MANUAL TRANSAXLE SYSTEM

MX04X–01

PRECAUTION

When working with FIPG material, you must observe the following items.

- ★ **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- ★ **Thoroughly clean all components to remove all the 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.**

TROUBLESHOOTING

MX04Y–01

PROBLEM SYMPTOMS TABLE

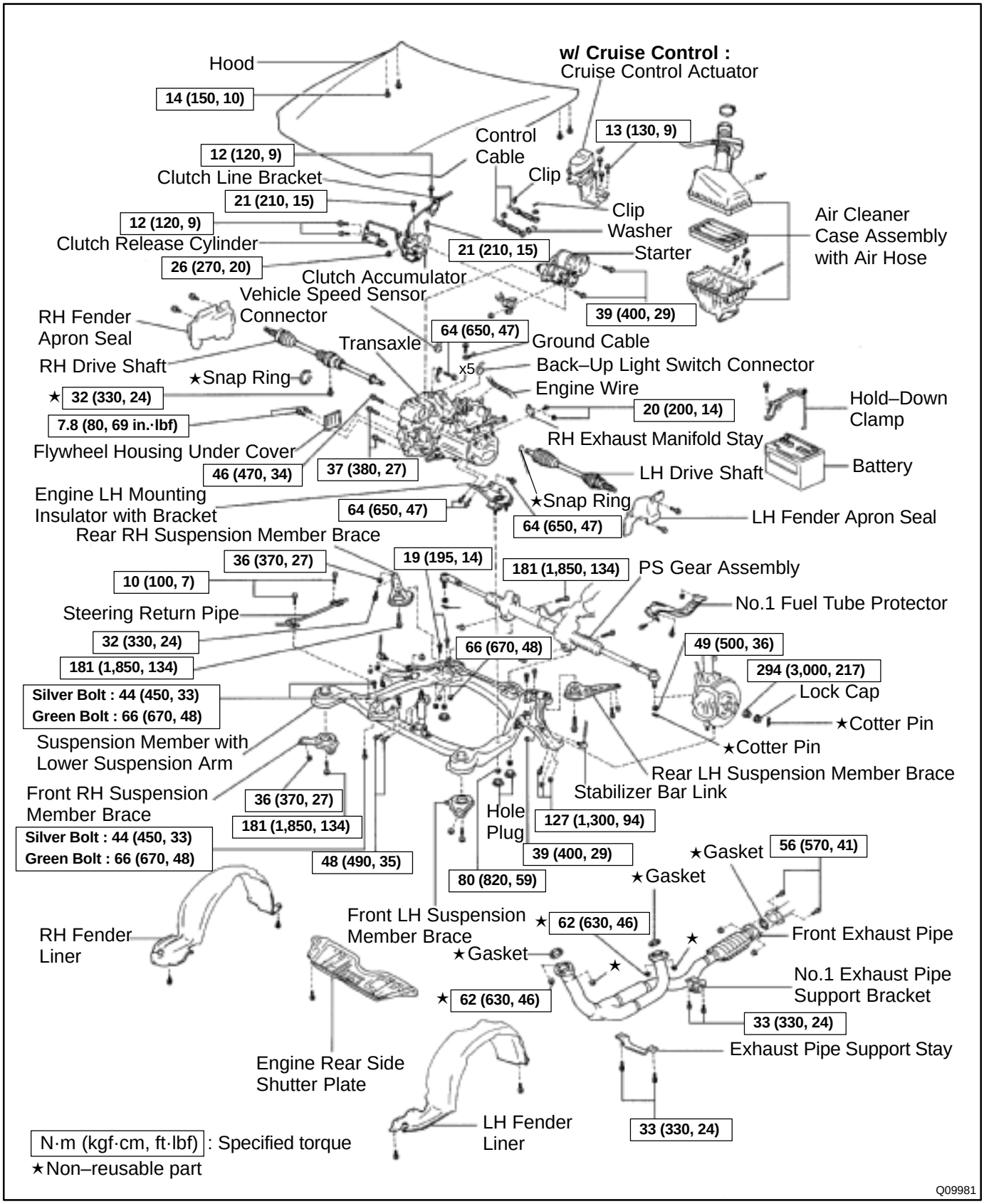
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–4
	2. Oil (Wrong)	MX–4
	3. Gear (Worn or damaged)	MX–10
	4. Bearing (Worn or damaged)	MX–10
Oil leakage	1. Oil (Level too high)	MX–4
	2. Gasket (Damaged)	MX–10
	3. Oil seal (Worn or damaged)	MX–10
	4. O–Ring (Worn or damaged)	MX–10
Hard to shift or will not shift	1. Control cable (Faulty)	MX–49
	2. Synchronizer ring (Worn or damaged)	MX–10 MX–24 MX–31
	3. Shift key spring (Damaged)	MX–10 MX–24 MX–31
Jumps out of gear	1. Locking ball spring (Damaged)	MX–10
	2. Shift fork (Worn)	MX–10
	3. Gear (Worn or damaged)	MX–10
	4. Bearing (Worn or damaged)	MX–10

MANUAL TRANSAXLE UNIT

MX04Z–01

COMPONENTS



MX050–01

REMOVAL

1. REMOVE HOOD

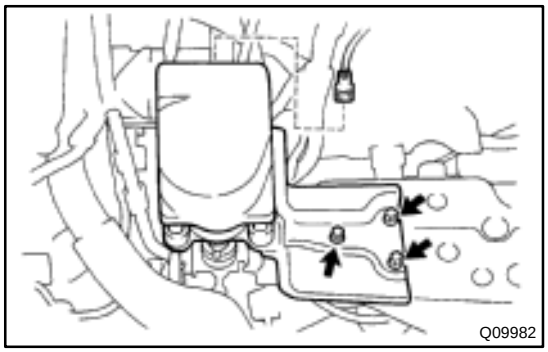
HINT:

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

Adjust the hood.

(See page BO–10)

2. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE


Q09982

3. w/ Cruise Control:
REMOVE CRUISE CONTROL ACTUATOR

(a) Disconnect the cruise control actuator connector.

(b) Remove the 3 bolts and cruise control actuator with the bracket.

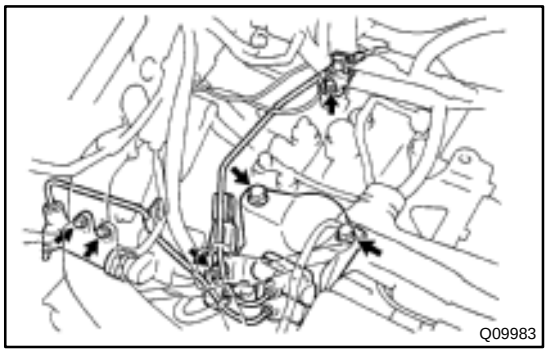
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

4. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

(b) Remove the 2 bolts and starter.

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


Q09983

5. DISCONNECT CLUTCH RELEASE CYLINDER

(a) Remove the 2 bolts and disconnect the release cylinder.

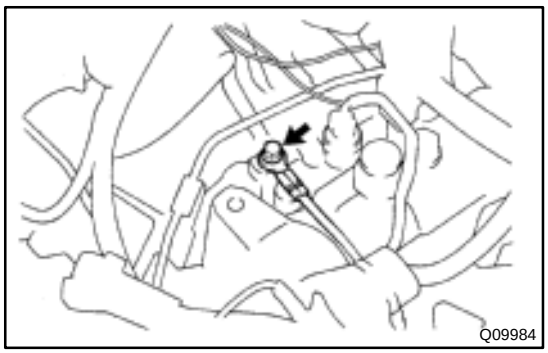
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

(b) Remove the 2 set bolts and nut of the clutch accumulator.

Torque:
Bolt: 21 N·m (210 kgf·cm, 15 ft·lbf)
Nut: 26 N·m (270 kgf·cm, 20 ft·lbf)

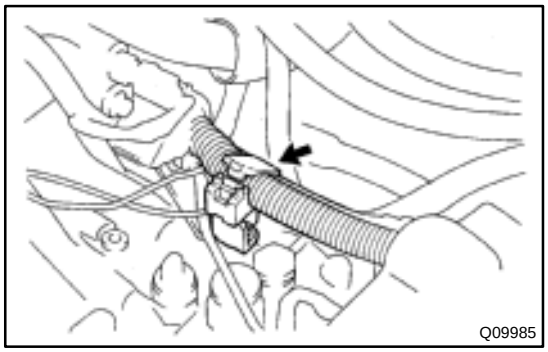
(c) Remove the set bolt of the clutch line bracket.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)


Q09984

6. DISCONNECT GROUND CABLE

Remove the set bolt of the ground cable from the transaxle.


Q09985

7. DISCONNECT ENGINE WIRE FROM CLAMP

8. DISCONNECT VEHICLE SPEED SENSOR AND BACK–UP LIGHT SWITCH CONNECTORS

9. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.

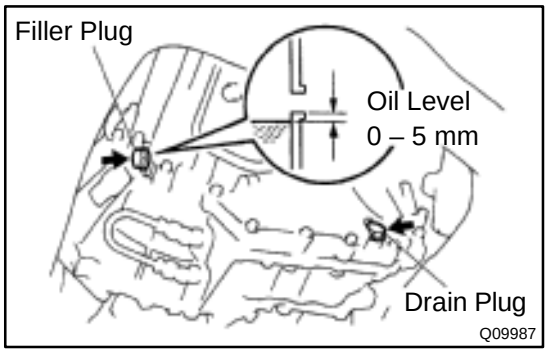
10. REMOVE 5 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque:
17 mm head: 64 N·m (650 kgf·cm, 47 ft·lbf)

11. REMOVE FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

12. RAISE VEHICLE

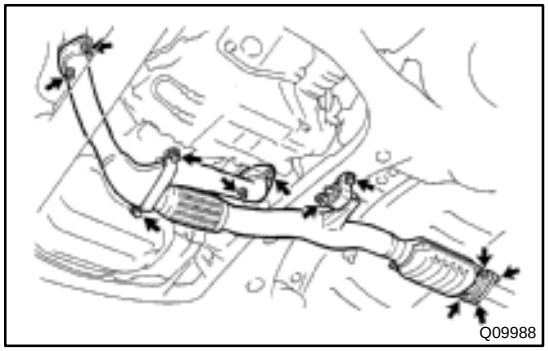
NOTICE:
Make sure that the vehicle is securely supported.

13. REMOVE ENGINE REAR SIDE SHUTTER PLATE AND LH AND RH FENDER APRON SEALS



14. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 4.2 liters (4.4 US qts, 3.7 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

15. REMOVE LH AND RH DRIVE SHAFTS
(See page SA–25)



16. REMOVE FRONT EXHAUST PIPE

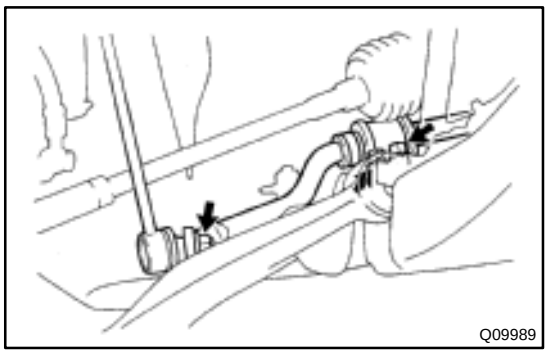
(a) Remove the 2 bolts and exhaust pipe support stay.
Torque: 33 N·m (330 kgf·cm, 24 ft·lbf)

(b) Remove the 4 nuts and 2 gaskets from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

(c) Remove the 2 bolts, nuts and gasket.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

(d) Remove the 2 set bolts of the No.1 exhaust pipe support bracket.
Torque: 33 N·m (330 kgf·cm, 24 ft·lbf)

(e) Remove the front exhaust pipe.

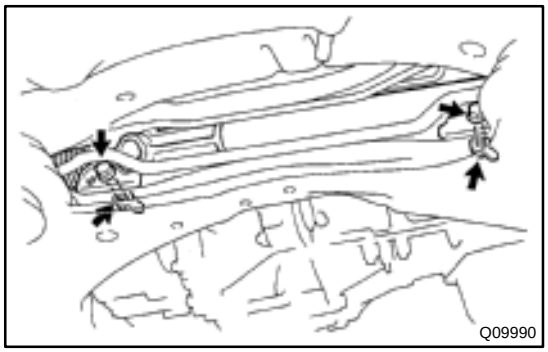


17. DISCONNECT PS GEAR ASSEMBLY FROM FRONT SUSPENSION MEMBER

(a) Remove the 2 nuts and disconnect the stabilizer bar link from the stabilizer bar.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

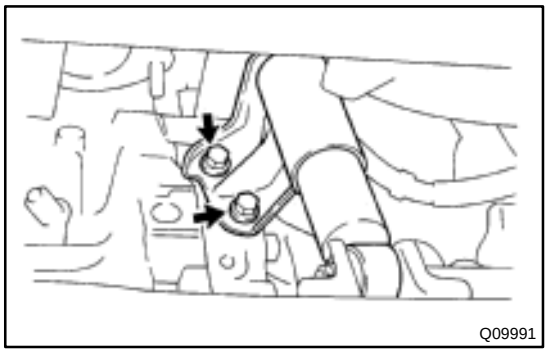
(b) Remove the 4 set bolts of the stabilizer bar bracket.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(c) Remove the 2 bolts, nut and No.1 fuel tube protector.



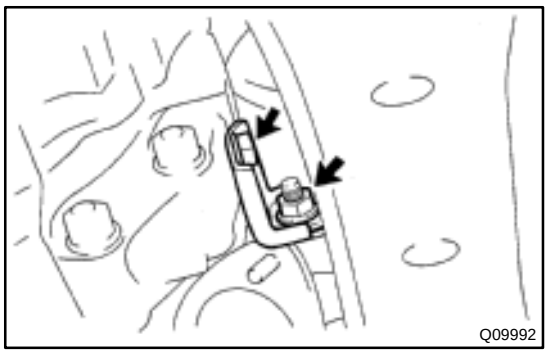
(d) Tie the PS gear assembly to the proper position with a code or an equivalent to suspend the assembly securely.

(e) Remove the 2 set bolts and nuts of the PS gear assembly.
Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)



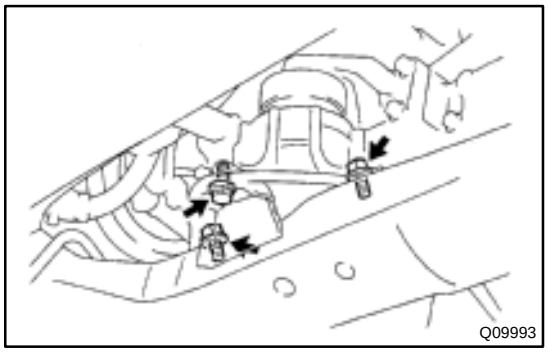
18. DISCONNECT FRONT ENGINE ABSORBER FROM TRANSAXLE

Remove the 2 bolts.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

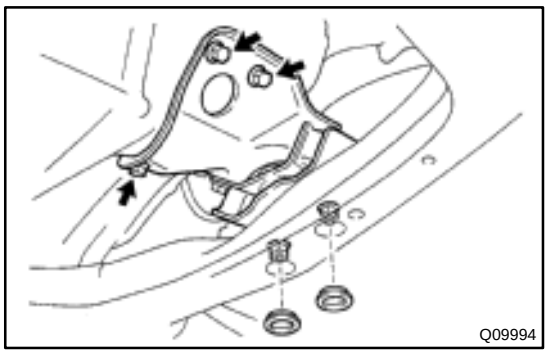


19. REMOVE RH EXHAUST MANIFOLD STAY

Remove the bolt, nut and stay.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



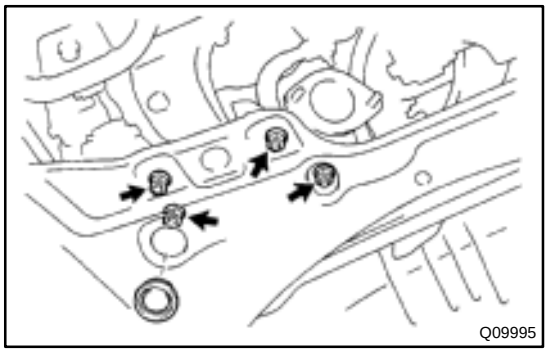
20. REMOVE 3 ENGINE FRONT SIDE MOUNTING BOLTS
Torque:
Silver bolt: 44 N·m (450 kgf·cm, 33 ft·lbf)
Green bolt: 66 N·m (670 kgf·cm, 48 ft·lbf)



21. REMOVE LH ENGINE MOUNTING INSULATOR WITH BRACKET

(a) Remove the 2 hole plugs, nuts and 3 bolts.
Torque:
Bolt: 64 N·m (650 kgf·cm, 47 ft·lbf)
Nut: 80 N·m (820 kgf·cm, 59 ft·lbf)

(b) Lift up the transaxle and remove the left engine mounting insulator with the bracket.

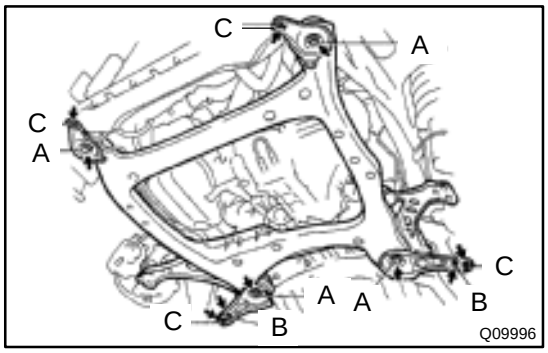


22. REMOVE HOLE PLUG AND 4 ENGINE REAR SIDE MOUNTING NUTS
Torque: 66 N·m (670 kgf·cm, 48 ft·lbf)

23. ATTACH ENGINE SLING DEVICE TO ENGINE HANGER
(See page EM–69)

24. DISCONNECT STEERING RETURN PIPE FROM FRONT SUSPENSION MEMBER

Remove the 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



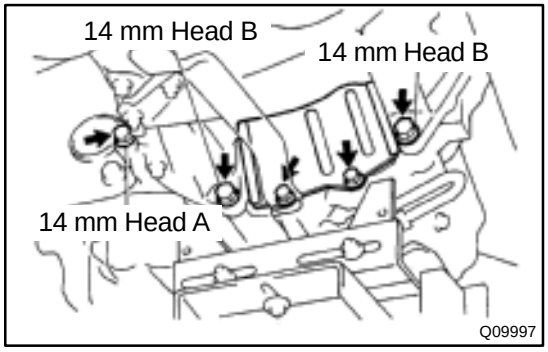
25. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

(a) Remove the LH and RH fender liner set screws.

(b) Remove the 6 bolts, 4 nuts, front LH and RH suspension member braces, rear LH and RH suspension member braces and front suspension member with the lower suspension arm.
Torque:
Bolt A: 181 N·m (1,850 kgf·cm, 134 ft·lbf)
Bolt B: 32 N·m (330 kgf·cm, 24 ft·lbf)
Nut C: 36 N·m (370 kgf·cm, 27 ft·lbf)

26. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.



27. REMOVE FLYWHEEL HOUSING UNDER COVER AND TRANSAXLE LOWER SIDE MOUNTING BOLT

(a) Remove the 2 bolts and cover.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

(b) Remove the 3 bolts of the transaxle lower side.
Torque:
14 mm head A: 46 N·m (470 kgf·cm, 34 ft·lbf)
14 mm head B: 37 N·m (380 kgf·cm, 27 ft·lbf)

28. 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.

MX051–01

INSTALLATION

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

HINT:

After installation, check and inspect items as follows.

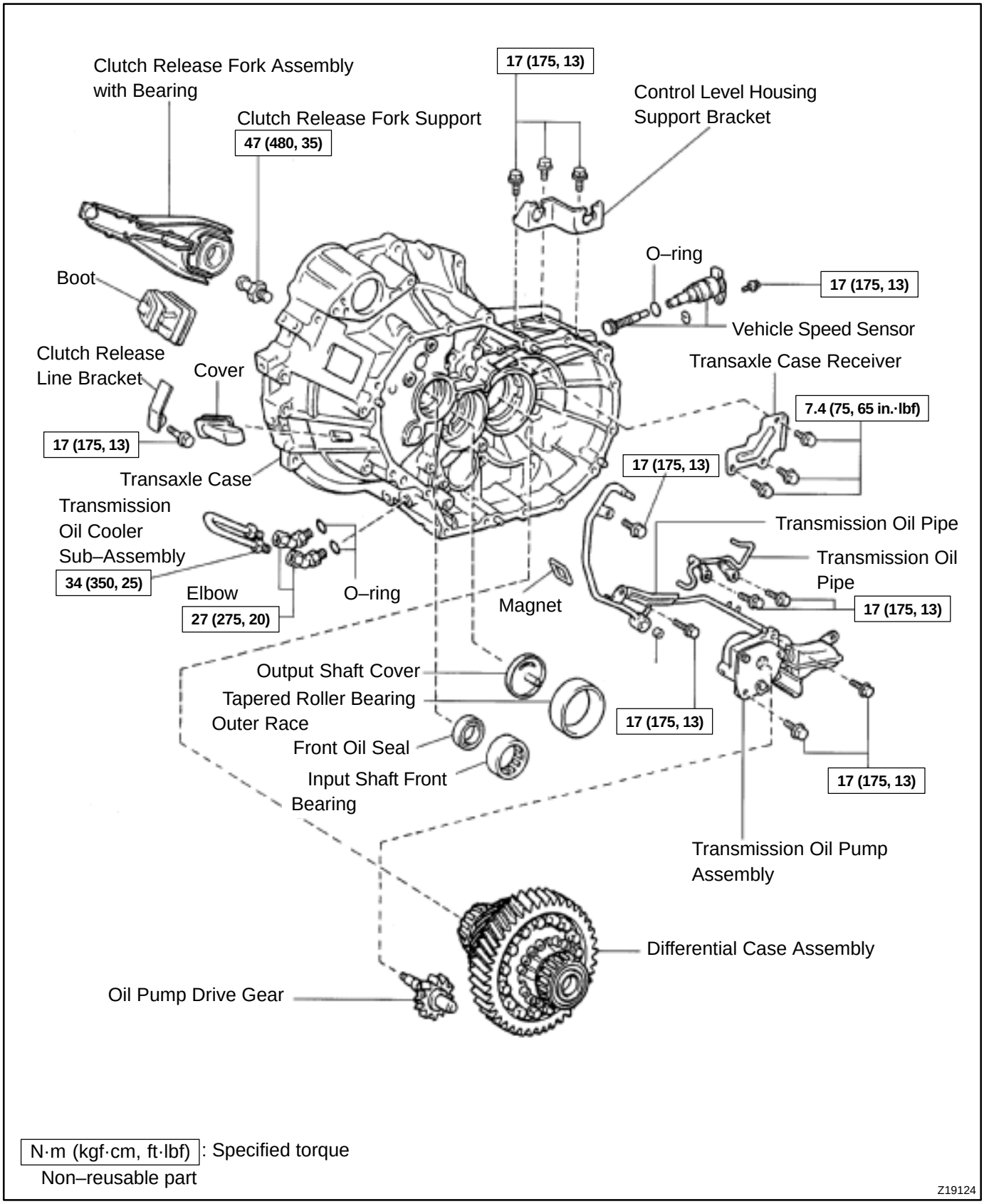
★ Front wheel alignment (See page SA–4).

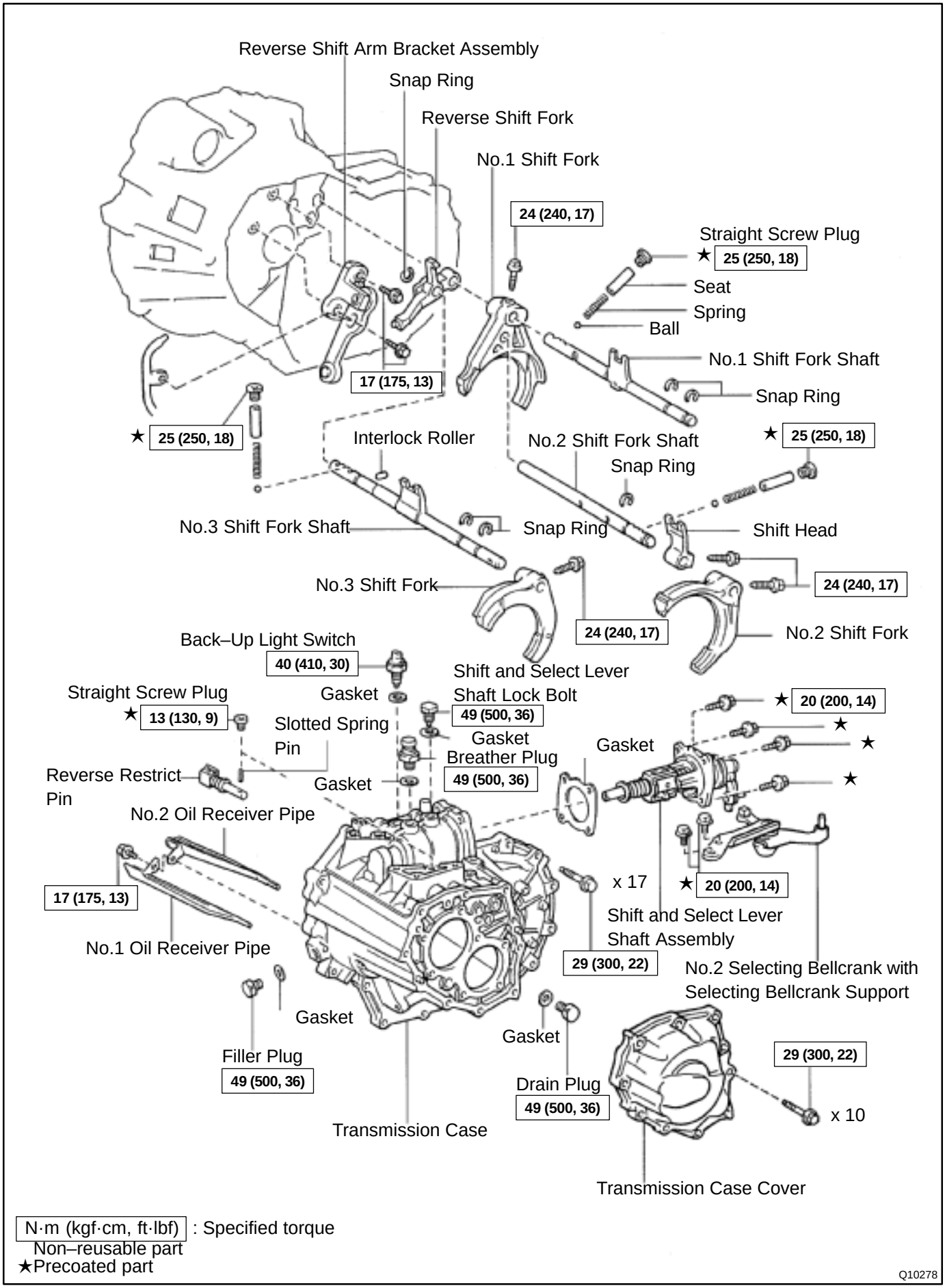
★ Do the road test.

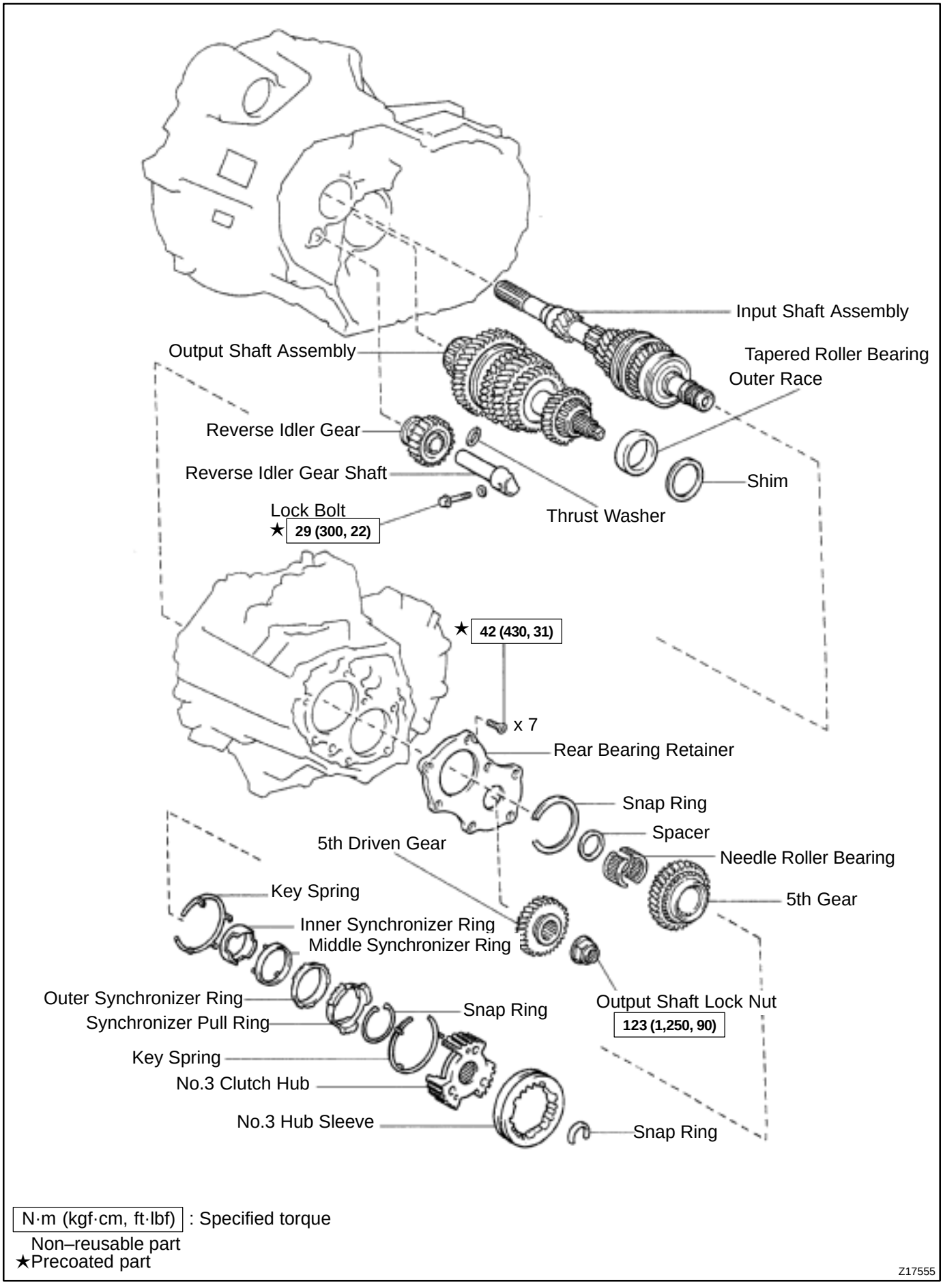
MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

MX052–02




Reverse Shift Arm Bracket Assembly
Snap Ring
Reverse Shift Fork
No.1 Shift Fork
24 (240, 17)
Straight Screw Plug
★ 25 (250, 18)
Seat
Spring
Ball
No.1 Shift Fork Shaft
Snap Ring
17 (175, 13)
★ 25 (250, 18)
Interlock Roller
No.2 Shift Fork Shaft
Snap Ring
★ 25 (250, 18)
No.3 Shift Fork Shaft
Snap Ring
Shift Head
No.3 Shift Fork
24 (240, 17)
24 (240, 17)
No.2 Shift Fork
Back–Up Light Switch
40 (410, 30)
Gasket
Shift and Select Lever Shaft Lock Bolt
49 (500, 36)
Straight Screw Plug
★ 13 (130, 9)
Slotted Spring Pin
Gasket
Breather Plug
49 (500, 36)
Gasket
Reverse Restrict Pin
Gasket
★ 20 (200, 14)
★
★
★
No.2 Oil Receiver Pipe
17 (175, 13)
No.1 Oil Receiver Pipe
x 17
★ 20 (200, 14)
Shift and Select Lever Shaft Assembly
29 (300, 22)
No.2 Selecting Bellcrank with Selecting Bellcrank Support
Gasket
Filler Plug
49 (500, 36)
Gasket
Drain Plug
49 (500, 36)
29 (300, 22)
x 10
Transmission Case
Transmission Case Cover
N·m (kgf·cm, ft·lbf) : Specified torque
Non–reusable part
★Precoated part
Q10278



N·m (kgf·cm, ft·lbf) : Specified torque
Non–reusable part
★Precoated part

Z17555

MX053–02

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

2. REMOVE BACK–UP LIGHT SWITCH WITH GASKET
Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

3. REMOVE BOLT AND VEHICLE SPEED SENSOR
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

4. REMOVE NO.2 SELECTING BELLCRANK WITH SELECTING BELLCRANK SUPPORT

Remove the 2 bolts and No.2 selecting bellcrank with the selecting bellcrank support.

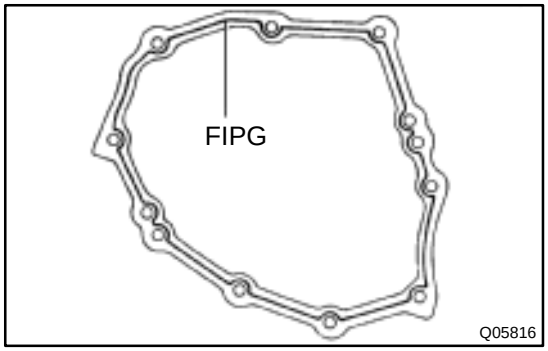
Sealant:
Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

5. REMOVE SHIFT AND SELECT LEVER SHAFT LOCK BOLT WITH GASKET
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

6. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY WITH GASKET

Remove the 4 bolts, shift and select lever shaft assembly and gasket.

Sealant:
Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

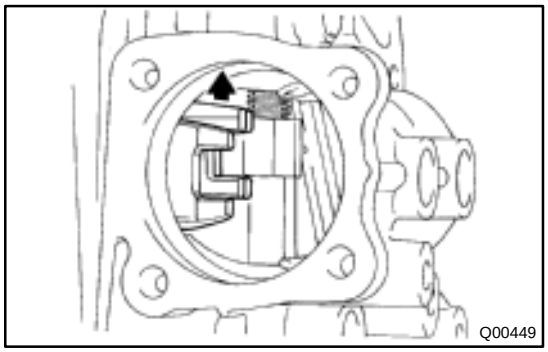


7. REMOVE TRANSMISSION CASE COVER

Remove the 10 bolts and transmission case cover.

FIPG:
Part No. 08826 – 00090, THREE BOND 1281 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

8. REMOVE BREATHER PLUG WITH GASKET
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

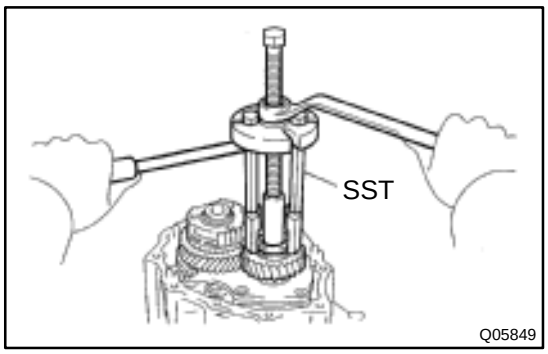


9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the lock nut.
(b) Engage the gear double meshing.
(c) Remove the lock nut.
Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)
(d) Disengage the gear double meshing.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

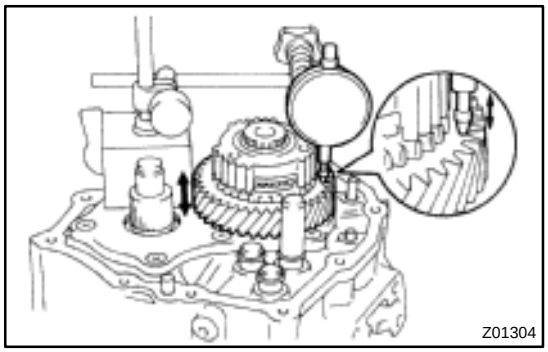
(a) Remove the No.3 shift fork set bolt.
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)
(b) Remove the No.3 hub sleeve and No.3 shift fork.



11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

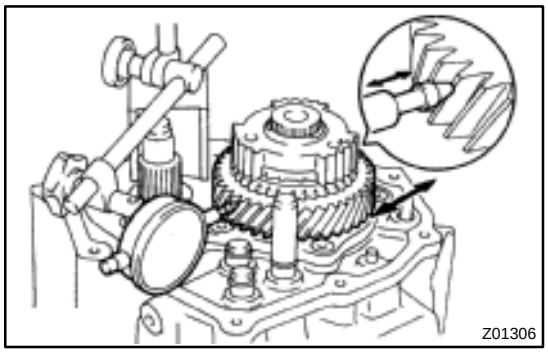
SST 09950–30010



12. MEASURE 5TH GEAR THRUST CLEARANCE AND RADIAL CLEARANCE

(a) Using a dial indicator, measure the thrust clearance.

Standard clearance:
0.10 – 0.57 mm (0.0039 – 0.0224 in.)
Maximum clearance:
0.65 mm (0.0256 in.)

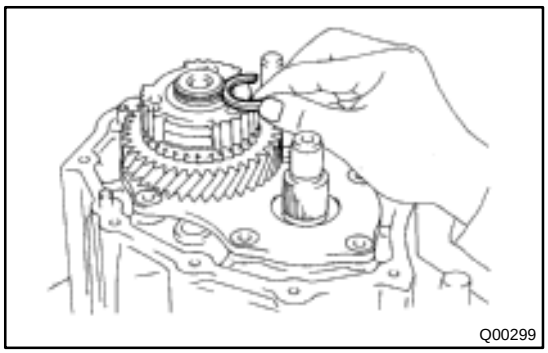


(b) Using a dial indicator, measure the radial clearance.

Standard clearance:
0.009 – 0.050 mm (0.0004 – 0.0020 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

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

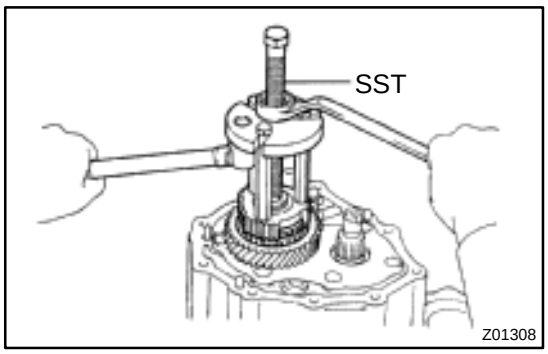
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.



HINT:

At the time of reassembly, please refer to the following item.
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
a	1.75 (0.0689)	f	2.00 (0.0787)
b	1.80 (0.0709)	g	2.05 (0.0807)
c	1.85 (0.0729)	h	2.10 (0.0827)
d	1.90 (0.0748)	j	2.15 (0.0847)
e	1.95 (0.0768)	–	–



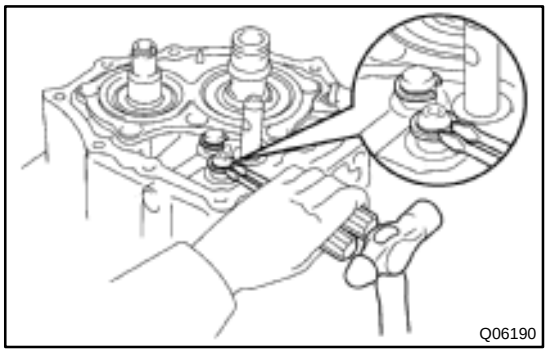
(b) Using SST, remove the No.3 clutch hub with the synchronizer ring and 5th gear.
SST 09950–30010

14. REMOVE NEEDLE ROLLER BEARING AND SPACER

15. REMOVE REAR BEARING RETAINER

Using a torx socket wrench (T45), remove the 7 torx screws and rear bearing retainer.

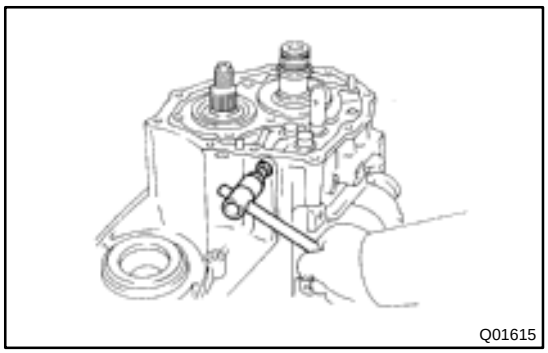
Sealant:
Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



16. REMOVE SNAP RING

(a) Using a snap ring expander, remove the input shaft rear bearing snap ring.

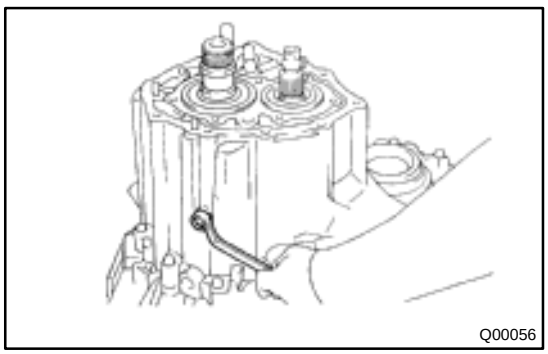
(b) Using 2 screwdrivers and a hammer, remove the 2 snap rings.



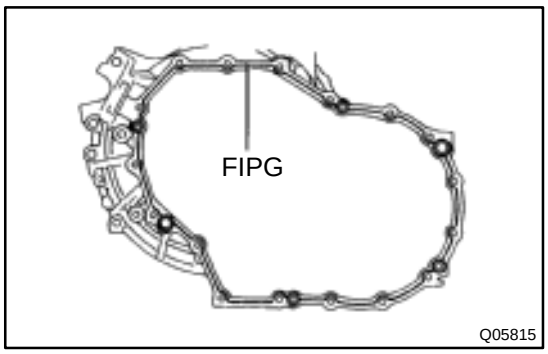
17. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND LOCKING BALL

(a) Using a hexagon wrench (6 mm), remove the plug.
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 seat, spring and locking ball.



18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT
Sealant:
Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



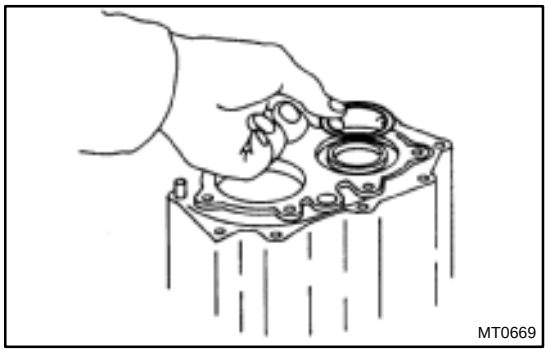
19. REMOVE TRANSMISSION CASE

Remove the 17 bolts and tap the case with a plastic hammer.

FIPG:

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

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



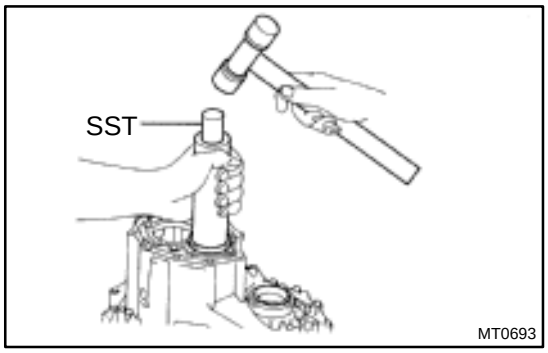
20. REMOVE SHIM

HINT:

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

Install the previously selected shim by adjusting output shaft preload.

(See page MX–22)



21. REMOVE OUTPUT SHAFT REAR TAPER ROLLER BEARING OUTER RACE

Using SST and a hammer, remove the output shaft rear taper roller bearing outer race.

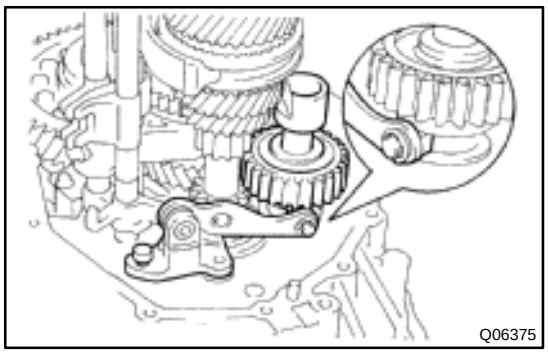
SST 09316–60011 (09316–00011)

22. REMOVE TRANSMISSION OIL PIPE

(a) Remove the gasket from the oil pipe.

(b) Remove the 2 bolts and oil pipe.

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



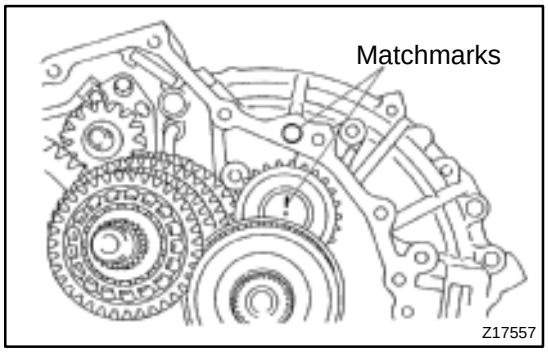
23. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY

Remove the bolt and pull off the reverse shift arm and bracket.

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

24. REMOVE REVERSE IDLER GEAR AND SHAFT

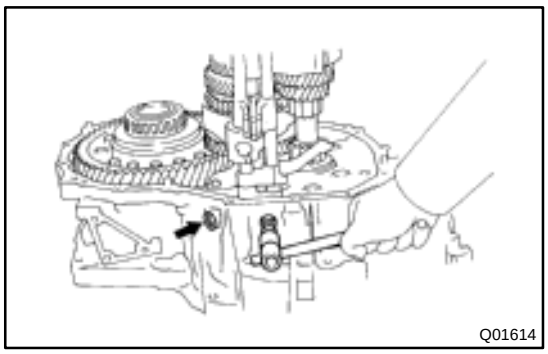
Pull out the shaft, and remove the reverse idler gear and thrust washer.



HINT:

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

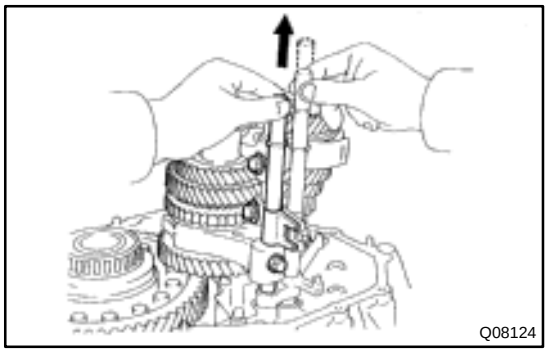
Align the matchmarks, as shown.



25. REMOVE STRAIGHT SCREW PLUG, LOCKING BALL AND SPRING

(a) Using a hexagon wrench (6 mm), remove the 2 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 2 seats, springs and balls.



26. REMOVE NO.1, NO.2 SHIFT FORKS AND SHIFT HEAD SET BOLT
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

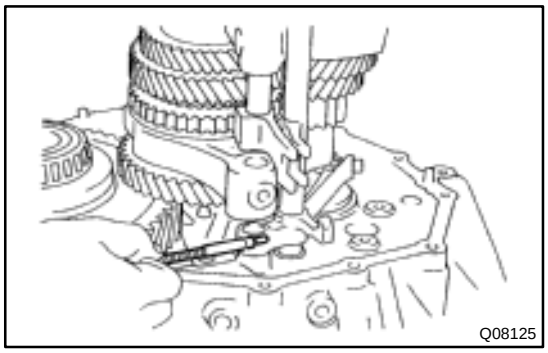
27. REMOVE NO.1 SHIFT FORK SHAFT

Pull up the No.3 shift fork shaft, and remove the No.1 shift fork shaft.

HINT:

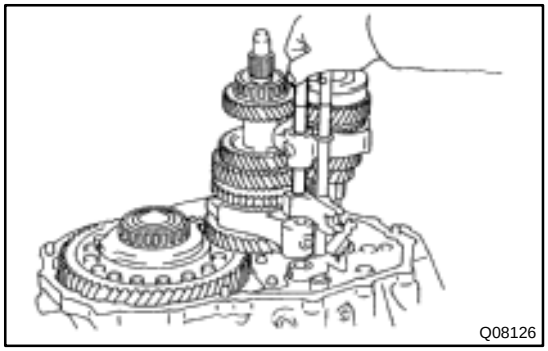
At the time of reassembly, please refer to the following item.

When it is difficult to push the fork shaft through the reverse shift fork, pull up the No.3 shift fork shaft.



28. REMOVE INTERLOCK ROLLER

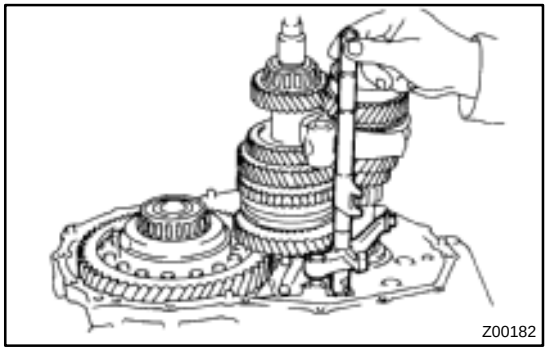
Using a magnetic finger, remove the interlock roller from the reverse shift fork.



29. REMOVE NO.2 SHIFT FORK SHAFT, SHIFT HEAD AND NO.1 SHIFT FORK

(a) Pull out the No.2 shift fork shaft.

(b) Remove the shift head and No.1 shift fork.



30. REMOVE NO.3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO.2 SHIFT FORK

(a) Pull out the No.3 shift fork shaft with the reverse shift fork.

(b) Remove the No.2 shift fork.

31. REMOVE SNAP RING

(a) Using 2 screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No.3 shift fork shaft.

(b) Using 2 screwdrivers and a hammer, remove the 3 snap rings from the No.1, No.2 and No.3 shift fork shafts.

32. REMOVE INPUT AND OUTPUT SHAFTS ASSEMBLY

(a) Leaning the output shaft to the differential side, remove the input shaft assembly.

(b) Lift up the differential case assembly, remove the output shaft assembly.

33. REMOVE DIFFERENTIAL CASE ASSEMBLY

(a) Remove the oil pump drive gear.

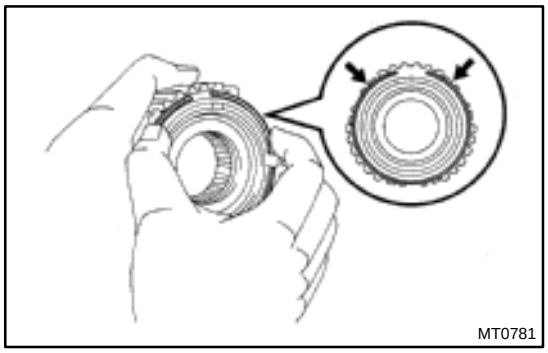
(b) Remove the differential case assembly.

34. REMOVE MAGNET FROM TRANSAXLE CASE

35. REMOVE TRANSMISSION OIL PUMP ASSEMBLY AND OIL PIPE

(a) Remove the 2 bolts and oil pipe.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

(b) Remove the 2 bolts and oil pump assembly.
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)


MT0781

36. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.

(b) Using a screwdriver, remove the snap ring.

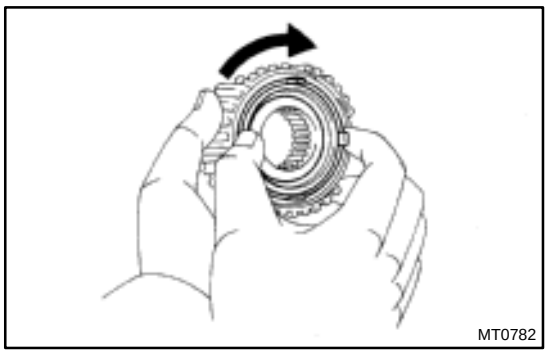
HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX054–01

INSPECTION

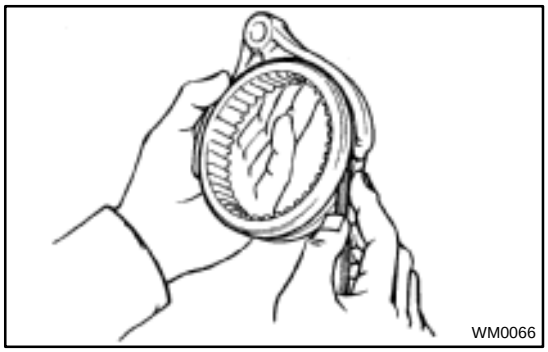

MT0782

1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring. Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

If it does not lock, replace the synchronizer ring.

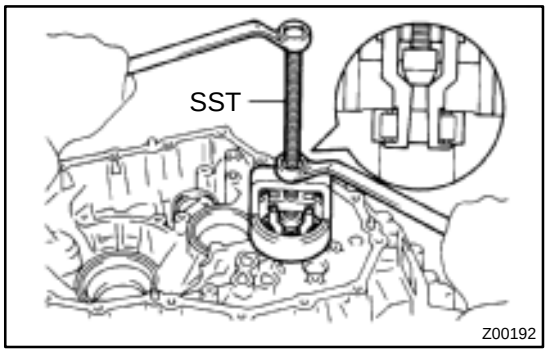

WM0066

2. MEASURE SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

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



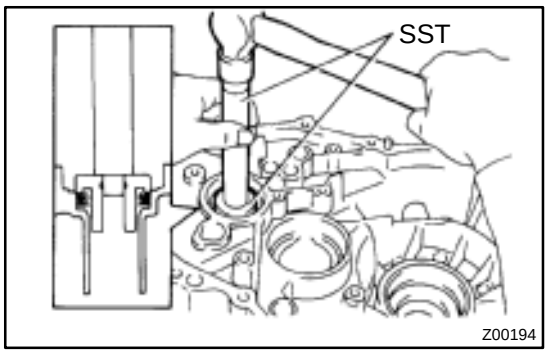
Z00192

3. IF NECESSARY, REPLACE INPUT SHAFT BEARING AND OIL SEAL

(a) Remove the 3 bolts and transaxle case receiver.

(b) Using SST, pull out the bearing.
SST 09612–65014

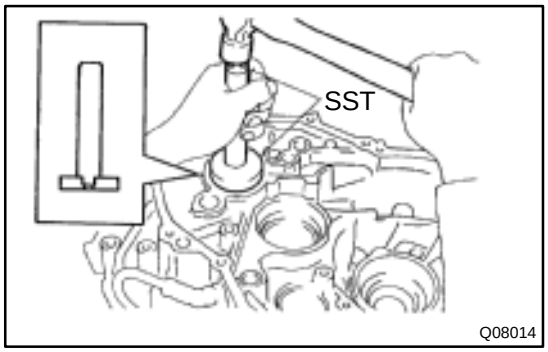
(c) Using a screwdriver, remove the oil seal.



Z00194

(d) Using SST, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)

(e) Coat the lip of seal with MP grease.

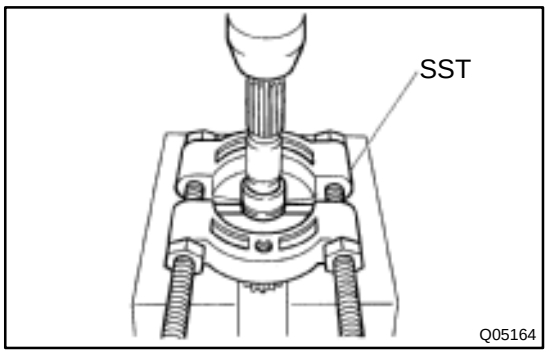


Q08014

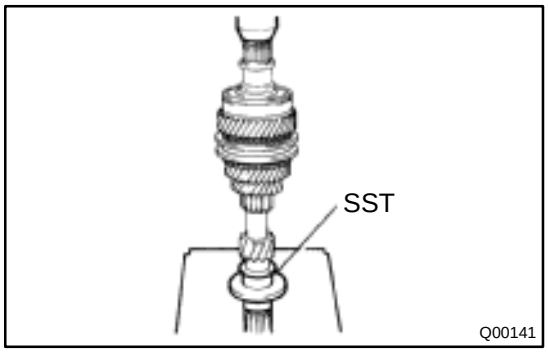
(f) Using SST, drive in a new bearing.
SST 09950–60010 (09951–00580), 09950–70010 (09951–07150)

(g) Install the transaxle case receiver.

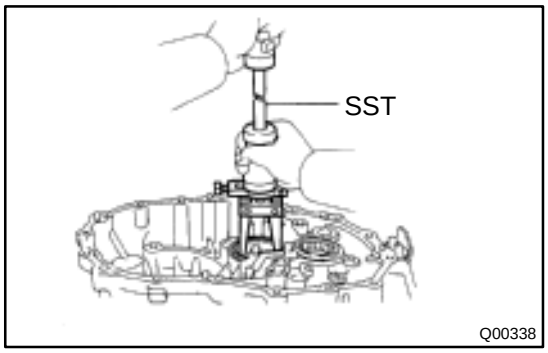
(h) Install and torque the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



(i) Using SST and a press, remove the inner race.
SST 09950–00020



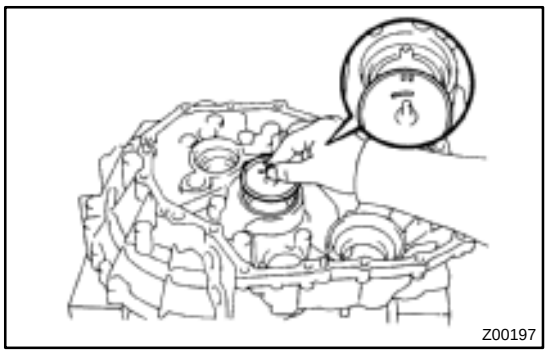
(j) Using SST and a press, install a new input shaft front bearing inner race.
SST 09316–60011 (09316–00021)



4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING OUTER RACE AND OUTPUT SHAFT FRONT COVER

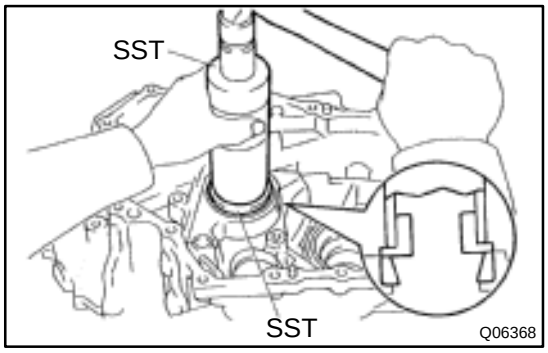
(a) Using SST, pull out the output shaft front bearing outer race.
SST 09308–00010

(b) Remove the output shaft cover.

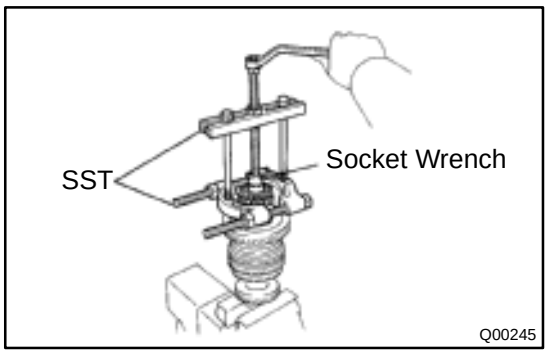


(c) Install a new output shaft cover.

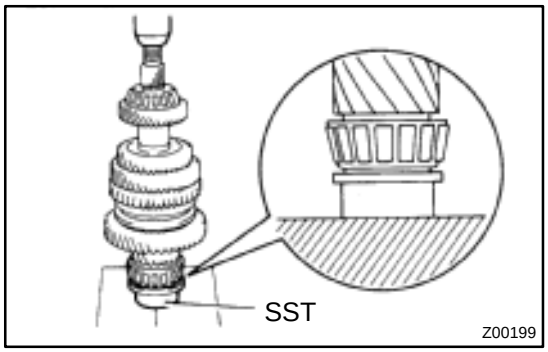
HINT:
Install the output shaft cover projection into the case side groove.



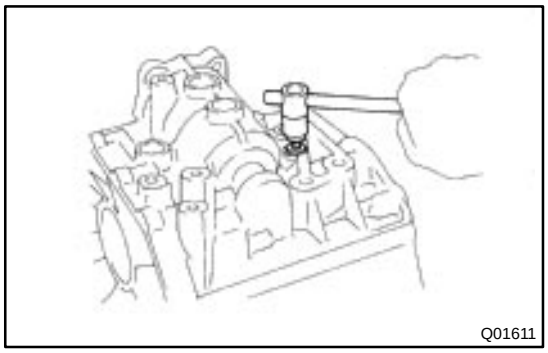
(d) Using SST and a hammer, drive in a new output shaft front bearing outer race.
SST 09316–60011 (09316–00011, 09316–00021)



(e) Using SST and a socket wrench, remove the output shaft front bearing.
SST 09950–00020, 09950–00030



(f) Using SST and a press, install a new output shaft front bearing.
SST 09316–60011 (09316–00071)

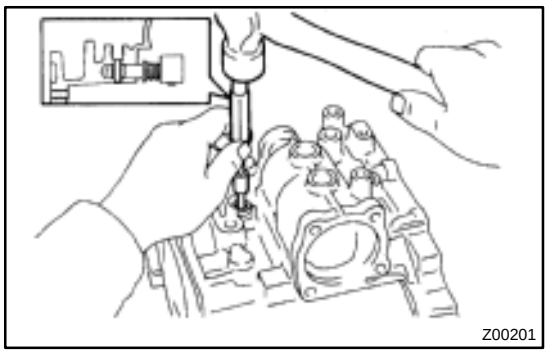


5. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

(a) Using a hexagon wrench (6 mm), remove the 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 (6 mm), install and torque the screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX055–01

REASSEMBLY

Reassembly is in the reverse order of disassembly.

HINT:

- ★ Before reassembly, select a shim by adjusting output shaft preload.
- ★ Coat all of the sliding and rotating surfaces with gear oil before reassembly.

ADJUST OUTPUT SHAFT PRELOAD

(a) Install the output shaft assembly to the transaxle case.

(b) Install the transmission case to the transaxle case.

HINT:

If necessary, tap on the case with a plastic hammer.

(c) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(d) Install the output shaft rear taper roller bearing outer race.

(e) Install the adjusting shim.

HINT:

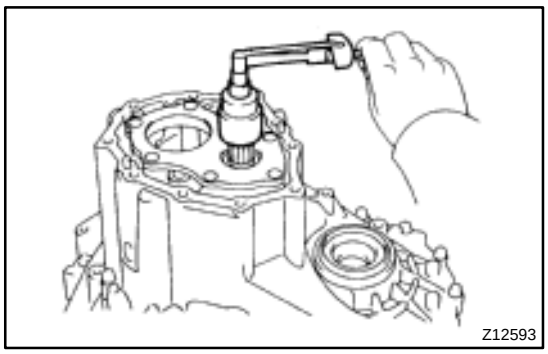
When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new taper roller bearing, first select and install a shim of lesser thickness than before.

(f) Install the rear bearing retainer.

(g) Using a torx wrench (T45), install and torque the 7 torx screws.
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(h) Install a new lock nut to the output shaft.

(i) Turn the output shaft right and left 2 or 3 times to allow the bearing to settle.


Z12593

(j) Using a torque wrench, measure the preload.
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, select an appropriate adjusting shim.
The preload will change approx. 0.4 – 0.5 N·m (4 – 5 kgf·cm, 3.5 – 4.3 in.·lbf) for every 0.05 mm change in adjusting shim thickness.

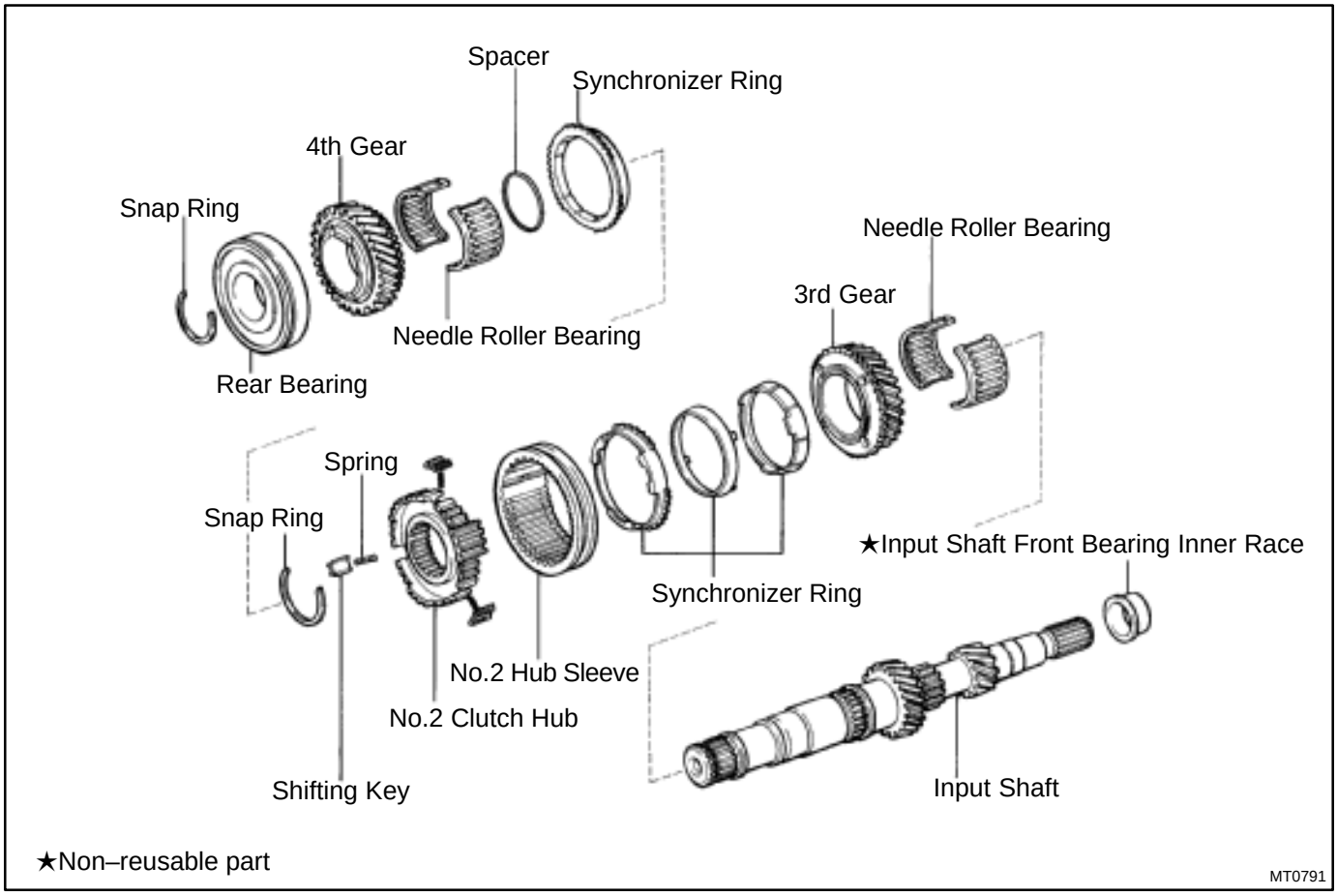
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	1.30 (0.0512)	D	1.95 (0.0768)
1	1.35 (0.0531)	E	2.00 (0.0787)
2	1.40 (0.0551)	F	2.05 (0.0807)
3	1.45 (0.0571)	G	2.10 (0.0827)
4	1.50 (0.0591)	H	2.15 (0.0846)
5	1.55 (0.0610)	J	2.20 (0.0866)
6	1.60 (0.0630)	K	2.25 (0.0886)
7	1.65 (0.0650)	L	2.30 (0.0906)
8	1.70 (0.0669)	M	2.35 (0.0925)
9	1.75 (0.0689)	N	2.40 (0.0945)
A	1.80 (0.0709)	P	2.45 (0.0965)
B	1.85 (0.0728)	Q	2.50 (0.0984)
C	1.90 (0.0748)	–	–

(k) Remove the lock nut.
(l) Remove these parts. Removal is in the reverse order of installation.
★ Rear bearing retainer
★ Shim
★ Transmission case
★ Output shaft assembly
★ Output shaft rear bearing outer race

INPUT SHAFT

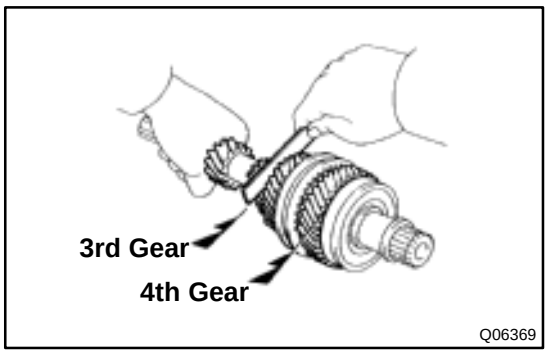
COMPONENTS

MX056–01



MX057–01

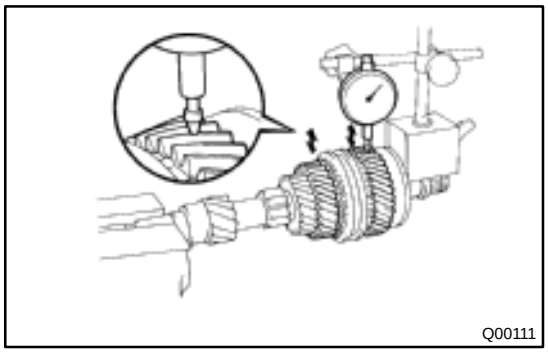
DISASSEMBLY



1. MEASURE 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: 0.40 mm (0.0157 in.)
4th gear: 0.60 mm (0.0236 in.)



2. CHECK 3RD AND 4TH GEARS RADIAL CLEARANCE

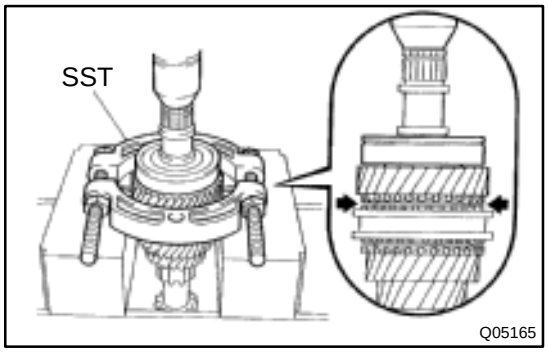
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
3rd gear: 0.009 – 0.053 mm (0.0004 – 0.0021 in.)
4th gear: 0.009 – 0.051 mm (0.0004 – 0.0020 in.)
Maximum clearance:
3rd and 4th gears: 0.070 mm (0.0028 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.



4. REMOVE REAR BALL BEARING AND 4TH GEAR

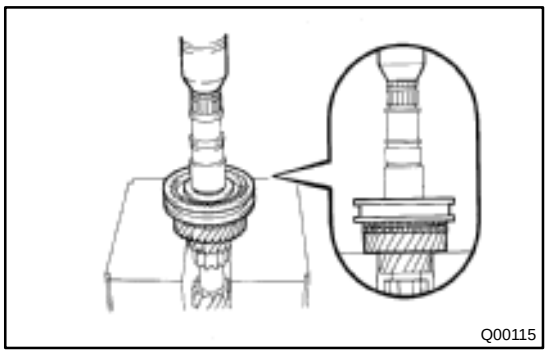
Using SST and a press, remove the rear bearing.

SST 09950–00020

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

6. REMOVE SNAP RING

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



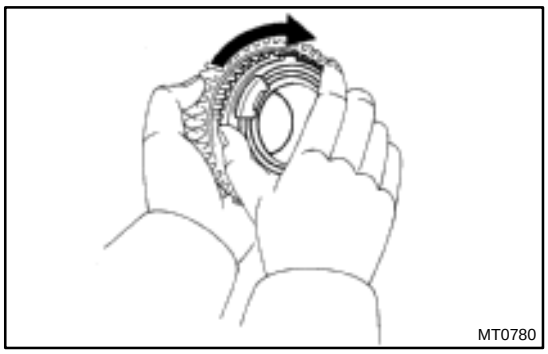
7. REMOVE NO.2 CLUTCH HUB ASSEMBLY, SYNCHRONIZER RING AND 3RD GEAR

Using a press, remove the No.2 hub sleeve, 3rd gear and synchronizer rings.

8. REMOVE NEEDLE ROLLER BEARING

MX058–01

INSPECTION

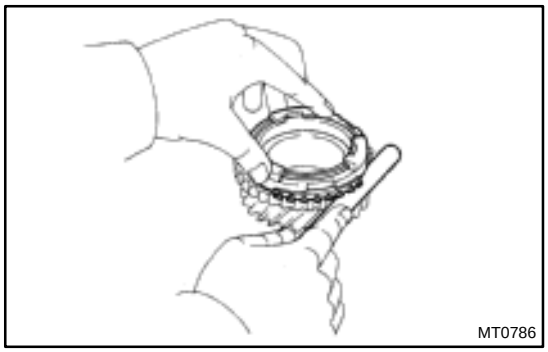


1. INSPECT 3RD GEAR SYNCHRONIZER RING

(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.

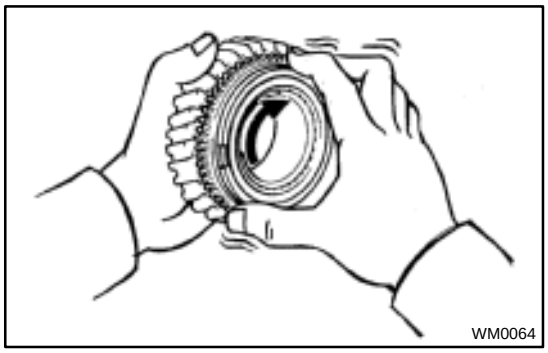
If it does not lock, replace the synchronizer ring.



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

Minimum clearance:
0.7 mm (0.028 in.)

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



2. INSPECT 4TH GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

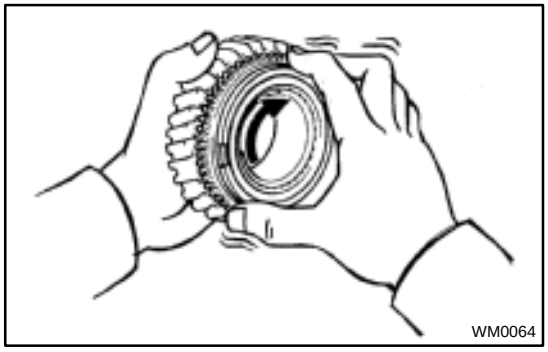
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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.



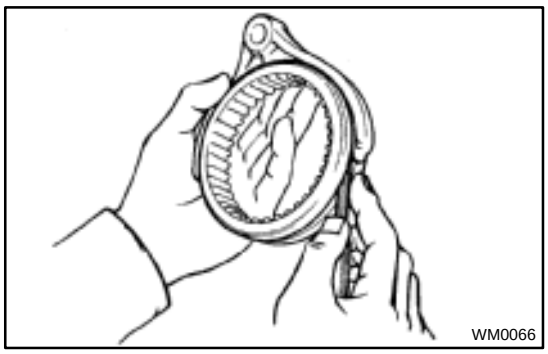
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and spline end.

Minimum clearance:
0.8 mm (0.031 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.

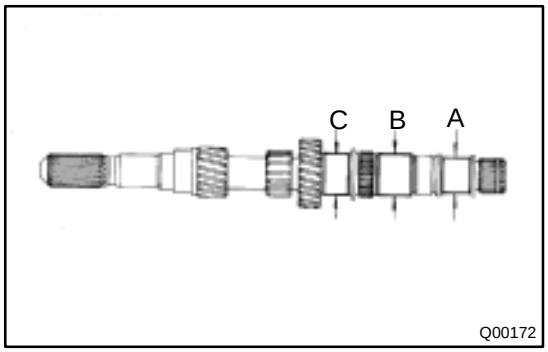


3. MEASURE NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

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

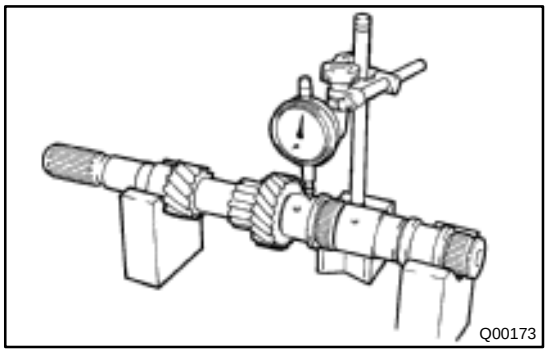


4. INSPECT INPUT SHAFT

(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: 27.950 mm (1.1004 in.)
Part B and C: 35.950 mm (1.4154 in.)

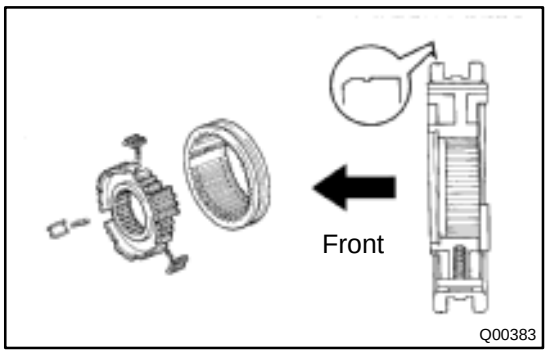


(c) Using a dial indicator, check the shaft runout.

Maximum runout:
0.05 mm (0.0020 in.)

MX059–02

REASSEMBLY



HINT:

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

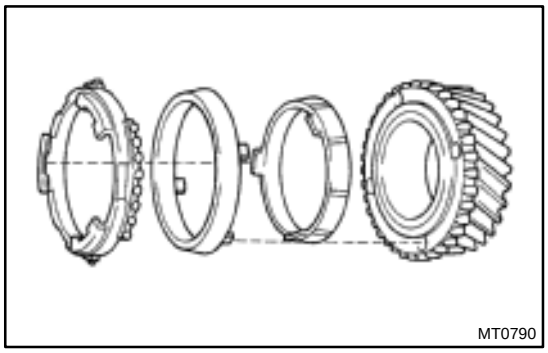
1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

HINT:

Direct identification groove of the hub sleeve to front of the transmission.

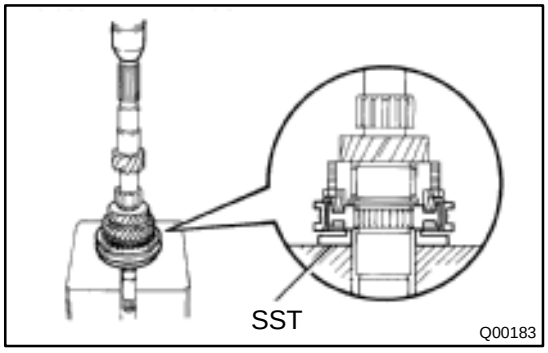


2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply MP grease to the needle roller bearing.

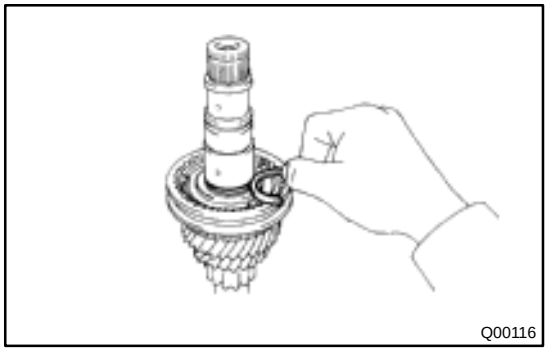
(b) Assemble the needle roller bearings into the 3rd gear.

(c) Place the synchronizer rings on the gear and align the ring slots with the shifting keys.



(d) Using SST and a press, install the 3rd gear and No.2 hub sleeve.

SST 09506–35010



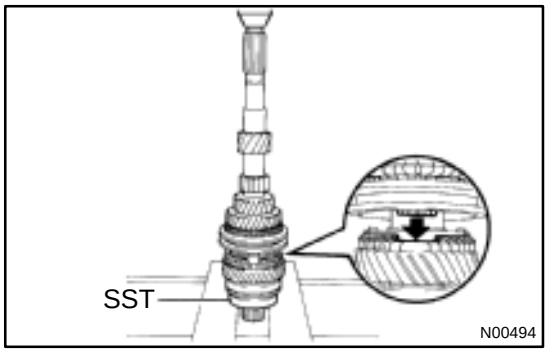
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
H	2.30 (0.0906)	M	2.50 (0.0984)
J	2.35 (0.0925)	N	2.55 (0.1004)
K	2.40 (0.0945)	P	2.60 (0.1024)
L	2.45 (0.0965)	–	–

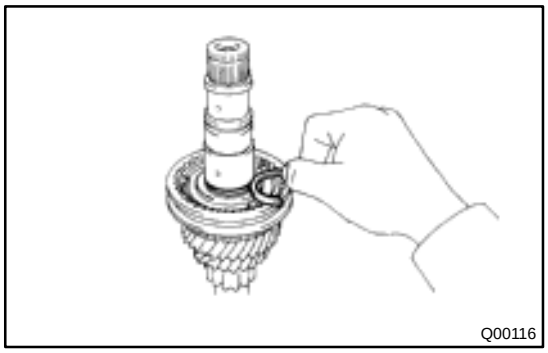
(b) Using a screwdriver and hammer, tap in the snap ring.

4. MEASURE 3RD GEAR THRUST CLEARANCE
(See page MX–24)



5. INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, 4TH GEAR AND REAR BALL BEARING

(a) Install the spacer.
(b) Apply MP grease to the needle roller bearings.
(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
(d) Install the 4th gear.
(e) Using SST and a press, install the rear ball bearing.
SST 09506–35010



6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.35 (0.0925)	5	2.55 (0.1004)
2	2.40 (0.0945)	6	2.60 (0.1024)
3	2.45 (0.0965)	7	2.65 (0.1043)
4	2.50 (0.0984)	8	2.70 (0.1063)

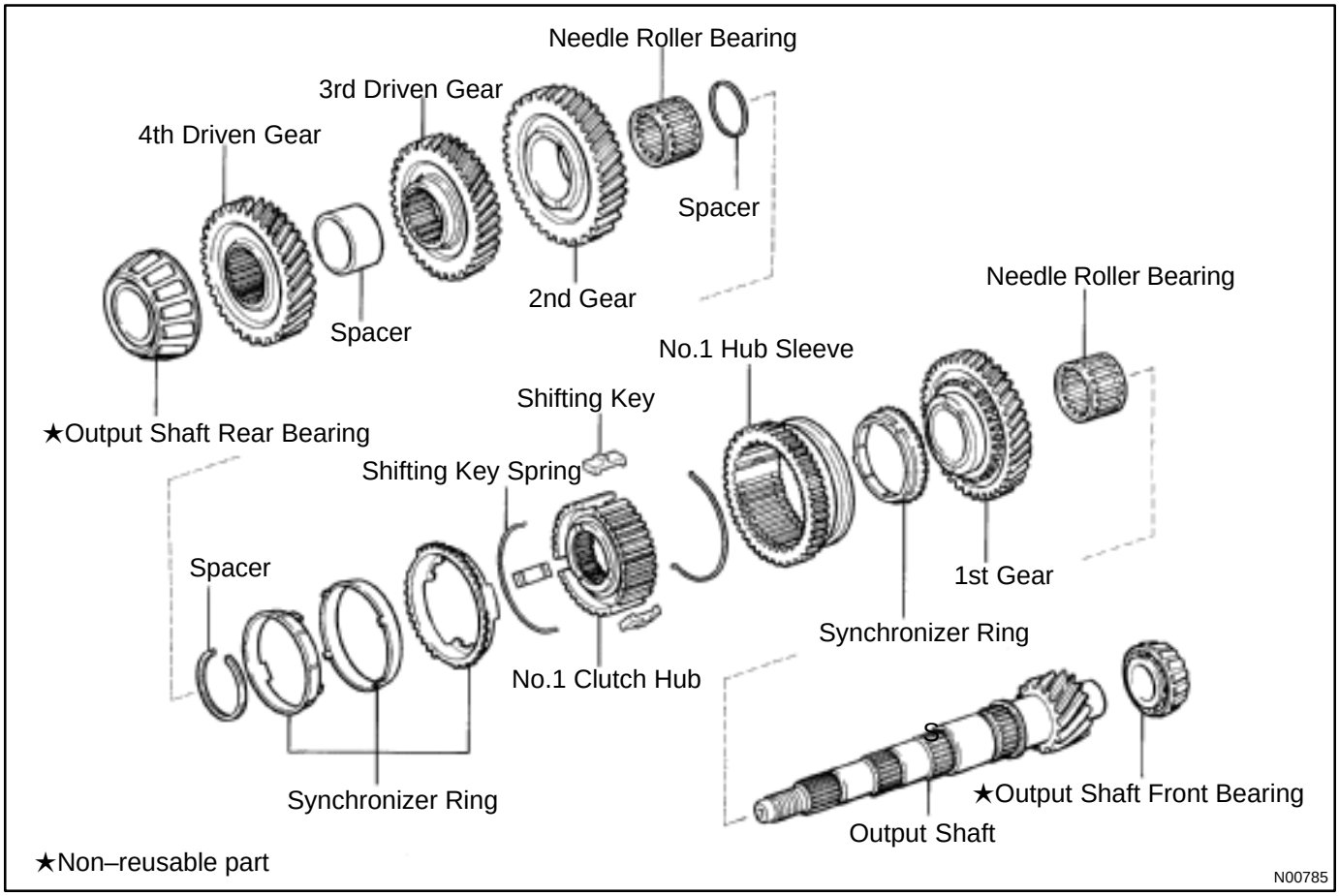
(b) Using a screwdriver and hammer, tap in the snap ring.

7. MEASURE 4TH GEAR THRUST CLEARANCE
(See page MX–24)

OUTPUT SHAFT

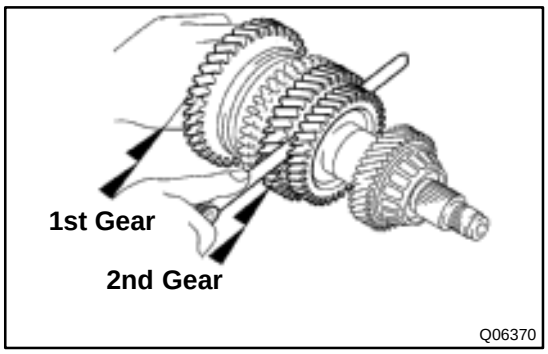
COMPONENTS

MX05A–01



MX05B–01

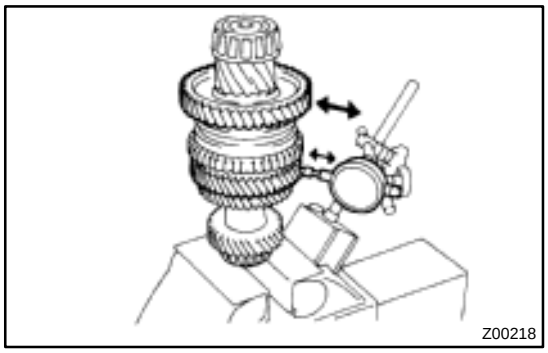
DISASSEMBLY



1. MEASURE 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
1st gear: 0.10 – 0.35 mm (0.0039 – 0.0138 in.)
2nd gear: 0.10 – 0.45 mm (0.0039 – 0.0177 in.)
Maximum clearance:
1st gear: 0.40 mm (0.0157 in.)
2nd gear: 0.50 mm (0.0197 in.)

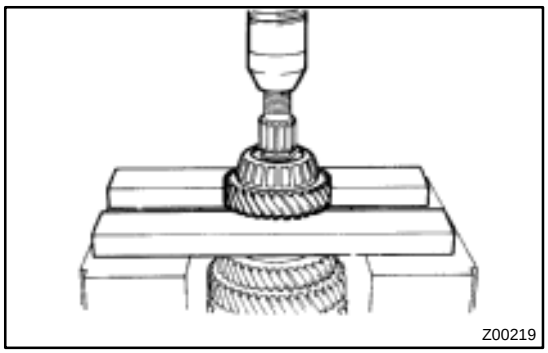


2. CHECK 1ST AND 2ND GEARS RADIAL CLEARANCE

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

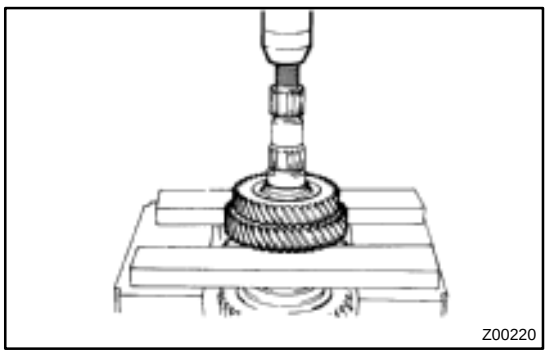
Standard clearance:
1st gear: 0.009 – 0.051 mm (0.0004 – 0.0020 in.)
2nd gear: 0.009 – 0.053 mm (0.0004 – 0.0021 in.)
Maximum clearance:
1st and 2nd gears: 0.070 mm (0.0028 in.)

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



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

(a) Using a press, remove the bearing and 4th driven gear.
(b) Remove the spacer.



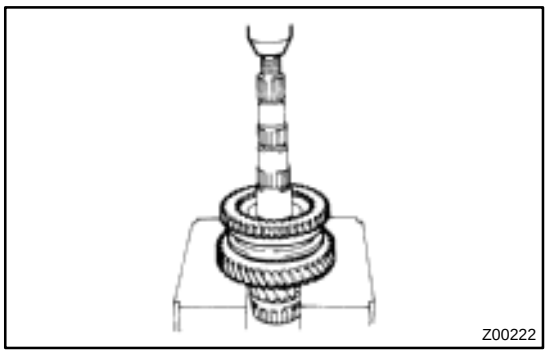
4. REMOVE 3RD DRIVEN GEAR AND 2ND GEAR

Using a press, remove the 3rd driven gear and 2nd gear.

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING

6. REMOVE SNAP RING

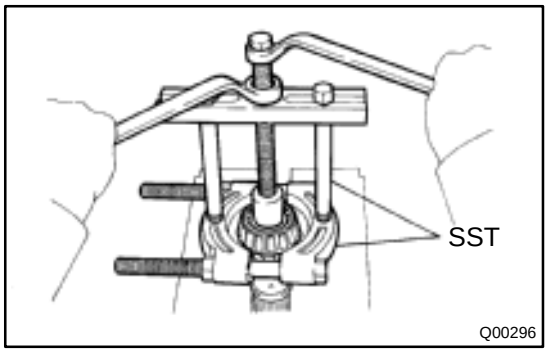
Using a snap ring expander, remove the snap ring.



7. REMOVE NO.1 HUB SLEEVE ASSEMBLY AND 1ST GEAR

Using a press, remove the No.1 hub sleeve and 1st gear.

8. REMOVE SYNCHRONIZER RING AND NEEDLE ROLLER BEARING



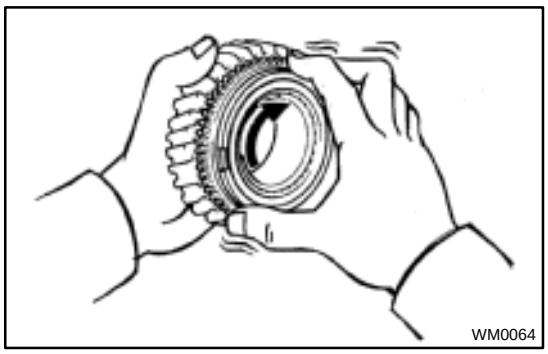
9. REMOVE OUTPUT SHAFT FRONT BEARING

Using SST, remove the output shaft front bearing.

SST 09950–00020, 09950–00030

MX05C–02

INSPECTION


WM0064

1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

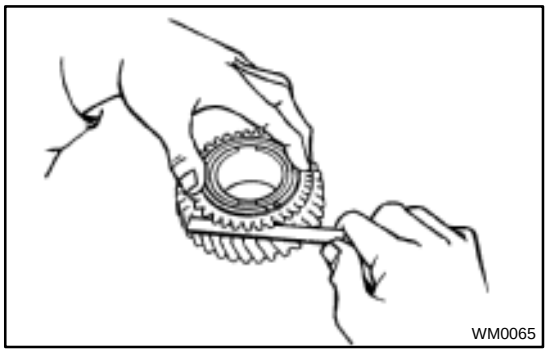
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

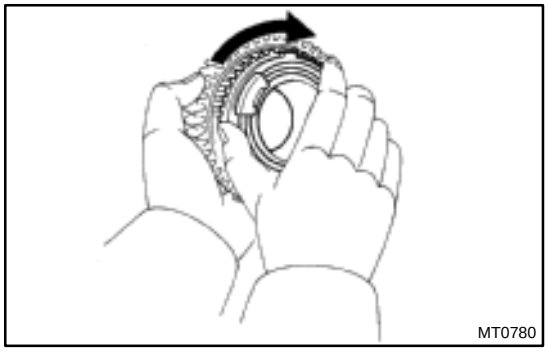
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:
0.8 mm (0.031 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.

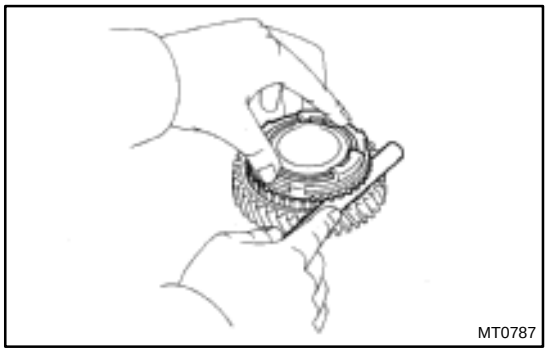

MT0780

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.

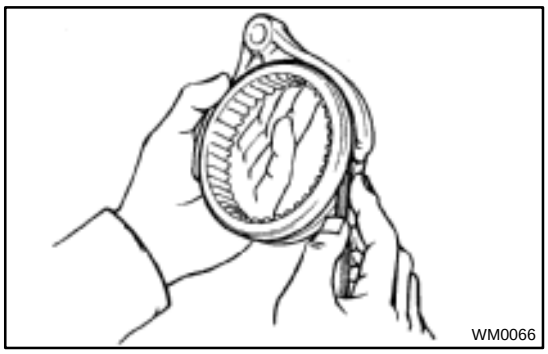
If it does not lock, replace the synchronizer ring.


MT0787

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

Minimum clearance:
0.7 mm (0.028 in.)

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

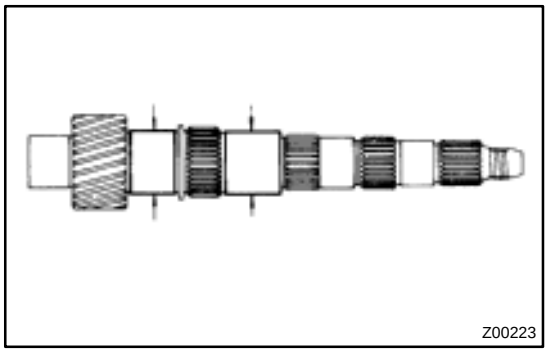

WM0066

3. MEASURE NO.1 SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

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

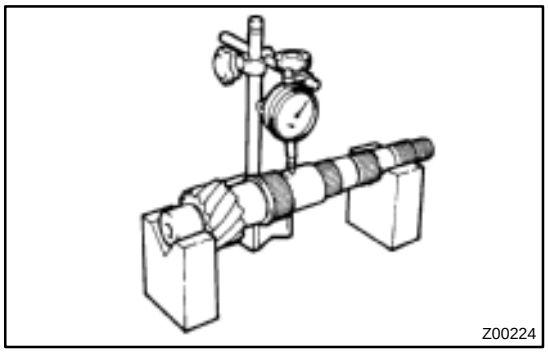

Z00223

4. INSPECT OUTPUT SHAFT

(a) Check the output shaft for wear or damage.

(b) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
38.950 mm (1.5335 in.)

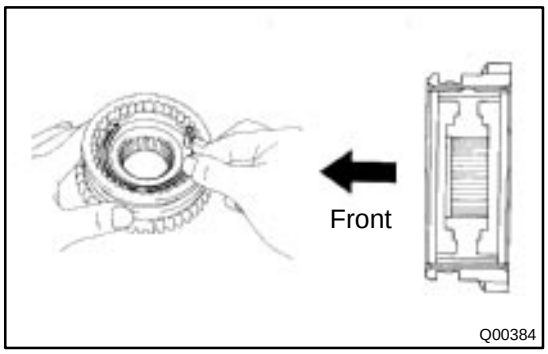

Z00224

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

Maximum runout:
0.06 mm (0.0024 in.)

MX05D–01

REASSEMBLY



HINT:

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

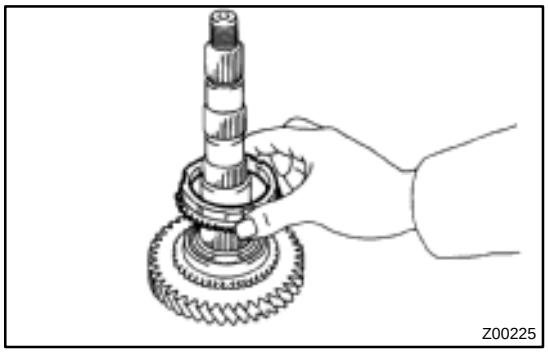
1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

NOTICE:

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

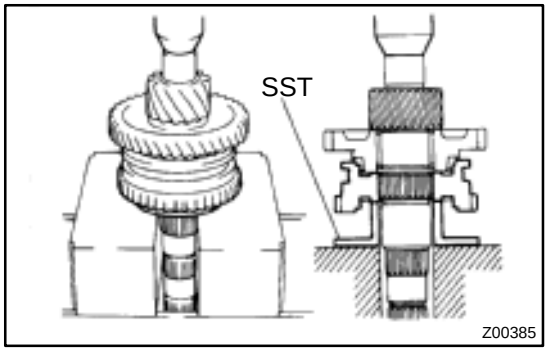


2. INSTALL NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Apply MP grease to the needle roller bearing.

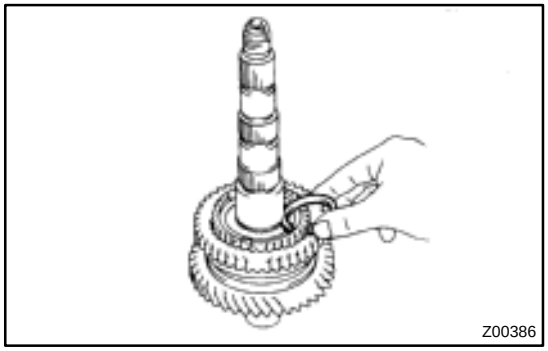
(b) Install the 1st gear.

(c) Place the synchronizer ring (for the 1st gear) on the gear and align the ring slots with the shifting keys.



(d) Using SST and a press, install the 1st gear and No.1 hub sleeve.

SST 09316–60011 (09316–00041)



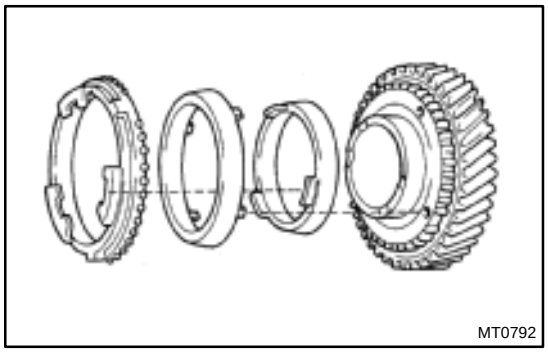
3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.80 (0.1102)	E	3.00 (0.1181)
B	2.85 (0.1122)	F	3.05 (0.1201)
C	2.90 (0.1142)	G	3.10 (0.1220)
D	2.95 (0.1161)	–	–

(b) Using a snap ring expander, install the snap ring.

4. MEASURE 1ST GEAR THRUST CLEARANCE
(See page MX–31)


MT0792

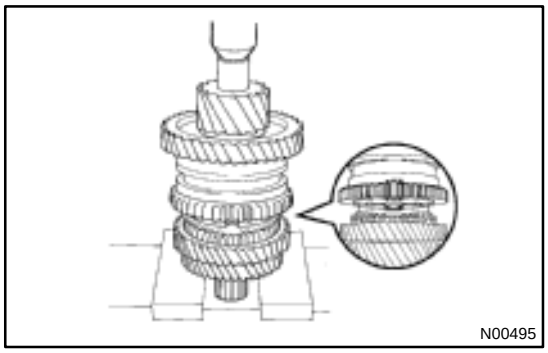
5. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR

(a) Install the spacer.
(b) Apply MP grease to the needle roller bearing.
(c) Place the synchronizer rings (for the 2nd gear) on the gear.

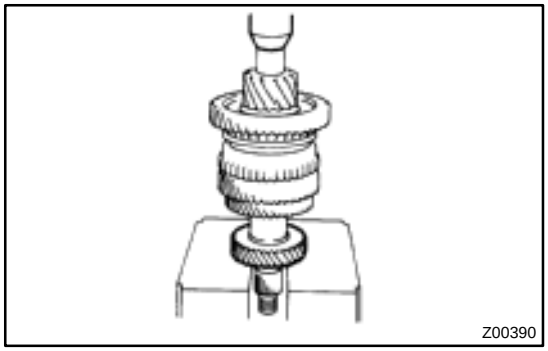
NOTICE:
Do not install the synchronizer ring for the 1st gear.

(d) Install the 2nd gear.
(e) Using a press, install the 3rd driven gear.

NOTICE:
Align the clutch hub grooves with the projections on the synchronizer ring.

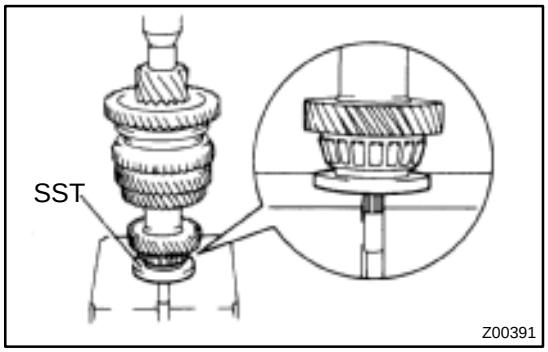

N00495

6. MEASURE 2ND GEAR THRUST CLEARANCE
(See page MX–31)


Z00390

7. INSTALL SPACER AND 4TH DRIVEN GEAR

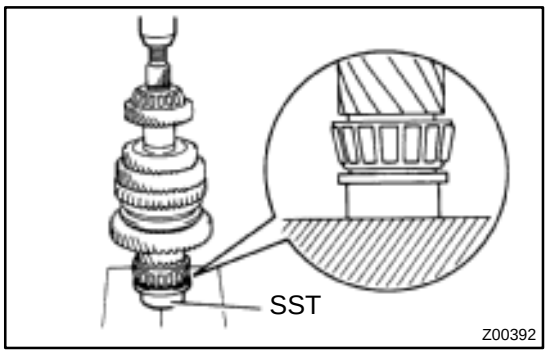
(a) Install the spacer.
(b) Using a press, install the 4th driven gear.



Z00391

8. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install the bearing.
SST 09506–30012



9. INSTALL OUTPUT SHAFT FRONT BEARING

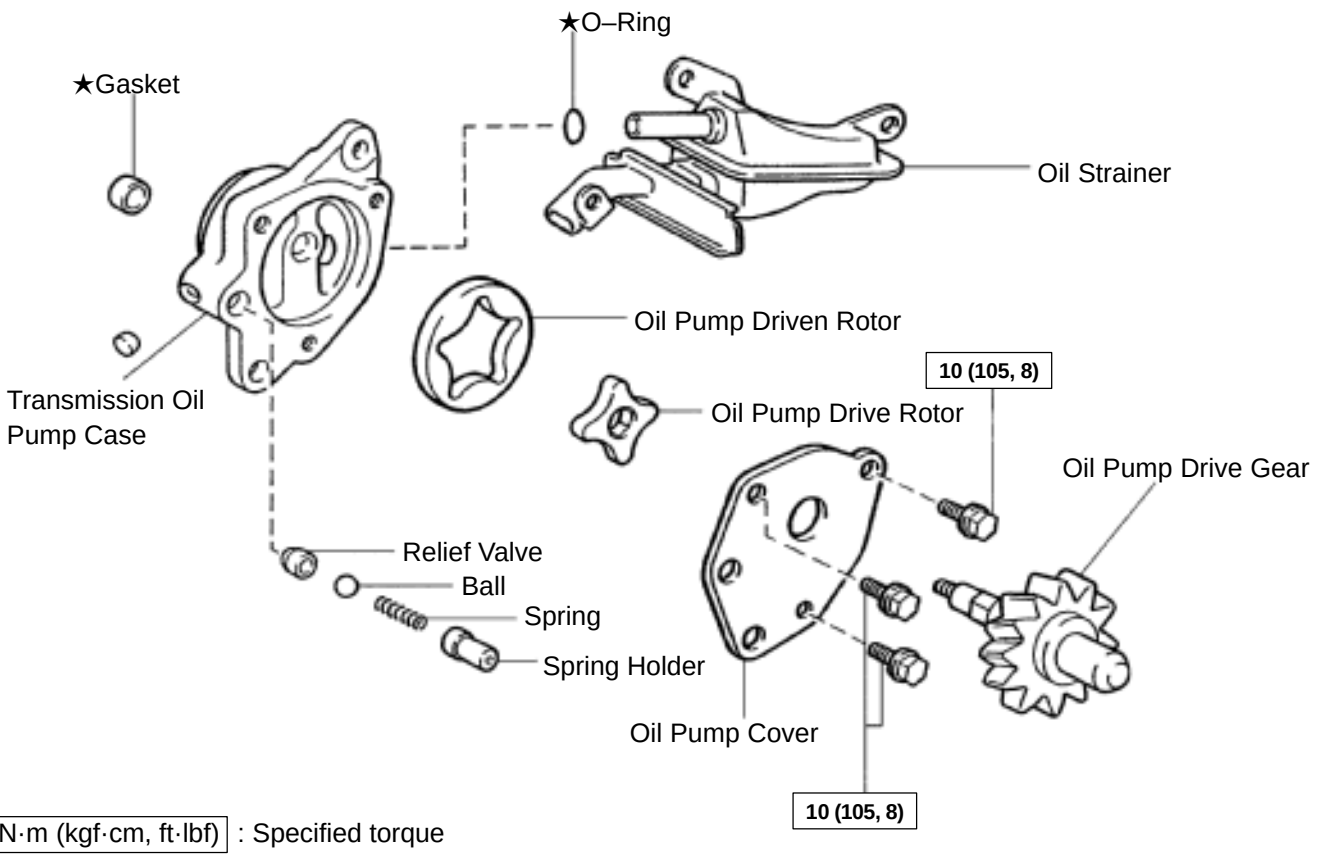
Using SST and a press, install a new output shaft front bearing.

SST 09316–60011 (09316–00071)

OIL PUMP

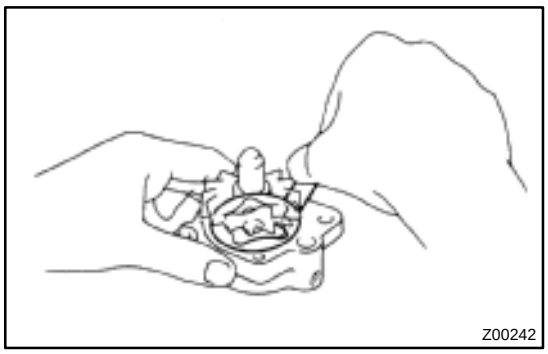
COMPONENTS

MX05E–01



MX05F–01

INSPECTION

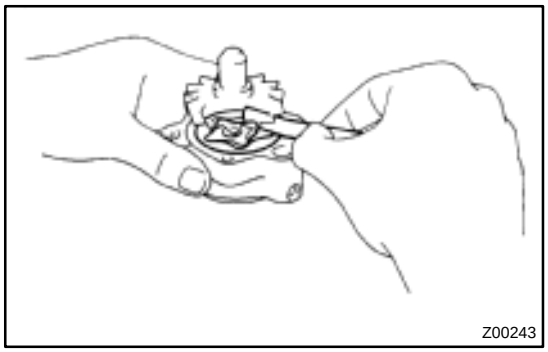


1. CHECK ROTOR BODY CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the body clearance between the drive rotor and oil pump case.

Standard clearance:
0.10 – 0.16 mm (0.0039 – 0.0063 in.)
Maximum clearance:
0.30 mm (0.0118 in.)

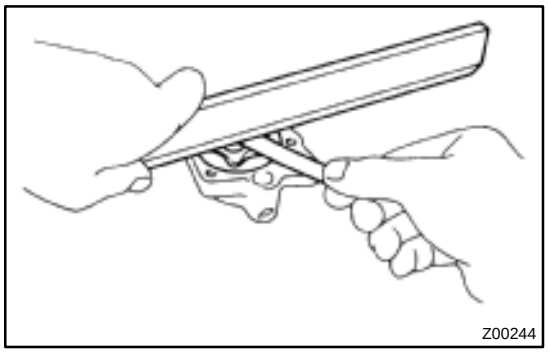


2. CHECK ROTOR TIP CLEARANCE

(a) Install the oil pump drive gear to the drive rotor.

(b) Using a feeler gauge, measure the tip clearance between the drive and driven rotors.

Standard clearance:
0.08 – 0.15 mm (0.0031 – 0.0059 in.)
Maximum clearance:
0.30 mm (0.0118 in.)



3. CHECK SIDE CLEARANCE

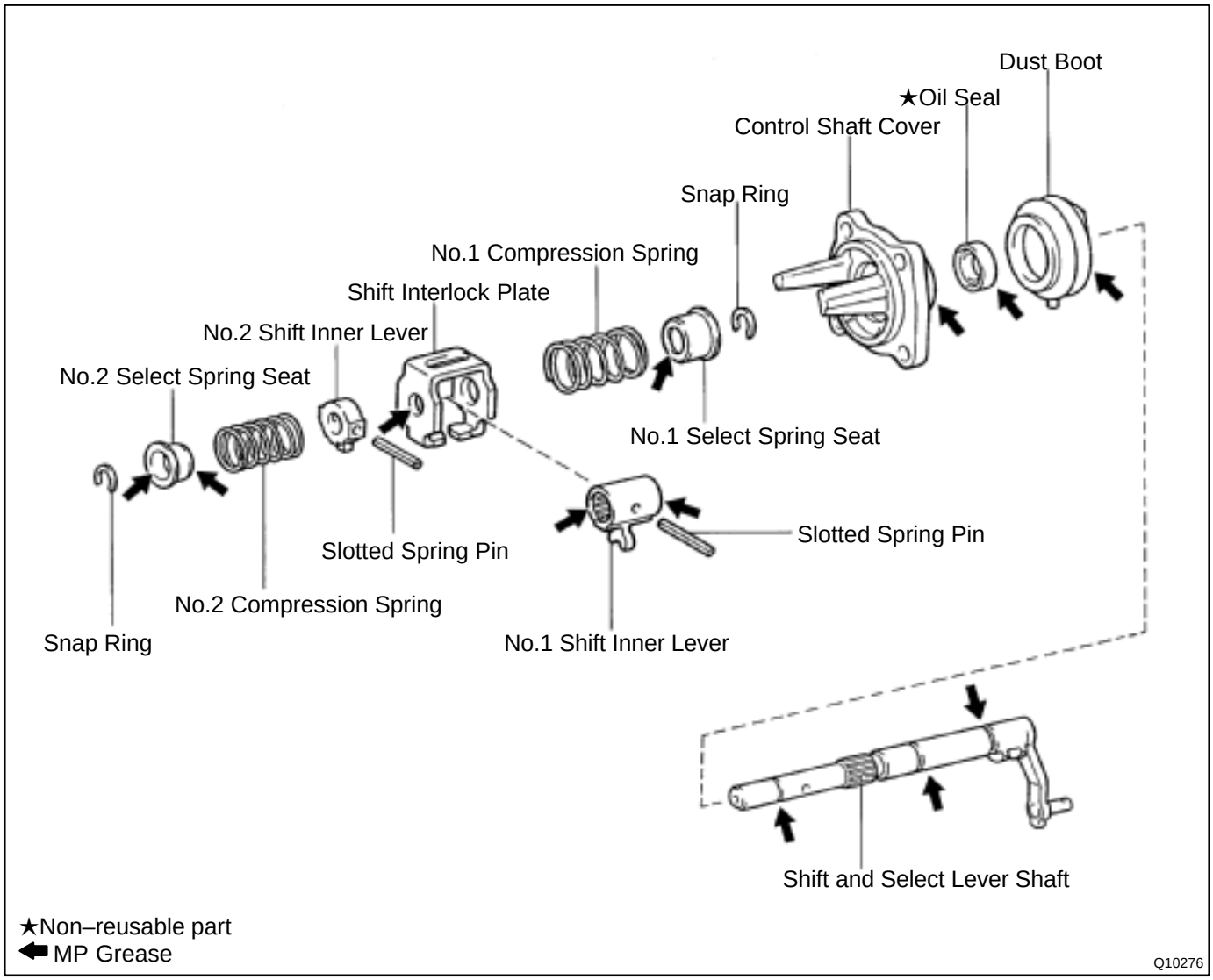
Using a precision straight edge and feeler gauge, measure the side clearance of both rotors.

Standard clearance:
0.03 – 0.08 mm (0.0012 – 0.0031 in.)
Maximum clearance:
0.15 mm (0.0059 in.)

SHIFT AND SELECT LEVER SHAFT

MX05G–02

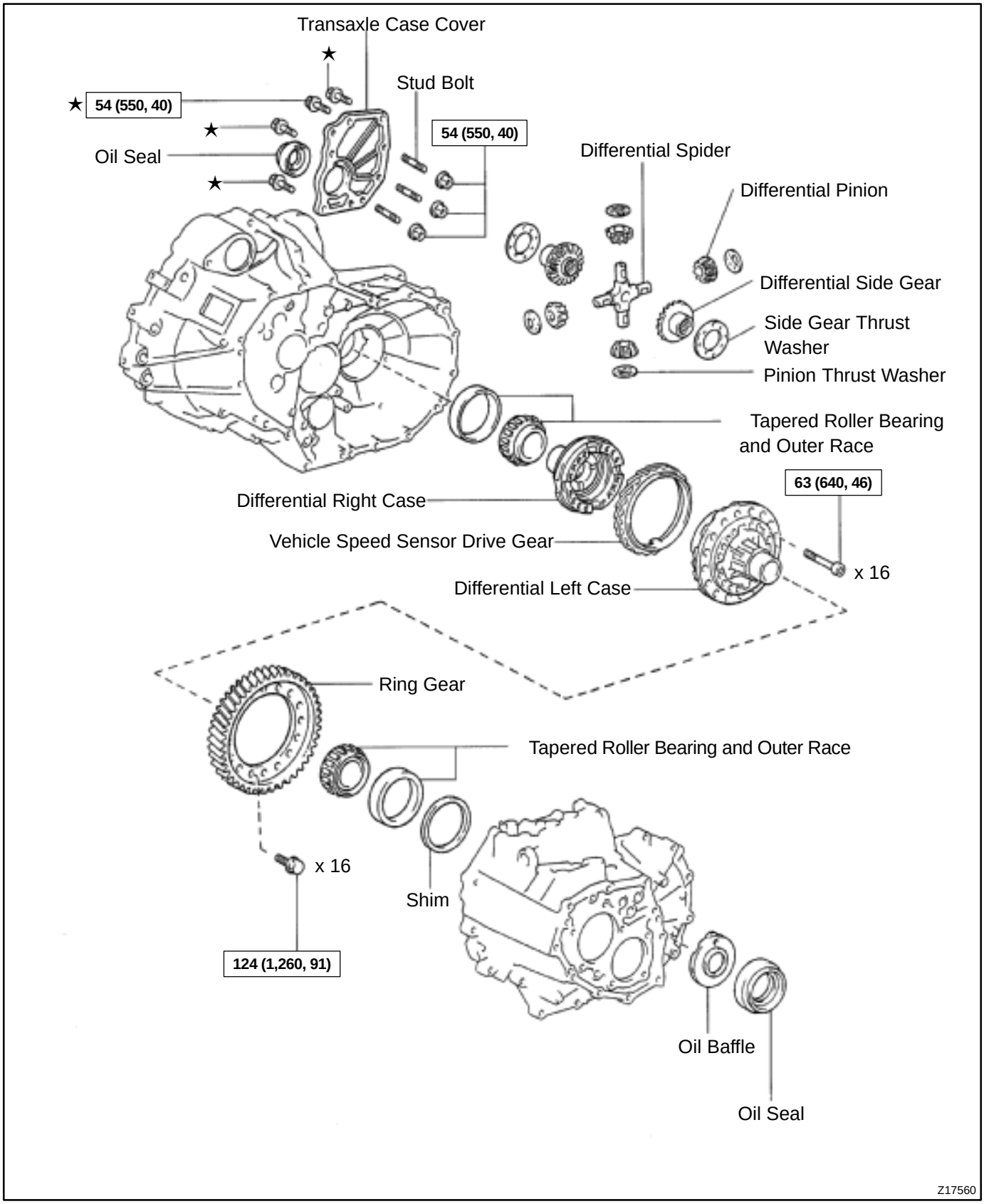
COMPONENTS



DIFFERENTIAL CASE

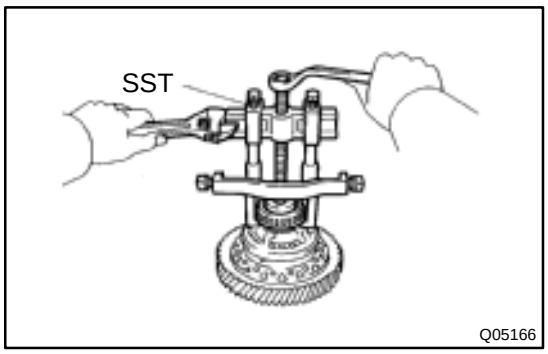
MX05H–01

COMPONENTS



MX05I–03

DISASSEMBLY



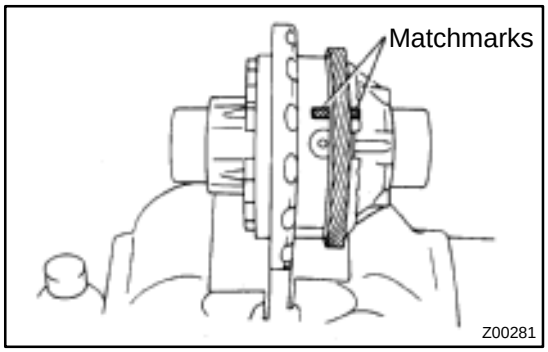
1. REMOVE TAPERED ROLLER BEARING

Using SST, remove the left and right bearings.

SST 09950–40011

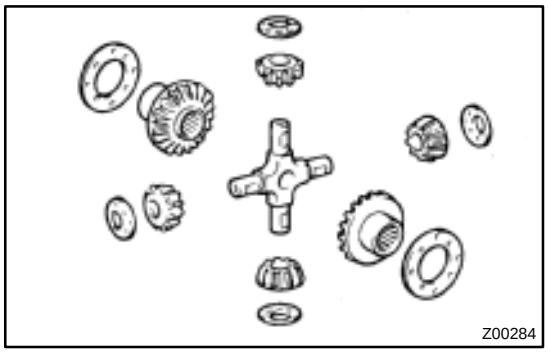
2. REMOVE RING GEAR

(a) Place matchmarks on both the differential case and ring gear.
(b) Remove the 16 bolts.
(c) Using a plastic hammer, tap the ring gear and remove it.

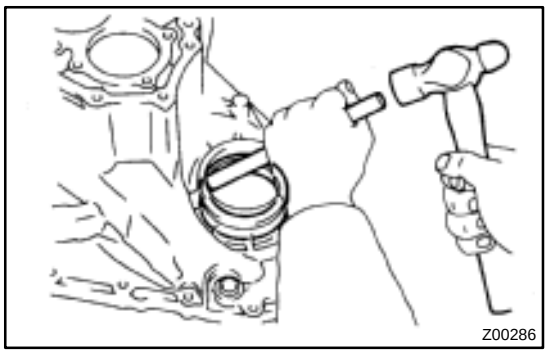


3. DISASSEMBLE DIFFERENTIAL CASE

(a) Place matchmarks on the differential right and left cases.
(b) Using a torx wrench (T50), remove the 16 torx screws.
(c) Using a plastic hammer, tap the differential left case.
(d) Remove the vehicle speed sensor drive gear from the differential right case.



(e) Remove the 2 differential side gears, side gear thrust washers, 4 differential pinions and pinion thrust washers from the differential left case.

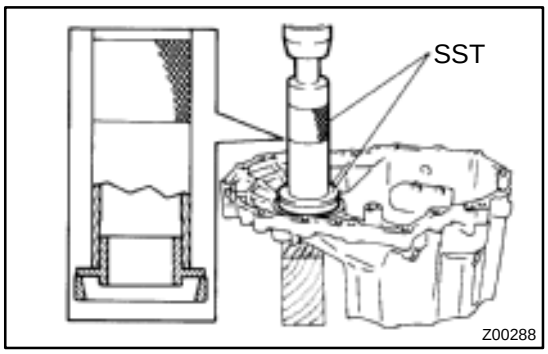


4. Transmission Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

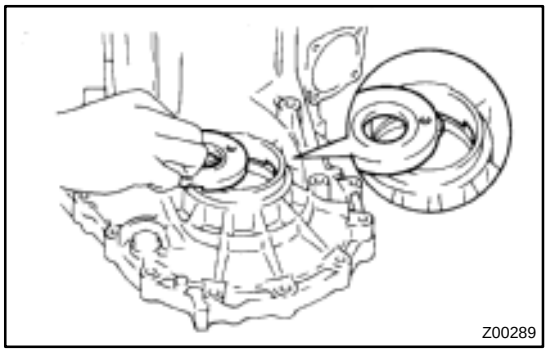
(a) Using a screwdriver, remove the oil seal.
(b) Remove the oil baffle.
(c) Using a brass bar and hammer, drive out the bearing outer race lightly and evenly.
(d) Remove the shim.
(e) Install the shim. (See page MX–42)

HINT:

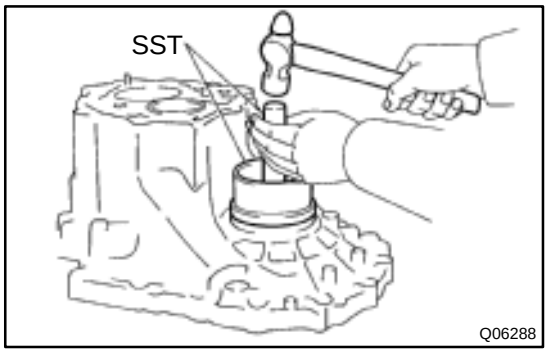
First select and install a shim of less thickness than before.



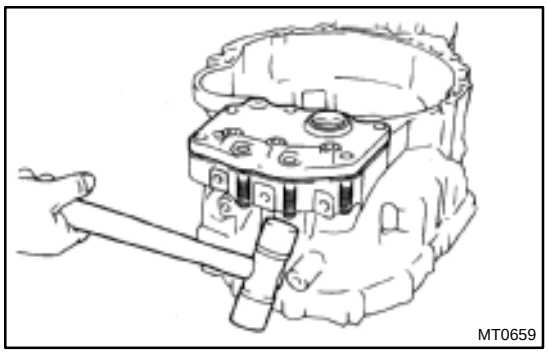
(f) Using SST and a press, install a new tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00041)



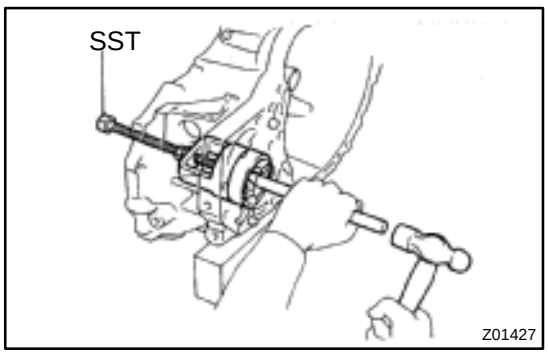
(g) Install the oil baffle.
HINT:
Install the oil baffle projection into the case side cutout.



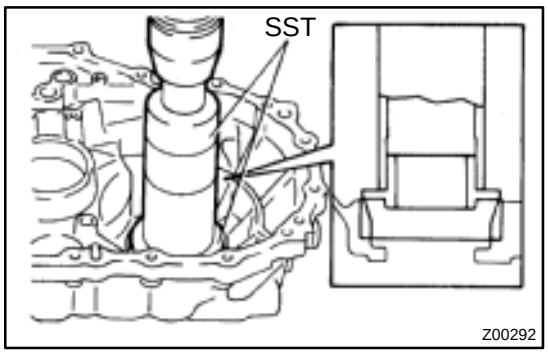
(h) Using SST and a hammer, drive in a new oil seal.
SST 09223–15020, 09950–70010 (09951–07150)
(i) Coat the lip of oil seal with MP grease.



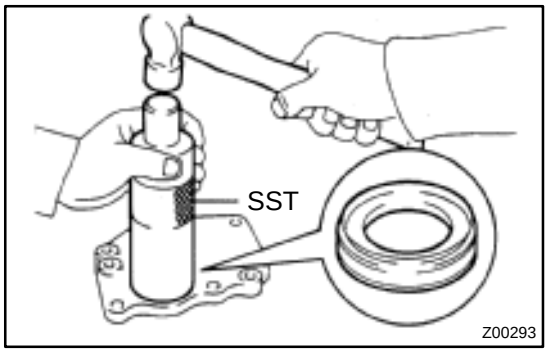
5. Transaxle Case Side:
IF NECESSARY, REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE
(a) Remove the 4 bolts and 3 nuts.
(b) Using a plastic hammer, tap the stud bolt and remove the transaxle case cover.
(c) Using a screwdriver and hammer, drive out the oil seal from the transaxle case cover.



(d) Using SST, a brass bar and hammer, remove the tapered roller bearing outer race.
SST 09612–65014

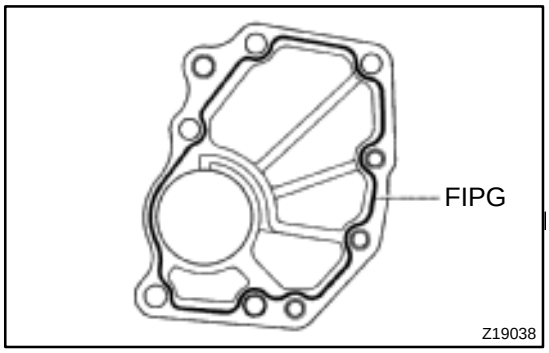


(e) Using SST and a press, install a new tapered roller bearing outer race.
SST 09316–60011 (09316–00011, 09316–00041)



(f) Using SST and a hammer, drive in a new oil seal.
SST 09316–60011 (09316–00011)

(g) Coat the oil seal lip with MP grease.



(h) Apply FIPG to the transaxle case cover, as shown.
FIPG:
Part No. 08826 – 00090, THREE BOND 1281 or equivalent

(i) Apply sealant to the bolt threads.
Sealant:
Part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

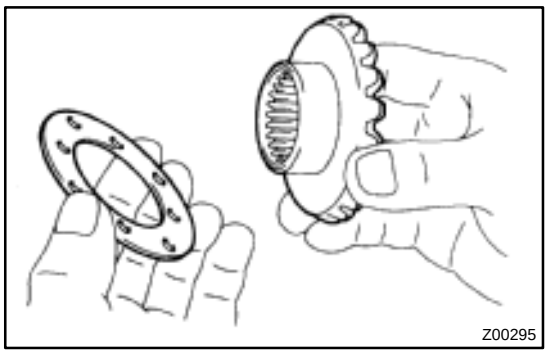
(j) Install the stud bolt and cover to the transaxle case.

(k) Install and torque the 4 bolts and 3 nuts.
Torque: 54 N·m (550 kgf·cm, 40 ft·lbf)

MX05J–01

REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE


Z00295

HINT:

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

(a) Install the thrust washer to the side gear.

(b) Install the 4 pinions and thrust washers to the spider.

(c) Install the side gear and spider with the 4 pinions to the differential left case.

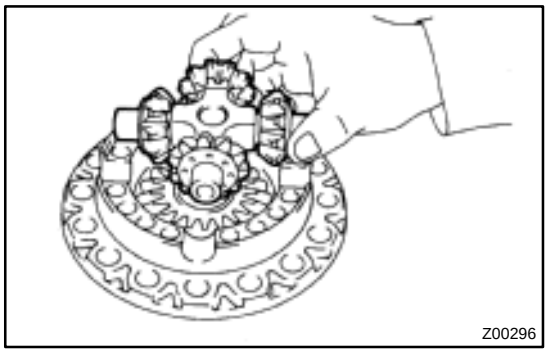
(d) Using a dial indicator, measure the backlash of the pinion gear while holding the differential left case.

Standard backlash:

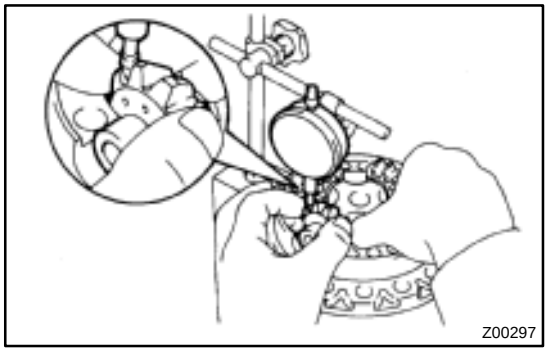
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

HINT:

Push the pinion gear and spider with the 4 pinions to the differential left case.

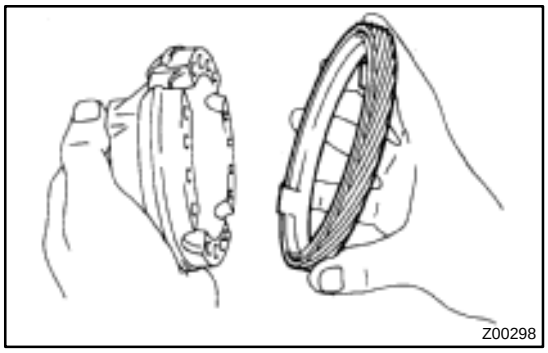

Z00296

(e) Install the side gear and spider with the 4 pinions to the right side of the differential case. Check the side gear backlash.

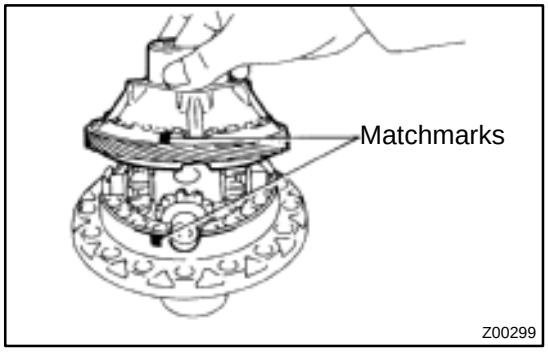

Z00297

(f) Refer to the table below, and select the thrust washer which will ensure that the backlash is within the specification. Try to select a washer of the same size.

Thickness mm (in.)	Thickness mm (in.)
0.80 (0.0315)	1.20 (0.0472)
0.90 (0.0354)	1.30 (0.0512)
1.00 (0.0394)	1.40 (0.0551)
1.10 (0.0433)	–


Z00298

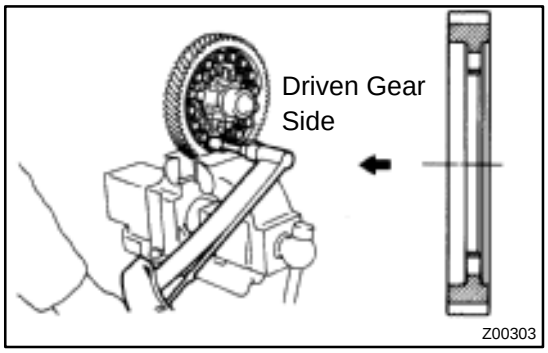
(g) Install the vehicle speed sensor drive gear.



(h) Align the matchmarks on the differential cases.
(i) Using a plastic hammer, carefully tap the differential case to install it.
(j) Using a torx wrench (T50), install and torque the 16 torx screws.
Torque: 63 N·m (640 kgf·cm, 46 ft·lbf)

2. INSTALL RING GEAR

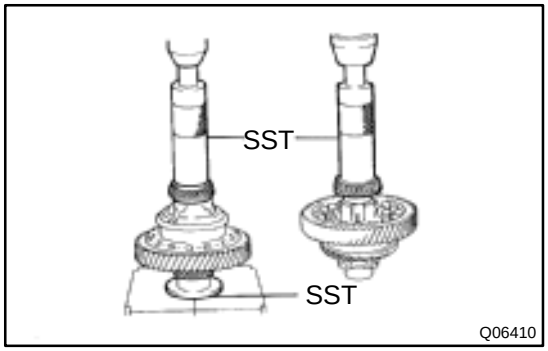
(a) Clean the contact surface of the differential case and the threads of the ring gear and differential case.
(b) Heat the ring gear in boiling water.
(c) Carefully remove the ring gear from the water.
(d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to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



HINT:
Align the matchmarks on the differential left case.
(e) Temporarily install the 16 bolts.

NOTICE:
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.
Torque: 124 N·m (1,260 kgf·cm, 91 ft·lbf)



3. INSTALL TAPERED ROLLER BEARING

Using SST and a press, install new left and right bearings onto the differential case.
SST 09316–20011, 09316–60011 (09316–00011)

HINT:
Press the bearing on the ring side first.

4. ADJUST OUTPUT SHAFT ASSEMBLY PRELOAD
(See pages MX–22)

5. INSTALL DIFFERENTIAL CASE ASSEMBLY TO TRANSAXLE CASE

6. INSTALL OUTPUT SHAFT ASSEMBLY

Lift up the differential case and install the output shaft assembly.

7. INSTALL TRANSMISSION CASE

(a) Install the transmission case.

HINT:
If necessary, tap on the case with a plastic hammer.

(b) Install and torque the 17 bolts.
Torque: 29 N·m (300 kgf·cm 22 ft·lbf)

8. INSTALL OUTPUT SHAFT REAR TAPERED ROLLER BEARING OUTER RACE

Using a plastic hammer, drive in the outer race.

9. INSTALL SHIM (See pages MX–22)

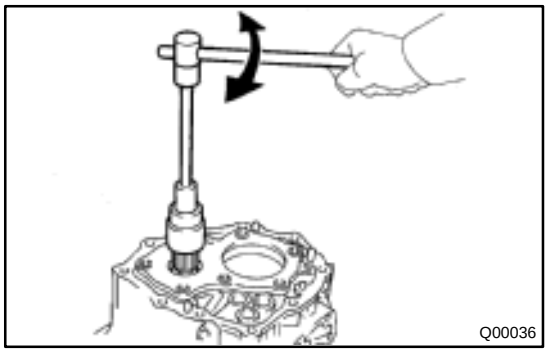
HINT:

Install the previously selected shim.

10. INSTALL REAR BEARING RETAINER

Using a torx wrench (T45), install and torque the 7 torx screws.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)


Q00036

11. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

(a) Install a new lock nut to the output shaft.

(b) Turn the output shaft right and left 2 or 3 times to allow the bearings to settle.

(c) Using a torque wrench, measure the preload.

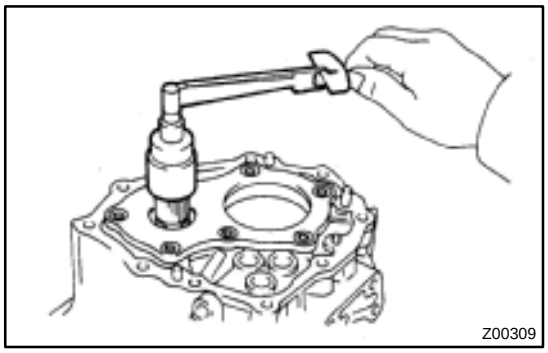
Preload (at starting):

New bearing (Output shaft preload plus)

0.2 – 0.3 N·m (1.8 – 3.5 kgf·cm, 1.6 – 3.0 in.·lbf)

Reused bearing (Output shaft preload plus)

0.1 – 0.2 N·m (1.1 – 2.2 kgf·cm, 1.0 – 1.9 in.·lbf)


Z00309

If the preload is not within the specification, select an appropriate adjusting shim.

HINT:

The total preload will change by about 0.1 – 0.2 N·m (1 – 2 kgf·cm, 0.9 – 1.7 in.·lbf) with each 0.05 mm change in adjusting shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

12. REMOVE REAR BEARING RETAINER

Using a torx wrench (T45), remove the 7 torx screws and rear bearing retainer.

13. REMOVE SHIM

14. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.

(b) Using a plastic hammer, tap the transmission case.

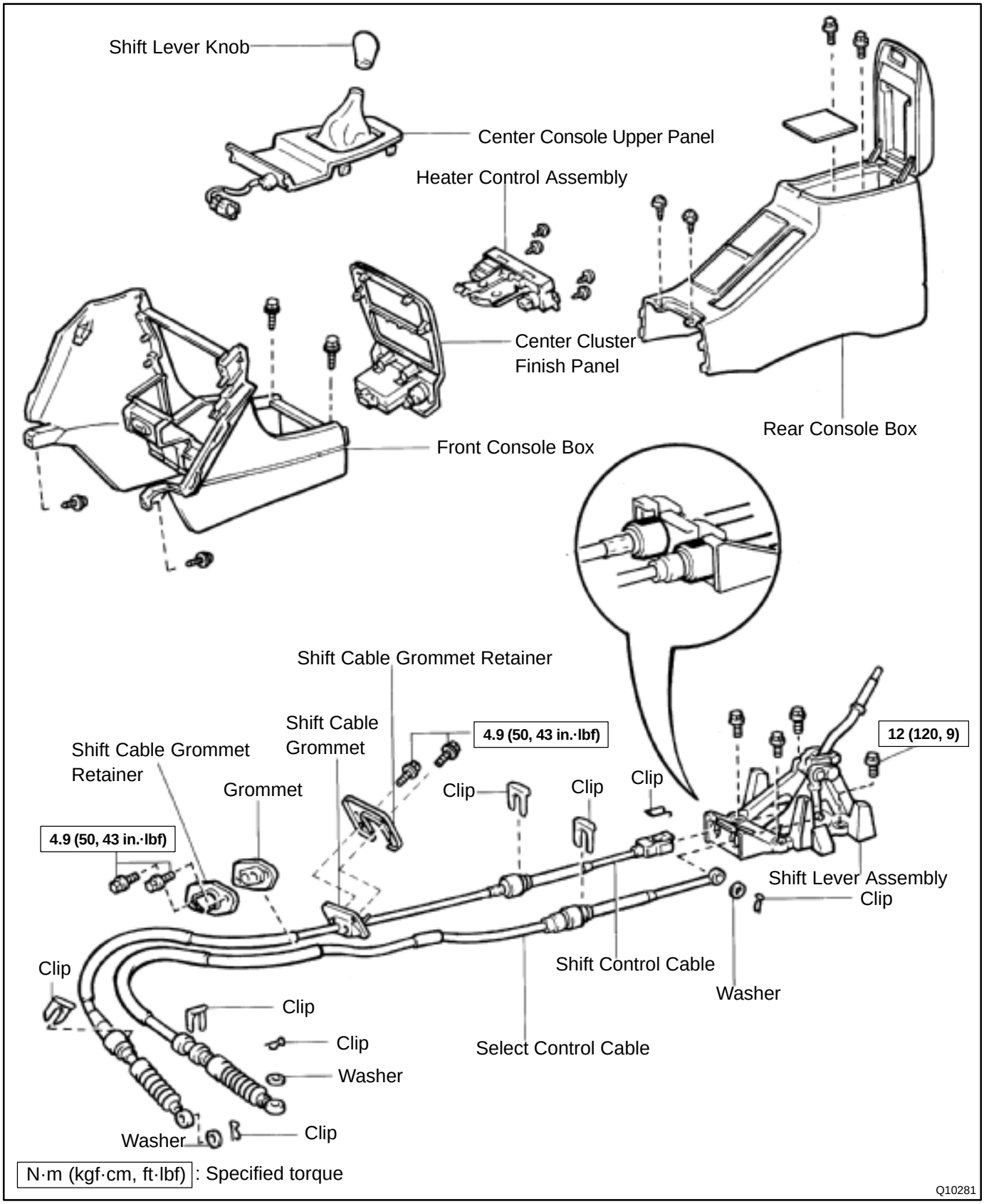
15. REMOVE OUTPUT SHAFT ASSEMBLY

16. REMOVE DIFFERENTIAL CASE ASSEMBLY

SHIFT LEVER AND CONTROL CABLE

MX05K–01

COMPONENTS



MANUAL TRANSAXLE SYSTEM

MX04A–01

PRECAUTION

When working with FIPG material, you must observe the following items.

- ★ **Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.**
- ★ **Thoroughly clean all components to remove all the 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.**

TROUBLESHOOTING

MX04B–04

PROBLEM SYMPTOMS TABLE

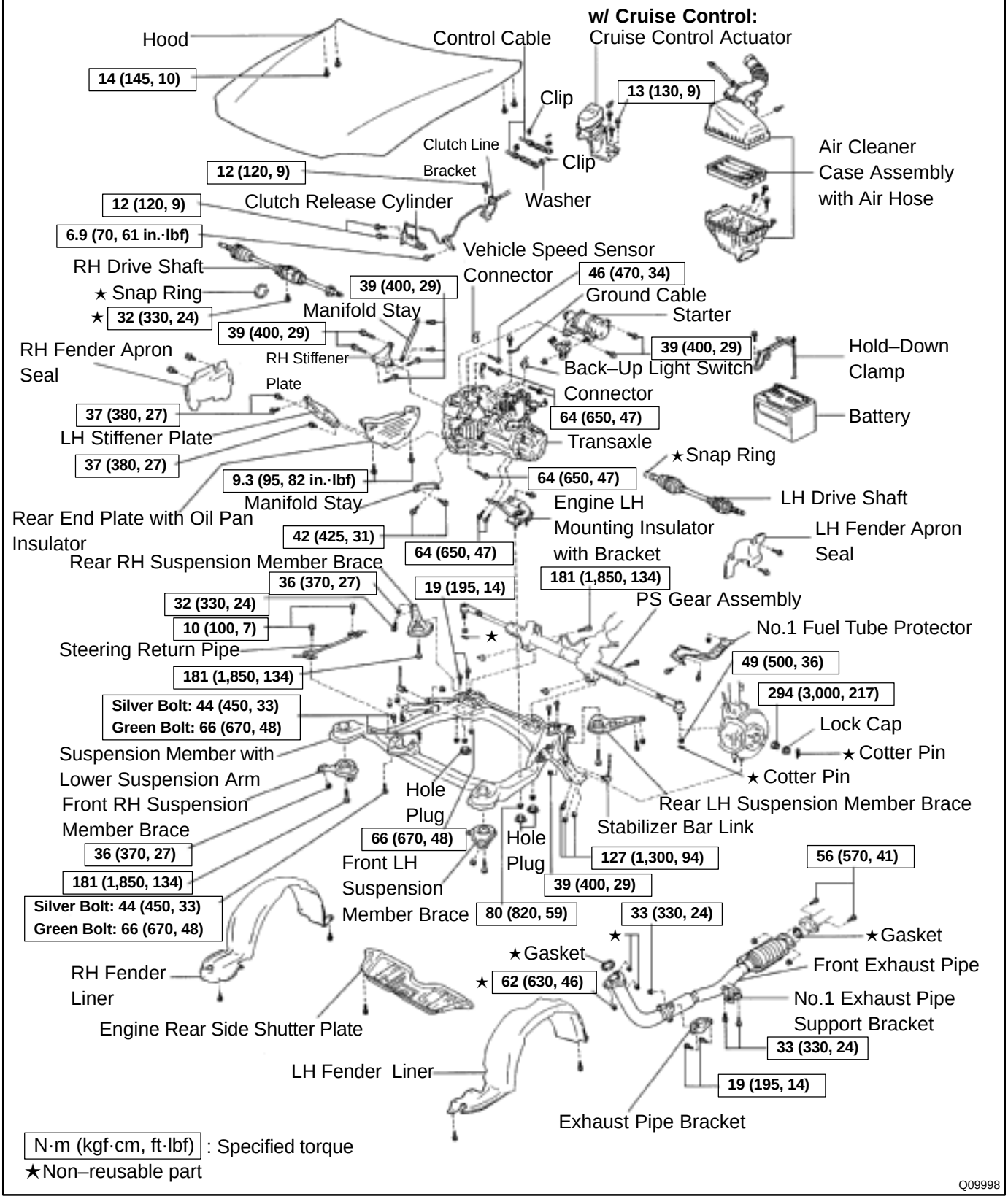
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Noise	1. Oil (Level low)	MX–4
	2. Oil (Wrong)	MX–4
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9
Oil leakage	1. Oil (Level too high)	MX–4
	2. Gasket (Damaged)	MX–9
	3. Oil seal (Worn or damaged)	MX–9
	4. O–ring (Worn or damaged)	MX–9
Hard to shift or will not shift	1. Control cable (Faulty)	MX–43
	2. Synchronizer ring (Worn or damaged)	MX–9 MX–20
	3. Shift key spring (Damaged)	MX–28 MX–9 MX–20 MX–28
Jumps out of gear	1. Locking ball spring (Damaged)	MX–9
	2. Shift fork (Worn)	MX–9
	3. Gear (Worn or damaged)	MX–9
	4. Bearing (Worn or damaged)	MX–9

MANUAL TRANSAXLE UNIT

COMPONENTS

MX04C–01



MX04D–01

REMOVAL

1. REMOVE HOOD

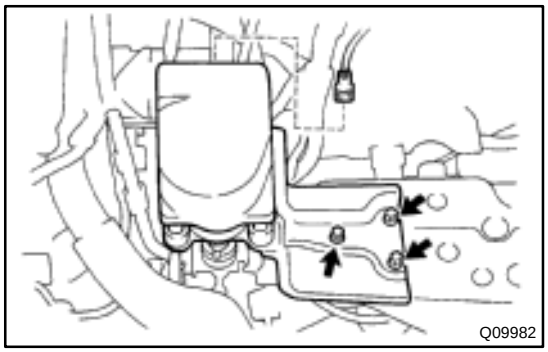
HINT:

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

Adjust the hood.

(See page BO–10)

2. REMOVE BATTERY AND AIR CLEANER CASE ASSEMBLY WITH AIR HOSE



3. w/ Cruise Control:
REMOVE CRUISE CONTROL ACTUATOR

(a) Disconnect the cruise control actuator connector.

(b) Remove the 3 bolts and cruise control actuator with the bracket.

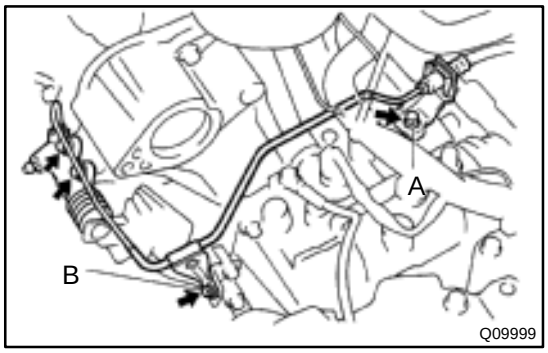
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

4. REMOVE STARTER

(a) Disconnect the connector and wire from the starter.

(b) Remove the 2 bolts and starter.

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



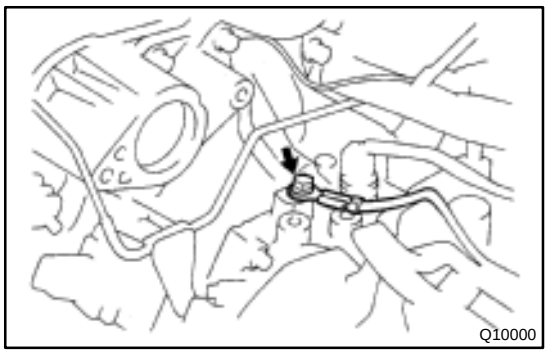
5. DISCONNECT CLUTCH RELEASE CYLINDER

(a) Remove the 2 bolts and disconnect the release cylinder.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

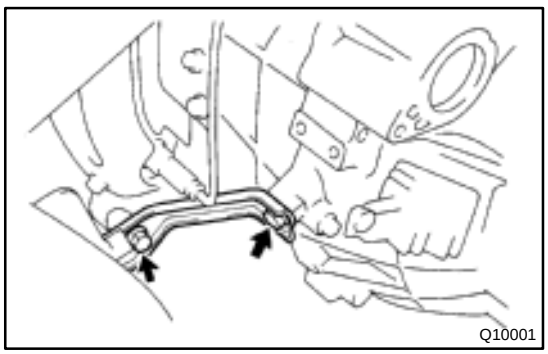
(b) Remove the 2 set bolts of the clutch line bracket.

Torque:
Bolt A: 12 N·m (120 kgf·cm, 9 ft·lbf)
Bolt B: 6.9 N·m (70 kgf·cm, 61 in.·lbf)



6. DISCONNECT GROUND CABLE

Remove the set bolt of the ground cable from the transaxle.



7. REMOVE MANIFOLD STAY

Remove the 2 bolts and stay.

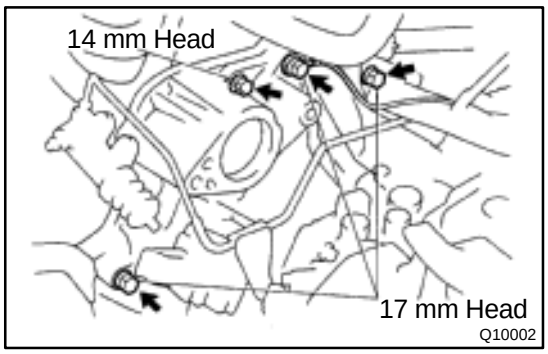
Torque: 42 N·m (425 kgf·cm, 31 ft·lbf)

8. DISCONNECT VEHICLE SPEED SENSOR AND BACK–UP LIGHT SWITCH CONNECTORS

9. DISCONNECT CONTROL CABLE

(a) Remove the 2 clips and washers.

(b) Remove the 2 clips from the cables.



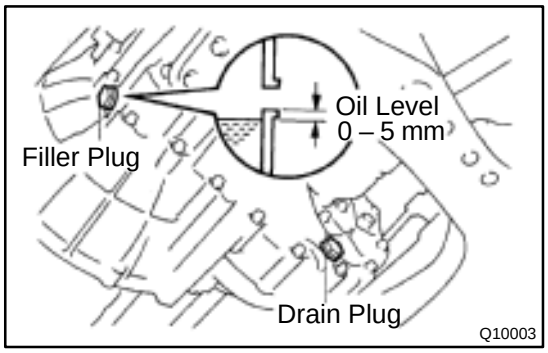
10. REMOVE 4 TRANSAXLE UPPER SIDE MOUNTING BOLTS
Torque:
17 mm head: 64 N·m (650 kgf·cm, 47 ft·lbf)
14 mm head: 46 N·m (470 kgf·cm, 34 ft·lbf)

11. REMOVE FRONT WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

12. RAISE VEHICLE

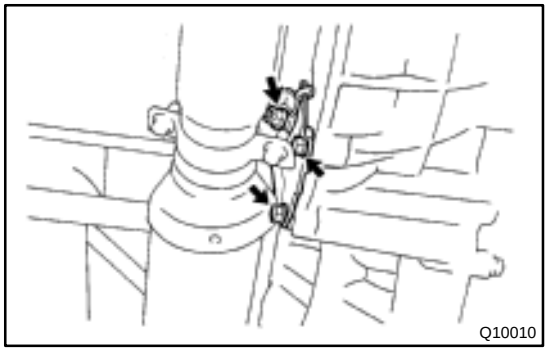
NOTICE:
Make sure that the vehicle is securely supported.

13. REMOVE ENGINE REAR SIDE SHUTTER PLATE AND LH AND RH FENDER APRON SEALS



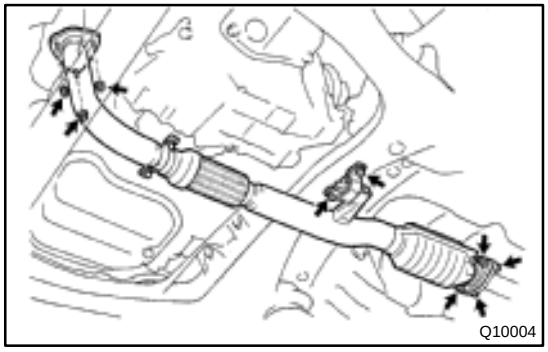
14. DRAIN TRANSAXLE OIL
Oil grade: API GL–4 or GL–5
Viscosity: SAE 75W–90
Capacity: 2.6 liters (2.7 US qts, 2.3 Imp. qts)
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

15. REMOVE LH AND RH DRIVE SHAFTS
(See page SA–16)



16. REMOVE FRONT EXHAUST PIPE

(a) Remove the 2 bolts, nut and exhaust pipe bracket.
Torque:
Bolt: 19 N·m (195 kgf·cm, 14 ft·lbf)
Nut: 33 N·m (330 kgf·cm, 24 ft·lbf)

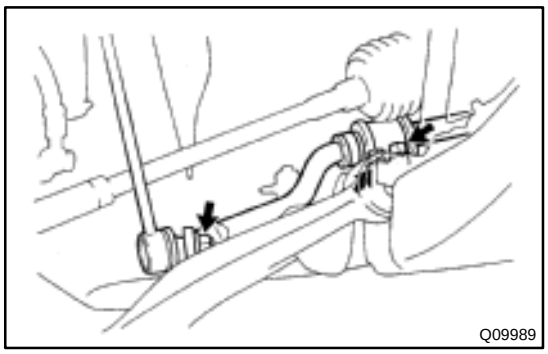


(b) Remove the 3 nuts and gasket from the exhaust manifold.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

(c) Remove the 2 bolts, nuts and gasket.
Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

(d) Remove the 2 set bolts of the No.1 exhaust pipe support bracket.
Torque: 33 N·m (330 kgf·cm, 24 ft·lbf)

(e) Remove the front exhaust pipe.



17. DISCONNECT PS GEAR ASSEMBLY FROM FRONT SUSPENSION MEMBER

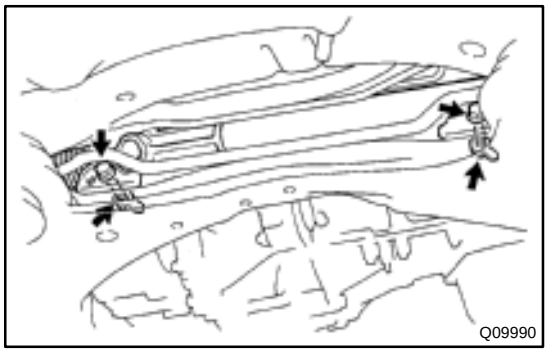
(a) Remove the 2 nuts and disconnect the stabilizer bar link from the stabilizer bar.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

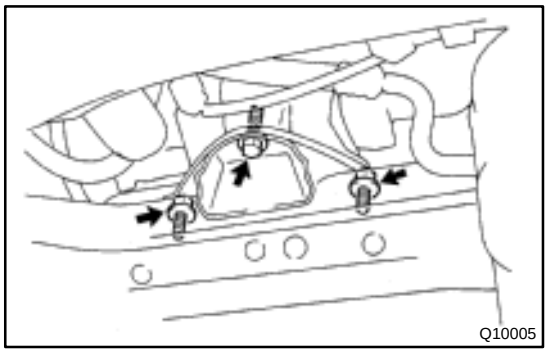
(b) Remove the 4 set bolts of the stabilizer bar bracket.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(c) Remove the 2 bolts, nut and No.1 fuel tube protector.

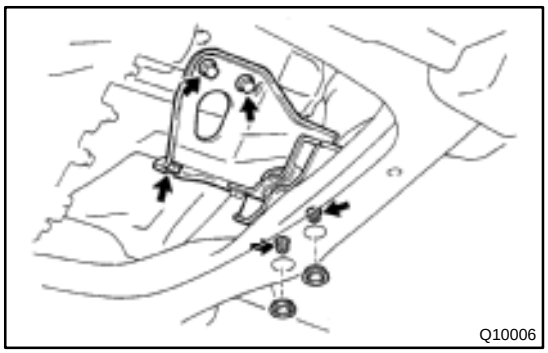
(d) Tie the PS gear assembly to the proper position with a code or an equivalent to suspend the assembly securely.

(e) Remove the 2 set bolts and nuts of the PS gear assembly.
Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)





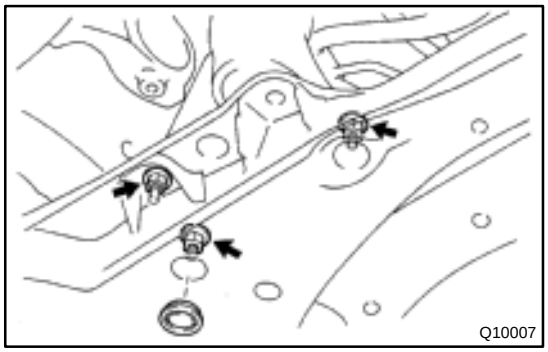
18. REMOVE 3 ENGINE FRONT SIDE MOUNTING BOLTS
Torque:
Silver bolt: 44 N·m (450 kgf·cm, 33 ft·lbf)
Green bolt: 66 N·m (670 kgf·cm, 48 ft·lbf)



19. REMOVE LH ENGINE MOUNTING INSULATOR WITH BRACKET

(a) Remove the 2 hole plugs, nuts and 3 bolts.
Torque:
Bolt: 64 N·m (650 kgf·cm, 47 ft·lbf)
Nut: 80 N·m (820 kgf·cm, 59 ft·lbf)

(b) Lift up the transaxle and remove the left engine mounting insulator with the bracket.

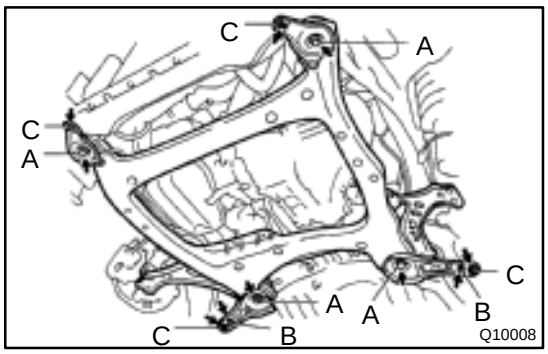


20. REMOVE HOLE PLUG AND 3 ENGINE REAR SIDE MOUNTING NUTS
Torque: 66 N·m (670 kgf·cm, 48 ft·lbf)

21. ATTACH ENGINE SLING DEVICE TO ENGINE HANGER
(See page EM–69)

22. DISCONNECT STEERING RETURN PIPE FROM FRONT SUSPENSION MEMBER

Remove the 2 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



23. REMOVE FRONT SUSPENSION MEMBER WITH LOWER SUSPENSION ARM

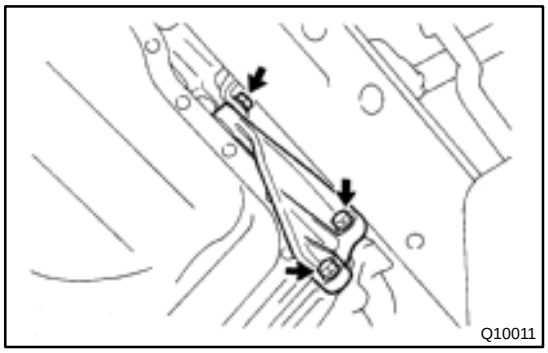
(a) Remove the LH and RH fender liner set screws.

(b) Remove the 6 bolts, 4 nuts, front LH and RH suspension member braces, rear LH and RH suspension member braces and front suspension member with the lower suspension arm.

Torque:
Bolt A: 181 N·m (1,850 kgf·cm, 134 ft·lbf)
Bolt B: 32 N·m (330 kgf·cm, 24 ft·lbf)
Nut C: 36 N·m (370 kgf·cm, 27 ft·lbf)

24. JACK UP TRANSAXLE SLIGHTLY

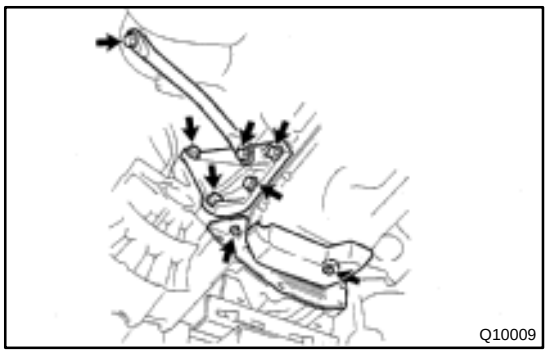
Using a transmission jack, support the transaxle.



25. REMOVE LH STIFFENER PLATE

Remove the 3 bolts and LH stiffener plate.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



26. REMOVE REAR END PLATE WITH OIL PAN INSULATOR AND RH STIFFENER PLATE

(a) Remove the 2 bolts and rear end plate with the oil pan insulator.

Torque: 9.3 N·m (95 kgf·cm, 82 in.·lbf)

(b) Remove the 2 bolts and manifold stay.

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

(c) Remove the 4 bolts and RH stiffener plate.

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

27. 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.

MX04E–01

INSTALLATION

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

HINT:

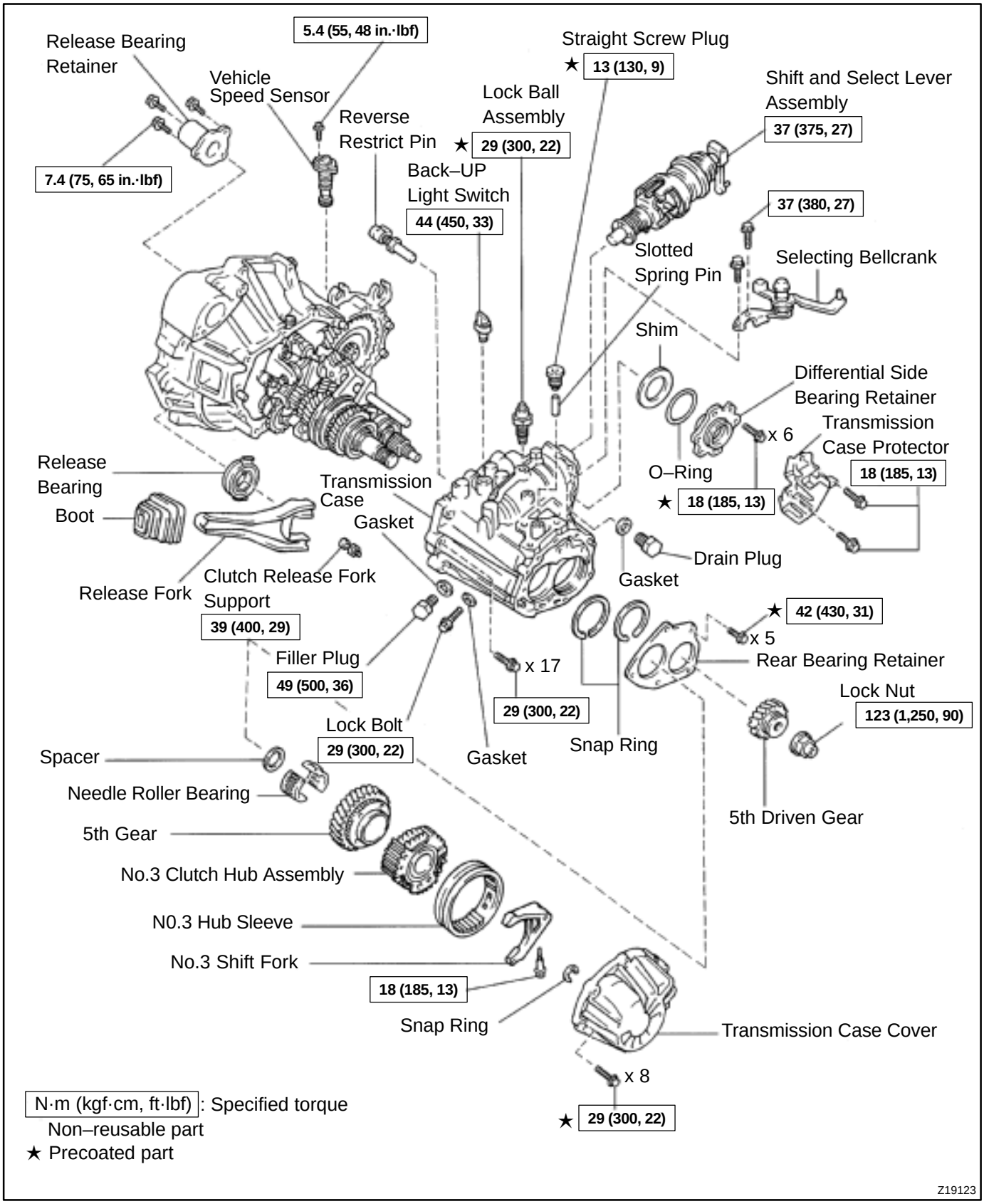
★ Front wheel alignment (See page SA–4).

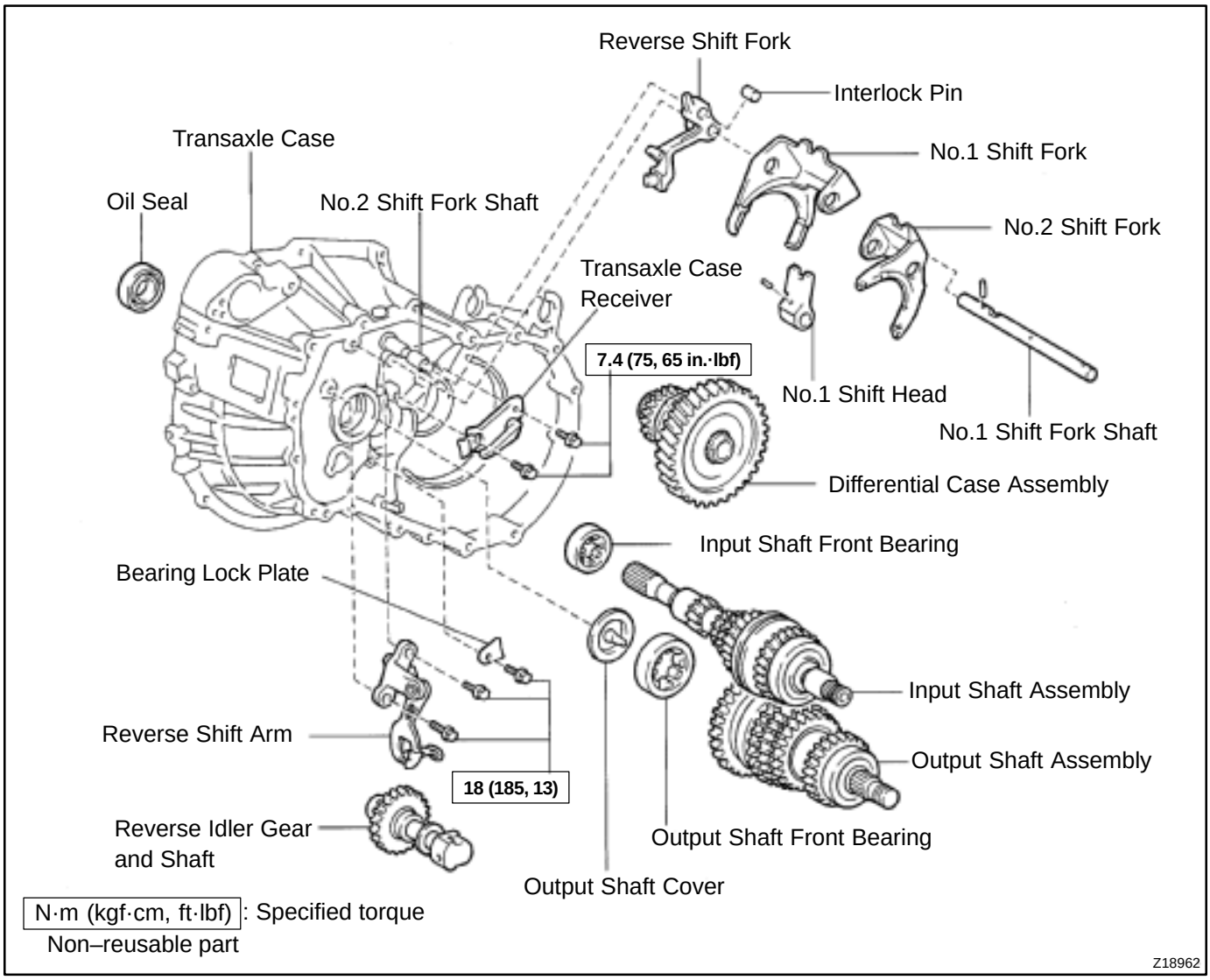
★ Do the road test.

MANUAL TRANSAXLE ASSEMBLY

MX04F–02

COMPONENTS




Reverse Shift Fork
Interlock Pin
Transaxle Case
No.1 Shift Fork
Oil Seal
No.2 Shift Fork Shaft
No.2 Shift Fork
Transaxle Case Receiver
7.4 (75, 65 in.·lbf)
No.1 Shift Head
No.1 Shift Fork Shaft
Differential Case Assembly
Input Shaft Front Bearing
Bearing Lock Plate
Input Shaft Assembly
Reverse Shift Arm
Output Shaft Assembly
18 (185, 13)
Reverse Idler Gear and Shaft
Output Shaft Front Bearing
Output Shaft Cover
N·m (kgf·cm, ft·lbf): Specified torque
Non–reusable part
Z18962

MX04G–02

DISASSEMBLY

1. REMOVE RELEASE FORK AND BEARING

2. REMOVE BACK–UP LIGHT SWITCH

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

3. REMOVE BOLT AND VEHICLE SPEED SENSOR

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

4. REMOVE RELEASE BEARING RETAINER

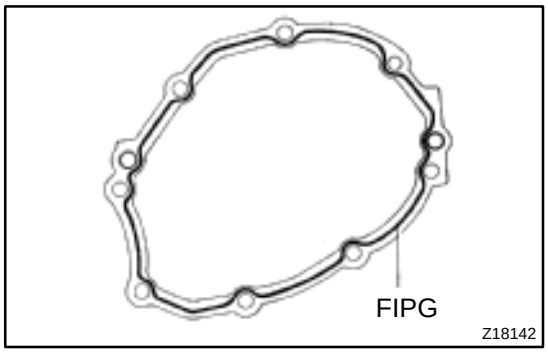
Remove the 3 bolts and retainer.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

5. REMOVE SELECTING BELLCRANK

Remove the 2 bolts and selecting bellcrank.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



6. REMOVE TRANSMISSION CASE COVER

(a) Remove the 8 bolts.

Sealant:

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

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

(b) Using a plastic hammer, tap the transmission case cover and remove it.

FIPG:

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

7. REMOVE 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)

8. REMOVE SHIFT AND SELECT LEVER ASSEMBLY

HINT:

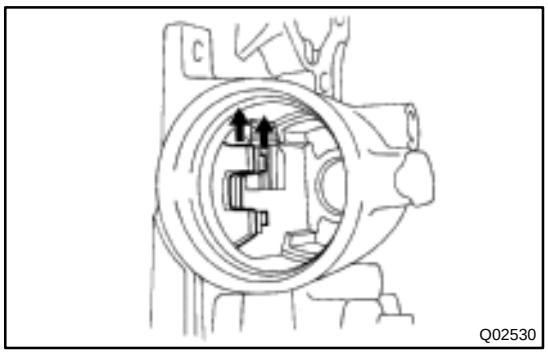
At the time of installation, please refer to the following item.

Apply FIPG to the underside of the flanged portion of the control shaft cover.

FIPG:

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

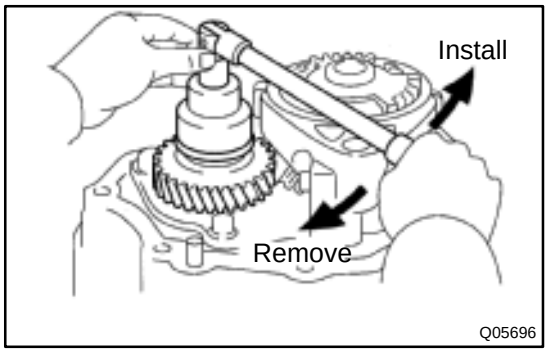
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



9. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the nut.

(b) Engage the gear double meshing.



(c) Rotate the lock nut clockwise and remove it.

Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

HINT:

The lock nut has LH threads.

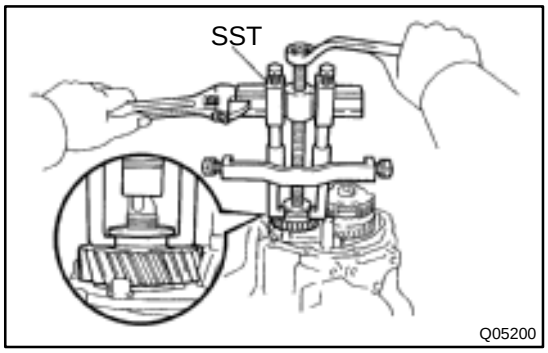
(d) Disengage the gear double meshing.

10. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

(a) Remove the No.3 shift fork set bolt.

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

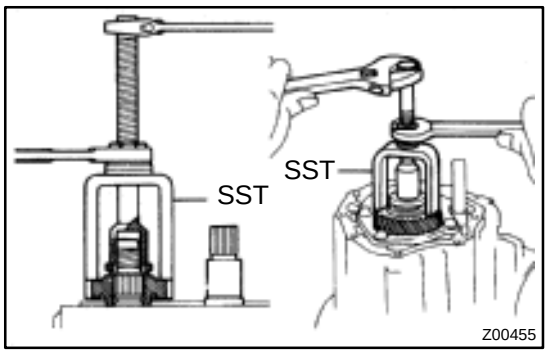
(b) Remove the No.3 hub sleeve and No.3 shift fork.



11. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

SST 09950–40011

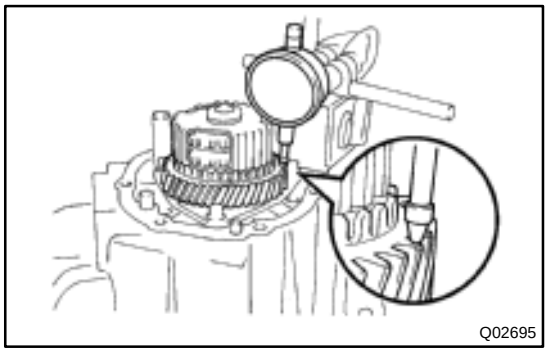


HINT:

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

Using SST, install the 5th driven gear.

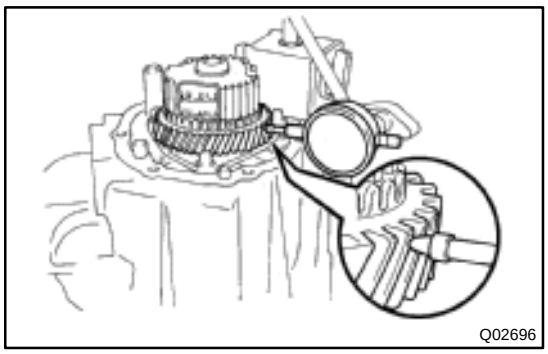
SST 09309–12020



12. MEASURE 5TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

Standard clearance:
0.20 – 0.40 mm (0.0079 – 0.0157 in.)
Maximum clearance:
0.45 mm (0.0177 in.)


Q02696

13. MEASURE 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

Standard clearance:
0.009 – 0.050 mm (0.0004 – 0.0020 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

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

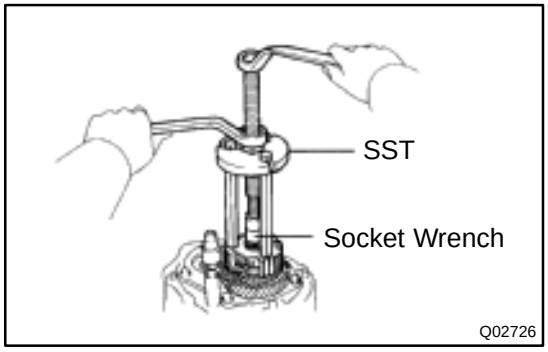
14. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

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

HINT:

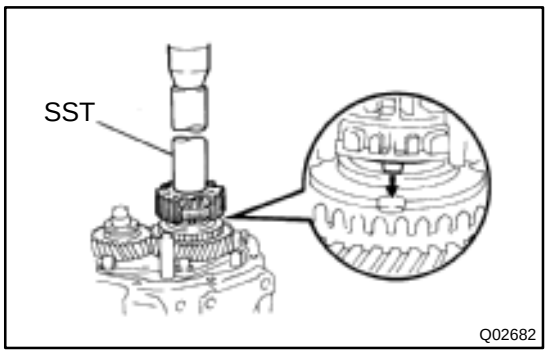
At the time of installation, please refer to the following item.
Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
13	2.20–2.25 (0.0866–0.0886)	21	2.60–2.65 (0.1024–0.1043)
14	2.25–2.30 (0.0886–0.0906)	22	2.65–2.70 (0.1043–0.1063)
15	2.30–2.35 (0.0906–0.0925)	23	2.70–2.75 (0.1063–0.1083)
16	2.35–2.40 (0.0925–0.0945)	24	2.75–2.80 (0.1083–0.1102)
17	2.40–2.45 (0.0945–0.0965)	25	2.80–2.85 (0.1102–0.1122)
18	2.45–2.50 (0.0965–0.0984)	26	2.85–2.90 (0.1122–0.1142)
19	2.50–2.55 (0.0984–0.1004)	27	2.90–2.95 (0.1142–0.1161)
20	2.55–2.60 (0.1004–0.1024)	–	–



Q02726

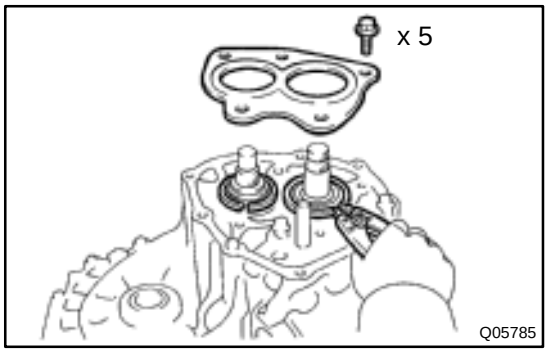
(b) Using SST and a socket wrench, remove the No.3 clutch hub with the synchronizer ring.
SST 09950–30010



HINT:
At the time of installation, please refer to the following item.
Using SST and a press, install the No.3 clutch hub assembly.
SST 09612–22011

(c) Remove the 5th gear.

15. REMOVE NEEDLE ROLLER BEARING



16. REMOVE REAR BEARING RETAINER

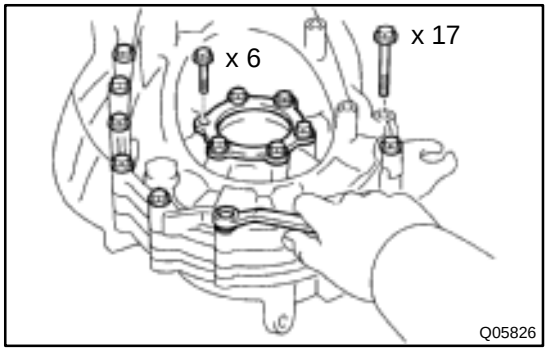
Remove the 5 bolts and retainer.

Sealant:
Part No.08833 – 00070, THREE BOND 1324 or equivalent
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

17. 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.



18. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

19. REMOVE DIFFERENTIAL SIDE BEARING RETAINER AND SHIM

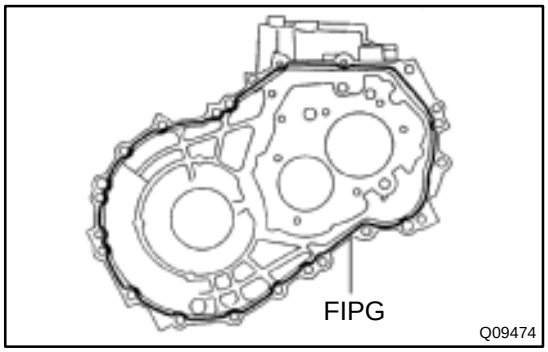
Remove the 6 bolts, retainer and shim.

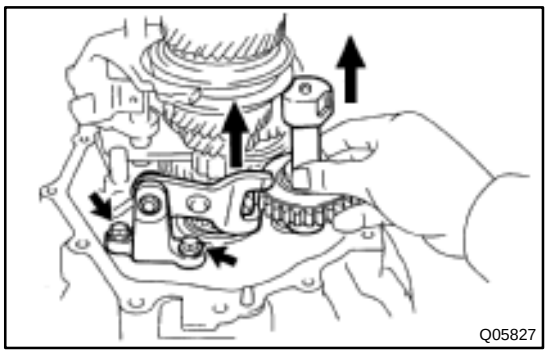
Sealant:
Part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

20. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

(b) Using a plastic hammer, tap the transmission case and remove it.
FIPG:
Part No. 08833 – 00090, THREE BOND 1281 or equivalent





21. REMOVE REVERSE IDLER GEAR AND SHAFT

(a) Pull out the shaft.

(b) Remove the idler gear and thrust washer.

22. REMOVE REVERSE SHIFT ARM

(a) Shift the fork shaft into reverse.

(b) Remove the 2 bolts and pull off the reverse shift arm.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

23. REMOVE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1 AND NO.2 SHIFT FORKS, REVERSE SHIFT FORK WITH INTERLOCK PIN, INPUT AND OUTPUT SHAFTS ASSEMBLY

24. REMOVE DIFFERENTIAL CASE ASSEMBLY

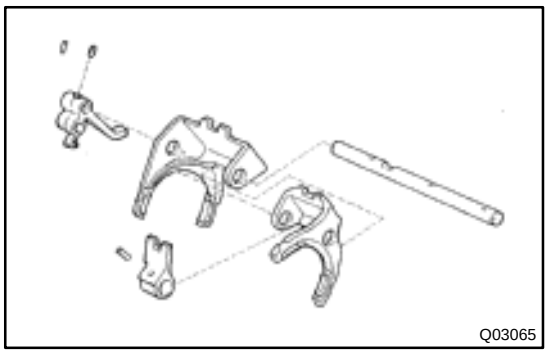
25. REMOVE MAGNET FROM TRANSAXLE CASE

26. REMOVE NO.2 SHIFT FORK SHAFT

(a) Using a hexagon wrench, remove the straight screw plug.
Sealant:
Part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Pull out the shaft.



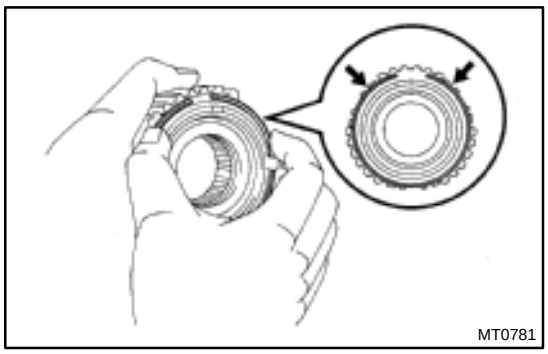
27. SEPARATE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1, NO.2 SHIFT FORKS AND REVERSE SHIFT FORK

(a) Mount the shift forks to the vise.

(b) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft.

(c) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft, as shown.

(d) Separate the No.1 shift fork shaft, No.1 shift head, No.1 and No.2 shift forks and reverse shift fork.



28. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

(a) Remove the No.5 synchronizer ring with the key spring from the No.3 clutch hub.

(b) Using a screwdriver, remove the snap ring.

HINT:

Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

(c) Remove the synchronizer rings.

MX05M–01

INSPECTION

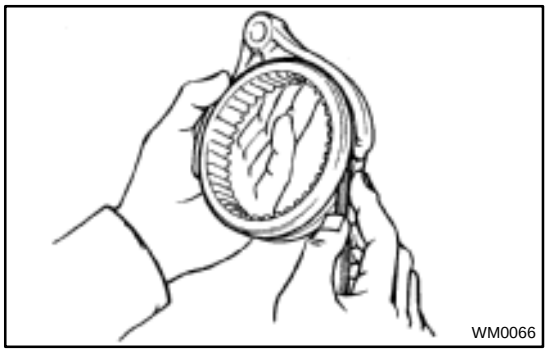
1. INSPECT NO.5 SYNCHRONIZER RING

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring.

Turn the middle No.5 synchronizer ring in one direction while pushing it to the outer No.5 synchronizer ring. Check that the ring locks.

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

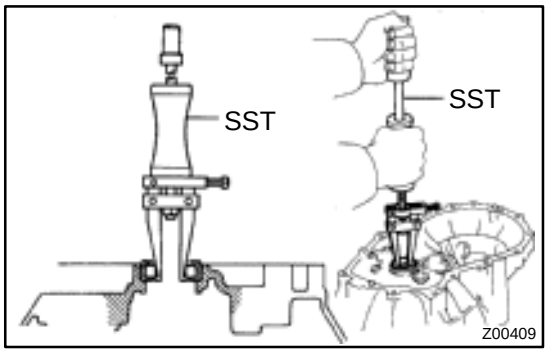


2. INSPECT NO.3 SHIFT FORK AND NO.3 HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

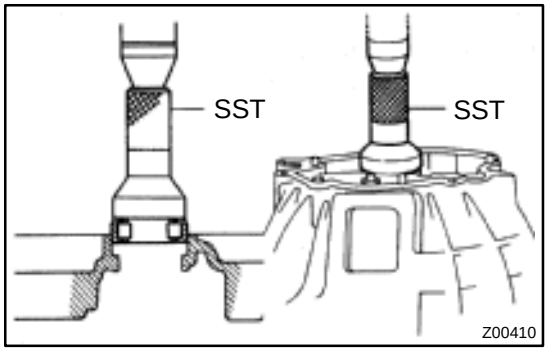
If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



3. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

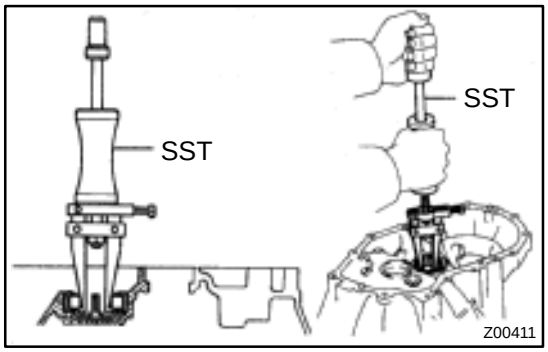
(a) Remove the 2 bolts and transaxle case receiver.

(b) Using SST, pull out the bearing.
SST 09308–00010



(c) Using SST, press in a new bearing.
SST 09310–35010

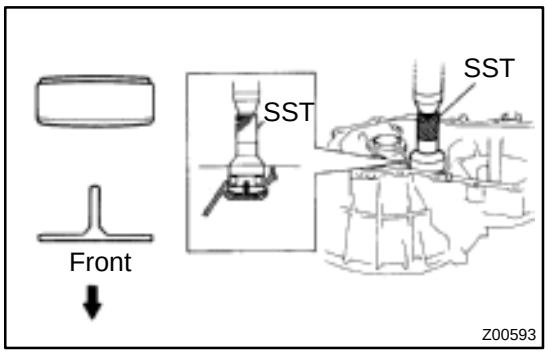
(d) Install the transaxle case receiver and torque the 2 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



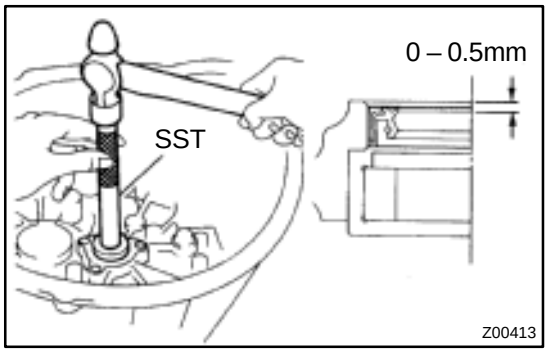
4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

(a) Remove the bolt and bearing lock plate.

(b) Using SST, pull out the bearing.
SST 09308–00010

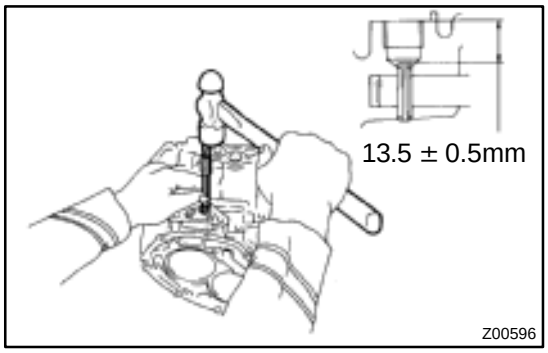


(c) Using SST, press in a new bearing.
SST 09310–35010
(d) Install the bearing lock plate and torque the bolt.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



5. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

(a) Using a screwdriver, pry out the oil seal.
(b) Using SST, drive in a new oil seal.
SST 09608–00081, 09950–70010 (09951–07150)
Drive in depth:
0 – 0.5 mm (0 – 0.020 in.)
(c) Coat the lip of the oil seal with MP grease.



6. 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.
Drive in depth:
13.5 ± 0.5 mm (0.531 ± 0.020 in.)
(e) Apply sealant to the plug threads.
Sealant:
Part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
(f) Using a hexagon wrench, install and torque the straight screw plug.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

MX04I–01

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page MX–11).

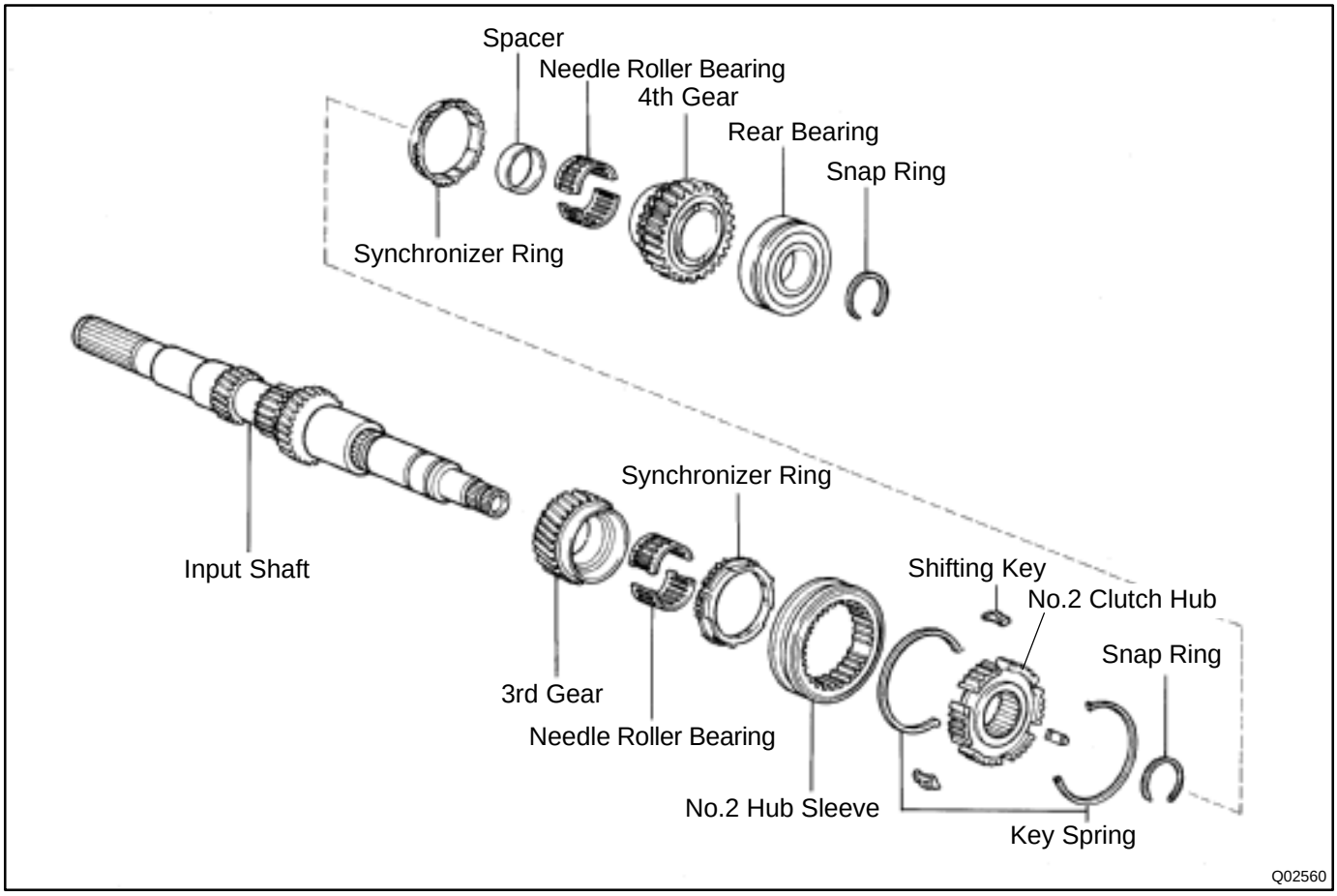
HINT:

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

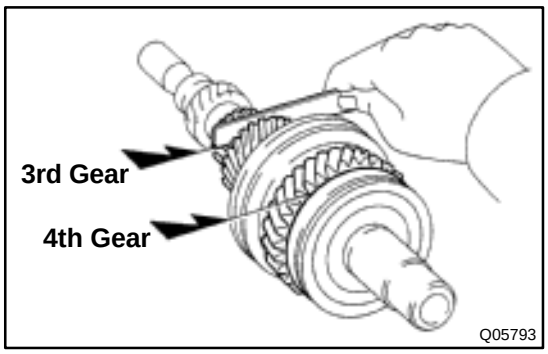
INPUT SHAFT

COMPONENTS

MX04J–01



MX04K–01

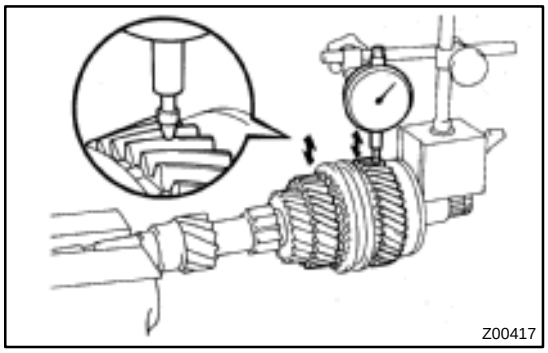


DISASSEMBLY

1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the clearance.

Standard clearance:
3rd gear: 0.10 – 0.25 mm (0.0039 – 0.0098 in.)
4th gear: 0.20 – 0.45 mm (0.0079 – 0.0177 in.)
Maximum clearance:
3rd gear: 0.30 mm (0.0118 in.)
4th gear: 0.50 mm (0.0197 in.)



2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCES

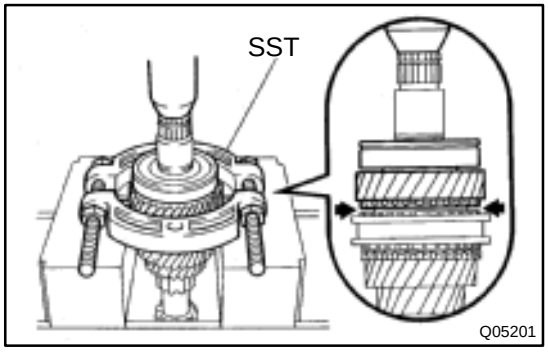
Using a dial indicator, measure the radial clearance between the gear and shaft.

Standard clearance:
0.009 – 0.053 mm (0.0004 – 0.0021 in.)
Maximum clearance:
0.070 mm (0.0028 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.



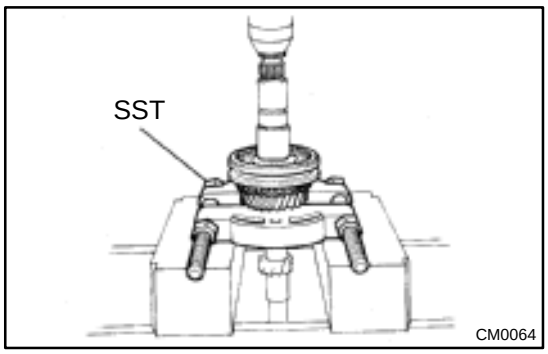
4. REMOVE REAR BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

(a) Using SST and a press, remove the 4th gear and rear bearing.
SST 09950–00020

(b) Remove the needle roller bearings, spacer and synchronizer ring.

5. REMOVE SNAP RING

Using a snap ring expander, remove the snap ring.



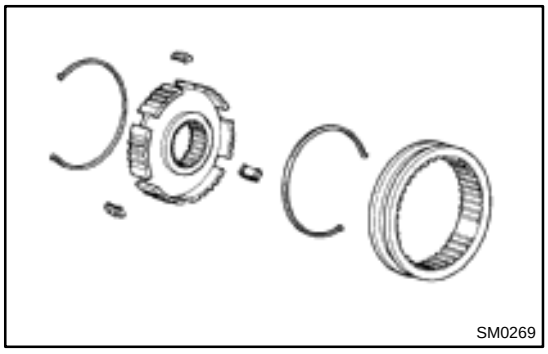
6. REMOVE NO.2 HUB SLEEVE ASSEMBLY, 3RD GEAR SYNCHRONIZER RING AND NEEDLE ROLLER BEARING

Using SST and a press, remove the No.2 hub sleeve, 3rd gear, synchronizer ring and needle roller bearings.

SST 09950–00020

NOTICE:

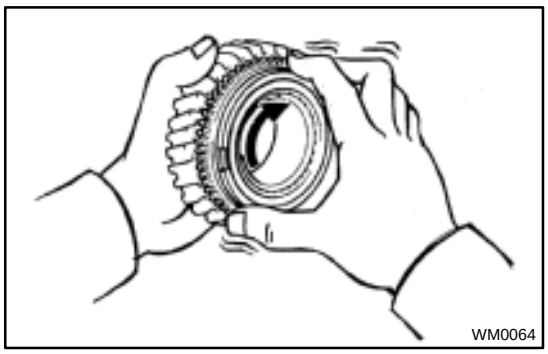
Be careful not to mistake the 3rd gear synchronizer ring for the 4th gear synchronizer ring.



7. REMOVE NO.2 HUB SLEEVE, SHIFTING KEY AND SPRING FROM NO.2 CLUTCH HUB

Using a screwdriver, remove the 3 shifting keys and 2 springs from the No.2 clutch hub.

MX04L–01


WM0064

INSPECTION

1. INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

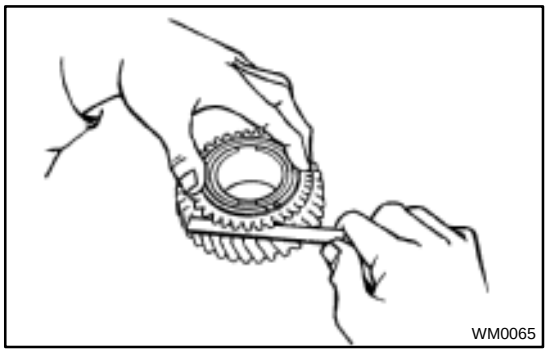
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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.


WM0065

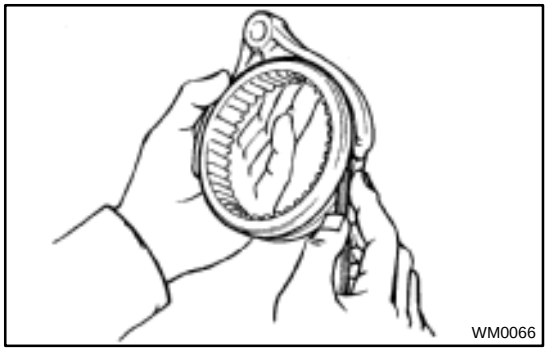
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:
0.6 mm (0.024 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.

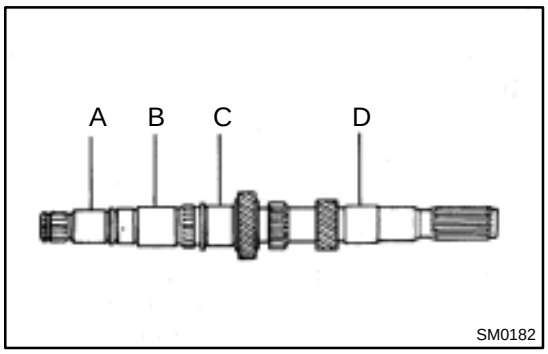

WM0066

2. INSPECT NO.2 SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

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



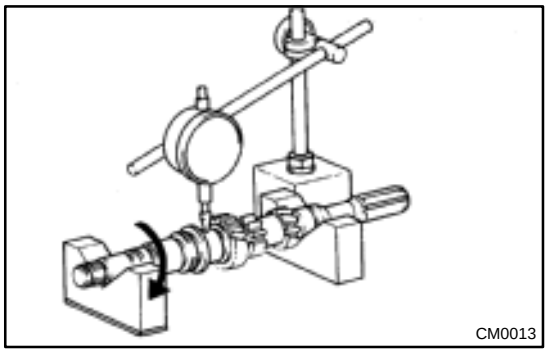
3. INSPECT INPUT SHAFT

(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: 26.970 mm (1.0618 in.)
Part B: 32.470 mm (1.2783 in.)
Part C: 33.090 mm (1.3028 in.)
Part D: 29.970 mm (1.1799 in.)

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



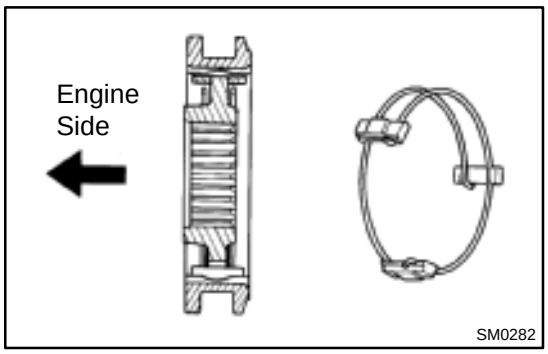
(c) Using a dial indicator, check the shaft runout.

Maximum runout:
0.05 mm (0.0020 in.)

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

MX04M–01

REASSEMBLY



HINT:

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

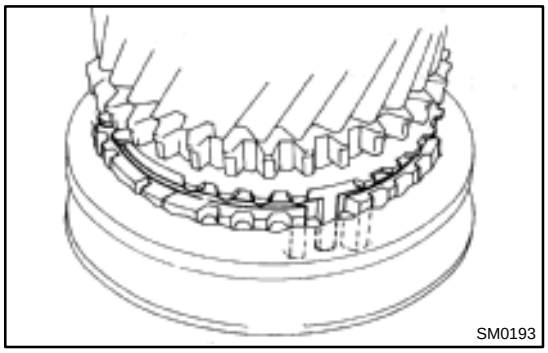
1. INSTALL NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the clutch hub and shifting keys to the hub sleeve.

(b) Install the shifting key springs under the shifting keys.

NOTICE:

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



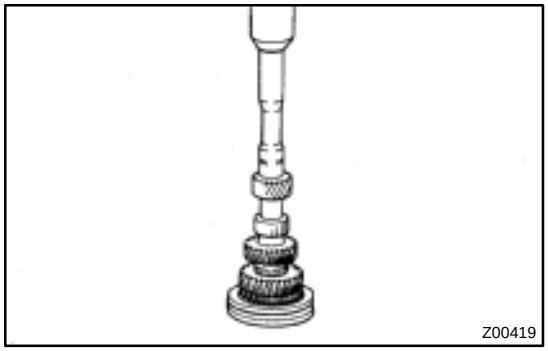
2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

(a) Apply gear oil to the needle roller bearings.

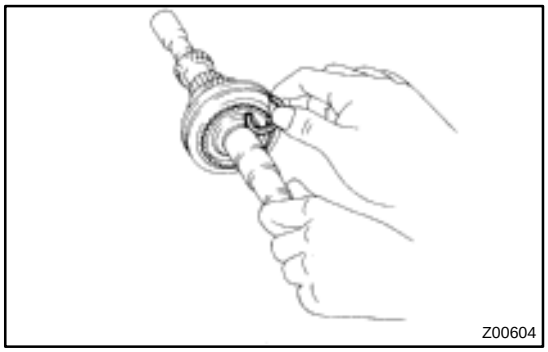
(b) Place the synchronizer ring (for the 3rd gear) on the gear and align the ring slots with the shifting keys.

NOTICE:

Do not install the synchronizer ring for 4th gear.



(c) Using a press, install the 3rd gear and No.2 hub sleeve.



3. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
1	1.95–2.00 (0.0768–0.0787)
2	2.00–2.05 (0.0787–0.0807)
3	2.05–2.10 (0.0807–0.0827)
4	2.10–2.15 (0.0827–0.0846)
5	2.15–2.20 (0.0846–0.0866)
6	2.20–2.25 (0.0866–0.0886)

(b) Using a snap ring expander, install the snap ring.

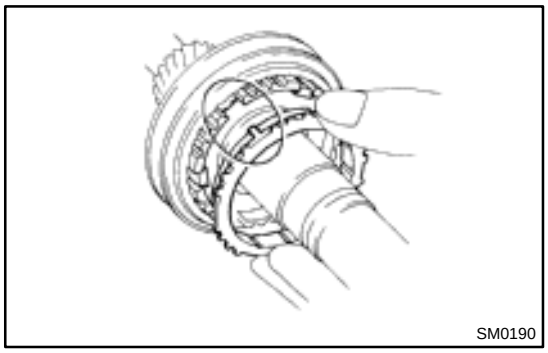
4. INSPECT 3RD GEAR THRUST CLEARANCE
(See page MX–20)


SM0189

5. INSTALL SYNCHRONIZER RING, NEEDLE ROLLER BEARING, SPACER, 4TH GEAR AND REAR BALL BEARING

(a) Apply gear oil to the needle roller bearings.

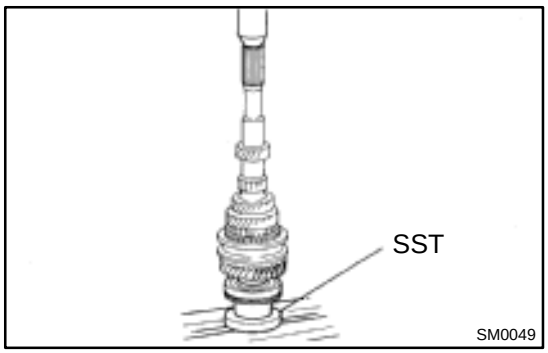
(b) Install the spacer and needle roller bearings.


SM0190

(c) Place the synchronizer ring on the gear.

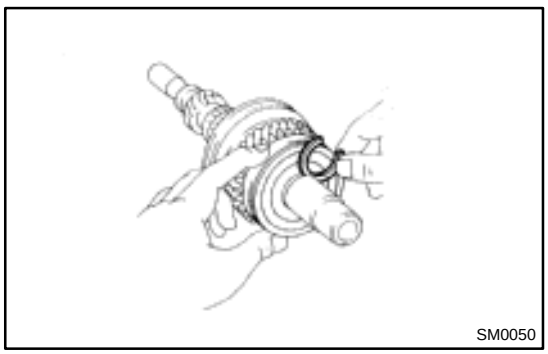
HINT:

Align the ring slots with the shifting keys and the ring projections with the hub slots.



SM0049

(d) Using SST and a press, install the rear ball bearing.
SST 09608–00071


SM0050

6. INSTALL SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.15–2.20 (0.0846–0.0866)
B	2.20–2.25 (0.0866–0.0886)
C	2.25–2.30 (0.0886–0.0906)
D	2.30–2.35 (0.0906–0.0925)
E	2.35–2.40 (0.0925–0.0945)

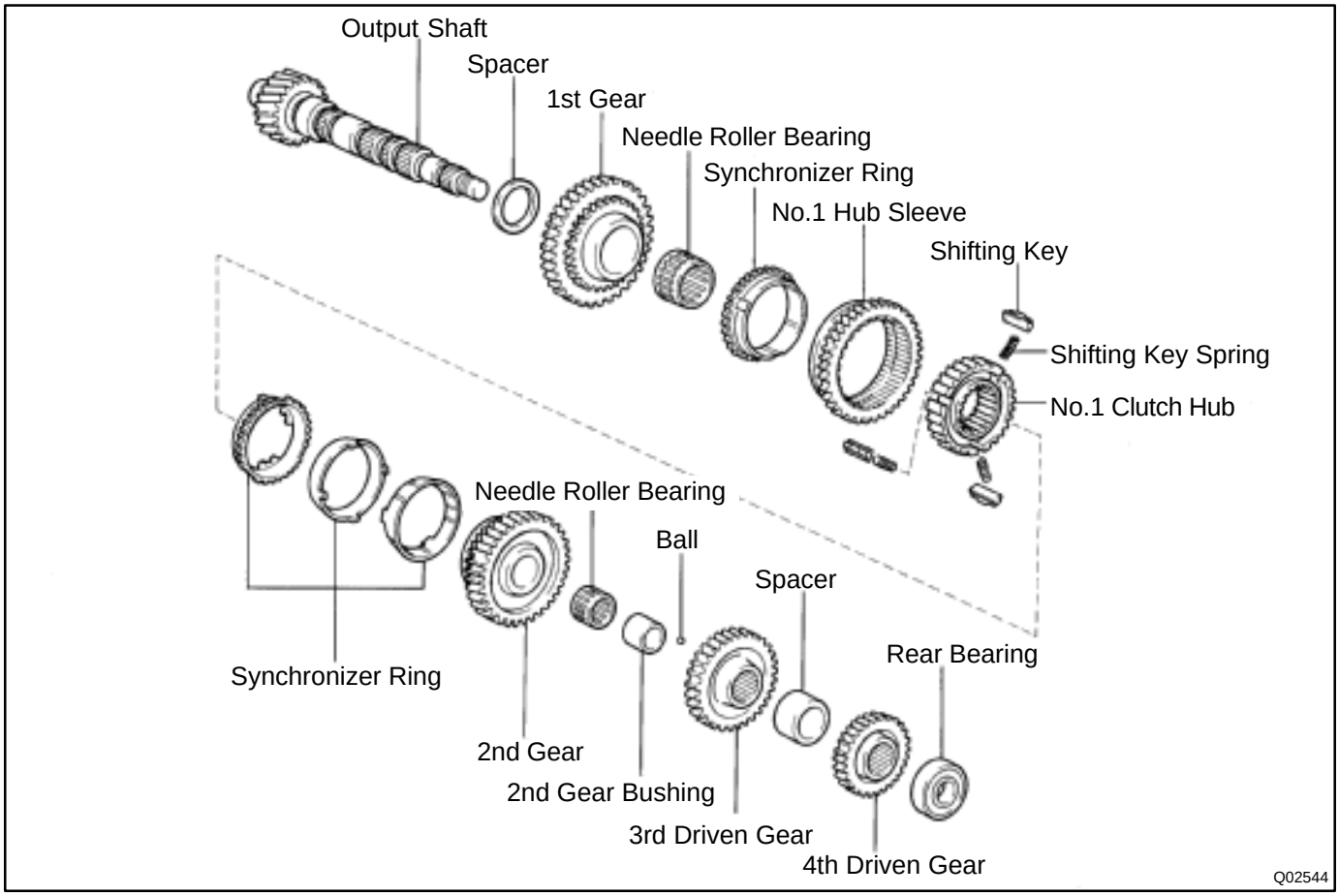
(b) Using a screwdriver and hammer, tap in the snap ring.

7. INSPECT 4TH GEAR THRUST CLEARANCE
(See page MX–20)

OUTPUT SHAFT

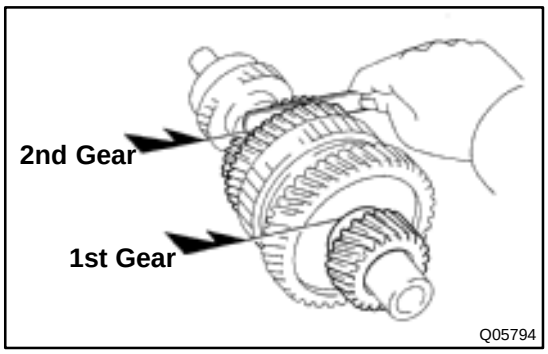
COMPONENTS

MX04N–01



MX04O–01

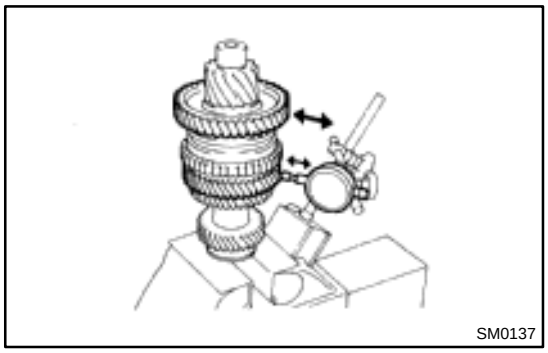
DISASSEMBLY



1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

Standard clearance:
1st gear: 0.10 – 0.29 mm (0.0039 – 0.0114 in.)
2nd gear: 0.20 – 0.44 mm (0.0079 – 0.0173 in.)
Maximum clearance:
1st gear: 0.35 mm (0.0138 in.)
2nd gear: 0.50 mm (0.0197 in.)

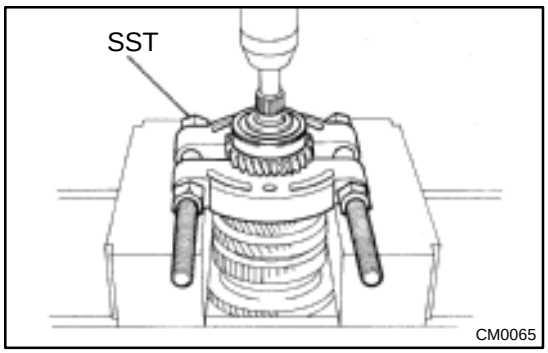


2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

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

Standard clearance:
0.009 – 0.053 mm (0.0004 – 0.0021 in.)
Maximum clearance:
0.070 mm (0.0028 in.)

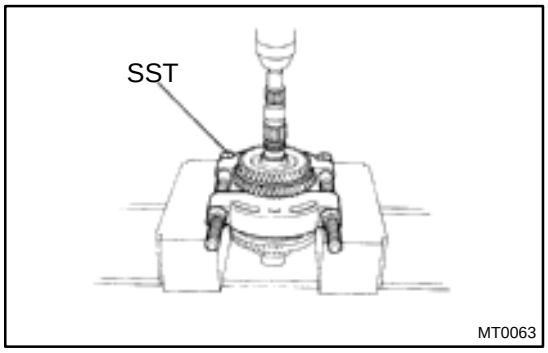
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



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

(a) Using SST and a press, remove the rear ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output gear spacer and ball.

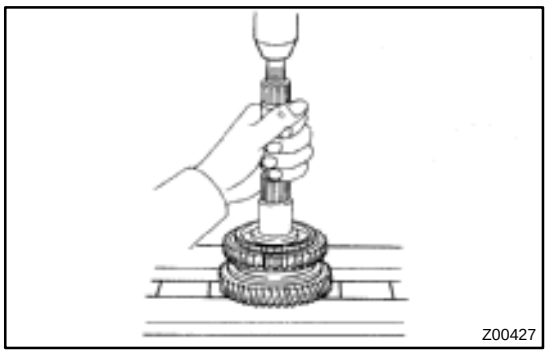


4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING AND SYNCHRONIZER RING

(a) Shift the No.1 hub sleeve into the 1st gear.

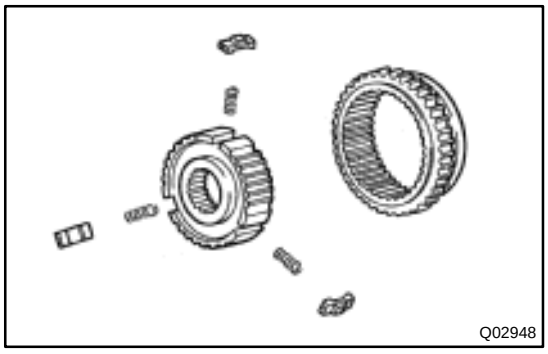
(b) Using SST and a press, remove the 3rd driven gear and 2nd gear.
SST 09950–00020

(c) Remove the needle roller bearing and synchronizer rings.



5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, 1ST GEAR, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND LOCKING BALL

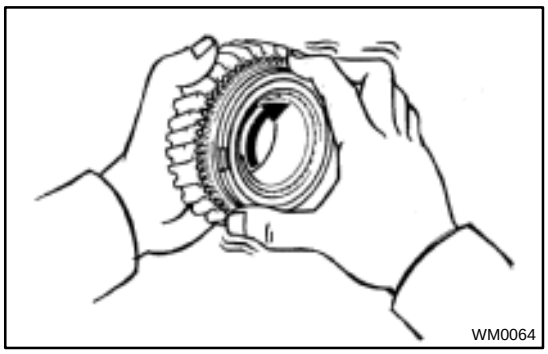
(a) Using a press, remove the No.1 hub sleeve, 1st gear and synchronizer ring.
(b) Remove the needle roller bearing and locking ball.
(c) Using a screwdriver and hammer, drive out the thrust washer.



6. REMOVE NO.1 HUB SLEEVE, 3 SHIFTING KEYS AND SPRINGS FROM NO.1 CLUTCH HUB

MX04P–01

INSPECTION


WM0064

1. INSPECT 1ST GEAR SYNCHRONIZER RING

(a) Check for wear or damage.

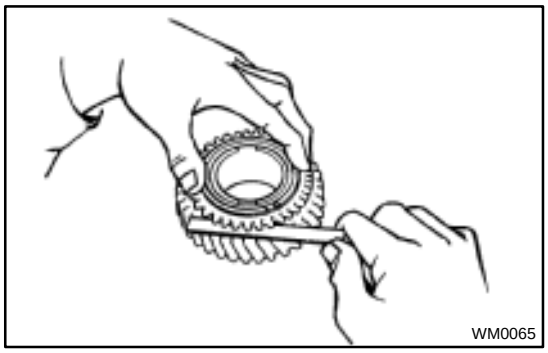
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

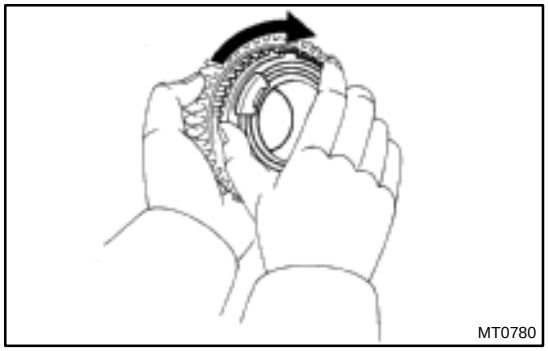
(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.

Minimum clearance:
0.6 mm (0.024 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.

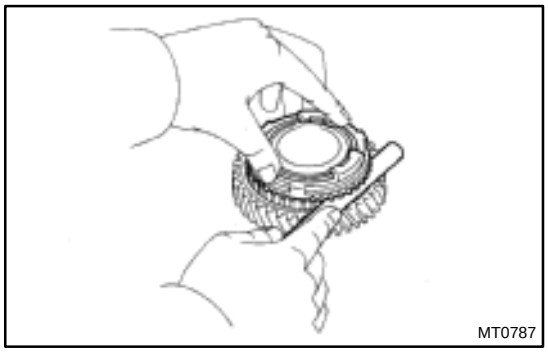

MT0780

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.

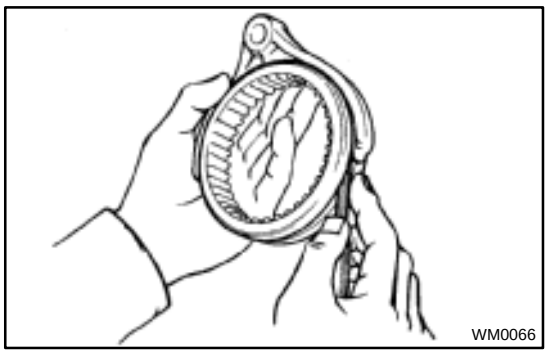
If the braking effect is insufficient, replace the synchronizer ring.


MT0787

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

Minimum clearance:
0.7 mm (0.028 in.)

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

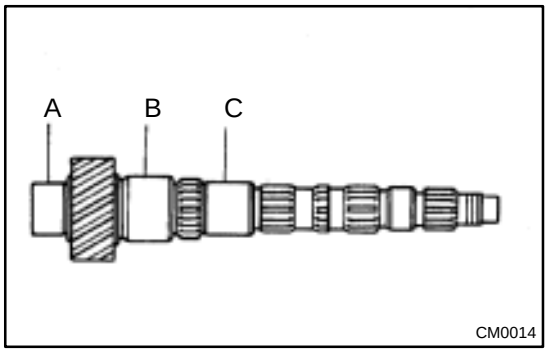

WM0066

3. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance:
1.0 mm (0.039 in.)

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



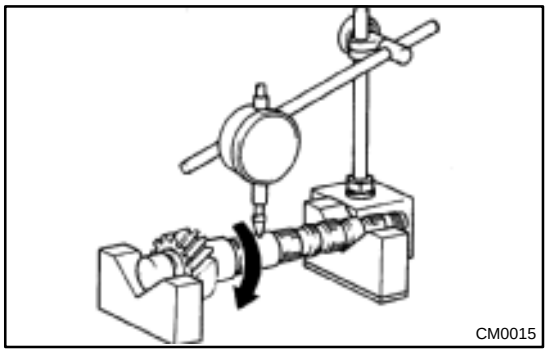
CM0014

4. INSPECT OUTPUT SHAFT

(a) Using a micrometer, measure the outer diameter of the output shaft journal surface.

Minimum outer diameter:
Part A: 31.970 mm (1.2587 in.)
Part B: 37.970 mm (1.4949 in.)
Part C: 31.990 mm (1.2594 in.)

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


CM0015

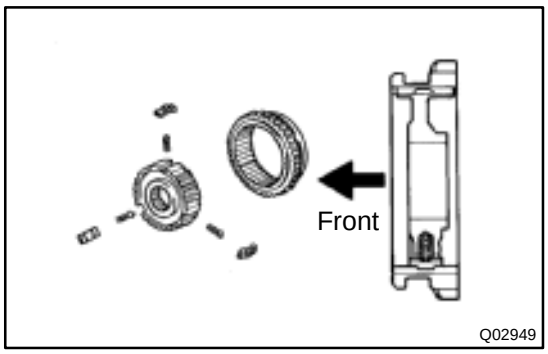
(b) Using a dial indicator, check the shaft runout.

Maximum runout:
0.05 mm (0.0020 in.)

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

MX04Q–01

REASSEMBLY



HINT:

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

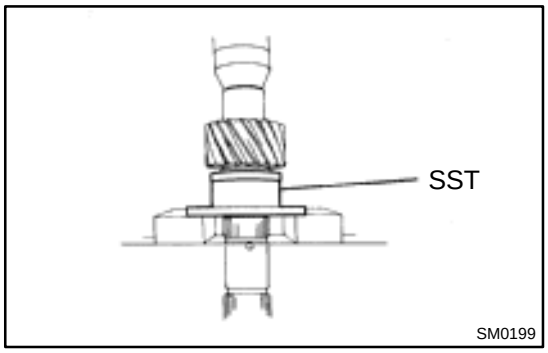
1. INSTALL NO.1 CLUTCH HUB INTO HUB SLEEVE

(a) Install the 3 springs and shifting keys to the clutch hub.

(b) Install the hub sleeve to the clutch hub.

HINT:

Position the identification groove of the hub sleeve to the front of the transmission.

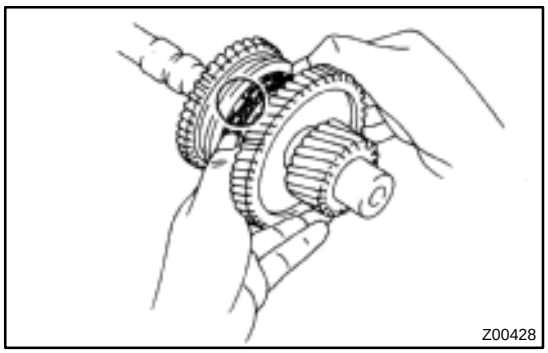


2. INSTALL THRUST WASHER, 1ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

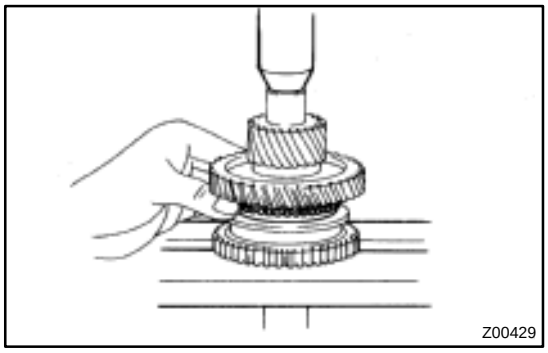
(a) Using SST and a press, install the thrust washer.

SST 09316–60011 (09316–00041)

(b) Apply gear oil to the needle roller bearing.

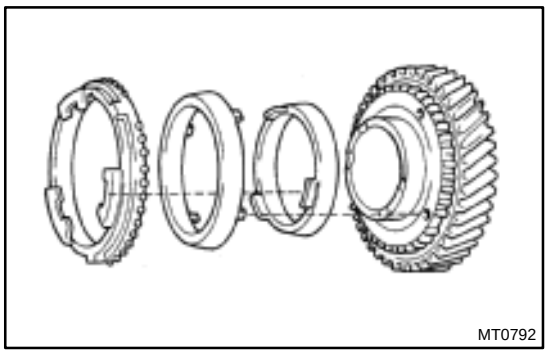


(c) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(d) Using a press, install the 1st gear and No.1 hub sleeve.

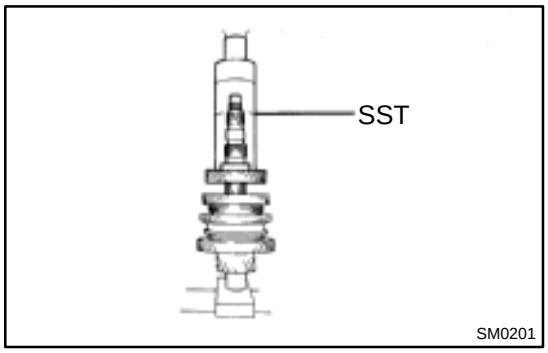
3. INSPECT 1ST GEAR THRUST CLEARANCE
(See page MX–28)


MT0792

4. INSTALL SYNCHRONIZER RING, 2ND GEAR, NEEDLE ROLLER BEARING AND 3RD DRIVEN GEAR

(a) Install the ball.
(b) Fit the 2nd gear bushing groove securely over the ball when installing the 2nd gear bushing on the shaft.
(c) Place the synchronizer rings on the 2nd gear.
(d) Apply gear oil to the needle roller bearing and install it.
(e) Install the 2nd gear.

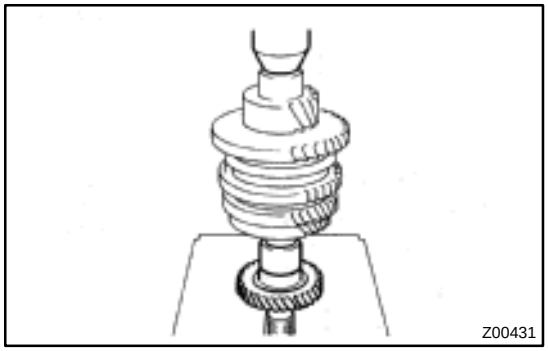
NOTICE:
Align the clutch hub grooves with the projections on the synchronizer ring.



SM0201

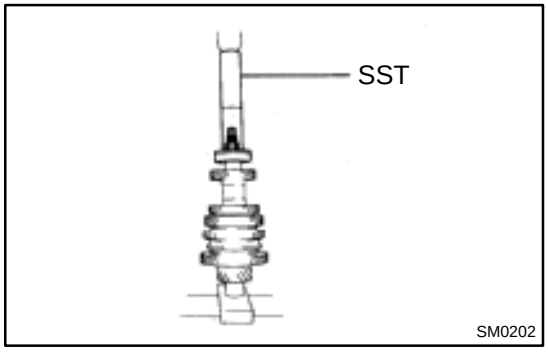
(f) Using SST and a press, install the 3rd driven gear.
SST 09316–60011 (09316–00011)

5. INSPECT 2ND GEAR THRUST CLEARANCE
(See page MX–28)


Z00431

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

(a) Install the outer gear spacer.
(b) Using a press, install the 4th driven gear and bearing.



SM0202

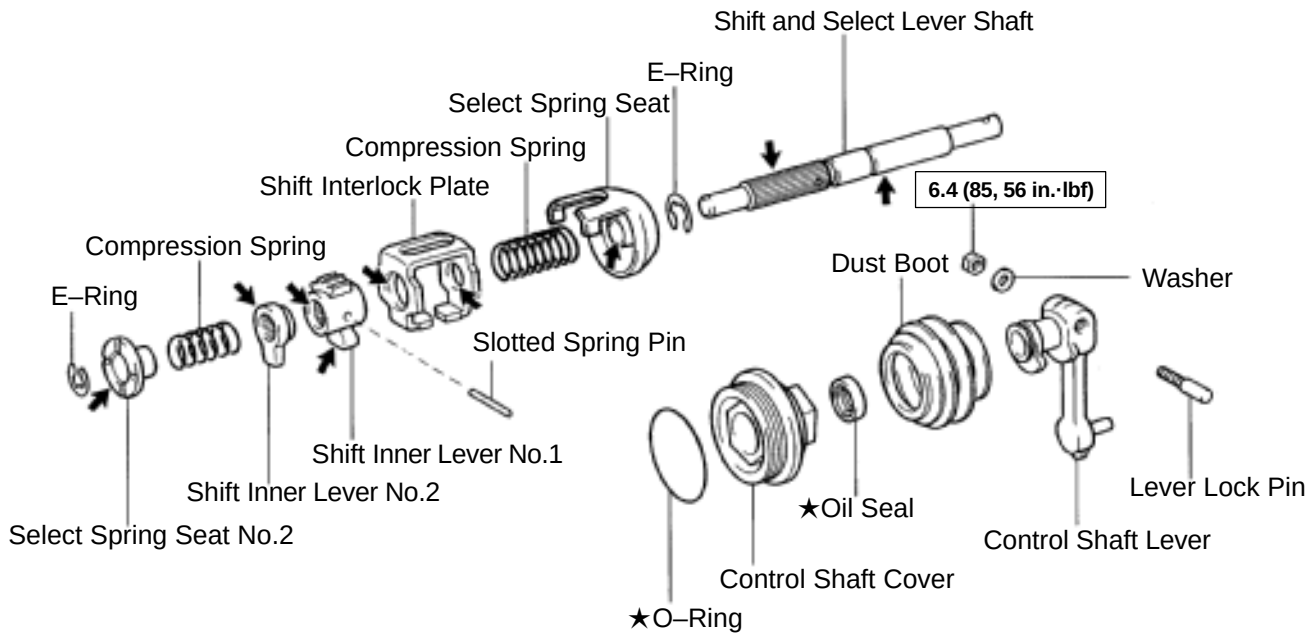
7. INSTALL REAR BEARING

Using SST and a press, install the rear bearing.
SST 09612–22011

SHIFT AND SELECT LEVER SHAFT

MX04R–01

COMPONENTS



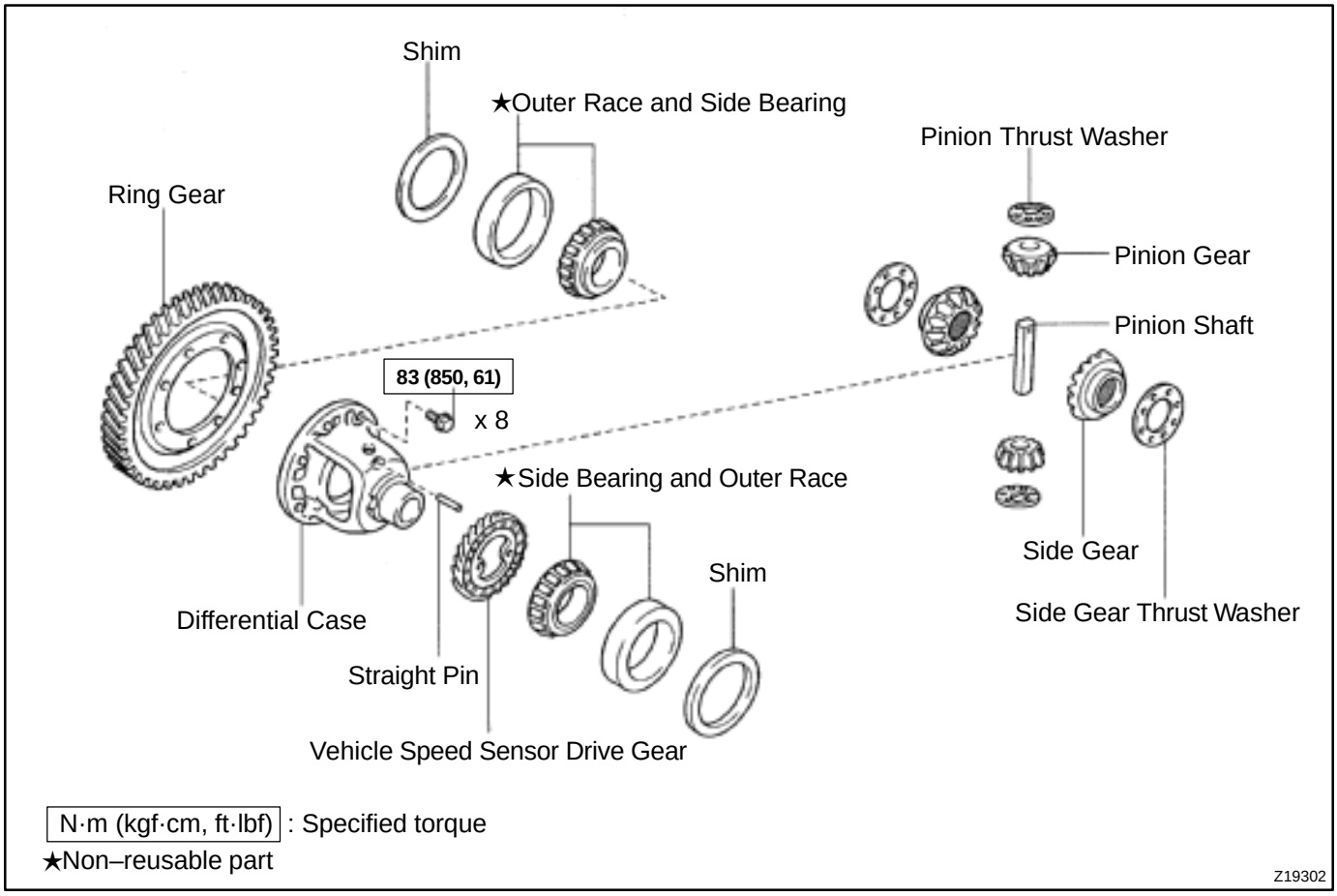
N·m (kgf·cm, ft·lbf): Specified torque
★ Non–reusable part
⬅ MP Grease

Q10277

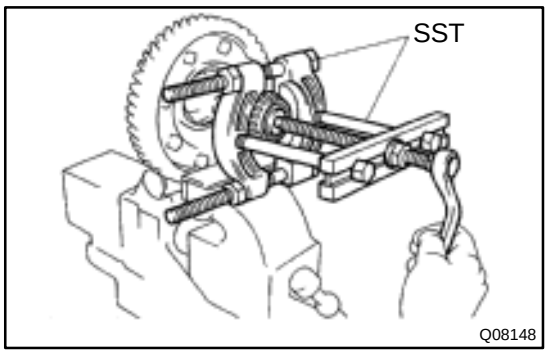
DIFFERENTIAL CASE

COMPONENTS

MX04S–01



MX04T–01



DISASSEMBLY

1. Vehicle Speed Sensor Drive Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

(a) Using SST, remove the bearing from the drive gear side of the case.
SST 09950–00020, 09950–00030

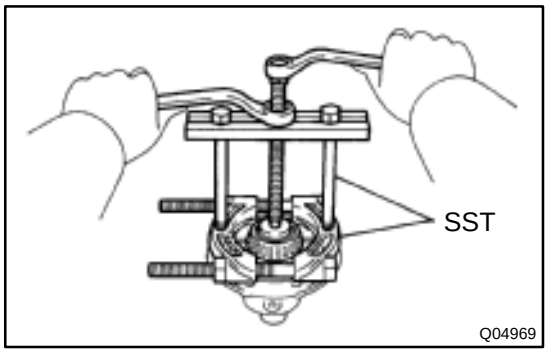
(b) Remove the vehicle speed sensor drive gear.

2. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and case.

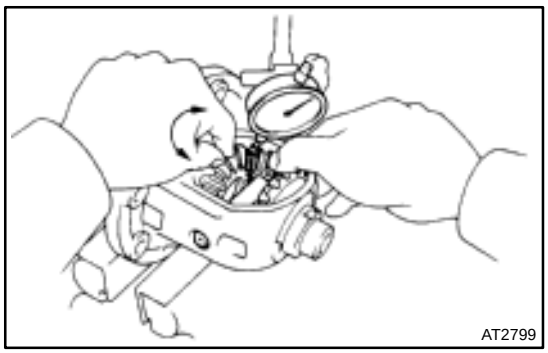
(b) Remove the 8 bolts.

(c) Using a copper hammer, tap on the ring gear to remove it from the case.



3. Ring Gear Side:
REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

Using SST, remove the bearing from the ring gear side of the case.
SST 09950–00020, 09950–00030



4. INSPECT SIDE GEAR BACKLASH

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

Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

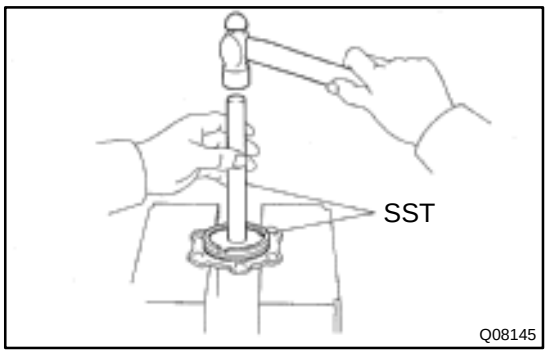
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

(a) Using a pin punch and hammer, drive out the straight pin.

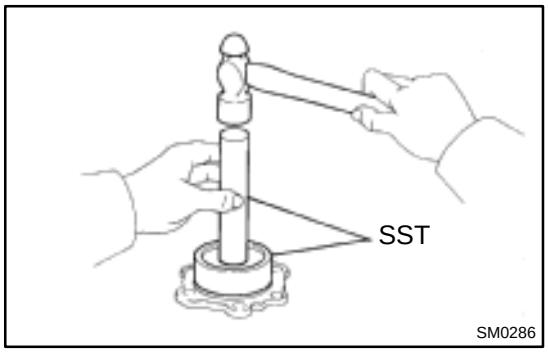
(b) Remove the pinion shaft from the case.

(c) Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



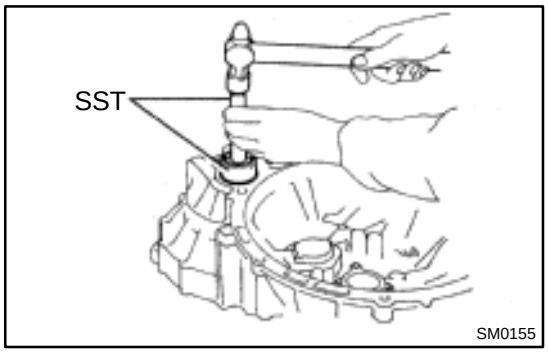
6. Transaxle Case Side:
IF NECESSARY, REPLACE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Using SST and a hammer, drive out the oil seal from the retainer.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)



(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

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

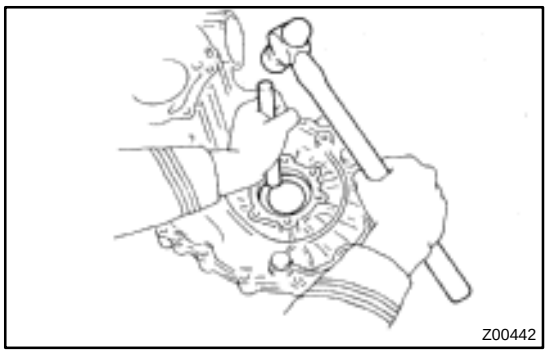


7. Transmission Case Side:
IF NECESSARY, REPLACE SIDE OIL SEAL

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

(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)

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

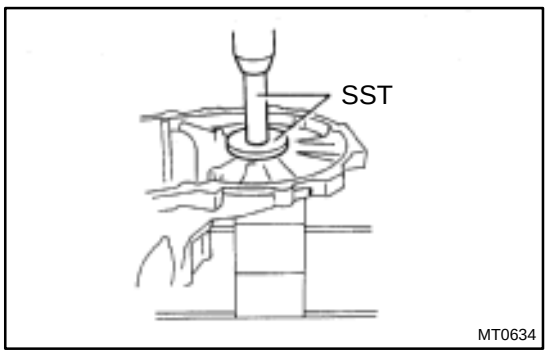


8. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race.

(b) Install the bearing retainer without an O–ring.

(c) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

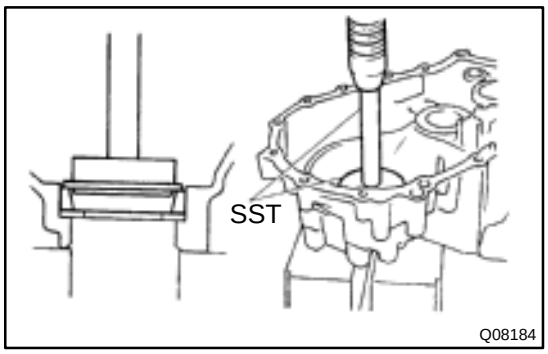


(d) Place the thinnest shim into the case.

(e) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

(f) Remove the 6 bolts.

(g) Remove the bearing retainer and shim.



9. Transaxle Case Side:
IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

(a) Using a brass bar and hammer, drive out the bearing outer race and shim.

(b) Place the shim into the case.

(c) Using SST and a press, install a new bearing outer race.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07150)

MX04U–01

REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

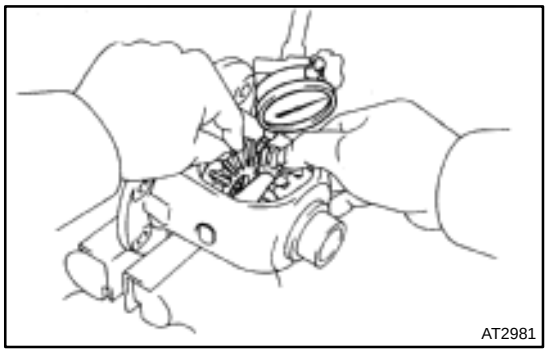
(a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.

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)

Install the thrust washers and side gears in the differential case.

(b) Install the pinion shaft.


AT2981

(c) Inspect the side gear backlash.
Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the 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.

(d) Using a pin punch and hammer, drive in the straight pin through the case and hole in the pinion shaft.

(e) Stake the differential case.

2. INSTALL RING GEAR ON DIFFERENTIAL CASE

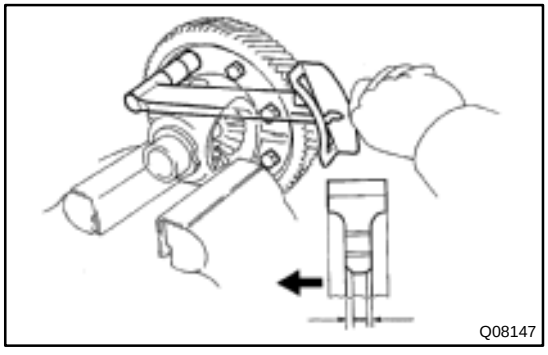
(a) Clean the contact surface of the differential case and the threads of the ring gear and differential case.

(b) Heat the ring gear in boiling water.

(c) Carefully take the ring gear out of the water.

(d) After moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

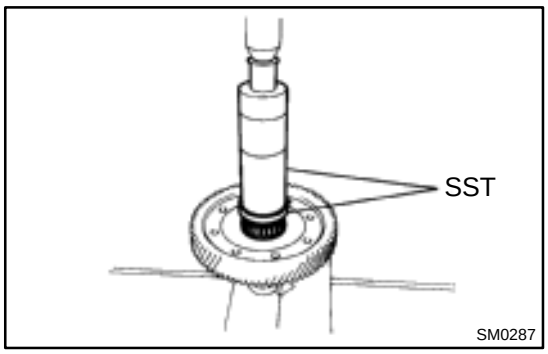
HINT:
Align the matchmarks on the differential case and the ring gear.


Q08147

(e) Temporarily install the 8 bolts.

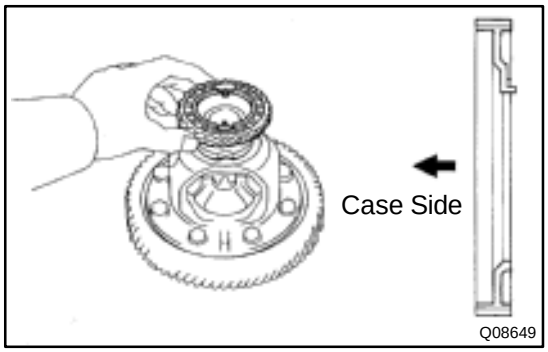
NOTICE:
The ring gear set bolts should not be torqued until the ring gear has cooled sufficiently.

(f) After the ring gear has cooled sufficiently, torque the ring gear set bolts.
Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

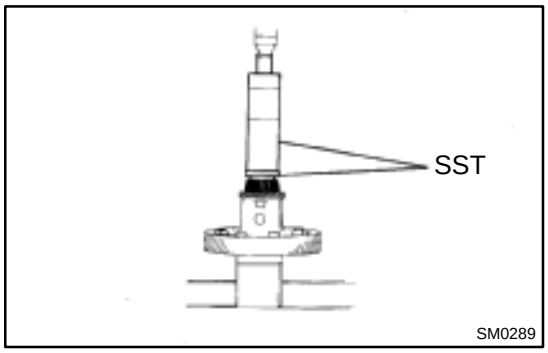


3. INSTALL SIDE BEARING TO DIFFERENTIAL CASE

(a) Using SST and a press, install a new side bearing to the transmission case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)



(b) Install the vehicle speed sensor drive gear to the transaxle case side.

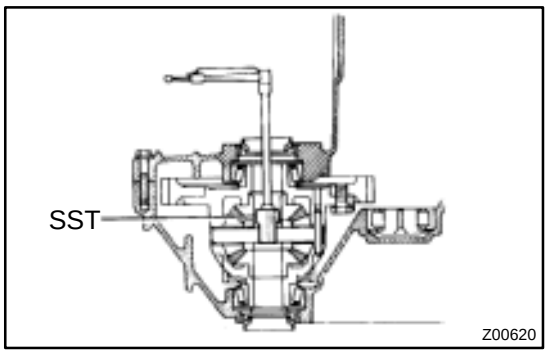


(c) Using SST and a press, install a new side bearing to the transaxle case side.
SST 09316–60011 (09316–00011), 09350–32014 (09351–32120)

NOTICE:
Install the black cage bearing on the vehicle speed sensor drive gear side.

4. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

(a) Install the differential to the transaxle case.
(b) Install the transmission case.
(c) Install and torque the case bolts.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)
(d) Install the shim into the transmission case.
(e) Install the bearing retainer without an O–ring.
(f) Install and torque the 6 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



(g) Using SST and a torque wrench, measure the preload.
SST 09564–32011
Preload (at starting):
0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)

If the preload is not within the specification, remove the transmission case side bearing retainer. Select another shim.
HINT:
The preload will change about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.·lbf) with each 0.05 mm (0.0019 in.) change in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	1.90 (0.0748)	11	2.40 (0.0945)
2	1.95 (0.0768)	12	2.45 (0.0965)
3	2.00 (0.0787)	13	2.50 (0.0984)
4	2.05 (0.0807)	14	2.55 (0.1004)
5	2.10 (0.0827)	15	2.60 (0.1024)
6	2.15 (0.0846)	16	2.65 (0.1043)
7	2.20 (0.0866)	17	2.70 (0.1063)
8	2.25 (0.0886)	18	2.75 (0.1083)
9	2.30 (0.0906)	19	2.80 (0.1102)
10	2.35 (0.0925)	–	–

(h) Remove the 6 bolts.
(i) Remove the bearing retainer and shim.
(j) Remove the 17 bolts.
(k) Remove the transmission case.

SHIFT LEVER AND CONTROL CABLE

MX04V–02

COMPONENTS