

Manual Transmission

S40 Model

(All except '99 – 00 2-door Si, SiR)

Manual Transmission 13-1

S4C Model ('99 – 00 2-door Si, SiR)

Manual Transmission 13-45



S40 Model (All except '99 – 00 2-door Si, SiR) Manual Transmission

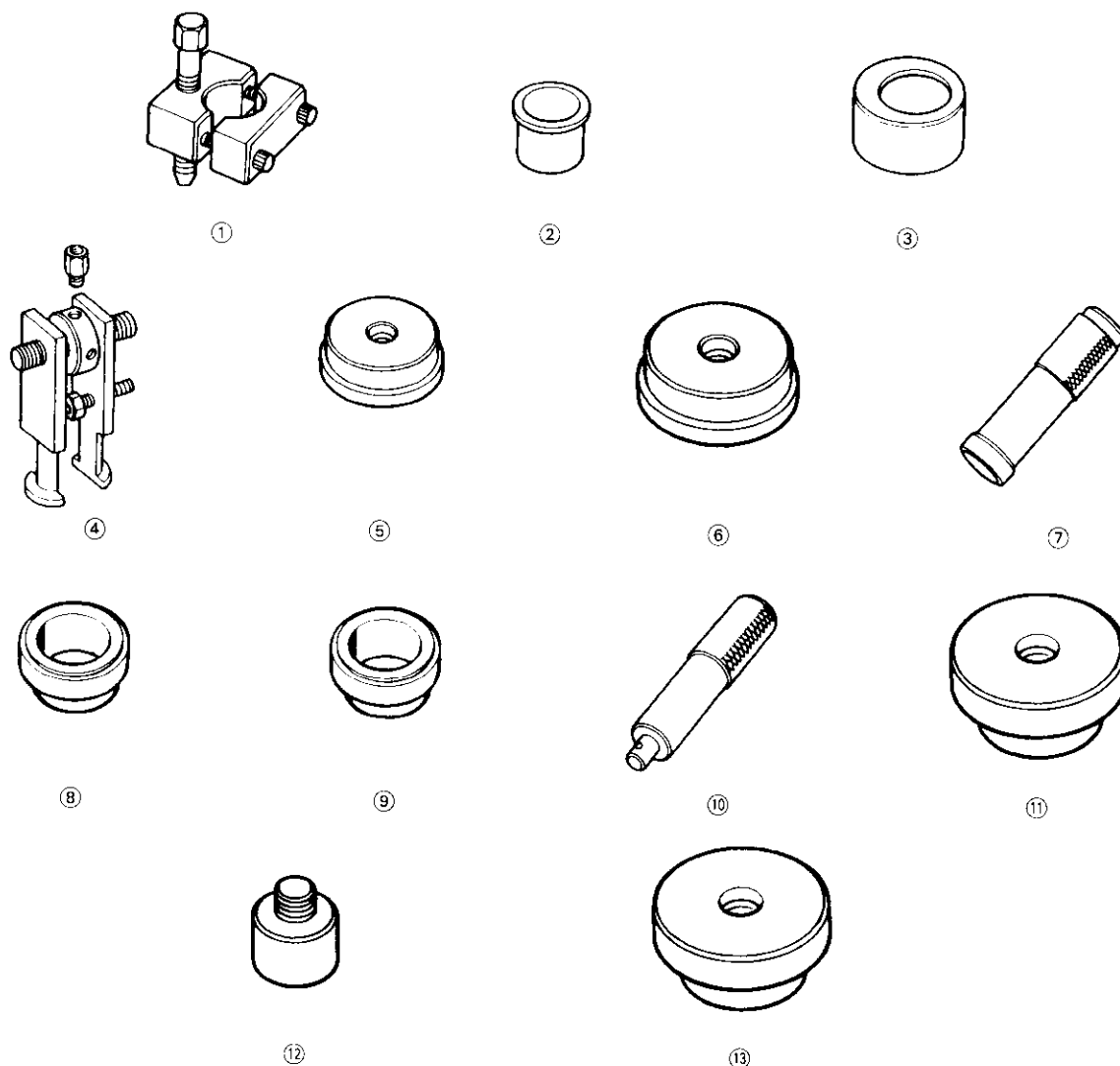
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Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAJ – PG20110	Mainshaft Holder	1	13-38
②	07GAJ – PG20120	Collar	1	13-37
③	07GAJ – PG20130	Mainshaft Base	1	13-37
*④	07736 – A01000A	Adjustable Bearing Puller, 25 – 40 mm	1	13-34, 35
⑤	07746 – 0010300	Attachment, 42 x 47 mm	1	13-34, 35
⑥	07746 – 0010400	Attachment, 52 x 55 mm	1	13-34, 35
⑦	07746 – 0030100	Driver, 40 mm I.D.	1	13-19, 24 31, 32
⑧	07746 – 0030300	Attachment, 30 mm I.D.	1	13-19, 24
⑨	07746 – 0030400	Attachment, 35 mm I.D.	1	13-19, 24
⑩	07749 – 0010000	Driver	1	13-34, 35, 43
⑪	07JAD – PH80101	Driver Attachment	1	13-43
⑫	07JAD – PH80200	Pilot, 26 x 30 mm	1	13-43
⑬	07947 – 6110501 or 07947 – 6110500	Seal Driver Attachment	1	13-43

* Must be used with commercially-available 3/8"-16 Slide Hammer.

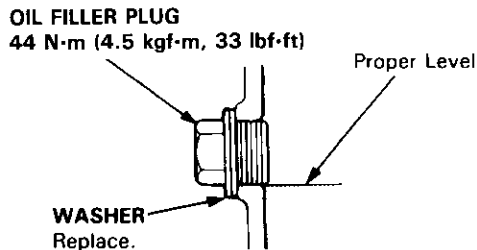




Transmission Oil

NOTE: Check the transmission oil with the engine OFF and the vehicle 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 filler hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug with a new washer.
3. If the transmission oil is dirty, remove the drain plug and drain the oil.
4. Reinstall the drain plug with a new washer, and refill the transmission with the recommended oil to the proper level.

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

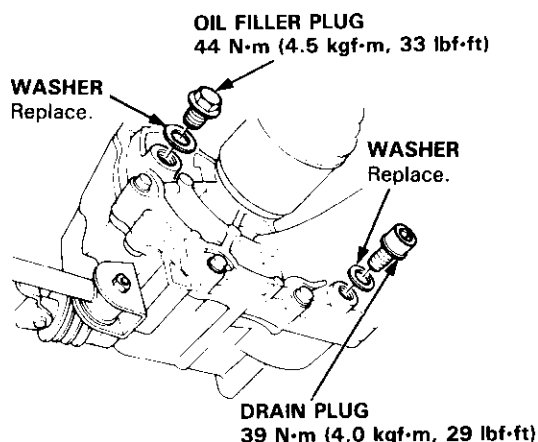
5. Reinstall the oil filler plug with a new washer.

Oil Capacity

1.8 l (1.9 US qt, 1.6 Imp qt) at oil change

1.9 l (2.0 US qt, 1.7 Imp qt) at overhaul

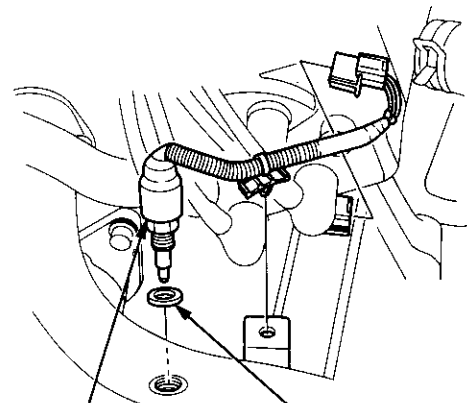
Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.



Replacement

NOTE: To test the back-up light switch, see section 23.

1. Disconnect the connector, then remove the back-up light switch connector from the connector clamp.
2. Remove the back-up light switch.



BACK-UP LIGHT SWITCH
25 N·m (2.5 kgf·m, 18 lbf·ft)

WASHER
Replace.

3. Install the new washer and back-up light switch.
4. Connect the back-up light switch connector.

Troubleshooting

Reverse Gear Noise Reduction System

Whenever the clutch pedal is depressed to shift into reverse, the mainshaft continues to rotate because of its inertia.

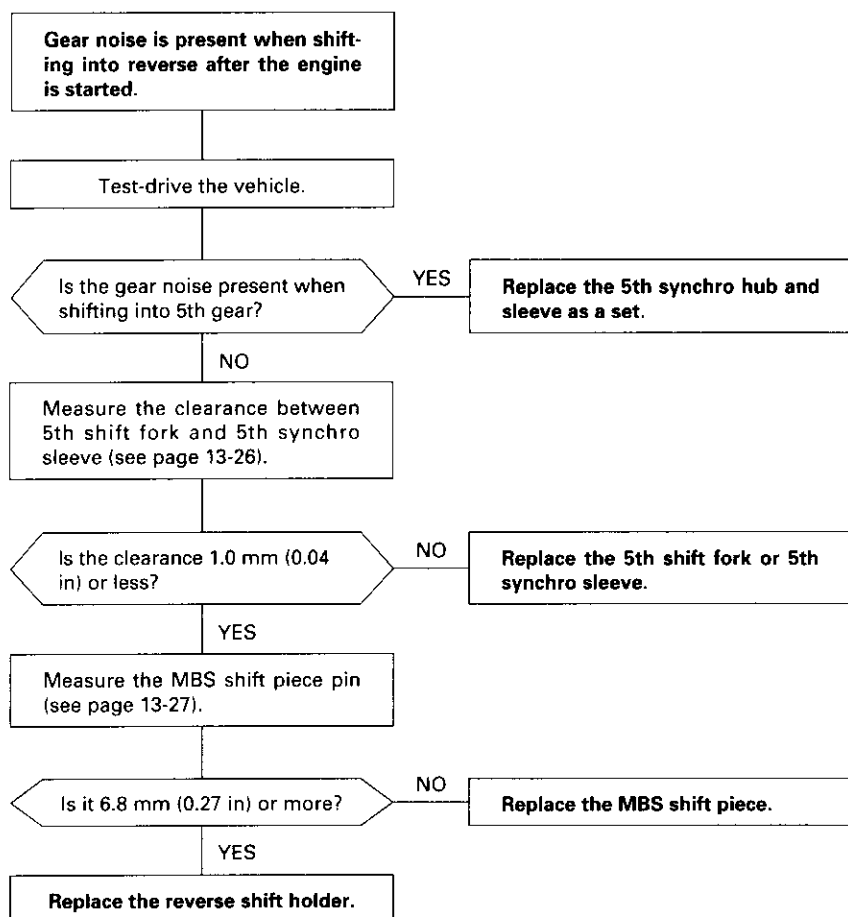
The resulting speed difference between mainshaft and reverse idler gear produces gear noise.

The reverse gear noise reduction system employs a cam plate which was added to the reverse shift holder. When shifting into reverse, the 5th/reverse shift piece, connected to the shift lever, rotates the cam plate. This causes the 5th synchro set to stop the rotating mainshaft. As there is no speed difference between mainshaft and reverse idler gear, there will be less gear noise.

NOTE: This system is not a fully-synchronized gear noise reduction system.

Therefore, you may hear gear noise when

- ① you shift into reverse with the vehicle not yet completely stopped.
- ② you shift quickly into reverse during fast idling.





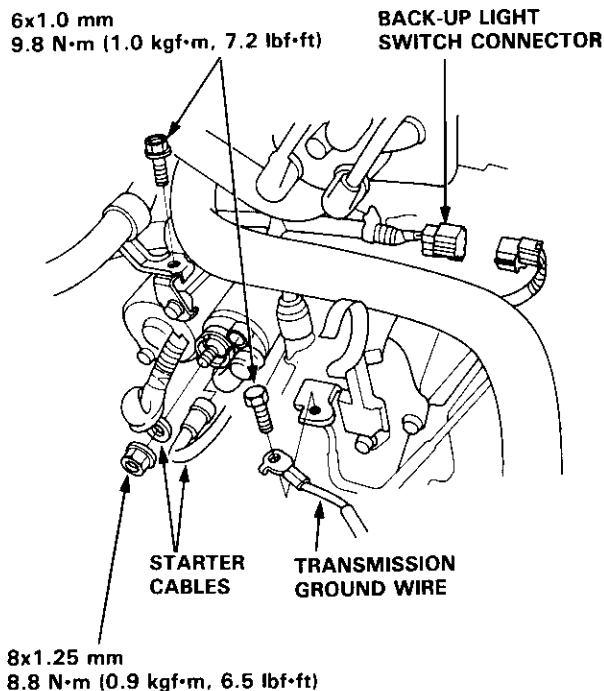
Removal

⚠ WARNING

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

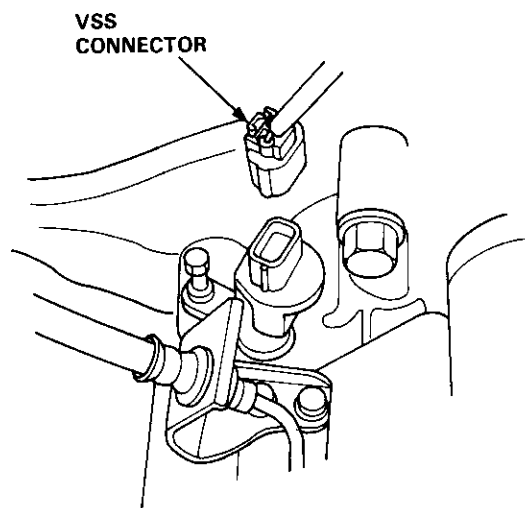
CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the negative (-) cable first, then the positive (+) cable from the battery.
2. Drain transmission oil (see page 13-3).
3. Remove the intake air tube, intake air duct and air cleaner housing assembly (see section 5).
4. Disconnect the starter motor cables, transmission ground wire and back-up light switch connector.



5. Remove the wire harness clamps.

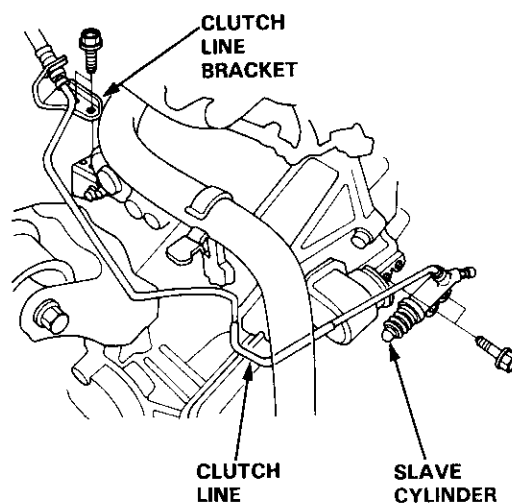
6. Disconnect the vehicle speed sensor (VSS) connector.



7. Remove the clutch line bracket, clutch line clamp, and slave cylinder.

CAUTION:

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



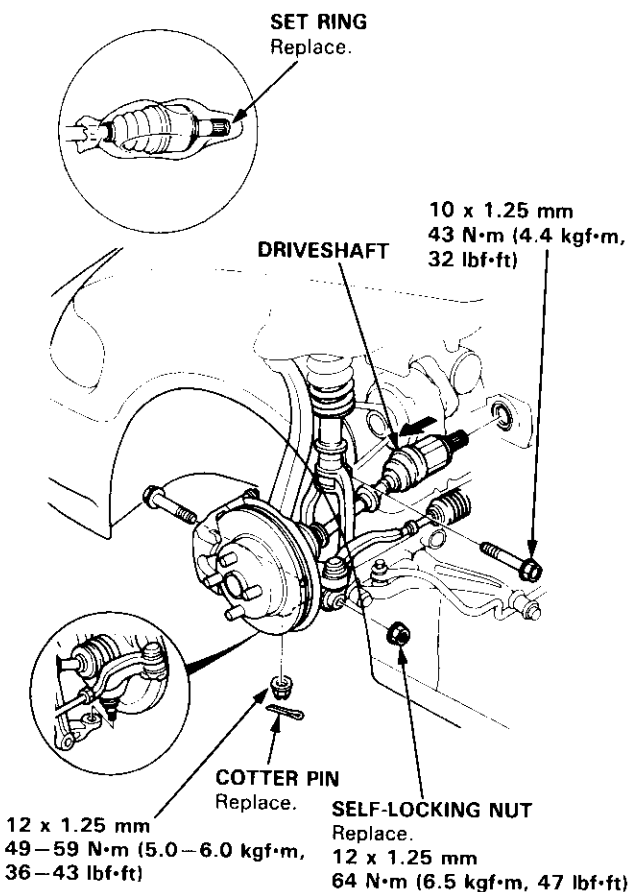
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Transmission Assembly

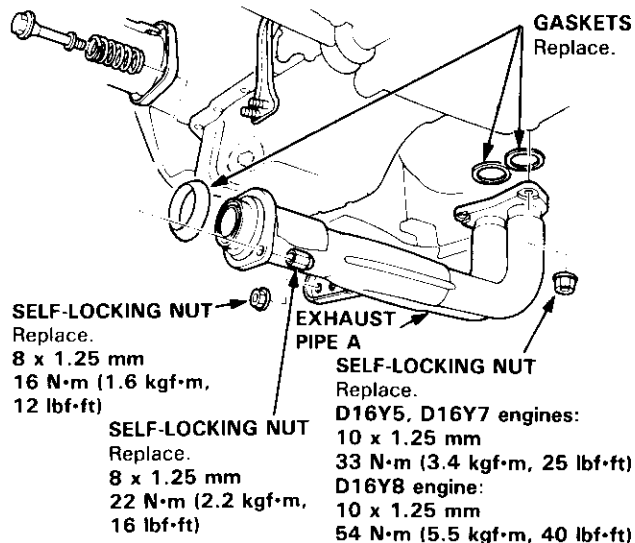
Removal (cont'd)

8. Remove the driveshafts (see section 16).

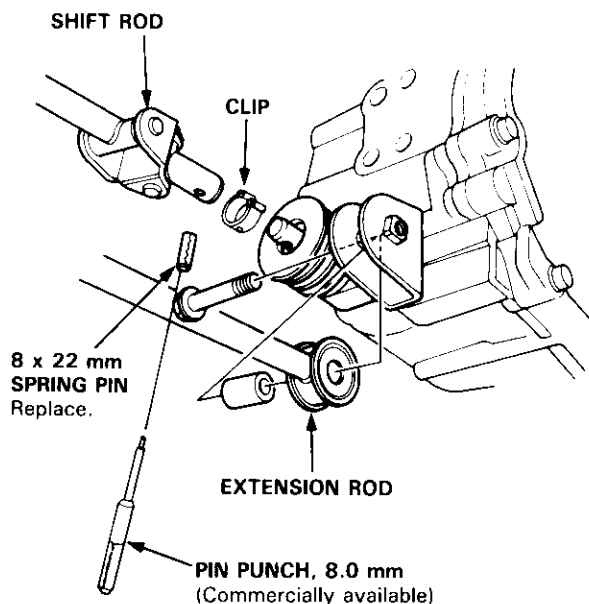
NOTE: Coat all the precision finished surfaces with clean engine oil or grease. Tie plastic bags over the driveshaft ends.



9. Remove exhaust pipe A.

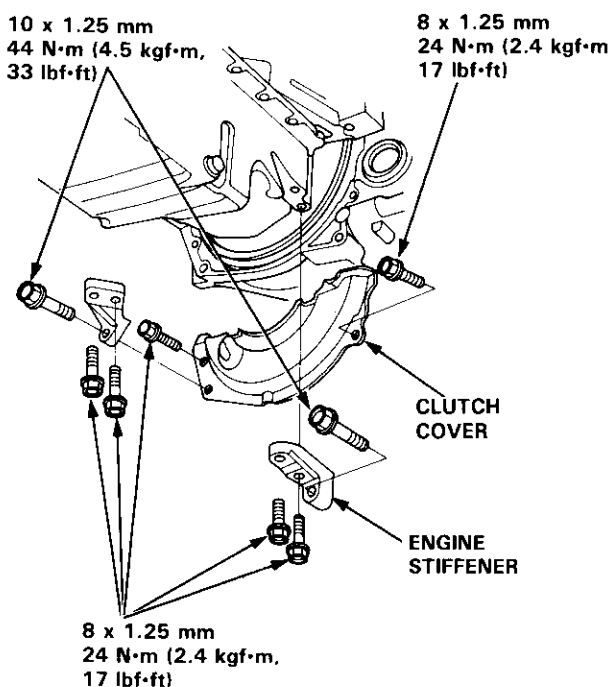


10. Remove the shift rod and extension rod.



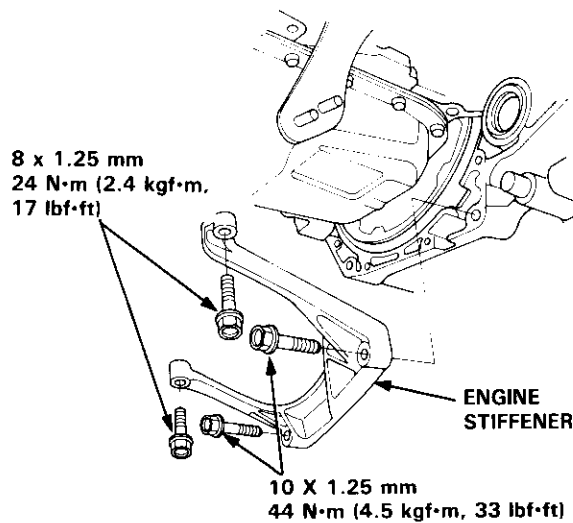
11. Remove the engine stiffeners and clutch cover.

D16Y5, D16Y8 engines:

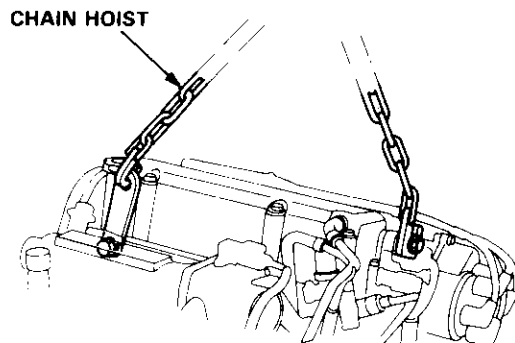




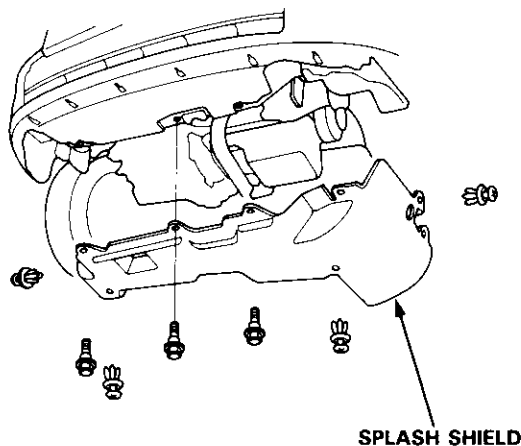
D16Y7 engine:



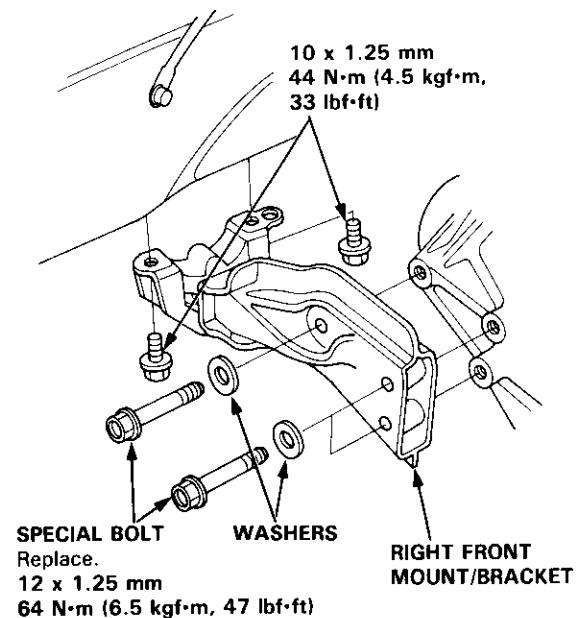
12. Install the bolts in the cylinder head and attach a chain hoist to the bolts, then lift the engine slightly to unload the engine and transmission mounts.



13. Remove the splash shield.

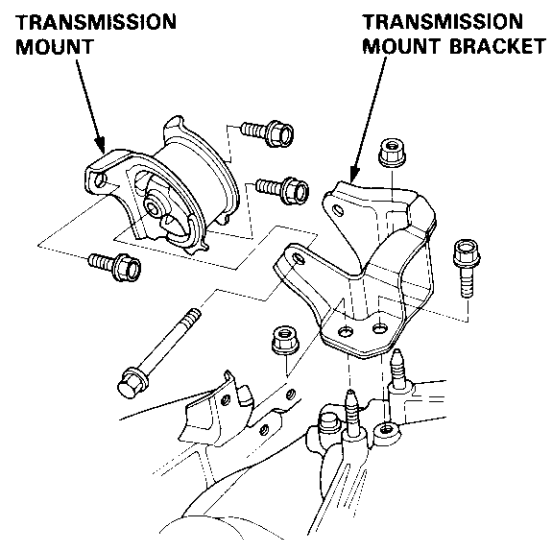


14. Remove the right front mount/bracket.



15. Place a jack under the transmission.

16. Remove the transmission mount bracket and mount.

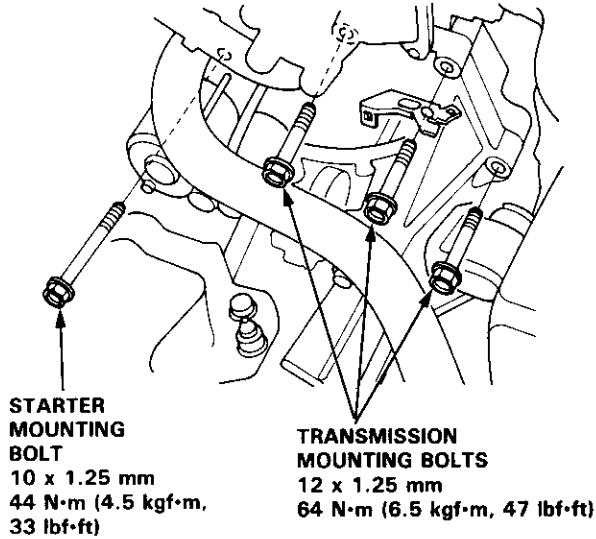


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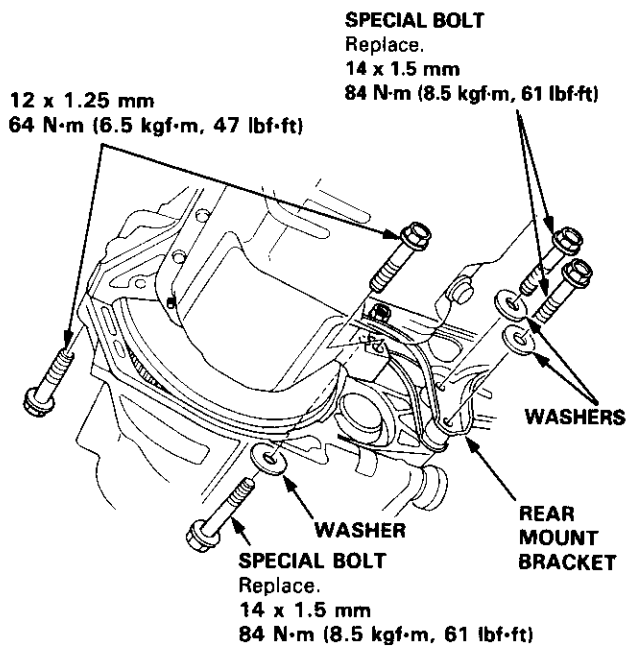
Transmission Assembly

Removal (cont'd)

17. Remove the three upper transmission mounting bolts and the lower starter mounting bolt.



18. Remove the rear mount bracket bolts and transmission mounting bolts.



19. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack.

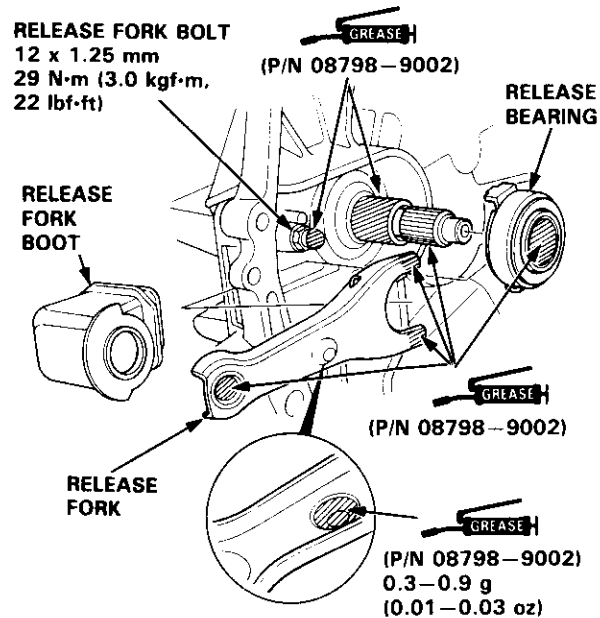
CAUTION: Take care not to bend the clutch line.

Installation

Install the transmission assembly in the reverse order of removal.

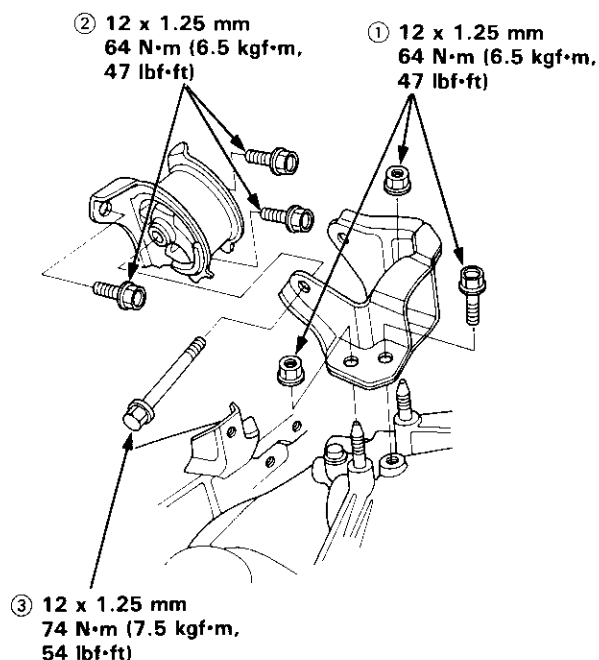
- Before installing, check that the two dowel pins are installed in the clutch housing.
- When installing the starter cable, make sure that the crimped side of the ring terminal is facing out (see section 23).
- Apply grease to the parts as shown, then install the release fork and release bearing.

NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).

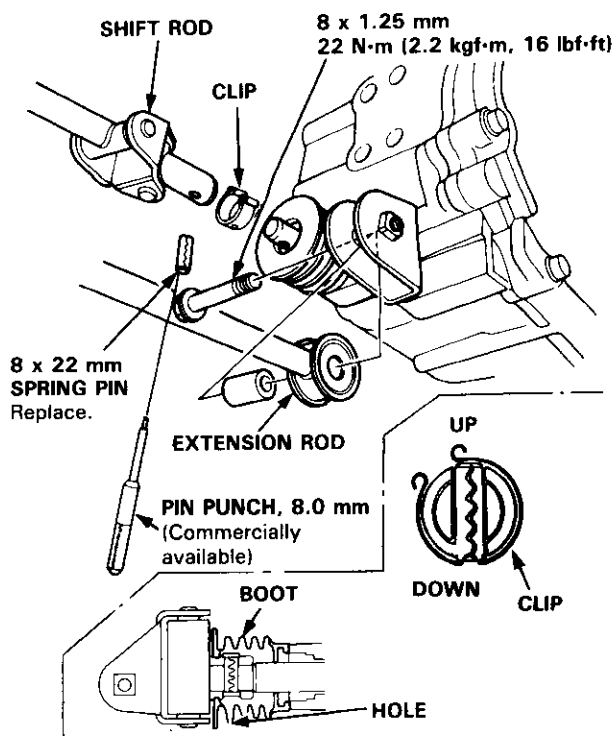




- Torque the mounting bolt and nuts in the sequence shown.



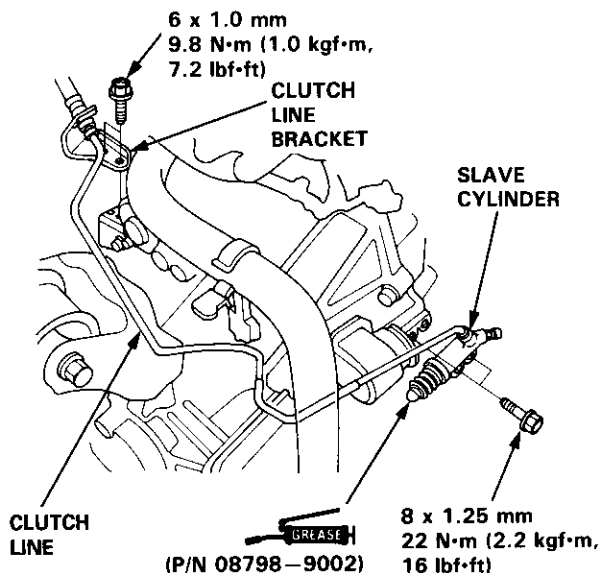
- Check that the bushings are not twisted or offset.
- Install the clip as shown.



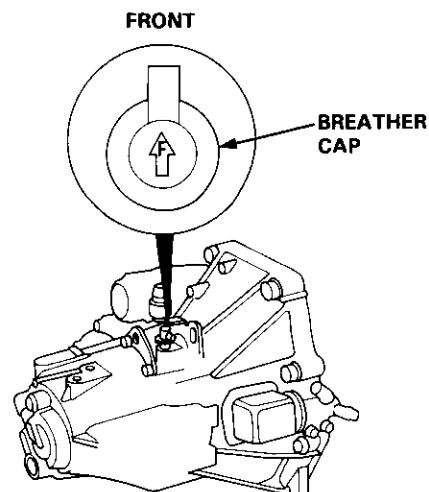
- Turn the boot so the hole is facing down.
- Make sure the boot is installed on the shift rod.

- Apply grease to the slave cylinder push rod.

NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).



- Turn the breather cap so that the "F" mark points at the front of the car as shown.



- Refill the transmission with the recommended oil (see page 13-3).
- Connect the positive (+) cable first, then the negative (-) cable to the battery.
- Check the clutch operation.
- Shift the transmission and check for smooth operation.
- Check the front wheel alignment (see section 18).

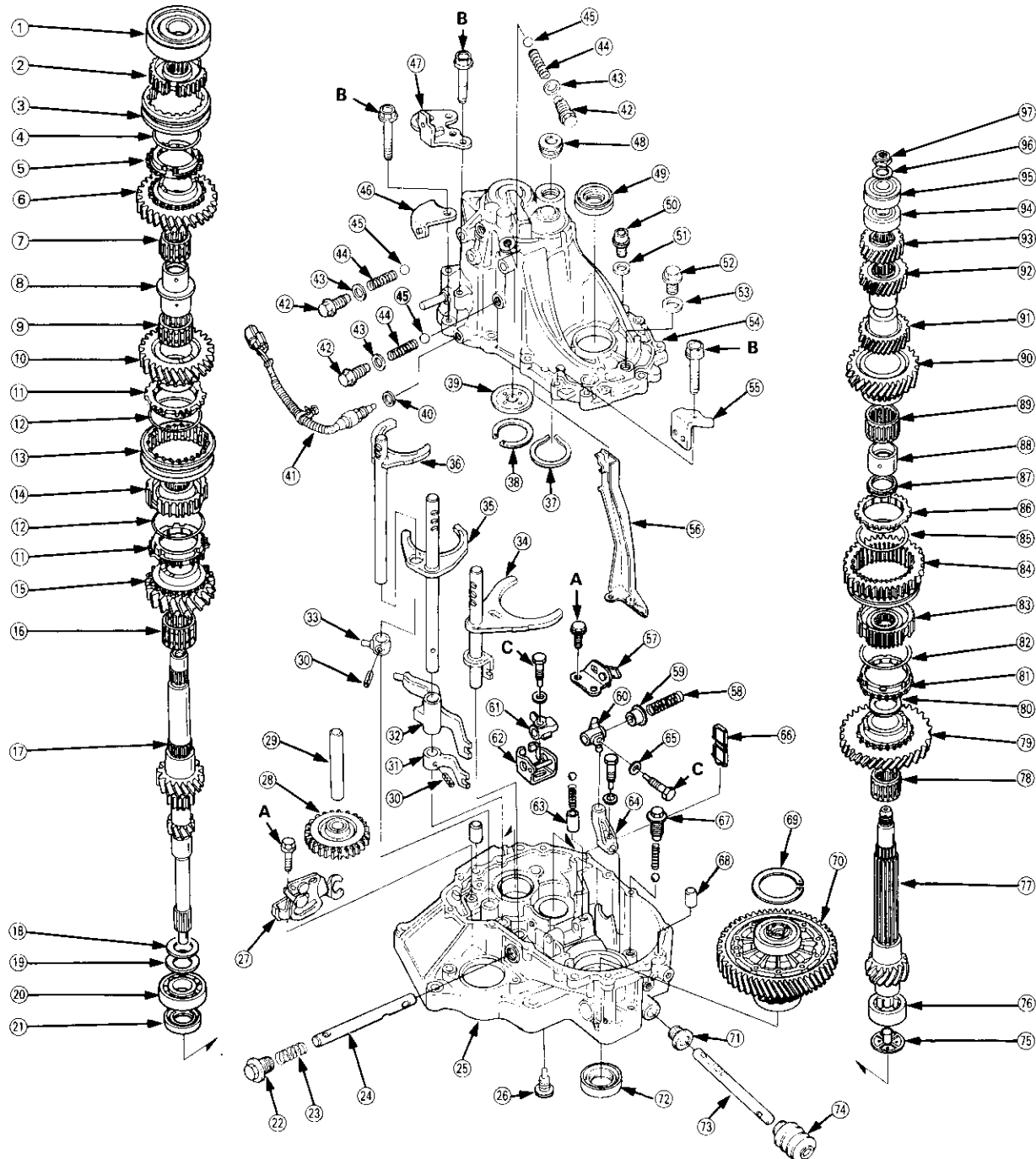
Illustrated Index

Refer to the drawing below for transmission disassembly/reassembly.
Clean all the parts thoroughly in solvent and dry with compressed air.

 Lubricate all the parts with oil before reassembly.

NOTE:

- This transmission uses no gaskets between the major housings; use liquid gasket (P/N 08718 - 0001 or 08718 - 0003) (see page 13-41).
- Always clean the magnet **66** whenever the transmission housing is disassembled.
- Inspect all the bearings for wear and operation.





Torque Value

A - 15 N·m (1.5 kgf·m, 11 lbf·ft)
B - 27 N·m (2.8 kgf·m, 20 lbf·ft)
C - 31 N·m (3.2 kgf·m, 23 lbf·ft)

- | | | |
|---|---|---|
| <p>① BALL BEARING (*1)
ANGULAR
BALL BEARING (*2)</p> <p>② 5TH SYNCHRO HUB</p> <p>③ 5TH SYNCHRO SLEEVE</p> <p>④ SYNCHRO SPRING</p> <p>⑤ SYNCHRO RING</p> <p>⑥ 5TH GEAR</p> <p>⑦ 32 x 37 x 23.5 mm
NEEDLE BEARING</p> <p>⑧ SPACER COLLAR</p> <p>⑨ 34 x 39 x 23 mm
NEEDLE BEARING</p> <p>⑩ 4TH GEAR</p> <p>⑪ SYNCHRO RING</p> <p>⑫ SYNCHRO SPRING</p> <p>⑬ 3RD/4TH SYNCHRO SLEEVE</p> <p>⑭ 3RD/4TH SYNCHRO HUB</p> <p>⑮ 3RD GEAR</p> <p>⑯ 34 x 39 x 27.5 mm
NEEDLE BEARING</p> <p>⑰ MAINSHAFT</p> <p>⑱ WASHER</p> <p>⑲ SPRING WASHER</p> <p>⑳ BALL BEARING
Check for wear and operation.</p> <p>㉑ 26 x 42 x 7 mm OIL SEAL
Replace.</p> <p>㉒ 28 mm PLUG BOLT
54 N·m (5.5 kgf·m, 40 lbf·ft)</p> <p>㉓ 1ST/2ND SELECT SPRING
L. 36.26 mm (1.428 in)</p> <p>㉔ SHIFT ARM SHAFT</p> <p>㉕ CLUTCH HOUSING</p> <p>㉖ INTERLOCK GUIDE BOLT
39 N·m (4.0 kgf·m, 29 lbf·ft)</p> <p>㉗ REVERSE SHIFT HOLDER</p> <p>㉘ REVERSE IDLER GEAR</p> <p>㉙ REVERSE IDLER GEAR SHAFT</p> <p>㉚ 5 x 22 mm SPRING PIN
Replace.</p> <p>㉛ 3RD/4TH SHIFT PIECE</p> <p>㉜ 5TH/REVERSE SHIFT PIECE</p> <p>㉝ MBS SHIFT PIECE</p> <p>㉞ 1ST/2ND SHIFT FORK</p> | <p>㉟ 3RD/4TH SHIFT FORK</p> <p>㊱ 5TH/REVERSE SHIFT FORK</p> <p>㊲ 52 mm SNAP RING</p> <p>㊳ 65 mm THRUST SHIM (*1)
70 mm THRUST SHIM (*2)
Selection, page 13-36</p> <p>㊴ OIL GUIDE PLATE</p> <p>㊵ WASHER Replace.</p> <p>㊶ BACK-UP LIGHT SWITCH
25 N·m (2.5 kgf·m, 18 lbf·ft)</p> <p>㊷ SET SCREW
22 N·m (2.2 kgf·m, 16 lbf·ft)</p> <p>㊸ WASHER Replace.</p> <p>㊹ SPRING L. 31.6 mm (1.24 in)</p> <p>㊺ STEEL BALL (5/16 in)</p> <p>㊻ BACK-UP LIGHT
SWITCH HARNESS BRACKET</p> <p>㊼ TRANSMISSION HANGER</p> <p>㊽ 32 mm SEALING BOLT
25 N·m (2.5 kgf·m, 18 lbf·ft)</p> <p>㊾ OIL SEAL
Replace.</p> <p>㊿ OIL DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)</p> <p>① WASHER Replace.</p> <p>② OIL FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)</p> <p>③ WASHER Replace.</p> <p>④ TRANSMISSION HOUSING</p> <p>⑤ CLUTCH LINE BRACKET</p> <p>⑥ OIL GUTTER PLATE</p> <p>⑦ REVERSE LOCK CAM</p> <p>⑧ REVERSE SELECT SPRING
L. 63.4 mm (2.496 in)</p> <p>⑨ REVERSE SELECT RETAINER</p> <p>⑩ SHIFT ARM C</p> <p>⑪ SHIFT ARM B</p> <p>⑫ INTERLOCK</p> <p>⑬ COLLAR</p> <p>⑭ SHIFT ARM A</p> <p>⑮ SPRING WASHER</p> <p>⑯ MAGNET</p> <p>⑰ SET BALL SPRING BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)</p> <p>⑱ 14 x 20 mm DOWEL PIN</p> | <p>⑲ 72 mm THRUST SHIM (*1)
80 mm THRUST SHIM (*2)
Selection, page 13-33</p> <p>㉑ DIFFERENTIAL ASSEMBLY
See page 13-30</p> <p>㉒ 14 x 25 x 17.5 mm OIL SEAL
Replace.</p> <p>㉓ 35 x 56 x 8 mm OIL SEAL
Replace.</p> <p>㉔ SHIFT ROD</p> <p>㉕ BOOT</p> <p>㉖ OIL GUIDE PLATE</p> <p>㉗ 30 x 47 x 21 mm
NEEDLE BEARING (*1)
30 x 55 x 21 mm
NEEDLE BEARING (*2)</p> <p>㉘ COUNTERSHAFT</p> <p>㉙ 36 x 41 x 25.5 mm
NEEDLE BEARING
Check for wear and operation.</p> <p>㉚ 1ST GEAR</p> <p>㉛ FRICTION DAMPER</p> <p>㉜ SYNCHRO RING</p> <p>㉝ SYNCHRO SPRING</p> <p>㉞ 1ST/2ND SYNCHRO HUB</p> <p>㉟ REVERSE GEAR</p> <p>㊱ SYNCHRO SPRING</p> <p>㊲ SYNCHRO RING</p> <p>㊳ FRICTION DAMPER</p> <p>㊴ SPACER</p> <p>㊵ 39 x 44 x 27 mm
NEEDLE BEARING</p> <p>㊶ 2ND GEAR</p> <p>㊷ 3RD GEAR</p> <p>㊸ 4TH GEAR</p> <p>㊹ 5TH GEAR</p> <p>㊿ BALL BEARING (*1)
NEEDLE BEARING (*2)</p> <p>① BALL BEARING</p> <p>② SPRING WASHER</p> <p>③ LOCKNUT Replace.
108 → 0 → 108 N·m
11.0 → 0 → 11.0 kgf·m,
79.6 → 0 → 79.6 lbf·ft</p> |
|---|---|---|

*1: D16Y7 engine

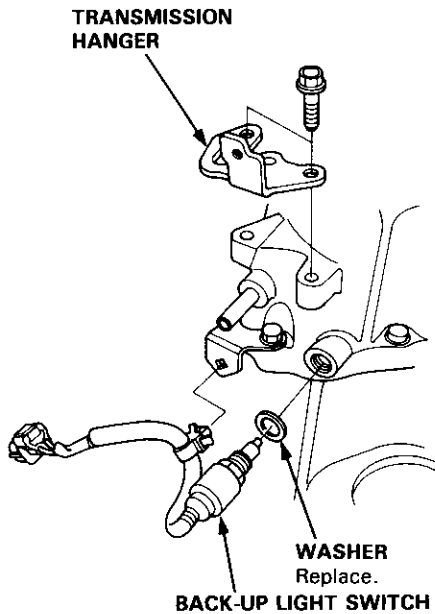
*2: D16Y5, D16Y8 engines

Transmission Housing

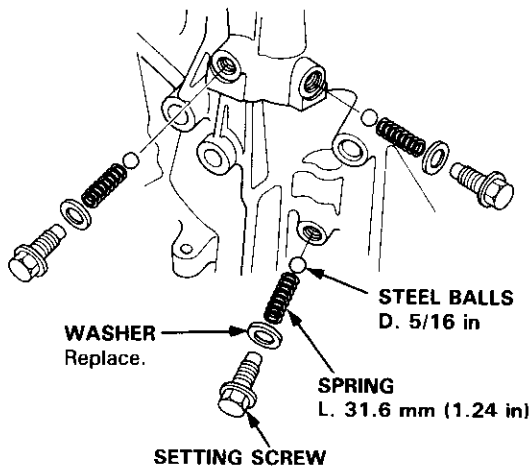
Removal

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

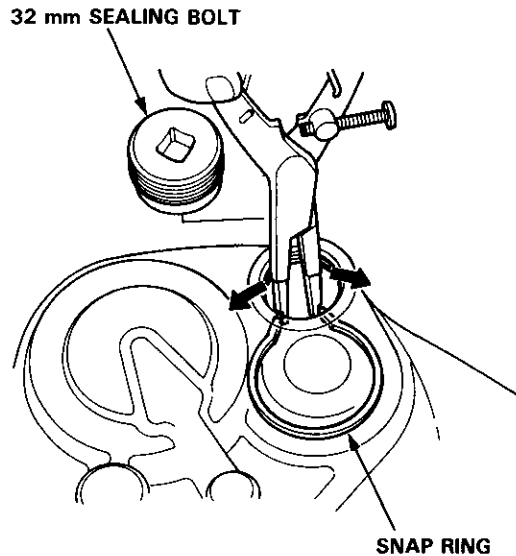
1. Remove the back-up light switch.
2. Remove transmission hanger.



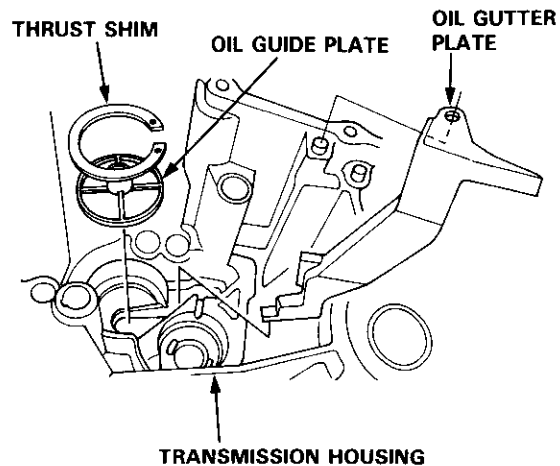
3. Remove the setting screws, washers, springs, and steel balls.



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



7. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.
8. Remove the thrust shim, oil guide plate, and oil gutter plate from the transmission housing.

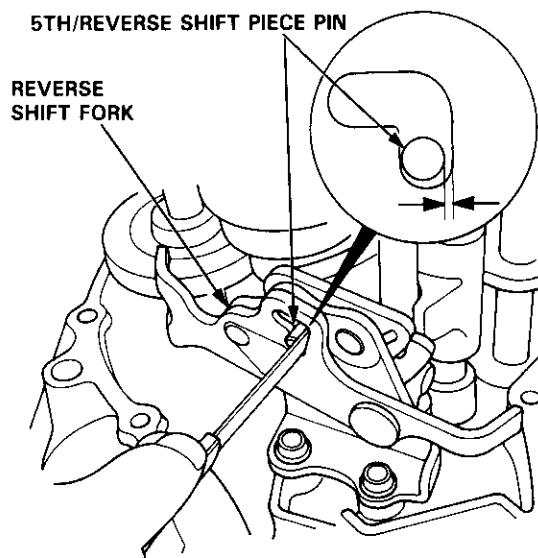




Clearance Inspection

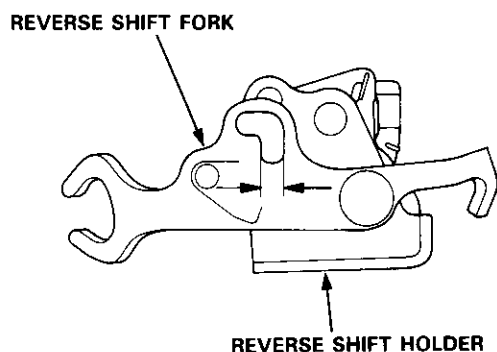
1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

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



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

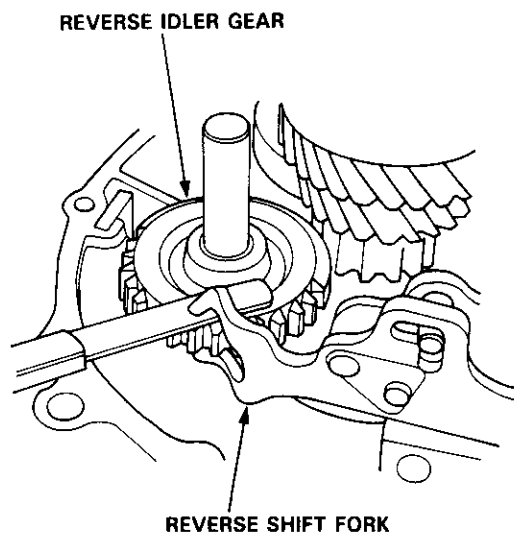
Standard: 7.05 – 7.25 mm (0.278 – 0.285 in)



- If the widths of the grooves are not within the standard, replace the reverse shift holder with a new one.
- If the width of the grooves are within the standard, replace the 5th/reverse shift piece with a new one.

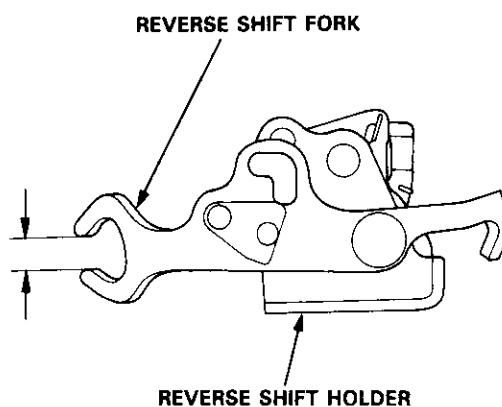
3. Measure the clearance between the reverse idler gear and the reverse shift fork.

Standard: 0.5 – 1.1 mm (0.02 – 0.04 in)
Service Limit: 1.8 mm (0.07 in)



4. If the clearances is more than the service limit, measure the width of the reverse shift fork.

Standard: 12.7 – 13.0 mm (0.500 – 0.512 in)



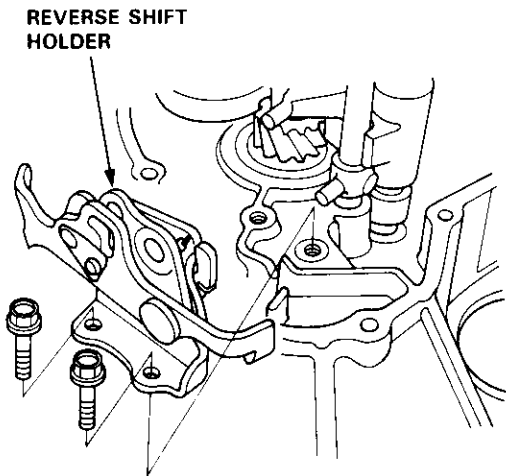
- If the width is not within the standard, replace the reverse shift holder with a new one.
- If the width is within the standard, replace the reverse idler gear with a new one.

Reverse Idler Gear

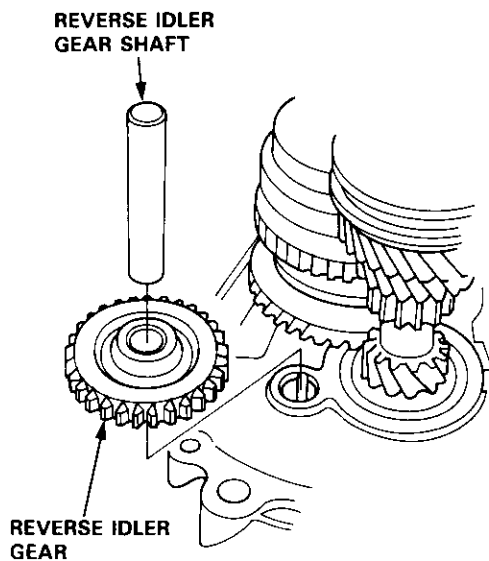
Mainshaft, Countershaft, Shift Fork

Removal

1. Remove the reverse shift holder.

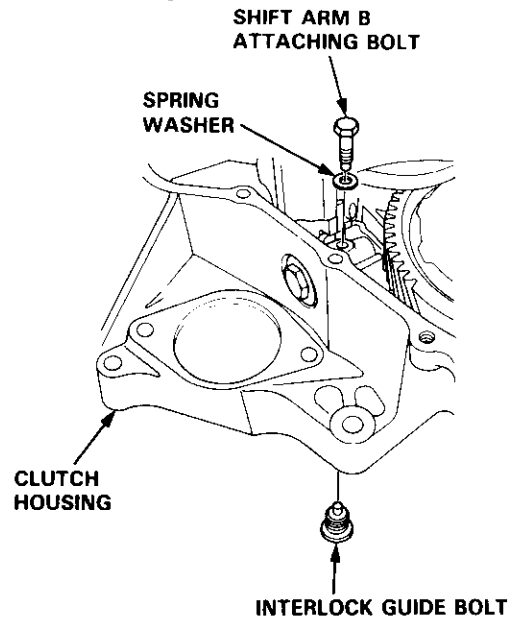


2. Remove the reverse idler gear shaft and reverse idler gear.



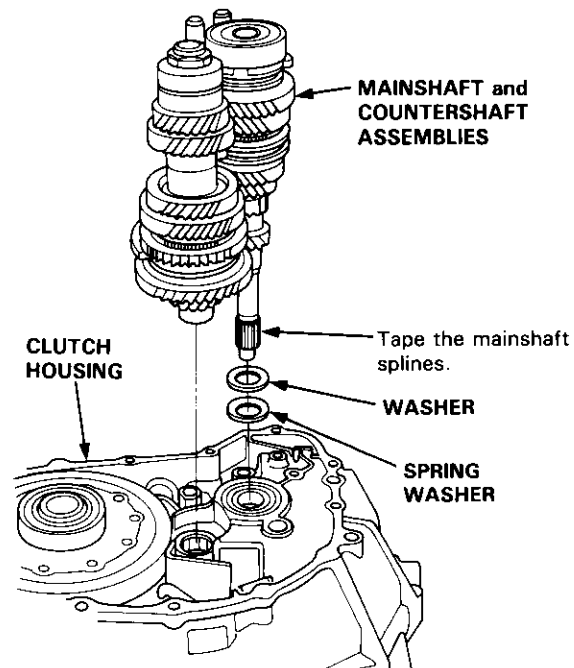
Disassembly

1. Remove the interlock guide bolt from under the clutch housing.



2. Remove the shift arm B attaching bolt.
3. Remove the mainshaft and countershaft assemblies with the shift fork from the clutch housing.

NOTE: Before removing the mainshaft and countershaft assemblies, tape the mainshaft splines to protect the seal.




Mainshaft Assembly

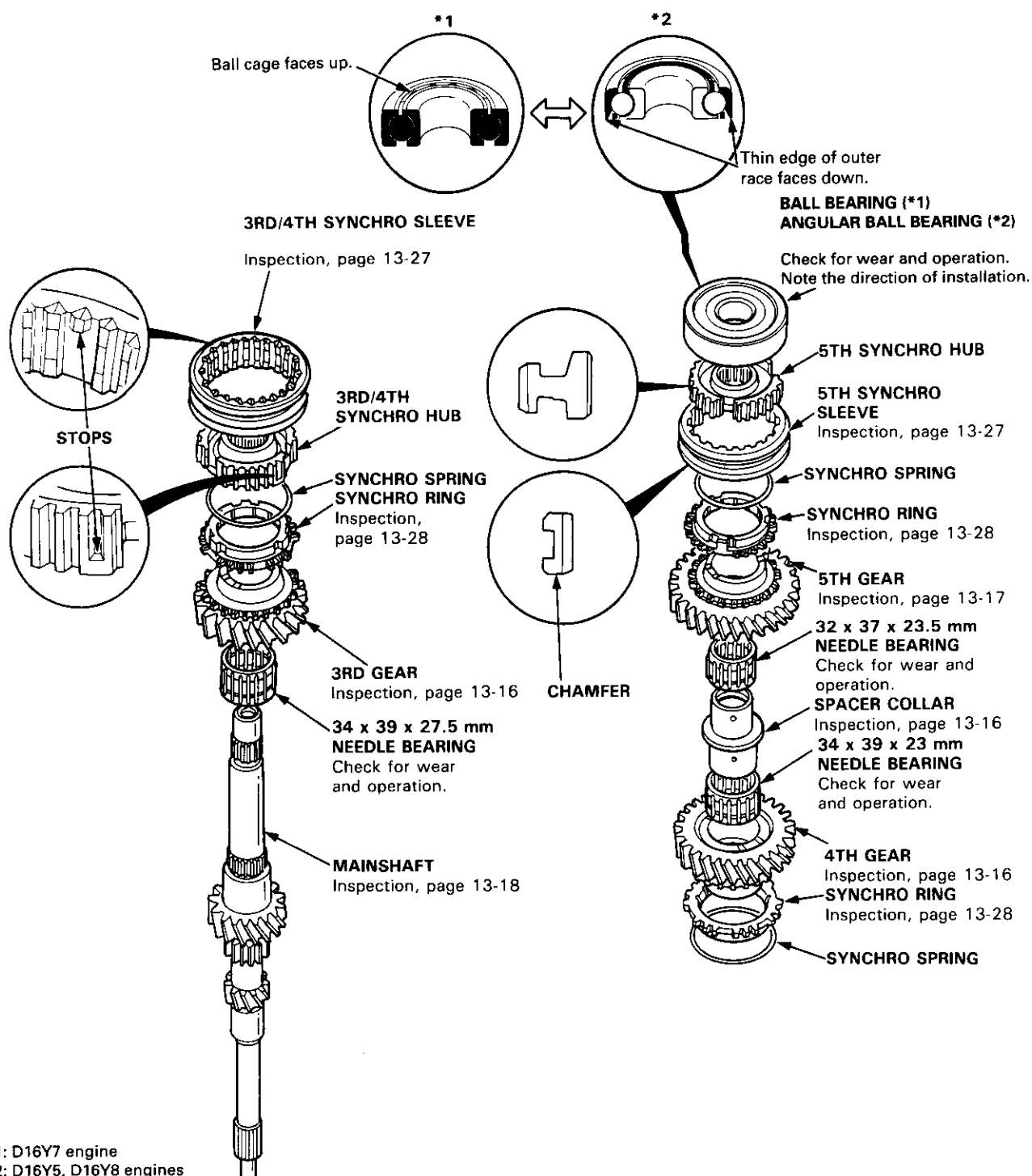


Index

Note the following during reassembly:

- The 3rd/4th and 5th synchro hubs are installed with a press.
- Install the angular ball bearing with the thin-edge outer race facing the 5th synchro hub.
- Install the ball bearing with the ball cage facing up.

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



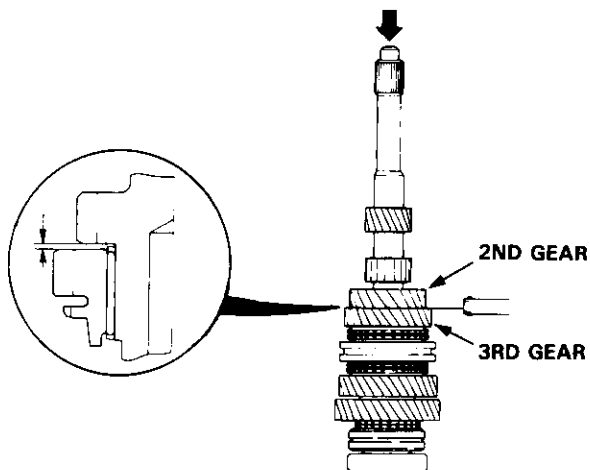
Mainshaft Assembly

Clearance Inspection

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

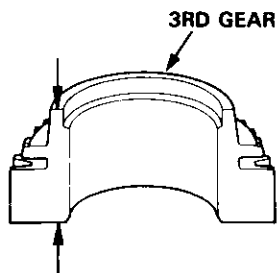
1. Measure the clearance between 2nd and 3rd gears.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.33 mm (0.013 in)



2. If the clearance is more than the service limit, measure the thickness of 3rd gear.

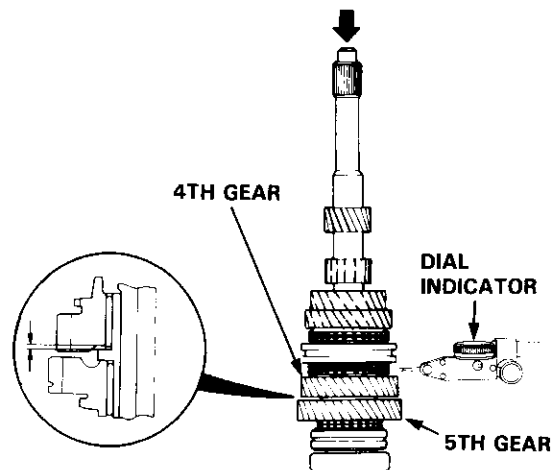
Standard: 30.22 – 30.27 mm
 (1.190 – 1.192 in)
Service Limit: 30.15 mm (1.187 in)



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

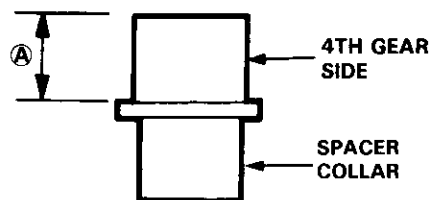
3. Measure the clearance between 4th gear and the spacer collar.

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



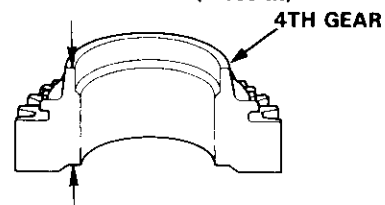
4. If the clearance is more than the service limit, measure distance A on the spacer collar.

Standard: 22.82 – 22.86 mm
 (0.898 – 0.900 in)
Service Limit: 22.81 mm (0.898 in)



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

Standard: 30.12 – 30.17 mm
 (1.186 – 1.188 in)
Service Limit: 30.05 mm (1.183 in)



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

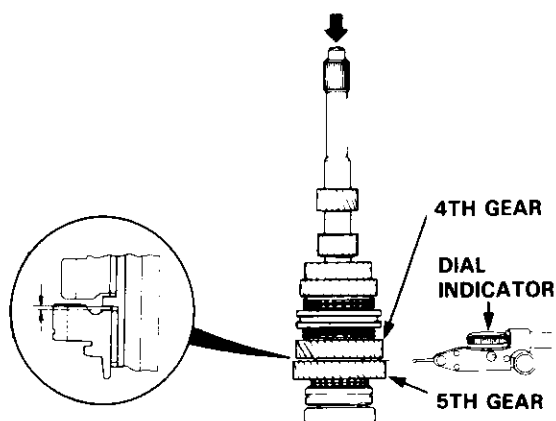


Disassembly

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

Standard: 0.06 – 0.19 mm (0.002 – 0.007 in)

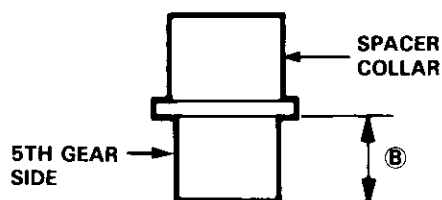
Service Limit: 0.31 mm (0.012 in)



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

Standard: 23.53 – 23.56 mm
(0.926 – 0.928 in)

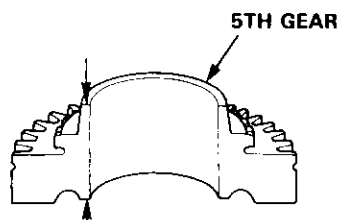
Service Limit: 23.51 mm (0.926 in)



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

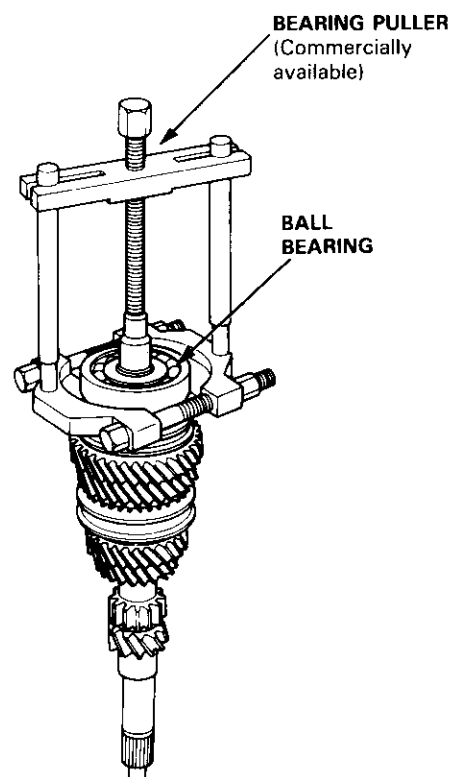
Standard: 28.42 – 28.47 mm
(1.119 – 1.121 in)

Service Limit: 28.35 mm (1.116 in)



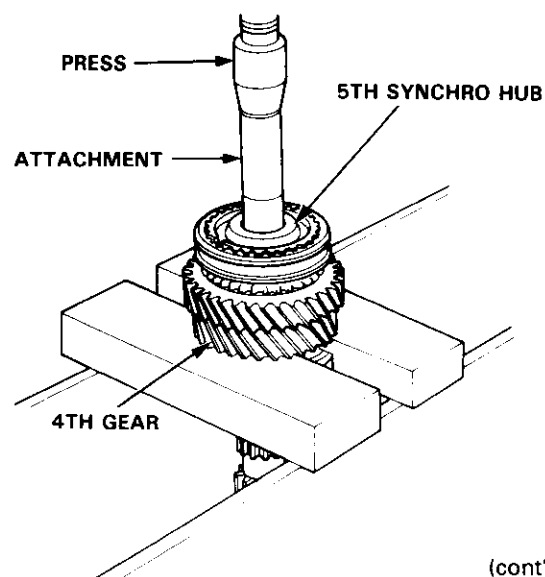
- If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
- If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

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



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

2. Support 4th gear on steel blocks, and press the mainshaft out of the 5th synchro hub as shown.

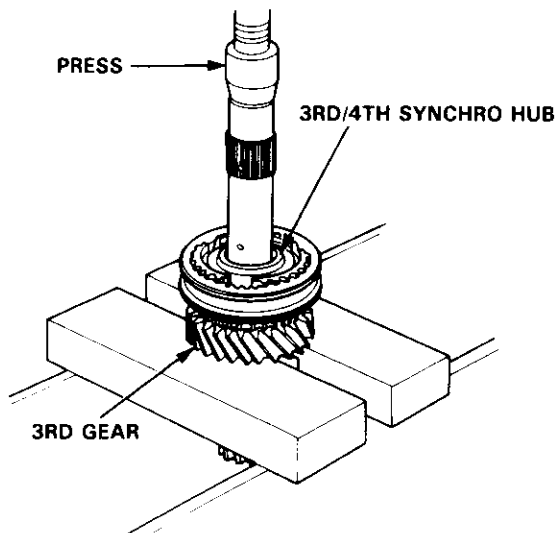


(cont'd)

Mainshaft Assembly

Disassembly (cont'd)

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



Inspection

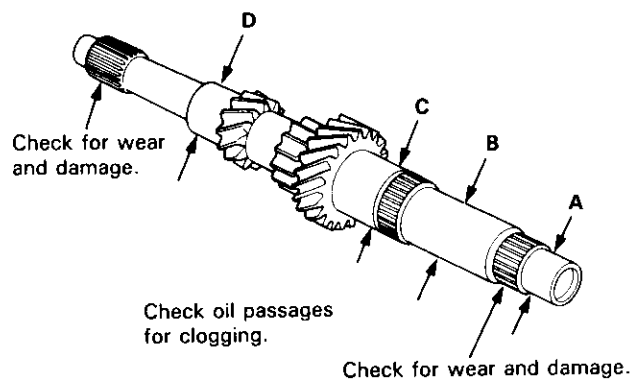
1. Inspect the gear surface and bearing surface for wear and damage, then measure the mainshaft at points A, B, C, and D.

Standard:

- A: 21.987 – 22.000 mm (0.8656 – 0.8661 in)
- B: 26.980 – 26.993 mm (1.0622 – 1.0627 in)
- C: 33.984 – 34.000 mm (1.3380 – 1.3386 in)
- D: 25.977 – 25.990 mm (1.0227 – 1.0232 in)

Service Limit:

- A: 21.930 mm (0.8634 in)
- B: 26.930 mm (1.0602 in)
- C: 33.930 mm (1.3358 in)
- D: 25.920 mm (1.0205 in)

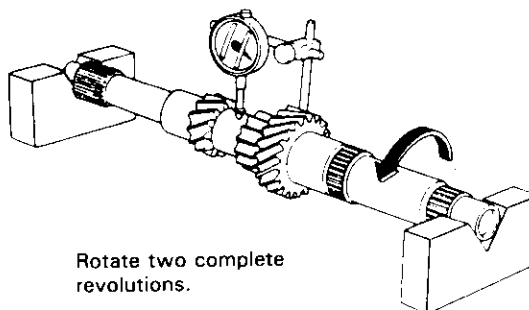


If any part of the mainshaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: 0.02 mm (0.001 in) max.
Service Limit: 0.05 mm (0.002 in)

NOTE: Support the mainshaft at both ends as shown.



If the runout is more than the service limit, replace the mainshaft with a new one.

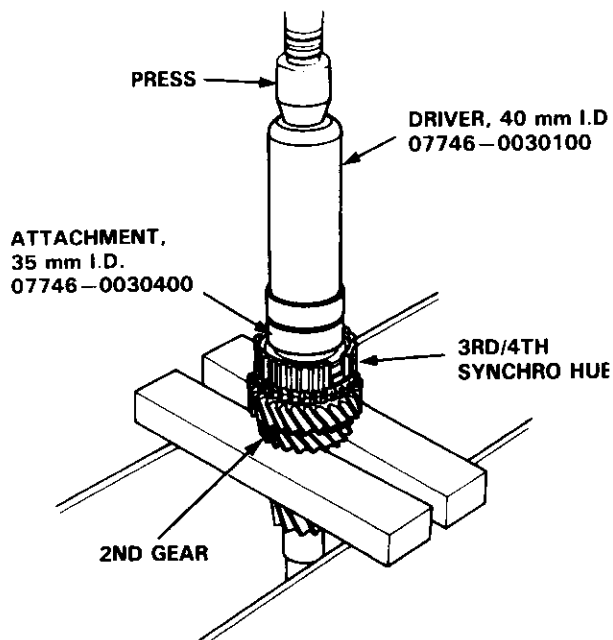


Reassembly

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

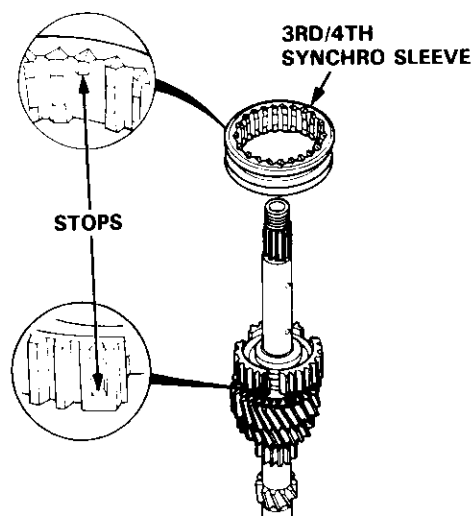
NOTE: Refer to page 13-15 for reassembly sequence.

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

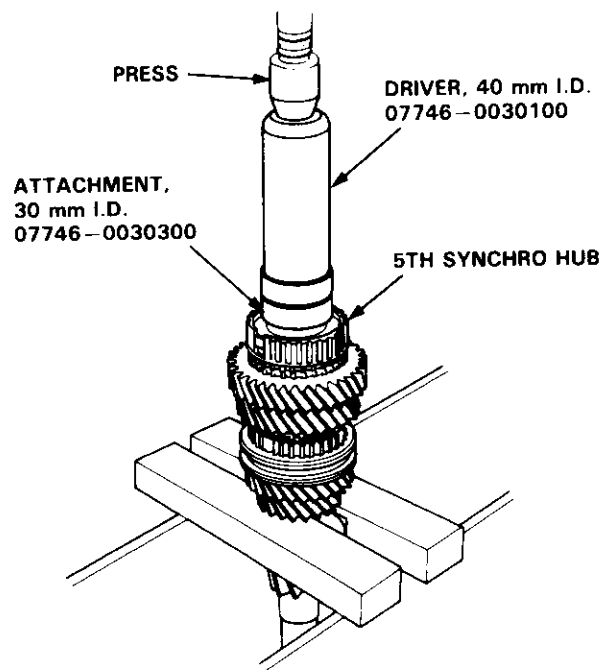


2. Install the 3rd/4th synchro sleeve by aligning the stops of the 3rd/4th synchro sleeve and hub.

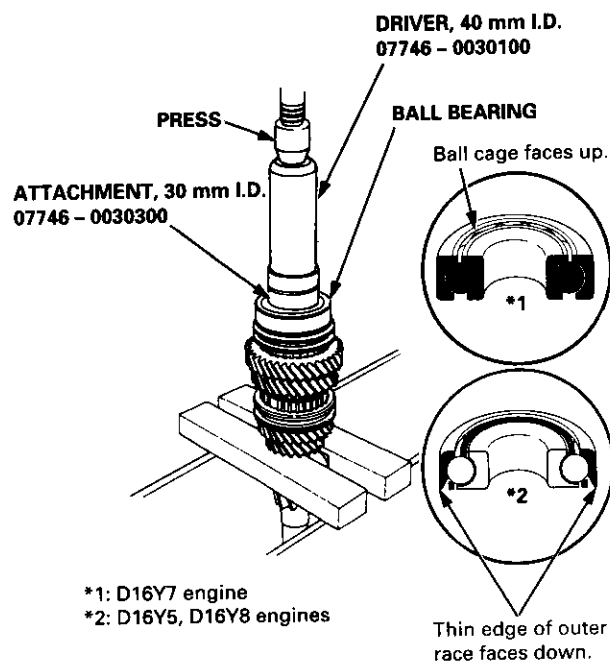
NOTE: After installing, check the operation of the 3rd/4th synchro hub set.



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




4. Install the ball bearing in the direction shown using the special tools and a press.

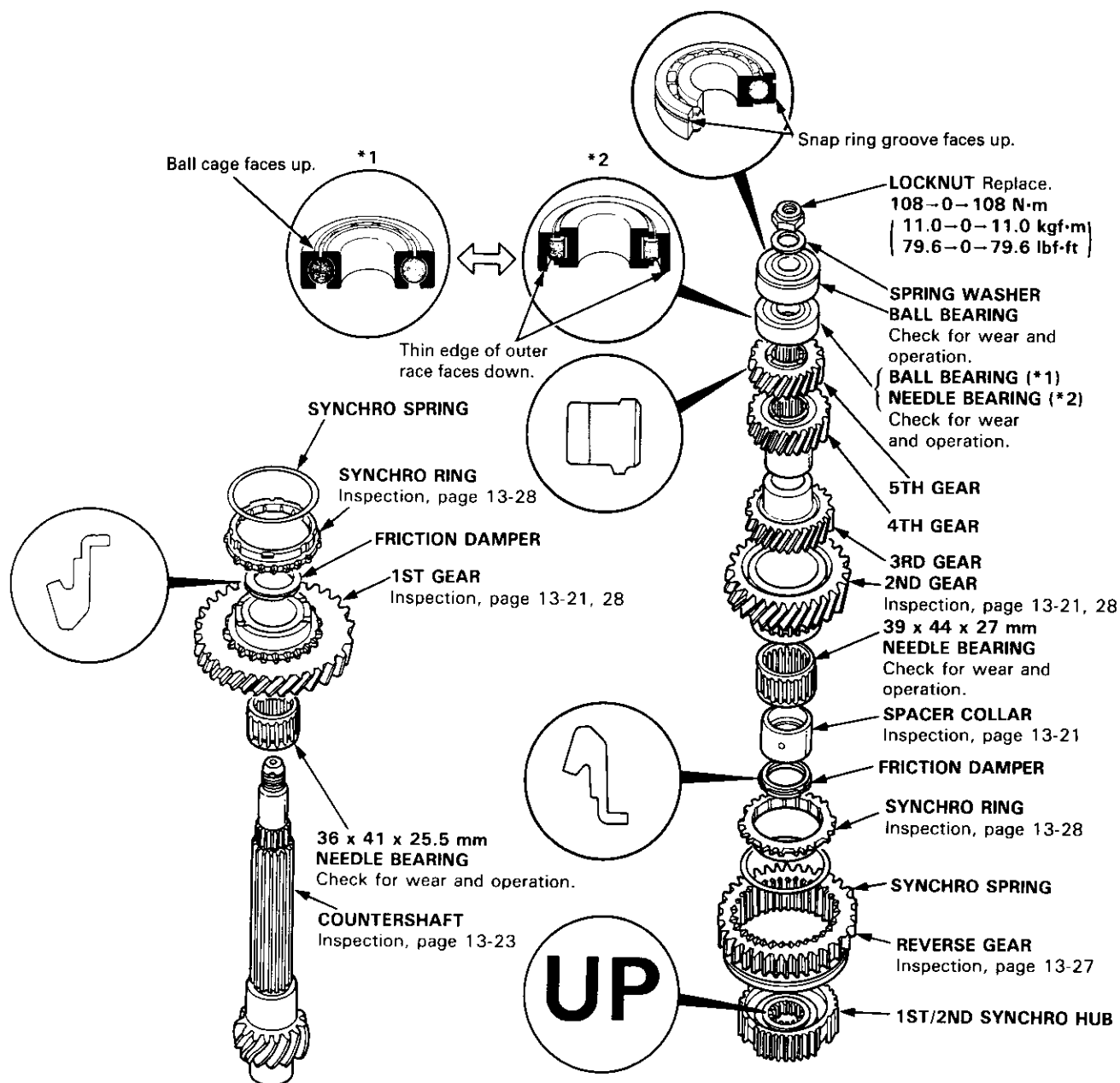


Countershaft Assembly

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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 all contact surfaces except the 3rd, 4th, and 5th gears.



*1: D16Y7 engine

*2: D16Y5, D16Y8 engines

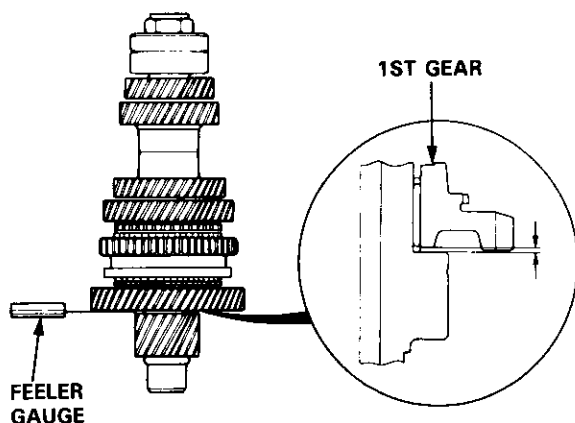


Clearance Inspection

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

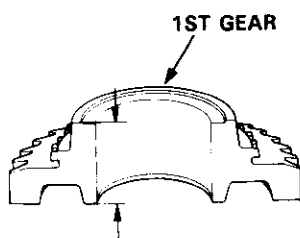
1. Measure the clearance between the countershaft and 1st gear.

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



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

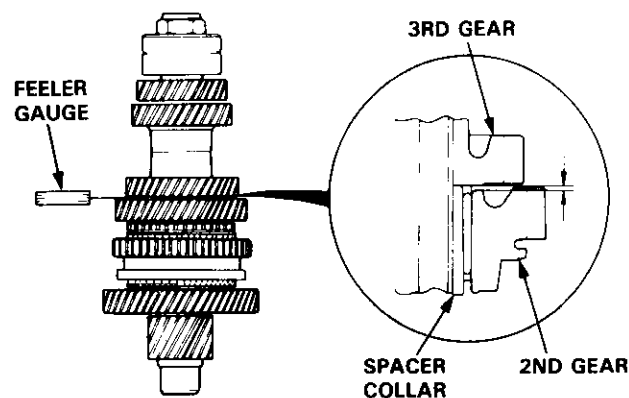
Standard: 30.41 – 30.44 mm
 (1.197 – 1.198 in)
Service Limit: 30.36 mm (1.195 in)



- If the thickness of 1st gear is less than the service limit, replace 1st gear with a new one.
- If the thickness of 1st gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

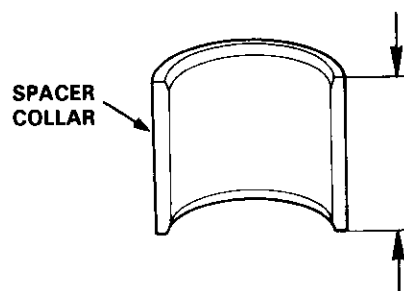
3. Measure the clearance between 2nd and 3rd gears.

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



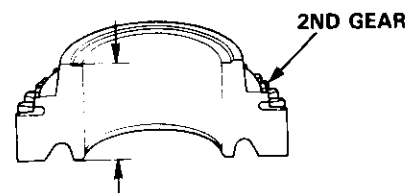
4. If the clearance is more than the service limit, measure the thickness of the spacer collar.

Standard: 32.03 – 32.06 mm
 (1.261 – 1.262 in)
Service Limit: 32.01 mm (1.260 in)



5. If the thickness is less than the service limit, replace the spacer collar with a new one. If the thickness is within the service limit, measure the thickness of 2nd gear.

Standard: 31.91 – 31.96 mm
 (1.256 – 1.258 in)
Service Limit: 31.85 mm (1.254 in)



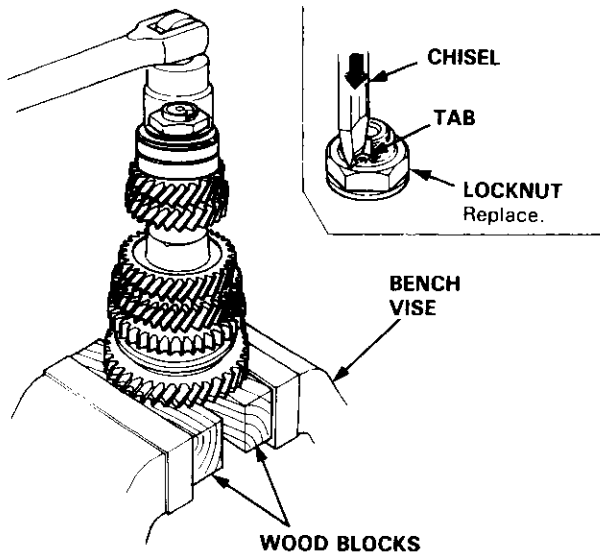
- If the thickness of 2nd gear is less than the service limit, replace 2nd gear with a new one.
- If the thickness of 2nd gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

Countershaft Assembly

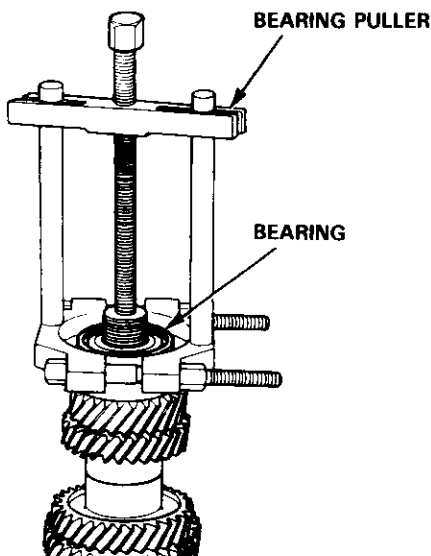
Disassembly

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

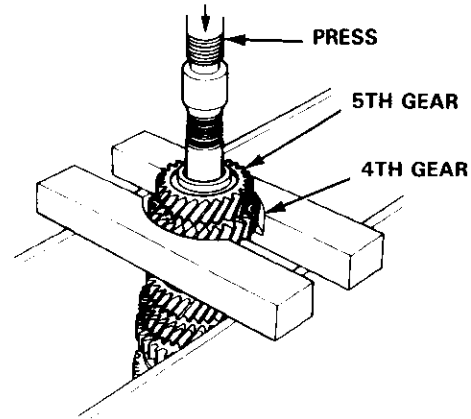
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.
2. Raise the locknut tab from the groove of the countershaft, then remove the locknut and the spring washer.



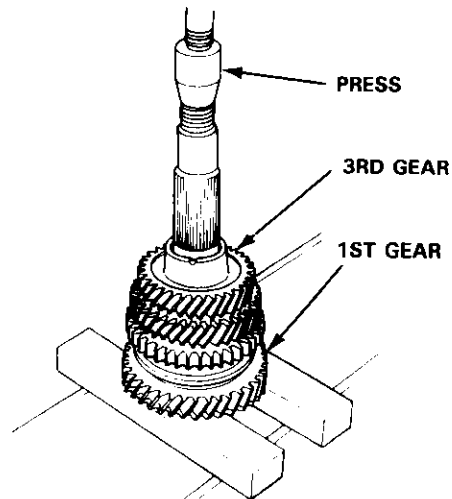
3. Remove the bearings using a bearing puller as shown.



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



5. Support 1st gear on steel blocks, and press the countershaft out of 3rd gear as shown.



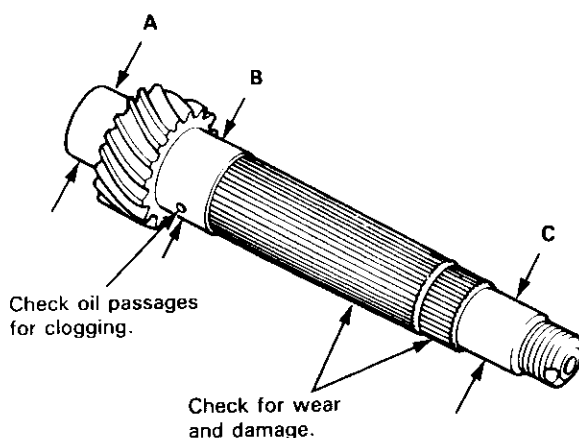


Inspection

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

Standard: A: 30.000 – 30.015 mm (1.1811 – 1.1817 in)
 B: 35.984 – 36.000 mm (1.4167 – 1.4173 in)
 C: 24.980 – 24.993 mm (0.9835 – 0.9840 in)

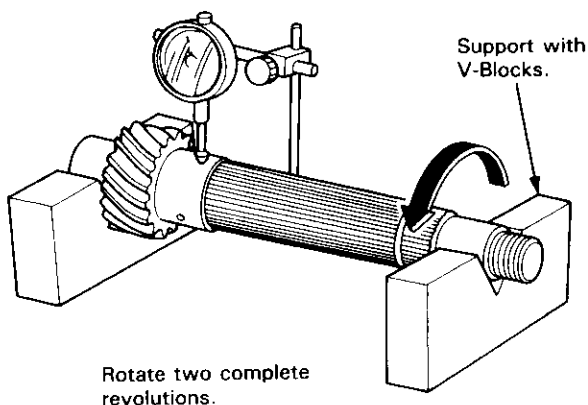
Service Limit: A: 29.950 mm (1.1791 in)
 B: 35.930 mm (1.4146 in)
 C: 24.930 mm (0.9815 in)



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

2. Inspect for runout.

Standard: 0.02 mm (0.001 in) max.
Service Limit: 0.05 mm (0.002 in)



- If the runout is more than the service limit, replace the countershaft with a new one.

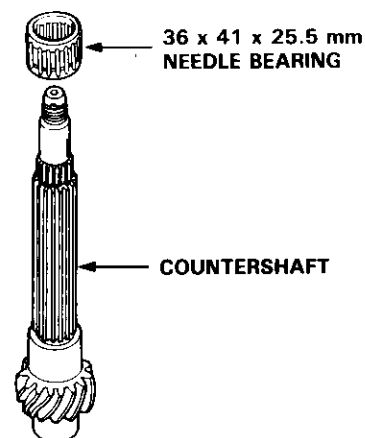
Reassembly

CAUTION:

- Press the 3rd, 4th, and 5th gears on the countershaft without lubrication.
- When installing the 3rd, 4th, and 5th gears, support the shaft on steel blocks and install the gears using a press.

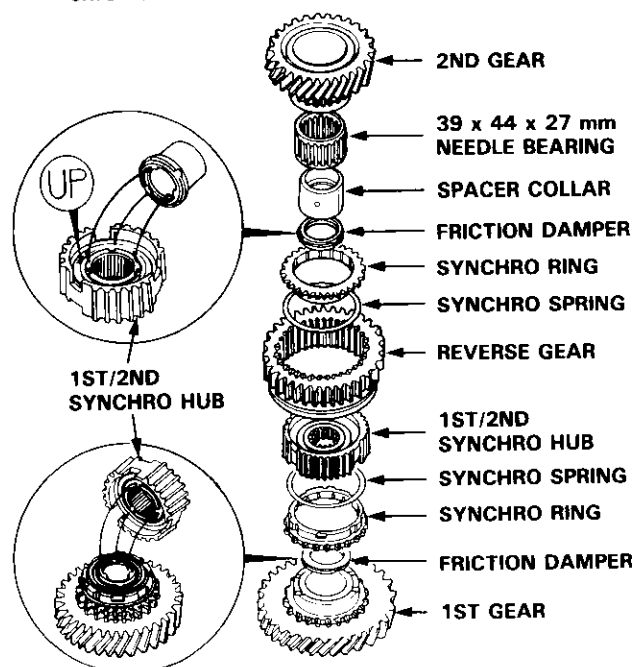
NOTE: Refer to page 13-20 for reassembly sequence.

1. Install the needle bearing on the countershaft.



2. Assemble the parts below as shown.

NOTE: Check that the fingers of the friction damper are securely set in the grooves of the 1st/2nd synchro hub.



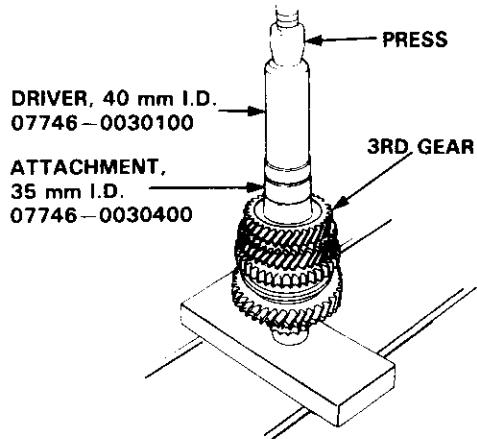
3. Install the parts on the countershaft.

(cont'd)

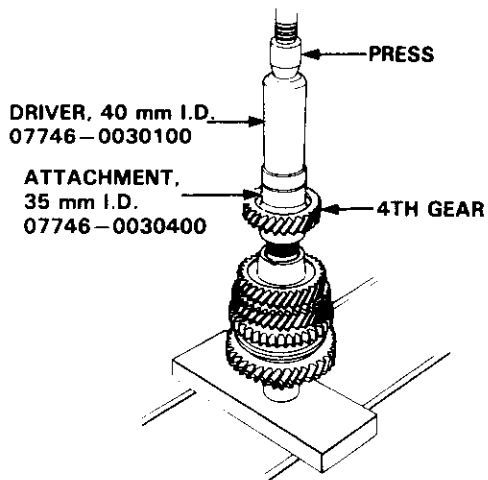
Countershaft Assembly

Reassembly (cont'd)

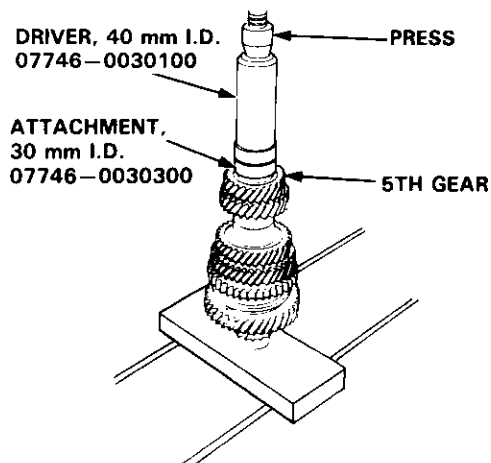
4. Support the countershaft on a steel block as shown and install 3rd gear using the special tools and a press.



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

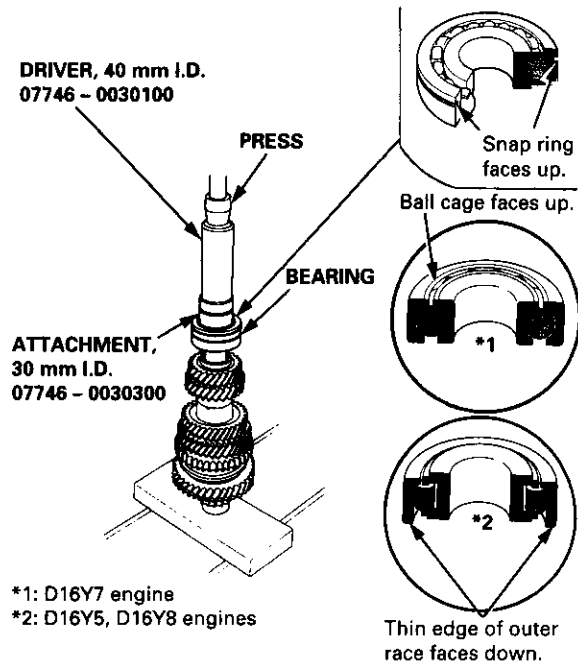


6. Install 5th gear using the special tools and a press.



7. Install the bearings in the direction shown using the special tools and a press.

CAUTION: Install the bearings with a maximum pressure of 7.8 kN (800 kgf, 5,786 lbf).

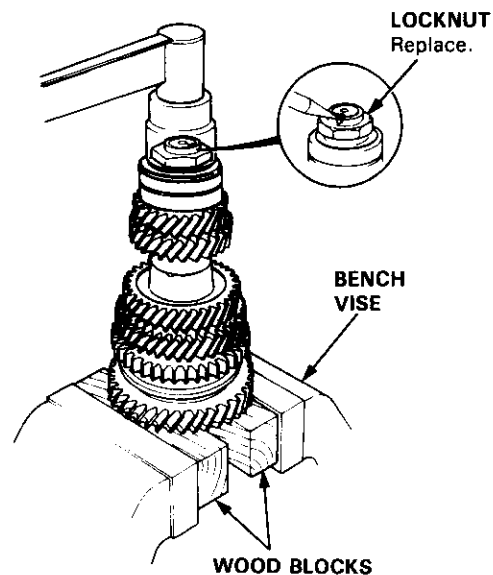


8. Securely clamp the countershaft assembly in a bench vise with wood blocks.

LOCKNUT

108 → 0 → 108 N·m

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



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

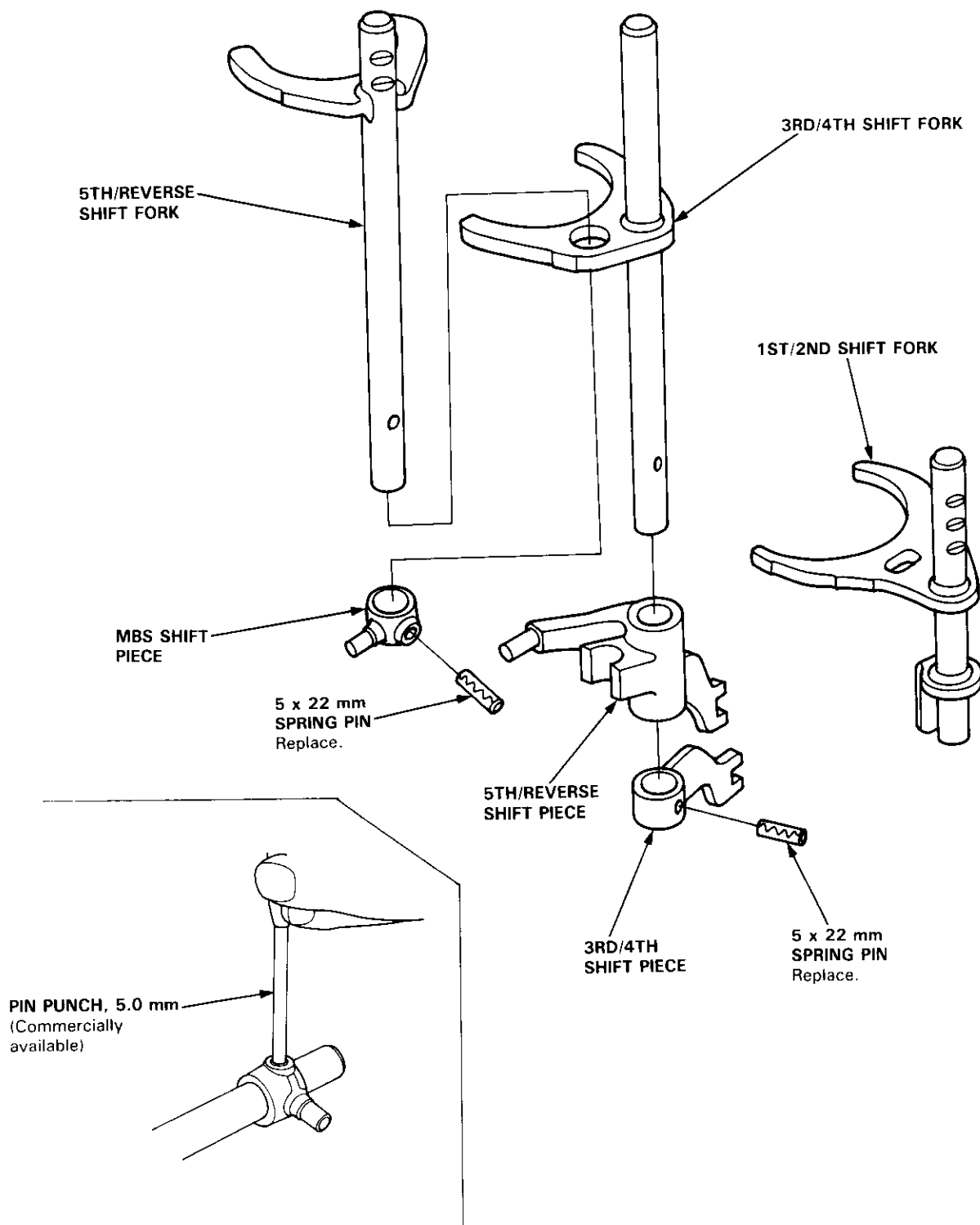


Shift Fork Assembly

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



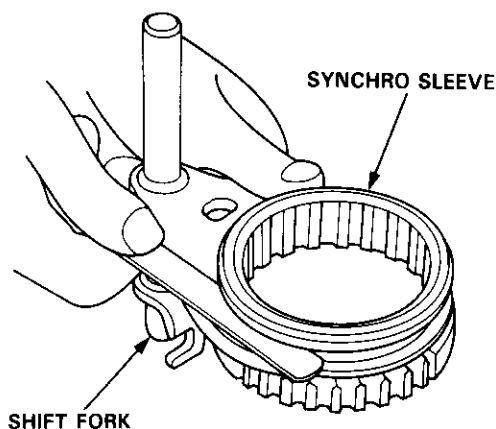
Shift Fork Assembly

Clearance Inspection

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

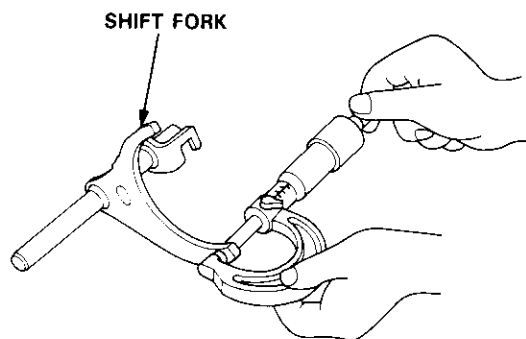
1. Measure the clearance between each shift fork and its matching synchro sleeve.

Standard: 0.35 – 0.65 mm (0.014 – 0.026 in)
Service Limit: 1.0 mm (0.04 in)



2. If the clearance is more than the service limit, measure the thickness of the shift fork fingers.

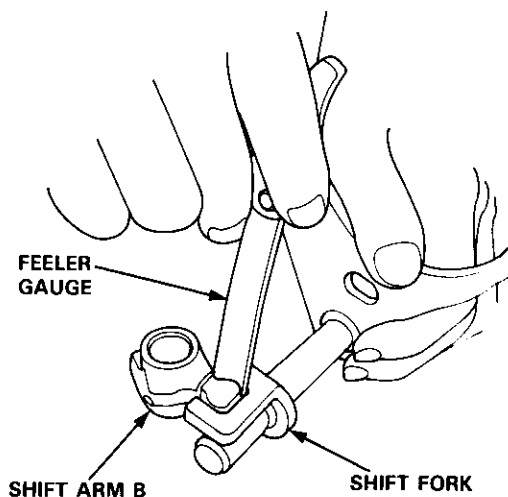
Standard:
3rd/4th: 7.4 – 7.6 mm (0.291 – 0.299 in)
1st/2nd, 5th: 6.2 – 6.4 mm (0.244 – 0.252 in)



- If the thickness of the shift fork fingers is not within the standard, replace the shift fork with a new one.
- If the thickness of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

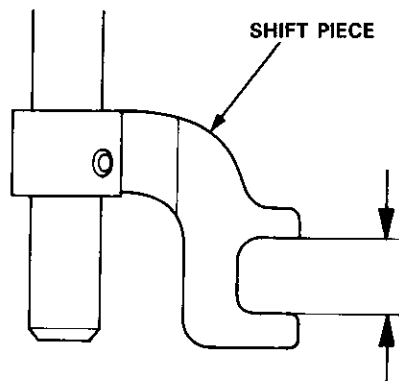
3. Measure the clearance between the shift piece or shift fork and the shift arm B.

Standard: 0.2 – 0.5 mm (0.008 – 0.02 in)
Service Limit: 0.62 mm (0.0244 in)



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

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



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

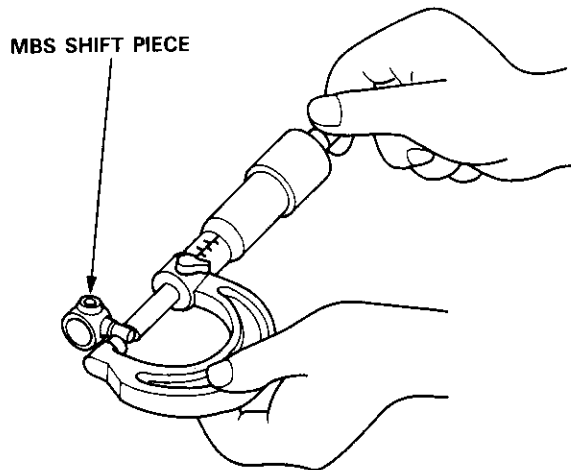


MBS Shift Piece Inspection

1. Measure the width of the MBS shift piece.

Standard: 6.9 – 7.1 mm (0.272 – 0.280 in)

Service Limit: 6.8 mm (0.268 in)

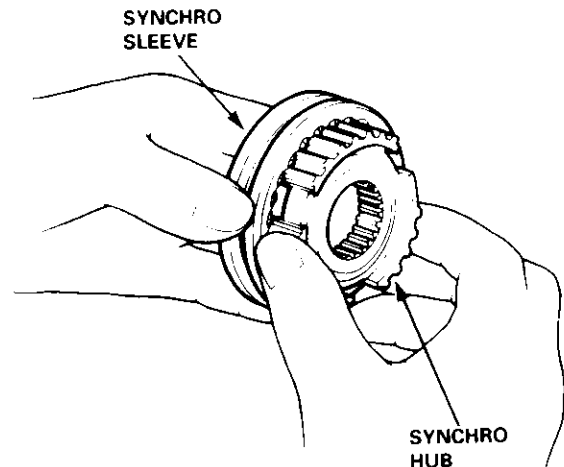


If the width of the MBS shift piece is less than the service limit, replace the MBS shift piece.

Inspection/Installation

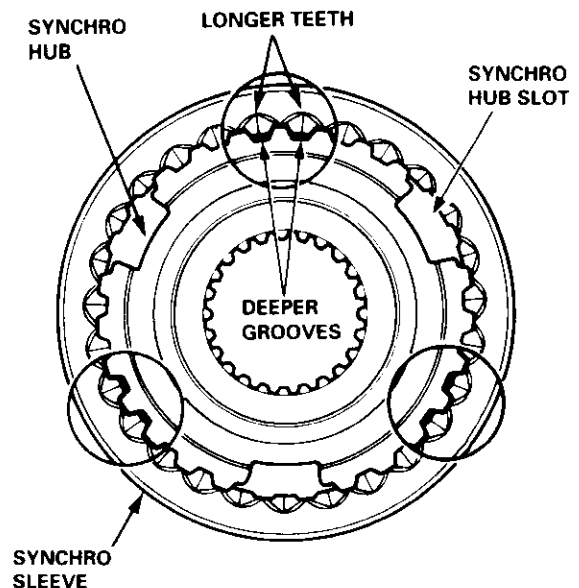
1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicate wear.
2. Install each synchro hub in its mating synchro sleeve, and check for freedom of movement.

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



3. When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.

CAUTION: Do not install the synchro sleeve with its longer teeth in the synchro hub slots because it will damage the spring ring.



Synchro Ring, Gear

Inspection

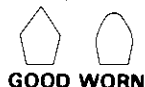
1. Inspect the synchro ring and gear.

A: Inspect the inside of the synchro ring for wear.

B: Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).



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



D: Inspect the gear hub thrust surface for wear.

E: Inspect the cone surface for wear and roughness.

F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.

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

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

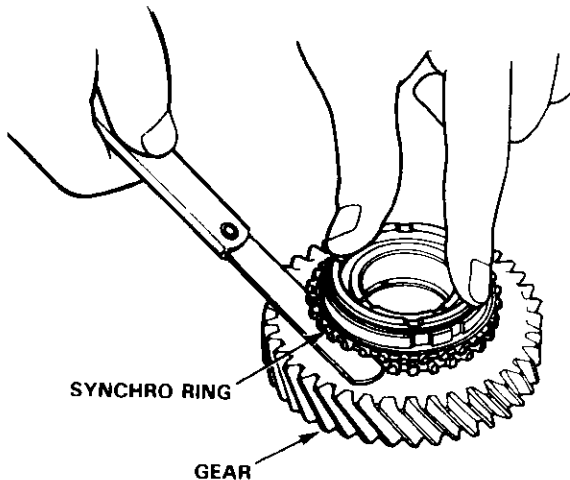
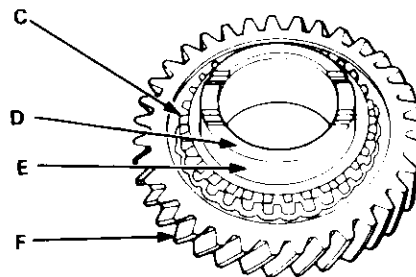
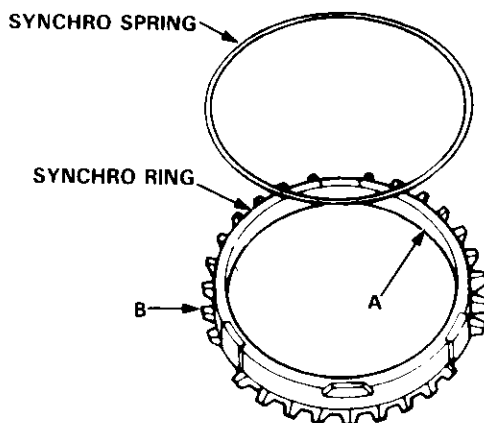
NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

Synchro Ring-to-Gear Clearance

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

Service Limit: 0.4 mm (0.02 in)

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





Shift Rod

Removal

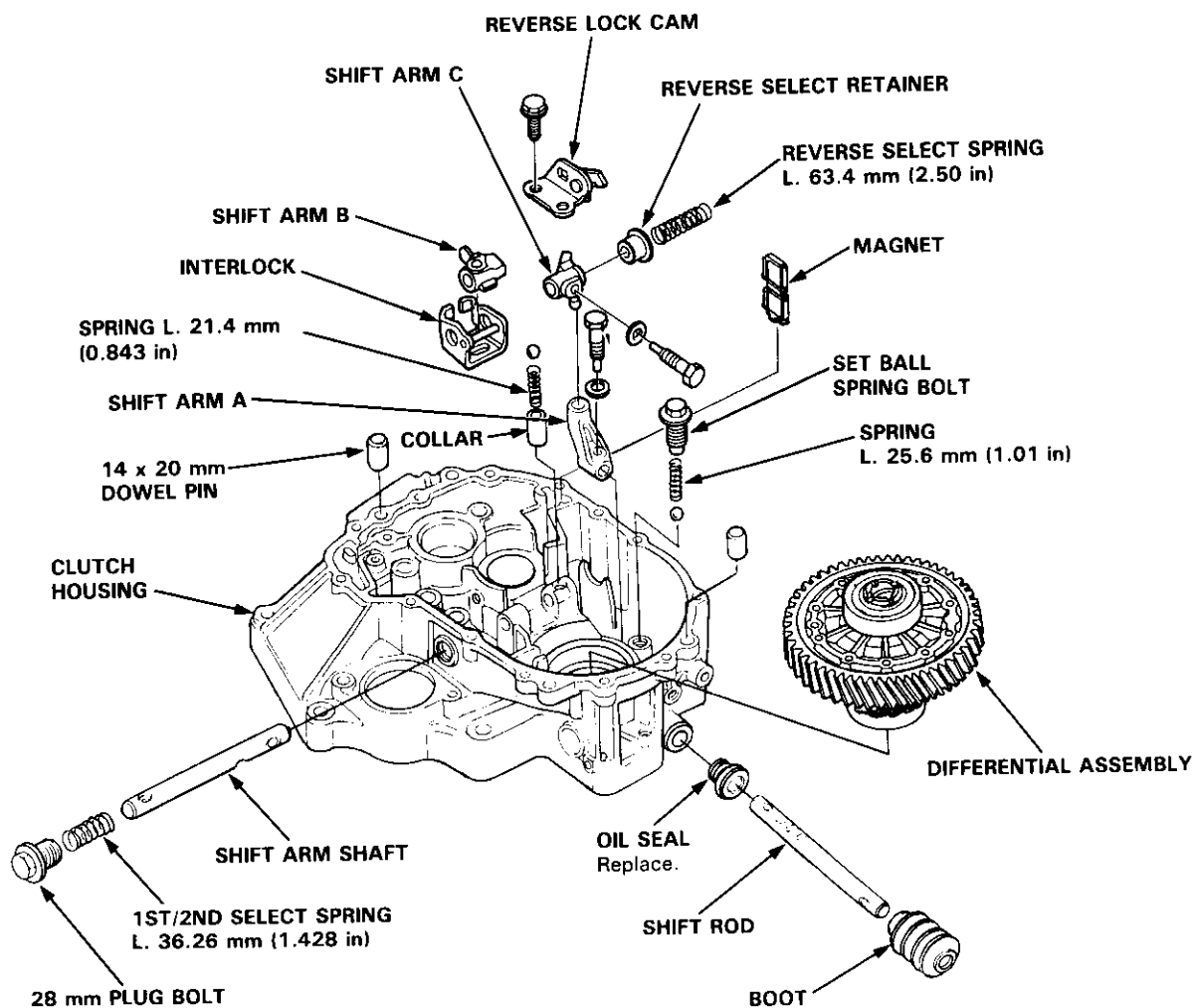
NOTE: The steel balls are all of the same size (5/16 in).

1. Remove the differential assembly.
2. Remove the 28 mm plug bolt and 1st/2nd select spring.
3. Remove the shift arm C attaching bolt.
4. Remove the shift arm shaft.

NOTE: Be careful not to lose the steel ball.

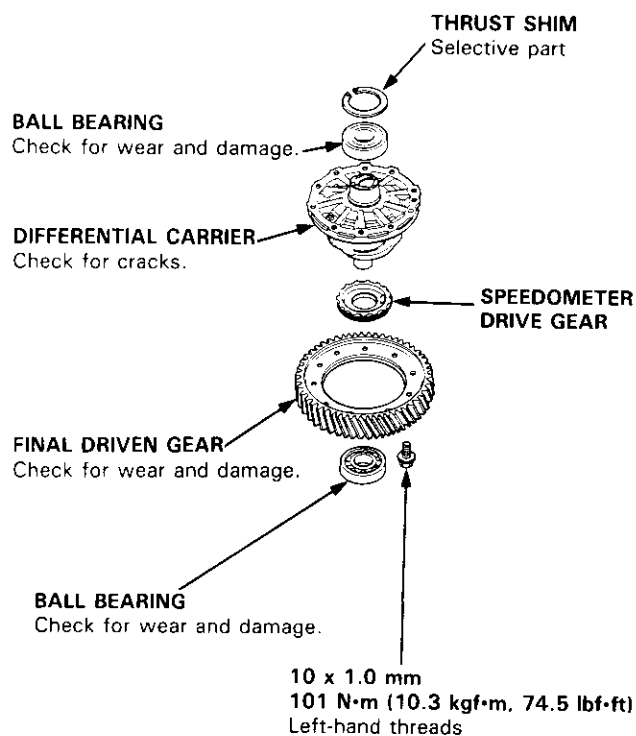
5. Remove the steel ball, spring, and collar.

6. Remove shift arms C and B, and the interlock, then remove the reverse select spring and retainer.
7. Remove the shift arm A attaching bolt, the set ball spring bolt, set spring, and steel ball.
8. Remove the shift rod, then remove the shift arm A.
9. Remove the reverse lock cam.
10. Remove the magnet.



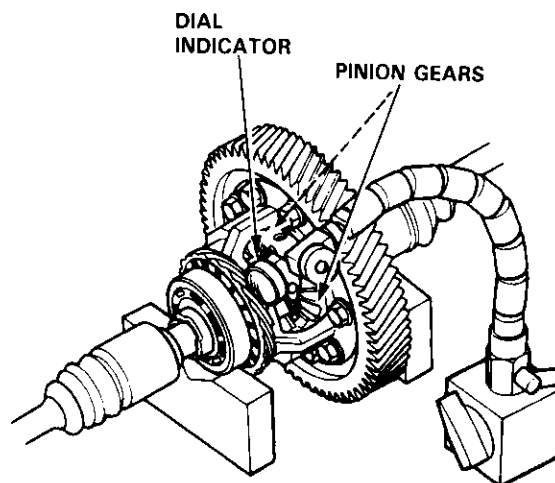
Differential

Index



Backlash Inspection

1. Place differential assembly on V-blocks, and install both driveshafts.



2. Measure backlash of both pinion gears.

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

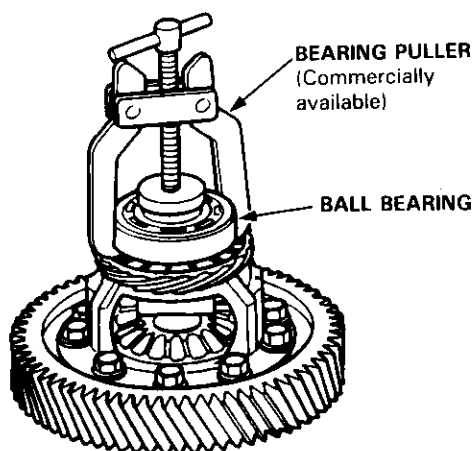
3. If the backlash is not within the standard, replace the differential carrier.



Bearing Replacement

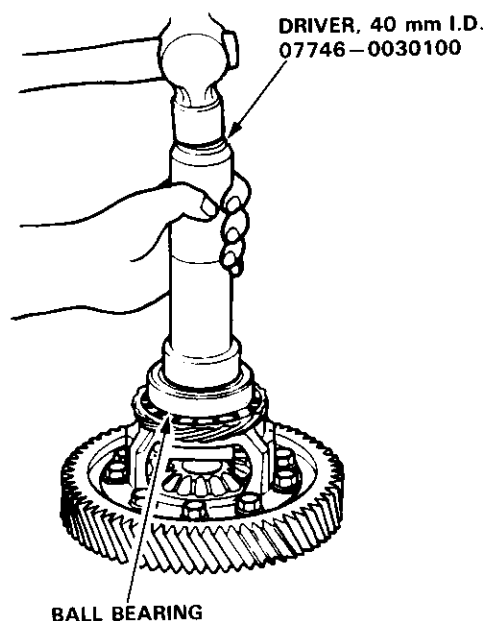
NOTE: Check bearings for wear and rough rotation. If the bearings are OK, removal is not necessary.

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



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

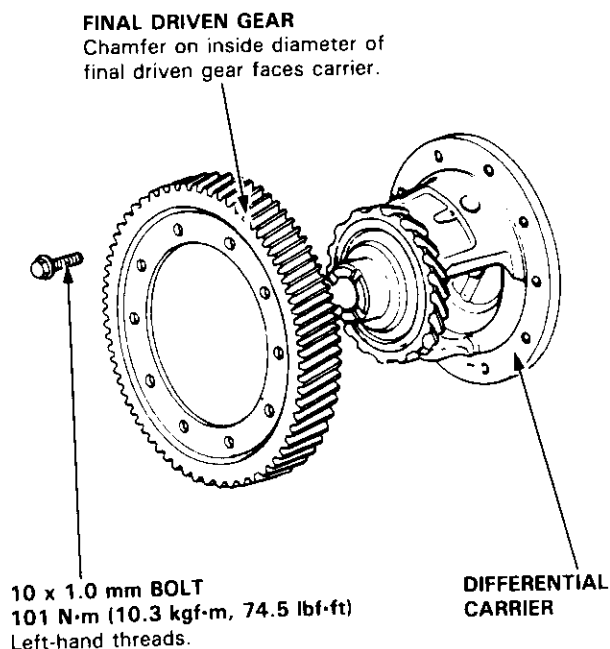
NOTE: Drive the bearings squarely until they bottom against the carrier.



Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear from the differential carrier.

NOTE: The final driven gear bolts have left-hand threads.

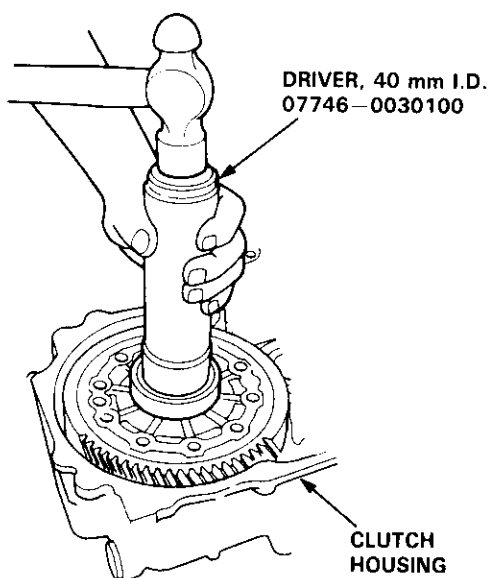


2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

Differential

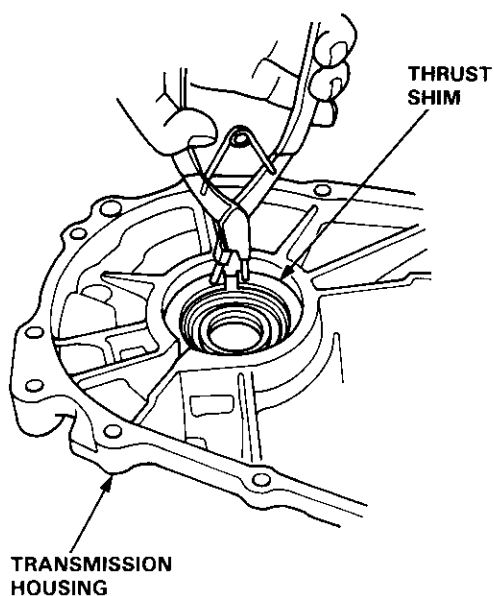
Thrust Shim Adjustment

1. Install the differential assembly, making sure it bottoms in the clutch housing, using the special tool as shown.



2. Install the thrust shim.

NOTE: Install the same size thrust shim that was removed.



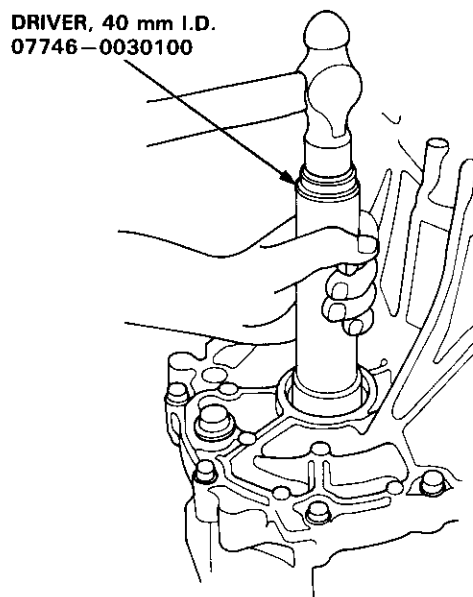
3. Install the transmission housing (see page 13-41).

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

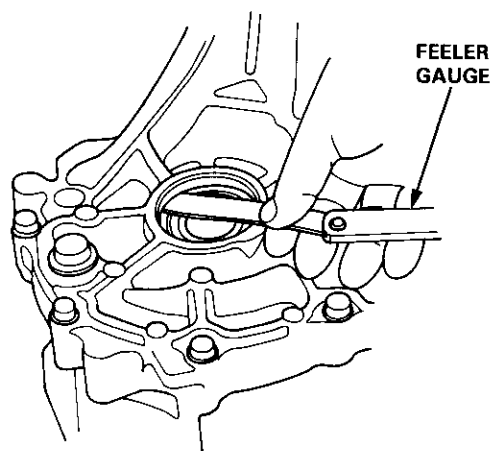
4. Tighten the transmission housing attaching bolts (see page 13-42).

8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)

5. Use the special tool to bottom the differential assembly in the clutch housing.



6. Measure clearance between thrust shim and bearing outer race in transmission housing.





7. If the clearance is more than the standard, select a new thrust shim from the following table.

NOTE: If the clearance measured in step 6 is within the standard, go to step 10.

Standard: 0 – 0.10 mm (0 – 0.004 in)

72 mm THRUST SHIM: D16Y7 engine

Part Number	Thickness
41441 – PL3 – A00	1.0 mm (0.0394 in)
41442 – PL3 – A00	1.1 mm (0.0433 in)
41443 – PL3 – A00	1.2 mm (0.0472 in)
41444 – PL3 – A00	1.3 mm (0.0512 in)
41445 – PL3 – A00	1.4 mm (0.0551 in)
41446 – PL3 – A00	1.5 mm (0.0591 in)
41447 – PL3 – A00	1.6 mm (0.0630 in)
41448 – PL3 – A00	1.7 mm (0.0669 in)
41449 – PL3 – A00	1.8 mm (0.0709 in)
41450 – PL3 – A00	1.05 mm (0.0413 in)
41451 – PL3 – A00	1.15 mm (0.0453 in)
41452 – PL3 – A00	1.25 mm (0.0492 in)
41453 – PL3 – A00	1.35 mm (0.0532 in)
41454 – PL3 – A00	1.45 mm (0.0571 in)
41455 – PL3 – A00	1.55 mm (0.0610 in)
41456 – PL3 – A00	1.65 mm (0.0650 in)
41457 – PL3 – A00	1.75 mm (0.0689 in)

80 mm THRUST SHIM: D16Y5, D16Y8 engines

Part Number	Thickness
41441 – PL3 – B00	1.0 mm (0.0394 in)
41442 – PL3 – B00	1.1 mm (0.0433 in)
41443 – PL3 – B00	1.2 mm (0.0472 in)
41444 – PL3 – B00	1.3 mm (0.0512 in)
41445 – PL3 – B00	1.4 mm (0.0551 in)
41446 – PL3 – B00	1.5 mm (0.0591 in)
41447 – PL3 – B00	1.6 mm (0.0630 in)
41448 – PL3 – B00	1.7 mm (0.0669 in)
41449 – PL3 – B00	1.8 mm (0.0709 in)
41450 – PL3 – B00	1.05 mm (0.0413 in)
41451 – PL3 – B00	1.15 mm (0.0453 in)
41452 – PL3 – B00	1.25 mm (0.0492 in)
41453 – PL3 – B00	1.35 mm (0.0532 in)
41454 – PL3 – B00	1.45 mm (0.0571 in)
41455 – PL3 – B00	1.55 mm (0.0610 in)
41456 – PL3 – B00	1.65 mm (0.0650 in)
41457 – PL3 – B00	1.75 mm (0.0689 in)

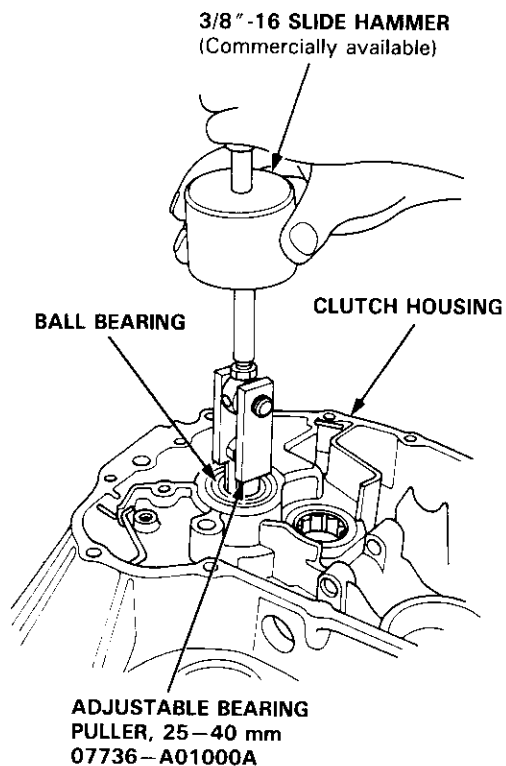
8. Remove the bolts and transmission housing.
9. Replace the thrust shim selected in step 7, then recheck the clearance.
10. Remove the bolts and transmission housing. Apply liquid gasket to the surface of the transmission housing and reassemble.

Clutch Housing Bearing

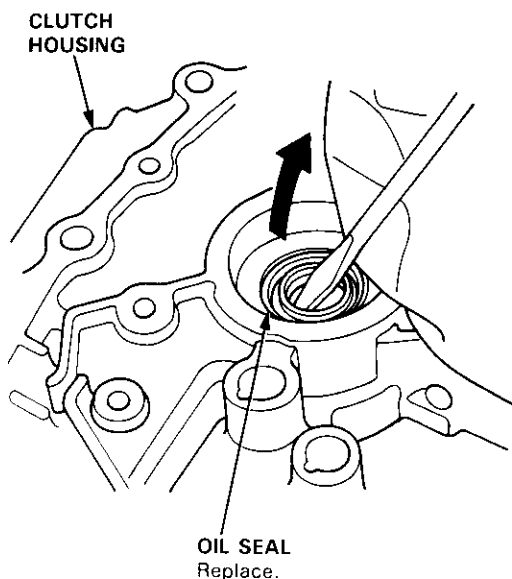
Replacement

Mainshaft

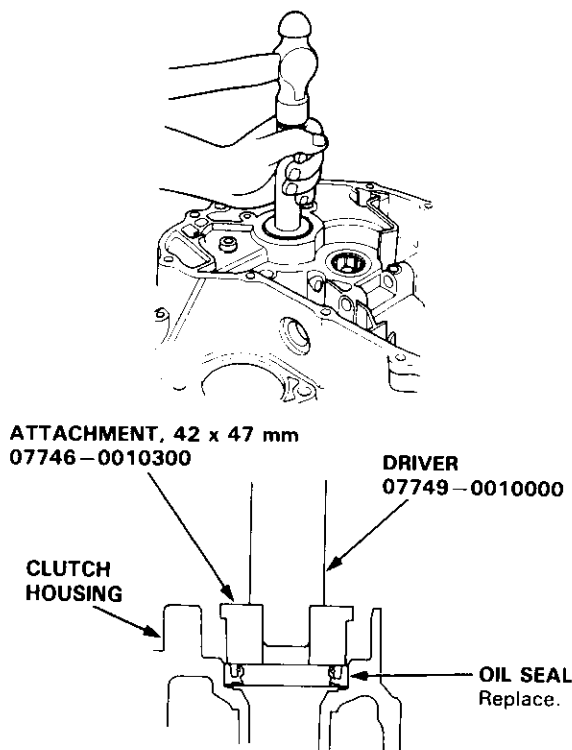
1. Remove the ball bearing using the special tool as shown.



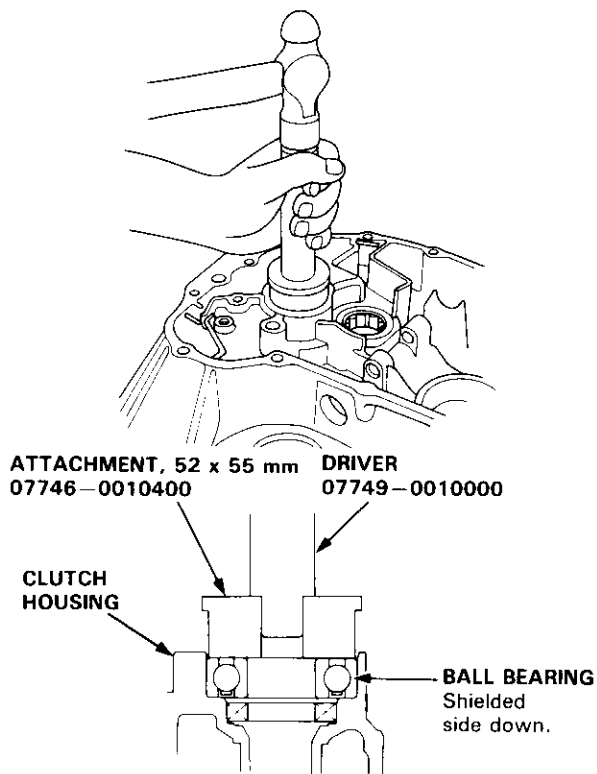
2. Remove the oil seal from the clutch housing.



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



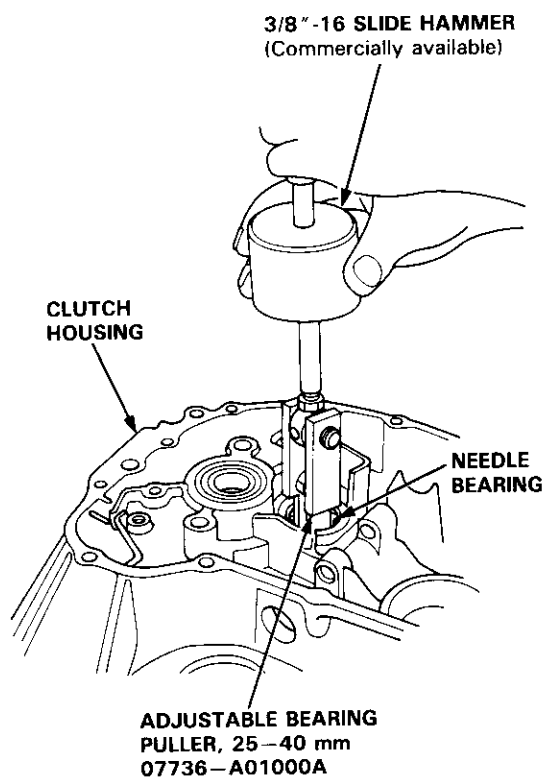
4. Drive the ball bearing into the clutch housing using the special tools as shown.



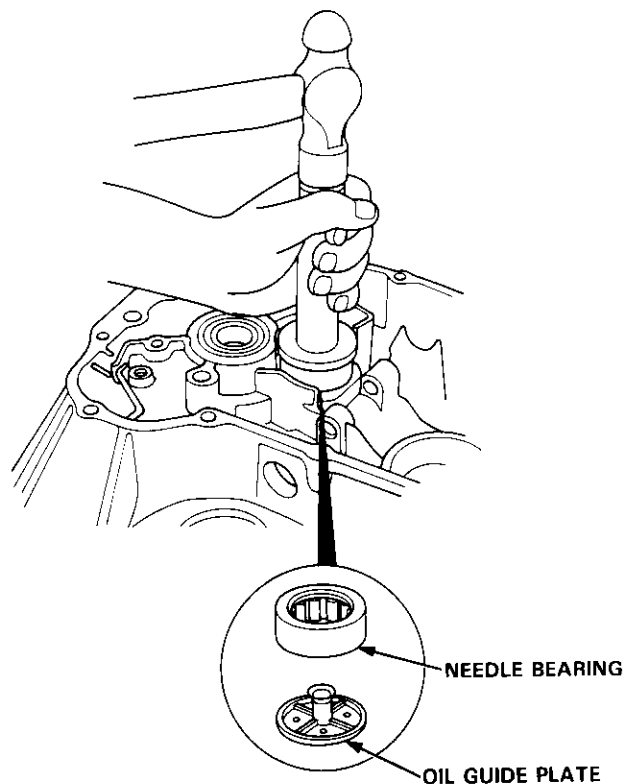


Countershaft

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

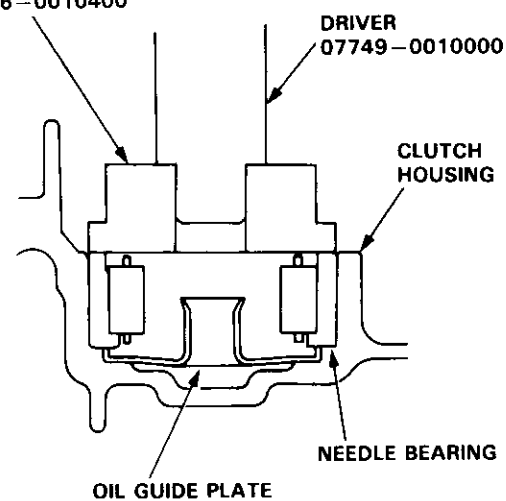


2. Install the oil guide plate, then drive the needle bearing into the clutch housing using the special tools as shown.



*1: ATTACHMENT, 42 x 47 mm
07746-0010300

*2: ATTACHMENT, 52 x 55 mm
07746-0010400



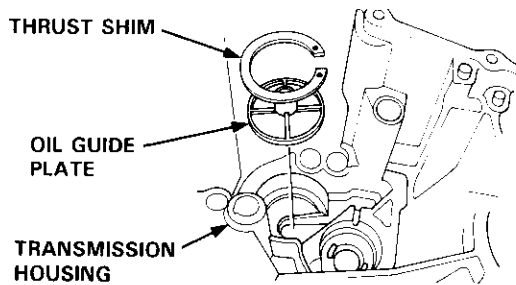
*1: D16Y7 engine

*2: D16Y5, D16Y8 engines

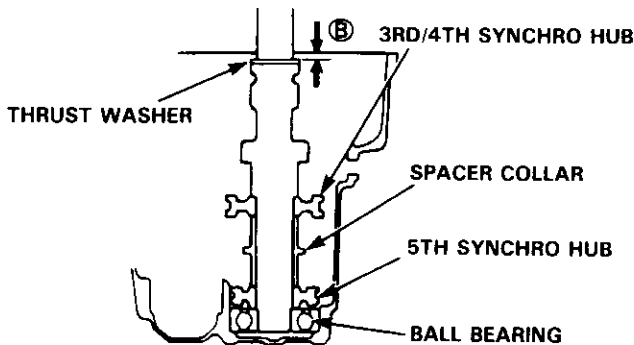
Mainshaft Thrust Shim

Adjustment

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



2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, ball bearing, and thrust washer on the mainshaft. Install the assembly in the transmission housing.



3. Measure the distance (B) between the end of the transmission housing and thrust washer.

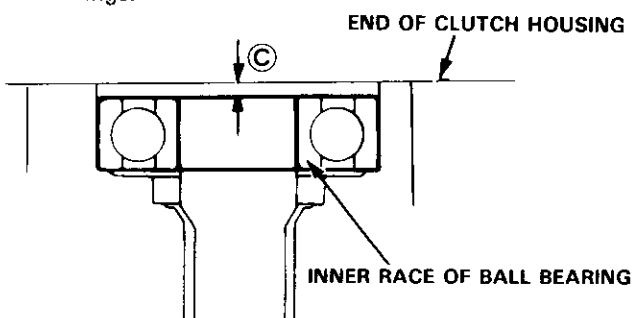
NOTE:

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

4. Measure the distance (C) between the surfaces of the clutch housing and bearing inner race.

NOTE:

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



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

NOTE: Use only one thrust shim.

(Basic Formula)

(B) + (C) - 0.95 = shim thickness

Example of calculation:

Distance (B) (2.00 mm) + Distance (C) (0.09 mm)
= 2.09 mm

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

65 mm THRUST SHIM: D16Y7 engine:

	Part Number	Thickness
A	23931 - PL3 - A10	0.60 mm (0.0236 in)
B	23932 - PL3 - A10	0.63 mm (0.0284 in)
C	23933 - PL3 - A10	0.66 mm (0.0260 in)
D	23934 - PL3 - A10	0.69 mm (0.0272 in)
E	23935 - PL3 - A10	0.72 mm (0.0283 in)
F	23936 - PL3 - A10	0.75 mm (0.0295 in)
G	23937 - PL3 - A10	0.78 mm (0.0307 in)
H	23938 - PL3 - A10	0.81 mm (0.0319 in)
I	23939 - PL3 - A10	0.84 mm (0.0331 in)
J	23940 - PL3 - A10	0.87 mm (0.0343 in)
K	23941 - PL3 - A10	0.90 mm (0.0354 in)
L	23942 - PL3 - A10	0.93 mm (0.0366 in)
M	23943 - PL3 - A10	0.96 mm (0.0378 in)
N	23944 - PL3 - A10	0.99 mm (0.0390 in)
O	23945 - PL3 - A10	1.02 mm (0.0402 in)
P	23946 - PL3 - A10	1.05 mm (0.0413 in)
Q	23947 - PL3 - A10	1.08 mm (0.0425 in)
R	23948 - PL3 - A10	1.11 mm (0.0437 in)
S	23949 - PL3 - A10	1.14 mm (0.0449 in)
T	23950 - PL3 - A10	1.17 mm (0.0461 in)
U	23951 - PL3 - A10	1.20 mm (0.0472 in)
V	23952 - PL3 - A10	1.23 mm (0.0484 in)
W	23953 - PL3 - A10	1.26 mm (0.0496 in)
X	23954 - PL3 - A10	1.29 mm (0.0508 in)
Y	23955 - PL3 - A10	1.32 mm (0.0520 in)
Z	23956 - PL3 - A10	1.35 mm (0.0531 in)
AA	23957 - PL3 - A10	1.38 mm (0.0543 in)
AB	23958 - PL3 - A10	1.41 mm (0.0555 in)
AC	23959 - PL3 - A10	1.44 mm (0.0567 in)
AD	23960 - PL3 - A10	1.47 mm (0.0579 in)
AE	23961 - PL3 - A10	1.50 mm (0.0591 in)
AF	23962 - PL3 - A10	1.53 mm (0.0602 in)
AG	23963 - PL3 - A10	1.56 mm (0.0614 in)
AH	23964 - PL3 - A10	1.59 mm (0.0626 in)
AI	23965 - PL3 - A10	1.62 mm (0.0638 in)
AJ	23966 - PL3 - A10	1.65 mm (0.0650 in)
AK	23967 - PL3 - A10	1.68 mm (0.0661 in)
AL	23968 - PL3 - A10	1.71 mm (0.0673 in)
AM	23969 - PL3 - A10	1.74 mm (0.0685 in)
AN	23970 - PL3 - A10	1.77 mm (0.0697 in)
AO	23971 - PL3 - A10	1.80 mm (0.0709 in)



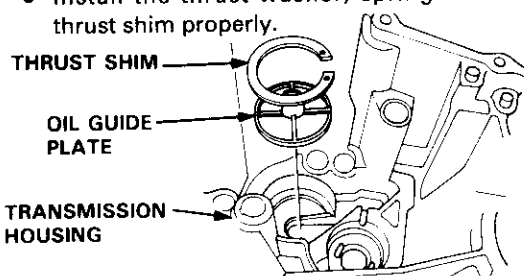
70 mm THRUST SHIM: D16Y5, D16Y8 engines

	Part Number	Thickness
A	23931 - PL3 - B00	0.60 mm (0.0236 in)
B	23932 - PL3 - B00	0.63 mm (0.0284 in)
C	23933 - PL3 - B00	0.66 mm (0.0260 in)
D	23934 - PL3 - B00	0.69 mm (0.0272 in)
E	23935 - PL3 - B00	0.72 mm (0.0283 in)
F	23936 - PL3 - B00	0.75 mm (0.0295 in)
G	23937 - PL3 - B00	0.78 mm (0.0307 in)
H	23938 - PL3 - B00	0.81 mm (0.0319 in)
I	23939 - PL3 - B00	0.84 mm (0.0331 in)
J	23940 - PL3 - B00	0.87 mm (0.0343 in)
K	23941 - PL3 - B00	0.90 mm (0.0354 in)
L	23942 - PL3 - B00	0.93 mm (0.0366 in)
M	23943 - PL3 - B00	0.96 mm (0.0378 in)
N	23944 - PL3 - B00	0.99 mm (0.0390 in)
O	23945 - PL3 - B00	1.02 mm (0.0402 in)
P	23946 - PL3 - B00	1.05 mm (0.0413 in)
Q	23947 - PL3 - B00	1.08 mm (0.0425 in)
R	23948 - PL3 - B00	1.11 mm (0.0437 in)
S	23949 - PL3 - B00	1.14 mm (0.0449 in)
T	23950 - PL3 - B00	1.17 mm (0.0461 in)
U	23951 - PL3 - B00	1.20 mm (0.0472 in)
V	23952 - PL3 - B00	1.23 mm (0.0484 in)
W	23953 - PL3 - B00	1.26 mm (0.0496 in)
X	23954 - PL3 - B00	1.29 mm (0.0508 in)
Y	23955 - PL3 - B00	1.32 mm (0.0520 in)
Z	23956 - PL3 - B00	1.35 mm (0.0531 in)
AA	23957 - PL3 - B00	1.38 mm (0.0543 in)
AB	23958 - PL3 - B00	1.41 mm (0.0555 in)
AC	23959 - PL3 - B00	1.44 mm (0.0567 in)
AD	23960 - PL3 - B00	1.47 mm (0.0579 in)
AE	23961 - PL3 - B00	1.50 mm (0.0591 in)
AF	23962 - PL3 - B00	1.53 mm (0.0602 in)
AG	23963 - PL3 - B00	1.56 mm (0.0614 in)
AH	23964 - PL3 - B00	1.59 mm (0.0626 in)
AI	23965 - PL3 - B00	1.62 mm (0.0638 in)
AJ	23966 - PL3 - B00	1.65 mm (0.0650 in)
AK	23967 - PL3 - B00	1.68 mm (0.0661 in)
AL	23968 - PL3 - B00	1.71 mm (0.0673 in)
AM	23969 - PL3 - B00	1.74 mm (0.0685 in)
AN	23970 - PL3 - B00	1.77 mm (0.0697 in)
AO	23971 - PL3 - B00	1.80 mm (0.0709 in)

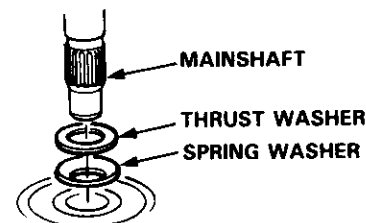
6. Install the oil guide plate and selected thrust shim in the transmission housing.

NOTE:

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



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



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

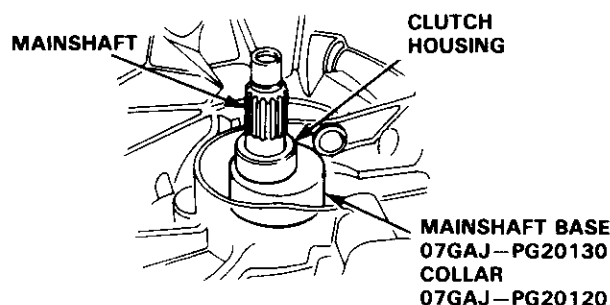
NOTE: It is not necessary to use sealing agent between the housings.

8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)

11. Tap the mainshaft with a plastic hammer.
12. Check the thrust clearance in the manner described below.

CAUTION: Measurement should be made at room temperature.

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



(cont'd)

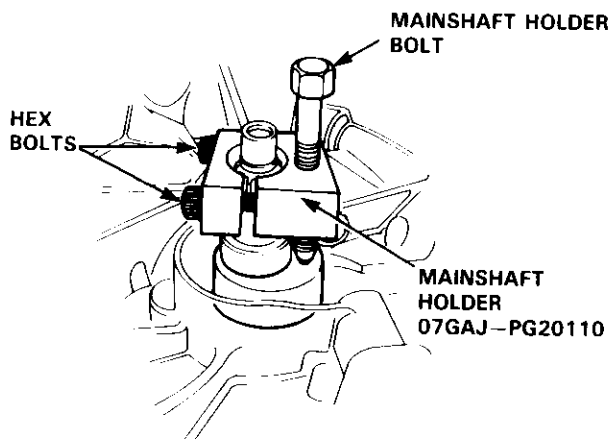
Mainshaft Thrust Shim

Adjustment (cont'd)

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

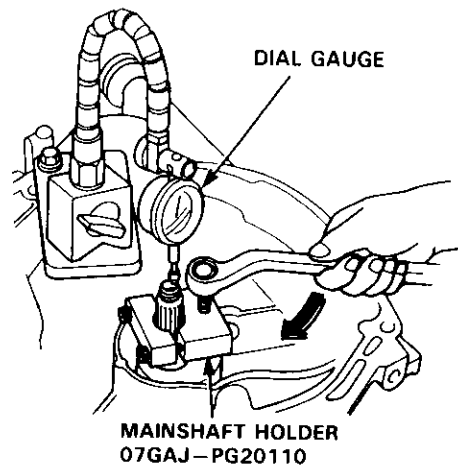
NOTE:

- Back-out the mainshaft holder bolt and loosen the two hex bolts.
- Fit the holder over the mainshaft so its lip is toward 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 on the end with a plastic hammer.
- d. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.

- e. Zero a dial gauge on the end of the mainshaft.



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

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

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

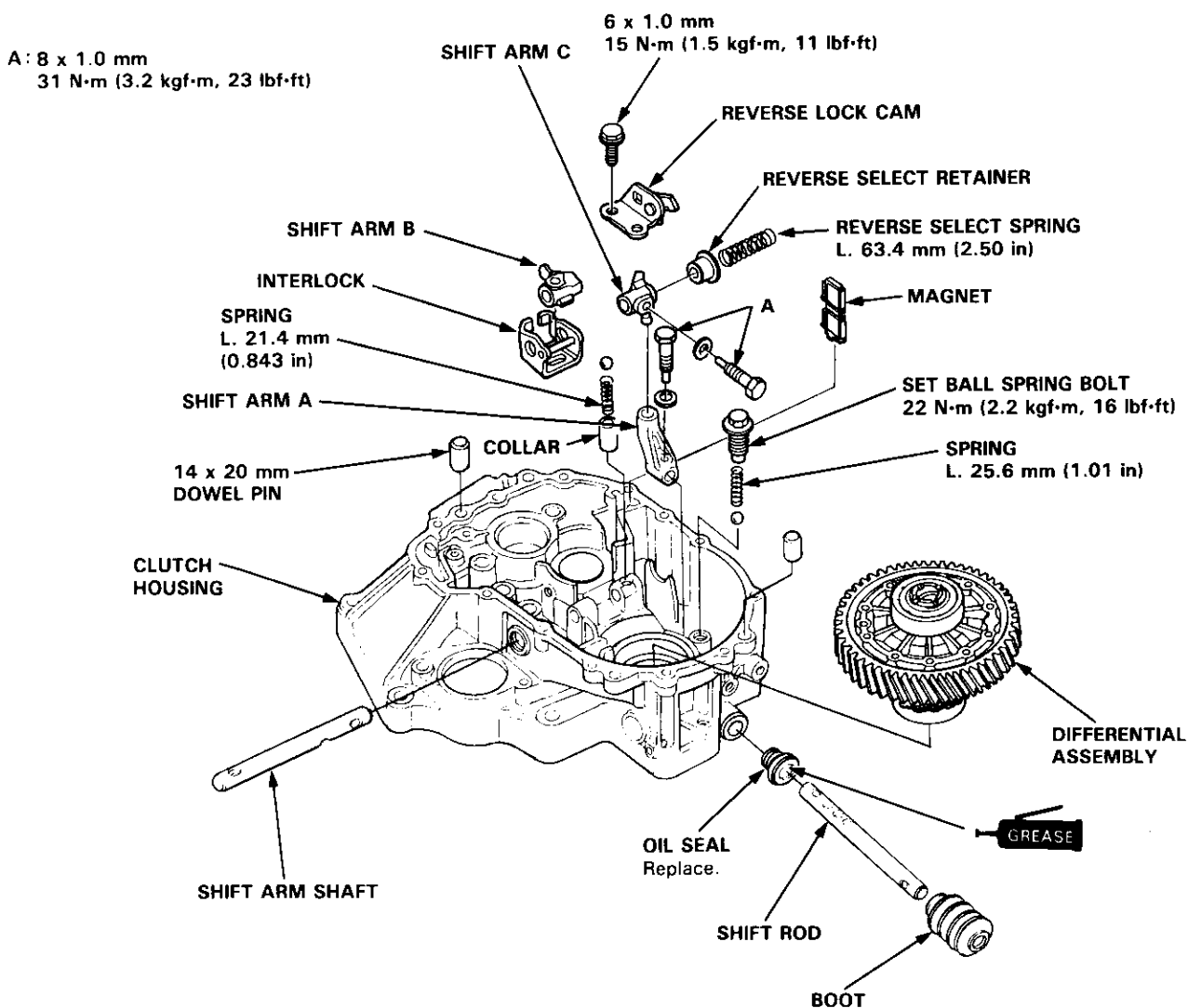
Standard: 0.11 – 0.18 mm (0.004 – 0.007 in)



Reassembly

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

1. Install the magnet and reverse lock cam.
2. Set shift arm A on the clutch housing, then install the shift rod.
3. Install the spring washer and shift arm A attaching bolt.
4. Install the steel ball, spring, and set ball spring bolt.
5. Install shift arm B in the interlock, then set it on the clutch housing.
6. Insert shift arm shaft in the clutch housing.
7. Install the collar, spring, and steel ball into the case. Compress the ball and insert the shift arm shaft.
8. Install shift arm C in shift arm A, then insert the shift arm shaft.
9. Install the reverse select retainer and reverse select spring onto shift arm shaft.
10. Install the differential assembly.

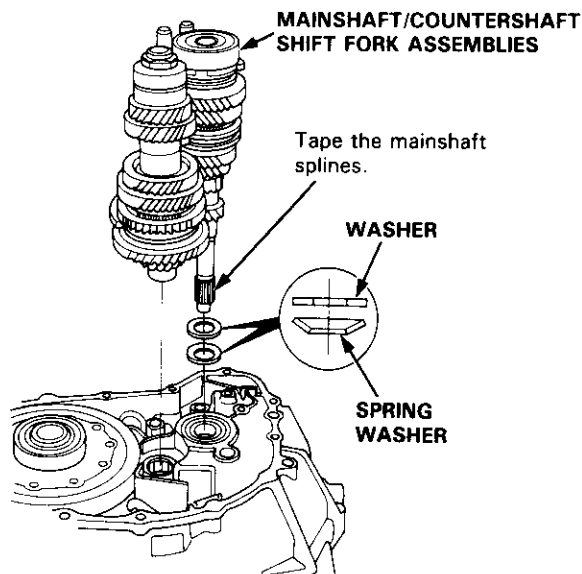


(cont'd)

Transmission

Reassembly (cont'd)

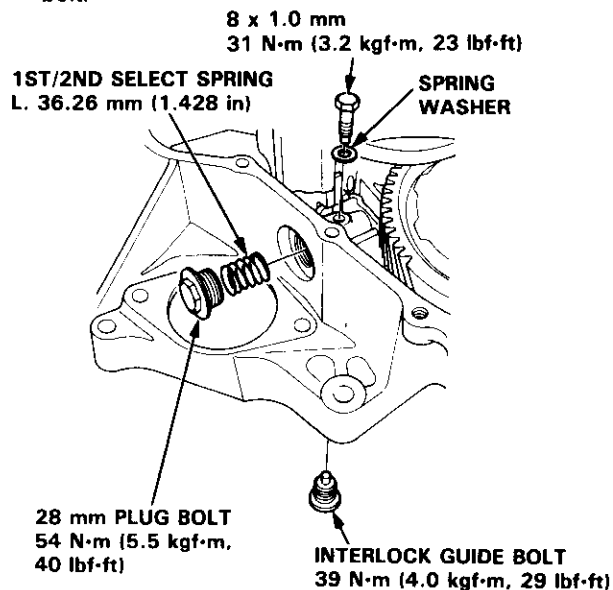
11. Position the 36 mm spring washer and washer onto the mainshaft bearing.



12. Install the mainshaft, countershaft, and shift fork assemblies.

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

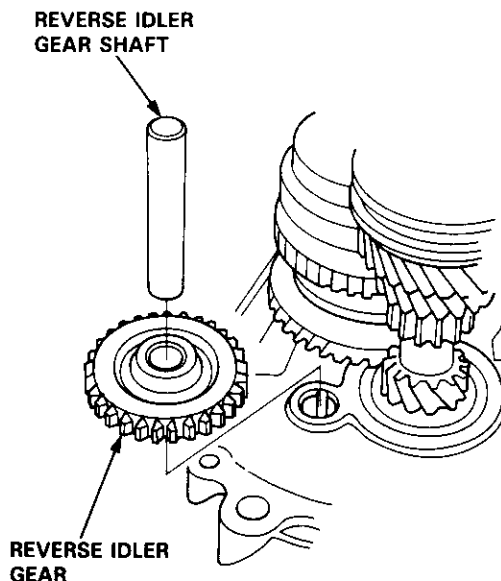
13. Install the spring washer and shift arm B attaching bolt.



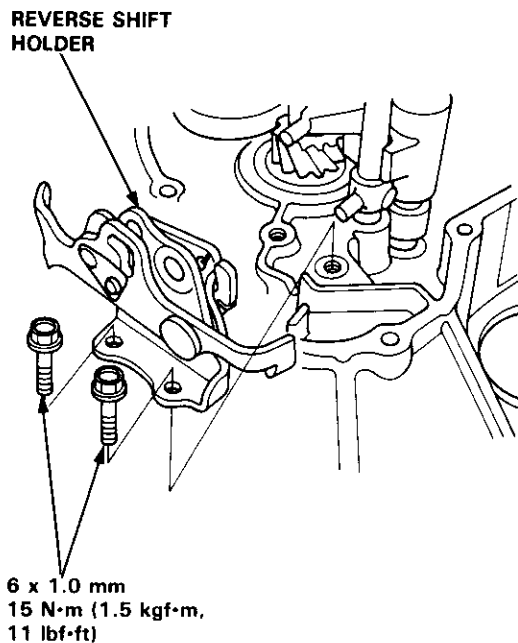
14. Install the 1st/2nd select spring, 28 mm plug bolt, and interlock guide bolt.

NOTE: Apply liquid gasket (P/N 08718 - 0001 or 08718 - 0003) to the threads of the 28 mm plug bolt and interlock guide bolt.

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

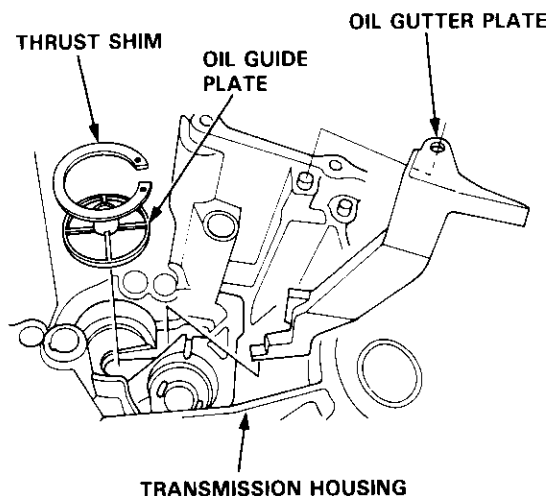


16. Install the reverse shift holder.





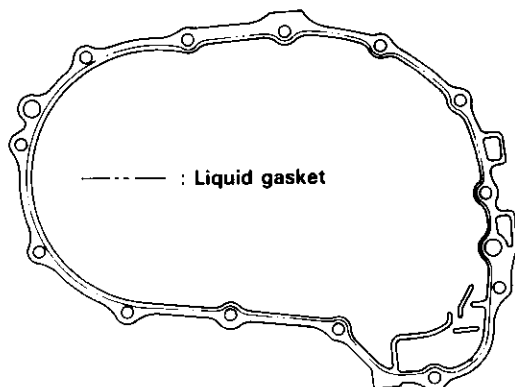
17. Install the oil gutter plate.



18. Install the oil guide plate and thrust shim on the transmission housing.
19. Apply liquid gasket to the surface of the transmission housing mating with the clutch housing as shown.

NOTE:

- Use liquid gasket (P/N 08718 - 0001 or 08718 - 0003).
- Remove the dirty oil from the sealing surface.
- If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings.
- Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

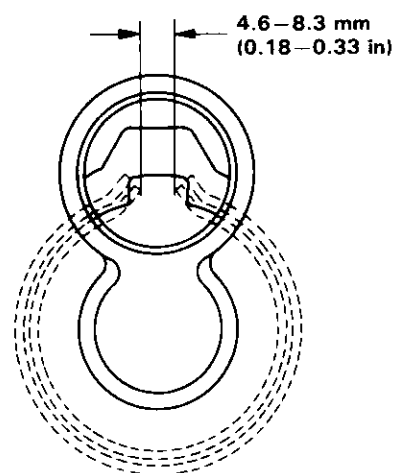
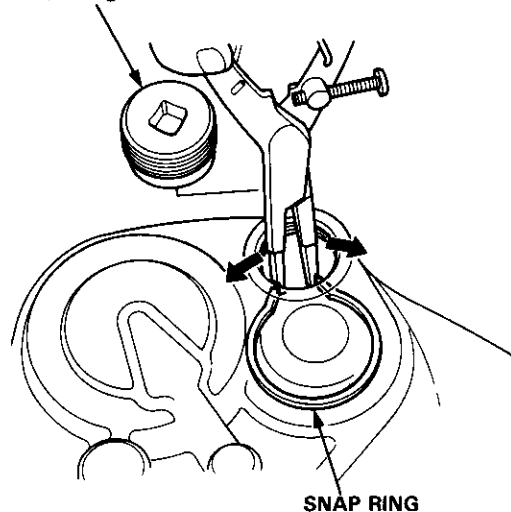


20. Install the dowel pins and the transmission housing.

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

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

32 mm SEALING BOLT
25 N·m (2.5 kgf·m, 18 lbf·ft)



22. Install the 32 mm sealing bolt.

NOTE: Apply liquid gasket (P/N 08718 - 0001 or 08718 - 0003) to the threads.

(cont'd)

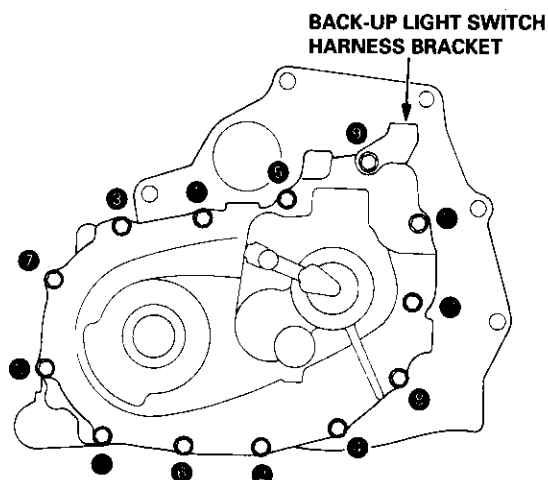
Transmission

Reassembly (cont'd)

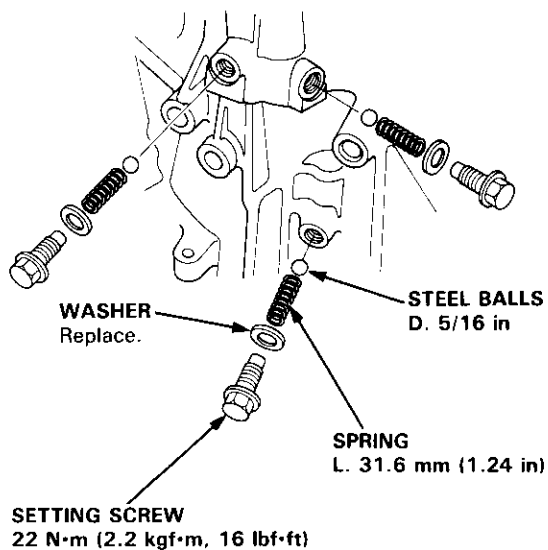
23. Tighten the transmission housing attaching bolts in the numbered sequence in several steps shown below.

8 x 1.25 mm

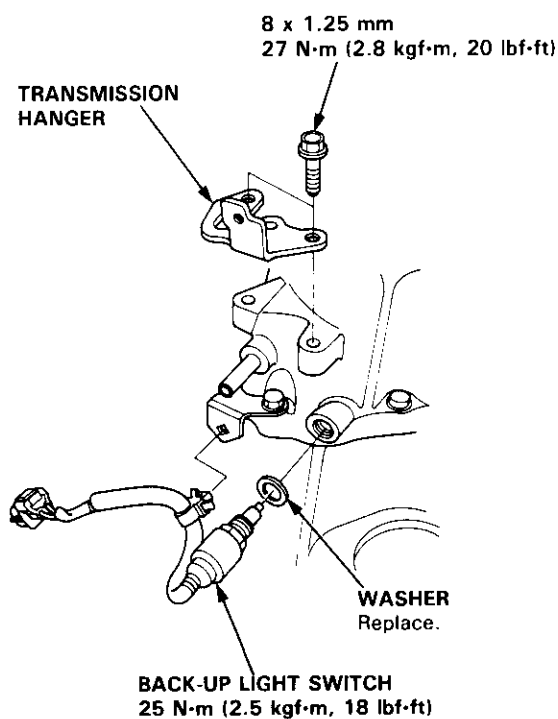
Torque: 27 N·m (2.8 kgf·m, 20 lbf·ft)



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



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

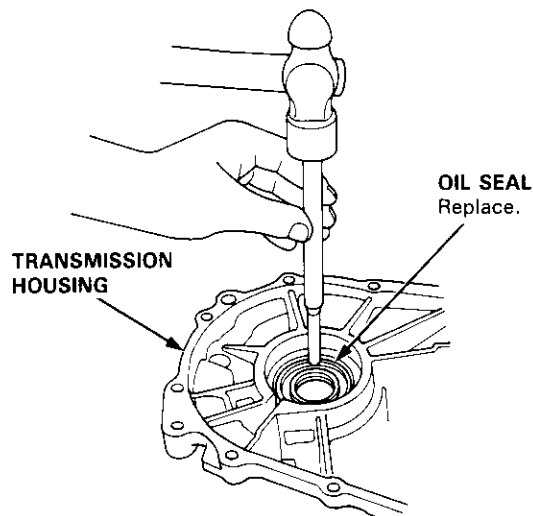




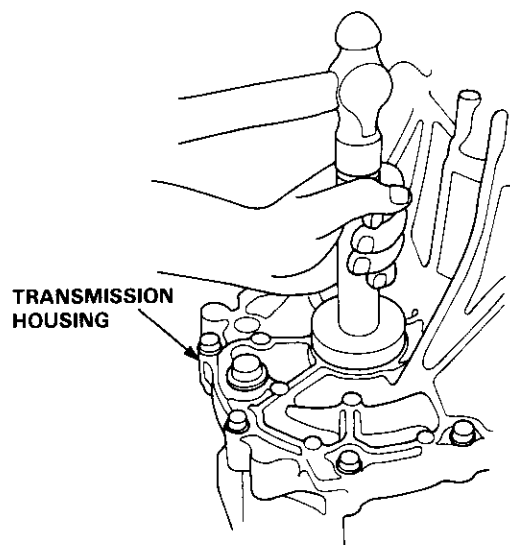
Replacement

Transmission Housing:

1. Remove the oil seal from the transmission housing.



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

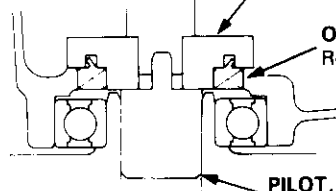


DRIVER
07749-0010000

SEAL DRIVER
ATTACHMENT
07947-6110501 or
07947-6110500

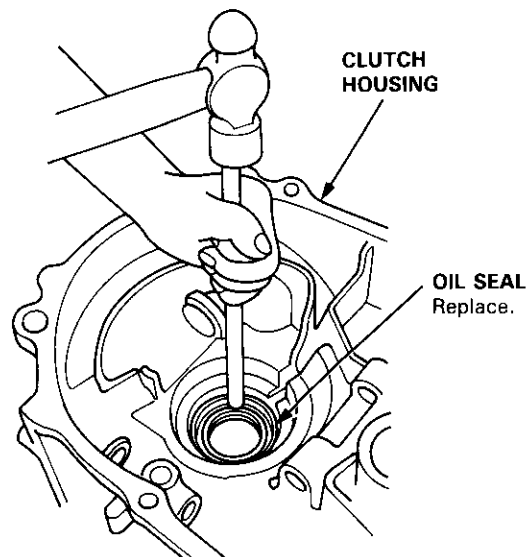
OIL SEAL
Replace.

PILOT, 26 x 30 mm
07JAD-PH80200

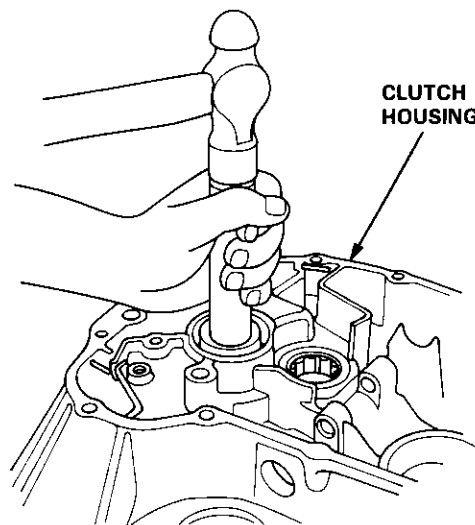


Clutch Housing:

1. Remove the oil seal from the clutch housing.



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

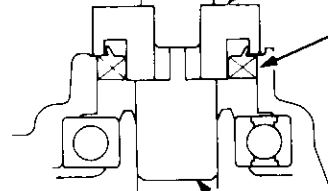


DRIVER
07749-0010000

DRIVER ATTACHMENT
07JAD-PH80101

OIL SEAL
Replace.

PILOT, 26 x 30 mm
07JAD-PH80200

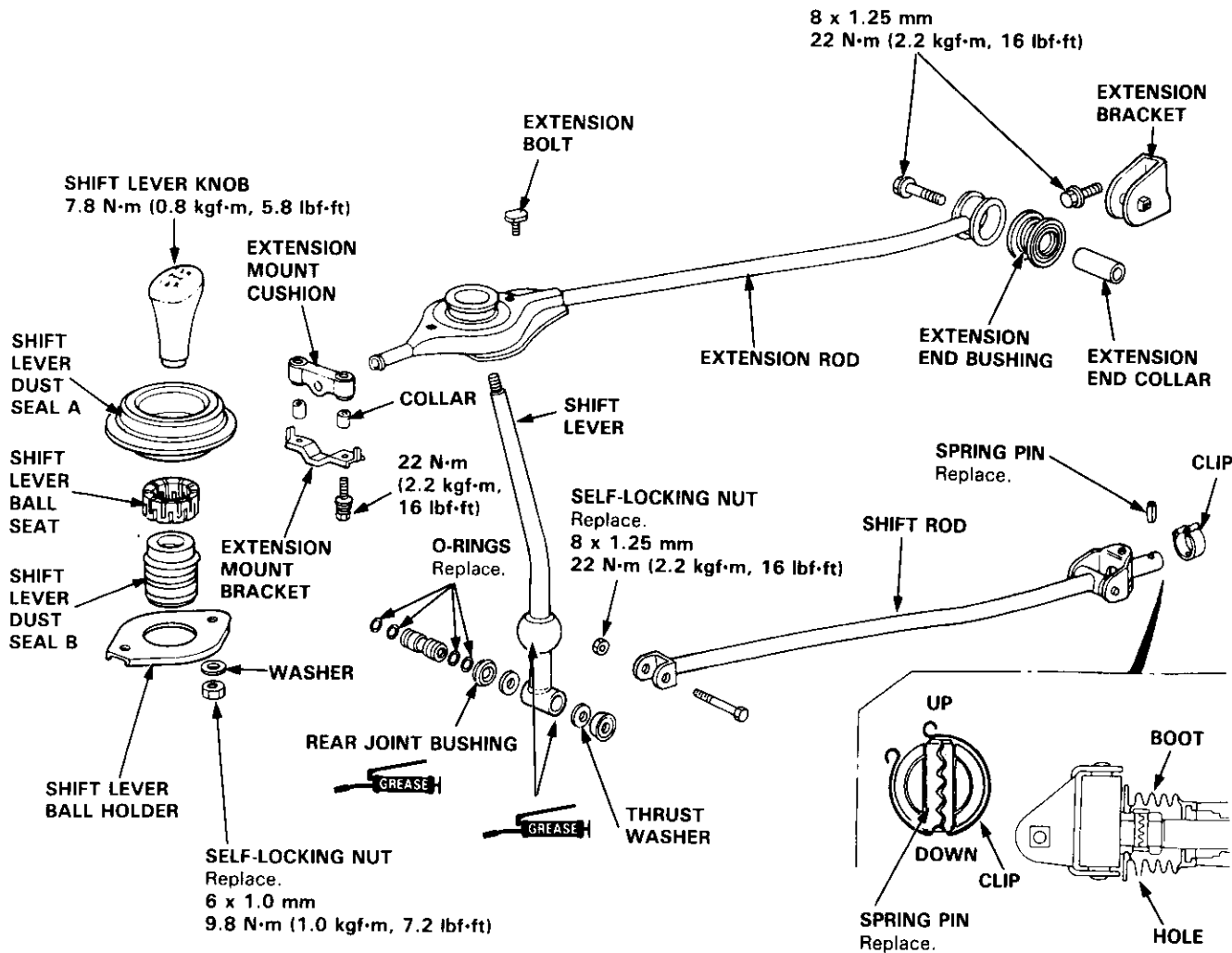


Gearshift Mechanism

Overhaul

NOTE:

- Inspect rubber parts for wear and damage when disassembling; replace any worn or damaged parts.
- Install the clip as shown.
- Turn the boot so the hole is facing down as shown.
- Make sure the boot is installed on the shift rod.



S4C Model ('99 – 00 2-door Si, SiR) Manual Transmission

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Disassembly	13-71		
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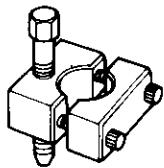


Special Tools

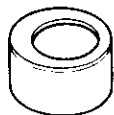
Special Tools

Ref. No.	Tool Number	Description	Qty	Remark
①	07GAJ - PG20110	Mainshaft Holder	1	13-90
②	07GAJ - PG20130	Mainshaft Base	1	13-90
③	07JAD - PH80101	Driver Attachment	1	13-96
*④	07736 - A01000A	Adjustable Bearing Puller, 25 - 40 mm	1	13-86, 87
⑤	07746 - 0010300	Attachment, 42 x 47 mm	1	13-86
⑥	07746 - 0010400	Attachment, 52 x 55 mm	1	13-86, 87
⑦	07746 - 0030100	Driver, 40 mm I.D.	1	13-73, 79, 83, 84
⑧	07746 - 0030300	Attachment, 30 mm I.D.	1	13-73, 79
⑨	07746 - 0030400	Attachment, 35 mm I.D.	1	13-73, 79
⑩	07746 - 0041100	Pilot, 28 mm	1	13-86
⑪	07749 - 0010000	Handle	1	13-86, 87, 96
⑫	07947 - SD90200	Driver Attachment	1	13-96

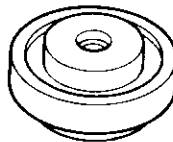
* Must be used with commercially-available 3/8"-16 Slide Hammer.



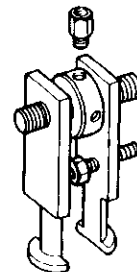
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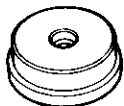
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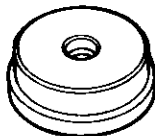
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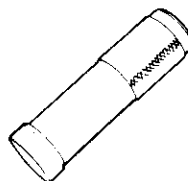
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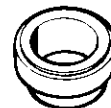
⑤



⑥



⑦



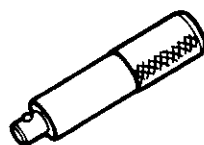
⑧



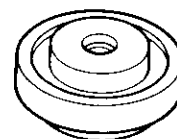
⑨



⑩



⑪



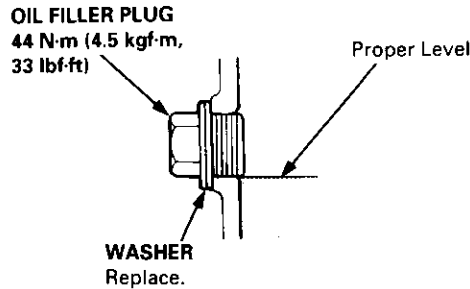
⑫



Transmission Oil

NOTE: Check the oil with the engine OFF, and the vehicle 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 filler hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug.
3. If the transmission oil is dirty, remove the drain plug and drain the oil.
4. Reinstall the drain plug with a new washer, and refill the transmission oil to the proper level.

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

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

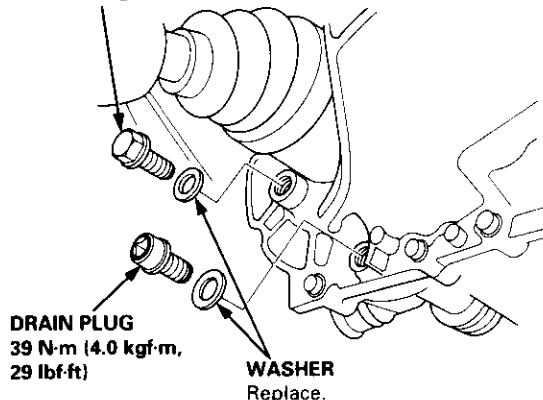
Oil Capacity

2.2 l (2.3 US. qt, 1.9 Imp. qt) at oil change.

2.3 l (2.4 US. qt, 2.0 Imp. qt) at overhaul.

Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.

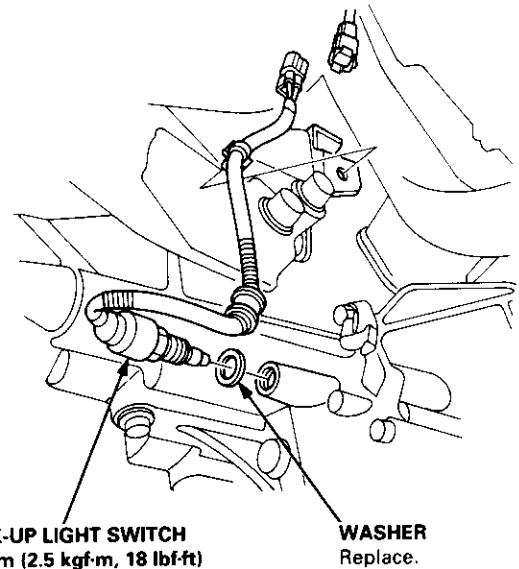
OIL FILLER PLUG
44 N·m (4.5 kgf-m, 33 lbf-ft)



Replacement

NOTE: To check the back-up light switch, see section 23.

1. Disconnect the connector, then remove the back-up light switch connector from the connector clamp.
2. Remove the back-up light switch.



3. Install the new washer and the back-up light switch.
4. Check the transmission oil level.

Transmission Assembly

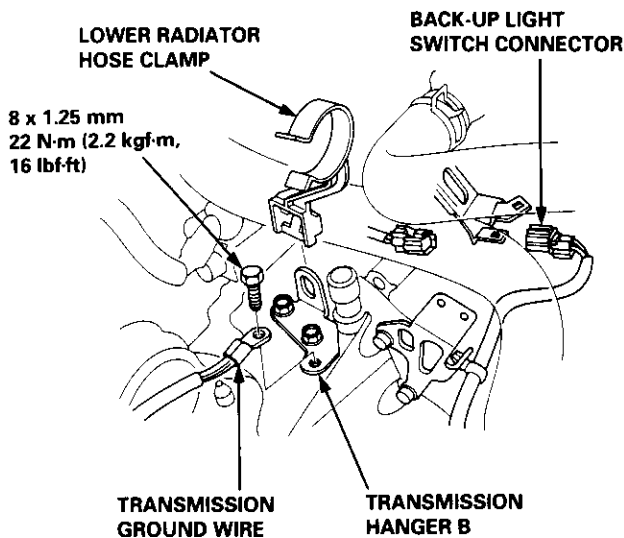
Removal

⚠ WARNING

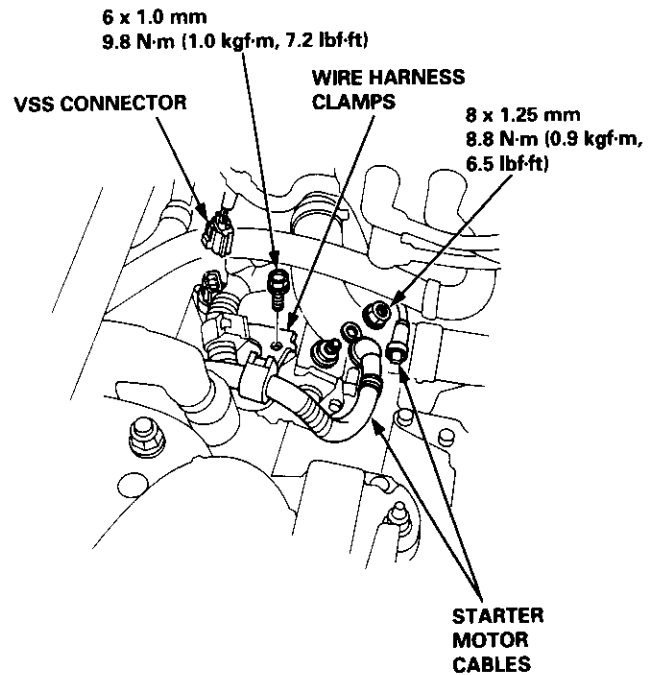
- Make sure jacks and safety stands are placed properly (see section 1).
- Apply parking brake and block rear wheels so car will not roll off stands and fall on you while working under it.

CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the negative (-) cable from the battery, then the positive (+) cable.
2. Drain the transmission oil, then reinstall the drain plug with a new washer (see page 13-47).
3. Remove the intake air duct and the air cleaner housing assembly (see section 5).
4. Disconnect the back-up light switch connector and the transmission ground wire.
5. Remove the lower radiator hose clamp from the transmission hanger B.

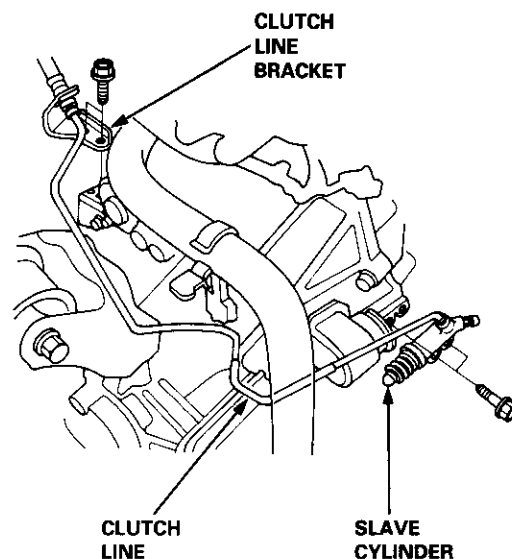


6. Remove the wire harness clamps.
7. Disconnect the starter motor cables and the vehicle speed sensor (VSS) connector.



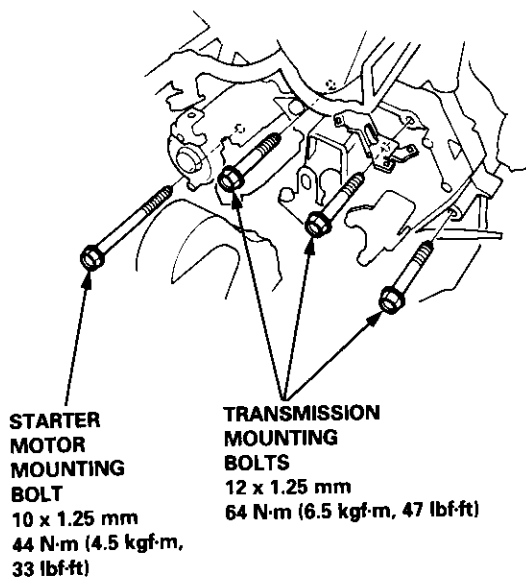
8. Remove the clutch line bracket and the slave cylinder.

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

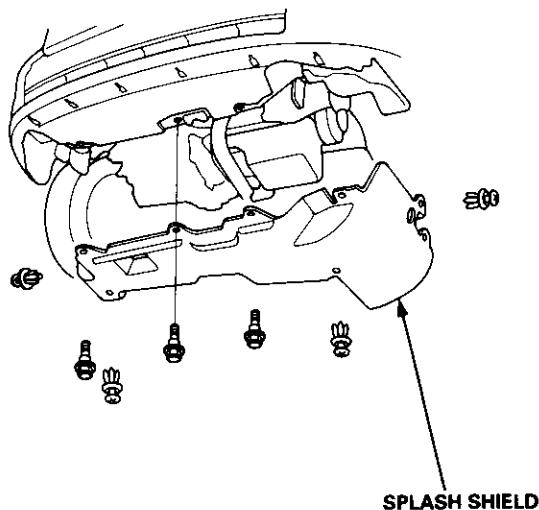




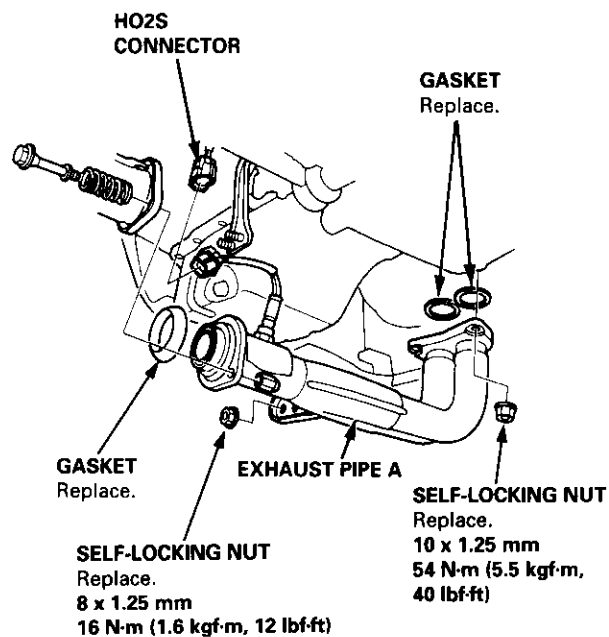
9. Remove the three upper transmission mounting bolts and lower starter motor mounting bolt.



10. Remove the engine splash shield.



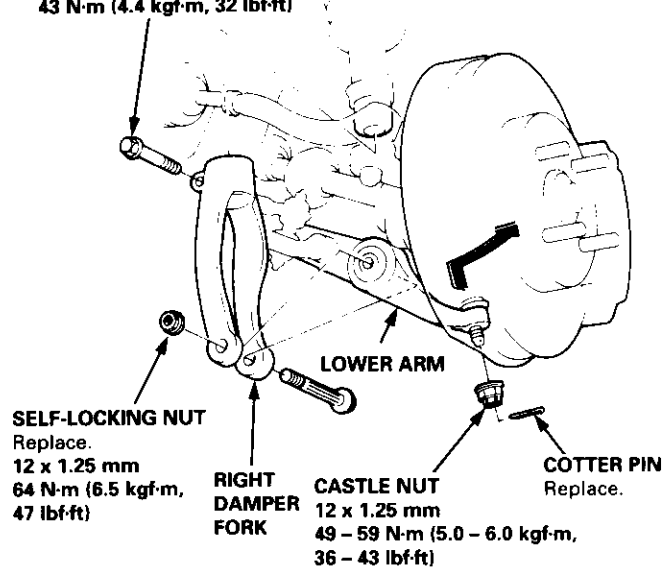
11. Disconnect the heated oxygen sensor (HO2S) connector, then remove exhaust pipe A.



12. Remove the cotter pins and loosen the castle nuts, then separate the ball joints from the lower arm (see section 18).

13. Remove the right damper fork.

10 x 1.25 mm
43 N·m (4.4 kgf·m, 32 lbf·ft)



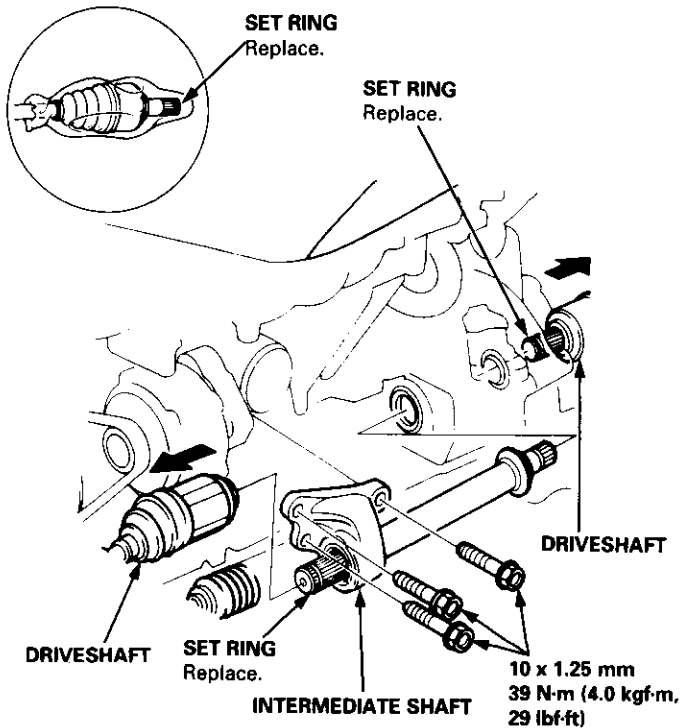
(cont'd)

Transmission Assembly

Removal (cont'd)

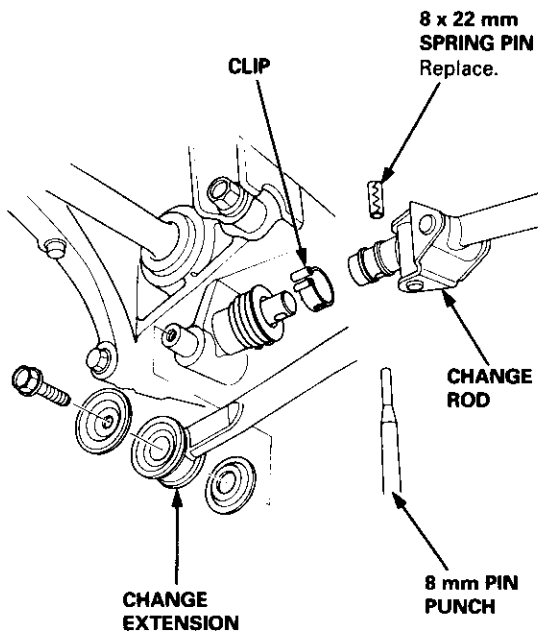
14. Remove the driveshafts and the intermediate shaft (see section 16).

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

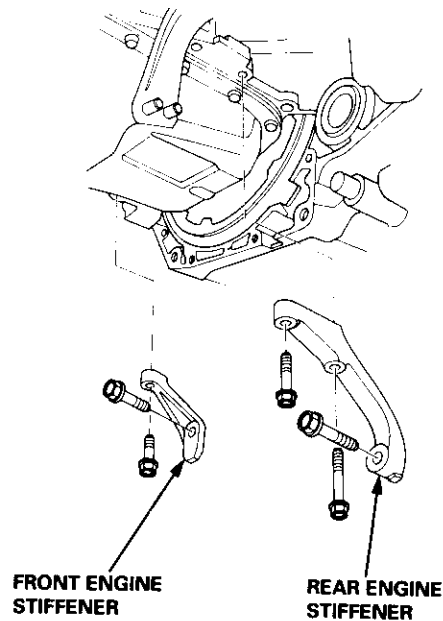


15. Remove the bolt, then disconnect the change extension.

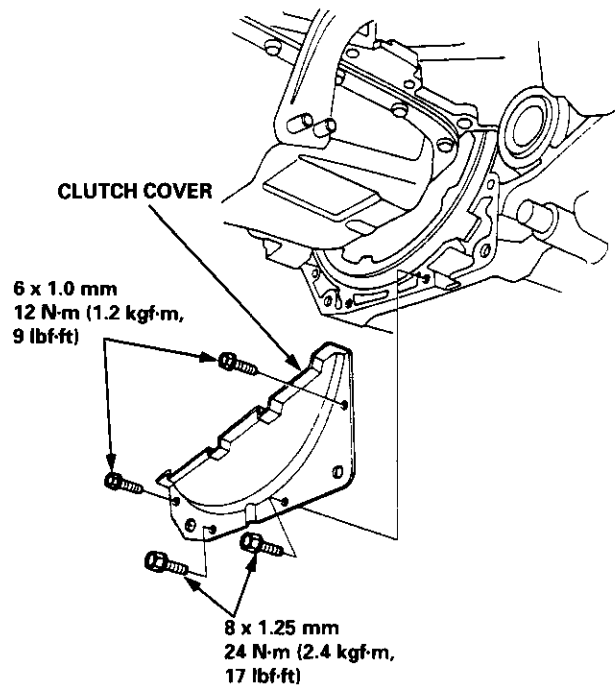
16. Remove the clip and the spring pin, then disconnect the change rod.



17. Remove the front and the rear engine stiffeners.

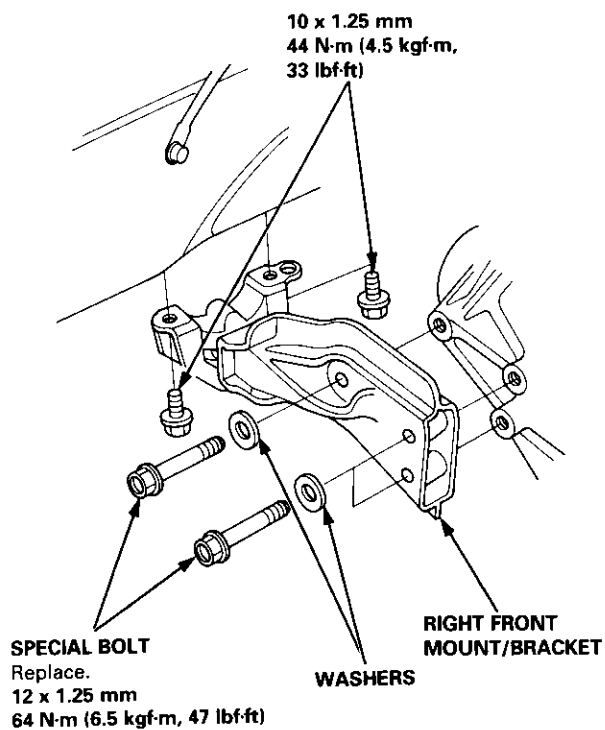


18. Remove the clutch cover.



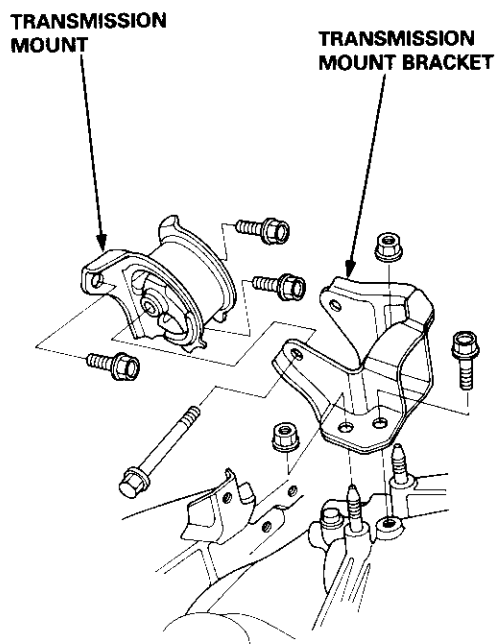


19. Remove the right front mount/bracket.

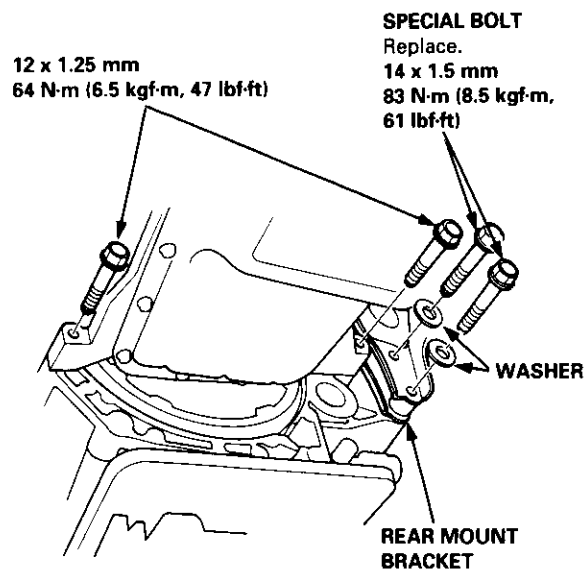


20. Place a transmission jack under the transmission and a jack stand under the engine.

21. Remove the transmission mount.



22. Remove the rear mount bracket bolts and the transmission mounting bolts.



23. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack.

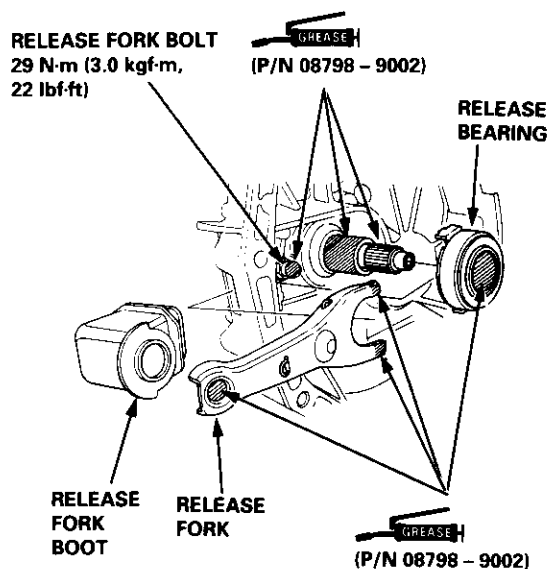
Transmission Assembly

Installation

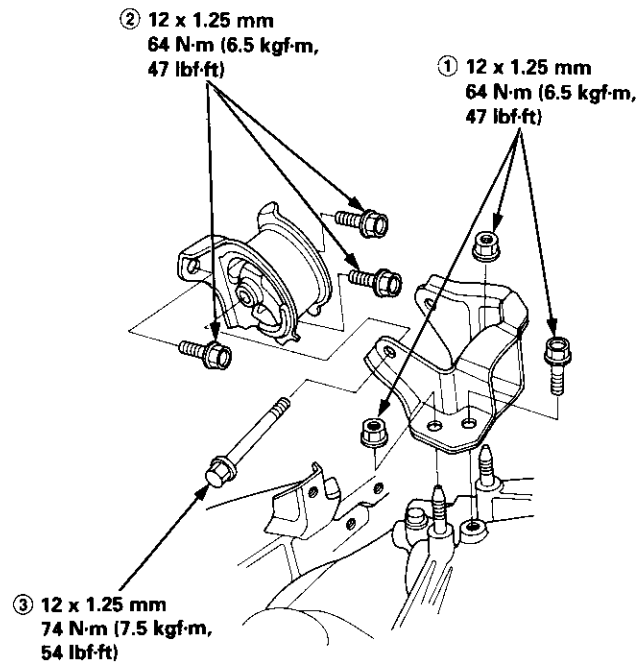
Install the transmission assembly in the reverse order of removal.

- Before installing, check that the two dowel pins are installed in the clutch housing.
- When installing the starter cable, make sure that the crimped side of the ring terminal is facing out (see section 23).
- Apply grease to the parts as shown, then install the release fork and release bearing.

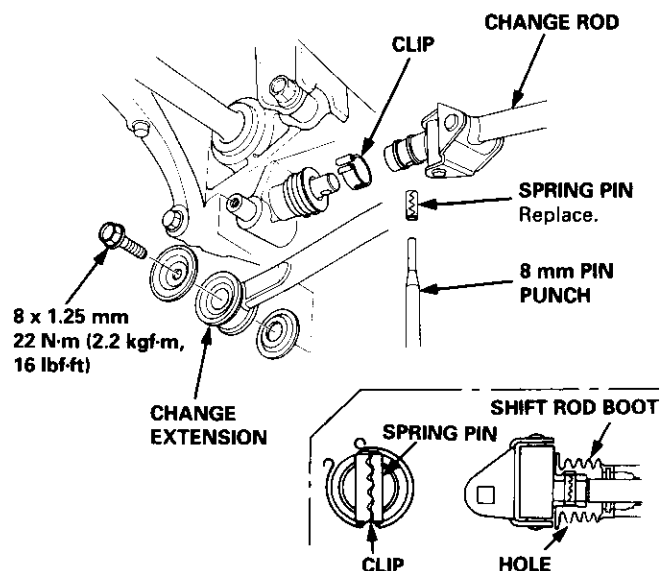
NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).



- Torque the mounting bolt and nuts in the sequence shown.
- Check that the busings are not twisted or offset.



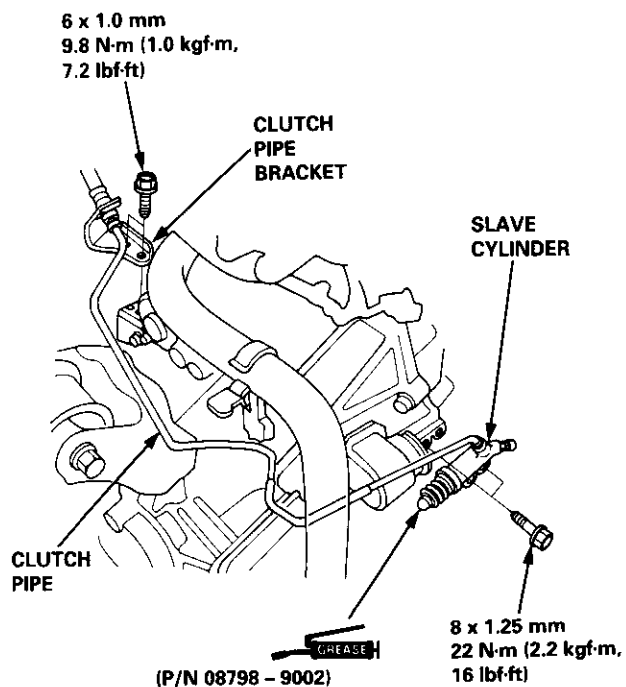
- Install the clip and the spring pin on the change joint as shown.
- Turn the shift rod boot so the hole is facing down as shown.
- Make sure the shift rod boot is installed on the change rod.





- Apply grease to the slave cylinder push rod.


NOTE: Use only Super High Temp Urea Grease (P/N 08798 – 9002).



- Refill the transmission with oil (see page 13-47).
- Connect the positive (+) cable first, then the negative (-) cable to the battery.
- Check the clutch operation.
- Shift the transmission, and check for smooth operation.
- Check the front wheel alignment (see section 18).

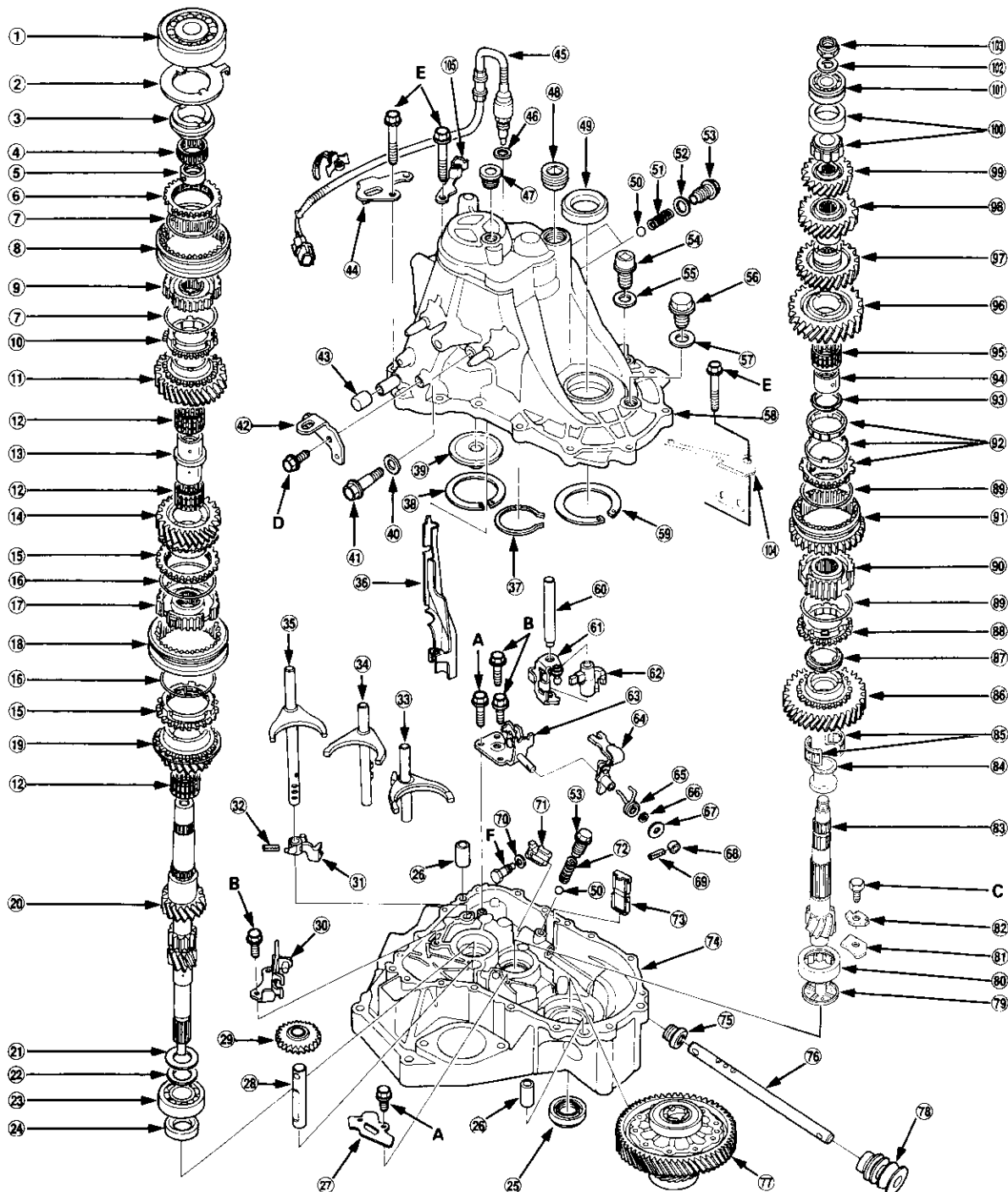
Illustrated Index

Refer to the drawing below for transmission disassembly/reassembly.
Clean all the parts thoroughly in solvent and dry with compressed air.

 Lubricate all the parts with oil before reassembly.

NOTE:

- This transmission uses no gaskets between the major housings; use liquid gasket (P/N 08718 – 0001 or 08718 – 0003) (see page 13-93).
- Always clean the magnet (73) whenever the transmission housing is disassembled.
- Inspect all the bearings for wear and operation.





	Bolt Size	Torque Value
A	6 x 1.0 mm	12 N·m (1.2 kgf·m, 8 lbf·ft)
B	6 x 1.0 mm	15 N·m (1.5 kgf·m, 11 lbf·ft)
C	8 x 1.0 mm	15 N·m (1.5 kgf·m, 11 lbf·ft)
D	8 x 1.25 mm	24 N·m (2.4 kgf·m, 17 lbf·ft)
E	8 x 1.25 mm	27 N·m (2.8 kgf·m, 20 lbf·ft)
F	8 x 1.0 mm	30 N·m (3.1 kgf·m, 22 lbf·ft)

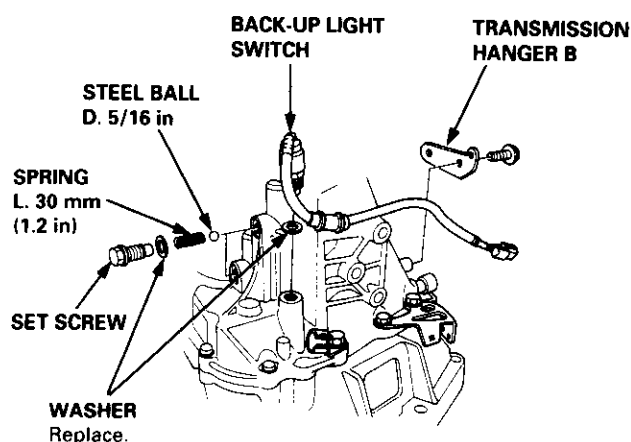
- ① ANGULAR BALL BEARING
- ② STOP RING
- ③ TAPER RING
- ④ NEEDLE BEARING
- ⑤ SPACER
- ⑥ SYNCHRO RING
- ⑦ SYNCHRO SPRING
- ⑧ 5TH/REVERSE SYNCHRO SLEEVE
- ⑨ 5TH/REVERSE SYNCHRO HUB
- ⑩ SYNCHRO RING
- ⑪ 5TH GEAR
- ⑫ 38 x 43 x 26 mm NEEDLE BEARING
- ⑬ SPACER COLLAR
- ⑭ 4TH GEAR
- ⑮ SYNCHRO RING
- ⑯ SYNCHRO SPRING
- ⑰ 3RD/4TH SYNCHRO HUB
- ⑱ 3RD/4TH SYNCHRO SLEEVE
- ⑲ 3RD GEAR
- ⑳ MAINSHAFT
- ㉑ WASHER
- ㉒ SPRING WASHER
- ㉓ BALL BEARING
- ㉔ 28 x 41 x 7 mm OIL SEAL Replace.
- ㉕ 35 x 56 x 8 mm OIL SEAL Replace.
- ㉖ 14 x 20 mm DOWEL PIN
- ㉗ OIL CHAMBER PLATE
- ㉘ REVERSE IDLER GEAR SHAFT
- ㉙ REVERSE IDLER GEAR
- ㉚ REVERSE SHIFT HOLDER
- ㉛ 5TH/REVERSE SHIFT PIECE
- ㉜ 5 x 22 mm SPRING PIN Replace.
- ㉝ 1ST/2ND SHIFT FORK
- ㉞ 3RD/4TH SHIFT FORK
- ㉟ 5TH/REVERSE SHIFT FORK
- ㊱ OIL GUTTER PLATE
- ㊲ SNAP RING
- ㊳ 72 mm THRUST SHIM
- ㊴ OIL GUIDE PLATE
- ㊵ 10 mm WASHER Replace.
- ㊶ REVERSE IDLER GEAR SHAFT BOLT
- ㊷ 54 N·m (5.5 kgf·m, 40 lbf·ft)
- ㊸ TRANSMISSION HANGER B
- ㊹ BREATHER CAP
- ㊺ TRANSMISSION HANGER A
- ㊻ BACK-UP LIGHT SWITCH
- ㊼ 25 N·m (2.5 kgf·m, 18 lbf·ft)
- ㊽ 14 mm WASHER Replace.
- ㊾ 16 mm SEALING BOLT
- ㊿ 29 N·m (3.0 kgf·m, 22 lbf·ft)
- ① 32 mm SEALING BOLT
- ② 25 N·m (2.5 kgf·m, 18 lbf·ft)
- ③ 40 x 62 x 9 mm OIL SEAL Replace.
- ④ STEEL BALL D. 5/16 in
- ⑤ SPRING L. 30 mm (1.2 in)
- ⑥ 12 mm WASHER Replace.
- ⑦ SET SCREW
- ⑧ 22 N·m (2.2 kgf·m, 16 lbf·ft)
- ⑨ OIL DRAIN PLUG
- ⑩ 39 N·m (4.0 kgf·m, 29 lbf·ft)
- ⑪ WASHER Replace.
- ⑫ OIL FILLER PLUG
- ⑬ 44 N·m (4.5 kgf·m, 33 lbf·ft)
- ⑭ WASHER Replace.
- ⑮ TRANSMISSION HOUSING
- ⑯ 80 mm SHIM
- ⑰ SHIFT PIECE SHAFT
- ⑱ INTERLOCK
- ⑲ SHIFT PIECE
- ⑳ SHIFT ARM HOLDER
- ㉑ SELECT ARM
- ㉒ SELECT RETURN SPRING
- ㉓ 10 mm SHIM
- ㉔ 10 mm WASHER
- ㉕ LOCK COLLAR
- ㉖ 3 x 16 mm SPRING PIN Replace.
- ㉗ 8 mm SPRING WASHER
- ㉘ CHANGE PIECE
- ㉙ SPRING L. 25.6 mm (1.01 in)
- ㉚ MAGNET
- ㉛ CLUTCH HOUSING
- ㉜ 14 x 25 x 16 mm OIL SEAL Replace.
- ㉝ SHIFT ROD
- ㉞ DIFFERENTIAL ASSEMBLY
- ㉟ See section 15
- ㊱ SHIFT ROD BOOT
- ㊲ OIL GUIDE PLATE
- ㊳ 33 x 60 x 20 mm NEEDLE BEARING
- ㊴ BEARING RETAINER PLATE
- ㊵ LOCK WASHER Replace.
- ㊶ COUNTERSHAFT
- ㊷ DISTANCE COLLAR
- ㊸ 42 x 47 x 22 mm NEEDLE BEARING
- ㊹ 1ST GEAR
- ㊺ FRICTION DAMPER
- ㊻ SYNCHRO RING
- ㊼ SYNCHRO SPRING
- ㊽ 1ST/2ND SYNCHRO HUB
- ㊾ REVERSE GEAR
- ㊿ DOUBLE CONE SYNCHRO
- ① FRICTION DAMPER
- ② SPACER
- ③ 42 x 47 x 24 mm NEEDLE BEARING
- ④ 2ND GEAR
- ⑤ 3RD GEAR
- ⑥ 4TH GEAR
- ⑦ 5TH GEAR
- ⑧ NEEDLE BEARING
- ⑨ BALL BEARING
- ⑩ SPRING WASHER
- ⑪ LOCKNUT Replace.
- ⑫ 108 → 0 → 108 N·m
- ⑬ (11.0 → 0 → 11.0 kgf·m,
- ⑭ 80 → 0 → 80 lbf·ft)
- ⑮ CLUTCH LINE BRACKET
- ⑯ BACK-UP LIGHT SWITCH HARNESS BRACKET

Transmission Housing

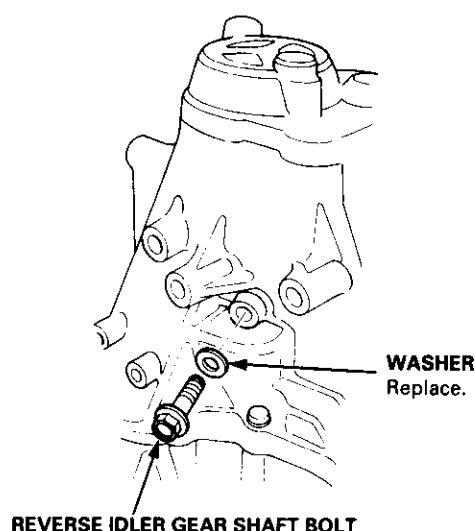
Removal

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

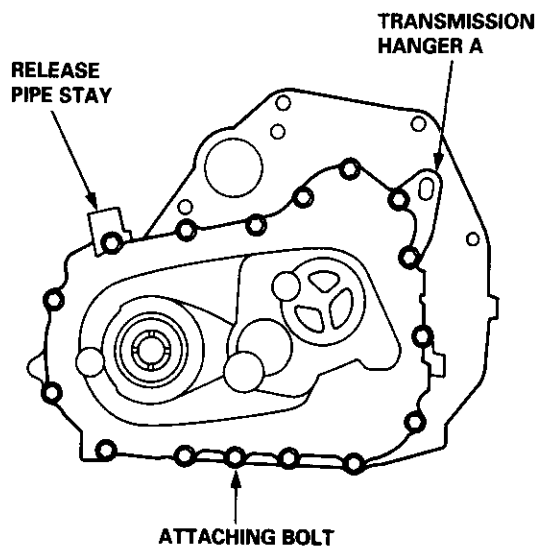
1. Remove the back-up light switch.
2. Remove transmission hanger B.
3. Remove the set screws, the springs, and the steel balls.



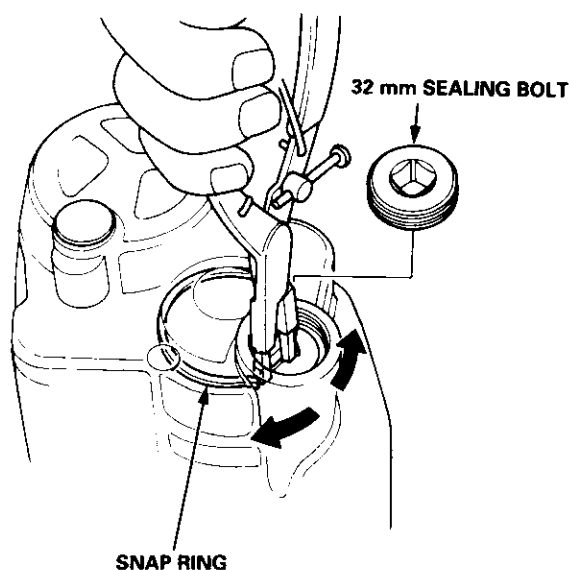
4. Remove the reverse idler gear shaft bolt.



5. Loosen the transmission housing attaching bolts in a crisscross pattern in several steps, then remove them.



6. Remove the 32 mm sealing bolt.
7. Expand the snap ring on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.

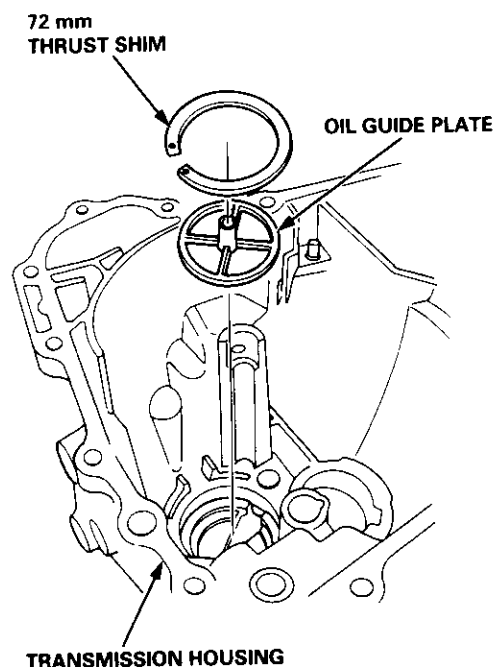




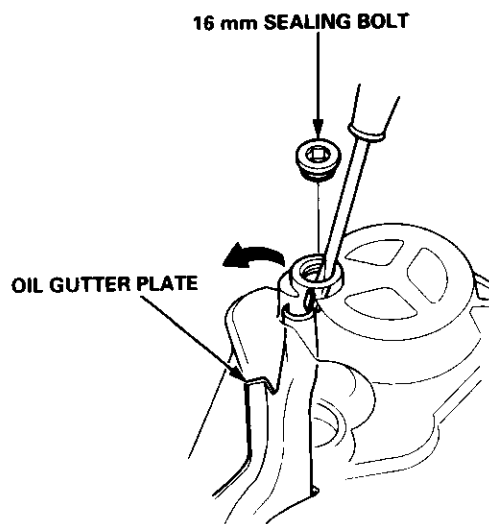
Clearance Inspection

8. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.

9. Remove the 72 mm thrust shim and the oil guide plate from the transmission housing.



10. Remove the 16 mm sealing bolt and the oil gutter plate.



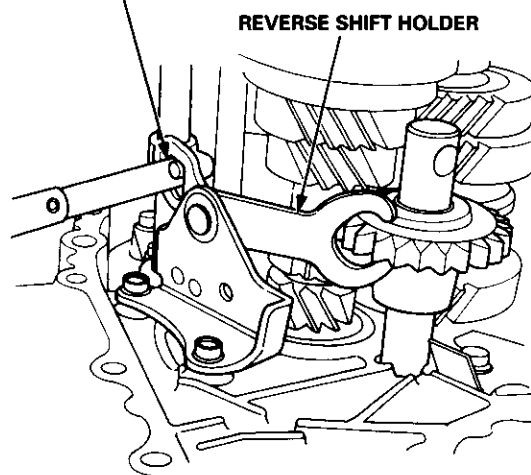
1. Measure the clearance between the reverse shift holder and the 5th/reverse shift piece pin.

Standard:

Reverse Side: 0.05 – 0.45 mm (0.002 – 0.018 in)

5th Side: 0.4 – 0.9 mm (0.02 – 0.04 in)

5TH/REVERSE SHIFT PIECE PIN



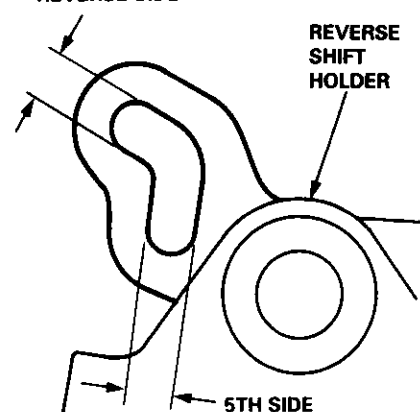
2. If the clearance are not within the standard, measure the width of the grooves in the reverse shift holder.

Standard:

Reverse Side: 7.05 – 7.25 mm (0.278 – 0.285 in)

5th Side: 7.4 – 7.7 mm (0.29 – 0.30 in)

REVERSE SIDE



- If the width of the grooves are not within the standard, replace the reverse shift holder with a new one.
- If the width of the grooves are within the standard, replace the 5th/reverse shift piece with a new one.

(cont'd)

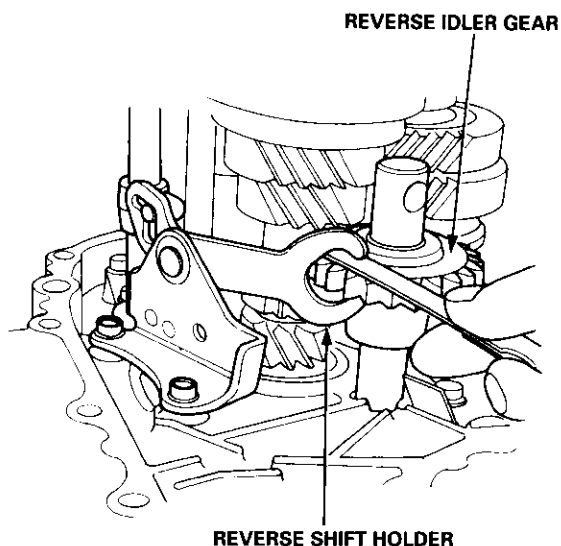
Reverse Shift Holder, Reverse Idler Gear

Clearance Inspection (cont'd)

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

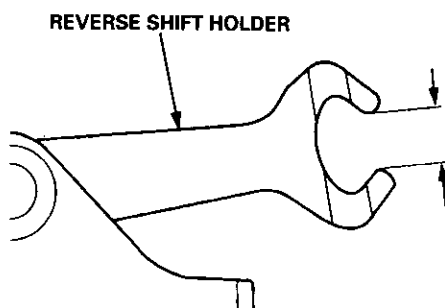
Standard: 0.5 – 1.0 mm (0.02 – 0.04 in)

Service Limit: 1.8 mm (0.07 in)



4. If the clearance is more than the service limit, measure the width of the reverse shift holder.

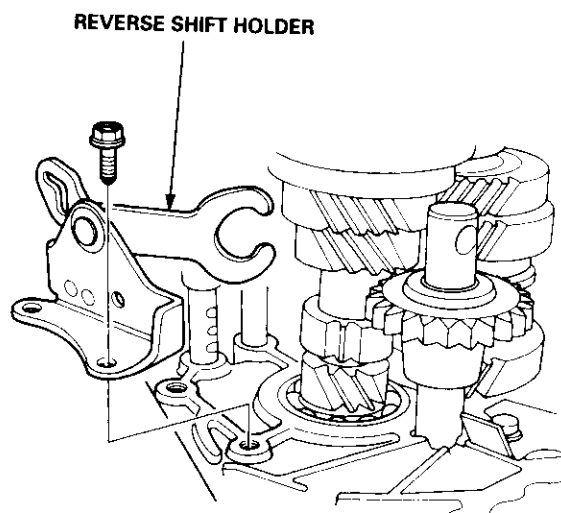
Standard: 13.0 – 13.3 mm (0.512 – 0.524 in)



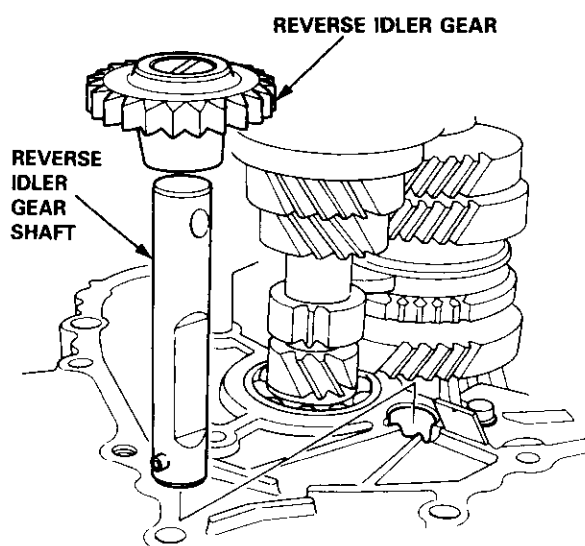
- If the width is not within the standard, replace the reverse shift holder with a new one.
- If the width is within the standard, replace the reverse idler gear with a new one.

Removal

1. Remove the reverse shift holder.



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



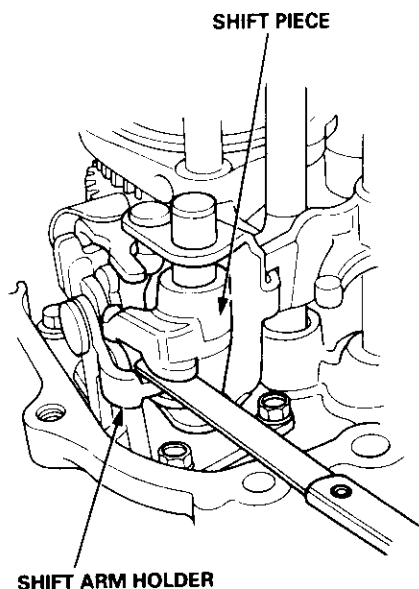


Clearance Inspection

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

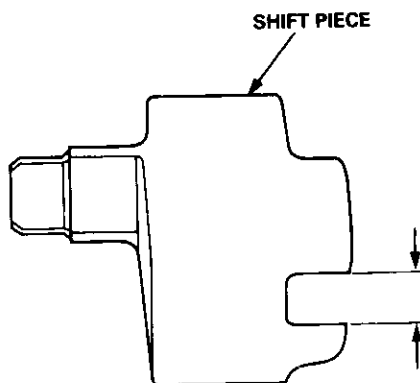
Standard: 0.1 – 0.3 mm (0.004 – 0.012 in)

Service Limit: 0.6 mm (0.02 in)



2. If the clearance is more than the service limit, measure the width of the groove in the shift piece.

Standard: 8.1 – 8.2 mm (0.319 – 0.323 in)

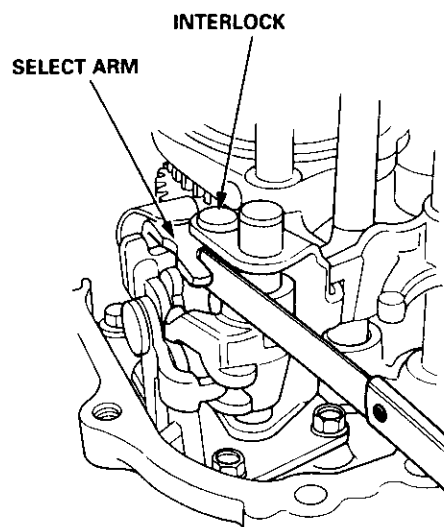


- If the width of the groove is not within the standard, replace the shift piece with a new one.
- If the width of the groove is within the standard, replace the shift arm holder with a new one.

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

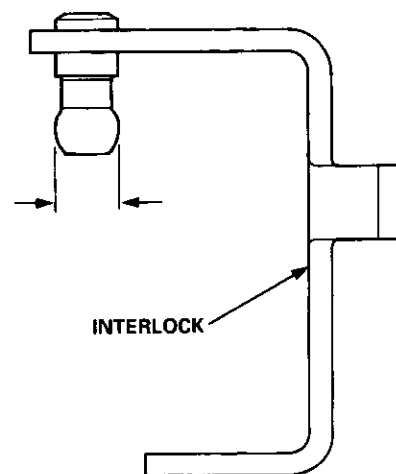
Standard: 0.05 – 0.20 (0.002 – 0.008 in)

Service Limit: 0.45 mm (0.018 in)



4. If the clearance is more than the service limit, measure the width of the interlock.

Standard: 9.9 – 10.0 mm (0.390 – 0.394 in)



- If the width is not within the standard, replace the interlock with a new one.
- If the width is within the standard, replace the select arm with a new one.

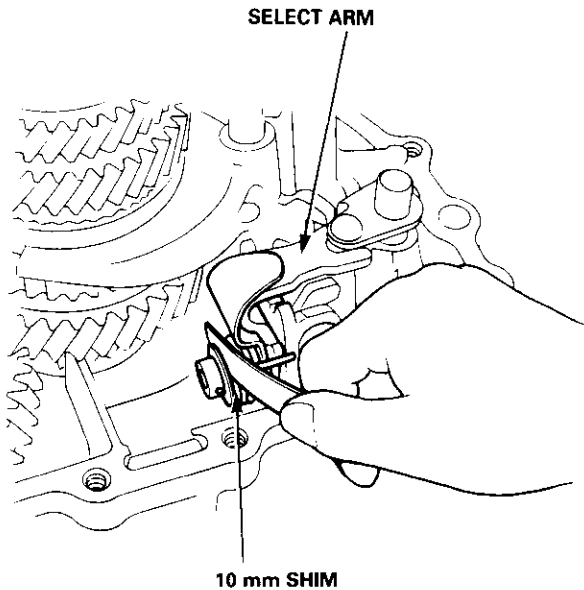
(cont'd)

Change Holder Assembly

Clearance Inspection (cont'd)

7. Measure the clearance between the select arm and the 10 mm shim.

Standard: 0.01 – 0.2 mm (0.0004 – 0.008 in)



8. If the clearance is not within the standard, select and install the appropriate 10 mm shim for the correct clearance from the chart below.

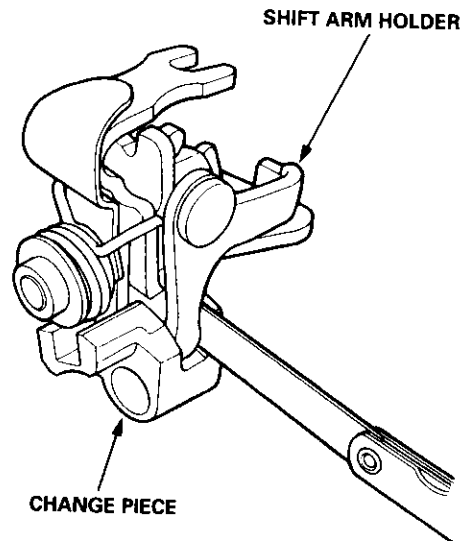
10 mm Shim

	Part Number	Thickness
A	24435 – 689 – 000	0.8 mm (0.031 in)
B	24436 – 689 – 000	1.0 mm (0.039 in)
C	24437 – 689 – 000	1.2 mm (0.047 in)
D	24438 – 689 – 000	1.4 mm (0.055 in)
E	24439 – 689 – 000	1.6 mm (0.063 in)

9. Measure the clearance between the shift arm holder and the change piece.

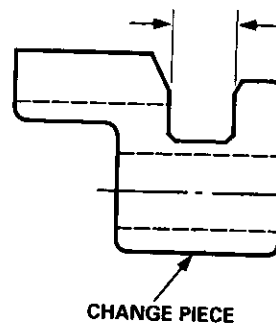
Standard: 0.05 – 0.35 (0.002 – 0.014 in)

Service Limit: 0.8 mm (0.03 in)



10. If the clearance is more than the service limit, measure the groove of the change piece.

Standard: 12.05 – 12.15 mm (0.4744 – 0.4783 in)



- If the groove is not within the standard, replace the change piece with a new one.
- If the groove is within the standard, replace the shift arm holder with a new one.

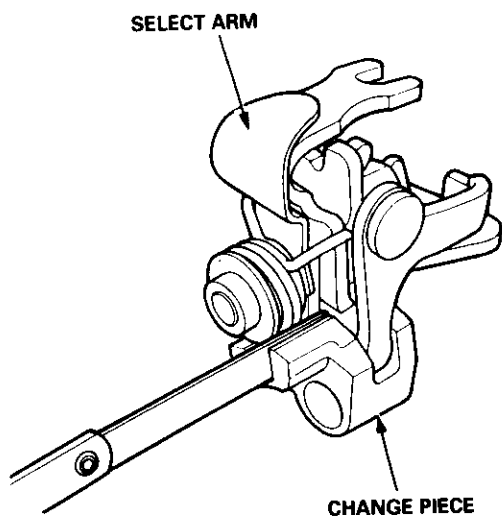


Removal

11. Measure the clearance between the select arm and the change piece.

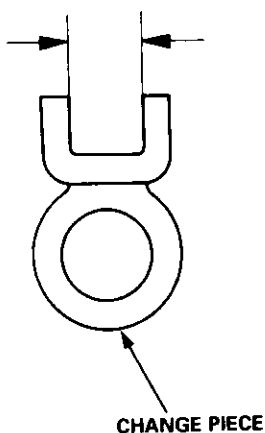
Standard: 0.05 – 0.25 mm (0.002 – 0.010 in)

Service Limit: 0.5 mm (0.02 in)



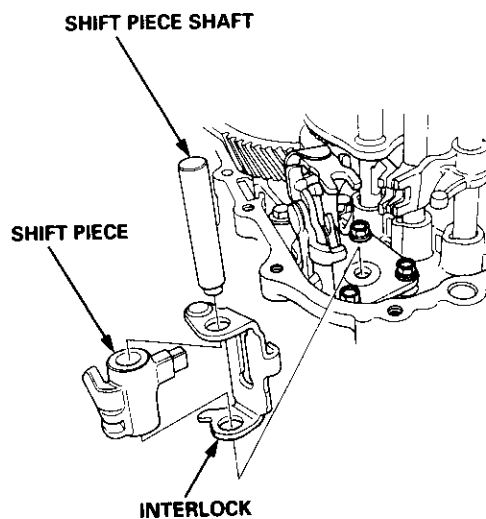
12. If the clearance is more than the service limit, measure the width of the change piece.

Standard: 12.05 – 12.15 mm (0.4744 – 0.4783 in)

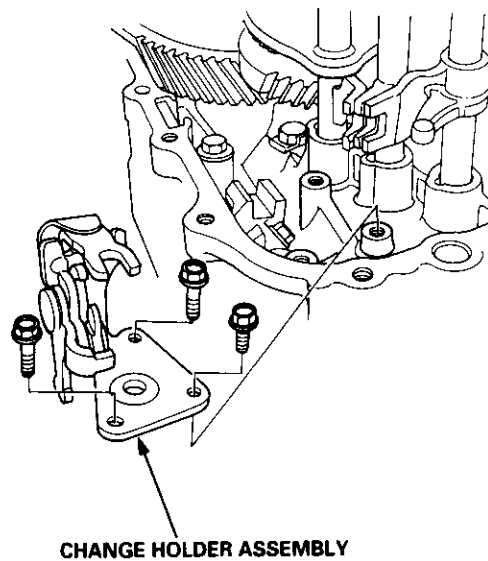


- If the width is not within the standard, replace the change piece with a new one.
- If the width is within the standard, replace the select arm with a new one.

1. Remove the shift piece shaft, then remove the shift piece and the interlock.




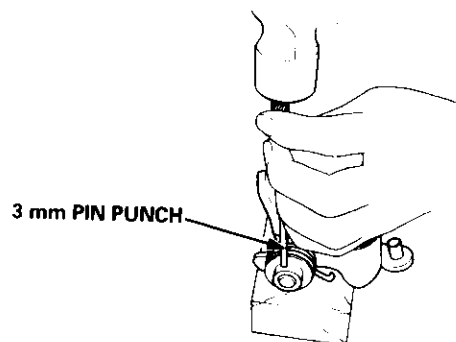
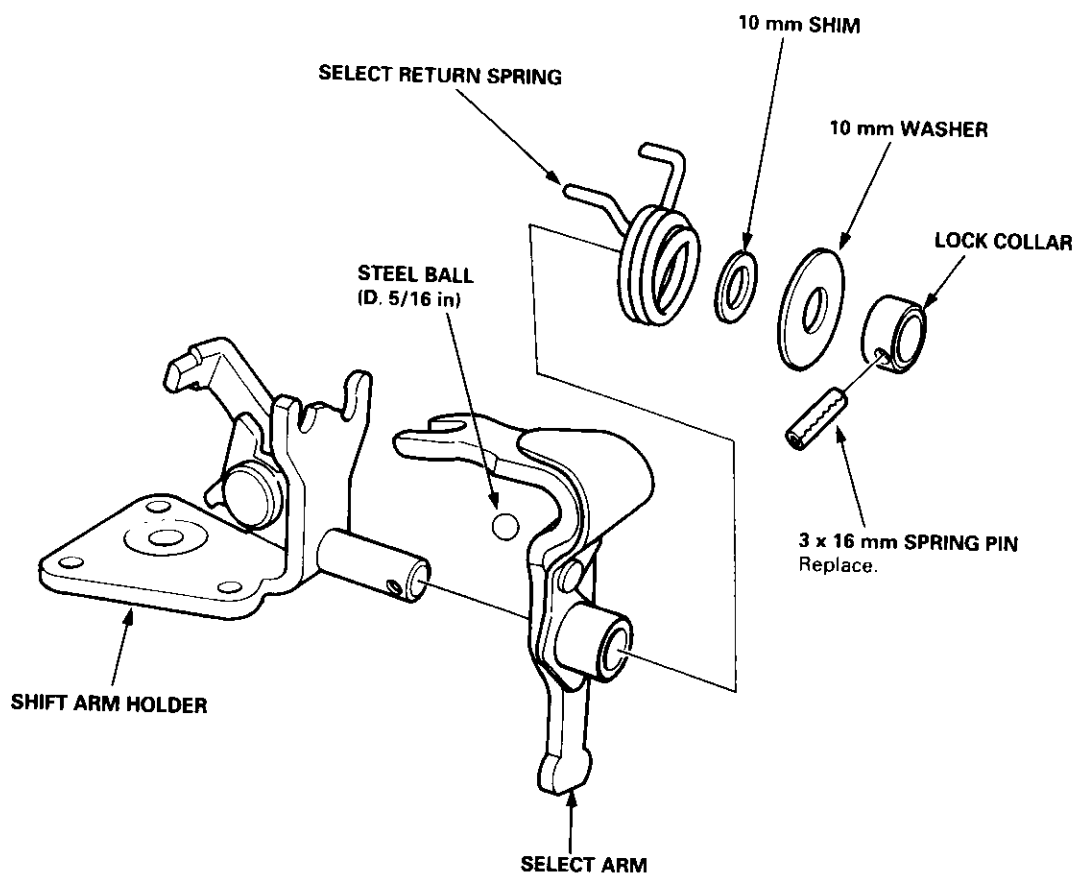
2. Remove the change holder assembly.



Change Holder Assembly

Disassembly/Reassembly

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



Mainshaft, Countershaft, Shift Fork

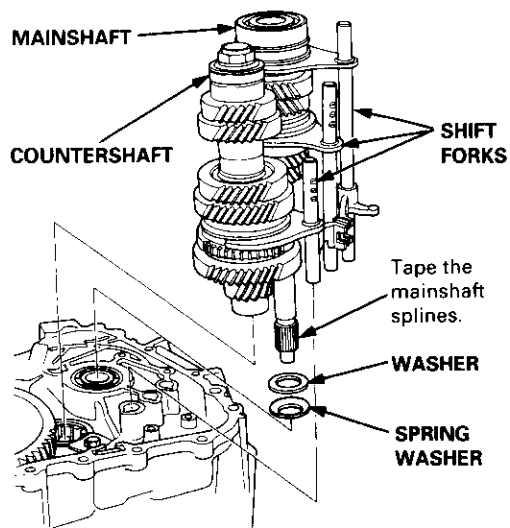


Removal

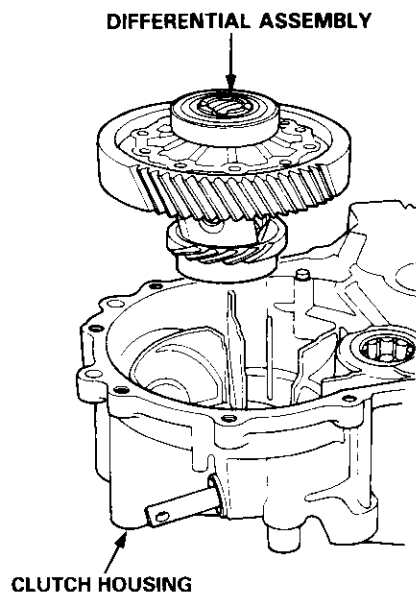
1. Remove the mainshaft and the countershaft assemblies with the shift forks from the clutch housing.

NOTE: Tape the mainshaft spline before removing the mainshaft and the countershaft assemblies.

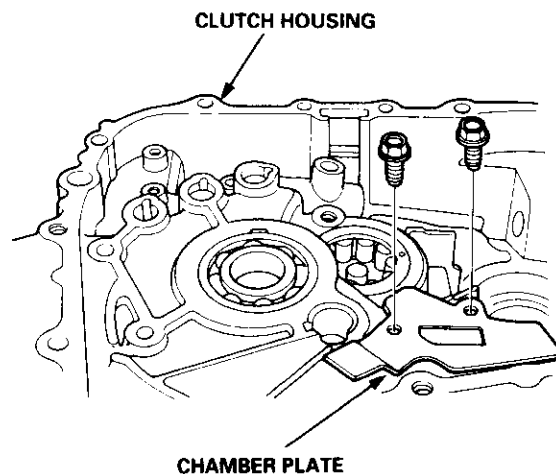
2. Remove the spring washer and the washer.



3. Remove the differential assembly from the clutch housing.



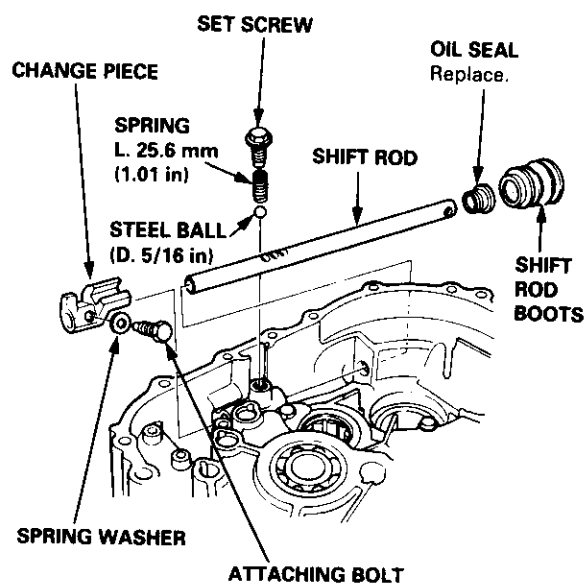
4. Remove the chamber plate.



Shift Rod

Removal

1. Remove the shift rod boots.
2. Remove the change piece attaching bolt and the spring washer.
3. Remove the set screw, then remove the spring and the steel ball.
4. Remove the shift rod, then remove the change piece.
5. Remove the oil seal.

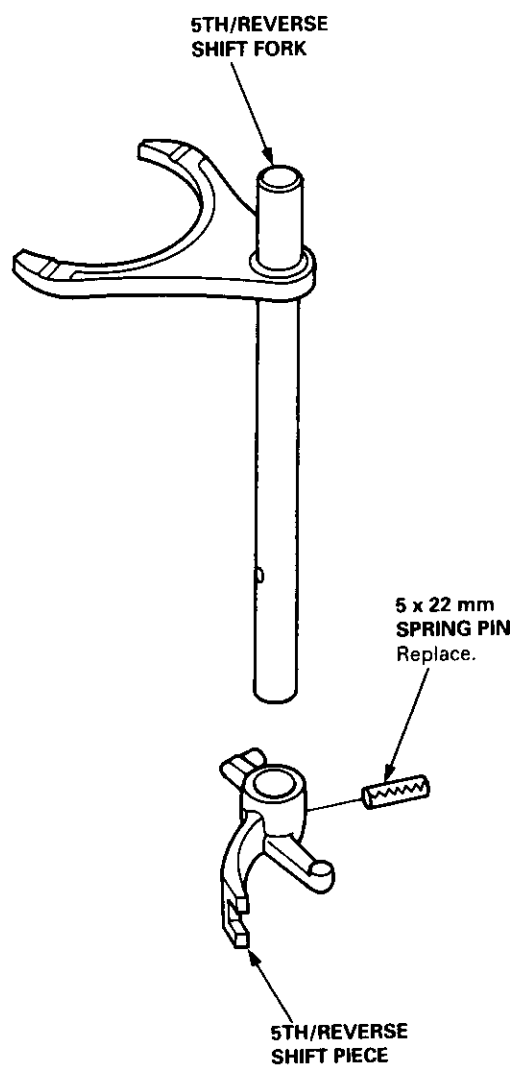
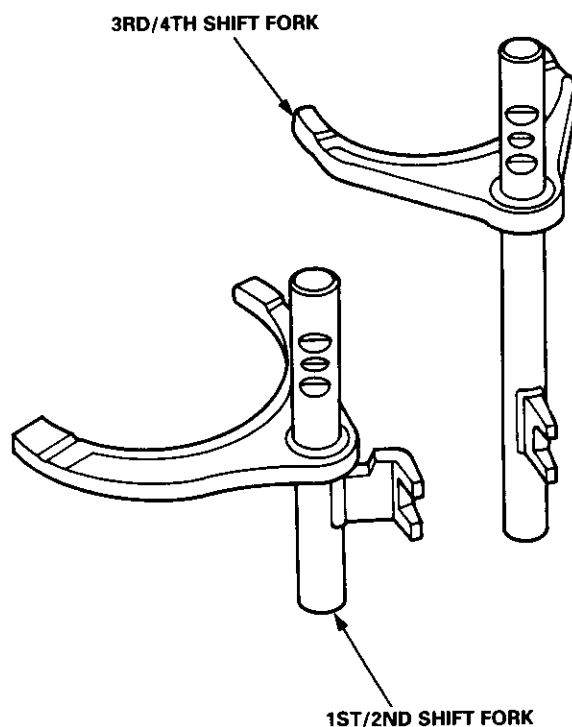
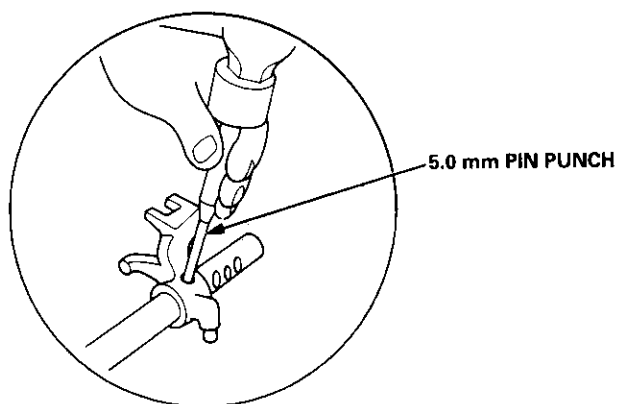




Shift Fork Assembly

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



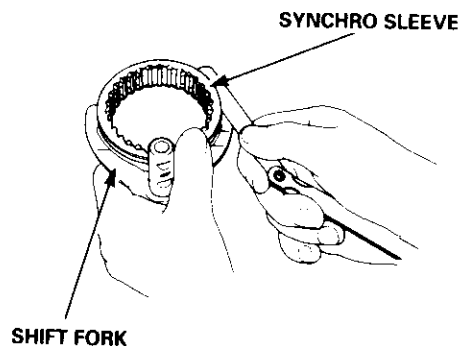
Shift Fork Assembly

Clearance Inspection

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

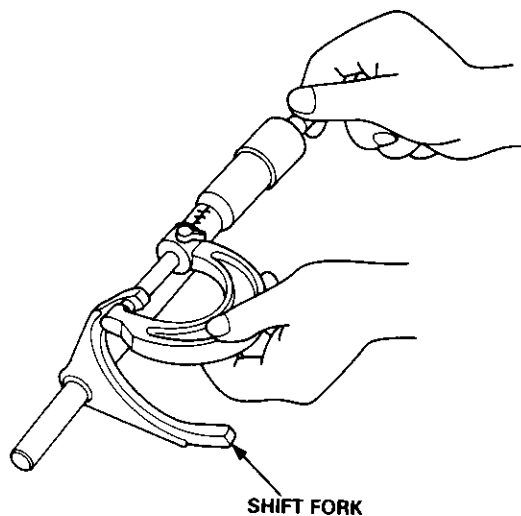
1. Measure the clearance between each shift fork and its matching synchro sleeve.

Standard: 0.35 – 0.65 mm (0.014 – 0.026 in)
Service Limit: 1.0 mm (0.04 in)



2. If the clearance is more than the service limit, measure the thickness of the shift fork fingers.

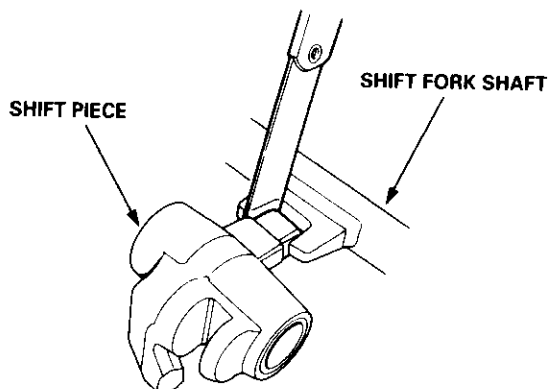
Standard: 7.4 – 7.6 mm (0.291 – 0.299 in)



- If the thickness of the shift fork fingers is not within the standard, replace the shift fork with a new one.
- If the thickness of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

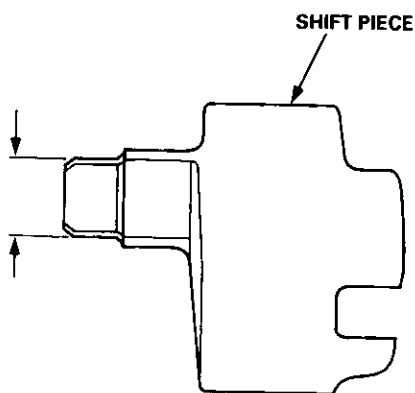
3. Measure the clearance between the shift piece and the shift fork shafts.

Standard: 0.2 – 0.5 mm (0.008 – 0.02 in)
Service Limit: 0.8 mm (0.03 in)



4. If the clearance is more than the service limit, measure the width of the shift piece.

Standard: 11.9 – 12.0 mm (0.469 – 0.472 in)



- If the width of the shift piece is not within the standard, replace the shift piece with a new one.
- If the width of the shift piece is within the standard, replace the shift fork with a new one.


Mainshaft Assembly

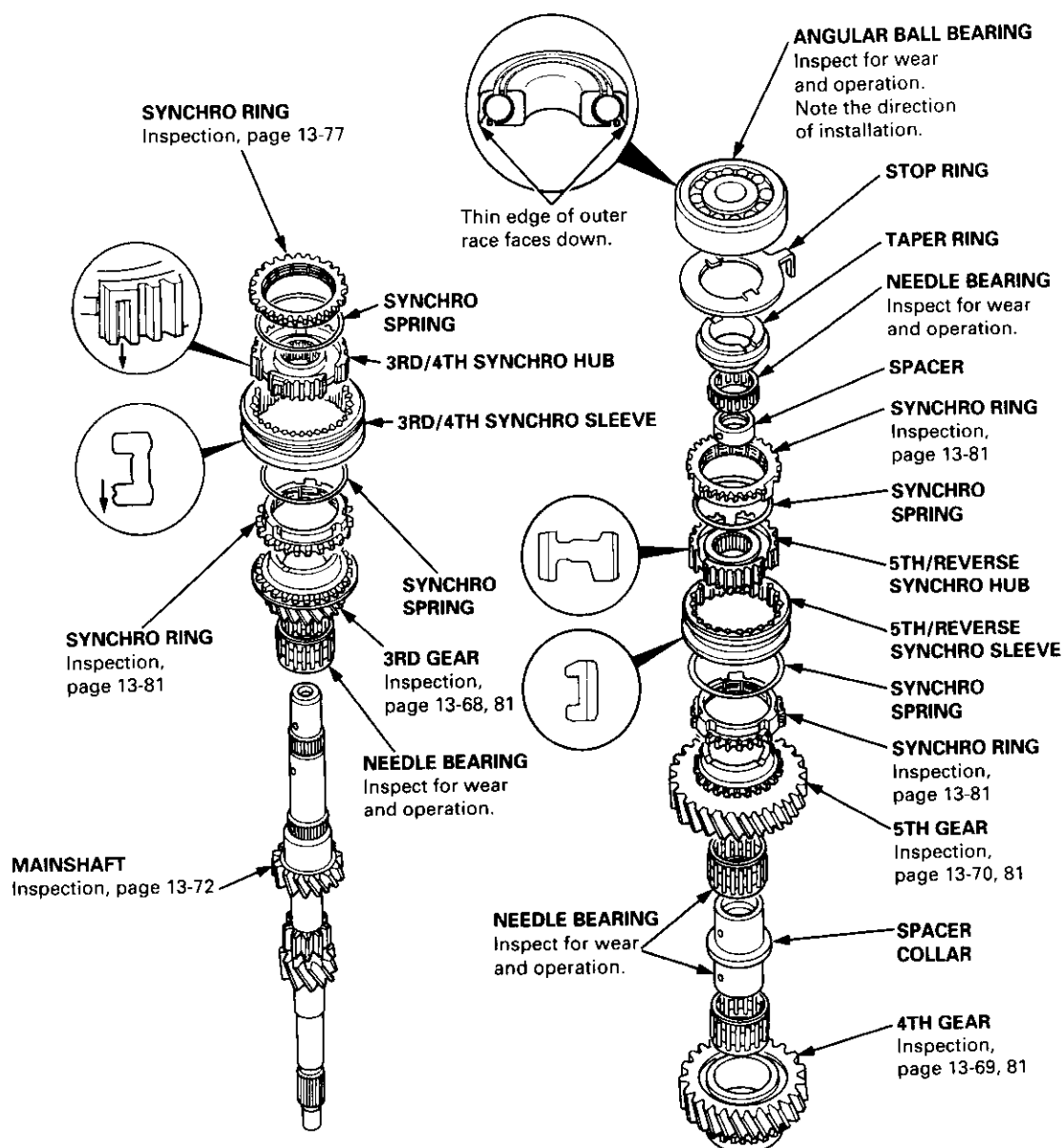


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Note the follow

- The 3rd/4th and the 5th synchro hubs are installed with a press.
- Install the angular ballbearing with the thin-edged outer race facing the stop ring.

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



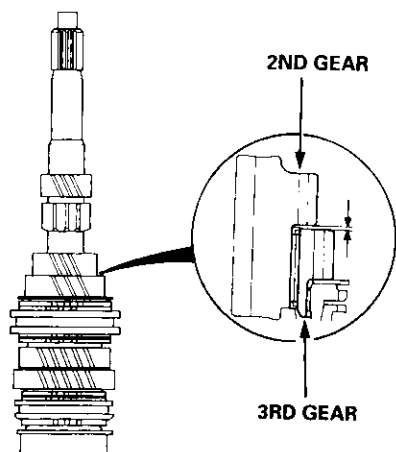
Mainshaft Assembly

Clearance Inspection

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

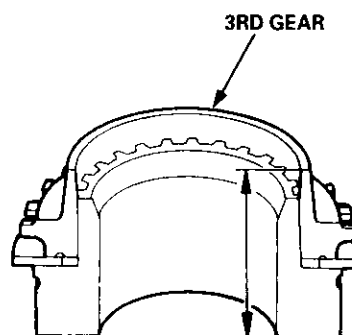
1. Measure the clearance between 2nd and 3rd gears.

Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
Service Limit: 0.3 mm (0.01 in)



2. If the clearance is more than the service limit, measure the thickness of 3rd gear.

Standard: 34.92 – 34.97 mm (1.375 – 1.377 in)
Service Limit: 34.3 mm (1.350 in)



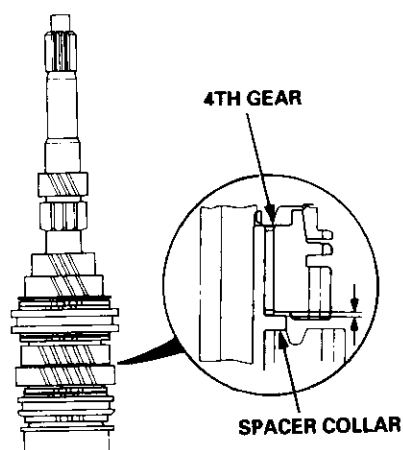
- If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
- If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.



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

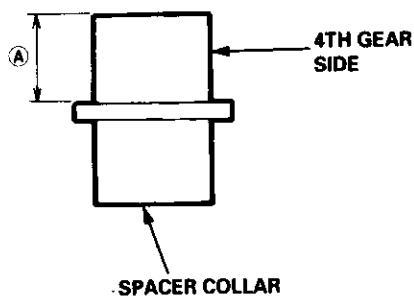
Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)

Service Limit: 0.3 mm (0.01 in)



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

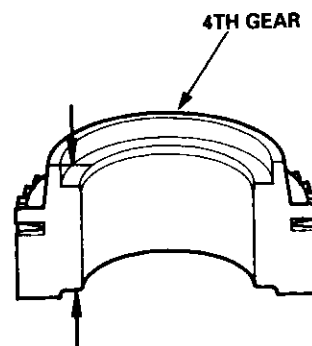
Standard: 26.03 – 26.08 mm (1.025 – 1.027 in)



5. If distance \textcircled{A} is not within the standard, replace the spacer collar with a new one. If distance \textcircled{A} is within the standard, measure the thickness of 4th gear.

Standard: 31.42 – 31.47 mm (1.237 – 1.239 in)

Service Limit: 31.3 mm (1.232 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.

(cont'd)

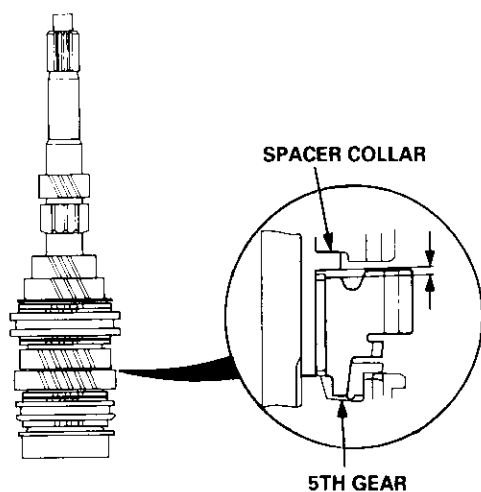
Mainshaft Assembly

Clearance Inspection (cont'd)

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

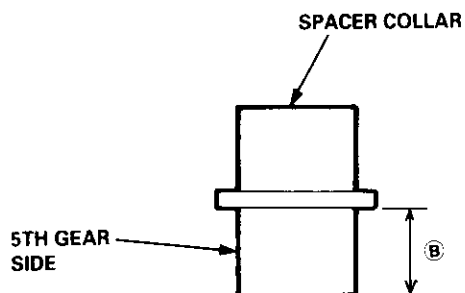
Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)

Service limit: 0.3 mm (0.012 in)



7. If the clearance is more than the service limit, measure distance ⑧ on the spacer collar.

Standard: 26.03 – 26.08 mm (1.025 – 1.027 in)

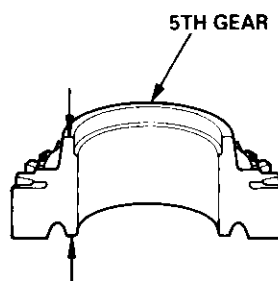


8. If distance ⑧ is not within the standard, replace the spacer collar with a new one.

If distance ⑧ is within the standard, measure the thickness of 5th gear.

Standard: 31.42 – 31.47 mm (1.237 – 1.239 in)

Service Limit: 31.3 mm (1.232 in)

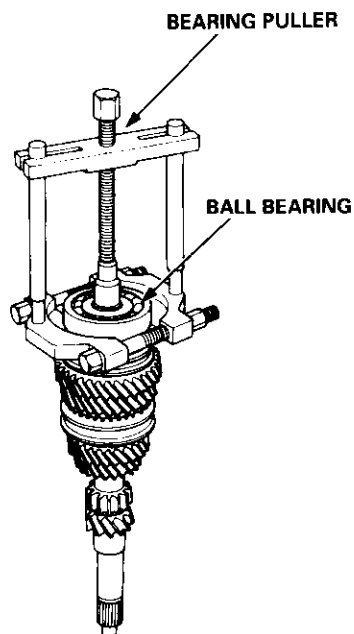


- If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
- If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.



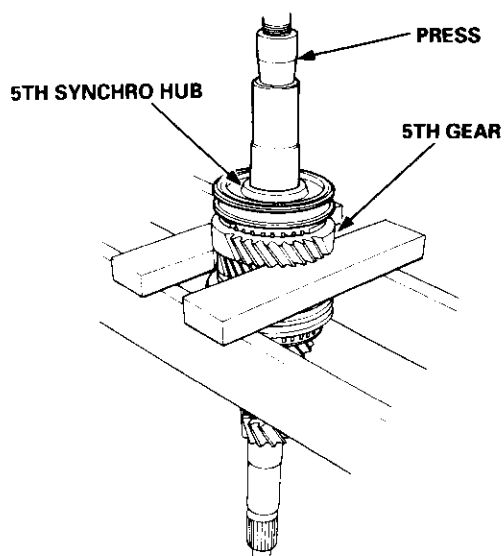
Disassembly

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

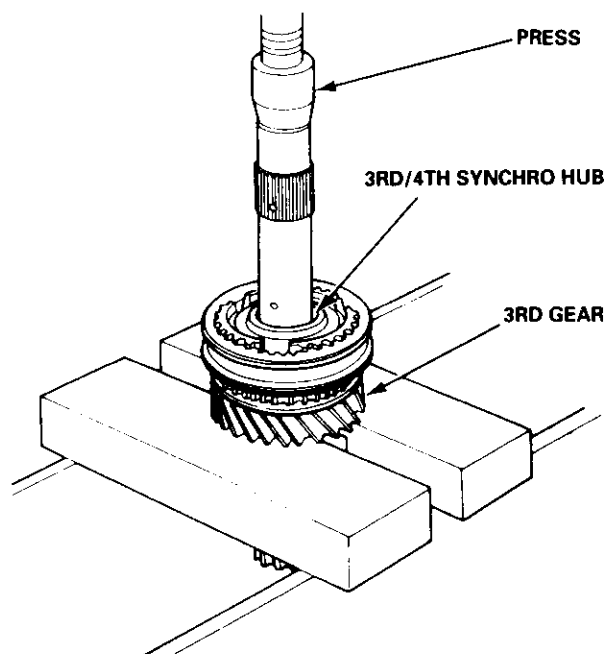


CAUTION: Remove the synchro hubs using a press and the steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

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



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



Mainshaft Assembly

Inspection

1. Inspect the gear surfaces and the bearing surfaces for wear and damage, then measure the mainshaft at points A, B, and C. If any parts of the mainshaft are less than the service limit, replace mainshaft with a new one.

Standard:

A: 27.987 – 28.000 mm (1.1018 – 1.1024 in)

B: 37.984 – 38.000 mm (1.4954 – 1.4960 in)

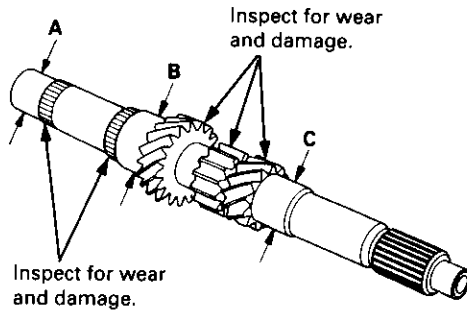
C: 27.977 – 27.990 mm (1.1015 – 1.1020 in)

Service Limit:

A: 27.940 mm (1.1000 in)

B: 37.930 mm (1.4933 in)

C: 27.930 mm (1.0996 in)



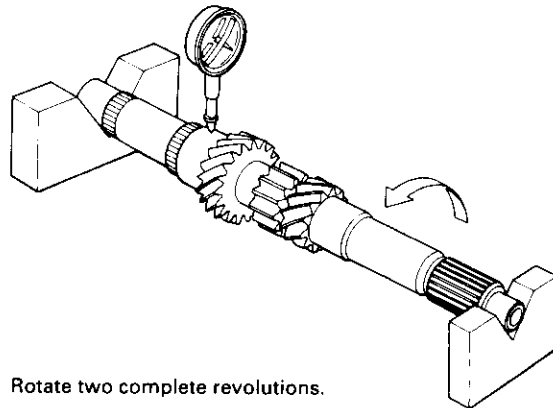
Inspect oil passages for clogging.

2. Inspect for runout. If the runout is more than the service limit, replace the mainshaft with a new one.

Standard: 0.02 mm (0.0008 in) max.

Service Limit: 0.05 mm (0.002 in)

NOTE: Support the mainshaft at both ends as shown.



Rotate two complete revolutions.



Reassembly

CAUTION:

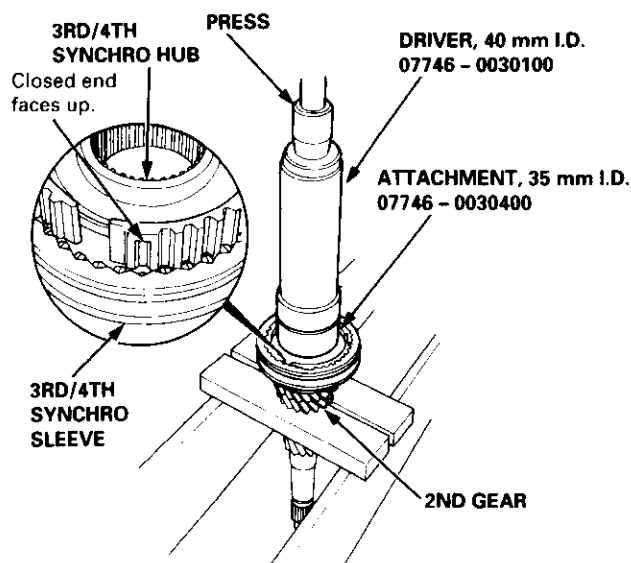
- Press the 3rd/4th and the 5th synchro hubs on the mainshaft without lubrication.
- When installing the 3rd/4th and the 5th synchro hubs, support the mainshaft on steel blocks, and install the synchro hubs using a press.
- Install the 3rd/4th and the 5th synchro hubs with a maximum pressure of 19.6 kN (2,000 kg, 14,466 lb).

NOTE: Refer to page 13-67 for reassembly sequence.

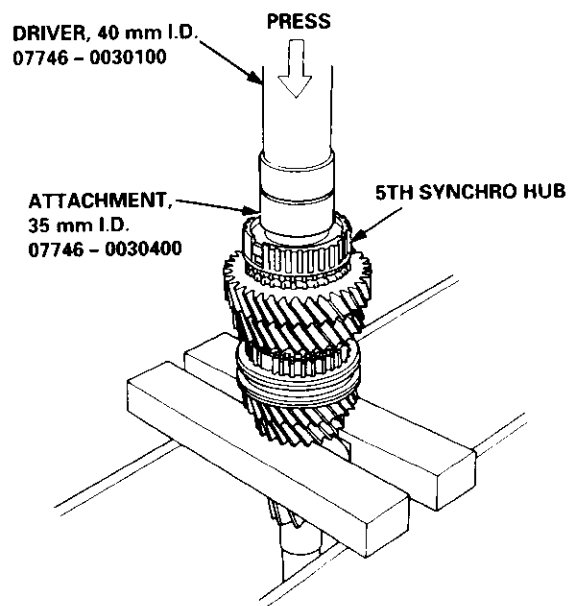
1. Support 2nd gear on steel blocks, then install the 3rd/4th synchro hub using the special tools and a press, as shown.

NOTE:

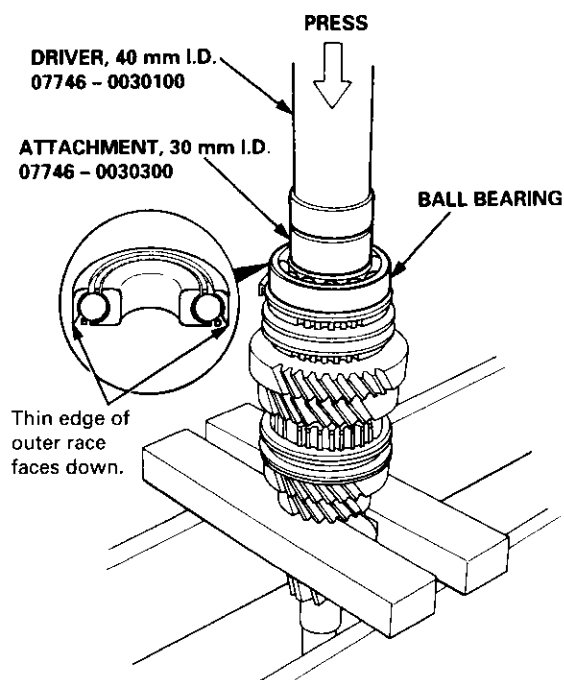
- After installing, check the operation of the 3rd/4th synchro sleeve and hub.
- Assemble the 3rd/4th synchro hub and sleeve together before installing them on the mainshaft.



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




3. Install the angular ball bearing using the special tools and a press as shown.

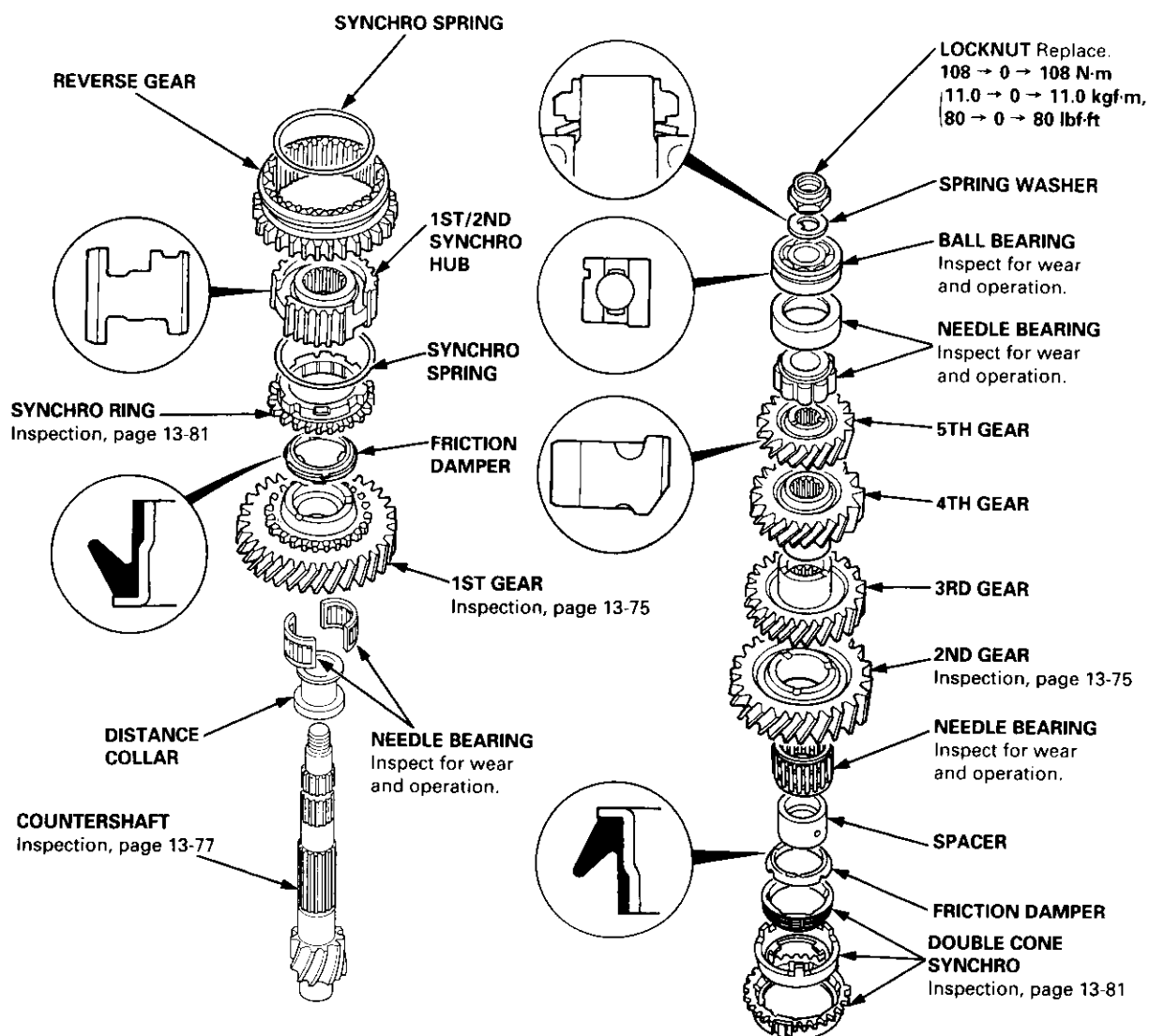


Countershaft Assembly

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

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



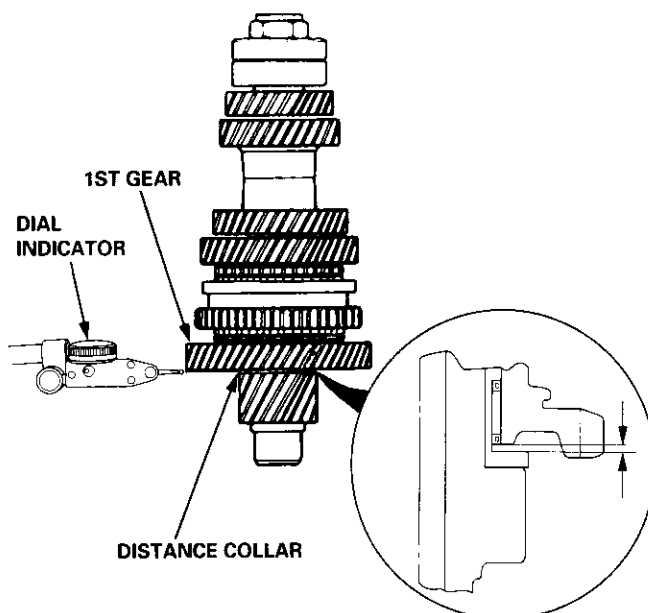


Clearance Inspection

1. Measure the clearance between the 1st gear and distance collar.

Standard: 0.045 – 0.205 mm
(0.002 – 0.008 in)

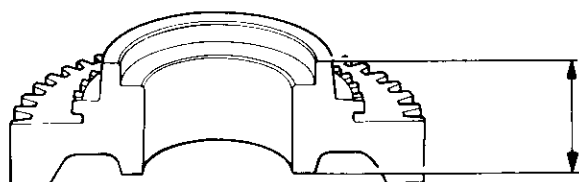
Service Limit: 0.25 mm (0.01 in)



2. If the clearance exceeds the service limit, measure the thicknesses of 1st gear.

1ST GEAR

Standard: 29.45 – 29.50 mm (1.159 – 1.161 in)

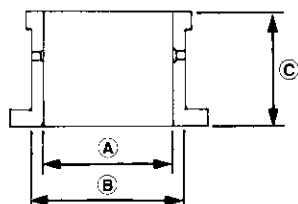


DISTANCE COLLAR

Standard: (A) 36.5 mm (1.44 in)

(B) 42.0 mm (1.65 in)

(C) 30.0 mm (1.18 in)

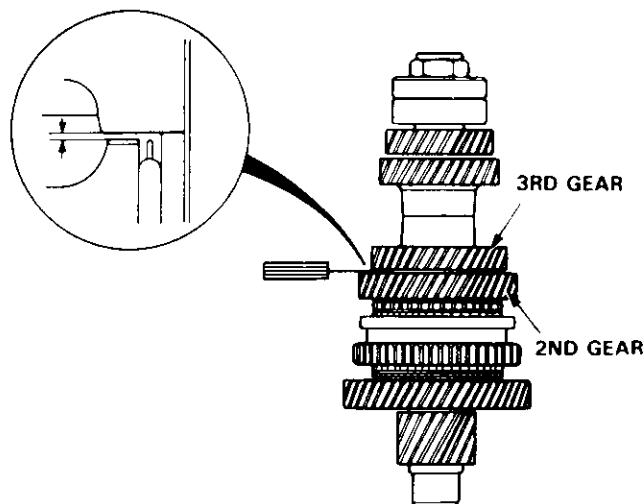


- If the thicknesses of 1st gear and distance collar are less than the standard, replace with a new one.
- If the thicknesses of 1st gear and distance collar are within the standard, replace the 1st/2nd synchro hub with a new one.

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

Standard: 0.07 – 0.14 mm
(0.003 – 0.006 in)

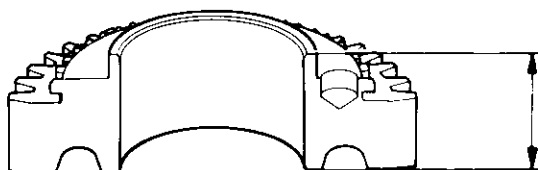
Service Limit: 0.24 mm (0.009 in)



4. If the clearance exceeds the service limit, measure the thicknesses of 2nd gear and spacer.

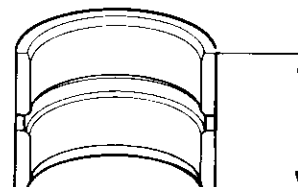
2ND GEAR

Standard: 28.92 – 28.97 mm (1.139 – 1.141 in)



SPACER COLLAR

Standard: 29.07 – 29.09 mm (1.144 – 1.145 in)

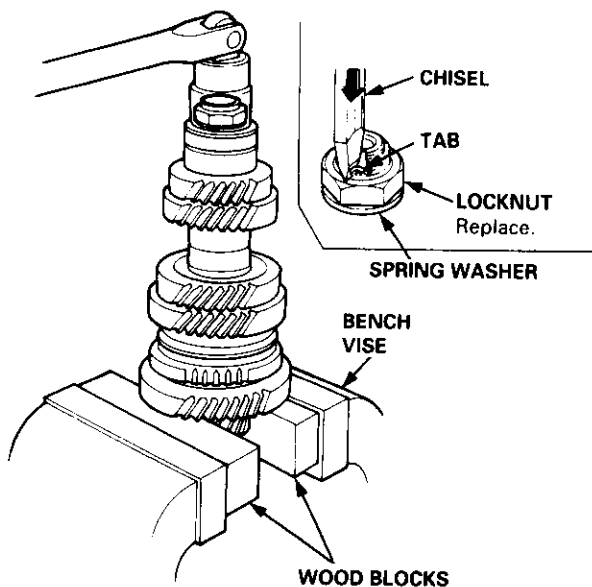


- If the thicknesses of 2nd gear and spacer are less than the standard, replace with a new one.
- If the thicknesses of 2nd gear and spacer are within the standard, replace the 1st/2nd synchro hub with a new one.

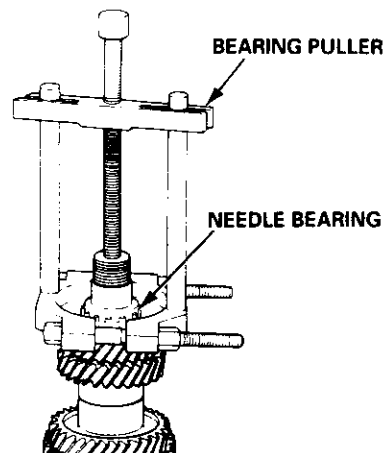
Countershaft Assembly

Disassembly

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

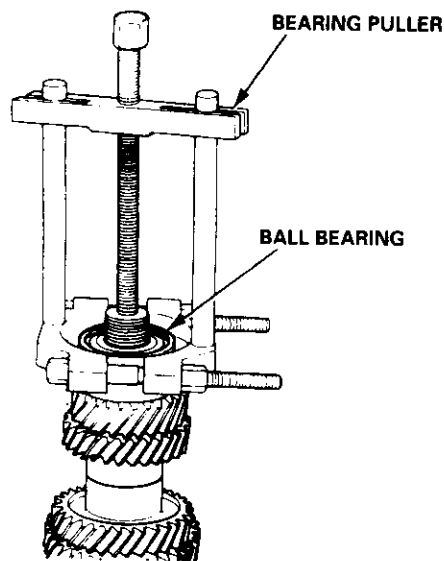


4. Remove the bearing outer race, then remove the needle bearing using a bearing puller as shown.

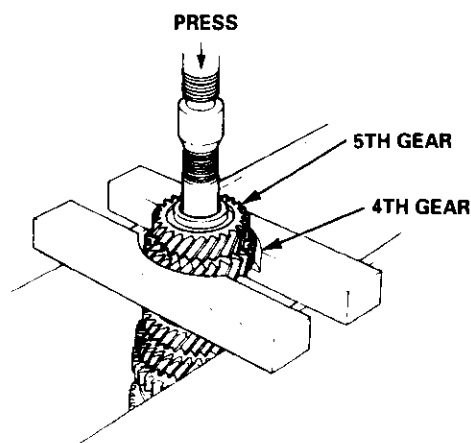


CAUTION: Remove the gears using a press and the steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

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



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





Inspection

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

Standard:

A: 24.980 – 24.993 mm (0.9835 – 0.9840 in)

B: 36.984 – 37.000 mm (1.4561 – 1.4567 in)

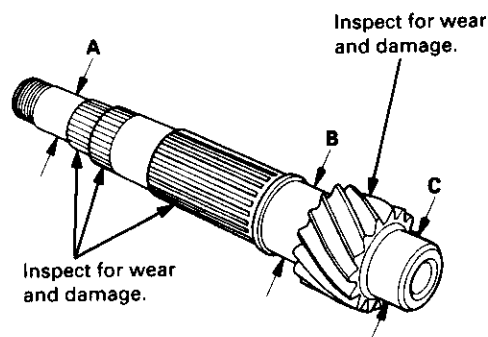
C: 33.000 – 33.015 mm (1.2992 – 1.2998 in)

Service Limit:

A: 24.940 mm (0.9819 in)

B: 36.930 mm (1.4539 in)

C: 32.950 mm (1.2972 in)



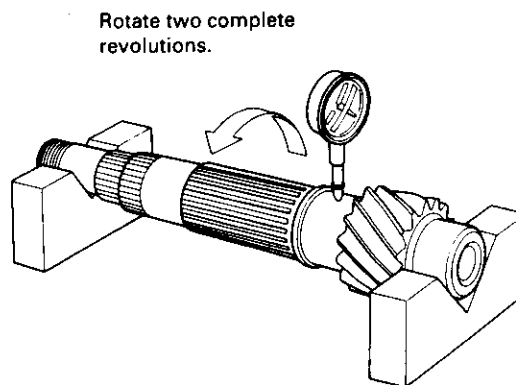
Inspect oil passage for clogging.

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

Standard: 0.02 mm (0.0008 in) max.

Service Limit: 0.05 mm (0.002 in)

NOTE: Support the countershaft at both ends as shown.



Countershaft Assembly

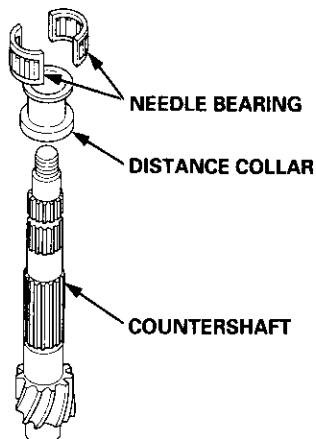
Reassembly

CAUTION:

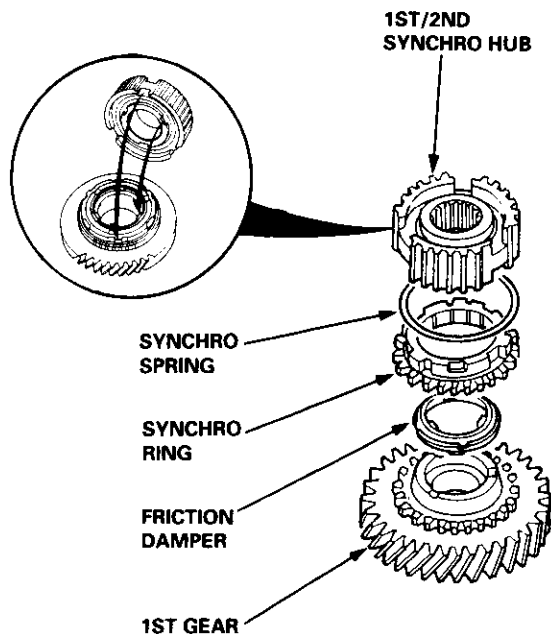
- Press 4th and 5th gears on the countershaft without lubrication.
- When installing 4th and 5th gears, support the shaft on steel blocks, and install the gears using a press.
- Install 4th and 5th gear with a maximum pressure of 25.5 kN (2,600 kgf, 18,806 lbf).

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

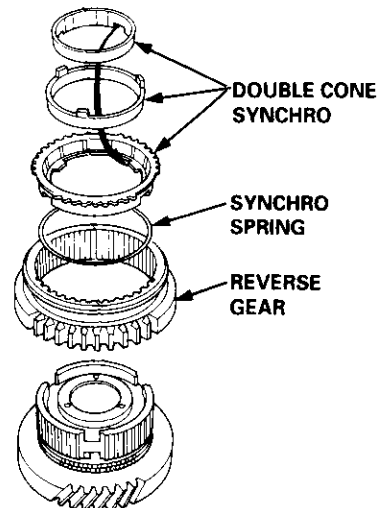
1. Install the distance collar and the needle bearings on the countershaft.



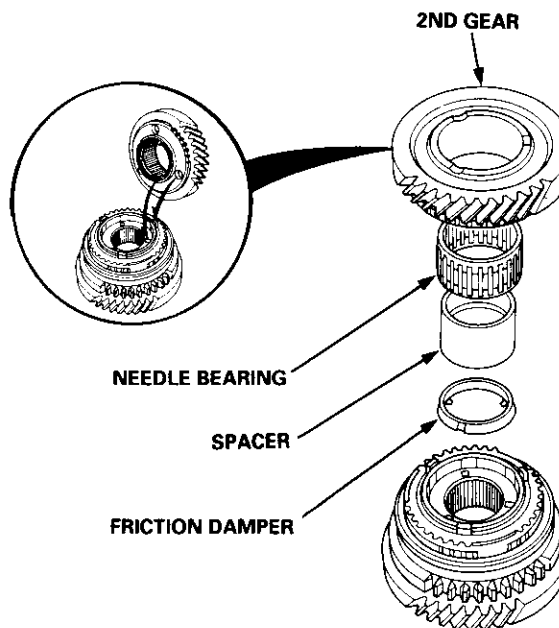
2. Install the friction damper, the synchro ring, and the synchro spring on 1st gear.
3. Install the 1st/2nd synchro hub by aligning the fingers on the friction damper and the grooves in the 1st/2nd synchro hub, as shown.



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



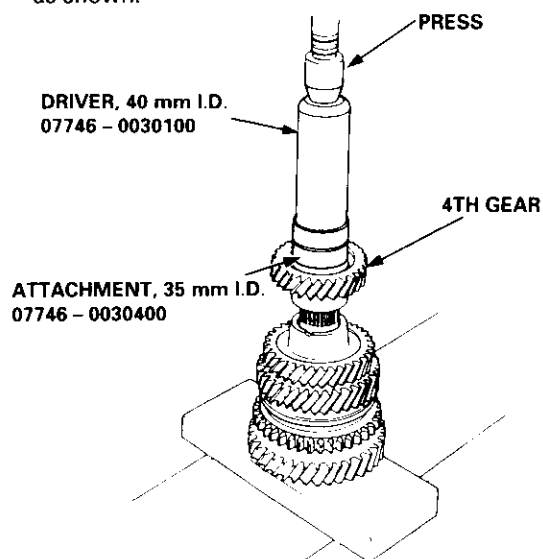
6. Assemble the friction damper, the needle bearing, and 2nd gear, then install them by aligning the fingers on the friction damper and the grooves in the 1st/2nd synchro hub with the fingers of the double cone synchro and the grooves on 2nd gear, as shown.
7. Install the spacer.



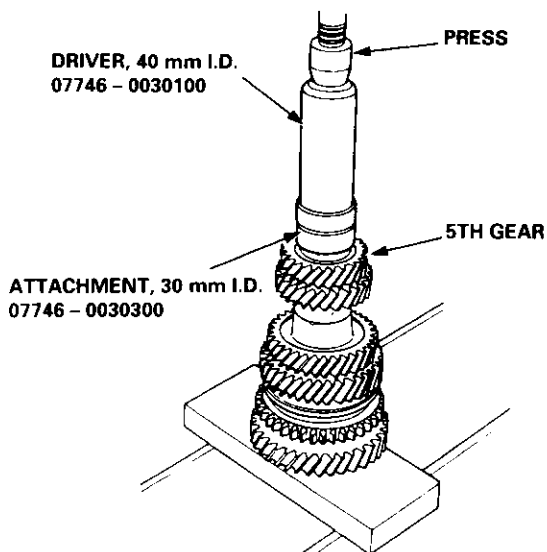
8. Install the parts assembled in steps 2 – 6 on the countershaft.



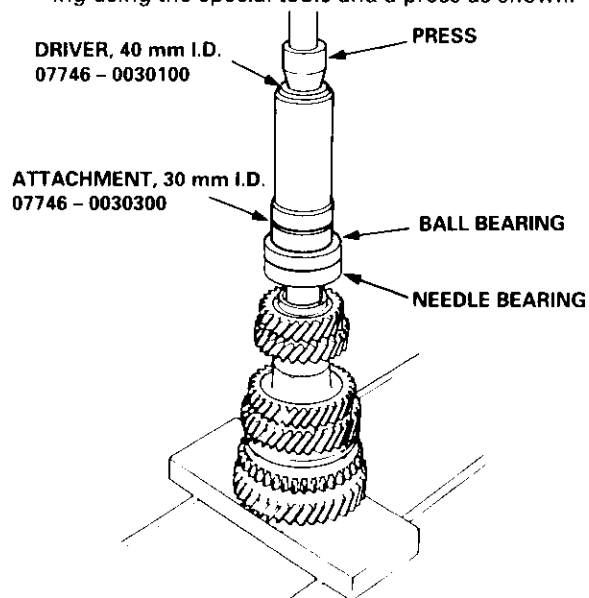
9. Support the countershaft on a steel block, and install 4th gear using the special tools and a press, as shown.



10. Support the countershaft on a steel block, and install 5th gear using the special tools and a press, as shown.



11. Install the needle bearing, then install the ball bearing using the special tools and a press as shown.

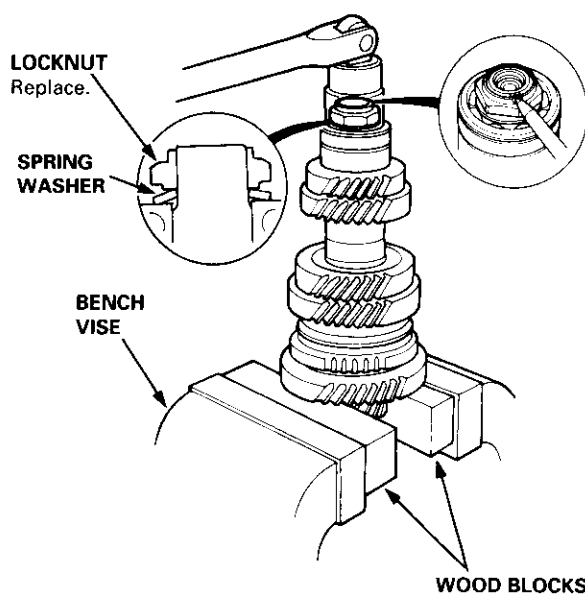


12. Securely clamp the countershaft assembly in a bench vise with wood blocks.

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

LOCKNUT

108 → 0 → 108 N·m (11.0 → 0 → 11.0 kgf·m,
80 → 0 → 80 lbf·ft)

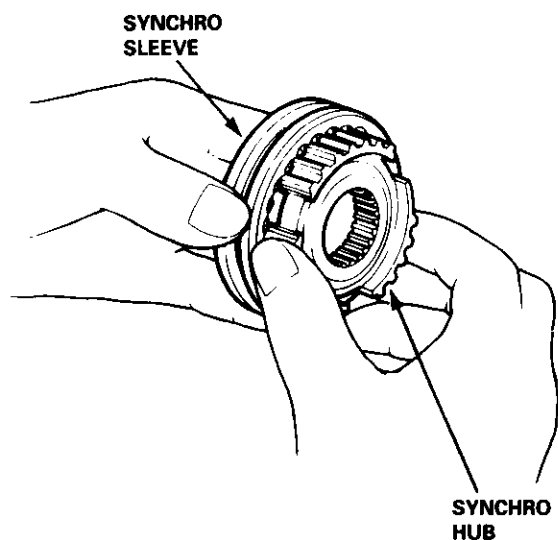


Synchro Sleeve, Synchro Hub

Inspection

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

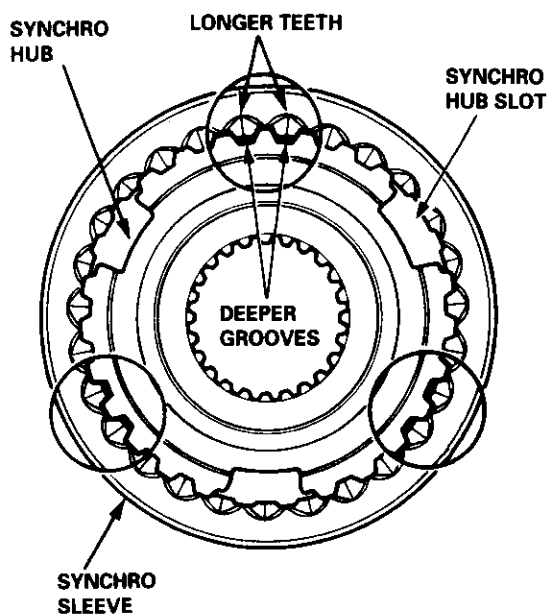
NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



Installation

When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.

CAUTION: Do not install the synchro sleeve with its longer teeth in the synchro hub slots, because it will damage the spring ring.



Synchro Ring, Gear



Inspection

1. Inspect the synchro ring and gear.

A: Inspect the inside of the synchro ring for wear.

B: Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).



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



D: Inspect the gear hub thrust surface for wear.

E: Inspect the cone surface for wear and roughness.

F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.

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

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

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

Synchro Ring-to-Gear Clearance

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

Service Limit: 0.4 mm (0.02 in)

Double Cone Synchro-to-Gear Clearance

Standard:

(A): (Outer Synchro Ring to Synchro Cone)

0.5 – 1.0 mm (0.02 – 0.04 in)

(B): (Synchro Cone to Gear)

0.5 – 1.0 mm (0.02 – 0.04 in)

(C): (Outer Synchro Ring to Gear)

0.95 – 1.68 mm (0.037 – 0.066 in)

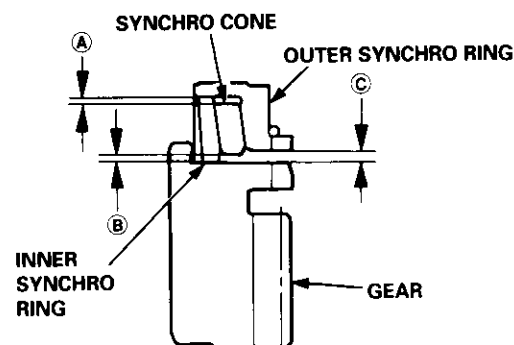
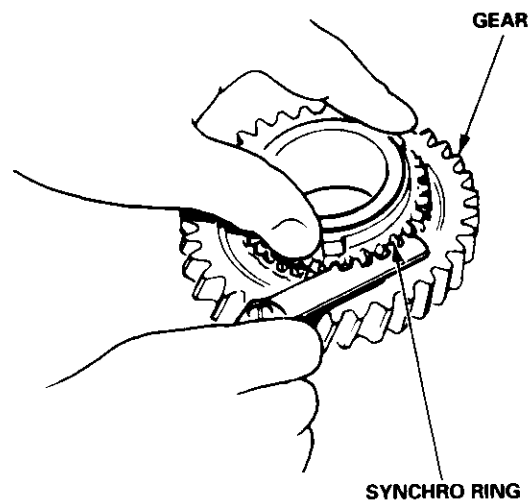
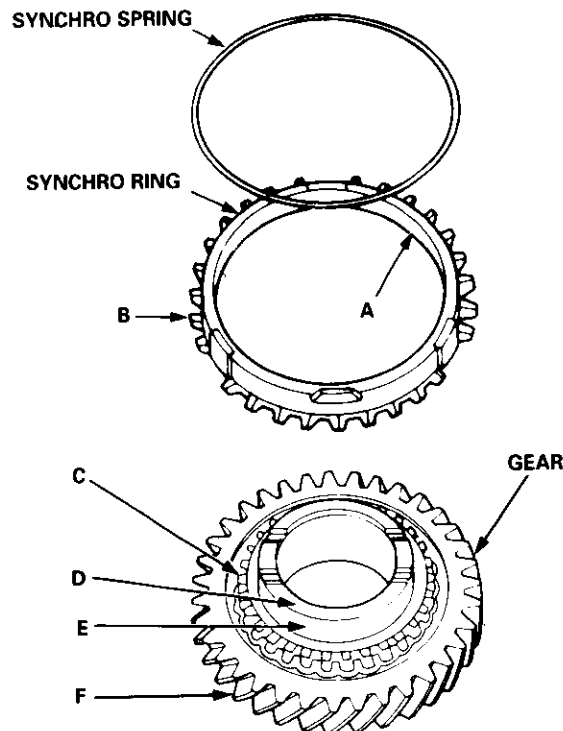
Service Limit:

(A): 0.3 mm (0.01 in)

(B): 0.3 mm (0.01 in)

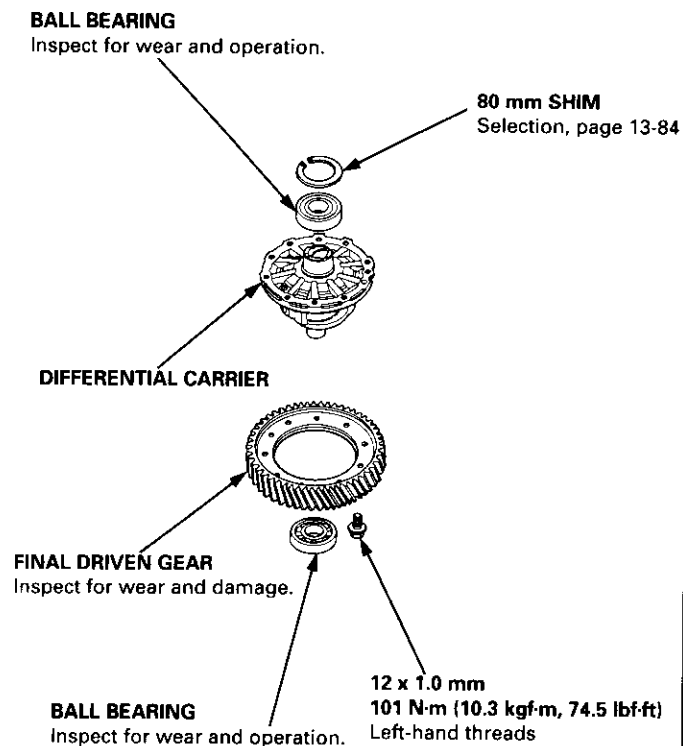
(C): 0.6 mm (0.02 in)

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



Differential

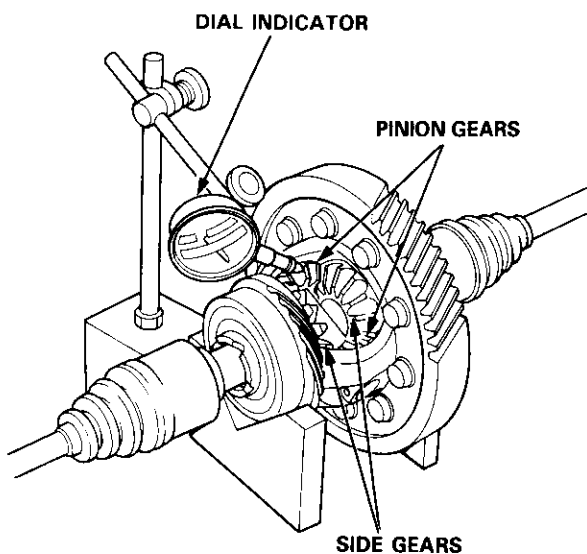
Index



Backlash Inspection

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

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

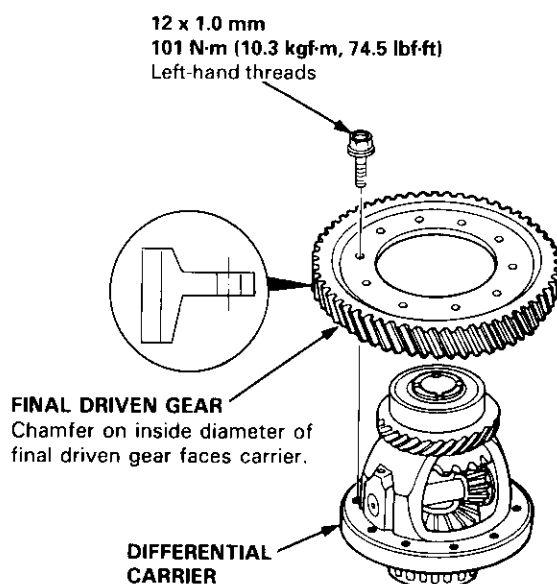




Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, and remove the final driven gear from the differential carrier.

NOTE: The final driven gear bolts have left-hand threads.

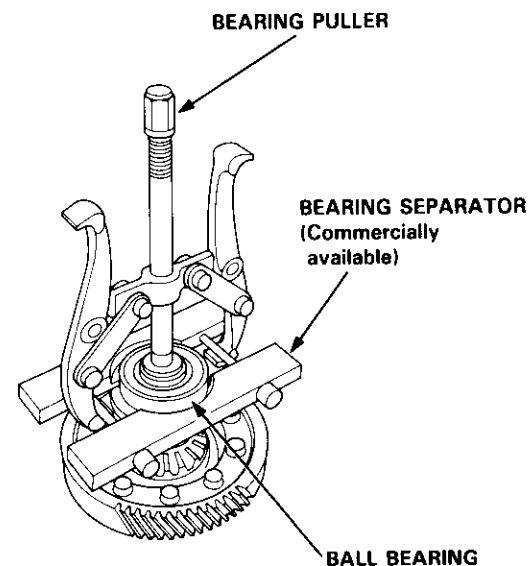


2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

Bearing Replacement

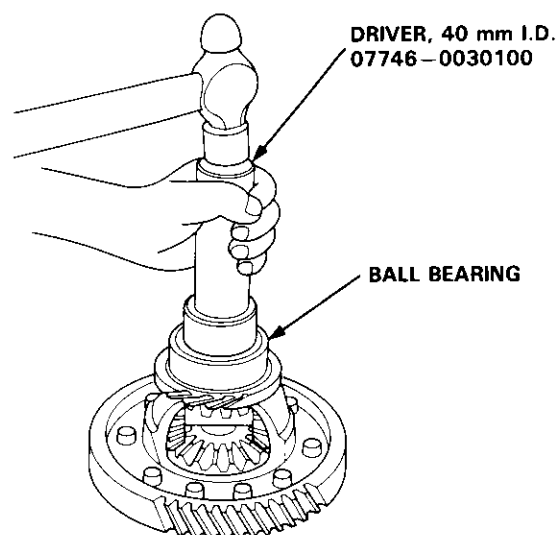
NOTE: Check the ball bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove the ball bearings using a standard bearing puller and bearing separator as shown.



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

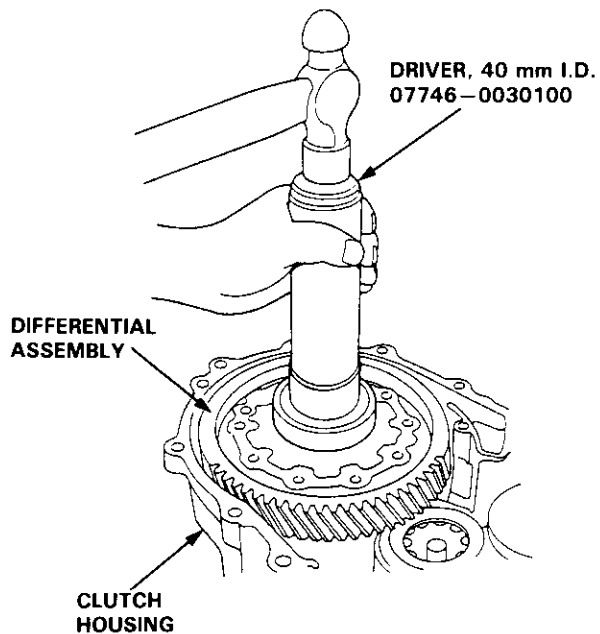
NOTE: Drive the bearings squarely until they bottom against the carrier.



Differential

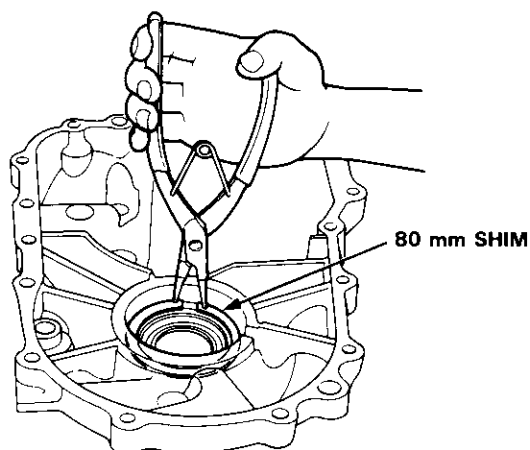
Thrust Shim Adjustment

1. Install the differential assembly, making sure it bottoms in the clutch housing, using the special tool as shown.



2. Install the 80 mm shim.

NOTE: Install the 80 mm shim that was removed.



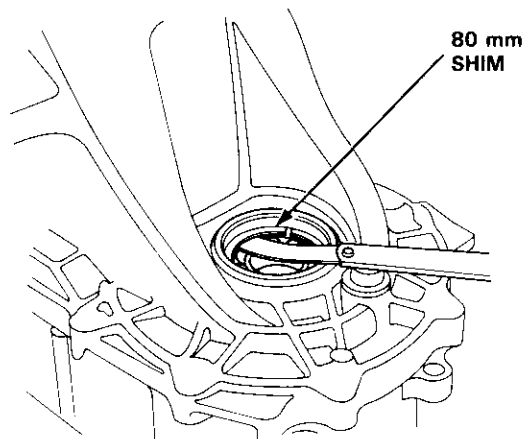
3. Install the transmission housing (see page 13-94).

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

4. Tighten the transmission housing attaching bolts (see page 13-94).

**8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)**

5. Use the special tool to bottom the differential assembly in the clutch housing.
6. Measure clearance between the 80 mm shim and bearing outer race in the transmission housing.





7. If the clearance is not within the standard, select a new 80 mm shim from the following table.

Standard: 0 – 0.10 mm (0 – 0.004 in)

80 mm Shim

	Part Number	Thickness
A	41441 – PL3 – B00	1.0 mm (0.0394 in)
B	41442 – PL3 – B00	1.1 mm (0.0433 in)
C	41443 – PL3 – B00	1.2 mm (0.0472 in)
D	41444 – PL3 – B00	1.3 mm (0.0512 in)
E	41445 – PL3 – B00	1.4 mm (0.0551 in)
F	41446 – PL3 – B00	1.5 mm (0.0591 in)
G	41447 – PL3 – B00	1.6 mm (0.0630 in)
H	41448 – PL3 – B00	1.7 mm (0.0669 in)
J	41449 – PL3 – B00	1.8 mm (0.0709 in)
K	41450 – PL3 – B00	1.05 mm (0.0413 in)
L	41451 – PL3 – B00	1.15 mm (0.0453 in)
M	41452 – PL3 – B00	1.25 mm (0.0492 in)
N	41453 – PL3 – B00	1.35 mm (0.0532 in)
P	41454 – PL3 – B00	1.45 mm (0.0571 in)
Q	41455 – PL3 – B00	1.55 mm (0.0610 in)
R	41456 – PL3 – B00	1.65 mm (0.0650 in)
S	41457 – PL3 – B00	1.75 mm (0.0689 in)

NOTE: If the clearance measured in step 6 is within the standard, it is not necessary to go to step 9.

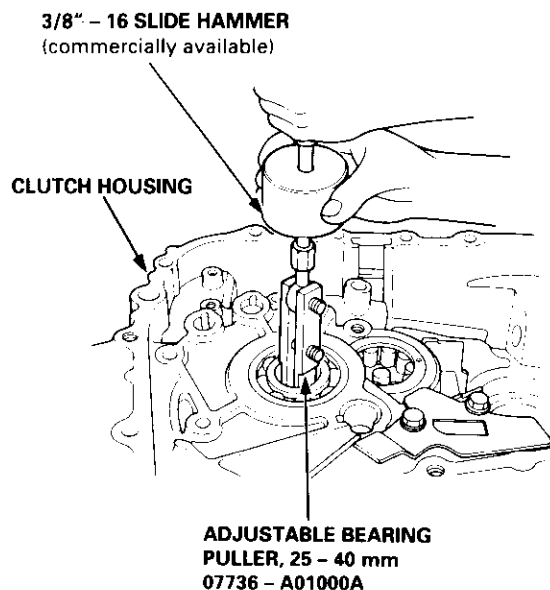
8. Remove the bolts and transmission housing.
9. Replace the 80 mm shim selected in step 7, then recheck the clearance.
10. Reassemble the transmission and install the transmission housing.

Clutch Housing Bearing

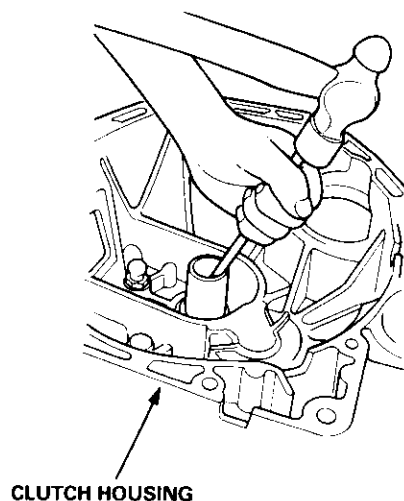
Replacement

Mainshaft:

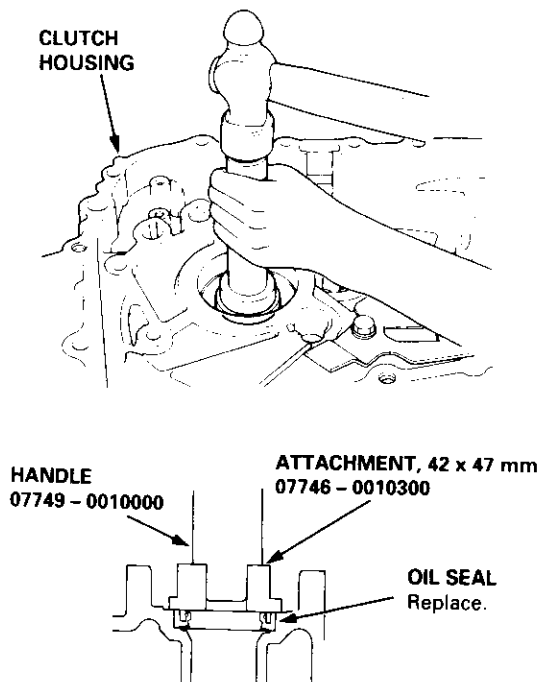
1. Remove the ball bearing using the special tools as shown.



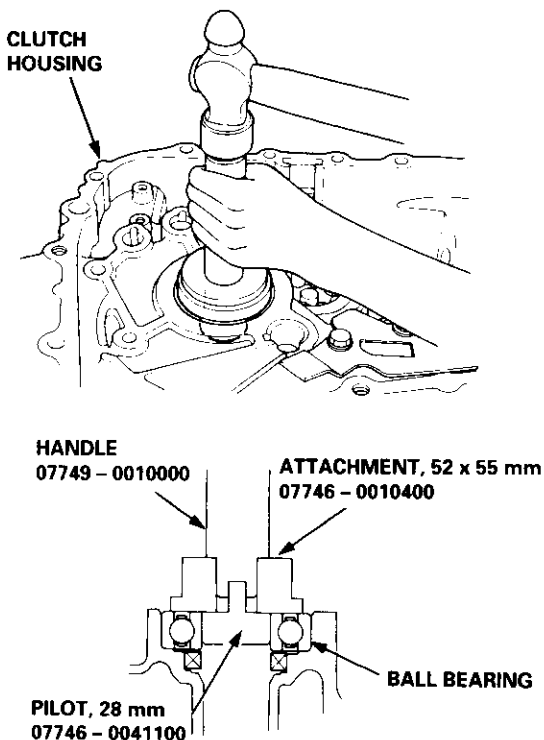
2. Remove the oil seal from the clutch housing.



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



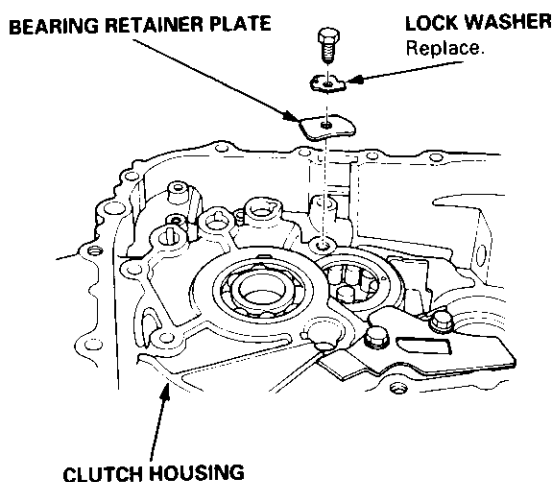
4. Drive the ball bearing into the clutch housing using the special tools as shown.





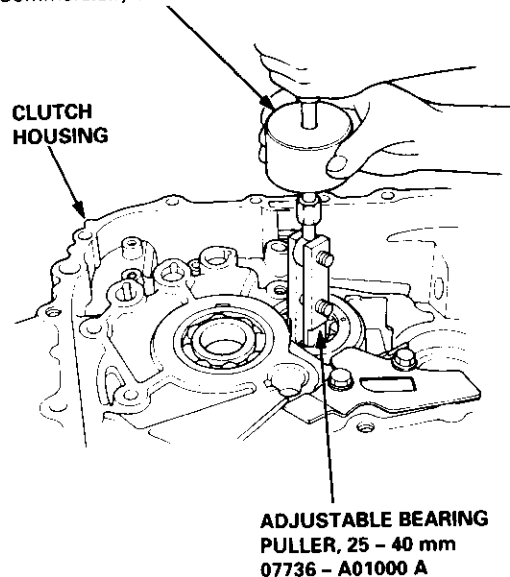
Countershaft:

1. Bend the tab on the lock washer down, then remove the bolt and bearing retainer plate.



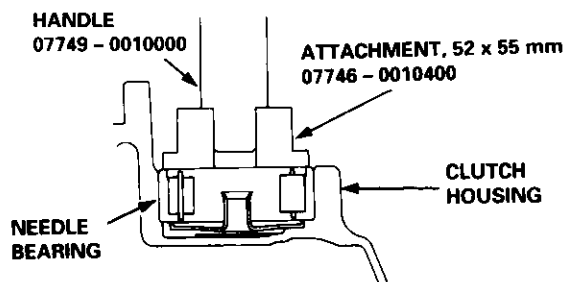
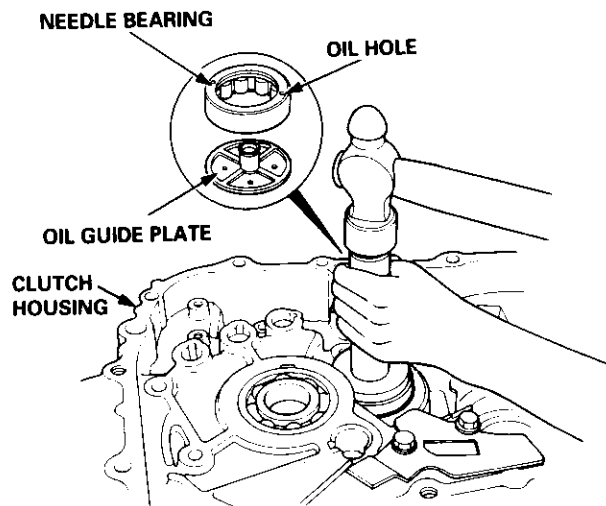
2. Remove the needle bearing using the special tools as shown, then remove the oil guide plate.

3/8" - 16 SLIDE HAMMER
(Commercially available)



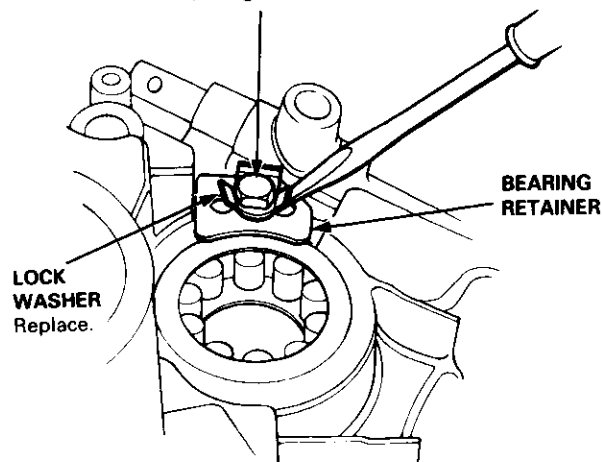
3. Position the oil guide plate and new needle bearing in the bore of the clutch housing, then drive in the needle bearing using the special tools as shown.

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



4. Install the bearing retainer plate and new lock washer, then bend the tab against the bolt head.

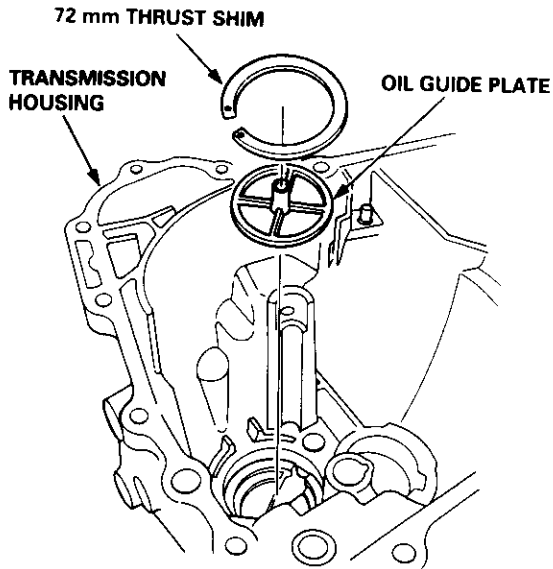
8 x 10 mm
15 N-m (1.5 kgf-m, 11 lbf-ft)



Mainshaft Thrust Clearance

Adjustment

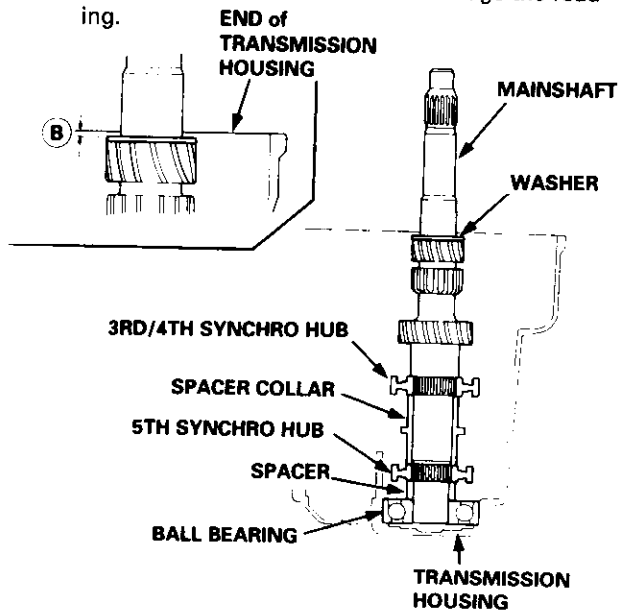
1. Remove the 72 mm thrust shim and oil guide plate from the transmission housing.



2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, spacer, and ball bearing on the mainshaft, then install the above assembly in the transmission housing.
3. Install the washer on the mainshaft.
4. Measure distance (B) between the end of the transmission housing and washer.

NOTE:

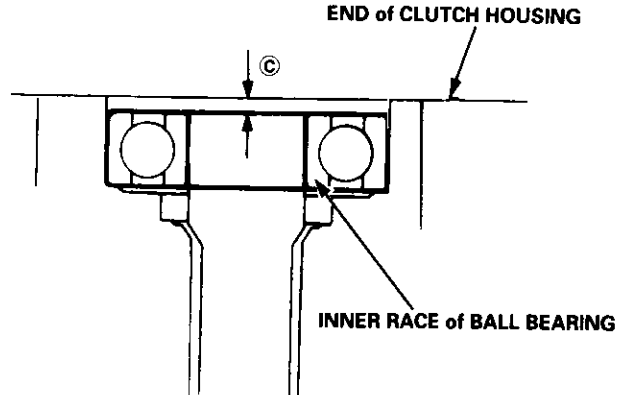
- Use a straight edge and vernier caliper.
- Measure at three locations and average the reading.



5. Measure distance (C) between the end of the clutch housing and bearing inner race.

NOTE:

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



6. Select the proper 72 mm thrust shim from the chart by using the formula below.

NOTE: Use only one 72 mm thrust shim.

Shim Selection Formula:

From the measurements you made in steps 4 and 5:

- Add distance (C) (step 5) to distance (B) (step 4).
- From this number, subtract 0.93 (which is the midpoint of the flex range of the clutch housing bearing spring washer).
- Take this number and compare it to the available shim sizes in the chart.

(For example)

B: 2.39	2.61
+ C: 0.22	- 0.93
<hr/>	<hr/>
= 2.61	= 1.68

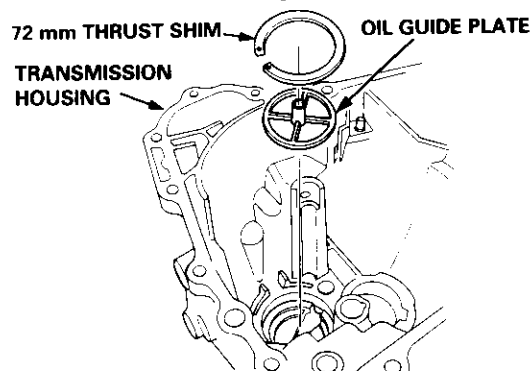
- Try the 1.68 mm (0.0661 in) shim.



72 mm Thrust Shim

	Part Number	Thickness
A	23931 - P21 - 000	0.60 mm (0.0236 in)
B	23932 - P21 - 000	0.63 mm (0.0248 in)
C	23933 - P21 - 000	0.66 mm (0.0260 in)
D	23934 - P21 - 000	0.69 mm (0.0272 in)
E	23935 - P21 - 000	0.72 mm (0.0283 in)
F	23936 - P21 - 000	0.75 mm (0.0295 in)
G	23937 - P21 - 000	0.78 mm (0.0307 in)
H	23938 - P21 - 000	0.81 mm (0.0319 in)
I	23939 - P21 - 000	0.84 mm (0.0331 in)
J	23940 - P21 - 000	0.87 mm (0.0343 in)
K	23941 - P21 - 000	0.90 mm (0.0354 in)
L	23942 - P21 - 000	0.93 mm (0.0366 in)
M	23943 - P21 - 000	0.96 mm (0.0378 in)
N	23944 - P21 - 000	0.99 mm (0.0390 in)
O	23945 - P21 - 000	1.02 mm (0.0402 in)
P	23946 - P21 - 000	1.05 mm (0.0413 in)
Q	23947 - P21 - 000	1.08 mm (0.0425 in)
R	23948 - P21 - 000	1.11 mm (0.0437 in)
S	23949 - P21 - 000	1.14 mm (0.0449 in)
T	23950 - P21 - 000	1.17 mm (0.0461 in)
U	23951 - P21 - 000	1.20 mm (0.0472 in)
V	23952 - P21 - 000	1.23 mm (0.0484 in)
W	23953 - P21 - 000	1.26 mm (0.0496 in)
X	23954 - P21 - 000	1.29 mm (0.0508 in)
Y	23955 - P21 - 000	1.32 mm (0.0520 in)
Z	23956 - P21 - 000	1.35 mm (0.0531 in)
AA	23957 - P21 - 000	1.38 mm (0.0543 in)
AB	23958 - P21 - 000	1.41 mm (0.0555 in)
AC	23959 - P21 - 000	1.44 mm (0.0567 in)
AD	23960 - P21 - 000	1.47 mm (0.0579 in)
AE	23961 - P21 - 000	1.50 mm (0.0591 in)
AF	23962 - P21 - 000	1.53 mm (0.0602 in)
AG	23963 - P21 - 000	1.56 mm (0.0614 in)
AH	23964 - P21 - 000	1.59 mm (0.0626 in)
AI	23965 - P21 - 000	1.62 mm (0.0638 in)
AJ	23966 - P21 - 000	1.65 mm (0.0650 in)
AK	23967 - P21 - 000	1.68 mm (0.0661 in)
AL	23968 - P21 - 000	1.71 mm (0.0673 in)
AM	23969 - P21 - 000	1.74 mm (0.0685 in)
AN	23970 - P21 - 000	1.77 mm (0.0697 in)
AO	23971 - P21 - 000	1.80 mm (0.0709 in)

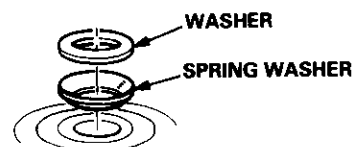
7. Install the thrust shim selected and oil guide plate in the transmission housing.



8. Install the spring washer and washer on the ball bearing.

NOTE:

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



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

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

**8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)**

12. Tap the mainshaft with a plastic hammer.

(cont'd)

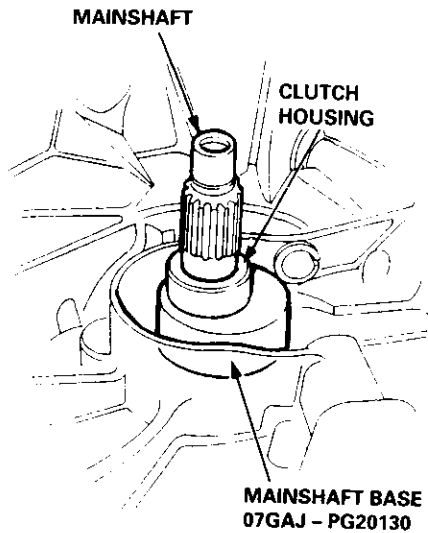
Mainshaft Thrust Clearance

Adjustment (cont'd)

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

CAUTION: Measurement should be made at room temperature.

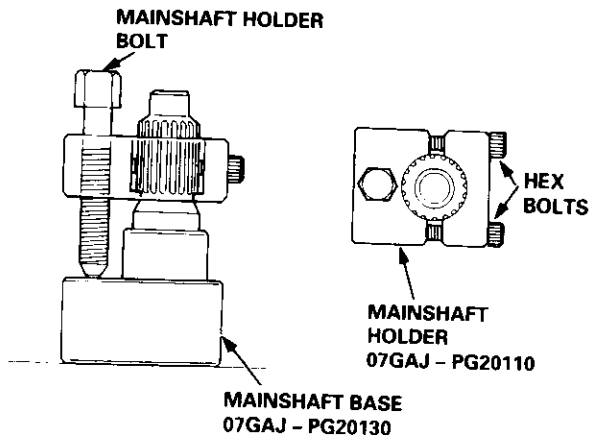
- a. Slide the mainshaft base over the mainshaft.



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

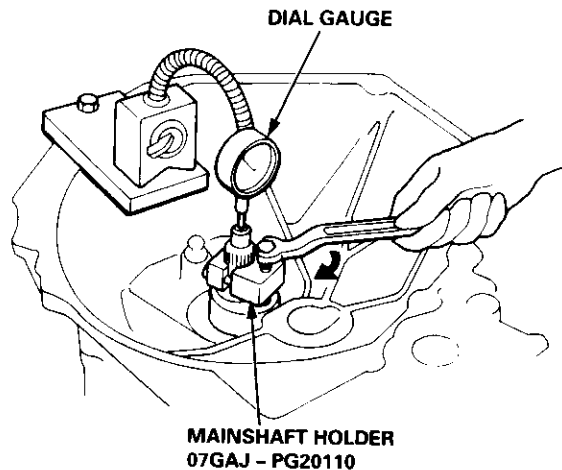
NOTE:

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



- c. Seat the mainshaft fully by tapping its end with a plastic hammer.
- d. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.
- e. Zero a dial gauge on the end of the mainshaft.
- f. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

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



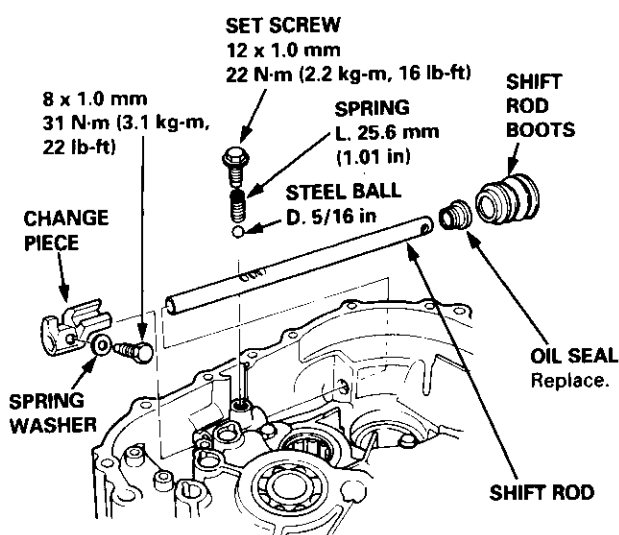
- g. If the reading is within the standard, the clearance is correct.
- If the reading is not within the standard, recheck the shim thickness.

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

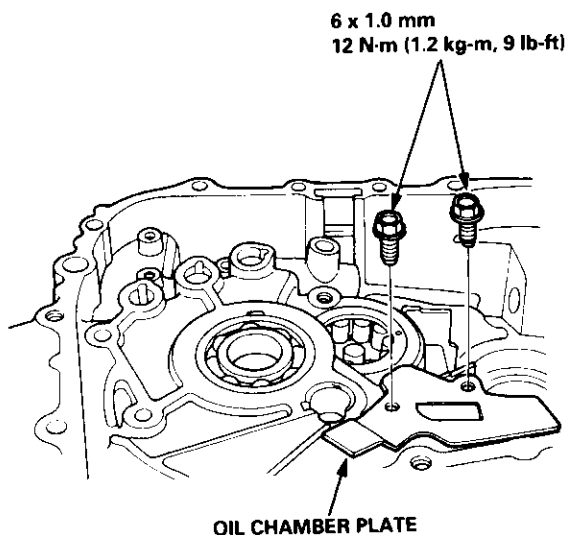


Reassembly

1. Install the new oil seal.
2. Set the change piece.
3. Install the shift rod.
4. Install the steel ball, the spring, and the set screw.
5. Install the spring washer and change piece attaching bolt.
6. Install the shift rod boots.

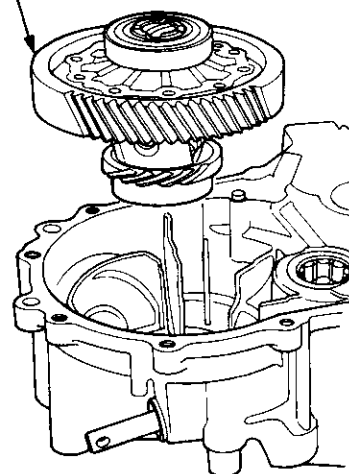


7. Install the oil chamber plate.



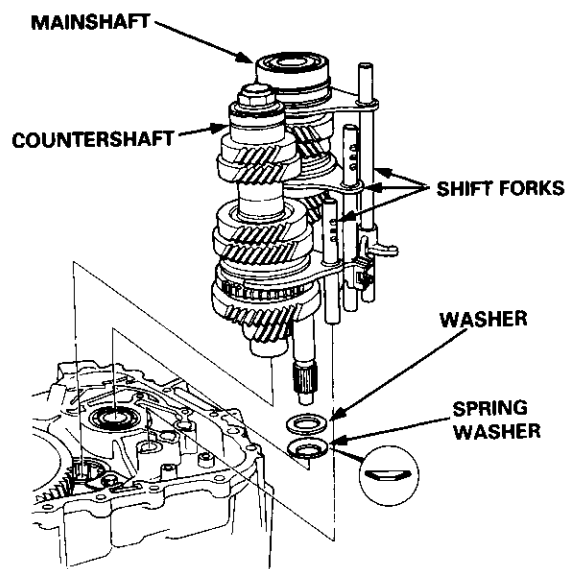
8. Install the differential assembly.

DIFFERENTIAL ASSEMBLY



9. Set the spring washer and the washer.
10. Install the mainshaft, the countershaft, and the shift fork assemblies.

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

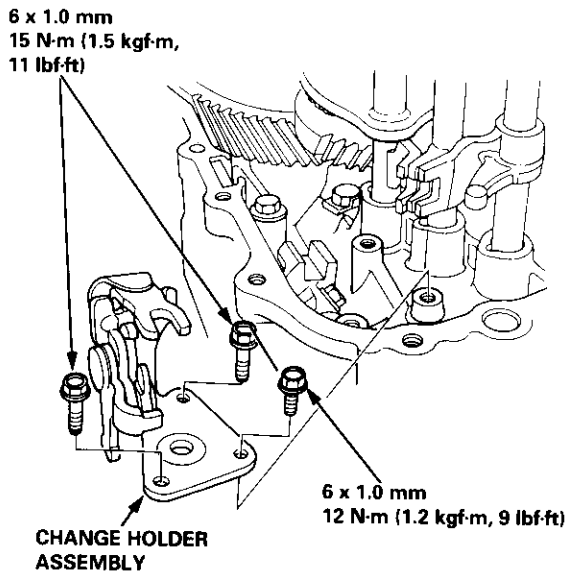


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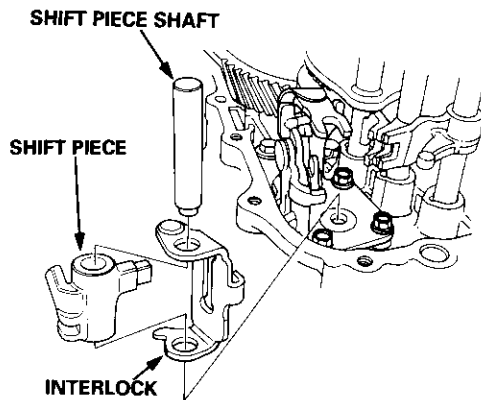
Transmission

Reassembly (cont'd)

11. Install the change holder assembly.

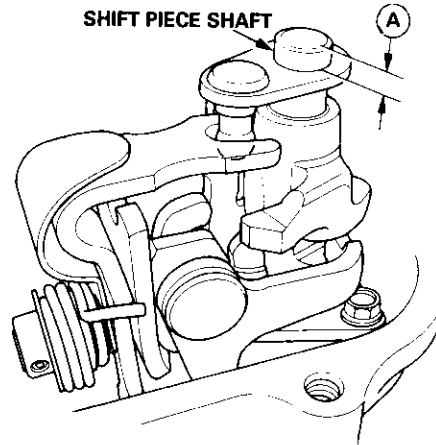


12. Install the shift piece and the interlock, then install the shift piece shaft.

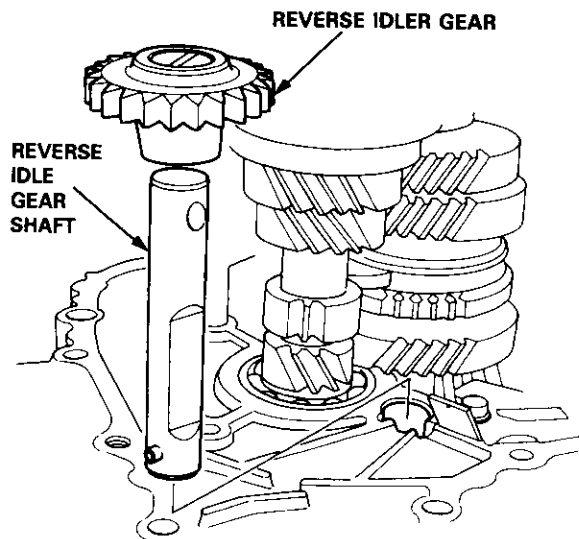


13. Measure the distance **A** after mounting the shift piece shaft. If it's incorrect, check the installation.

Distance **A**: 11.9 – 12.3 mm (0.47 – 0.48 in)

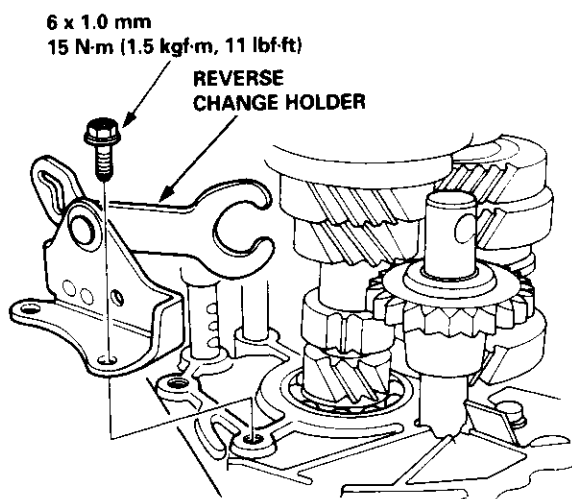


14. Install the reverse idler gear and the reverse idler gear shaft.

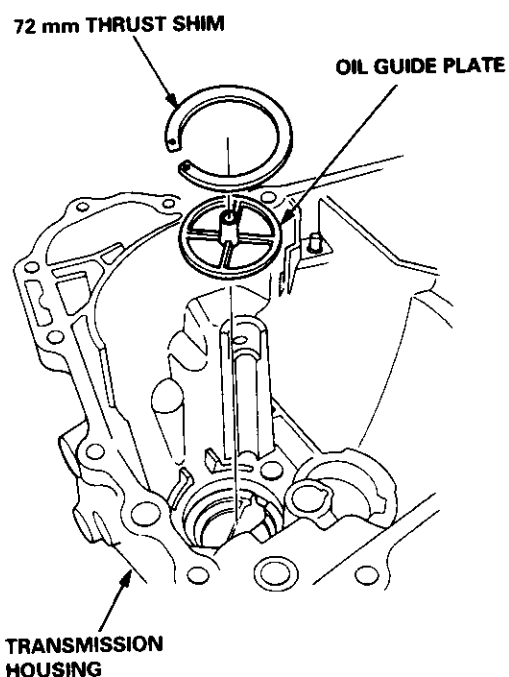




15. Install the reverse change holder.



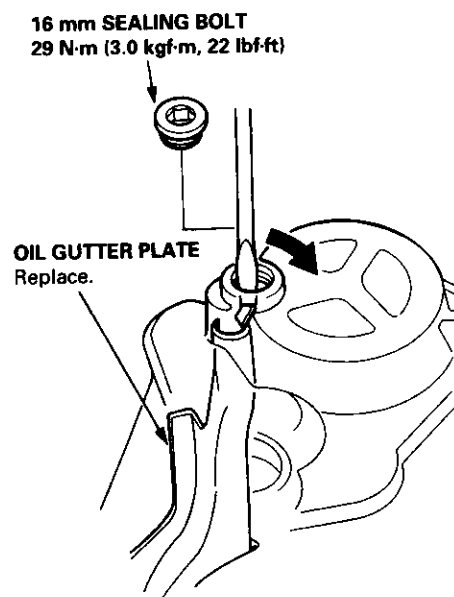
16. Install the oil guide plate and the 72 mm thrust shim into the transmission housing.



17. Install the oil gutter plate.

18. Bend the hook of the oil gutter plate, then install the 16 mm sealing bolt.

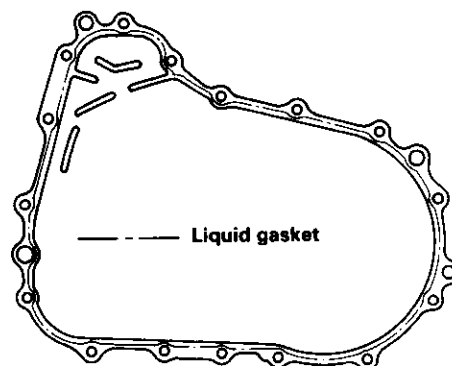
NOTE: Apply liquid gasket (P/N 08718 - 0001 or 08718 - 0003) to the threads.



19. Apply liquid gasket to the surface of the transmission housing as shown.

NOTE:

- Use liquid gasket (P/N 08718 - 0001 or 08718 - 0003).
- Remove the dirty oil from the sealing surface.
- If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings.
- Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

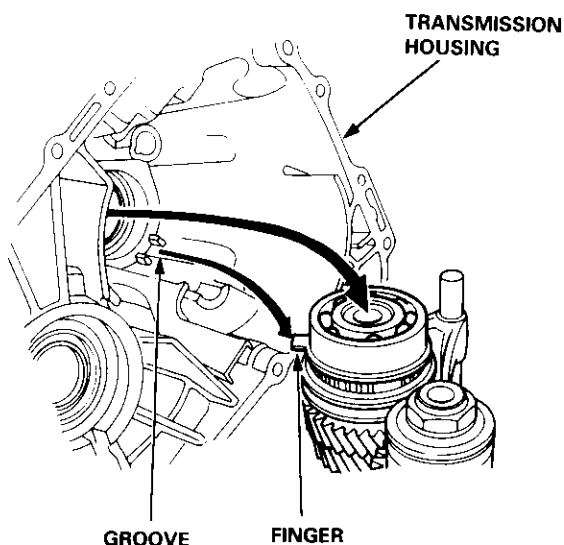


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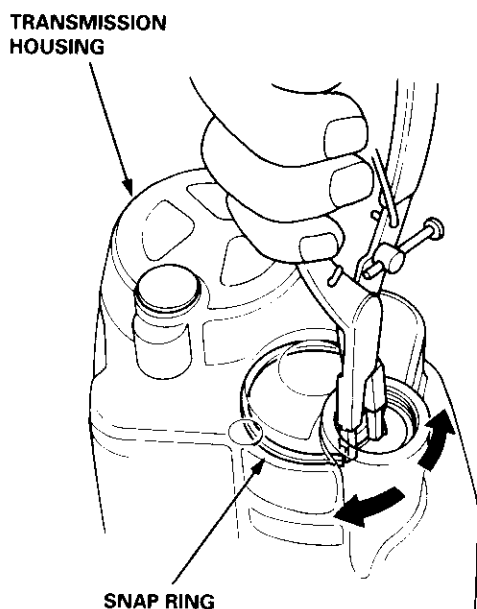
Transmission

Reassembly (cont'd)

20. Install the dowel pins.
21. Install the transmission housing by aligning the groove in the housing with the finger on the stop ring.

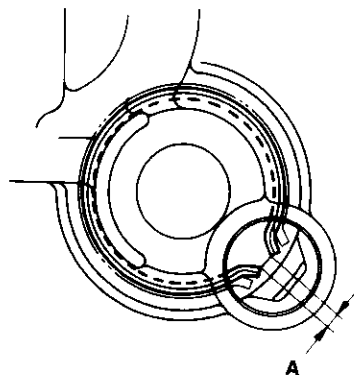


22. Lower the transmission housing with the snap ring pliers, and set the snap ring in the groove of the countershaft bearing.



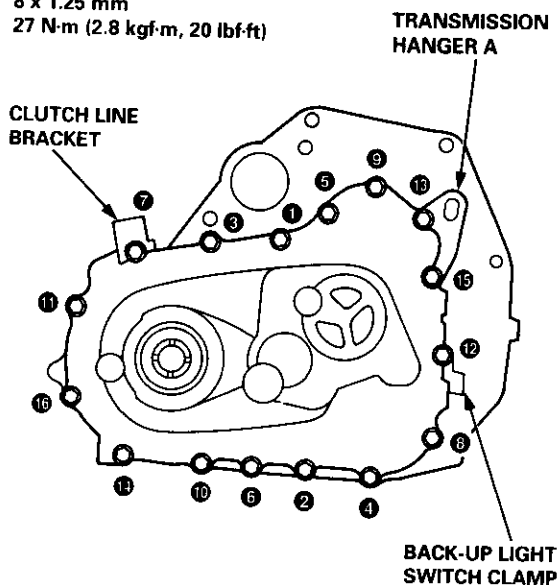
23. Check that the snap ring is securely seated in the groove of the countershaft bearing.

Dimension **A** as installed: 4.6 – 8.3 mm
(0.181 – 0.327 in)



24. Install the clutch line bracket, transmission hanger A and back-up light switch clamp, then tighten the transmission housing attaching bolts in the numbered sequence shown below.

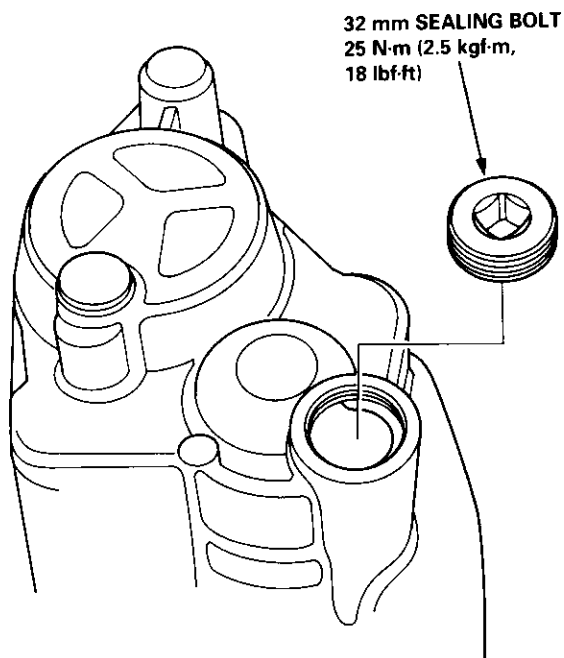
ATTACHING BOLTS
8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)



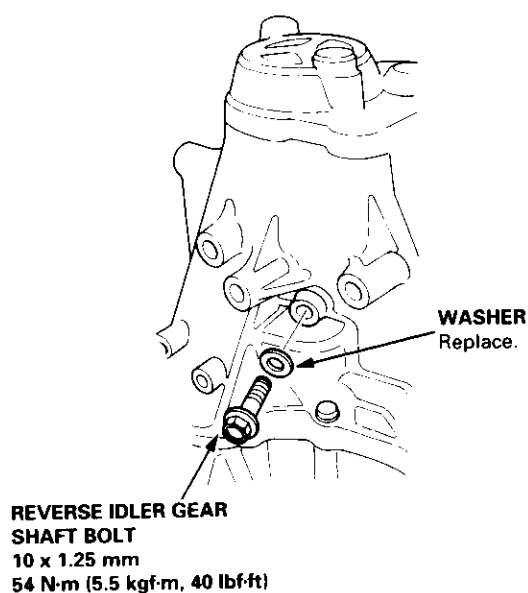


25. Install the 32 mm sealing bolt.

NOTE: Apply liquid gasket (P/N 08718 - 0001 or 08718 - 0003) to the threads.

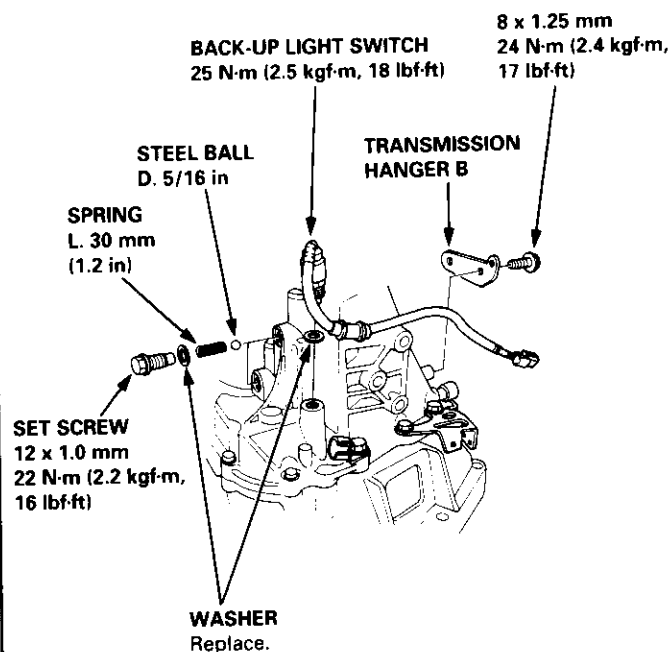


26. Tighten the reverse idler gear shaft bolt.



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

28. Install the back-up light switch and the transmission hanger B.

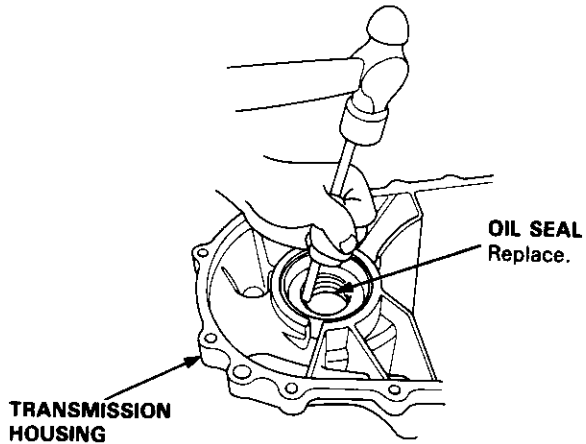


Oil Seals

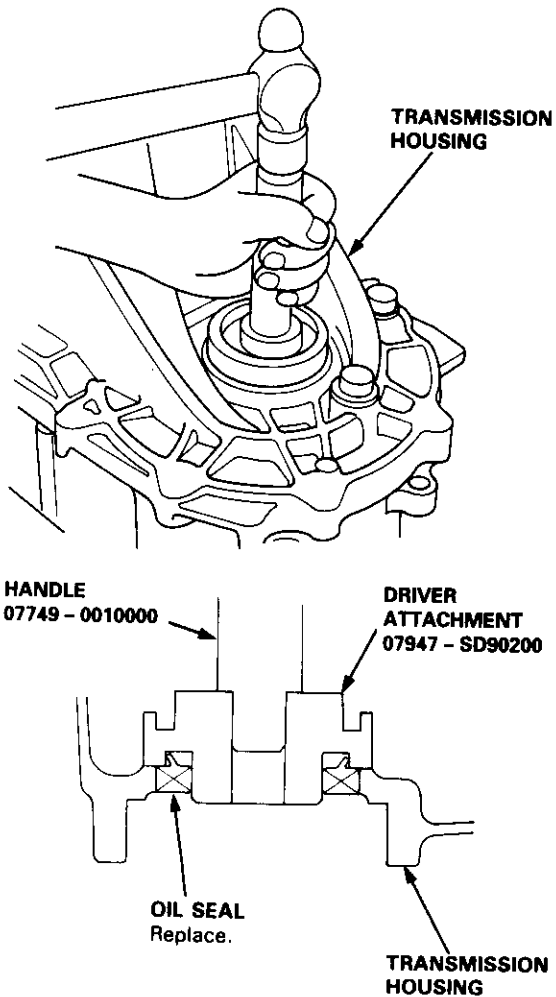
Replacement

Transmission Housing:

1. Remove the oil seal from the transmission housing.

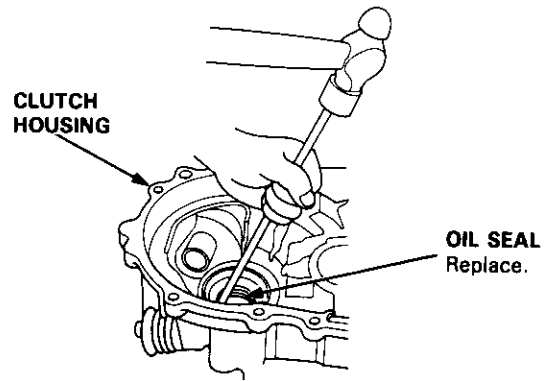


2. Install the oil seal into the transmission housing using the special tools as shown.

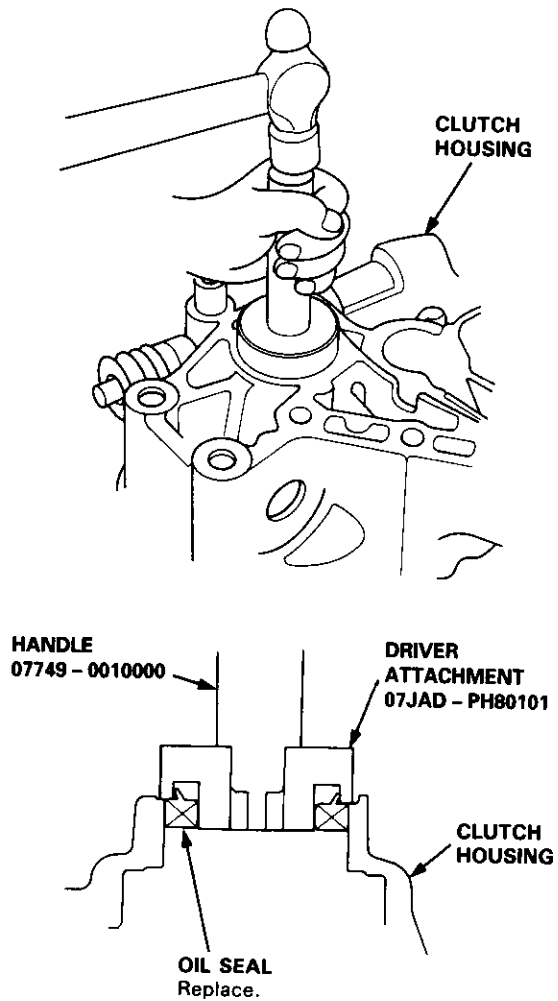


Clutch Housing:

1. Remove the oil seal from the clutch housing.



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



Gearshift Mechanism



Overhaul

NOTE:

- Inspect rubber parts for wear and damage when disassembling; replace any worn or damaged parts.
- Install the spring pin and the clip on the change joint as shown.
- Turn the shift rod boot so the hole is facing down as shown.
- Make sure the shift rod boot is installed on the shift rod.

