

MANUAL TRANSMISSION AND CLUTCH MYY SERIES

SECTION 7B MANUAL TRANSMISSION

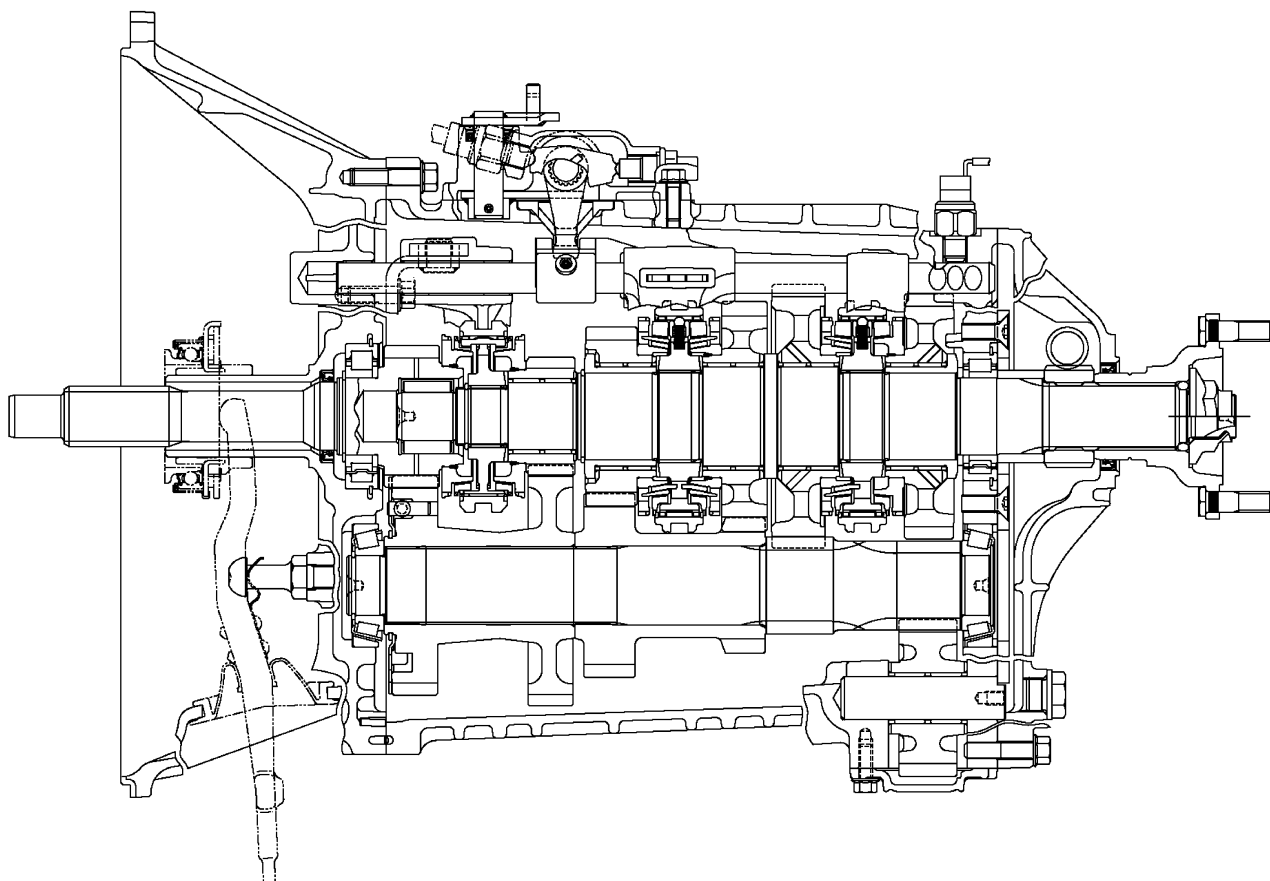
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MANUAL TRANSMISSION MECHANISM

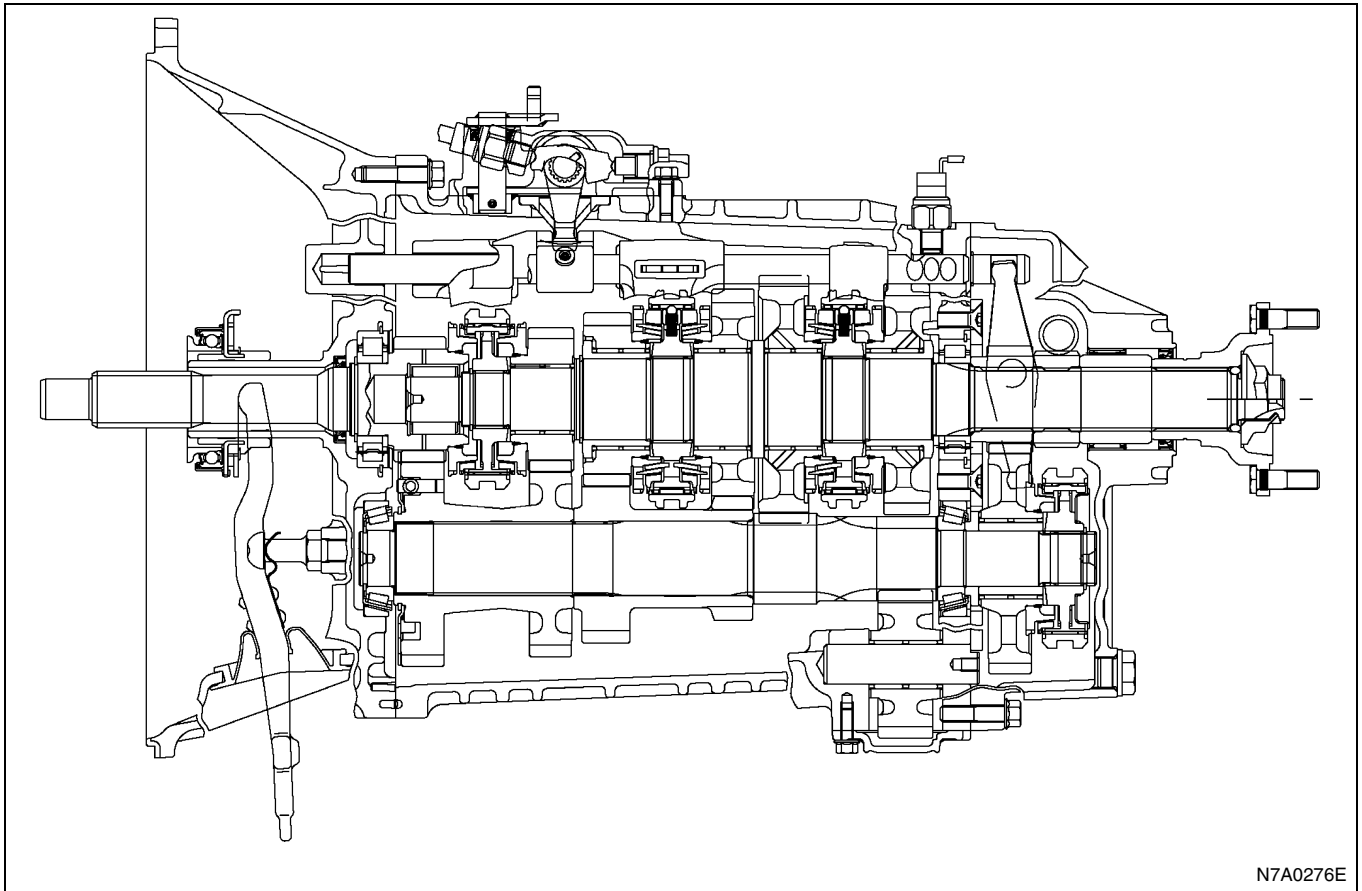
Function and Operation

- 5MT



N7A0275E

• 6MT



N7A0276E

MYT transmission is designed to enable weight saving and to adapt larger available torque input 392 N·m (40 kg·m/289.3 lb·ft). New technology is adopted such as

aluminum-tube type case (3 piece) structure, tapered roller bearing (main shaft front and rear, counter shaft front and rear) and twin-rod type shift control layout.

Inspection

Diagnostic chart for troubleshooting

Trouble	Cause	Treatment
Noise	Wear of flywheel pilot bearing	Replace
	Wear or damage of bearing (main shaft, counter shaft)	Replace
	Wear, crack and damage of gear (main shaft, counter shaft, reverse idle gear)	Replace
	Wear of spline (main shaft, synchronizer clutch hub)	Replace
	Seizure of gear or bearing thrust surface	Replace
	Backlash shortage of mesh gear	Replace
Shift difficulty	Clutch pedal play inaccuracy	Adjust
	Wear of change lever sliding portion	Repair or replace, lubricate grease
	Wear of shift block, shift rod or control box sliding portion	Replace
	Wear of shift arm or synchronizer sleeve groove	Replace the worn parts
	Wear of thrust washer, collar or gear thrust surface (main shaft and counter shaft thrust play)	Replace the worn parts
	Wear of synchronizer parts	Replace

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Trouble	Cause	Treatment
Out of gear	Wear of detent ball	Replace
	Wear of shift rod or control box sliding portion	Replace
	Wear of shift arm or synchronizer sleeve groove	Replace the worn parts
	Wear of thrust washer, collar or gear thrust surface (main shaft and counter shaft thrust play)	Replace the worn parts
	Wear or damage of bearing	Replace
	Wear of spline (main shaft, synchronizer hub)	Replace
	Fatigue or damage of synchronizer spring	Replace
Oil leakage	Looseness of drain plug or filler plug	Tighten the plug or refill oil
	Damaged gasket	Replace
	Wear or damage of oil seal	Replace

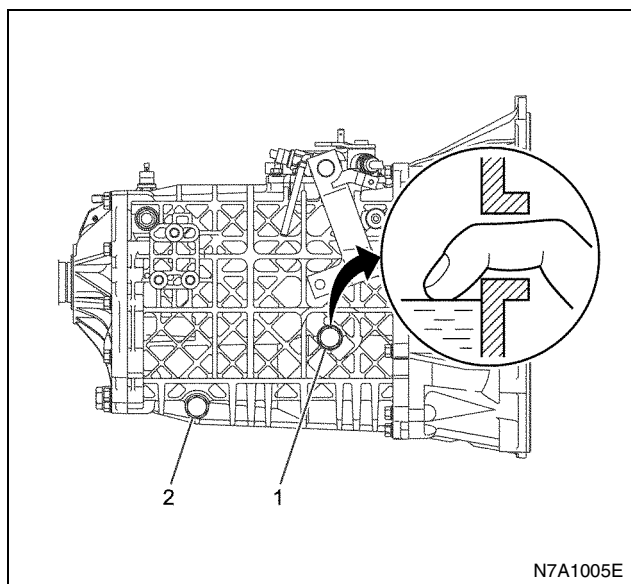
Oil Inspection

1. Remove the filler plug.
2. Check the oil level by inserting a finger to the filler plug hole.
3. Refill oil when the oil level is out of the specified amount.
 - Applicable oil = Besco gear oil transaxle (5W-30)
4. Fix the filler plug to the specified torque.

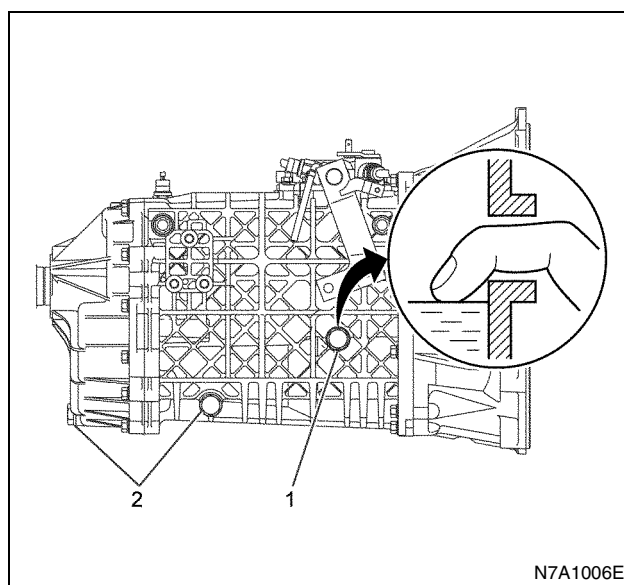
Tighten:

Filler plug to 39 N·m (4.0 kg·m / 29 lb·ft)

- 5MT



- 6MT



Legend

1. Filler plug
2. Drain plug

Oil Replacement

1. Start the engine and idle the transmission sufficiently.
2. Stop the engine, remove the drain plug, and then drain oil.
3. Fix the drain plug.

Tighten:

Drain plug to 39 N·m (4.0 kg·m / 29 lb·ft)

4. Remove the filler plug.
5. Fill oil through the filler plug hole to the lower edge of the hole.
 - Applicable oil = Besco gear oil transaxle (5W-30)

Oil Capacity	L (US qt/Imp qt)	
	6MT	5MT
Normal	3.5 (3.7 / 3.1)	2.8 (3.0 / 2.5)
4WD	—	3.5 (3.7 / 3.1)
With front PTO	—	5.5 — 6.0 (5.8 — 6.3 / 4.8 — 5.3)
With side PTO	3.8 (4.0 / 3.3)	3.1 (3.3 / 2.7)
With side PTO (4WD)	—	3.8 (4.0 / 3.3)

6. Fix the filler plug to the specified torque.

Tighten:

Filler plug to 39 N·m (4.0 kg·m / 29 lb·ft)

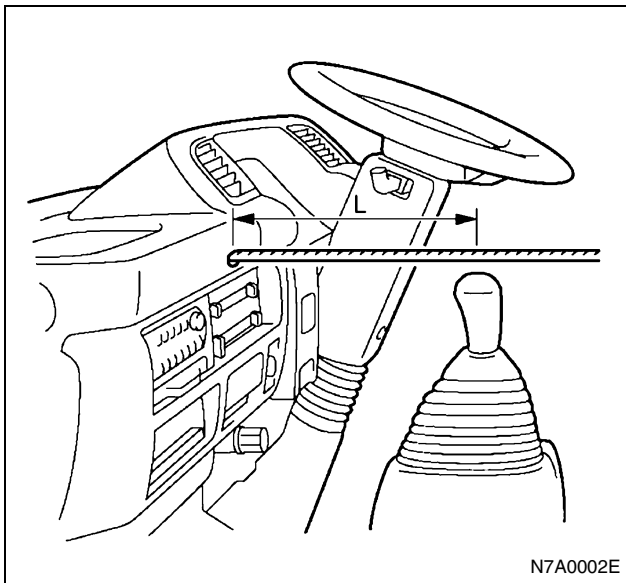
Inspection and Adjustment of The Gear Control

1. Shift the shift select external lever of the transmission side to neutral.
2. Measure the dimension (L) between the center of the change lever play and the instrument panel.

L dimension

Standard cab model = 247 ± 15 mm (9.72 ± 0.6 in)

Wide cab model = 283 ± 15 mm (11.1 ± 0.6 in)

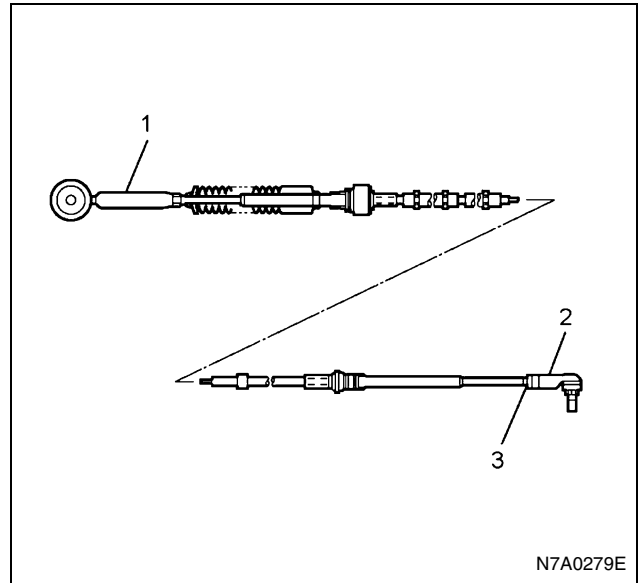


3. When the L dimension is out of specification, adjust it by the following:

- Remove the change lever knob.
- Remove the boot.
- Remove the console box assembly.
- Remove the shift select cable at the change lever side.
- Shift the shift select external lever of the transmission side to neutral.
- Loosen the lock nut of the shift cable, and install it by adjusting the cable length and making the L dimension become within specification.
- Fix the lock nut.

Tighten:

Lock nut to 6 N·m (0.6 kg·m / 4 lb·ft)



Legend

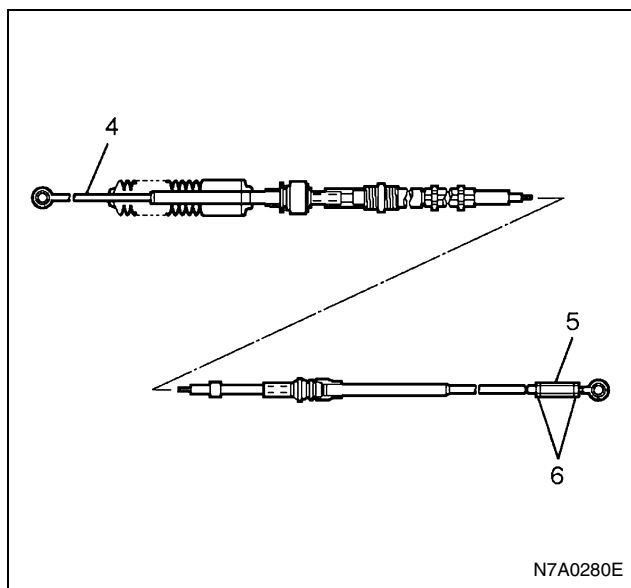
1. Transmission side
2. Joint ball
3. Change lever side

- Loosen the lock nut of the select cable joint, adjust the select cable length to make the change lever select direction (right and left direction) tilt a little (2.7°) to the left against the vertical direction, and then joint the change lever.
- Fix the lock nut.

Tighten:

Lock nut to 6 N·m (0.6 kg·m / 4 lb·ft)

- Install the console box, the boot and the change lever knob.

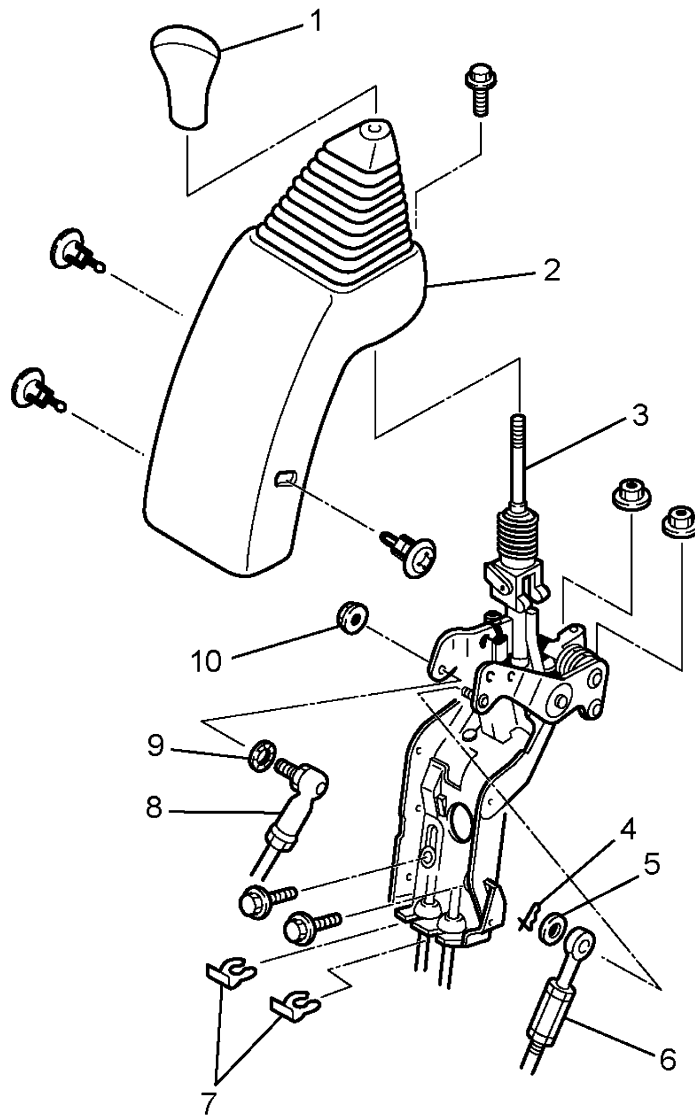


Legend

- 4. Transmission side
 - 5. Turn buckle
 - 6. Lock nut
-

ON-VEHICLE SERVICE

Change Lever Components



N7A0281E

Legend

- | | |
|--------------------------|-------------------------|
| 1. Change lever knob | 6. Shift & select cable |
| 2. Gear control cover | 7. Clip |
| 3. Change lever assembly | 8. Shift & select cable |
| 4. Snap pin | 9. Lock washer |
| 5. Plain washer | 10. Nut |

Removal

1. Remove the change lever knob.
2. Remove the gear control cover.
3. Disconnect the change lever and cable from the shift & select cable.
4. Remove the change lever assembly.

- Remove the parking brake cable from the bracket and put it aside, remove the bracket securing bolt and nut, and then remove the change lever assembly with the bracket.

Installation

1. Install the change lever assembly.
2. Install the shift & select cable.

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- Adjustment should be done after fixing the shift cable securing nut to the specified torque.
- Install the parking brake cable to the bracket.
- For adjustment, refer to MANUAL TRANSMISSION MECHANISM.

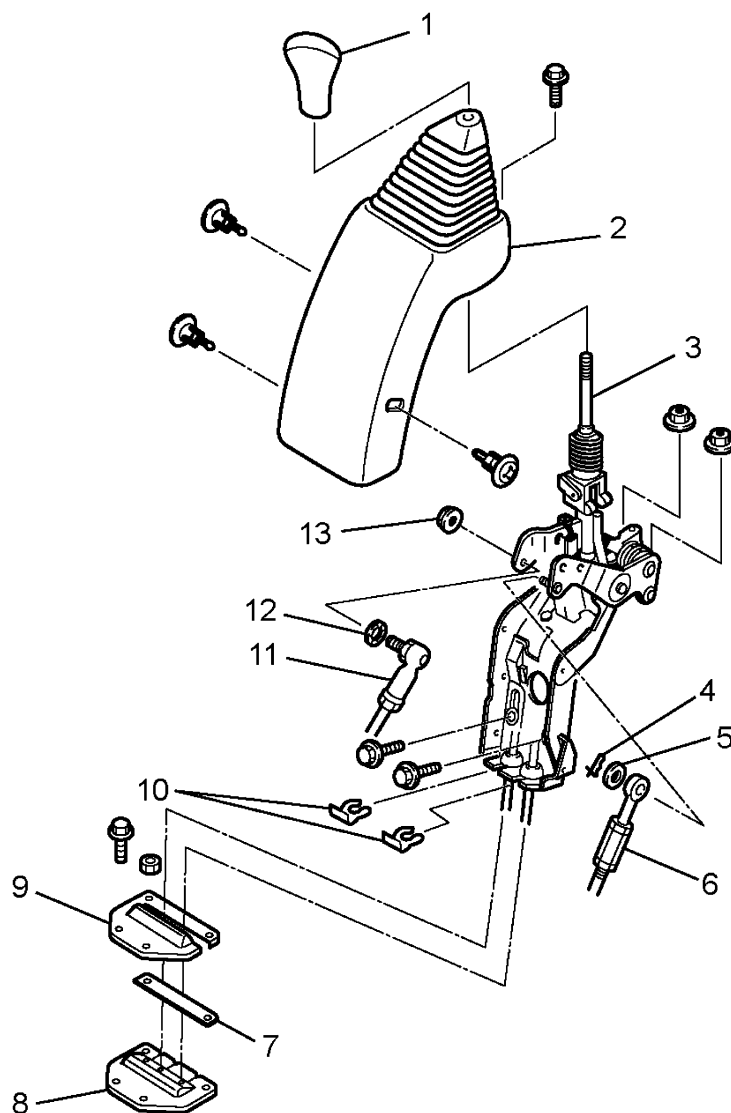
Tighten:

Shift cable securing nut to 21 N·m (2.1 kg·m / 15 lb·ft)

3. Install the gear control cover.
4. Install the change lever knob.

Gear Control Cable

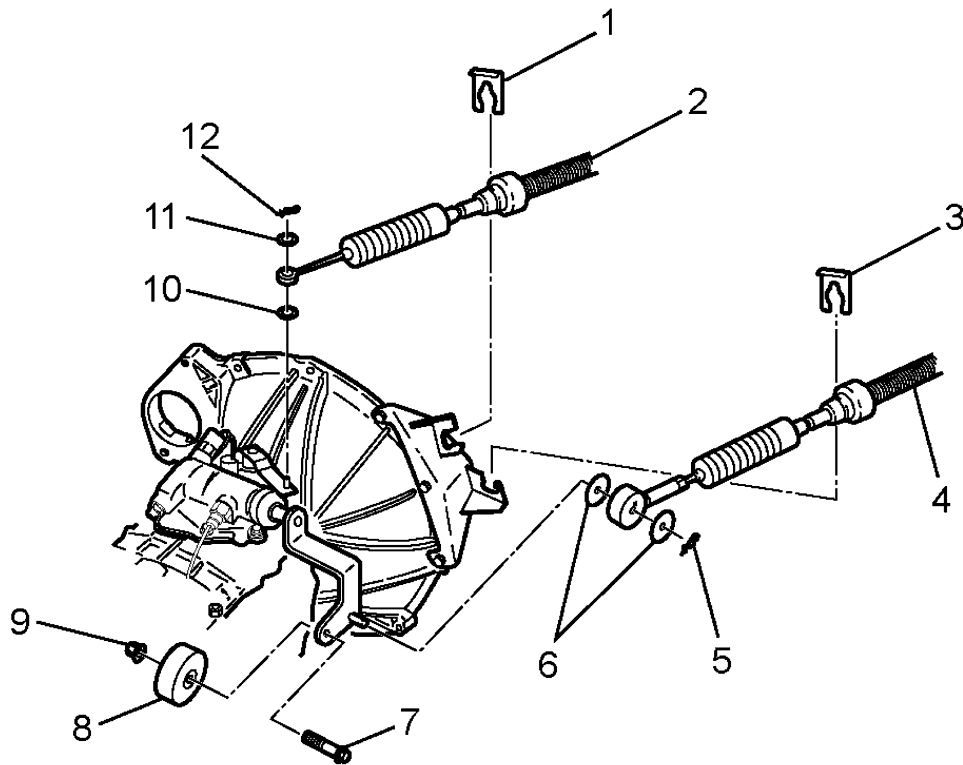
Components



N7A0282E

Legend

- | | |
|--------------------------|--------------------------|
| 1. Change lever knob | 8. Grommet |
| 2. Gear control cover | 9. Grommet retainer |
| 3. Change lever assembly | 10. Clip |
| 4. Snap pin | 11. Shift & select cable |
| 5. Plain washer | 12. Lock washer |
| 6. Shift & select cable | 13. Nut |
| 7. Grommet seat | |



N7A0283E

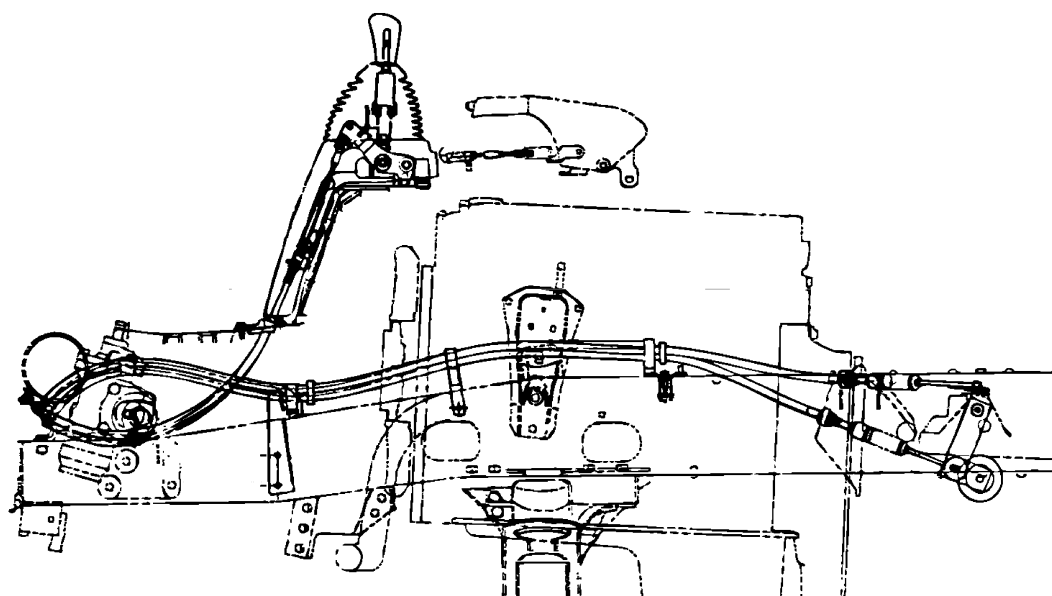
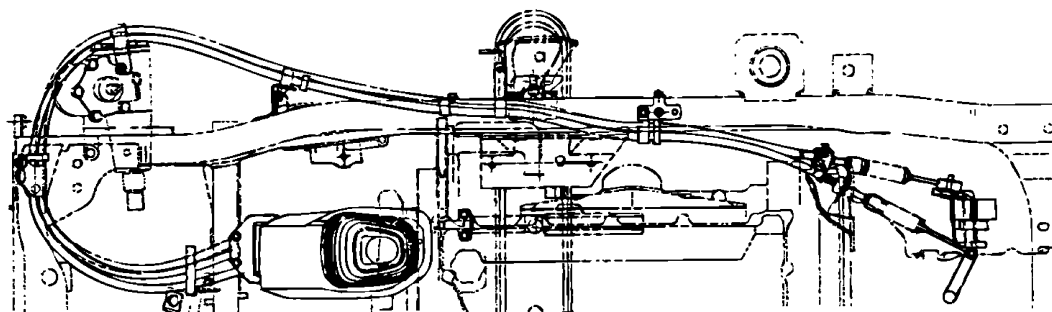
Legend

- | | |
|-----------------|------------------|
| 1. Clip | 7. Bolt |
| 2. Select cable | 8. Weight |
| 3. Clip | 9. Nut |
| 4. Shift cable | 10. Wave washer |
| 5. Snap pin | 11. Plain washer |
| 6. Plain washer | 12. Snap pin |

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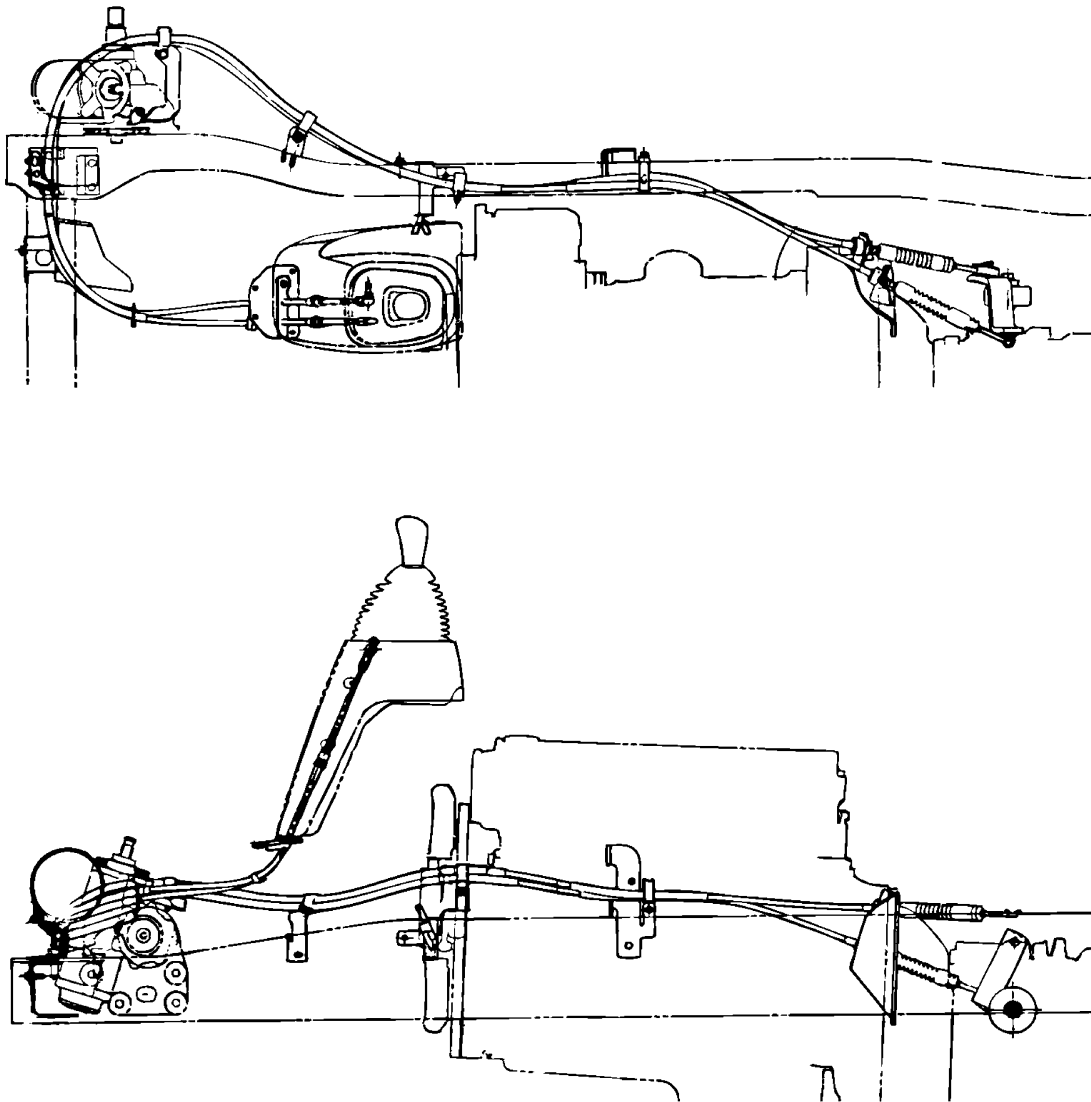
Gear Control Cable Layout

NKR



N7A0284E

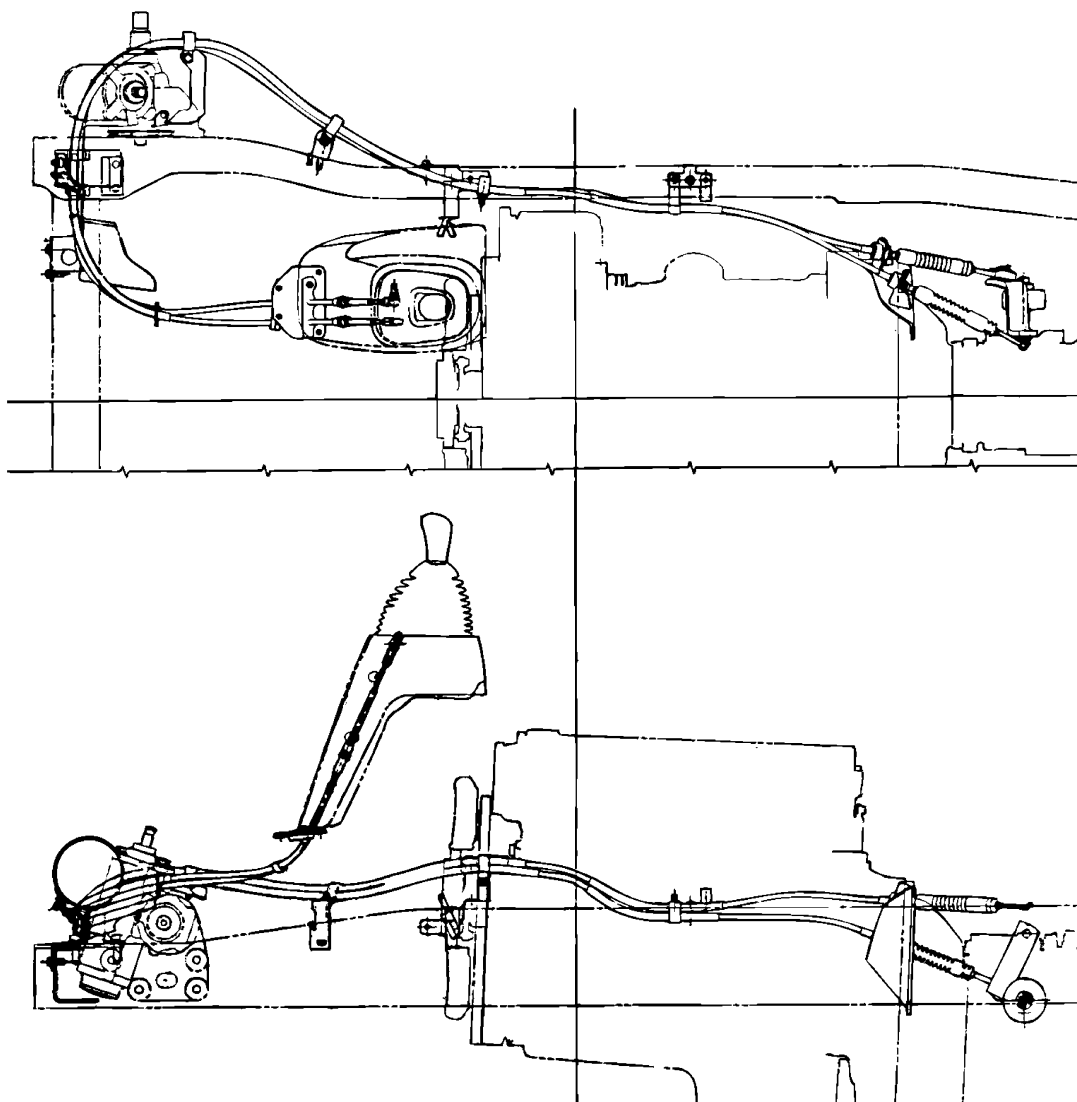
NPR



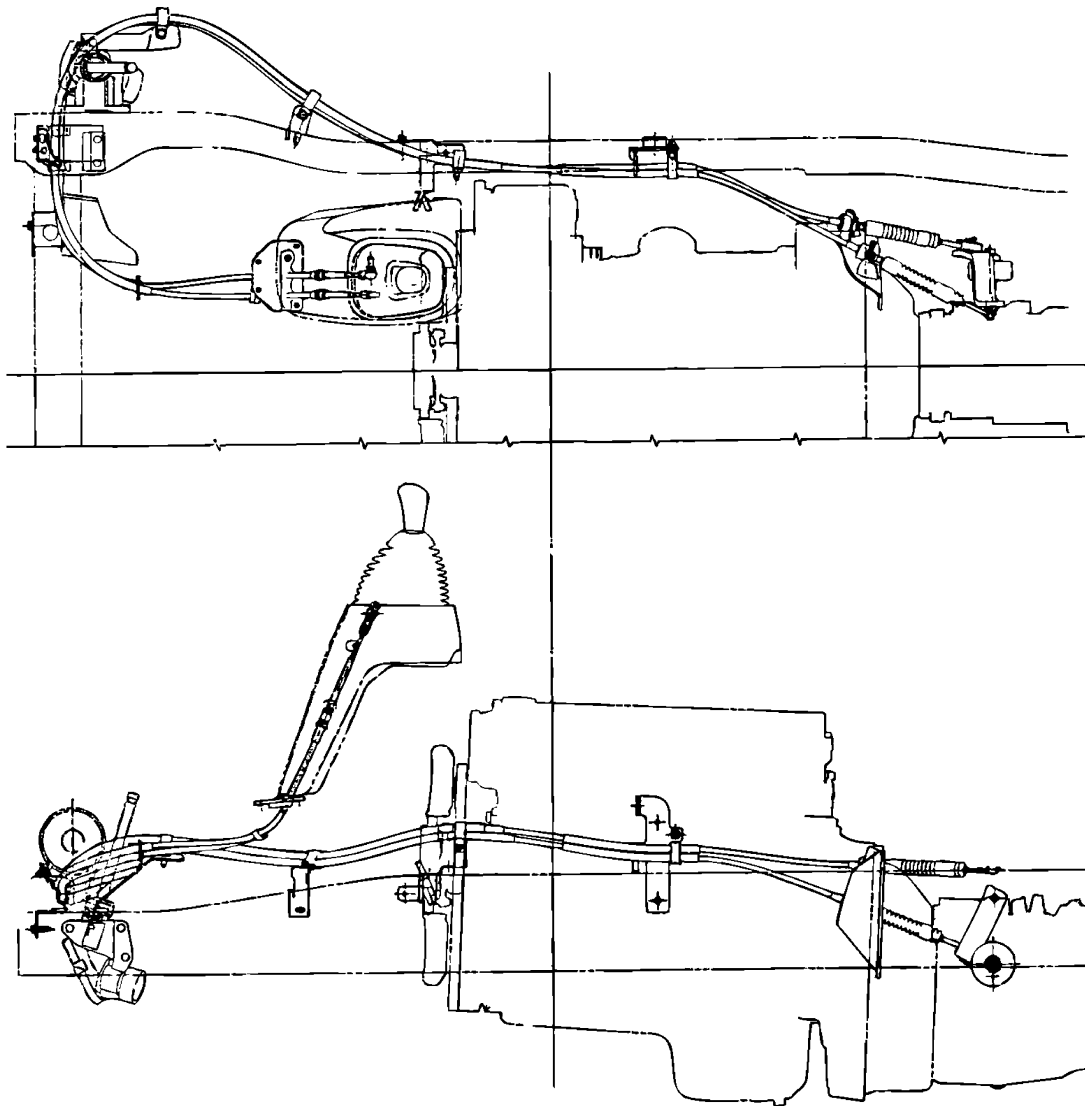
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7B-12 MANUAL TRANSMISSION

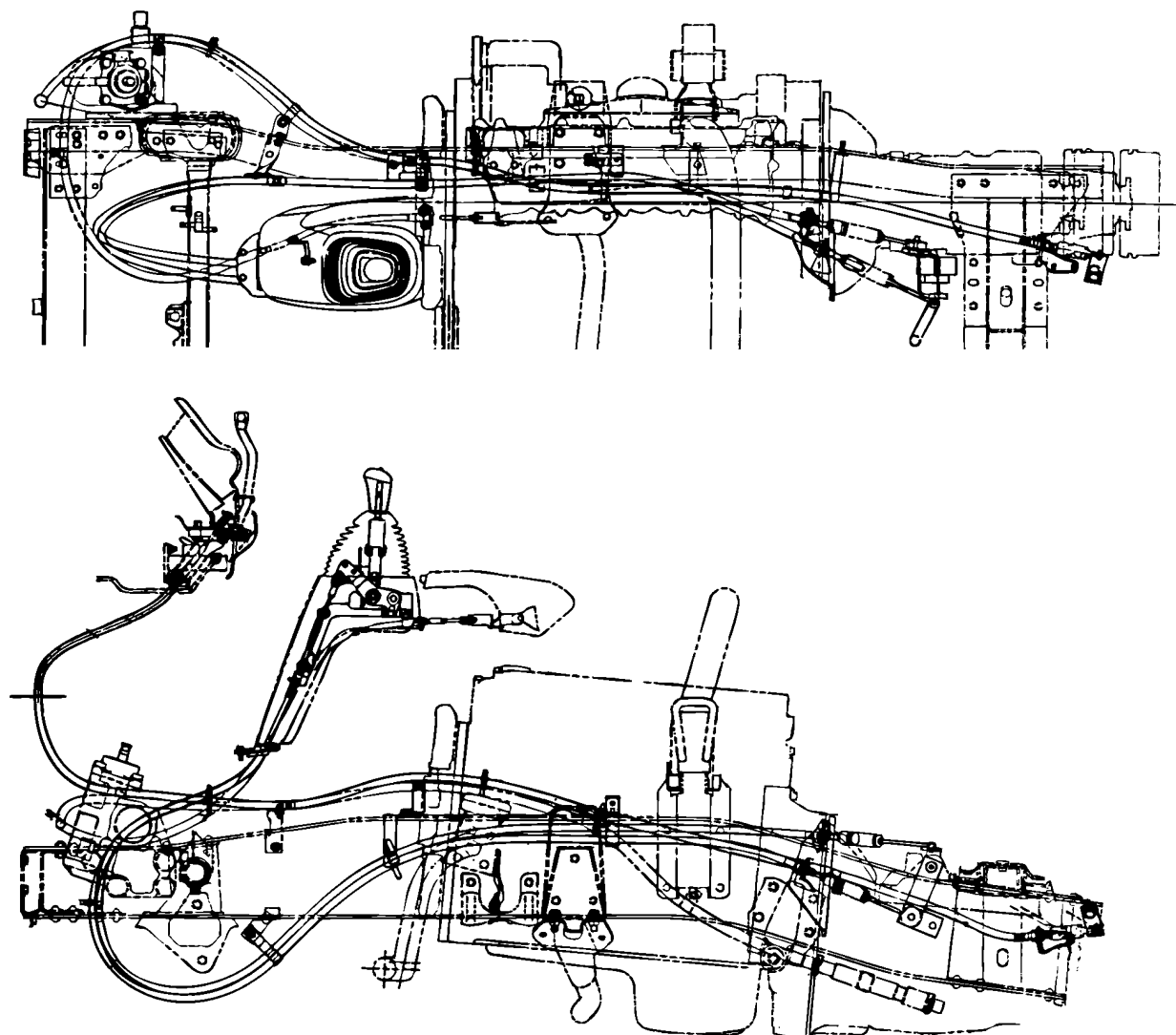
NPR (Bottle Car)



N7A0286E

NPR/S (Double Wishbone Suspension)

N7A0287E



N7A0288E

Removal

1. Remove the change lever knob.
2. Remove the gear control cover.
 - Remove the screw and clip, and then remove the cover.
3. Remove the shift & select cable from the change lever side.
 - Disconnect the cable from the change lever.
 - Remove the clip securing the cable.
4. Remove the grommet retainer and the grommet seat.
 - Remove the securing bolt and nut, and then remove the grommet retainer and the seal.
5. Remove the grommet.
6. Remove the shift & select cable of the transmission side.
7. Remove all the clips and clamps.

- Remove all the clips and clamps securing the cable to the frame, etc.

8. Remove the shift & select cable.

Inspection

- Check whether the cable is deformed, damaged, corroded or not, and whether the boot is damaged, poor-slid or not, and then replace abnormal parts found by the check.

Installation

1. Install the shift & select cable.
2. Secure the cable with a clip and clamp.
3. Fix the shift & select cable nut of the transmission side.

Tighten:

- Select cable nut to 21 N·m (2.1 kg·m / 15 lb·ft)
- Shift weight nut to 103 N·m (10.5 kg·m / 76 lb·ft)
- 4. Install the grommet.

5. Install the grommet retainer.

Tighten:

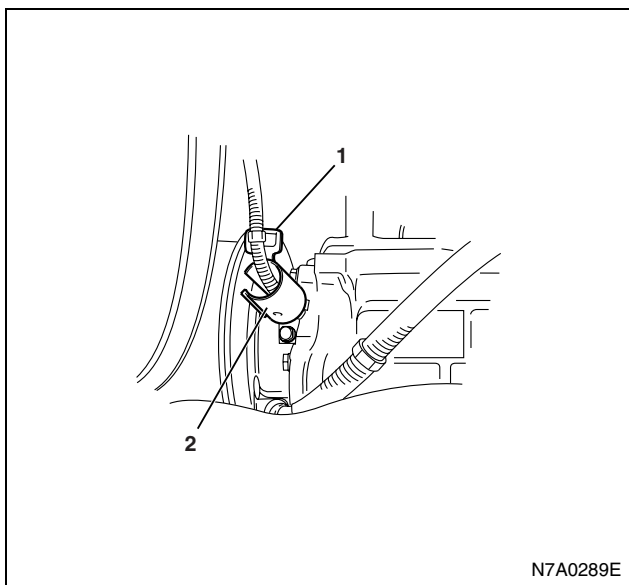
Securing bolt & nut to 11 N·m (1.1 kg·m / 8 lb·ft)

6. Install the shift & select cable joint portion (change lever side).
 - Adjust it after fixing the shift cable securing nut to the specified torque.
 - For adjustment, refer to MANUAL TRANSMISSION MECHANISM.
7. Install the gear control cable cover.
8. Install the change lever knob.
9. Install the seal behind the cab.

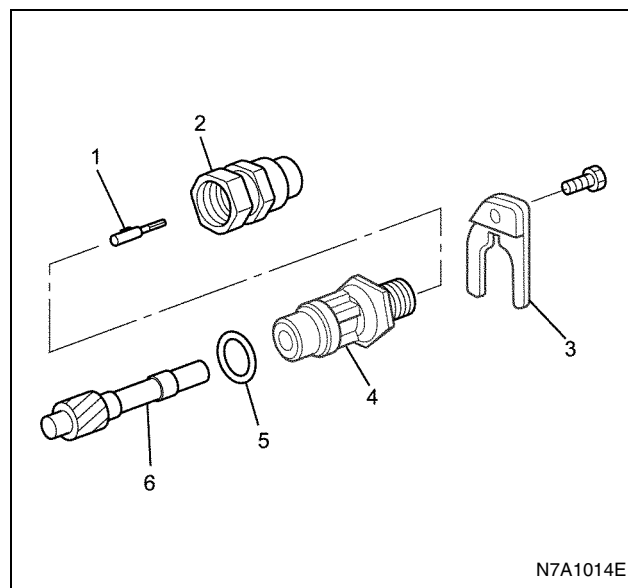
Vehicle Speed Sensor

Removal

1. Remove the clip (1), and then remove the protector (2).
2. Remove the wiring connector.



3. Remove the securing screw, and then remove the vehicle speed sensor.



Legend

1. Plug sensor
2. Vehicle speed sensor
3. Plate
4. Bush
5. O-ring
6. Driven gear

Installation

1. Install the vehicle speed sensor with a securing screw.

Tighten:

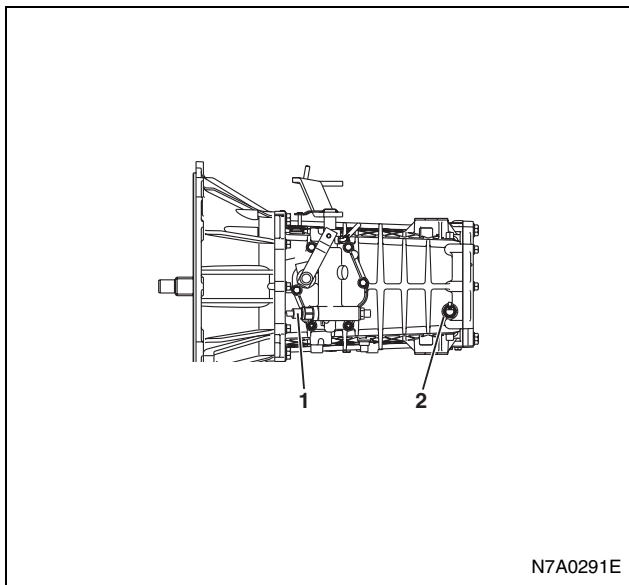
- Securing screw to 20 N·m (2.0 kg·m / 15 lb·ft)
 - Bush and vehicle speed sensor to 25 N·m (2.5 kg·m / 18 lb·ft)
2. Connect the wiring connector.
 3. Secure the protector with a clip.

Reverse and Neutral Switch

Removal

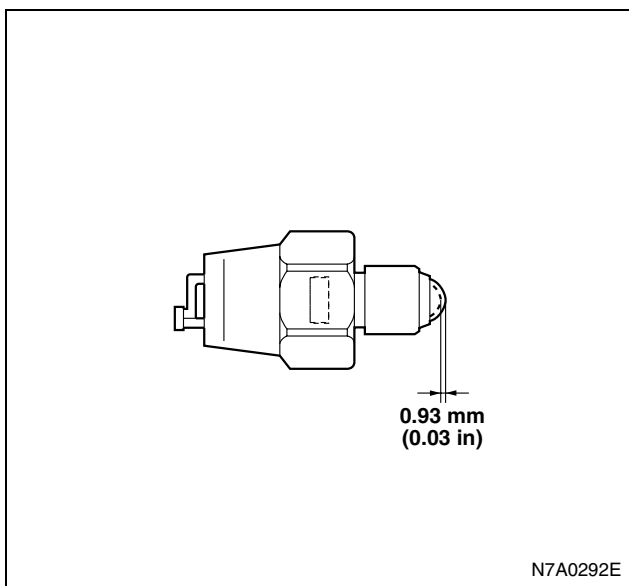
1. Remove the wiring connector.
2. Remove the reverse switch (2) (black connector).
3. Remove the neutral switch (1) (black connector).

3. Connect the wiring connector.



Inspection

- It is normal if there is continuity between the switch terminals when the ball is not pushed, and no continuity when pushing in the ball.
- Switch operating stroke = 0.93 mm (0.03 in)



Installation

1. Install the neutral switch.

Liquid gasket: Three Bond 1141

Tighten:

Neutral switch to 34 N·m (3.5 kg·m / 25 lb·ft)

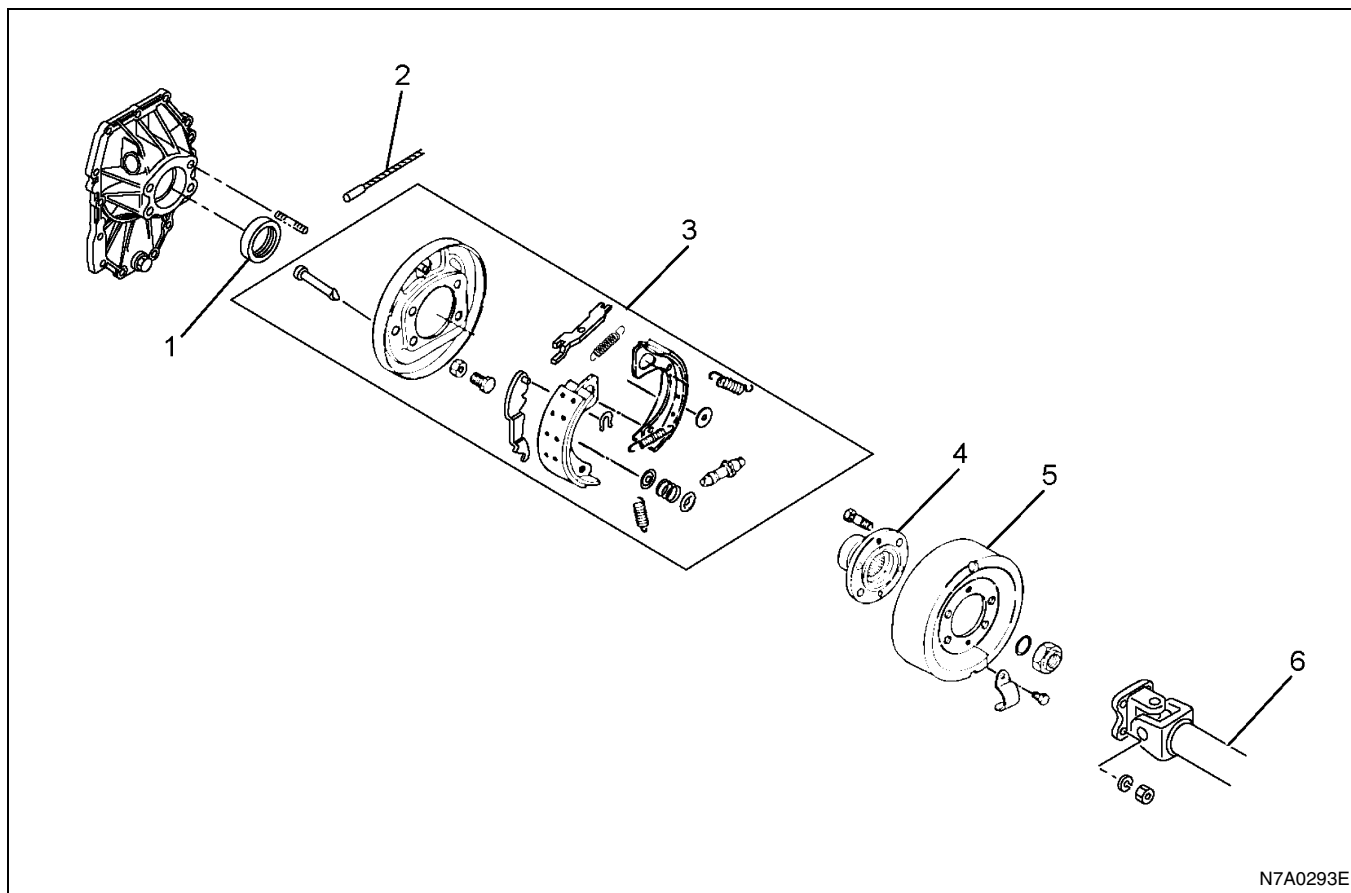
2. Install the reverse switch.

- Apply liquid gasket to the switch thread before installation.

Liquid gasket: Three Bond 1141

Tighten:

Reverse switch to 39 N·m (4.0 kg·m / 29 lb·ft)

Rear Oil Seal (5MT)**Components**

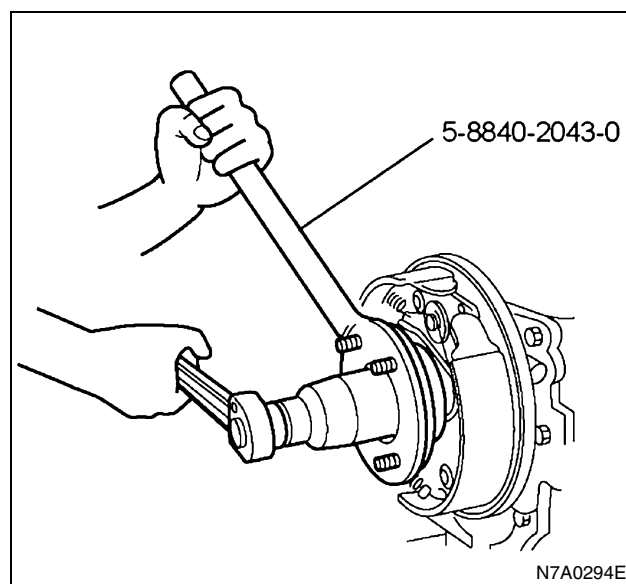
N7A0293E

Legend

- | | |
|---------------------------|----------------------------------|
| 1. Oil seal | 4. Coupling driver |
| 2. Parking brake cable | 5. Parking brake drum |
| 3. Parking brake assembly | 6. Rear propeller shaft assembly |

Removal

1. Remove the rear propeller shaft assembly.
 - Refer to REAR PROPELLER SHAFT ASSEMBLY.
2. Remove the parking brake cable.
 - Refer to PARKING BRAKE CABLE.
3. Remove the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.
4. Remove the coupling driver and O-ring.
 - Raise the lock nut caulking portion (two parts) securely, and then remove the lock nut using the flange holder 5-8840-2043-0.



N7A0294E

5. Remove the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.

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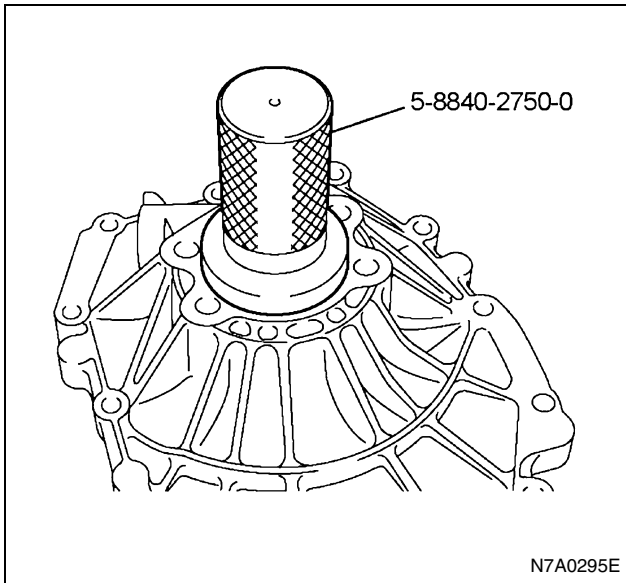
6. Remove the rear oil seal using the flat-tip screwdriver.

Installation

1. Apply engine oil 5W-30 around a new oil seal, and then press in the oil seal to the rear cover using the installer 5-8840-2750-0.
 - Apply Besco L2 grease on the lip of the oil seal.

Caution:

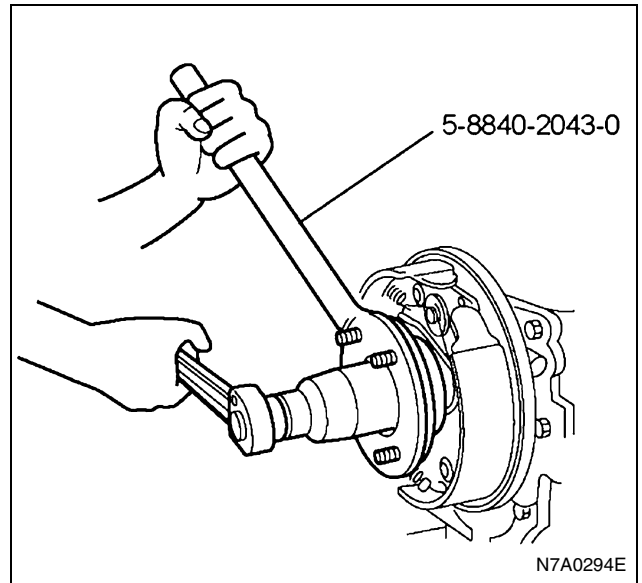
Be careful not to damage the lip of the oil seal.



2. Install the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.
3. Install the coupling driver.
 - a. Apply engine oil 5W-30 to the O-ring, and then install the coupling driver and the O-ring.
 - b. Use a new lock nut and apply engine oil 5W-30 on its seat, and then fix the lock nut using the flange holder 5-8840-2043-0.

Tighten:

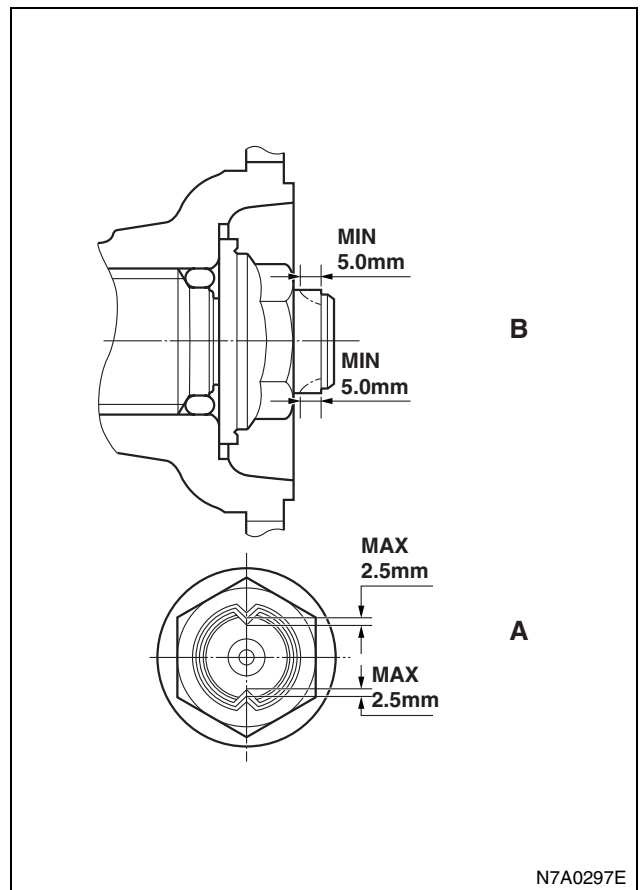
Lock nut to 289 N·m (29.5 kg·m / 213 lb·ft)



- After fixing it to the specified torque, align the lip part of the nut to the V-groove of the shaft edge. Securely caulk the two parts of the nut lip using a chisel whose tip form is approx. 1 mm (0.04 in) radius by 60°, to make a length (B) of 5 mm (0.2 in) or more, and a clearance between the bottom of the shaft and the nut lip (A) of 1.5 mm (0.06 in) or less.

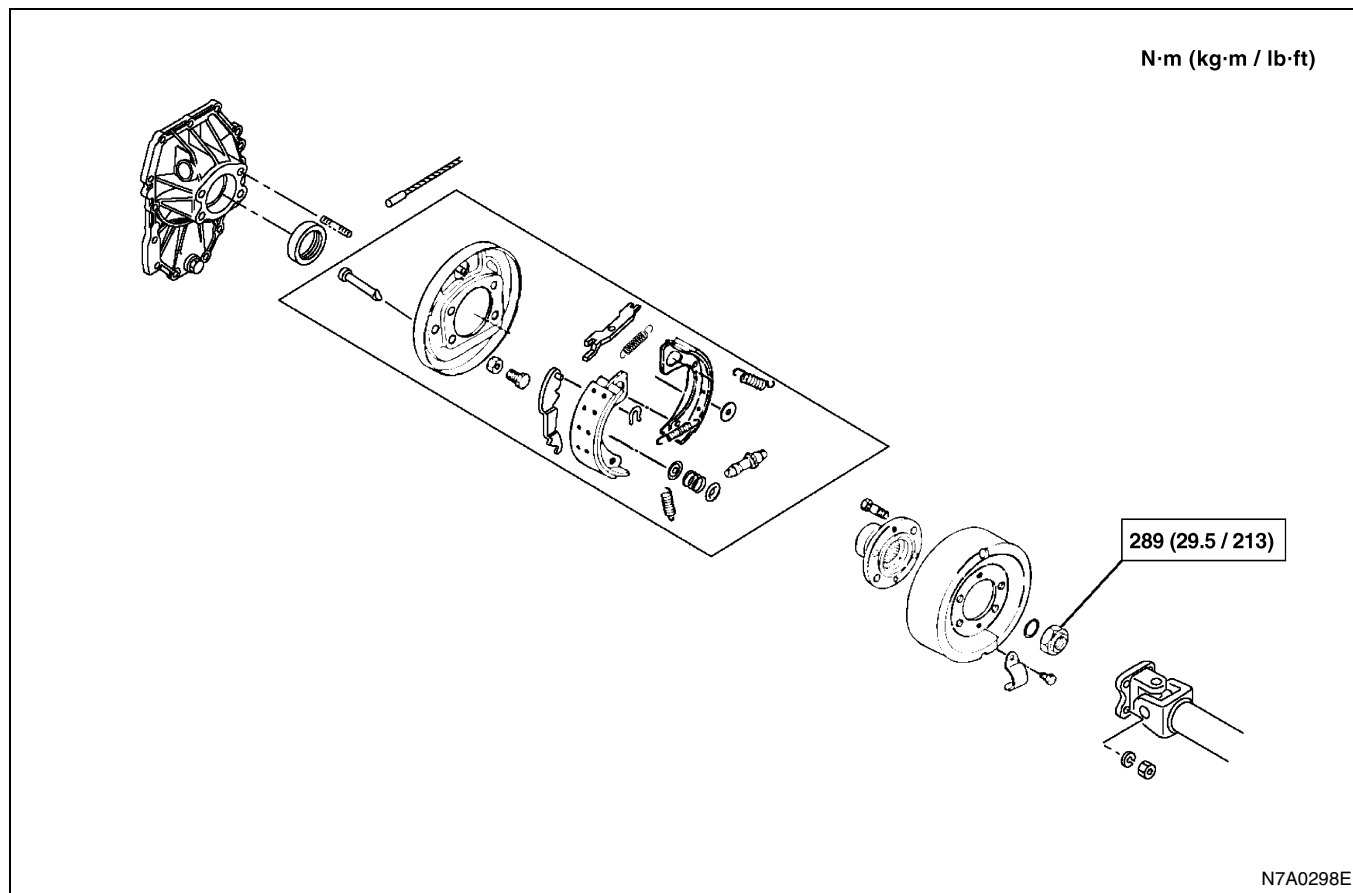
Caution:

If any crack is found on the caulking portions of the nut after the check, replace the lock nut and caulk it again.

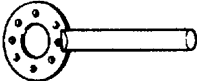
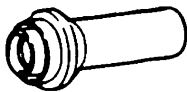


4. Install the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.
5. Install the parking brake cable.
 - Refer to PARKING BRAKE CABLE.
6. Install the rear propeller shaft assembly.
 - Refer to REAR PROPELLER SHAFT ASSEMBLY.

Fixing Torque

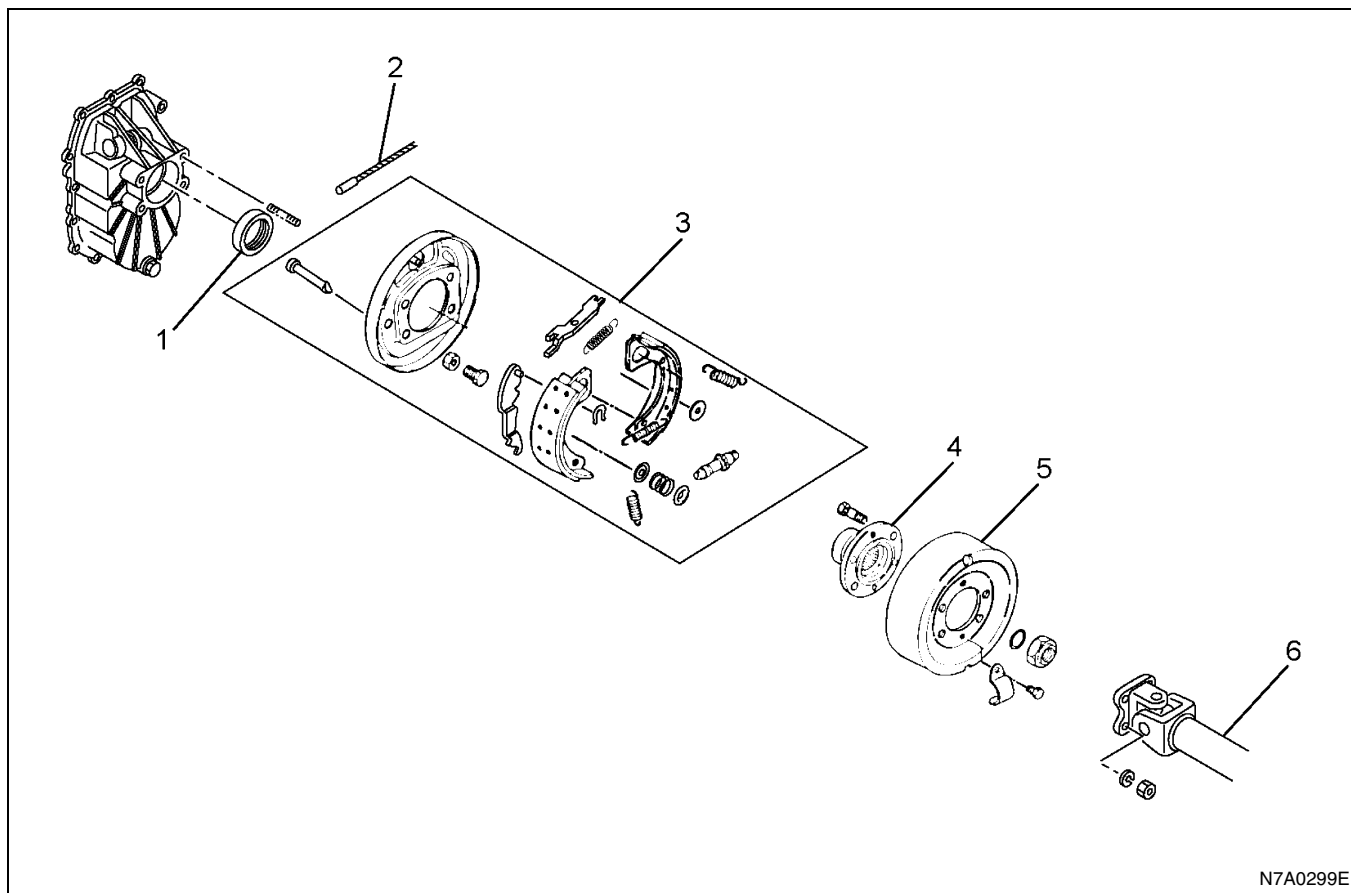


Special Tools

Illustration	Tool Number / Description / Remarks
 5884020430	5-8840-2043-0 / Flange Holder
 5884027500	5-8840-2750-0 / Oil Seal Installer

Rear Oil Seal (6MT)

Components



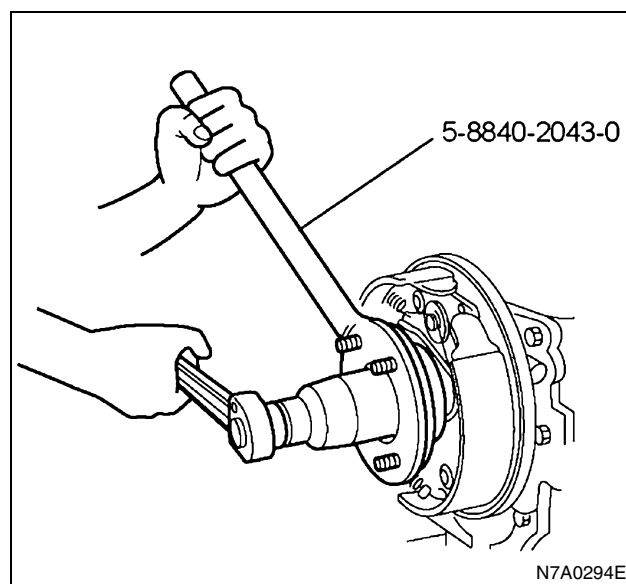
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Legend

- | | |
|---------------------------|----------------------------------|
| 1. Oil seal | 4. Coupling driver |
| 2. Parking brake cable | 5. Parking brake drum |
| 3. Parking brake assembly | 6. Rear propeller shaft assembly |

Removal

1. Remove the rear propeller shaft assembly.
 - Refer to REAR PROPELLER SHAFT ASSEMBLY.
2. Remove the parking brake cable.
 - Refer to PARKING BRAKE CABLE.
3. Remove the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.
4. Remove the coupling driver and O-ring.
 - Raise the caulking portion (2 parts) of the lock nut securely, and remove it using the flange holder 5-8840-2043-0.



N7A0294E

5. Remove the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.

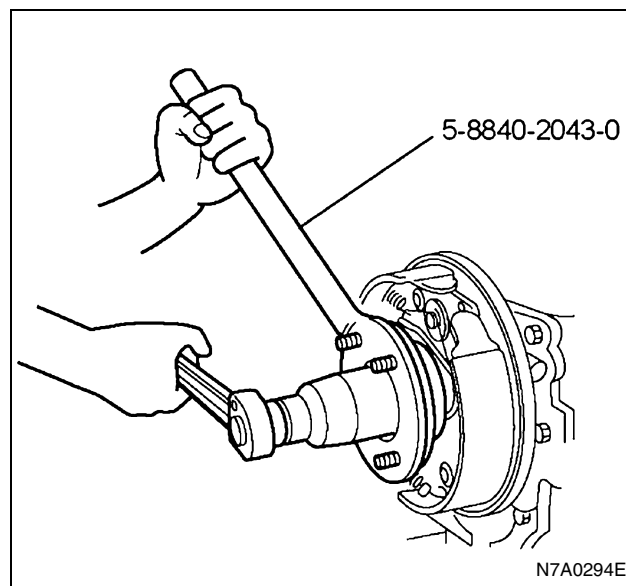
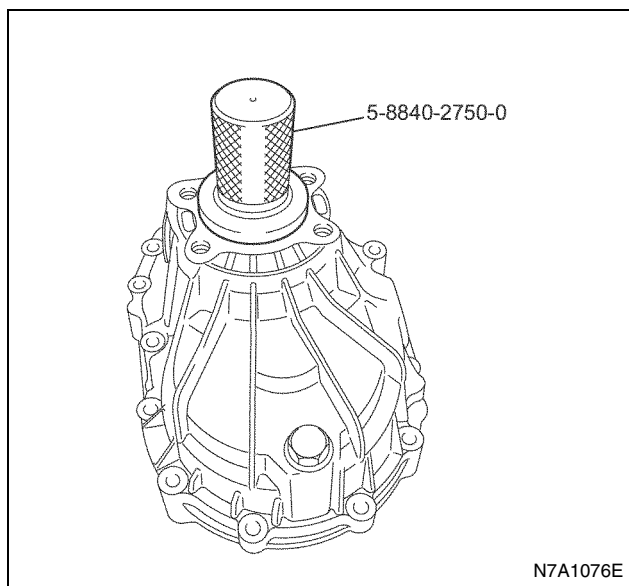
6. Remove the rear oil seal using the flat-tip screwdriver.

Installation

1. Apply engine oil 5W-30 around a new oil seal, and then press in the oil seal to the rear cover using the installer 5-8840-2750-0.
 - Apply Besco L2 grease to the lip portion of the oil seal.

Caution:

Be careful not to damage the oil seal lip portion.



- After fixing it to the specified torque, align the lip part of the nut to the V-groove of the shaft edge. Securely caulk the two parts of the nut lip using a chisel whose tip form is approx. 1 mm (0.04 in) radius by 60°, to make a length (B) of 5 mm (0.2 in) or more, and a clearance between the bottom of the shaft and the nut lip (A) of 1.5 mm (0.06 in) or less.

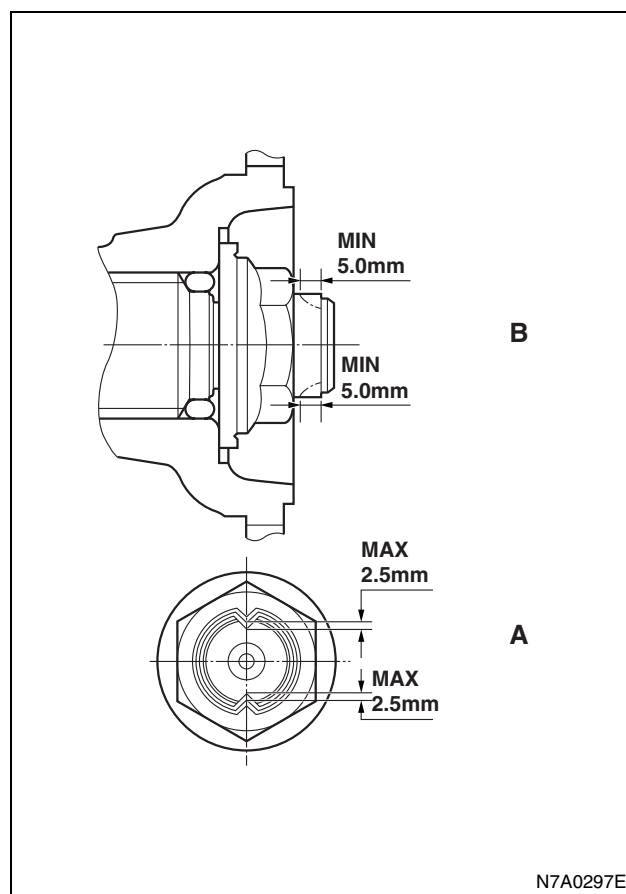
Caution:

If any crack is found on the caulking portions of the nut after the check, replace the lock nut and caulk it again.

2. Install the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.
3. Install the coupling driver.
 - a. Apply engine oil 5W-30 to the O-ring, and then install the coupling driver and the O-ring.
 - b. Use a new lock nut and apply engine oil 5W-30 on its seat, and then fix the lock nut using the flange holder 5-8840-2043-0.

Tighten:

Lock nut to 289 N·m (29.5 kg·m / 213 lb·ft)



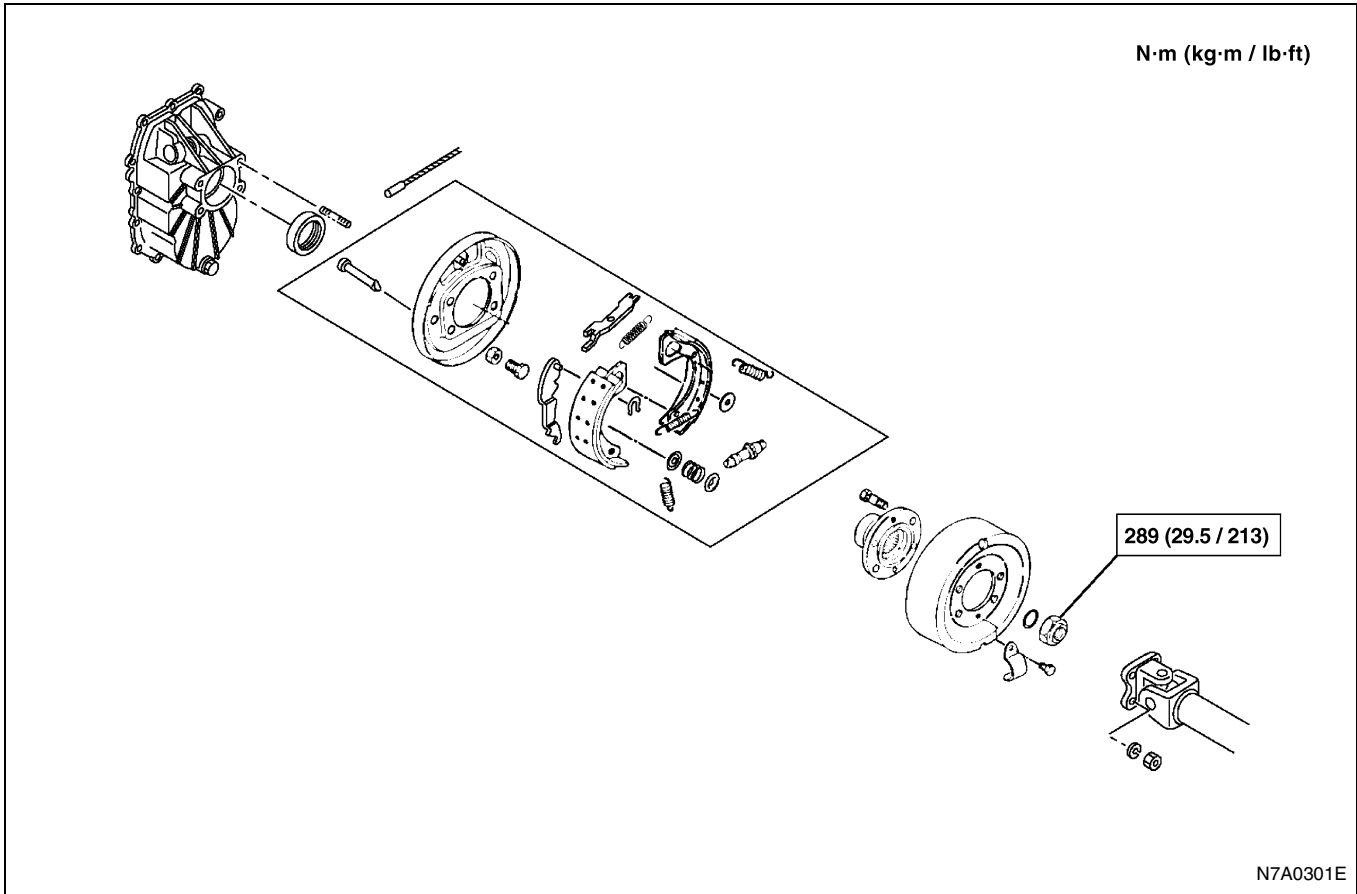
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4. Install the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.

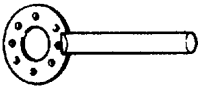
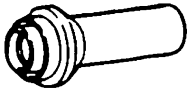
5. Install the parking brake cable.
- Refer to PARKING BRAKE CABLE.

6. Install the rear propeller shaft assembly.
 - Refer to REAR PROPELLER SHAFT ASSEMBLY.

Fixing Torque



Special Tools

Illustration	Tool Number / Description / Remarks
 5884020430	5-8840-2043-0 / Flange Holder
 5884027500	5-8840-2750-0 / Oil Seal Installer

Transmission Assembly

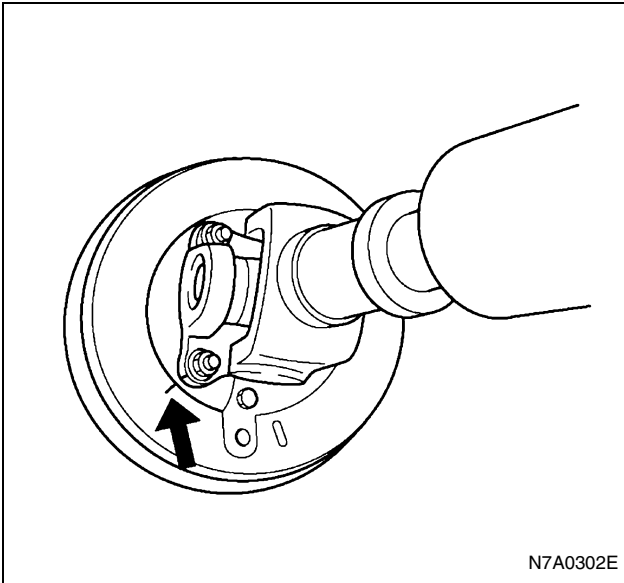
Removal

Preparation: Jack up the vehicle, and support it with rigid racks.

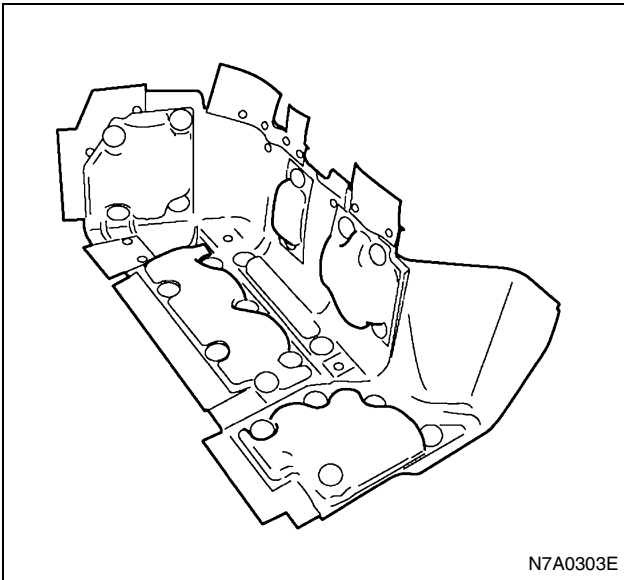
1. Remove the rear propeller shaft assembly.

Caution:

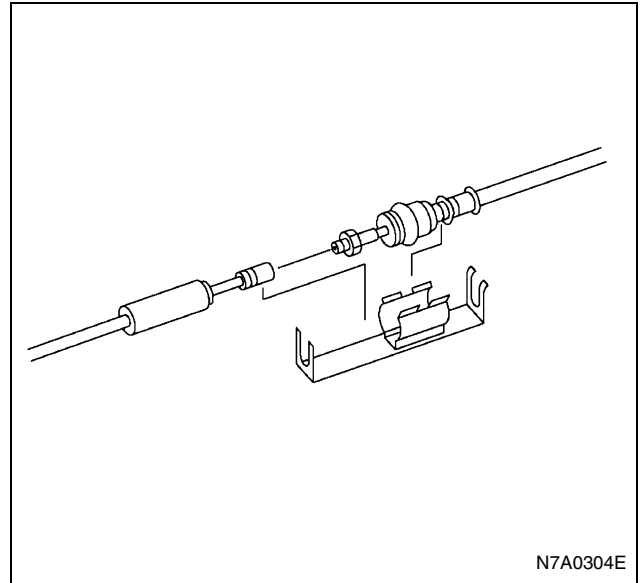
Put an alignment mark on the drum and the flange yoke. Put them aside and hang them up using a wire or something to prevent them from interrupting the work.



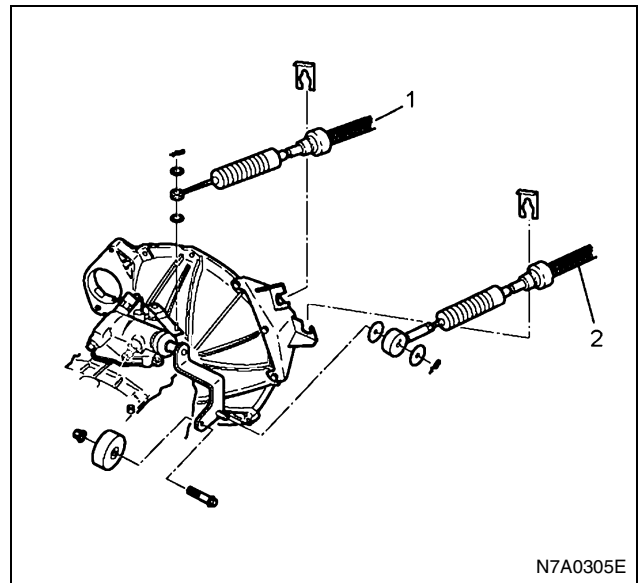
2. Remove the transmission side cover.



3. Remove the connection of the vehicle speed sensor connector.
4. Remove the connection of the neutral switch connector.
5. Remove the connection of the reverse switch connector.
6. Remove the connector from the harness bracket taking care not to damage the clip portion.
7. Disconnect the parking cable.
 - Remove the cable bracket and move the cover, and then disconnect the cable by loosening the longer nut located to the vehicle front side.



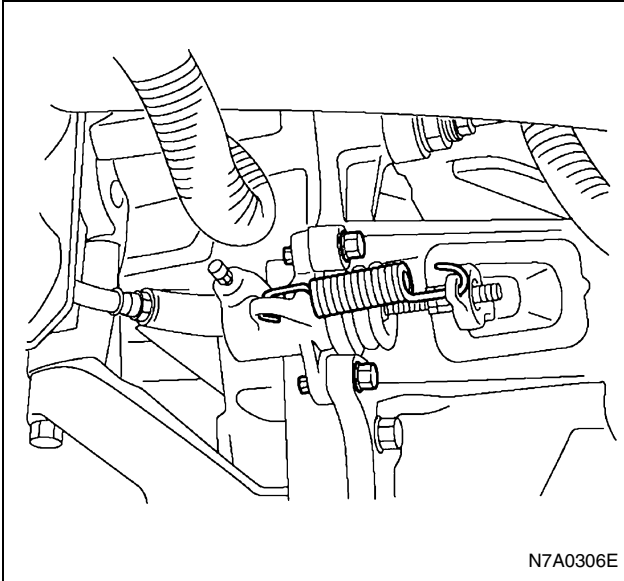
8. Remove the shift cable split pin and disconnect the shift cable.
9. Remove the select cable split pin and disconnect the select cable.



Legend

1. Select cable
2. Shift cable

10. Remove the clutch slave cylinder assembly.
 - Remove the return spring and the securing bolt, and then hang them up using a wire or something to prevent them from interrupting the work.



Installation

1. Install the mounting bracket assembly.

Tighten:

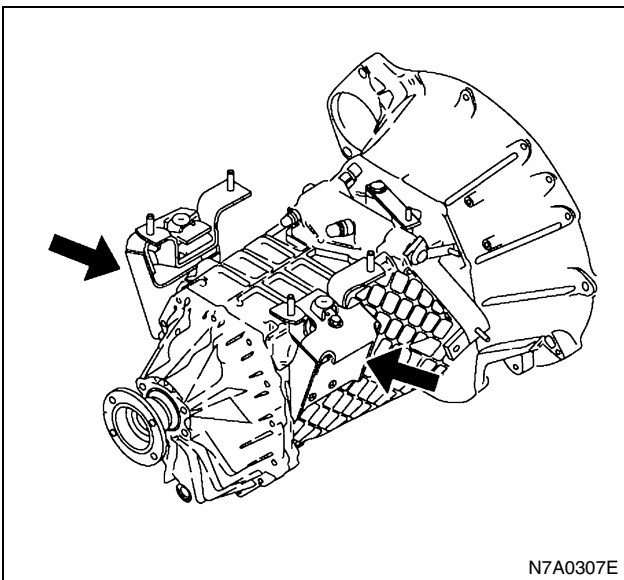
Mounting bracket to 97 N·m (9.9 kg·m / 72 lb·ft)

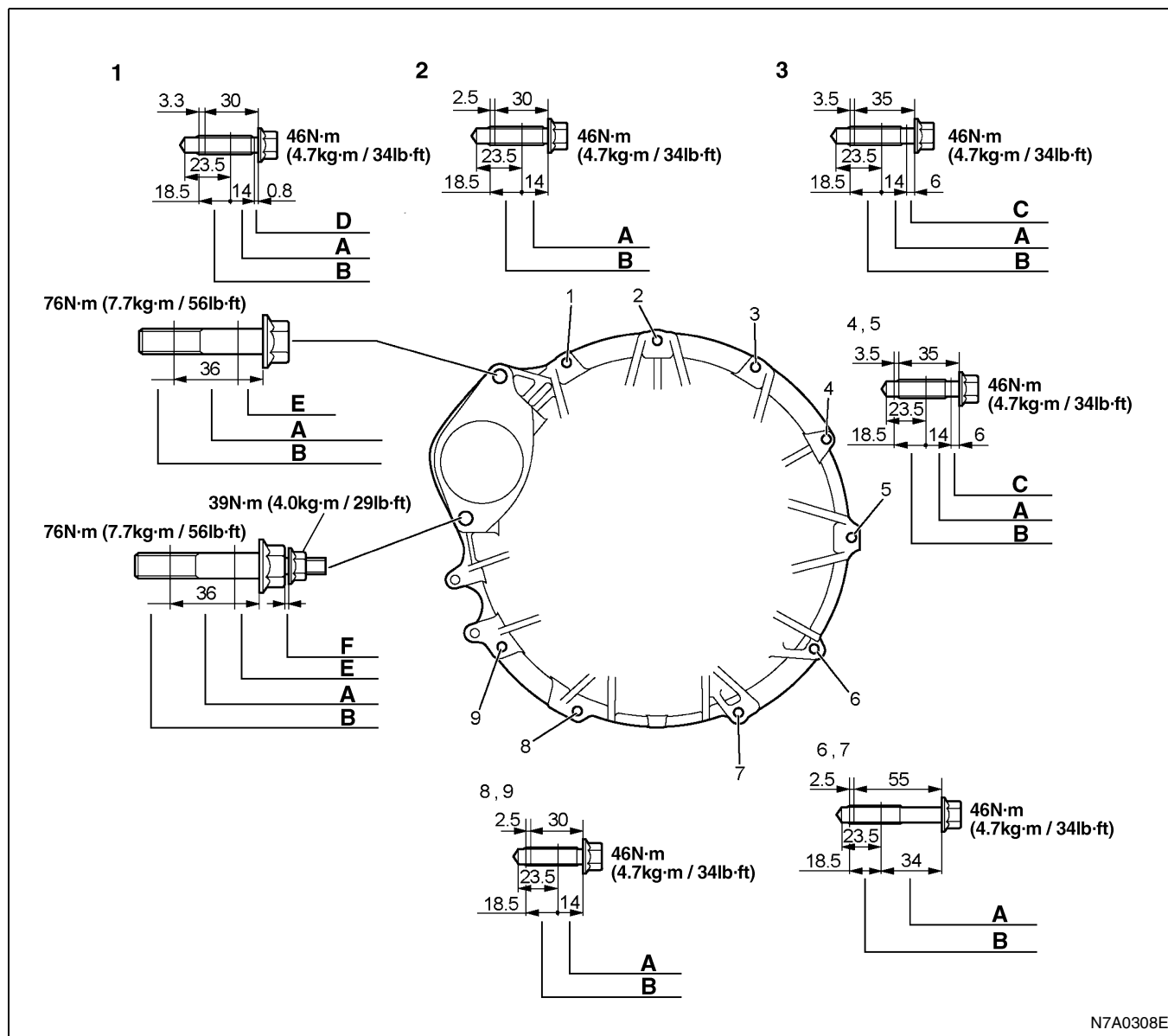
2. Install the transmission assembly.
 - Fix and secure the transmission in the same way of removal.

Tighten:

Transmission assembly to 46 N·m (4.7 kg·m / 34 lb·ft)

11. Remove the starter ground cable.
12. Remove the starter motor assembly.
 - Hang them up using a wire or something to prevent them from interrupting the work.
13. Remove the nut securing the transmission and the frame (crossmember).
 - Support the engine using a garage jack or a wire, and then set the transmission jack under the transmission and secure it with a chain not to fall down.
 - For the vehicles with a double wishbone type suspension, remove the mounting bracket bolt on the transmission side, if necessary, and remove the mounting bracket.
14. Remove the transmission assembly.
 - Remove the bolt securing the clutch housing, and then remove the transmission assembly by operating the transmission jack.
15. Remove the mounting bracket assembly bolt, and then remove the bracket.





N7A0308E

Legend

- A: Clutch housing
- B: Fly wheel housing
- C: Gear control bracket

- D: Harness clip
- E: Starter
- F: Engine ground cable

3. Fix the nut securing the transmission and the frame (crossmember).

Tighten:

Nut to 40 N·m (4.1 kg·m / 30 lb·ft)

- For the vehicles with a double wishbone type suspension, install the mounting bracket on the transmission after installing the transmission.

Tighten:

Mounting bracket on the transmission to 46 N·m (4.7 kg·m / 34 lb·ft)

4. Install the starter motor assembly.

Tighten:

Starter motor assembly to 76 N·m (7.7 kg·m / 56 lb·ft)

5. Install the starter ground cable.

Tighten:

Starter ground cable to 39 N·m (4.0 kg·m / 29 lb·ft)

6. Install the clutch slave cylinder assembly.

Tighten:

Clutch slave cylinder assembly 16 N·m (1.6 kg·m / 12 lb·ft)

7. Install the select cable.

- For installation, refer to GEAR CONTROL CABLE.

8. Install the shift cable.

- For installation, refer to GEAR CONTROL CABLE.

7B-26 MANUAL TRANSMISSION

9. Install the parking brake cable.
10. Install the harness connector.
11. Install the reverse switch connector.
12. Install the neutral switch connector.
13. Install the vehicle speed sensor connector.
14. Install the transmission side cover.
15. Install the rear propeller shaft assembly aligning it to the alignment mark.

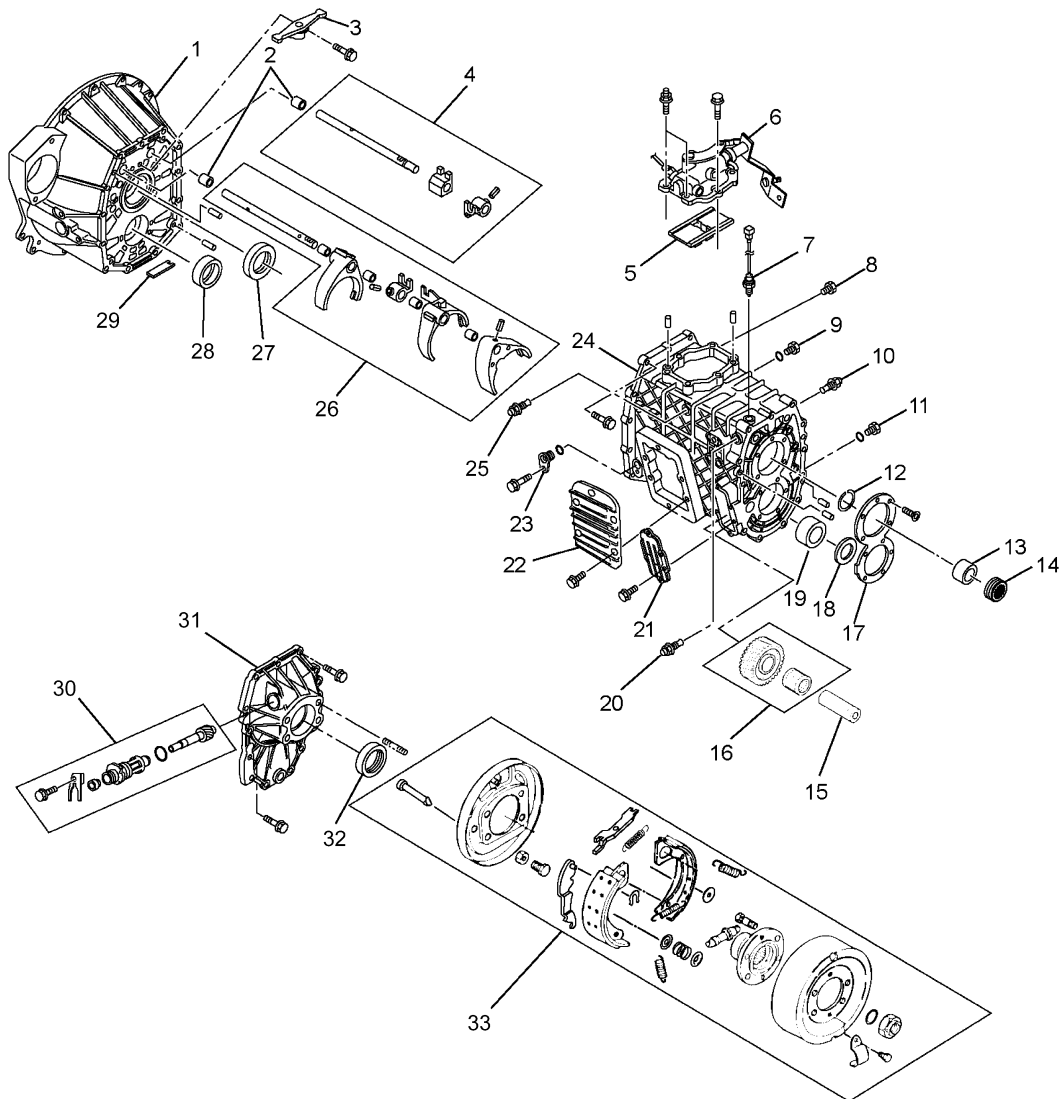
Tighten:

Rear propeller shaft assembly to 102 N·m (10.5 kg·m / 75 lb·ft)

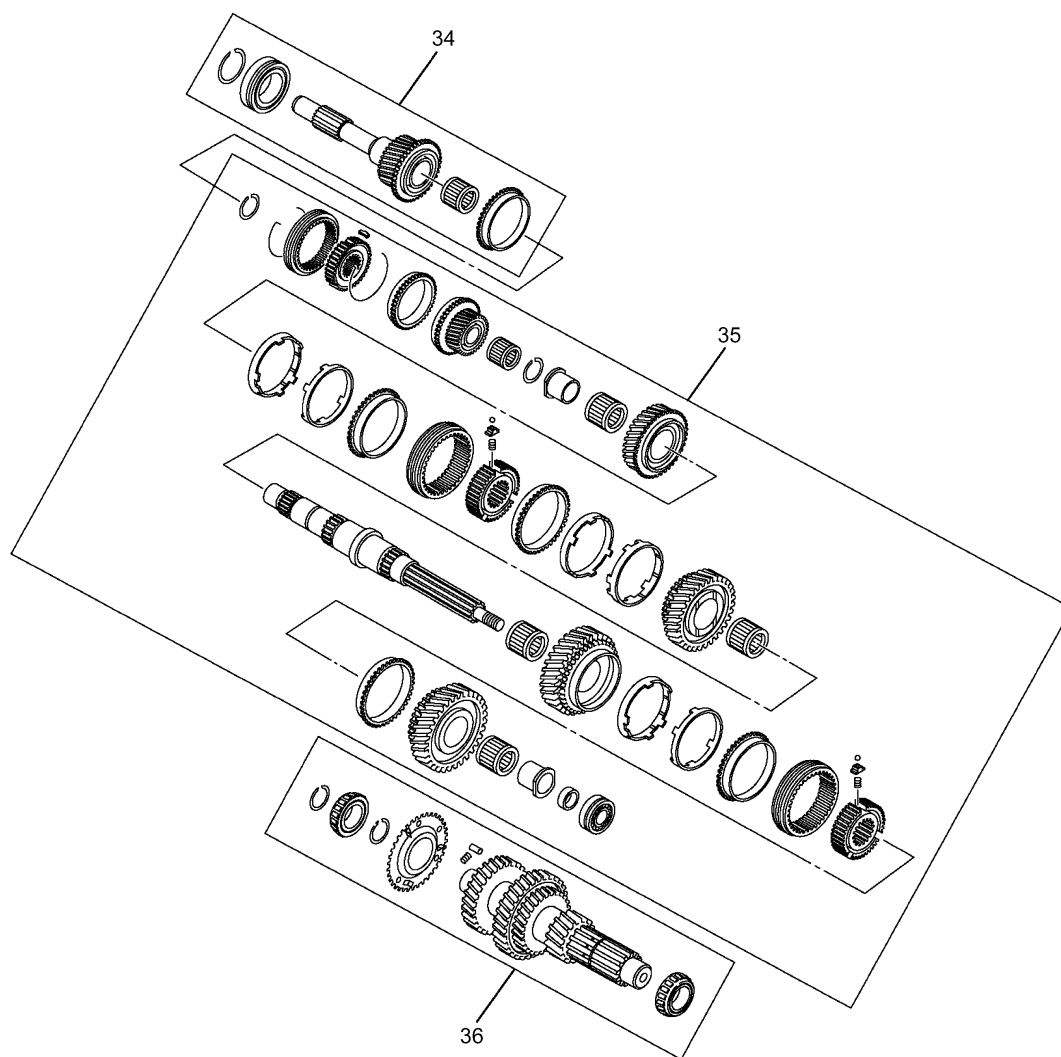
UNIT REPAIR

Transmission (5MT)

Components



N7A0309E



N7A0310E

Legend

- | | |
|--|--|
| 1. Clutch housing | 19. Counter rear bearing |
| 2. Bush; Clutch housing | 20. Detent assembly |
| 3. 5th relay lever | 21. Reverse idle cover |
| 4. 4th-5th shift block | 22. PTO cover |
| 5. Interlock plate | 23. Sensor dummy plug |
| 6. Control box | 24. Transmission case |
| 7. Reverse switch | 25. Detent assembly |
| 8. Detent plug | 26. 1st reverse, 2nd-3rd and 4th-5th shift arm |
| 9. Filler plug | 27. Front oil seal |
| 10. Detent assembly | 28. Bearing outer race |
| 11. Drain plug | 29. Magnet |
| 12. Snap ring | 30. Speedometer driven gear |
| 13. Collar | 31. Rear cover |
| 14. Speedometer gear | 32. Rear oil seal |
| 15. Reverse idle shaft | 33. Parking brake assembly |
| 16. Reverse idle gear and needle bearing | 34. Top gear shaft assembly |
| 17. Retainer | 35. Main shaft assembly |
| 18. Shim; Counter | 36. Counter shaft assembly |

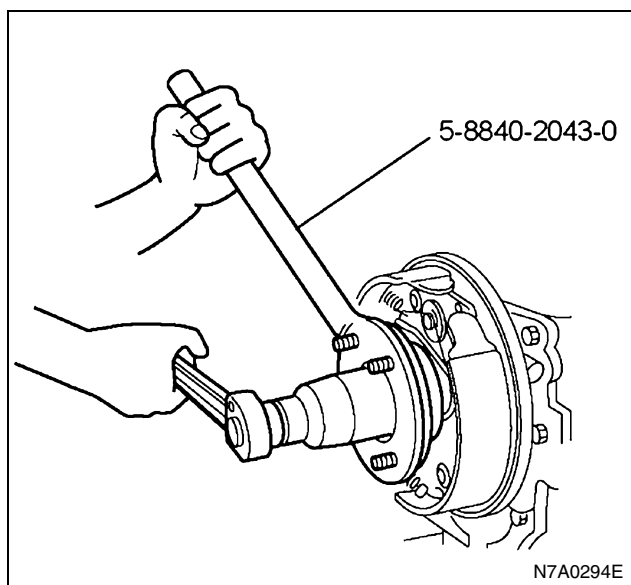
Disassembly

Caution:

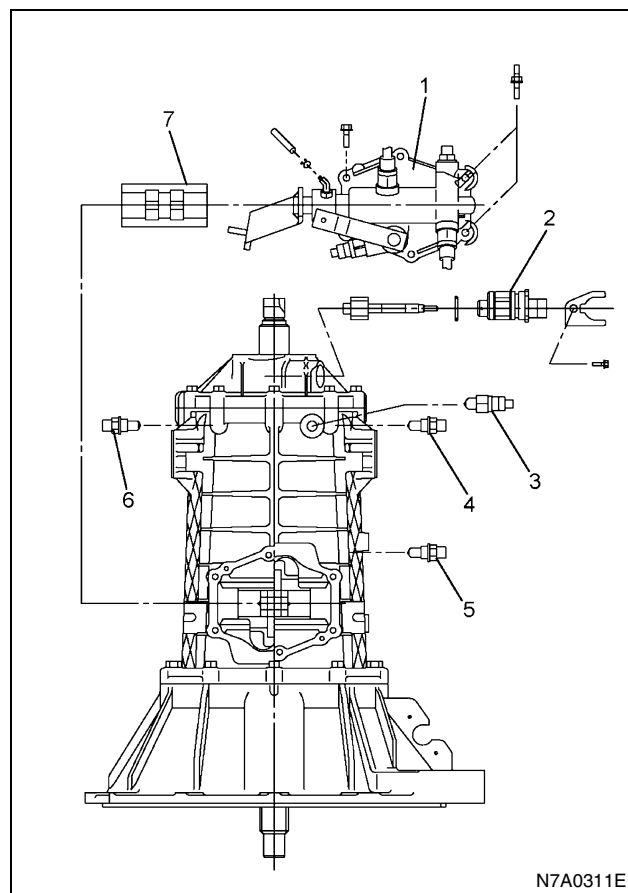
Be careful not to damage the transmission case and the clutch housing because they are made of aluminum. Further attention should be paid to the rib because its damage weakens hardness of the case.

Do not hurt yourself when working on something heavy such as cases and gears.

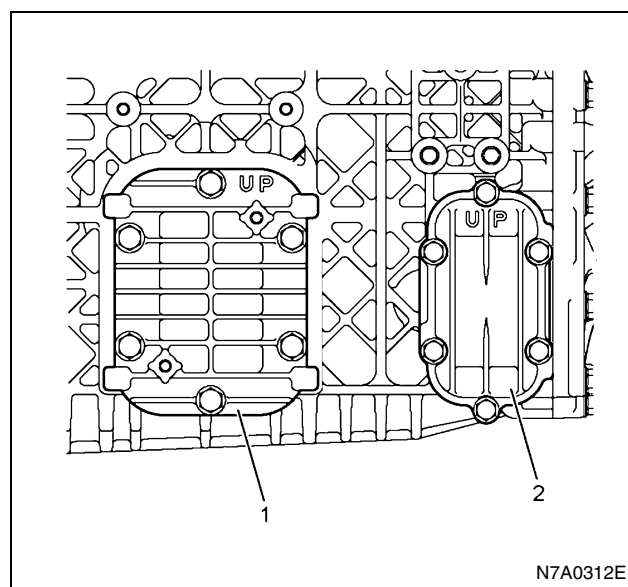
1. Remove the shift block assembly.
 - Refer to CLUTCH.
2. Remove the shift fork and the support bolt.
 - Refer to CLUTCH.
3. Remove the bolt securing the adjust hole cover and remove the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.
4. Raise the caulking portion (2 parts) of the coupling driver lock nut securely, and then remove the lock nut using the flange holder 5-8840-2043-0.



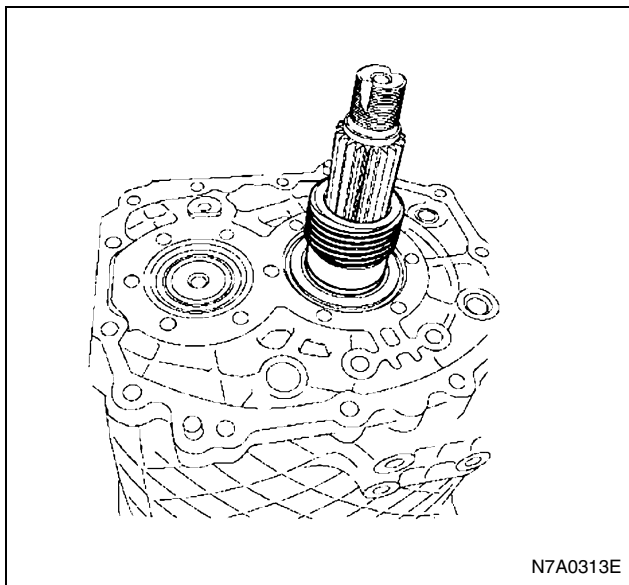
5. Remove the coupling driver and O-ring.
6. Remove the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.
7. Remove the filler plug and O-ring.
8. Remove the drain plug and O-ring.
 - Drain the transmission oil. Check the amount of oil and the existence of metal particles and foreign matters while draining oil.
9. Remove the speedometer driven gear (2).
10. Remove the reverse switch (3).
11. Remove the detent assembly (4)(5)(6).
12. Remove the control box (1) and the interlock plate (7).



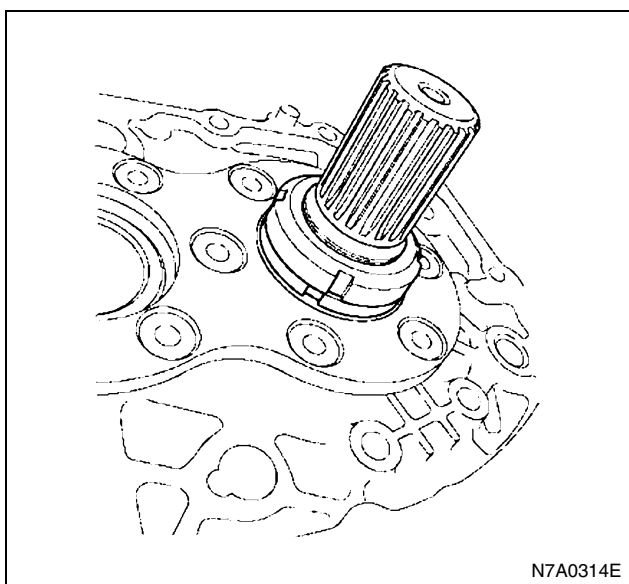
13. Remove the PTO cover (1).
14. Remove the reverse idle cover (2).



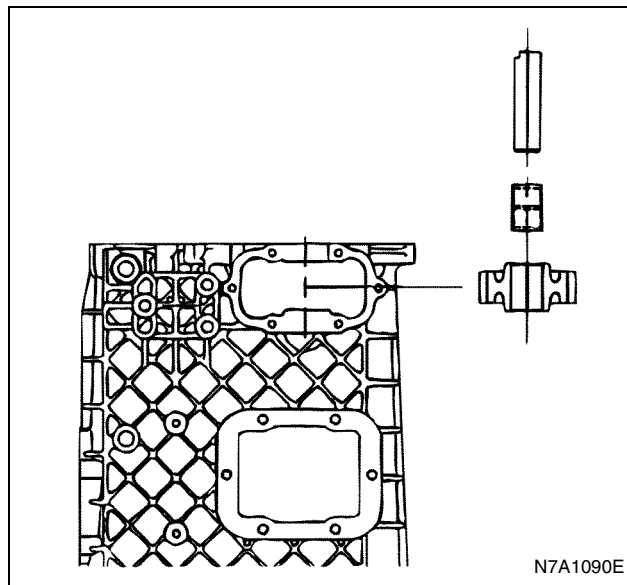
15. Remove the rear cover assembly.
16. If worn or damaged parts are found after checking the rear cover oil seal, remove the oil seal from rear cover using the flat-tip screwdriver.
17. Remove the speedometer gear and collar.



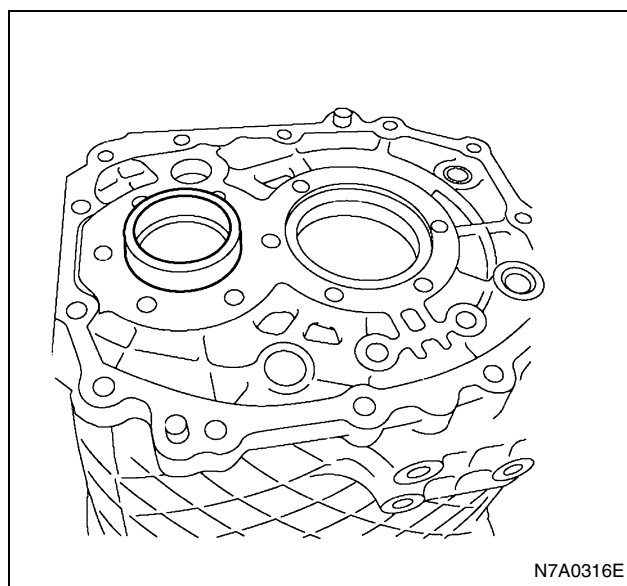
18. Remove the main shaft end lock nut using the wrench 5-8840-2798-0. (4WD model)



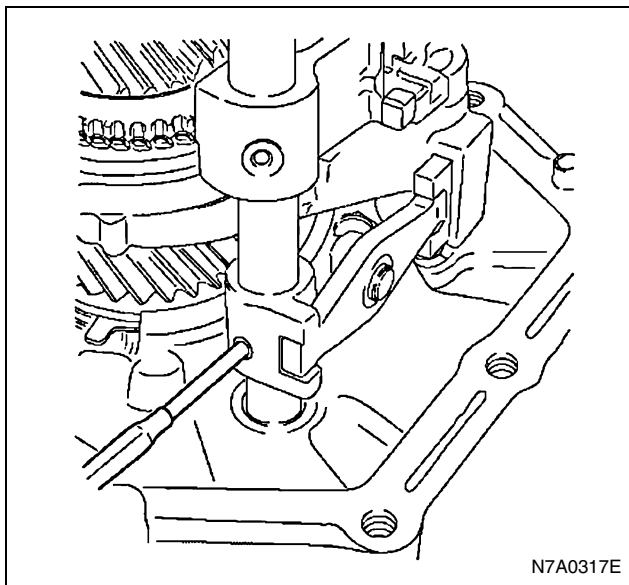
19. Remove the retainer from the transmission case.
20. Pull out the reverse idle shaft, and then remove the reverse idle gear and the needle bearing.



21. Remove the snap ring from the main shaft rear bearing.
22. Remove the shim from the counter shaft rear bearing.
23. Remove the transmission case from the clutch housing.
24. Remove the bearing rear outer race from the transmission case.

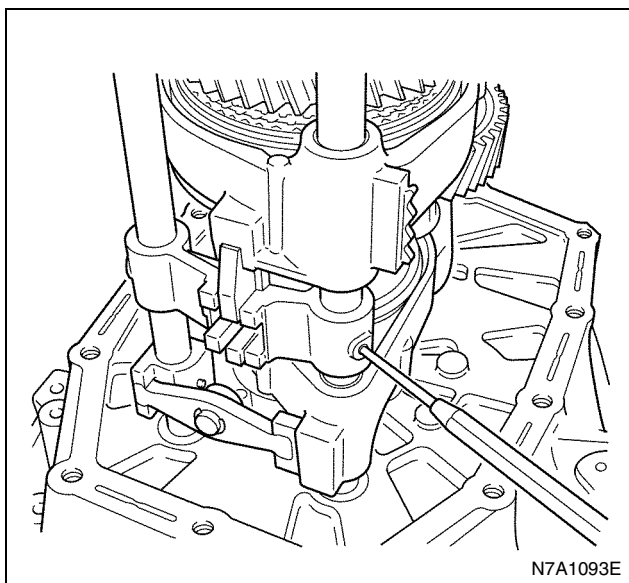


25. Remove the 4th-5th shift rod, 4th-5th main shift block and 4th-5th sub shift block.
- When driving out the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then remove the spring pin using the spring pin remover.

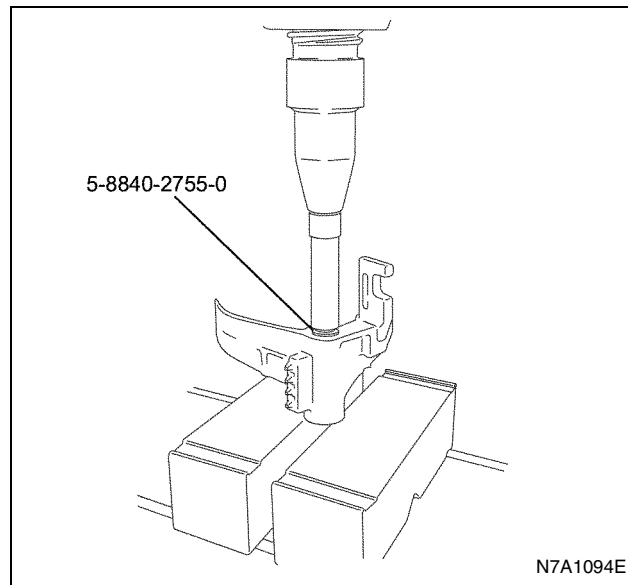


26. Remove the 1st-reverse and 2nd-3rd shift rod, 1st-reverse shift arm, 2nd-3rd shift arm, 1st-reverse shift block, and 4th-5th shift arm.

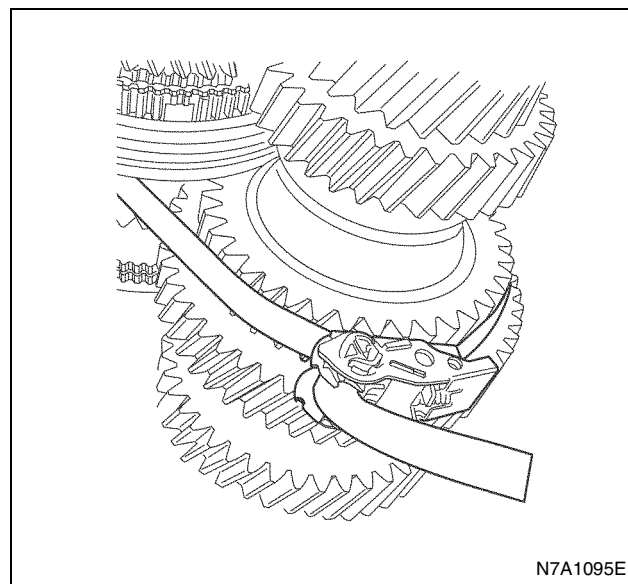
- When driving out the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then remove the spring pin using the spring pin remover.



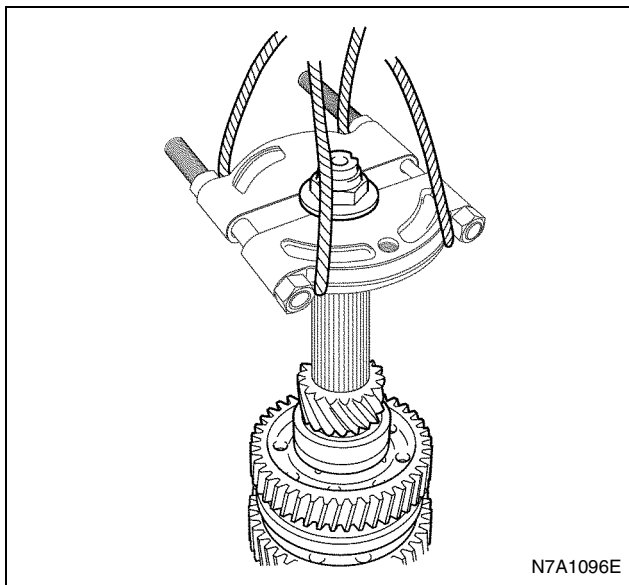
27. Remove the bush from the 2nd-3rd shift arm using the remover 5-8840-2755-0.
28. Remove the bush from the 4th-5th shift arm using the remover 5-8840-2755-0.
- Use the remover with a round pole whose length is enough to push the remover to the end.



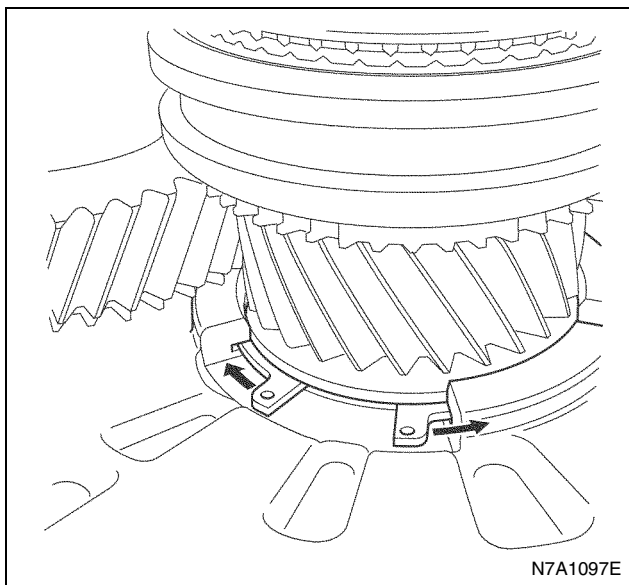
29. Remove the 5th relay lever from the clutch housing.
30. Remove the magnet from the clutch housing.
31. Remove the main shaft assembly, the top gear shaft assembly and counter shaft assembly.
- Tie the main shaft assembly, the counter shaft assembly and the top gear shaft assembly at the two positions not to let them come apart using a lashing belt or other belts with a fixing function, and then fix them securely.



- Install the bearing remover to the main shaft and secure it with a lock nut, hang them with a hoist and a wire, and then remove the top gear shaft assembly, the main shaft assembly, the counter shaft assembly from the clutch housing as a unit while spreading the top gear shaft bearing outer snap ring installed to the clutch housing.

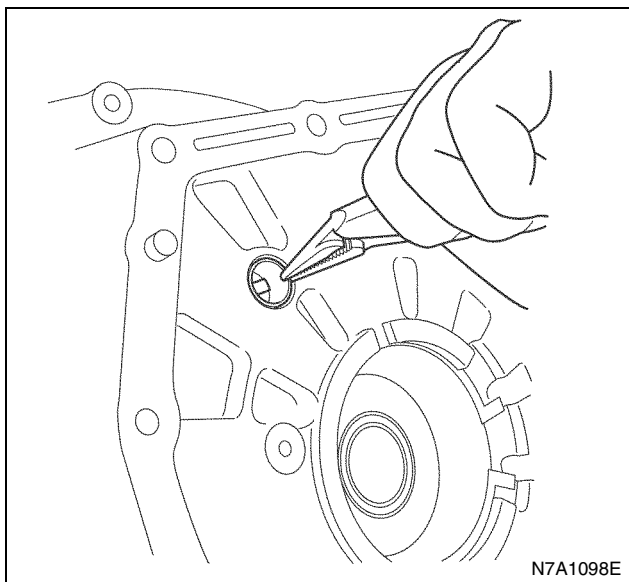


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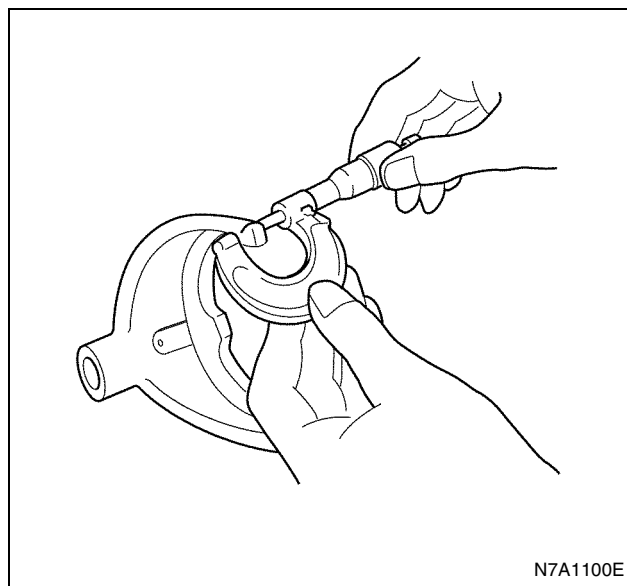
32. Check the clutch housing bush, and then remove it from the clutch housing using a pliers if it is worn or damaged.



N7A1098E

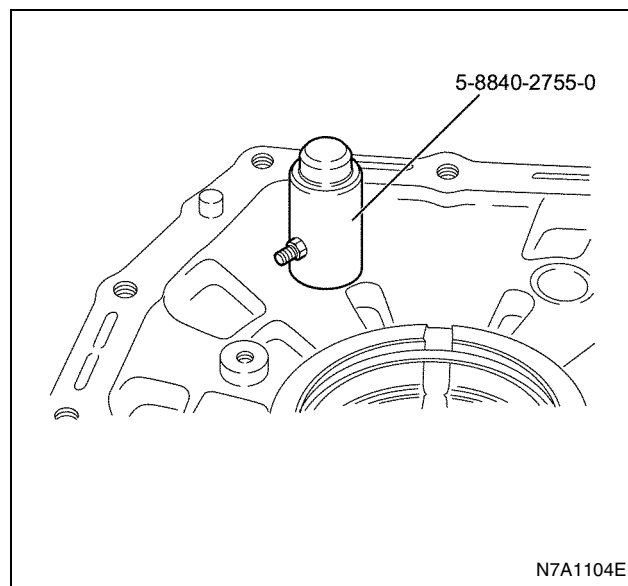
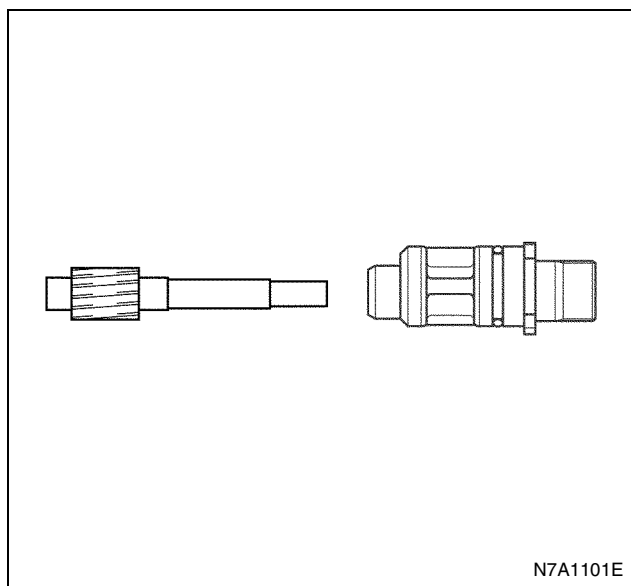
33. Check the front oil seal, and then remove it from the clutch housing using a flat-tip screwdriver if it is worn or damaged.
34. Check each part, and then correct and replace it if some worn, damaged or faulty parts are found. Check each part of the shift mechanism, and then correct light damage, deflection or stepped wear. Replace it when it is heavily damaged or its usage limit is over.
- Deflection, wear and damage of the shift rod and the shift arm
 - Shift arm thickness
 - Measure the thickness of the shift arm tip using the micrometer.

Shift arm thickness, mm (in)		
	Standard	Limit
1st-reverse	9.60 — 9.85	9.0 (0.354)
3rd-2nd	(0.377 —	
5th-4th	0.387)	



N7A1100E

35. Check the wear of the speedometer driven gear and the driven gear bush.
- Replace them if they are heavily worn.



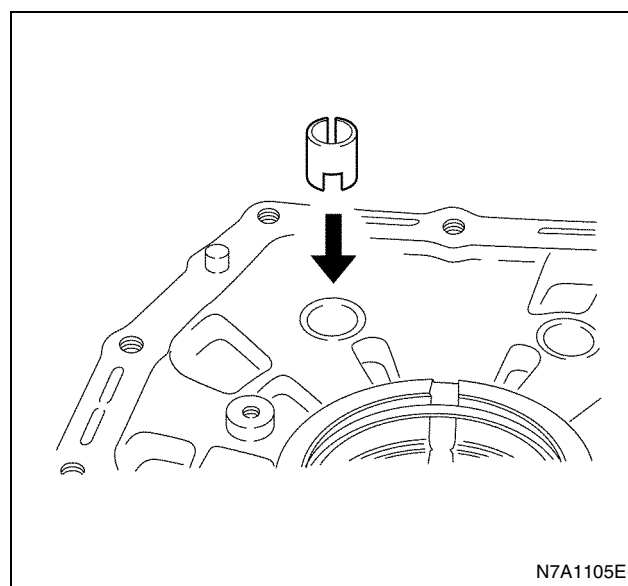
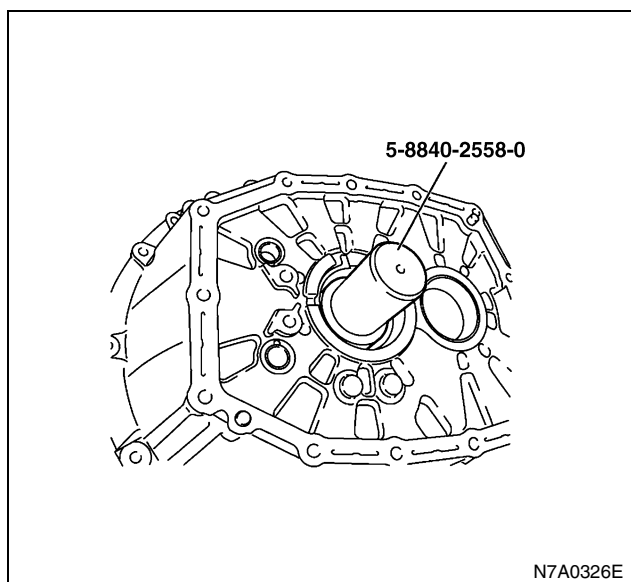
Assembly

1. When finding the oil seal worn and damaged after the check and replacing it with a new one, apply engine oil 5W-30 around the oil seal, and then press in the oil seal into the clutch housing using the installer 5-8840-2558-0, or when the front PTO is equipped, using the installer 5-8840-2754-0 and the grip 5-8840-0007-0.

- Apply Besco L2 grease on the oil seal lip portion.

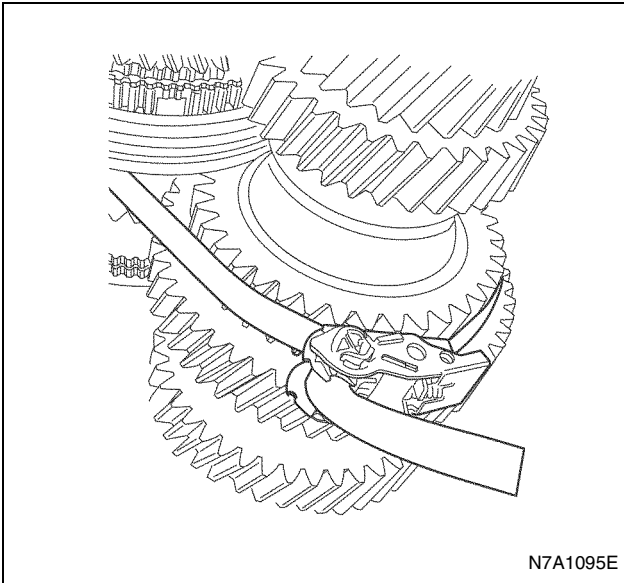
Caution:

Be careful not to damage the oil seal lip portion.

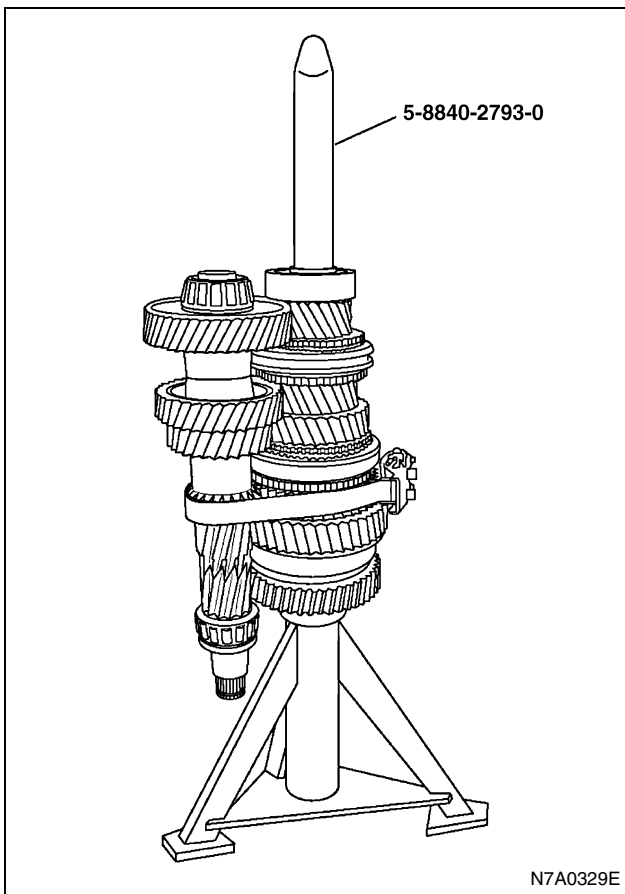


2. When the clutch housing bush is replaced with a new one after checking it for wear and damage, press it in using the installer 5-8840-2755-0.
 - During installation, caulk three portions securely except older caulking portions and grooves.

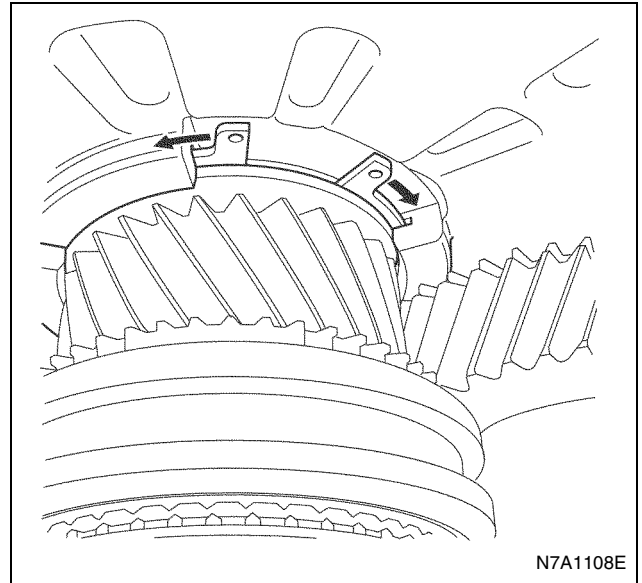
3. Install the main shaft assembly, the top gear shaft assembly and the counter shaft assembly.
 - a. Tie the main shaft assembly, the counter shaft assembly and the top gear shaft at the two positions not to let them come apart using a lashing belt or other belts with a fixing function, and then fix them securely. Be careful not to drop the top gear shaft while lifting up.



- b. Stick up the three of the top gear shaft assembly, the main gear shaft assembly and the counter shaft assembly on the support stand as the top gear shaft assembly is put on the top.
- c. Install the oil seal protector 5-8840-2793-0 to the main shaft.



- d. Set the top gear shaft bearing outer snap ring to the clutch housing, spread it using a snap ring pliers, and then insert it to the clutch housing after aligning the top gear shaft, the counter shaft and the shift rod positions.



Caution:

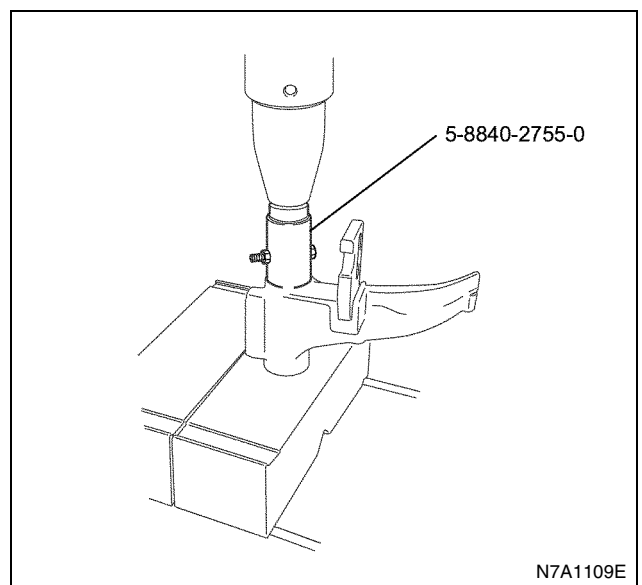
- Make sure the snap ring is installed securely.
- Work carefully not to damage the front oil seal.

4. Install the magnet to the clutch housing.
5. Install the 5th relay lever to the clutch housing.

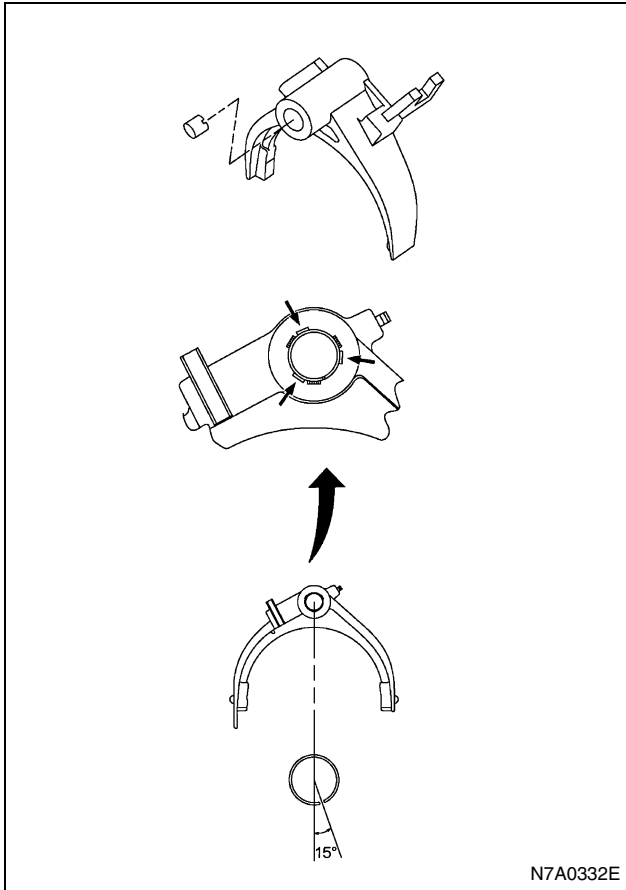
Tighten:

5th relay lever to 44 N·m (4.5 kg·m / 34 lb·ft)

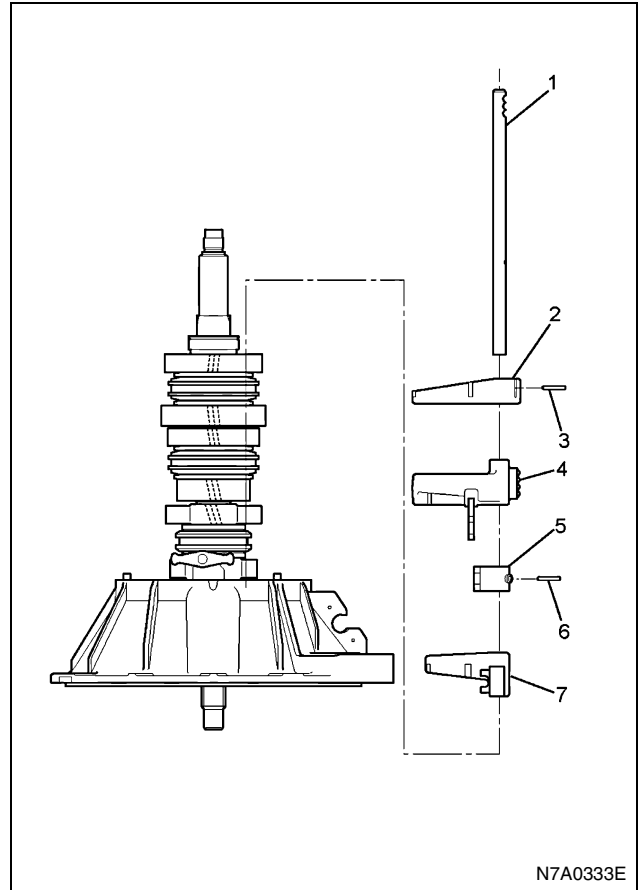
6. When replacing the 4th-5th shift arm bush with a new one after checking it for wear or damage, press fit the bush using the installer 5-8840-2755-0.
7. When replacing the 2nd-3rd shift arm bush with a new one after checking it for wear or damage, press in the bush using the installer 5-8840-2755-0.



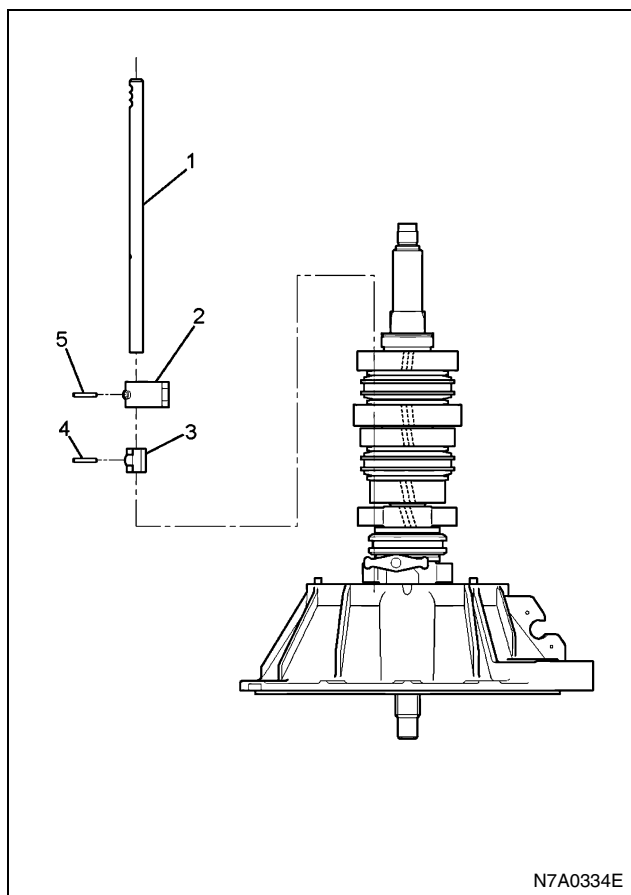
- Press it taking care of the direction and angle of the shift arm bush, caulk the three portions except the bush cut and older caulking portions.



8. Install the 4th-5th shift arm (7), the 1st-reverse shift block (5), the 2nd-3rd shift arm (4), the 1st-reverse shift arm (2), and the 1st-reverse and 2nd-3rd shift rod (1).
 - Drive the spring pin (3) and (6) using a hammer after aligning the spring pin hole.
 - When pressing in the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then press in the spring pin.



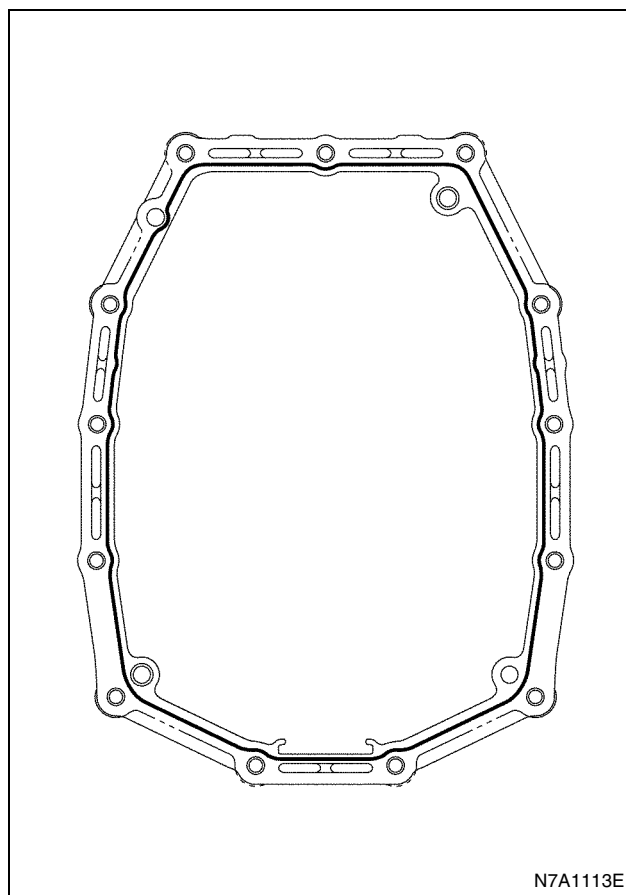
9. Install the 4th-5th sub shift block (3), 4th-5th main shift block (2), 4th-5th shift rod (1).
 - Drive in the spring pin (4) and (5) using a hammer after aligning the spring pin hole.
 - When pressing in the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then press in the spring pin.



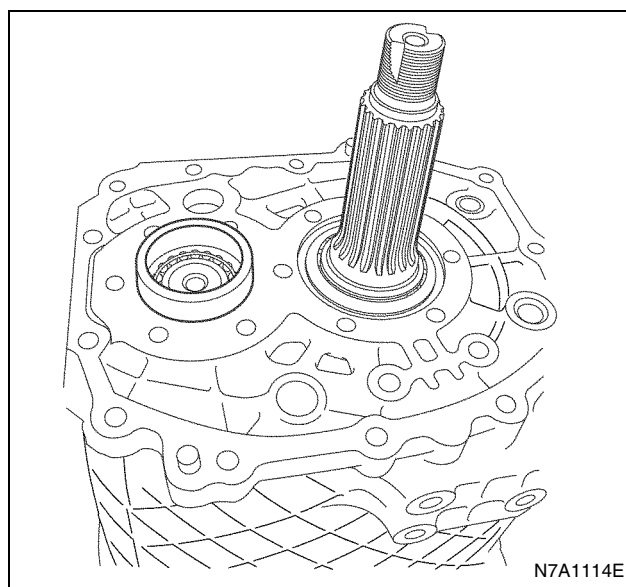
10. Apply ThreeBond 1215 to the mating surface of the transmission case and the clutch housing, and then install the clutch housing.
- Wipe off moisture and lubricant from the mating surface, and then apply the bond continuously with a diameter of 2 mm (0.079 in) or more.

Tighten:

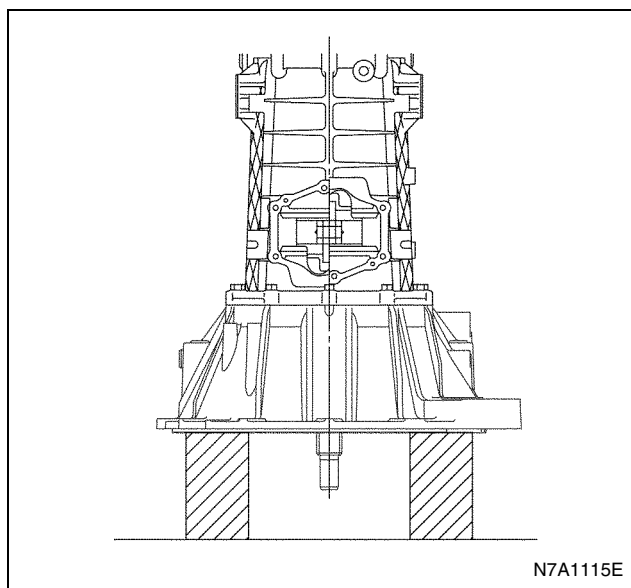
Clutch housing to 46 N·m (4.7 kg·m / 34 lb·ft)



11. Install the bearing rear outer race to the transmission case.



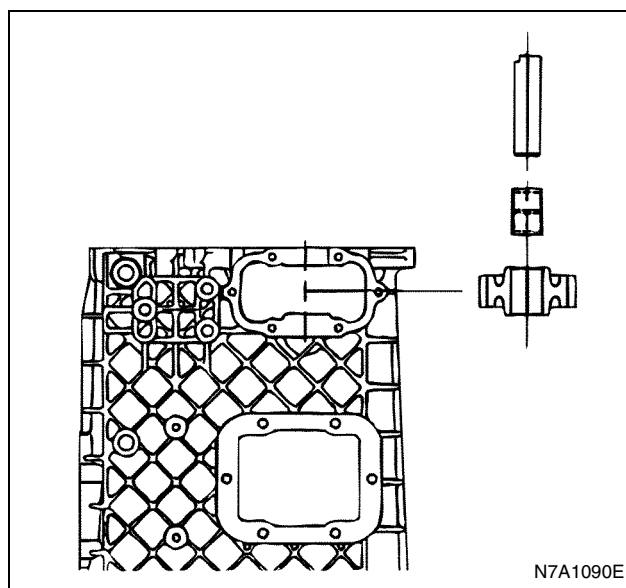
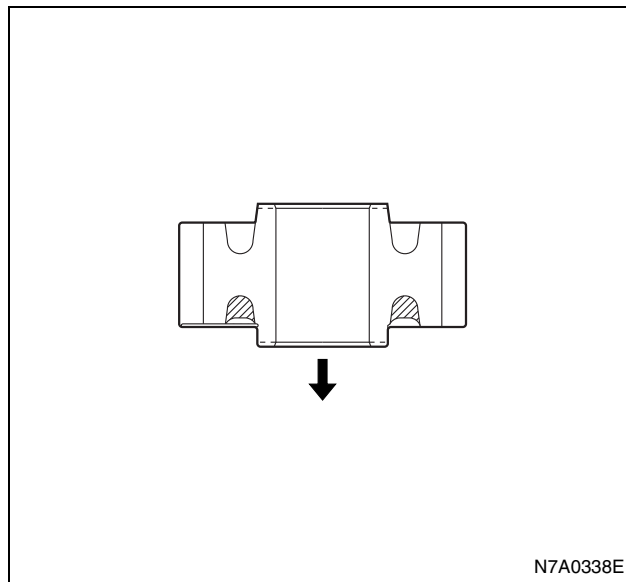
12. Install the shim to the counter shaft rear bearing.
- Shift the position to the neutral.
 - Set the transmission assembly with the clutch housing faced down.



- c. Revolve the counter shaft more than 30 times and smooth the taper roller bearing.
- d. Select the counter shim.
 - Measure the depth at the points equally divided into three from the end surface of the transmission case to the outer ring edge surface of the counter shaft rear bearing, and then take an average of them.
 - Select the shim whose thickness agrees with the list below.

Measured value, mm (in)	Thickness of applicable shim
more than — less than	
3.34 — 3.40 (0.132 — 0.133)	3.19 (0.125)
3.28 — 3.34 (0.130 — 0.131)	3.13 (0.123)
3.22 — 3.28 (0.127 — 0.129)	3.70 (0.120)
3.16 — 3.22 (0.125 — 0.126)	3.01 (0.118)
3.10 — 3.16 (0.122 — 0.124)	2.95 (0.116)
3.04 — 3.10 (0.120 — 0.122)	2.89 (0.113)
2.98 — 3.04 (0.118 — 0.119)	2.83 (0.111)
2.92 — 2.98 (0.115 — 0.117)	2.77 (0.109)
2.86 — 2.92 (0.113 — 0.114)	2.71 (0.106)
2.80 — 2.86 (0.110 — 0.112)	2.65 (0.104)
2.74 — 2.80 (0.108 — 0.110)	2.59 (0.101)
2.68 — 2.74 (0.106 — 0.107)	2.53 (0.099)
2.62 — 2.68 (0.104 — 0.105)	2.47 (0.097)
2.56 — 2.62 (0.101 — 0.103)	2.41 (0.094)
2.50 — 2.56 (0.099 — 0.100)	2.35 (0.092)
2.44 — 2.50 (0.096 — 0.098)	2.29 (0.090)
2.38 — 2.44 (0.094 — 0.096)	2.23 (0.087)
2.32 — 2.38 (0.092 — 0.093)	2.17 (0.085)
2.26 — 2.32 (0.089 — 0.091)	2.11 (0.083)

13. Install the snap ring to the main shaft rear bearing.
14. Apply engine oil 5W-30 to the needle bearing, install the reverse idle gear and needle bearing, and then insert the reverse idle shaft.
 - The arrow mark shows the direction of the transmission front side.



15. Install the retainer to the transmission case.

Tighten:

Retainer to 26 N·m (2.7 kg·m / 19 lb·ft)

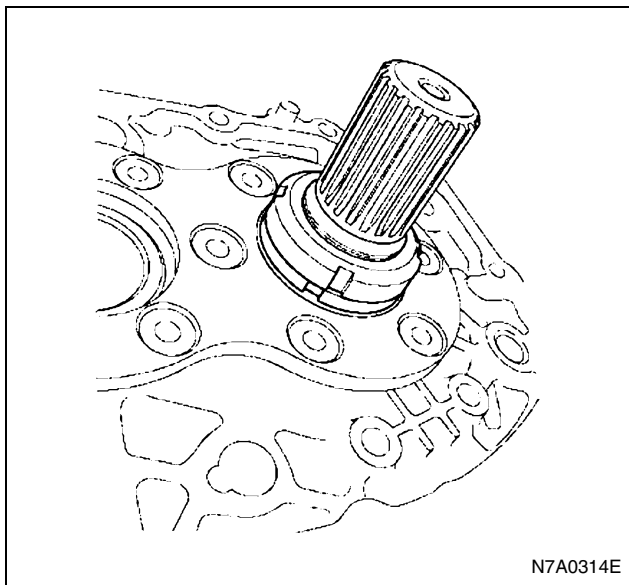
Caution:

Clean up the sealing agent on the screw thread of the transmission case and replace all screws with new ones.

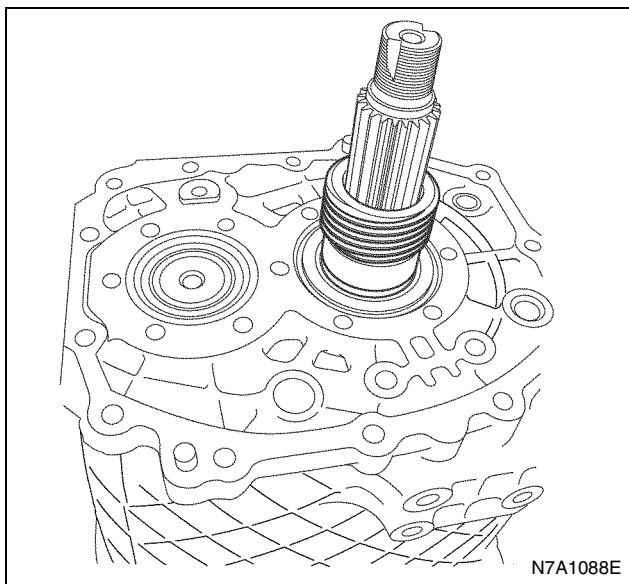
16. Fix the main shaft end lock nut using the wrench 5-8840-2798-0. (4WD model)

Tighten:

Main shaft end lock nut to 359 N·m (36.6 kg·m / 265 lb·ft)



17. Install the collar and speedometer gear.

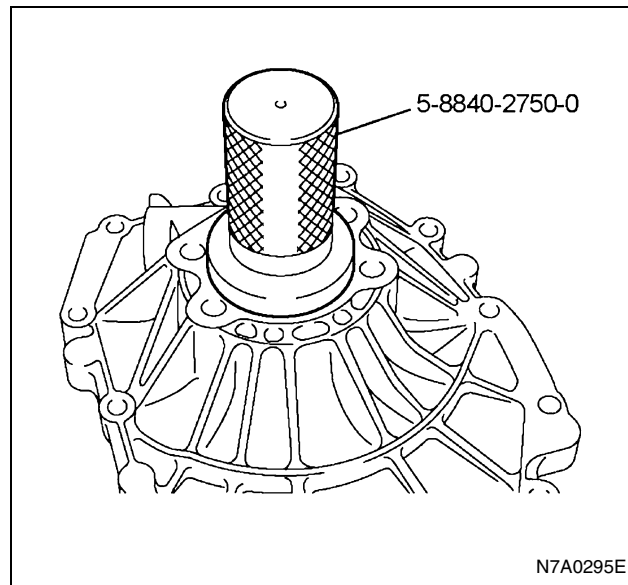


18. When replacing the oil seal of the rear cover with a new one after checking it for wear or damage, apply engine oil 5W-30 around the oil seal, and then press it in to the rear cover using the installer 5-8840-2750-0.

- Apply Besco L2 grease to the oil seal lip.

Caution:

Be careful not to damage the lip portion of the oil seal.



19. Apply ThreeBond 1215 to the mating surface of the transmission case rear cover, and then install the rear cover.

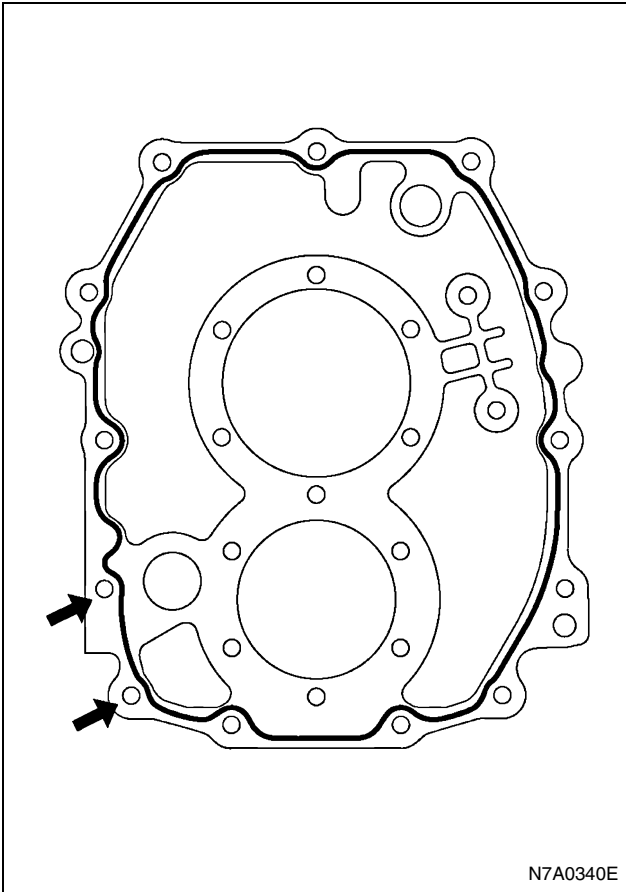
Wipe off moisture and lubricant from the connecting surface, and then apply the gasket continuously with a diameter of 2 mm (0.079 in) or more.

Caution:

Since the two bolts with arrow marks are installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use new bolts with LOCTITE sealing agent.

Tighten:

Rear cover to 46 N·m (4.7 kg·m / 34 lb·ft)

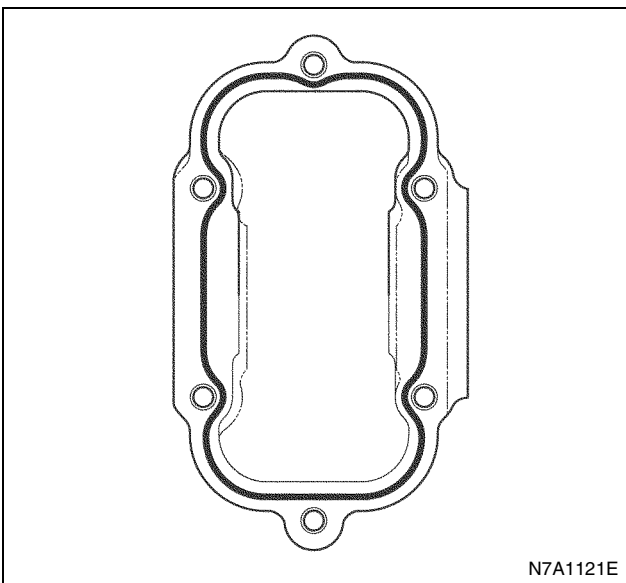


20. Apply ThreeBond 1215 to the mating surface of the transmission case reverse idle cover, and then install the reverse idle cover.

Tighten:

Reverse idle cover to 20 N·m (2.0 kg·m / 15 lb·ft)

- Wipe off moisture water and lubricant from the mating surface, and then apply the gasket continuously with a diameter of 2 mm (0.079 in) or more.



21. Apply ThreeBond 1215 to the mating surface of the transmission case front side cover, and then install the PTO cover.

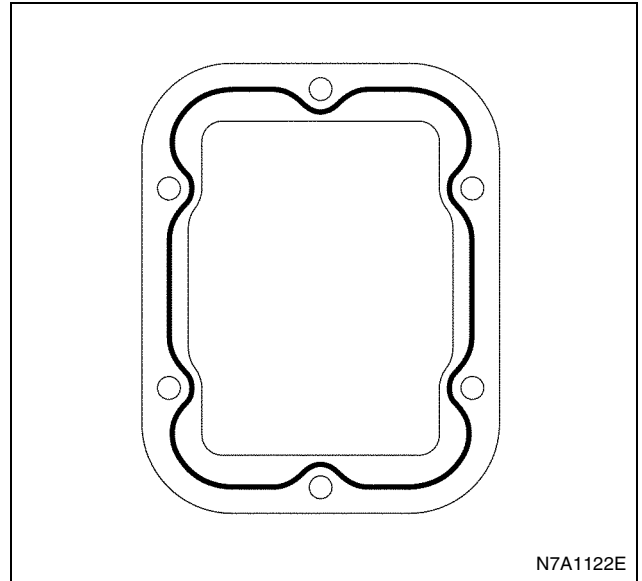
- Wipe off moisture and lubricant from the mating surface, and then apply the gasket continuously with a diameter of 2 mm (0.079 in) or more.

Tighten:

PTO cover to 37 N·m (3.8 kg·m / 27 lb·ft)

Caution:

Since the bolt is installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use a new bolt with LOCTITE sealing agent.



22. Shift the position to the neutral, apply ThreeBond 1215 to the mating surface of the transmission case control box, and then install the interlock plate (7) and the control box (1).

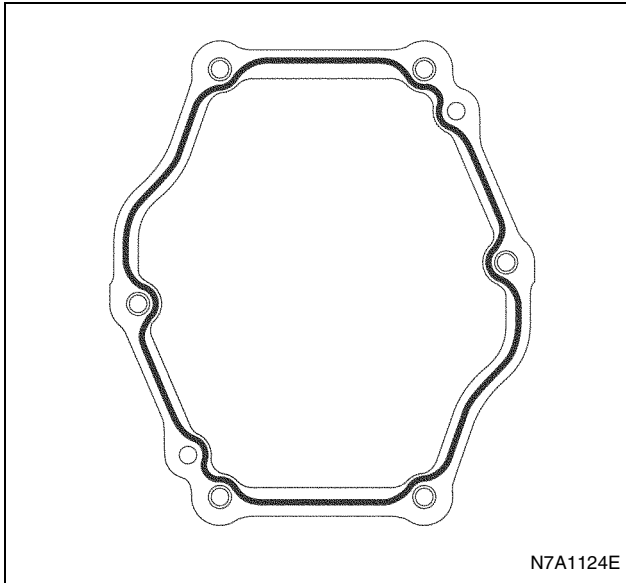
- Wipe off moisture and lubricant from the mating surface, and then apply the gasket continuously with a diameter of 2 mm (0.079 in) or more.

Tighten:

Control box (1) to 27 N·m (2.8 kg·m / 20 lb·ft)

Caution:

Since the bolt is installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use a new bolt with LOCTITE sealing agent.



23. Install the detent assembly (6) (5) (4).

Tighten:

Detent assembly (6) (5) (4) to 27 N·m (2.8 kg·m / 20 lb·ft)

24. Apply Three Bond 1141 to the reverse switch thread portion, and then install the reverse switch (3).

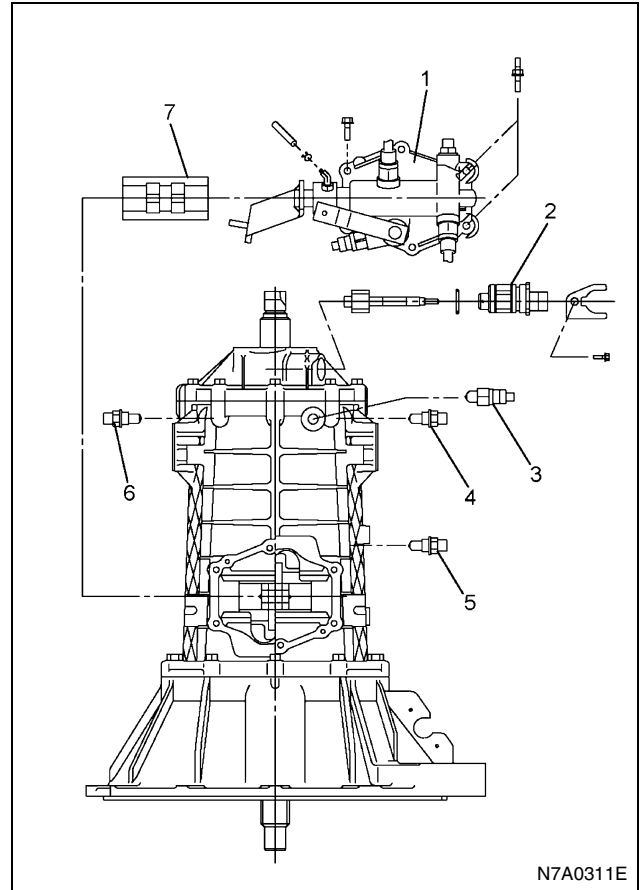
Tighten:

Reverse switch (3) to 39 N·m (4.0 kg·m / 29 lb·ft)

25. Apply engine oil 5W-30 to the speedometer driven gear and the O-ring, and then install the speedometer driven gear (2).

Tighten:

Speedometer driven gear (2) to 20 N·m (2.0 kg·m / 15 lb·ft)



26. Apply engine oil 5W-30 to the O-ring, and then install the drain plug and the O-ring.

Tighten:

Drain plug to 39 N·m (4.0 kg·m / 29 lb·ft)

27. Apply engine oil 5W-30 to the O-ring, and then install the filler plug and the O-ring.

Tighten:

Filler plug to 39 N·m (4.0 kg·m / 29 lb·ft)

28. Install the parking brake assembly.

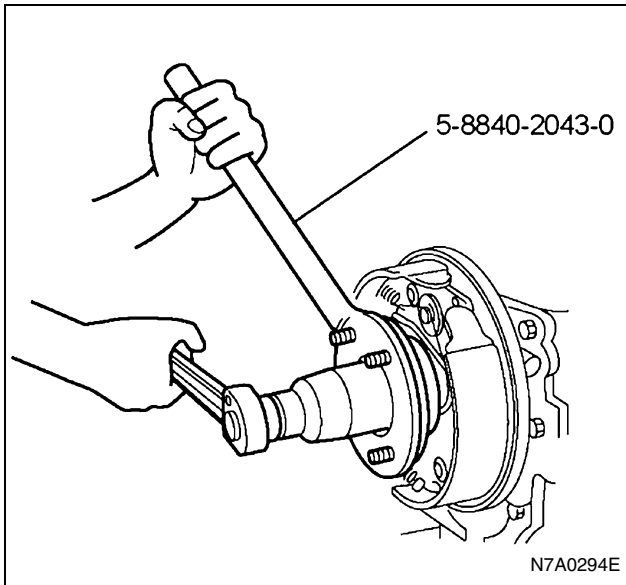
- Refer to PARKING BRAKE ASSEMBLY.

29. Apply engine oil 5W-30 to the O-ring, and then install the coupling driver and the O-ring.

30. Use a new lock nut, apply engine oil 5W-30 to the seat, and then fix the lock nut using the flange holder 5-8840-2043-0.

Tighten:

Lock nut to 289 N·m (29.5 kg·m / 213 lb·ft)

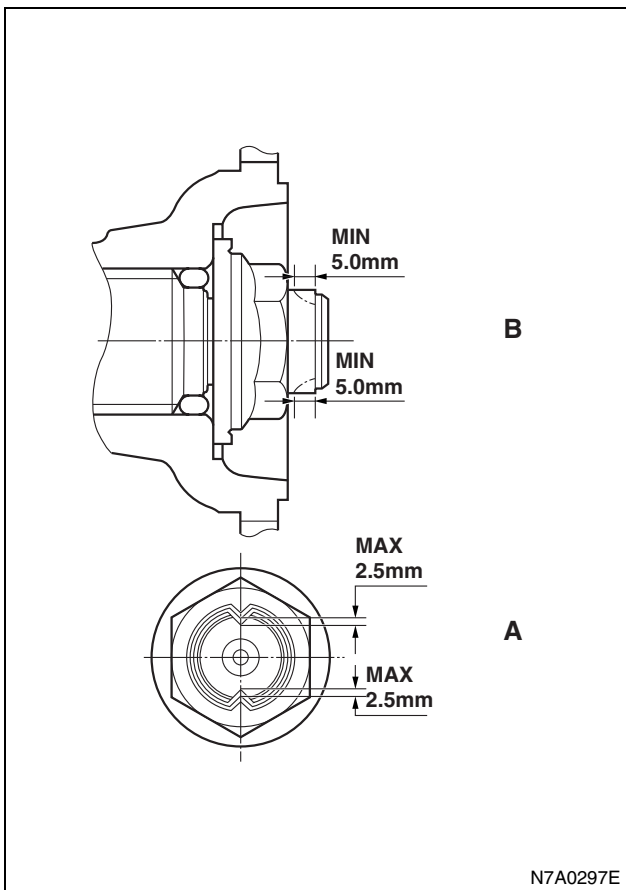


31. Install the parking brake drum and the adjust hole cover securing bolt.
 - Refer to PARKING BRAKE ASSEMBLY.
32. Install the shift fork and the support bolt.
 - Refer to CLUTCH.
33. Install the shift block assembly.
 - Refer to CLUTCH.

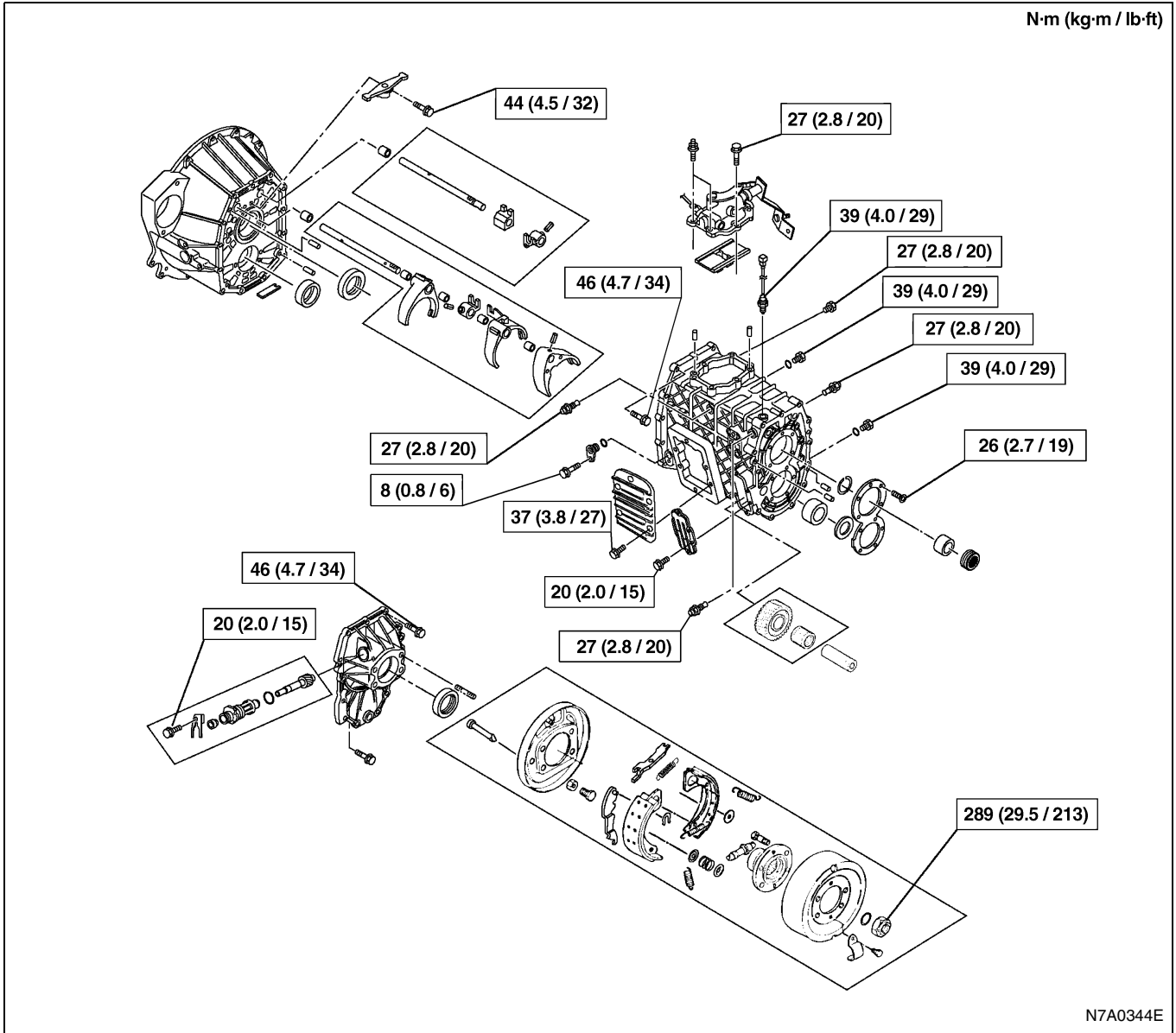
- After fixing it to the specified torque, align the lip part of the nut to the V-groove of the shaft edge. Securely caulk the two parts of the nut lip using a chisel whose tip form is approx. 1 mm (0.04 in) radius by 60°, to make a length (B) of 5 mm (0.2 in) or more, and a clearance between the bottom of the shaft and the nut lip (A) of 2.5 mm (0.06 in) or less.

Caution:

If any crack is found on the caulking portions of the nut after the check, replace the lock nut and caulk it again.



Fixing Torque



Special Tools

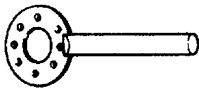
Illustration	Tool Number / Description / Remarks
 5884000070	5-8840-0007-0 / Grip
 5884020430	5-8840-2043-0 / Flange Holder

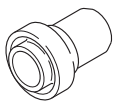
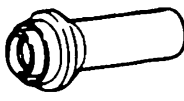
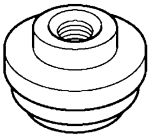
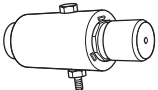
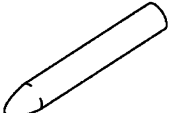
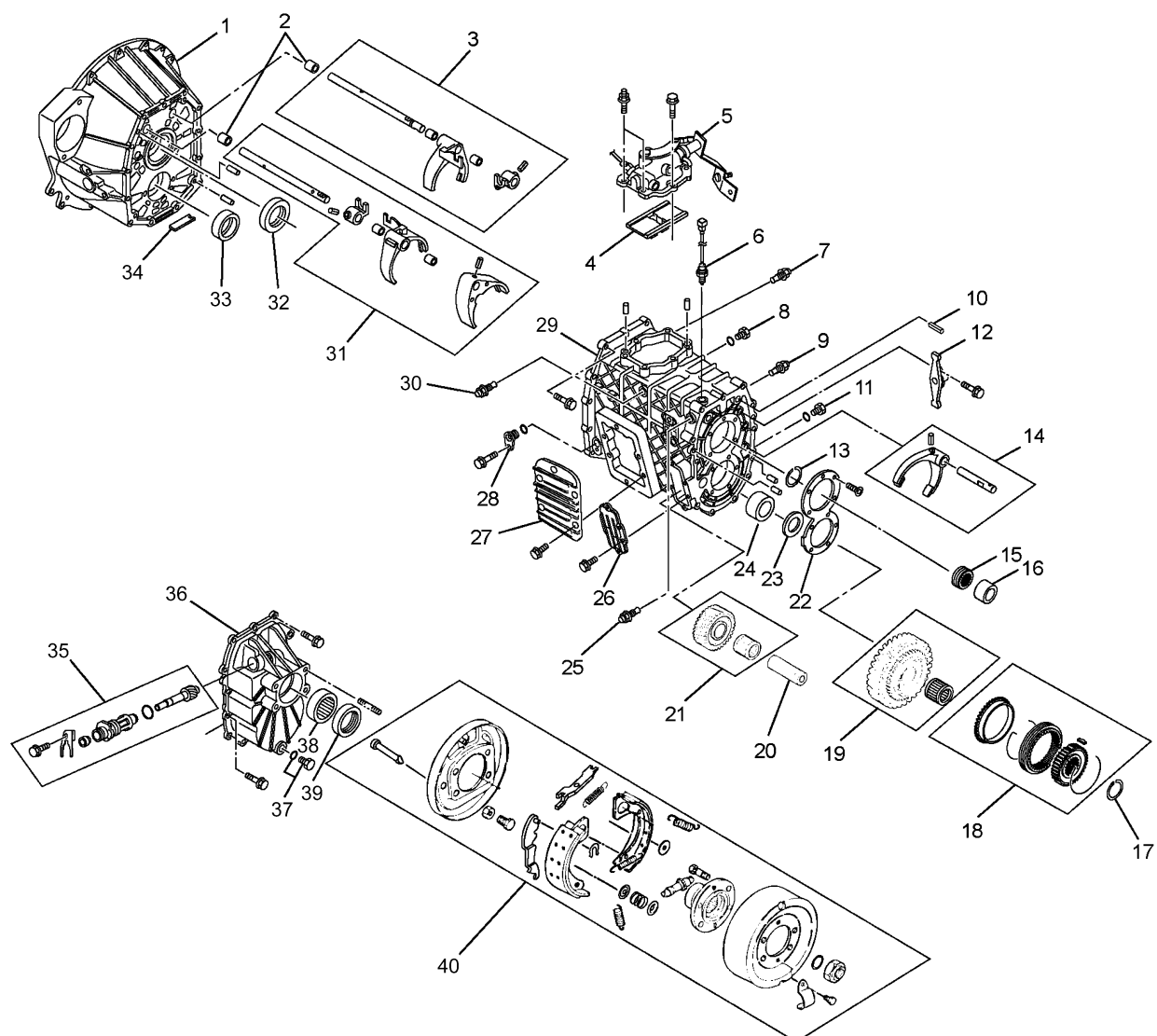
Illustration	Tool Number / Description / Remarks
 5884025580	5-8840-2558-0 / Oil Seal Installer
 5884027500	5-8840-2750-0 / Oil Seal Installer

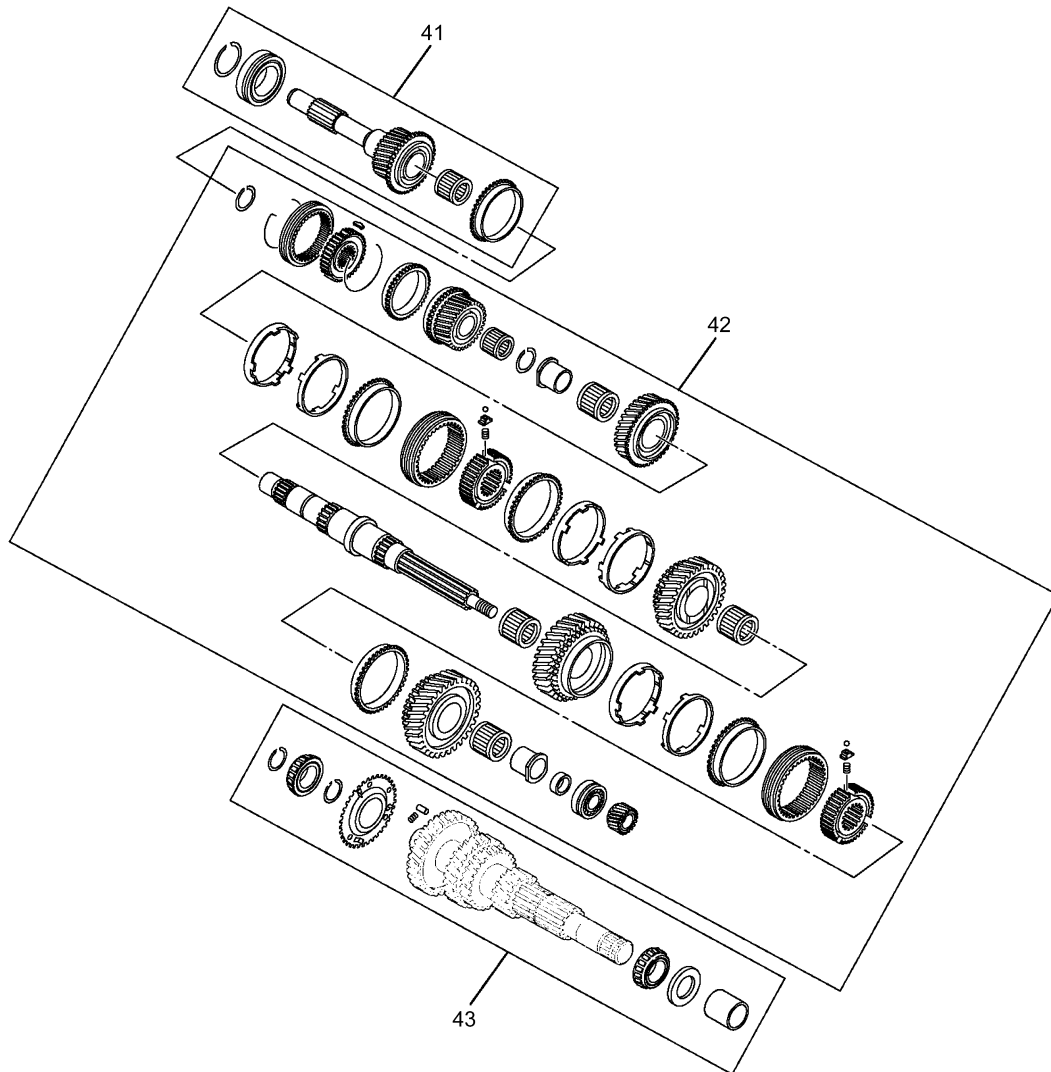
Illustration	Tool Number / Description / Remarks
 5884027540	5-8840-2754-0 / Oil Seal Installer
 5884027550	5-8840-2755-0 / Bush Remover & Installer
 5884027930	5-8840-2793-0 / Oil Seal Protector
 5884027980	5-8840-2798-0 / Wrench

Transmission (6MT)

Components



N7A0345E



N7A0346E

Legend

- | | |
|--|---------------------------------------|
| 1. Clutch housing | 23. Shim; counter |
| 2. Bush; Clutch housing | 24. Counter rear bearing |
| 3. 4th-5th, 6th shift arm | 25. Detent assembly |
| 4. Interlock plate | 26. Reverse idle cover |
| 5. Control box | 27. PTO cover |
| 6. Reverse switch | 28. Sensor dummy plug |
| 7. Detent assembly | 29. Transmission case |
| 8. Filler plug | 30. Detent assembly |
| 9. Detent assembly | 31. 1st-reverse and 2nd-3rd shift arm |
| 10. Spring pin | 32. Front oil seal |
| 11. Drain plug | 33. Bearing outer race |
| 12. 6th relay lever | 34. Magnet |
| 13. Snap ring | 35. Speedometer driven gear |
| 14. 6th shift arm and shift rod | 36. Rear cover |
| 15. Speedometer gear | 37. Drain plug |
| 16. Collar | 38. Needle bearing; main end |
| 17. Snap ring | 39. Rear oil seal |
| 18. 6th clutch hub assembly and sleeve | 40. Parking brake assembly |

19. 6th gear and needle bearing
20. Reverse idle shaft
21. Reverse idle gear and needle bearing
22. Retainer

41. Top gear shaft assembly
42. Main shaft assembly
43. Counter shaft assembly

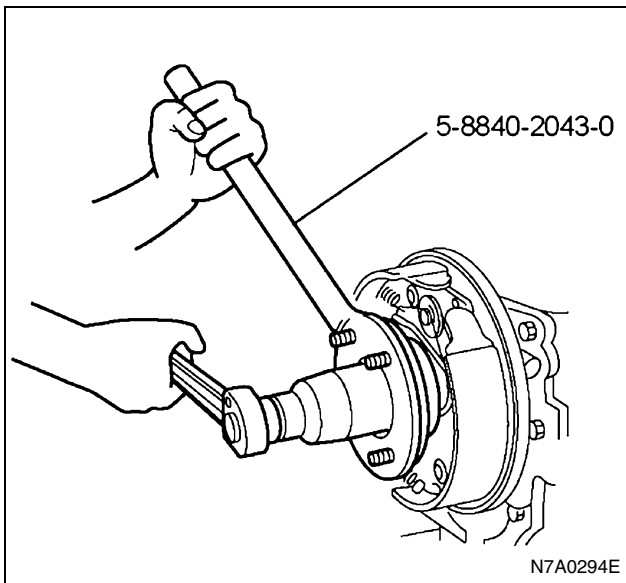
Disassembly

Caution:

Be careful not to damage the transmission case and the clutch housing because they are made of aluminum. Further attention should be paid to the rib because its damage weakens hardness of the case.

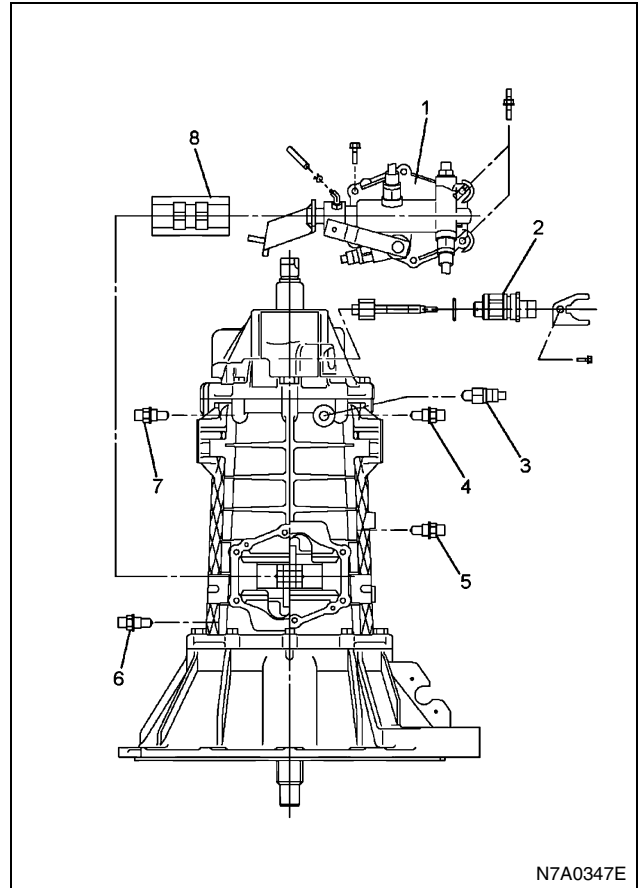
Do not hurt yourself when working on something heavy such as cases and gears.

1. Remove the shift block assembly.
 - Refer to CLUTCH.
2. Remove the shift fork and the support bolt.
 - Refer to CLUTCH.
3. Remove the adjust hole cover securing bolt, and then remove the parking brake drum.
 - Refer to PARKING BRAKE ASSEMBLY.
4. Raise the caulking portions (two parts) of the coupling driver lock nut securely, and then remove the lock nut using the flange holder 5-8840-2043-0.

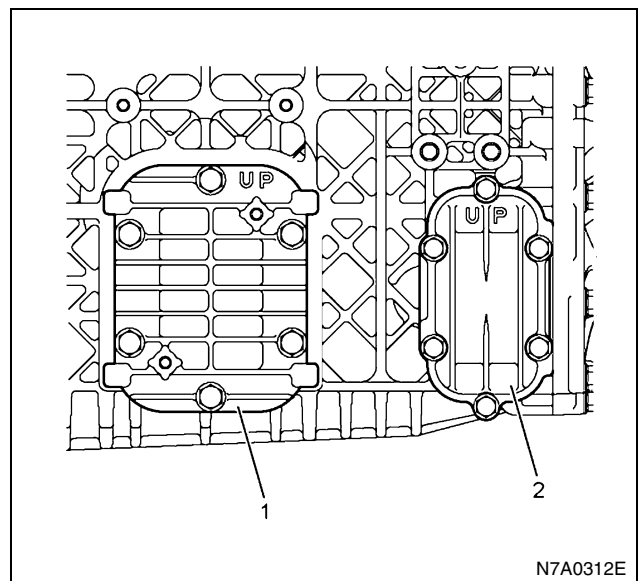


5. Remove the coupling driver and the O-ring.
6. Remove the parking brake assembly.
 - Refer to PARKING BRAKE ASSEMBLY.
7. Remove the filler plug and the O-ring.
8. Remove the drain plug and the O-ring.
 - Drain transmission oil. Check the amount of oil and the existence of metal particles and foreign matters while draining oil.
9. Remove the noise cover.
10. Remove the speedometer driven gear (2).
11. Remove the reverse switch (3).
12. Remove the detent assembly (4) (5) (6) (7).

13. Remove the control box (1) and the interlock plate (8).

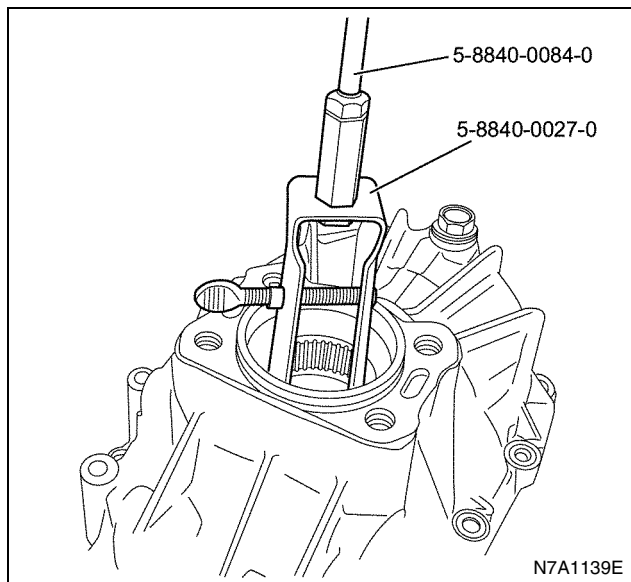


14. Remove the front side cover (1).
15. Remove the reverse idle cover (2).

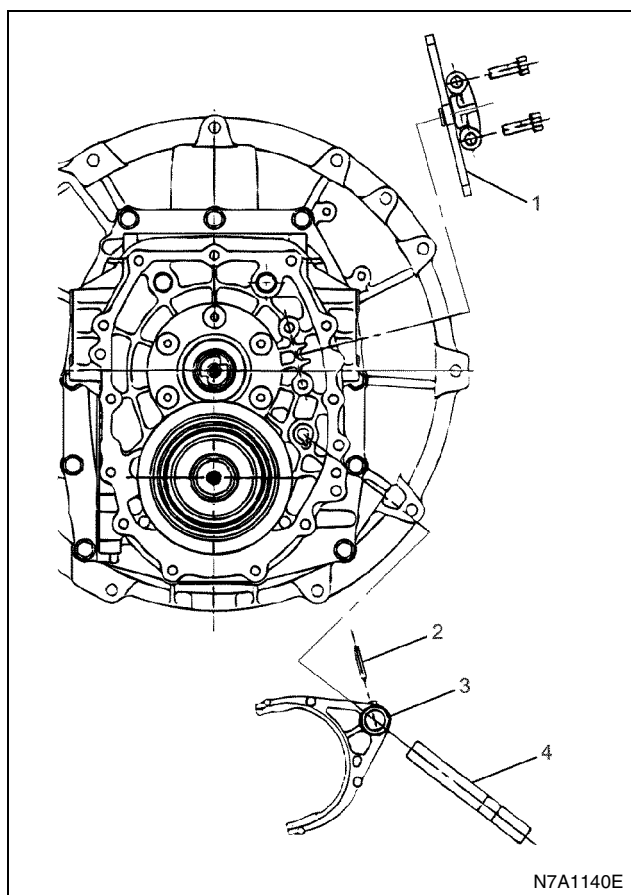


16. Remove the rear cover assembly.

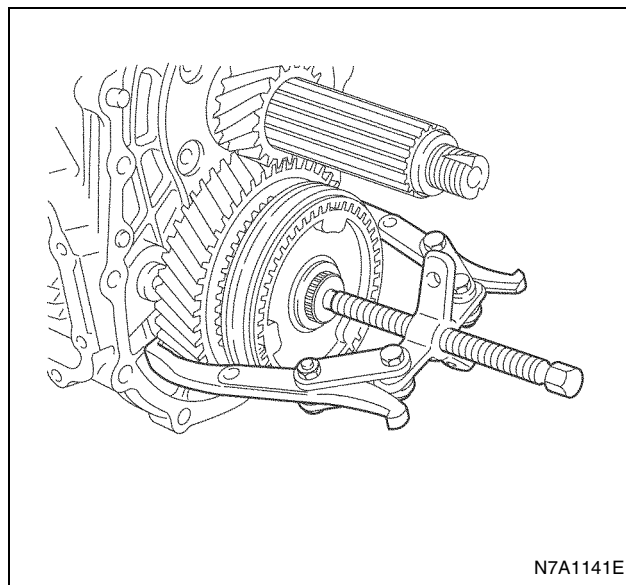
17. When worn or damaged parts are found after checking the rear cover oil seal, remove it from the rear cover using the flat-tip screwdriver.
18. Remove the needle bearing; main end from the rear cover using the remover 5-8840-0027-0 and the sliding hammer 5-8840-0084-0.



19. Remove the 6th relay lever (1).
20. Remove the 6th shift arm (3) and 6th shift rod (4).
 - Using the spring remover, drive out the spring pin (2).



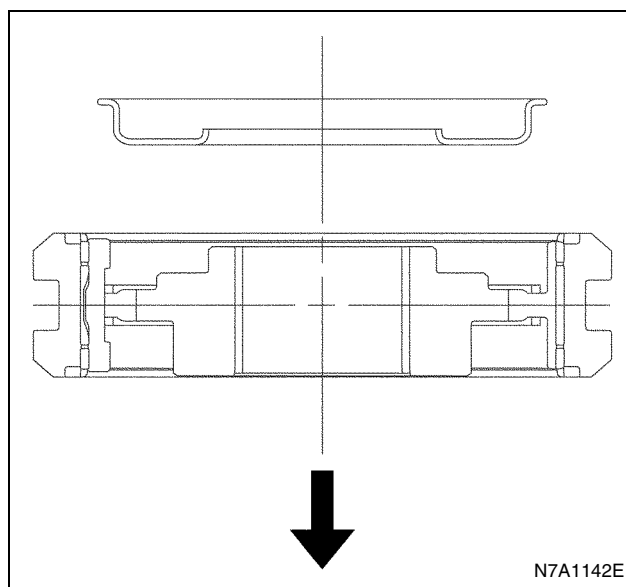
21. Using the snap ring pliers, remove the snap ring; 6th clutch hub.
22. Using the puller, remove the 6th clutch hub assembly and sleeve, the 6th block ring, the 6th gear and the needle bearing from the counter shaft.



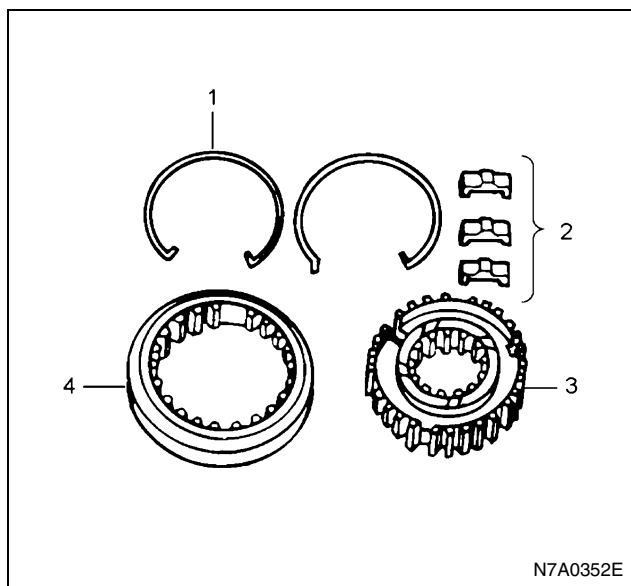
23. Disassemble the 6th clutch hub assembly and sleeve.
 - a. Remove the stopper from the clutch hub.
 - The arrow mark shows the direction of the transmission front side.

Caution:

When removing the stopper plate, replace it with a new one on installation.



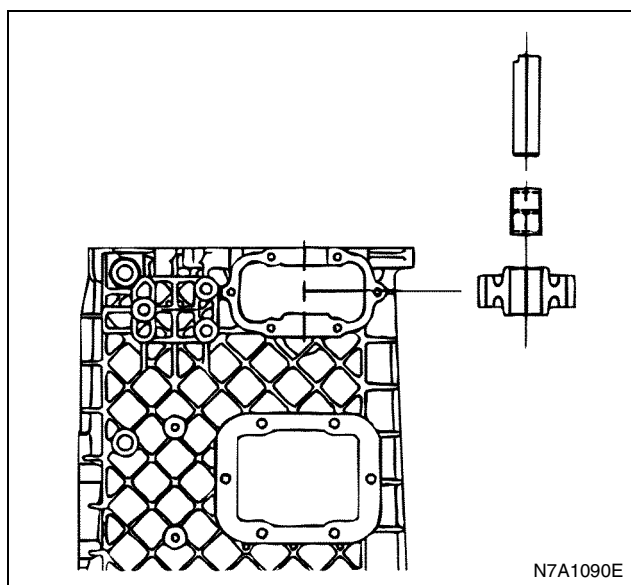
- b. Disassemble the clutch hub assembly and sleeve.



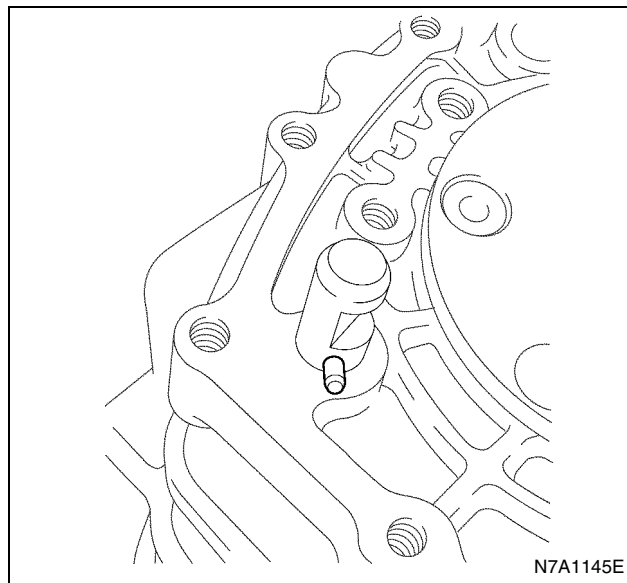
Legend

1. Spring
2. Insert
3. Clutch hub
4. Sleeve

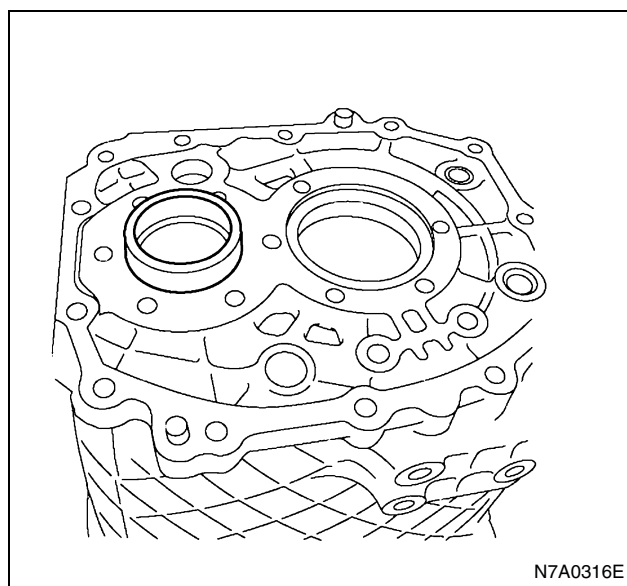
24. Remove the collar and the speedometer gear.
25. Remove the retainer from the transmission case.
26. Pull out the reverse idle shaft, and then remove the reverse idle gear and the needle bearing.



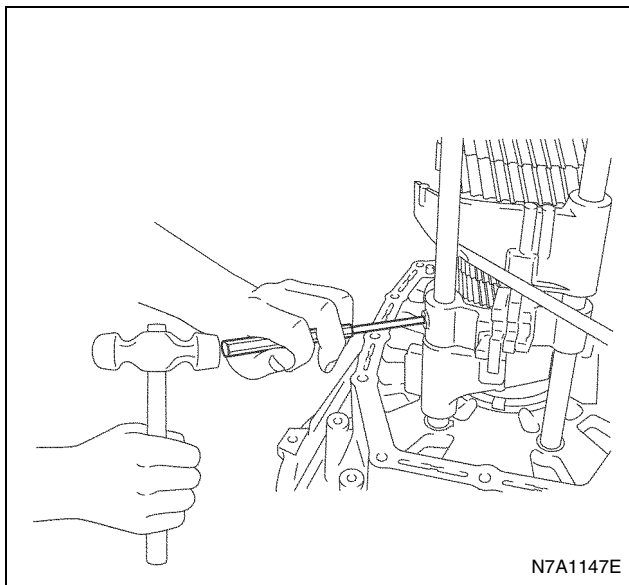
27. Remove the snap ring from the main shaft rear bearing.
28. Remove the shim from the counter shaft rear bearing.
29. Remove the spring pin; 4th-5th and 6th shift rod.



30. Remove the transmission case from the clutch housing.
31. Remove the bearing rear outer race from the transmission case.

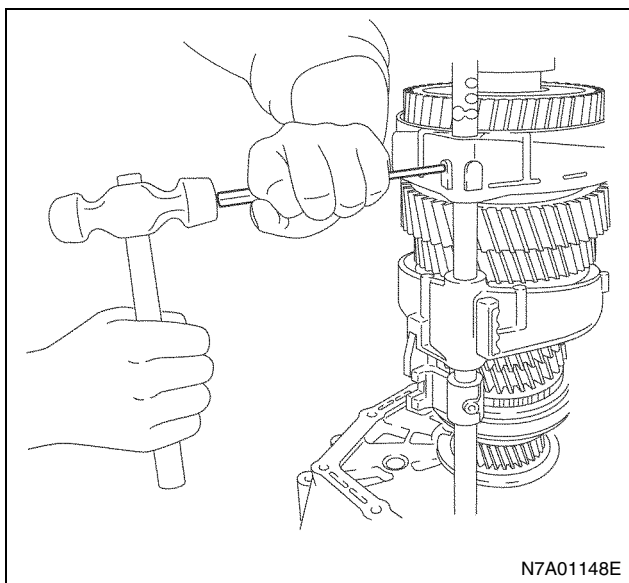


32. Remove the 4th-5th and 6th shift rod, the 1st-reverse and 6th shift block and the 4th - 5th shift arm.
 - When driving out the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then remove the spring pin using the spring pin remover.

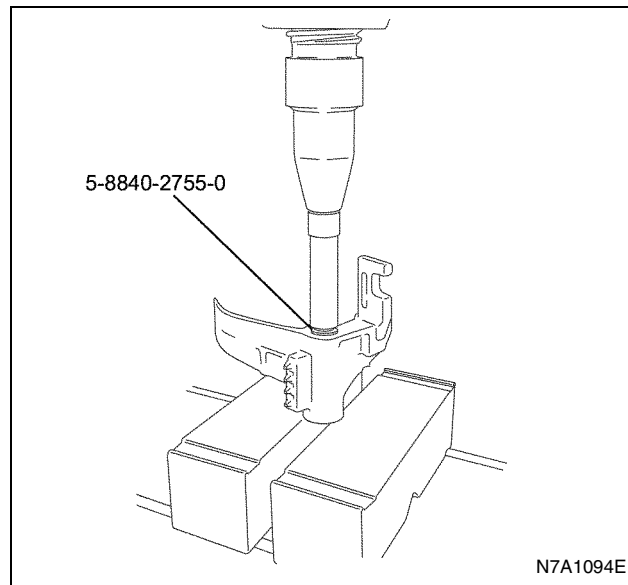


33. Remove the 1st-reverse and 2nd-3rd shift rod, the 1st-reverse shift arm, the 3rd-2nd shift arm, the 1st-reverse and 6th shift block.

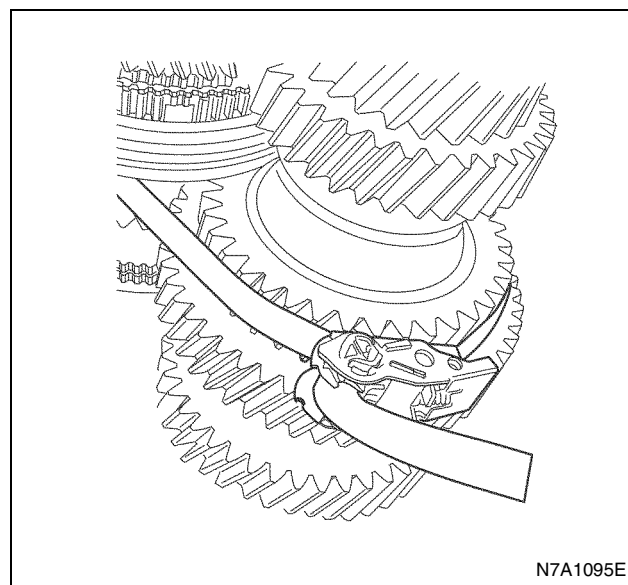
- When driving out the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then remove the spring pin using the spring pin remover.



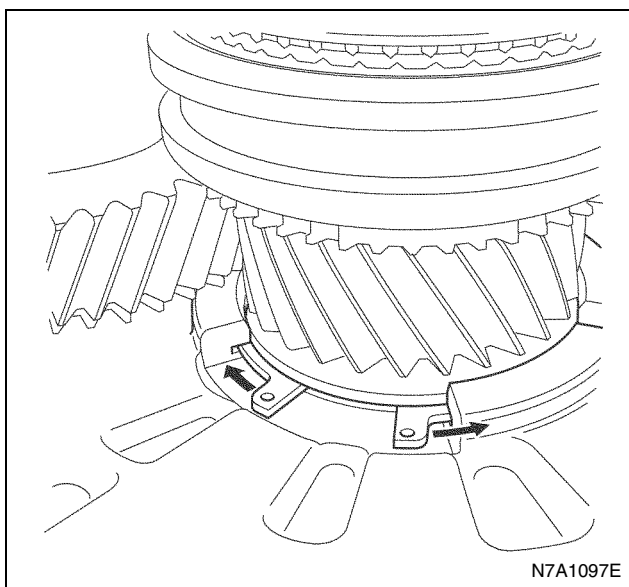
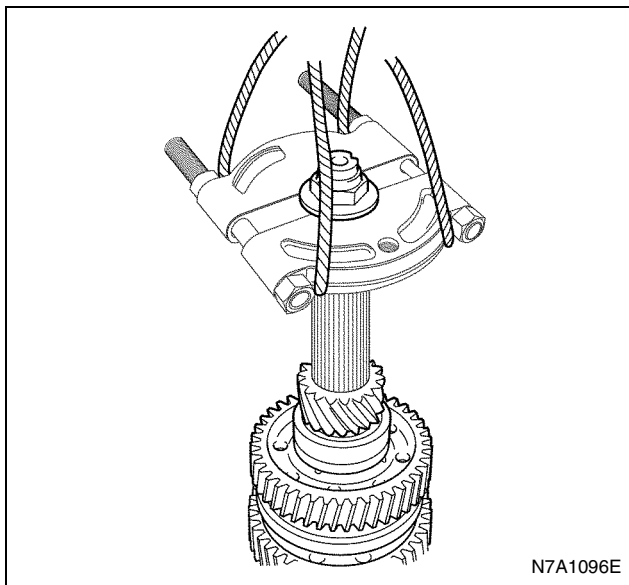
34. Remove the bush from the 4th-5th shift arm using the remover 5-8840-2755-0.
35. Remove the bush from the 1st-reverse shift arm using the remover 5-8840-2755-0.
36. Remove the bush from the 3rd-2nd shift arm using the remover 5-8840-2755-0.
- Use a round pole whose length is enough to push the remover to the end.



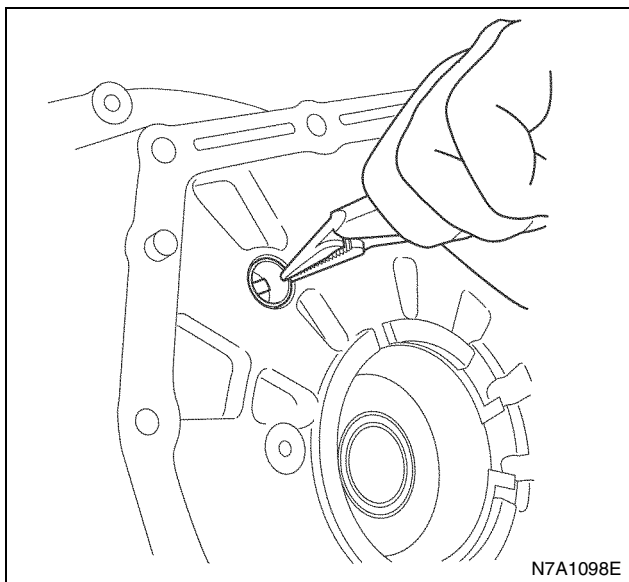
37. Remove the magnet from the clutch housing.
38. Remove the main shaft assembly, the top gear shaft assembly and the counter shaft assembly.
- a. Tie the main shaft assembly, the counter shaft assembly and the top gear shaft assembly at the two positions not to let them come apart using a lashing belt or other belts with a fixing function, and then fix them securely.



- b. Install the bearing remover to the main shaft and secure it with a lock nut, hang them with a hoist and a wire, and then remove the top gear shaft assembly, the main shaft assembly, the counter shaft assembly from the clutch housing as a unit while spreading the top gear shaft bearing outer snap ring installed to the clutch housing.

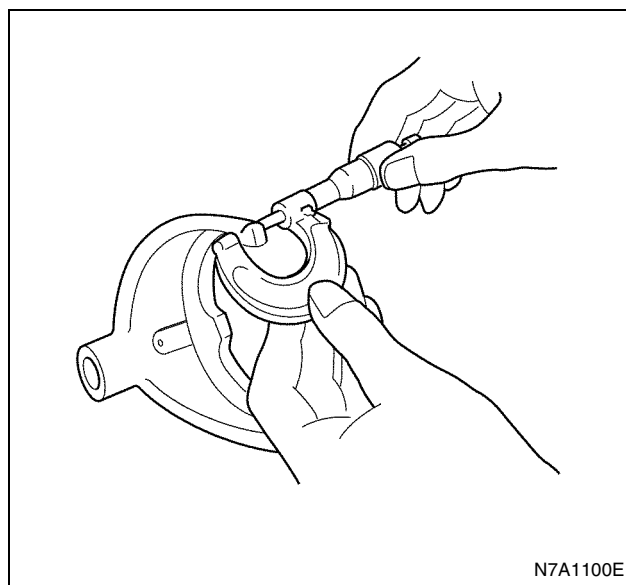


39. Check the clutch housing bush, and then remove it from the clutch housing using a pliers if it is worn or damaged.

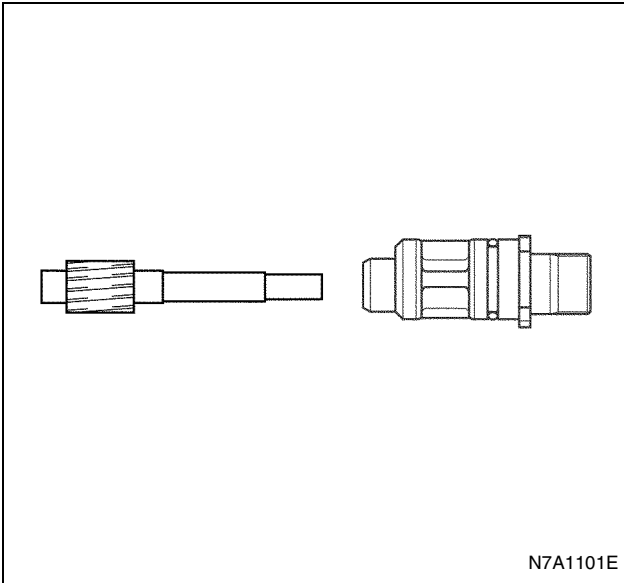


40. Check the front oil seal, and then remove it from the clutch housing using a flat-tip screwdriver if it is worn or damaged.
Check each part, and then correct and replace it if some worn, damaged or faulty parts are found.
41. Check each part of the shift mechanism, and then correct light damage, deflection or stepped wear. Replace it when it is heavily damaged or its usage limit is over.
- Deflection, wear and damage of the shift rod and the shift arm
 - Shift arm thickness
 - Measure the thickness of the shift arm tip using the micrometer.

Shift arm thickness, mm (in)		
	Standard	Limit
1st-reverse 3rd-2nd 5th-4th	9.60 — 9.85 (0.378 — 0.387)	9.0 (0.354)
6th	9.60 — 9.85 (0.378 — 0.387)	9.3 (0.366)



42. Check whether the speedometer driven gear and the driven gear bush are worn.
- Replace them if they are worn heavily.



43. Measure the clearance between the insert and the block ring groove.

- Measure the clearance using a caliper.
- Replace the insert and the block ring if their measured values are out of the limit.

Clearance between insert and block ring, mm (in)	
	Standard
6th	3.46 — 3.76 (0.136 — 0.148)

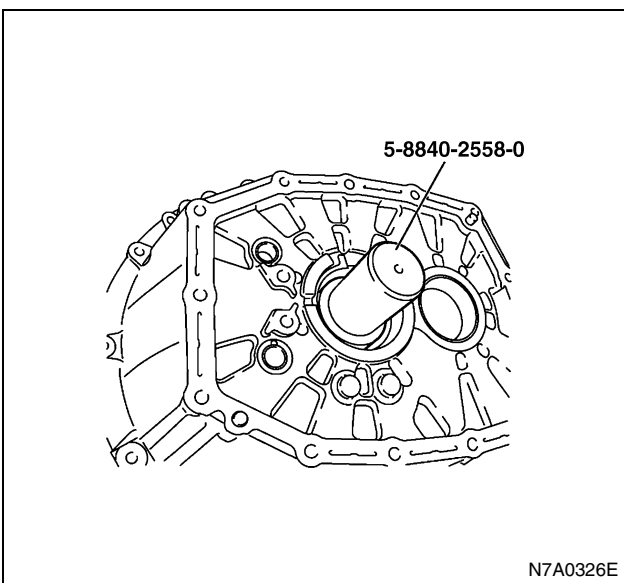
Assembly

1. When finding the oil seal worn and damaged after the check and replacing it with a new one, apply engine oil 5W-30 around the oil seal, and then press in the oil seal into the clutch housing using the installer 5-8840-2558-0.

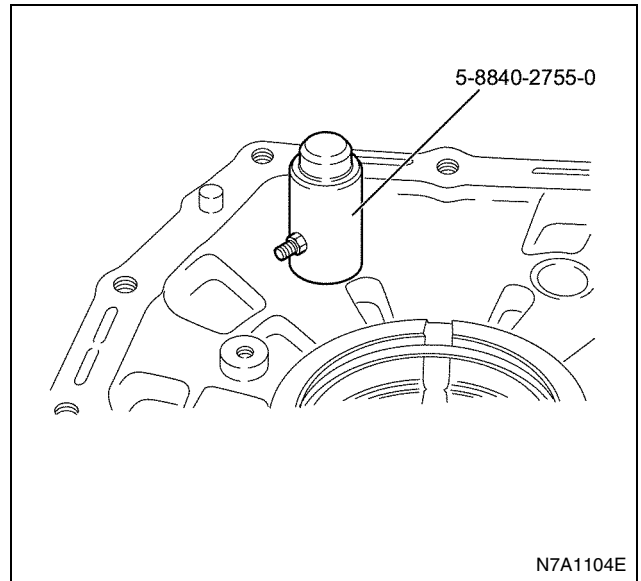
- Apply Besco L2 grease on the oil seal lip portion.

Caution:

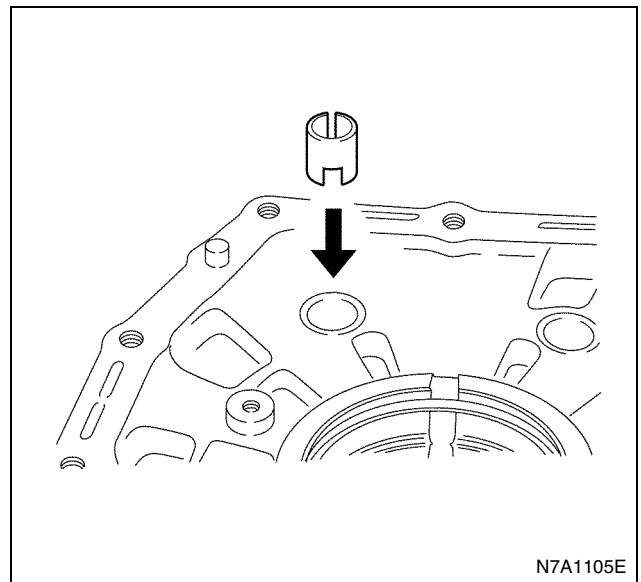
Be careful not to damage the oil seal lip portion.



2. When the clutch housing bush is replaced with a new one after checking it for wear and damage, press it in using the installer 5-8840-2755-0.

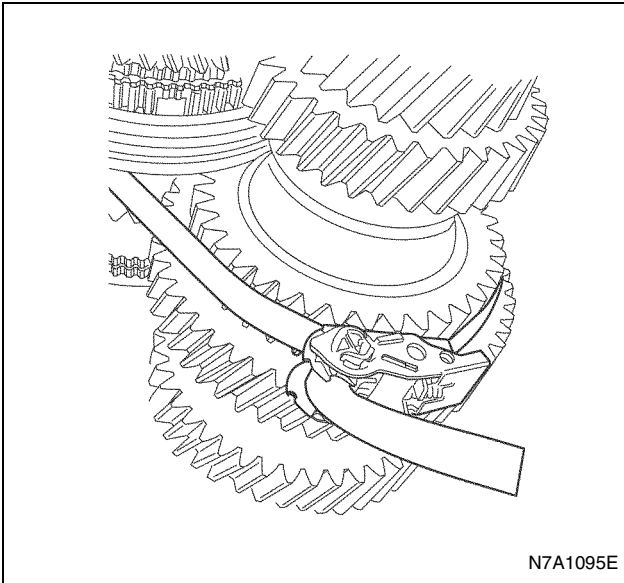


- During installation, the direction of the bush and the position of the caulking should be set as indicated in the figure.
- For the bush pressing in for the second time and onwards, press in the bush facing its notched portion to the clutch housing.

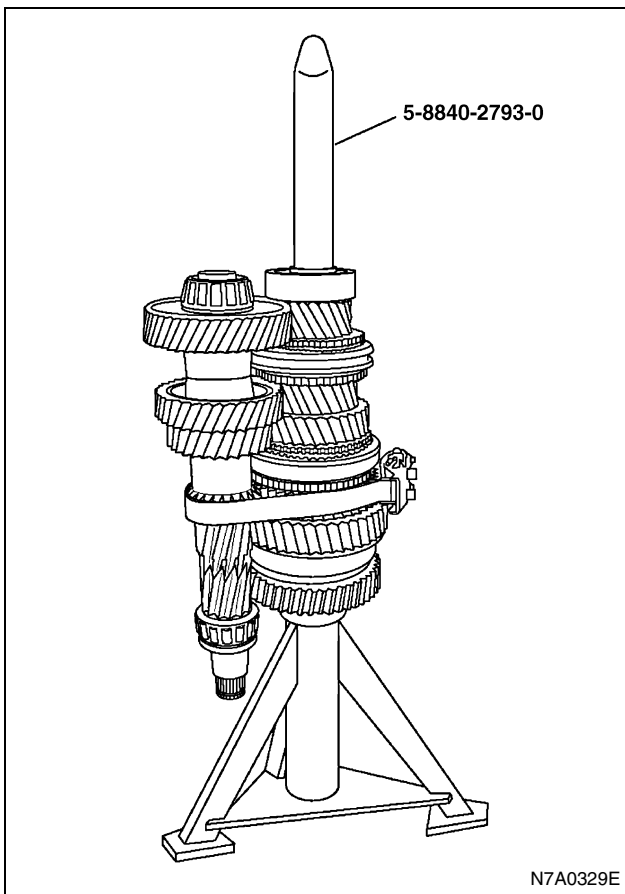


3. Install the main shaft assembly, the top gear shaft assembly and the counter shaft assembly.

- Tie the main shaft assembly, the counter shaft assembly and the top gear shaft assembly at the two positions not to let them come apart using a lashing belt or other belts with a fixing function, and then fix them securely. Be careful not to drop the top gear shaft while lifting up.



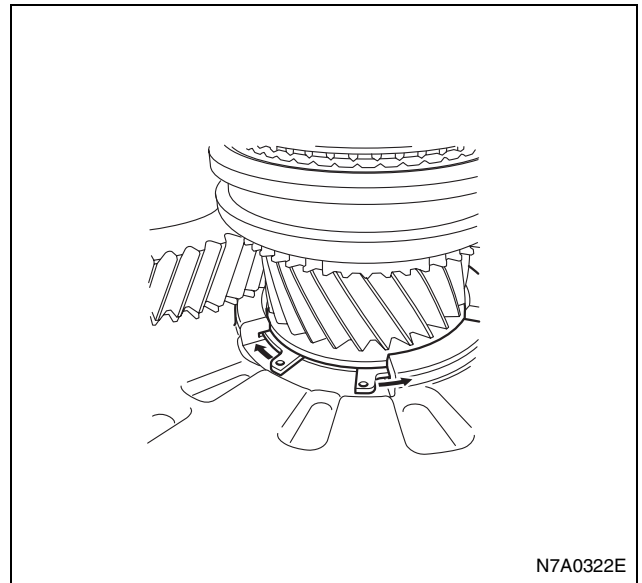
- b. Stick up the three of the top gear shaft assembly, the main gear shaft assembly and the counter shaft assembly on the support stand as the top gear shaft assembly is put on the top.
- c. Install the oil seal protector 5-8840-2793-0 to the main shaft.



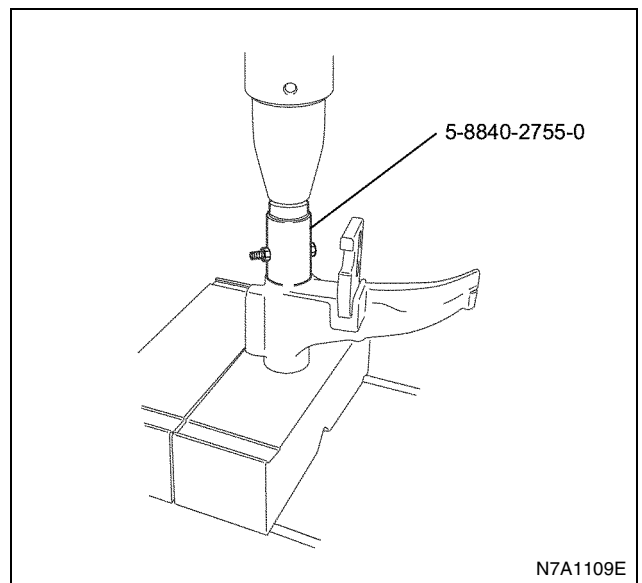
- d. Set the top gear shaft bearing outer snap ring to the clutch housing, spread it using a snap ring pliers, and then insert it to the clutch housing after aligning the top gear shaft, the counter shaft and the shift rod positions.

Caution:

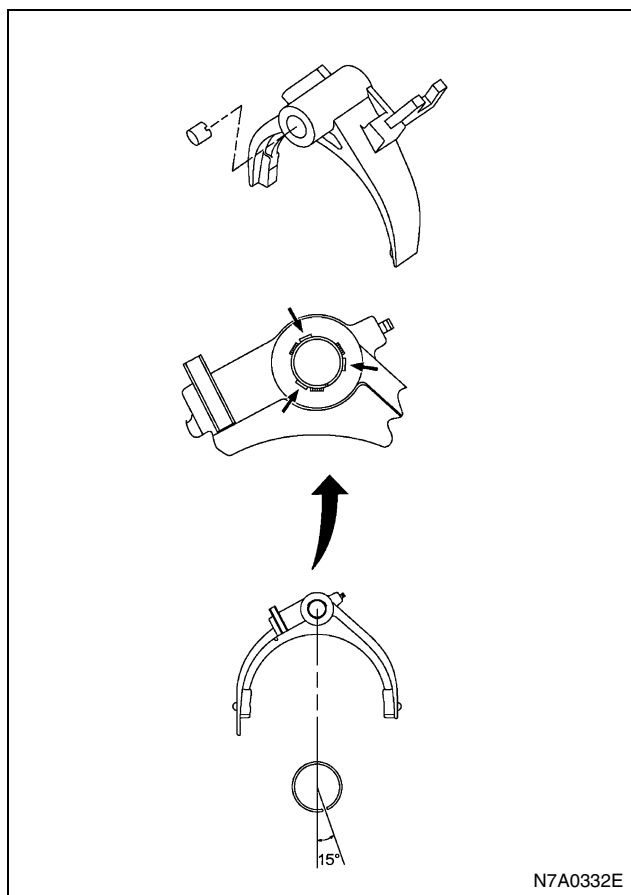
- Make sure the snap ring is installed securely.
- Work carefully not to damage the front oil seal.



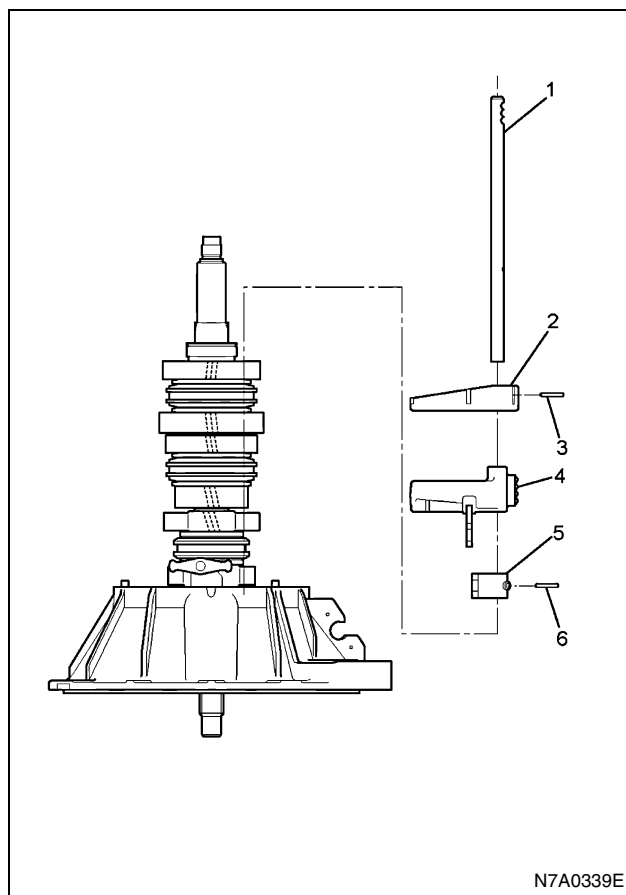
4. Install the magnet to the clutch housing.
5. When replacing the 3rd-2nd shift arm bush with a new one after checking it for wear or damage, press in the bush using the installer 5-8840-2755-0.
6. When replacing the 4th-5th shift arm bush with a new one after checking it for wear or damage, press in the bush using the installer 5-8840-2755-0.
7. When replacing the 4th-5th shift arm bush with a new one after checking it for wear or damage, press in the bush using the installer 5-8840-2755-0.



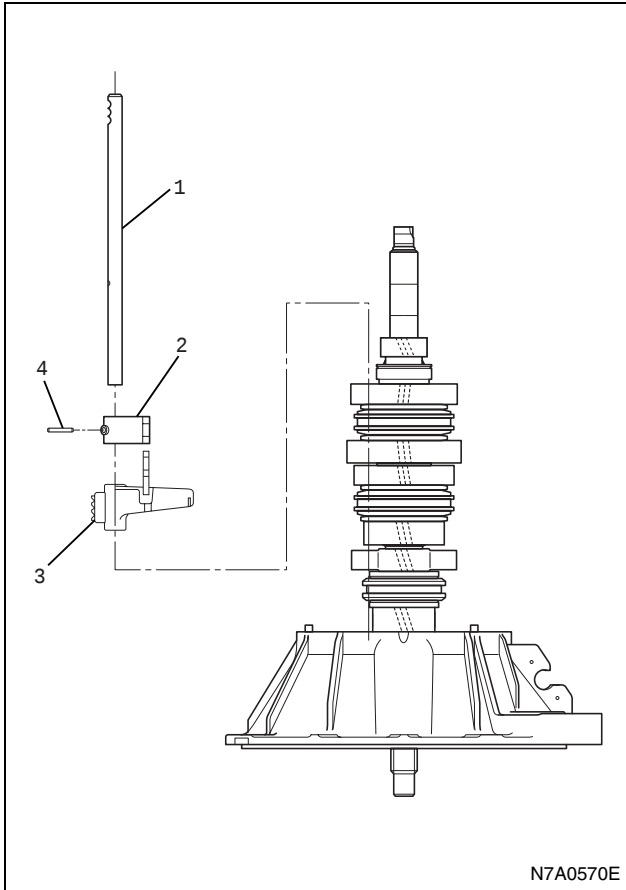
- Press it in taking care of the direction and angle of the shift arm bush, and then caulk the three portions except the bush cut and older caulking portions.



8. Install the 1st-reverse and 2nd-3rd shift rod (1) to the 1st-reverse and 6th shift block (5), the 2nd-3rd shift arm (4), the 1st-reverse shift arm (2).
 - Drive in the spring pin (3) and (6) using a hammer after aligning the spring pin hole.
 - When pressing in the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then press in the spring pin.



9. Install the 4th-5th and 6th shift rod (1) to the 4th-5th shift arm (3), 1st-reverse and 6th shift block (2).
 - Drive in the spring pin (4) using a hammer after aligning the spring pin hole.
 - When pressing in the spring pin, put a round pole on the opposite side of the shift rod not to damage other parts, and then press in the spring pin.

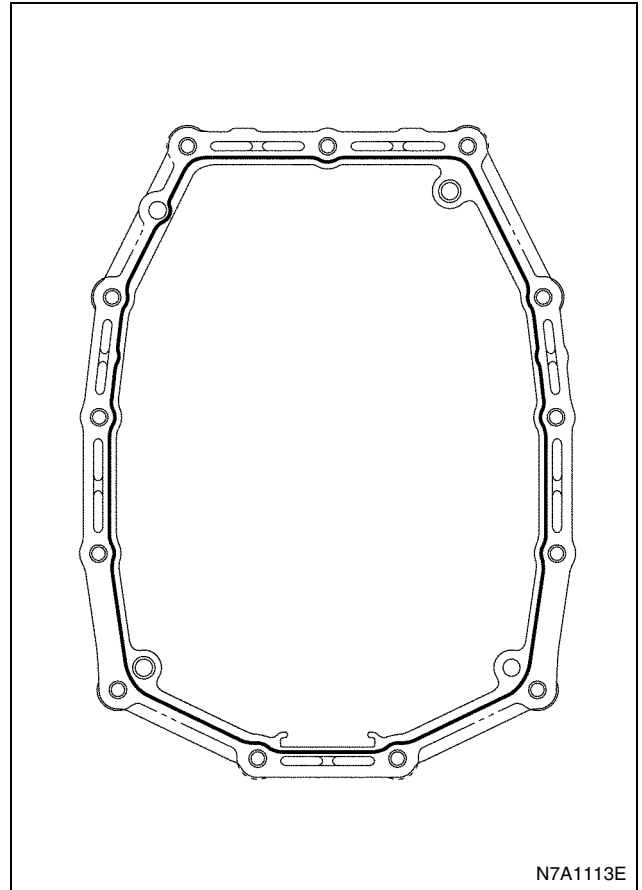


10. Apply ThreeBond 1215 to the mating surface of the transmission case and the clutch housing, and then install the clutch housing.

- Wipe off moisture and lubricant from the mating surface, and then apply the gasket continuously with a diameter of 2 mm (0.079 in) or more.

Tighten:

Clutch housing to 46 N·m (4.7 kg·m / 34 lb·ft)

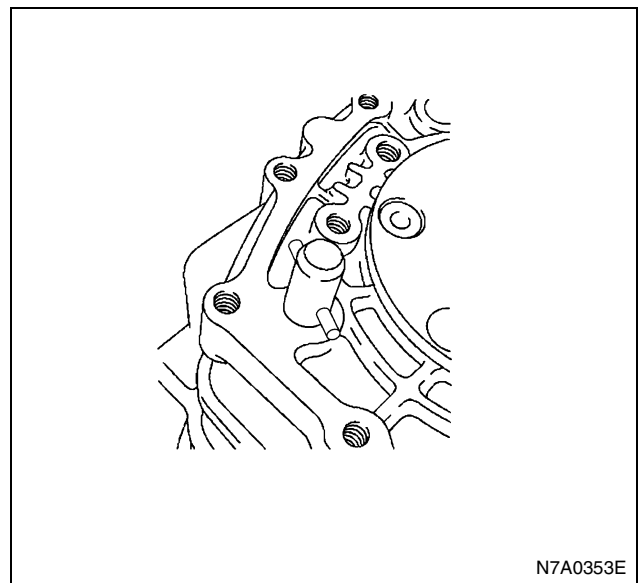


11. Install the bearing rear outer race to the transmission case.

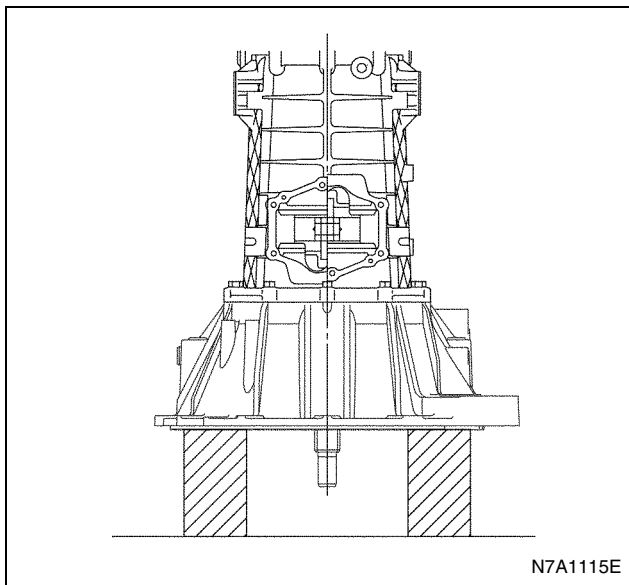
12. Install the spring pin; 4th-5th and 6th shift rod.

Caution:

When the snap ring is deformed or damaged, replace it with a new one, and make sure it is completely installed.



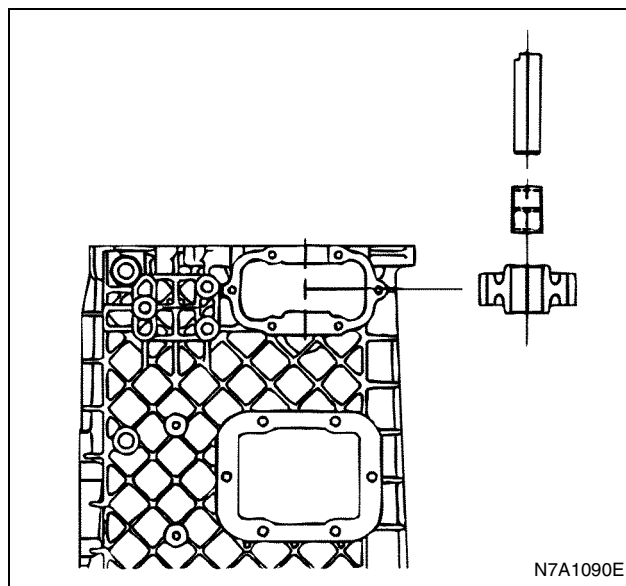
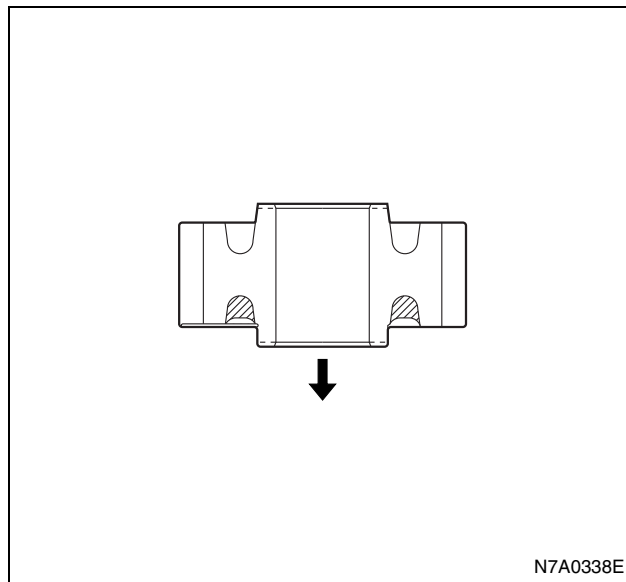
13. Install the shim to the counter shaft rear bearing.
- Shift the position to the neutral.
 - Set the transmission assembly with the clutch housing faced down.



- c. Revolve the counter shaft more than 30 times and smooth the taper roller bearing.
- d. Select the counter shim.
 - Measure the depth at the points equally divided into three from the end surface of the transmission case to the outer ring edge surface of the counter shaft rear bearing, and then take an average of them.
 - Select the shim whose thickness agrees with the list below.

Measured value, mm (in)	Thickness of applicable shim
more than — less than	
3.34 — 3.40 (0.132 — 0.133)	3.19 (0.125)
3.28 — 3.34 (0.130 — 0.131)	3.13 (0.123)
3.22 — 3.28 (0.127 — 0.129)	3.70 (0.120)
3.16 — 3.22 (0.125 — 0.126)	3.01 (0.118)
3.10 — 3.16 (0.122 — 0.124)	2.95 (0.116)
3.04 — 3.10 (0.120 — 0.122)	2.89 (0.113)
2.98 — 3.04 (0.118 — 0.119)	2.83 (0.111)
2.92 — 2.98 (0.115 — 0.117)	2.77 (0.109)
2.86 — 2.92 (0.113 — 0.114)	2.71 (0.106)
2.80 — 2.86 (0.110 — 0.112)	2.65 (0.104)
2.74 — 2.80 (0.108 — 0.110)	2.59 (0.101)
2.68 — 2.74 (0.106 — 0.107)	2.53 (0.099)
2.62 — 2.68 (0.104 — 0.105)	2.47 (0.097)
2.56 — 2.62 (0.101 — 0.103)	2.41 (0.094)
2.50 — 2.56 (0.099 — 0.100)	2.35 (0.092)
2.44 — 2.50 (0.096 — 0.098)	2.29 (0.090)
2.38 — 2.44 (0.094 — 0.096)	2.23 (0.087)
2.32 — 2.38 (0.092 — 0.093)	2.17 (0.085)
2.26 — 2.32 (0.089 — 0.091)	2.11 (0.083)

14. Install the snap ring to the main shaft rear bearing.
15. Apply engine oil 5W-30 to the needle bearing, install the reverse idle gear and needle bearing, and then insert the reverse idle shaft.
 - The arrow mark shows the direction of the transmission front side.



16. Install the retainer to the transmission case.

Tighten:

Retainer to 26 N·m (2.7 kg·m / 19 lb·ft)

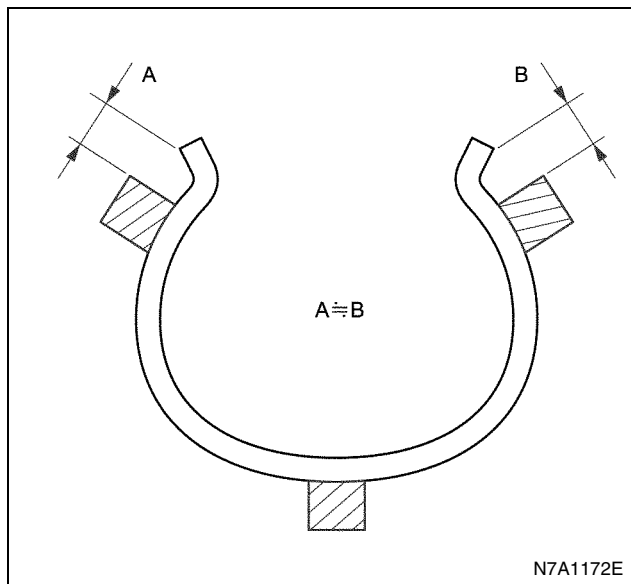
Caution:

Clean up the sealing agent on the screw thread of the transmission case and replace all screws with new ones.

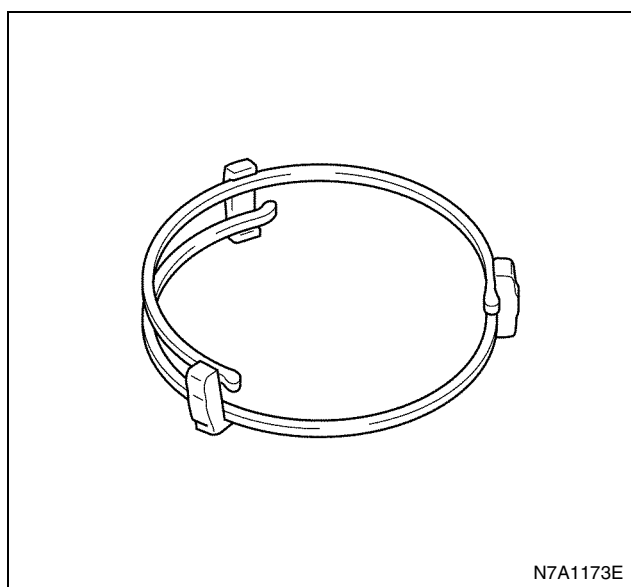
17. Install the collar and the speedometer gear.
18. Assemble the 6th clutch hub assembly (2) and the sleeve (1) following the procedure below.
 - a. Assemble the insert (3) securely to the block ring insert groove.
 - b. Install the insert spring (4) to the insert.

Caution:

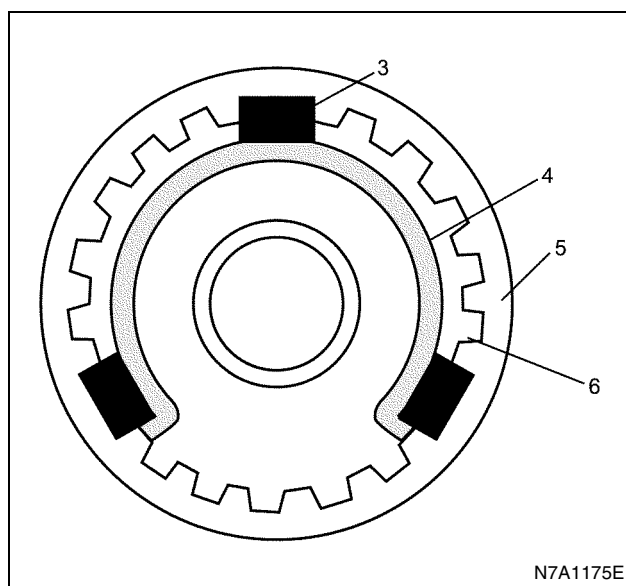
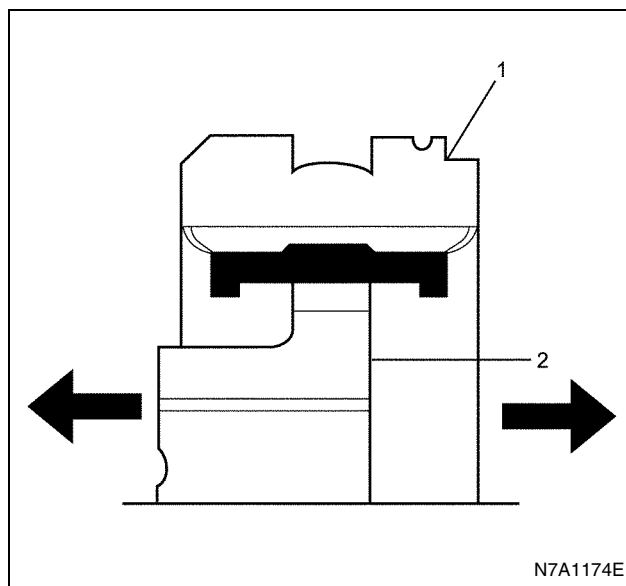
- When assembling the insert spring, equalize the length of the both edges of the spring not to adversely interfere with the inside diameter of the hub.



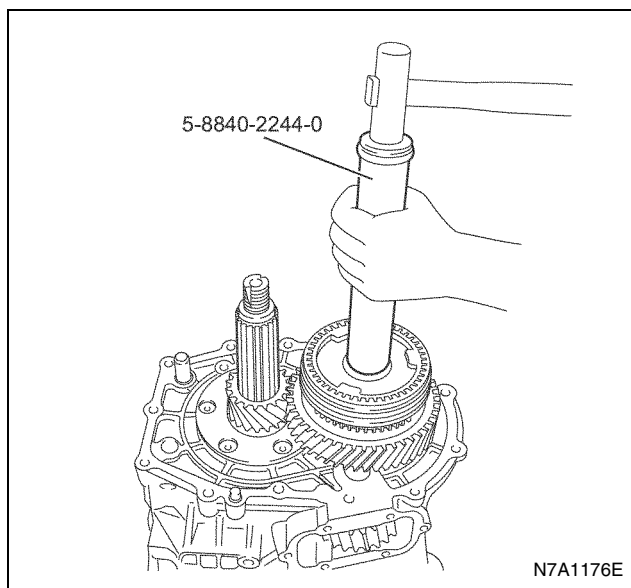
- Make sure that the open part of the insert spring assembled on the reverse side, is not aligned with the open part of the front side.



- c. Make sure the clutch hub (5) and the sleeve (6) slide smoothly.



- d. Install a new stopper plate to the clutch hub.
19. Apply engine oil 5W-30 to the needle bearing and the block ring bore, assemble the 6th gear, the needle bearing and the 6th block ring, align the aspect of the clutch hub block ring groove, assemble the 6th clutch hub assembly and the sleeve, and then press in them using the installer 5-8840-2244-0 and a hammer.



20. Using the snap ring pliers, install the snap ring and the 6th clutch hub.

- Select the thickest snap ring of the available three.

Thickness, mm (in)	Identification Color
1.7 (0.066)	White
1.8 (0.070)	No color
1.9 (0.074)	Blue

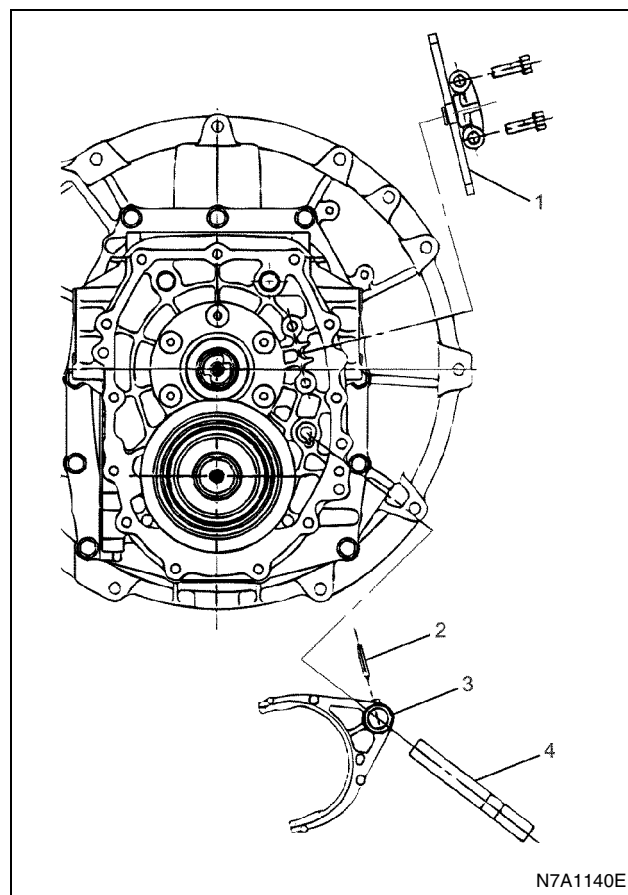
Caution:

When the snap ring is deformed or damaged on installation, replace it with a new one, and make sure it is completely installed.

21. Apply engine oil 5W-30 to the shift rod hole of the transmission case, install the 6th shift arm (3) and 6th shift rod (4), and then press in the spring pin (2) aligning its hole.
22. Install the 6th relay lever (1).

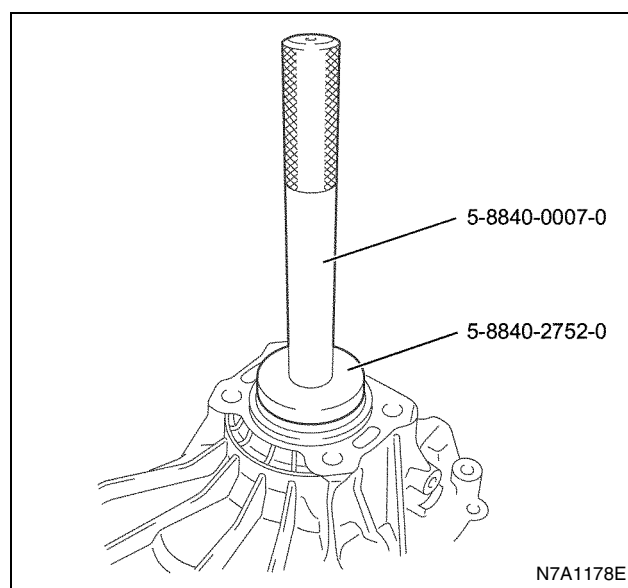
Tighten:

6th relay lever (1) to 44 N·m (4.5 kg·m / 32 lb·ft)



23. Install the needle bearing; main end.

- Apply Besco L2 grease inside the needle bearing, and apply engine oil 5W-30 to the bearing connecting bore of the rear cover.
- Press in the needle bearing to the rear cover from outside by turning the bearing stamped surface out and using the installer 5-8840-2752-0 and the grip 5-8840-0007-0.



24. When replacing the rear cover oil seal with a new one after checking for wear and damage or when replacing the needle bearing, apply engine oil 5W-

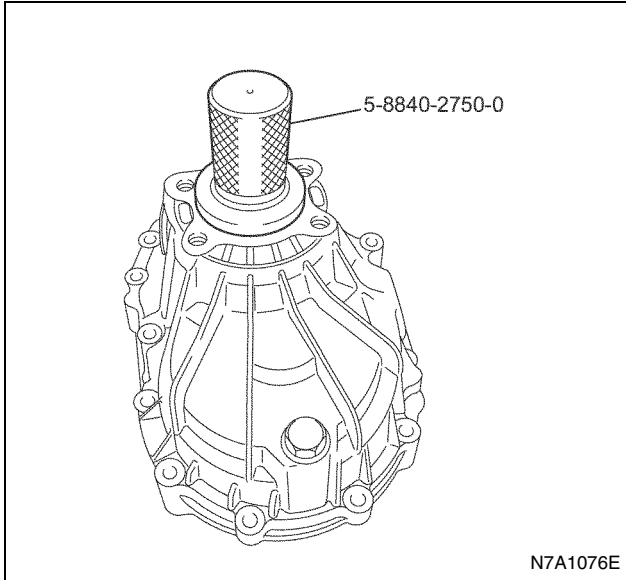
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30 around the oil seal, and then press in the oil seal to the rear cover using the installer 5-8840-2750-0.

- Apply Besco L2 grease to the lip portion of the oil seal.

Caution:

Be careful not to damage the oil seal lip portion.

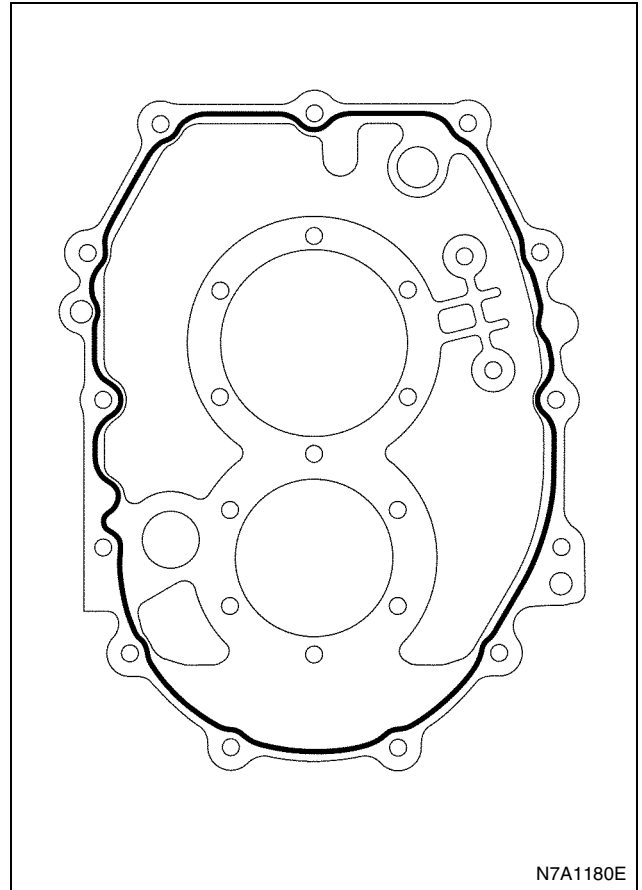


25. Apply ThreeBond 1215 to the mating surface of the transmission case rear cover, and then install the rear cover.

- Wipe off moisture and lubricant from the connecting surface. And then apply the bond continuously with a diameter of 2 mm (0.079 in).

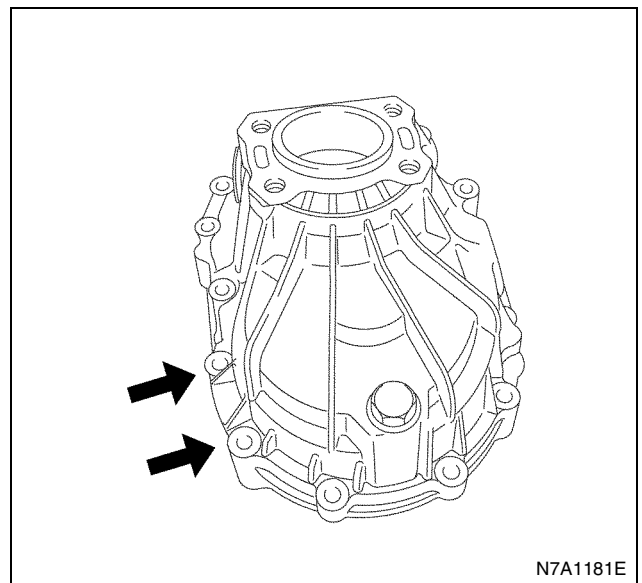
Tighten:

Rear cover to 46 N·m (4.7 kg·m / 34 lb·ft)



Caution:

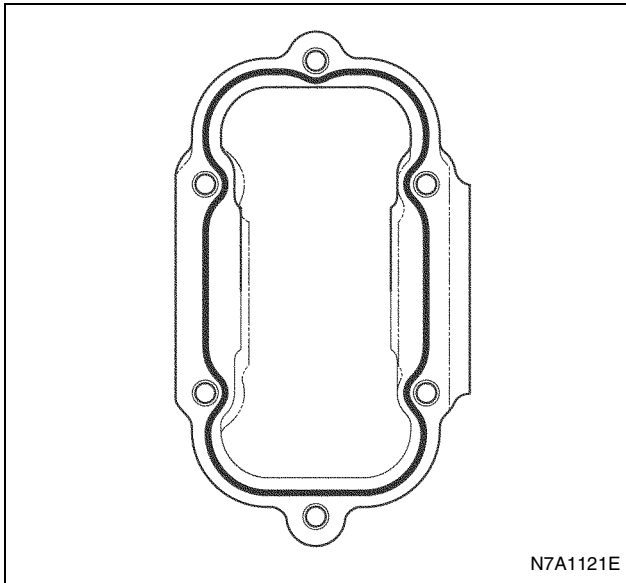
Since the two bolts with arrow marks are installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use new bolts with LOCTITE sealing agent.



26. Apply ThreeBond 1215 to the mating surface of the transmission case reverse idle cover, and then install the reverse idle cover.
- Wipe off moisture and lubricant from the mating surface. And then apply the bond continuously with a diameter of 2 mm (0.079 in) or more.

Tighten:

Reverse idle cover to 20 N·m (2.0 kg·m / 15 lb·ft)



27. Apply ThreeBond 1215 to the mating surface of the transmission case PTO cover, and then install the PTO cover.

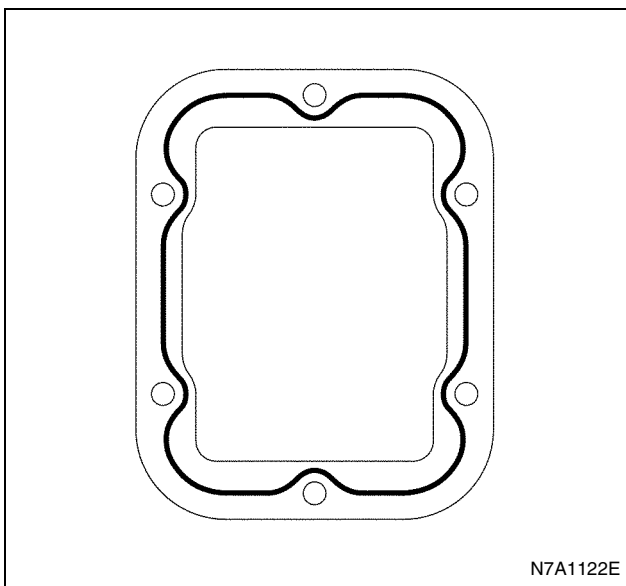
- Wipe off moisture and lubricant from the connecting surface before applying it as a more than 2 mm (0.079 in) diameter solid line.

Tighten:

PTO cover to 37 N·m (3.8 kg·m / 27 lb·ft)

Caution:

Since the bolt is installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use a new bolt with LOCTITE sealing agent.



28. Shift the position to the neutral, apply ThreeBond 1215 to the mating surface of the transmission case control box, and then install the interlock plate (8) and the control box (1).

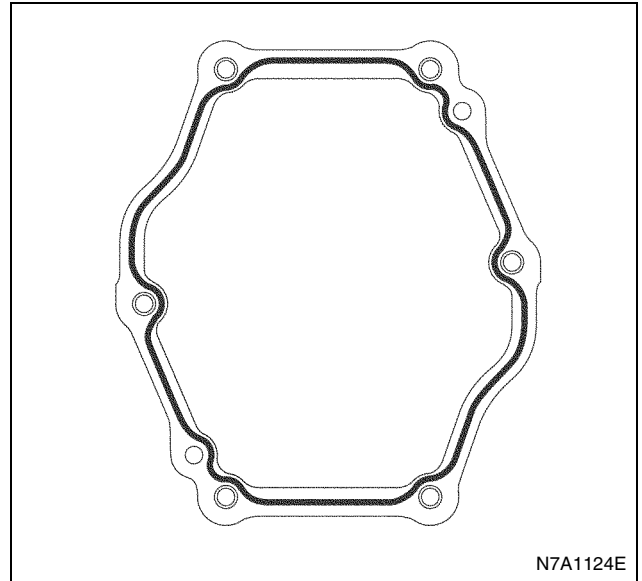
Tighten:

Control box (1) to 27 N·m (2.8 kg·m / 20 lb·ft)

- Wipe off moisture and lubricant from the mating surface. And then apply the bond continuously with a diameter of 2 mm (0.079 in) or more.

Caution:

Since the bolt is installed with LOCTITE sealing agent, clean up the sealing agent remaining on the screw thread of the transmission case, and then use a new bolt with LOCTITE sealing agent.



29. Install the detent assembly (7) (6) (5) (4) after cleaning up the sealing on the thread and applying the LOCTITE 242.

Tighten:

Detent assembly (7) (6) (5) (4) to 27 N·m (2.8 kg·m / 20 lb·ft)

30. Apply LOCTITE 242 to the reverse switch thread portion, and then install the reverse switch (3).

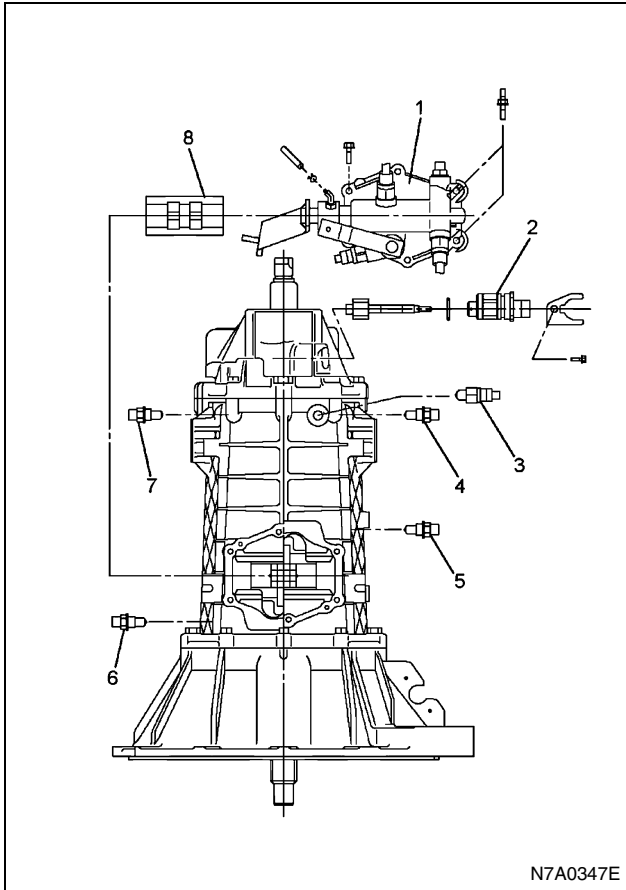
Tighten:

Reverse switch (3) to 39 N·m (4.0 kg·m / 29 lb·ft)

31. Apply engine oil 5W-30 to the speedometer driven gear and the O-ring, and then install the speedometer driven gear (2).

Tighten:

Speedometer driven gear (2) to 20 N·m (2.0 kg·m / 15 lb·ft)



32. Apply engine oil 5W-30 to the O-ring, and then install the drain plug and the O-ring.

Tighten:

Drain plug to 39 N·m (4.0 kg·m / 29 lb·ft)

33. Apply engine oil 5W-30 to the O-ring, and then install the filler plug and the O-ring.

Tighten:

Filler plug to 39 N·m (4.0 kg·m / 29 lb·ft)

34. Install the parking brake assembly.

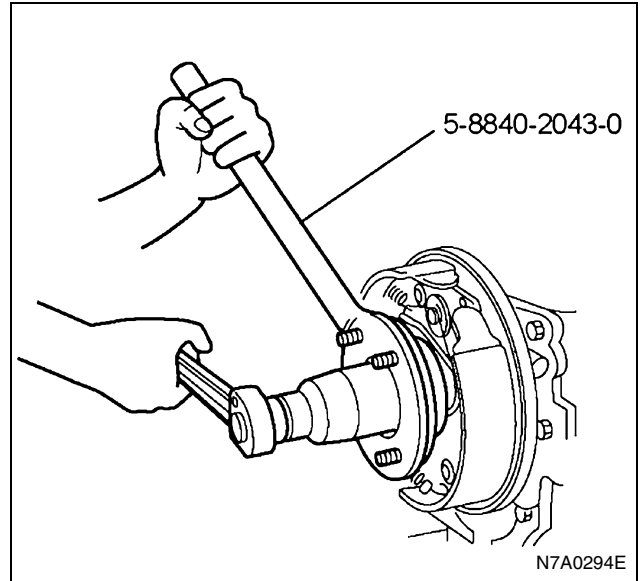
- Refer to PARKING BRAKE ASSEMBLY.

35. Apply engine oil 5W-30 to the O-ring, and then install the coupling driver and the O-ring.

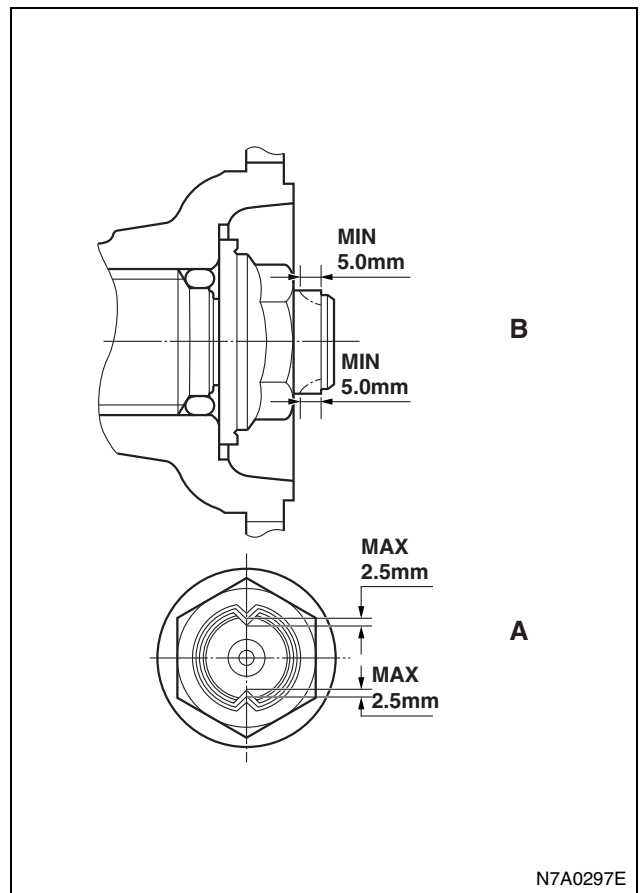
36. Use a new lock nut, apply engine oil 5W-30 to the seat, and then fix the lock nut using the flange holder 5-8840-2043-0.

Tighten:

Lock nut to 289 N·m (29.5 kg·m / 213 lb·ft)



- After fixing it to the specified torque, align the lip part of the nut to the V-groove of the shaft edge. Securely caulk the two parts of the nut lip using a chisel whose tip form is approx. 1 mm (0.04 in) radius by 60°, to make a length (B) of 5 mm (0.2 in) or more, and a clearance between the bottom of the shaft and the nut lip (A) of 2.5 mm (0.06 in) or less.



37. Install the parking brake drum and adjust hole cover fixing bolt.

- Refer to PARKING BRAKE ASSEMBLY.

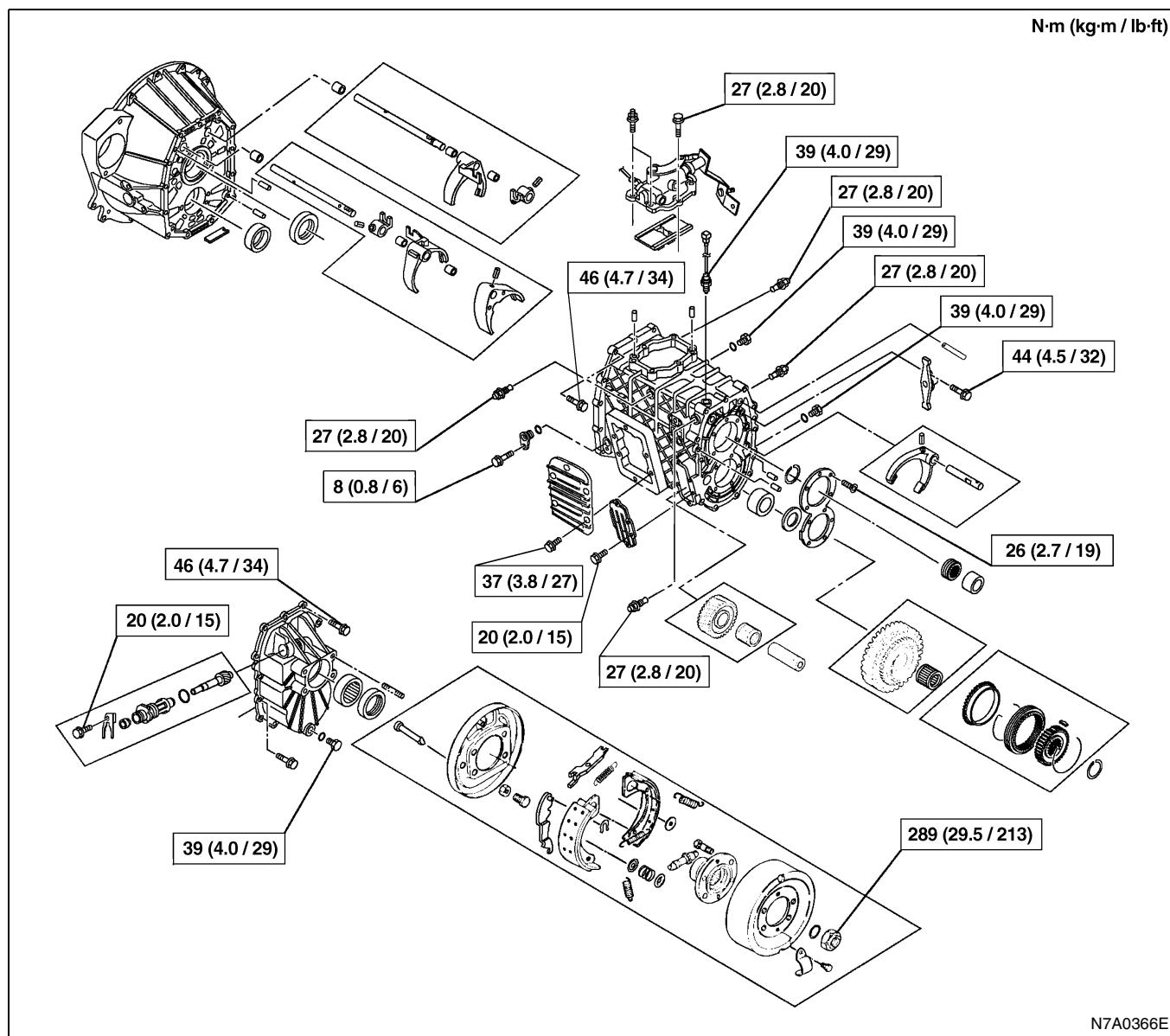
38. Install the shift fork and the support bolt.

- Refer to CLUTCH.

39. Install the shift block assembly.

- Refer to CLUTCH.

Fixing Torque



Special Tools

Illustration	Tool Number / Description / Remarks
	5-8840-0007-0 / Grip
5884000070	

Illustration	Tool Number / Description / Remarks
	5-8840-0084-0 / Sliding Hammer
58840000840	

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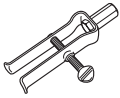
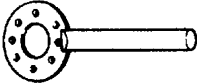
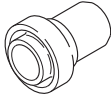
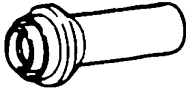
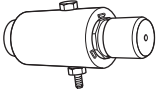
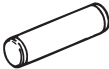
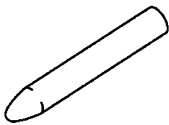
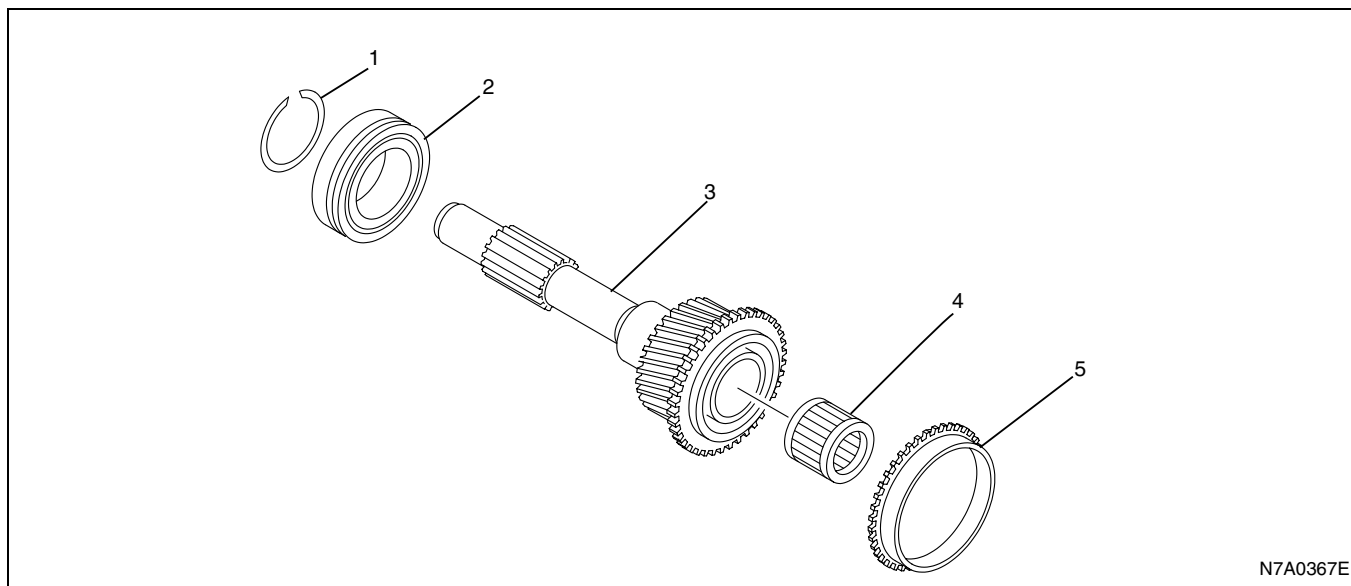
Illustration	Tool Number / Description / Remarks
 5884000270	5-8840-0027-0 / Bearing Remover
 5884020430	5-8840-2043-0 / Flange Holder
 5884025580	5-8840-2558-0 / Oil Seal Installer
 5884027500	5-8840-2750-0 / Oil Seal Installer
 5884027520	5-8840-2752-0 / Bearing Installer
 5884027550	5-8840-2755-0 / Bush Remover & Installer
 5884022440	5-8840-2244-0 / Bearing Installer

Illustration	Tool Number / Description / Remarks
 5884027930	5-8840-2793-0 / Oil Seal Protector

Top Gear Shaft Components



N7A0367E

Legend

- | | |
|-------------------|-------------------|
| 1. Snap ring | 4. Needle bearing |
| 2. Bearing | 5. Block ring |
| 3. Top gear shaft | |

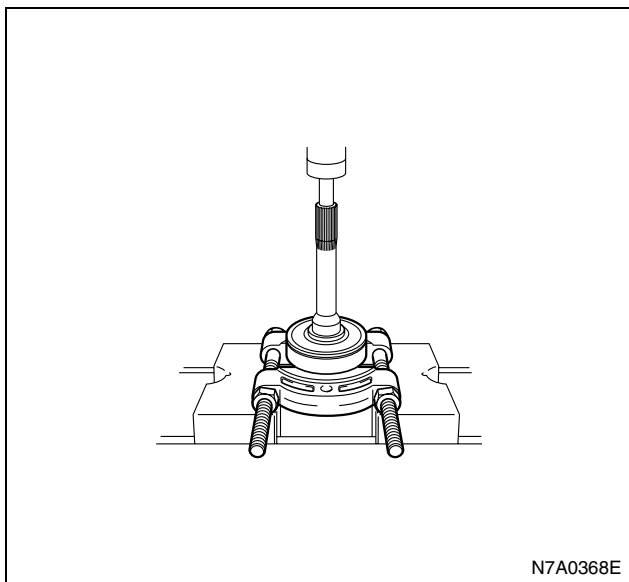
Disassembly

1. Remove the block ring from the top gear shaft.
2. Remove the needle bearing from the top gear shaft.

Caution:

As the needle bearing is of separation type, make sure not to drop and damage the roller.

3. Remove the snap ring using snap ring pliers.
4. Remove the bearing by a press using a bearing remover.



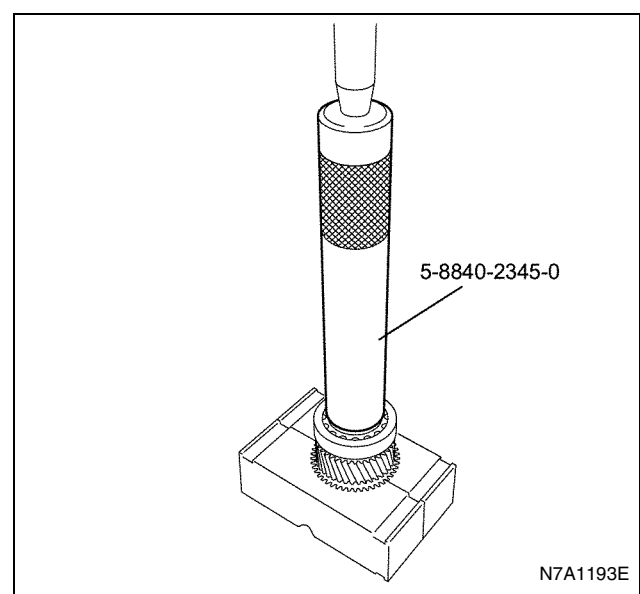
N7A0368E

Inspect each part. If any wear, damage or other abnormality is found, repair or replace the part.

5. Inspect the gear tooth, spline part and the sliding part of the top for damage and wear. If any abnormality is found, replace them with new ones.
6. Inspect each bearing regarding the following items. If any abnormality is found, replace it with a new one.
 - Smoothness of rotation
 - Noise
 - Abnormal external appearance, including damage, rust, etc.
 - Abnormal free play in thrust direction
 - Discoloration, excessive wear and pitching of the rolling body and surface of the needle bearing

Assembly

1. Press the bearing using the installer 5-8840-2345-0.



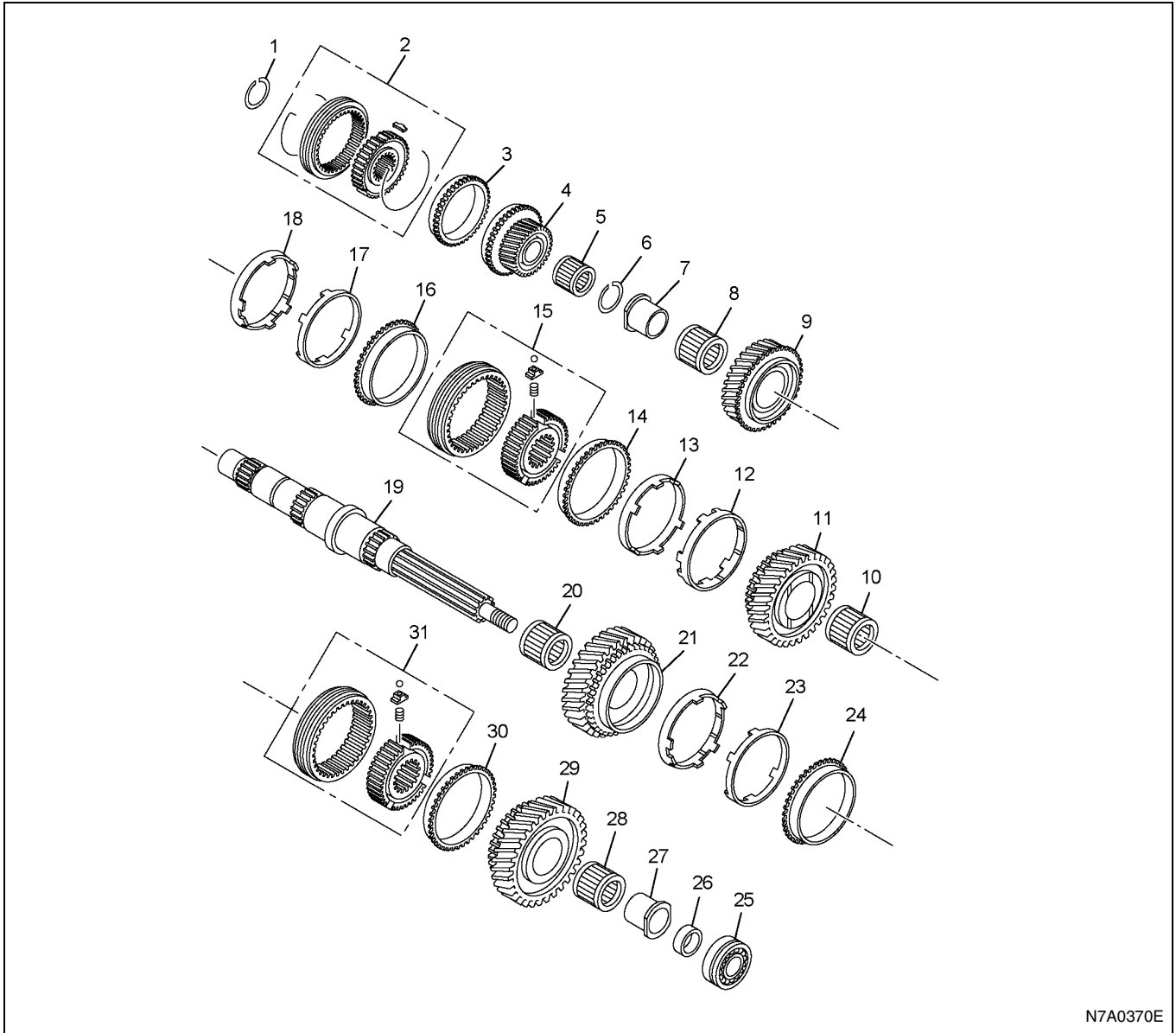
2. Install the snap ring using snap ring pliers.
3. Install the needle bearing to the top gear shaft.
4. Apply engine oil 5W-30 sufficiently to the internal surface of the block ring, and install the block ring to the top gear shaft.

Special Tools

Illustration	Tool Number / Description / Remarks
5884023450	5-8840-2345-0 / Clutch Hub & Collar Installer

Main Shaft (5MT)

Components

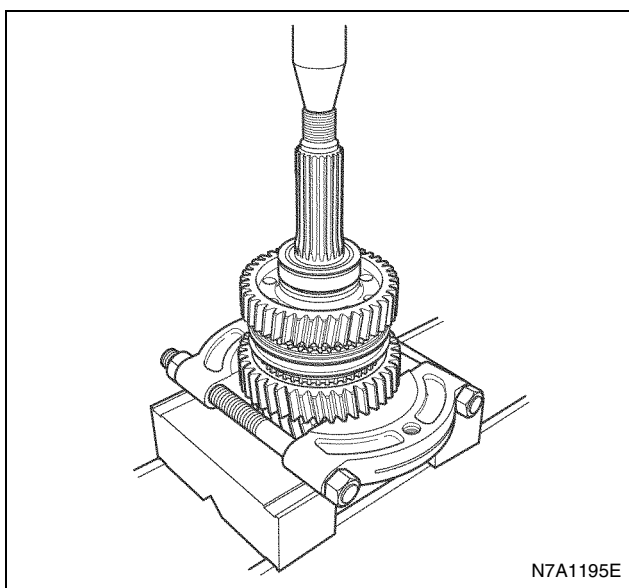


Legend

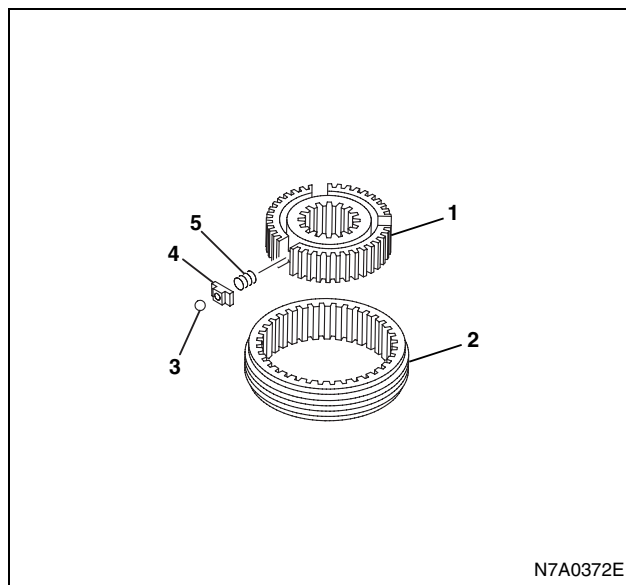
- | | |
|--|--|
| 1. Snap ring | 17. 3rd outside ring |
| 2. 4th-5th clutch hub assembly and sleeve | 18. 3rd inside ring |
| 3. 5th block ring | 19. Main shaft |
| 4. 5th gear | 20. Needle bearing |
| 5. Needle bearing | 21. 1st gear |
| 6. Snap ring | 22. 1st inside ring |
| 7. Collar | 23. 1st outside ring |
| 8. Needle bearing | 24. 1st block ring |
| 9. 3rd gear | 25. Bearing |
| 10. Needle bearing | 26. Spacer |
| 11. 2nd gear | 27. Collar |
| 12. 2nd inside ring | 28. Needle bearing |
| 13. 2nd outside ring | 29. Reverse gear |
| 14. 2nd block ring | 30. Reverse block ring |
| 15. 2nd-3rd clutch hub assembly and sleeve | 31. 1st-reverse clutch hub assembly & sleeve |
| 16. 3rd block ring | |

Disassembly

1. Remove simultaneously the following parts with a press using a bearing remover; the bearing, spacer, collar, reverse gear, needle bearing, reverse block ring, 1st-reverse clutch hub assembly & sleeve, 1st block ring, 1st outside ring, 1st inside ring, 1st gear, and needle bearing.

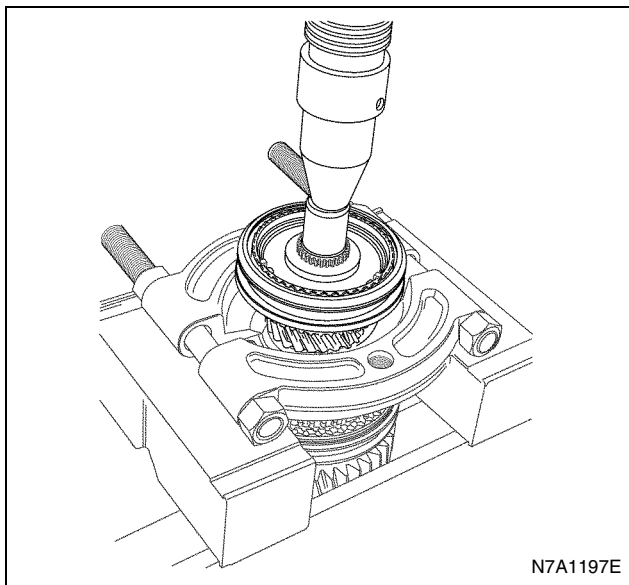


2. Disassemble the 1st-reverse clutch hub & sleeve.

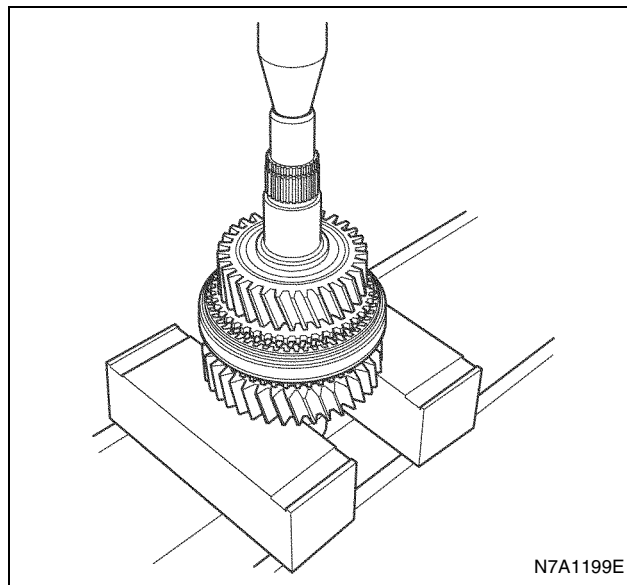


Legend

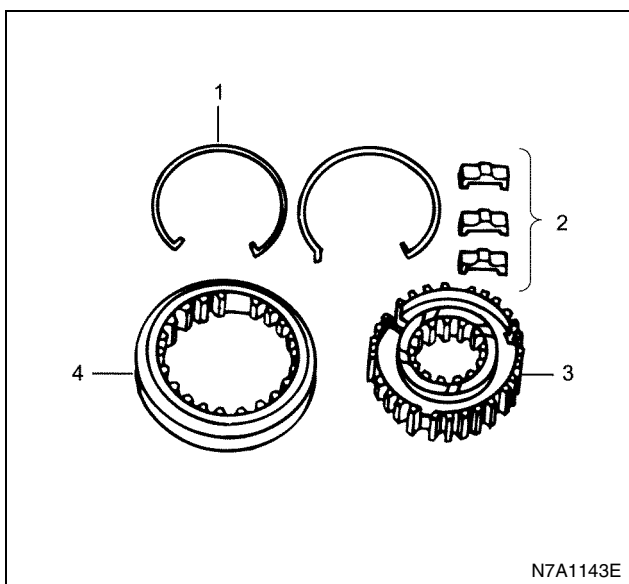
- | |
|---------------|
| 1. Clutch hub |
| 2. Sleeve |
| 3. Ball |
| 4. Block |
| 5. Spring |
3. Remove the 4th-5th clutch hub assembly fixing snap ring using snap ring pliers.
 4. Remove simultaneously the following parts with a press using a bearing remover; the 4th-5th clutch hub assembly & sleeve, 5th block ring, 5th gear, needle bearing.



5. Disassemble the 4th-5th clutch hub assembly & sleeve.



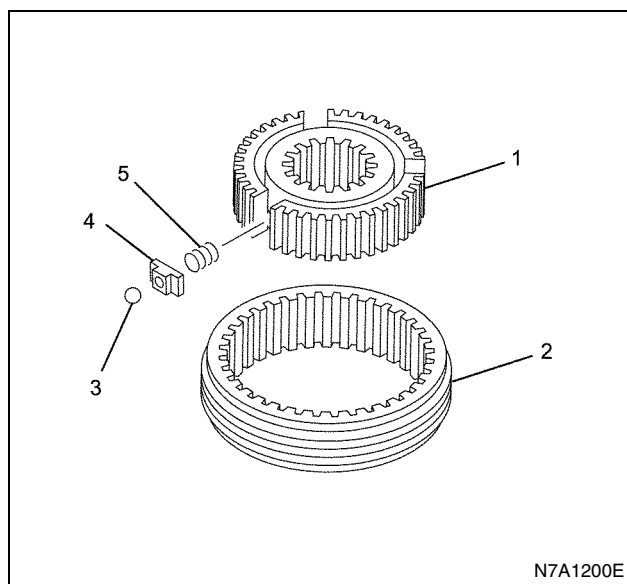
8. Disassemble the 2nd-3rd clutch hub assembly & sleeve.



Legend

1. Spring
2. Insert
3. Clutch hub
4. Sleeve

6. Remove the 3rd gear collar fixing snap ring using snap ring pliers.
7. Remove simultaneously from the main shaft the following parts with a press using a bearing remover; the collar, 3rd gear, needle bearing, 3rd inside ring, 3rd outside ring, 3rd block ring, 2nd-3rd clutch hub assembly & sleeve, 2nd block ring, 2nd outside ring, 2nd inside ring, 2nd gear, and needle bearing.



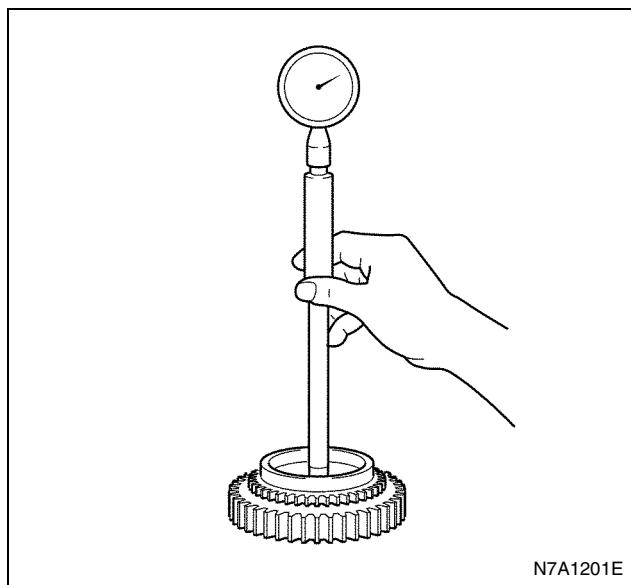
Legend

1. Clutch hub
2. Sleeve
3. Ball
4. Block
5. Spring

9. Inspect each bearing with respect to the following items, and if any abnormality is found, replace the part.
 - Smoothness of rotation
 - Noise
 - Abnormal external appearance, including damage, rust, etc.

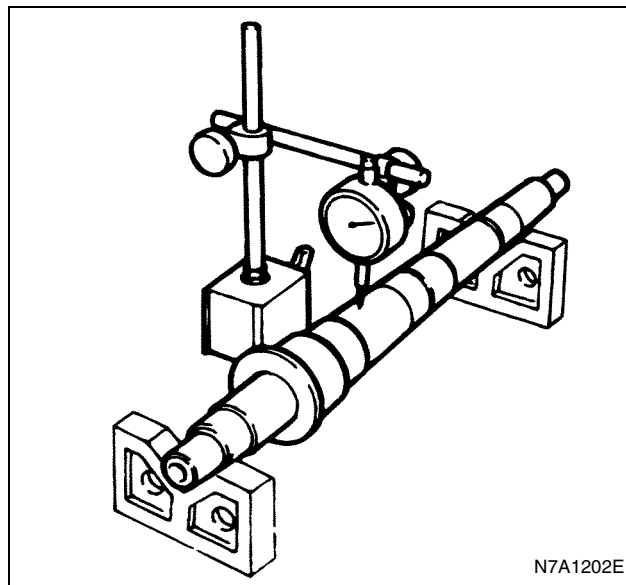
- Abnormal free play in thrust direction
10. Inspect the internal diameter of the gear.
- Measure the inside diameter of each gear using an inside dial gauge.
 - If the measured value exceeds the limit, replace the gear.

Gear Internal Diameter, mm (in)		
	Standard	Limit
5th gear	44.009 — 44.025 (1.732 — 1.733)	44.065 (1.734)
3rd gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
2nd gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
1st gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
Reverse Gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)



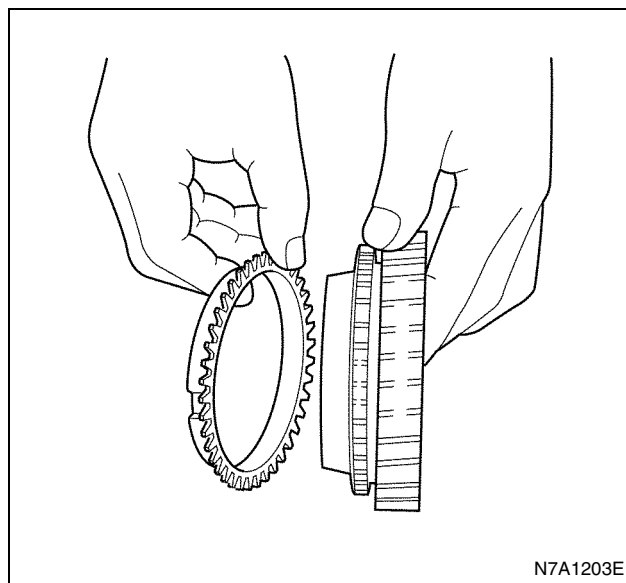
11. Main shaft deflection

- Measure the deflection of the main shaft using a dial gauge.
 - If the measured value exceeds the limit, replace the main shaft.
- Standard: 0.015 mm (0.000059 in)
Limit: 0.1 mm (0.00393 in)



12. Inspect the synchronesh system.

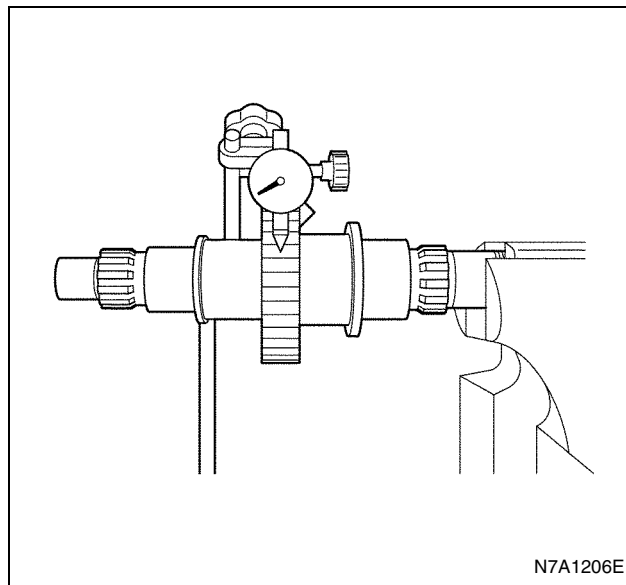
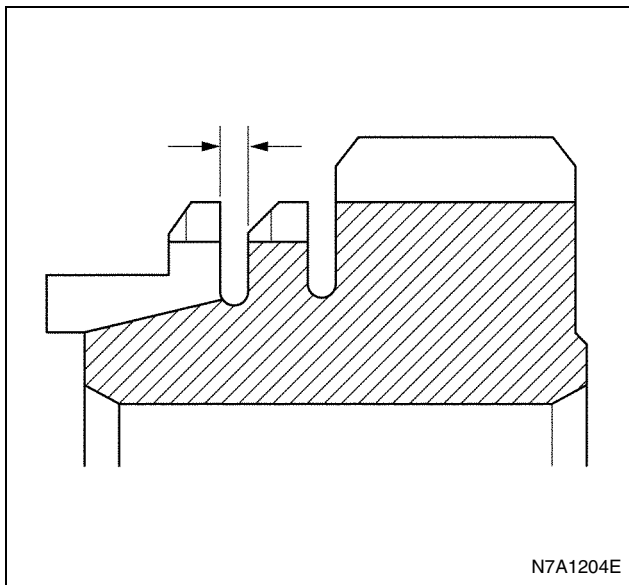
- Inspect the components, and repair light stepped wear and damage using an oil stone or a pencil grinder.



13. Clearance between block ring and dog gear

- Measure the clearance using a thickness gauge.
- If the measured value exceeds the limit, replace the block gear.

Clearance between Block Ring and Dog Gear, mm (in)		
	Standard	Limit
4th / 5th / Reverse	1.30 — 2.60 (0.051 — 0.102)	0.5 (0.019)
2nd / 3rd	1.00 — 2.50 (0.039 — 0.098)	0.5 (0.019)
1st	1.00 — 2.50 (0.039 — 0.098)	0.5 (0.019)

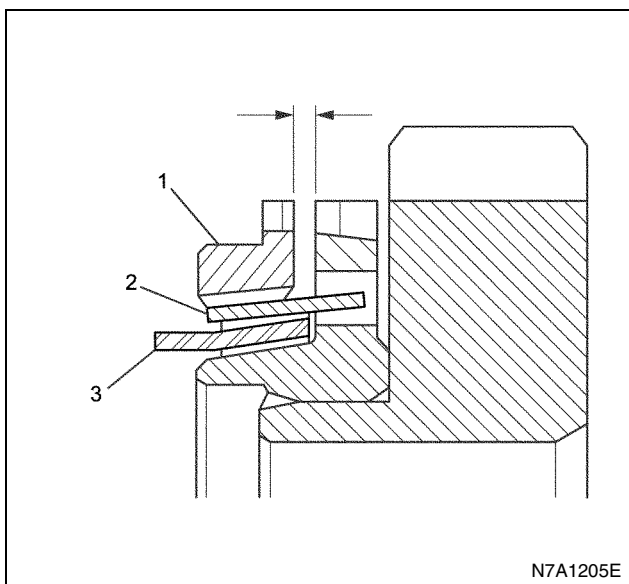


16. Measure the clearance between the insert and block ring groove using a caliper.

- If the measured value exceeds the limit, replace the insert and block ring.

Clearance between Insert and Block Ring Groove, mm (in)

	Standard
4th / 5th	3.46 — 3.76 (0.136 — 0.148)

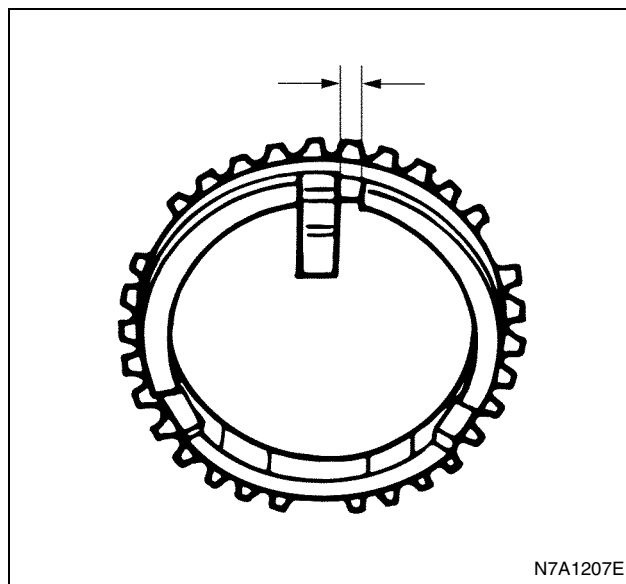


Legend

1. Block ring
2. Outside ring
3. Inside ring

14. Inspect the sliding part, spline part, inserting part and insert groove of the clutch hub and sliding sleeve for wear and damage.
15. Measure the free play in the direction of spline rotation on the clutch hub external circumference.
- If the measured value exceed the limit, replace the part.

Spline Free Play, mm (in)	
Standard	Limit
0 — 0.05 (0 — 0.0019)	0.3 (0.0118)

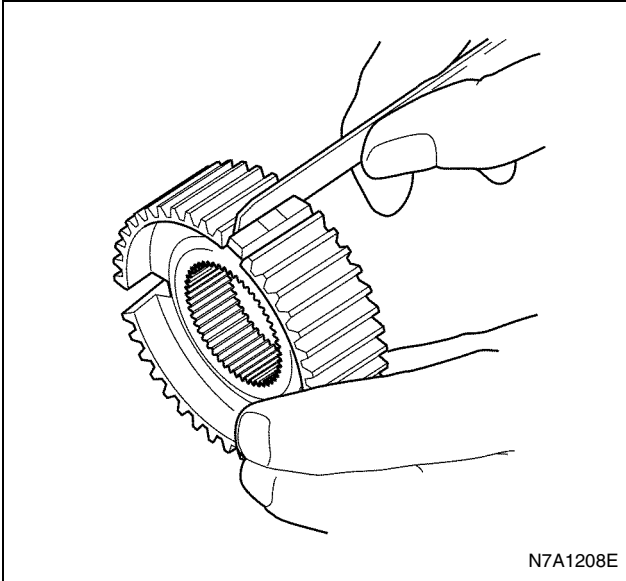


17. Measure the clearance between the insert and clutch hub using a thickness gauge.

- If the measured value exceeds the limit, replace the insert and clutch hub.

Clearance between Insert and Clutch Hub, mm (in)

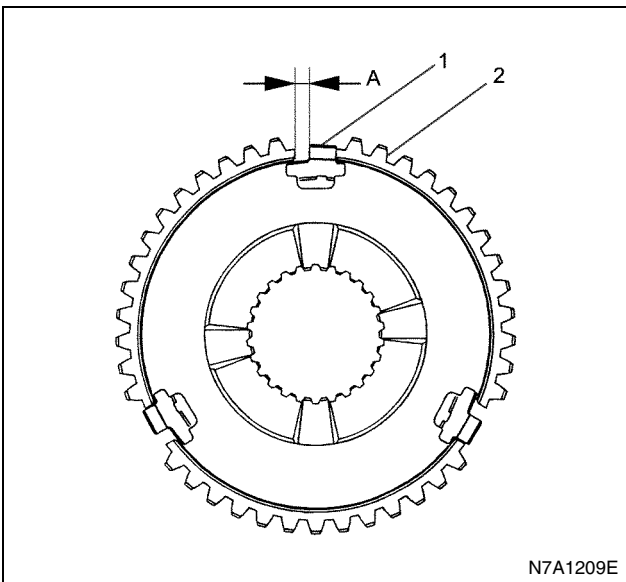
	Standard
4th / 5th	0.01 — 0.21 (0.00039 — 0.00826)



18. Measure the clearance A between the block ring and the clutch hub using a thickness gauge.

- If the measured value exceeds the limit, replace the block and clutch hub.

Clearance between Block Ring and Clutch Hub, mm (in)	
	Standard
2nd / 3rd	4.30 — 4.70 (0.16929 — 0.18503)
1st / Reverse	4.30 — 4.70 (0.16929 — 0.18503)



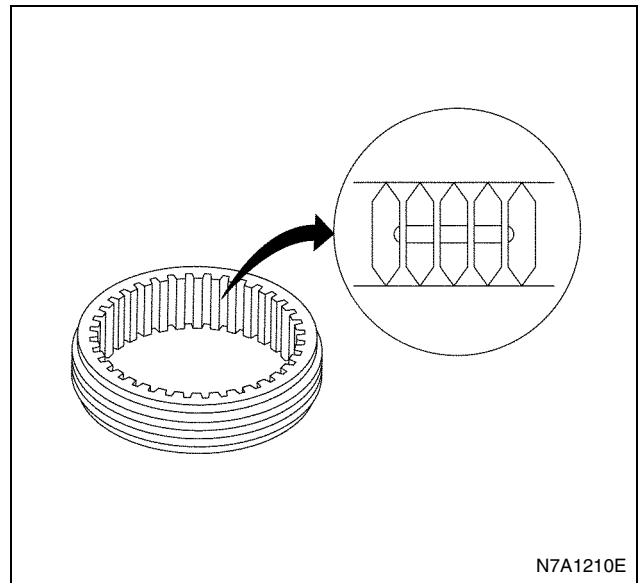
Legend

1. Block ring
2. Clutch hub

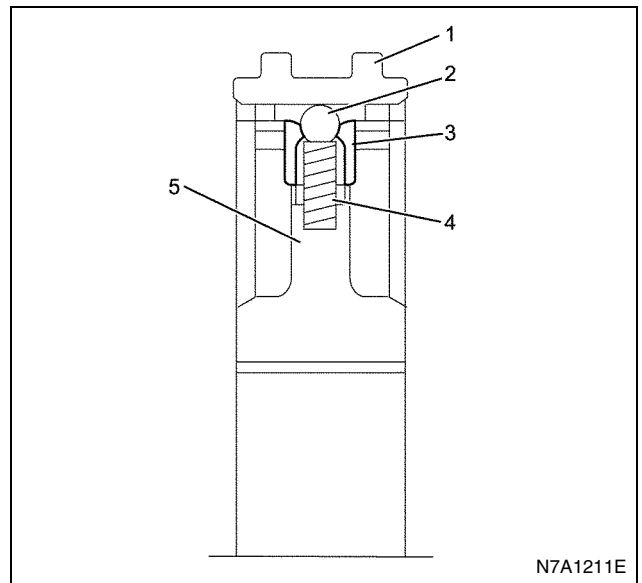
Assembly

- Clean up each part.

- Set the main shaft in a vise, with the long spline part at the bottom. When setting the main shaft, make sure not to damage the grind surface.
1. Assemble the 2nd-3rd clutch hub assembly & sleeve following the procedure below.
 - a. Install the block and sleeve to the clutch hub.
 - b. Inside the sleeve, there are three ball grooves. Align the phase to let the ball enter the center of the ball grooves.



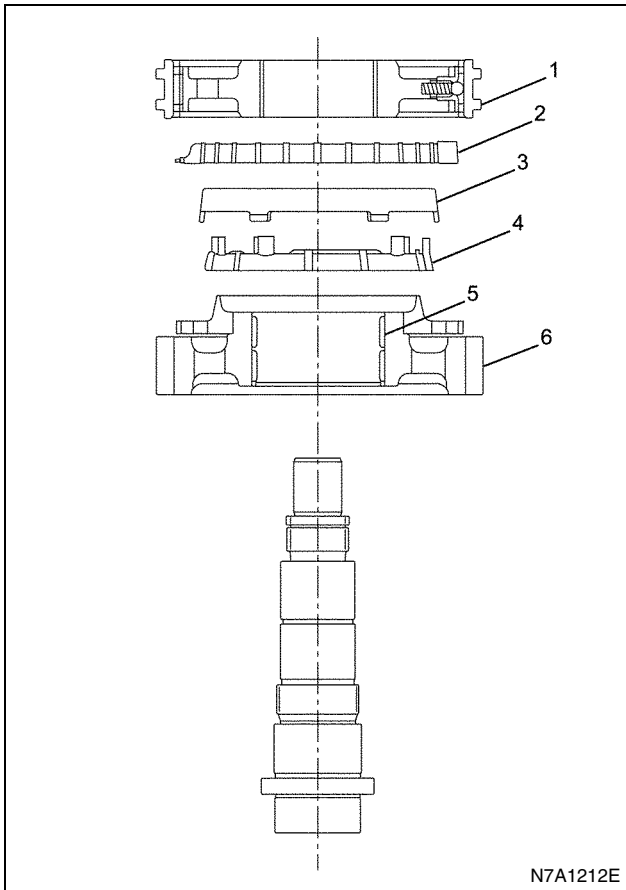
- c. Insert sleeve (1) until the clutch hub (5) slightly overlaps the block.
- d. Securely insert the sleeve until the ball enters the ball groove of the sleeve by pushing the ball (2), block (3) and spring (4).



2. Apply engine oil 5W-30 to the needle bearing, 2nd gear thrust surface and synchro cone taper surface. And install the 2nd gear (6) and needle bearing (5) to the main shaft with the dog gear turned upward.

7B-70 MANUAL TRANSMISSION

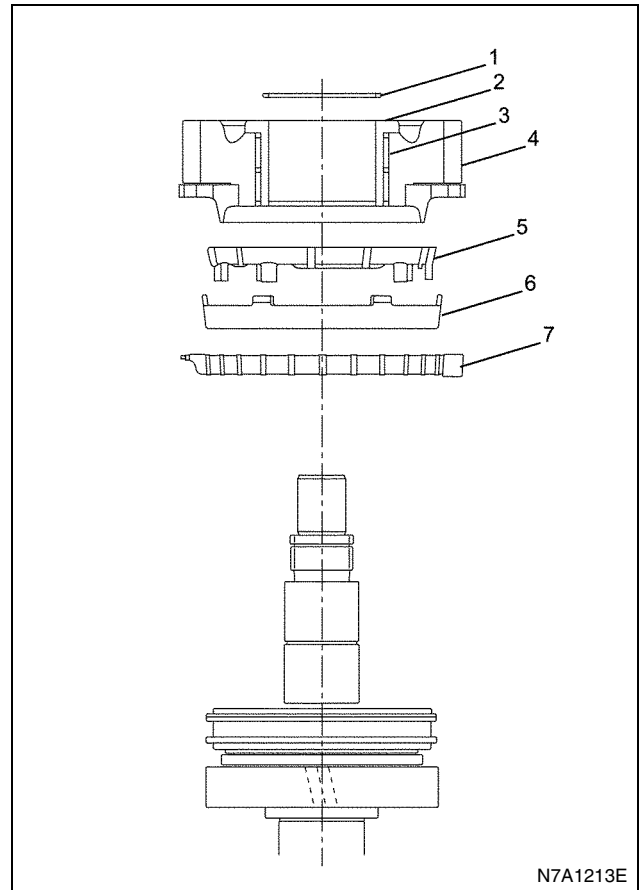
3. Install the 2nd inside ring (4), 2nd outside ring (3) and 2nd block ring (2) inserting the nail of the outside ring into the gear hole of the 2nd gear. At this time, make sure to apply engine oil 5W-30 sufficiently to the both sides of the inside ring and outside ring, and inside diameter surface of the block ring.
4. Insert the 2nd-3rd clutch hub assembly & sleeve with a press using the installer 5-8840-2345-0, setting the six nails of the inside ring to enter the six holes of the hub.



5. During installation, set the six nails of the inside ring of the 3rd block ring (7), 3rd outside ring (6) and 3rd inside ring (5) to enter the six hub holes respectively. At this time, apply engine oil 5W-30 sufficiently to the inside surface of the outside ring and the inside diameter surface of the block ring.
6. Apply engine oil 5W-30 to the needle bearing, 3rd gear thrust surface and synchro cone taper. Turn the dog gear downward, and insert the 3rd gear (4), needle bearing (3) and collar (2) with a press using the installer 5-8840-2345-0, setting the nail of the outer ring to enter the dog gear hole of the 3rd gear.
7. Install the snap ring (1) using snap ring pliers.

Caution:

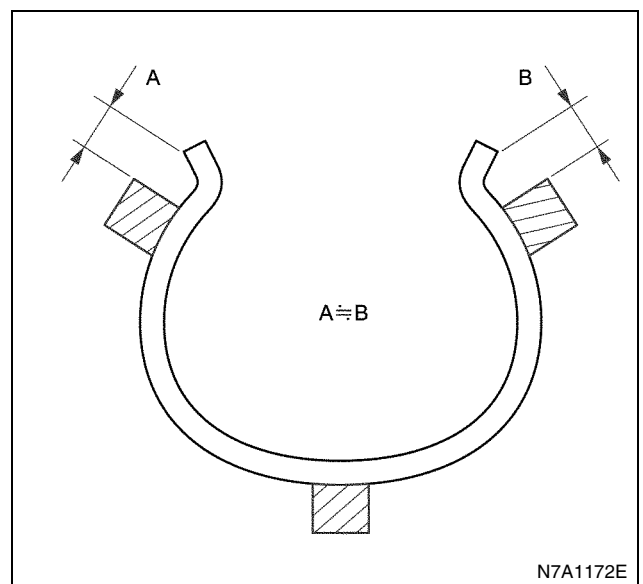
Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.



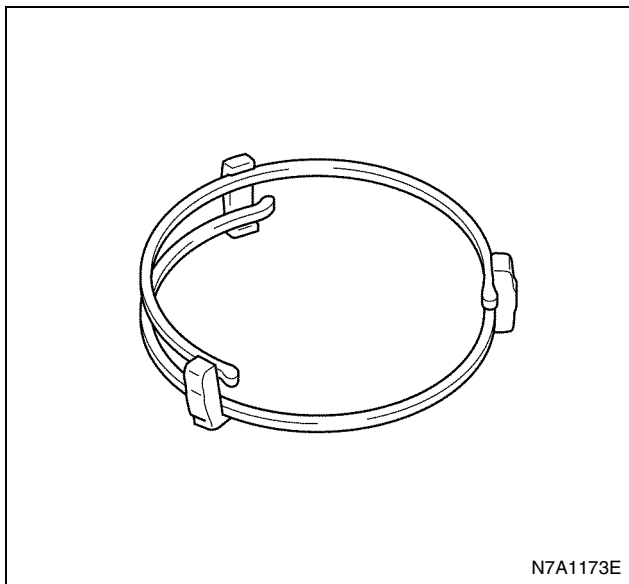
8. Assemble the 4th-5th clutch hub assembly & sleeve following the procedure below.
 - a. Assemble securely the insert (2) to the insert groove of the block ring.
 - b. Install the insert spring (3) to the insert.

Caution:

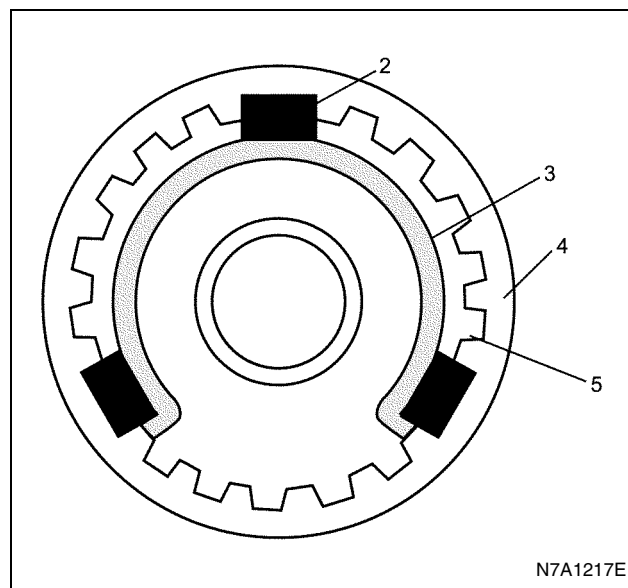
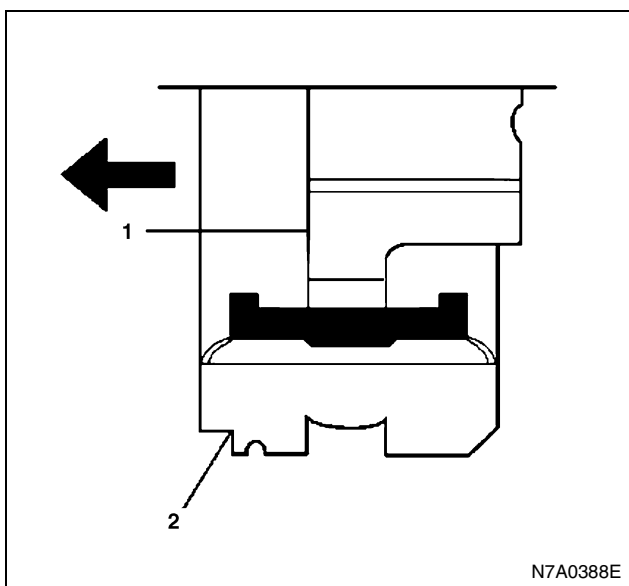
- When assembling the insert spring, equalize the length of the both edges of the spring not to adversely interfere with the inside diameter of the hub.



- Make sure that the open part of the insert spring assembled on the reverse side, is not aligned with the open part of the front side.



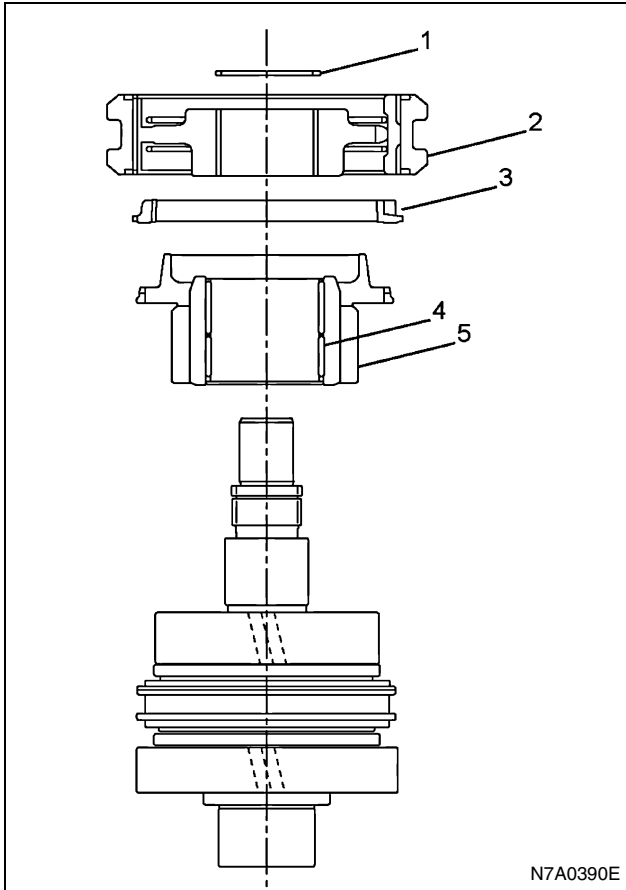
- c. Check that the clutch hub (5) and sleeve (4) are smoothly sliding.
- The arrow (1) indicates the front side of the transmission.



9. Apply engine oil 5W-30 sufficiently to the needle bearing, 5th gear thrust surface and synchro cone taper, and install the 5th gear (5) and needle bearing (4) with the dog gear turned upward.
10. Apply engine oil 5W-30 to the 5th block ring (3), and install.
11. Turning the surface with oil groove downward, align the 4th-5th clutch hub assembly and sleeve (2) to the groove of the 4th-5th block ring, and then insert with a press using the installer 5-8840-2345-0.
12. Install the snap ring (1) using snap ring pliers.

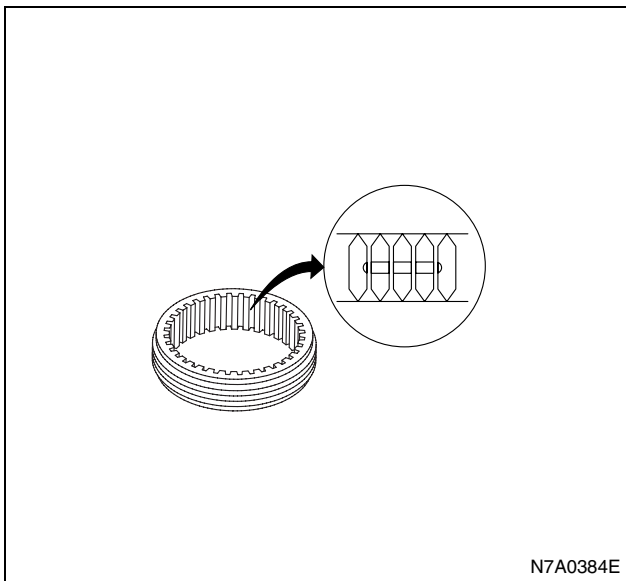
Caution:

Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.



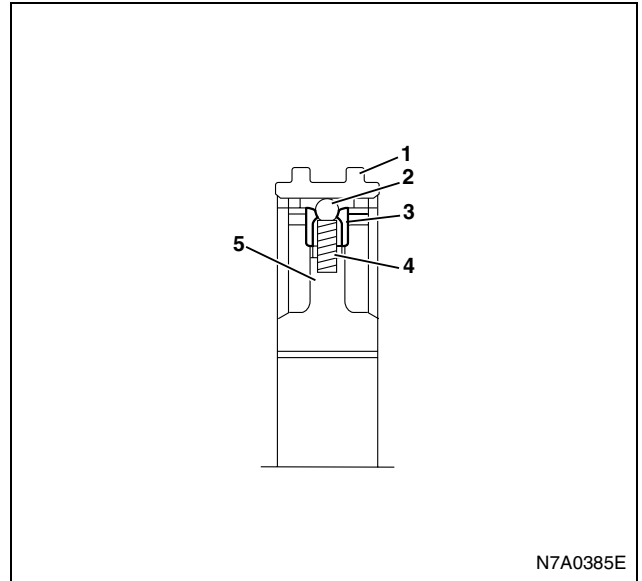
N7A0390E

13. Assemble the 1st-reverse clutch hub assembly and sleeve following the procedure below.
 - a. Install the block and spring to the clutch hub.
 - b. Inside the sleeve, there are three ball grooves. Align the phase to let the ball enter the ball groove.



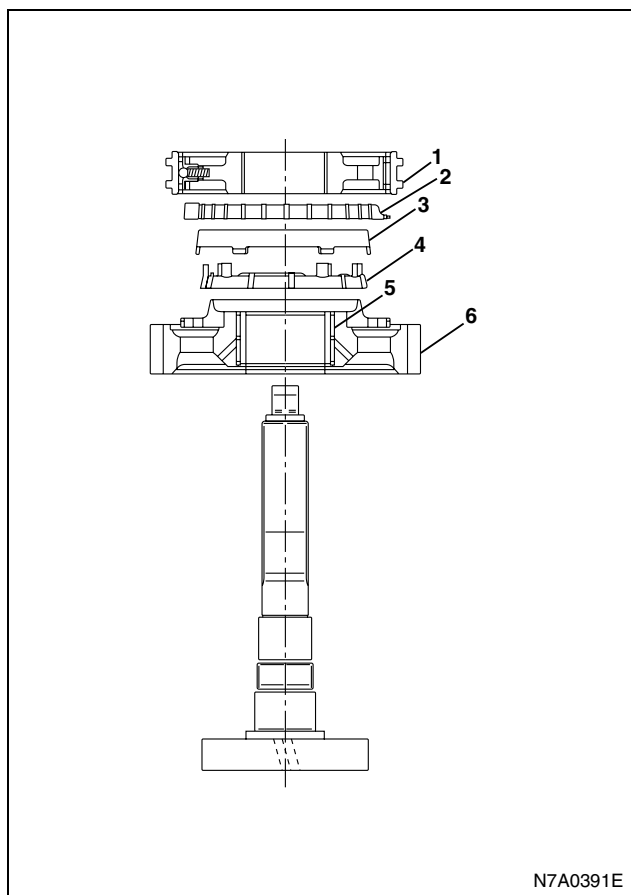
N7A0384E

- c. Insert the sleeve (1) until the block slightly overlaps the clutch hub (5).
- d. Securely insert the sleeve until the ball enters the ball groove of the sleeve by pushing the ball (2), block (3) and spring (4).



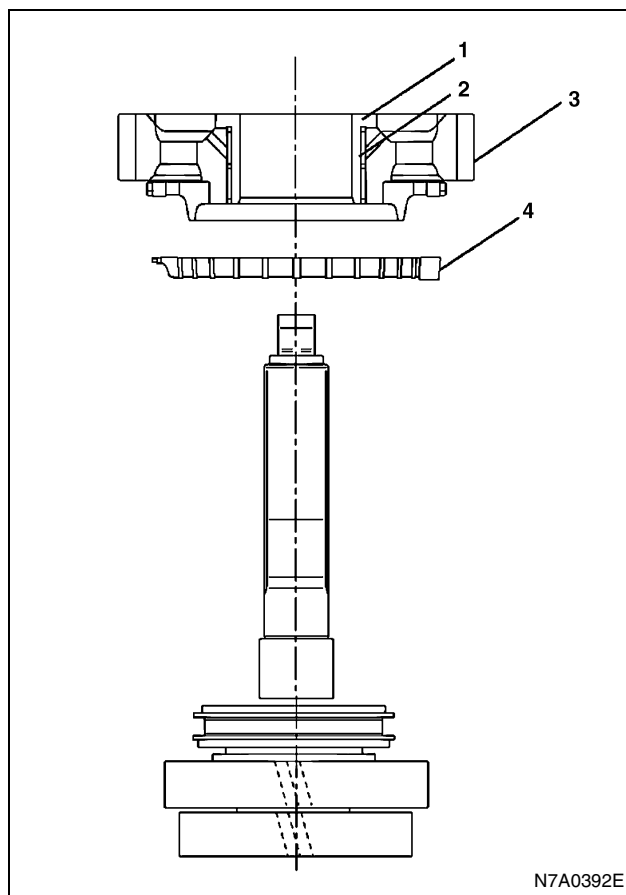
N7A0385E

14. Apply engine oil 5W-30 to the needle bearing, 1st gear thrust surface and synchro cone taper surface. And install the 1st gear (6) and needle bearing (5), turning the dog gear upward.
15. Assemble the 1st inside ring (4), 1st outside ring (3) and 1st block ring (2), inserting the nail of the outer ring into the dog gear hole of the 1st gear. At this time, make sure to apply engine oil 5W-30 sufficiently to the both sides of the inside ring and outside ring, and inside diameter surface of the block ring.
16. Insert the 1st-reverse clutch hub assembly & sleeve (1) with a press using the installer 5-8840-2345-0, setting the six nails of the inside ring to enter the six holes of the hub.



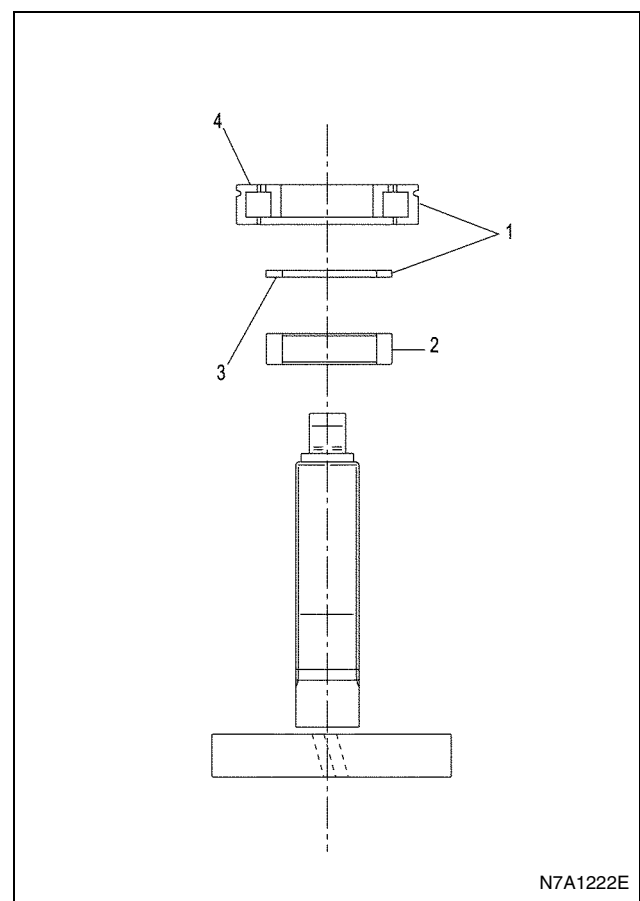
N7A0391E

17. Apply engine oil 5W-30 sufficiently to the reverse block ring (4), and then align the phase of the block ring groove to the 1st-reverse clutch hub assembly and sleeve, and install.
18. Apply engine oil 5W-30 to the needle bearing, the reverse gear thrust surface and the synchro cone taper. Turning the dog gear downward, align the phase of the synchro cone phase of the reverse gear to the nail of the outer ring, and insert the reverse gear (3), needle bearing (2), and collar (1) with a press using the installer 5-8840-2345-0.



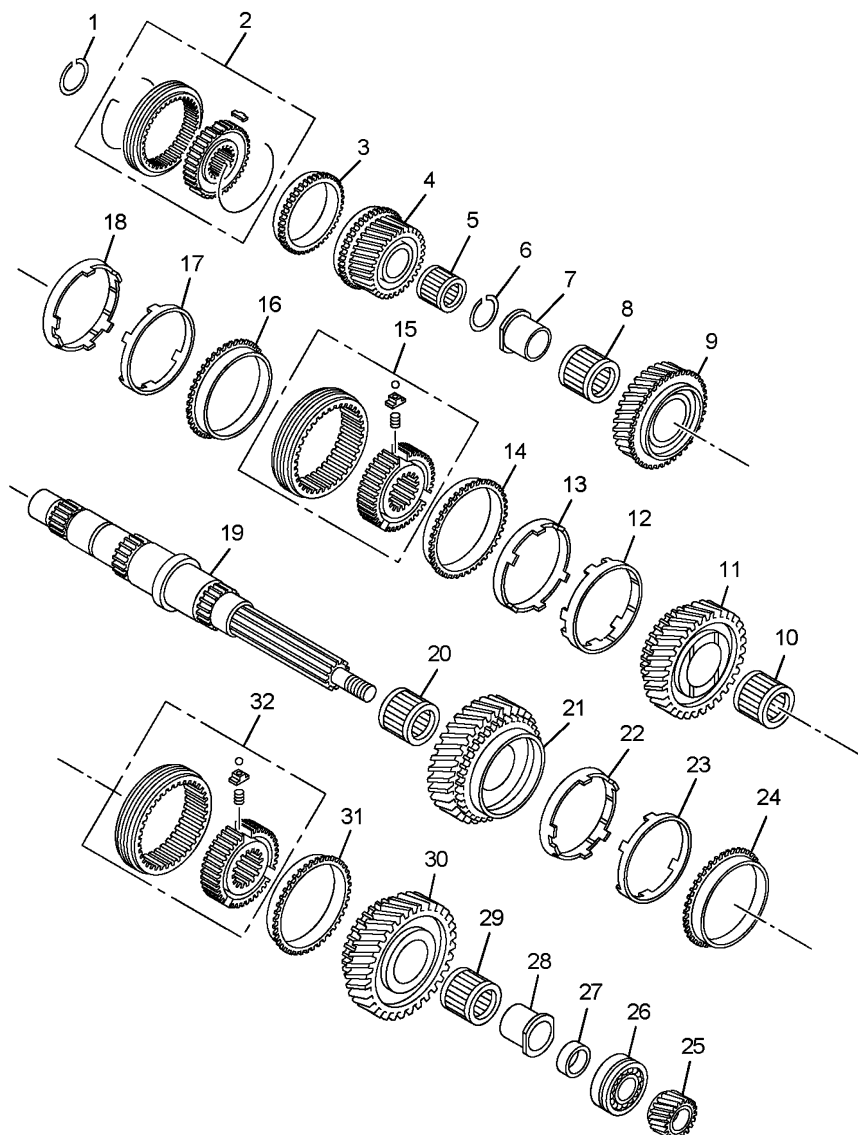
N7A0392E

19. Install the spacer (2).
20. Insert the bearing (1) with a press using the installer 5-8840-2345-0, turning the stamped surface (4) upward and the stamped surface (3) downward.



Special Tools

Illustration	Tool Number / Description / Remarks
 5884023450	5-8840-2345-0 / Clutch Hub & Collar Installer

Main Shaft (6MT)**Components**

N7A0393E

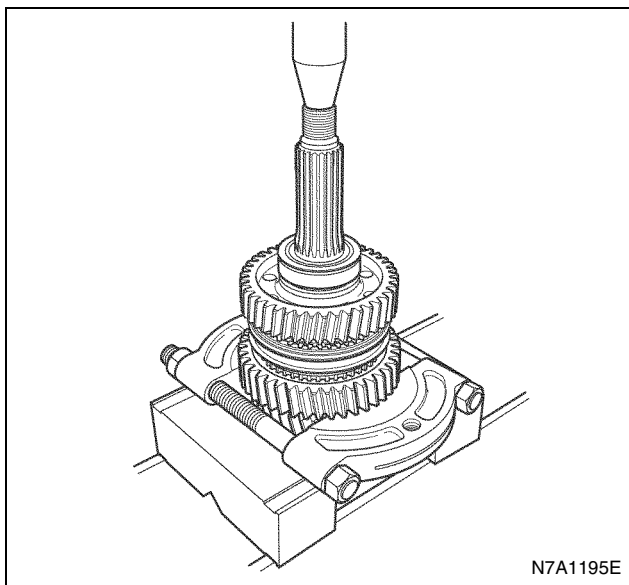
Legend

- | | |
|--|------------------------|
| 1. Snap ring | 17. 3rd outside ring |
| 2. 4th-5th clutch hub assembly & sleeve | 18. 3rd inside ring |
| 3. 4th block ring | 19. Main shaft |
| 4. 4th gear | 20. Needle bearing |
| 5. Needle bearing | 21. 1st gear |
| 6. Snap ring | 22. 1st inside ring |
| 7. Collar | 23. 1st outside ring |
| 8. Needle bearing | 24. 1st block ring |
| 9. 3rd bearing | 25. 6th gear |
| 10. Needle bearing | 26. Bearing |
| 11. 2nd bearing | 27. Spacer |
| 12. 2nd inside ring | 28. Collar |
| 13. 2nd outside ring | 29. Needle bearing |
| 14. 2nd block ring | 30. Reverse gear |
| 15. 2nd-3rd clutch hub assembly & sleeve | 31. Reverse block ring |

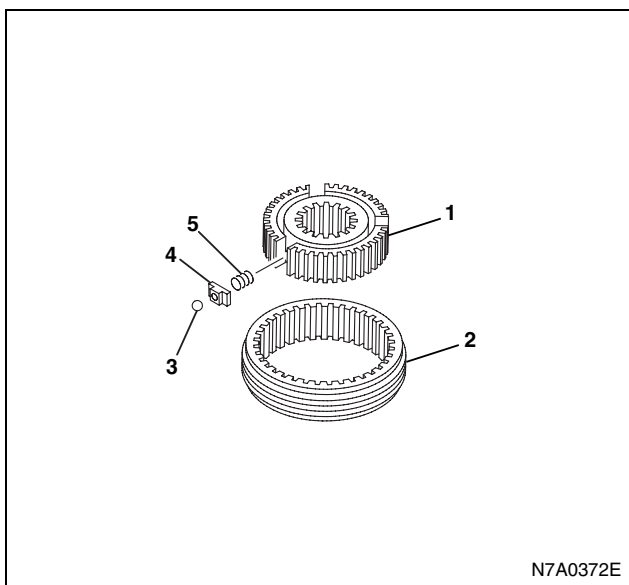
16. 3rd block ring

Disassembly

1. Remove the 6th gear.
2. Remove simultaneously the following parts using a bearing remover with a press; the bearing, spacer, collar, reverse gear, needle bearing, 2nd-3rd, reverse block ring, 1st-reverse clutch hub assembly & sleeve, 1st block ring, 1st outside ring, 1st inside ring, 1st gear, needle bearing.



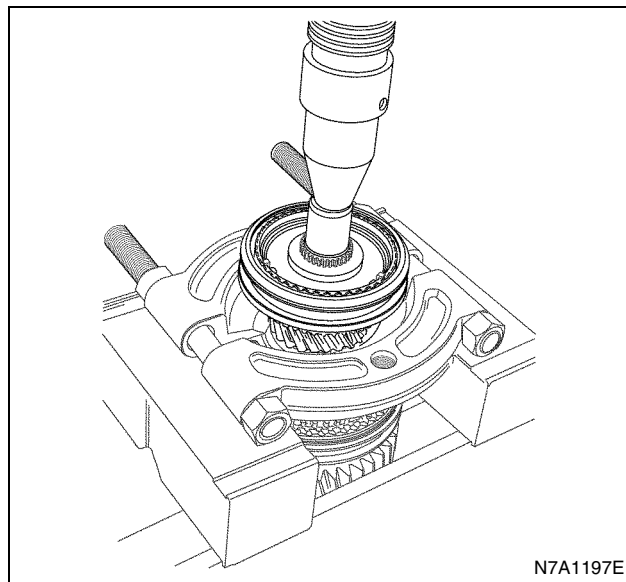
3. Disassemble the 1st-reverse clutch hub assembly & sleeve.


Legend

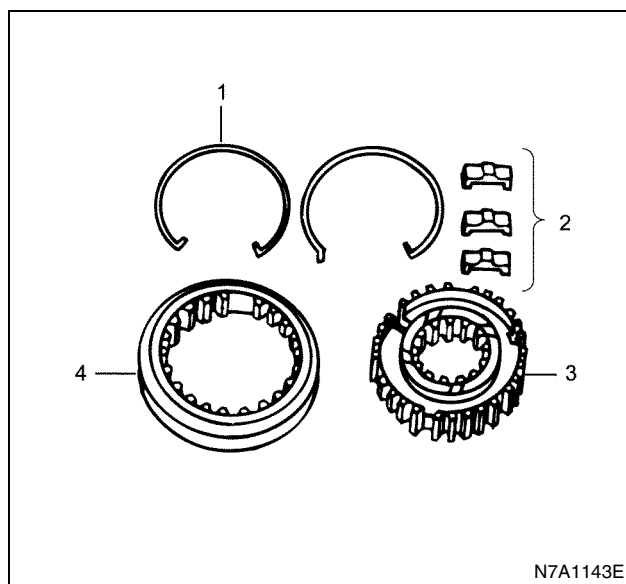
1. Clutch hub
2. Sleeve
3. Ball
4. Block
5. Spring

32. 1st-reverse clutch hub assembly & sleeve

4. Remove the 4th-5th clutch hub assembly fixing snap ring using snap ring pliers.
5. Remove simultaneously the following parts, using a bearing remover with a press; 4th-5th clutch hub assembly & sleeve, 4th block ring 4th gear and needle bearing.



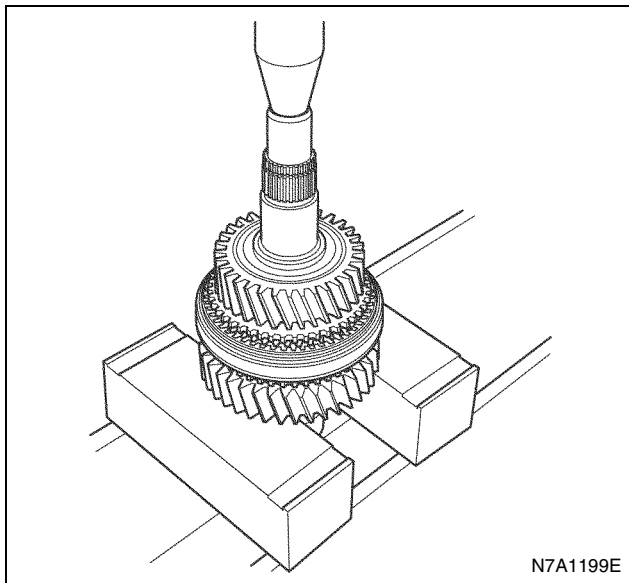
6. Disassemble the 4th-5th clutch hub assembly & sleeve.


Legend

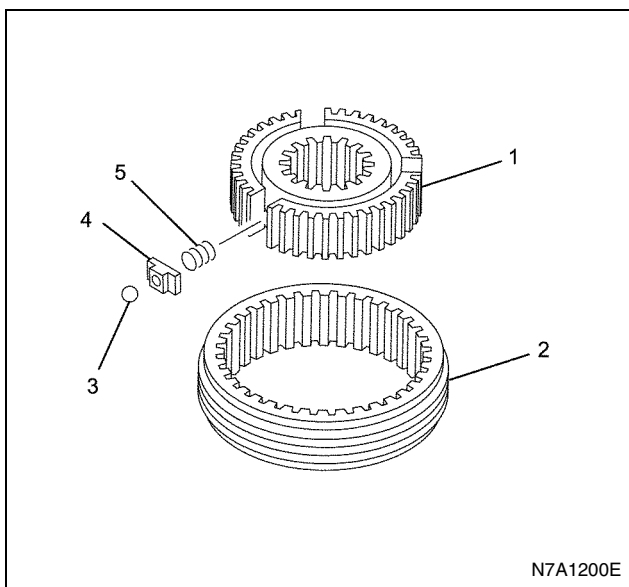
1. Spring
2. Insert
3. Clutch hub
4. Sleeve

7. Remove the 3rd gear collar fixing snap ring, using snap ring pliers.

8. Remove from the main shaft the following parts using a bearing remover with a press; the collar, 3rd gear, needle bearing, 3rd inside ring, 3rd outside ring, 3rd block ring, 2nd-3rd clutch hub assembly & sleeve, 2nd block ring, 2nd outside ring, 2nd inside ring, 2nd gear, needle bearing.



9. Disassemble the 2nd-3rd clutch hub assembly & sleeve.



Legend

1. Clutch hub
2. Sleeve
3. Ball
4. Block
5. Spring

Inspect each part. If any wear, damage or other abnormality is found, repair or replace the part.

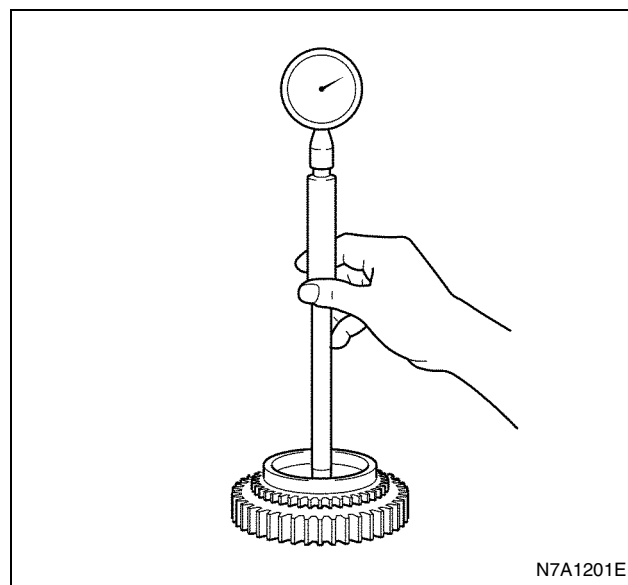
10. Inspect each bearing with respect to the following items. If any abnormality is found, replace the item.
- Smoothness of rotation

- Noise
- Abnormal external appearance, including damage, rust, etc.

11. Inspect the inside diameter of the gear.

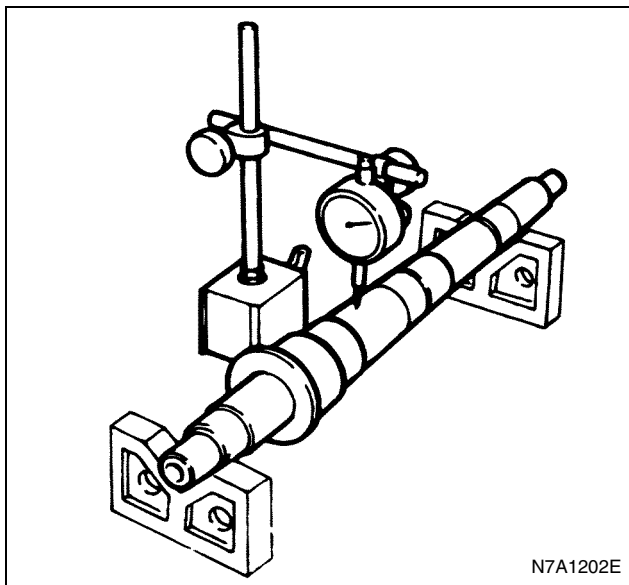
- Measure the inside diameter of each gear using an inside dial gauge.
- If the measured value exceeds the limit, replace the gear.

Gear Inside Diameter, mm (in)		
	Standard	Limit
6th gear	50.009 — 50.025 (1.968 — 1.969)	50.065 (1.971)
4th gear	44.009 — 44.025 (1.732 — 1.733)	44.065 (1.734)
3rd gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
2nd gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
1st gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)
Reverse Gear	63.010 — 63.029 (2.480 — 2.481)	63.069 (2.483)



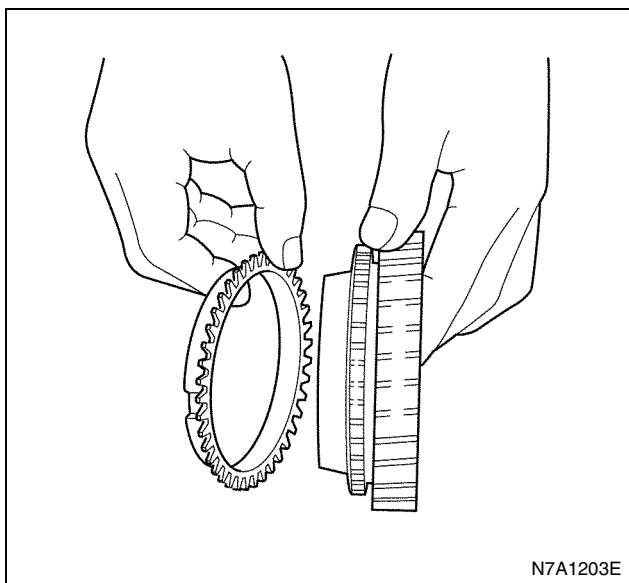
12. Inspect the deflection of the main shaft.

- Measure the deflection of the main shaft using a dial gauge.
- If the measured value exceeds the limit, replace the main shaft.
Standard: 0.015 mm (0.00059 in)
Limit: 0.1 mm (0.00393 in)



13. Inspect the synchromesh system.

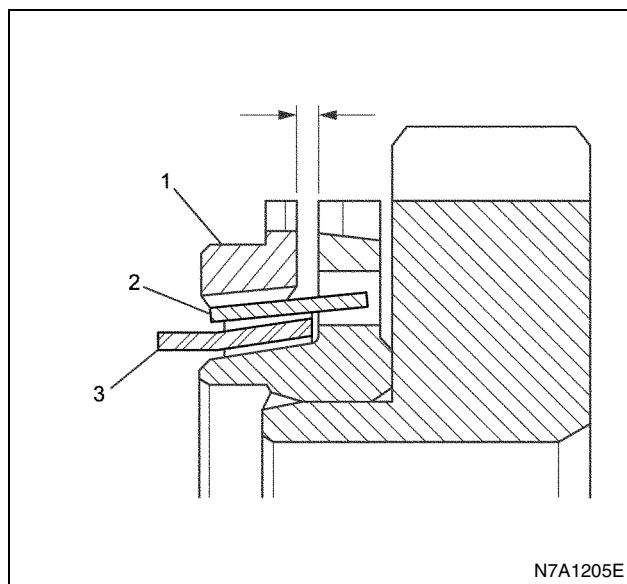
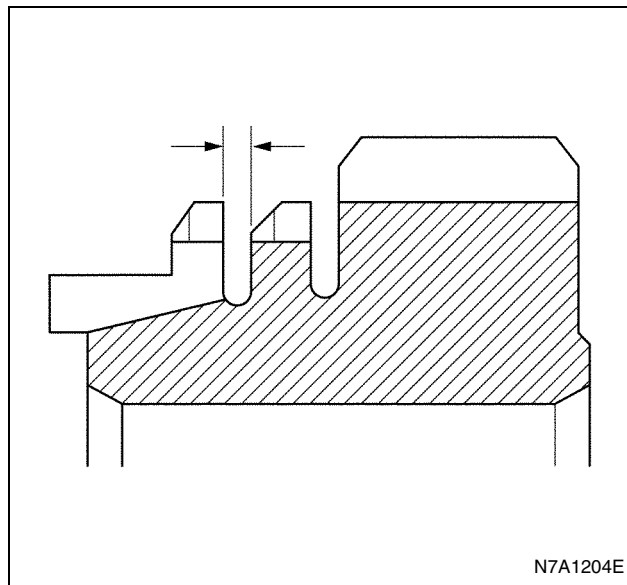
- Inspect the components. Repair the slight stepped wear and damage using an oil stone or a pencil grinder.



14. Measure the clearance between the block ring and the dog gear using a thickness gauge.

- If the measured value exceeds the limit, replace the block gear.

Clearance between Block Ring and Dog Gear, mm (in)		
	Standard	Limit
4th / 5th / 6th / Reverse	1.30 — 2.60 (0.051 — 0.102)	0.5 (0.019)
2nd / 3rd	1.00 — 2.50 (0.039 — 0.098)	0.5 (0.019)
1st	1.00 — 2.50 (0.039 — 0.098)	0.5 (0.019)



Legend

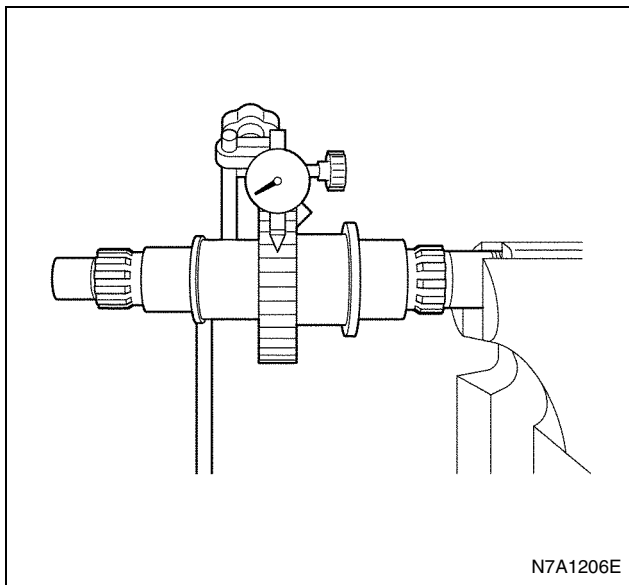
1. Block ring
2. Outside ring
3. Inside ring

15. Inspect the sliding part, spline part, inserting part and insert groove of the clutch hub and sliding sleeve for wear and damage.

16. Measure the free play in the direction of spline rotation on the clutch hub external circumference.

- If the measured value exceeds the limit, replace the part.

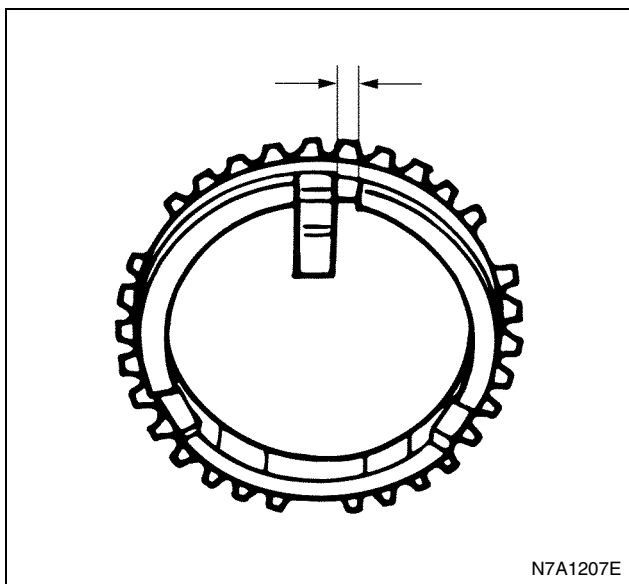
Spline Free Play, mm (in)	
Standard	Limit
0 — 0.05 (0 — 0.0019)	0.3 (0.0118)



17. Measure the clearance between the insert and block ring groove using a caliper.

- If the measured value exceeds the limit, replace the insert and block ring.

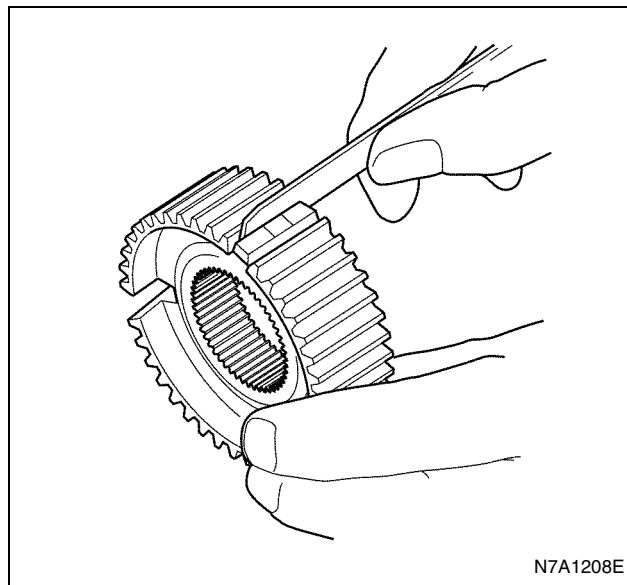
Clearance between Insert and Block Ring Groove, mm (in)	
	Standard
4th / 5th / 6th	3.46 — 3.76 (0.136 — 0.148)



18. Measure the clearance between the insert and clutch hub using a thickness gauge.

- If the measured value exceeds the limit, replace the insert and clutch hub.

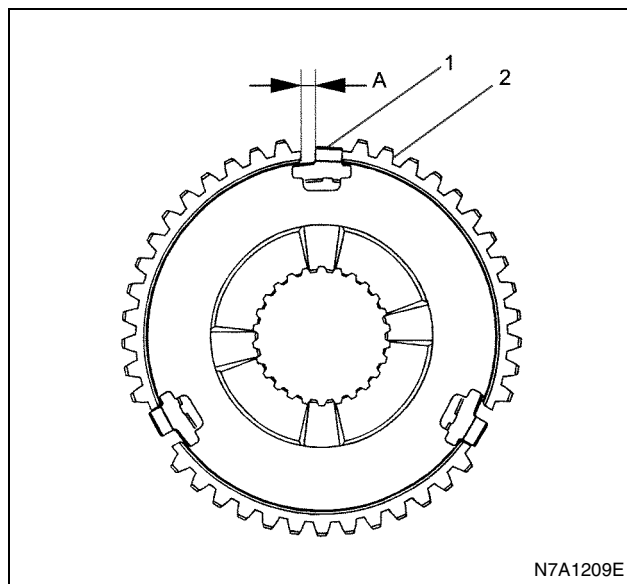
Clearance between Insert and Clutch Hub, mm (in)	
	Standard
4th / 5th / 6th	0.01 — 0.21 (0.00039 — 0.00826)



19. Measure the clearance between the block ring and the clutch hub using a thickness gauge.

- If the measured value exceeds the limit, replace the block and clutch hub.

Clearance between Block Ring and Clutch Hub, mm (in)	
	Standard
2nd / 3rd	4.30 — 4.70 (0.16929 — 0.18503)
1st / Reverse	4.30 — 4.70 (0.16929 — 0.18503)



Legend

1. Block ring
2. Clutch hub

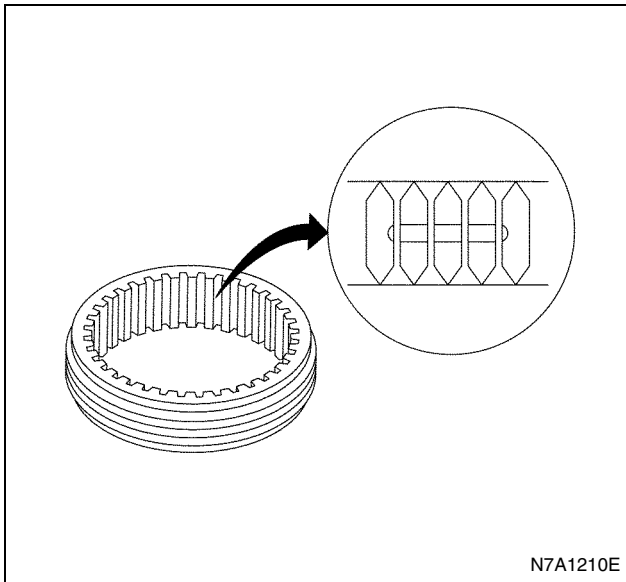
Assembly

- Clean up each part.
- Set the main shaft in a vise, with the long spline part at the bottom.

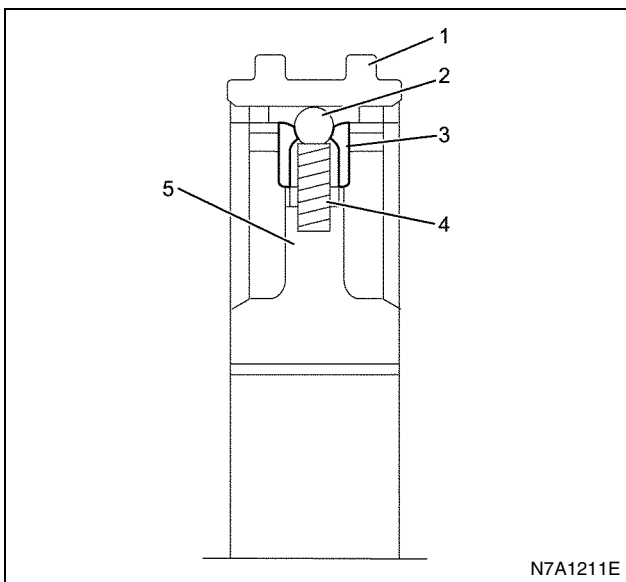
7B-80 MANUAL TRANSMISSION

When setting the main shaft, make sure not to damage the grind surface.

1. Assemble the 2nd-3rd clutch hub assembly & sleeve following the procedure below.
 - a. Install the block and sleeve to the clutch hub.
 - b. Inside the sleeve, there are three ball grooves. Align the phase to let the ball enter the center of the ball grooves.



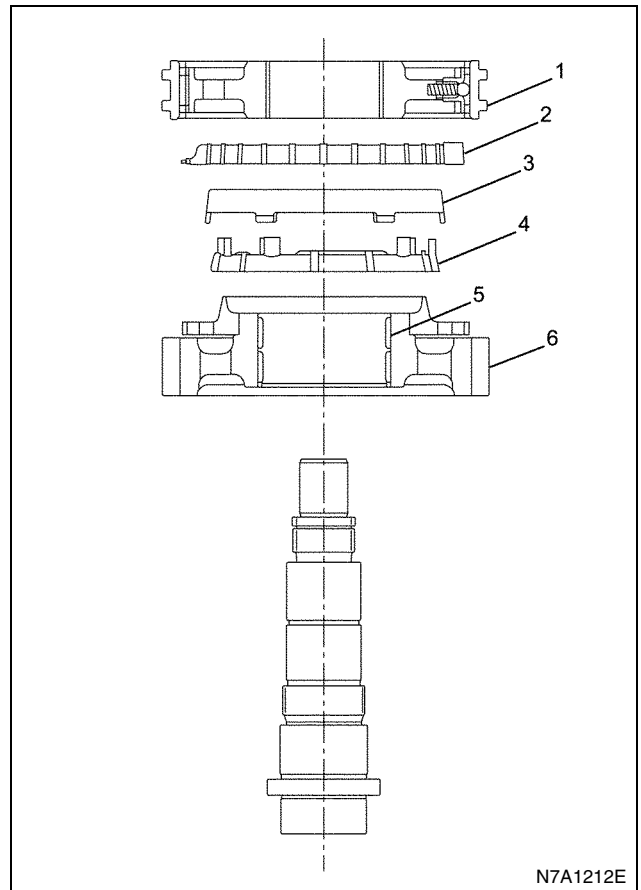
- c. Insert sleeve (1) until the clutch hub (5) slightly overlaps the block.
 - d. Securely insert the sleeve until the ball enters the ball groove of the sleeve by pushing the ball (2), block (3) and spring (4).



2. Apply engine oil 5W-30 to the needle bearing, 2nd gear thrust surface and synchro cone taper surface. And install the 2nd gear (6) and needle bearing (5) to the main shaft with the dog gear turned upward.
3. Install the 2nd inside ring (4), 2nd outside ring (3) and 2nd block ring (2) inserting the nail of the out-

side ring into the gear hole of the 2nd gear. At this time, make sure to apply engine oil 5W-30 sufficiently to the both sides of the inside ring and outside ring, and inside diameter surface of the block ring.

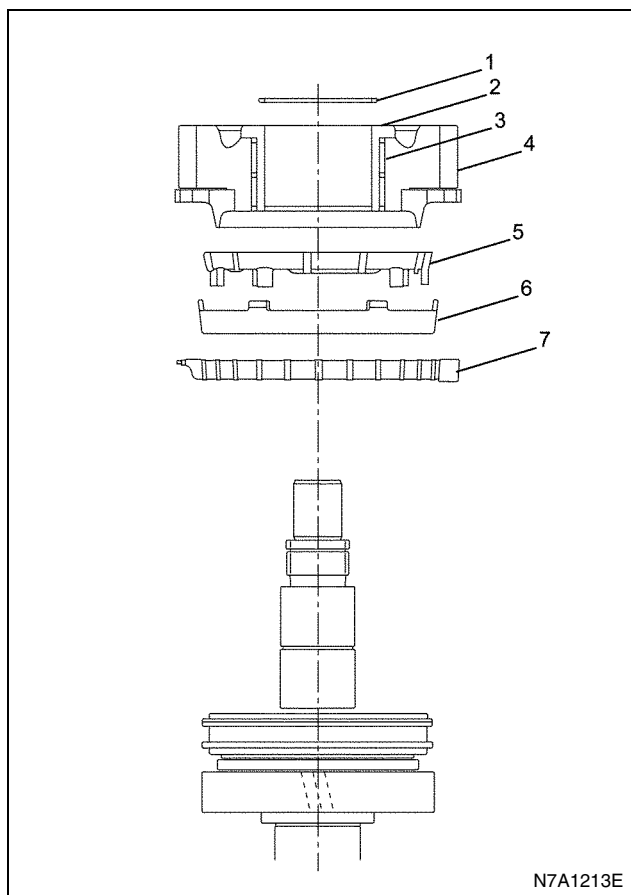
4. Insert the 2nd-3rd clutch hub assembly & sleeve with a press using the installer 5-8840-2345-0, setting the six nails of the inside ring to enter the six holes of the hub.



5. During installation, set the six nails of the inside ring of the 3rd block ring (7), 3rd outside ring (6) and 3rd inside ring (5) to enter the six hub holes, respectively. At this time, apply engine oil 5W-30 sufficiently to the inside surface of the outside ring and the inside diameter surface of the block ring.
6. Apply engine oil 5W-30 to the needle bearing, 3rd gear thrust surface and synchro cone taper. Turn the dog gear downward, and insert the 3rd gear (4), needle bearing (3) and collar (2) using the installer 5-8840-2345-0 with a press, setting the nail of the outer ring to enter the dog gear hole of the 3rd gear.
7. Install the snap ring (1) using snap ring pliers.

Caution:

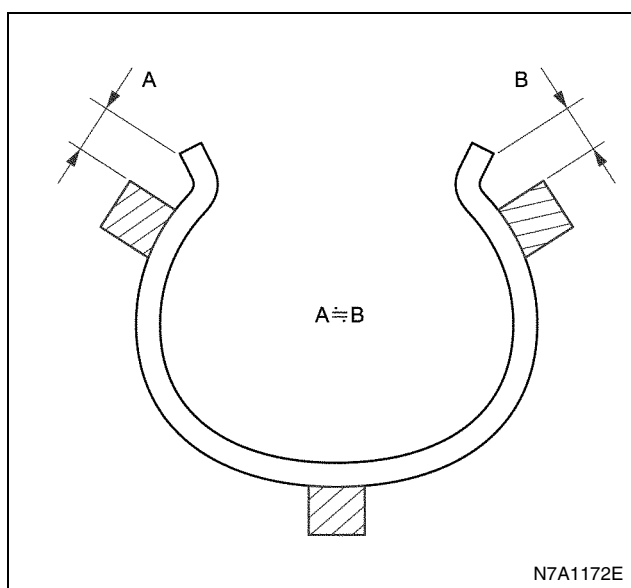
Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.



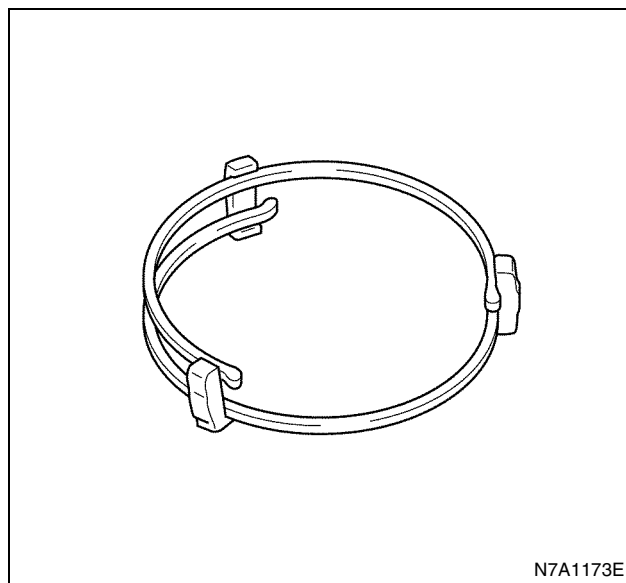
8. Assemble the 4th-5th clutch hub assembly & sleeve following the procedure below.
 - a. Assemble securely the insert (2) to the insert groove of the block ring.
 - b. Install the insert spring (3) to the insert.

Caution:

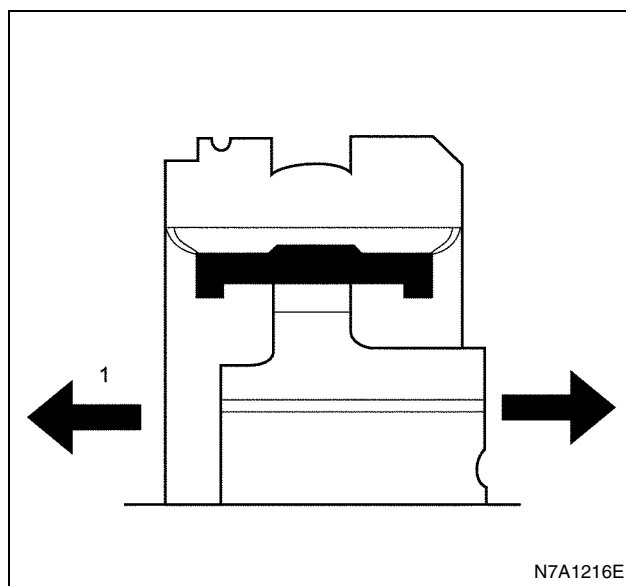
- When assembling the insert spring, equalize the length of the both edges of the spring not to adversely interfere with the inside diameter of the hub.

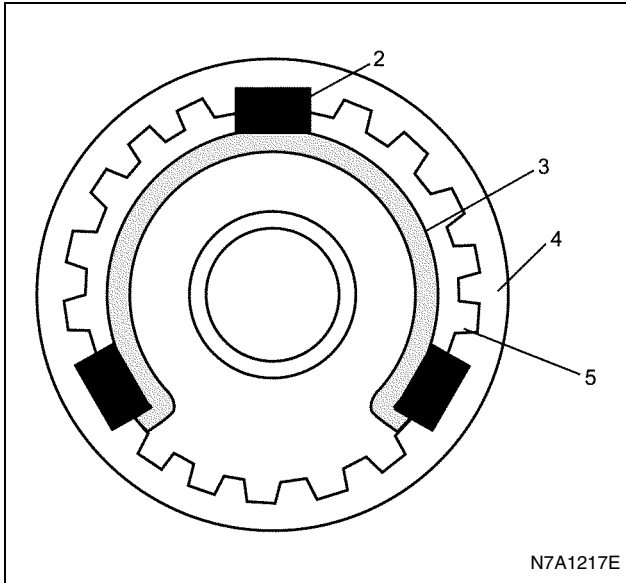


- Make sure that the open part of the insert spring assembled on the reverse side, is not aligned with the open part of the front side.



- c. Check that the clutch hub (5) and sleeve (4) are smoothly sliding.
 - The arrow (1) indicates the front side of the transmission.



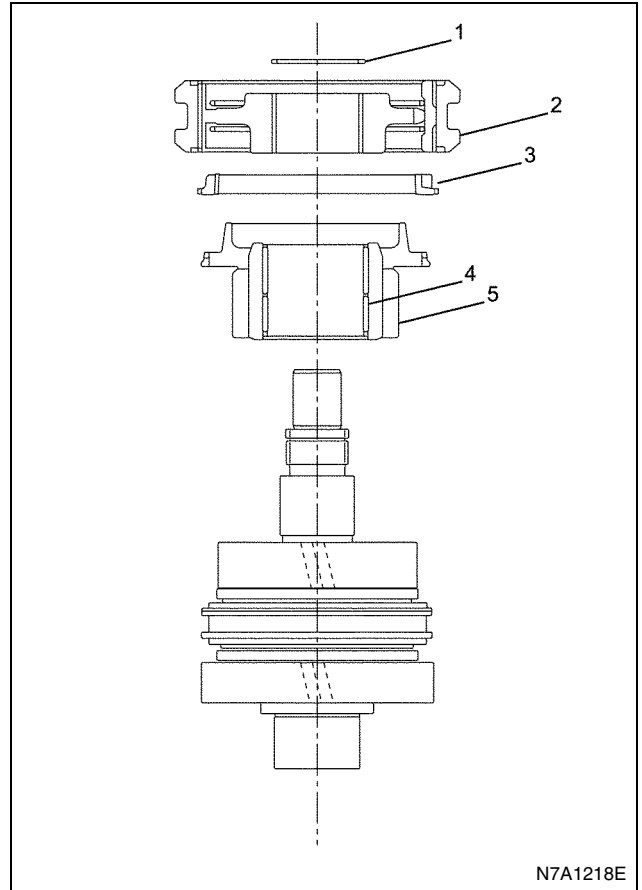


N7A1217E

9. Apply engine oil 5W-30 sufficiently to the needle bearing, 4th gear thrust surface and synchro cone taper, and install the 4th gear (5) and needle bearing (4) with the dog gear turned upward.
10. Apply engine oil 5W-30 to the 4th block ring (3), and install.
11. Turning the surface with oil groove downward, align the 4th-5th clutch hub assembly and sleeve (2) to the groove of the 4th-5th block ring, and then insert with a press using the installer 5-8840-2345-0.
12. Install the snap ring (1) using snap ring pliers.

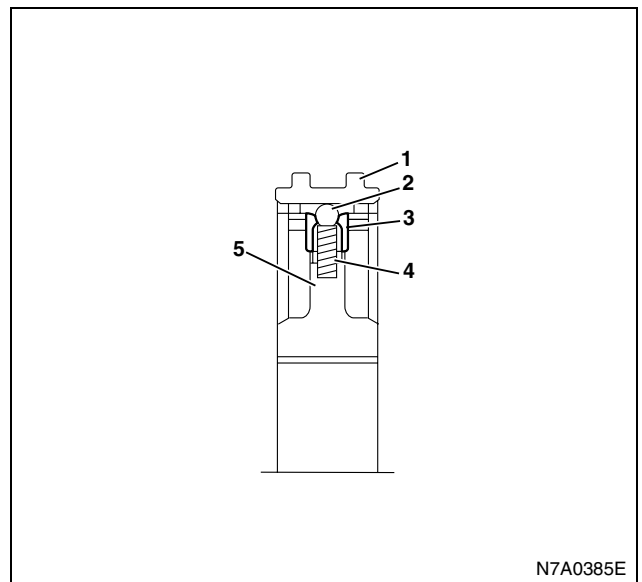
Caution:

Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.



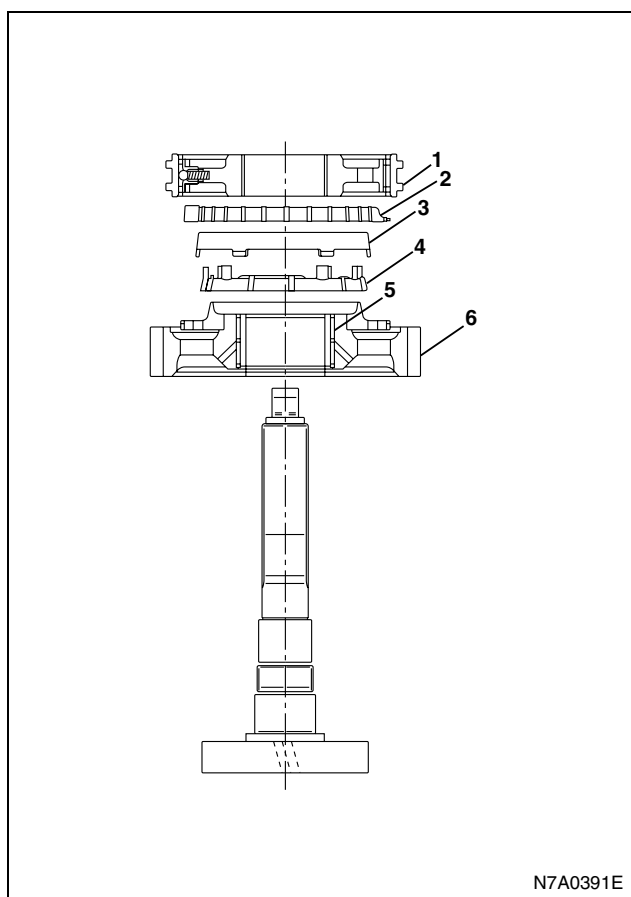
N7A1218E

13. Assemble the 1st-reverse clutch hub assembly and sleeve following the procedure below.
 - a. Install the block and spring to the clutch hub.
 - b. Inside the sleeve, there are three ball grooves. Align the phase to let the ball enter the ball groove.
 - c. Insert the sleeve (1) until the block slightly overlaps the clutch hub (5).
 - d. Securely insert the sleeve until the ball enters the ball groove of the sleeve by pushing the ball (2), block (3) and spring (4).

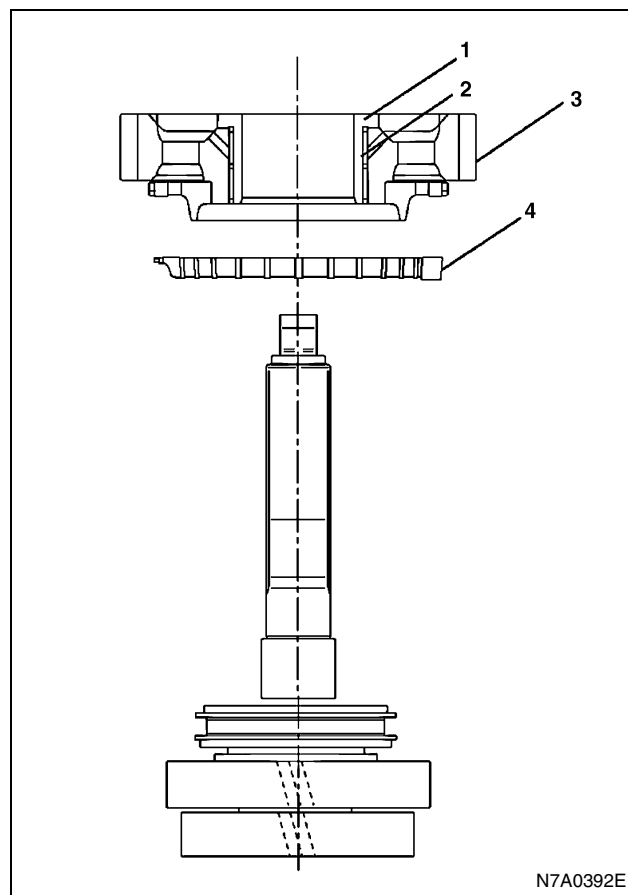


N7A0385E

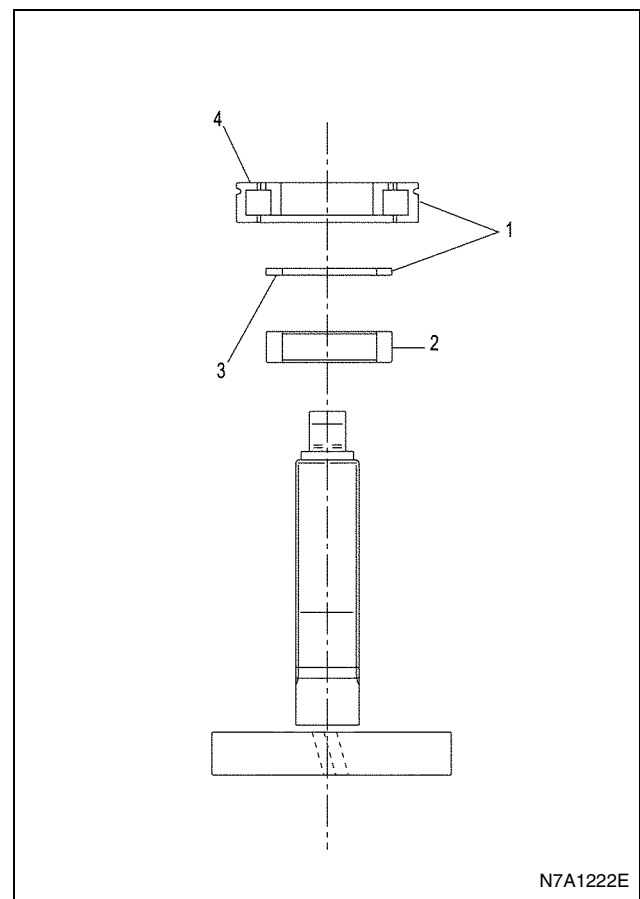
14. Apply engine oil 5W-30 to the needle bearing, 1st gear thrust surface and synchro cone taper surface, and then install the 1st gear (6) and needle bearing (5), turning the dog gear upward.
15. Assemble the 1st inside ring (4), 1st outside ring (3) and 1st block ring (2), inserting the nail of the outer ring into the dog gear hole of the 1st gear. At this time, make sure to apply engine oil 5W-30 sufficiently to the both sides of the inside ring and outside ring, and inside diameter surface of the block ring.
16. Insert the 1st-reverse clutch hub assembly & sleeve (1) with a press using the installer 5-8840-2345-0, setting the six nails of the inside ring to enter the six holes of the hub.



17. Apply engine oil 5W-30 sufficiently to the reverse block ring (4), and then align the phase of the block ring groove to the 1st-reverse clutch hub assembly and sleeve, and install.
18. Apply engine oil 5W-30 to the needle bearing, the reverse gear thrust surface and the synchro cone taper. Turning the dog gear downward, align the phase of the synchro cone phase of the reverse gear to the nail of the outer ring, and then insert the reverse gear (3), needle bearing (2), and collar (1) with a press using the installer 5-8840-2345-0.

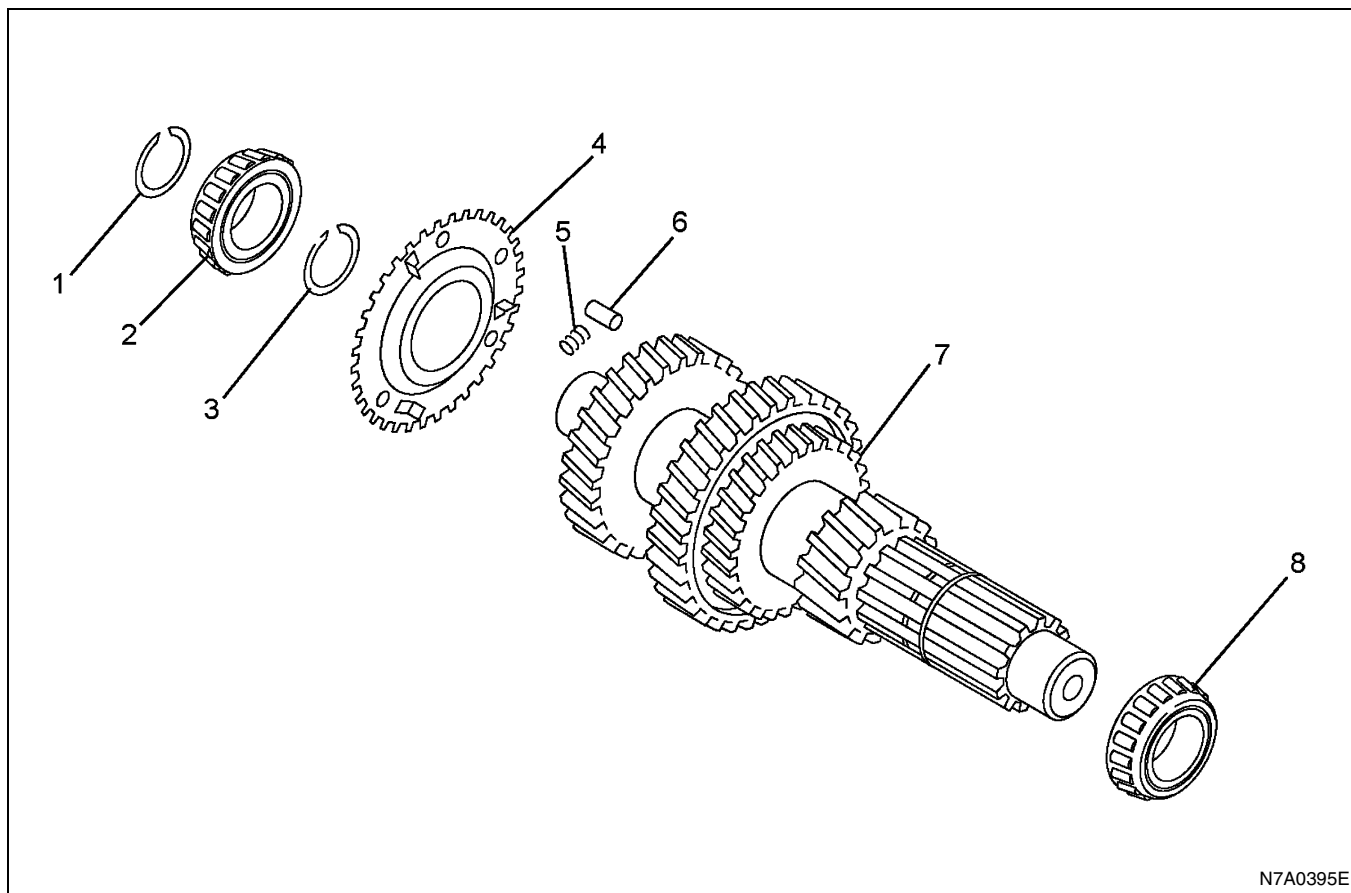


19. Install the spacer (2).
20. Insert the bearing (1) with a press using the installer 5-8840-2345-0, turning the stamped surface (4) upward and the stamped surface (3) downward.
21. Install the 6th gear.
 - Install with the convex part at the bottom.



Special Tools

Illustration	Tool Number / Description / Remarks
 5884023450	5-8840-2345-0 / Clutch Hub & Collar Installer

Counter Shaft (5MT)**Components**

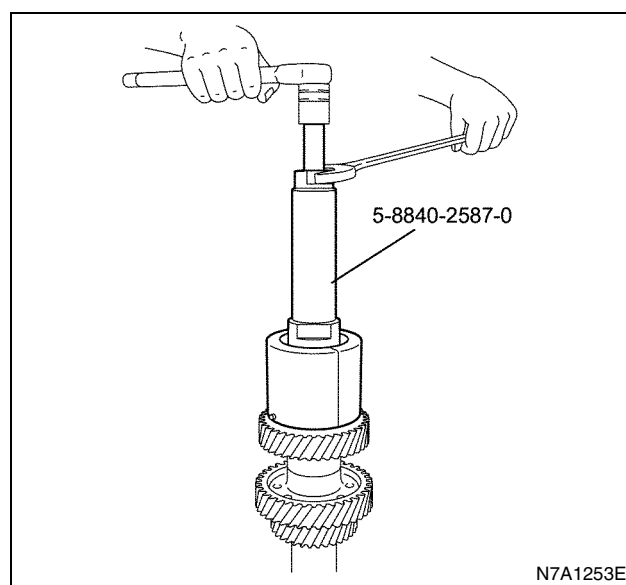
N7A0395E

Legend

- | | |
|---------------------------|---------------------------|
| 1. Snap ring | 5. Coil spring |
| 2. Bearing; Counter front | 6. Straight pin |
| 3. Snap ring | 7. Counter shaft assembly |
| 4. Anti-lash plate | 8. Bearing; Counter rear |

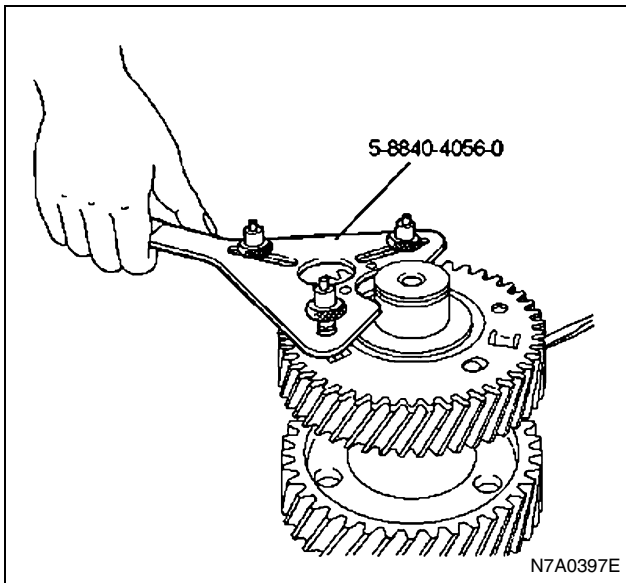
Disassembly

1. Remove the bearing fixing snap ring using snap ring pliers.
2. Remove the bearing; counter front using the bearing remover 5-8840-2587-0.

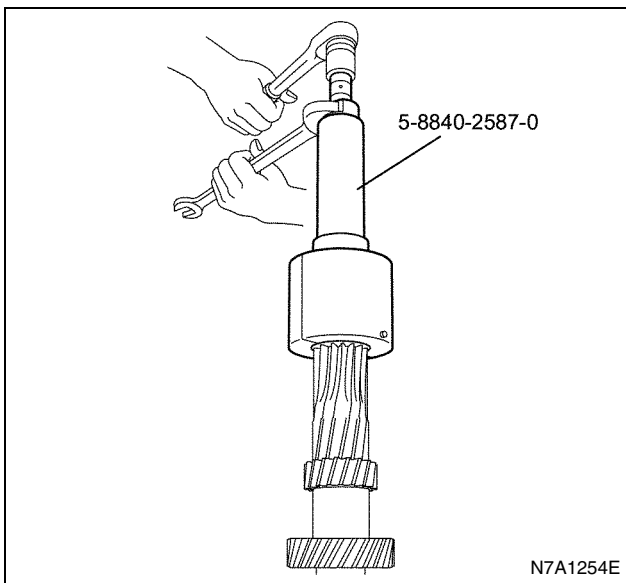


N7A1253E

3. Remove the anti-lash plate fixing snap ring using snap ring pliers.
4. Remove the anti-lash plate using the flange holder 5-8840-4056-0.



5. Remove the three coil springs from the 5th gear.
6. Remove the straight pin from the 5th gear.
7. Remove the bearing; counter rear using the bearing remover 5-8840-2587-0.



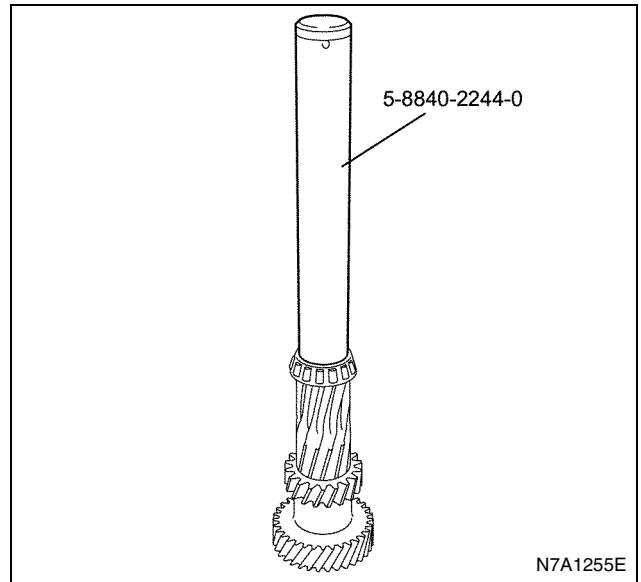
If any wear, damage or other abnormality is found on the disassembled parts, repair or replace the parts.

8. Inspect the surface of each gear for damage or wear. If any abnormality is found, replace the gear.
9. Inspect each bearing with respect to the following items. If any abnormality is found, replace with a new one.
 - Smoothness of rotation
 - Noise
 - Abnormal external appearance, including damage, rust, etc.

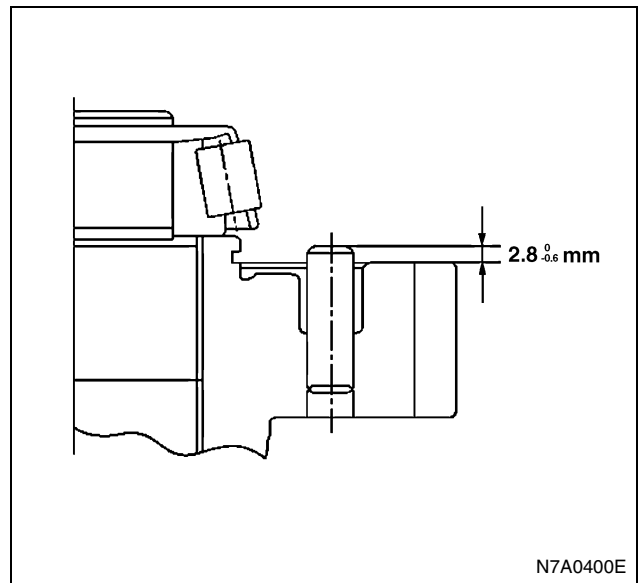
- Abnormal free play in thrust direction

Assembly

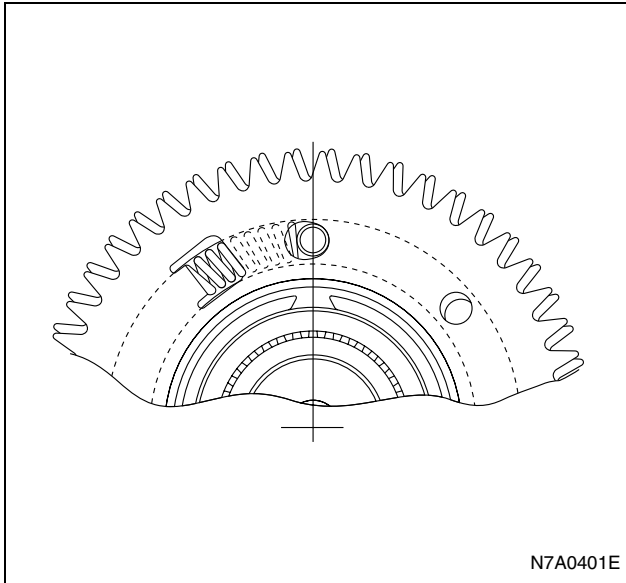
1. Insert the bearing counter rear with a press using the installer 5-8840-2244-0.



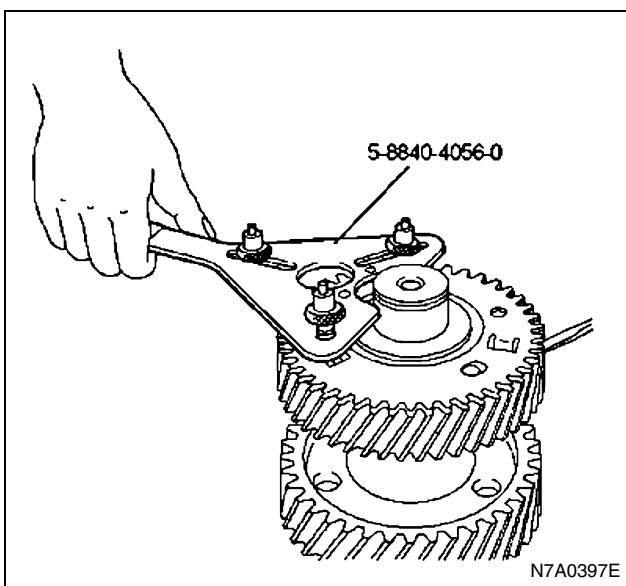
2. Install the straight pin within the range of protrusion.



3. Assemble the three coil springs to the groove on the side of the 5th gear, while these springs have to touch the left side of the pin viewing from the center of the gear.



4. Set the springs between the folded protrusion of the anti-lash plate and the straight pin. Using the flange holder 5-8840-4056-0, align the set hole of the anti-lash plate with the set hole of the 5th gear, and install.

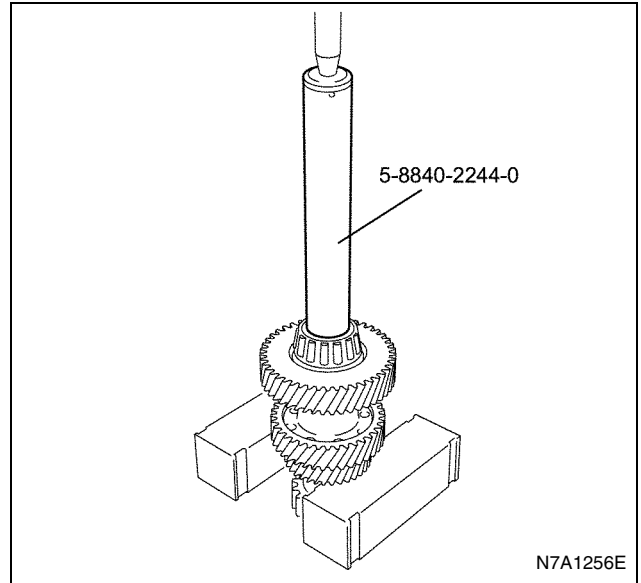


5. Install the anti-lash plate fixing snap ring using snap ring pliers.

Caution:

Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.

6. Install the bearing: counter front with a press using the installer 5-8840-2244-0.



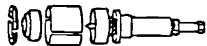
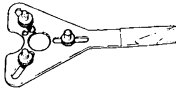
7. Install the bearing fixing snap ring using snap ring pliers.
 - Select the thickest snap ring installable from the following three types.

Thickness, mm (in)	Color
1.9 (0.0748)	Blue
2.1 (0.0826)	Yellow
2.3 (0.0905)	Pink

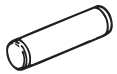
Caution:

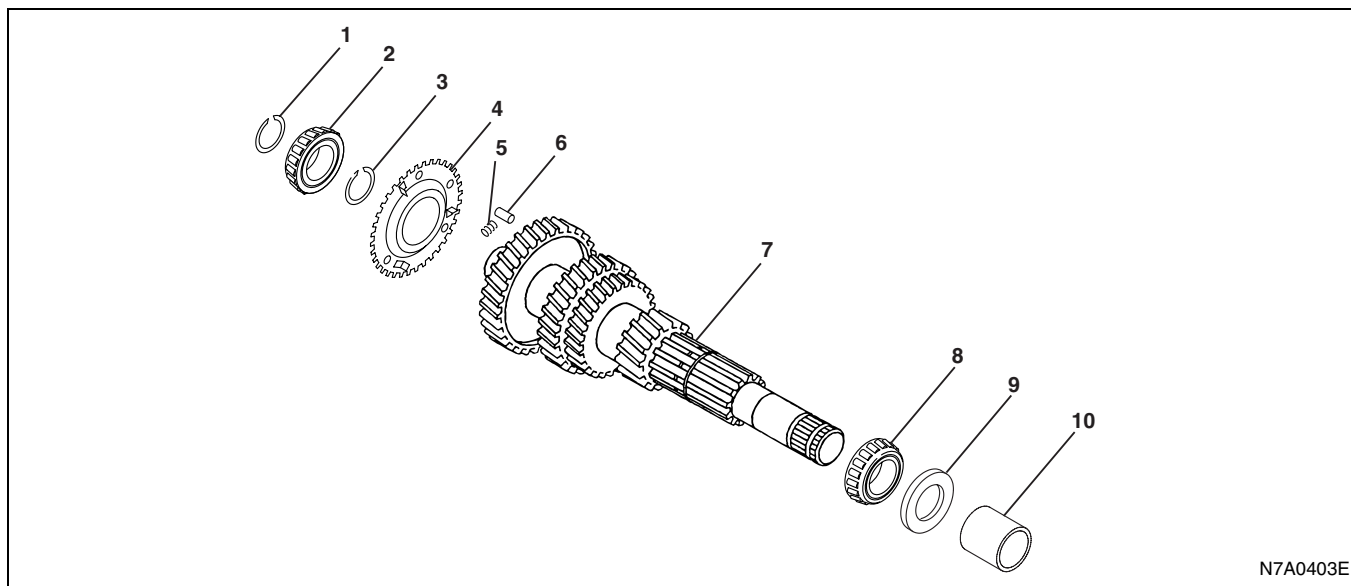
Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.

Special Tools

Illustration	Tool Number / Description / Remarks
 5884025870	5-8840-2587-0 / Bearing Remover
 5884040560	5-8840-4056-0 / Flange Holder

7B-88 MANUAL TRANSMISSION

Illustration	Tool Number / Description / Remarks
 5884022440	5-8840-2244-0 / Bearing Installer

Counter Shaft (6MT)**Components**

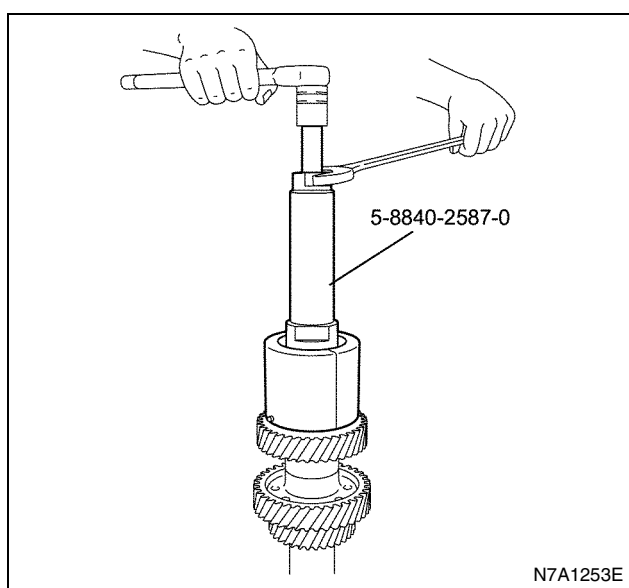
N7A0403E

Legend

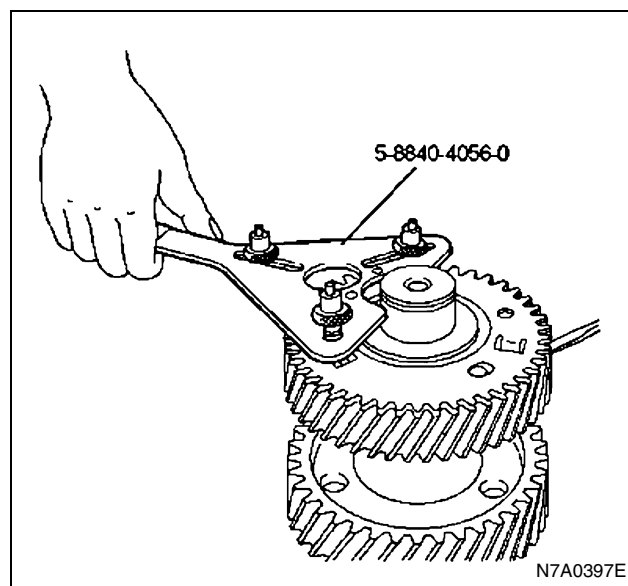
- | | |
|---------------------------|---------------------------|
| 1. Snap ring | 6. Straight pin |
| 2. Bearing; Counter front | 7. Counter shaft assembly |
| 3. Snap ring | 8. Bearing; Counter rear |
| 4. Anti-lash plate | 9. Thrust washer |
| 5. Coil spring | 10. Collar |

Disassembly

1. Remove the bearing fixing snap ring using snap ring pliers.
2. Remove the bearing; counter front using the bearing remover 5-8840-2587-0.



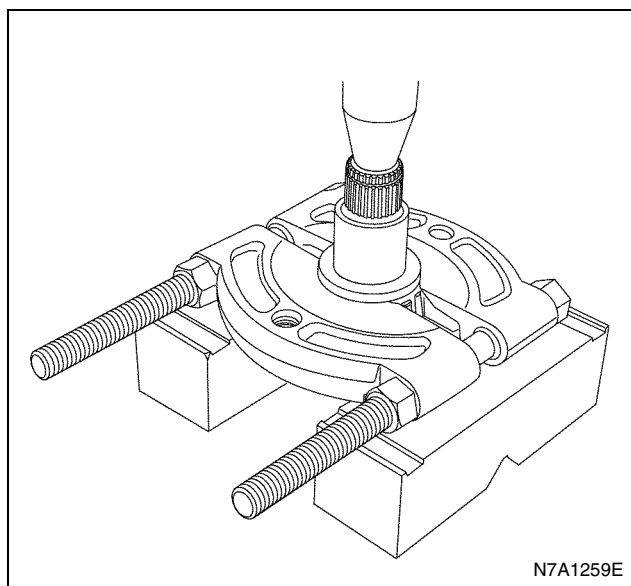
N7A1253E



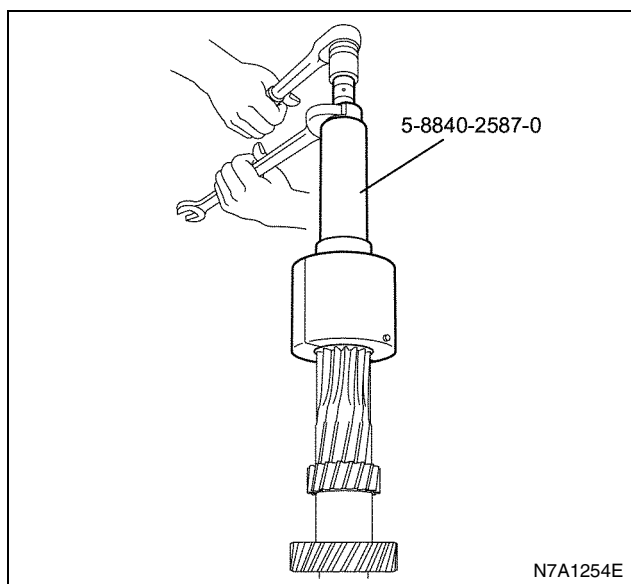
N7A0397E

5. Remove the three coil springs from the 5th gear.
6. Remove the straight pin from the 5th gear.
7. Remove the collar and thrust washer with a press using a bearing remover.

3. Remove the anti-lash plate fixing snap ring using snap ring pliers.
4. Remove the anti-lash plate using the flange holder 5-8840-4056-0.



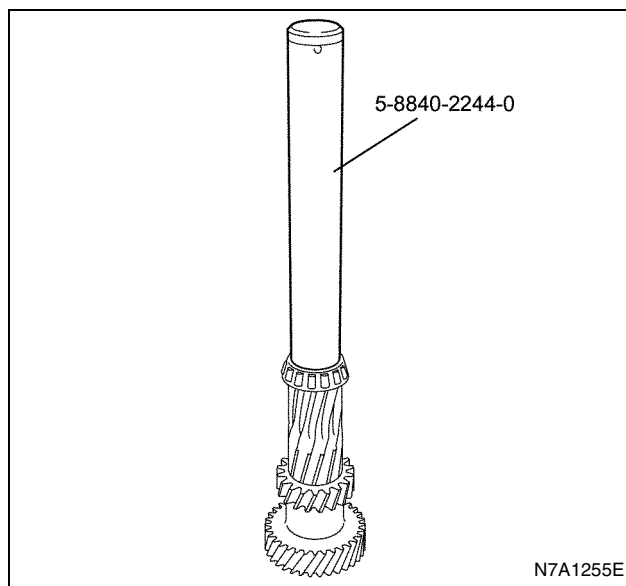
8. Remove the bearing; counter rear using the bearing remover 5-8840-2587-0.



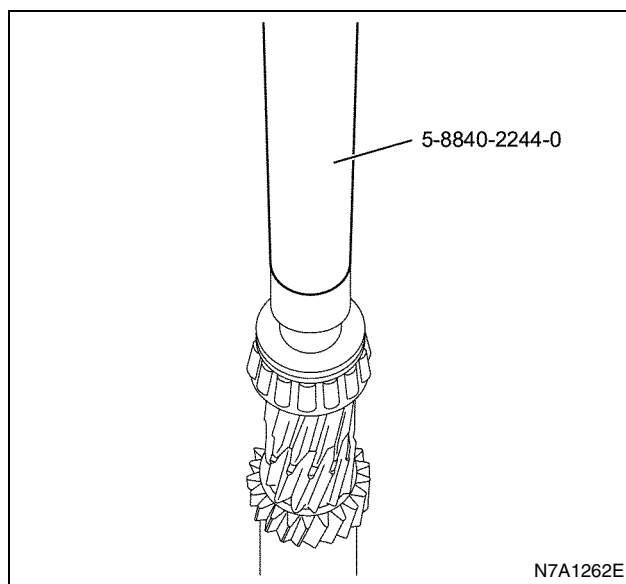
- If any wear, damage or other abnormality is found on the disassembled parts, repair or replace the parts.
9. Inspect the surface of each gear for damage or wear. If any abnormality is found, replace the gear.
 10. Inspect each bearing with respect to the following items. If any abnormality is found, replace with a new one.
 - Smoothness of rotation
 - Noise
 - Abnormal external appearance, including damage, rust, etc.
 - Abnormal free play in thrust direction

Assembly

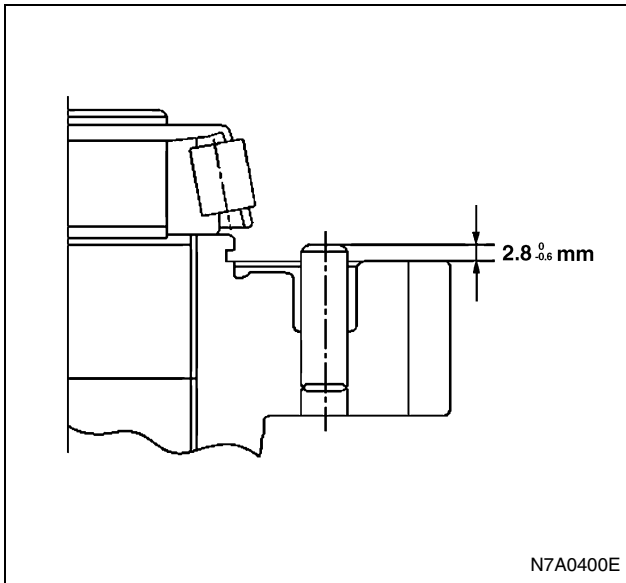
1. Insert the bearing; counter rear with a press using the installer 5-8840-2244-0.



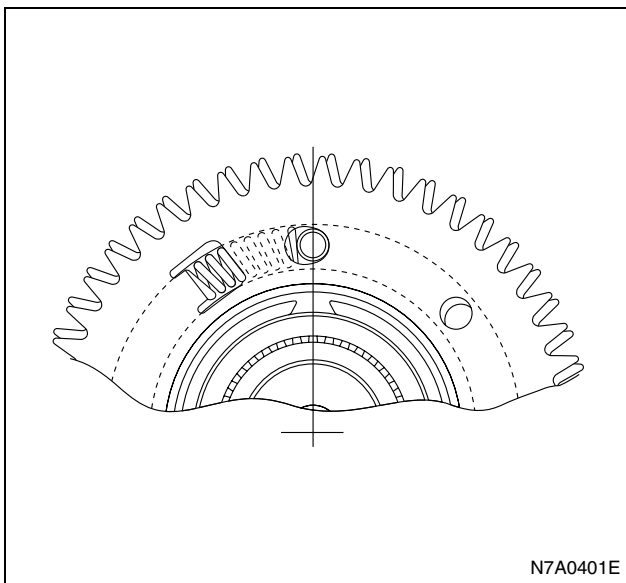
2. Insert the collar and thrust washer with a press using the installer 5-8840-2244-0.



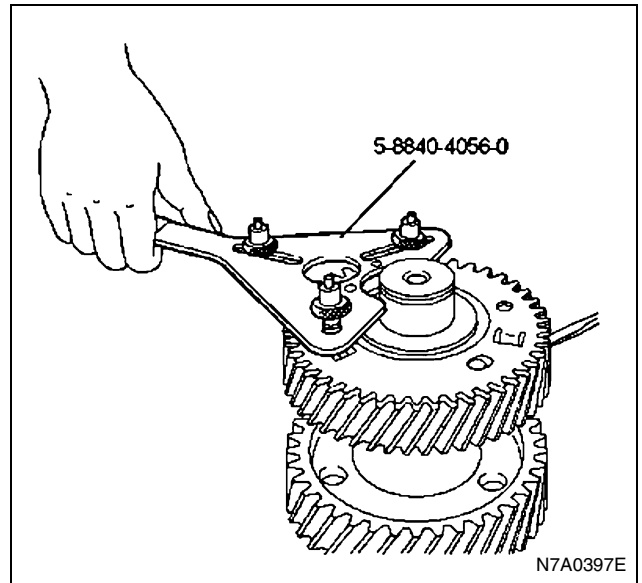
3. Install the straight pin within the range of protrusion.



4. Assemble the three coil springs to the groove on the side of the 5th gear, while these springs have to touch the left side of the pin viewing from the center of the gear.



5. Set the springs between the folded protrusion of the anti-lash plate and the straight pin. Using the flange holder 5-8840-4056-0, align the set hole of the anti-lash plate with the set hole of the 5th gear, and install.

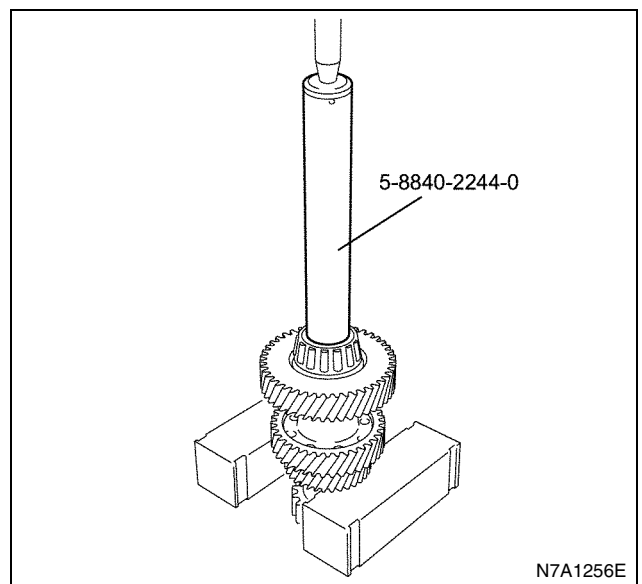


6. Install the anti-lash plate fixing snap ring using snap ring pliers.

Caution:

Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.

7. Install the bearing: counter front with a press using the installer 5-8840-2244-0.



8. Install the bearing fixing snap ring using snap ring pliers.
 - Select the thickest snap ring installable from the following three types.

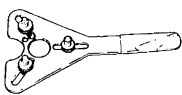
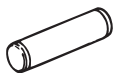
Thickness, mm (in)	Color
1.9 (0.0748)	Blue
2.1 (0.0826)	Yellow
2.3 (0.0905)	Pink

7B-92 MANUAL TRANSMISSION

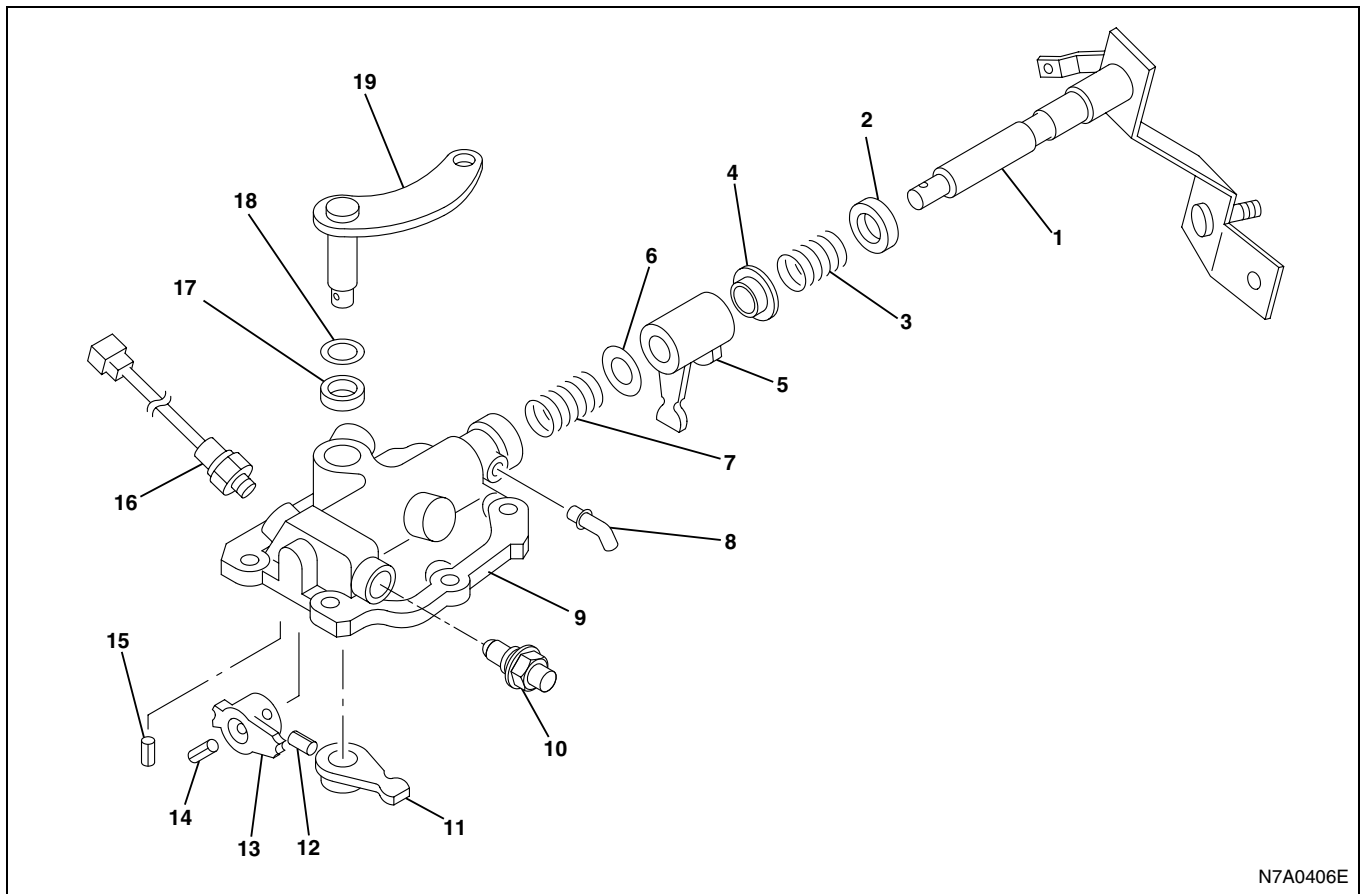
Caution:

Replace deformed or damaged snap rings with new ones. Check that the parts are securely installed.

Special Tools

Illustration	Tool Number / Description / Remarks
 5884025870	5-8840-2587-0 / Bearing Remover
 5884040560	5-8840-4056-0 / Flange Holder
 5884022440	5-8840-2244-0 / Bearing Installer

Control Box Components



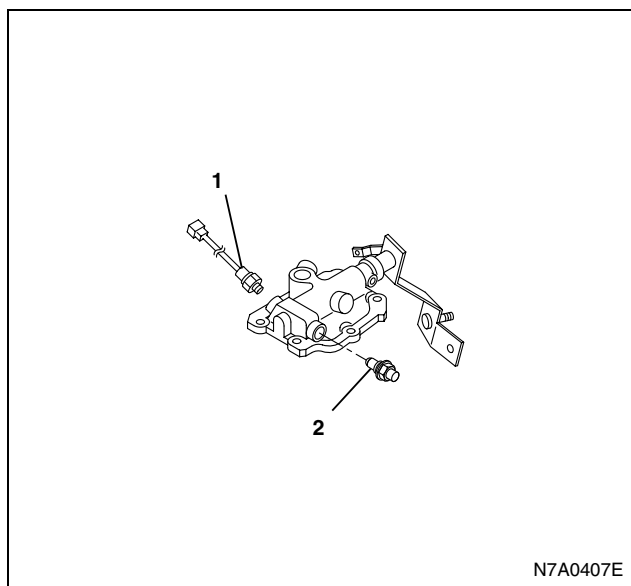
N7A0406E

Legend

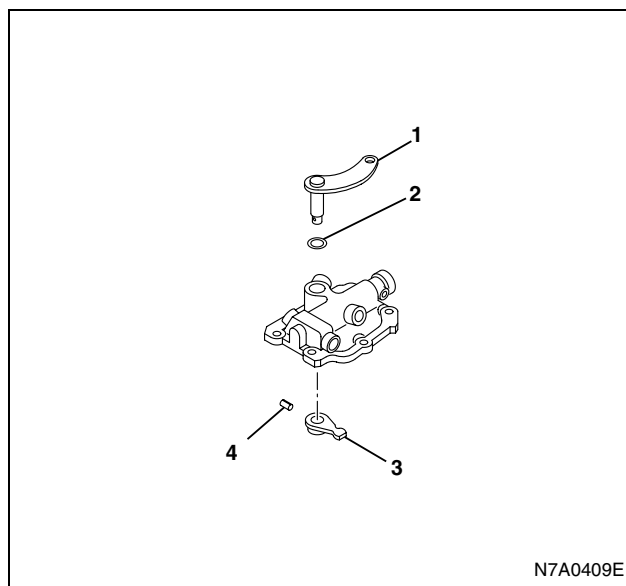
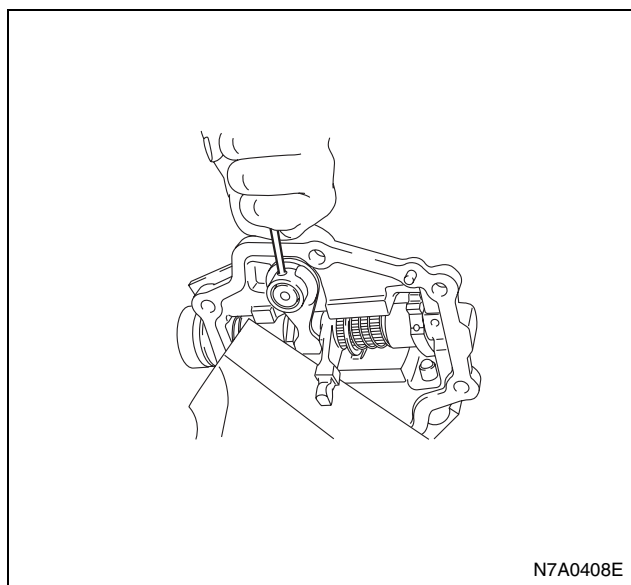
- | | |
|-------------------------------|---------------------------------------|
| 1. Shift lever shaft | 11. Select internal lever |
| 2. Shift lever shaft oil seal | 12. Spring pin; Select internal lever |
| 3. Spring | 13. Stopper ring |
| 4. Washer | 14. Spring pin; Stopper ring |
| 5. Shift internal lever | 15. Spring pin; Shift lever shaft |
| 6. Spring sheet | 16. Neutral switch |
| 7. Spring | 17. Select lever shaft oil seal |
| 8. Pipe | 18. Washer |
| 9. Control box | 19. Select external lever |
| 10. Detent | |

Disassembly

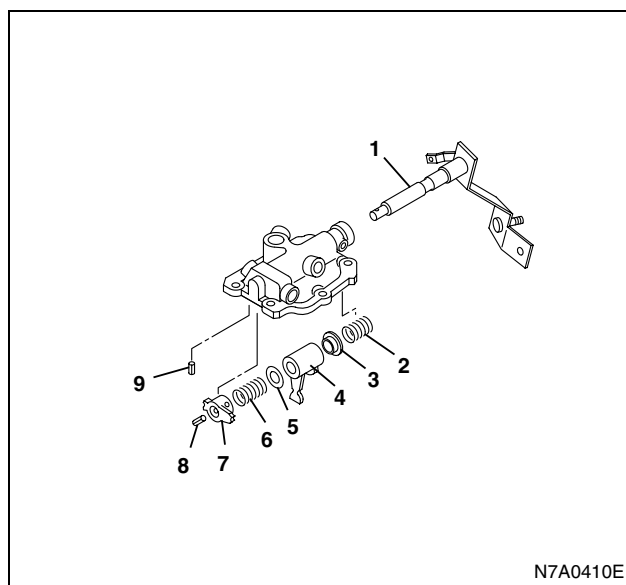
1. Remove the neutral switch (1) and detent (2).



2. Remove the spring pin; select internal lever (4) using the spring pin remover, and then remove the select internal lever (3), select external lever (1) and washer (2).



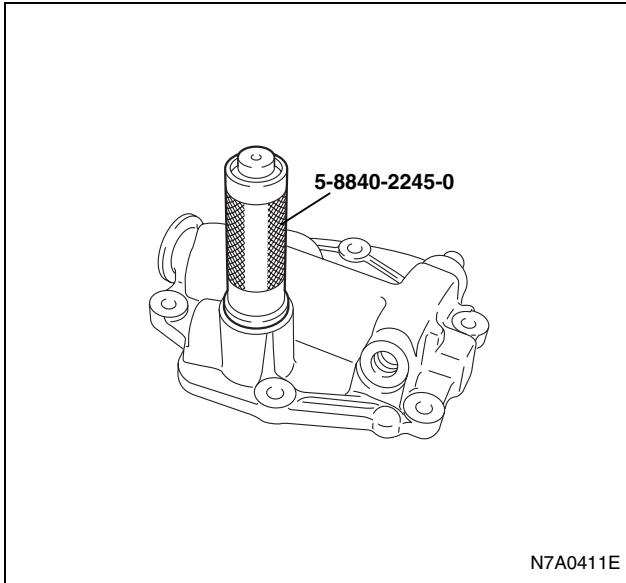
3. Remove the spring pin; stopper ring (8) and the spring pin; shift lever shaft (9).
4. Pull out the shift lever shaft (1), and remove the stopper ring (7), spring (6), spring sheet (5), shift internal lever (4), washer (3) and spring (2).



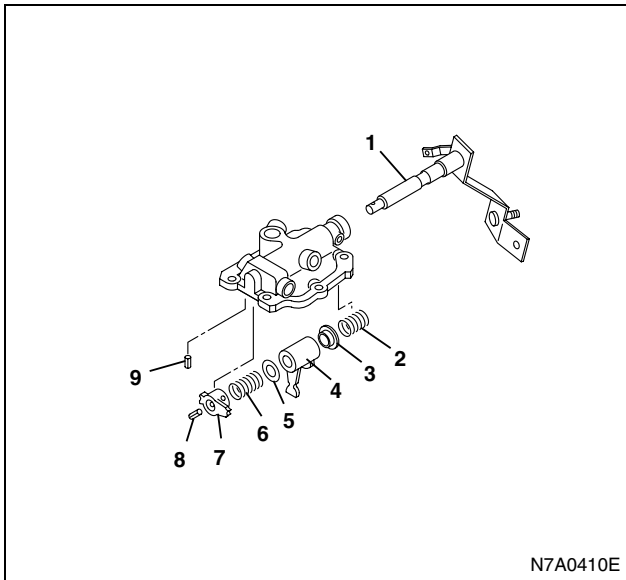
5. Pry and remove with a driver the select lever shaft oil seal and shift lever shaft oil seal from the control box.
If any wear, damage or other abnormality is found on the disassembled parts, repair or replace them.
6. Inspect wear of the shift shaft, free play of the control box and roughness of the manipulation. If any abnormality is found, replace the part.

Assembly

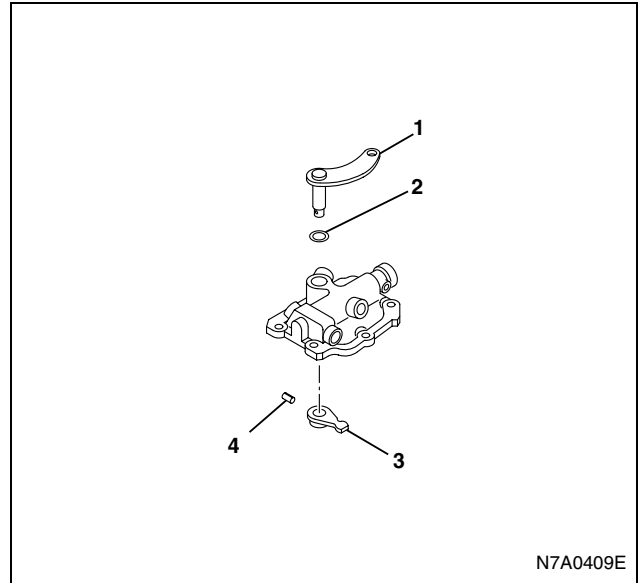
1. Using the installer 5-8840-2245-0 for the control box, install the shift lever shaft oil seal and select lever shaft oil seal.



2. Assemble the spring (2), washer (3), shift internal lever (4), spring sheet (5), spring (6) and stopper ring (7) to the control box. Insert the shift lever shaft (1). Align the pin hole of the shift lever shaft with the pin hole of the stopper ring, and then drive in a new spring pin; stopper ring (8) and spring pin; shift lever shaft (9).



3. Insert the select external lever (1) and washer (2) into the control box. Install the select internal lever (3), and then drive in a new spring pin; select internal lever (4).



4. Install the detent (2).
 - The detent contains pre-coating agent. Remove completely the seal agent on the screw of the case side before using new detent.

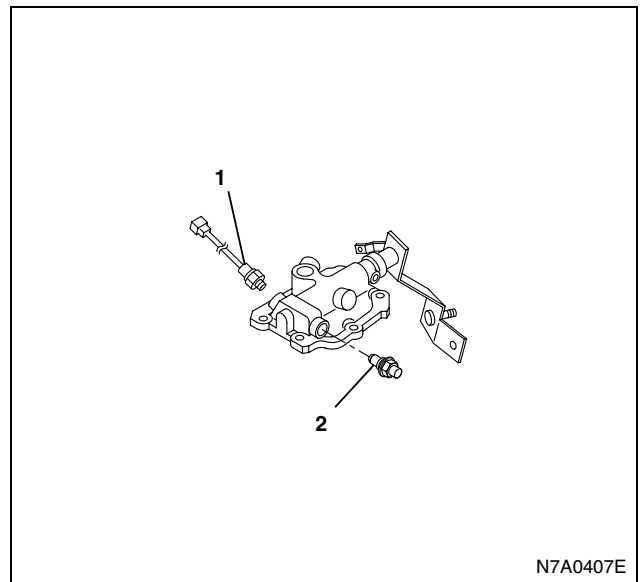
Tighten:

Detent (2) to 28 N·m (2.9 kg·m / 21 lb·ft)

5. Fix the neutral switch (1) to the specified torque.

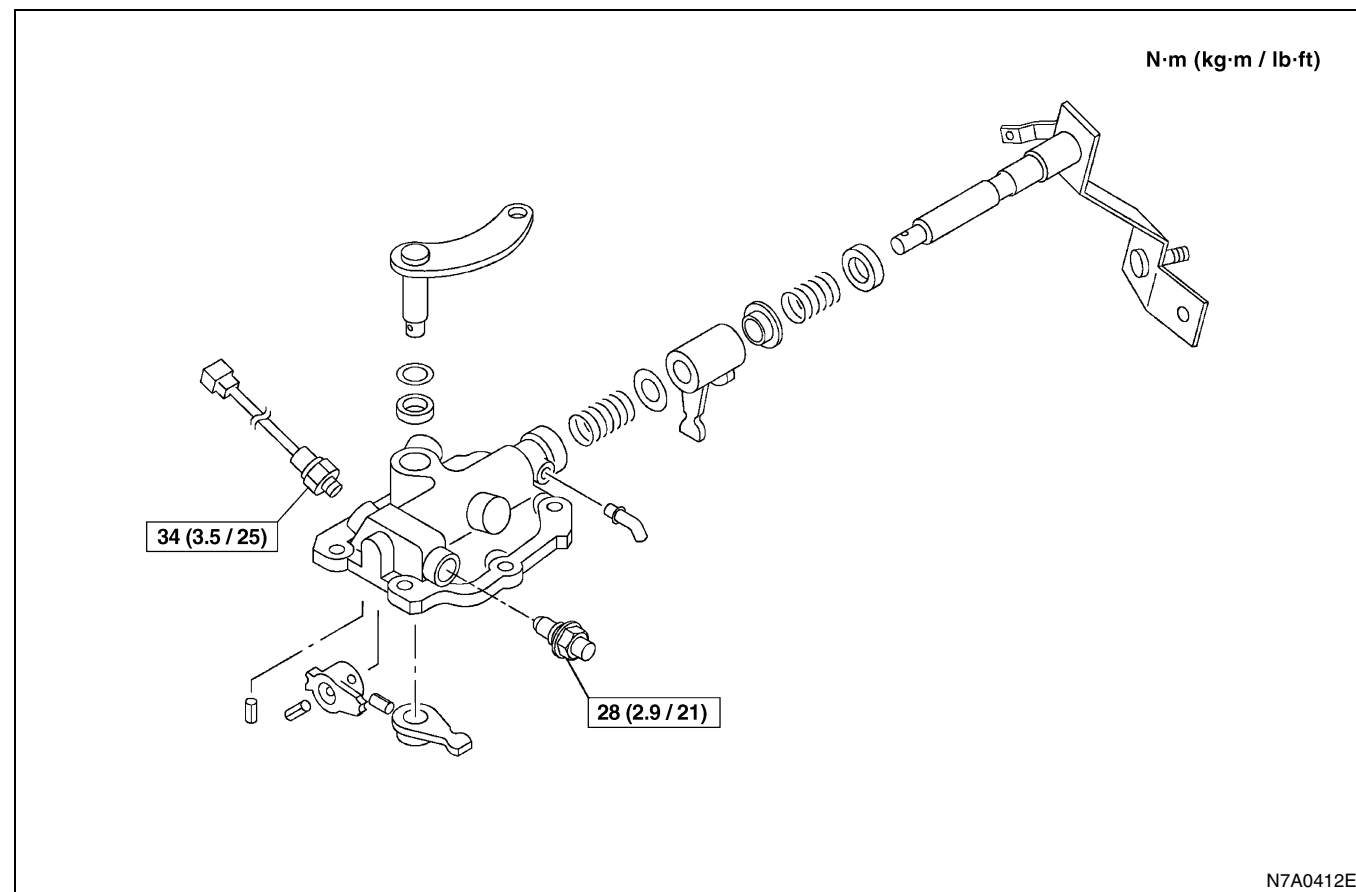
Tighten:

Neutral switch (1) to 34 N·m (3.5 kg·m / 25 lb·ft)

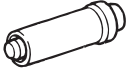


Specifications

Transmission Type			MY6P	MY5T
Control System			Floor Remote Control	Floor Remote Control
Gear Ratio				
	Transmission	1st	5.979	5.315
		2nd	3.434	3.053
		3rd	1.862	1.655
		4th	1.297	1
		5th	1	0.721
		6th	0.774	—
		Reverse	5.701	5.068
Oil Capacity L (US qt / Imp qt)	Standard	3.5 (3.7 / 3.1)	2.8 (3.0 / 2.5)	
	4 × 4 Vehicle	—	3.5 (3.7 / 3.1)	
	With Front PTO	—	5.5 — 6.0 (5.8 — 6.3 / 4.8 — 5.3)	
	With Side PTO	3.8 (4.0 / 3.3)	3.1 (3.3 / 2.7)	
	With Side PTO (4 × 4 Vehicle)	—	3.8 (4.0 / 3.3)	
Oil			Besco Transaxle Oil 5W-30	

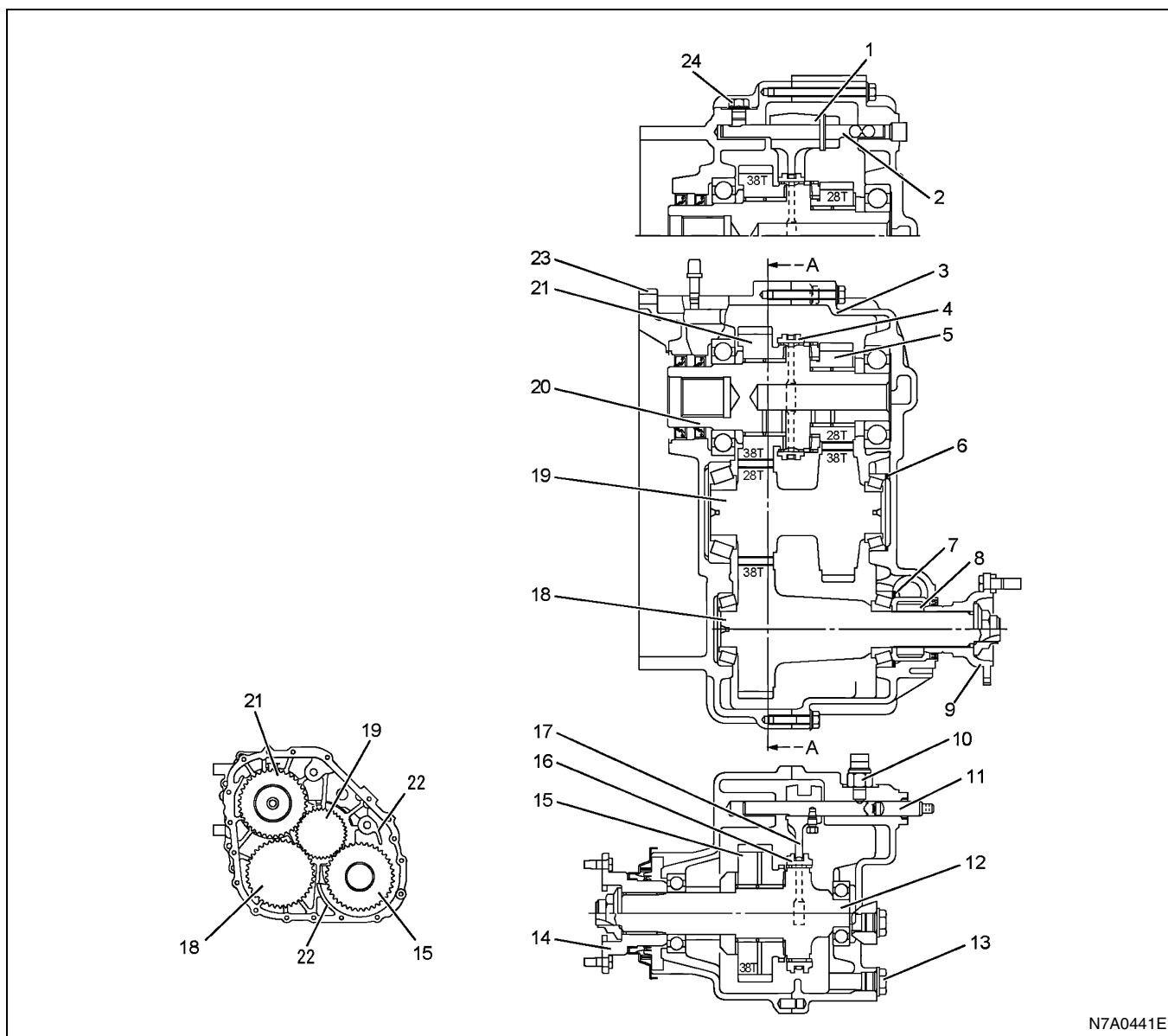
Fixing Torque

Special Tools

Illustration	Tool Number / Description / Remarks
 5884022450	5-8840-2245-0 / Control Box Oil Seal Installer

Transfer System (MYT Rigid Type)

Function and Operation



N7A0441E

Legend

- | | |
|------------------------------------|-----------------------------------|
| 1. Low / high shift arm | 13. Drain plug |
| 2. Low / high shift rod | 14. Driver coupling; Front output |
| 3. Transfer rear case | 15. Front output drive gear |
| 4. Sleeve; Low / high | 16. Sleeve; 2WD / 4WD |
| 5. Transfer low gear | 17. 2WD / 4WD shift arm |
| 6. Shim; Counter shaft bearing | 18. Rear output shaft |
| 7. Shim; Rear output shaft bearing | 19. Idle gear shaft |
| 8. Speedometer drive gear | 20. Input shaft |
| 9. Driver coupling; Rear output | 21. Transfer high gear |
| 10. 2WD / 4WD sensor switch | 22. Current plate |
| 11. 2WD / 4WD shift rod | 23. Transfer front case |
| 12. Front output shaft | 24. Low / high sensor switch |

Specifications

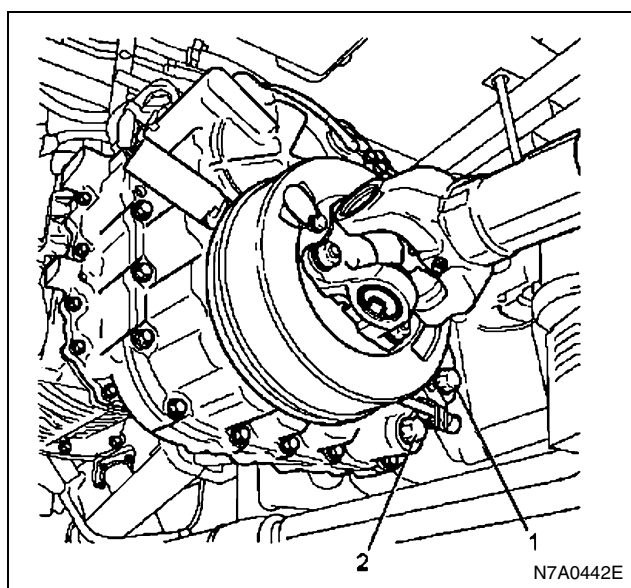
Type		2nd, helical gear type
Gear Ratio	High Range	1.000 (28/38 × 38/28)
	Low Range	1.842 (38/28 × 38/28)
Specified Oil		Besco Gear Oil Transaxle (5W-30)
Oil Capacity	L (US qt/Imp qt)	1.8 (1.9 / 1.6)

Transfer Assembly (MY Y Rigid Type)

Removal

Preparation

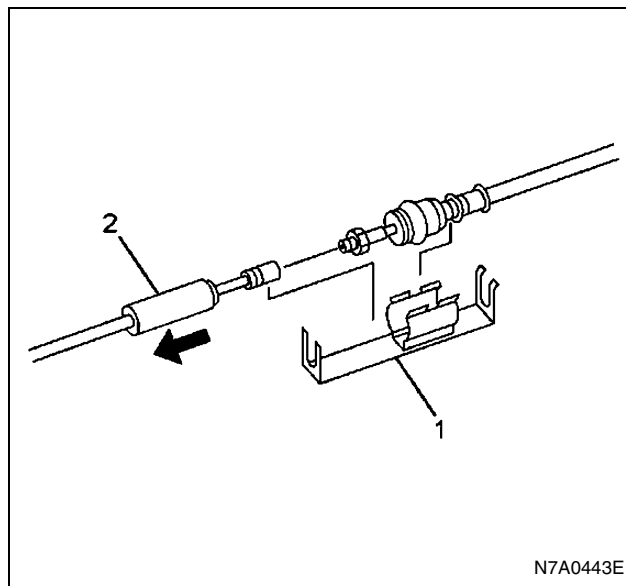
- Jack up the vehicle, and support with a rigid rack.
- Remove the drain plug, and drain the oil.



Legend

1. Filler plug
2. Drain plug

1. Remove the propeller shaft guard.
2. Remove the transfer side of the rear propeller shaft.
 - Before removing the propeller shaft, put alignment marks on the transfer flange and the propeller shaft flange yoke.
 - The removed propeller shaft must be put aside not to interfere with the operation, and fix securely with wire.
3. Disconnect the parking brake cable.
 - Remove the cable bracket (1) and slide the cover (2) in the direction indicated by an arrow.
 - Loosen the lock nut, and remove the front cable and the rear cable.



- Remove the cable clip of the rear cable.
4. Remove the front propeller shaft.
 - Before removing the propeller shaft, put alignment marks on the transfer flange and the propeller shaft flange yoke.
 5. Remove the low / high shift cable installation bracket.
 6. Remove the vehicle speed sensor connector.
 7. Remove the 2WD / 4WD change warning lamp switch connector.
 8. Remove the 2 parts of the vacuum hose.
 9. Remove the harness and nut on the transfer side.
 10. Remove the transfer assembly from the transmission.
 - Set securely the transmission jack to the transfer assembly.
 - Remove 11 bolts and 2 nuts for transfer installation.
 - Remove the transfer assembly by operating the transmission jack.

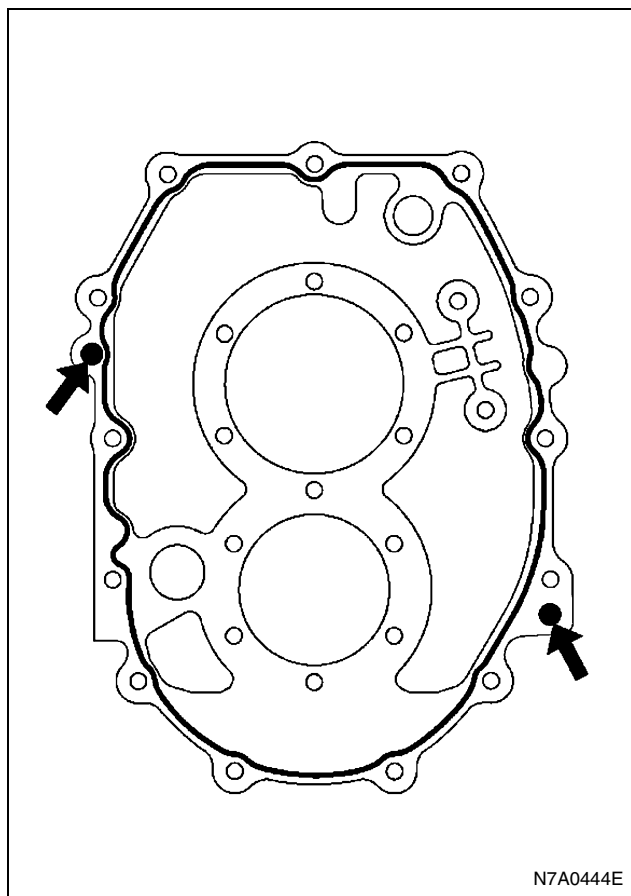
Installation

Install in the reverse order of removal, observing the following items.

- Apply liquid packing (ThreeBond 1215) on the transfer mating surface of the transmission case.

7B-100 MANUAL TRANSMISSION

- Liquid packing (ThreeBond 1215) must be applied continuously with a diameter of 2 mm (0.079 in).
- Align the transfer assembly with the stud bolts indicated by arrows, and install it to the transmission.

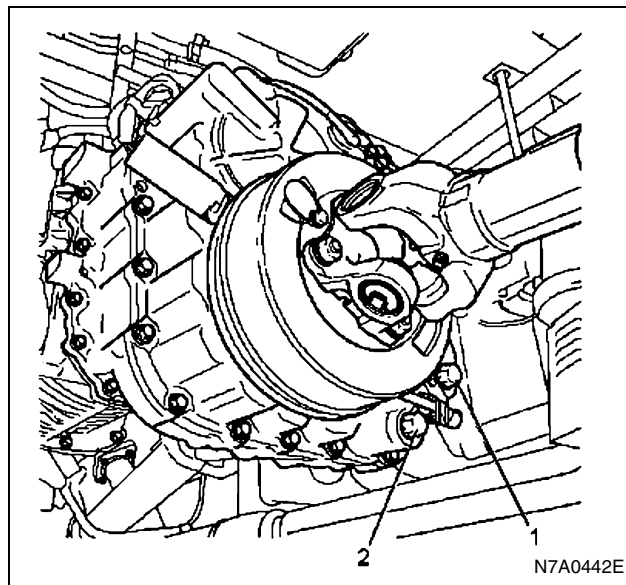


- Transfer assembly to transmission assembly fixing torque

Tighten:

Transfer assembly to transmission assembly to 46 N·m (4.7 kg·m / 34 lb·ft)

- Inject gear oil into the transfer assembly.
Product Name: Besco Gear Oil Transaxle (5W-30)
Capacity: 1.8L (1.9 US qt / 1.6 Imp qt)



Legend

1. Filler plug
2. Drain plug

- Fixing torque of the oil filler and drain plug

Tighten:

Oil filler and drain plug to 39 N·m (4.0 kg·m / 29 lb·ft)

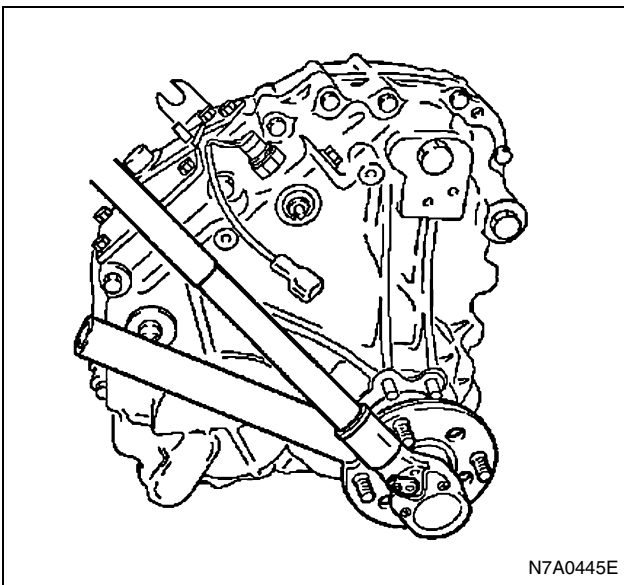
Transfer (MYT Rigid Type)

Disassembly

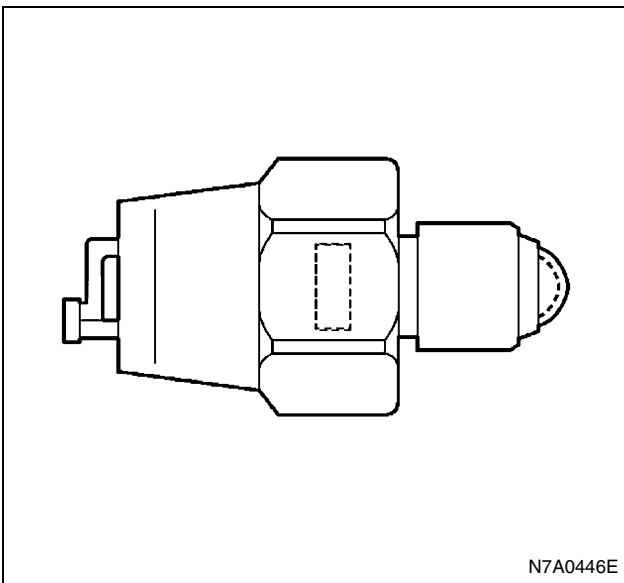
Caution:

Make sure to shift the gear to 4H before disassembling the front & rear transfer case.

1. Securely raise the caulking parts of the lock nut of the coupling driver.
2. Fix the rear coupling driver using the flange holder 5-8840-2043-0, and remove the lock nut.
3. Fix the front coupling driver using the flange holder 5-8840-0133-0, and remove the lock nut.
 - The rear coupling driver is shown in the figure below.

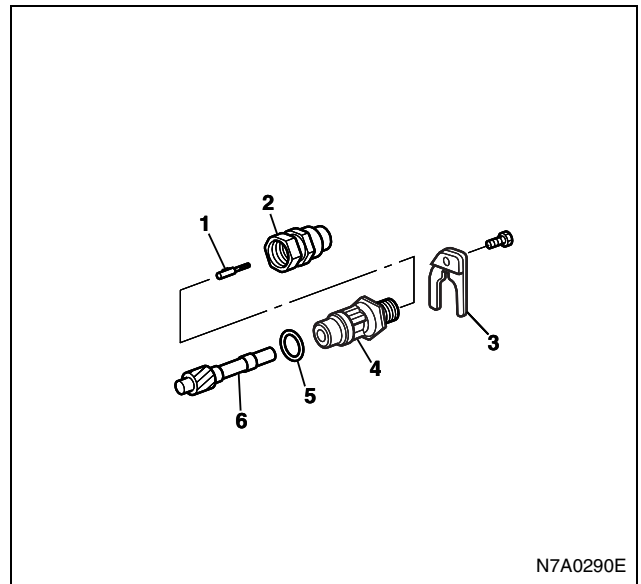


4. Remove the 2WD/4WD change warning lamp switch.



5. Remove the breather.

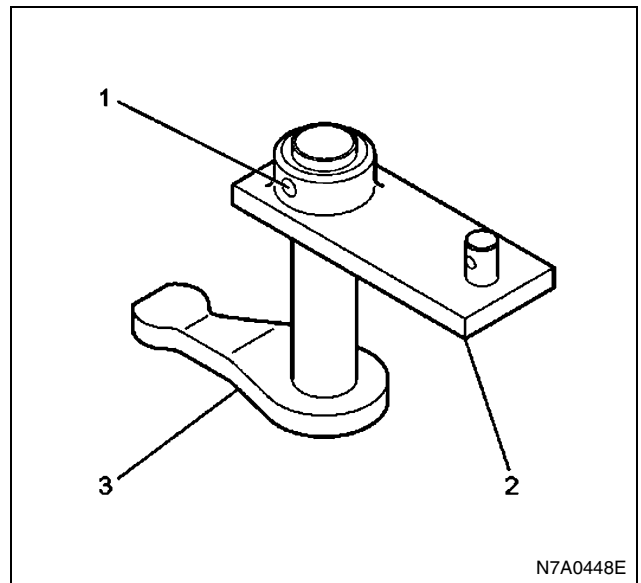
6. Remove the speed sensor driven gear.



Legend

1. Insertion key
2. Vehicle speed sensor
3. Plate
4. Bush
5. O-ring
6. Driven gear

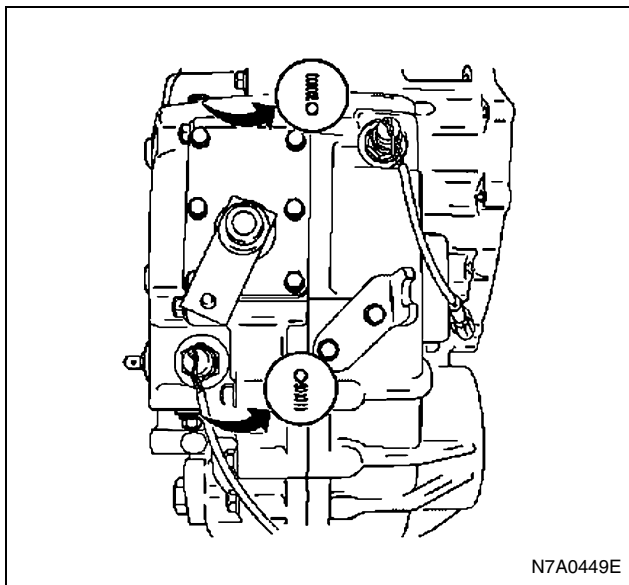
7. Remove the low / high change lever.



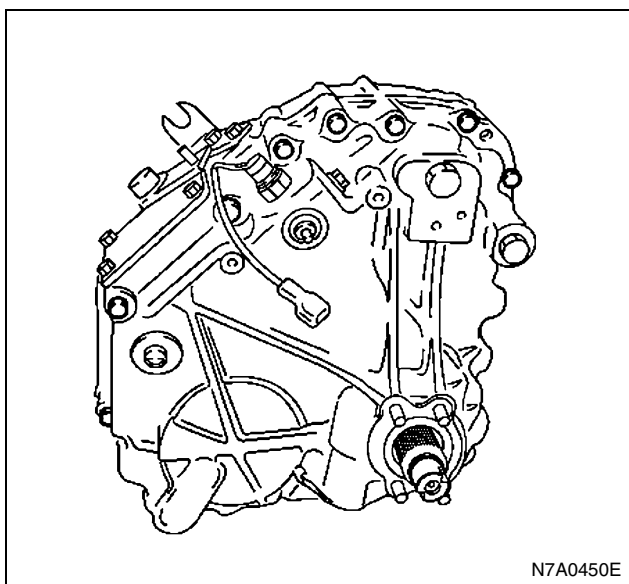
Legend

1. Spring pin
2. Select external lever
3. Select internal lever

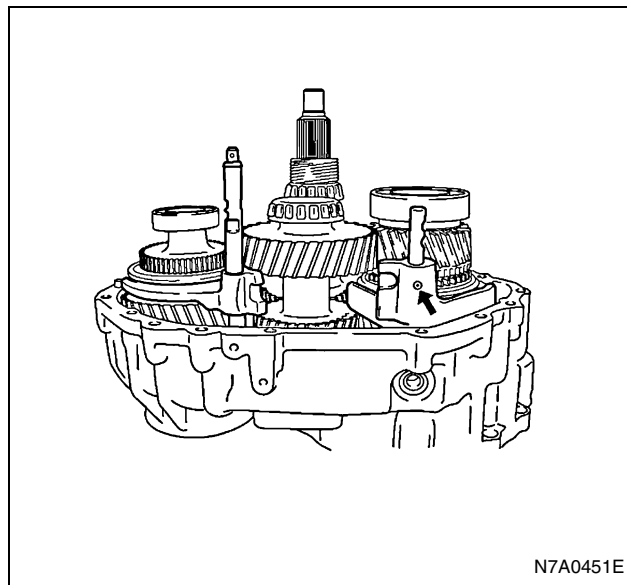
8. Remove the control cable bracket.
9. Remove the detent ball and detent spring.
 - Two parts



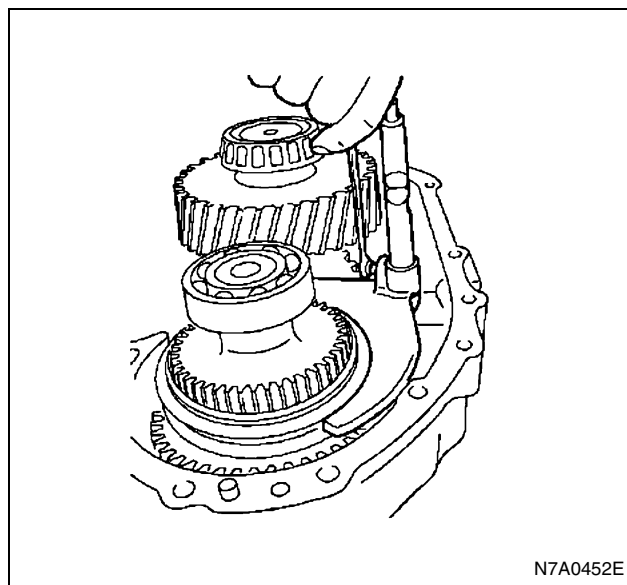
10. Remove the transfer rear case.
- Remove the 18 bolts.



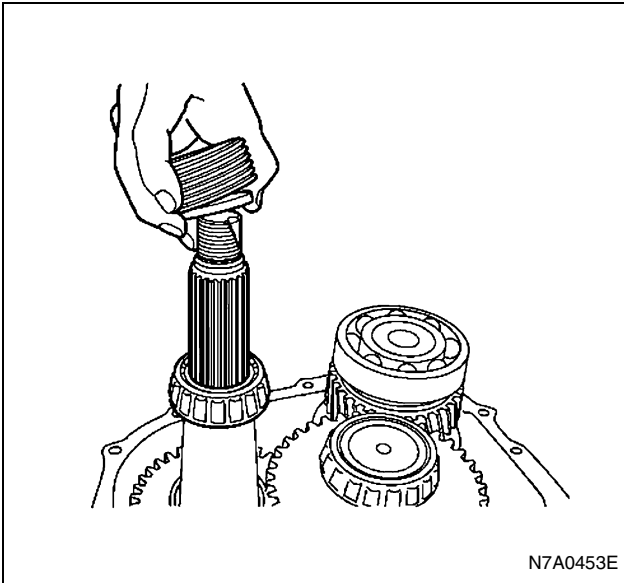
11. Remove the low / high change shift arm and the shift lock.
- Drive out the spring pin, and then remove the shift arm and the shift rod.



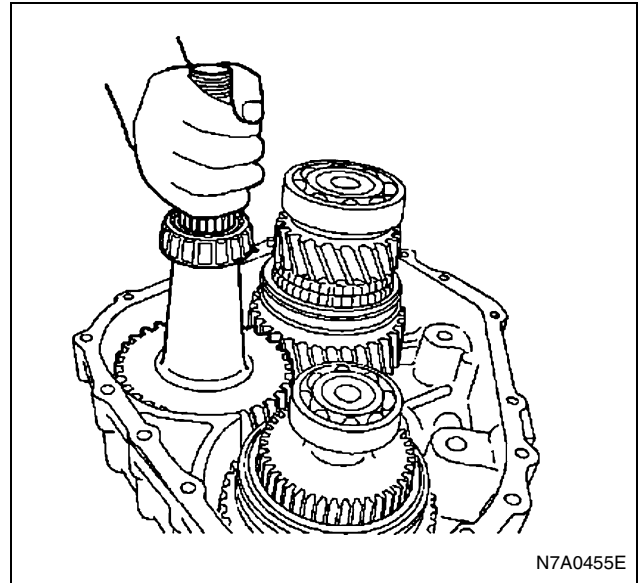
12. Remove the 2WD / 4WD change shift arm and shift rod.
- Loosen the shift arm fixing bolt, and remove the shift arm and the shift rod.



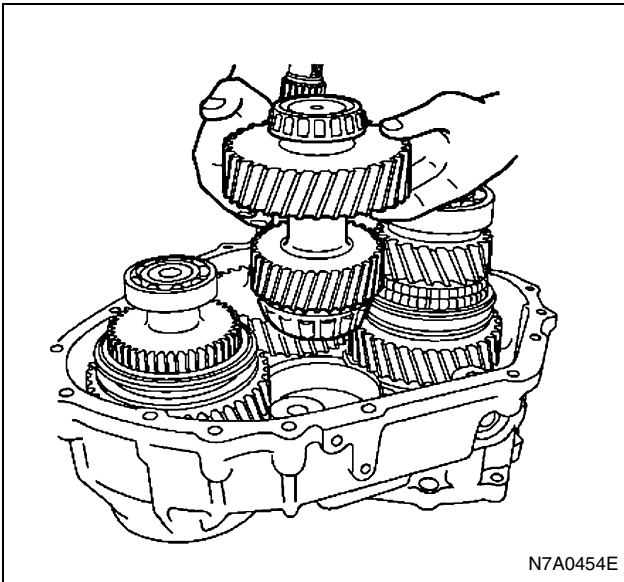
13. Remove the speedometer driven gear and the thrust washer.



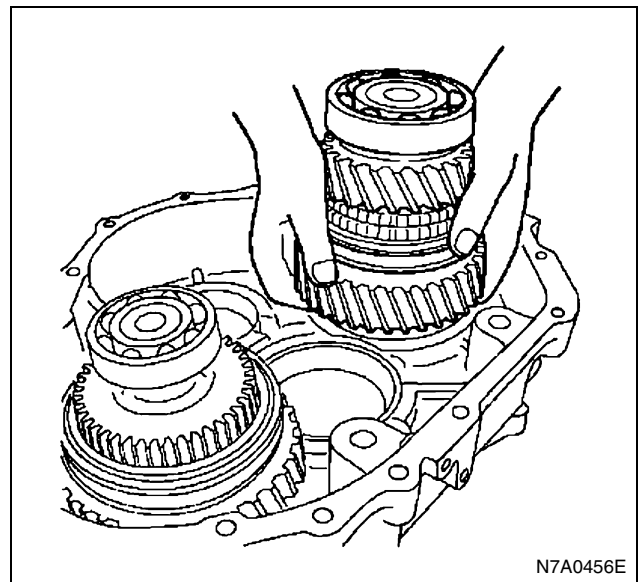
14. Remove the idle gear shaft from the transfer case.



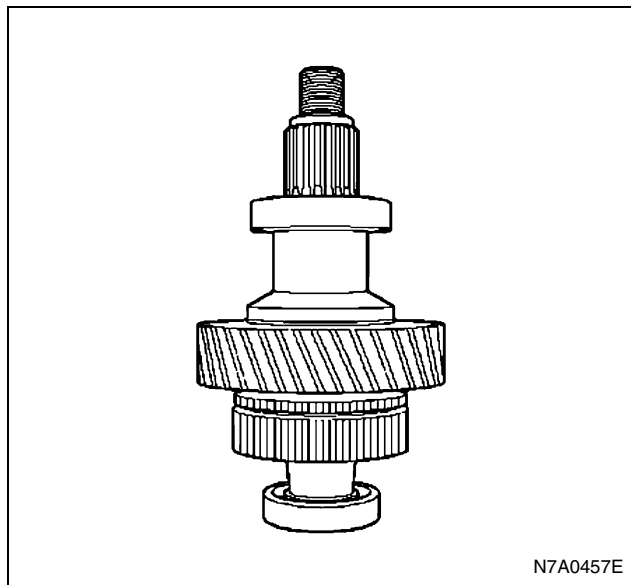
16. Remove the input gear shaft from the transfer case.



15. Remove the rear output gear shaft from the transfer case.

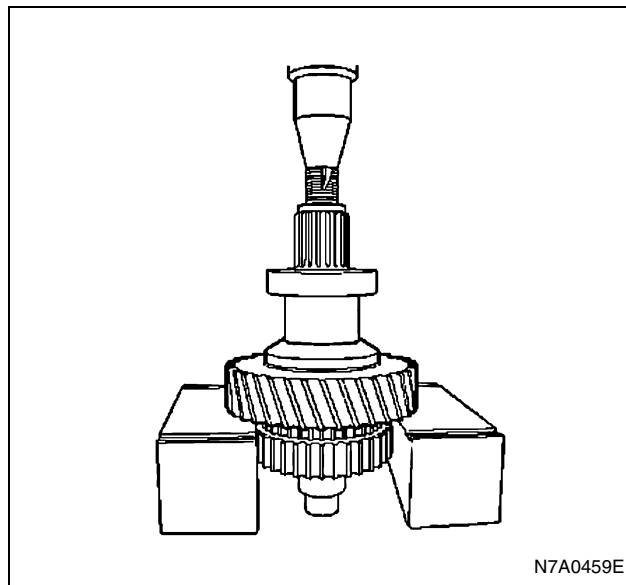


17. Remove the front output gear shaft from the transfer case.



18. Remove the front & rear bearing from the idle shaft.

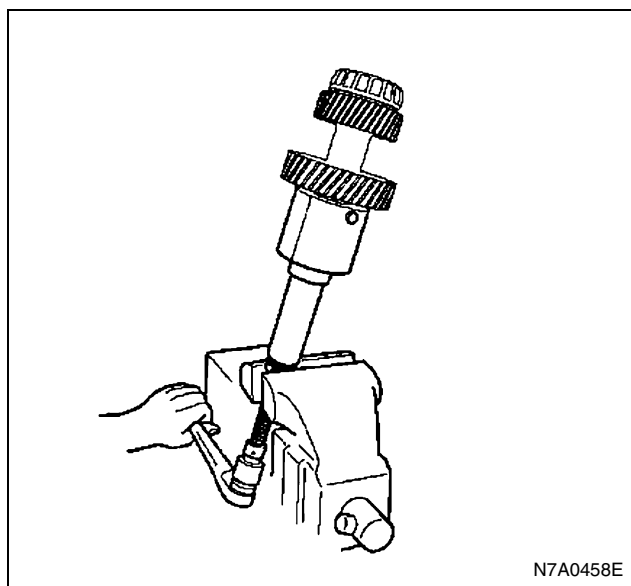
- Remove the front bearing using a general-purpose bearing remover.
- Remove the rear bearing using the insert 303173 and the collet 44801 from among the parts of the bearing remover 5-8840-2587-0.



- After removing the ball bearing, remove the collar, thrust washer, front output drive gear and needle bearing.

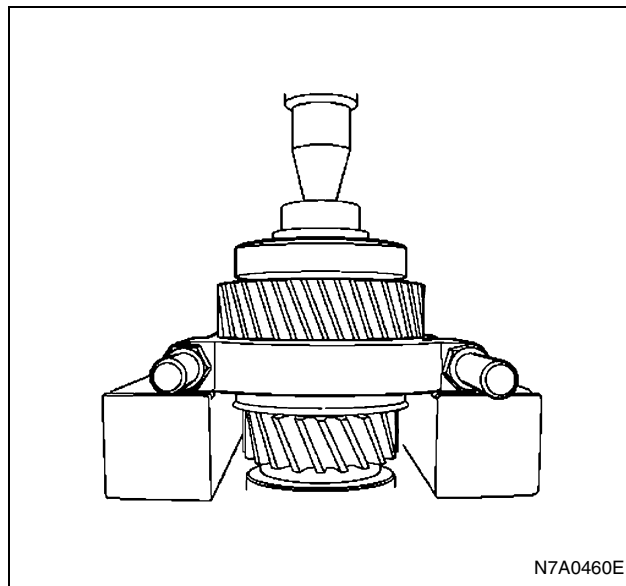
20. Disassemble the input gear shaft.

- Remove the front & rear bearing using a general-purpose bearing remover.



19. Disassemble the front output gear shaft.

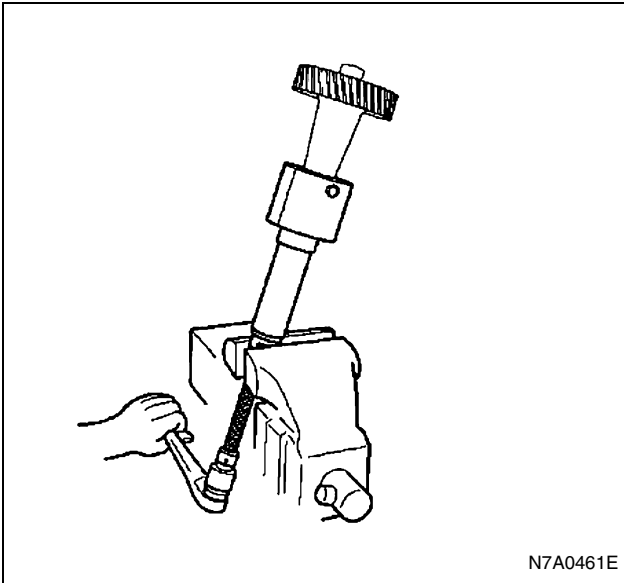
- Before removing the ball bearing, put a mark which indicates the installation direction.
- Remove the front & rear bearing using a general-purpose bearing remover.



- After removing the front bearing, remove the thrust washer, transfer high gear, needle bearing and sleeve.
- After removing the rear bearing, remove the thrust washer, transfer low gear and needle bearing.

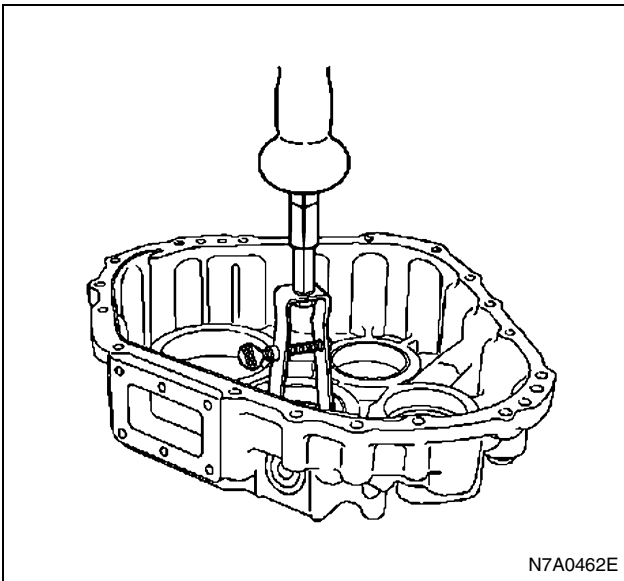
21. Remove the front & rear bearing from the rear output gear shaft.

- Remove using the bearing remover 5-8840-2587-0.
- Remove using the insert 303173 and the collet 44801 from among the parts of the bearing remover.



22. Remove the bearing outer race of the idle gear shaft.

- Remove using the bearing race remover 5-8840-0027-0.



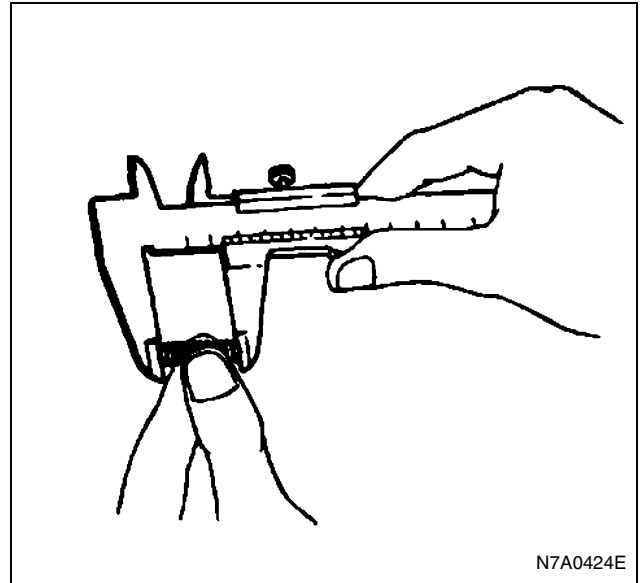
Assembly

1. Clean and inspect the disassembled parts. If any abnormality including wear, damage or corrosion is found, repair or replace the part.

- Measure the free length of the detent spring.

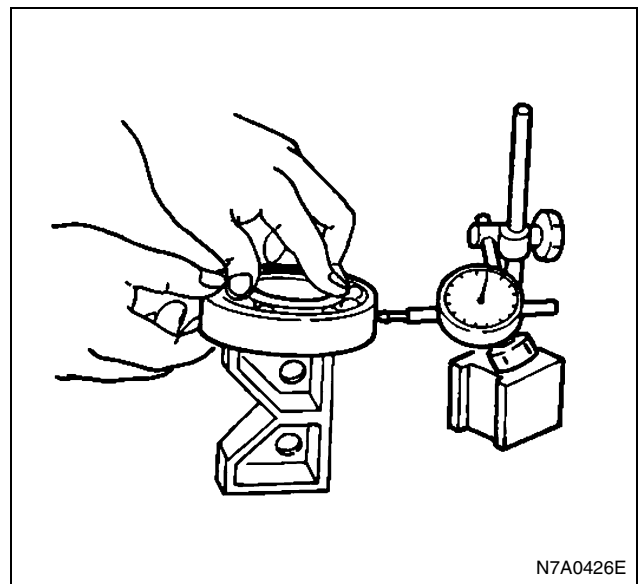
Free Length of Detent Spring

Standard: 31.6 mm (1.244 in) Limit: 30.1 mm (1.185 in)



- Inspect each bearing. If any abnormality is found, replace the bearing.
 - Smoothness of rotation
 - Noise
 - Abnormal external appearance, including damage or rust
 - Abnormal free play in thrust direction
 - Discoloration, excessive wear and pitching of rotating body and rotating surface of needle bearing
- Measure the free play in the radial direction of the ball bearing.

Free play in the radial direction of the ball bearing
Limit: 0.2 mm (0.0079 in)



- Inspect the sleeve sliding surface of the shift arm. Check that there is no excessive wear or damage.
- Inspect the gear. Repair slight stepped surface or roughness using an oil stone or pencil grinder.

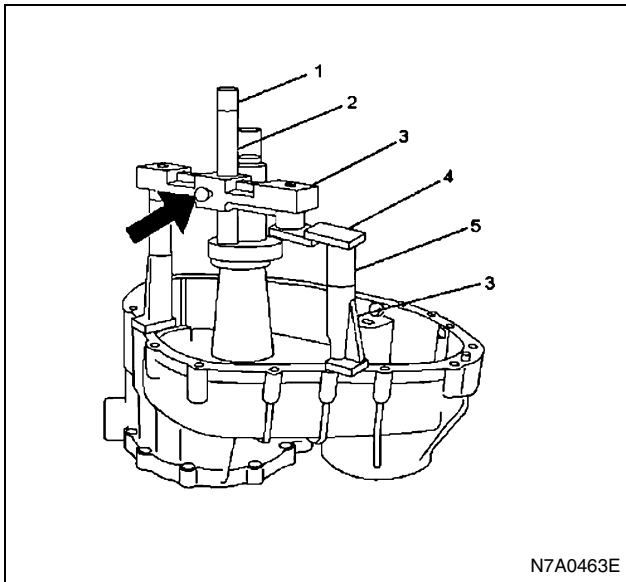
- Damage on tooth surfaces
- Excessive wear of tooth surfaces
- If excessive wear or damage is found on the tooth surfaces of the dog clutch, replace the part.

- Oil seal

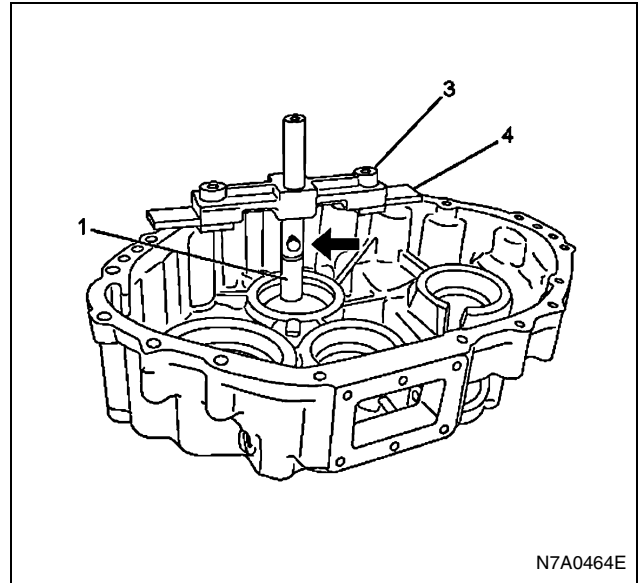
- Replace the removed oil seal with a new one.

2. Bearing shim adjustment

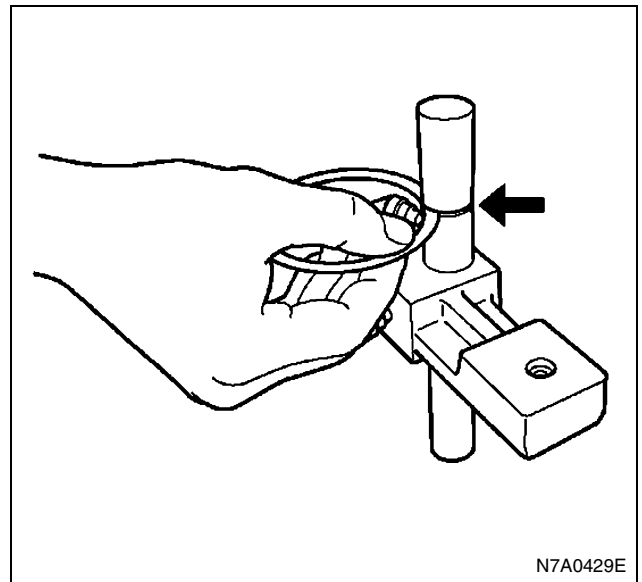
- Adjust the thickness of the shim of the rear output shaft rear bearing, using the shim selector 5-8840-0194-0 and shim selector adaptor 5-8840-2794-0.
- Measure the thickness of the shim, using the gauge pin J-35824-8 (1), gauge cylinder J-35824-31(2), bridge assembly J-35824-1(3), extension J-35824-19(4) and spacer J-35824-30(5) included in the shim selector gauge and the shim selector set.



- a. Loosen the screw, put the gauge cylinder on the rear bearing edge surface of the output shaft, and fix with the screw.
- b. Remove the leg and spacer from the bridge. Install the extension (4) to the bridge to enable the bridge to connect to the rear transfer case mating surface.



- c. Turn the bridge assembly upside down, and then set the bearing assembly to the installation hole surface of the output shaft rear bearing of the mating side rear transfer case.
- d. Loosen the screw, put the gauge pin (1) on the bearing installation surface, and fix the screw.
- e. Measure the clearance between the gauge cylinder and the gauge pin, and select the size of the shim. Adjustment to the standard end plate 0 — 0.05 mm (0 — 0.002 in) becomes possible.



- Set the selected shim on the bearing surface of the bearing race, and press in the race.
- Adjust the shim for the bearing outer of the idle shaft in the same manner.

Shims, which can be selected, mm (in)	
Idle gear shaft	0.18 (0.0070)
Rear output gear shaft	0.25 (0.0098)
	0.30 (0.0118)
	0.35 (0.0137)
	0.40 (0.0157)
	0.50 (0.0196)

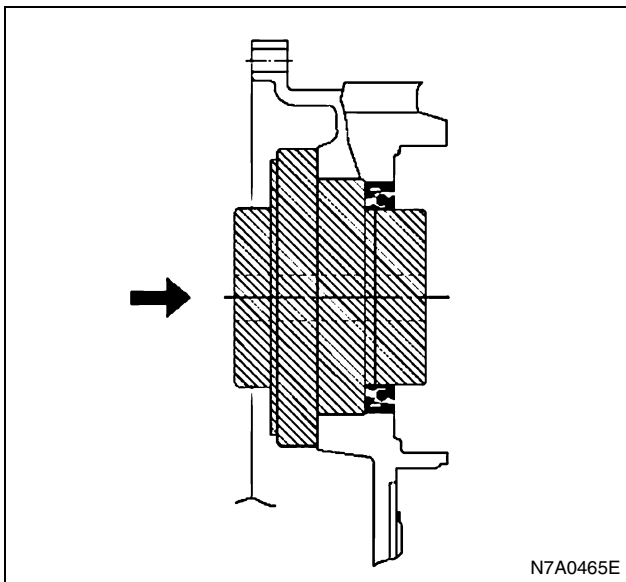
3. Install the oil seals of the rear output shaft, front output shaft and input shaft.

- Apply engine oil on the outer circumference of a new oil seal, and apply grease (Besco L2 or equivalent) to the lip part.
- Install the rear output oil seal using the installer 5-8840-2775-0.
- Install the front output oil seal using the installer 5-8840-2774-0.
- Install the input oil seal using the installer 5-8840-2776-0.

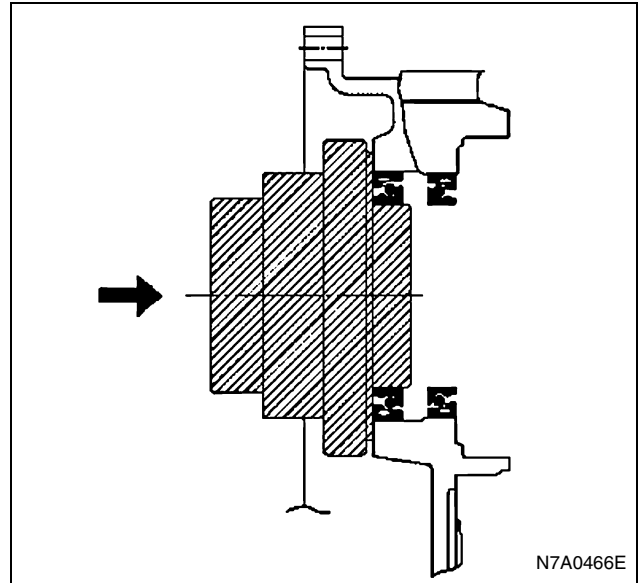
Caution:

Make sure to install the inner side and outer side of the input shaft oil seal from the transmission side.

- Installation direction of the inner side oil seal of the input shaft is indicated.

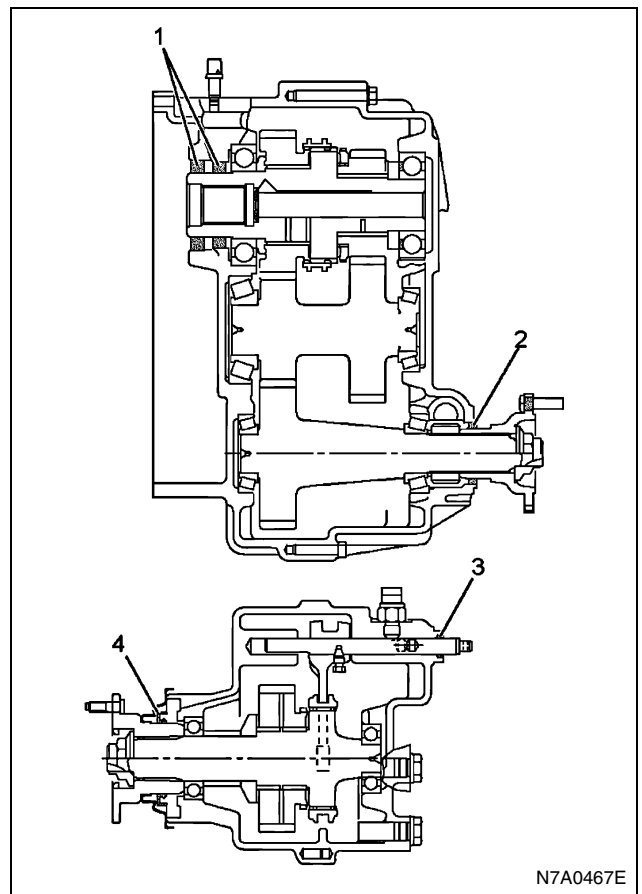


- Installation direction of the outer side oil seal of the input shaft is indicated.



- Install the oil seal of the 2WD / 4WD change shift rod part of the rear transfer case.
- Install the front output shaft oil seal to the front transfer case.

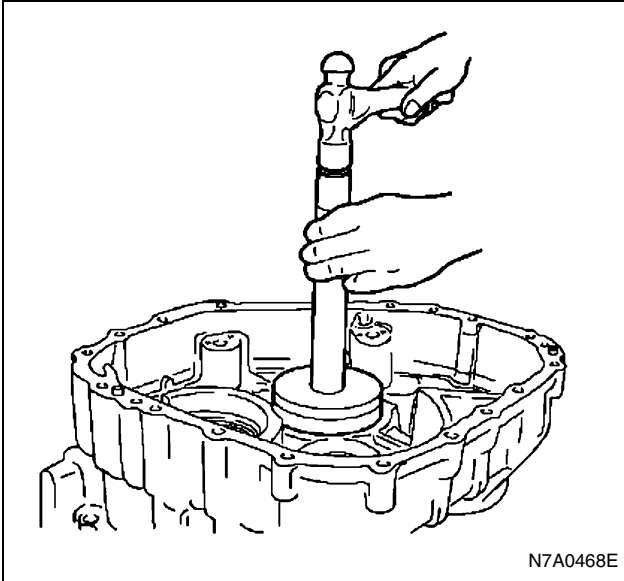
Installation Position



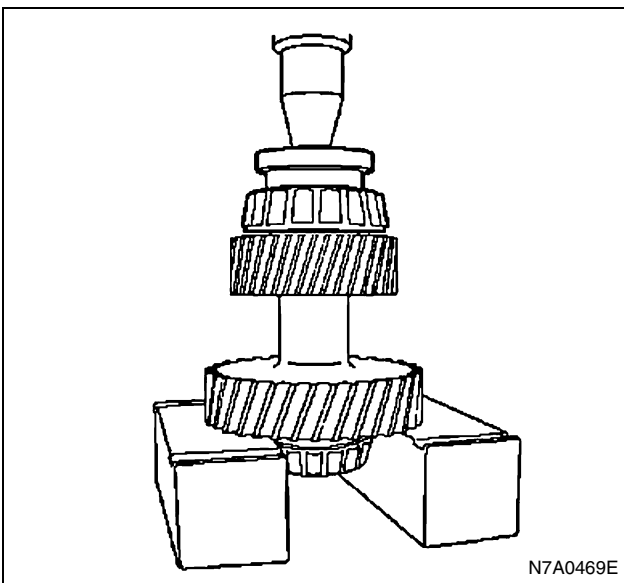
Legend

1. Input shaft oil seal
2. Rear output shaft oil seal
3. Shift rod oil seal
4. Front output shaft oil seal

4. Press in the bearing outer race of the idle gear shaft and rear output gear shaft.
 - Use the installer 5-8840-2773-0 and the grip 5-8840-0007-0 to press in the front side outer race of the idle gear shaft.
 - Use the installer 5-8840-2235-0 and the grip 5-8840-0007-0 to press in the rear side outer race of the idle gear shaft.
 - Use the installer 5-8840-2772-0 and the grip 5-8840-0007-0 to press in the front & rear side outer race of the rear output gear shaft.

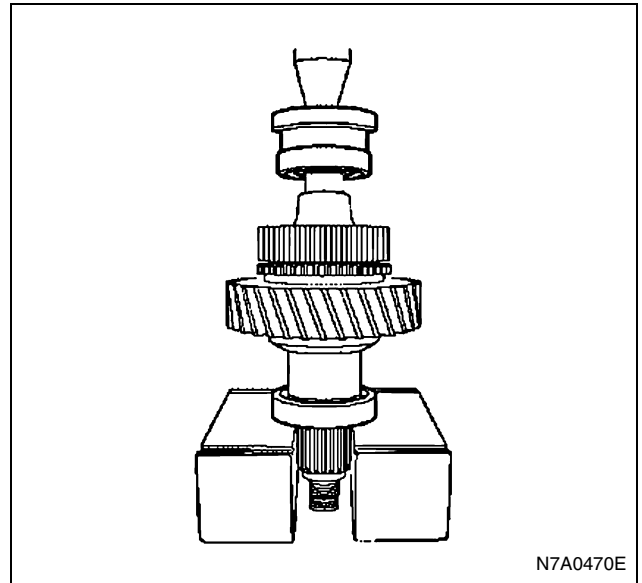


5. Install the front & rear bearing inner race of the idle gear shaft.
 - Use a press machine to press in the roller bearing.



6. Assemble the front output gear shaft.
 - Before installing the ball bearing, install the needle bearing, front output drive gear, thrust washer and collar.

- Use a press machine to press in the ball bearing.



- After installing the ball bearing, install the sleeve in accordance with the marked direction.

Caution:

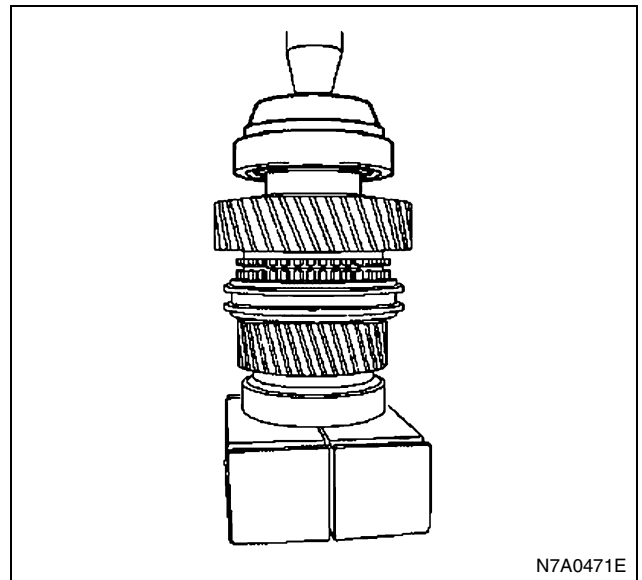
Make sure to install in the correct direction.

7. Assemble the input gear shaft.
 - Before installing the front side ball bearing, install the needle bearing, transfer low gear and thrust washer.
 - Before installing the rear side ball bearing, install the sleeve, needle bearing, transfer high gear and thrust washer.

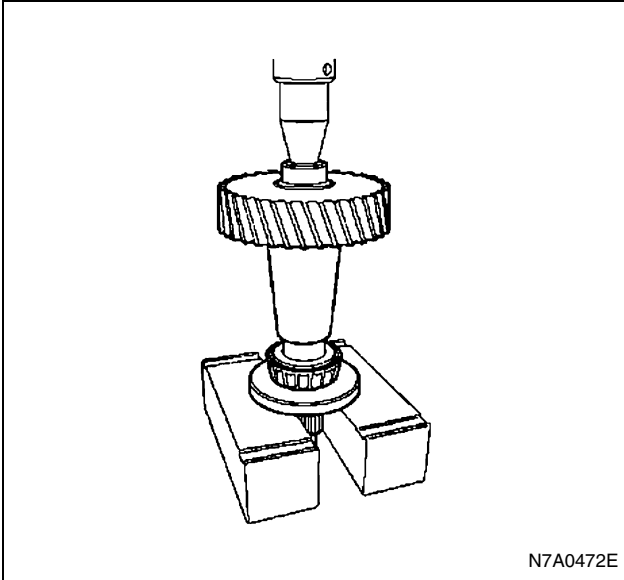
Caution:

Install the sleeve by turning the side, which has a groove along its outer circumference, toward the front side.

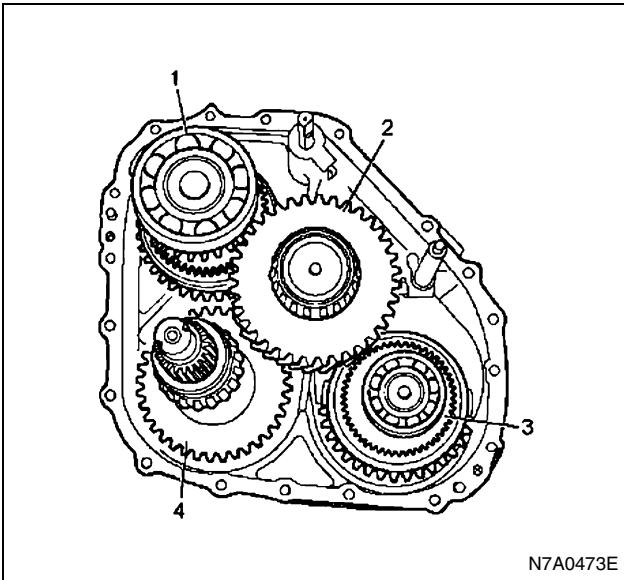
- Use a press machine to press in the ball bearing.



8. Install the bearing of the rear output gear shaft.
 - Use a press machine to press in the ball bearing.



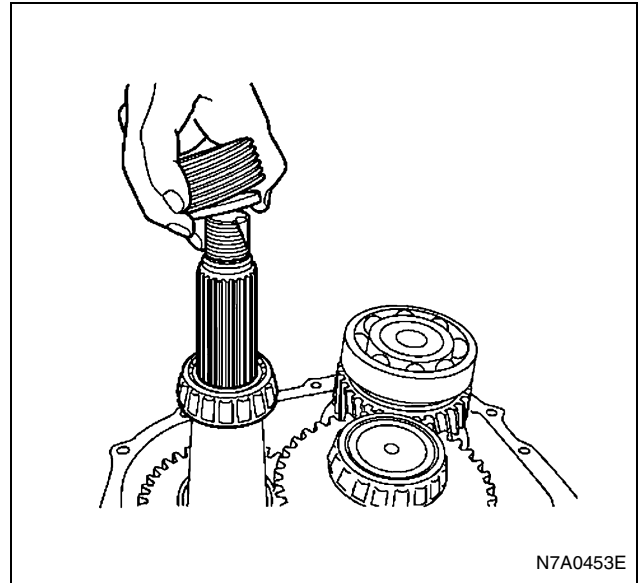
9. Install the front output gear shaft to the front transfer case.
10. Install the input gear shaft.
11. Install the rear output gear shaft.
12. Install the idle gear shaft.
 - Install in the order of 9, 10, 11 and 12.



Legend

1. Input gear shaft
2. Idle gear shaft
3. Front output gear shaft
4. Rear output gear shaft

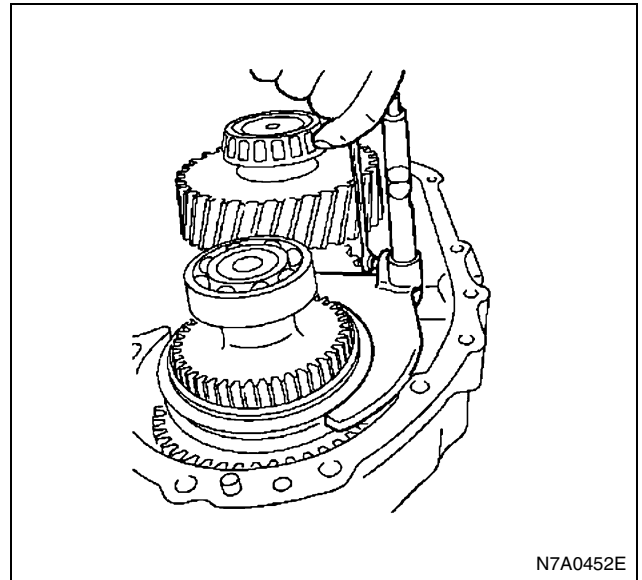
13. Install the thrust washer and speedometer drive gear.



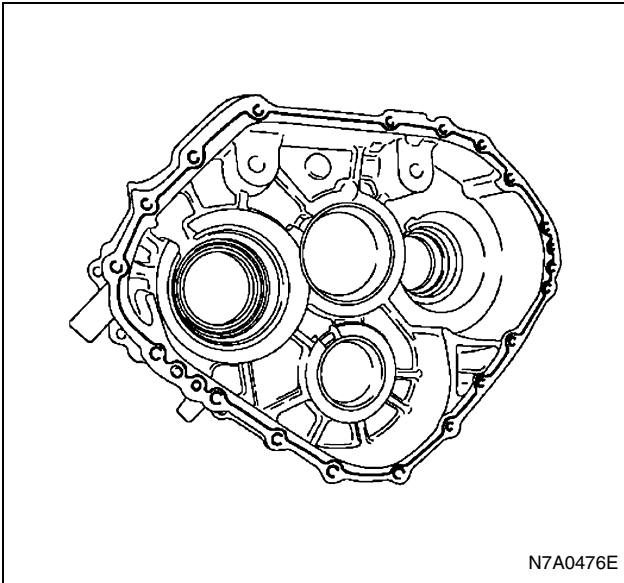
14. Install the shift arm and shift rod.
 - Use a spring pin to install the shift arm of the low / high change side.
 - Use a bolt to fix the shift arm of the 2WD / 4WD change side. Apply LOCTITE 242 to the threaded part of the bolt.

Tighten:

Shift arm and shift rod to 23 N·m (2.3 kg·m / 17 lb·ft)



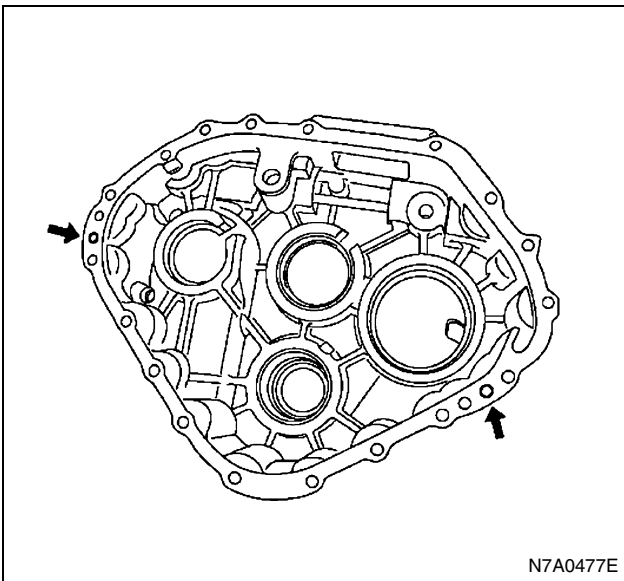
15. Install the rear transfer case.
 - Apply liquid packing (ThreeBond 1215) to the mating surface of the front transfer case. Liquid packing must be applied to the inside of the bolt hole continuously with a diameter of 2 mm (0.079 in).



- Do not drop the detent shaft.
- Align with the 2 knock pins.
- Set the 18 bolts on the fixing holes, and fix them diagonally and equally.

Tighten:

Transfer case to 33 N·m (3.4 kg·m / 24 lb·ft)

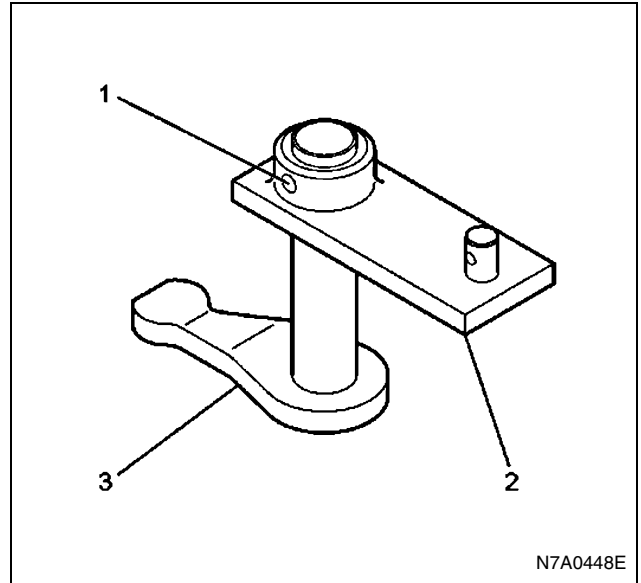


16. Install the shift lever.

- Check that the internal lever is securely put in the groove of the shift arm.
- Apply liquid packing (ThreeBond 1215) to the mating surfaces of the shift cover and transfer case, and fix it with a bolt.

Tighten:

Shift lever to 17 N·m (1.7 kg·m / 13 lb·ft)



Legend

1. Spring pin
2. Select external lever
3. Select internal lever

17. Install the detent balls and springs in two parts.

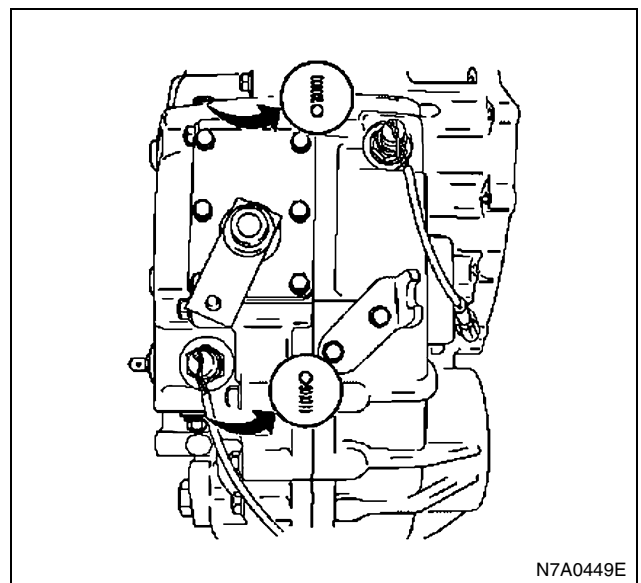
- Install the detent balls and springs for 4H & 4L and 2WD & 4WD to the rear transfer case.
- Apply liquid gasket (ThreeBond 1105) to the thread of the plug, and fix it to the specified torque.

Tighten:

Plug to 25 N·m (2.5 kg·m / 18 lb·ft)

Caution:

Do not drop the parts.



18. Install the low / high shift lever cable installation bracket.

- Apply liquid gasket (ThreeBond 1215) only to the thread of the bolt, which is to be fixed through the bore hole of the case side.

Tighten:

Bolt to 17 N·m (1.7 kg·m / 13 lb·ft)

19. Install the 2WD / 4WD change warning lamp switch.

- Apply liquid gasket (ThreeBond 1105) to the switch thread.

Tighten:

2WD / 4WD change warning lamp switch to 33 N·m (3.4 kg·m / 25 lb·ft)

20. Install the rear & front coupling driver.

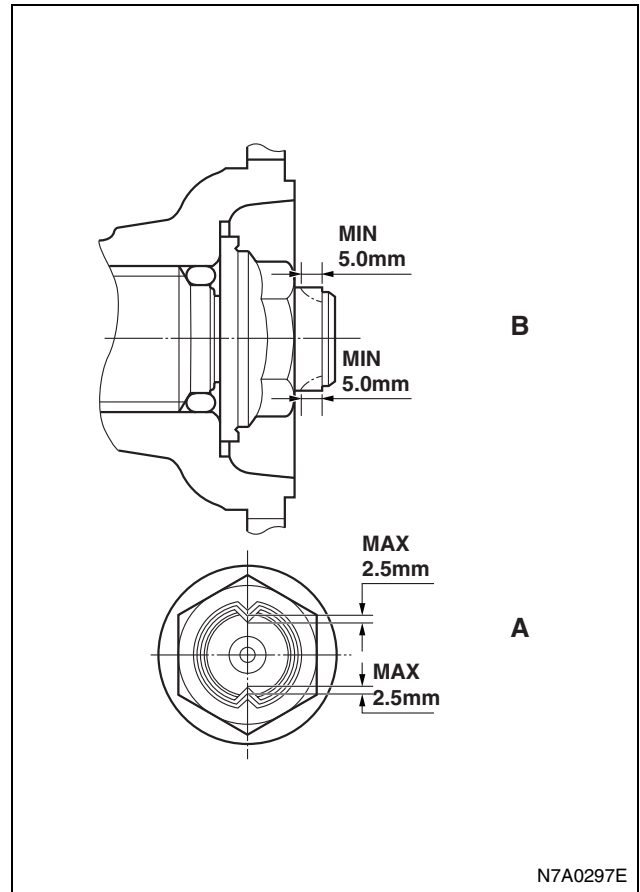
- Use the flange holder 5-8840-0133-0 to fix the front coupling driver, and tighten it with a lock nut.
- After installing the parking brake assembly, use the coupling driver and lock nut to install the rear output shaft.
Tighten the lock nut by fixing the coupling driver using the flange holder 5-88470-2043-0.

Tighten:

- Parking brake to 83 N·m (8.5 kg·m / 61 lb·ft)
- Front output shaft to 290 N·m (29 kg·m / 214 lb·ft)
- Rear output shaft to 226 N·m (23 kg·m / 167 lb·ft)
- After tightening to the specified torque, align the lip part of the nut to the V-groove of the shaft edge. Caulk the nut lip with a chisel to make a length (B) of 5 mm (0.2 in) or more, and a clearance between the bottom of the shaft and the nut lip (A) of 2.5 mm (0.06 in) or less.

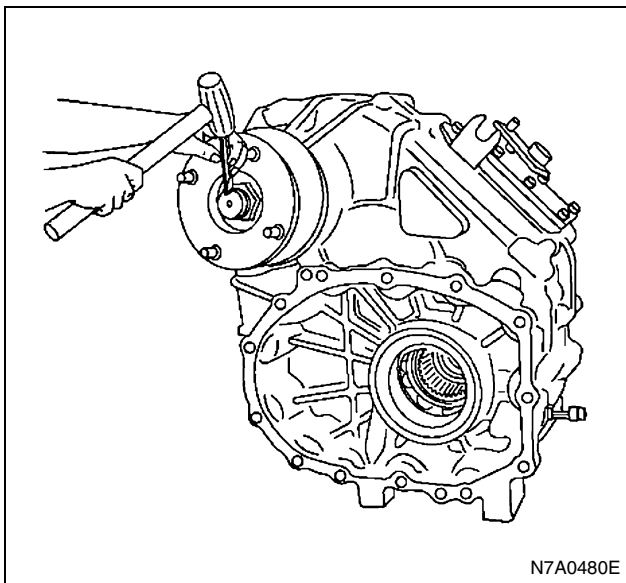
Caution:

When caulking, be careful not to crack the nut.



21. Install the parking brake drum.

- Tighten the adjustment hole cover fixing bolt.



Special Tools

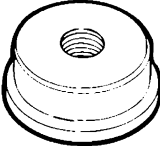
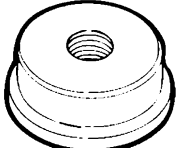
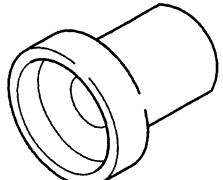
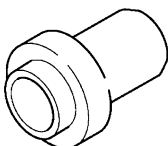
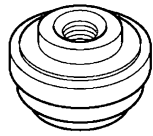
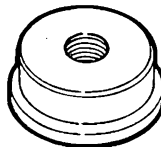
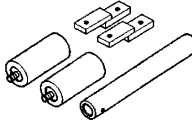
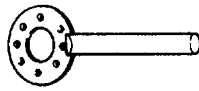
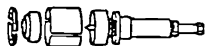
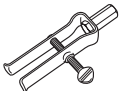
Illustration	Tool Number / Description / Remarks
 5884027720	5-8840-2772-0 / Bearing Installer
 5884027730	5-8840-2773-0 / Bearing Installer
 5884027740	5-8840-2774-0 / Bearing Installer
 5884027750	5-8840-2775-0 / Oil Seal Installer
 5884027760	5-8840-2776-0 / Oil Seal Installer
 5884001940	5-8840-0194-0 / Shim Selector

Illustration	Tool Number / Description / Remarks
 5884022350	5-8840-2235-0 / Bearing Installer
 5884027940	5-8840-2794-0 / Shim Selector Adapter Kit
 5884000070	5-8840-0007-0 / Grip
 5884020430	5-8840-2043-0 / Flange Holder
 5884025870	5-8840-2587-0 / Bearing Remover
 5884000270	5-8840-0027-0 / Remover