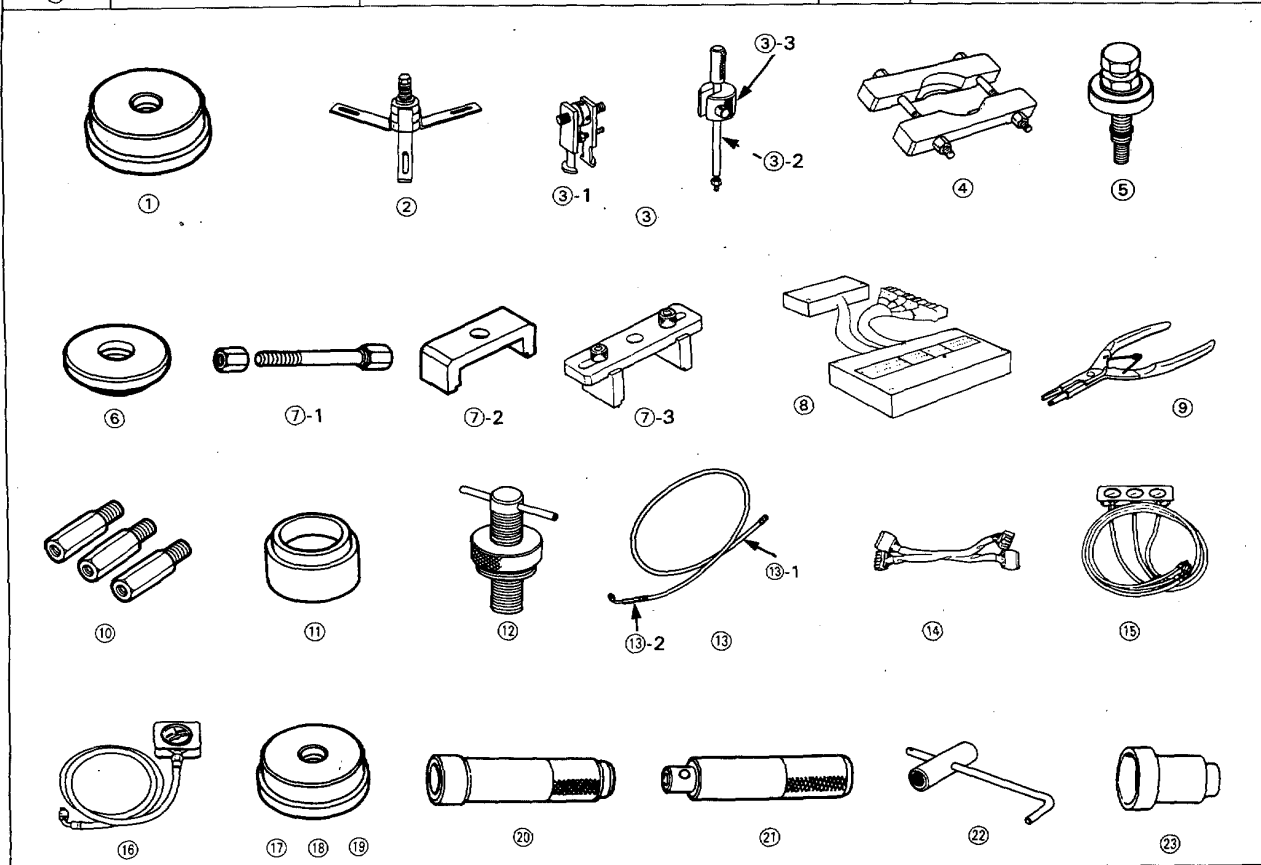
Automatic Transmission

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Special Tools

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①	07GAD—SD40101	Attachment, 78 x 90 mm	1	14-137, 141
②	07HAC—PK40100	Housing Puller	1	14-112
③	07JAC—PH80000	Adjustable Bearing Remover Set	1	14-154
③-1	07JAC—PH80100	Bearing Remover Attachment	(1)	14-154
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④	07KAF—PS30200	Bearing Race Remover	1	14-139
⑤	07LAC—PW50100	Extension Shaft Puller	1	14-100
⑥	07LAD—SM40100	Oil Seal Driver Attachment	1	14-143
⑦	07LAE—PX40000	Clutch Spring Compressor Set	1	14-147, 150
⑦-1	07GAE—PG40200	Clutch Spring Compressor Bolt	(1)	14-147, 150
⑦-2	07HAE—PL50100	Clutch Spring Compressor Attachment	(1)	14-147, 150
⑦-3	07LAE—PX40100	Clutch Spring Compressor Attachment	(1)	14-147, 150
⑧	07LAJ—PT30100	Test Harness	1	14-51, 90
⑨	07LGC—0010100	Snap Ring Pliers	1	14-110, 148, 151, 154
⑩	07MAC—PY40100	Housing Puller Setting Bolt	1	14-112
⑪	07MAD—PR90100	Attachment, 45 x 55 mm	1	14-129, 130, 139
⑫	07MAF—PY40100	Extension Shaft Installer	1	14-163
⑬	07MAJ—PY40100	A/T Oil Pressure Gauge Hose Set	1	14-91
⑬-1	07MAJ—PY40110	A/T Oil Pressure Gauge Hose	(1)	14-91
⑬-2	07MAJ—PY40120	A/T Oil Pressure Gauge Joint	(1)	14-91
⑭	07MAZ—PY40100	A/T Test Harness Adapter	1	14-51
⑮	07406—0020003	A/T Oil Pressure Gauge Set	1	14-91
⑯	07406—0070000	A/T Low Pressure Gauge	1	14-91
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⑲	07746—0010600	Attachment, 72 x 75 mm	1	14-141, 143, 153
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㉓	07947—6340500	Attachment	1	14-153





The automatic transmission is a combination of a 3-element torque converter and a dual-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, assembled 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 drive plate 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 two parallel shafts, the mainshaft and the countershaft. The mainshaft is in line with the engine crankshaft.

The mainshaft includes the clutches for 1st, 4th and 2nd, and gears for 4th, 1st, 2nd and reverse (3rd gear is integral with the mainshaft).

The countershaft includes the clutches for 3rd, 1st-hold and reverse, and gears for 3rd, 4th, 1st, 2nd and reverse. The secondary drive gear is integrated with the countershaft.

The gears on the mainshaft are in constant mesh with those on the countershaft.

When certain combinations of gears in the transmission are engaged by clutches, power is transmitted from the mainshaft to the countershaft to provide **[1]**, **[2]**, **[D₃]**, and **[D₄]**.

Electronic Control

The electronic control system consists of PGM-FI/AT Electronic Control Unit (ECU), sensors, a linear solenoid and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The ECU is located below the dashboard, under the front lower panel on the passenger's side.

Hydraulic Control

The lower valve body assembly includes the main valve body, secondary valve body, throttle valve body, linear solenoid, shift control solenoid valves and the oil pass body. They are bolted on the lower part of the transmission housing.

Other valve bodies, the regulator valve body, oil pump body and the accumulator body, are bolted to the torque converter housing.

The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, 3-4 shift valve, 4-3 kick-down valve and Clutch Pressure Control(CPC) valve.

The secondary valve body contains the 3-4 orifice control valve, shift timing valve, modulator valve and accumulator pistons.

The throttle valve body includes the throttle valve which is bolted onto the secondary valve body.

The linear solenoid is joined to the throttle valve body.

The regulator valve body contains the regulator valve, lock-up shift valve and cooler relief valve.

Fluid from the regulator passes through the manual valve to the various control valves.

The oil pump body contains the lock-up timing valve, lock-up control valve and relief valve. The torque converter check valve is located in the torque converter housing under the oil pump body.

The accumulator body contains the accumulator pistons. The reverse accumulator and 1st-hold accumulator pistons are assembled in the rear cover.

The 1st, 1st-hold and reverse clutches receive oil from their respective feed pipes.

Shift Control Mechanism

Input from various sensors located throughout the car determines which shift control solenoid valve the ECU will activate.

Activating a shift control solenoid valve changes modulator pressure, causing a shift valve to move. This pressurizes a line to one of the clutches, engaging that clutch and its corresponding gear.

Lock-up Mechanism

In **[D₄]** position, in 2nd, 3rd and 4th, pressurized fluid is drained from the back of the torque converter through an oil 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 ECU optimizes the timing of the lock-up mechanism. The lock-up valves control the range of lock-up according to lock-up control solenoid valves A and B, and throttle valve. When lock-up control solenoid valves A and B activate, modulator pressure changes. The lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the ECU.

(cont'd)

Description

(cont'd)

Gear Selection

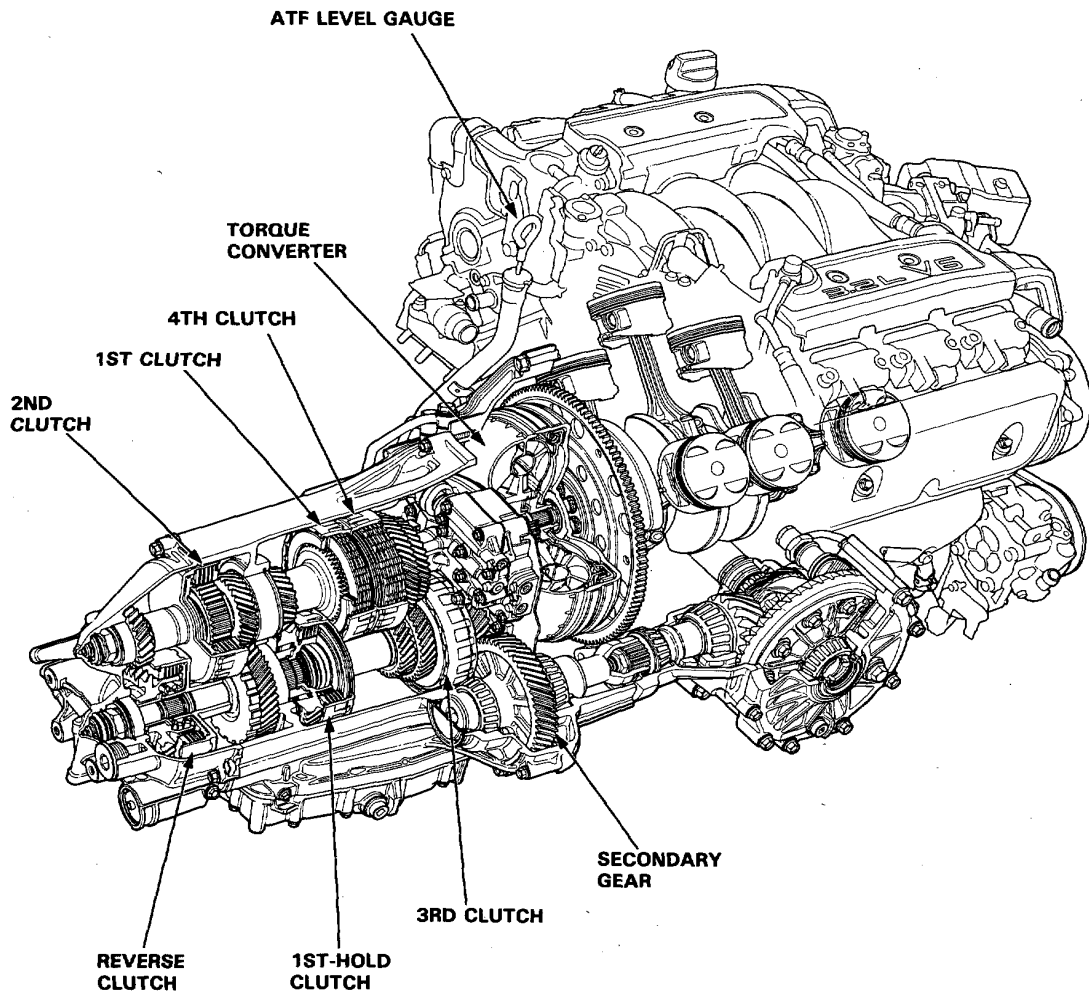
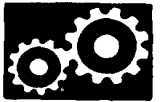
The selector lever has seven positions; **P** PARK, **R** REVERSE, **N** NEUTRAL, **D4** 1st through 4th positions, **D3** 1st through 3rd positions, **2** 2nd gear and **1** 1st gear.

Position	Description
P PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse clutch engaged.
N NEUTRAL	All clutches released.
D4 DRIVE (1 through 4)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in 2nd, 3rd and 4th when the transmission in D4.
D3 DRIVE (1 through 3)	For rapid acceleration at highway speeds and general driving; starts off in 1st, shifts automatically to 2nd then 3rd, depending on vehicle speed and throttle position. Downshifts through lower gears on deceleration to stop.
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 or slippery surface.
1 FIRST	Driving in 1st gear; stays in 1st gear, does not shift up and down. For engine braking.

Starting is possible only in **P** and **N** position through use of a slide-type, neutral-safety switch.

Position Indicator

A position indicator in the instrument panel shows what gear has been selected without having look down at the console.



(cont'd)

Description

Clutches (cont'd)

The four speed automatic transmission uses hydraulically actuated clutches to engage or disengage the transmission gears. When clutch pressure is introduced into the clutch drum, the clutch piston is applied. 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 clutch pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other while disengaged. This allows the gear to spin independently of its shaft, transmitting no power.

[1st Clutch]

The first clutch engages/disengages first gear, and is located at the right of center on the mainshaft. The first clutch is joined back-to-back to the fourth clutch. The first clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

[1st-hold Clutch]

The first hold clutch engages/disengages first hold, 1 position or 2 position, and is located at the center of the countershaft. The first hold clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

[2nd Clutch]

The second clutch engages/disengages second gear, and is located at the right of the mainshaft. The second clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

[3rd Clutch]

The third clutch engages/disengages third gear, and is located at the end of the countershaft, opposite the rear cover. The third clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

[4th Clutch]

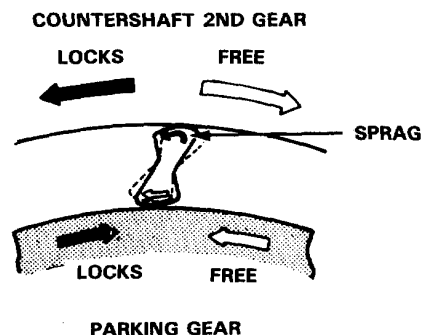
The fourth clutch engages/disengages fourth gear, and is located at the left of center on the mainshaft. The fourth clutch is joined back-to-back to the first clutch. The fourth clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

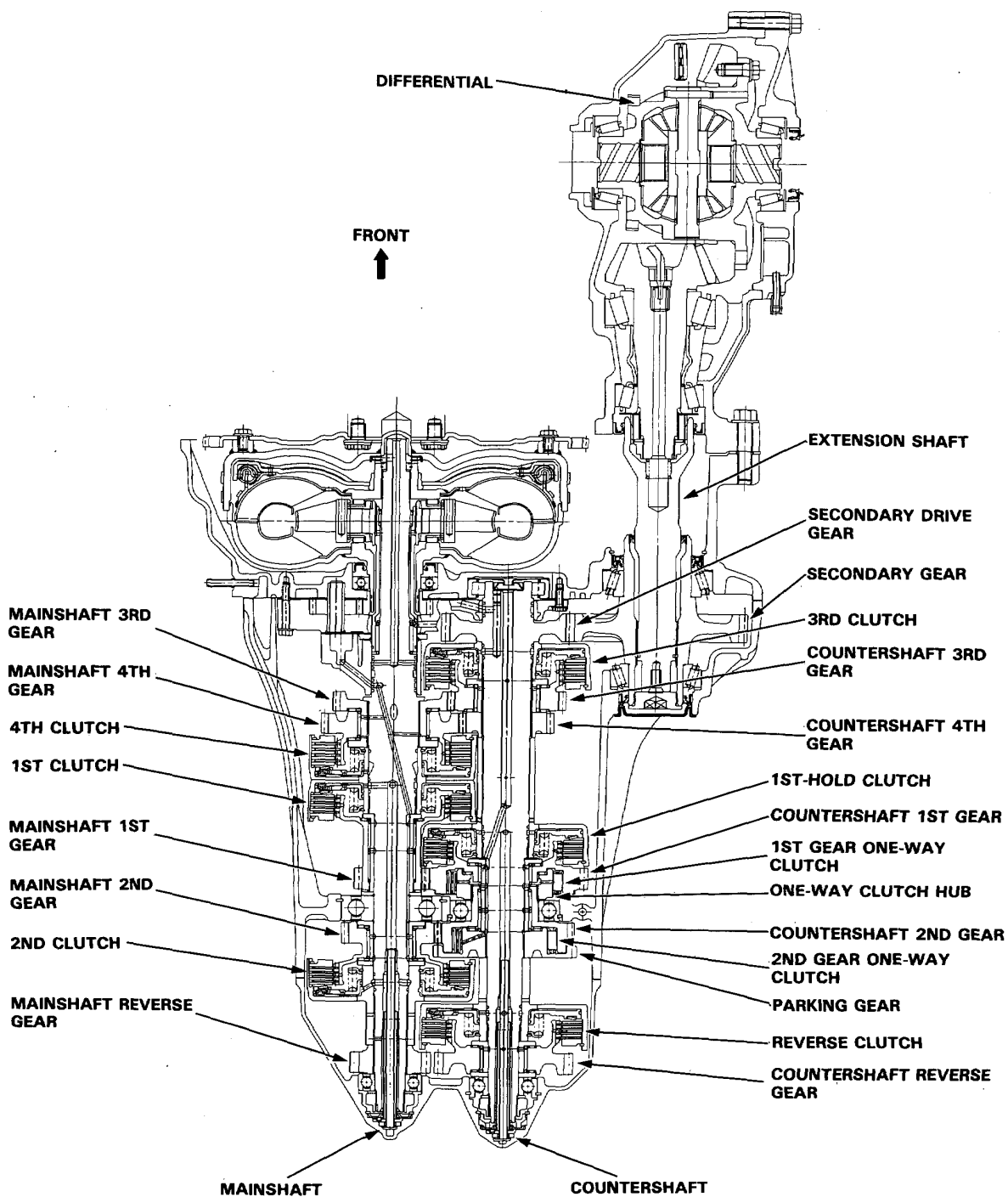
[Reverse Clutch]

The reverse clutch engages/disengages reverse gear, and is located at the right of the countershaft. The reverse clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

[One-way Clutch]

This transmission has two one-way clutches, the first gear one-way clutch and the second gear one-way clutch. The first gear one-way clutch is positioned between the first gear and the one-way clutch hub, with the one-way clutch hub splined to second gear. The first gear provides the outer race surface. The second gear one-way clutch is positioned between the second gear and the parking gear, with the parking gear splined to the countershaft. The second gear provides the outer race surface, and the parking gear provides the inner race surface. The one-way clutches lock up when power is transmitted from the mainshaft first gear to the countershaft first gear. The second gear one-way clutch locks up when power is transmitted from the mainshaft second gear to the countershaft second gear. The first clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the D₃ or D₄ position. However, the first gear one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the D₃ or D₄ position. This is because the increased rotational speed of the gears on the countershaft over-ride the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch freewheels with the first clutch still engaged.





(cont'd)

Description

Clutches (cont'd)

Lock-up Clutch

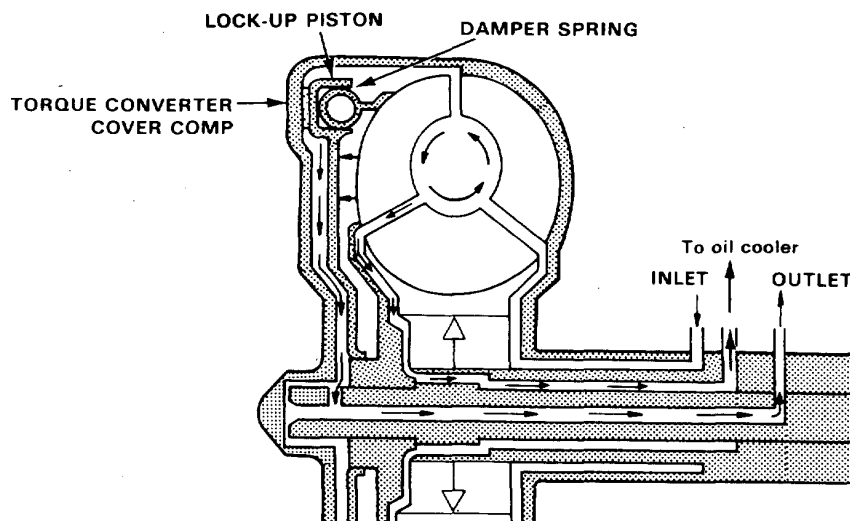
1. Operation (clutch on)

With the lock-up clutch on, the oil in the chamber between the torque converter cover and lock-up piston is discharged, and the converter oil exerts pressure through the piston against the converter cover. As a result, the converter turbine is locked on the converter cover firmly. The effect is to bypass the converter, thereby placing the car in direct drive.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft

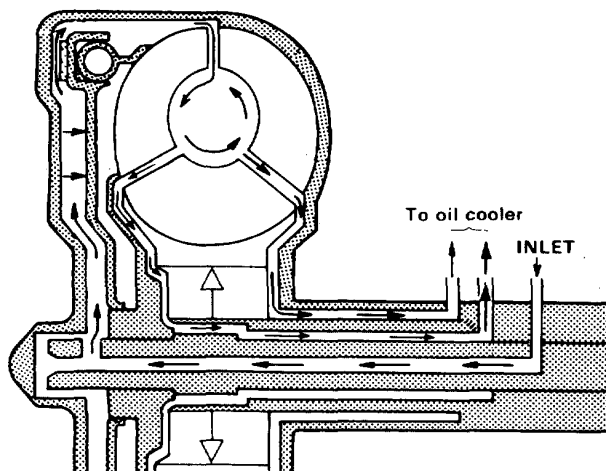


2. Operation (clutch off)

With the lock-up clutch off, the oil flows in the reverse of CLUTCH ON. As a result, the lock-up piston is moved away from the converter cover; that is, the torque converter lock-up is released.

Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft





Power Flow

PART RANGE	TORQUE CONVERTER	1ST HOLD CLUTCH	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH GEAR 4TH CLUTCH	RVS. GEAR REVERSE CLUTCH	PARKING GEAR
P	○	×	×	×	×	×	×	○
R	○	×	×	×	×	×	○	×
N	○	×	×	×	×	×	×	×
D4	1ST	○	×	○	×	×	×	×
	2ND	○	×	○*	○	×	×	×
	3RD	○	×	○*	○*	○	×	×
	4TH	○	×	○*	○*	×	○	×
D3	1ST	○	×	○	×	×	×	×
	2ND	○	×	○*	○	×	×	×
	3RD	○	×	○*	○*	○	×	×
2	○	○	×	○	×	×	×	×
1	○	○	○	×	×	×	×	×

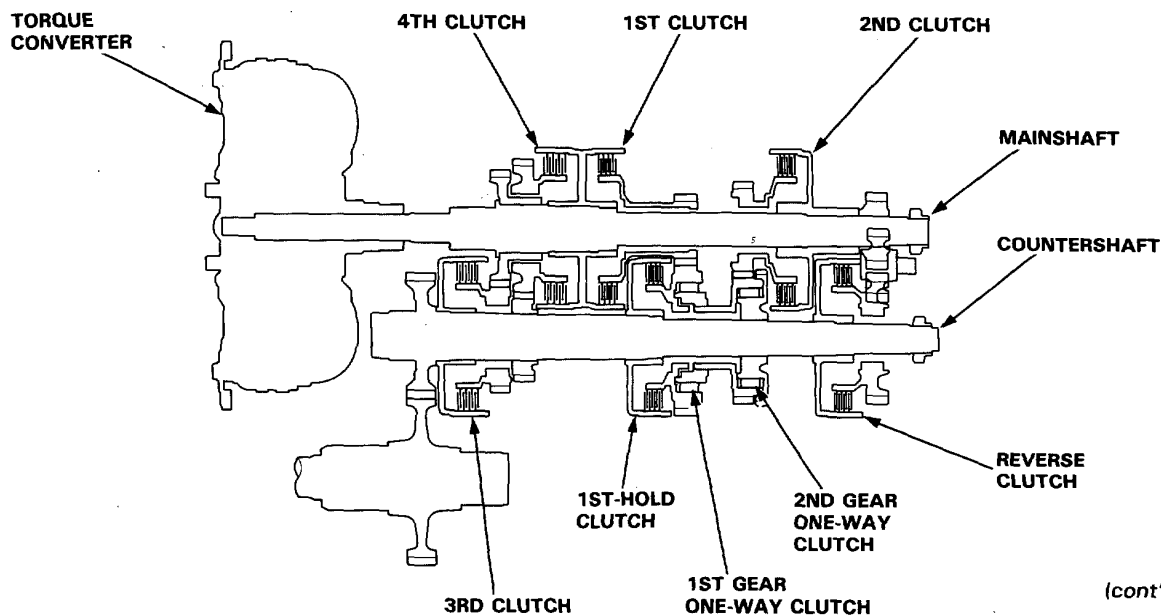
○: Operates, ×: Doesn't, *: Although the 1st clutch engages, driving power is not transmitted because the one-way clutch slips.

N Position

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.

P Position

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the parking pawl interlocking the parking gear.



(cont'd)

Description

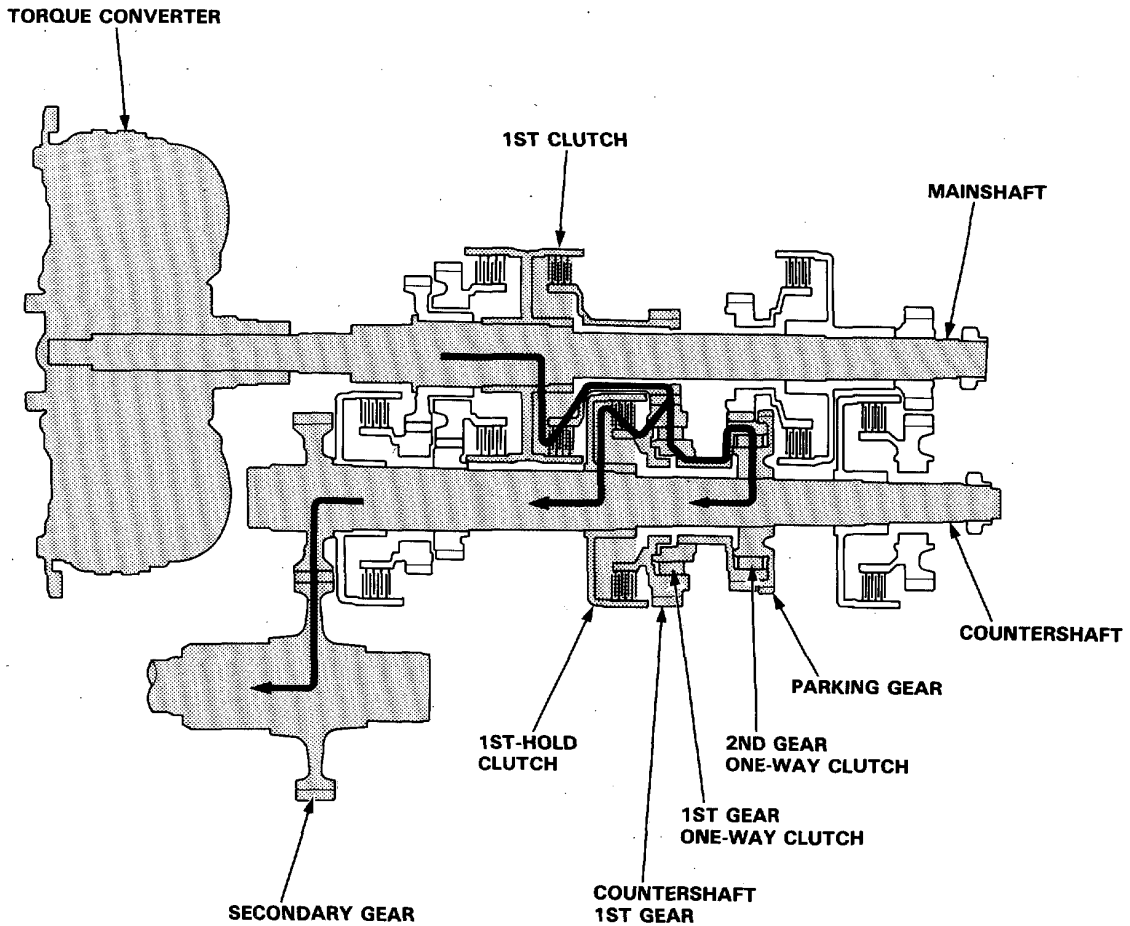
Power Flow (cont'd)

1 Position

At **1** position, hydraulic pressure is applied to the 1st clutch and 1st-hold clutch.

The power flow when accelerating is as follows;

1. Hydraulic pressure is applied to the 1st clutch on the mainshaft and power is transmitted via the 1st clutch to the mainshaft 1st gear.
2. Hydraulic pressure is also applied to the 1st-hold clutch on the countershaft. Power transmitted to the mainshaft 1st gear is conveyed via the countershaft 1st gear to the 1st gear one-way clutch and 2nd gear one-way clutch, and the 1st-hold clutch. The one-way clutches are used to drive the countershaft, and the 1st-hold clutch drives the countershaft.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.

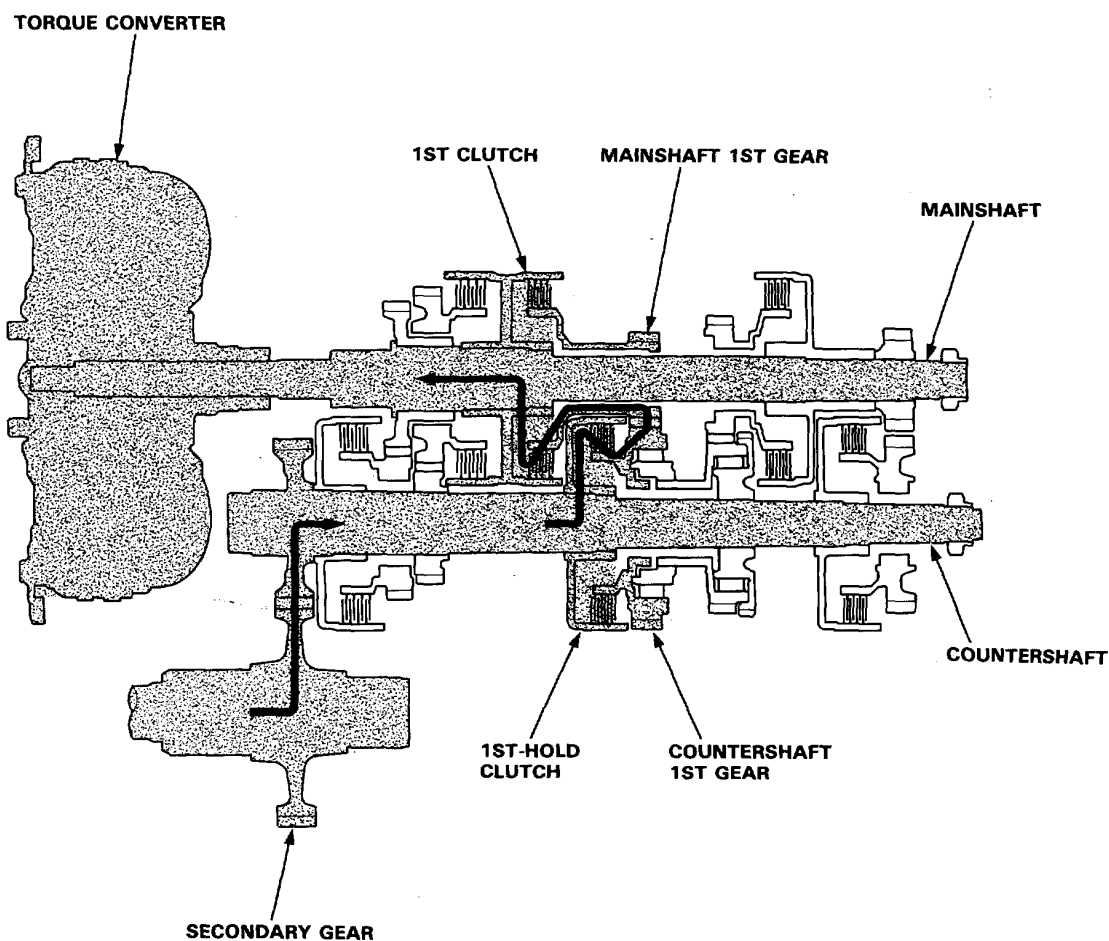




1 Position

The power flow when decelerating is as follows;

1. Rolling resistance from the road surface goes through the front wheels to the secondary drive gear, then to the countershaft 1st gear via the 1st-hold clutch which is applied during deceleration.
2. The 1st gear one-way clutch becomes free at this time because the countershaft torque reverses.
3. The counterforce conveyed to the countershaft 1st gear turns the mainshaft 1st gear. At this time, since hydraulic pressure is also applied to the 1st clutch, counterforce is also transmitted to the mainshaft. As a result, engine braking can be obtained with 1st gear.



(cont'd)

Description

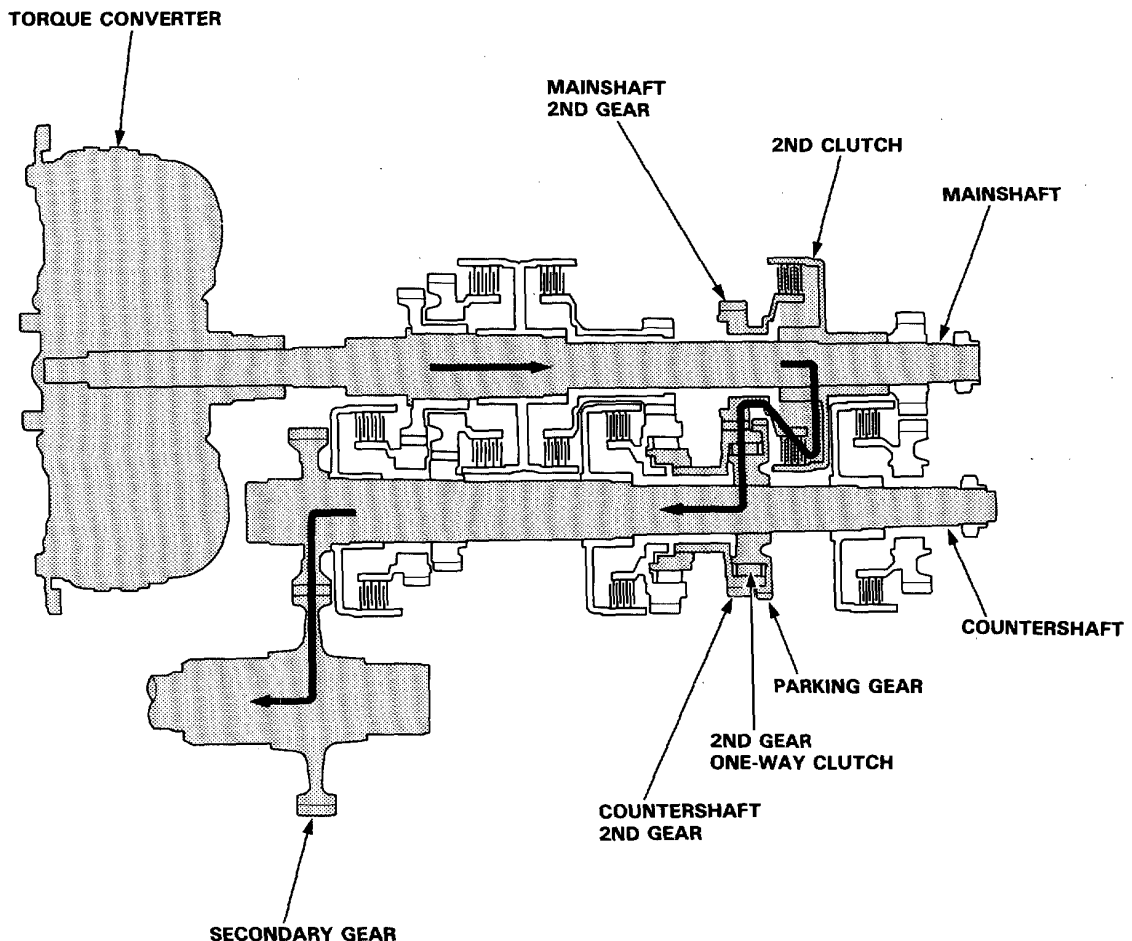
Power Flow (cont'd)

2 Position is provided to drive only 2nd speed.

At **2** position, hydraulic pressure is applied to the 2nd clutch and to the 1st-hold clutch.

The power flow when accelerating is as follows;

1. Hydraulic pressure is applied to the 2nd clutch on the mainshaft and power is transmitted via the 2nd clutch to the mainshaft 2nd gear.
2. Power transmitted to the mainshaft 2nd gear is conveyed via the countershaft 2nd gear to the 2nd gear one-way clutch on the inside of the countershaft 2nd gear. The 2nd gear one-way clutch is used to drive the countershaft.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.
Hydraulic pressure is applied to the 1st-hold clutch but the countershaft is rotated by the 1st gear one-way clutch.

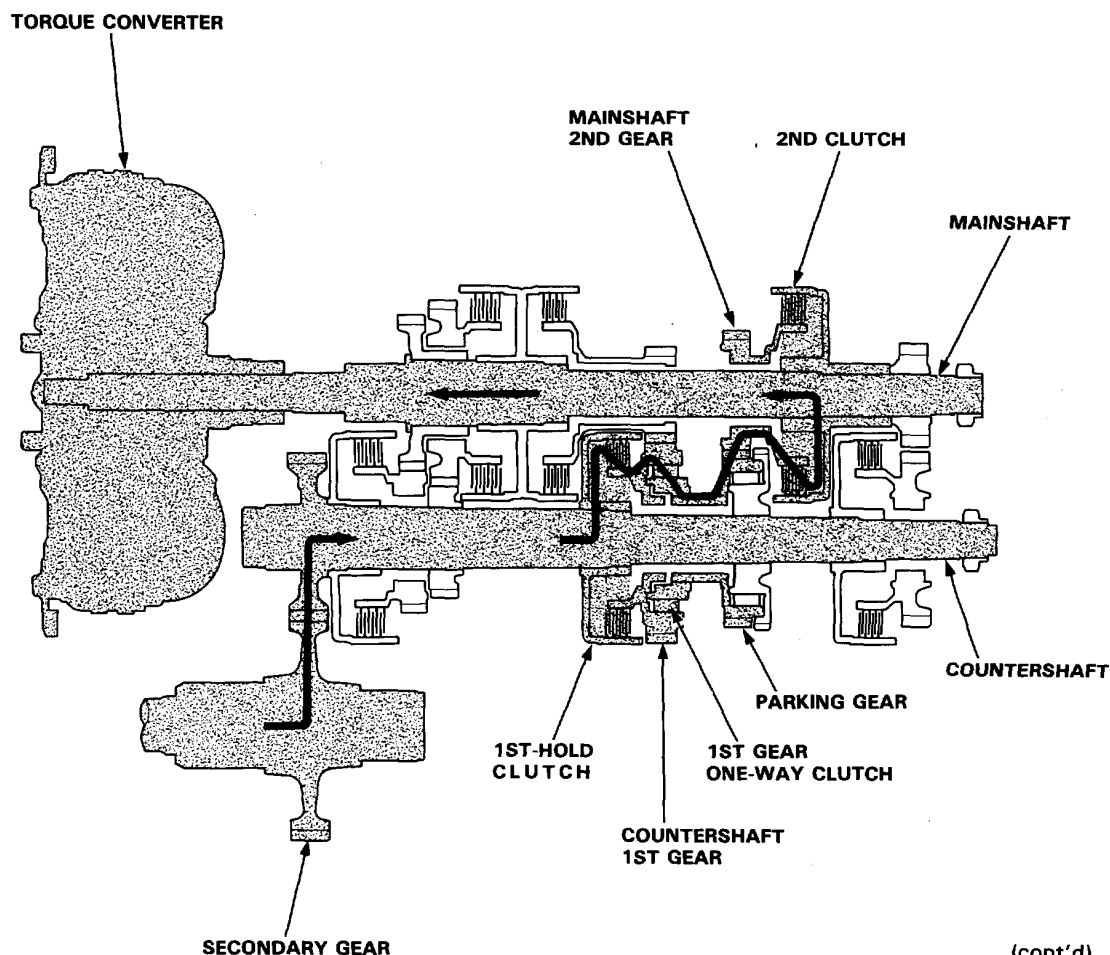




2 Position

The power flow when decelerating is as follows;

1. Rolling resistance from the road surface goes through the front wheels to the secondary drive gear, then to the countershaft 1st gear via the 1st-hold clutch which is applied during deceleration.
2. Power transmitted to the countershaft 1st gear is conveyed via the 1st gear one-way clutch on the inside of the countershaft 1st gear to the countershaft 2nd gear. The 1st gear one-way clutch is used to drive the countershaft 2nd gear.
3. The 2nd gear one-way clutch becomes free at this time because the countershaft torque reverses.
4. The counterforce conveyed to the countershaft 1st gear turns the mainshaft 2nd gear. At this time, since hydraulic pressure is applied to the 2nd clutch, counterforce is transmitted to the mainshaft. As a result, engine braking can be obtained with 2nd gear.



(cont'd)

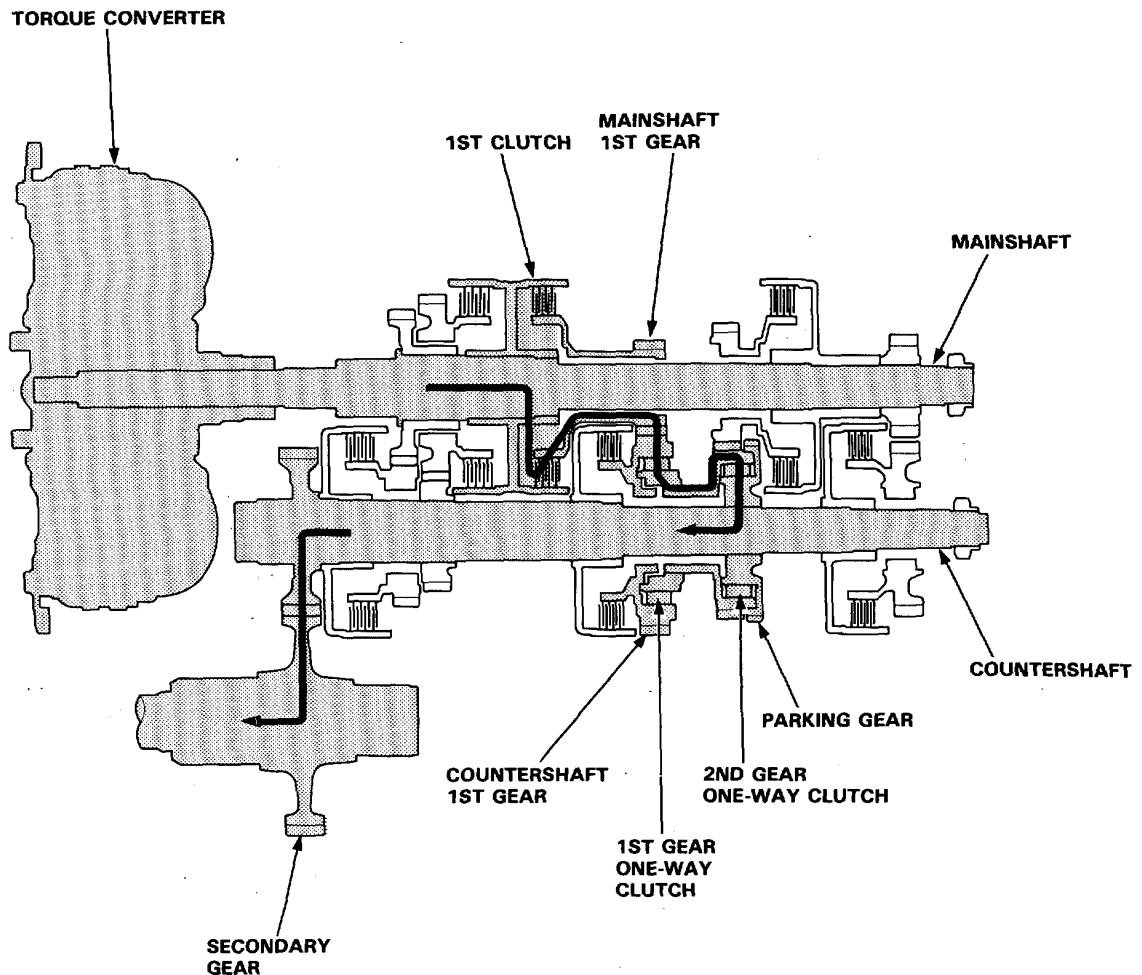
Power Flow (cont'd)

In **D₄** or **D₃** position, the optimum gear is automatically selected from 1st, 2nd, 3rd and 4th speeds, according to conditions such as the balance between throttle opening (engine load) and vehicle speed.

D₄ or D₃ Position, 1st speed

1. Hydraulic pressure is applied to the 1st clutch, which rotates together with the mainshaft, and the mainshaft 1st gear rotates.
2. Power is transmitted to the countershaft 1st gear, and drives the countershaft via the one-way clutches.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.

NOTE: In **D₄** or **D₃** position, hydraulic pressure is not applied to the 1st-hold clutch.

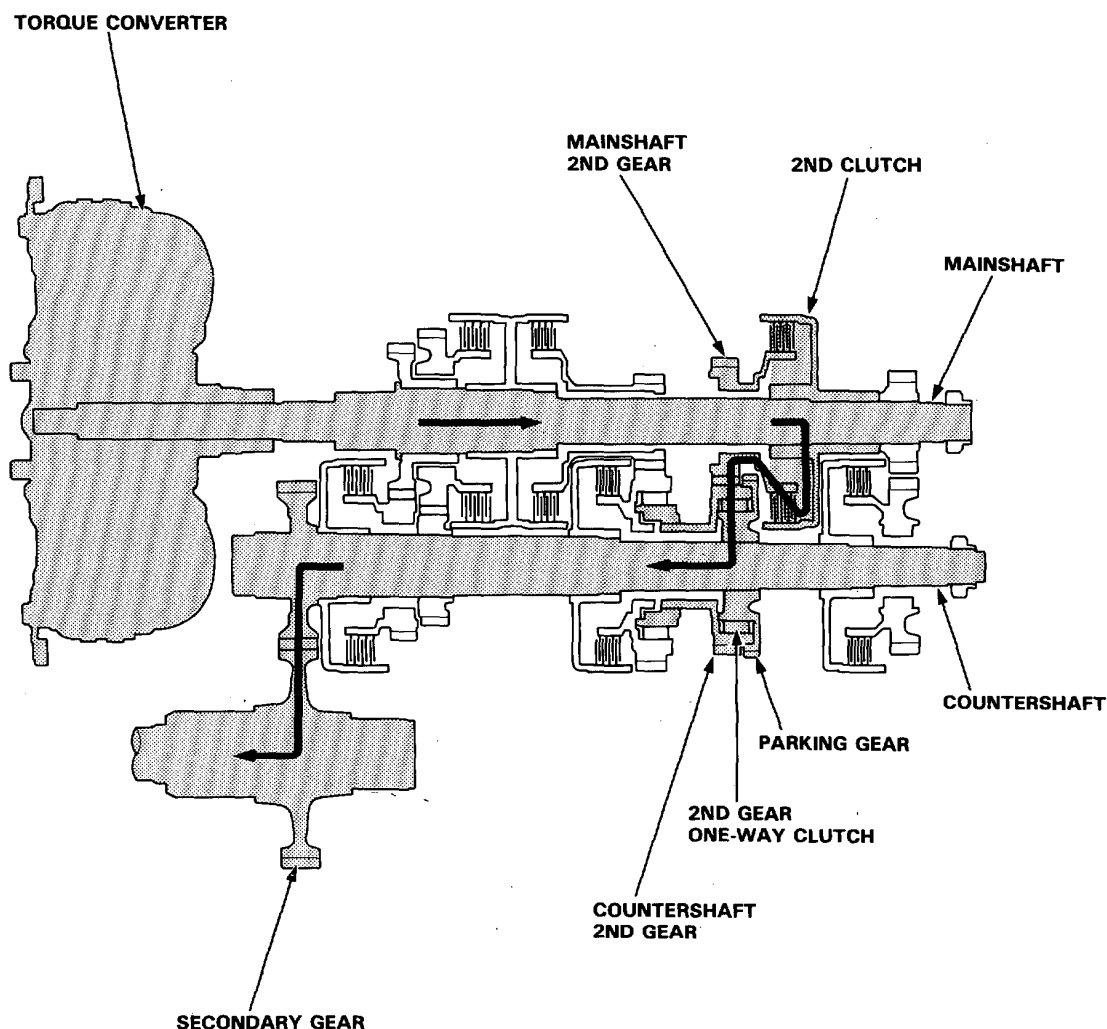




D₄ or D₃ Position, 2nd speed

1. Hydraulic pressure is applied to the 2nd clutch, which rotates together with the mainshaft, and the mainshaft 2nd gear rotates.
2. Power is transmitted to the countershaft 2nd gear, and drives the countershaft via the 2nd gear one-way clutch.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.

NOTE: In **D₄** or **D₃** position, 2nd speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the 1st gear one-way clutch.



(cont'd)

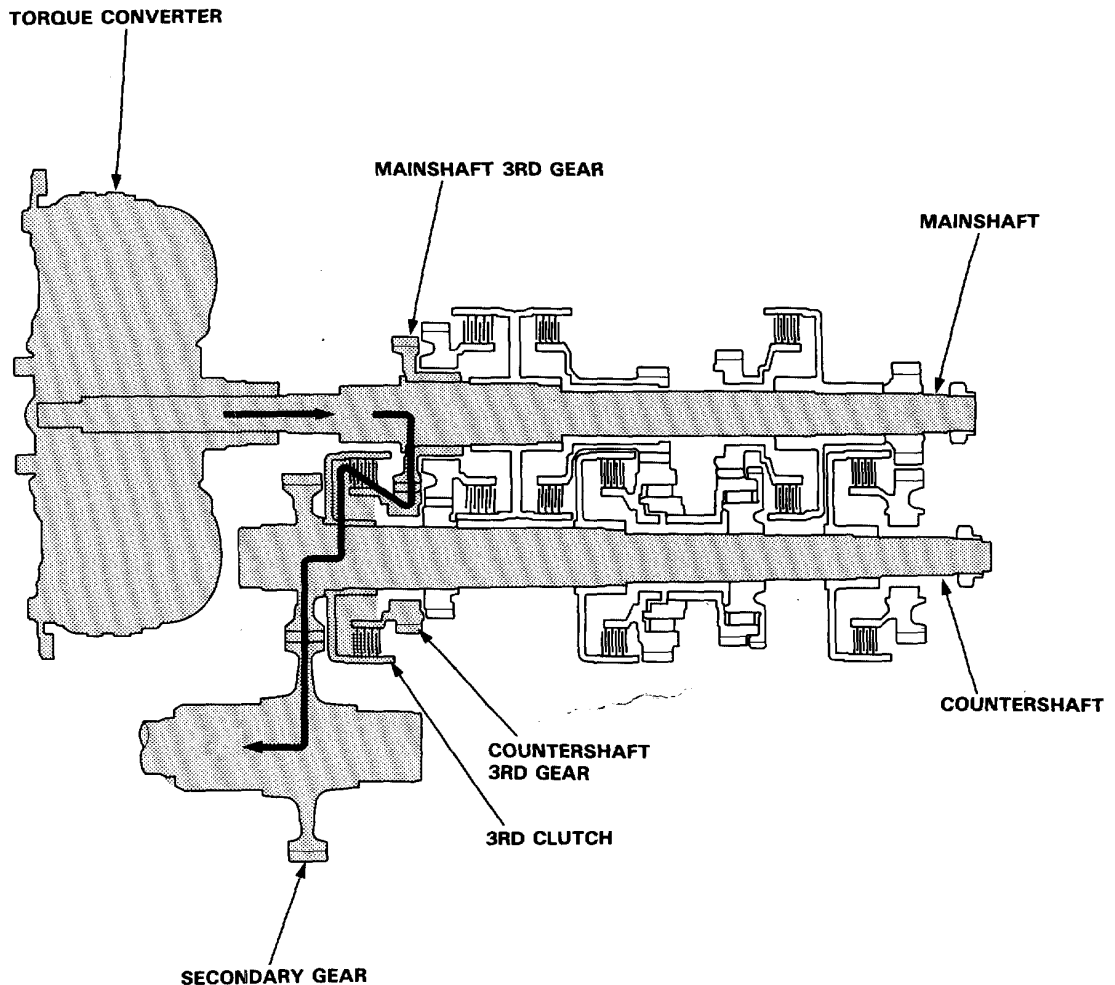
Description

Power Flow (cont'd)

D₄ or **D₃** Position, 3rd speed

1. Hydraulic pressure is applied to the 3rd clutch. Power from the mainshaft 3rd gear is transmitted to the countershaft 3rd gear.
2. Power is transmitted to the secondary drive gear and drives the secondary gear.

NOTE: In **D₄** or **D₃** position, 3rd speed, hydraulic pressure is also applied to the 1st clutch and to the 2nd clutch, but since the rotation speed of 3rd gear exceeds that of 2nd gear, power from 2nd gear is cut off at the 2nd gear one-way clutch.

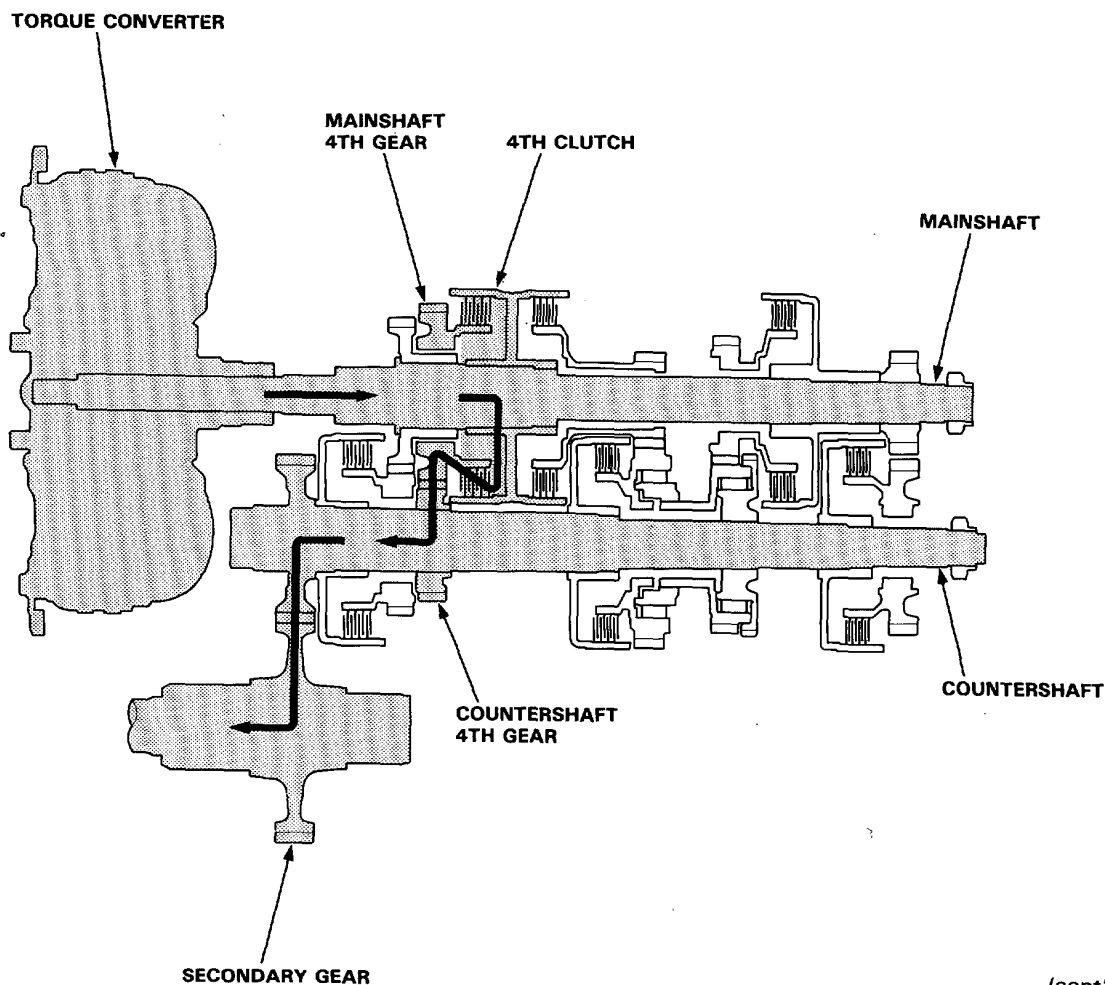




D₄ Position, 4th speed

1. Hydraulic pressure is applied to the 4th clutch, which rotates together with the mainshaft, and the mainshaft 4th gear rotates.
2. Power is transmitted to the countershaft 4th gear, and drives the countershaft.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.

NOTE: In **D₄** position, 4th speed, hydraulic pressure is also applied to the 1st clutch and to the 2nd clutch, but since the rotation speed of 4th gear exceeds that of 2nd gear, power from 2nd gear is cut off at the 2nd gear one-way clutch.



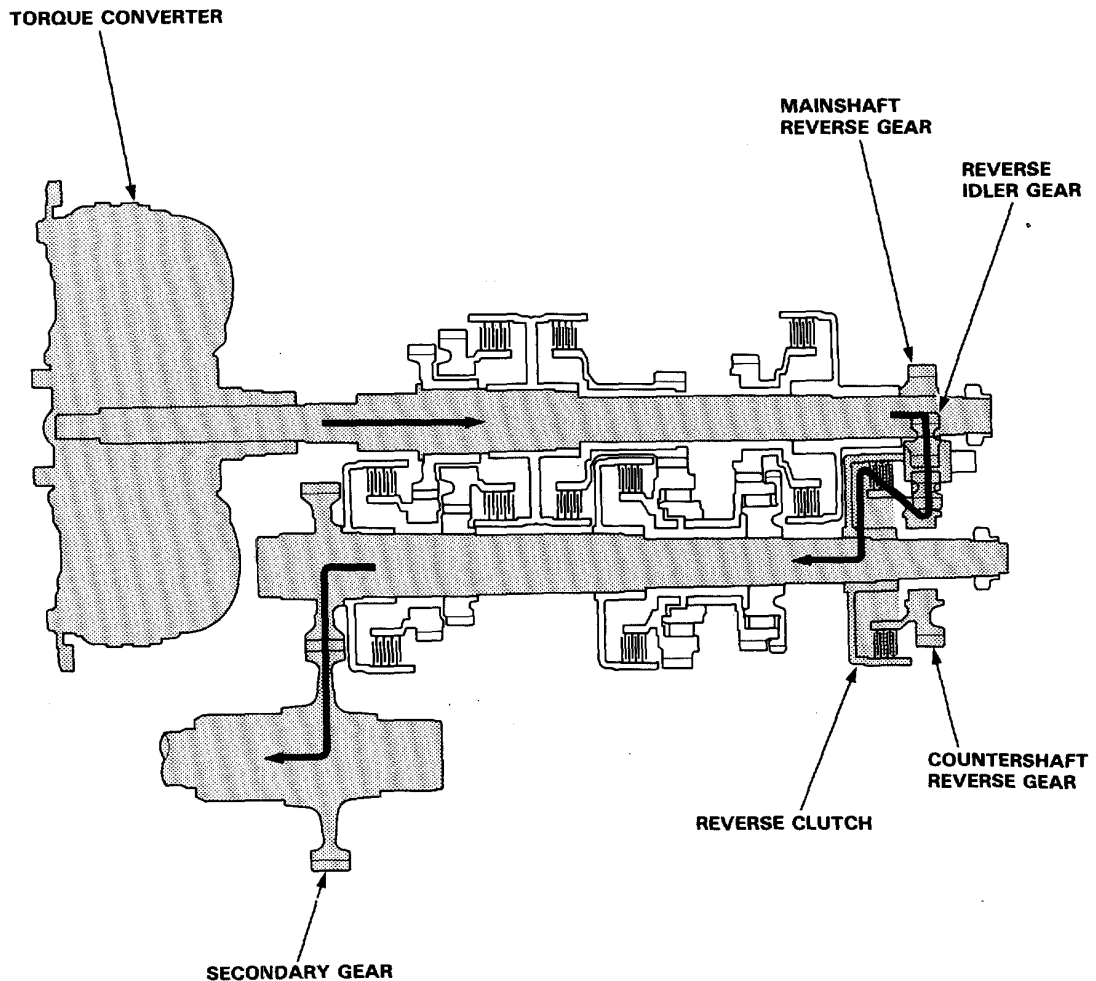
(cont'd)

Description

Power Flow (cont'd)

R Position

1. Hydraulic pressure is applied to the reverse clutch. Power is transmitted from the mainshaft reverse gear via the reverse idler gear to the countershaft reverse gear.
2. Rotation direction of the countershaft reverse gear is changed via the reverse idler gear in the rear cover.
3. Power is transmitted to the secondary drive gear and drives the secondary gear.





Electronic Control System

Electronic Control System

The electronic control system consists of the PGM-FI/AT Electronic Control Unit (ECU), sensors, a linear solenoid and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The ECU is located below the dashboard, under the front lower panel on the passenger's side.

Shift control

Shifting is related to engine torque through the linear solenoid used to operate throttle valve B which is controlled by the ECU. Getting a signal from each sensor, the ECU determines the appropriate shift point and activates shift control solenoid valves A and/or B.

The combination of driving signals to shift control solenoid valves A and B is shown in the table below.

Shift control sol. valve	A	B
Range (gear)		
1, D ₄ D ₃ (1ST)	OFF	ON
2, D ₄ D ₃ (2ND)	ON	ON
D ₄ D ₃ (3RD)	ON	OFF
D ₄ (4TH)	OFF	OFF

Lock-up control

From sensor input signals, the ECU determines whether to turn the lock-up ON or OFF and activates lock-up control solenoid valve A and/or B accordingly.

The combination of driving signals to lock-up control solenoid valves A and B is shown in the table below.

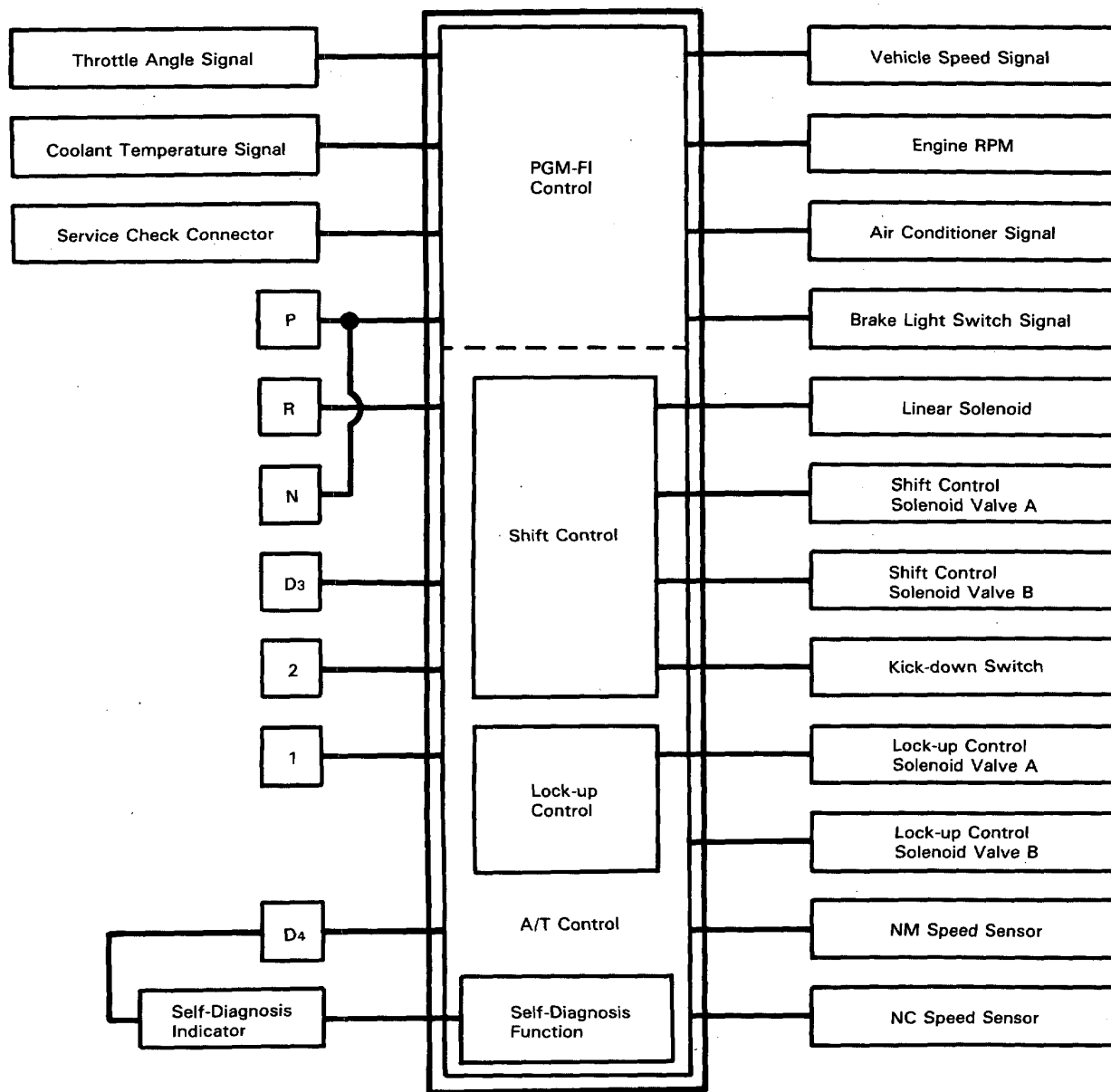
Solenoid valve	A	B
Lock-up condition		
Lock-up OFF	OFF	OFF
Lock-up, slight	ON	OFF
Lock-up, half	ON	ON
Lock-up, full	ON	ON
Lock-up during deceleration	ON	Duty operation OFF ↔ ON

(cont'd)

Description

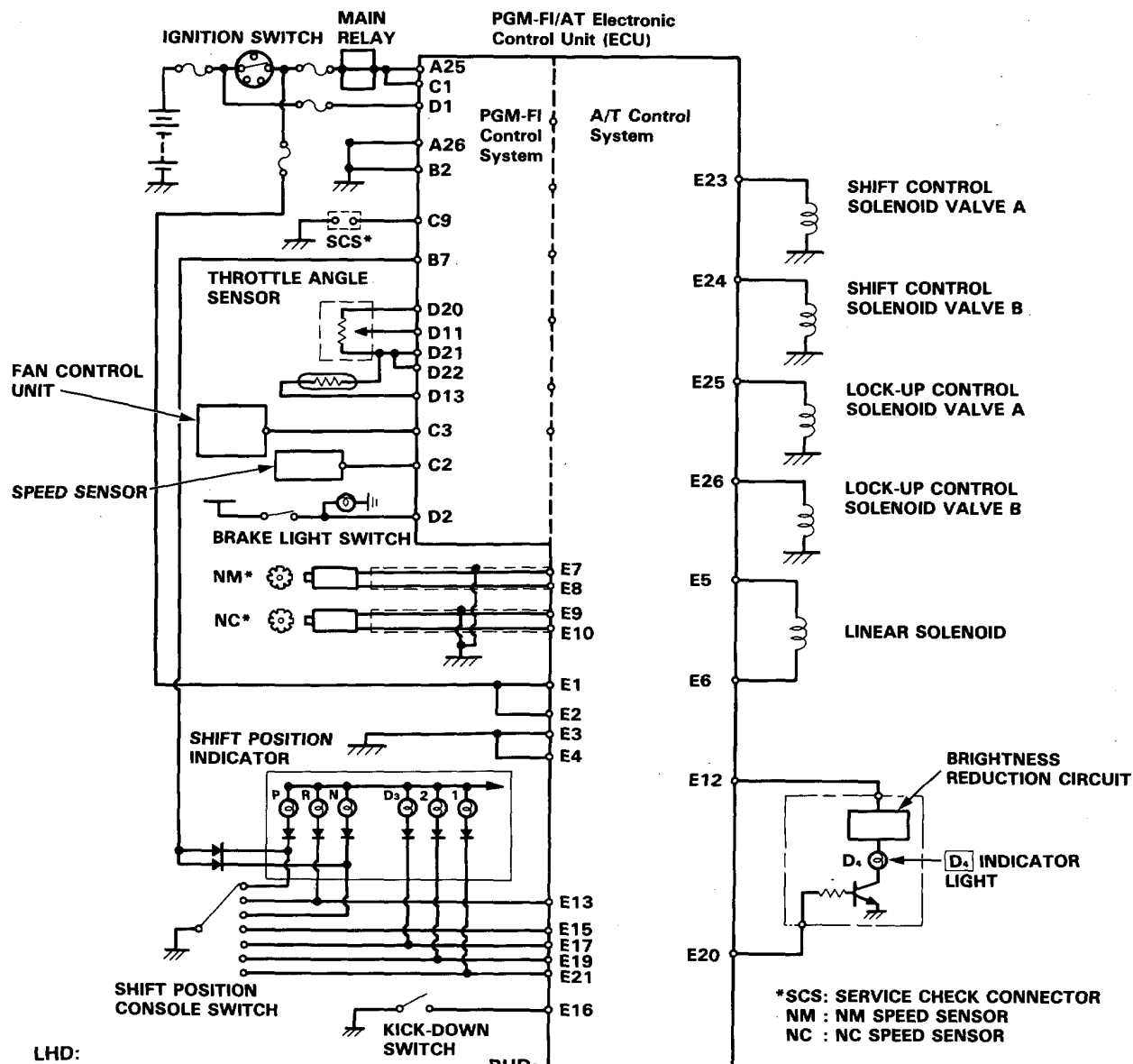
Electronic Control System (cont'd)

PGM-FI/AT Electronic Control Unit (ECU)

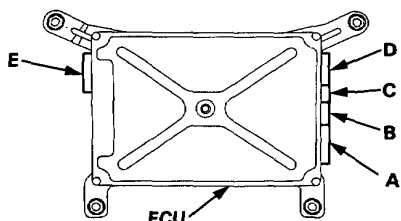




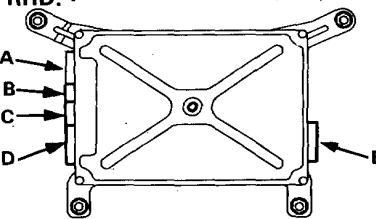
Circuit Diagram



LHD:



RHD:



ECU TERMINAL LOCATION

A1	A3	A5	A7	A9	A11	A13	A15	A17	A19	A21	A23	A25
A2	A4	A6	A8	A10	A12	A14	A16	A18	A20	A22	A24	A26

A

B3	B5	B7	B9	B11	B13	B15
B2	B4	B6	B8	B10	B12	B14

B

C1	C3	C5	C7	C9	C11
C2	C4	C6	C8	C10	C12

C

D1	D3	D5	D7	D9	D11	D13	D15	D17	D19	D21
D2	D4	D6	D8	D10	D12	D14	D16	D18	D20	D22

D

E1	E3	E5	E7	E9	E11	E13	E15	E17	E19	E21	E23	E25
E2	E4	E6	E8	E10	E12	E14	E16	E18	E20	E22	E24	E26

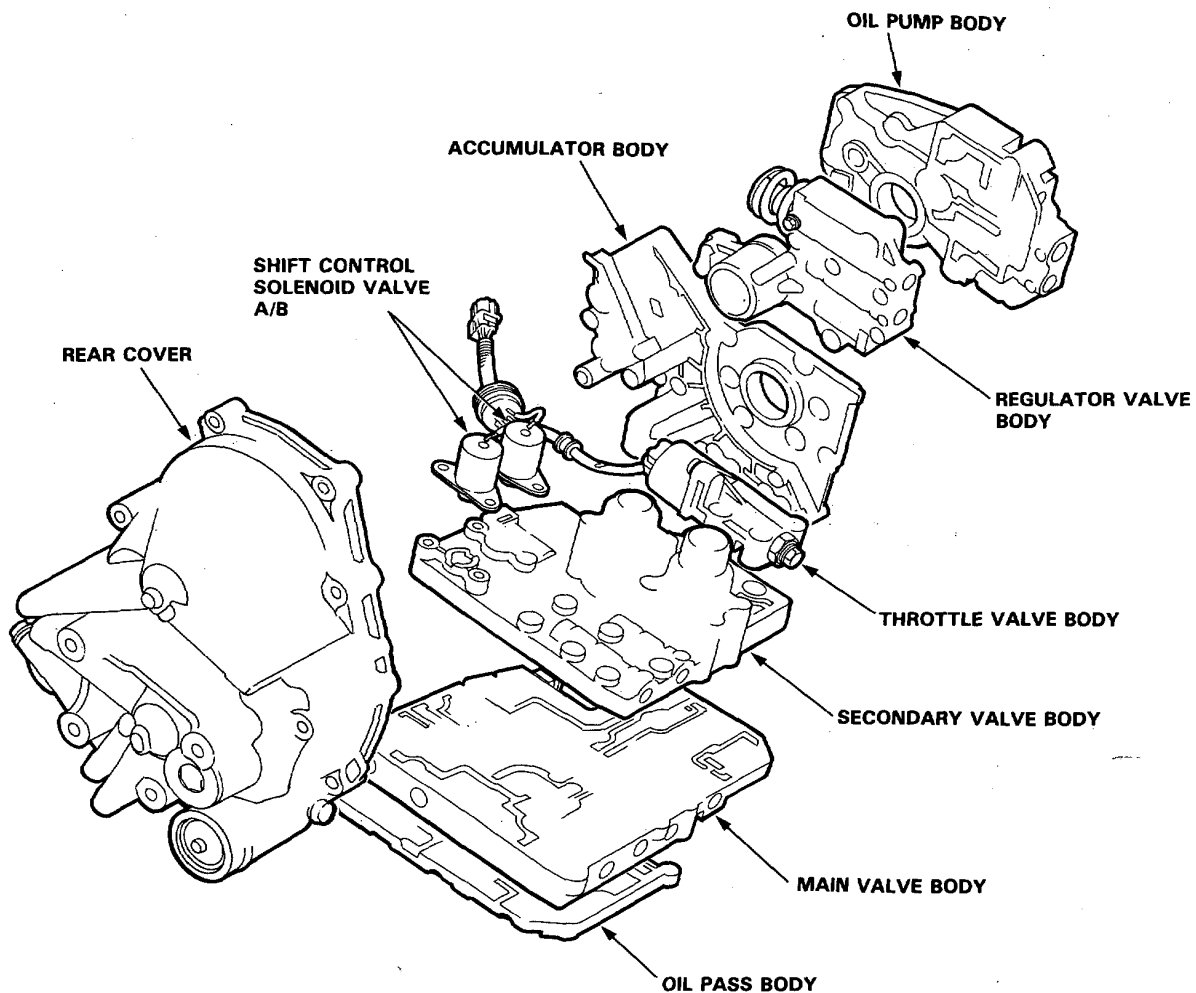
E

Description

Hydraulic Control

The valve bodies include the main valve body, secondary valve body, throttle valve body, oil pump body, regulator valve body, and accumulator body.

The oil pump is driven by splines behind the torque converter which is attached to the engine. Oil 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.





Lower Valve Body Assembly

The lower valve body assembly is located on the bottom of the transmission. The lower valve body assembly consists of main valve body, secondary valve body and oil pass body.

Main Valve Body

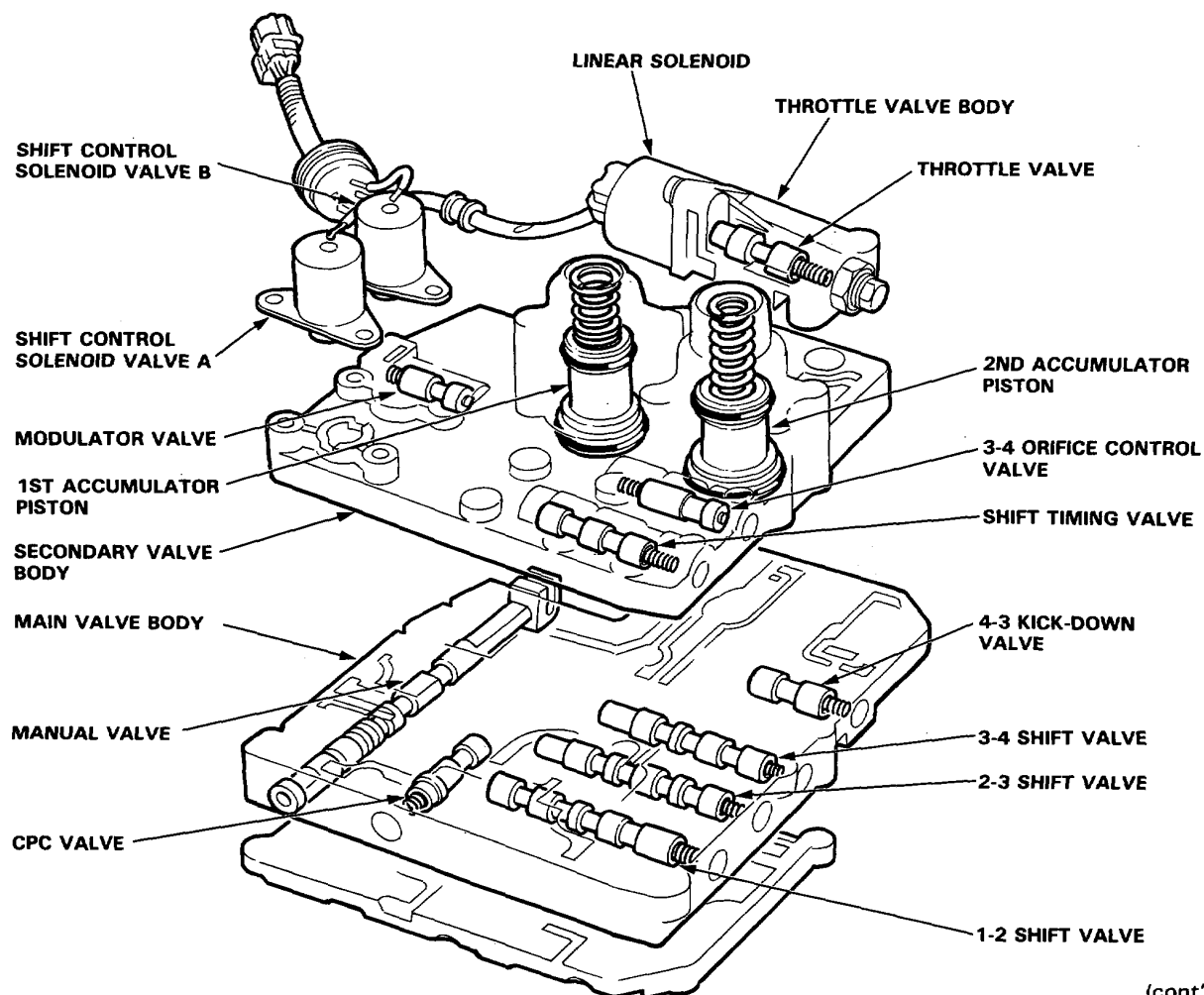
The manual valve, 1-2, 2-3, 3-4 shift valves, 4-3 kick-down valve and CPC valve are all built into the main valve body. The primary function of this valve body is switching oil passages on and off and controlling the hydraulic pressure going to the hydraulic control system.

Secondary Valve Body

The secondary valve body is located on the main valve body with the modulator valve, 3-4 orifice control valve, shift timing valve, 1st and 2nd accumulator built in.

Throttle Valve Body

The throttle valve body is located on the secondary valve body with the throttle valve operated by the linear solenoid.



(cont'd)

Description

Hydraulic Control (cont'd)

Oil Pump Body

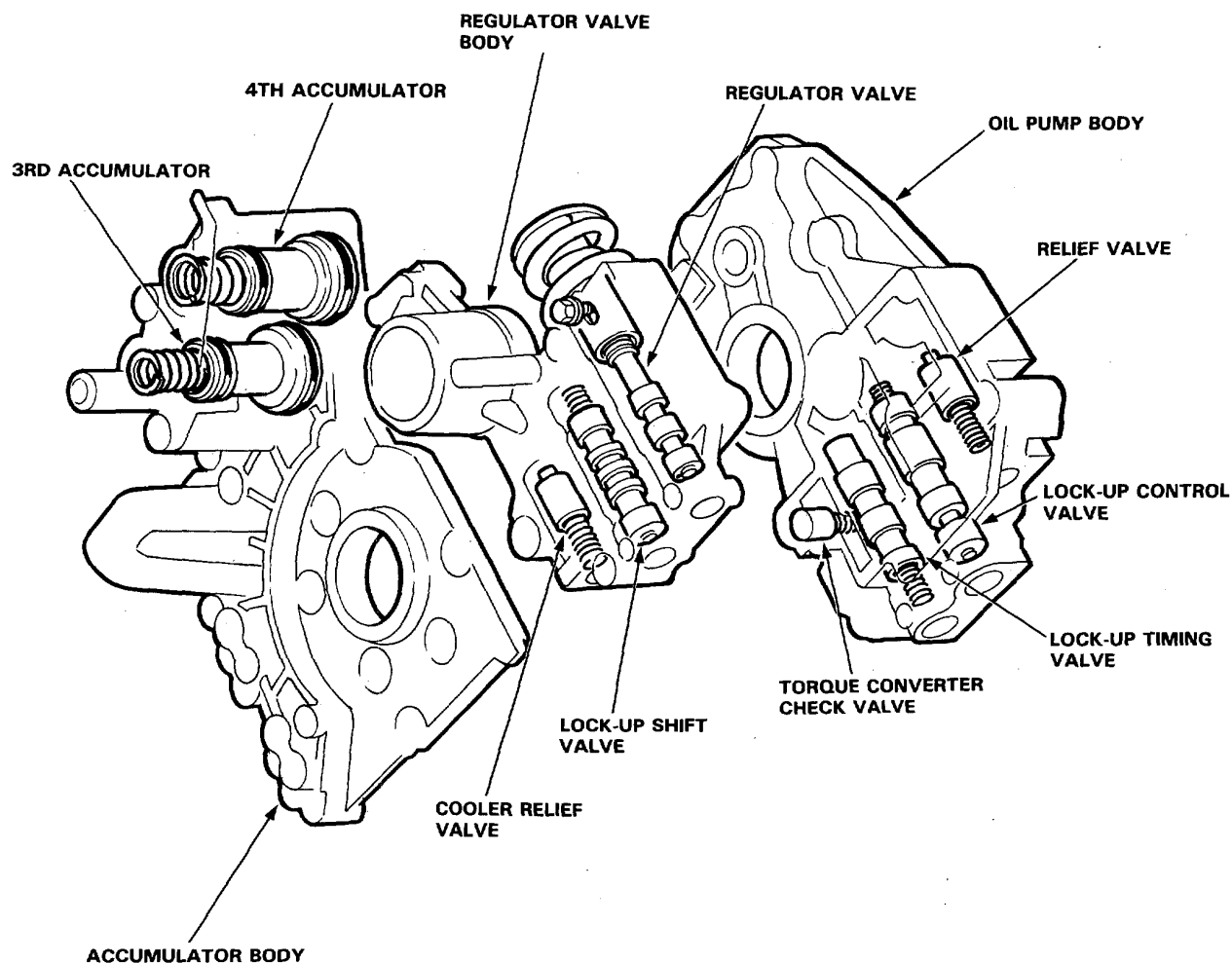
The oil pump body consists of the oil pump gears, lock-up timing valve, lock-up control valve and relief valve. The torque converter check valve is located under the oil pump body.

Accumulator Body

The accumulator body consists of the 3rd and 4th accumulators.

Regulator Valve Body

The regulator valve body is located on the oil pump body with the regulator valve, lock-up shift valve and cooler relief valve built in.

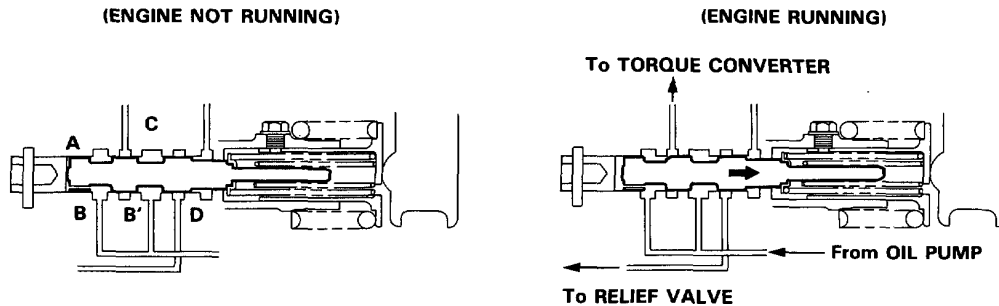




Regulator Valve

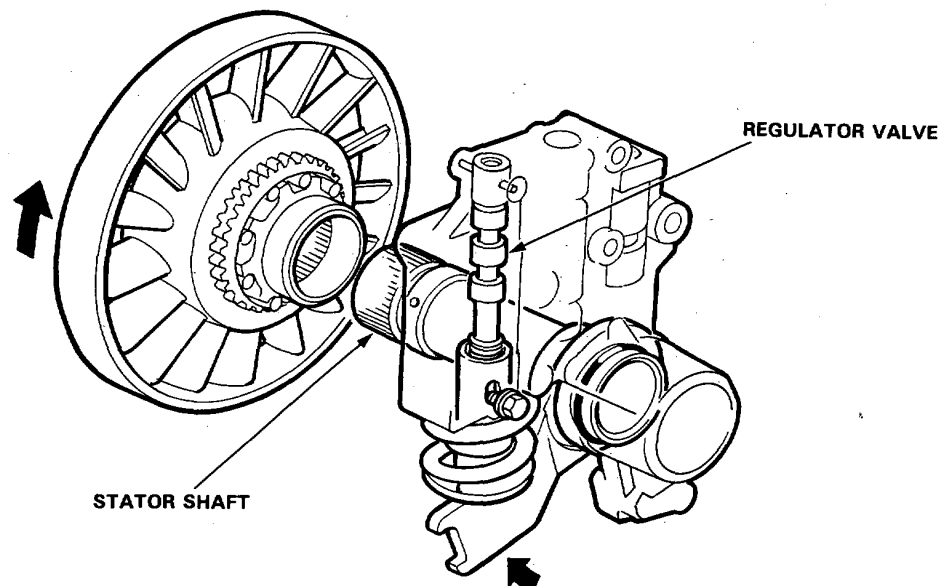
The regulator valve maintains a constant hydraulic pressure from the oil pump to the hydraulic control system, while also furnishing oil to the lubricating system and torque converter.

Oil flows through B and B'. The oil which enters through B flows through the valve orifice to A, pushing the regulator valve to the right. According to the level of hydraulic pressure through B, the position of the valve changes, and the amount of the oil through B' from D thus changes. This operation is continued, thus maintaining the line pressure.



Stator Reaction Hydraulic Pressure Control

Hydraulic pressure increase according to torque is performed by the regulator valve using stator torque reaction. The stator shaft is splined to the stator and its arm end contacts the regulator spring cap. When the car 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 this → direction in proportion to the reaction. The spring compresses and the valve moves to increase the regulated control pressure or line pressure. Line pressure is maximum when the stator reaction is maximum.



Description

Hydraulic Flow

General Chart of Hydraulic Pressure

Oil Pump → Regulator Valve → $\left\{ \begin{array}{l} \text{Line Pressure} \\ \text{Torque Converter Pressure} \\ \text{Lubrication Pressure} \end{array} \right.$

Distribution of Hydraulic Pressure

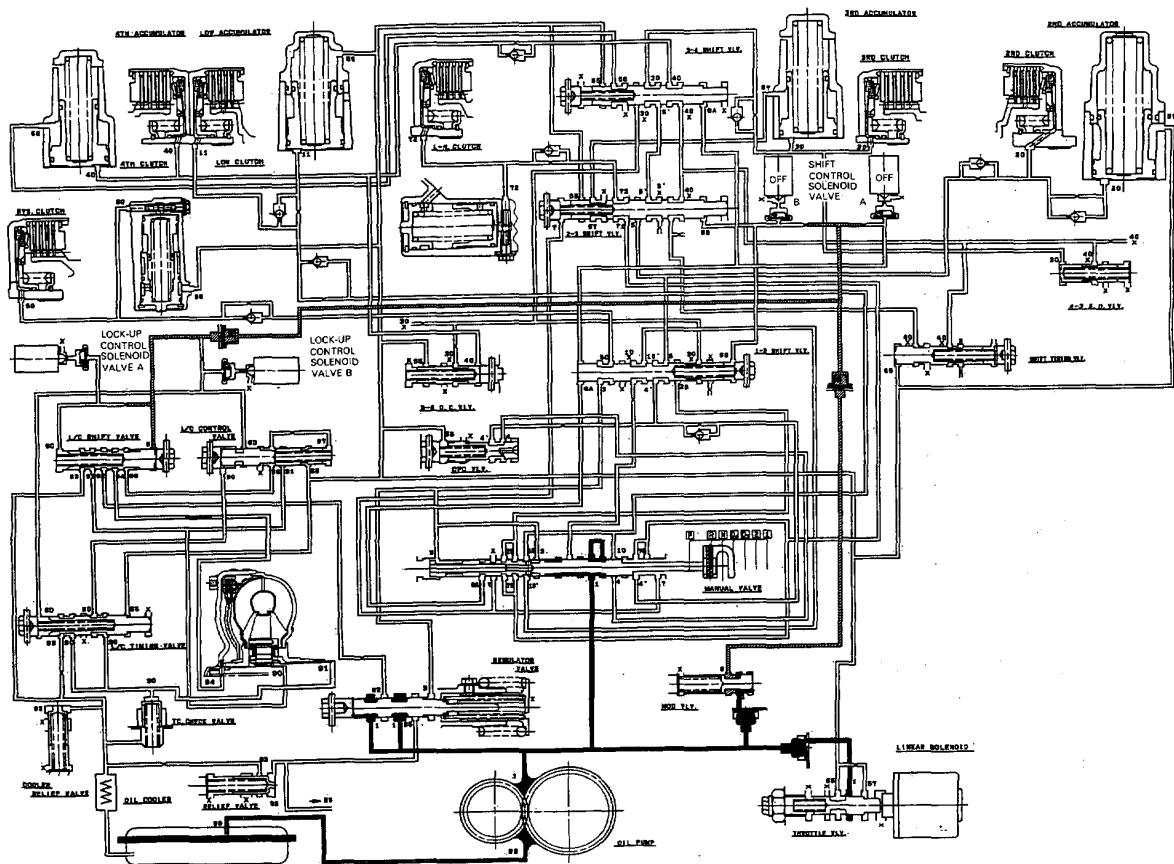
- Manual Valve → To Select Line Pressure
- Throttle Valve B → Throttle B Pressure
- 1-2 Shift Valve } → Clutch Pressure
- 2-3 Shift Valve }
- 3-4 Shift Valve }
- Line Pressure → Throttle Valve

NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE
1	LINE	10	1ST CLUTCH	71	1ST-HOLD CLUTCH
2	LINE	10'	1ST CLUTCH	72	1ST-HOLD CLUTCH
4	LINE	11	1ST CLUTCH	90	TORQUE CONVERTER
4'	LINE	20	2ND CLUTCH	91	TORQUE CONVERTER
4''	LINE	25	LINE	92	TORQUE CONVERTER
5	LINE	30	3RD CLUTCH	93	OIL COOLER
6	MODULATOR	40	4TH CLUTCH	94	TORQUE CONVERTER
6A	MODULATOR (SHIFT SOL A)	50	REVERSE CLUTCH	95	LUBRICATION
6B	MODULATOR (SHIFT SOL B)	55	THROTTLE B	96	TORQUE CONVERTER
6C	MODULATOR (L/C SOL A)	56	THROTTLE B	99	SUCTION
6D	MODULATOR (L/C SOL B)	57	THROTTLE B	X	BLEED
7	LINE	70	1ST-HOLD CLUTCH		

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As the engine turns, the oil pump also starts to operate. Automatic transmission fluid is drawn from (99) and discharged into (1). Then, ATF pressure is controlled by the regulator valve and becomes line pressure (1). The torque converter inlet pressure (92) enters (94) of torque converter through the orifice and discharges into (90). The torque converter check valve prevents the torque converter pressure from falling. Under this condition, the hydraulic pressure is not applied to the clutches.



(cont'd)

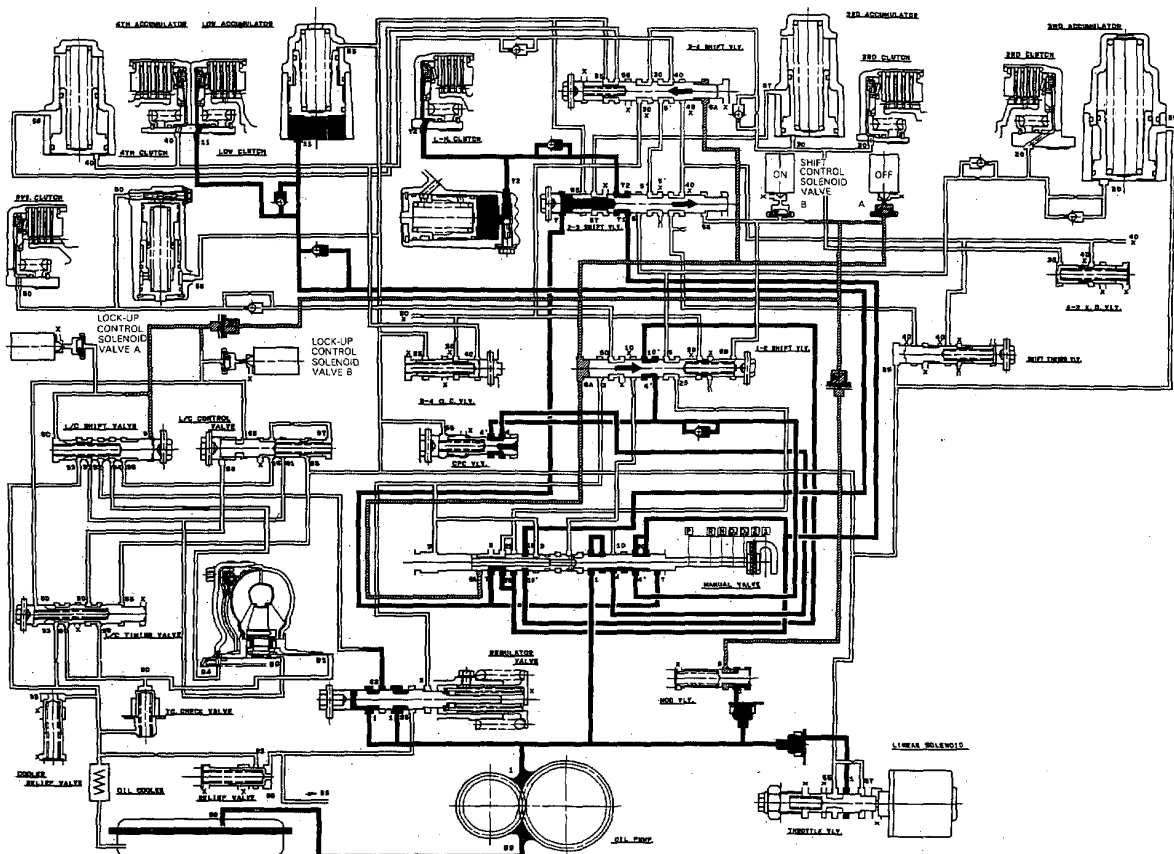
Description

Hydraulic Flow (cont'd)

1 Position

The line pressure (1) becomes the line pressure (4), (4'), (70) as it passes through the manual valve. Also, the line pressure (1) goes to the modulator valve through the filter and becomes the modulator pressure (6). The modulator pressure (6) is supplied to the 1-2 shift valve and 3-4 shift valve. The 1-2 shift valve is moved to the right side and the 3-4 shift valve is moved to the left side because the shift control solenoid valve A is turned OFF and B turned is ON by the ECU. The line pressure (4') becomes the 1st clutch pressure (10) via the 1-2 shift valve. The 1st clutch pressure (10) passed through the manual valve to the 1st clutch, then the 1st clutch is engaged. The 1st-hold clutch pressure (70) goes to the 1st-hold clutch via the 2-3 shift valve, then the 1st-hold clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the flow chart.





2 Position

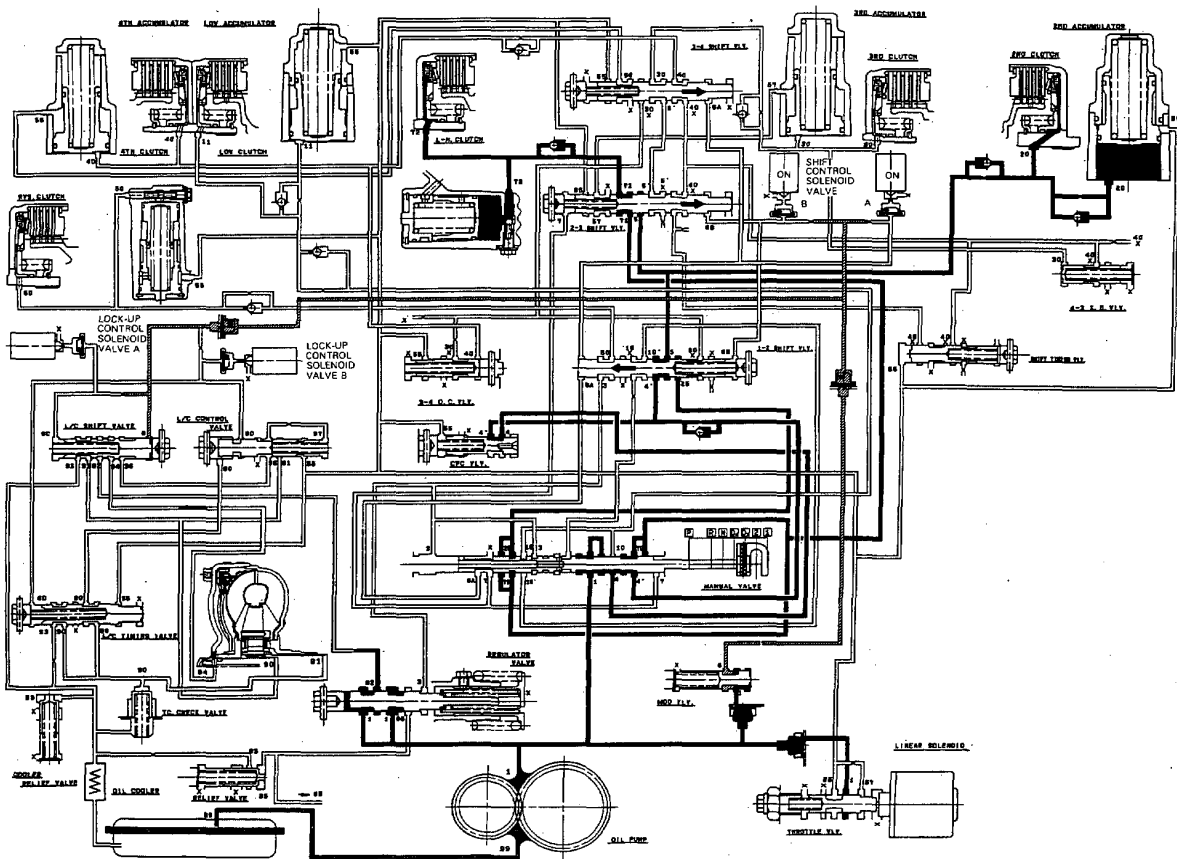
The line pressure (1) becomes line pressure (4), (4'), (70) as it passes through the manual valve.

The line pressure (1) goes to the modulator valve and becomes the modulator pressure (6). The modulator pressure (6) is not supplied to the shift valve. The 1-2 shift valve is moved to the left side and the 2-3 and 3-4 shift valves are moved to the right side because the shift control solenoid valves A and B are turned ON by the ECU.

The line pressure (4') becomes the line pressure (5) via the 1-2 shift valve. The line pressure (5) passed through the orifice becomes the 2nd clutch pressure (20). The 2nd clutch pressure (20) goes to the 2nd clutch, then the 2nd clutch is engaged.

The 1st-hold clutch pressure (70) goes to the 1st-hold clutch via the 2-3 shift valve, then the 1st-hold clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the flow chart.



(cont'd)

Description

Hydraulic Flow (cont'd)

D₄ or D₃ Position

1. 1st speed

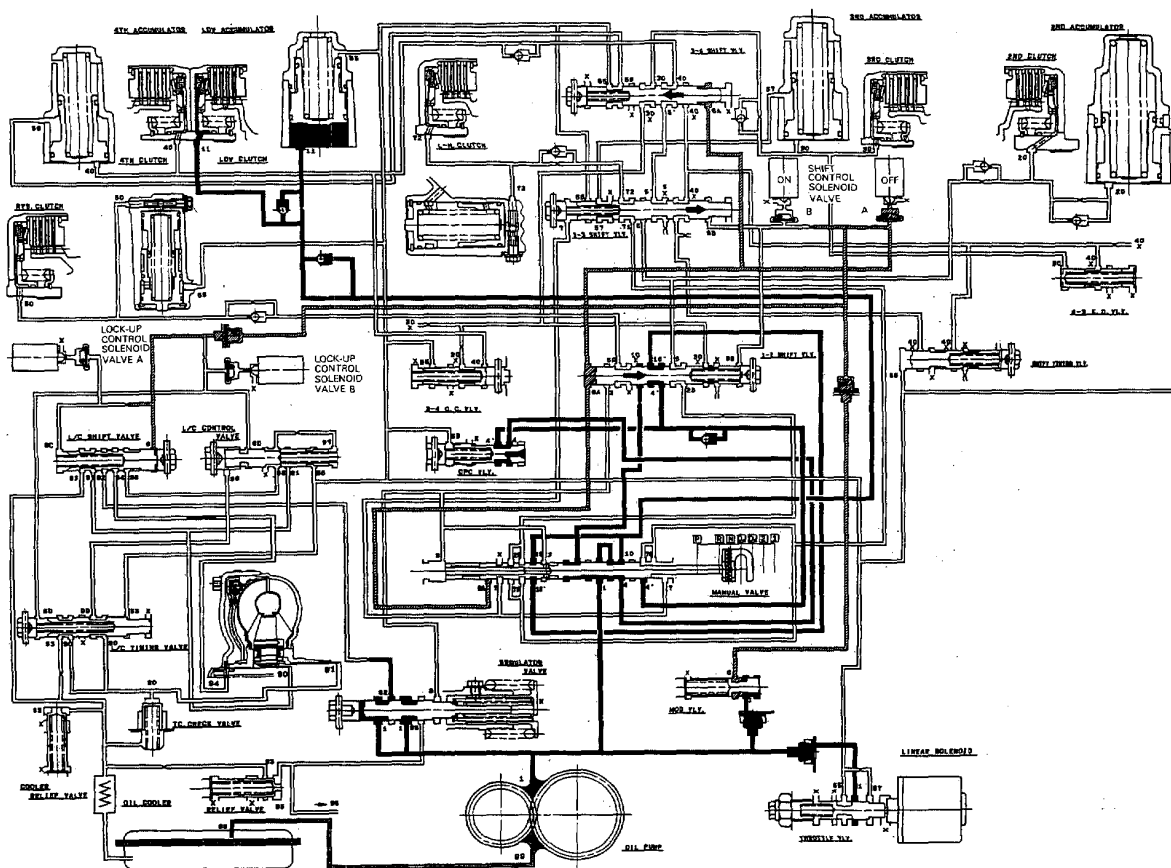
The flow of fluid through the torque converter is the same as in **N** position.

The line pressure (1) becomes the 1st clutch pressure (10), as it passes through the manual valve. The 1st clutch pressure is applied to the 1st clutch and the 1st clutch accumulator, consequently the vehicle will move as the engine power is transmitted.

The line pressure (1) becomes the modulator pressure (6) by the modulator valve and travels to each shift valve. The 1-2 shift valve is moved to the right side and the 3-4 shift valve is moved to the left side because the shift control solenoid valve A is turned OFF and valve B is turned ON by the ECU.

The line pressure (1) also flows to the throttle valve.

NOTE: When used, "left" or "right" indicates direction on the flow chart.





2. 2nd speed

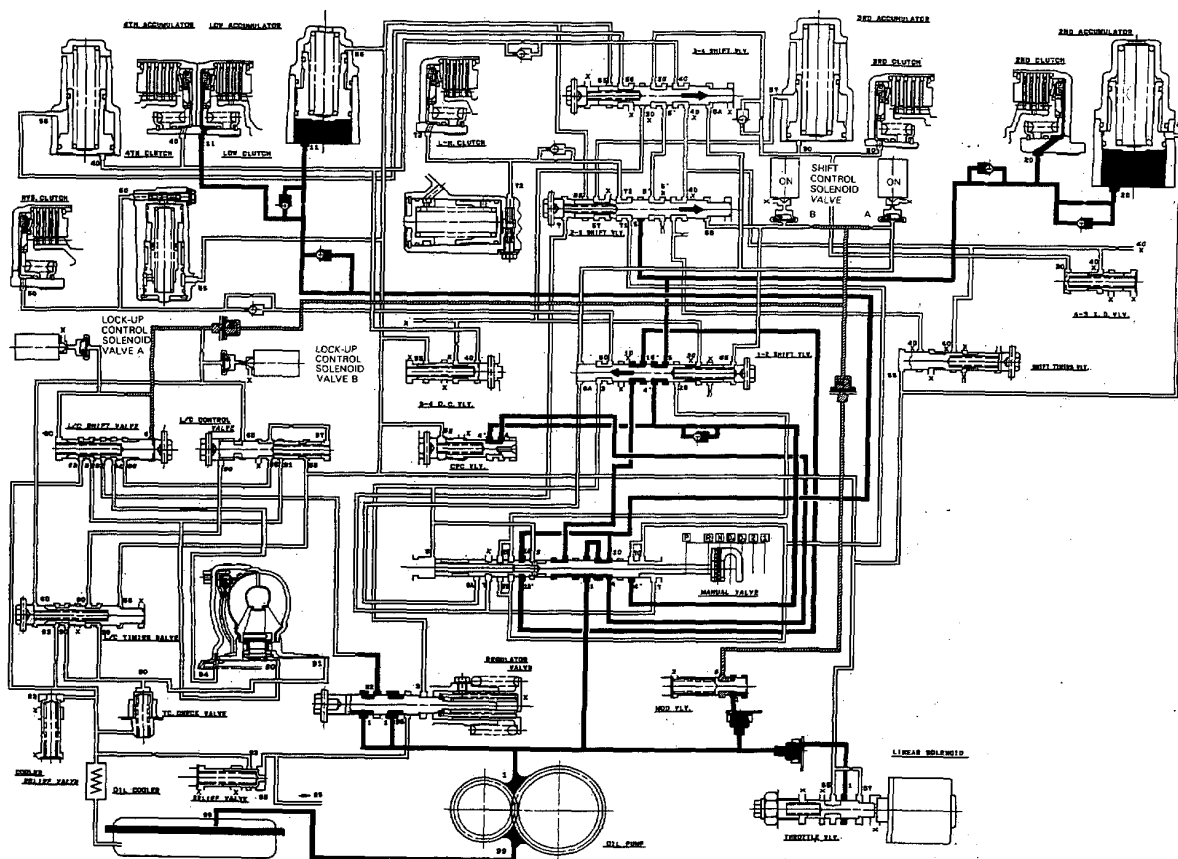
The flow of fluid up to the 1-2 and 2-3 shift valves is the same as in the 1st speed range. As the speed of the car reaches the prescribed value, the shift control solenoid valves A and B are turned ON by means of the ECU. As a result, the 1-2 shift valve is moved to the left side and uncovers the port leading to the 2nd clutch; the 2nd clutch is engaged.

Fluid flows by way of:

- Line Pressure (4) → CPC valve — Line Pressure (4') → 1-2 Shift Valve — Line Pressure (5) → Orifice
- 2nd Clutch Pressure (20) → 2nd Clutch

The hydraulic pressure also flows to the 1st clutch. However no power is transmitted by means of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the flow chart.



(cont'd)

Description

Hydraulic Flow (cont'd)

3. 3rd Speed

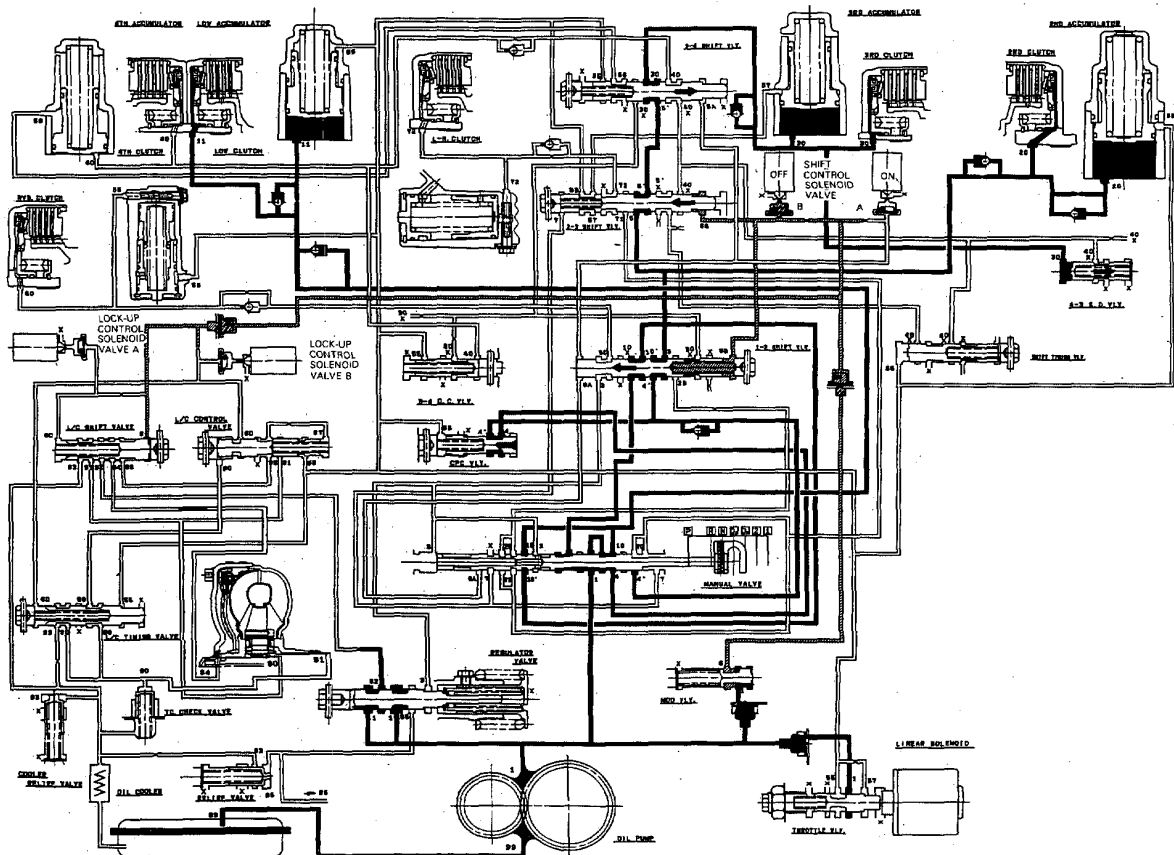
The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in the 2nd speed range. As the speed of the car reaches the prescribed value, the shift control solenoid valve B is turned OFF (Shift control solenoid valve A remains ON). The 2-3 shift valve is then moved to the left side, uncovering the oil port leading to the 3rd clutch. Since the 3-4 shift valve is moved to the right side to cover the oil port to the 4th clutch, the 3rd clutch is engaged.

Fluid flows by way of:

- Line Pressure (4) → CPC Valve — Line Pressure (4') → 1-2 Shift Valve — Line Pressure (5) → 2-3 Shift Valve
- Line Pressure (5') → 3-4 Shift Valve — 3rd clutch Pressure (30) → Orifice → 3rd Clutch

The hydraulic pressure also flows to the 1st clutch and to the 2nd clutch. However no power is transmitted by means of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the flow chart.





4. 4th Speed

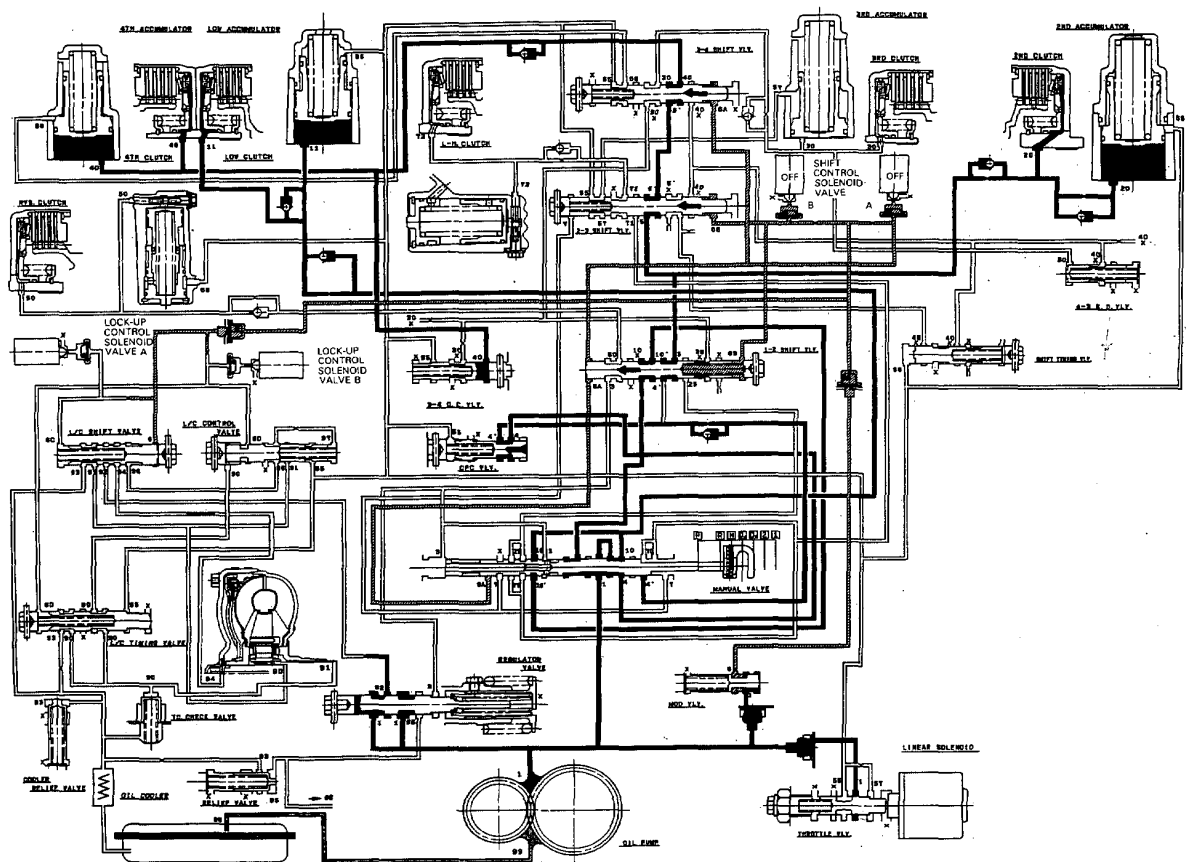
The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in the 3rd speed range. As the speed of the car reaches the prescribed value, the shift control solenoid valve A is turned OFF (Shift control solenoid valve B remains OFF). As this takes place, the 3-4 shift valve is moved to the left side and uncovers the oil port leading to the 4th clutch. Since the 1-2 and 2-3 shift valves are kept on the left side, the fluid flows through the 4th clutch; the power is transmitted through the 4th clutch.

Fluid flows by way of:

- Line Pressure (4) → CPC Valve — Line Pressure (4') → 1-2 Shift Valve — Line Pressure (5) → 2-3 Shift Valve
- Line Pressure (5) → 3-4 Shift Valve — 4th Clutch Pressure (40) → Orifice → 4th Clutch

The hydraulic pressure also flows to the 1st clutch and to the 2nd clutch. However no power is transmitted by means of the one-way clutch as in 3rd speed.

NOTE: When used, "left" or "right" indicates direction on the flow chart.



(cont'd)

Hydraulic Flow (cont'd)

The line pressure (1) becomes the line pressure (3) as it passes through the manual valve. Also, the line pressure (1) goes to the modulator valve through the filter and becomes the modulator pressure (6). The modulator pressure (6) is supplied to the 1-2 shift valve and 2-3 shift valve.

The line pressure (3) becomes the reverse clutch pressure (50) via the 1-2 shift valve. The reverse clutch pressure goes to the reverse clutch, then the reverse clutch is engaged.

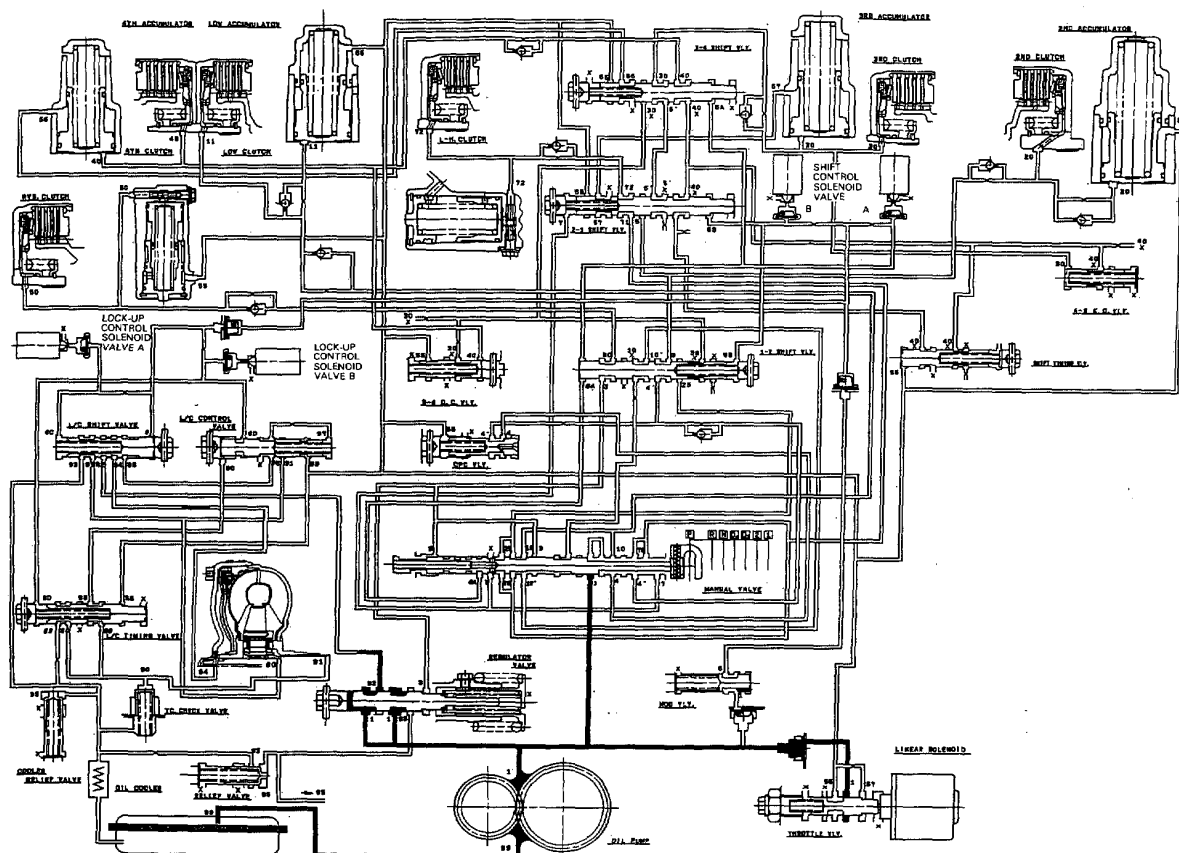
When the **R** position is selected while the vehicle is moving forward at more than a certain speed, the ECU outputs 1st signal (Shift control solenoid valve A: ON, B: OFF), and the 1-2 shift valve is moved to the right side. The line pressure (3) is intercepted by the 1-2 shift valve; consequently the power is not transmitted, since the reverse clutch is not operated.



P position

The flow of fluid through the torque converter is the same in **N** position.

The line pressure (1) is intercepted by the manual valve and is not supplied to the clutches. The power is not transmitted.

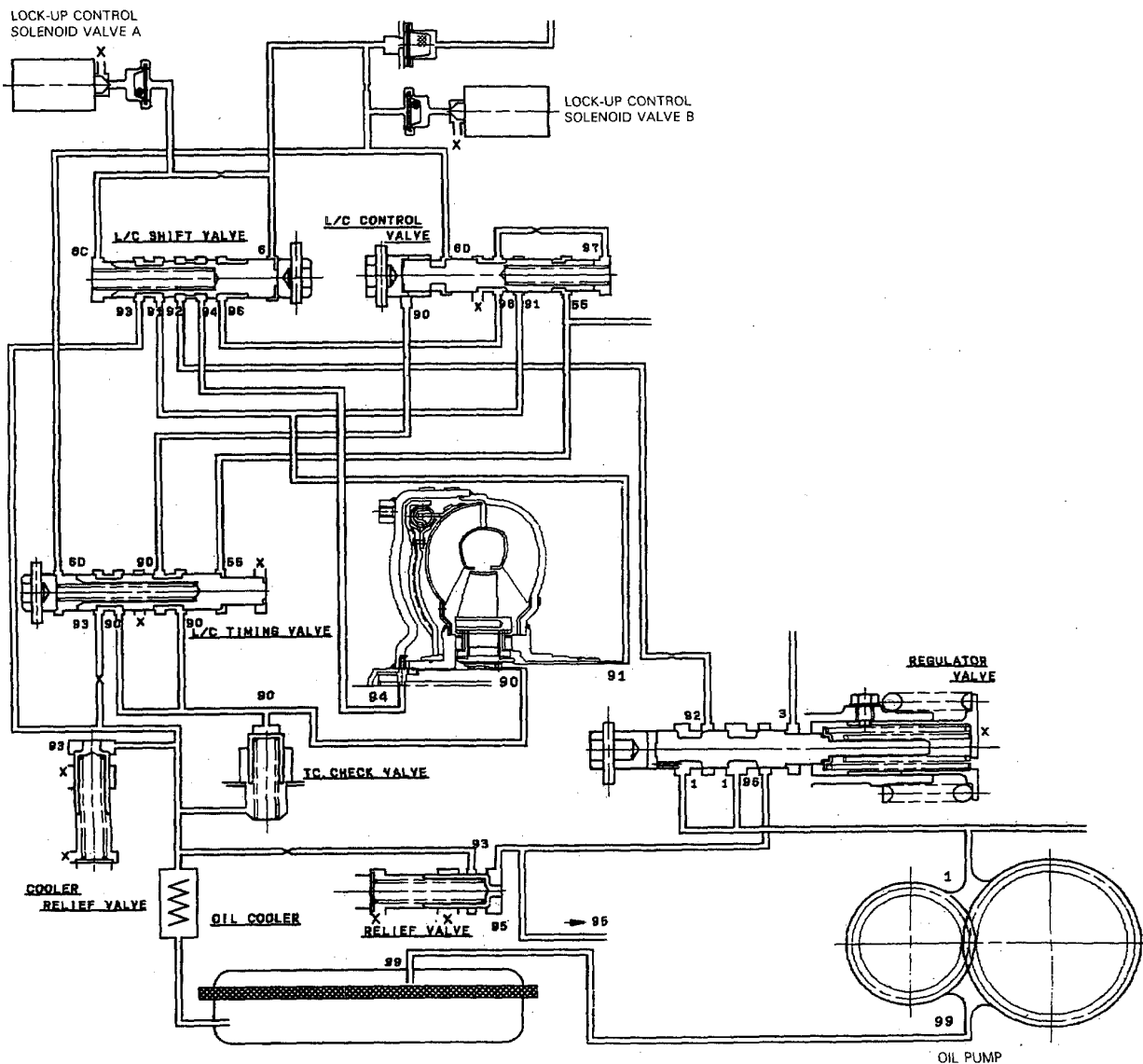


Description

Lock-up System

In **D₄** in 2nd, 3rd and 4th, pressurized fluid is drained from the back of the torque converter through an oil 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 ECU optimizes the timing of the lock-up system. Under certain conditions, the lock-up operation is applied during deceleration, in 3rd and 4th speed.

The lock-up shift valve controls the range of lock-up according to lock-up control solenoid valves A and B, and throttle valve B. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing and are controlled by the ECU.

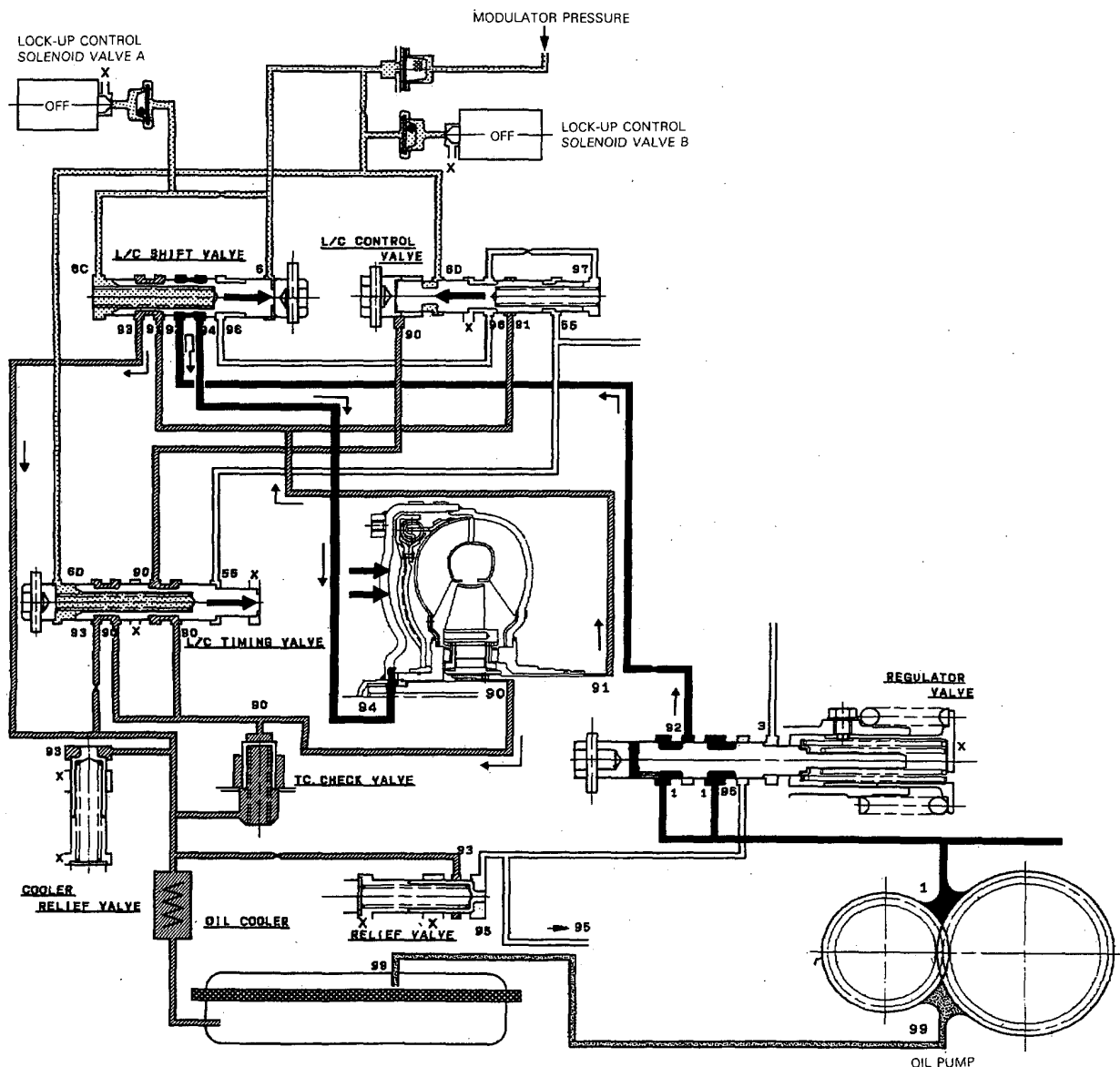




No Lock-up

Pressured fluid regulated by the modulator works on both ends of the lock-up shift valve and on the left side of the lock-up control valve. Under this condition, the pressure on both ends of the lock-up shift valve are equal, and the shift valve is moved to the right side by the tension of the valve spring alone. The fluid from the oil pump will flow through the left side of the lock-up clutch to the torque converter; i.e., the lock up clutch is in OFF condition.

NOTE: When used, "left" or "right" indicates direction on the flow chart.



(cont'd)

Description

Lock-up System (cont'd)

Partial Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: OFF

The ECU switches the solenoid valve A to ON to release the modulator pressure in the left cavity of the lock-up shift valve. The modulator pressure in the right cavity of the lock-up shift valve overcomes the spring force, thus the lock-up shift valve is moved to the left side.

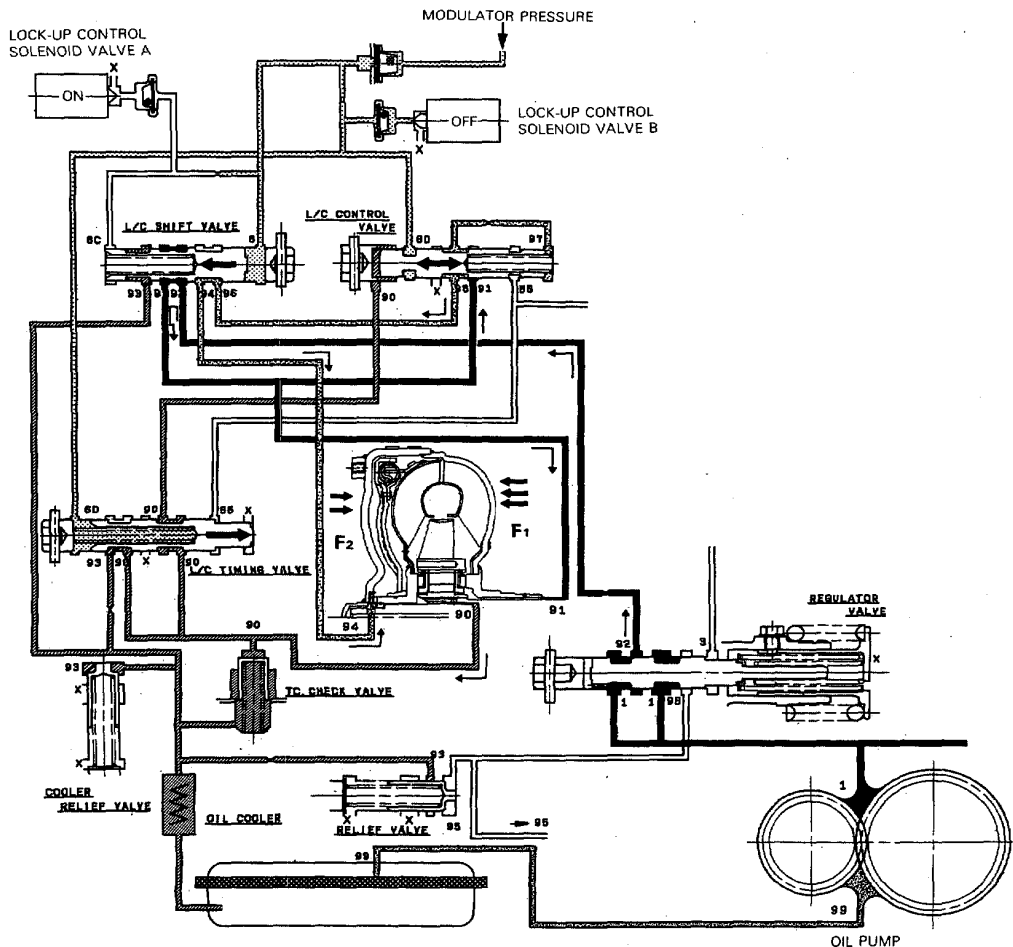
The torque converter pressure is separated into two passages:

Torque Converter Inner Pressure: entered into right side—to engage lock-up clutch

Torque Converter Back Pressure: entered into left side—to disengage lock-up clutch

The back pressure (F2) is regulated by the lock-up control valve whereas the position of the lock-up timing valve B is determined by the throttle B pressure, tension of the valve spring and pressure regulated by the modulator. Also the position of the lock-up control valve is determined by the throttle valve B pressure, back pressure of the lock-up control valve and torque converter pressure regulated by the check valve. In low speed range, the throttle B pressure working on the right side of the lock-up control valve is low, causing the valve to be moved to the right side. With the lock-up control solenoid valve B kept OFF, the modulator pressure is maintained in the left end of the lock-up control valve; in other words, the lock-up control valve is moved slightly to the left side. This slight movement of the lock-up control valve causes the back pressure to be lowered slightly, resulting in partial lock-up.

NOTE: When used, "left" or "right" indicates direction on the flow chart.





Half Lock-up

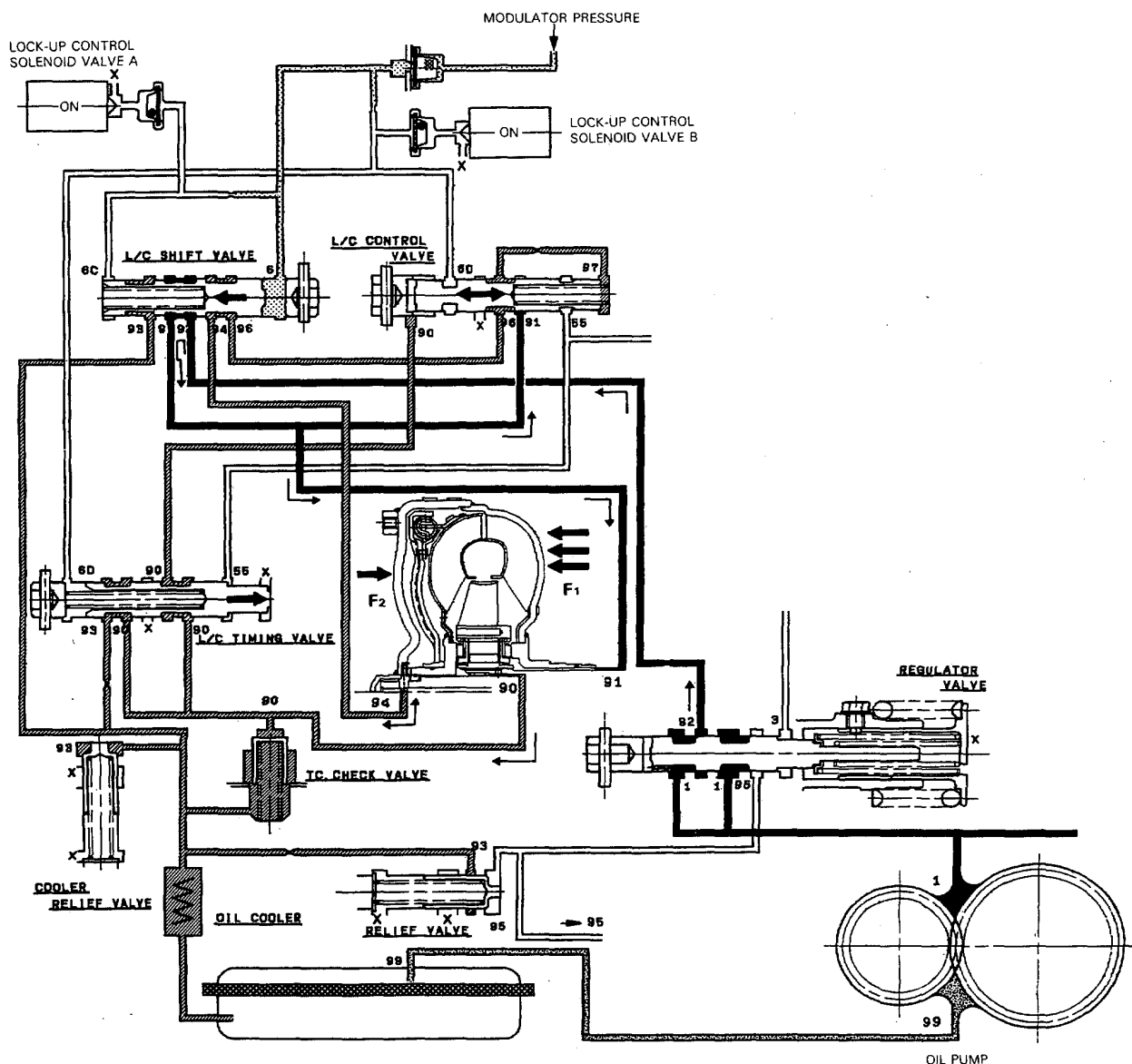
Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: ON

The modulator pressure is released by the solenoid valve B, causing the modulator pressure in the left cavity of the lock-up control valve to lower.

Also the modulator pressure in the left cavity of the lock-up timing valve B is low. However the throttle B pressure is still low at this time, consequently the lock-up timing valve B is kept on the right side by the spring force.

With the lock-up control solenoid valve B turned ON, the lock-up control valve is moved somewhat to the right side, causing the back pressure (F2) to lower. This allows a greater amount of the fluid (F1) to work on the lock-up clutch. The back pressure (F2) which still exists prevents the clutch from engaging fully.

NOTE: When used, "left" or "right" indicates direction on the flow chart.



(cont'd)

Description

Lock-up System (cont'd)

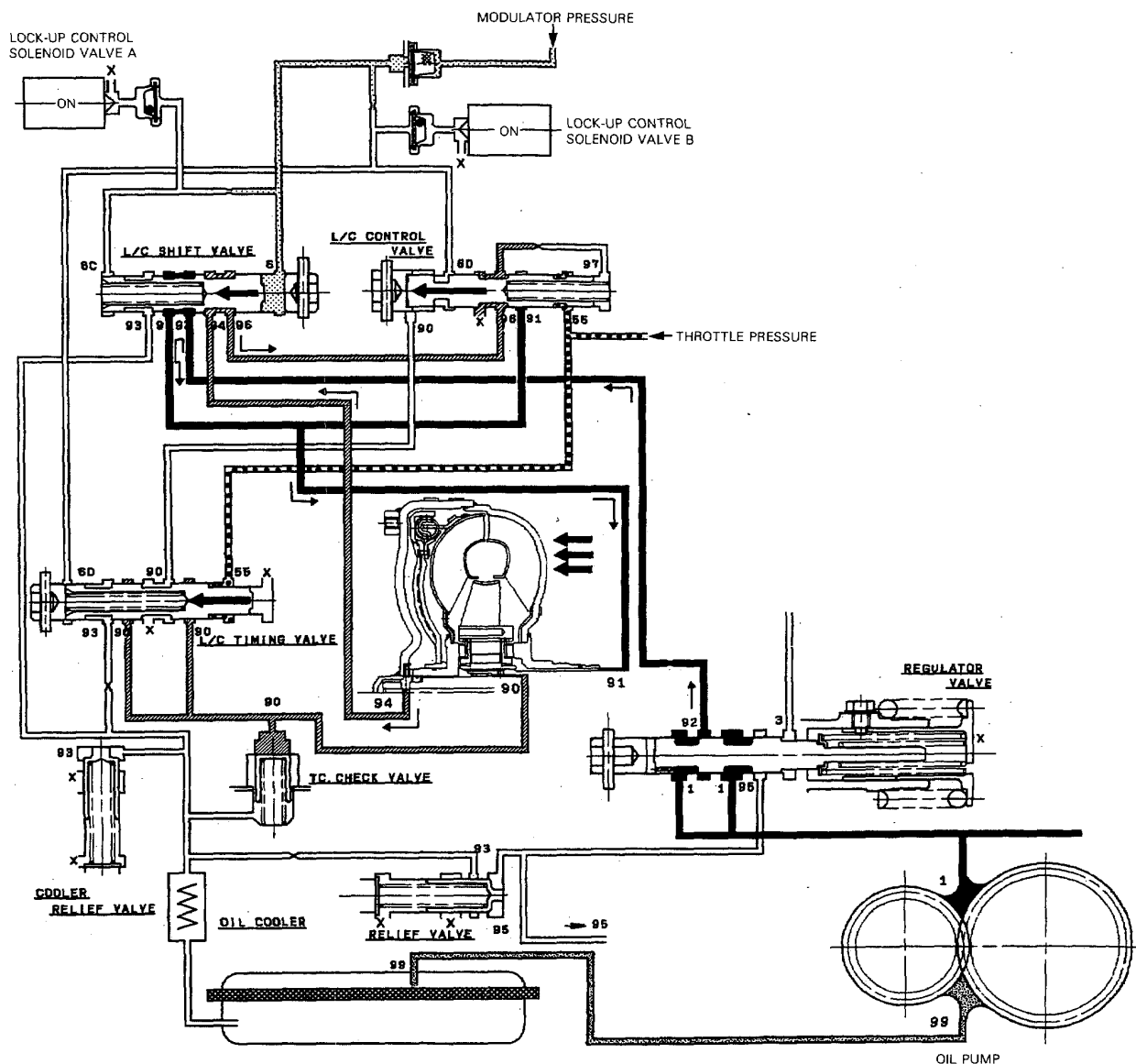
Full Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: ON

When the vehicle speed further increases, the throttle valve B pressure is increased in accordance with the throttle opening. The lock-up timing valve B overcomes the spring force and moves to the left side. Also this valve closes the oil port leading to the torque converter check valve.

Under this condition, the throttle B pressure working on the right end of the lock-up control valve becomes greater than that on the left end (modulator pressure in the left end has already been released by the solenoid valve B); i. e., the lock-up control valve is moved to the left side. As this happens, the torque converter back pressure is released fully, causing the lock-up clutch to be engaged fully.

NOTE: When used, "left" or "right" indicates direction on the flow chart.

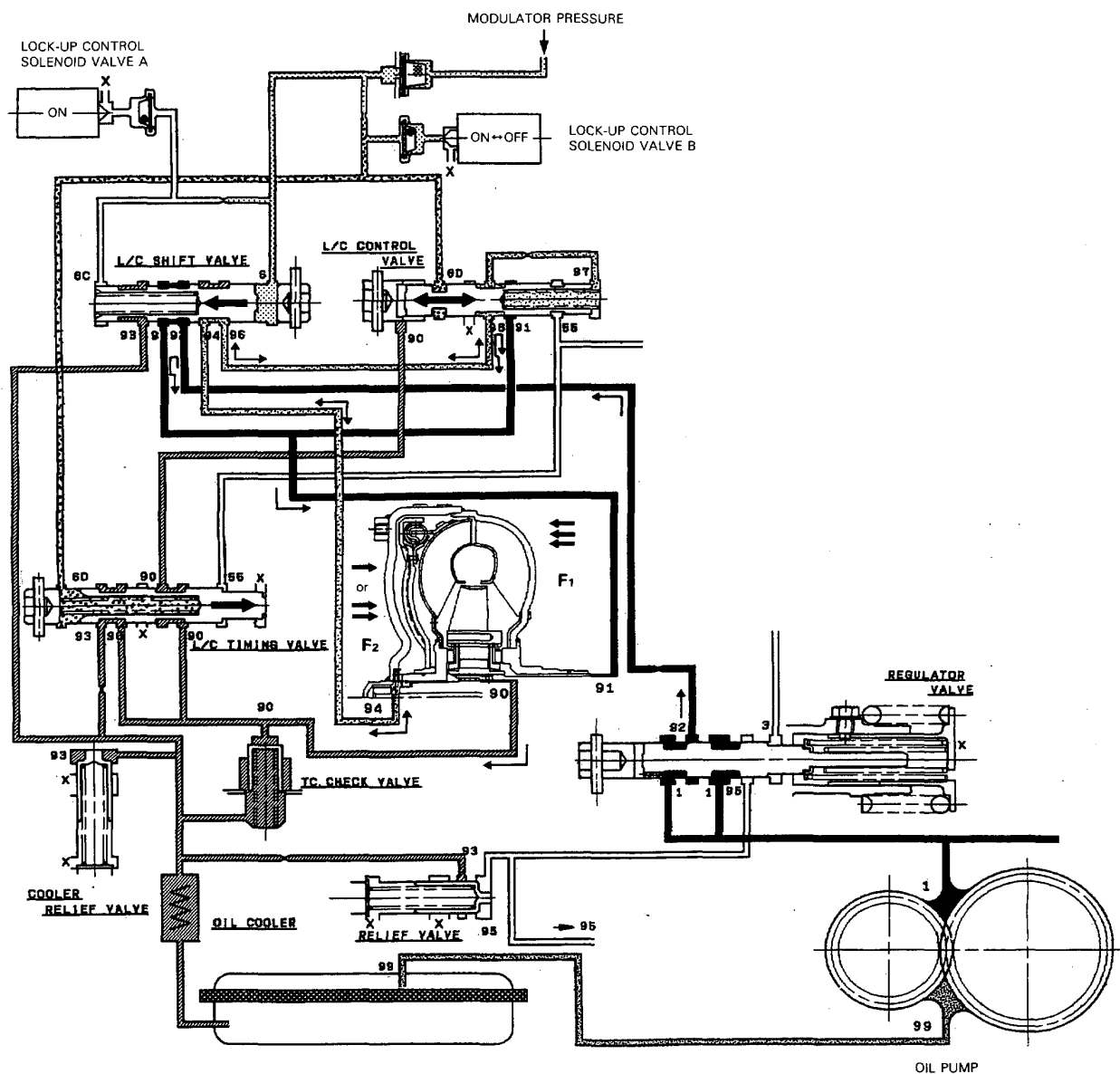




Deceleration Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: Duty Operation (ON ↔ OFF)
The ECU switches the solenoid valve B to ON and OFF alternately at high speeds under certain conditions. The slight lock-up and half lock-up regions are maintained so as to lock the torque converter properly.

NOTE: When used, "left" or "right" indicates direction on the flow chart.

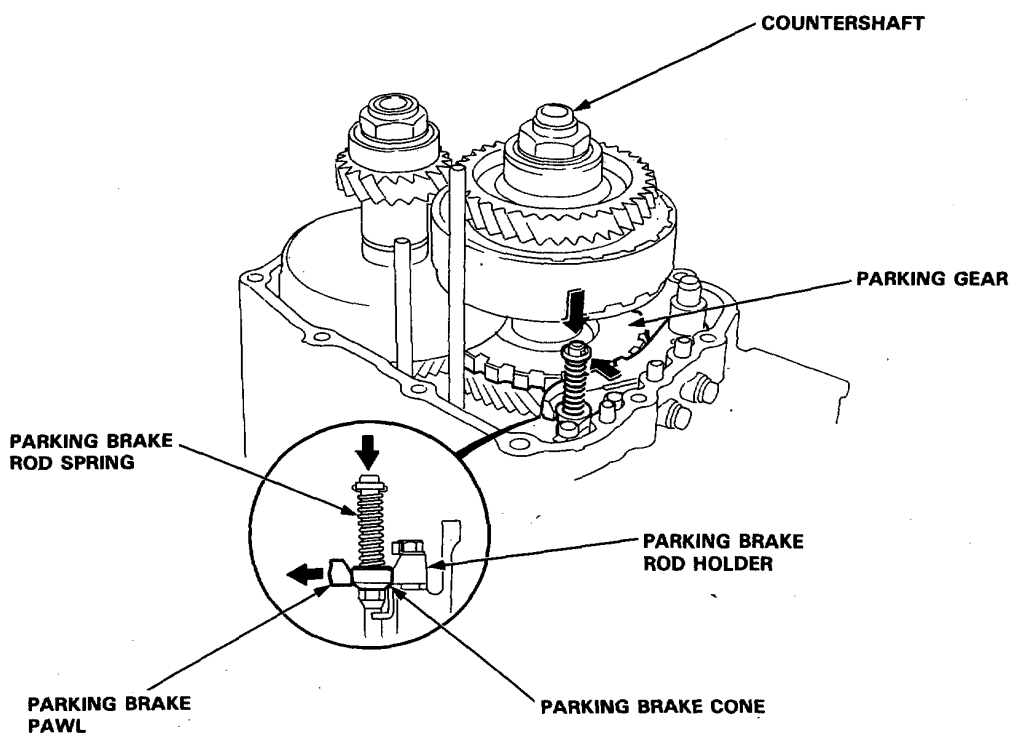


Description

Parking Brake Mechanism

The parking brake mechanism locks the transmission by engaging the parking brake pawl into the parking gear which is splined to the countershaft.

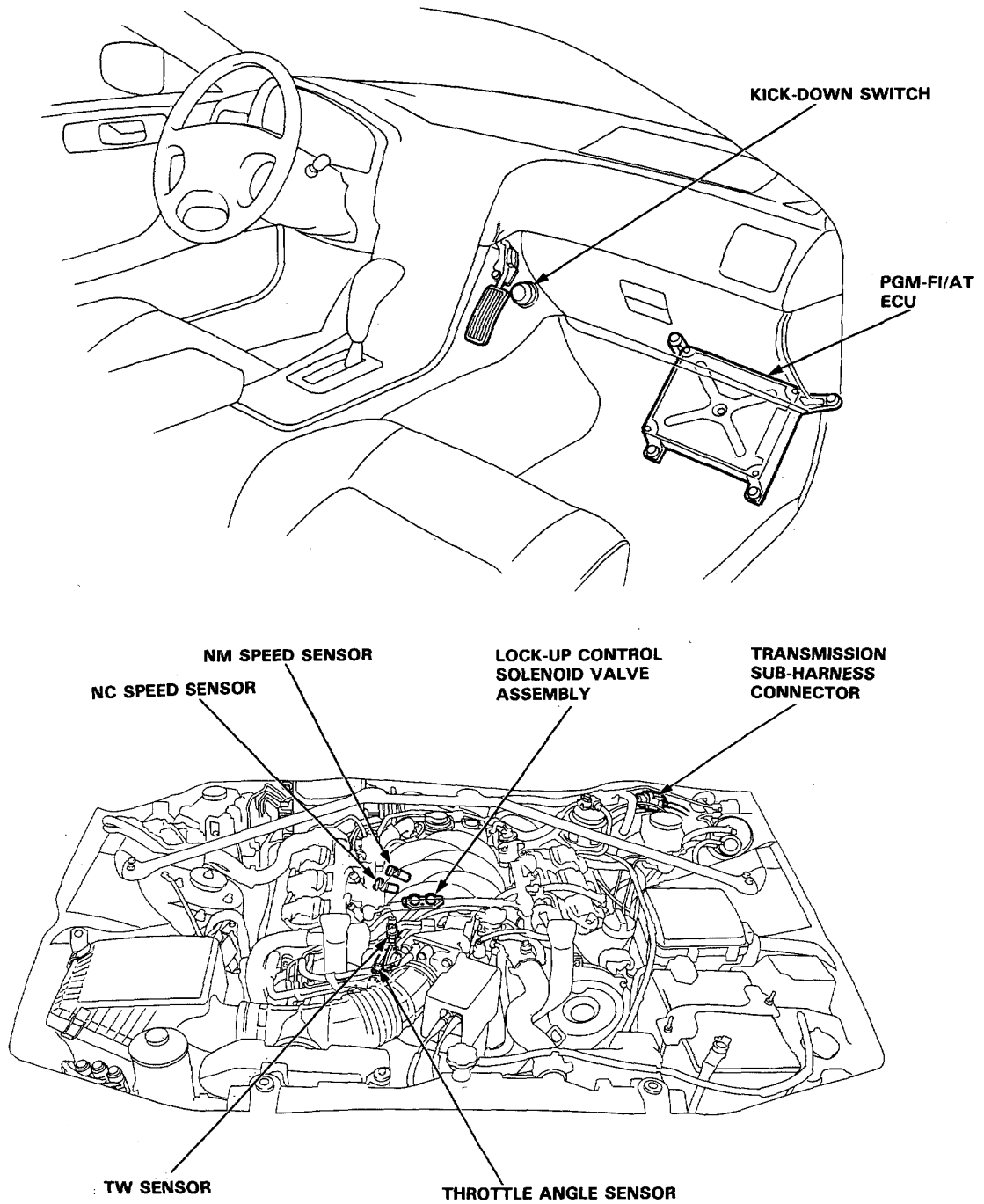
Setting the select lever to **P** position causes the parking brake cone (installed at the end of the parking brake rod) to press the parking brake pawl onto the parking gear. Even if the end of the parking brake pawl rides on top of the parking gear teeth, slight movement of the countershaft will cause the parking brake pawl and the parking gear to mesh with each other completely, because the parking brake cone receives tension from the parking brake rod spring. The parking brake pawl receives the tension (which acts to separate the parking brake pawl from the parking gear) from the parking pawl spring.





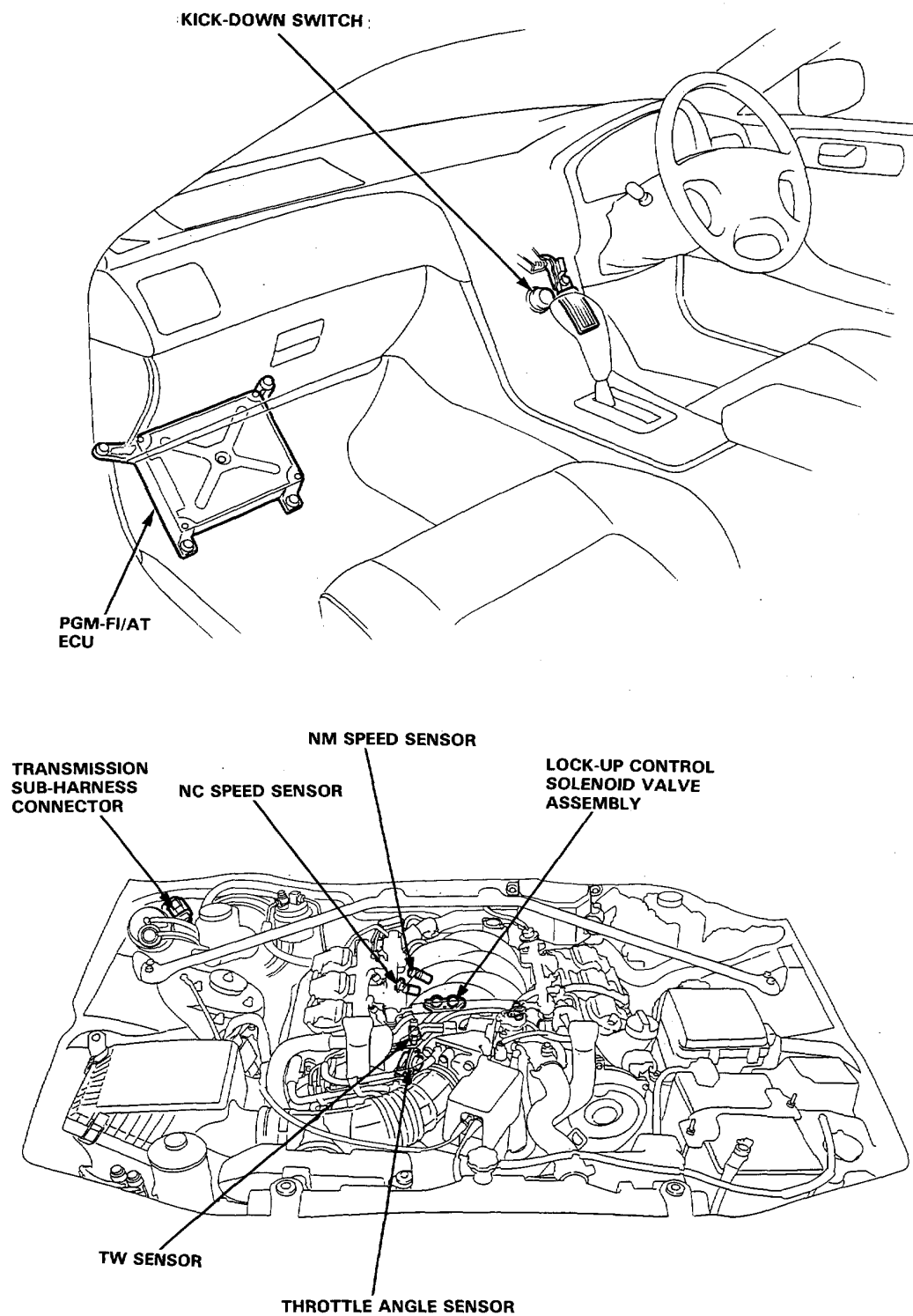
Component Location

LHD:



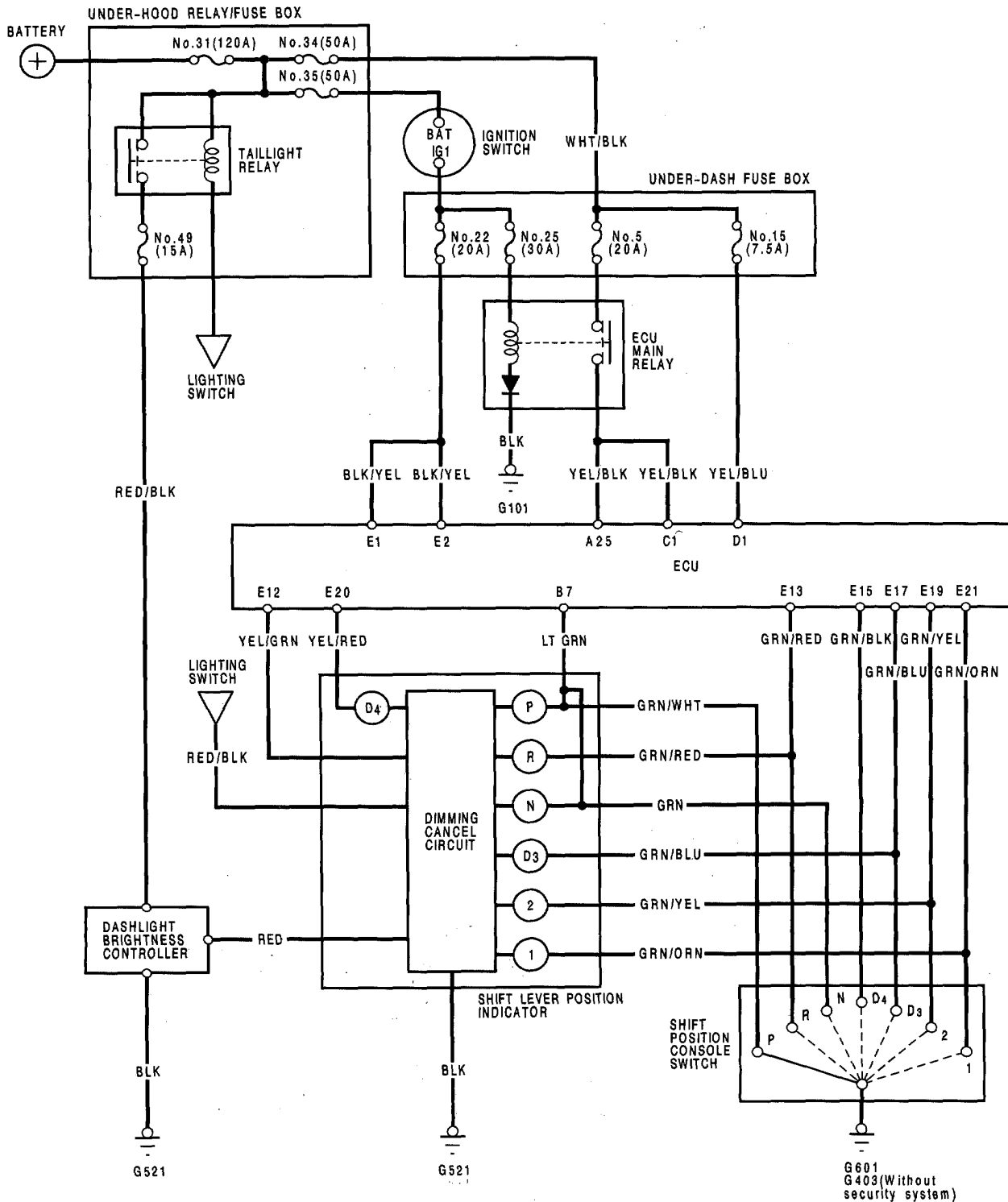


RHD:



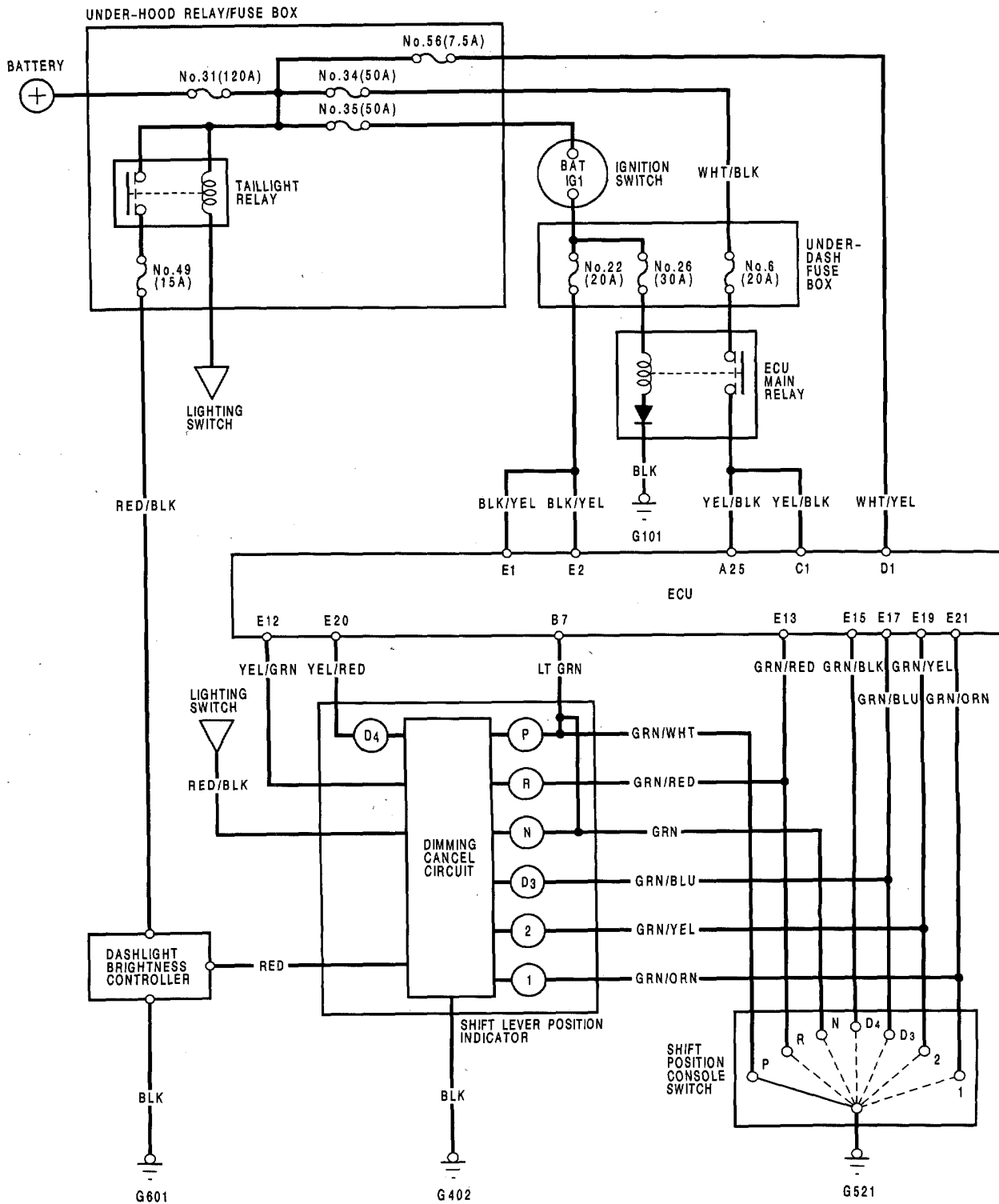
Circuit Diagram

LHD :



Circuit Diagram

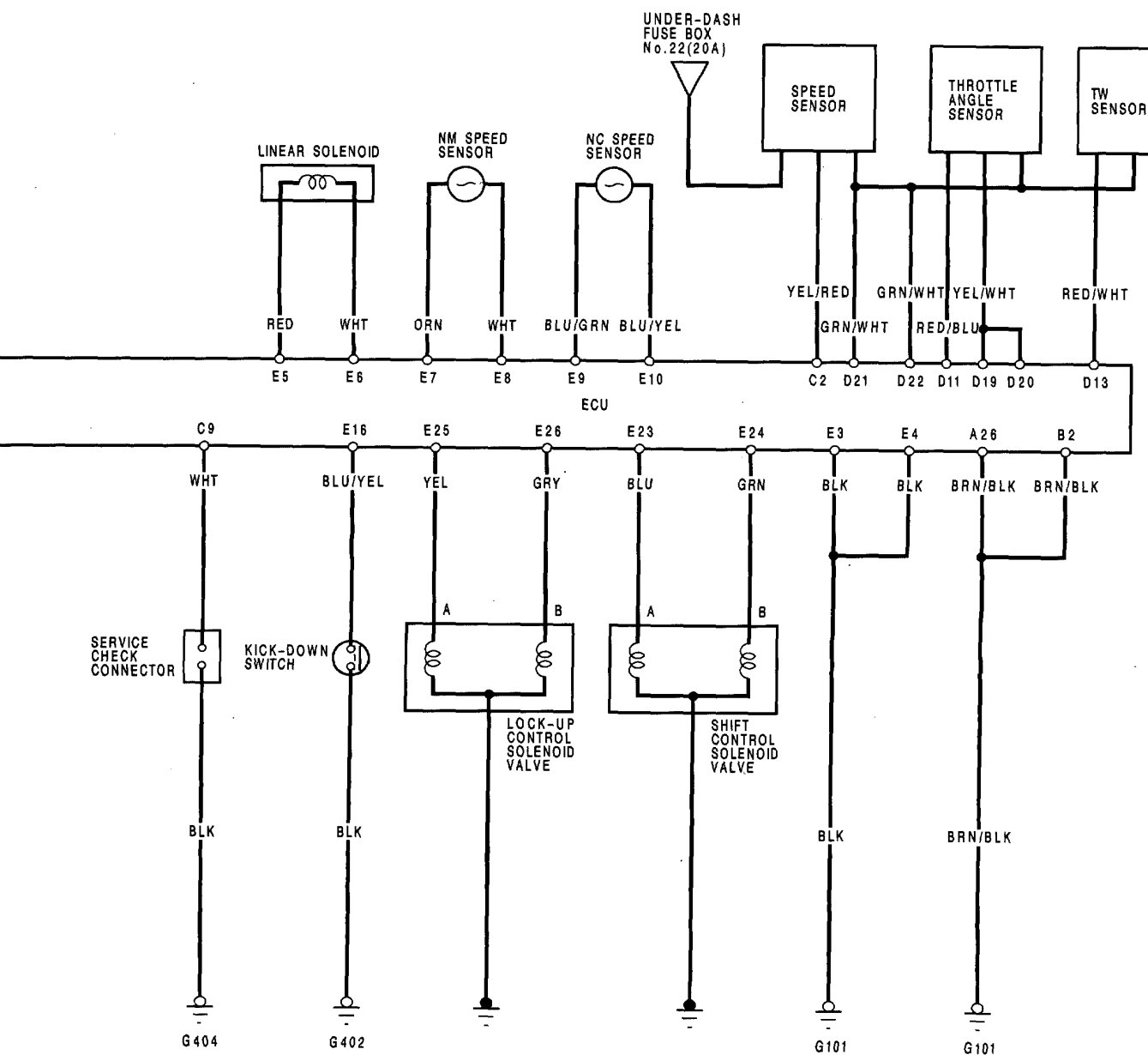
RHD :





Terminal Location

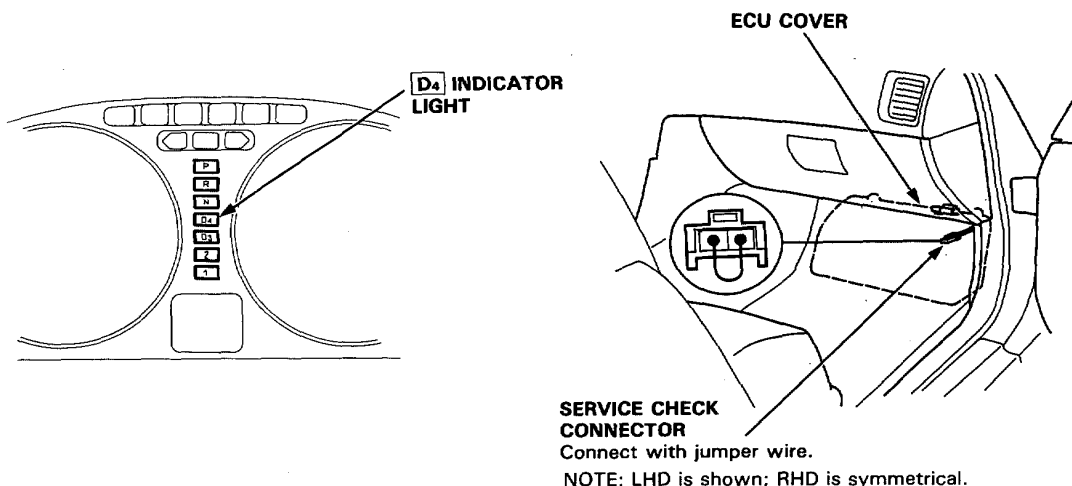
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 A26	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20 B21 B22 B23 B24 B25 B26	C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26	E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16 E17 E18 E19 E20 E21 E22 E23 E24 E25 E26
A	B	C	D	E



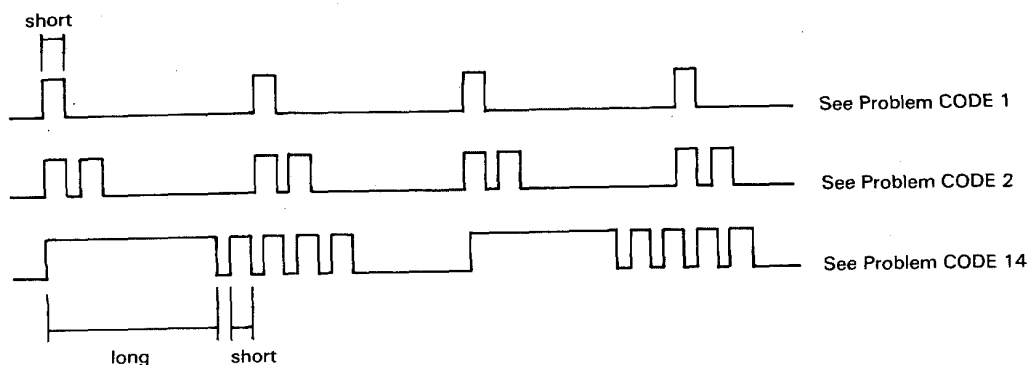
Troubleshooting Procedures

When the PGM-FI/AT Electronic Control Unit (ECU) senses an abnormality in the input or output systems, the **D₄** indicator light in the gauge assembly will blink. However, when the Service Check Connector (located on the ECU cover) is connected with a jumper wire, the **D₄** indicator light will blink the problem code when the ignition switch is turned on.

When the **D₄** indicator light has been reported on, connect the two terminals of the Service Check Connector together. Then turn on the ignition switch and observe the **D₄** indicator light.



Problem codes 1 through 9 are indicated by individual short blinks, Problem codes 10 through 17 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 problem code. After determining the problem code, refer to the electrical system Symptom-to-Component Chart on page 14-52.



Some PGM-FI problems will also make the **D₄** indicator light come on. After repairing the PGM-FI system, disconnect the following fuse for more than 10 seconds to reset the ECU memory.

- LHD: No. 15 ACG (S) fuse (7.5 A) in the under dash fuse box
- RHD: BACK UP fuse (7.5 A) in the under-hood relay/fuse box

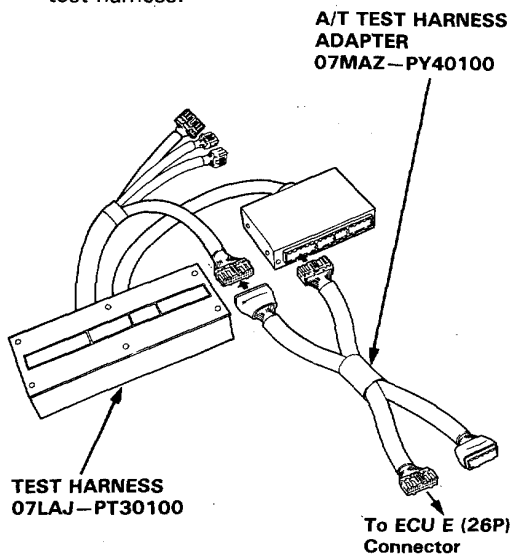
NOTE:

- Disconnecting the No. 15 ACG (S) fuse (7.5 A) also cancels the power seat setting.
- Disconnecting the BACK UP fuse (7.5 A) 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.



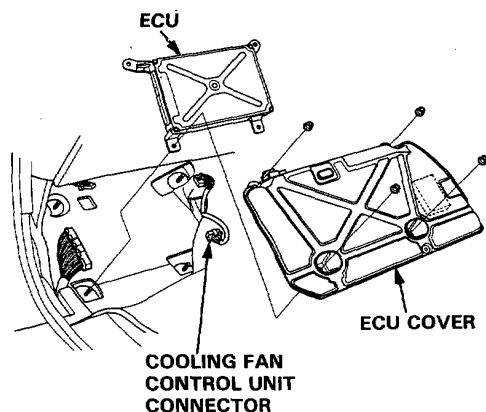
If the inspection for a particular code requires the Test Harness connecting the A/T test harness adapter.

1. Connect the A/T test harness adapter to the ECU test harness.



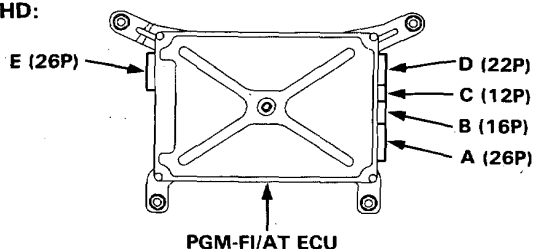
2. Remove the passenger's side door sill molding and small cover on the passenger's side kick panel, and pull the carpet back to expose the ECU.
3. Disconnect the connector from the cooling fan control unit.

NOTE: RHD is shown; LHD is similar.

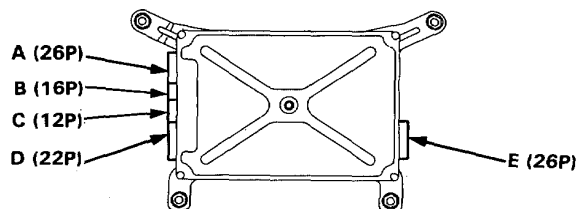


4. Disconnect the appropriate Connector (E: 26P, B: 16P or C: 12P) and connect it to the Test Harness.

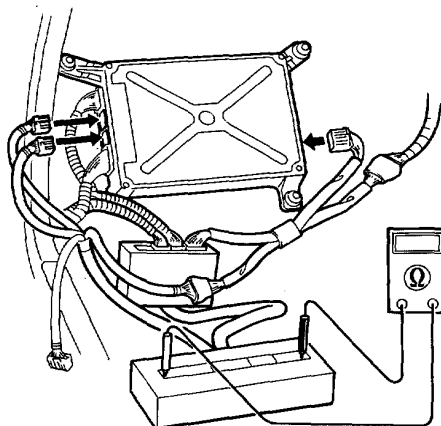
LHD:



RHD:



NOTE: RHD is shown; LHD is similar.



NOTE:

- The A section of the Test Harness corresponds to the E (26P) connector, while connecting to test the A/T Test Harness Adapter.
- Unless otherwise noted, use only the Digital Multimeter for testing.

Electrical Troubleshooting

Symptom-to-Component Chart

Number of D4 indicator light blinks while Service Check Connector is jumped.	D4 indicator light	Possible Cause	Symptom	Refer to page
1	Blinks	• Disconnected lock-up control solenoid valve A connector • Short or open in lock-up control solenoid valve A wire • Faulty lock-up control solenoid valve A	• Lock-up clutch does not engage. • Lock-up clutch does not disengage. • Unstable idle speed.	14-54
2	Blinks	• Disconnected lock-up control solenoid valve B connector • Short or open in lock-up control solenoid valve B wire • Faulty lock-up control solenoid valve B	• Lock-up clutch does not engage.	14-55
3	Blinks or OFF	• Disconnected throttle angle sensor connector • Short or open in throttle angle sensor wire • Faulty throttle angle sensor	• Lock-up clutch does not engage.	14-56
4	Blinks	• Disconnected speed sensor connector • Short or open in speed sensor wire • Faulty speed sensor	• Lock-up clutch does not engage.	14-57
5	Blinks	• Short in shift position console switch wire • Faulty shift position console switch	• Fails to shift other than 2nd ↔ 4th gears. • Lock-up clutch does not engage.	14-58
6	OFF	• Disconnected shift position console switch connector • Open in shift position console switch wire • Faulty shift position console switch	• Fails to shift other than 2nd ↔ 4th gears. • Lock-up clutch does not engage. • Lock-up clutch engages and disengages alternately.	14-60
7	Blinks	• Disconnected shift control solenoid valve A connector • Short or open in shift control solenoid valve A wire • Faulty shift control solenoid valve A	• Fails to shift (between 1st ↔ 4th, 2nd ↔ 4th or 2nd ↔ 3rd gears only). • Fails to shift (stuck in 4th gear).	14-62
8	Blinks	• Disconnected shift control solenoid valve B connector • Short or open in shift control solenoid valve B wire • Faulty shift control solenoid valve B	• Fails to shift (stuck in 1st or 4th gears).	14-63
9	Blinks	• Disconnected NC speed sensor connector • Short or open in the NC speed sensor wire • Faulty NC speed sensor	• Lock-up clutch does not engage.	14-64



Number of D ₄ indicator light blinks while Service Check Connector is jumped.	D ₄ indicator light	Possible Cause	Symptom	Refer to page
10	Blinks	• Disconnected water temperature sensor connector • Short or open in the water temperature sensor wire • Faulty water temperature sensor	• Lock-up clutch does not engage.	14-66
11	OFF	• Trouble in ECU	• Lock-up clutch does not engage.	14-67
14	OFF	• Trouble in ECU	• Transmission jerks hard when shifting.	14-68
15	OFF	• Disconnected NM speed sensor connector • Short or open in NM speed sensor wire • Faulty NM speed sensor	• Transmission jerks hard when shifting.	14-69
16	Blinks	• Disconnected linear solenoid connector • Short or open in linear solenoid wire • Faulty linear solenoid	• Transmission jerks hard when shifting. • Lock-up clutch does not engage.	14-72
17	OFF	• Short in kick-down switch wire • Faulty kick-down switch	• 4th → 2nd kick-down speed is low.	14-73

If the self-diagnosis **D₄** indicator light does not blink, perform an inspection according to the table listed below.

Symptom	Probable Cause	Ref. page
D ₄ indicator light does not come on for 2 seconds after ignition is first turned on.	—	14-74
D ₄ indicator light is on steady, not blinking whenever the ignition is on.	—	14-76
Transmission does not kick-down when the kick-down switch is on.	Check kick-down switch signal.	14-73

- If a customer describes the symptoms for codes 3, 6, 11 or 17, yet the **D₄** indicator light is not blinking, it will be necessary to recreate the symptom by test driving, and then checking the **D₄** indicator light with the ignition still ON.
- If the **D₄** indicator light displays codes 1, 2, 3, 7, 8, or 16, check first the No. 31, 25, 6 and 22 fuse before electrical troubleshooting. If any of the fuses have blown, repair them and then recheck. (Fuse No.; See Section 23.)
- If the **D₄** indicator light displays codes other than those listed above or stays lit continuously, the ECU is faulty.
- Sometimes the **D₄** indicator light and the Check Engine light may come on simultaneously. If so, check the PGM-FI system according to the number of blinks on the PGM-FI self-diagnosing indicator, then reset the memory by removing the following fuse for more than 10 seconds. Drive the vehicle for several minutes at speeds over 30 mph (50 km/h), then recheck the lights.
 - LHD: No. 15 ACG (S) fuse (7.5 A) in the under dash fuse box
 - RHD: BACK UP fuse (7.5 A) in the under-hood relay/fuse box

NOTE:

- Disconnecting the No. 15 ACG (S) fuse (7.5 A) also cancels the power seat setting.
- Disconnecting the BACK UP fuse (7.5 A) also cancels the radio preset stations and clock setting. Make note of the radio presets before removing the fuse so you can reset them.

Electrical Troubleshooting

Troubleshooting Flowchart

Self-diagnosis D4 indicator light blinks once.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Turn the ignition switch ON.

Measure the voltage between the A25 and A3/A4 terminals.

Is there voltage?

YES

Repair short to power source in YEL wire between the E25 terminal and the lock-up control solenoid valve A.

NO

Turn the ignition switch OFF.

Disconnect the transmission sub-harness connector.

Check for continuity between the A25 and A3/A4 terminals.

Is there continuity?

YES

Repair short to ground in YEL wire between the E25 terminal and the lock-up control solenoid valve A.

NO

Connect the transmission sub-harness connector.

Measure the resistance between the A25 and A3/A4 terminals.

Is the resistance 12–24 Ω ?

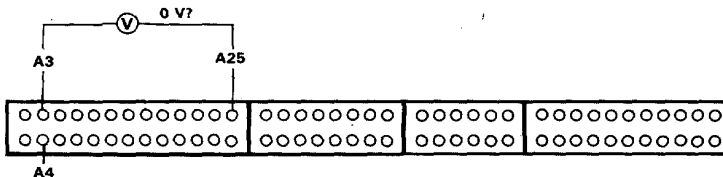
NO

Check for open in YEL wire between the E25 terminal and the lock-up control solenoid valve A. If wire is OK, check the lock-up control solenoid valve A. (See page 14-78.)

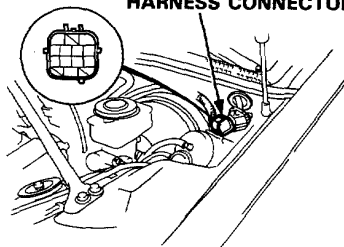
YES

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

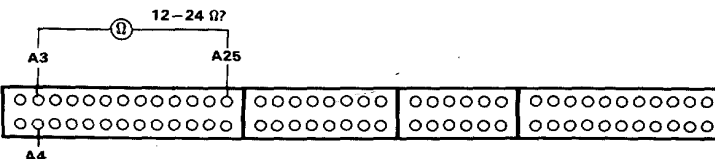
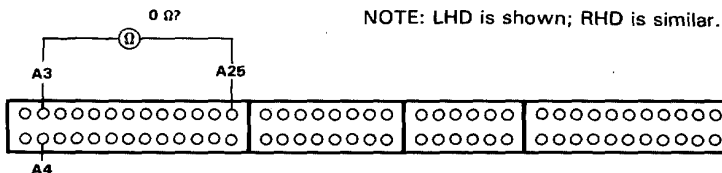
NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



TRANSMISSION SUB-HARNESS CONNECTOR



NOTE: LHD is shown; RHD is similar.





Self-diagnosis D4 indicator light blinks twice.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Turn the ignition switch ON.

Measure the voltage between the A26 and A3/A4 terminals.

Is there voltage?

YES

Repair short to power source in GRY wire between the E26 terminal and the lock-up control solenoid valve B.

NO

Turn the ignition switch OFF.

Disconnect the transmission sub-harness connector.

Check for continuity between the A26 and A3/A4 terminals.

Is there continuity?

YES

Repair short to ground in GRY wire between the E26 terminal and the lock-up control solenoid valve B.

NO

Connect the transmission sub-harness connector.

Measure the resistance between the A26 and A3/A4 terminals.

Is the resistance 12–24 Ω ?

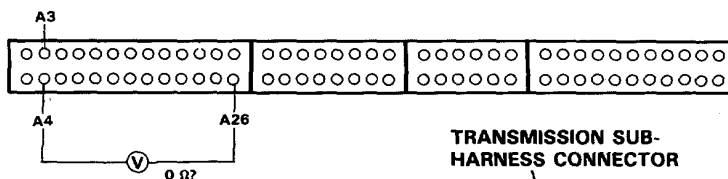
NO

Check for open in GRY wire between the E26 terminal and the lock-up control solenoid valve B. If wire is OK, check the lock-up control solenoid valve B. (See page 14-78.)

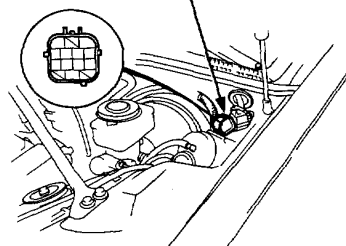
YES

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

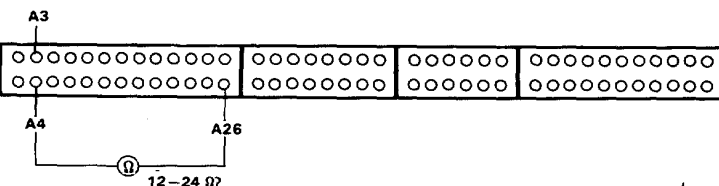
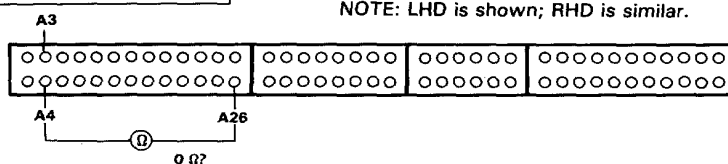
NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



TRANSMISSION SUB-HARNESS CONNECTOR



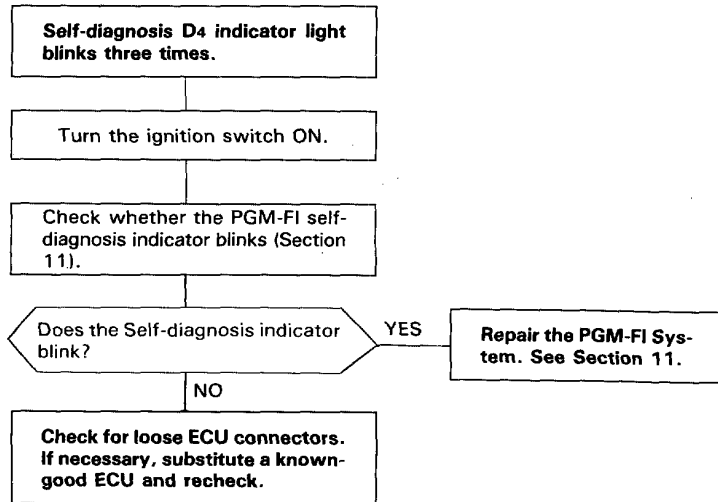
NOTE: LHD is shown; RHD is similar.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)





Self-diagnosis D4 indicator light blinks four times.

Raise the car.

Shift transmission to **N**.

Disconnect the E (26P) and C (12P) connectors from the ECU. Connect the Test Harness "A" and "C" connectors to the wire harness only, not to the ECU. (14-51)

Turn the ignition switch ON.

Rotate the front wheel and check for voltage between the C2 and A3/A4 terminals. Block the other wheel so it does not turn.

Does the voltage 0–5 V appear alternately?

YES

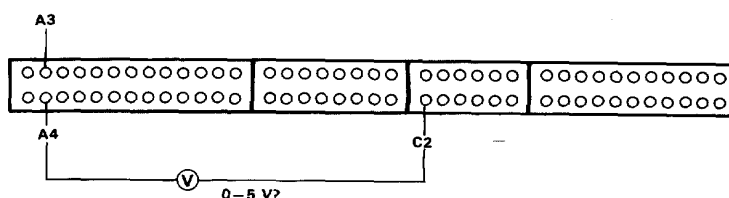
Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

NO

Check for short or open in YEL/RED wire between the C2 terminal and the speed sensor. If wire is OK, check the speed sensor. See Section 23.

⚠ WARNING Make sure lifts, jacks and safety stands are placed properly. (See page 1-6.)

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D4 indicator light blinks five times.

Turn the ignition switch ON.

Observe the A/T shift indicator and select each position separately.

Does the indicator light properly?

NO

See A/T shift position indicator inspection (Section 23).

YES

Turn the ignition switch OFF.

Connect the Test Harness between the ECU and connectors.

Turn the ignition switch ON.

Shift to other than **R** position.

Measure the voltage between the A13 and A3/A4 terminals.

Is there battery voltage?

NO

Check for short in GRN/RED wire between the E13 terminal and the shift position console switch or shift position indicator. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

YES

Shift to other than **N** and **P** position.

Measure the voltage between the B7 and A3/A4 terminals.

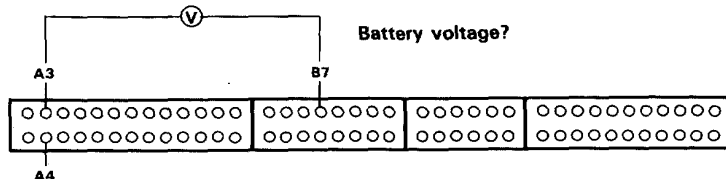
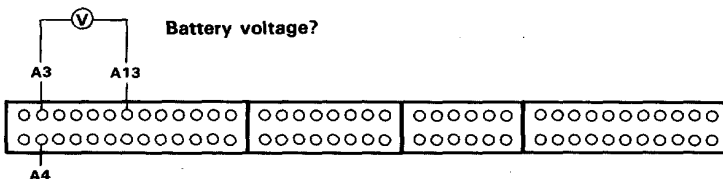
Is there battery voltage?

NO

Check for short in LT GRN wire between the B7 terminal and the shift position console switch. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

YES

To page 14-59





From page 14-58

Shift to other than **D4** position.

Measure the voltage between the A15 and A3/A4 terminals.

Is there battery voltage?

NO

YES

Shift to other than **D3** position.

Measure the voltage between the A17 and A3/A4 terminals.

Is there battery voltage?

NO

YES

Shift to other than **2** position.

Measure the voltage between the A19 and A3/A4 terminals.

Is there battery voltage?

NO

YES

Shift to other than **1** position.

Measure the voltage between the A21 and A3/A4 terminals.

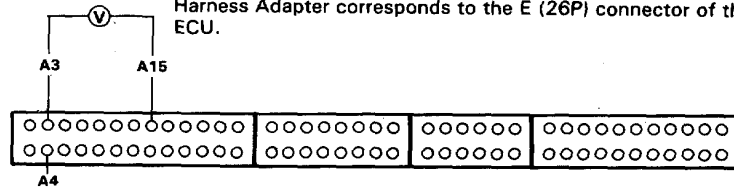
Is there battery voltage?

NO

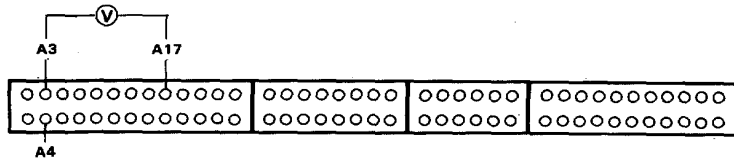
YES

Check for loose ECU connectors.
If necessary, substitute a known-good ECU and recheck.

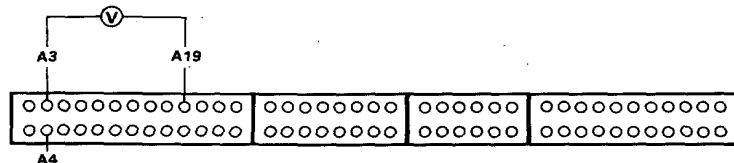
NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



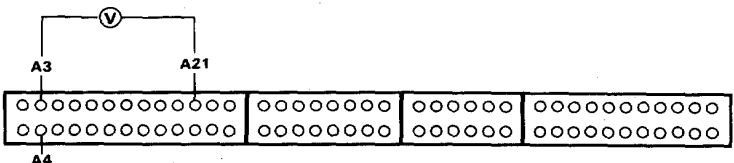
Check for short in GRN/BLK wire between the E15 terminal and the shift position console switch. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.



Check for short in GRN/BLU wire between the E17 terminal and the shift position console switch or shift position indicator. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.



Check for short in GRN/YEL wire between the E19 terminal and the shift position console switch or shift position indicator. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.



Check for short in GRN/ORN wire between the E21 terminal and the shift position console switch or shift position indicator. If wire is OK, check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D4 indicator light blinks six times.

Turn the ignition switch ON.

Observe the A/T shift indicator and select each position separately.

Does the indicator light properly?

NO

See A/T shift position indicator inspection. (Section 23)

YES

Turn the ignition switch OFF.

Connect the Test Harness between the ECU and connectors.

Turn the ignition switch ON.

Shift to **R** position.

Measure the voltage between the A13 and A3/A4 terminals.

Is there voltage?

YES

Repair open in GRN/RED wire between the E13 terminal and the shift position console switch.

NO

Shift to **N** or **P** position.

Measure the voltage between the B7 and A3/A4 terminals.

Is there voltage?

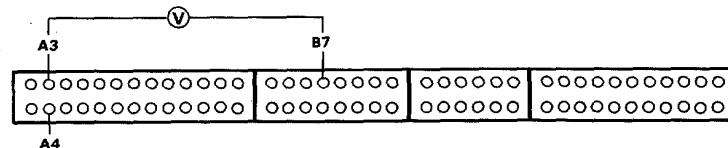
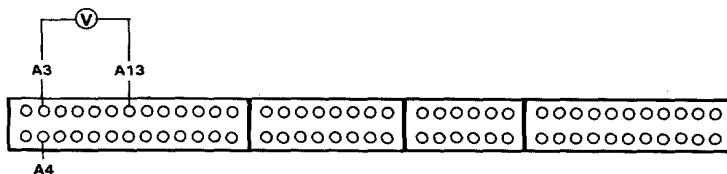
YES

Repair open in LT GRN wire between the B7 terminal and the shift position console switch.

NO

To page 14-61

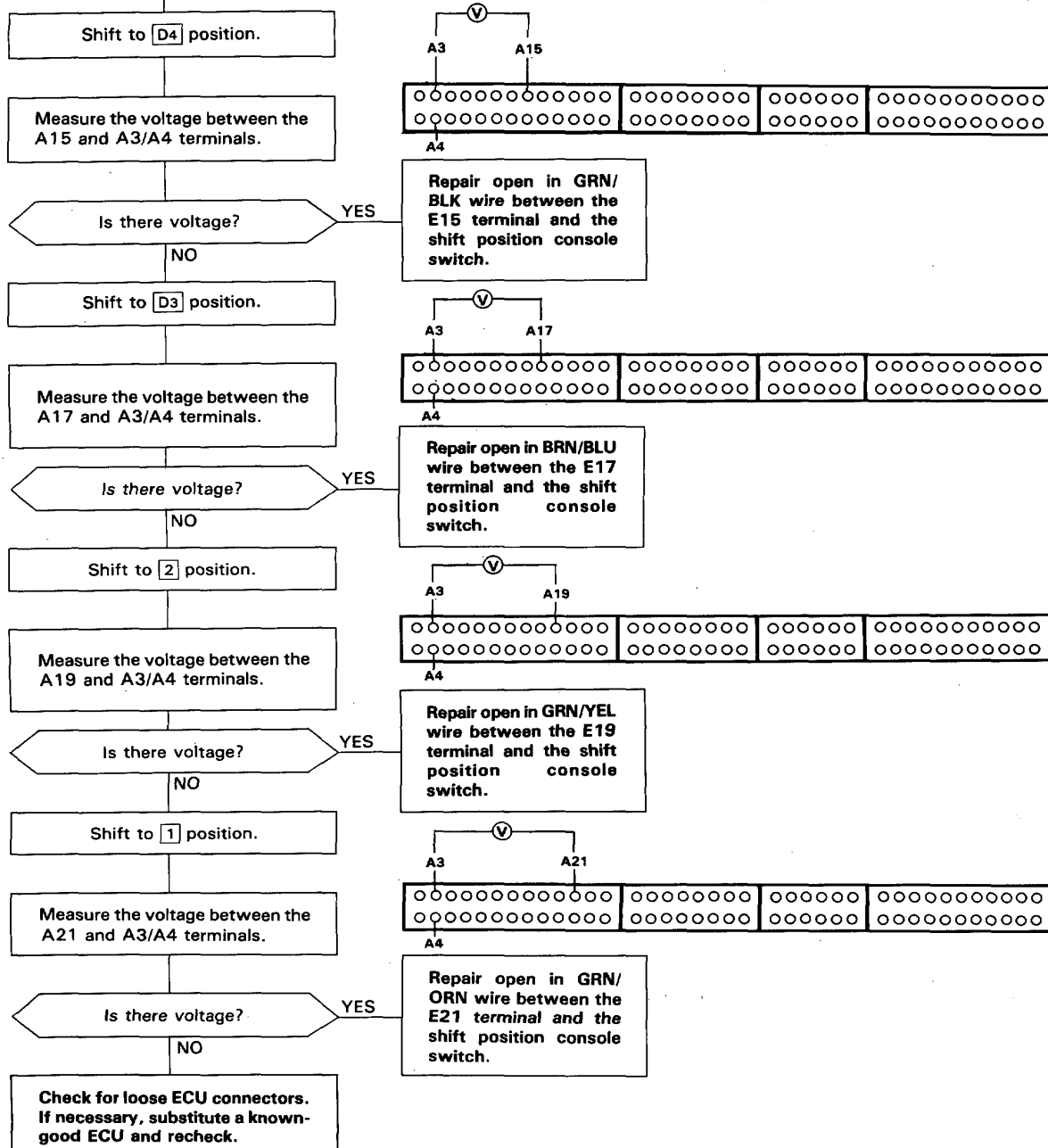
NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.





From page 14-60

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D4 indicator light blinks seven times.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Turn the ignition switch ON.

Measure the voltage between the A23 and A3/A4 terminals.

Is there voltage?

YES

Repair short to power source in BLU wire between the E23 terminal and the shift control solenoid valve A.

NO

Turn the ignition switch OFF.

Measure the resistance between the A23 and A3/A4 terminals.

Is the resistance 12–24 Ω ?

NO

Check for open in BLU wire between the E23 terminal and the shift control solenoid valve A. If wire is OK, check the shift control solenoid valve A. (See page 14-80.)

YES

Disconnect the transmission sub-harness connector.

Check for continuity between the A23 and A3/A4 terminals.

Is there continuity?

YES

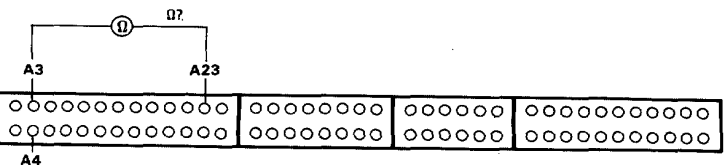
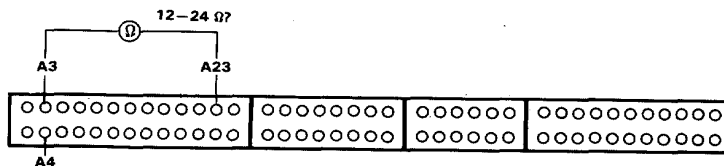
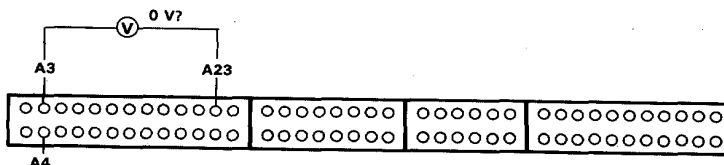
Repair short to ground in BLU wire between the E23 terminal and the shift control solenoid valve A.

NO

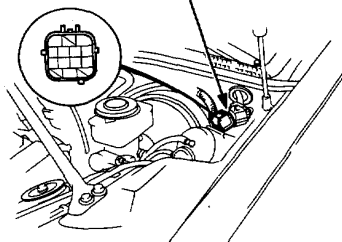
Connect the transmission sub-harness connector to.

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



TRANSMISSION SUB-HARNESS CONNECTOR



NOTE: LHD is shown; RHD is similar.



Self-diagnosis D4 indicator light blinks eight times.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Turn the ignition switch ON.

Measure the voltage between the A24 and A3/A4 terminals.

Is there voltage?

YES

Repair short to power source in GRN wire between the E24 terminal and shift control solenoid valve B.

NO

Turn the ignition switch OFF.

Measure the resistance between the A24 and A3/A4 terminals.

Is the resistance 12-24 Ω ?

NO

Check for open in GRN wire between the E24 terminal and the shift control solenoid valve B. If wire is OK, check the shift control solenoid valve B. (See page 14-80.)

YES

Disconnect the transmission sub-harness connector.

Check for continuity between the A24 and A3/A4 terminals.

Is there continuity?

YES

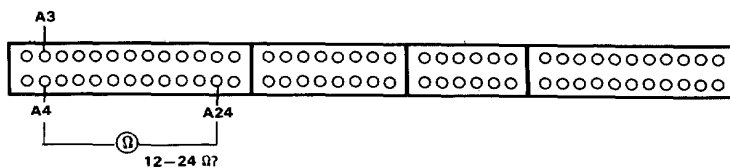
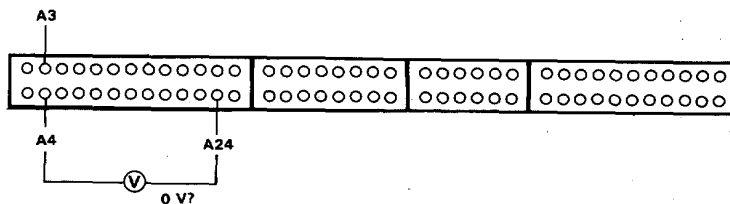
Repair short to ground in GRN wire between the E24 terminal and the shift control solenoid valve B.

NO

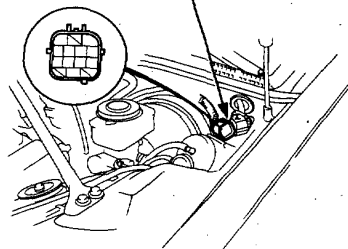
Connect the transmission sub-harness connector.

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

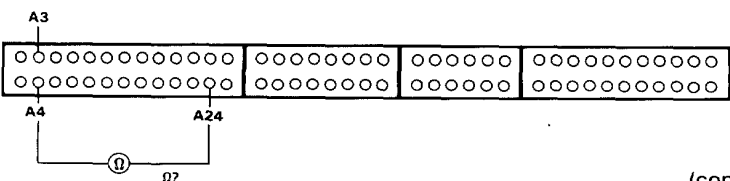
NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



TRANSMISSION SUB-HARNESS CONNECTOR



NOTE: LHD is shown; RHD is similar.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D4 indicator light blinks nine times.

Check the state of installation of the NC speed sensor.

OK?

NO

Reinstall and recheck.

YES

Disconnect the transmission sub-harness connector.

Measure the resistance between the No.9 and No.10 terminals for the NC speed sensor.

Is the resistance 400–600 ohms? (70°F, 20°C)

NO

Disconnect the NC speed sensor from the sub-harness at the transmission.
Measure the resistance between the BLU/YEL and BLU/GRN on the NC speed sensor.

YES

Reconnect the transmission sub-harness connector.

Disconnect the E(26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Is the resistance 400–600 ohms? (70°F, 20°C)

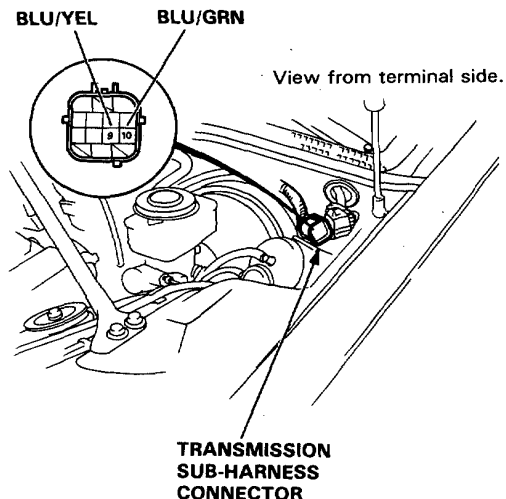
NO

Replace the NC speed sensor.

YES

Replace the transmission sub-harness.

NOTE: LHD is shown; RHD is similar.

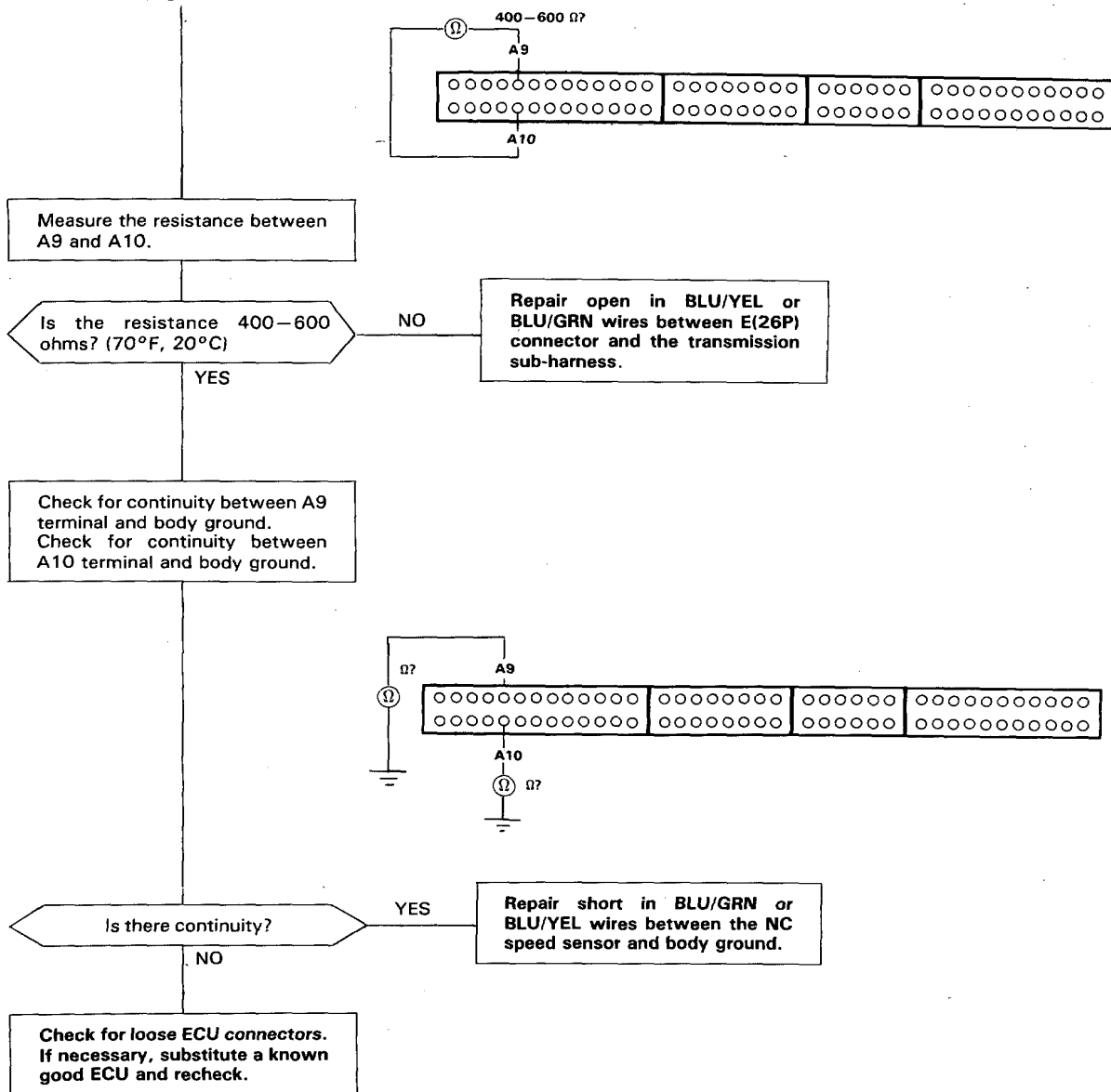


To page 14-65



NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.

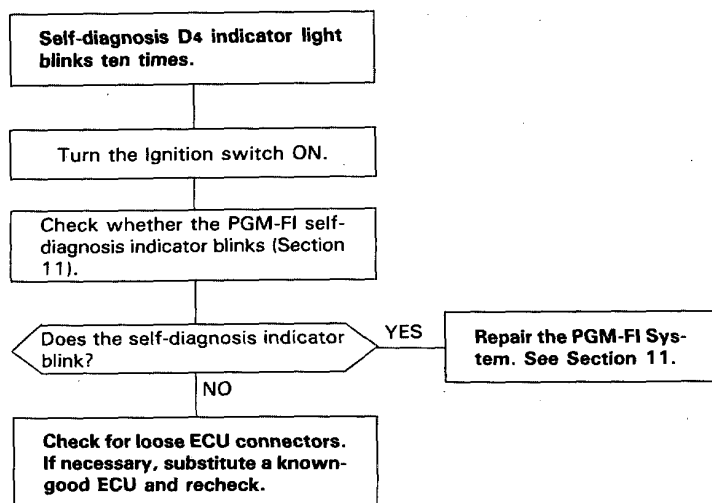
From page 14-64

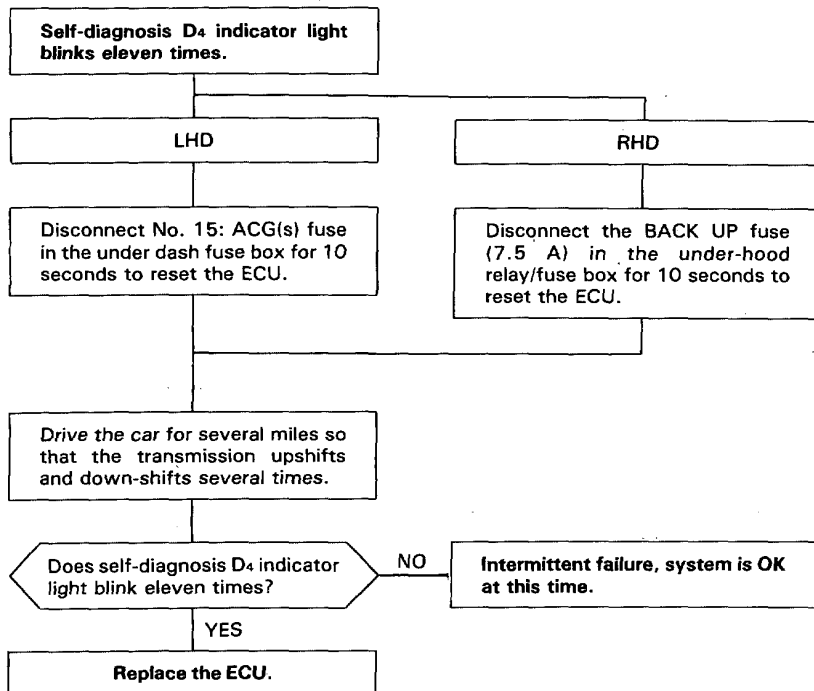


(cont'd)

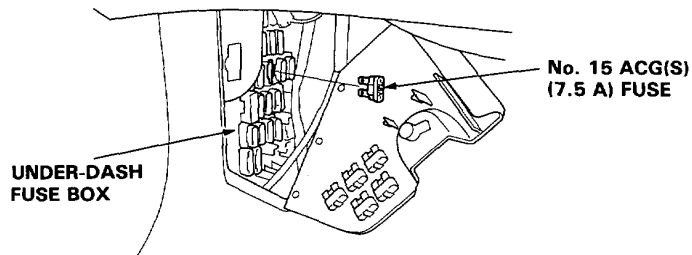
Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

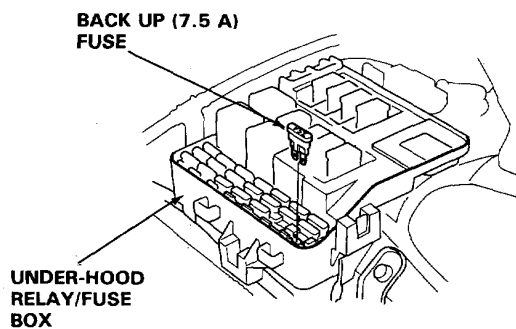




LHD:



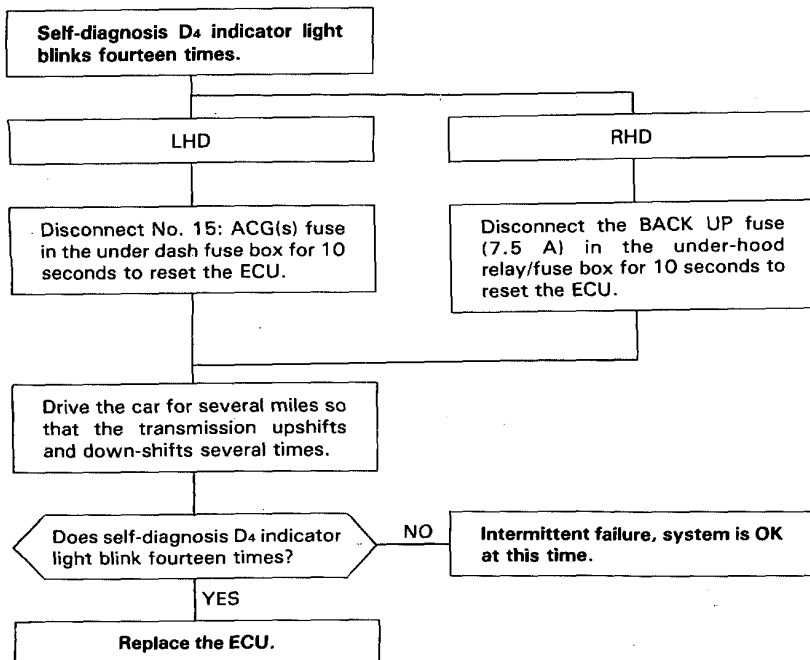
RHD:



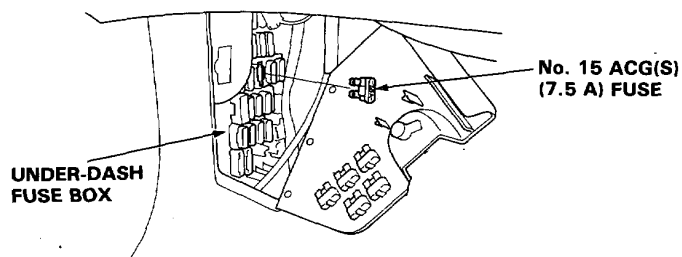
(cont'd)

Electrical Troubleshooting

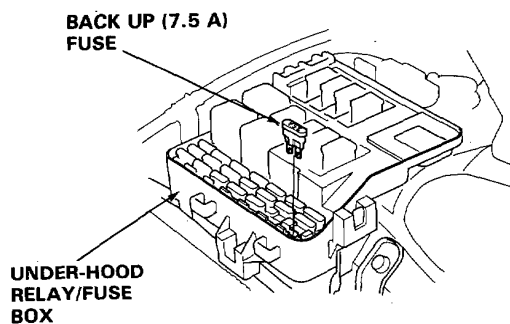
Troubleshooting Flowchart (cont'd)



LHD:



RHD:





NOTE: LHD is shown; RHD is similar.

Self-diagnosis D4 indicator light blinks fifteen times.

Check the state of installation of NM (NC) speed sensor.

OK?

NO

Reinstall and recheck.

YES

Disconnect the transmission sub-harness connector.

Measure the resistance between the No.5 terminal and No.6 for the NM speed sensor.

Is the resistance 400–600 ohms?

NO

Replace the NM speed sensor.

YES

Reconnect the transmission sub-harness connector.

Disconnect the E (26P) connector from the ECU. Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Measure the resistance between A8 and A7 terminals.

Is the resistance 400–600 ohms? (20°C)

NO

Check for continuity between A7 terminal and body ground.

YES

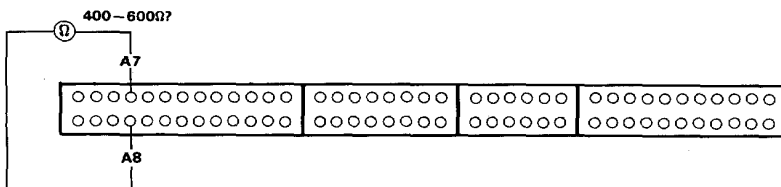
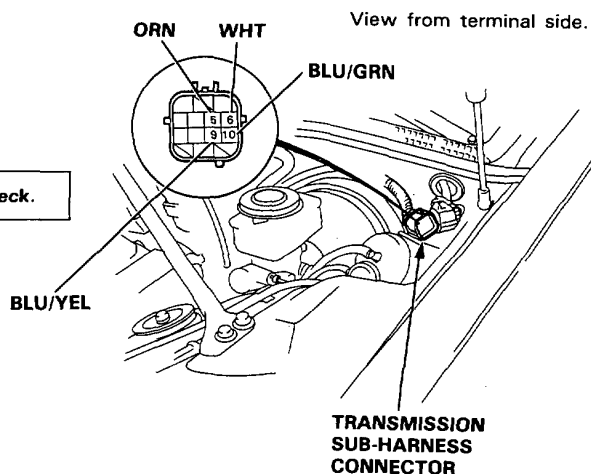
Disconnect the transmission sub-harness connector.

Measure the resistance between the No.9 terminal of the transmission sub-harness connector and No.10 for the NC speed sensor.

To page 14-70

To page 14-70

(cont'd)



NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.

Is there continuity?

YES

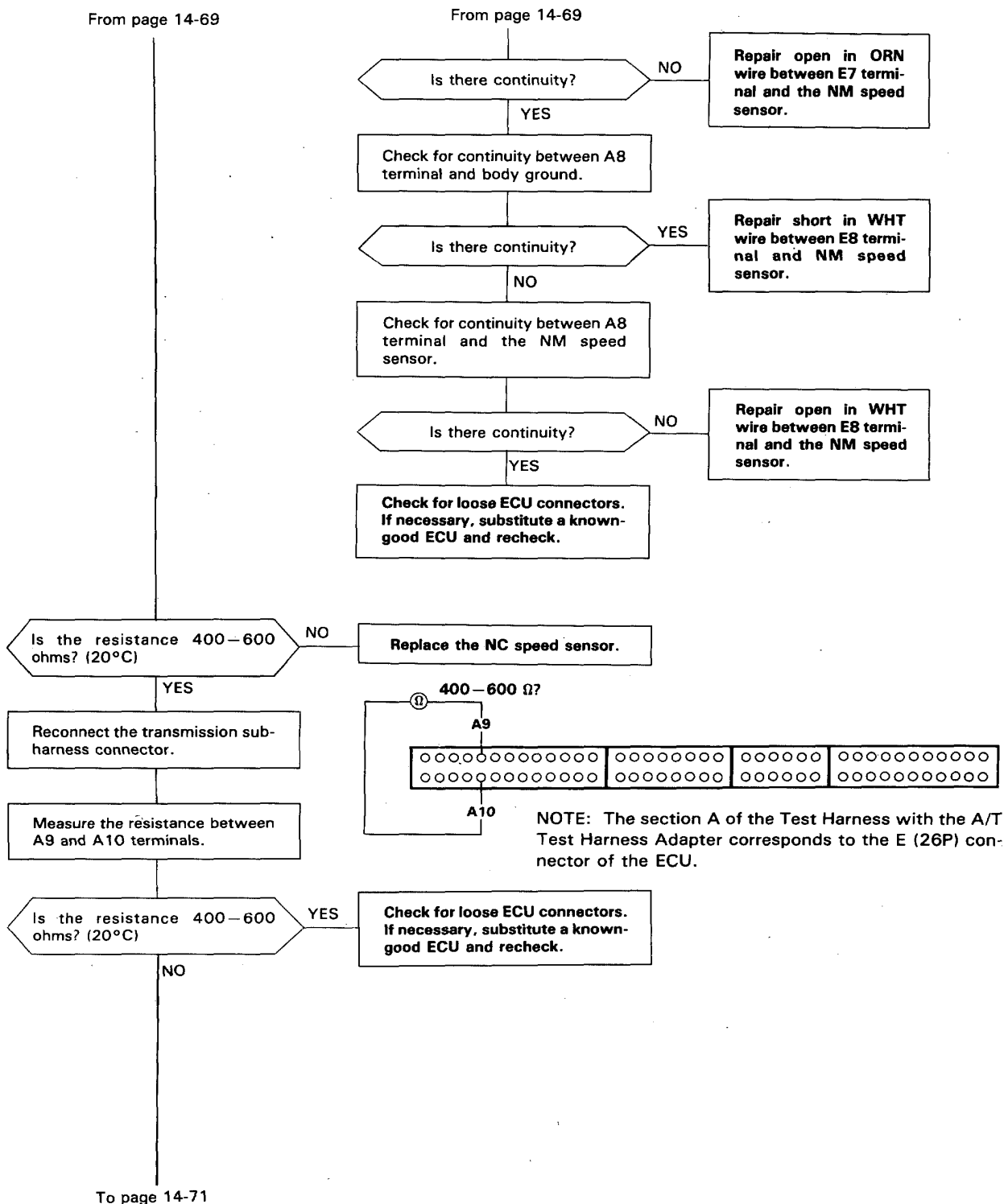
Repair short in ORN wire between E7 terminal and the NM speed sensor.

NO

Check for continuity between A7 terminal and the NM speed sensor.

Electrical Troubleshooting

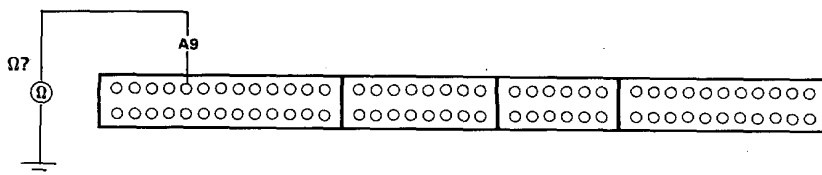
Troubleshooting Flowchart (cont'd)





From page 14-70

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



Check for continuity between A9 terminal and body ground.

Is there continuity?

YES

Repair short in BLU/GRN wire between E9 terminal and the NC speed sensor.

NO

Check for continuity between A9 terminal and the NC speed sensor.

Is there continuity?

NO

Repair open in BLU/GRN wire between E9 terminal and the NC speed sensor.

YES

Check for continuity between A10 terminal and body ground.

Is there continuity?

YES

Repair short in BLU/YEL wire between E10 terminal and the NC speed sensor.

NO

Check for continuity between A10 terminal and the NC speed sensor.

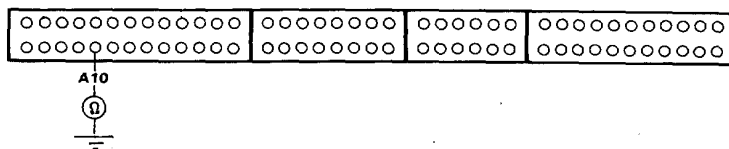
Is there continuity?

NO

Repair open in BLU/YEL wire between E10 terminal and the NC speed sensor.

YES

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D₄ indicator light blinks sixteen times.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Measure the resistance between the A5 and the A6 terminals.

Is the resistance approximately 5 Ω?

YES

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

NO

Disconnect the transmission sub-harness connector.

Measure the resistance between the No.7 (RED) and the No.8 (WHT) terminals of the transmission sub-harness connector for the linear solenoid.

Is the resistance approximately 5 Ω?

NO

Check the Linear Solenoid. See pages 14-81 and 97.

YES

Check the continuity between A5 terminal and the No.18 (RED) terminal of the engine room harness connector.

Is there continuity?

NO

Repair open in RED wire between E5 terminal and the No.18 of the engine room harness connector.

YES

Check the continuity between A6 terminal and the No.19 (WHT) terminal of the engine room harness connector.

Is there continuity?

NO

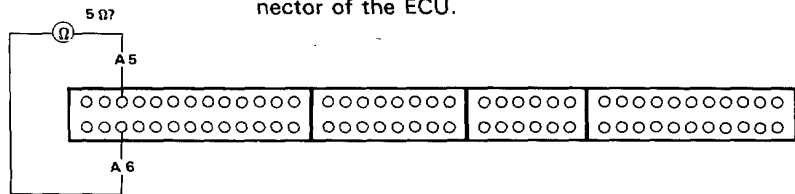
Repair open in WHT wire between E6 terminal and the No.19 terminal of the engine room harness connector.

YES

Reconnect the transmission sub-harness connectors.

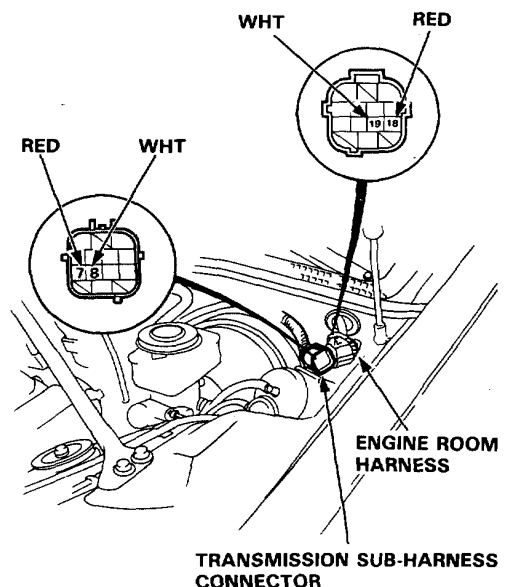
Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



NOTE: LHD is shown; RHD is similar.

View from terminal side.





Self-diagnosis D4 indicator light blinks seventeen times.

Disconnect the E (26P) connector from the ECU.
Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Check for continuity between the A16 and body ground.

Is there continuity?

YES

Repair short in BLU/YEL wire between E16 terminal and the kick-down switch. If wire is OK, replace the kick-down switch.

NO

Check for continuity between the A16 and body ground with the kick-down switch pushed.

Is there continuity?

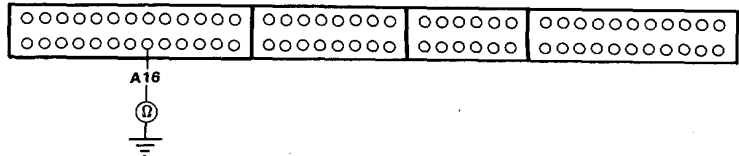
NO

Repair open in BLU/YEL wire between E16 terminal and the kick-down switch. If wire is OK, check for loose kick-down switch connector. Check the BLK wire and ground connection. Check the kick-down switch.

YES

Check for loose ECU and kick-down switch connectors. If necessary, substitute a known-good ECU and recheck.

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

D4 indicator light does not come on with the ignition switch ON. (It should come on for about 2 seconds.)

Is the service check connector jumped?

YES

Disconnect the jumper wire and recheck.

NO

Shift to **D4** position.

Does the **D4** indicator light come on?

YES

Check for loose ECU connectors. If necessary, substitute a known-good ECU and recheck.

NO

Turn the ignition switch OFF.

Disconnect the E (26P) connector from the ECU. Connect the Test Harness "A" connector to the wire harness only, not to the ECU. (14-51)

Check for continuity between the A3 terminal and body ground and A4 and body ground.

Is there continuity?

NO

Repair open BLK wire between E3 and E4 terminal and G101.

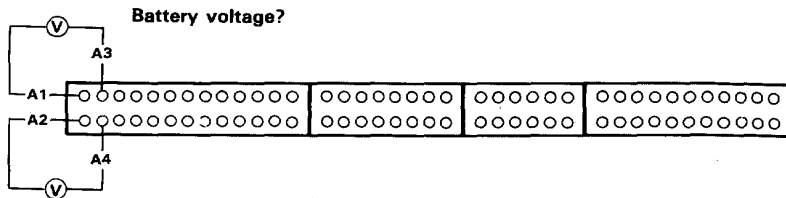
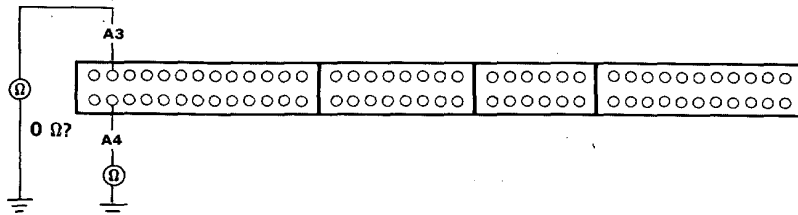
YES

Turn the ignition switch ON.

Measure voltage between the A1 or A2 and A3 or A4 terminals.

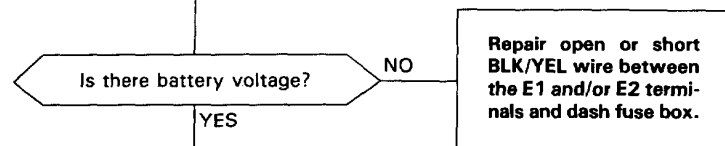
To page 14-75

NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.





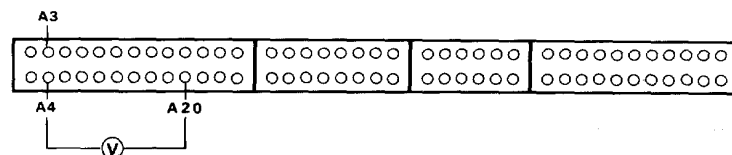
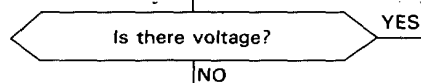
From page 14-74



Turn the ignition switch OFF.

Connect the Test Harness "A" connector to the ECU.

Turn the ignition switch ON. Be sure that voltage is available for 2 seconds between the A20 terminal and A3/A4 terminal.

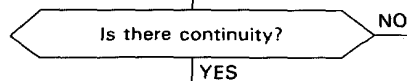


Check for open or short in YEL/RED wire between the E20 terminal and the gauge assembly.

Turn the ignition switch OFF.

Disconnect the Test Harness "A" connector from the ECU.

Check for continuity between the A20 terminal and the YEL/RED wire at the gauge assembly.



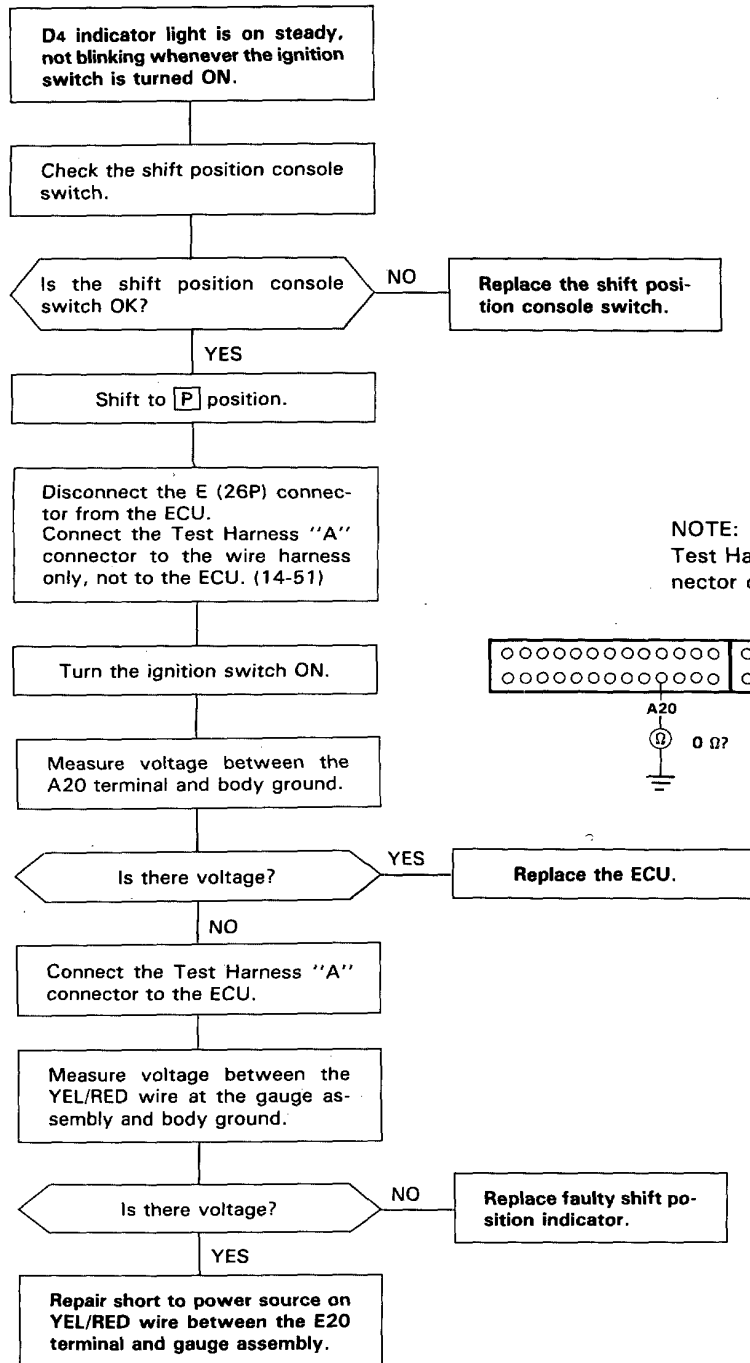
Repair open in YEL/RED wire between the E20 terminal and the gauge assembly.

Check for loose ECU connectors. Check the shift position console switch. If necessary, substitute a known-good ECU and recheck.

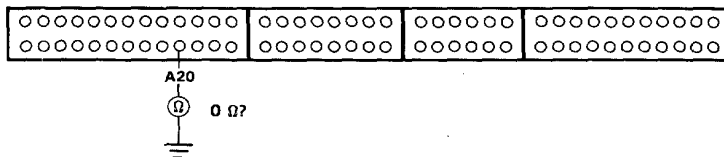
(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)



NOTE: The section A of the Test Harness with the A/T Test Harness Adapter corresponds to the E (26P) connector of the ECU.

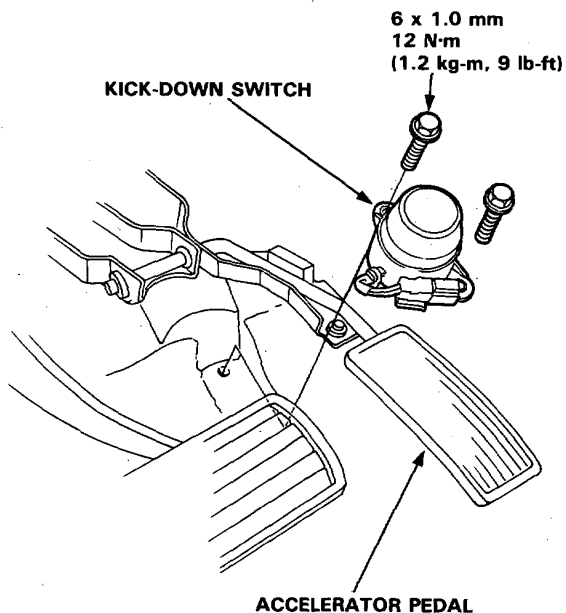




Kick-down Switch

Replacement

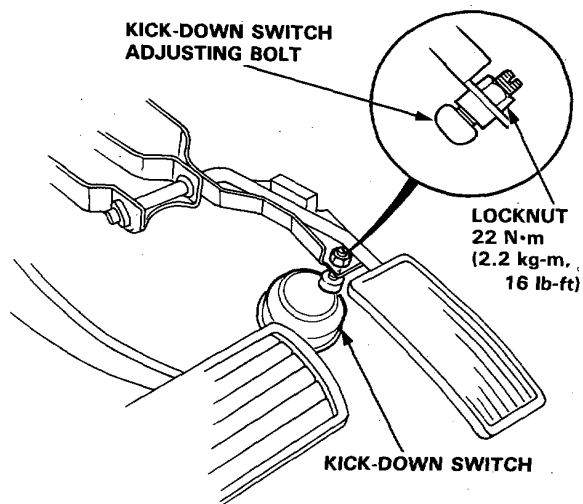
1. Remove the 6 mm bolts.
2. Disconnect the connector.
3. Replace the kick-down switch.



Adjustment

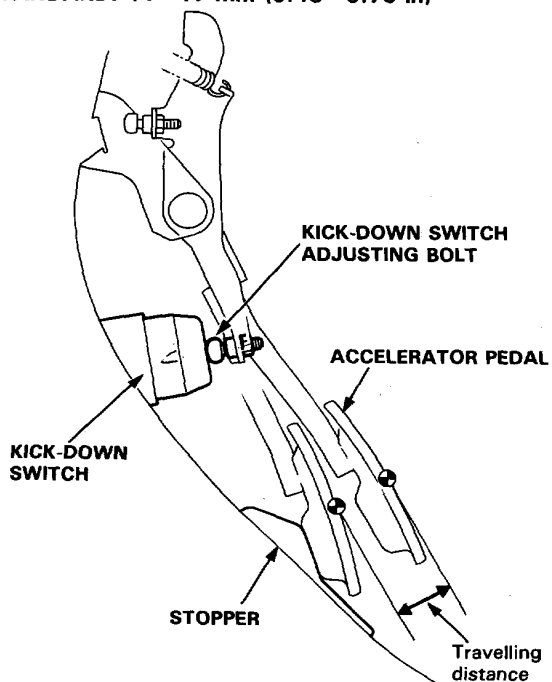
NOTE: LHD is shown; RHD is similar.

1. Loosen the locknut.



2. Adjust the length of the kick-down switch adjusting bolt so that the accelerator pedal travelling distance between the point where the bolt first contacts with the kick-down switch and the point where the accelerator pedal hits the stopper becomes the specified value.

STANDARD: 11—17 mm (0.43—0.70 in)



3. Tighten the locknut.

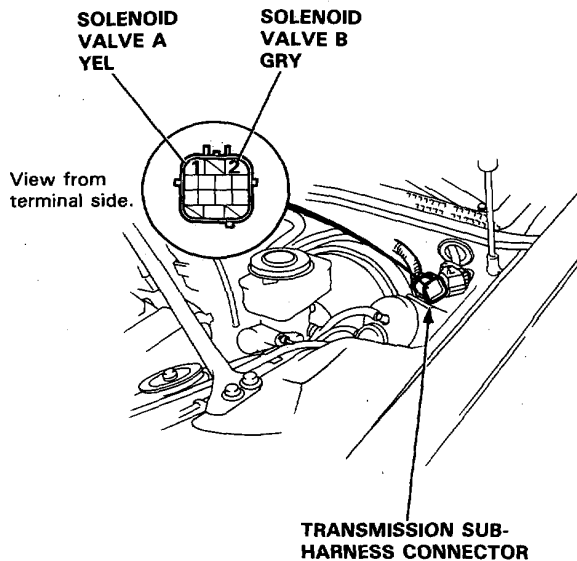
Lock-up Control Solenoid Valve A/B

Test

NOTE: Lock-up control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect the transmission sub harness connector.
2. Measure the resistance between the No.1 terminal (SOL. V A) of the transmission sub-harness connector and body ground and between the No.2 terminal (SOL.V B) and body ground.

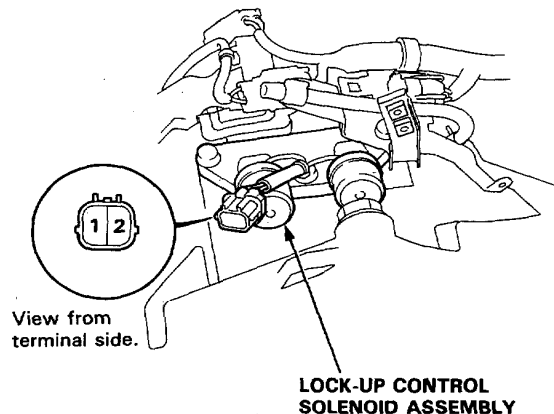
STANDARD: 12–24 Ω



NOTE: LHD is shown; RHD is similar.

3. If the resistance is out of specification, disconnect the connector from the lock-up control solenoid valve A/B.
4. Measure the resistance between the No.1 terminal (SOL. V A) of the lock-up control solenoid valve connector and body ground and between the No.2 terminal (SOL. VB) and body ground.

STANDARD: 12–24 Ω



5. If the resistance is OK, replace the transmission sub-harness.
6. Replace the lock-up control solenoid valve assembly if the resistance is out of specification.
7. Connect the No.1 terminal of the lock-up control solenoid valve 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.
8. If not, check for continuity between the ECU E25 or E26 harness and body ground (page 14-54, 55).
9. Replace the lock-up control solenoid valve assembly if there is continuity between the ECU E25 or E26 harness and body ground (page 14-54, 55).



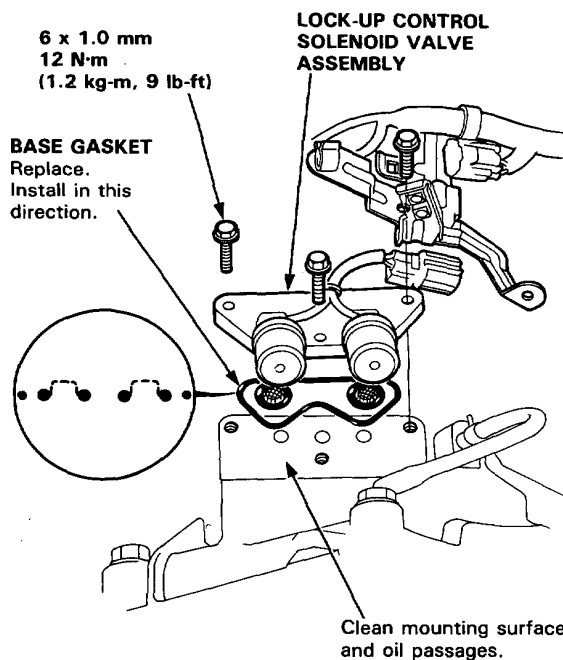
A/T Speed Sensors

Replacement

1. Remove the mounting bolts and lock-up control solenoid valve assembly.

NOTE: Be sure to remove or replace the lock-up control solenoid valves A and B as an assembly.

2. Check the lock-up control solenoid valve oil passages for dust or dirt and replace as an assembly, if necessary.



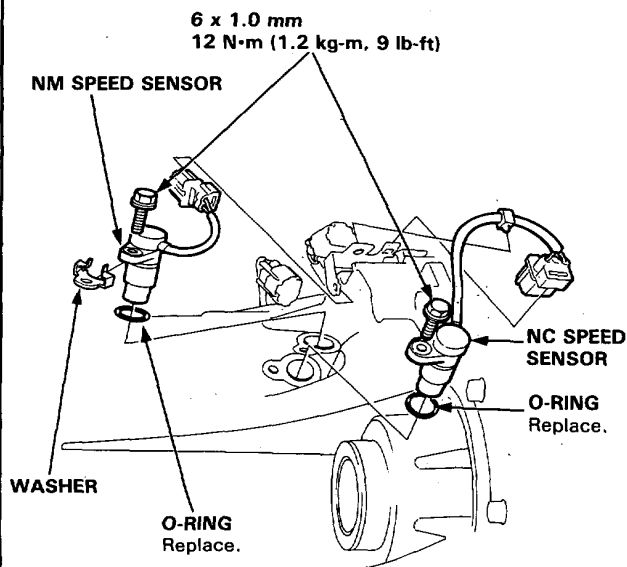
3. Clean the mounting surface and oil passages of the lock-up control solenoid valve assembly and install a new base gasket.

NOTE: Install the base gasket in the direction shown.

4. Check connector for rust, dirt or oil and reconnect it securely.

Replacement

1. Remove the 6 mm bolt from the transmission housing and remove the A/T speed sensor.
2. Replace the O-ring with a new one before reassembling the A/T speed sensor.



NOTE: Install the washer to the NM speed sensor before reassembling the NM speed sensor.

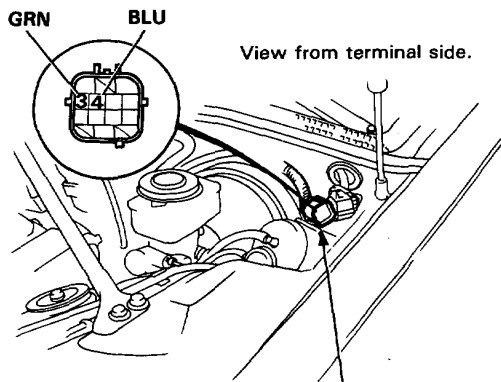
Shift Control Solenoid Valve

Test

Note: Shift control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect the transmission sub-harness connector.
2. Measure the resistance between the No.3 terminal of the transmission sub-harness and body ground and between the No.4 terminal and body ground.

STANDARD : 12 - 24 Ω

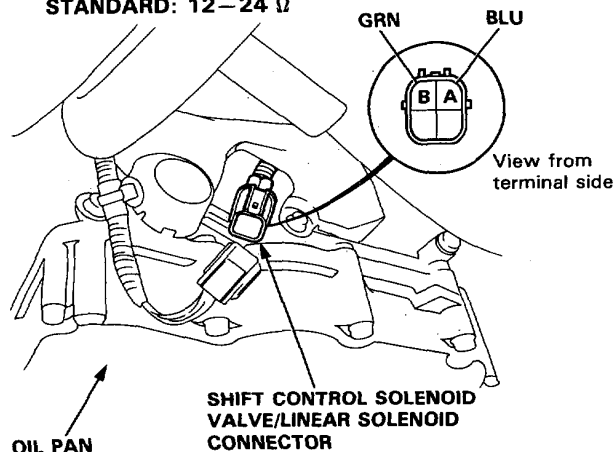


NOTE: LHD is shown;
RHD is similar

**TRANSMISSION
SUB-HARNESS
CONNECTOR**

3. If the resistance is out of specification, disconnect the transmission sub-harness from the shift control solenoid valve/linear solenoid harness.
4. Measure the resistance between the A terminal of the shift control solenoid valve/linear solenoid harness and body ground and between the B terminal and body ground.

STANDARD: 12-24 Ω



**SHIFT CONTROL SOLENOID
VALVE/LINEAR SOLENOID
CONNECTOR**

5. Replace the transmission sub-harness if the resistance is within specification.
6. Replace the shift control solenoid valve assembly if the resistance is out of specification.
7. Connect the A terminal of the shift control solenoid valve/linear solenoid connector to the battery positive terminal. A clicking sound should be heard. Connect the B terminal to the battery positive terminal. A clicking sound should be heard.
8. If not, check for continuity between the ECU E23 or E24 terminal harness and body ground (page 14-62, 63).
9. Replace the shift control solenoid valve assembly if there is continuity between the ECU E23 or E24 harness and body ground.

NOTE: See Shift Control Solenoid Valve Replacement, page 14-98.

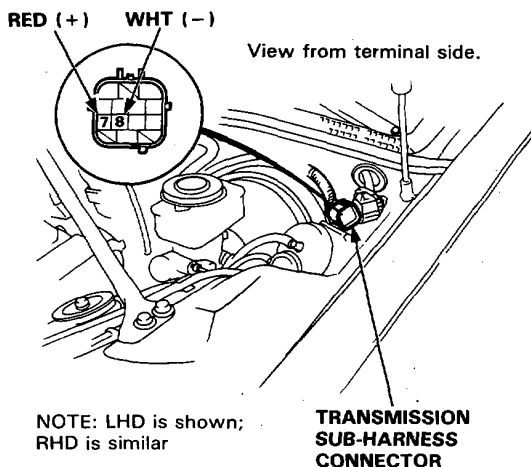


Linear Solenoid

Test

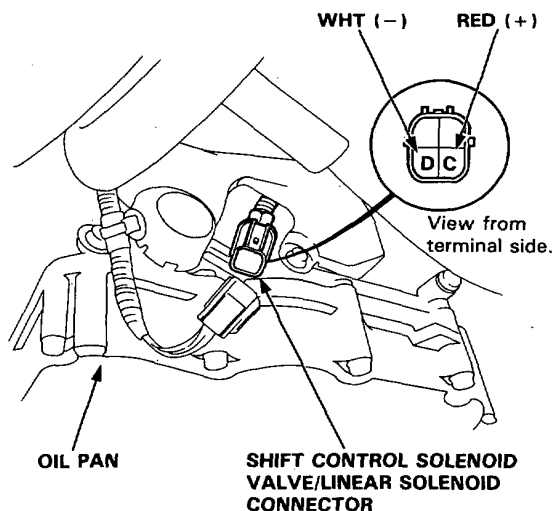
1. Disconnect the transmission sub-harness connector.
2. Measure the resistance between the No.7 and No.8 terminals of the transmission sub-harness.

STANDARD: 5.0–5.6 Ω (at 70°F, 20°C)



3. If the resistance is out of specification, disconnect the transmission sub-harness from the shift control solenoid valve/linear solenoid harness.
4. Measure the resistance between the C and D terminals of the shift control solenoid valve/linear solenoid harness.

STANDARD: 5.0–5.6 Ω (at 70°F, 20°C)



5. Replace the transmission sub-harness if the resistance is within specification.
6. Replace the linear solenoid if the resistance is out of specification.
7. Connect the C terminal of the shift control solenoid valve/linear solenoid connector to the battery positive terminal and connect the D terminal to the battery negative terminal. A clicking sound should be heard.
8. If not, replace the linear solenoid.

NOTE: See Throttle Valve Body/Linear Solenoid Replacement, page 14-97 and 98.

Hydraulic System

Symptom-to-Component Chart

SYMPTOM	Check these items on the PROBABLE CAUSE LIST	Check these items on the NOTES CHART
Engine runs, but car does not move in any gear.	1, 6, 7, 16, 42, 43	K, L, R, S
Car moves in [2] but not in [D4] or [D3] .	1, 8, 23, 29, 44, 48	C, M, O
Car moves in [D4] , [D3] , [1] , [R] but not in [2] .	1, 9, 30, 48, 49	C, L
Car moves in [D4] , [D3] , [2] , [1] but not in [R] .	1, 39, 40	C, L, Q
Car moves in [N] .	1, 8, 9, 10, 11, 46, 47	C, D
Excessive idle vibration.	5, 6, 17, 36	B, K, L
Slips in all gears.	6, 7, 16	C, L, U
No engine braking in [1] position.	8, 12	C, D, L
No engine braking in [2] position.	9, 12, 48	C, D, L
Slips in 1st gear.	8, 29, 44, 48	C, N, O, U
Slips in 2nd gear.	9, 20, 23, 30, 48, 49	C, L, U
Slips in 3rd gear.	10, 21, 23, 31, 44	C, L, U
Slips in 4th gear.	11, 23, 32	C, L, U
Slips in reverse gear.	34, 39, 40	C
Flares on 1—2 upshift. ✓	2, 3, 15, 19, 30, 48	E, L, V
Flares on 2—3 upshift. ✓	2, 3, 15, 20, 31, 44, 48	E, L, V
Flares on 3—4 upshift. ✓	2, 3, 15, 21, 25, 32, 44	E, L, V
No upshift, trans stays in 1st gear.	14, 19, 23	G, L
No downshift to 1st gear.	12, 19	G, L
Late upshift.	14	L, V
Erratic shifting.	14, 26	V
Harsh shift (up and down shifting). ✓	2, 3, 4, 15, 23, 26, 27, 47	E, H, I, L, V
Harsh shift (1—2).	2, 9	C, D, V
Harsh shift (2—3).	2, 10, 23, 26	C, D, H, L, V
Harsh shift (3—4).	2, 11, 23, 25	C, D, I, L, V
✗ Harsh kick-down shifts. ✓	2, 3, 23, 26, 27	L, V, Q
Harsh kick-down shift (2—1).	8, 25, 48	O
Harsh downshift at closed throttle.	15	E, T
Harsh shift when manually shifting to [1] .	33	L
Axle(s) slips out of trans on turns.	43, 50	L, P, Q
Axle(s) stuck in trans.	43	L, Q
Ratcheting noise when shifting into [R] .	6, 7, 39, 40	K, L, Q
Loud popping noise when taking off in [R] .	39, 40	L, Q
Ratcheting noise when shifting from [R] to [P] or from [R] to [N] .	39, 40	L, Q
Noise from trans in all selector lever positions.	6, 17	K, L, Q
Noise from trans only when wheels are rolling.	39, 42	L, Q
Gear whine, rpm related (pitch changes with shifts).	8, 41	K, L, Q
Gear whine, speed related (pitch changes with speed).	42	L, Q
Trans will not shift into 4th gear in [D4] .	1, 21, 25, 32	L
Lock-up clutch does not lock up smoothly.	17, 36, 37	L
Lock-up clutch does not operate properly.	2, 3, 15, 18, 35, 36, 37	E, L, V
Transmission has multitude of problems shifting. At disassembly, large particles of metal are found on magnet.	43	L, Q



PROBABLE CAUSE	
1.	Shift cable broken/out of adjustment.
2.	Throttle valve body/throttle valve misadjusted.
3.	Linear solenoid defective/damaged.
4.	Wrong type ATF.
5.	Idle rpm too low/high.
6.	Oil pump worn or binding.
7.	Pressure regulator stuck.
8.	1st clutch defective.
9.	2nd clutch defective.
10.	3rd clutch defective.
11.	4th clutch defective.
12.	1st hold clutch defective.
14.	Modulator valve stuck.
15.	Throttle valve B stuck.
16.	ATF strainer clogged.
17.	Torque converter defective.
18.	Torque converter check valve stuck.
19.	1—2 shift valve stuck.
20.	2—3 shift valve stuck.
21.	3—4 shift valve stuck.
22.	EAT D inhibitor valve stuck.
23.	Clutch pressure control valve stuck.
24.	2nd orifice control valve stuck.
25.	3—4 orifice control valve stuck.
26.	Shift timing valve stuck.
27.	4—3 kick-down valve stuck.
28.	4th exhaust valve stuck.
29.	1st accumulator defective.
30.	2nd clutch accumulator defective.
31.	3rd clutch accumulator defective.
32.	4th accumulator defective.
33.	1st hold clutch accumulator defective.
34.	Reverse clutch accumulator defective.
35.	Lock-up clutch timing valve stuck.
36.	Lock-up clutch shift valve stuck.
37.	Lock-up clutch control valve stuck.
38.	Shift fork bent.
39.	Reverse gears worn/damaged (3 gears).
40.	Reverse clutch worn.
41.	3rd gears worn/damaged (2 gears)
42.	Final gears worn/damaged (2 gears)
43.	Extension shaft worn.
44.	Feedpipe O-ring broken.
45.	4th gears worn/damaged (2 gears).
46.	Gear clearance incorrect.
47.	Clutch clearance incorrect.
48.	Sprag clutch defective.
49.	Sealing rings/guide worn.
50.	Axle-inboard joint clip missing.

(cont'd)

Hydraulic System

Symptom-to-Component Chart (cont'd)

The following symptoms can be caused by improper repair or assembly.	Check these items on the PROBABLE CAUSE DUE TO IMPROPER REPAIR	Items on the NOTES CHART
Car creeps in N .	R1, R2	
Car does not move in D4 or D3 .	R4	
Trans locks up in R .	R3	
Excessive drag in trans.	R6	R, K
Excessive vibration, rpm related.	R7	
Noise with wheels moving only.	R1	
Main seal pops out.	R8	S
Various shifting problems.	R9, R10	
Harsh upshifts.	R11	

PROBABLE CAUSE DUE TO IMPROPER REPAIR	
R1.	Improper clutch clearance.
R2.	Improper gear clearance.
R3.	Parking brake lever installed upside down.
R4.	Sprag clutch installed upside down.
R5.	Reverse hub installed upside down.
R6.	Oil pump binding.
R7.	Torque converter not fully seated in oil pump.
R8.	Main seal improperly installed.
R9.	Springs improperly installed.
R10.	Valves improperly installed.
R11.	Ball check valves not installed.
R12.	Shift fork bolt 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 service manual.
C.	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D.	If the clutch pack is seized or is excessively worn, inspect the other clutches for wear and check the orifice control valves and throttle valves for free movement.
E.	If throttle valve B is stuck, inspect the clutches for wear.
G.	If the 1—2 valve is stuck closed, the transmission will not upshift. If stuck open the transmission has no 1st gear.
H.	If the shift timing valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I.	If the 3—4 orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J.	If the clutch pressure control valve is stuck closed, the transmission will not shift out of 1st gear.
K.	Improper alignment of oil pump body and torque converter case may cause oil pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak.



NOTES

L.	If the oil screen is clogged with particles of steel or aluminum, inspect the oil pump. If OK and no cause for the contamination is found, replace the torque converter.
M.	If the 1st clutch feedpipe guide in the rear cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the rear cover as it is dented. The O-ring under the guide is probably worn.
N.	Replace the mainshaft if the bushings for the 1st and 2nd feedpipe are loose or damaged. If the 1st feedpipe is damaged or out of round, replace it. If the 2nd feedpipe is damaged or out of round, replace the rear cover.
O.	A worn or damaged sprag clutch is mostly a result of shifting the trans in D3 or D4 while the wheels rotate in reverse, such as rocking the car in snow.
P.	Inspect the frame for collision damage.
Q.	Inspect the reverse clutch for damage or wear. Inspect bottom of 3rd clutch for swirl marks. Replace reverse clutch if worn or damaged. If trans makes clicking, grinding or whirring noise, also replace mainshaft reverse gear, reverse idler gear, and countershaft reverse gear. If bottom of 3rd clutch is swirled and trans makes gear noise, replace the countershaft.
R.	Be very careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the oil pump when you torque down the oil pump body. This will result in oil pump seizure if not detected. Use proper tools.
S.	Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the oil return passage and result in damage.
T.	Harsh downshifts when coasting to a stop with zero throttle may be caused by the linear solenoid not working.
U.	Check if servo valve stopper cap is installed. If it was not installed, the check valve may have been pushed out by hydraulic pressure causing a leak (internal), affecting all forward gears.
V.	Adjusting the throttle valve body, throttle valve, and linear solenoid is essential for proper operation of the transmission. Not only does it affect the shift quality if misadjusted, but also the lock-up clutch operation.

Fluid Level

Checking/Changing

Checking

With the car on level ground, pull the transmission dipstick and check the level of fluid immediately after the engine is shut off (within one minute).

The fluid level should be between the upper and lower marks. Push the dipstick all the way in to check the fluid level. If the level is at, or below, the lower mark, add DEXRON or DEXRON-II type automatic transmission fluid.

Changing

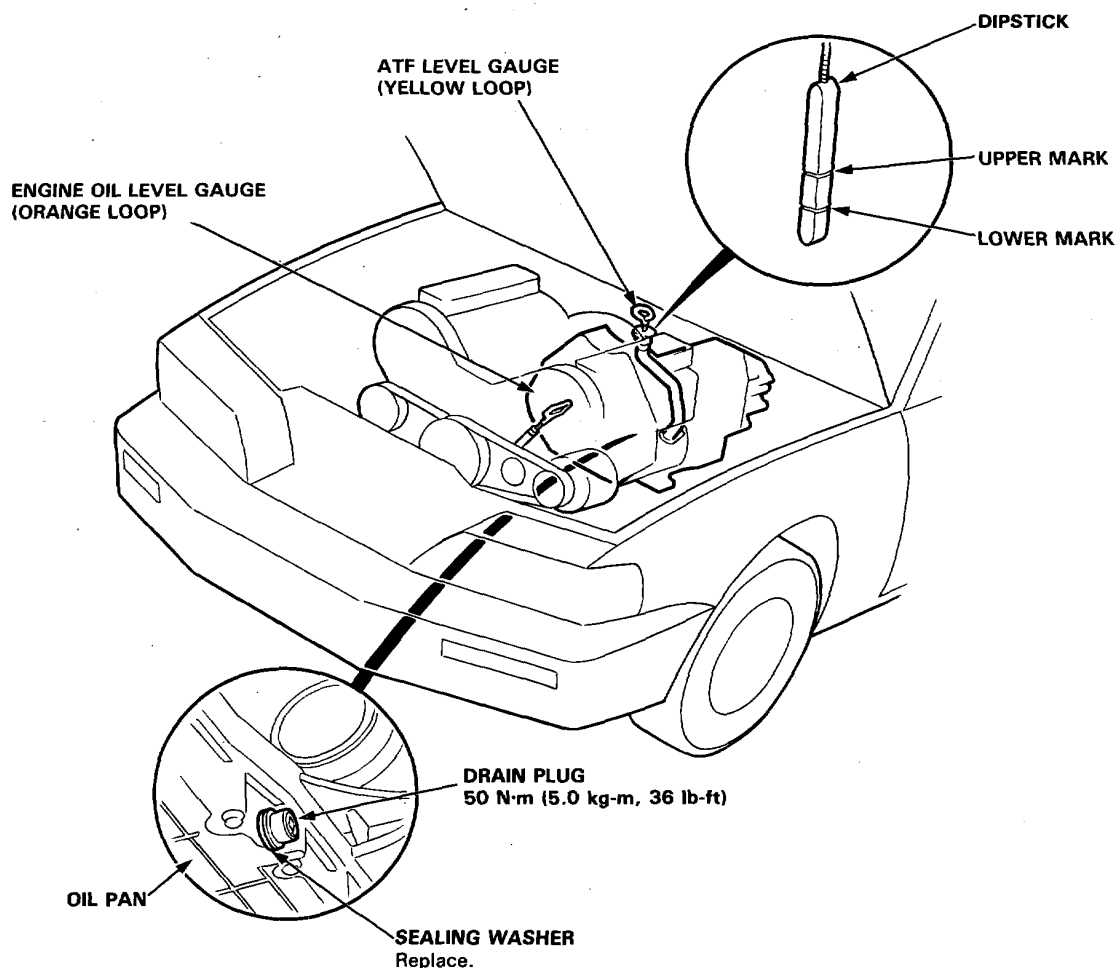
1. Bring the transmission up to operating temperature by driving the car. Park the car on level ground, turn the engine off, then remove drain plug.
2. Reinstall the drain plug with a new washer, then refill the transmission to the upper mark on the dipstick.

Automatic Transmission Fluid Capacity:

3.3 l (3.5 US qt., 2.9 Imp. qt.) at change

8.7 l (9.2 US qt., 7.7 Imp. qt.) after overhaul

7.2 l (7.6 US qt., 6.3 Imp. qt.) after overhaul
with new torque
converter



Stall Speed



Test

CAUTION:

- To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.
- Do not shift the lever while raising the engine speed.
- Be sure to remove the pressure gauge before testing stall speed.

1. Engage the parking brake and block all four wheels.
2. Connect the tachometer, and start the engine.
3. After the engine has warmed up to normal operating temperature, shift into **[2]** position.
4. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed.
5. Allow 2 minutes for cooling, then repeat same test in **[1]**, **[D₄]** and **[R]** position.

NOTE:

- Stall speed test must be made only for checking the cause of trouble.
- Stall speed in **[D₄]**, **[2]**, **[1]** and **[R]** must be same, and must also be within limits.

Stall Speed RPM: 1,850—2,150 min⁻¹ (rpm)

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D₄] , [2] , [1] and [R] position	• Low fluid level or oil pump output • Clogged oil strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in [1] position	• Slippage of 1st clutch, 1st-hold clutch or 1st gear one-way clutch
Stall rpm high in [2] position	• Slippage of 2nd clutch, 1st-hold clutch or 2nd gear one-way clutch
Stall rpm high in [D₄] position	• Slippage of 1st clutch, 2nd clutch, 1st gear one-way clutch or 2nd gear one-way clutch
Stall rpm high in [R] position	• Slippage of reverse clutch
Stall rpm low in [D₄] , [2] , [1] and [R] position	• Engine output low • Torque converter one-way clutch slipping

Road Test

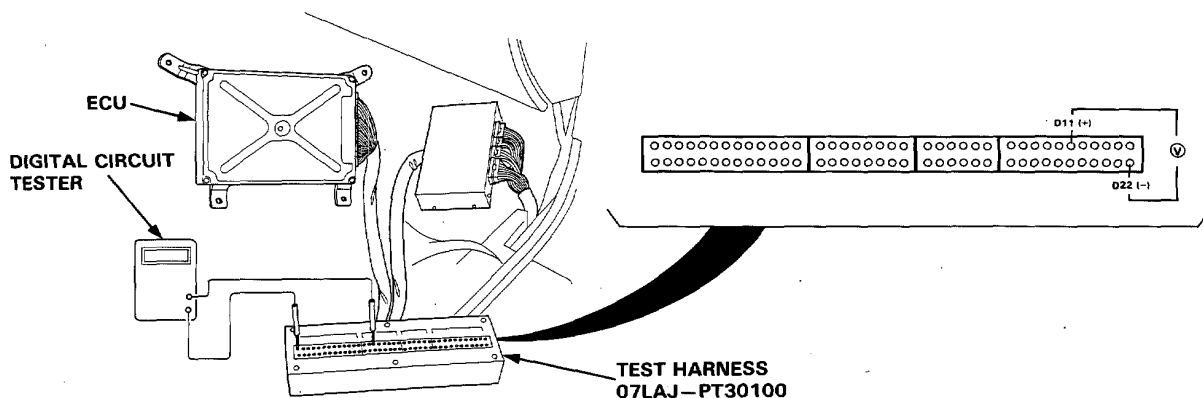
NOTE: Warm up the engine to operating temperature.

1. Apply parking brake and block the wheels. Start the engine, then move the selector lever to **D₄** position while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. Engine should not stall.
2. Repeat same test in **D₃** position.
3. Shift the selector lever to **D₄** position and check that the shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

NOTE: Throttle angle sensor voltage represents the throttle opening.

- 1. Connect the Test Harness between the ECU and connector (See pages 11-28 and 29).
- 2. Set the digital circuit tester to check voltage between D11 (+) terminal and D22 (-) terminal for the throttle angle sensor.

Throttle Angle Sensor Voltage	Throttle Opening
0.822–0.878 V	0.5/8 Throttle
2.175–2.325 V	3.5/8 Throttle



NOTE: LHD is shown; RHD is similar.

KE, KG, KF, KS, KX models: **D₄** range

● Upshift

		1st–2nd	2nd–3rd	3rd–4th	Lock up Clutch ON
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting down-hill from a stop	km/h	15–19	30–35	42–49	32–37
	mph	9–12	19–22	26–30	20–23
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) Acceleration from a stop	km/h	36–40	61–69	92.5–101.5	120–129
	mph	22–25	38–43	57–63	75–80
Full-throttle Acceleration from a stop	km/h	62–70	111–124	174–191	169–186
	mph	39–43	69–77	108–119	105–116

● Downshift

		Lock up Clutch OFF	4th–3rd	3rd–2nd	2nd–1st
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting or braking to a stop	km/h	31–36	28–33	—	12–17
	mph	19–22	17–21	—	7–11
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	96–105	—	—	—
	mph	60–65	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	162–178	152–168	92–103	43–51
	mph	101–111	94–104	57–64	27–32



Austria model: **D4** range

● Upshift

		1st–2nd	2nd–3rd	3rd–4th	Lock up Clutch ON
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting down-hill from a stop	km/h	15–19	30–35	42–49	32–37
	mph	9–12	19–22	26–30	20–23
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) Acceleration from a stop	km/h	34–40	61–69	92.5–101.5	120–129
	mph	21–25	38–43	57–63	75–80
Full-throttle Acceleration from a stop	km/h	62–70	111–124	174–191	169–186
	mph	39–43	69–77	108–119	105–116

● Downshift

		Lock up Clutch OFF	4th–3rd	3rd–2nd	2nd–1st
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting or braking to a stop	km/h	31–36	28–33	—	12–17
	mph	19–22	17–21	—	7–11
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	96–105	—	—	—
	mph	60–65	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	162–178	152–168	92–103	43–51
	mph	101–111	94–104	57–64	27–32

KY model: **D4** range

● Upshift

		1st–2nd	2nd–3rd	3rd–4th	Lock up Clutch ON
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting down-hill from a stop	km/h	15–19	25–30	37–44	27–32
	mph	9–12	15.5–19	23–27.5	16.5–20
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) Acceleration from a stop	km/h	40–47	58–67	82–92	115–124
	mph	25–29	36–41.5	51–57	71.5–77
Full-throttle Acceleration from a stop	km/h	60–68	105–118	159–177	163–180
	mph	37–42.5	65–73.5	99–110	101–112

● Downshift

		Lock up Clutch OFF	4th–3rd	3rd–2nd	2nd–1st
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting or braking to a stop	km/h	25–30	28–34	—	12–18
	mph	15.5–19	17.5–21	—	7.5–11
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	94–103	—	—	—
	mph	58.5–64	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	154–171	138–154	87–98	40–49
	mph	96–106.5	85–95.5	54–61	25–30.5

(cont'd)

Road Test

(cont'd)

KQ, KT models: **D4** range

● Upshift

		1st–2nd	2nd–3rd	3rd–4th	Lock up Clutch ON
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting down-hill from a stop	km/h	15–19	28–33	41–48	29–34
	mph	9–12	17–21	25–30	18–21
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) Acceleration from a stop	km/h	32.5–38.5	58.5–66.5	83.5–92.5	116–125
	mph	20–24	36–41	52–57	72–78
Full-throttle Acceleration from a stop	km/h	59–67	107–120	162–179	166–183
	mph	37–42	66–75	101–111	103–114

● Downshift

		Lock up Clutch OFF	4th–3rd	3rd–2nd	2nd–1st
Throttle angle sensor voltage: 0.822–0.878 V (0.5/8 throttle) Coasting or braking to a stop	km/h	28–33	28–33	—	12–17
	mph	17–21	17–21	—	7–11
Throttle angle sensor voltage: 2.175–2.325 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	96–115	—	—	—
	mph	60–71	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	158–174	137–153	87–98	40–48
	mph	98–108	85–95	54–61	25–30

4. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift **D4** to **2**. The car should immediately begin slowing down from engine braking.

CAUTION: Do not shift from **D4** or **D3** to **2** or **1** at speeds over 62.5 mph (100 km/h); you may damage the transmission.

5. Check for abnormal noise and clutch slippage in the following position.

1 (1st Gear) Position

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

2 (2nd Gear) Position

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

R (Reverse) Position

Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

6. Test in **P** (Parking) Position

Park car on slope (approx. 16°), apply the parking brake, and shift into Park. Release the brake; the car should not move.

Pressure Testing



⚠ WARNING

- While testing, be careful of the rotating front wheels.
- Make sure lifts, jacks, and safety stands are placed properly.

CAUTION:

- Before testing, be sure the transmission fluid is filled to the proper level.
- Warm up the engine before testing.

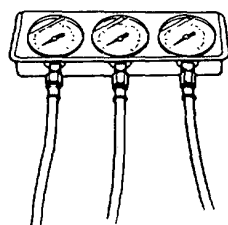
1. Raise the car. (See page 1-6.)
2. Warm up the engine, then stop the engine and connect a tachometer.
3. Connect the oil pressure gauge to each inspection hole(s).

18 N·m (1.8 kg-m, 12 lb-ft)

CAUTION: Connect the oil pressure gauge securely, be sure not to allow dust and other foreign particles to enter the inspection hole.

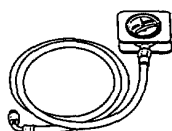
A/T OIL PRESSURE GAUGE SET
07406-0020003

A/T OIL PRESSURE
GAUGE HOSE
ASSEMBLY
07MAJ-PY40100



OIL PRESSURE
GAUGE HOSE
07MAJ-PY40110

OIL PRESSURE
JOINT
07MAJ-PY40120



A/T LOW
PRESSURE
GAUGE
07406-0070000

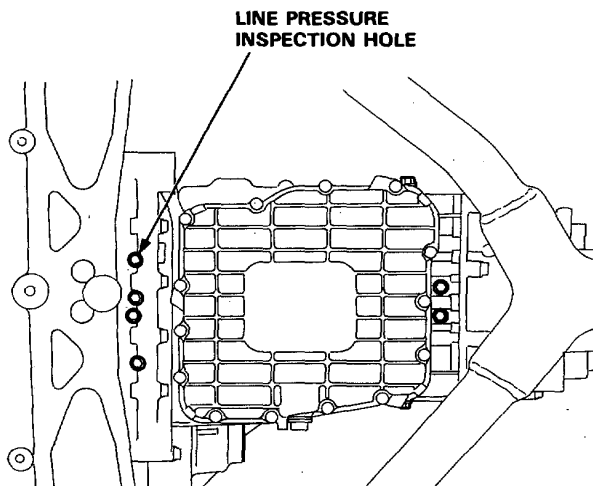
NOTE: Use the A/T Oil Pressure Gauge Set or A/T Low Pressure Gauge replacing the oil pressure gauge hose assembly.

4. Start the engine and measure the respective pressure as follows.
 - Line Pressure
 - Clutch Pressure
 - Clutch Low/High Pressure
 - Throttle B Pressure
5. Install a new washer and the sealing bolt in the inspection hole and tighten to the specified torque. 18 N·m (1.8 kg-m, 12 lb-ft)

NOTE: Do not reuse old aluminum washers.

- Line Pressure

- 1. Set the parking brake and block both wheels securely.
- 2. Run the engine at 2,000 min⁻¹ (rpm).
- 3. Shift the select lever to **N** or **P**.
- 4. Measure line pressure.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line	N or P	No (or low) line pressure	Torque converter, oil pump pressure regulator, torque converter check valve, oil pump.	800–860 kPa (8.0–8.6 kg/cm ² , 114–122 psi)	750 kPa (7.5 kg/cm ² , 107 psi)

NOTE: Higher pressures may be indicated if measurements are made in selector positions other than **N** or **P**.
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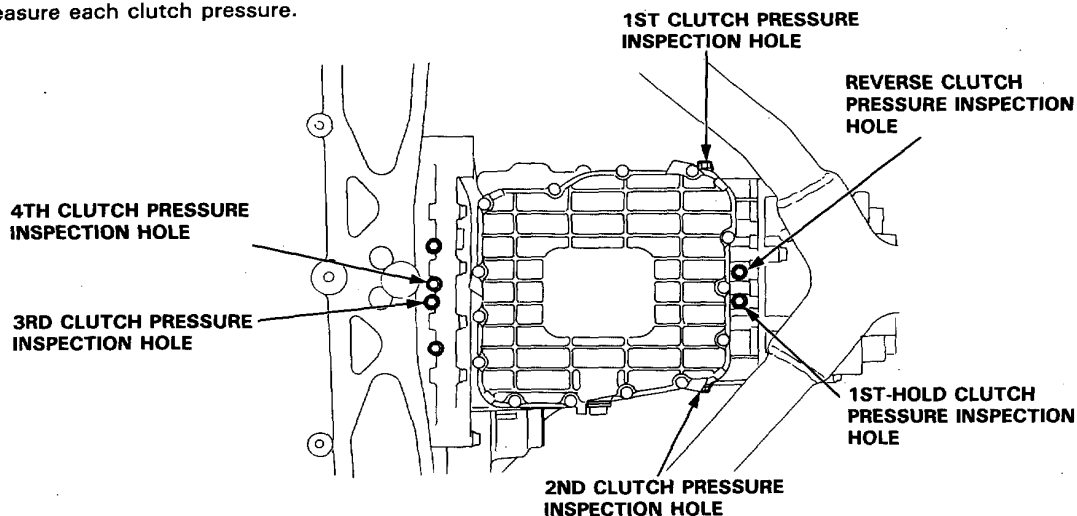
Pressure Testing

(cont'd)

• Clutch Pressure Measurement

⚠ WARNING While testing, be careful of the rotating front wheels.

- 1. Set the parking brake and block both rear wheels securely.
- 2. Raise the front of the car and support with safety stands.
- 3. Allow the front wheels to rotate freely.
- 4. Run the engine at 2,000 min⁻¹ (rpm).
- 5. Measure each clutch pressure.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
1st Clutch	D₄ or D₃	No or low 1st pressure	1st Clutch	800–860 kPa (8.0–8.6 kg/cm ² , 113–123 psi)	750 kPa (7.5 kg/cm ² , 107 psi)
2nd Clutch	D₄	No or low 2nd pressure	2nd Clutch	460 kPa (4.6 kg/cm ² , 65 psi) (throttle fully closed) 860 kPa (8.6 kg/cm ² , 123 psi) (throttle more than 2/8 opened)	430 kPa (4.3 kg/cm ² , 61 psi) (throttle fully closed) 750 kPa (7.5 kg/cm ² , 107 psi) (throttle more than 2/8 opened)
3rd Clutch		No or low 3rd pressure	3rd Clutch		
4th Clutch		No or low 4th pressure	4th Clutch		
1st Clutch	2 or 1	No or low 1st pressure	1st Clutch	800–860 kPa (8.0–8.6 kg/cm ² , 113–123 psi)	750 kPa (7.5 kg/cm ² , 107 psi)
2nd Clutch		No or low 2nd pressure	2nd Clutch		
1st-Hold Clutch		No or low 1st-hold pressure	1st-Hold Clutch		
Reverse Clutch	R	No or low Reverse pressure	Reverse Clutch	1,190–1,270 kPa (11.9–12.7 kg/cm ² , 169–181 psi)	1,150 kPa (11.5 kg/cm ² , 163 psi)

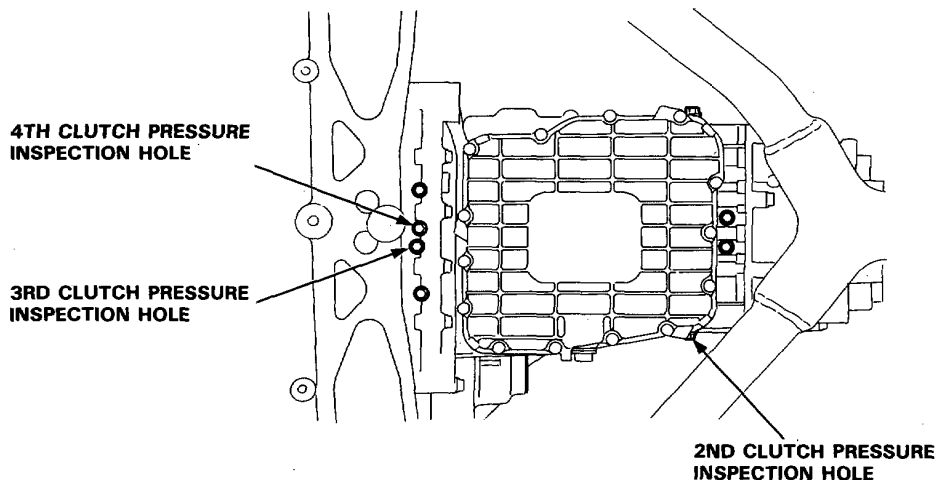


● Clutch Low/High Pressure Measurement

⚠ WARNING While testing, be careful of the rotating front wheels.

- 1. Allow the front wheels to rotate freely.
- 2. Start the engine and let it idle.
- 3. Shift the select lever to **D₄** position.
- 4. Slowly press down the accelerator pedal to increase engine rpm until pressure is indicated on the oil pressure gauge. Then release the accelerator pedal, allowing the engine return to an idle, and measure the pressure reading.
- 5. Repeat step -4 for each clutch pressure being inspected.

- 6. With the engine idling, press down the accelerator pedal approximately 1/2 of its possible travel and increase the engine rpm until pressure is indicated on the gauge, then measure the highest pressure reading obtained.
- 7. Repeat step -6 for each clutch pressure being inspected.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2nd Clutch	D₄	No or low 2nd pressure	2nd Clutch	460–860 kPa (4.6–8.6 kg/cm ² , 65–123 psi) varies with throttle opening	430 kPa (4.3 kg/cm ² , 61 psi) with accelerator pedal released 750 kPa (7.5 kg/cm ² , 107 psi) with accelerator pedal more than 2/8 opened
3rd Clutch		No or low 3rd pressure	3rd Clutch		
4th Clutch		No or low 4th pressure	4th Clutch		

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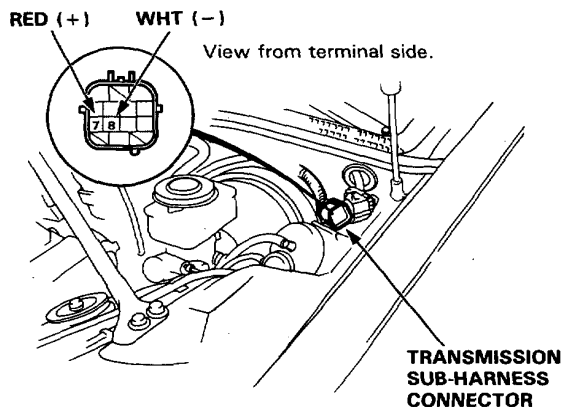
Pressure Testing

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● Throttle B Pressure Measurement

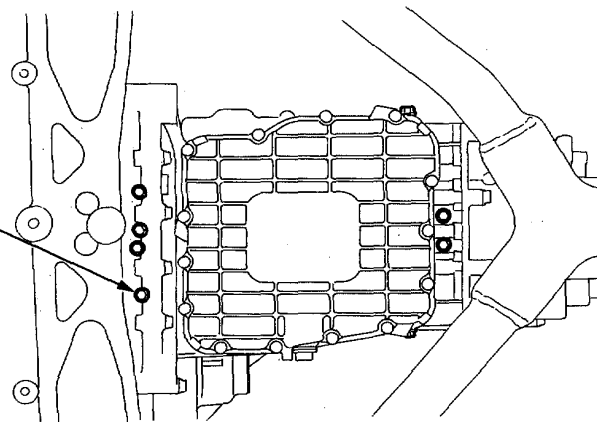
⚠ WARNING While testing, be careful of the rotating front wheels.

- 1. Allow the front wheels to rotate freely.
- 2. Disconnect the transmission sub-harness connector.
- 3. Shift the select lever to **D₄** position.
- 4. Run the engine at 1,000 min⁻¹ (rpm).
- 5. Measure full open throttle B pressure.
- 6. Connect battery voltage to the linear solenoid terminals of the transmission sub-harness connector.
- 7. Measure full closed throttle B pressure.



NOTE: LHD is shown; RHD is similar.

THROTTLE B PRESSURE
INSPECTION HOLE



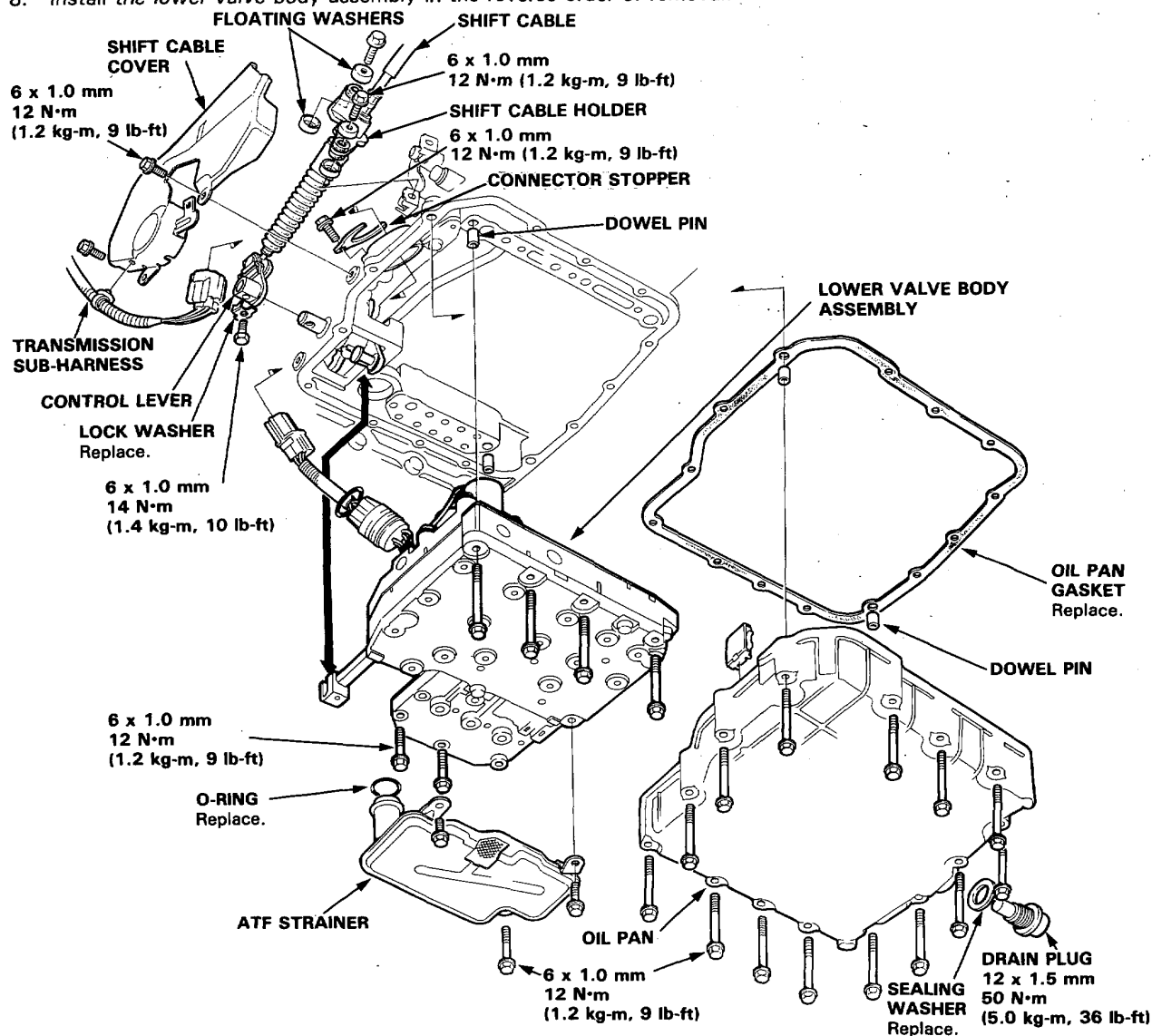
PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Throttle B	D₄	Pressure too high	Throttle Valve Body Assembly	0–15 kPa (0–0.15 kg/cm ² , 0–2 psi) throttle full closed	—
		No or low pressure		590–640 kPa (5.9–6.4 kg/cm ² , 84–91 psi) throttle full opened	550 kPa (5.5 kg/cm ² , 78 psi) throttle full opened

Lower Valve Body Assembly



Removal/Installation

1. Remove the drain plug, and drain automatic transmission fluid (ATF). Reinstall the drain plug with a new washer.
2. Remove the shift cable cover and remove the control lever from the control shaft.
3. Remove the shift control solenoid valve/linear solenoid harness connector stopper.
4. Disconnect the shift control solenoid valve/linear solenoid connector from the transmission sub-harness connector.
5. Remove the oil pan and oil pan gasket.
6. Remove 3 bolts and the ATF strainer.
7. Remove 6 bolts and the lower valve body assembly.
8. Install the lower valve body assembly in the reverse order of removal.



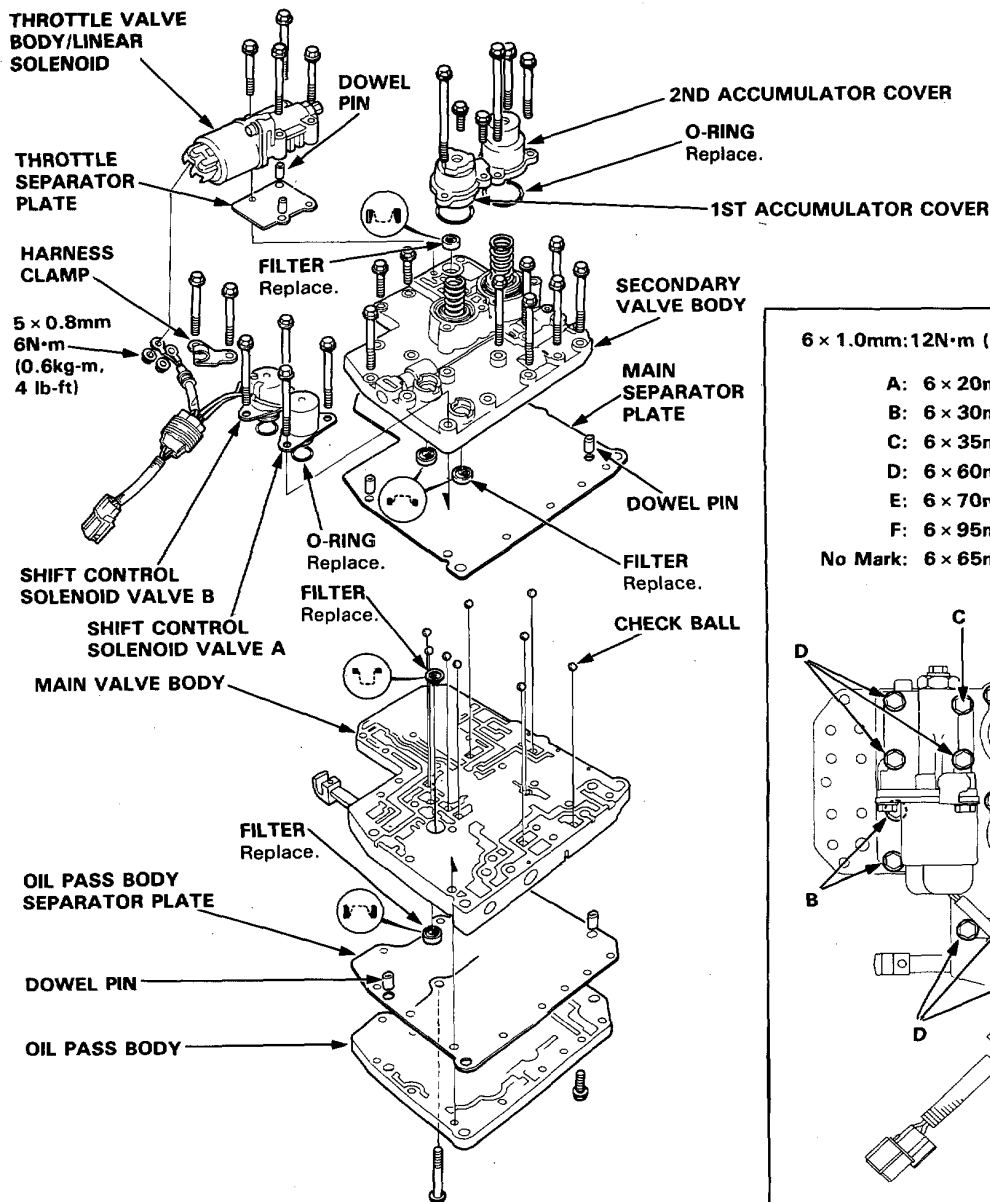
Lower Valve Body Assembly

Disassembly/Reassembly

NOTE:

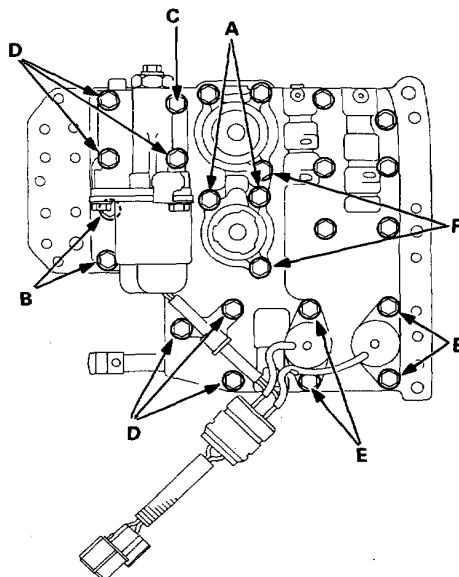
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Coat all parts with ATF before reassembly.
- Replace the O-rings and filters.
- Install the filters in the direction shown.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.



6 × 1.0mm: 12N·m (1.2 kg-m, 9 lb-ft)

- A: 6 × 20mm 2 Bolts
- B: 6 × 30mm 2 Bolts
- C: 6 × 35mm 1 Bolt
- D: 6 × 60mm 6 Bolts
- E: 6 × 70mm 4 Bolts
- F: 6 × 95mm 2 Bolts
- No Mark: 6 × 65mm 8 Bolts



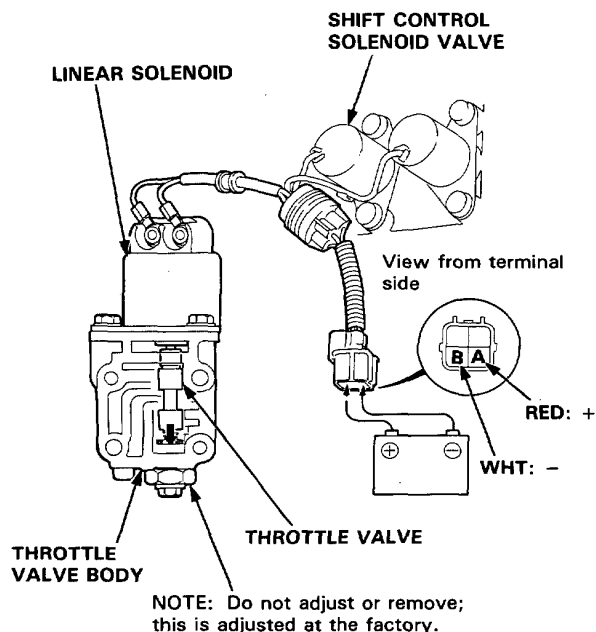
Throttle Valve Body/Linear Solenoid



Test

1. Connect the A (RED:+) terminal of the shift control solenoid valve/linear solenoid to the positive battery terminal and the B (WHT:-) terminal to the negative battery terminal. Check that the throttle valve moves.
2. Disconnect the battery terminals and check that the throttle valve is released.
3. Repeat the above steps 1-2.

NOTE: You can see the movement of the throttle valve through the oil passage in the attaching surface of the throttle valve body.

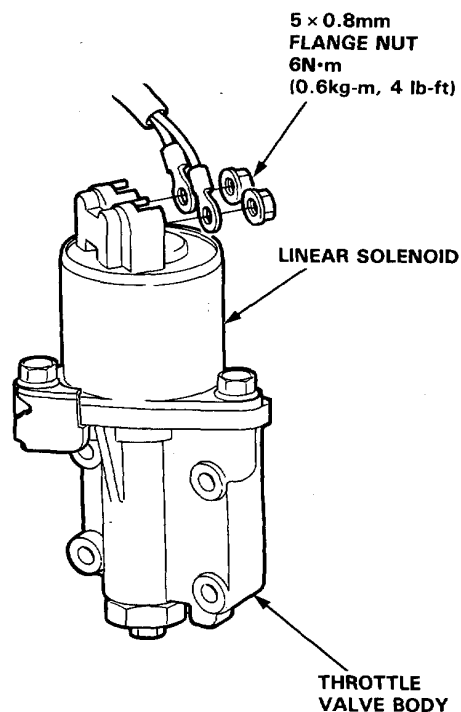


4. If the throttle valve binds, or moves but sluggishly, or the linear solenoid does not operate, replace the throttle valve body/linear solenoid as an assembly.
5. If the linear solenoid does not operate, disconnect the linear solenoid harness from the linear solenoid assembly. Connect the battery terminals directly to the linear solenoid.
6. If the linear solenoid operates after connecting the battery, and the throttle valve movement is OK, replace the shift control solenoid valve assembly.

Replacement

NOTE: Throttle valve body/linear solenoid must be replaced as an assembly.

1. Check the throttle valve body passages for dust or dirt and replace as an assembly, if necessary.
2. Clean the mounting surface and oil passages of the throttle valve body.
3. Assemble the throttle valve body/linear solenoid to the secondary valve body.

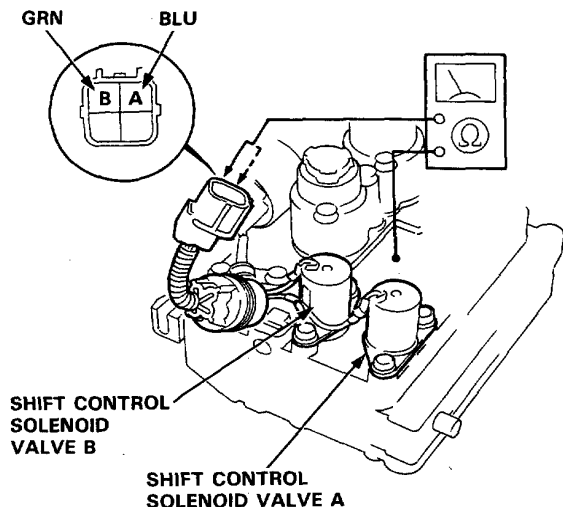


Shift Control Solenoid Valve

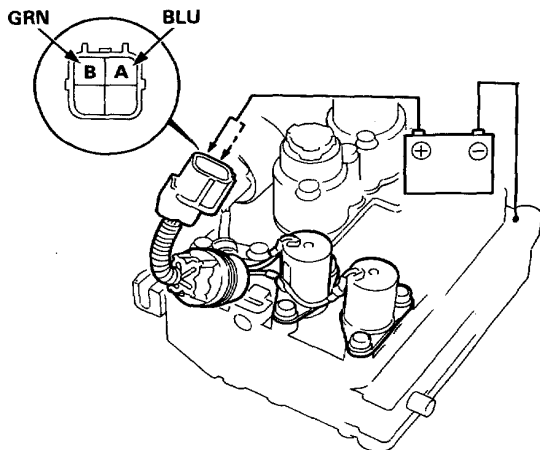
Test

1. Measure the resistance between the A terminal (BLU; SOL.V.A) of the shift control solenoid valve/linear solenoid connector and body ground and between the B terminal (GRN; SOL.V.B) and body ground.

STANDARD : 12—24 Ω



2. Replace the shift control solenoid valve assembly if the resistance is out of specification.
3. Connect the A terminal of the shift control solenoid valve/linear solenoid connector to the battery positive terminal and the negative terminal to body ground. A clicking sound should be heard. Connect the B terminal to the battery positive terminal. A clicking sound should be heard.
4. If a clicking sound is not heard, replace the shift control solenoid valve assembly.

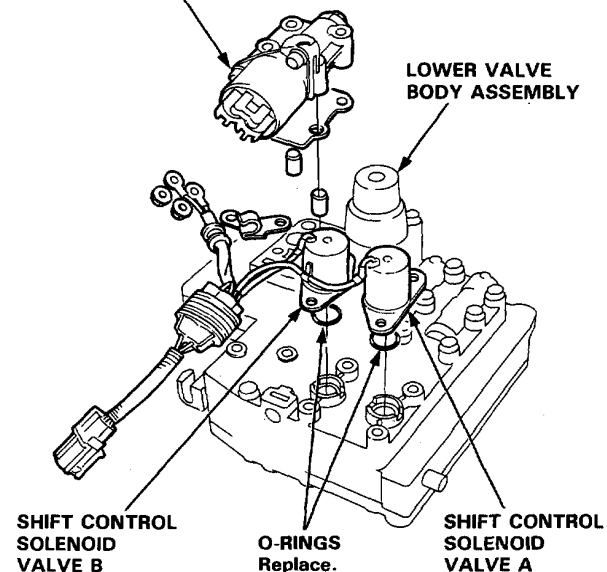


Replacement

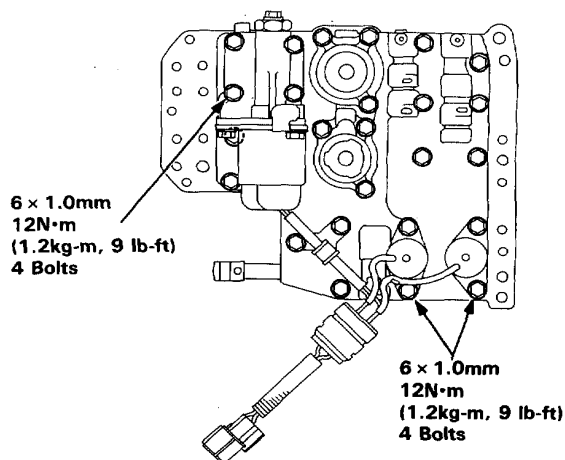
NOTE: Shift control solenoid valve A and B must be replaced as an assembly.

1. Remove the shift control solenoid valve A, B and linear solenoid/throttle valve body from the lower valve body assembly.
2. Disconnect the linear solenoid terminals.

THROTTLE VALVE BODY/LINEAR SOLENOID



3. Clean the mounting surfaces and oil passages.
4. Connect the linear solenoid terminal then install the shift control solenoid valve A, B and linear solenoid/throttle valve body on the lower valve body.



Transmission



Removal

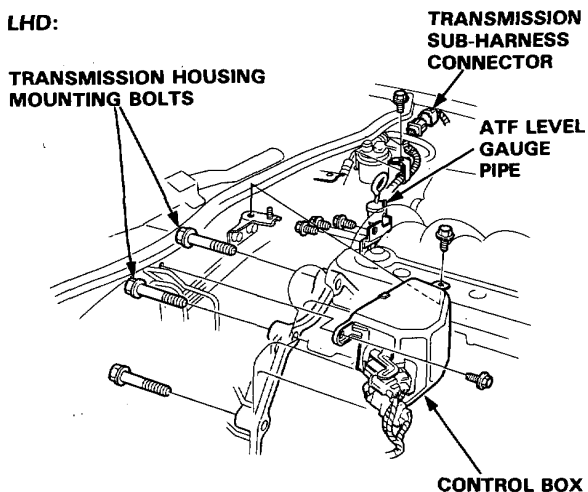
⚠ WARNING Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (See page 1-6).

1. Disconnect the battery negative (–) and positive (+) cables from the battery.
2. Remove the strut bar.
3. Remove the control box. (LHD only)

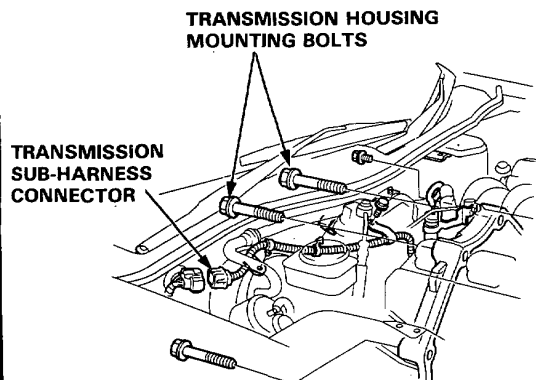
CAUTION: Do not remove the vacuum tubes from the control box.

4. Disconnect the transmission sub-harness connector and remove the transmission sub-harness clamp.
5. Remove the ATF level gauge pipe.
6. Remove the transmission housing mounting bolts.
7. Drain automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer.

LHD:

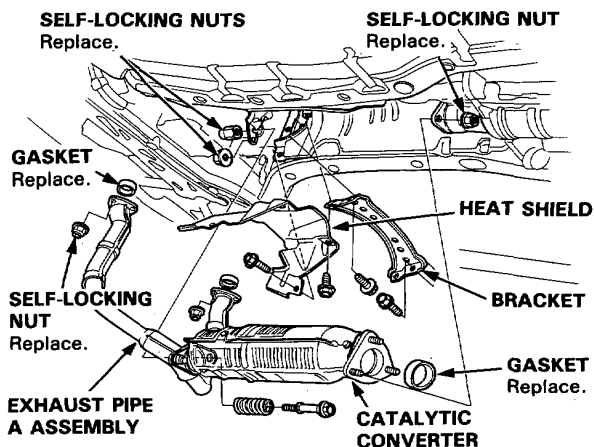


RHD:



8. Remove the exhaust pipe A assembly and catalytic converter.

9. Remove the exhaust pipe heat shield and bracket.



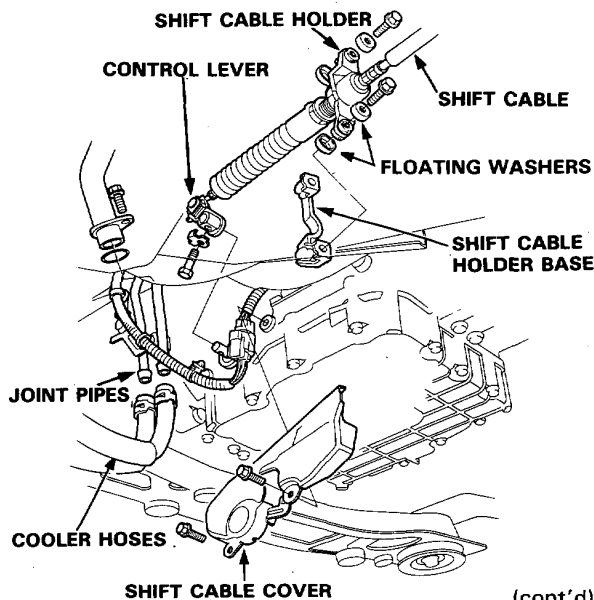
10. Remove the cooler hoses at the joint pipes. Turn the ends up to prevent ATF flowing out.

NOTE: Check for any signs of leakage at hose joints.

11. Remove the transmission sub-harness connector from the shift cable cover and remove the shift cable cover.

12. Remove the shift cable holder from the shift cable holder base.

13. Remove the control lever from the control shaft.



(cont'd)

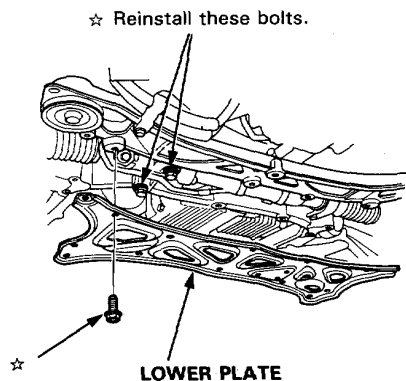
Transmission

Removal (cont'd)

14. Remove the lower plate and reinstall the steering gearbox mounting bolts.

NOTE: LHD is shown. The locations of the steering gearbox mounting bolts on the RHD are symmetrical.

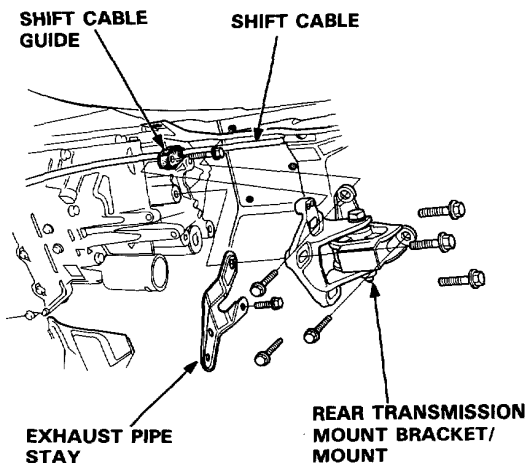
☆: Corrosion resistant bolt



15. Remove the shift cable guide.

CAUTION: Take care not to bend the shift cable.

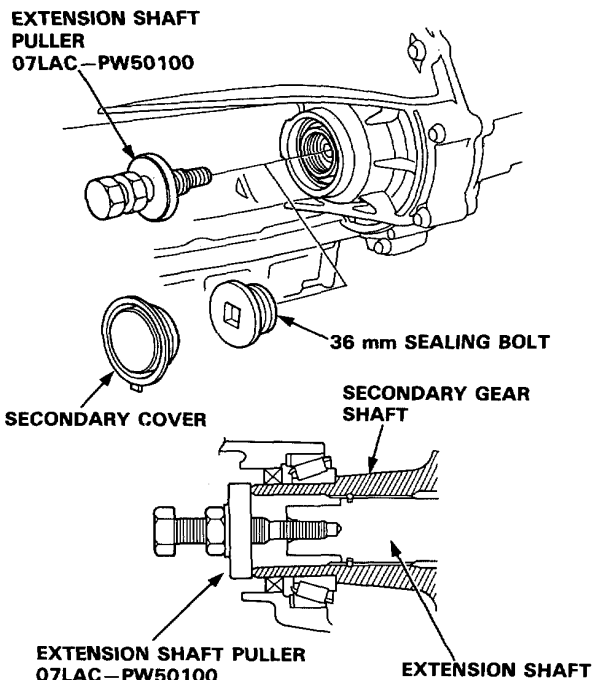
16. Remove the rear transmission mount bracket/mount and exhaust pipe stay.



17. Shift to **P** position rotating the control shaft.

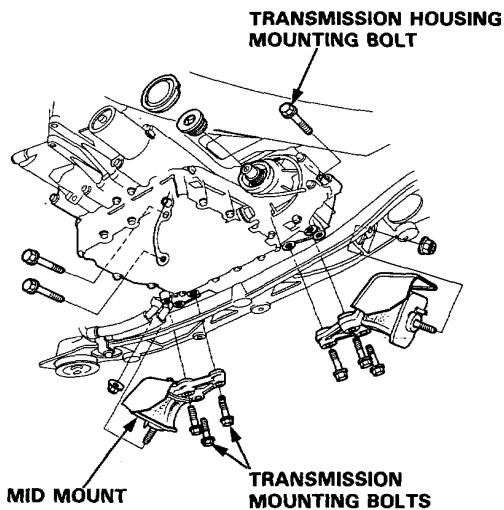
18. Remove the secondary cover and 36 mm sealing bolts.

19. Remove the extension shaft from the differential using the special tool as shown.



20. Place a jack under the transmission and raise the transmission just enough to take weight off of the mounts, then remove the mid mounts.

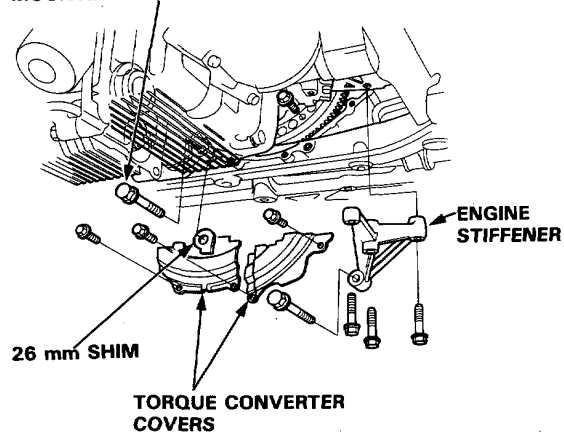
21. Remove the transmission mounting bolts.





22. Remove the engine stiffener.
23. Remove the torque converter covers.
24. Remove the plug, then remove the drive plate bolts one at a time while rotating the crankshaft pulley.
25. Remove the transmission housing mounting bolts.

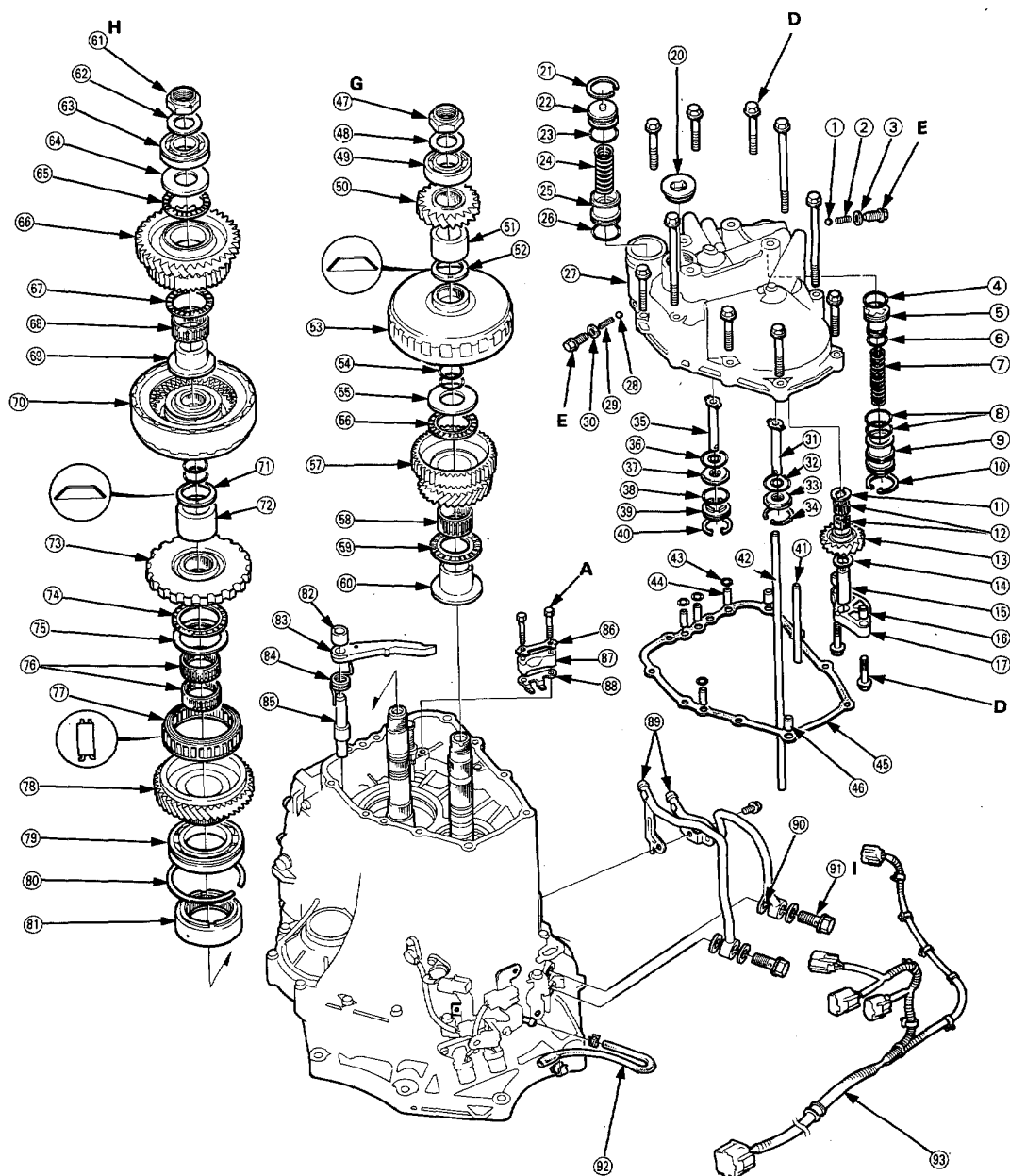
**TRANSMISSION HOUSING
MOUNTING BOLT**



26. Pull the transmission away from the engine until it clears the dowel pin, then lower it on the transmission jack.

Illustrated Index

Rear Cover





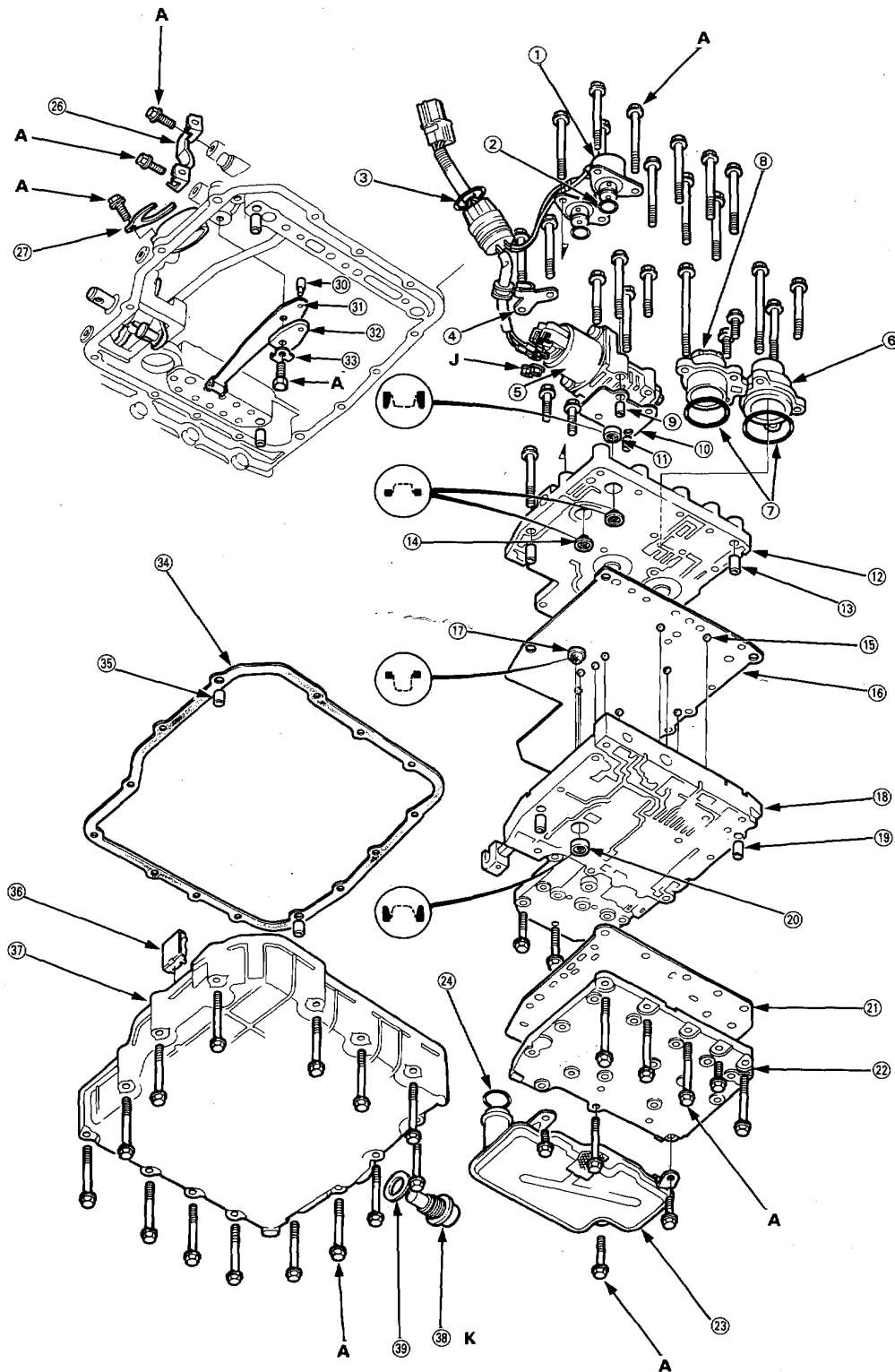
- ① STEEL BALL
- ② ONE-WAY BALL SPRING
- ③ SEALING WASHER Replace.
- ④ O-RING Replace.
- ⑤ REVERSE ACCUMULATOR PISTON
- ⑥ O-RING Replace.
- ⑦ REVERSE ACCUMULATOR SPRING
- ⑧ O-RING Replace.
- ⑨ REVERSE ACCUMULATOR SLEEVE
- ⑩ SNAP RING
- ⑪ THRUST SHIM 14 x 30 mm
- ⑫ NEEDLE BEARINGS
- ⑬ REVERSE IDLER GEAR
- ⑭ THRUST SHIM 14 x 25 mm
- ⑮ REVERSE IDLER GEAR SHAFT
- ⑯ DOWEL PIN
- ⑰ REVERSE IDLER GEAR SHAFT HOLDER
- ⑱ SEALING BOLT 34 x 1.25 mm
- ⑲ SNAP RING
- ⑳ 1ST-HOLD ACCUMULATOR SLEEVE
- ㉑ O-RING Replace.
- ㉒ 1ST-HOLD ACCUMULATOR SPRING
- ㉓ 1ST-HOLD ACCUMULATOR PISTON
- ㉔ O-RING Replace.
- ㉕ REAR COVER
- ㉖ STEEL BALL
- ㉗ ONE-WAY BALL SPRING
- ㉘ SEALING WASHER Replace.
- ㉙ 2ND CLUTCH FEED PIPE
- ㉚ O-RING Replace.
- ㉛ FEED PIPE GUIDE
- ㉜ SNAP RING
- ㉝ REVERSE CLUTCH FEED PIPE
- ㉞ O-RING Replace.
- ㉟ FEED PIPE GUIDE
- ㊱ O-RING Replace.
- ㊲ OIL FEED GUIDE
- ㊳ SNAP RING
- ㊴ FEED PIPE
- ㊵ FEED PIPE
- ㊶ O-RING Replace.
- ㊷ OIL PIPE
- ㊸ REAR COVER GASKET Replace.
- ㊹ DOWEL PIN
- ㊺ MAINSHAFT LOCKNUT 24 x 1.25 mm Replace.
- ㊻ WASHER 24 mm
- ㊼ BALL BEARING
- ㊽ MAINSHAFT REVERSE GEAR
- ㊾ MAINSHAFT REVERSE GEAR DISTANCE COLLAR
- ㊿ MAINSHAFT DISC SPRING 28 mm Replace.
- ① 2ND CLUTCH ASSEMBLY
- ② O-RING Replace.
- ③ THRUST SHIM 29 mm
- ④ THRUST NEEDLE BEARING
- ⑤ MAINSHAFT 2ND GEAR
- ⑥ NEEDLE BEARING
- ⑦ THRUST NEEDLE BEARING
- ⑧ MAINSHAFT 2ND GEAR COLLAR
- ⑨ COUNTERSHAFT LOCKNUT 24 x 1.25 mm Replace.
- ⑩ WASHER 24 mm
- ⑪ BALL BEARING
- ⑫ THRUST SHIM 25 mm
- ⑬ THRUST NEEDLE BEARING
- ⑭ COUNTERSHAFT REVERSE GEAR
- ⑮ THRUST NEEDLE BEARING
- ⑯ NEEDLE BEARING
- ⑰ COUNTERSHAFT REVERSE GEAR COLLAR
- ⑱ REVERSE CLUTCH ASSEMBLY
- ⑲ COUNTERSHAFT DISC SPRING 29 mm Replace.
- ㉑ REVERSE CLUTCH DISTANCE COLLAR
- ㉒ PARKING GEAR
- ㉓ THRUST NEEDLE BEARING
- ㉔ THRUST SHIM 48 x 60 mm Selective part
- ㉕ NEEDLE BEARINGS
- ㉖ 2ND GEAR ONE-WAY CLUTCH
- ㉗ COUNTERSHAFT 2ND GEAR
- ㉘ BALL BEARING
- ㉙ SNAP RING
- ㉚ ONE-WAY CLUTCH HUB
- ㉛ PARKING BRAKE PAWL SHAFT SLEEVE
- ㉜ PARKING BRAKE PAWL
- ㉝ PARKING BRAKE PAWL SPRING
- ㉞ PARKING BRAKE PAWL SHAFT
- ㉟ LOCK PLATE Replace.
- ㊱ PARKING BRAKE ROD HOLDER
- ㊲ PARKING BRAKE ROD GUIDE
- ㊳ ATF COOLER PIPES
- ㊴ SEALING WASHER Replace.
- ㊵ JOINT BOLT
- ㊶ BREATHER PIPE
- ㊷ TRANSMISSION SUB-HARNESS

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
D	27 N·m (2.7 kg-m, 20 lb-ft)	8 x 1.25 mm	
E	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	Sealing Bolt
G	170 N·m (17.0 kg-m, 123 lb-ft)	24 x 1.25 mm	Mainshaft Locknut
H	170 N·m (17.0 kg-m, 123 lb-ft)	24 x 1.25 mm	Countershaft Locknut (Left-hand threads)
I	40 N·m (4.0 kg-m, 29 lb-ft)	14 x 1.5 mm	Joint Bolt

✓ Illustrated Index

Transmission Housing/Lower Valve Body





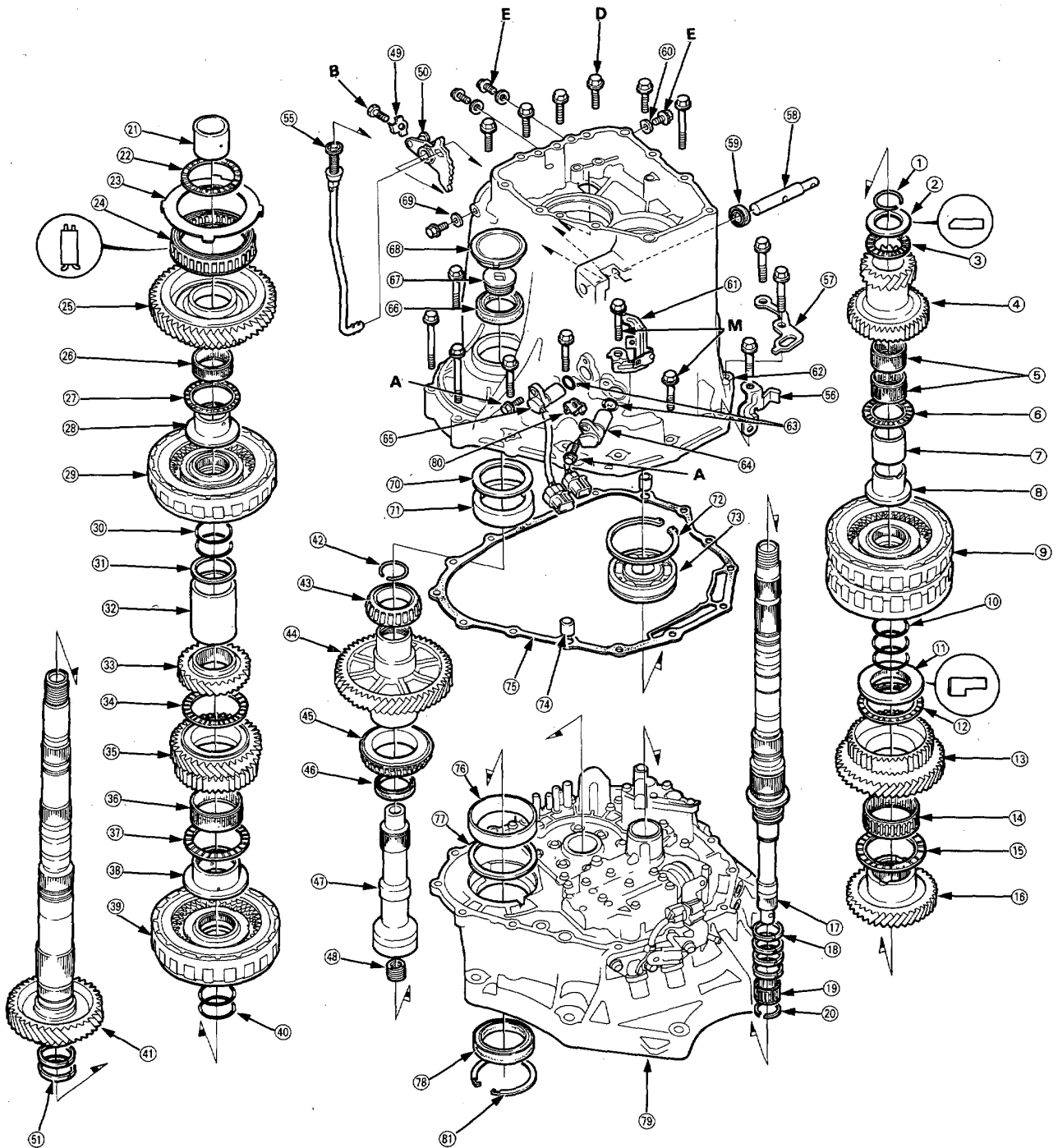
- ① SHIFT CONTROL SOLENOID VALVE A/B
- ② O-RING Replace.
- ③ O-RING Replace.
- ④ HARNESS CLAMP
- ⑤ LINEAR SOLENOID/THROTTLE VALVE BODY
- ⑥ 2ND ACCUMULATOR COVER
- ⑦ O-RINGS Replace.
- ⑧ 1ST ACCUMULATOR COVER
- ⑨ DOWEL PIN
- ⑩ THROTTLE SEPARATOR PLATE
- ⑪ FILTER Replace.
- ⑫ SECONDARY VALVE BODY
- ⑬ DOWEL PIN
- ⑭ FILTER Replace.
- ⑮ CHECK BALLS
- ⑯ MAIN SEPARATOR PLATE
- ⑰ FILTER Replace.
- ⑱ MAIN VALVE BODY
- ⑲ DOWEL PIN
- ⑳ FILTER Replace.
- ㉑ OIL PASS BODY SEPARATOR PLATE
- ㉒ OIL PASS BODY
- ㉓ ATF STRAINER
- ㉔ O-RING Replace.
- ㉕ SHIFT CABLE HOLDER BASE
- ㉖ CONNECTOR STOPPER
- ㉗ DETENT SPRING FIX PIN
- ㉘ DETENT SPRING
- ㉙ DETENT SPRING PLATE
- ㉚ LOCK WASHER Replace.
- ㉛ OIL PAN GASKET Replace.
- ㉜ DOWEL PIN
- ㉝ ATF MAGNET
- ㉞ OIL PAN
- ㉟ DRAIN PLUG
- ㊱ SEALING WASHER Replace.

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
J	6 N·m (0.6 kg-m, 4 lb-ft)	5 x 0.8 mm	Flange Nut
K	50 N·m (5.0 kg-m, 36 lb-ft)	18 x 1.5 mm	Drain Plug

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Transmission Housing





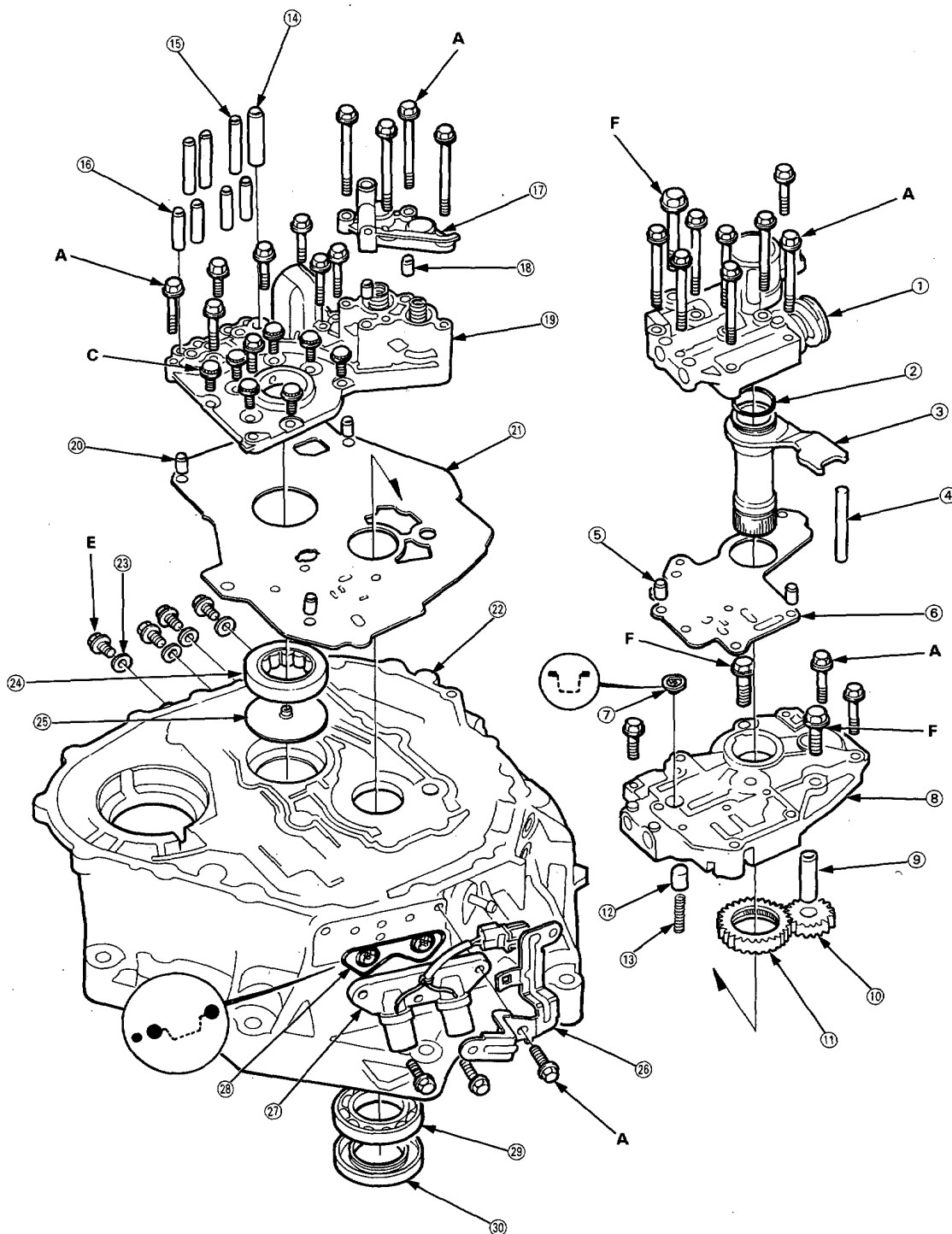
- ① SNAP RING
- ② THRUST WASHER
- ③ THRUST NEEDLE BEARING
- ④ MAINSHAFT 1ST GEAR
- ⑤ NEEDLE BEARINGS
- ⑥ THRUST NEEDLE BEARING
- ⑦ MAINSHAFT 1ST GEAR DISTANCE COLLAR
- ⑧ MAINSHAFT 1ST GEAR COLLAR
- ⑨ 1ST/4TH CLUTCH ASSEMBLY
- ⑩ O-RING Replace.
- ⑪ 4TH CLUTCH COLLAR Selective part
- ⑫ THRUST NEEDLE BEARING
- ⑬ MAINSHAFT 4TH GEAR
- ⑭ NEEDLE BEARING
- ⑮ THRUST NEEDLE BEARING
- ⑯ MAINSHAFT 3RD GEAR
- ⑰ MAINSHAFT
- ⑱ SEALING RING 37 mm
- ⑲ NEEDLE BEARING
- ⑳ SET RING
- ㉑ COUNTERSHAFT 2ND GEAR COLLAR
- ㉒ THRUST NEEDLE BEARING
- ㉓ SET PLATE
- ㉔ 1ST GEAR ONE-WAY CLUTCH
- ㉕ COUNTERSHAFT 1ST GEAR
- ㉖ NEEDLE BEARING
- ㉗ THRUST NEEDLE BEARING
- ㉘ COUNTERSHAFT 1ST GEAR COLLAR
- ㉙ 1ST-HOLD CLUTCH ASSEMBLY
- ㉚ O-RING Replace.
- ㉛ THRUST SHIM 38.8 x 47 mm Selective part
- ㉜ 1ST-HOLD CLUTCH DISTANCE COLLAR
- ㉝ COUNTERSHAFT 4TH GEAR
- ㉞ THRUST NEEDLE BEARING
- ㉟ COUNTERSHAFT 3RD GEAR
- ㊱ NEEDLE BEARING
- ㊲ THRUST NEEDLE BEARING
- ㊳ COUNTERSHAFT 3RD GEAR COLLAR
- ㊴ 3RD CLUTCH ASSEMBLY
- ㊵ O-RING Replace.
- ㊶ COUNTERSHAFT
- ㊷ SET RING Replace.
- ㊸ TAPERED ROLLER BEARING
- ㊹ SECONDARY GEAR SHAFT
- ㊺ TAPERED ROLLER BEARING
- ㊻ SECONDARY GEAR SHAFT OIL SEAL Replace.
- ㊼ EXTENSION SHAFT
- ㊽ SECONDARY SPRING
- ㊾ LOCK WASHER Replace.
- ㊿ DETENT LEVER
- ① SEALING RING 42 mm
- ② PARKING BRAKE ROD
- ③ HARNESS STAY
- ④ TRANSMISSION HANGER
- ⑤ CONTROL SHAFT
- ⑥ OIL SEAL Replace.
- ⑦ SEALING WASHER Replace.
- ⑧ SPEED SENSOR CONNECTOR STAY
- ⑨ TRANSMISSION HOUSING
- ⑩ O-RINGS Replace.
- ⑪ NM SPEED SENSOR
- ⑫ NC SPEED SENSOR
- ⑬ TRANSMISSION HOUSING OIL SEAL Replace.
- ⑭ SEALING BOLT
- ⑮ SECONDARY COVER
- ⑯ SEALING WASHER Replace.
- ⑰ THRUST SHIM 75 mm Selective part
- ⑱ BEARING OUTER RACE
- ⑲ SNAP RING
- ㉑ TRANSMISSION HOUSING MAINSHAFT BEARING
- ㉒ DOWEL PIN
- ㉓ TRANSMISSION HOUSING GASKET Replace.
- ㉔ BEARING OUTER RACE
- ㉕ WASHER
- ㉖ TORQUE CONVERTER HOUSING OIL SEAL Replace.
- ㉗ TORQUE CONVERTER HOUSING
- ㉘ NM SPEED SENSOR WASHER
- ㉙ SNAP RING

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
B	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	Special Bolt
D	34 N·m (3.4 kg-m, 26 lb-ft)	8 x 1.25 mm	14 Bolts
E	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	Oil Pressure Check Bolt
M	27 N·m (2.7 kg-m, 20 lb-ft)	8 x 1.25 mm	2 Bolts (with connector stay)

Illustrated Index

Torque Converter Housing/Valve Body





- ① REGULATOR VALVE BODY
- ② O-RING Replace.
- ③ STATOR SHAFT
- ④ STOPPER PIN
- ⑤ DOWEL PIN
- ⑥ REGULATOR SEPARATOR PLATE
- ⑦ OIL PUMP BODY FILTER Replace.
- ⑧ OIL PUMP BODY
- ⑨ OIL PUMP DRIVEN GEAR SHAFT
- ⑩ OIL PUMP DRIVEN GEAR
- ⑪ OIL PUMP DRIVE GEAR
- ⑫ TORQUE CONVERTER CHECK VALVE
- ⑬ TORQUE CONVERTER CHECK VALVE SPRING
- ⑭ OIL PIPE 10 x 60 mm
- ⑮ OIL PIPE 8 x 57.5 mm
- ⑯ OIL PIPE 8 x 40 mm
- ⑰ ACCUMULATOR COVER
- ⑱ DOWEL PIN
- ⑲ ACCUMULATOR BODY
- ⑳ DOWEL PIN
- ㉑ ACCUMULATOR BODY SEPARATOR PLATE
- ㉒ TORQUE CONVERTER HOUSING
- ㉓ SEALING WASHER Replace.
- ㉔ TORQUE CONVERTER HOUSING COUNTERSHAFT BEARING Replace.
- ㉕ OIL GUIDE PLATE Replace.
- ㉖ LOCK-UP CONTROL SOLENOID VALVE CONNECTOR STAY
- ㉗ LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY
- ㉘ LOCK-UP CONTROL SOLENOID FILTER/GASKET Replace.
- ㉙ TORQUE CONVERTER HOUSING MAINSHAFT BEARING Replace.
- ㉚ MAINSHAFT OIL SEAL Replace.

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
C	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	Special Bolt
E	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	Oil Pressure Check Bolt
F	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	

Lower Valve Body

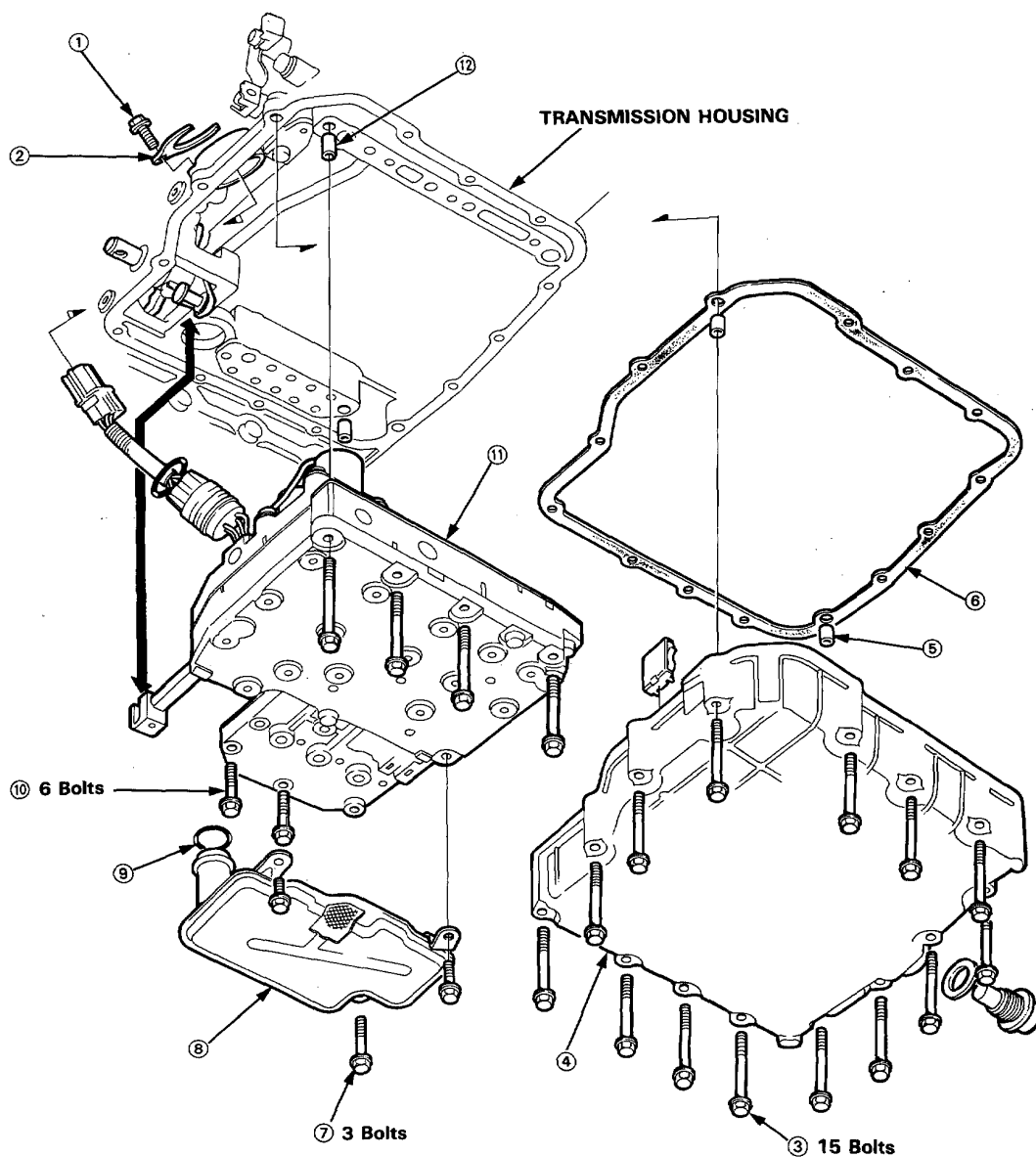
Removal

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.

1. Remove the lower valve body following the numbered sequence.

CAUTION: Do not turn over the transmission before removing the oil pan.



Rear Cover



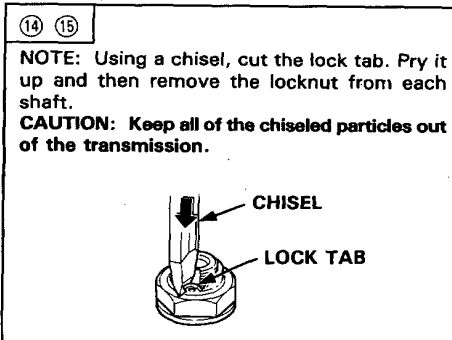
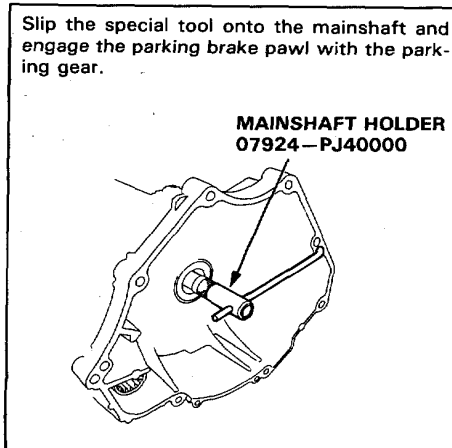
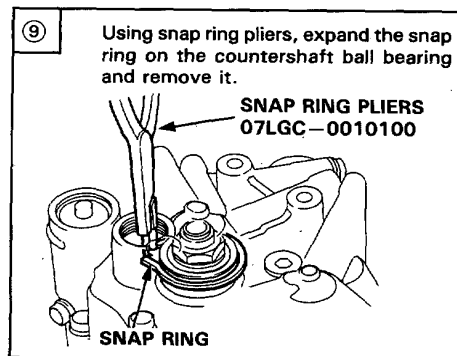
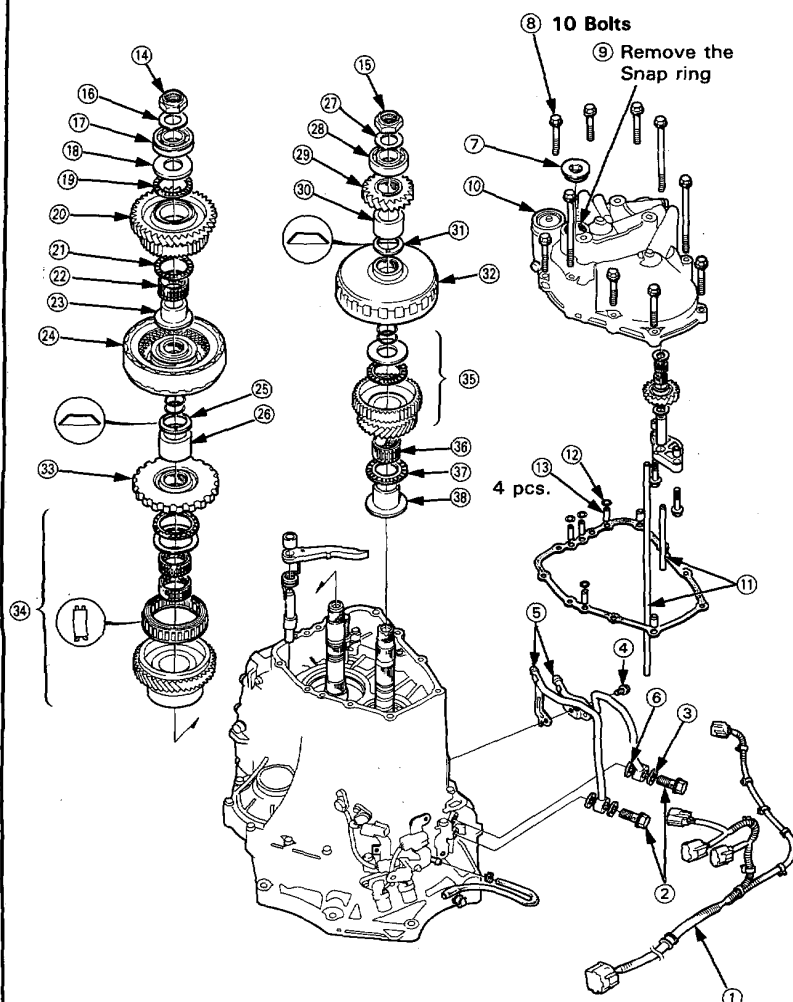
Removal

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Cut the lock tab and raise it, then remove the locknut on each shaft.
- Countershaft locknut has left-hand threads.

1. Disconnect the transmission sub-harness connector from the shift control solenoid valve/linear solenoid connector.
2. Remove the transmission rear cover following the numbered sequence.

NOTE: Remove the special tool from the mainshaft after removing the locknuts.



Transmission Housing

Removal

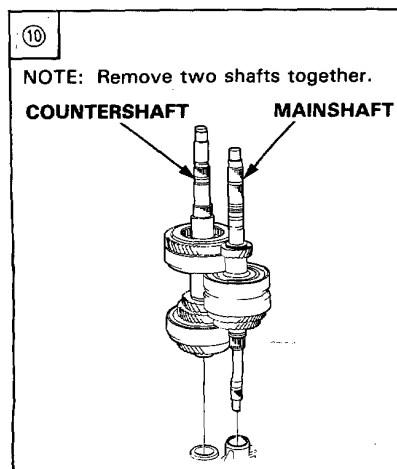
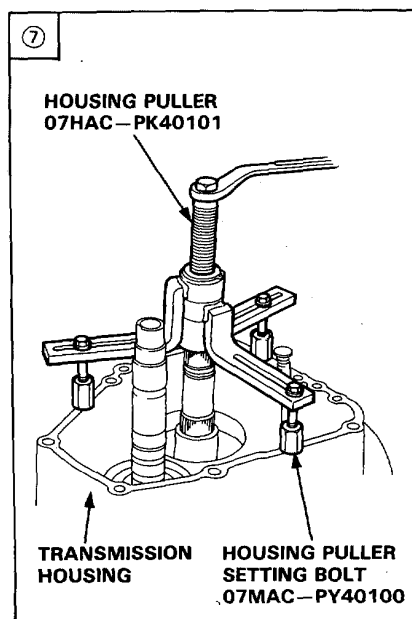
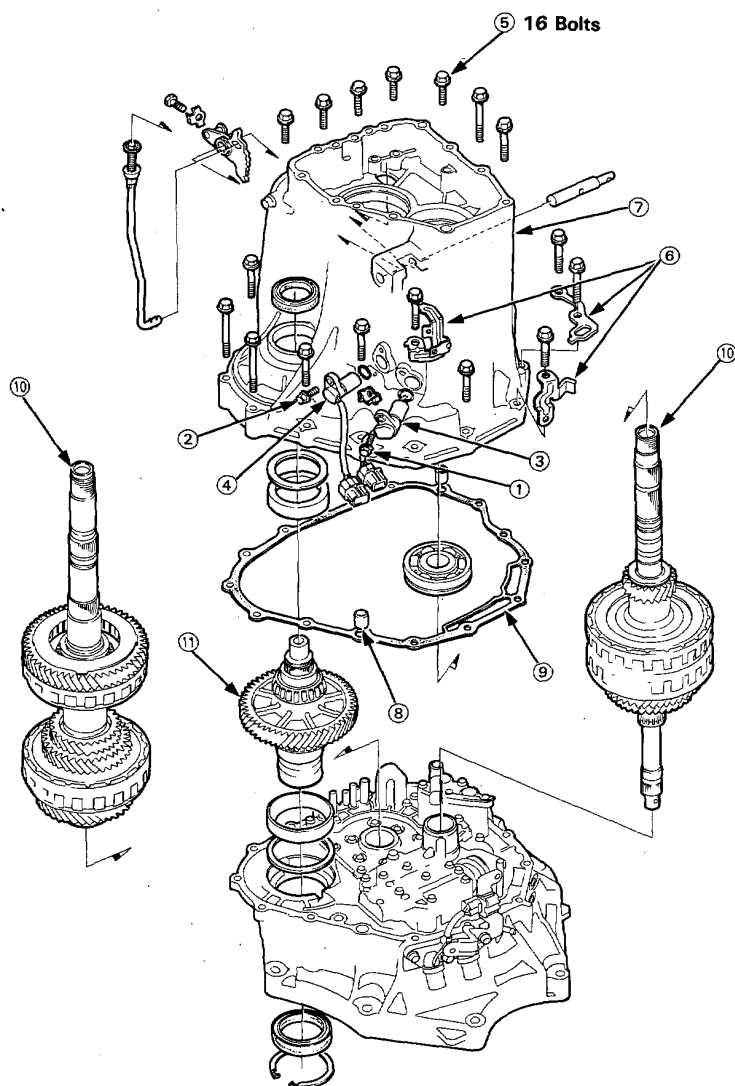
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.

1. Remove the transmission housing following the numbered sequence.

NOTE: Install the special tools as shown to remove the transmission housing.

CAUTION: Make sure that the NM and NC speed sensors are removed from the transmission housing before removing the transmission housing from the torque converter housing.





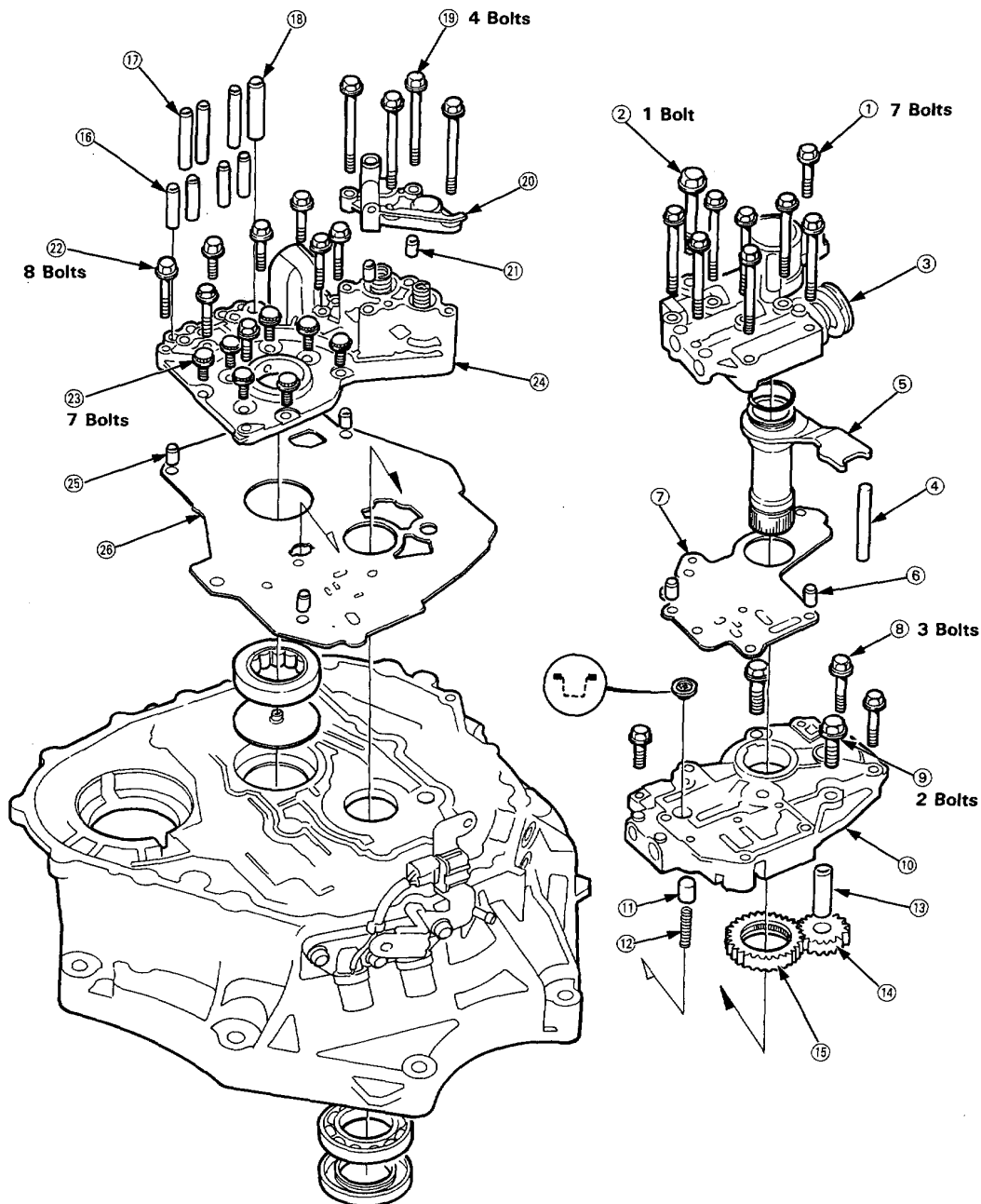
Torque Converter Housing/Valve Body

Removal

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Accumulator cover is spring loaded; to prevent stripping the threads in the torque converter housing, press down on the accumulator cover while unscrewing the bolts in a crisscross pattern.

1. Remove the valve body following the numbered sequence.



Valve

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. You may use this procedure to free the valves in the valve bodies.

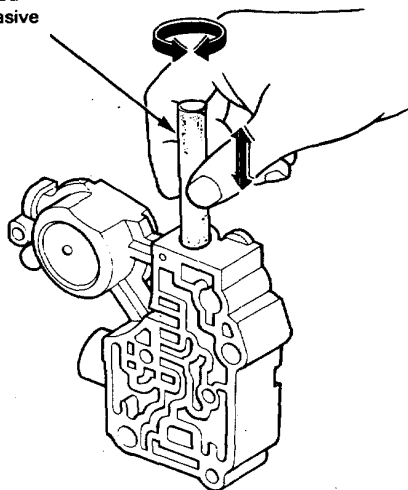
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

CAUTION: It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

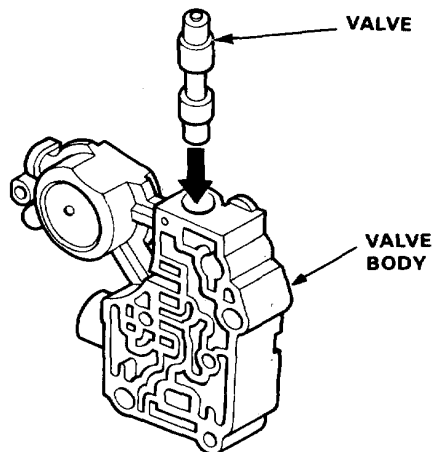
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

CAUTION: 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 and thoroughly wash the entire valve body in solvent, then dry 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.



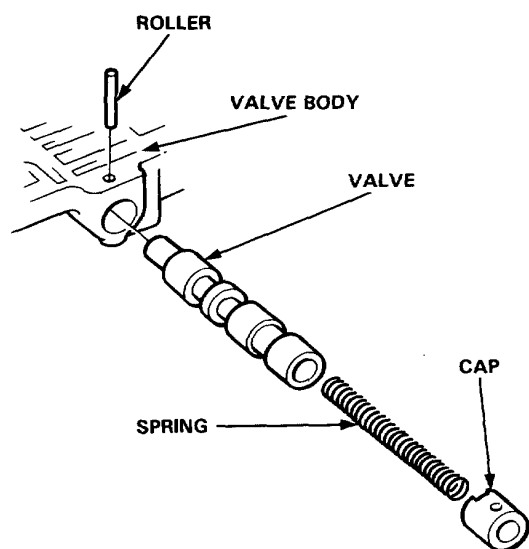
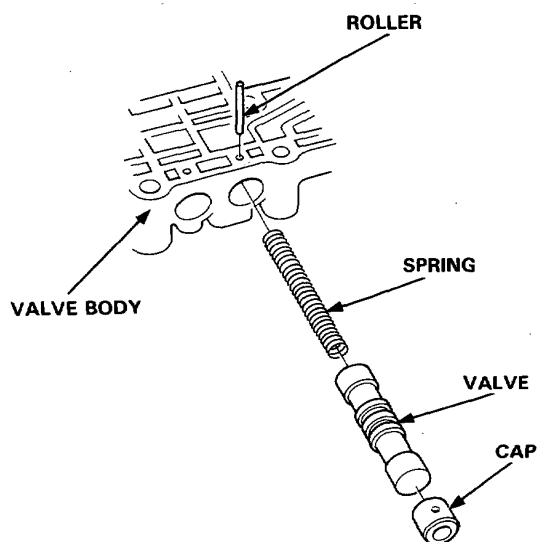
7. Remove the valve and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.



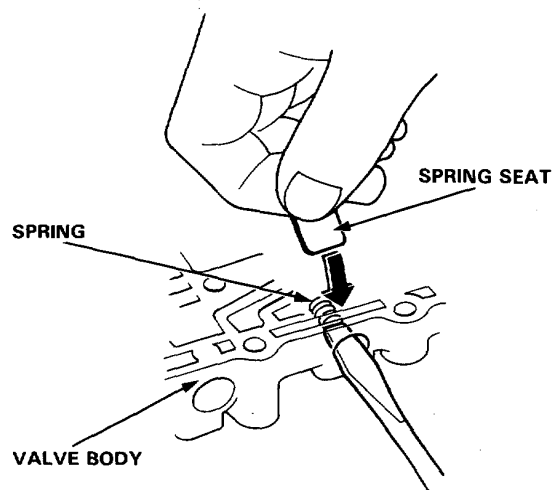
Assembly

NOTE: Coat all parts with ATF before assembly.

1. Install the valve, valve spring and cap in the valve body and secure with the roller.



2. Set the spring in the valve and install it in the valve body. Push the spring in with a screwdriver then install the spring seat.

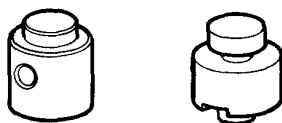


✓ Valve Caps

Description

- Caps with one projected tip and one flat end are installed with the flat end toward the spring.
- Caps with a projected tip on each end are installed with the smaller tip toward the spring. The small tip is a spring guide.

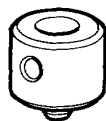
Toward outside of valve body.



Toward spring.

- Caps with one projected tip and hollow end are installed with the tip toward the spring. The tip is a spring guide.

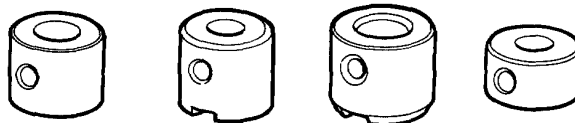
Toward outside of valve body.



Toward spring.

- Caps with hollow ends are installed with the hollow end away from the spring.
- Caps with notched ends are installed with the notch toward the spring.
- Caps with flat ends and a hole through the center are installed with the smaller hole toward the spring.

Toward outside of valve body.



Toward spring.

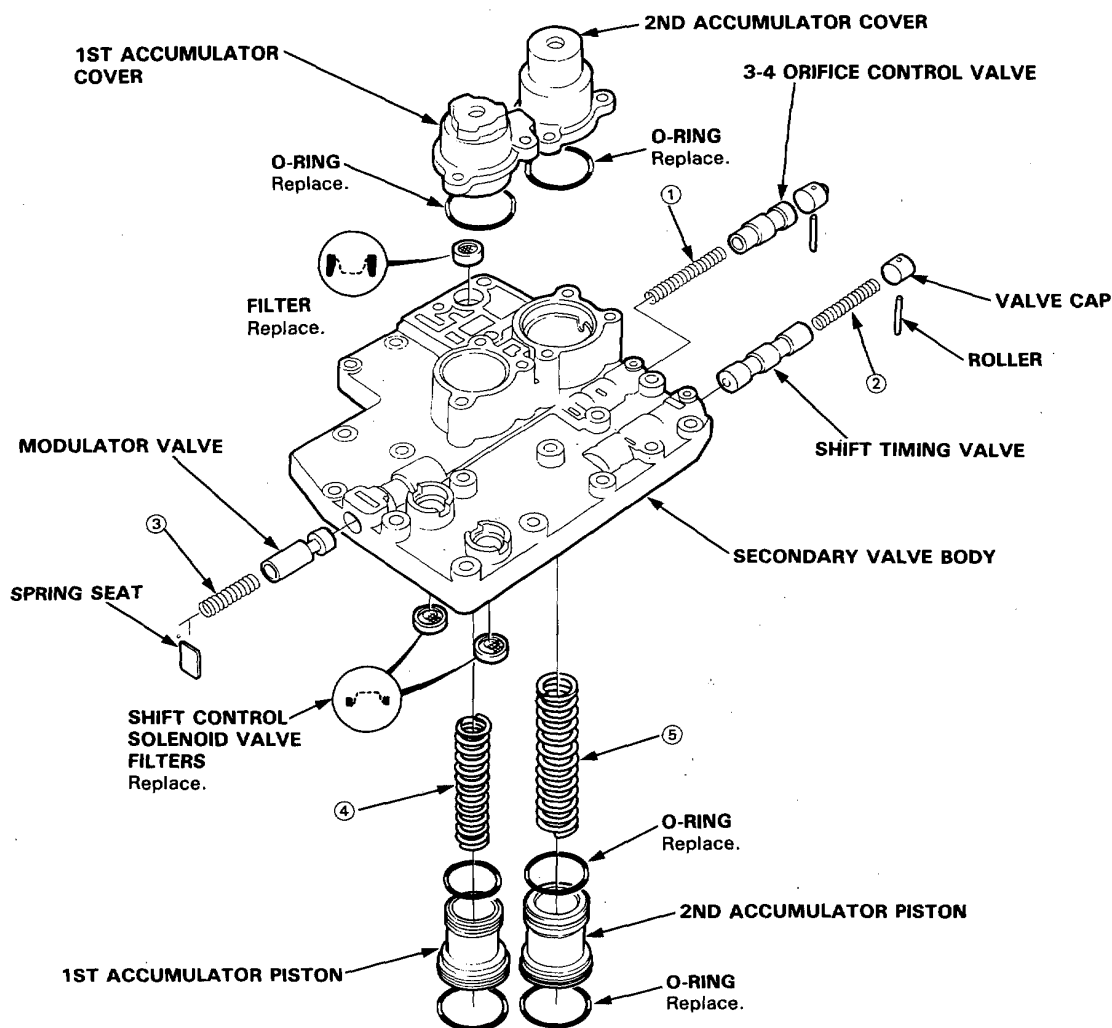


Secondary Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry 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 14-114.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3-4 orifice control valve spring	1.0 (0.039)	6.6 (0.260)	52.2 (2.055)	26.0
②	Shift timing valve spring	0.8 (0.031)	6.6 (0.260)	54.8 (2.157)	30.0
③	Modulator valve spring A	1.5 (0.059)	9.4 (0.370)	30.6 (1.205)	9.9
	Modulator valve spring A, B	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
④	1st accumulator spring	3.1 (0.122)	18.0 (0.709)	74.0 (2.913)	11.3
⑤	2nd accumulator spring	3.9 (0.154)	22.0 (0.866)	92.9 (3.657)	12.1

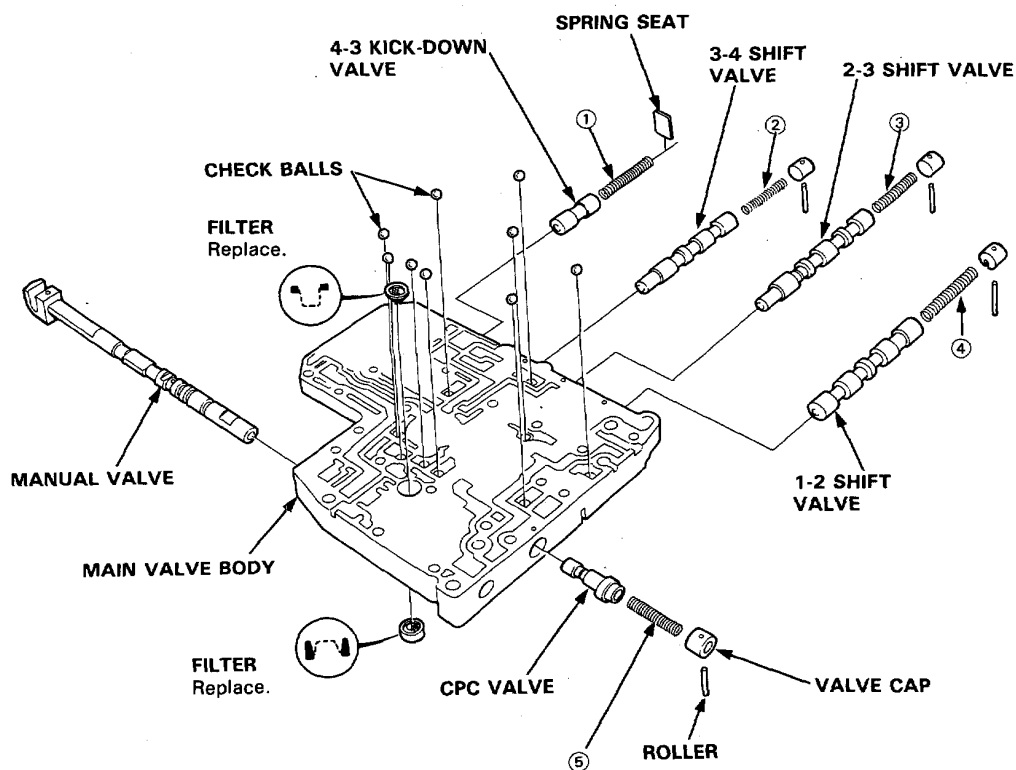
Main Valve Body

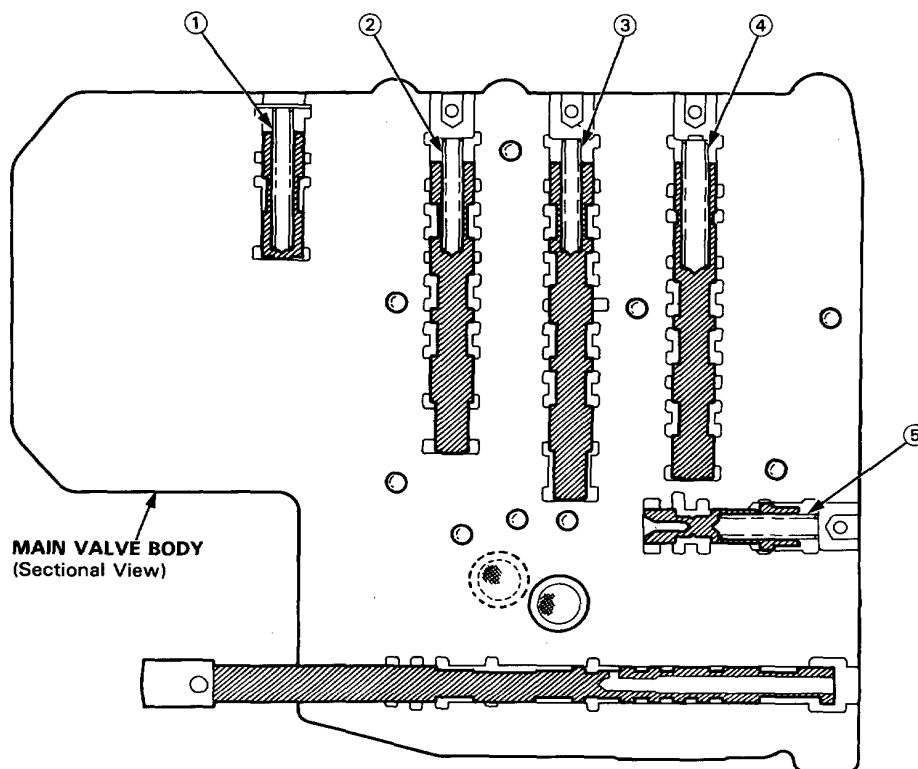
Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-114.
- Coat all parts with ATF before reassembly.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.





SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	4—3 kick-down valve spring	1.1 (0.043)	7.1 (0.280)	51.3 (2.020)	22.5
②	3—4 shift valve spring	0.8 (0.031)	6.6 (0.260)	42.1 (1.657)	22.0
③	2—3 shift valve spring	0.8 (0.031)	6.6 (0.260)	42.1 (1.657)	22.0
④	1—2 shift valve spring	0.9 (0.035)	7.6 (0.299)	55.5 (2.185)	24.0
⑤	CPC valve spring	1.2 (0.047)	8.6 (0.339)	39.1 (1.539)	14.0

✓ Regulator Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-114.

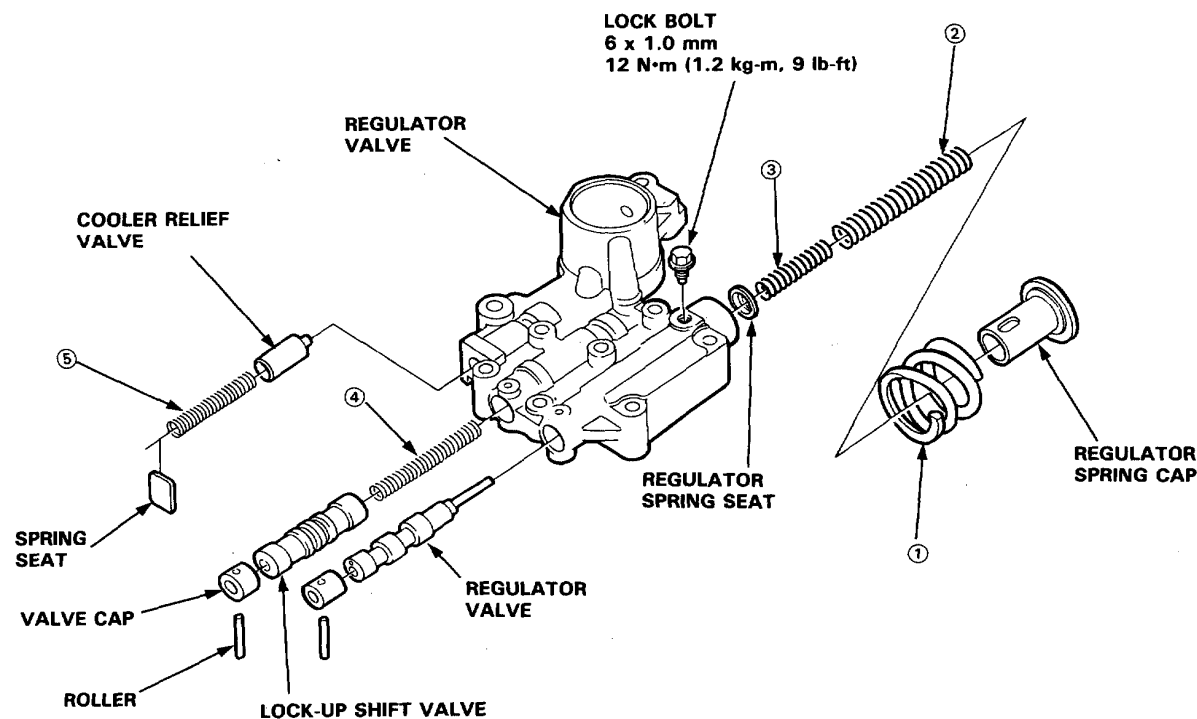
1. Hold the regulator spring cap in place while removing the lock bolt. Once the bolt is removed, release the spring cap slowly.

CAUTION: The regulator spring cap can pop out when the lock bolt is removed.

2. Reassembly is in the reverse order of disassembly.

NOTE:

- Coat all parts with ATF.
- Align the hole in the regulator cap with the hole in the valve body, press the spring cap into the body and tighten the lock bolt.



SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Stator reaction spring	6.5 (0.256)	26.4 (1.039)*	30.3 (1.193)	1.9
②	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	86.5 (3.406)	16.5
③	Regulator valve spring B	1.7 (0.067)	6.0 (0.236)*	43.0 (1.693)	13.5
④	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
⑤	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0

*: Inside Diameter

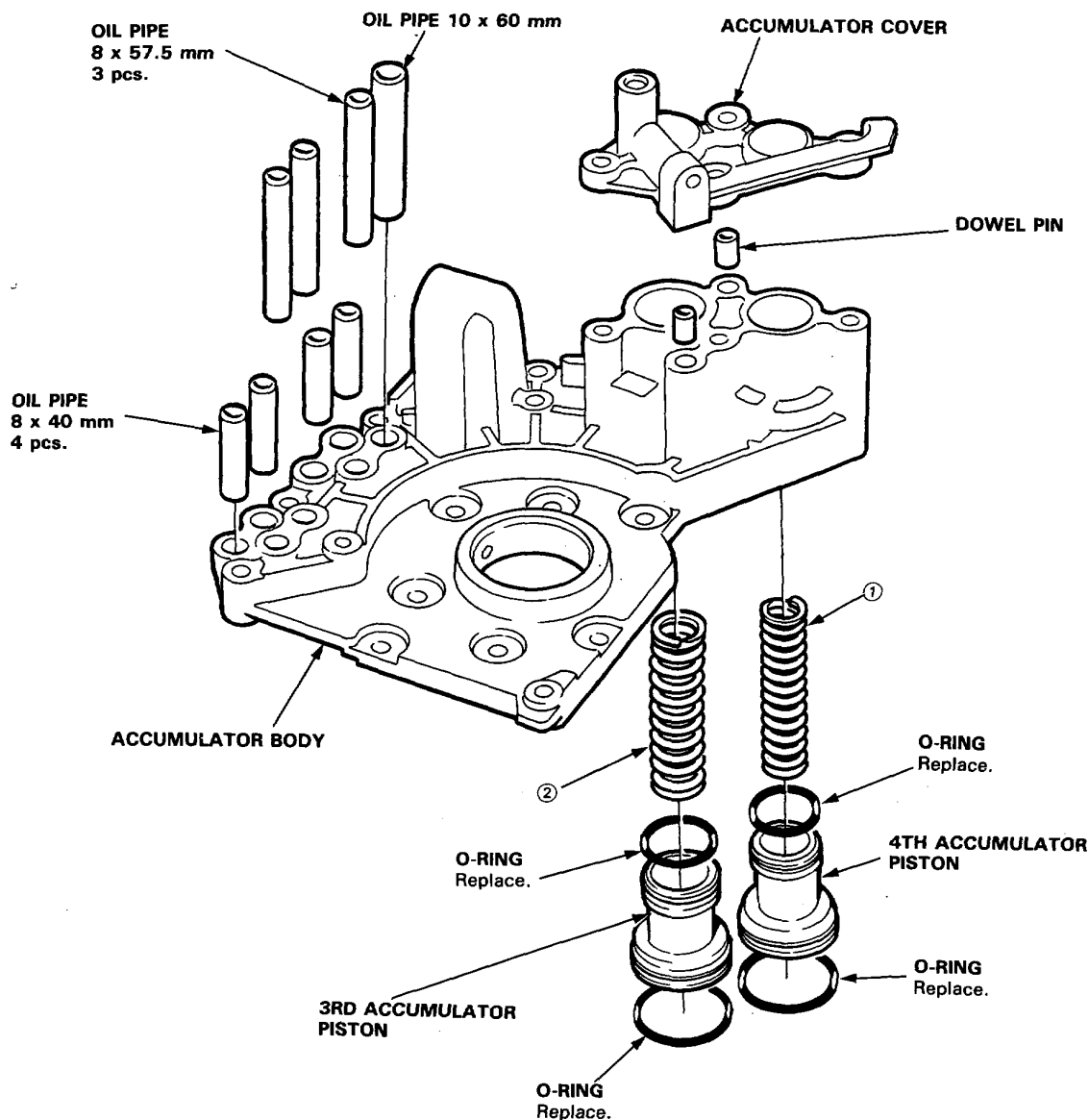


Accumulator Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry 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 14-114.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

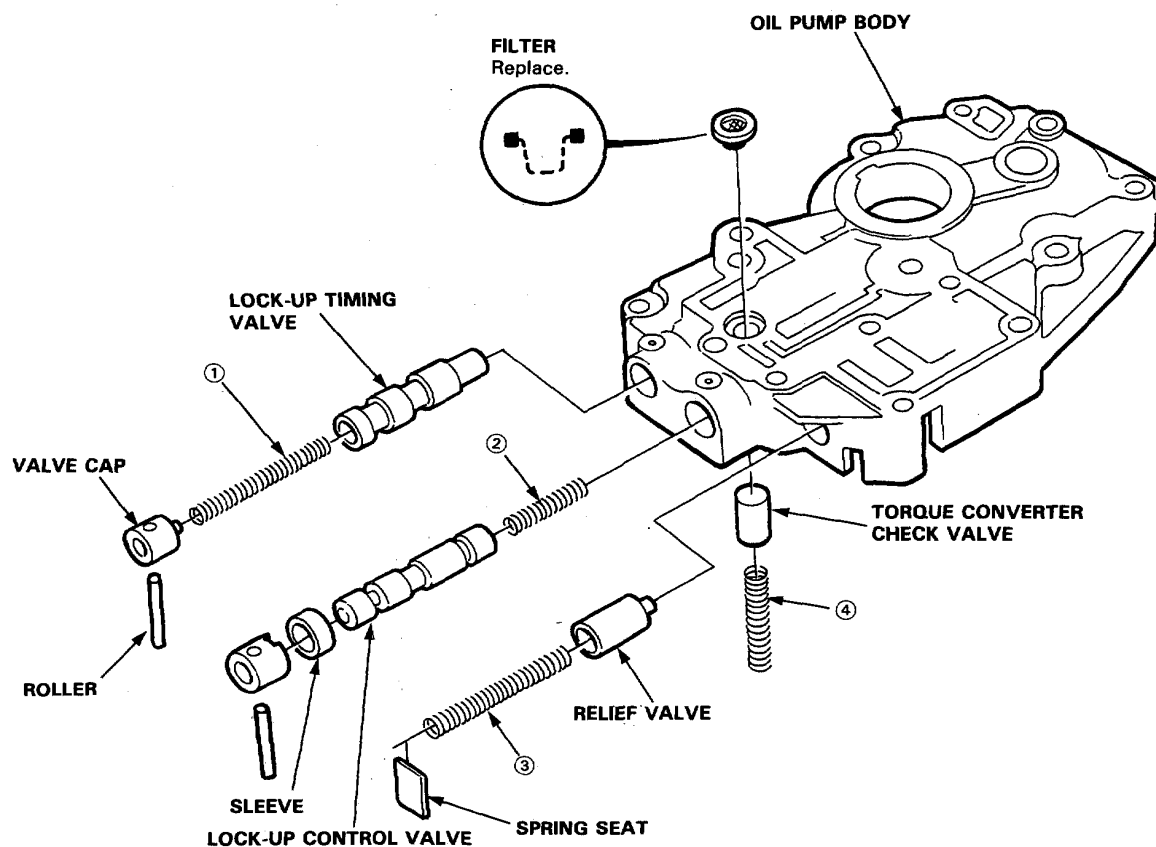
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	4th accumulator spring	2.8 (0.110)	16.5 (0.650)	78.1 (3.075)	13.5
②	3rd accumulator spring	3.2 (0.126)	19.0 (0.748)	78.6 (3.094)	11.7

Oil Pump Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-114.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

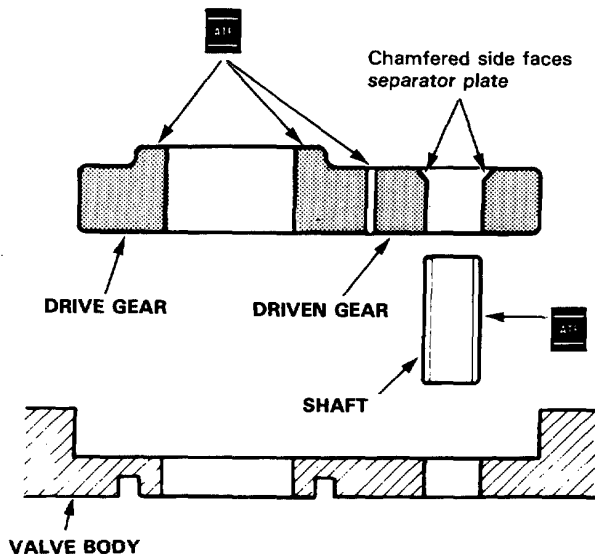
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	61.2 (2.409)	38.5
		0.7 (0.026)	6.6 (0.260)	36.3 (1.429)	14.1
②	Lock-up control valve spring	0.7 (0.026)	6.6 (0.260)	37.5 (1.476)	24.6
		0.7 (0.026)	6.6 (0.260)	38.5 (1.516)	24.6
③	Relief valve spring	0.9 (0.035)	8.4 (0.331)	56.5 (2.224)	22.4
④	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7

Oil Pump



Inspection

1. Install the pump gears and shaft in the oil pump body.



2. Install the oil pump shaft and measure the side clearance of the drive and driven gears.

Pump Gears Side (Radial) Clearance:

Standard (New): Drive gear

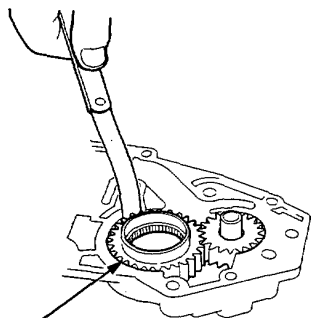
0.210–0.265 mm

(0.0083–0.0104 in)

Driven gear

0.07–0.125 mm

(0.0028–0.0049 in)



DRIVE GEAR

Inspect teeth for wear or damage.

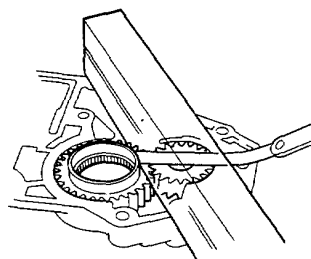
3. Measure the thrust clearance of the driven gear-to-oil pump body.

Drive/Driven Gear thrust (Axial) Clearance:

Standard (New): 0.03–0.05 mm

(0.001–0.002 in)

Service Limit: 0.07 mm (0.0028 in)

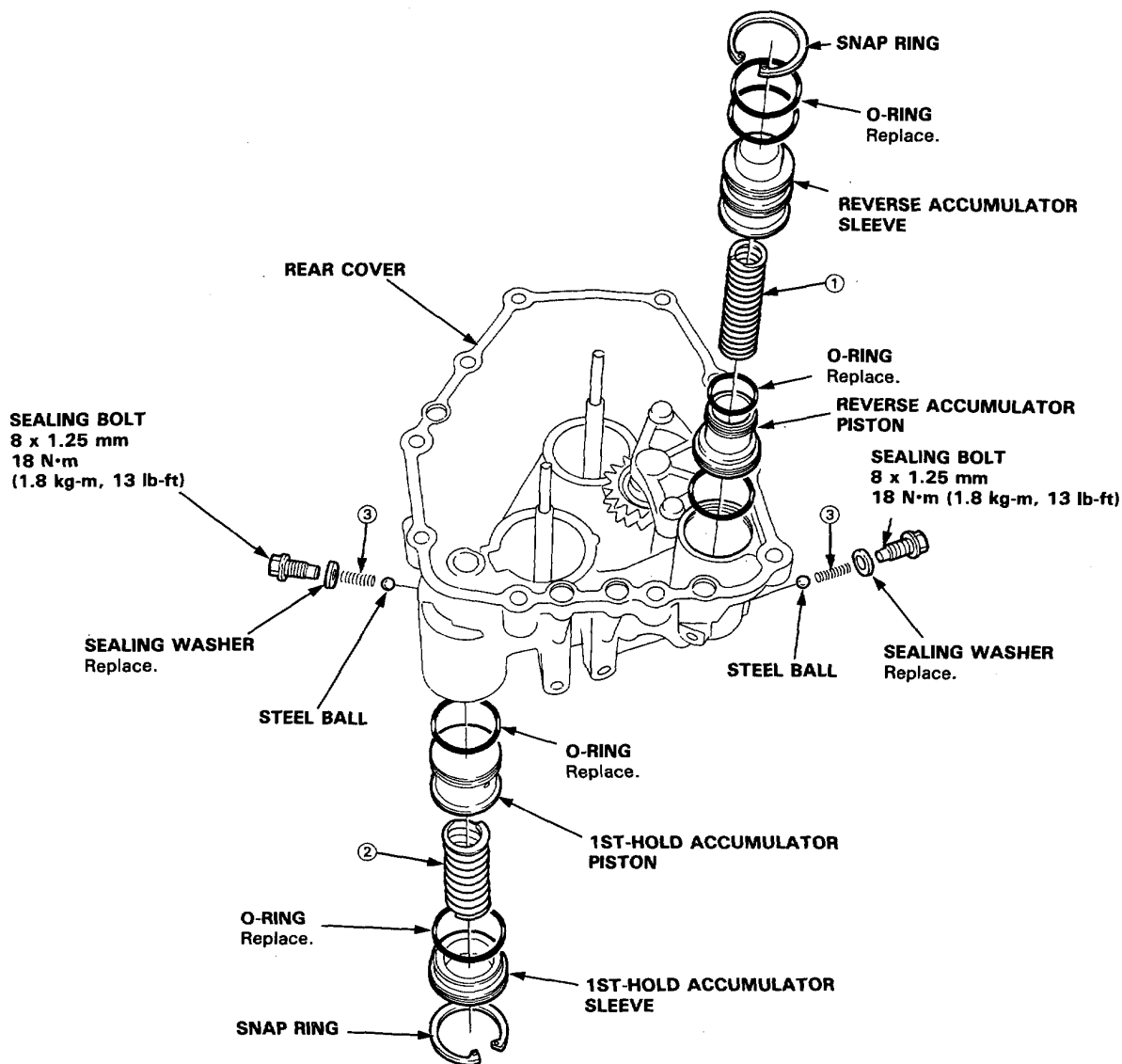


Reverse Accumulator/1st-hold Accumulator

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace the O-rings.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-114.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Reverse accumulator spring	3.5 (0.138)	18.6 (0.732)	94.4 (3.717)	15.2
②	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	68.4 (2.693)	7.2
③	One-way ball spring	0.29 (0.011)	4.0 (0.157)	14.0 (0.551)	13.0



Disassembly

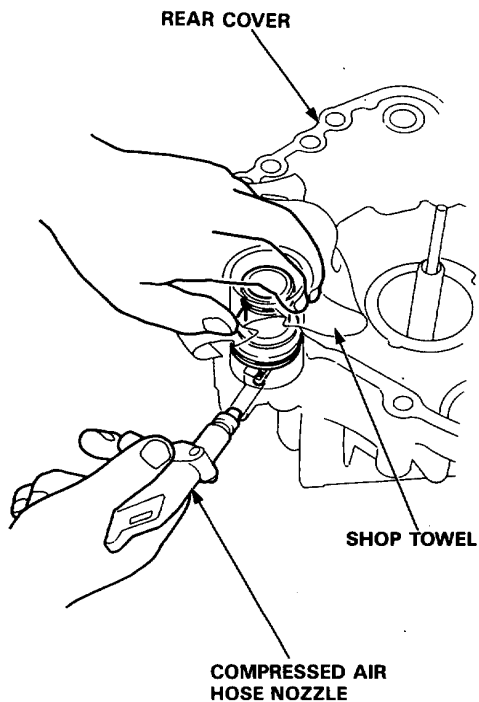
1. Remove the snap ring.
2. Remove the piston sleeve and spring.
3. Remove the one-way ball spring.

NOTE: Do not remove the steel ball.

4. Wrap a shop towel around the accumulator piston and apply air pressure to the oil passage to remove the piston.

⚠ WARNING

- Do not place your fingers in front of piston.
- Do not use high air pressure.

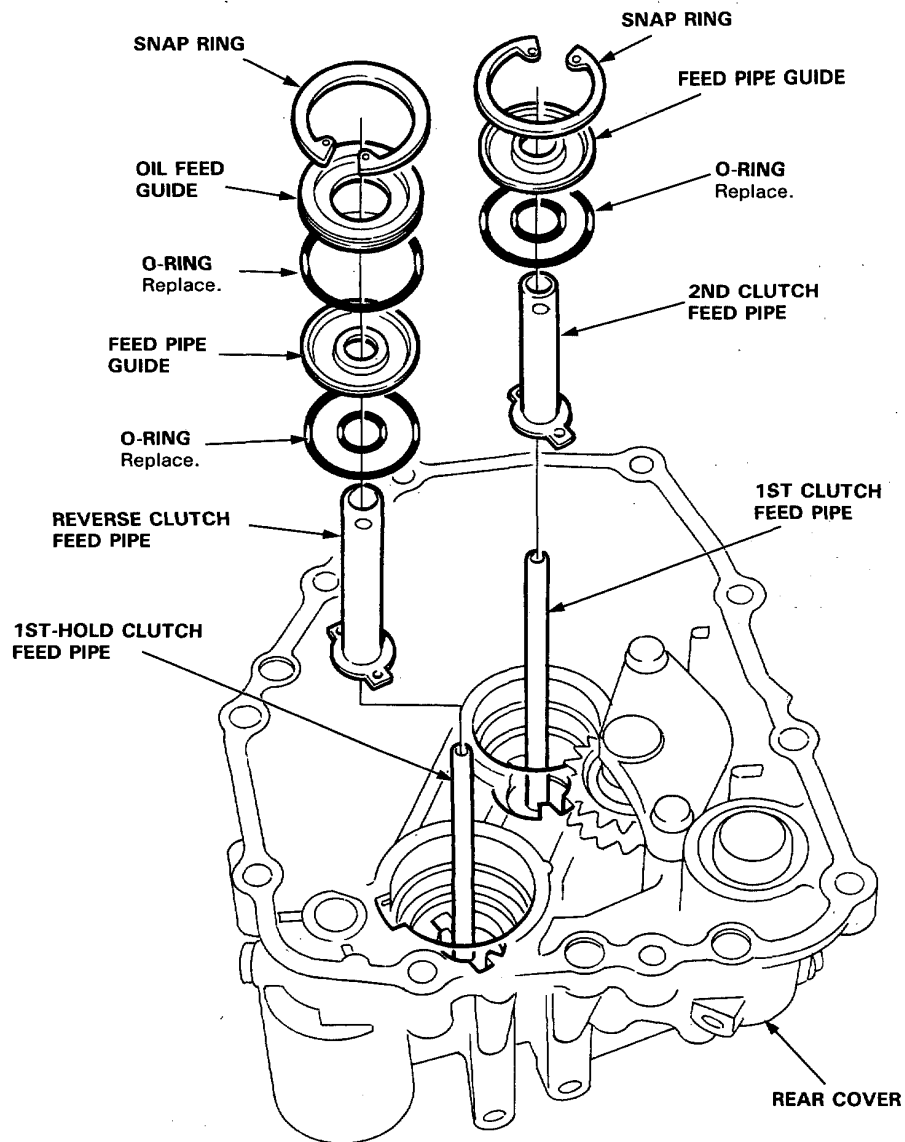


Rear Cover

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Replace the O-rings.
- Coat all parts with ATF before reassembly.



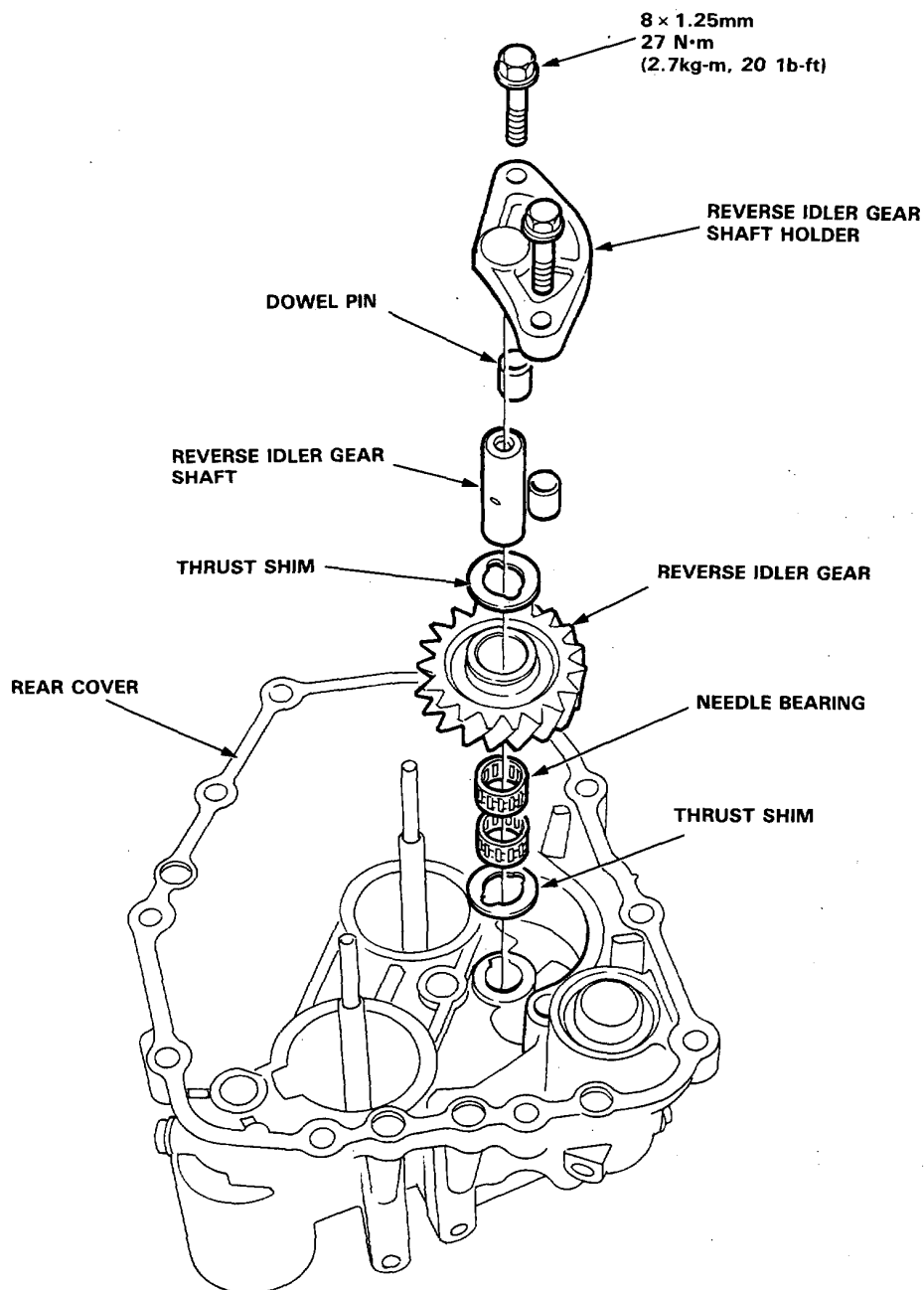


Reverse Idler Gear

Disassembly/Inspection/Reassembly

NOTE:

- Inspect the needle bearings for galling and rough movement.
- Coat all parts with ATF before reassembly.



Mainshaft

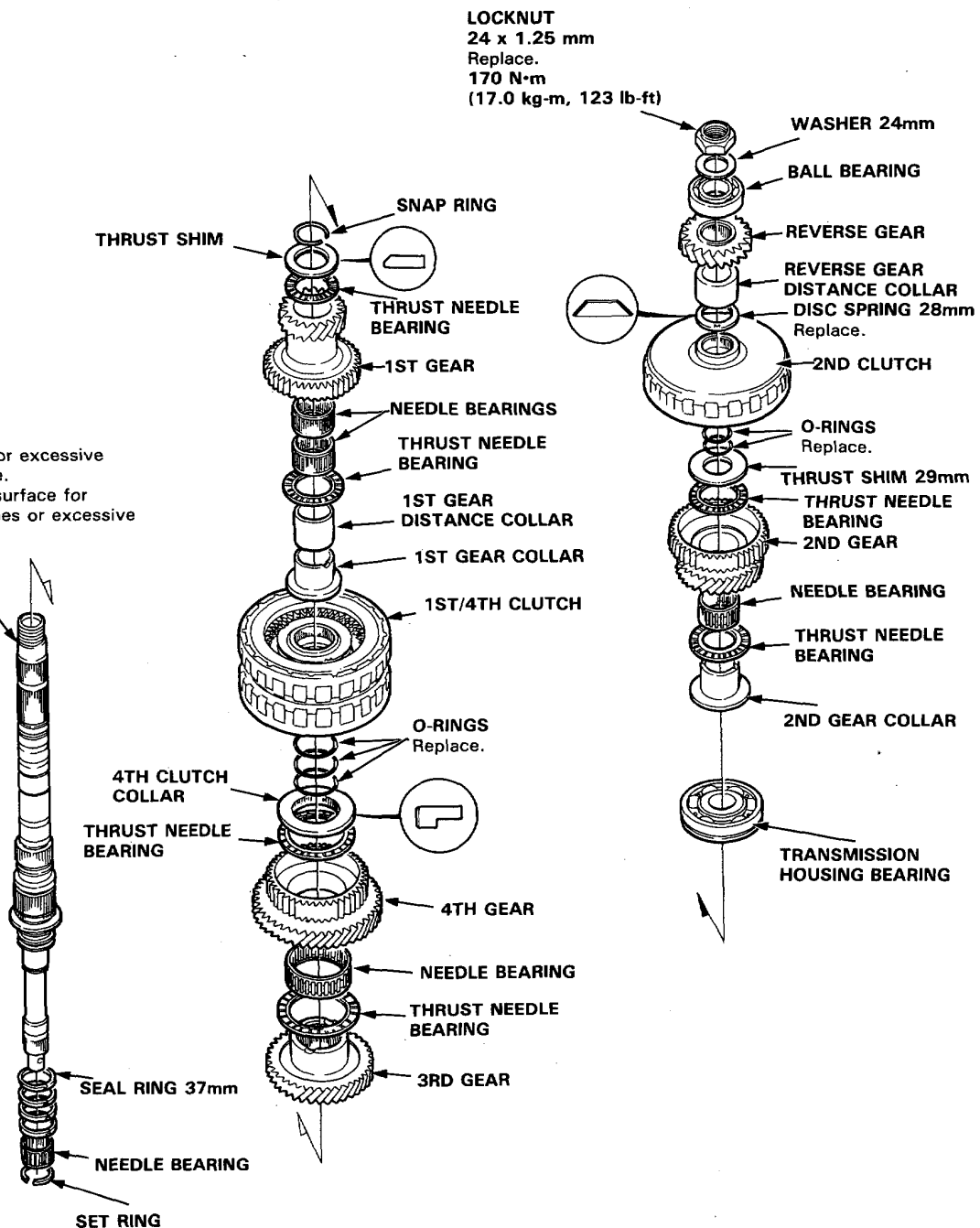
Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect thrust needle and needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

MAINSHAFT

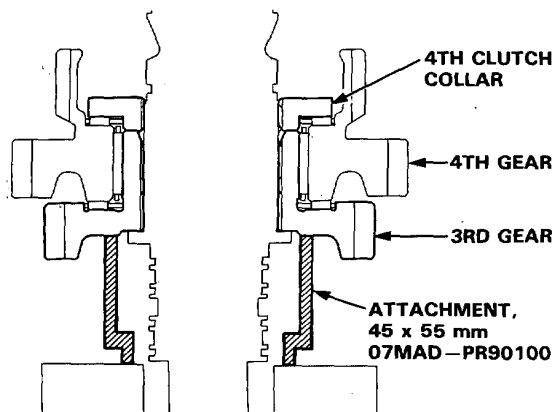
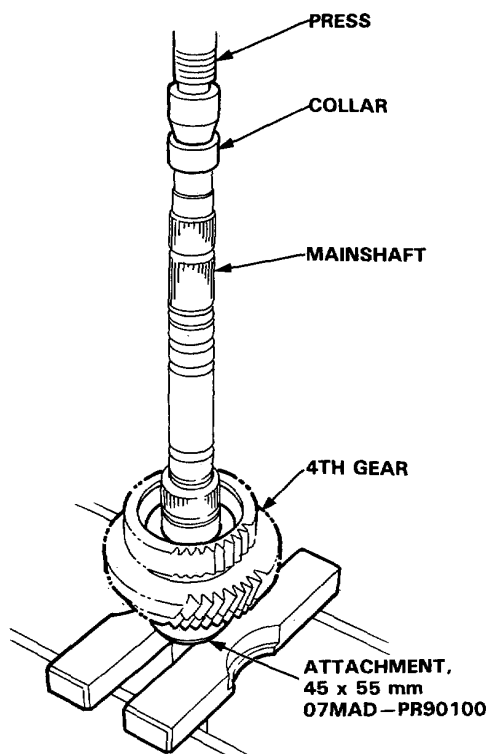
Check splines for excessive wear or damage.
Check bearing surface for scoring, scratches or excessive wear.





Disassembly

1. Remove the mainshaft 3rd gear, 4th gear and 4th clutch collar from the mainshaft using the special tool and a press as shown.

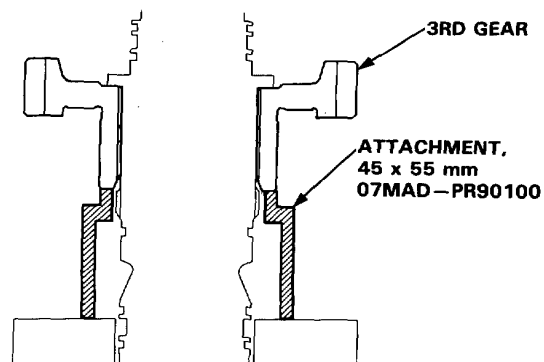
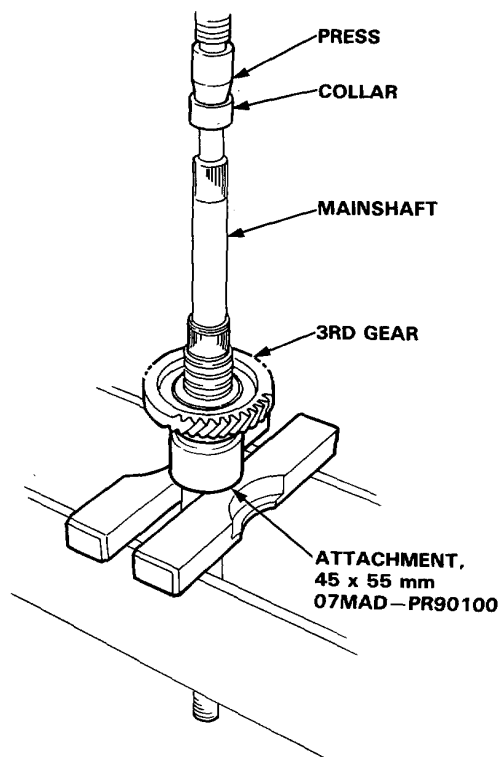


Inspection

NOTE:

- Inspect and adjust the 4th clutch collar when disassembling the mainshaft assembly or replacing the mainshaft 3rd gear and/or 1st/4th clutch assembly.
- Lubricate all parts with ATF during assembly.

1. Install the mainshaft 3rd gear on the mainshaft using the special tool and a press as shown.



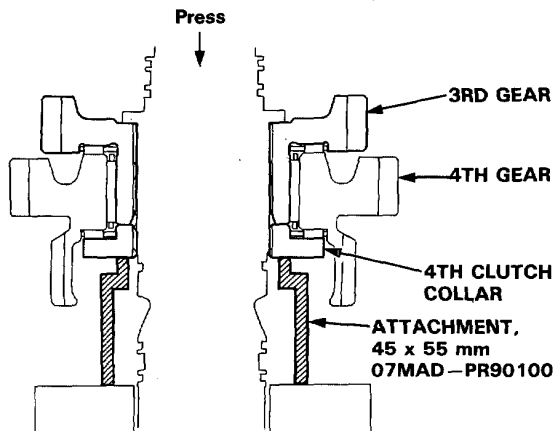
(cont'd)

Mainshaft

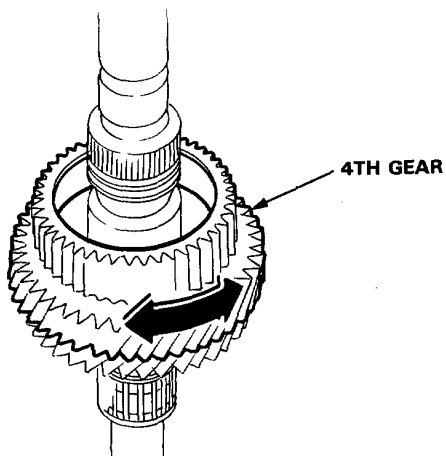
Inspection (cont'd)

2. Assemble the thrust needle bearing, needle bearing and 4th gear, and install the 4th clutch collar using the special tool and a press as shown.

NOTE: Replace the 4th clutch collar, if it can be installed by pressing with your hand.



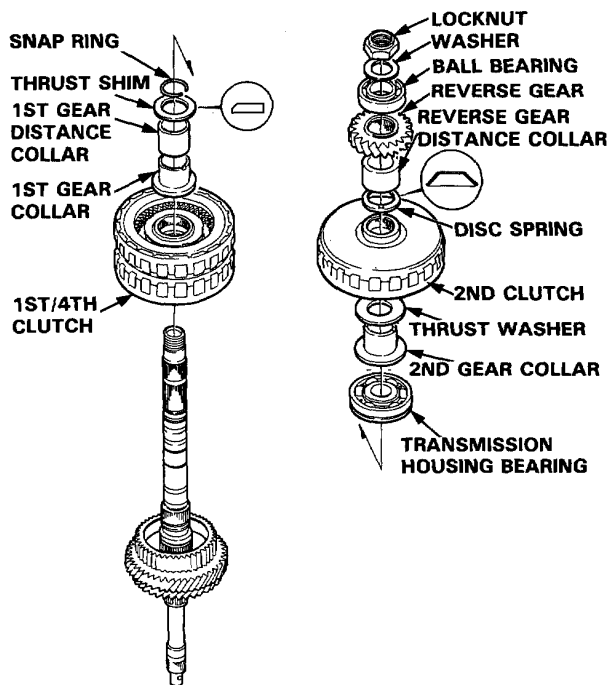
3. Spin the mainshaft 4th gear by hand to check for clearance. The clearance is considered normal if it turns freely without binding.



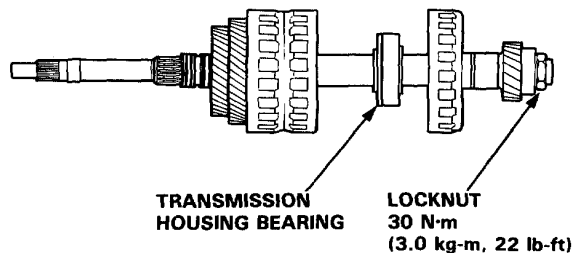
4. Remove the mainshaft bearing from the transmission housing (See page 14-154).

5. Assemble the parts below on the mainshaft.

NOTE: Do not assemble the O-rings and mainshaft 1st gear.



6. Torque the mainshaft locknut to 30 N·m (3.0 kg-m, 22 lb-ft).



7. Move the 1st/4th clutch assembly to check the axial clearances.

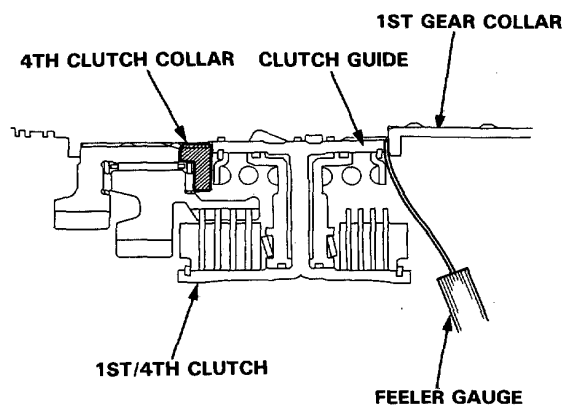
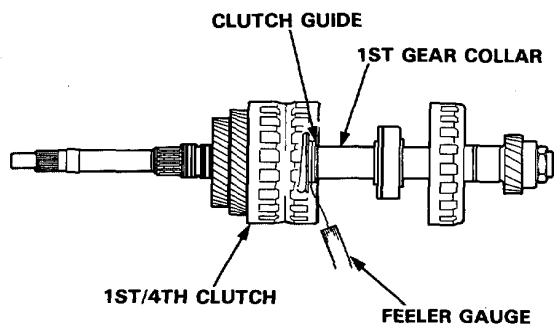


8. Measure the clearance between the 1st/4th clutch guide and 1st gear collar with a feeler gauge.

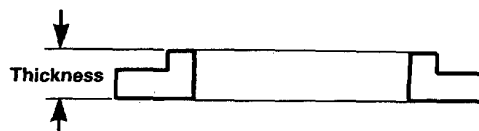
STANDARD: 0–0.08 mm (0–0.003 in)

NOTE:

- Take measurements in at least three places and take the average as the actual clearance.
- If the 0.08 mm (0.003 in) feeler gauge can be inserted, replace the 4th clutch collar.



9. If the clearance is out of specification, remove the 4th clutch collar and measure the thickness.



10. Select and install a new 4th clutch collar then recheck.

4TH CLUTCH COLLAR

No.	Part Number	Thickness mm (in)
1	90431-PY4-010	9.67–9.70 (0.381–0.382)
2	90432-PY4-010	9.72–9.75 (0.383–0.384)
3	90433-PY4-010	9.77–9.80 (0.385–0.386)
4	90434-PY4-010	9.82–9.85 (0.387–0.388)
5	90435-PY4-010	9.87–9.90 (0.389–0.390)
6	90436-PY4-010	9.92–9.95 (0.391–0.392)
7	90437-PY4-010	9.97–10.00 (0.393–0.394)

Countershaft

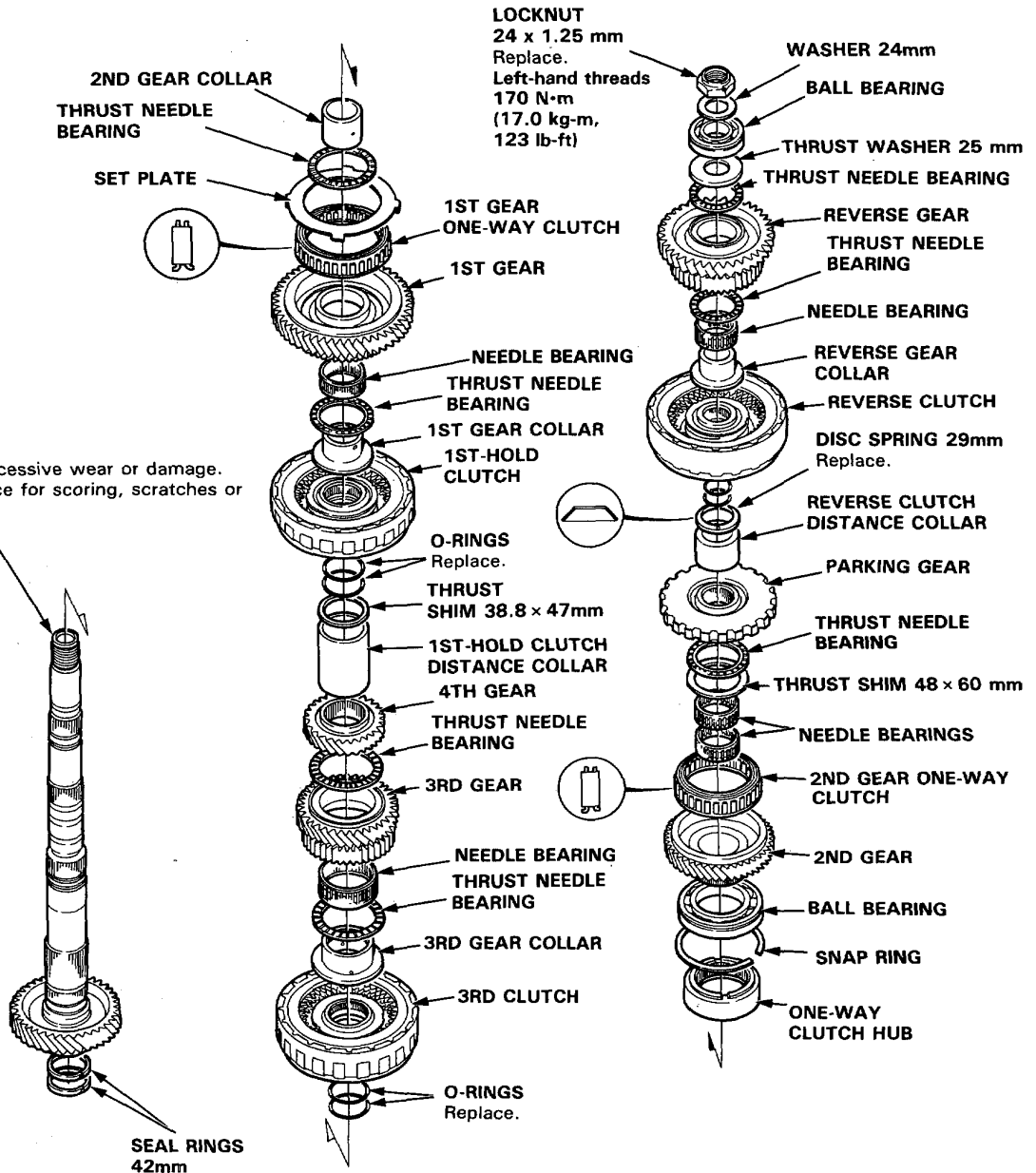
Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect thrust needle and needle bearings 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.

COUNTERSHAFT

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





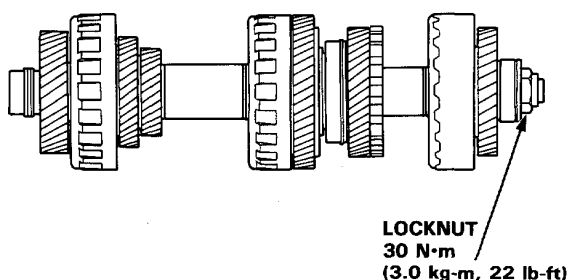
Inspection

● Clearance Measurements

NOTE:

- Lubricate all parts with ATF during assembly.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

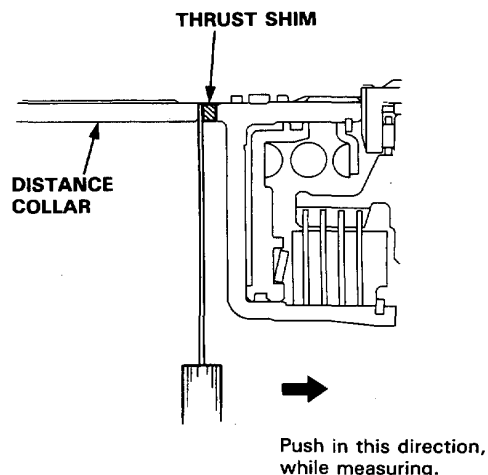
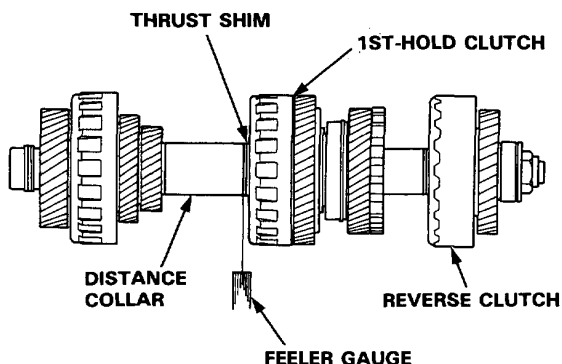
1. Assemble all parts on the countershaft.
2. Torque the countershaft locknut to 30 N·m (3.0 kg-m, 22 lb-ft).



3. Hold the 1st-hold clutch assembly against the reverse clutch. Measure the clearance between the thrust shim 38.8 x 47 mm and the 1st-hold clutch distance collar with a feeler gauge.

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

STANDARD: 0–0.08 mm (0–0.003 in)



4. If the clearance is out of tolerance, select and install a new thrust shim.

THRUST SHIM 38.3 x 47 mm

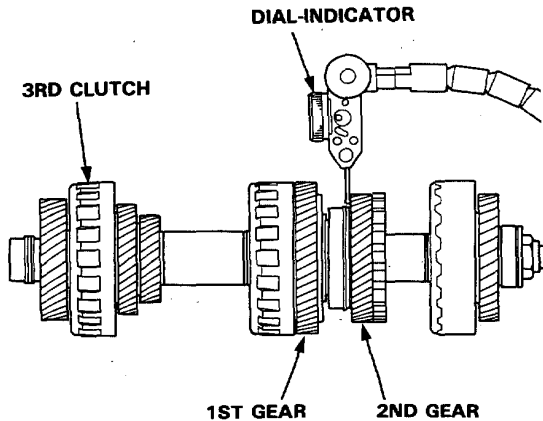
No.	Part Number	Thickness mm (in)
1	90451-PY4-000	2.97–3.00 (0.117–0.118)
2	90452-PY4-000	3.02–3.05 (0.119–0.120)
3	90453-PY4-000	3.07–3.10 (0.121–0.122)
4	90454-PY4-000	3.12–3.15 (0.123–0.124)
5	90455-PY4-000	3.17–3.20 (0.125–0.126)
6	90456-PY4-000	3.22–3.25 (0.127–0.128)
7	90457-PY4-000	3.27–3.30 (0.129–0.130)
8	90458-PY4-000	3.32–3.35 (0.131–0.132)
9	90459-PY4-000	3.37–3.40 (0.133–0.134)
10	90460-PY4-000	3.42–3.45 (0.135–0.136)
11	90461-PY4-000	3.47–3.50 (0.137–0.138)

(cont'd)

Countershaft

Inspection (cont'd)

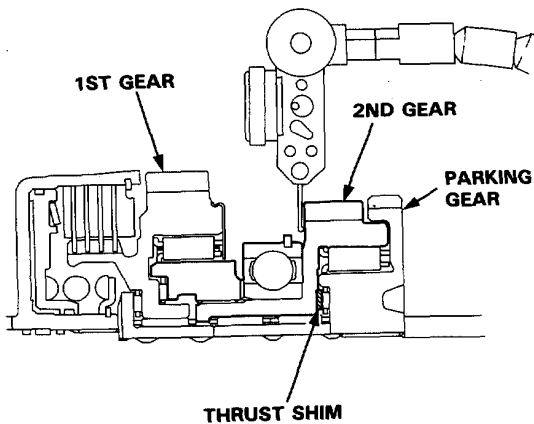
5. Attach the dial-indicator to the countershaft 2nd gear.



6. Measure the 2nd gear axial clearance while pushing 1st gear towards the 1st-hold clutch assembly.

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

STANDARD: 0.05–0.13 mm (0.002–0.005 in)

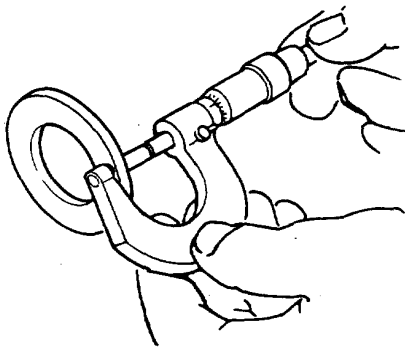


7. If the clearance is out of tolerance, select and install a new thrust shim.

THRUST SHIM 48 x 60 mm

No.	Part Number	Thickness mm (in)
1	90411-PY4-000	1.27–1.30 (0.050–0.051)
2	90412-PY4-000	1.32–1.35 (0.052–0.053)
3	90413-PY4-000	1.37–1.40 (0.054–0.055)
4	90414-PY4-000	1.42–1.45 (0.056–0.057)
5	90415-PY4-000	1.47–1.50 (0.058–0.059)
6	90416-PY4-000	1.52–1.55 (0.060–0.061)
7	90417-PY4-000	1.57–1.60 (0.062–0.063)
8	90418-PY4-000	1.62–1.65 (0.064–0.065)
9	90419-PY4-000	1.67–1.70 (0.066–0.067)
10	90420-PY4-000	1.72–1.75 (0.068–0.069)
11	90421-PY4-000	1.77–1.80 (0.070–0.071)
12	90422-PY4-000	1.82–1.85 (0.072–0.073)
13	90423-PY4-000	1.87–1.90 (0.074–0.075)

Note: After replacing the thrust shim, make sure that the clearance is within tolerance.

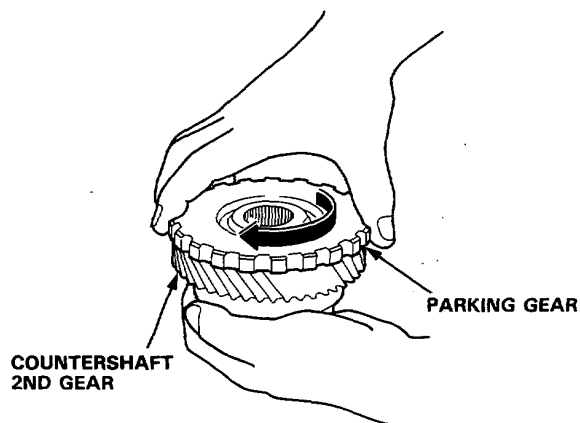




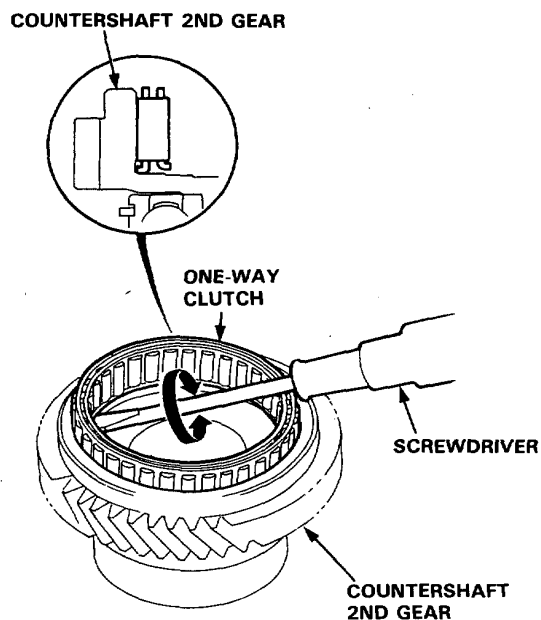
2nd Gear One-way Clutch/Parking Gear

Disassembly

1. Separate the countershaft 2nd gear from the parking gear by turning the parking gear in the direction shown.

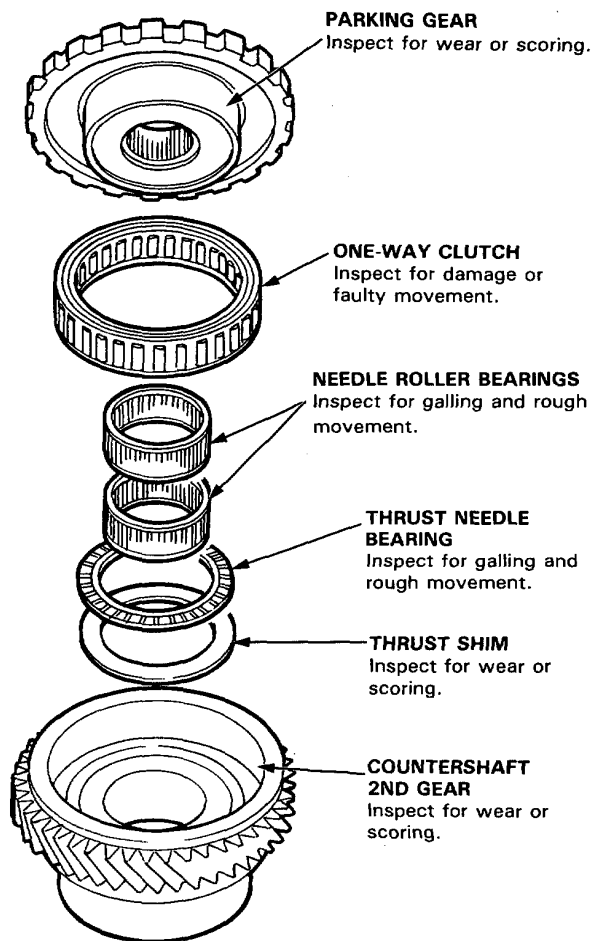


2. Remove the one-way clutch by prying it up with the end of a screwdriver.



Inspection

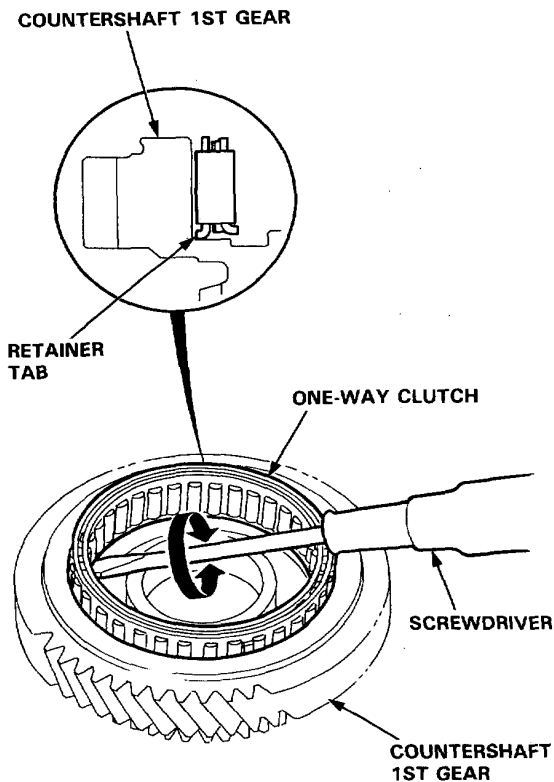
Inspect the parts as follows:



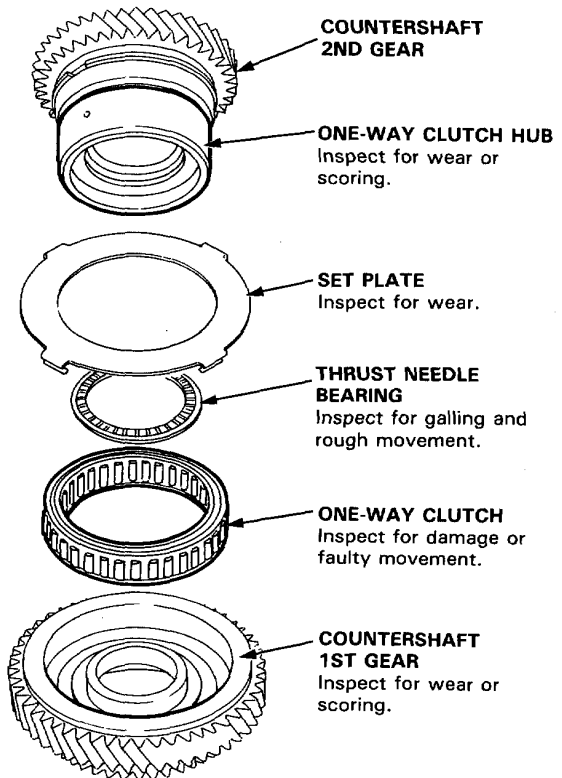
1st Gear One-way Clutch/Countershaft 1st, 2nd Gear

Disassembly/Inspection/Reassembly

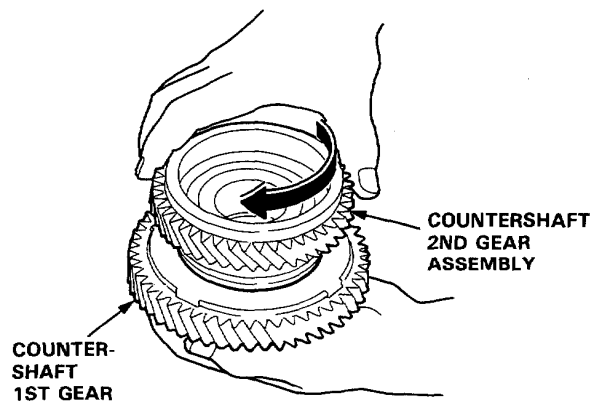
1. Remove the set plate from the countershaft 1st gear.
2. Remove the one-way clutch by prying it up with the end of a screwdriver.



3. Inspect the following parts.



4. Assemble the one-way clutch, thrust needle bearing and set plate.
5. Hold the countershaft 1st gear and turn the countershaft 2nd gear assembly in direction shown to be sure it turns freely.

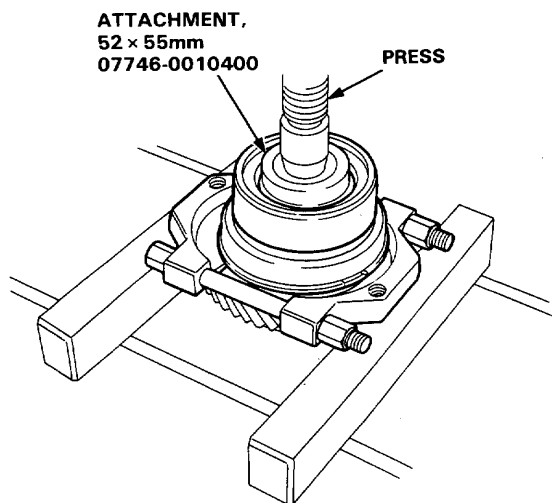


Countershaft 2nd Gear/One-way Clutch Hub/Ball Bearing



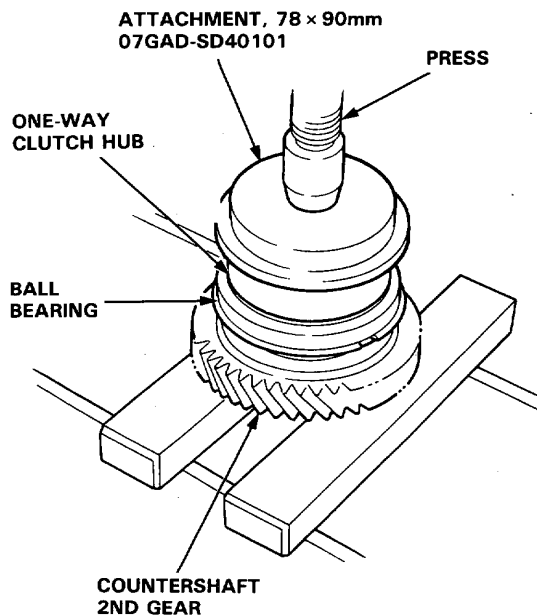
Disassembly

1. Remove the one-way clutch hub and ball bearing from the countershaft 2nd gear using the special tool and a press.



Reassembly

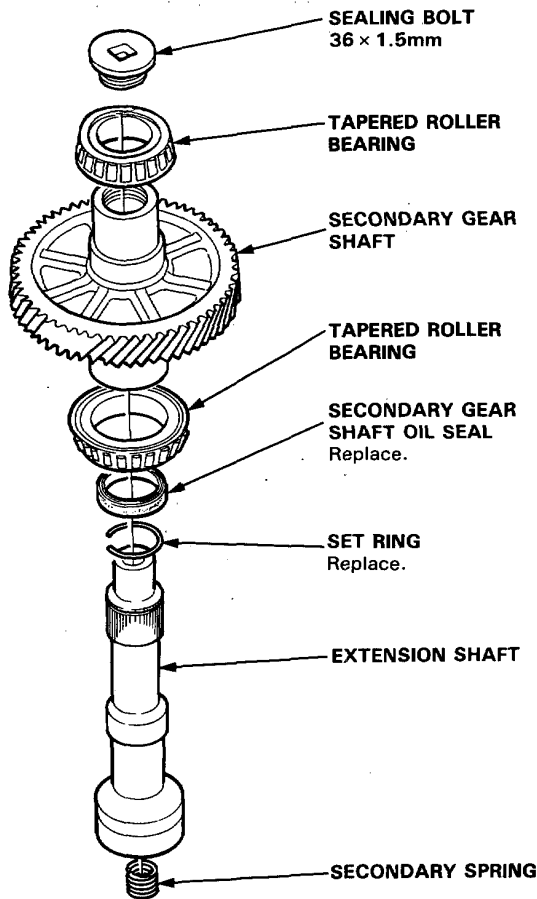
1. Install the ball bearing and one-way clutch hub to the countershaft 2nd gear using the special tool and a press.



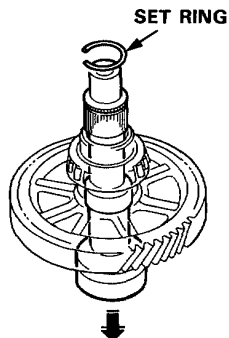
Secondary Gear Shaft Oil Seal

Extension Shaft

Disassembly

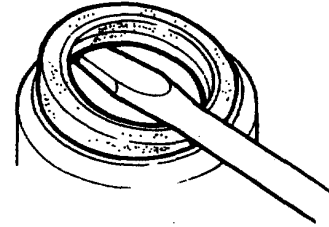


1. Remove the set ring.
2. Remove the extension shaft from the secondary gear shaft.

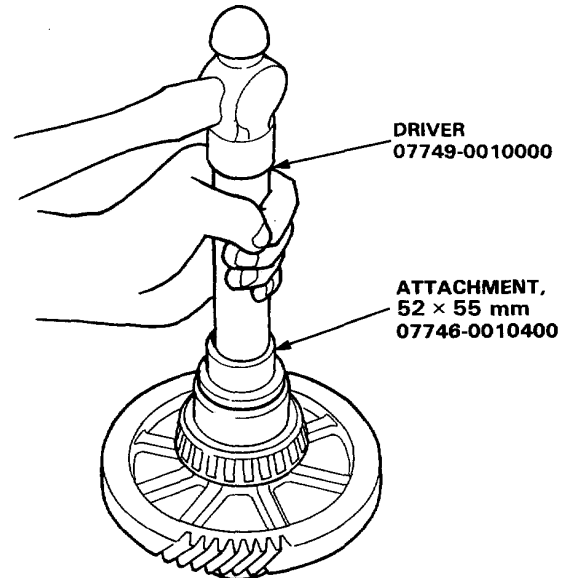


Replacement

1. Remove the oil seal from the secondary gear shaft.



2. Drive the oil seal into the secondary gear shaft, using the special tools as shown.





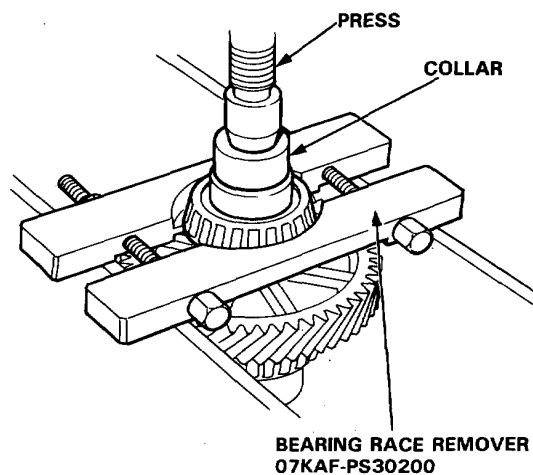
Tapered Roller Bearing

Replacement

NOTE:

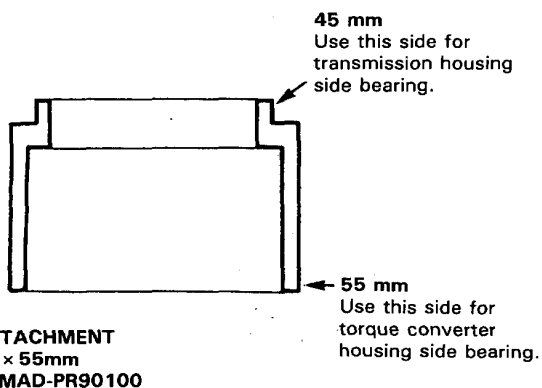
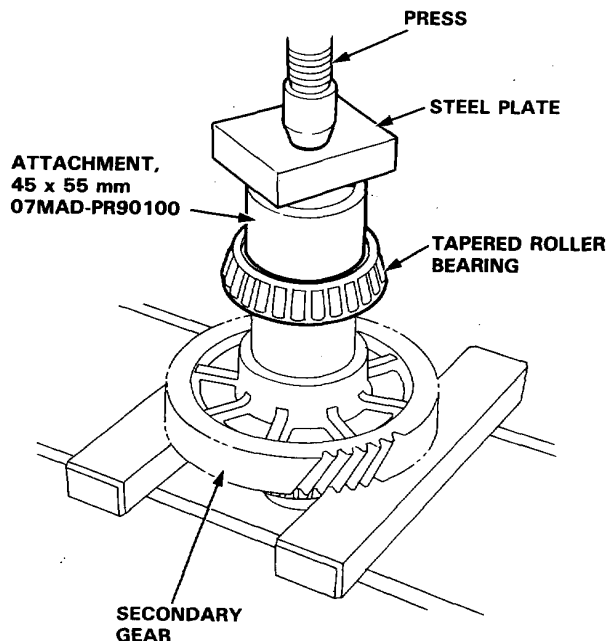
- The bearing and outer race should be replaced as a set.
- If the bearing is replaced, inspect and adjust the bearing preload (page 14-142).

1. Remove the tapered roller bearings from the secondary gear shaft, using the special tool and a press as shown.



2. Install the bearings using the special tool and a press as shown.

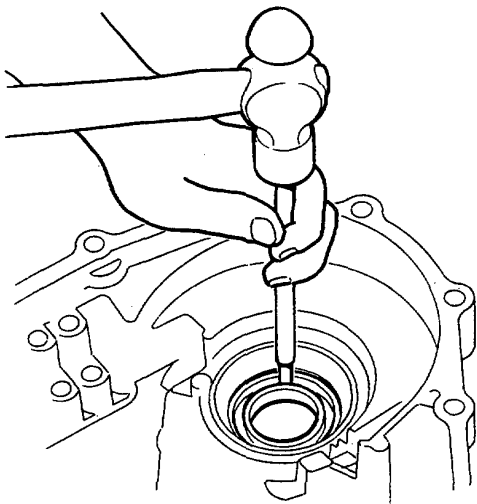
NOTE: Press the bearings in squarely until they bottom.



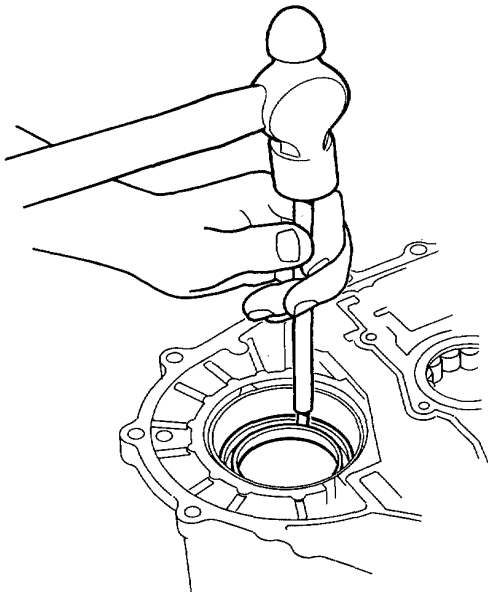
Oil Seal

Removal

1. Remove the oil seal from the transmission housing.



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



Bearing Outer Race

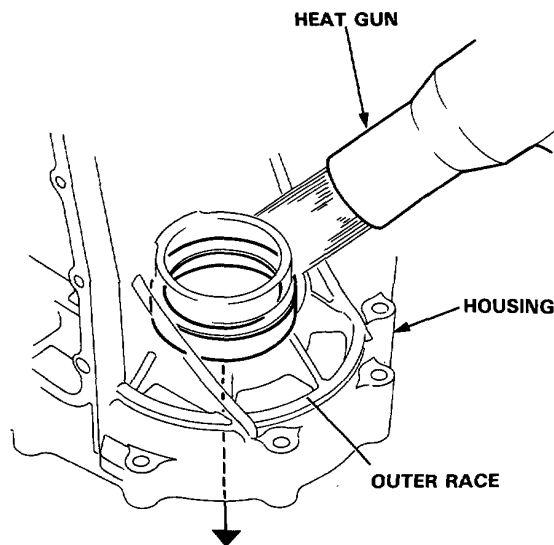
Replacement

NOTE:

- The bearing and outer race should be replaced as a set.
- If the bearings, thrust shim and/or washer are replaced, inspect and adjust the bearing preload (page 14-142).

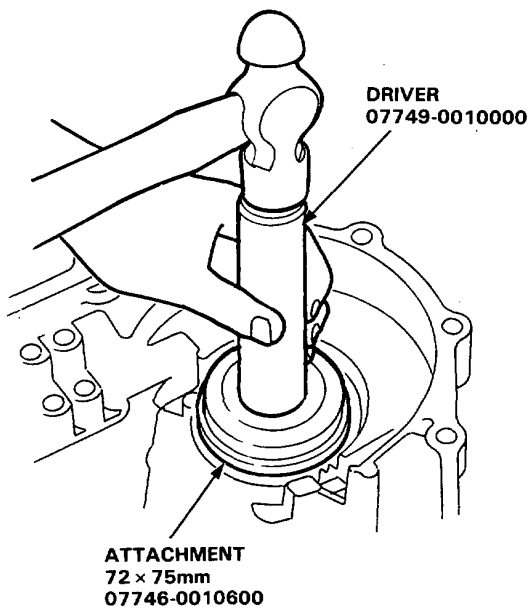
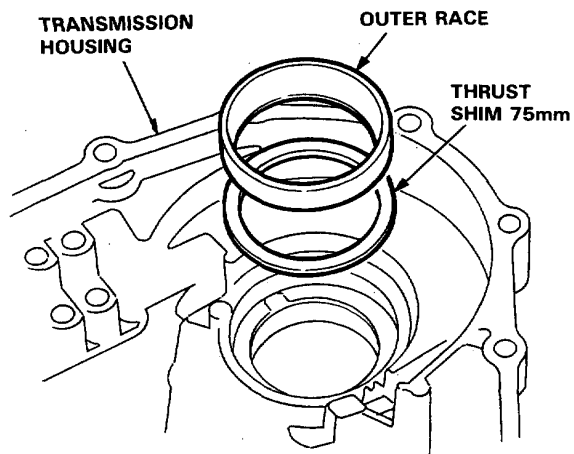
1. Remove the bearing outer race by heating the housings to 100°C (212°F) with a heat gun, then tap the housing until the bearing outer race falls out.

CAUTION: Do not heat the housings in excess of 100°C (212°F).

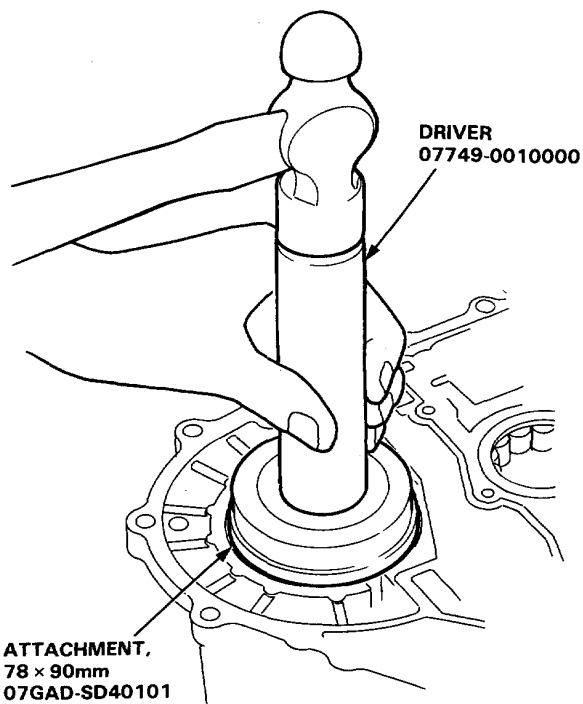
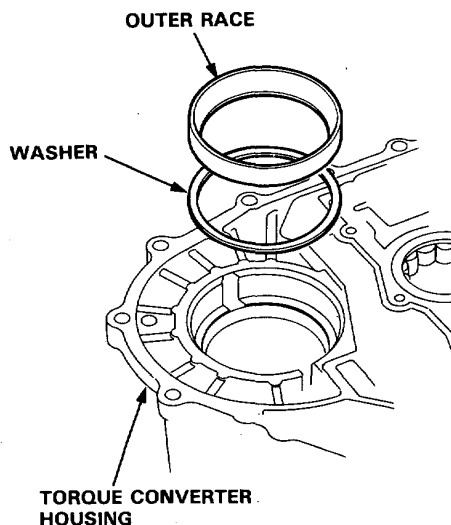




2. Install the thrust shim and bearing outer race.
3. Drive the outer race into the transmission housing, using the special tools as shown.



4. Install the washer and bearing outer race.
5. Drive the outer race into the torque converter housing, using the special tools as shown.



Tapered Roller Bearing Preload

Adjustment

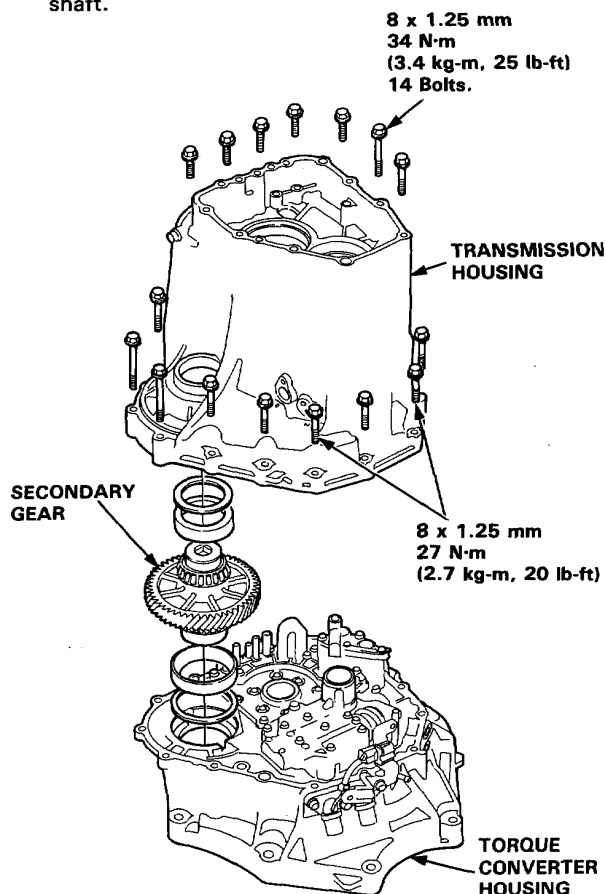
NOTE:

- If any of the listed parts were replaced, the bearing preload must be adjusted:
 - Transmission Housing
 - Torque Converter Housing
 - Tapered Roller Bearing/Bearing Outer Race
 - 75 mm Thrust Shim
 - 90 mm Washer

CAUTION: If the outer race was removed using heat, let the transmission cool down to room temperature before adjusting the bearing preload.

1. Remove the oil seals from both housings.
2. Install the sealing bolt to the secondary gear shaft and torque to 20 N·m (2.0 kg-m, 14 lb-ft).
3. Install the secondary gear in the torque converter housing, then install the transmission housing.

NOTE: Do not install the mainshaft and countershaft.

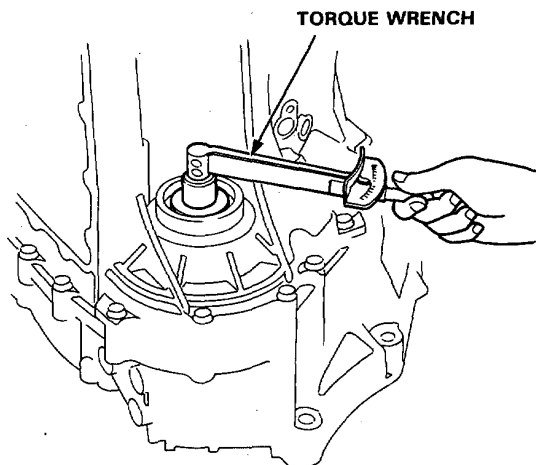


4. Rotate the secondary gear in both directions to seat the bearings.
5. Measure the starting torque of the secondary gear with a torque wrench.

STANDARD: 3.5—4.5 N·m
(35—45 kg-cm, 30—39 lb-in)

NOTE:

- Measure the preload at room temperature in both directions.
- Do not use more than one thrust shim to adjust the bearing preload.





Oil Seal

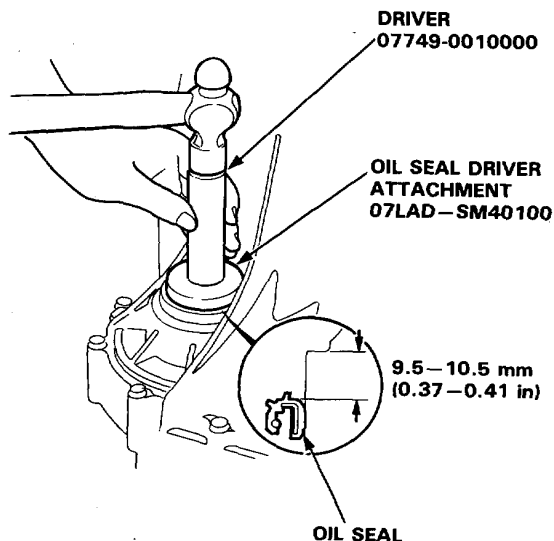
Installation

- If the bearing preload is out of tolerance, select and install a new thrust shim then recheck.

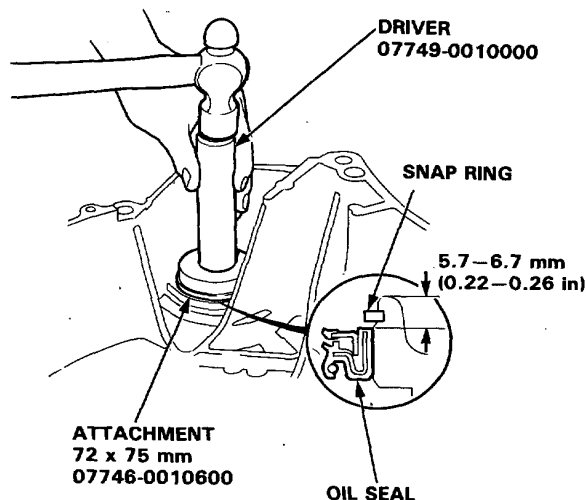
THRUST SHIM 75 mm

No.	Part Number	Thickness mm (in)
A	23941-PY5-000	1.56 (0.061)
B	23942-PY5-000	1.59 (0.063)
C	23943-PY5-000	1.62 (0.064)
D	23944-PY5-000	1.65 (0.065)
E	23945-PY5-000	1.68 (0.066)
F	23946-PY5-000	1.71 (0.067)
G	23947-PY5-000	1.74 (0.069)
H	23948-PY5-000	1.77 (0.070)
I	23949-PY5-000	1.80 (0.071)
J	23950-PY5-000	1.83 (0.072)
K	23951-PY5-000	1.86 (0.073)
L	23952-PY5-000	1.89 (0.074)
M	23953-PY5-000	1.92 (0.076)
N	23954-PY5-000	1.95 (0.077)
O	23955-PY5-000	1.98 (0.078)
P	23956-PY5-000	2.01 (0.079)
Q	23957-PY5-000	2.04 (0.080)
R	23958-PY5-000	2.07 (0.081)
S	23959-PY5-000	2.10 (0.083)
T	23960-PY5-000	2.13 (0.084)
U	23961-PY5-000	2.16 (0.085)
V	23962-PY5-000	2.19 (0.086)
W	23963-PY5-000	2.22 (0.087)
X	23964-PY5-000	2.25 (0.089)
Y	23965-PY5-000	2.28 (0.090)
Z	23966-PY5-000	2.31 (0.091)
AA	23967-PY5-000	2.34 (0.092)
AB	23968-PY5-000	2.37 (0.093)
AC	23969-PY5-000	2.40 (0.094)
AD	23970-PY5-000	2.43 (0.096)

- Install the oil seal in the transmission housing, using the special tools.

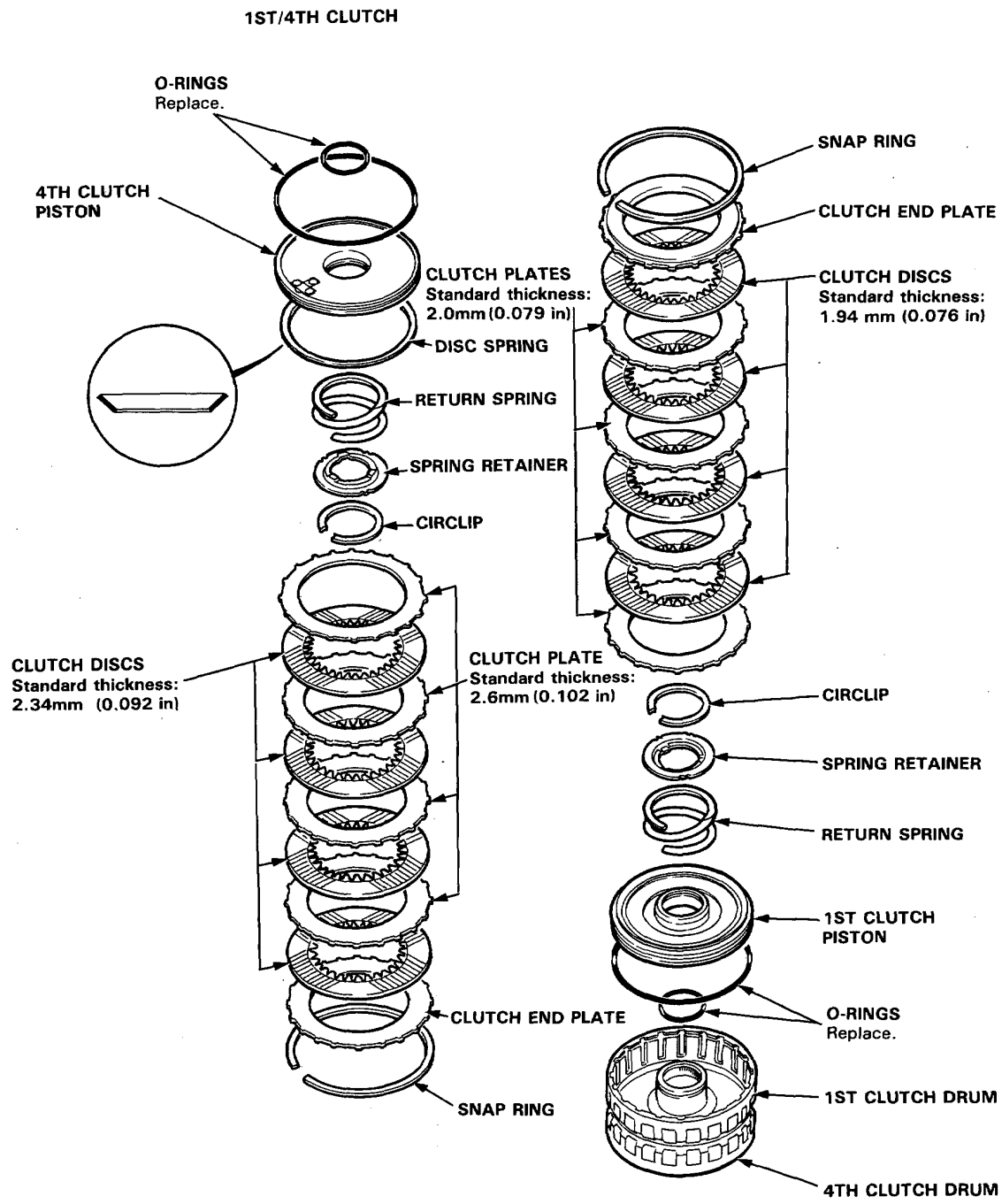


- Install the oil seal in the torque converter housing, using the special tools as shown.
- Install the snap ring in the torque converter housing.



Clutch

Illustrated Index

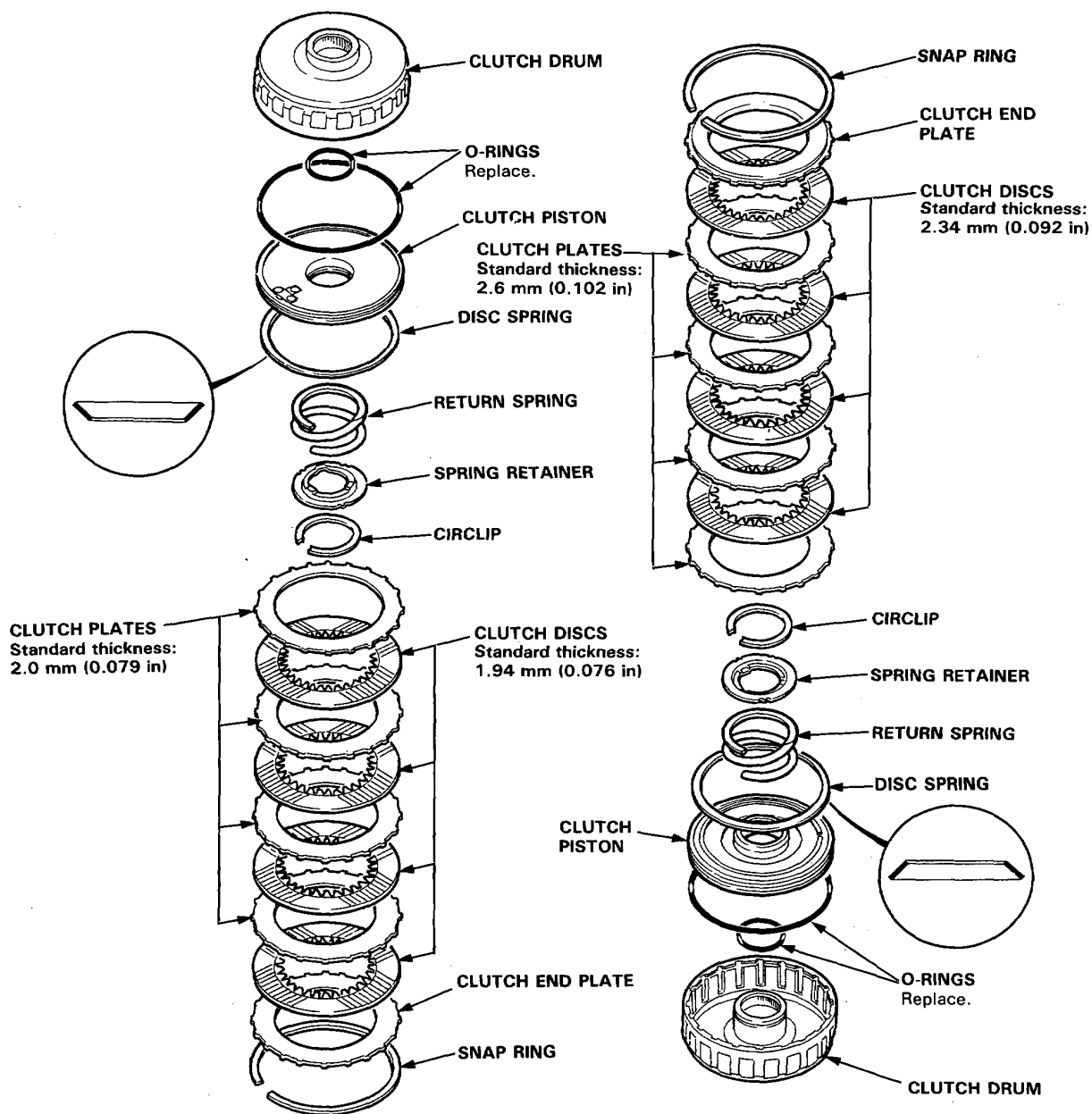


cardiagn.com



2ND CLUTCH

3RD CLUTCH



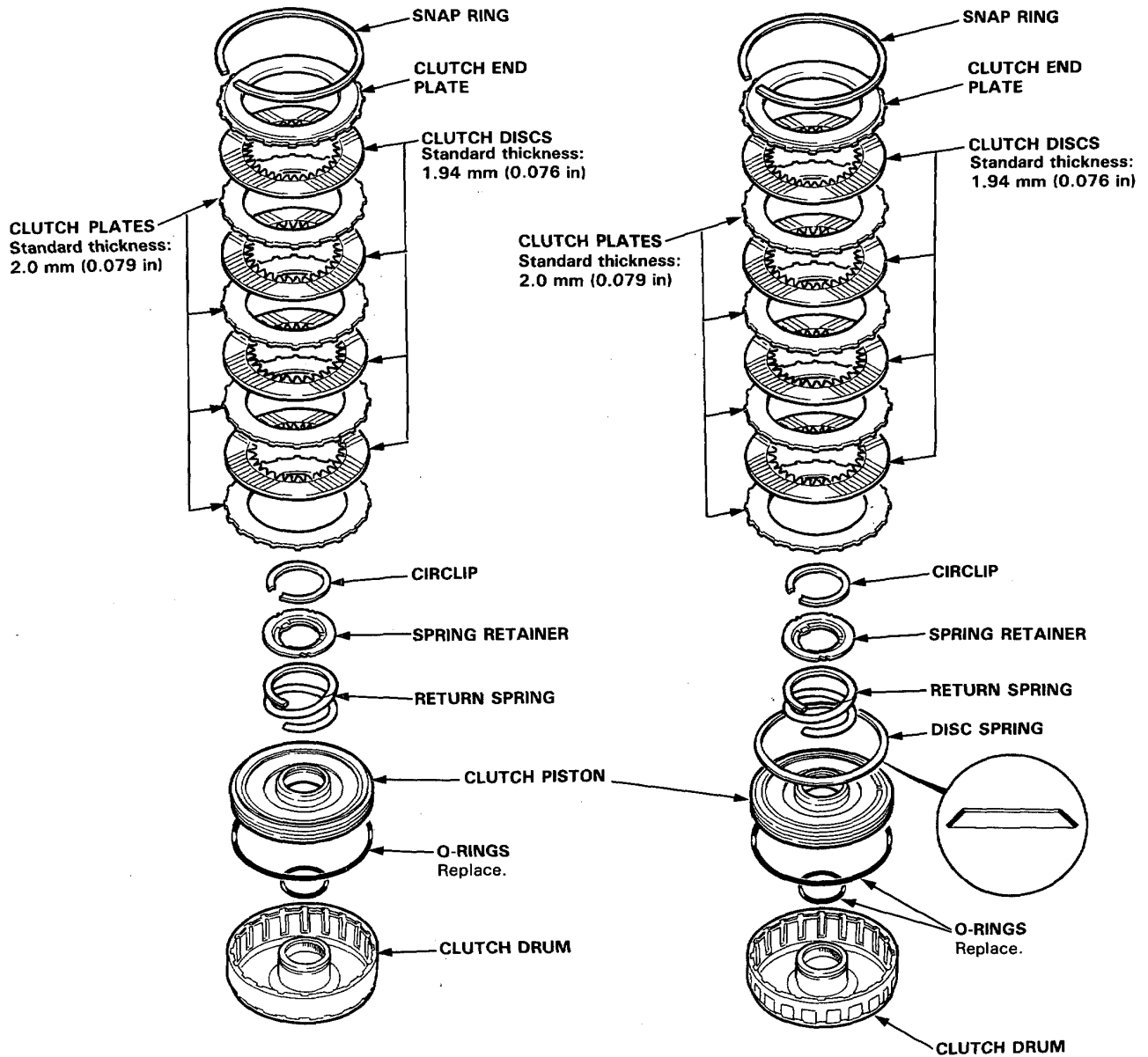
(cont'd)

Clutch

Illustrated Index (cont'd)

REVERSE CLUTCH

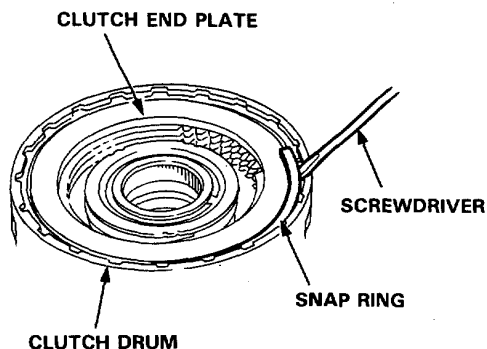
1ST-HOLD CLUTCH





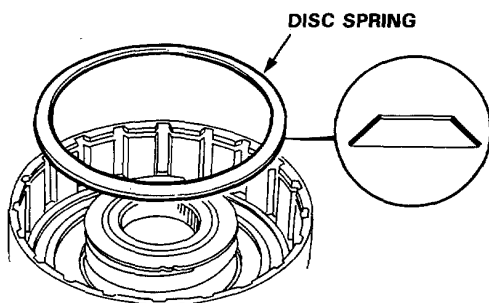
Disassembly

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



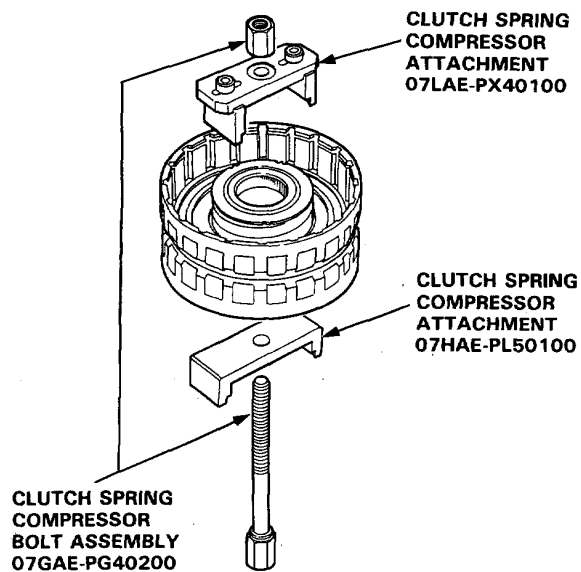
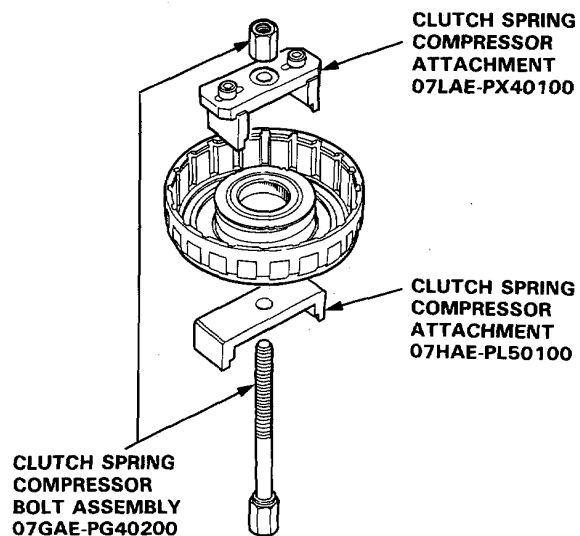
2. Remove the disc spring.

NOTE: For 2nd, 3rd, 4th and 1st-hold clutches



3. Install the special tools as shown.

CLUTCH SPRING COMPRESSOR SET:
07LAE-PX40000

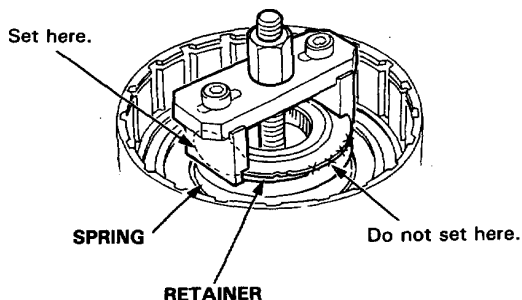


(cont'd)

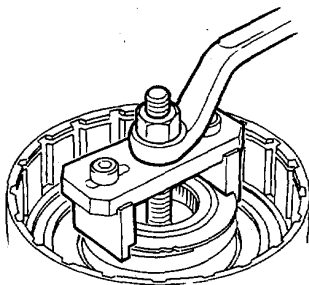
Clutch

Disassembly (cont'd)

CAUTION: If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.

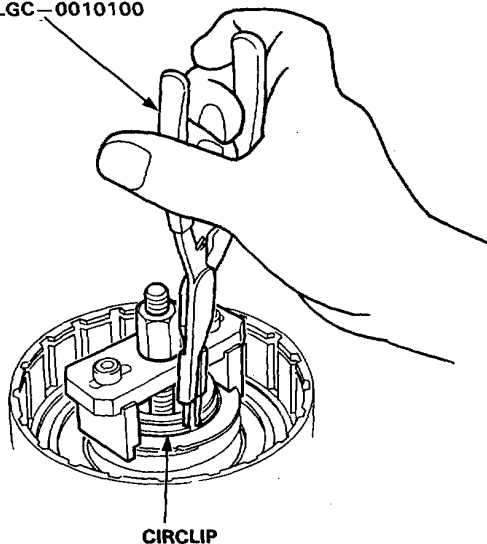


4. Compress the clutch return spring.

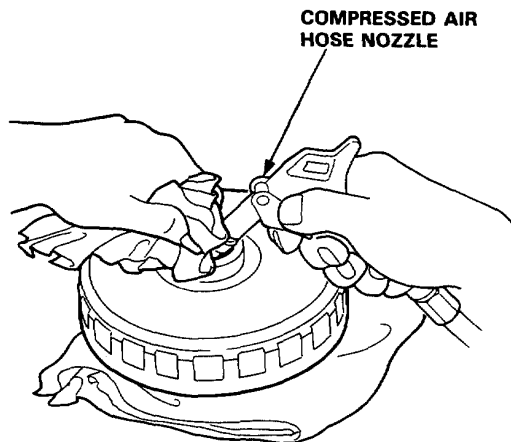


5. Remove the circlip. Then remove the special tools, spring retainer and return spring.

SNAP RING PLIERS
07LGC-0010100



6. Wrap a shop towel 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.



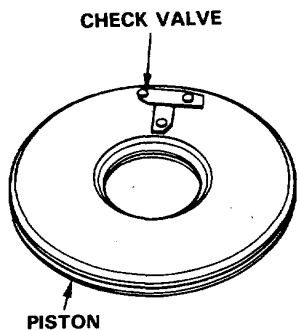


Reassembly

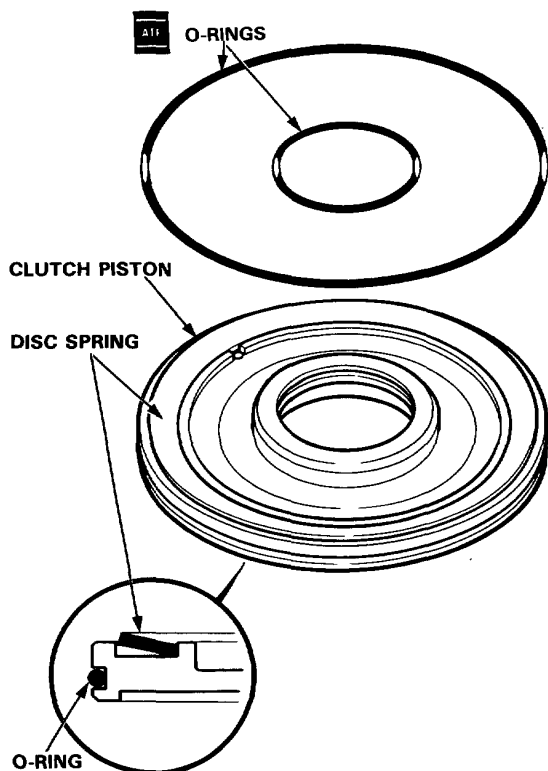
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Lubricate all parts with ATF before reassembly.

1. Inspect for a loose check valve.



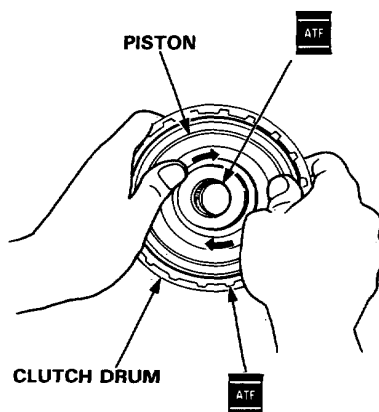
2. Install a new O-ring on the clutch piston.
 3. Be sure that the disc spring is securely staked.
- NOTE: For 1st and reverse clutches.



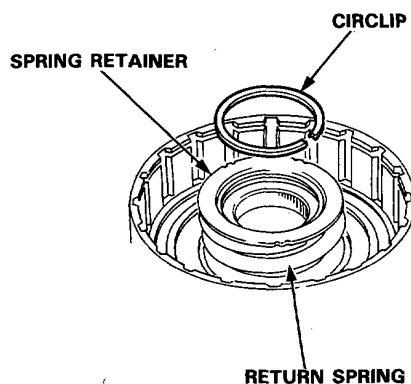
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

NOTE: Lubricate the piston O-ring with ATF before installing.

CAUTION: Do not pinch O-ring by installing the piston with force.



5. Install the return spring and spring retainer and position the circlip on the retainer.



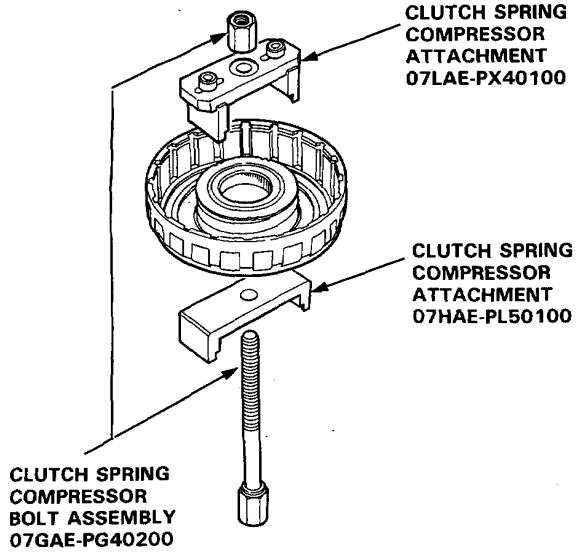
(cont'd)

Clutch

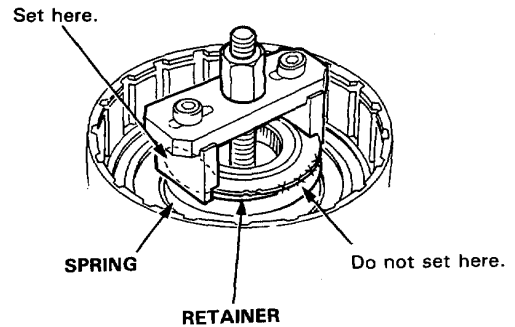
Reassembly (cont'd)

6. Install the special tools as shown.

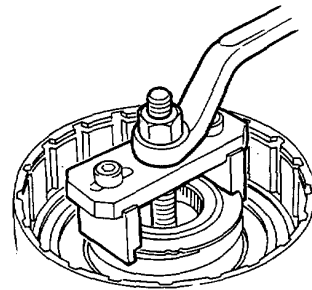
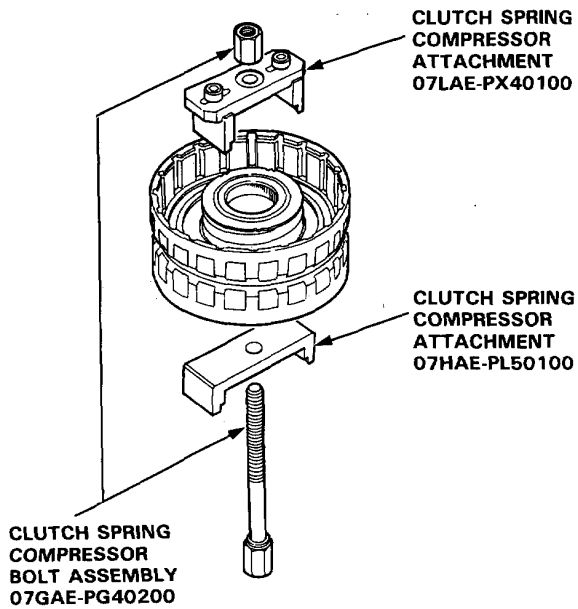
CLUTCH SPRING COMPRESSOR SET:
07LAE-PX40000



CAUTION: If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the retainer spring, the retainer may be damaged.



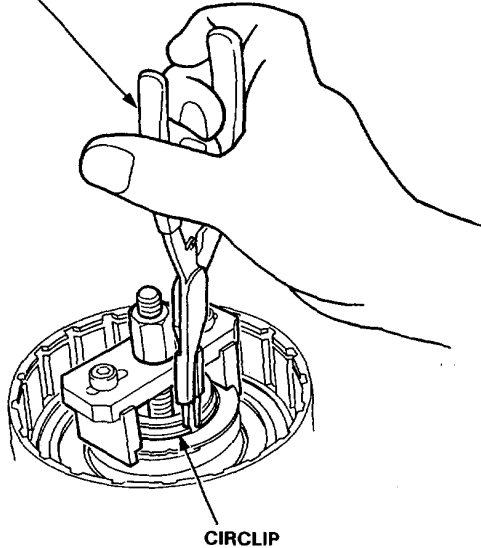
7. Compress the clutch return spring.





8. Install the circlip, then remove the special tools.

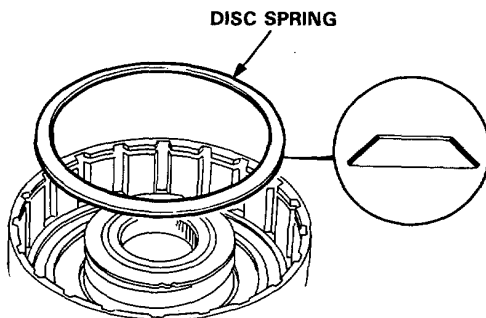
SNAP RING PLIERS
07LGC-0010100



9. Install the disc spring.

NOTE:

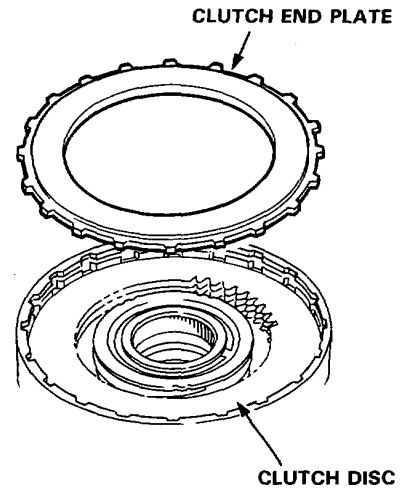
- For 2nd, 3rd, 4th and 1st-hold clutches
- Install the disc spring in the direction shown.



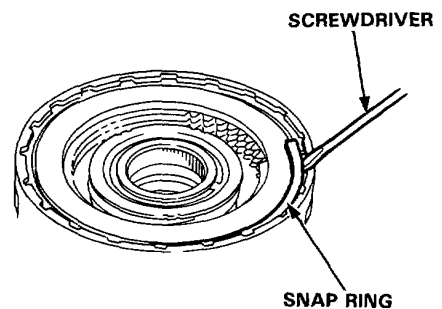
10. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

NOTE: Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt or other foreign matter.



12. Install the snap ring.



(cont'd)

Clutch

Reassembly (cont'd)

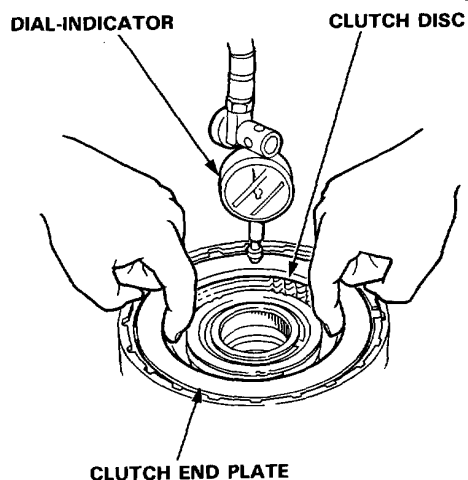
13. Check the clutch engagement by blowing air into the oil passage in the clutch drum hub. Remove the air pressure and check that the clutch releases.

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: Measure at three locations.

End Plate-to-Top Disc Clearance:

Clutch	Service Limit
1st	0.65–0.85 mm (0.026–0.033 in)
2nd	0.60–0.80 mm (0.024–0.031 in)
3rd	0.60–0.80 mm (0.024–0.031 in)
4th	0.50–0.70 mm (0.020–0.028 in)
1st-Hold	0.70–0.90 mm (0.028–0.035 in)
Reverse	0.75–0.95 mm (0.030–0.037 in)



15. If the clearance is not within the service limits, select a new clutch end plate from the appropriate 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, 2ND, 3RD and 4TH CLUTCH

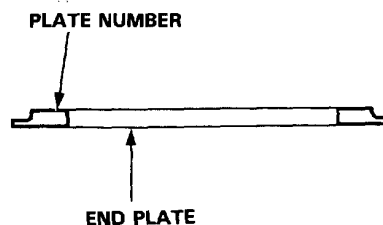
Part Number	Plate No.	Thickness mm (in)
22551–PY4–003	1	2.1 (0.083)
22552–PY4–003	2	2.2 (0.087)
22553–PY4–003	3	2.3 (0.091)
22554–PY4–003	4	2.4 (0.094)
22555–PY4–003	5	2.5 (0.098)
22556–PY4–003	6	2.6 (0.102)
22557–PY4–003	7	2.7 (0.106)
22558–PY4–003	8	2.8 (0.110)
22559–PY4–003	9	2.9 (0.114)

1ST-HOLD CLUTCH

Part Number	Plate No.	Thickness mm (in)
22351–PY4–003	L1	2.1 (0.083)
22352–PY4–003	L2	2.2 (0.087)
22353–PY4–003	L3	2.3 (0.091)
22354–PY4–003	L4	2.4 (0.094)
22355–PY4–003	L5	2.5 (0.098)
22356–PY4–003	L6	2.6 (0.102)
22357–PY4–003	L7	2.7 (0.106)
22358–PY4–003	L8	2.8 (0.110)
22359–PY4–003	L9	2.9 (0.114)

REVERSE CLUTCH

Part Number	Plate No.	Thickness mm (in)
22451–PY4–003	R1	4.1 (0.161)
22452–PY4–003	R2	4.2 (0.165)
22453–PY4–003	R3	4.3 (0.169)
22454–PY4–003	R4	4.4 (0.173)
22455–PY4–003	R5	4.5 (0.177)
22456–PY4–003	R6	4.6 (0.181)
22457–PY4–003	R7	4.7 (0.185)
22458–PY4–003	R8	4.8 (0.189)
22459–PY4–003	R9	4.9 (0.193)

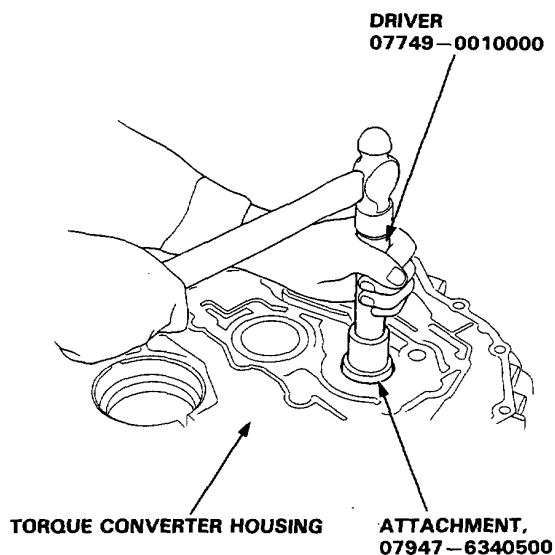




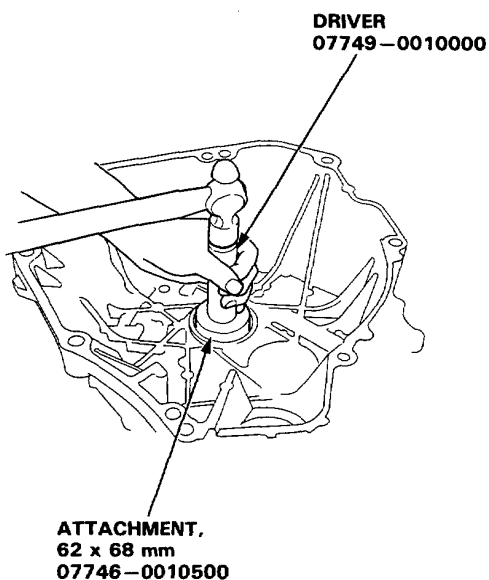
Torque Converter Housing Bearings

Mainshaft Bearing Replacement

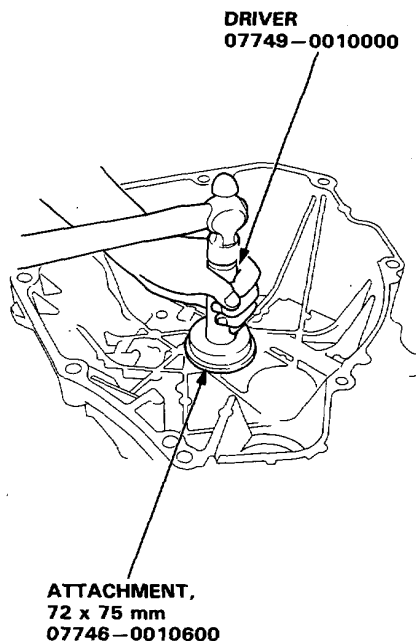
1. Drive out the mainshaft bearing and oil seal using the special tools.



2. Drive in the new mainshaft bearing until it bottoms in the housing, using the special tools.



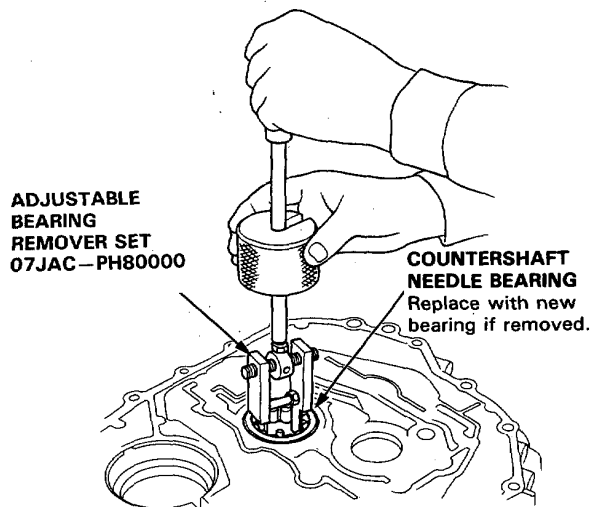
3. Install the new oil seal flush with the housing using the special tools.



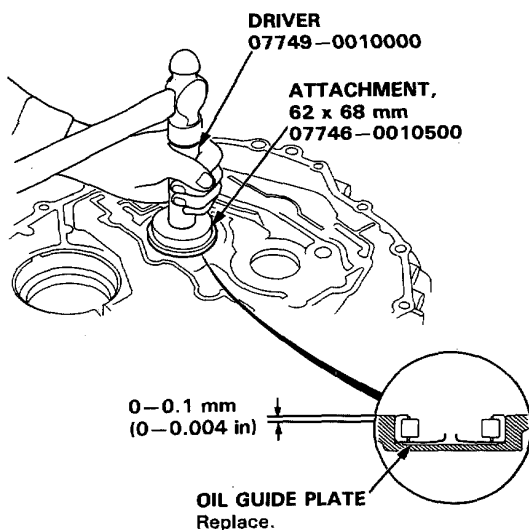
Torque Converter Housing Bearings

Countershaft Bearing Replacement

1. Remove the countershaft bearing using the special tool.



2. Replace the oil guide plate.
3. Drive the new bearing into the housing using the special tools.

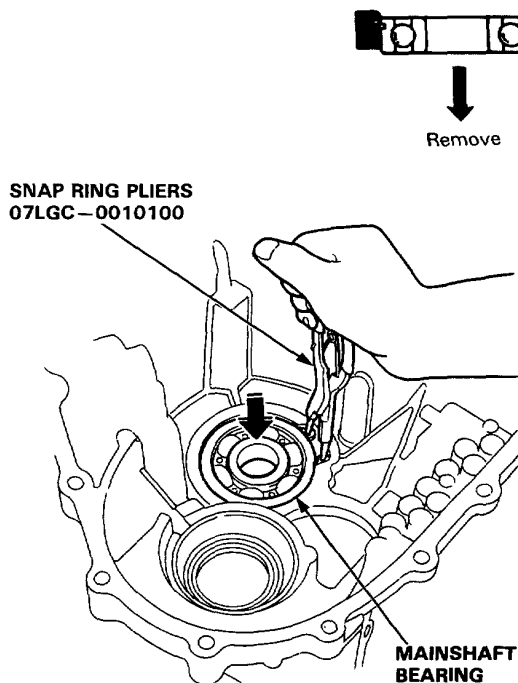


Transmission Housing Bearing

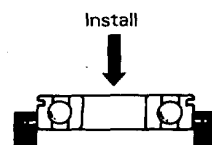
Replacement

1. To remove the mainshaft bearing from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

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



2. Expand each snap ring with the snap ring pliers, insert the new bearing part-way into it, then release the pliers. Push the bearing down into the transmission until the ring snaps in place around it.

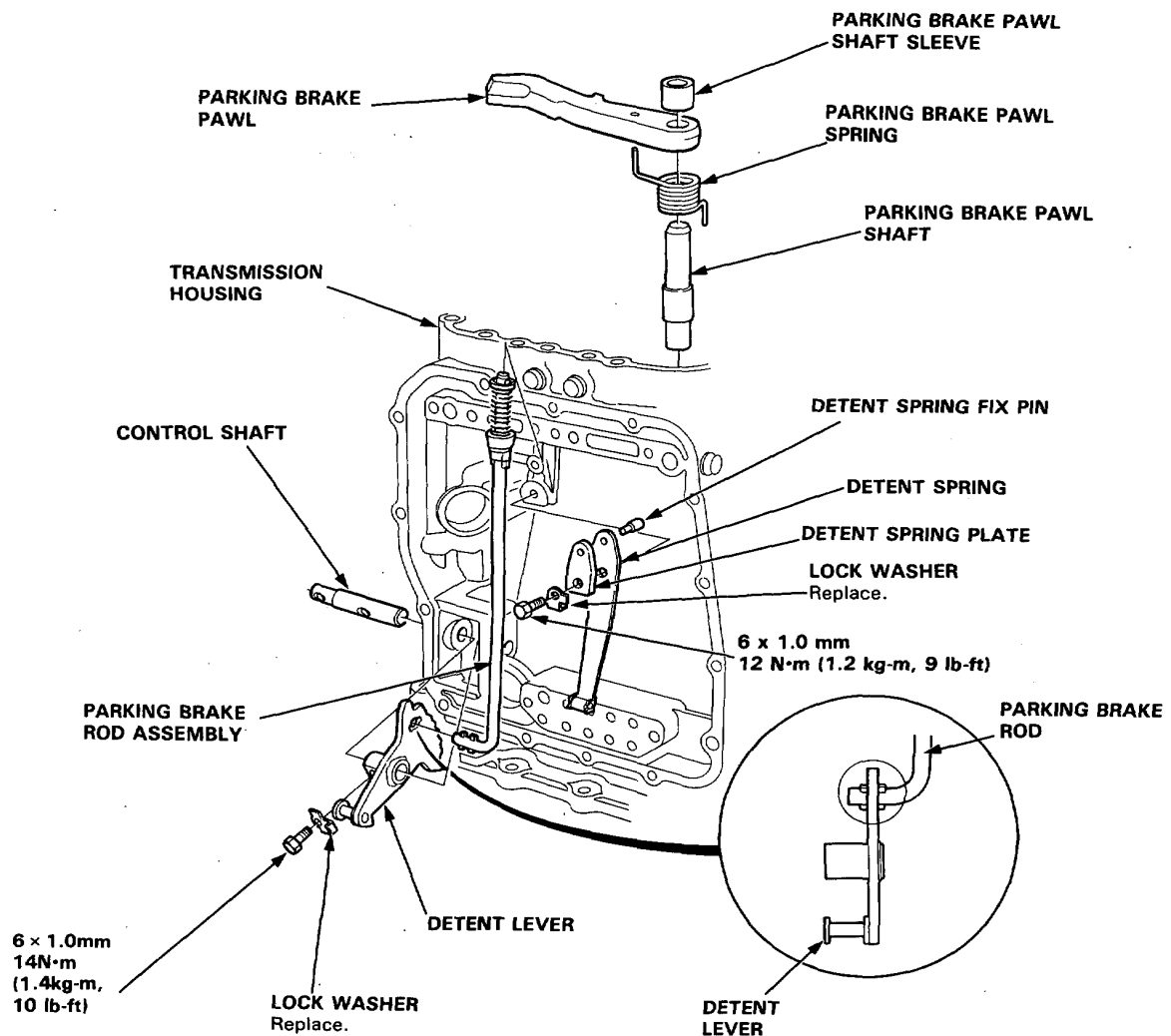




Parking Brake Mechanism

Disassembly/Inspection/Reassembly

1. Remove the parking brake pawl shaft sleeve, parking brake pawl and parking brake pawl spring.
2. Remove the control shaft.
3. Remove the detent lever and parking brake rod from the transmission housing.
4. Assemble the parking brake mechanism in the reverse order of disassembly.



Transmission

Reassembly

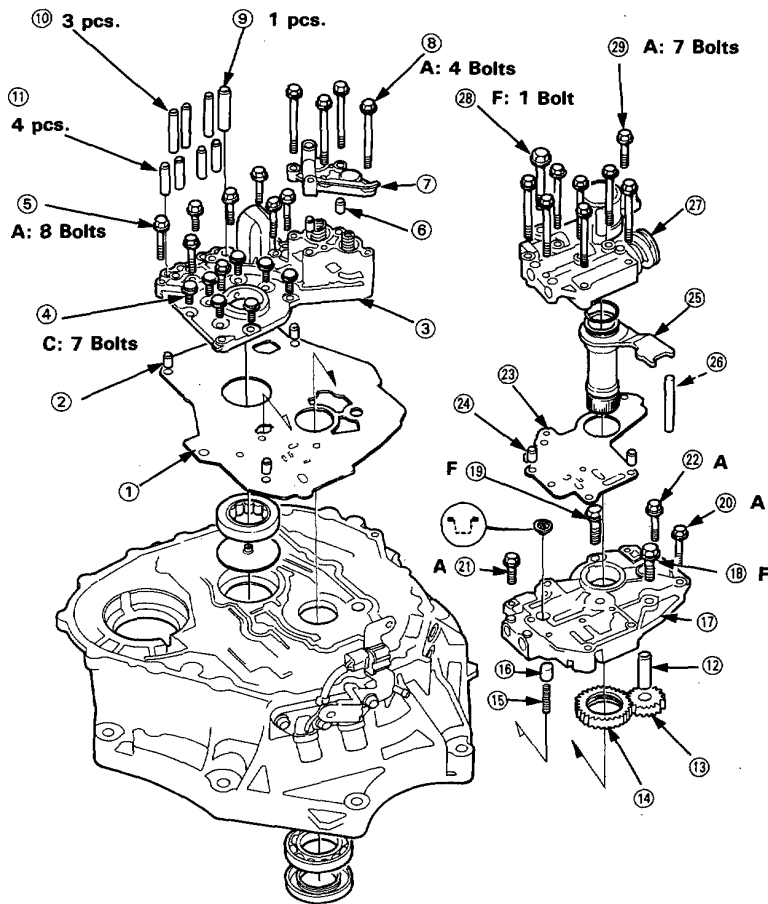
NOTE: Coat all parts with ATF.

1. Assemble the valve bodies following the numbered sequence.

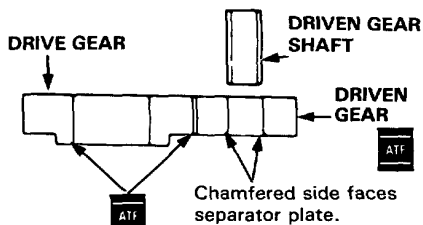
CAUTION: To prevent stripping the threads, press down on the accumulator cover while installing the bolts.

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Number
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	⑤ ⑧ ②① ②② ②③
B	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	④
C	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	⑱ ⑲ ⑳

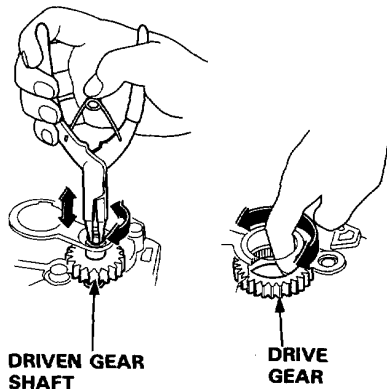


NOTE: Install the oil pump driven gear with its chamfered side facing down.



NOTE: Make sure the pump drive gear rotates smoothly in the normal operating direction and the pump shaft moves smoothly in the axial and normal operating directions.

CAUTION: If the pump gear and pump shaft do not move freely, loosen the valve body bolts, realign the shaft, and then retighten to the specified torque. Failure to align the pump shaft correctly will result in seized pump gear or pump shaft.



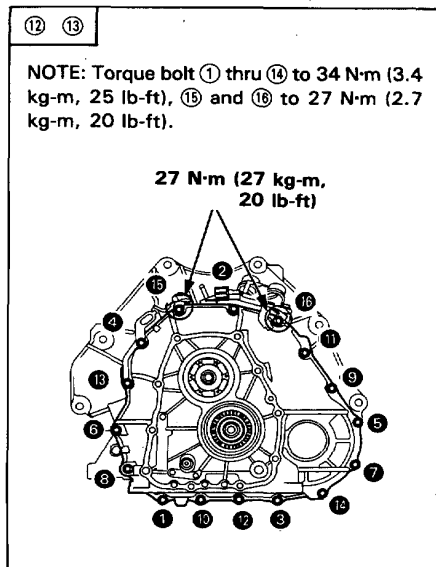
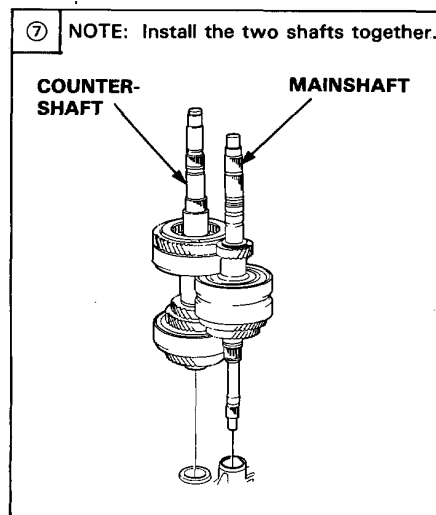
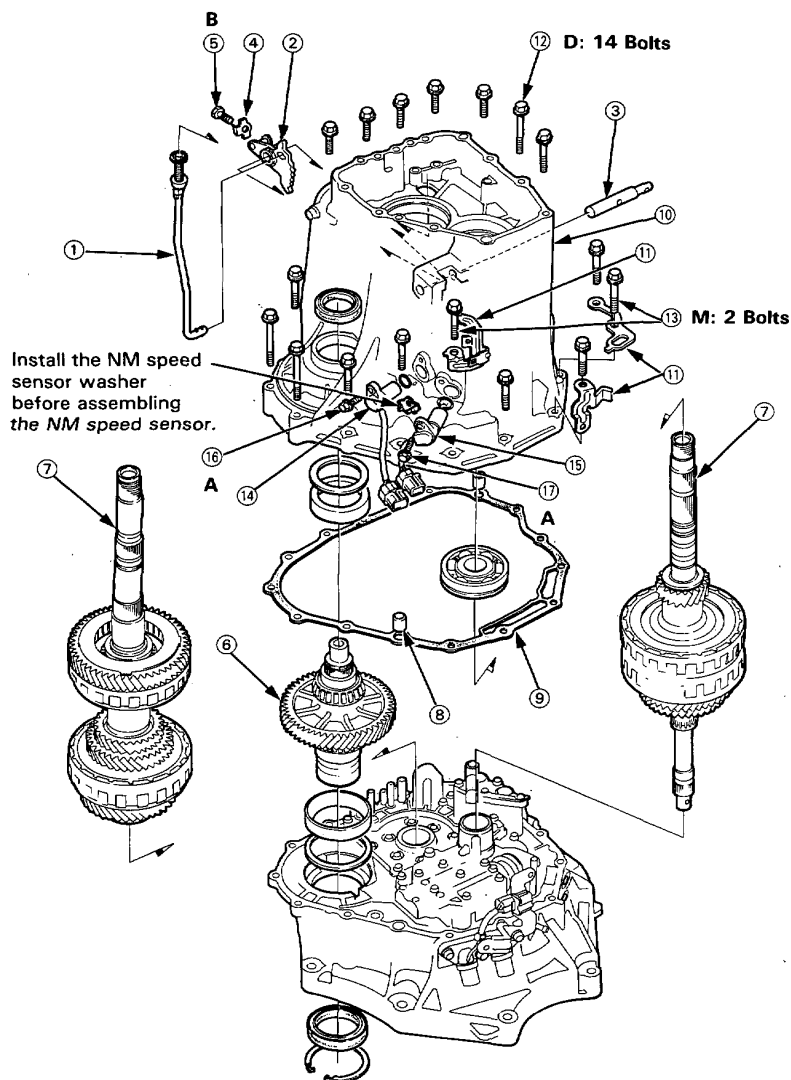


2. Assemble the transmission housing following the numbered sequence.

CAUTION: Make sure that the NM and NC speed sensors are not installed in the transmission housing before installing the transmission on the torque converter housing.

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Number
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	⑬ ⑭
B	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	⑤
D	34 N·m (3.4 kg-m, 25 lb-ft)	8 x 1.25 mm	⑫
M	27 N·m (2.7 kg-m, 20 lb-ft)	8 x 1.25 mm	⑬



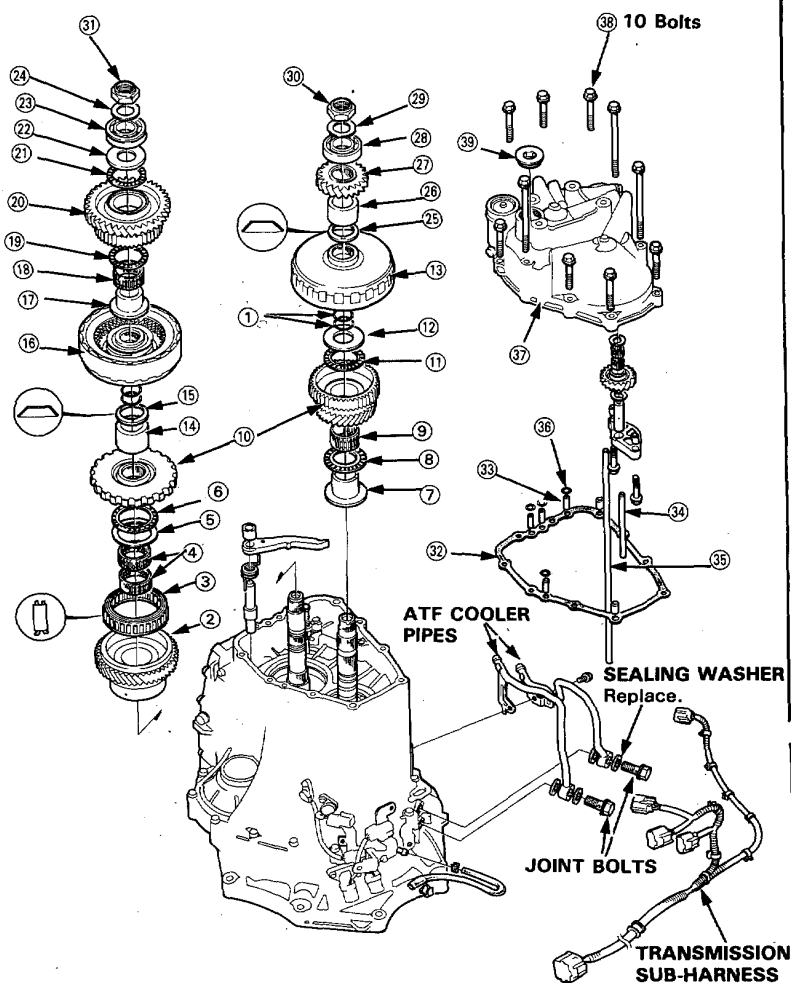
(cont'd)

Transmission

Reassembly (cont'd)

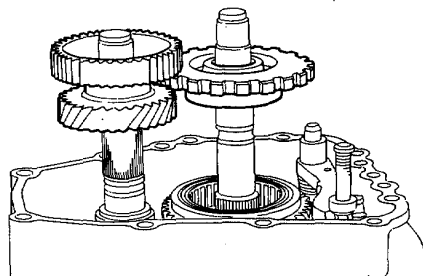
3. Assemble the rear cover following the numbered sequence.

NOTE: Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

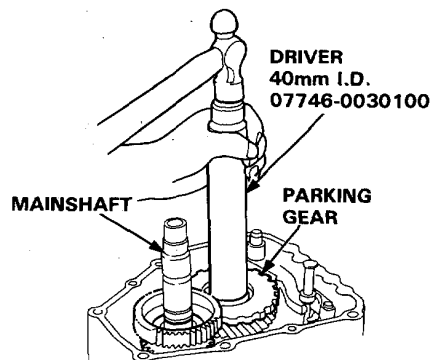


10

Combine the mainshaft 2nd gear with the parking gear.

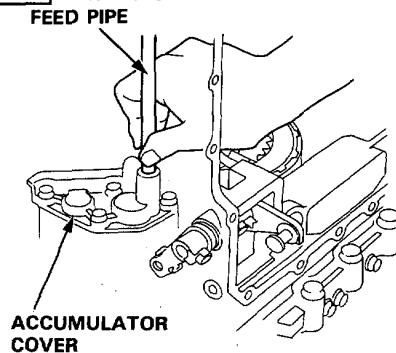


Tap the parking gear using the special tool as shown.



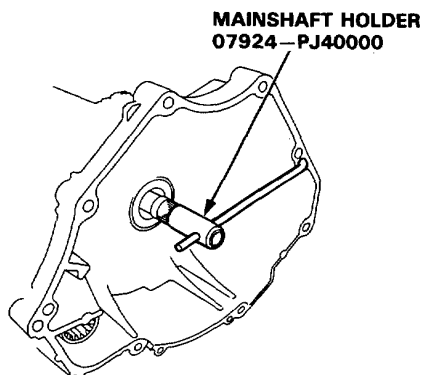
35

Install the feed pipe in the accumulator cover.





4. Install the special tool onto the mainshaft as shown, and engage the parking brake pawl with the parking gear.

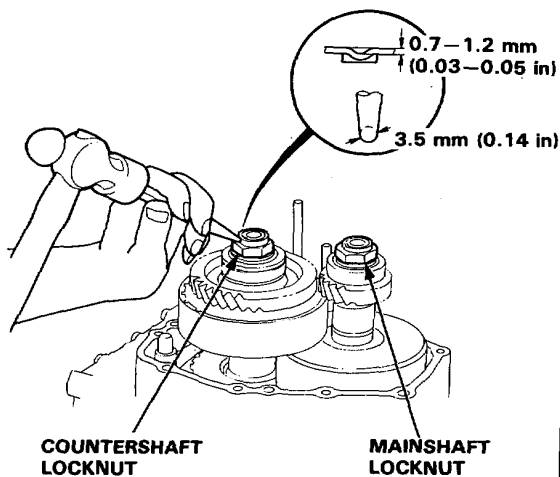


5. Install and torque the new locknuts. Tighten to specified torque, then loosen and retighten to specified torque.

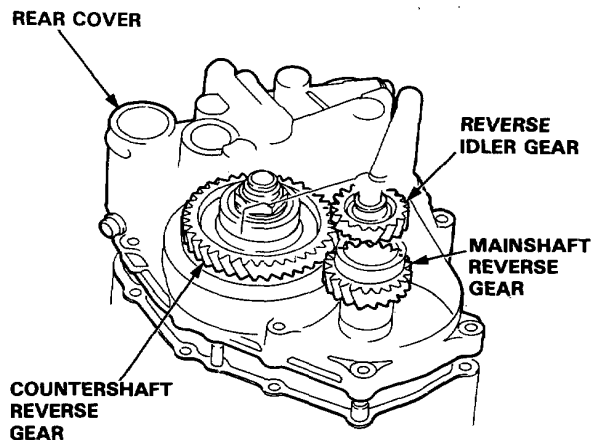
**TORQUE: 170 N·m
(17.0 kg-m, 123 lb-ft)**

NOTE: Countershaft locknut has left-hand threads.

6. Stake each locknut into its shaft, using a 3.5 mm punch.

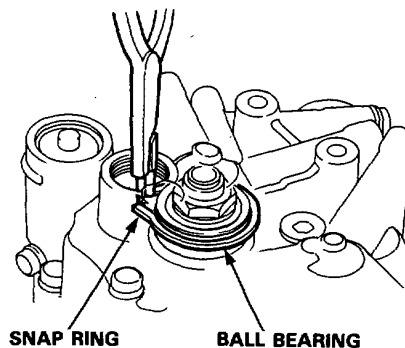


7. Install the rear cover and engage the reverse gears while rotating the mainshaft.



8. Install the snap ring in the ball bearing.

NOTE: Make sure the snap ring fits in place around the bearing. If not, raise the countershaft to fit the snap ring in place.



9. Torque the bolts on the rear cover.

TORQUE: 27 N·m (2.7 kg-m, 20 lb-ft)

10. Apply liquid gasket (P/N: OY740-99986) to the sealing bolt threads and install it on the rear cover.

TORQUE: 80 N·m (8.0 kg-m, 58 lb-ft)

(cont'd)

cardiagn.com

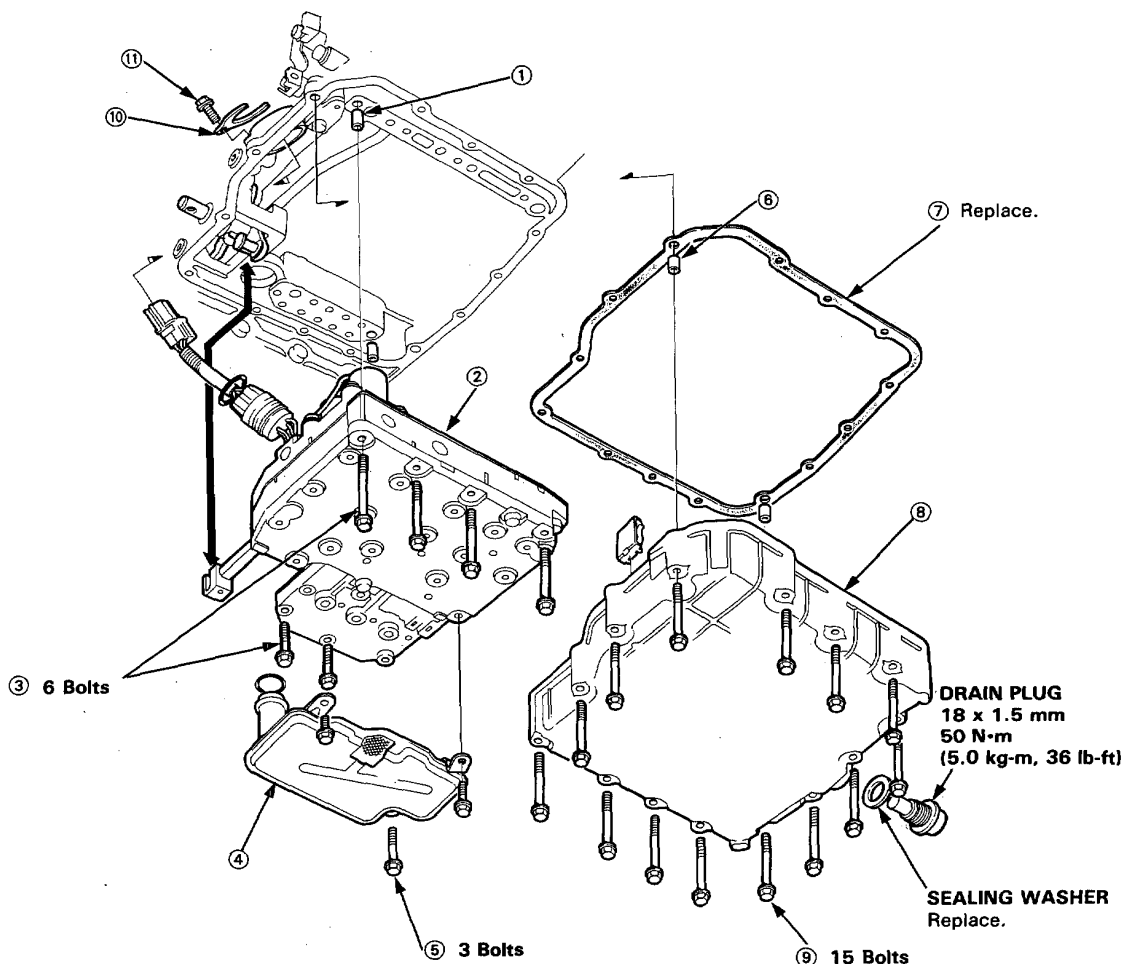
Transmission

Reassembly (cont'd)

11. Assemble the lower valve body assembly and oil pan following the numbered sequence.

NOTE: Pass the shift control solenoid valve/linear solenoid harness through the transmission housing and put the manual valve and detent lever together, then install the valve body.

TORQUE: 6 × 1.0mm; all bolts: 12N·m (1.2kg-m, 9 lb-ft)



12. Install the ATF cooler pipes and torque the joint bolts.

TORQUE: 40 N·m (4.0 kg-m, 29 lb-ft)

13. Connect the transmission sub-harness connector to the shift control solenoid valve/linear solenoid harness connector, and install it on the transmission housing.



Torque Converter

Disassembly

8 × 1.25mm
27N·m
(2.7kg-m, 20 lb-ft)

DRIVE PLATE/RING GEAR

WASHER

TORQUE CONVERTER
ASSEMBLY

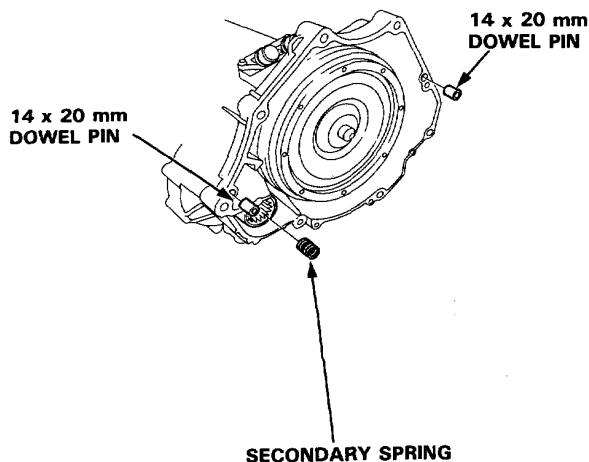
12 × 1.0mm
75N·m
(7.5kg-m, 54 lb-ft)
Torque in crisscross pattern.

O-RING
Replace.

Transmission

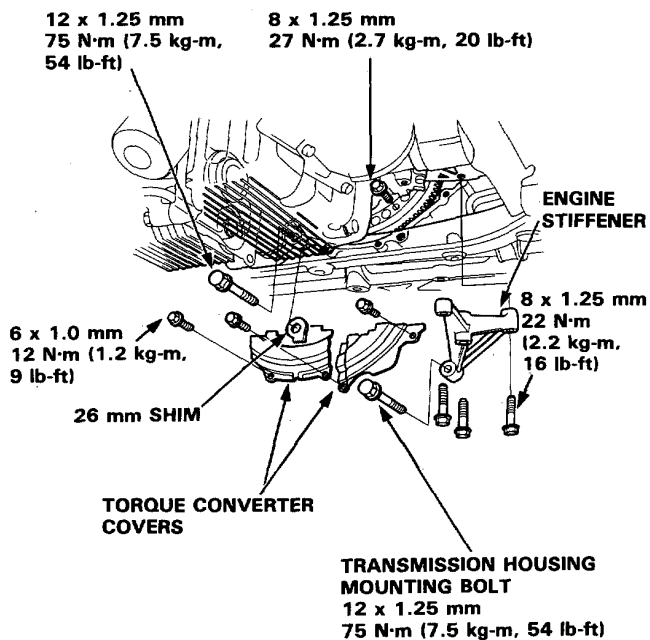
Installation

1. Install the 14 mm dowel pins in the torque converter housing.
2. Set the extension shaft, and apply Honda genuine grease UM264 (P/N 41211—PY5—305) to the shaft splines.
3. Install the secondary spring in the differential side of the extension shaft.
4. Place the transmission on a transmission jack, and raise to the engine level.



5. Install the transmission housing mounting bolt and 26 mm shim.
6. Attach the torque converter covers to the drive plate with 6 bolts and torque to 27 N·m (2.7 kg-m, 20 lb-ft). Rotate the crankshaft as necessary to tighten the bolts 1/2 of specified torque, then final torque, in a crisscross pattern. Check for free rotation after tightening the last bolt.
7. Install the torque converter covers.
8. Install the engine stiffener.

NOTE: Loosely install the engine stiffener 8 mm mounting bolts, then torque to specified torque after installing the transmission housing mounting 12 mm bolt on the engine stiffener.



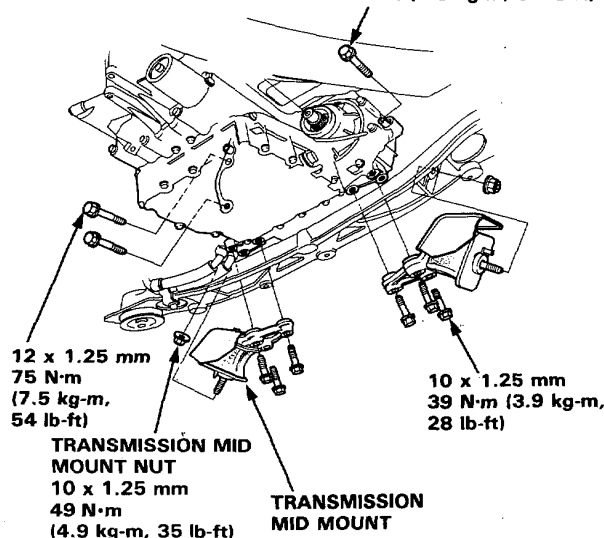


9. Install the 3 transmission housing mounting bolts.

10. Install the transmission mounting bolts and transmission mid mounts.

NOTE: Loosely install the transmission mid mount nuts, then torque to specified torque after installing the rear transmission mount bracket/mount.

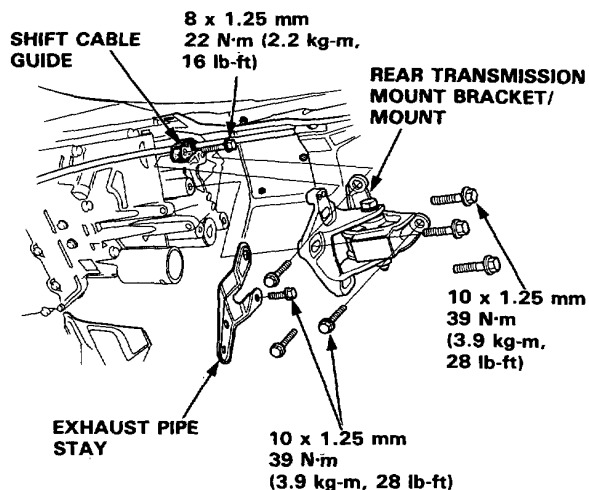
TRANSMISSION HOUSING MOUNTING BOLT
12 x 1.25 mm
75 N·m (7.5 kg-m, 54 lb-ft)



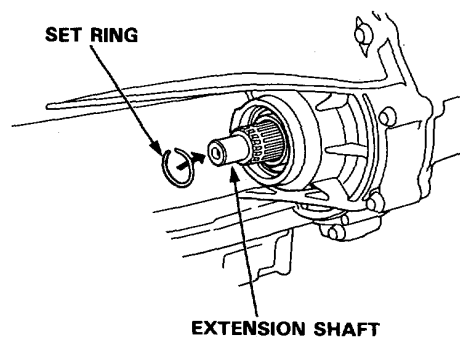
11. Install the rear transmission mount bracket/mount and exhaust pipe stay.

12. Install the shift cable guide.

13. Torque the transmission mid mount nuts to specified torque as shown in step 10.



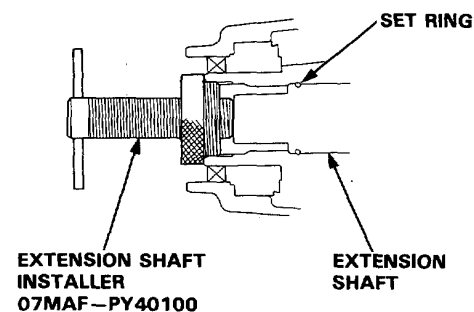
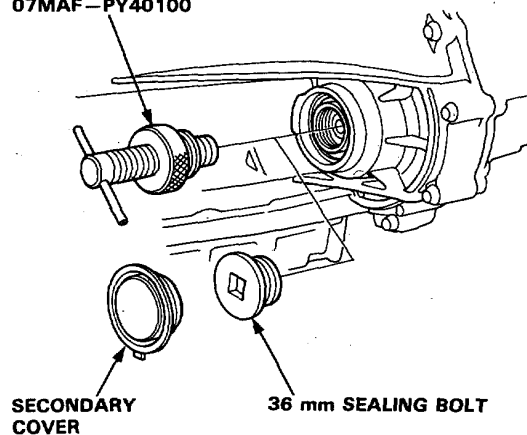
14. Install a new set ring in the extension shaft groove.



15. Install the extension shaft using the special tool as shown.

NOTE: Make sure that the secondary spring is installed, and the extension shaft locks securely in the secondary gear shaft.

EXTENSION SHAFT INSTALLER
07MAF-PY40100



(cont'd)

Transmission

Installation (cont'd)

16. Fill the opening between the secondary gear shaft and extension shaft with Honda genuine grease UM264 (P/N 41211-PY5-305), as shown.
17. Apply liquid gasket (P/N OY740-99986) to the 36 mm sealing bolt threads.
18. Install the 36 mm sealing bolt and secondary cover on the transmission housing.

NOTE: Shift to P position rotating the control shaft.

**HONDA GENUINE GREASE
UM264 (P/N 41211-PY5-305)
12-14g**

**SECONDARY
COVER**

36 mm SEALING BOLT

Apply liquid gasket.

60-100 N·m

(6.0-10.0 kg-m, 43-72 lb-ft)

19. Remove the steering gearbox mounting bolts, then install the lower plate.

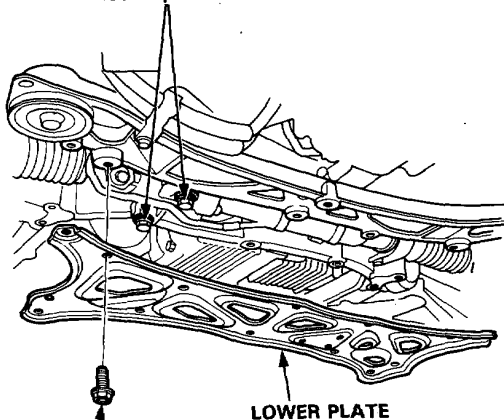
NOTE: LHD is shown. The location of the steering gearbox mounting bolts on the RHD are symmetrical.

☆: **Corrosion resistant bolt**

☆ 10 x 1.25 mm

60 N·m (6.0 kg-m, 43 lb-ft)

Remove these bolts
before installing the
lower plate.

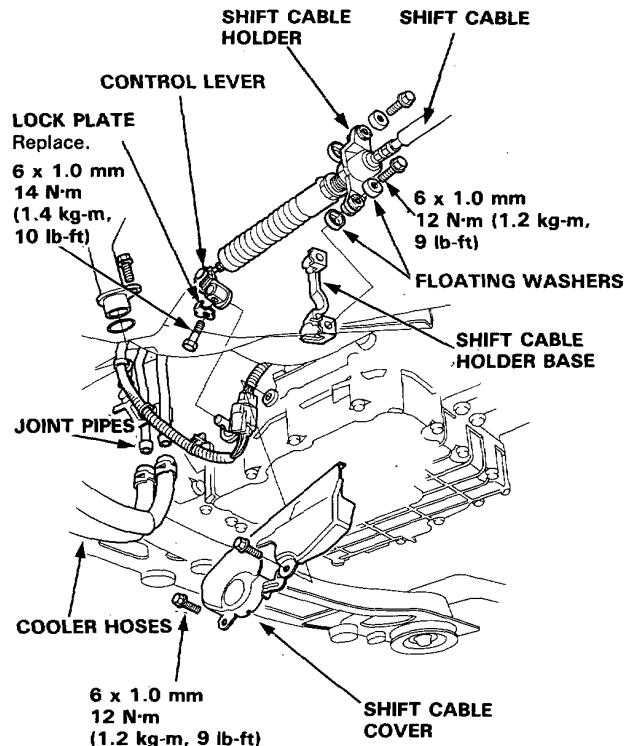


☆ 10 x 1.25 mm

39 N·m (3.9 kg-m, 28 lb-ft)

20. Install the control lever to the control shaft with a new lock plate. Bend the lock plate after installing the bolt.
21. Install the shift cable holder on the shift cable holder base.
22. Install the shift cable cover.
23. Connect the cooler hoses to joint pipes.
24. Connect the shift control solenoid valve/linear solenoid connector to the transmission sub-harness connector. Then install the connector on the shift cable cover.

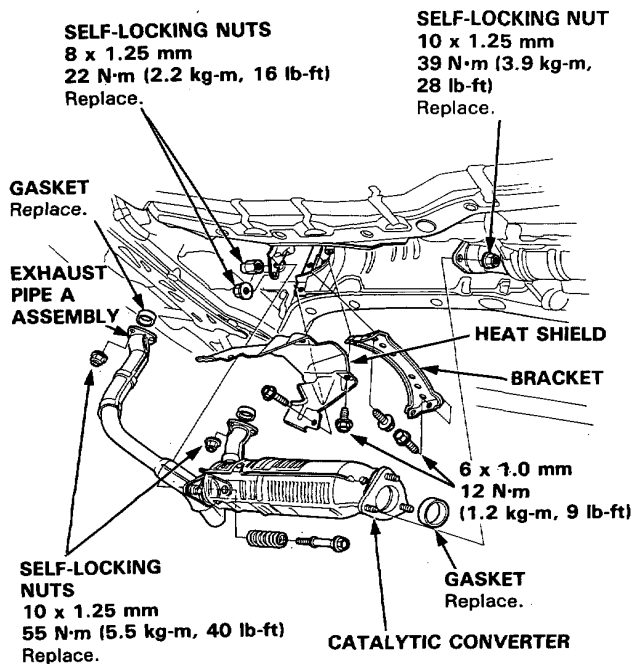
CAUTION: Take care not to bend the cable when removing/installing it.





25. Install the bracket and heat shield.

26. Install the exhaust pipe A assembly and the catalytic converter.



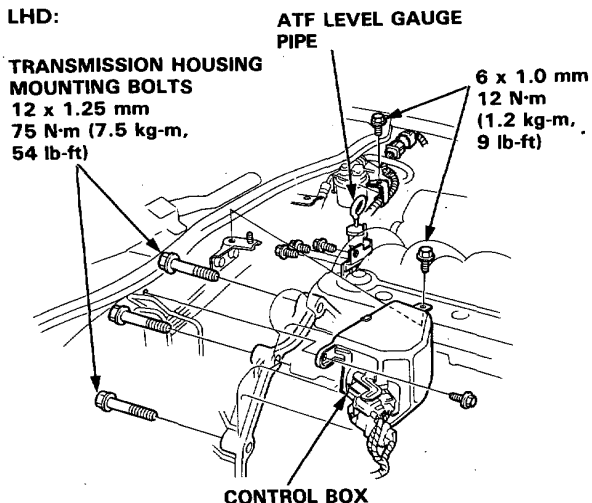
27. Install the transmission housing mounting bolts.

28. Install the ATF level gauge pipe and level gauge.

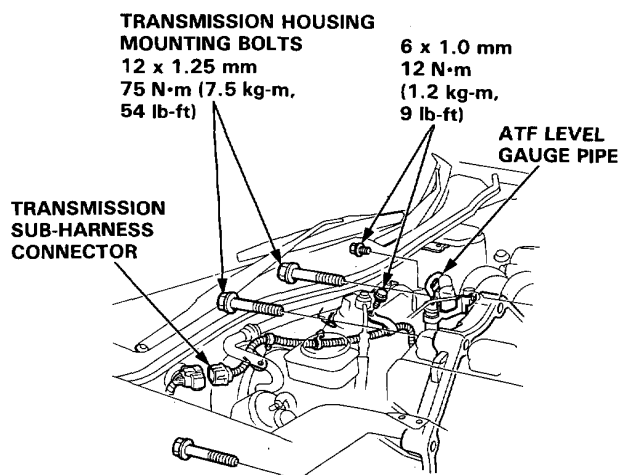
29. Connect the transmission sub-harness connector.

30. Install the control box. (LHD only)

LHD:



RHD:



31. Install the strut bar.

32. Refill the transmission with ATF.

33. Connect the battery positive (+) and negative (-) cables to the battery.

34. Start the engine. Set the parking brake, and shift the transmission through all gears three times. Check for proper shift cable adjustment.

35. Let the engine reach operating temperature with the transmission in Neutral or Park, then turn it off and check fluid level.

36. Road test as described on pages 14-88 thru 90.

Shift Cable

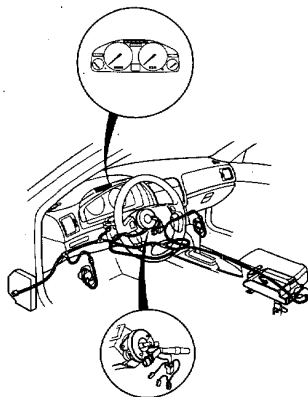
Removal/Installation

SRS wire harness is routed near the gearshift selector.

⚠ WARNING All SRS wire harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.

CAUTION: Be careful not to damage the SRS wire harness when servicing the gearshift selector.

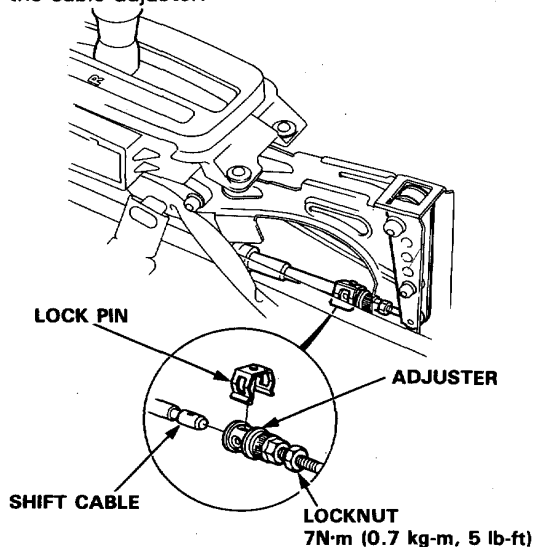
NOTE: LHD is shown; RHD is similar.



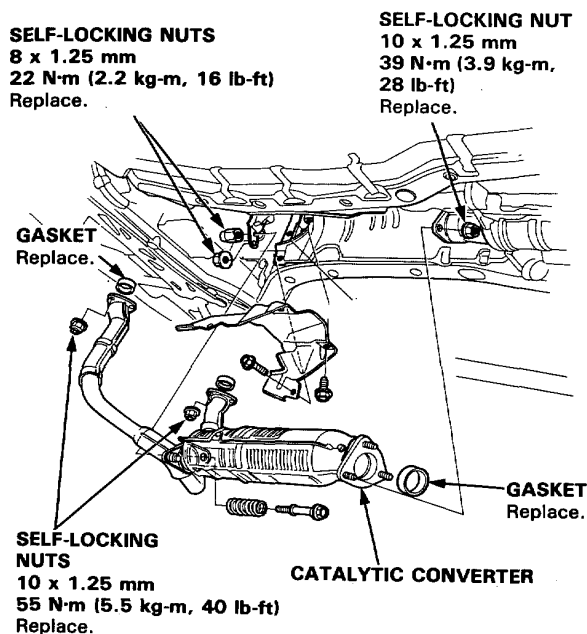
⚠ WARNING

- Make sure lifts, jacks and safety stands are placed properly (See Section 1).
- Apply parking brake and block rear wheels, so the car will not roll off stands and fall while you are working under it.

1. Remove the center console (See Section 20).
2. Shift to **R** position, then remove the lock pin from the cable adjuster.

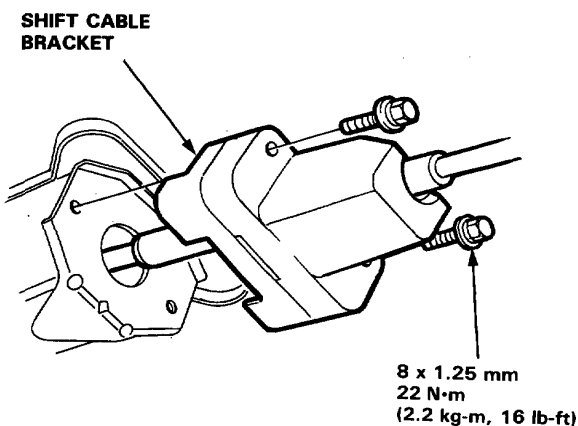


3. Remove the exhaust pipe A assembly, catalytic converter and heat shield.



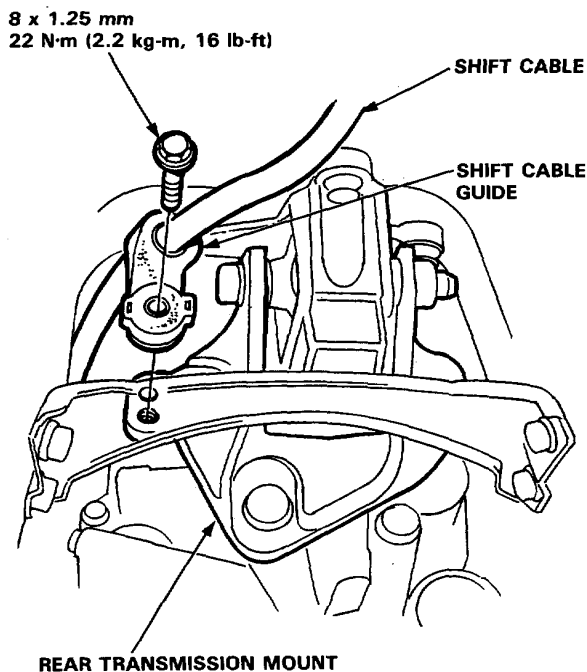
4. Remove the shift cable bracket.

CAUTION: Take care not to bend the cable when removing/installing it.

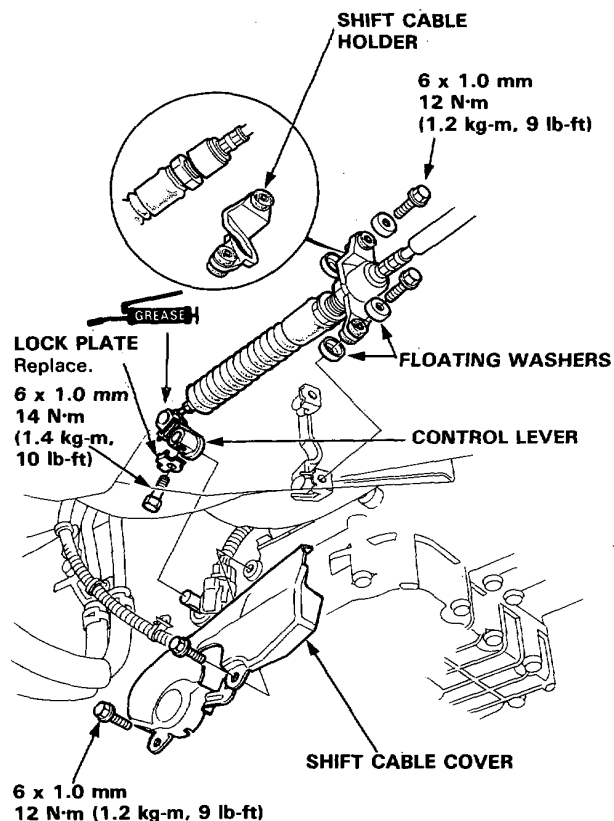




5. Remove the shift cable guide from the rear transmission mount.



6. Remove the shift cable cover.
7. Remove the shift cable holder from the shift cable holder base and from the shift cable.
8. Remove the control lever from the control shaft.
9. Remove the shift cable.



10. Install the shift cable in the reverse order of removal.
11. Check the cable adjustment on reassembly, on page 14-168.

Shift Cable

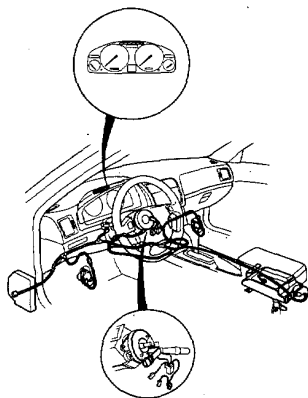
Adjustment

SRS wire harness is routed near the gearshift selector.

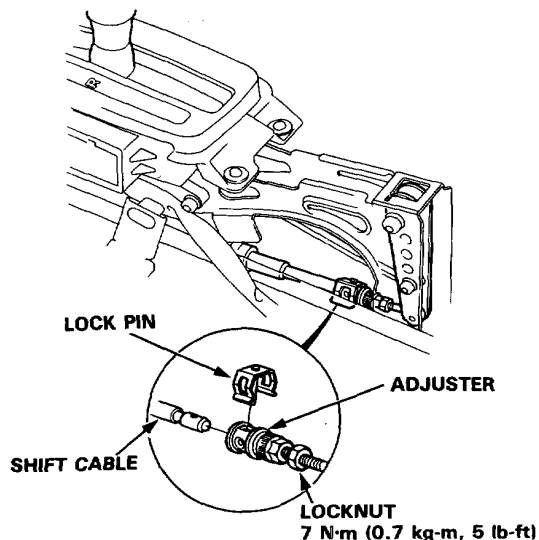
⚠ WARNING All SRS wire harnesses and connectors are colored yellow. Do not use electrical test equipment on these circuits.

CAUTION: Be careful not to damage the SRS wire harness when servicing the gearshift selector.

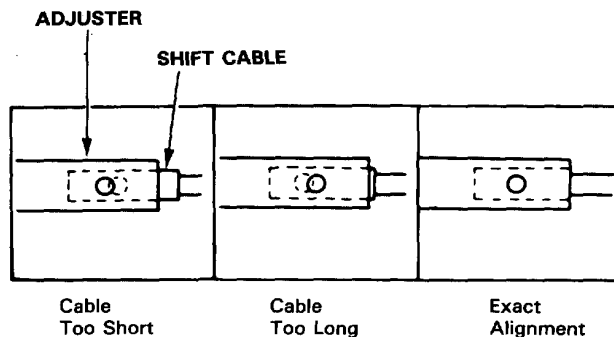
NOTE: LHD is shown; RHD is similar.



1. Start the engine. Shift to reverse to see if the reverse gear engages. If not, refer to troubleshooting.
2. With the engine off, remove the console. (See Section 20.)
3. Shift to **R** position, then remove the lock pin from the cable adjuster.



4. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable.



NOTE: There are two holes in the end of the shift cable. They are positioned 90° apart to allow cable adjustments in 1/4 turn increments.

5. If not perfectly aligned, loosen the locknut on shift cable and adjust as required.
6. Tighten the locknut.
7. Install the lock pin on the adjuster.

NOTE: If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.

8. Start the engine and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting on page 14-82 thru 85.



Gearshift Selector

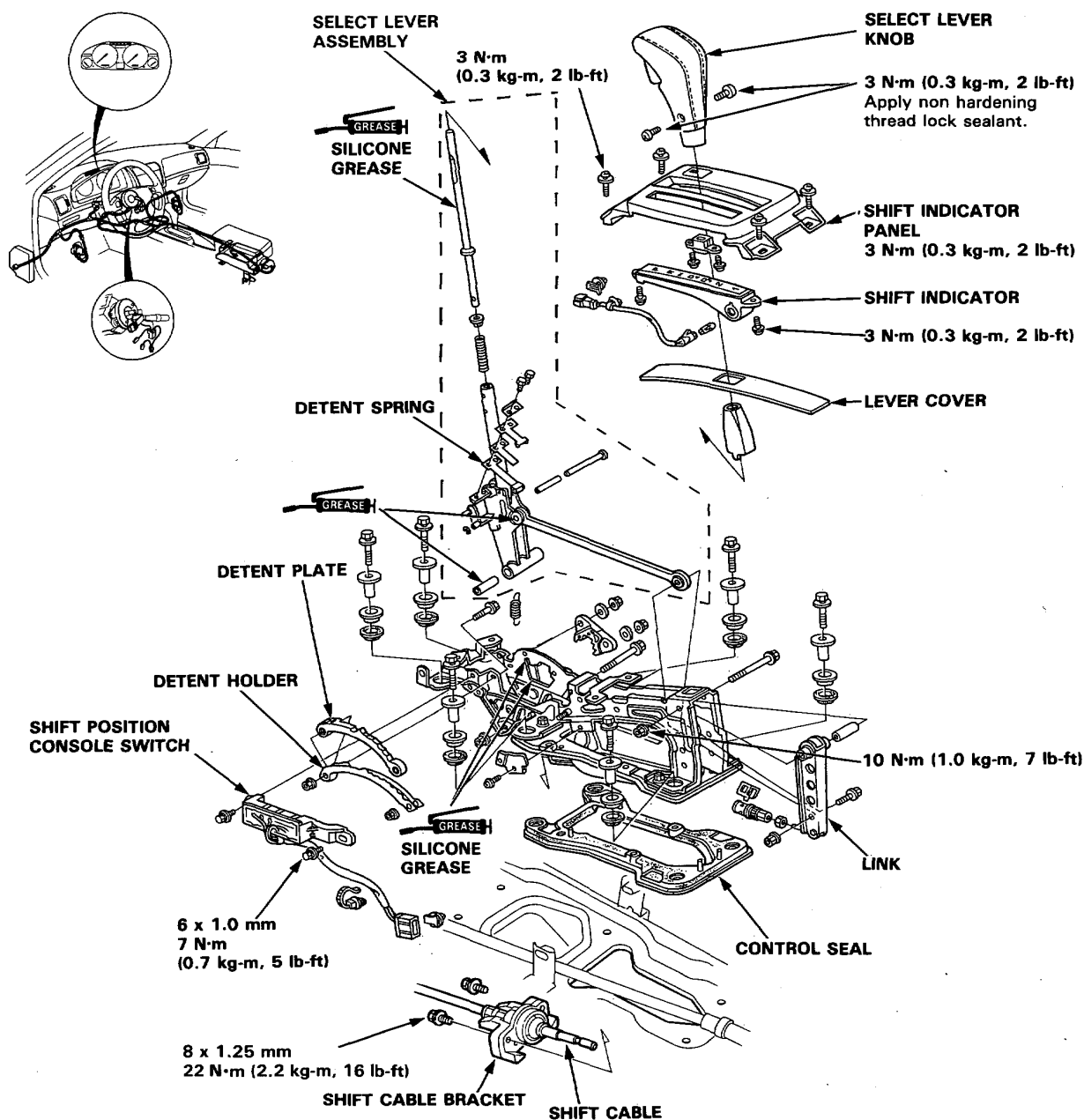
Disassembly/Reassembly

SRS wire harness is routed near the gearshift selector.

⚠ WARNING All SRS wire harnesses and connectors are colored yellow. Do not use electrical test equipment on these circuits.

CAUTION: Be careful not to damage the SRS wire harness when servicing the gearshift selector.

NOTE: LHD is shown; RHD is symmetrical.



Gearshift Selector

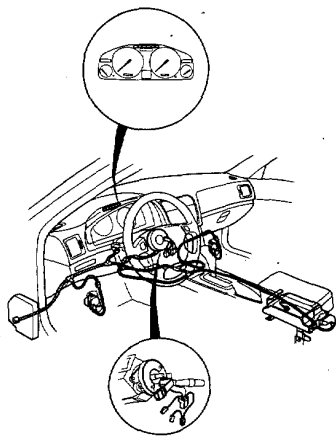
Inspection/Adjustment

SRS wire harness is routed near the gearshift selector.

⚠ WARNING All SRS wire harnesses and connectors are colored yellow. Do not use electrical test equipment on these circuits.

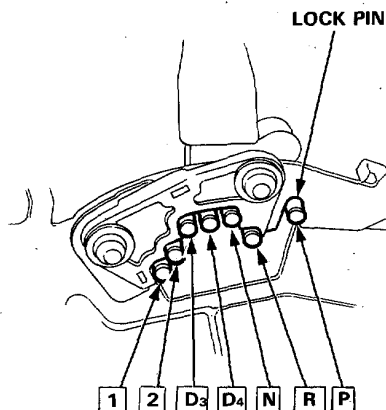
CAUTION: Be careful not to damage the SRS wire harness when servicing the gearshift selector.

NOTE: LHD is shown; RHD is similar.



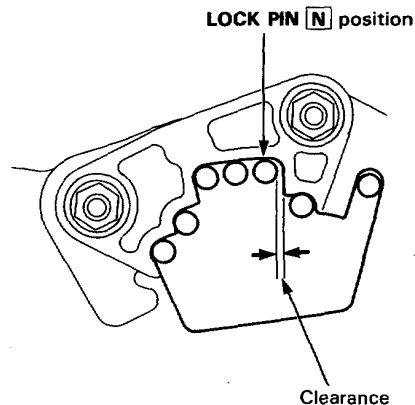
NOTE: Inspect the detent spring adjustment when replacing the selector lever.

1. Install the selector lever assembly onto the selector lever bracket.
2. Verify the gearshift selector movement.



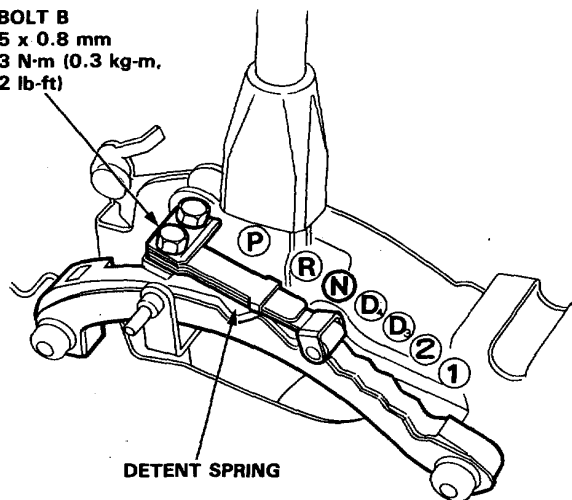
3. Shift the select lever to **N** position.
4. Measure the clearance between the lock pin and lock pin gate as shown.

Specification: 0.2–0.5 mm (0.008–0.020 in)



5. If the clearance is out of specification, loosen the bolt B and adjust.

BOLT B
5 x 0.8 mm
3 N·m (0.3 kg·m,
2 lb·ft)



NOTE: Verify the gearshift selector movement after adjusting.



Shift Indicator Panel

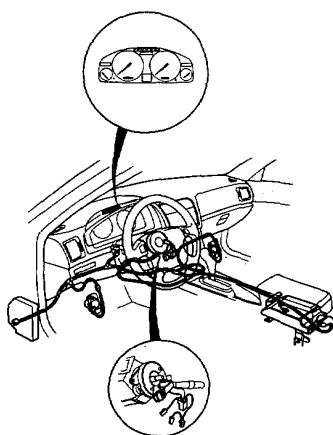
Adjustment

SRS wire harness is routed near the gearshift selector.

⚠ WARNING All SRS wire harnesses and connectors are colored yellow. Do not use electrical test equipment on these circuits.

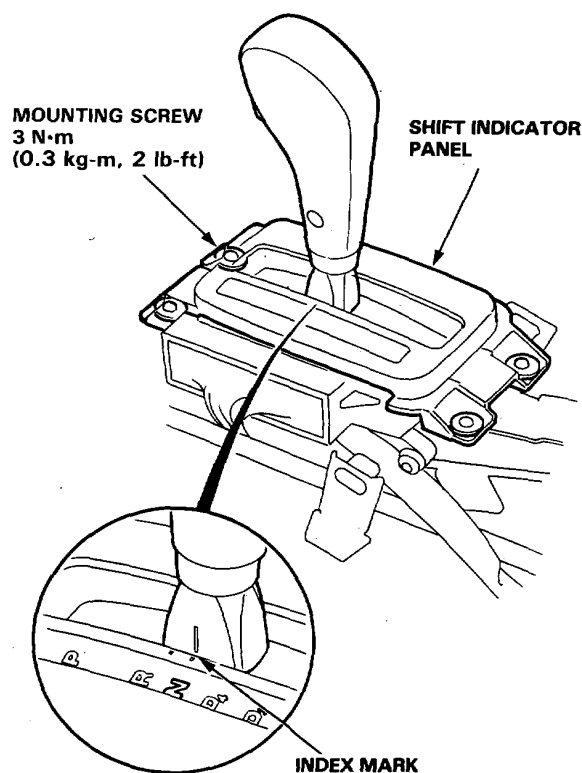
CAUTION: Be careful not to damage the SRS wire harness when servicing the shift indicator panel.

NOTE: LHD is shown; RHD is similar.



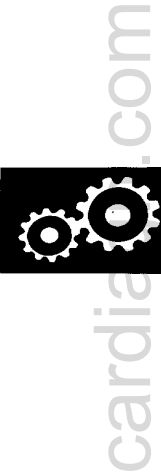
1. Check that the index mark of the indicator aligns with the N mark of the shift indicator panel with the transmission in NEUTRAL.
2. If not aligned, remove the center console panel. (See section 20.)
3. Remove the shift indicator panel mounting screws and adjust by moving the panel.

NOTE: Whenever the shift indicator panel is removed, reinstall the panel as described above.



Differential

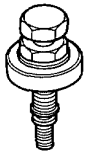
Special Tools	15-2
Troubleshooting	15-3
Maintenance	15-4
Differential Assembly	
Removal/Installation	15-5
Differential	
Illustrated Index	15-7
Inspection	15-8
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Differential	
Reassembly	15-16
Drive Pinion	
Height Adjustment	15-22
Ring Gear Tooth Contact	
Adjustment	15-23
Ring Gear Backlash	
Adjustment	15-24



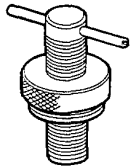
Special Tools

Special Tools

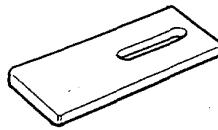
Ref. No.	Tool Number	Description	Qty	Remarks
①	07LAC—PW50100	Extension Shaft Puller	1	
②	07MAF—PY40100	Extension Shaft Installer	1	
③	07979—PJ40001	Magnet Stand Base	1	
④	07LAA—SM40200	Locknut Wrench	1	
⑤	07749—0010000	Outer Handle A	1	
⑥	07GAD—PG40100	Oil Seal Driver	1	
⑦	07746—0030100	Inner Handle C	1	
⑧	07KAF—PS30200	Bearing Race Remover	1	
⑨	07MAD—PR90100	Attachment, 45 x 55 mm	1	
⑩	07744—0010400	Pin Driver, 5.0 mm	1	
⑪	07746—0030400	Inner Driver, 35 mm	1	
⑫	07MAF—SP00100	Bearing Race Installer	1	
⑫-1	07MAF—SP00110	Bearing Race Installer A	(1)	} Component Tools
⑫-2	07MAF—SP00120	Bearing Race Installer B	(1)	
⑫-3	07JAF—SJ80120	Nut	(1)	
⑫-4	07JAF—SJ80110	Shaft	(1)	
⑬	07GAD—SD40101	Attachment, 78 x 90 mm	1	
⑭	07MAD—SP00200	Pinion Seal Driver	1	
⑮	07965—SA00600	Oil Seal Driver	1	
⑯	07MAD—PR90200	Pilot Driver, 32 x 50 mm	1	



①



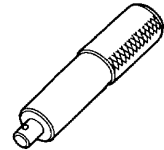
②



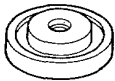
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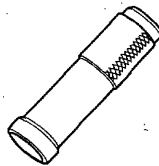
④



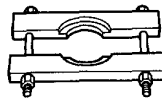
⑤



⑥



⑦



⑧



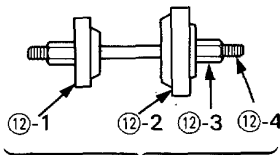
⑨



⑩



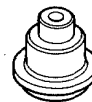
⑪



⑫



⑬



⑭



⑮



⑯

Differential

Troubleshooting



NOTE:

Most problems in the unit are to be diagnosed by identifying noises from the gears or bearings.

Care should be taken during diagnosis not to confuse differential noises with those from other drivetrain components.

[Noise symptoms will be most prominent]

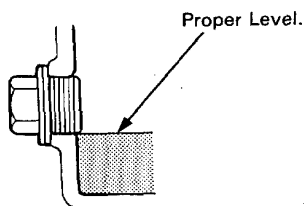
Symptom	Probable Cause	Remedy
Consistent noise during cruising	- Lack of oil - Foreign matter stuck in gears, etc. - Improper tooth contact between ring gear and drive pinion - Worn or damaged side bearing - Deformed ring gear or carrier	- Replenish oil - Clean and inspect - Adjust or replace - Replace any damaged or faulty parts
Gear noises while accelerating	- Lack of oil - Foreign matter stuck in gears, etc. - Improper drive pinion preload - Chipped or damaged gears	- Replenish oil - Clean and inspect - Replace
Gear noises while coasting or accelerating	- Improper drive pinion preload - Damaged or chipped gears	Adjust or replace
Bearing noises while accelerating or coasting/deceleration	Cracked or damaged drive pinion bearing or side bearing	Replace
Abnormal noises when rounding a curve	- Worn (excessive play) or damaged side bearing - Damaged side gear, pinion, or pinion shaft	Replace
Abnormal noises during acceleration or when first driving away from a stop.	- Excessive backlash between ring gear and drive pinion. - Improper ring gear or drive pinion preload - Excessive pinion backlash - Worn differential splines - Loose companion flange nuts and other fasteners	- Adjust - Replace - Recheck torque or replace
Oil leak	- Oil level too high - Clogged breather hole - Loose carrier or inadequate sealing - Worn or damaged oil seal	- Lower to proper level - Clean or replace - Recheck torque or apply sealant - Replace
Overheating	- Lack of oil - Insufficient ring gear-to-pinion backlash - Excessive ring gear or drive pinion preload - Chipped or damage oil cooler	- Replenish - Adjust - Adjust or replace - Replace
Coolant leak	Inadequate hose or clamp	Recheck torque or replace

Maintenance

Differential Oil

NOTE: Check the oil at operating temperature, engine OFF, and the car on level ground.

1. Remove the oil filler plug, then check the level and condition of the oil.



2. The oil level must be up to the fill hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug.
3. If the oil is dirty, remove drain plug and drain the differential oil.
4. Reinstall the drain plug with a new washer, and refill to proper level.

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

5. Reinstall the oil filler plug with a new washer.

Oil Capacity

1.05 l (1.11 U.S. qt.) after drain.

1.10 l (1.16 U.S. qt.) after overhaul.

Recommended oil:

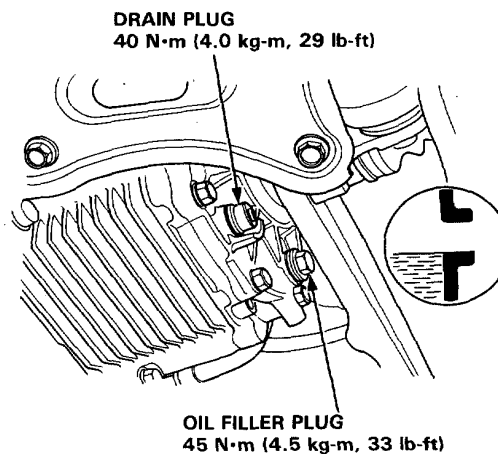
Hypoid gear oil

API Classification GL4 or GL5 ✓

viscosity

SAE #90 above -18°C (-0.4°F)

SAE #80 or SAE 80 W 90 below -18°C (-0.4°F)





Differential Assembly

Removal/Installation

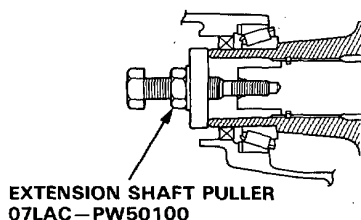
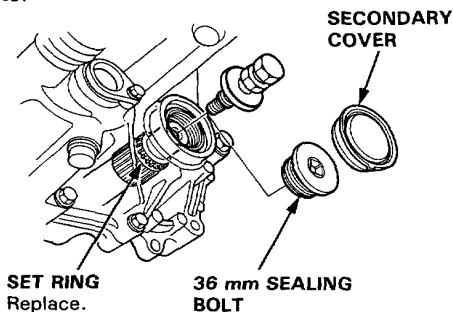
⚠ WARNING

- Make sure jacks and safety stands are placed properly, and hoist brackets are attached to correct positions on the engine.
- Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Drain the coolant. (See section 10)
2. Remove drain plug and drain differential oil (page 15-4).
3. Remove the driveshafts and intermediate shaft (See section 16).
4. Remove the lower plate.

NOTE: Install the steering gear box mounting bolts.



Set this bolt and breather hose clamp (A/T) into the bolt hole before installing the differential assembly.

12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

26 mm SHIM

First tighten.

12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

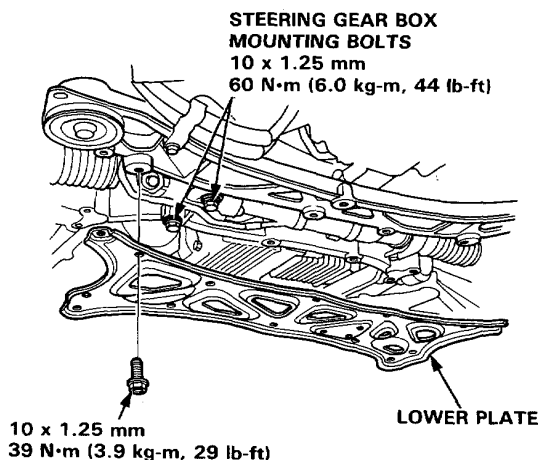
5. Remove the speed sensor.

NOTE: Do not disconnect the hoses.

6. Disconnect the oil cooler hoses at joint pipes.
7. Remove the secondary cover and 36 mm sealing bolt.

NOTE: Shift to low gear or **P** position to lock the secondary gear.

8. Disconnect the extension shaft from the differential using the special tool.
9. Remove the mounting bolts and 26 mm shim, then remove the differential assembly.



O-RING
Replace.

6 x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)

SPEED SENSOR

O-RING
Replace.

(cont'd)

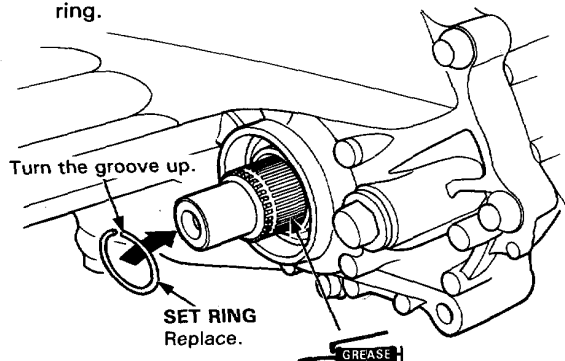
Differential Assembly

Removal/Installation (cont'd)

10. Install the differential assembly in the reverse order of removal, and as follows.

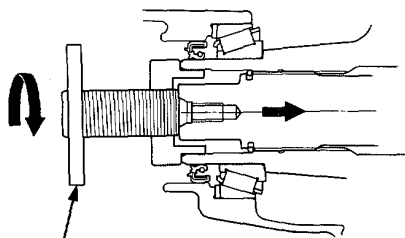
• EXTENSION SHAFT, 36 mm SEALING BOLT

- 1. Apply Genuine Honda UM264 grease to the spline of the extension shaft, then install the new set ring.



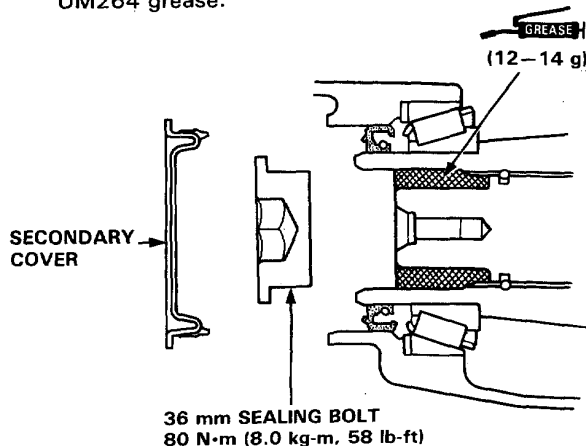
- 2. Install the extension shaft using the special tool as shown.

NOTE: Make sure extension locks in the secondary gear.



EXTENSION SHAFT INSTALLER
07MAF-PY40100

- 3. Fill the secondary gear with Genuine Honda UM264 grease.

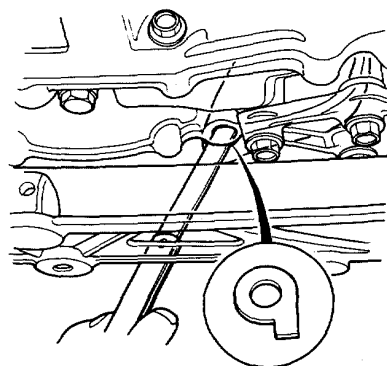


- 4. Install the 36 mm sealing bolt and secondary cover.

NOTE: Apply liquid gasket (P/N 08718-0001) to the threads.

• ADJUSTING THE 26 mm SHIM

- 1. Install the differential assembly.
—2. Measure the clearance between the differential and transmission.



- 3. Select shim from the following table.

26 mm SHIM

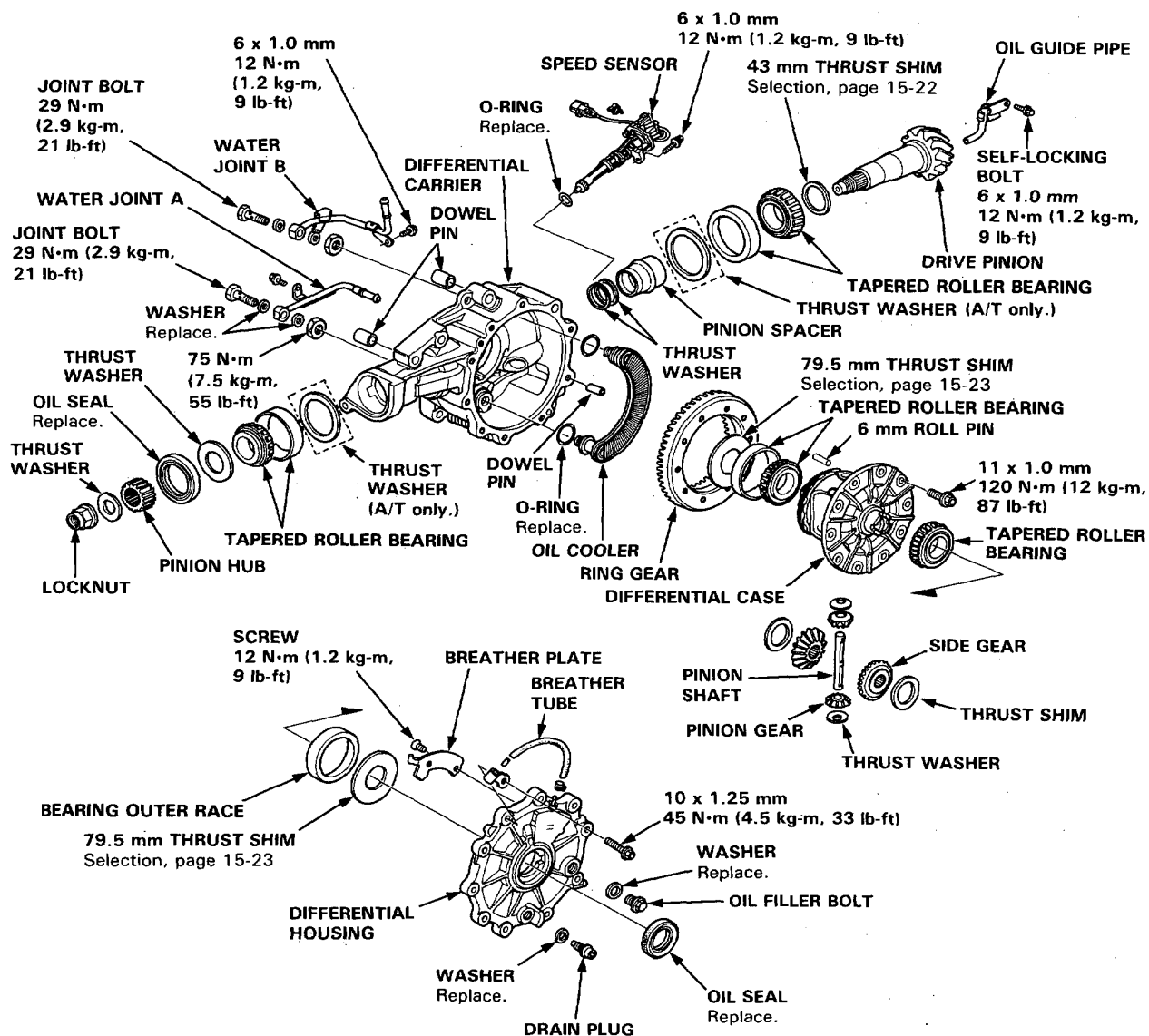
Part Number	Thickness	Measurement Value
41432-PY4-000	1.9 mm (0.0748 in.)	1.99-1.9 mm
41433-PY4-000	2.0 mm (0.0787 in.)	2.09-2.0 mm
41434-PY4-000	2.1 mm (0.0827 in.)	2.19-2.1 mm
41435-PY4-000	2.2 mm (0.0866 in.)	2.29-2.2 mm
41436-PY4-000	2.3 mm (0.0906 in.)	2.39-2.3 mm
41437-PY4-000	2.4 mm (0.0945 in.)	2.49-2.4 mm
41438-PY4-000	2.5 mm (0.0984 in.)	2.59-2.5 mm
41439-PY4-000	2.6 mm (0.1024 in.)	2.69-2.6 mm
41440-PY4-000	2.7 mm (0.1063 in.)	2.79-2.7 mm
41441-PY4-000	2.8 mm (0.1102 in.)	2.89-2.8 mm
41442-PY4-000	2.9 mm (0.1142 in.)	2.99-2.9 mm
41443-PY4-000	3.0 mm (0.1181 in.)	3.09-3.0 mm

11. Check the following items after reassembly.
- 1. Transmission has been refilled.
 - 2. Coolant has been refilled.
 - 3. The clip at the tip of the drive shafts is completely inserted into the groove of the differential or intermediate shaft.

Differential



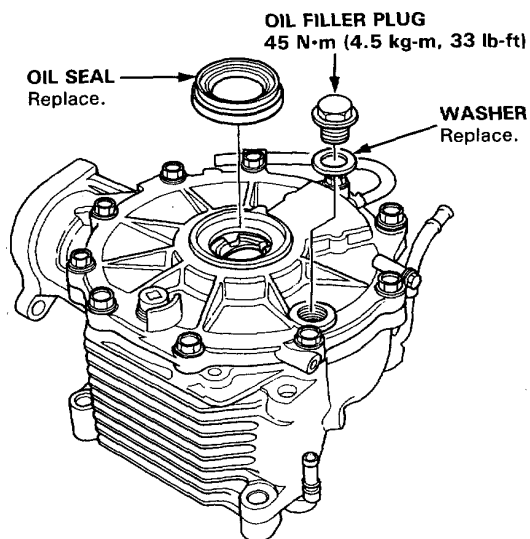
Illustrated Index



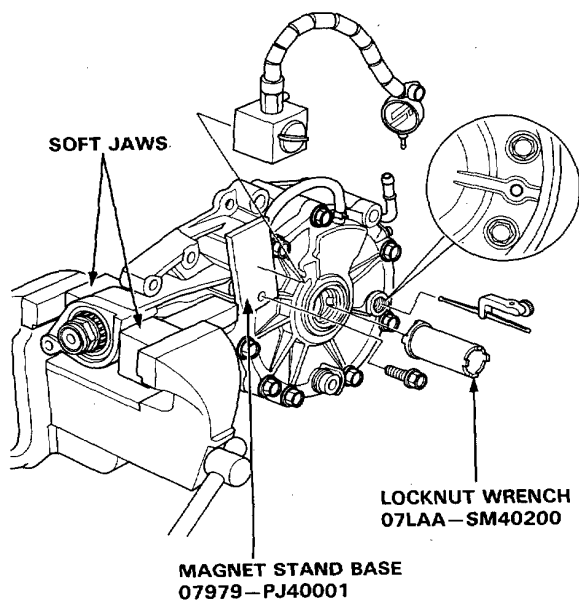
cardiagn.com

Differential Inspection

1. Remove the oil filler plug and oil seal.

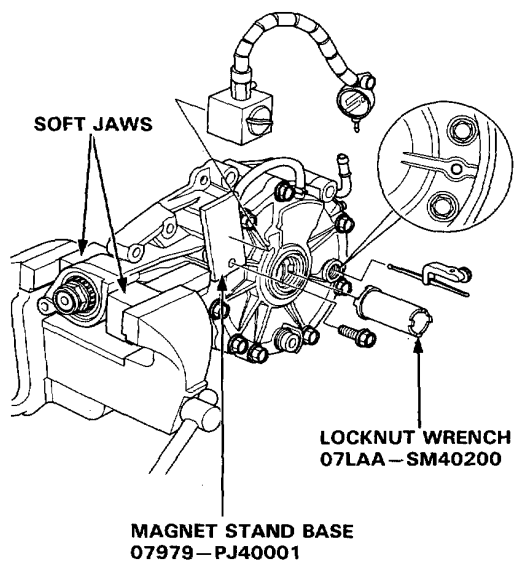


2. Hold the differential using a vice with soft jaws.
3. Align the differential gear inspection hole with the oil filler plug hole.



4. Measure backlash of ring gear.

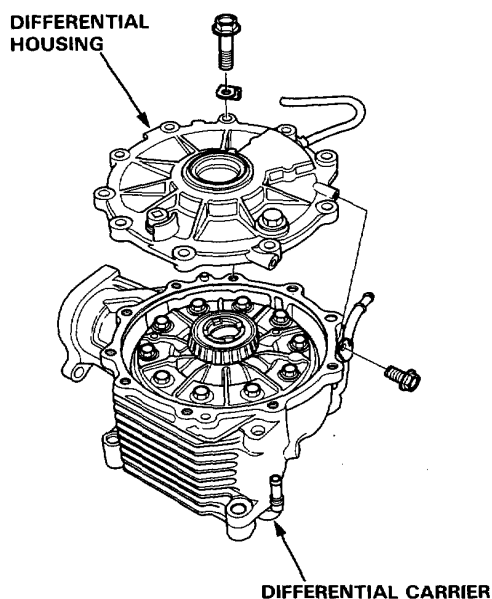
Standard: 0.06—0.14 mm (0.0024—0.0055 in)



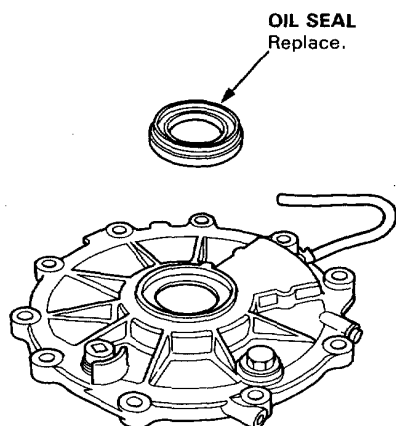


Disassembly

1. Remove the differential housing.

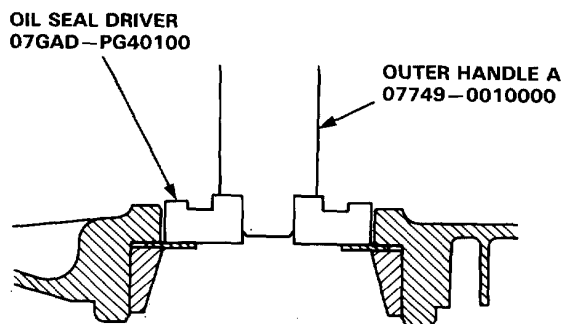


2. Remove the oil seal from the differential housing.



3. Remove the bearing outer race and 79.5 mm thrust shims.

M/T: Use the special tools.

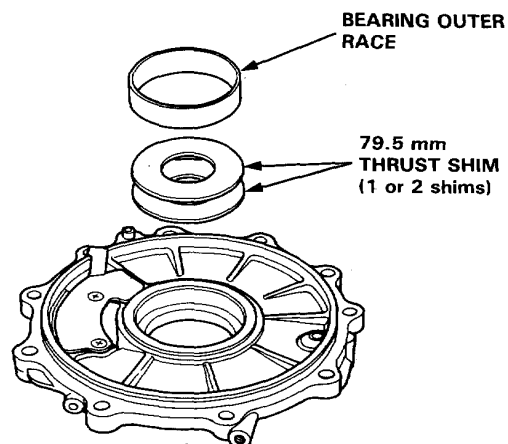


A/T: Pry up on the bearing outer race or heat the housing to about 100°C (212°F).

CAUTION: Do not reuse the thrust shim if the outer race was pried out.

NOTE:

- Let the differential cool to room temperature if the outer race was removed by heating the case before adjusting the bearing preload.
- Do not heat the differential housing in excess of 100°C (212°F).
- Replace the bearing with a new one whenever the outer race is replaced.

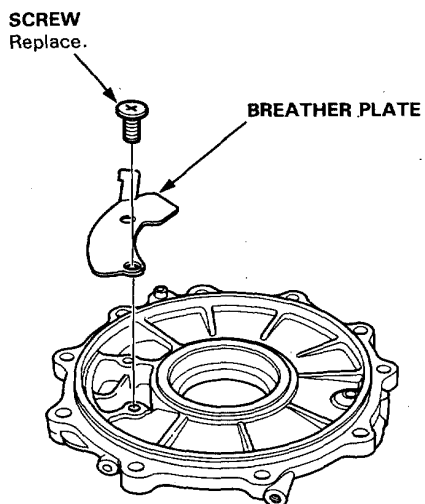


(cont'd)

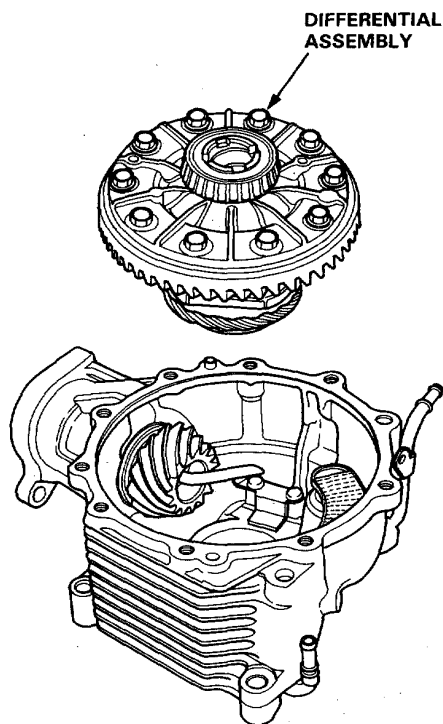
Differential

Disassembly (cont'd)

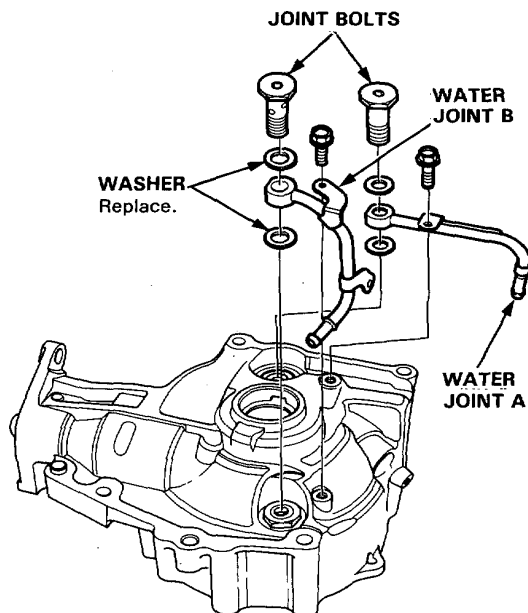
4. Remove the breather plate.



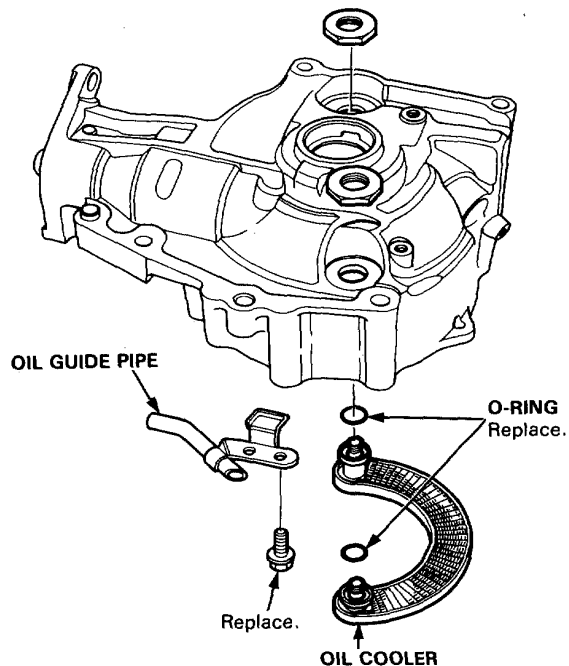
5. Remove the differential assembly from the differential carrier.



6. Remove the joint bolts, then remove the water joints A and B.

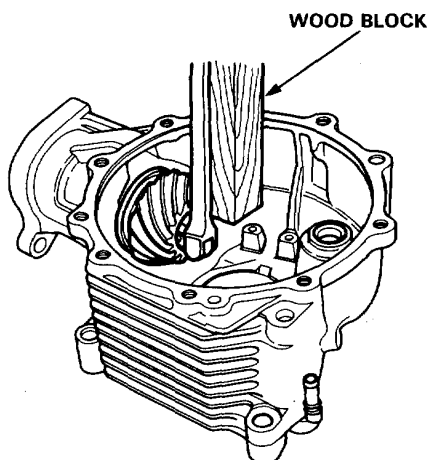


7. Remove the oil cooler and oil guide pipe.

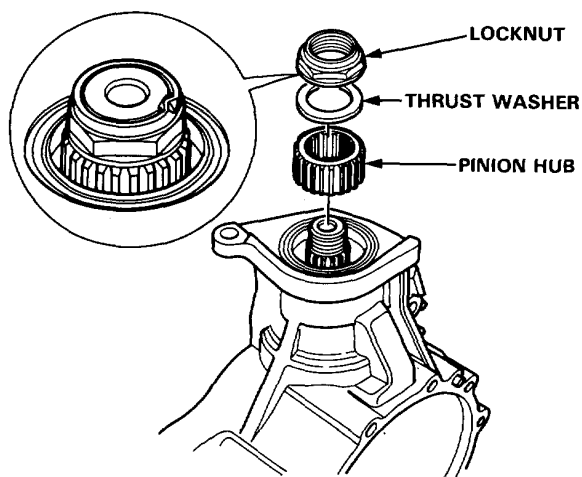




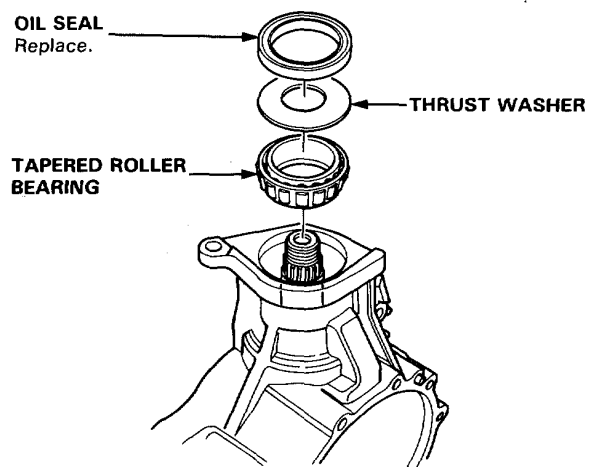
8. Hold the drive pinion using a 17 mm hex wrench as shown.



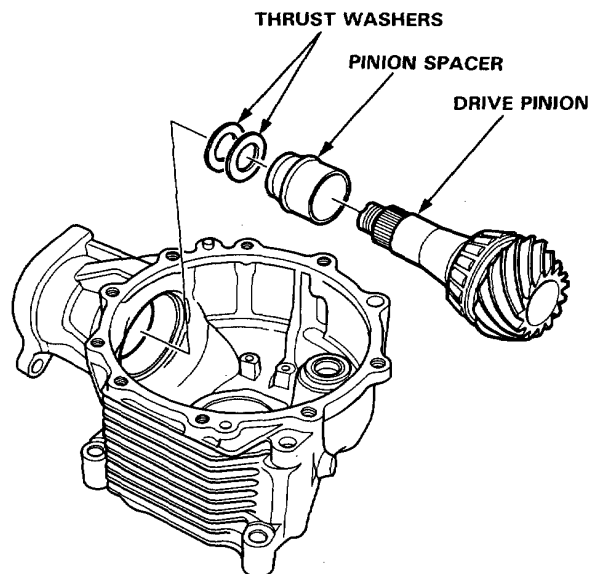
9. Raise the locknut tab from the groove of the shaft and remove the locknut, thrust washer and pinion hub.



10. Remove the oil seal, then remove the thrust washer and tapered roller bearing.



11. Remove the drive pinion, pinion spacer and thrust washers.



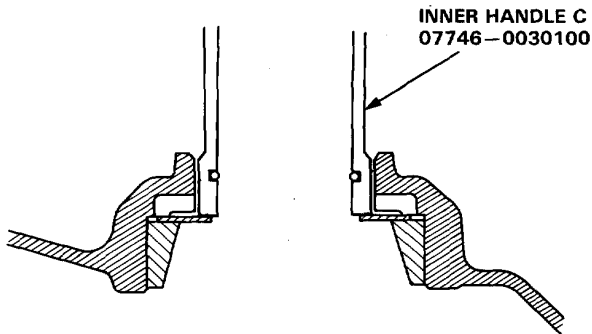
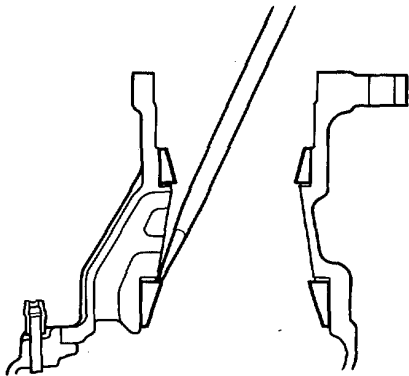
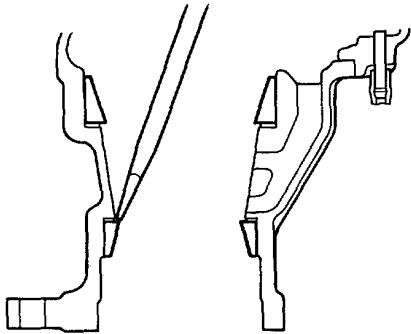
(cont'd)

Differential

Disassembly (cont'd)

12. Remove the bearing outer races, thrust washers and thrust shim.

M/T: Use the special tools.

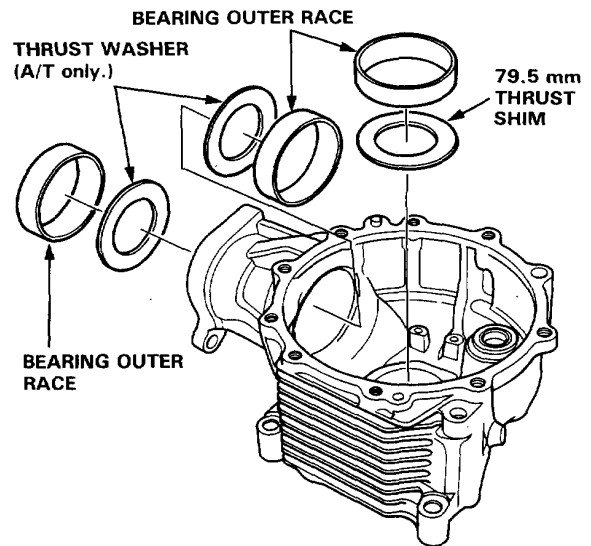


A/T: Pry up on the bearing outer race or heat the housing to about 100°C (212°F).

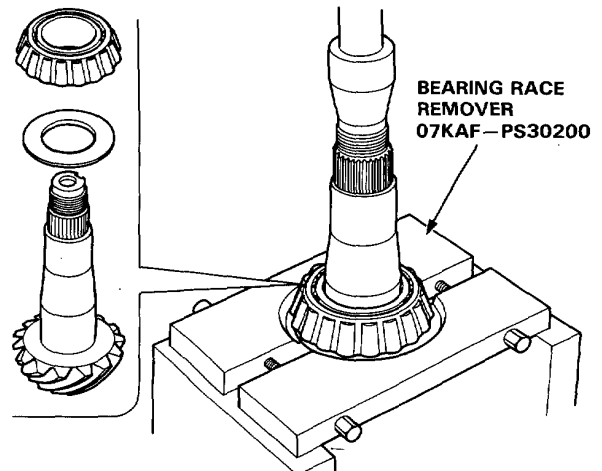
CAUTION: Do not reuse the thrust shim if the outer race was pried out.

NOTE:

- Let the differential cool to room temperature if the outer race was removed by heating the case before adjusting the bearing preload.
- Do not heat the differential housing in excess of 100°C (212°F).
- Replace the bearing with a new one whenever the outer race is replaced.



13. Remove the tapered roller bearing using a press.

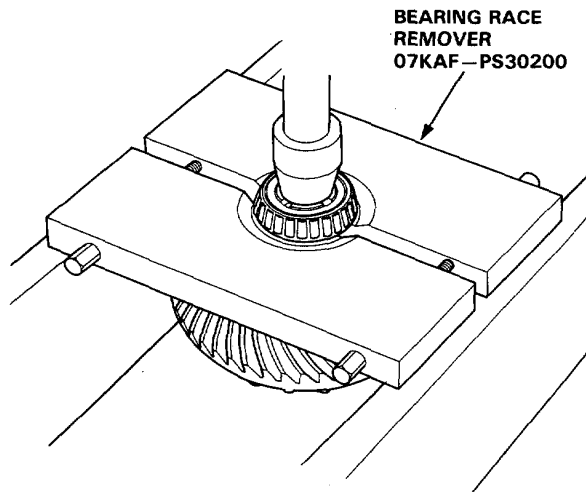




Differential Case

Inspection

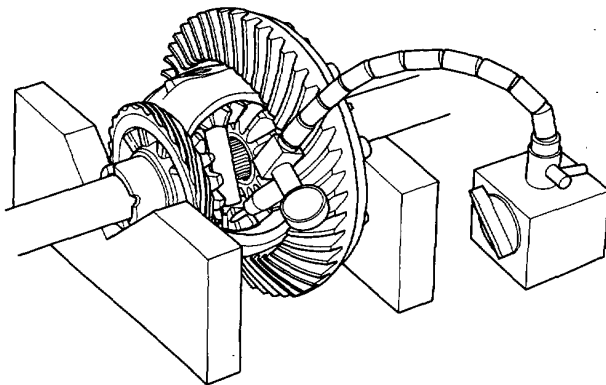
1. Remove the tapered roller bearings.



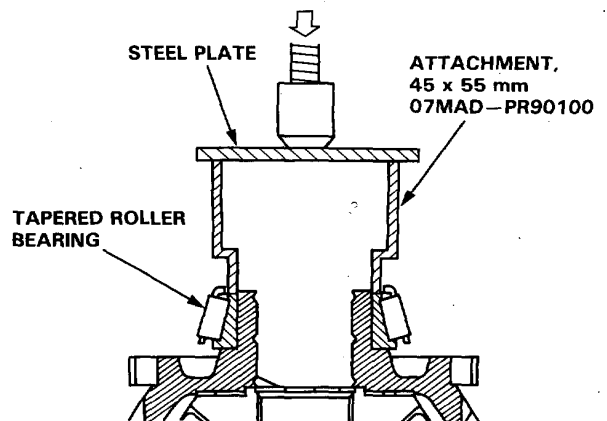
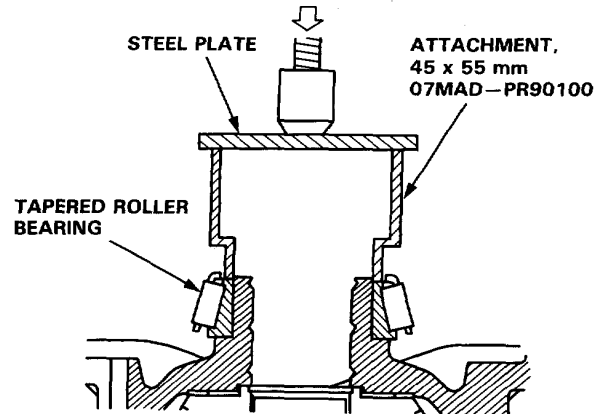
2. Install the L. driveshaft and intermediate shaft in the side gears.

3. Measure the backlash of both pinion gears.

Standard: 0.05–0.15 mm (0.002–0.006 in)
Service Limit: 0.3 mm (0.012 in)



4. If the backlash is less than the service limit, replace the differential assembly.
5. Install the tapered roller bearings using the special tools as shown.

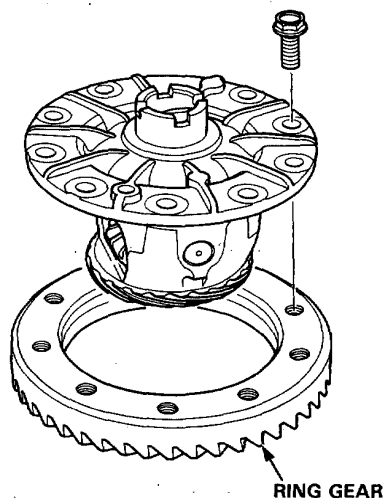


Differential Case

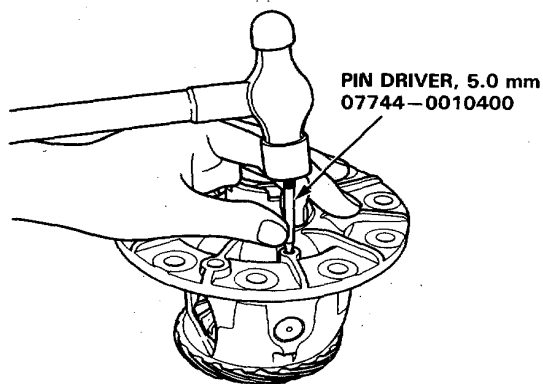
Disassembly

1. Remove the tapered roller bearings (page 15-13).

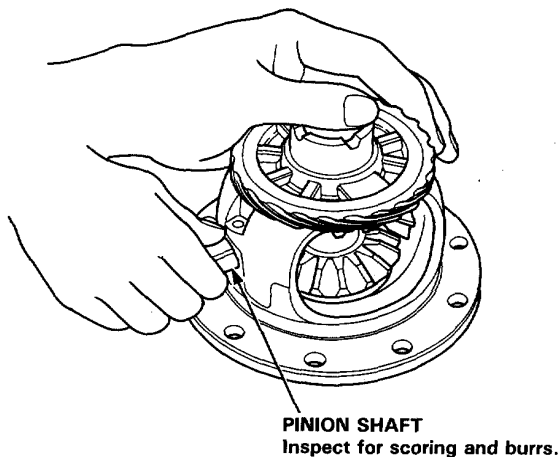
2. Remove the ring gear.



3. Drive out 6 mm roll pin with a pin driver.

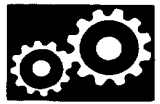


4. Remove the pinion shaft, pinion gears, side gears, thrust washers and thrust shims.



5. Wash the parts thoroughly in solvent and dry them with compressed air. Inspect all parts for wear or damage and replace any that are defective.

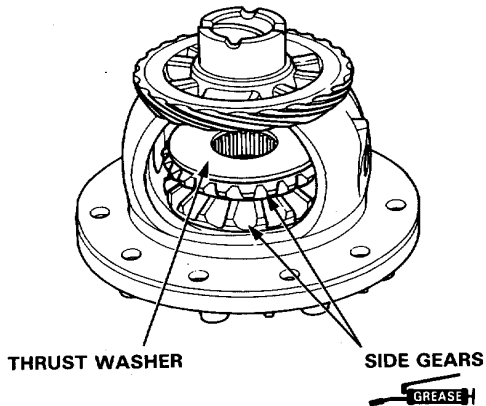
Differential Case



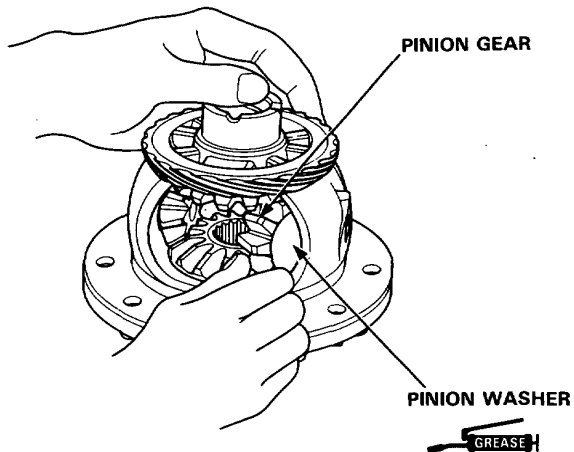
Reassembly

1. Install the side gears and thrust washers in the differential carrier.

NOTE: Coat all gears with molybdenum disulfide grease on all sides.

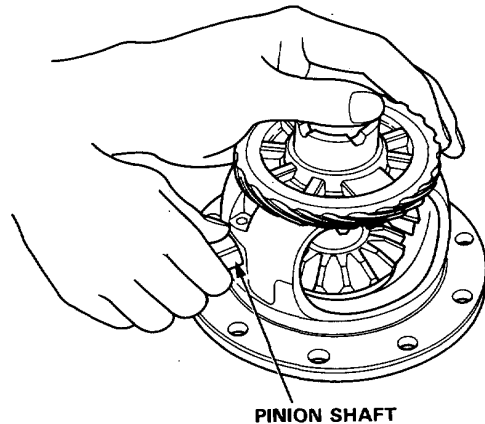


2. Set pinion gears in place exactly opposite each other in mesh with side gears, then install a pinion washer behind each one. Washers must be of equal thickness.

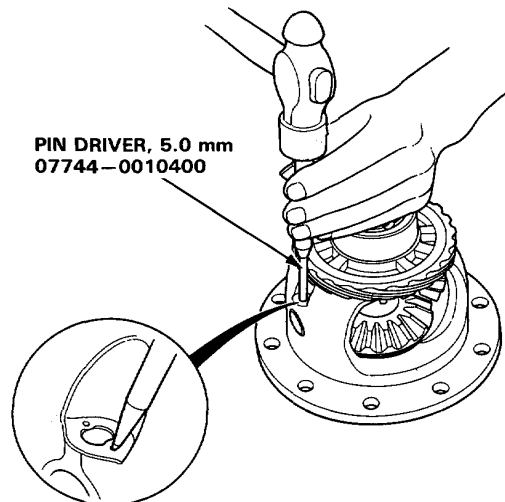


3. Rotate gears as shown until shaft holes in pinion gears line up with shaft holes in carrier.
4. Insert pinion shaft and align spring pin holes in one end with matching hole in carrier.

NOTE: Align spring pin holes.



5. Drive in a new 6 mm spring pin with the pin driver.



6. Check backlash of both pinion gears again. (see page 15-13)

(cont'd)

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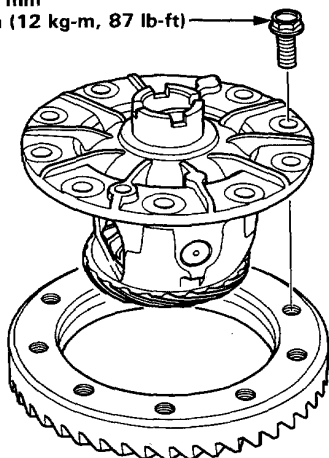
Differential Case

Reassembly (cont'd)

7. Install the ring gear.

CAUTION: The ring gear bolts have left-hand threads.

11 x 1.0 mm
120 N·m (12 kg-m, 87 lb-ft)



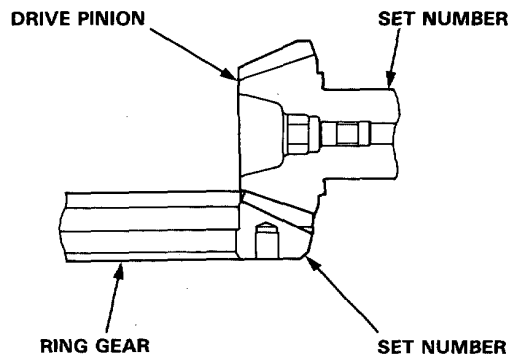
8. Install the tapered roller bearings (see page 15-13).

Differential

Reassembly

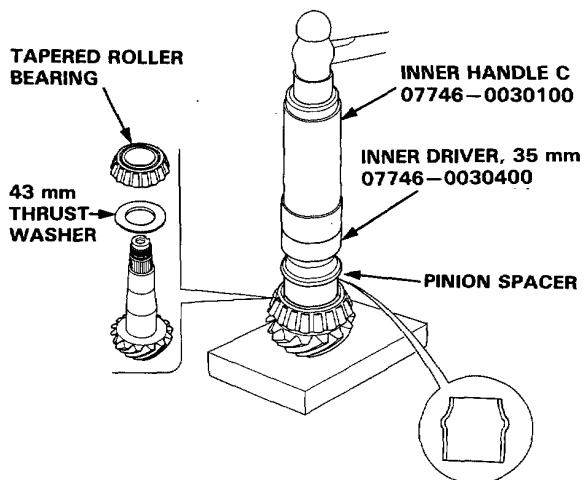
NOTE:

- If replacement is required, always replace the drive pinion and ring gear as a set.
- If necessary, check the height adjustment, see page 15-22.



1. Install the 43 mm thrust shim and tapered roller bearing using the special tools as shown.

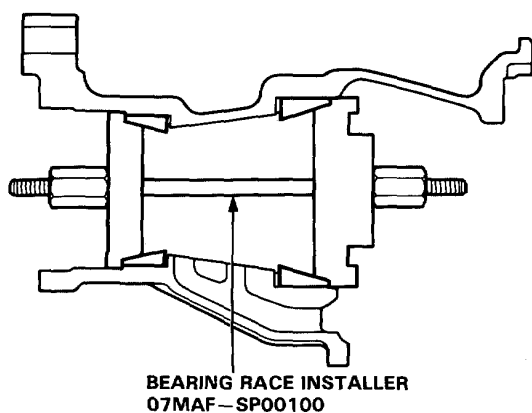
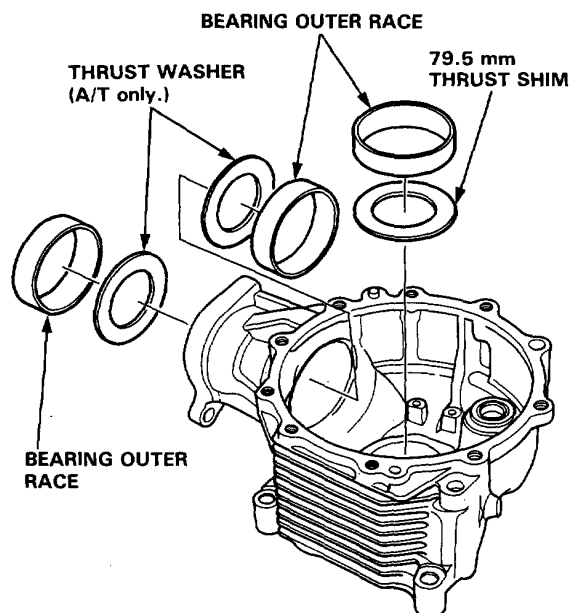
NOTE: Use old spacer for bearing installation.





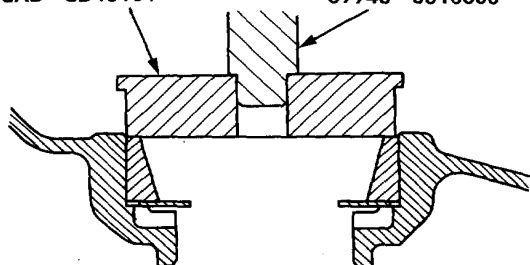
2. Install the thrust washers, thrust shim and bearing outer race using the special tools.

NOTE: Install the 79.5 mm thrust shim that was removed.

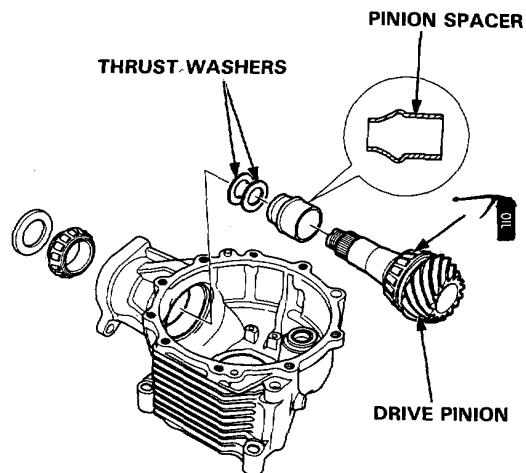


ATTACHMENT, 78 x 90 mm
07GAD-SD40101

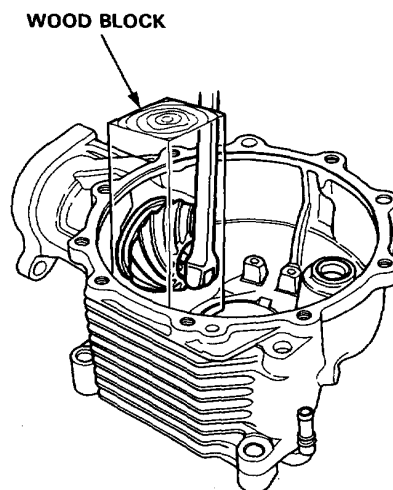
OUTER HANDLE A
07749-0010000



3. Install the thrust washers tapered roller bearing, pinion spacer and drive pinion.



4. Hold the drive pinion using 17 mm hex wrench as shown.



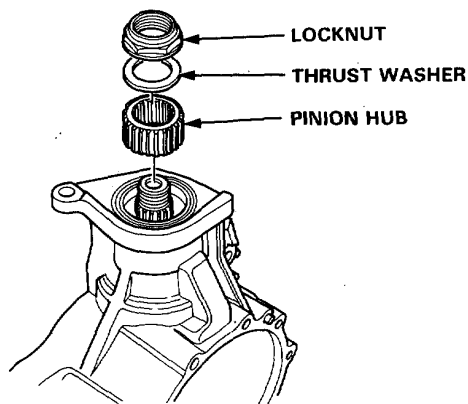
(cont'd)

Differential

Reassembly (cont'd)

5. Install the pinion hub, thrust washer and locknut.

 Apply lubricant to the locknut and drive pinion of the threads.



6. Measure the bearing preload.

NOTE:

- After adjustment of the gear tooth contact and backlash, adjust the preload.
- Rotate the drive pinion several times to assure proper bearing contact.

Standard:

M/T:

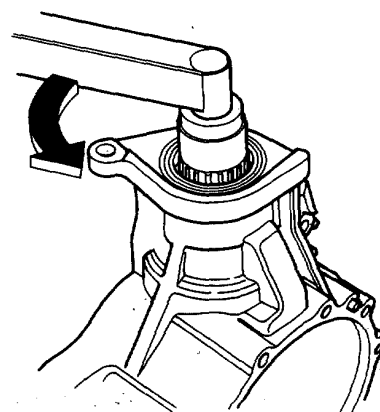
New: 0.93–1.57 N·m
(9.3–15.7 kg-cm, 8.1–13 lb-in)

Reused: 0.72–1.21 N·m
(7.2–12.1 kg-cm, 6.3–10.5 lb-in)

A/T:

New: 1.86–2.54 N·m
(18.6–25.4 kg-cm, 16.2–22 lb-in)

Reused: 1.45–1.95 N·m
(14.5–19.5 kg-cm, 12.6–16.9 lb-in)



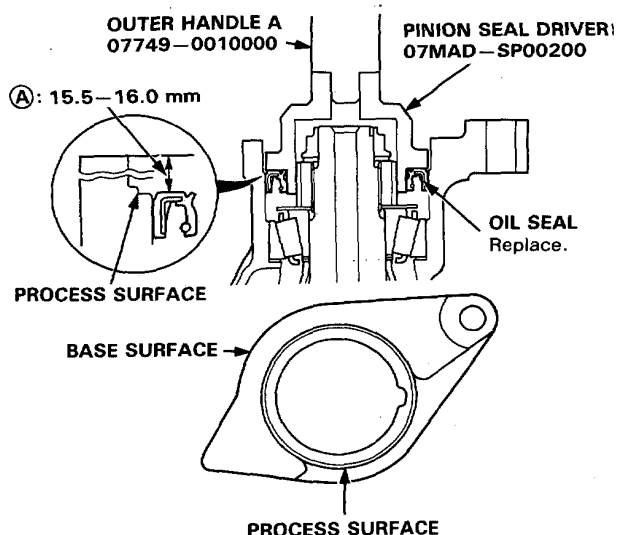
If the preload exceeds the standard, replace the distance collar.

If the bearing preload is less than the standard, adjust by tightening the locknut a little at a time, but keep the torque within 22–32 kg-m. If this is not possible, replace the distance collar.

7. Install the tapered roller bearing and thrust washer, then install the oil seal using the special tools.

NOTE: Make sure that distance (A) is correct.

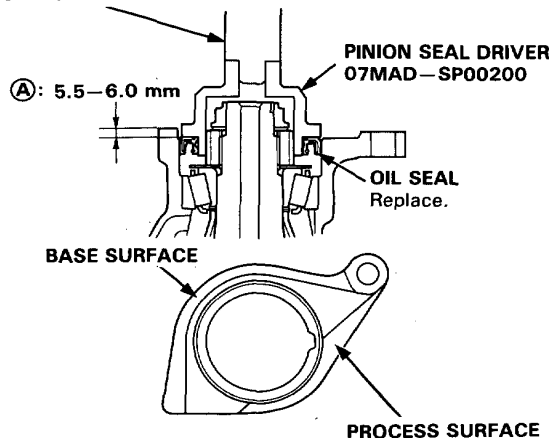
A/T:



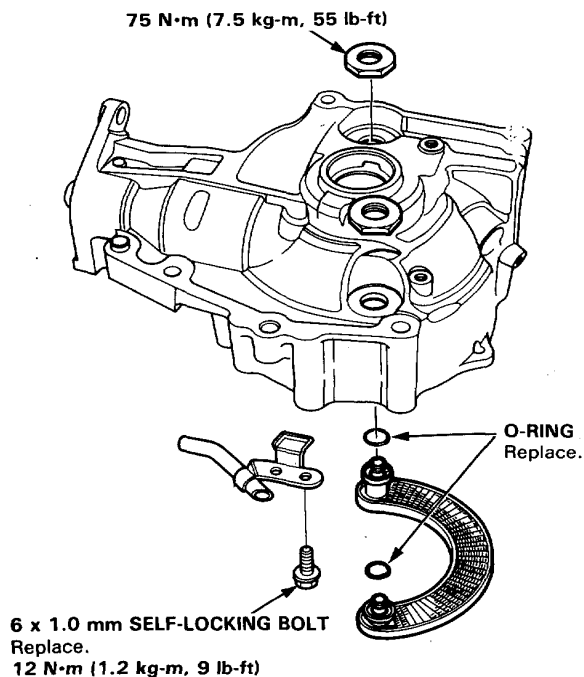


M/T:

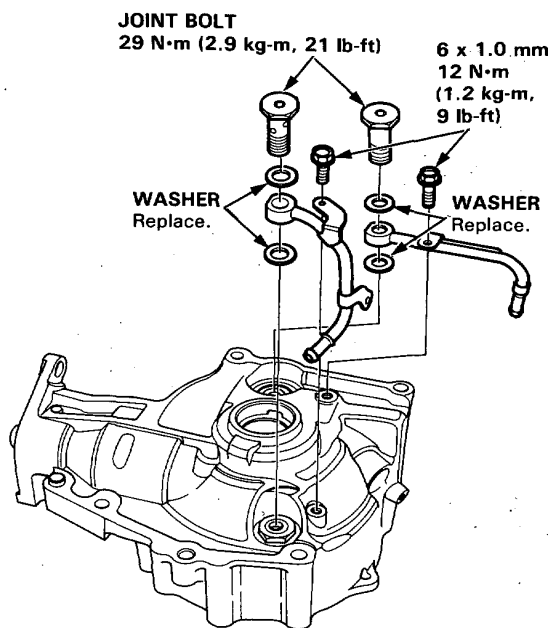
OUTER HANDLE A
07749-0010000



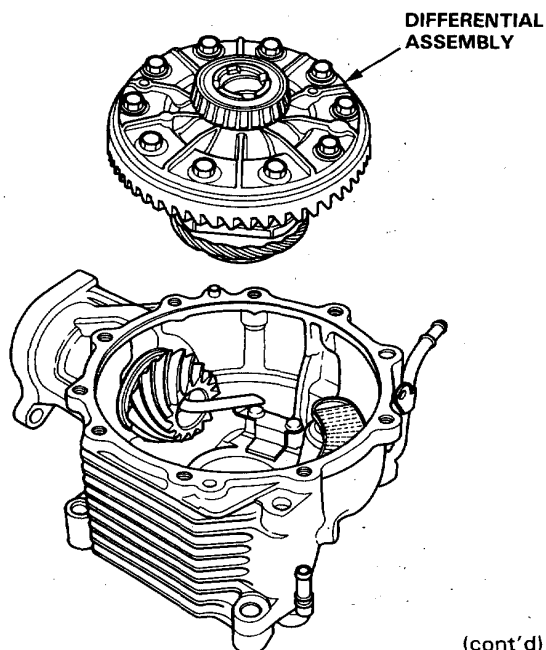
8. Install the oil cooler and oil guide pipe.



9. Install the water joints A and B, then install the joint bolts.



10. Install the differential assembly in the differential carrier.

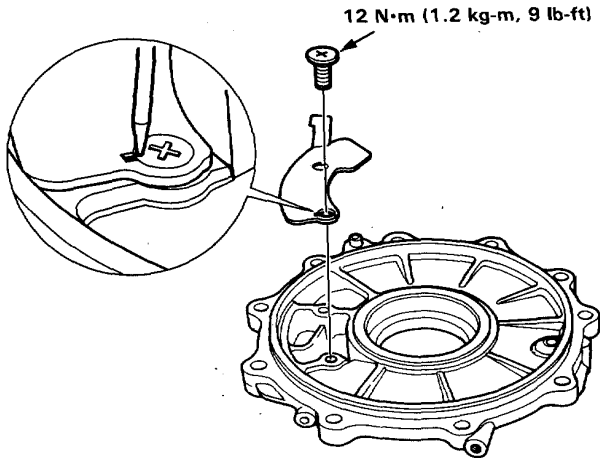


(cont'd)

Differential

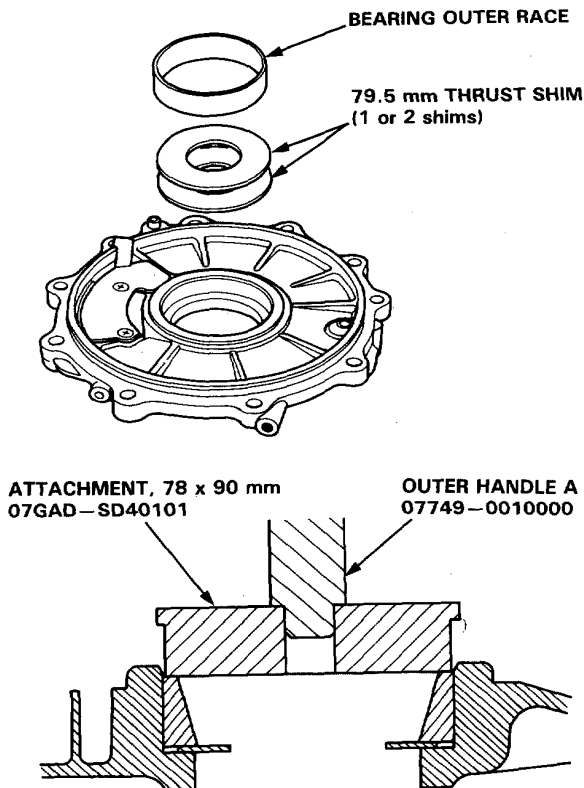
Reassembly (cont'd)

11. Install the breather plate and stake the screw heads in the groove in the breather plate.



12. Install the 79.5 mm thrust shim and bearing outer race using the special tools.

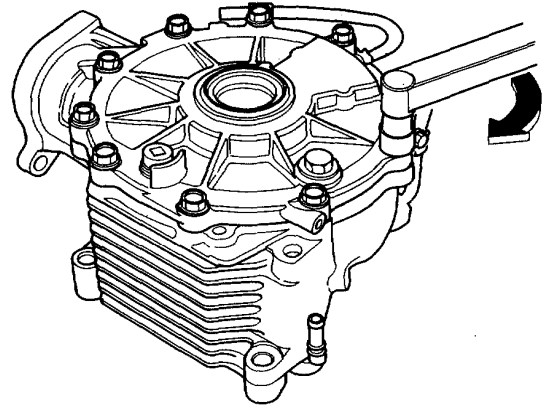
NOTE: Install the 79.5 mm thrust shim that was removed.



13. Install the differential housing.

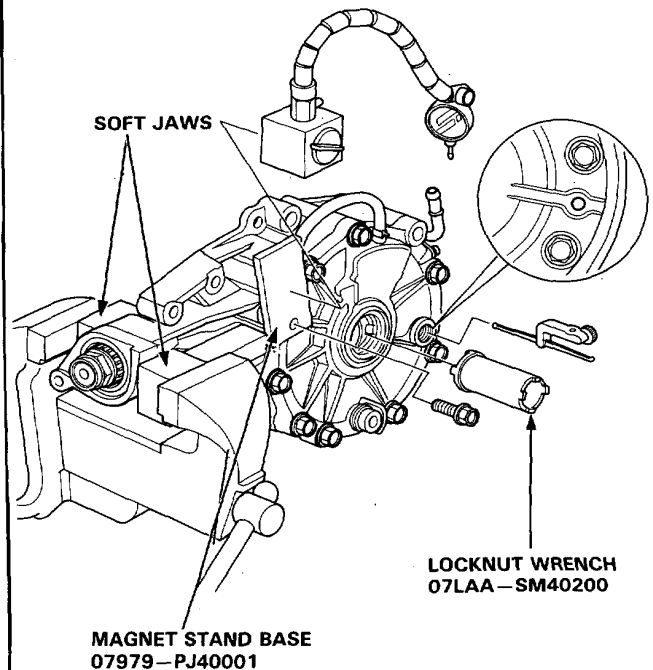
NOTE: Torque the bolts in a crisscross pattern.

Torque: 45 N·m (4.5 kg-m, 33 lb-ft)



14. Hold the differential using a vise with soft jaws.

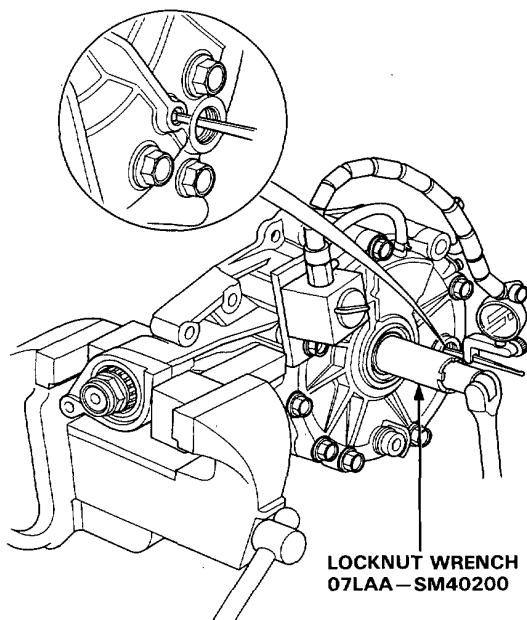
15. Align the differential gear inspection hole with the oil filler plug hole.





16. Measure backlash of ring gear.

Standard: 0.06–0.14 mm (0.0024–0.0055 in)

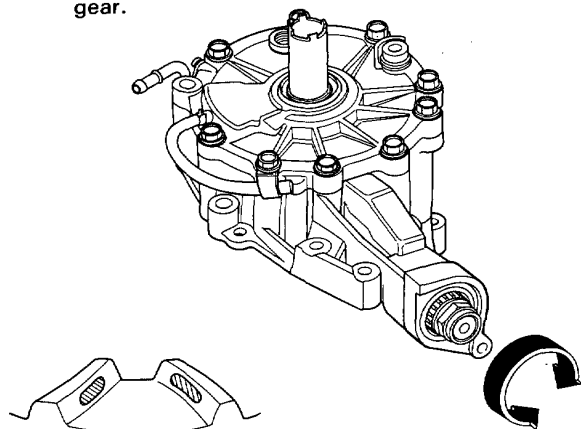


17. If the backlash is less than the standard, adjust the ring gear backlash (See page 15-24).

18. Check the contact between the ring gear and drive pinion.

NOTE:

- Paint the ring gear teeth lightly and evenly with Prussian Blue (on both sides of each tooth).
- Rotate the pinion one full turn forward and backward while applying pressure to the ring gear.



CORRECT TOOTH CONTACT

19. If the tooth contact is not correct, adjust the ring gear tooth contact (see page 15-23).

20. Measure the total preload.

NOTE:

- Rotate the drive pinion several times to assure proper bearing contact.
- Apply lubricant to the tapered roller bearings.

Standard:

M/T:

New bearings:

1.48–2.35 N·m
(14.8–23.5 kg-cm, 12.8–20.3 lb-in)

Reused bearings:

1.37–2.00 N·m
(13.7–20.0 kg-cm, 11.9–17.3 lb-in)

Replaced only the bearing on the ring gear side:

1.27–1.99 N·m
(12.7–19.9 kg-cm, 11.1–17.2 lb-in)

Replaced only the bearing on the drive pinion side:

1.58–2.36 N·m
(15.8–23.6 kg-cm, 13.8–20.4 lb-in)

A/T:

New bearings:

2.92–3.82 N·m
(29.2–38.2 kg-cm, 25.4–33.1 lb-in)

Reused bearings:

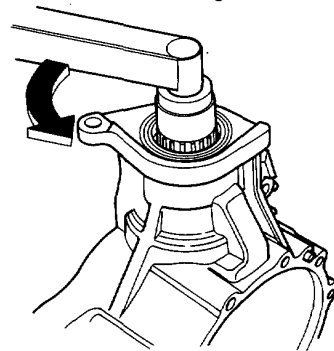
2.41–3.04 N·m
(24.1–30.4 kg-cm, 21.0–26.3 lb-in)

Replaced only the bearing on the ring gear side:

2.51–3.23 N·m
(25.1–32.3 kg-cm, 21.8–28.0 lb-in)

Replaced only the bearing on the drive pinion side:

2.82–3.63 N·m
(28.2–36.3 kg-cm, 24.5–31.5 lb-in)



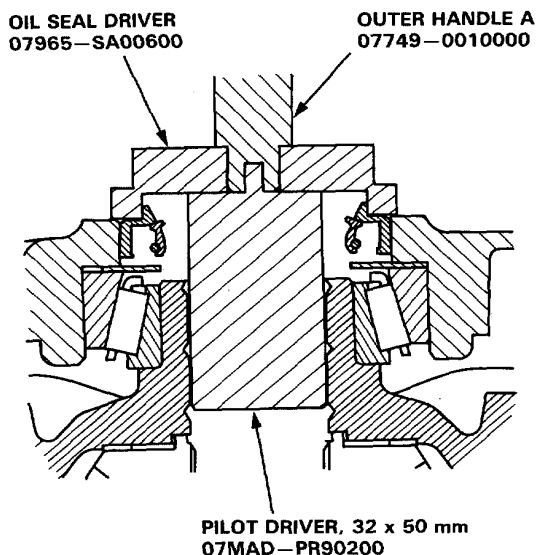
If the preload exceeds the standard, adjust the ring gear backlash (See page 15-24).

(cont'd)

Differential

Reassembly (cont'd)

21. Install the oil seal using the special tools.



22. Stake the locknut tab into the groove.

Drive Pinion

Height Adjustment

Select the proper shim follows:

NOTE: If replacement is required, always replace the drive pinion and ring gear as a set.

To select the proper shim, you need to calculate the difference in size between the old shim and the new pinion.

The number on each pinion is the plus (+) or minus (-) tolerance in hundredth's of a millimeter. So, a pinion with +2 is 0.02 mm large and a pinion with -2 is 0.02 mm small.

1. If the number on the old pinion is a plus (+), add it to the old shim thickness.
If it is a minus (-), subtract it from the old shim thickness.
2. If the number on the new pinion is a plus (+), subtract it from the number you got in step 1. If it is a minus (-), add it to the step 1 number.
3. Select the shim that is closest (but not more than) the final number you got from steps 1 and 2.

Example 1:

Old shim	2.00 mm thickness
Old pinion	+2 (0.02 mm)
New pinion	-1 (-0.01 mm)

$$2.00 + 0.02 + 0.01 = 2.03$$

Select the 2.03 mm new shim.

Example 2:

Old shim:	1.70 mm thickness
Old pinion:	-1 (-0.01 mm)
New pinion:	-2 (-0.02 mm)

$$1.70 - 0.01 + 0.02 = 1.71$$

Select the 1.70 mm new shim.

Ring Gear Tooth Contact



43 mm THRUST SHIM

	Part Number	Thickness
A	41410-PY4-000	1.64 mm (0.0646 in)
B	41411-PY4-000	1.67 mm (0.0657 in)
C	41412-PY4-000	1.70 mm (0.0669 in)
D	41413-PY4-000	1.73 mm (0.0681 in)
E	41414-PY4-000	1.76 mm (0.0693 in)
F	41415-PY4-000	1.79 mm (0.0705 in)
G	41416-PY4-000	1.82 mm (0.0717 in)
H	41417-PY4-000	1.85 mm (0.0728 in)
I	41418-PY4-000	1.88 mm (0.0740 in)
J	41419-PY4-000	1.91 mm (0.0752 in)
K	41420-PY4-000	1.94 mm (0.0764 in)
L	41421-PY4-000	1.97 mm (0.0776 in)
M	41422-PY4-000	2.00 mm (0.0787 in)
N	41423-PY4-000	2.03 mm (0.0799 in)
O	41424-PY4-000	2.06 mm (0.0811 in)
P	41425-PY4-000	2.09 mm (0.0823 in)
Q	41426-PY4-000	2.12 mm (0.0835 in)
R	41427-PY4-000	2.15 mm (0.0846 in)
S	41428-PY4-000	2.18 mm (0.0858 in)
T	41429-PY4-000	2.21 mm (0.0870 in)
U	41430-PY4-000	2.24 mm (0.0882 in)
V	41431-PY4-000	2.27 mm (0.0894 in)

Adjustment

1) CORRECT TOOTH CONTACT



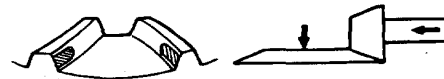
2) TOE CONTACT

- Use a thinner pinion shim to move the drive pinion away from the ring gear.



3) HEEL CONTACT

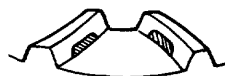
- Use a thicker pinion shim to move the drive pinion toward the ring gear.



4) FLANK CONTACT

- Use a thinner side bearing shim on the drive pinion side and a thicker one on the ring gear side to move the ring gear toward the drive pinion.

NOTE: Recheck backlash after replacing the side bearing shims. If out of specification, adjust as described under TOE CONTACT.



5) FACE CONTACT

- Use thicker side bearing shim on the drive pinion side and a thinner one on the ring gear side to move the ring gear away from the drive pinion.

NOTE: Recheck backlash after, replacing the side bearing shims.
If out of specification, adjust as described under HEEL CONTACT.



Ring Gear Backlash

Adjustment

1. If the backlash exceeds the standard, correct by decreasing the shim thickness on one side and increasing the thickness of the other shim the same amount.

NOTE:

- The total thickness of both shims must still equal the total thickness the original shims.
- If there is too much backlash, move the ring gear toward the drive pinion. If there is not enough backlash, move the ring gear away from the drive pinion.

Standard: 0.06–0.14 mm (0.0024–0.0055 in)

79.5 mm THRUST SHIM

	Part Number	Thickness
A	41460–PY4–000	0.66 mm (0.0260 in)
B	41461–PY4–000	1.17 mm (0.0461 in)
C	41462–PY4–000	1.20 mm (0.0472 in)
D	41463–PY4–000	1.23 mm (0.0484 in)
E	41464–PY4–000	1.26 mm (0.0496 in)
F	41465–PY4–000	1.29 mm (0.0508 in)
G	41466–PY4–000	1.32 mm (0.0520 in)
H	41467–PY4–000	1.35 mm (0.0531 in)
I	41468–PY4–000	1.38 mm (0.0543 in)
J	41469–PY4–000	1.41 mm (0.0555 in)
K	41470–PY4–000	1.44 mm (0.0567 in)
L	41471–PY4–000	1.47 mm (0.0579 in)
M	41472–PY4–000	1.50 mm (0.0591 in)
N	41473–PY4–000	1.53 mm (0.0602 in)
O	41474–PY4–000	1.56 mm (0.0614 in)
P	41475–PY4–000	1.59 mm (0.0626 in)
Q	41476–PY4–000	1.62 mm (0.0638 in)
R	41477–PY4–000	1.65 mm (0.0650 in)
S	41478–PY4–000	1.68 mm (0.0661 in)
T	41479–PY4–000	1.71 mm (0.0673 in)
U	41480–PY4–000	1.74 mm (0.0685 in)
V	41481–PY4–000	1.77 mm (0.0697 in)
W	41482–PY4–000	1.80 mm (0.0709 in)
X	41483–PY4–000	1.83 mm (0.0720 in)

Driveshafts

Special Tools	16-2
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Driveshafts

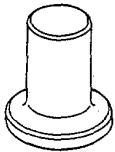
Removal	16-3
Disassembly	16-4
Disassembly/Inspection	16-5
Reassembly	16-6

Intermediate Shaft

Replacement	16-9
Disassembly	16-9
Index/Inspection	16-11
Reassembly	16-12

Special Tools

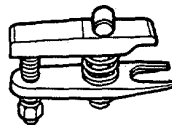
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD—PH70200	Oil Seal Driver	1	16-12
②	07GAF—SD40700	Hub Dis Assembly Base	2	16-10,16-13
③	07MAC—SL00100	Ball Joint Remover, 32 mm	1	16-3
④	07MAD—SP00100	Oil Seal Driver Attachment	1	16-13
⑤	07746—0010300	Attachment, 42 x 47 mm	1	16-10
⑥	07746—0010400	Attachment, 52 x 55 mm	1	16-12
⑦	07746—0030100	Driver, 40 mm I.D.	1	16-12
⑧	07749—0010000	Driver	1	16-10, 16-12, 16-13



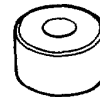
①



②



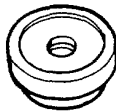
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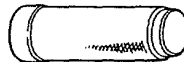
④



⑤



⑥



⑦



⑧

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Driveshafts



Removal

INSPECTION

Driveshaft Boot

Check the boots on the driveshaft for cracks, damage, leaking grease or loose boot bands.

If any damage is found, replace the boot.

Spline Looseness

Turn the driveshaft by hand and make sure the spline and joint are not excessively loose.

If damage is found, replace the inboard joint.

Twisted or Cracked

Make sure the driveshaft is not twisted or cracked.

Replace if necessary.

1. Raise the car and place safety stands in the proper locations (see section 1).

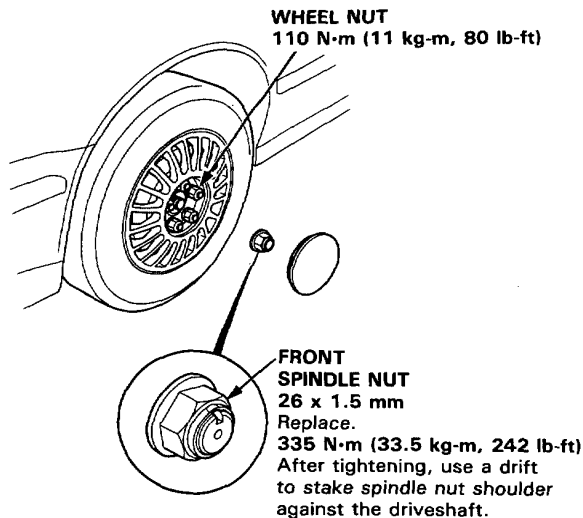
2. Remove the front wheels.

NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and inside of the wheel.

3. Drain the differential oil.

NOTE: It is not necessary to drain the differential oil when the left driveshaft is removed.

4. Raise the locking tab on the spindle nut and loosen it.



5. Remove the damper fork nut and damper pinch bolt.
6. Remove the damper fork.

DAMPER PINCH BOLT
51 N·m (5.1 kg-m, 36 lb-ft)

DAMPER FORK NUT
70 N·m (7.0 kg-m, 50 lb-ft)

7. Remove the cotter pin from the lower arm ball joint castle nut and remove the nut.
8. Install the 14 mm hex nut on the ball joint. Be sure that the 14 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Use the ball joint remover, 32 mm (07MAC-SL00100) as shown on page 18-12 to separate the ball joint and lower arm.

9. Position the special tool between the knuckle and lower arm as shown, then separate the lower arm.

CAUTION:

- Be careful not to damage the ball joint boot.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

CASTLE NUT
70–80 N·m
(7.0–8.0 kg-m,
51–58 lb-ft)

COTTER PIN
Replace.
On reassembly,
bend the cotter pin as shown.

BALL JOINT REMOVER, 32 mm
07MAC-SL00100

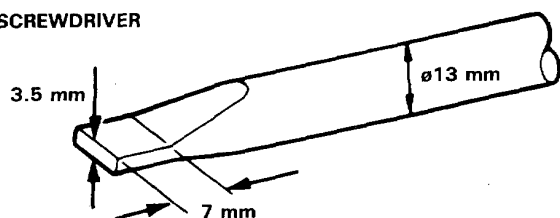
(cont'd)

Driveshafts

Removal (cont'd)

10. Pry the driveshaft assembly with a screwdriver as shown to force the set ring past the groove.

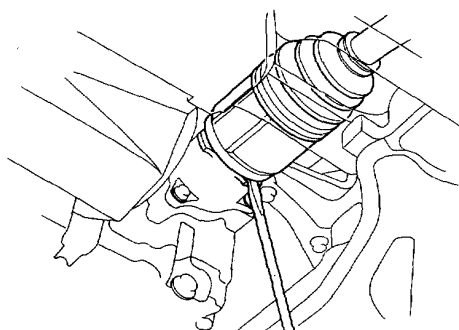
SCREWDRIVER



11. Pull the inboard joint and remove the driveshaft and CV joint from the differential case or intermediate shaft as an assembly.

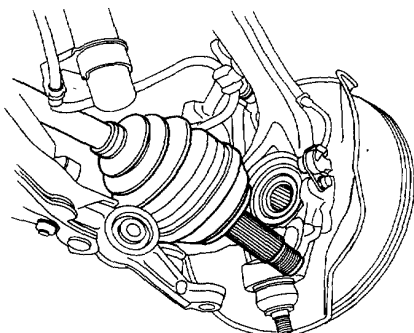
CAUTION:

- Do not pull on the driveshaft, as the CV joint may come apart.
- Use care when prying out the assembly and pull it straight to avoid damaging the differential oil seal or intermediate shaft dust seal.



12. Remove the spindle nut.

13. Pull the knuckle outward and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



14. Installation is the reverse order of removal.

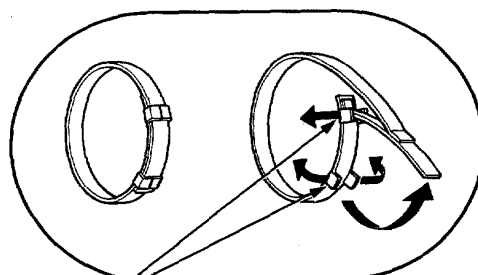
15. After installing the driveshafts, adjust the wheel alignment (see section 18).

Disassembly

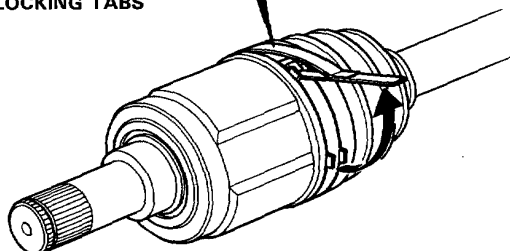
1. To remove the boot band, pry up the locking tabs with a screwdriver and raise the end of the band.

NOTE: Carefully clamp the driveshaft in a vise with soft jaws.

CAUTION: Take care not to damage the boots.

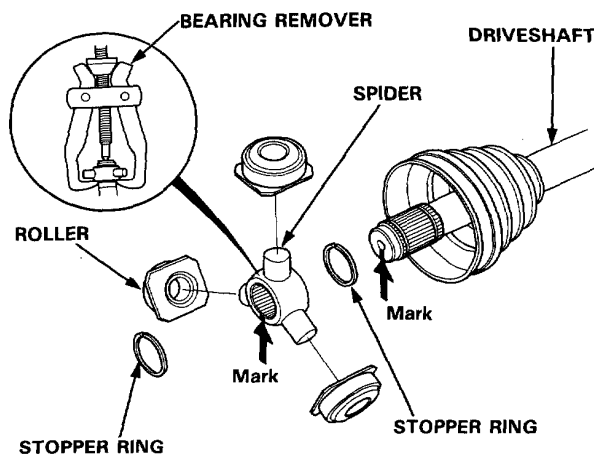


LOCKING TABS



2. Remove the inboard joint and rollers.
3. Remove the stopper ring, then remove the spider with a bearing remover.

NOTE: Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.





Disassembly/Inspection

NOTE:

- Mark the rollers and roller grooves during disassembly to ensure proper positioning during reassembly.
- Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.
- The inboard joint must be removed to replace the boots.

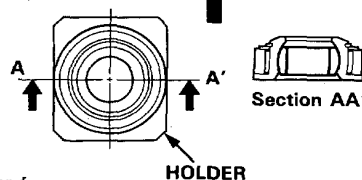
GREASE Thoroughly pack the inboard joint and both joint boots with joint grease included in the new driveshaft set.

Grease Quantity:

Inboard Joint	130—140 g (4.6—4.9 oz)
Outboard Joint	140—150 g (4.9—5.3 oz)

Install the holder or roller toward the slot of the inboard joint as shown below.

Spline direction



SET RING
Replace.

INBOARD JOINT
Check splines for wear or damage.
Check inside bore for wear.
Inspect for cracks.

GREASE
Pack cavity with grease.

STOPPER RING

SPIDER

SPIDER

ROLLER
High shoulder faces toward outside.

HOLDER

ROLLER

STOPPER RING

INBOARD JOINT BOOT
Inspect for cracking, splitting and wear.

GREASE
Pack cavity with grease.

BOOT BAND
Replace.

BOOT BANDS
Replace.

OUTBOARD JOINT BOOT
Inspect for cracking, splitting and wear.

GREASE
Pack cavity with grease.

BOOT BAND
Replace.

DRIVESHAFT

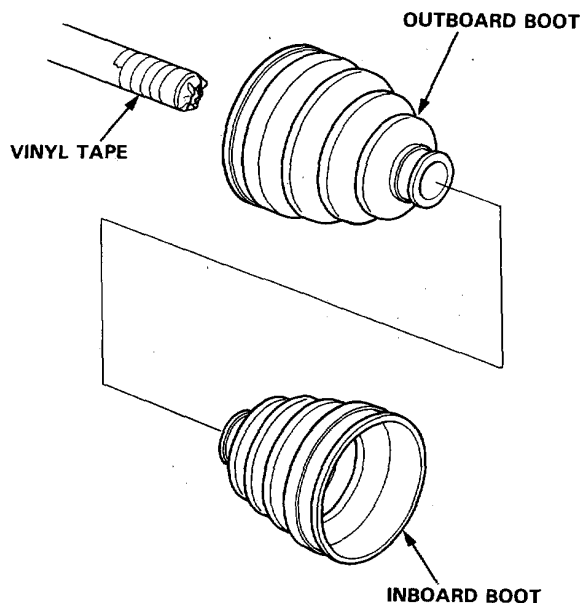
OUTBOARD JOINT
Inspect for faulty movement and wear.
Inspect ball bearings while rotating.
Do not try to disassemble.

OUTBOARD RING
Check for damage.

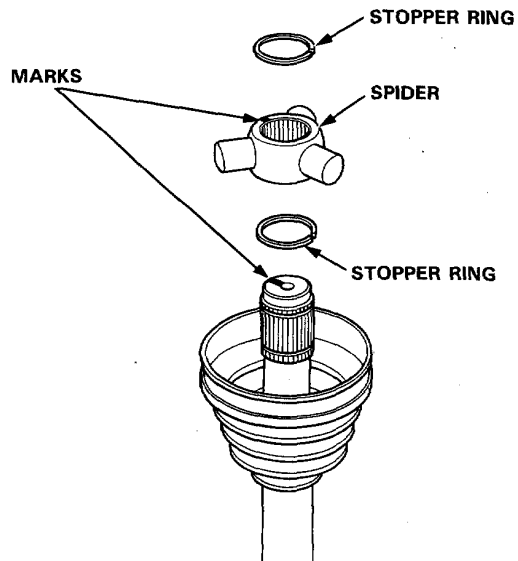
Driveshafts

Reassembly

1. Wrap the splines with vinyl tape to prevent damage to the boots.
2. Install the outboard boot and inboard boot to the driveshaft, then remove the vinyl tape.



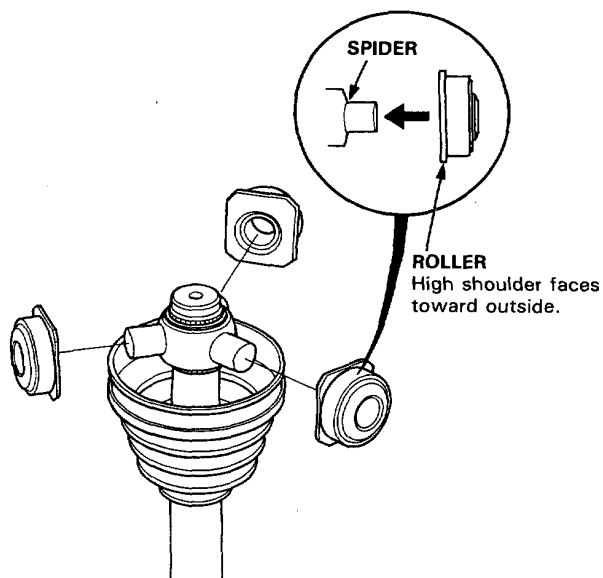
3. Install the stopper ring onto the driveshaft groove.
4. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.
5. Fit the stopper ring onto the driveshaft groove.



6. Fit the rollers to the spider with their high shoulders facing outward.

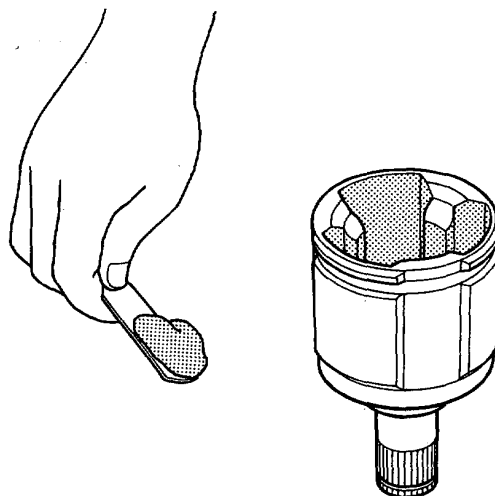
CAUTION:

- Reinstall the rollers to their original positions on the spider.
- To prevent it from falling off, hold the driveshaft assembly so the spider and roller point up.



7. Pack the joint with joint grease included in the new driveshaft set.

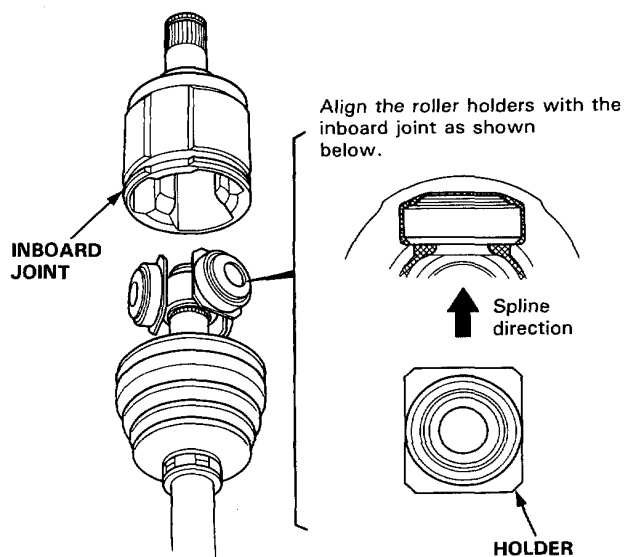
Grease Quantity: 130–140 g (4.6–4.9 oz)





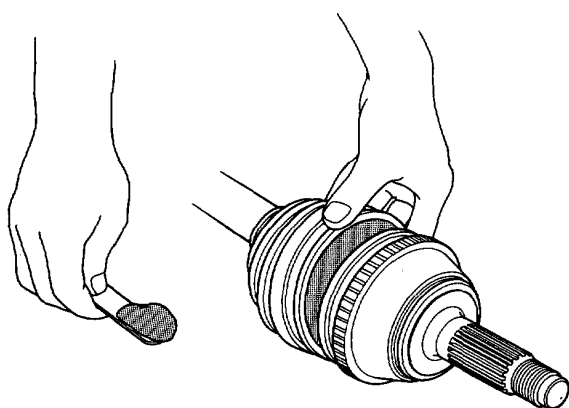
8. Fit the inboard joint onto the driveshaft.

CAUTION: To prevent it from falling off, hold the driveshaft assembly so the inboard joint points up.



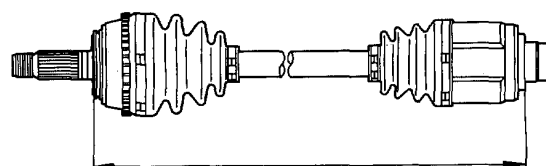
9. Pack the joint with joint grease included in the new driveshaft set.

Grease Quantity: 140–150 g (4.9–5.3 oz)

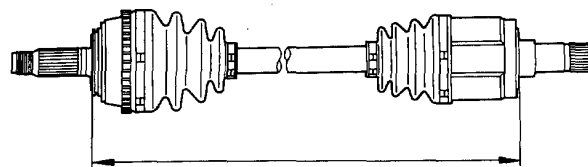


10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and extension.

NOTE: The ends of boots seat in the groove of the driveshaft and joint.



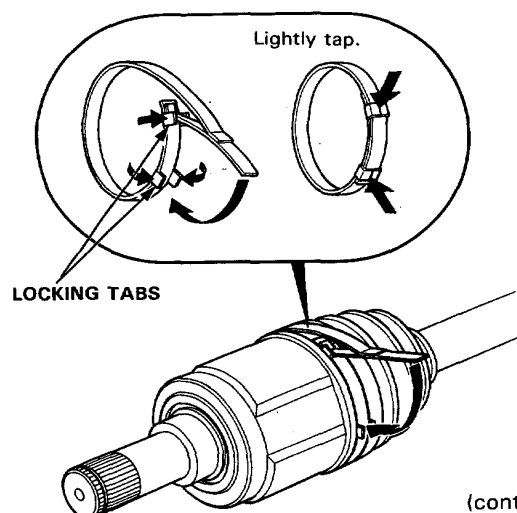
L. Driveshaft
582.1–587.1 mm
(22.92–23.11 in)



R. Driveshaft
496.1–501.1 mm
(19.53–19.73 in)

11. Install new boot bands on the boots and bend both sets of locking tabs.

12. Lightly tap on the doubled-over portions to reduce their height.



(cont'd)

Driveshafts

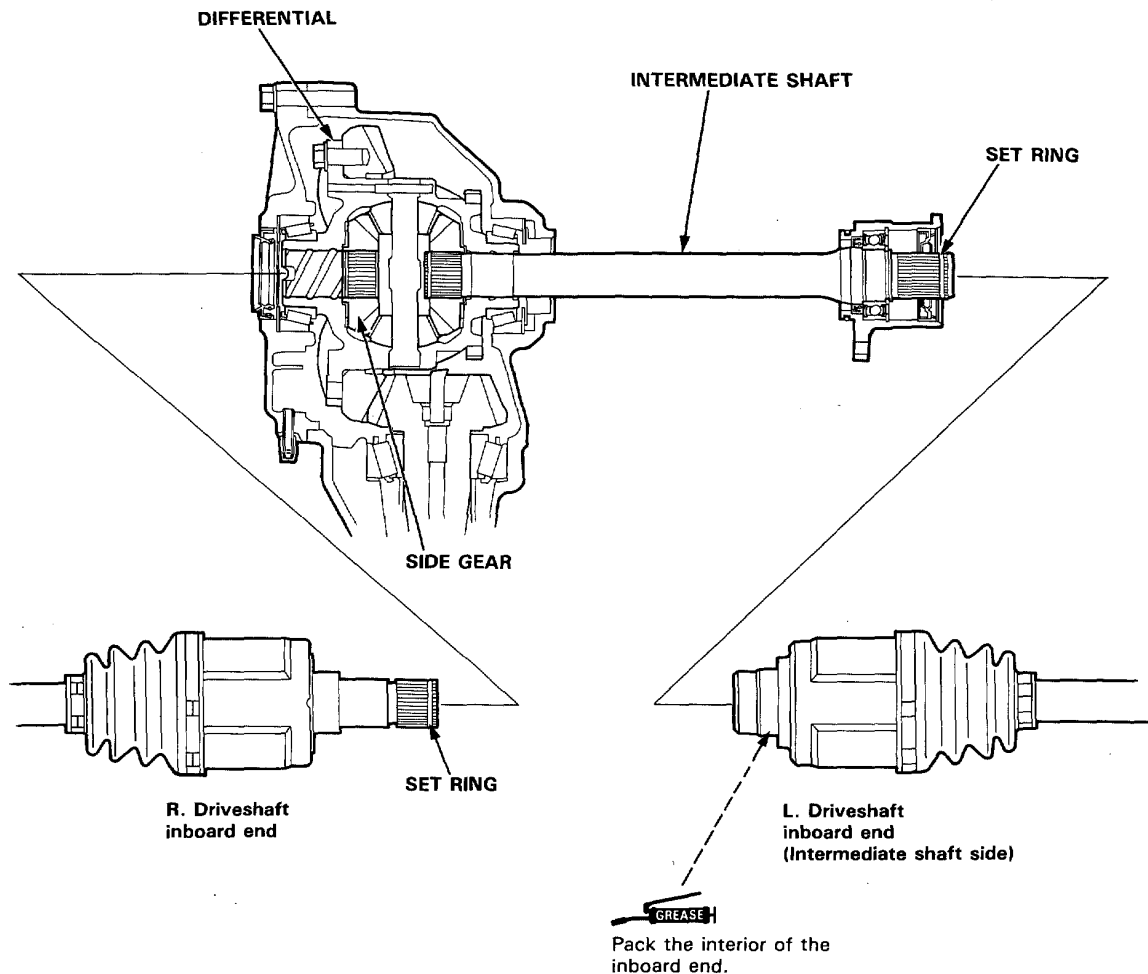
Reassembly (cont'd)

NOTE: Install the outboard joint in the knuckle before installing the driveshaft into the differential or intermediate shaft. Loosely install the spindle nut at this time.

13. Install the new set rings in the R. driveshaft groove and intermediate shaft groove.
14. Install the inboard end of the driveshaft into differential or intermediate shaft.

CAUTION:

- Always use a new set ring whenever the driveshaft is being installed.
- Make sure the R. driveshaft locks in the differential side gear groove, and the CV joint subaxle bottoms in the differential.
- Insert the L. driveshaft CV joint subaxle into the intermediate shaft until the intermediate shaft set ring locks in the groove in the L. driveshaft.

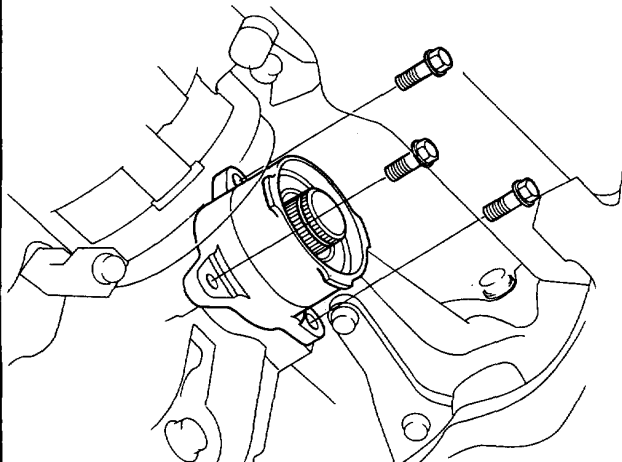




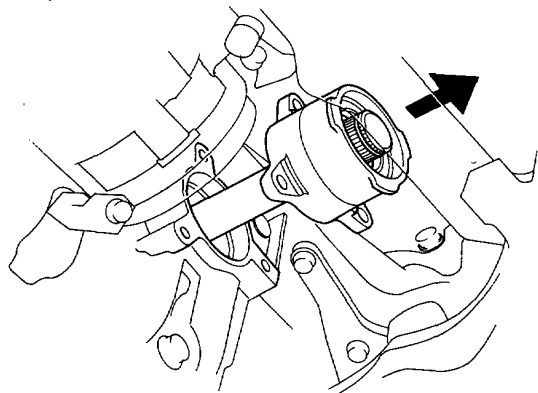
Intermediate Shaft

Replacement

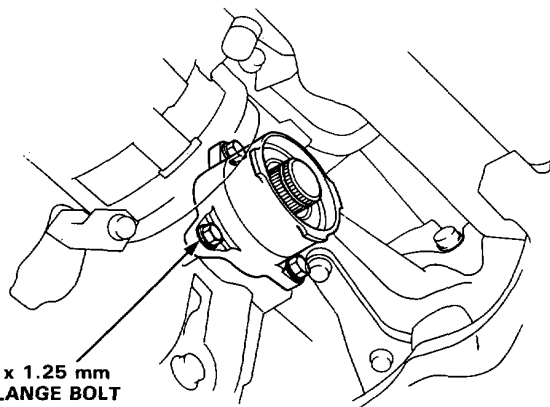
1. Drain the oil from the differential.
2. Remove the left driveshaft assembly (page 16-3).
3. Remove the three bolts.



4. Remove the intermediate shaft assembly from the oil pan.



5. Installation is the reverse order of removal.

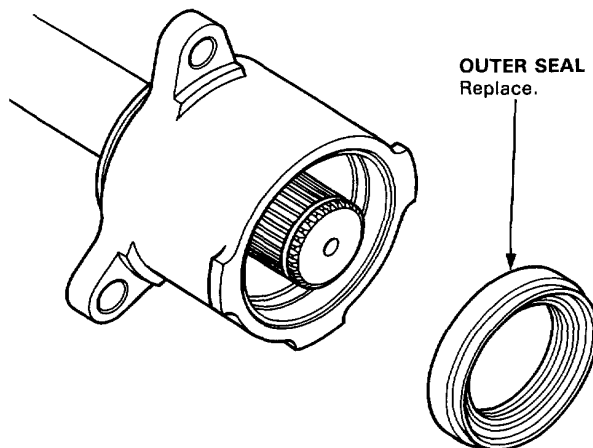


8 x 1.25 mm
FLANGE BOLT
22 N·m (2.2 kg-m, 16 lb-ft)

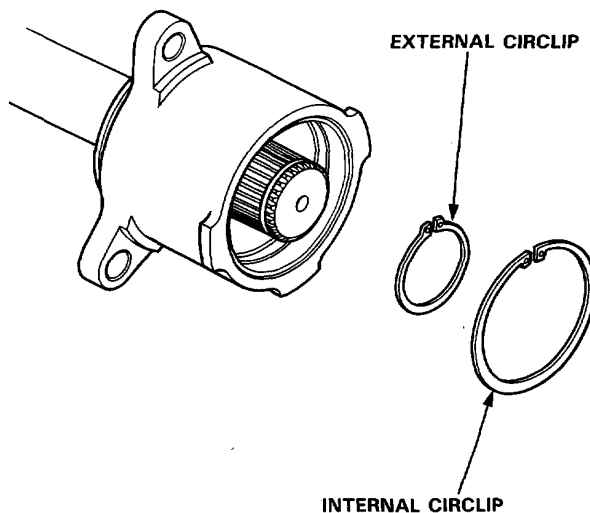
Disassembly

CAUTION: The bearing support and support base are made of aluminum. Be careful not to damage them when servicing.

1. Remove the intermediate shaft outer seal from the bearing support.



2. Remove the external circlip and internal circlip.

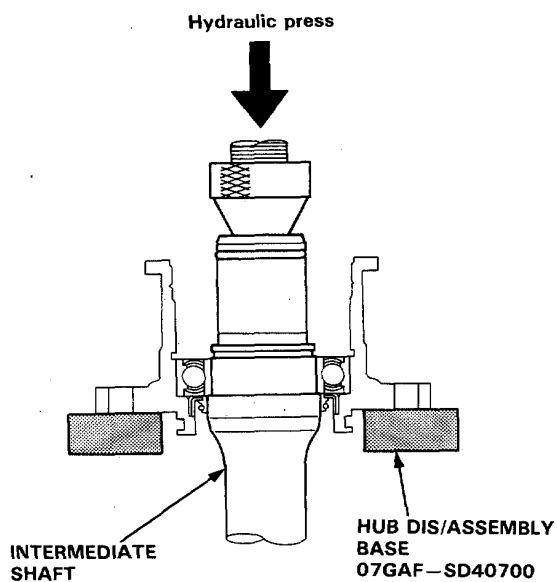


(cont'd)

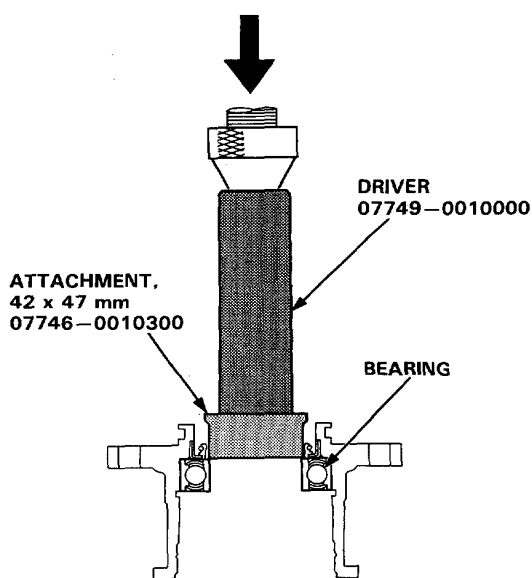
Intermediate shaft

Disassembly (cont'd)

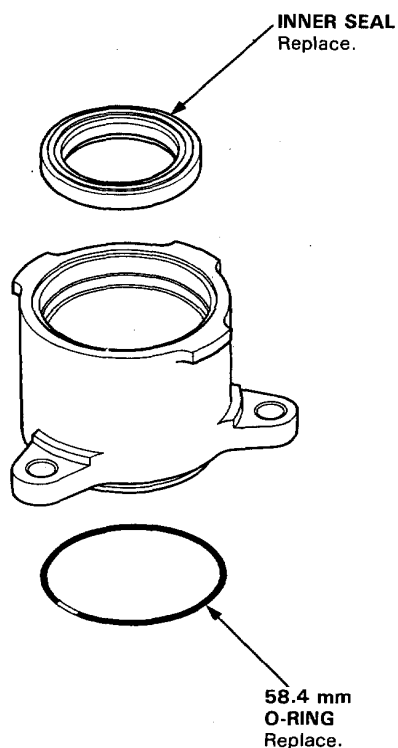
3. Press the intermediate shaft out of the shaft bearing using the special tool.



4. Press the intermediate shaft bearing out of the bearing support using the special tools.



5. Remove the intermediate shaft inner seal from the bearing support.
6. Remove the 58.4 mm O-ring.

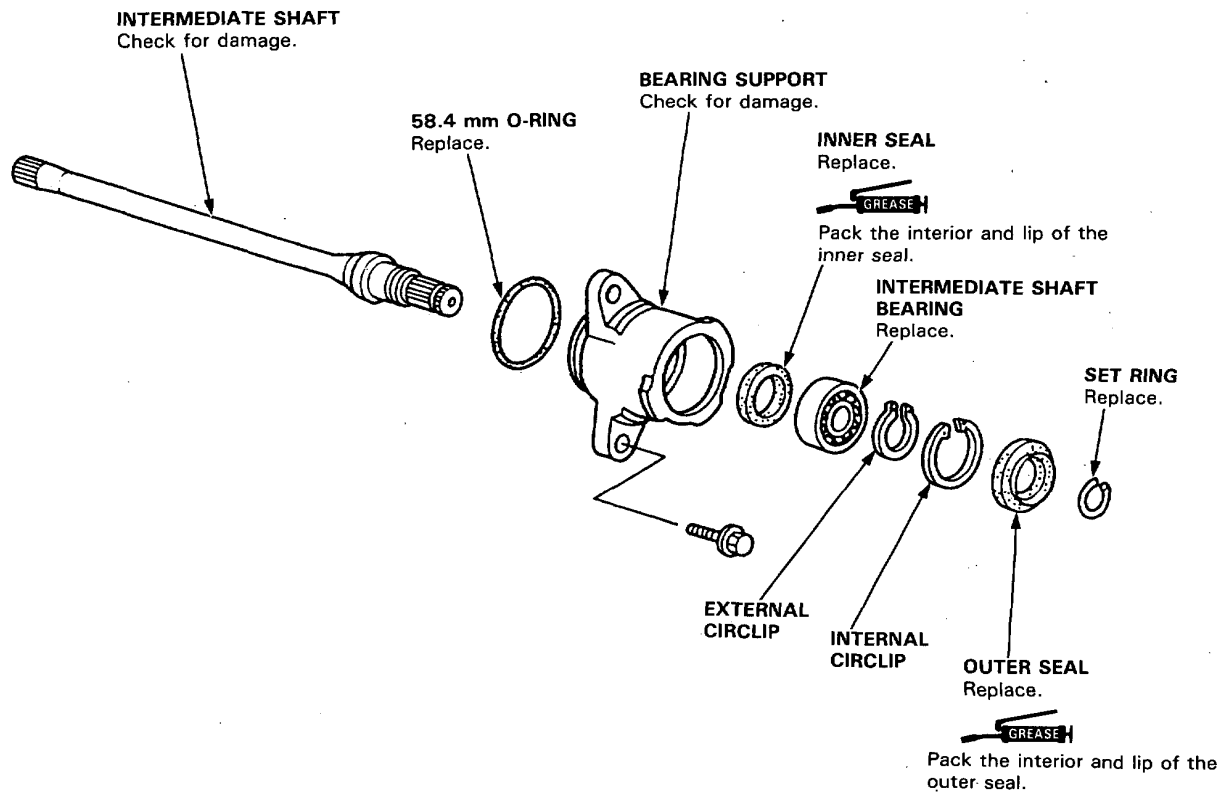




Index/Inspection

CAUTION:

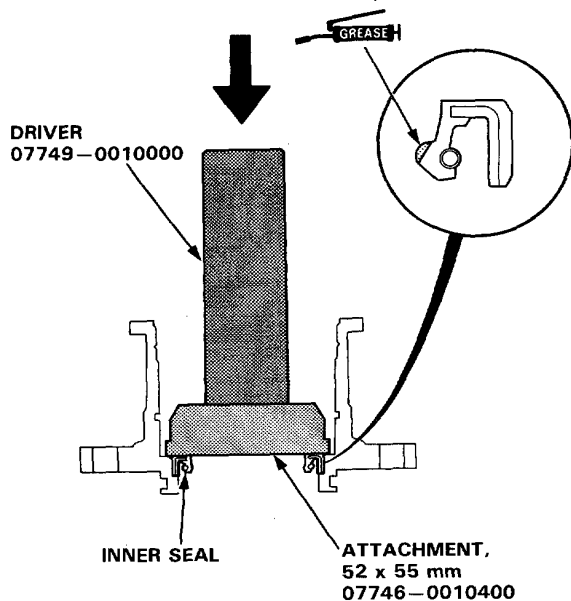
- The bearing support is made of aluminum. Be careful not to damage it when servicing.
- Do not damage the lip on inner and outer seals during installation.



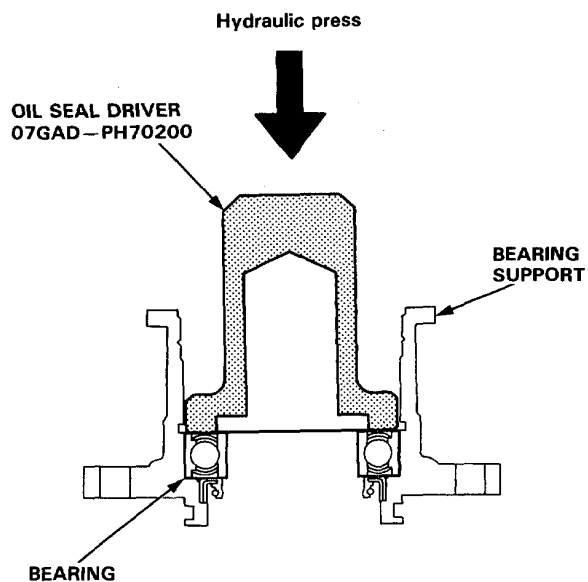
Intermediate shaft

Reassembly

1. Drive the intermediate shaft inner seal into the bearing support using the special tools.

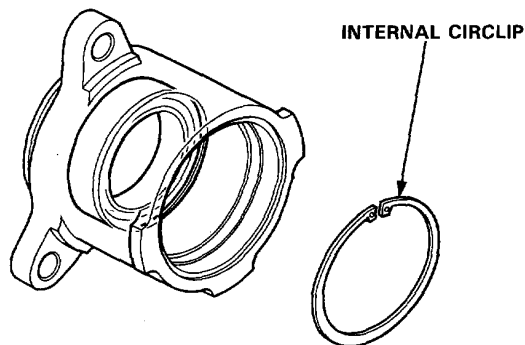


2. Press the intermediate shaft bearing into the bearing support using the special tool.

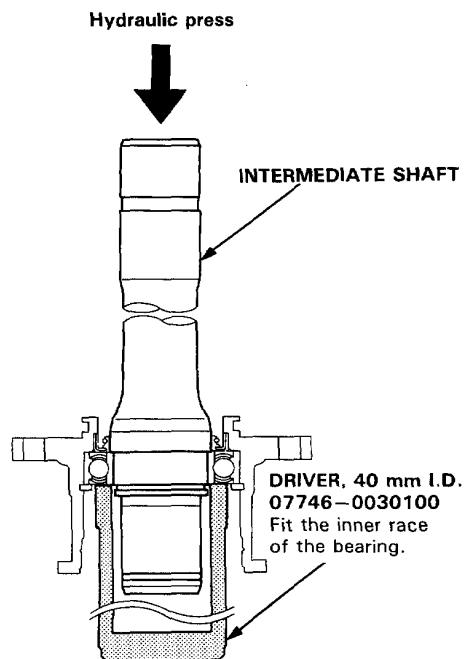


3. Seat the internal circlip in the groove of the bearing support.

CAUTION: Install the circlip with the tapered end facing out.



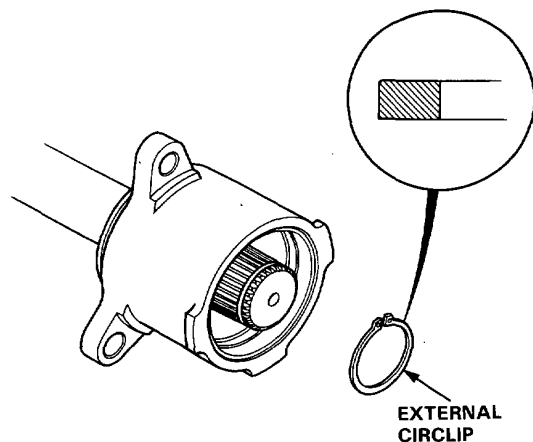
4. Press the intermediate shaft into the shaft bearing using the special tool.





5. Seat the external circlip in the groove of the intermediate shaft.

CAUTION: Install the circlip with the tapered end facing out.



6. Install the outer seal into the bearing support using the special tools.

NOTE: Drive in the outer seal until it is 7 mm (0.28 in) from the end of the bearing support.

