

Clutch

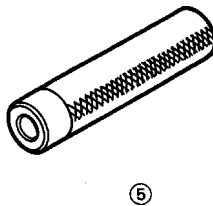
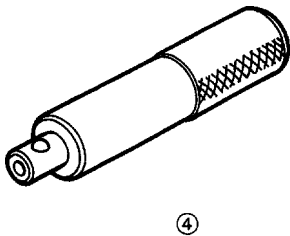
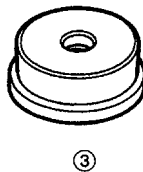
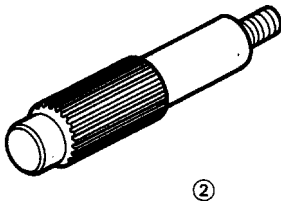
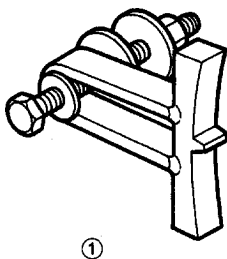
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Special Tools

• Special Tools

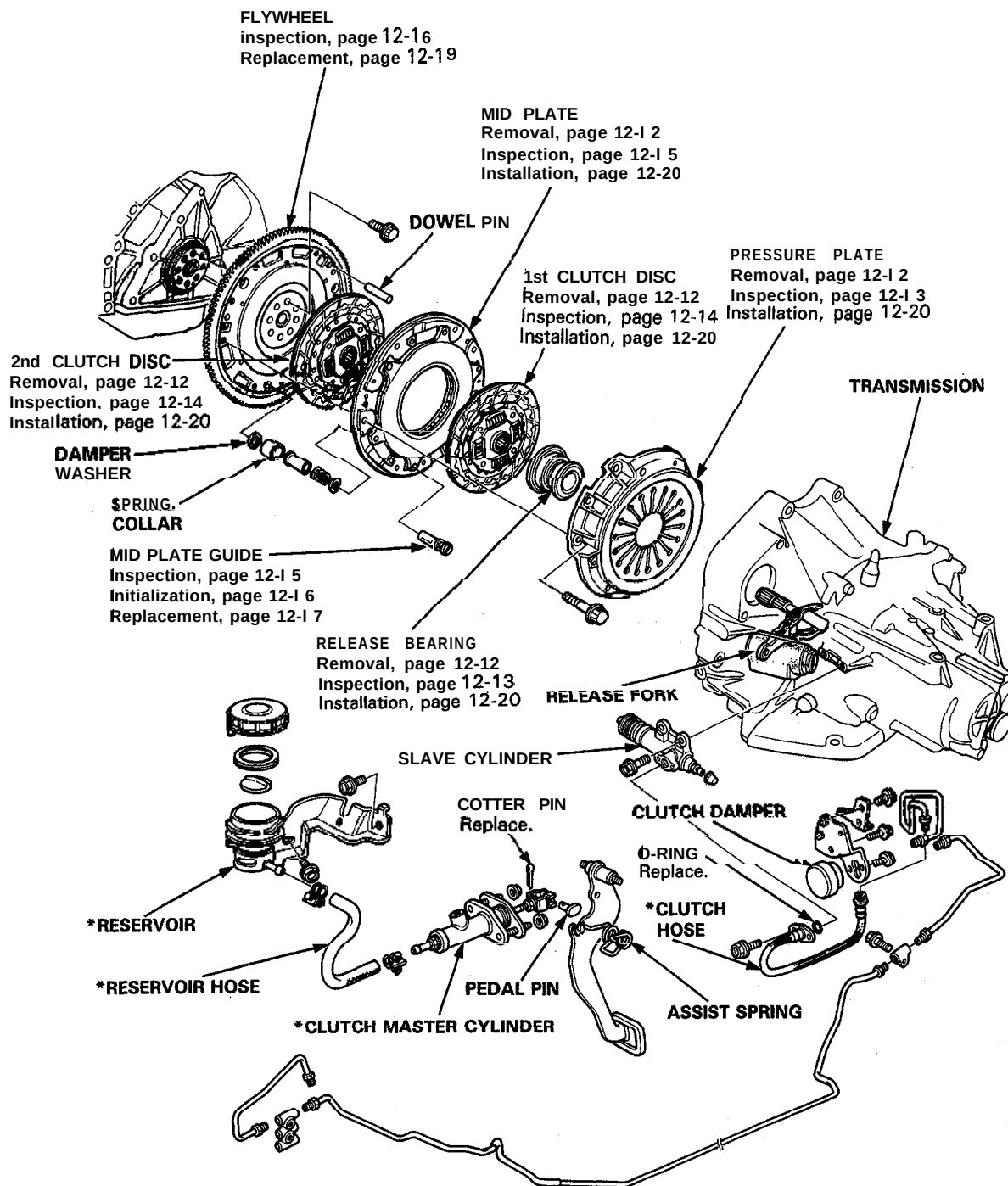
Ref.No.	Tool Number	Description	Q'ty	Page Reference
①	07LAB—PV00100 or 07924— PD20003	Ring Gear Holder	1	12-12
②	07MAF—PR80100	Clutch Alignment Shaft	1	12-20
③	07746-0010200	Attachment, 37 x 40 mm	1	12-19
④	07749-0010000	Driver	1	12-19
⑤	07936-3710100	Handle	1	12-20





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.



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 further 1/4 – 1/2 turn.

6. Tighten locknut A.

7. Loosen locknut B and pedal switch B.

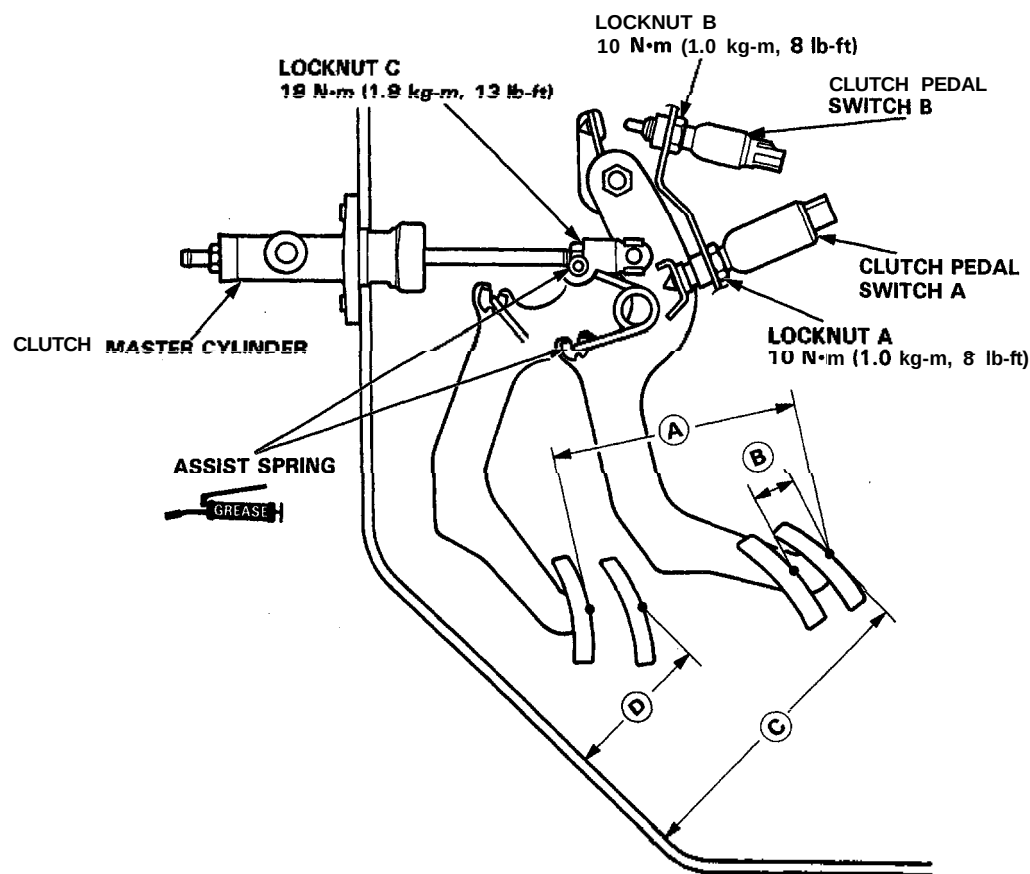
8. Measure the clearance between the floor board and clutch pedal with the clutch pedal fully depressed.

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 in 1/4 – 1/2 turn further.

11. Tighten locknut B.



(A) (STROKE AT PEDAL): 130-135 mm (5.12-5.31 in.)

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

(C) (CLUTCH PEDAL HEIGHT): 186.4 mm (7.34 in.)

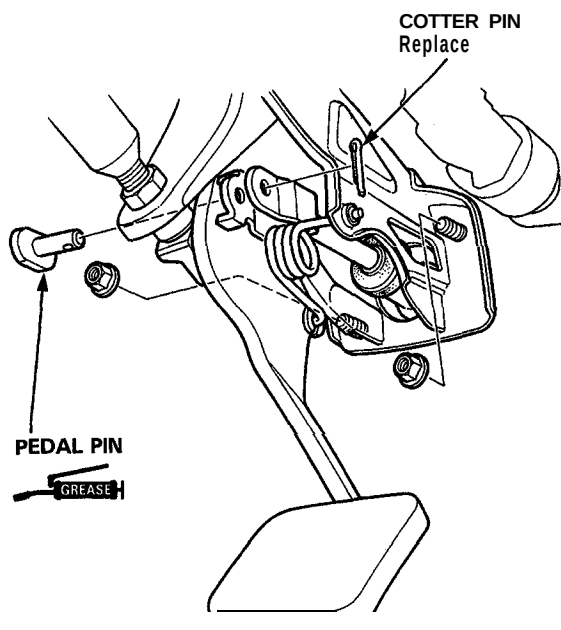
(D) (CLUTCH PEDAL DISENGAGEMENT HEIGHT): 93 mm (3.66 in.) minimum to the floor.



Clutch Master Cylinder

Removal

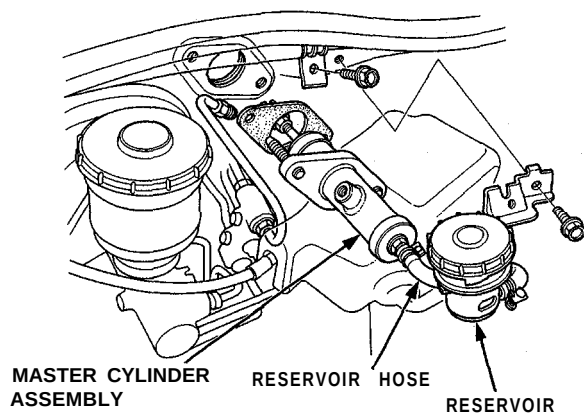
1. Pry out the cotter pin, and pull the pedal pin out of the yoke.



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:

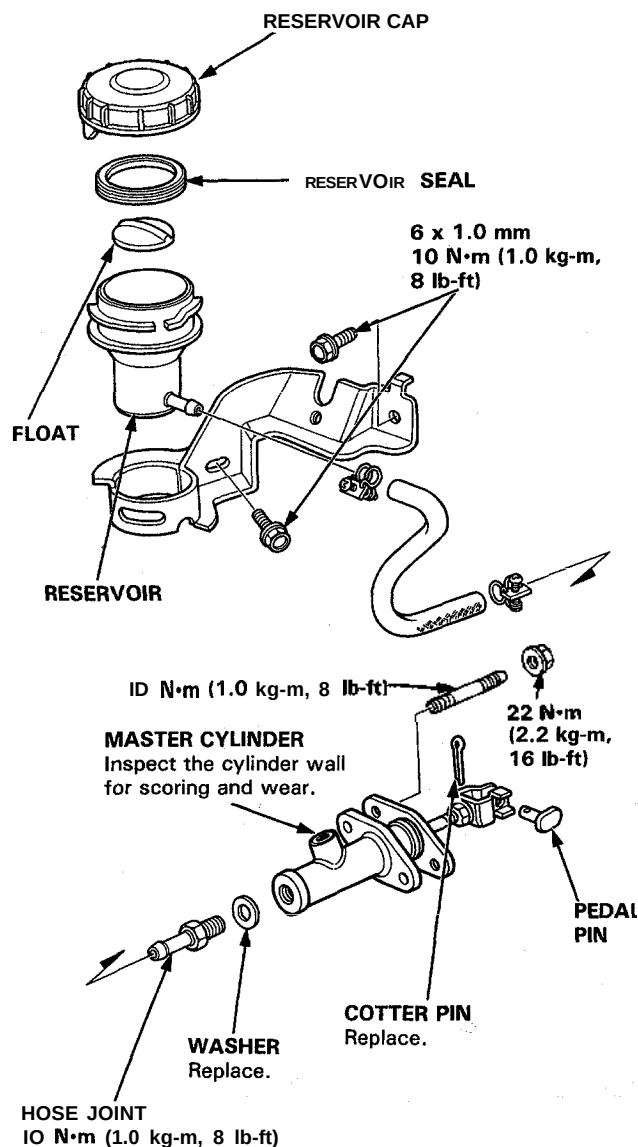
- Avoid spilling brake fluid on paint as it may damage the finish.
- Plug the end of the clutch pipe and reservoir hose with a shop towel to prevent fluid from flowing out of the clutch pipe and reservoir hose after disconnecting.



Installation

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

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



Slave Cylinder

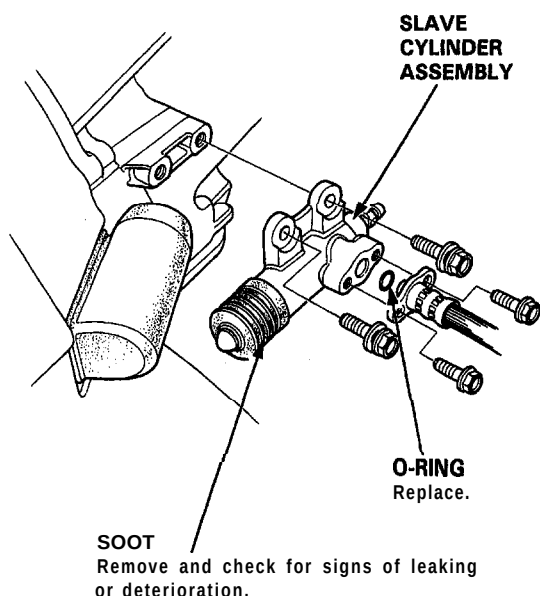
Removal

1. 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.

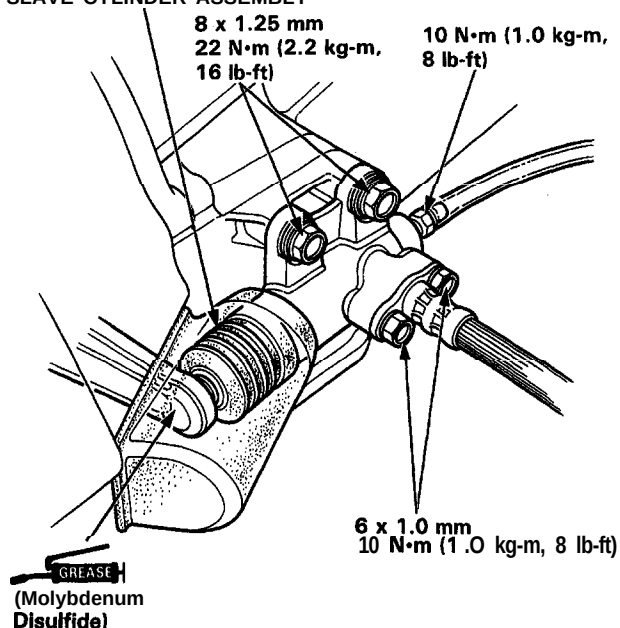
2. Remove the slave cylinder from the clutch housing.



Installation

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

SLAVE CYLINDER ASSEMBLY

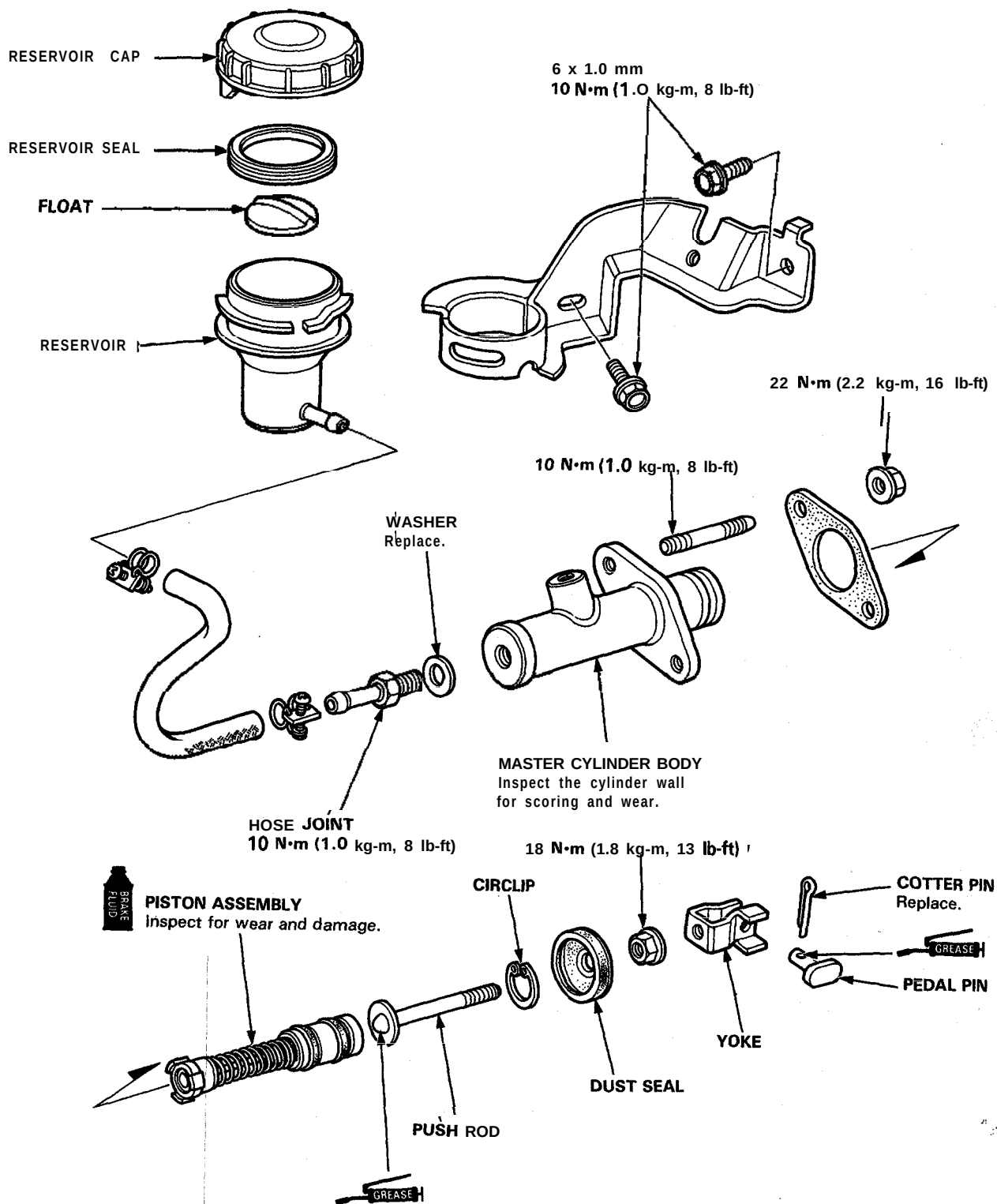


2. Bleed the clutch hydraulic system:

- 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.
- Refill the master cylinder fluid when done.
- Use only DOT 3 or 4 brake fluid.

Clutch Master Cylinder (CANADA)

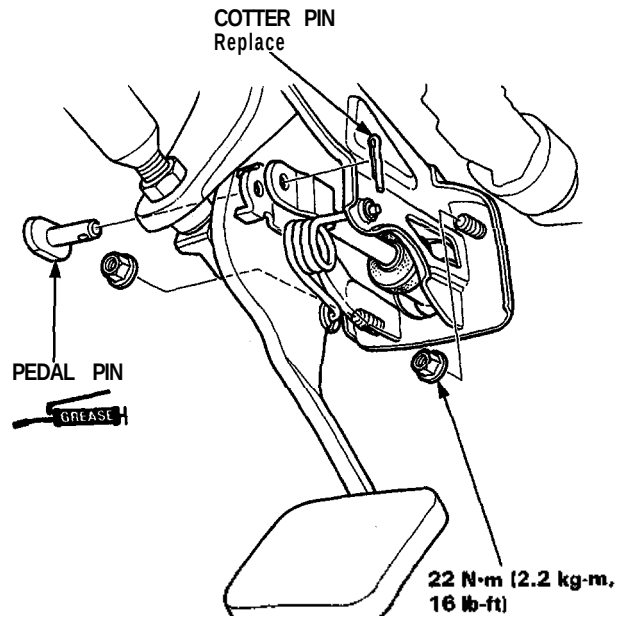
Overhaul/Inspection



Clutch Master Cylinder (CANADA)

Removal/Installation

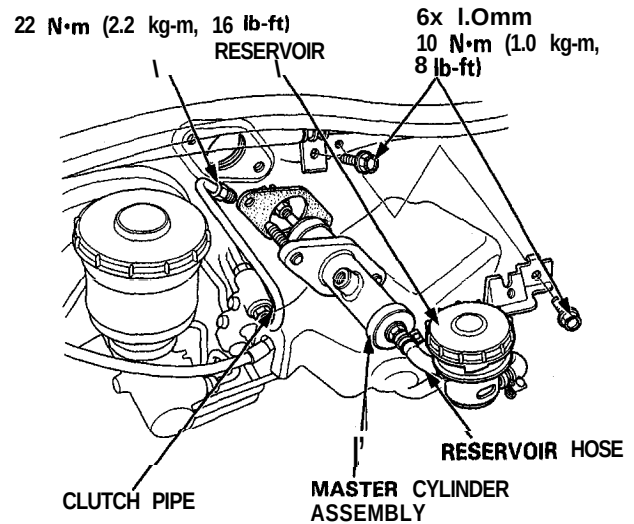
1. Pry out the cotter pin, and pull the pedal pin out of the yoke.



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 paint as it may damage the finish.
- Plug the end of the clutch pipe and reservoir hose with a shop towel prevent fluid from flowing out of the clutch pipe and reservoir hose after disconnecting.



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

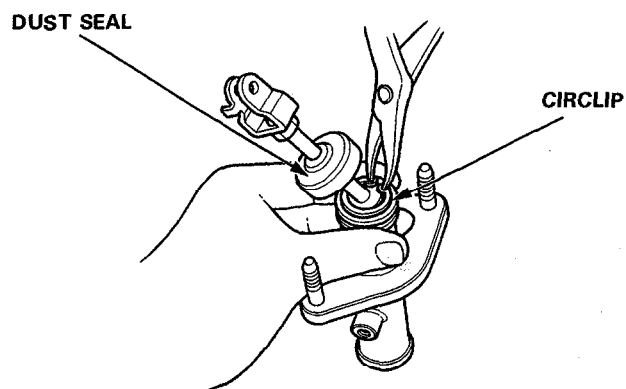
NOTE: Bleed the clutch hydraulic system (page 12 - 11) .



Disassembly

CAUTION: Avoid spilling brake fluid on paint as it may damage the finish.

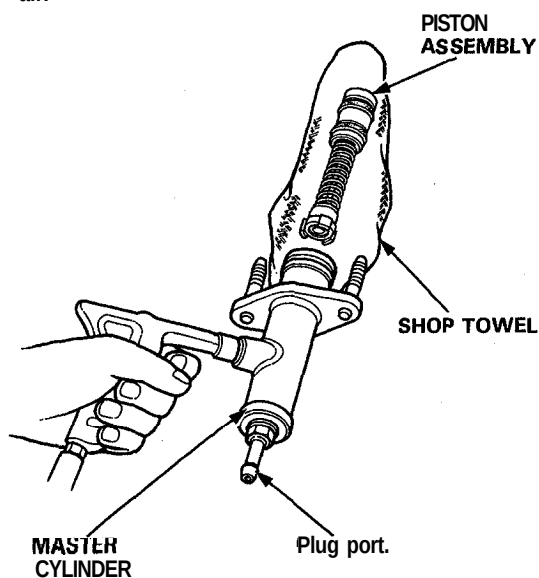
1. Remove the dust seal from the master cylinder.



2. Pry the circlip off the master cylinder.
3. Carefully remove the piston by applying air pressure through the clutch line hose.

CAUTION:

- Hold a shop towel over the master cylinder, to stop the piston in case it comes out suddenly.
- Plug the end of the clutch hose port with a shop towel to prevent fluid from coming out.
- Clean all disassembled parts in solvent and blow through all ports and passages with compressed air.

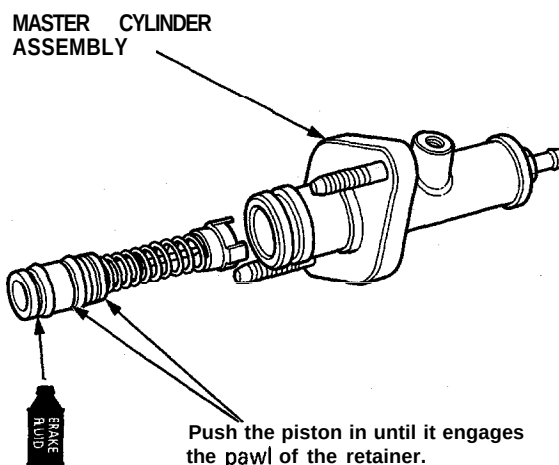


Reassembly

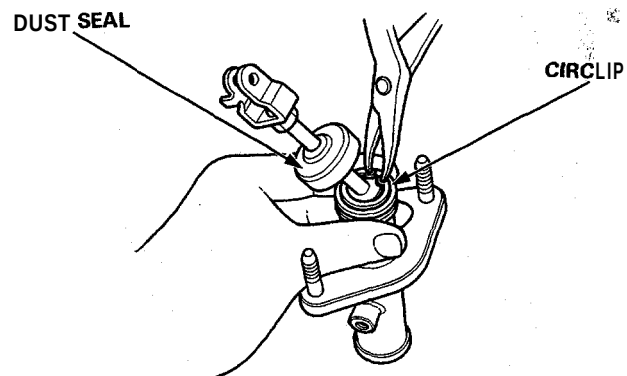
CAUTION:

- Before assembling, make sure all parts are completely clean.
- Replace parts with new ones whenever specified to do so.
- Do not allow dust or water to enter the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the brake fluid which was drained out.
- Avoid spilling the brake fluid on painted surfaces, as it may damage the finish.

1. Assemble the piston noting the proper direction of the parts (page 1 2-7).



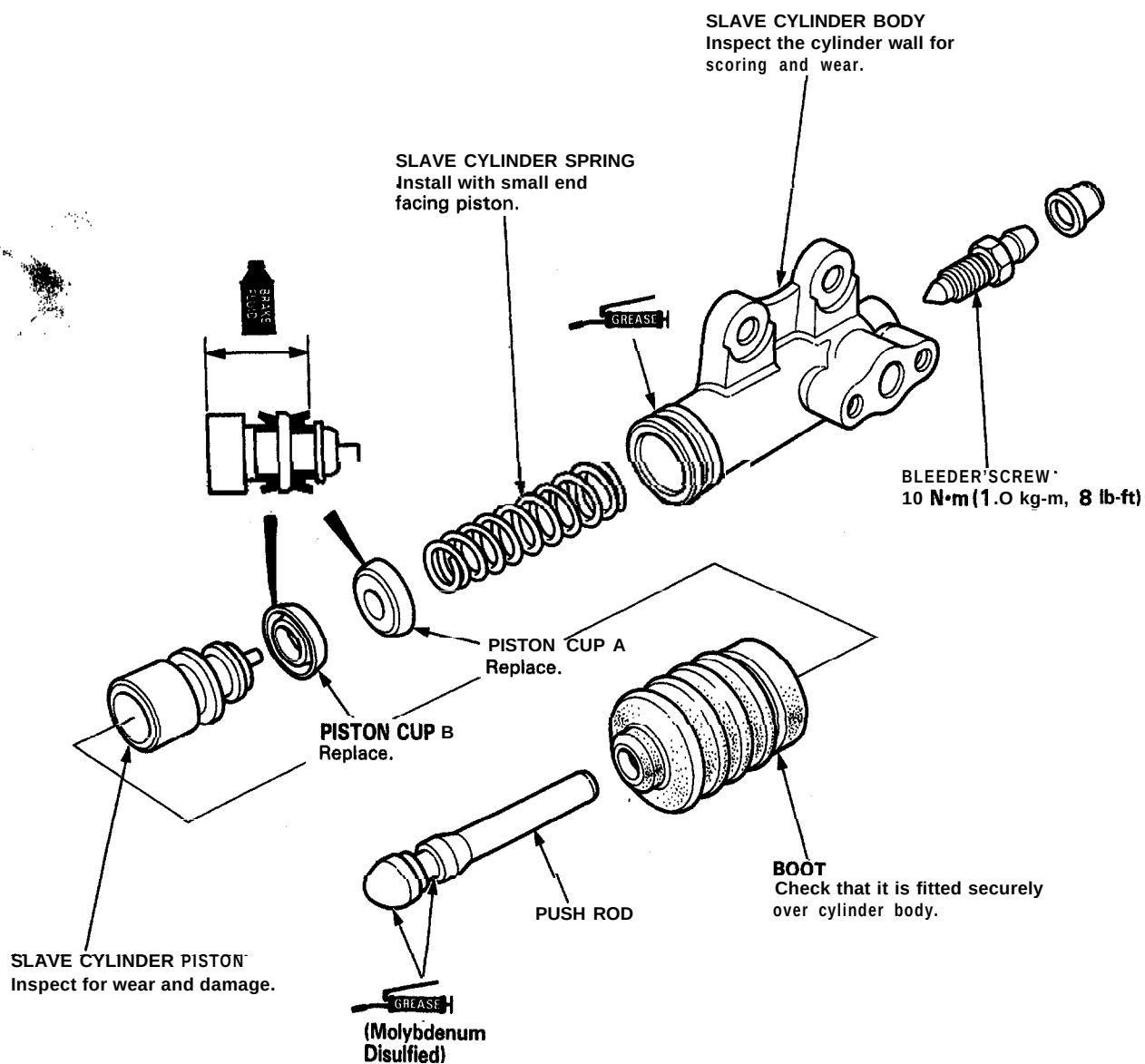
2. Slide the piston assembly into the master cylinder.
3. Install the circlip in the groove of the master cylinder.



4. Install the dust seal.

Slave Cylinder (CANADA)

Overhaul/Inspection





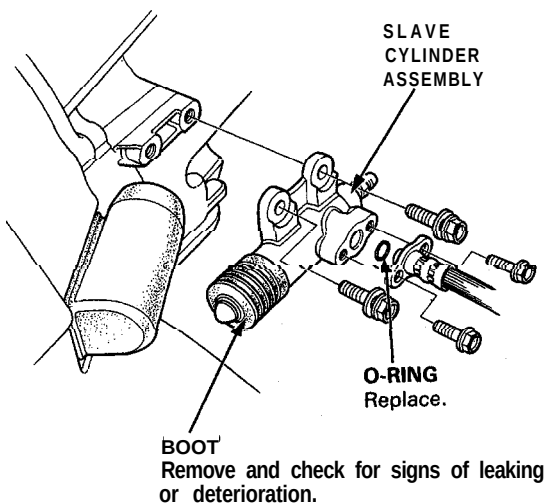
Removal

1. 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.

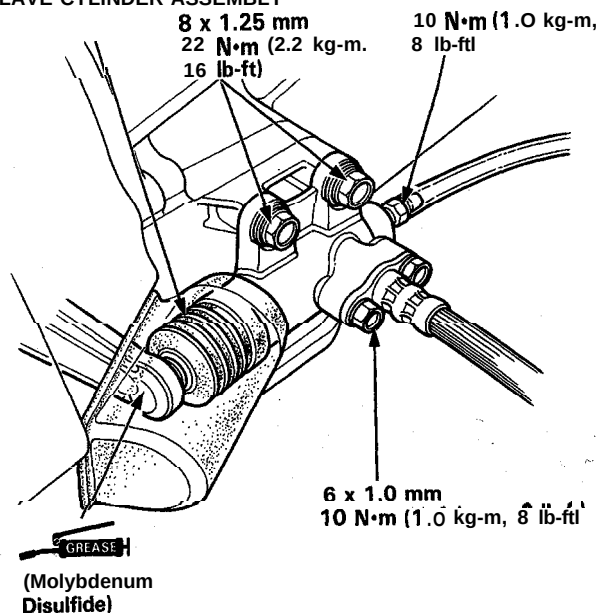
2. Remove the slave cylinder from the clutch housing.



Installation

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

SLAVE CYLINDER ASSEMBLY



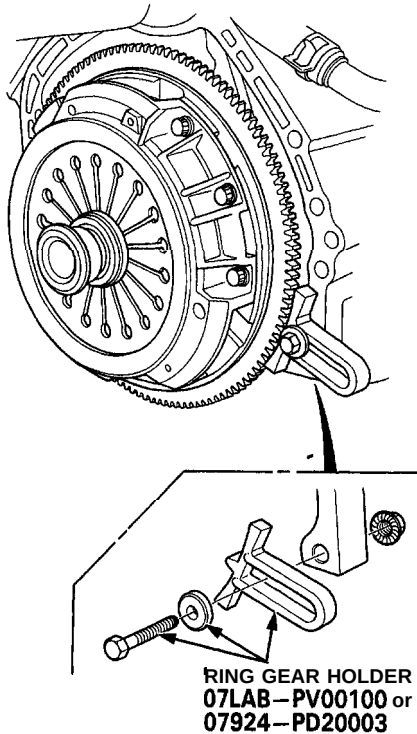
2. Bleed the clutch hydraulic system:

- 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.
- Refill the master cylinder fluid when done.
- Use only DOT 3 or 4 brake fluid.

Pressure Plate, Clutch Disc, Mid Plate

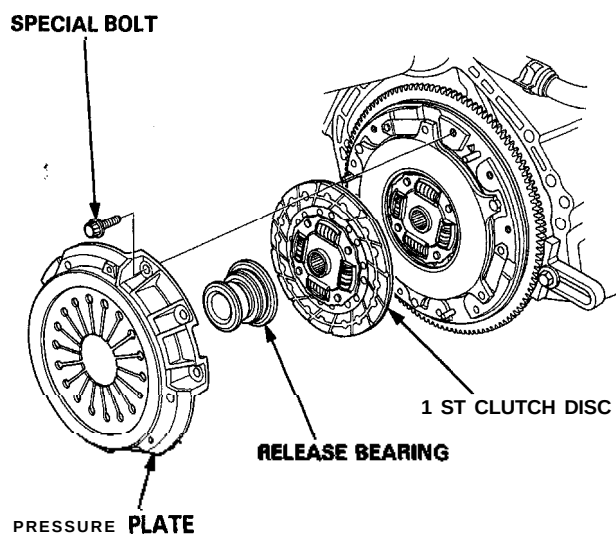
- Removal

1. Install the Ring Gear Holder.

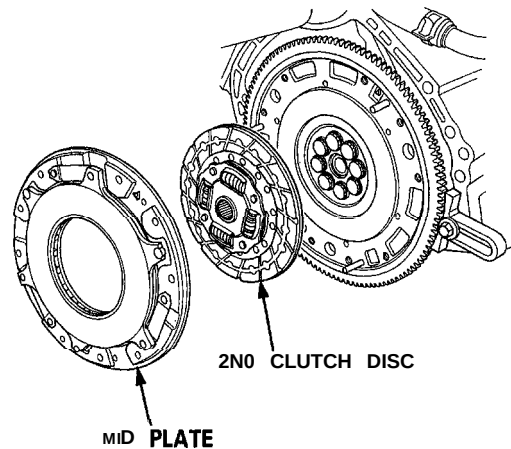


2. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern, then remove the pressure plate and the 1 st clutch disc.

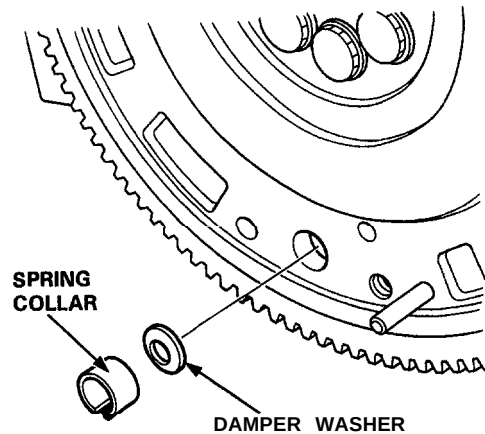
3. Remove the release bearing from the pressure plate.



4. Remove the mid plate and the 2nd clutch disc.



5. Remove the spring collar and damper washer from the flywheel.





Pressure Plate

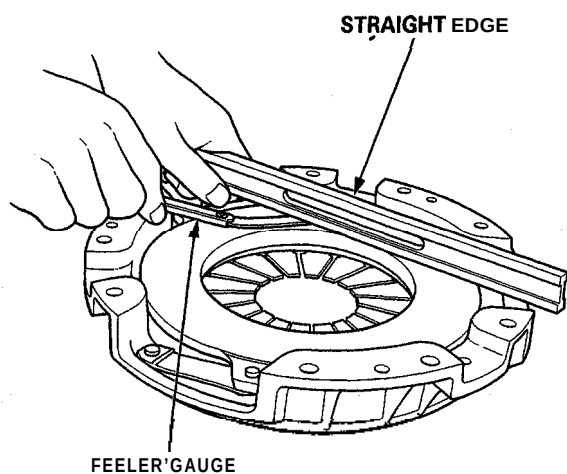
Inspection

NOTE: If replacement is required, always replace the pressure plate, mid plate and flywheel as a set.

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.

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

Measure across the pressure plate at three points.

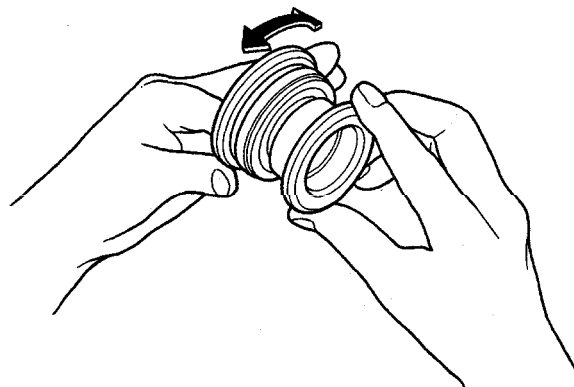


Release Bearing

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.

1st and 2nd Clutch Discs

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.

Standard:

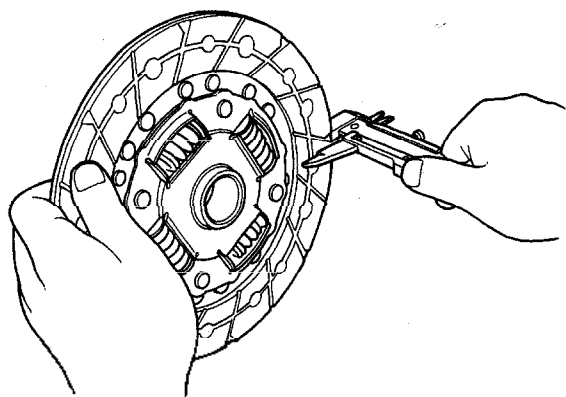
1st Clutch Disc: 8.3-9.0 mm
(0.327-0.354 in.)

2nd Clutch Disc: 7.6-8.3 mm
(0.299-0.327 in.)

Service Limit:

1st Clutch Disc: 5.9 mm (0.232 in.)

2nd Clutch Disc: 5.4 mm (0.213 in.)

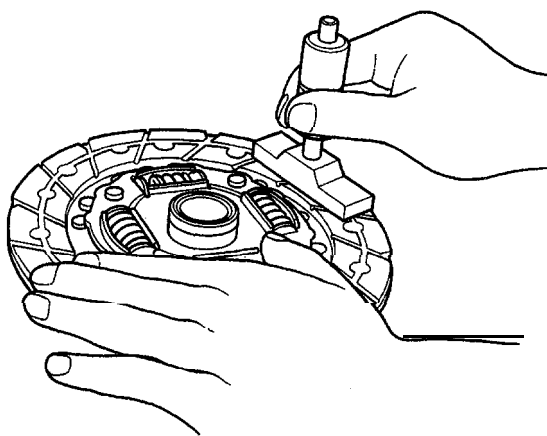


3. Measure the depth from the lining surface to the rivets, on both sides.

1st and 2nd Clutch Discs:

Standard: 1.1 mm 10.043 in.) min.

Service Limit: 0.5 mm 10.020 in.)



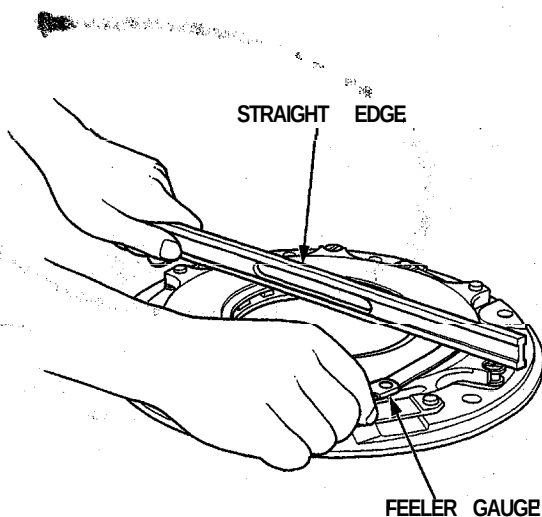
Mid Plate

Inspection

NOTE: If replacement is required, always replace the pressure plate, mid plate and flywheel as a set.

1. Inspect the mid plate surface for wear, cracks, or burning.
2. Inspect for warpage using a straight edge and feeler gauge.

Standard: (New): 0.05 mm (0.0020 in.) min.
Service Limit: 0.15 mm (0.0059 in.)



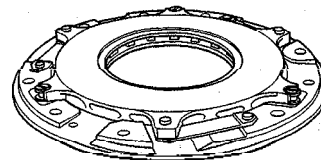
Mid Plate Guide

Inspection

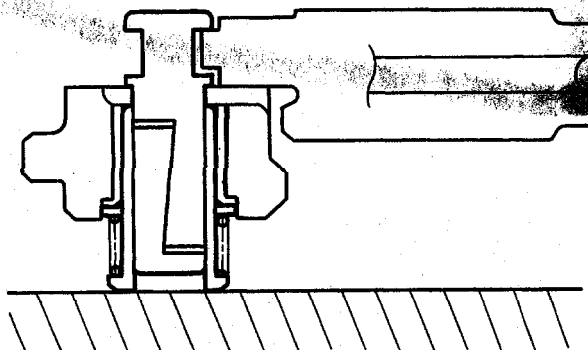
NOTE: Make sure all parts are clean before inspection.

1. Make sure the mid plate guide moves when you apply 1 O-60 kg/per one place of pressure to the disc surface of the mid plate.

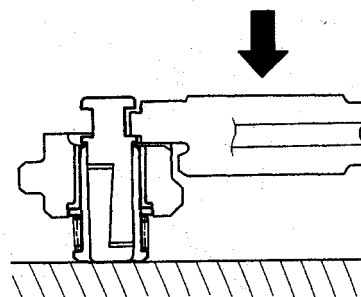
NOTE: inspection all the mid plate guides as described above.



Before Pressing:



After Pressing:



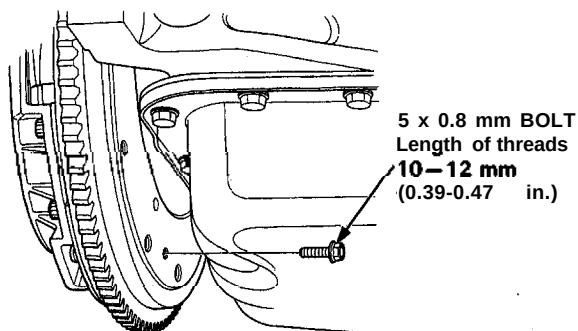
Mid Plate Guide

Initialization

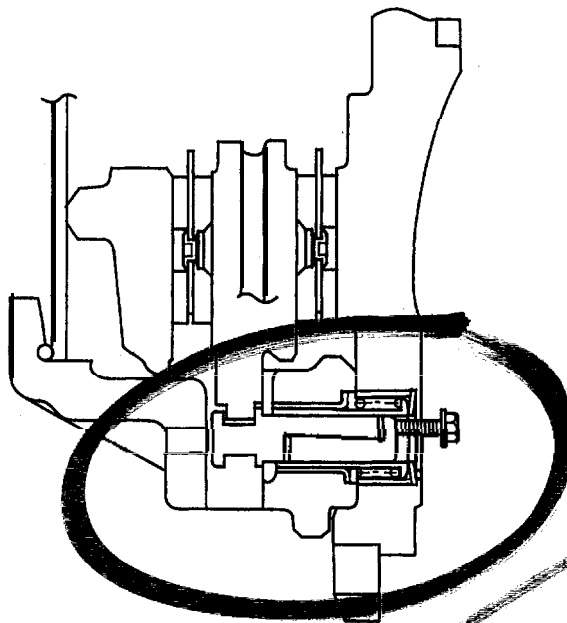
NOTE:

- If the pressure plate mounting bolts are unscrewed, the mid plate guide must be initialized.
- Initialize after tightening the pressure plate mount bolts.

1. Screw the 5 mm bolt into the back of the flywheel until it just touches the mid plate guide.

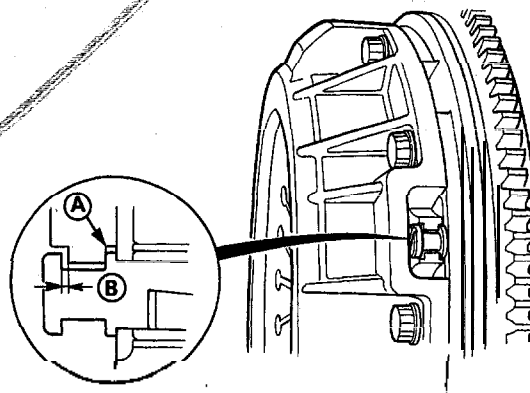
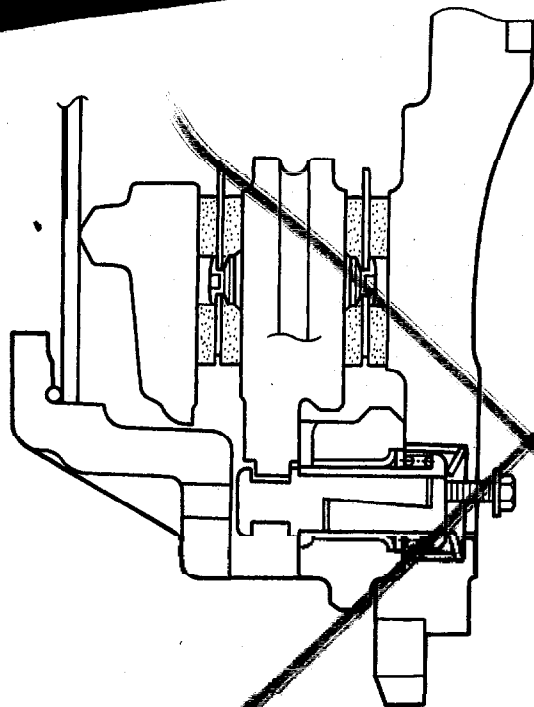


2. Screw the 5 mm bolt in 150-210" further.



3. Make sure that:

- The mid plate guide touches the back of the mid plate (A).
- There is 0.40-0.55 mm (0.016-0.022 in.) clearance between the mid plate guide and the front of the mid plate.



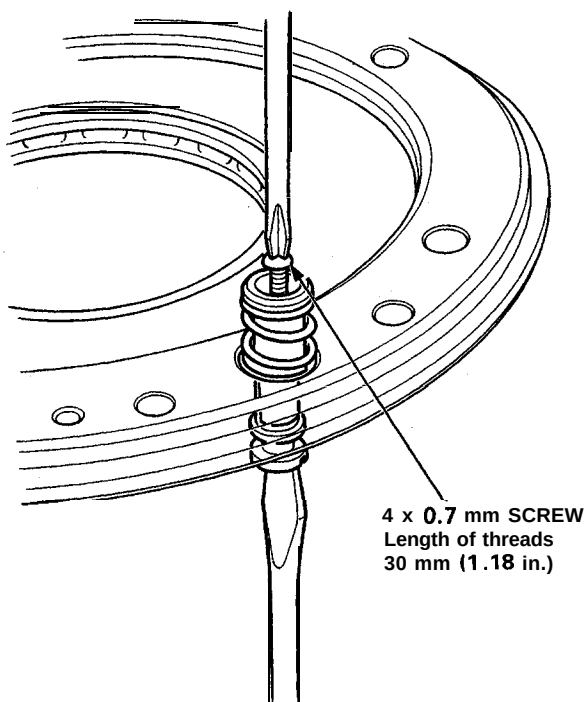
4. Initialize the remaining mid plate guides as described above, then remove the 5 mm bolt.



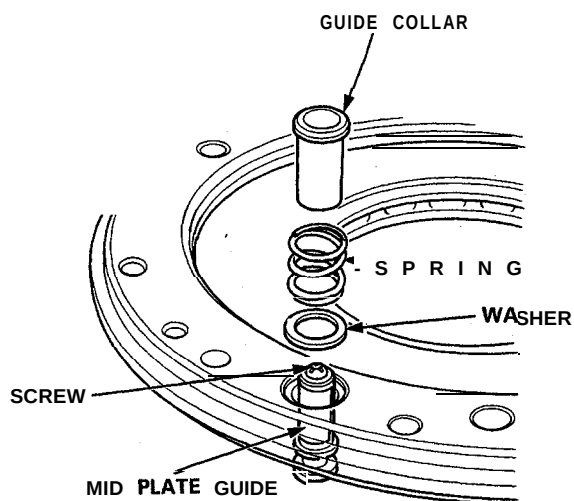
Replacement

NOTE: Make sure all parts are clean before installation.

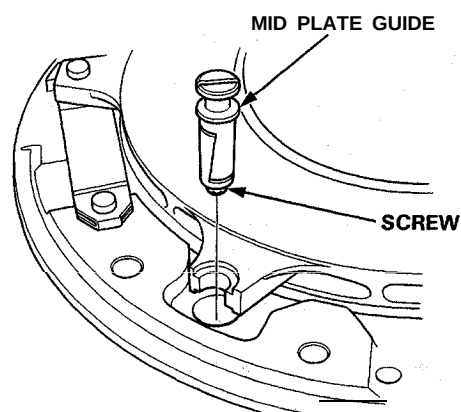
1. Thread and tighten a 4 mm screw into mid plate guide.



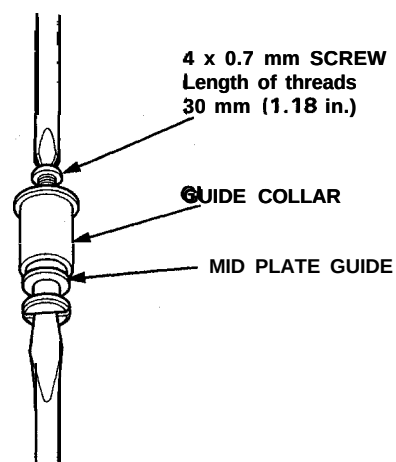
2. Remove the guide collar, spring and washer



3. Remove the mid plate guide with the screw installed.



4. Thread and tighten a 4 mm screw into the new mid plate guide, then remove the mid plate guide from the guide collar.

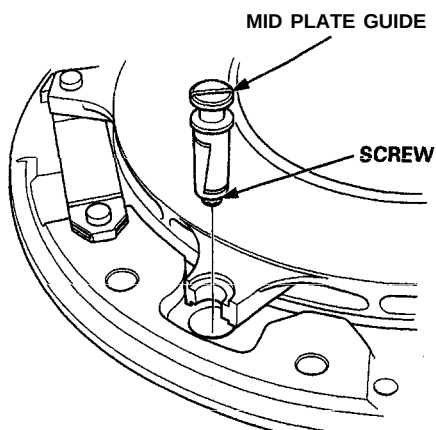


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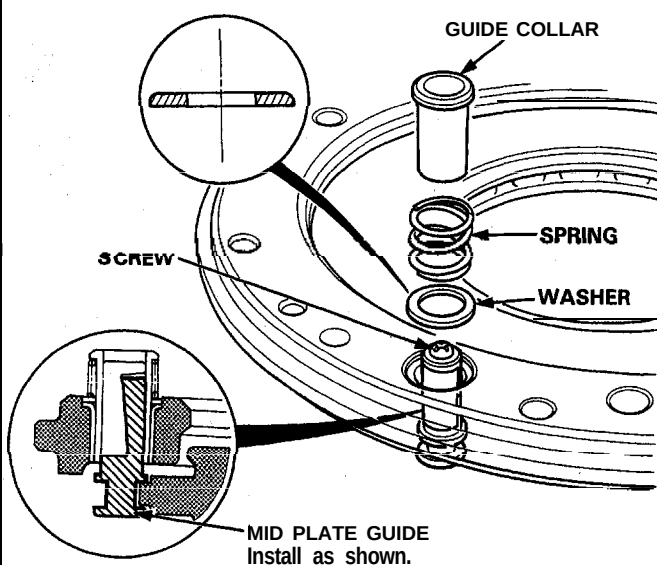
Mid Plate Guide

Replacement (cont'd)

5. Install the new mid plate guide with the screw installed.



6. Install the washer, spring and guide collar, then remove the screw.



7. Initialize the mid plate guides after installing the clutch assembly. (See page 12-I 6).

Flywheel, Flywheel Bearing

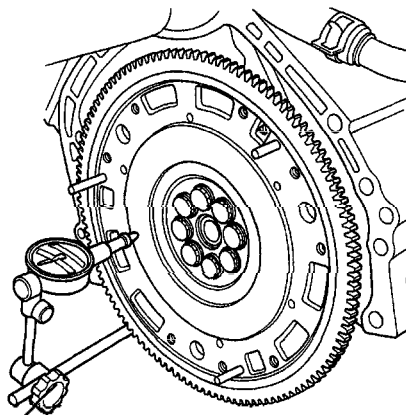
Inspection

NOTE: If replacement is required, always replace the pressure plate, mid plate and flywheel as a set.

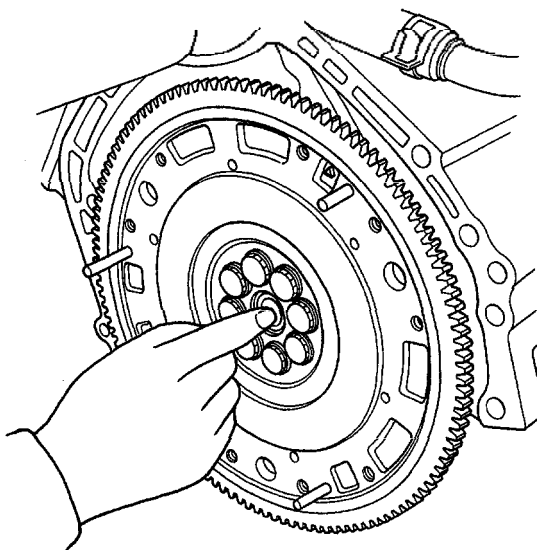
1. Inspect the ring gear teeth for wear or damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks or burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push against the flywheel each time you turn it to take up the crankshaft thrust 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 10.0059 in.)



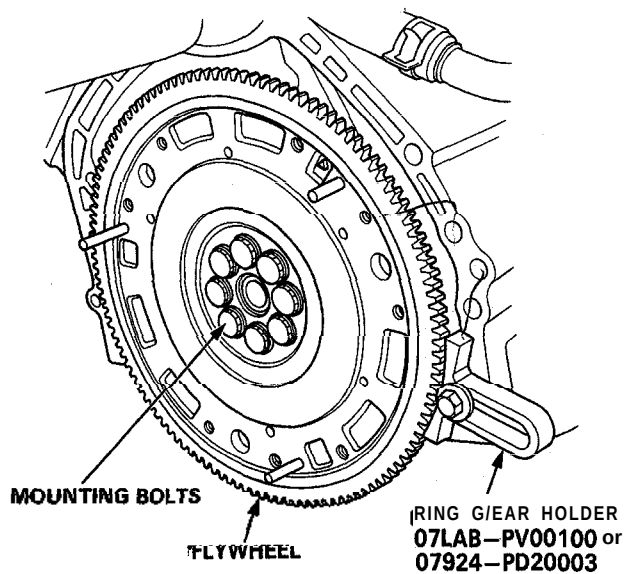
4. Turn the inner race of the flywheel bearing with your finger. The bearing should turn smoothly and quietly. Check that the bearing outer race fits tightly in the flywheel. Replace the bearing if the race does not turn smoothly, quietly, or fit tight in the flywheel.



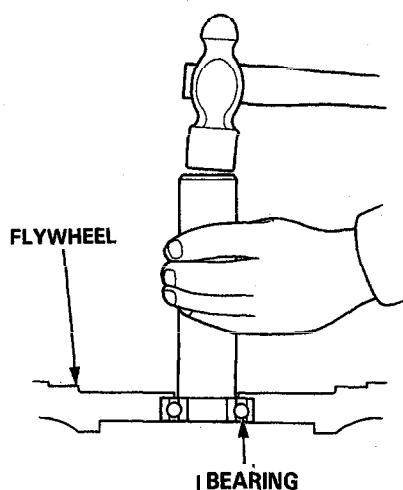


Replacement

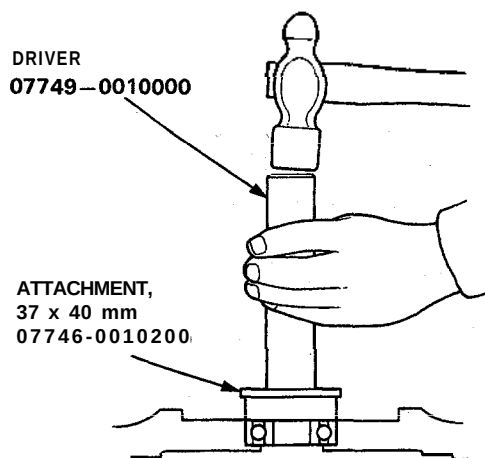
1. Remove the flywheel mounting bolts and the flywheel.



2. Remove the bearing from the flywheel.

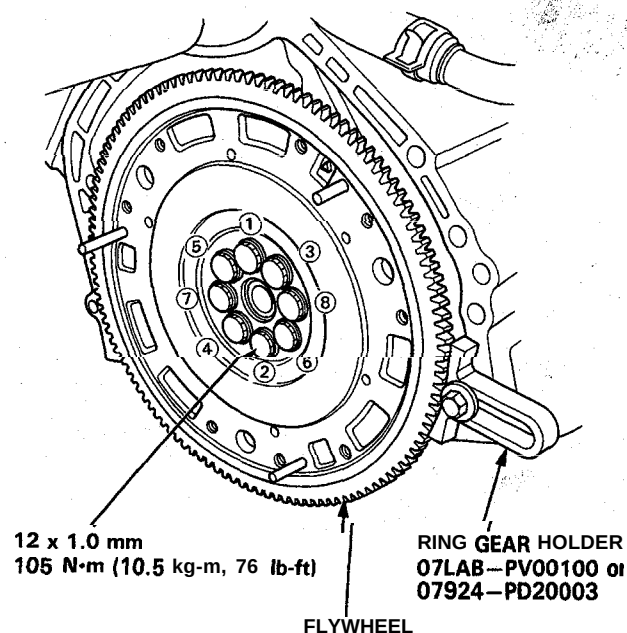


3. Drive in the new bearing into the flywheel using the special tools.



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.



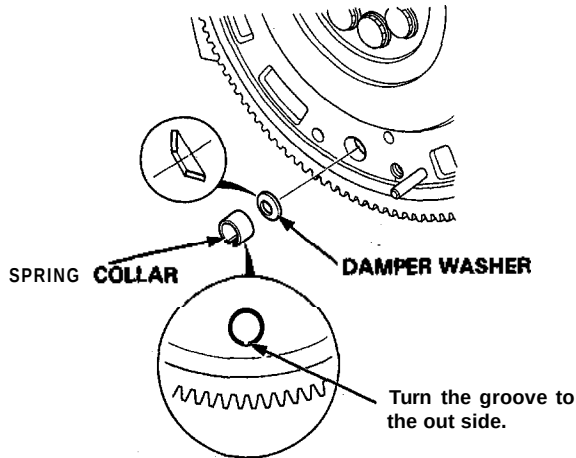
Pressure Plate, Clutch Disc Mid Plate

Installation

NOTE:

- Install the pressure plate, clutch discs and mid plate is a set.
- Do not mix-up the 1 st and 2nd clutch discs. The 2nd clutch disc has a flat plate between the two friction surfaces. The 1st clutch disc has a spring plate between the two friction surfaces.

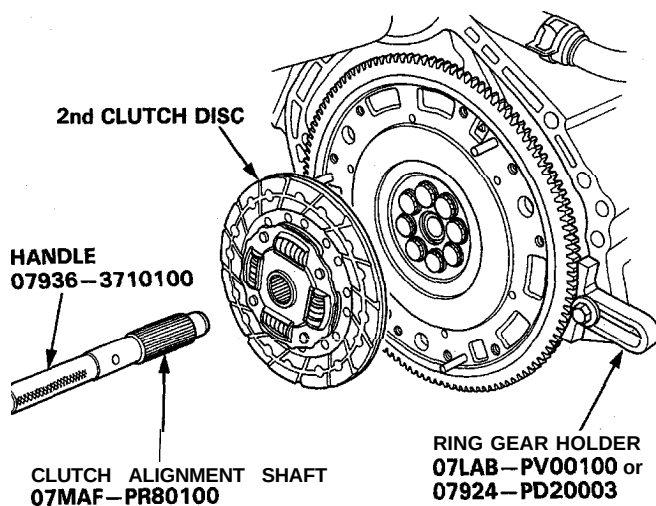
1. Install the damper washer and spring collar.



2. Install the ring gear holder.

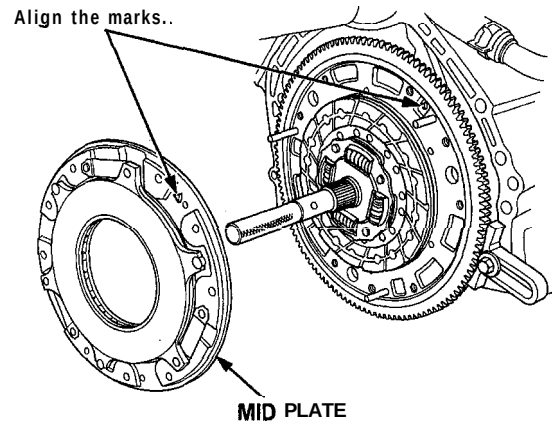
3. Install the 2nd clutch disc.

NOTE: The index mark on the 2nd clutch disc should face away from the flywheel.



4. Install the mid plate.

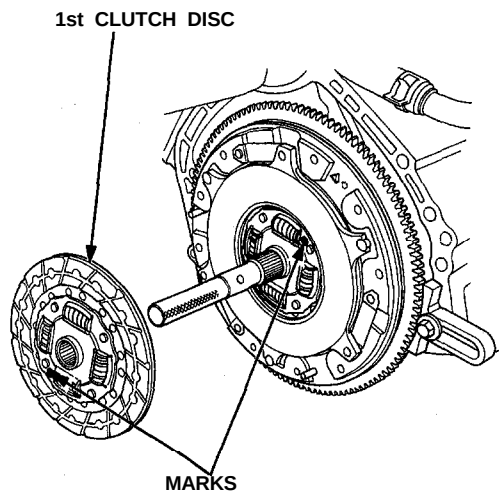
NOTE: Align the mark on the flywheel with the mark on the mid plate.



5. Install the 1st clutch disc.

NOTE:

- The marks on the 1st and 2nd clutch discs should be 180° a part.
- The index mark on the 1st clutch disc should face away from the flywheel.



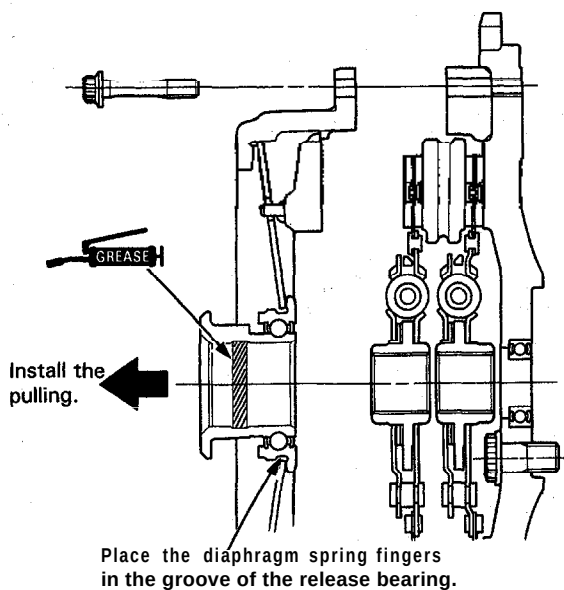
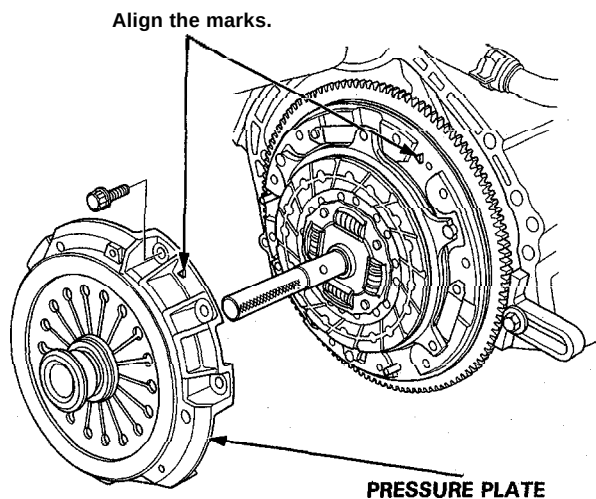


6.. Install the release bearing on the pressure plate.

7. Install the pressure plate.

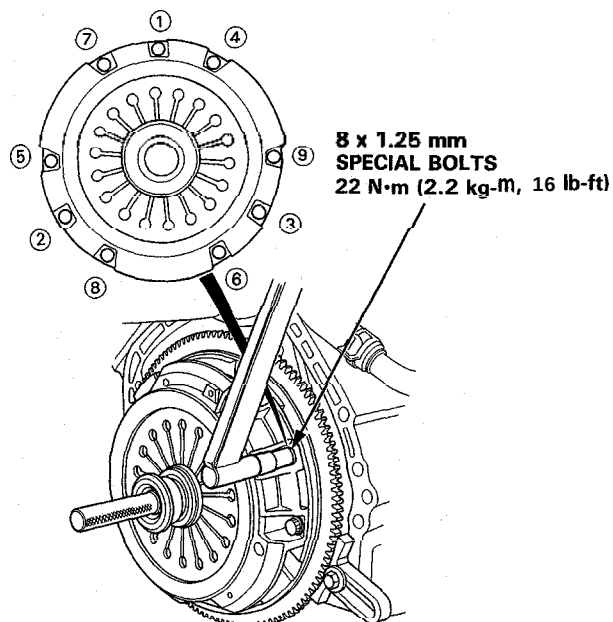
NOTE:

- Align the mark on the mid plate with the mark on the pressure plate.
- After installed, make sure the release bearing no come off.



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

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



9. Remove the alignment tool and ring gear holder.

10. Initialize the mid plate guides (See Page 12— 16).

Manual Transmission

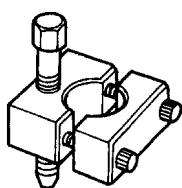
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Clearance Inspection	13-21	Installation	13-48
Shift Fork Assembly			
Disassembly/Reassembly	13-22		



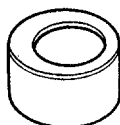
Special Tools

Special Tools

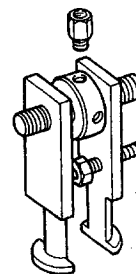
Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07GAJ-PG20110	Mainshaft Holder	1	13-42
②	07GAJ-PG20130	Mainshaft Base	1	13-42
③	* 07736-A01000A	Adjustable Bearing Puller, 25-40 mm	1	13-39
④	07746-0010400	Attachment, 52 x 55 mm	1	13-40
⑤	07746-0010500	Attachment, 62 x 68 mm	1	13-39
⑥	07746-0030100	Driver 40 mm I.D.	1	13-42
⑦	07746-0030400	Attachment 35 mm I.D.	1	13-42
⑧	07749-0010000	Driver	1	13-39



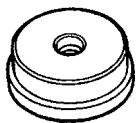
①



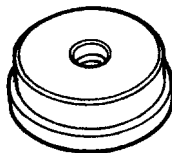
②



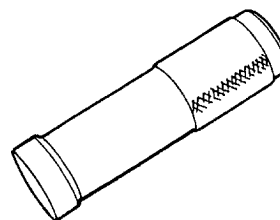
③



④



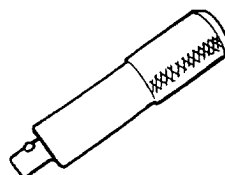
⑤



⑥



⑦



⑧

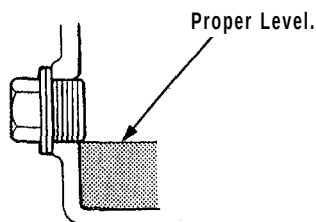
* Must be used with commercially available 3/8 x 1.6 Slide Hammer

Maintenance

Transmission Oil

NOTE: Check with 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.
5. Reinstall the oil filler plug with a new washer.

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

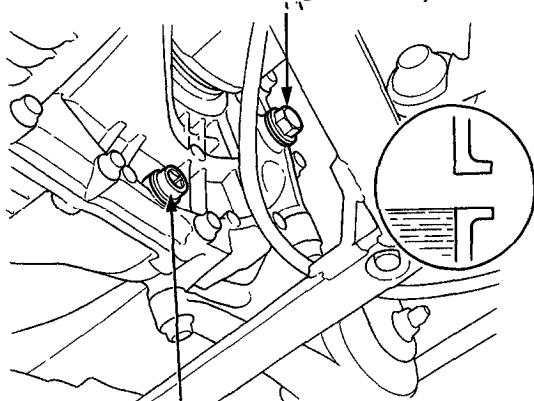
Oil Capacity

2.7 l (2.9 U.S. qt.) after drain.

2.8 l (3.0 U.S. qt.) after **overhaul**.

Use only SAE1 OW-30 or 1 OW-40, that exceeds SE 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)

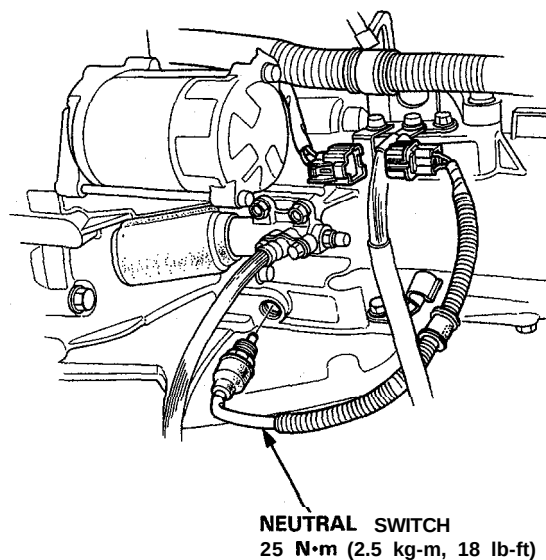
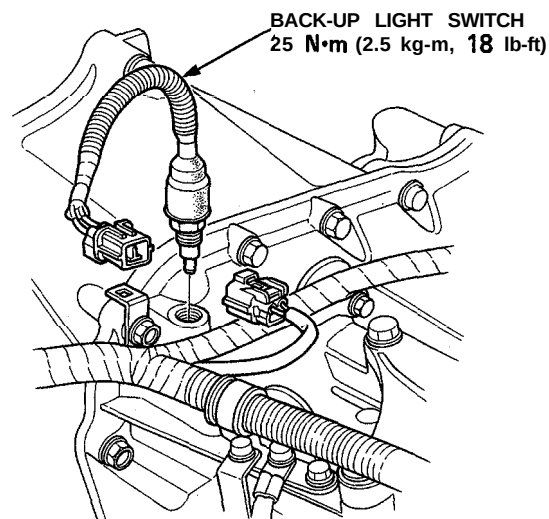
Back-up Light Switch, Neutral Switch



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/N0871 8-550000 OE) to the switch threads, then install the switch.

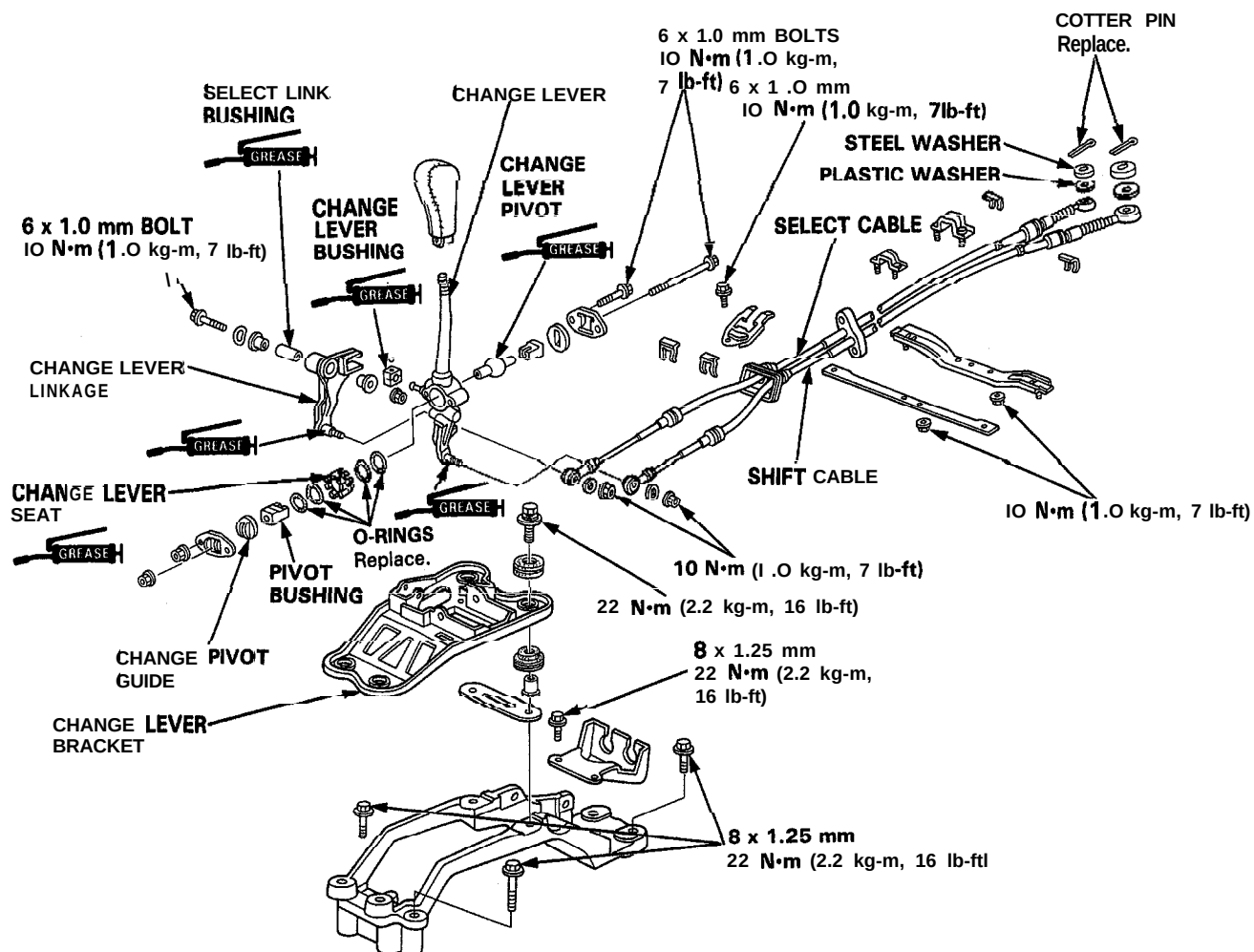


Gearshift Mechanism

Overhaul

NOTE:

- inspect rubber parts for wear or damage when disassembling.
- Check that the new cotter pin is seated firmly.





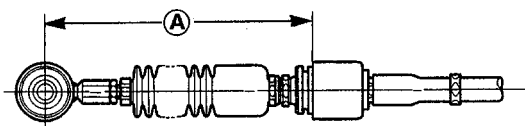
Cable Adjustment

NOTE: See page 13-6, 13-47 for removal and installation.

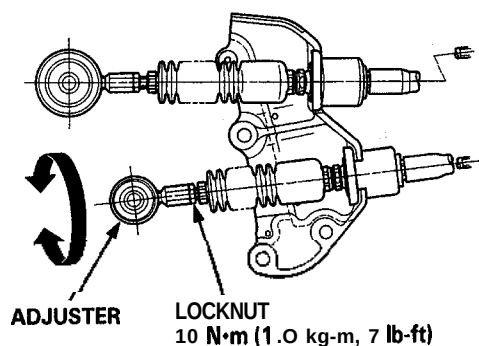
Select Cable

1. With the transmission in neutral, measure the distance **(A)**.

(A): 140.5-141.5 mm (5.53-5.57 in)



2. If distance **(A)** is out of spec, loosen the locknut and turn the adjuster as necessary.



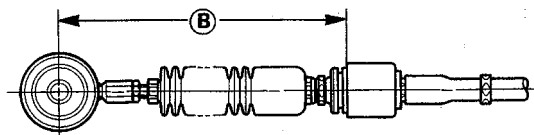
3. Tighten the locknut.

NOTE: After adjustment, check operation of the gearshift lever.

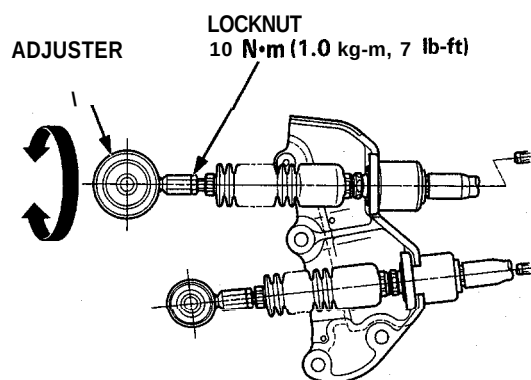
Shift Cable

1. With the transmission in neutral, measure distance **(B)**.

(B): 157.5– 158.5 mm (6.20-6.24 in)



2. If distance **(B)** is out of spec, loosen the locknut and turn the adjuster as necessary.



3. Tighten the locknut.

NOTE: After adjustment, check operation of the gearshift lever.

Transmission Assembly

Removal

WARNING Make sure lifts are placed properly, and hoist brackets are attached to correct position. (See page I-6).

CAUTION:

- Use fender covers to avoid damaging painted surfaces.
- Before removing the transmission, be sure to check and record the rear camber.

1. Check and record the rear camber. (See section 18.)
2. Disconnect the battery negative (-), and positive (+) cables from the battery.
3. Drain transmission oil. Reinstall the drain plug with a new washer.

4. Remove the strut bar.

5. Remove the air cleaner case.

6. Remove the connectors from the control box and remove the control box.

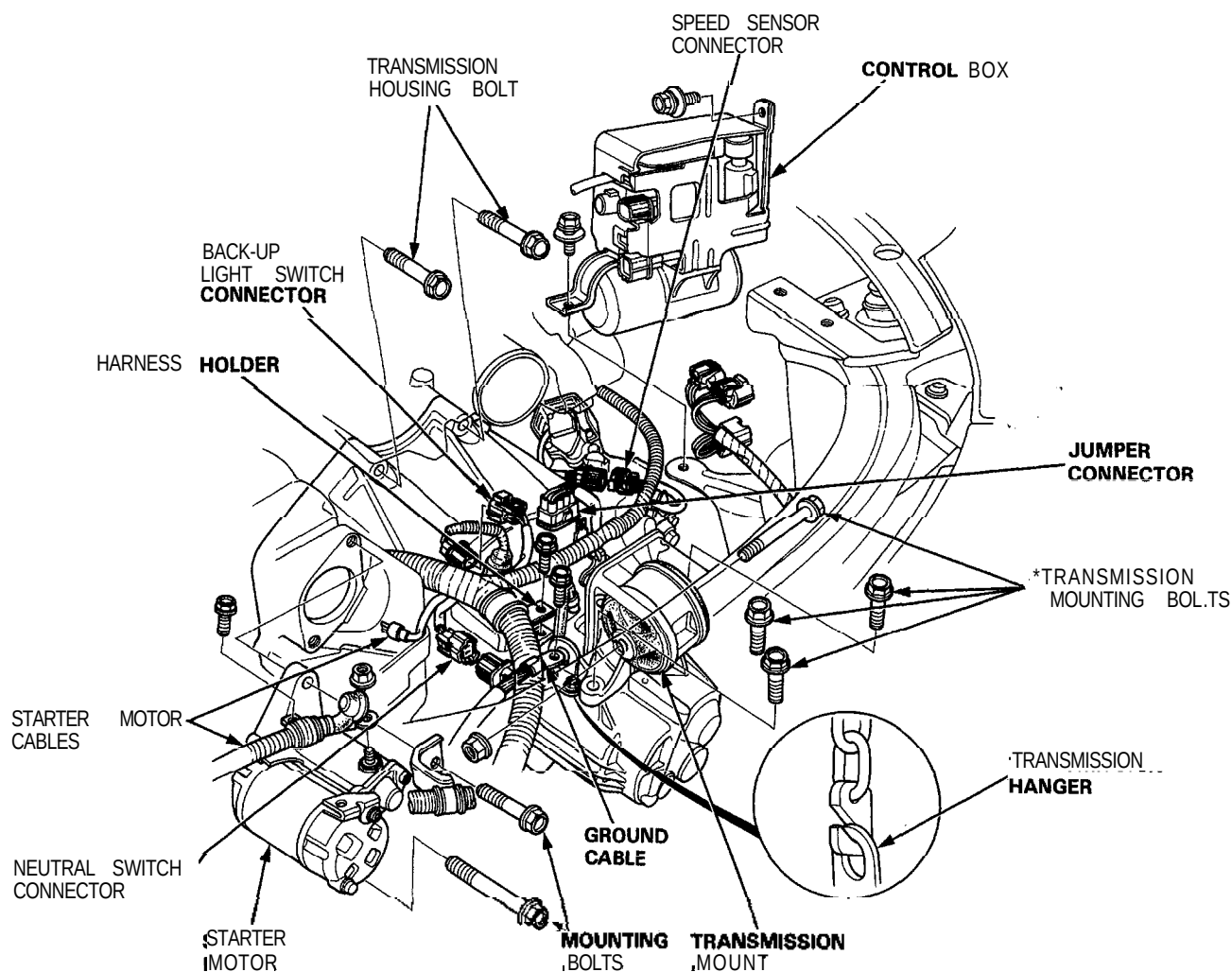
CAUTION: Do not remove the vacuum tubes from the control box.

7. Remove the wire harness holder, jumper connector and transmission ground cable.

8. Disconnect the switch connectors, then remove the back-up light switch and neutral switch.

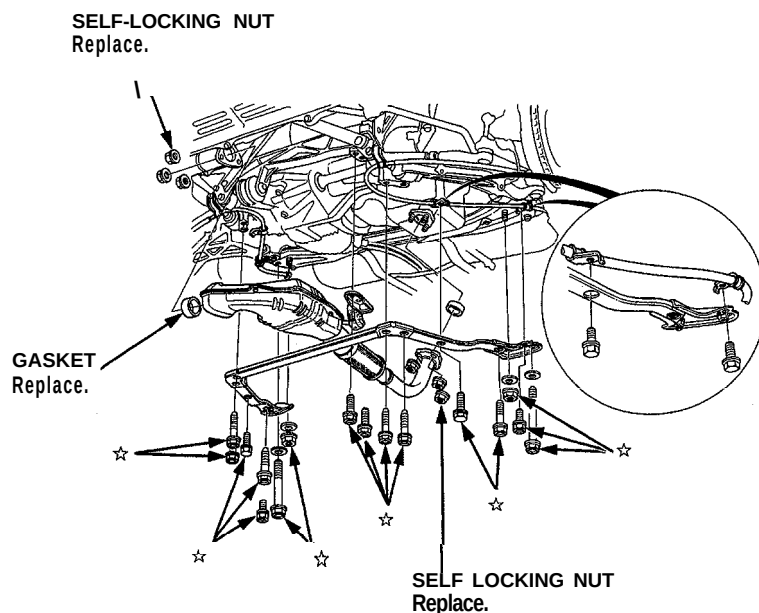
9. Disconnect the starter motor cables, then remove the starter motor.

10. Remove the transmission housing bolts.

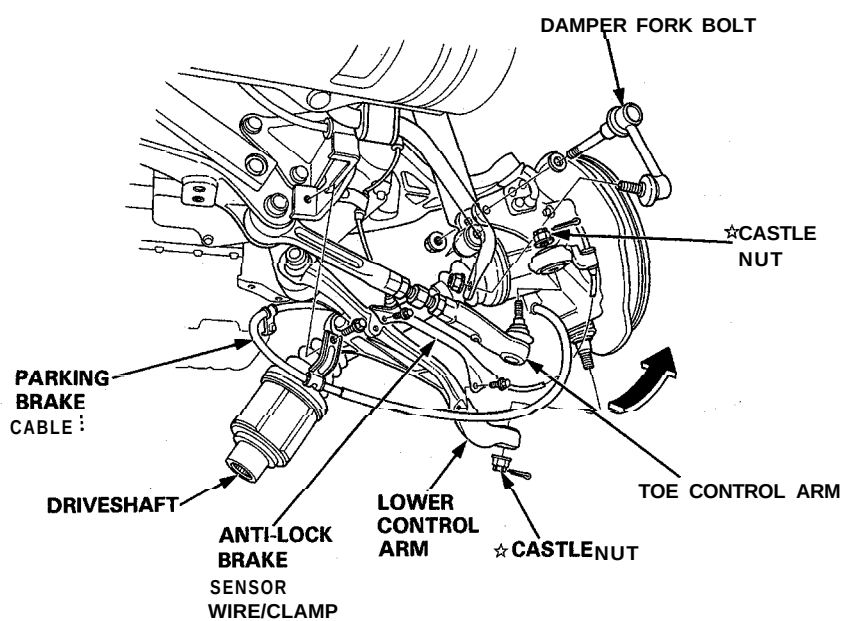




1. Remove the parking brake cable holders from the rear beam rod.
12. Remove the rear beam rod.
13. Remove the front exhaust pipe A.



14. Remove the parking brake cable holder and the Anti-lock Brake sensor wire clamp.
15. Loosen the ball joint nut, then separate the toe control arm from the knuckle using the special tool. (See Section 18.)
16. Remove the damper fork bolt.
17. Remove the ball joint nut using the special tool and separate the lower control arm from the knuckle. (See Section 18.)
18. Remove the right driveshaft from the intermediate shaft.



(cont'd)

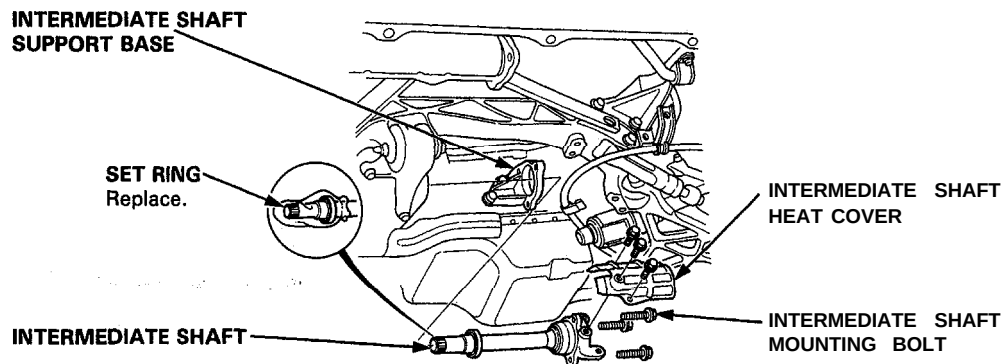
Transmission Assembly

▪ Removal (cont'd)

19. Remove the intermediate shaft heat cover and the intermediate shaft mounting bolts.
20. Pry the intermediate shaft out of the differential, Pull and remove it.

NOTE:

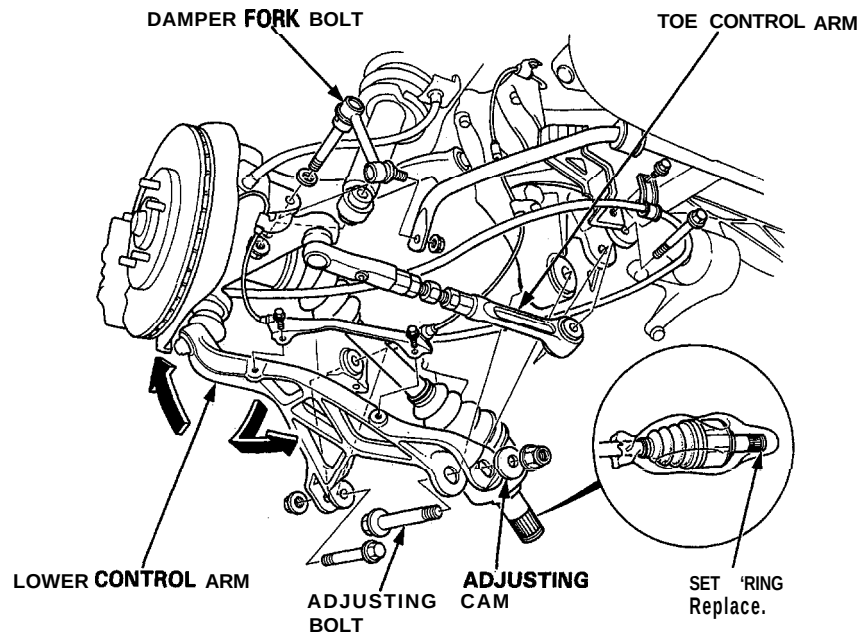
- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



21. Remove the parking brake cable holder and the Anti-lock Brake sensor wire clamp.
22. Scribe a reference mark on the flange of the adjusting bolt, adjusting cam and lower control arm.
23. Loosen the ball joint nut, then separate the toe control arm from the knuckle using the special tool. (See Section 18.)
24. Remove the damper fork bolt.
25. Remove the bolts and lower control arm from the side beam.
26. Remove the left driveshaft from the differential.
27. Pry the driveshaft out of the differential, Pull and remove it.

NOTE:

- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.

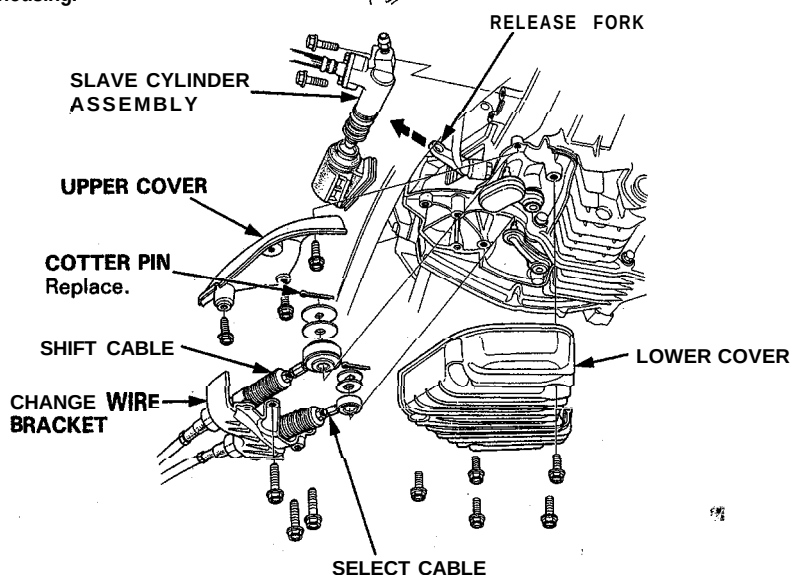
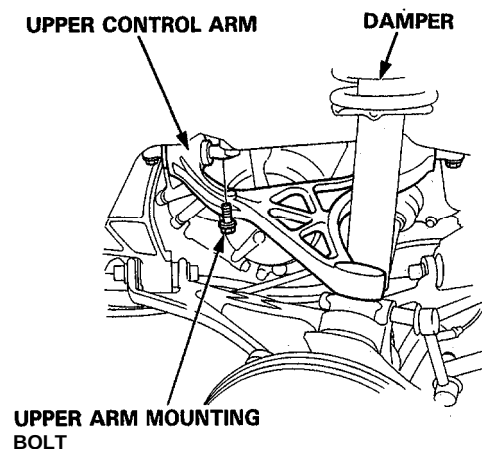




28. Remove the one of the upper control arm mounting bolts.
29. Remove the lower cover, change wire bracket and upper cover.
30. Remove the shift cable and select cable.
31. Remove the slave cylinder from the transmission.

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

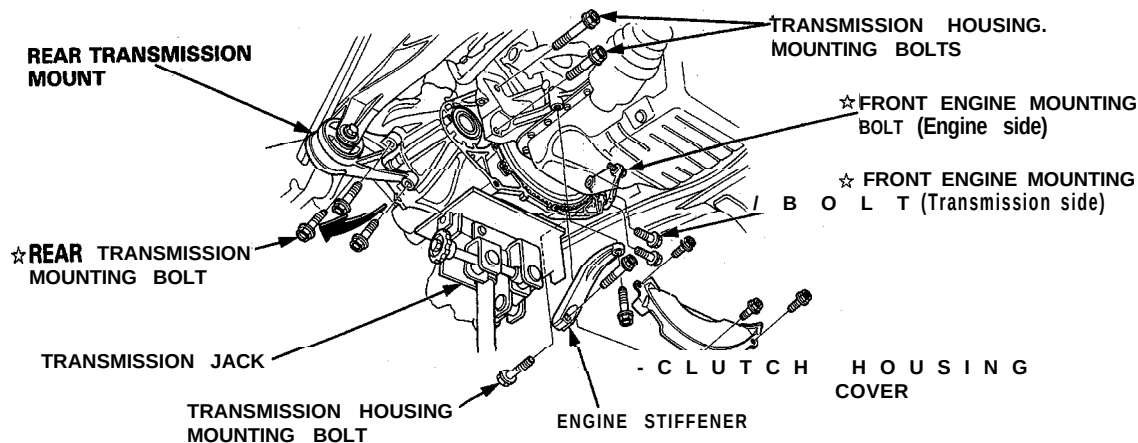
32. Remove the release fork from the clutch release hanger, then hang the release fork on the clutch housing.



33. Remove the clutch housing cover.
34. Attach a chain hoist to the transmission hangers.
35. Place a jack under the transmission and raise the transmission just enough to take weight off mounts.
36. Remove the front engine mounting bolts on the transmission side and retighten the bolt on the engine side.

CAUTION: Loosen the front engine mounting bolt on the engine side, but do not remove it. After removing the two bolts on the transmission side, be sure to retighten the bolt on the engine side.

37. Remove the rear transmission mounting bolts and engine stiffener.
38. Remove the transmission housing mounting bolts.
39. Pull the transmission away from the engine until it clears the Mainshaft, then lower it on the transmission jack.



Illustrated Index

Clean all parts thoroughly in solvent and dry with compressed air.



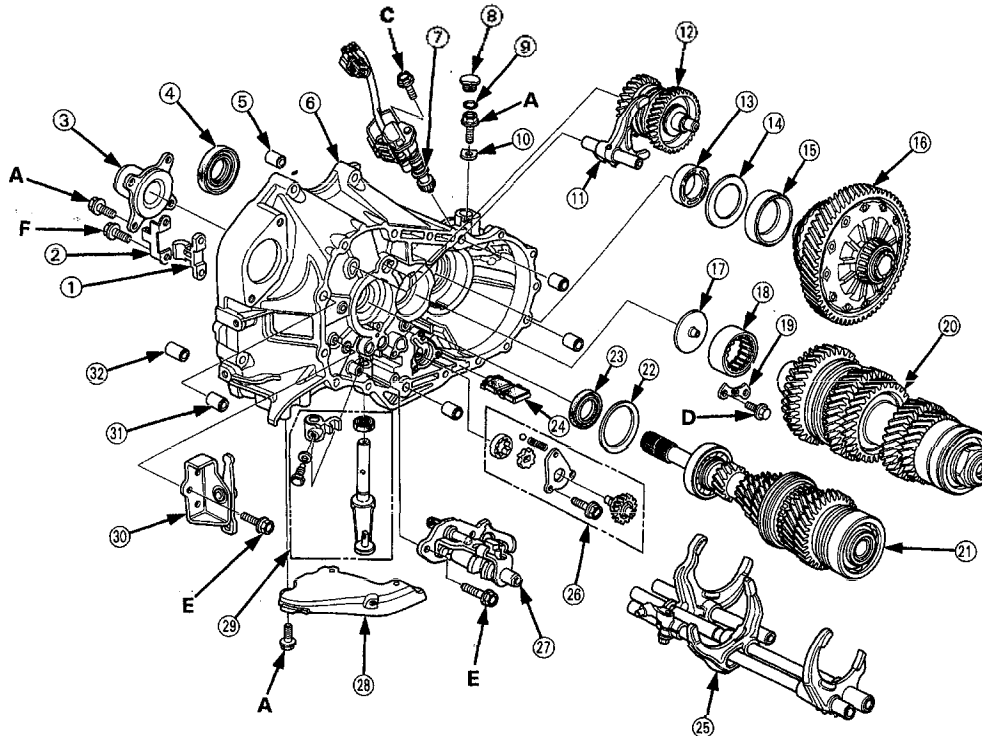
Lubricate all parts with oil before reassembly.

NOTE:

- This transmission uses no gaskets between the major housings; use P/N 08718-550000 OE sealant.

Assemble the housings within 20 minutes after applying the sealant and allow it to cure at least 30 minutes after assembly before filling the transmission with oil.

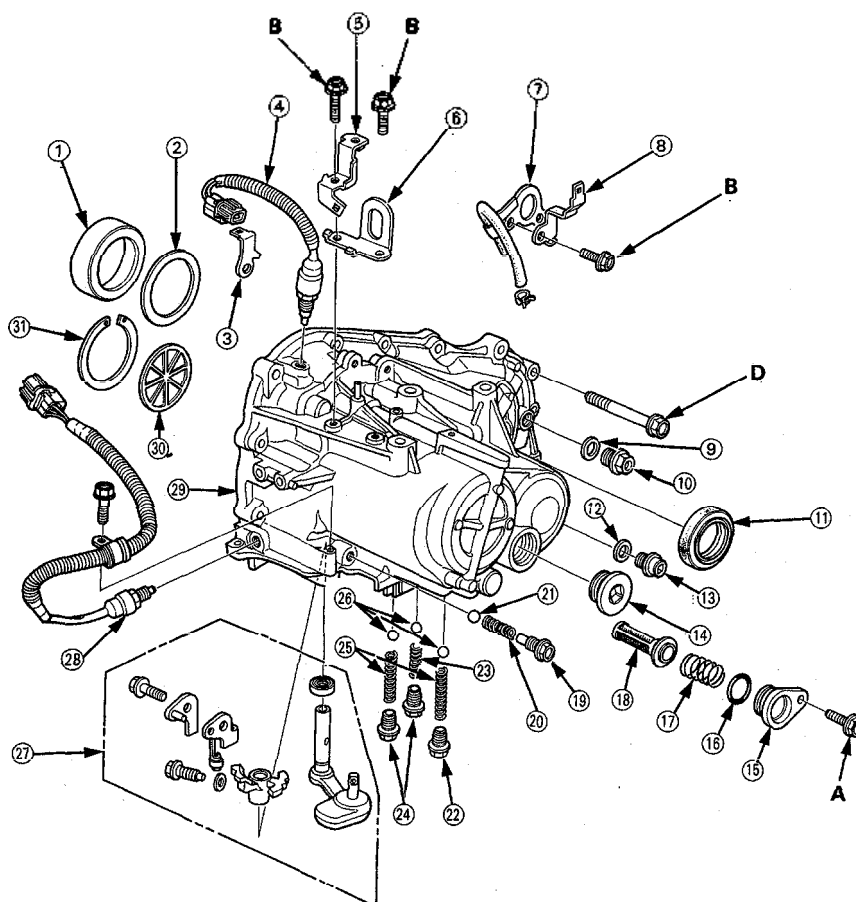
- Always clean the magnet (24) whenever the transmission housing is disassembled.



- ① CLUTCH RELEASE HANGER
- ② RELEASE HANGER SPRING
- ③ RELEASE BEARING GUIDE
- ④ 40 x 68 x 12.5 mm OIL SEAL
Replace.
- ⑤ 10 x 20 mm DOWL PIN
- ⑥ CLUTCH HOUSING
- ⑦ SPEED SENSOR
- ⑧ SENSOR DUMMY COVER
- ⑨ O-RING
Replace.
- ⑩ HOLDER PLATE
- ⑪ REVERSE SHIFT FORK ASSEMBLY
• Disassembly/Reassembly, page 13-16
- ⑫ REVERSE IDLE GEAR SHAFT ASSEMBLY
• Disassembly/Reassembly, page 13-15

- ⑬ OIL GUIDE RING
- ⑭ 90 mm WASHER
- ⑮ BEARING OUTER RACE
- ⑯ DIFFERENTIAL ASSEMBLY
• See Section 15
- ⑰ OIL GUIDE PLATE
- ⑱ 44 x 72 x 23 mm NEEDLE BEARING
- ⑲ BEARING RETAINING PLATE
- ⑳ COUNTERSHAFT ASSEMBLY
• Index, page 13-29
- ㉑ MAINSHAFT ASSEMBLY
• Index, page 13-23
- ㉒ 75 mm SPRING WASHER
- ㉓ 32 x 46 x 7 mm OIL SEAL
Replace.

- ㉔ TRANSMISSION MAGNET
- ㉕ SHIFT FORK ASSEMBLY
• Disassembly/Reassembly, page 13-22
- ㉖ OIL PUMP ASSEMBLY
• Disassembly/Reassembly, page 13-37
- ㉗ CHANGE HOLDER ASSEMBLY
• Disassembly/Reassembly, page 13-19
- ㉘ UPPER COVER
- ㉙ SELECT LEVER ASSEMBLY
• Removal, page 13-17
• Installation, page 13-43
- ㉚ REVERSE SHIFT ARM
- ㉛ 14 x 20 mm DOWEL PINS
- ㉜ 14 x 20 mm DOWEL PIN



- ① BEARING OUTER RACE
- ② 75 mm THRUST SHIM
Selection.
- ③ CLAMP
- ④ BACK-UP LIGHT SWITCH
25 N•m (2.5 kg-m, 18 lb-ft)
- ⑤ CLAMP
- ⑥ TRANSMISSION HANGER A
- ⑦ TRANSMISSION HANGER B
- ⑧ STAY
- ⑨ WASHER
Replace.
- ⑩ OIL FILLER PLUG
45 N•m (4.5 kg-m, 33 lb-ft)
- ⑪ 42 x 63 x 12.5 mm OIL SEAL
Replace.
- ⑫ WASHER
Replace.
- ⑬ DRAIN PLUG
40 N•m (4.0 kg-m, 29 lb-ft)

- ⑭ 36 mm SEALING BOLT
35 N•m (3.5 kg-m, 25 lb-ft)
- ⑮ STRAINER COVER
- ⑯ O-RING
Replace.
- ⑰ STRAINER SET SPRING
- ⑱ OIL PUMP STRAINER
- ⑲ 14 mm SEALING BOLT
33 N•m (3.3 kg-m, 24 lb-ft)
- ⑳ SPRING (L. 25 mm)
- ㉑ STEEL BALL (LARGE)
- ㉒ 16 mm SEALING BOLT
42 N•m (4.2 kg-m, 30 lb-ft)

- ㉓ SPRING (L. 24.2 mm)
- ㉔ 16 mm SEALING BOLTS
42 N•m (4.2 kg-m, 30 lb-ft)
- ㉕ SPRING (L. 30 mm)
- ㉖ STEEL BALL (SMALL)
- ㉗ SHIFT LEVER ASSEMBLY
• Removal, page 13-17
• Installation, page 13-43
- ㉘ NEUTRAL SWITCH
25 N•m (2.5 kg-m, 18 lb-ft)
- ㉙ TRANSMISSION HOUSING
- ㉚ OIL GUIDE PLATE
- ㉛ 82 mm THRUST SHIM
• Selection, page 13-41

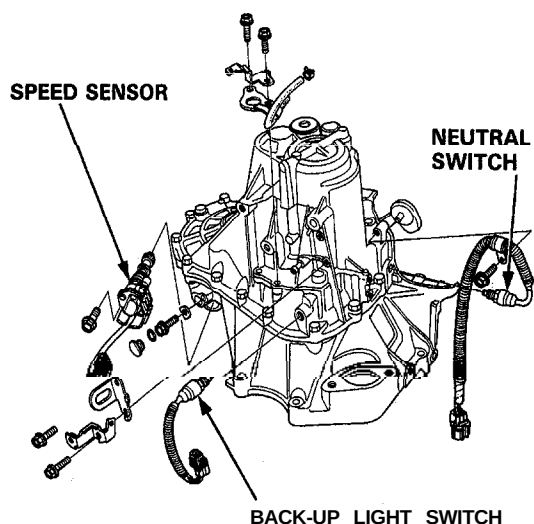
Torque Value	Bolt Size
A-12 N•m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm
B- 24 N•m (2.4 kg-m, 17 lb-ft)	8 x 1.25 mm
C-26 N•m (2.6 kg-m, 19 lb-ft)	8 x 1.25 mm
D-45 N•m (4.5 kg-m, 33 lb-ft)	10 x 1.25 mm
E- 12 N•m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm SPECIAL BOLT
F- 15 N•m (1.5 kg-m, 11 lb-ft)	6 x 1.0 mm SPECIAL BOLT
G-26 N•m (2.6 kg-m, 19 lb-ft)	8 x 1.25 mm SPECIAL BOLT

Transmission Housing

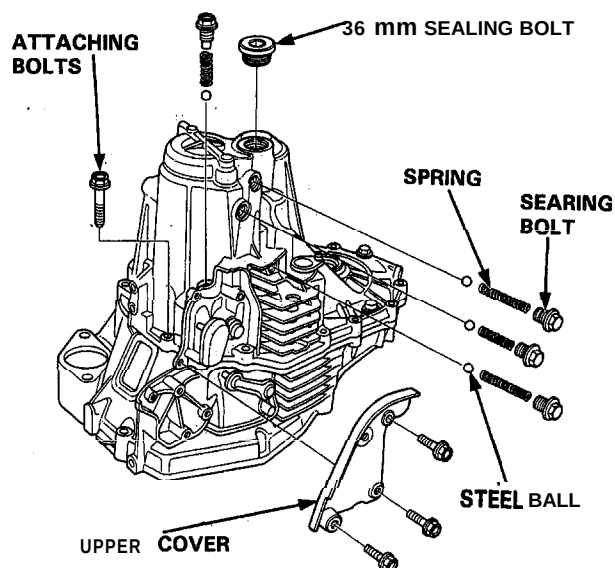
Removal

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

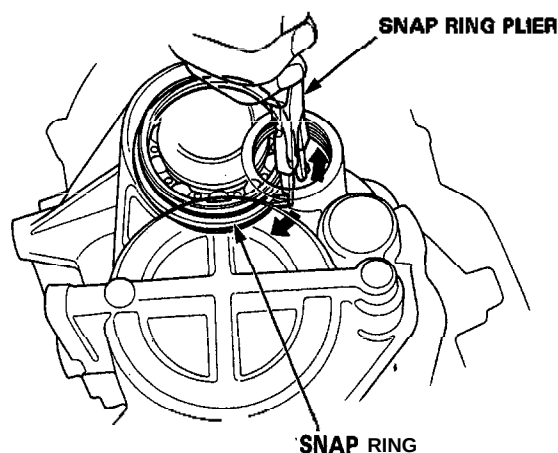
1. Remove the back-up light switch, neutral switch and speed sensor.



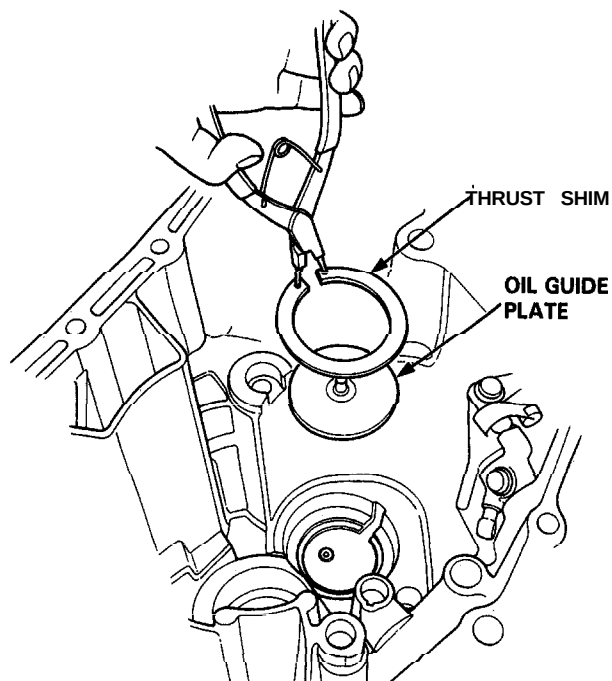
2. Remove the sealing bolts, springs and steel balls.
3. Remove the upper cover, then remove the transmission housing attaching bolts.
4. Remove the 36 mm sealing bolt.



5. Expand the snap ring on the countershaft ball bearing and remove it from the groove using a pair of snap ring pliers.



6. Separate the clutch housing from the transmission housing.
7. Remove the thrust shim and oil guide plate from the transmission housing.



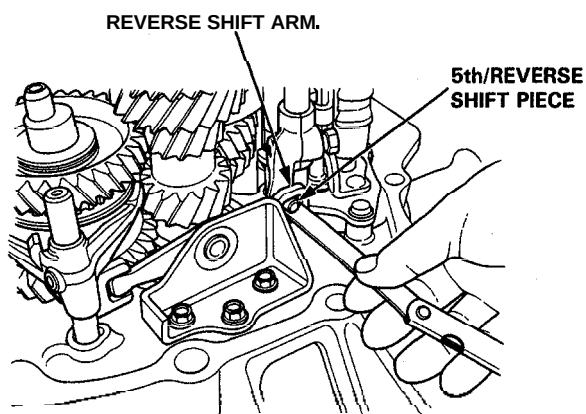


Reverse Shift Arm., Reverse Shift Fork

-Clearance Inspection-

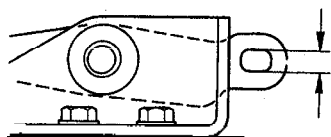
1. Measure the clearance between the reverse shift arm and the 5th/reverse shift piece.

Standard: 0.05-0.30 mm
(0.0020-0.0118 in.)
Service Limit: 0.5 mm (0.020 in.)



2. If the clearance exceeds the service limit, measure the width of the groove in the reverse shift arm.

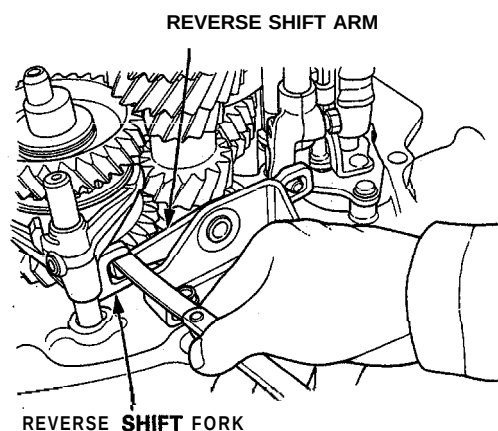
Standard: 7.05-7.20 mm (0.2776-0.2835 in.)



If the width of the groove exceeds the standard, replace the reverse shift arm with a new one.
If the width of the groove is within the standard, replace the 5th/reverse shift piece with a new one.

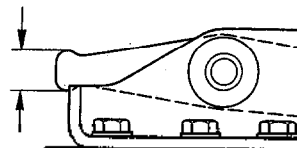
3. Measure the clearance between the reverse shift arm and reverse shift fork.

Standard: 0.05-0.35 mm
(0.0020-0.0138 in.)
Service Limit: 0.5 mm (0.020 in.)



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

Standard: 12.8-13.0 mm (0.5039-0.512 in.)



If the width exceeds the standard, replace the reverse shift arm with a new one.
If the width is within the standard, replace the reverse shift fork with a new one.

(cont'd)

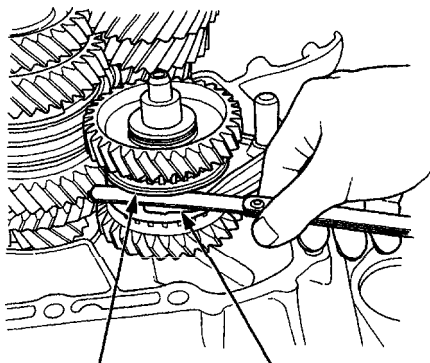
Reverse Shift Arm, Reverse Shift Fork

- Clearance Inspection (cont'd)

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

Standard: 0.45-0.65 mm
(0.0177-0.0256 in.)

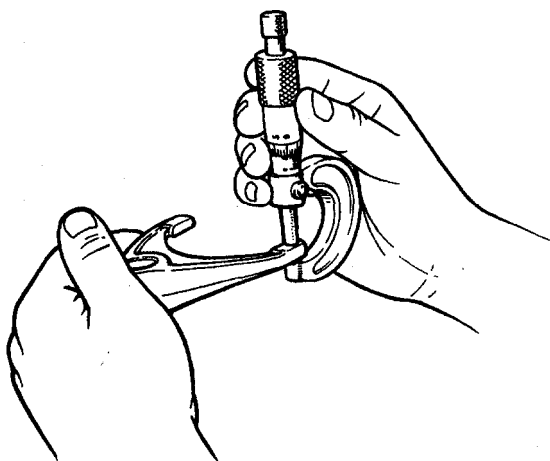
Service Limit: 1.0 mm (0.394 in.)



REVERSE SYNCHRO SLEEVE REVERSE SHIFT FORK

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

Standard: 6.4-6.5 mm (0.2520-0.2559 in)



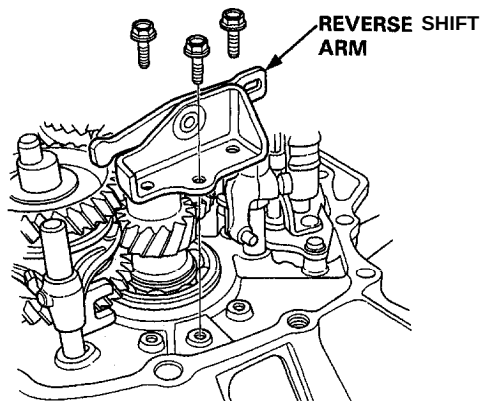
If the thickness exceeds the standard, replace the reverse shift fork with a new one.
If the thickness is within the standard, replace the reverse synchro sleeve with a new one.

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

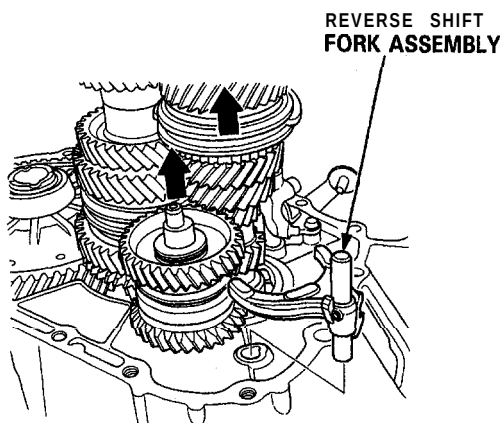
Reverse Idler Gear Shaft Assembly

- Removal

1. Remove the reverse shift arm from the clutch housing.

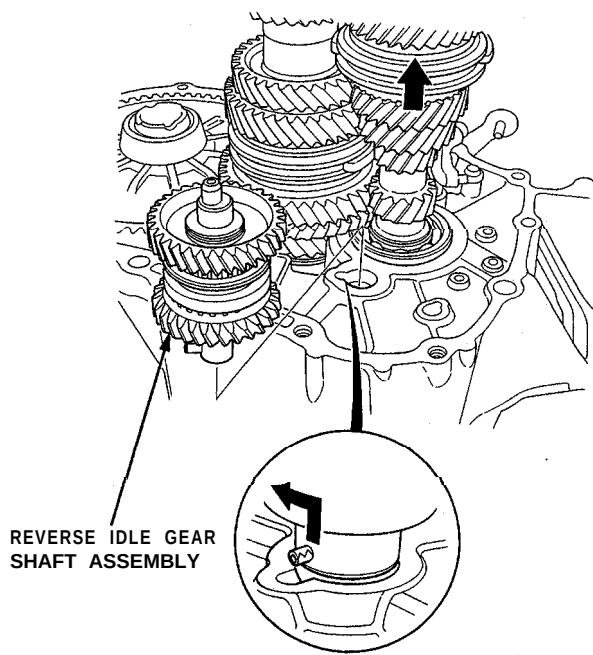


2. Shift the reverse shift fork to the driven gear side.
3. Lift the mainshaft assembly and reverse idler gear shaft assembly, then remove the reverse shift fork assembly.





4. Lift the reverse idler gear shaft, then remove the spring pin from the groove and remove the idler gear shaft assembly.



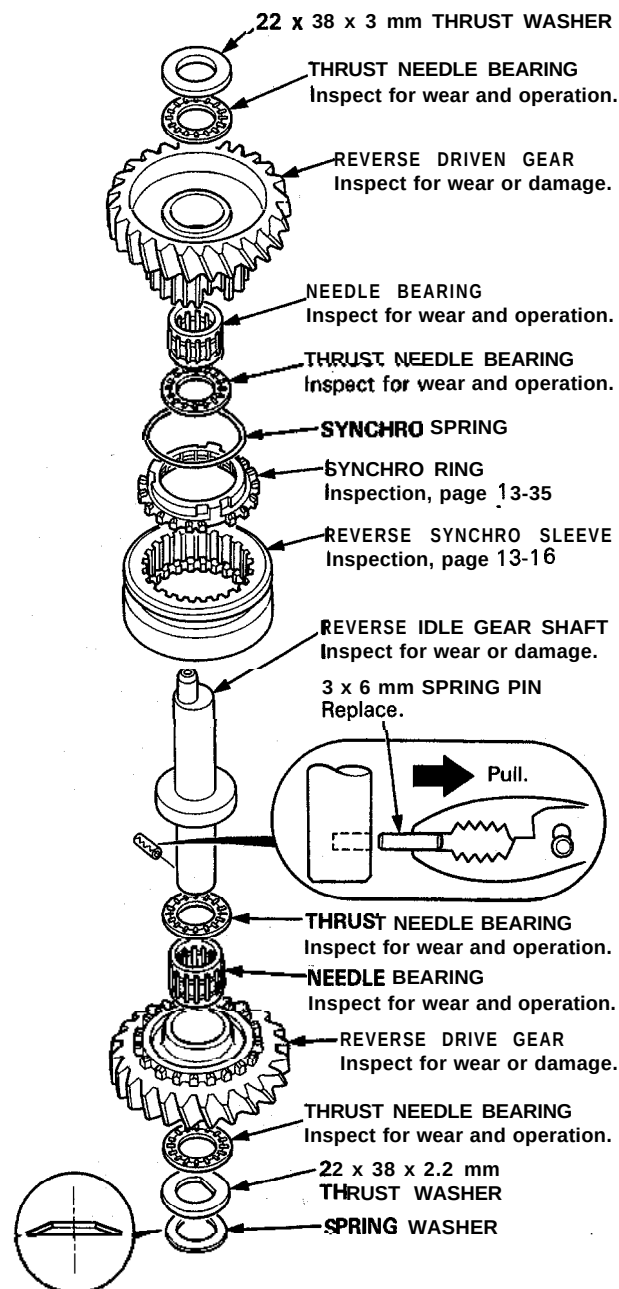
-Disassembly/Reassembly

NOTE:

- The thrust needle bearing are the same size.
- The needle bearing are the same size.



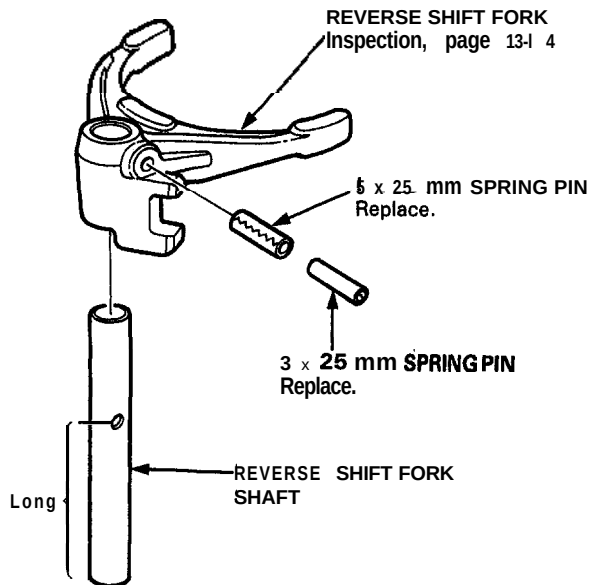
Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surface.



Reverse Shift Fork Assembly

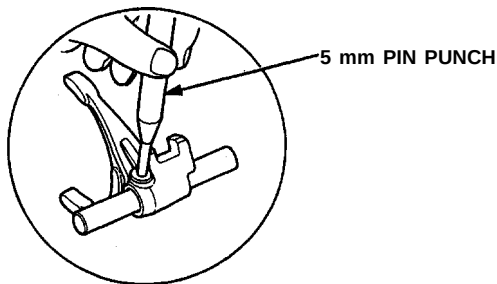
Disassembly/Reassembly

NOTE: The spring pin grooves should be 180° apart.



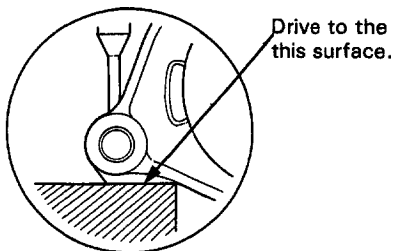
Disassembly:

Remove with the 3 mm spring pin and 5 mm spring pin.



Reassembly:

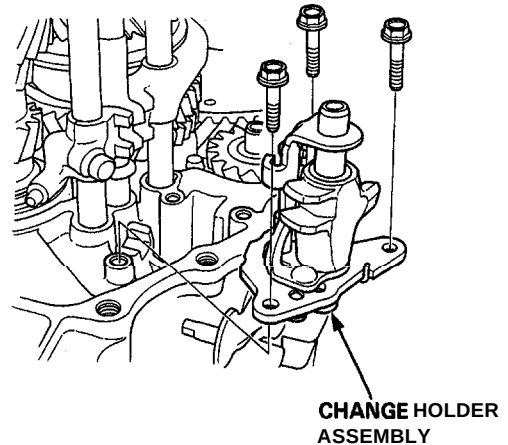
Install the 5 mm spring pin first, then install the 3 mm spring pin.



Mainshaft, Countershaft, Differential Assemblies

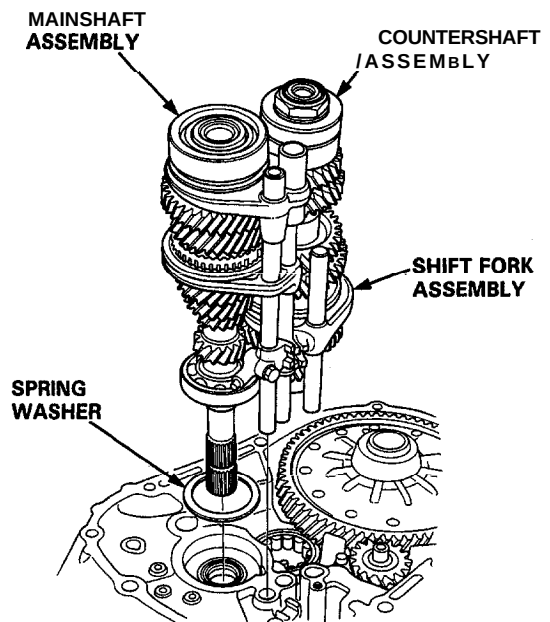
Removal

1. Remove the change holder assembly from the clutch housing.



2. Remove the mainshaft assembly and countershaft assembly with the shift fork from the clutch housing.

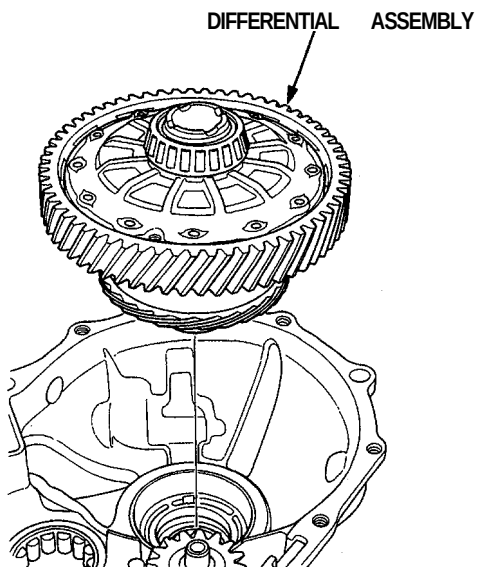
NOTE: Tape the mainshaft splines to protect them before removing the mainshaft and countershaft assemblies.



Shift Lever, Select Lever

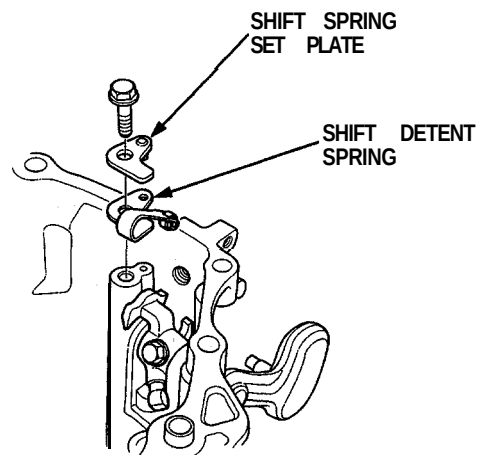


3. Remove the differential assembly from the clutch housing.

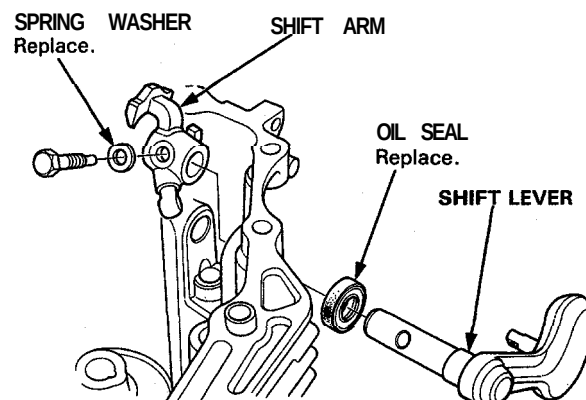


Removal

1. Remove the shift spring set plate and shift detent spring from the transmission housing.



2. Remove the bolt and spring washer.
3. Pull out the shift lever, then remove the shift arm.

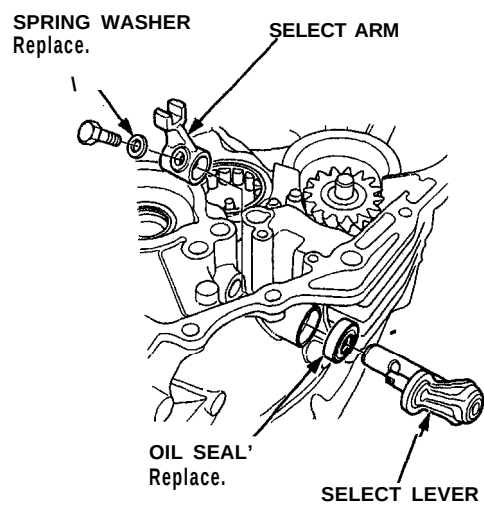


(con'd)

Shift Lever, Select Lever

Removal (cont'd)

4. Remove the bolt and spring washer.
5. Pull out the select lever, then remove the select arm.





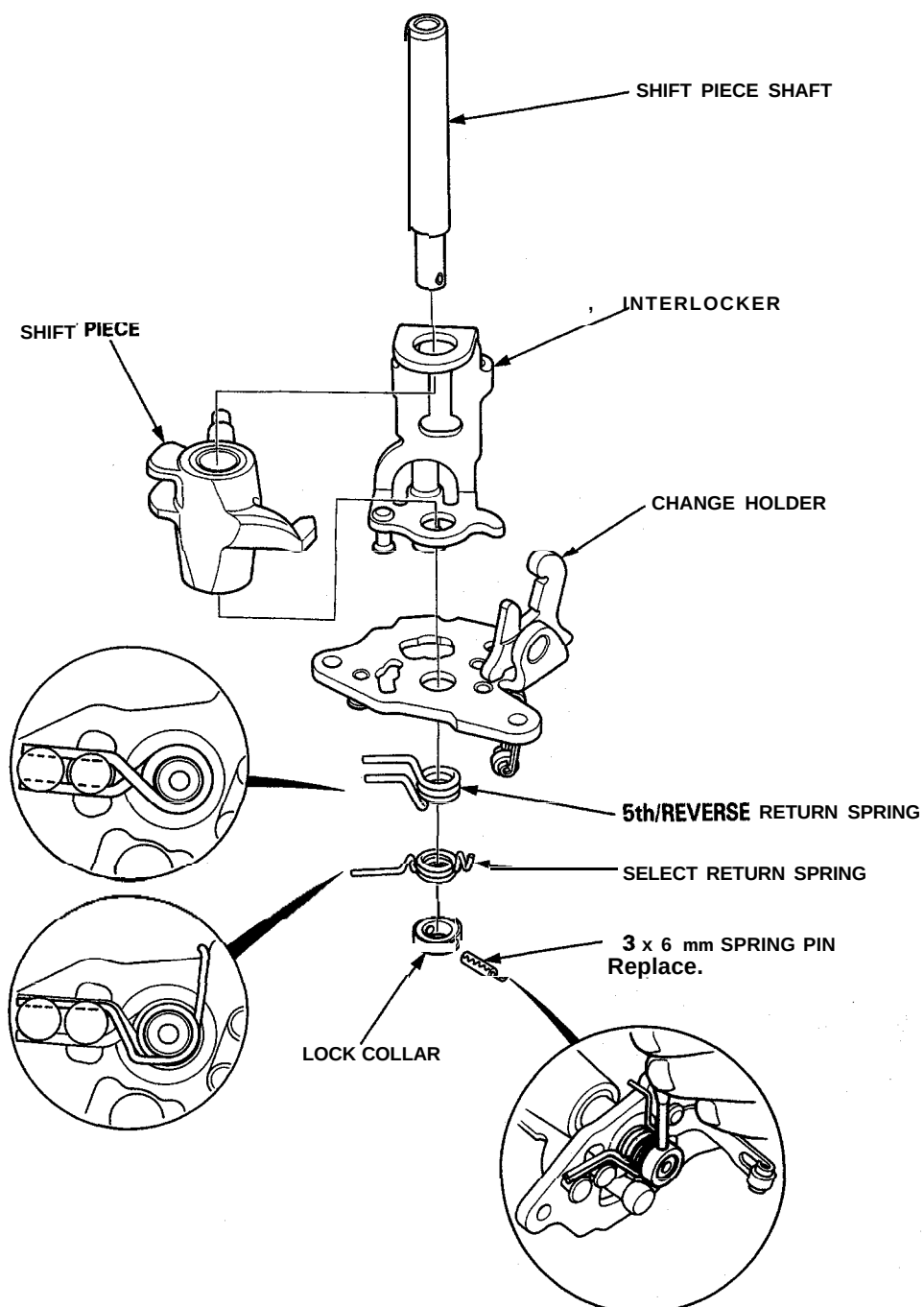
Change Holder Assembly

-Disassembly/Reassembly

NOTE: Make sure the return springs are installed properly.



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



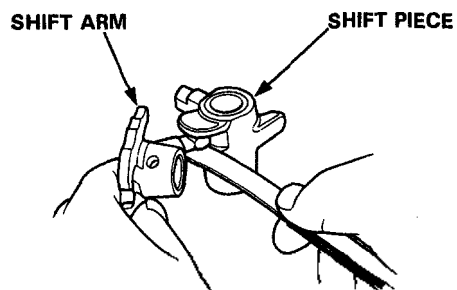
Change Holder Assembly, Shift Fork

• Clearance Inspection

1. Measure the clearance between the shift piece and shift arm.

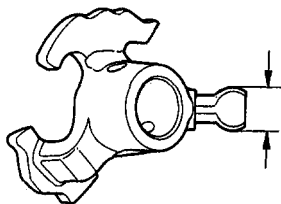
Standard: 0.05–0.25 mm
(0.0020–0.0098 in.)

Service Limit: 0.5 mm (0.020 in.)



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

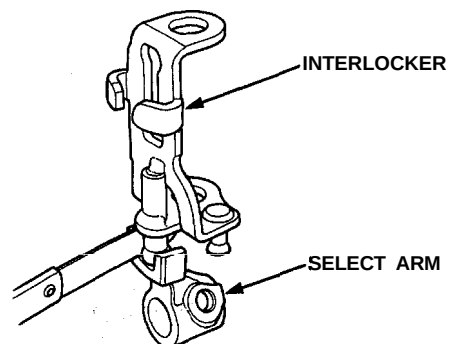
Standard: 12.9–13.0 mm (0.5079–0.5118 in.)



If the width of the shift arm exceeds the standard, replace the shift arm with a new one.
If the width of the shift arm is within the standard, replace the shift piece with a new one.

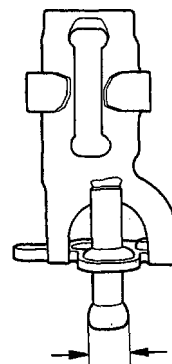
3. Measure the clearance between the interlocker and select arm.

Standard: 0.03–0.15 mm (0.0012–0.0059 in.)



4. If the clearance exceeds the standard, measure the interlocker finger.

Standard: 11.95–12.00 mm
(0.4705–0.4724 in.)



If the width of the interlocker exceeds the standard, replace the interlocker with a new one.
If the width of the interlocker is within the standard, replace the select arm with a new one.

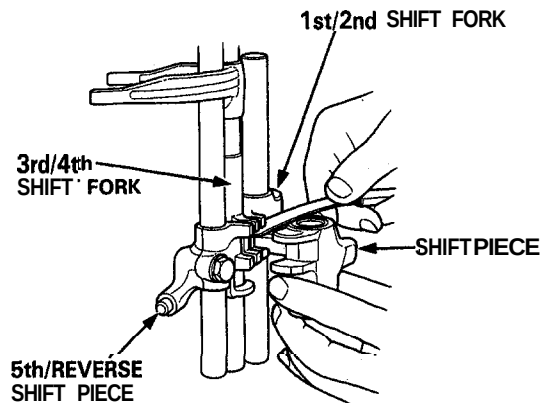
Shift Fork, Synchro Sleeve



- Measure the clearance between the shift fork, the 5th/Reverse shift piece and shift piece.

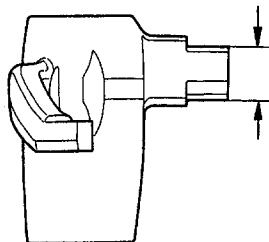
Standard: 0.2-0.5 mm
(0.0079-0.0197 in.)

Service Limit: 0.6 mm (0.024 in.)



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

Standard: 11.9- 12.0 mm (0.4685-0.4724 in.)



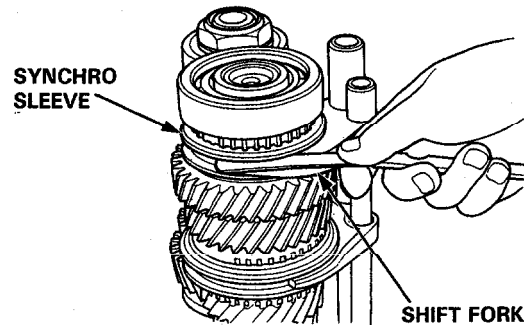
If the width of the shift piece exceeds the standard, replace the shift piece with a new one.
If the width of the shift piece is within the standard, replace the 5th/Reverse shift piece with a new one.

Clearance Inspection

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

Standard: 0.45-0.65 mm
(0.0177-0.0256 in.)

Service Limit: 1.0 mm (0.0394 in.)



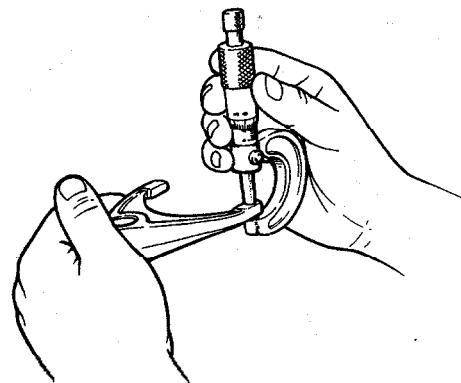
- If the clearance exceeds the service limit, measure the width of the shift fork fingers.

Standard:

1st/2nd SHIFT FORK: 8.9-9.0 mm
(0.3504-0.3543 in.)

3rd/4th SHIFT FORK: 7.4-7.5 mm
(0.2913-0.2953 in.)

5th SHIFT FORK: 6.4-6.5 mm
(0.2520-0.2559 in.)



If the width of the shift fork fingers exceeds the standard, replace the shift fork with a new one.
If the width of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

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

Shift Fork Assembly

-Disassembly/Reassembly

NOTE:

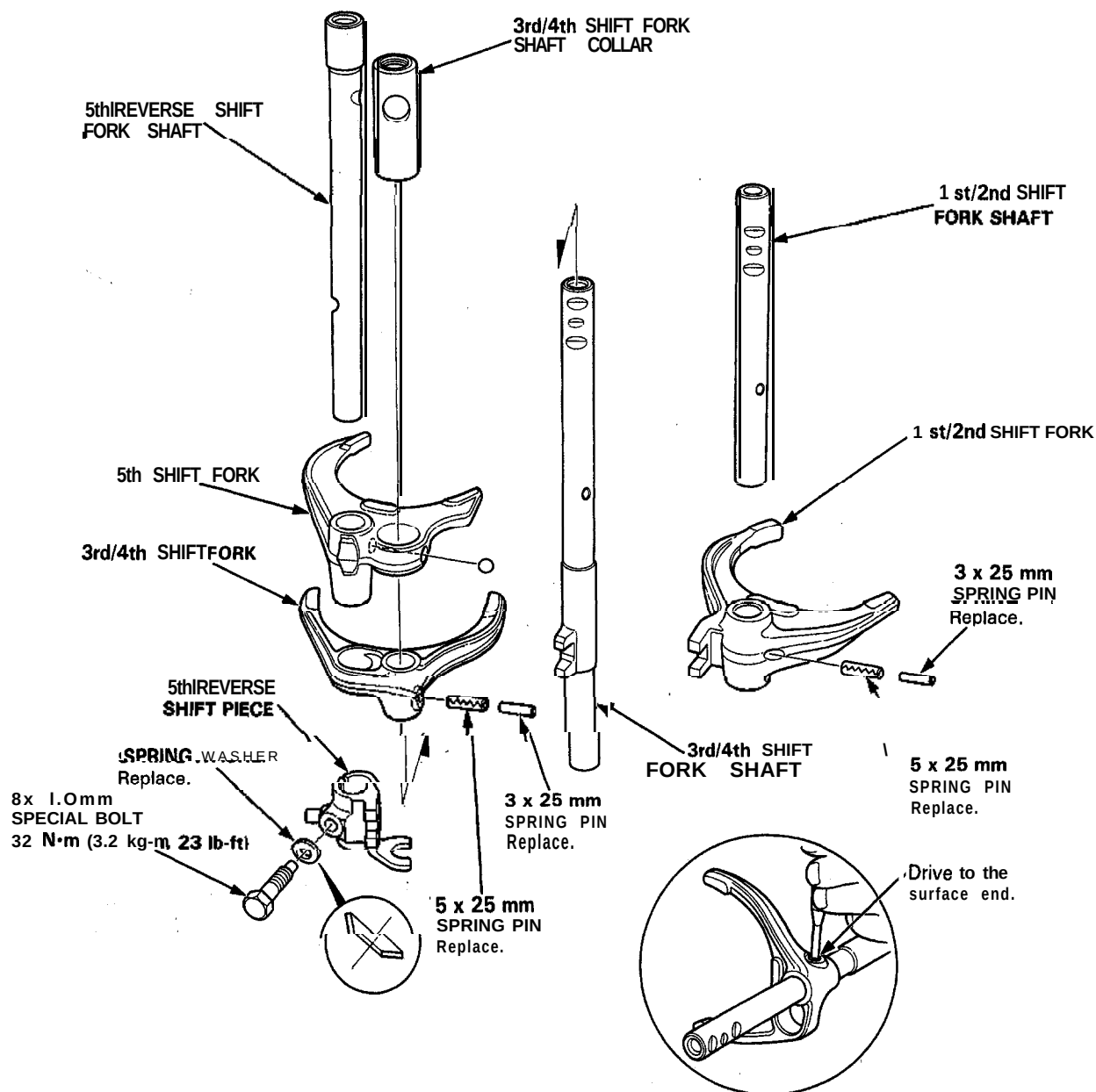
- Be careful, not to lose the 5th shift fork steel ball.
- Install the spring pins, so their grooves are 1 80° apart.



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

Disassembly: Remove with the 3 mm spring pin and 5 spring pin.

Reassembly: Install the 5 mm spring pin first, then install the 3 mm spring pin.





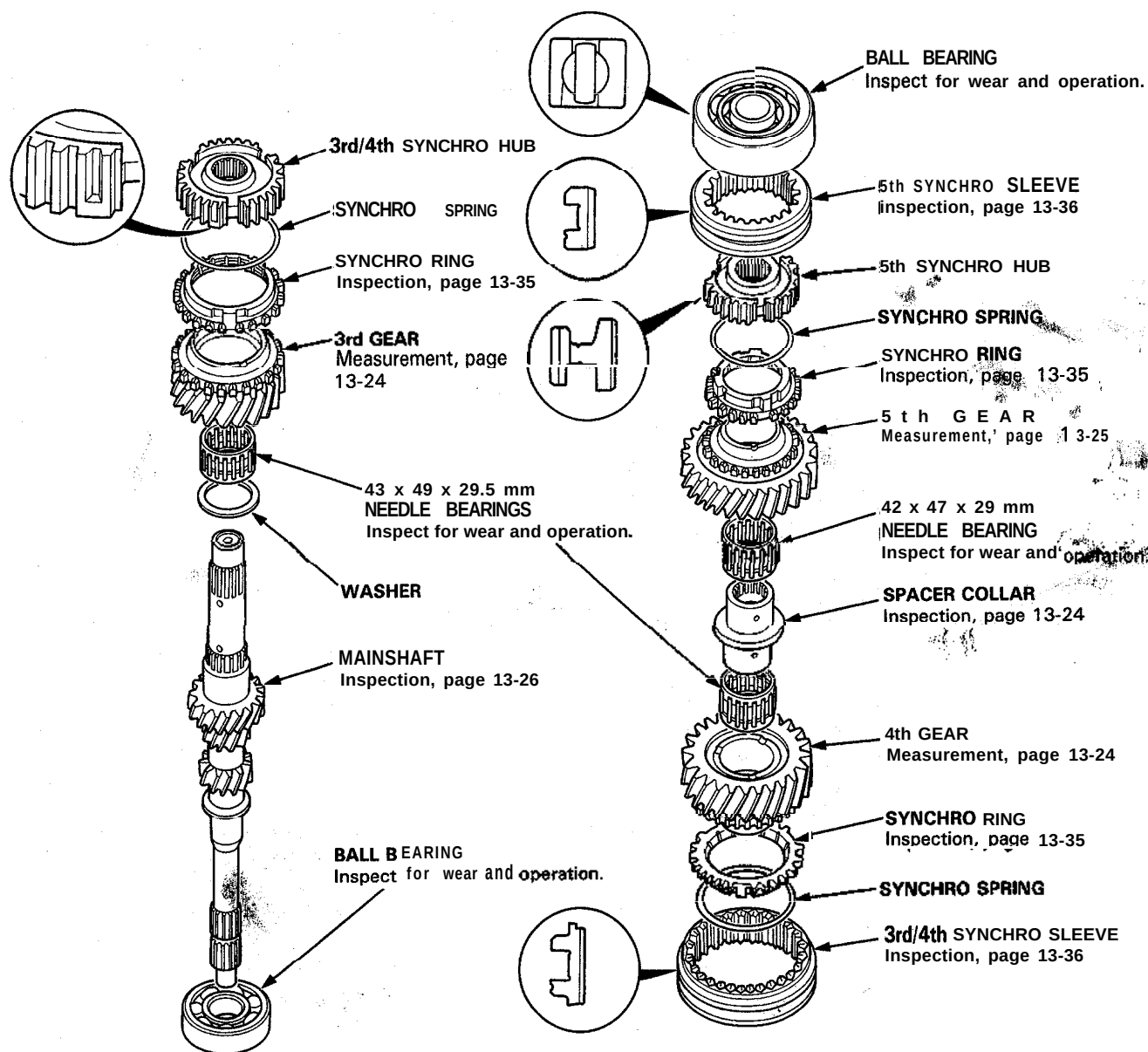
Mainshaft Assembly

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



Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd/4th and 5th synchro hubs, however, should be installed with a press before lubricating them.



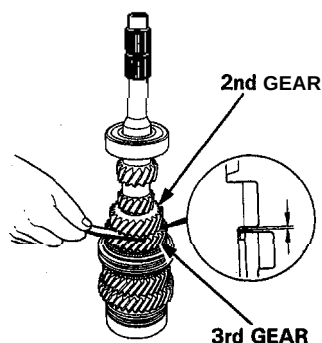
Mainshaft Assembly

Clearance Inspection

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

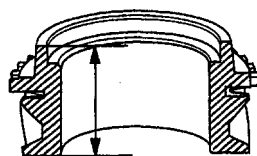
1. Measure the clearance between 2nd and 3rd gears.

Standard: 0.06-0.23 mm
(0.0024-0.0091 in)
Service Limit: 0.3 mm (0.012 in)



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

Standard: 36.92-35.97 mm
(1.4142-1.4161 in)
Service Limit: 35.80 mm (1.4094 in)

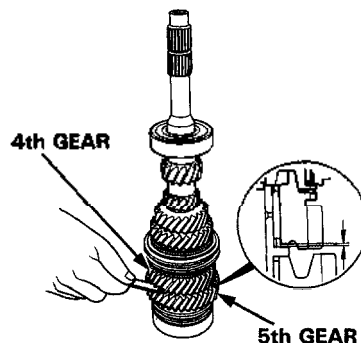


If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.

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

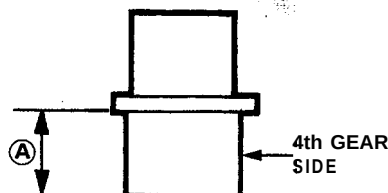
3. Measure the clearance between 4th gear and the spacer collar.

Standard: 0.06-0.21 mm
(0.0024-0.0083 in)
Service Limit: 0.3 mm (0.012 in)



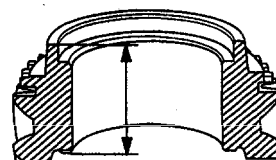
4. If the clearance exceeds the service limit, measure distance (A) on the spacer collar.

Standard: 29.53-29.68 mm
(1.1626-1.1646 in)
Service Limit: 29.51 mm (1.1618 in)



5. If distance (A) is more than the service limit, replace the spacer collar with a new one.
If distance (A) is within the service limit, measure the thickness of 4th gear.

Standard: 35.92-35.97 mm
(1.4142-1.4161 in)
Service Limit: 35.80 mm (1.4094 in)



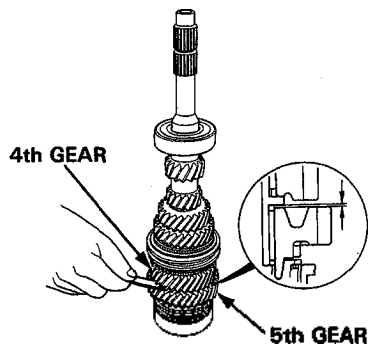
If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.

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



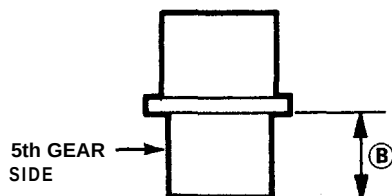
6. Measure the clearance between the spacer collar and 5th gear.

Standard: 0.06-0.21 mm
(0.0024-0.0083 in)
Service Limit: 0.3 mm (0.012 in)



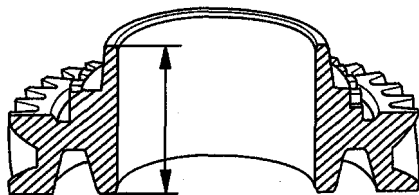
7. If the clearance exceeds the service limit, measure distance (B) on the spacer collar.

Standard: 28.53-28.58 mm
(1.1252-1.1272 in)
Service Limit: 28.51 mm (1.1224 in)



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

Standard: 34.92-34.97 mm
(1.3748-1.3768 in)
Service Limit: 34.80 mm (1.3700 in)



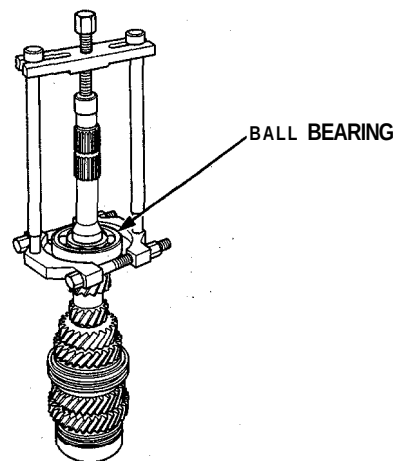
If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

Disassembly

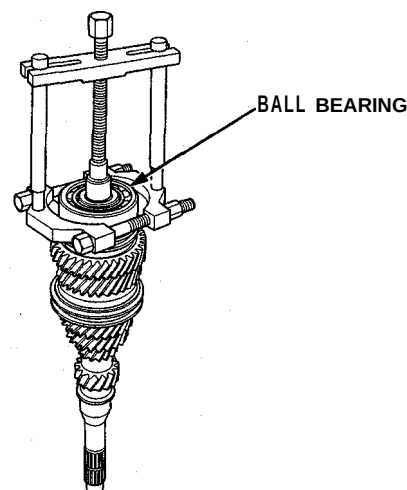
CAUTION: Remove the synchro hubs using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

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

Clutch housing side:



Transmission housing side:

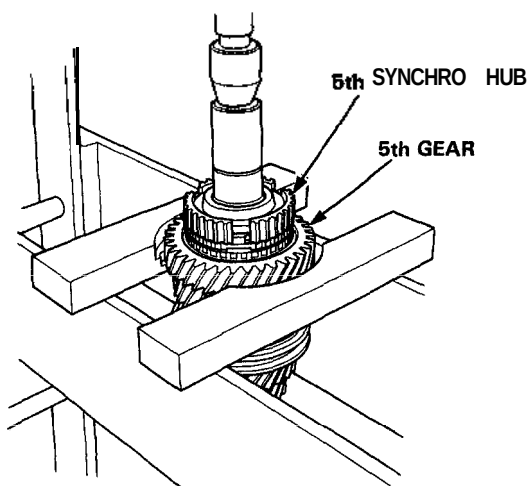


(cont'd)

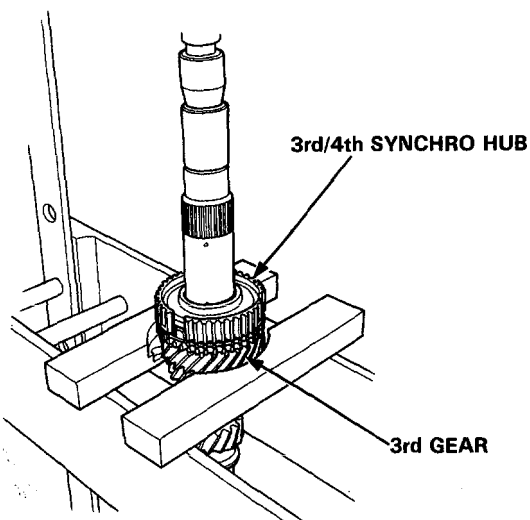
Mainshaft Assembly

Disassembly (cont'd)

2. Support 5th gear on steel blocks as shown and press the shaft out of the 5th synchro hub.



3. In the same manner as above, support the 3rd gear on steel blocks and press the shaft out of the 3rd/4th synchro hub.



Inspection

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

Standard:

A (Ball bearing surface): 32.002–32.018 mm
(1.2599–1.2605 in)

B (Needle bearing surface): 42.984–43.000 mm
(1.6923–1.6929 in)

C (Ball bearing surface): 30.984–31.000 mm
(1.2198–1.2205 in)

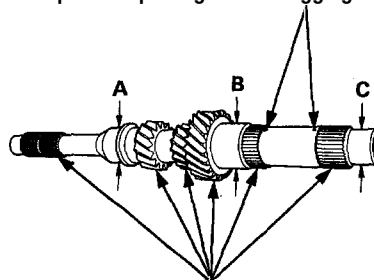
Service limit:

A: 31.95 mm (1.2579 in)

B: 42.93 mm (1.6902 in)

C: 30.93 mm (1.2177 in)

Inspect oil passages for clogging.



Inspect for wear or damage.

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

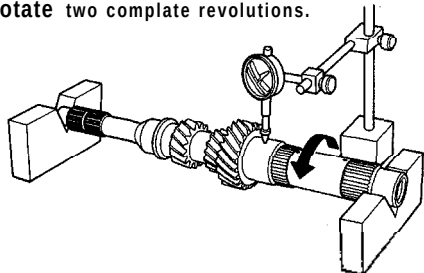


2. Inspect for runout.

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

NOTE: Support the mainshaft at both ends as shown.

Rotate two complete revolutions.

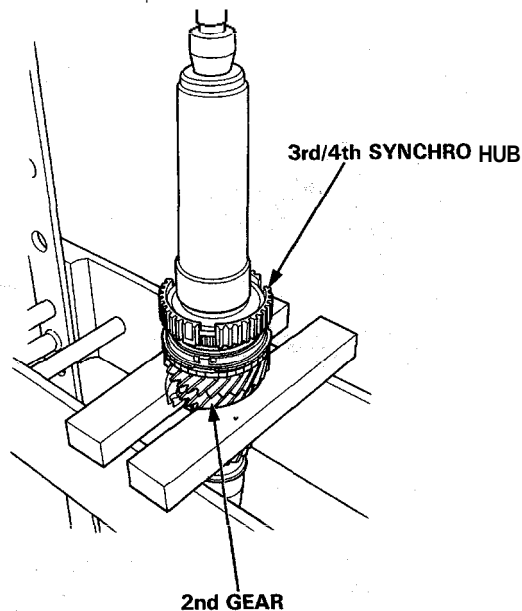


If the runout exceeds the service limit, replace the mainshaft with a new one.

Reassembly

CAUTION:

- Press the 3rd/4th and 5th synchro hubs on the mainshaft without lubrication.
 - When installing the 3rd/4th and 5th synchro hubs, support the shaft on steel blocks and install the synchro hubs using a press.
 - Install the 3rd/4th and 5th synchro hubs with a maximum pressure of 1.000 kg, and press the 3rd/4th and 5th synchro hubs with a pressure of 2.000 kg.
 - The clutch housing ball bearing is installed when it's time to check the mainshaft clearances.
1. Support 2nd gear on steel blocks as shown, then install the 3rd/4th synchro hub using a press.

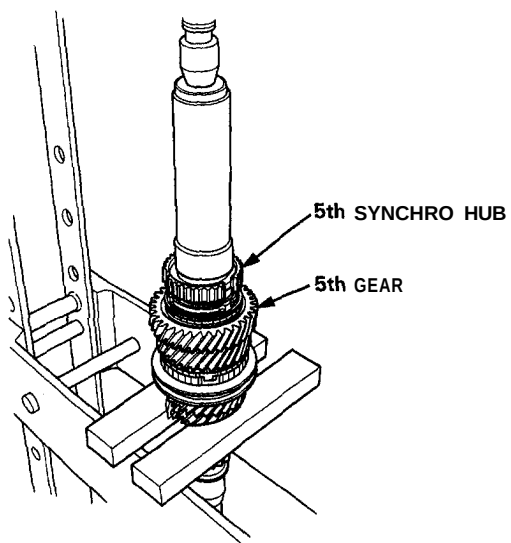


(cont'd)

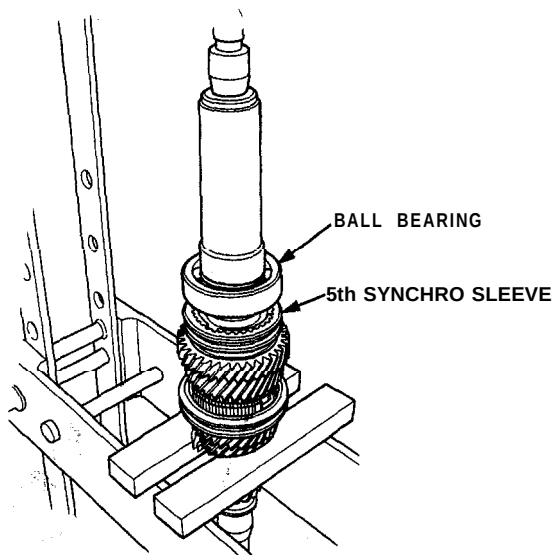
Mainshaft Assembly

Reassembly (cont'd)

1. Install the 5th synchro hub using a press as shown.



3. install the transmission housing side ball bearing using a press as shown.





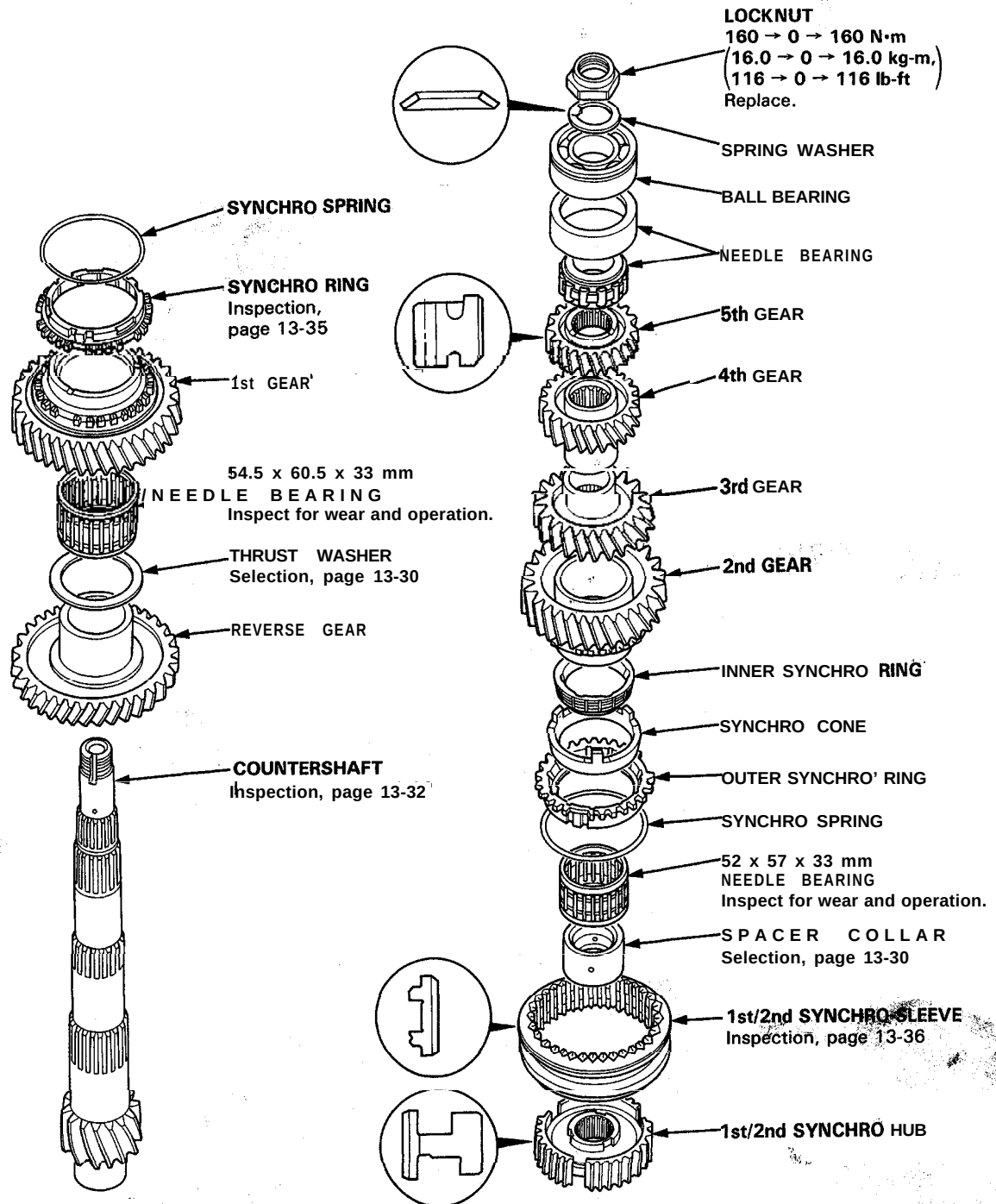
Countershaft Assembly

- Index

NOTE: The 3rd, 4th and 5th gears are installed with a press.



Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd, 4th and 5th gears, should be installed without lubrication using a press.

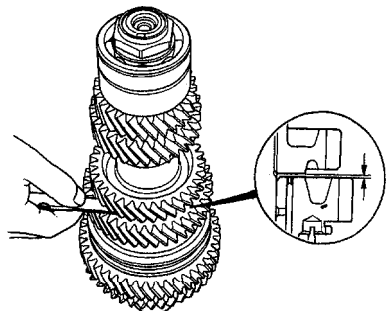


Countershaft Assembly

— Clearance Inspection —

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

Standard: 0.04-0.10 mm (0.0016-0.0039 in.)

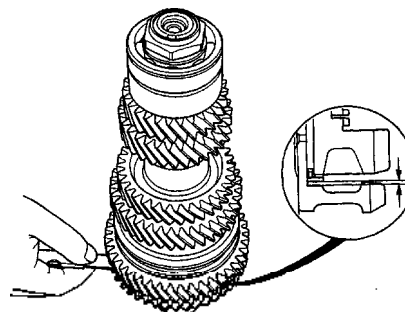


2. If the clearance exceeds the standard, select the appropriate spacer collar for the correct clearance from the chart below.

	PART NUMBER	THICKNESS
A	23912-PR8-000	33.003-33.005 mm (1.2993-1.3012 in)
B	23913-PR8-000	32.998-33.000 mm (1.2991-1.2992 in)

3. Measure the clearance between 1st and reverse gear.

Standard: 0.04-0.10 mm (0.0016-0.0039 in)



4. If the clearance exceeds the standard, select the appropriate thrust washer for the correct clearance from the chart below.

	PART NUMBER	THICKNESS
A	23921-PR8-000	1.42-1.44 mm (0.0559-0.0567 in)
B	23922-PR8-000	1.45-1.47 mm (0.0571-0.0579 in)
C	23923-PR8-000	1.48-1.50 mm (0.0583-0.0591 in)
D	23924-PR8-000	1.51-1.53 mm (0.0594-0.0602 in)
E	23925-PR8-000	1.54-1.56 mm (0.0606-0.0614 in)

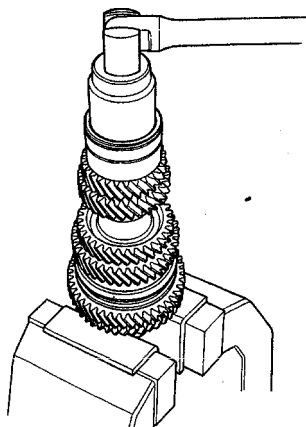


-Disassembly

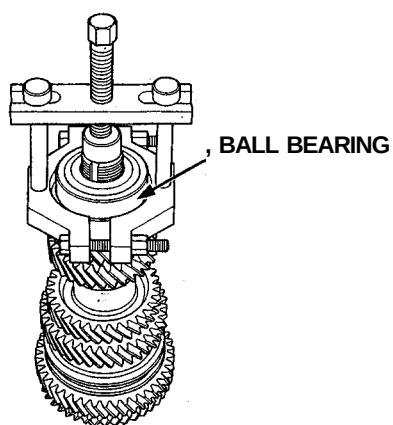
CAUTION: Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

1. Raise the locknut tab from the groove of the shaft and remove the locknut and the spring washer.

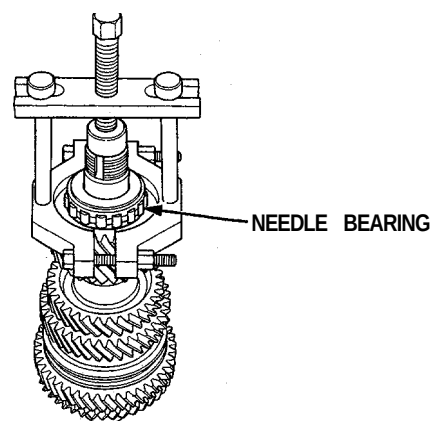
NOTE: Locknut has left-hand threads.



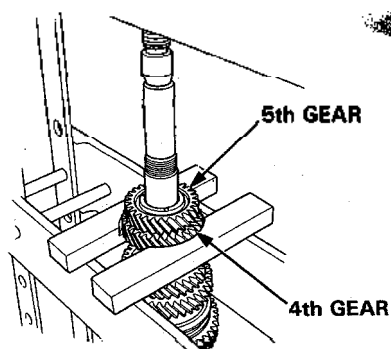
2. Remove the ball bearing using a bearing puller as shown.



3. Remove the outer bearing race of the needle bearing, then remove the needle bearing using a bearing puller as shown.



4. Support 4th gear on steel blocks as shown and press the shaft out of 5th and 4th gears.

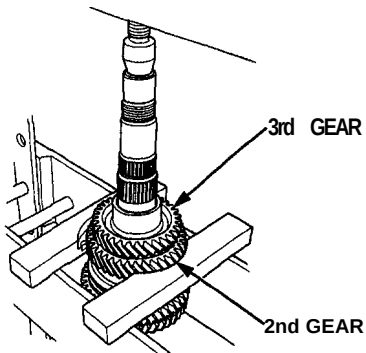


(cont'd)

Countershaft Assembly

-Disassembly (cont'd)

5. Support 2nd gear on steel blocks as shown and press the shaft out of 3rd and 2nd gears.



-Inspection

1. Inspect the gear surfaces and bearing surfaces for wear or damage, then measure the countershaft at points A and B.

Standard:

A (Needle bearing surface): 43.974-43.990 mm
11.7313-11.7319 in)

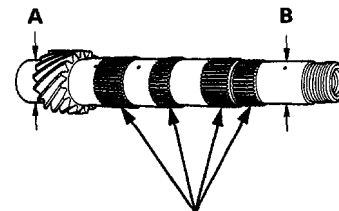
B (Ball bearing surface): 33.984-34.000 mm
(1.3380— 1.3386 in)

Service Limit:

A: 43.92 mm (1.7291 in)

B: 33.93 mm (1.3358 in)

NOTE: Inspect oil passages for clogging.



Inspect for wear and damage.

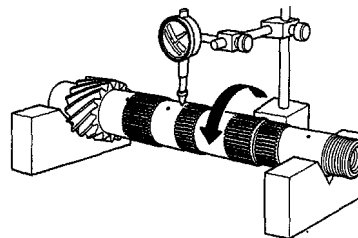
If any part of the countershaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: 0.02 mm (0.0008 in) min.

Service Limit: 0.05 mm (0.0020 in)

NOTE: Support the countershaft at both ends as shown.



Rotate two complete revolutions.

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

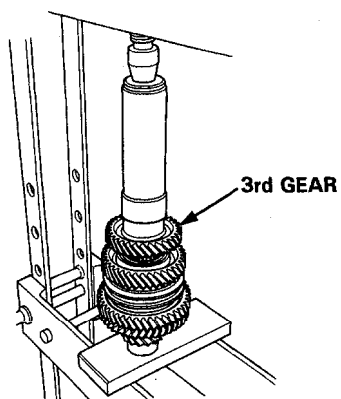


-Reassembly

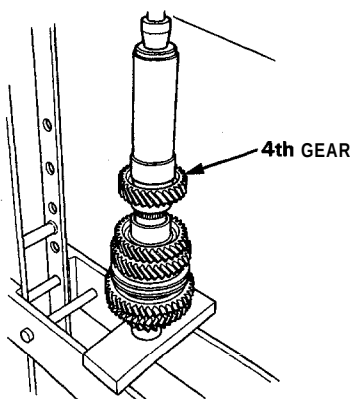
CAUTION:

- Press the 3rd, 4th and 5th gears on the countershaft without lubrication.
- When installing the 3rd, 4th and 5th gears, support the shaft on steel blocks and install the gears using a press.
- Install the 3rd, 4th and 5th gears with a maximum pressure of 1,000 kg, and press the 3rd, 4th and 5th gears with a pressure of 2,600 kg.

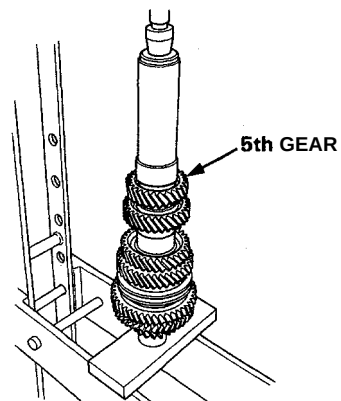
1. Support the countershaft on a steel block as shown and install 3rd gear using a press.



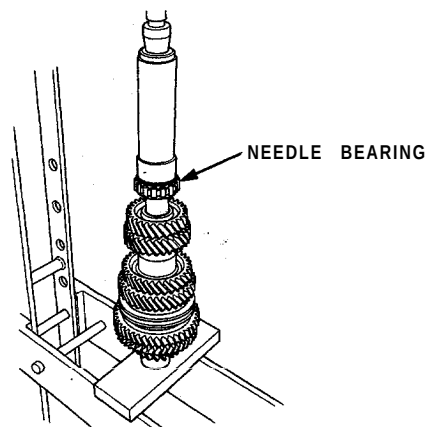
2. Install 4th gear using a press as shown.



3. Install 5th gear using a press as shown.



4. Install the needle bearing using a press as shown then install the bearing outer race.

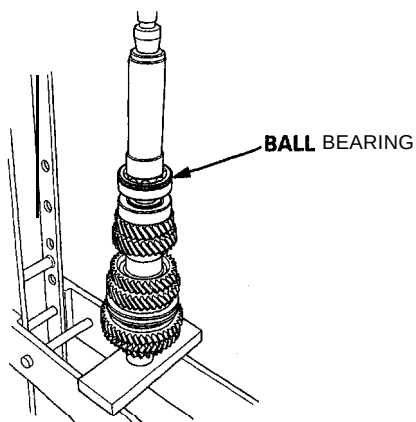


(cont'c)

Countershaft Assembly

Reassembly (cont'd)

5. Install the ball bearing using a press as shown.



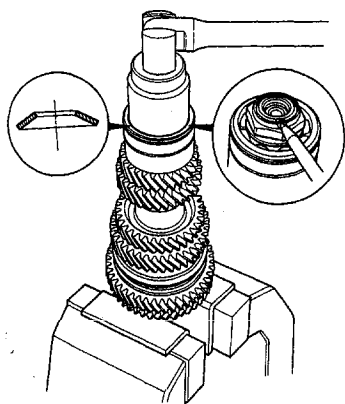
6. Install the spring washer, tighten the locknut, then stake the locknut tab into the groove.

NOTE: Locknut has left-hand threads.

LOCKNUT

160 → 0 → 160N.m

(16.0 → 0 → 16.0 kg-m, 116 → 0 → 116 lb-ft)

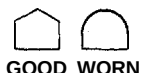


Synchro Ring, Gear



Inspection

1. Inspect the inside of the synchro ring for wear.
2. Inspect the synchrosleeve 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.

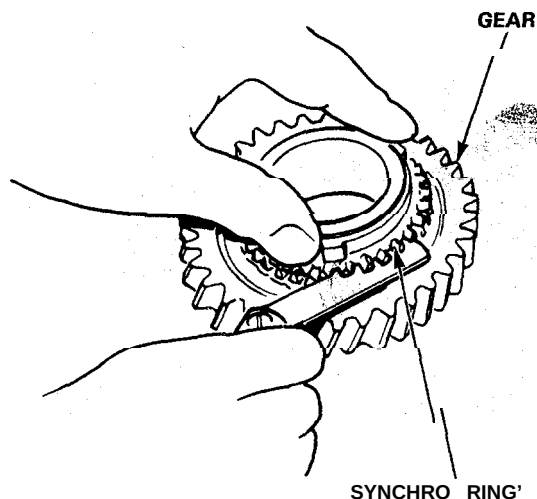
7. Coat the cone surface of the gear with oil and place the synchro ring on the matching gear. Rotate the ring, making sure that it does not slip.

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.

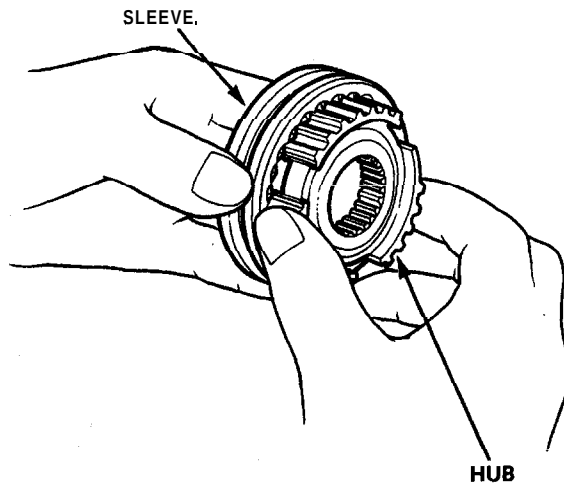


Synchro Sleeve, Synchro Hub

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.

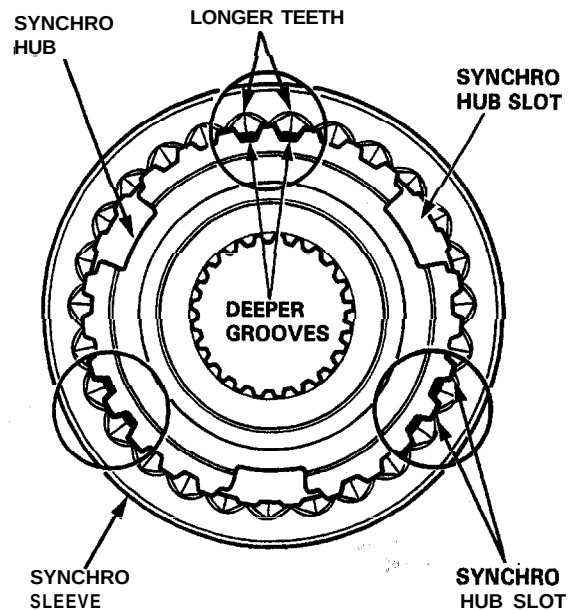
NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.



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.

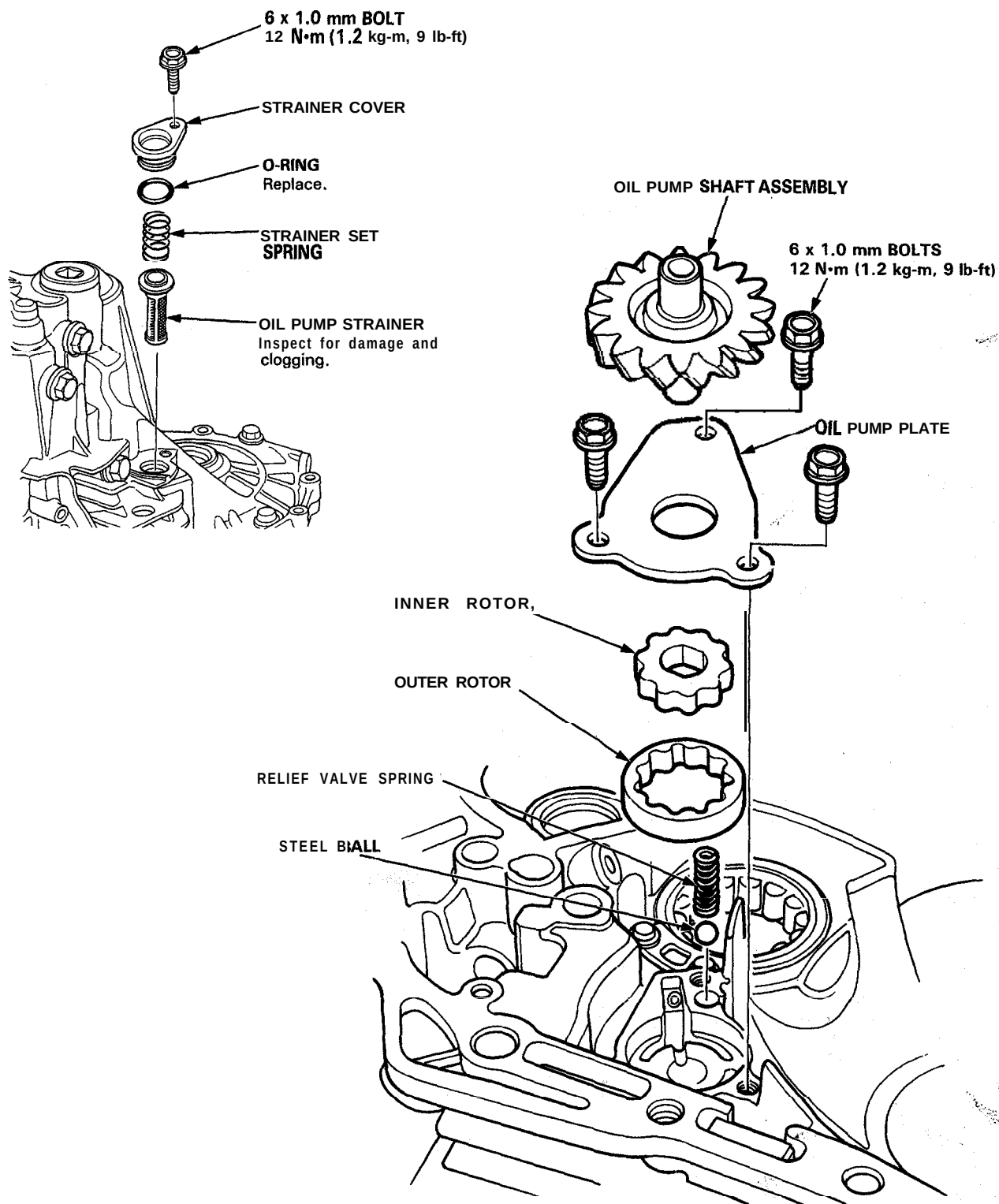


Oil Pump

Disassembly/Reassembly



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



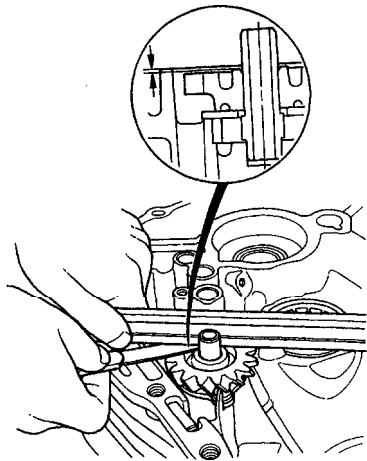
Oil Pump

Clearance Inspection

1. Check the clearance between the transmission mating surface of the clutch housing and the oil pump gear.

Standard: 0.3-0.8 mm (0.012-0.032 in.)

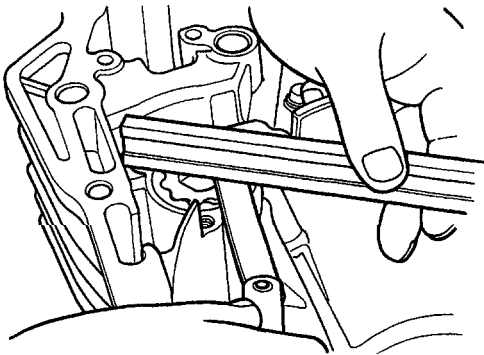
Service Limit: 0.9 mm (0.035 in.)



2. Check the axial clearance on the pump rotor.

Clutch Housing-to-Rotor Axial clearance
Standard: 0.03-0.1 mm
(0.0012-0.0039 in)

Service Limit: 0.15 mm (0.0059 in)

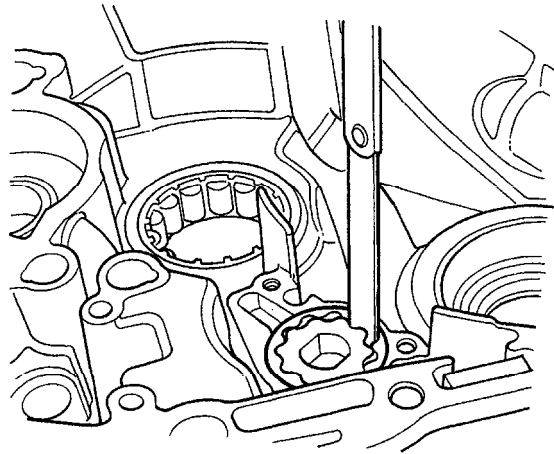


3. Check the radial clearance on the pump rotor.

Inner Rotor-to-Outer Rotor Radial clearance

Standard: 0.14 mm (0.0055 in)

Service Limit: 0.2 mm (0.008 in)



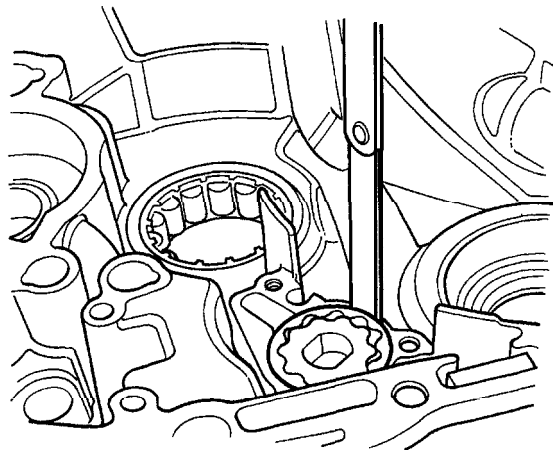
4. Check the radial clearance between the clutch housing and the outer rotor.

Clutch housing-to-Rotor Radial Clearance

Standard: 0.1-0.2 mm

(0.0039-0.0079 in)

Service Limit: 0.22 mm (0.0087 in)

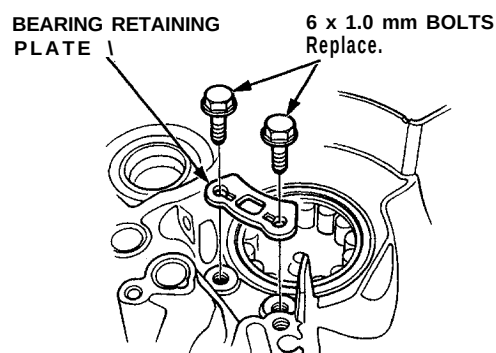




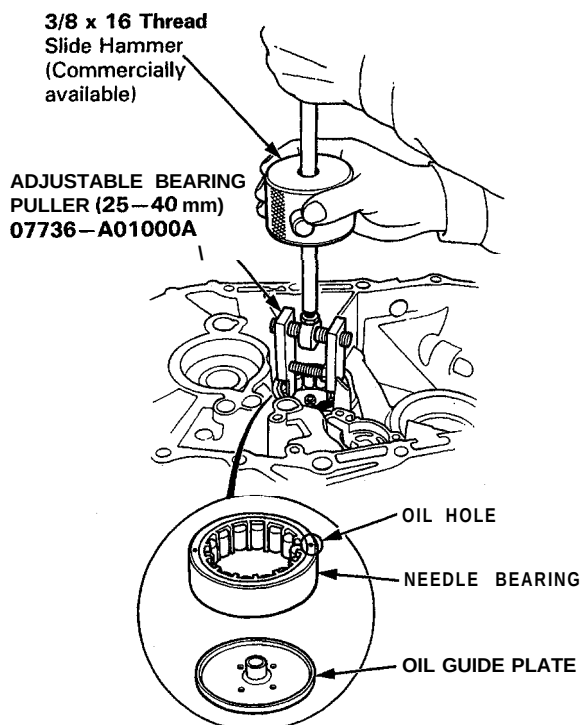
Countershaft Bearing (Clutch Housing)

- Replacement

1. Remove the bearing retaining plate.



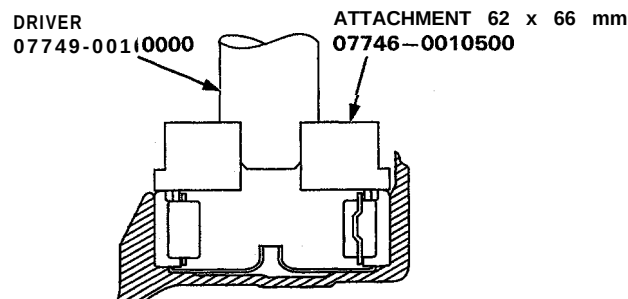
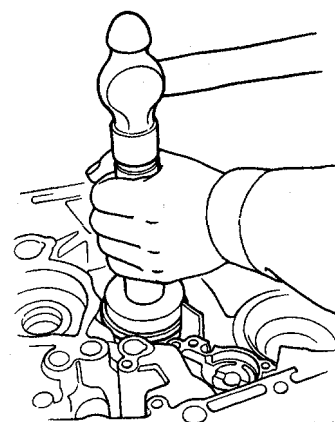
2. Remove the needle bearing with the special tool, then remove the oil guide plate.



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

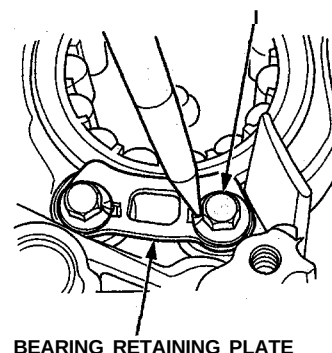
NOTE: Position the needle bearing with the oil hole facing up.

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



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

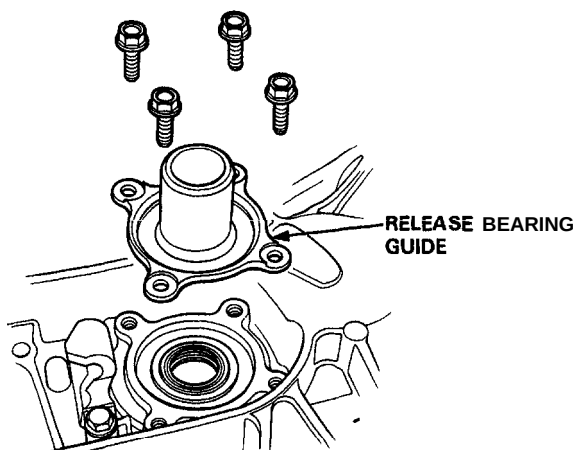
12 N·m (1.2 kg-m, 8.7 lb-ft)



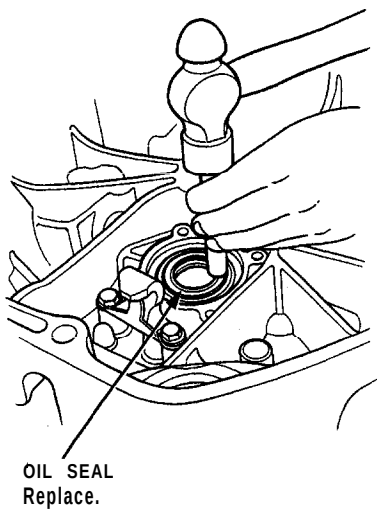
Mainshaft Oil Seal (Clutch Housing)

-Replacement

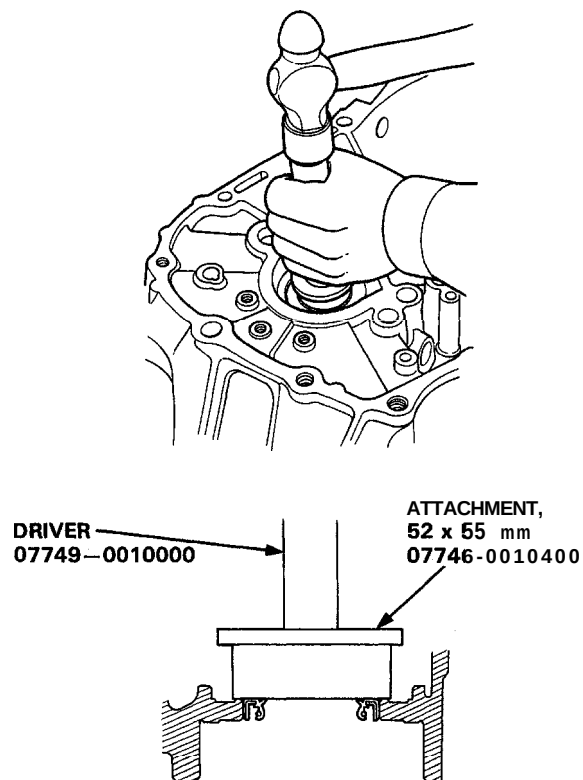
1. Remove the release bearing guide.



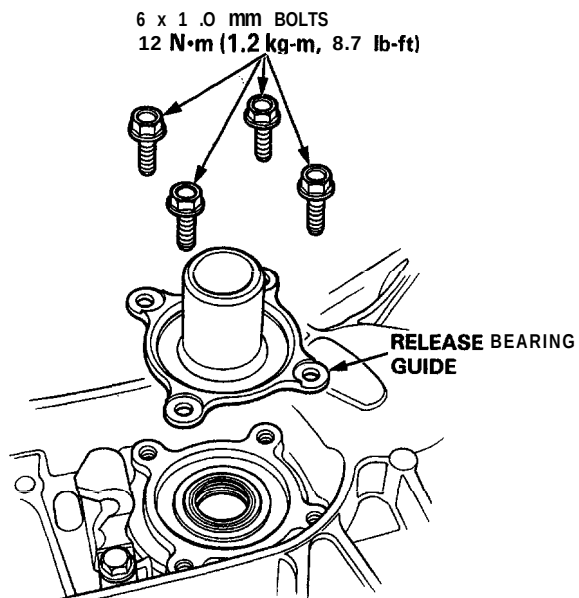
2. Remove the oil seal.



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



4. Install the release bearing guide.





Mainshaft Thrust Shim

-Adjustment

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

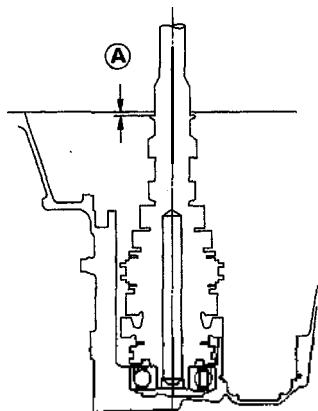
2. Install the mainshaft in the transmission housing.

NOTE: Do not install the clutch housing side ball bearing.

3. Measure distance **(A)** between the end of the transmission housing and mainshaft.

NOTE:

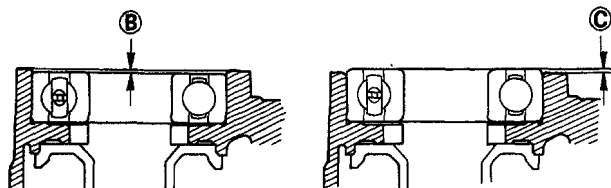
- Use a straight edge and feeler gauge.
- Measure at three locations and average the readings.



4. Set the mainshaft ball bearing in the clutch housing, and measure distance **(B)** or **(C)** between the surfaces of the clutch housing and the bearing inner race.

NOTE:

- Use a straight edge and feeler gauge.
- Measure at three locations and average the readings.
- Do not install the spring washer.



5. Select the proper shim on the basis of the following calculations.

NOTE: Do not use more than one shim.

(Basic Formula)

$(A) + (B) - 0.99 \text{ mm} = \text{shim thickness (max.)}$

$(A) + (B) - 1.06 \text{ mm} = \text{shim thickness (min.)}$

$(A) - (C) - 0.99 \text{ mm} = \text{shim thickness (max.)}$

$(A) - (C) - 1.06 \text{ mm} = \text{shim thickness (min.)}$

	PART NUMBER	THICKNESS
A	23931-PR8-000	0.50 mm (0.0197 in)
B	23932-PR8-000	0.55 mm (0.0217 in)
C	23933-PR8-000	0.60 mm (0.0236 in)
D	23934-PR8-000	0.65 mm (0.0256 in)
E	23935-PR8-000	0.70 mm (0.0276 in)
F	23936-PR8-000	0.75 mm (0.0295 in)
G	23937-PR8-000	0.80 mm (0.0315 in)
H	23938-PR8-000	0.85 mm (0.0335 in)
I	23939-PR8-000	0.90 mm (0.0354 in)
J	23940-PR8-000	0.95 mm (0.0374 in)
K	23941-PR8-000	1.00 mm (0.0394 in)
L	23942-PR8-000	1.05 mm (0.0413 in)
M	23943-PR8-000	1.10 mm (0.0433 in)
N	23944-PR8-000	1.15 mm (0.0453 in)

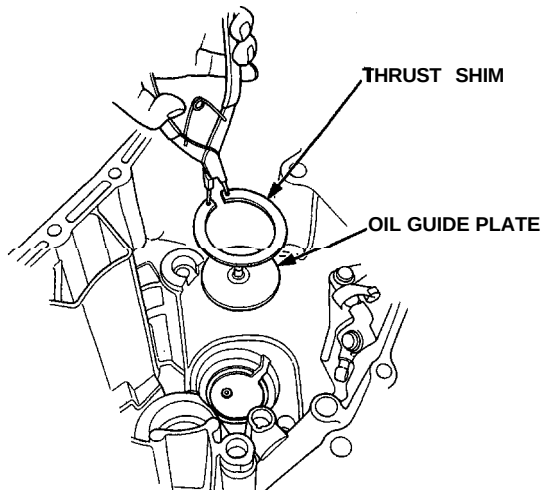
(cont'd)

Mainshaft Thrust Shim

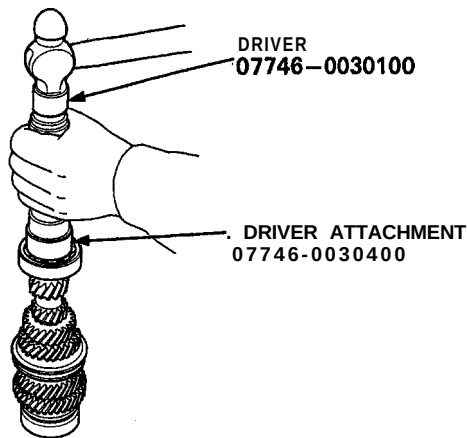
-Adjustment (cont'd)

NOTE: Clean all the parts thoroughly before installation

6. Install the oil guide plate and thrust shim into the transmission housing.



7. Install the ball bearing onto the mainshaft, then install the spring washer and mainshaft assembly into the clutch housing.



8. Install the transmission housing.

Housing Mount Bolts: 45 N·m (4.5 kg-m, 33 lb-ft)

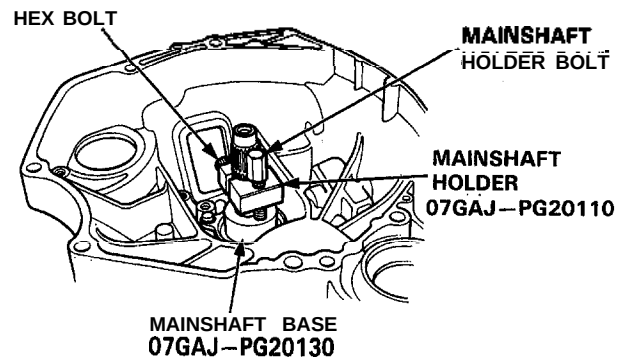
9. Check the thrust clearance in the manner described below.

NOTE: Carry out the measurement at normal room temperature.

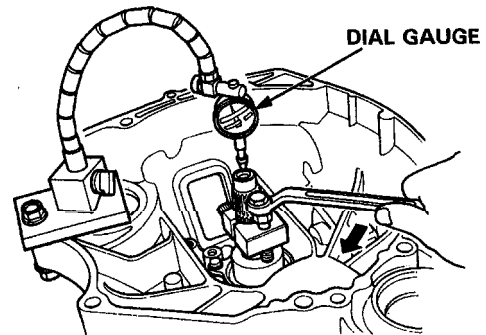
- a. Slide the mainshaft base over the mainshaft.

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

- Back-out the mainshaft holder bolt and loosen the two hex bolts.
- Fit the holder over the mainshaft so its lip is towards the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



- c. Seat the mainshaft fully by tapping its end with a plastic hammer.
- d. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.
- e. Zero a dial gauge on the end of the mainshaft.



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

CAUTION: Turning the shaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.

- g. Clearance is correct if reading is between 0.14-0.21 mm (0.0055-0.0083 in). If not, recheck shim thickness, as necessary.

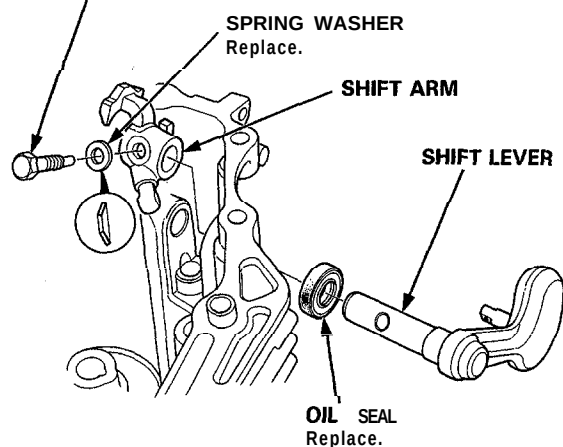


Transmission

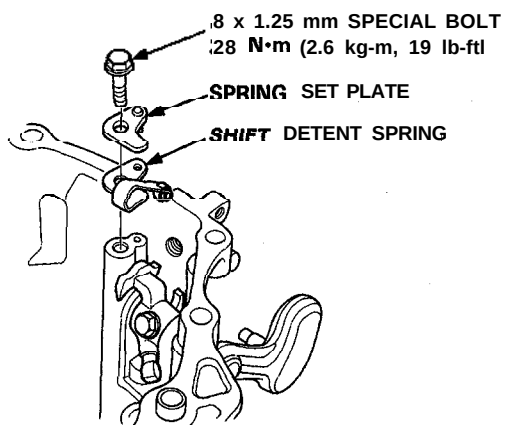
Reassembly

1. Install the oil seal, shift arm and shift lever in the transmission housing.

8 x 1.0 mm SPECIAL BOLT
32 N·m 13.2 kg-m, 23 lb-ft

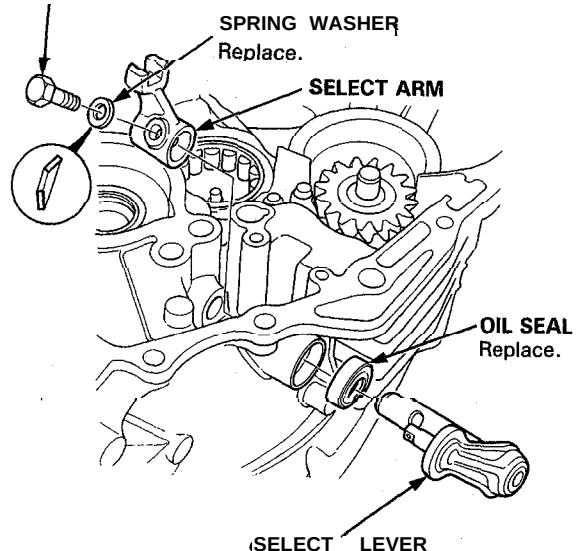


2. Install the shift detent spring and spring set plate.

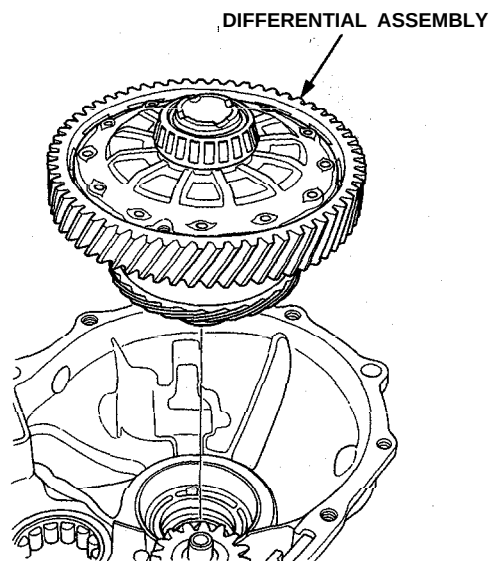


3. Install the oil seal, select arm and select lever in the clutch housing.

8 x 1.0 mm SPECIAL BOLT
32 N·m (3.2 kg-m, 23 lb-ft)



4. Install the differential assembly in the clutch housing.



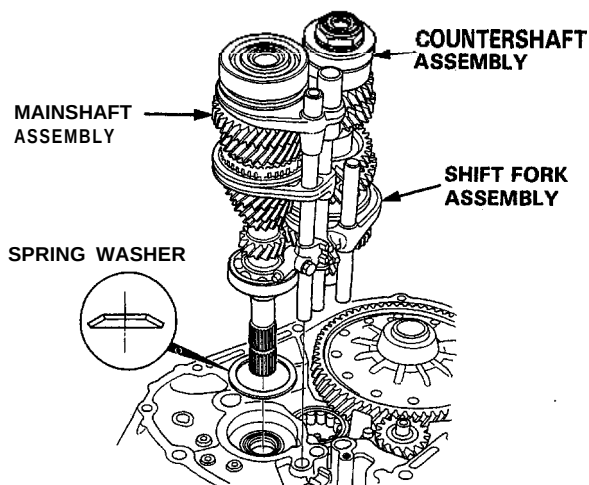
(cont'd)

Transmission

- Reassembly (cont'd)

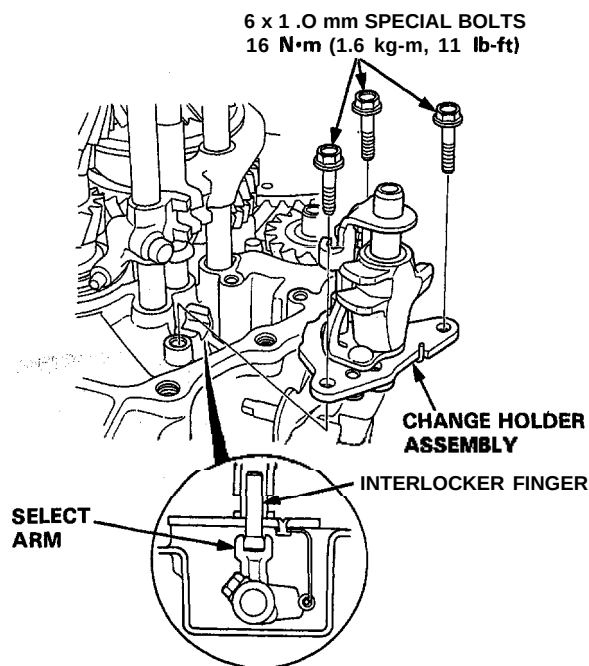
5. Install the spring washer, then insert the mainshaft and countershaft into the shift forks and install them as an assembly.

NOTE: Tape the mainshaft spline, before installation.

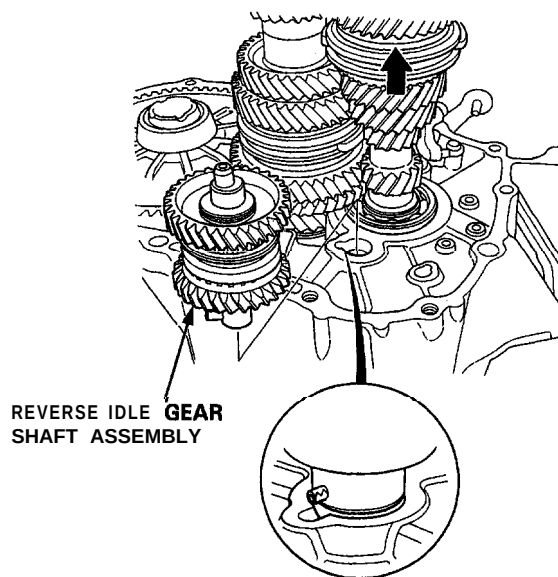


6. install the change holder assembly in the clutch housing.

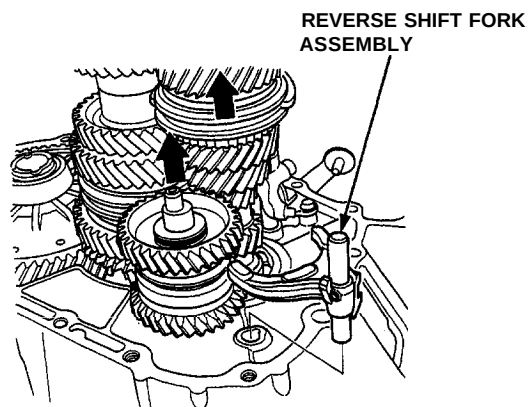
NOTE: Plate the interlocker finger in the groove of the select arm.



7. Lift the mainshaft assembly, then install the reverse idle gear shaft assembly with the spring pin matching the groove of the clutch housing.

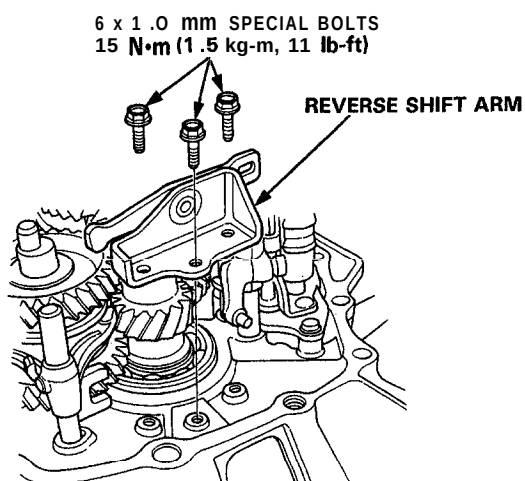


8. Shift the reverse shift fork to the driven gear side. Lift the mainshaft assembly and reverse idle gear shaft assembly, then install the reverse shift fork assembly.



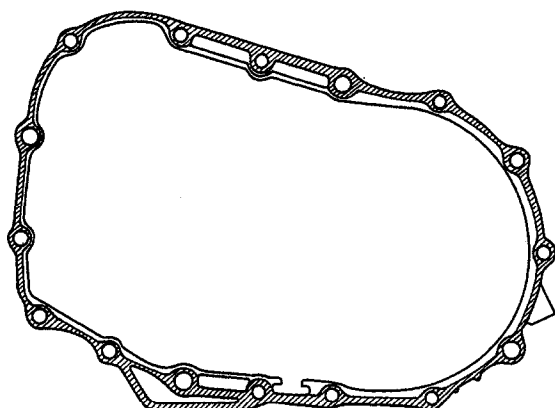


9. Install the reverse shift arm.



10. Apply liquid gasket to the transmission mating surface of the clutch housing.

NOTE: This transmission uses no gasket between the major housings; use Honda Genuine liquid gasket (P/N 0Y740-99986). 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.

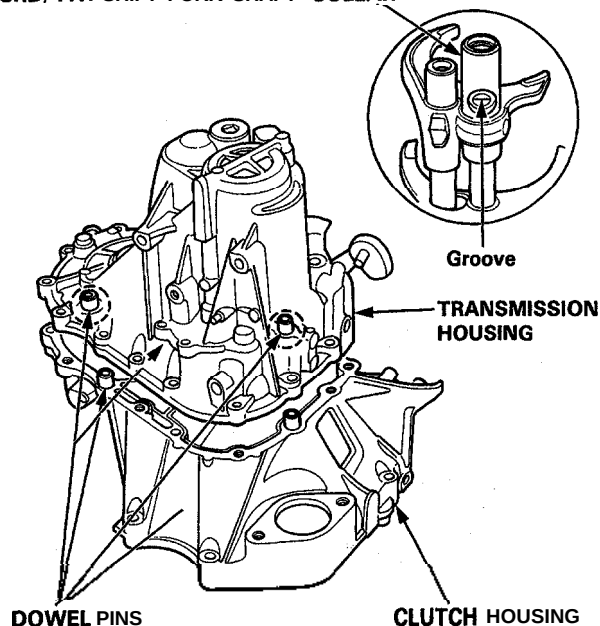


11. Install the dowel pins on the clutch housing.

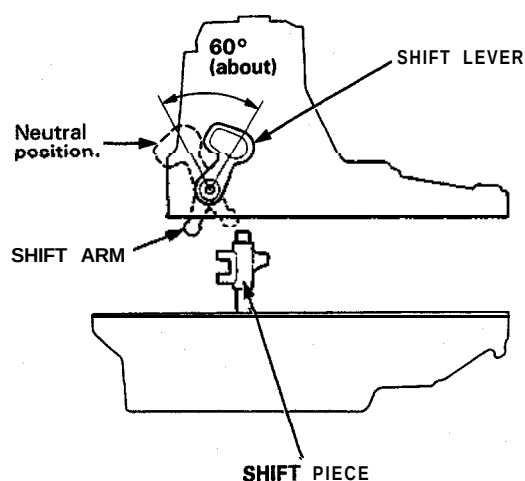
12. Place the transmission housing over the clutch housing, being careful to line up the shafts.

NOTE: Make sure the 3rd/4th shift fork shaft collar mates with the 3rd/4th shift fork shaft.

3RD/4TH SHIFT FORK SHAFT COLLAR



- a. Place the shift lever as a shown.

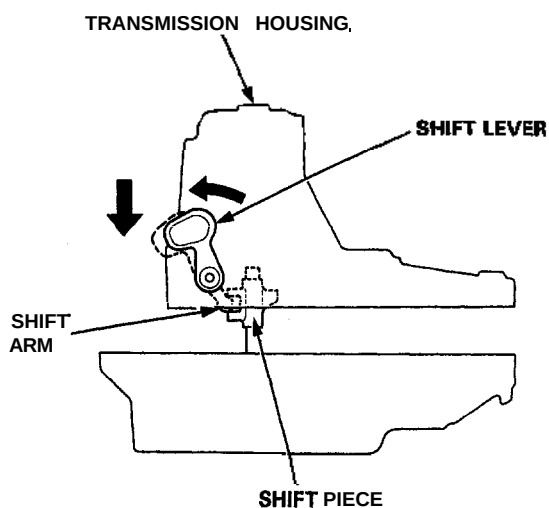


(cont'd)

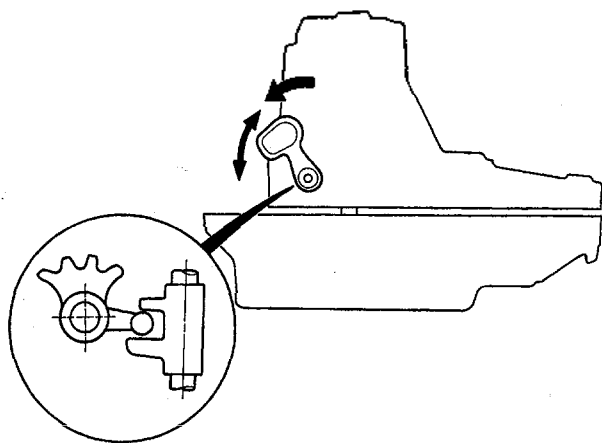
Transmission

Reassembly (cont'd)

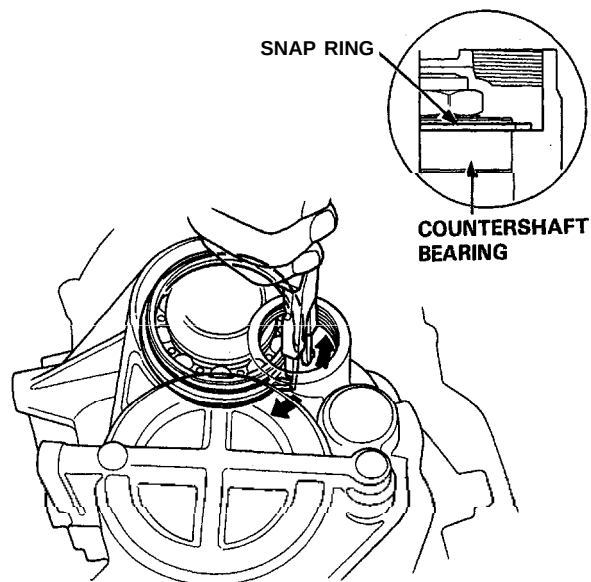
- b. Lower the transmission housing, then place the shift arm in the groove of the shift piece by turning the shift lever.



- c. Check the operation of the shift lever.

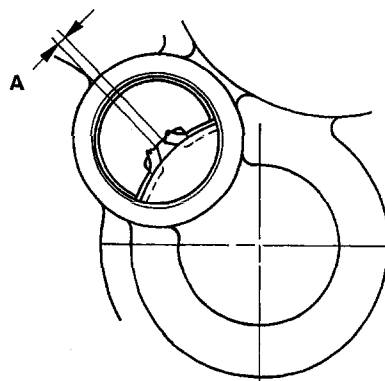


13. Lower the transmission housing with the snap ring expanded and set the snap ring in the groove of the countershaft bearing.



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

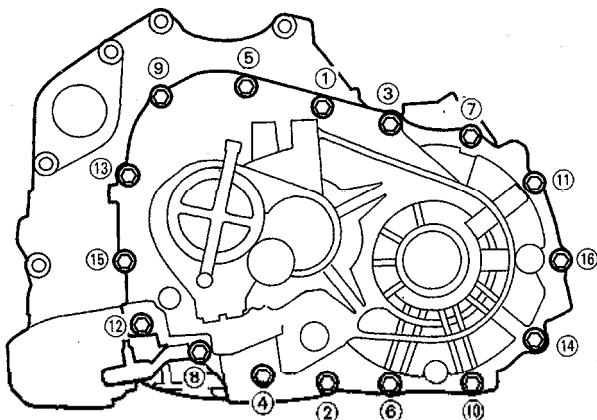
Dimension A as installed: 1.60-8.15 mm
(0.0630-0.3209 in)





15. Tighten the transmission housing attaching bolts in the numbered sequence shown below.

Torque: 45 N·m (4.5 kg-m, 33 lb-ft)



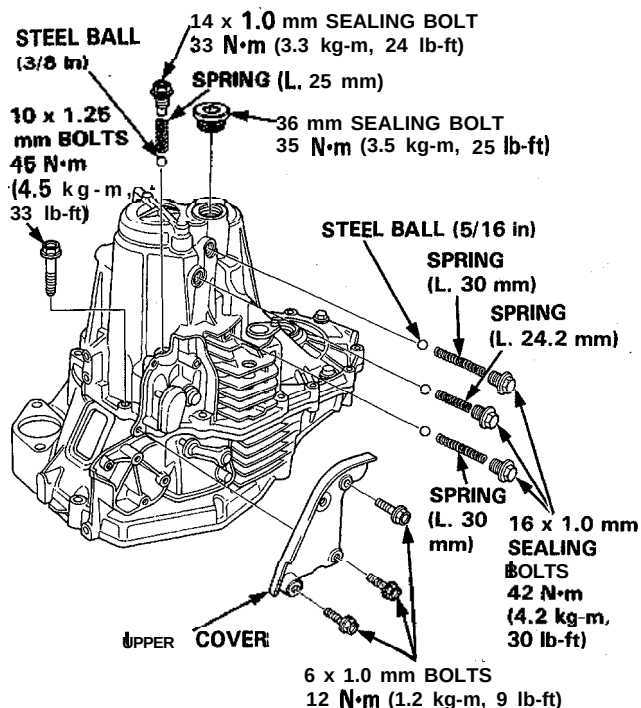
16. install the 36 mm sealing bolt.

NOTE: Apply Honda Genuine liquid gasket (P/N OY740-99986) to the flange.

17. Install the steel balls, spring and sealing bolts.

NOTE: Apply Honda Genuine liquid gasket (P/N OY740-99986) to the threads, but don't plug the hole with liquid gasket.

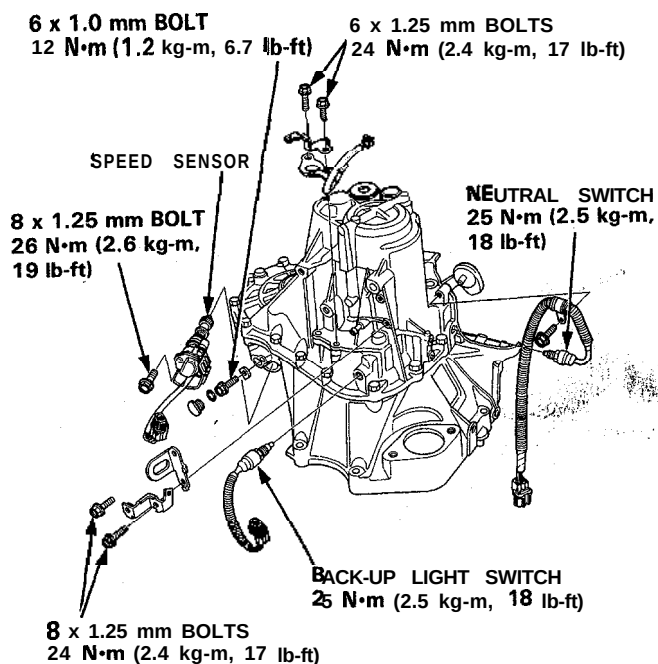
18. Install the upper cover.



19. Install the back-up light switch and neutral switch.

NOTE: Apply Honda Genuine liquid gasket (P/N OY740-99986) to the threads.

20. Install the speed sensor.

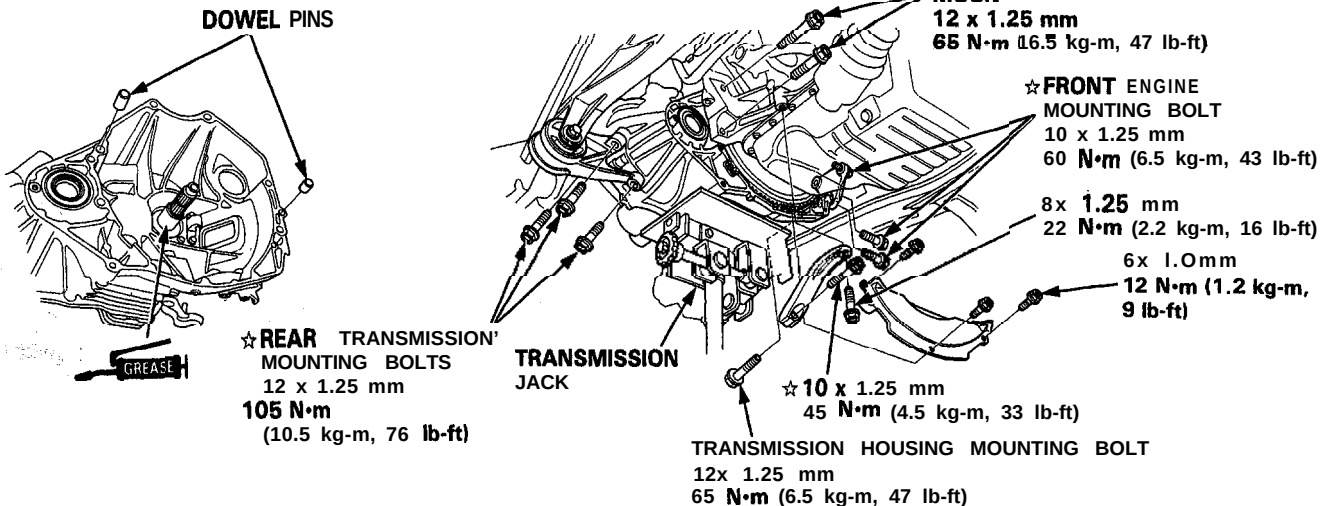


Transmission Assembly

Installation

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

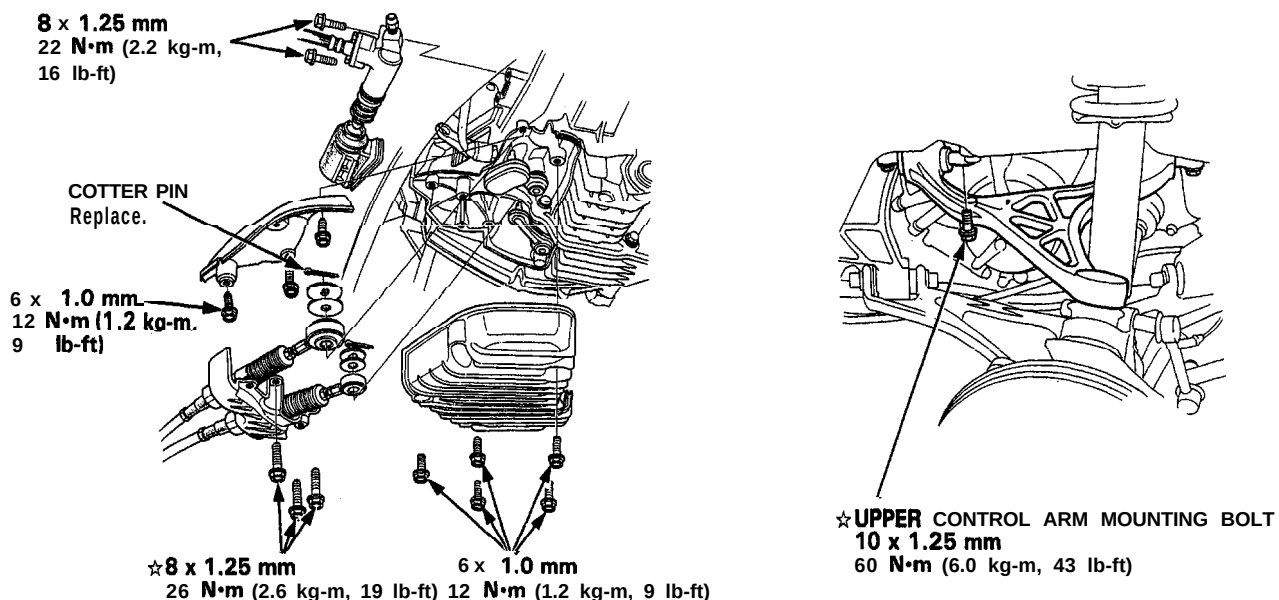
1. Place the transmission on the transmission jack, and raise it to the engine level.
2. Set the release fork to the clutch housing. (See page, 13-9)
3. Install the 2 transmission housing mounting bolts and engine stiffener.
4. Install the 3 rear transmission mounting bolts.
5. Loosen the front engine mounting bolt, then install the 2 front engine mounting bolts to the transmission side.
6. Remove the transmission jack.
7. Install the clutch housing cover.



8. Install the slave cylinder.
9. Install the shift cable and select cable.

CAUTION: Take care not to bend the cables.

10. Install the upper cover, change wire bracket and lower cover.,
11. Install the upper control arm mounting bolt.





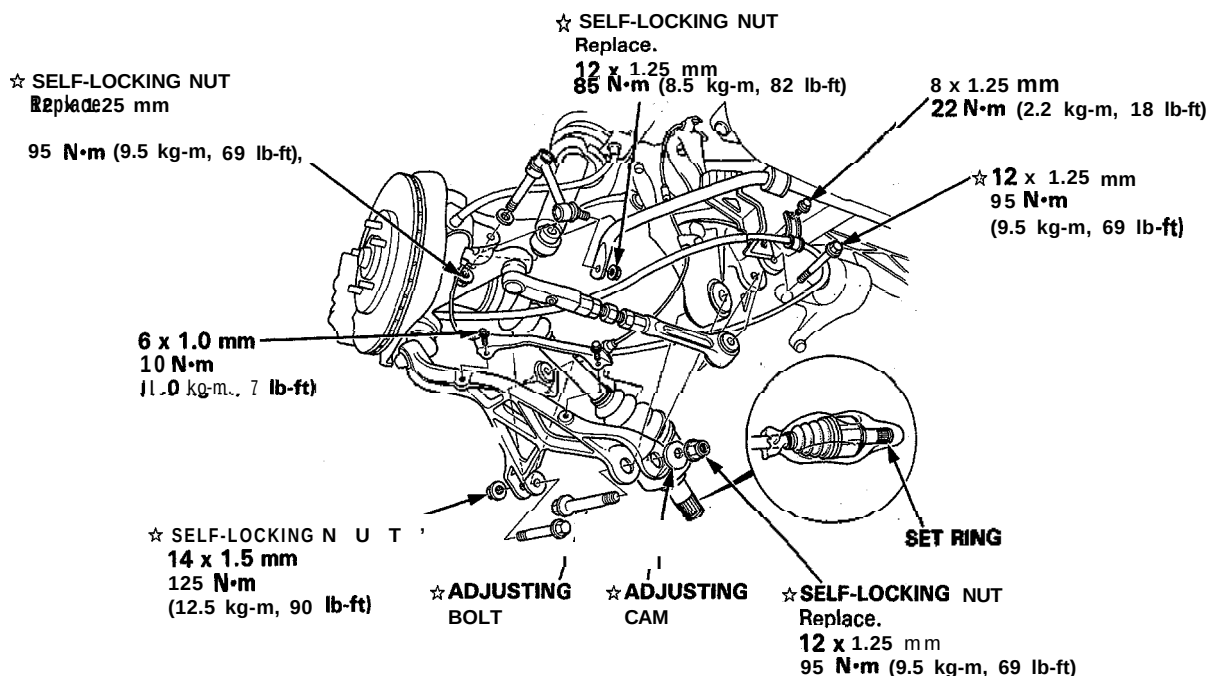
12. Install a new set ring on the end of the left driveshaft and intermediate shaft.
13. Install the left driveshaft.
14. Install the lower arm to the side beam.

CAUTION: Align the reference marks on the adjusting bolt, adjusting cam and lower control arm.

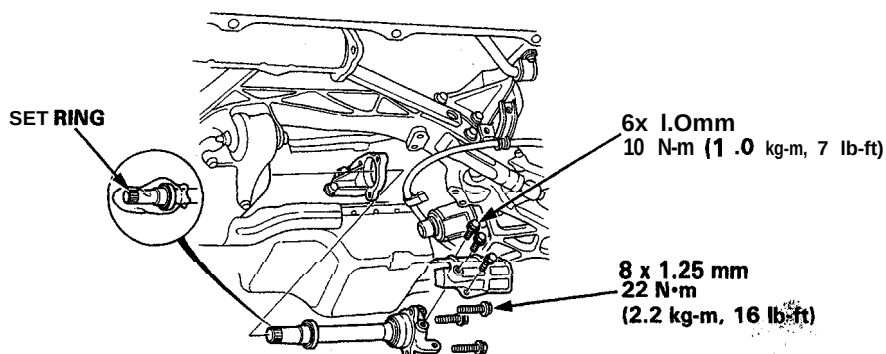
15. Install the damper fork bolt.
16. Install the ball joint nut to the toe control arm at the knuckle.

CAUTION: Make sure that the arrow marks on the toe control arm are aligned.

17. Install the ALB sensor wire clamp and parking brake cable holder.



18. Install the intermediate shaft and tighten the intermediate shaft mounting bolts to the intermediate shaft support base.
19. Install the intermediate shaft heat cover.



(cont'd)

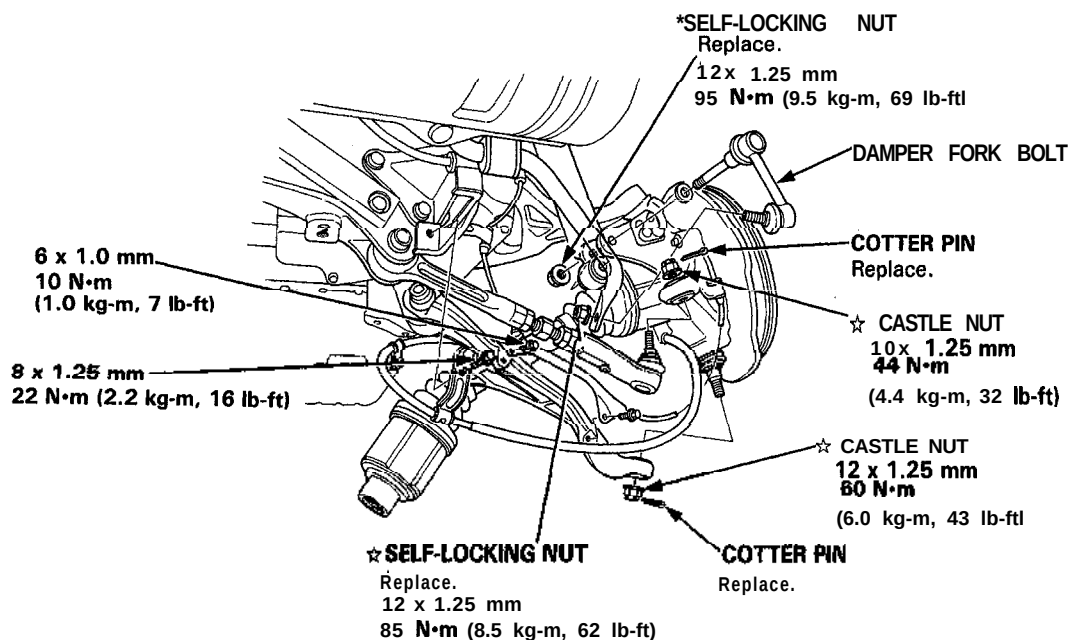
Transmission Assembly

Installation (cont'd)

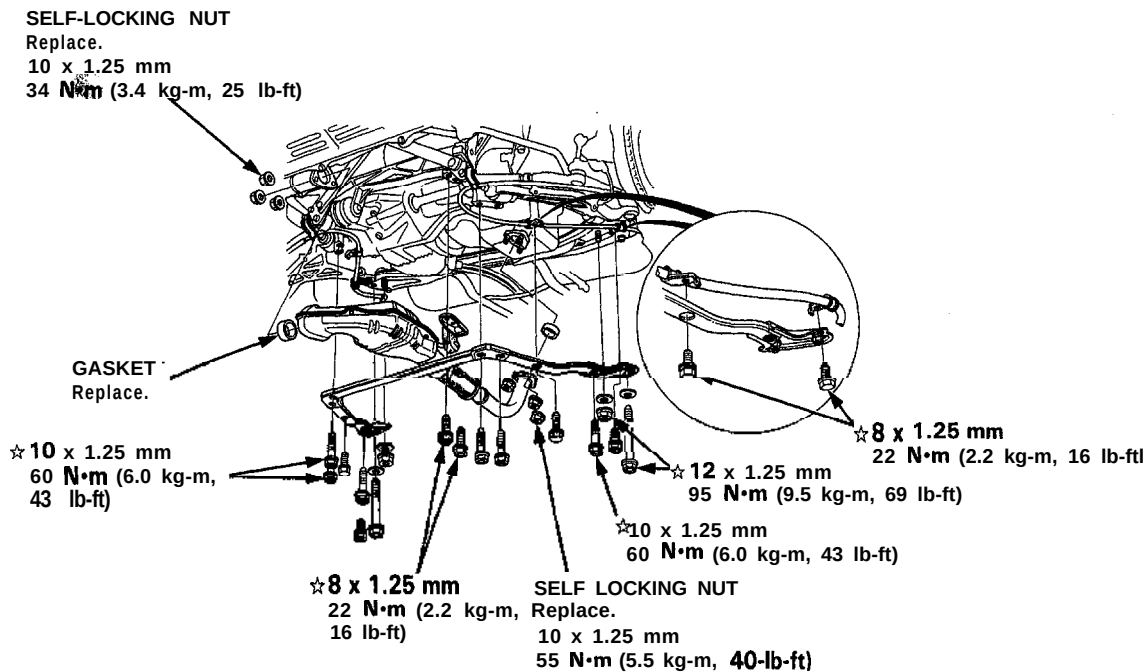
20. Install the right driveshaft onto the intermediate shaft.
21. Install the castle nut on the lower control arm at the knuckle.
22. Install the damper fork bolt.
23. Install the castle nut on the toe control arm at the knuckle.

CAUTION: Make sure that the arrow marks on the toe control arm are aligned.

24. Install the Anti-lock brake sensor wire clamp and parking brake cable holder.



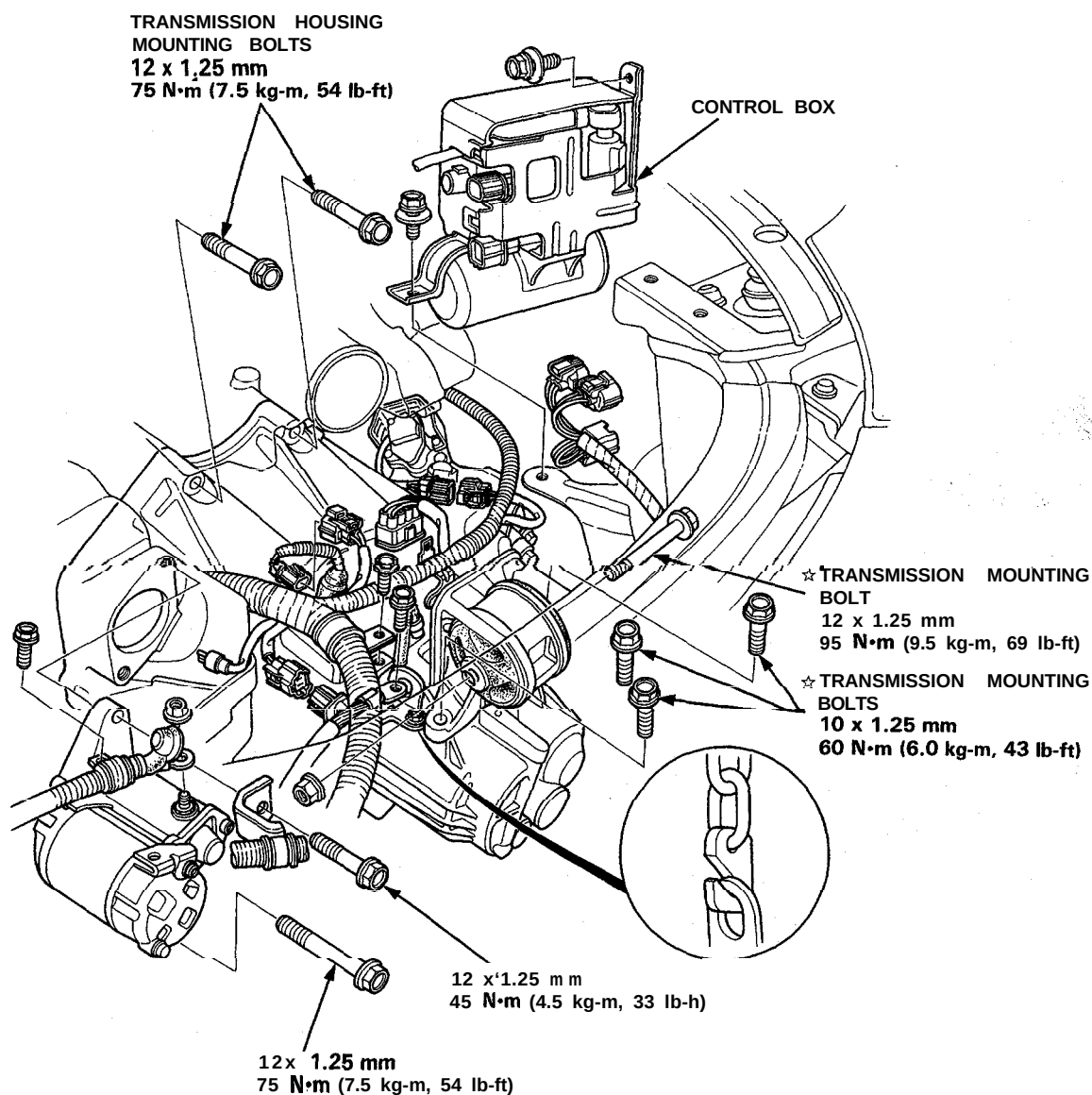
25. Install the front exhaust pipe A.
26. Install the rear beam rod.
27. Install the parking brake cable.





28. Install the transmission mount and 2 transmission housing mounting bolts.
29. Install the starter motor and connect the starter motor cables.
30. Install the transmission ground cable and jumper connector, and connect the back-up light switch, neutral switch and speed sensor connectors.
31. Install the control box and connect the control box connectors.

32. Install the air cleaner case.
33. Install the strut bar.
34. Refill the transmission with oil.
35. Connect the battery positive (+) and negative (-) cables to the battery.
36. Inspect the rear camber (See Section 18).
37. Check the clutch operation.
38. Shift the transmission and check for smooth operation.



Automatic Transmission

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SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The NS-X includes a driver's side Airbag, located in the steering wheel hub, as part of a Supplemental Restraint System (SRS). Information necessary to safely service the SRS is included in this Service Manual. Items marked * in this section include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special caution and tools and should therefore be done by an authorized Acura 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 Acura 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 and related components are located in the steering column, center console, dash, and dashboard lower panel. Do not use electrical test equipment on these circuits.

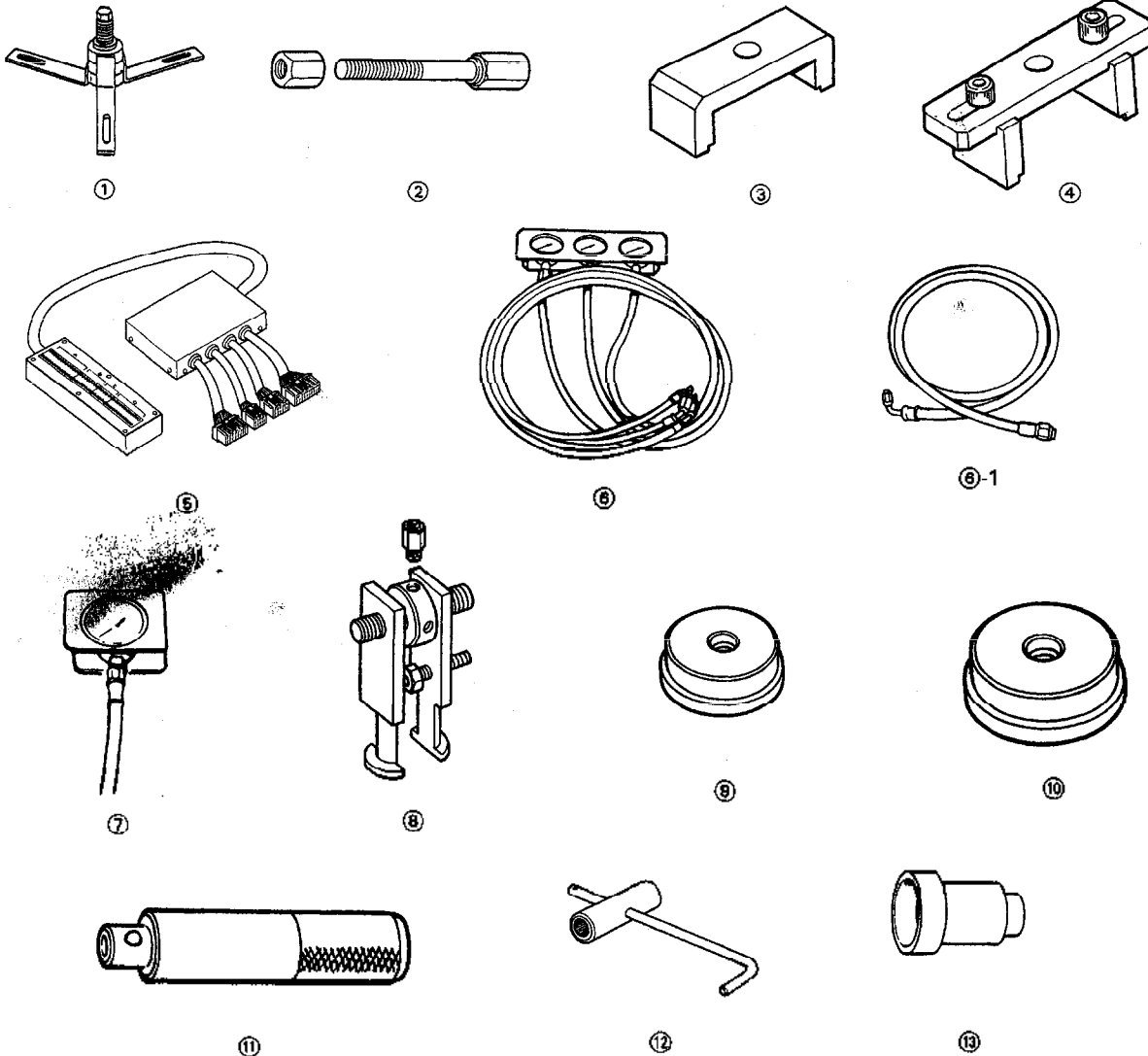


Special Tools

- Special Tools

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07HAC-PK4010A	Housing Puller	1	14-107
②	07GAE-PG40200	Clutch Spring Compressor Bolt Assembly	1	14-131, 134
③	07HAE-PL50100	Clutch Spring Compressor Attachment	1	14-131, 134
④	07LAE-PX40100	Clutch Spring Compressor Attachment	1	14-131, 134
⑤	07LAJ-PT3010A	ECU Test Harness	1	14-51
⑥	07406-0020003	A/T Oil Pressure Gauge Set	1	14-90
⑥-1	07406-0020201	A/T Oil Pressure Gauge Replacement Hose	(1)	14-90
⑦	07406-0070000	A/T Low Pressure Gauge	1	14-90
⑧*	07736-A01000A*	'Adjustable Bearing Puller, 25-40 mm	1	14-139
⑨	07746-0010500	Attachment, 62 x 68 mm	1	14-138
⑩	07746-0010600	Attachment, 72 x 75 mm	1	14-137, 138, 139
⑪	07749-0010000	Driver	1	14-137, 138, 139
⑫	07924-PJ40000	Mainshaft Holder	1	14-106, 146
⑬	07947-6340500	Attachment	1	14-138

* ⑧ must be used with commercially available 3/8 x 16 thread Slide Hammer.





The automatic transmission is a combination of a 3-element torque converter and a triple-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 in 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 torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft.

The transmission has three parallel shafts, the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft.

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

The countershaft includes the clutches for 1st-Hold and 3rd, and gears for 2nd, 3rd, 4th, Reverse and 1st.

The secondary shaft includes the 2nd clutch and gears for 2nd and 3rd.

The 4th and reverse gears can be locked to the countershaft at its center, providing 4th gear or Reverse, depending on which way the selector is moved.

The gears on the mainshaft and secondary shaft 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, 3, and D.

ELECTRONIC CONTROL

The electronic control system consists of an automatic transmission control unit, sensors, a linear solenoid and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The A/T control unit is located on the insulator center bulkhead, behind the driver's seat.

HYDRAULIC CONTROL

The valve assembly includes the main valve body, secondary valve body, servo valve body, regulator valve body, lock-up valve body and the 2nd accumulator body.

They are bolted to the torque converter case as an assembly.

The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, 3-4 shift valve, relief valve, one-way relief valve and oil pump gears.

The secondary valve body contains the 3-2 kick-down valve, CPC (clutch pressure control) valve, 2nd orifice control valve, 3rd orifice control valve, modulator valve, 4th exhaust valve, servo control valve, 2nd exhaust valve and 4-3 kick-down valve.

The servo valve body contains the accumulator pistons and servo valve. The throttle valve body includes the throttle B valve which is bolted onto the servo valve body.

The regulator valve body contains the pressure regulator valve, lock-up control valve and cooler relief valve. Fluid from the regulator passes through the manual valve to the various control valves.

The lock-up valve body contains the lock-up timing B valve and lock-up shift valve. The 2nd accumulator body contains the accumulator pistons and LSD relief valve.

The torque converter check valve is located in the torque converter housing, under the main valve body.

The 1st, 1st-Hold, 3rd and 4th 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 A/T control unit 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 3 or D 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, an electronic control unit 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 B. 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 A/T control unit.

(cont'd)

Description

(cont'd)

GEAR SELECTION

The selector lever has seven positions:



REVERSE, **N** NEUTRAL,



1 st through 4th gear positions,



3rd

gear, 2nd gear and 1st gear.

Position	Description
P PARK	Rear wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch locked.
N NEUTRAL	All clutches released.
D DRIVE	General driving; starts in low speed, shifts automatically, 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.
3 THIRD	Driving in 3rd gear; stays in 3rd gear, does not shift up and down. For climbing or downhill and light engine braking on high speed condition.
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.

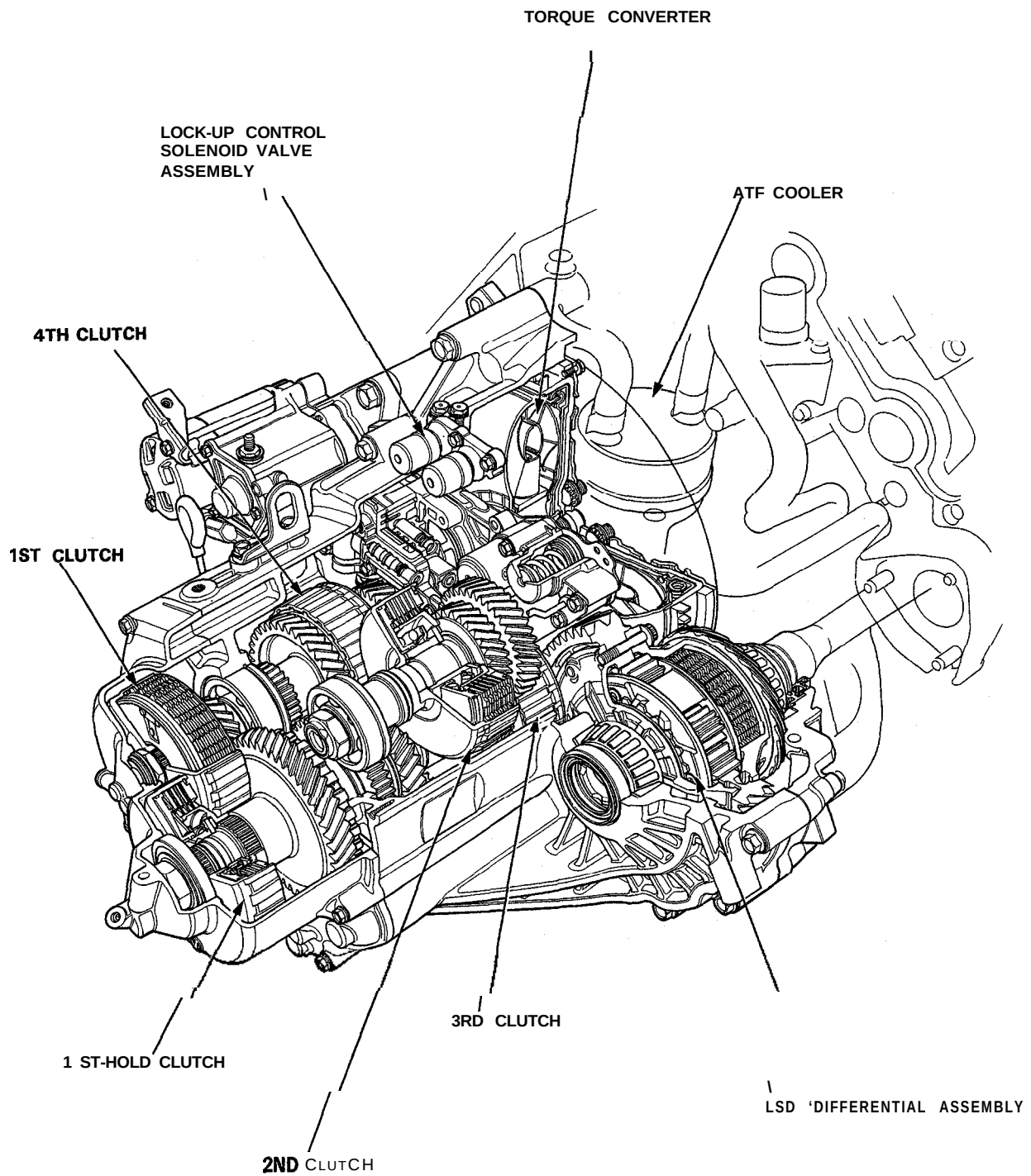
Starting is possible only in and **N** position through use of a slide-type, neutral-safety switch.

POSITION INDICATOR

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

ATF COOLER

With this mid-engine type car, the radiator is mounted at the front of the car, so the ATF cooler is installed directly on the transmission housing.



(cont'd)

Description

- Clutches (cont'd)

The Acura 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 end of the mainshaft, just behind the end cover. The first clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

[1st-Hold Clutch]

The first hold clutch engages/disengages low hold or 1 position, and is located at the end of the countershaft, just behind the end cover. The 1st 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 on the secondary shaft. The second clutch is supplied clutch pressure through the secondary shaft by a circuit connected to the 2nd accumulator body.

[3rd Clutch]

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

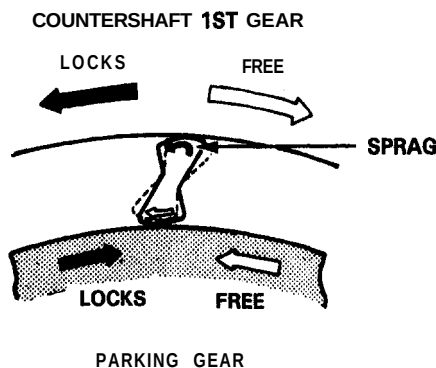
[4th Clutch]

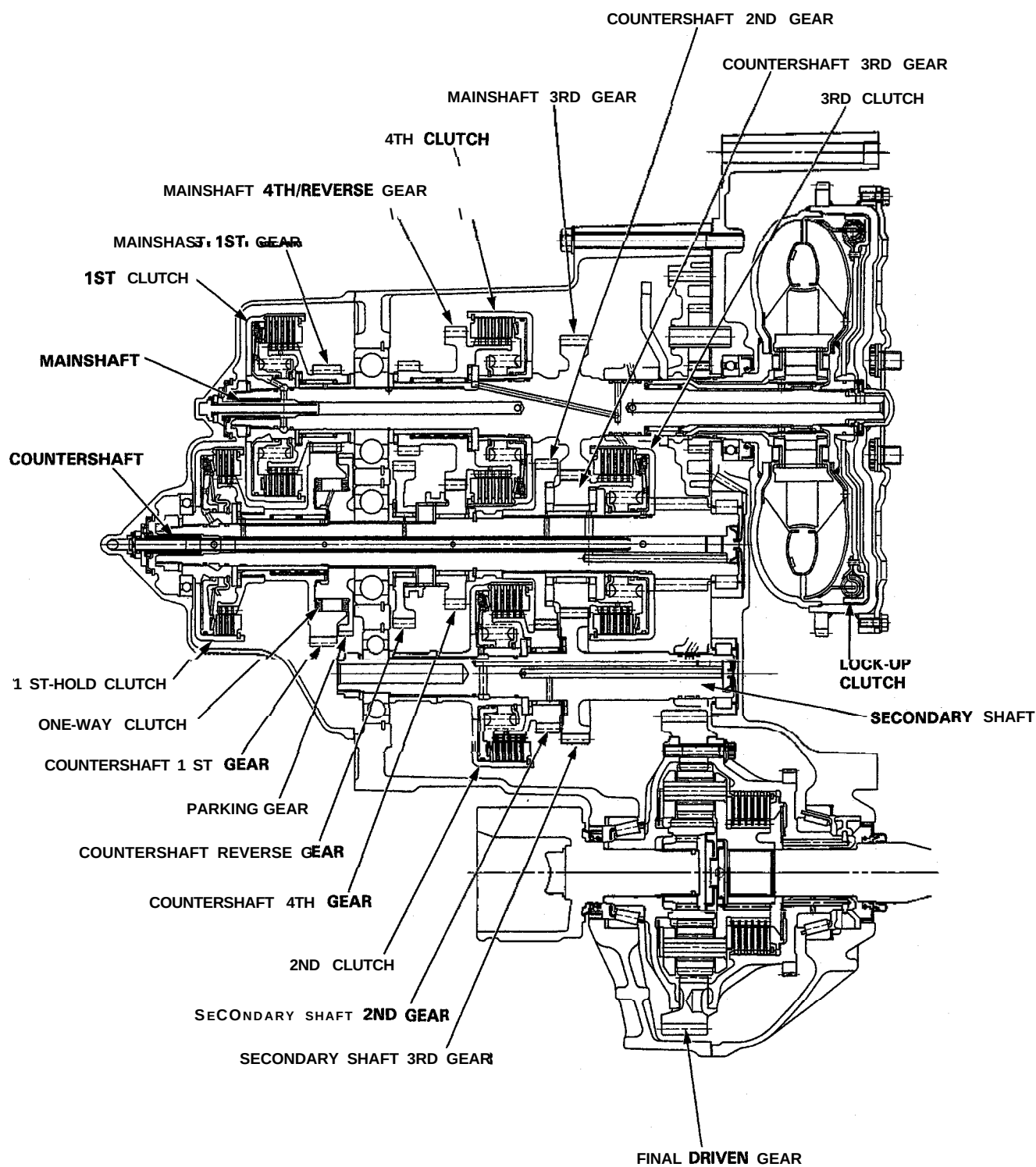
The fourth clutch engages/disengages fourth gear, as well as reverse gear, and is located at the center of the mainshaft. The fourth clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

[One-way Clutch]

The one-way clutch is positioned between the parking gear and first gear, with the parking gear splined to the countershaft. The first gear provides the outer race surface, and the parking gear provides the inner race surface. The one-way clutch locks up when power is transmitted from the mainshaft first gear to the countershaft first gear.

The first clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the  position. However, the one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the  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

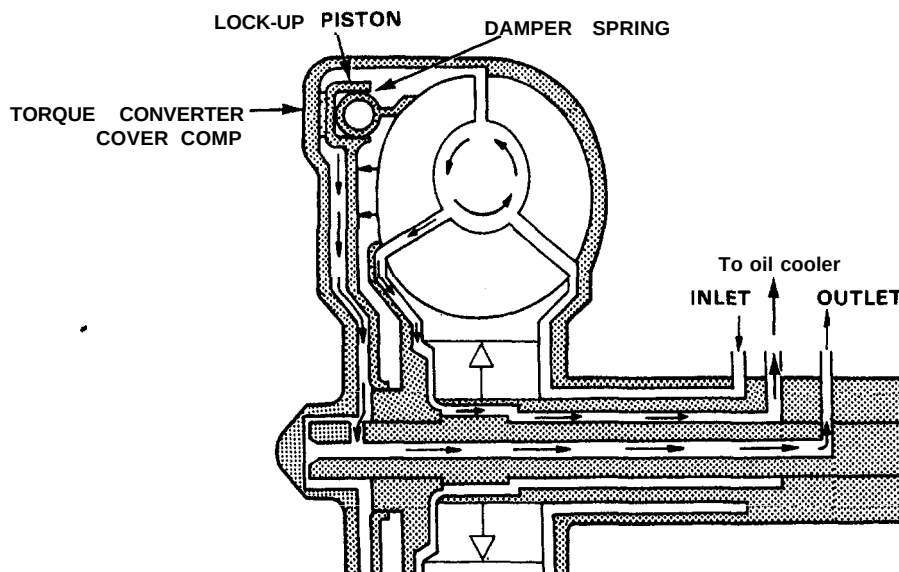
1. Operation (clutch on)

With the lock-up clutch on, the oil in the chamber between the 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

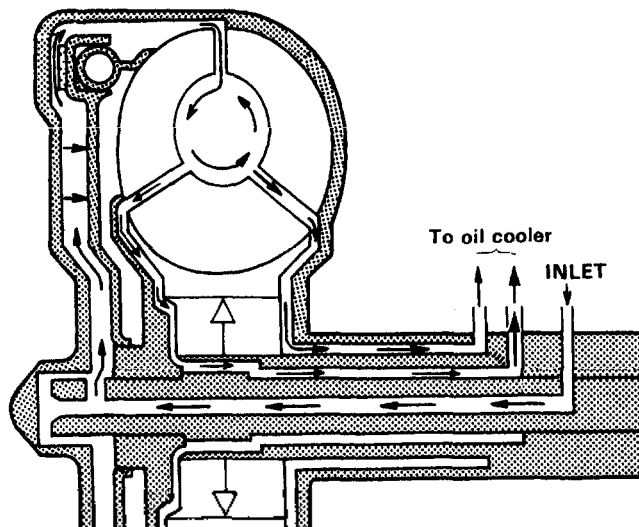


2. Operation (clutch off)

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

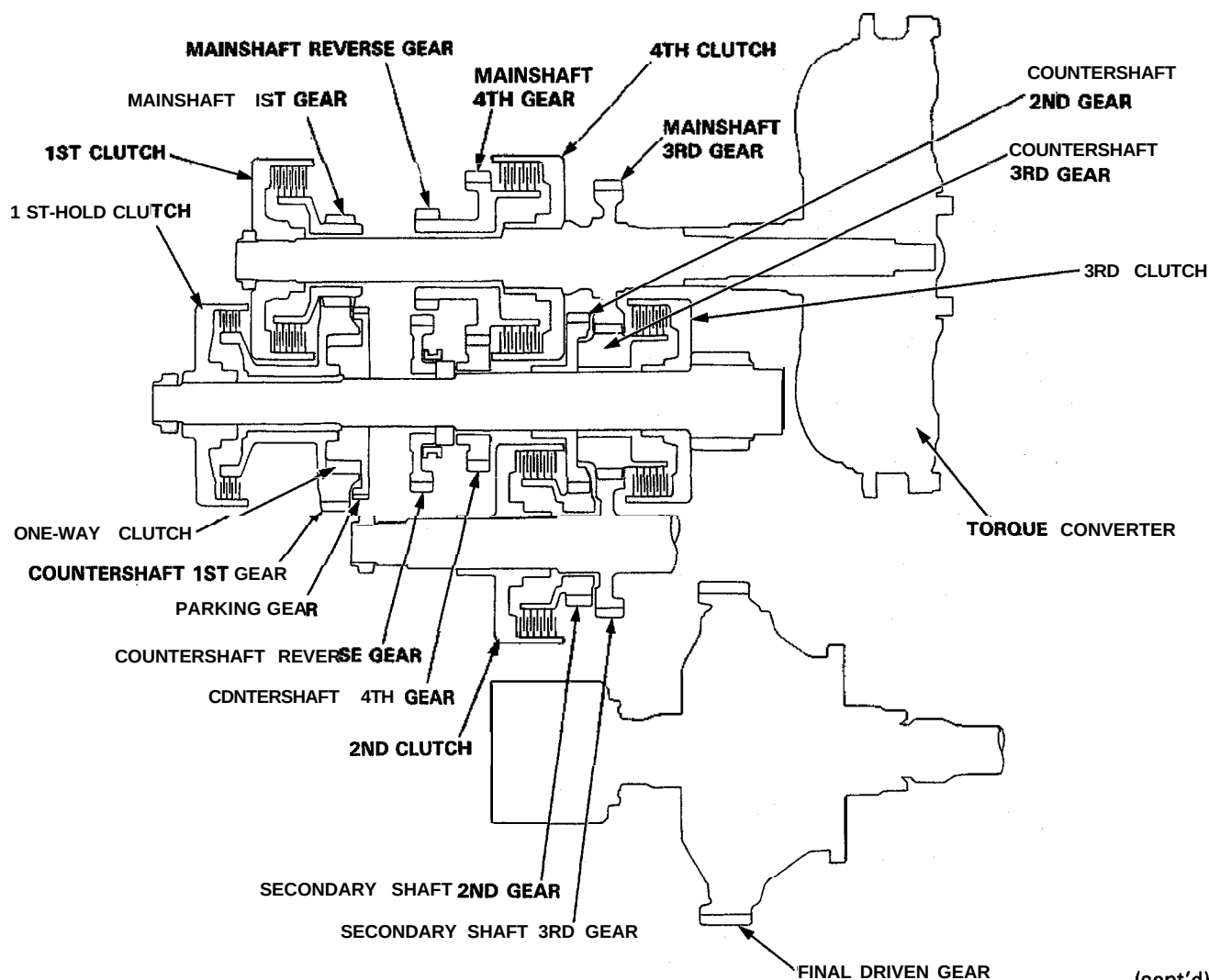




Power Flow

PART RANGE	TORQUE CON- VERTER	1ST GEAR 1ST HOLD CLUTCH	1ST GEAR 1ST CLUTCH	1ST GEAR ONE-WAY CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4th		REVERSE GEAR	PARKING GEAR
							GEAR	CLUTCH		
P	○	x	x	x	x	x	x	x	x	○
R	○	x	x	x	x	x	x	○	○	x
N	○	x	x	x	x	x	x	x	x	x
D	1ST	○	x	○	x	x	x	x	x	x
	2ND	○	x	○*	x	x	x	x	x	x
	3RD	○	x	○*	x	○	x	x	x	x
	4TH	○	x	○*	x	x	○	○	x	x
3	○	x	○*	x	x	○	x	x	x	x
2	○	x	○*	x	○	x	x	x	x	x
1	○	○	○	x	x	x	x	x	x	x

0: Operates, x : Doesn't operate, *: Although the 1st clutch engages, driving power is not transmitted as the one-way clutch slips.



(cont'd)

Description

Power Flow (cont'd)

1 Position

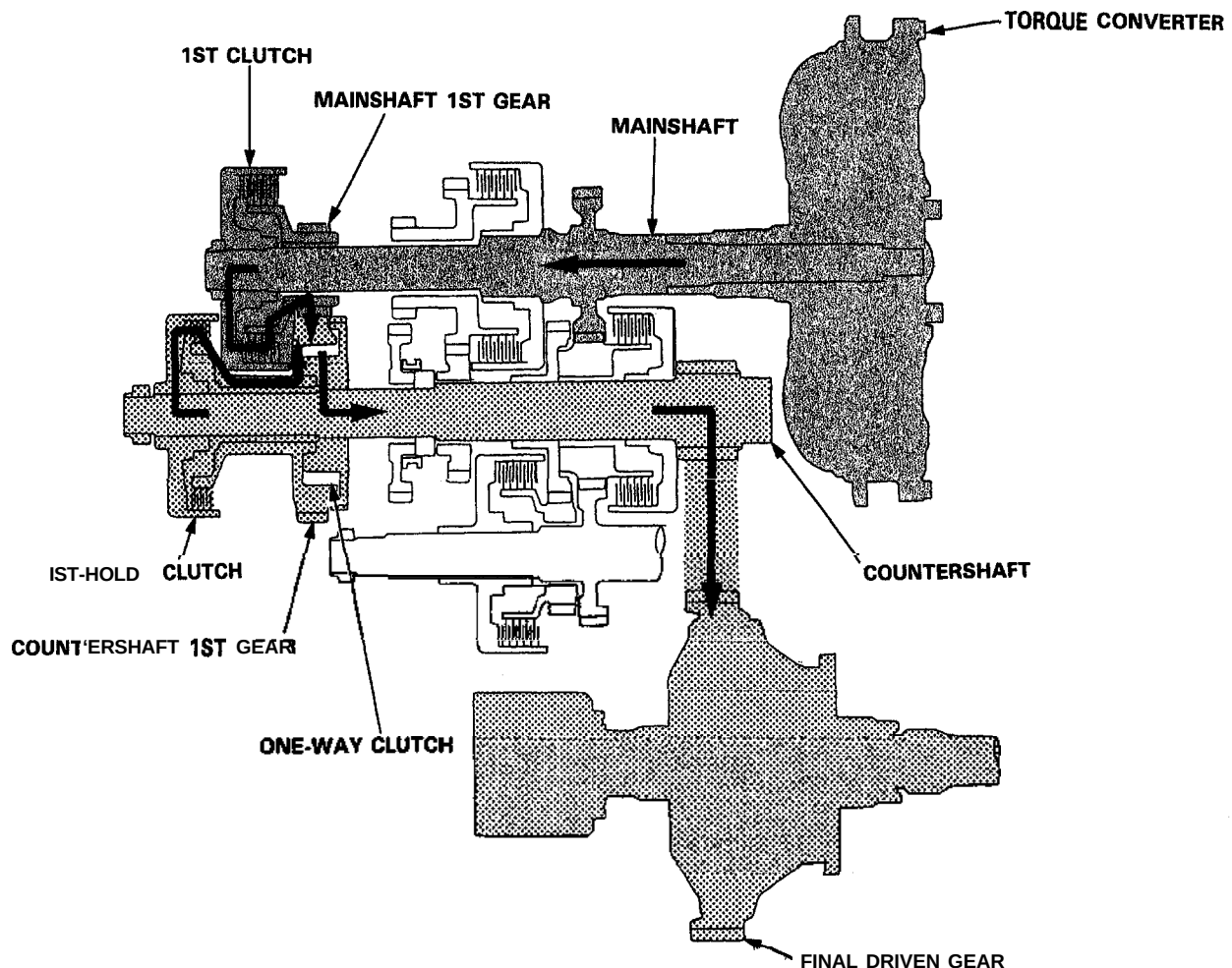
At 1 position, hydraulic pressure is applied to the 1st clutch and to the 1st hold clutch.

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

The power flow when decelerating is as follows;

1. Rolling resistance from the road surface through the rear wheels to the final drive gear, then to the countershaft 1st gear via the 1st-hold clutch which is applied during deceleration.
2. The one-way clutch becomes free at this time because of the countershaft rotates in reverse at the time of accelerating.
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 speed gear.



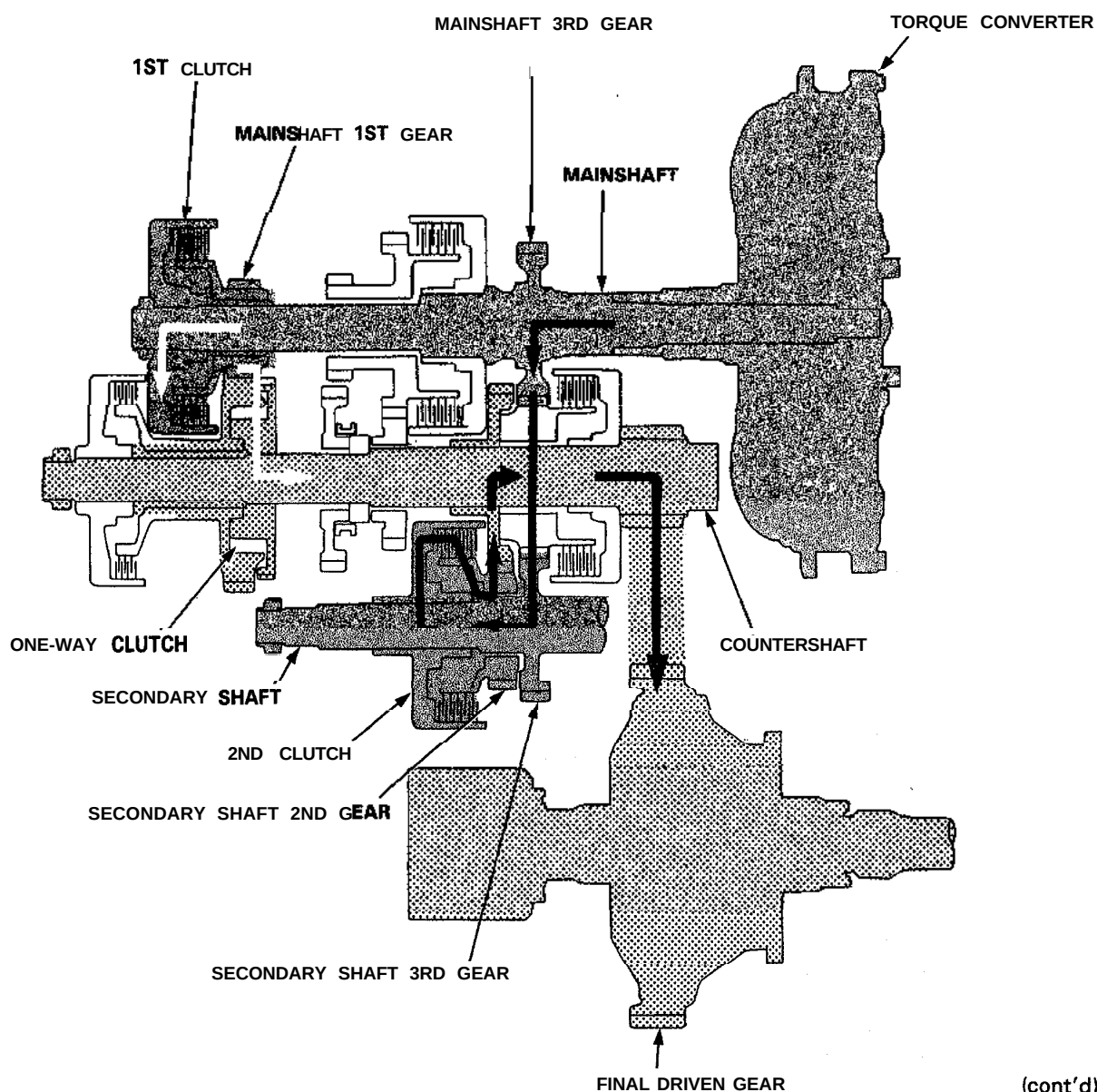


2 Position is provided to drive only in 2nd speed.

1. Power from the mainshaft 3rd gear drives the countershaft 3rd gear. Since at this time there is no hydraulic pressure to the 3rd clutch. The countershaft 3rd gear turns freely and drives the secondary shaft 3rd gear.
2. The power is also transmitted to the secondary shaft 2nd gear because hydraulic pressure is applied to 2nd clutch.
3. The secondary shaft 2nd gear drives the countershaft 2nd gear. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE:

- At 2 position, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of the 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.
- Power flow in D position, 2nd speed is the same as 2 position.



(cont'd)

Description

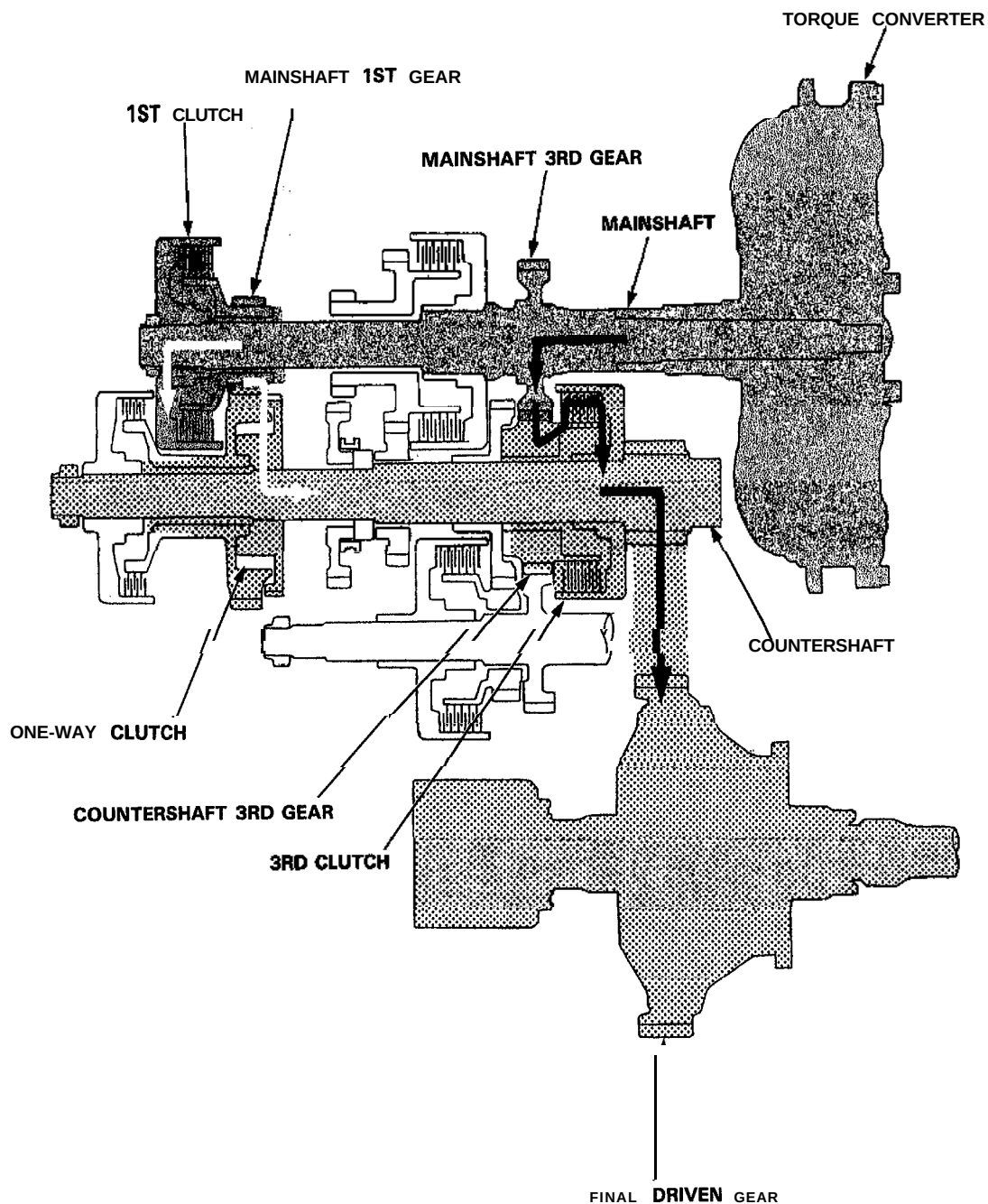
Power Flow (cont'd)

3 Position is provided to drive only in 3rd speed.

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

NOTE:

- At 3 position, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of the 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.
- Power flow in D position, 3rd speed is the same as 3 position.



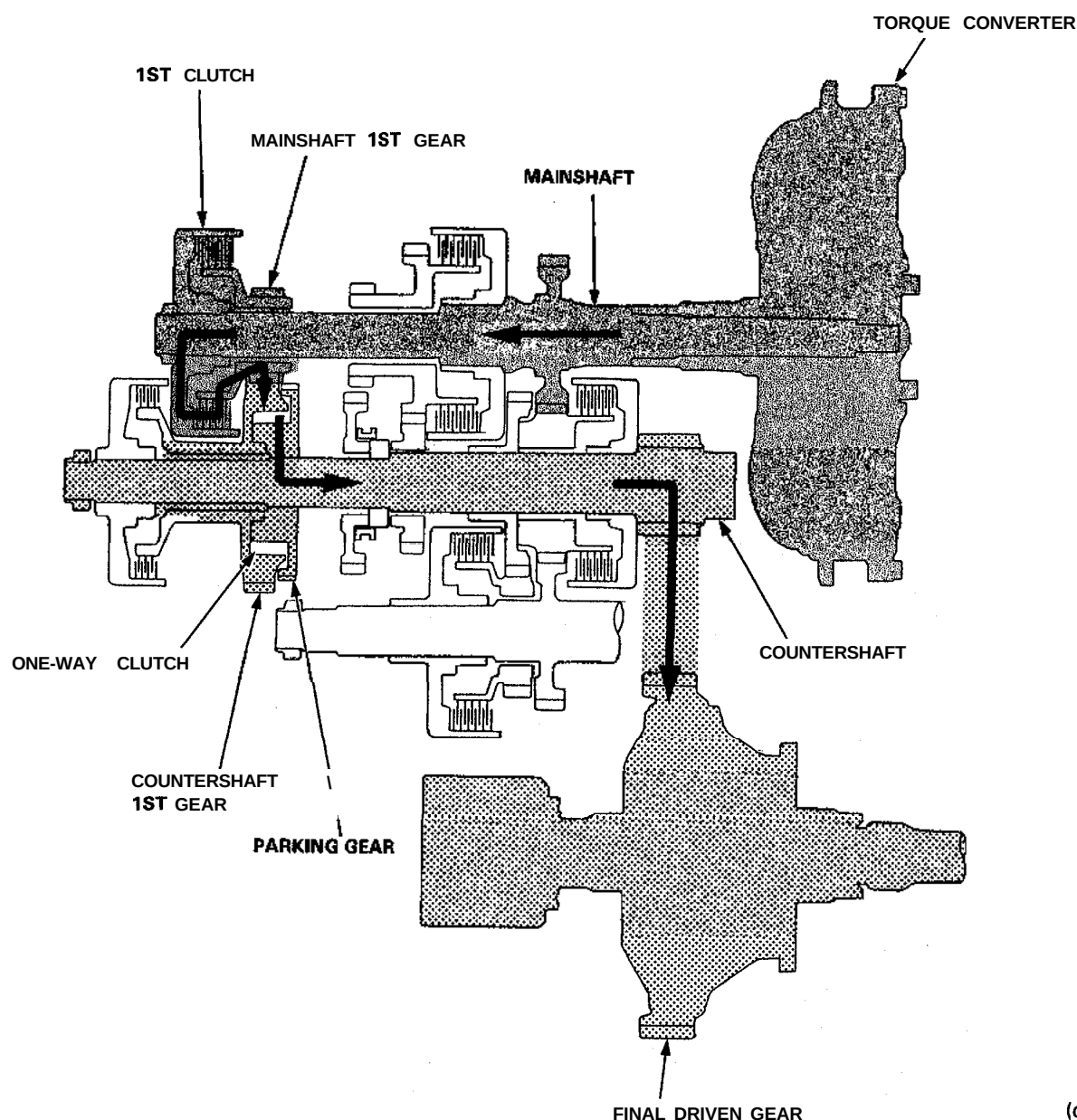


In D position, the optimum gear is automatically selected from the gear ratios of 1 st, 2nd, 3rd and 4th speeds, according to conditions such as the balance between throttle opening (engine load) and vehicle speed.

D 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 clutch.
3. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: In the D position, hydraulic pressure is not applied to the 1st-hold clutch.



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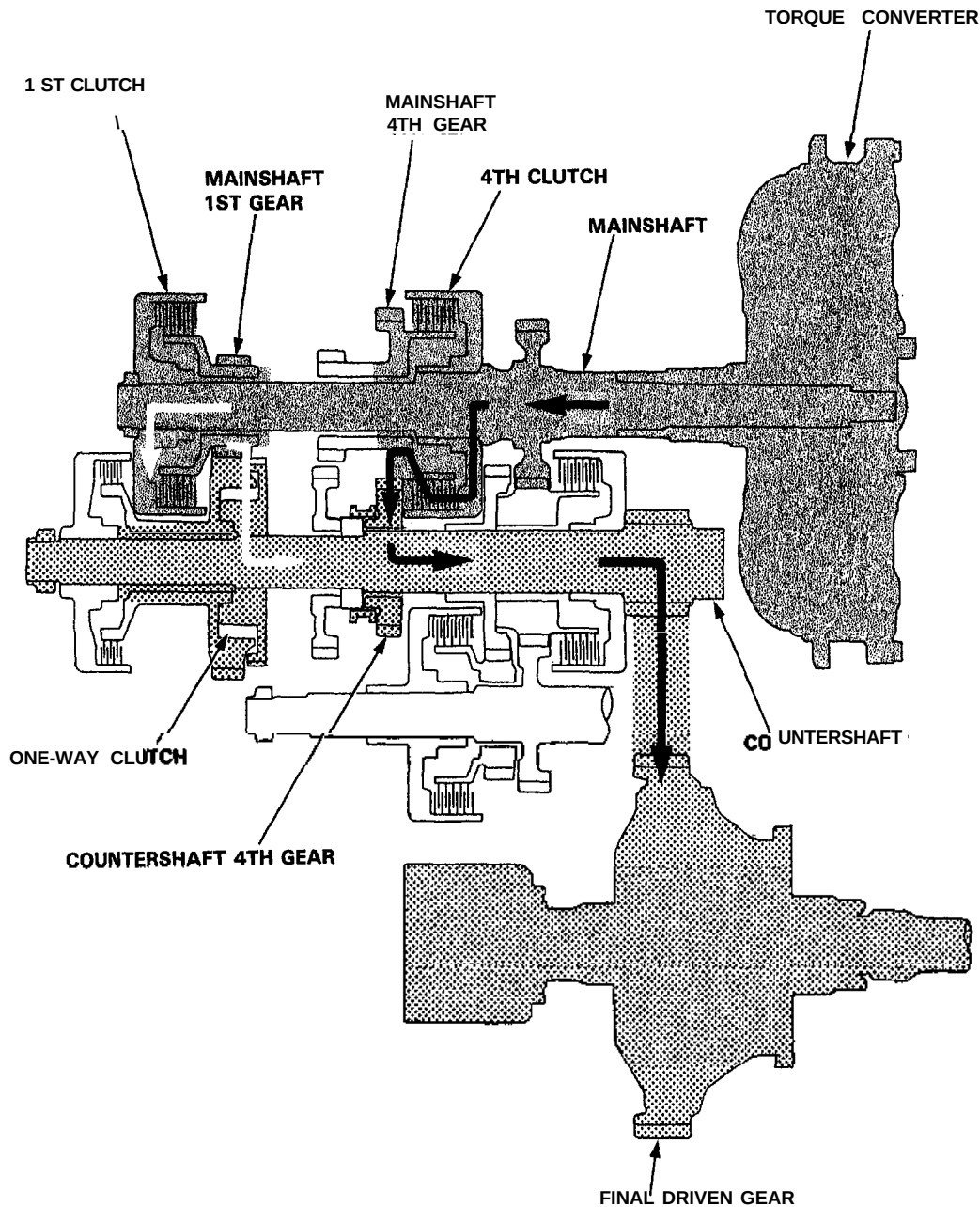
Description

Power Flow (cont'd)

D 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 through countershaft 4th gear to the countershaft.
3. Power is transmitted to the final drive gear and drives the final driven gear.

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





Electronic Control System

Electronic Control System

The electronic control system consists of the A/T control unit, sensors, a linear solenoid and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The A/T control unit is located on the insulator center bulkhead, behind the driver's seat.

Shift control

Shifting is related to engine torque through the linear solenoid used to operate throttle valve B which is controlled by the A/T control unit the control throttle pressure.

Getting a signal from each sensor, the A/T control unit detects the appropriate gear shifting 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)		
☒ (1st)	OFF	ON
☐ (2nd)	ON	OFF
☐ (3rd), ☐ (1st)	ON	OFF
☐ (4th), ☐ (2nd)	OFF	OFF

Lock-up control

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

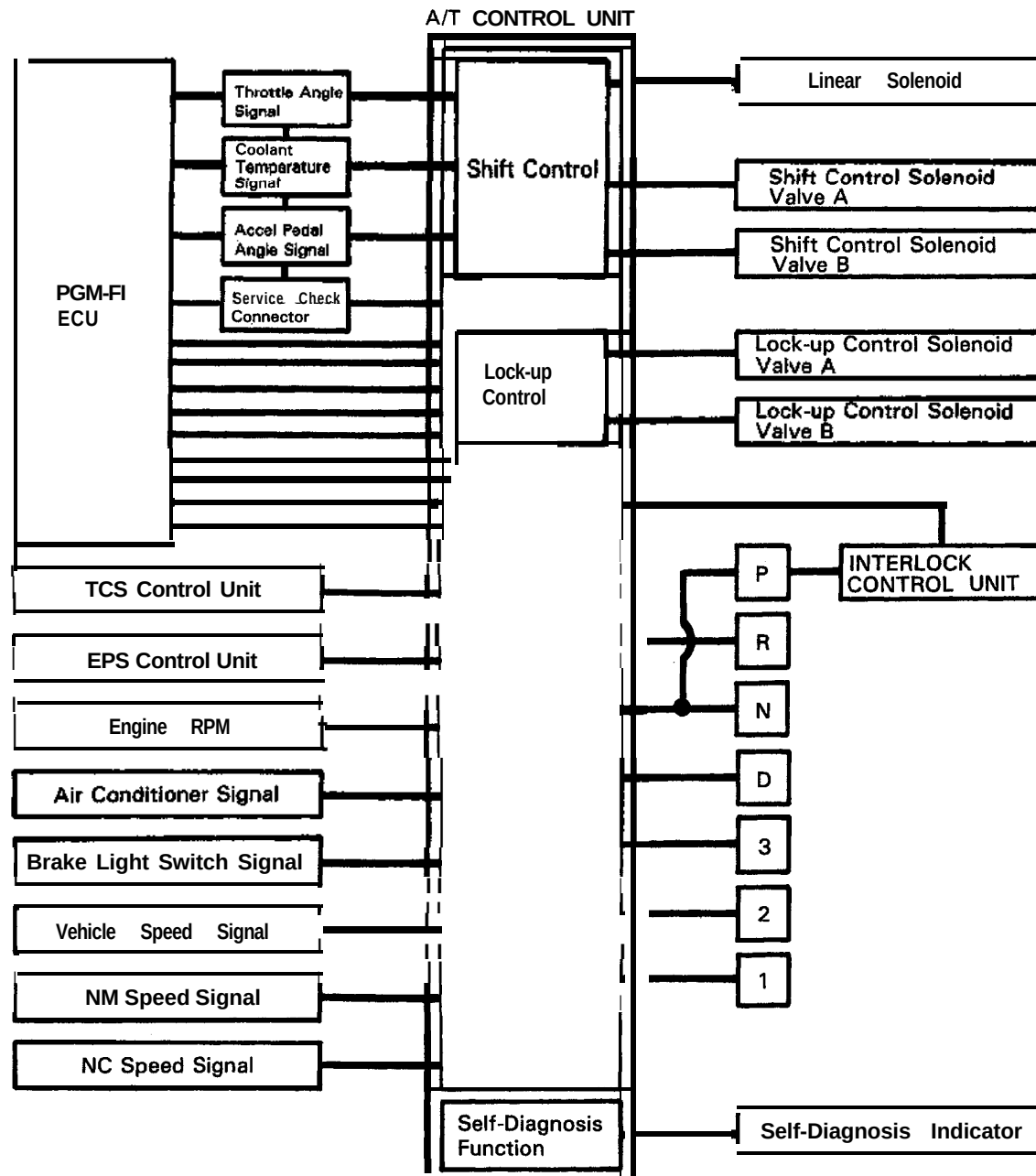
The combination of driving signals to lock-up control solenoid valves A and B is shown in the table below.

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)

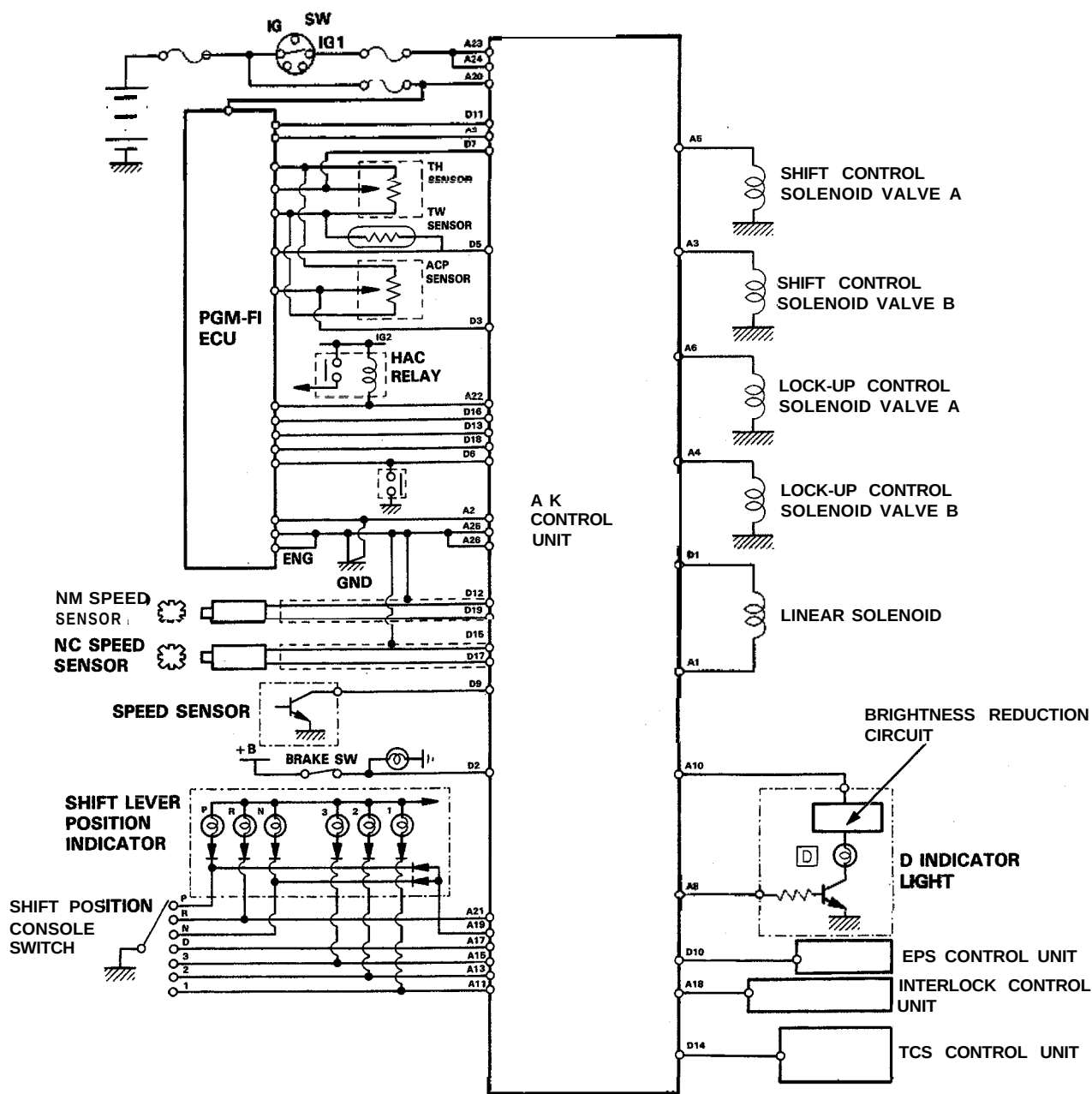
Description

- Electronic Control System (cont'd)





Circuit Diagram and Terminal Location



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

D1	D3	D5	D7	D9	D11	D13	D15	D17	D19
D2	D6	D10	D12	D14	D16	D18			

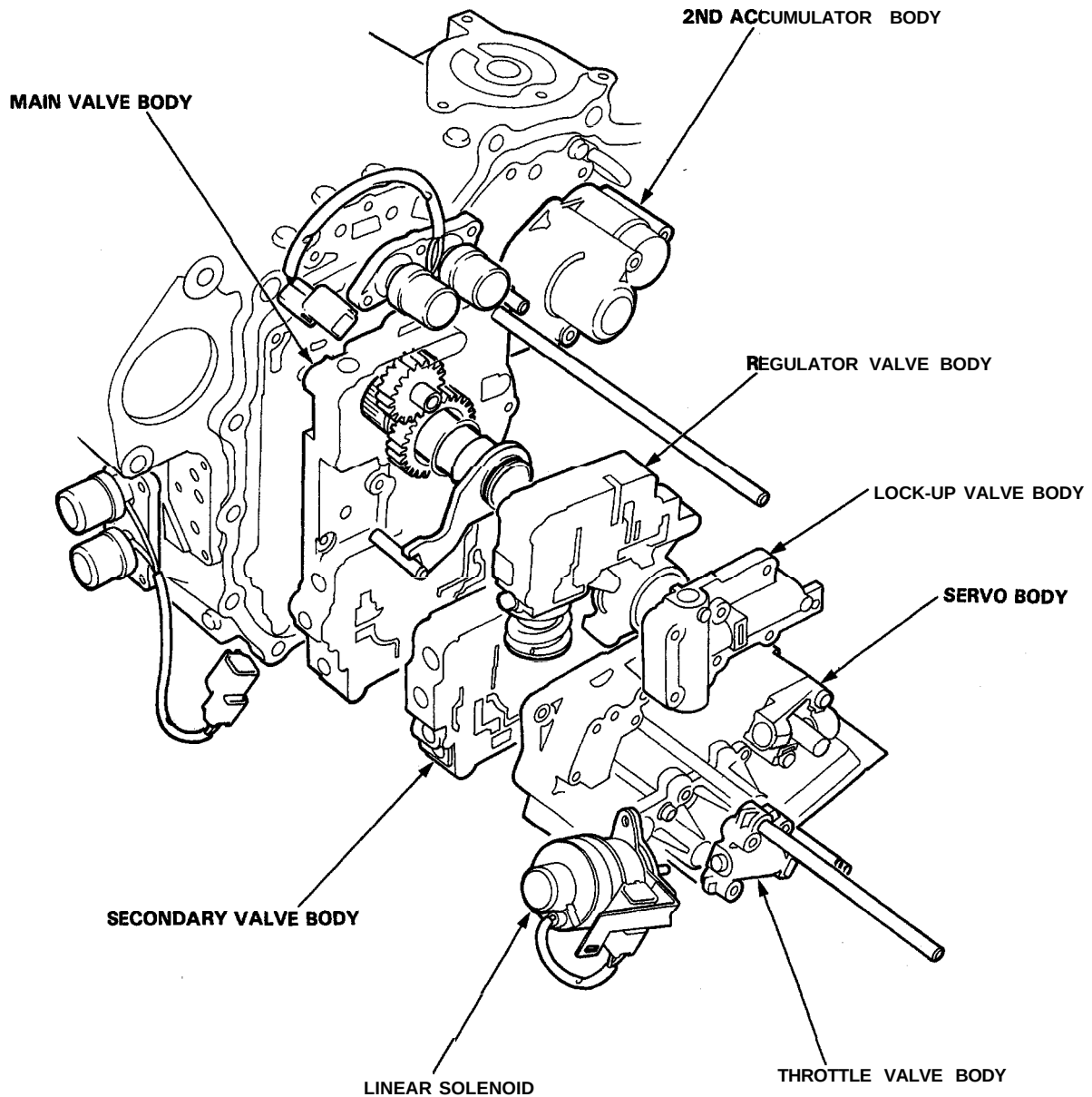
TERMINAL LOCATION

Description

- Hydraulic Control

The valve bodies include the main valve body, regulator valve body, lock-up valve body, secondary valve body, servo body, throttle valve body and 2nd accumulator body.

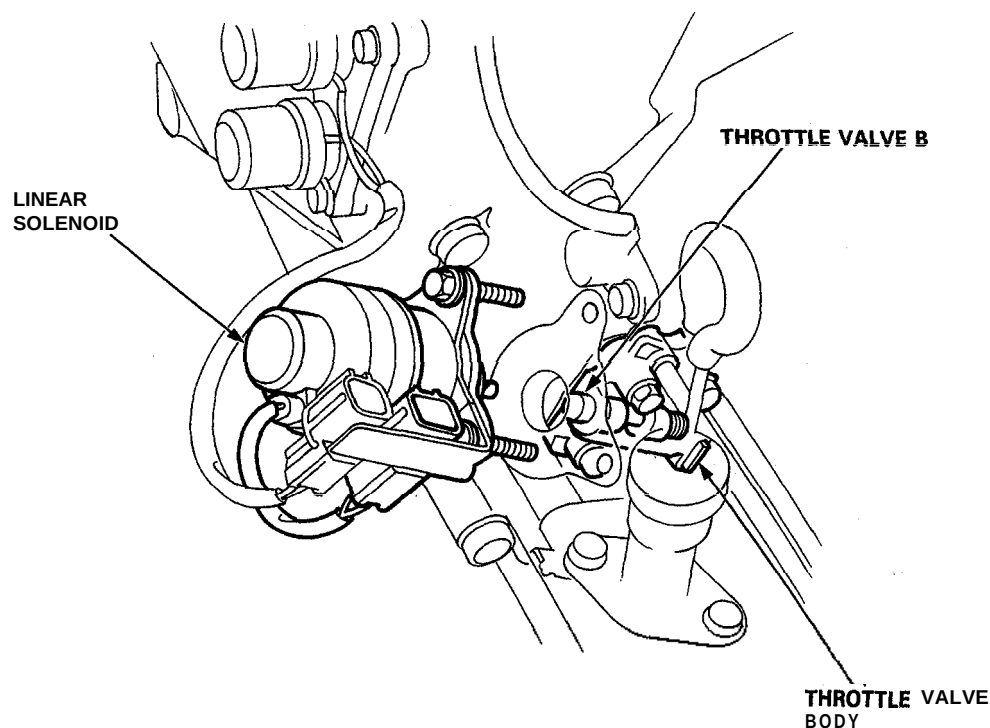
The oil pump is driven by splines on the left end of the torque converter which is attached to the engine. Oil flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, and the servo body, directing pressure to each of the clutches.





Throttle Valve Body

The throttle valve body is mounted on the servo valve body with the throttle valve built in,

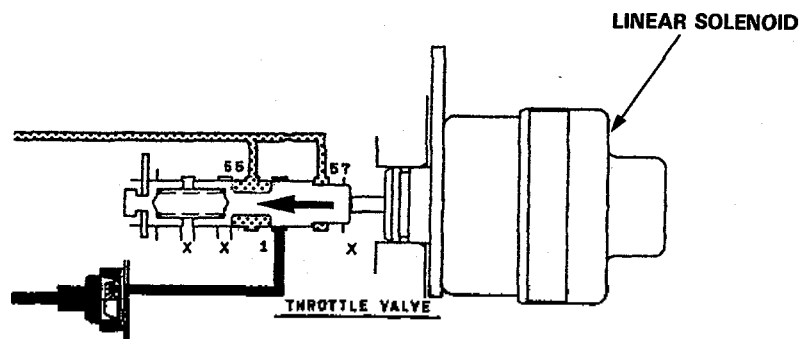


Throttle Valve B, Linear Solenoid

Throttle valve B converts changes in the throttle opening to changes in transmission hydraulic pressure, to determine transmission shift quality and lock-up operation. Throttle valve B also operates on accumulator back pressure, to make smooth changes from one gear to another.

The end of the valve contacts the linear solenoid which is controlled by the A/T control unit.

The throttle pedal load has been reduced by eliminating the cable.



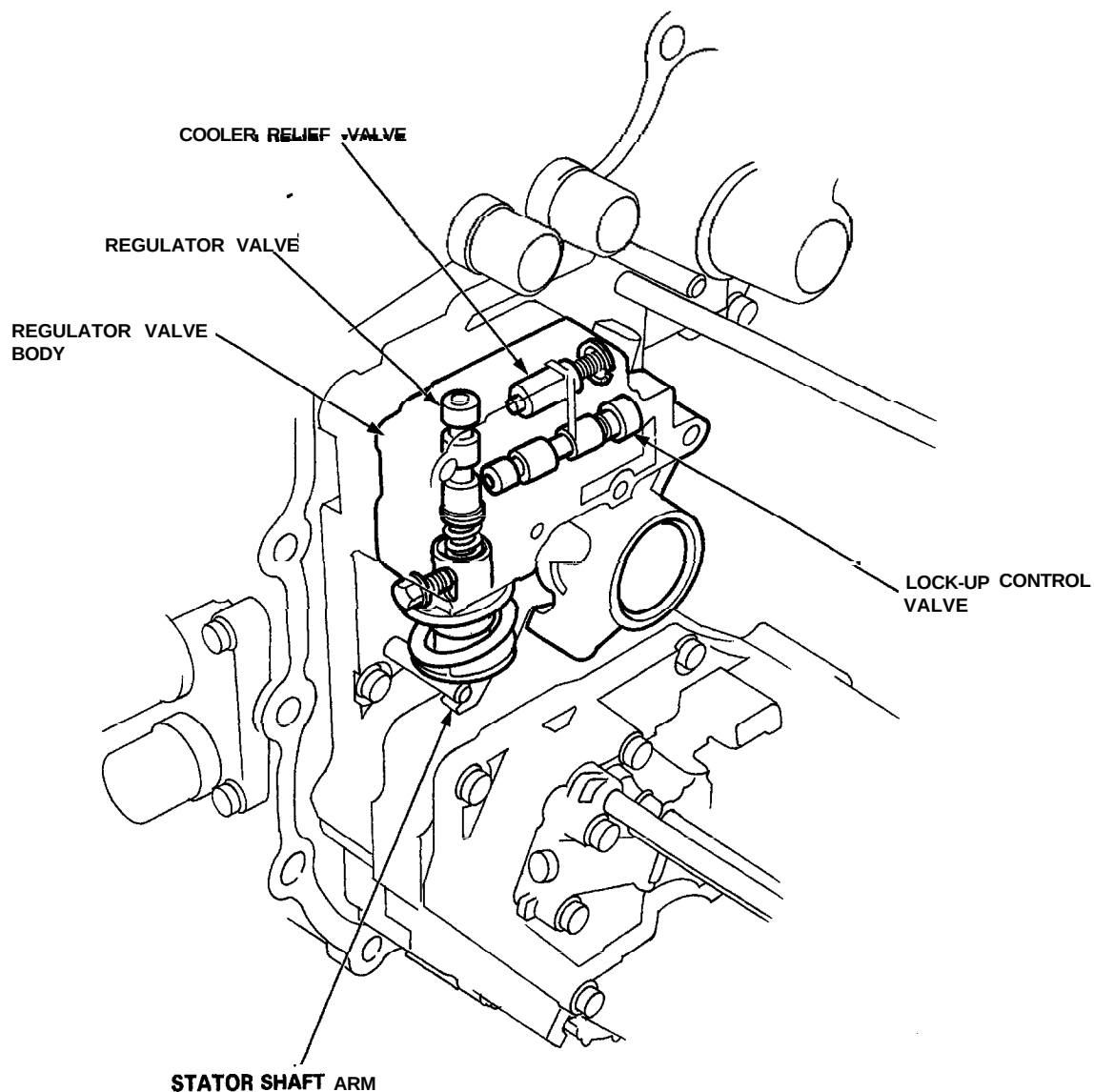
(cont'd)

Description

Hydraulic Control (cont'd)

Regulator Valve Body

The regulator valve body is mounted on the main valve body with the regulator valve, lock-up control valve and cooler relief valve built in. The stator shaft arm contacts the end of the regulator valve. The hydraulic pressure (line pressure) is controlled by the regulator valve.



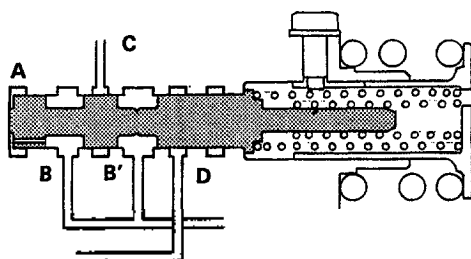


Regulator Valve

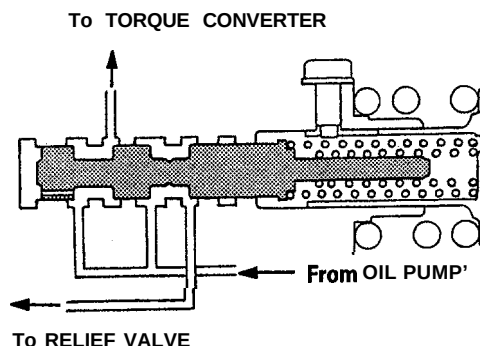
The regulator valve maintains a constant hydraulic pressure sent from the oil pump to the hydraulic control system, while also furnishing oil to the lubricating system and torque converter.

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.

(ENGINE NOT RUNNING)

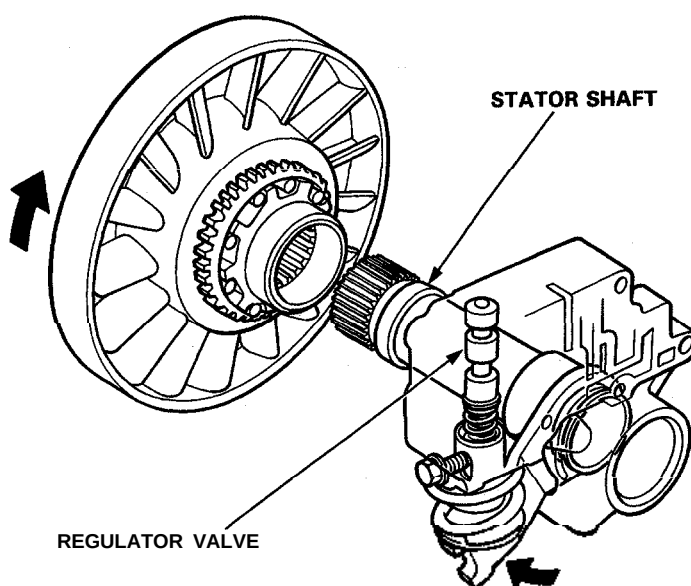


(ENGINE RUNNING)



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 in 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.



(cont'd)

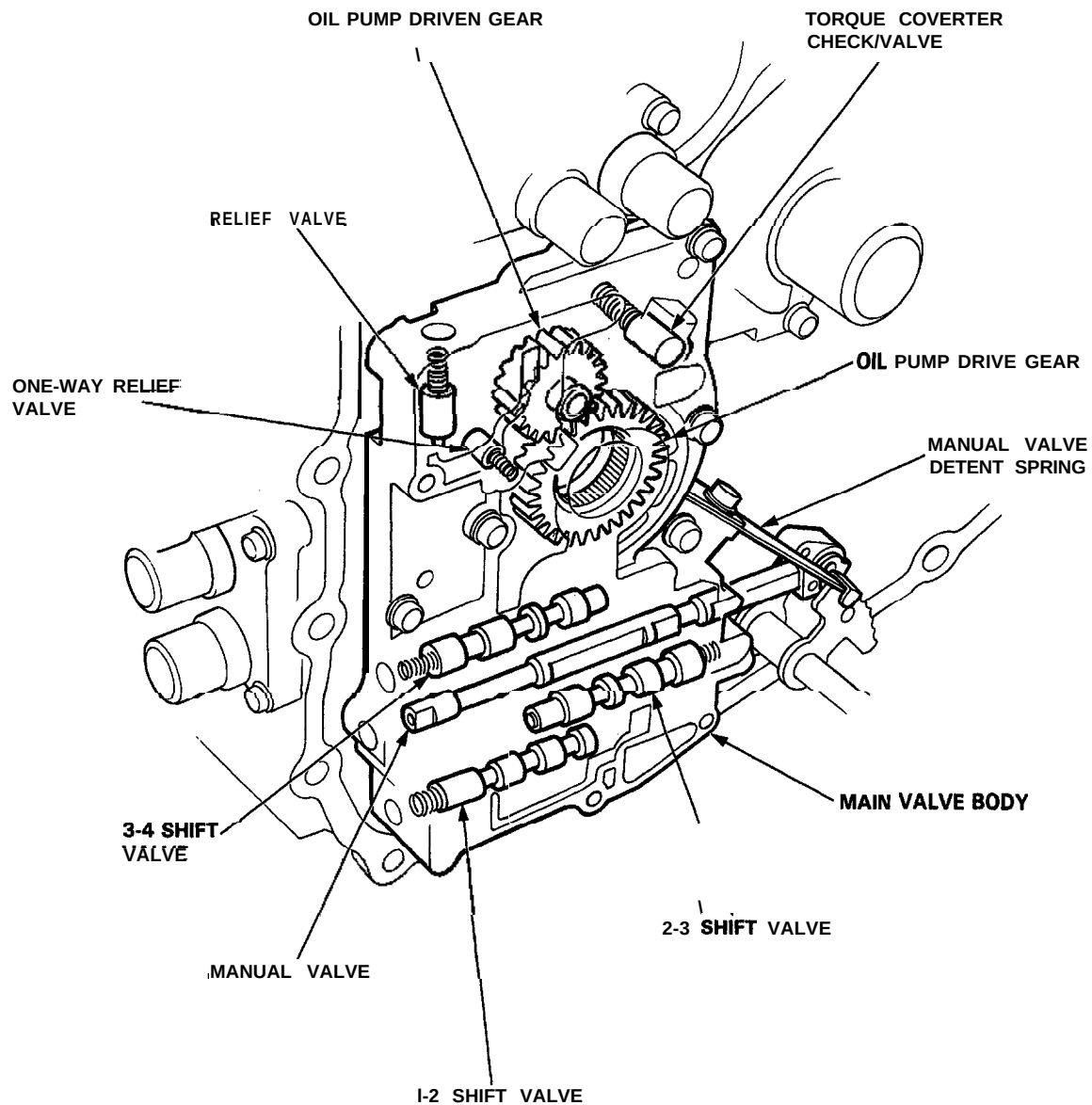
Description

- Hydraulic Control (cont'd)

Main Valve Body

The main valve body is located on the torque converter housing. The oil pump gear, torque converter check valve, manual valve, 1-2, 2-3, 3-4 shift valves, relief valve and one-way relief valve are all built into the main valve body.

The primary function of this valve body is switching on and off oil passages and controlling the hydraulic pressure going to the hydraulic control system.



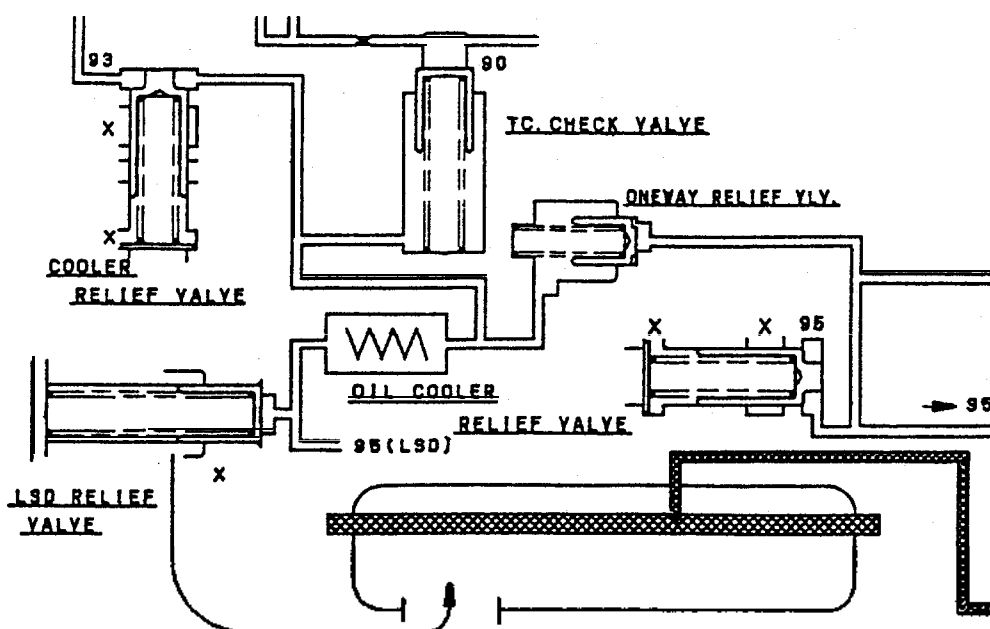


Oil Pump

The external tooth gear type oil pump consists of a housing together with the main valve body, a pump drive gear, a pump driven gear, and a pump shaft. The oil pump is installed on the torque converter housing. The pump's driving force is transmitted by the torque converter pump (directly connected to the engine) to the pump shaft. The gears are provided in the housing. The intake and exhaust lines and the torque converter line are provided in the housing.

One way Relief Valve

The one-way relief valve is used at times of high speed or high temperature to send relief oil to the oil cooler so that cooling of ATF will be effective.



(cont'd)

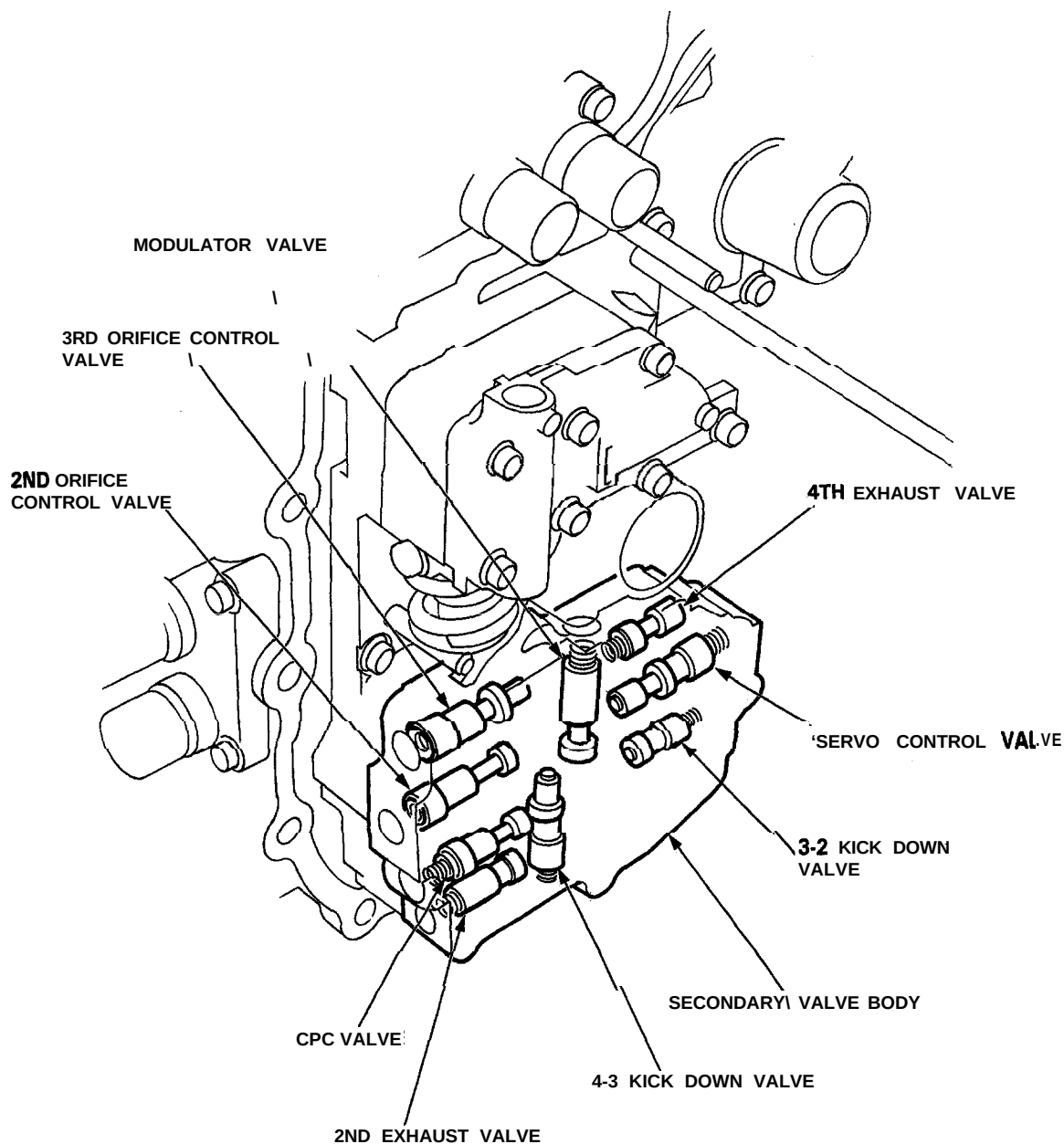
Description

Hydraulic Control (cont'd)

Secondary Valve Body

The secondary valve body is also mounted on the main valve body with the 3-2 kick down valve, CPC valve, 2nd orifice control valve, 3rd orifice control valve, modulator valve, 4th exhaust valve, 2nd exhaust valve, servo control valve and 4-3 kick down valve built in.

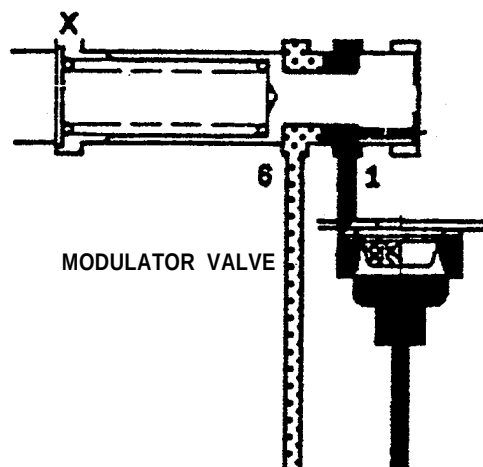
Primarily, it regulates shift valve operation timing and clutch pressure for shock reduction during shifting.





Modulator Valve

The modulator valve maintains line pressure from the regulator which is supplied to shift control solenoid valves A/B and lock-up control solenoid valves A/B, thus maintaining accurate shift and lock-up characteristics.

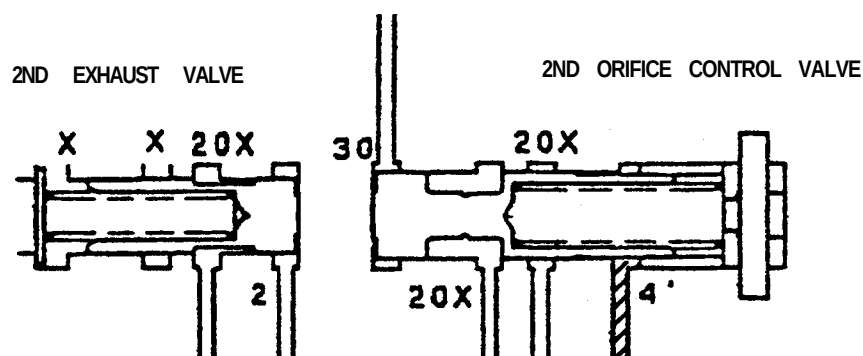


2nd Orifice Control Valve

For smooth shifting between the 2nd and 3rd gear, the open pressure on the 2nd gear side is relieved through a fixed orifice. The valve also moves to equalize pressure differences between the 2nd and 3rd gear.

2nd Exhaust Valve

The 2nd exhaust valve is installed to release 2nd clutch pressure quickly when shifting from the range at which hydraulic pressure is applied to the 2nd clutch to the N position.



(cont'd)

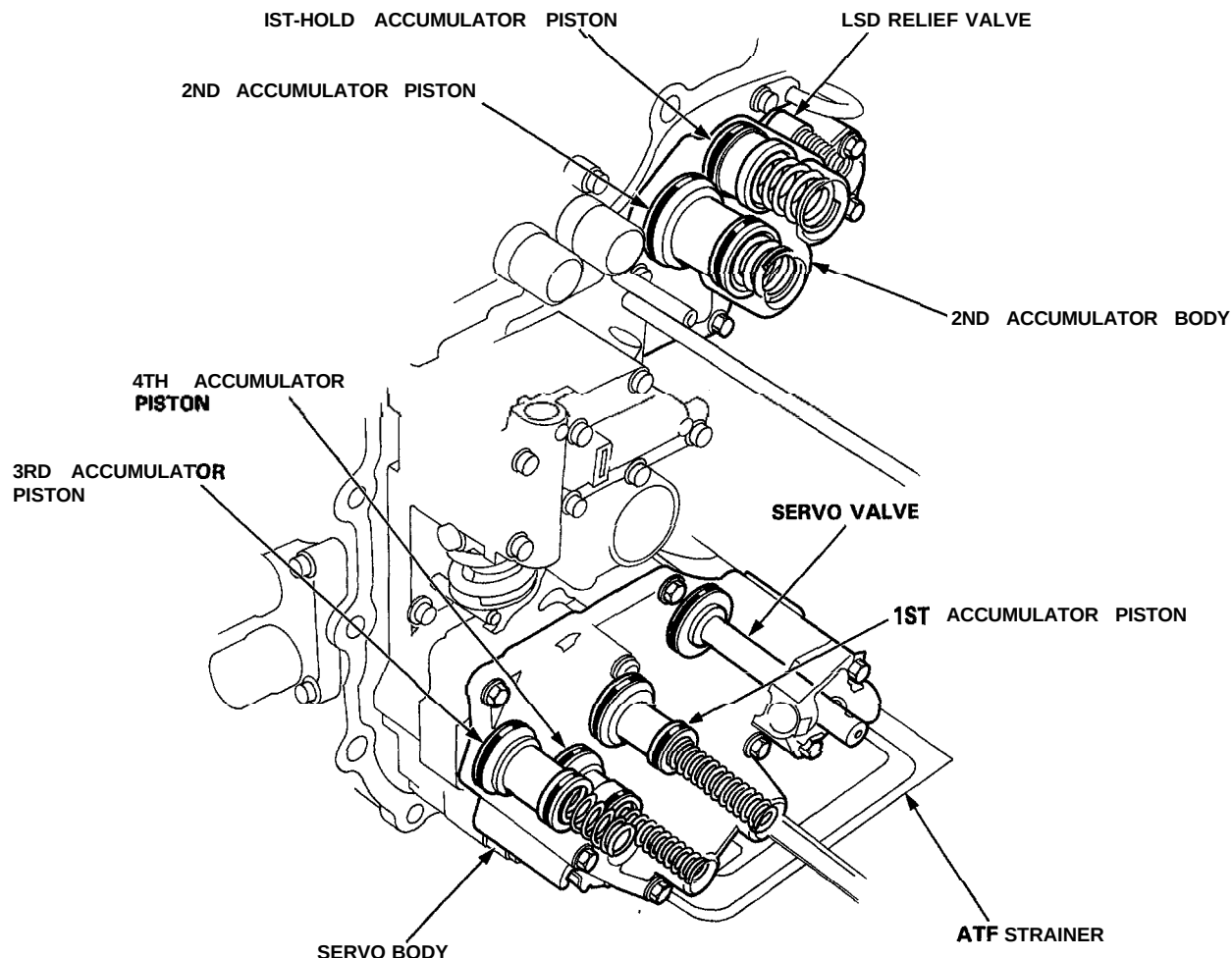
Description

Hydraulic Control (cont'd)

Servo Valve Body/2nd Accumulator Body

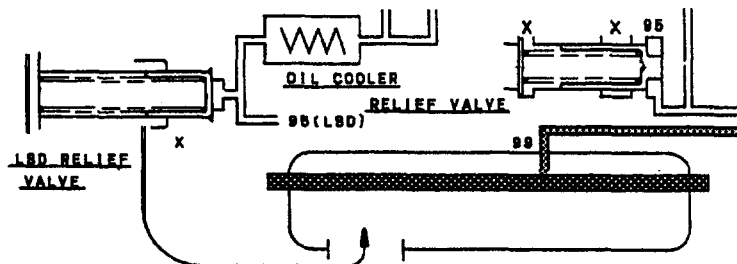
The servo valve body is mounted on the secondary valve body with the servo valve, 1st accumulator piston, 3rd accumulator piston and 4th accumulator piston built in. The primary function of the servo valve body is forward and reverse switching and control.

The 2nd accumulator body is mounted on the torque converter housing with the 1st hold accumulator, 2nd accumulator and LSD relief valve built in.



LSD Relief Valve

When the resistance of oil flow inside the LSD becomes large, the LSD relief valve is opened, and oil is sent to the oil cooler and cooled.

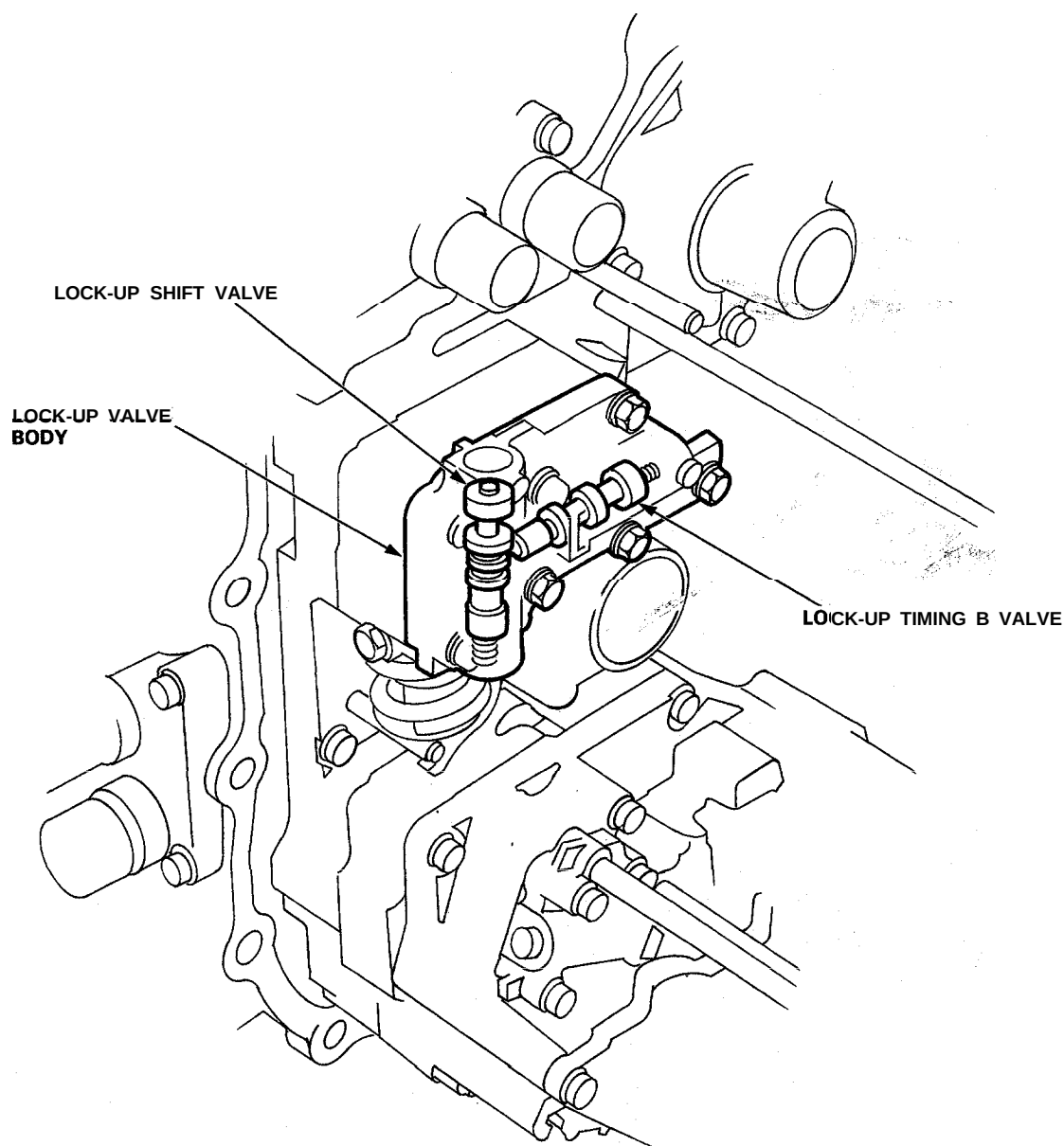




Lock-up Valve Body

The lock-up valve body is mounted on the regulator valve body with the lock-up shift valve and lock-up timing B valve built in.

The capacity of the lock-up clutch is controlled by the lock-up valve body.



Description

Hydraulic Flow

General of Hydraulic Pressure

Oil Pump → Regulator Valve → { Line Pressure
Torque Converter Pressure
Lubrication Pressure

Distribution of Hydraulic Pressure

● Manual Valve → to select Line Pressure

● Throttle Valve B → Throttle B Pressure

● 1-2 Shift Valve }
● 2-3 Shift Valve } → Clutch Pressure
● 3-4 Shift Valve }

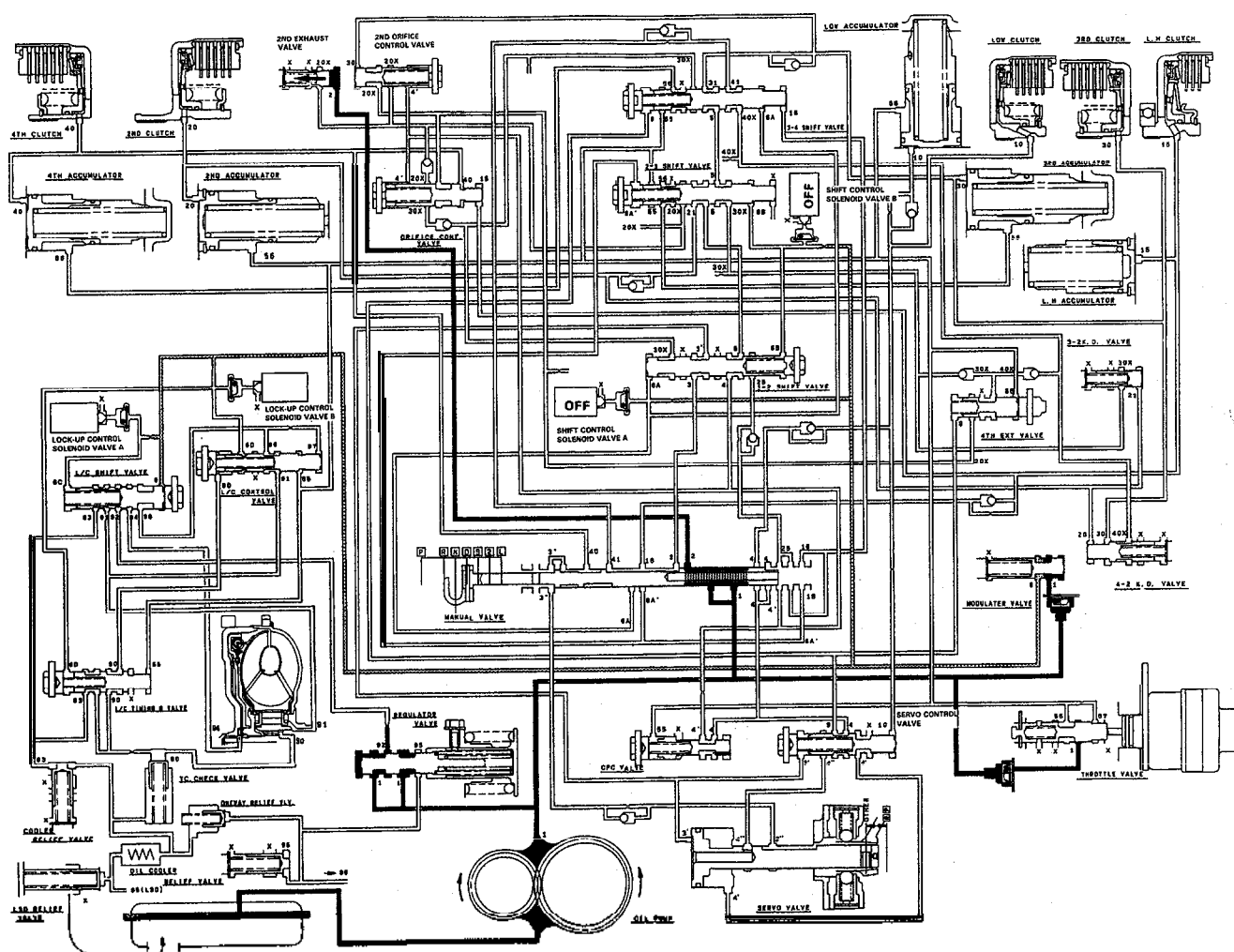
● Line Pressure → { Servo Valve
Throttle Valve

NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE
1	LINE	10	1ST CLUTCH	90	TORQUE CONVERTER
2	LINE	15	1ST-HOLD CLUTCH	91	TORQUE CONVERTER
3	LINE	16	1ST-HOLD CLUTCH	92	TORQUE CONVERTER
3'	LINE	18	LINE	93	OIL COOLER
3''	LINE	20	2ND CLUTCH	94	TORQUE CONVERTER
4	LINE	21	2ND CLUTCH	95	LUBRICATION
4'	CLUTCH PRESSURE CONTROL	25	LINE	96	TORQUE CONVERTER
5	CLUTCH PRESSURE CONTROL	30	3RD CLUTCH	97	TORQUE CONVERTER
6	MODULATOR	31	3RD CLUTCH	99	SUCTION
6A	MODULATOR (SHIFT SOL. V A)	40	4TH CLUTCH	X	BLEED
6B	MODULATOR (SHIFT SOL. V B)	41	4TH CLUTCH		
6C	MODULATOR (L/C SOL. V A)	55	THROTTLE B		
6D	MODULATOR (L/C SOL. V B)	56	THROTTLE B		
9	LINE	57	THROTTLE B		

N position

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 (1) 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

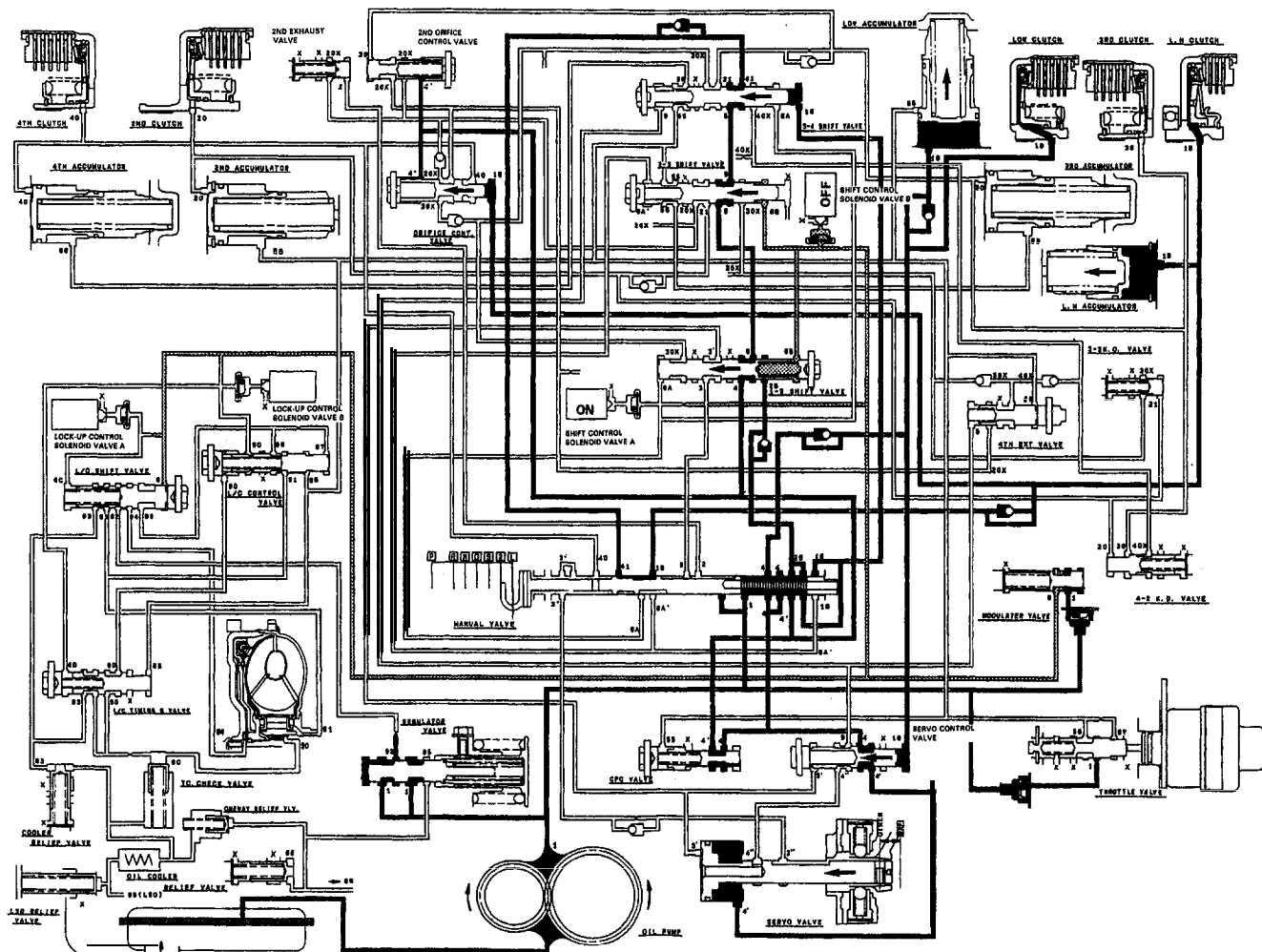
The line pressure (1) becomes the line pressure (4), (18), (25) as it passes through the manual valve. Also, the line pressure (1) goes to the modulator valve through the filter and becomes the modulator pressure (6). The modulator pressure (6) is supplied to the 1-2 shift valve and 2-3 shift valve.

The 1-2 shift and 2-3 shift valves are moved to the left side because the shift control solenoid valve A is turned ON and B is OFF by the A/T control unit.

The line pressure (18) is supplied to the 3-4 shift valve, and it is moved to the left side. The line pressure (4) is the 1st clutch pressure (10), then the 1st clutch is engaged.

The line pressure (4) becomes the 1st-hold clutch pressure (16) via the 1-2 shift valve, 2-3 shift valve, 3-4 shift valve and manual valve, then the 1st-hold clutch is engaged.

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





2 Position

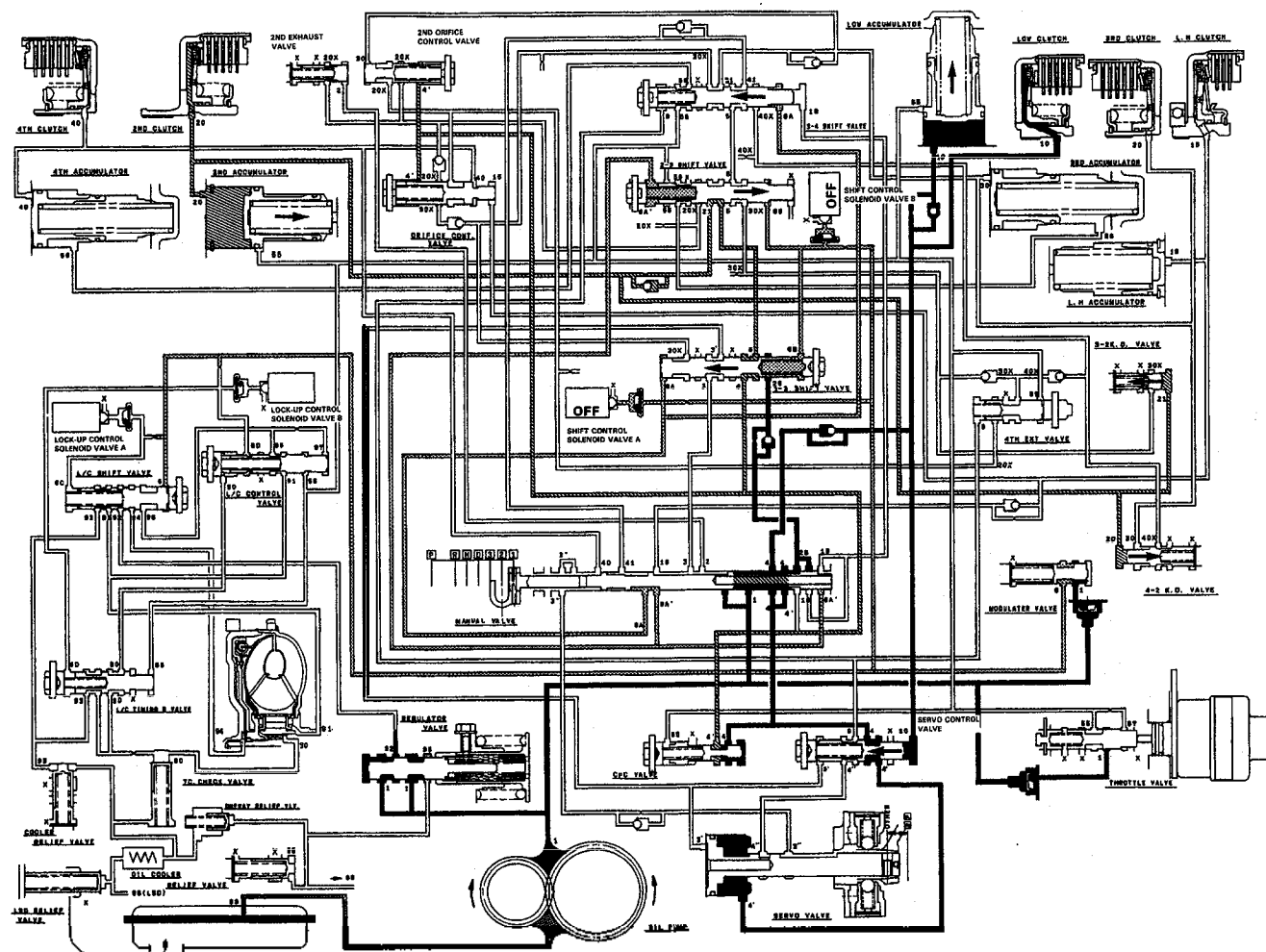
The line pressure (1) becomes the line pressure (4), (25) as it passes through the manual valve.

The line pressure (1) goes to the modulator valve and becomes the modulator pressure (6). The modulator pressure (6) is supplied to the I-2 shift valve and 3-4 shift valve. The I-2 shift and 3-4 shift valves are moved to the left side end the 2-3 shift valve is moved to the right side because the shift control solenoid valve A and B are turned OFF by the A/T control unit.

The line pressure (4) goes through the line (20) to the 2nd clutch, then the 2nd clutch is engaged.

The line pressure (4) also flows to the throttle valve and the line pressure (1) 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 Position

The line pressure (1) becomes the modulator pressure (6) as it passes the modulator valve.

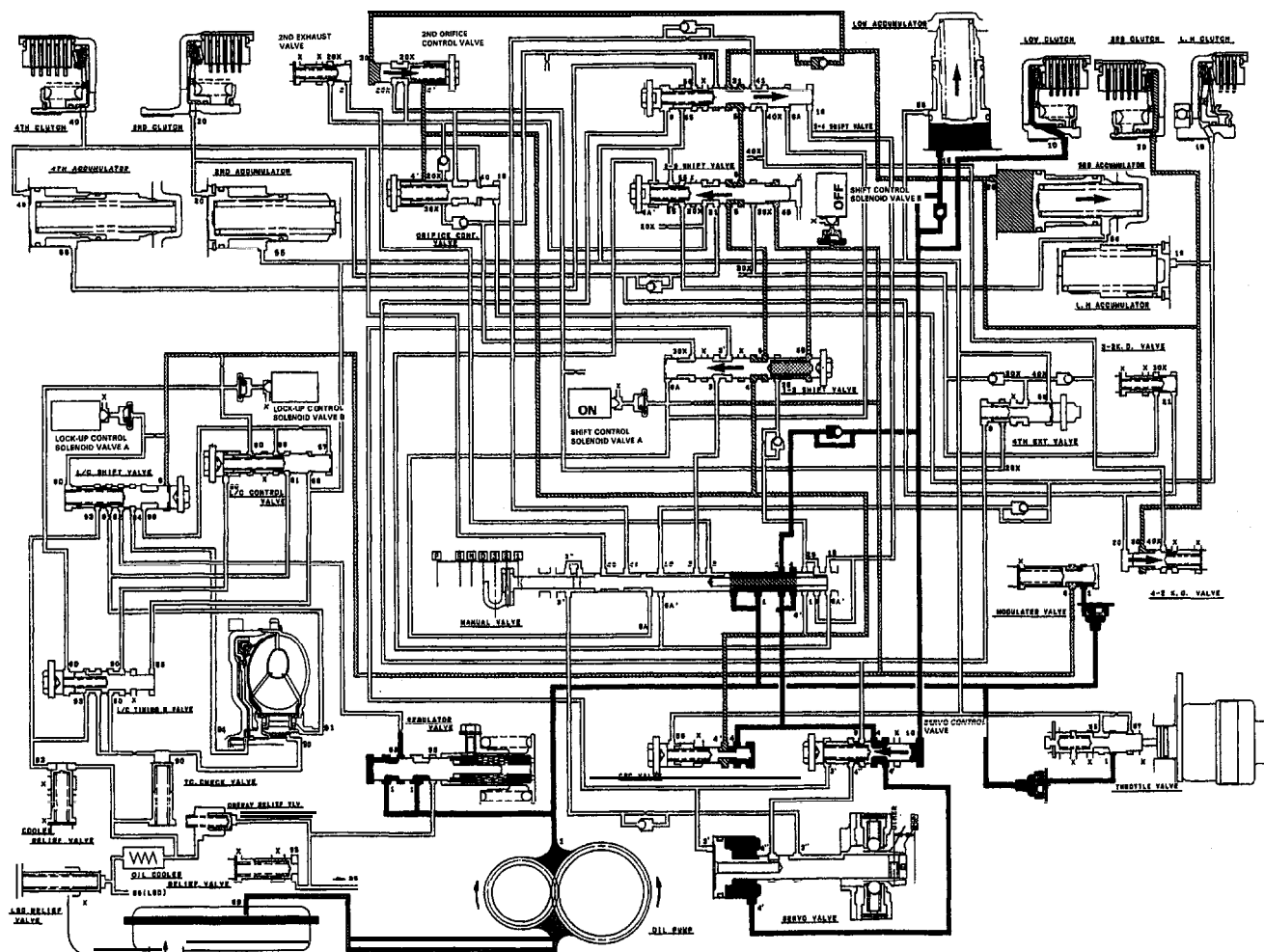
Also, the modulator pressure (6) is supplied to the 1-2 shift valve and 2-3 shift valve, and they are moved to the left because the shift control solenoid A is turned ON and B is OFF by the A/T control unit.

The line pressure (4) becomes the clutch pressure control (5) and the 3rd clutch pressure (31).

Then it goes to the 3rd clutch. The 3rd clutch is engaged.

The line pressure (4) also flows to the throttle valve and line pressure (1) flows to the 1st clutch. However no power is transmitted by means of the one-way clutch as in 2nd speed.

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



Description

Hydraulic Flow (cont'd)

2. 2nd speed

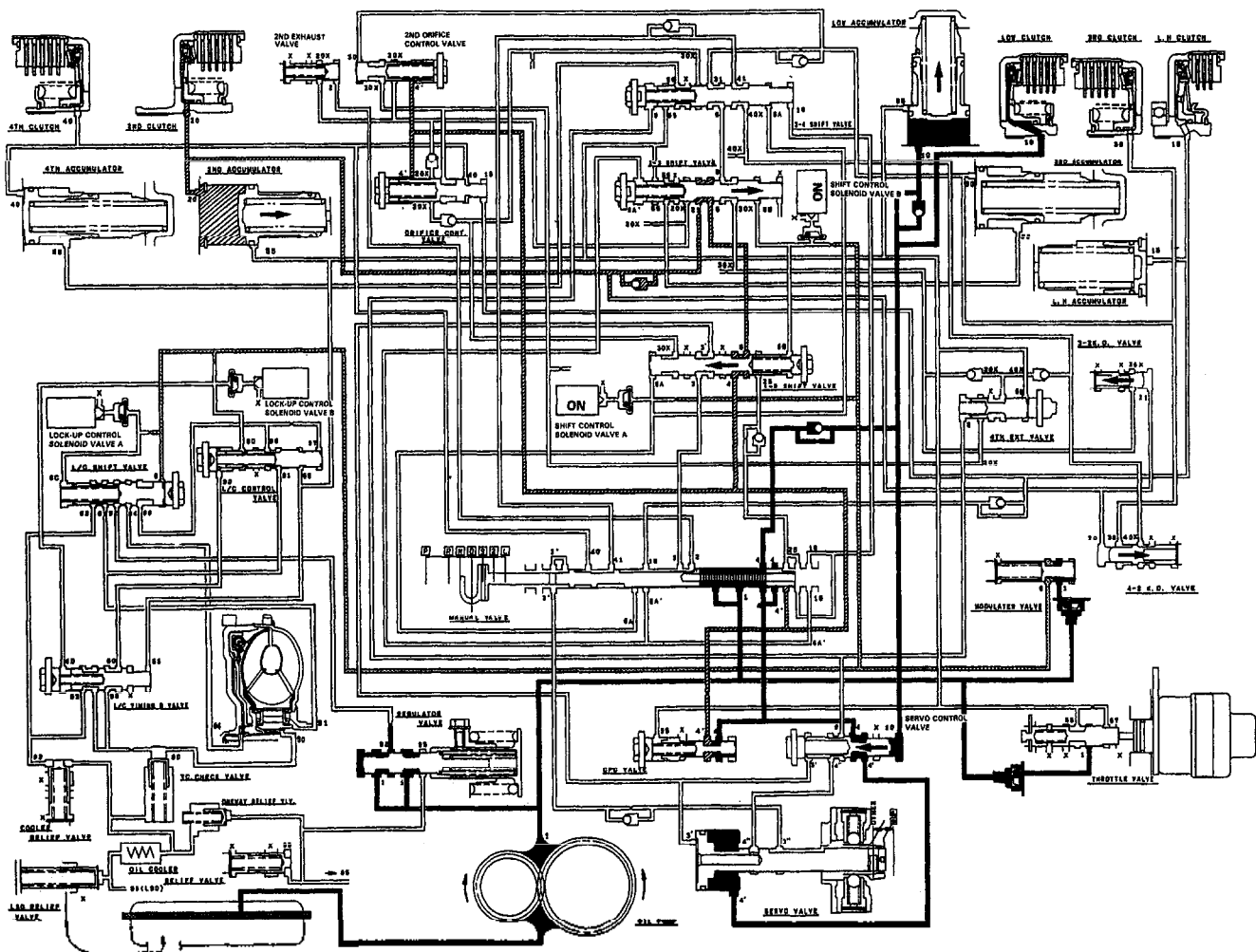
The flow of fluid up to the 1-2 and 2-3 shift valves is the same as in the 1st speed range. As the speed of the car reaches the prescribed value, the solenoid valve A is turned ON by means of the A/T control unit. As a result, the 1-2 shift valve is moved to the left side and uncovers the port leading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

-Line Pressure (4) → CPC Valve → Clutch Control Pressure (4') → 1-2 Shift Valve → Clutch Pressure Control

(5) → 2-3 Shift Valve → 2nd Clutch Pressure (21) → 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.



Description

Hydraulic Flow (cont'd)

4. 4th Speed

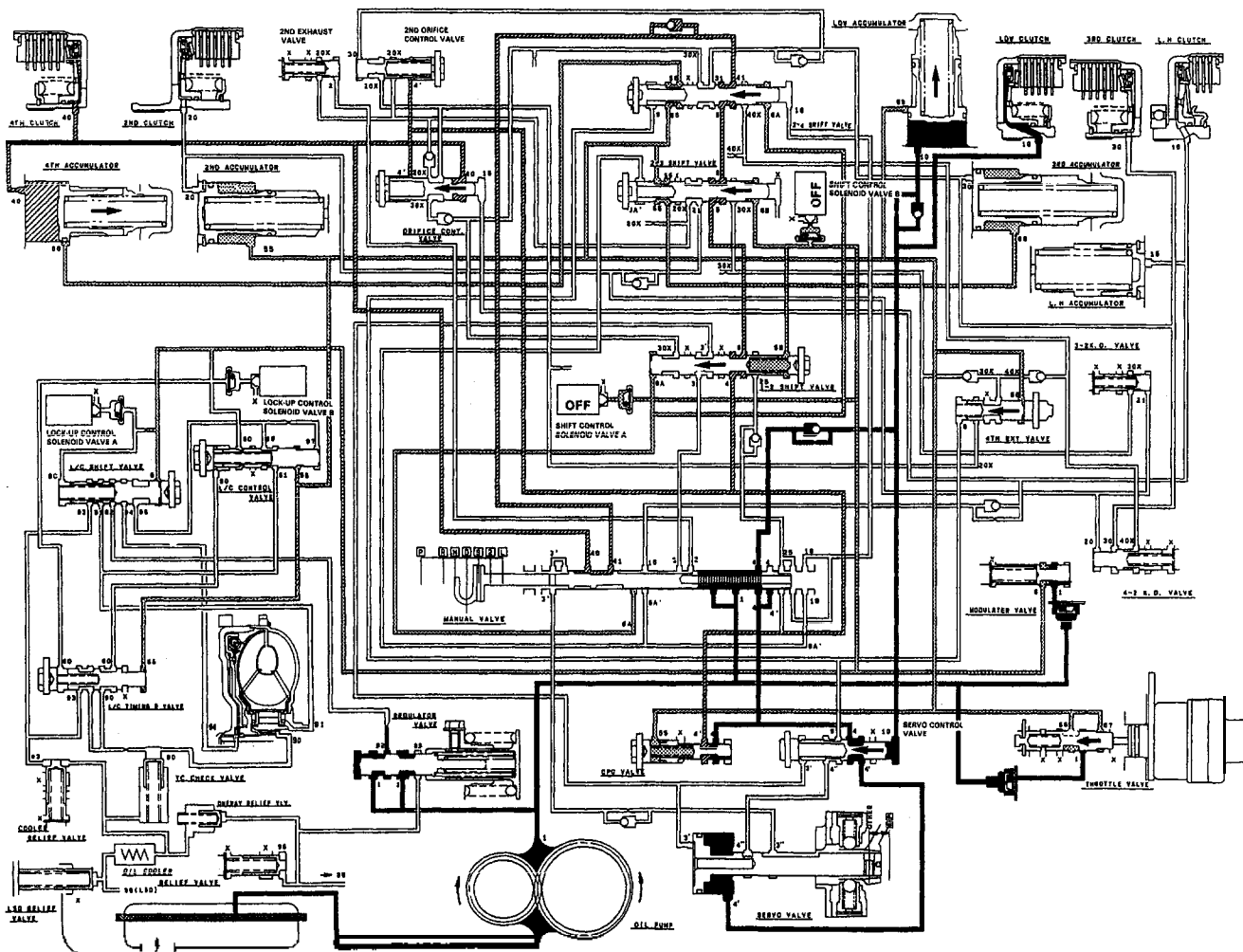
The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in the 3rd speed. When the speed of the car reaches the prescribed value, the shift control solenoid valve A is turned OFF (Shift control solenoid valve B remains OFF). As this takes place, the 3-4 shift valve is moved to the left 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 → CPC Valve → Clutch Pressure Control (4') → 1-2 Shift Valve → Clutch Pressure Control (5) → 2-3 Shift Valve → Clutch Pressure Control (5) → 3-4 Shift Valve → 4th Clutch Pressure (41) → Manual Valve → 4th Clutch Pressure (40) → 4th Clutch

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

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



R Position

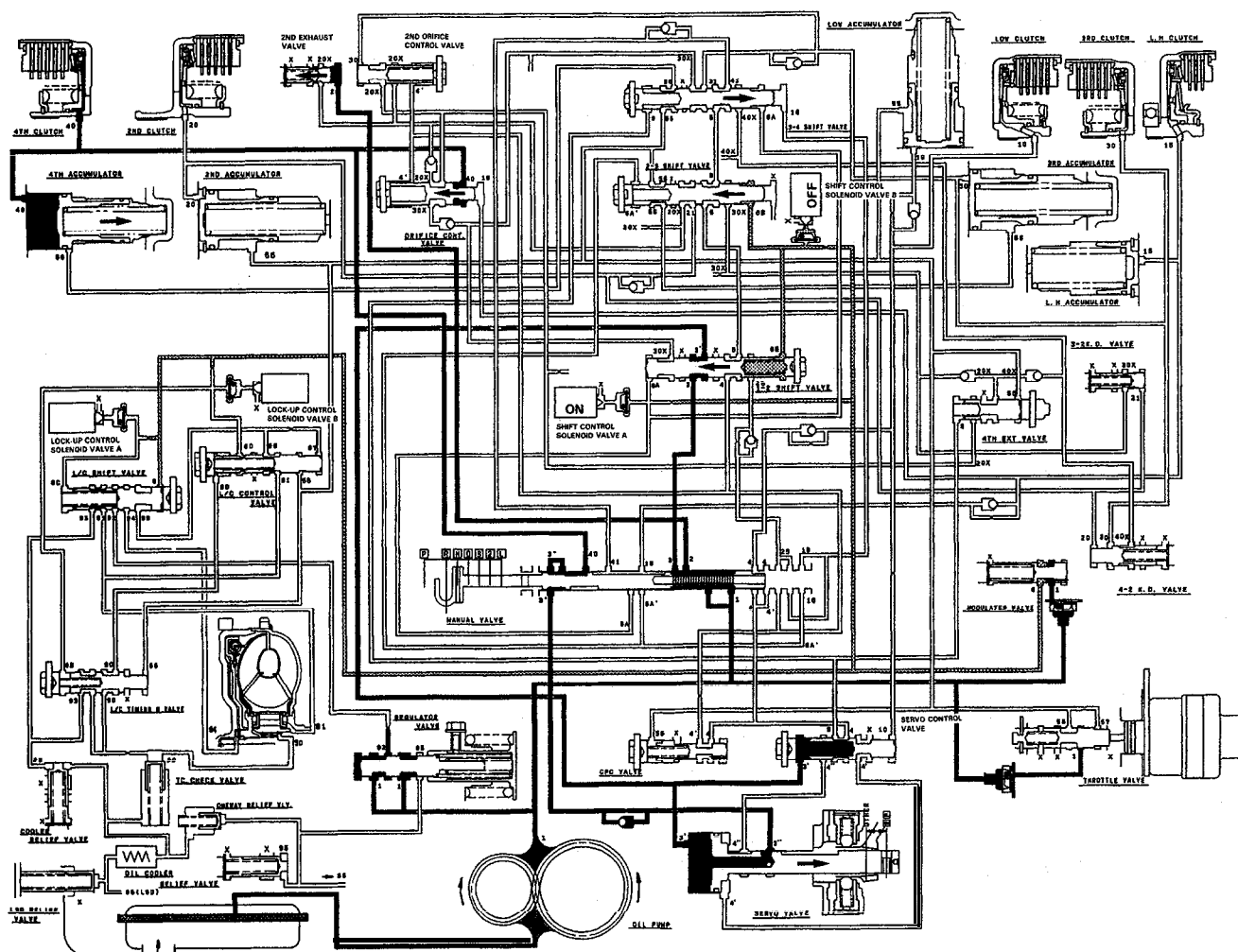
The flow of fluid through the torque converter circuit is the same as in the **N**. The fluid (1) from the oil pump flows through the manual valve and becomes the line pressure (3). It then flows through the 1-2 shift valve to the servo valve (3), causing the shift fork shaft to be moved in to the reverse position.

Under this condition, the shift control solenoid valve A is turned ON and the valve B is turned OFF as in 3rd speed. As a result, the 1-2 shift valve is also moved to the left side. The fluid (3)' will flow through the servo valve and manual valve to the 4th clutch; power is transmitted through the 4th clutch.

Reverse Inhibitor Control

When the **R** position is selected while the vehicle is moving forward at a speed over 6 MPH, the control unit outputs 1st signal (A: OFF, B: ON), the I-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 as the 4th clutch and servo valve are not operated.

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



(cont'd)

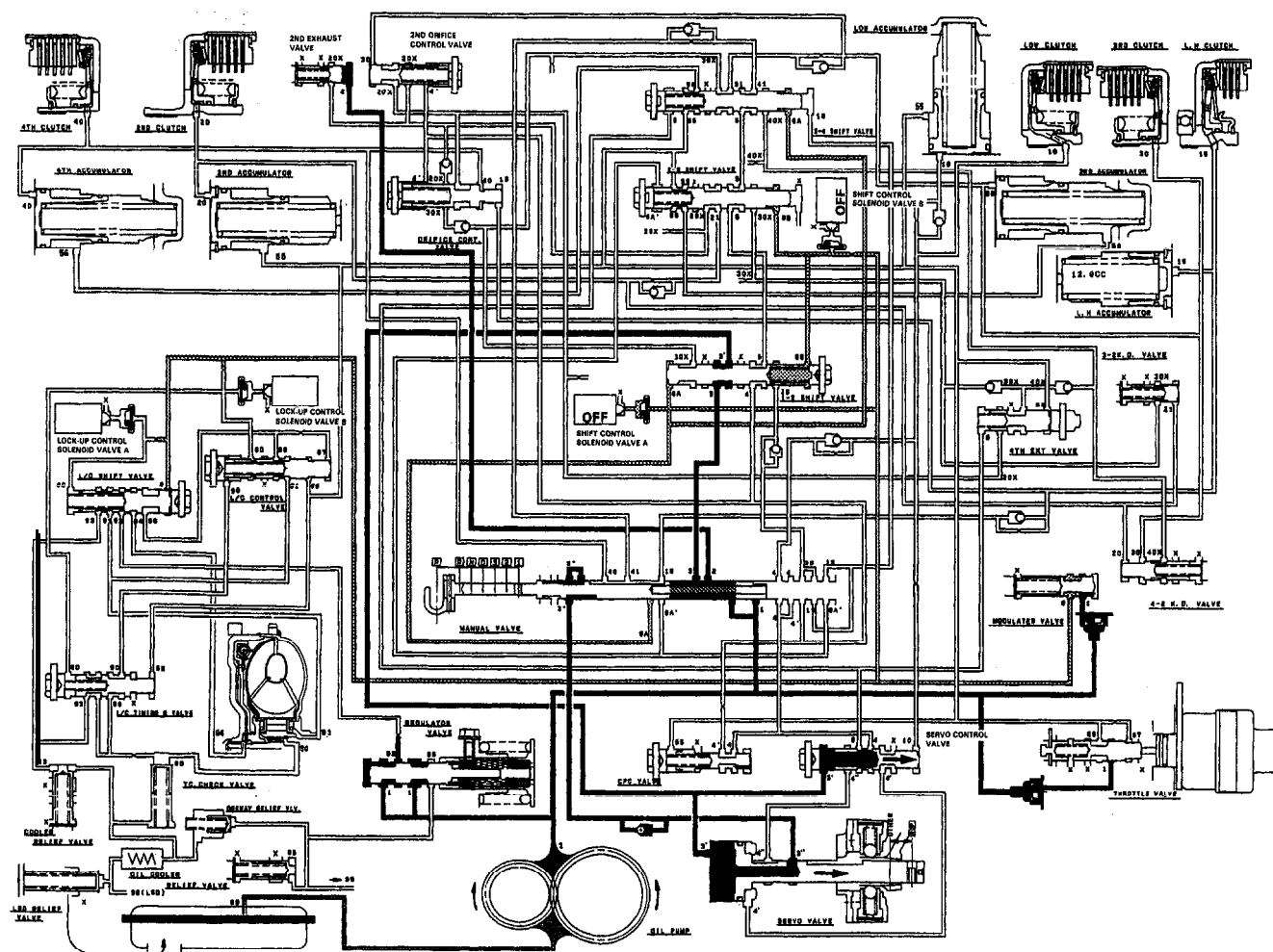
Description

Hydraulic Flow (cont'd)

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.



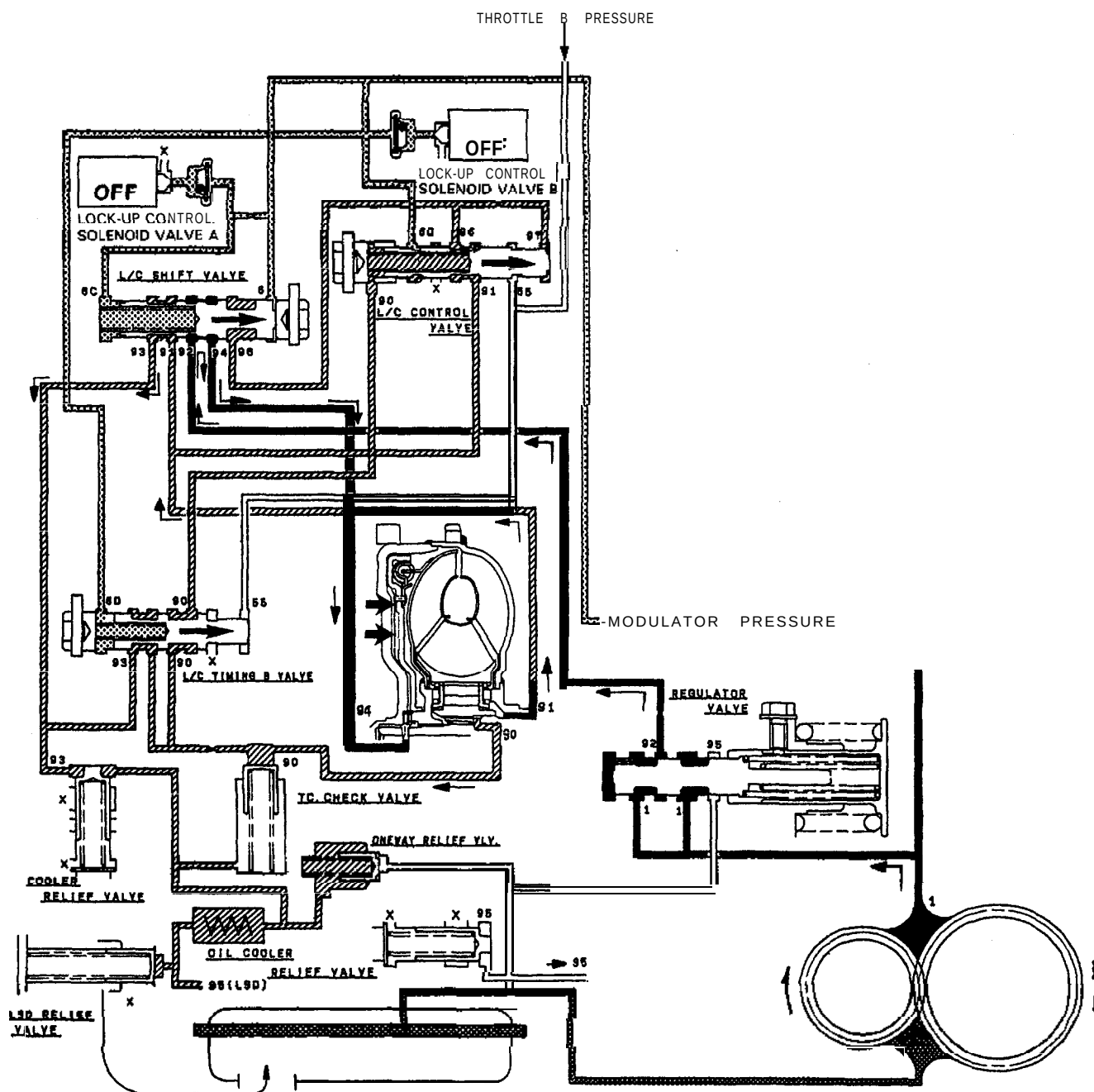
Description

Lock-up System (cont'd)

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.





Partial Lock-up

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

The control unit 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.

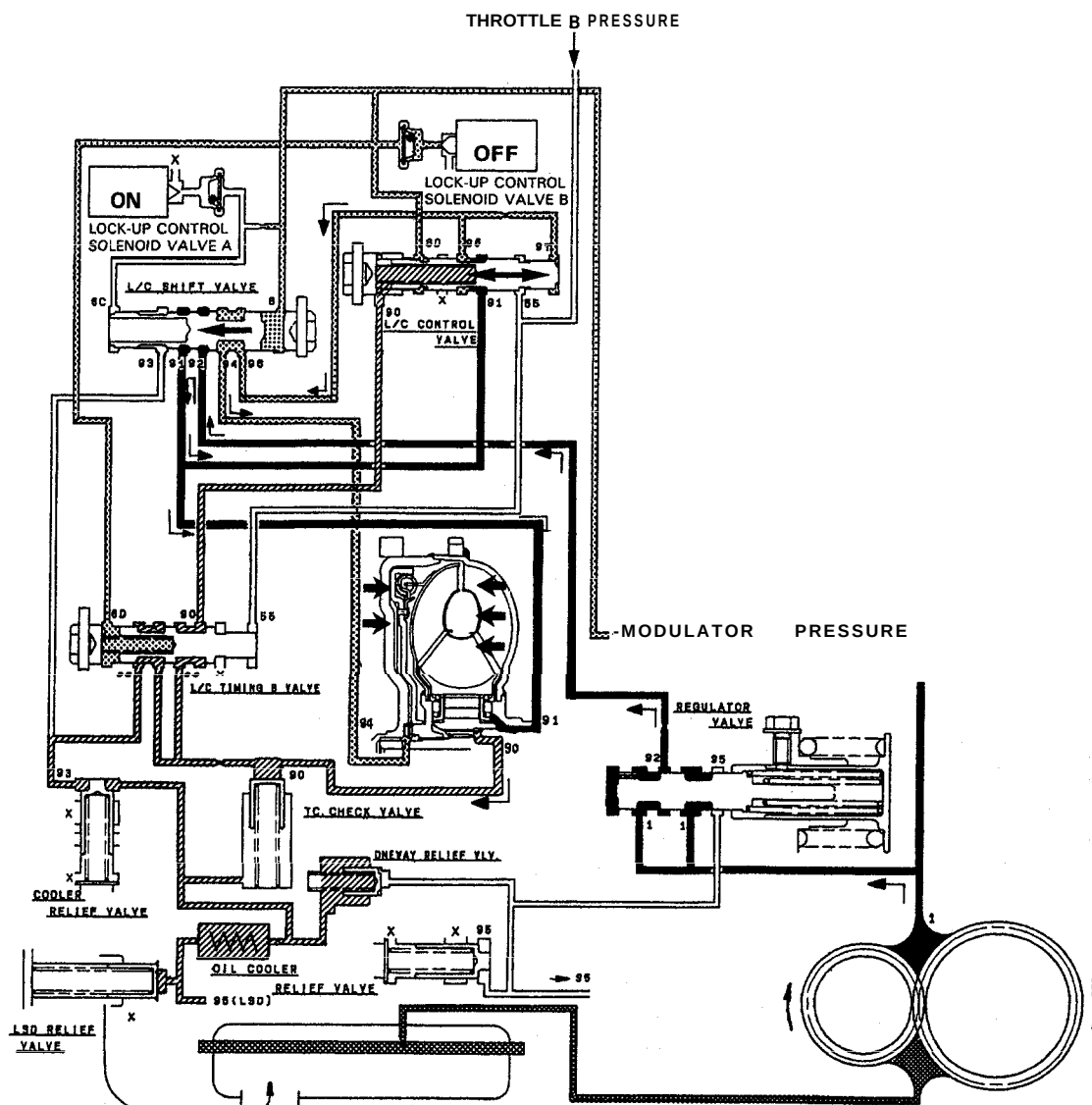
The torque converter pressure is separated into two passages:

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.



(cont'd)

Description

Lock-up System (cont'd)

Half Lock-up

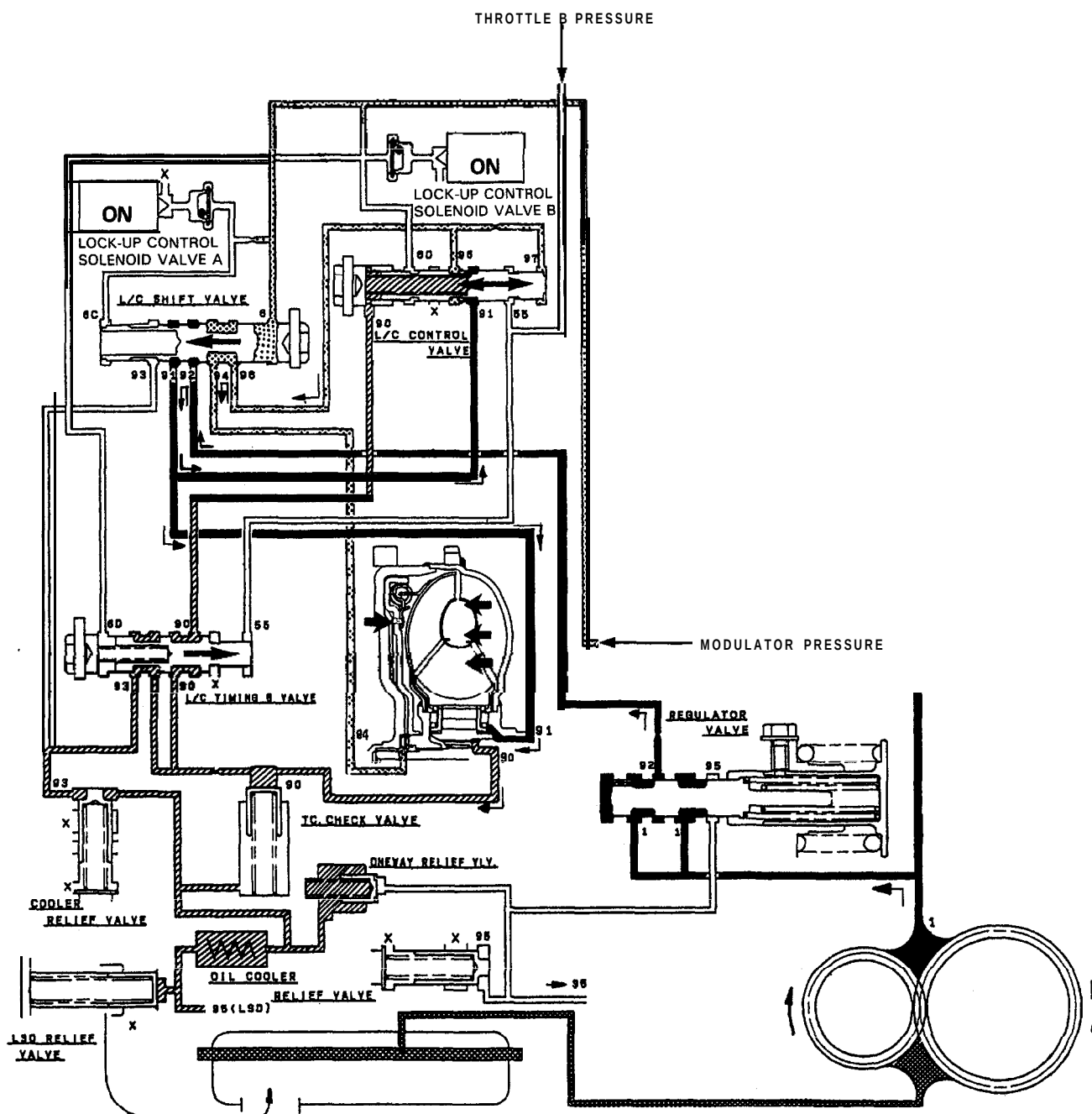
Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: ON

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 so as to engage the 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.





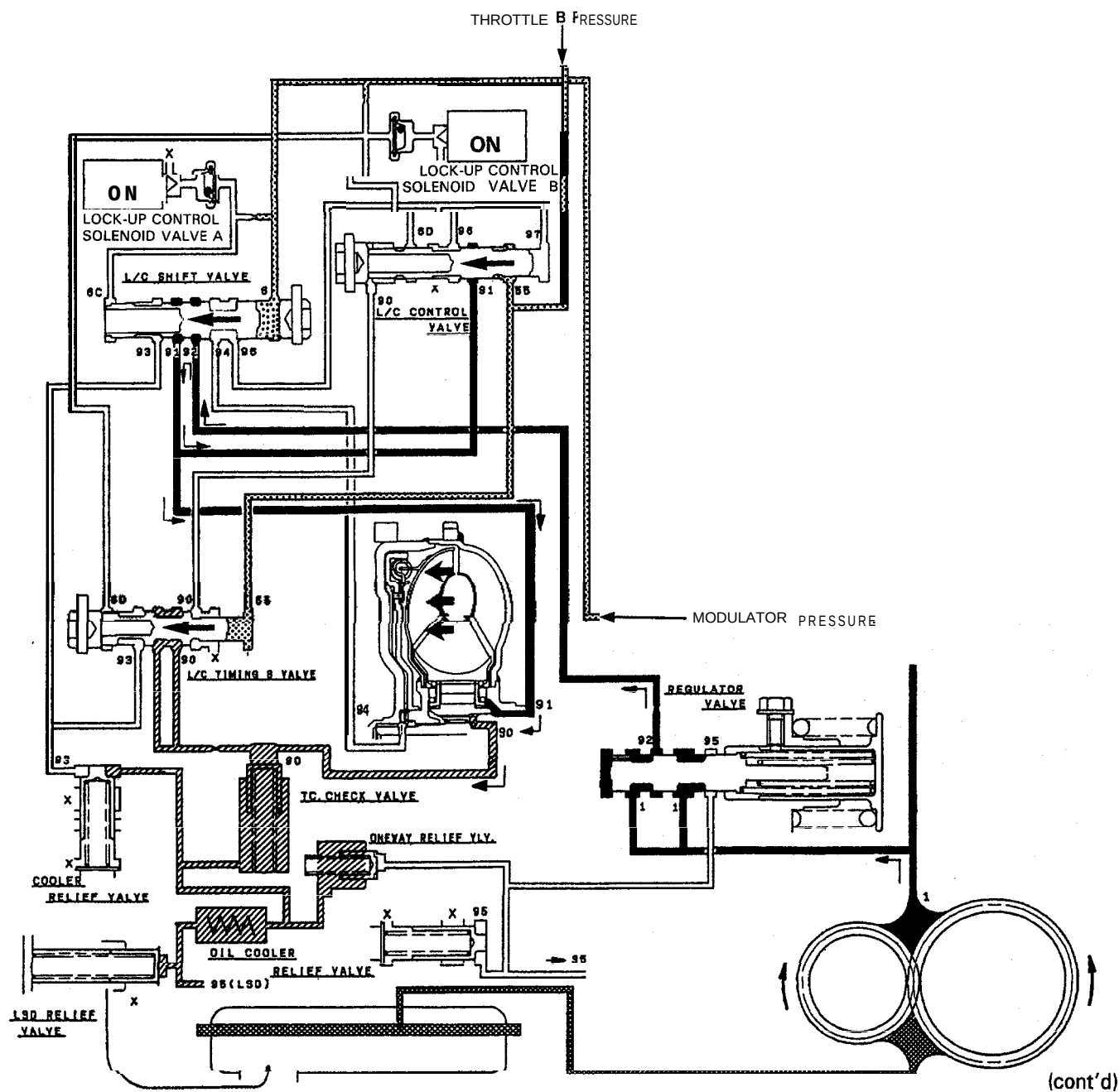
Full Lock-up

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.



Description

Lock-up System (cont'd)

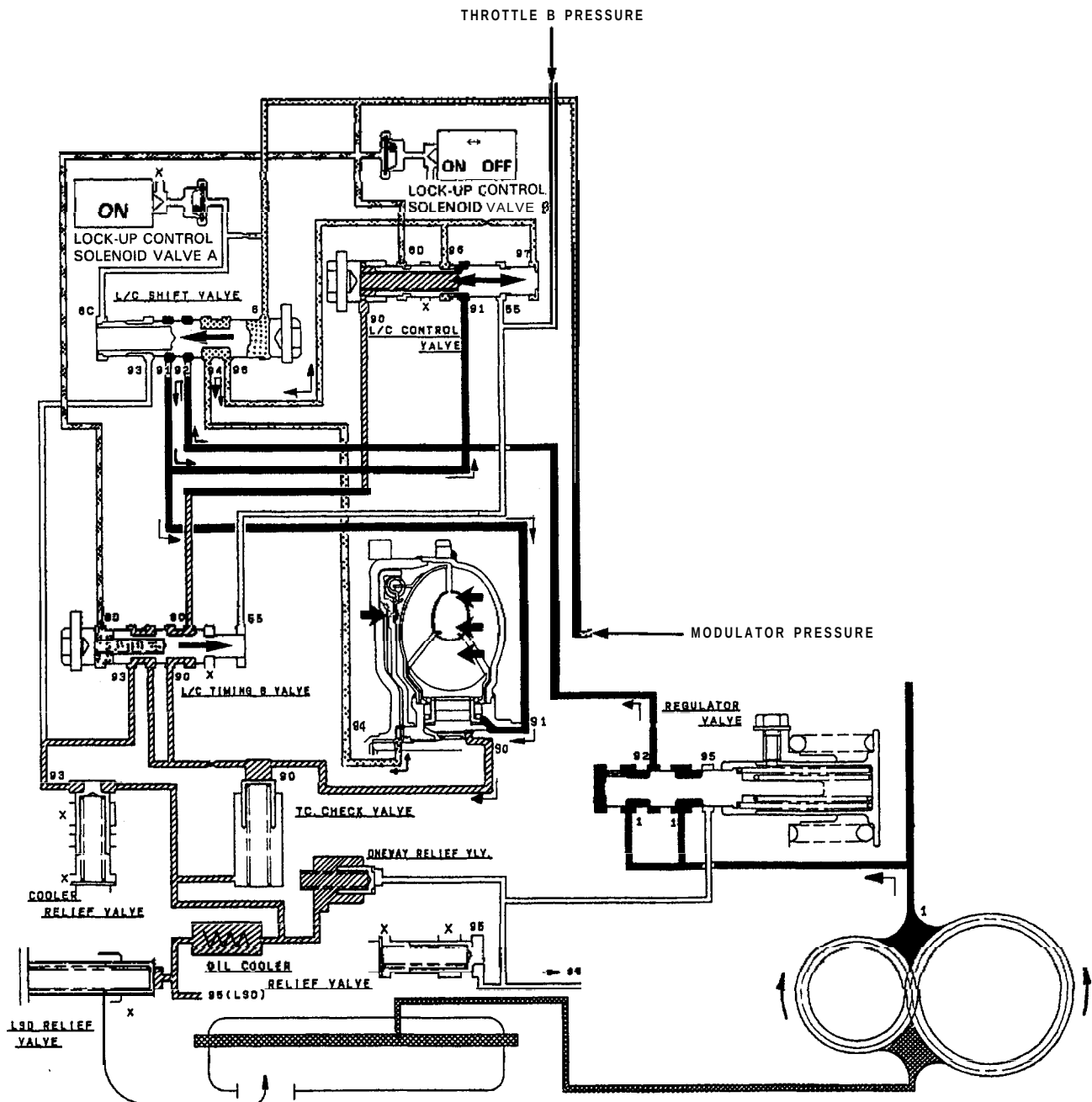
Deceleration Lock-up

Lock-up Control Solenoid Valve A: ON

Lock-up Control Solenoid Valve B: Duty Operation (ON ↔ OFF)

The A/T control unit 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.

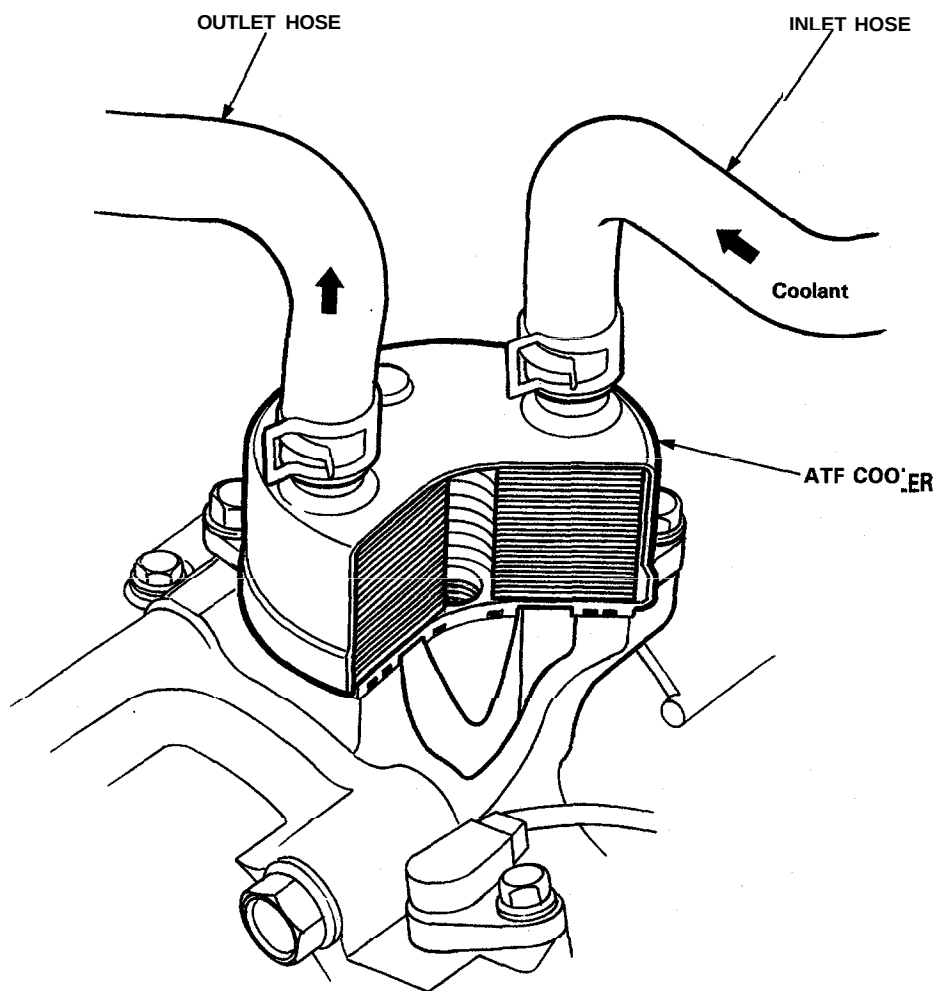
NOTE: When used, "left" or "right" indicates direction on the flow chart.



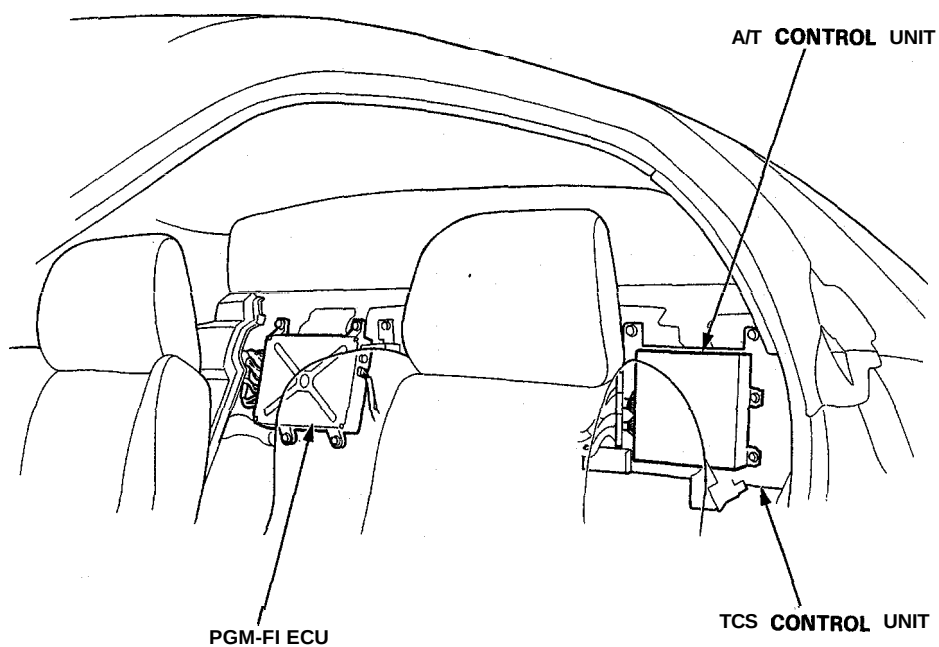
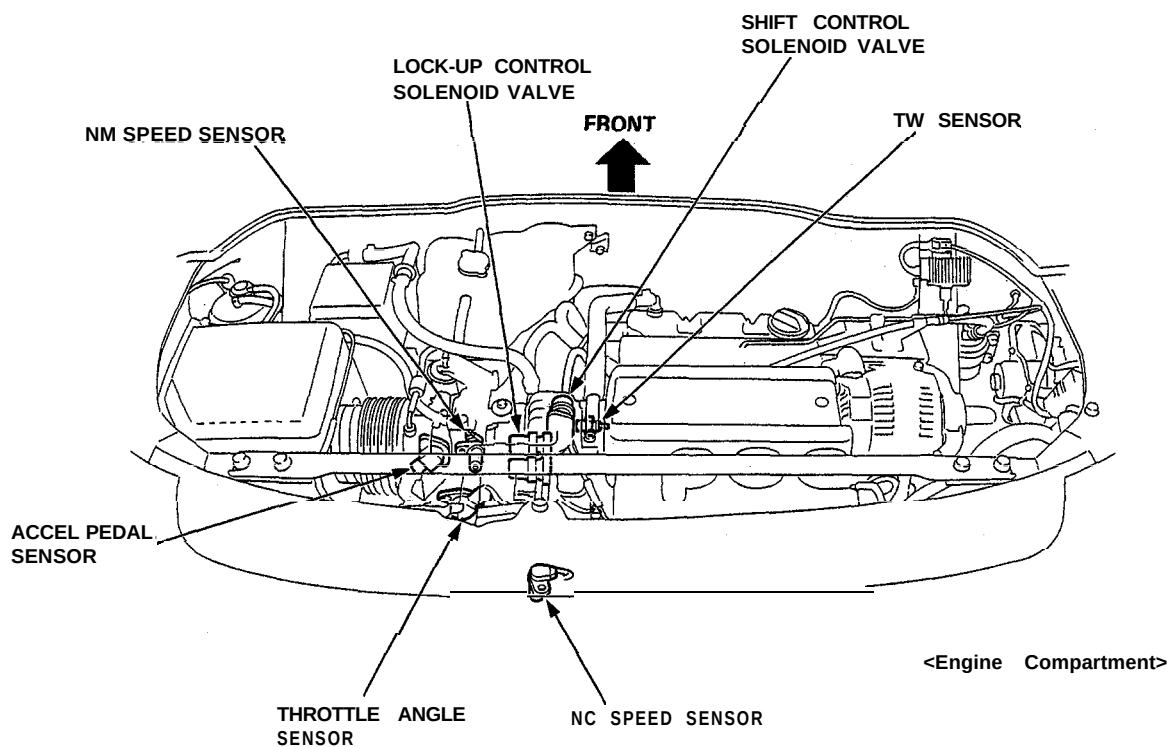


ATF Cooler

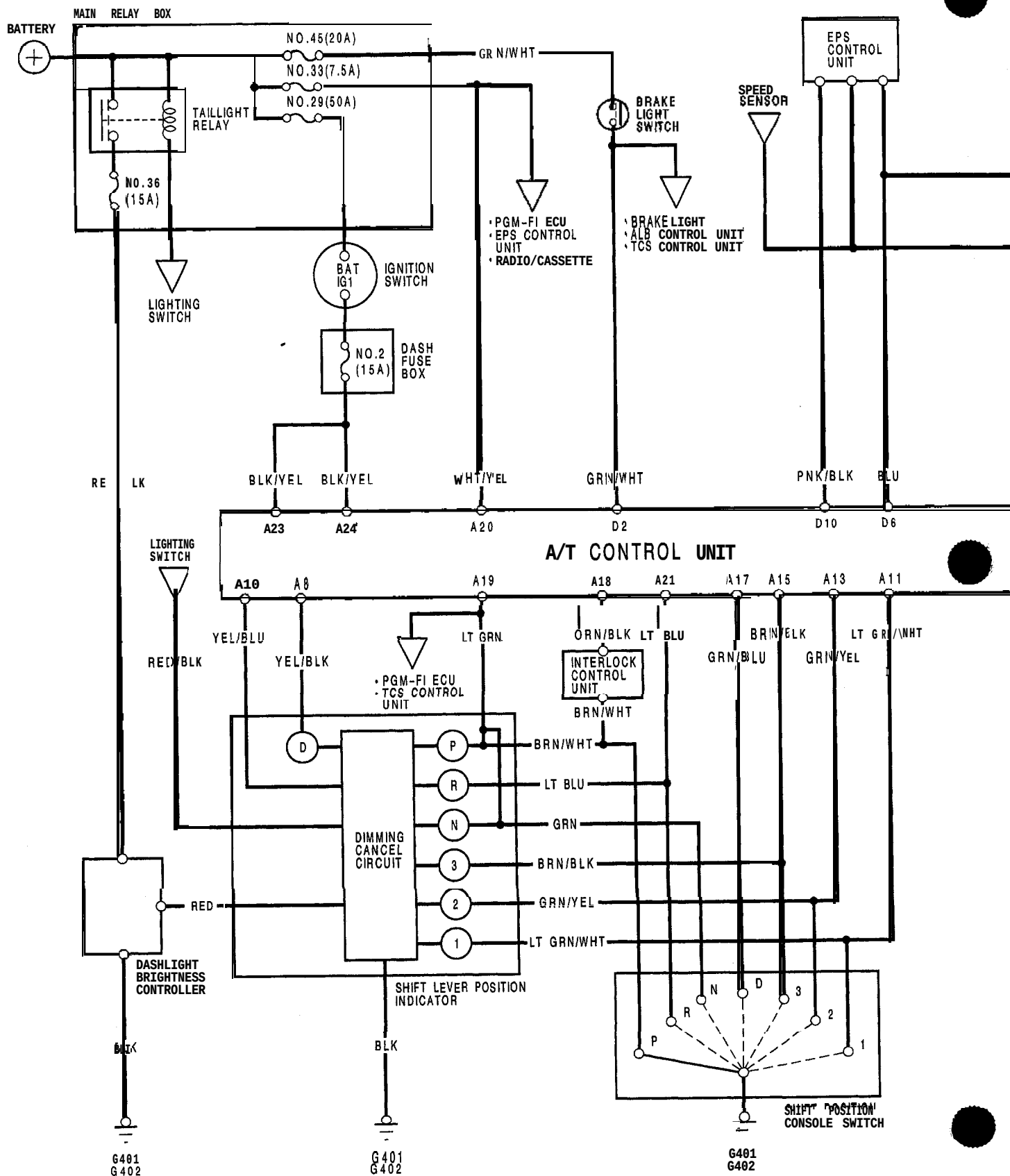
The radiator is mounted at the front of the vehicle. The ATF cooler is installed directly on the transmission housing. The ATF is cooled by the engine coolant.

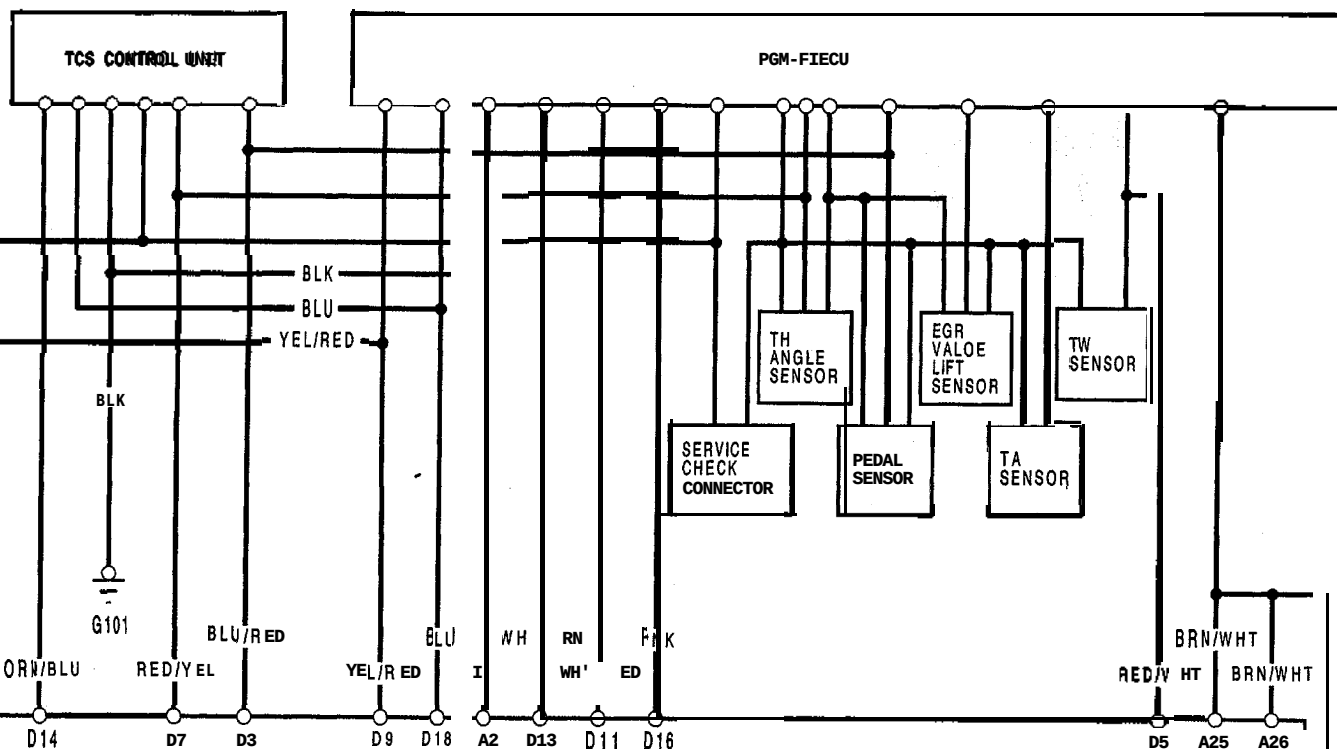


Component Location

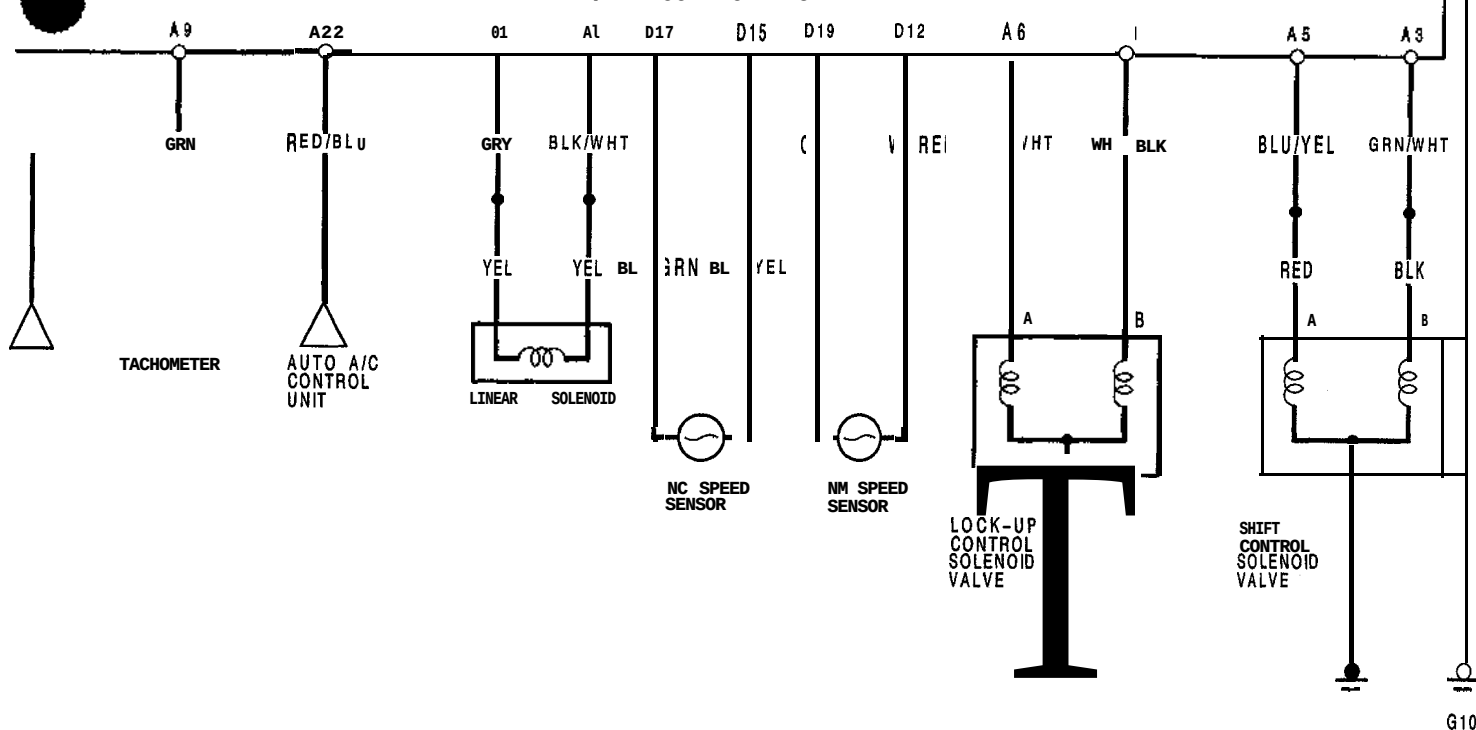


Circuit Diagram





A/T CONTROL UNIT



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

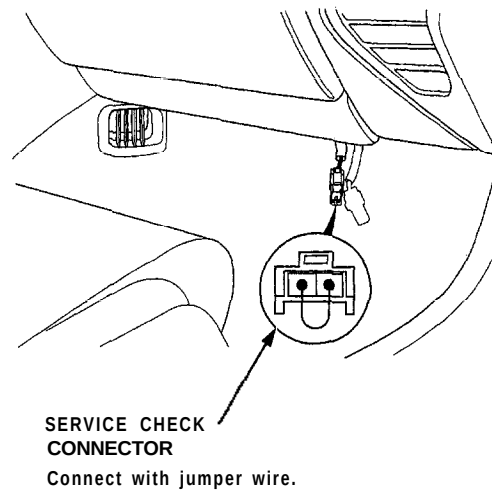
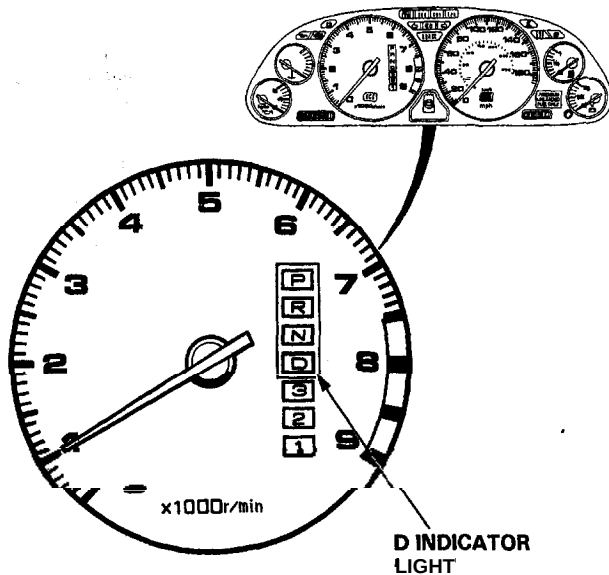
TERMINAL LOCATION

View from terminal side

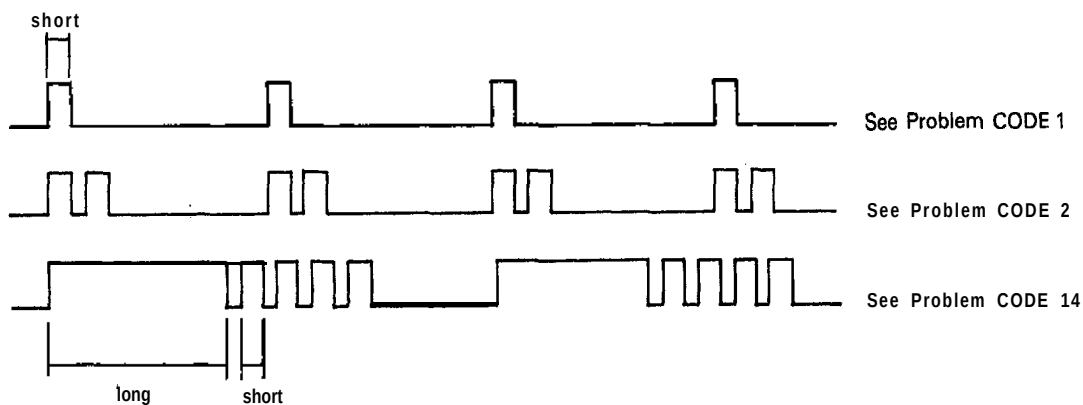
Troubleshooting Procedures

When the A/T control unit senses an abnormality in the input or output systems, the D indicator light in the gauge assembly will blink. However, when the Service Check Connector (located to the lower right of the glove compartment) is connected with a jumper wire, the D indicator light will blink the problem code when the ignition switch is turned on.

When the D 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 D indicator light.

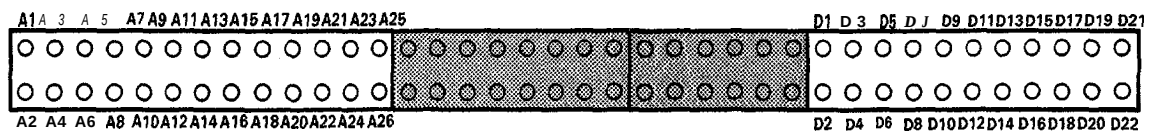
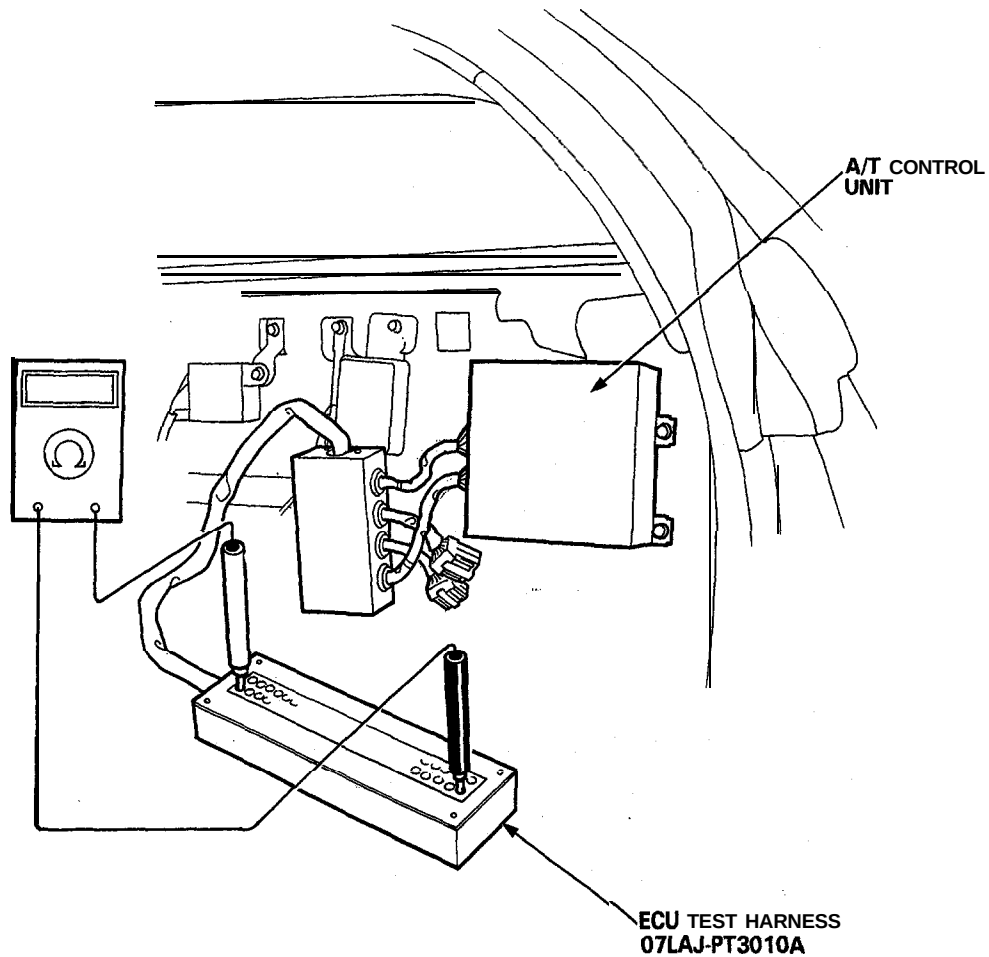


Problem codes 1 through 9 are indicated by individual short blinks, Problem codes 10 through 16 are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the problem code. After determining the problem code, refer to the electrical system Symptom-to-Component Chart on page 14-52.



Some PGM-FI problems will also make the D indicator light come on. After repairing the PGM-FI system, disconnect the CLOCK fuse (7.5 A) in the main relay box for more than 10 seconds to reset the A/T control unit memory.

NOTE: Disconnecting the CLOCK fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.



Terminal Locations

NOTE:

- Only the A and D sections of the ECU test harness are used for A/T troubleshooting.
- Unless otherwise noted, use only the Digital Multimeter, KS-AHM-32-003, for testing.

Symptom-to-Component Chart

• Electrical System

Number of D indicator light blinks while Service Check Connector is jumped.	D 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



Number of D indicator light blinks while Service Check Connector is jumped.	D indicator light	Possible Cause	Symptom	Refer to page
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
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	- Disconnected gauge assembly connector - Short or open in tachometer wire - Faulty tachometer	Lock-up clutch does not engage.	14-67
14	OFF	- Short or open in FAS wire - Trouble in PGM-FI unit	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.	14-70
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.	14-73

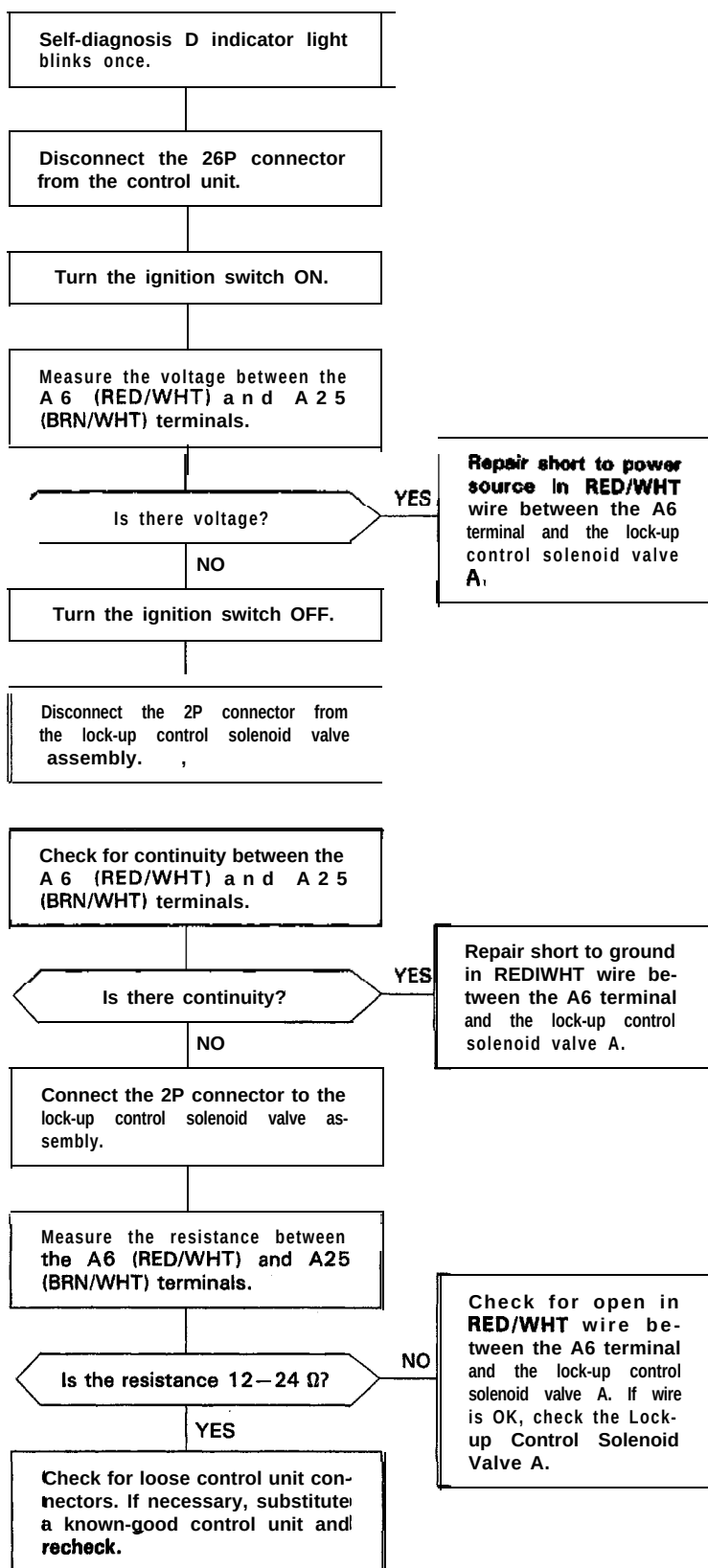
If the self-diagnosis D indicator light does not blink, perform an inspection according to the table listed below.

Symptom	Probable Cause	Ref. page
D indicator light does not come on for 2 seconds after ignition is first turned on.	—	14-74
D indicator light is on steady, not blinking whenever the ignition is on.	—	14-76
Lock-up clutch does not have duty operation (ON-OFF).	Check A/C signal with A/C on	14-77
Lock-up clutch does not engage.		
Fails to shift from 2nd to 1st gear after releasing the brake pedal from a stop when in the D position.	Check brake light signal.	14-78

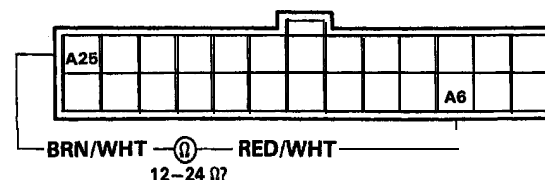
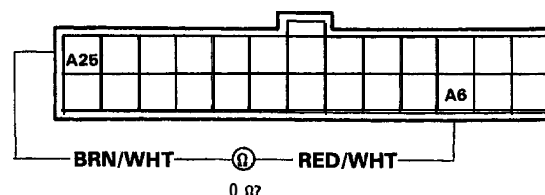
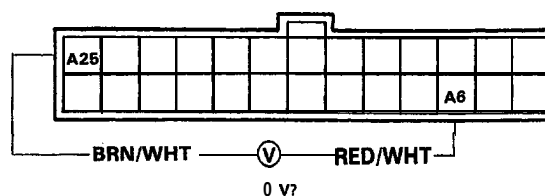
- If a customer describes the symptoms for codes 3, 6, or 11, yet the D indicator light is not blinking, it will be necessary to recreate the symptom by test driving, and then checking the D indicator light with the ignition still ON.
- If the D indicator light displays codes 1, 2, 3, 8, 11 or 16, check first the No. 9, 13 and 18 fuse before electrical troubleshooting. If any of the fuses have blown, repair them and then recheck.
- If the D indicator light displays codes other than those listed above or stays lit continuously, the control unit is faulty.
- Sometimes the D 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 ECU self-diagnosing indicator, then reset the memory by removing the CLOCK fuse in the main relay box for more than 10 seconds. Drive the vehicle for several minutes at speed over 30 mph (50 Km/h) then recheck the lights.

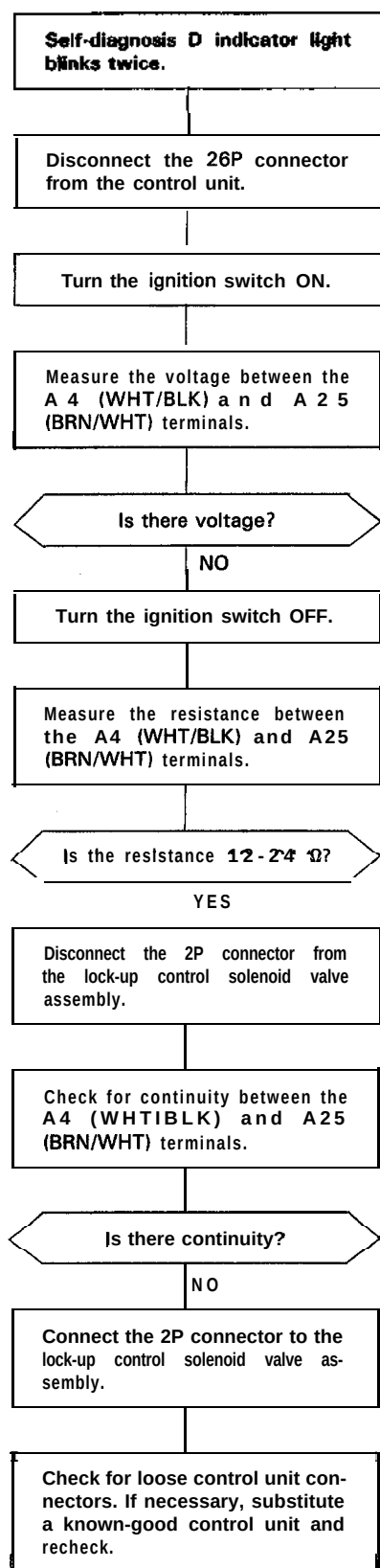
NOTE: Disconnecting the CLOCK fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.

Troubleshooting Flowchart

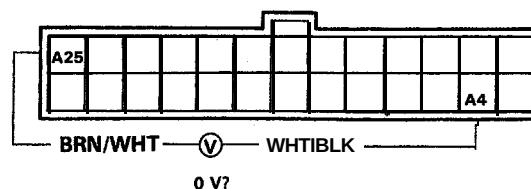


NOTE: View from terminal side.

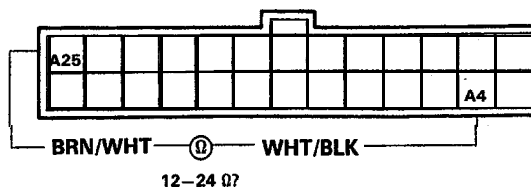




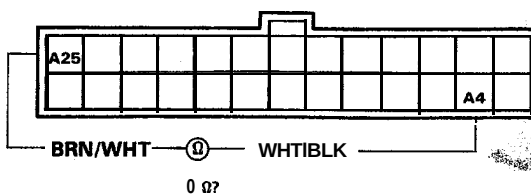
NOTE: View from terminal side.



Repair short to power source in WHTIBLK wire between the A4 terminal and the lock-up control solenoid valve B.



Check for open in WHTIBLK wire between the A4 terminal and the lock-up control solenoid valve B. If wire is OK, check the Lock-up Control Solenoid Valve B.



Repair short to ground in WHTIBLK wire between the A4 terminal and the lock-up control solenoid valve B.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D indicator light blinks three times.

Turn the ignition switch ON.

Check whether the PGM-FI self-diagnosis indicator blinks (Section 11).

Does the Self-diagnosis indicator blink?

YES

Repair the PGM-FI System. See Section 11.

NO

Turn the ignition switch OFF.

Disconnect the 26P and 22P connectors from the control unit.

Turn the ignition switch ON.

Measure the voltage between the D18 (BLU) and A25 (BRN/WHT) terminals.

Is the voltage 4.75-5.25 V?

NO

Repair open short in BLU wire between the D18 terminal and the D18 terminal of the PGM-FI ECU.

YES

Turn the ignition switch OFF.

Connect the ECU test harness between the connectors and the control unit.

Turn the ignition switch ON.

Measure the voltage between the D7 and A25 terminals.

Is the voltage 0.44-0.56 V?*

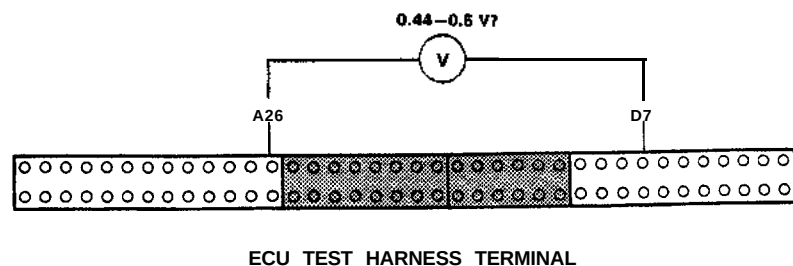
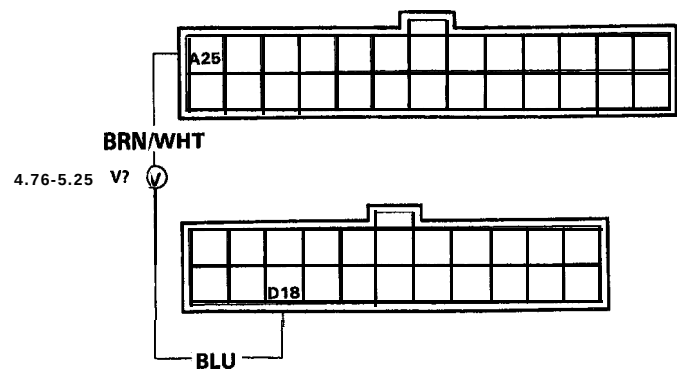
NO

Repair open or short in RED/YEL wire between the D7 terminal and the throttle angle sensor.

YES * $\pm 10\%$

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

NOTE: View from terminal side.





Self-diagnosis D indicator light blinks four times.

Raise the car.

Shift transmission to ☐

Disconnect the 26P and 22P connectors from the control unit.

Turn the ignition switch ON.

Rotate the rear wheel and check for voltage between the A25 (BRN/WHT) and D9 (YEL/RED) terminals.

Does the voltage 0—5 V appear alternately?

YES

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

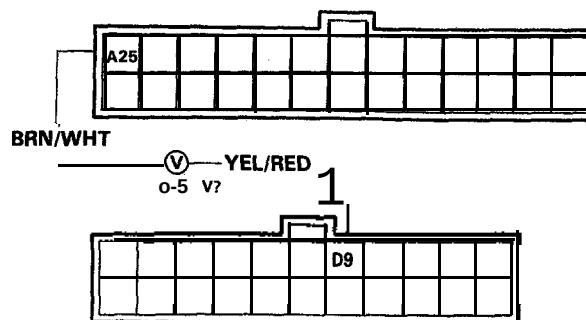
NO

Check for short or open in YEL/RED wire between the D9 terminal and the Speed Sensor. If wire is OK, check the Speed Sensor. See Section 23.



WARNING

Make sure lifts are placed properly. (See page I-6.)

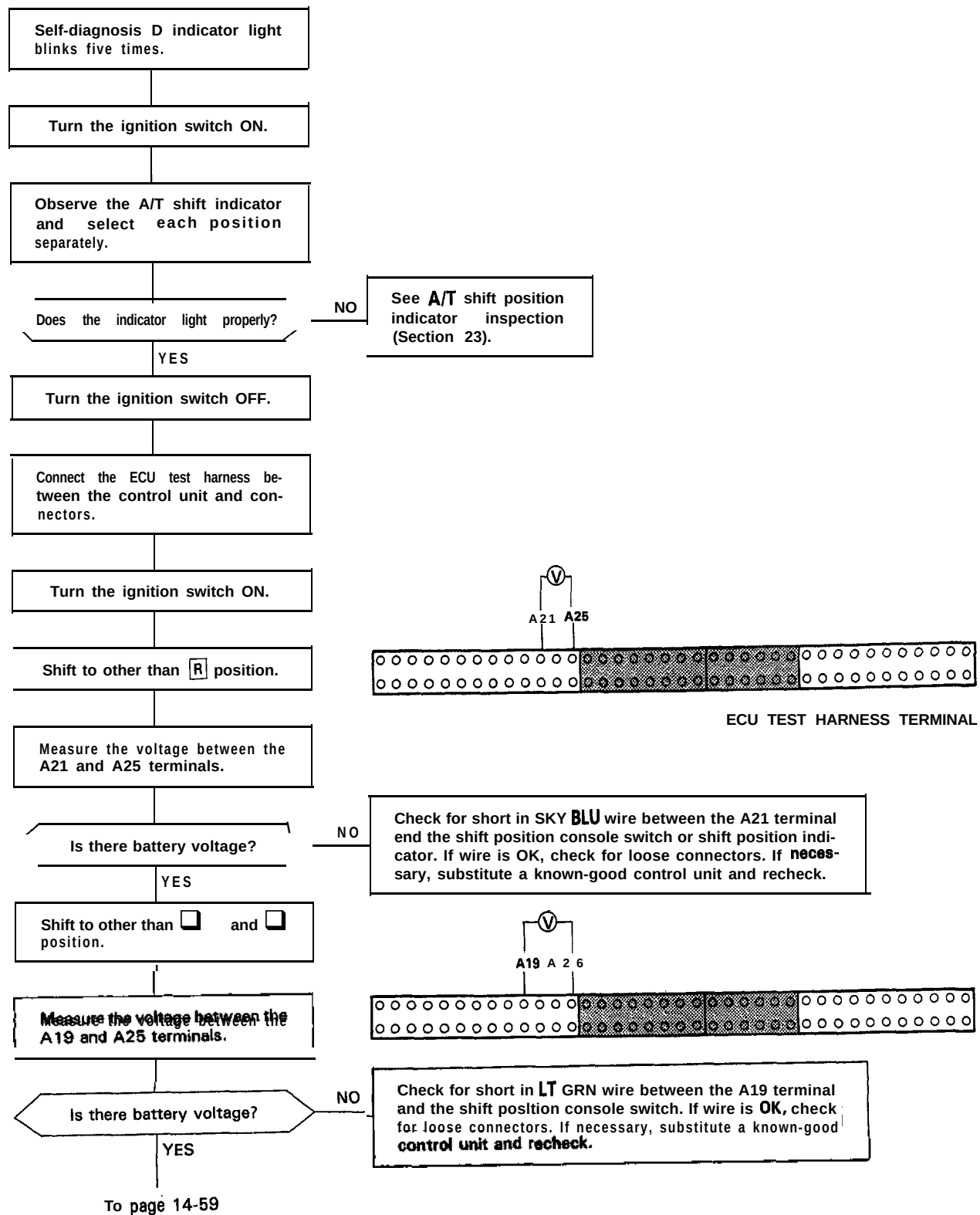


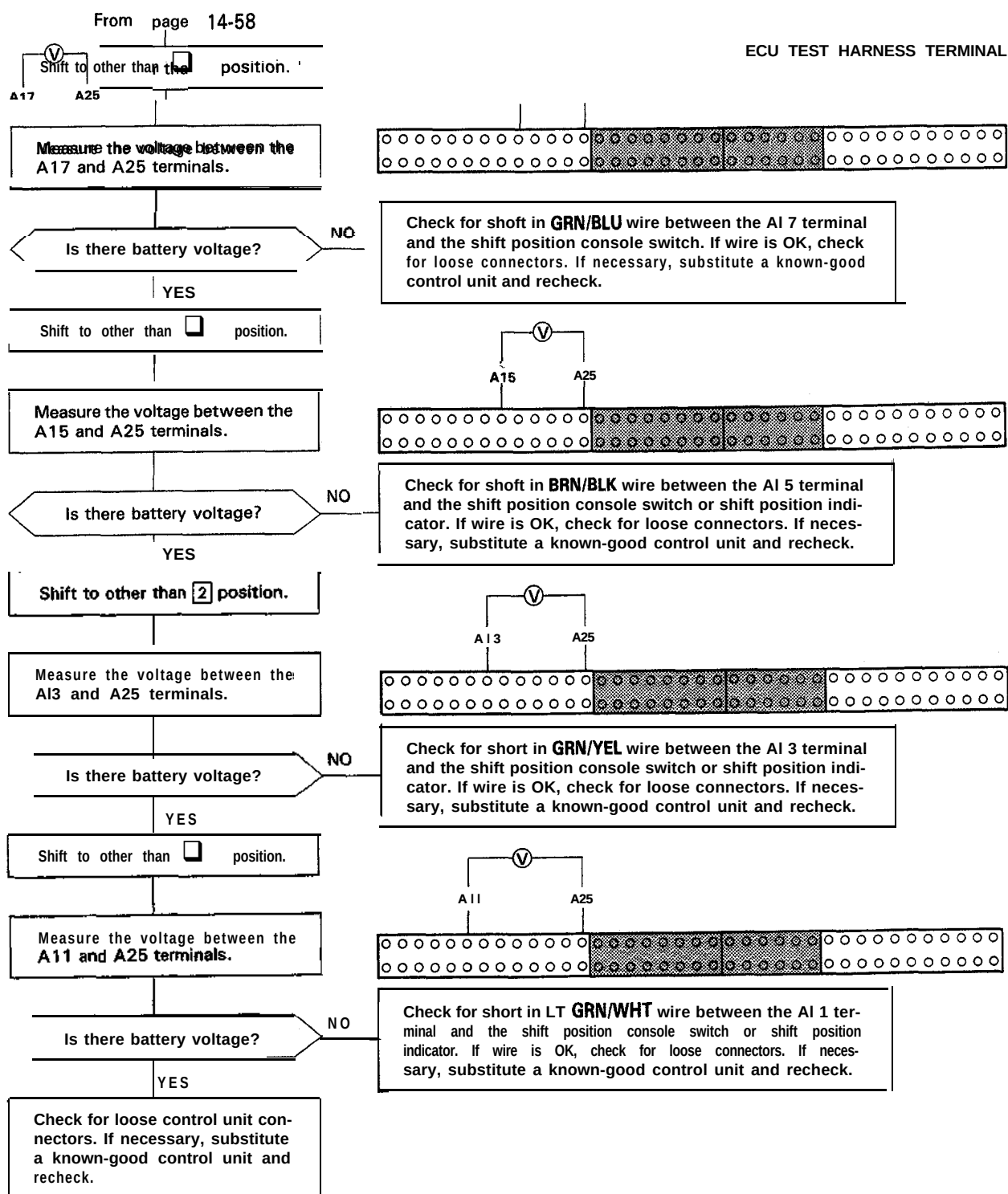
NOTE: View from terminal side.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)





(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D 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 AK shift position indicator inspection. (Section 23)

YES

Turn the ignition switch OFF.

Connect the ECU test harness between the control unit and connectors.

Turn the ignition switch ON.

Shift to ☐ position.

Measure the voltage between the A21 and A25 terminals.

Is there voltage?

YES

Repair open in SKY BLU wire between the A21 terminal and the shift position console switch.

NO

Shift to ☐ or ☐ position.

Measure the voltage between the A19 and A25 terminals.

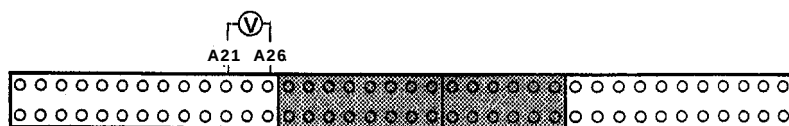
Is there voltage?

YES

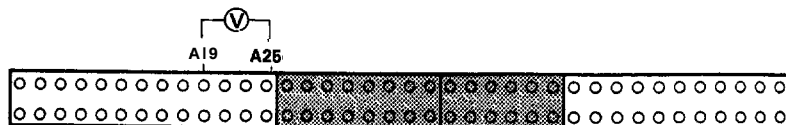
Repair open in LT GRN wire between the A19 terminal and the shift position console switch.

NO

To page 14-61



ECU TEST HARNESS TERMINAL



ECU TEST HARNESS TERMINAL



From page 14-60

ECU TEST HARNESS TERMINAL

Shift to **D** position.

Measure the voltage between the A17 and A25 terminals.

Is there voltage?

YES

Repair open in GRN/BLU wire between the A17 terminal and the shift position console switch.

NO

Shift to **R** position.

Measure the voltage between the A15 and A25 terminals.

Is there voltage?

YES

Repair open in BRN/BLK wire between the A15 terminal and the shift position console switch.

NO

Shift to **N** position.

Measure the voltage between the A13 and A25 terminals.

Is there voltage?

YES

Repair open in GRN/YEL wire between the A13 terminal and the shift position console switch.

NO

Shift to **1** position.

Measure the voltage between the A11 and A25 terminals.

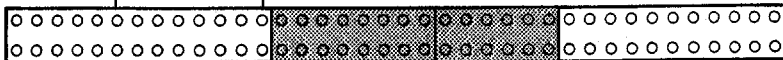
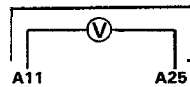
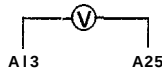
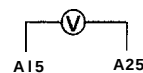
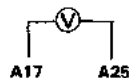
Is there voltage?

YES

Repair open in LT GRN/WHT wire between the A11 terminal and the shift position console switch.

NO

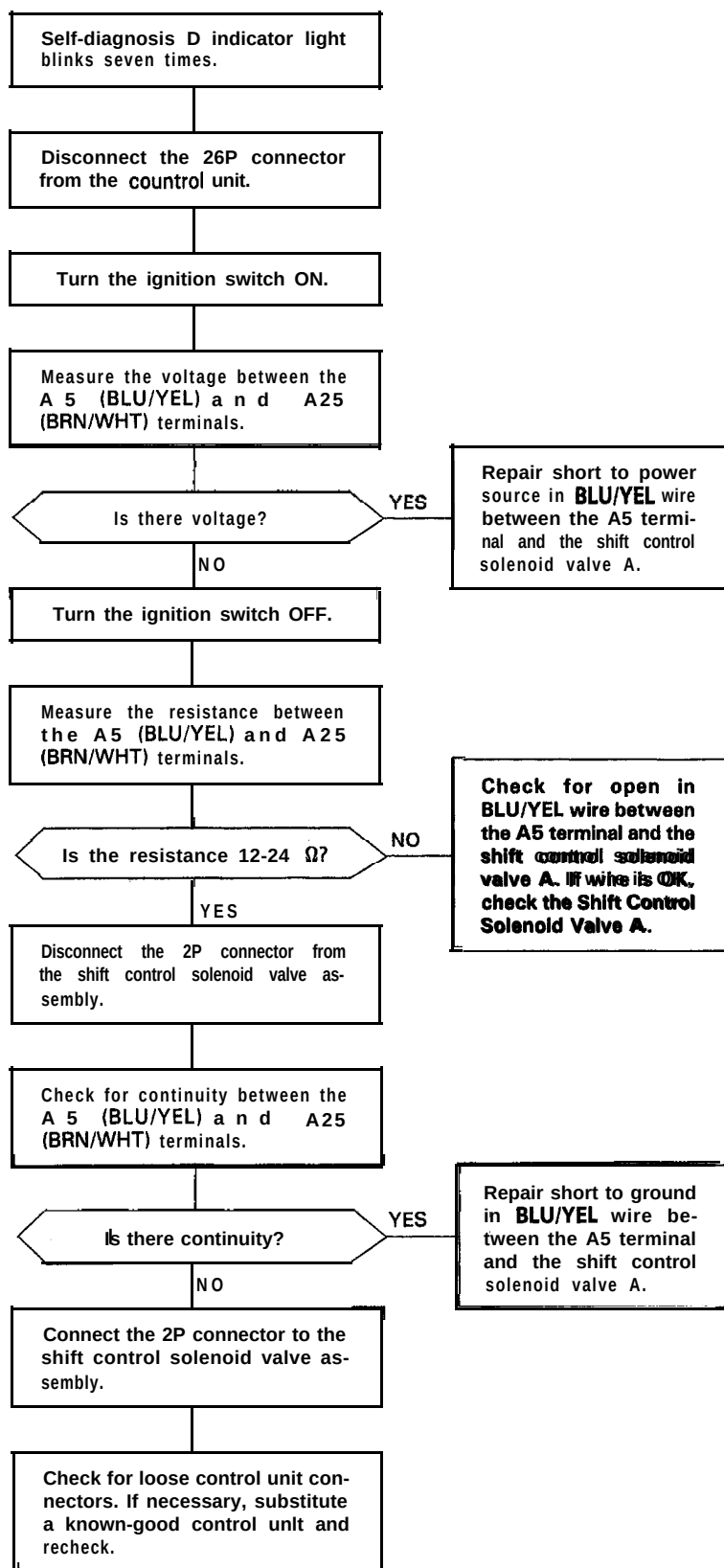
Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.



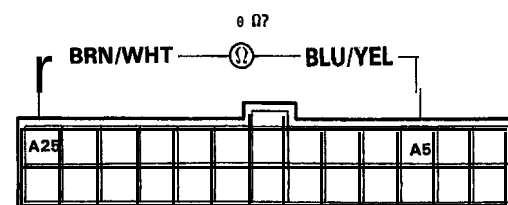
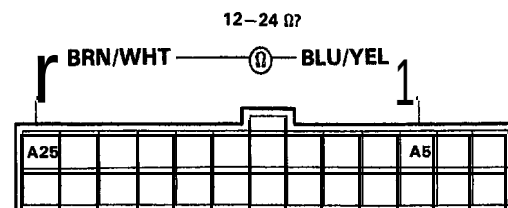
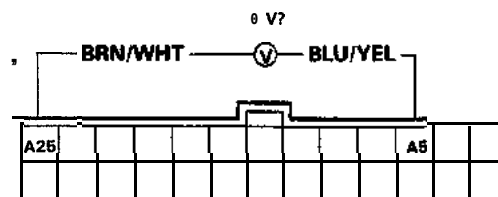
(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)



NOTE: View from terminal side.





Self-diagnosis D indicator light blinks eight times.

Disconnect the 26P connector from the control unit.

Turn the ignition switch ON.

Measure the voltage between the A 3 (GRN/WHT) and A 2 5 (BRN/WHT) terminals.

Is there voltage?

YES

NO

Turn the ignition switch OFF.

Measure the resistance between the A 3 (GRN/WHT) and A 2 5 (BRN/WHT) terminals.

Is the resistance 12-24 Ω ?

NO

YES

Disconnect the 2P connector from the shift control solenoid valve assembly.

Check for continuity between the A 3 (GRN/WHT) and A 2 5 (BRN/WHT) terminals.

Is there continuity?

YES

NO

Connect the 2P connector to the shift control solenoid valve assembly.

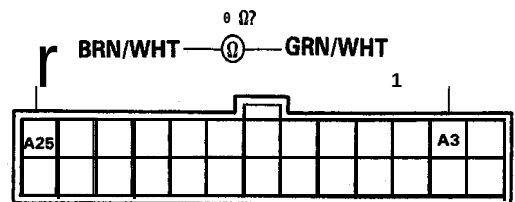
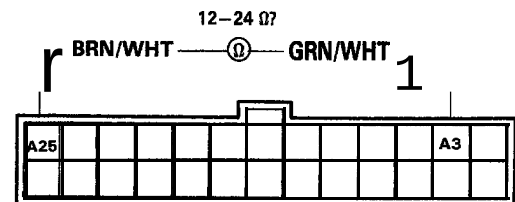
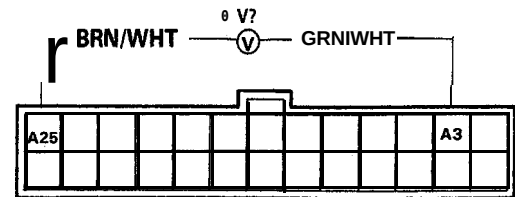
Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

Repair short to power source in **GRN/WHT** wire between the A3 terminal and shift control solenoid valve B.

Check for open in **GRN/WHT** wire between the A3 terminal and the shift control solenoid valve B. If wire is OK, check the Shift Control Solenoid Valve B.

Repair short to ground in **GRN/WHT** wire between the A3 terminal and the shift control solenoid valve B.

NOTE: View from terminal side.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D indicator light blinks nine times.

Check the state of installation of the NC SPEED SENSOR.

OK?

NO

Reinstall and recheck.

YES

Disconnect the 2P connector from the NC speed sensor coupler.

Measure the resistance of the NC speed sensor.

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

NO

Replace the NC speed sensor.

YES

Reconnect the NC speed sensor.

Disconnect the 22P connector from the control unit.

Measure the resistance between D17 (BLU/GRN) and D15 (BLU/YEL).

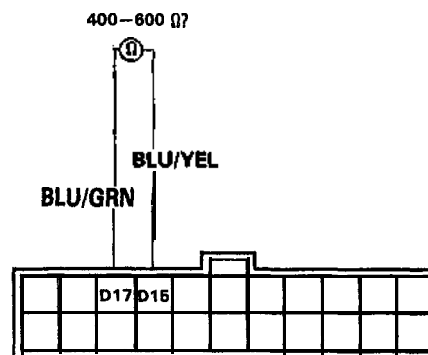
Is the resistance 400–600 ohms? (20°C)

NO

YES

Check for loose control unit connector. If necessary, substitute a known-good control unit and recheck.

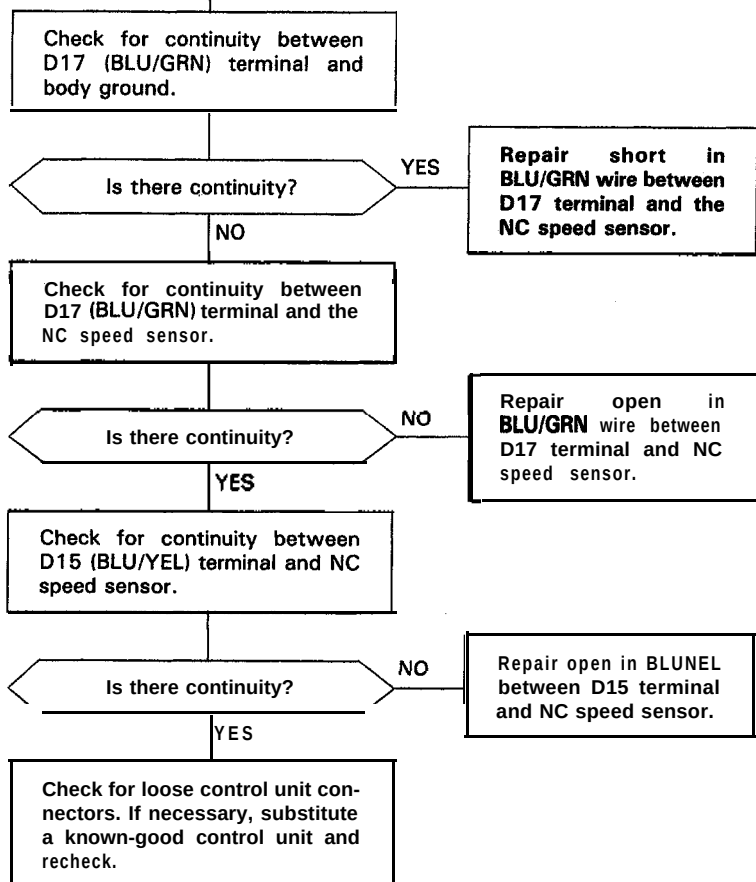
To page 14-65



NOTE: View from terminal side.



From page 14-64



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D indicator light blinks ten times.

Turn the Ignition switch ON.

Check whether the PGM-FI self-diagnosis indicator blinks (Section 11).

Does the self-diagnosis indicator blink?

YES

Repair the PGM-FI System. See Section 11.

NO

Turn the ignition switch OFF.

Disconnect the 26P and 22P connectors from the control unit.

Turn the ignition switch ON.

Measure the voltage between the D18 (BLU) and A25 (BRN/WHT) terminals.

Is the voltage 4.75-5.25 V?

NO

Repair open or short in BLU wire between the D18 terminal and the D18 terminal of the PGM-FI ECU.

YES

Turn the ignition switch OFF.

Connect the ECU test harness between the control unit and the connectors.

Start the engine and warm it up to normal operating temperature.

Measure the voltage between the D5 and A25 terminals.

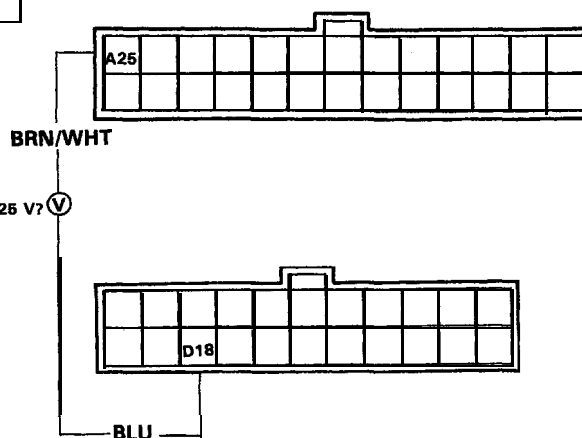
Is the voltage 0.50 - 1.20 V? *

NO

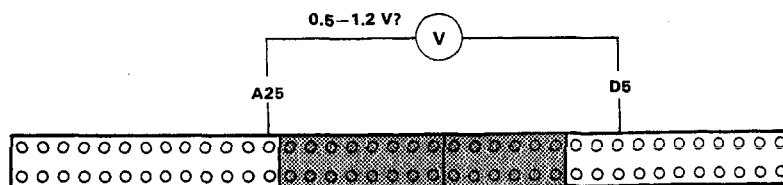
Repair open or short in RED/WHT wire between the D5 terminal and the coolant temperature sensor.

YES * $\pm 10\%$

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



NOTE: View from terminal side.



ECU TEST HARNESS TERMINAL



Self-diagnosis D indicator light
blinks eleven times.

Disconnect the 26P connector
from the control unit.

Turn the ignition switch ON

Measure the voltage between the
A9 (GRN) and A25 (BRN/WHT)
terminals.

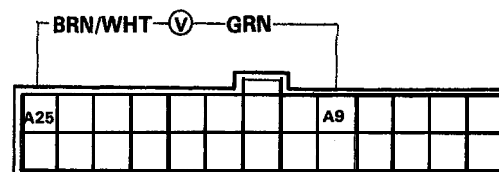
Is there battery voltage?

NO

Repair open or short in
GRN wire between the
A9 terminal and the
gauge assembly.

YES

Check for loose control unit con-
nectors. If necessary, substitute
a known-good control unit and
recheck.



NOTE: View from terminal side.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis D indicator light blinks fourteen times.

Start the engine and warm it up to normal operating temperature.

Shift to **P** position.

Turn the ignition switch OFF.

Connect the ECU test harness between the control unit and connectors.

Turn the ignition switch ON and wait for at least two seconds.

Using an analog voltmeter, measure the voltage between the D 16 (+) and A25 (-) terminals.

Is there approx. 5 V for over five seconds?

YES

Raise the car.

Start the engine.

Shift to **R** position.

Raise the engine to over 2,000 rpm (over 40 mph in 4th gear) for five seconds.

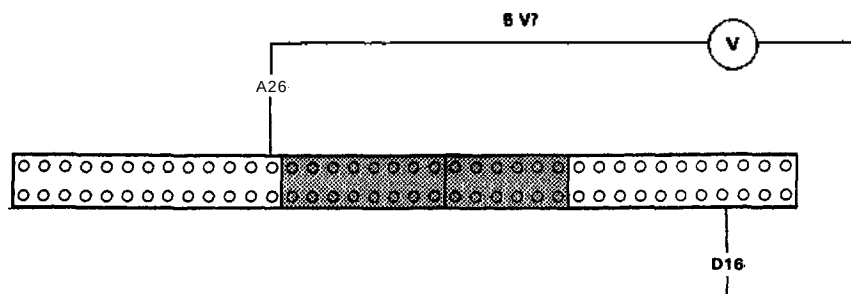
Release and depress the throttle so that the transmission downshifts and upshifts.

Using an analog voltmeter, measure the voltage between D16 (+) and A25 (-) terminals

To page 14-69

⚠ WARNING

- **Make sure** lifts are placed properly. (See page I-6.1)
- While testing, be careful of the rotating rear wheels.



ECU TEST HARNESS TERMINAL

NO

Does the meter jerk from 0 V to 4 V approx. every four seconds?

YES

Refer to PGM-FI A/T Signal (Section 11).

NO

Is the Check Engine light on?

YES

Repair the PGM-FI System (Section 11).

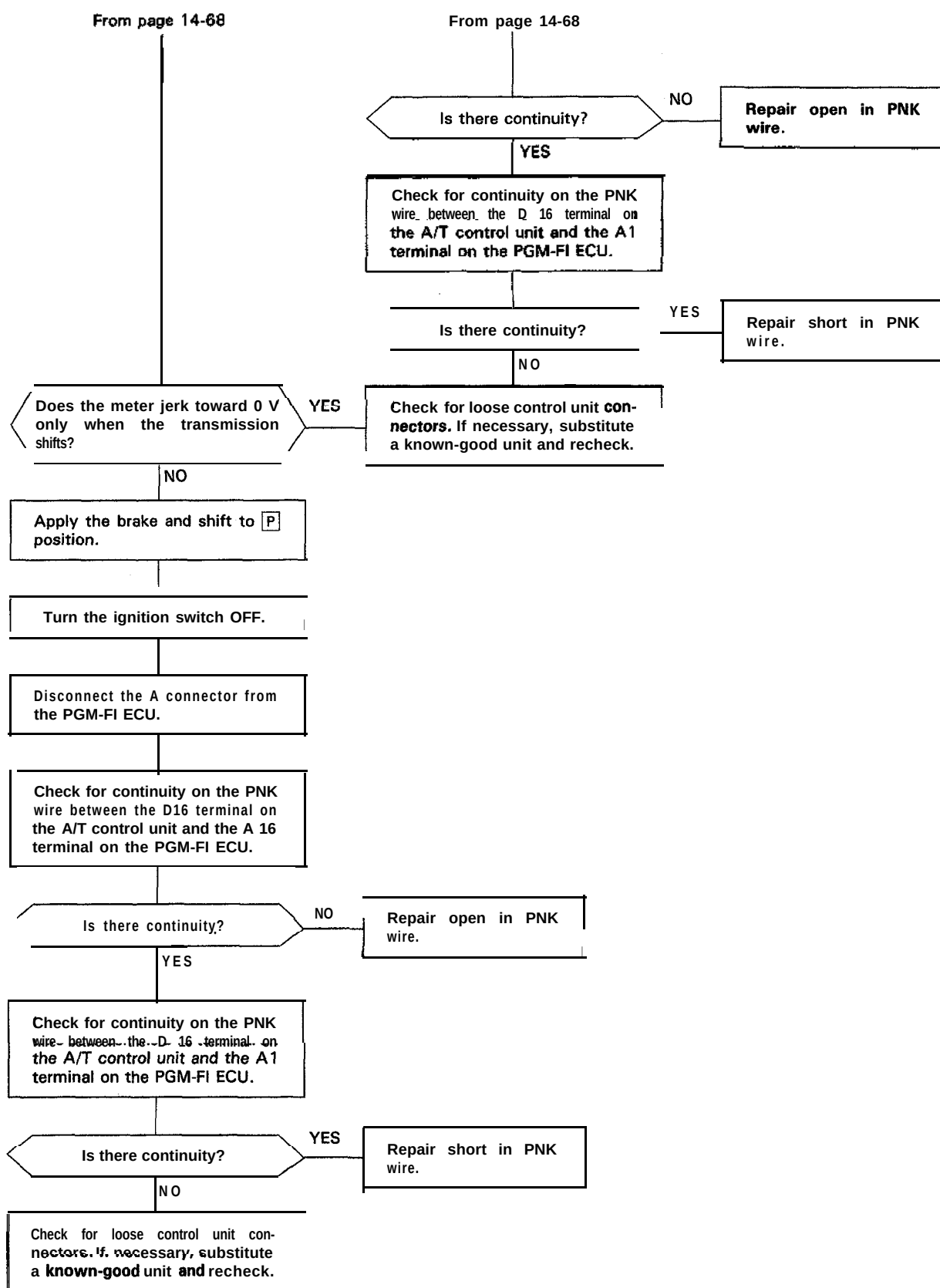
NO

Turn the ignition switch OFF.

Disconnect the A connector from the PGM-FI ECU.

Check for continuity on the PNK wire between the D 16 terminal on the A/T control unit and the A16 terminal on the PGM-FI ECU.

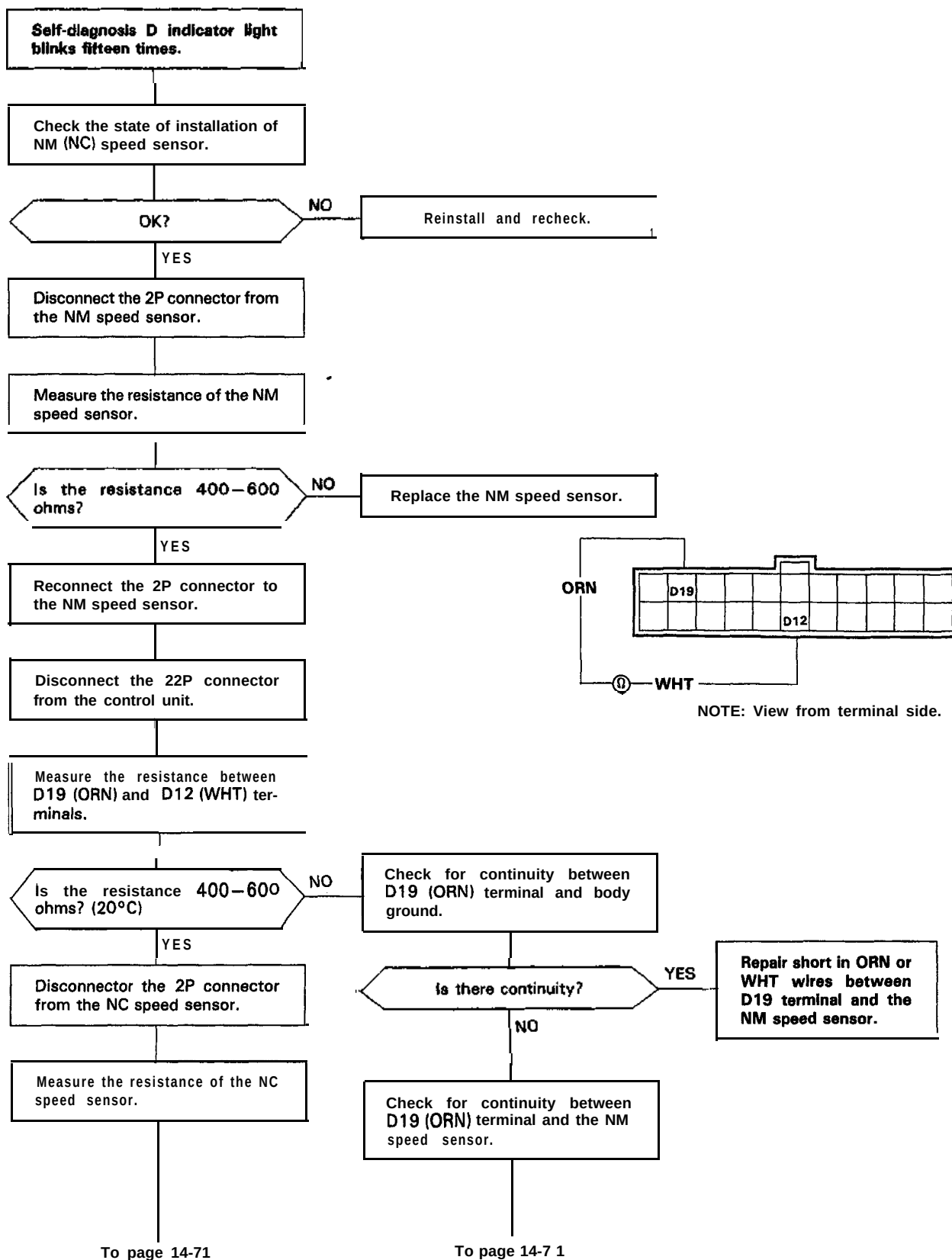
To page 14-69



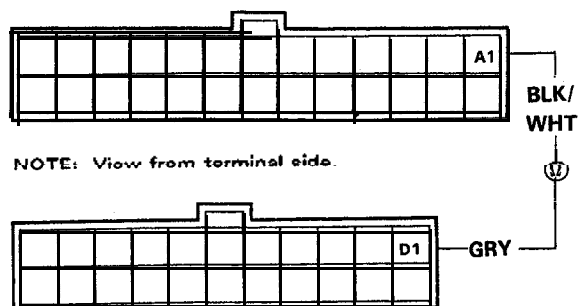
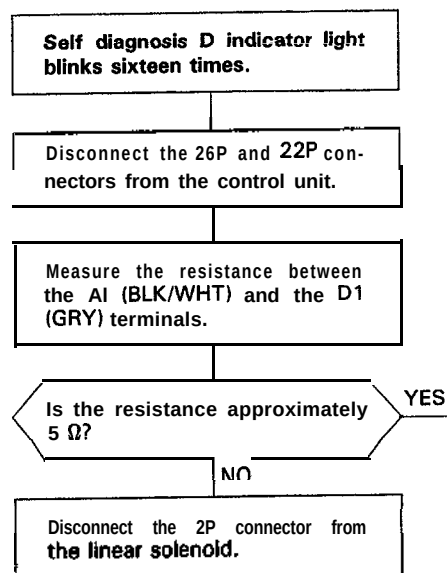
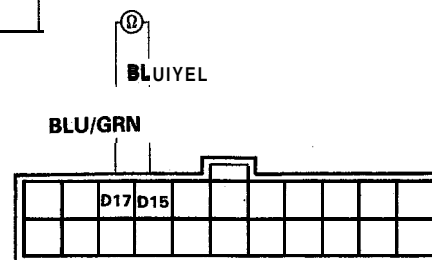
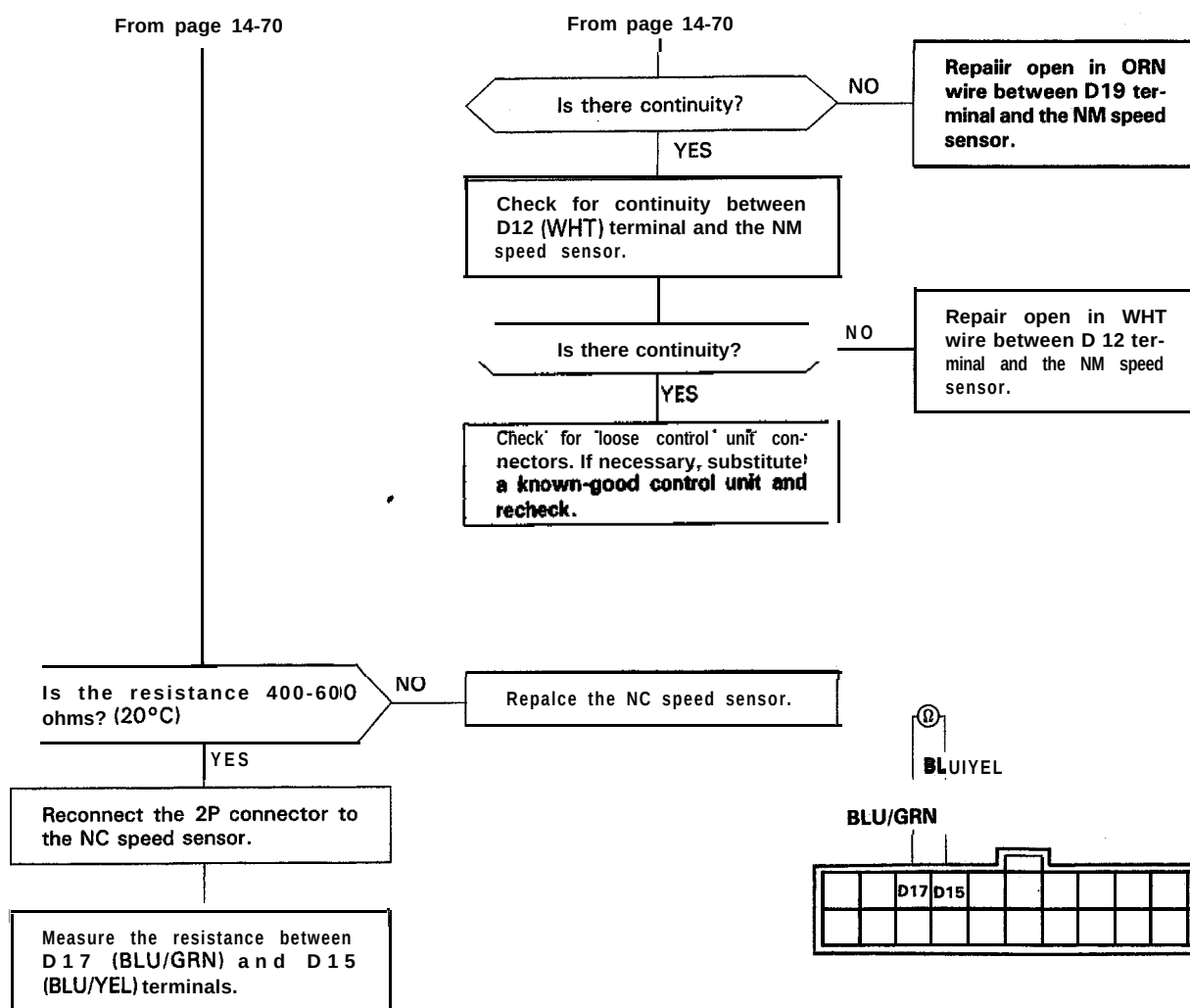
(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

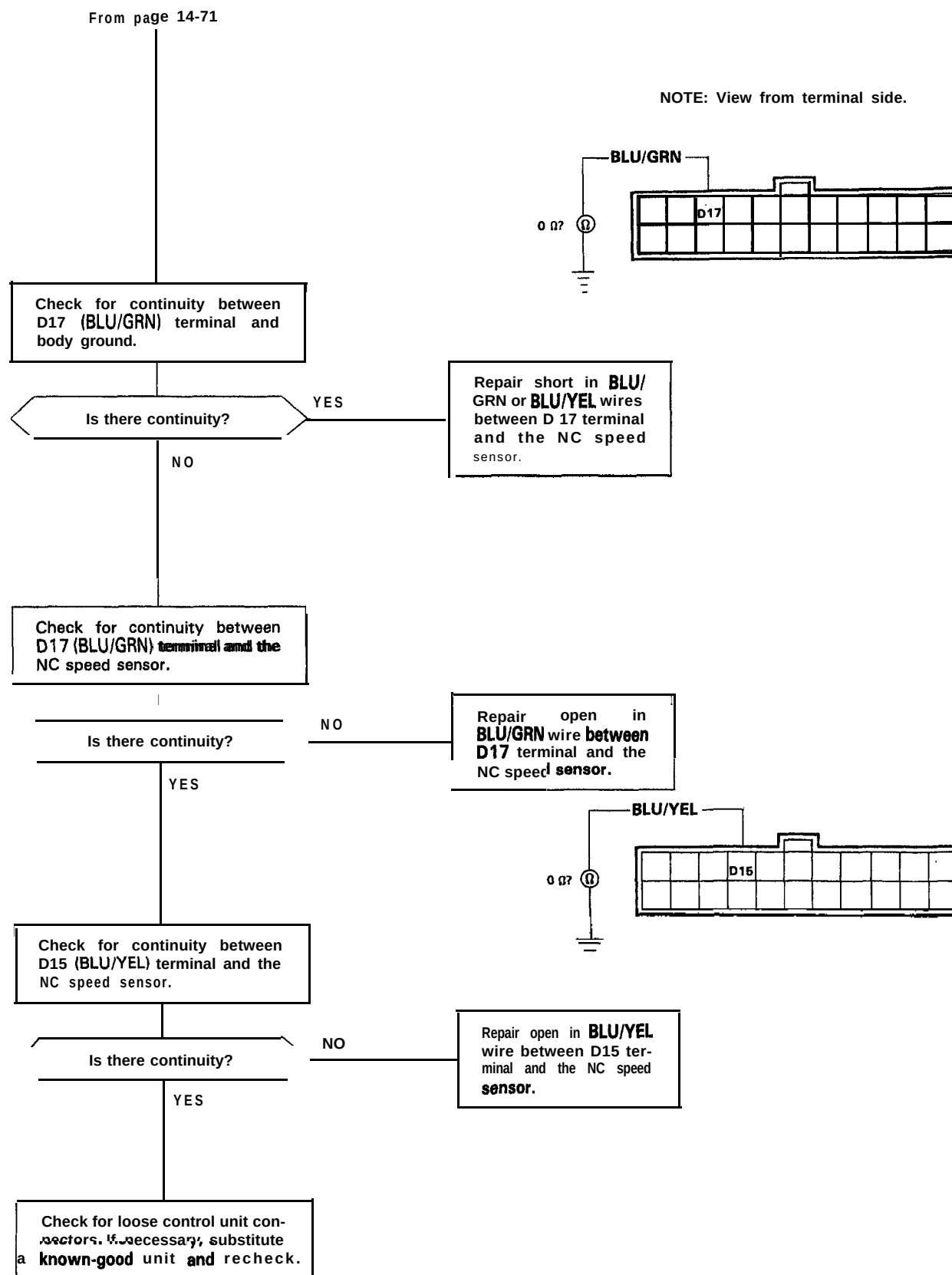


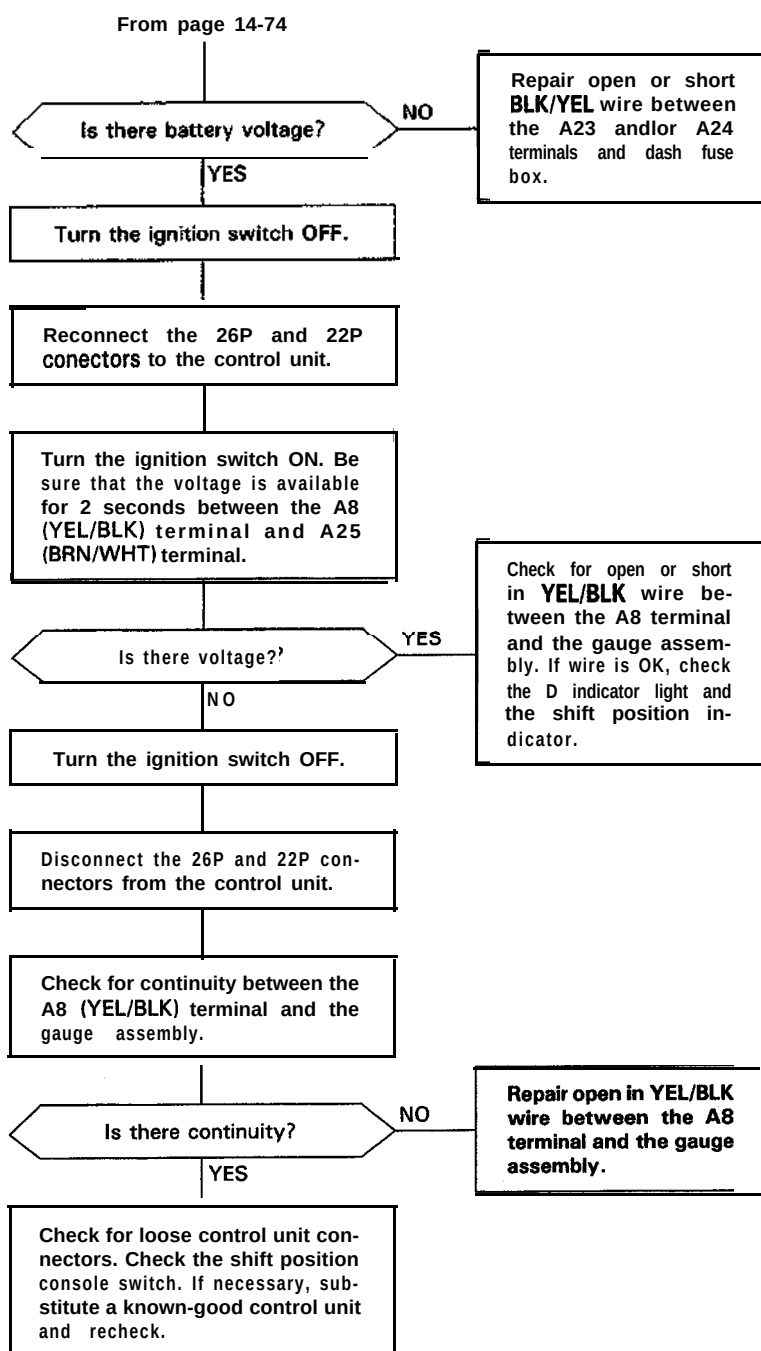
From page 14-70



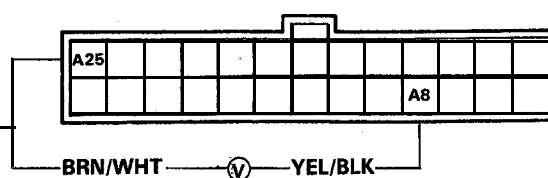
Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)





NOTE: View from terminal side.



(cont'd)

Troubleshooting Flowchart (cont'd)

D indicator light is on steady, not blinking whenever the ignition switch ON.

Measure voltage between the A8 (YEL/BLK) terminal and body ground.

Is there voltage?

NO

Replace the A/T control unit.

YES

Measure voltage between the YEL/BLK wire at the gauge assembly and body ground.

Is there voltage?

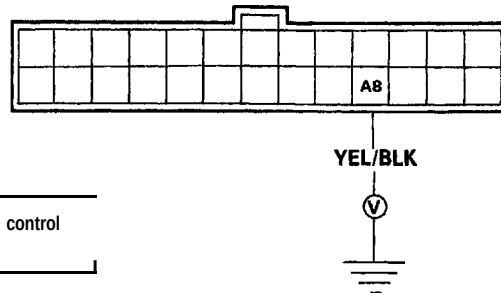
NO

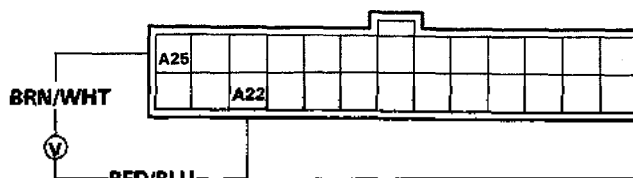
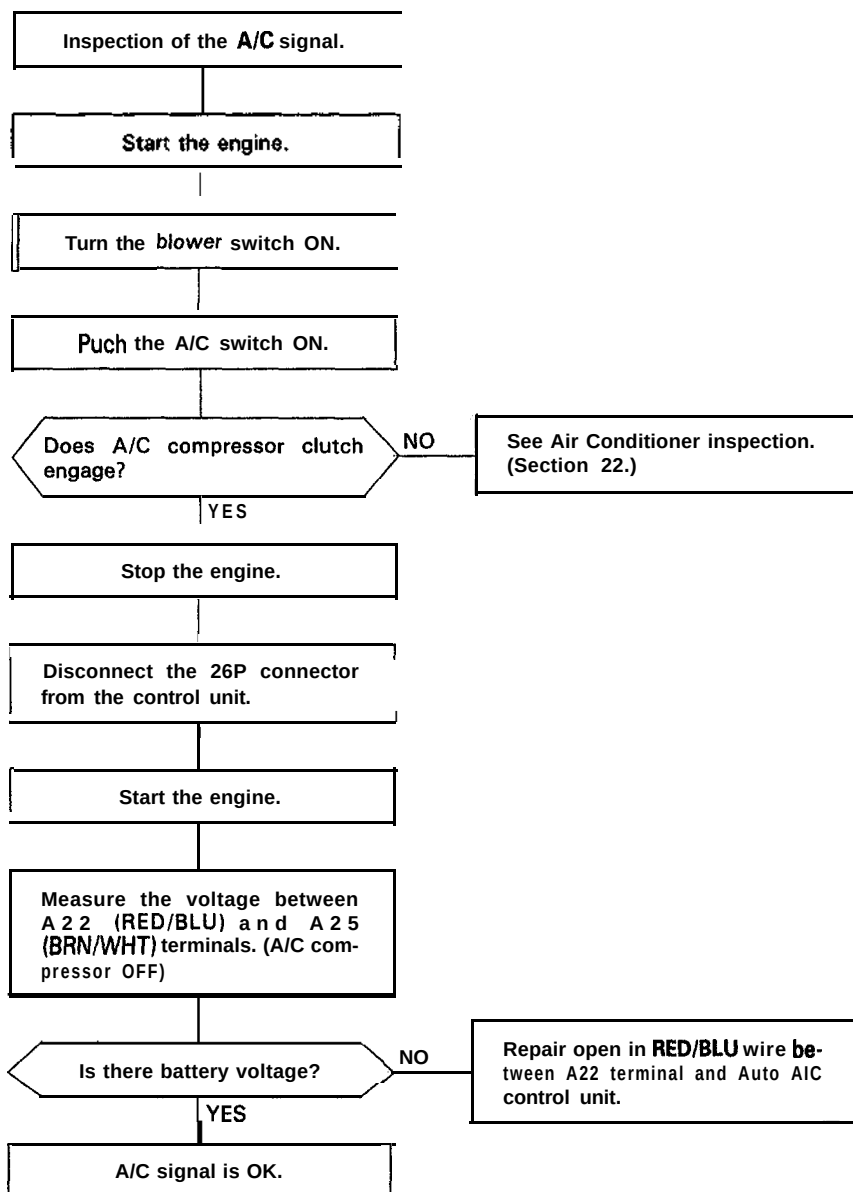
Replace faulty shift position indicator.

YES

Repair short to power source on YEL/BLK wire between the A8 terminal and gauge assembly.

NOTE: View from terminal side.





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 connector from the lock-up control

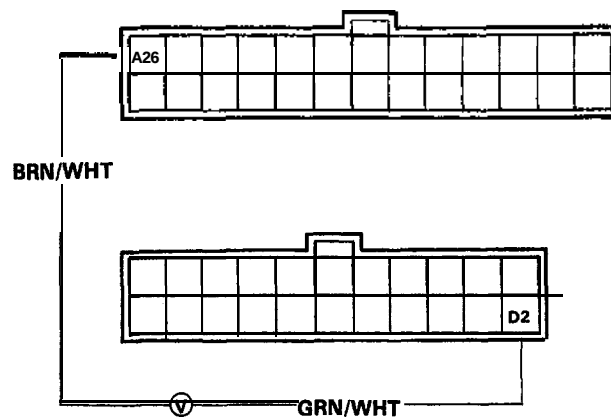
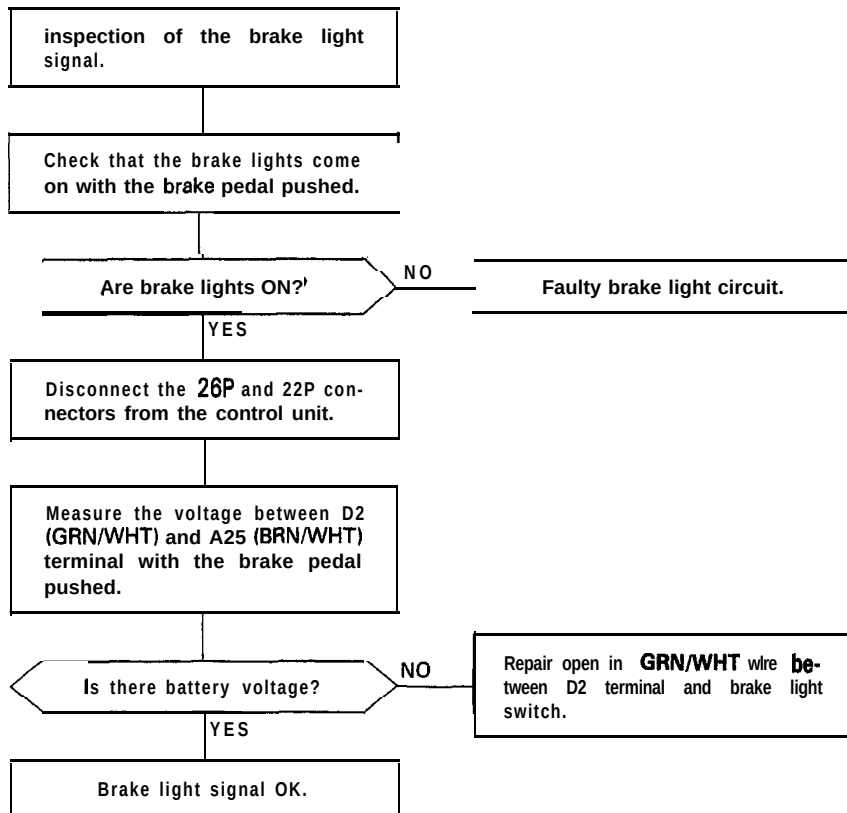
Replacement

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.

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)



NOTE: View from terminal side.

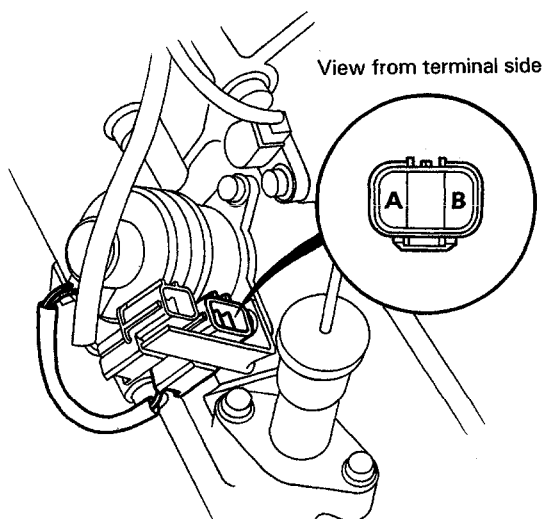
Linear Solenoid



Test

1. Remove the linear solenoid connector.
2. Measure the resistance between the A and B terminal.

STANDARD: 4.65 ~ 5.35 Ω

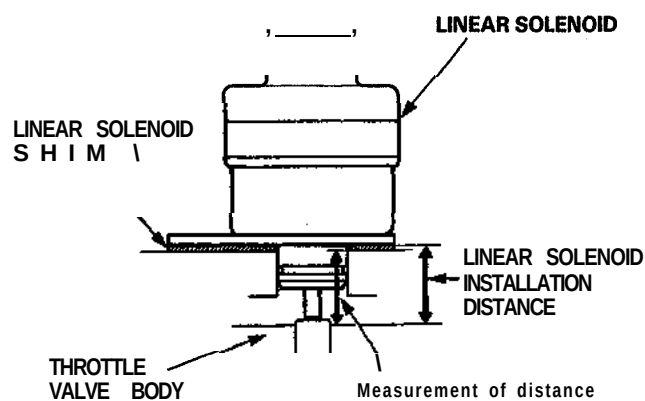
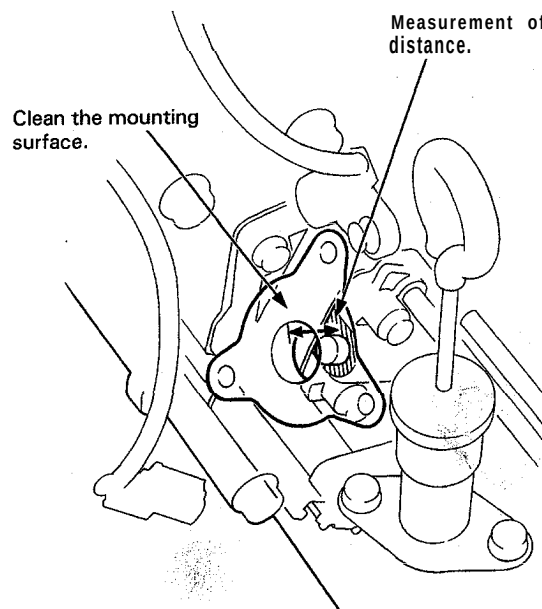


3. Replace the linear solenoid if resistance is out of specification.
4. Connect the A terminal of the linear solenoid connector to the battery. A clicking sound should be heard. Connect the B terminal of the linear solenoid connector to the battery. A clicking sound should be heard.
5. If not, check for continuity between the A/T control unit AI or D1 harness and body ground page 14-73.
6. Replace the linear solenoid assembly if there is continuity between the AI or D1 and body ground.

Replacement

NOTE: Select the appropriate shim when the linear solenoid is replaced.

1. Remove the linear solenoid and shim from the transmission housing.
2. Clean the mounting surface.
3. Measure the distance between the mounting surface of the linear solenoid and the throttle valve body.



LINEAR SOLENOID INSTALLATION DISTANCE:
23.5 ~ 23.7 mm (0.925 ~ 0.933 in)

NOTE: If the measurement of distance is 21.6 mm (0.850 in), select the shim of 2.0 mm (0.079 in) to obtain the installation distance of 23.6 mm (0.929 in).

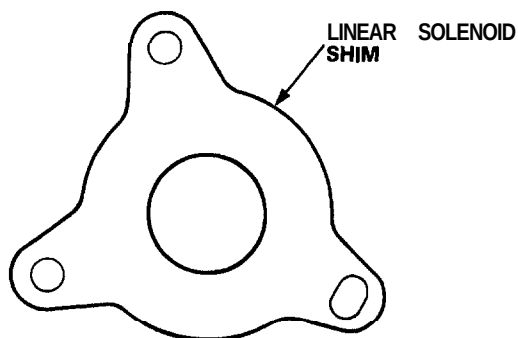
(cont'd)

Linear Solenoid

Replacement (cont'd)

- Select a new shim from the chart below.

NOTE: Identification color is painted on the side of the shim.



LINEAR SOLENOID SHIM

NO	PART NUMBER	THICKNESS	COLOR
1	28252-PR9-000	1.2 mm (0.047 in)	BLACK
2	28253-PR9-000	1.4 mm (0.055 in)	BROWN
3	28254-PR9-000	1.6 mm (0.063 in)	RED
4	28255-PR9-000	1.8 mm (0.071 in)	PINK
5	28256-PR9-000	2.0 mm (0.079 in)	YELLOW
6	28257-PR9-000	2.2 mm (0.087 in)	GREEN
7	28258-PR9-000	2.4 mm (0.094 in)	BLUE
8	28259-PR9-000	2.6 mm (0.102 in)	SKY BLUE
9	28260-PR9-000	2.8 mm (0.110 in)	WHITE

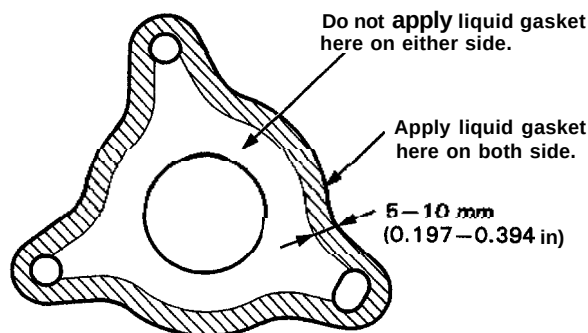
- Apply liquid gasket to both sides of the linear solenoid shim as shown. Use liquid gasket Part No. 08718-550000 OE.

CAUTION:

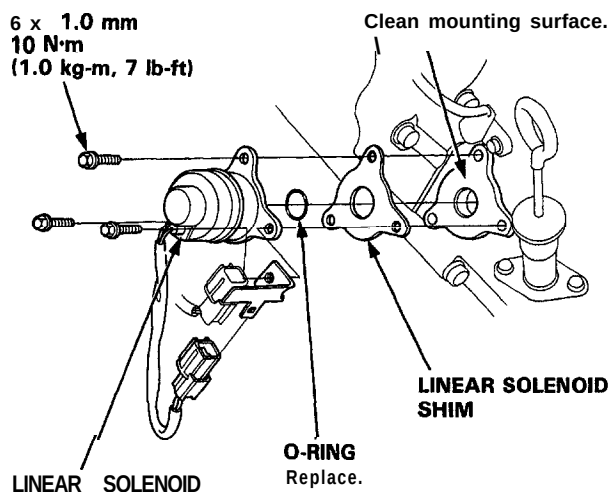
- Install the linear solenoid within 10 minute of applying the liquid gasket.
- After installation, wipe off any liquid gasket, that squeezed out from around the linear solenoid shlm.

NOTE:

- Check that the mounting surfaces are clean and dry before applying liquid gasket. Degrease if necessary.
- Apply the liquid gasket evenly.
- Do not install the parts if 10 minutes or more has passed since you first applied the liquid gasket. If 10 minutes has passed, reapply liquid gasket after removing the residue.
- Wait at least 30 minutes before filling with oil.



- Install the linear solenoid and shim to the transmission housing.

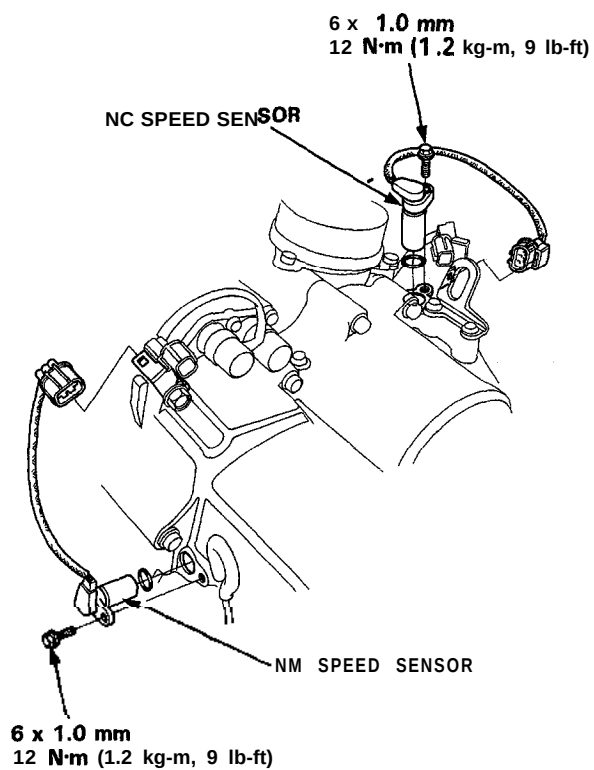




A/T Speed Sensors

• 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.



Symptom-to-Component Chart

Hydraulic System (cont'd)

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	K, L, R, S
Car <i>moves</i> in R, 2 and 3, but not in D or 1.	8, 29, 44, 48	C, M, O
Car moves in D, 2, 1, R but not in 3.	10, 31	C, L
Car moves in D, 3, 1, R but not in 2.	9, 30, 49	C, L
Car moves in D, 3, 2, 1, but not in R.	1, 11, 22, 34, 38, 39, 40	C, L, Q
Car moves in N.	1, 8, 10, 911, 46, 47	C, D
Excessive idle vibration.	5, 17	B, K, L
Slips in all gears.	6, 7, 16	C, L, u
No engine braking in ☐ position.	12	C, D, L
Slips in 1st gear.	8, 29, 44, 48	C, N, O, U
Slips in 2nd gear.	9, 20, 23, 30, 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.	11, 32, 34	C
Flares on 1-2 upshift.	3, 15	E, L, V
Flares on 2-3 upshift.	3, 15, 24, 44	E, L, V
Flares on 3-4 upshift.	3, 15, 25, 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, 4, 15, 23, 24, 27, 47	A, E, H, I, L, V
Harsh shift (1-2).	2, 9	C, D, V
Harsh shift (2-3).	2, 10, 23, 24	C, D, H, L, V
Harsh shift (3-4).	2, 11, 23, 25	C, D, I, L, V
Harsh kickdown shifts.	2, 23, 27, 28	L, V, Q
Harsh kickdown shift (2-1).	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, 38, 39, 40	K, L, Q
Loud popping noise when taking off in R.	38, 39, 40	L, Q
Ratcheting noise when shifting from R to P or from R to N.	38, 39, 40, 45	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).	38, 42	L, Q
Trans will not shift into 4th gear in D.	1, 21, 28, 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.	Linear solenoid shim too thin.
3.	Linear solenoid shim too thick.
4.	Wrong type ATF.
5.	Idle rpm too low/high.
6.	Oil pump worn or binding.
7.	Pressure regulator stuck.
8.	1 st 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 B valve 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.	3rd orifice control valve stuck.
26.	3-2 kickdown valve stuck.
27.	3rd kickdown valve stuck.
28.	4th exhaust valve stuck.
29.	1 st accumulator defective.
30.	2nd clutch accumulator defective.
31.	3rd clutch accumulator defective.
32.	4th/reverse accumulator defective.
33.	1st hold clutch accumulator defective.
34.	Servo valve stuck.
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.



NOTES	
L.	If the oil screen is clogged with particles of steel or aluminum, inspect the oil pump and differential clutch and planetary gear assembly. If both are OK and no cause for the contamination is found, replace the torque converter.
M.	If the 1st clutch feedpipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the trnsmisison housing. If OK, replace the end 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 4th feedpipe are loose or damaged. If the 1st feedpipe is damaged or out of round, replace it. If the 4th feedpipe is damaged or out of round, replace the end cover.
O.	A worn or damaged sprag clutch is mostly a result of shifting the trans in D while the wheels

Symptom-to-Component Chart

- Hydraulic System (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.	RI, R2	
Car does not move in D.	R4	
Trans locks up in R.	R3, R12	
Excessive drag in trans.	R6	R, K
Excessive vibration, rpm related.	R7	
Noise with wheels moving only.	R5	
Main seal pops out.	R6	S
Various shifting problems.	R9, R10	
Harsh upshifts.	RI1	

PROBABLE CAUSE DUE TO IMPROPER REPAIR

RI.	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.
RIO.	Valves improperly installed.
RI 1.	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 2nd orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I.	If the 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 main valve body and torque converter case may cause oil pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeek.



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, 3, D and R position.

NOTE: Stall speed test must be made only for checking the cause of trouble.

Stall Speed RPM: Specification: 1,950–2,250 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in 2 position	. Low fluid level or oil pump output . Clogged oil strainer . Pressure regulator valve stuck closed . Slippage of 2nd clutch
Stall rpm high in 1 position	. Slippage of 1st clutch or 1st hold clutch
Stall rpm high in 3 position	. Slippage of 3rd clutch
Stall rpm high in D position	. Slippage of 1 st clutch or 1 st gear one-way clutch
Stall rpm high in R position	. Slippage of 4th clutch
Stall rpm low in 2 position	. Engine output low . Torque converter one-way clutch slipping

Pressure

Testing

⚠ WARNING

- While testing, be careful of the rotating rear wheels.
- Make sure lifts 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 I-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)

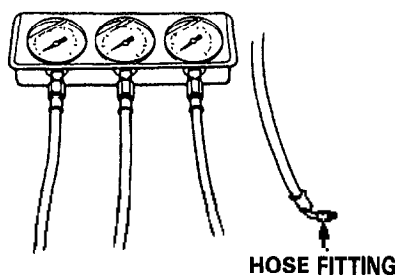
CAUTION: Connect the oil pressure gauge securely, being sure not to allow dust and other foreign particles to enter the inspection hole.

A/T OIL PRESSURE GAUGE SET

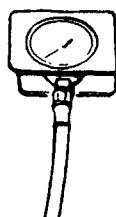
07406-0020003

A/T OIL PRESSURE GAUGE REPLACEMENT HOSE

07406-0020201



HOSE FITTING



A/T LOW PRESSURE GAUGE
07406-0070000

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)

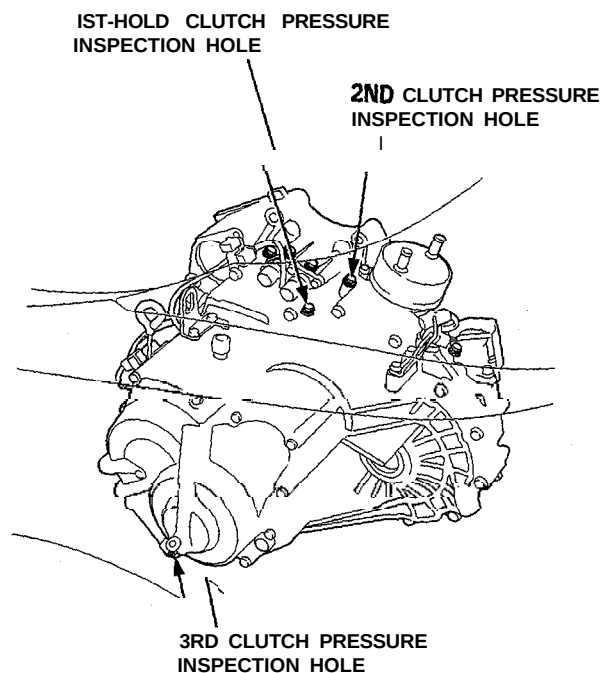
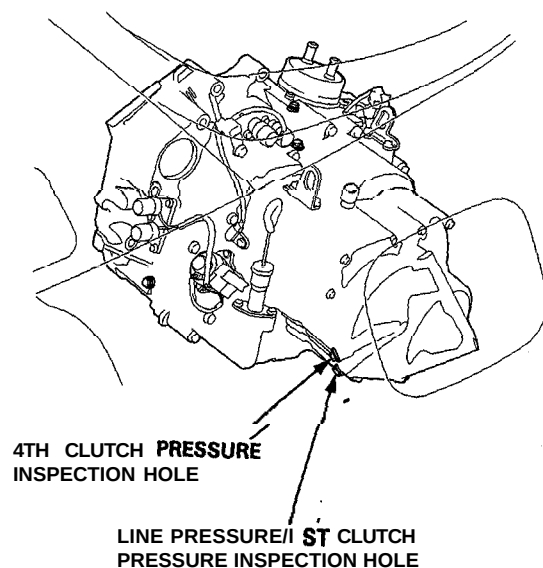
NOTE: Do not reuse old aluminum washers.

- Line Pressure/Clutch Pressure Measurement

- 1. Allow the rear wheels to rotate freely.
- 2. Run the engine at 2,000 rpm.
- 3. Shift the select lever as shown on the chart on the next page.
- 4. Measure each clutch pressure.

⚠ WARNING

While testing, be careful of the rotating rear wheels.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line/1st Clutch	D or 1	No or low line/1st pressure	Torque converter, oil pump pressure regulator, torque converter check valve, oil pump, 1st Clutch	834-883 kPa (8.5-9.0 kg/cm ² , 121-128 psi)	785 kPa (8.0 kg/cm ² , 114 psi)
1st hold Clutch	1	No or low 1st hold pressure	1st Hold Clutch		
2nd Clutch	2	No or low 2nd pressure	2nd Clutch		
3rd Clutch	3	No or low 3rd pressure	3rd Clutch		
2nd Clutch	D	No or low 2nd pressure	2nd Clutch	490 kPa (5.0 kg/cm ² , 71 psi)	441 kPa (4.5 kg/cm ² , 64 psi)
3rd Clutch		No or low 3rd pressure	3rd Clutch	(throttle fully closed) 883 kPa (9.0 kg/cm ² , 128 psi)	(throttle fully closed) 785 kPa (8.0 kg/cm ² , 114 psi)
4th Clutch		No or low 4th pressure	4th Clutch	(throttle more than 2/8 opened)	(throttle more than 2/8 opened)
	R		Servo valve or 4th Clutch	834-883 kPa (8.5-9.0 kg/cm ² , 121-128 psi)	785 kPa (8.0 kg/cm ² , 114 psi)

(cont'd)

Pressure

Testing (cont'd)

● Clutch Low/High Pressure Measurement

- 1. Allow the rear wheels to rotate freely.
- 2. Start the engine and let it idle.
- 3. Shift the select lever to D 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.

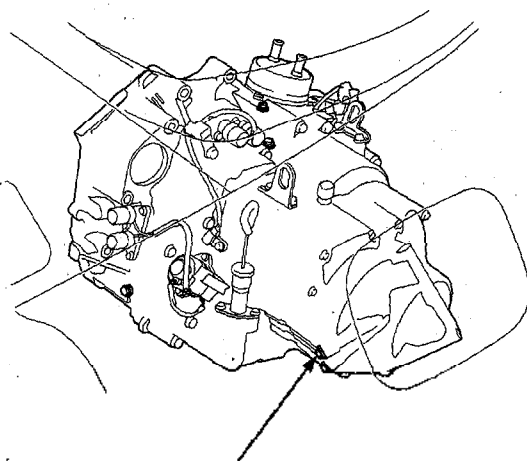
⚠ WARNING While testing, be careful of the rotating rear wheels.

- 5. Repeat step -4 for each clutch pressure being inspected.

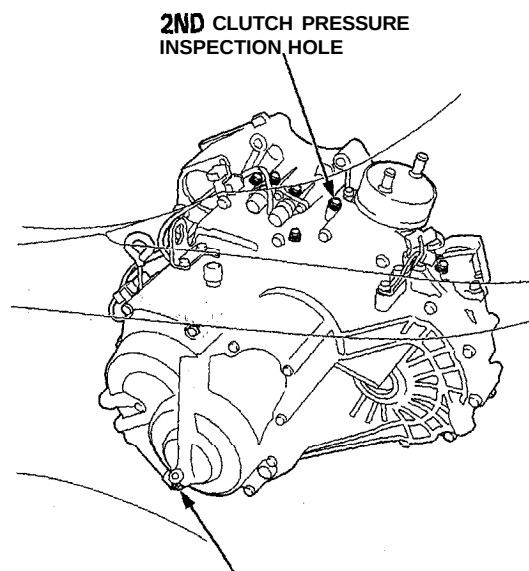
- 6. With the engine idling, press down the accelerator pedal approximately 1/2 of its possible travel and increase the engine rpm until pressure is indicated on the gauge, measure the highest pressure reading obtained.

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

- 7. Repeat step -6 for each clutch pressure being inspected.



4TH CLUTCH PRESSURE
INSPECTION HOLE



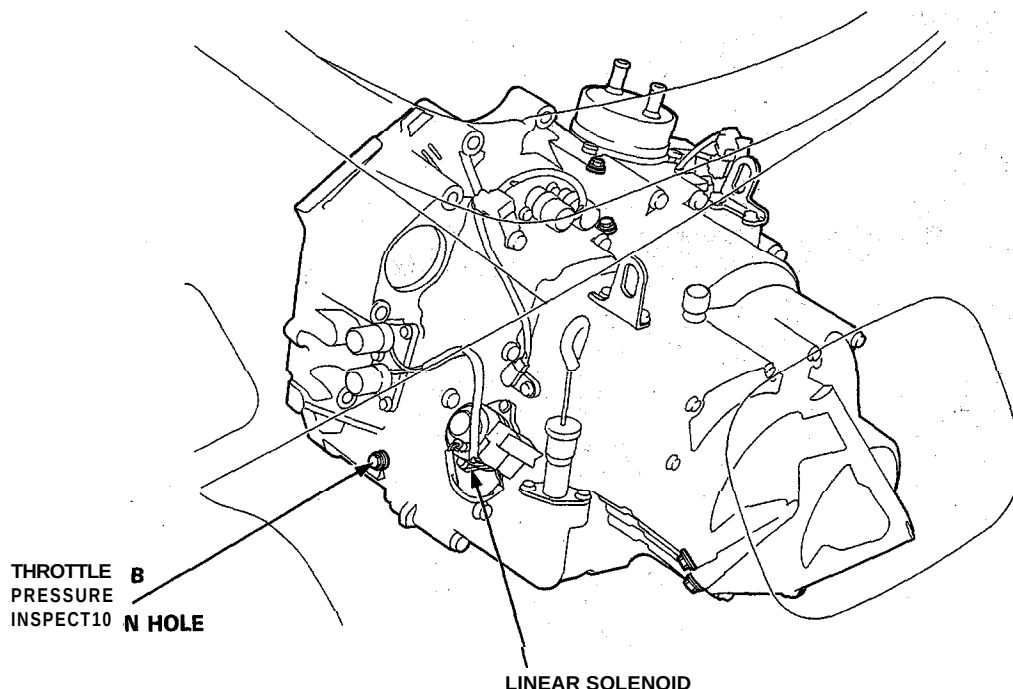
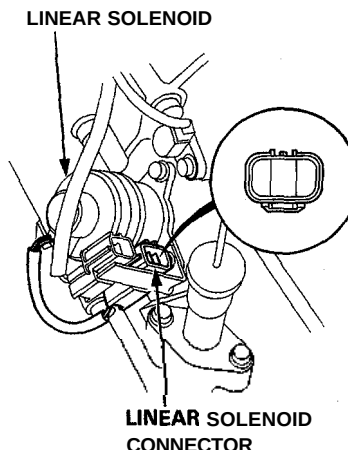
3RD CLUTCH PRESSURE
INSPECTION HOLE

PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2nd Clutch	D	No or low 2nd pressure	2nd Clutch	490-883 kPa (5.0-9.0 kg/cm ² , 71-128 psi) varies with throttle opening	441 kPa (4.5 kg/cm ² , 64 psi) with accelerator pedal released 785 kPa (8.0 kg/cm ² , 114 ps) with accelerator ped more than 2/8 open
3rd Clutch		No or low 3rd pressure	3rd Clutch		
4th Clutch		No or low 4th pressure	4th Clutch		



● Throttle B Pressure Measurement

- 1. Allow the rear wheels to rotate freely.
 - 2. Disconnect the linear solenoid connector.
 - 3. Shift the select lever to D position.
 - 4. Run the engine at 1,000 rpm.
 - 5. Measure full closed throttle B pressure.
- ⚠ WARNING** While testing, be careful of the rotating rear wheels.
- 6. Connect battery voltage to the linear solenoid.
 - 7. Measure full opened throttle B pressure.
- ⚠ WARNING** While testing, be careful of the rotating rear wheels.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Throttle B	D	Pressure too high	Linear Solenoid	0-15 kPa (0-0.15 kg/cm ² , 0-2 psi)	0-15 kPa 10-0.15 kg/cm ² , 0-2 psi)
		No or low pressure	Faulty throttle B valve	598-657 kPa (6.1-6.7 kg/cm ² , 87-95 psi)	598-657 kPa (6.1-6.7 kg/cm ² , 87-95 psi)

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 full and low marks. Push the dipstick all the way in to check the fluid level. If the level is at, or below, the low mark, add Honda Premium Formula Automatic Transmission Fluid or an equivalent DEXRON-II type automatic transmission fluid.

Changing

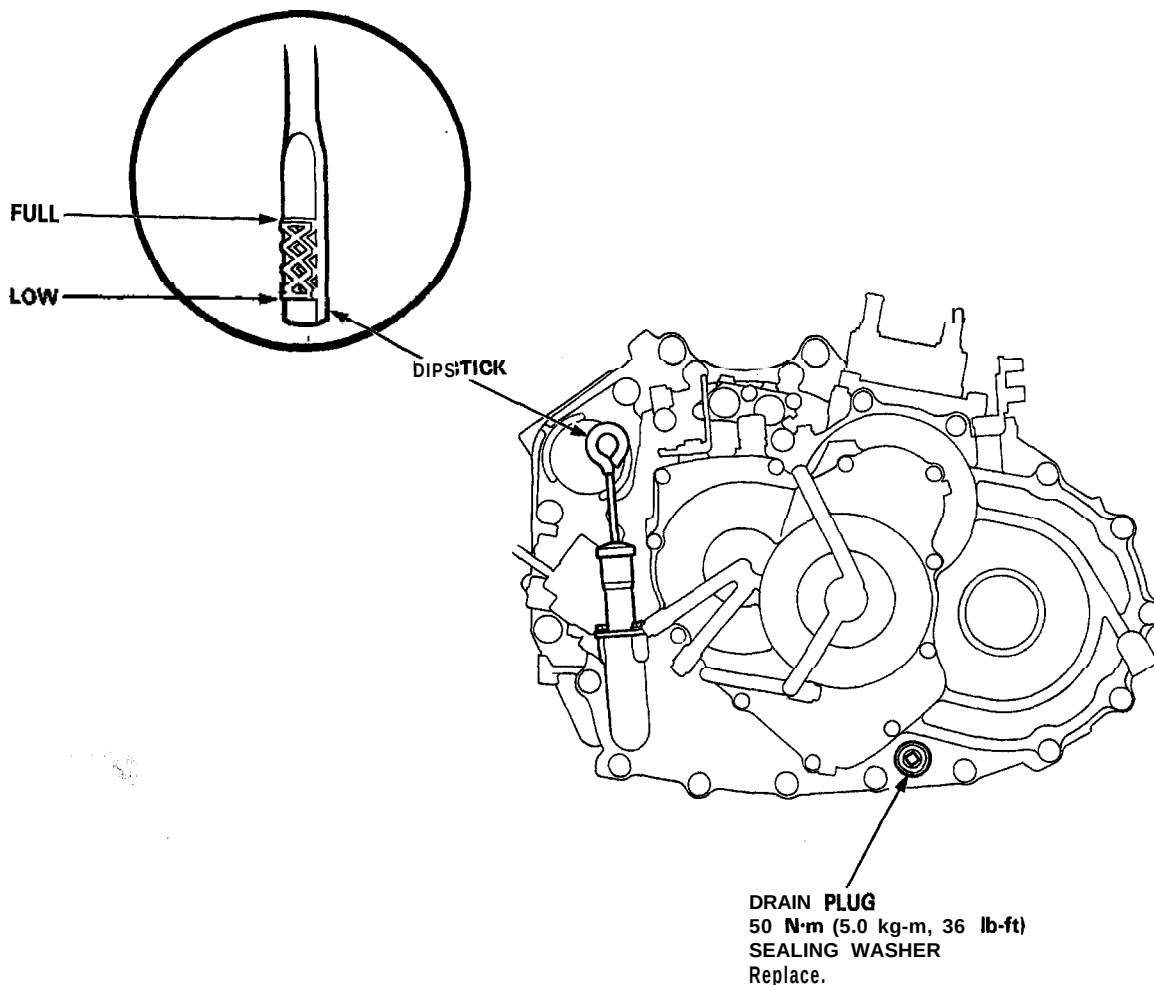
1. Bring the transmission up to operating temperature by driving the car. Park the car on level ground, turn the engine off, then remove drain plug.
2. Reinstall the drain plug with a new washer, then refill the transmission to the full mark on the dipstick.

Automatic Transmission Fluid Capacity:

2.9 l (3.1 US qt., 2.6 Imp. qt.) at change

7.0 l (7.4 US qt., 6.2 Imp. qt.) after overhaul

6.3 l (6.7 US qt., 5.5 Imp. qt.) after overhaul
with new torque
converter.





Transmission

-Removal

⚠ WARNING Make sure lifts are placed properly, and hoist brackets are attached to correct position. (See page I-6.)

CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Check and record the rear camber. (See Section 18.)
2. Disconnect the battery negative (–) first, and positive (+) cable from the battery.
3. Drain automatic transmission fluid (ATF). Reinstall the drain plug with a new washer.

NOTE: Removing the ATF level gauge will allow the ATF to drain more rapidly.

4. Remove the strut bar.

5. Remove the air cleaner case. (See Section 11.)

6. Remove the connectors from the control box and remove the control box.

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

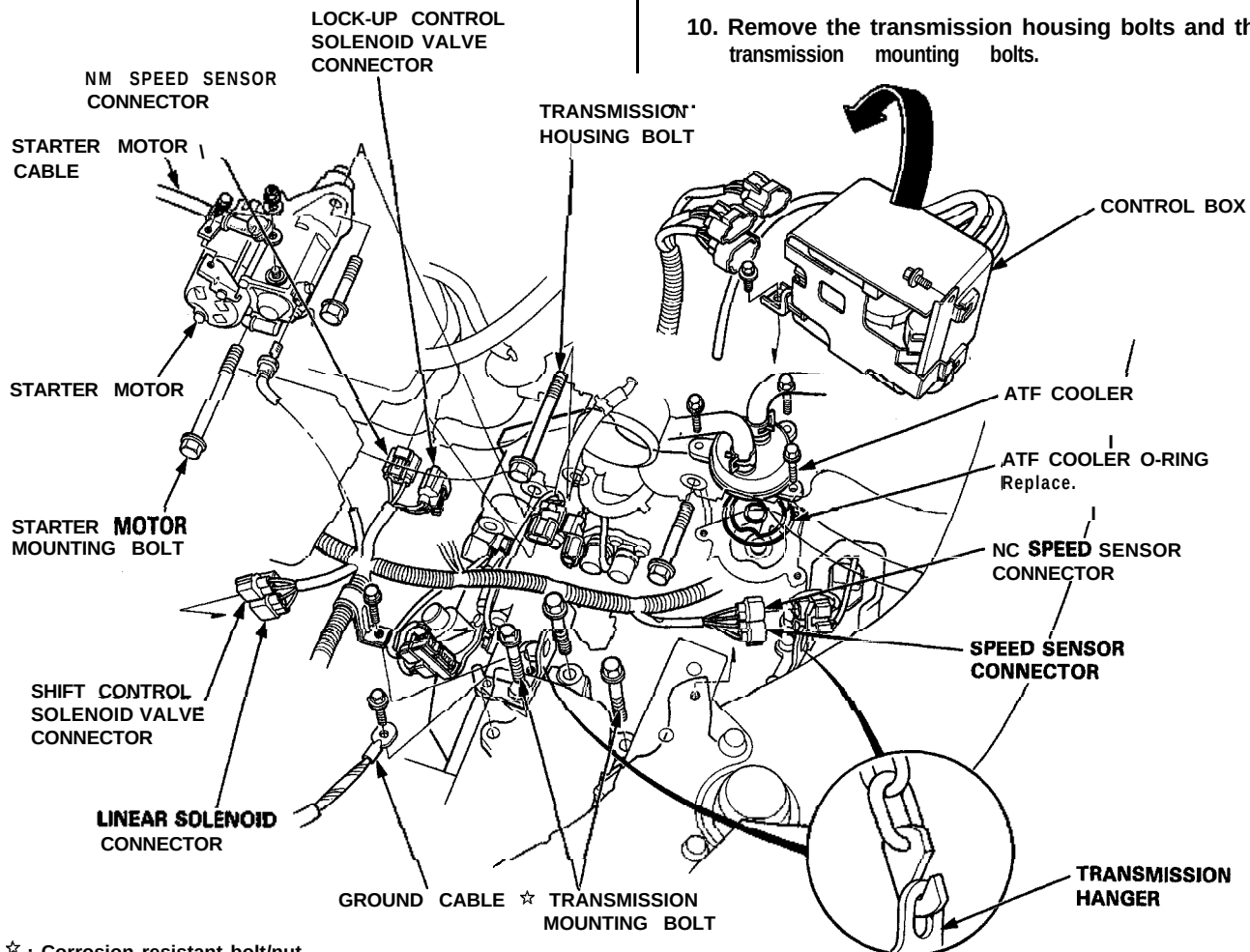
7. Remove the wire harness holder, disconnect the speed sensor wire connectors, solenoid valve wire connectors, starter motor cables and transmission ground cable.

8. Remove the ATF cooler as it is connected by the hoses.

CAUTION: Do not remove the hoses from the ATF cooler.

9. Remove the starter motor mounting bolts, then remove the starter motor.

10. Remove the transmission housing bolts and the transmission mounting bolts.

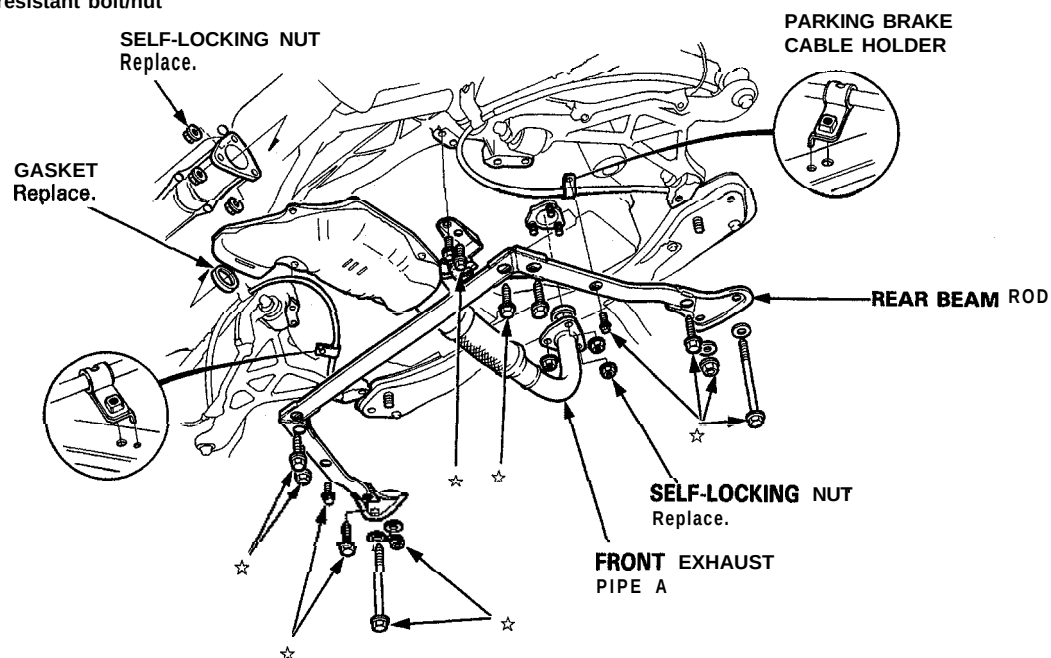


☆ : Corrosion resistant bolt/nut



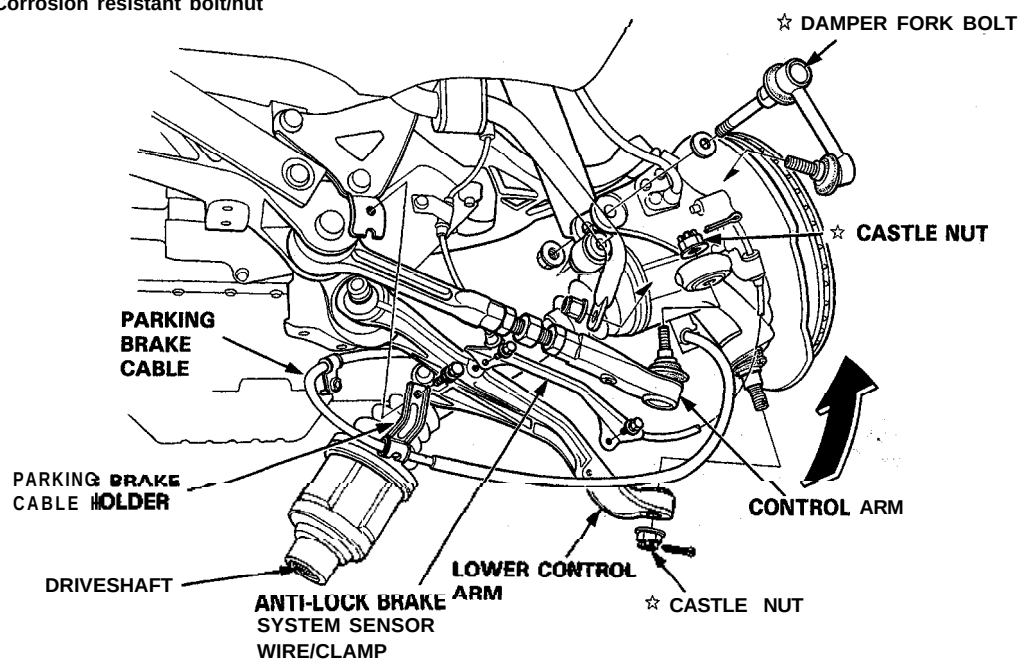
11. Remove the parking brake cable holders from the rear beam rod.
12. Remove the rear beam rod.
13. Remove the front exhaust pipe A.

☆ : Corrosion resistant bolt/nut



14. Remove the parking brake cable holder and the anti-lock brake system sensor wire clamp.
15. Remove the castle nut and separate the control arm from the knuckle (See Section 18).
16. Remove the damper fork bolt.
17. Remove the castle nut and separate the lower control arm from the knuckle (See Section 18).
18. Remove the right driveshaft from the intermediate shaft.

☆ : Corrosion resistant bolt/nut



(cont'd)

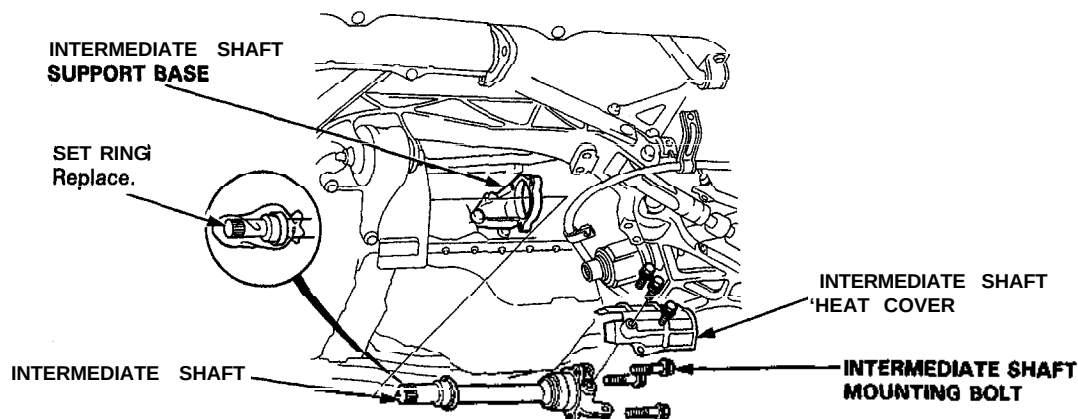
Transmission

- Removal (cont'd)

19. Remove the intermediate shaft heat cover and the intermediate shaft mounting bolts.
20. Pry the intermediate shaft out of the differential. Pull and remove it.

NOTE:

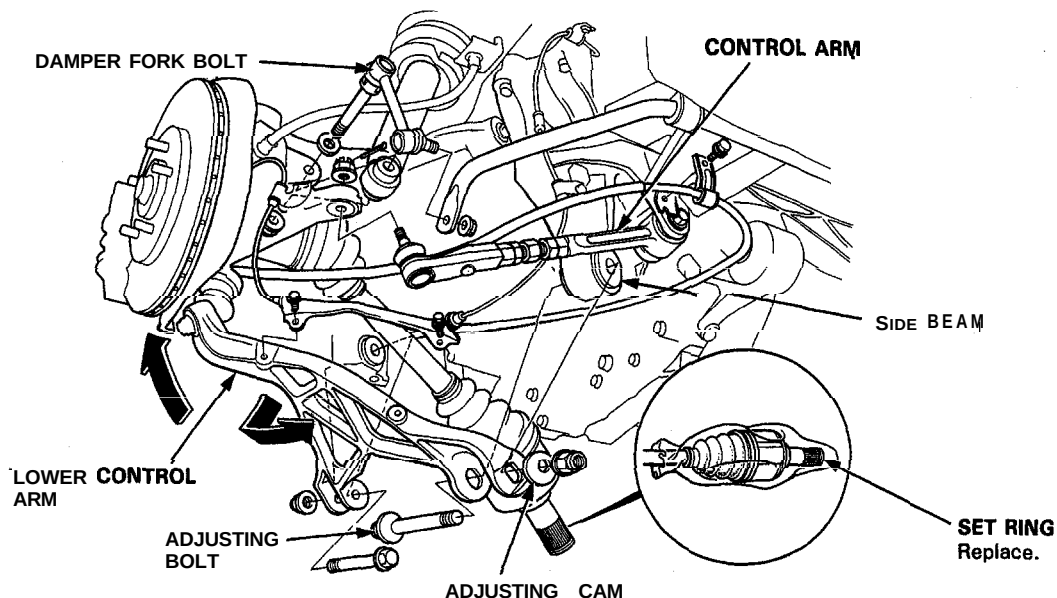
- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



31. Remove the parking brake cable holder and the anti-lock brake system sensor wire clamp.
32. Make a reference mark on the flange of the adjusting bolt, adjusting cam and lower control arm.
33. Remove the castle nut and separate the control arm from the knuckle (See Section 18).
34. Remove the damper fork bolt.
35. Remove the bolts and lower arm from the side beam.
36. Pry the driveshaft out of the differential. Pull and remove it.

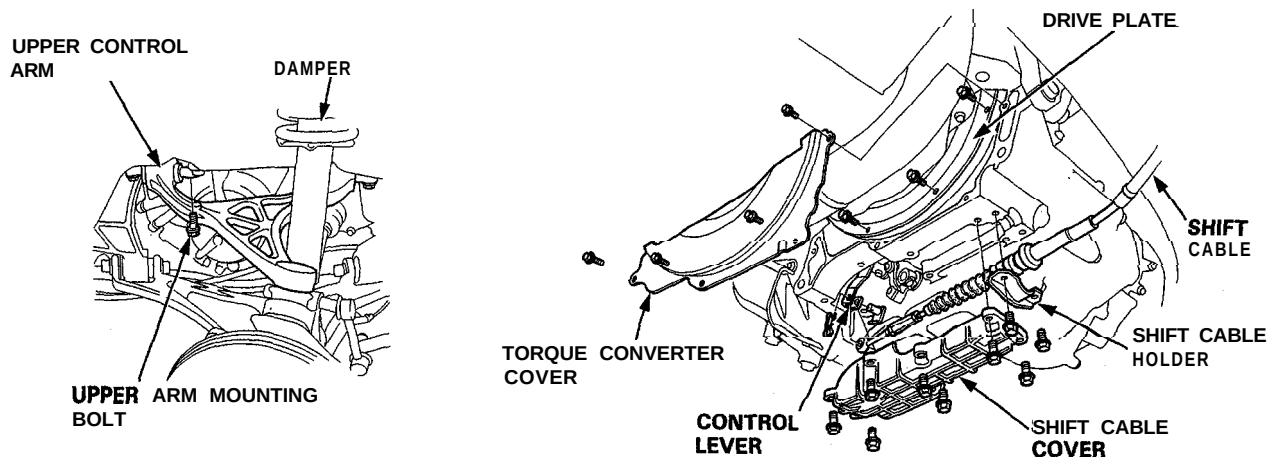
NOTE:

- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.

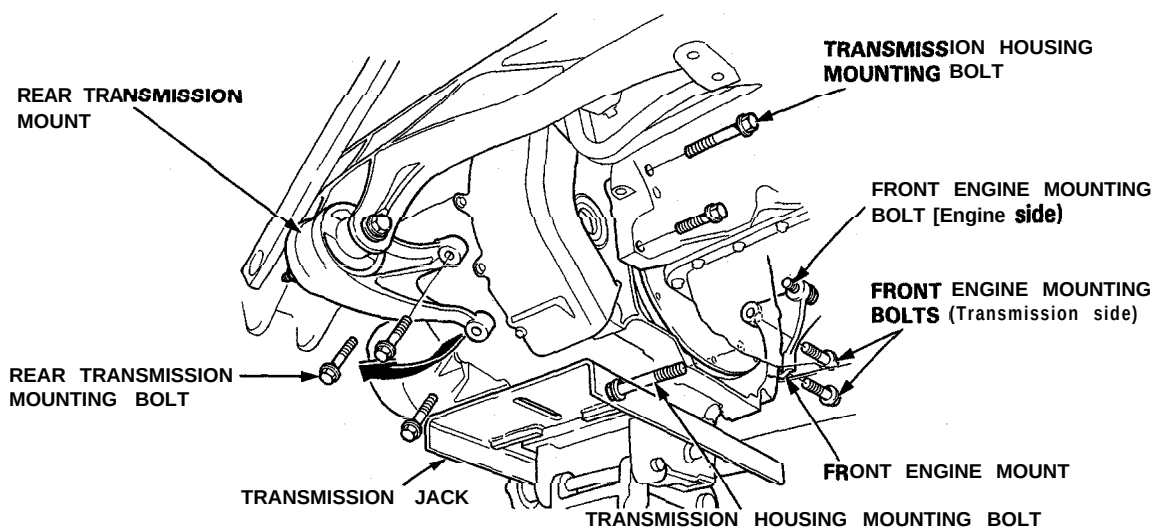




37. Remove the one bolt of the upper arm mounting bolts,
38. Remove the shift cable cover and shift cable holder.
39. Remove the shift cable from the control lever.
40. Remove the torque converter cover and then remove the drive plate bolts.

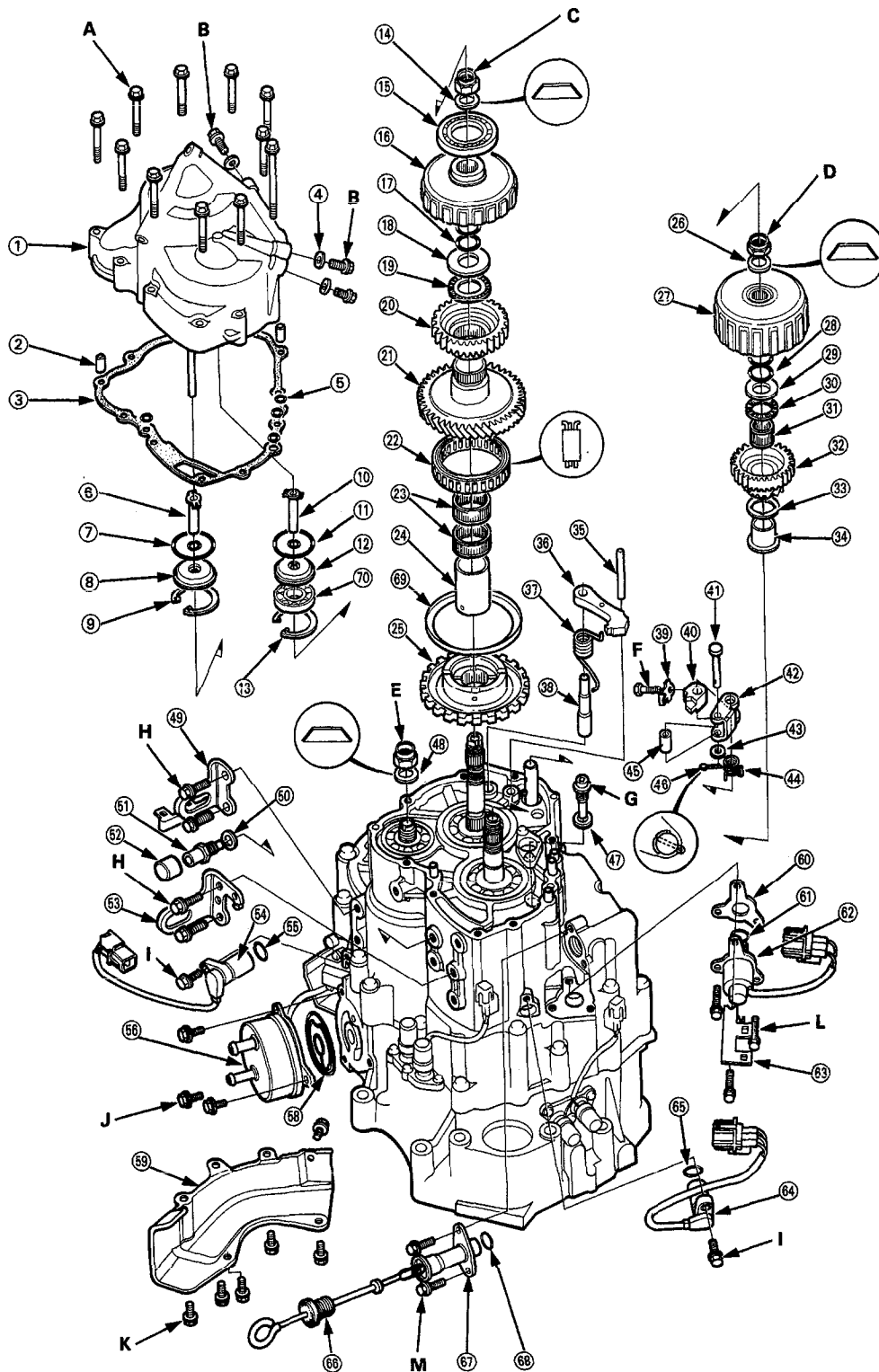


41. Attach a chain hoist to the transmission hangers.
42. Place a jack under the transmission and raise the transmission just enough to take weight off of the mounts.
43. Remove the front engine mounting bolts on the transmission side and retighten the bolt on the engine side.
CAUTION: Loosen the front engine mounting bolt on the engine side, but do not remove it. After removing the two bolts on the transmission side, be sure to retighten the bolt on the engine side.
44. Remove the rear transmission mounting bolts.
45. Remove the transmission housing mounting bolts..
46. Pull the transmission away from the engine until it clears the dowel pins, then lower it on the transmission jack.



Illustrated Index

L. Side Cover





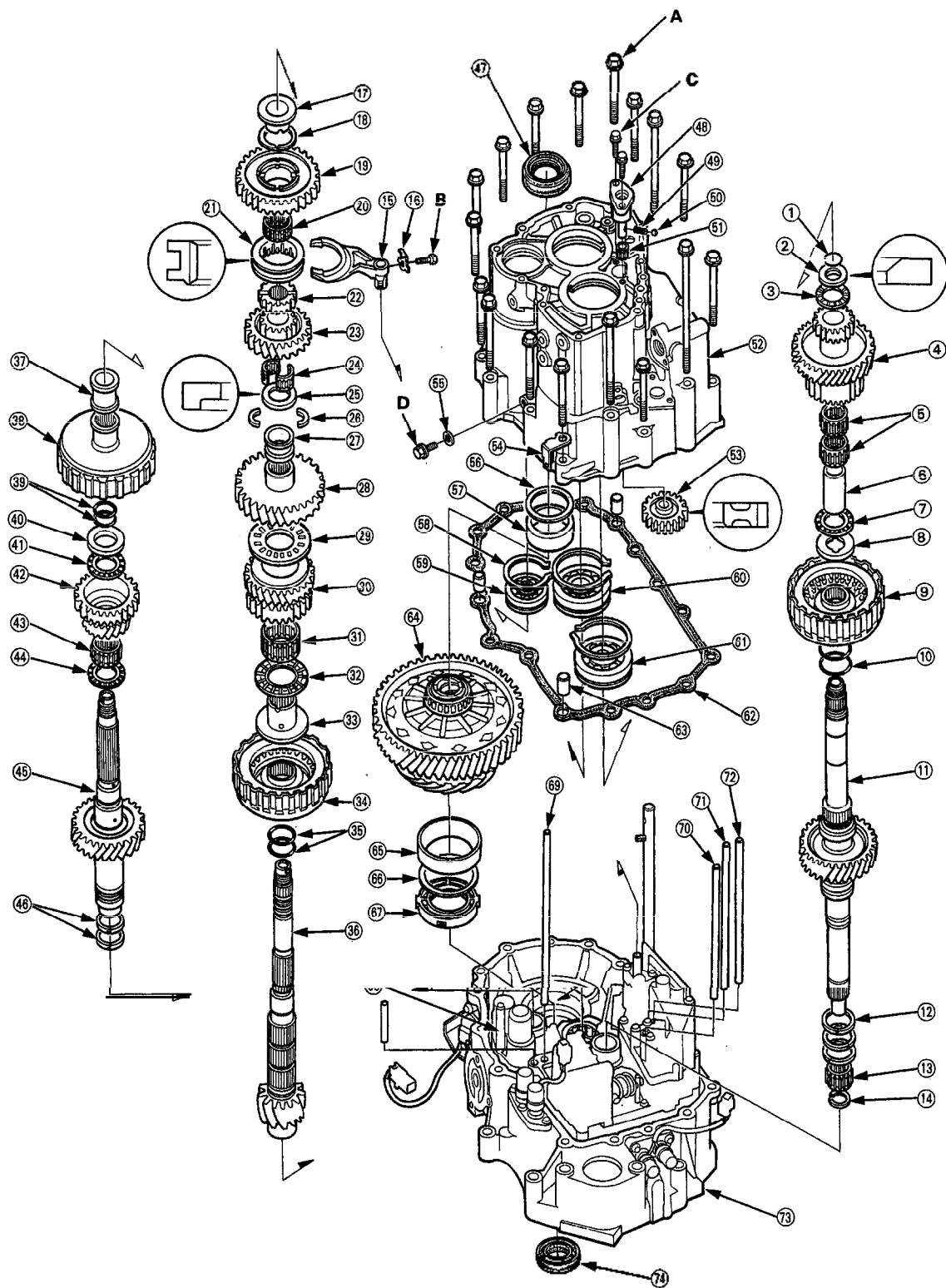
- ① L. SIDE COVER
- ② DOWEL PIN
- ③ GASKET Replace.
- ④ SEALING WASHER Replace.
- ⑤ O-RING Replace.
- ⑥ 1ST-HOLD CLUTCH FEED PIPE
- ⑦ O-RING Replace.
- ⑧ FEED PIPE FLANGE
- ⑨ SNAP RING
- ⑩ 1ST CLUTCH FEED PIPE
- ⑪ O-RING Replace.
- ⑫ FEED PIPE FLANGE
- ⑬ SNAP RING
- ⑭ DISC SPRING Replace.
- ⑮ BALL BEARING
- ⑯ IS+HOLD CLUTCH ASSEMBLY
- ⑰ O-RING Replace.
- ⑱ THRUST WASHER
- ⑲ THRUST NEEDLE BEARING
- ⑳ IST-HOLD CLUTCH HUB
- ㉑ COUNTERSHAFT 1ST GEAR
- ㉒ ONE-WAY CLUTCH
- ㉓ NEEDLE BEARING
- ㉔ COUNTERSHAFT 1ST GEAR COLLAR
- ㉕ PARKING GEAR
- ㉖ DISC SPRING Replace.
- ㉗ 1ST CLUTCH ASSEMBLY
- ㉘ O-RING Replace.
- ㉙ THRUST WASHER
- ㉚ THRUST NEEDLE BEARING
- ㉛ NEEDLE BEARING
- ㉜ MAINSHAFT 1ST GEAR
- ㉝ THRUST WASHER
- ㉞ MAINSHAFT 1ST GEAR COLLAR
- ㉟ PARKING BRAKE PAWL STOPPER

- ㊱ PARKING BRAKE PAWL
- ㊲ PARKING BRAKE PAWL SPRING
- ㊳ PARKING BRAKE PAWL SHAFT
- ㊴ LOCK WASHER Replace.
- ㊵ PARKING BRAKE STOPPER
- ㊶ ROLLER PIN
- ㊷ PARKING BRAKE LEVER
- ㊸ WASHER
- ㊹ PARKING BRAKE SPRING
- ㊺ ROLLER
- ㊻ COTTER PIN Replace.
- ㊼ SEALING WASHER Replace.
- ㊽ DISC SPRING Replace.
- ㊾ TRANSMISSION HANGER/CONNECTOR STAY
- ㊿ SEALING WASHER Replace.
- ① BREATHER JOINT
- ② BREATHER CAP
- ③ TRANSMISSION HANGER
- ④ NC SPEED SENSOR
- ⑤ O-RING Replace.
- ⑥ ATF COOLER
- ⑦ ATF COOLER FILTER/GASKET Replace.
- ⑧ SPEED SENSOR COVER
- ⑨ LINEAR SOLENOID SHIM
- ⑩ O-RING Replace.
- ⑪ LINEAR SOLENOID
- ⑫ CONNECTOR STAY
- ⑬ NM SPEED SENSOR
- ⑭ O-RING Replace.
- ⑮ ATF LEVEL GAUGE
- ⑯ ATF LEVEL GAUGE PIPE
- ⑰ O-RING Replace.
- ⑱ RETAINER PLATE
- ⑲ BALL BEARING

TORQUE SPECIFICATION

JO.	TORQUEVALUE	BOLT SIZE	REMARKS
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	OIL PRESSURE CHECK BOLT COUNTERSHAFT LOCKNUT (Left-hand threads)
B	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	
C	140→0→140 N·m (14.0→0→14.0 kg-m, 101→0→101 lb-ft)	24 x 1.25 mm	
D	140→0→140 N·m (14.0→0→14.0 kg-m, 101→0→101 lb-ft)	23 x 1.25 mm	MAINSHAFT LOCKNUT
E	140→0→140 N·m (14.0→0→14.0 kg-m, 101→0→101 lb-ft)	24 x 1.25 mm	SECONDARY SHAFT LOCKNUT
F	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	Special bolt (Replace.)
G	50 N·m (5.0 kg-m, 36 lb-ft)	18 x 1.5 mm	DRAIN PLUG
H	30 N·m (3.0 kg-m, 22 lb-ft)	8 x 1.25 mm	ATF COOLER BOLT
I	12 N·m (1.2 kg-m, 9 lb-ft)	6x 1.0mm	
J	30 N·m (3.0 kg-m, 22 lb-ft)	8 x 1.25 mm	
K	12 N·m (1.2 kg-m, 9 lb-ft)	6x 1.0mm	LINEAR SOLENOID BOLT
L	10 N·m (1.0 kg-m, 7 lb-ft)	6 x 1.0 mm	
M	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	

Illustrated Index
Transmission Housing





- ① SNAP RING
- ② WASHER
- ③ THRUST NEEDLE BEARING
- ④ MAINSHAFT 4TH GEAR
- ⑤ NEEDLE BEARING
- ⑥ MAINSHAFT 4TH GEAR COLLAR
- ⑦ THRUST NEEDLE BEARING
- ⑧ THRUST WASHER
- ⑨ 4TH CLUTCH ASSEMBLY
- ⑩ O-RING Replace.
- ⑪ MAINSHAFT
- ⑫ SEAL RING 37 mm
- ⑬ NEEDLE BEARING
- ⑭ SET RING
- ⑮ REVERSE SHIFT FORK
- ⑯ LOCK WASHER Replace.
- ⑰ COUNTERSHAFT REVERSE GEAR COLLAR
- ⑱ THRUST WASHER
- ⑲ NEEDLE BEARING
- ⑳ COUNTERSHAFT REVERSE GEAR
- ㉑ REVERSE SELECTOR
- ㉒ REVERSE SELECTOR HUB
- ㉓ COUNTERSHAFT 4TH GEAR
- ㉔ NEEDLE BEARING (Separate type)
- ㉕ COTTER RETAINER
- ㉖ COTTER
- ㉗ COUNTERSHAFT 2ND GEAR SPACER
- ㉘ COUNTERSHAFT 2ND GEAR
- ㉙ THRUST NEEDLE BEARING
- ㉚ COUNTERSHAFT 3RD GEAR
- ㉛ NEEDLE BEARING
- ㉜ THRUST NEEDLE BEARING
- ㉝ COUNTERSHAFT 3RD GEAR COLLAR
- ㉞ 3RD CLUTCH ASSEMBLY
- ㉟ O-RING Replace.
- ㊱ COUNTERSHAFT
- ㊲ SPACER 31 mm

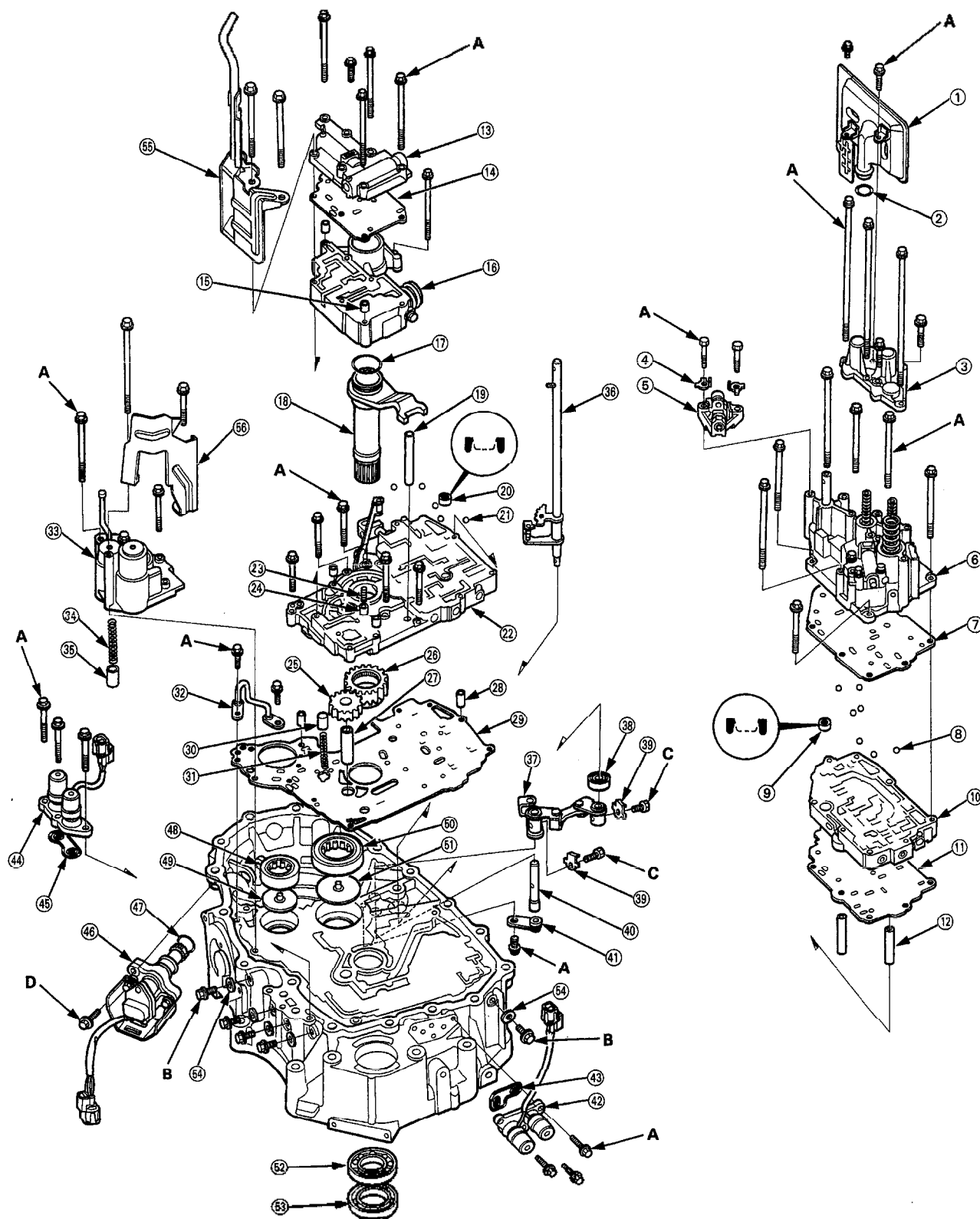
- ㊳ 2ND CLUTCH ASSEMBLY
- ㊴ O-RING Replace.
- ㊵ THRUST WASHER
- ㊶ THRUST NEEDLE BEARING
- ㊷ SECONDARY SHAFT 2ND GEAR
- ㊸ NEEDLE BEARING
- ㊹ THRUST NEEDLE BEARING
- ㊺ SECONDARY SHAFT
- ㊻ SEAL RING 35 mm
- ㊼ DIFFERENTIAL OIL SEAL Replace.
- ㊽ REVERSE IDLER GEAR SHAFT/HOLDER
- ㊾ REVERSE IDLER GEAR SHAFT SPRING
- ㊿ STEEL BALL
- ① NEEDLE BEARING
- ② TRANSMISSION HOUSING
- ③ REVERSE IDLER GEAR
- ④ CONNECTOR STAY
- ⑤ SEALING WASHER Replace.
- ⑥ THRUST SHIM
- ⑦ BEARING OUTER RACE
- ⑧ SNAP RING
- ⑨ SECONDARY SHAFT BALL BEARING
- ⑩ COUNTERSHAFT BALL BEARING
- ⑪ MAINSHAFT BALL BEARING
- ⑫ GASKET Replace.
- ⑬ DOWEL PIN
- ⑭ DIFFERENTIAL GEAR ASSEMBLY
- ⑮ BEARING OUTER RACE
- ⑯ THRUST SHIM
- ⑰ DIFFERENTIAL OIL GUIDE RING
- ⑱ 2ND CLUTCH FEED PIPE
- ⑲ IST-HOLD CLUTCH FEED PIPE
- ⑳ 4TH CLUTCH FEED PIPE
- ㉑ 1ST CLUTCH FEED PIPE
- ㉒ 3RD CLUTCH FEED PIPE
- ㉓ TORQUE CONVERTER HOUSING
- ㉔ DIFFERENTIAL OIL SEAL Replace.

TORQUE SPECIFICATION

No.	TORQUE VALUE	BOLT SIZE	REMARKS
A	55 N·m 15.5 kg-m, 40 lb-ft)	10 x 1.25 mm	
B	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	Special bolt (Replace.)
C	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0mm	
D	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	OIL PRESSURE CHECK BOLT

Illustrated Index

Torque Converter Housing/Valve Body





- ① ATF STRAINER Replace or clean.
- ② O-RING Replace.
- ③ ACCUMULATOR COVER
- ④ LOCK WASHER Replace.
- ⑤ SERVO DETENT BASE
- ⑥ SERVO VALVE BODY
- ⑦ SERVO SEPARATOR PLATE
- ⑧ CHECK BALLS
- ⑨ SECONDARY VALVE BODY FILTER Replace.
- ⑩ SECONDARY VALVE BODY
- ⑪ SECONDARY SEPARATOR PLATE
- ⑫ DOWEL PIN
- ⑬ LOCK-UP VALVE BODY
- ⑭ LOCK-UP SEPARATOR PLATE
- ⑮ DOWEL PIN
- ⑯ REGULATOR VALVE BODY
- ⑰ O-RING Replace.
- ⑱ **STATOR** SHAFT ASSEMBLY
- ⑲ STOPPER PIN
- ⑳ MAIN VALVE BODY FILTER Replace.
- ㉑ CHECK BALLS
- ㉒ MAIN VALVE BODY
- ㉓ ONE-WAY RELIEF VALVE SPRING
- ㉔ ONE-WAY RELIEF VALVE
- ㉕ OIL PUMP DRIVEN GEAR
- ㉖ OIL PUMP DRIVE GEAR
- ㉗ OIL PUMP DRIVEN GEAR SHAFT
- ㉘ DOWEL PIN

- ㉙ MAIN SEPARATOR PLATE
- ㉚ TORQUE CONVERTER CHECK VALVE
- ㉛ TORQUE CONVERTER CHECK VALVE SPRING
- ㉜ ATF LUBRICATION PIPE
- ㉝ 2ND ACCUMULATOR BODY
- ㉞ LSD RELIEF VALVE SPRING
- ㉟ LSD RELIEF VALVE
- ㊱ CONTROL SHAFT
- ㊲ CONTROL LEVER
- ㊳ OIL SEAL Replace.
- ㊴ LOCK WASHER Replace.
- ㊵ CHANGE SHAFT
- ㊶ CHANGE SHAFT CAP
- ㊷ SHIFT CONTROL SOLENOID VALVE ASSEMBLY
- ㊸ SHIFT CONTROL SOLENOID FILTER/GASKET Replace.
- ㊹ LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY
- ㊺ LOCK-UP CONTROL SOLENOID FILTER/GASKET Replace.
- ㊻ SPEED SENSOR ASSEMBLY
- ㊼ O-RING Replace.
- ㊽ SECONDARY SHAFT NEEDLE BEARING Replace.
- ㊾ OIL GUIDE PLATE Replace.
- ㊿ COUNTERSHAFT NEEDLE BEARING Replace.
- ① OIL GUIDE PLATE Replace.
- ② MAINSHAFT BALL BEARING Replace.
- ③ MAINSHAFT OIL SEAL Replace.
- ④ SEALING WASHER Replace.
- ⑤ 4TH OIL GUIDE PLATE/PIPE
- ⑥ 3RD OIL GUIDE PLATE

TORQUE SPECIFICATION

No.	TORQUE VALUE	BOLT SIZE	REMARKS
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0mm	OIL PRESSURE CHECK BOLT Special bolt
B	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	
C	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	
D	30 N·m (3.0 kg-m, 22 lb-ft)	8 x 1.25 mm	

L. Side Cover

- Removal

NOTE:

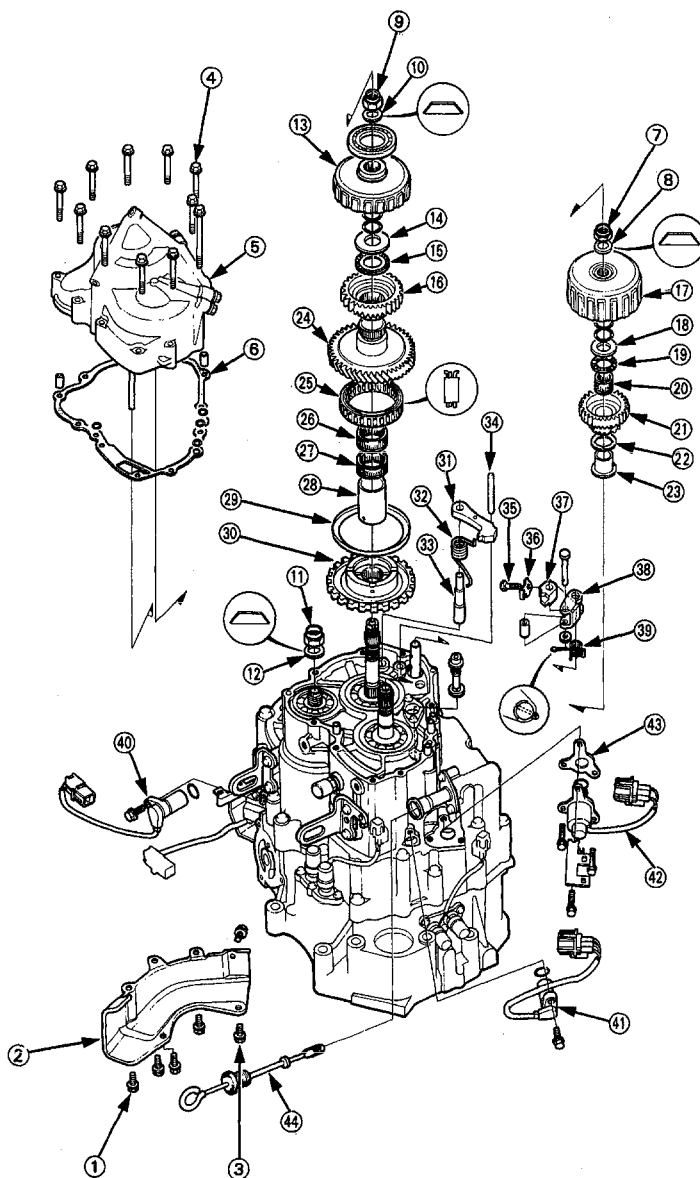
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Cut the lock tab and raise it, then remove the locknut of each shaft.
- Countershaft locknut has left-hand threads.

1. Remove the speed sensor cover, then reinstall three bolts around the driveshaft oil seal.
CAUTION: Do not damage the driveshaft oil seal lip.

2. Slip the special tool onto the mainshaft and engage the parking brake pawl with the parking gear.

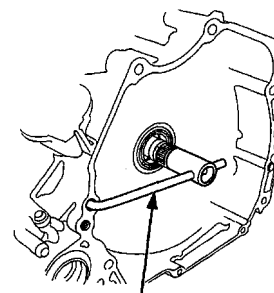
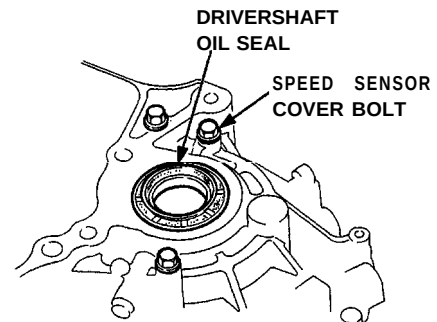
3. Remove the transmission L. Side Cover in the following numbered sequence.

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



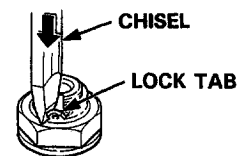
Reinstall 3 bolts around the driveshaft oil seal.

CAUTION: Protect the lip of the driveshaft oil seal by reinstalling three bolts, after removing the speed sensor cover.



**MAINSHAFT HOLDER
07924-PJ40000**

NOTE: Using a chisel, cut the lock tab. Pry it up and then remove the locknut from each shaft.





Transmission Housing

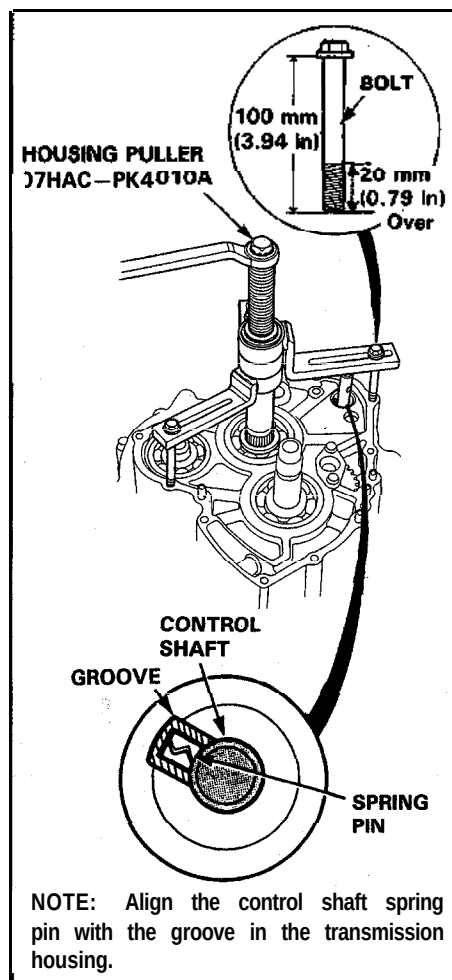
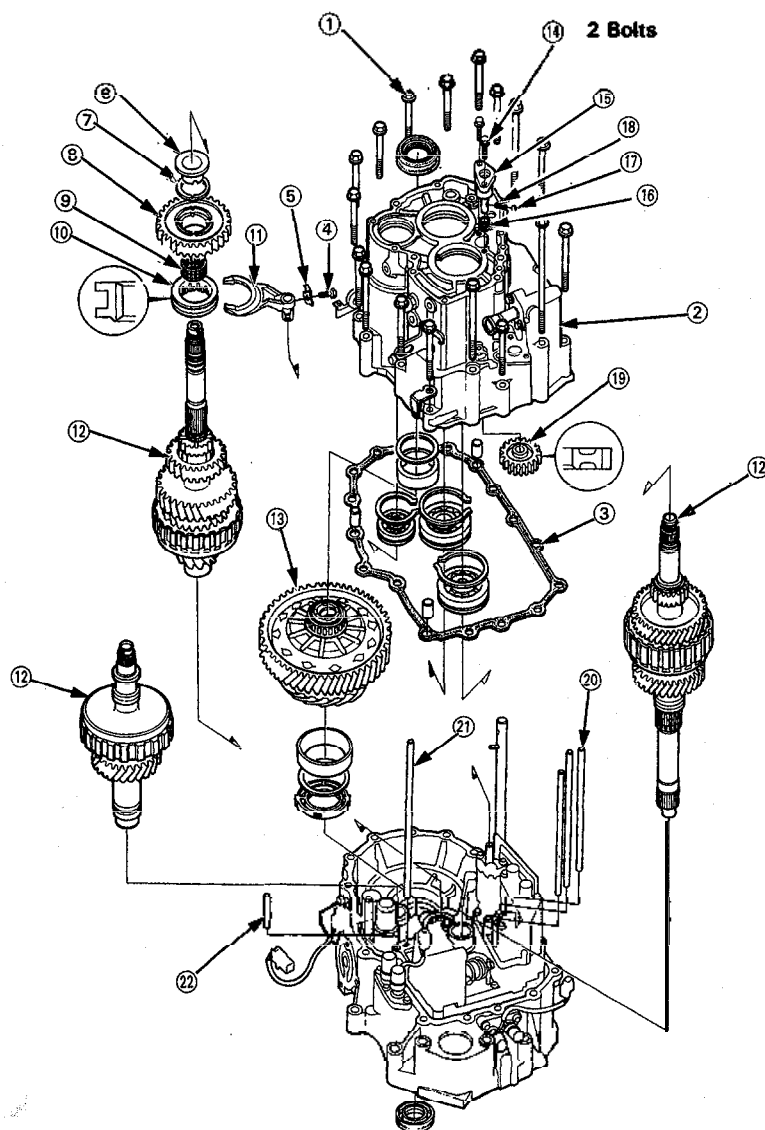
- Removal

NOTE:

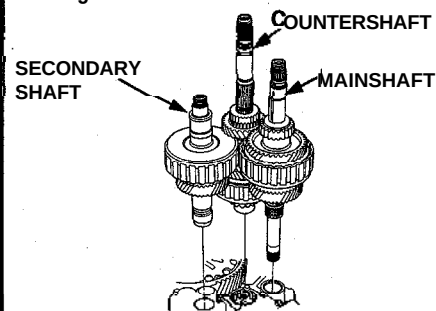
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Steel ball in reverse idler gear shaft is under spring pressure, take care not to let it pop out.

1. Remove the transmission housing in the following numbered sequence.

CAUTION: Set the special tool with **bolts** as shown.



- 12 NOTE: Remove three shafts together.



Valve Body

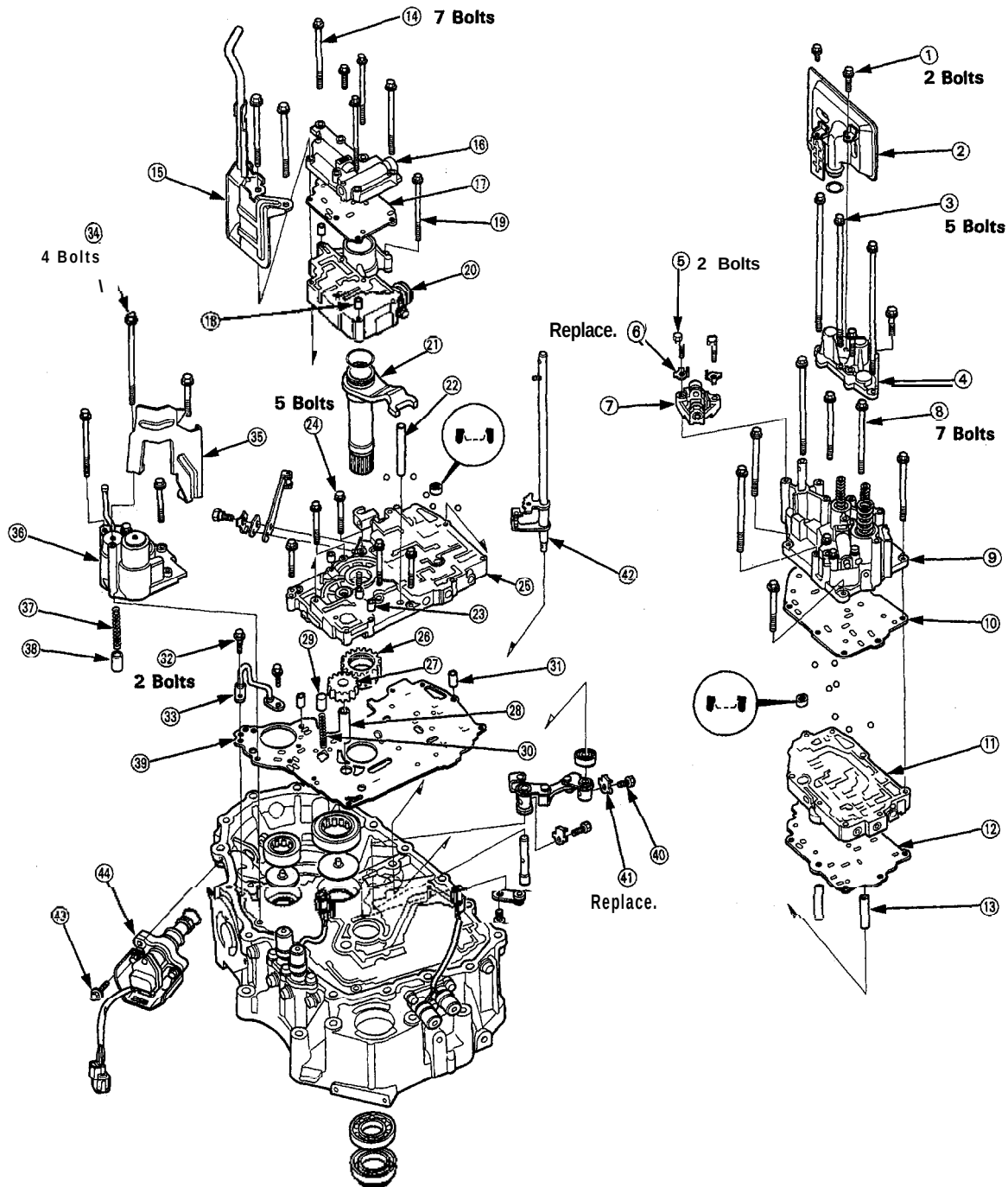
• Removal

NOTE:

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

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

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



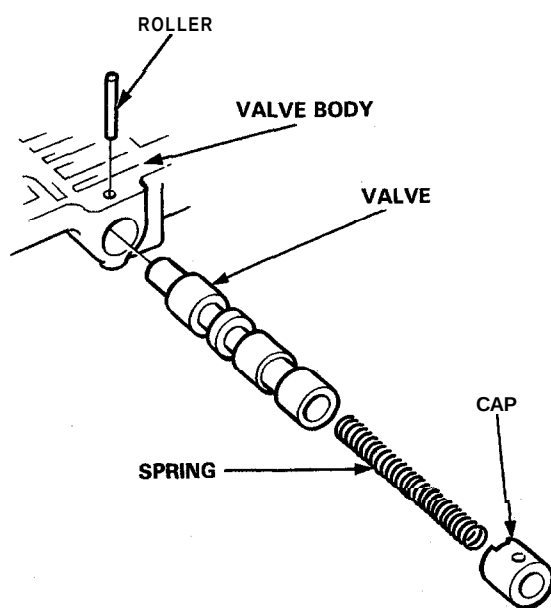
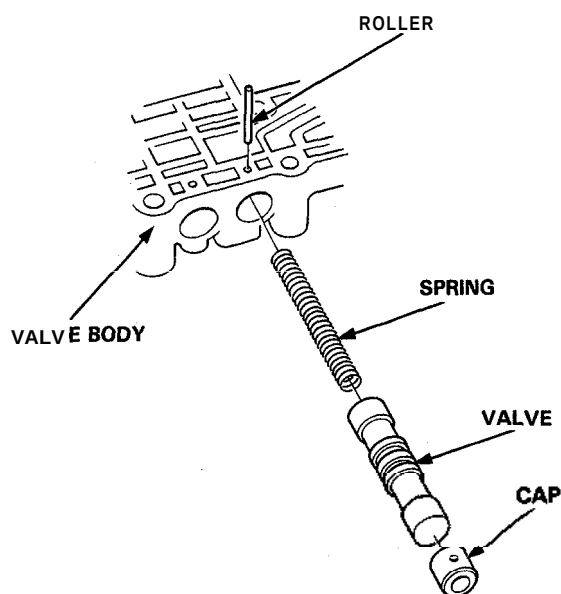


Valve

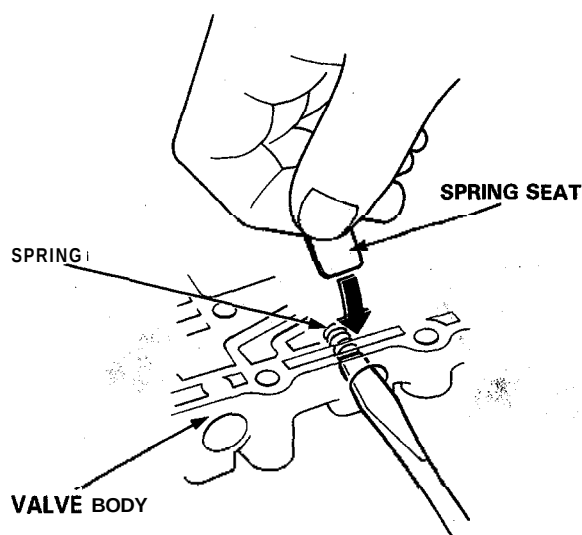
- Assembly

NOTE: Coat all parts with ATF before assembly.

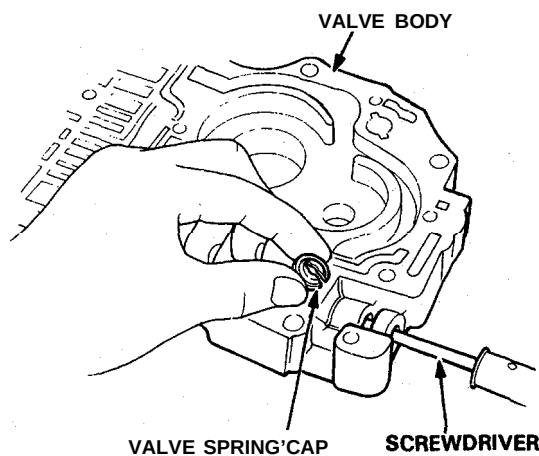
1. Install the valve, valve spring and cap in the valve body and secure with the roller.



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.



3. Set the spring in the valve and install it in the valve body. Install the spring with a screwdriver, then install the valve cap with the cutout aligned with the screwdriver.



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.

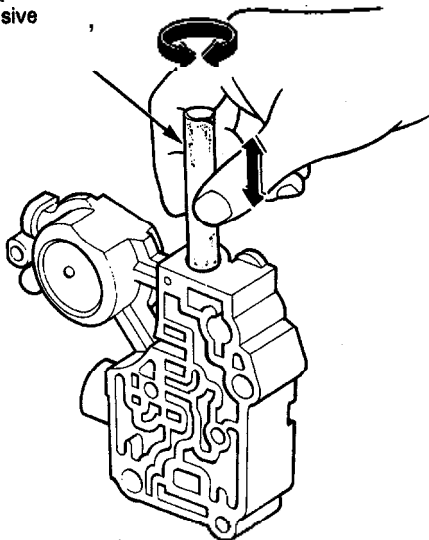
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

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.

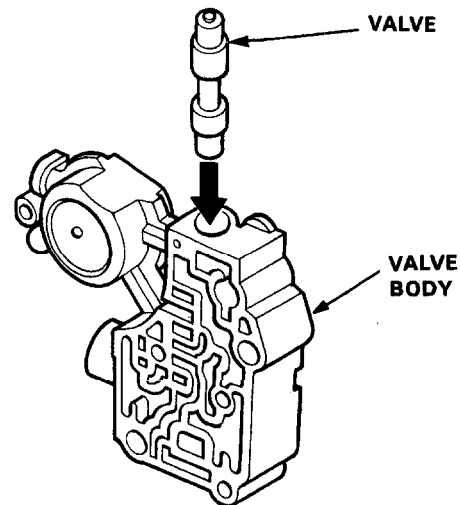
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked paper and insert it in the valve bore of the sticking valve. Twist the paper slightly,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



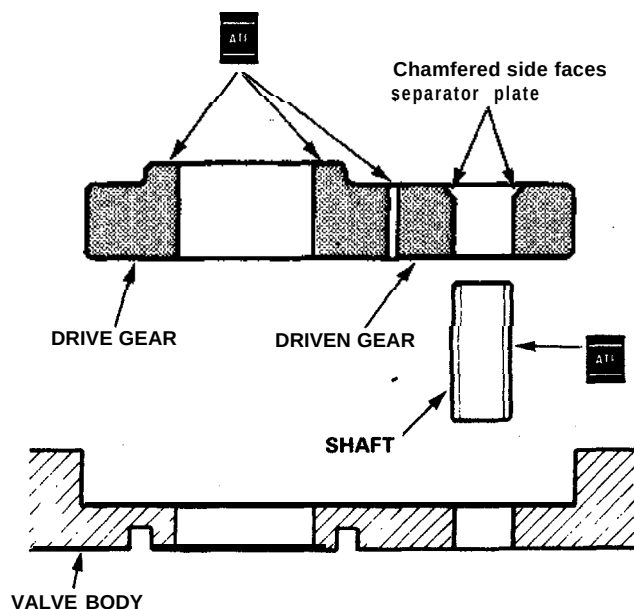
7. Remove the valve and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.



Oil Pump

Inspection

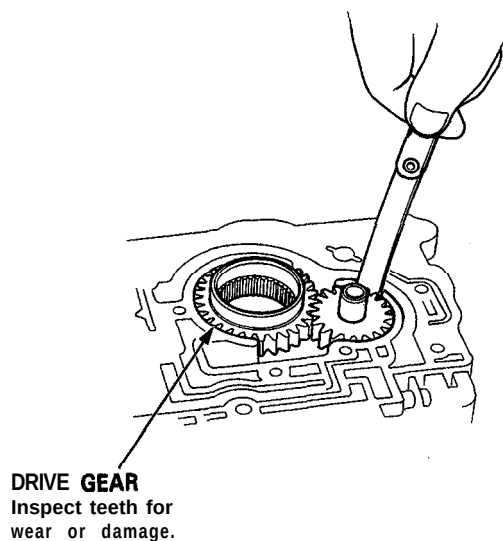
1. Install the pump gears and shaft in the main valve body.



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

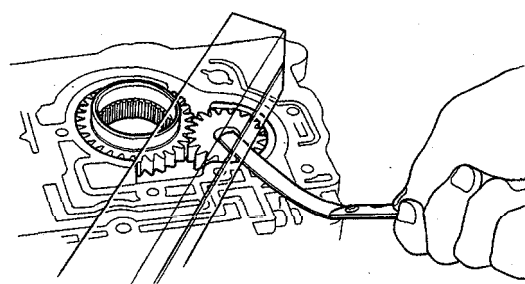
Pump Gears Side (Radial) Clearance:
Standard (New): Drive gear (diameter)
0.210-0.265 mm
(0.0083-0.0104 in)

Driven gear (radius)
0.035-0.063 mm
(0.0014-0.0025 in)



3. Measure the thrust clearance of the driven gear-to-valve 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.)



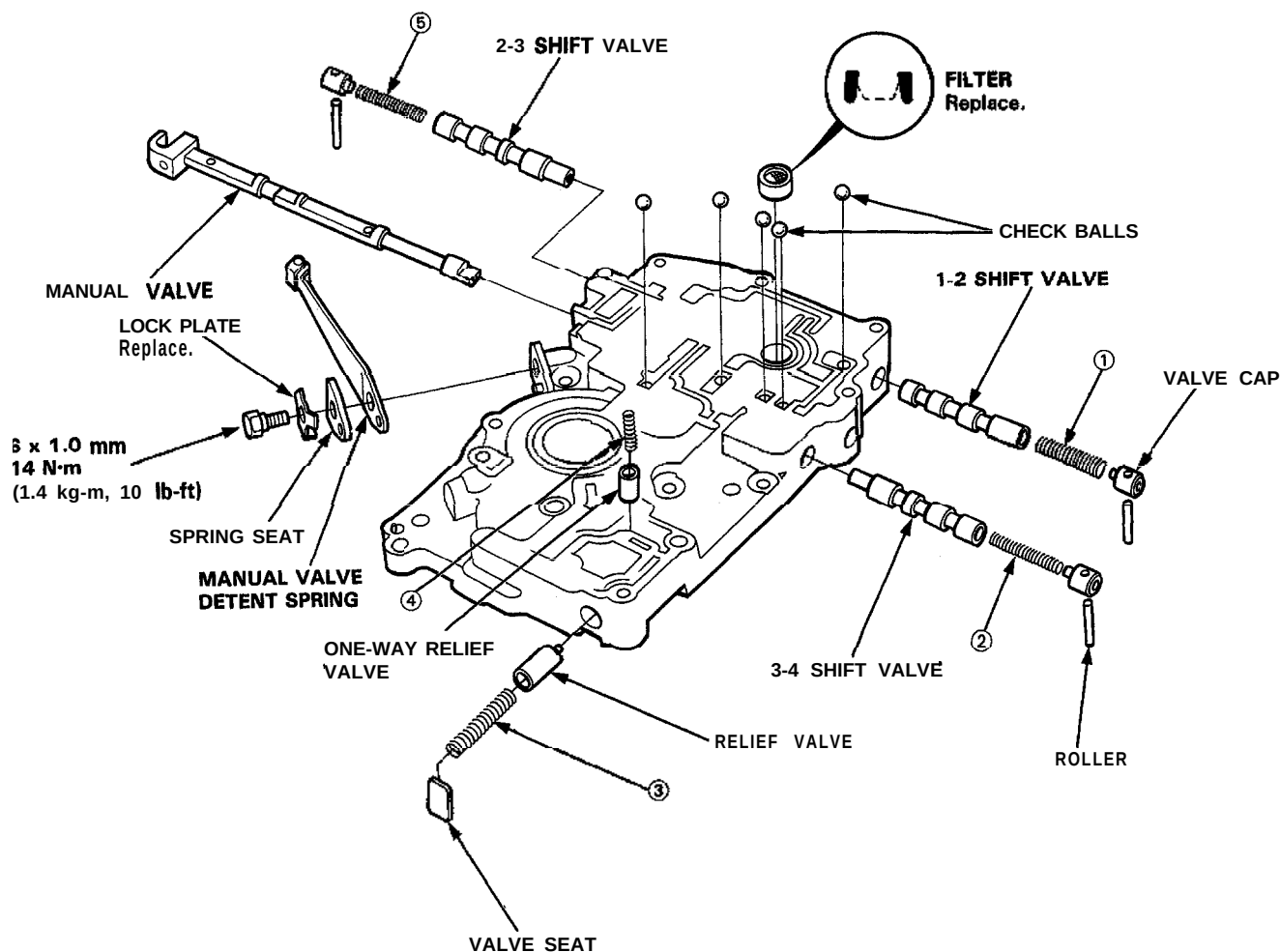
Main Valve Body

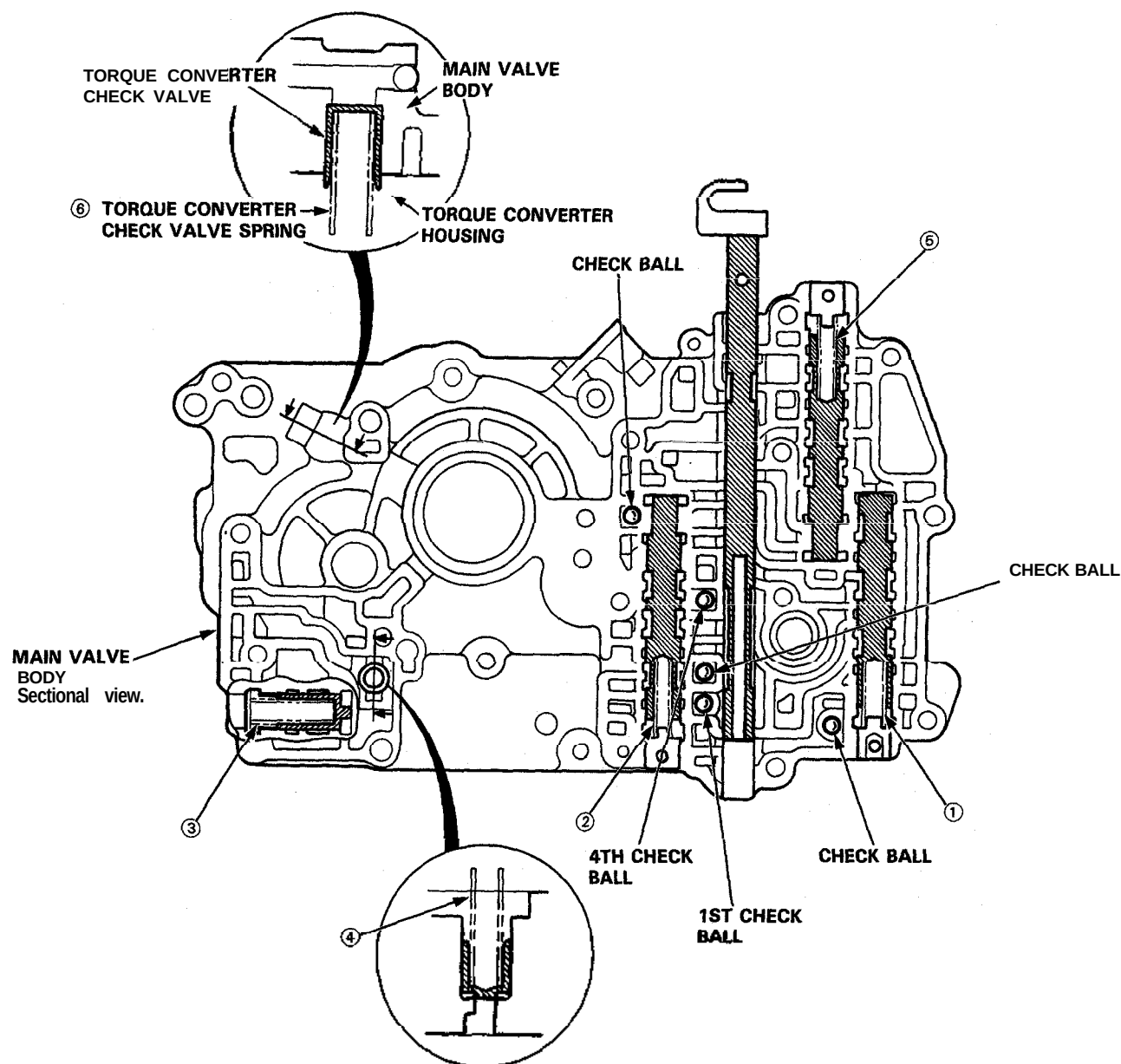
Disassembly/Inspection/Reassembly

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 14-1 10.
 - Coat all parts with ATF before reassembly.
 - Adjust and select the manual valve detent spring when the manual valve or manual valve detent spring is replaced.
- See page 14-142.

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	1-2 shift spring	0.8 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
②	2-3/3-4 shift spring	1.1 (0.031)	7.0 (0.276)	43.7 (1.720)	21.2
③	Relief valve spring	0.9 (0.043)	8.4 (0.331)	44.4 (1.748)	19.5
④	One-way relief valve spring	0.8 (0.035)	6.4 (0.252)	25.1 (0.988)	11.9
⑤	2-3/3-4 shift spring	1.1 (0.031)	7.0 (0.276)	43.7 (1.720)	21.2
⑥	Torque converter check valve spring	(0.043)	8.4 (0.331)	41.8 (1.646)	15.7

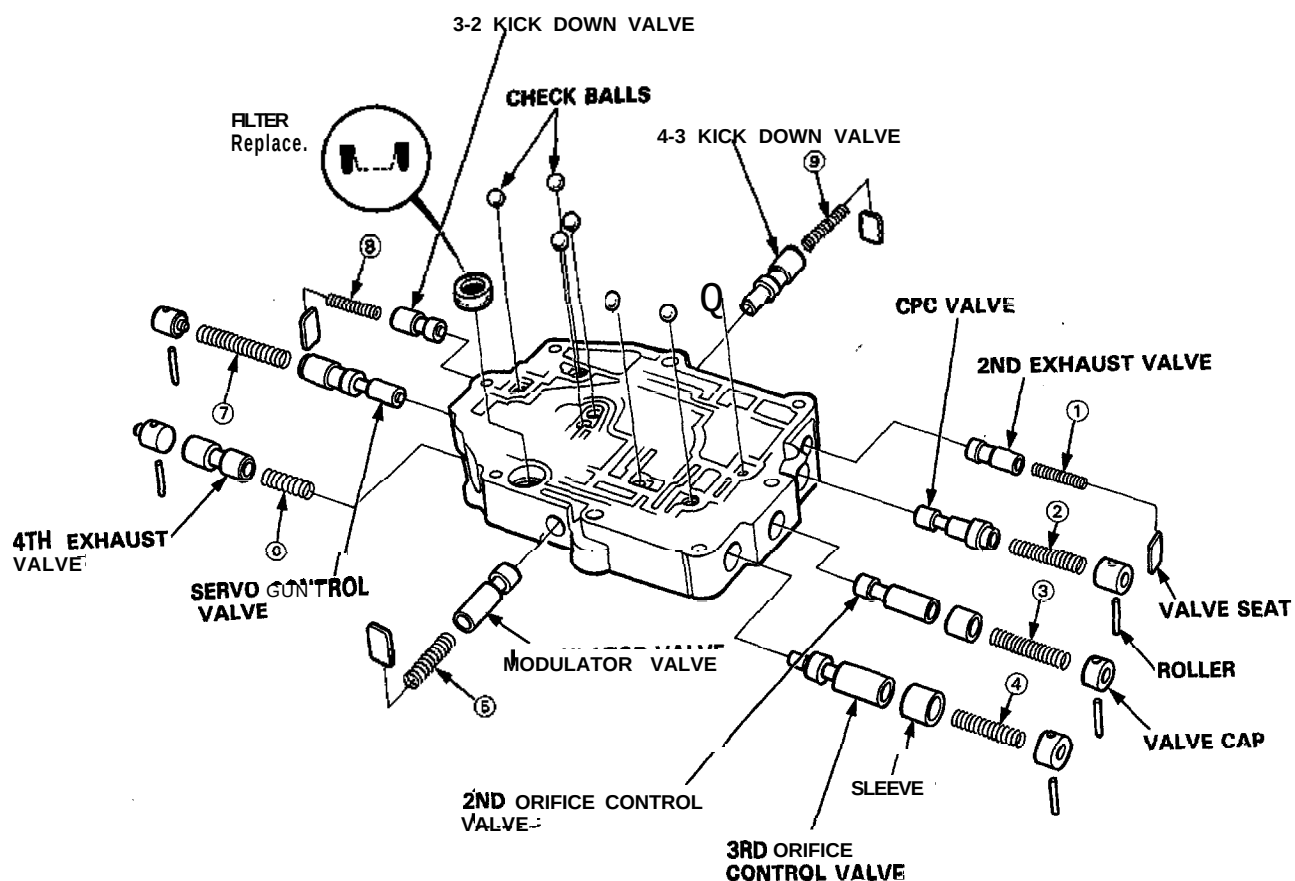
Secondary Valve Body

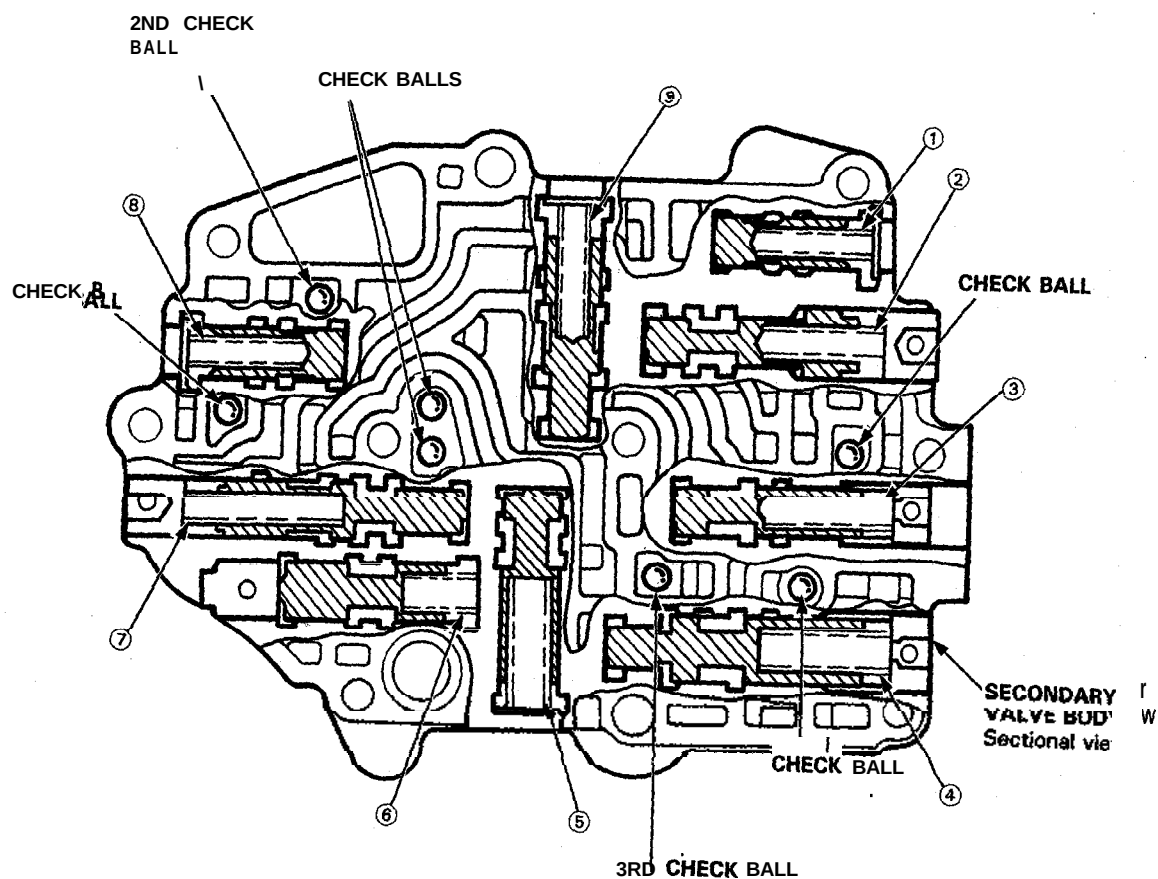
Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- 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 14-110.
- 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)

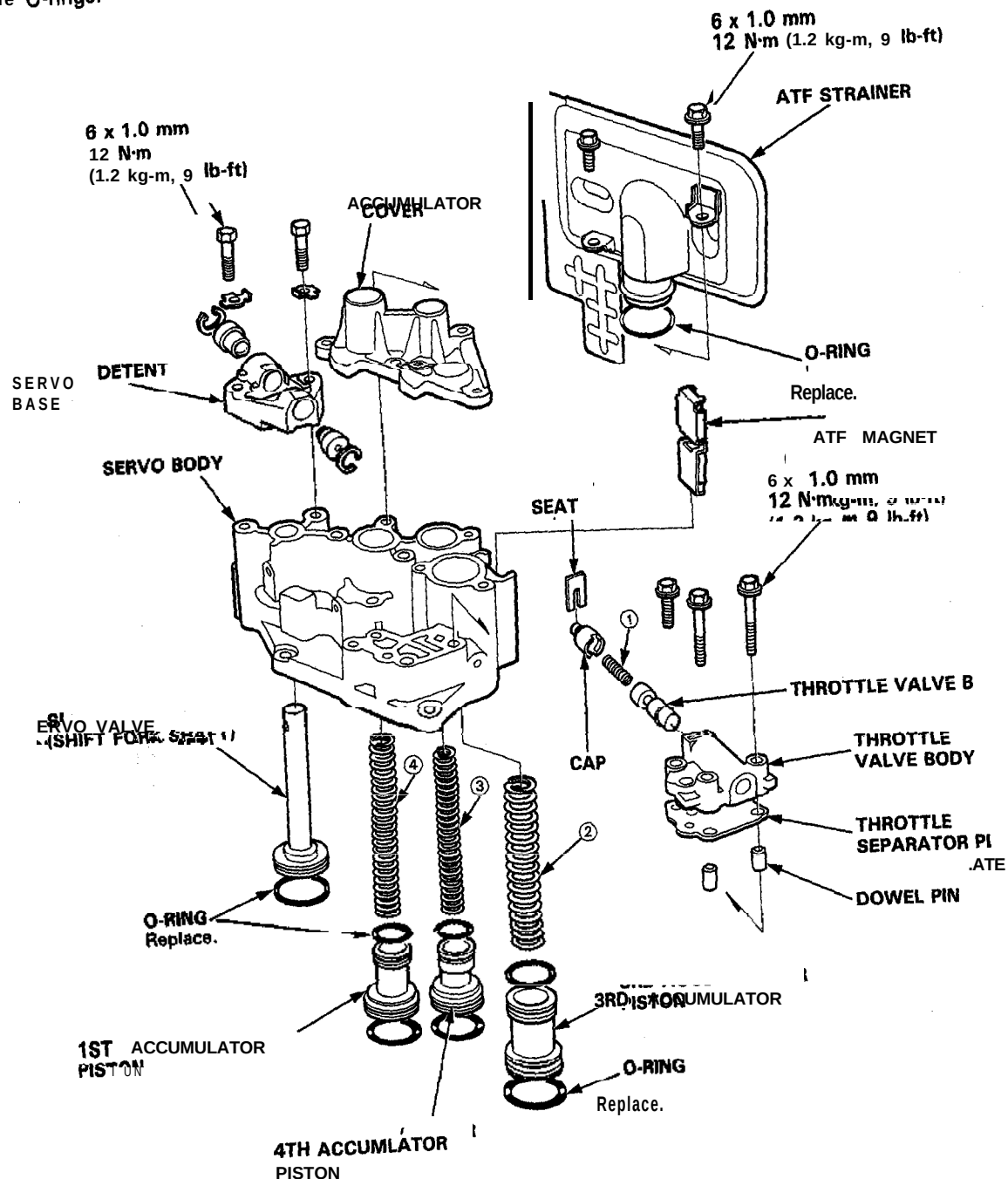
No.	Spring	Standard (New)			
		Wire Dia.	O. O.	Free Length	No. of Coils
①	2nd exhaust valve spring	1.0 (0.039)	8.1 (0.319)	27.1 (1.067)	73.4
②	CPC valve spring	1.0 (0.039)	8.1 (0.319)	32.1 (1.264)	15.6
③	2nd orifice control valve spring	0.8 (0.031)	8.6 (0.339)	47.9 (1.886)	16.0
④	3rd orifice control valve spring	0.9 (0.035)	9.4 (0.370)	48.3 (1.902)	16.6
⑤	Modulator valve spring	1.4 (0.055)	7.6 (0.299)	33.0 (1.299)	70.5
⑥	4th exhaust valve spring	0.8 (0.024)	8.1 (0.319)	24.4 (0.967)	7.9
⑦	Servo control valve spring	1.0 (0.039)	6.1 (0.240)	53.5 (2.106)	20.8
⑧	3-2 kick down valve spring	1.0 (0.039)	6.6 (0.260)	27.1 (1.067)	73.4
⑨	4-3 kick down valve spring	0.9 (0.035)	30.7 (1.209)		72.9

Servo Body Inspection/Reassembly

Disassembly

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. If any fail to slide freely, see Valve Body Repair on page 14-110.
- Check all valves for free movement.
- Coat all parts with ATF before reassembly.
- Replace the O-rings.





SPRING SPECIFICATIONS

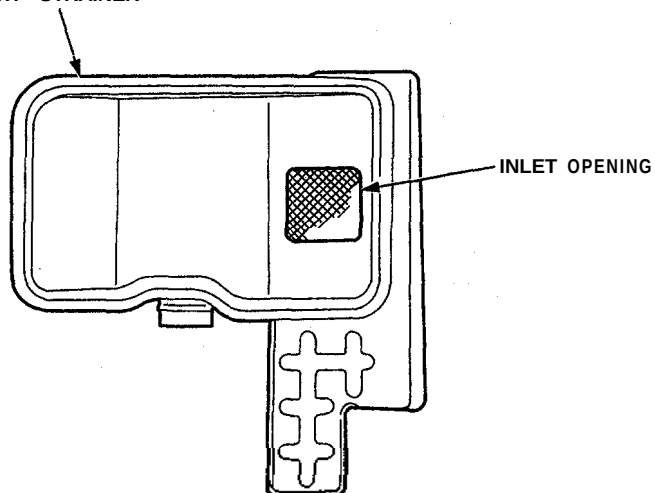
Unit of length: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Throttle valve B spring	0.9 (0.035)	7.1 (0.280)	29.0 (1.142)	12.6
②	3rd accumulator spring	3.2 (0.126)	19.0 (0.748)	88.6 (3.488)	14.3
③	4th accumulator spring	3.0 (0.118)	18.0 (0.709)	84.5 (3.327)	12.8
④	1 st accumulator spring	2.3 (0.091)	20.0 (0.787)	104.6 (4.118)	14.8

NOTE:

- After disassembly of the ATF strainer, check that it is in good condition, and the inlet opening is not clogged. Replace the strainer with a new one if it is clogged or damaged.
- The strainer can be reused if it is not clogged. Clean the inlet opening thoroughly with compressed air before reinstalling it.

ATF STRAINER



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 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 14-110.

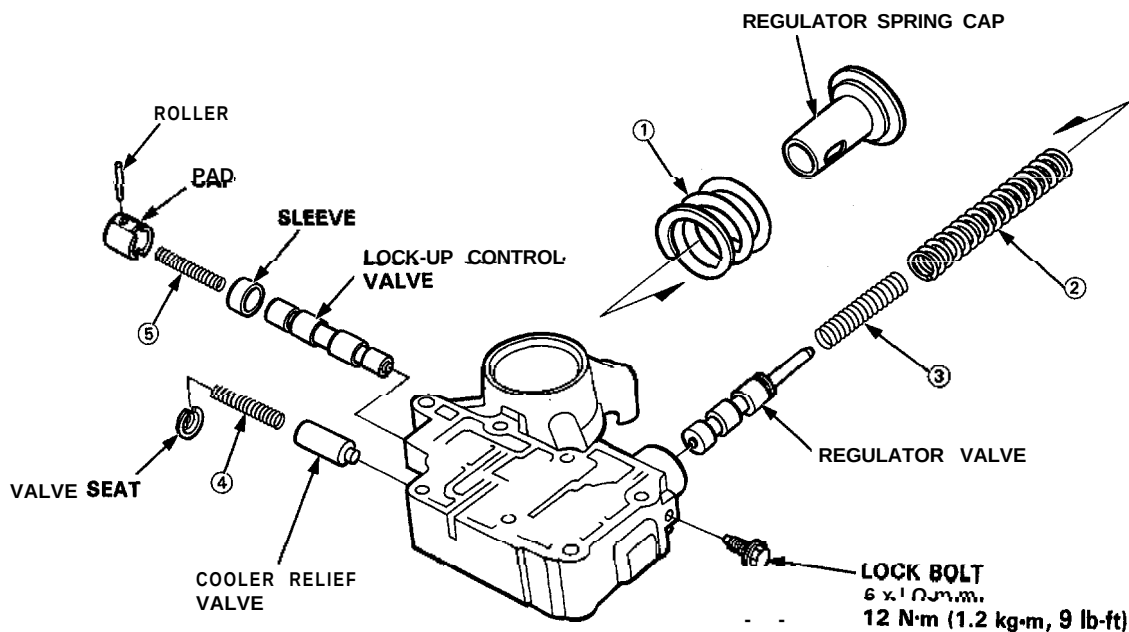
1. Hold the regulator spring cap in place while removing the lock bolt. Once the bolt is removed, release the spring cap slowly.

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	6.0 (0.236)	38.4 (1.512)	30.3 (1.193)	2.0
②	Regulator valve spring A	1.58 x 2.0 (0.062 x 0.079)	14.7 (0.579)	88.6 (3.488)	20.9
③	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	14.7
④	Cooler relief valve spring	1.2 (0.047)	8.4 (0.331)	35.7 (1.406)	16.5
⑤	L/C control spring	0.8 (0.031)	6.6 (0.260)	38.3 (1.5081)	25.0

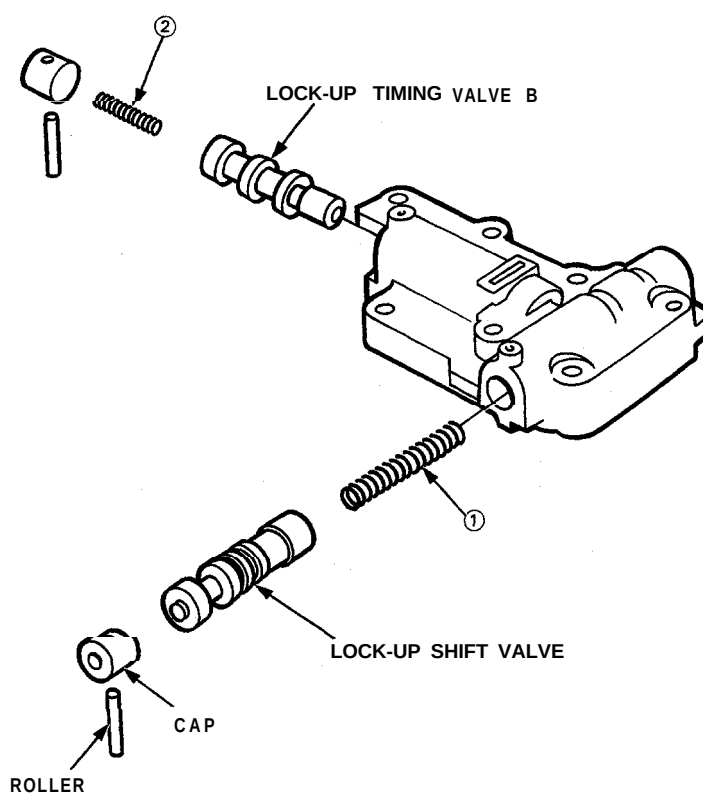


Lock-up Valve Body

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 14-1 IO.
- Coat all parts with ATF before reassembly.



SPRING SPECIFICATIONS

Unit of length: mm (in)

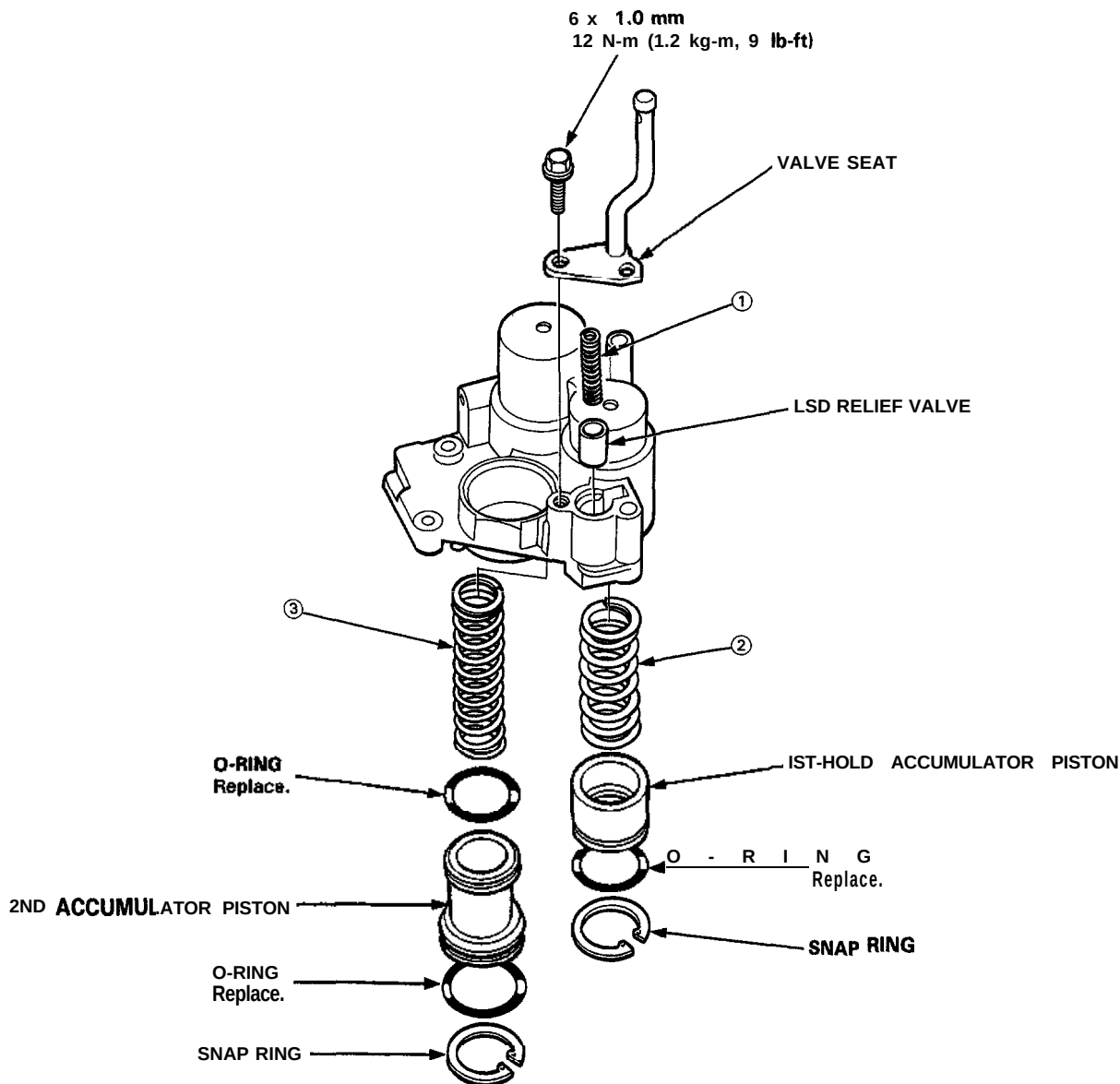
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up shift valve spring	1.0 (0.039)	8.6 (0.339)	51.3 (2.0201)	19.8
②	Lock-up timing valve B spring	0.8 (0.031)	5.6 (0.220)	27.8 (1.094)	16.4

2nd Accumulator 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 14-110.
- 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	LSD relief valve spring	0.8 (0.031)	8.4 (0.331)	37.3 (1.469)	12.1
②	Ist-hold accumulator spring	3.4 (0.134)	24.3 (0.957)	64.7 (2.547)	6.7
③	2nd accumulator spring	3.3 (0.130)	20.2 (0.795)	78.0 (3.071)	11.8

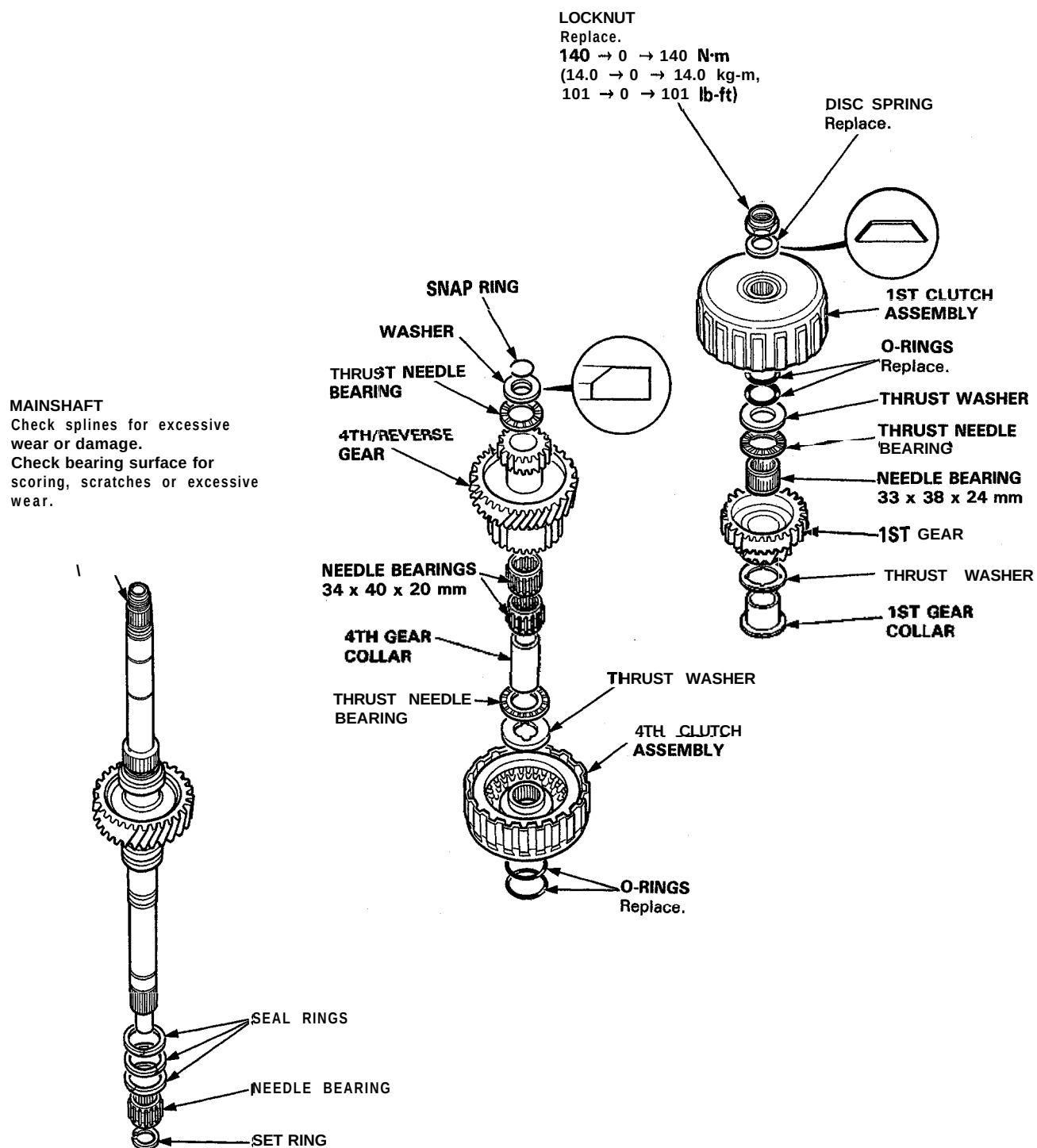


Mainshaft

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.

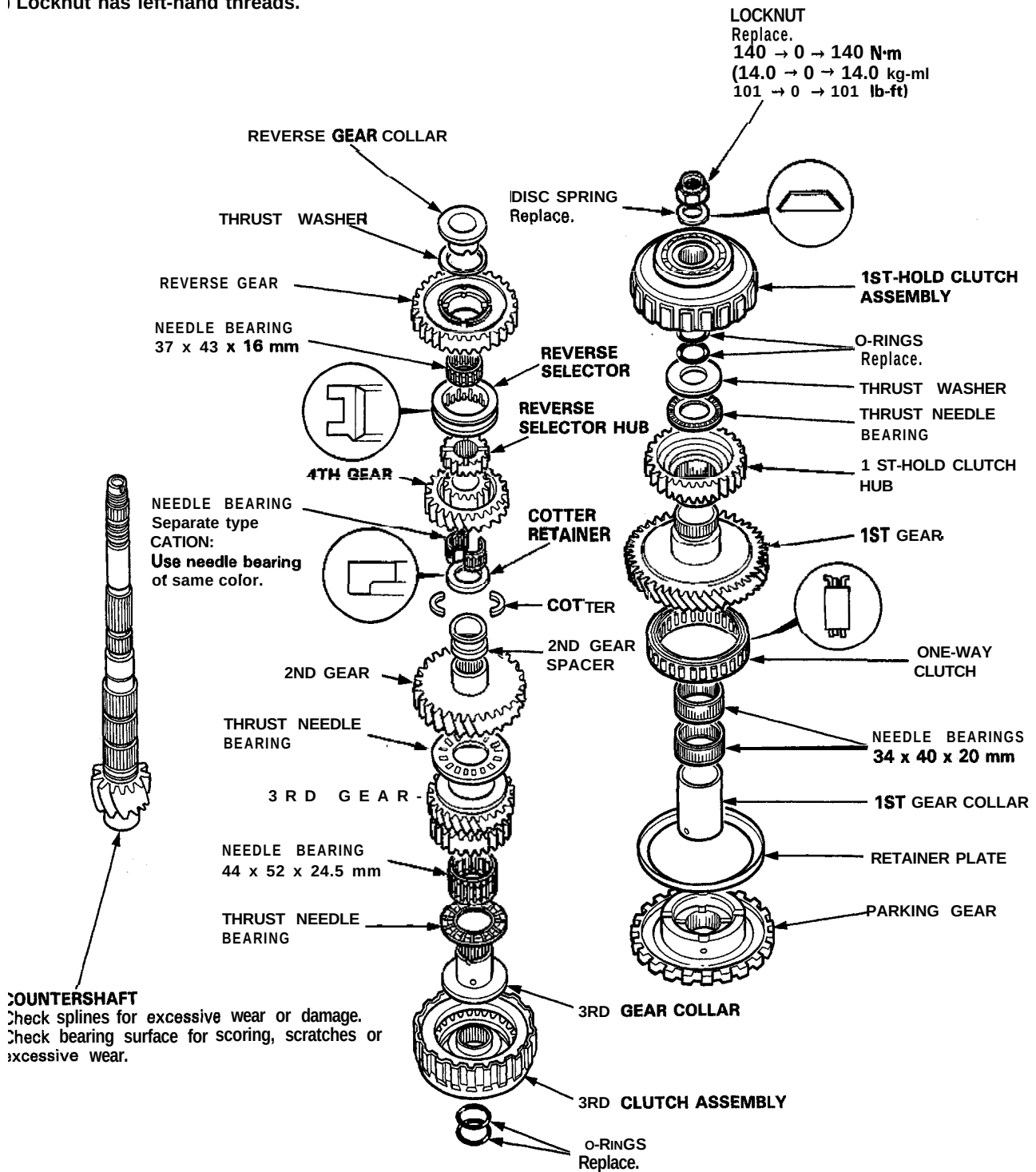


Countershaft

Disassembly/Inspection/Reassembly

NOTE:

- 1 Lubricate all parts with ATF during reassembly.
- 1 Install thrust needle bearings with unrolled edge of bearing retainer facing washer.
- 1 Inspect thrust needle and needle bearings for galling and rough movement.
- 1 Locknut has left-hand threads.

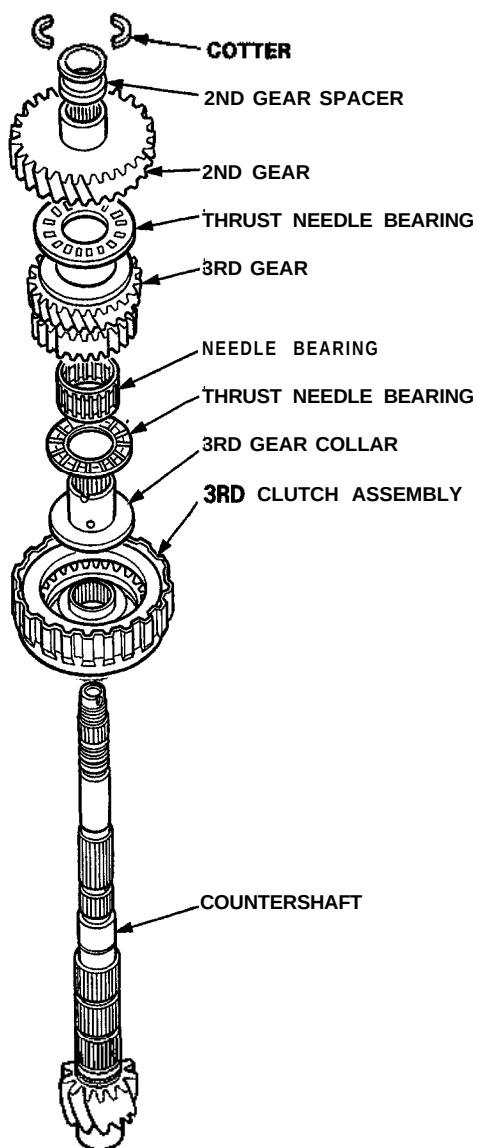




Inspection/Installation

NOTE: Lubricate all parts with ATF during assembly.

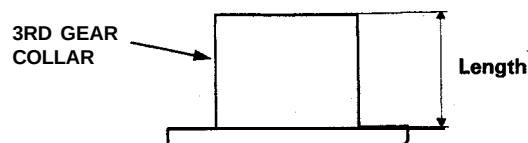
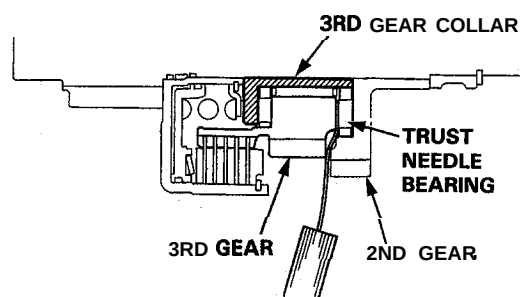
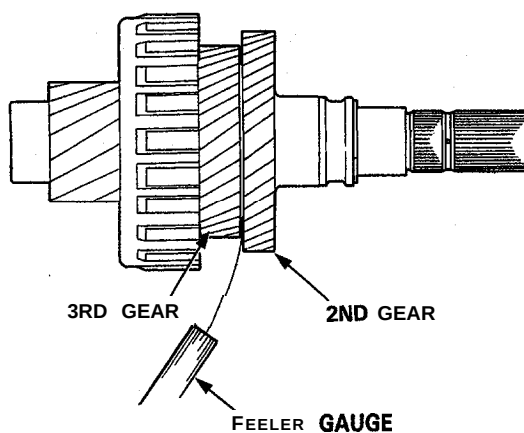
1. Assemble the parts below on the countershaft.



2. Hold the 2nd gear against the 3rd gear. Measure the clearance between the 3rd gear and thrust needle bearing with a feeler gauge.

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

STANDARD: 0-0.03 mm (0-0.001 in)



3RD GEAR COLLAR

No	Part Number	Length mm (in)
1	90413-PR9-000	35.425-35.440 (1.3947-1.3952)
2	90414-PR9-000	35.440-35.455 (1.3952-1.3959)
3	90415-PR9-000	35.455-35.470 (1.3959-1.3965)
4	90416-PR9-000	35.470-35.485 (1.3965-1.3970)
5	90417-PR9-000	35.485-35.500 (1.3970-1.3976)
6	90418-PR9-000	35.500-35.515 (1.3976-1.3982)

Countershaft

Inspection/Installation (cont'd)

3. If the clearance is out of tolerance;

- 1. Select and install a new 3rd gear collar and recheck the clearance.
- 2. If the clearance is still out of tolerance, replace the two thrust needle bearings and recheck the clearance.

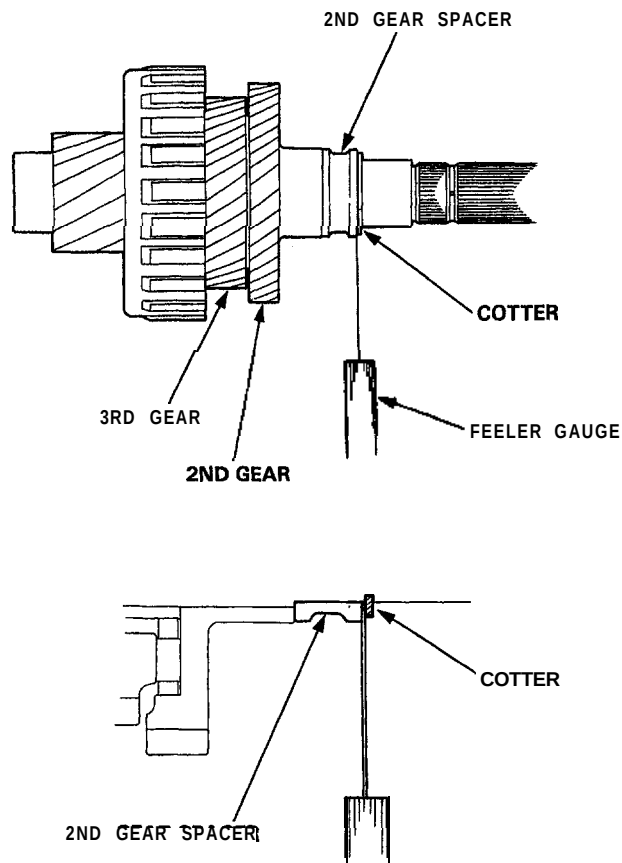
NOTE:

- If the clearance still exceeds the service limit even with *new* thrust needle bearings, check the 3rd gear, 2nd gear and 3rd gear collar for wear, and replace any worn parts.
- After replacing parts, make sure that the clearance is within tolerance.

4. Hold the 2nd gear against the 3rd gear. Measure the clearance between the 2nd gear spacer and cotters with a feeler gauge.

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

STANDARD: 0-0.05 mm (0-0.002 in)



5. If the clearance is out of tolerance, select and install a new cotters.

COTTER 31.5 mm

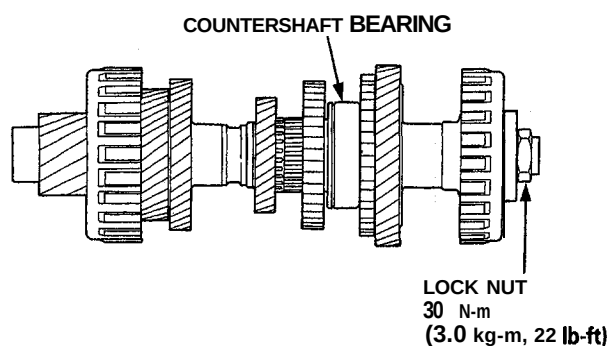
No	Part Number	Thickness mm (in)
1	90441 -PR9-000	1.975-2.000 (0.078-0.079)
2	90442-PR9-000	2.000-2.025 (0.079-0.080)
3	90443-PR9-000	2.025-2.050 (0.080-0.081)
4	90444-PR9-000	2.050-2.075 (0.081-0.082)
5	90445-PR9-000	2.075-2.100 (0.082-0.083)
6	90446-PR9-000	2.100-2.125 (0.083-0.084)
7	90447-PR9-000	2.125-2.150 (0.084-0.085)
8	90448-PR9-000	2.150-2.175 (0.085-0.086)
9	90449-PR9-000	2.175-2.200 (0.086-0.087)
10	90450-PR9-000	2.200-2.225 (0.087-0.088)
11	90451 -PR9-000	2.225-2.250 (0.088-0.089)
12	90452-PR9-000	2.250-2.275 (0.089-0.090)
13	90453-PR9-000	2.275-2.300 (0.090-0.091)
14	90454-PR9-000	2.300-2.325 (0.091-0.092)
15	90455-PR9-000	2.325-2.350 (0.092-0.093)
16	90456-PR9-000	2.350-2.375 (0.093-0.094)

NOTE: After replacing the cotters, make sure that the clearance is held within tolerance.

- 6. Remove the countershaft bearing from the transmission housing. See page 14-I 40.
- 7. Assemble the countershaft including bearing and all parts shown to on page 14-I 22.



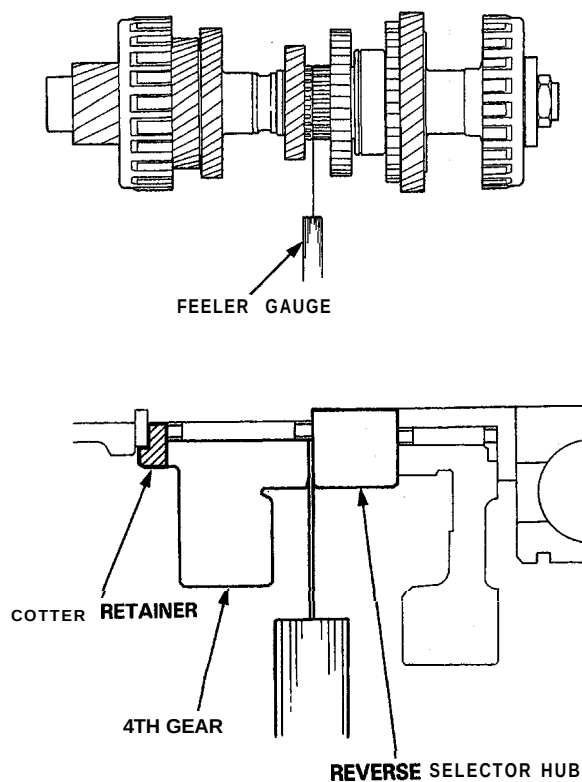
8. Torque the countershaft locknut to 30 N·m (3.0 kg-m, 22 lb-ft).



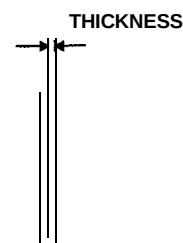
9. Measure the clearance between 4th gear and reverse selector hub with a feeler gauge.

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

STANDARD: 0.05-0.16 mm (0.002-0.006 in)



10. If the clearance is out of tolerance, select and install a new cotter retainer.



COTTER RETAINER

No.	Parts Number	Thickness
1	90432-PR9-000	3.00 - 3.03 mm (0.118 - 0.119 in)
2	90433-PR9-000	3.03 - 3.06 mm (0.119 - 0.120 in)
3	90434-PR9-000	3.06 - 3.09 mm (0.120 - 0.122 in)
4	90435-PR9-000	3.09 - 3.12 mm (0.122 - 0.123 in)

NOTE: After replacing the cotter retainer, make sure that the clearance is within tolerance.

One-Way Clutch/Parking Gear

Disassembly and Inspection

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

PARKING GEAR

COUNTERSHAFT
1 ST GEAR

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

CAUTION: Do not pry on the three copper friction strips; if you break a strip, the clutch will not work properly.

COUNTERSHAFT
1 ST GEAR

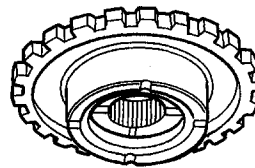
COPPER FRICTION STRIP

RETAINER TAB

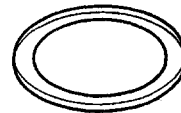
ONE-WAY CLUTCH

SCREWDRIVER

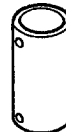
Inspect the parts as follows:



PARKING GEAR
Inspect for wear or scoring.



RETAINER PLATE
Inspect for wear or scoring.



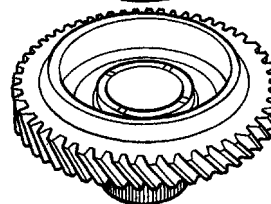
1 ST GEAR COLLAR



NEEDLE ROLLER BEARINGS
Inspect for galling and rough movement.

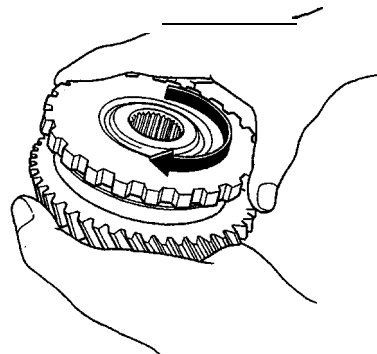


ONE-WAY CLUTCH
Inspect for damage or faulty movement.



COUNTERSHAFT
1ST GEAR
Inspect for wear or scoring.

3. After the parts are assembled, hold the countershaft 1st gear and turn the parking gear in direction shown to be sure it turns freely.





Secondary Shaft

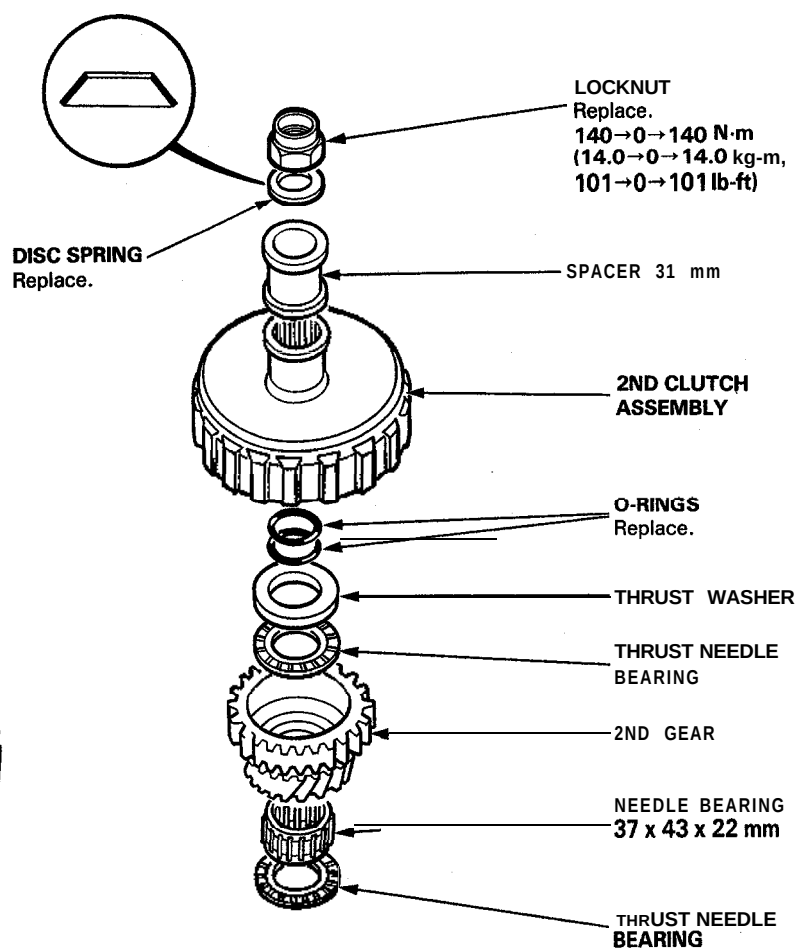
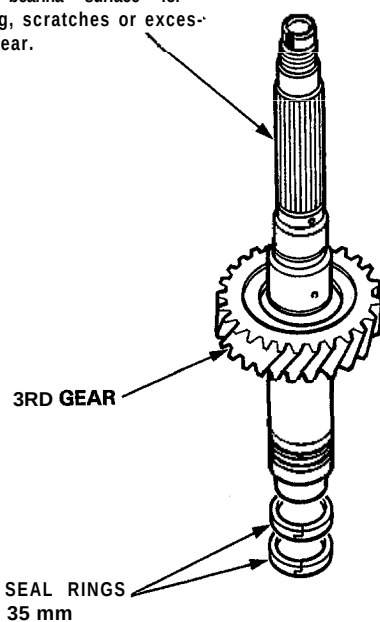
- Disassembly/Inspection/Reassembly

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.

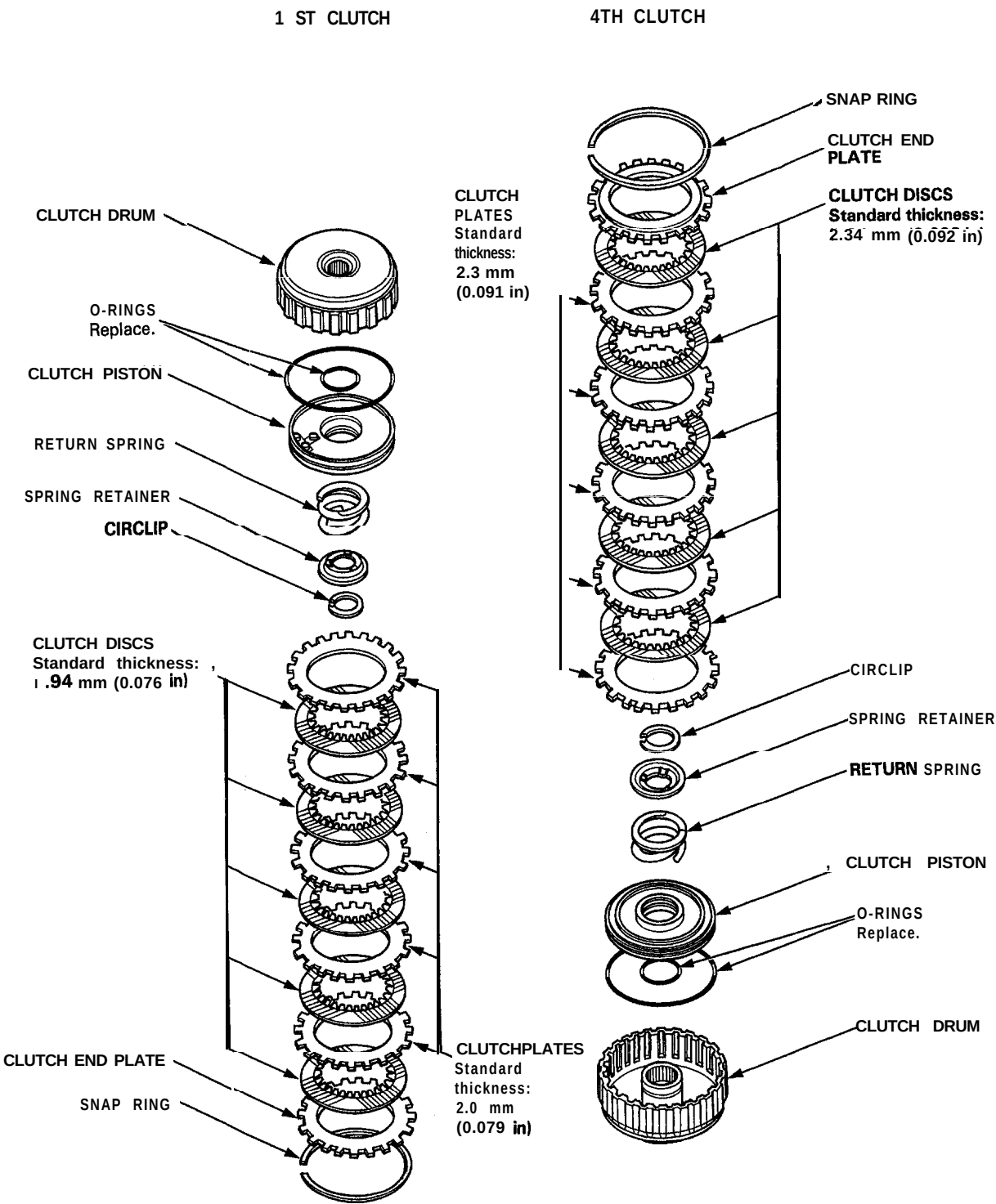
SECONDARY SHAFT

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



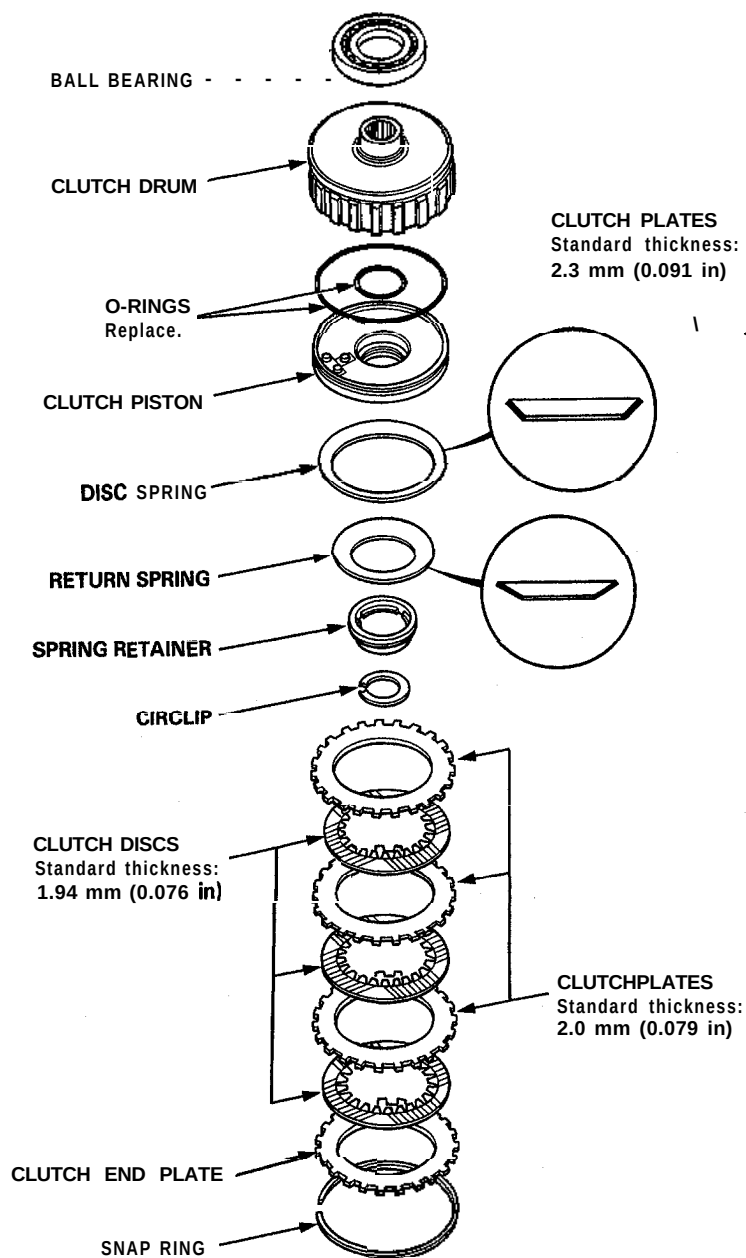
Clutch

Illustrated Index

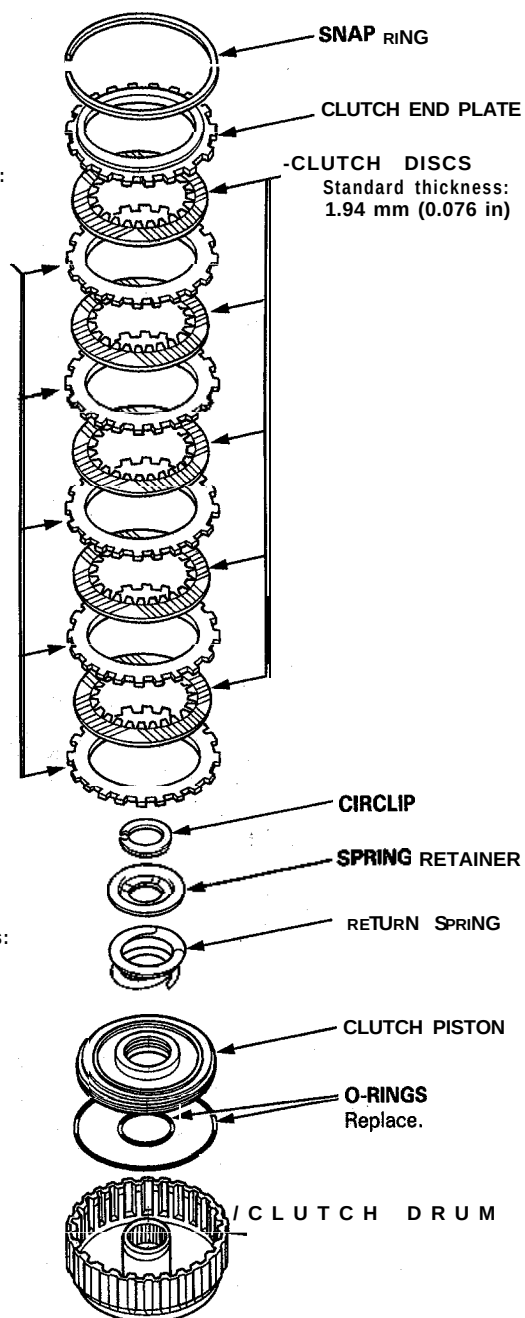




1 ST-HOLD CLUTCH



3RD CLUTCH

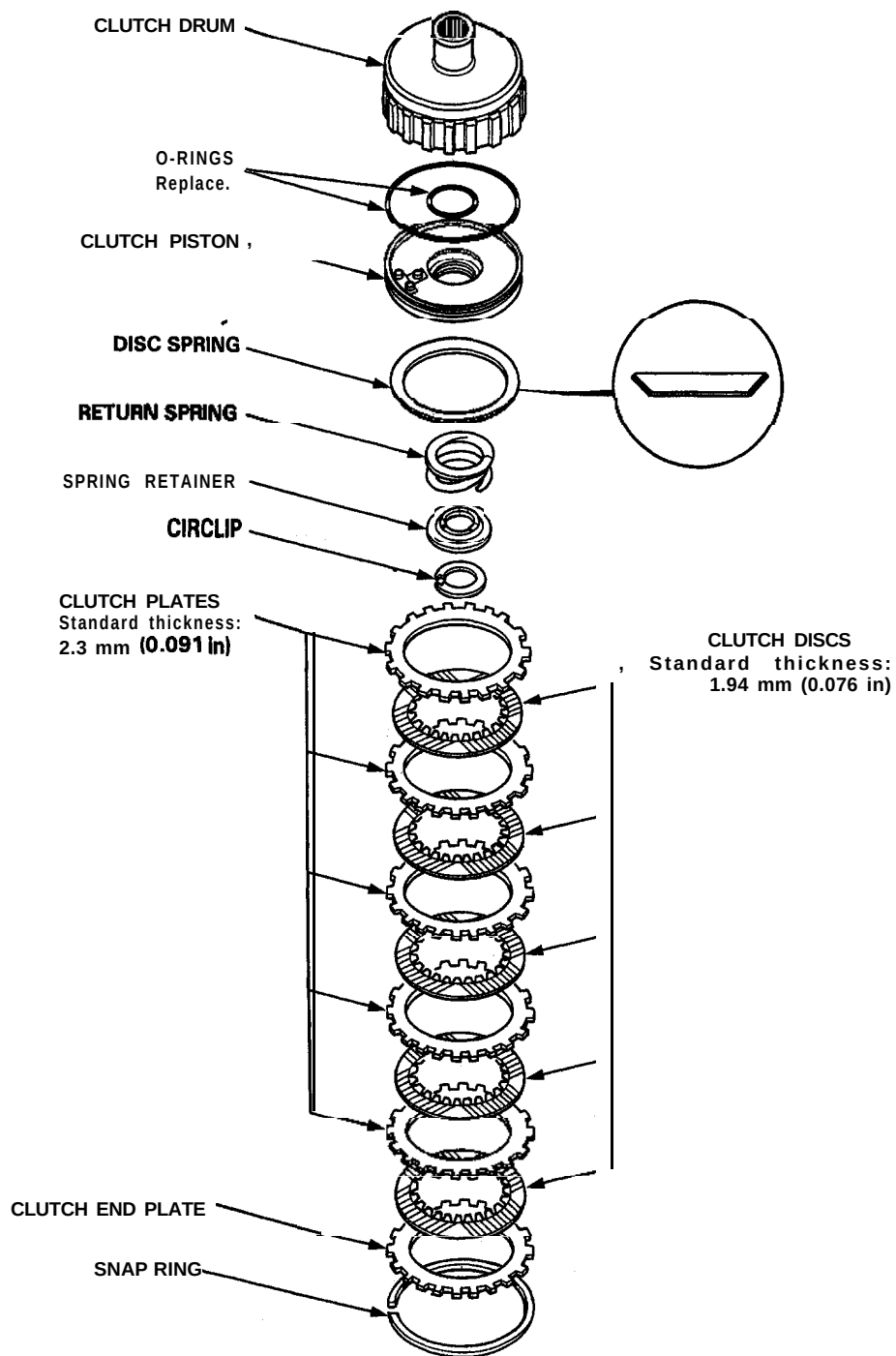


(cont'd)

Clutch

Illustrated Index

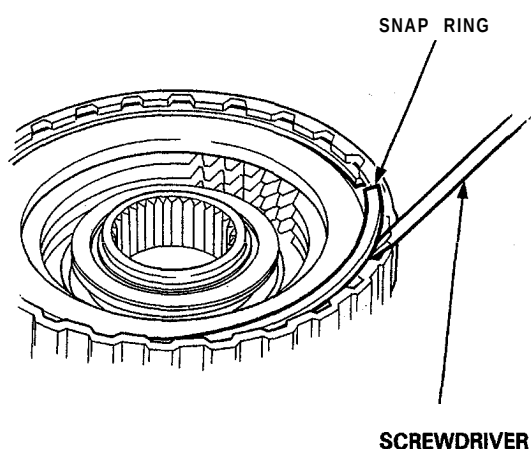
2ND CLUTCH





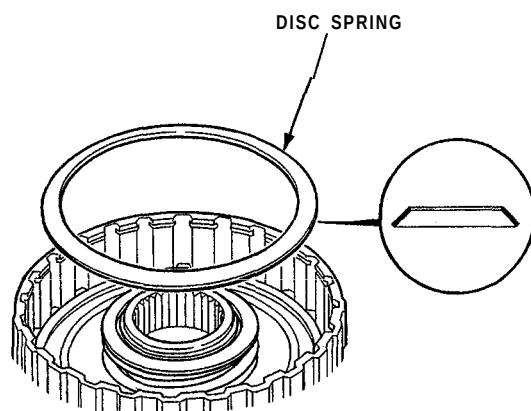
- Disassembly

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

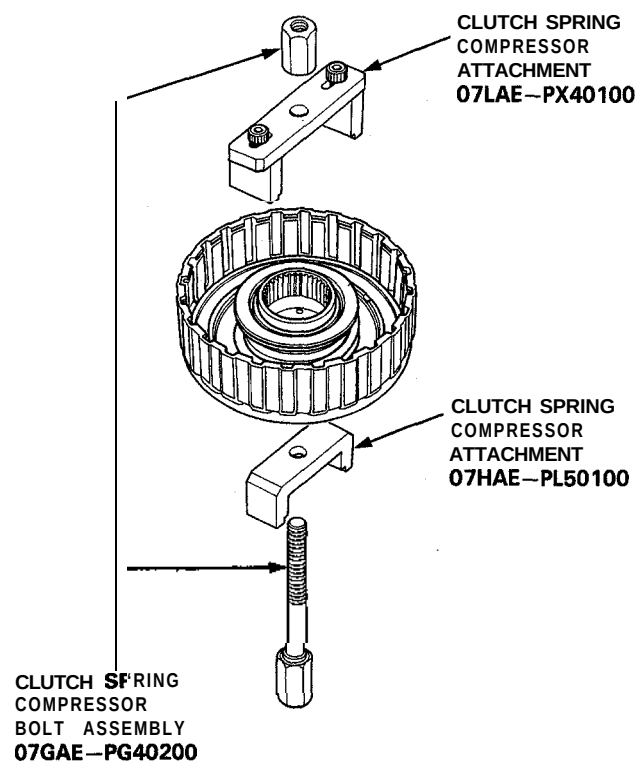


2. Remove the disc spring.

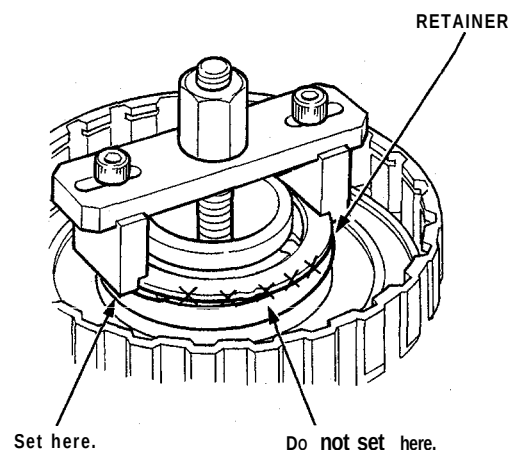
NOTE: For 1st hold and 2nd clutches



3. Install the special tools as shown.



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.

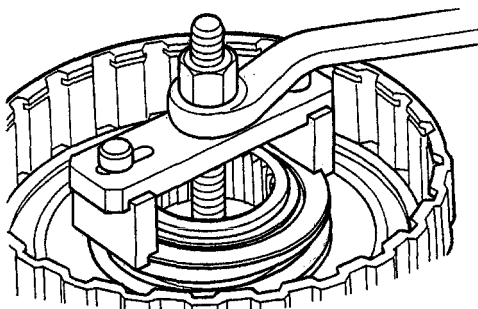


(cont'd)

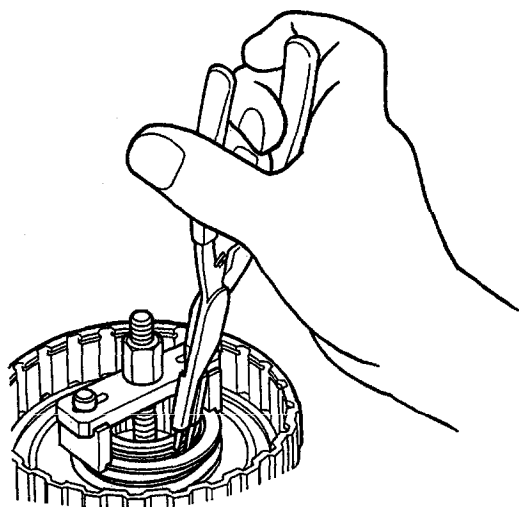
Clutch

Disassembly (cont'd)

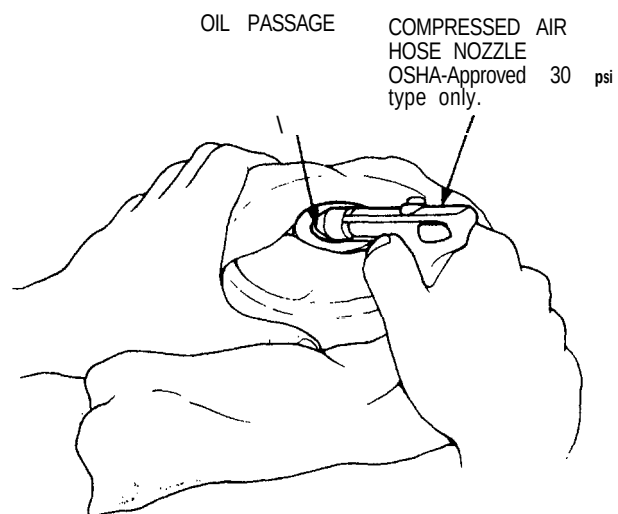
4. Compress the clutch return spring.



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



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



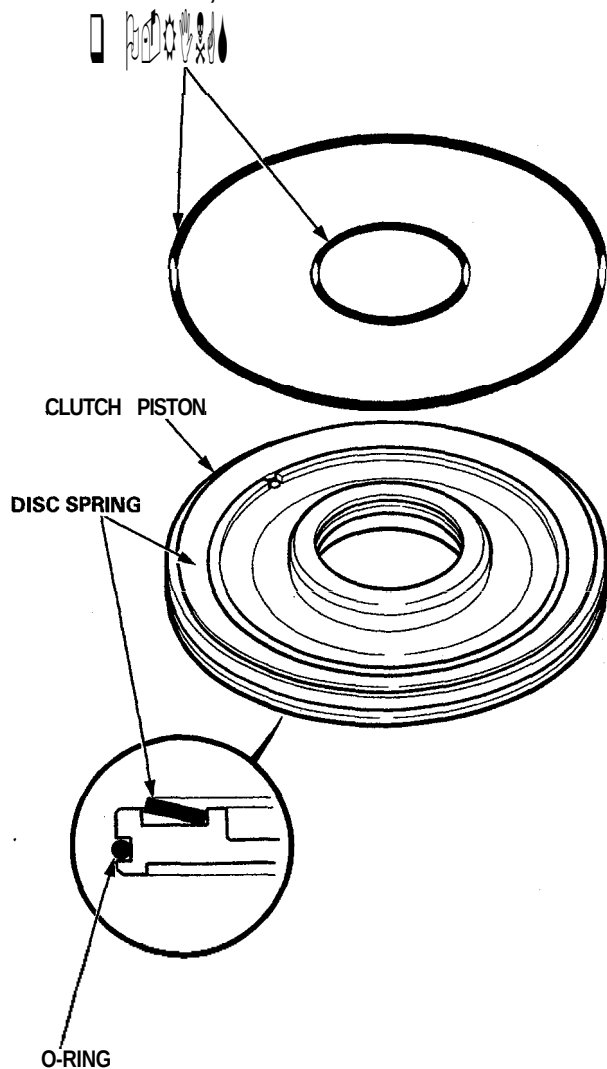


- Reassembly

NOTE:

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

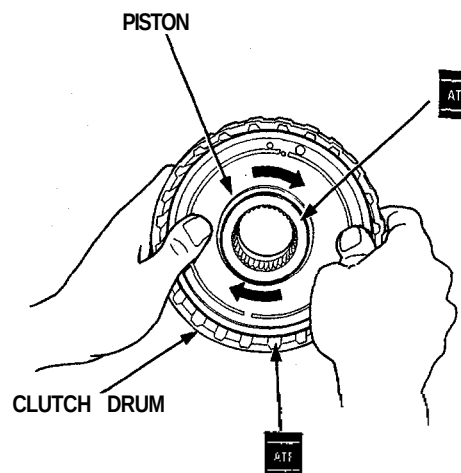
1. install a new O-ring on the clutch piston.
 2. Be sure that the disc spring is securely staked.
- NOTE: For 1st, 3rd and 4th clutches



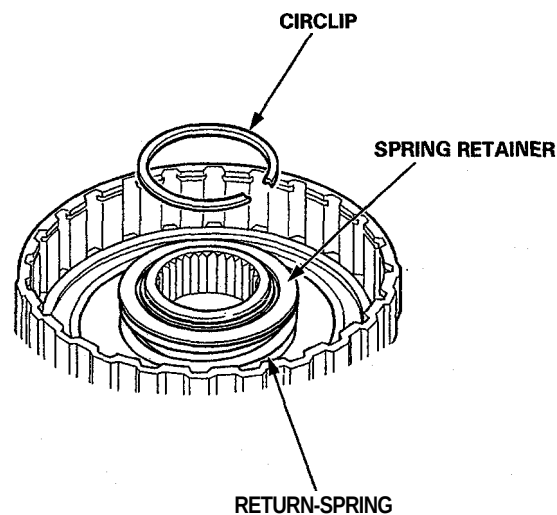
3. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

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

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



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

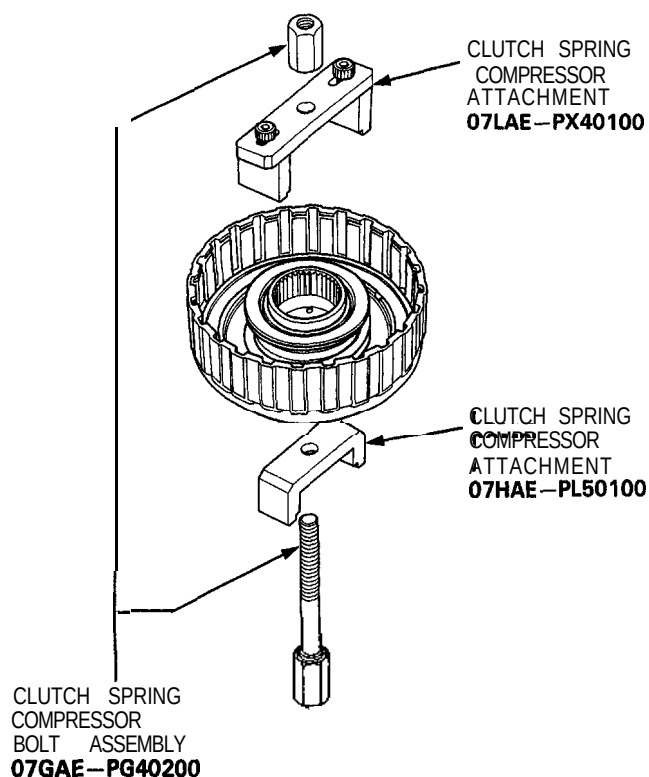


(cont'd)

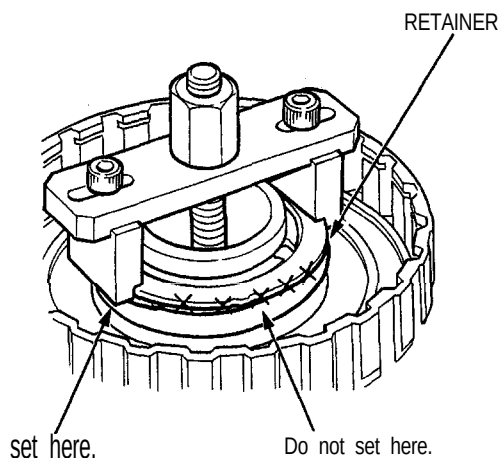
Clutch

Reassembly (cont'd)

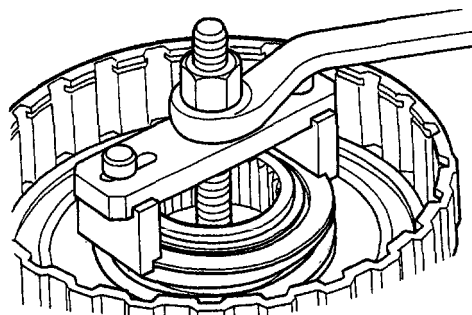
5. Install the special tools as shown.



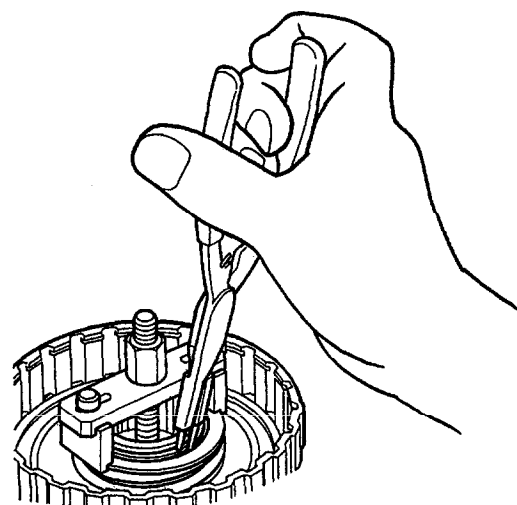
CAUTION: If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the retainer spring, the retainer may be damaged.



6. Compress the clutch return spring.



7. Install the circlip.



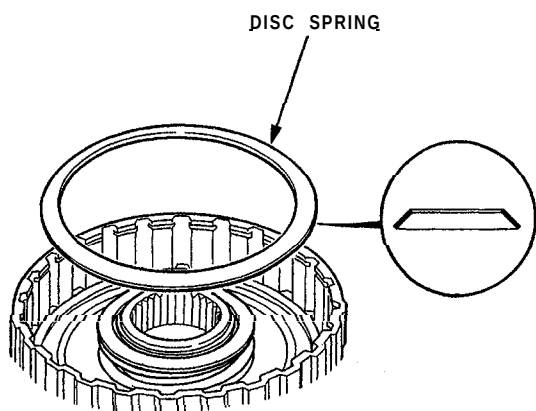
8. Remove the special tools.



9. install the disc spring.

NOTE:

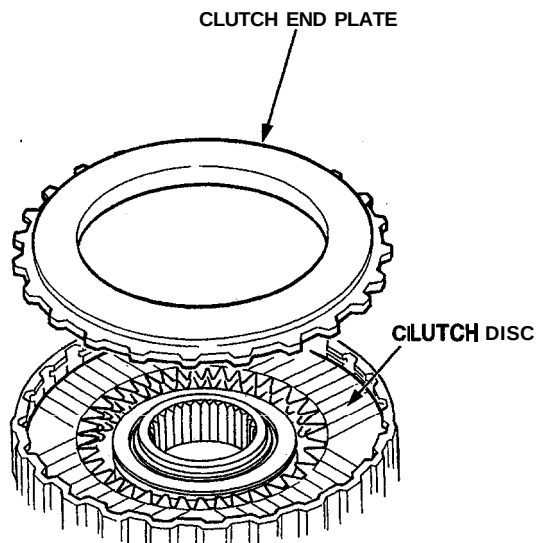
- For 1st hold and 2nd clutches
- Install the disc spring in the right direction.



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

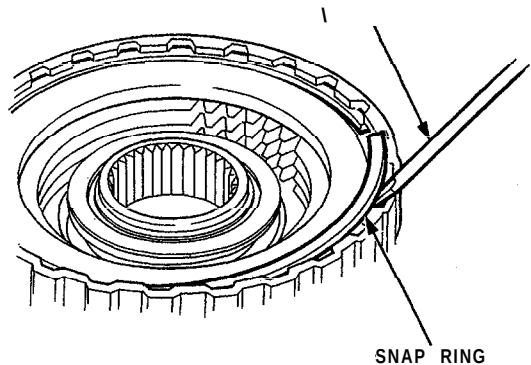
11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

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

SCREWDRIVER



(cont'd)

Clutch

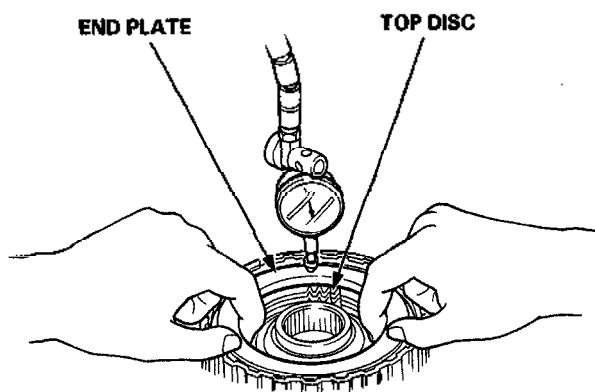
Reassembly (cont'd)

13. 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	0.75 – 0.95 mm (0.030 – 0.037 in)
3rd	0.75 – 0.95 mm (0.030 – 0.037 in)
4th	0.75 – 0.95 mm (0.030 – 0.037 in)
1st-Hold	0.70 – 0.90 mm (0.028 – 0.035 in)



14. If the clearance is not within the service limits, select a new clutch end plate from the following table.

NOTE: If the thickest clutch end plate is installed but the clearance is still over the standard, replace the clutch discs and clutch plates.

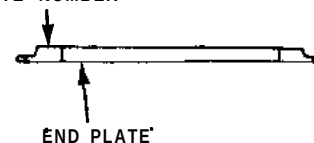
2ND, 3RD, 4TH and 1ST HOLD CLUTCH

PART No.	PLATE No.	THICKNESS: mm (in)
22551 –PX4–003	1	2.1 (0.083)
22552 –PX4–003	2	2.2 (0.087)
22553 –PX4–003	3	2.3 (0.091)
22554 –PX4–003	4	2.4 (0.094)
22555 –PX4–003	5	2.5 (0.098)
22556 –PX4–003	6	2.6 (0.102)
22557 –PX4–003	7	2.7 (0.106)
22558 –PX4–003	8	2.8 (0.110)
22559 –PX4–003	9	2.9 (0.114)

1 ST CLUTCH

PART No.	PLATE No.	THICKNESS mm (in)
22631 –PR9–003	1	2.1 (0.083)
22632 –PR9–003	2	2.2 (0.087)
22633 –PR9–003	3	2.3 (0.091)
22634 –PR9–003	4	2.4 (0.094)
22635 –PR9–003	5	2.5 (0.098)
22636 –PR9–003	6	2.6 (0.102)
22637 –PR9–003	7	2.7 (0.106)
22638 –PR9–003	8	2.8 (0.110)
22639 –PR9–003	9	2.9 (0.114)

PLATE NUMBER

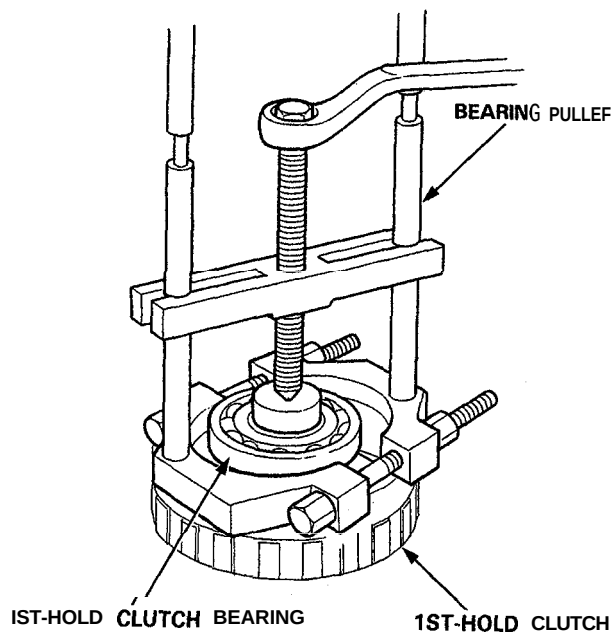


1st-Hold Clutch Bearing



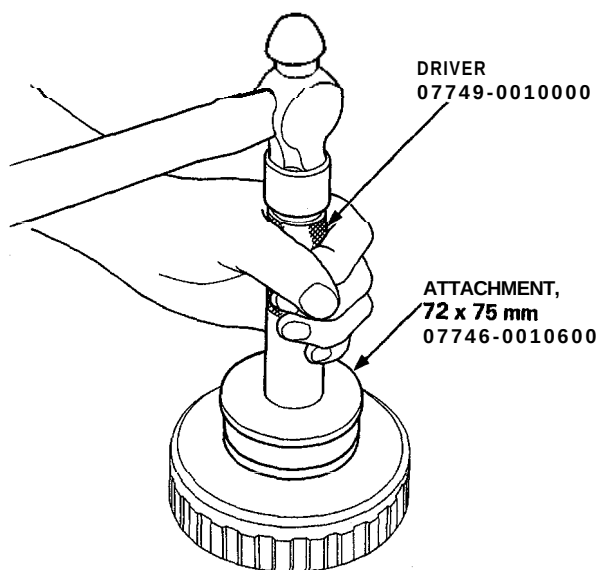
Replacement

1. Remove the 1st-hold clutch bearing using a bearing puller.



2. Install a new bearing using the special tools.

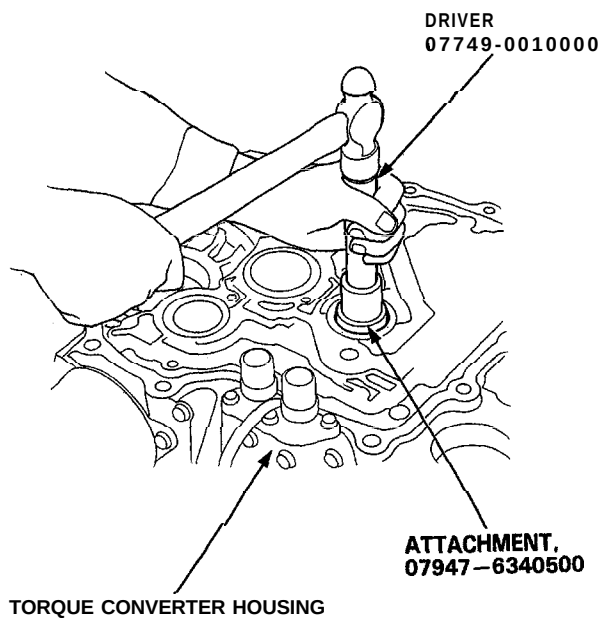
NOTE: Drive in the bearing until it fully bottoms.



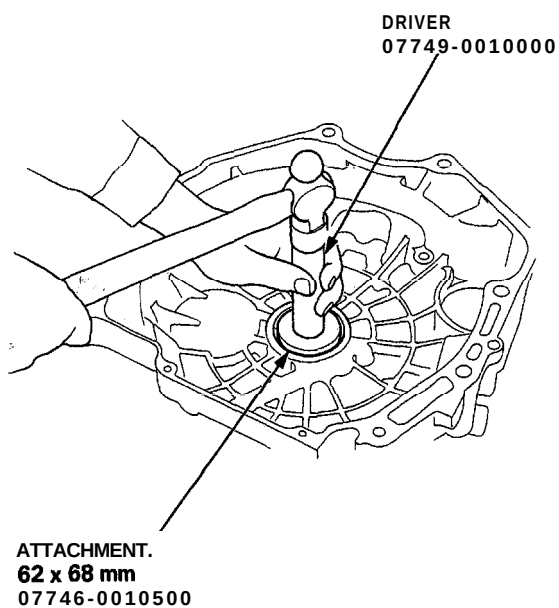
Torque Converter Housing Bearings Mainshaft Bearing

Replacement

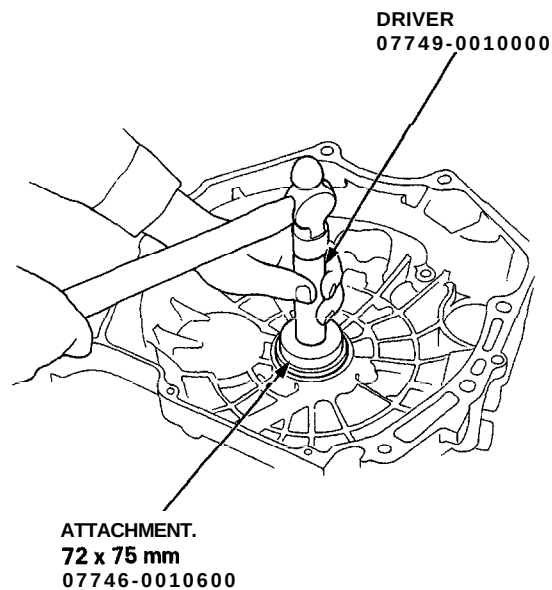
1. Drive out the mainshaft bearing and oil seal using the special tools.



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.





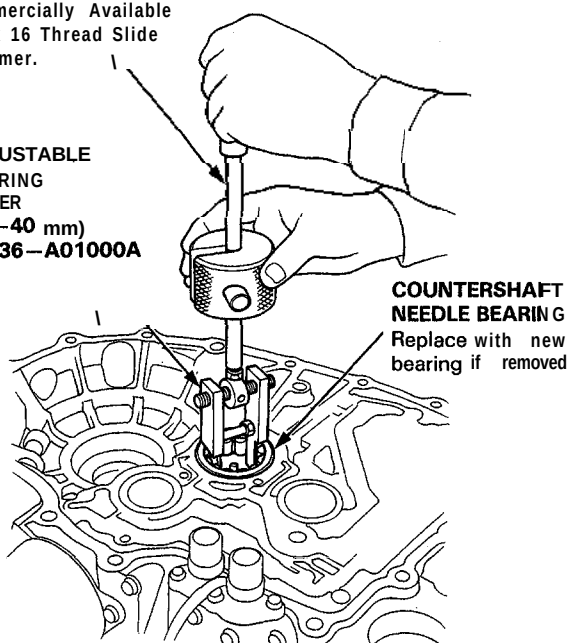
Countershaft Bearing

- Replacement

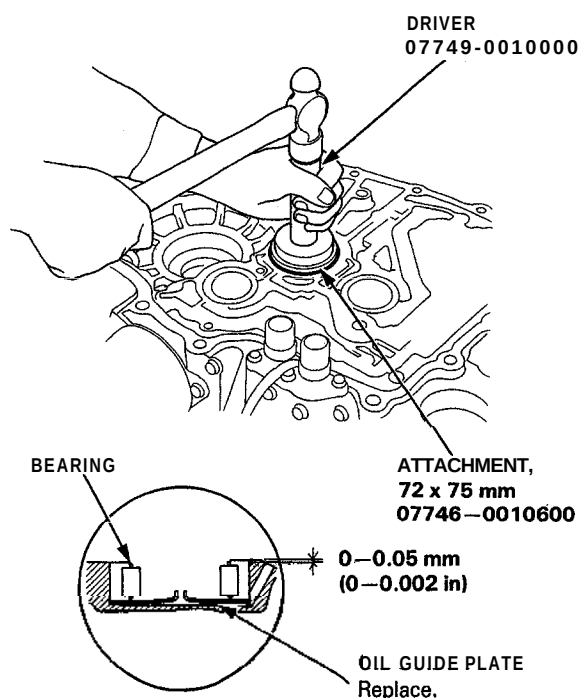
1. Remove the countershaft bearing using the special tool.

Commercially Available
3/8 x 16 Thread Slide
Hammer.

ADJUSTABLE
BEARING
PULLER
(25—40 mm)
07736—A01000A



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



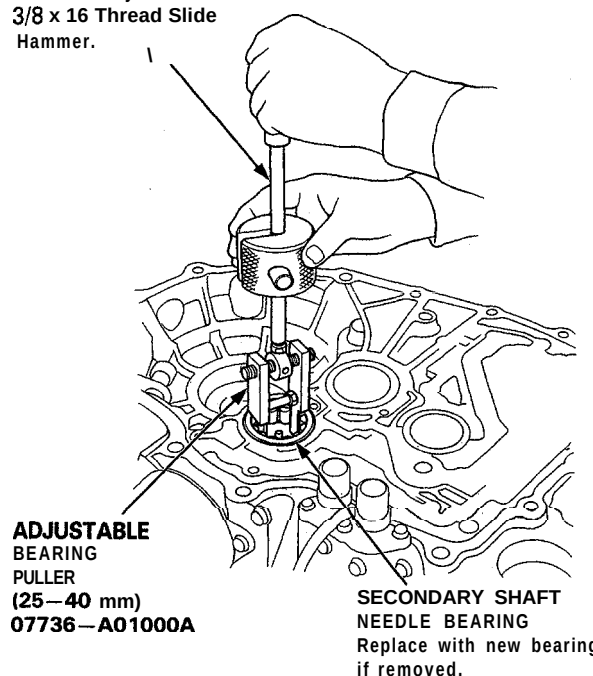
Secondary Shaft Bearing

- Replacement

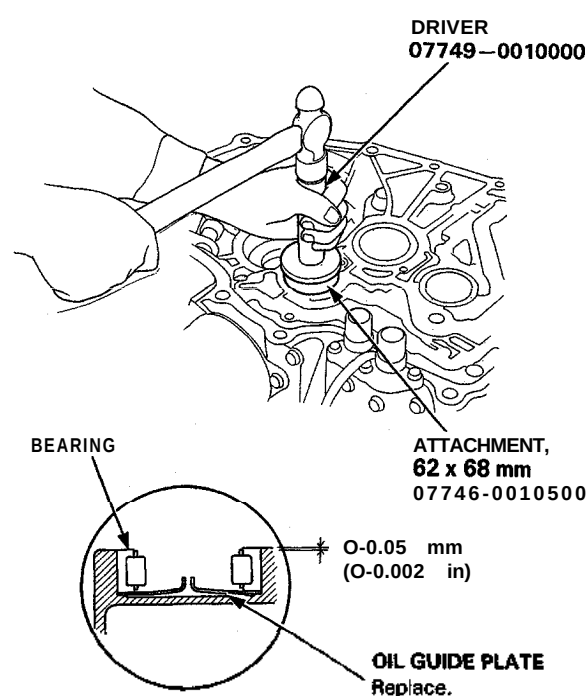
1. Remove the secondary shaft bearing using the special tool.

Commercially Available
3/8 x 16 Thread Slide
Hammer.

ADJUSTABLE
BEARING
PULLER
(25—40 mm)
07736—A01000A



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

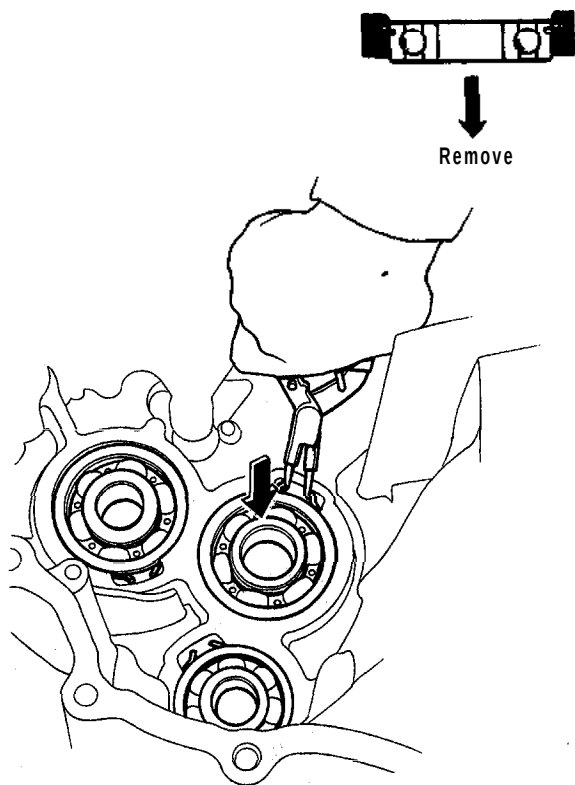


Transmission Housing Bearings

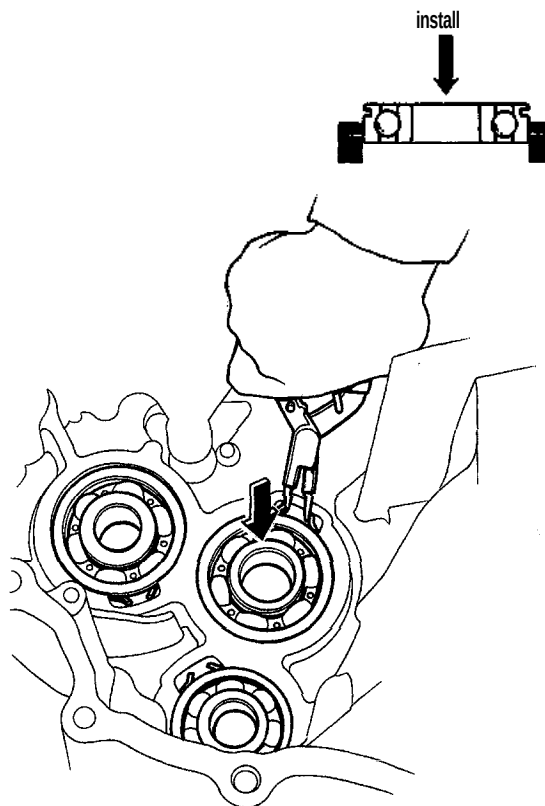
Replacement

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

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.



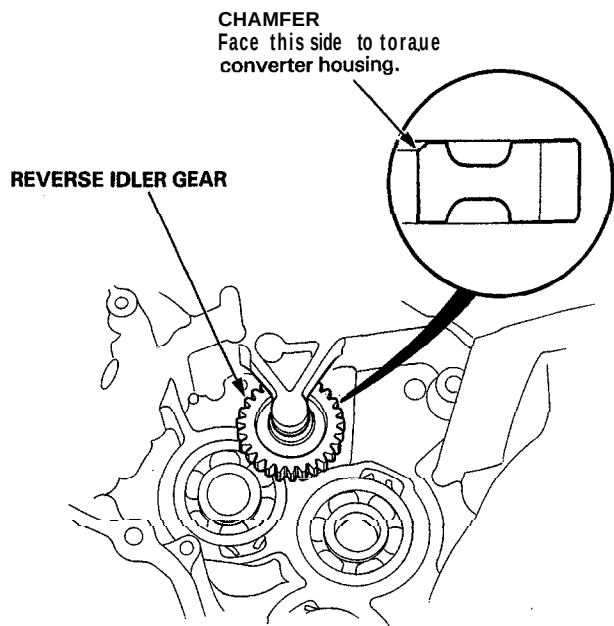
Reverse Idler Gear



Installation

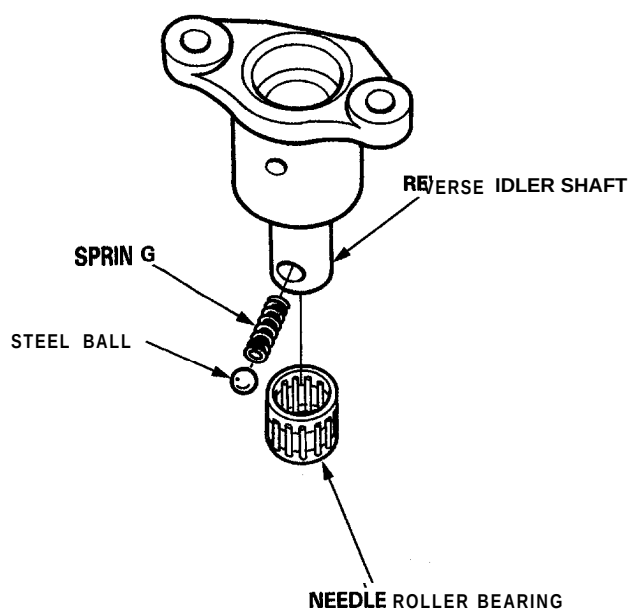
1. Install the reverse idler gear.

NOTE: install the reverse idler gear so that the large chamfer on the shaft bore faces the torque converter housing.

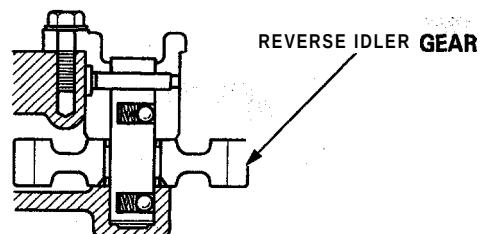
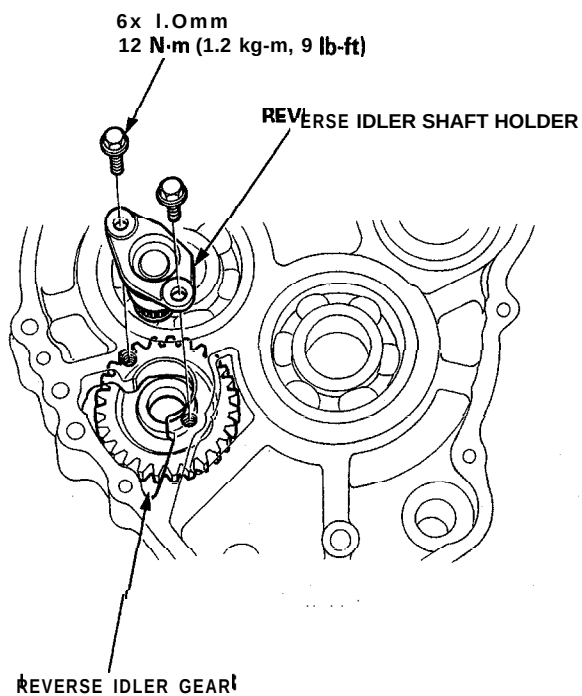


2. Set the spring in the reverse idler shaft. Push the spring in with the steel ball then install the needle bearing.

NOTE: The steel ball is under spring pressure. Take care not to let it pop out.



3. Install the reverse idler shaft holder into the transmission housing, then tighten the bolts.



Manual Valve Detent Spring

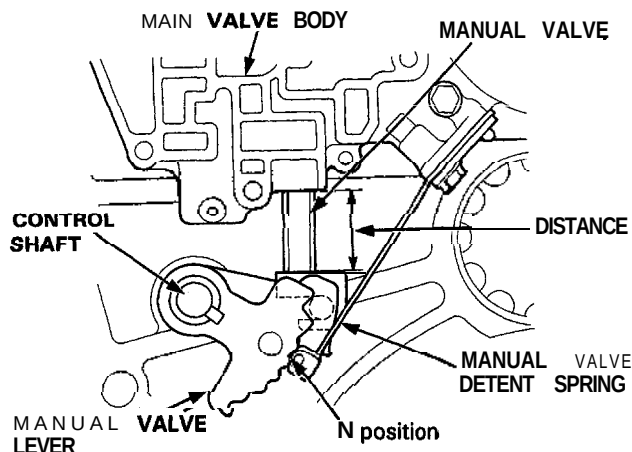
Replacement/Adjustment

NOTE: Select the appropriate manual valve detent spring when below parts are replaced.

- Manual Valve
- Manual Valve Detent Spring
- Manual Valve Lever of Control Shaft

1. Install the main valve body, including the oil pump gears, onto the torque converter housing and tighten to 12 N·m (1.2 kg-m, 9 lb-ft). See page 14-143.
2. Install the control shaft.
3. Install the manual valve detent spring on the main valve body and tighten to 14 N·m (1.4 kg-m, 10 lb-ft).
4. Set the manual valve to N position.
5. Measure the distance between the main valve body and manual valve as shown.

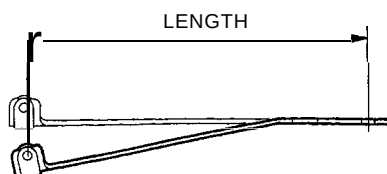
DISTANCE: 28.0-29.0 mm (1.102–1.142 in)



6. If the measurement is out of tolerance, select the appropriate manual valve detent spring using table below, then install it and recheck.

MANUAL VALVE DETENT SPRING

No.	Part Number	Length
1	24618-PR9-000	103.5 mm (4.07 in)
2	24619-PR9-000	104.0 mm (4.09 in)
3	24620-PR9-000	104.5 mm (4.11 in)

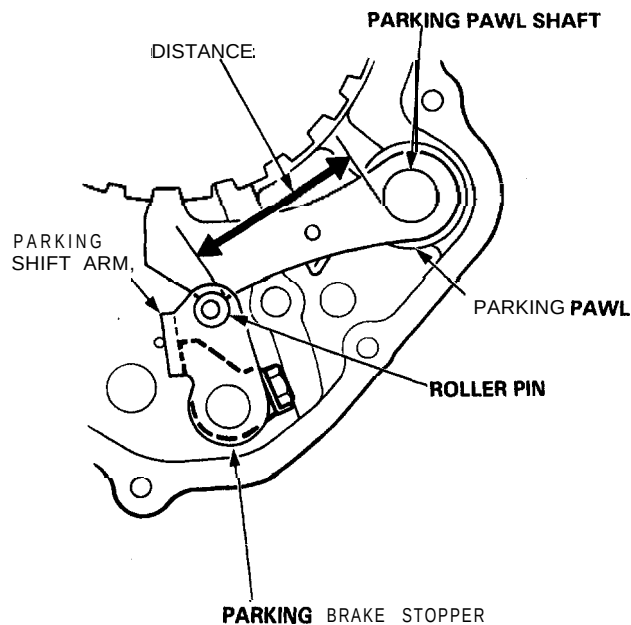


Parking Brake Stopper

Inspection/Adjustment

1. Set the parking shift arm in the PARK position.
2. Measure the distance between the face of the parking pawl shaft and face of the parking shift arm roller pin as shown.

DISTANCE: 52.1-53.1 mm (2.051-2.091 in)



3. If the measurement is out of tolerance, select the appropriate parking brake stopper using the table below, and install it on the parking shift arm.

PARKING BRAKE STOPPER

No.	Part Number
1	24537-PA9-003
2	24538-PA9-003
3	24539-PA9-003



Transmission

Reassembly

NOTE: Coat all parts with ATF.

1. Reassemble the valve bodies in the following numbered sequence.

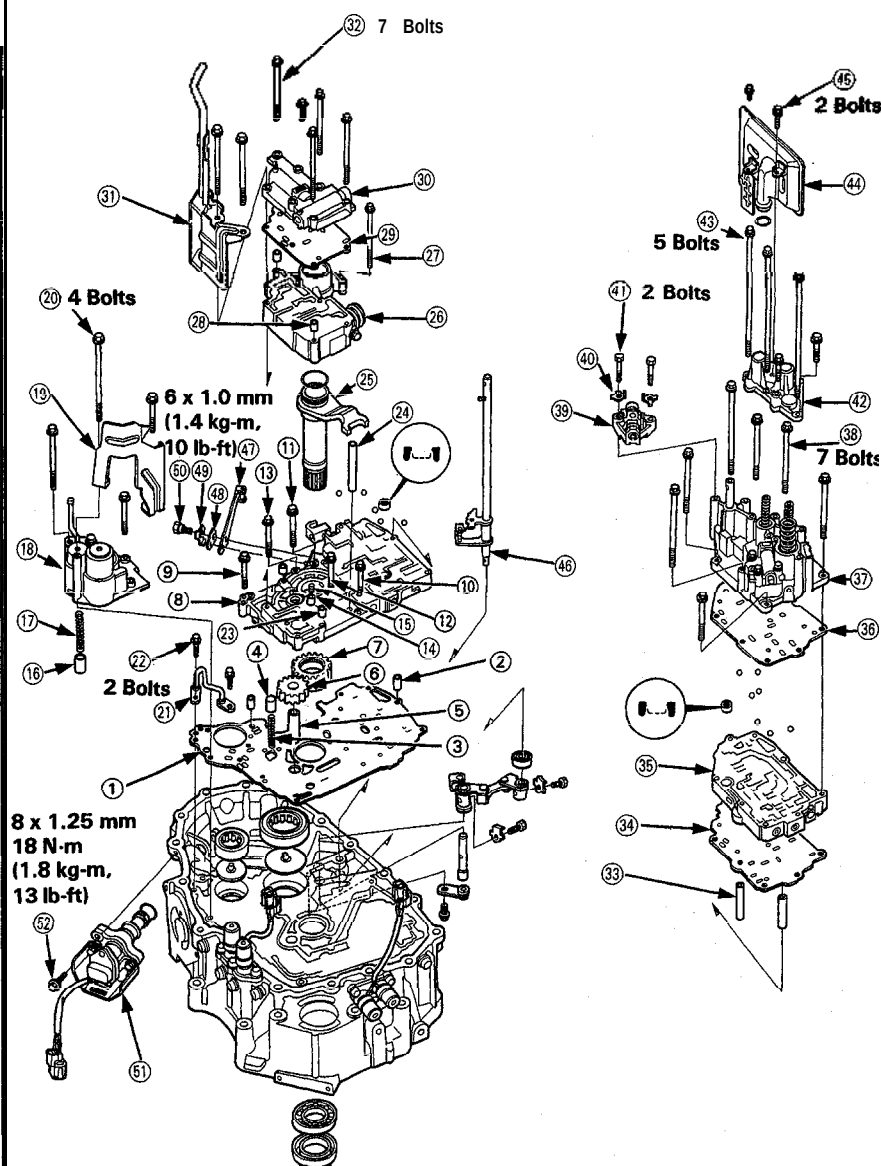
CAUTION: To prevent stripping the threads, press down on the accumulator cover while installing the bolts.

TORQUE:

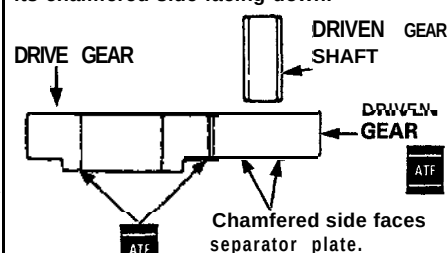
6 x 1 .0 mm: all bolts except ⑤0: 12 N·m (1.2 kg-m, 9 lb-ft)

6 x 1 .0 mm: ⑤0: 14 N·m (1.4 kg-m, 10 lb-ft)

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

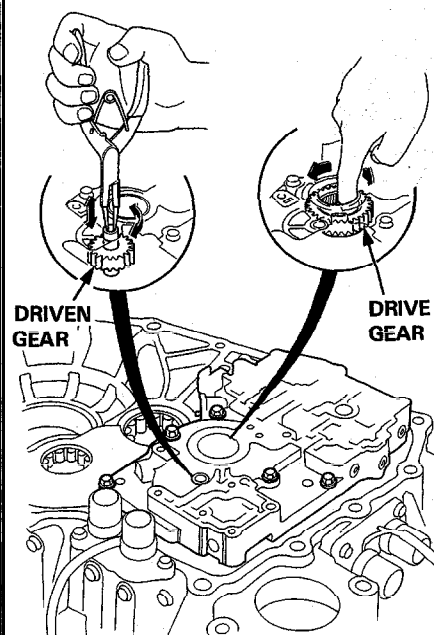


NOTE: Install the oil pump driven gear with its chamfered side facing down.



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.



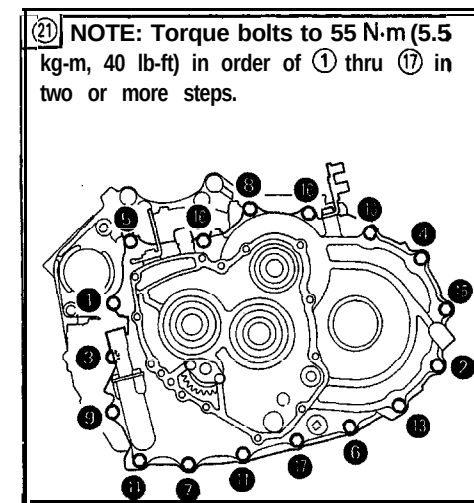
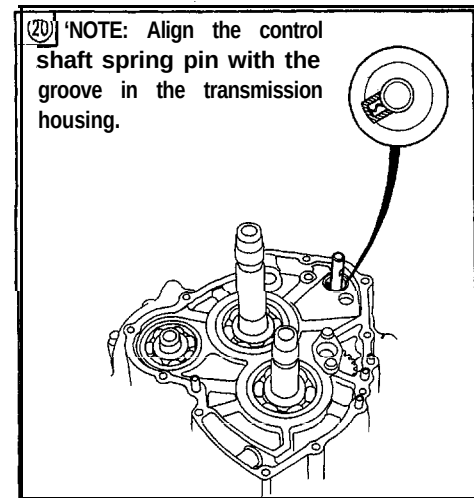
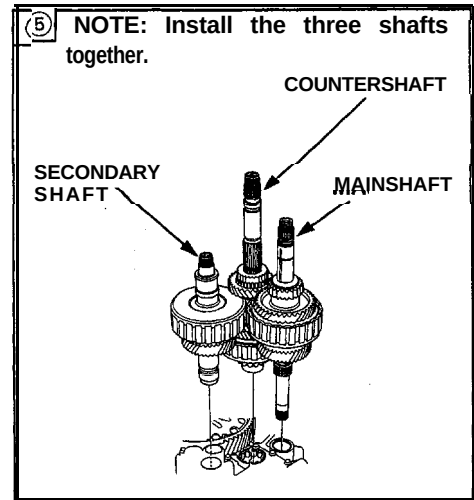
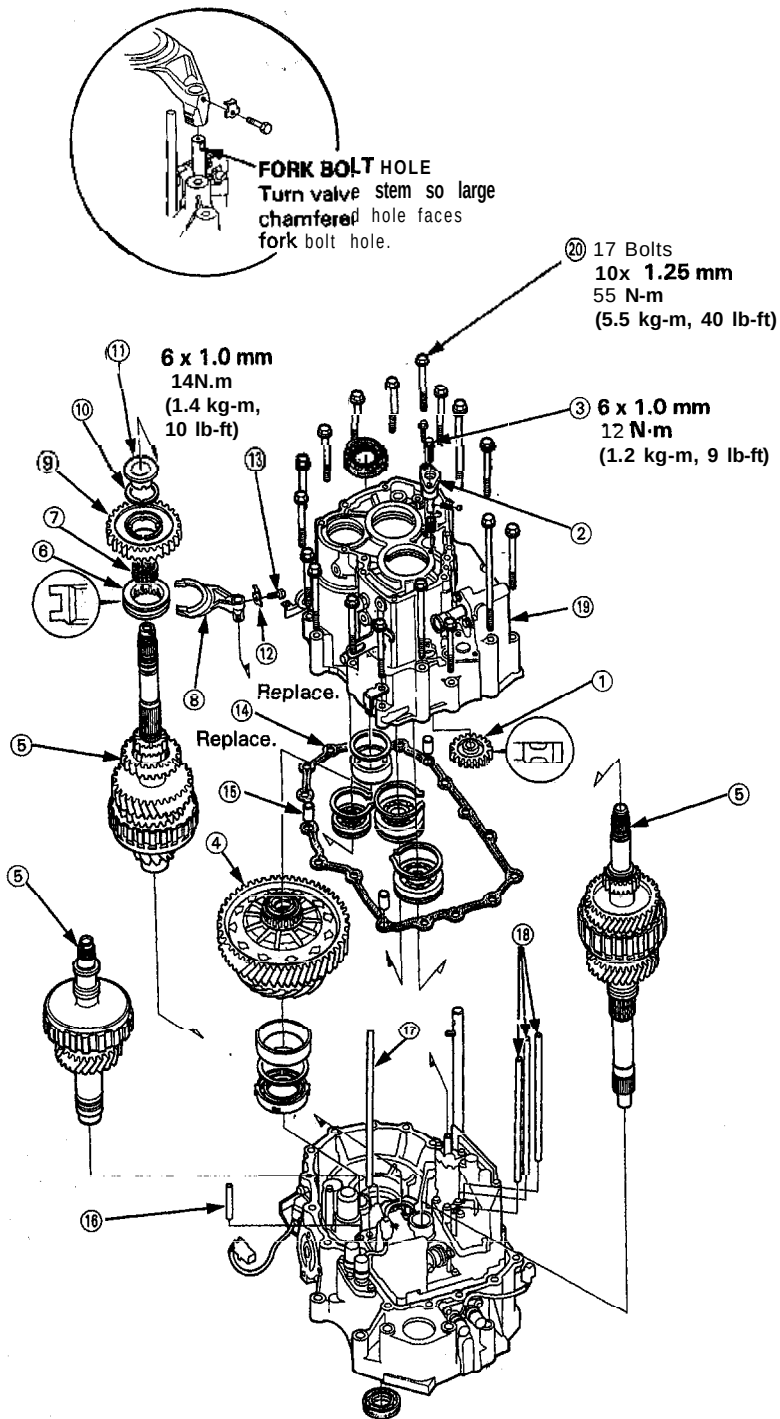
((cont'd))

Transmission

Reassembly

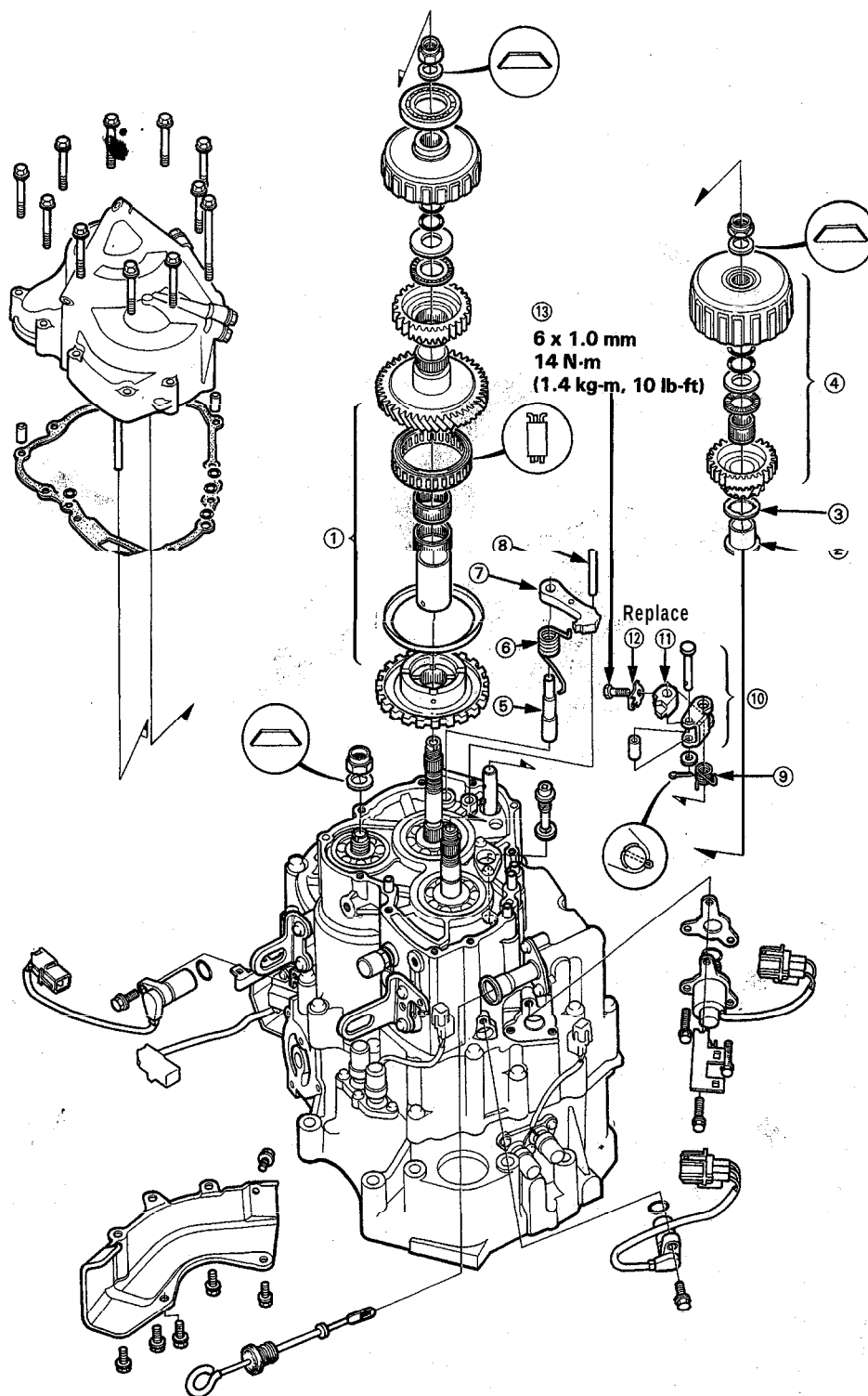
2. Assemble the transmission housing in the following numbered sequence.

NOTE: See page 14-41 when installing the reverse idler gear.





3. Assemble the transmission in the following numbered sequence.



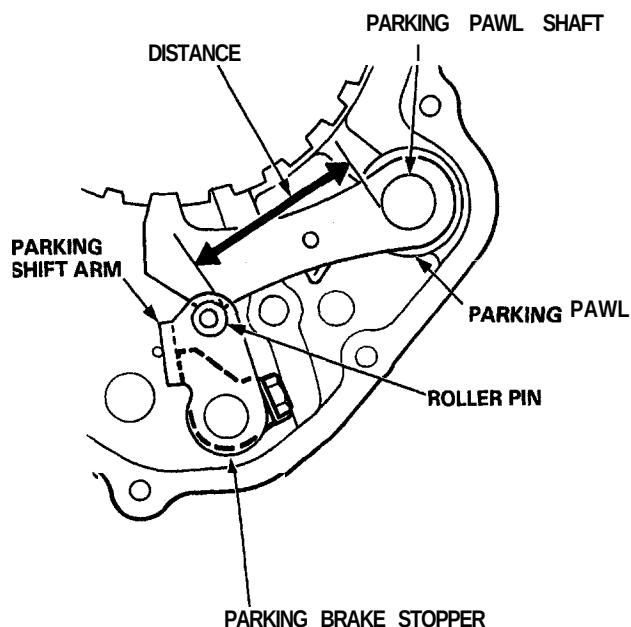
(cont'd)

Transmission

Reassembly

4. Set the parking shift arm in the PARK position.
5. Measure the distance between the face of the parking pawl shaft and face of the parking shift arm rollers pin as shown.

DISTANCE: 52.1 — 53.1 mm (2.051 — 2.091 in)



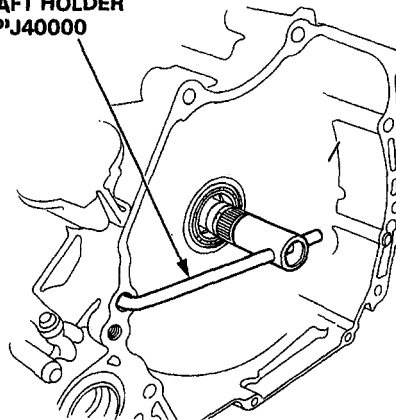
6. If the measurement is out of tolerance, select the appropriate parking brake stopper using the table below, and install it on the parking shift arm.

PARKING BRAKE STOPPER

NO.	PARTS NUMBER
1	24537-PA9-003
2	24538-PA9-003
3	24539-PA9-003

7. Install the special tool as shown, and shift to PARK position.

MAINSHAFT HOLDER
07924-PJ40000



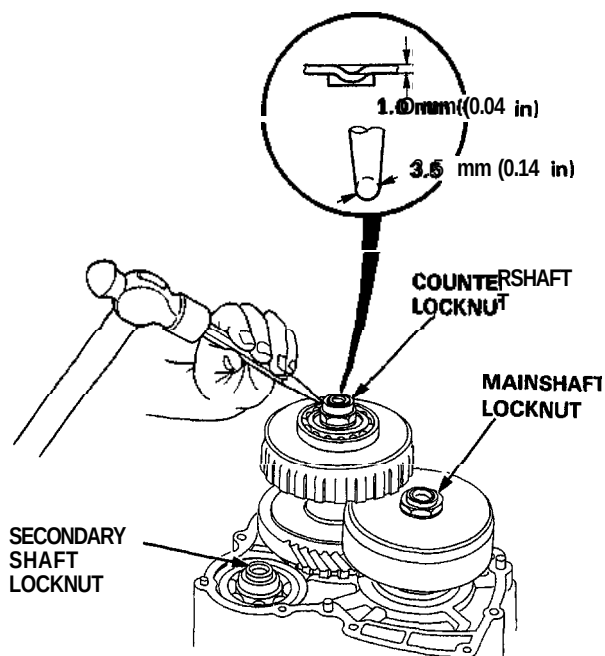
8. Install and torque the new locknuts. Tighten to specified torque, then loosen and retighten to specified torque.

TORQUE: 140 → 0 → 140 N·m

(14.0 → 0 → 14.0 kg-m, 101 → 0 → 101 lb-ft)

NOTE: Countershaft locknut has left-hand threads.

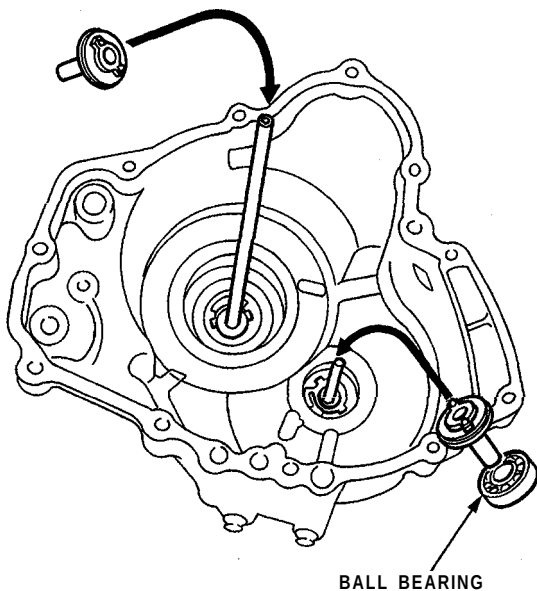
9. Stake each locknut into its shaft, using a 3.5 mm punch.





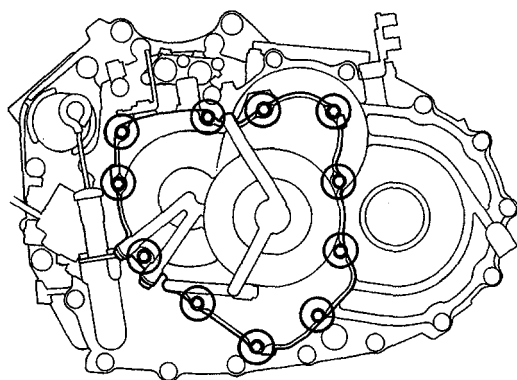
10. Install the feed pipes and ball bearing in the L. Side Cover, aligning the lugs of the 1st and 1st-hold clutch feed pipes with the grooves of the L. side cover.

11. Install the snap ring.



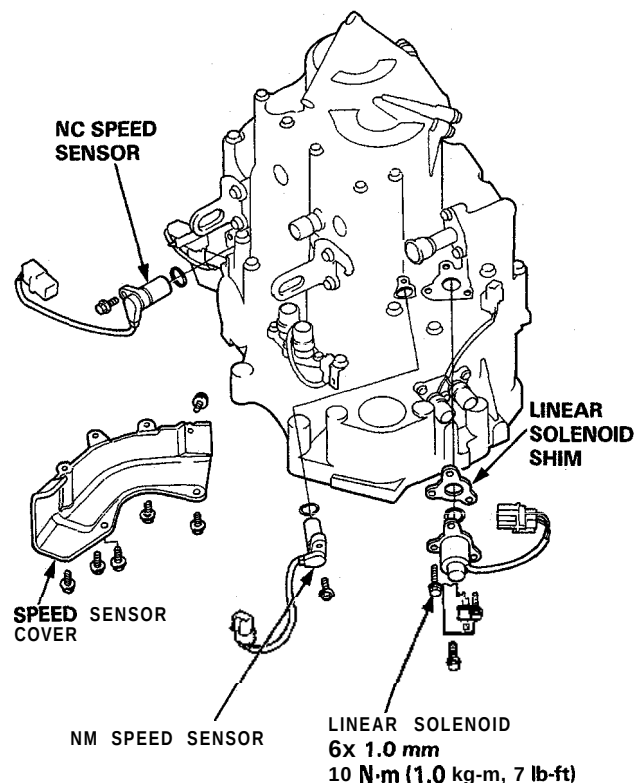
12. Install the L. Side Cover.

TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)



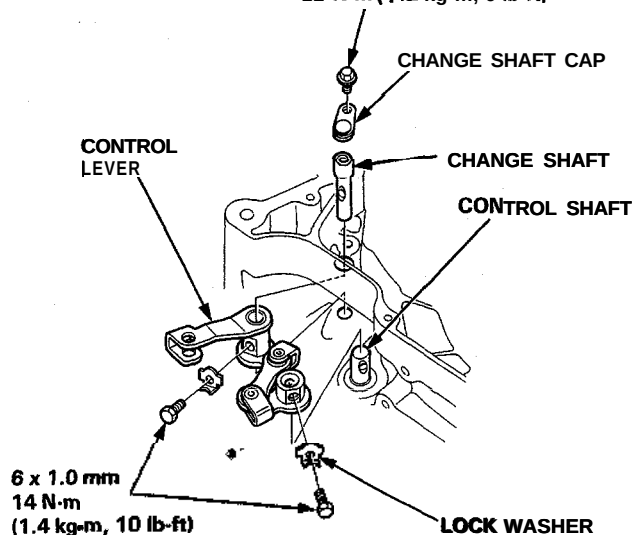
13. Install the speed sensors, speed sensor cover and linear solenoid.

TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

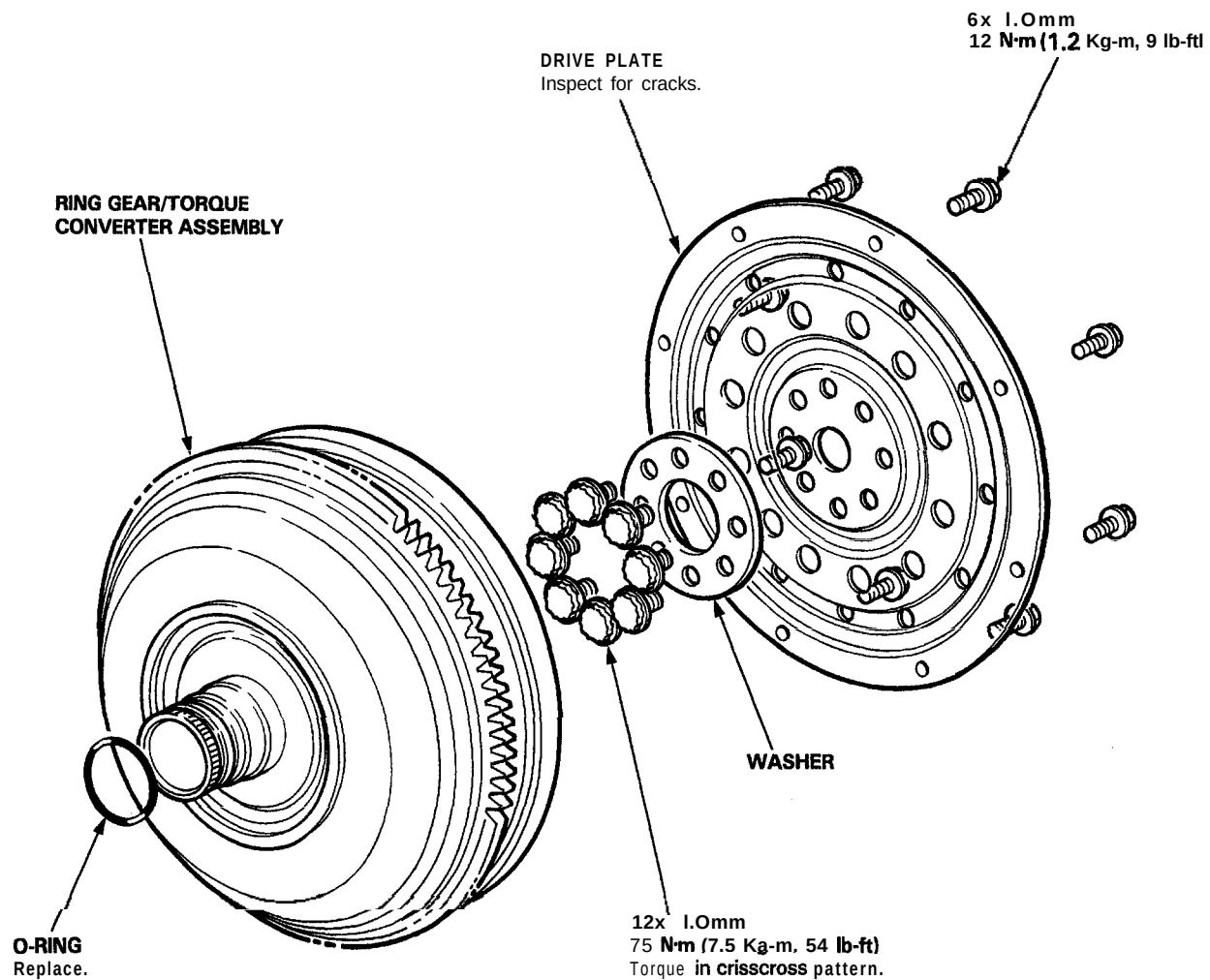


14. Install the control lever, new lock washers, change shaft and change shaft cap on the other end of the control shaft. Tighten the bolts and then bend the tab over against the bolt head.

6x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)



Disassembly



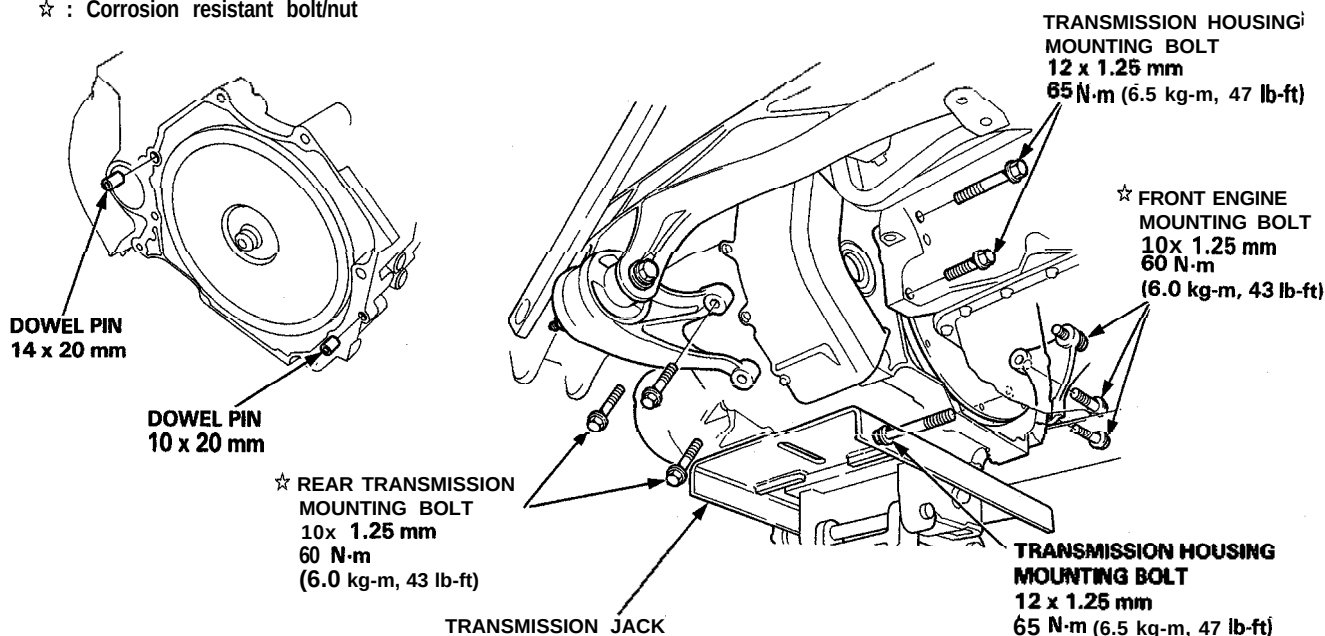


Transmission

Installation

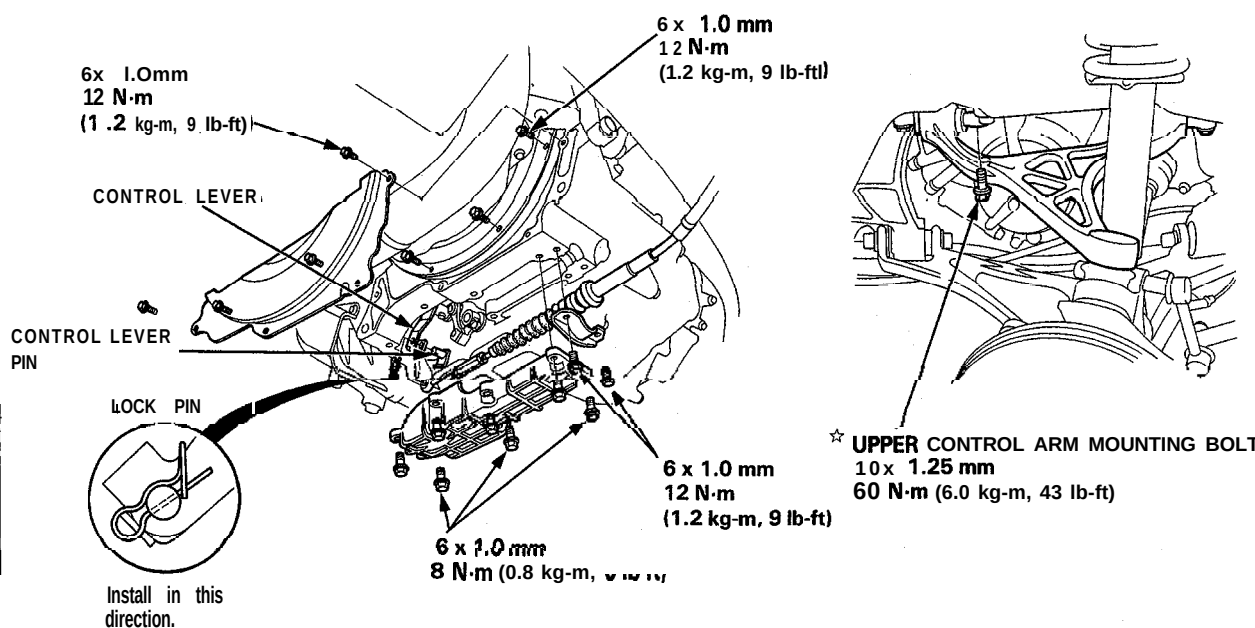
1. Place the transmission on the transmission jack, and raise to the engine level.
2. Check that the 14 mm and 10 mm dowel pins are installed in the torque converter housing.
3. Install the 3 transmission housing mounting bolts.
4. Install the 3 rear transmission mounting bolts.
5. Loosen the front engine mounting bolt, then install the 2 front engine mounting bolts to transmission side.
6. Remove the transmission jack.

☆ : Corrosion resistant bolt/nut



7. Attach the torque converter to the drive plate with 8 bolts to 12 N·m (1.2 kg-m, 9 lb-ft). Rotate the crankshaft as necessary to tighten bolts to 1/2 of specified torque, then final torque, in a crisscross pattern. Check for free rotation after tightening the last bolt.
8. Install the torque converter cover.
9. Install the shift cable, shift cable holder and shift cable cover.
10. Install the upper control arm mounting bolt.

☆ : Corrosion resistant bolt/nut



(cont'd)

Transmission

• Installation (cont'd)

11. Install a new set ring on the end of the left driveshaft and intermediate shaft.
12. Install the left driveshaft.
13. install the lower control arm to the side beam.

CAUTION: Line up the reference marks on the adjusting bolt, adjusting cam and lower control arm.

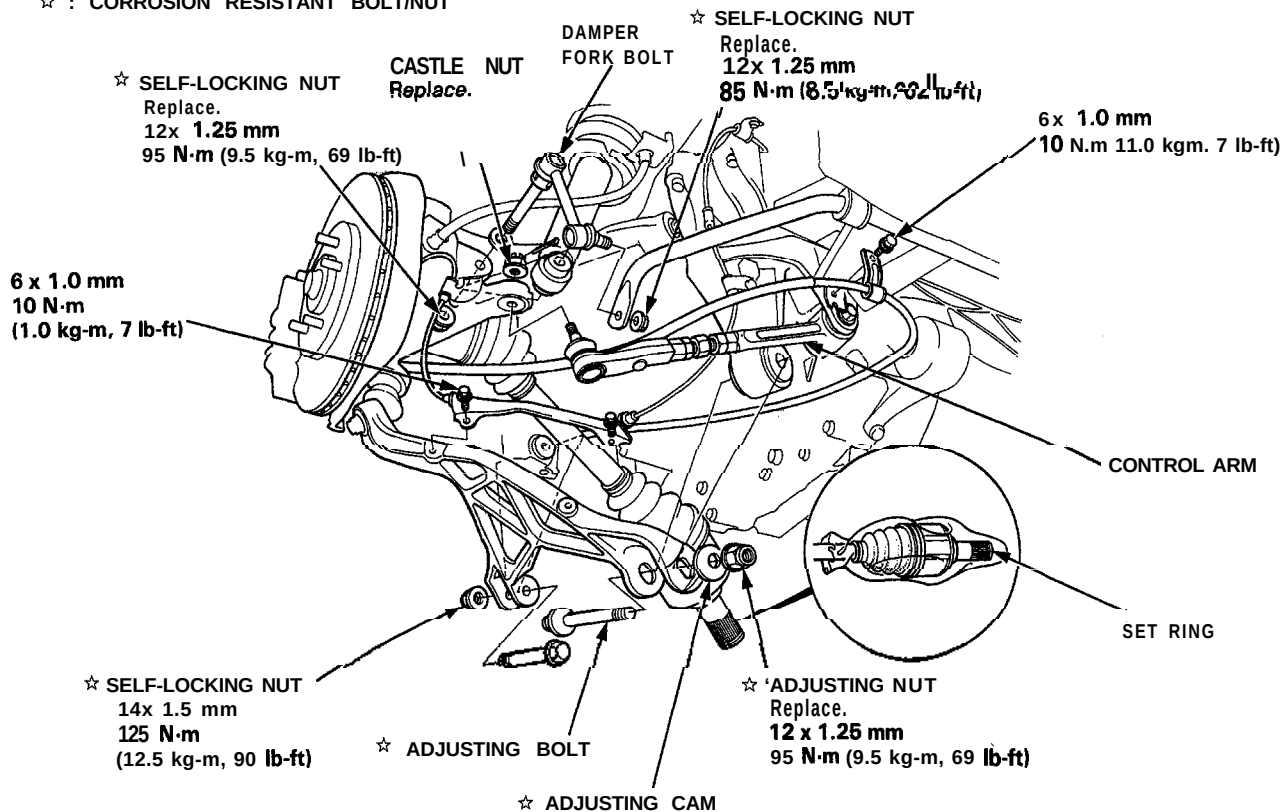
14. Install the damper fork bolt.

15. Install the castle nut to the control arm at the knuckle.

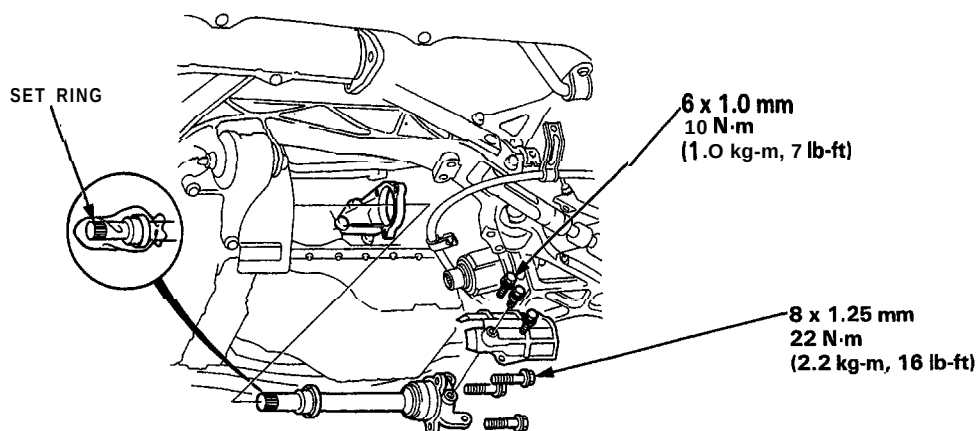
CAUTION: Make sure that the reference marks on the control arm are aligned.

16. Install the anti-lock brake system sensor wire clamp and parking brake cable holder.

☆ : CORROSION RESISTANT BOLT/NUT



17. Install the intermediate shaft and tighten the intermediate shaft mounting bolts to the intermediate shaft support base.
18. Install the intermediate shaft heat cover.



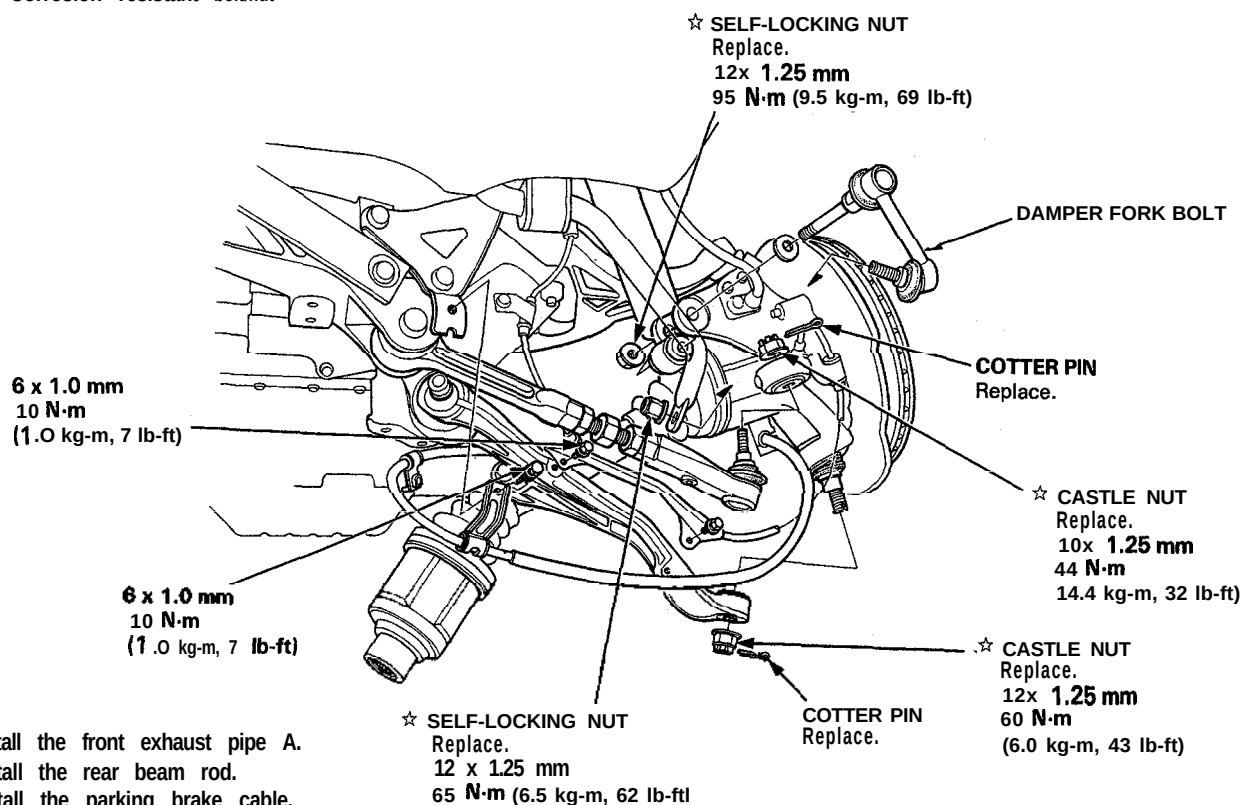


19. Install the right driveshaft on the intermediate shaft.
20. Install the castle nut on the lower arm at the knuckle.
21. Install the damper fork bolt.
22. Install the castle nut on the control arm at the knuckle.

CAUTION: Make sure that the reference marks on the control arm are aligned.

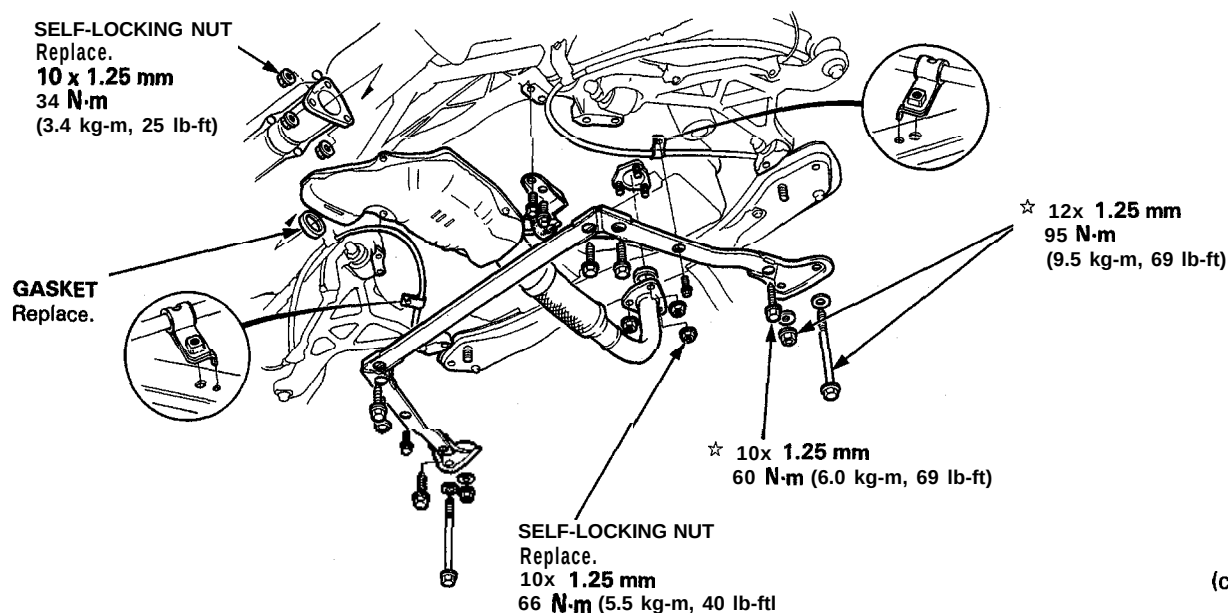
23. Install the ALB sensor wire clamp and parking brake cable holder.

☆ : Corrosion resistant bolt/nut



24. Install the front exhaust pipe A.
25. Install the rear beam rod.
26. Install the parking brake cable.

☆ : Corrosion resistant bolt/nut



(cont'd)

Transmission

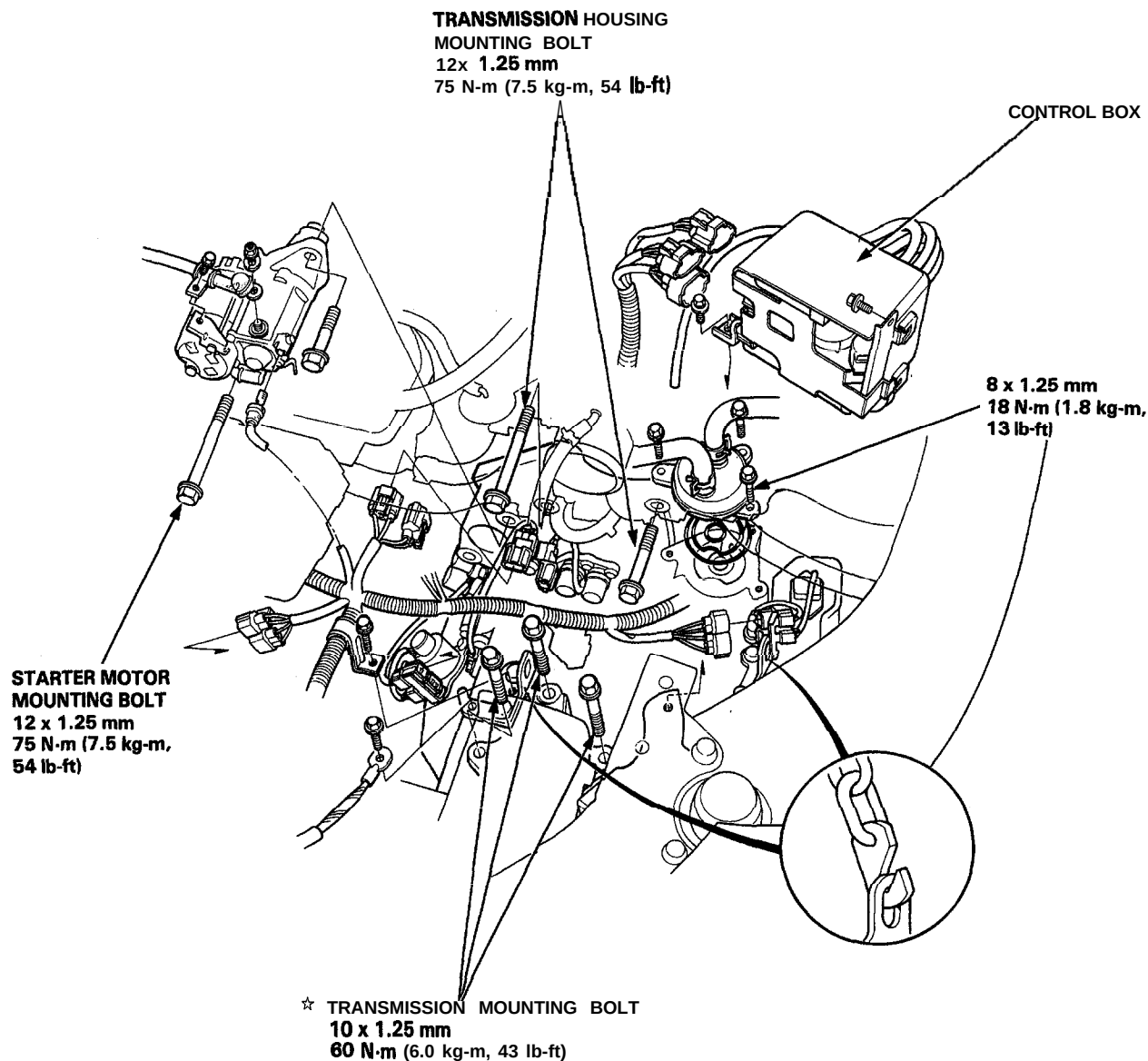
• Installation (cont'd)

27. Install the 3 transmission mounting bolts, and the 2 transmission housing mounting bolts.
28. Install the starter motor and tighten the starter motor mounting bolts.
29. Install the ATF cooler.
30. Connect the transmission ground cable, starter motor cable, solenoid valve wire connectors and speed sensor wire connectors.
31. Install the control box and connect the control box connectors.
32. Install the air cleaner case.
33. Install the strut bar.

TORQUE: 39 N·m (3.9 kg-m, 28 lb-ft)

34. Refill the transmission with ATF.
35. Connect the battery positive (+) and negative (-) cable to the battery.
36. Inspect the rear camber (See Section 18).
37. Start the engine. Set the parking brake, and shift the transmission through all gears three times. Check for proper shift cable adjustment.
38. Check the ignition timing (See Section 23).
39. Let the engine each operating temperature with the transmission in Neutral or Park, then turn it off and check the fluid level.
40. Road test as described on page 14-88.

☆ : Corrosion resistant bolt/nut





Shift Cable

Adjustment

1. Start the engine. Shift to reverse to see if the reverse gear engages. If not, refer to Troubleshooting on pages 14-84 thru 14-87.

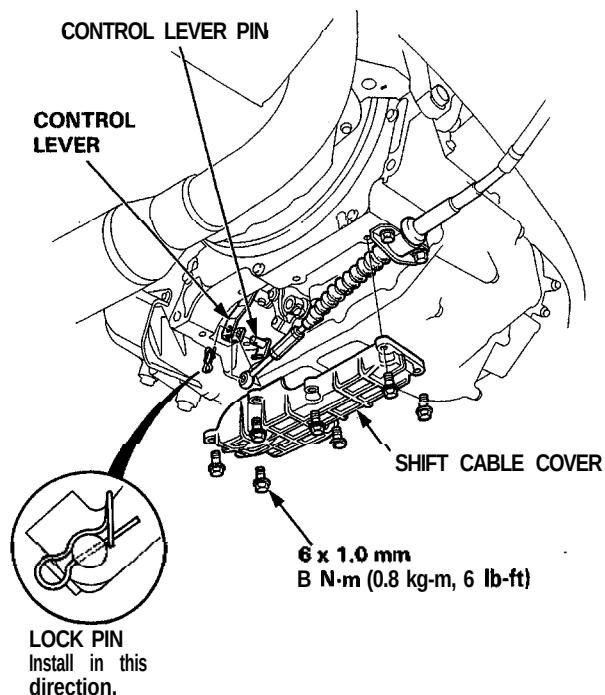
2. Stop the engine.

3. Raise the car. (See page I-6.)

4. Shift the selector lever to 1 position.

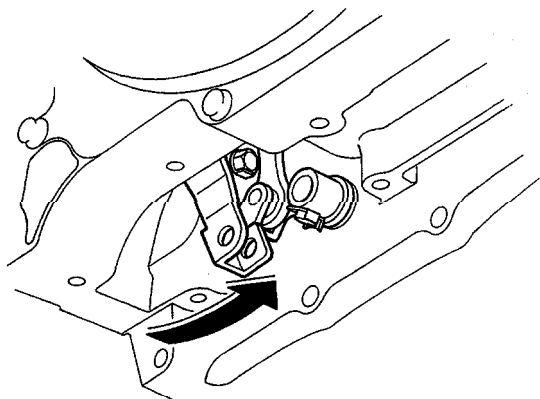
5. Remove the shift cable cover.

6. Remove the control lever pin and lock pin from the control lever.



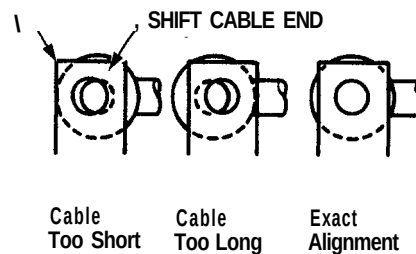
7. Shift the control lever to 1 position.

NOTE: 1 position moves the control lever toward to the front of the car.

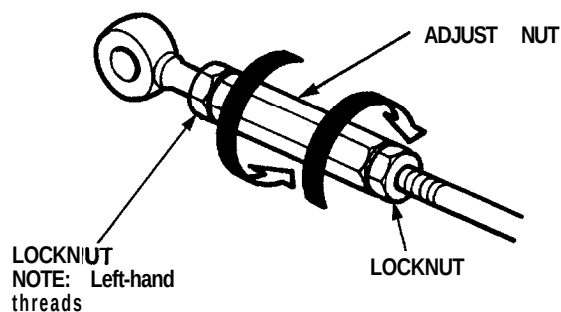


8. Check that the hole in the control lever is perfectly aligned with the hole in the shift cable.

CONTROL LEVER



9. If not perfectly aligned, loosen the locknut on the shift cable and adjust as required.



10. Tighten the locknut.

11. Install the control lever pin and lock pin.

NOTE:

- If you feel the control lever pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.
- Install the lock pin as shown in step 6.

12. Install the shift cable cover.

13. Start the engine and check the shift lever in all gears. If any gear does not work properly, refer to Troubleshooting on pages 14-84 thru 14-87.

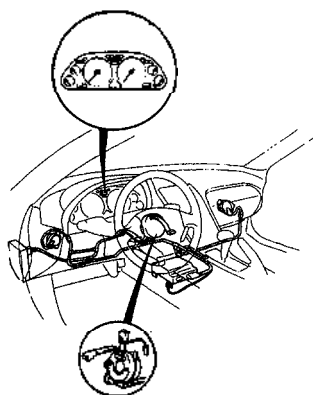
Shift Cable

Removal/Installation

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.

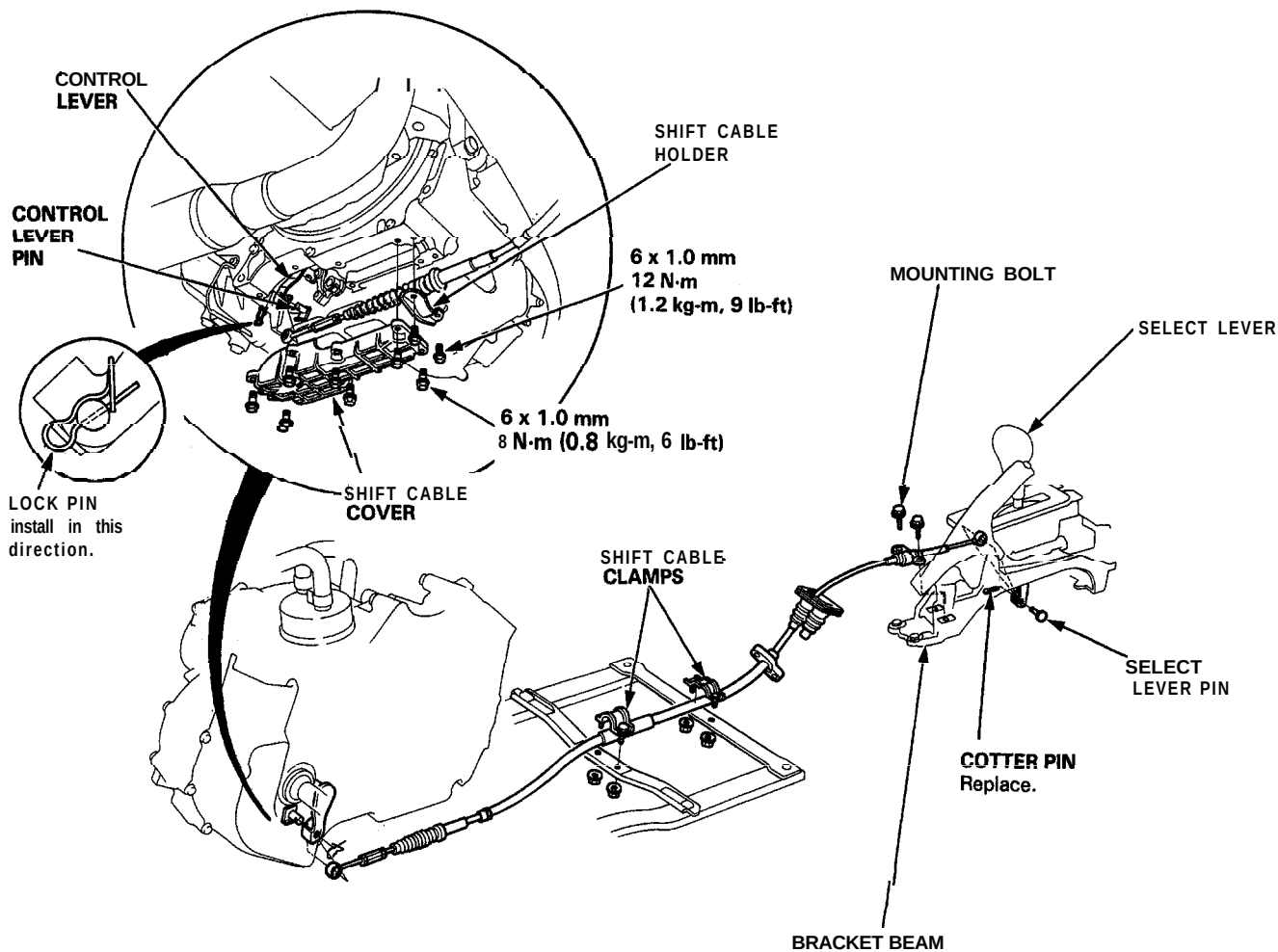


⚠ WARNING Make sure **lifts** are placed properly.

1. Remove the center console panel.
2. Remove the shift cable by removing the cotter pin and selector lever pin from the selector lever, and mounting bolts from the bracket beam.
3. Remove the shift cable clamps.
4. Remove the shift cable holder and shift cable cover.
5. Remove the shift cable by removing the lock pin and control lever pin from the control lever.

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

6. Install the shift cable in the reverse order of removal.
7. Check the cable adjustment on reassembly, on page 14-153.



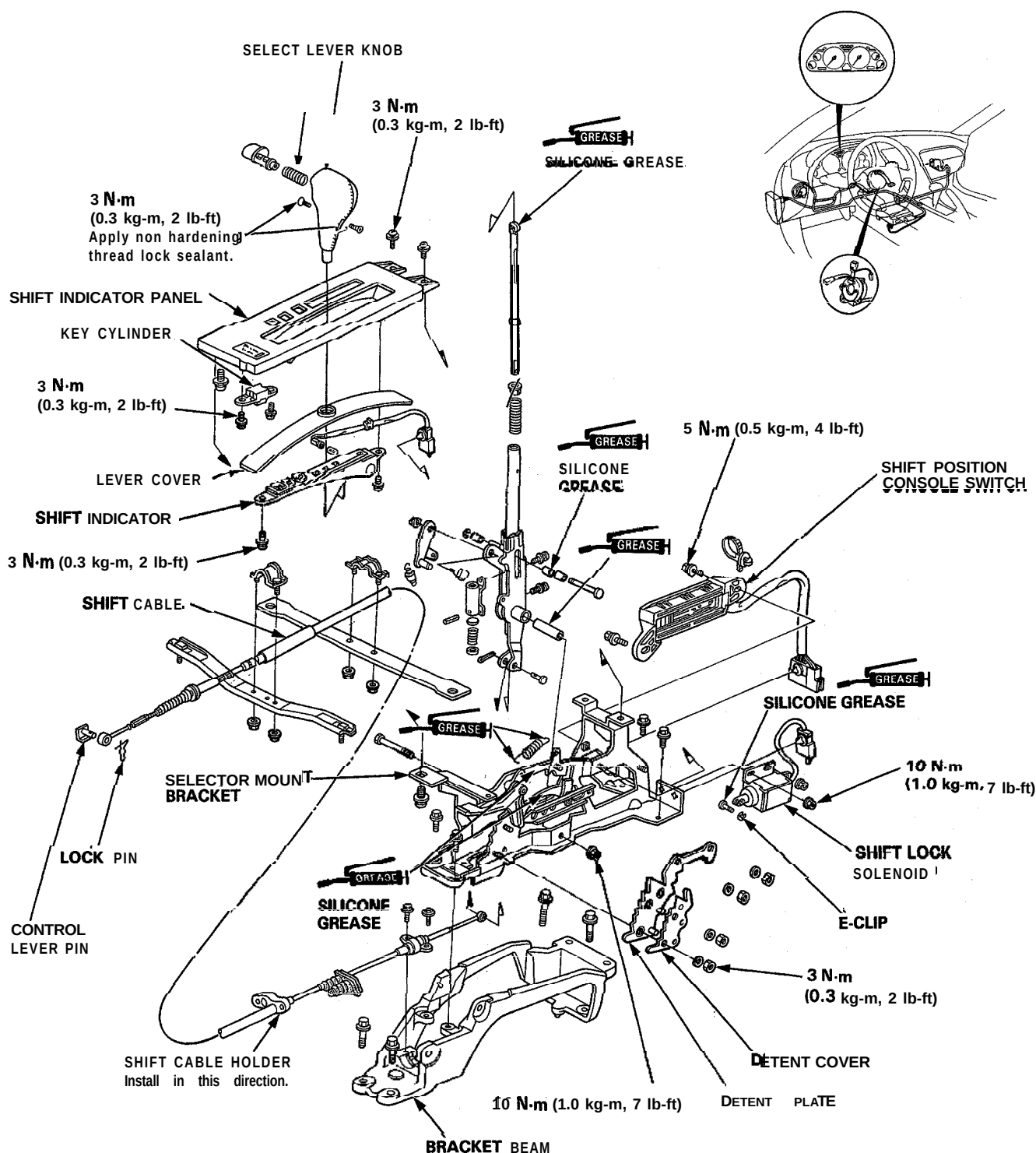


Gearshift Selector

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 carefull not to damage the SRS wire harness when servicing the gearshift selector.



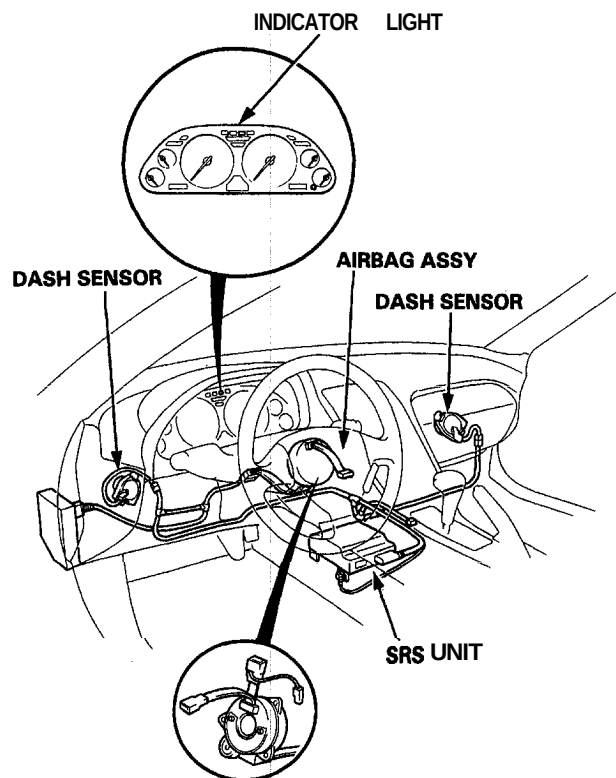
Shift Indicator Panel

Adjustment

SRS wire harness is routed near the gearshift selector.

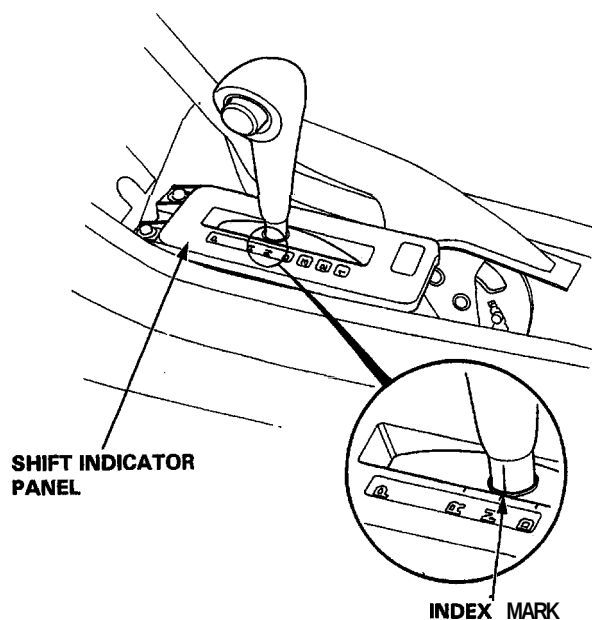
⚠ WARNING All SRS **wire** harnesses and connectors are colored yellow. Do not use electrical test equipment on these circuits.

CAUTION: Be **carefull** not to damage the SRS wire harness when servicing the shift indicator panel.



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

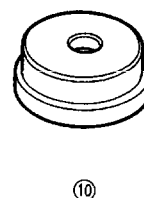
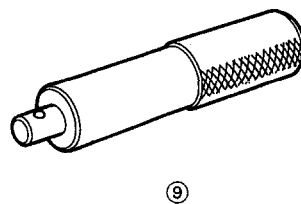
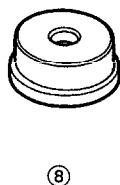
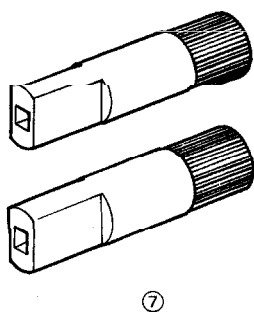
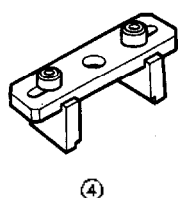
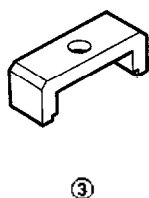
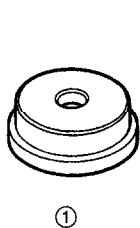
Special Tools	15-2
Illustrated Index	15-3
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Disassembly	15-6
Clutch Disc, Clutch plate	
Replacement	15-8
Differential	
Reassembly	15-9
Oil Seal	
Replacement	15-11
Bearing Outer Race	
Replacement (Clutch Housing Side)	15-12
Bearing Preload	
Adjustment	15-12
Oil Seal	
Installation	15-14



Special Tools

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07GAD—SD40101	Attachment, 78 x 70 mm	1	15-12
②	07GAE—PL50100	Clutch Spring Compressor Bolt Assembly	1	15-6, 15-10
③	07HAE—PG40200	Clutch Spring Compressor Attachment	1	15-6, 15-10
④	07LAE—PX40100	Clutch Spring Compressor Attachment	1	15-6, 15-10
⑤	07MAD—PR90200	Pilot 32 x 60 mm	1	15-14
⑥	07MAD—PR90300	Attachment, 45 x 55 mm	1	15-5
⑦	07MAJ—PR90100	Differential Inspection Tools	1	15-4, 15-6, 15-11, 15-13
⑧	07746-0010500	Attachment, 62 x 68 mm	1	15-12
⑨	07749-0010000	Driver	1	15-12, 15-14
⑩	07965—SA00600	Driver Attachment	1	15-14

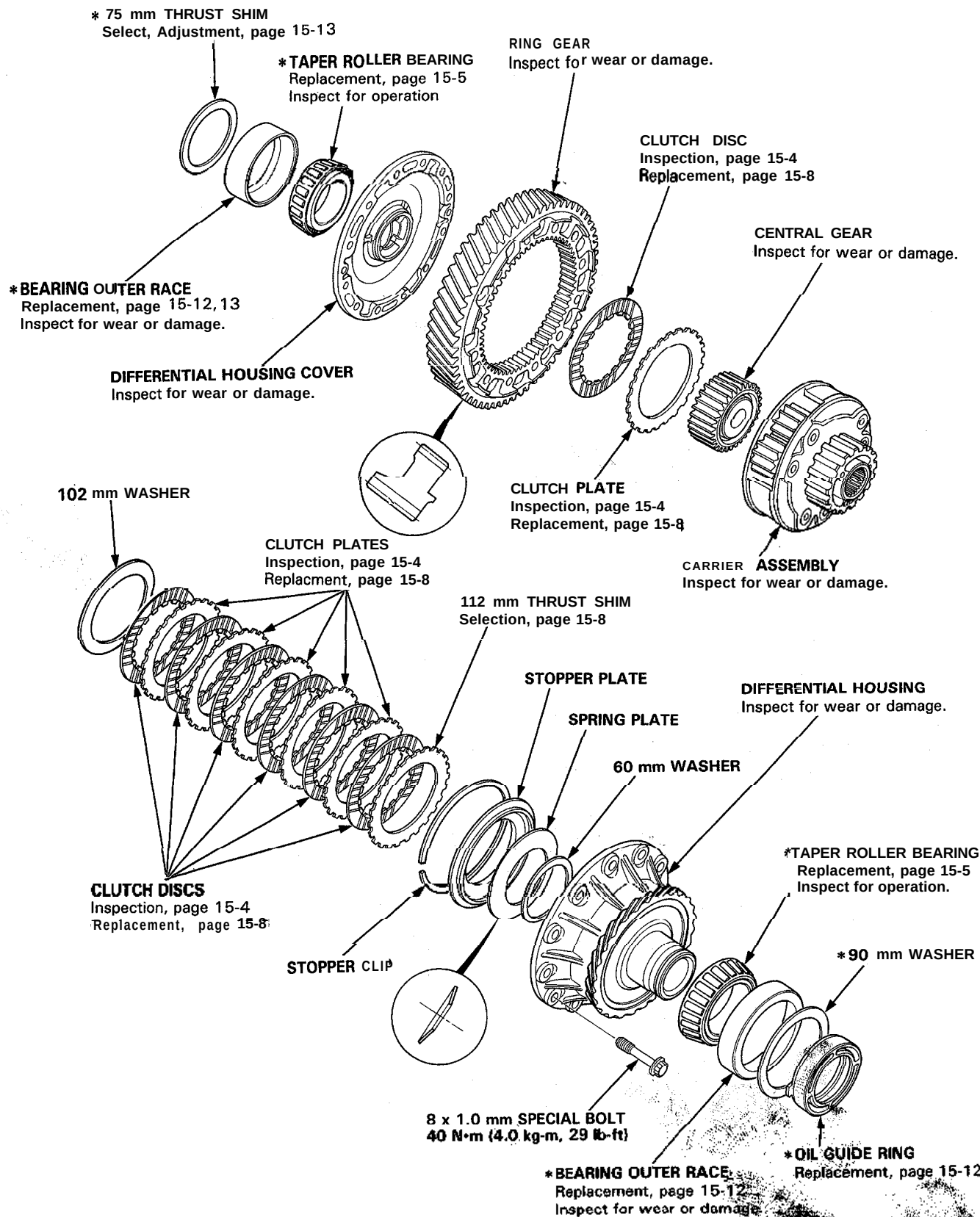




Differential

Illustrated Index

NOTE: If the * mark parts are replaced, the bearing preload must be adjusted (page 15-12).



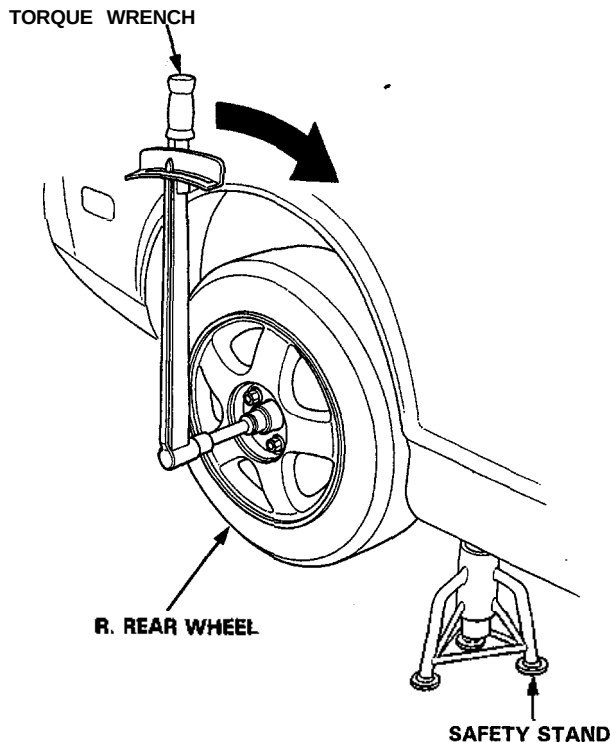
Preset Torque

-Inspection

On-Car:

1. Lift up right rear wheel and place the safety stand. (Lift and Support Points, page I-6).
2. Block the other three wheels.
3. Measure preset torque clockwise using a torque wrench as shown.

Standard: 60 – 140 N·m
(6 – 14 kg·m, 43-101 lb-ft)
Service Limits: 30 N·m (3 kg·m, 22 lb-ft)

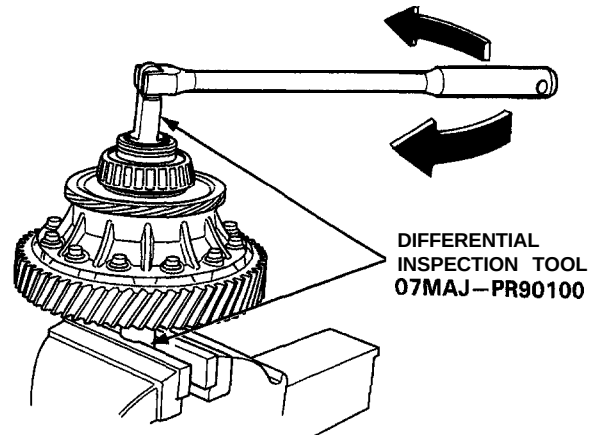


4. If preset torque is less than the service limit, replace the clutch discs with new ones.

NOTE: Adjust the thrust shim whenever the clutch discs are replaced. (See page 15-8).

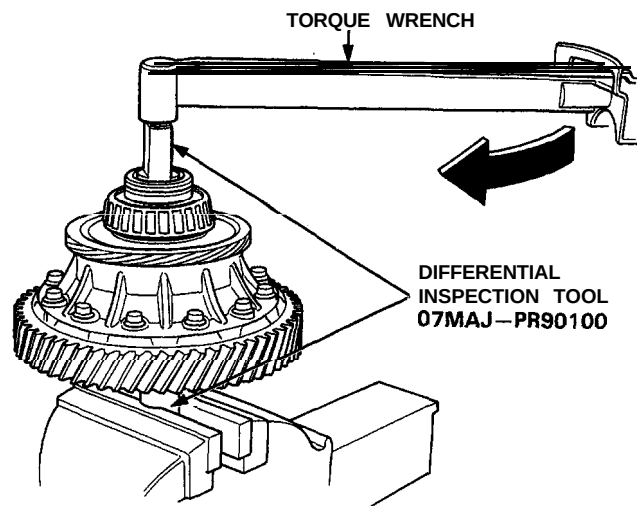
Assembly:

1. Place one special tool in a vise. Place the left side of the differential assembly on the special tool, then preset the differential with 3-5 rotations, both clockwise and counterclockwise.



2. Measure preset torque clockwise using a torque wrench as shown.

Standard: 60 – 140 N·m
(6 – 14 kg·m, 43-101 lb-ft)
Service Limit: 30 N·m (3 kg·m, 22 lb-ft)



3. If preset torque is less than the service limit, replace the clutch discs with new ones.

NOTE: Adjust the thrust shim whenever the clutch discs are replaced. (See page 15-8).



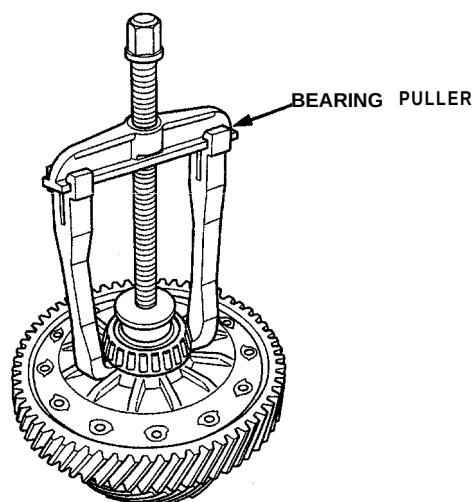
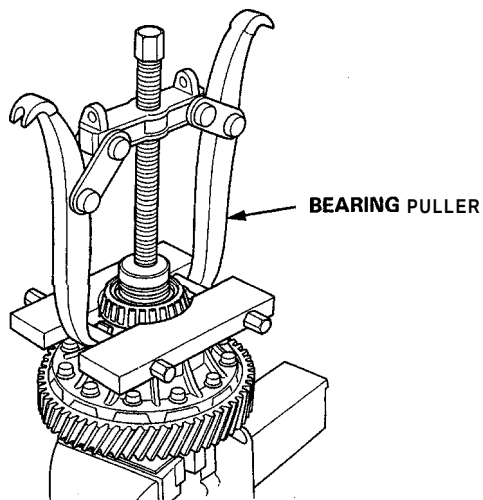
Bearing

• Replacement

NOTE:

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

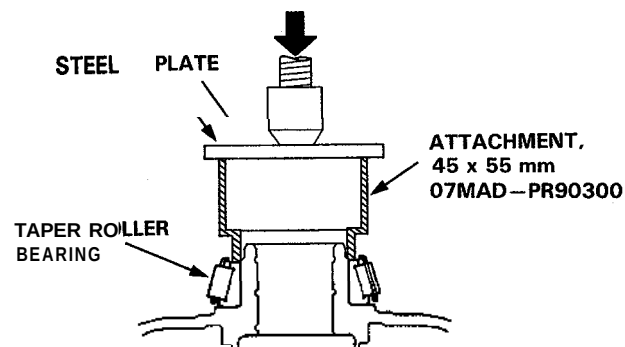
1. Remove the bearings using standard bearing pullers.



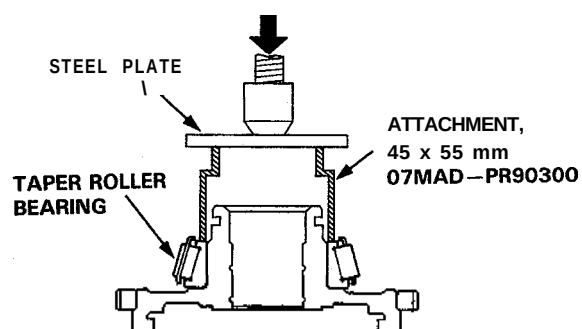
2. Install the bearings using a press as shown.

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

Transmission Housing Side:



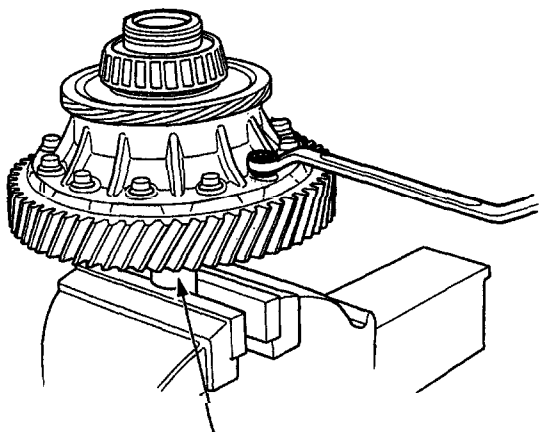
Clutch Housing Side:



Differential

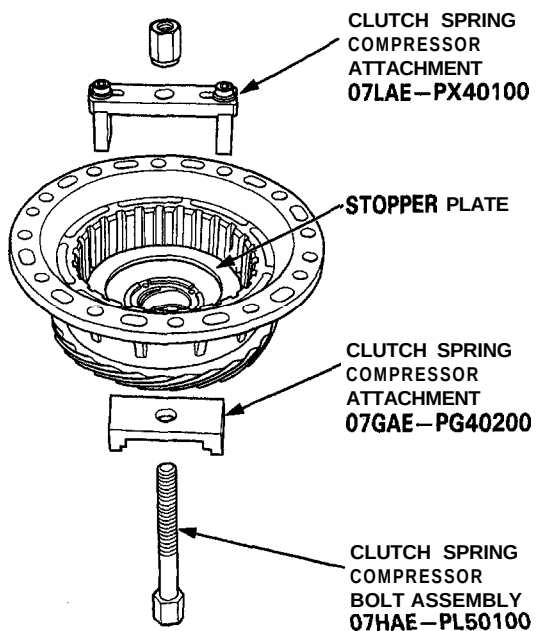
Disassembly

1. Hold the differential in a vise using a special tool, then remove the differential housing mounting bolts.



DIFFERENTIAL
INSPECTION TOOL
07MAJ-PR90100

2. Remove the differential case, then install the special tools on the stopper plate as shown.



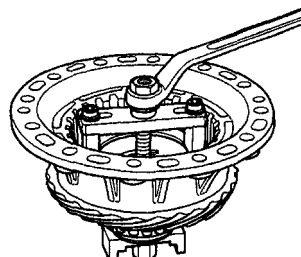
CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07LAE-PX40100

STOPPER PLATE

CLUTCH SPRING
COMPRESSOR
ATTACHMENT
07GAE-PG40200

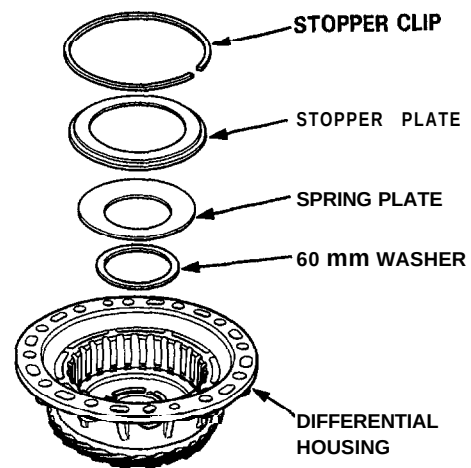
CLUTCH SPRING
COMPRESSOR
BOLT ASSEMBLY
07HAE-PL50100

3. Compress the spring plate.



4. Remove the stopper clip.

5. Remove the special tools and then remove the stopper plate, spring plate and 60 mm washer.



STOPPER CLIP

STOPPER PLATE

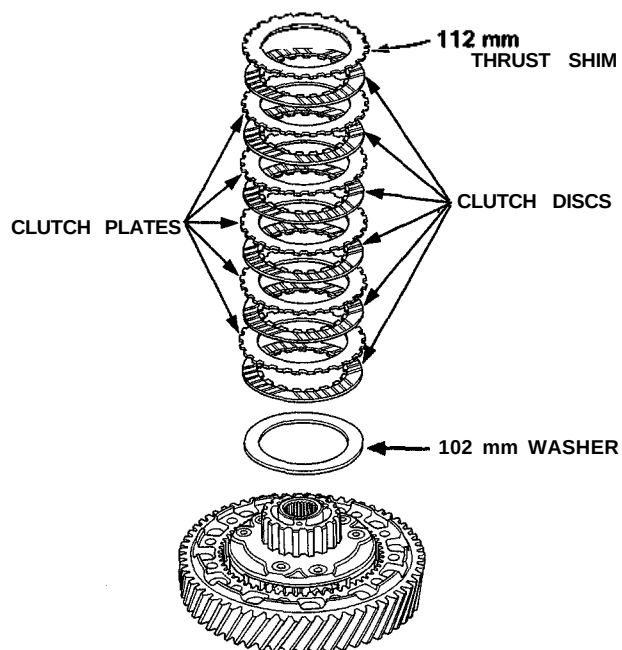
SPRING PLATE

60 mm WASHER

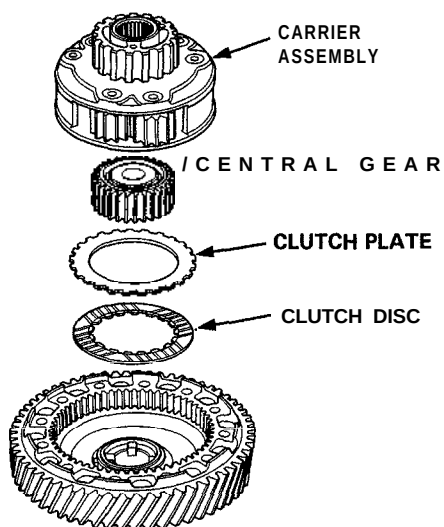
DIFFERENTIAL
HOUSING



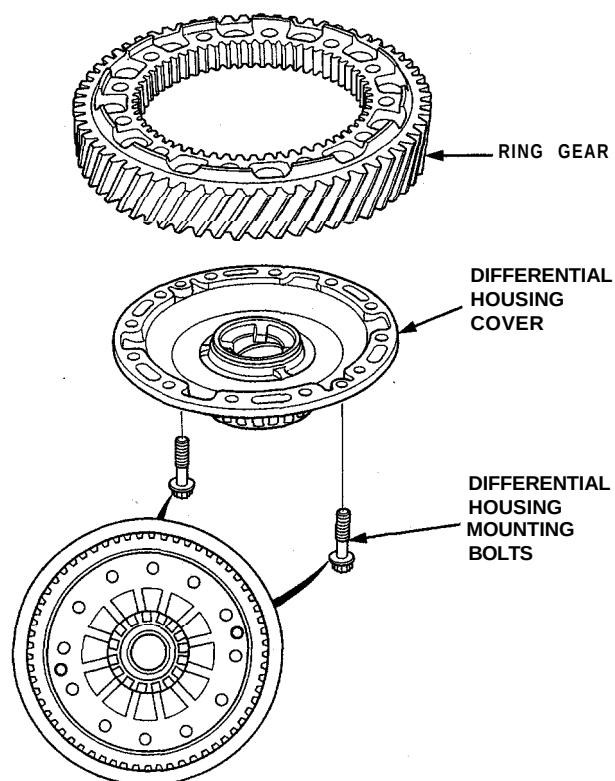
6. Remove the 112 mm thrust shim, clutch discs, clutch plates and 102 mm washer.



7. Remove the carrier assembly, central gear, clutch plate and clutch disc.



8. Remove the ring gear by installing the differential housing mounting bolts into the threaded holes and tightening them.



Clutch Disc, Clutch Plate

Replacement

NOTE: The clutch disks and clutch plates should be replaced as a set.

1. Remove the clutch discs and clutch plates. (See page 15-6).
2. Soak the clutch discs for five minutes in transmission oil.
3. Install the clutch discs, clutch plates and a standard shim.

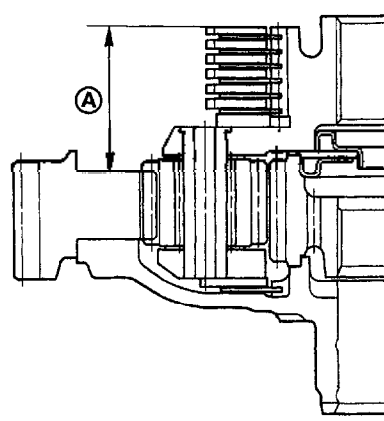
112 mm THRUST SHIM

○Standard shim

	PART NUMBER	THICKNESS
A	41261-PR8-000	1.2 mm (0.0472 in.)
B	41262-PR8-000	1.4 mm (0.0551 in.)
C	41263-PR8-000	1.6 mm (0.0630 in.)
D	41264-PR8-000	1.8 mm (0.0709 in.)
E	41265-PR8-000	2.0 mm (0.0787 in.)
F	41266-PR8-000	2.2 mm (0.0866 in.)
G	41267-PR8-000	2.4 mm (0.0945 in.)
Ⓐ	41268-PR8-000	2.6 mm (0.1024 in.)
I	41269-PR8-000	2.8 mm (0.1102 in.)
J	41270-PR8-000	3.0 mm (0.1181 in.)

<Reference>

Measure Ⓐ: 41.7-41.9 mm
(1.6417-1.6496 in)



4. install the differential case.

NOTE: Tighten the bolts evenly in several steps, then torque them in a criss-cross pattern.

Torque: 40 N·m (4.0 kg-m, 29 lb-ft)

5. Make sure the preset torque is within the standard. (See page 15-4).
6. If preset torque is beyond the standard, replace the 112 mm thrust shim as necessary.

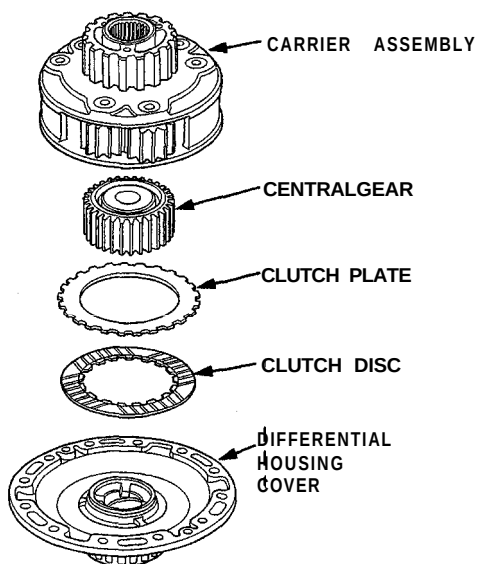
Differential



Reassembly

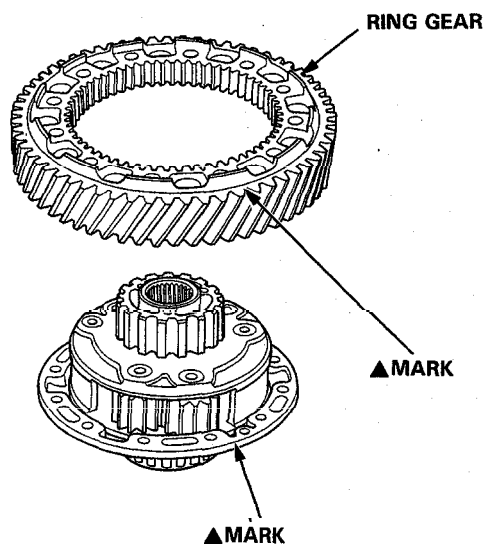
1. install the clutch disc, clutch plate, central gear and carrier assembly.

NOTE: Lubricate the clutch disc surface with transmission oil.



2. Install the ring gear.

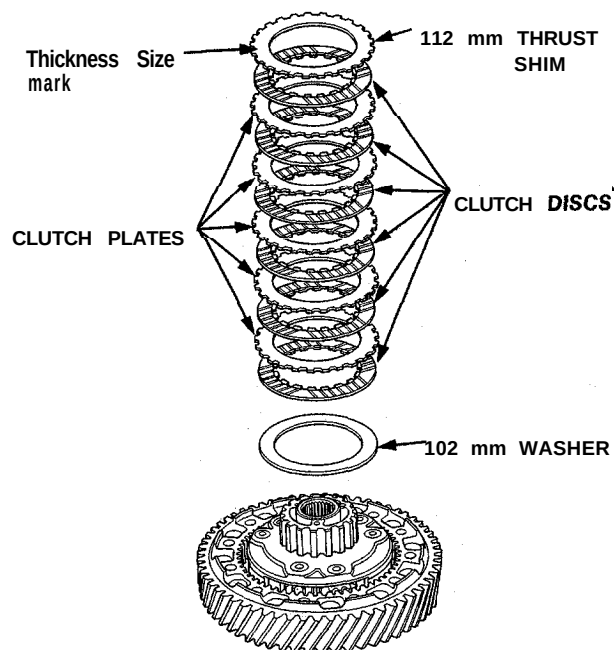
NOTE: Align the mark on the differential housing cover with the mark on the ring gear.



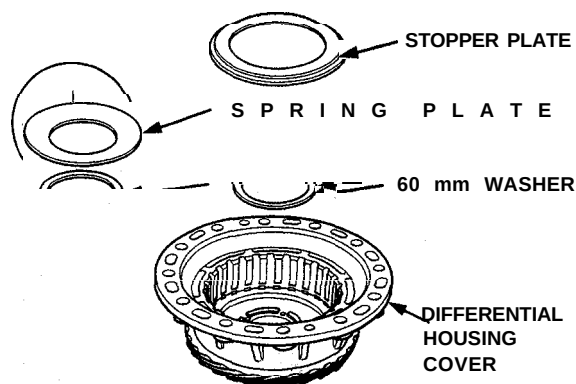
3. Install the 102 mm washer, clutch discs, clutch plate and 112 mm thrust shim.

NOTE:

- Lubricate the clutch discs with transmission oil.
- Position the 112 mm thrust shim with the thickness size mark facing away from the clutch discs.



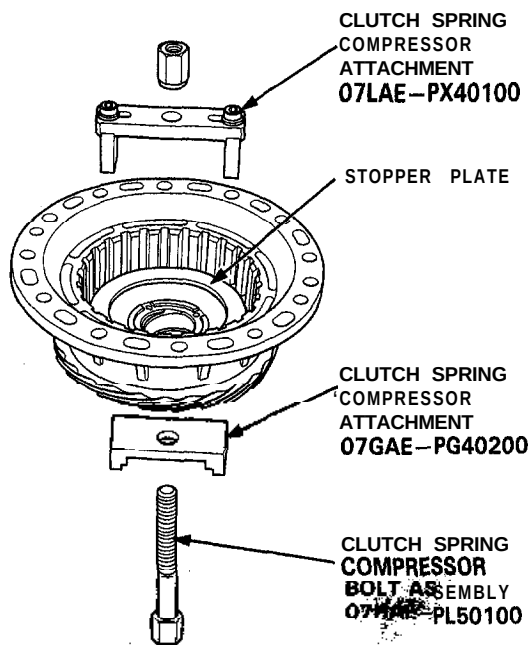
4. Install the 60 mm washer, spring plate and stopper plate.



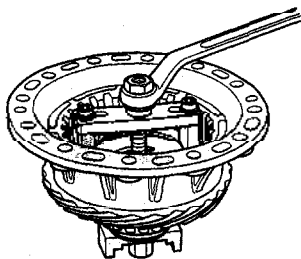
(cont'd)

Reassembly (cont'd)

5. Install the special tools on the stopper plate.

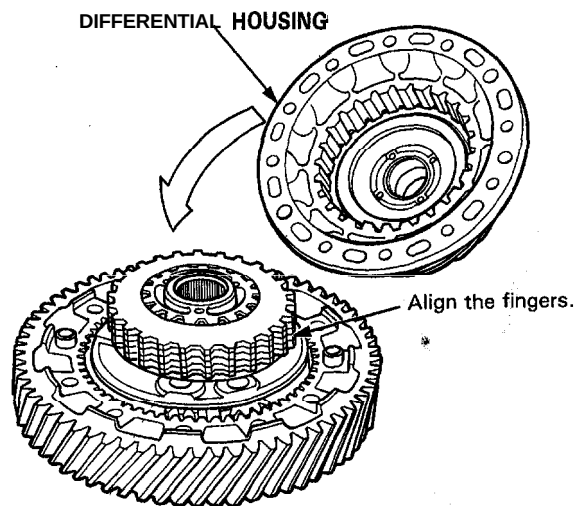


6. Compress the spring plate, then install the stopper clip.

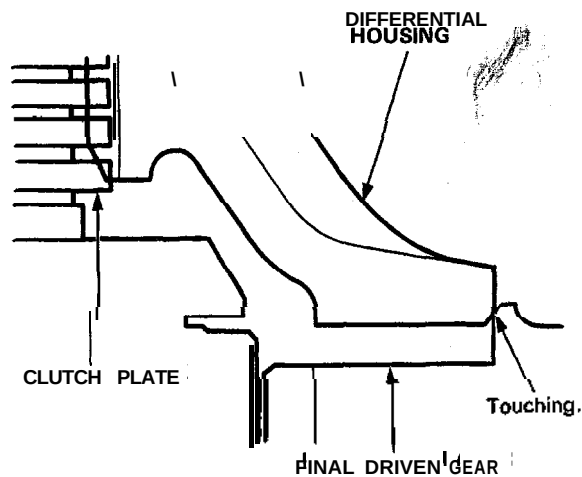


7. Install the differential housing.

NOTE: Align the fingers of the clutch plates and clutch discs.



8. Make sure the differential housing touches the final driven gear.



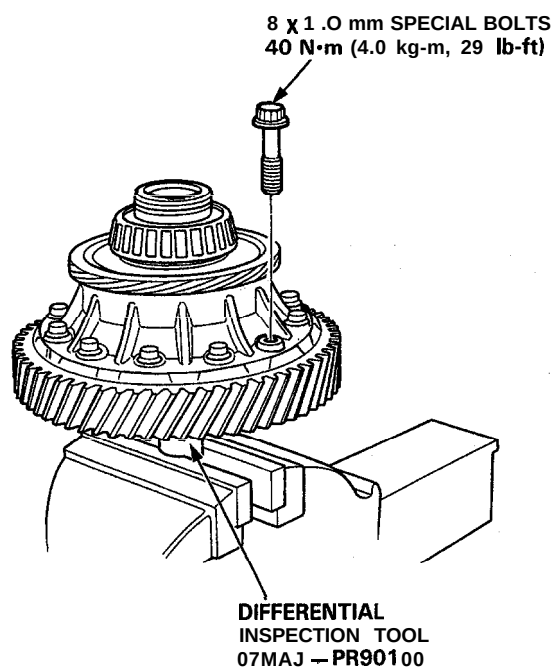


Oil Sea!

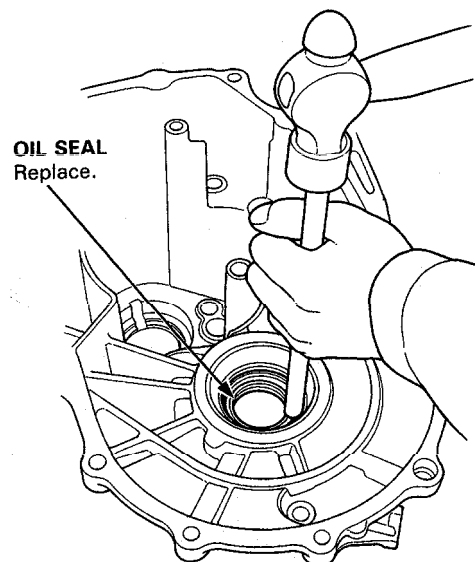
Removal

8. Hold the differential in a vise using a special tool, then install the differential housing mount bolts.

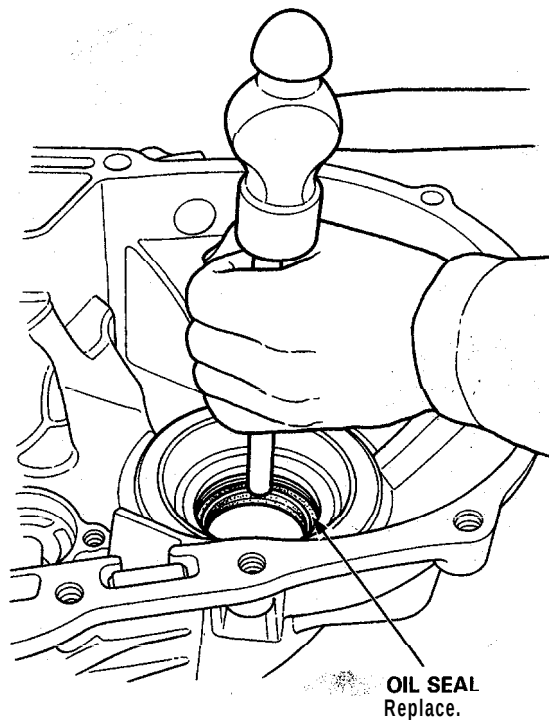
NOTE: Tighten the bolts two turns at a time, then torque them in a crisscross pattern.



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



3. Remove the oil seal from the clutch housing.



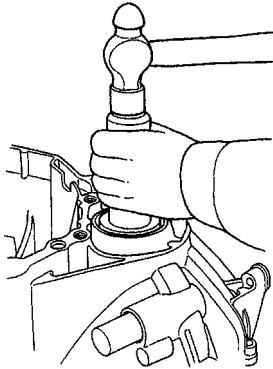
Bearing Outer Race

Replacement (Clutch housing side)

NOTE:

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

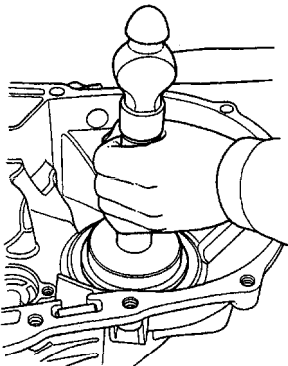
1. Remove the outer race, 90 mm washer and oil guide ring.



DRIVER
07746-0010000

ATTACHMENT,
62 x 68 mm
07746-0010500

2. Install the oil guide ring and 90 mm washer, then drive the outer race into the clutch housing.



DRIVER
07746-0010000

ATTACHMENT,
78 x 70 mm
07GAD-SD40101

Bearing Preload

Adjustment

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

- TRANSMISSION HOUSING
- CLUTCH HOUSING
- DIFFERENTIAL
- TAPER ROLLER BEARING and OUTER RACE
- 75 mm THRUST SHIM
- 90 mm WASHER
- OIL GUIDE RING

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).

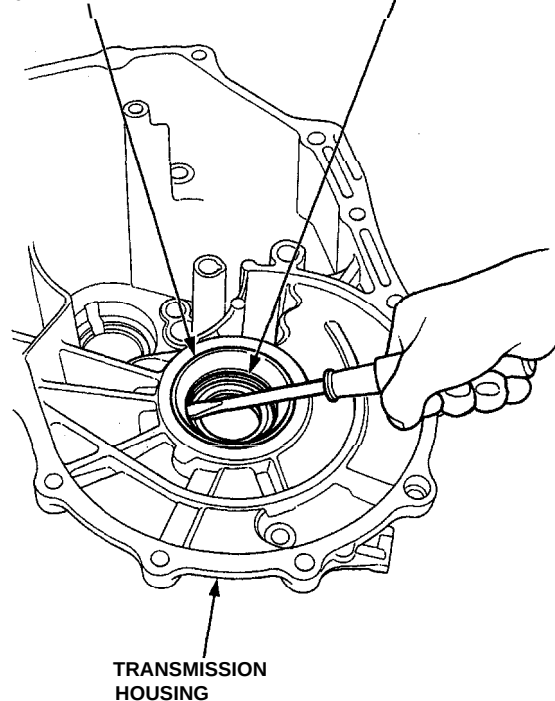
CAUTION: Do not reuse the thrust shim if the outer race was pried out.

NOTE:

- Let the transmission cool to the 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.

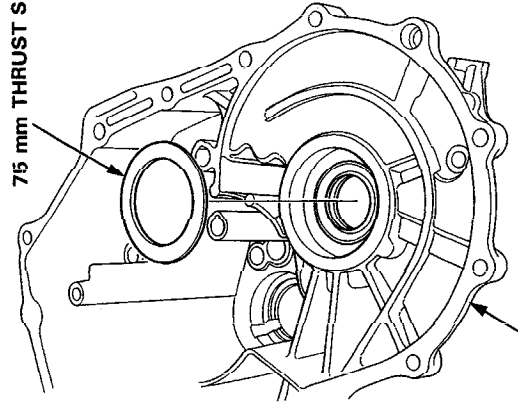
BEARING OUTER
RACE

76 mm THRUST SHIM
Replace.



2. First try a 1.97 mm thrust shim (J).

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



3. Select shim from the following table.

75 mm SHRUST SHIM

○Standard shim

	PART NUMBER	THICKNESS
A	41481-PR8-000	1.70 mm (0.0669 in.)
B	41482-PR8-000	1.73 mm (0.0681 in.)
C	41483-PR8-000	1.76 mm (0.0693 in.)
D	41484-PR8-000	1.79 mm (0.0705 in.)
E	41485-PR8-000	1.82 mm (0.0723 in.)
F	41486-PR8-000	1.85 mm (0.0728 in.)
G	41487-PR8-000	1.88 mm (0.0740 in.)
H	41488-PR8-000	1.91 mm (0.0752 in.)
I	41489-PR8-000	1.94 mm (0.0764 in.)
J	41490-PR8-000	1.97 mm (0.0776 in.)
K	41491-PR8-000	2.00 mm (0.0787 in.)
L	41492-PR8-000	2.03 mm (0.0799 in.)
M	41493-PR8-000	2.06 mm (0.0811 in.)
N	41494-PR8-000	2.09 mm (0.0823 in.)
O	41495-PR8-000	2.12 mm (0.0835 in.)
P	41496-PR8-000	2.15 mm (0.0846 in.)
Q	41497-PR8-000	2.18 mm (0.0858 in.)
R	41498-PR8-000	2.21 mm (0.0870 in.)
S	41499-PR8-000	2.24 mm (0.0882 in.)
T	41500-PR8-000	2.27 mm (0.0894 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 differential assembly in the clutch housing, then install the transmission housing.

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

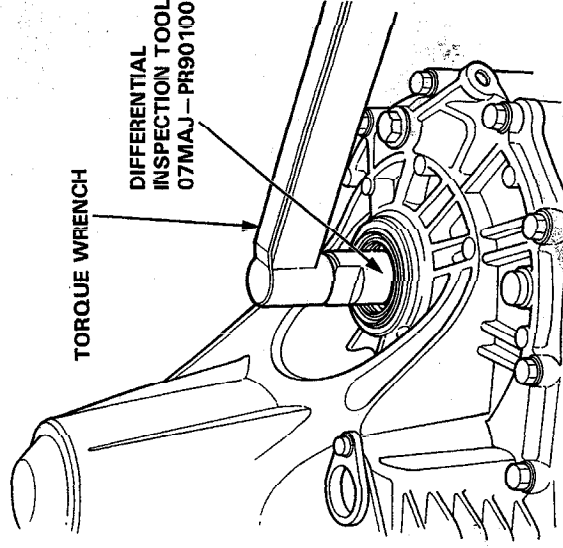
Torque: 43 N·m (4.3 kg·m, 31 lb·ft)

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

7. Measure the starting torque of the differential assembly with the differential inspection tool and a torque wrench.

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

**Standard: 2.0—3.0 N·m
(20—30 kg·cm, 17-26 lb·in)**



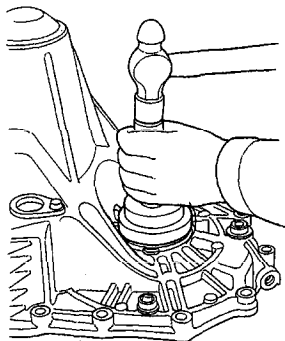
8. If the bearing preload is beyond the standard, select the shim that will give you the correct preload and recheck.

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

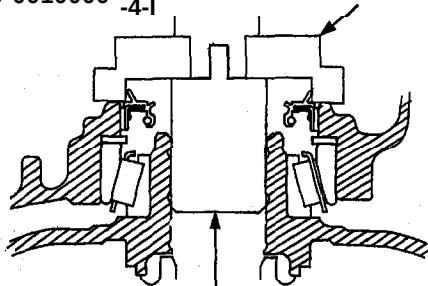
Installation

1. Install the oil seal in the transmission housing.



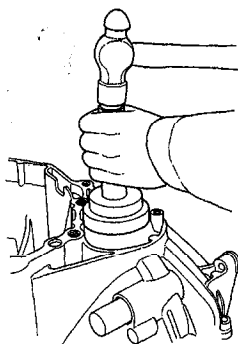
DRIVER
07749-0010000 -4-I

DRIVER ATTACHMENT
07965-SA00600



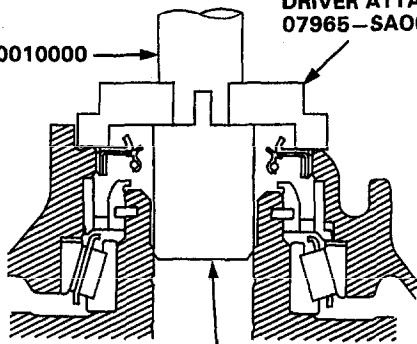
PILOT 32 x 60 mm
07MAD-PR90200

2. Install the oil seal in the clutch housing.



DRIVER
07749-0010000

DRIVER ATTACHMENT
07965-SA00600



PILOT 32 x 60 mm
07MAD-PR90200

Driveshafts

Special Tools	16-2
Driveshafts	
Removal	16-3
Disassembly	16-6
Inspection	16-7
Reassembly	16-8
Intermediate Shaft	
Replacement	16-12
Disassembly	16-13
Index/Inspection	16-15
Reassembly	16-16



Special Tools

Number	Tool Number	Description	Q'ty	Page Reference
①	07GAF—SD40700	Hub Dis/Assembly Base	2	16-13, 14, 16
②	07GAF—SE00200	Hub Driver Attachment	1	16-16
③	07GAD—PG40100	Attachment	1	16-16
④	07JAD—SH30100	Oil Seal Driver Attachment	1	16-16
⑤	07MAC—SL00100	Ball Joint Remover	1	16-5
⑥	07746-0010400	Attachment, 52 x 55 mm	1	16-14
⑦	07749-0010000	Driver	1	16-14, 16
⑧	07941-6920003	Ball Joint Remover	1	16-4



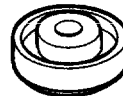
①



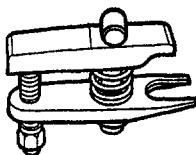
②



③



④



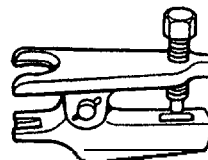
⑤



⑥



⑦



⑧



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.

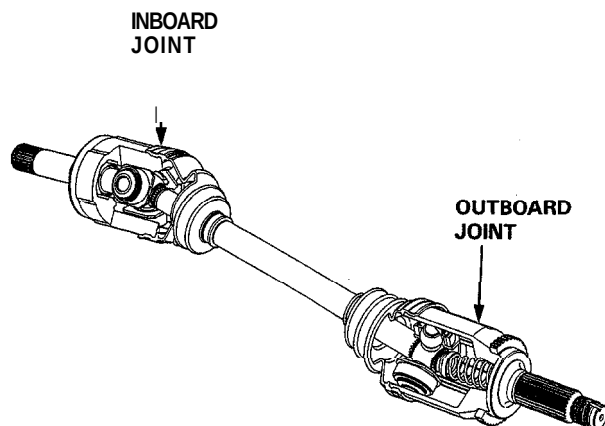
Spline Looseness

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).

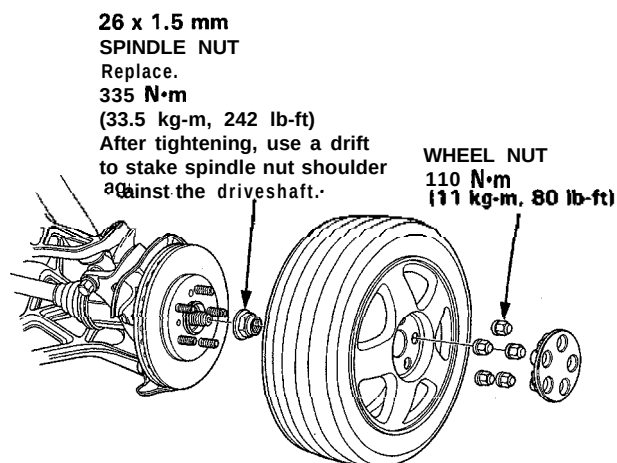
2. Remove the rear wheels.

3. Drain the transmission oil (see section 13).

NOTE: It is not necessary to drain the transmission oil when the right driveshaft is removed.

4. Raise the locking tab on the spindle nut and loosen it.

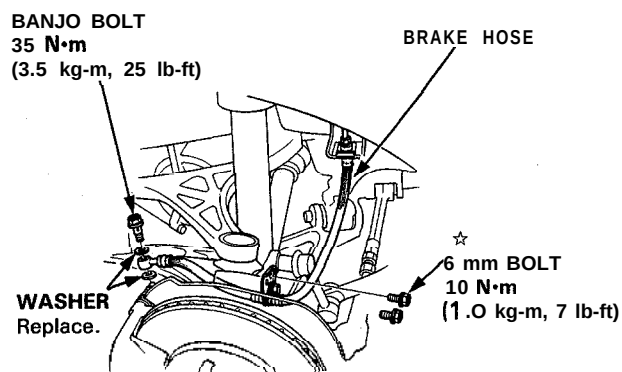
NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and inside of the wheel.



5. Remove the banjo bolt and disconnect the brake hose, then remove the brake hose clamp from the knuckle.

CAUTION: Avoid spilling brake fluid on painted, plastic or rubber surfaces as it can damage the finish;

Wash spilled brake fluid off immediately with clean water.



*Corrosion resistant bolt

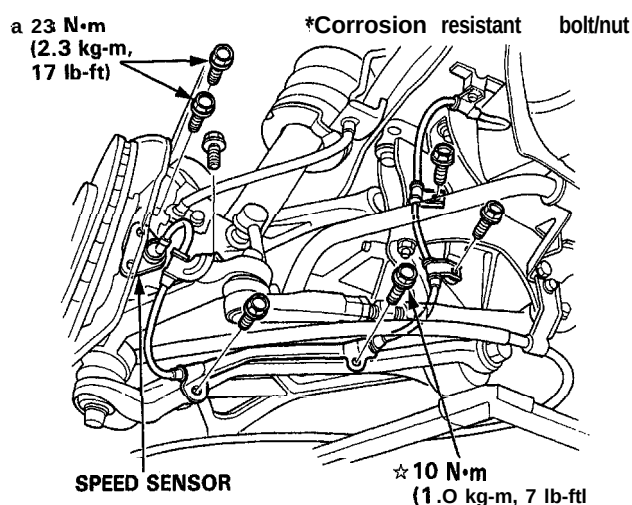
(cont'd)

Driveshafts

— Removal (cont'd)

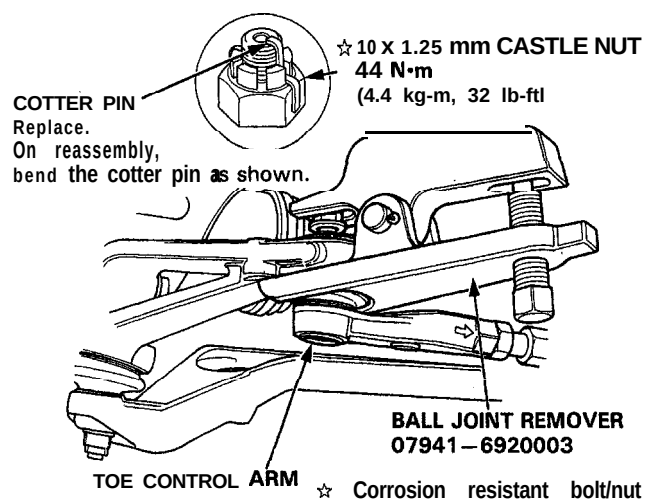
6. Remove the speed sensor from the knuckle and rear lower arm, but do not disconnect it.

NOTE: Avoid twisting the wires when reinstalling the sensors.



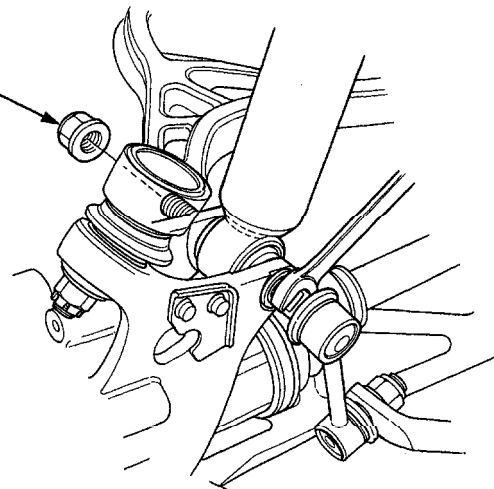
7. Remove the cotter pin from the toe control arm castle nut and remove the nut.
8. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
9. Position the special tool between the knuckle and control arm as shown, then separate the toe control arm.

CAUTION: Be careful not to damage the ball-joint boot.



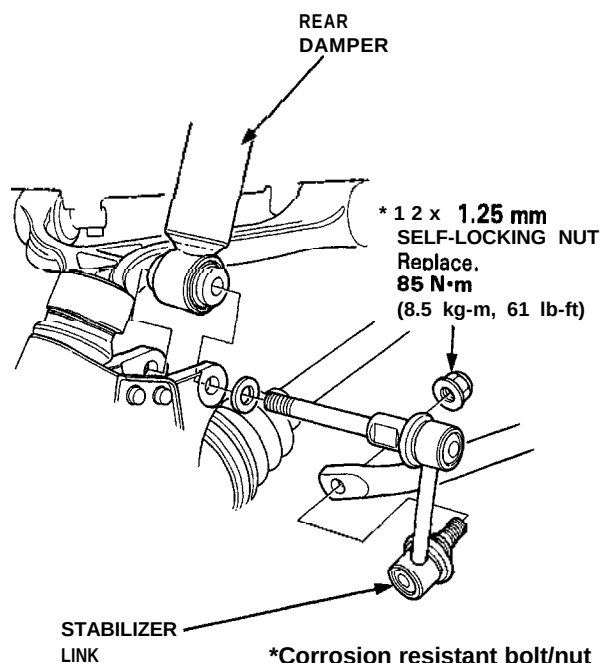
10. Hold the stabilizer link with a wrench and remove the damper mounting nut.

☆ 12 x 1.25 mm
DAMPER MOUNTING NUT
Replace.
95 N·m
(9.5 kg-m,
67 lb-ft)



*Corrosion resistant bolt/nut

11. Remove the stabilizer link from the stabilizer bar and knuckle.





12. Remove the cotter pin from the lower control arm ball joint castle nut and remove the nut.

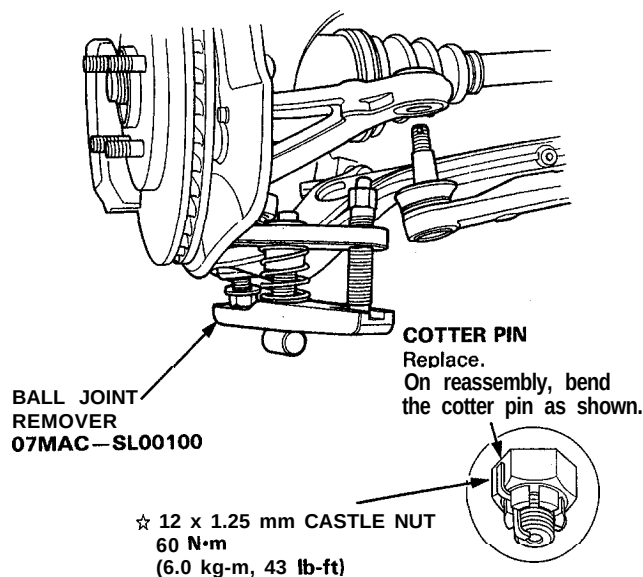
13. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Use the ball joint remover (07MAC—SL00100) by adjusting it so that its upper section and lower section are parallel to each other.

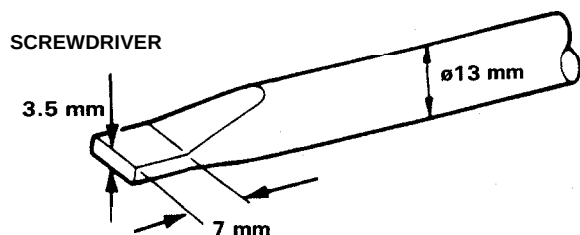
14. Position the special tool between the knuckle and lower control arm as shown, then separate the lower control arm.

CAUTION: Be careful not to damage the ball joint boot.

*Corrosion resistant bolt/nut



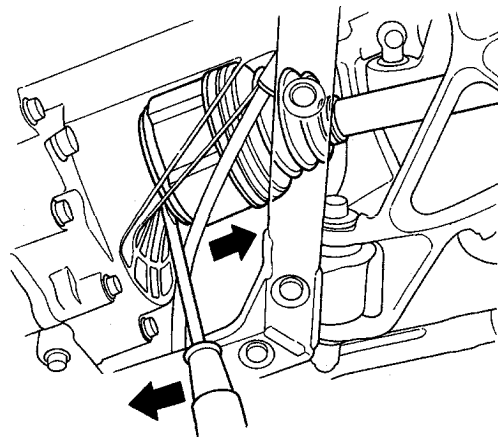
15. Pry the driveshaft assembly with a screwdriver as shown to force the set ring past the groove.



16. Pull the inboard joint and remove the driveshaft and CV joint from of the differential case or intermediate shaft as an assembly.

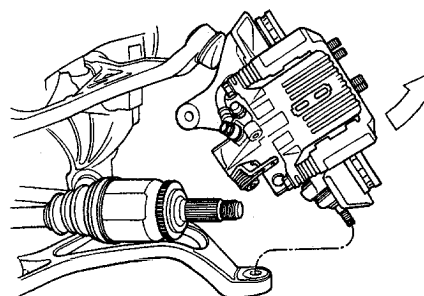
CAUTION:

- 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.



17. Remove the spindle nut.

18. Pull the knuckle outward and remove the driveshaft outboard joint from the rear wheel hub using a plastic hammer.



19. Installation is the reverse order of removal. After installing the driveshafts, adjust the wheel alignment (see section 18).

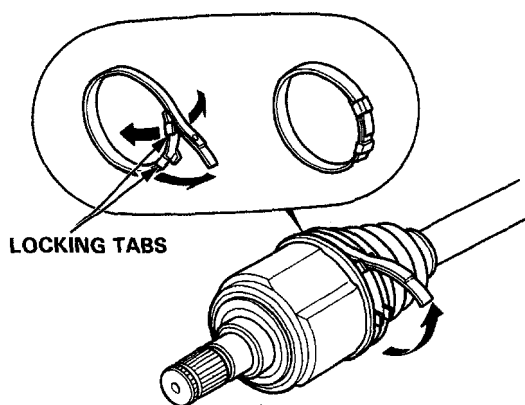
Driveshafts

-Disassembly

1. To remove the boot band, pry up the locking tabs with screwdriver and raise the end of the band.

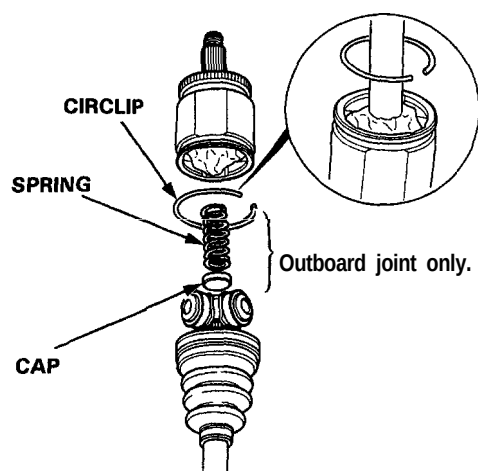
NOTE: Carefully clamp the driveshaft in a vise with soft jaws.

CAUTION: Take care not to damage the boots.

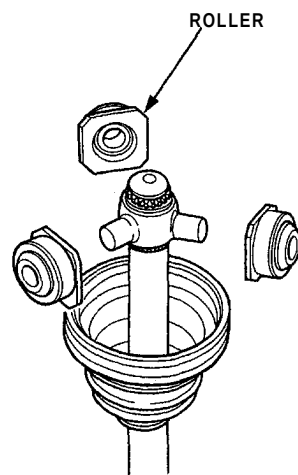


2. Remove both joints.

- Outboard joint side only:
 - Remove the circlip from the outboard joint groove.
 - Remove the outboard joint and spring.

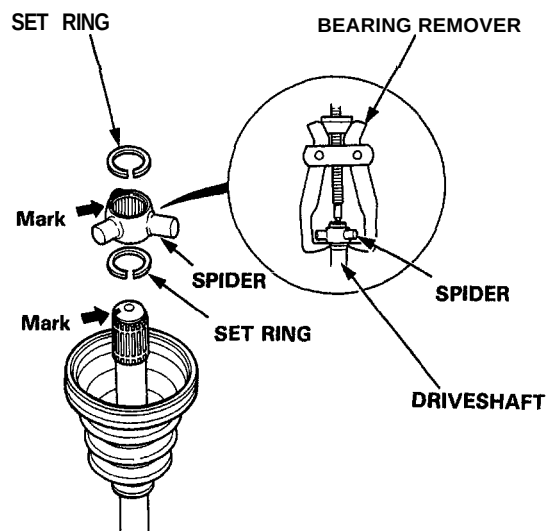


3. Remove the rollers from the spider.



4. Remove the set 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.





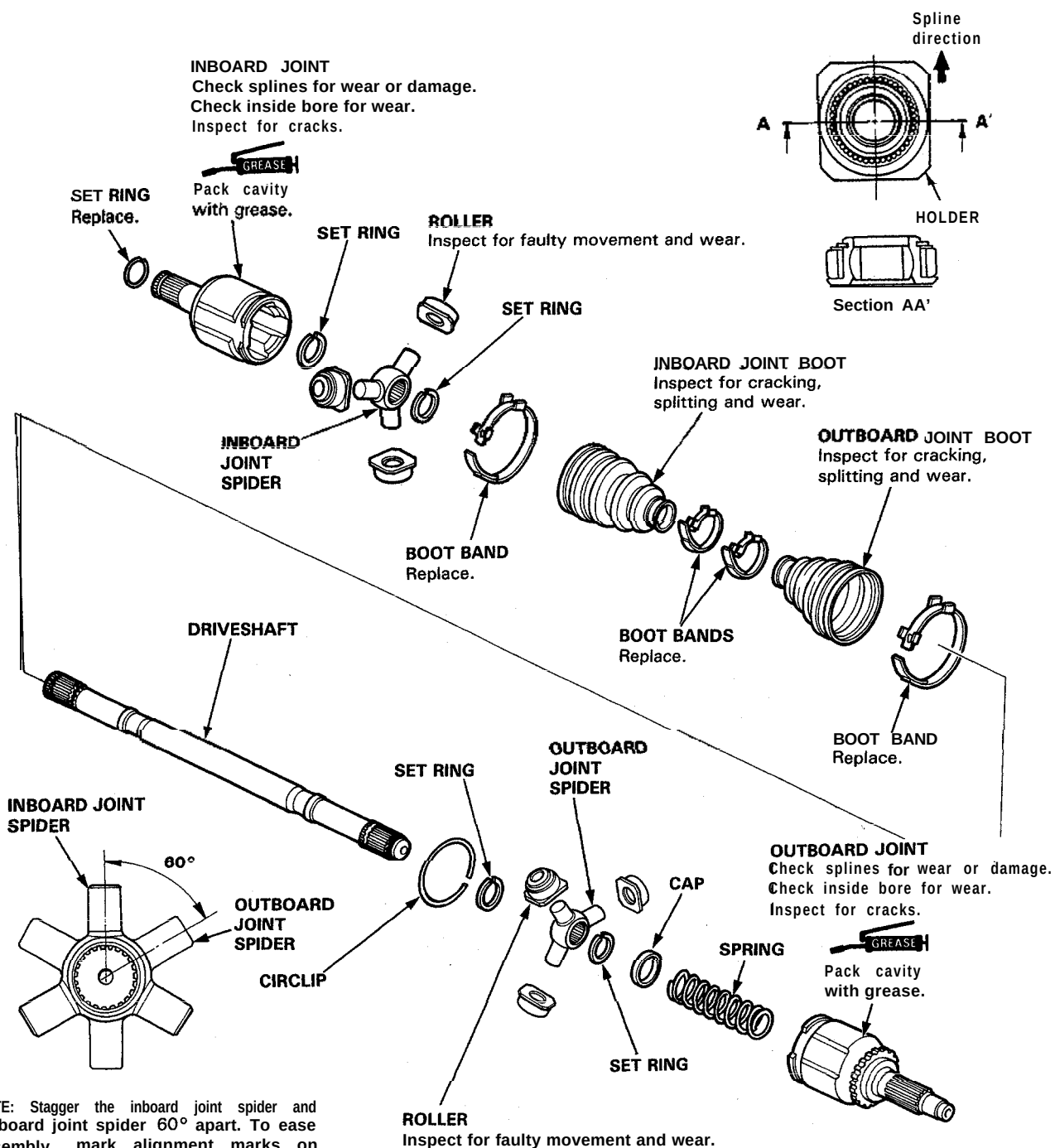
- Inspection

GREASE Thoroughly pack the inboard joint and outboard joint with joint grease included in the new joint boot set.

Grease Quantity:

Inboard Joint	120-130 g
Outboard Joint	170-180 g

NOTE: Mark the rollers and roller grooves during disassembly to ensure proper positioning during reassembly.



NOTE: Stagger the inboard joint spider and outboard joint spider 60° apart. To ease assembly, mark alignment marks on driveshaft and spiders before disassembling them.

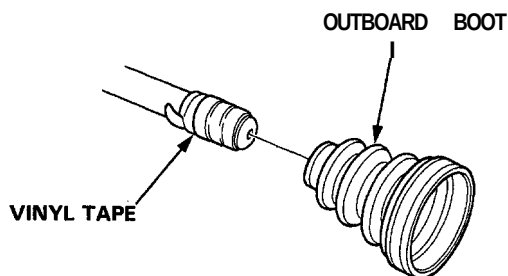
Driveshafts

— Reassembly

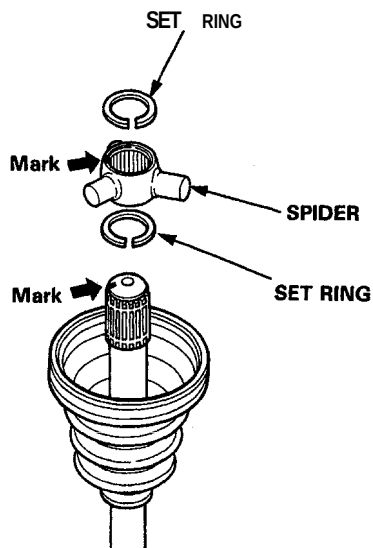
Outboard joint side

NOTE: Wrap the splines with vinyl tape to prevent damage to the boot.

1. install the outboard boot to the driveshaft, then remove the vinyl tape.



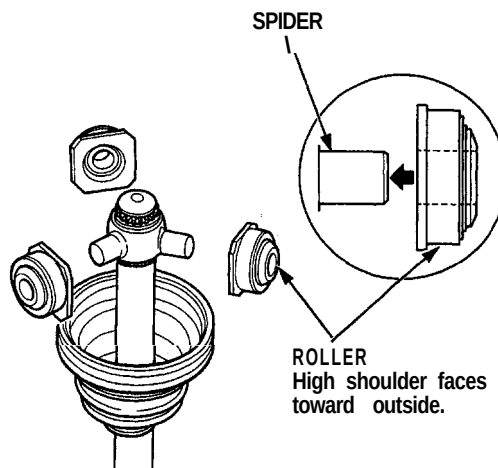
2. Install the set ring into the driveshaft groove.
3. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.
4. install the set ring into the driveshaft groove.



5. Fit the rollers to the spider with their high shoulders facing outward.

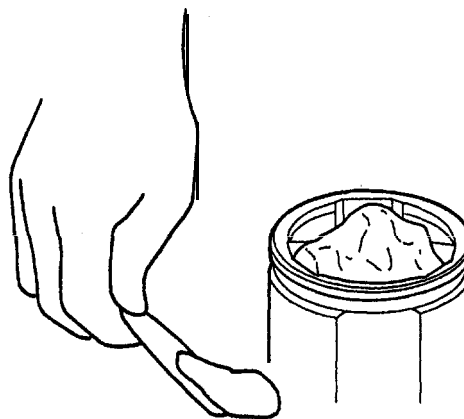
CAUTION:

- Reinstall the rollers in their original positions on the spider.
- Hold the driveshaft assembly with the rollers up, to prevent them from falling off.



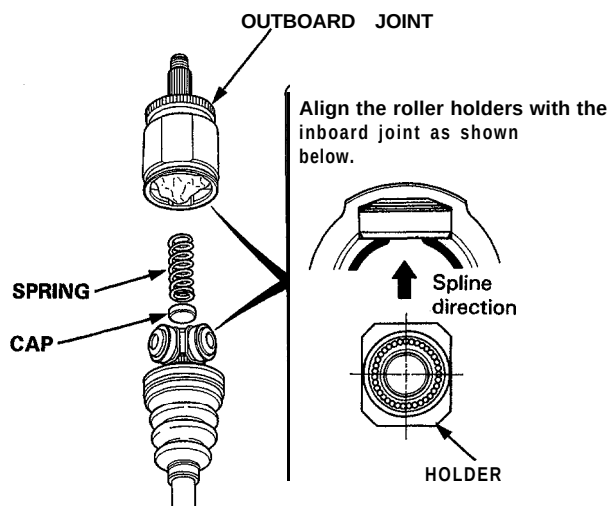
6. Pack the joint with joint grease included in the new joint boot set.

Grease Quantity: 170—180 g

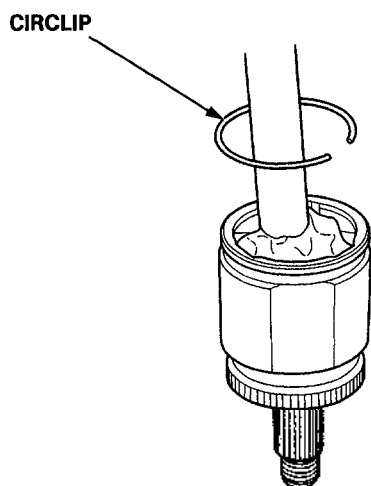




7. Install the spring and cap, then fit the outboard joint onto the driveshaft.



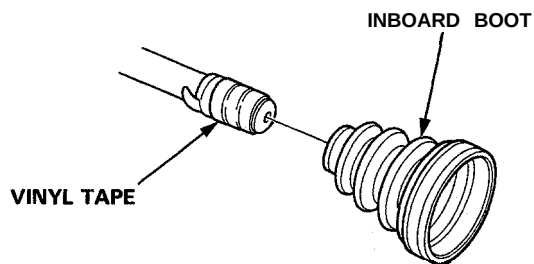
8. Fit the circlip into the outboard joint inner groove.



inboard joint side

NOTE: Wrap the splines with vinyl tape to prevent damage to the boot.

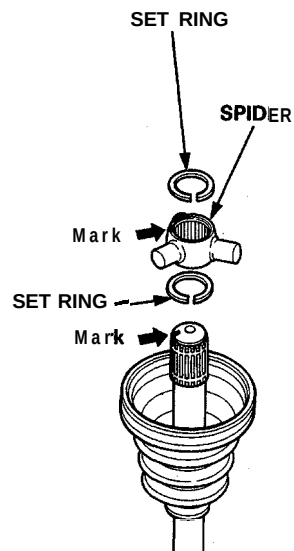
9. Install the inboard boot to the driveshaft, then remove the vinyl tape.



10. Install the set ring into the driveshaft groove.

11. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.

12. Install the set ring into the driveshaft groove.



(cont'd)

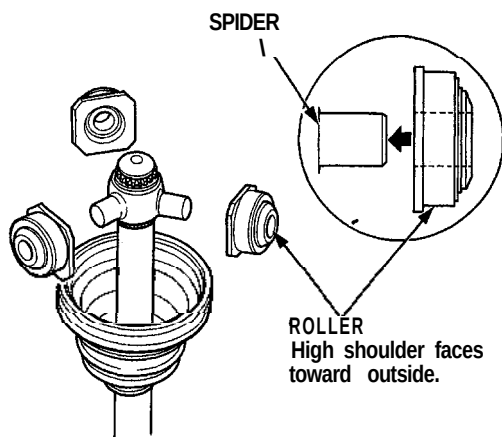
Driveshafts

Reassembly (cont'd)

13. Fit the rollers to the spider with their high shoulders facing outward.

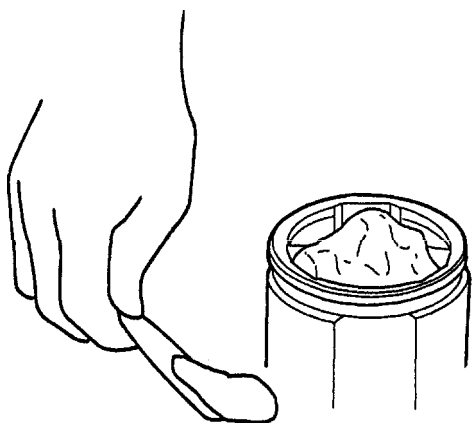
CAUTION:

- Reinstall the rollers in their original positions on the spider.
- Hold the drivashaft assembly with the rollers up, to prevent them from falling off.

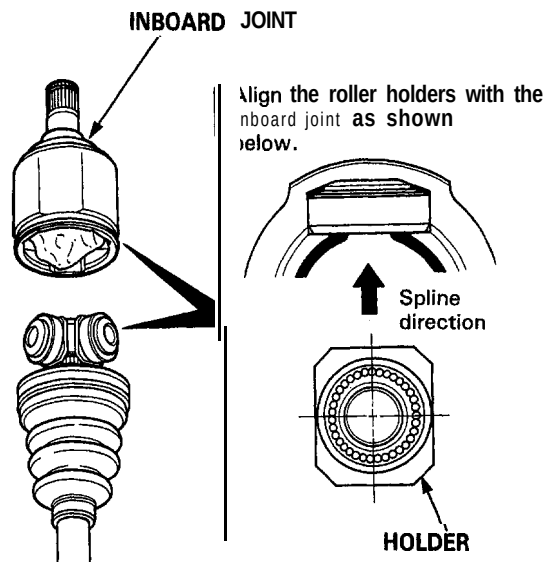


14. Pack the joint with joint grease included in the new joint boot set.

Grease Quantity: 120–130 g

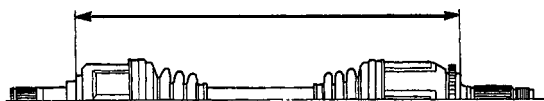


15. Fit the inboard joint onto the driveshaft.



16. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and extension.

L. Driveshaft
M/T: 513.5-514.0 mm (20.22-20.24 in)
A/T: 519.5-520.0 mm (20.45-20.47 in)



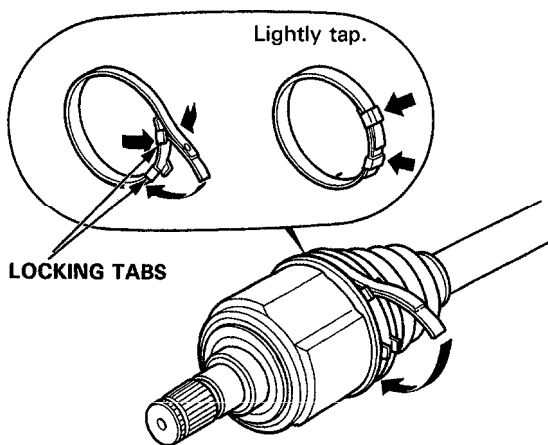
R. Driveshaft
M/T/A/T: 542.0–542.5 mm (21.34-21.36 in)



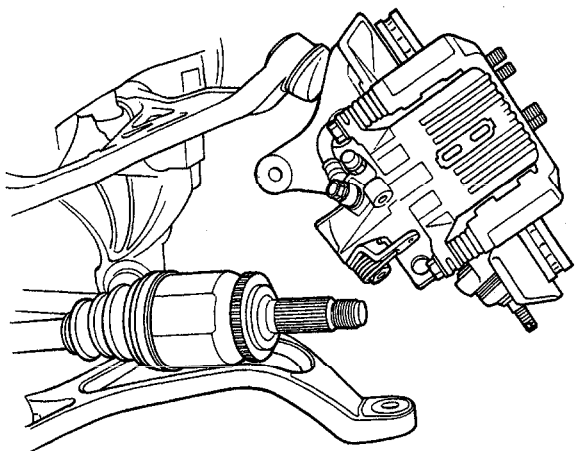


17. Install new boot bands on the boots and bend both sets of locking tabs.

18. Lightly tap on the doubled-over portions to reduce their height.



NOTE: Install the outboard joint in the knuckle before installing the driveshaft into the differential or intermediate shaft. Loosely install the spindle nut this time.

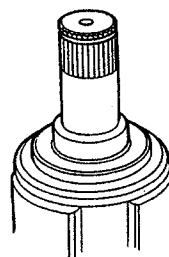
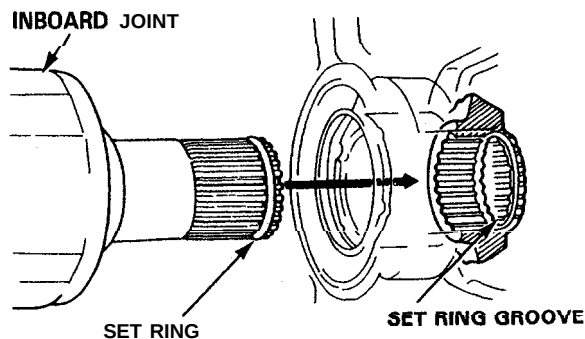


19. Install the new set rings in the driveshaft groove and intermediate shaft groove.

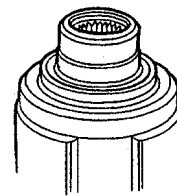
20. Install the inboard end of the driveshaft into differential or intermediate shaft.

CAUTION:

- Always use a new set ring whenever the driveshaft is being installed.
- Make sure the L. driveshaft locks in the differential side gear groove, and the CV joint subaxle bottoms in the differential.
- Insert the R. driveshaft CV joint subaxle into the intermediate shaft until the intermediate shaft set ring locks in the groove in the R. driveshaft.



L. Driveshaft
inboard end



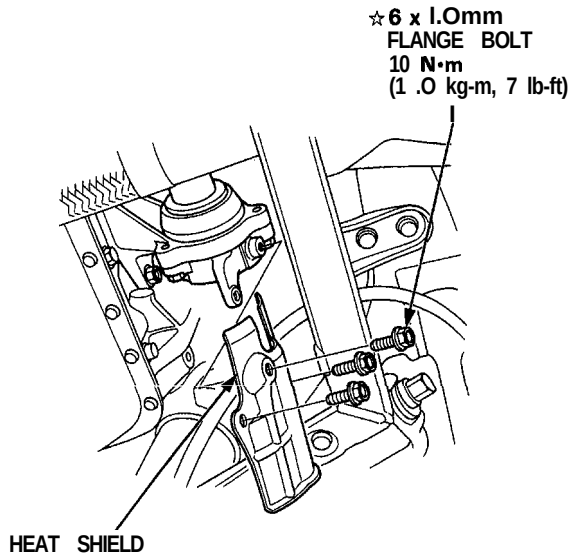
R. Driveshaft
inboard end
(Intermediate shaft side)

Intermediate Shaft

-Replacement

1. Drain the oil from the transmission (see section 13).
2. Remove the right driveshaft assembly (page 16-3).
3. Remove the heat shield.

*Corrosion resistant bolt/nut



4. The bearing support assembly is a light press fit in the support base. To remove the bearing support assembly, remove the 8 x 1.25 mm flange bolts, with the support base still attached to the engine block. Tap the flanged section of the bearing support with a plastic hammer toward the wheel side, then remove the bearing support assembly from the support base.

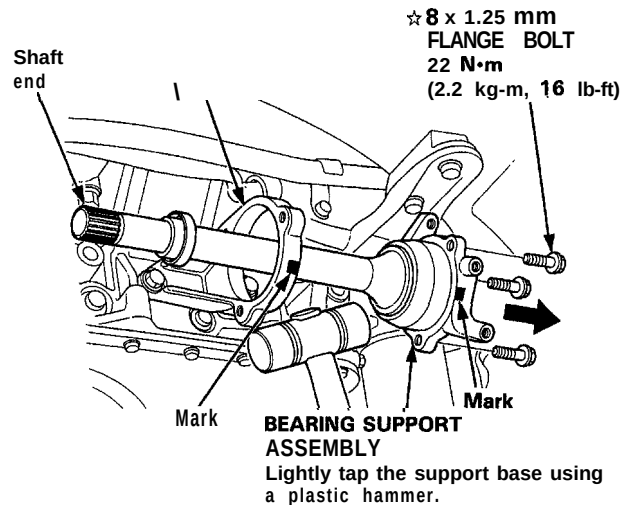
CAUTION: To prevent damage to the differential oil seal, hold the intermediate shaft horizontal until it is clear of the differential.

NOTE: Mark the support base and bearing support during disassembly to ensure proper positioning during reassembly.

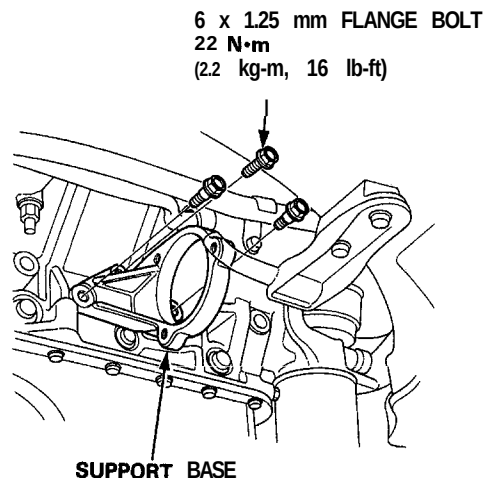
CAUTION: The bearing support and support base are made of aluminum. Be careful not to damage them when servicing.

*Corrosion resistant bolt/nut

SUPPORT BASE



5. Remove the support base from the engine block.



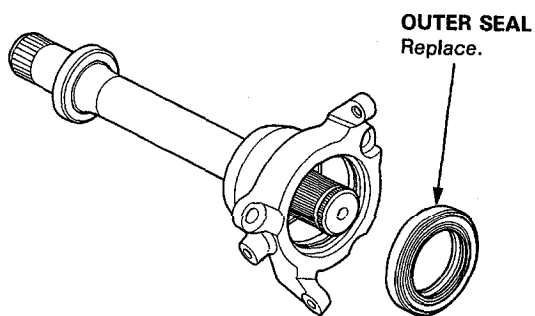
6. Installation is the reverse order of removal. Align the marks and install by tapping on the bearing support assembly shaft end.



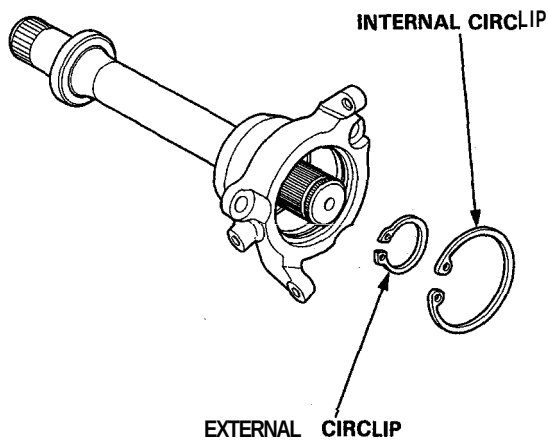
Disassembly

CAUTION: The bearing support and support base are made of aluminum. Be careful not to damage them when servicing.

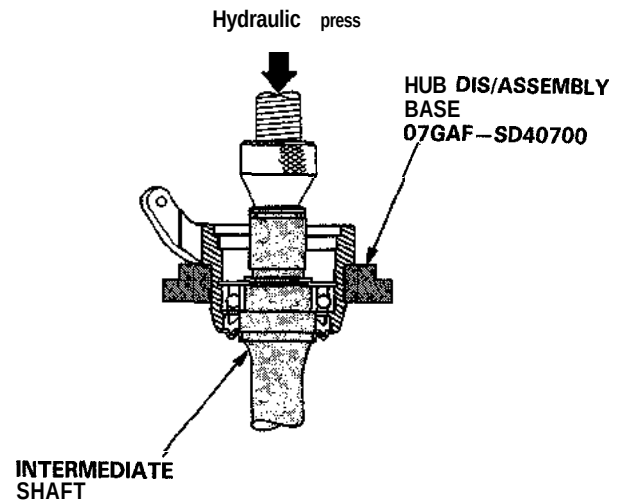
1. Remove the intermediate shaft outer seal from the bearing support.



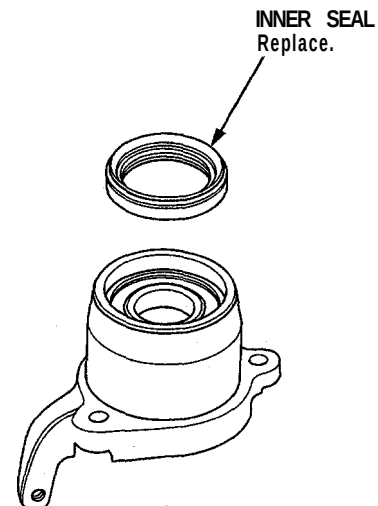
2. Remove the external circlip and internal circlip.



3. Press the intermediate shaft out of the shaft bearing using the special tool.



4. Remove the intermediate shaft inner seal from the bearing support.

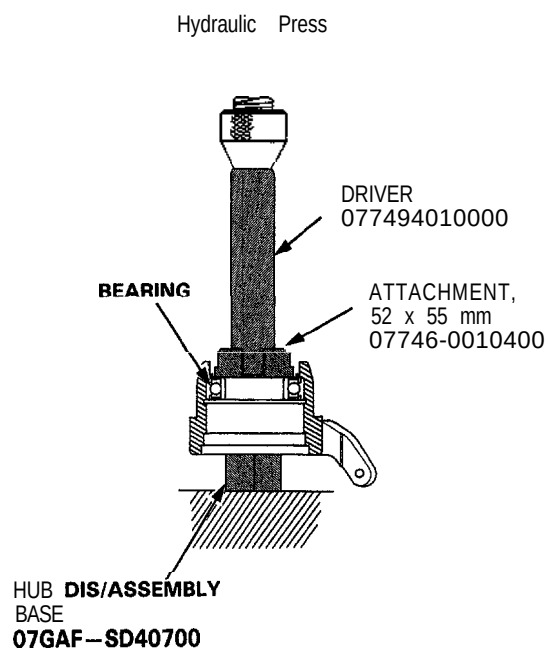


(cont'd)

Intermediate shaft

— Disassembly (cont'd) —

5. Press the intermediate shaft bearing out of the bearing support using the special tools.



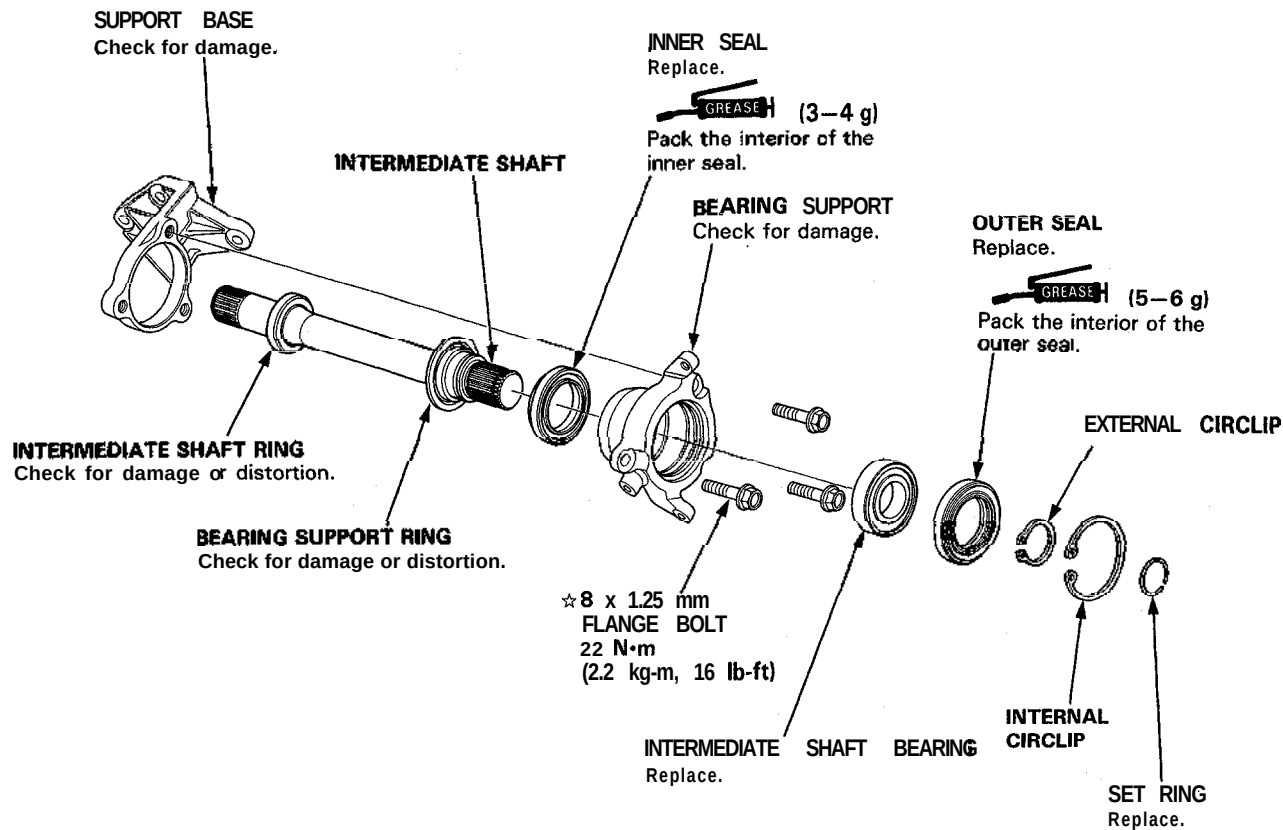


- Index/Inspection

CAUTION:

- The bearing support and support base are made of aluminum. Be careful not to damage them when servicing.
- The bearing support and support base are fitted, and must be replaced as an assembly.

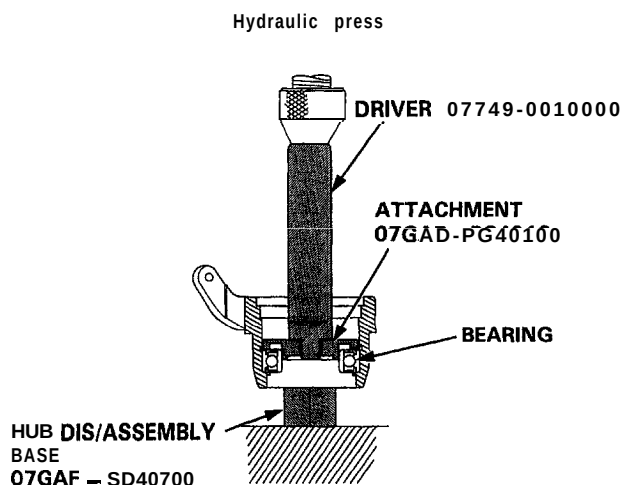
*Corrosion resistant bolt/nut



Intermediate shaft

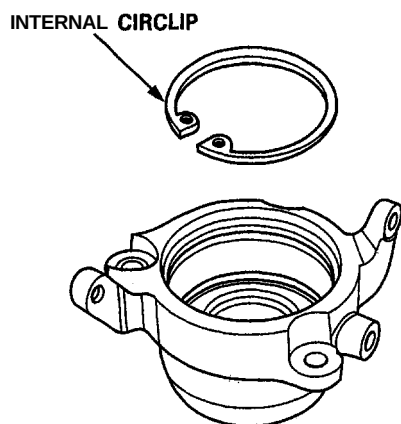
— Reassembly

1. Press the intermediate shaft bearing into the bearing support using the special tools.

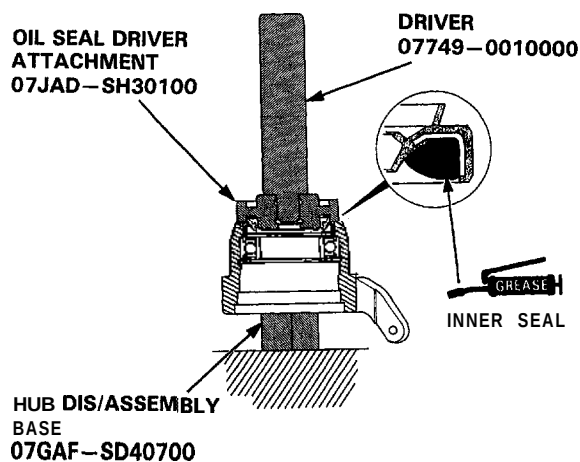


2. Seat the internal circlip in the groove of the bearing support.

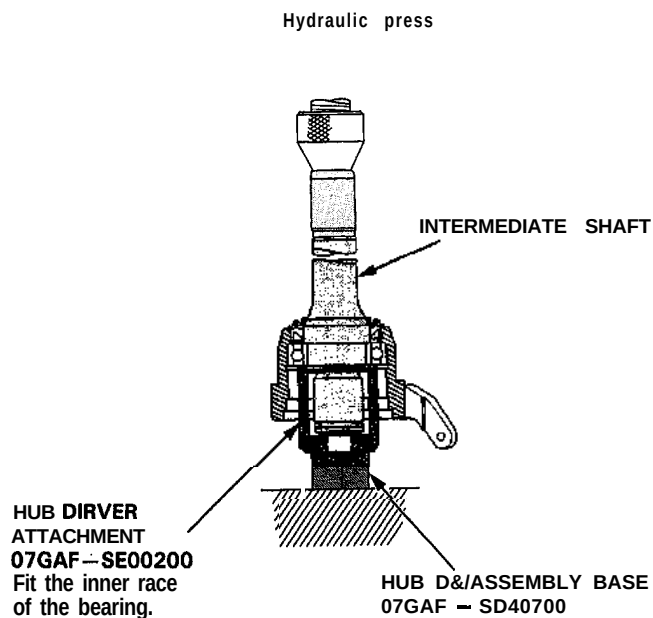
CAUTION: Install the circlip with the tapered end facing out.



3. Drive the intermediate shaft inner seal into the bearing support using the special tools.



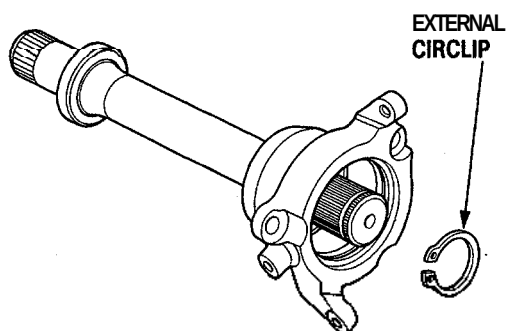
4. Press the intermediate shaft into the shaft bearing using the special tools.





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.

