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This file was not scanned to deprive Mazda of any money - it was scanned due to the rareness of the original manuals and the overwhelming need of the RX-7 owner to have this information so that they can accurately troubleshoot problems. Perhaps if Mazda's dealerships could support the Rotary Engine it wouldn't be so necessary for the owners to do so.



Many thanks to Lenny Terris for scanning this.

Before beginning any service procedure, refer to the 1994 RX-7 Body Electrical Troubleshooting Manual; see section S for air bag system service warnings and section J1 for audio antitheft system alarm conditions.

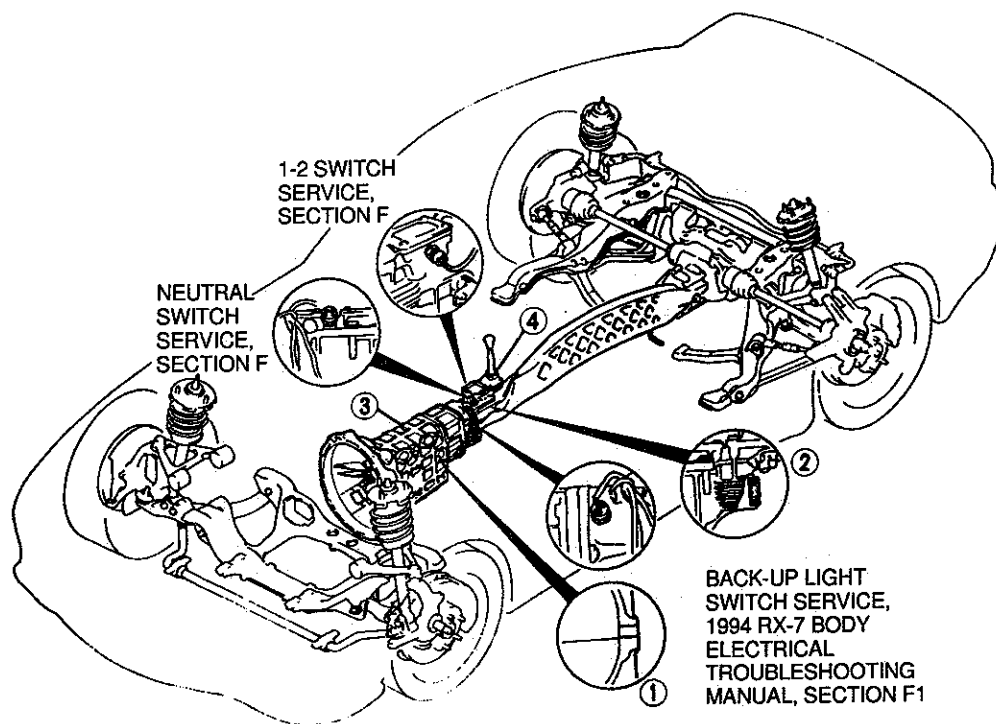
J

## MANUAL TRANSMISSION (R15M-D)

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## INDEX



## OIL SPECIFICATION

GRADE : API SERVICE GL-4 OR GL-5  
 ALL SEASON : SAE 75W-90  
 ABOVE 10°C (50°F) : SAE 80W-90  
 CAPACITY : 2.5 L (2.6 US qt, 2.2 Imp qt)

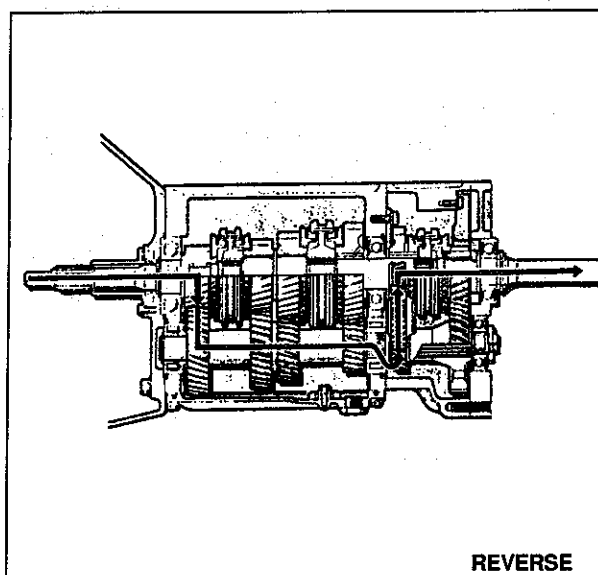
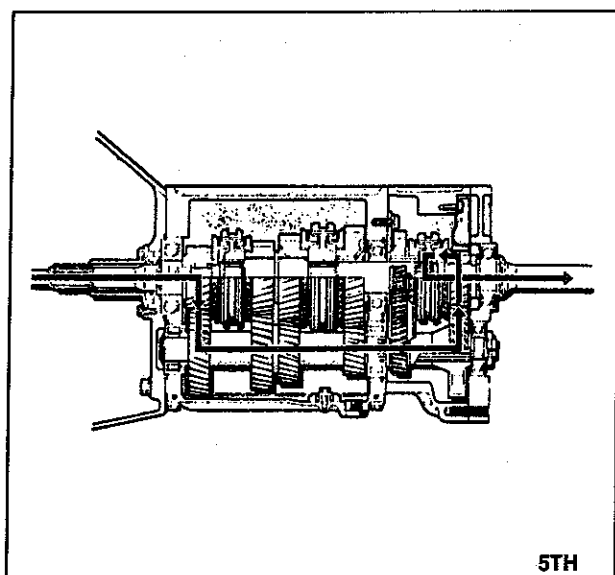
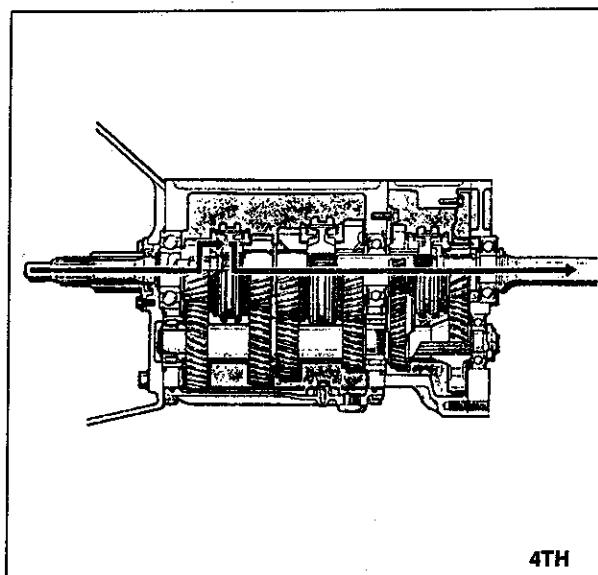
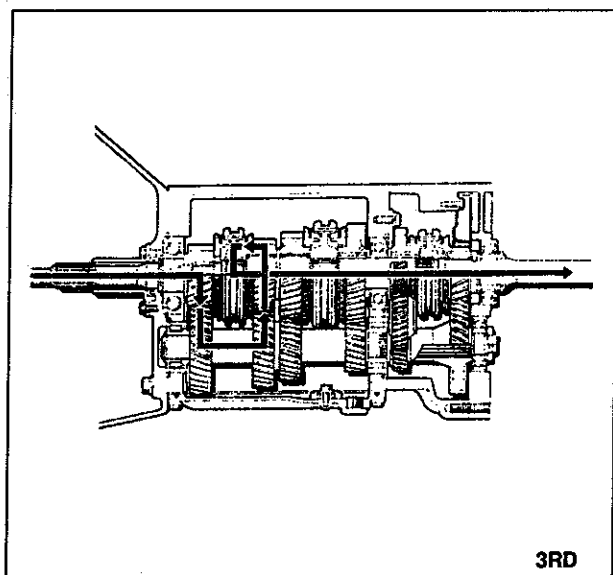
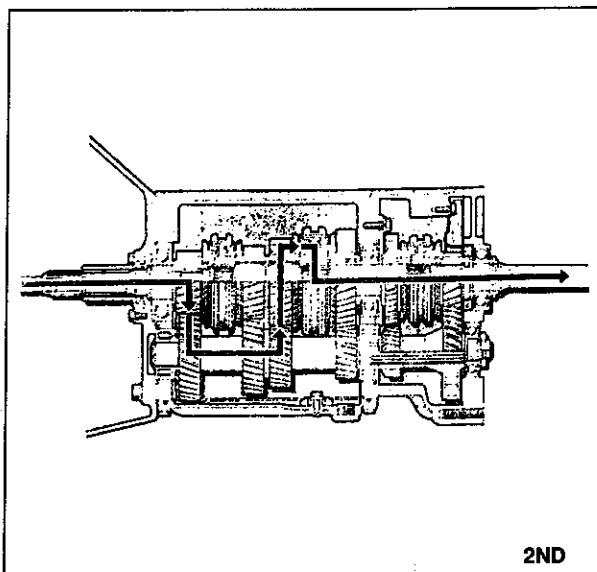
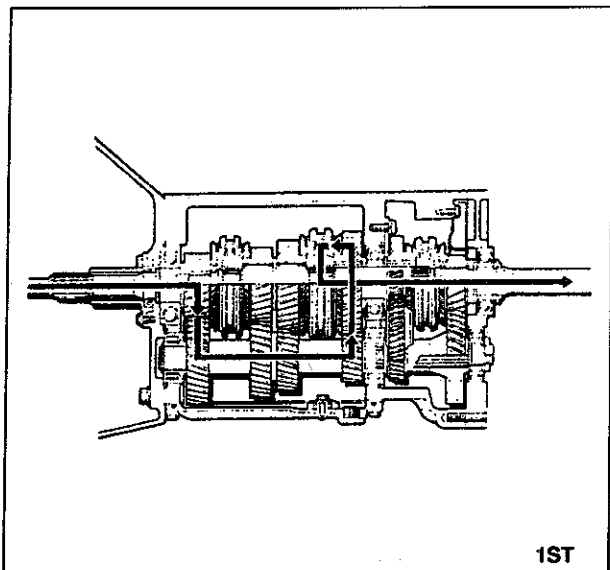
1. Transmission oil  
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 2. Oil seal (extension housing)  
 On-vehicle  
 replacement ... page J-7

3. Transmission  
 Removal ..... page J-10  
 Disassembly .. page J-13  
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4. Shift mechanism  
 Overhaul ..... page J-58

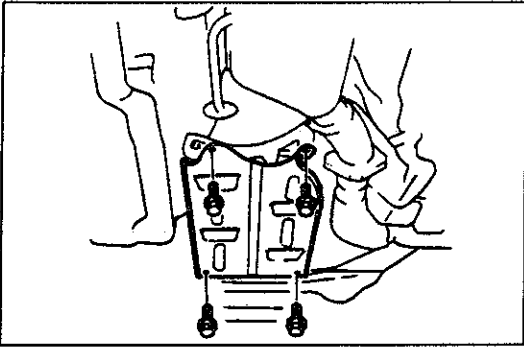


## POWERFLOW



## TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
<b>Abnormal noise</b>	Insufficient oil	Add oil	J-6
	Deterioration of oil quality	Replace with specified oil	J-6
	Worn bearing	Replace	—
	Worn contact surface of countershaft gear	Replace	J-24
	Worn contact surface of gears	Replace	J-16, 20, 24
	Excessive gear backlash	Replace	J-16, 20, 24
	Damaged gear teeth	Replace	J-16, 20, 24
<b>Difficult to shift</b>	Object caught in gears	Repair or replace	J-16, 20, 24
	Bent shift rod	Replace	J-16
	Insufficient oil	Add oil	J-6
	Deterioration of oil quality	Replace with specified oil	J-6
	Wear or play of shift fork or shift rod	Replace	J-16, 20
	Worn or damaged synchronizer ring (1st, 4th, 5th, Reverse)	Replace	J-16, 24
	Worn or damaged synchronizer assembly (2nd and 3rd)	Replace	J-24
	Worn synchronizer gear cone	Replace	J-16, 20, 24
	Poor contact of synchronizer ring and gear cone	Replace	J-16, 20, 24
	Excessive longitudinal play of gears	Replace	J-16, 20, 24
	Worn bearing	Replace	—
	Improper disengagement of clutch	Refer to section H	—
	Weak synchronizer key spring	Replace	J-16, 24
<b>Jumps out of gear</b>	Weak detent ball spring	Replace	J-16
	Worn shift fork	Replace	J-16, 20
	Worn clutch hub	Replace	J-16, 24
	Worn clutch hub sleeve	Replace	J-16, 24
	Worn gears	Replace	J-16, 20, 24
	Excessive gear backlash	Replace	J-16, 20, 24
	Worn bearing	Replace	—
	Loose engine mounts or transmission mounts	Tighten	—



## TRANSMISSION OIL

### INSPECTION

1. On level ground, jack up the vehicle and support it evenly on safety stands.
2. Remove the transmission cover.
3. Remove the filler plug.
4. Verify that the oil is up to the bottom of the filler plug hole.
5. If the oil level is low, add the specified oil through the filler plug port.
6. Install a new filler plug.

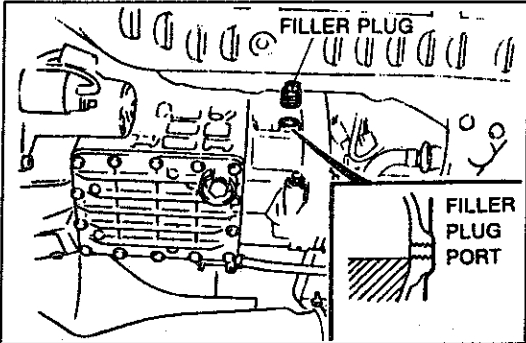
### Tightening torque:

25–39 N·m{2.5–4.0 kgf·m, 19–28 ft·lbf}

7. Install the transmission cover.

### Tightening torque:

7.9–10.7 N·m{80–110 kgf·cm, 70–95.4 in·lbf}



### REPLACEMENT

1. Remove the transmission cover.
2. Remove plug A (with washer) and B, and drain the oil into a suitable container.
3. Wipe both plugs clean.
4. Apply sealant to the B plug threads.
5. Install plug A (with new washer) and B.

### Tightening torque:

A: 40–58 N·m{4.0–6.0 kgf·m, 29–43 ft·lbf}

B: 21–31 N·m{2.1–3.2 kgf·m, 16–23 ft·lbf}

6. Remove the filler plug and add the specified oil through the filler plug port until the level rises to the bottom of the port.

### Specified oil:

Grade: API service GL-4 or GL-5

All-season: SAE 75W-90

Above 10°C {50°F}: SAE 80W-90

Capacity: 2.5 L {2.6 US qts, 2.2 Imp qts}

7. Install a new filler plug.

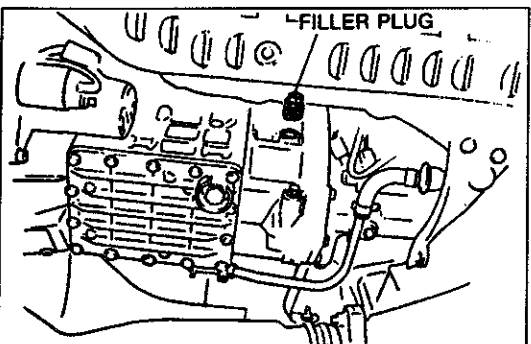
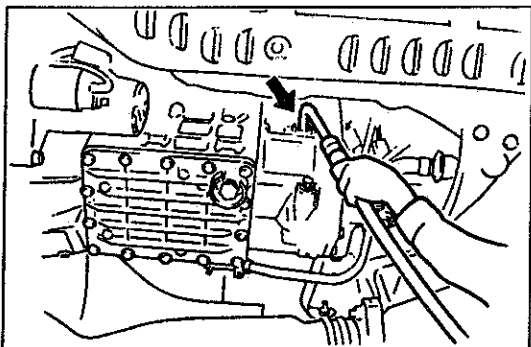
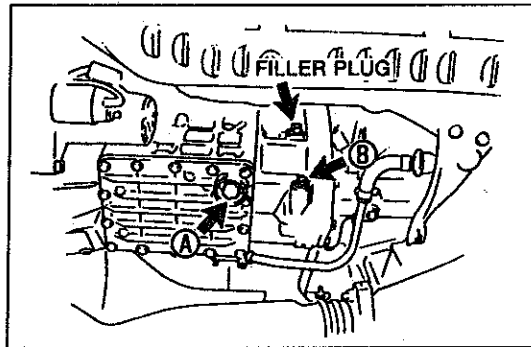
### Tightening torque:

25–39 N·m{2.5–4.0 kgf·m, 19–28 ft·lbf}

8. Install the transmission cover.




### Tightening torque:

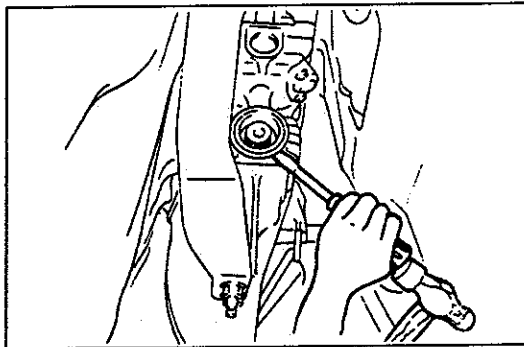
7.9–10.7 N·m{80–110 kgf·cm, 70–95.4 in·lbf}



## OIL SEAL (EXTENSION HOUSING)

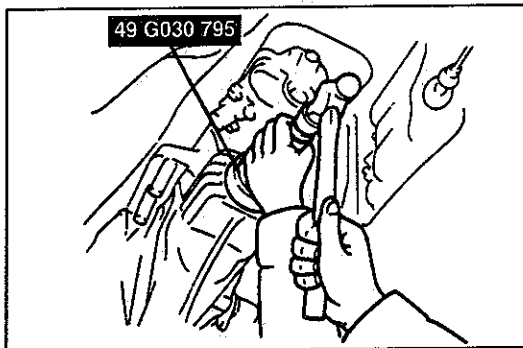
PREPARATION  
SST

<p>49 G030 795</p> <p>Installer, oil seal</p> 	<p>For installation of oil seal</p>	<p>49 G030 796</p> <p>Body (Part of 49 G030 795)</p> 	<p>For installation of oil seal</p>
<p>49 G030 797</p> <p>Handle (Part of 49 G030 795)</p> 	<p>For installation of oil seal</p>		



## ON-VEHICLE REPLACEMENT

1. Remove the transmission cover.
2. Remove the propeller shaft. (Refer to section L.)
3. Remove the oil seal.



4. Apply the specified oil to the new oil seal.
5. Install the oil seal by using the SST.
6. Install the propeller shaft. (Refer to section L.)
7. Inspect the oil level. (Refer to page J-6)
8. Install the transmission cover.

## Tightening torque:


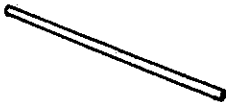
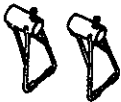
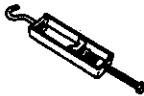

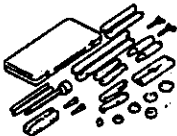






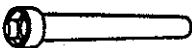
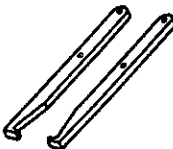
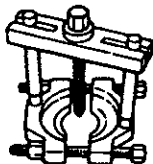
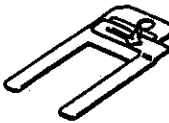
7.9-10.7 N·m{80-110 kgf·cm, 70-95.4 in·lbf}

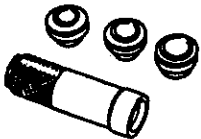


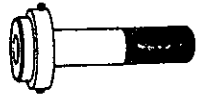
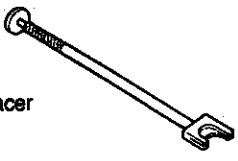


## TRANSMISSION

## PREPARATION

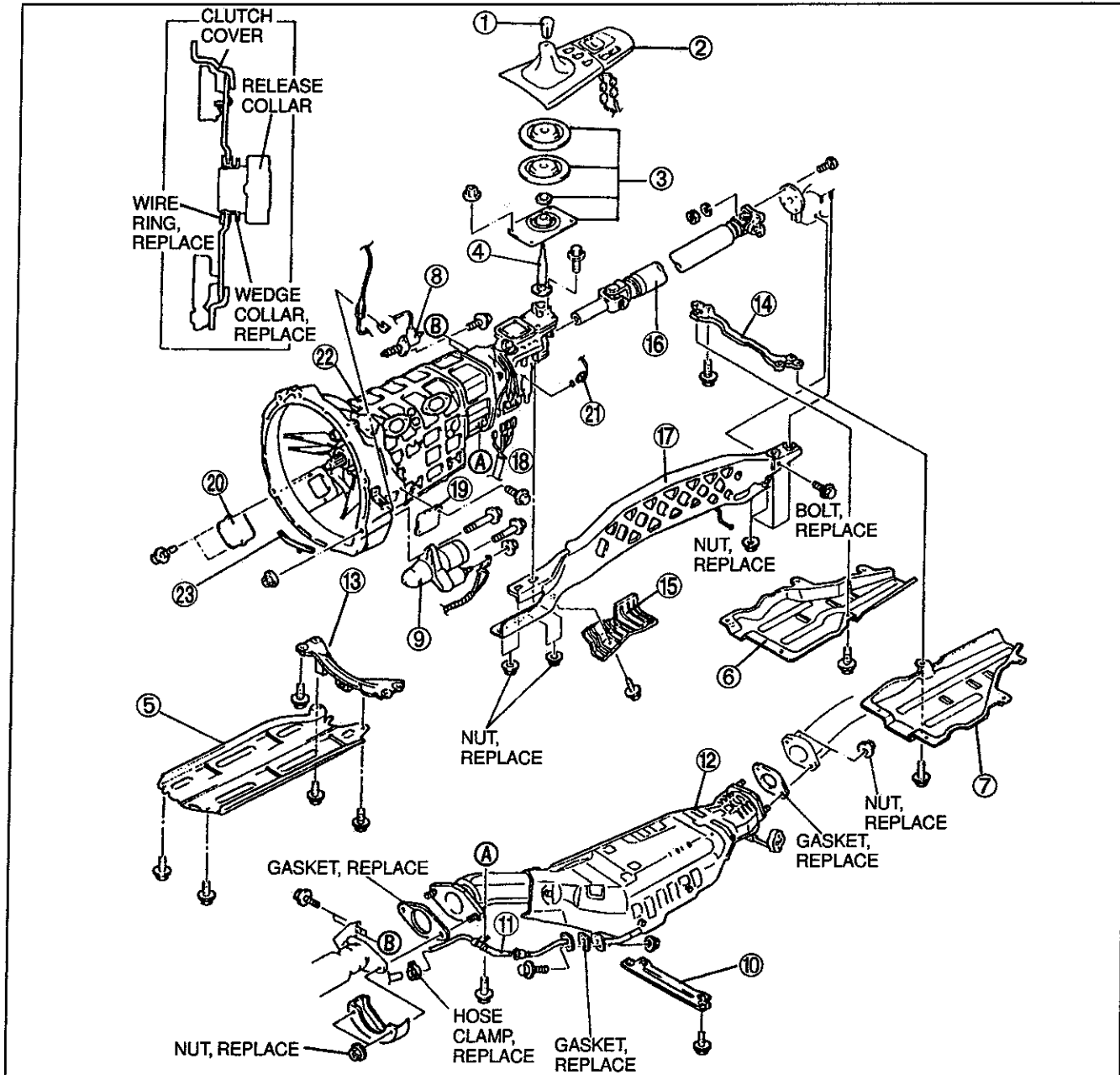
## SST

49 G017 5A0 Support, engine 	For support of engine	49 G017 501 Bar (Part of 49 G017 5A0) 	For support of engine
49 G017 502 Support (Part of 49 G017 5A0) 	For support of engine	49 G017 503 Hook (Part of 49 G017 5A0) 	For support of engine
49 S120 440 Holder, mainshaft 	For holding mainshaft	49 0839 425C Puller set, bearing 	For removal of bearing
49 G030 795 Installer, oil seal 	For installation of oil seal	49 G030 796 Body (Part of 49 G030 795) 	For installation of oil seal
49 G030 797 Handle (Part of 49 G030 795) 	For installation of oil seal	49 0500 330 Installer, transmission bearing 	For installation of bearing
49 0636 145 Puller, fan pulley boss 	For removal of clutch hub assembly	49 0862 350 Guide, shift fork 	For installation of interlock pin
49 1243 465A Wrench, mainshaft locknut 	For removal of locknut	49 H017 101 Hook 	For removal of bearing
49 0710 520 Puller, bearing 	For removal of bearing	49 F017 101 Holder, synchronizer ring 	For installation of bearing

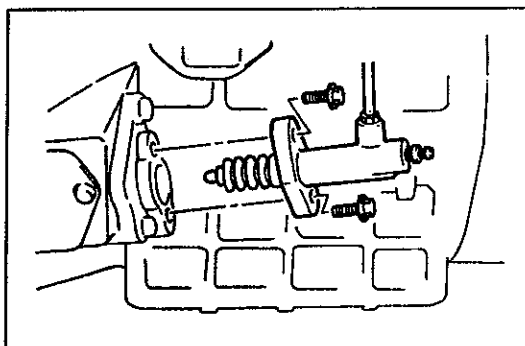
<p>49 F401 330B Installer set, bearing</p> 	<p>For installation of bearing</p>	<p>49 F401 331 Body (Part of 49 F401 330B)</p> 	<p>For Installation of clutch hub assembly</p>
<p>49 F401 335A Attachment A (Part of 49 F401 330B)</p> 	<p>For installation of bearing race</p>	<p>49 0813 235 Replacer, main bearing</p> 	<p>For installation of main bearing</p>
<p>49 S017 401 Retaining ring replacer</p> 	<p>For removal/installation of retaining ring</p>		

**REMOVAL**

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.



- |   |  |   |
|---|--|---|
| 1. Shift lever knob   | 11. Secondary air injection pipe               | 17. Power Plant Frame (PPF)<br>Removal Note |
| 2. Console panel assembly                                     | 12. Catalytic converter assembly               | ..... page J-11                             |
| 3. Insulator assembly   | 13. Tunnel reinforcement (front)               | 18. Connectors                              |
| 4. Shift lever assembly                                       | 14. Tunnel reinforcement (rear)                | 19. Service hole A cover                    |
| 5. Transmission cover   | 15. Cover                                      | 20. Service hole B cover                    |
| 6. Right undercover   | 16. Propeller shaft<br>Removal ..... section L | 21. Back-up light switch                    |
| 7. Left undercover  |  | 22. Transmission<br>Removal Note            |
| 8. Clutch release cylinder<br>Removal Note<br>..... page J-11 |  | ..... page J-11                             |
| 9. Starter  |  | 23. Dust cover                              |
| 10. Tunnel reinforcement (center)                             |  |   |

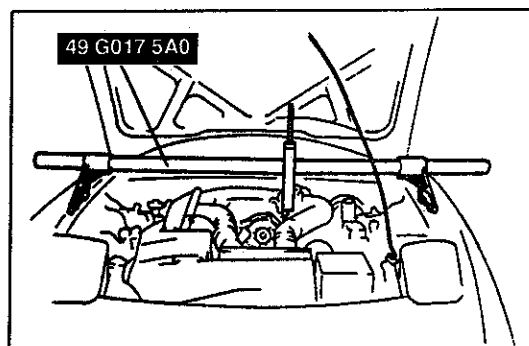


### Removal Note Clutch release cylinder

#### Caution

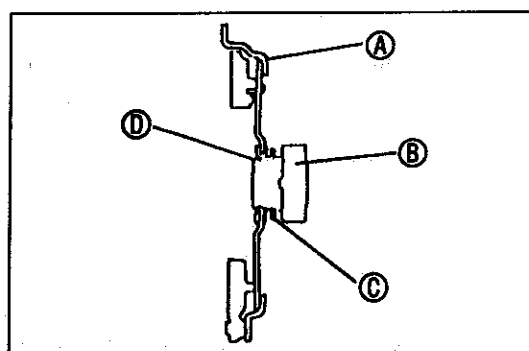
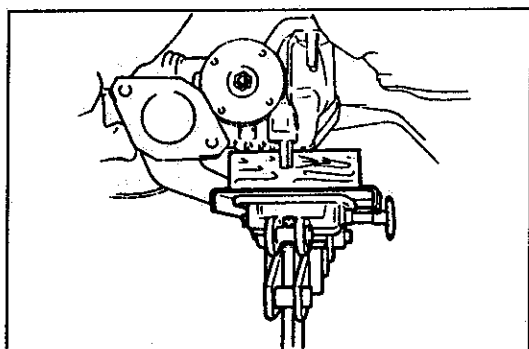
- Bending the clutch pipe can cause kinks or cracks.

1. Loosen the clutch release cylinder installation bolts.
2. Loosen the clutch pipe bracket bolt.
3. Secure the clutch release cylinder/clutch pipe assembly in a place where it will not interfere with transmission removal.



### Power plant frame (PPF)

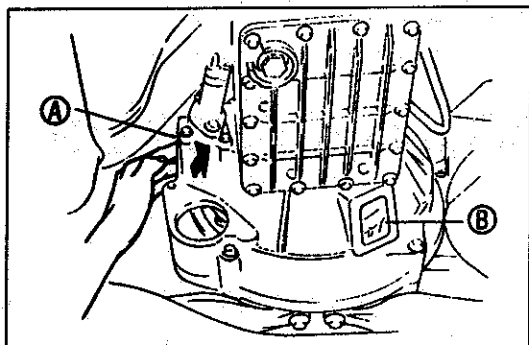
1. Hold the engine by using the SST (engine supports).
2. Hold the differential with a transmission jack.
3. Remove the PPF.
4. Remove the back-up light switch from the transmission.



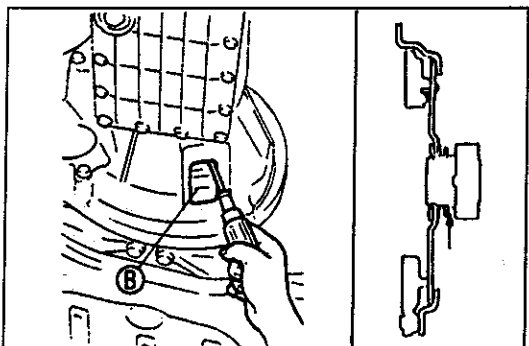
### Transmission

1. The clutch cover and clutch release collar are joined as shown in the figure.

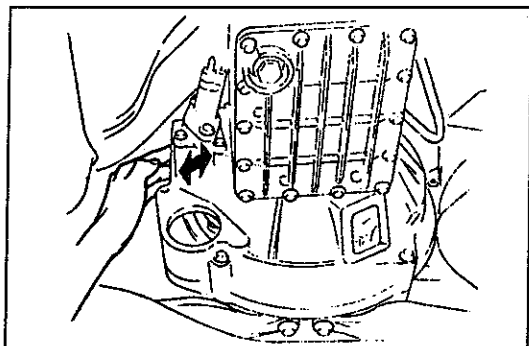
- A: Clutch cover  
B: Clutch release collar  
C: Wedge collar  
D: Wire ring



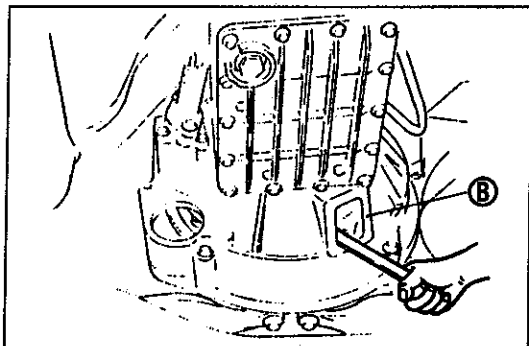
2. Remove the covers from service holes A and B.
3. Through service hole A, swing the release fork so that the release collar is pushed and held toward the clutch cover (engine side).



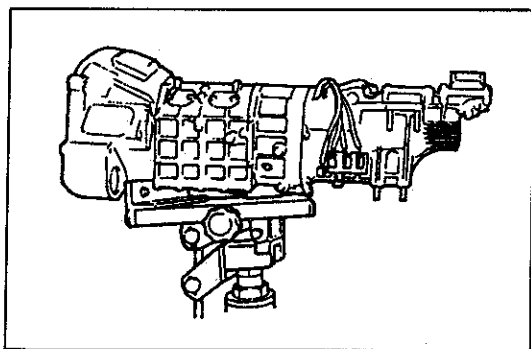
4. Insert a screwdriver through service hole B, into the space between the wedge collar and the release collar. Pry and separate the release collar from the clutch cover.



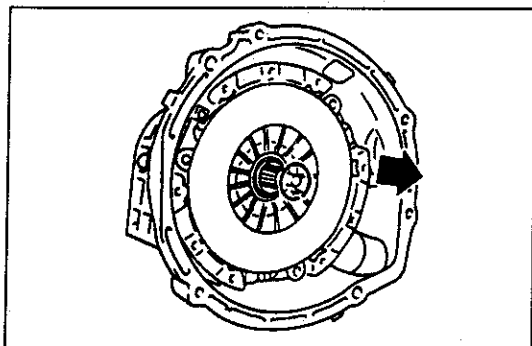
5. Swing the release fork back and forth to make sure that the release collar and clutch cover are separated.



6. If the above procedure does not work, then separate the clutch cover from the flywheel, following the procedure below.
- (1) Through service hole B, gradually loosen the 6 clutch cover installation bolts in a crisscross pattern.
  - (2) Remove the clutch cover installation bolts, and separate the clutch cover from the flywheel.



7. Support the transmission with a transmission jack.  
8. Loosen the transmission installation bolts.  
9. Remove the transmission.



10. Remove the clutch cover.
- (1) Remove the clutch cover from the flywheel. (Refer to section H.)
  - (2) If the transmission was removed by following step 6, remove the wire ring from the release collar and separate the release collar from the clutch cover.

## DISASSEMBLY

### Precaution

1. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvents before disassembly.

### Warning

- Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eyewear whenever using compressed air.

### Caution

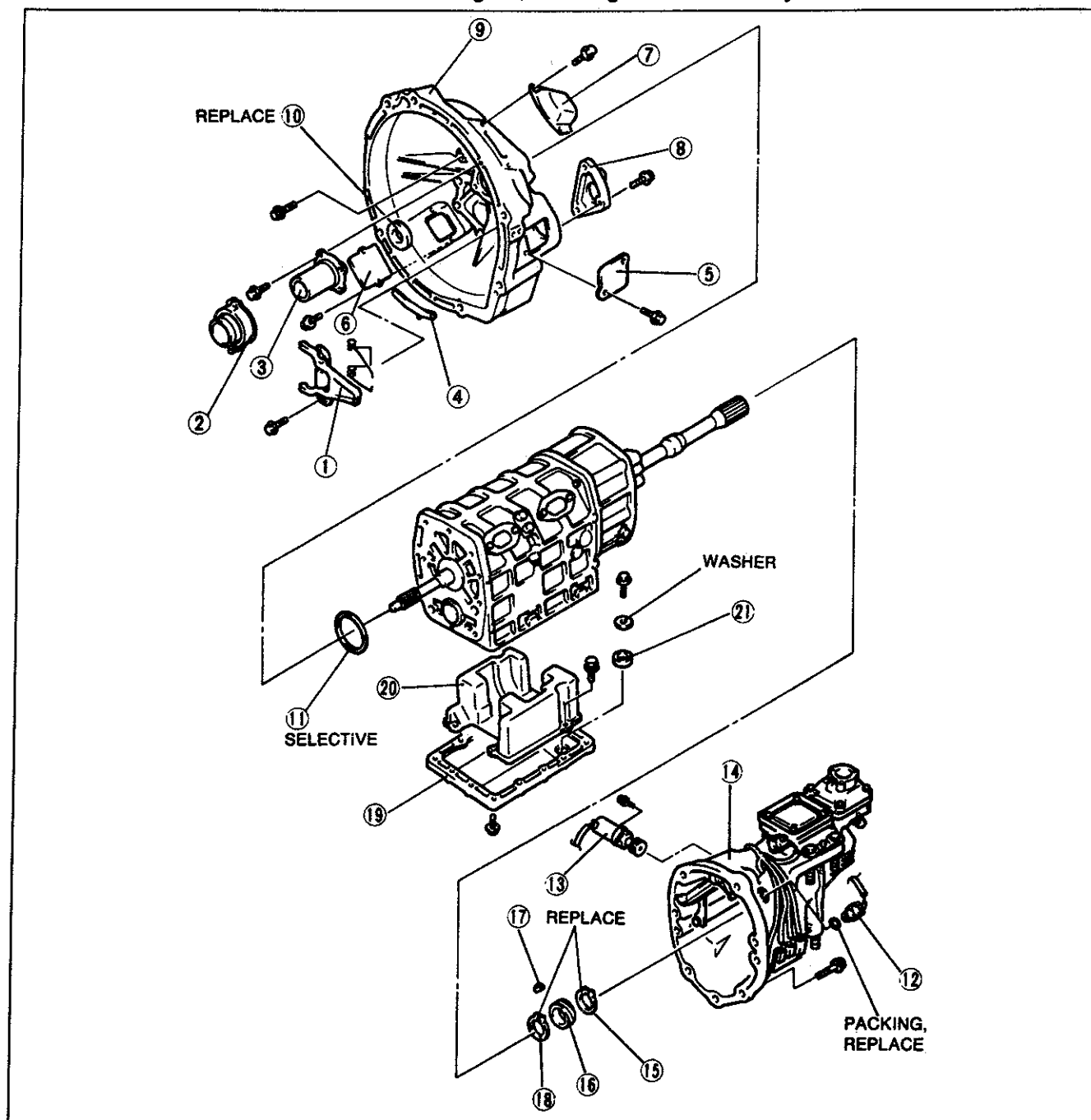
- Cleaning sealed bearings with cleaning fluids or a steam cleaner can wash the grease out of the bearing.
2. Clean the removed parts (except sealed bearings) with cleaning solvent, and dry with compressed air. Clean out all holes and passages with compressed air, and check that there are no obstructions.
  3. Use a plastic hammer when disassembling the transmission case and other light alloy metal parts.

## Clutch Housing and Extension Housing Components

**Note**

- The front and rear oil seals do not need to be removed unless you are replacing them.

Disassemble in the order shown in the figure, referring to **Disassembly Note**.

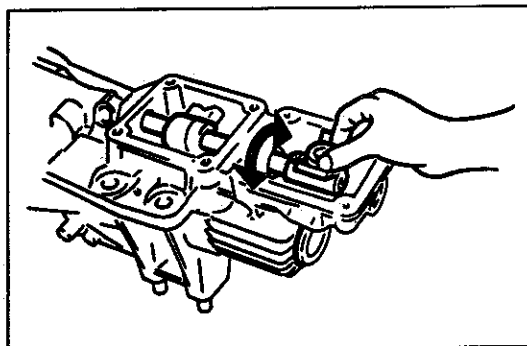


1. Release fork assembly
2. Release collar
3. Front cover
4. Dust cover
5. Service hole A cover
6. Service hole B cover
7. Vent cover
8. Release cylinder support
9. Clutch housing

10. Oil seal (clutch housing)
11. Adjustment shim
12. Back-up light switch
13. Speedometer sensor  
(Speedometer driven gear)
14. Extension housing
15. Snap ring

16. Speedometer drive gear
17. Key
18. Snap ring
19. Undercover
20. Oil baffle
21. Magnet

Disassembly Note  
..... page J-15

**Disassembly note****Extension Housing**

1. Temporarily reinstall the shifter lever, and move the control rod end to the neutral position.
2. Remove the shift lever.
3. Remove the extension housing installation bolts.

**Caution**

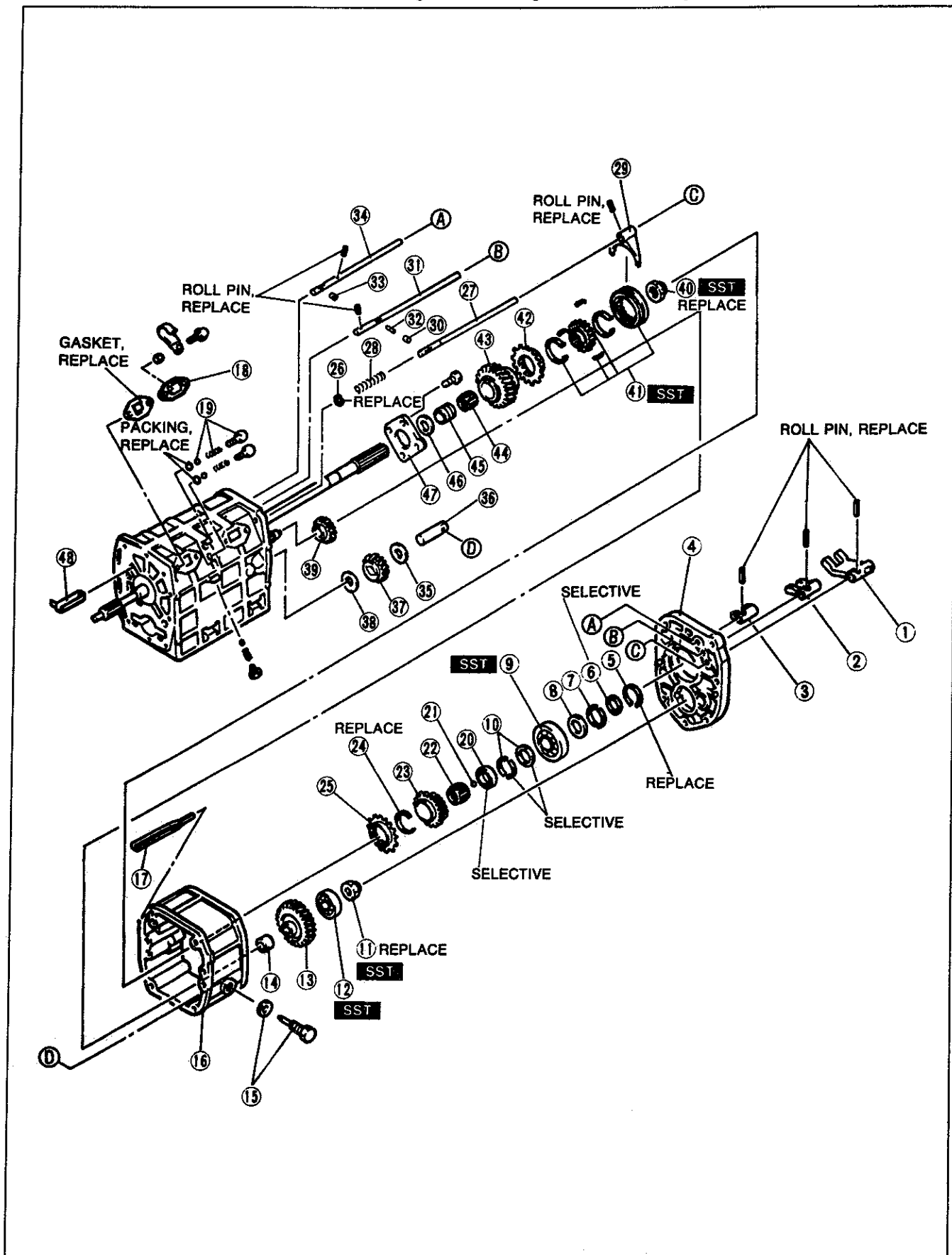
- When removing the extension housing, be careful that the control lever is not pulled into or pushed against the shift rod gates.

4. Lift up on and remove the extension housing from the center housing.

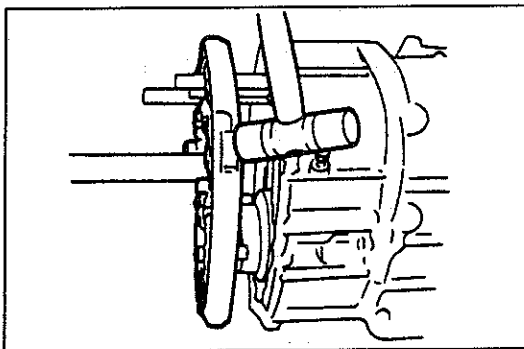


## 5th/Reverse Gear and Housing Components

Disassemble in the order shown in the figure, referring to **Disassembly Note**.



- |  |  |   |
|--|--|---|
| 1. 5th/Reverse shift rod end<br>Inspection .... page J-30                                  | 16. Center housing<br>Disassembly Note<br>..... page J-18        | 34. 1st/2nd shift rod<br>Disassembly Note<br>..... page J-19                  |
| 2. 3rd/4th shift rod end<br>Inspection .... page J-30                                      | 17. Oil guide  | 35. Thrust washer   |
| 3. 1st/2nd shift rod end<br>Inspection .... page J-30                                      | 18. Blind cover  | 36. Reverse idler gear shaft<br>Inspection .... page J-31                     |
| 4. Bearing housing<br>Disassembly Note<br>..... below                                      | 19. Cap plug, spring, and<br>detent ball                         | 37. Reverse idler gear<br>Inspection .... page J-31                           |
| 5. Snap ring   | 20. Thrust lock washer   | 38. Thrust washer   |
| 6. Thrust washer   | 21. Steel ball   | 39. Counter reverse gear<br>Inspection .... page J-29                         |
| 7. C-washers   | 22. Bearing<br>Inspect for damage                                | 40. Locknut<br>Disassembly Note<br>..... page J-19                            |
| 8. Retaining ring  | 23. 5th gear<br>Inspection .... page J-29                        | 41. 5th/Reverse clutch hub<br>assembly<br>Disassembly Note<br>..... page J-19 |
| 9. Mainshaft rear bearing<br>Disassembly Note<br>..... below<br>Inspect for damage         | 24. Retaining ring   | 42. Reverse synchronizer ring<br>Inspection .... page J-30                    |
| 10. C-washers and<br>retaining ring  | 25. 5th synchronizer ring<br>Inspection .... page J-30           | 43. Reverse gear<br>Inspection .... page J-29                                 |
| 11. Locknut<br>Disassembly Note<br>..... page J-18   | 26. Retaining ring   | 44. Bearing<br>Inspect for damage   |
| 12. Countershaft rear bearing<br>Disassembly Note<br>..... page J-18<br>Inspect for damage | 27. 5th/Reverse shift rod<br>Disassembly Note<br>..... page J-18 | 45. Bearing race  |
| 13. Counter 5th gear<br>Inspection .... page J-29  | 28. Spring<br>Inspection .... page J-31                          | 46. Thrust washer   |
| 14. Spacer   | 29. 5th/Reverse shift fork                                       | 47. Bearing cover   |
| 15. Set bolt and washer  | 30. Interlock pin (large)  | 48. Oil guide   |
|  | 31. 3rd/4th shift rod<br>Disassembly Note<br>..... page J-19     |   |
|  | 32. Interlock pin (small)  |   |
|  | 33. Interlock pin (large)  |   |

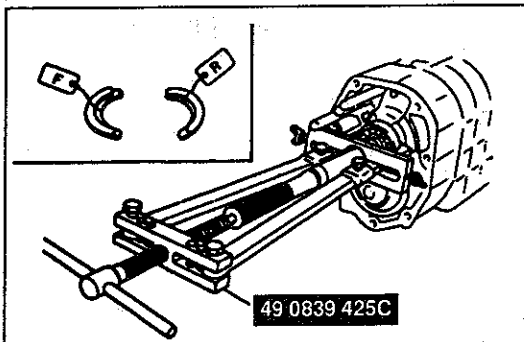


## Disassembly note Bearing housing

### Caution

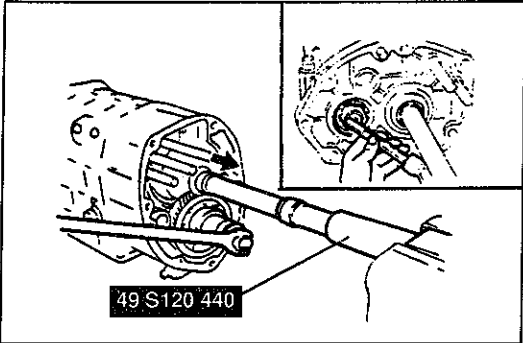
- The bearing housing is made of aluminum, and is therefore easily dented and scratched by metal tools. When removing the bearing housing, do not use metal tools.

Hit down and outward on the bearing housing with a plastic hammer to remove.



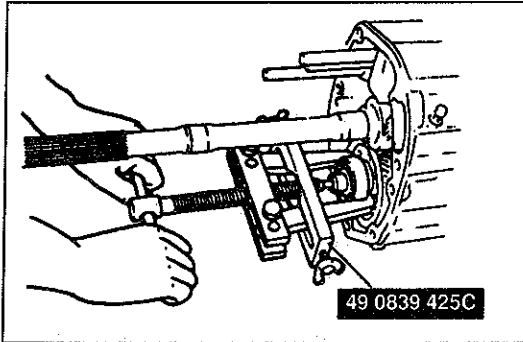
## Mainshaft rear bearing

1. Remove the snap ring, washer, retaining ring, and rear C-washers. Keep the rear C-washers together for correct reassembly.
2. Remove the mainshaft rear bearing by using the SST.
3. Remove the retaining ring and the front C-washers. Keep the front C-washers together for correct reassembly.

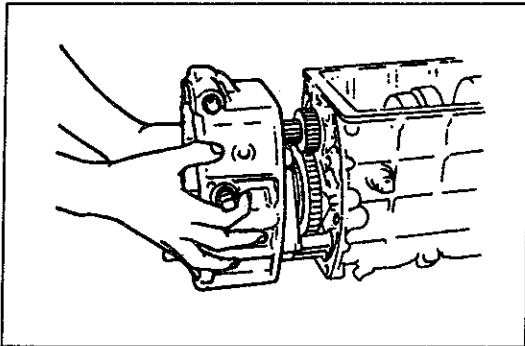


### Locknut and countershaft rear bearing

1. Shift the 1st/2nd shift rod to 1st gear.
2. Uncrimp the tab of the locknut.
3. Hold the mainshaft by using the SST and a vise.
4. Remove the locknut.

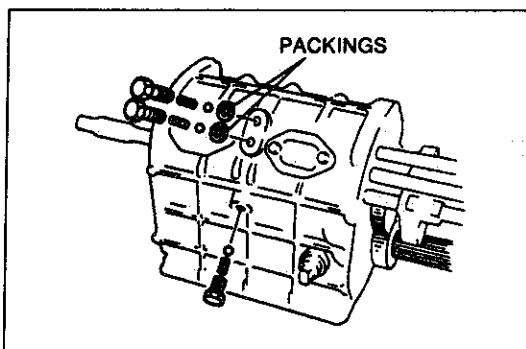


5. Remove the countershaft rear bearing by using the SST.



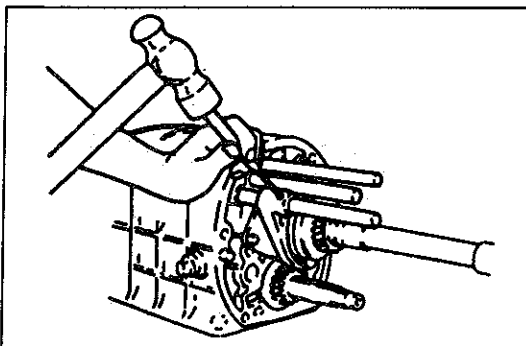
### Center housing

1. Remove the set bolt and washer from the center housing.
2. Remove the center housing by tapping around its edge with a plastic hammer.

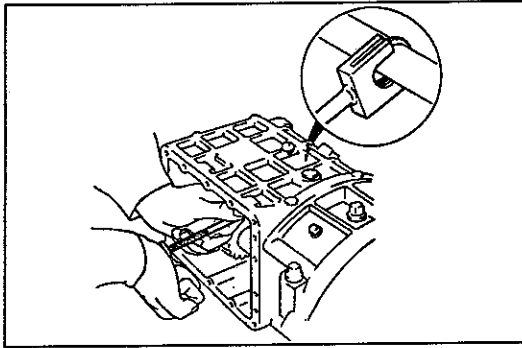


### 5th/Reverse shift rod

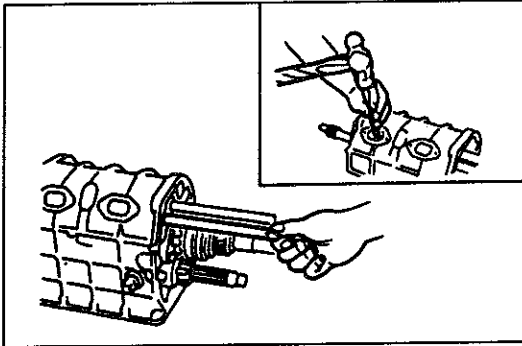
1. Remove the three cap plugs, packings, detent balls, and springs.



2. Drive the roll pin from the 5th/Reverse shift fork.

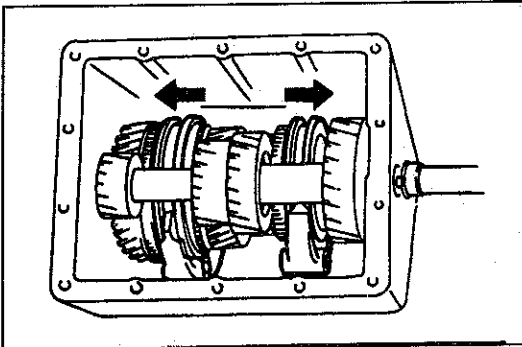


3. Remove the retaining ring from the 5th/Reverse shift rod by using the SST.
4. Slide the 5th/Reverse shift rod out of the transmission case, and remove the spring.



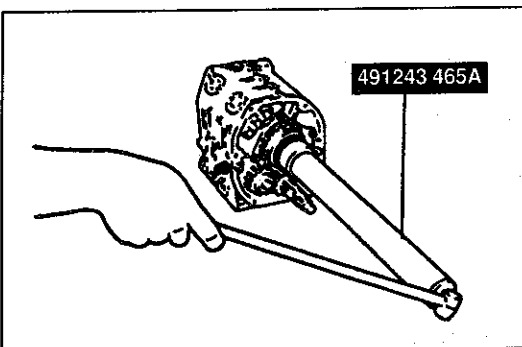
#### 1st/2nd and 3rd/4th shift rods

1. Shift the transmission into 4th gear to gain access to the roll pin. Drive the roll pin from the 3rd/4th shift fork.
2. Slide the 3rd/4th shift rod and interlock pin (small) out from the rear of the transmission case.
3. Drive the roll pin from the 1st/2nd shift fork. Slide the 1st/2nd shift rod out from the rear of the transmission case, and remove the interlock pin (large).

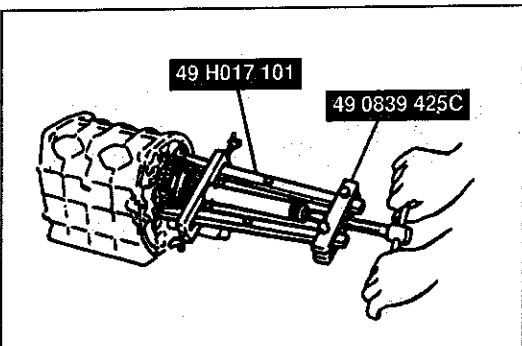


#### Locknut

1. Uncrimp the tab of the locknut.
2. Shift into 1st and 4th gears to lock the rotation of the mainshaft.



3. Remove the locknut by using the SST.

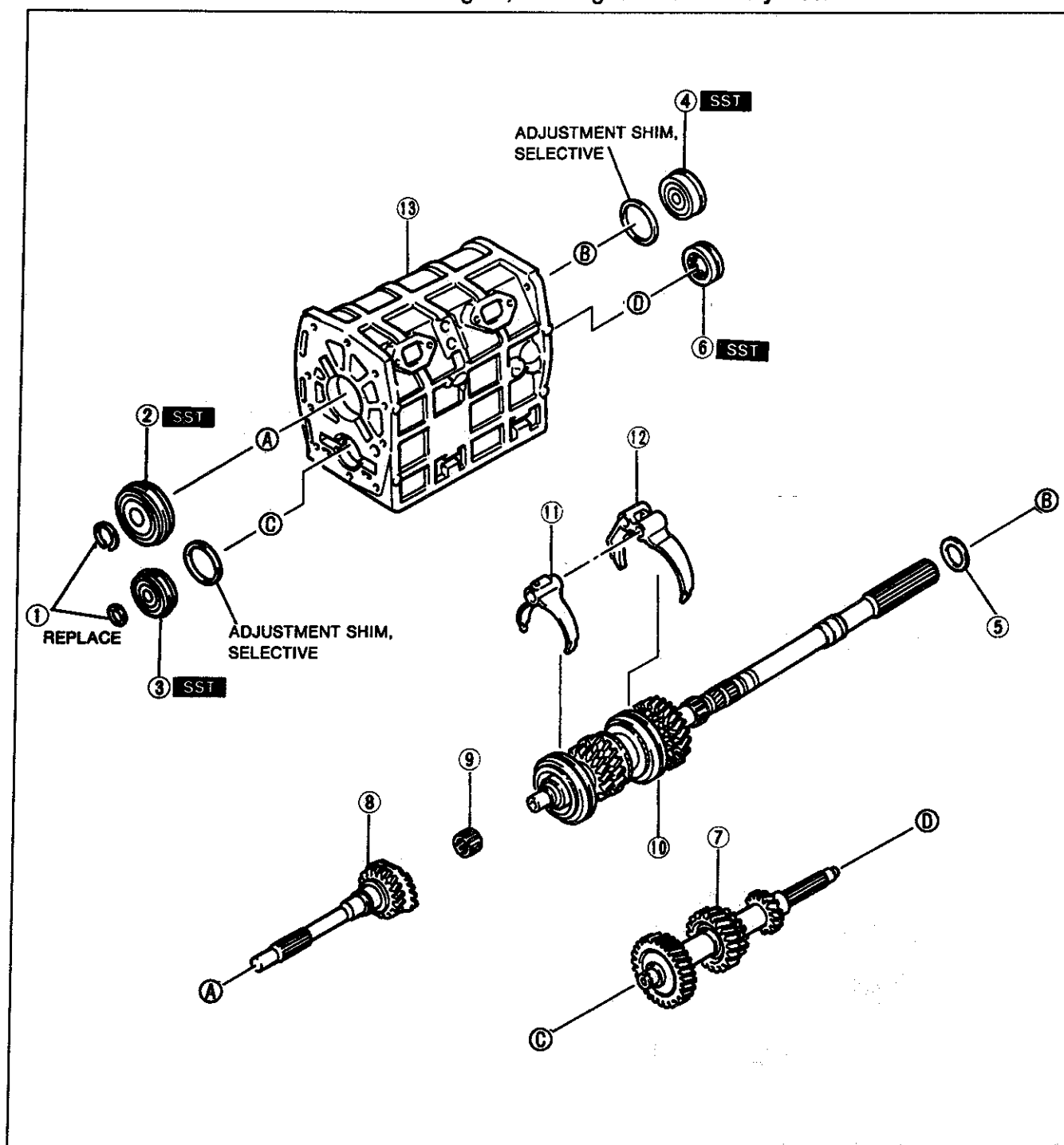


#### 5th/Reverse clutch hub assembly

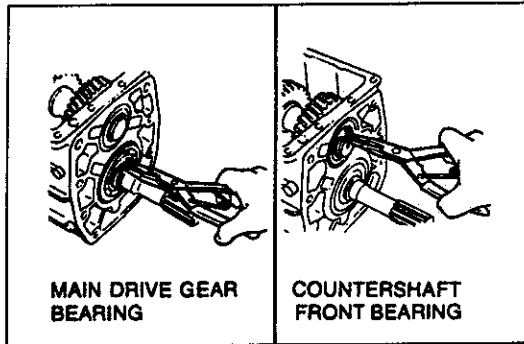
1. Remove the bearing cover installation bolts.
2. Attach the SST to the bearing cover and remove the assembly, which consists of the following parts:
  - 5th/Reverse clutch hub assembly
  - Synchronizer ring
  - Needle bearing
  - Bearing race
  - Reverse gear
  - Thrust washer

**Transmission Case Components**

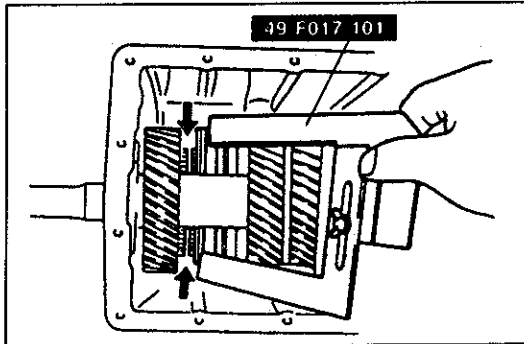
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



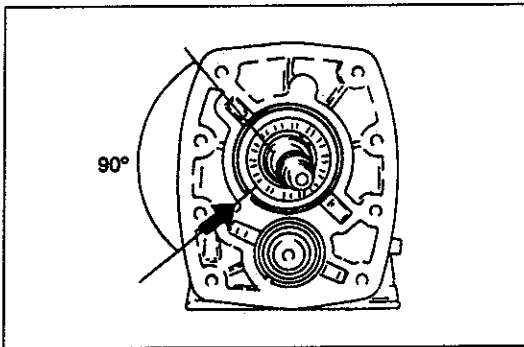
- |  |   |  |
|--|---|--|
| 1. Snap rings<br>Disassembly Note<br>..... page J-21                                       | 4. Mainshaft front bearing<br>Disassembly Note<br>..... page J-22<br>Inspect for damage     | 8. Main drive gear<br>Inspection .... page J-29                    |
| 2. Main drive gear bearing<br>Disassembly Note<br>..... page J-21<br>Inspect for damage    | 5. Thrust washer  | 9. Bearing   |
| 3. Countershaft front bearing<br>Disassembly Note<br>..... page J-21<br>Inspect for damage | 6. Countershaft center bearing<br>Disassembly Note<br>..... page J-22<br>Inspect for damage | 10. Mainshaft gear assembly<br>Disassembly Note<br>..... page J-22 |
|  | 7. Countershaft assembly  | 11. 3rd/4th shift fork   |
|  |   | 12. 1st/2nd shift fork   |
|  |   | 13. Transmission case  |

**Disassembly note****Snap rings**

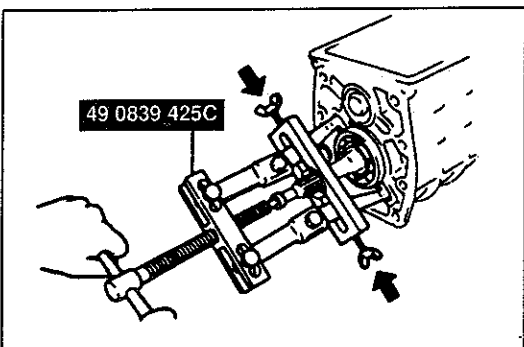
Remove the snap rings from the mainshaft and the countershaft by using snap ring pliers.

**Main drive gear bearing**

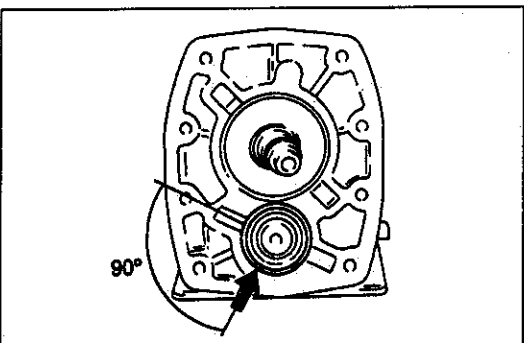
1. Install the SST between the 4th gear synchronizer ring and main drive synchromesh gear.



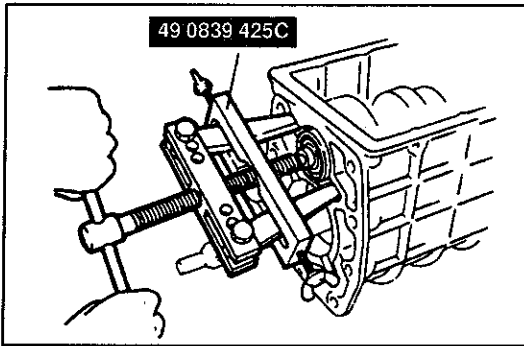
2. Turn the bearing snap rings so that the ends are 90° to the transmission case grooves.



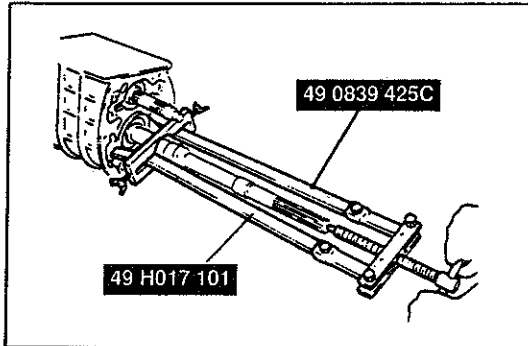
3. Install the SST, making sure to hand tighten the side screws as tightly as possible, and remove the main drive gear bearing.

**Countershaft front bearing**

1. Turn the bearing snap rings so that the ends are 90° to the transmission case grooves.

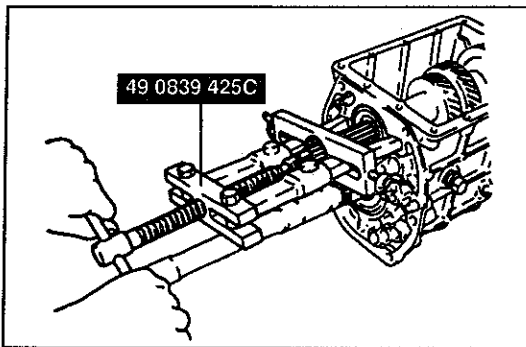


2. Remove the countershaft front bearing by using the SST.



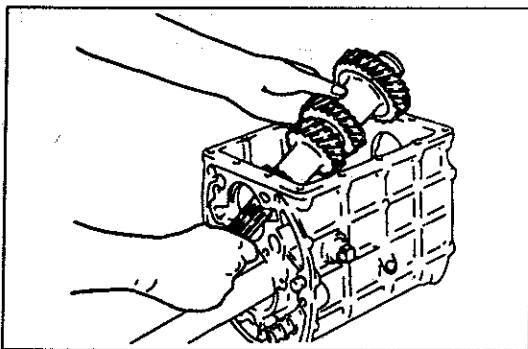
#### Mainshaft front bearing

Remove the mainshaft front bearing by using the SST.

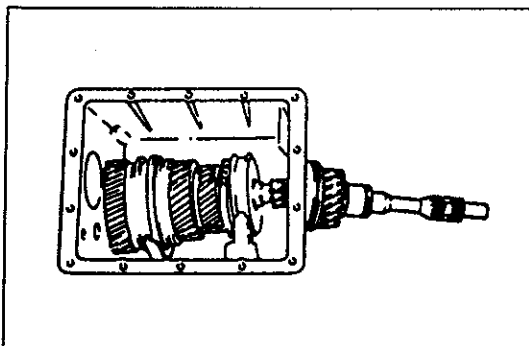


#### Countershaft center bearing

1. Remove the countershaft center bearing by using the SST.

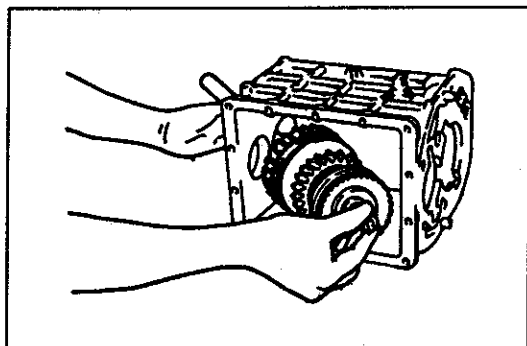


2. Remove the countershaft.



#### Mainshaft gear assembly

1. Remove the main drive gear from the transmission case.  
2. Remove the needle bearing from the mainshaft joint of the main drive gear.



3. Remove the mainshaft gear assembly from the transmission case.

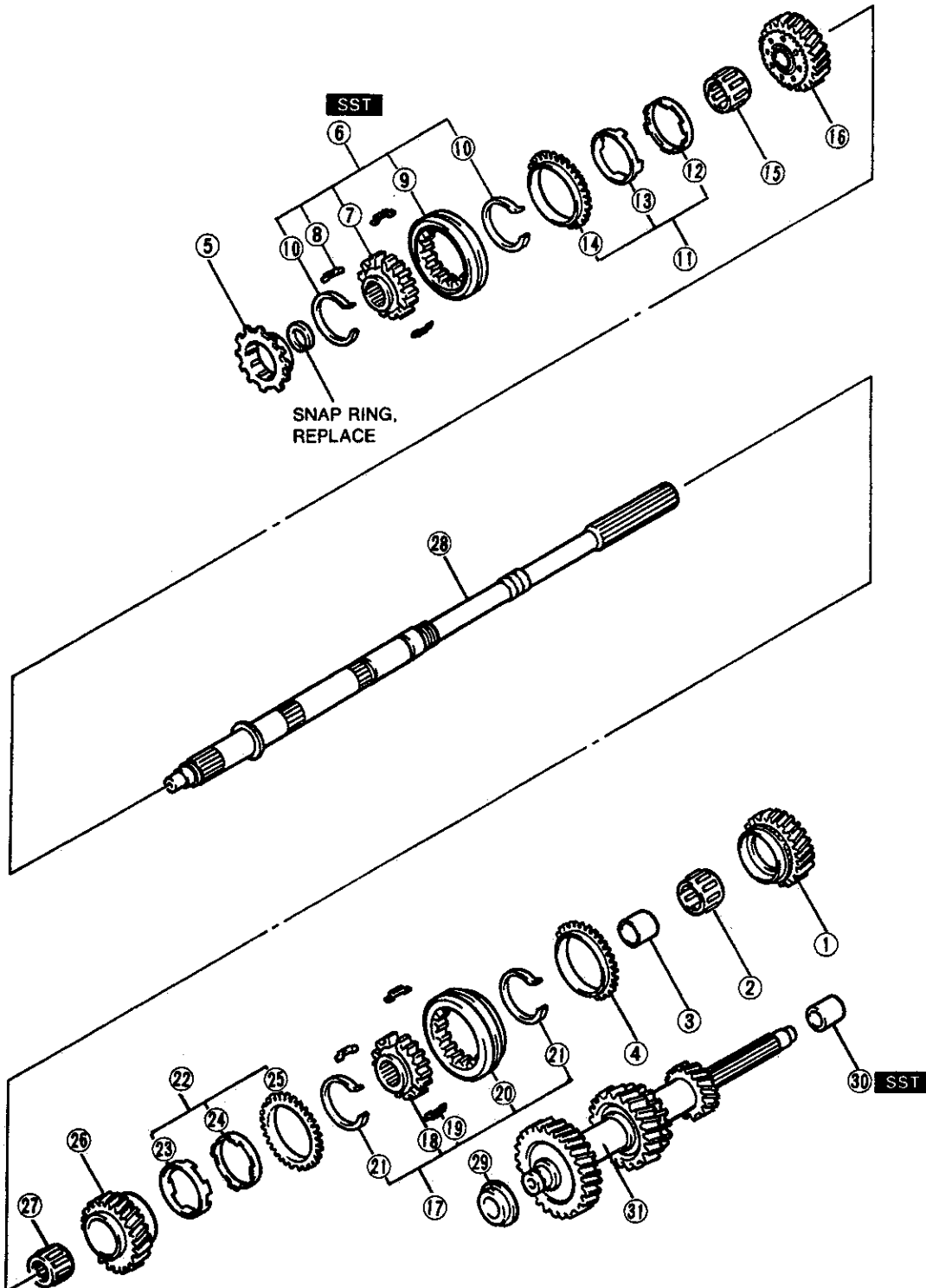


## Mainshaft and Countershaft Components

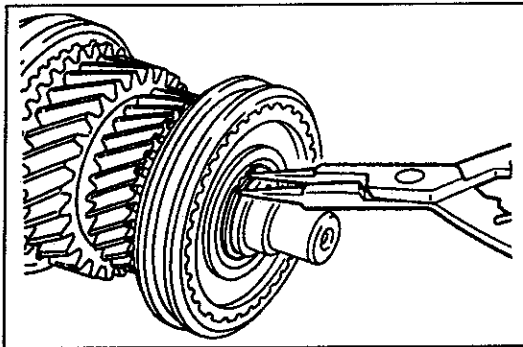
## Note

- The countershaft center bearing race does not need to be removed unless you are replacing it.

Disassemble in the order shown, referring to **Disassembly Note**.



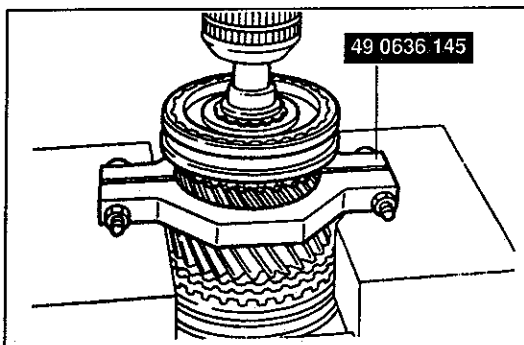
- |   |  |  |
|---|--|--|
| 1. 1st gear<br>Inspection .... page J-29  | 12. Inner cone   | 23. Inner cone   |
| 2. Bearing<br>Inspect for damage  | 13. Double cone  | 24. Double cone  |
| 3. Bearing race   | 14. Synchronizer ring  | 25. Synchronizer ring  |
| 4. 1st synchronizer ring<br>Inspection .... page J-30   | 15. Bearing<br>Inspect for damage  | 26. 2nd gear<br>Inspection .... page J-29                                      |
| 5. 4th synchronizer ring<br>Inspection .... page J-30   | 16. 3rd gear<br>Inspection .... page J-29  | 27. Bearing<br>Inspect for damage  |
| 6. 3rd/4th clutch hub<br>assembly<br>Disassembly Note<br>..... below<br>Inspection .... page J-30 | 17. 1st/2nd clutch hub<br>assembly<br>Disassembly Note<br>..... below<br>Inspection .... page J-30 | 28. Mainshaft<br>Inspection .... page J-29                                     |
| 7. 3rd/4th clutch hub   | 18. 1st/2nd clutch hub   | 29. Countershaft front<br>bearing spacer                                       |
| 8. Synchronizer key   | 19. Synchronizer key   | 30. Countershaft center<br>bearing race<br>Disassembly Note<br>..... page J-26 |
| 9. Clutch hub sleeve  | 20. Clutch hub sleeve  | 31. Countershaft<br>Inspection .... page J-29                                  |
| 10. Synchronizer key<br>spring  | 21. Synchronizer key springs   |  |
| 11. 3rd synchronizer assembly<br>Inspection .... page J-31  | 22. 2nd synchronizer assembly<br>Inspection .... page J-31   |  |



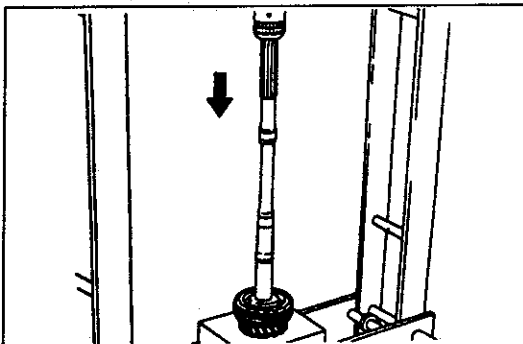
## Disassembly note

### 3rd/4th clutch hub assembly

1. Remove the snap ring from the front of the mainshaft.

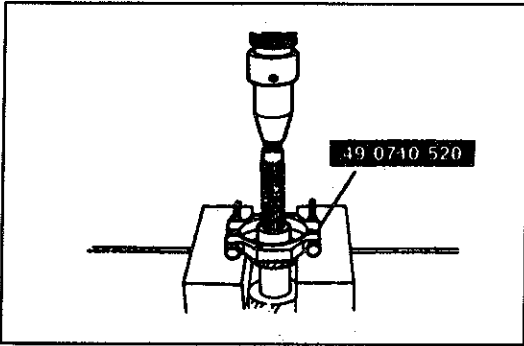


2. Position the SST between 2nd and 3rd gears, and hold the mainshaft from underneath.
3. Press the mainshaft out from the 3rd gear, 3rd synchronizer ring assembly, and the 3rd/4th clutch hub assembly.



### 1st/2nd clutch hub assembly

- Hold the mainshaft, and press the 1st/2nd clutch hub assembly, 2nd synchronizer ring assembly, and 2nd gear from the mainshaft.

**Countershaft center bearing race**

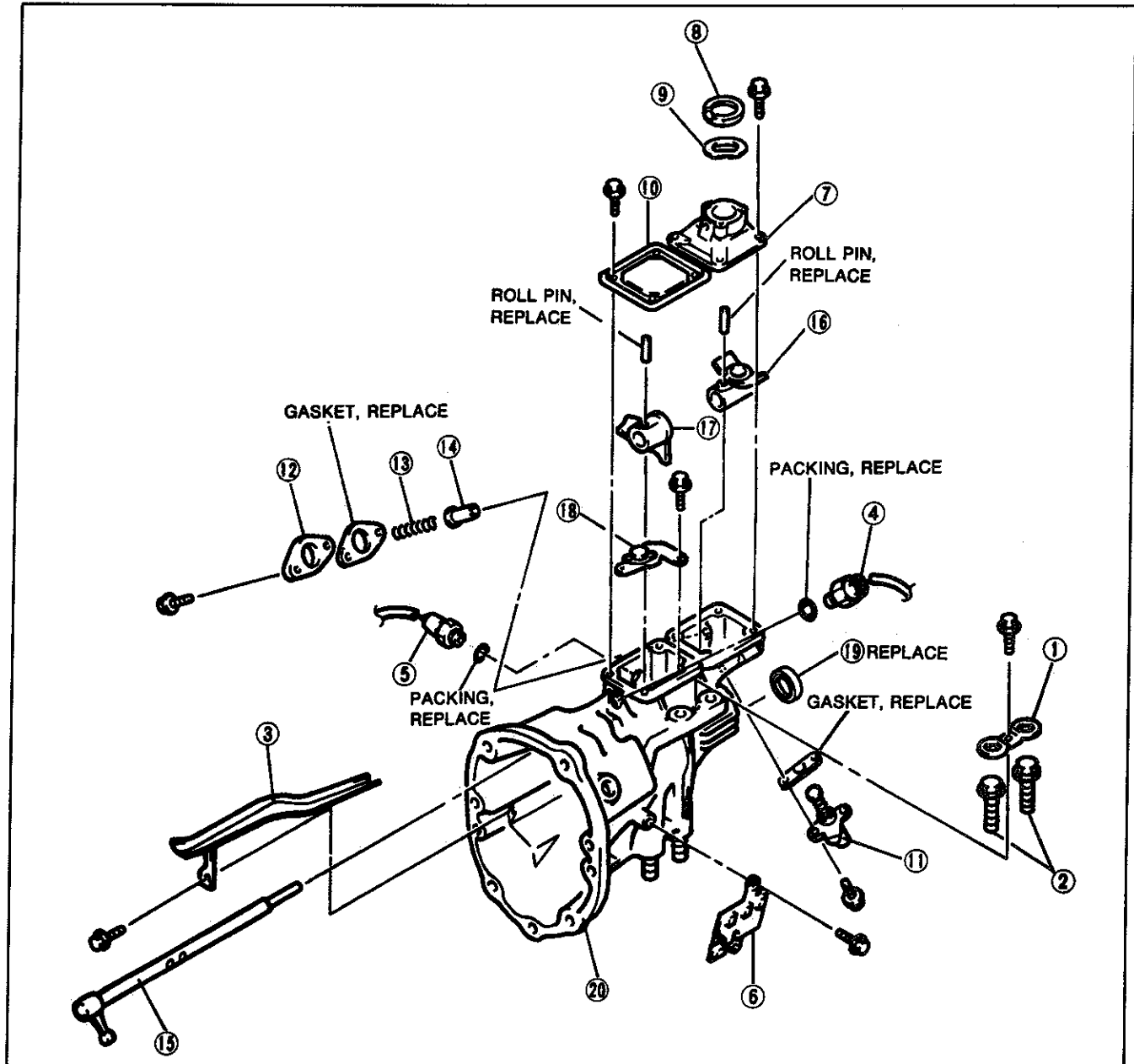
Hold the countershaft from underneath, and remove the countershaft bearing race by using the SST.

## Extension Housing Components

**Note**

- The extension housing oil seal does not need to be removed unless you are replacing it.

Disassemble in the order shown, referring to **Disassembly Note**.



1. Stopper
2. Power plant frame installation bolts

3. Oil guide
4. Neutral switch
5. 1-2 switch

6. Bracket
7. Control case

8. Bushing  
Inspect for wear and damage

9. Wave washer  
Inspect for wear and damage

10. Blind cover
11. Select spindle assembly
12. Spring cap
13. Select lock spindle spring  
Inspection .... page J-31
14. Select lock spindle

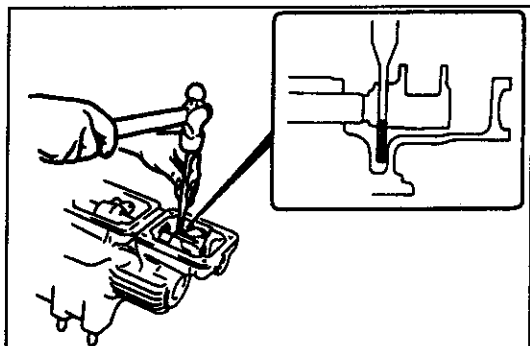
15. Control rod  
Disassembly Note

..... page J-28  
Inspection ..... page J-30

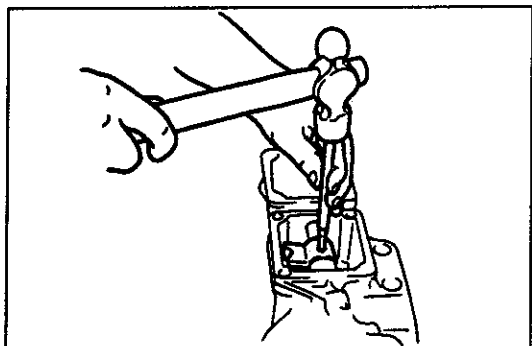
16. Control rod end
17. Selector
18. Shift guide assembly
19. Oil seal

Disassembly Note  
..... page J-28

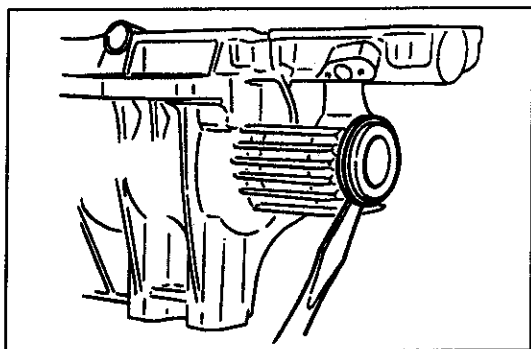
20. Extension housing  
Inspection .... page J-32

**Disassembly note****Control rod**

1. Slide the control rod end to the point where the roll pin is directly above the recess in the extension housing.
2. Remove the roll pin from the control rod end by using a pin punch and hammer.



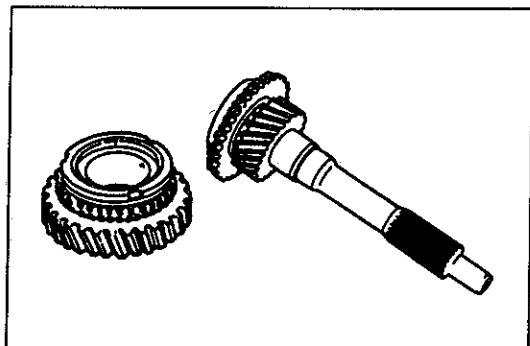
3. Remove the roll pin from the selector by using a pin punch and hammer.
4. Slide the control rod from the extension housing, and remove the control rod end and selector.

**Oil seal (extension housing)**

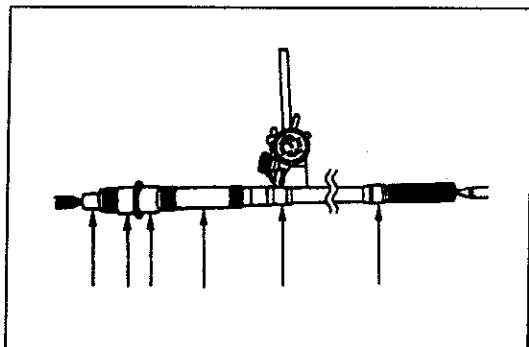
Remove the oil seal from the extension housing by using a screwdriver.

**INSPECTION**

Inspect all parts, and repair or replace as necessary.

**Each Gear and Main Drive Gear**

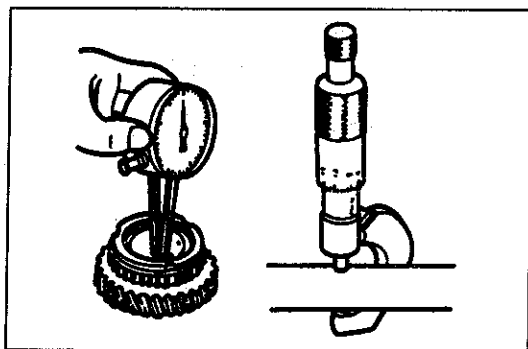
1. Inspect synchronizer cones for wear.
2. Inspect individual gear teeth for damage, wear, and cracks.
3. Inspect synchronizer ring matching teeth for damage and wear.
4. Inspect main drive gear splines for damage and wear.

**Mainshaft**

1. Measure the mainshaft runout.

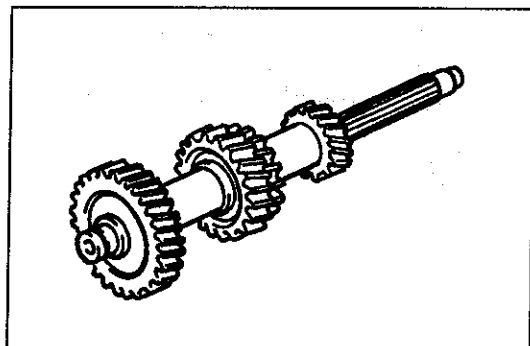
**Runout: 0.03 mm {0.0012 in} max.**

2. Inspect splines for damage and wear.

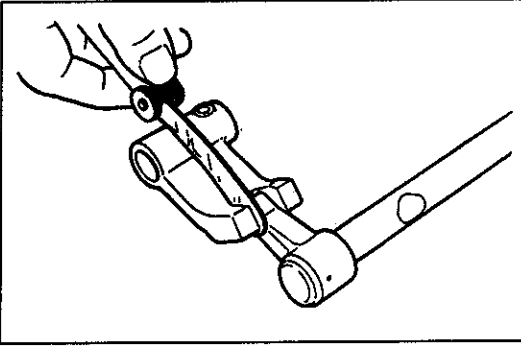


3. Measure the clearance between mainshaft and gear (or bushing).

**Clearance: 0.15 mm {0.006 in} max.**

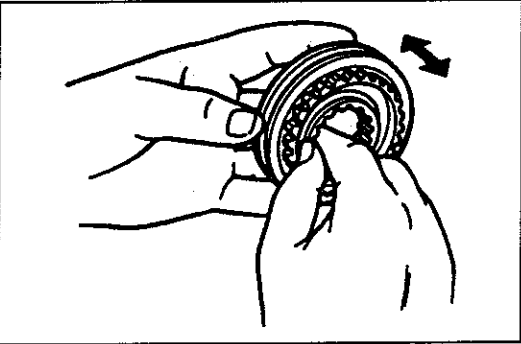
**Countershaft**

1. Inspect gear teeth for damage, wear, and cracks.
2. Inspect splines for damage and wear.

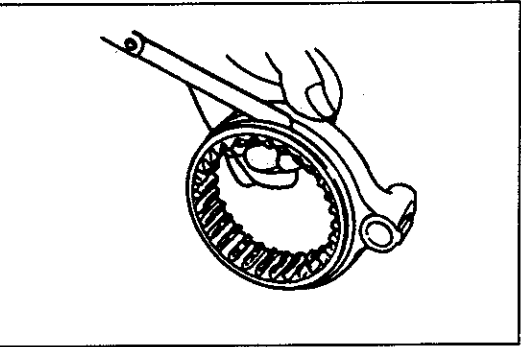
**Control Rod Lever and Shift Rod**

Measure the clearance between the control rod lever and the shift rod gate.

**Clearance: 0.8 mm {0.031 in} max.**

**Each Clutch Hub Assembly**

1. Inspect clutch hub sleeve and hub operation.
2. Inspect individual gear teeth for damage, wear, and cracks.
3. Inspect synchronizer keys for damage, wear, and cracks.

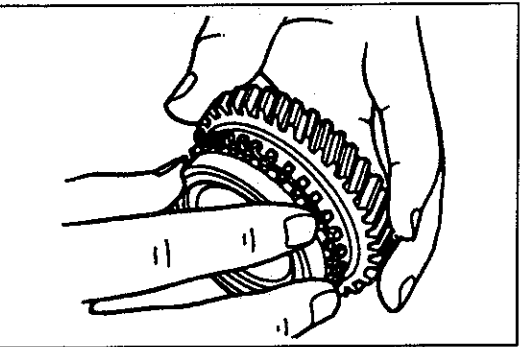


4. Measure the clearance between the hub sleeve groove and shift fork.

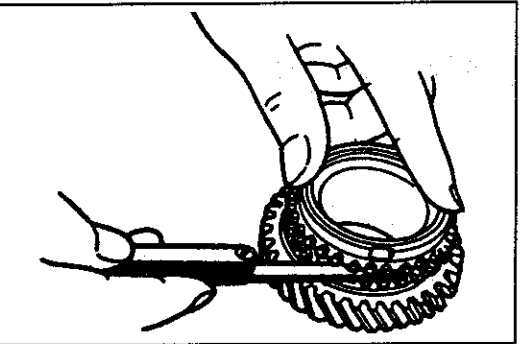
**Clearance:**

**0.2–0.3 mm {0.008–0.012 in}**

**Maximum: 0.5 mm {0.020 in}**

**1st, 4th, 5th, Reverse Synchronizer Rings**

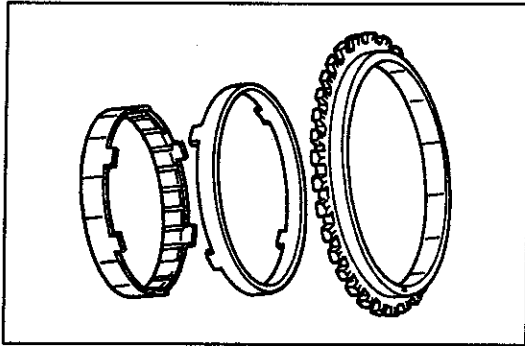
1. Inspect individual synchronizer ring teeth for damage, wear, and cracks.
2. Inspect taper surface for wear and cracks.



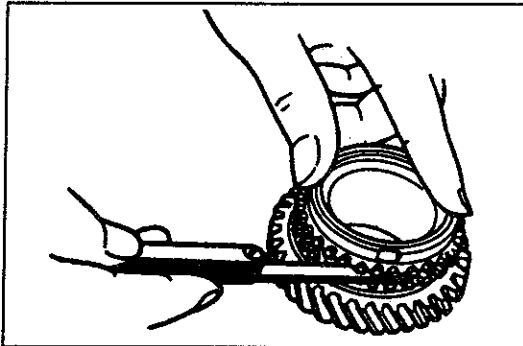
3. Set the synchronizer ring squarely in the gear.
4. Measure the clearance between the synchronizer ring and flank surface of gear all around the circumference.

**Clearance: 1.5 mm {0.059 in}**

**Minimum: 0.8 mm {0.031 in}**

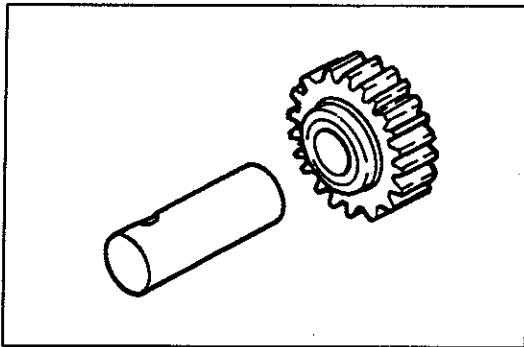
**2nd/3rd Synchronizer Assembly**

1. Inspect individual synchronizer ring gear teeth for damage, wear, and cracks. Replace the synchronizer assembly if any such damage is found.
2. Inspect for wear and damage to the tapered surfaces of the inner cone, double cone, and synchronizer ring. Replace the synchronizer assembly if any such damage is found.

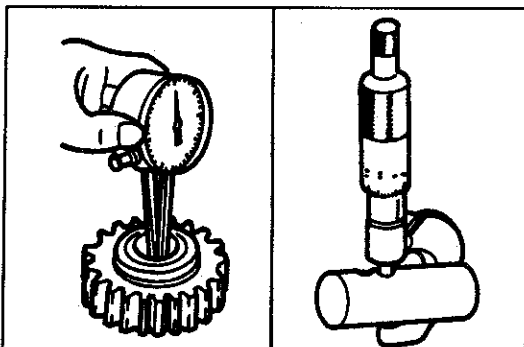


3. Set the synchronizer assembly squarely in the gear.
4. Measure the clearance between the synchronizer ring and flank surface of gear.

**Clearance:** 1.5 mm {0.059 in}  
**Minimum:** 0.8 mm {0.031 in}

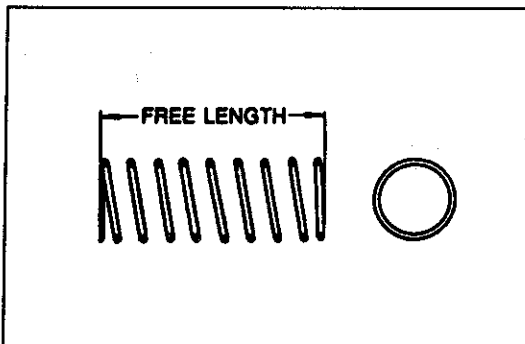
**Reverse Idler Gear and Shaft**

1. Inspect gear teeth for damage, wear, and cracks.



2. Measure the clearance between the reverse idler gear bushing and shaft.

**Clearance:**  
 0.02–0.05 mm {0.0008–0.0020 in}  
**Maximum:** 0.15 mm {0.006 in}

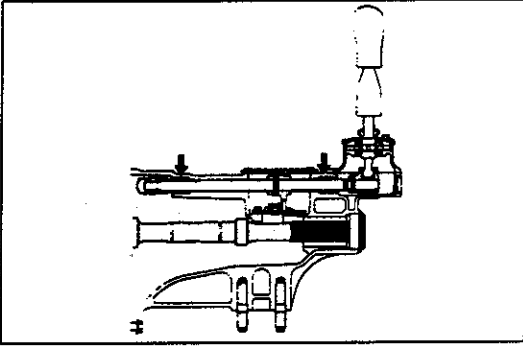
**Spring**

Measure the free length of the spring.

**Standard free length**

**Detent ball spring:** 22.5 mm {0.886 in}  
**5th/Reverse retaining spring:** 73.00 mm {2.874 in}  
**Select lock spindle spring:** 43.25 mm {1.703 in}



**Extension Housing**

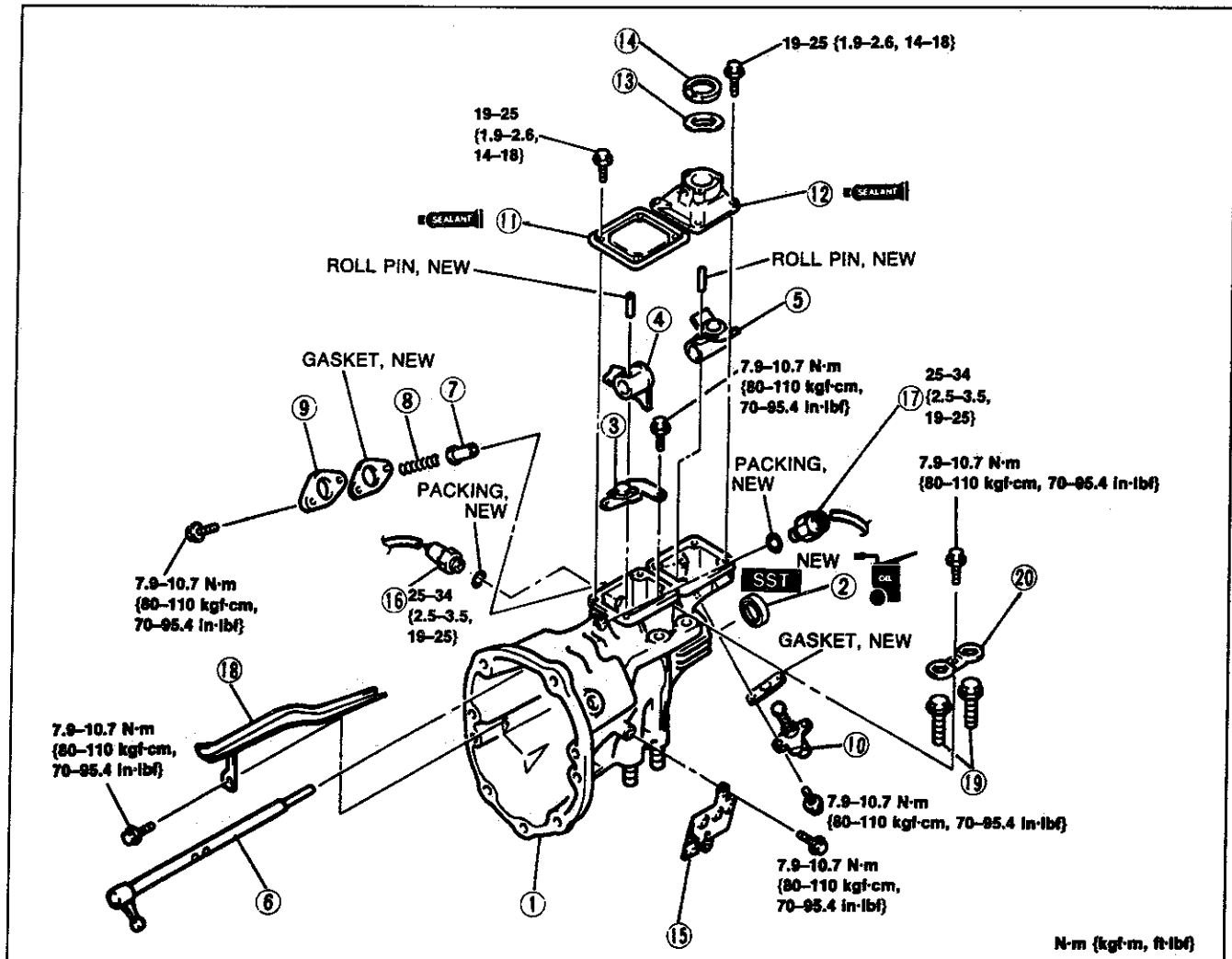
1. Inspect the indicated bearings for damage.
2. Replace the extension housing if necessary.

**ASSEMBLY****Precaution**

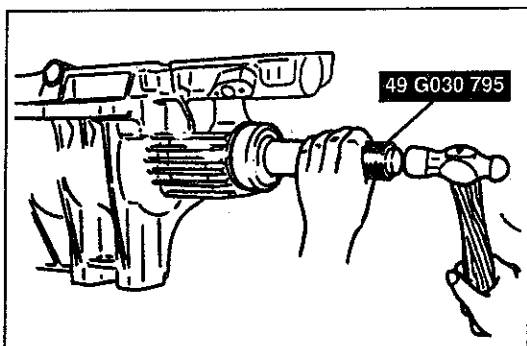
1. Make sure each part is cleaned before assembling.
2. Coat all movable parts with the specified oil.
3. Replace parts wherever required.
4. Remove old sealant from contact surfaces before applying new sealant.
5. Assemble the parts within 10 minutes after applying sealant. Allow all sealant to cure at least 30 minutes after assembly before filling the transmission with transmission oil.

**Extension Housing Components**

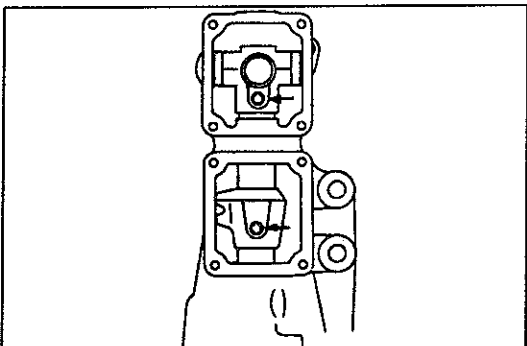
Assemble in the order shown, referring to **Assembly Note**.



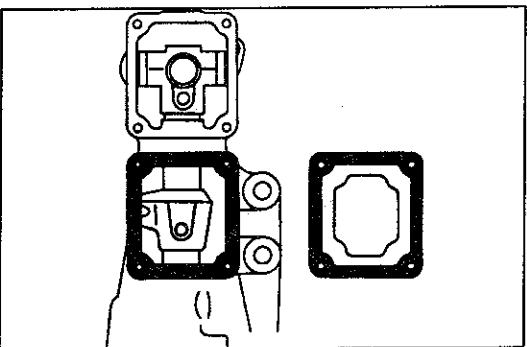
- |                                 |                               |                       |
|---------------------------------|-------------------------------|-----------------------|
| 1. Extension housing            | 7. Select lock spindle        | 13. Wave washer       |
| 2. Oil seal (extension housing) | 8. Select lock spindle spring | 14. Bushing           |
| Assembly Note                   | 9. Spring cap                 | 15. Bracket           |
| ..... page J-34                 | 10. Select spindle assembly   | 16. 1-2 switch        |
| 3. Shift guide assembly         | 11. Blind cover               | 17. Neutral switch    |
| 4. Selector                     | Assembly Note                 | 18. Oil guide         |
| 5. Control rod end              | ..... page J-34               | 19. Power plant frame |
| 6. Control rod                  | 12. Control case              | installation bolts    |
| Assembly Note                   | Assembly Note                 | 20. Stopper           |
| ..... page J-34                 | ..... page J-34               |                       |

**Assembly note****Oil seal (extension housing)**

1. Apply clean oil to the lip and outer edge of a new oil seal.
2. Install the oil seal evenly and gradually by using the SST.

**Control rod**

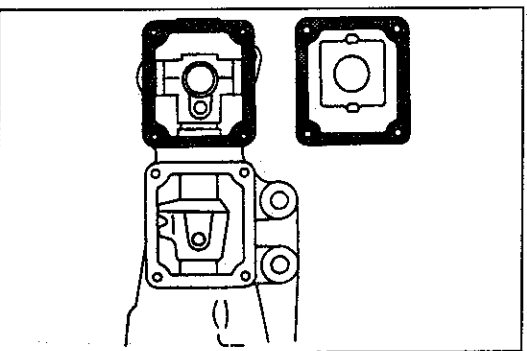
1. Install the control rod through the selector and the control rod end, into the extension housing.
2. Install new roll pins into the selector and control rod ends as shown in the figure.

**Blind cover**

1. Apply sealant to the contact surfaces of the blind cover and extension housing.
2. Install the blind cover.

**Tightening torque:**

19–25 N·m{1.9–2.6 kgf·m, 14–18 ft·lbf}

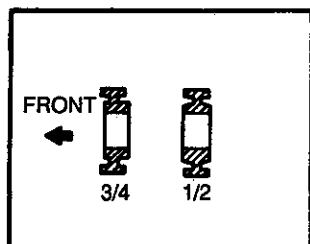
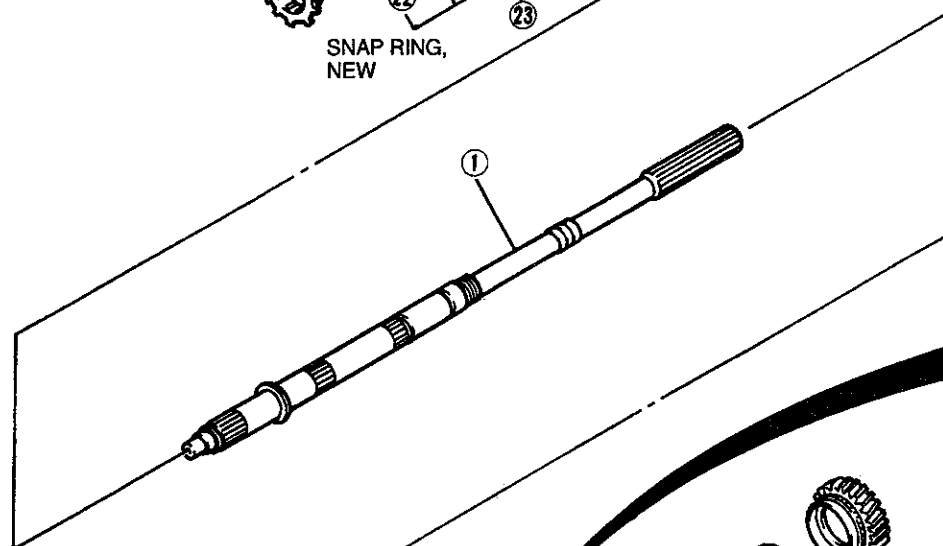
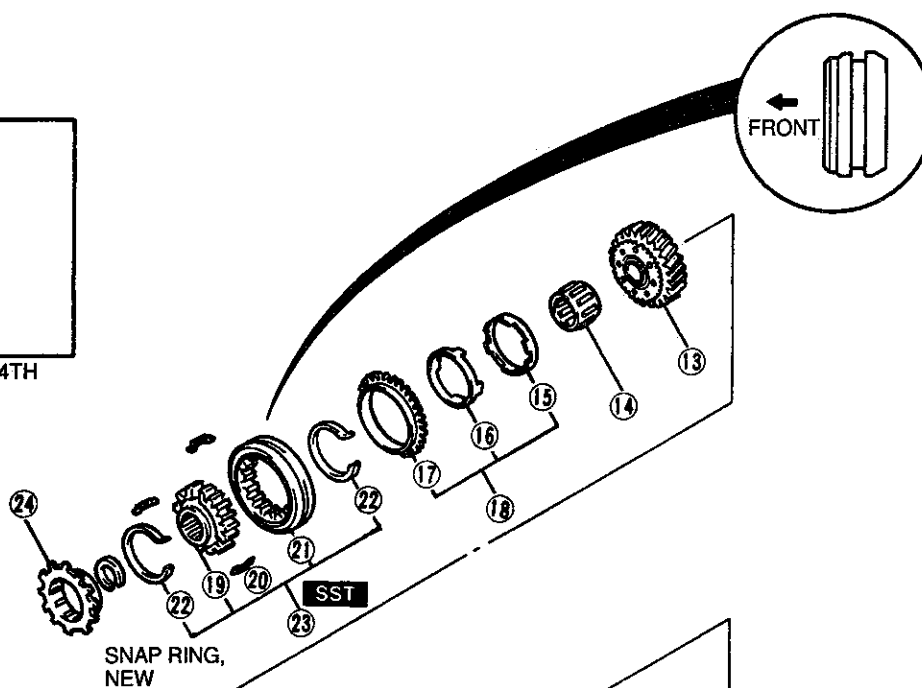
**Control case**

1. Apply sealant to the contact surfaces of the extension housing and control case.
2. Install the control case to the extension housing.

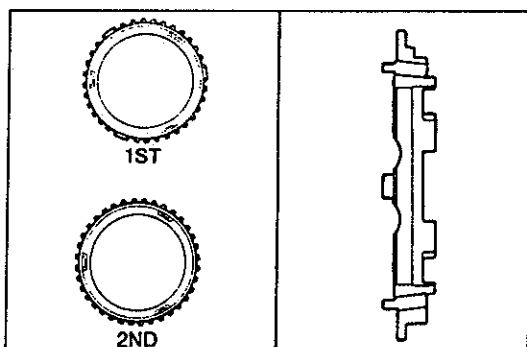
**Tightening torque:**

19–25 N·m{1.9–2.6 kgf·m, 14–18 ft·lbf}

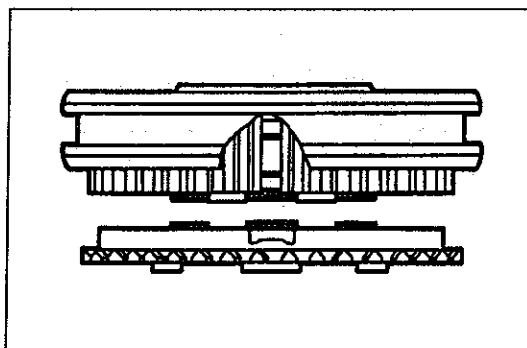
MEMO

**Mainshaft and Countershaft Components**Assemble in the order shown, referring to **Assembly Note**.1ST/2ND AND 3RD/4TH  
CLUTCH HUBS

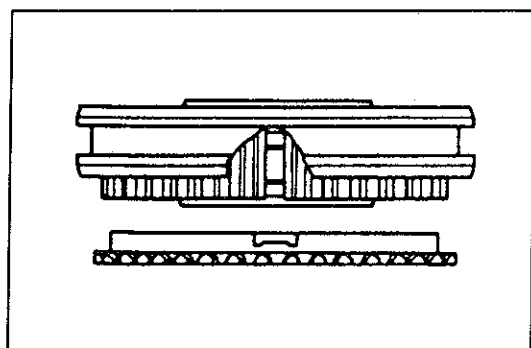
- |                                 |                                 |                                       |
|---------------------------------|---------------------------------|---------------------------------------|
| 1. Mainshaft                    | 13. 3rd gear                    | 25. 1st synchronizer ring             |
| 2. Bearing                      | 14. Bearing                     | 26. Bearing race                      |
| 3. 2nd gear                     | 15. Inner cone                  | 27. Bearing                           |
| 4. Inner cone                   | 16. Double cone                 | 28. 1st gear                          |
| 5. Double cone                  | 17. Synchronizer ring           | 29. Countershaft                      |
| 6. Synchronizer ring            | 18. 3rd synchronizer assembly   | 30. Countershaft center bearing race  |
| 7. 2nd synchronizer assembly    | Assembly Note . . . . . below   | Assembly Note . . . . . page J-39     |
| 8. 1st/2nd clutch hub           | 19. 3rd/4th clutch hub          |                                       |
| 9. Synchronizer key             | 20. Synchronizer key            |                                       |
| 10. Clutch hub sleeve           | 21. Clutch hub sleeve           | 31. Countershaft front bearing spacer |
| 11. Synchronizer key springs    | 22. Synchronizer key springs    | Assembly Note . . . . . page J-39     |
| 12. 1st/2nd clutch hub assembly | 23. 3rd/4th clutch hub assembly |                                       |
| Assembly Note . . . . . below   | Assembly Note . . . . . below   |                                       |
|                                 | 24. 4th synchronizer ring       |                                       |

**Assembly note****2nd, 3rd synchronizer assemblies**

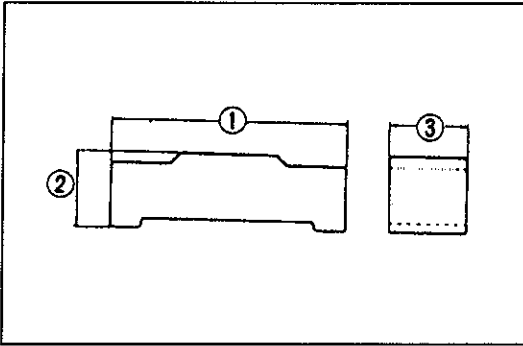
Install the inner cone, double cone, and synchronizer ring as shown in the figure. The 1st synchronizer ring has two teeth fused together at three places around its outer edge.

**1st/2nd, 3rd/4th clutch hub assemblies**

1. For the 2nd and 3rd synchronizer assemblies, align the synchronizer ring grooves and keys, and fit the inner cone tabs into the clutch hub slots.



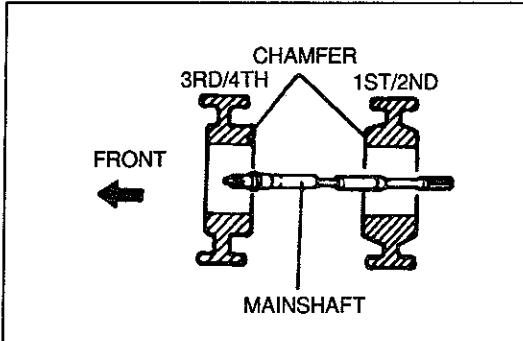
2. For the 1st and 4th synchronizer rings, align the synchronizer ring grooves and synchronizer keys.



## Standard key dimensions

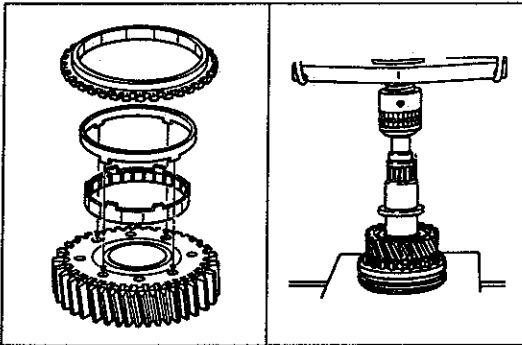
mm {in}

	1	2	3
1st and 2nd	18.00 {0.709}	5.45 {0.215}	6.00 {0.236}
3rd and 4th	17.00 {0.669}	4.25 {0.167}	5.00 {0.197}

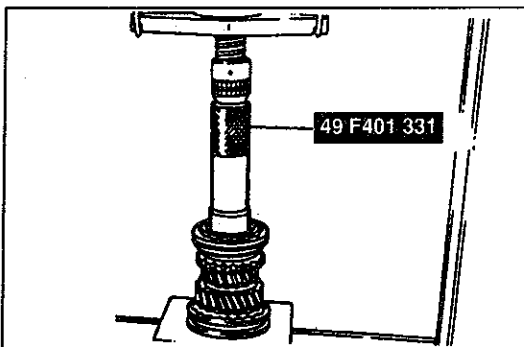


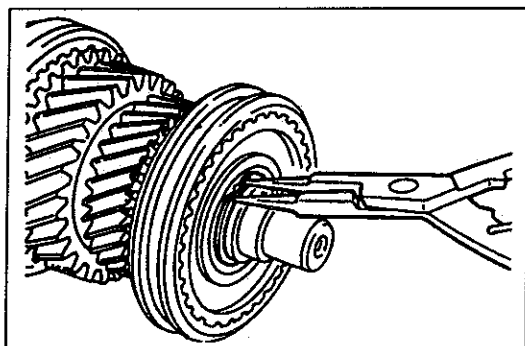
3. When installing the gears and clutch hub assemblies in the following procedure, make sure that they are installed in the direction shown in the figure.

4. Set the needle bearing, 2nd gear, 2nd synchronizer assembly, and the 1st/2nd clutch hub assembly on the mainshaft. Press the parts onto the mainshaft while keeping the parts from becoming crooked or misaligned.

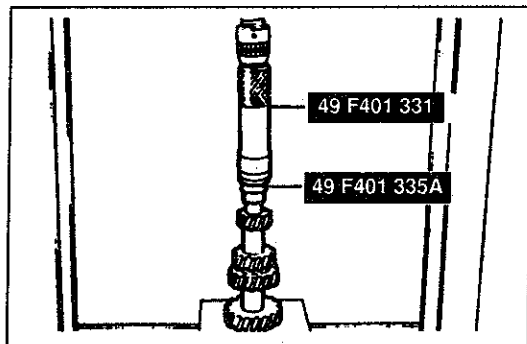


5. Set the needle bearing, 3rd gear, 3rd synchronizer assembly, and 3rd/4th clutch hub assembly on the mainshaft. Press the parts onto the mainshaft by using the SST, while keeping the parts from becoming crooked or misaligned.



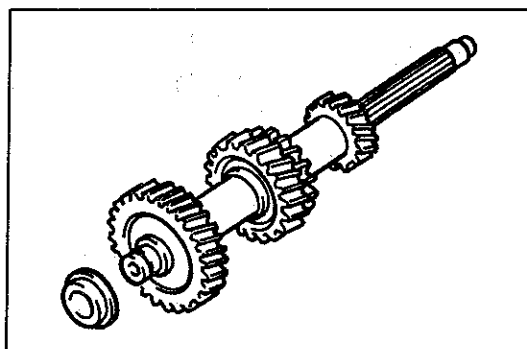


6. Install a new snap ring on the front of the mainshaft.



**Countershaft center bearing race**

Press the countershaft center bearing race onto the countershaft by using the SST.



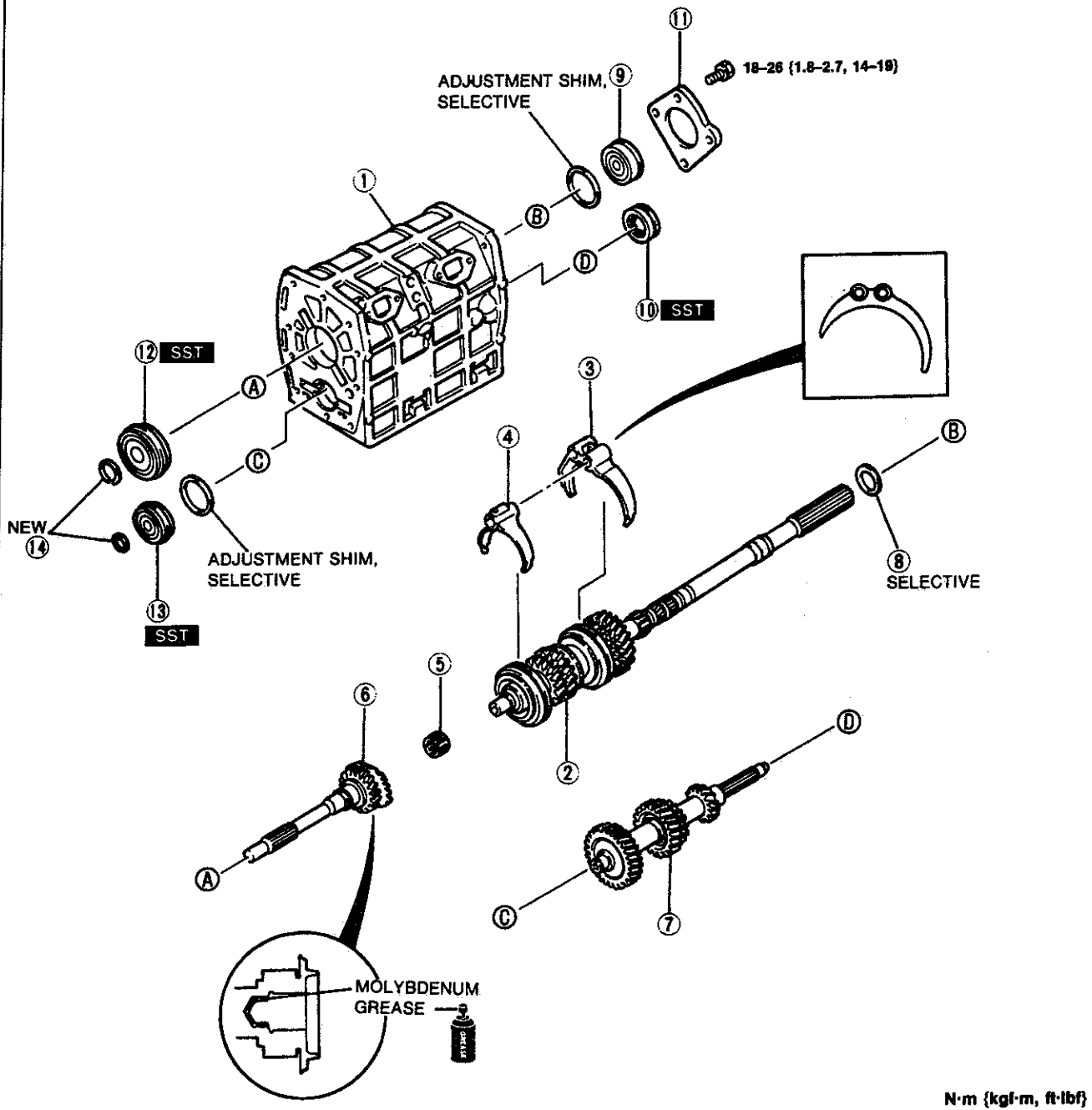
**Countershaft front bearing spacer**

Install the countershaft front bearing spacer. If the countershaft front bearing or countershaft front bearing spacer is being replaced, replace them as an assembly.

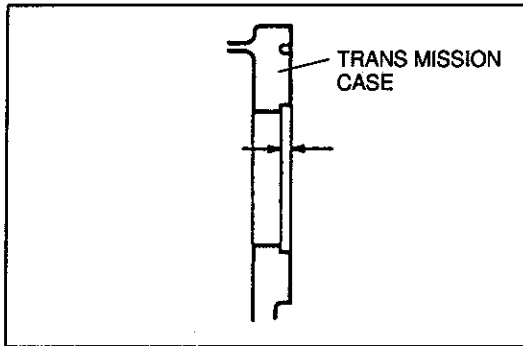


## Transmission Case Components

**Assemble in the order shown, referring to Assembly Note.**

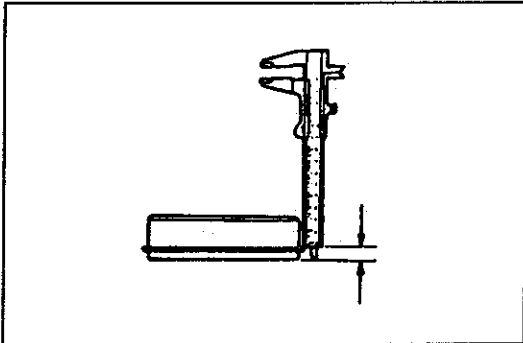


- |  |  |  |
|--|--|--|
| 1. Transmission case<br>Assembly Note<br>..... page J-41 | 7. Countershaft assembly<br>8. Thrust washer<br>9. Mainshaft front bearing<br>Assembly Note<br>..... page J-42 | 12. Main drive gear bearing<br>Assembly Note<br>..... page J-42    |
| 2. Mainshaft gear assembly                               | 10. Countershaft center<br>bearing<br>Assembly Note<br>..... page J-42   | 13. Countershaft front bearing<br>Assembly Note<br>..... page J-43 |
| 3. 1st/2nd shift fork                                    |  | 14. Snap rings   |
| 4. 3rd/4th shift fork                                    |  |  |
| 5. Bearing   |  |  |
| 6. Main drive gear                                       |  |  |
|  | 11. Bearing cover  |  |

**Assembly note****Transmission case**

1. Measure the mainshaft front bearing thrust play as follows.

- (1) Measure the depth of the mainshaft front bearing bore in the rear of the transmission case.



- (2) Measure the mainshaft front bearing height.

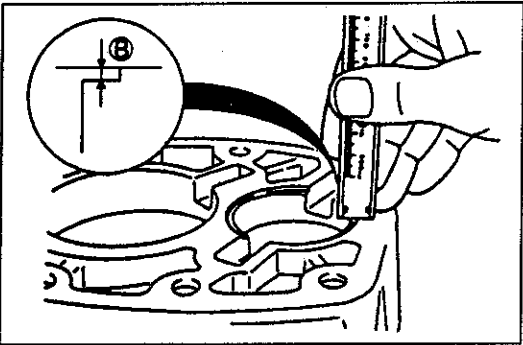
The difference between the two measurements indicates the required thickness of the adjustment shim.

**Standard thrust play:**

0–0.05 mm {0–0.002 in}

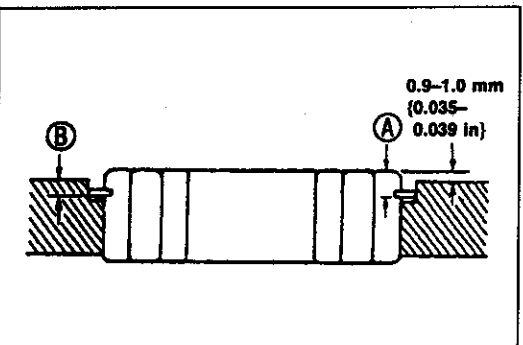
**Adjustment shim thicknesses:**

0.1mm {0.004 in}, 0.3 mm {0.012 in}



2. Measure the countershaft front bearing thrust play as follows.

- (1) Measure depth B of the countershaft front bearing bore in the transmission case.



- (2) Measure the countershaft front bearing snap ring height A.

- (3) Choose an adjustment shim that will allow the difference between the two measurements to be equal to the standard bearing height.

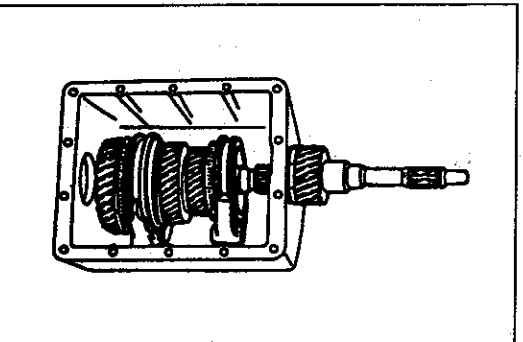
$$A - B + \text{Adjustment shim(s)} = 0.9 - 1.0 \text{ mm} \{0.035 - 0.039 \text{ in}\}$$

**Standard bearing height on installing:**

0.9–1.0 mm {0.035–0.039 in}

**Adjustment shim thicknesses:**

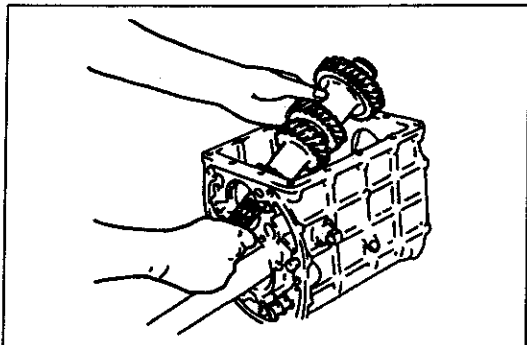
0.1mm {0.004 in}, 0.3 mm {0.012 in}



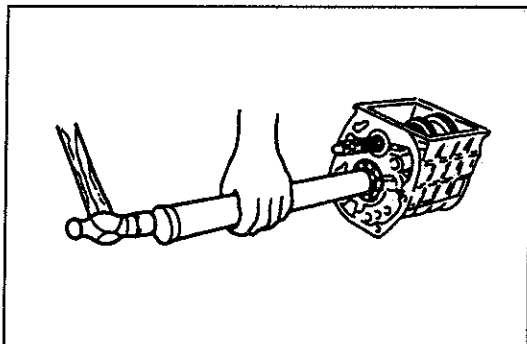
3. Position the 1st/2nd and 3rd/4th shift forks into the grooves of the clutch hub and sleeve assemblies.

4. Apply molybdenum grease to the needle bearing and install it in the main drive gear.

5. Install the main drive gear onto the front of the mainshaft.



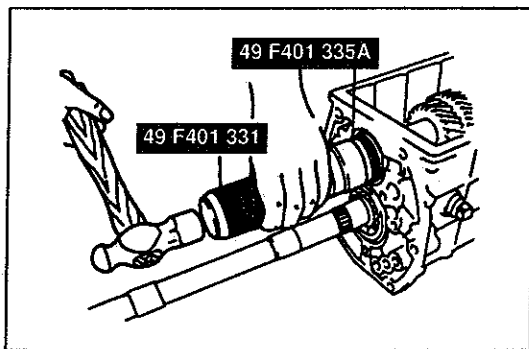
6. Set the countershaft assembly into the case, making sure the countershaft gears engage each gear of the mainshaft assembly.



#### Mainshaft front bearing

1. Install the correct shim onto the rear of the mainshaft as determined in the transmission case assembly note (page J-43.)
2. Install the mainshaft front bearing with a suitable pipe.

**Bearing inner diameter: 32 mm {1.3 in}**  
**Bearing outer diameter: 75 mm {3.0 in}**

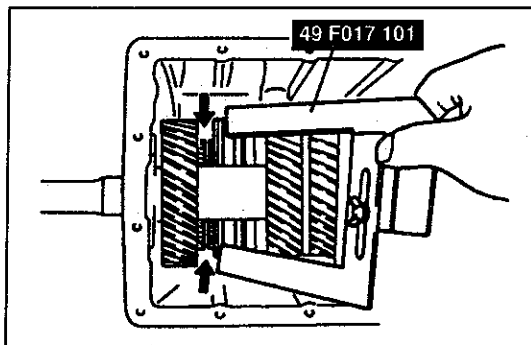
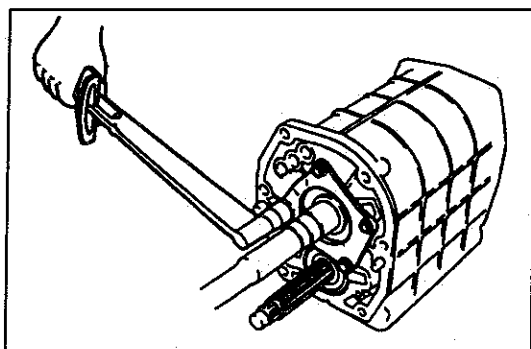


#### Countershaft center bearing

1. Install the countershaft center bearing onto the rear of the countershaft by using the SST.

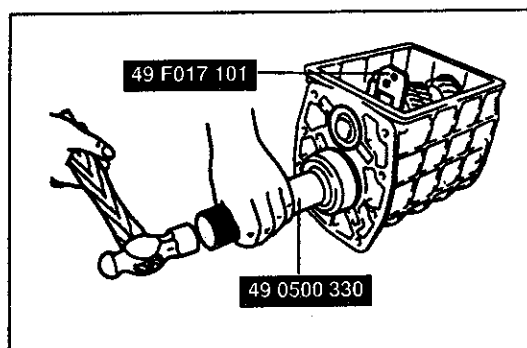
2. Install the bearing cover.

**Tightening torque:**  
**18-26 N·m {1.8-2.7 kgf·m, 14-19 ft·lbf}**

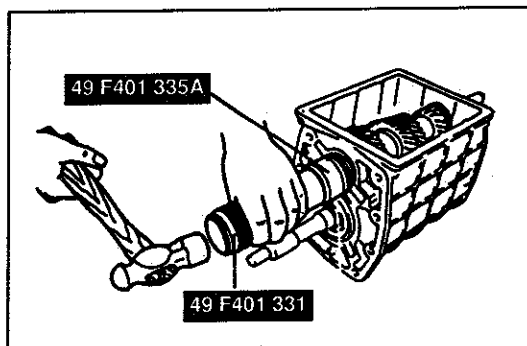


#### Main drive gear bearing

1. Install the SST between the 4th synchronizer ring and the main drive synchromesh gear.

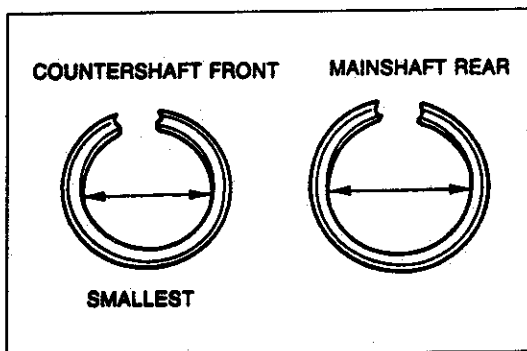


2. Install the main drive gear bearing by using the SSTs.

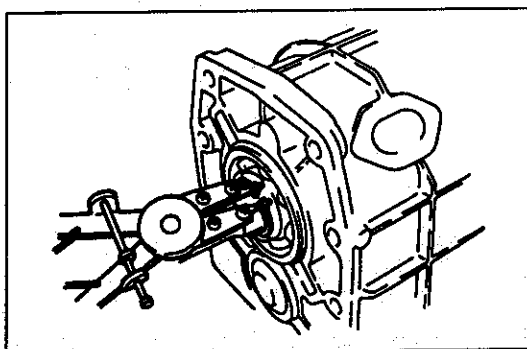


### Countershaft front bearing

1. Install the correct shim onto the countershaft front bearing as determined in the transmission case assembly note (page J-43.)
2. Install the countershaft front bearing by using the SST. If the countershaft front bearing or countershaft front bearing spacer is being replaced, replace them as an assembly.



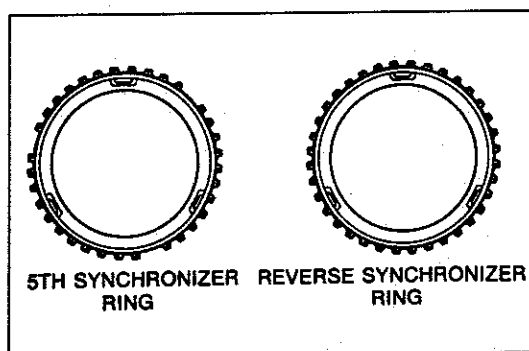
3. Install new snap rings to the main drive gear and countershaft gear. Install the smaller snap ring to the countershaft gear, and the larger one to the main drive gear.



Assemble in the order shown, referring to **Assembly Note**.



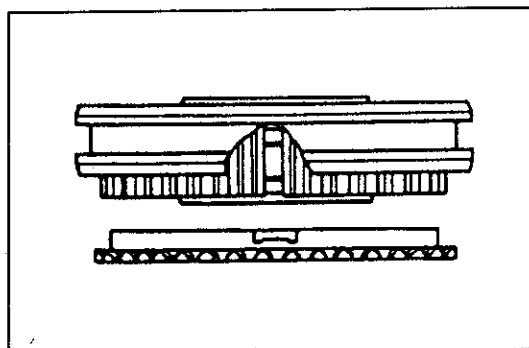
- |                                  |                            |                               |
|----------------------------------|----------------------------|-------------------------------|
| 1. Counter reverse gear          | 20. 1st/2nd shift rod      | 35. Counter 5th gear          |
| 2. Thrust washer                 | Assembly Note              | 36. Countershaft rear bearing |
| 3. Reverse idler gear            | ..... page J-47            | Assembly Note                 |
| 4. Reverse idler gear shaft      | 21. Interlock pin (large)  | ..... page J-49               |
| 5. Thrust washer                 | 22. Interlock pin (small)  | 37. Locknut                   |
| 6. Thrust washer                 | 23. 3rd/4th shift rod      | 38. Mainshaft rear bearing    |
| 7. Bearing race                  | Assembly Note              | Assembly Note                 |
| 8. Bearing                       | ..... page J-47            | ..... page J-49               |
| 9. Reverse gear                  | 24. Interlock pin (large)  | 39. Retaining ring            |
| 10. Reverse synchronizer ring    | 25. 5th/Reverse shift fork | 40. C-washers                 |
| Assembly Note ..... below        | Assembly Note              | 41. Thrust washer             |
| 11. 5th/Reverse clutch hub       | ..... page J-47            | 42. Snap ring                 |
| assembly                         | 26. Spring                 | 43. Bearing housing           |
| Assembly Note ..... below        | 27. 5th/Reverse shift rod  | Assembly Note                 |
| 12. Locknut                      | Assembly Note              | ..... page J-50               |
| Assembly Note ..... below        | ..... page J-47            | 44. 1st/2nd shift rod end     |
| 13. 5th synchroniser ring        | 28. Retaining ring         | Assembly Note                 |
| Assembly Note ..... below        | 29. Cap plug, spring, and  | ..... page J-50               |
| 14. Retaining ring               | detent ball                | 45. 3rd/4th shift rod end     |
| 15. 5th gear                     | 30. Blind cover            | Assembly Note                 |
| Assembly Note                    | 31. Oil guide              | ..... page J-50               |
| ..... page J-46                  | 32. Center housing         | 46. 5th/Reverse shift rod end |
| 16. Bearing                      | Assembly Note              | Assembly Note                 |
| 17. Steel ball                   | ..... page J-48            | ..... page J-50               |
| 18. Thrust lock washer           | 33. Set bolt and washer    | 47. Oil guide                 |
| 19. C-washers and retaining ring | 34. Spacer                 |                               |



## Assembly note Synchroizer ring (5th/Reverse)

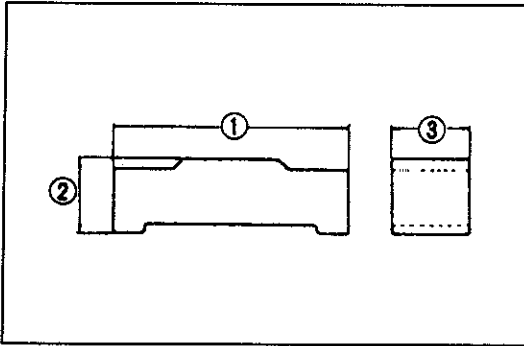
The 5th and Reverse synchronizer rings are differentiated as follows.

- (1) The 5th synchronizer ring has 3 places on its circumference with one tooth missing in each place.
- (2) The Reverse synchronizer ring has no distinguishing marks.



## 5th/Reverse clutch hub assembly and locknut

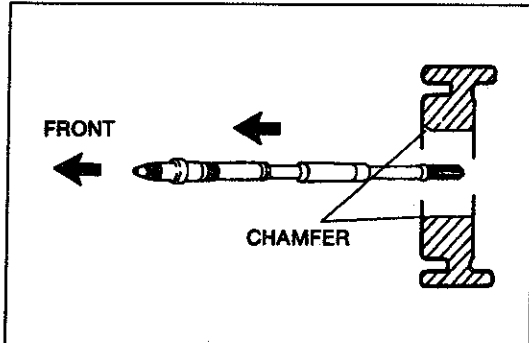
1. Align the 5th/Reverse synchronizer grooves and the synchronizer keys.



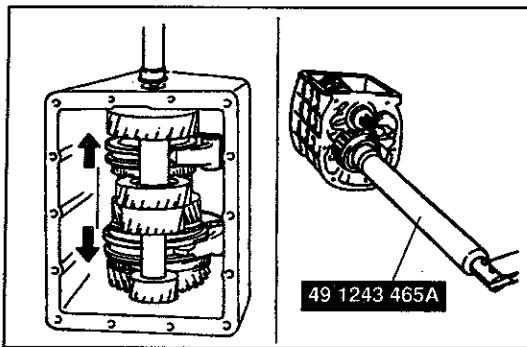
## Standard key dimensions

mm {in}

	1	2	3
5th/Reverse	17.00 {0.669}	4.250 {0.167}	5.00 {0.197}



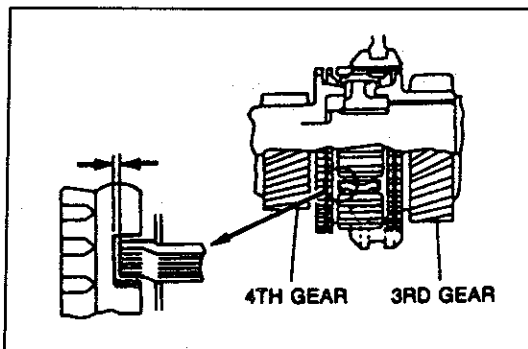
2. Install the 5th/Reverse clutch hub assembly onto the mainshaft in the direction shown.



3. Shift the clutch hubs into 1st and 4th gears to lock the rotation of the mainshaft.  
4. Install a new locknut and tighten it with the SST.

## Tightening torque:

157–235 N·m {16.0–24.0 kgf·m, 116–173 ft·lbf}



5. Check the clearance between the synchronizer key and the exposed edge of the synchronizer ring.

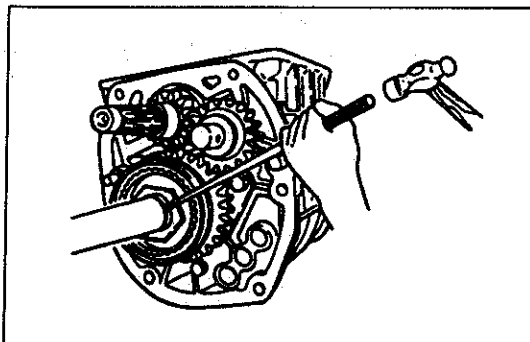
If the clearance is not as specified, adjust it by changing the thrust washers on the front and rear of the mainshaft front bearing. The total combined thickness of the front and rear thrust washers must equal 6.0 mm {0.236 in}

Clearance: 0.66–2.00 mm {0.026–0.079 in}

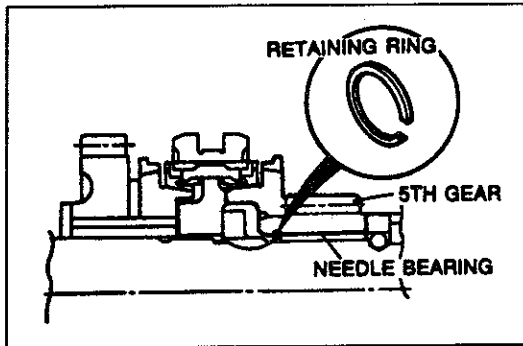
## Available thrust washer thicknesses:

2.5 mm {0.098 in}, 3.0 mm {0.118 in}

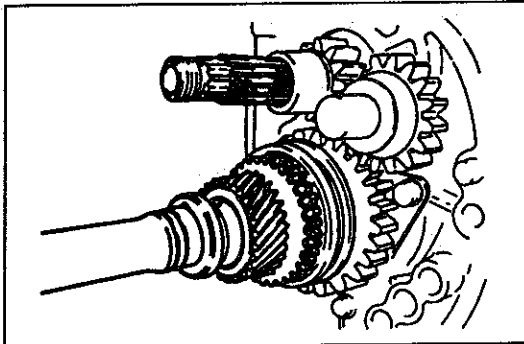
3.5 mm {0.138 in}



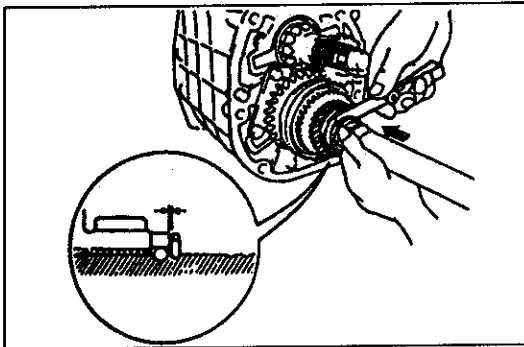
6. Stake the locknut into the mainshaft groove.

**5th gear**

1. Install a new retaining ring to the 5th gear.



2. Install the synchronizer ring, 5th gear, and needle bearing.
3. Install the steel ball and thrust lock washer.
4. Install the 3.0 mm {0.118 in} C-washers and hold them with a retaining ring.

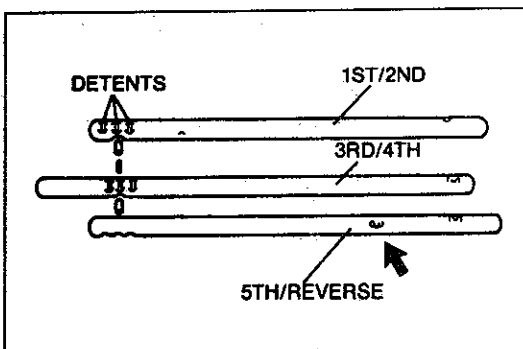


5. Push the C-washers toward 5th gear and measure the clearance between the C-washers and thrust lock washer. If the clearance is not as specified, select the proper thrust lock washer.

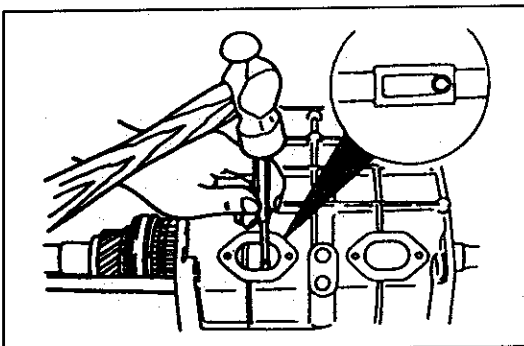
**Standard: 0.1–0.2 mm {0.004–0.008 in}**

**Available thrust lock washer thicknesses:**

6.2 mm {0.244 in}, 6.3 mm {0.248 in}  
 6.4 mm {0.252 in}, 6.5 mm {0.256 in}  
 6.6 mm {0.260 in}, 6.7 mm {0.264 in}

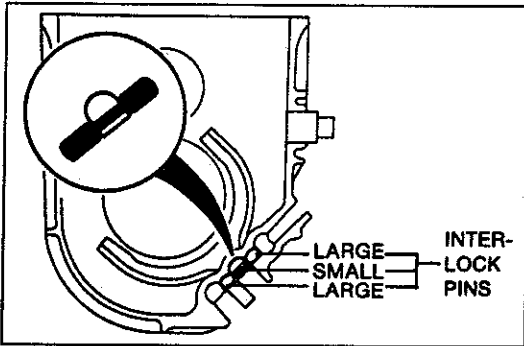
**Shift forks and rods**

1. Refer to the figure to identify each shift rod. When installing the shift rods in the following procedure, install them so that the detent grooves are facing the detent balls.

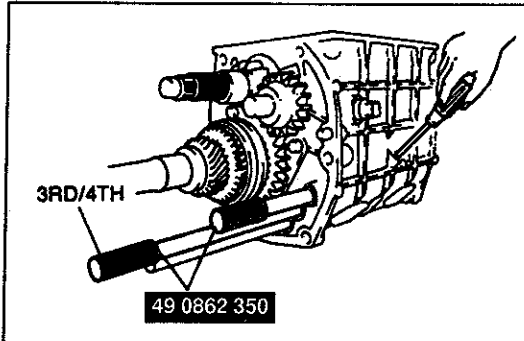


2. Slide the 1st/2nd shift rod into the case.
3. Secure the 1st/2nd shift fork to the rod with a new roll pin. The split in the roll pin must be facing in the direction shown in the figure.

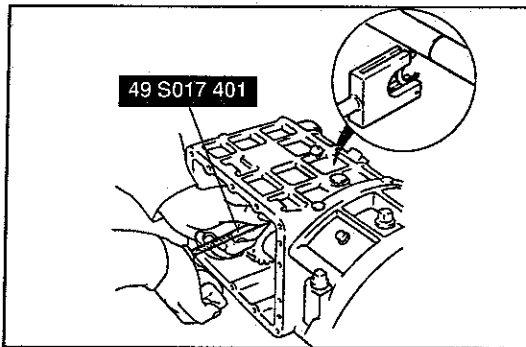




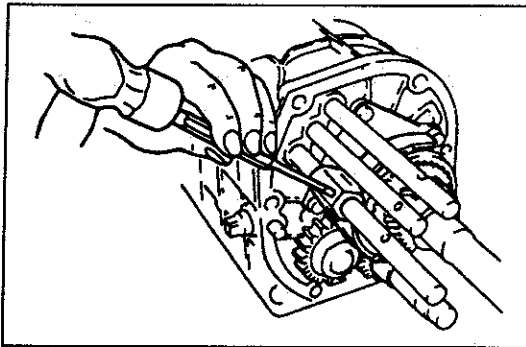
4. Install the interlock pins as shown in the figure when doing steps 4 through 8.



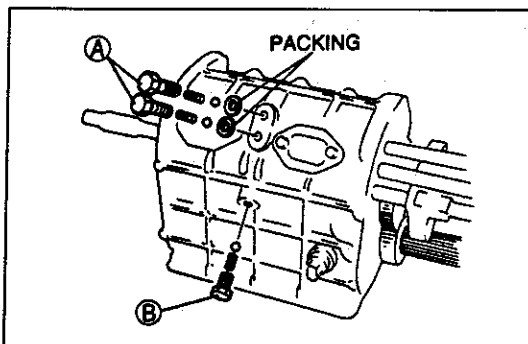
5. Slide the two SST into the transmission case to guide the interlock pins, and insert the first pin.  
 6. Remove the 3rd/4th shift fork guide from the case.  
 7. Slide the 3rd/4th shift rod containing the interlock pin (small) into the case.  
 8. Secure the 3rd/4th shift rod onto the fork with the new roll pin.  
 9. Insert the remaining interlock pin and remove the SST.



10. Install the 5th/Reverse shift fork onto the clutch hub.  
 11. Install the 5th/Reverse shift rod in the transmission case through the spring.  
 12. Push back the spring, and install a new clip to the 5th/Reverse shift rod by using the SST.



13. Install a new roll pin into the 5th/Reverse shift fork.



14. Install the two blind covers and two new gaskets.

**Tightening torque:**

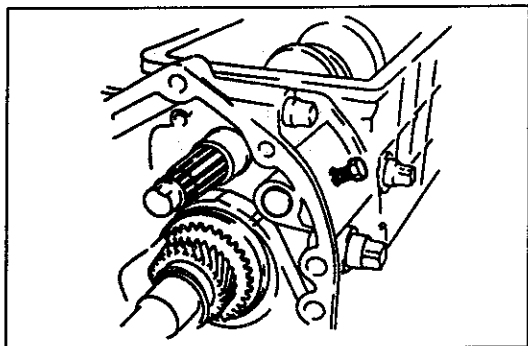
7.9–10.7 N·m{80–110 kgf·cm, 70.0–95.4 in·lbf}

15. Install the packings, detent balls, springs, and cap bolts.

**Tightening torque:**

A: 40–58 N·m{4.0–6.0 kgf·m, 29–43 ft·lbf}

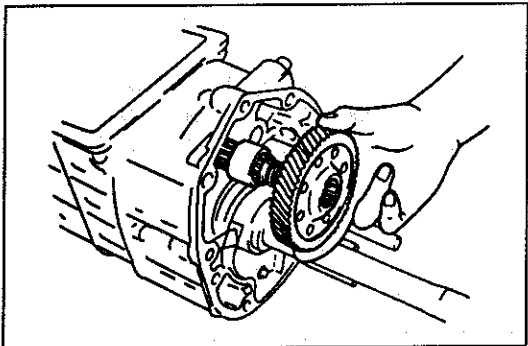
B: 19–25 N·m{1.9–2.6 kgf·m, 14–18 ft·lbf}

**Center housing**

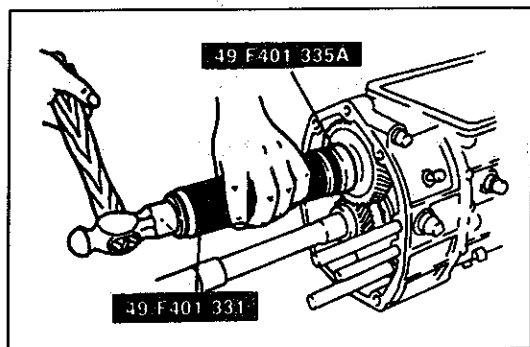
1. Apply sealant to the contact surfaces of the transmission case and center housing.
2. Install the oil guide.
3. Install the center housing.
4. Align the reverse idler gear shaft with the set bolt hole, and install the set bolt and washer.

**Tightening torque:**

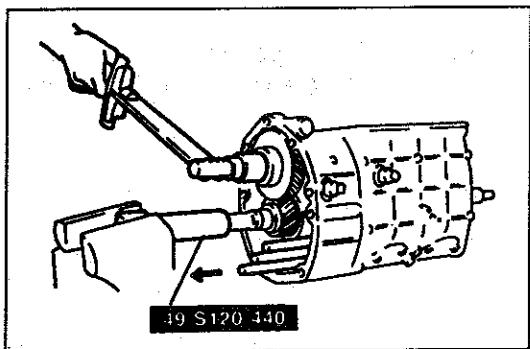
8.9–13.7 N·m{90–140 kgf·cm, 79–121 in·lbf}



5. Install the spacer and counter 5th gear.

**Countershaft rear bearing**

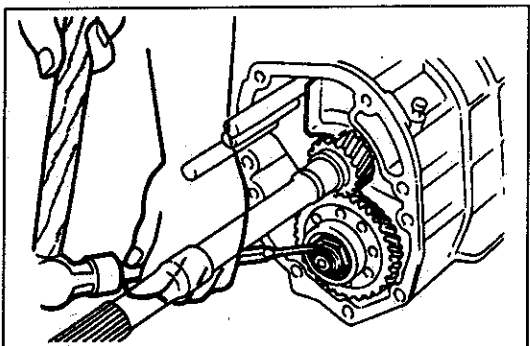
1. Install the countershaft rear bearing by using the SST.



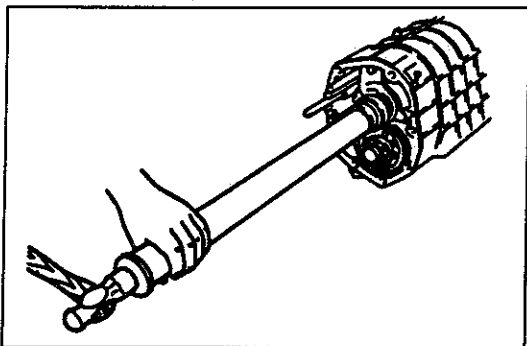
2. Connect the SST to the mainshaft and mount it securely in a vise.
3. Shift into 1st gear to lock the countershaft.
4. Install the new countershaft locknut.

**Tightening torque:**

128–196 N·m{13.0–20.0 kgf·m, 95–144 ft·lbf}



5. Stake the locknut into the countershaft groove.

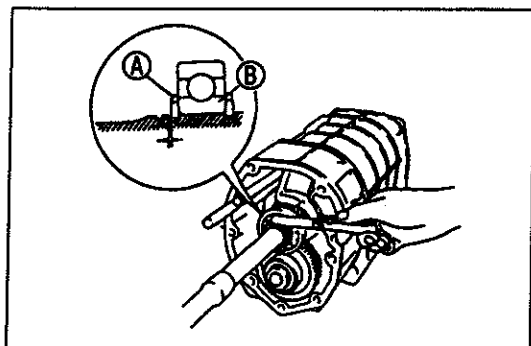


### Mainshaft rear bearing

1. Drive on the mainshaft rear bearing with a suitable pipe.

Bearing diameter (inner): 22 mm {0.87 in}

Bearing diameter (outer): 56 mm {2.2 in}



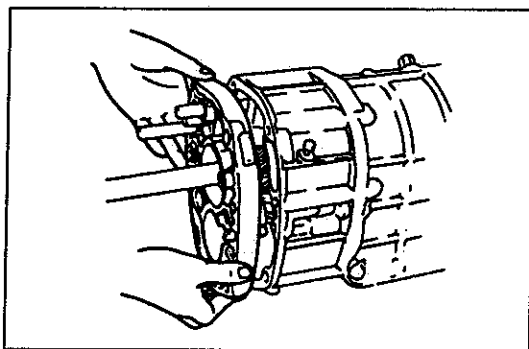
2. Install the C-washers and hold them in place with a new retaining ring.
3. With points A and B pressed tightly together, measure the clearance between the C-washers and the groove. If the clearance is not as specified, select the proper C-washers.

Standard: 0–0.1 mm {0–0.004 in}

### Available C-washer thicknesses:

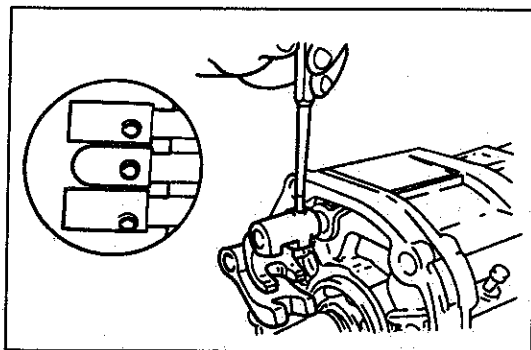
2.9 mm {0.114 in}, 3.0 mm {0.118 in}

3.1 mm {0.122 in}, 3.2 mm {0.126 in}



### Bearing housing

1. Apply sealant to the contact surfaces of the center housing and bearing housing.
2. Install the bearing housing onto the center housing.

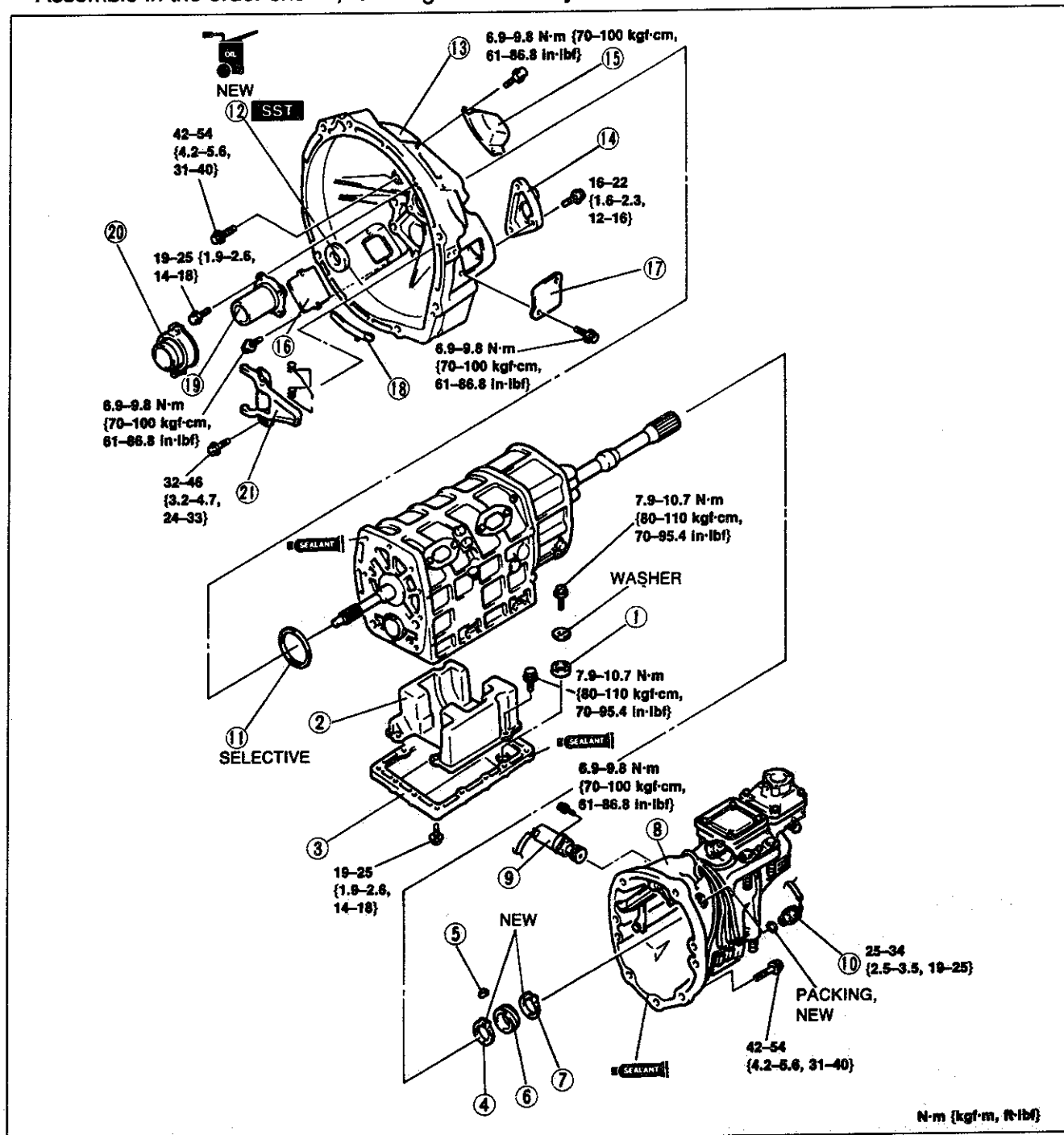


### Shift rod ends

Install the shift rod ends onto the proper shift rods, and secure them with new roll pins facing as shown in the figure.

## Clutch Housing and Extension Housing Components

Assemble in the order shown, referring to **Assembly Note**.



1. Magnet
2. Oil baffle
3. Undercover

Assembly Note

4. Snap ring

5. Key

6. Speedometer drive gear

7. Snap ring

8. Extension housing

Assembly Note

..... page J-52

9. Speedometer sensor  
(Speedometer driven gear)

10. Back-up light switch

11. Assist shim

12. Oil seal (clutch housing)

Assembly Note

..... page J-52

13. Clutch housing

Assembly Note

..... page J-52

14. Release cylinder support

15. Vent cover

16. Service hole B cover

17. Service hole A cover

18. Dust cover

19. Front cover

20. Release collar

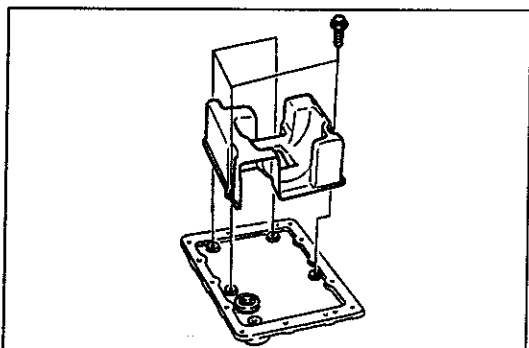
Assembly Note

..... page J-53

21. Release fork assembly

Assembly Note

..... page J-53

**Assembly note****Undercover**

1. Install the magnet to the undercover.

**Tightening torque:**

7.9–10.7 N·m{80–110 kgf·cm, 70.0–95.4 in·lbf}

2. Install the oil baffle to the undercover.

**Tightening torque:**

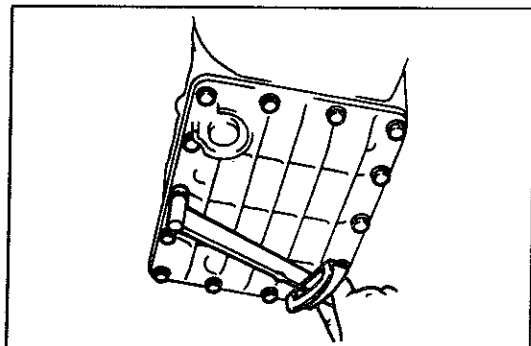
7.9–10.7 N·m{80–110 kgf·cm, 70.0–95.4 in·lbf}

3. Apply sealant to the contact surfaces of the undercover and the transmission case.

4. Install the undercover.

**Tightening torque:**

19–25 N·m{1.9–2.6 kgf·m, 14–18 ft·lbf}

**Extension housing**

1. Apply sealant to the contact surfaces of the extension housing and bearing housing.
2. Install the extension housing.

**Bolt length (measured from below the head):**

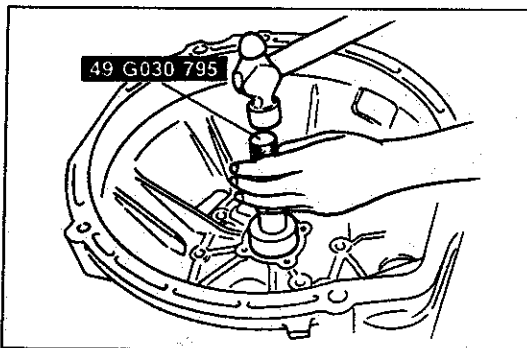
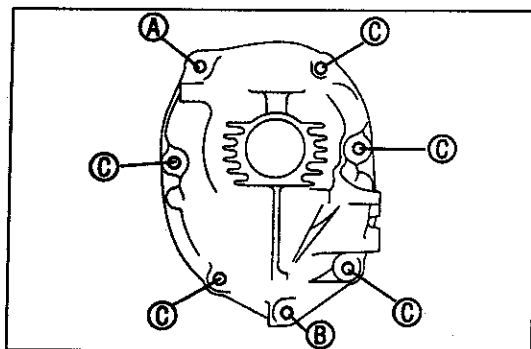
A: 135 mm {5.31 in}

B: 48 mm {1.89 in}

C: 165 mm {6.50 in}

**Tightening torque:**

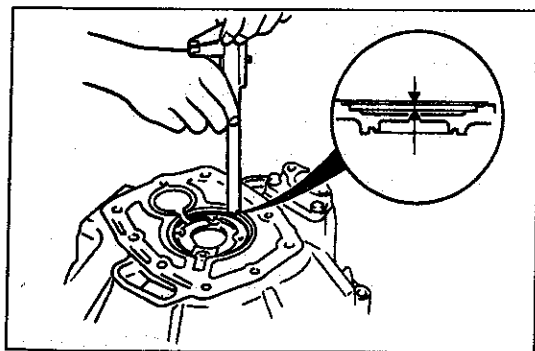
42–54 N·m{4.2–5.6 kgf·m, 31–40 ft·lbf}

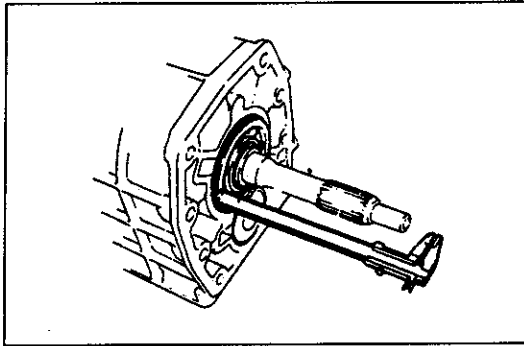
**Oil seal (clutch housing)**

1. Apply the specified oil to the lip of a new oil seal.
2. Install the oil seal evenly by using the SST.

**Clutch housing**

1. Measure the depth of the main drive gear bearing bore in the clutch housing by using vernier calipers.





2. Measure the main drive gear bearing height.
3. The difference between the measurements in steps 1 and 2 indicates the required thickness of the adjustment shim.

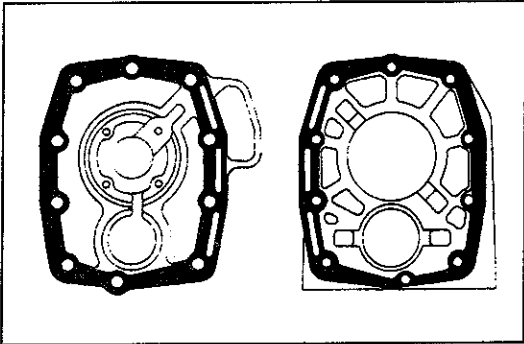
**Standard thrust play: 0–0.1 mm {0–0.004 in}**

**Adjustment shim thicknesses:**

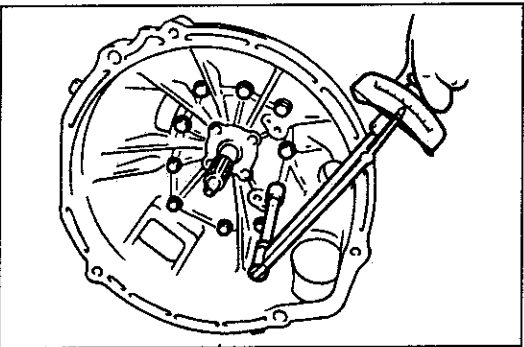
0.3 mm {0.012 in}, 0.4 mm {0.016 in}

0.5 mm {0.020 in}, 0.6 mm {0.024 in}

0.7 mm {0.028 in}



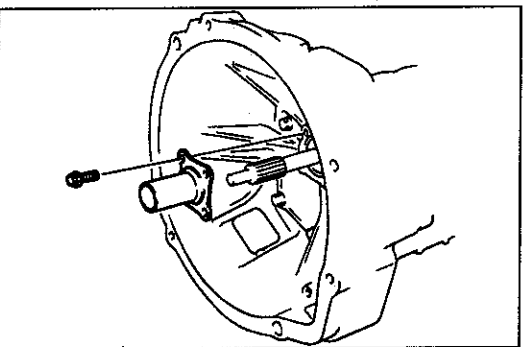
4. Apply sealant to the contact surfaces of the clutch housing and transmission case.
5. Install the correct adjustment shim on the main drive gear bearing as determined in steps 1 and 2.



6. Install the clutch housing.

**Tightening torque:**

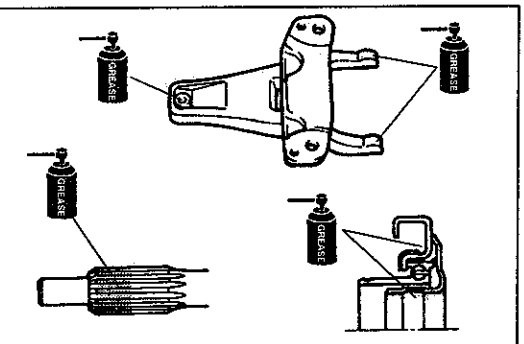
42–54 N·m{4.2–5.6 kgf·m, 31–40 ft·lbf}



7. Install the front cover to the clutch housing.

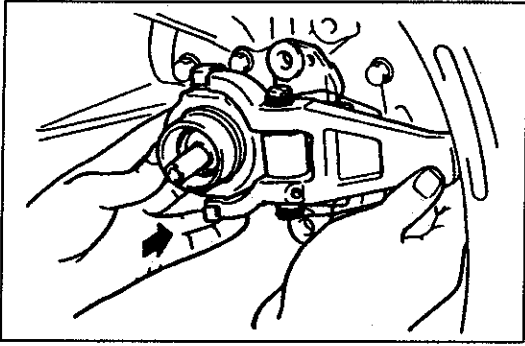
**Tightening torque:**

19–25 N·m{1.9–2.6 kgf·m, 14–18 ft·lbf}



## Release collar and release fork assembly

1. Apply molybdenum grease to the shaded areas of the release bearing and release fork.



2. Install the release bearing and release fork assembly.

**Tightening torque:**

**32–46 N·m {3.2–4.7 kgf·m, 24–33 ft·lbf}**

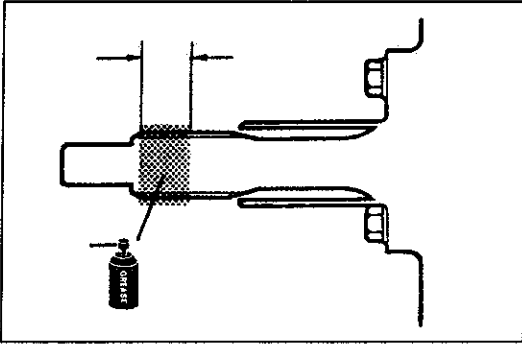
1. Install in the order shown, referring to Installation Note.

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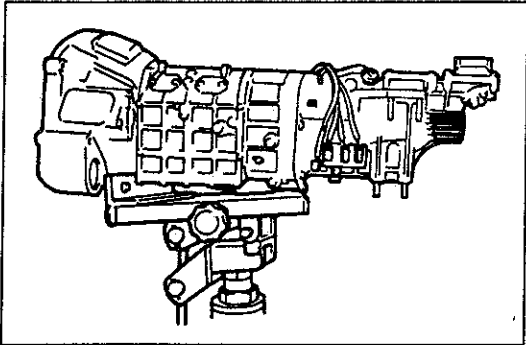
- ## J-55



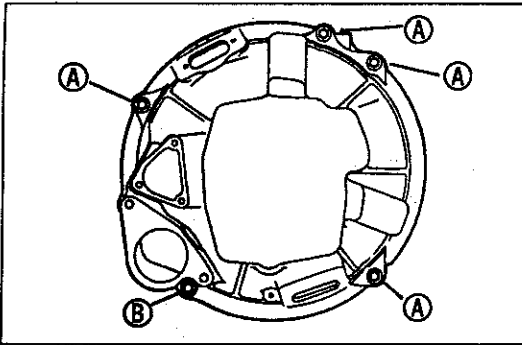


### Installation Note Transmission

1. Coat the main drive gear splines with grease as shown in the figure.



2. Set the transmission on a transmission jack.



3. Raise the transmission into place and install it to the engine, being careful not to dent or scratch the wedge collar and wiring.
4. Tighten the installation bolts.

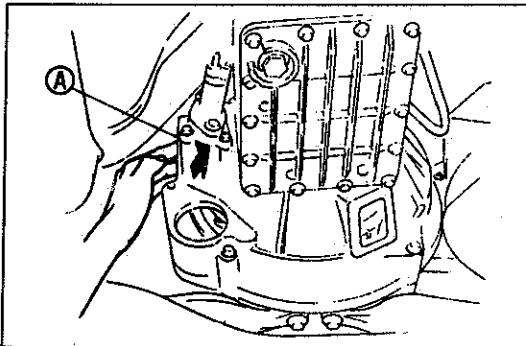
### Bolt length:

A: 55 mm {2.2 in}

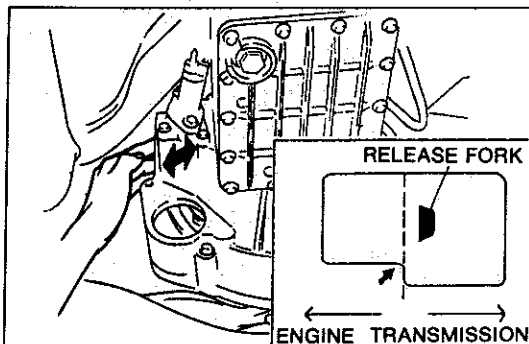
B: 90 mm {3.5 in}

### Tightening torque:

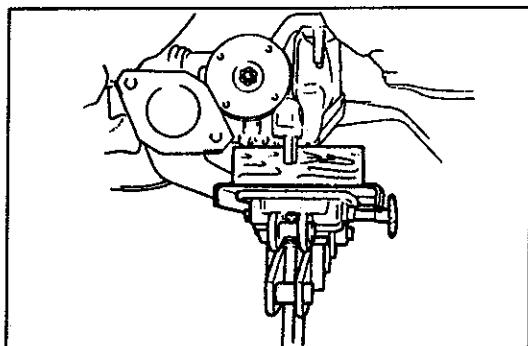
38–51 N·m {3.8–5.3 kgf·m, 28–38 ft·lbf}



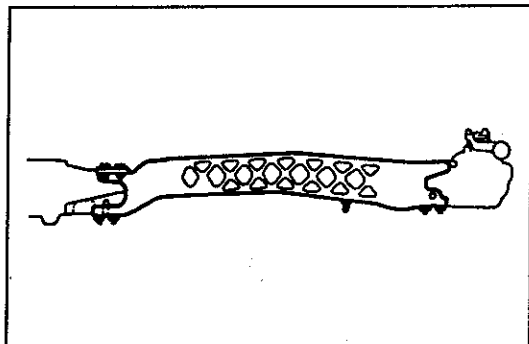
5. Through service hole A, push the release-cylinder end of the clutch release fork toward the transmission, and connect the clutch release collar to the clutch cover. The clutch release collar should snap into the clutch cover when installed properly.



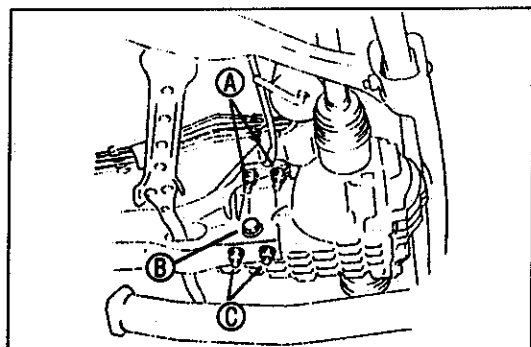
6. Swing the clutch release fork back and forth to verify that the clutch release collar is connected to the clutch cover.
7. Push the release-cylinder end of the clutch release fork toward the engine, and verify that it does not move past the dotted line.

**Power plant frame (PPF)**

1. Hold the differential at a 0° angle by using the transmission jack.



2. Hold the PPF in place with a new bolt and 8 new nuts.



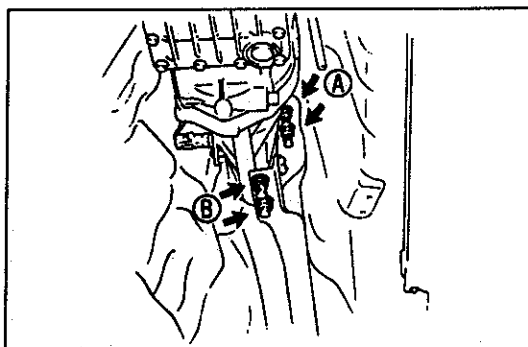
3. Tighten the differential-side PPF installation bolt and nuts in the order shown.

**Tightening torque:**

A, C: 148–176 N·m

{15.0–18.0 kgf·m, 109–130 ft·lbf}

B: 75–93 N·m {7.6–9.5 kgf·m, 55–68 ft·lbf}

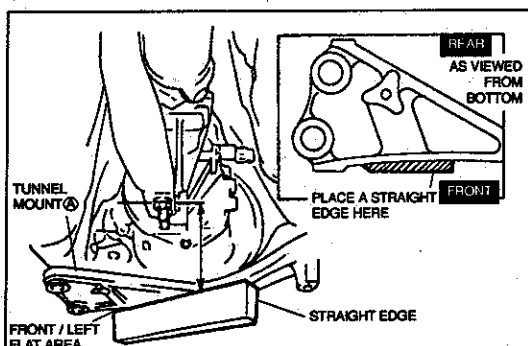


4. Tighten the transmission-side PPF installation nuts in the order shown.

**Tightening torque:**

148–176 N·m {15.0–18.0 kgf·m, 109–130 ft·lbf}

5. Remove the transmission jack.
6. Lower the vehicle to the ground, and remove the SST (engine supports).



7. Place a straightedge on the flat area on the front/left edge of the tunnel mount (A) so that it passes under the PPF installation bolts. Measure from the top of the straightedge to the PPF.

**Standard:** 75.1 mm {2.96 in}

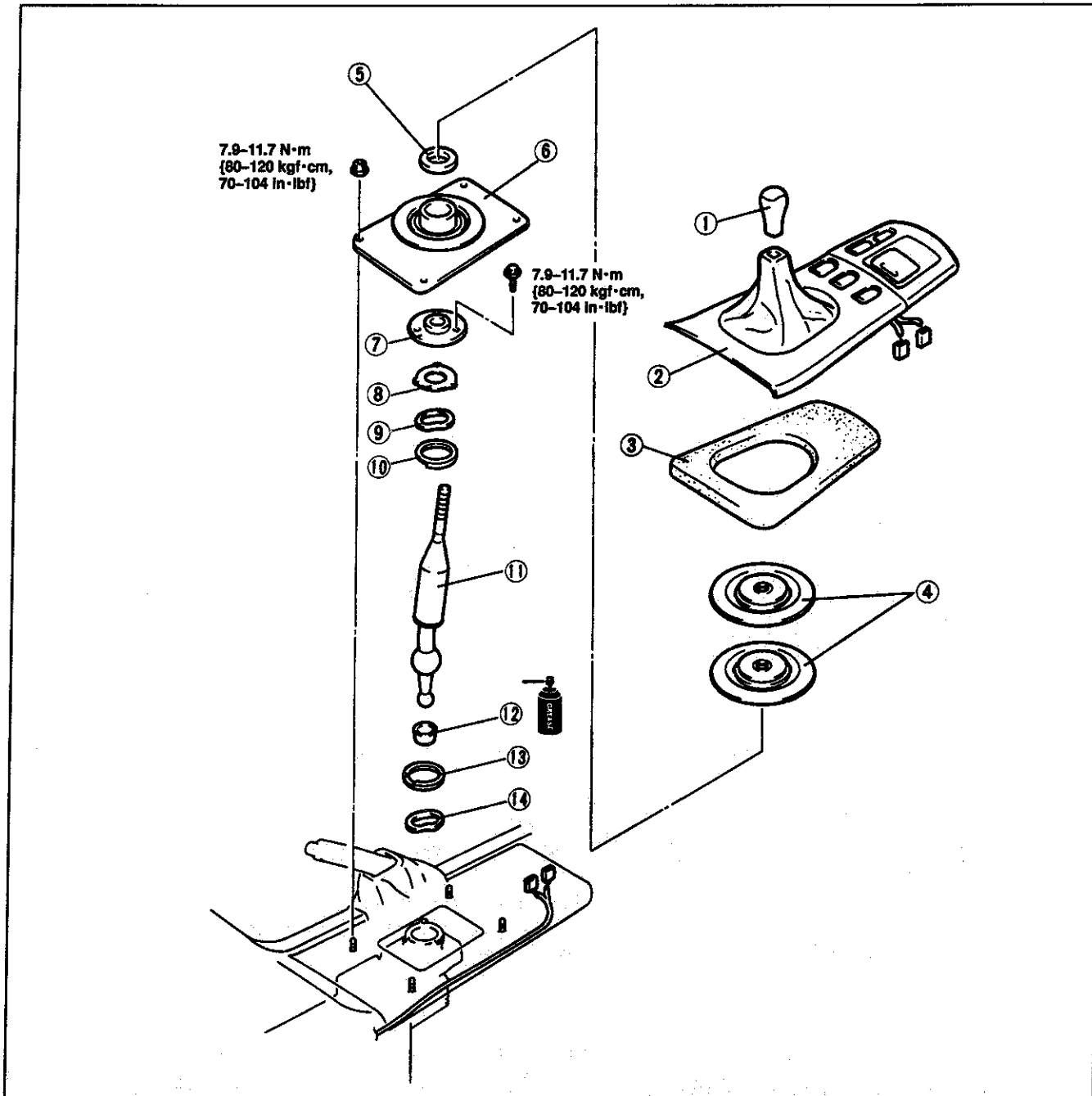
**Acceptable range:** 70–77 mm {2.76–3.03 in}

8. If the clearance is not within specification, readjust the PPF.

## SHIFT MECHANISM

## OVERHAUL

1. Disassemble as shown in the figure.
2. Inspect each part, and replace if necessary.
3. Assemble in the reverse order of disassembly.
4. After assembly, pump the clutch pedal and verify that the shift lever moves smoothly.



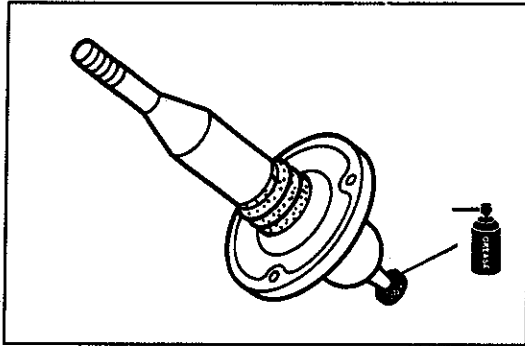
1. Shift lever knob
2. Console panel assembly
3. Bushing pad
4. Insulator boot pads
5. Insulator boot ring
6. Insulator boot
7. Dust boot

8. Gasket  
9. Wave washer  
10. Bushing  
11. Shift lever
- Assembly Note**

12. Shift seat  
Assembly Note  
.....  
13. Bushing  
14. Wave washer

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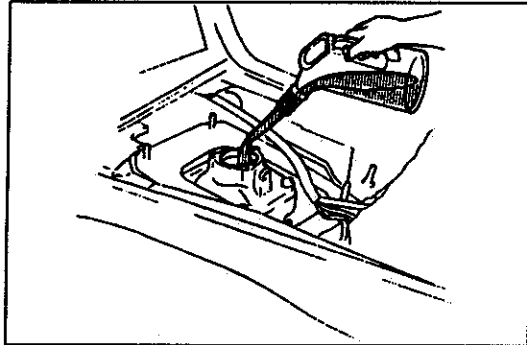
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## Assembly Note

### Shift seat

Apply grease to both the inside and outside of the shift seat.

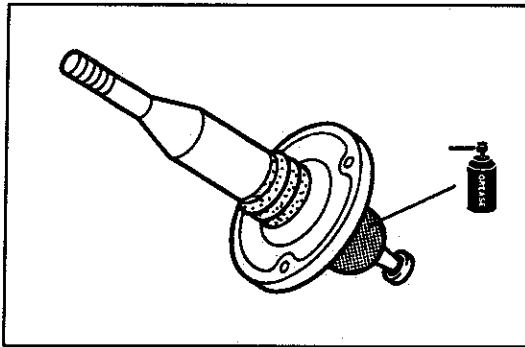


## Shift lever

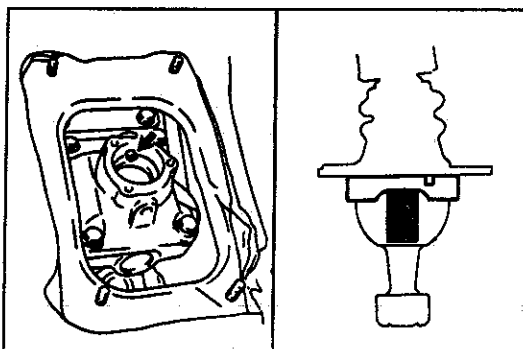
The change control case must be filled with oil after the transmission has been reassembled and installed.

1. Fill the change control case with the specified oil.

**Capacity: 80-95 cm<sup>3</sup> {4.9-5.8 cu in}**



2. Apply grease to the shift lever ball joint.



3. Align the control case pin with the slots in the change bushings and the shift lever, and install.