

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

MX002-15

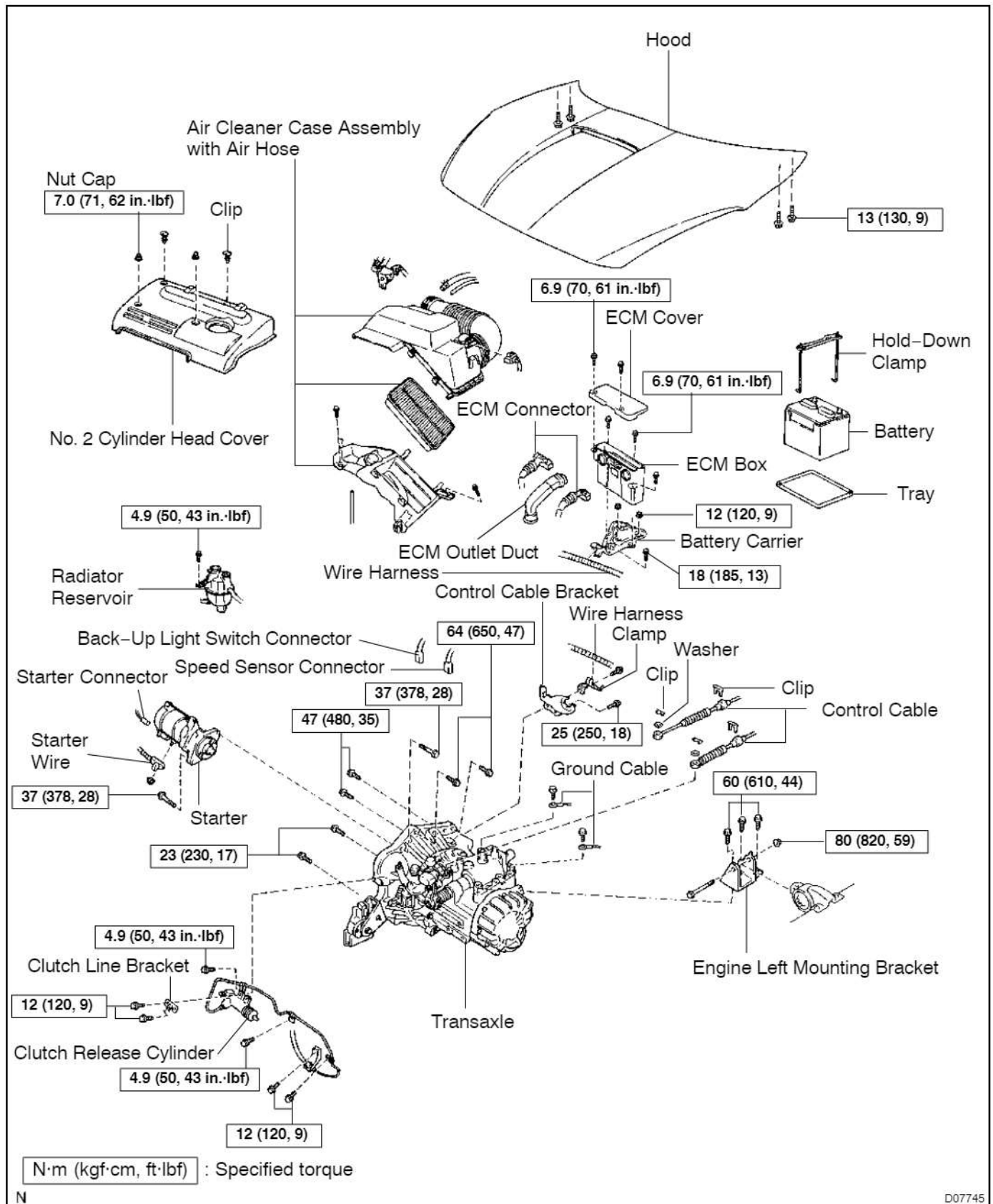
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low) 2. Oil (Wrong) 3. Gear (Worn or damaged) 4. Bearing (Worn or damaged)	MX-4 MX-4 MX-10 MX-10
Oil leakage	1. Oil (Level too high) 2. Gasket (Damaged) 3. Oil seal (Worn or damaged) 4. O-Ring (Worn or damaged)	MX-4 MX-4 MX-4 MX-4
Hard to shift or will not shift	1. Control cable (Faulty) 2. Synchronizer ring (Worn or damaged) 3. Shifting key spring (Damaged)	MX-53 MX-4 MX-30 MX-39 MX-4 MX-30 MX-39
Jumps out of gear	1. Locking ball spring (Damaged) 2. Gear shift fork (Worn) 3. Gear (Worn or damaged) 4. Bearing (Worn or damaged)	MX-4 MX-4 MX-4 MX-4

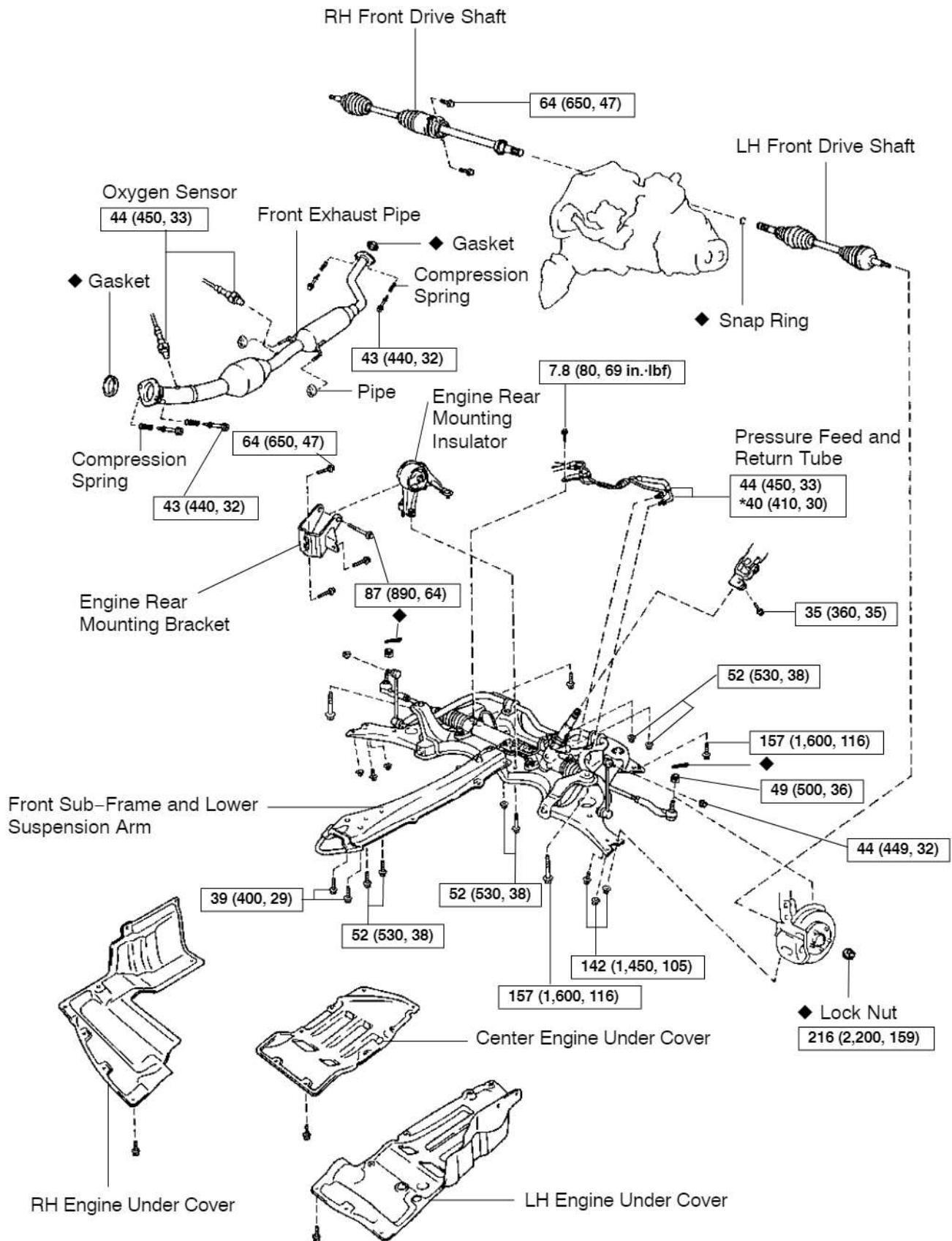
MANUAL TRANSAXLE UNIT

COMPONENTS

MX06P-08



D07745



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

* For use with SST

N

D10558

REMOVAL

1. REMOVE HOOD

HINT:

At the time of installation, please refer to the following item.
Adjust the hood (See page BO-9).

2. REMOVE NO. 2 CYLINDER HEAD COVER

Remove the 2 nut caps, clips and No. 2 cylinder head cover.

Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)

3. DISCONNECT RADIATOR RESERVOIR

Remove the bolt and disconnect the radiator reservoir.

Torque: 4.9 N·m (50 kgf·cm, 43 in·lbf)

4. REMOVE BATTERY

5. REMOVE AIR CLEANER CASE ASSEMBLY WITH AIR HOSE AND ECM BOX

(a) Remove the 2 bolts and ECM cover.

Torque: 6.9 N·m (70 kgf·cm, 61 in·lbf)

(b) Disconnect the ECM connectors from the ECM.

(c) Remove the ECM outlet duct.

(d) Remove the air cleaner case assembly with the air hose.

(e) Remove the 3 bolts and ECM box.

Torque: 6.9 N·m (70 kgf·cm, 61 in·lbf)

(f) Disconnect the wire harness, and remove the 2 nuts, bolt and battery carrier.

Torque:

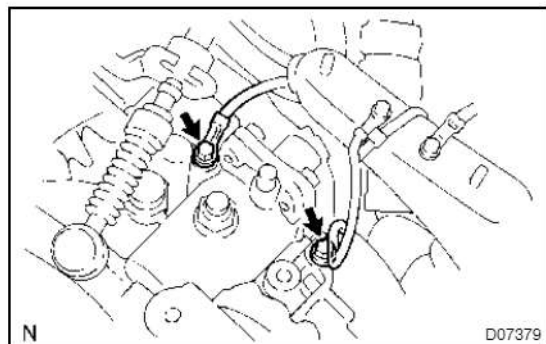
Bolt: 18 N·m (185 kgf·cm, 13 ft·lbf)

Nut: 12 N·m (120 kgf·cm, 9 ft·lbf)

6. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

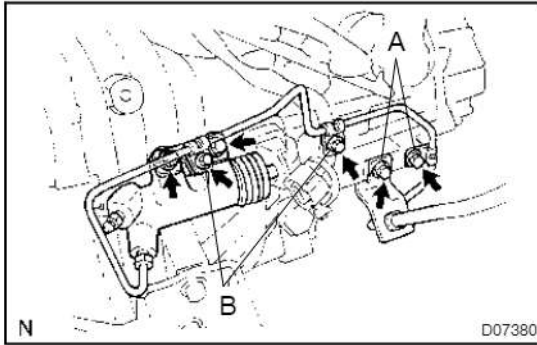
(b) Remove the 2 clips and disconnect the control cables from the transaxle.



7. DISCONNECT GROUND CABLE

Remove the 2 set bolts of the 2 ground cables from the transaxle.

8. DISCONNECT SPEED SENSOR AND BACK-UP LIGHT SWITCH CONNECTORS



9. DISCONNECT CLUTCH RELEASE CYLINDER

- (a) Remove the 4 set bolts of the clutch line.

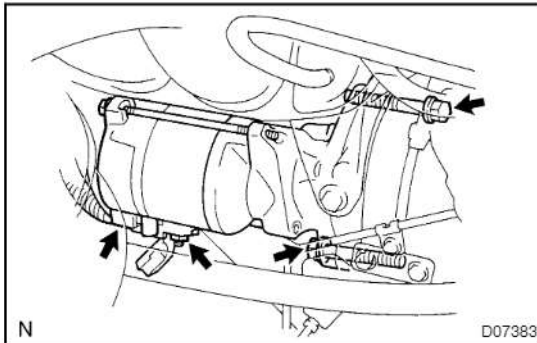
Torque:

Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)

Bolt B: 4.9 N·m (50 kgf·cm, 43 in·lbf)

- (b) Remove the 2 set bolts of the clutch release cylinder and clutch line bracket.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



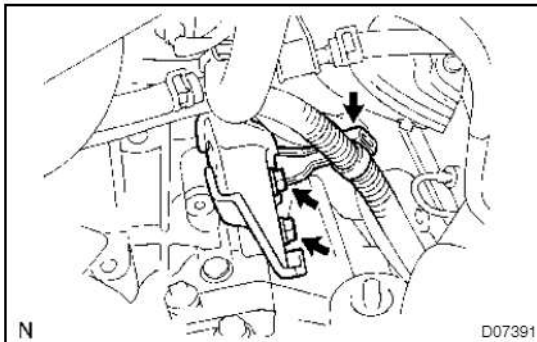
10. REMOVE STARTER

- (a) Disconnect the starter connector.

- (b) Remove the nut and disconnect the starter wire.

- (c) Remove the 2 bolts and starter.

Torque: 37 N·m (378 kgf·cm, 28 ft·lbf)

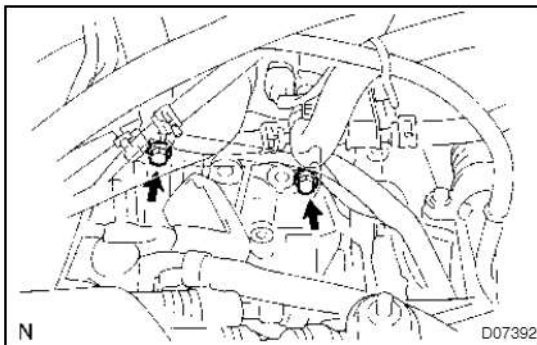


11. REMOVE CONTROL CABLE BRACKET

- (a) Disconnect the wire harness from the clamp.

- (b) Remove the 2 bolts, clamp and control cable bracket from the transaxle.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



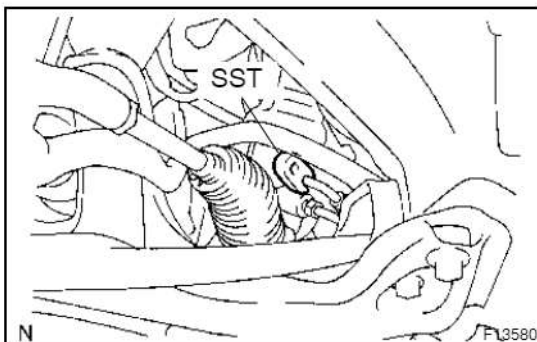
12. REMOVE 2 TRANSAXLE UPPER SIDE MOUNTING BOLTS

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

13. DISCONNECT RH AND LH TIE ROD ENDS

(See page SA-13)

14. DISCONNECT NO. 2 INTERMEDIATE SHAFT ASSEMBLY (See page SR-13)



15. DISCONNECT PRESSURE FEED AND RETURN TUBES

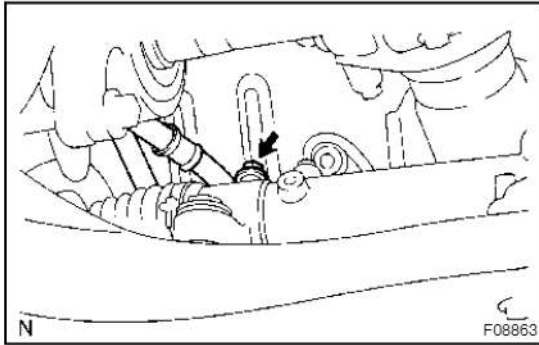
Using SST, disconnect the pressure feed and return tubes.

SST 09023-38401

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

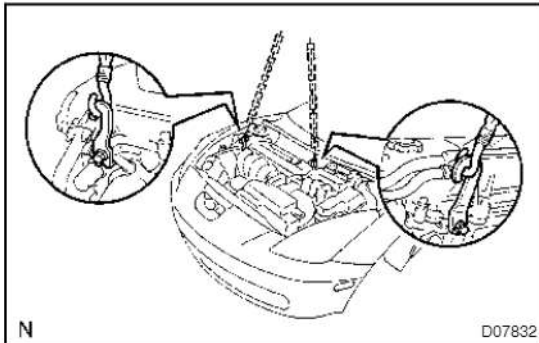
HINT:

- Use torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

**16. DISCONNECT TUBE CLAMP**

Remove the bolt and disconnect the tube clamp.

Torque: 7.8 N·m (80 kgf·cm, 69 in·lbf)

**17. ATTACH ENGINE SLING DEVICE TO ENGINE HANGER**

- (a) Disconnect the 2 PCV hoses.
- (b) Install the No. 1 and No. 2 engine hangers in the correct direction.

Parts No.:

No. 1 engine hanger: 12281-22021

No. 2 engine hanger: 12281-15040 or 12281-15050

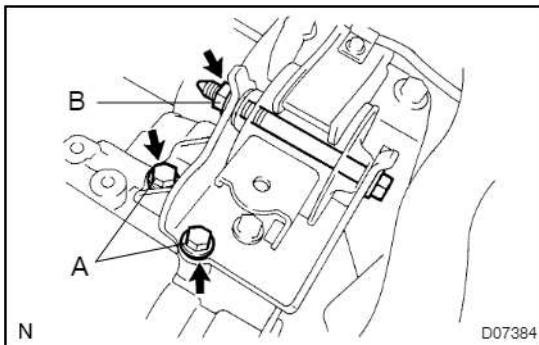
Bolt: 91512-B1016

Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)

- (c) Attach the engine chain hoist to the engine hangers.

CAUTION:

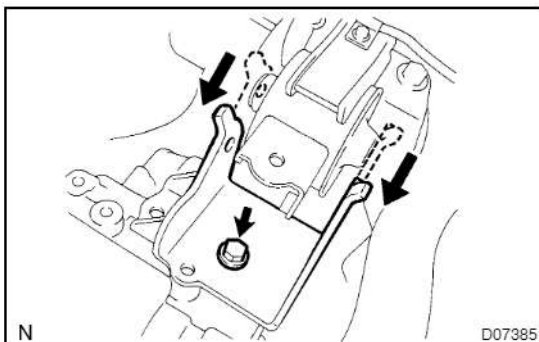
Do not attempt to hang the engine by hooking the chain to any other part.

**18. REMOVE ENGINE LEFT MOUNTING BRACKET 3 SET BOLTS AND NUT**

Torque:

Bolt A: 60 N·m (610 kgf·cm, 44 ft·lbf)

Nut B: 80 N·m (820 kgf·cm, 59 ft·lbf)

**19. REMOVE ENGINE LEFT MOUNTING BRACKET**

Lower the transaxle side, and remove the bolt and engine left mounting bracket.

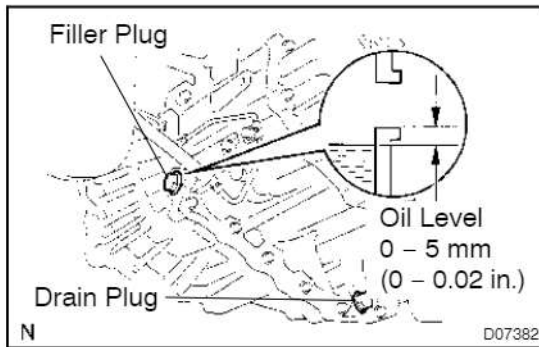
Torque: 60 N·m (610 kgf·cm, 44 ft·lbf)

20. RAISE VEHICLE

CAUTION:

Make sure that the vehicle is securely supported.

21. REMOVE CENTER, LH AND RH ENGINE UNDER COVERS

**22. DRAIN TRANSAXLE OIL**

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity: 1.9 liters (2.0 US qts, 1.7 Imp. qts)

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

23. REMOVE LH AND RH FRONT DRIVE SHAFTS

(See page SA-19)

24. REMOVE FRONT EXHAUST PIPE

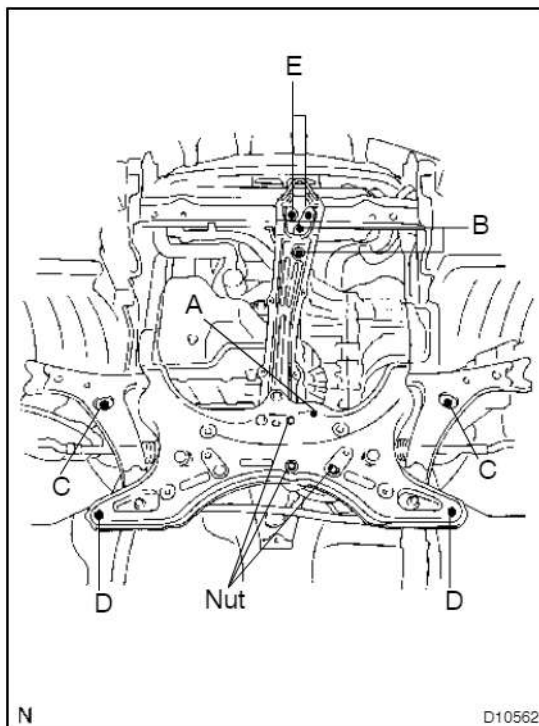
- (a) Disconnect the 2 heated oxygen sensors.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

HINT:

At the time of installation, please refer to the following items.

- Before installing the heated oxygen sensor, twist the sensor wire counterclockwise 3 and 1/2 turns.
 - After installing the heated oxygen sensor, check that the sensor wire is not twisted. If it is twisted, remove the heated oxygen sensor and reinstall it.
- (b) Remove the 4 bolts, compression springs and 2 gaskets.
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)
- (c) Disconnect the front exhaust pipe from the pipe supports and remove it.
- 25. DISCONNECT LOWER BALL JOINT FROM LOWER SUSPENSION ARM (See page SA-43)**
- 26. DISCONNECT STABILIZER BAR LINK**
- (a) Remove the nut and disconnect the stabilizer bar link.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)
- (b) Employ the same manner described above to the other side.

**27. DISCONNECT ENGINE REAR MOUNT INSULATOR AND FRONT SUSPENSION MEMBER**

Remove the bolt (bolt A) and 3 nuts, and disconnect the engine rear mount insulator and front suspension member.

Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

28. DISCONNECT ENGINE FRONT MOUNT INSULATOR AND FRONT SUSPENSION MEMBER

Remove the 2 bolts (bolt B) and disconnect the engine front mount insulator and front suspension member.

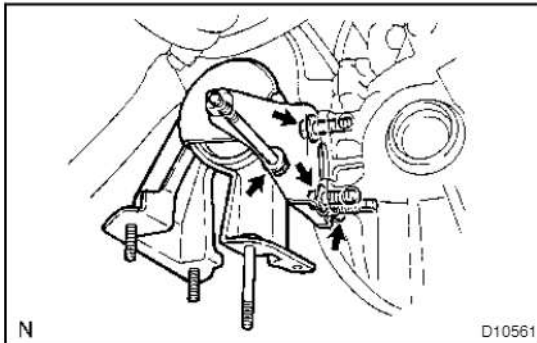
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

29. SUPPORT FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

Using a transmission jack, support the front suspension member with lower suspension arm.

30. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM AND PS GEAR ASSEMBLY

Remove the 6 bolts (bolt C, D and E) and front suspension member with lower suspension arm and PS gear assembly.

Torque:**Bolt C: 157 N·m (1,600 kgf·cm, 116 ft·lbf)****Bolt D: 157 N·m (1,600 kgf·cm, 116 ft·lbf)****Bolt E: 39 N·m (400 kgf·cm, 29 ft·lbf)****31. REMOVE ENGINE REAR MOUNTING INSULATOR AND BRACKET**

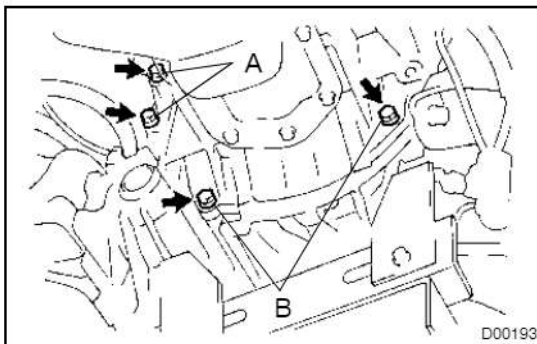
- (a) Remove the bolt and engine rear mounting insulator.

Torque: 87 N·m (890 kgf·cm, 64 ft·lbf)

- (b) Remove the 3 bolts and engine rear mounting bracket.

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)**32. JACK UP TRANSAXLE SLIGHTLY**

Using a transmission jack, support the transaxle.

**33. REMOVE 4 TRANSAXLE LOWER SIDE MOUNTING BOLTS****Torque:****Bolt A: 47 N·m (480 kgf·cm, 35 ft·lbf)****Bolt B: 23 N·m (230 kgf·cm, 17 ft·lbf)****34. REMOVE TRANSAXLE**

Lower the engine left side and remove the transaxle from the engine.

HINT:

At the time of installation, please refer to the following items.

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

INSTALLATION

Installation is in the reverse order of removal. (See page MX-4)

HINT:

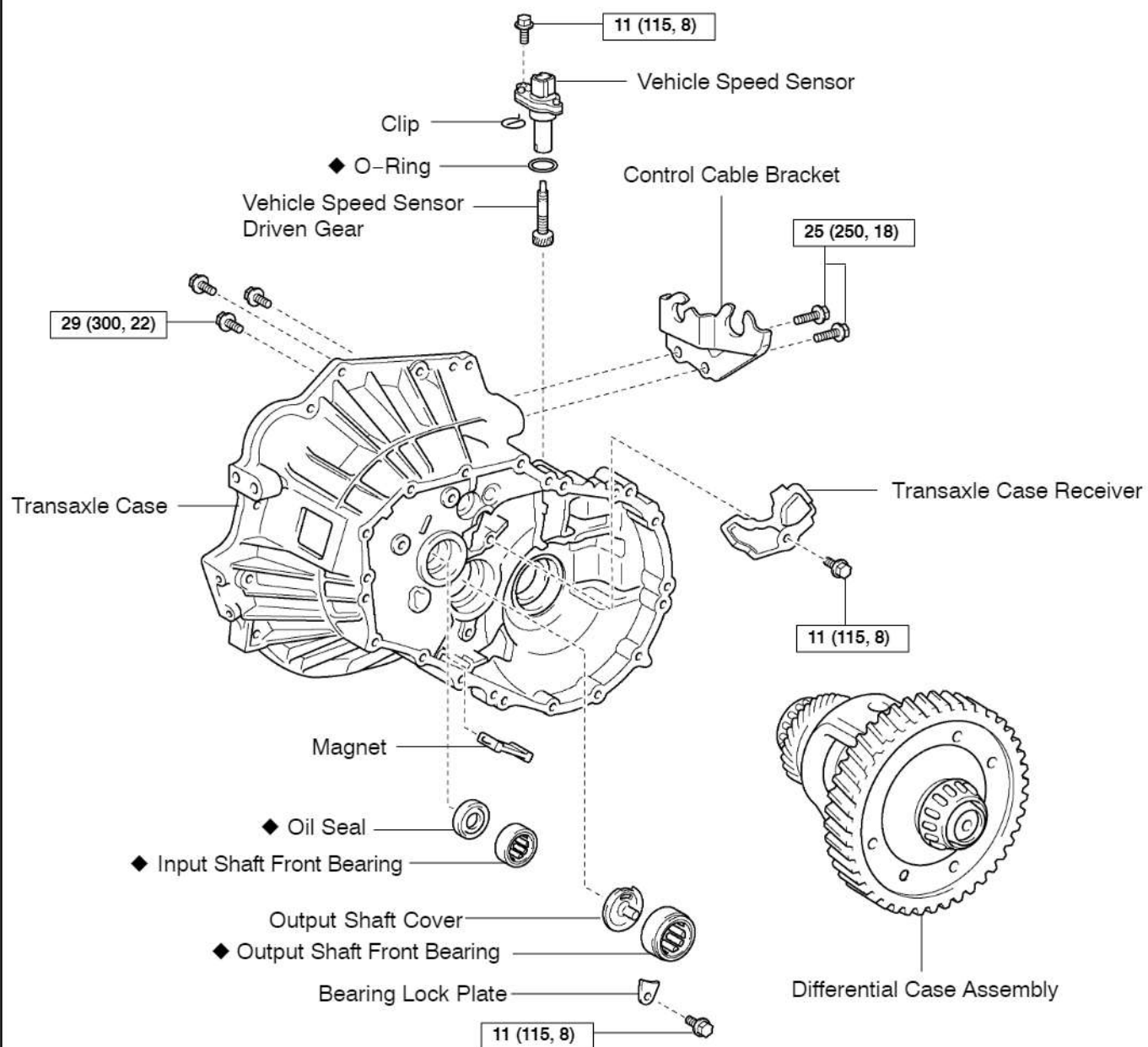
After installation, check and inspect items as follows.

- Bleed power steering system (See page SR-4).
- Front wheel alignment (See page SA-5).
- Do the road test.

MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

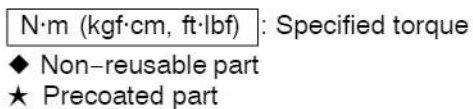
MX008-17



N·m (kgf·cm, ft·lbf) : Specified torque

γ ◆ Non-reusable part

D06023





DISASSEMBLY

1. REMOVE FILLER PLUG AND DRAIN PLUG WITH 2 GASKETS

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

2. REMOVE VEHICLE SPEED SENSOR

- (a) Remove the bolt and vehicle speed sensor.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

- (b) Using a small screwdriver, remove the clip from the vehicle speed sensor.

- (c) Remove the vehicle speed sensor driven gear from the speed sensor.

- (d) Using a small screwdriver, remove the O-ring from the vehicle speed sensor.

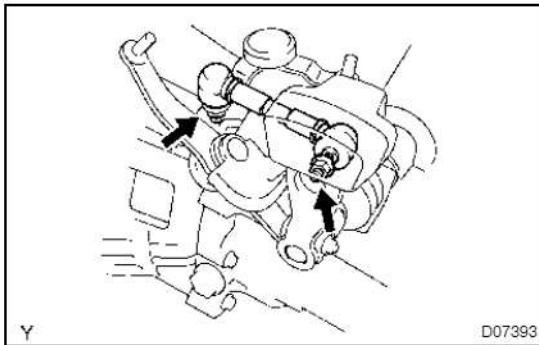
3. REMOVE BACK-UP LIGHT SWITCH WITH GASKET

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

4. REMOVE CONTROL CABLE BRACKET

Remove the 2 bolts and control cable bracket.

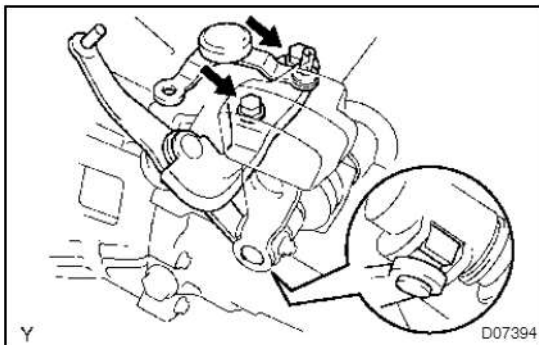
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



5. REMOVE CONTROL SHAFT ASSEMBLY

Remove the 2 nuts, wave washer and control shaft assembly.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



6. REMOVE SELECTING BELLCRANK ASSEMBLY

- (a) Remove the 2 bolts and selecting bellcrank assembly.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

NOTICE:

At the time of reassembly, please refer to the following item.

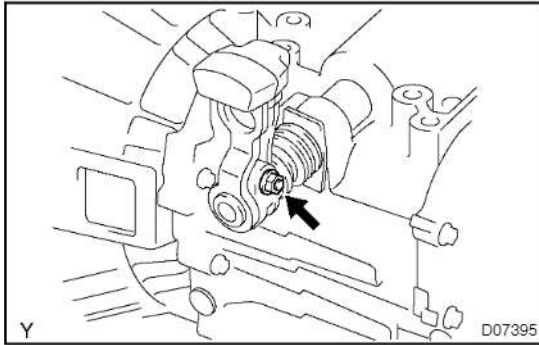
Fit the selecting bellcrank assembly pin part with the dust cover into a groove in the control shift lever.

- (b) Remove the control bellcrank dust cover from the selecting bellcrank assembly.

NOTICE:

At the time of reassembly, please refer to the following item.

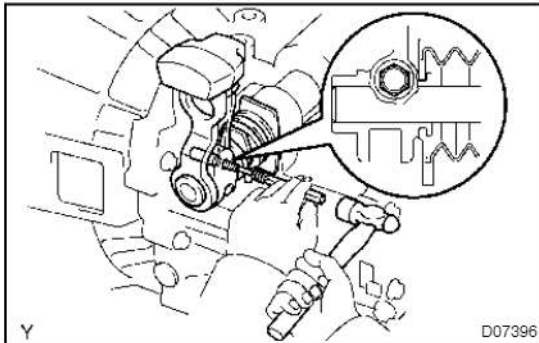
Apply MP grease to the inside circumferential surface of the control bellcrank dust cover.



7. REMOVE CONTROL SHIFT LEVER AND DUST BOOT

- (a) Remove the nut and wave washer.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)



- (b) Using a pin punch and hammer, drive out the lever lock pin.

NOTICE:

At the time of reassembly, please refer to the following item.

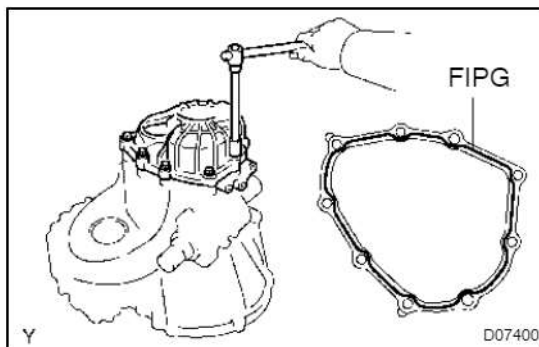
When fixing the lever lock pin, properly position the shaft groove.

- (c) Remove the control shift lever and dust boot.

NOTICE:

At the time of reassembly, please refer to the following items.

- Install the dust boot into a groove in the control shift lever.
- Be sure to install the dust boot in the correct direction, as shown in the illustration.



8. REMOVE TRANSMISSION CASE COVER

- (a) Remove the 9 bolts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

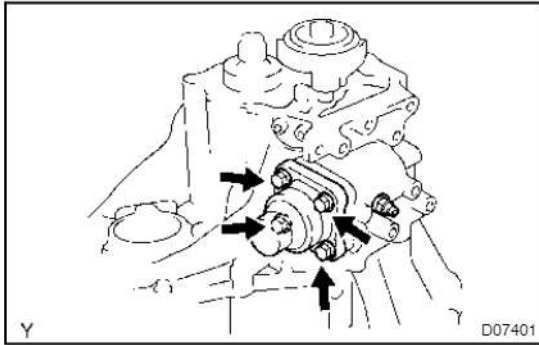
- (b) Using a brass bar and hammer, carefully tap the projection of the transmission case cover to remove the transmission case cover from the transmission case.

HINT:

At the time of reassembly, please refer to the following item. Apply FIPG to the transmission case cover, as shown in the illustration.

FIPG:

Part No. 08826-00090, THREE BOND 1281 or equivalent



9. REMOVE LOCK BALL ASSEMBLY AND CONTROL SHAFT COVER

- (a) Remove the lock ball assembly.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

- (b) Remove the 4 bolts and control shaft cover with the gasket.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

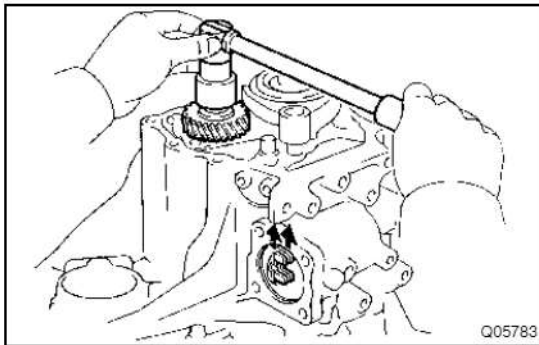
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

10. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

NOTICE:

At the time of reassembly, please refer to the following item.

Set the claws of the shift interlock plate into the shift head part of the gear shift fork shaft securely.

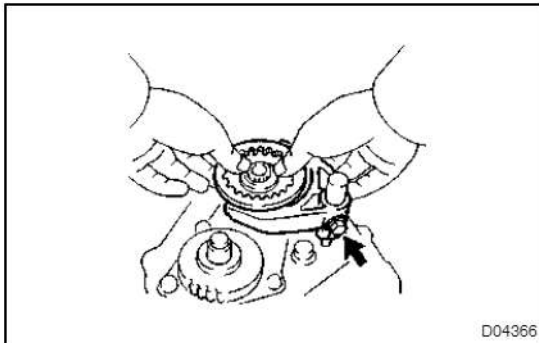


11. REMOVE LOCK NUT

- (a) Engage the gear double meshing.
 (b) Using a chisel and hammer, loosen the staked part of the nut.
 (c) Remove the lock nut.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

- (d) Disengage the gear double meshing.



12. REMOVE NO. 3 HUB SLEEVE AND NO. 3 GEAR SHIFT FORK

- (a) Remove the bolt from the No. 3 gear shift fork.

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

Sealant:

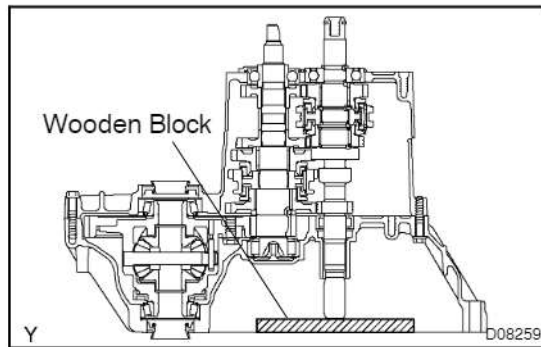
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- (b) Remove the No. 3 hub sleeve with the No. 3 gear shift fork.

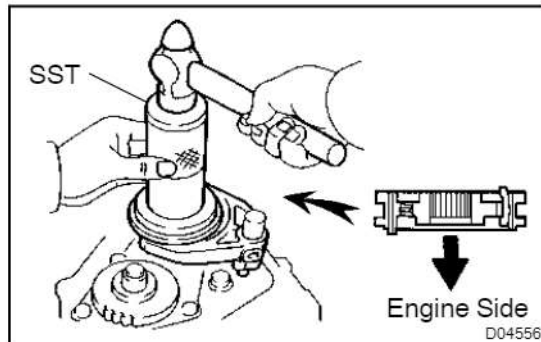
HINT:

At the time of reassembly, please refer to the following items.

- Install the No. 3 clutch hub assembly to the No. 3 hub sleeve.



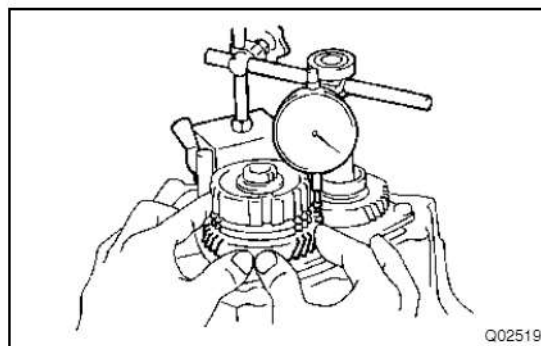
- Before driving in the No. 3 clutch hub assembly, place the suitable sized wooden block on the rear side of the input shaft, as shown in the illustration. When driving it in, fix the input shaft firmly so that it is not pushed downward. Otherwise the input shaft rear radial ball bearing is overloaded, it might be damaged.



- Using SST and a hammer, drive in the No. 3 hub sleeve assembly with the No. 3 gear shift fork.
SST 09636-20010

NOTICE:

- Be sure to install the No. 3 hub sleeve assembly in the correct direction, as shown in the illustration.
- Align the No. 3 synchronizer ring slots with the No. 3 shifting keys.

**13. INSPECT 5TH GEAR THRUST CLEARANCE**

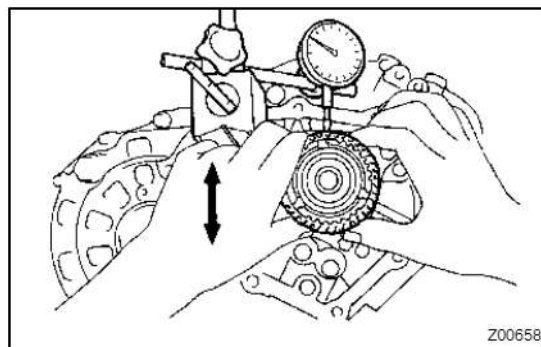
Using a dial indicator, measure the thrust clearance.

Standard clearance:

0.10 – 0.57 mm (0.0039 – 0.0224 in.)

Maximum clearance:

0.57 mm (0.0224 in.)

**14. INSPECT 5TH GEAR RADIAL CLEARANCE**

Using a dial indicator, measure the radial clearance.

Standard clearance:

KOYO made:

0.015 – 0.058 mm (0.0006 – 0.0023 in.)

NSK made:

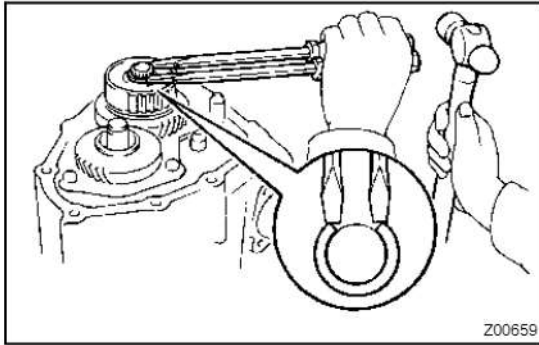
0.015 – 0.056 mm (0.0006 – 0.0022 in.)

Maximum clearance:

KOYO made: 0.058 mm (0.0023 in.)

NSK made: 0.056mm (0.0022 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



15. REMOVE NO. 3 CLUTCH HUB AND 5TH GEAR

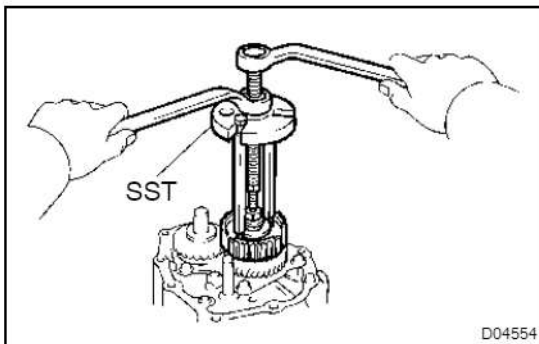
- (a) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

At the time of reassembly, please refer to the following item.
Select a snap ring from the table below that will make the thrust clearance of the No. 3 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.25 (0.0886)	E	2.49 (0.0980)
B	2.31 (0.0909)	F	2.55 (0.1004)
C	2.37 (0.0933)	G	2.61 (0.1028)
D	2.43 (0.0957)	-	-

- (b) Using a screwdriver, remove the shifting key spring from the No. 3 clutch hub.



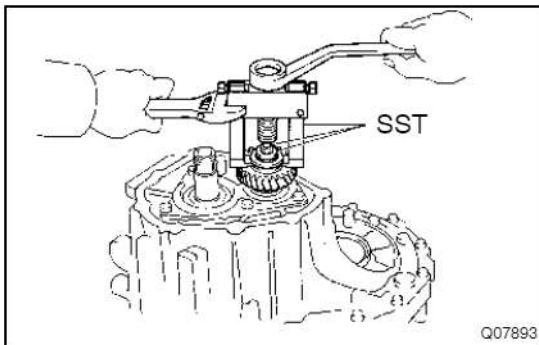
- (c) Install a bolt and washer to the tip of the input shaft and using SST, remove the No. 3 clutch hub.

SST 09950-30012

HINT:

Select a bolt whose outer diameter is smaller than the screw hole of the input shaft so that it can be turned easily.

- (d) Remove the No. 3 synchronizer ring, 5th gear, needle roller bearing and spacer.



16. REMOVE 5TH DRIVEN GEAR

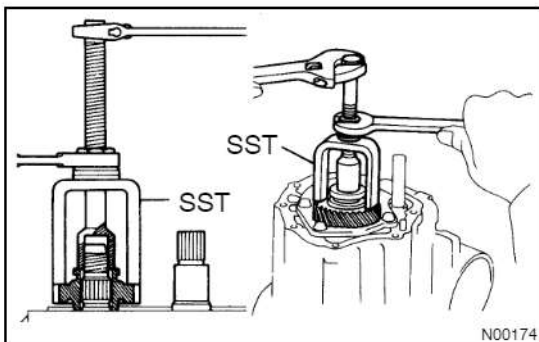
Using SST, remove the 5th driven gear.

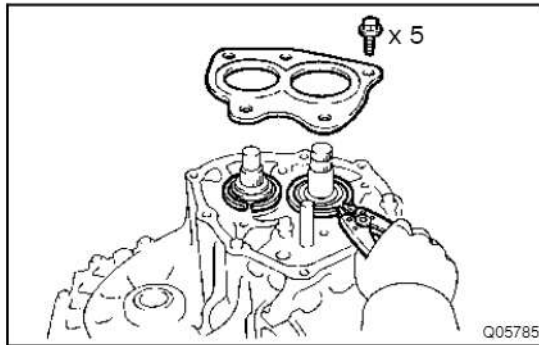
SST 09628-62011, 09950-40011 (09957-04010),
09950-60010 (09951-00230)

HINT:

At the time of reassembly, please refer to the following item.
Using SST, install the 5th driven gear.

SST 09309-12020



**17. REMOVE REAR BEARING RETAINER**

Remove the 5 bolts and rear bearing retainer.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

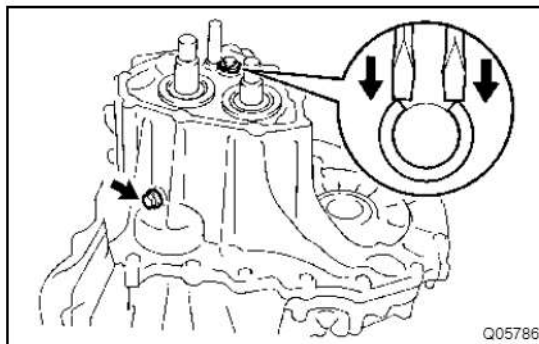
Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

18. REMOVE BEARING SNAP RING

Using a snap ring expander, remove the 2 snap rings.

HINT:

If it is difficult to remove and install the snap rings, pull up the shafts.

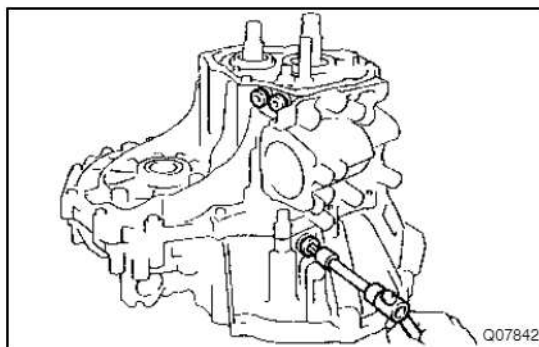
**19. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET****Sealant:**

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

20. REMOVE SNAP RING FROM NO. 2 SHIFT FORK SHAFT

Using 2 screwdrivers and a hammer, tap out the snap ring.

**21. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND BALL**

- (a) Using a hexagon wrench, remove the 3 straight screw plugs.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

- (b) Using a magnetic finger, remove the 3 seats, springs and balls.

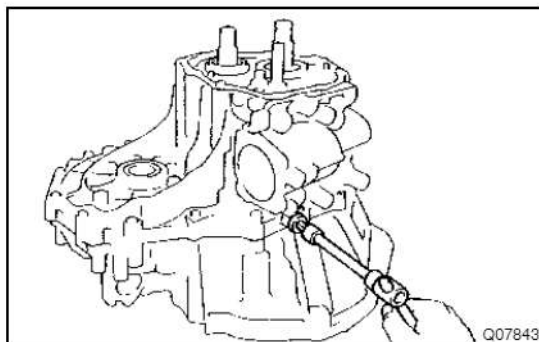
22. REMOVE LOCK BALL ASSEMBLY

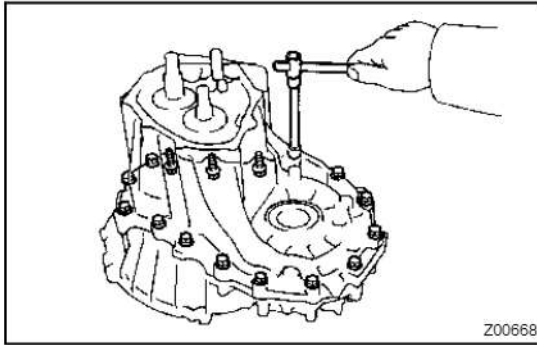
Using a hexagon wrench, remove the lock ball assembly.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

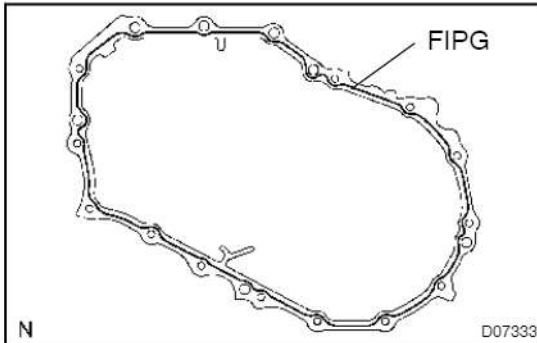
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)





23. REMOVE TRANSMISSION CASE

- (a) Remove the 16 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
- (b) Using a plastic hammer, carefully tap the projection of the transmission case to remove the transmission case from the transaxle case.

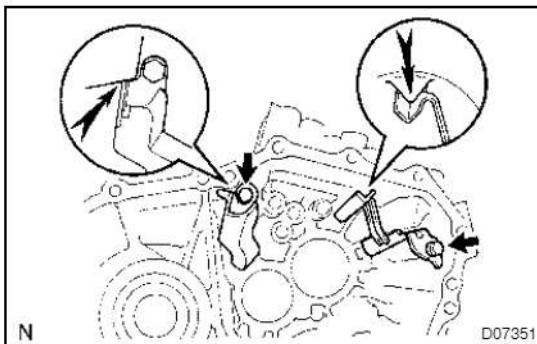


HINT:

At the time of reassembly, please refer to the following item.
Apply FIPG to the transaxle case, as shown in the illustration.

FIPG:

Part No. 08826-00090, THREE BOND 1281 or equivalent



24. REMOVE OIL RECEIVER PIPE

Remove the 2 bolts and oil receiver pipes from the transmission case.

Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

NOTICE:

At the time of reassembly, please refer to the following items.

- Prevent the oil receiver pipes from being deformed.
- Install the oil receiver pipes while placing it against the transmission case, as shown in the illustration.

25. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT

26. REMOVE REVERSE SHIFT ARM BRACKET

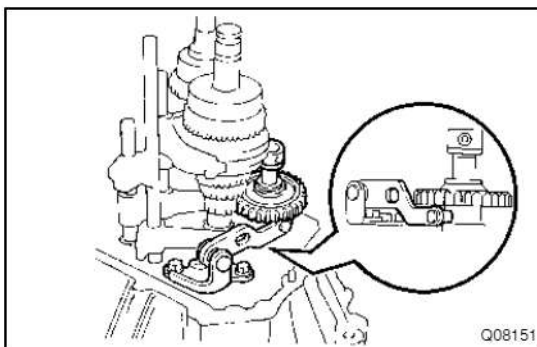
Remove the 2 bolts and reverse shift arm bracket.

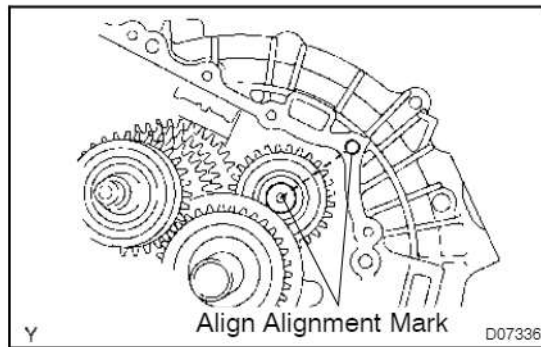
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

NOTICE:

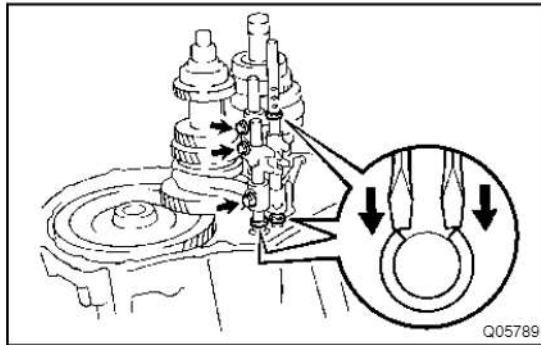
At the time of reassembly, please refer to the following items.

- Set the pin on the top of the reverse shift arm into a groove on the reverse idler gear.
- Fit the claw of the reverse shift arm bracket with the notch of the input shaft front bearing.





- Install the reverse idler gear, thrust washer and shaft, as shown in the illustration.



27. REMOVE GEAR SHIFT FORK AND GEAR SHIFT FORK SHAFT

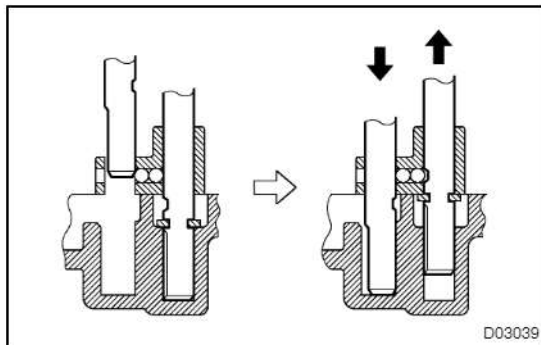
- Using 2 screwdrivers and a hammer, tap out the 3 snap rings from each gear shift fork shaft.
- Remove the 3 bolts from the No. 1 gear shift head, No. 1 and No. 2 gear shift forks.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

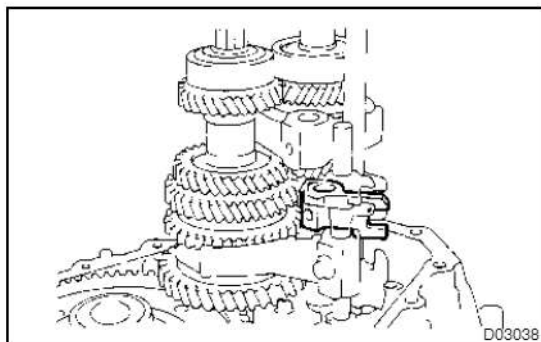
- Pull up the No. 3 gear shift fork shaft, remove the No. 2 gear shift fork shaft.



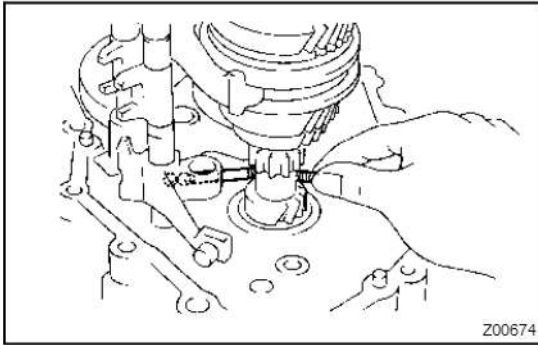
NOTICE:

At the time of reassembly, please refer to the following item.

To avoid the interference of the 2 balls, lift up the No. 3 gear shift fork shaft at the position shown in the illustration.



- Remove the No. 1 gear shift head.



- (e) Using a magnetic finger, remove the 2 balls from the reverse shift fork.
- (f) Remove the No. 3 gear shift fork shaft and reverse shift fork.
- (g) Pull out the No. 1 gear shift fork shaft.
- (h) Remove the No. 1 and No. 2 gear shift forks.

28. REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE

29. REMOVE DIFFERENTIAL CASE ASSEMBLY

NOTICE:

At the time of reassembly, please refer to the following item.

Before reassembly, inspect the differential tapered roller bearing preload. (See page MX-50)

30. REMOVE MAGNET FROM TRANSAXLE CASE

31. DISASSEMBLE NO. 3 CLUTCH HUB ASSEMBLY

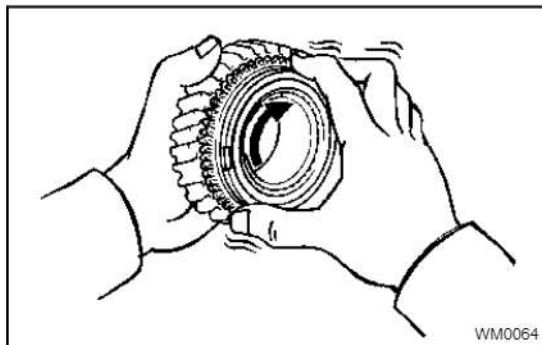
- (a) Using a screwdriver, remove the shifting key spring.

NOTICE:

At the time of reassembly, please refer to the following item.

Position the shifting key springs so that their end gaps are not aligned.

- (b) Remove the 3 No. 3 shifting keys from the No. 3 clutch hub.



INSPECTION

1. INSPECT 5TH GEAR SYNCHRONIZER RING

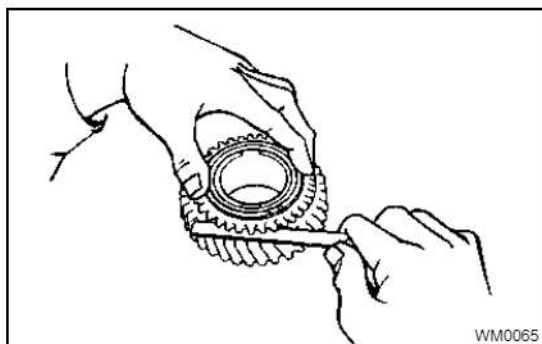
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

- (c) Check again the braking effect of the synchronizer ring.



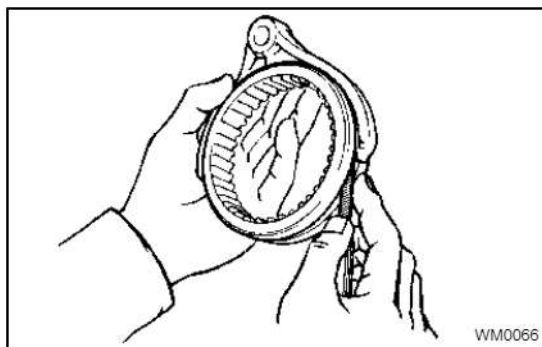
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.5 mm (0.020 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.



2. INSPECT GEAR SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and gear shift fork.

Maximum clearance: 0.5 mm (0.020 in.)

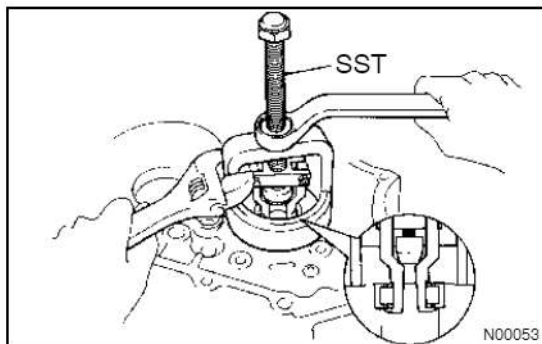
If the clearance exceeds the maximum, replace the gear shift fork or hub sleeve.

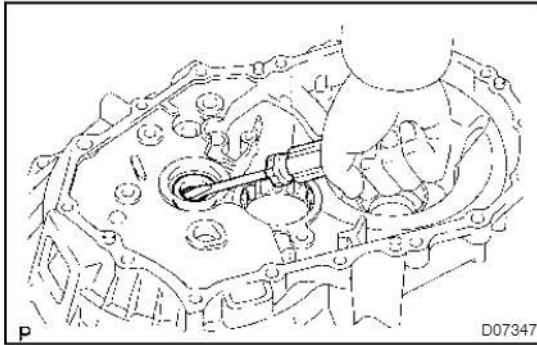
3. REMOVE TRANSAXLE CASE RECEIVER

Remove the bolt and transaxle case receiver from the transaxle case.

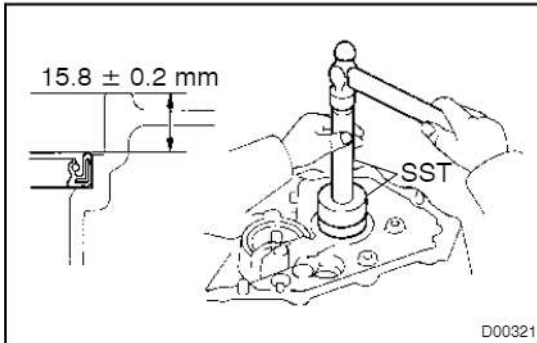
4. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING AND OIL SEAL

- (a) Using SST, remove the input shaft front bearing.
SST 09612-65014





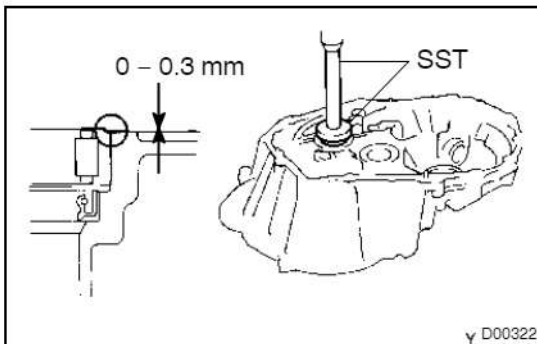
- (b) Using a screwdriver, remove the oil seal.



- (c) Using SST and a hammer, drive in a new oil seal.
SST 09950-60010 (09951-00360), 09950-70010 (09951-07150)

Drive in depth: 15.8 ± 0.2 mm (0.622 ± 0.008 in.)

- (d) Coat the lip of the oil seal with MP grease.

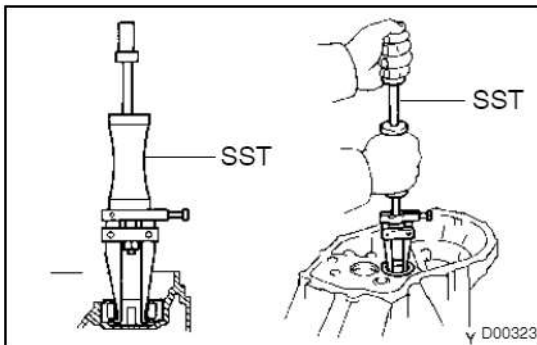


- (e) Using SST and a press, install a new input shaft front bearing.
SST 09950-60010 (09951-00400), 09950-70010 (09951-07150)

Drive in depth: 0 - 0.3 mm (0 - 0.012 in.)

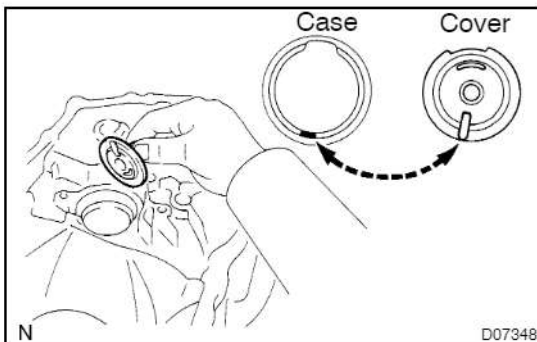
NOTICE:

Be sure to install a new bearing in the correct direction, as shown in the illustration.



5. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING AND OUTPUT SHAFT COVER

- (a) Remove the bolt and bearing lock plate.
(b) Using SST, pull out the output shaft front bearing.
SST 09308-00010

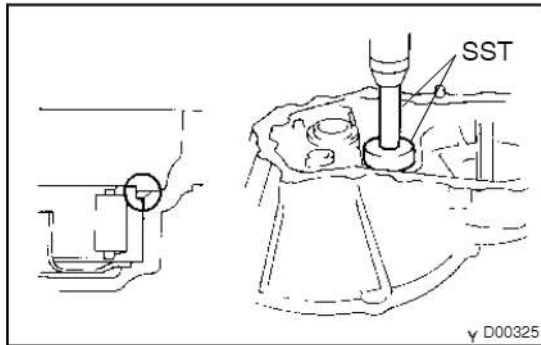


- (c) Remove the output shaft cover.

- (d) Install the output shaft cover.

NOTICE:

Install the output shaft cover projection into the case side hollow.



- (e) Using SST and a press, install a new output shaft front bearing.
SST 09950-60010 (09951-00560), 09950-70010 (09951-07150)

NOTICE:

- Be sure to install a new bearing in the correct direction, as shown in the illustration.
- When replacing the output shaft front bearing, replace the output shaft front bearing inner race along with it.

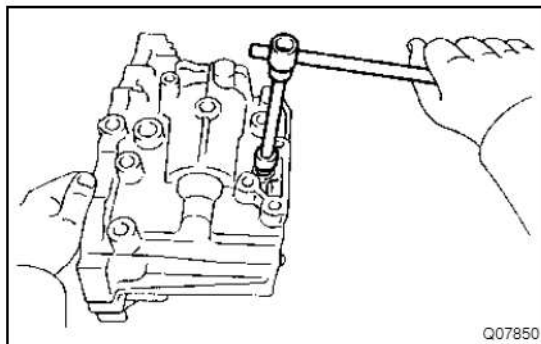
- (f) Install the bearing lock plate with the bolt.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

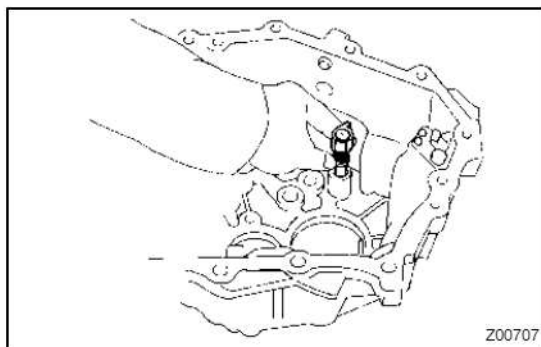
6. INSTALL TRANSAXLE CASE RECEIVER

Install the transaxle case receiver to the transaxle case with the bolt.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)

**7. IF NECESSARY, REPLACE REVERSE RESTRICT PIN**

- (a) Using a hexagon wrench, remove the straight screw plug.
(b) Using a pin punch and hammer, drive out the slotted spring pin.

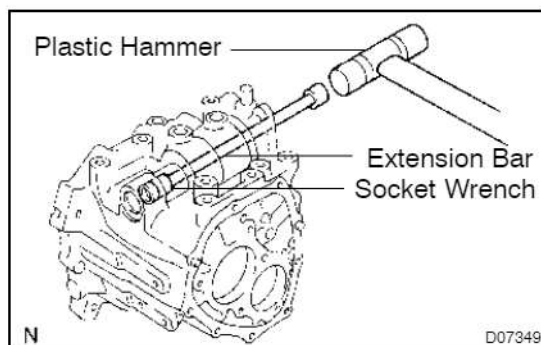


- (c) Replace the reverse restrict pin.
(d) Using a pin punch and hammer, drive in the slotted spring pin.
(e) Apply sealant to the screw plug threads.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

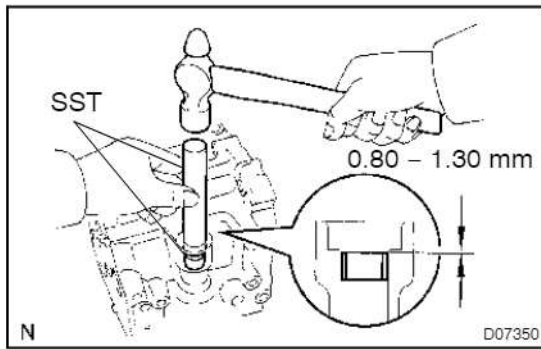
- (f) Using a hexagon wrench, install the straight screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

**8. IF NECESSARY, REPLACE TRANSMISSION CASE BUSHING**

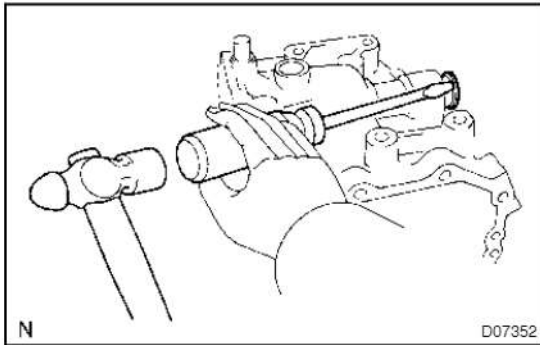
- (a) Using a socket wrench (12 mm), extension bar and plastic hammer, drive out the bushing.

NOTICE:

When driving out the bushing, be careful not to damage the transmission case by the socket wrench.

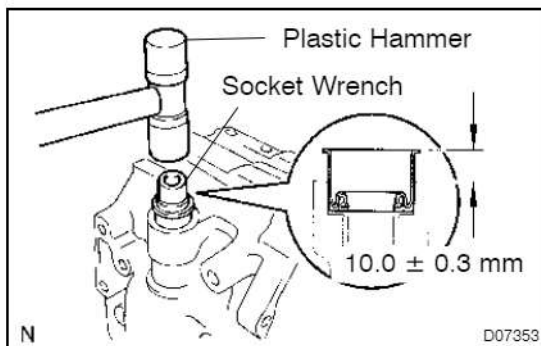


- (b) Using SST and a hammer, drive in a new bushing.
 SST 09950-60010 (09951-00180), 09950-70010 (09951-07100)
Drive in depth: 0.80 – 1.30 mm (0.0315 – 0.0512 in.)



9. IF NECESSARY, REPLACE TRANSMISSION CASE OIL SEAL

- (a) Using a screwdriver and hammer, drive out the oil seal.



- (b) Using a socket wrench (17 mm) and plastic hammer, drive in a new oil seal.
Drive in depth: 10.0 ± 0.3 mm (0.394 ± 0.012 in.)
 (c) Coat the lip of the oil seal with MP grease.

REASSEMBLY

Reassembly is in the reverse order of disassembly. (See page MX-13)

NOTICE:

When working with FIPG material, you must observe the followings.

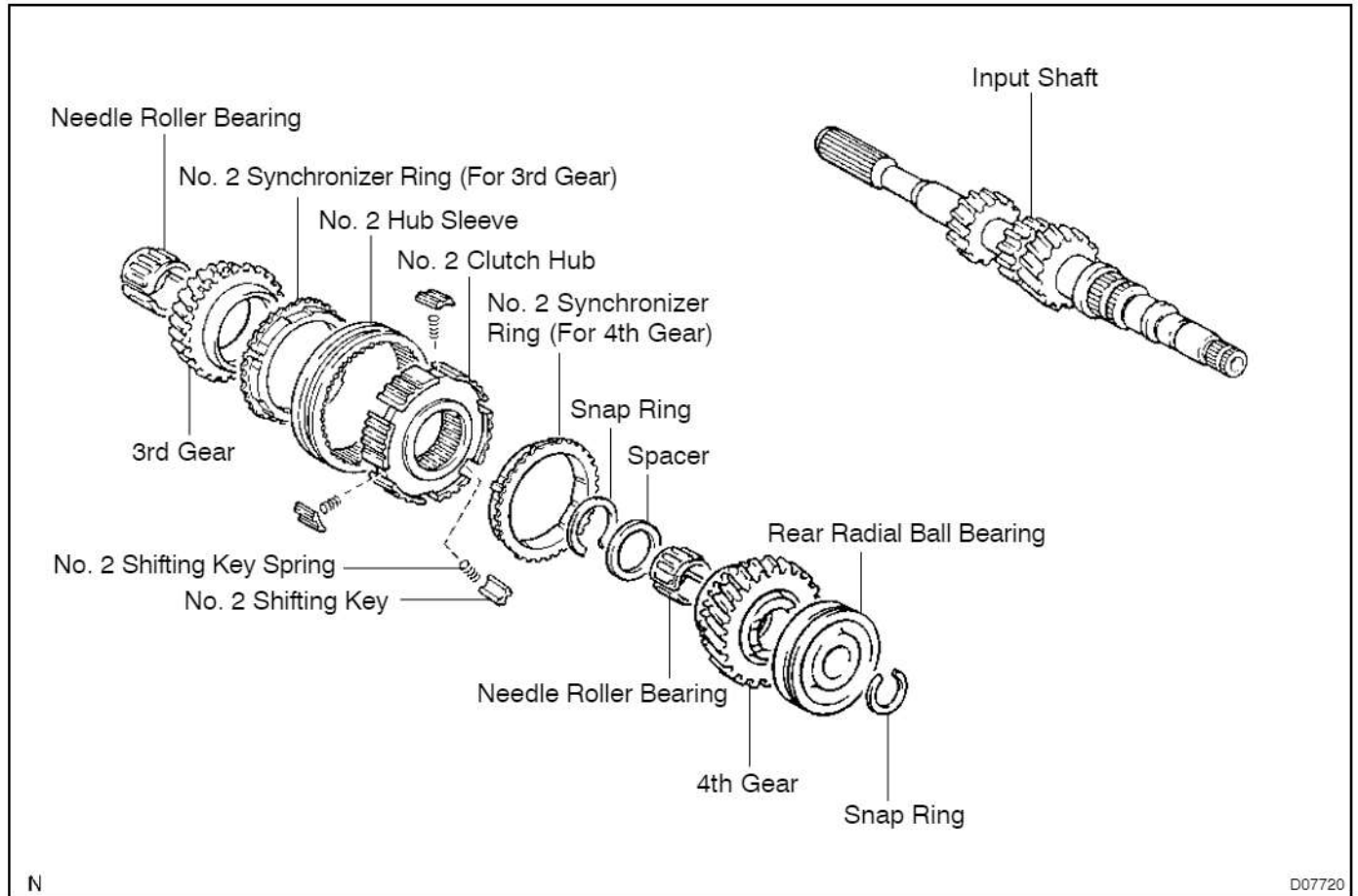
- Using a razor blade and gasket scraper, remove all old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.
- Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.

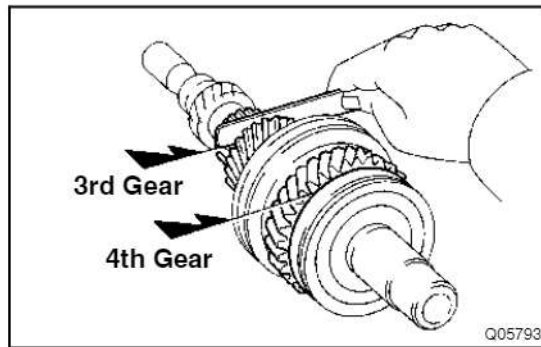
INPUT SHAFT COMPONENTS

MX09K-10



N

D07720



DISASSEMBLY

1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:

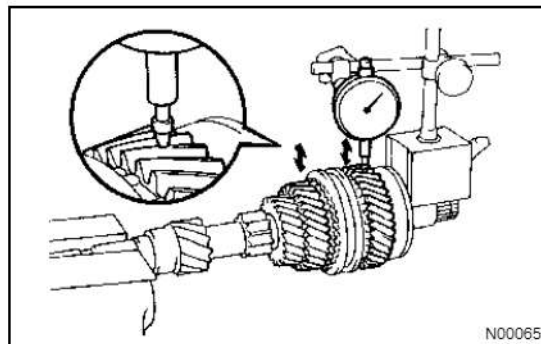
3rd gear: 0.10 – 0.35 mm (0.0039 – 0.0138 in.)

4th gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)

Maximum clearance:

3rd gear: 0.35 mm (0.0138 in.)

4th gear: 0.55 mm (0.0217 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:

KOYO made:

0.015 – 0.058 mm (0.0006 – 0.0023 in.)

NSK made:

0.015 – 0.056 mm (0.0006 – 0.0022 in.)

Maximum clearance:

KOYO made: 0.058 mm (0.0023 in.)

NSK made: 0.056 mm (0.0022 in.)

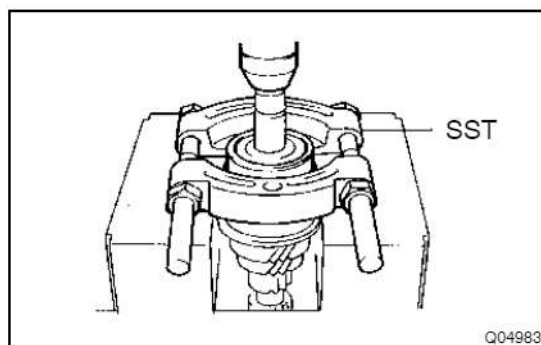
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

3. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

Take care not to damage the journal surface of the input shaft.



4. REMOVE REAR RADIAL BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND NO. 2 SYNCHRONIZER RING (FOR 4TH GEAR) FROM INPUT SHAFT

- (a) Using SST and a press, remove the rear radial ball bearing and 4th gear.

SST 09950-00020

HINT:

Support the input shaft assembly by hand so that it will not be dropped off.

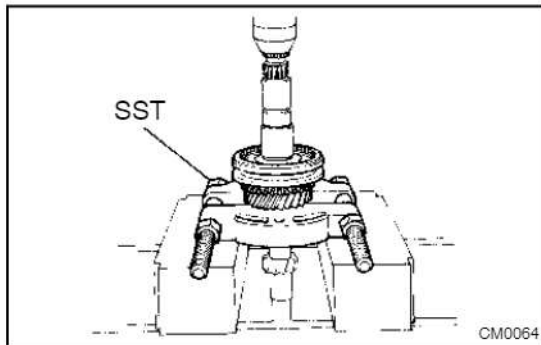
- (b) Remove the needle roller bearings, spacer and No. 2 synchronizer ring (for the 4th gear).

5. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

Take care not to damage the journal surface of the input shaft.



6. REMOVE NO. 2 HUB SLEEVE ASSEMBLY, 3RD GEAR, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR) AND NEEDLE ROLLER BEARING

- (a) Using SST and a press, remove the No. 2 hub sleeve assembly, 3rd gear and No. 2 synchronizer ring (for the 3rd gear).

SST 09950-00020

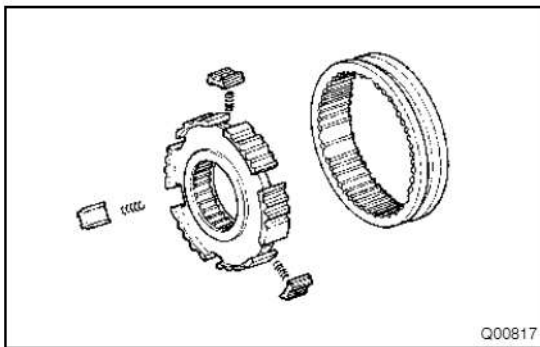
HINT:

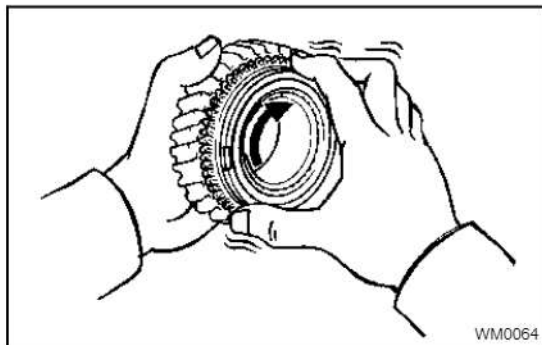
Support the input shaft by hand so that it will not be dropped off.

- (b) Remove the needle roller bearings.

7. DISASSEMBLE NO. 2 HUB SLEEVE ASSEMBLY

- (a) Remove the No. 2 hub sleeve from the No. 2 clutch hub.
- (b) Remove the 3 No. 2 shifting keys and No. 2 shifting key springs from the No. 2 clutch hub.





INSPECTION

1. INSPECT SYNCHRONIZER RING

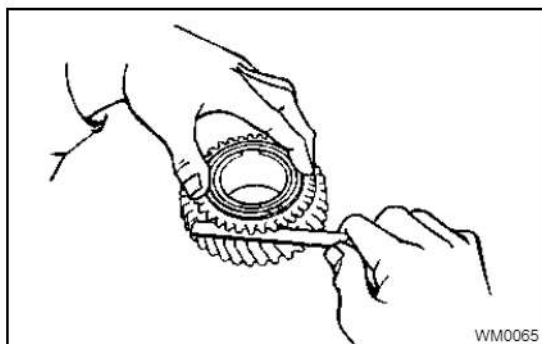
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

- (c) Check again the braking effect of the synchronizer ring.



- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:

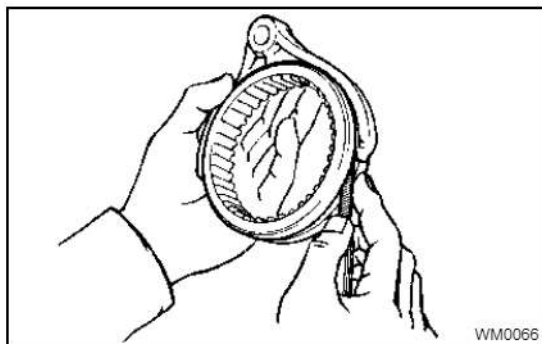
3rd gear: 0.65 mm (0.0256 in.)

4th gear: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

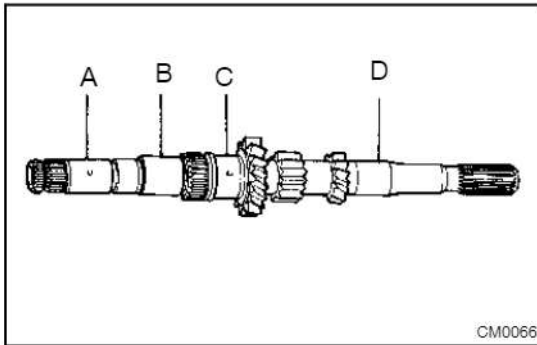


2. INSPECT GEAR SHIFT FORK AND HUB SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and gear shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the gear shift fork or hub sleeve.



3. INSPECT INPUT SHAFT

- (a) Check the input shaft for wear or damage.
- (b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

Minimum outer diameter:

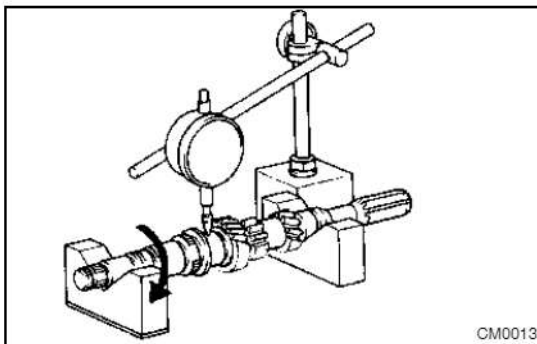
Part A: 24.885 mm (0.9797 in.)

Part B: 28.985 mm (1.1411 in.)

Part C: 30.985 mm (1.2199 in.)

Part D: 24.985 mm (0.9837 in.)

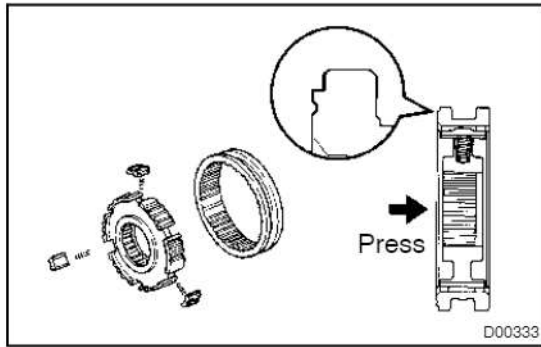
If the outer diameter is less than the minimum, replace the input shaft.



- (c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

If the runout exceeds the maximum, replace the input shaft.



REASSEMBLY

HINT:

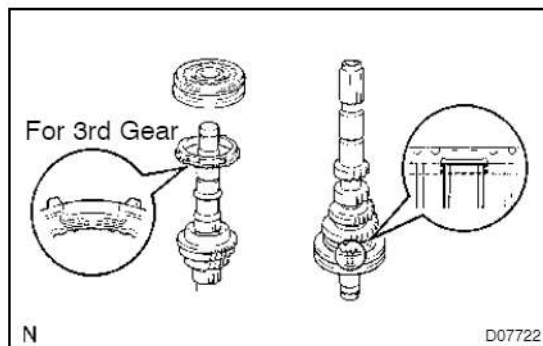
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. ASSEMBLE NO. 2 HUB SLEEVE ASSEMBLY

- (a) Install the 3 No. 2 shifting key springs and No. 2 shifting keys to the No. 2 clutch hub.
- (b) Install the No. 2 hub sleeve to the No. 2 clutch hub.

NOTICE:

Assemble the No. 2 hub sleeve and No. 2 clutch hub in the direction shown in the illustration.



2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR) AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

- (a) Apply gear oil to the needle roller bearings and install it.
- (b) Install the 3rd gear and No. 2 synchronizer ring (for the 3rd gear).

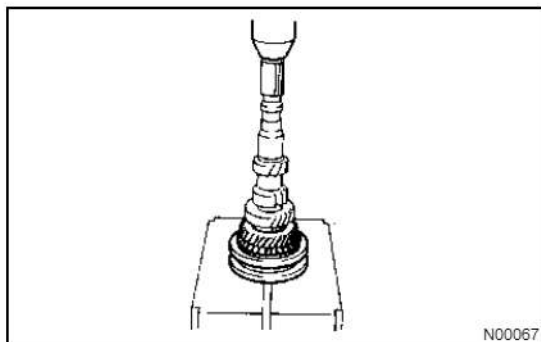
NOTICE:

Distinguish the No. 2 synchronizer ring (for the 3rd gear) by the teeth on the synchronizer ring.

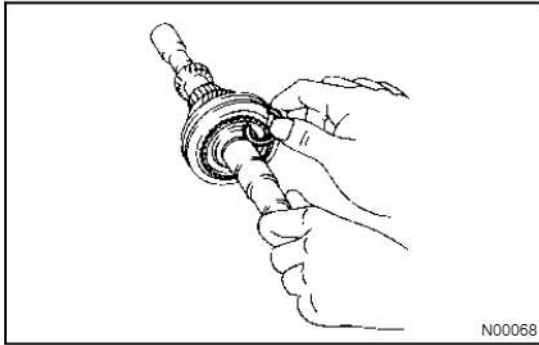
- (c) Install the No. 2 hub sleeve assembly so that the No. 2 synchronizer ring slots and No. 2 shifting keys are aligned.

NOTICE:

Be sure to install the No. 2 hub sleeve assembly in the correct direction, as shown in the illustration.



- (d) Using a press, install the No. 2 hub sleeve assembly.



3. INSTALL SNAP RING

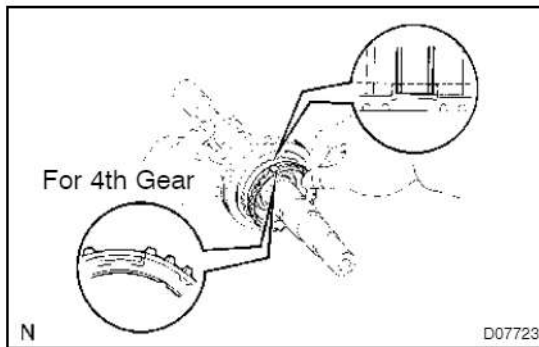
- (a) Select a snap ring from the table below that will make the thrust clearance of the No. 2 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

- (b) Using a screwdriver and hammer, tap in the snap ring.
HINT:

Take care not to damage the journal surface of the input shaft.

4. INSPECT 3RD GEAR THRUST CLEARANCE (See page MX-28)

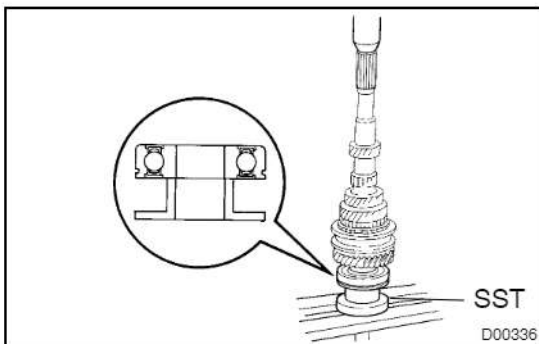


5. INSTALL SPACER, NEEDLE ROLLER BEARING, NO. 2 SYNCHRONIZER RING (FOR 4TH GEAR), 4TH GEAR AND REAR RADIAL BALL BEARING

- (a) Install the spacer.
(b) Apply gear oil to the needle roller bearings and install it.
(c) Place the No. 2 synchronizer ring (for the 4th gear) on the No. 2 hub sleeve assembly and align the No. 2 synchronizer ring slots with the No. 2 shifting keys.
(d) Install the 4th gear.

NOTICE:

Distinguish the No. 2 synchronizer ring (for the 4th gear) by the teeth on the synchronizer ring.



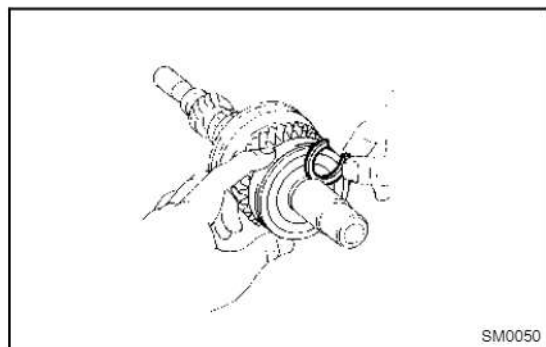
- (e) Using SST and a press, install the rear radial ball bearing.
SST 09608-00071

NOTICE:

Be sure to install the rear radial ball bearing in the correct direction, as shown in the illustration.

HINT:

Set SST to the bearing inner race securely.

**6. INSTALL SNAP RING**

- (a) Select a snap ring from the table below that will make the thrust clearance of the rear radial ball bearing less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.29 (0.0902)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0949)	F	2.59 (0.1020)

- (b) Using a screwdriver and hammer, tap in the snap ring.

HINT:

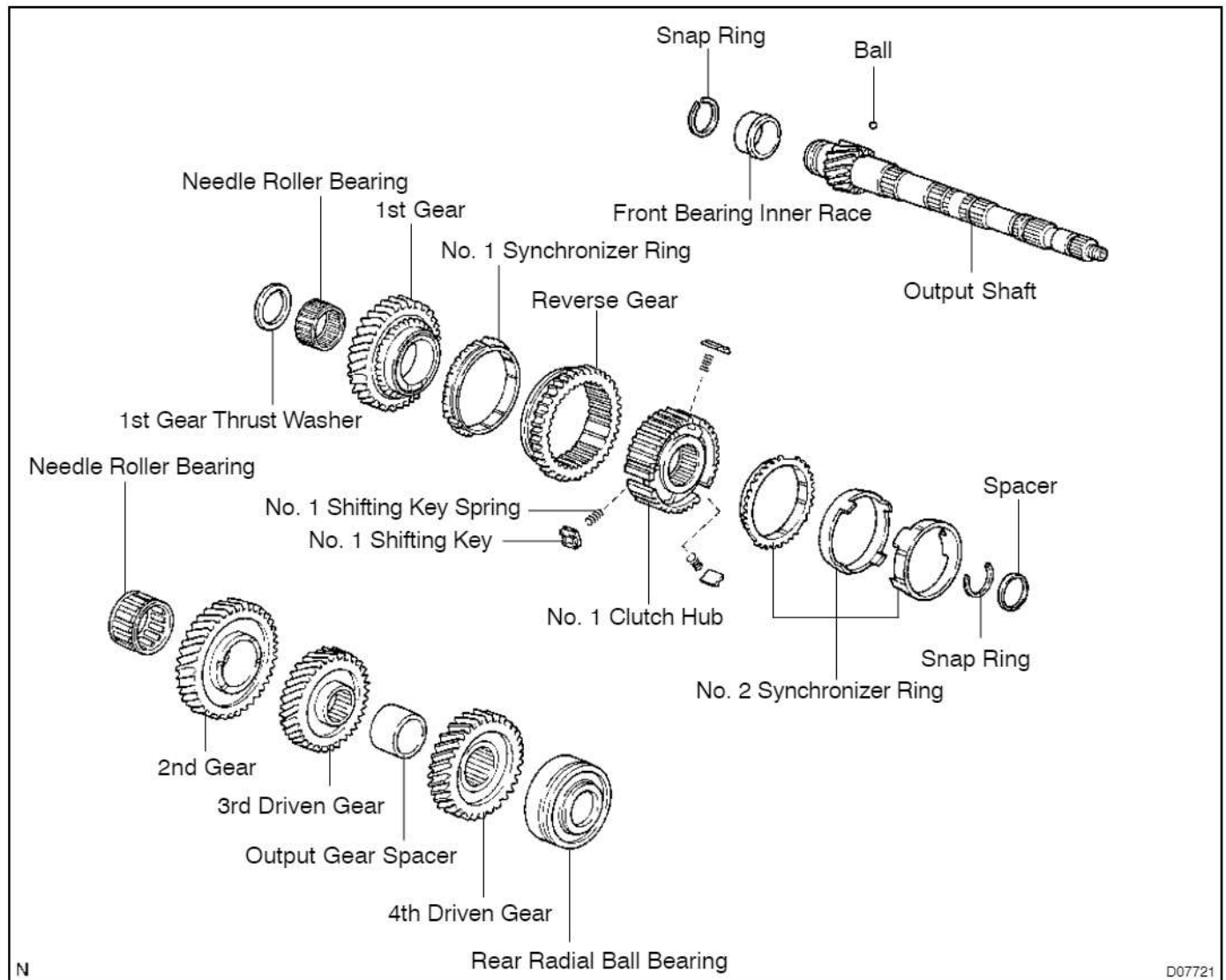
Take care not to damage the journal surface of the input shaft.

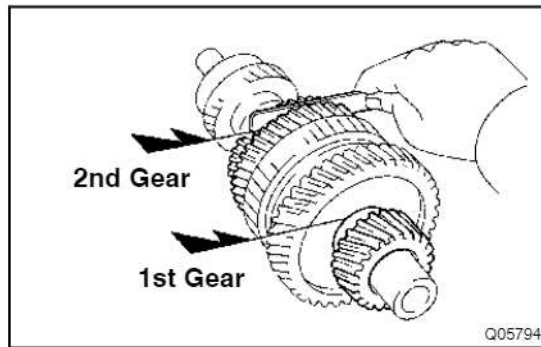
7. INSPECT 4TH GEAR THRUST CLEARANCE

(See page MX-28)

OUTPUT SHAFT COMPONENTS

MX090-10





DISASSEMBLY

1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:

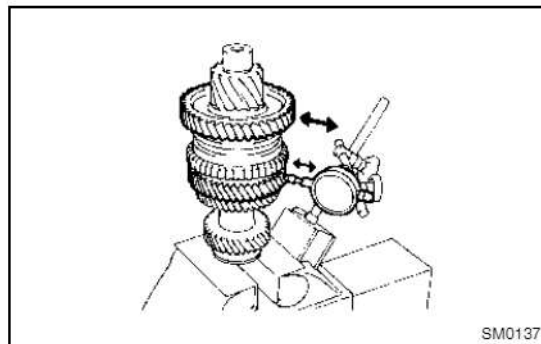
1st gear: 0.10 – 0.40 mm (0.0039 – 0.0157 in.)

2nd gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)

Maximum clearance:

1st gear: 0.40 mm (0.0157 in.)

2nd gear: 0.55 mm (0.0217 in.)



2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:

KOYO made:

0.015 – 0.058 mm (0.0006 – 0.0023 in.)

NSK made:

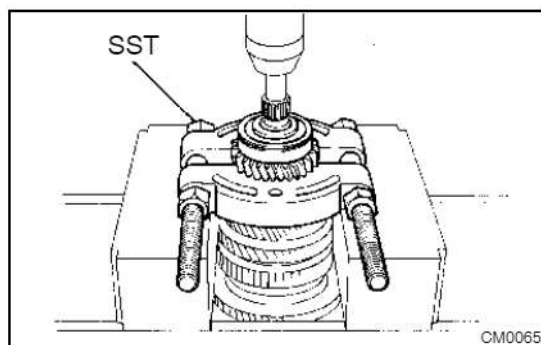
0.015 – 0.056 mm (0.0006 – 0.0022 in.)

Maximum clearance:

KOYO made: 0.058 mm (0.0023 in.)

NSK made: 0.056 mm (0.0022 in.)

If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



3. REMOVE REAR RADIAL BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

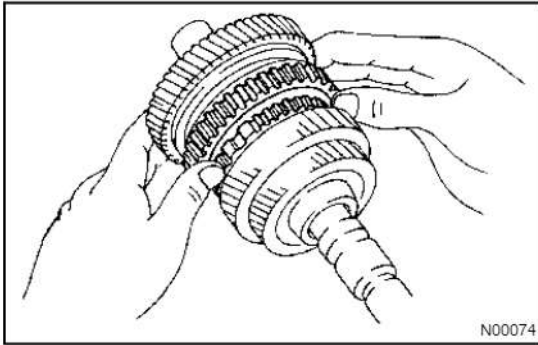
- (a) Using SST and a press, remove the rear radial ball bearing and 4th driven gear.

SST 09950-00020

HINT:

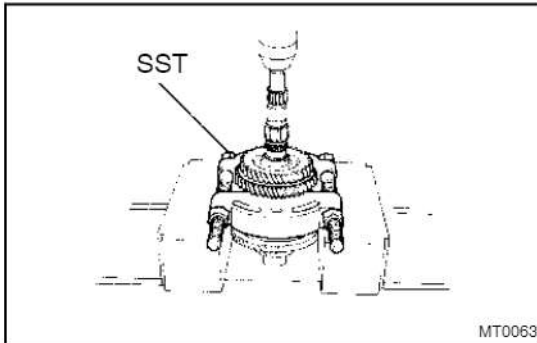
Support the output shaft assembly by hand so that it will not be dropped off.

- (b) Remove the output gear spacer.



4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING, SPACER AND NO. 2 SYNCHRONIZER RING

- (a) Shift the reverse gear into the 1st gear.



- (b) Using SST and a press, remove the 3rd driven gear and 2nd gear.

SST 09950-00020

HINT:

Support the output shaft assembly by hand so that it will not be dropped off.

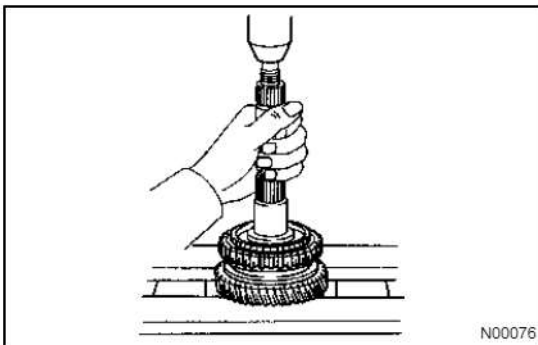
- (c) Remove the needle roller bearing, spacer and No. 2 synchronizer rings.

5. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

Take care not to damage the journal surface of the output shaft.



6. REMOVE REVERSE GEAR ASSEMBLY, 1ST GEAR, NO. 1 SYNCHRONIZER RING, NEEDLE ROLLER BEARING, 1ST GEAR THRUST WASHER AND BALL

- (a) Using a press, remove the reverse gear assembly, 1st gear and No. 1 synchronizer ring.

HINT:

Support the output shaft assembly by hand so that it will not be dropped off.

- (b) Remove the needle roller bearing and 1st gear thrust washer.

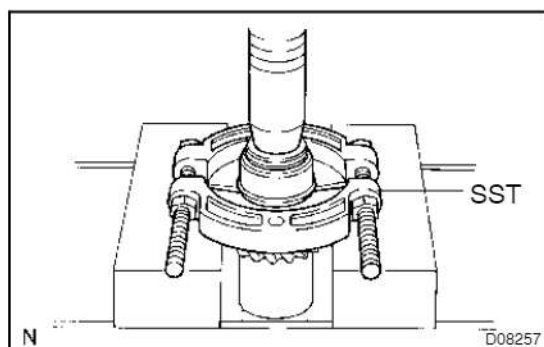
- (c) Using a magnetic finger, remove the ball.

7. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

Take care not to damage the journal surface of the output shaft.

**8. REMOVE FRONT BEARING INNER RACE**

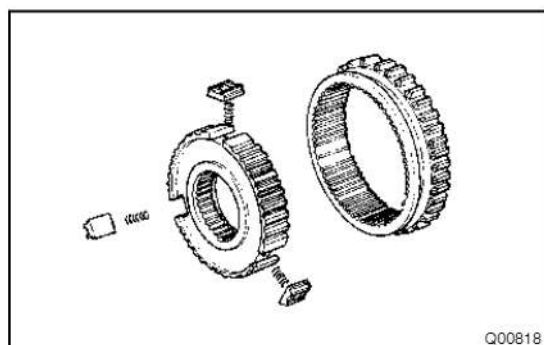
Using SST and a press, remove the front bearing inner race.
SST 09950-00020

NOTICE:

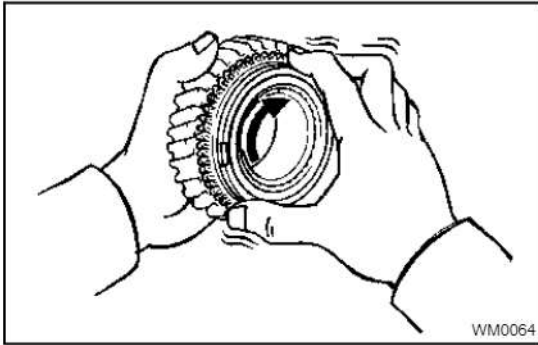
When replacing the front bearing inner race, replace the output shaft front bearing along with it.

HINT:

Support the output shaft by hand so that it will not be dropped off.

**9. DISASSEMBLE REVERSE GEAR ASSEMBLY**

- (a) Remove the reverse gear from the No. 1 clutch hub.
- (b) Remove the 3 No. 1 shifting keys and No. 1 shifting key springs from the No. 1 clutch hub.



WM0064

INSPECTION

1. INSPECT 1ST GEAR SYNCHRONIZER RING

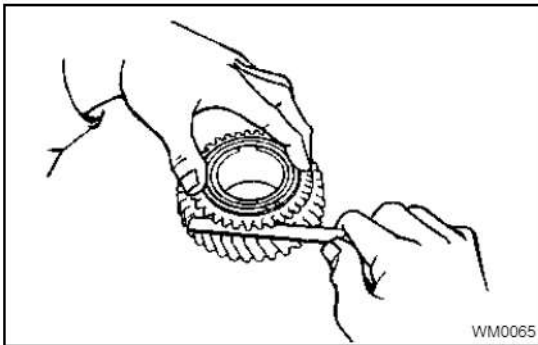
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.

- (c) Check again the braking effect of the synchronizer ring.



WM0065

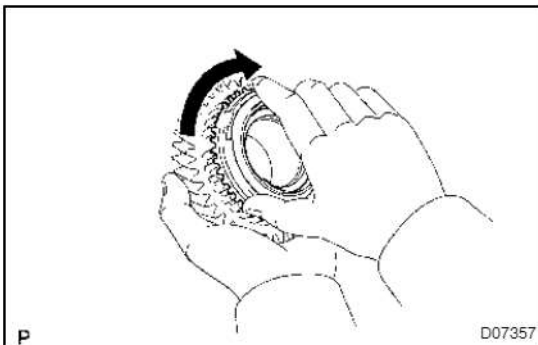
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.75 mm (0.0295 in.)

If the clearance is less than the minimum, replace the synchronizer ring, and apply a small amount of the fine lapping compound on gear cone.

NOTICE:

Ensure the fine lapping compound is completely washed off after rubbing.



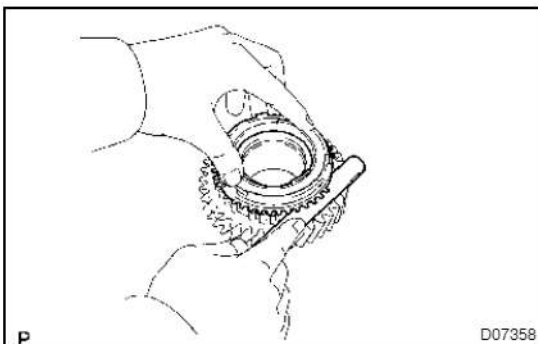
P

D07357

2. INSPECT 2ND GEAR SYNCHRONIZER RING

- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, replace the synchronizer ring.



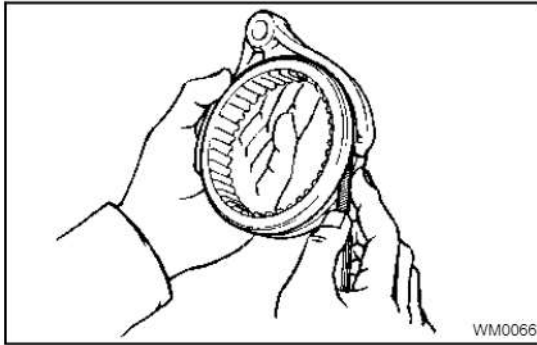
P

D07358

- (c) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance: 0.70 mm (0.0276 in.)

If the clearance is less than the minimum, replace the synchronizer ring.

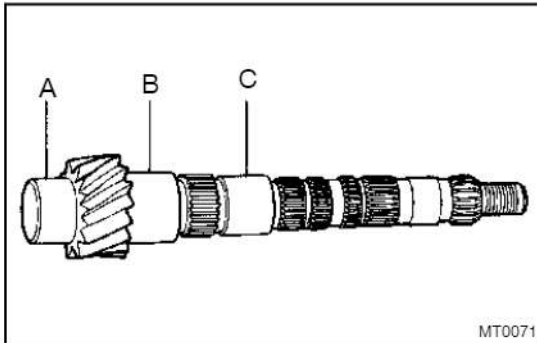


3. INSPECT GEAR SHIFT FORK AND REVERSE GEAR CLEARANCE

Using a feeler gauge, measure the clearance between the reverse gear and gear shift fork.

Maximum clearance: 0.35 mm (0.014 in.)

If the clearance exceeds the maximum, replace the gear shift fork or hub sleeve.



4. INSPECT OUTPUT SHAFT

- Check the output shaft for wear or damage.
- Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:

Part A: 32.985 mm (1.2986 in.)

Part B: 37.985 mm (1.4955 in.)

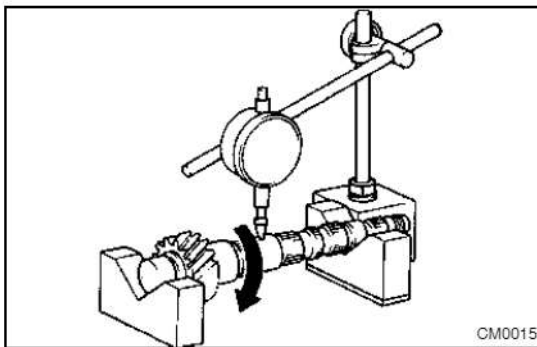
Part C: 31.985 mm (1.2592 in.)

If the outer diameter is less than the minimum, replace the output shaft.

- Using a dial indicator, check the shaft runout.

Maximum runout: 0.03 mm (0.0012 in.)

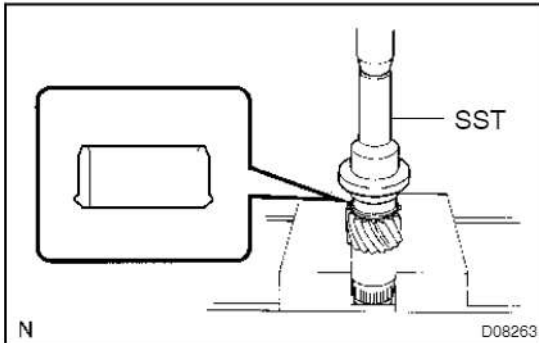
If the runout exceeds the maximum, replace the output shaft.



REASSEMBLY

HINT:

Coat all of the sliding and rotating surfaces with gear oil before reassembly.



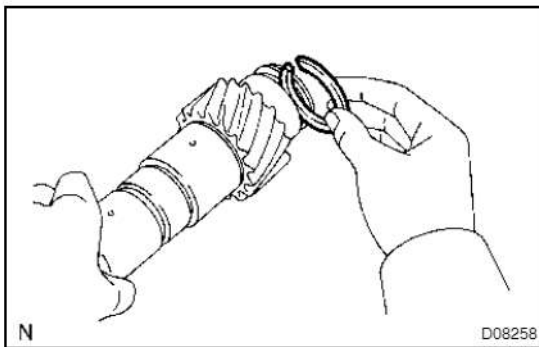
1. INSTALL FRONT BEARING INNER RACE

Using SST and a press, install the front bearing inner race.

SST 09223-50010

NOTICE:

Be sure to install the front bearing inner race in the correct direction, as shown in the illustration.



2. INSTALL SNAP RING

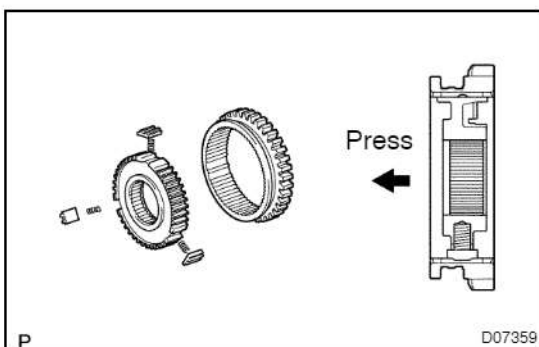
- (a) Select a snap ring from the table below that will make the thrust clearance of the front bearing inner race less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
7	1.85 (0.0728)	3	2.05 (0.0807)
8	1.90 (0.0748)	4	2.10 (0.0827)
1	1.95 (0.0768)	5	2.15 (0.0846)
2	2.00 (0.0787)	6	2.20 (0.0866)

- (b) Using a screwdriver and hammer, tap in the snap ring.

HINT:

Take care not to damage the journal surface of the output shaft.

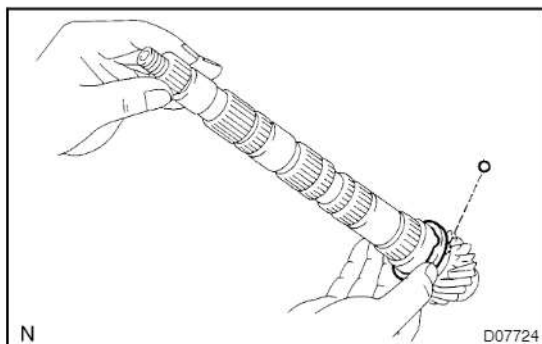


3. ASSEMBLE REVERSE GEAR ASSEMBLY

- (a) Install the 3 No. 1 shifting key springs and No. 1 shifting keys to the No. 1 clutch hub.
- (b) Install the No. 1 clutch hub to the reverse gear.

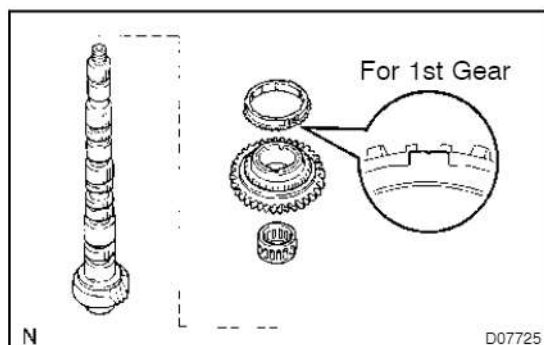
NOTICE:

Assemble the No. 1 clutch hub and reverse gear in the direction shown in the illustration.



4. INSTALL BALL, 1ST GEAR THRUST WASHER, NEEDLE ROLLER BEARING, 1ST GEAR, NO. 1 SYNCHRONIZER RING AND REVERSE GEAR ASSEMBLY TO OUTPUT SHAFT

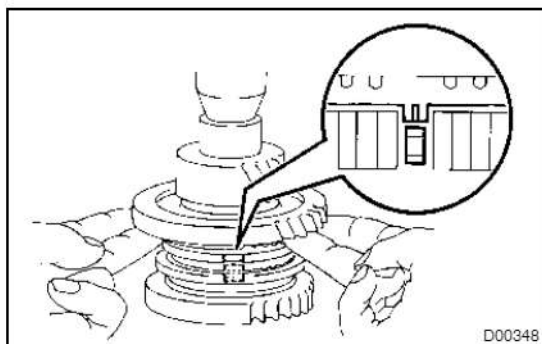
- Using a magnetic finger, install the ball to the output shaft.
- Fit the 1st gear thrust washer groove securely over the locking ball when installing the thrust on the output shaft.



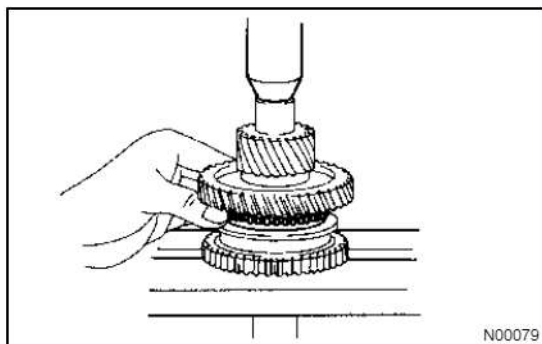
- Apply gear oil to the needle roller bearing and install it.
- Install the 1st gear and No. 1 synchronizer ring.

NOTICE:

Distinguish the No. 1 synchronizer ring by the teeth on the synchronizer ring.



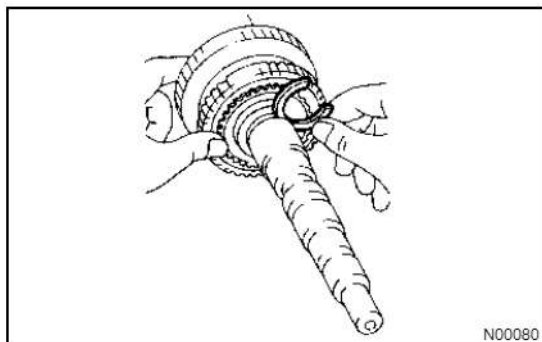
- Place the reverse gear assembly and align the No. 1 synchronizer ring slots with the No. 1 shifting keys.



- Using a press, install the reverse gear assembly.

NOTICE:

- Be sure to install the reverse gear assembly in the correct direction, as shown in the illustration.
- When installing, make sure that the ball is placed in a groove of the 1st gear thrust washer.



5. INSTALL SNAP RING

- Select a snap ring from the table below that will make the thrust clearance of the No. 1 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

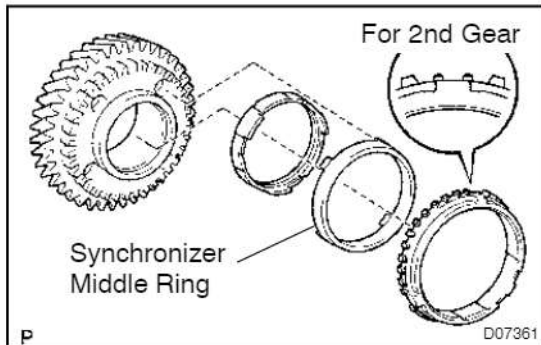
- Using a screwdriver and hammer, tap in the snap ring.

HINT:

Take care not to damage the journal surface of the output shaft.

6. INSPECT 1ST GEAR THRUST CLEARANCE

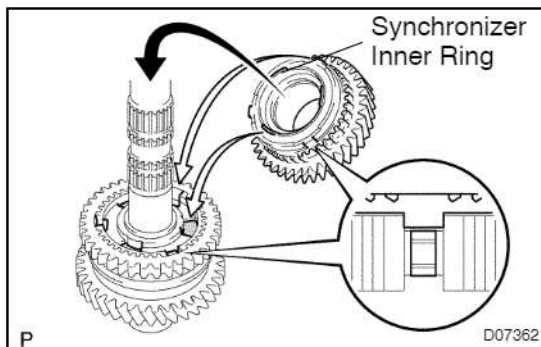
(See page MX-36)

**7. INSTALL SPACER, NEEDLE ROLLER BEARING, NO. 2 SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR**

- (a) Install the spacer.
- (b) Apply gear oil to the needle roller bearing and install it.
- (c) Place the No. 2 synchronizer rings on the 2nd gear.

NOTICE:

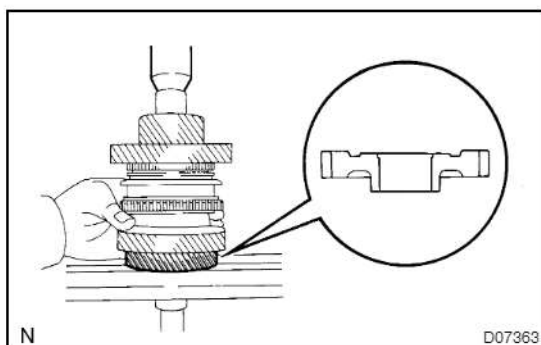
- Properly fit the synchronizer middle ring claws into the holes in the 2nd gear.
- Distinguish the No. 2 synchronizer ring by the teeth on the synchronizer ring.



- (d) Place the 2nd gear with the No. 2 synchronizer rings and align the No. 2 synchronizer ring slots with the No. 1 shifting keys.

NOTICE:

Fit the synchronizer inner ring claws into the slots in the No. 1 clutch hub.



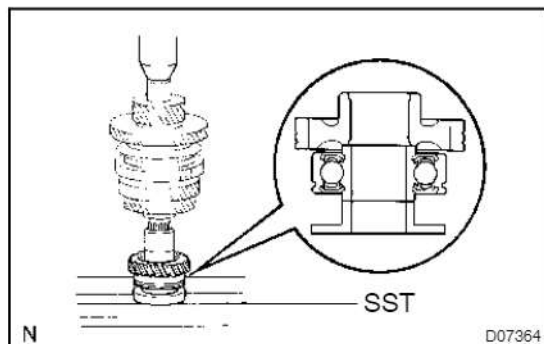
- (e) Using a press, install the 3rd driven gear.

NOTICE:

Be sure to install the 3rd driven gear in the correct direction, as shown in the illustration.

8. INSPECT 2ND GEAR THRUST CLEARANCE

(See page MX-36)



9. INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND REAR RADIAL BALL BEARING

- (a) Install the output gear spacer.
- (b) Using SST and a press, install the 4th driven gear and rear radial ball bearing.

SST 09608-00071

NOTICE:

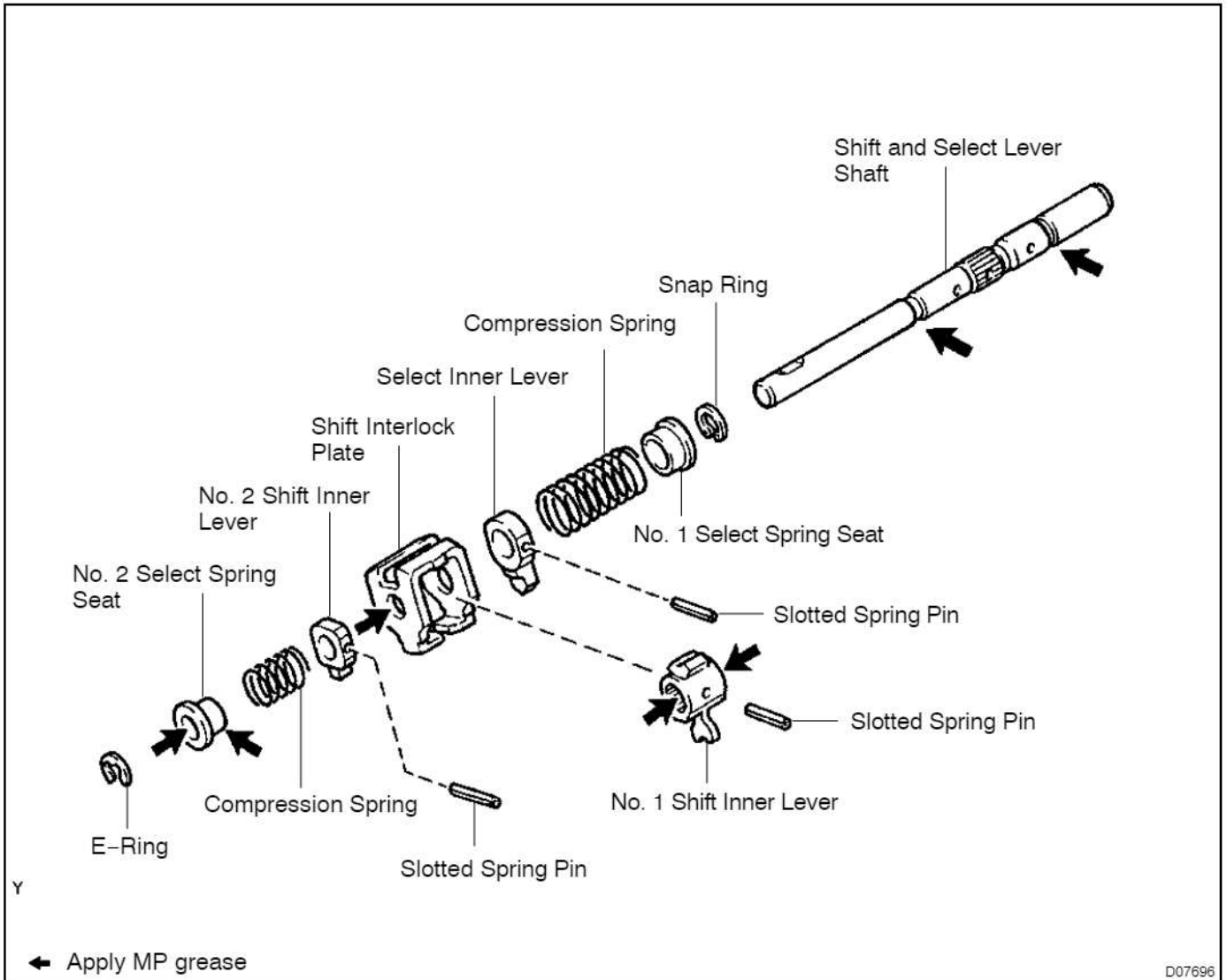
Be sure to install the 4th driven gear and rear radial ball bearing in the correct direction, as shown in the illustration.

HINT:

Set SST to the bearing inner race securely.

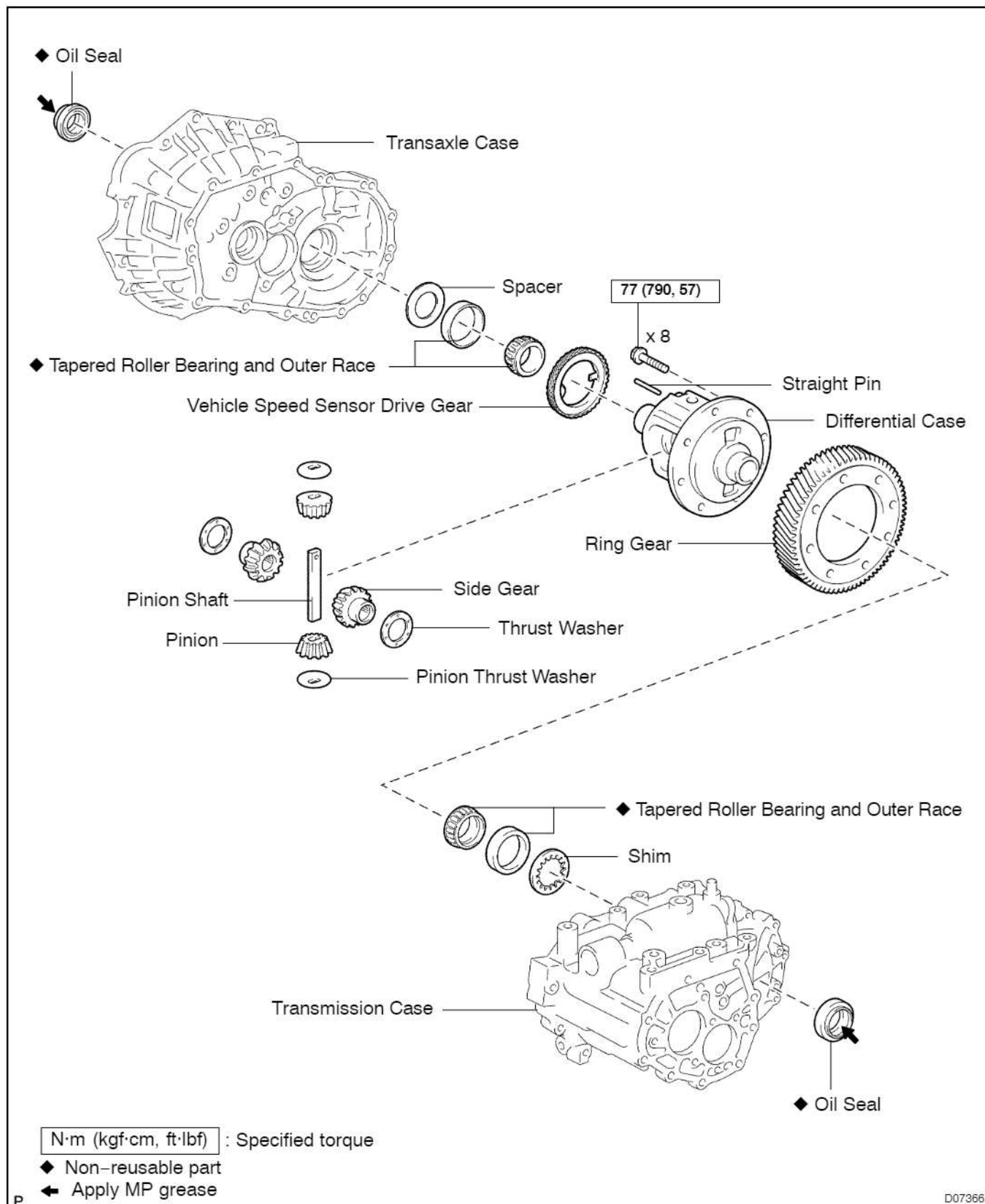
SHIFT AND SELECT LEVER SHAFT COMPONENTS

MX001-18

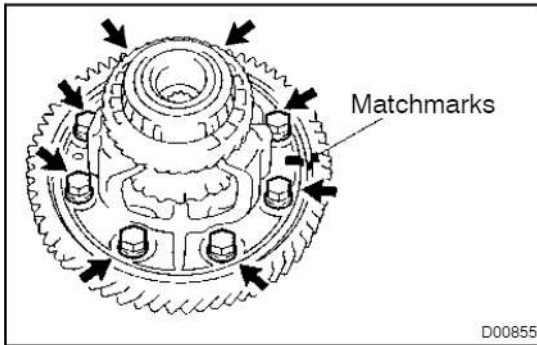


DIFFERENTIAL CASE COMPONENTS

MX099-10



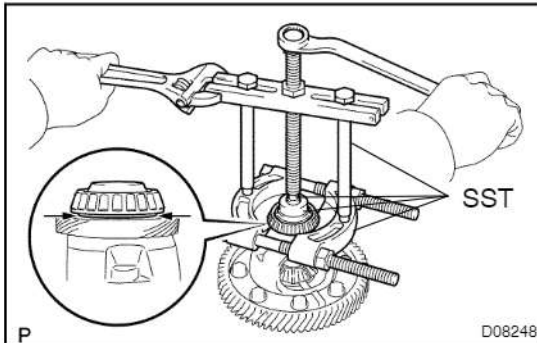
D07366



DISASSEMBLY

1. REMOVE RING GEAR

- Place matchmarks on the ring gear and differential case.
- Remove the 8 bolts.
- Using a copper hammer, tap on the ring gear to remove it from the differential case.



2. Vehicle speed sensor drive gear side:

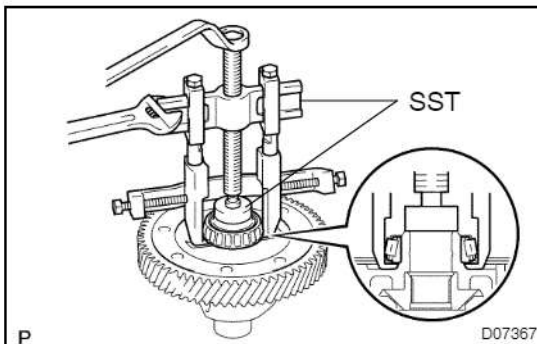
REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

- Using SST, remove the tapered roller bearing.
SST 09950-00020, 09950-00030, 09950-40011
(09957-04010), 09950-60010 (09951-00350)

HINT:

Set the claw of SST to the bearing inner race securely.

- Remove the vehicle speed sensor drive gear.



3. Ring gear side:

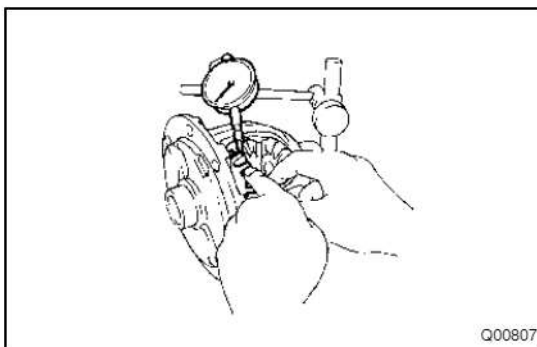
REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

Using SST, remove the tapered roller bearing.

SST 09950-40011, 09950-60010 (09951-00350)

HINT:

Set the claw of SST to the bearing inner race at the position where the differential case is indented.



4. INSPECT SIDE GEAR BACKLASH

Using a dial indicator, measure the backlash of one side gear while holding one pinion toward the differential case.

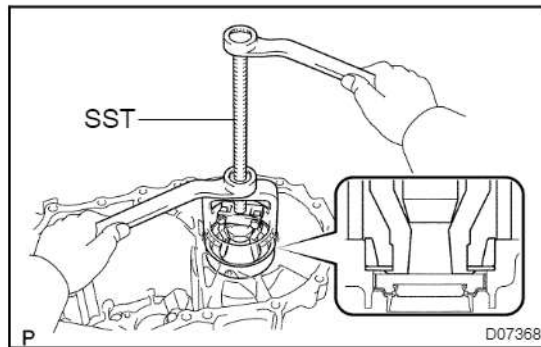
Standard backlash:

0.05 - 0.20 mm (0.0020 - 0.0079 in.)

If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

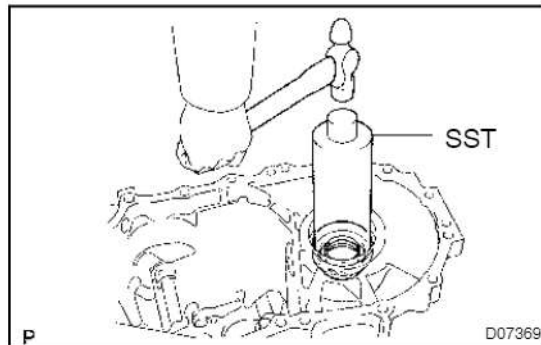
- Using a pin punch and hammer, drive out the straight pin.
- Remove the pinion shaft from the differential case.
- Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



6. Transmission case side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

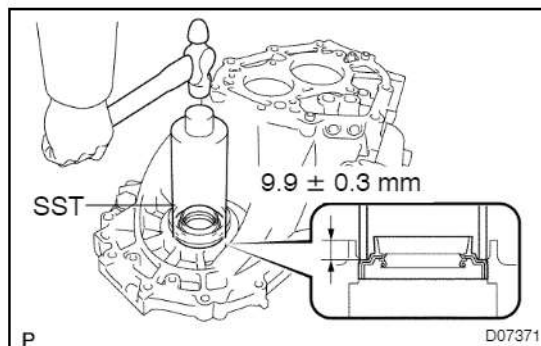
- (a) Using SST, pull out the tapered roller bearing outer race and shim.

SST 09612-65014



- (b) Using SST and a hammer, drive out the oil seal.

SST 09226-10010



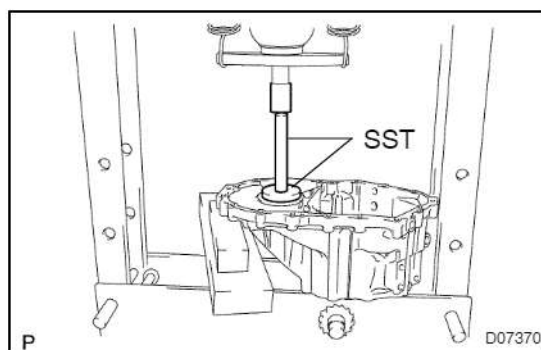
- (c) Using SST and a hammer, drive in a new oil seal.

SST 09226-10010

Drive in depth: 9.9 ± 0.3 mm (0.390 ± 0.012 in.)

- (d) Coat the lip of the oil seal with MP grease.

- (e) Place the shim into the differential case.

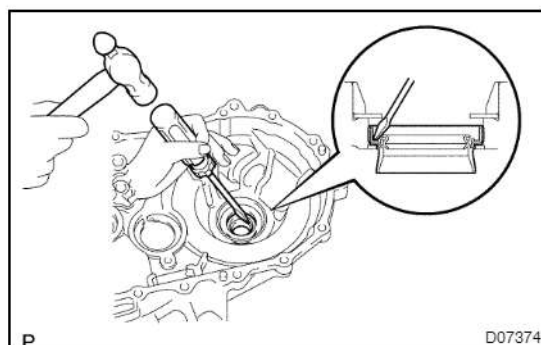


- (f) Using SST and a press, install the tapered roller bearing outer race.

SST 09950-60020 (09951-00710), 09950-70010 (09951-07150)

NOTICE:

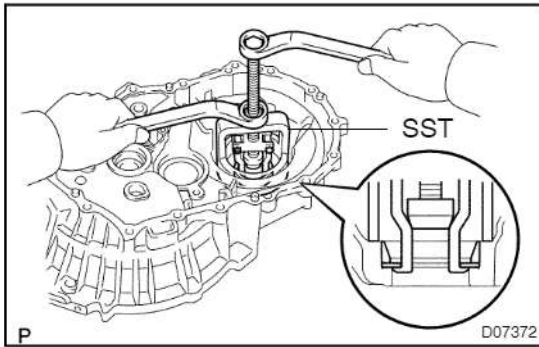
When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.



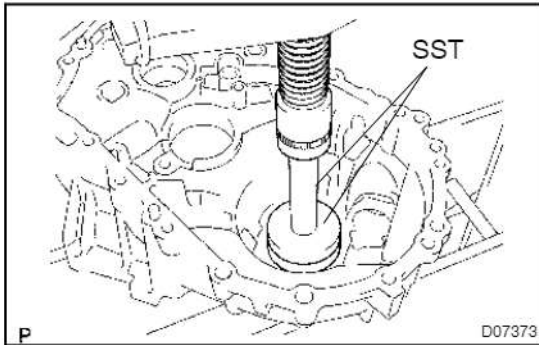
7. Transaxle case side:

IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

- (a) Using a screwdriver and hammer, drive out the oil seal.



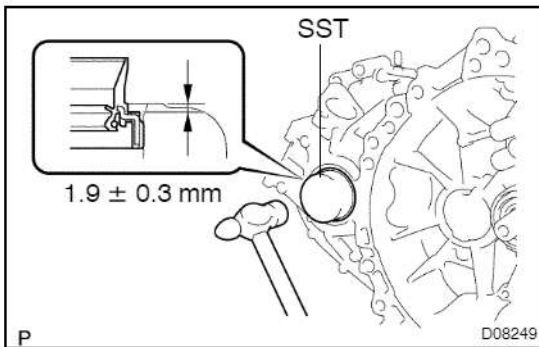
- (b) Using SST, pull out the tapered roller bearing outer race and spacer.
SST 09612-65014
- (c) Place the spacer into the differential case.



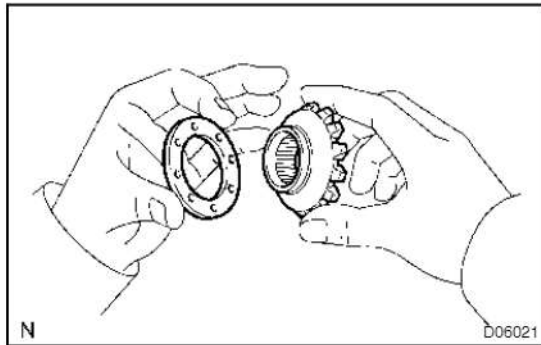
- (d) Using SST and a press, install the tapered roller bearing outer race.
SST 09950-60020 (09951-00680), 09950-70010 (09951-07150)

NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.



- (e) Using SST and a hammer, drive in a new oil seal.
SST 09710-28021 (09710-08041)
Drive in depth: 1.9 ± 0.3 mm (0.075 ± 0.012 in.)
- (f) Coat the lip of the oil seal with MP grease.



REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

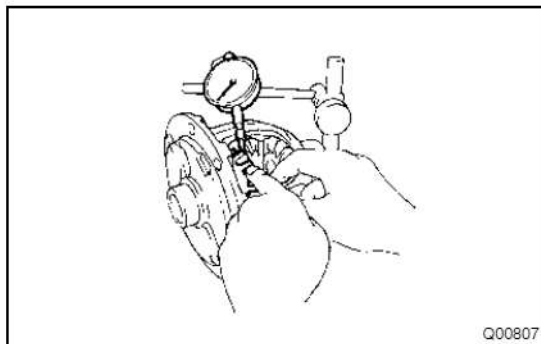
- (a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.

Standard backlash:

0.05 – 0.20 mm (0.0020 – 0.0079 in.)

Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

- (b) Install the thrust washers and side gears in the differential case.
- (c) Install the pinion shaft.



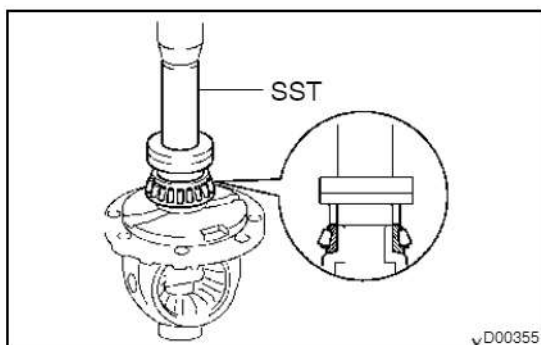
- (d) Using a dial indicator, check the side gear backlash. Measure the side gear backlash while holding one pinion toward the differential case.

Standard backlash:

0.05 – 0.20 mm (0.0020 – 0.0079 in.)

If the backlash is not within the specification, install a thrust washer of different thickness.

- (e) Using a pin punch and hammer, drive in the straight pin through the differential case and hole in the pinion shaft.
- (f) Using a chisel and hammer, caulk the pin holes around the circumference of the differential case.



2. Ring gear side:

INSTALL TAPERED ROLLER BEARING

Using SST and a press, install the tapered roller bearing.

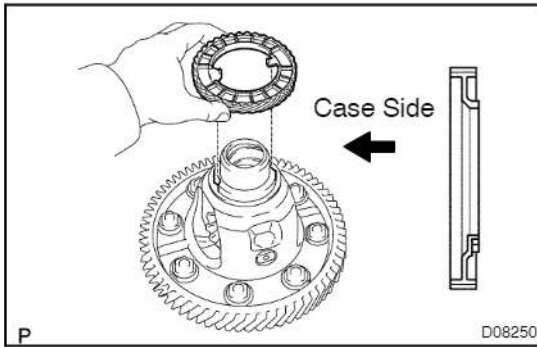
SST 09350-32014 (09351-32120, 09351-32140)

NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.

HINT:

Set SST to the bearing inner race securely.

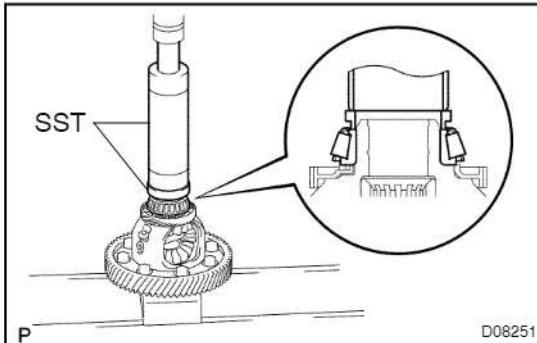


3. Vehicle speed sensor drive gear side: INSTALL TAPERED ROLLER BEARING

- (a) Place the vehicle speed sensor drive gear in position to stop it turning, and install the vehicle speed sensor drive gear.

NOTICE:

Be sure to install the vehicle speed sensor drive gear in the correct direction, as shown in the illustration.



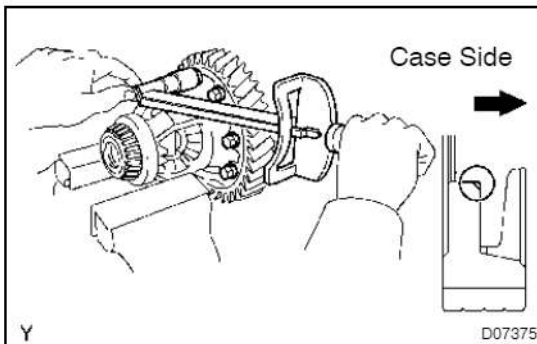
- (b) Using SST and a press, install a new side bearing.
SST 09316-60011 (09316-00011), 09350-32014 (09351-32120)

NOTICE:

When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.

HINT:

Set SST to the bearing inner race securely.



4. INSTALL RING GEAR ON DIFFERENTIAL CASE

- (a) Clean the contact surface of the differential case.
(b) Heat the ring gear in boiling water.
(c) Carefully take the ring gear out of the water.
(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT:

Align the matchmarks on the differential case and contact the ring gear.

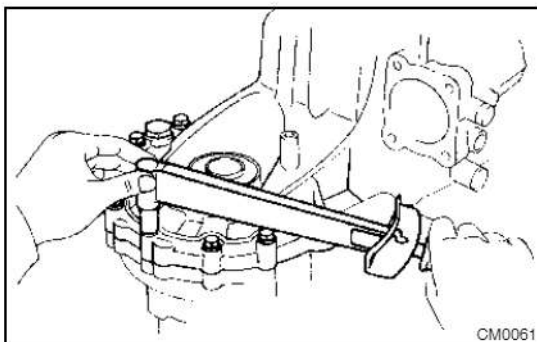
- (e) Temporarily install the 8 set bolts.

CAUTION:

The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

- (f) After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.

Torque: 77 N·m (790 kgf·cm, 57 ft·lbf)



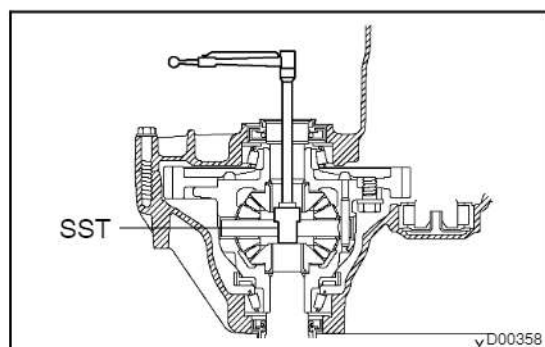
5. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD

NOTICE:

Perform this only when replacing the tapered roller bearing and outer race of the differential case.

- (a) Install the differential case assembly to the transaxle case.
(b) Install the transmission case to the transaxle case with the 16 bolts.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



- (c) Using SST and a torque wrench, turn the differential case assembly right and left 2 or 3 times to allow the bearings to settle.

SST 09564-32011

- (d) Using SST and a torque wrench, measure the preload.

SST 09564-32011

Preload (at starting):

New bearing

0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)

Reused bearing

0.5 – 1.0 N·m (5 – 10 kgf·cm, 4.3 – 8.7 in.·lbf)

If the preload is not within the specification, remove the transmission case side outer race of the tapered roller bearing with SST (See page MX-47). Select an appropriate shim.

HINT:

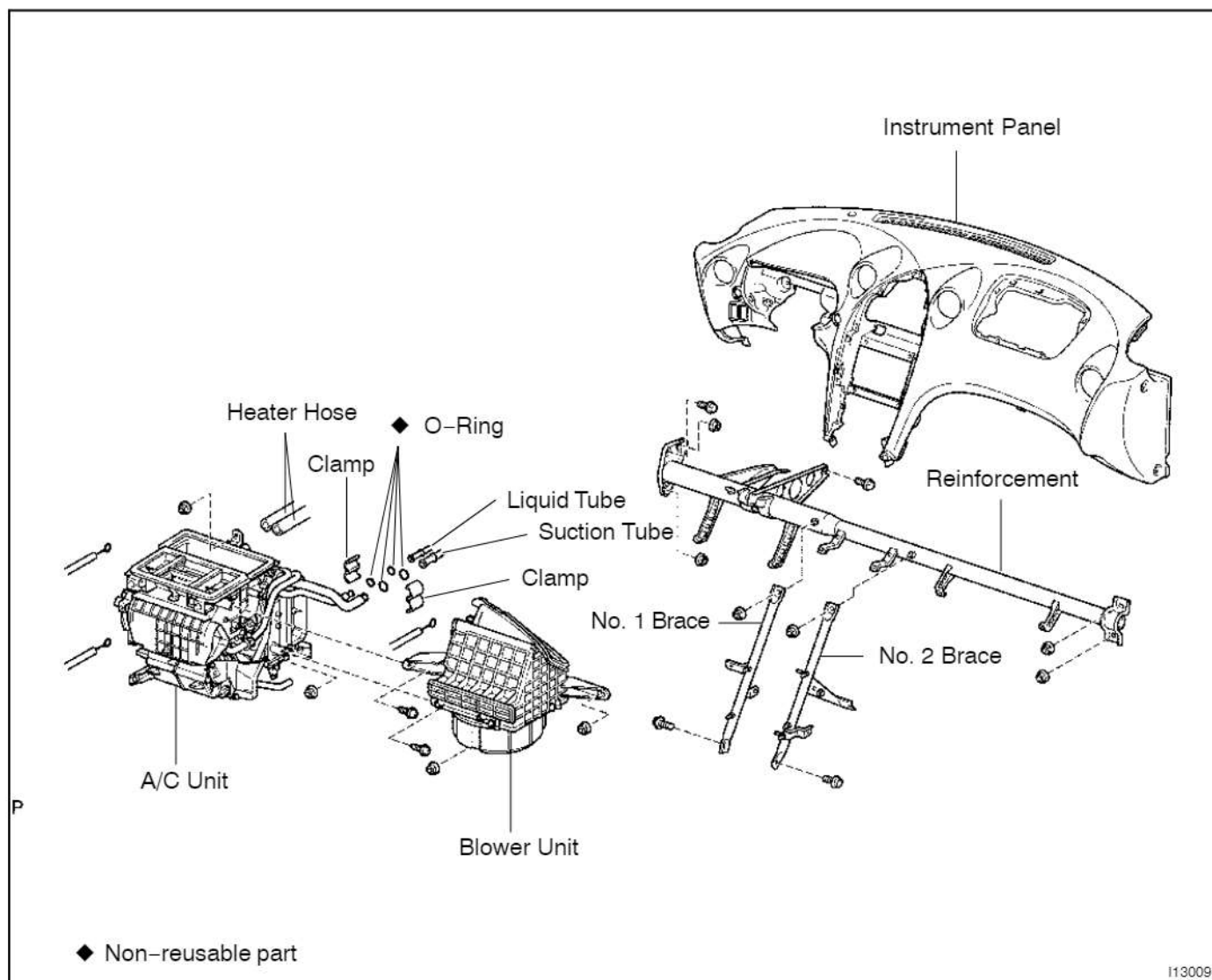
The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.·lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

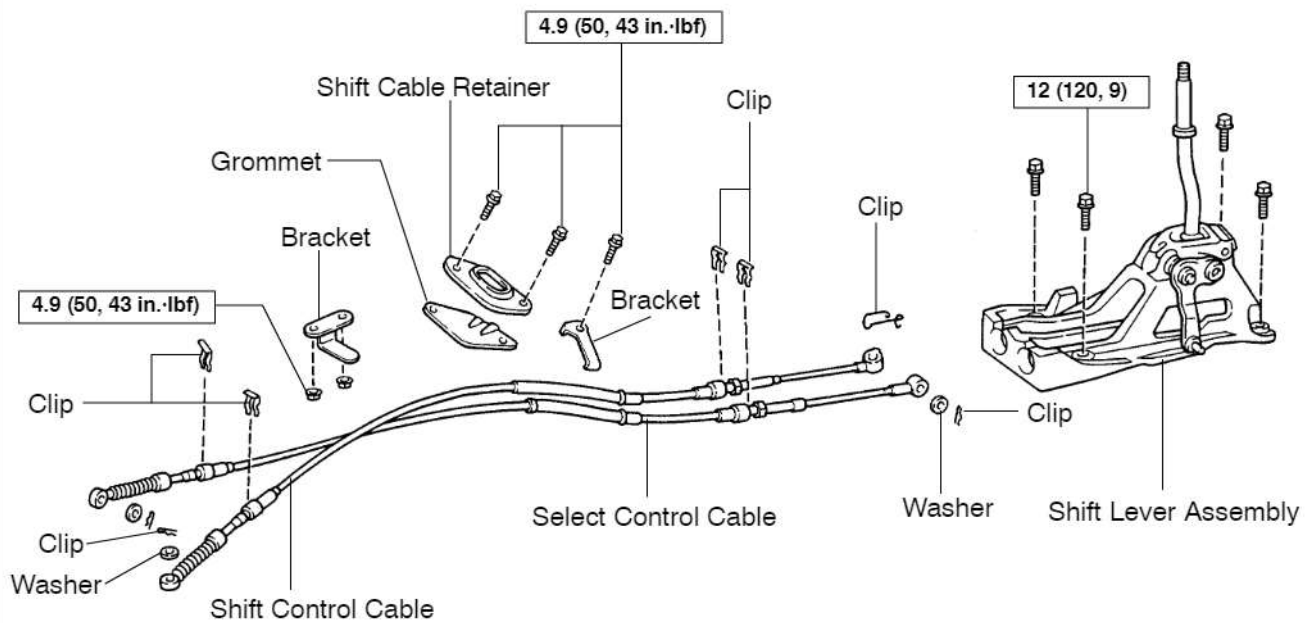
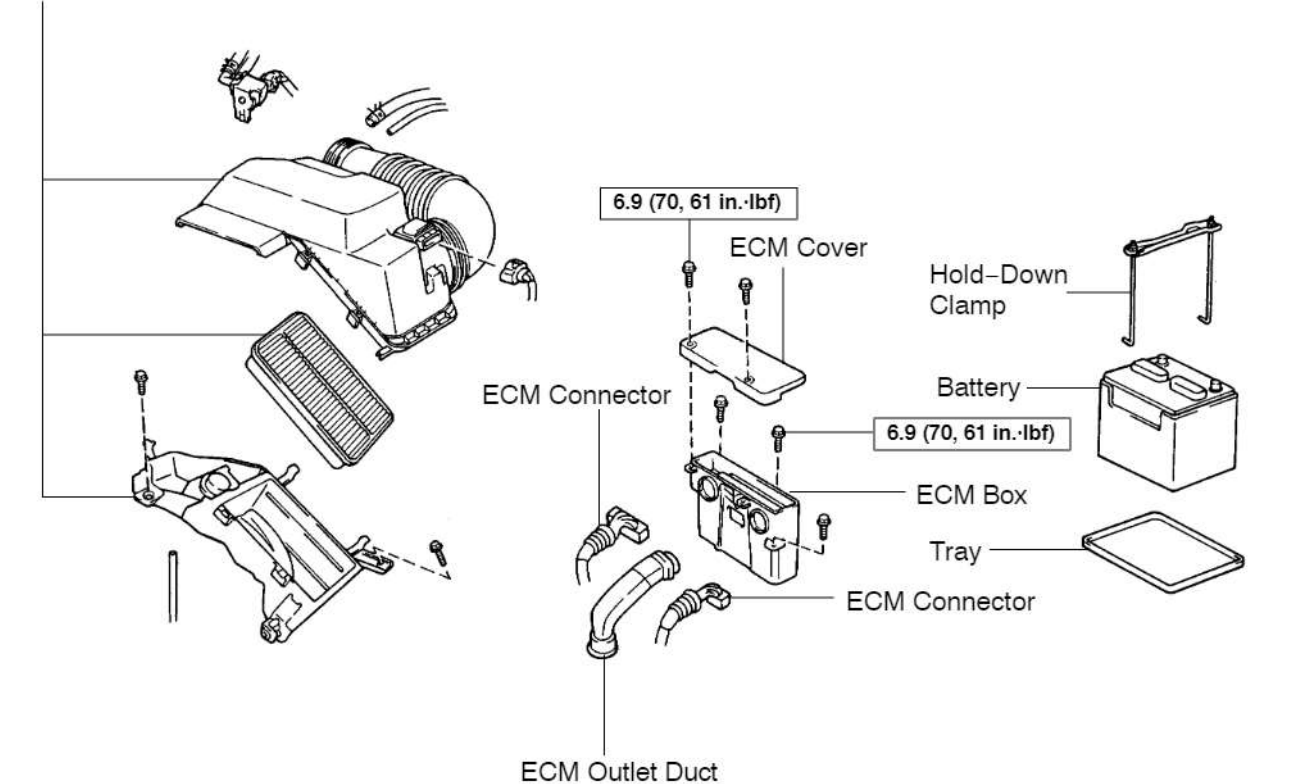
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	–	–

- (e) Remove the 16 bolts and transmission case.
 (f) Remove the differential case assembly.

MYD88-08





Air Cleaner Case Assembly
with Air Hose

N N·m (kgf·cm, ft·lbf) : Specified torque

D07749